



Shinkoh Elecs  
Find your possibilities

# PHOTO SENSOR

光センサ データブック

vol. 9



透過型フォトセンサ  
PHOTO INTERRUPTER



反射型フォトセンサ  
PHOTO REFLECTOR



分離型フォトセンサ  
PHOTO INTERRUPTER-SEPARATE TYPE



LED・受光素子  
LED・PHOTO DIODE・PHOTO TRANSISTOR



プリズムフォトセンサ  
PRISM PHOTO SENSOR



アクチュエータタイプフォトセンサ  
PHOTO INTERRUPTER - ACTUATOR TYPE



限定反射型フォトセンサ  
CONVERGENT REFLECTIVE PHOTO SENSOR

Autorisierter Distributor

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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KD834 254                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KI Series / Page                                                                                                                                                                                                                                      |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KI1314 41                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KI1315 43                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI1319 45                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI1320 43                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KI1324 45                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI1390 47                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI1391 47                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI1400 49                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI1401 49                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI1470 51                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI1600 53                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI1601 53                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3024 55                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3050 57                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3051 57                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3052 57                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3053 57                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3060 59                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3061 59                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3064 61                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3110 63                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3111 63                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3300 65                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3301 65                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3520 67                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3521 67                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3524 69                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3534 69                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3544 69                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3642 71                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3644 73                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KI Series / Page                                                                                                                                                                                                                                      |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3652 75                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3654 77                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3662 79                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3663 81                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3664 83                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3674 85                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3700 87                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3701 87                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3710 87                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3711 87                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3720 89                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3740 91                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3741 91                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3744 93                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3750 95                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3751 95                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3780 97                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3781 97                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3890 99                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3940 101                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3990 103                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3991 103                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI3994 105                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5110 107                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5111 107                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5140 109                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5141 109                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5220 111                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5221 111                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5230 113                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5231 113                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5234 115                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5240 117                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI Series / Page                                                                                                                                                                                                                                      |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5264 119                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5274 121                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5350 123                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5351 123                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5354 125                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5365 127                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5510 129                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5511 129                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5530 131                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5531 131                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5540 131                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5541 131                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5770 133                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KI5771 133                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KI5774 135                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KI5780 137                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KI5781 137                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KI5784 139                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KL856 246                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KL857 248                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KL899 250                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KL3095 252                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KP1430 228                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KP1650 230                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KP1651 230                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KP1660 232                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KP1662 234                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KP1663 234                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KP1850 236                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KP3250 238                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KR Series / Page                                                                                                                                                                                                                                      |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR864 171                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| KR865 171                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR866 171                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR894 173                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR895 173                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR1207 175                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR1210 177                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR1211 179                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR1218 181                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR1219 181                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR1226 183                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR1227 183                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR1228 185                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR1229 185                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR1570 187                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR1571 187                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3140 189                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3320 191                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3330 193                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3331 195                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3380 197                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3610 199                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3620 201                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                                                                                                                                                                                                                                                             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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3630 203                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3900 181                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3910 181                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3920 181                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR3930 181                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KR5015 205                                                                                                                                                                                                                                            |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KM Series / Page                                                                                                                                                                                                                                      |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                                                                                                                                                                                                                                                             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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KMA1 207-227                                                                                                                                                                                                                                          |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                                                                                                                                                                                                                                                             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 |            |            |            |            |            |            |            |            |            |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KMBA1 207-227                                                                                                                                                                                                                                         |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                                                                                                                                                                                                                                                             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 |            |            |            |            |            |            |            |            |            |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KMBA2 207-227                                                                                                                                                                                                                                         |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KMBA3 207-227                                                                                                                                                                                                                                         |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KS Series / Page                                                                                                                                                                                                                                      |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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         |            |            |            |            |                  |              |               |               |               |                  |           |
| KS853 256                                                                                                                                                                                                                                             |                  |            |            |            |            |            |            |            |                                                                              |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                                                                                                                                                                                                                                                             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         |            |            |            |            |                  |              |               |               |               |                  |           |

機能検索目次 / Photo sensor series Functional Index

Output type   A: アナログ出力 / D:Photo IC 出力 / M: 光変調式 / RGB: カラーセンサ  
Output type   A :Analog / D :Photo IC / M :Light modulation type / RGB:Color sensor

| 透過型フォトセンサ / Photo Interrupter |                       |             |               |             |                       |             |
|-------------------------------|-----------------------|-------------|---------------|-------------|-----------------------|-------------|
| GAP<br>(mm)                   | Slit<br>Width<br>(mm) | Out-<br>put | 接続<br>Connect | 取付<br>Mount | 型名<br>Model number    | ページ<br>Page |
| 2.2                           | 0.2 ※ 1               | A           | PCB           | Boss        | KI3720                | 89          |
| 3                             | 0.5                   | A           | PCB           | Boss        | KI1470                | 51          |
| 3                             | 0.5                   | D           | PCB           | -           | KI3662                | 79          |
| 3                             | 0.5                   | D           | PCB           | -           | KI3663                | 81          |
| 3                             | 0.5                   | A           | PCB           | -           | KI3664                | 83          |
| 3                             | 0.5                   | A           | PCB           | -           | KI3674                | 85          |
| 3.4                           | 0.7                   | A           | Connector     | Screw       | KI5274                | 121         |
| 3.5                           | 0.5                   | D           | Connector     | Screw       | KI5220/5221           | 111         |
| 4                             | 0.5                   | A           | PCB           | Boss        | KI1221                | 17          |
| 4                             | 0.5                   | A           | Connector     | Screw       | KI3890                | 99          |
| 4.7                           | 0.5                   | D           | Connector     | Screw       | KI5140/5141           | 109         |
| 5                             | 0.25                  | D           | Connector     | Screw       | KI3110/3111           | 63          |
| 5                             | 0.5                   | D           | Connector     | Screw       | KI1138                | 11          |
| 5                             | 0.5                   | A           | Connector     | Screw       | KI1232                | 25          |
| 5                             | 0.5                   | D           | Connector     | Screw       | KI1233/1234/1235/1236 | 27          |
| 5                             | 0.5                   | D           | Connector     | Screw       | KI1285/1286           | 31          |
| 5                             | 0.5                   | D           | PCB           | Boss/Screw  | KI1315/1320           | 43          |
| 5                             | 0.5                   | A           | PCB           | Boss/Screw  | KI1319/1324           | 45          |
| 5                             | 0.5                   | D           | Connector     | Screw       | KI1400/1401           | 49          |
| 5                             | 0.5                   | D           | Connector     | Screw       | KI1600/1601           | 53          |
| 5                             | 0.5                   | A           | Connector     | Snap in     | KI3024                | 55          |
| 5                             | 0.5                   | D           | Connector     | Screw       | KI3050/3051/3052/3053 | 57          |
| 5                             | 0.5                   | D           | PCB           | -           | KI3520/3521           | 67          |
| 5                             | 0.5                   | A           | PCB           | -/Screw     | KI3524/3534/3544      | 69          |
| 5                             | 0.5                   | D           | PCB           | -           | KI3642                | 71          |
| 5                             | 0.5                   | A           | PCB           | -           | KI3644                | 73          |
| 5                             | 0.5                   | D           | PCB           | -           | KI3652                | 75          |
| 5                             | 0.5                   | A           | PCB           | -           | KI3654                | 77          |
| 5                             | 0.5                   | D           | PCB           | Boss        | KI3740/3741           | 91          |
| 5                             | 0.5 ※ 1               | A           | PCB           | Boss        | KI3744                | 93          |
| 5                             | 0.5 ※ 1               | D           | Connector     | Screw       | KI3750/3751           | 95          |

| 透過型フォトセンサ / Photo Interrupter |                       |             |               |             |                       |             |
|-------------------------------|-----------------------|-------------|---------------|-------------|-----------------------|-------------|
| GAP<br>(mm)                   | Slit<br>Width<br>(mm) | Out-<br>put | 接続<br>Connect | 取付<br>Mount | 型名<br>Model number    | ページ<br>Page |
| 5                             | 0.5                   | D           | Connector     | Snap in     | KI3780/3781           | 97          |
| 5                             | 0.5                   | A           | PCB           | Boss        | KI3940                | 101         |
| 5                             | 0.5                   | D           | PCB           | Boss        | KI3990/3991           | 103         |
| 5                             | 0.5                   | A           | PCB           | Boss        | KI3994                | 105         |
| 5                             | 0.5                   | D           | Connector     | Screw       | KI5110/5111           | 107         |
| 5                             | 0.5                   | D           | Connector     | Screw       | KI5230/5231           | 113         |
| 5                             | 0.5                   | A           | Connector     | Screw       | KI5234                | 115         |
| 5                             | 0.5                   | A           | Connector     | Screw       | KI5264                | 119         |
| 5                             | 0.5                   | D           | Connector     | Screw       | KI5350/5351           | 123         |
| 5                             | 0.5                   | A           | Connector     | Screw       | KI5354                | 125         |
| 5                             | 0.5                   | A           | Connector     | Screw       | KI5365                | 127         |
| 5                             | 0.5                   | D           | Wires         | Screw       | KI5510/5511           | 129         |
| 5                             | 0.5                   | D           | Connector     | Screw       | KI5530/5531/5540/5541 | 131         |
| 5                             | 0.5                   | D           | Connector     | Snap in     | KI5770/5771           | 133         |
| 5                             | 0.5                   | A           | Connector     | Snap in     | KI5774                | 135         |
| 5                             | 0.5                   | D           | Connector     | Screw       | KI5780/5781           | 137         |
| 5                             | 0.5                   | A           | Connector     | Screw       | KI5784                | 139         |
| 6                             | 0.5                   | D           | Connector     | Screw       | KI1390/1391           | 47          |
| 7                             | 0.5                   | D           | Connector     | Snap in     | KI5240                | 117         |
| 8                             | 0.5                   | D           | Connector     | Screw       | KI3300/3301           | 65          |
| 8                             | 0.5                   | D           | Wires         | Screw       | KI3700/3701/3710/3711 | 87          |
| 8                             | 0.8                   | D           | Connector     | Screw       | KI1300/1301/1302/1303 | 33          |
| 8                             | 0.8                   | D           | Connector     | Snap in     | KI1305/1306           | 35          |
| 8                             | 0.8                   | A           | Connector     | Snap in     | KI1309                | 37          |
| 8                             | 0.8                   | D           | PCB           | Boss        | KI1310/1311           | 39          |
| 8                             | 0.8                   | A           | PCB           | Boss        | KI1314                | 41          |
| 10                            | 1                     | A           | PCB           | Boss        | KI1222                | 19          |
| 10                            | 1                     | D           | PCB           | Boss        | KI1230/1231           | 23          |
| 10                            | 2                     | D           | PCB           | Screw       | KI3060/3061           | 59          |
| 10                            | 2                     | A           | PCB           | Screw       | KI3064                | 61          |
| 13                            | 2                     | D           | Connector     | Snap in     | KI1215/1216           | 13          |
| 13                            | 2                     | A           | Connector     | Snap in     | KI1220                | 15          |
| 15                            | 2                     | A           | PCB           | Boss        | KI1223                | 21          |
| 15                            | 2                     | D           | Connector     | Screw       | KI1248/1249/1250/1251 | 29          |

※ 1 : 横スリット /Horizontal Slit

| 分離型フォトセンサ / Photo Interrupter-Separate type |             |               |             |                    |             |
|---------------------------------------------|-------------|---------------|-------------|--------------------|-------------|
| Distance<br>(mm)                            | Out-<br>put | 接続<br>Connect | 取付<br>Mount | 型名<br>Model number | ページ<br>Page |
| 100                                         | A           | Connector     | Screw       | KB1242             | 143         |
| 100                                         | A           | Connector     | Screw       | KB1284             | 149         |
| 100                                         | A           | Connector     | -           | KB3290             | 153         |
| 100                                         | A           | Connector     | Snap-in     | KB3390             | 155         |
| 100                                         | A           | Connector     | Screw       | KB3820             | 157         |
| 100                                         | A           | Connector     | Screw       | KB3830             | 159         |
| 100                                         | A           | Connector     | -           | KB3870             | 161         |
| 100                                         | A           | Connector     | -           | KB3880             | 163         |
| 100                                         | D           | Connector     | Screw       | KB1240 / 1241      | 141         |
| 200                                         | A           | Connector     | Screw       | KB3820             | 157         |
| 400                                         | M           | Wires         | Screw       | KB1246             | 145         |
| 400                                         | M           | Connector     | Screw       | KB1281             | 147         |
| 400                                         | M           | Connector     | -           | KB1700             | 151         |
| 800                                         | M           | Connector     | Screw       | KB1581             | 147         |
| 800                                         | M           | Connector     | -           | KB5280             | 165         |
| 1500                                        | M           | Wires         | Screw       | KB5921             | 169         |
| 2000                                        | M           | Wires         | Screw       | KB5900 / 5901      | 167         |

| 反射型フォトセンサ / Photo Reflector |             |               |             |                                           |             |
|-----------------------------|-------------|---------------|-------------|-------------------------------------------|-------------|
| Distance<br>(mm)            | Out-<br>put | 接続<br>Connect | 取付<br>Mount | 型名<br>Model number                        | ページ<br>Page |
| 1                           | A           | PCB           | -           | KR1218 / 1219 / 3900 / 3910 / 3920 / 3930 | 181         |
| 2                           | A           | PCB           | Boss        | KR1570 / 1571                             | 187         |
| 2.7                         | A           | PCB           | Boss        | KR1226                                    | 183         |
| 2.7                         | A           | PCB           | Boss        | KR1227                                    | 183         |
| 4                           | A           | PCB           | -           | KR3140                                    | 189         |
| 4.5                         | A           | PCB           | Boss        | KR1211                                    | 179         |
| 4.9                         | A           | PCB           | Boss        | KR1228                                    | 185         |
| 5.1                         | A           | PCB           | Boss        | KR1229                                    | 185         |
| 6                           | RGB         | Connector     | -           | KR5015                                    | 205         |
| 6.5                         | A           | PCB           | Boss        | KR1210                                    | 177         |
| 2 ～ 5.5                     | D           | Connector     | Screw       | KR894                                     | 173         |
| 1 ～ 7                       | M           | Connector     | Screw       | KR3330                                    | 193         |
| 1.5 ～ 7                     | M           | Connector     | Screw       | KR895                                     | 173         |
| 2 ～ 7                       | M           | Connector     | Screw       | KR3380                                    | 197         |
| 1 ～ 9                       | M           | Connector     | Screw       | KR3610                                    | 199         |
| 7 ～ 11                      | D           | Connector     | Screw       | KR864                                     | 171         |
| 1 ～ 15                      | M           | Connector     | Screw       | KR1207                                    | 175         |
| 4 ～ 17                      | M           | Connector     | Screw       | KR3331                                    | 195         |
| 4 ～ 18                      | M           | Connector     | Screw       | KR3620                                    | 201         |
| 7 ～ 25                      | M           | Connector     | Screw       | KR865                                     | 171         |
| 9 ～ 25                      | M           | Connector     | Screw       | KR3630                                    | 203         |
| 4 ～ 32                      | M           | Connector     | Screw       | KR866                                     | 171         |
| 4 ～ 32                      | M           | Connector     | Screw       | KR3320                                    | 191         |

機能検索目次 / Photo sensor series Functional Index

Output type A: アナログ出力 / D:Photo IC 出力 /M: 光変調式 / RGB: カラーセンサ  
Output type A :Analog / D :Photo IC /M :Light modulation type / RGB:Color sensor

| 限定反射型フォトセンサ / Convergent Reflective PhotoSensor |         |            |          |                                                    |          |
|-------------------------------------------------|---------|------------|----------|----------------------------------------------------|----------|
| Distance (mm)                                   | Out-put | 接続 Connect | 取付 Mount | 型名 Model number                                    | ページ Page |
| 5 and 10                                        | D/M     | Connector  | Screw    | 薄型ショートタイプ (KMA1 シリーズ )/Thin short type(KMA1series) | 207-227  |
| 5 ～ 10                                          | D/M     | Connector  | Screw    | ショートタイプ (KMBA1 シリーズ )/Short type(KMBA1series)      | 207-227  |
| 20 ～ 80                                         | D/M     | Connector  | Screw    | ミドルタイプ (KMBA2 シリーズ )/Middle type(KMBA2series)      | 207-227  |
| 50 ～ 200                                        | D/M     | Connector  | Screw    | ロングタイプ (KMBA3 シリーズ )/Long type(KMBA3series)        | 207-227  |

| アクチュエータフォトセンサ / Photo Interrupter-Acutuator type |         |            |          |                       |          |
|--------------------------------------------------|---------|------------|----------|-----------------------|----------|
| 動作位置 Angle                                       | Out-put | 接続 Connect | 取付 Mount | 型名 Model number       | ページ Page |
| 12°                                              | A       | Wires      | Snap-in  | KA1354                | 242      |
| 8° /13°                                          | A       | Wires      | Snap-in  | KA3434/3435           | 244      |
| 8° /19°                                          | D       | Connector  | Snap-in  | KA1335/1336/1345/1346 | 240      |

| LED / Light Emitting Diode |            |                 |          |
|----------------------------|------------|-----------------|----------|
| Peak Wavelength (nm)       | 形態 Package | 型名 Model number | ページ Page |
| 660                        | TO46+Lens  | KL3095          | 252      |
| 660/880                    | TO18+Lens  | KL856           | 246      |
| 880                        | TO18+Lens  | KL899           | 250      |
| 940                        | TO18+Lens  | KL857           | 248      |

| 受光素子 / Detecting device |            |                 |          |
|-------------------------|------------|-----------------|----------|
| Peak Wavelength (nm)    | 形態 Package | 型名 Model number | ページ Page |
| 900                     | TO18+Lens  | KD834           | 254      |
| 900                     | TO18+Lens  | KS853           | 256      |

| プリズム型 フォトセンサ / Prism Photo sensor |         |            |          |                 |          |
|-----------------------------------|---------|------------|----------|-----------------|----------|
| Distance (mm)                     | Out-put | 接続 Connect | 取付 Mount | 型名 Model number | ページ Page |
| 5                                 | A       | Connector  | Snap-in  | KP1660          | 232      |
| 20                                | A       | Connector  | Snap-in  | KP1650/1651     | 230      |
| 30                                | A       | Connector  | Snap-in  | KP1430          | 228      |
| 30                                | A       | Connector  | Snap-in  | KP1662/1663     | 234      |
| 30                                | A       | Connector  | Snap-in  | KP3250          | 238      |
| 100                               | M       | Connector  | Snap-in  | KP1850          | 236      |

# 新光電子カタログの説明・注意事項

## Glossary / Notice of statement in catalogue

### 製品写真について The Product Photos on each Catalogue

個別の製品写真は、代表例を掲載しております。実物と異なる場合もありますので、ご了承ください。  
詳細は弊社営業窓口までお問合せください。

The photos used on front page of each catalogue are a typical and not quite same among the variations.  
Please confirm the details to our Sales department.

### 製品図面・仕様について The Drawings and Specification

個別カタログの図面は、代表品番に基づいた仕様です。

コネクタ・ハーネス等の指定によって実際と異なる場合がありますので、ご注文前に弊社営業窓口までご確認ください。

Each drawing used on front page of each catalogue is one of typical model.

Please note that the dimensions may be different according to connection parts and so on.

Please confirm the formal specification and drawings before you order.

### 製品品番とバリエーションについて The Part number and variations

個別カタログの品番は、代表型名のみ表記しております。

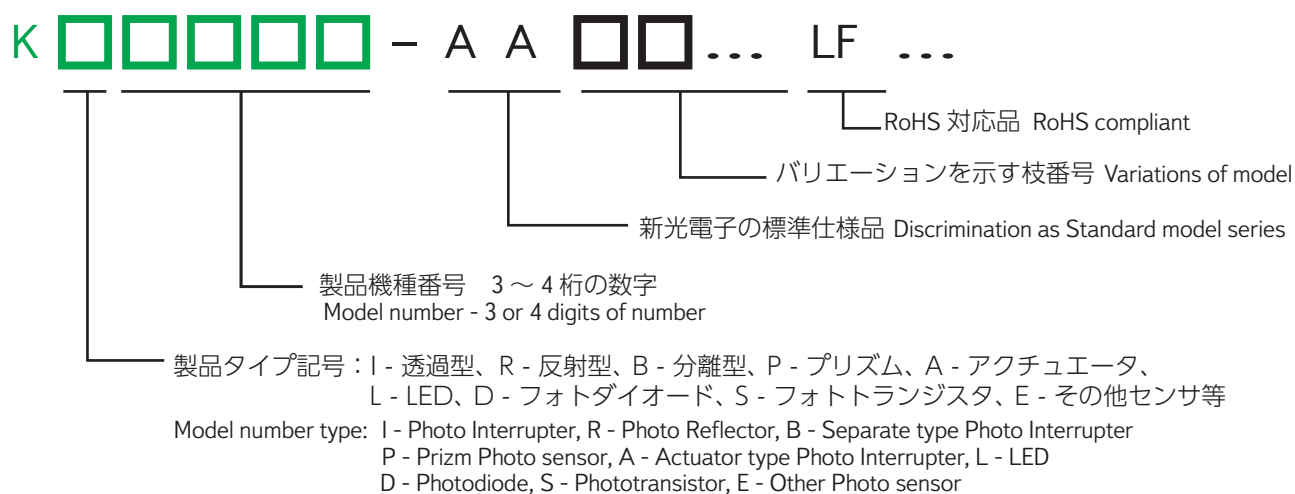
ご注文の際は正式型番を先にご確認いただき、ご用命ください。

Product number of each catalogue is typical model number. The formal Part number for order should be specified after your selection from model variations. The green part of below is 'typical model number'.

#### 【新光センサの型名と品番】

(注) 緑色部分がカタログで表示している「代表型名」です。

(注) カatalog図面にいう「枝番」は、“-”以下を示します。



### 環境対応について Environmental program

新光電子のフォトセンサは環境対応に配慮し、また各社からのグリーン調達要求にも対応すべく、標準品の環境負荷物質の撤廃を推進しております。

弊社の品質活動の詳細は、ホームページから「環境への取組」をご覧ください。

www.shinkoh-elecs.jp

弊社では標準品の光センサについてすべて「RoHS 適合品」を用意し、お客様へのご提案を行っております。

「RoHS 適合」を示す品番識別は、品番の末尾に「LF」の表記をさせていただき、ご注文時にその品番にてご注文いただいております。

またカスタム品についても、弊社は環境対応に配慮した製品設計をご提案します。

Shinkoh Electronics advance environmental measures and green action. Our photo sensors are designed as to reduction of environmental burdens. Please also refer environmental activities on our website.

www.shinkoh-elecs.jp

'LF' - suffix of part number for order - should be referred when you require RoHS compliant.

We also recommend green action to your custom design and product.

# カタログ記号の説明

## Explanation of Symbol in catalogue

### 特殊仕様対応記号 Symbol - Specific structure of housings



防塵対策仕様品であることを表示しています。  
この記号は、JIS や IEC の IP 規格基準とは一致しないことをご注意ください。  
This symbol means that product is best solution for paper dust.  
Please also note that this classificatoin is not compatible to IP standard of IEC or JIS(Japan).



完全防塵対策仕様品であることを表示しています。  
この記号は、JIS や IEC の IP 規格基準とは一致しないことをご注意ください。  
This symbol means that product is perfect solution for paper dust to protect inner cleanness of sensor. Please also note that this classificatoin is not compatible to IP standard of IEC or JIS(Japan).



防塵・防滴対策仕様品であることを表示しています。  
この記号は、JIS や IEC の IP 規格基準とは一致しないことをご注意ください。  
This symbol means that product is best solution for paper dust and water drip.  
Please also note that this classificatoin is not compatible to IP standard of IEC or JIS(Japan).



フロー半田対応  
Flow soldering type



抜け防止ロック機構付きコネクタ採用品  
Secure locking structure connector type



リフロー半田対応  
Reflow soldering type

### センサ検知回路識別記号 Symbol - Classification of Sensing method



フォトトランジスタ出力  
Photo transistor output



フォトダイオード出力  
Photo diode output



RGB カラーセンサ  
RGB color-sensor



フォト IC 出力  
Photo IC output



光変調型フォト IC 出力  
Light modulation type  
Photo IC output

### センサ発光素子識別記号 Symbol - Classification of wavelength for Emitter



赤色 LED タイプ  
Red LED type



緑色 LED タイプ  
Green LED type



青色 LED タイプ  
Blue LED type



白色 LED タイプ  
White LED type



IR(赤外線) LED タイプ  
Infrared LED type



UV(紫外線) LED タイプ  
Ultraviolet LED type

# 新光電子のフォトセンサ・シリーズ

## 「あったらいいな！」を実現する新光電子のフォトセンサ・シリーズ

このカタログでは、弊社の標準品として販売しているフォトセンサを紹介しております。しかし、弊社のフォトセンサはこれだけにとどまりません。むしろ、長年培った多彩なセンシング技術、ノウハウを投入したカスタムモデルのセンサにこそ弊社の開発技術の真髄があります。貴社のご要望にぴったりの製品が見つからないときでも、ぜひ貴社のアイデアをお聞かせください。新光電子を貴社の製品実現にお役立てください。

## 弊社取り扱いのフォトセンサ

### ・透過型フォトセンサ

一般にフォトインタラプタと呼ばれる光センサです。主に通過する各種の遮蔽物の有無をセンシングするために使われます。弊社では、遮蔽物にあわせて、他社では類をみない多様な検知幅（ギャップ）のセンサを用意しています。また、紙粉対策に特化したパッケージも用意しております。

### ・反射型フォトセンサ

一般にフォトリフレクタと呼ばれる光センサです。主に対象物にあたって反射した光量を検知した受光素子の信号を使ってセンシングするために使われます。弊社では、UV（紫外線）からIR（赤外線）まで多様な光源を使用して特殊な検知用途にお応えしています。

### ・分離型フォトセンサ

フォトインタラプタと呼ばれるものの中で特に発光と受光を独立したパッケージにいたものをいいます。光電スイッチのように2mに及び非常に長いセンサ間距離を可能にします。また、反射センサ - プリズムタイプとしての光学系設計も可能です。

### ・プリズムフォトセンサ

フォトリフレクタと呼ばれるものの中で特にプリズムを組み合わせるセンシングすることを目的にしたものです。導光路が設定されるため安定した光センシングが可能となります。対向する一方に配線不要な設計が可能です。

### ・アクチュエータタイプフォトセンサ

フォトインタラプタにアクチュエータを組み合わせることでメカ的に光センシングします。アクチュエータは、個々の用途に応じてカスタマイズされるケースが多いため、弊社で用意する比較的汎用的な形状を基にして最適な形状設計をされるのが望ましいです。弊社は、光センサの長年の経験から貴社の設計のお手伝いをします。

### ・発光素子・受光素子

一般にLEDと呼ばれる、単一波長を発光する半導体素子を封止したディスクリート製品を発光ダイオード（発光素子）と呼び、シリコンやゲルマニウムなどのUVからIRに広く感度を有する半導体素子を封止したディスクリート製品をフォト・ディテクタ（受光素子）と呼びます。受光素子には、フォトダイオード、フォトトランジスタからフォトICのような集積回路をもつものまであります。弊社では、これらを主にフォトセンサ用部品として使用していますが一部単体でも販売を行っております。

### ・その他カスタムフォトセンサ

光センサは用途別に、個々に特別設計されたセンサ、センサモジュールが非常に多く存在します。よく似た設計品でも一工夫を加えることで格段に利便性が向上することが多いためです。カスタム仕様のセンサ、センサモジュールは、カタログには掲載しておりませんので、個々に貴社のご質問・ご要望を弊社営業窓口までお聞かせください。弊社の光センサ技術が貴社の望んでおられた仕様実現のお役に立てることを願っております。

## Photo sensor series made by SHINKOH

### ・ Photo Interrupter - Slotted type

KL series

This is the sensor that a emitter is set opposite side to a detector and it detects the object passing through the slot between the emitter and the detector. There are many kinds of photo sensors in slot width or depth in accordance with detecting object. We also provide 'dust proof' model for paper dust protection.

### ・ Photo Interrupter - Reflective type

KR series

This is also called as 'Photo reflector'. This type has the sensing theory that the detector detects the reflection beam which comes from object. There are many kinds of light source from UV to Infrared for customer's application.

### ・ Photo Interrupter - Separate type

KB series

The most unique feature of this sensor is that package of emitter and detector is independent of each other. It realizes longer range of detection like Photoelectric sensor --- we can offer till 2m sensing. It is also available to use as reflective sensor or prism sensor.

### ・ Prism sensor

KP series

This is a kind of Photo reflector. This sensor is used with prism to determine the light guiding and to realize the stable sensing. It can help non-electrical circuit design on prism side.

### ・ Photo Interrupter - Actuator type

KA series

This is the Photo sensor combined the optoelectronic sensing with mechanical lever. By use of actuator, it enables the accurate sensing that doesn't depend on the condition, difference or tolerance of detecting object. We also help your design of custom actuator.

### ・ Emitter and Detector

KL series (LED), KD series (Photo diode), KS series (Photo transistor)

The emitter - Light emitting diode:  
It is called as 'LED' in general. It emits a unique wavelength of light. We also provide the models having of chips of several wavelengths.  
The detector:  
It are called as 'Photo diode', 'Photo transistor' or 'Photo IC'.  
It differs by integrated level of detector elements. We are providing some models as discrete sales.

### ・ Custom designed Photo sensor

The customers demand specific and suitable sensors or sensor module by the application and purpose. Some creative thinking can help you improve the performance of sensor. Please feel free to contact our sales.

# 光センサ ご使用に当たっての注意事項 Precaution for use



## 製品への荷重 Load to product

- ・製品に変形、変質をきたす荷重を加えないように保存、使用してください。
- ・端子のフォーミング時には端子根元の固定をしてください。
- ・リード切断を行う場合やコネクタの抜き差しは、常温下で作業してください。

Be aware that much load gives a damage to product as deforming or deterioration.

At forming of terminals, fasten the root of terminals.

Lead-cutting or insert/remove of connector should be worked in room temperature.

## 変質や汚れ、キズ Deterioration, scratch and grime

- ・製品の酸化や腐食などによる変質・変色、汚れなどを防止するため、結露、水漏れ、腐食性ガス、塩風などに注意して保管してください。(窒素流入型デシケータ 内の保管を推奨) また、そのような変質しやすい環境下で使用しないでください。
- ・ケース表面 (特に受発光面) にキズや汚れがつかないように保存、使用してください。

To avoid tarnish, alteration and stain by the oxidation or corrosion, keep the product in environment of non-condensing, no water drop, and no corrosive gases or salt air.

We recommend to use desiccator with nitrogen air. Please note the scratches, stains, or bruises on the products, especially on sensing surface, for storage and handling.

## 振動、衝撃 Vibration and Impact

- ・保存、運搬、使用時での機械的振動、衝撃は製品の変形などの損傷、破損につながる場合がありますので注意してください。

Please note Mechanical vibration and an impact by the preservation, carriage and use as it might occur some damages or transformation of product.

## 外乱光 Ambient light

- ・直接外乱光が 入らない場所で使用してください。(特に太陽光やタングステンランプ光、センサを複数使用する場合は当該センサ以外の光。) 装置内部で光が反射し誤動作する場合がありますので、よくご確認の上ご使用ください。

外乱光対策に、変調光タイプも用意しております。

Please use in environment where there is no direct ambient light. In particular, sun-light, incandescent or when use plural sensors: light other than the sensor is used. Please check carefully that there is no malfunction due to light reflection inside the equipment. Light modulation type is available for solution with influence of ambient light.

## 遮光物 Shielding object

- ・遮光板などの遮光物を用いる場合には、遮光特性の優れた材質を使用してください。

For light shielding, High extinction efficiency is recommended in material.

## 洗浄 Cleaning

- ・薬剤を使用した洗浄は避けてください。製品によっては特性を満足しなくなる場合があります。
- 必要な場合は、エアブロー又はやわらかい布類でふき取るか、予め弊社までご確認の上、作業を行ってください。

Don't use chemicals but blower or soft cloth for cleaning. If you have any problem, please consult our Sales Dept.

## 静電気 Static electricity

- ・製品によっては、人体に帯電する静電気、測定装置や周辺回路からのサージ電圧により製品劣化や破壊につながる危険性があるため、作業時、作業台、測定装置、接続回路等でのアースは必ず取るようにしてください。

The worker, working table, instrument and circuit should be always grounded to prevent damage of product from static electricity or surge voltage.

## LEDの特性 LED characteristics

- ・長時間連続使用される場合は、LED の出力低下を考慮してください。

Please consider the LED output reduction when using continuously for a long time.

## 半田付け取扱い注意 Notice of Soldering

半田付け取扱い注意

- ・製品の半田付けについては、必ず実機にて確認のうえご利用ください。また使用されるフラックスによってはパッケージクラック等の影響が発生する事があるため、外観、信頼性について十分にご確認ください。

Please check the performance of soldering at customer's assembly in advance.

It also need to check the problem with the appearance or reliability by using of flux.

|                           |                                                                                                                                                                                                                                                                                    |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| フロー半田付け<br>Flow soldering | 260℃以下、5 秒以内 / 260℃ max, 5 s max.<br>(半田付け直後のパッケージ / リードへの機械的な力は禁止。予備加熱での半田付け、リフロー半田は禁止。)<br>After soldering, do not apply mechanical stress to the leads and the package until the component to cool to room temperature. Pre-heating soldering and reflow soldering unsupported. |
| 手半田付け<br>Hand soldering   | 330℃以下、2 秒以内、各端子につき 1 回のみ / 330℃ max, 2 s max, 1 time.<br>(こて先を直接リード端子に接触させる事は禁止。半田が十分固化する前に製品をずらす力をかける事は禁止。)<br>The tip of soldering iron should never touch the leads. Please avoid pressure which could dislocate the components until the solder is cool and hard.             |



## 安全にお使いいただくために Warning to users

### 定格・注意事項の遵守 Compliance of ratings and notice

製品の使用にあたっては、仕様上の最大定格や注意事項を守ってご使用ください。その事項を超える使用に起因する損害については、弊社では責任を負いかねます。また、本製品及び本製品を組み込む装置の運用を理由とする損失、逸失利益等の請求につきましては、いかなる責任も負いかねますのであらかじめご了承ください。

Operation never exceeds each value of Maximum Ratings and comply with each notice at design/Operation. Please note that we are free from any risk, expense, and damage caused by ignorance and defects of these ratings and/or notice directly and indirectly.

### 分解・パッケージ開封 Disassembly of Product

製品を分解・開封する行為は危険ですので絶対にしないでください。また故障・劣化の原因となる場合があります。故障等の調査であっても許可なく分解せず、返却頂き調査解析依頼をお願いします。

Don't take the product apart for danger. After being disassembled without our formal approval in advance, we can't warrant any performance on specification sheet. Please contact us if you need analysis.

### 紫外線を発光する製品について Measure for UV safety

紫外線 LED を使用する製品については、紫外光が目へ直接又は光学系経由で入光すると危険ですので安全眼鏡などの入光しない対策をとってください。光の反射を受ける場合も同様に対策をお願いします。

Please do measure for UV safety - for example, UV protection lenses of spectacles - as it is danger for eyes to look UV light directly or by way of optical system during operation. Same measure is also required in possibility of reflection of UV light.

### フェール・セーフ設計 / フォールト・トレラント設計 Fail safe / Fault tolerance

フェール・セーフとは、部品やシステム等の故障によって本来の性能が機能しないとき、システム全体として致命的な障害とならないように「安全側」に倒れるようにすることを指します。

故障が発生したとき、安全確保のため誤動作防止の意味でヒューズを働かせることもその事例にあたります。

機能・精度において信頼性、安全性が求められる用途には、特にこの措置を施し、システム・機器全体の安全設計にご配慮ください。また、故障や誤動作が発生してもシステムの機能が正しく維持されるべく、フォールト・トレラントを踏まえた設計をされることを推奨します。特に耐故障性を要求される用途には冗長設計をご配慮ください。ご採用に際しては実機組込み、実使用上での機能、寿命、安全性その他品質につきましては十分貴社にて信頼性試験等でご評価頂いたうえ、ご利用の可否をご判断下さい。評価について疑問がございましたら、弊社営業窓口まで事前にご確認のほどお願いします。

A fail-safe describes a device, parts or system which, in the even of failure, fails in a way that will cause no harm at least a minimum of harm to other device or danger to personnel.

In the event of failure, for example, operating fuse for the safety can apply for this designing.

Please plan the safety design for entire system and device, especially in applications which require reliability and safety about function and accuracy.

Also, we recommend that the design based on "Fault Tolerant" should properly hold the system despite malfunction or wrong operation. Please consider the redundancy design, especially in applications which require the fault tolerance.

When adopting the product, evaluate the functions, service life, safety and the other quality of your system in the operating environment with reliability tests. Please judge whether it can be used based on the result.

Please contact us and confirm in advance, if you have any questions about the evaluation.

### 特殊な用途への使用に関して Specific design and application

弊社製品は原則として下記の用途に使用する目的で製造された製品です。

・電算機 ・OA 機器 ・通信機器（端末） ・計測機器 ・工作機器 ・AV 機器 ・家電製品

機能・精度において高い信頼性・安全性が必要とされる及び生命に関わる下記の用途に使用されるように製造されたものではありません。

・宇宙機器 ・原子力制御機器 ・軍事用目的の機器 ・医療精密機器 ・車載機器 ・各種保安・安全に係わる機器など

用途について疑問がございましたら、弊社営業窓口まで事前にご確認のほどお願いします。

Our products are designed for use in the following applications.

Computer/OA equipment/Telecommunication equipment(Terminal)/Measuring equipment/Machine tool/AV equipment/Consumer electronics.

Never used for that requires high reliability, safety and for an application involving serious risk to life such as: Space appliance/Devices for atomic power control/Military purpose/Medical precision equipment/Automotive equipment/Security of every kind, etc. Our standard models might be not suitable to your application.

Please contact us and confirm in advance, if you have any questions about certification of conformity for your application.

### フール・プルーフ設計 Fool proof design

貴社の製品、システムの設計にあたっては、人が誤って不適切な操作を行っても危険を生じない、あるいは正常な動作を妨害されない設計をお願いします。弊社では、本設計の不備による二次的な損害を含む被害に関して損失のご請求に応じかねますのでご了承ください。

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# フォトセンサ・シリーズ Photo sensor series - Index

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|    | 反射型フォトセンサ<br>Photo Reflector<br>限定反射型フォトセンサ<br>Convergent Reflective PhotoSensor | KR シリーズ<br>KR series<br>KM シリーズ<br>KM series                         |
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透過型

分離型

反射型

プリズムタイプ

アクチュエータタイプ

受発光素子

# KI1138

透過型フォトセンサ 防塵・2ビームタイプ

Photo Interrupter - Dust proof · Dual Beam type



## 概要 Description

KI1138 は、外側にケースカバー、内側に検出用スリットをもつ 2 重構造の防塵型、2 ビームフォト IC 出力の小型透過型フォトセンサです。

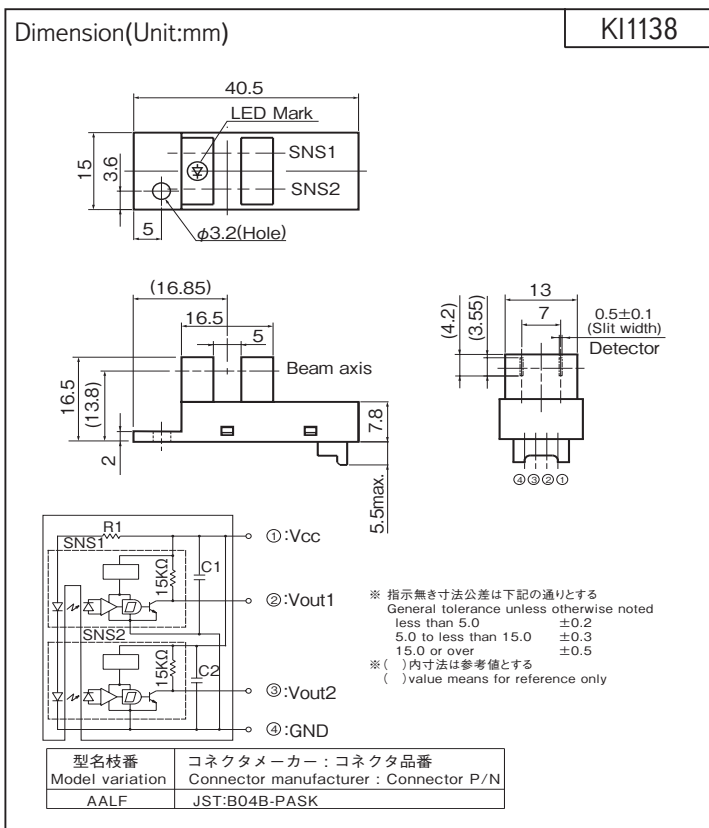
Model KI1138 consists of an Infrared LED and a High sensitive Photo IC (Digital Output), and has slitless plastic housing.

## 特長 Feature

- ・ アンプ内蔵、プルアップ抵抗内蔵タイプ
- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：内蔵スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ LED 制限抵抗内蔵タイプ
- ・ 抜け防止強ロック機構付きコネクタ採用
- ・ Built-in amplifier, Pull-up Resistor output type.
- ・ Easy removing paper dust.
- ・ High-resolution : slit width 0.5mm.
- ・ Visible Light cut filter.
- ・ Built in resistor for LED drive.
- ・ with secure locking structure connector.

## 用途 Application

- ・ アミューズメント機器、自動販売機のコイン通過検出
- ・ Coin-passing for Auto vending machine and Amusement.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition               | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|-------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC          | —                       | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | 遮光時 Shutter in          | —       | —    | 25   | mA   |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | 入光時 w/o Shutter         | —       | —    | 25   | mA   |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | 遮光時、IOL=16mA Shutter in | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | 入光時 w/o Shutter         | VCCx0.9 | —    | —    | V    |
| 応答時間<br>Response Time               | 上昇 Rise Time |                         | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time |                         | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI1138

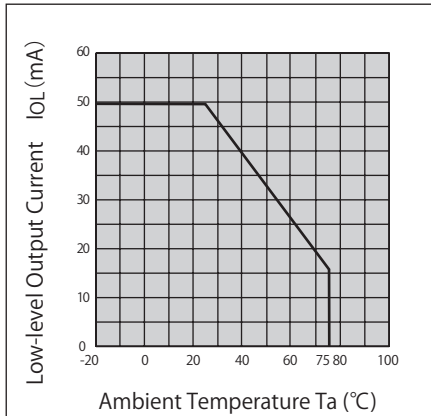
定格・特性曲線

Characteristics

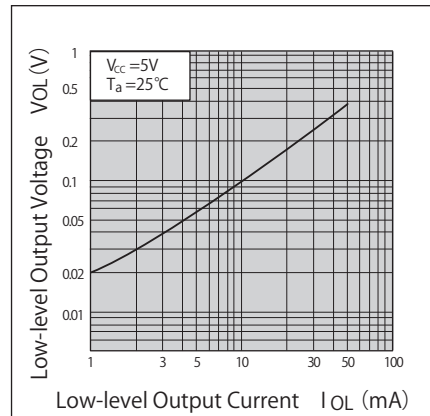
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

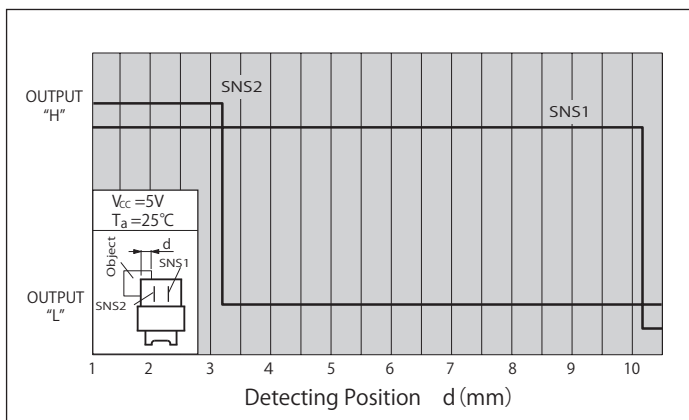
ローレベル出力電流低減曲線



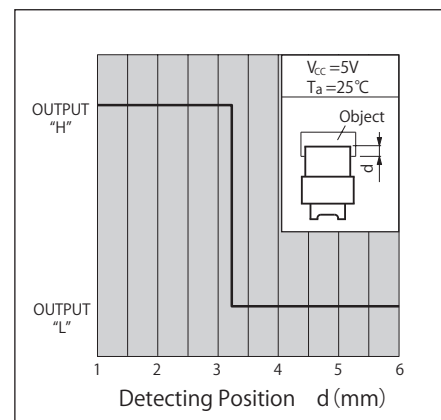
ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)



検出位置特性1 (代表例)



検出位置特性2 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ A Customized design available on request.
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ Specifications are subject to change without notice.

## KI1215/1216



透過型フォトセンサ ギャップ幅広タイプ

Photo Interrupter - Wide slot type



## 概要 Description

KI1215/1216 は、赤外発光ダイオードと受光素子に、フォトIC (デジタル出力) を組合わせた透過型フォトセンサです。ギャップ幅が 13mm と大変広いので厚みのある検知物に最適です。

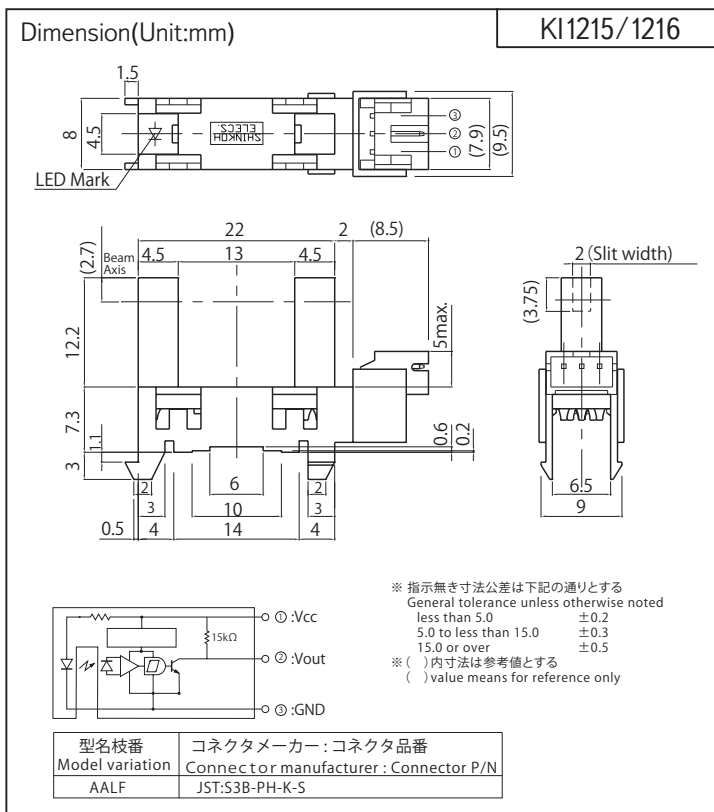
Model KI1215/1216 consist of an Infrared LED and a High sensitive Photo IC (Digital Output).

## 特長 Feature

- 検出ギャップ 13mm/ 深さ 12.2mm で大きな物でも検出可能
- アンプ内蔵型
- その他シリーズ  
フォトトランジスタ出力タイプ・・・KI1220
- Wide Slot width-13mm, Slot depth-12.2mm.
- Built-in amplifier.
- Other models Phototransistor output type・・・KI1220

## 用途 Application

- カード機器、両替機の物体通過検出
- 自動販売機、アミューズメント機器のコイン通過検出
- 複写機、プリンター等トナーボットの残量検出
- パチンコ玉検出
- Object passing for Card reader, Bill exchanger.
- Coin-passing for Auto vending machine and Amusement.
- Toner remaining detection in Copy machine and Printing machine.
- Pachinko ball detection.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI1215 | Low  | 入光時 at Beam detecting |
| KI1216 | High | 入光時 at Beam detecting |

## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt;Operation Notice&gt;

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol | Rating    | Unit |
|------------------------------------|--------|-----------|------|
| 電源電圧 Supply Voltage                | VCC    | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL    | 50        | mA   |
| 動作温度 Operating Temperature         | Topr   | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | Tstg   | -40 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI1215 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI1216 遮光時 Shutter in           | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI1215 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI1216 入光時 w/o Shutter          | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI1215 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  | V    |
|                                     |              | KI1216 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI1215 遮光時 Shutter in           | VCC×0.9 | —    | —    | V    |
|                                     |              | KI1216 入光時 w/o Shutter          | VCC×0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                              |         |      | —    | μs   |
|                                     | 下降 Fall Time | tf                              |         |      | 0.05 | —    |

\*\* : Ta=25°C unless otherwise noted

# KI1215/1216

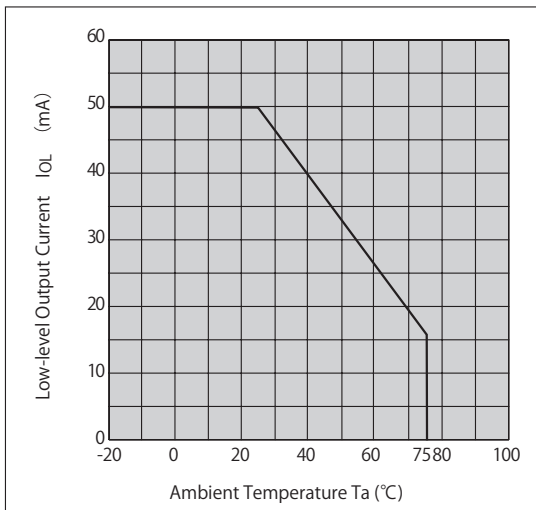
## 定格・特性曲線

### Characteristics

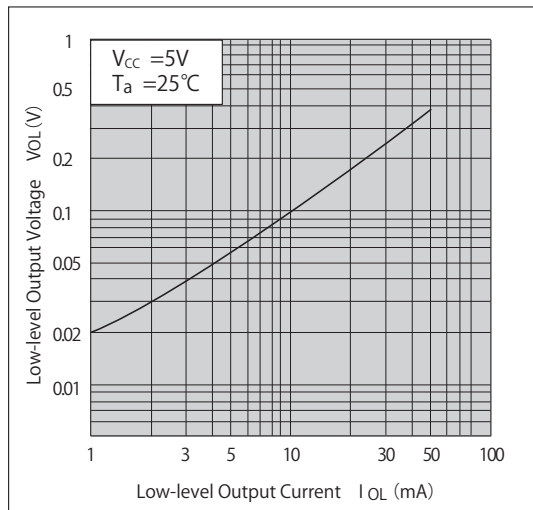
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

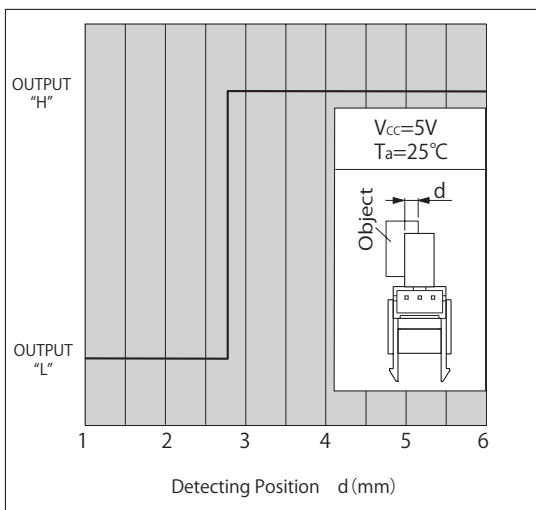
ローレベル出力電流一周囲温度特性



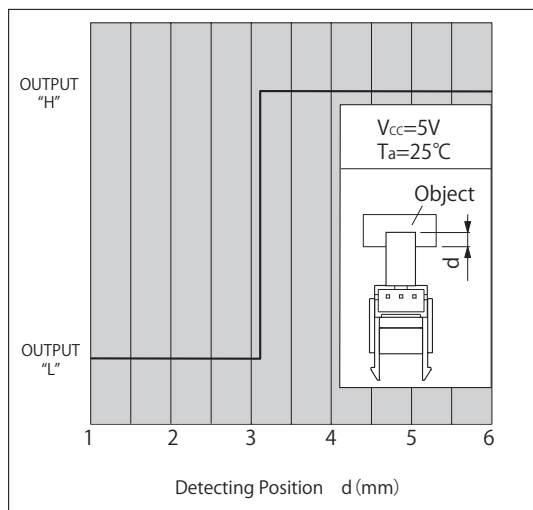
ローレベル出力電圧ーローレベル出力電流特性 (代表例)



検出位置特性1 (代表例)

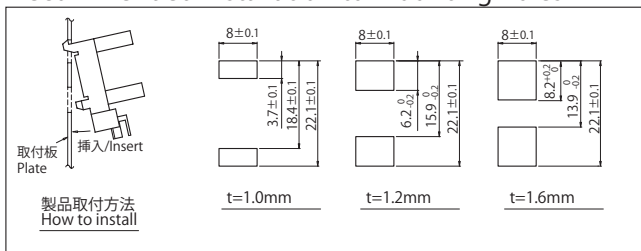


検出位置特性2 (代表例)



## 推奨取付穴寸法図

### Recommended installation to mounting holes



・取付板のプレス側から取付けを推奨します。  
・We recommend to mount the sensor from pressed surface of plate.

・実際に取り付けてガタツキ度合いをご確認され取付け方法を決定ください。  
・The actual tolerance should be confirmed after setting of sensor.

・カスタマイズも承ります。お気軽にお問合せください

・A Customized design available on request.

・この仕様は改良のため予告なく変更する場合があります

・Specifications are subject to change without notice.

## KI1220



透過型フォトセンサ ギャップ幅広タイプ

Photo Interrupter - Wide slot type



## 概要 Description

KI1220 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した透過型フォトセンサです。

Model KI1220 consists of an Infrared LED and a High sensitive Photo transistor.

## 特長 Feature

- 検出溝の深さ 12.2mm の深溝型
- 検出溝幅が 13mm と広いので厚みのある物でも検出可能
- 可視光カットタイプ
- その他シリーズ
  - 13mm ギャップ、フォト IC 出力・・・KI1215/1216
  - 15mm ギャップ、フォト IC 出力・・・KI1248/1249
- Wide Slot width-13mm, Slot depth-12.2mm.
- Visible Light cut filter.
- The other model of wide Slot width as;
  - 13mm Slot width at photo IC・・・KI1215/KI1216
  - 15mm Slot width at photo IC・・・KI1248/KI1249

## 用途 Application

- カード機器、両替機の物体通過検出
- 自動販売機、アミューズメント機器のコイン通過検出
- OA 機器、その他
- Object passing for Card reader, Bill exchanger.
- Coin-passing for Auto vending machine and Amusement.
- Paper detection for O.A. equipment.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       |                                        | Symbol           | Rating    | Unit |
|----------------------------|----------------------------------------|------------------|-----------|------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF               | 50        | mA   |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP              | 1         | A    |
|                            | 逆電圧 Reverse Voltage                    | VR               | 5         | V    |
|                            | 許容損失 Power Dissipation                 | P                | 75        | mW   |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 30        | V    |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 5         | V    |
|                            | コレクタ電流 Collector Current               | IC               | 20        | mA   |
|                            | コレクタ損失 Collector Power Dissipation     | PC               | 75        | mW   |
| 動作温度 Operating Temperature |                                        | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature   |                                        | T <sub>stg</sub> | -30 ~ +80 | °C   |

※1. パルス幅  $t_w \leq 100\mu s$  Duty 比=0.01※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                                     | Symbol               | Condition                                                       | min. | typ. | max. | Unit |
|-----------------|-----------------------------------------------------|----------------------|-----------------------------------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage                                 | V <sub>F</sub>       | I <sub>F</sub> =20mA                                            | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current                                 | I <sub>R</sub>       | V <sub>R</sub> =3V                                              | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                                    | I <sub>CEO</sub>     | V <sub>CE</sub> =20V, 0 lx                                      | —    | —    | 0.1  | μA   |
|                 | 光電流 Light Current                                   | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                       | 0.3  | —    | —    | mA   |
| 伝達特性<br>Coupled | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =20mA, I <sub>C</sub> =0.15mA                    | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                                  | 上昇 Rise Time         | V <sub>CC</sub> =5V, I <sub>C</sub> =0.5mA, R <sub>L</sub> =1kΩ | —    | 15   | —    | μs   |
|                 |                                                     | 下降 Fall Time         |                                                                 | —    | 17   | —    |      |

\*\*: Ta=25°C unless otherwise noted

# KI1220

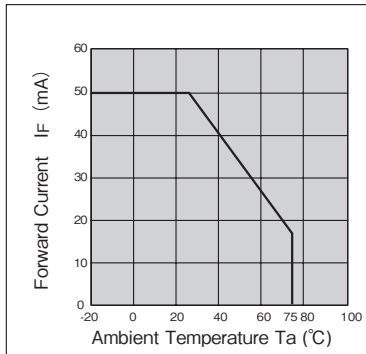
定格・特性曲線

Characteristics

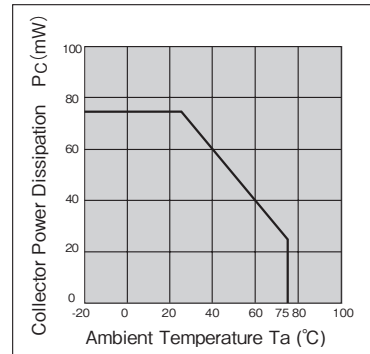
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

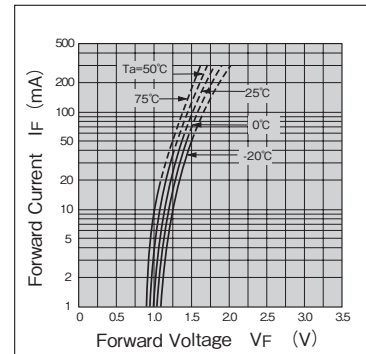
順電流低減曲線



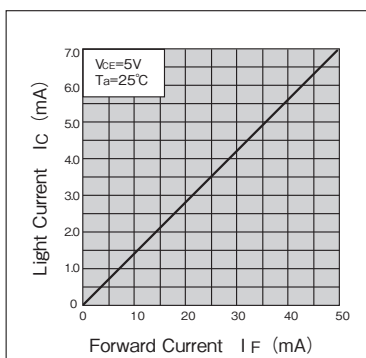
コレクタ損失低減曲線



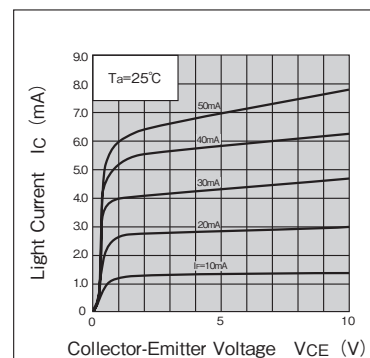
順電流－順電圧特性 (代表例)



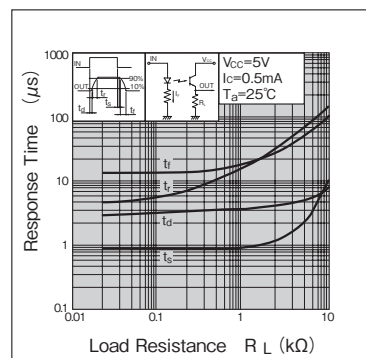
光電流－順電流特性 (代表例)



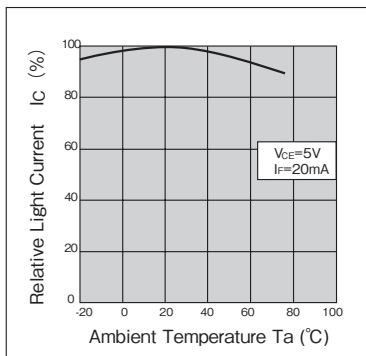
光電流－コレクタ・エミッタ間電圧特性 (代表例)



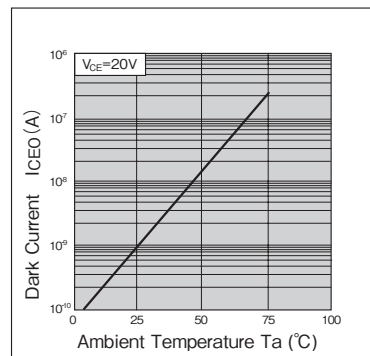
応答時間－負荷抵抗特性 (代表例)



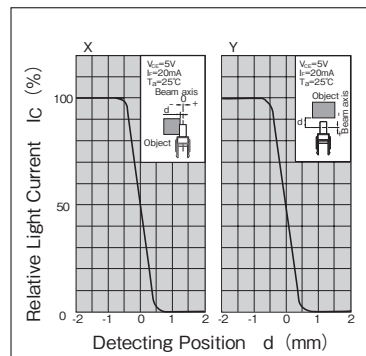
光電流－周囲温度特性 (代表例)



暗電流－周囲温度特性 (代表例)

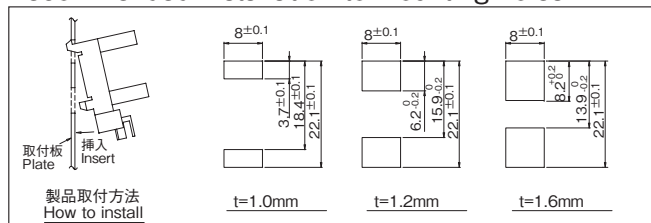


検出位置特性 (代表例)



## 推奨取付寸法図

Recommended installation to mounting holes



・取付板のプレス側から取付けを推奨します。

・We recommend to mount the sensor from pressed surface of plate.

・実際に取り付けがガタツキ度合いをご確認され取り付け方法を決定下さい。

・The actual tolerance should be confirmed after setting of sensor

・カスタマイズも承ります。お気軽にお問合せください

・A Customized design available on request.

・この仕様は改良のため予告なく変更する場合があります

・Specifications are subject to change without notice.

## KI1221



透過型フォトセンサ

Photo Interrupter



## 概要 Description

KI1221 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した透過型フォトセンサです。

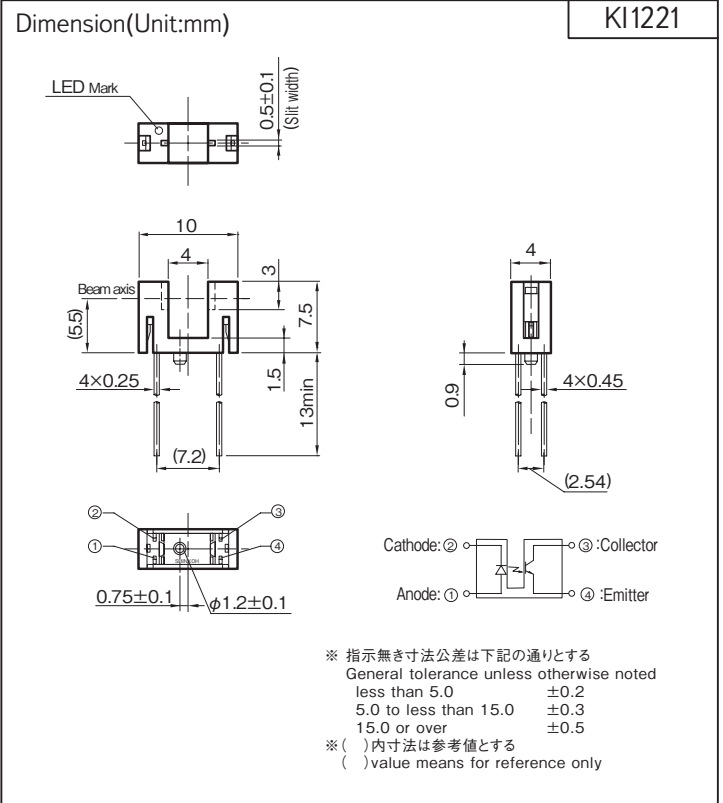
Model KI1221 consists of an Infrared LED and a High sensitive Photo transistor(Analog output).

## 特長 Feature

- ・ 小型タイプ
- ・ ローコスト
- ・ 検出溝の深さ 6mm の深溝型
- ・ 検出溝幅が 4mm と広い
- ・ Compact Package.
- ・ Low Cost.
- ・ Slot depth-6mm.
- ・ Slot width-4mm.

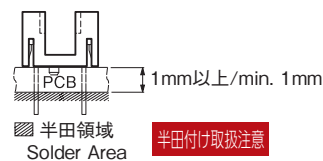
## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           |                                        | Symbol           | Rating    | Unit |
|--------------------------------|----------------------------------------|------------------|-----------|------|
| 発光側<br>Emitter                 | 順電流 Forward Current                    | IF               | 50        | mA   |
|                                | パルス順電流 Pulse Forward Current ※1        | IFP              | 1         | A    |
|                                | 逆電圧 Reverse Voltage                    | VR               | 5         | V    |
|                                | 許容損失 Power Dissipation                 | P                | 75        | mW   |
| 受光側<br>Detector                | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 30        | V    |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 5         | V    |
|                                | コレクタ電流 Collector Current               | IC               | 20        | mA   |
|                                | コレクタ損失 Collector Power Dissipation     | Pc               | 75        | mW   |
| 動作温度 Operating Temperature     |                                        | T <sub>opr</sub> | -20 ~ +85 | °C   |
| 保存温度 Storage Temperature       |                                        | T <sub>stg</sub> | -30 ~ +85 | °C   |
| 半田付温度 Soldering Temperature ※2 |                                        | T <sub>sol</sub> | 330       | °C   |



- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
 ※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)

- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01  
 ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                                     | Symbol               | Condition                                                       | min. | typ. | max. | Unit |
|-----------------|-----------------------------------------------------|----------------------|-----------------------------------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage                                 | V <sub>F</sub>       | I <sub>F</sub> =20mA                                            | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current                                 | I <sub>R</sub>       | V <sub>R</sub> =3V                                              | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                                    | I <sub>CEO</sub>     | V <sub>CE</sub> =10V, 0 lx                                      | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流 Light Current                                   | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                       | 0.3  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =20mA, I <sub>C</sub> =0.15mA                    | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                                  | 上昇 Rise Time         | V <sub>CC</sub> =5V, I <sub>C</sub> =0.5mA, R <sub>L</sub> =1kΩ | —    | 50   | —    | μs   |
|                 |                                                     | 下降 Fall Time         |                                                                 | —    | 50   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI1221

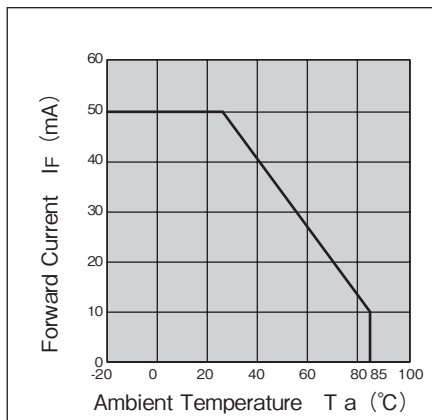
## 定格・特性曲線

### Characteristics

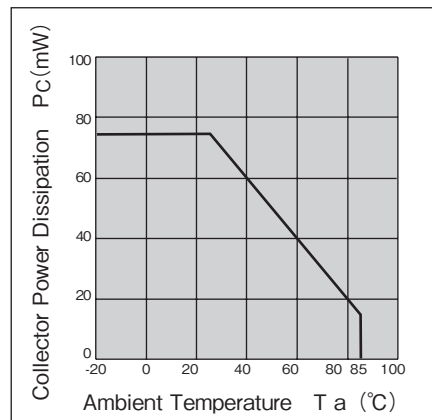
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

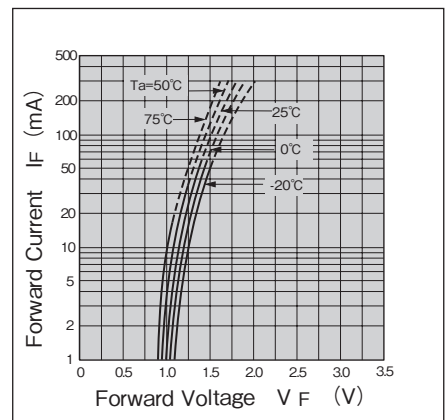
### 順電流低減曲線



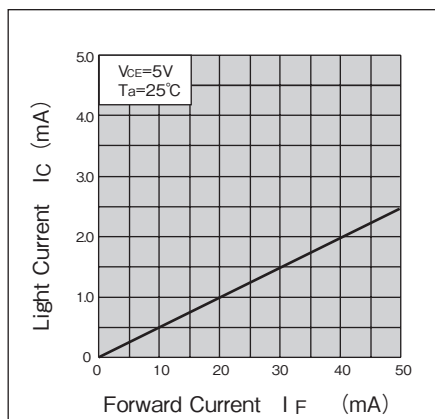
### コレクタ損失低減曲線



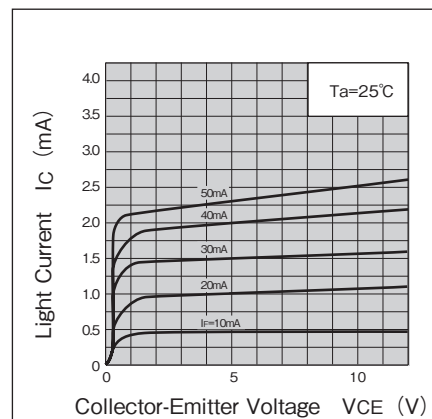
### 順電流－順電圧特性 (代表例)



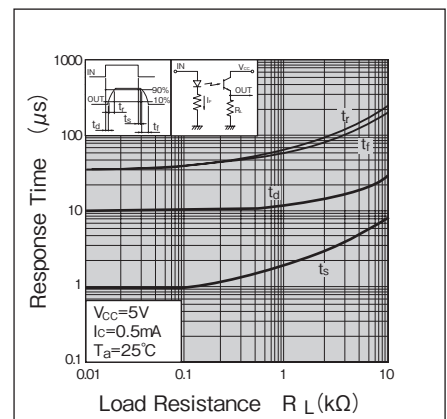
### 光電流－順電流特性 (代表例)



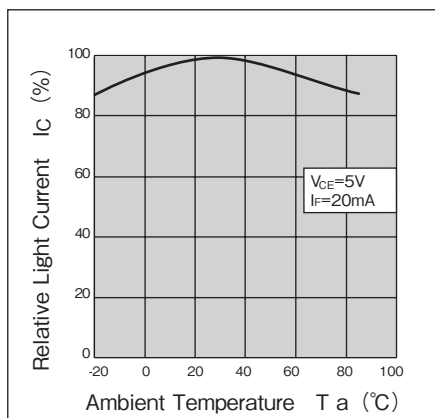
### 光電流－コレクタ・エミッタ間電圧特性 (代表例)



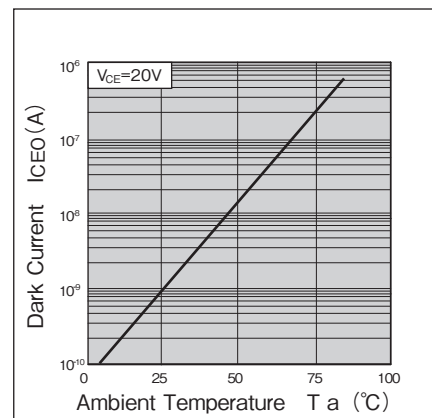
### 応答時間－負荷抵抗特性 (代表例)



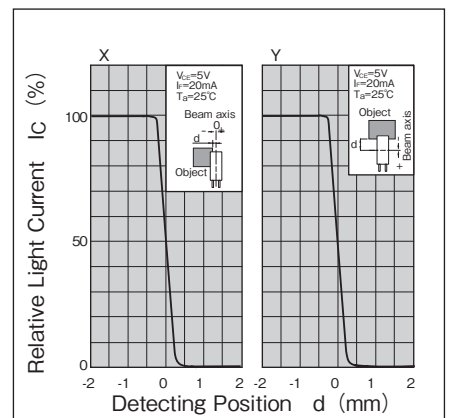
### 光電流－周囲温度特性 (代表例)



### 暗電流－周囲温度特性 (代表例)



### 検出位置特性 (代表例)



・ カスタマイズも承ります。お気軽にお問合せください

・ A Customized design available on request.

・ この仕様は改良のため予告なく変更する場合があります

・ Specifications are subject to change without notice.

## KI1222



透過型フォトセンサ ギャップ幅広タイプ

Photo Interrupter - Wide slot type



## 概要 Description

KI1222 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した透過型フォトセンサです。

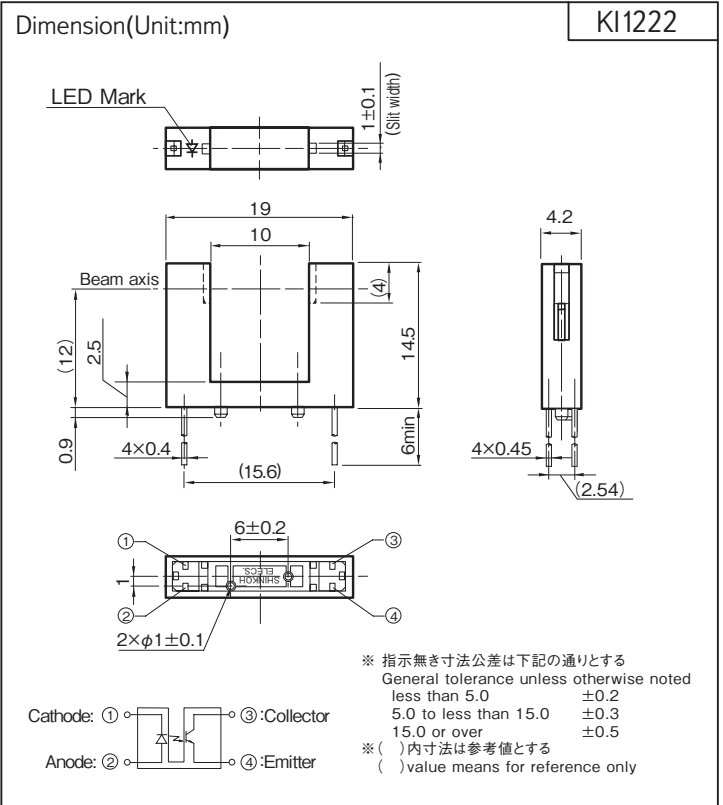
Model KI1222 consists of an Infrared LED and a High sensitive Photo transistor(Analog output).

## 特長 Feature

- 検出溝の深さ 12mm の深溝型
- 検出溝幅が 10mm と広いので厚みのある物でも検出可能
- 可視光カットタイプ
- フォト IC タイプも用意しております  
... KI1230/1231
- Slot depth-12mm.
- Wide Slot width-10mm.
- Visible Light cut filter.
- The model of Photo IC Output is also available.  
... KI1230/1231

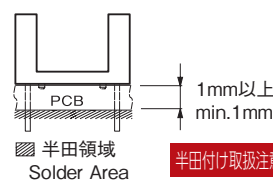
## 用途 Application

- カード機器、両替機の物体通過検出
- 自動販売機、アミューズメント機器のコイン通過検出
- OA 機器、その他
- Object passing for Card reader, Bill exchanger.
- Coin-passing for Auto vending machine and Amusement.
- Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           | Symbol                                 | Rating    | Unit  |
|--------------------------------|----------------------------------------|-----------|-------|
| 発光側<br>Emitter                 | 順電流 Forward Current                    | IF        | 50 mA |
|                                | パルス順電流 Pulse Forward Current ※1        | IFP       | 1 A   |
|                                | 逆電圧 Reverse Voltage                    | VR        | 5 V   |
|                                | 許容損失 Power Dissipation                 | P         | 75 mW |
| 受光側<br>Detector                | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO      | 30 V  |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO      | 5 V   |
|                                | コレクタ電流 Collector Current               | IC        | 20 mA |
|                                | コレクタ損失 Collector Power Dissipation     | Pc        | 75 mW |
| 動作温度 Operating Temperature     | Topr                                   | -20 ~ +85 | °C    |
| 保存温度 Storage Temperature       | Tstg                                   | -30 ~ +85 | °C    |
| 半田付温度 Soldering Temperature ※2 | Tsol                                   | 330       | °C    |



- ※1. パルス幅  $t_w \leq 100\mu s$  Duty比=0.01
- ※2. パッケージ下面より 1mm 以上の位置で 2 秒以内(上図参照) 手半田付けのみ可(フロー半田付け不可)
- ※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01
- ※2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            | Symbol                            | Condition    | min.                     | typ. | max. | Unit |
|-----------------|-----------------------------------|--------------|--------------------------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | VF           | IF=20mA                  | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | IR           | VR=3V                    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | ICEO         | VCE=10V, 0 lx            | —    | 0.1  | μA   |
|                 | 光電流 Light Current                 | IC           | VCE=5V, IF=20mA          | 0.5  | —    | mA   |
| 伝達特性<br>Coupled | コレクタ・エミッタ間飽和電圧 Saturation Voltage | VCE(sat)     | IF=20mA, IC=0.25mA       | —    | 0.4  | V    |
|                 | 応答時間 Response Time                | 上昇 Rise Time | VCC=5V, IC=0.5mA, RL=1kΩ | 15   | —    | μs   |
|                 |                                   | 下降 Fall Time |                          | 17   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI1222

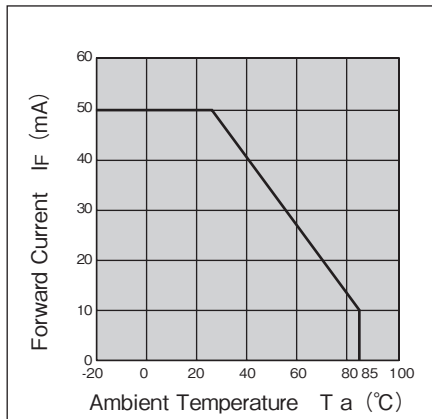
## 定格・特性曲線

### Characteristics

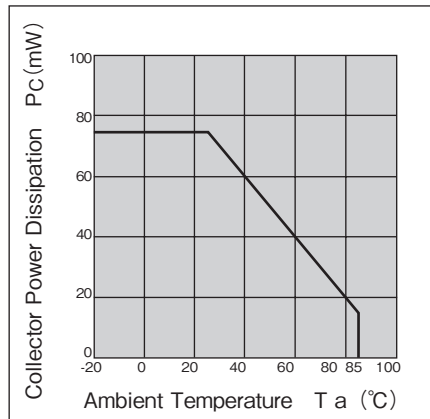
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

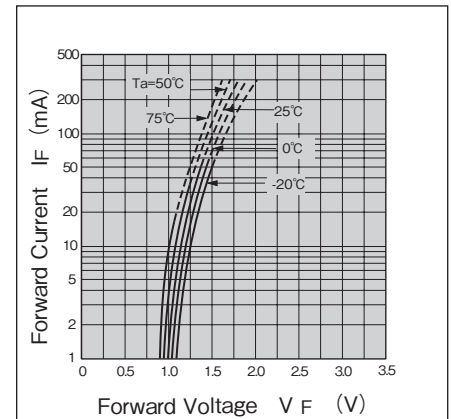
### 順電流低減曲線



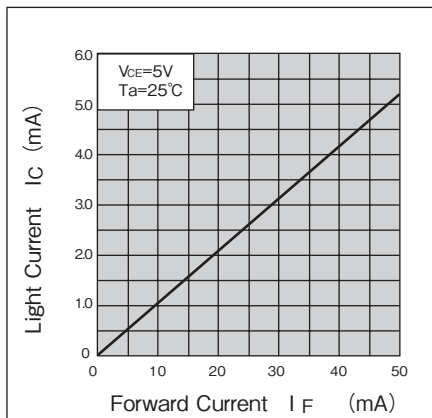
### コレクタ損失低減曲線



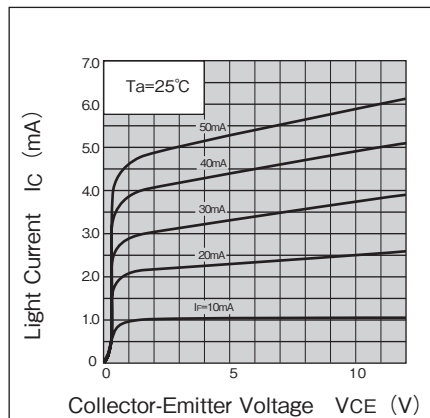
### 順電流－順電圧特性 (代表例)



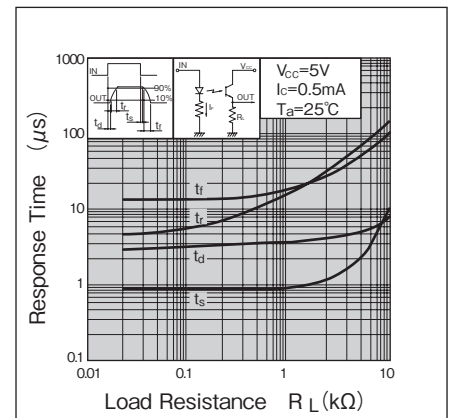
### 光電流－順電流特性 (代表例)



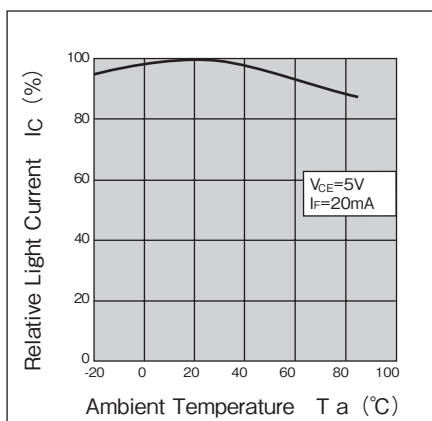
### 光電流－コレクタ・エミッタ間電圧特性 (代表例)



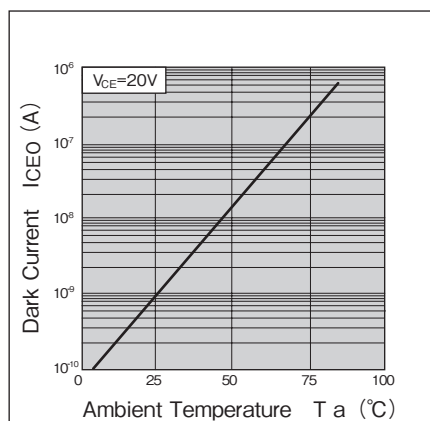
### 応答時間－負荷抵抗特性 (代表例)



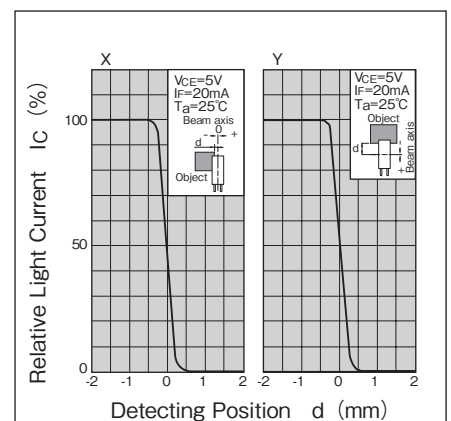
### 光電流－周囲温度特性 (代表例)



### 暗電流－周囲温度特性 (代表例)



### 検出位置特性 (代表例)



・ カスタマイズも承ります。お気軽にお問合せください

・ A Customized design available on request.

・ この仕様は改良のため予告なく変更する場合があります

・ Specifications are subject to change without notice.

## KI1223



透過型フォトセンサ ギャップ幅広タイプ Photo Interrupter - Wide slot type



## 概要 Description

KI1223 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した透過型フォトセンサです。

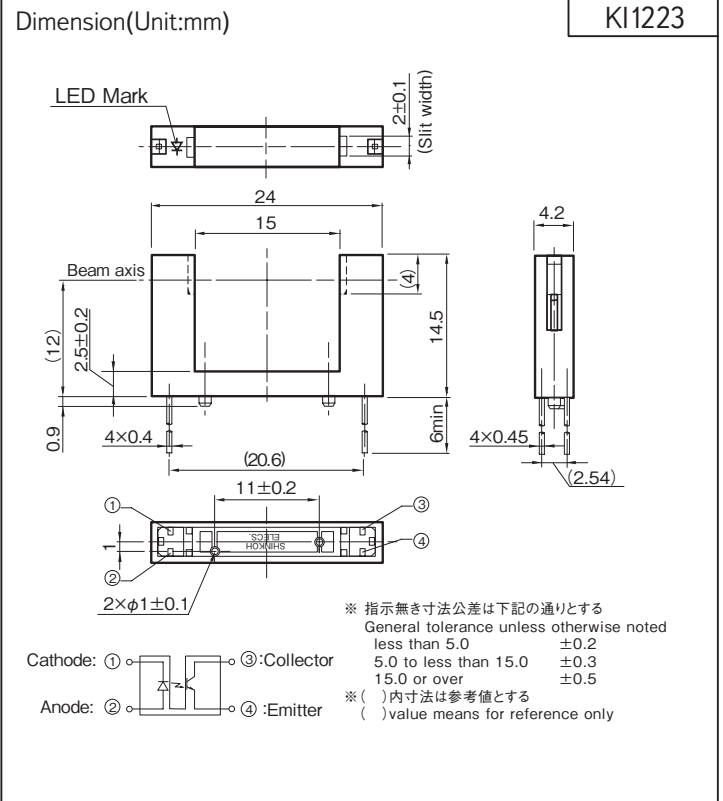
Model KI1223 consists of an Infrared LED and a High sensitive Photo transistor (Analog output).

## 特長 Feature

- 検出溝の深さ 12mm の深溝型
- 検出溝幅が 15mm と広いので厚みのある物でも検出可能
- Slot depth-12mm.
- Wide Slot width-15mm.

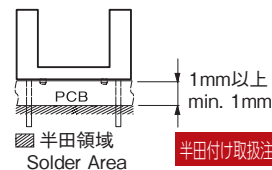
## 用途 Application

- カード機器、両替機の物体通過検出
- 自動販売機、アミューズメント機器のコイン通過検出
- OA 機器、その他
- Object passing for Card reader, Bill exchanger.
- Coin-passing for Auto vending machine and Amusement.
- Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           | Symbol                                 | Rating    | Unit  |
|--------------------------------|----------------------------------------|-----------|-------|
| 発光側<br>Emitter                 | 順電流 Forward Current                    | IF        | 50 mA |
|                                | パルス順電流 Pulse Forward Current ※1        | IFP       | 1 A   |
|                                | 逆電圧 Reverse Voltage                    | VR        | 5 V   |
|                                | 許容損失 Power Dissipation                 | P         | 75 mW |
| 受光側<br>Detector                | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO      | 30 V  |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO      | 5 V   |
|                                | コレクタ電流 Collector Current               | IC        | 20 mA |
|                                | コレクタ損失 Collector Power Dissipation     | Pc        | 75 mW |
| 動作温度 Operating Temperature     | Topr                                   | -20 ~ +85 | °C    |
| 保存温度 Storage Temperature       | Tstg                                   | -30 ~ +85 | °C    |
| 半田付温度 Soldering Temperature ※2 | Tsol                                   | 330       | °C    |



※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01

※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照)  
手半田付けのみ可 (フロー半田付け不可)

※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

※ 2. Soldering condition less than 2s. at 1mm over from body.  
Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            | Symbol                            | Condition    | min.                             | typ. | max. | Unit        |
|-----------------|-----------------------------------|--------------|----------------------------------|------|------|-------------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | VF           | IF=20mA                          | —    | 1.2  | 1.5 V       |
|                 | 逆電流 Reverse Current               | IR           | VR=3V                            | —    | —    | 10 $\mu A$  |
| 受光側<br>Detector | 暗電流 Dark Current                  | ICEO         | VCE=10V, 0 lx                    | —    | —    | 0.1 $\mu A$ |
| 伝達特性<br>Coupled | 光電流 Light Current                 | IC           | VCE=5V, IF=20mA                  | 0.5  | —    | mA          |
|                 | コレクタ・エミッタ間飽和電圧 Saturation Voltage | VCE(sat)     | IF=20mA, IC=0.25mA               | —    | —    | 0.4 V       |
|                 | 応答時間 Response Time                | 上昇 Rise Time | VCC=5V, IC=0.5mA, RL=1k $\Omega$ | —    | 15   | $\mu s$     |
|                 |                                   | 下降 Fall Time |                                  | —    | 17   |             |

\*\* : Ta=25°C unless otherwise noted

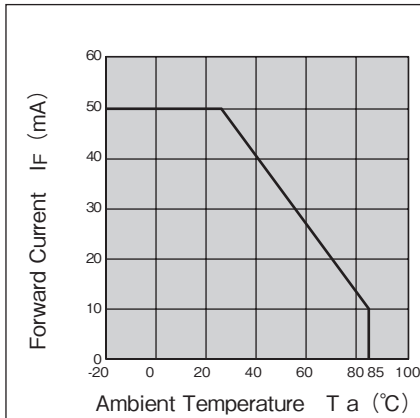
# KI1223

定格・特性曲線  
Characteristics

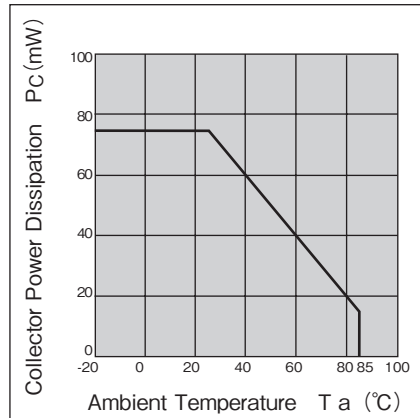
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

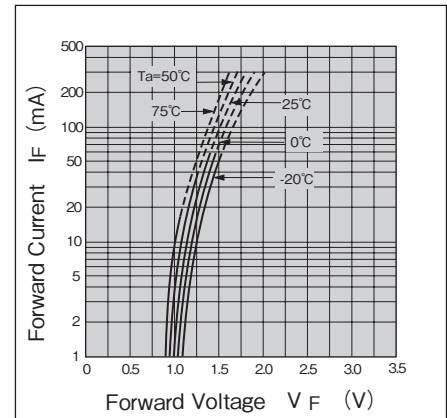
順電流低減曲線



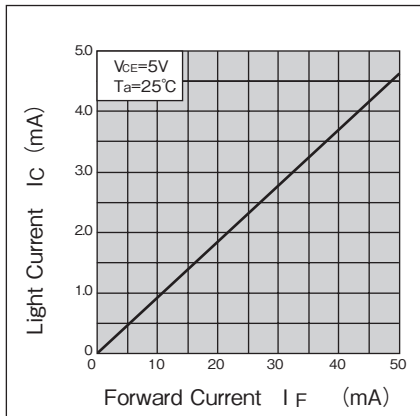
コレクタ損失低減曲線



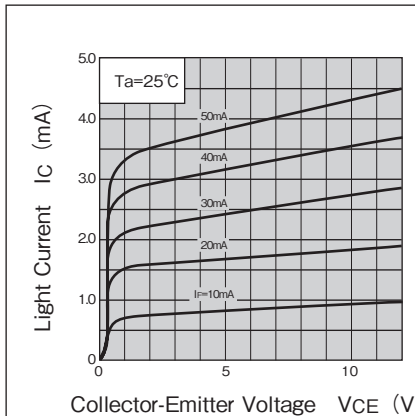
順電流－順電圧特性(代表例)



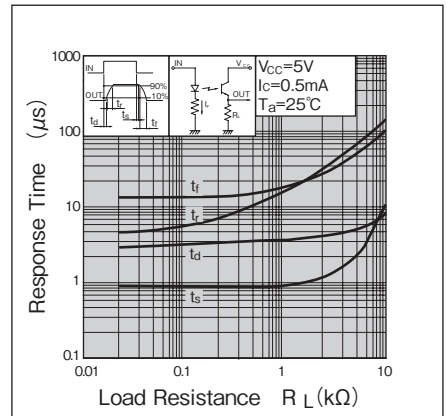
光電流－順電流特性 (代表例)



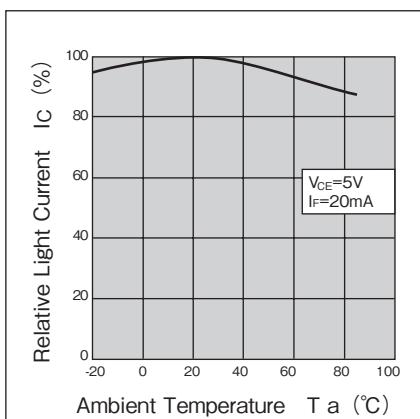
光電流－コレクタ・エミッタ間電圧特性 (代表例)



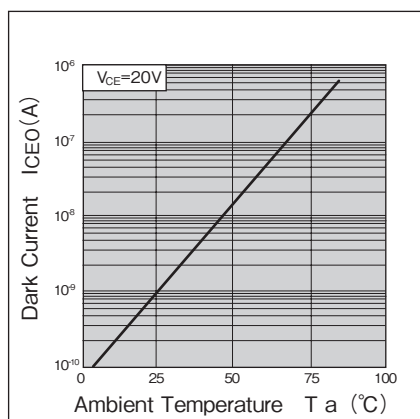
応答時間－負荷抵抗特性(代表例)



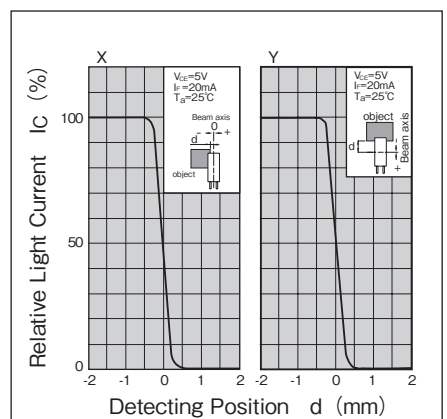
光電流－周囲温度特性 (代表例)



暗電流－周囲温度特性(代表例)



検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1230/1231



透過型フォトセンサ ギャップ幅広タイプ

Photo Interrupter - Wide slot type



## 概要 Description

KI1230/1231 は、発光側に赤外発光ダイオード、受光側にフォト IC 出力を採用した透過型フォトセンサです。

Model KI1230/1231 consist of an Infrared LED and a Photo IC.

## 特長 Feature

- ・アンプ内蔵、プルアップ抵抗内蔵タイプ
- ・検出溝の深さ 12mm の深溝型
- ・検出溝幅が 10mm と広いので厚みのあるものを検出可能
- ・フォトトランジスタ出力タイプも用意しております  
... KI1222
- ・ Built-in amplifier, Pull-up Resistor output type.
- ・ Slot depth-12mm.
- ・ Wide Slot width-10mm.
- ・ The model of Phototransistor Output is also available  
... KI1222

## 用途 Application

- ・カード機器、両替機の物体通過検出
- ・自動販売機、アミューズメント機器のコイン通過検出
- ・OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           | Symbol                             | Rating          | Unit   |
|--------------------------------|------------------------------------|-----------------|--------|
| 発光側<br>Emitter                 | 順電流 Forward Current                | I <sub>F</sub>  | 50 mA  |
|                                | パルス順電流 Pulse Forward Current ※1    | I <sub>FP</sub> | 1 A    |
|                                | 逆電圧 Reverse Voltage                | V <sub>R</sub>  | 5 V    |
| 受光側<br>Detector                | 電源電圧 Supply Voltage                | V <sub>CC</sub> | 17 V   |
|                                | ローレベル出力電流 Low-Level Output Current | I <sub>OL</sub> | 16 mA  |
|                                | 出力許容損失 Output Power Dissipation    | P <sub>O</sub>  | 175 mW |
| 動作温度 Operating Temperature     | T <sub>opr</sub>                   | -20 ~ +85       | °C     |
| 保存温度 Storage Temperature       | T <sub>stg</sub>                   | -30 ~ +85       | °C     |
| 半田付温度 Soldering Temperature ※2 | T <sub>sol</sub>                   | 330             | °C     |

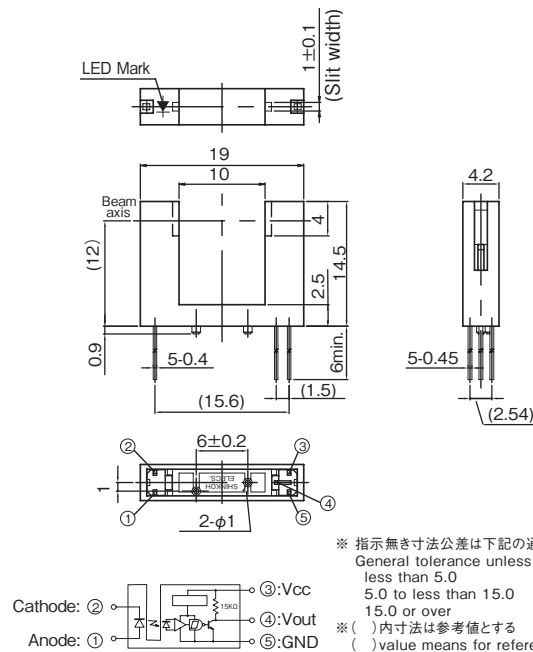
電気的光学的特性 Electro-Optical Characteristics [V<sub>CC</sub>=5V, Ta=25°C \*\*] ( )=KI1231

| Item            | Symbol                               | Condition                                                       | min.                 | typ. | max. | Unit |
|-----------------|--------------------------------------|-----------------------------------------------------------------|----------------------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage                  | I <sub>F</sub> =20mA                                            | —                    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current                  | V <sub>R</sub> =3V                                              | —                    | —    | 10   | μA   |
| 受光側<br>Detector | ローレベル出力電圧 Low-Level Output Voltage   | I <sub>OL</sub> =16mA, I <sub>F</sub> =15mA (I <sub>F</sub> =0) | —                    | 0.15 | 0.4  | V    |
|                 | ハイレベル出力電圧 High-Level Output Voltage  | I <sub>F</sub> =0(I <sub>F</sub> =15mA)                         | V <sub>CC</sub> ×0.9 | —    | —    | V    |
|                 | ローレベル供給電流 Low-Level Supply Current   | V <sub>CC</sub> =5V, I <sub>F</sub> =15mA (I <sub>F</sub> =0)   | —                    | —    | 3.4  | mA   |
|                 | ハイレベル供給電流 High-Level Supply Current  | V <sub>CC</sub> =5V, I <sub>F</sub> =0 (I <sub>F</sub> =15mA)   | —                    | —    | 2.2  | mA   |
| 伝達特性<br>Coupled | スレッショールド入力電流 Threshold Input Current | I <sub>FHL</sub> KI1230 High → Low                              | —                    | —    | 10   | mA   |
|                 |                                      | I <sub>FLH</sub> KI1231 Low → High                              | —                    | —    | 10   |      |
|                 | ヒステリシス Hysteresis                    | V <sub>CC</sub> =5V                                             | —                    | 0.65 | —    | —    |
|                 | 応答時間 Response Time                   | 上昇 Rise Time                                                    | —                    | 0.1  | —    | μs   |
|                 |                                      | 下降 Fall Time                                                    | —                    | 0.05 | —    |      |

\*\* : Ta=25°C unless otherwise noted

## Dimension(Unit:mm)

KI1230/1231



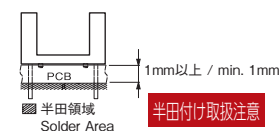
| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI1230 | Low  | 入光時 at Beam detecting |
| KI1231 | High | 入光時 at Beam detecting |

## &lt; ご使用上の注意 &gt;

センサ近くの V<sub>CC</sub>-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt;Operation Notice&gt;

We recommend to use with 0.01μF of bypass capacitor between V<sub>CC</sub> and GND and nearby of sensor.



- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比=0.01  
 ※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)

- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01  
 ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

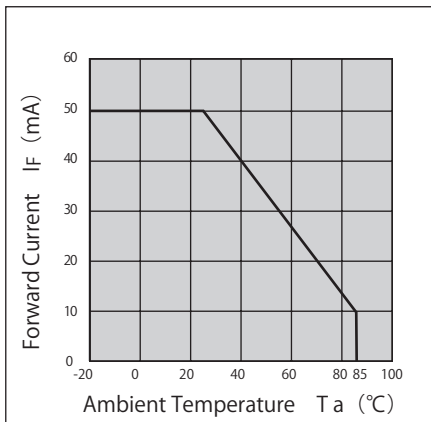
# KI1230/1231

定格・特性曲線  
Characteristics

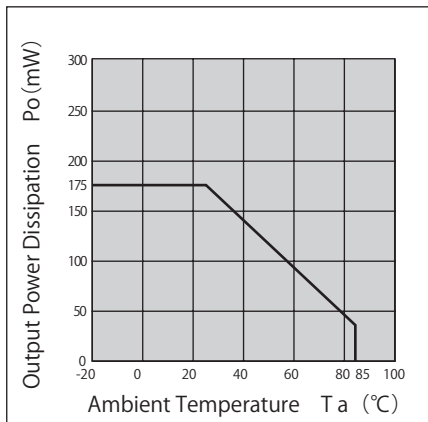
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

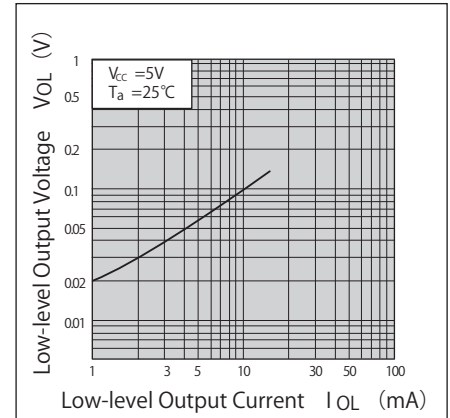
順電流低減曲線



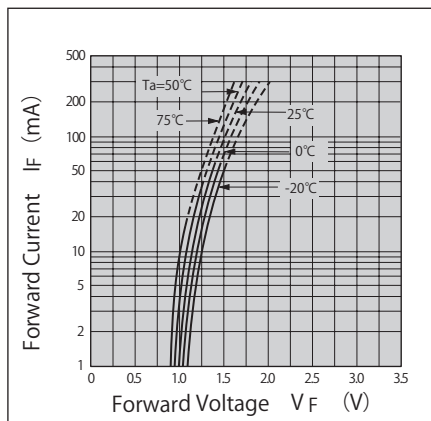
出力許容損失低減曲線



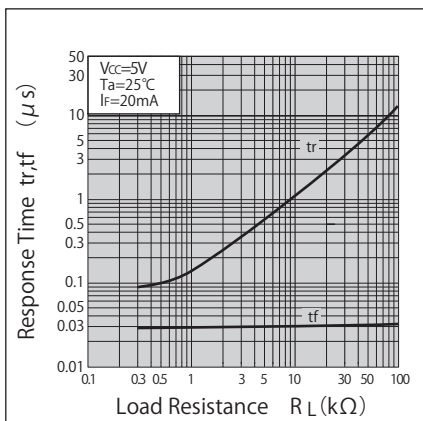
ローレベル出力電圧—  
ローレベル出力電流特性 (代表例)



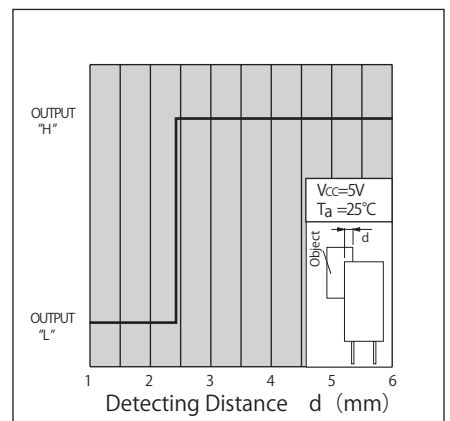
順電流—順電圧曲線 (代表例)



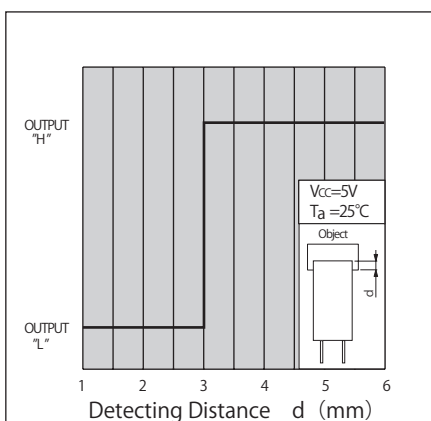
上昇、下降時間—  
負荷抵抗特性 (代表例)



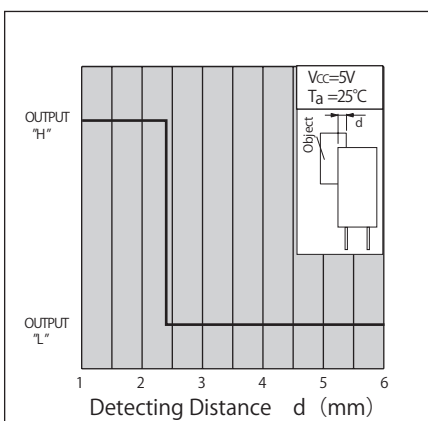
検出位置特性 1 (代表例) KI1230



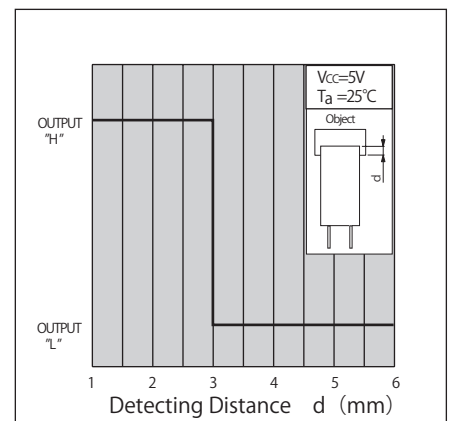
検出位置特性 2 (代表例) KI1230



検出位置特性 1 (代表例) KI1231



検出位置特性 2 (代表例) KI1231



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1232



透過型フォトセンサ 防塵タイプ

Photo Interrupter - Dust proof type



## 概要 Description

KI1232 は、外側にケースカバー、内側に検出用スリットをもつ 2 重構造の防塵タイプ小型透過型フォトセンサです。

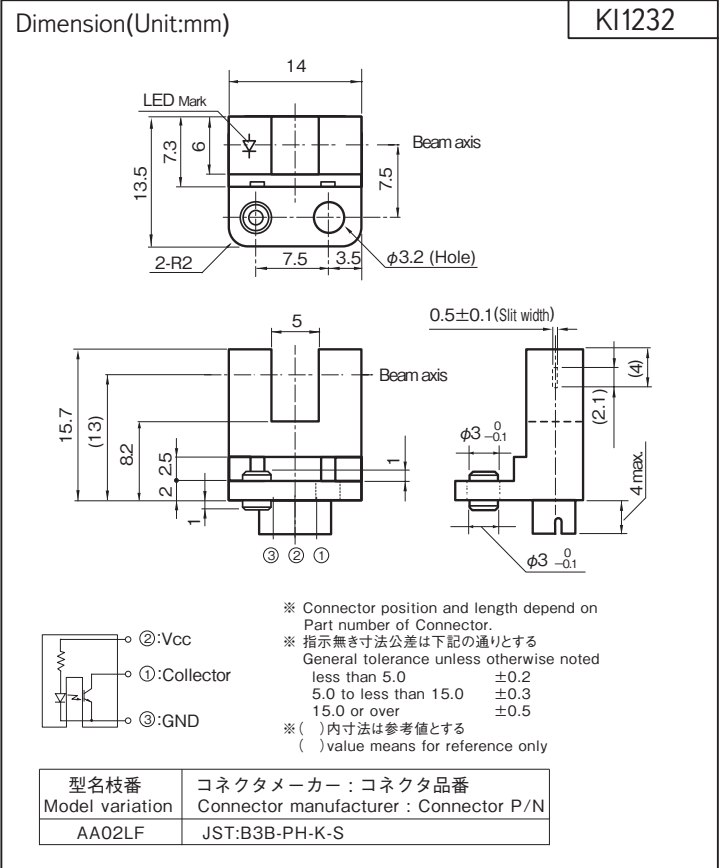
Model KI1232 consists of an Infrared LED and a High sensitive Photo transistor (Analog output).

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：内蔵スリット幅 0.5 mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ Easy removing paper dust.
- ・ High-resolution : slit width 0.5mm.
- ・ Visible Light cut filter.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の用紙通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item              |              |                             | Symbol | Rating    | Unit |
|-------------------|--------------|-----------------------------|--------|-----------|------|
| 発 光 側<br>Emitter  | 電 源 電 圧      | Supply Voltage              | VCC    | 6         | V    |
|                   | 逆 電 圧        | Reverse Voltage             | VR     | 5         | V    |
| 受 光 側<br>Detector | コレクタ・エミッタ間電圧 | Collector-Emitter Voltage   | VCEO   | 30        | V    |
|                   | エミッタ・コレクタ間電圧 | Emitter-Collector Voltage   | VECO   | 5         | V    |
|                   | コ レ ク タ 電 流  | Collector Current           | Ic     | 20        | mA   |
|                   | コ レ ク タ 損 失  | Collector Power Dissipation | Pc     | 75        | mW   |
| 動 作 温 度           |              | Operating Temperature       | Topr   | -20 ～ +75 | ℃    |
| 保 存 温 度           |              | Storage Temperature         | Tstg   | -30 ～ +85 | ℃    |

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*]

| Item               |                                                     | Symbol   | Condition                | min. | typ. | max. | Unit |
|--------------------|-----------------------------------------------------|----------|--------------------------|------|------|------|------|
| 発 光 側<br>Emitter   | 動 作 電 源 電 圧 Supply Voltage                          | VCC      | —                        | 4.5  | 5.0  | 5.5  | V    |
| 受 光 側<br>Detector  | 暗 電 流 Dark Current                                  | ICEO     | VCE=20V, 0 lx            | —    | —    | 0.2  | μA   |
| 伝 達 特 性<br>Coupled | 光 電 流 Light Current                                 | IC       | VCC=5V, VCE=5V           | 0.3  | —    | —    | mA   |
|                    | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat) | VCC=5V, IC=0.15mA        | —    | —    | 0.4  | V    |
|                    | 応 答 時 間 上昇 Rise Time                                | tr       | VCC=5V, IC=0.1mA, RL=1kΩ | —    | 50   | —    | μs   |
|                    | Response Time 下降 Fall Time                          | tf       |                          | —    | 50   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI1232

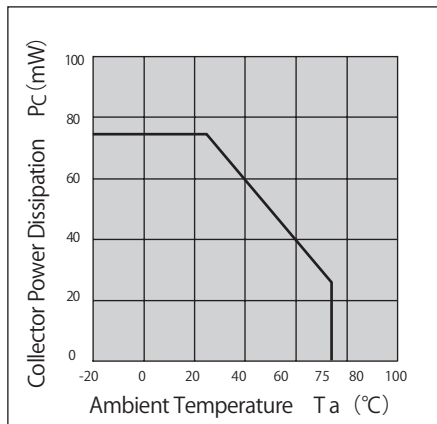
## 定格・特性曲線

### Characteristics

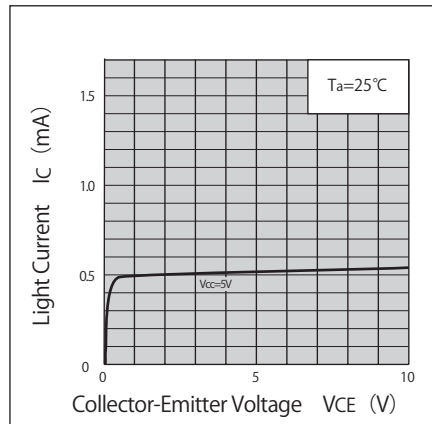
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

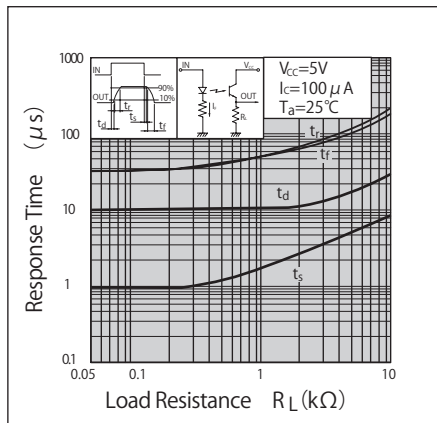
## コレクタ損失低減曲線



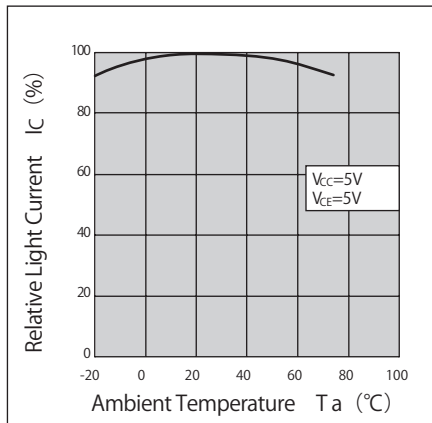
## 光電流-コレクタ・エミッタ間電圧特性 (代表例)



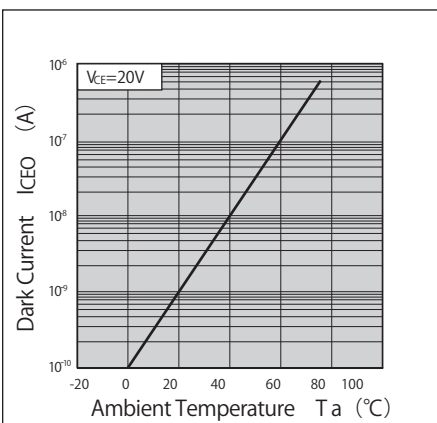
## 応答時間-負荷抵抗特性 (代表例)



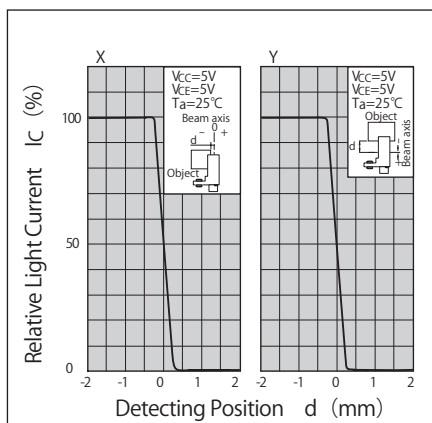
## 光電流-周囲温度特性 (代表例)



## 暗電流-周囲温度特性 (代表例)



## 検出位置特性 (代表例)



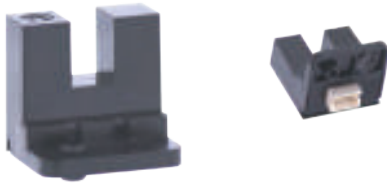
- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1233/1234/1235/1236



透過型フォトセンサ 防塵タイプ

Photo Interrupter - Dust proof type



## 概要 Description

KI1233/1234/1235/1236 は、外側にケースカバー、内側に検出用スリットをもつ 2 重構造の防塵型、フォト IC 出力の小型透過型フォトセンサです。

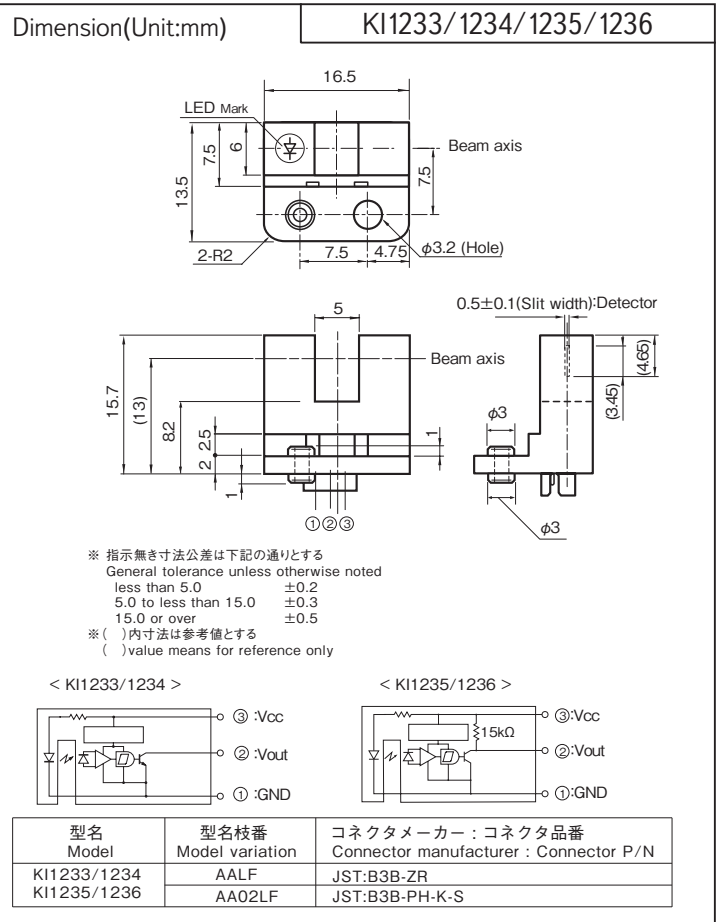
Model KI1233/1234/1235/1236 consist of an Infrared LED and a Photo IC (Digital Output). Outer package has no aperture on the both light pass surfaces of the emitter and detector.

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：内蔵スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ LED 制限抵抗内蔵タイプ
- ・ Easy removing paper dust.
- ・ High-resolution : slit width 0.5mm.
- ・ Visible Light cut filter.
- ・ Built in resistor for LED drive.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の用紙通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol | Rating    | Unit |
|------------------------------------|--------|-----------|------|
| 電源電圧 Supply Voltage                | Vcc    | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL    | 50        | mA   |
| 動作温度 Operating Temperature         | Topr   | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | Tstg   | -40 ~ +80 | °C   |
| KI1233 / 1234 出力電圧 Output Voltage  | VO     | 28        | V    |

| Model       | Output type              |
|-------------|--------------------------|
| KI1233/1234 | オープンコレクタ Open collector  |
| KI1235/1236 | プルアップ抵抗 Pull-up Resistor |

| Model       | Mode | Condition             |
|-------------|------|-----------------------|
| KI1233/1235 | High | 入光時 at Beam detecting |
| KI1234/1236 | Low  | 入光時 at Beam detecting |

## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*] ※ 1. KI1233/1234 - RL=47kΩ

| Item                                    | Symbol       | Condition                            | min.    | typ. | max. | Unit |
|-----------------------------------------|--------------|--------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage                   | Vcc          | —                                    | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current      | ICCL         | KI1233/1235 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                         |              | KI1234/1236 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current     | ICCH         | KI1233/1235 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                         |              | KI1234/1236 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage      | VOL          | KI1233/1235 遮光時 IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                         |              | KI1234/1236 入光時 IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage ※ 1 | VOH          | KI1233/1235 入光時 w/o Shutter          | VCCx0.9 | —    | —    | V    |
|                                         |              | KI1234/1236 遮光時 Shutter in           | VCCx0.9 | —    | —    |      |
| 応答時間 Response Time                      | 上昇 Rise Time | tr                                   | —       | 1.47 | —    | μs   |
|                                         | 下降 Fall Time | tf                                   | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI1233/1234/1235/1236

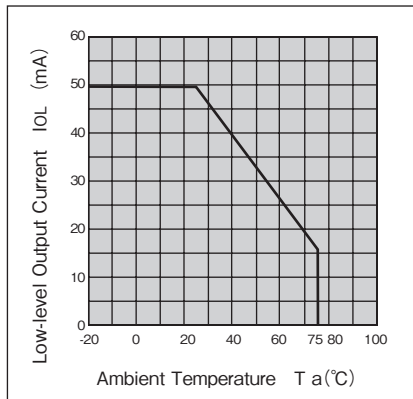
定格・特性曲線

Characteristics

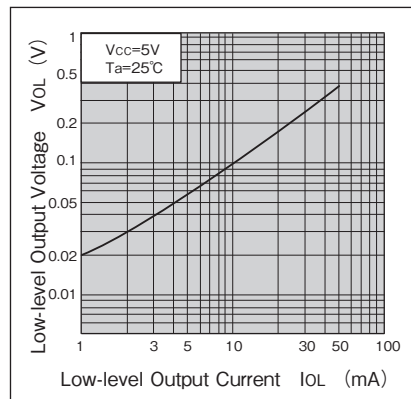
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

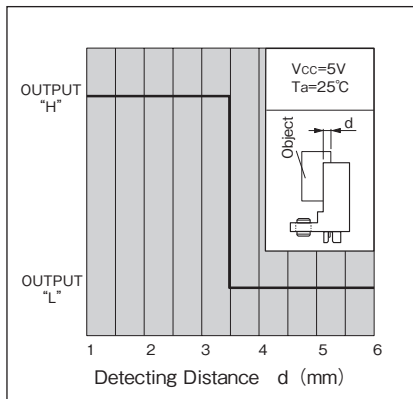
ローレベル出力電流低減曲線



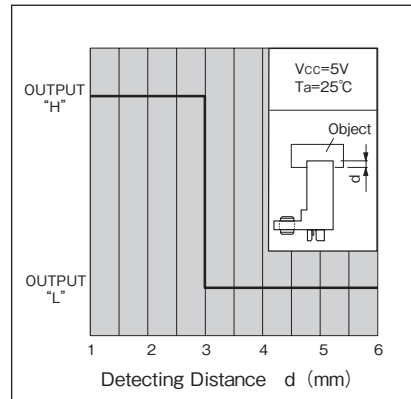
ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)



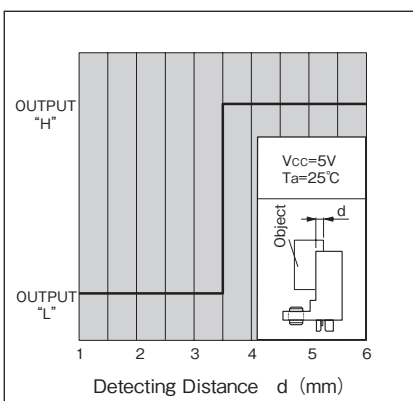
検出位置特性1 (代表例) KI1233/1235



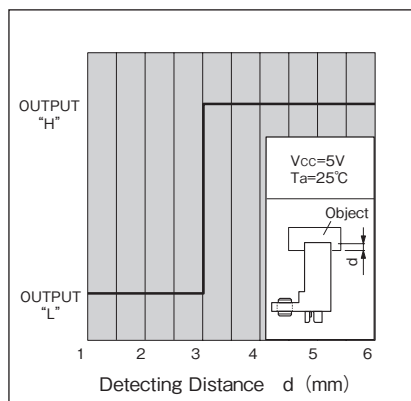
検出位置特性2 (代表例) KI1233/1235



検出位置特性1 (代表例) KI1234/1236



検出位置特性2 (代表例) KI1234/1236



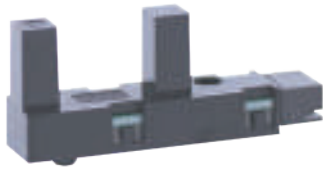
- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1248/1249/1250/1251



透過型フォトセンサ ギャップ幅広・防塵タイプ

Photo Interrupter - Wide slot · Dust proof type



## 概要 Description

KI1248/1249/1250/1251 は、外側にケースカバー、内側に検出用スリットをもつ 2 重構造の防塵型、フォト IC 出力の透過型フォトセンサです。

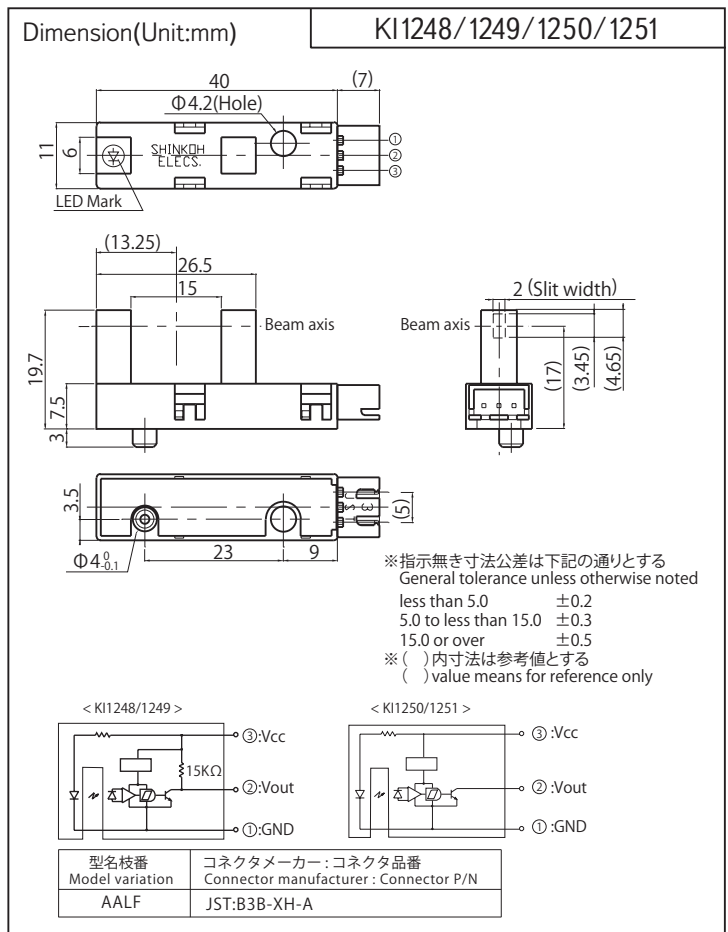
Model KI1248/1249/1250/1251 consist of an Infrared LED and a Photo IC.

## 特長 Feature

- ・ アンプ内蔵型
- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出溝の深さが 12.2mm の深溝型
- ・ 検出溝幅が 15mm と広いので厚みのある物でも検出可能
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ Built-in amplifier
- ・ Easy removing paper dust.
- ・ Wide Slot width-15mm, Slot depth-12.2mm.
- ・ Visible Light cut filter.

## 用途 Application

- ・ カード機器、両替機の物体通過検知
- ・ 自動販売機、アミューズメント機器の物体通過検出
- ・ OA 機器のトナーボトル内残量検知、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Object-passing for Auto vending machine and Amusement.
- ・ Remaining detection in toner bottle for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |
| KI1250 / 1251 出力電圧 Output Voltage  | VO               | 28        | V    |

| Model       | Output type              |
|-------------|--------------------------|
| KI1248/1249 | プルアップ抵抗 Pull-up Resistor |
| KI1250/1251 | オープンコレクタ Open collector  |

| Model       | Mode | Condition             |
|-------------|------|-----------------------|
| KI1248/1250 | Low  | 入光時 at Beam detecting |
| KI1249/1251 | High | 入光時 at Beam detecting |

< ご使用上の注意 >

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

< Operation Notice >

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

※ 1. KI1250/1251 - RL=47kΩ

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                    | Symbol       | Condition                            | min.    | typ. | max. | Unit |
|-----------------------------------------|--------------|--------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage                   | VCC          | —                                    | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current      | ICCL         | KI1248/1250 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                         |              | KI1249/1251 遮光時 Shutter in           | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current     | ICCH         | KI1248/1250 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                         |              | KI1249/1251 入光時 w/o Shutter          | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage      | VOL          | KI1248/1250 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  | V    |
|                                         |              | KI1249/1251 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage ※ 1 | VOH          | KI1248/1250 遮光時 Shutter in           | VCC×0.9 | —    | —    | V    |
|                                         |              | KI1249/1251 入光時 w/o Shutter          | VCC×0.9 | —    | —    |      |
| 応答時間 Response Time                      | 上昇 Rise Time | tr                                   | —       | 1.2  | —    | μs   |
|                                         | 下降 Fall Time | tf                                   | —       | 0.05 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI1248/1249/1250/1251

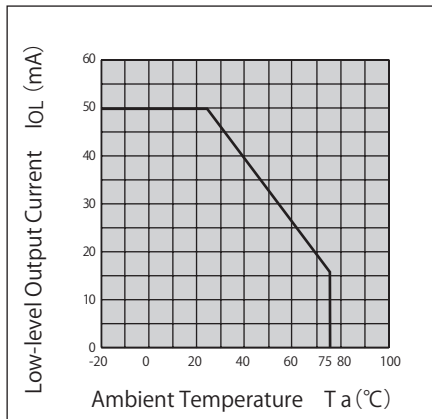
定格・特性曲線

Characteristics

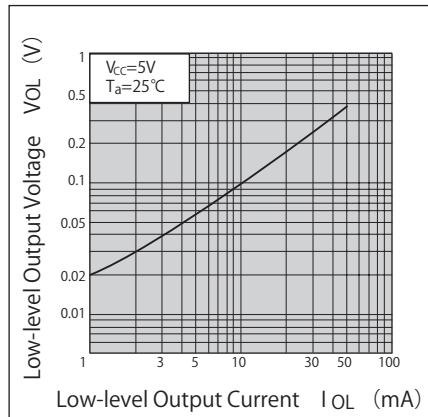
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

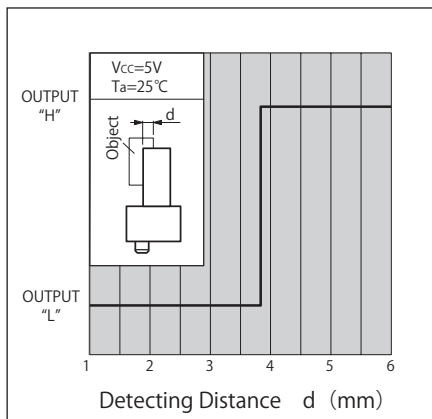
ローレベル出力電流低減曲線



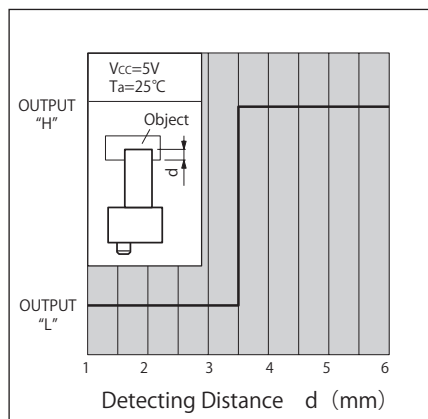
ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)



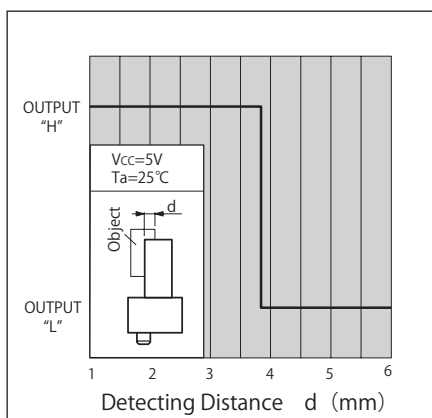
検出位置特性 1 (代表例) KI1248/1250



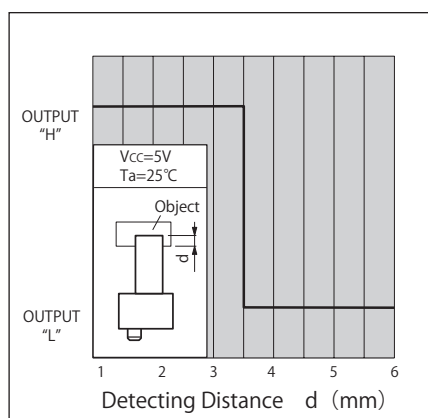
検出位置特性2 (代表例) KI1248/1250



検出位置特性 1 (代表例) KI1249/1251



検出位置特性2 (代表例) KI1249/1251



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1285/1286



透過型フォトセンサ 防塵タイプ

Photo Interrupter - Dust proof type



## 概要 Description

KI1285/1286 は、外側にケースカバー、内側に検出用スリットをもつ 2 重構造の防塵型、フォト IC 出力の小型透過型フォトセンサです。

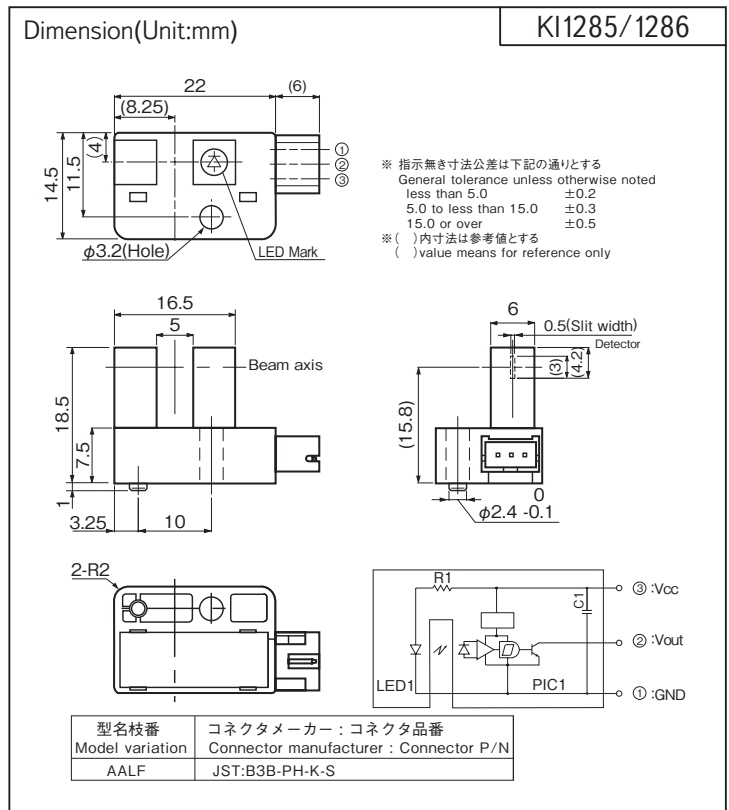
Model KI1285/1286 consist of an Infrared LED and a Photo IC (Digital Output). Outer package has no aperture on the both light pass surfaces of the emitter and detector.

## 特長 Feature

- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：内蔵スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ LED 制限抵抗内蔵タイプ
- ・ Built-in amplifier, Open collector output type.
- ・ Easy removing paper dust.
- ・ High-resolution: slit width 0.5mm.
- ・ Visible Light cut filter.
- ・ Built in resistor for LED drive.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の用紙通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI1285 | High | 入光時 at Beam detecting |
| KI1286 | Low  | 入光時 at Beam detecting |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI1285 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI1286 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI1285 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI1286 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI1285 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI1286 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI1285 入光時、RL=47kΩ w/o Shutter  | VCCx0.9 | —    | —    | V    |
|                                     |              | KI1286 遮光時、RL=47kΩ Shutter in   | VCCx0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                              | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time | tf                              | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI1285/1286

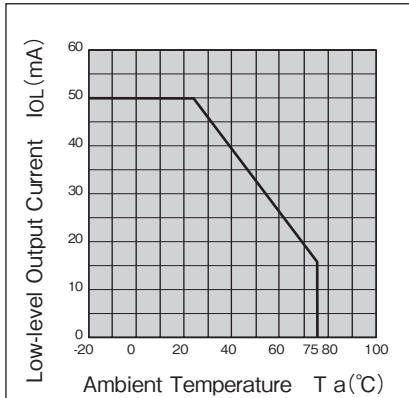
## 定格・特性曲線

Characteristics

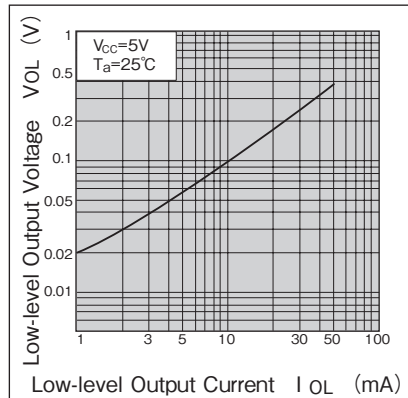
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

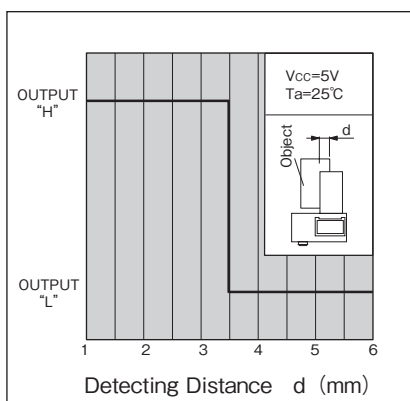
ローレベル出力電流低減曲線



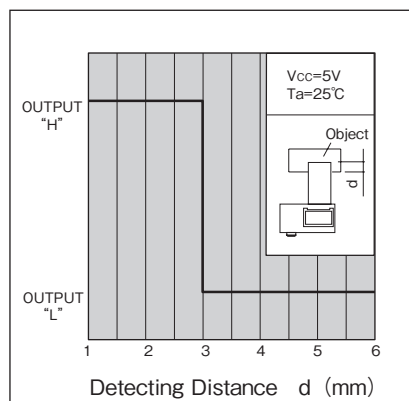
ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)



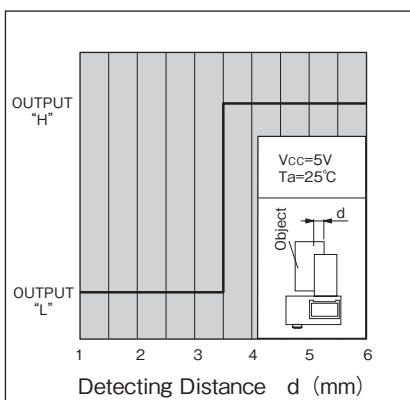
検出位置特性1 (代表例) KI1285



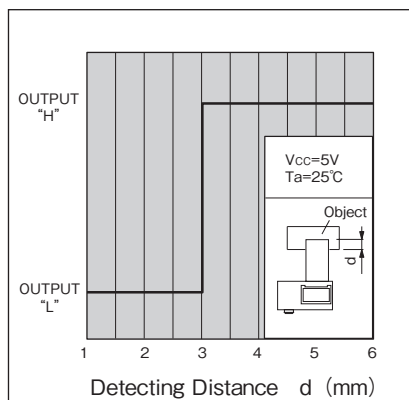
検出位置特性2 (代表例) KI1285



検出位置特性1 (代表例) KI1286



検出位置特性2 (代表例) KI1286



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1300/1301/1302/1303



透過型フォトセンサ ギャップ幅広タイプ

Photo Interrupter - Wide slot type



## 概要 Description

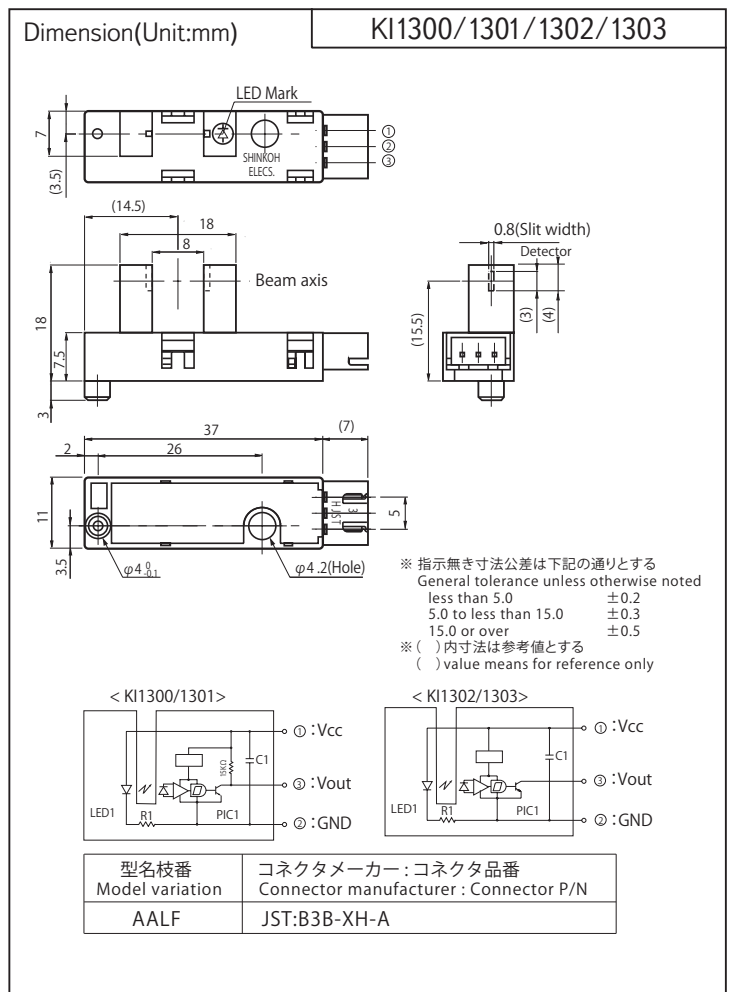
KI1300/1301/1302/1303 は、発光側に赤外発光ダイオード、受光側にフォト IC 出力を採用した透過型フォトセンサです。  
Model KI1300/1301/1302/1303 consist of an Infrared LED and a High sensitive Photo IC(Digital Output).

## 特長 Feature

- 検出精度が高い：スリット幅 0.8mm
- アンプ内蔵タイプ
- LED 制限抵抗内蔵タイプ
- High-resolution : slit width 0.8mm.
- Built in amplifier type.
- Built in resistor for LED drive.

## 用途 Application

- カード機器、両替機の物体通過検出
- 自動販売機、アミューズメント機器のコイン通過検出
- 券売機用の紙通過検出
- OA 機器、その他
- Object passing for Card reader, Bill exchanger.
- Coin-passing for Auto vending machine and Amusement.
- Object passing in Auto vender and Ticket vending machine.
- Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |
| KI1302/1303 出力電圧 Output Voltage    | VO               | 28        | V    |

| Model       | Output type              |
|-------------|--------------------------|
| KI1300/1301 | プルアップ抵抗 Pull-up Resistor |
| KI1302/1303 | オープンコレクタ Open collector  |

| Model       | Mode | Condition             |
|-------------|------|-----------------------|
| KI1300/1302 | High | 入光時 at Beam detecting |
| KI1301/1303 | Low  | 入光時 at Beam detecting |

※ 1. KI1302/1303 - R<sub>L</sub>=47kΩ

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                    | Symbol       | Condition                            | min.    | typ. | max. | Unit |
|-----------------------------------------|--------------|--------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage                   | Vcc          | —                                    | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current      | ICCL         | KI1300/1302 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                         |              | KI1301/1303 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current     | ICCH         | KI1300/1302 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                         |              | KI1301/1303 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage      | VOL          | KI1300/1302 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                         |              | KI1301/1303 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage ※ 1 | VOH          | KI1300/1302 入光時 w/o Shutter          | VCCx0.9 | —    | —    | V    |
|                                         |              | KI1301/1303 遮光時 Shutter in           | VCCx0.9 | —    | —    |      |
| 応答時間 Response Time                      | 上昇 Rise Time | tr                                   | —       | 1.47 | —    | μs   |
|                                         | 下降 Fall Time | tf                                   | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI1300/1301/1302/1303

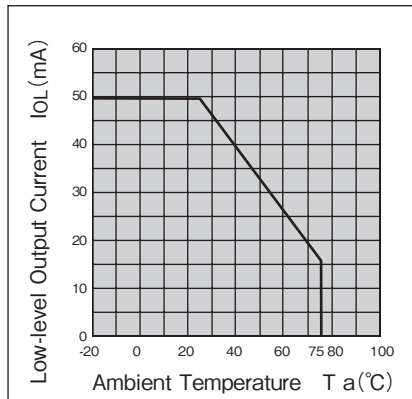
定格・特性曲線

Characteristics

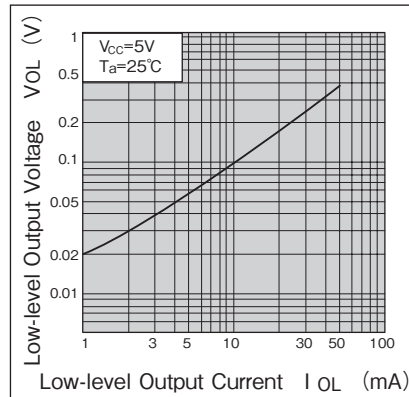
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

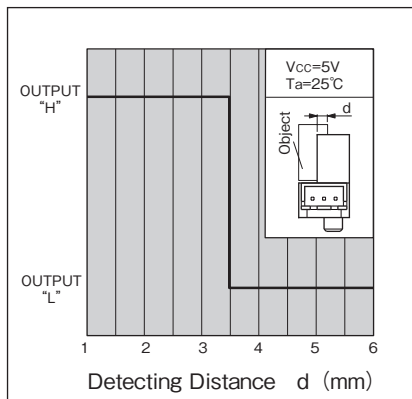
ローレベル出力電流低減曲線



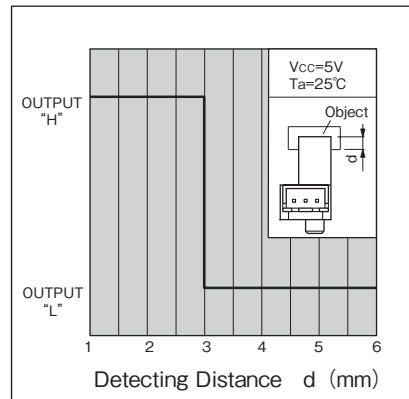
ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)



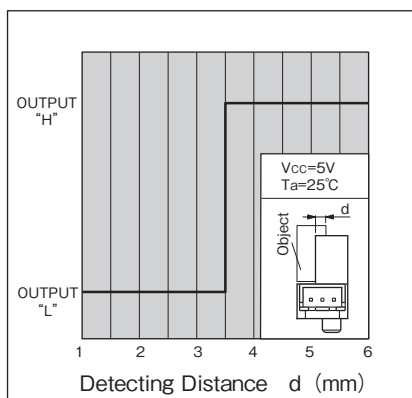
検出位置特性 1 (代表例) KI1300/1302



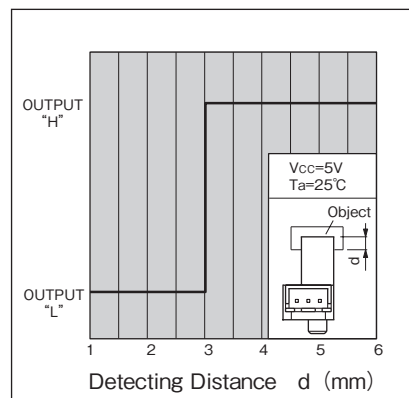
検出位置特性 2 (代表例) KI1300/1302



検出位置特性 1 (代表例) KI1301/1303



検出位置特性 2 (代表例) KI1301/1303



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1305/1306



透過型フォトセンサ ギャップ幅広タイプ

Photo Interrupter - Wide slot type



## 概要 Description

KI1305/1306 は、発光側に赤外発光ダイオード、受光側にフォト IC (デジタル出力) を組合わせた透過型フォトセンサです。

Model KI1305/1306 consist of an Infrared LED and a High sensitive Photo IC(Digital Output).

## 特長 Feature

- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ 検出溝が深い: 12.2mm
- ・ 検出溝幅が広い: 8mm
- ・ 検出精度が高い: スリット幅 0.8mm
- ・ LED 制限抵抗内蔵タイプ
- ・ その他シリーズ  
フォトトランジスタタイプ・・・KI1309
- ・ Built-in amplifier, Open collector output type.
- ・ Slot depth-12.2mm.
- ・ Wide Slot width-8mm.
- ・ High-resolution: slit width 0.8mm.
- ・ Built in resistor for LED drive.
- ・ The other model; Phototransistor type・・・KI1309

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

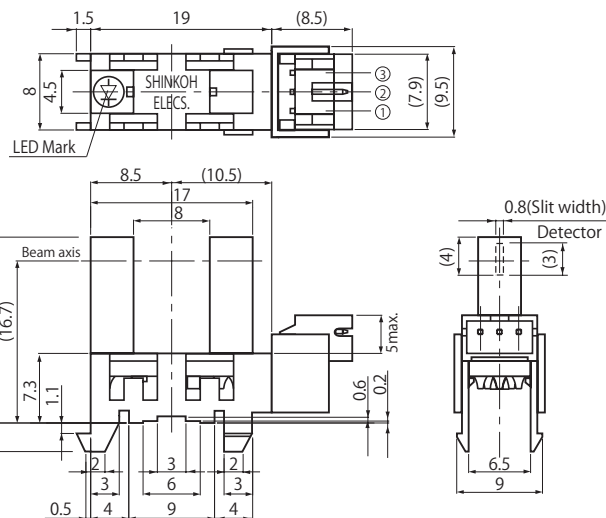
## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI1305 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI1306 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI1305 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI1306 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI1305 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI1306 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI1305 入光時、RL=47kΩ w/o Shutter  | VCC×0.9 | —    | —    | V    |
|                                     |              | KI1306 遮光時、RL=47kΩ Shutter in   | VCC×0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | KI1305            KI1306        | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time |                                 | —       | 0.02 | —    |      |

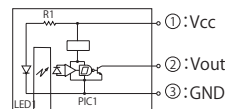
\*\* : Ta=25°C unless otherwise noted

## Dimension(Unit:mm)

KI1305/1306



※ 指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5  
※ ( ) 内寸法は参考値とする  
( ) value means for reference only



|                         |                                                             |
|-------------------------|-------------------------------------------------------------|
| 型名枝番<br>Model variation | コネクタメーカー : コネクタ品番<br>Connector manufacturer : Connector P/N |
| AALF                    | JST:S3B-PH-K-S                                              |

| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI1305 | High | 入光時 at Beam detecting |
| KI1306 | Low  | 入光時 at Beam detecting |

## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with 0.01 μF of bypass capacitor between Vcc and GND and nearby of sensor.

# KI1305/1306

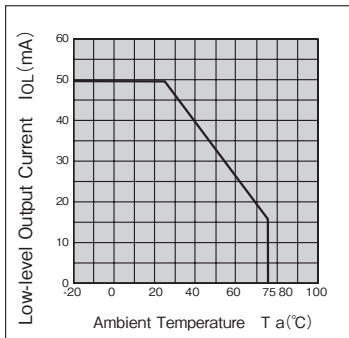
## 定格・特性曲線

Characteristics

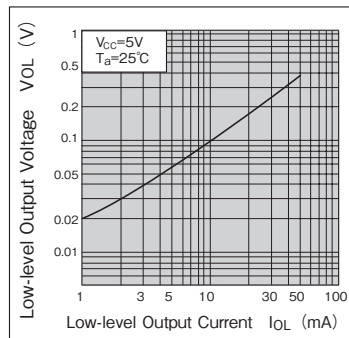
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

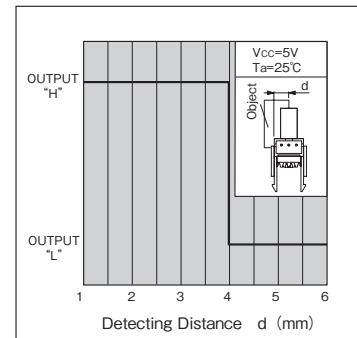
### ローレベル出力電流低減曲線



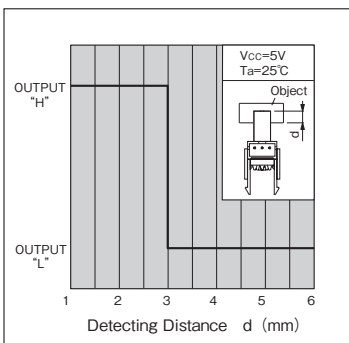
### ローレベル出力電圧・ ローレベル出力電流特性 (代表例)



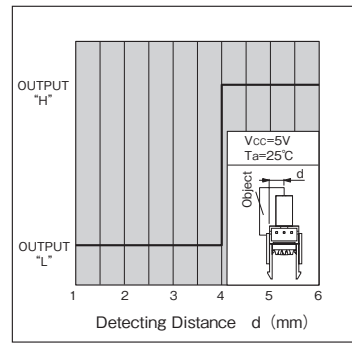
### 検出位置特性 1 (代表例) KI1305



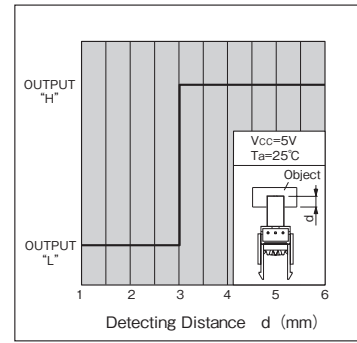
### 検出位置特性 2 (代表例) KI1305



### 検出位置特性 1 (代表例) KI1306

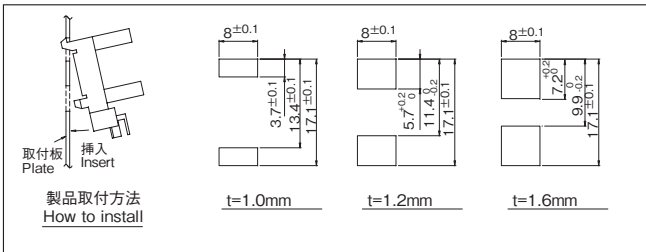


### 検出位置特性 2 (代表例) KI1306



### 推奨取付穴寸法図

Recommended installation to mounting holes



- ・取付板のプレス側から取り付けを推奨します。  
We recommend to mount the sensor from pressed surface of plate.
- ・実際に取付けてガタツキ度合いをご確認され  
取付方法を決定ください。  
The actual tolerance should be confirmed after setting of sensor

- ・カスタマイズも承ります。お気軽にお問合せください
- ・この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1309



透過型フォトセンサ ギャップ幅広タイプ

Photo Interrupter - Wide slot type



## 概要 Description

KI1309 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した透過型フォトセンサです。

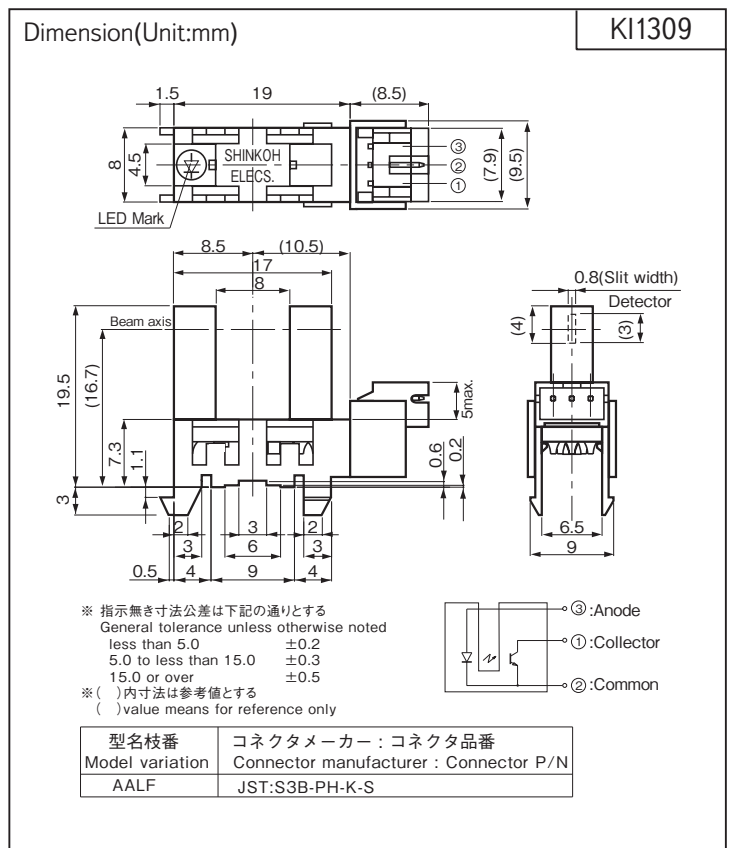
Model KI1309 consists of an Infrared LED and a High sensitive Photo transistor.

## 特長 Feature

- ・ 検出溝が深い：12.2mm
- ・ 検出溝幅が広い：8mm
- ・ その他シリーズ  
フォト IC 出力タイプ・・・KI1305/1306
- ・ Slot depth-12.2mm.
- ・ Wide Slot width-8mm.
- ・ The other model;  
Photo IC output type・・・KI1305, KI1306.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item            |              |                             | Symbol | Rating    | Unit |
|-----------------|--------------|-----------------------------|--------|-----------|------|
| 発光側<br>Emitter  | 順電流          | Forward Current             | IF     | 50        | mA   |
|                 | パルス順電流       | Pulse Forward Current ※1    | IFP    | 1         | A    |
|                 | 逆電圧          | Reverse Voltage             | VR     | 5         | V    |
|                 | 許容損失         | Power Dissipation           | P      | 75        | mW   |
| 受光側<br>Detector | コレクタ・エミッタ間電圧 | Collector-Emitter Voltage   | VCEO   | 30        | V    |
|                 | エミッタ・コレクタ間電圧 | Emitter-Collector Voltage   | VECO   | 5         | V    |
|                 | コレクタ電流       | Collector Current           | IC     | 20        | mA   |
|                 | コレクタ損失       | Collector Power Dissipation | Pc     | 75        | mW   |
| 動作温度            |              |                             | Topr   | -20 ~ +75 | °C   |
| 保存温度            |              |                             | Tstg   | -30 ~ +85 | °C   |

※1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                       |                                      | Symbol   | Condition                | min. | typ. | max. | Unit |
|-----------------|-----------------------|--------------------------------------|----------|--------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧                   | Forward Voltage                      | VF       | IF=20mA                  | —    | 1.2  | 1.5  | V    |
|                 | 逆電流                   | Reverse Current                      | IR       | VR=3V                    | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流                   | Dark Current                         | ICEO     | VCE=20V, 0 lx            | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流                   | Light Current                        | IC       | VCE=5V, IF=20mA          | 0.5  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧        | Collector-Emitter Saturation Voltage | VCE(sat) | IF=20mA, IC=0.25mA       | —    | —    | 0.4  | V    |
|                 | 応答時間<br>Response Time | 上昇<br>Rise Time                      | tr       | VCC=5V, IC=0.5mA, RL=1kΩ | —    | 15   | —    | μs   |
|                 |                       | 下降<br>Fall Time                      | tf       |                          | —    | 17   | —    |      |

\*\*: Ta=25°C unless otherwise noted

# KI1309

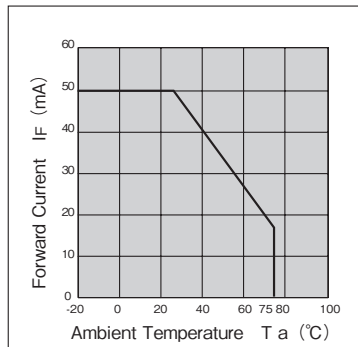
## 定格・特性曲線

Characteristics

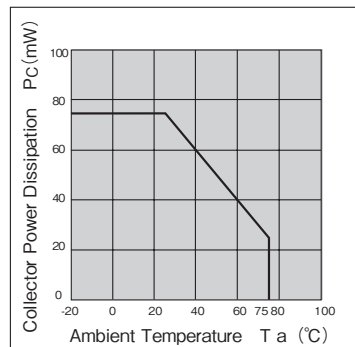
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

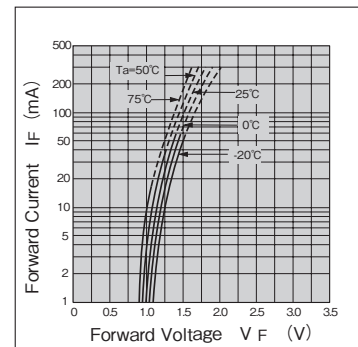
順電流低減曲線



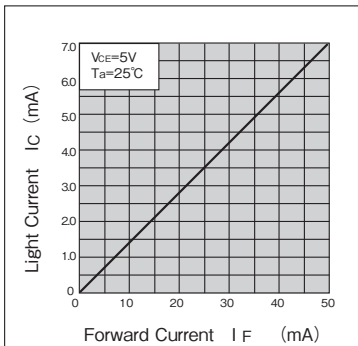
コレクタ損失低減曲線



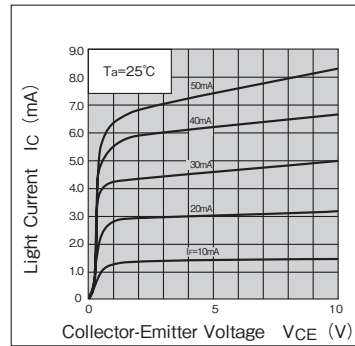
順電流－順電圧曲線 (代表例)



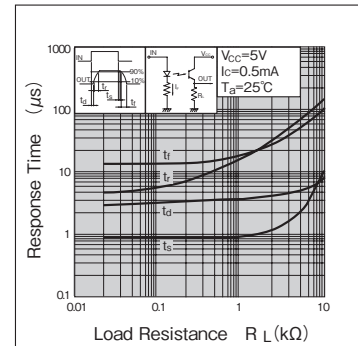
光電流－順電流特性 (代表例)



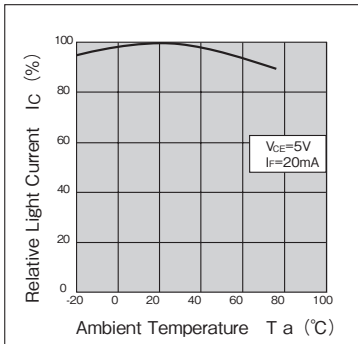
光電流－コレクタ・エミッタ間電圧特性 (代表例)



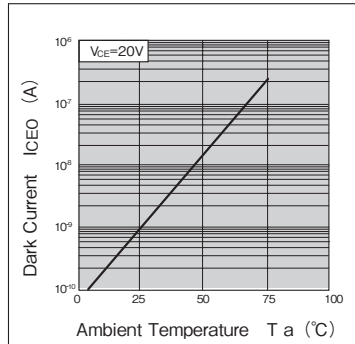
応答時間－負荷抵抗特性 (代表例)



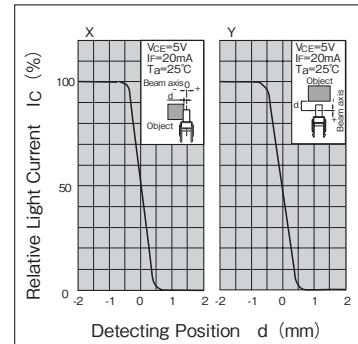
光電流－周囲温度特性 (代表例)



暗電流－周囲温度特性 (代表例)

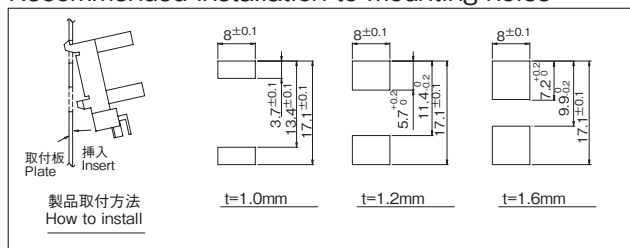


検出位置特性 (代表例)



## 推奨取付穴寸法図

Recommended installation to mounting holes



- ・取付板のプレス側から取り付けを推奨します。  
We recommend to mount the sensor from pressed surface of plate.
- ・実際に取付けてガタツキ度合いをご確認され  
取付方法を決定ください。  
The actual tolerance should be confirmed after setting of sensor

- ・カスタマイズも承ります。お気軽にお問合せください
- ・この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1310/1311



透過型フォトセンサ ギャップ幅広タイプ Photo Interrupter - Wide slot type



## 概要 Description

KI1310/1311 は、発光側に赤外発光ダイオード、受光側にフォト IC 出力を採用した透過型フォトセンサです。

Model KI1310/1311 consist of an Infrared LED and a High sensitive Photo IC(Digital Output).

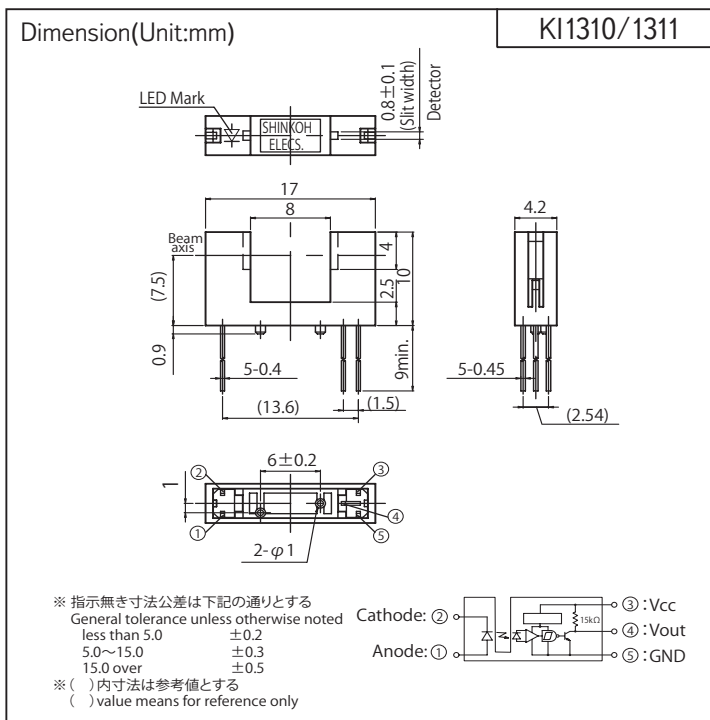
## 特長 Feature

- ・ アンプ内蔵、プルアップ抵抗内蔵タイプ
- ・ 検出溝幅が広い：8mm
- ・ その他シリーズ  
フォトトランジスタタイプ・・・KI1314

- ・ Built-in amplifier, Pull-up Resistor output type.
- ・ Wide Slot width-8mm.
- ・ The other model; Phototransistor type・・・KI1314

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.



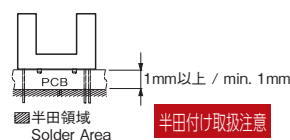
| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI1310 | Low  | 入光時 at Beam detecting |
| KI1311 | High | 入光時 at Beam detecting |

## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with min. 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.



- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
 ※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)

- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01  
 ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           | Symbol                             | Rating    | Unit   |
|--------------------------------|------------------------------------|-----------|--------|
| 発光側<br>Emitter                 | 順電流 Forward Current                | IF        | 50 mA  |
|                                | パルス順電流 Pulse Forward Current ※1    | IFP       | 1 A    |
|                                | 逆電圧 Reverse Voltage                | VR        | 5 V    |
| 受光側<br>Detector                | 電源電圧 Supply Voltage                | VCC       | 17 V   |
|                                | ローレベル出力電流 Low-Level Output Current | IOL       | 16 mA  |
|                                | 出力許容損失 Output Power Dissipation    | PO        | 175 mW |
| 動作温度 Operating Temperature     | T <sub>opr</sub>                   | -20 ~ +85 | °C     |
| 保存温度 Storage Temperature       | T <sub>stg</sub>                   | -30 ~ +85 | °C     |
| 半田付温度 Soldering Temperature ※2 | T <sub>sol</sub>                   | 330       | °C     |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*] ( ) = KI1311

| Item              |                          |                            | Symbol     | Condition                |                          | min.    | typ. | max. | Unit |    |   |
|-------------------|--------------------------|----------------------------|------------|--------------------------|--------------------------|---------|------|------|------|----|---|
| 発 光 側<br>Emitter  | 順電圧                      | Forward Voltage            | VF         | IF=20mA                  |                          | —       | 1.2  | 1.5  | V    |    |   |
|                   | 逆電流                      | Reverse Current            | IR         | VR=3V                    |                          | —       | —    | 10   | μA   |    |   |
| 受 光 側<br>Detector | ローレベル出力電圧                | Low-Level Output Voltage   | VOL        | IOL=16mA, IF=15mA (IF=0) |                          | —       | 0.15 | 0.4  | V    |    |   |
|                   | ハイレベル出力電圧                | High-Level Output Voltage  | VOH        | IF=0 (IF=15mA)           |                          | VCCx0.9 | —    | —    | V    |    |   |
|                   | ローレベル供給電流                | Low-Level Supply Current   | ICCL       | VCC=5V, IF=15mA (IF=0)   |                          | —       | —    | 3.4  | mA   |    |   |
|                   | ハイレベル供給電流                | High-Level Supply Current  | ICCH       | VCC=5V, IF=0 (IF=15mA)   |                          | —       | —    | 2.2  | mA   |    |   |
| 伝達特性<br>Coupled   | スレッシュホールド<br>入 力 電 流     | Threshold Input<br>Current | IFHL       | KI1310                   | High → Low               | VCC=5V  | —    | —    | 10   | mA |   |
|                   |                          |                            | IFLH       | KI1311                   | Low → High               |         | —    | —    | 10   |    |   |
|                   | ヒステリシス                   |                            | Hysteresis | IFLH/IFHL<br>(IFHL/IFLH) |                          | VCC=5V  |      | —    | 0.65 | —  | — |
|                   | 応 答 時 間<br>Response Time | 上昇                         | Rise Time  | tr                       | VCC=5V, IF=20mA, RL=280Ω |         | —    | 0.1  | —    | μs |   |
|                   |                          | 下降                         | Fall Time  | tf                       |                          |         | —    | 0.05 | —    |    |   |

\*\* : Ta=25°C unless otherwise noted

# KI1310/1311

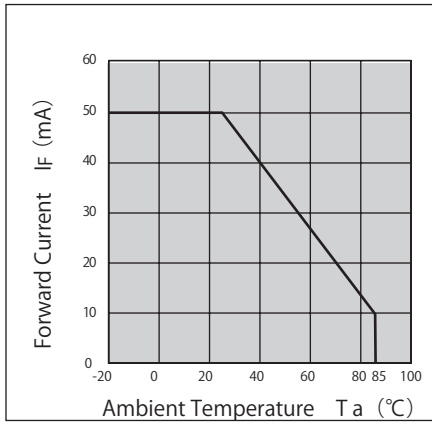
## 定格・特性曲線

Characteristics

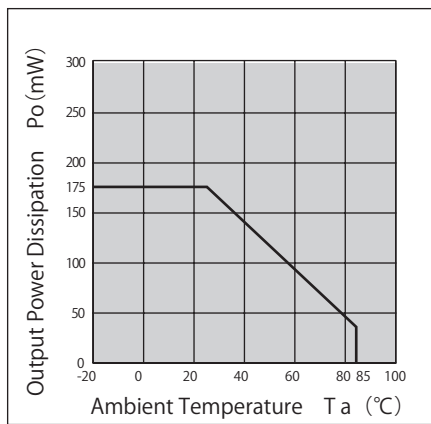
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

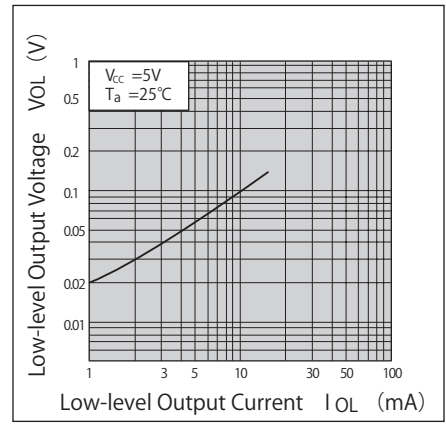
### 順電流低減曲線



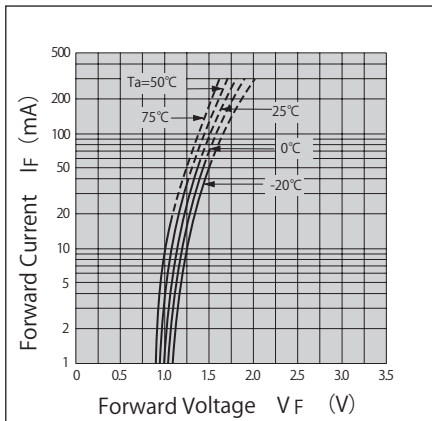
### 出力許容損失低減曲線



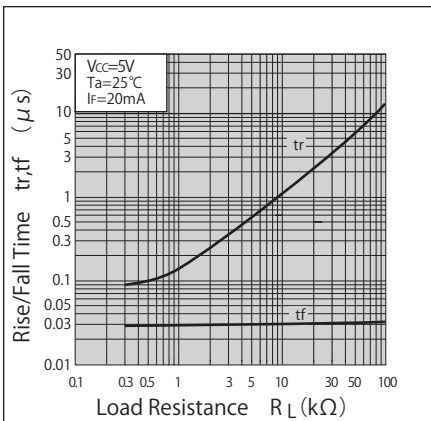
### ローレベル出力電圧ー ローレベル出力電流特性(代表例)



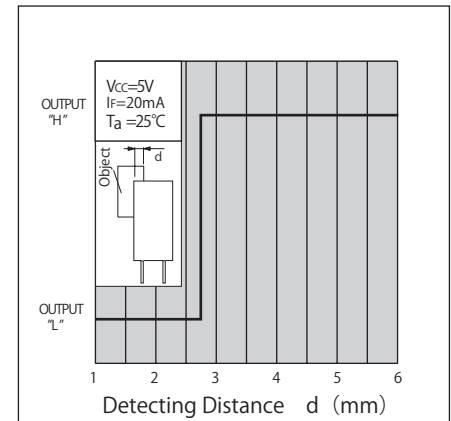
### 順電流ー順電圧曲線(代表例)



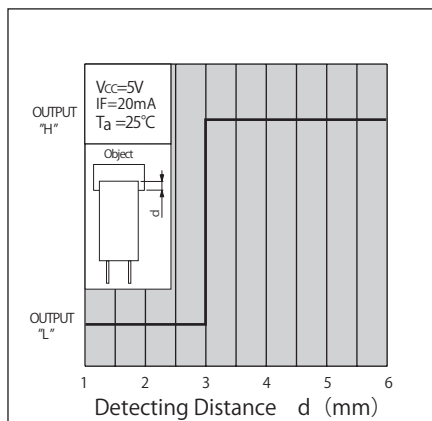
### 上昇、下降時間ー負荷抵抗特性(代表例)



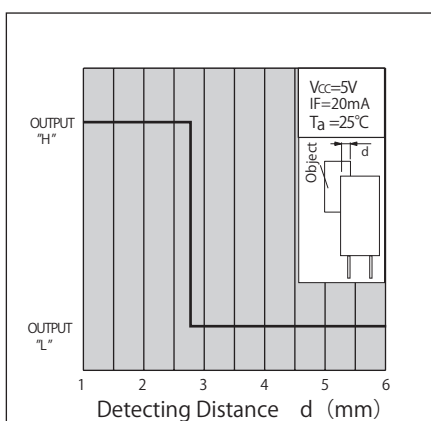
### 検出位置特性1(代表例) KI1310



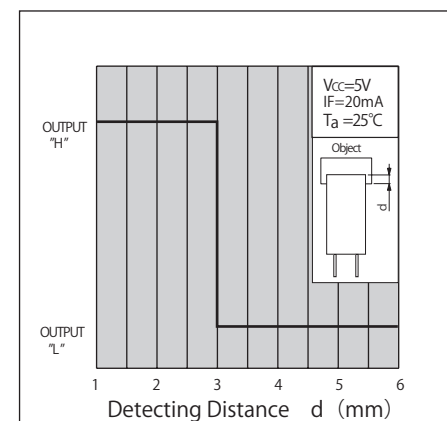
### 検出位置特性2(代表例) KI1310



### 検出位置特性1(代表例) KI1311



### 検出位置特性2(代表例) KI1311



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1314



透過型フォトセンサ ギャップ幅広タイプ

Photo Interrupter - Wide slot type



## 概要 Description

KI1314 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した透過型フォトセンサです。

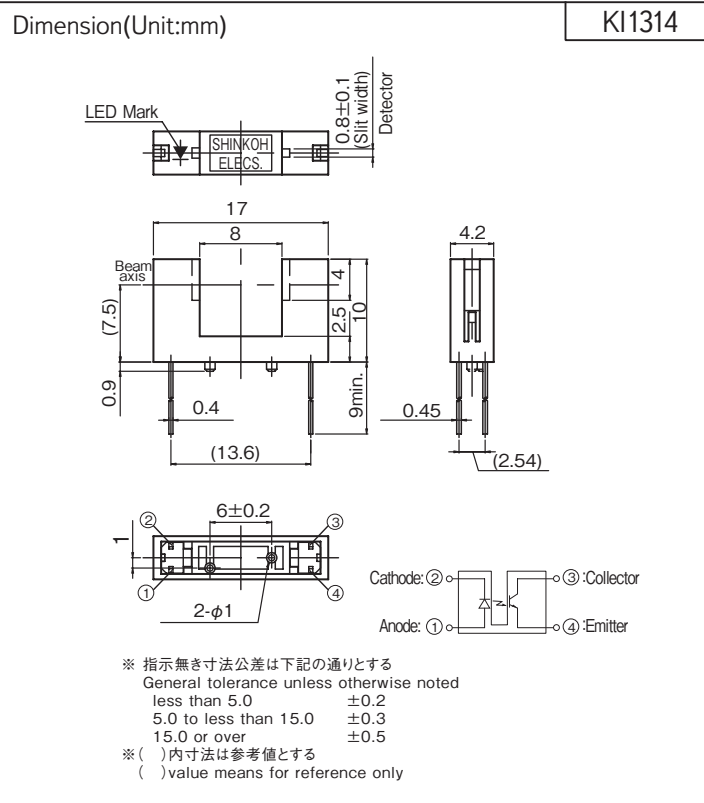
Model KI1314 consists of an Infrared LED and a High sensitive Photo transistor.

## 特長 Feature

- ・ 検出溝幅が広い：8mm
- ・ その他シリーズ  
フォト IC 出力タイプ・・・KI1310/1311
- ・ Wide Slot width-8mm.
- ・ The other model; Photo IC output type・・・KI1310/KI1311

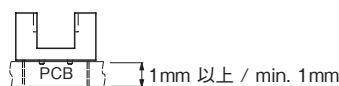
## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           | Symbol                                 | Rating    | Unit  |
|--------------------------------|----------------------------------------|-----------|-------|
| 発光側<br>Emitter                 | 順電流 Forward Current                    | IF        | 50 mA |
|                                | パルス順電流 Pulse Forward Current ※1        | IFP       | 1 A   |
|                                | 逆電圧 Reverse Voltage                    | VR        | 5 V   |
|                                | 許容損失 Power Dissipation                 | P         | 75 mW |
| 受光側<br>Detector                | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO      | 30 V  |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO      | 5 V   |
|                                | コレクタ電流 Collector Current               | IC        | 20 mA |
|                                | コレクタ損失 Collector Power Dissipation     | Pc        | 75 mW |
| 動作温度 Operating Temperature     | T <sub>opr</sub>                       | -20 ~ +85 | °C    |
| 保存温度 Storage Temperature       | T <sub>stg</sub>                       | -30 ~ +85 | °C    |
| 半田付温度 Soldering Temperature ※2 | T <sub>sol</sub>                       | 330       | °C    |



半田領域 Solder Area 半田付け取扱注意

- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01
- ※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)
- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01
- ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            | Symbol                            | Condition    | min.                     | typ. | max. | Unit |
|-----------------|-----------------------------------|--------------|--------------------------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | VF           | IF=20mA                  |      |      | V    |
|                 | 逆電流 Reverse Current               | IR           | VR=3V                    |      |      | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | ICEO         | VCE=10V, 0 lx            |      |      | μA   |
| 伝達特性<br>Coupled | 光電流 Light Current                 | IC           | VCE=5V, IF=20mA          |      |      | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Saturation Voltage | VCE(sat)     | IF=20mA, IC=0.25mA       |      |      | V    |
|                 | 応答時間 Response Time                | 上昇 Rise Time | VCC=5V, IC=0.5mA, RL=1kΩ |      |      | μs   |
|                 |                                   | 下降 Fall Time |                          |      |      |      |

\*\* : Ta=25°C unless otherwise noted

# KI1314

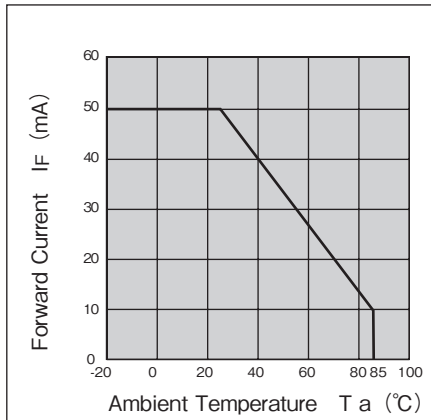
## 定格・特性曲線

Characteristics

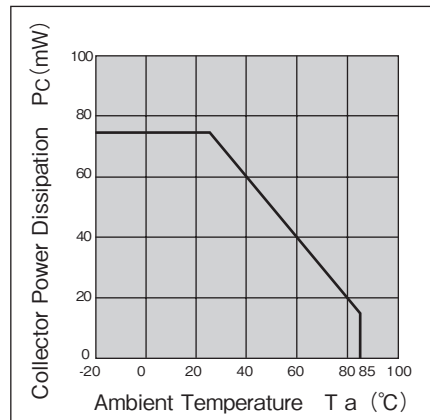
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

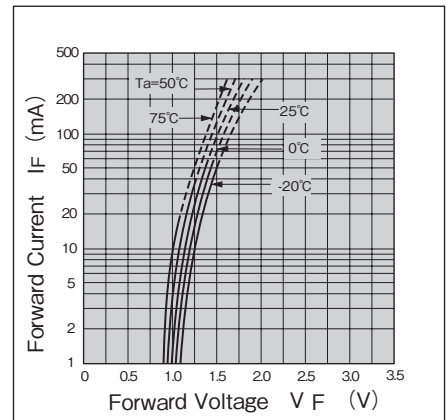
### 順電流低減曲線



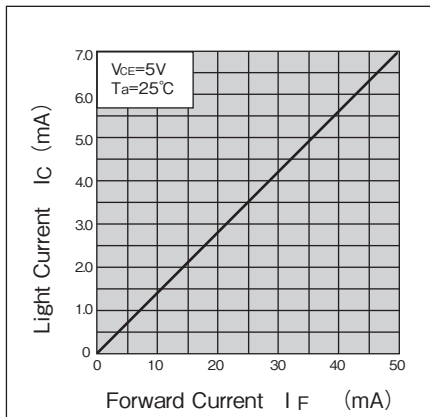
### コレクタ損失低減曲線



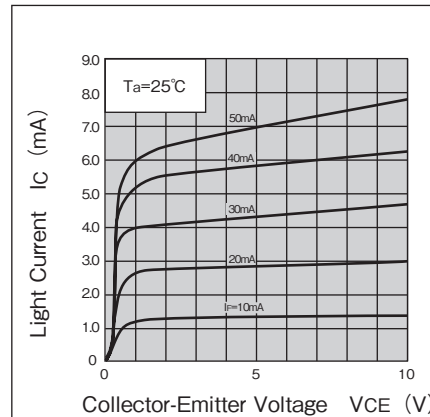
### 順電流－順電圧曲線 (代表例)



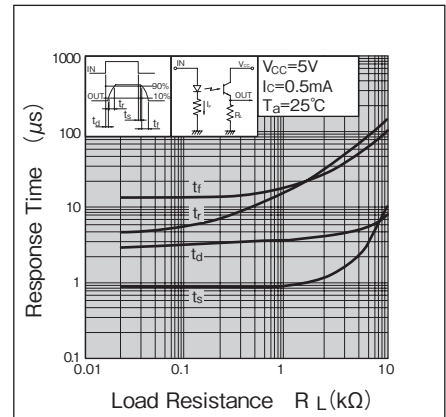
### 光電流－順電流特性 (代表例)



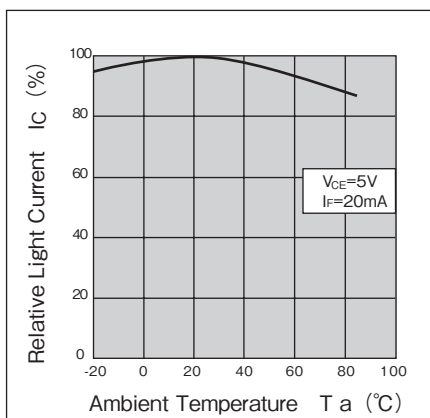
### 光電流－コレクタ・エミッタ間電圧特性 (代表例)



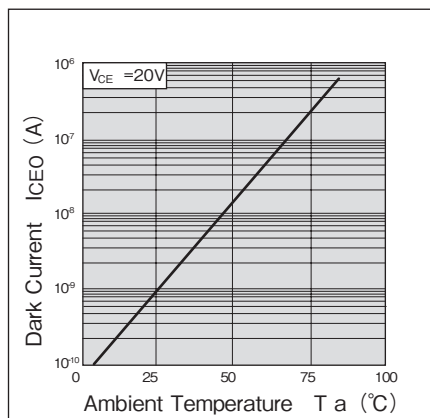
### 応答時間－負荷抵抗特性 (代表例)



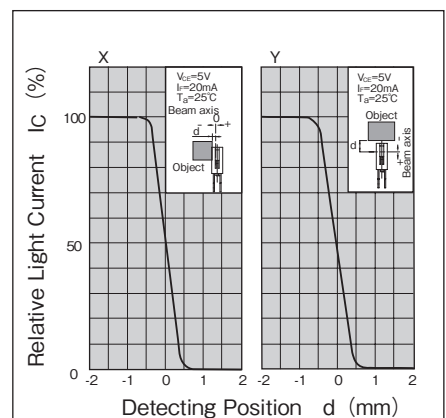
### 光電流－周囲温度特性 (代表例)



### 暗電流－周囲温度特性 (代表例)



### 検出位置特性 (代表例)

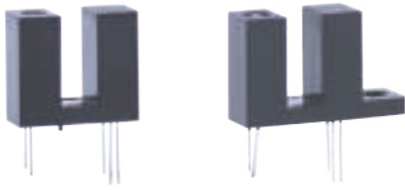


- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1315/1320



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

KI1315/1320 は、外側にケースカバー、内側に検出用スリットを持つ 2 重構造の防塵型、フォト IC 出力の透過型フォトセンサです。

Model KI1315/1320 consist of an Infrared LED and a Photo IC(Digital Output). Outer package has no aperture on the both light pass surfaces of the emitter and detector.

## 特長 Feature

- ・アンプ内蔵、オープンコレクタ出力
- ・防塵構造：粉塵の影響を受けにくい
- ・検出精度が高い：内蔵スリット幅 0.5mm
- ・検出溝が深い：12mm
- ・その他シリーズ  
フォトトランジスタタイプ・・・KI1319/1324
- ・Built-in amplifier, Open collector output type.
- ・Easy removing paper dust.
- ・High-resolution : slit width 0.5mm.
- ・Slot depth-12mm.
- ・The other model; Phototransistor type・・・KI1319/KI1324

## 用途 Application

- ・カード機器、両替機の物体通過検出
- ・自動販売機、アミューズメント機器のコイン通過検出
- ・OA 機器、その他
- ・Object passing for Card reader, Bill exchanger.
- ・Coin-passing for Auto vending machine and Amusement.
- ・Paper detection for O.A. equipment.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

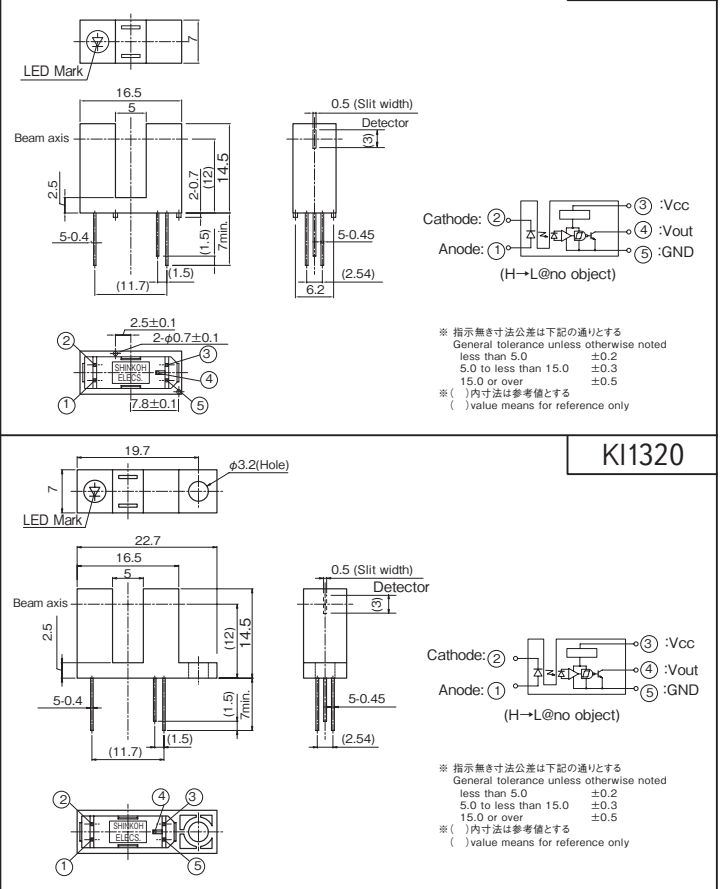
|                   | Item                               | Symbol           | Rating    | Unit |
|-------------------|------------------------------------|------------------|-----------|------|
| 発 光 側<br>Emitter  | 順 電 流 Forward Current              | IF               | 50        | mA   |
|                   | パルス順電流 Pulse Forward Current ※1    | IFP              | 1         | A    |
|                   | 逆 電 圧 Reverse Voltage              | VR               | 5         | V    |
| 受 光 側<br>Detector | 電 源 電 圧 Supply Voltage             | VCC              | 17        | V    |
|                   | ローレベル出力電流 Low-Level Output Current | IOL              | 16        | mA   |
|                   | 出力許容損失 Output Power Dissipation    | PO               | 175       | mW   |
| 動 作               | 温 度 Operating Temperature          | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保 存               | 温 度 Storage Temperature            | T <sub>stg</sub> | -30 ~ +85 | °C   |
| 半 田 付             | 温 度 Soldering Temperature ※2       | T <sub>sol</sub> | 330       | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

|                    | Item                                  | Symbol    | Condition                | min.    | typ.       | max. | Unit |
|--------------------|---------------------------------------|-----------|--------------------------|---------|------------|------|------|
| 発 光 側<br>Emitter   | 順 電 圧 Forward Voltage                 | VF        | IF=20mA                  | —       | 1.2        | 1.5  | V    |
|                    | 逆 電 流 Reverse Current                 | IR        | VR=3V                    | —       | —          | 10   | μA   |
| 受 光 側<br>Detector  | ローレベル出力電圧 Low-Level Output Voltage    | VOL       | IOL=16mA, IF=15mA        | —       | 0.15       | 0.4  | V    |
|                    | ハイレベル出力電圧 High-Level Output Voltage   | VOH       | RL=47kΩ, IF=0            | VCC×0.9 | —          | —    | V    |
|                    | ローレベル供給電流 Low-Level Supply Current    | ICCL      | VCC=5V, IF=15mA          | —       | —          | 3.4  | mA   |
|                    | ハイレベル供給電流 High-Level Supply Current   | ICCH      | VCC=5V, IF=0             | —       | —          | 2.2  | mA   |
| 伝 達 特 性<br>Coupled | スレッシュホールド入力電流 Threshold Input Current | IFHL      | VCC=5V                   | —       | —          | 10   | mA   |
|                    | ヒステリシス Hysteresis                     | IFLH/IFHL | VCC=5V                   | —       | 0.65       | —    | —    |
|                    | 応答時間 Response Time                    | tr / tf   | VCC=5V, IF=20mA, RL=280Ω | —       | 0.1 / 0.04 | —    | μs   |

\*\* : Ta=25°C unless otherwise noted

## Dimension(Unit:mm)

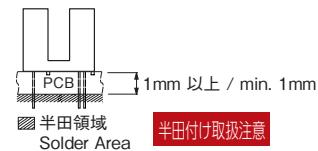


## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with min. 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比=0.01

※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)

※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01

※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

# KI1315/1320

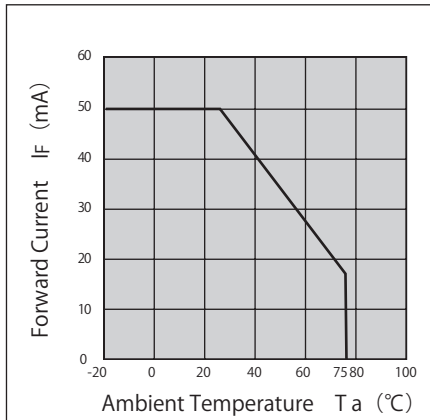
## 定格・特性曲線

Characteristics

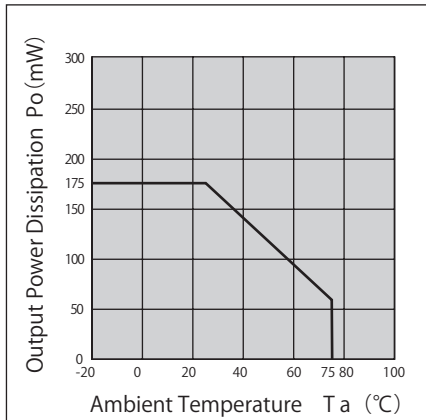
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

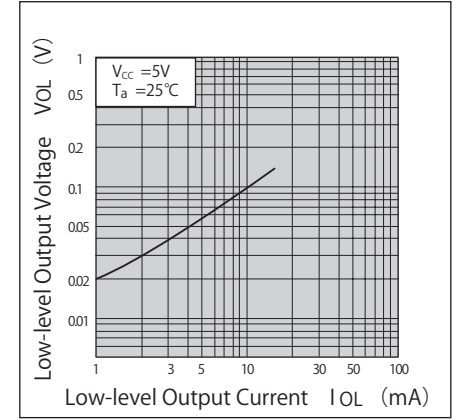
### 順電流低減曲線



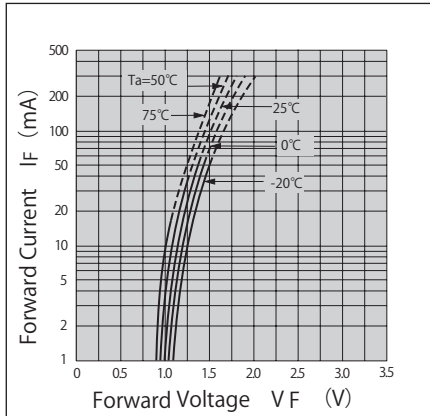
### 出力許容損失低減曲線



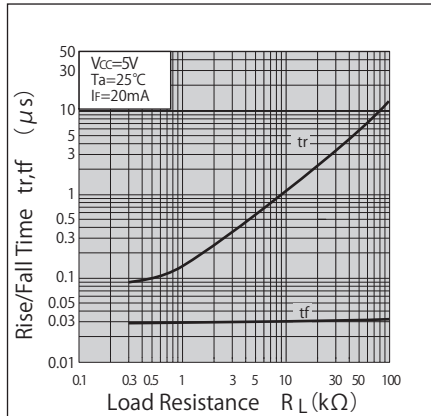
### ローレベル出力電圧ー ローレベル出力電流特性 (代表例)



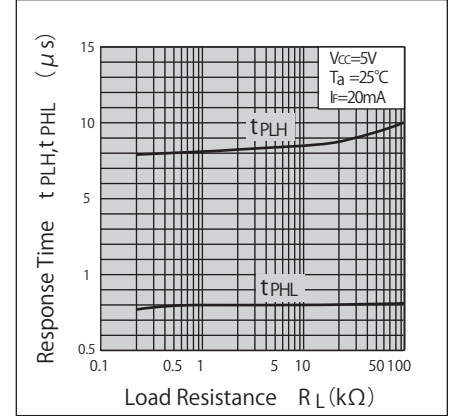
### 順電流ー順電圧特性 (代表例)



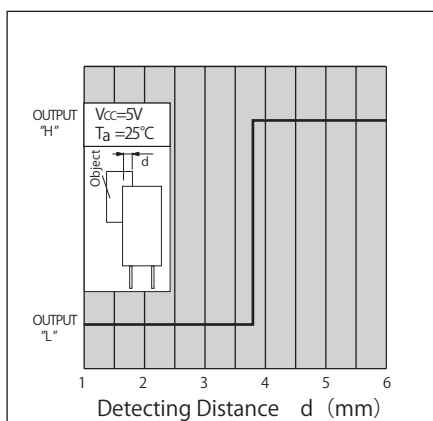
### 上昇、下降時間ー 負荷抵抗特性 (代表例)



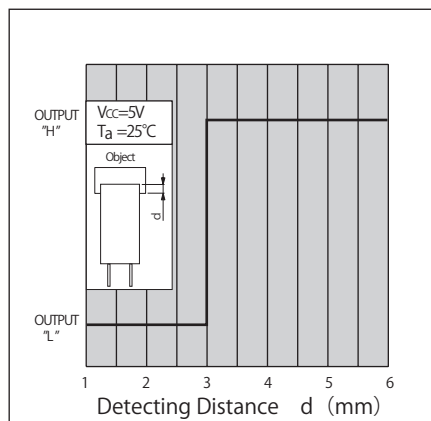
### 伝搬時間ー負荷抵抗特性 (代表例)



### 検出位置特性1 (代表例)



### 検出位置特性2 (代表例)

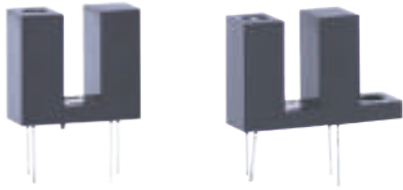


- ・ カスタマイズも承ります。お気軽にお問合せください
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- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1319/1324



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

KI1319/1324 は、外側にケースカバー、内側に検出用スリットを持つ 2 重構造の防塵型、フォトトランジスタ出力の透過型フォトセンサです。

Model KI1319/1324 consist of an Infrared LED and a High sensitive Photo transistor. Outer package has no aperture on the both light pass surfaces of the emitter and detector.

## 特長 Feature

- ・ オープンコレクタ出力
- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出溝が深い：12mm
- ・ その他シリーズ  
フォト IC 出力タイプ・・・KI1315/1320
- ・ Open collector output type.
- ・ Easy removing paper dust.
- ・ Slot depth-12mm.
- ・ The other model;  
Photo IC output type・・・KI1315/KI1320

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           |                                        | Symbol | Rating    | Unit |
|--------------------------------|----------------------------------------|--------|-----------|------|
| 発光側<br>Emitter                 | 順電流 Forward Current                    | IF     | 50        | mA   |
|                                | パルス順電流 Pulse Forward Current ※1        | IFP    | 1         | A    |
|                                | 逆電圧 Reverse Voltage                    | VR     | 5         | V    |
|                                | 許容損失 Power Dissipation                 | P      | 75        | mW   |
| 受光側<br>Detector                | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO   | 30        | V    |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO   | 5         | V    |
|                                | コレクタ電流 Collector Current               | IC     | 20        | mA   |
|                                | コレクタ損失 Collector Power Dissipation     | PC     | 75        | mW   |
| 動作温度 Operating Temperature     |                                        | Topr   | -20 ~ +85 | °C   |
| 保存温度 Storage Temperature       |                                        | Tstg   | -30 ~ +85 | °C   |
| 半田付温度 Soldering Temperature ※2 |                                        | Tsol   | 330       | °C   |

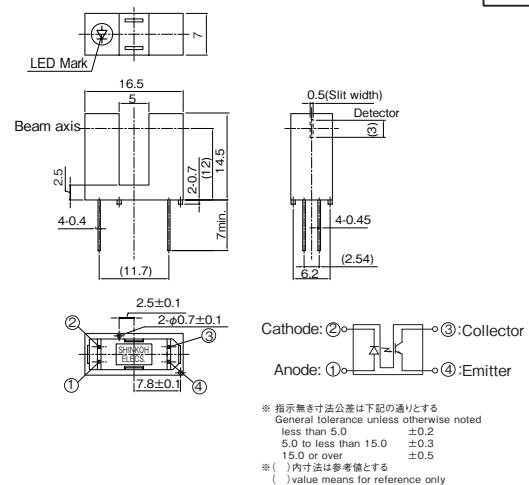
## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                                     | Symbol       | Condition                 | min. | typ. | max. | Unit |
|-----------------|-----------------------------------------------------|--------------|---------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage                                 | VF           | IF=20mA                   | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current                                 | IR           | VR=3V                     | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                                    | ICEO         | VCE=10V, 0 lx             | —    | —    | 0.1  | μA   |
|                 | 光電流 Light Current                                   | IC           | VCE=5V, IF=20mA           | 0.5  | 1.5  | —    | mA   |
| 伝達特性<br>Coupled | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat)     | IF=20mA, IC=0.25mA        | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                                  | 上昇 Rise Time | VCC=5V, IC=0.25mA, RL=1kΩ | —    | 15   | —    | μs   |
|                 |                                                     | 下降 Fall Time |                           | —    | 17   | —    |      |

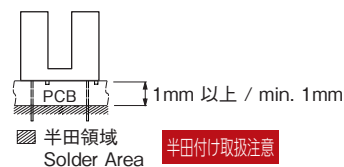
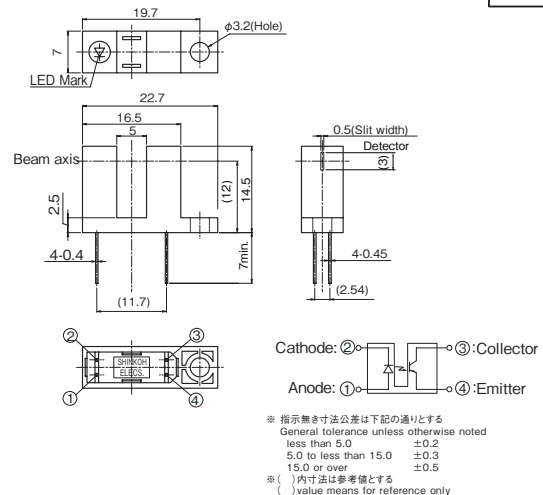
\*\* : Ta=25°C unless otherwise noted

## Dimension(Unit:mm)

KI1319



KI1324



- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01
- ※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)
- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01
- ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

# KI1319/1324

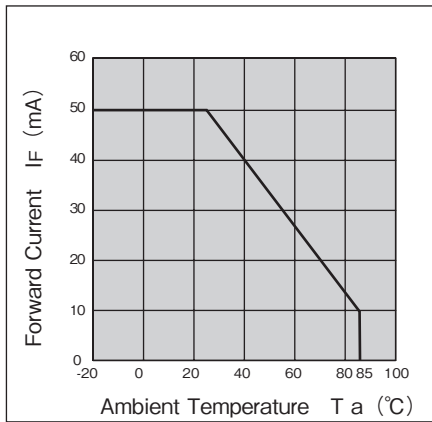
## 定格・特性曲線

Characteristics

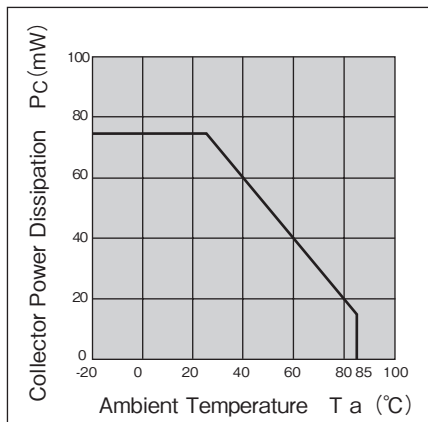
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

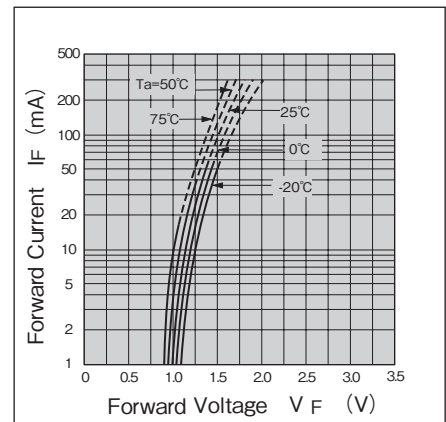
### 順電流低減曲線



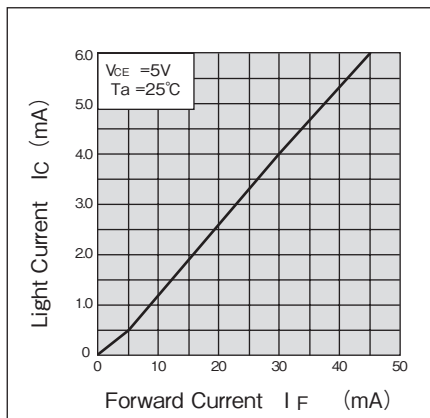
### コレクタ損失低減曲線



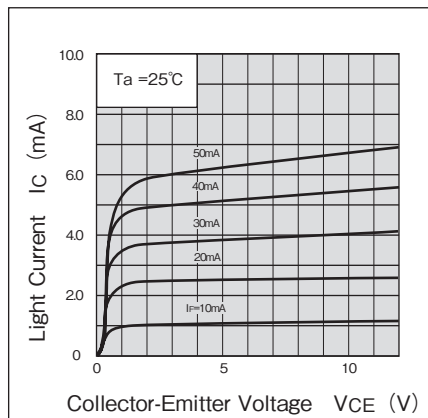
### 順電流－順電圧曲線 (代表例)



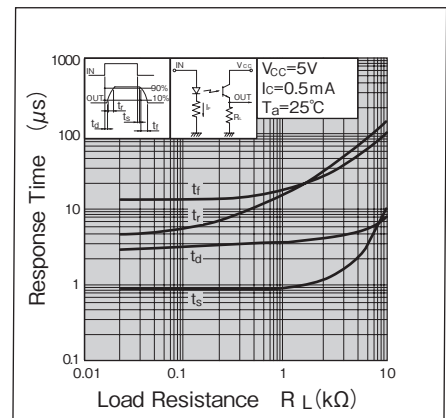
### 光電流－順電流特性 (代表例)



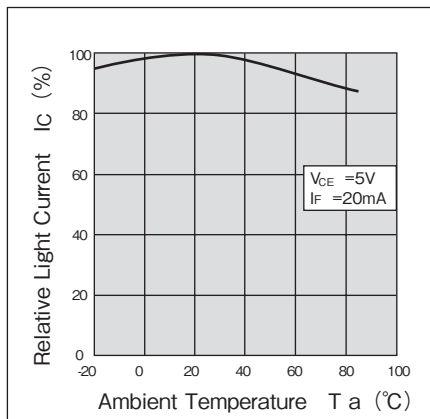
### 光電流－コレクタ・エミッタ間電圧特性 (代表例)



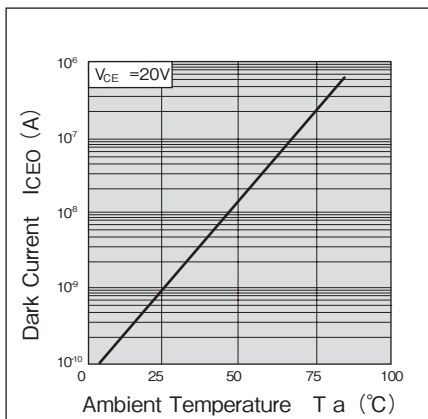
### 応答時間－負荷抵抗特性 (代表例)



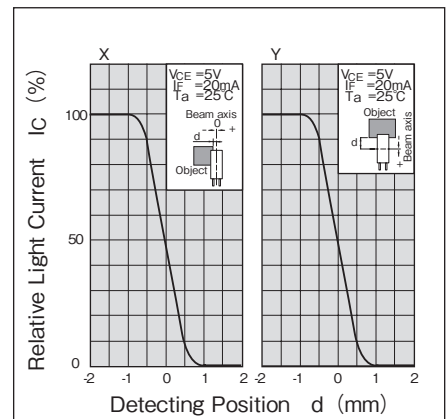
### 光電流－周囲温度特性 (代表例)



### 暗電流－周囲温度特性 (代表例)



### 検出位置特性 (代表例)

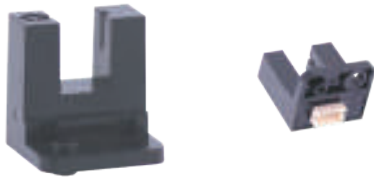


- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1390/1391



透過型フォトセンサ Photo Interrupter



## 概要 Description

KI1390/1391 は、フォト IC 出力の小型透過型フォトセンサです。

Model KI1390/1391 are compact size of Photo Interrupter and consist of an Infrared LED and a Photo IC.

## 特長 Feature

- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ LED 制限抵抗内蔵タイプ
- ・ その他シリーズ  
プルアップ抵抗内蔵タイプ・・・KI1393, 1394
- ・ Built-in amplifier, Open collector output type.
- ・ Built in resistor for LED drive.
- ・ The other model;  
Pull-up Resistor output type・・・KI1393, KI1394

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.

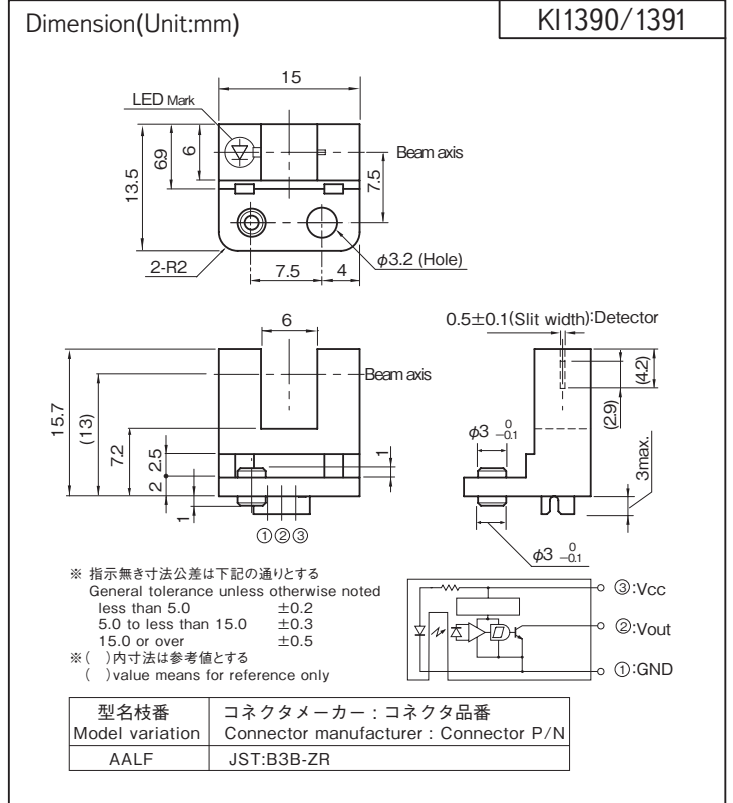
## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI1390 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI1391 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI1390 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI1391 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI1390 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI1391 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI1390 入光時、RL=47kΩ w/o Shutter  | VCC×0.9 | —    | —    | V    |
|                                     |              | KI1391 遮光時、RL=47kΩ Shutter in   | VCC×0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time |                                 | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time |                                 | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI1390 | High | 入光時 at Beam detecting |
| KI1391 | Low  | 入光時 at Beam detecting |

## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt;Operation Notice&gt;

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

# KI1390/1391

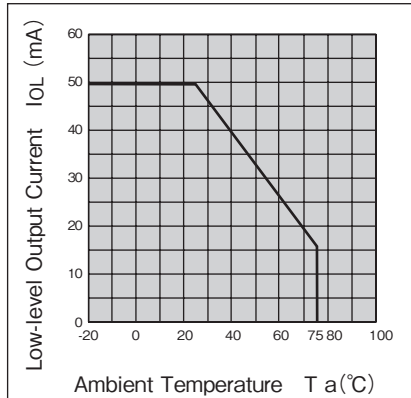
## 定格・特性曲線

Characteristics

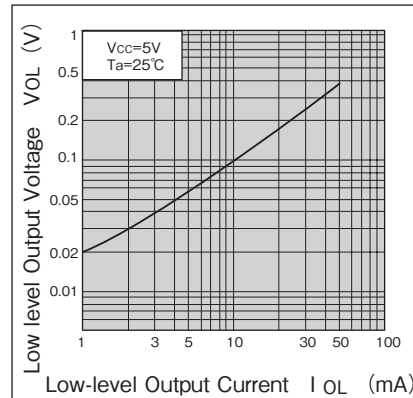
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

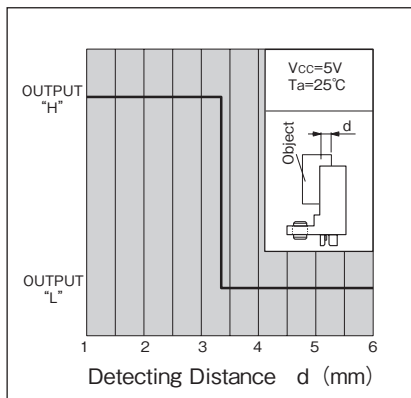
### ローレベル出力電流低減曲線



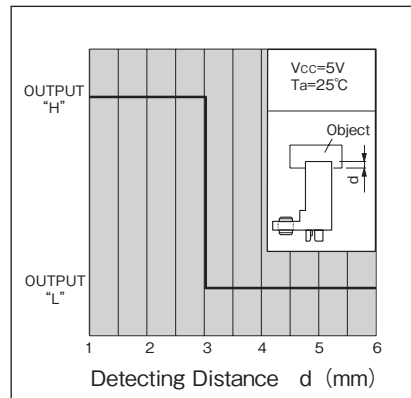
### ローレベル出力電圧ー ローレベル出力電流特性 (代表例)



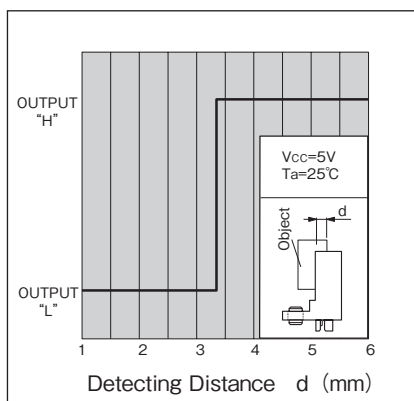
### 検出位置特性1 (代表例) KI1390



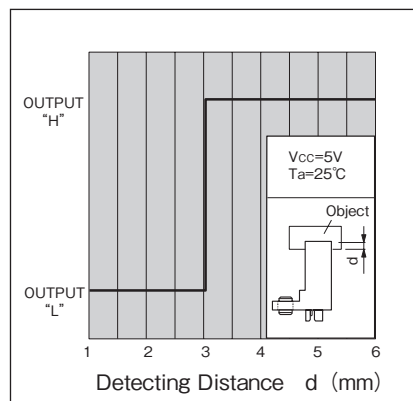
### 検出位置特性2 (代表例) KI1390



### 検出位置特性1 (代表例) KI1391



### 検出位置特性2 (代表例) KI1391



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1400/1401



透過型フォトセンサ 4方向取付可能タイプ

Photo Interrupter - Installation at 4 directions type ※ 1



## 概要 Description

KI1400/1401 は、フォト IC 出力の小型透過型フォトセンサです。

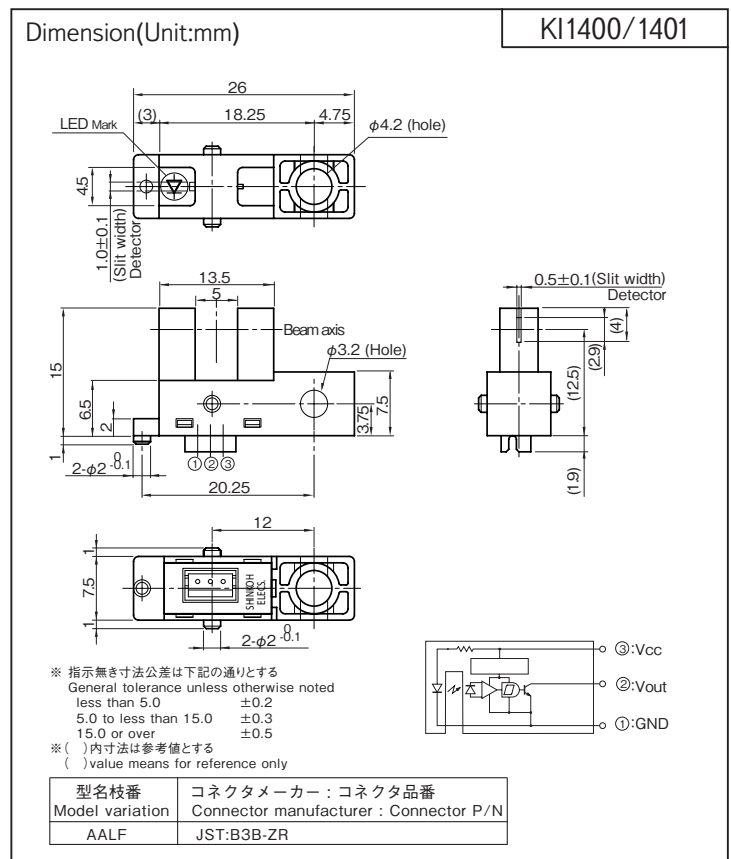
Model KI1400/1401 are compact size of Photo Interrupter and consist of an Infrared LED and a Photo IC.

## 特長 Feature

- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ LED 制限抵抗内蔵タイプ
- ・ Built-in amplifier, Open collector output type.
- ・ Built in resistor for LED drive.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



※ 1 実用新案登録 第 3114641 号  
※ 1 Registered utility model No.3114641 (JPO)

| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI1400 | High | 入光時 at Beam detecting |
| KI1401 | Low  | 入光時 at Beam detecting |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

## &lt;ご使用上の注意&gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt;Operation Notice&gt;

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI1400 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI1401 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI1400 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI1401 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI1400 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI1401 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI1400 入光時、RL=47kΩ w/o Shutter  | VCCx0.9 | —    | —    | V    |
|                                     |              | KI1401 遮光時、RL=47kΩ Shutter in   | VCCx0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                              | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time | tf                              | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI1400/1401

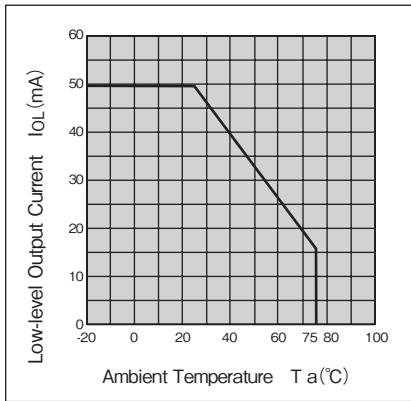
## 定格・特性曲線

Characteristics

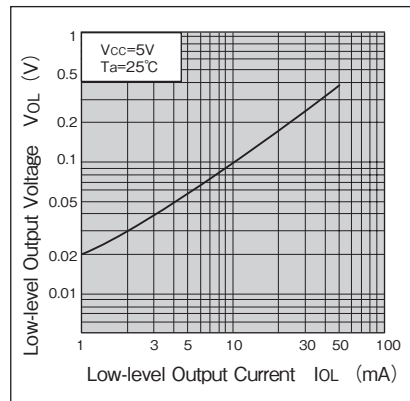
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

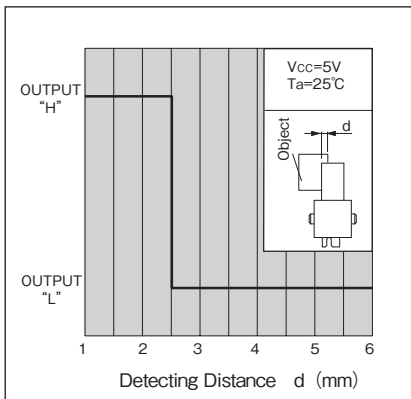
### ローレベル出力電流低減曲線



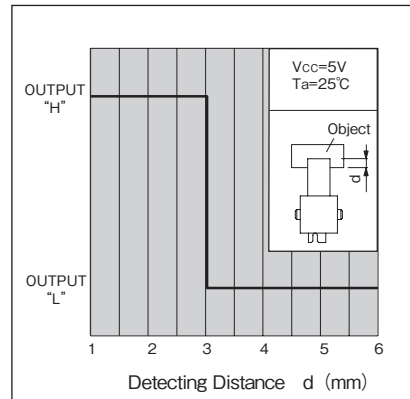
### ローレベル出力電圧ー ローレベル出力電流特性 (代表例)



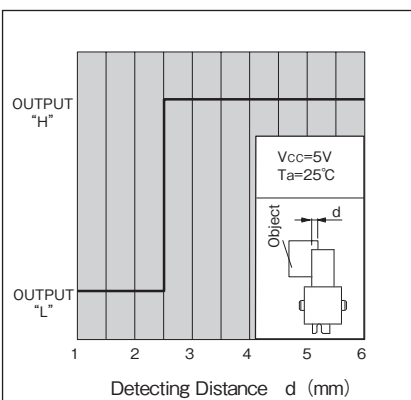
### 検出位置特性1 (代表例) KI1400



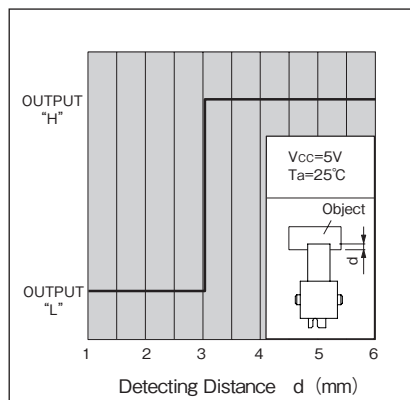
### 検出位置特性2 (代表例) KI1400



### 検出位置特性1 (代表例) KI1401



### 検出位置特性2 (代表例) KI1401



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1470



透過型フォトセンサ Photo Interrupter



## 概要 Description

KI1470 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した透過型フォトセンサです。

Model KI1470 consists of an Infrared LED and a Phototransistor.

## 特長 Feature

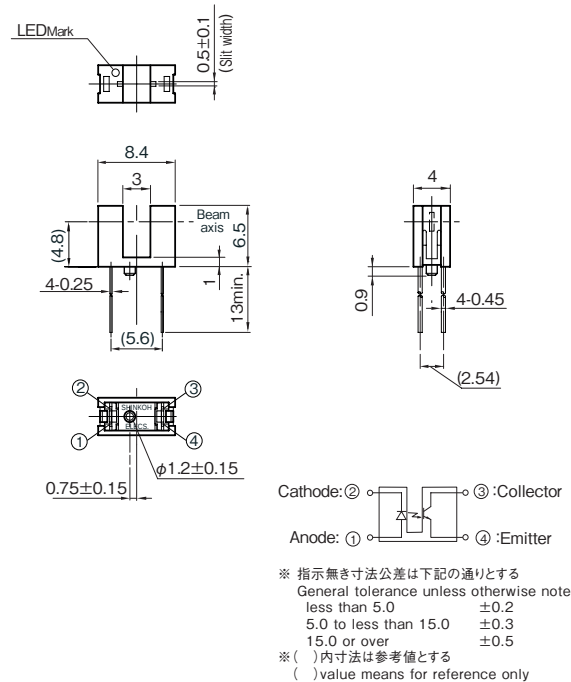
- ・ 小型タイプ
- ・ ローコスト
- ・ 検出溝の深さ 5.5mm
- ・ 検出溝幅が 3mm
- ・ Compact Package.
- ・ Low Cost.
- ・ Slot depth-5.5mm.
- ・ Slot width-3mm.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Paper detection for O.A. equipment.

## Dimension(Unit:mm)

KI1470



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                                |                                         | Symbol           | Rating    | Unit |
|-------------------------------------|-----------------------------------------|------------------|-----------|------|
| 発 光 側<br>Emitter                    | 順 電 流 Forward Current                   | IF               | 50        | mA   |
|                                     | パ ル ス 順 電 流 Pulse Forward Current ※ 1   | IFP              | 1         | A    |
|                                     | 逆 電 圧 Reverse Voltage                   | VR               | 5         | V    |
|                                     | 許 容 損 失 Power Dissipation               | P                | 75        | mW   |
| 受 光 側<br>Detector                   | コレクタ・エミッタ間電圧 Collector-Emitter Voltage  | VCEO             | 30        | V    |
|                                     | エミッタ・コレクタ間電圧 Emitter-Collector Voltage  | VECO             | 5         | V    |
|                                     | コ レ ク タ 電 流 Collector Current           | IC               | 20        | mA   |
|                                     | コ レ ク タ 損 失 Collector Power Dissipation | Pc               | 75        | mW   |
| 動 作 温 度 Operating Temperature       |                                         | T <sub>opr</sub> | -20 ~ +85 | °C   |
| 保 存 温 度 Storage Temperature         |                                         | T <sub>stg</sub> | -30 ~ +85 | °C   |
| 半 田 付 温 度 Soldering Temperature ※ 2 |                                         | T <sub>sol</sub> | 330       | °C   |



- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01
- ※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)
- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01
- ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item               |                                                     | Symbol               | Condition                                                       | min. | typ. | max. | Unit |
|--------------------|-----------------------------------------------------|----------------------|-----------------------------------------------------------------|------|------|------|------|
| 発 光 側<br>Emitter   | 順 電 圧 Forward Voltage                               | V <sub>F</sub>       | I <sub>F</sub> =20mA                                            | —    | 1.2  | 1.5  | V    |
|                    | 逆 電 流 Reverse Current                               | I <sub>R</sub>       | V <sub>R</sub> =3V                                              | —    | —    | 10   | μA   |
| 受 光 側<br>Detector  | 暗 電 流 Dark Current                                  | I <sub>CEO</sub>     | V <sub>CE</sub> =10V, 0 lx                                      | —    | —    | 0.1  | μA   |
| 伝 達 特 性<br>Coupled | 光 電 流 Light Current                                 | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                       | 0.3  | —    | —    | mA   |
|                    | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =20mA, I <sub>C</sub> =0.15mA                    | —    | —    | 0.4  | V    |
|                    | 応 答 時 間 Response Time                               | 上昇 Rise Time         | V <sub>CC</sub> =5V, I <sub>C</sub> =0.5mA, R <sub>L</sub> =1kΩ | —    | 50   | —    | μs   |
|                    |                                                     | 下降 Fall Time         |                                                                 | —    | 50   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI1470

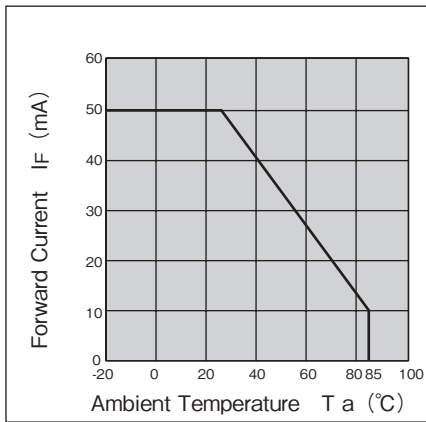
## 定格・特性曲線

Characteristics

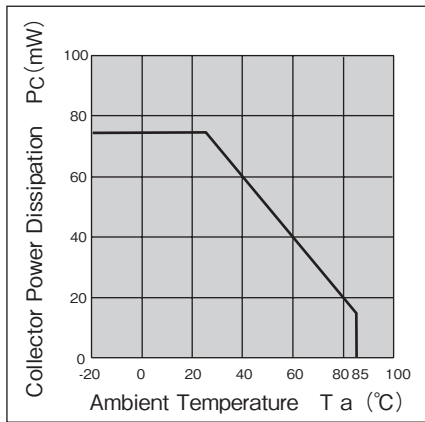
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

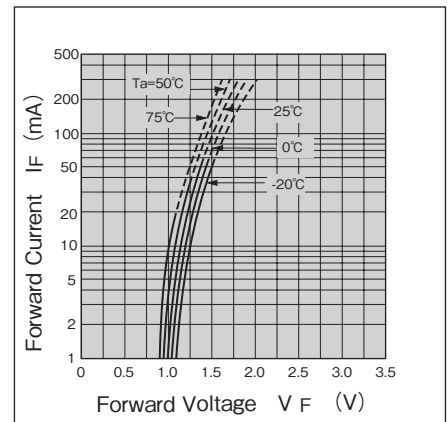
### 順電流低減曲線



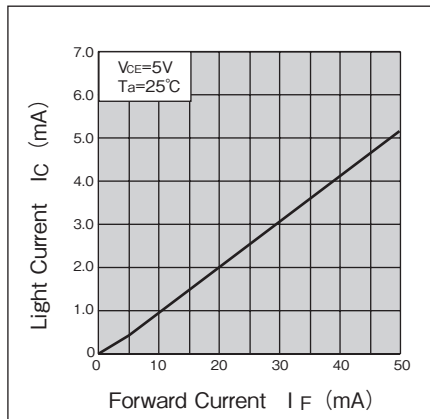
### コレクタ損失低減曲線



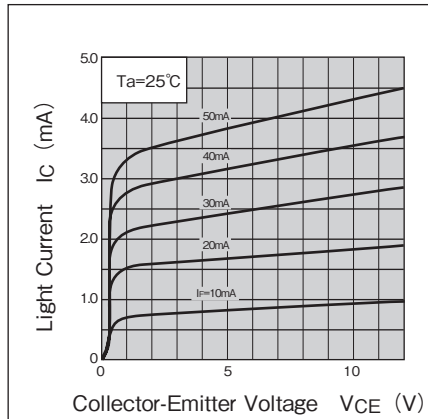
### 順電流—順電圧特性 (代表例)



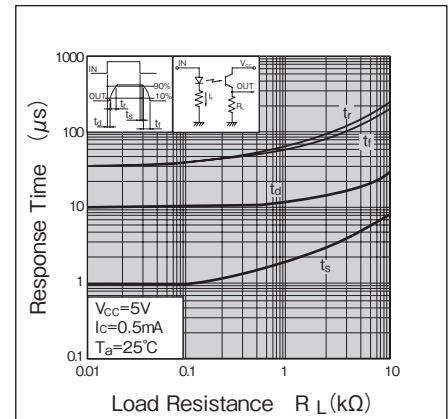
### 光電流—順電流特性 (代表例)



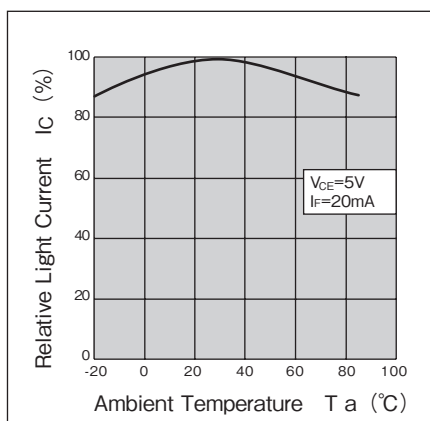
### 光電流—コレクタ・エミッタ間電圧特性 (代表例)



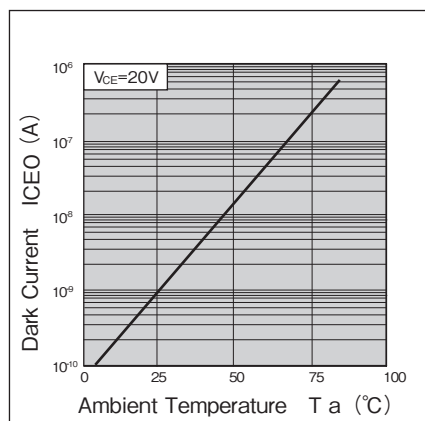
### 応答時間—負荷抵抗特性 (代表例)



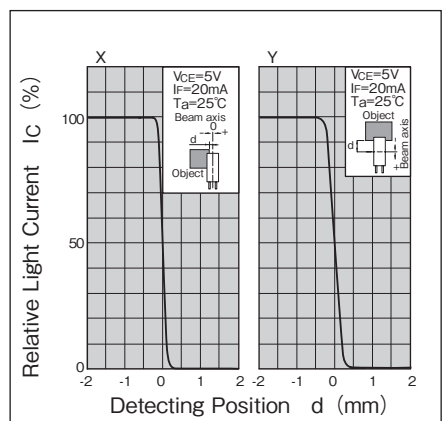
### 光電流—周囲温度特性 (代表例)



### 暗電流—周囲温度特性 (代表例)



### 検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI1600/1601



透過型フォトセンサ 防塵・4方向取付け可能タイプ Photo Interrupter - Dust proof - Installation at 4 directions type ※ 1



## 概要 Description

KI1600/1601 は、防塵タイプのフォト IC 出力の小型透過型フォトセンサです。

Model KI1600/1601 are compact size of Photo Interrupter and consist of an Infrared LED and a Photo IC. These sensors have slitless plastic housing.

## 特長 Feature

- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ LED 制限抵抗内蔵タイプ
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ Built-in amplifier, Open collector output type.
- ・ Built in resistor for LED drive.
- ・ Visible Light cut filter.

## 用途 Application

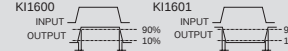
- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ O A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.

※ 1 実用新案登録 第 3114641 号  
※ 1 Registered utility model No.3114641 (JPO)

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

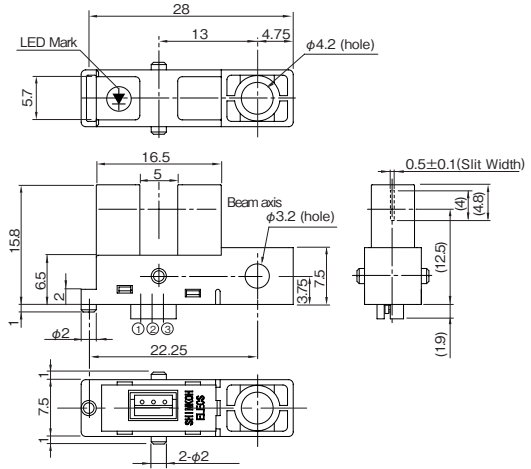
## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                |              | Symbol | Condition                                                                            |             | min.    | typ. | max. | Unit |    |
|-------------------------------------|--------------|--------|--------------------------------------------------------------------------------------|-------------|---------|------|------|------|----|
| 動作電源電圧 Supply Voltage               |              | VCC    | —                                                                                    |             | 4.5     | 5.0  | 5.5  | V    |    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI1600 | 遮光時                                                                                  | Shutter in  | —       | —    | 25   | mA   |    |
|                                     |              | KI1601 | 入光時                                                                                  | w/o Shutter | —       | —    | 25   |      |    |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI1600 | 入光時                                                                                  | w/o Shutter | —       | —    | 25   | mA   |    |
|                                     |              | KI1601 | 遮光時                                                                                  | Shutter in  | —       | —    | 25   |      |    |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI1600 | 遮光時、IOL=16mA                                                                         | Shutter in  | —       | —    | 0.4  | V    |    |
|                                     |              | KI1601 | 入光時、IOL=16mA                                                                         | w/o Shutter | —       | —    | 0.4  |      |    |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI1600 | 入光時、RL=47kΩ                                                                          | w/o Shutter | VCCx0.9 | —    | —    | V    |    |
|                                     |              | KI1601 | 遮光時、RL=47kΩ                                                                          | Shutter in  | VCCx0.9 | —    | —    |      |    |
| 応答時間<br>Response Time               | 上昇 Rise Time | tr     |  |             |         | —    | 1.47 | —    | μs |
|                                     | 下降 Fall Time | tf     |                                                                                      |             |         | —    | 0.02 | —    |    |

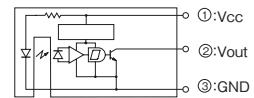
\*\* : Ta=25°C unless otherwise noted

## Dimension(Unit:mm)

KI1600/1601



※ 指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5  
※ ( ) 内寸法は参考値とする  
( ) value means for reference only



|                         |                                                           |
|-------------------------|-----------------------------------------------------------|
| 型名枝番<br>Model variation | コネクタメーカー：コネクタ品番<br>Connector manufacturer : Connector P/N |
| AALF                    | JST:B3B-ZR                                                |

| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI1600 | High | 入光時 at Beam detecting |
| KI1601 | Low  | 入光時 at Beam detecting |

## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

# KI1600/1601

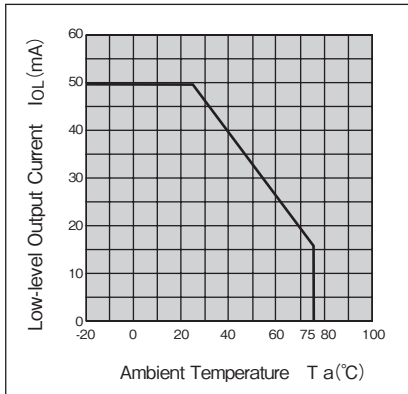
## 定格・特性曲線

Characteristics

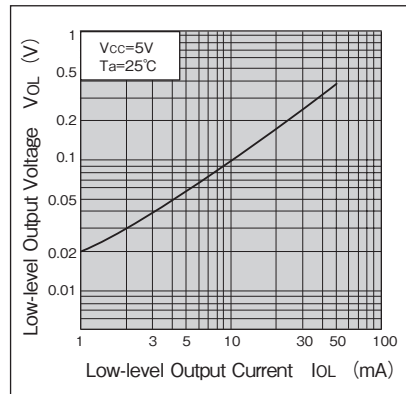
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

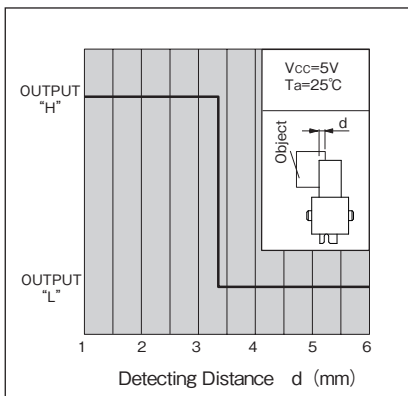
ローレベル出力電流低減曲線



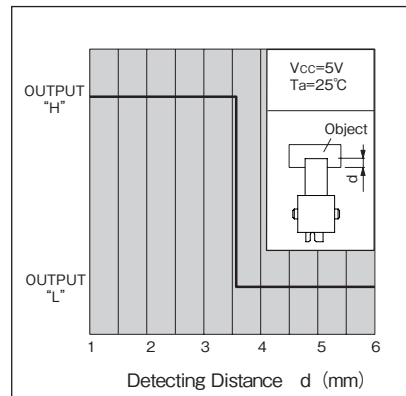
ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)



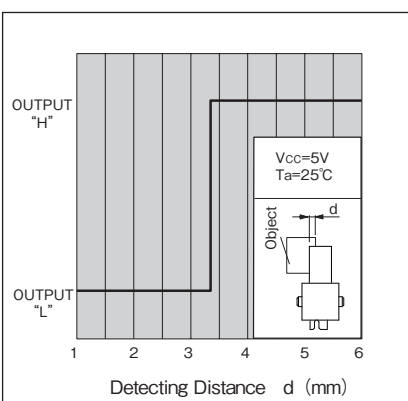
検出位置特性1 (代表例) KI1600



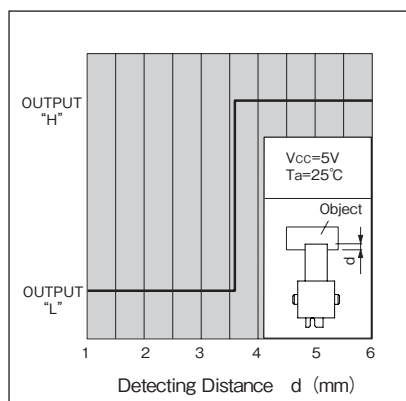
検出位置特性2 (代表例) KI1600



検出位置特性1 (代表例) KI1601



検出位置特性2 (代表例) KI1601



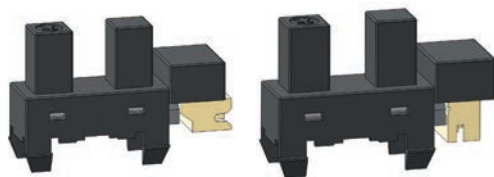
- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3024



透過型フォトセンサ 防塵タイプ

Photo Interrupter - Dust proof type



## 概要 Description

KI3024 は、アナログ出力の防塵タイプ透過型フォトセンサです。

Model KI3024 consists of an Infrared LED and a High sensitive Photo transistor (Analog output).

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ スナップ構造で取付が容易
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ Easy removing paper dust.
- ・ Easy to install by snap in.
- ・ High-resolution : slit width 0.5mm.
- ・ Visible Light cut filter.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の用紙通過検出
- ・ O.A機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

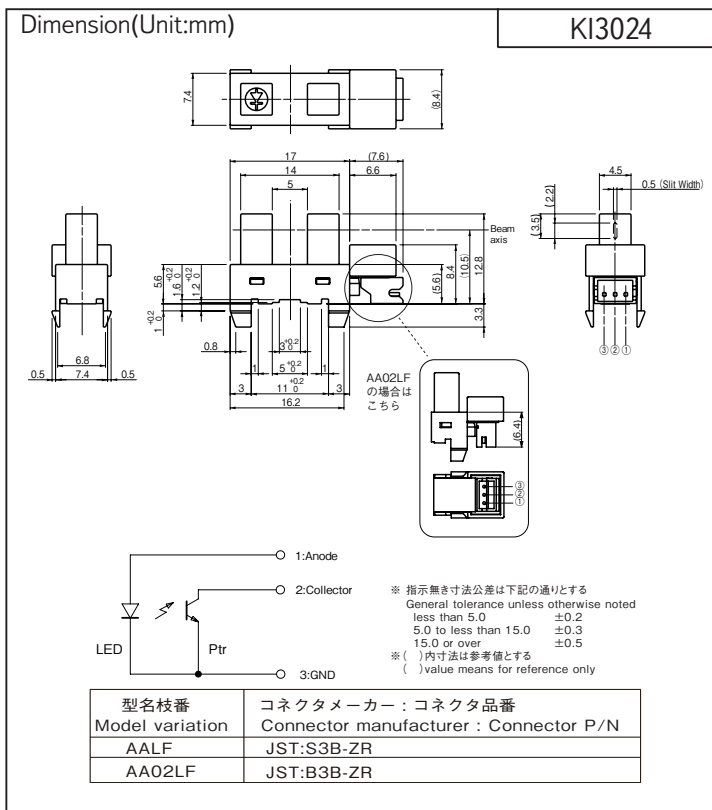
| Item                       |                                        | Symbol           | Rating    | Unit |
|----------------------------|----------------------------------------|------------------|-----------|------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF               | 50        | mA   |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP              | 1         | A    |
|                            | 逆電圧 Reverse Voltage                    | VR               | 5         | V    |
|                            | 許容損失 Power Dissipation                 | P                | 75        | mW   |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 30        | V    |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 5         | V    |
|                            | コレクタ電流 Collector Current               | IC               | 20        | mA   |
|                            | コレクタ損失 Collector Power Dissipation     | Pc               | 75        | mW   |
| 動作温度 Operating Temperature |                                        | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature   |                                        | T <sub>stg</sub> | -30 ~ +80 | °C   |

※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                   | Symbol               | Condition                                                       | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|----------------------|-----------------------------------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | V <sub>F</sub>       | I <sub>F</sub> =20mA                                            | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | I <sub>R</sub>       | V <sub>R</sub> =3V                                              | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | I <sub>CEO</sub>     | V <sub>CE</sub> =20V, 0 lx                                      | —    | —    | 0.1  | μA   |
|                 | 光電流 Light Current                 | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                       | 0.3  | —    | —    | mA   |
| 伝達特性<br>Coupled | コレクタ・エミッタ間飽和電圧 Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =20mA, I <sub>C</sub> =0.15mA                    | —    | —    | 0.4  | V    |
|                 | 応答時間<br>Response Time             | 上昇<br>Rise Time      | V <sub>CC</sub> =5V, I <sub>C</sub> =0.5mA, R <sub>L</sub> =1kΩ | —    | 15   | —    | μs   |
|                 |                                   | 下降<br>Fall Time      |                                                                 | —    | 17   | —    |      |

\*\*: Ta=25°C unless otherwise noted



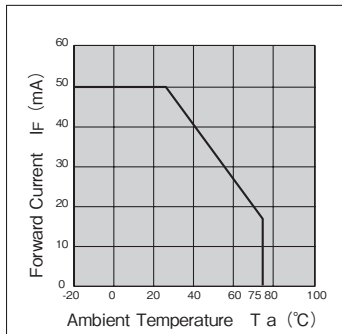
# KI3024

## 定格・特性曲線 Characteristics

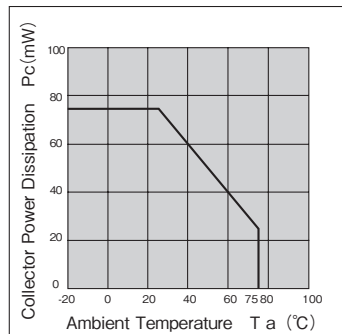
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

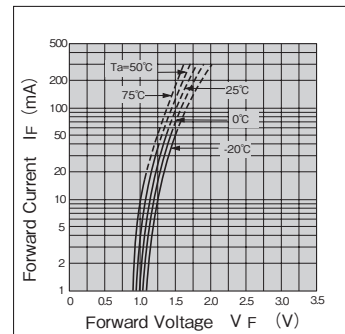
順電流低減曲線



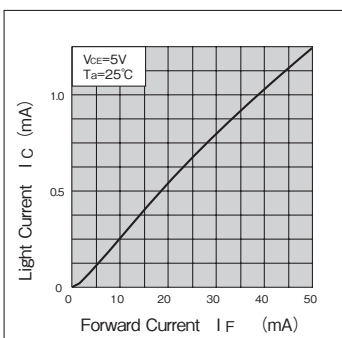
コレクタ損失低減曲線



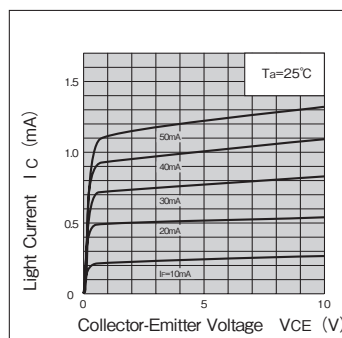
順電流－順電圧曲線 (代表例)



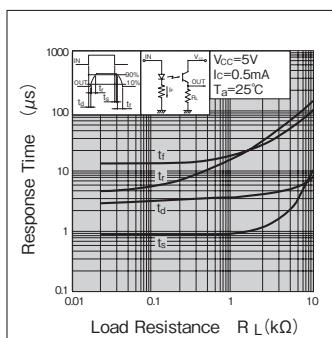
光電流－順電流特性 (代表例)



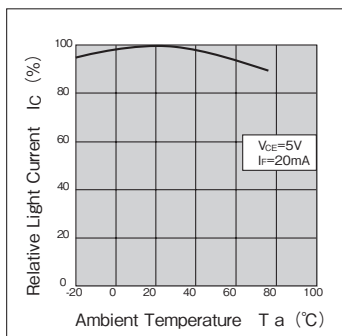
光電流－コレクタ・エミッタ間電圧特性 (代表例)



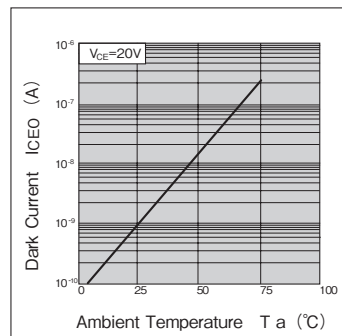
応答時間－負荷抵抗特性 (代表例)



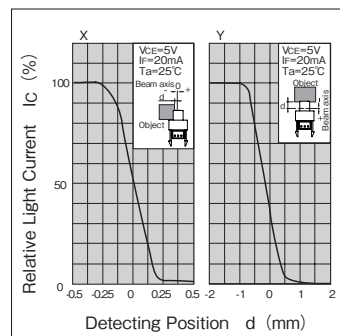
光電流－周囲温度特性 (代表例)



暗電流－周囲温度特性 (代表例)

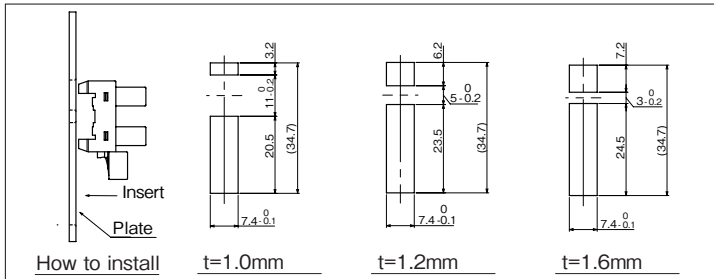


検出位置特性 (代表例)



## 推奨取付穴寸法図

Recommended installation to mounting holes



- ・取付板のプレス側から取付けを推奨します。
- ・We recommend to mount the sensor from pressed surface of plate.

- ・実際に取り付けてガタツキ度合いをご確認され取り付け方法を決定下さい。
- ・The actual tolerance should be confirmed after setting of sensor

・カスタマイズも承ります。お気軽にお問合せください

・ A Customized design available on request.

・この仕様は改良のため予告なく変更する場合があります

・ Specifications are subject to change without notice.

## KI3050/3051/3052/3053



透過型フォトセンサ

Photo Interrupter



## 概要 Description

KI3050/3051/3052/3053 は、フォト IC 出力の小型透過型フォトセンサです。

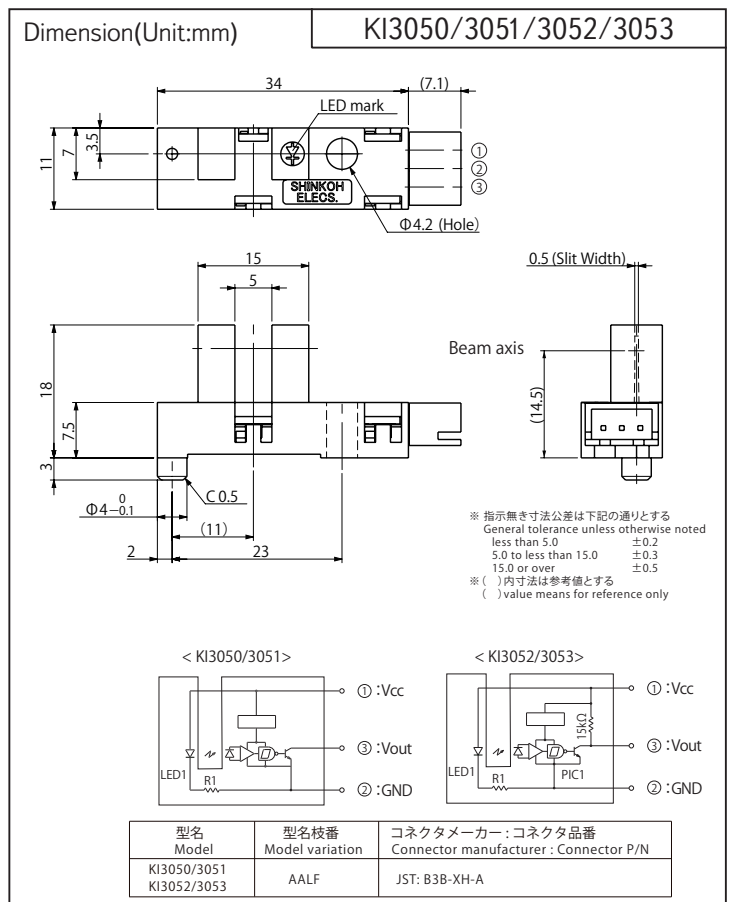
Model KI3050/3051/3052/3053 consist of an Infrared LED and a Photo IC(Digital Output).

## 特長 Feature

- ・ アンプ内蔵
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ Built-in amplifier
- ・ High-resolution : slit width 0.5mm

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の用紙通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電 源 電 圧 Supply Voltage             | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |
| KI3050 / 3051 出力電圧 Output Voltage  | VO               | 28        | V    |

| Model       | Output type              |
|-------------|--------------------------|
| KI3050/3051 | オープンコレクタ Open collector  |
| KI3052/3053 | プルアップ抵抗 Pull-up Resistor |

| Model       | Mode | Condition             |
|-------------|------|-----------------------|
| KI3050/3052 | High | 入光時 at Beam detecting |
| KI3051/3053 | Low  | 入光時 at Beam detecting |

## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

※ 1. KI3050/3051 - RL=47kΩ

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                    | Symbol       | Condition                             | min.    | typ. | max. | Unit |
|-----------------------------------------|--------------|---------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage                   | VCC          | —                                     | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current      | ICCL         | KI3050/3052 遮光時 Shutter in            | —       | —    | 25   | mA   |
|                                         |              | KI3051/3053 入光時 w/o Shutter           | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current     | ICCH         | KI3050/3052 入光時 w/o Shutter           | —       | —    | 25   | mA   |
|                                         |              | KI3051/3053 遮光時 Shutter in            | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage      | VOL          | KI3050/3052 遮光時, IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                         |              | KI3051/3053 入光時, IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage ※ 1 | VOH          | KI3050/3052 入光時 w/o Shutter           | VCC×0.9 | —    | —    | V    |
|                                         |              | KI3051/3053 遮光時 Shutter in            | VCC×0.9 | —    | —    |      |
| 応 答 時 間 Response Time                   | 上昇 Rise Time | tr                                    | —       | 1.47 | —    | μs   |
|                                         | 下降 Fall Time | tf                                    | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI3050/3051/3052/3053

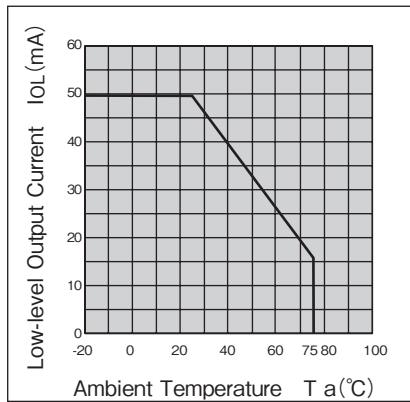
定格・特性曲線

Characteristics

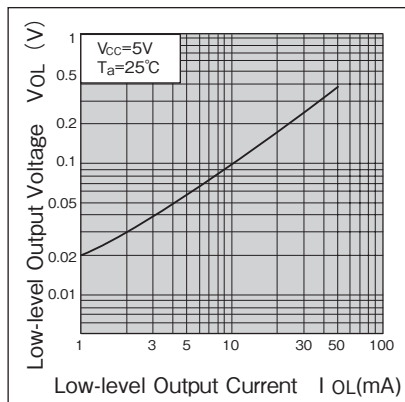
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

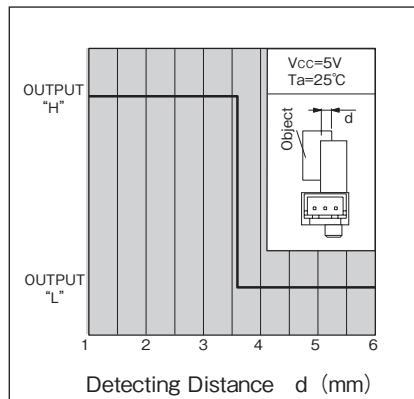
ローレベル出力電流低減曲線



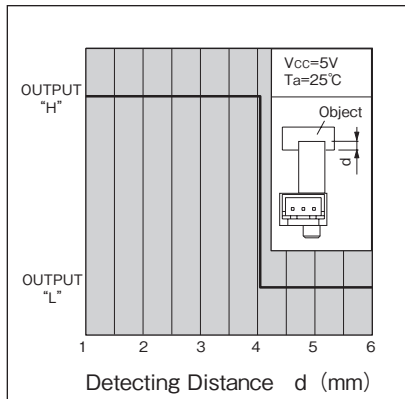
ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)



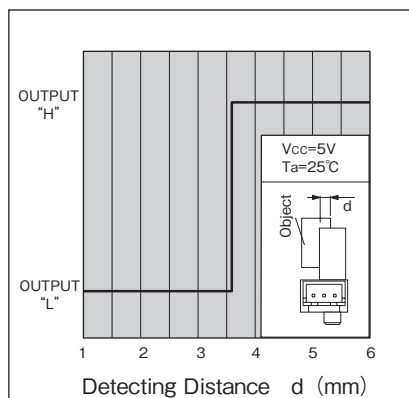
検出位置特性1 (代表例) KI3050/3052



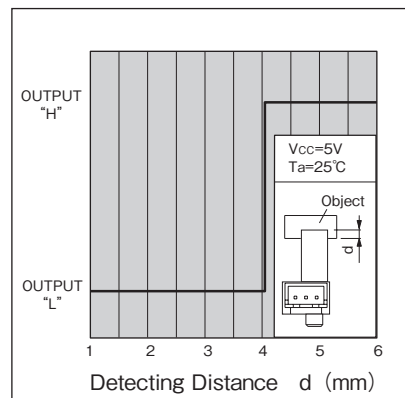
検出位置特性2 (代表例) KI3050/3052



検出位置特性1 (代表例) KI3051/3053



検出位置特性2 (代表例) KI3051/3053



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3060/3061



透過型フォトセンサ ギャップ幅広タイプ Photo Interrupter - Wide slot type



## 概要 Description

KI3060/3061 は、発光側に赤外発光ダイオード、受光側にフォト IC 出力を採用した透過型フォトセンサです。

Model KI3060/3061 consist of an Infrared LED and a High sensitive Photo IC(Digital Output).

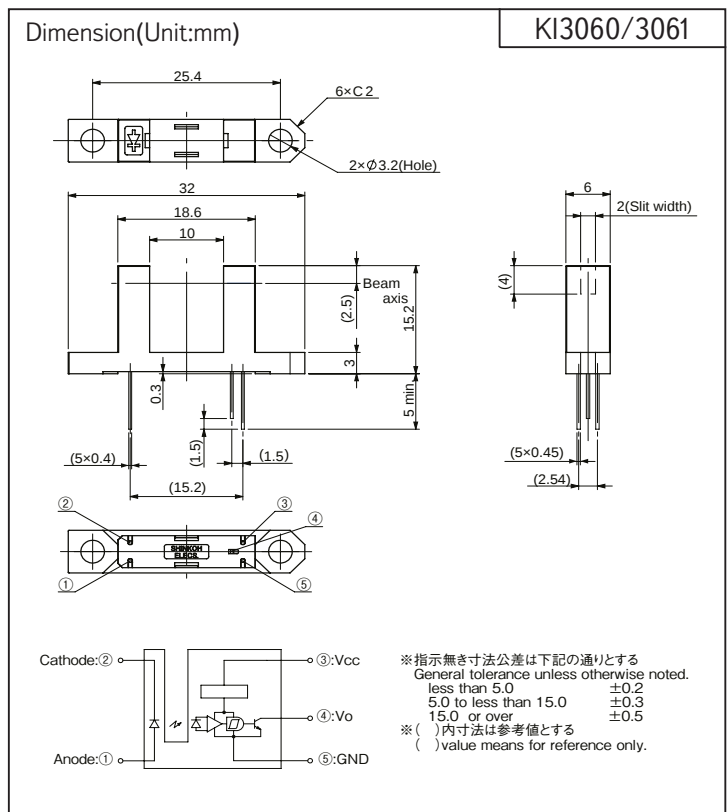
## 特長 Feature

- ・アンプ内蔵型
- ・検出溝の深さ 12.2mm の深溝型
- ・検出溝幅が 10mm と広いので厚みのあるものを検出可能
- ・フォトトランジスタ出力タイプも用意しております  
... KI3064

- ・ Built-in amplifier.
- ・ Slot depth-12.2mm.
- ・ Wide Slot width-10mm.
- ・ The model of Phototransistor Output is also available  
... KI3064

## 用途 Application

- ・カード機器、両替機の物体通過検出
- ・自動販売機、アミューズメント機器のコイン通過検出
- ・OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI3060 | High | 入光時 at Beam detecting |
| KI3061 | Low  | 入光時 at Beam detecting |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

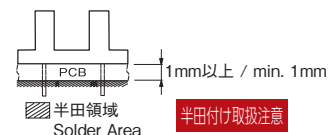
| Item                           | Symbol                             | Rating    | Unit   |
|--------------------------------|------------------------------------|-----------|--------|
| 発光側<br>Emitter                 | 順電流 Forward Current                | If        | 50 mA  |
|                                | パルス順電流 Pulse Forward Current ※1    | IfP       | 1 A    |
|                                | 逆電圧 Reverse Voltage                | VR        | 5 V    |
| 受光側<br>Detector                | 電源電圧 Supply Voltage                | VCC       | 17 V   |
|                                | ローレベル出力電流 Low-Level Output Current | IOL       | 16 mA  |
|                                | 出力許容損失 Output Power Dissipation    | Po        | 175 mW |
| 動作温度 Operating Temperature     | Topr                               | -20 ~ +85 | °C     |
| 保存温度 Storage Temperature       | Tstg                               | -30 ~ +85 | °C     |
| 半田付温度 Soldering Temperature ※2 | Tsol                               | 330       | °C     |

## &lt;ご使用上の注意&gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt;Operation Notice&gt;

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.



※1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01

※2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)

※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

※2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*] ( ) = KI3061

| Item            | Symbol                                | Condition                               | min.                | typ. | max. | Unit |
|-----------------|---------------------------------------|-----------------------------------------|---------------------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage                   | $I_f = 20mA$                            | —                   | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current                   | $V_R = 3V$                              | —                   | —    | 10   | μA   |
| 受光側<br>Detector | ローレベル出力電圧 Low-Level Output Voltage    | $I_{OL} = 16mA, I_f = 0 (I_f = 15mA)$   | —                   | 0.15 | 0.4  | V    |
|                 | ハイレベル出力電圧 High-Level Output Voltage   | $R_L = 47k\Omega, I_f = 15mA (I_f = 0)$ | $V_{CC} \times 0.9$ | —    | —    | V    |
|                 | ローレベル供給電流 Low-Level Supply Current    | $V_{CC} = 5V, I_f = 0 (I_f = 15mA)$     | —                   | —    | 3.4  | mA   |
|                 | ハイレベル供給電流 High-Level Supply Current   | $V_{CC} = 5V, I_f = 15mA (I_f = 0)$     | —                   | —    | 2.2  | mA   |
| 伝達特性<br>Coupled | スレッシュホールド入力電流 Threshold Input Current | Low → High                              | —                   | —    | 10   | mA   |
|                 |                                       | High → Low                              | —                   | —    | 10   | mA   |
|                 | ヒステリシス Hysteresis                     | $V_{CC} = 5V$                           | —                   | 0.65 | —    | —    |
|                 | 応答時間 Response Time                    | 上昇 Rise Time                            | —                   | 0.1  | —    | μs   |
|                 |                                       | 下降 Fall Time                            | —                   | 0.05 | —    | μs   |

\*\* : Ta=25°C unless otherwise noted

# KI3060/3061

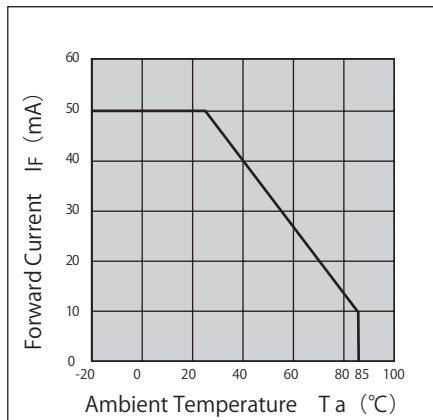
## 定格・特性曲線

Characteristics

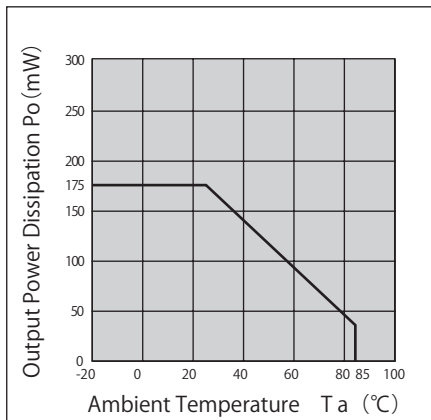
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

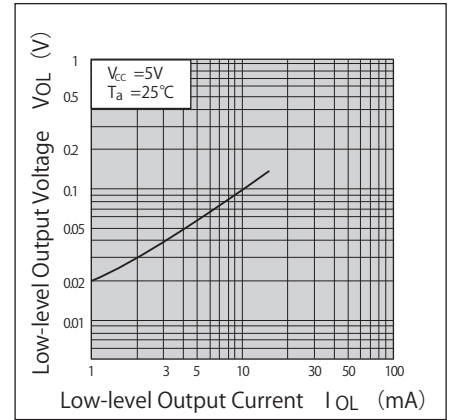
### 順電流低減曲線



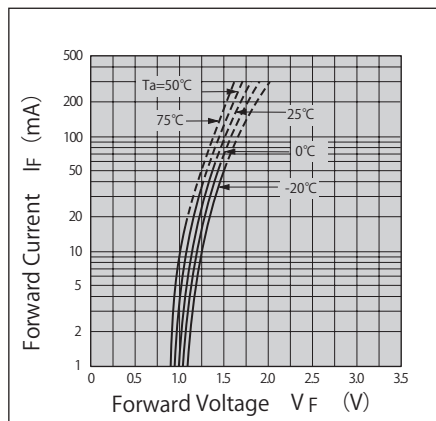
### 出力許容損失低減曲線



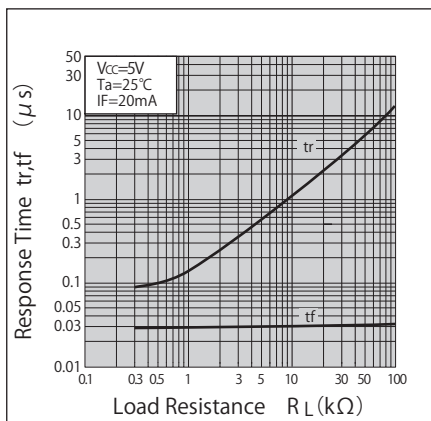
### ローレベル出力電圧ー ローレベル出力電流特性 (代表例)



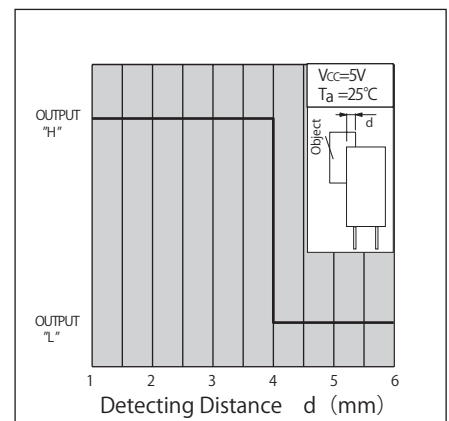
### 順電流ー順電圧曲線 (代表例)



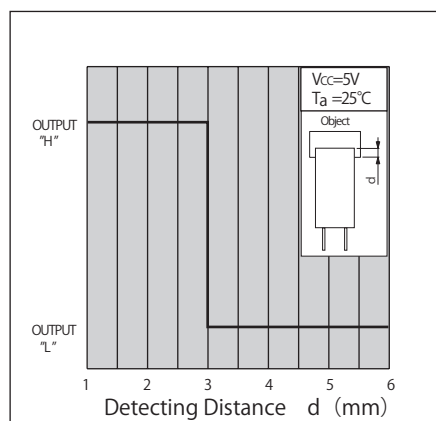
### 上昇、下降時間ー 負荷抵抗特性 (代表例)



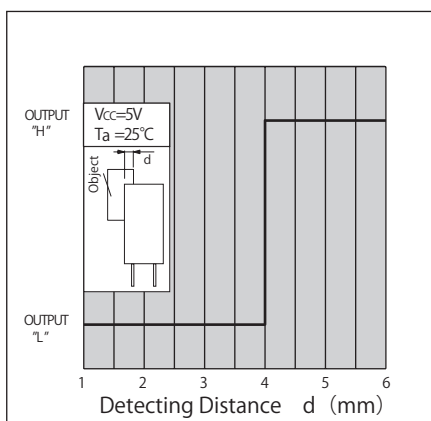
### 検出位置特性 1 (代表例) KI3060



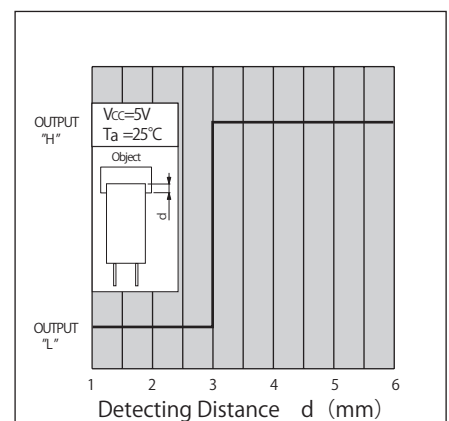
### 検出位置特性 2 (代表例) KI3060



### 検出位置特性 1 (代表例) KI3061



### 検出位置特性 2 (代表例) KI3061



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3064



透過型フォトセンサ ギャップ幅広タイプ

Photo Interrupter - Wide slot type



## 概要 Description

KI3064 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した透過型フォトセンサです。

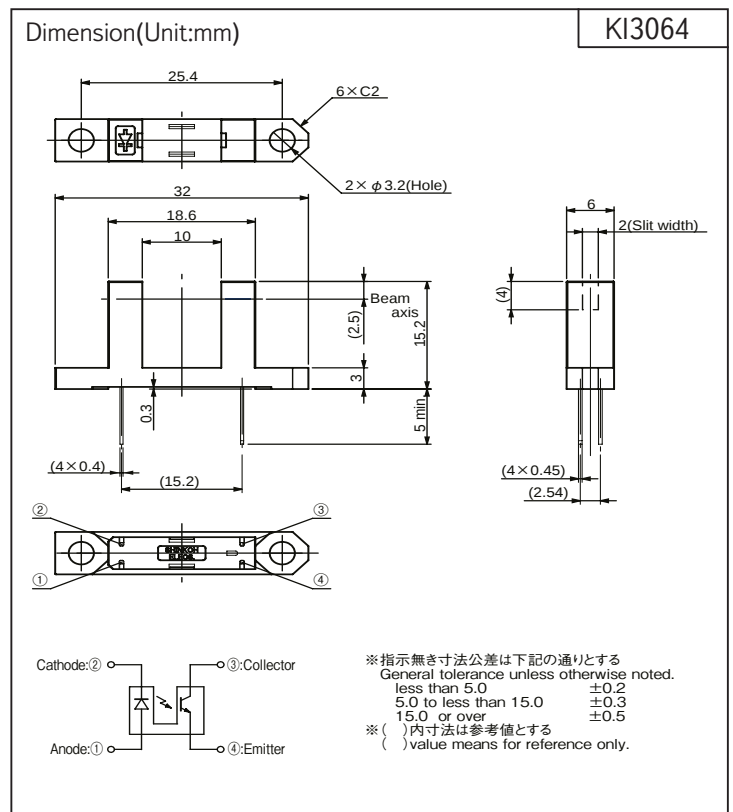
Model KI3064 consists of an Infrared LED and a High sensitive Photo transistor(Analog output).

## 特長 Feature

- 検出溝の深さ 12.2mm の深溝型
- 検出溝幅が 10mm と広いので厚みのある物でも検出可能
- 可視光カットタイプ
- フォト IC タイプも用意しております  
... KI3060/3061
- Slot depth-12.2mm.
- Wide Slot width-10mm.
- Visible Light cut filter.
- The model of Photo IC Output is also available.  
... KI3060/3061

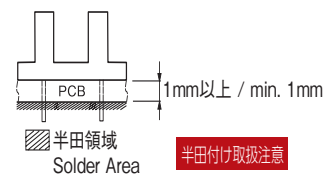
## 用途 Application

- カード機器、両替機の物体通過検出
- 自動販売機、アミューズメント機器のコイン通過検出
- OA機器、その他
- Object passing for Card reader, Bill exchanger.
- Coin-passing for Auto vending machine and Amusement.
- Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item            |              | Symbol | Rating    | Unit |
|-----------------|--------------|--------|-----------|------|
| 発光側<br>Emitter  | 順電流          | IF     | 50        | mA   |
|                 | パルス順電流       | IFP    | 1         | A    |
|                 | 逆電圧          | VR     | 5         | V    |
|                 | 許容損失         | P      | 75        | mW   |
| 受光側<br>Detector | コレクタ・エミッタ間電圧 | VCEO   | 30        | V    |
|                 | エミッタ・コレクタ間電圧 | VECO   | 5         | V    |
|                 | コレクタ電流       | IC     | 20        | mA   |
|                 | コレクタ損失       | Pc     | 75        | mW   |
| 動作温度            |              | Topr   | -20 ~ +85 | °C   |
| 保存温度            |              | Tstg   | -30 ~ +85 | °C   |
| 半田付温度           |              | Tsol   | 330       | °C   |



- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01
- ※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照)  
手半田付けのみ可 (フロー半田付け不可)
- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01
- ※ 2. Soldering condition less than 2s. at 1mm over from body.  
Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                       | Symbol          | Condition                | min. | typ. | max. | Unit |
|-----------------|-----------------------|-----------------|--------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧                   | VF              | IF=20mA                  | —    | 1.2  | 1.5  | V    |
|                 | 逆電流                   | IR              | VR=3V                    | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流                   | ICEO            | VCE=10V, 0 lx            | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流                   | IC              | VCE=5V, IF=20mA          | 0.5  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧        | VCE(sat)        | IF=20mA, IC=0.25mA       | —    | —    | 0.4  | V    |
|                 | 応答時間<br>Response Time | 上昇<br>Rise Time | VCC=5V, IC=0.5mA, RL=1kΩ | —    | 15   | —    | μs   |
|                 |                       | 下降<br>Fall Time |                          | —    | 17   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI3064

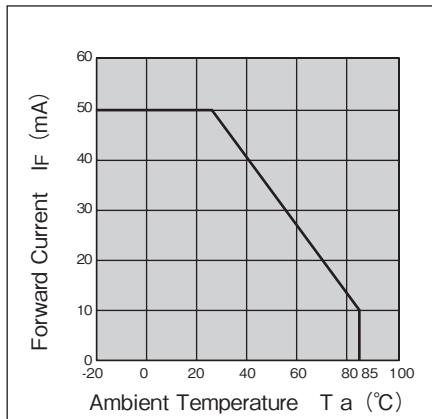
## 定格・特性曲線

Characteristics

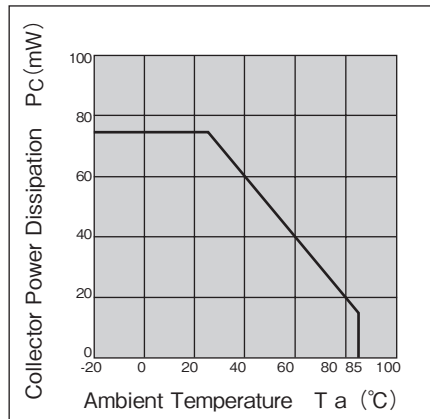
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

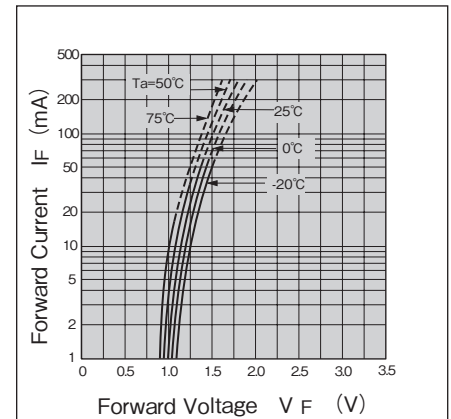
### 順電流低減曲線



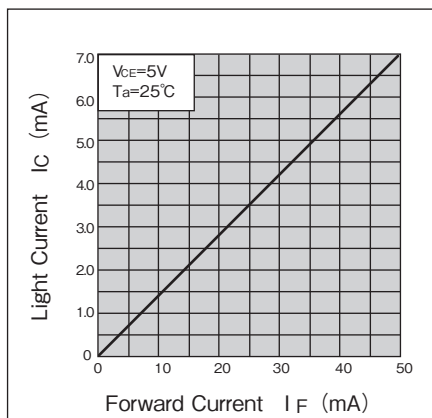
### コレクタ損失低減曲線



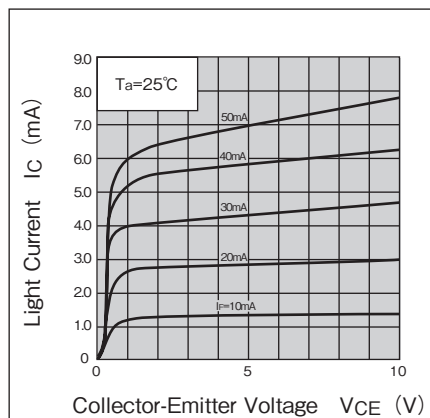
### 順電流－順電圧特性 (代表例)



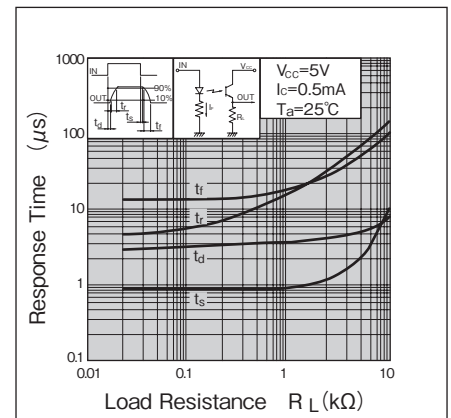
### 光電流－順電流特性 (代表例)



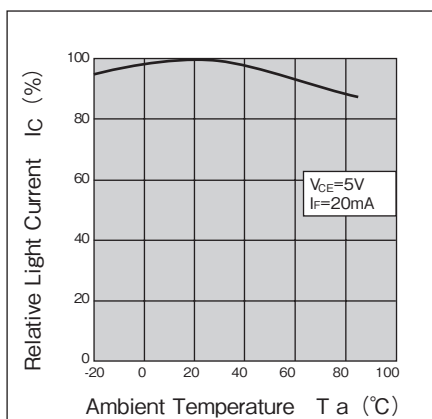
### 光電流－コレクタ・エミッタ間電圧特性 (代表例)



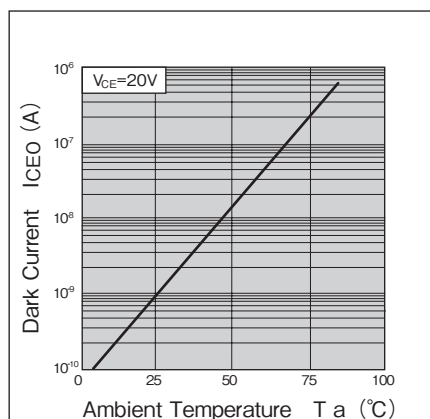
### 応答時間－負荷抵抗特性 (代表例)



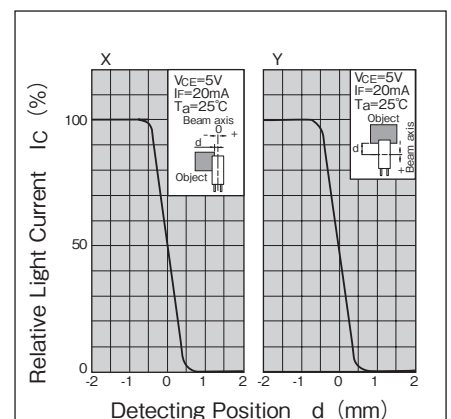
### 光電流－周囲温度特性 (代表例)



### 暗電流－周囲温度特性 (代表例)



### 検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3110/3111



透過型フォトセンサ スリット幅 0.25mm タイプ

Photo Interrupter - Slit width 0.25mm type



## 概要 Description

KI3110/3111 は、デジタル出力タイプの透過型フォトセンサです。

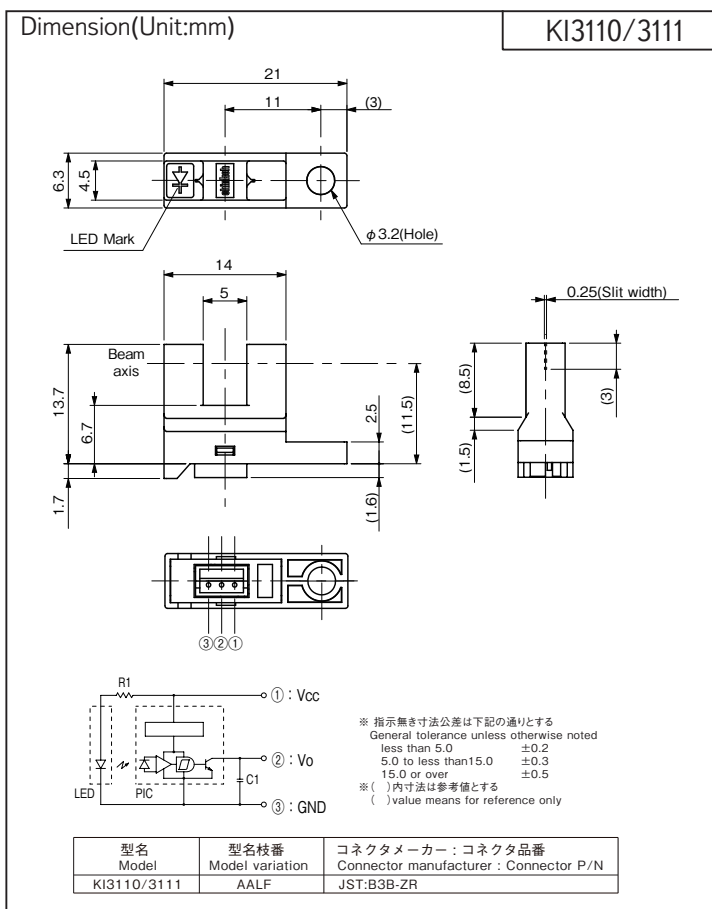
Model KI3110/3111 consist of an Infrared LED and a Photo IC(Digital Output).

## 特長 Feature

- ・検出精度が高い：スリット幅 0.25mm
- ・可視光カットタイプの為、外乱光の影響を受けにくい
- ・Vo-GND 間コンデンサ内蔵タイプ
- ・High-resolution : slit width 0.25mm.
- ・Visible Light cut filter.
- ・Built in Capacitor between Vout and GND.

## 用途 Application

- ・カード機器、両替機の物体通過検出
- ・自動販売機、アミューズメント機器のコイン通過検出
- ・券売機の利用紙通過検出
- ・OA機器、その他
- ・Object passing for Card reader, Bill exchanger.
- ・Coin-passing for Auto vending machine and Amusement.
- ・Object passing in Auto vender and Ticket vending machine.
- ・Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol | Rating    | Unit |
|------------------------------------|--------|-----------|------|
| 電源電圧 Supply Voltage                | VCC    | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL    | 50        | mA   |
| 出力電圧 Output Voltage                | VO     | 28        | V    |
| 動作温度 Operating Temperature         | Topr   | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | Tstg   | -40 ~ +80 | °C   |

| Model       | Output type             |
|-------------|-------------------------|
| KI3110/3111 | オープンコレクタ Open collector |

| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI3110 | High | 入光時 at Beam detecting |
| KI3111 | Low  | 入光時 at Beam detecting |

< ご使用上の注意 >  
センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

< Operation Notice >

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                        | min.    | typ.  | max. | Unit |
|-------------------------------------|--------------|----------------------------------|---------|-------|------|------|
| 動作電源電圧 Supply Voltage               | Vcc          | —                                | 4.5     | 5.0   | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI3110 遮光時 Shutter in            | —       | —     | 25   | mA   |
|                                     |              | KI3111 入光時 w/o Shutter           | —       | —     | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI3110 入光時 w/o Shutter           | —       | —     | 25   | mA   |
|                                     |              | KI3111 遮光時 Shutter in            | —       | —     | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI3110 遮光時, IOL=16mA Shutter in  | —       | —     | 0.4  | V    |
|                                     |              | KI3111 入光時, IOL=16mA w/o Shutter | —       | —     | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI3110 入光時, RL=47kΩ w/o Shutter  | VCCx0.9 | —     | —    | V    |
|                                     |              | KI3111 遮光時, RL=47kΩ Shutter in   | VCCx0.9 | —     | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                               | —       | 2.8   | —    | ms   |
|                                     | 下降 Fall Time | tf                               | —       | 0.004 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI3110/3111

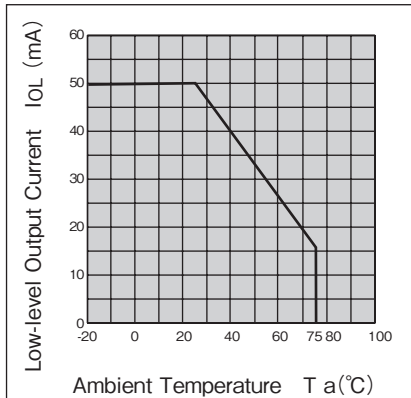
定格・特性曲線

Characteristics

※注意 最大定格を超えないようにご使用ください

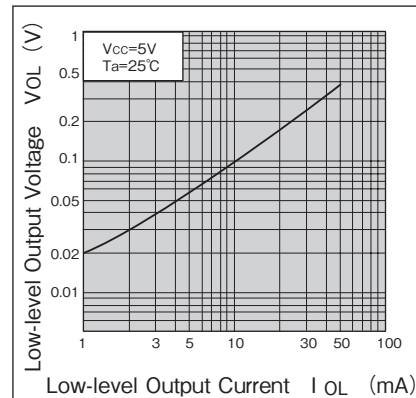
Note: Operation never exceeds each value of Maximum Ratings.

ローレベル出力電流低減曲線

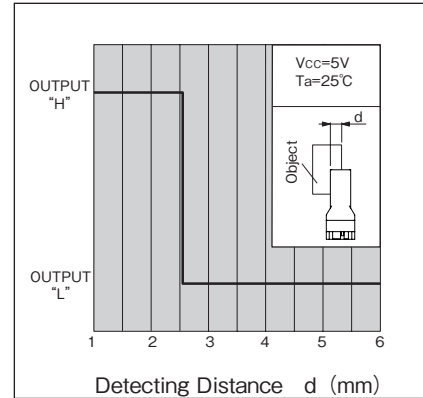


ローレベル出力電圧ー

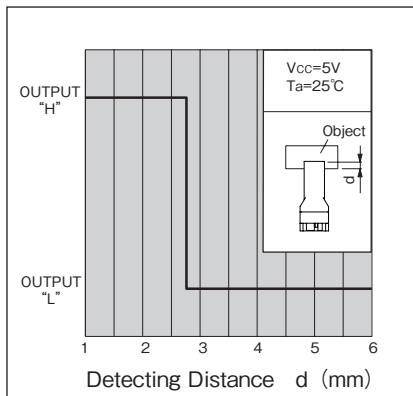
ローレベル出力電流特性 (代表例)



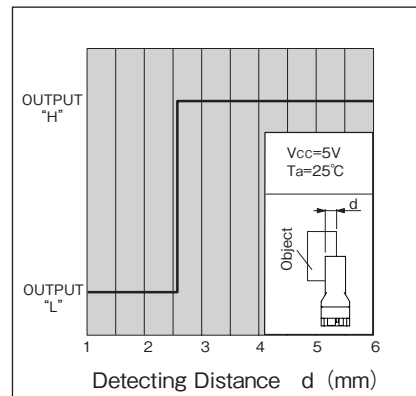
検出位置特性1 (代表例) KI3110



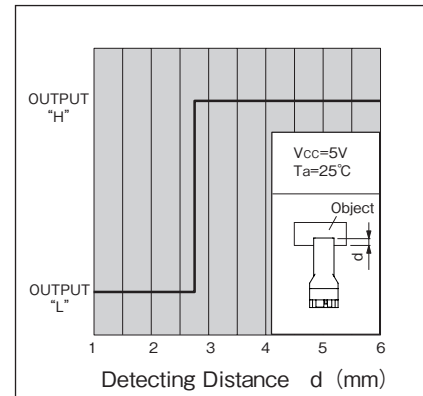
検出位置特性2 (代表例) KI3110



検出位置特性1 (代表例) KI3111

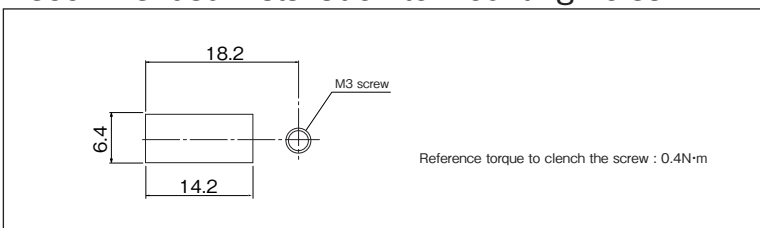


検出位置特性2 (代表例) KI3111



## 推奨取付穴寸法図

Recommended installation to mounting holes



・取付板のプレス側から取付けを推奨します。

・We recommend to mount the sensor from pressed surface of plate.

・実際に取り付けてガタツキ度合いをご確認され取り付け方法を決定下さい。

・The actual tolerance should be confirmed after setting of sensor.

・カスタマイズも承ります。お気軽にお問合せください

・ A Customized design available on request.

・この仕様は改良のため予告なく変更する場合があります

・ Specifications are subject to change without notice.

## KI3300/3301



透過型フォトセンサ 防塵タイプ

Photo Interrupter - Dust proof type



## 概要 Description

KI3300/3301 は、外側にケースカバー、内側に検出用スリットをもつ 2 重構造の防塵型、フォト IC 出力の小型透過型フォトセンサです。

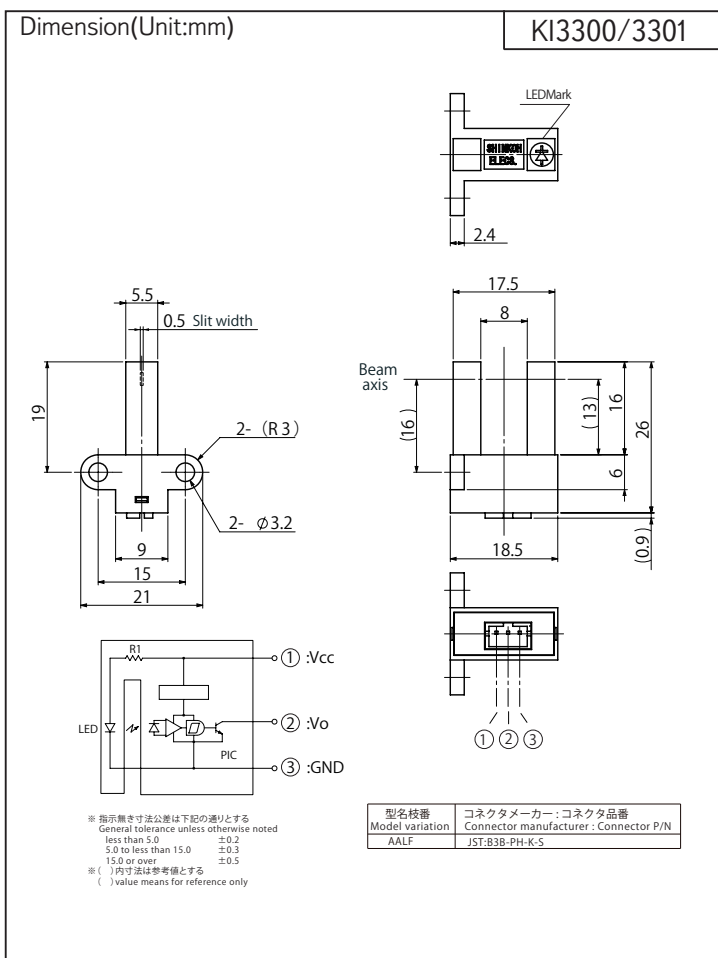
Model KI3300/3301 consist of an Infrared LED and a Photo IC (Digital Output). Outer package has no aperture on the both light pass surfaces of the emitter and detector.

## 特長 Feature

- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：内蔵スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ LED 制限抵抗内蔵タイプ
- ・ Built-in amplifier, Open collector output type.
- ・ Easy removing in paper-dust.
- ・ High-resolution : slit width 0.5mm.
- ・ Visible Light cut filter.
- ・ Built in resistor for LED drive.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の利用紙通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI3300 | High | 入光時 at Beam detecting |
| KI3301 | Low  | 入光時 at Beam detecting |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | Vcc          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | IcCL         | KI3300 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI3301 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | IcCH         | KI3300 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI3301 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI3300 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI3301 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI3300 入光時、RL=47kΩ w/o Shutter  | VCCx0.9 | —    | —    | V    |
|                                     |              | KI3301 遮光時、RL=47kΩ Shutter in   | VCCx0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                              | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time | tf                              | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI3300/3301

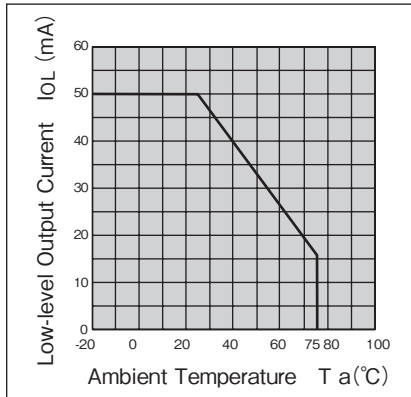
定格・特性曲線

Characteristics

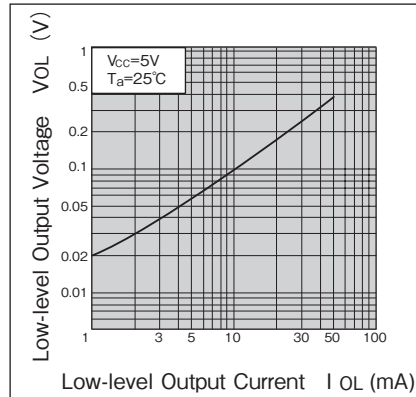
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

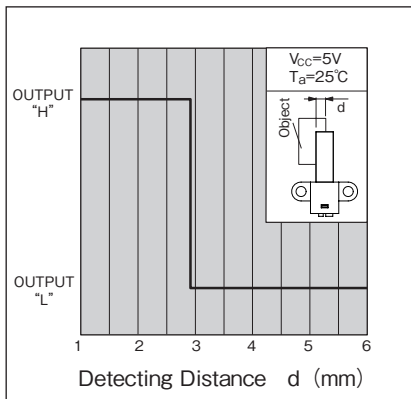
ローレベル出力電流低減曲線



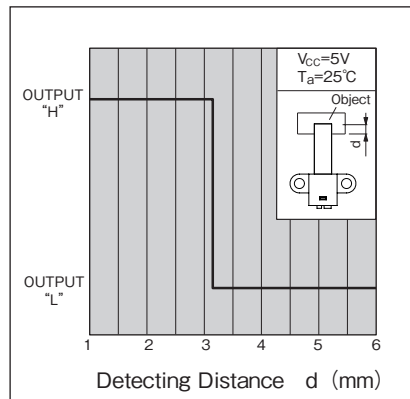
ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)



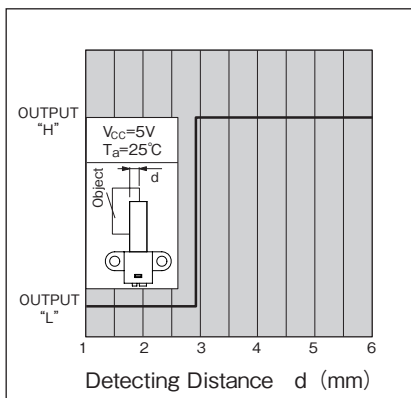
検出位置特性1 (代表例) KI3300



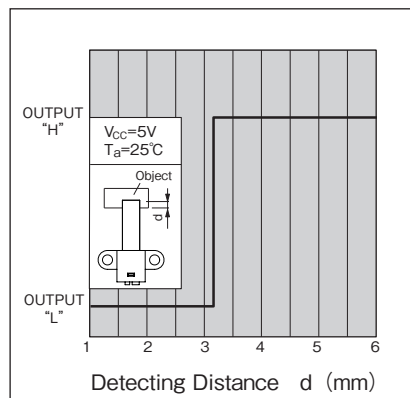
検出位置特性2 (代表例) KI3300



検出位置特性1 (代表例) KI3301



検出位置特性2 (代表例) KI3301



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3520/3521



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

KI3520/3521 は、発光側に赤外発光ダイオード、受光側にフォト IC 出力を採用した防塵タイプの小型透過型フォトセンサです。  
Model KI3520/3521 consist of an Infrared LED and a High sensitive Photo IC (Digital Output). Outer package has no aperture on the both light pass surfaces of the emitter and detector.

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ その他シリーズ  
    フォトトランジスタタイプ・・・KI3524
- ・ Easy removing paper dust.
- ・ High resolution: slit width 0.5mm.
- ・ Visible Light cut filter.
- ・ Built-in amplifier, Open Collector output type.
- ・ The other model; Phototransistor type・・・KI3524

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item              |           |                          | Symbol  | Rating    | Unit |
|-------------------|-----------|--------------------------|---------|-----------|------|
| 発 光 側<br>Emitter  | 順電流       | Forward Current          | IF      | 50        | mA   |
|                   | パルス順電流    | Pulse Forward Current ※1 | IFP     | 1         | A    |
|                   | 逆電圧       | Reverse Voltage          | VR      | 5         | V    |
| 受 光 側<br>Detector | 電源電圧      | Supply Voltage           | VCC     | 17        | V    |
|                   | ローレベル出力電流 | Low-Level Output Current | IOL     | 16        | mA   |
|                   | 出力許容損失    | Output Power Dissipation | Po      | 175       | mW   |
| 動作温度              |           |                          | Topr    | -20 ～ +85 | ℃    |
| 保存温度              |           |                          | Tstg    | -30 ～ +85 | ℃    |
| 半田付温度             |           |                          | Tsol ※2 | 330       | ℃    |

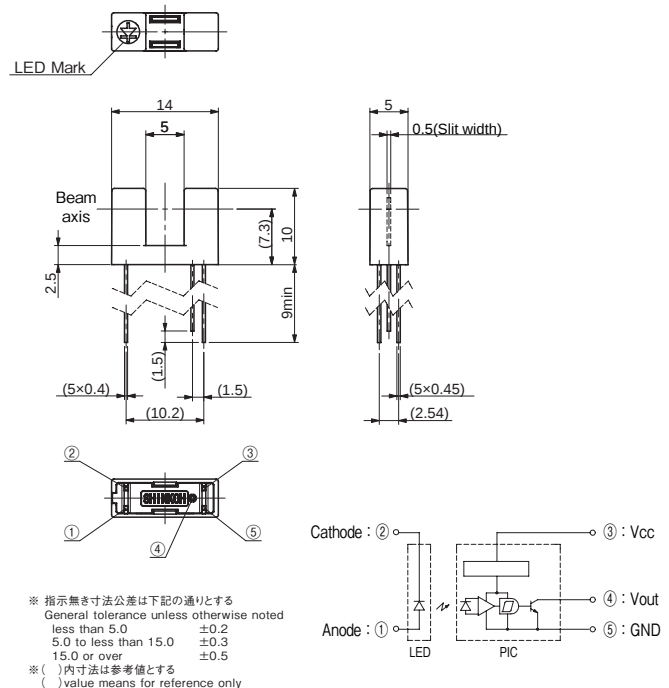
## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*] ( ) = KI3521

| Item               |                                                 |                           | Symbol     | Condition                                           |                          | min.    | typ. | max. | Unit |    |   |
|--------------------|-------------------------------------------------|---------------------------|------------|-----------------------------------------------------|--------------------------|---------|------|------|------|----|---|
| 発 光 側<br>Emitter   | 順電圧                                             | Forward Voltage           | VF         | IF=20mA                                             |                          | —       | 1.2  | 1.5  | V    |    |   |
|                    | 逆電流                                             | Reverse Current           | IR         | VR=3V                                               |                          | —       | —    | 10   | μA   |    |   |
| 受 光 側<br>Detector  | ローレベル出力電圧                                       | Low-Level Output Voltage  | VOL        | IOL=16mA, IF=0 (IF=15mA)                            |                          | —       | 0.15 | 0.4  | V    |    |   |
|                    | ハイレベル出力電圧                                       | High-Level Output Voltage | VOH        | IF=15mA (IF=0)                                      |                          | VCC×0.9 | —    | —    | V    |    |   |
|                    | ローレベル供給電流                                       | Low-Level Supply Current  | ICCL       | VCC=5V, IF=0 (IF=15mA)                              |                          | —       | —    | 3.4  | mA   |    |   |
|                    | ハイレベル供給電流                                       | High-Level Supply Current | ICCH       | VCC=5V, IF=15mA (IF=0)                              |                          | —       | —    | 2.2  | mA   |    |   |
| 伝 達 特 性<br>Coupled | スレッシュホールド<br>入 力 電 流<br>Threshold Input Current |                           | IFLH       | KI3520                                              | Low → High               | VCC=5V  | —    | —    | 10   | mA |   |
|                    |                                                 |                           | IFHL       | KI3521                                              | High → Low               |         | —    | —    | 10   |    |   |
|                    | ヒステリシス                                          |                           | Hysteresis | $\frac{I_{FHL}}{I_{FLH}} / \frac{I_{FLH}}{I_{FHL}}$ |                          | VCC=5V  |      | —    | 0.65 | —  | — |
|                    | 応 答 時 間<br>Response Time                        | 上昇                        | Rise Time  | tr                                                  | VCC=5V, IF=20mA, RL=280Ω |         | —    | 0.1  | —    | μs |   |
|                    |                                                 | 下降                        | Fall Time  | tf                                                  |                          |         | —    | 0.05 | —    |    |   |

\*\* : Ta=25°C unless otherwise noted

## Dimension (Unit:mm)

KI3520/3521



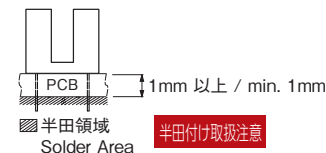
| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI3520 | High | 入光時 at Beam detecting |
| KI3521 | Low  | 入光時 at Beam detecting |

## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with min. 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

※ 1. パルス幅  $tw \leq 100\mu s$  Duty 比 = 0.01

※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)

※ 1. Pulse width  $tw \leq 100\mu s$  Duty ratio = 0.01

※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

# KI3520/3521

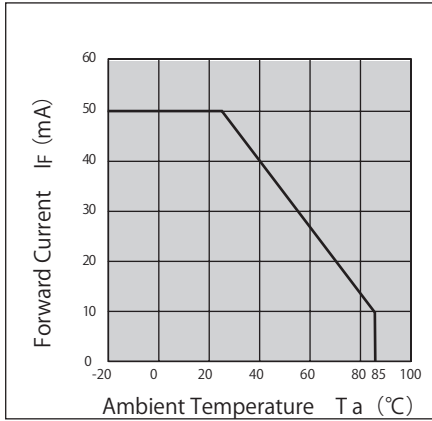
## 定格・特性曲線

Characteristics

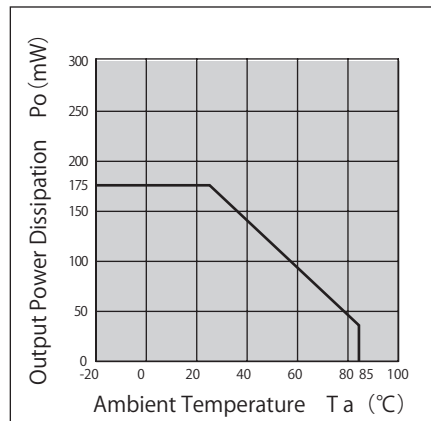
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

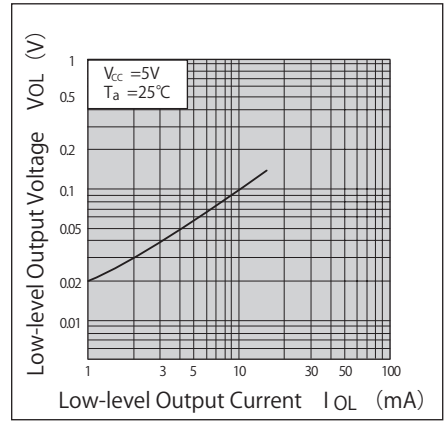
### 順電流低減曲線



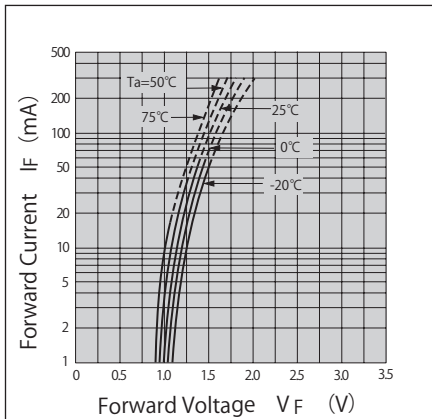
### 出力許容損失低減曲線



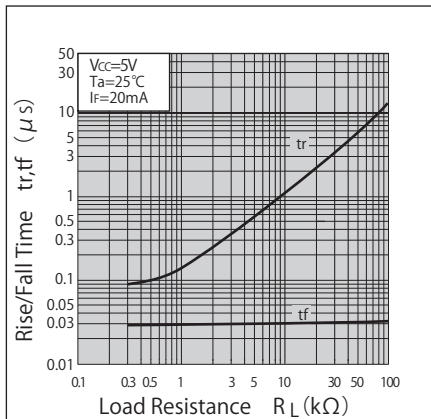
### ローレベル出力電圧ー ローレベル出力電流特性(代表例)



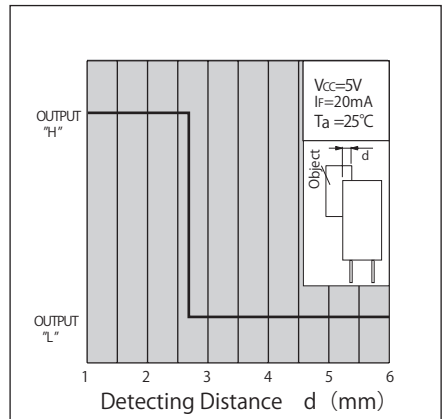
### 順電流ー順電圧曲線(代表例)



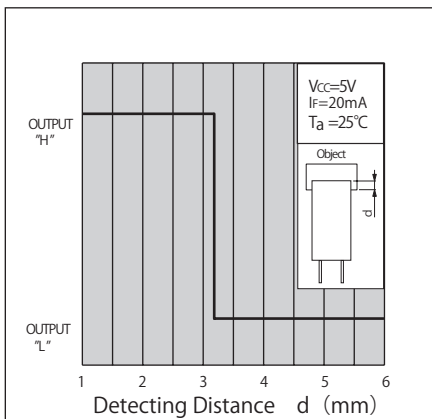
### 上昇、下降時間ー負荷抵抗特性(代表例)



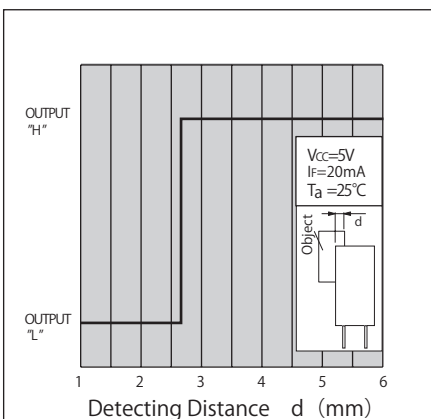
### 検出位置特性1(代表例) KI3520



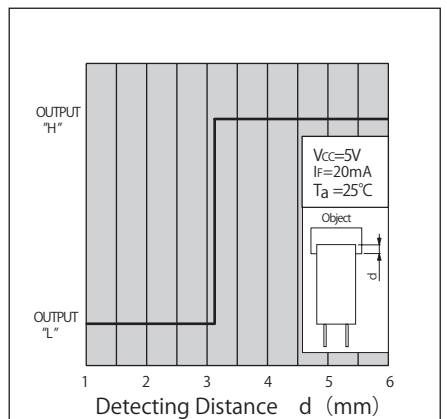
### 検出位置特性2(代表例) KI3520



### 検出位置特性1(代表例) KI3521



### 検出位置特性2(代表例) KI3521



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3524/3534/3544



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

KI3524/3534/3544 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した防塵タイプの小型透過型フォトセンサです。

Model KI3524/3534/3544 consist of an Infrared LED and a High sensitive Photo transistor. Outer package has no aperture on the both light pass surfaces of the emitter and detector.

## 特長 Feature

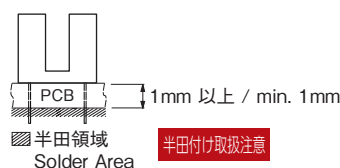
- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ その他シリーズ  
フォト IC 出力タイプ・・・KI3520/3521/3530/3531/3540/3541
- ・ Easy removing paper dust.
- ・ High resolution: slit width 0.5mm.
- ・ Visible Light cut filter.
- ・ The other model;  
Photo IC output type・・・KI3520/3521/3530/3531/3540/3541

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           |                                        | Symbol           | Rating    | Unit |
|--------------------------------|----------------------------------------|------------------|-----------|------|
| 発光側<br>Emitter                 | 順電流 Forward Current                    | IF               | 50        | mA   |
|                                | パルス順電流 Pulse Forward Current ※1        | IFP              | 1         | A    |
|                                | 逆電圧 Reverse Voltage                    | VR               | 5         | V    |
|                                | 許容損失 Power Dissipation                 | P                | 75        | mW   |
| 受光側<br>Detector                | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 30        | V    |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 5         | V    |
|                                | コレクタ電流 Collector Current               | IC               | 20        | mA   |
|                                | コレクタ損失 Collector Power Dissipation     | Pc               | 75        | mW   |
| 動作温度 Operating Temperature     |                                        | T <sub>opr</sub> | -20 ~ +85 | °C   |
| 保存温度 Storage Temperature       |                                        | T <sub>stg</sub> | -30 ~ +85 | °C   |
| 半田付温度 Soldering Temperature ※2 |                                        | T <sub>sol</sub> | 330       | °C   |



- ※1. パルス幅  $tw \leq 100\mu s$  Duty 比=0.01
- ※2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)
- ※1. Pulse width  $tw \leq 100\mu s$  Duty ratio=0.01
- ※2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                   | Symbol               | Condition                                                       | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|----------------------|-----------------------------------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | V <sub>F</sub>       | I <sub>F</sub> =20mA                                            | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | I <sub>R</sub>       | V <sub>R</sub> =3V                                              | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | I <sub>CEO</sub>     | V <sub>CE</sub> =10V, 0 lx                                      | —    | —    | 0.2  | μA   |
|                 | 光電流 Light Current                 | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                       | 0.3  | —    | —    | mA   |
| 伝達特性<br>Coupled | コレクタ・エミッタ間飽和電圧 Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =20mA, I <sub>C</sub> =0.15mA                    | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                | 上昇 Rise Time         | V <sub>CC</sub> =5V, I <sub>C</sub> =0.1mA, R <sub>L</sub> =1kΩ | —    | 50   | —    | μs   |
|                 |                                   | 下降 Fall Time         |                                                                 | —    | 50   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI3524/3534/3544

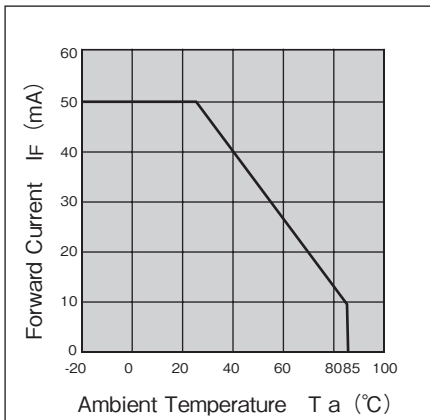
## 定格・特性曲線

Characteristics

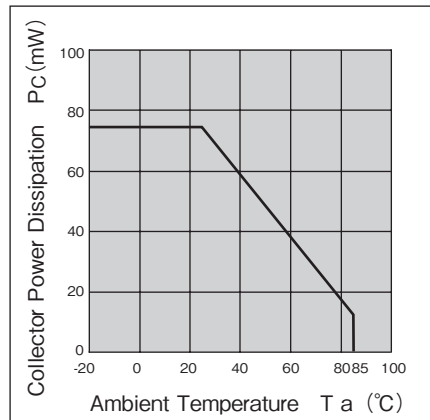
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

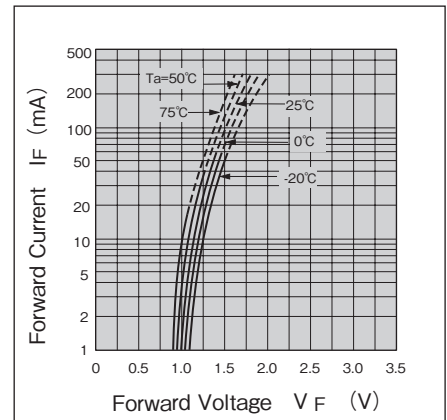
### 順電流低減曲線



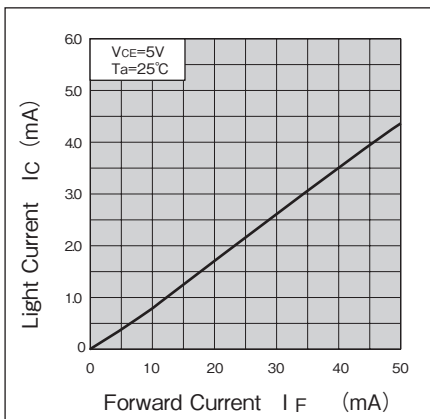
### コレクタ損失低減曲線



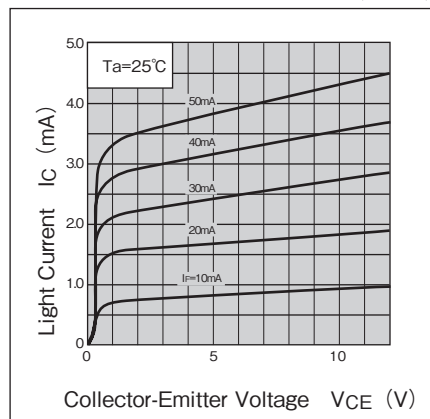
### 順電流－順電圧特性(代表例)



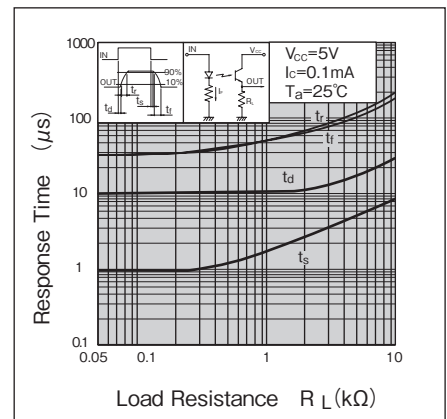
### 光電流－順電流曲線 (代表例)



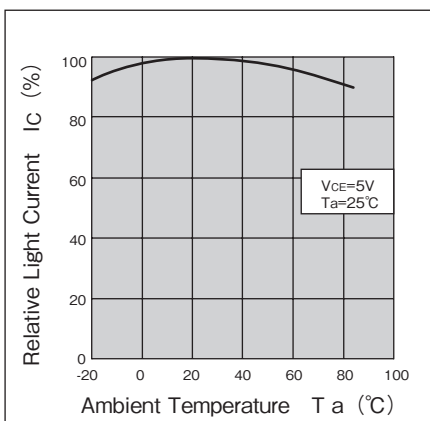
### 光電流－コレクタ・エミッタ間電圧特性 (代表例)



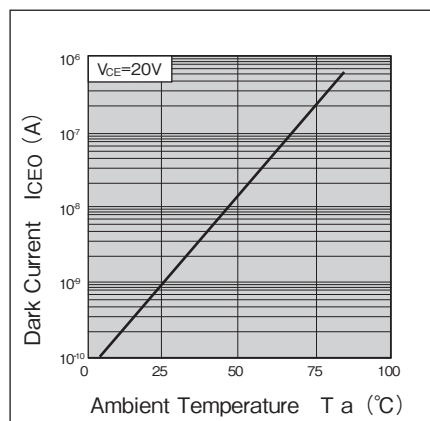
### 応答時間－負荷抵抗特性(代表例)



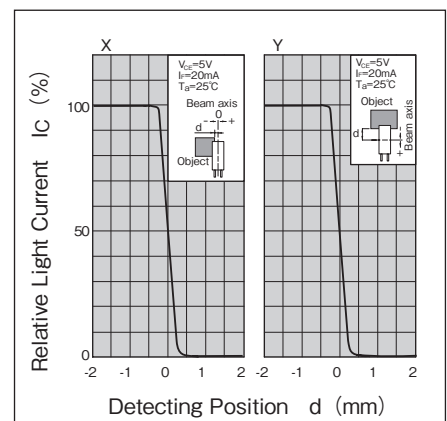
### 光電流－周囲温度特性 (代表例)



### 暗電流－周囲温度特性(代表例)



### 検出位置特性 (代表例)



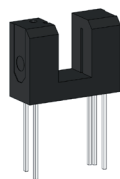
- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3642

業界標準準拠 Industry Standard Compliant



透過型フォトセンサ Photo Interrupter



## 概要 Description

KI3642 は、発光側に赤外発光ダイオード、受光側にフォト IC 出力を採用した小型透過型フォトセンサです。

Model KI3642 consist of an Infrared LED and a High sensitive Photo IC (Digital Output).

## 特長 Feature

- ・ フロー半田付け対応
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ アンプ内蔵、プルアップ抵抗内蔵タイプ
- ・ その他シリーズ  
フォトトランジスタタイプ・・・KI3644

- ・ Suitable for flow soldering.
- ・ High resolution: slit width 0.5mm.
- ・ Built-in amplifier, Pull-up Resistor output type.
- ・ The other model; Phototransistor type・・・KI3644

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

|              | Item                             | Symbol | Rating     | Unit |
|--------------|----------------------------------|--------|------------|------|
| 入力<br>Input  | 順電流 Forward Current ※1           | IF     | 50         | mA   |
|              | せん頭順電流 Peak Forward Current ※1,2 | IFM    | 1          | A    |
|              | 逆電圧 Reverse Voltage              | VR     | 6          | V    |
|              | 許容損失 Power Dissipation           | P      | 75         | mW   |
| 出力<br>Output | 電源電圧 Supply Voltage              | VCC    | -0.5 ~ +17 | V    |
|              | 出力電流 Output Current ※1           | IO     | 50         | mA   |
|              | 許容損失 Power Dissipation ※1        | PO     | 250        | mW   |
| 動作           | 温度 Operating Temperature         | Topr   | -25 ~ +85  | °C   |
| 保存           | 温度 Storage Temperature           | Tstg   | -40 ~ +100 | °C   |
| 半田付          | 温度 Soldering Temperature ※3      | Tsol   | 260        | °C   |

※1. 定格・特性曲線参照

※2. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01※3. フロー半田付けの場合：5 秒以内。  
手半田付けの場合：350°C 以下。3 秒以内。

※4. "IFLH" は出力が "Low" から "High" になる時の順電流

※5. "IFHL" は出力が "High" から "Low" になる時の順電流

※1. Refer to Characteristics graphs.

※2. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01※3. Flow soldering condition less than 5s.  
Hand soldering condition less than 3s at 350°C.

※4. "IFLH" represents forward current when output goes from "Low" to "High".

※5. "IFHL" represents forward current when output goes from "High" to "Low".

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

|                 | Item                                                  | Symbol                                   | Condition               | min. | typ. | max. | Unit    |
|-----------------|-------------------------------------------------------|------------------------------------------|-------------------------|------|------|------|---------|
| 入力<br>Input     | 順電圧 Forward Voltage                                   | VF                                       | IF=8mA                  | —    | 1.14 | 1.4  | V       |
|                 | 逆電流 Reverse Current                                   | IR                                       | VR=3V                   | —    | —    | 10   | $\mu A$ |
| 出力<br>Output    | 動作電源電圧範囲 Operating Supply Voltage                     | VCC                                      | —                       | 4.5  | —    | 17   | V       |
|                 | ローレベル出力電圧 Low-Level Output Voltage                    | VOL                                      | VCC=5V, IOL=16mA, IF=0  | —    | 0.15 | 0.4  | V       |
|                 | ハイレベル出力電圧 High-Level Output Voltage                   | VOH                                      | VCC=5V, IF=8mA,         | 4.9  | —    | —    | V       |
|                 | ローレベル供給電流 Low-Level Supply Current                    | ICCL                                     | VCC=5V, IF=0            | —    | 1.7  | 3.8  | mA      |
|                 | ハイレベル供給電流 High-Level Supply Current                   | ICCH                                     | VCC=5V, IF=8mA          | —    | 0.7  | 2.2  | mA      |
|                 | L→H スレッシュホールド入力電流 Low→High Threshold Input Current ※4 | IFLH                                     | VCC=5V                  | —    | 1.5  | 8    | mA      |
| 伝達特性<br>Coupled | ヒステリシス Hysteresis ※5                                  | IFHL/IFLH                                | VCC=5V                  | 0.55 | 0.75 | 0.95 | —       |
|                 | 応答時間<br>Response Time ※1                              | L→H 伝搬時間 Low→High Propagation delay time | VCC=5V, IF=8mA, RL=280Ω | —    | 3    | 9    | $\mu s$ |
|                 |                                                       | H→L 伝搬時間 High→Low Propagation delay time |                         | —    | 5    | 15   |         |
|                 |                                                       | 上昇 Rise Time                             |                         | —    | 0.1  | 0.5  |         |
|                 |                                                       | 下降 Fall Time                             |                         | —    | 0.05 | 0.5  |         |
|                 |                                                       |                                          |                         |      |      |      |         |

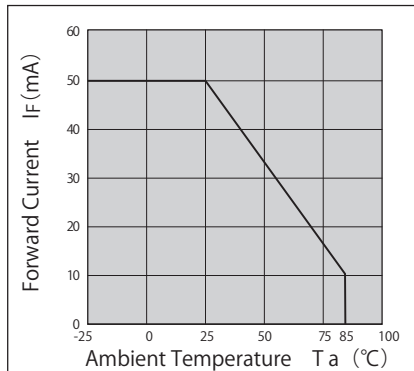
\*\*: Ta=25°C unless otherwise noted

# KI3642

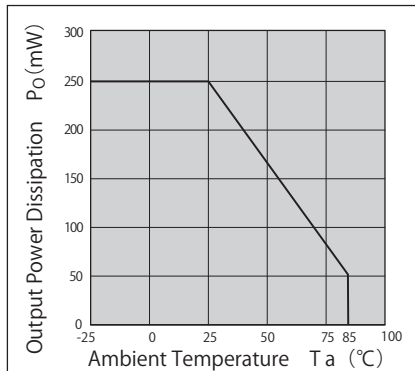
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

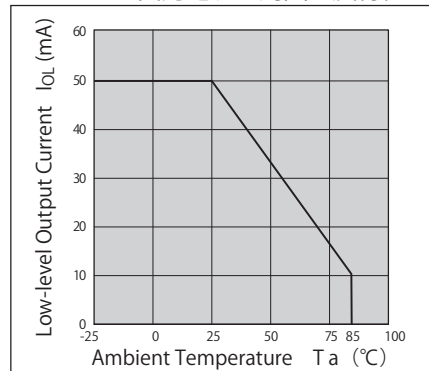
順電流低減曲線



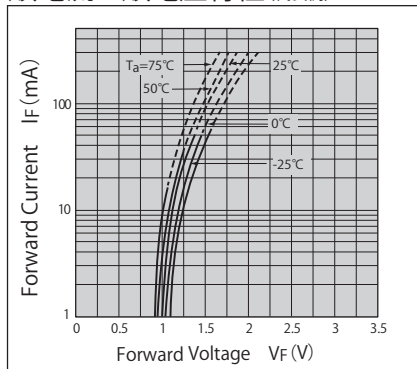
出力許容損失低減曲線



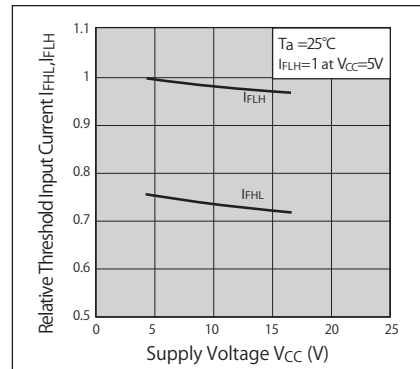
ローレベル出力電流一周囲温度特性



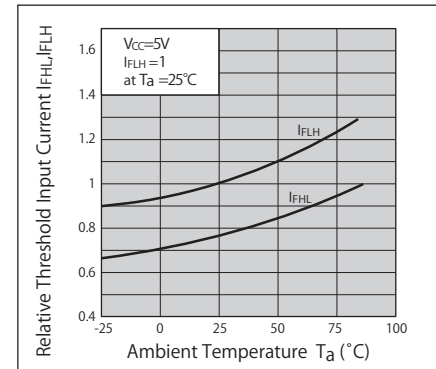
順電流一順電圧特性 (代表例)



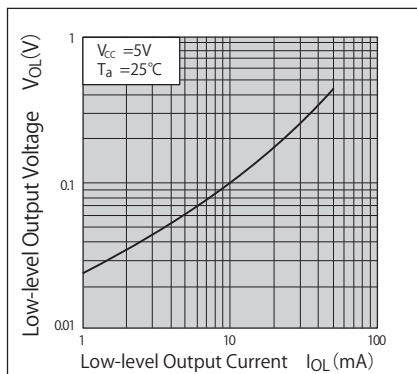
相対スレッショールド入力電流一電源電圧特性 (代表例)



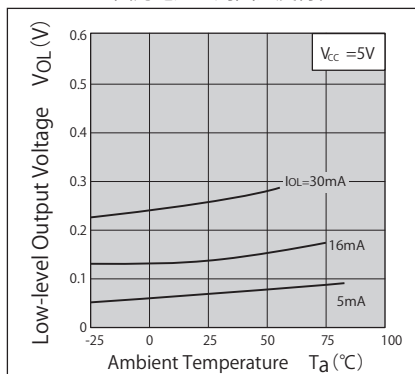
相対スレッショールド入力電流一周囲温度特性 (代表例)



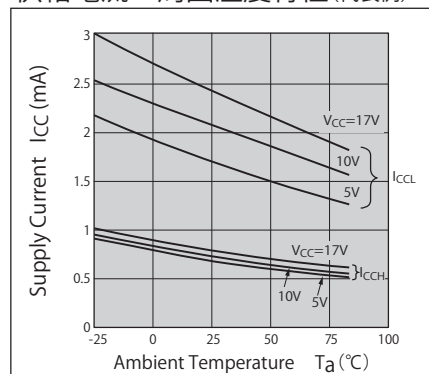
ローレベル出力電圧一ローレベル出力電流特性 (代表例)



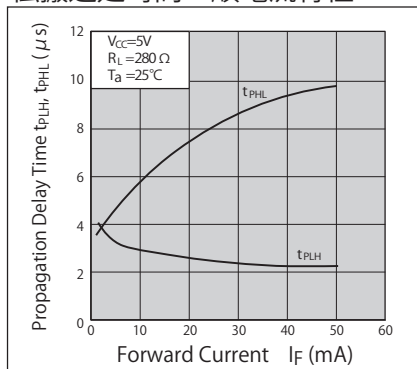
ローレベル出力電圧一周囲温度特性 (代表例)



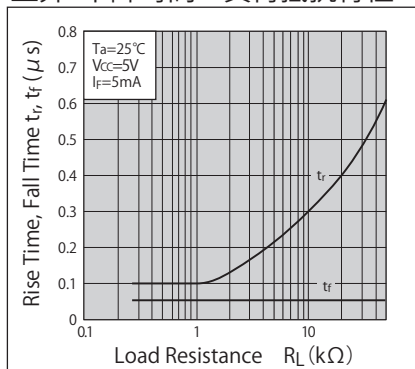
供給電流一周囲温度特性 (代表例)



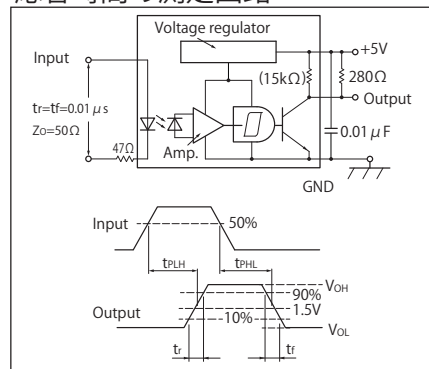
伝搬遅延時間一順電流特性



上昇・下降時間一負荷抵抗特性



応答時間の測定回路



- ・ カスタマイズも承ります。お気軽にお問合せください
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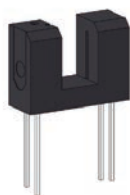
KI3644

業界標準準拠 Industry Standard Compliant



透過型フォトセンサ

Photo Interrupter



## 概要 Description

KI3644 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した小型透過型フォトセンサです。

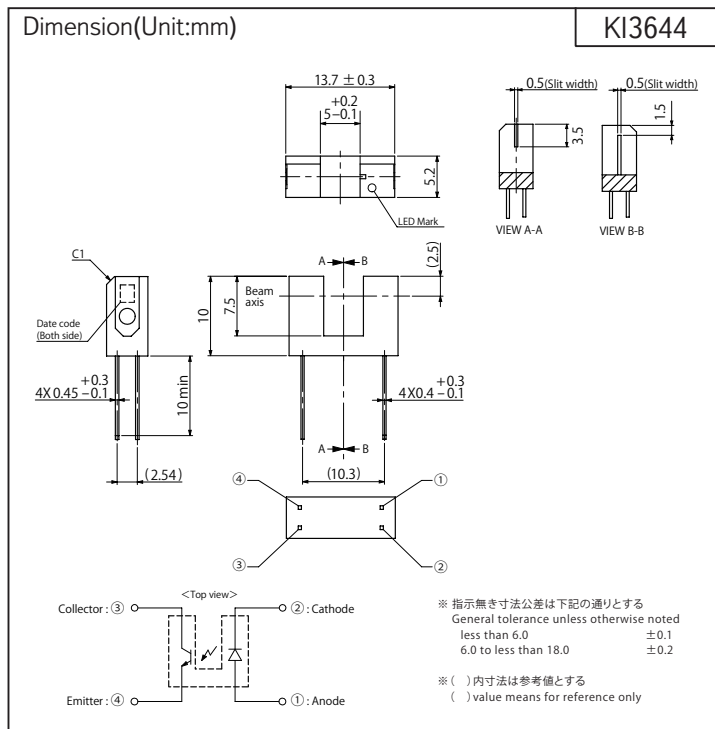
Model KI3644 consist of an Infrared LED and a High sensitive Photo transistor.

## 特長 Feature

- ・ フロー半田付け対応
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ その他シリーズ  
フォト IC 出力タイプ・・・KI3642
- ・ Suitable for flow soldering.
- ・ High resolution: slit width 0.5mm.
- ・ The other model; Photo IC output type・・・KI3642

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                            | Symbol                                 | Rating     | Unit  |
|---------------------------------|----------------------------------------|------------|-------|
| 入力<br>Input                     | 順電流 Forward Current ※ 1                | IF         | 50 mA |
|                                 | せん頭順電流 Peak Forward Current ※ 1,2      | IFM        | 1 A   |
|                                 | 逆電圧 Reverse Voltage                    | VR         | 6 V   |
|                                 | 許容損失 Power Dissipation                 | P          | 75 mW |
| 出力<br>Output                    | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO       | 35 V  |
|                                 | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO       | 6 V   |
|                                 | コレクタ電流 Collector Current               | IC         | 20 mA |
|                                 | コレクタ損失 Collector Power Dissipation ※ 1 | Pc         | 75 mW |
| 動作温度 Operating Temperature      | T <sub>opr</sub>                       | -25 ~ +85  | °C    |
| 保存温度 Storage Temperature        | T <sub>stg</sub>                       | -40 ~ +100 | °C    |
| 半田付温度 Soldering Temperature ※ 3 | T <sub>sol</sub>                       | 260        | °C    |

- ※ 1. 定格・特性曲線参照  
 ※ 2. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
 ※ 3. フロー半田付けの場合：5 秒以内。  
 手半田付けの場合：350°C 以下。3 秒以内。

- ※ 1. Refer to Characteristics graphs.  
 ※ 2. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01  
 ※ 3. Flow soldering condition less than 5s.  
 Hand soldering condition less than 3s at 350°C .

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*]

| Item            | Symbol                                              | Condition       | min.                            | typ. | max. | Unit       |
|-----------------|-----------------------------------------------------|-----------------|---------------------------------|------|------|------------|
| 入力<br>Input     | 順電圧 Forward Voltage                                 | VF              | IF=20mA                         | —    | 1.25 | 1.4 V      |
|                 | せん頭順電圧 Peak Forward Voltage                         | VFM             | IFM=0.5A                        | —    | 3    | 4 V        |
|                 | 逆電流 Reverse Current                                 | IR              | VR=3V                           | —    | —    | 10 $\mu A$ |
| 出力<br>Output    | 暗電流 Dark Current                                    | ICEO            | VCE=20V                         | —    | 1    | 100 nA     |
| 伝達特性<br>Coupled | 光電流 Light Current                                   | IC              | VCE=5V, IF=20mA                 | 0.5  | —    | 15 mA      |
|                 | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat)        | IF=40mA, IC=0.2mA               | —    | —    | 0.4 V      |
|                 | 応答時間<br>Response Time                               | 上昇<br>Rise Time | VCE=2V, IC=2mA, RL=100 $\Omega$ | —    | 3    | $\mu s$    |
|                 |                                                     | 下降<br>Fall Time |                                 | —    | 4    |            |

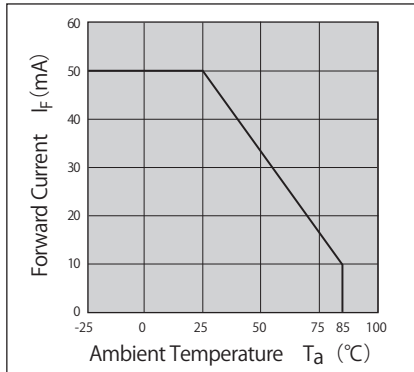
\*\* : Ta=25°C unless otherwise noted

# KI3644

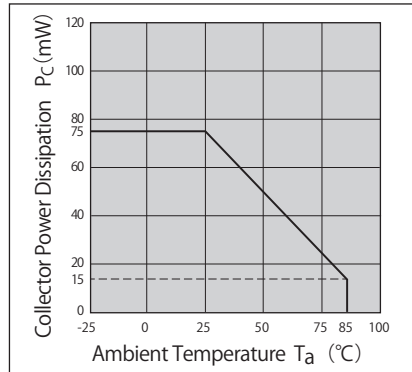
定格・特性曲線  
Characteristics

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Note: Operation never exceeds each value of Maximum Ratings.

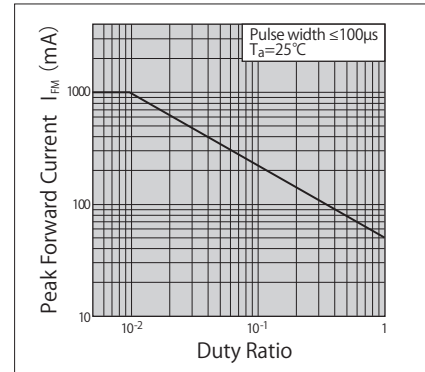
順電流低減曲線



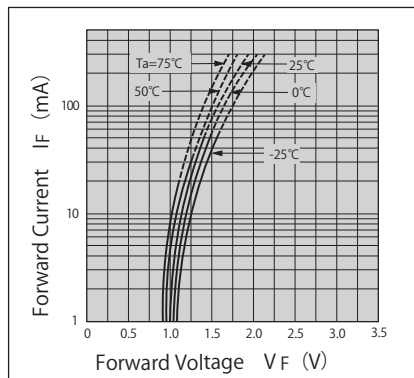
コレクタ損失低減曲線



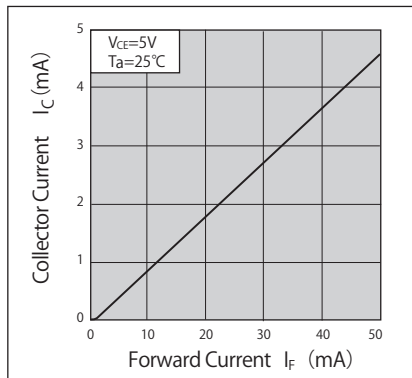
せん頭順電流一デューティ比



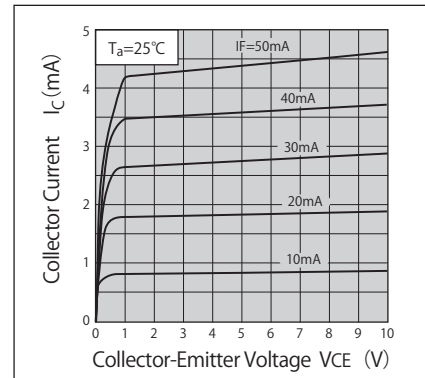
順電流一順電圧特性 (代表例)



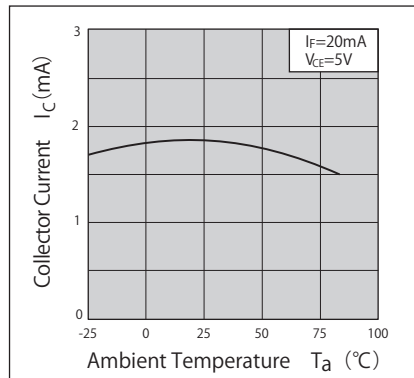
光電流一順電流特性 (代表例)



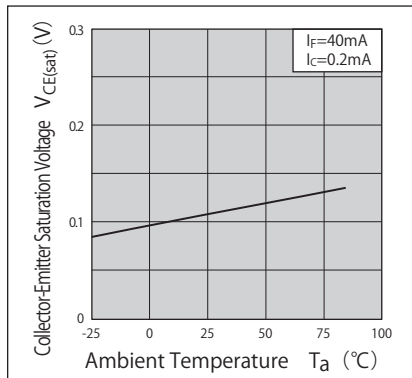
光電流一コレクタ・エミッタ間電圧特性 (代表例)



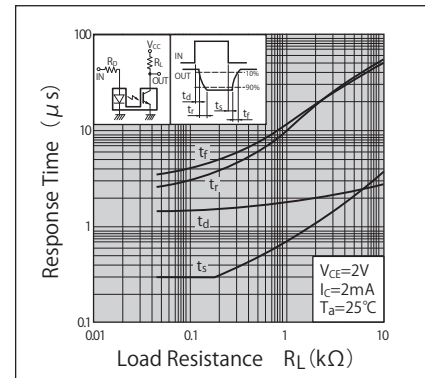
光電流一周囲温度特性 (代表例)



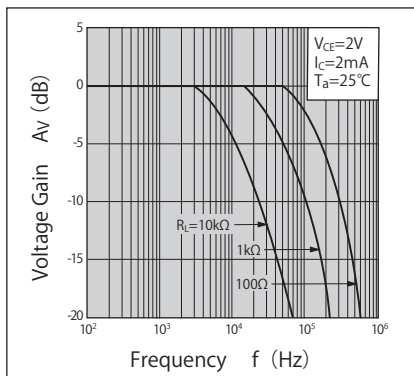
コレクタ・エミッタ間飽和電圧一周囲温度特性 (代表例)



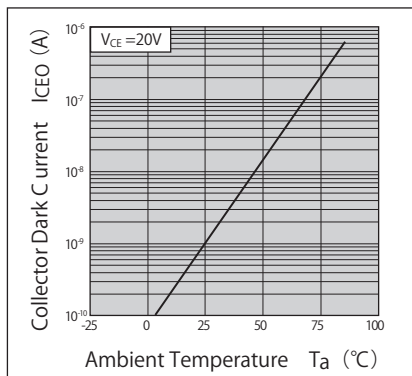
応答時間一負荷抵抗特性 (代表例)



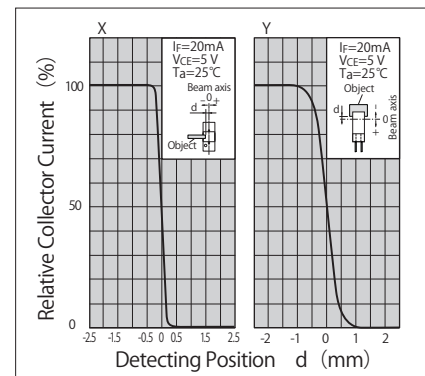
周波数特性 (代表例)



暗電流一周囲温度特性 (代表例)



検出位置特性 (代表例)



・ カスタマイズも承ります。お気軽にお問合せください  
・ A Customized design available on request.

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KI3652

業界標準準拠 Industry Standard Compliant



透過型フォトセンサ

Photo Interrupter



## 概要 Description

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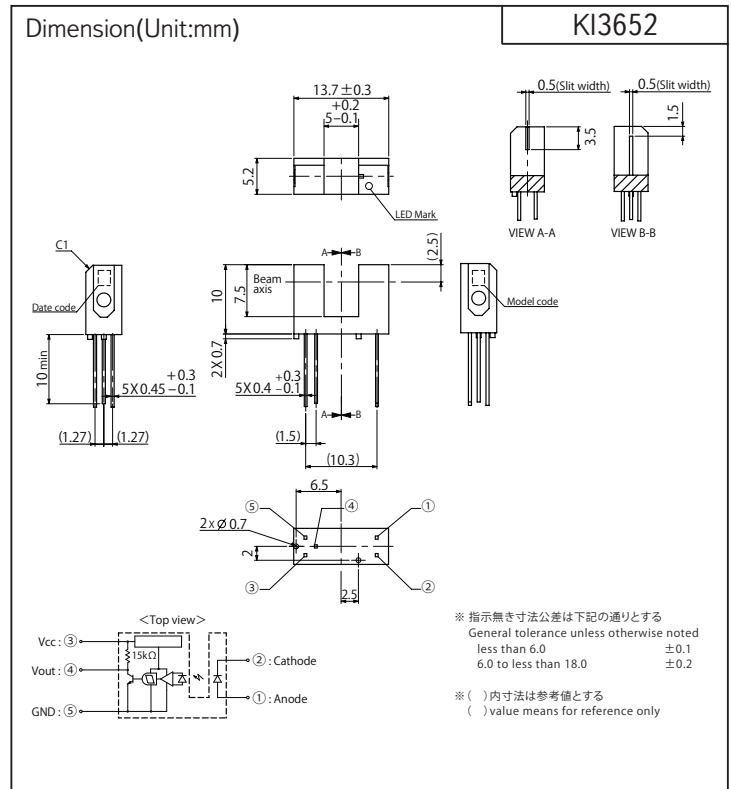
Model KI3652 consist of an Infrared LED and a High sensitive Photo IC (Digital Output).

## 特長 Feature

- ・ フロー半田付け対応
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ アンプ内蔵、プルアップ抵抗内蔵タイプ
- ・ その他シリーズ  
フォトトランジスタタイプ・・・KI3654
- ・ Suitable for flow soldering.
- ・ High resolution: slit width 0.5mm.
- ・ Built-in amplifier, Pull-up Resistor output type.
- ・ The other model; Phototransistor type・・・KI3654

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
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- ・ Coin-passing for Auto vending machine and Amusement.
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## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           |                                  | Symbol | Rating     | Unit |
|--------------------------------|----------------------------------|--------|------------|------|
| 入力<br>Input                    | 順電流 Forward Current ※1           | IF     | 50         | mA   |
|                                | せん頭順電流 Peak Forward Current ※1,2 | IFM    | 1          | A    |
|                                | 逆電圧 Reverse Voltage              | VR     | 6          | V    |
|                                | 許容損失 Power Dissipation           | P      | 75         | mW   |
| 出力<br>Output                   | 電源電圧 Supply Voltage              | VCC    | -0.5 ~ +17 | V    |
|                                | 出力電流 Output Current ※1           | IO     | 50         | mA   |
|                                | 許容損失 Power Dissipation ※1        | PO     | 250        | mW   |
| 動作温度 Operating Temperature     |                                  | Topr   | -25 ~ +85  | °C   |
| 保存温度 Storage Temperature       |                                  | Tstg   | -40 ~ +100 | °C   |
| 半田付温度 Soldering Temperature ※3 |                                  | Tsol   | 260        | °C   |

※1. 定格・特性曲線参照

※2. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01※3. フロー半田付けの場合：5 秒以内。  
手半田付けの場合：350°C 以下。3 秒以内。

※4. "IFLH" は出力が "Low" から "High" になる時の順電流

※5. "IFHL" は出力が "High" から "Low" になる時の順電流

※1. Refer to Characteristics graphs.

※2. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01※3. Flow soldering condition less than 5s.  
Hand soldering condition less than 3s at 350°C.

※4. "IFLH" represents forward current when output goes from "Low" to "High".

※5. "IFHL" represents forward current when output goes from "High" to "Low".

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                                       | Symbol                                   | Condition               | min. | typ. | max. | Unit |
|-----------------|-------------------------------------------------------|------------------------------------------|-------------------------|------|------|------|------|
| 入力<br>Input     | 順電圧 Forward Voltage                                   | VF                                       | IF=8mA                  | —    | 1.14 | 1.4  | V    |
|                 | 逆電流 Reverse Current                                   | IR                                       | VR=3V                   | —    | —    | 10   | μA   |
| 出力<br>Output    | 動作電源電圧範囲 Operating Supply Voltage                     | VCC                                      | —                       | 4.5  | —    | 17   | V    |
|                 | ローレベル出力電圧 Low-Level Output Voltage                    | VOL                                      | VCC=5V, IOL=16mA, IF=0  | —    | 0.15 | 0.4  | V    |
|                 | ハイレベル出力電圧 High-Level Output Voltage                   | VOH                                      | VCC=5V, IF=8mA,         | 4.9  | —    | —    | V    |
|                 | ローレベル供給電流 Low-Level Supply Current                    | ICCL                                     | VCC=5V, IF=0            | —    | 1.7  | 3.8  | mA   |
|                 | ハイレベル供給電流 High-Level Supply Current                   | ICCH                                     | VCC=5V, IF=8mA          | —    | 0.7  | 2.2  | mA   |
|                 | L→H スレッシュホールド入力電流 Low→High Threshold Input Current ※4 | IFLH                                     | VCC=5V                  | —    | 1    | 8    | mA   |
| 伝達特性<br>Coupled | ヒステリシス Hysteresis ※5                                  | IFHL/IFLH                                | VCC=5V                  | 0.55 | 0.75 | 0.95 | —    |
|                 | 応答時間<br>Response Time ※1                              | L→H 伝搬時間 Low→High Propagation delay time | VCC=5V, IF=8mA, RL=280Ω | —    | 3    | 9    | μs   |
|                 |                                                       | H→L 伝搬時間 High→Low Propagation delay time |                         | —    | 5    | 15   |      |
|                 |                                                       | 上昇 Rise Time                             |                         | —    | 0.1  | 0.5  |      |
|                 |                                                       | 下降 Fall Time                             |                         | —    | 0.05 | 0.5  |      |
|                 |                                                       |                                          |                         |      |      |      |      |

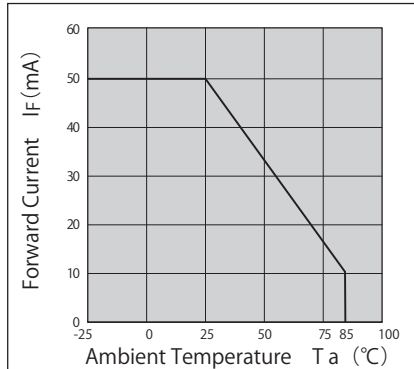
\*\*: Ta=25°C unless otherwise noted

# KI3652

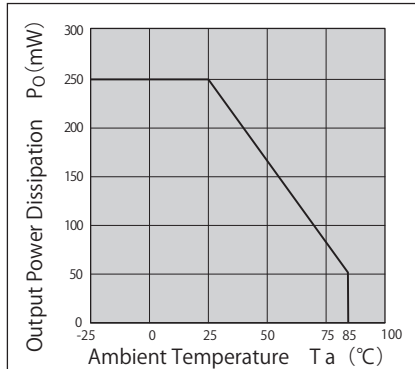
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

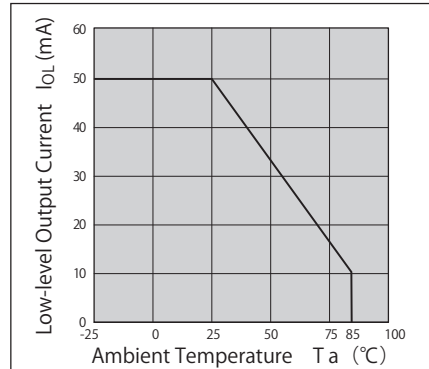
順電流低減曲線



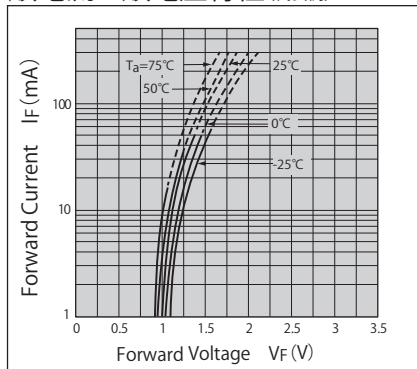
出力許容損失低減曲線



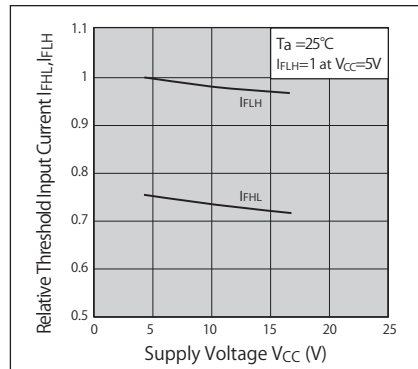
ローレベル出力電流一周囲温度特性



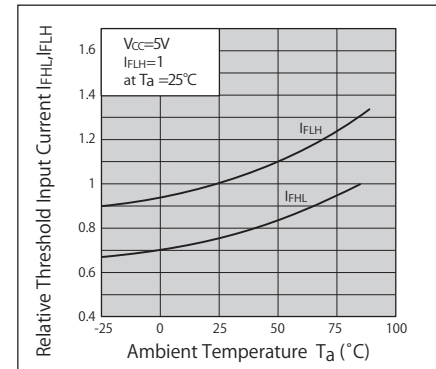
順電流一順電圧特性 (代表例)



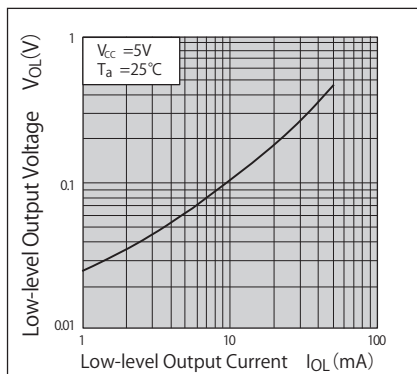
相対スレッショールド入力電流一電源電圧特性 (代表例)



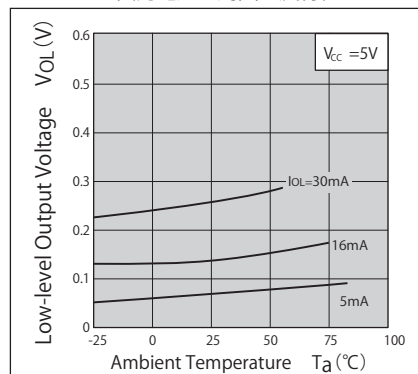
相対スレッショールド入力電流一周囲温度特性 (代表例)



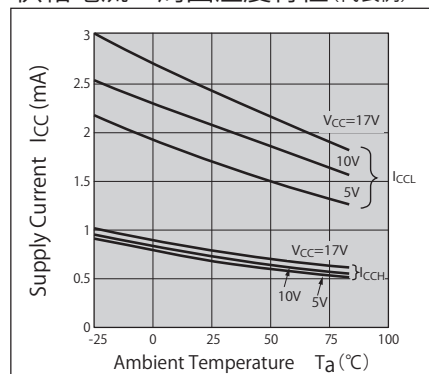
ローレベル出力電圧一ローレベル出力電流特性 (代表例)



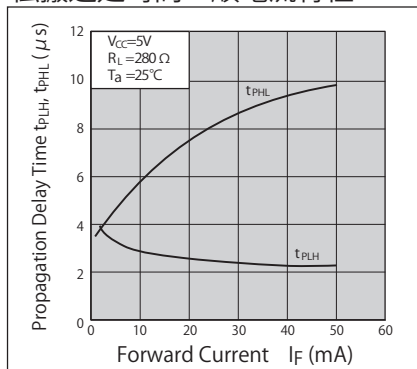
ローレベル出力電圧一周囲温度特性 (代表例)



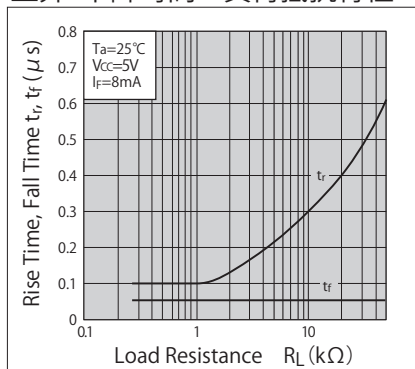
供給電流一周囲温度特性 (代表例)



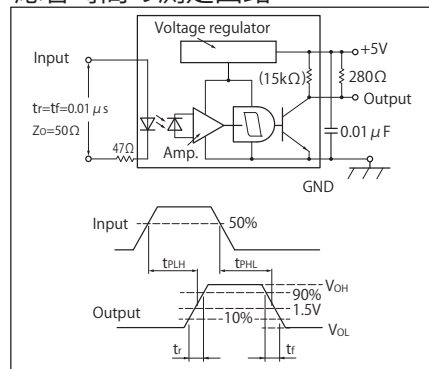
伝搬遅延時間一順電流特性



上昇・下降時間一負荷抵抗特性



応答時間の測定回路



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

KI3654

業界標準準拠 Industry Standard Compliant



透過型フォトセンサ

Photo Interrupter



## 概要 Description

KI3654 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した小型透過型フォトセンサです。

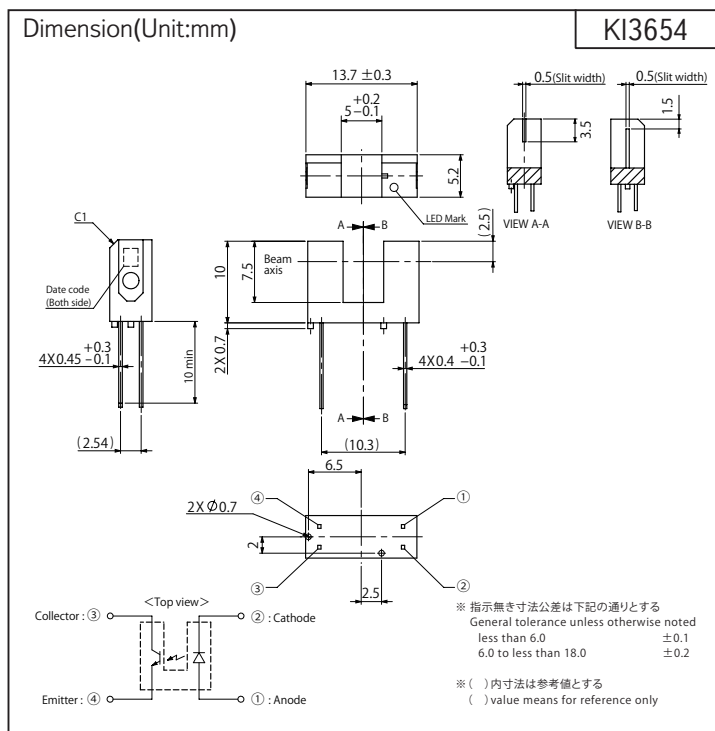
Model KI3654 consist of an Infrared LED and a High sensitive Photo transistor.

## 特長 Feature

- ・ フロー半田付け対応
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ その他シリーズ  
フォト IC 出力タイプ・・・KI3652
- ・ Suitable for flow soldering.
- ・ High resolution: slit width 0.5mm.
- ・ The other model; Photo IC output type・・・KI3652

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                            |                                        | Symbol           | Rating     | Unit |
|---------------------------------|----------------------------------------|------------------|------------|------|
| 入力<br>Input                     | 順電流 Forward Current ※ 1                | IF               | 50         | mA   |
|                                 | せん頭順電流 Peak Forward Current ※ 1,2      | IFM              | 1          | A    |
|                                 | 逆電圧 Reverse Voltage                    | VR               | 6          | V    |
|                                 | 許容損失 Power Dissipation                 | P                | 75         | mW   |
| 出力<br>Output                    | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 35         | V    |
|                                 | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 6          | V    |
|                                 | コレクタ電流 Collector Current               | IC               | 20         | mA   |
|                                 | コレクタ損失 Collector Power Dissipation ※ 1 | Pc               | 75         | mW   |
| 動作温度 Operating Temperature      |                                        | T <sub>opr</sub> | -25 ~ +85  | °C   |
| 保存温度 Storage Temperature        |                                        | T <sub>stg</sub> | -40 ~ +100 | °C   |
| 半田付温度 Soldering Temperature ※ 3 |                                        | T <sub>sol</sub> | 260        | °C   |

- ※ 1. 定格・特性曲線参照  
※ 2. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
※ 3. フロー半田付けの場合：5 秒以内。  
手半田付けの場合：350°C 以下。3 秒以内。

- ※ 1. Refer to Characteristics graphs.  
※ 2. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01  
※ 3. Flow soldering condition less than 5s.  
Hand soldering condition less than 3s at 350°C .

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*]

| Item            |                                                     | Symbol               | Condition                                                      | min. | typ. | max. | Unit |
|-----------------|-----------------------------------------------------|----------------------|----------------------------------------------------------------|------|------|------|------|
| 入力<br>Input     | 順電圧 Forward Voltage                                 | V <sub>F</sub>       | I <sub>F</sub> =20mA                                           | —    | 1.25 | 1.4  | V    |
|                 | せん頭順電圧 Peak Forward Voltage                         | V <sub>FM</sub>      | I <sub>FM</sub> =0.5A                                          | —    | 3    | 4    | V    |
|                 | 逆電流 Reverse Current                                 | I <sub>R</sub>       | V <sub>R</sub> =3V                                             | —    | —    | 10   | μA   |
| 出力<br>Output    | 暗電流 Dark Current                                    | I <sub>CEO</sub>     | V <sub>CE</sub> =20V                                           | —    | 1    | 100  | nA   |
| 伝達特性<br>Coupled | 光電流 Light Current                                   | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                      | 0.5  | —    | 15   | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =40mA, I <sub>C</sub> =0.2mA                    | —    | —    | 0.4  | V    |
|                 | 応答時間<br>Response Time                               | 上昇<br>Rise Time      | V <sub>CE</sub> =2V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω | —    | 3    | 15   | μs   |
|                 |                                                     | 下降<br>Fall Time      |                                                                | —    | 4    | 20   |      |

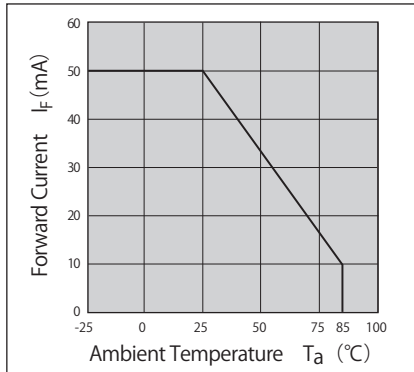
\*\* : Ta=25°C unless otherwise noted

# KI3654

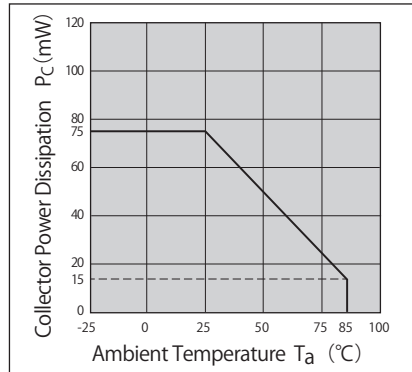
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

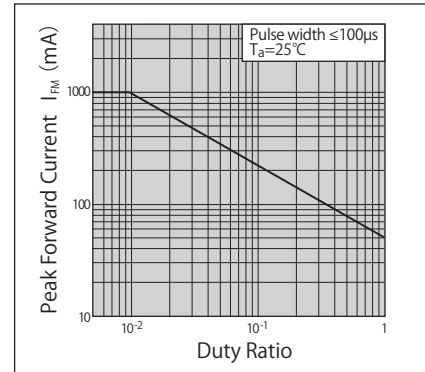
順電流低減曲線



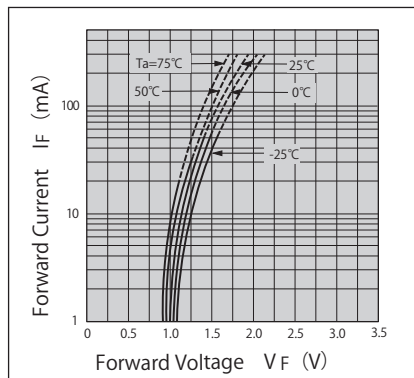
コレクタ損失低減曲線



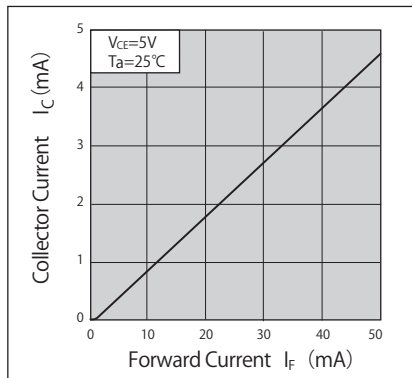
せん頭順電流一デューティ比



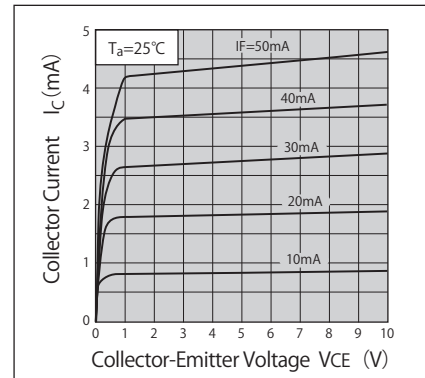
順電流一順電圧特性 (代表例)



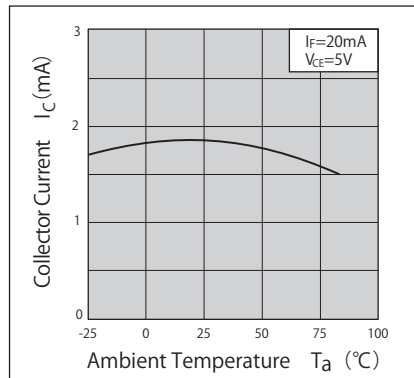
光電流一順電流特性 (代表例)



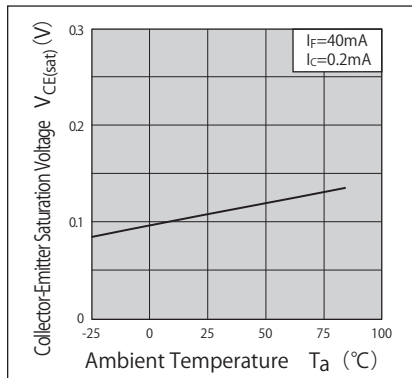
光電流一コレクタ・エミッタ間電圧特性 (代表例)



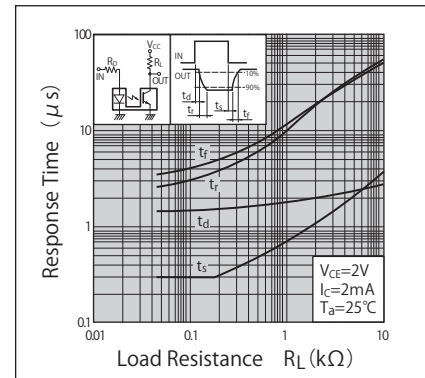
光電流一周囲温度特性 (代表例)



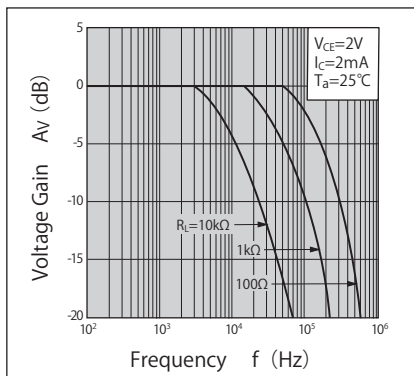
コレクタ・エミッタ間飽和電圧一周囲温度特性 (代表例)



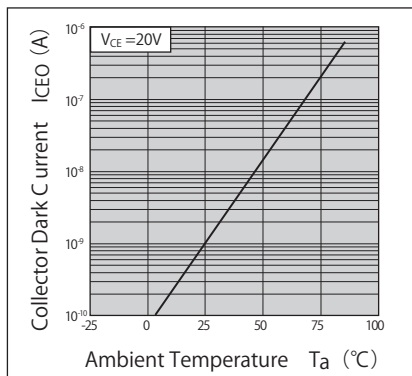
応答時間一負荷抵抗特性 (代表例)



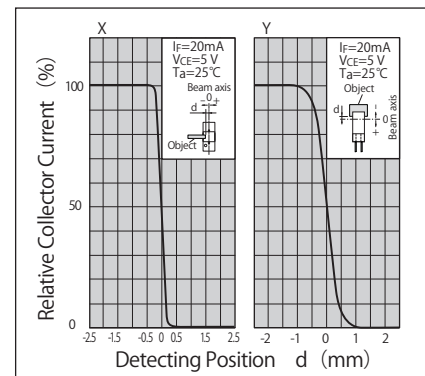
周波数特性 (代表例)



暗電流一周囲温度特性 (代表例)



検出位置特性 (代表例)



・カスタマイズも承ります。お気軽にお問合せください  
・A Customized design available on request.

・この仕様は改良のため予告なく変更する場合があります  
・Specifications are subject to change without notice.

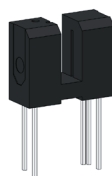
## KI3662

業界標準準拠 Industry Standard Compliant



透過型フォトセンサ

Photo Interrupter



## 概要 Description

KI3662 は、発光側に赤外発光ダイオード、受光側にフォト IC 出力を採用した小型透過型フォトセンサです。

Model KI3662 consist of an Infrared LED and a High sensitive Photo IC (Digital Output).

## 特長 Feature

- ・ フロー半田付け対応
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ アンプ内蔵、プルアップ抵抗内蔵タイプ
- ・ その他シリーズ
  - 入光時ローレベル出力タイプ・・・KI3663
  - フォトトランジスタタイプ・・・KI3664
- ・ Suitable for flow soldering.
- ・ High resolution: slit width 0.5mm.
- ・ Built-in amplifier, Pull-up Resistor output type.
- ・ The other model; Low - Level output at beam detecting type・・・KI3663
- Phototransistor type・・・KI3664

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

|              | Item                             | Symbol | Rating     | Unit |
|--------------|----------------------------------|--------|------------|------|
| 入力<br>Input  | 順電流 Forward Current ※1           | IF     | 50         | mA   |
|              | せん頭順電流 Peak Forward Current ※1,2 | IFM    | 1          | A    |
|              | 逆電圧 Reverse Voltage              | VR     | 6          | V    |
|              | 許容損失 Power Dissipation           | P      | 75         | mW   |
| 出力<br>Output | 電源電圧 Supply Voltage              | VCC    | -0.5 ~ +17 | V    |
|              | 出力電流 Output Current ※1           | IO     | 50         | mA   |
|              | 許容損失 Power Dissipation ※1        | PO     | 250        | mW   |
| 動作           | 温度 Operating Temperature         | Topr   | -25 ~ +85  | °C   |
| 保存           | 温度 Storage Temperature           | Tstg   | -40 ~ +100 | °C   |
| 半田付          | 温度 Soldering Temperature ※3      | Tsol   | 260        | °C   |

- ※1. 定格・特性曲線参照  
 ※2. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
 ※3. フロー半田付けの場合：5 秒以内。  
 手半田付けの場合：350°C 以下。3 秒以内。  
 ※4. "IFLH" は出力が "Low" から "High" になる時の順電流  
 ※5. "IFHL" は出力が "High" から "Low" になる時の順電流

- ※1. Refer to Characteristics graphs.  
 ※2. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01  
 ※3. Flow soldering condition less than 5s.  
 Hand soldering condition less than 3s at 350°C .  
 ※4. "IFLH" represents forward current when output goes from "Low" to "High".  
 ※5. "IFHL" represents forward current when output goes from "High" to "Low".

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

|                 | Item                                                  | Symbol                                   | Condition               | min. | typ. | max. | Unit    |
|-----------------|-------------------------------------------------------|------------------------------------------|-------------------------|------|------|------|---------|
| 入力<br>Input     | 順電圧 Forward Voltage                                   | VF                                       | IF=5mA                  | —    | 1.1  | 1.4  | V       |
|                 | 逆電流 Reverse Current                                   | IR                                       | VR=3V                   | —    | —    | 10   | $\mu A$ |
| 出力<br>Output    | 動作電源電圧範囲 Operating Supply Voltage                     | VCC                                      | —                       | 4.5  | —    | 17   | V       |
|                 | ローレベル出力電圧 Low-Level Output Voltage                    | VOL                                      | VCC=5V, IOL=16mA, IF=0  | —    | 0.15 | 0.4  | V       |
|                 | ハイレベル出力電圧 High-Level Output Voltage                   | VOH                                      | VCC=5V, IF=5mA,         | 4.9  | —    | —    | V       |
|                 | ローレベル供給電流 Low-Level Supply Current                    | ICCL                                     | VCC=5V, IF=0            | —    | 1.7  | 3.8  | mA      |
|                 | ハイレベル供給電流 High-Level Supply Current                   | ICCH                                     | VCC=5V, IF=5mA          | —    | 0.7  | 2.2  | mA      |
|                 | L→H スレッシュホールド入力電流 Low→High Threshold Input Current ※4 | IFLH                                     | VCC=5V                  | —    | 1    | 5    | mA      |
| 伝達特性<br>Coupled | ヒステリシス Hysteresis ※5                                  | IFHL/IFLH                                | VCC=5V                  | 0.55 | 0.75 | 0.95 | —       |
|                 | 応答時間<br>Response Time ※1                              | L→H 伝搬時間 Low→High Propagation delay time | VCC=5V, IF=5mA, RL=280Ω | —    | 3    | 9    | $\mu s$ |
|                 |                                                       | H→L 伝搬時間 High→Low Propagation delay time |                         | —    | 5    | 15   |         |
|                 |                                                       | 上昇 Rise Time                             |                         | —    | 0.1  | 0.5  |         |
|                 |                                                       | 下降 Fall Time                             |                         | —    | 0.05 | 0.5  |         |
|                 |                                                       |                                          |                         |      |      |      |         |

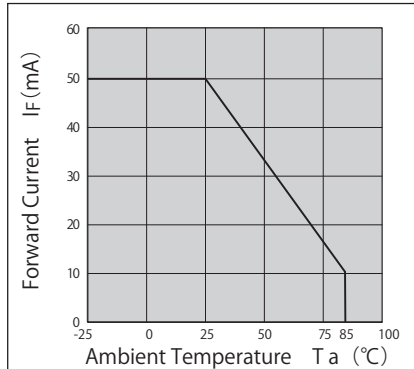
\*\* : Ta=25°C unless otherwise noted

# KI3662

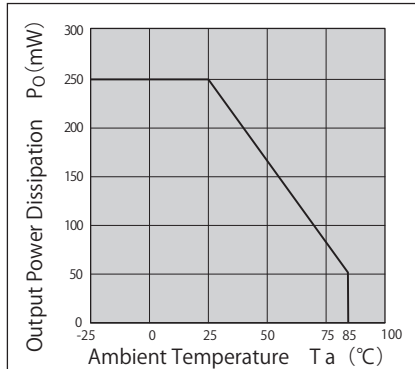
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

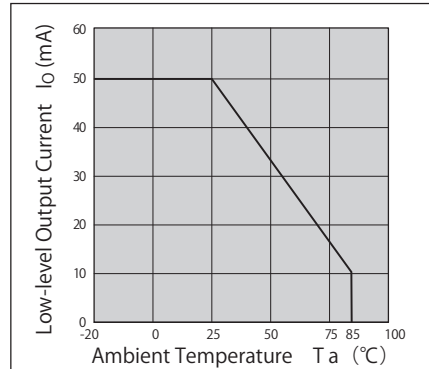
順電流低減曲線



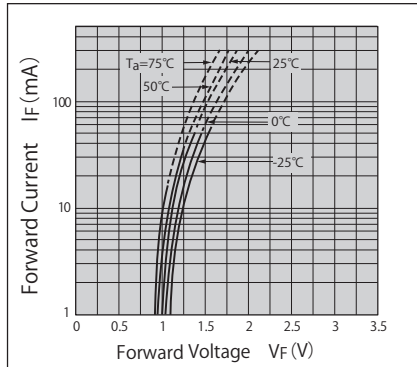
出力許容損失低減曲線



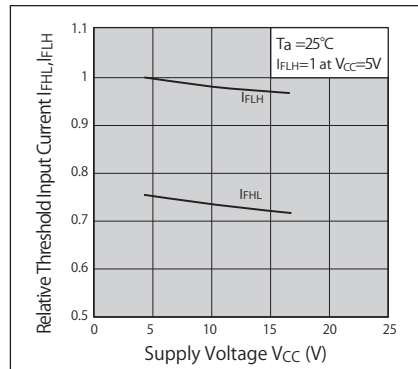
ローレベル出力電流一周囲温度特性



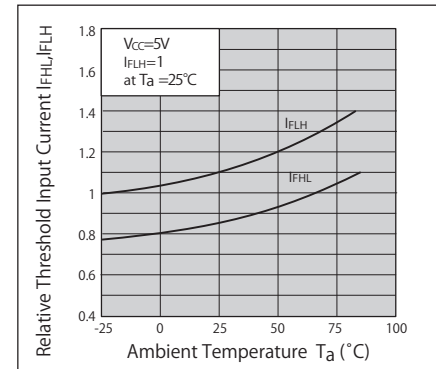
順電流一順電圧特性 (代表例)



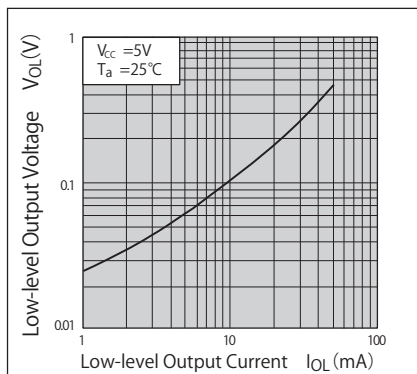
相対スレッショールド入力電流一電源電圧特性 (代表例)



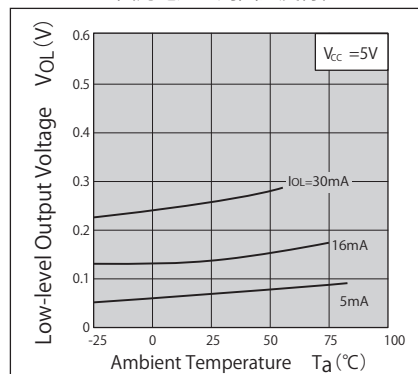
相対スレッショールド入力電流一周囲温度特性 (代表例)



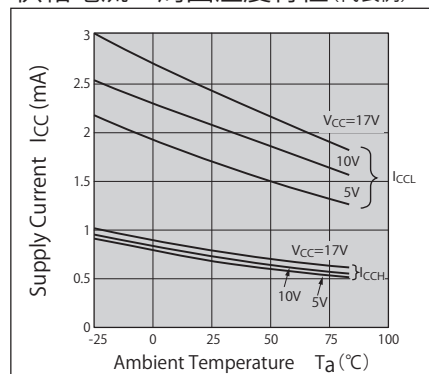
ローレベル出力電圧一ローレベル出力電流特性 (代表例)



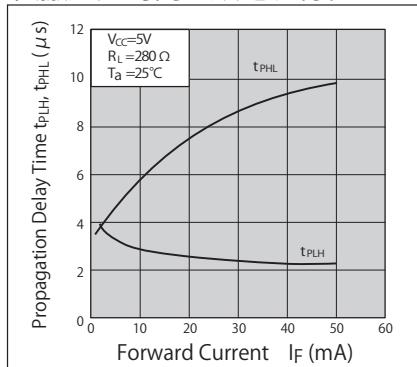
ローレベル出力電圧一周囲温度特性 (代表例)



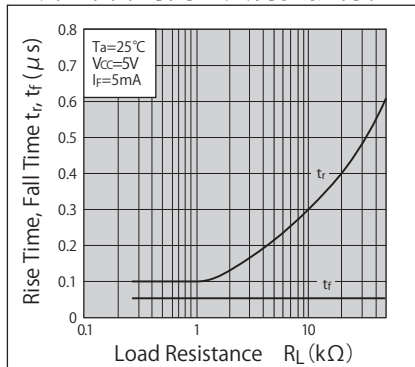
供給電流一周囲温度特性 (代表例)



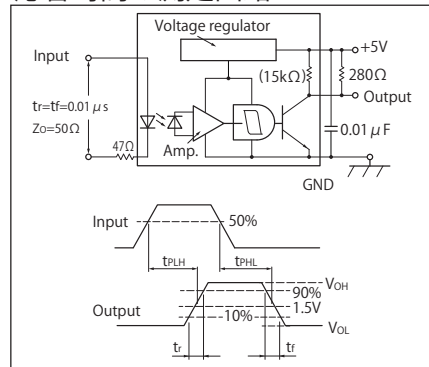
伝搬遅延時間一順電流特性



上昇・下降時間一負荷抵抗特性



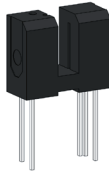
応答時間の測定回路



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## 透過型フォトセンサ

## Photo Interrupter



## 概要 Description

KI3663 は、発光側に赤外発光ダイオード、受光側にフォト IC 出力を採用した小型透過型フォトセンサです。

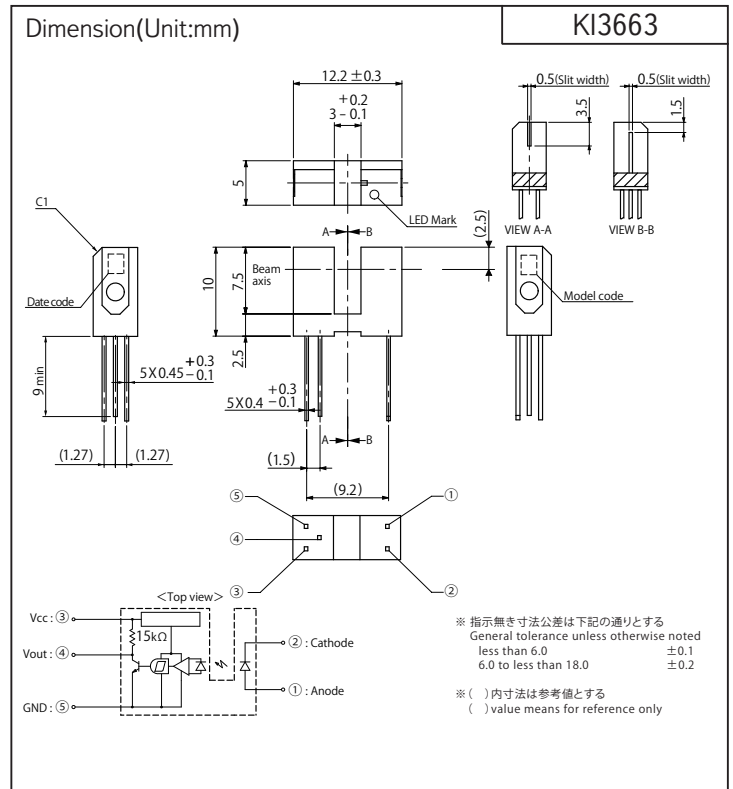
Model KI3663 consist of an Infrared LED and a High sensitive Photo IC (Digital Output).

## 特長 Feature

- ・ フロー半田付け対応
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ アンプ内蔵、プルアップ抵抗内蔵タイプ
- ・ その他シリーズ
  - 入光時ハイレベル出力タイプ・・・KI3662
  - フォトトランジスタタイプ・・・KI3664
- ・ Suitable for flow soldering.
- ・ High resolution: slit width 0.5mm.
- ・ Built-in amplifier, Pull-up Resistor output type.
- ・ The other model; High - Level output at beam detecting type・・・KI3662
- Phototransistor type・・・KI3664

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

|       | Item                                   | Symbol | Rating     | Unit |
|-------|----------------------------------------|--------|------------|------|
| 入 力   | 順 電 流 Forward Current ※ 1              | IF     | 50         | mA   |
|       | せ ん 頭 順 電 流 Peak Forward Current ※ 1,2 | IFM    | 1          | A    |
|       | 逆 電 圧 Reverse Voltage                  | VR     | 6          | V    |
|       | 許 容 損 失 Power Dissipation              | P      | 75         | mW   |
| 出 力   | 電 源 電 圧 Supply Voltage                 | VCC    | -0.5 ~ +17 | V    |
|       | 出 力 電 流 Output Current ※ 1             | IO     | 50         | mA   |
|       | 許 容 損 失 Power Dissipation ※ 1          | Po     | 250        | mW   |
| 動 作   | 温 度 Operating Temperature              | Topr   | -25 ~ +85  | °C   |
| 保 存   | 温 度 Storage Temperature                | Tstg   | -40 ~ +100 | °C   |
| 半 田 付 | 温 度 Soldering Temperature ※ 3          | Tsol   | 260        | °C   |

※ 1. 定格・特性曲線参照

※ 2. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01

※ 3. フロー半田付けの場合：5 秒以内。  
手半田付けの場合：350°C 以下。3 秒以内。

※ 4. "IFHL" は出力が "High" から "Low" になる時の順電流

※ 5. "IFLH" は出力が "Low" から "High" になる時の順電流

※ 1. Refer to Characteristics graphs.

※ 2. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

※ 3. Flow soldering condition less than 5s.  
Hand soldering condition less than 3s at 350°C .

※ 4. "IFHL" represents forward current when output goes from "High" to "Low".

※ 5. "IFLH" represents forward current when output goes from "Low" to "High".

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

|                 | Item                                                         | Symbol                                     | Condition                | min. | typ. | max. | Unit |
|-----------------|--------------------------------------------------------------|--------------------------------------------|--------------------------|------|------|------|------|
| 入 力             | 順 電 圧 Forward Voltage                                        | VF                                         | IF=5mA                   | —    | 1.1  | 1.4  | V    |
|                 | 逆 電 流 Reverse Current                                        | IR                                         | VR=3V                    | —    | —    | 10   | μA   |
| 出 力             | 動 作 電 源 電 圧 範 囲 Operating Supply Voltage                     | VCC                                        | —                        | 4.5  | —    | 17   | V    |
|                 | ロ ー レベル 出 力 電 圧 Low-Level Output Voltage                     | VOL                                        | VCC=5V, IOL=16mA, IF=5mA | —    | 0.15 | 0.4  | V    |
|                 | ハ イ レベル 出 力 電 圧 High-Level Output Voltage                    | VOH                                        | VCC=5V, IF=0             | 4.9  | —    | —    | V    |
|                 | ロ ー レベル 供 給 電 流 Low-Level Supply Current                     | ICCL                                       | VCC=5V, IF=5mA           | —    | 1.7  | 3.8  | mA   |
|                 | ハ イ レベル 供 給 電 流 High-Level Supply Current                    | ICCH                                       | VCC=5V, IF=0             | —    | 0.7  | 2.2  | mA   |
|                 | 伝 達 特 性 Coupled                                              |                                            |                          |      |      |      |      |
| 伝 達 特 性 Coupled | H → L スレッシュホールド 入 力 電 流 High→Low Threshold Input Current ※ 4 | IFHL                                       | VCC=5V                   | —    | 1    | 5    | mA   |
|                 | ヒ ス テ リ シ ス Hysteresis ※ 5                                   | IFLH/IFHL                                  | VCC=5V                   | 0.55 | 0.75 | 0.95 | —    |
|                 | 応 答 時 間                                                      | H → L 伝搬時間 High→Low Propagation delay time | VCC=5V, IF=5mA, RL=280Ω  | —    | 3    | 9    | μs   |
|                 |                                                              | L → H 伝搬時間 Low→High Propagation delay time |                          | —    | 5    | 15   |      |
|                 |                                                              | 上 昇 Rise Time                              |                          | —    | 0.1  | 0.5  |      |
|                 | Response Time ※ 1                                            | 下 降 Fall Time                              |                          | —    | 0.05 | 0.5  |      |

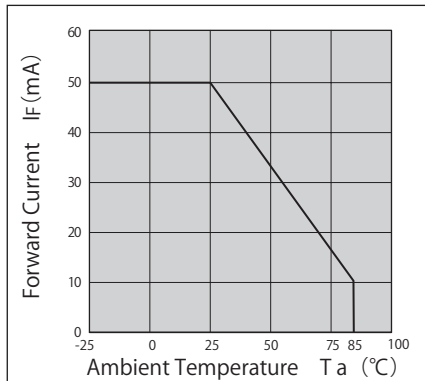
\*\* : Ta=25°C unless otherwise noted

# KI3663

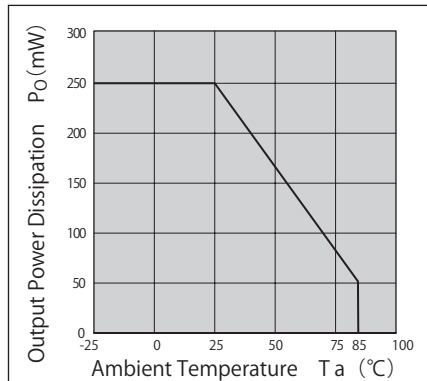
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

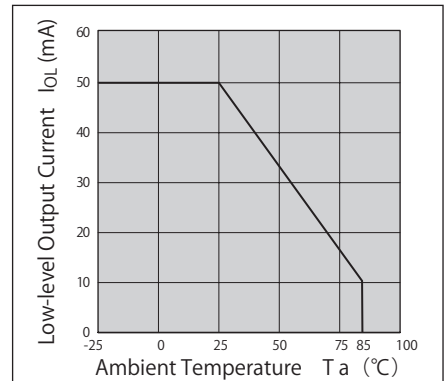
順電流低減曲線



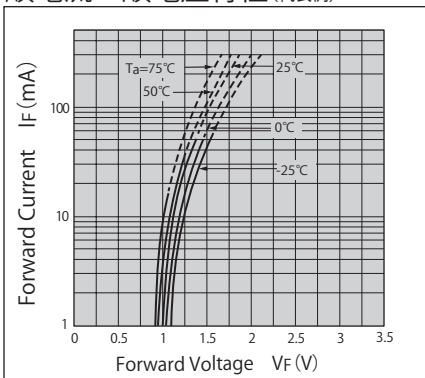
出力許容損失低減曲線



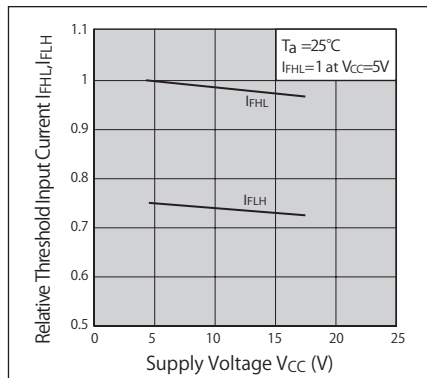
ローレベル出力電流－周囲温度特性



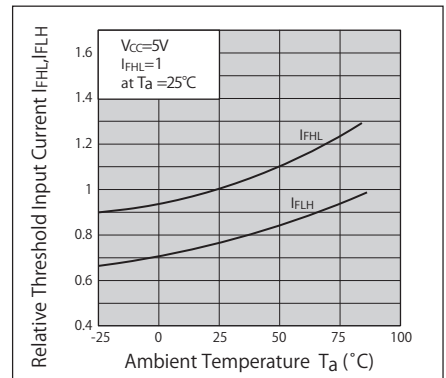
順電流－順電圧特性 (代表例)



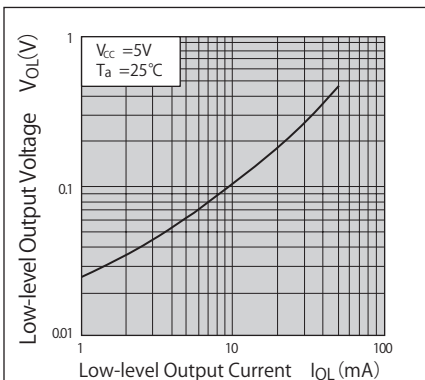
相対スレッショールド入力電流－電源電圧特性 (代表例)



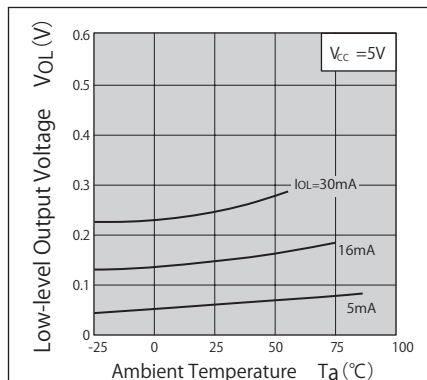
相対スレッショールド入力電流－周囲温度特性 (代表例)



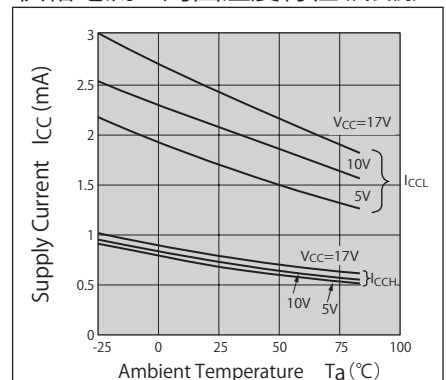
ローレベル出力電圧－ローレベル出力電流特性 (代表例)



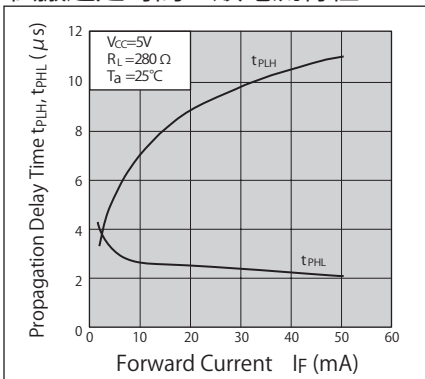
ローレベル出力電圧－周囲温度特性 (代表例)



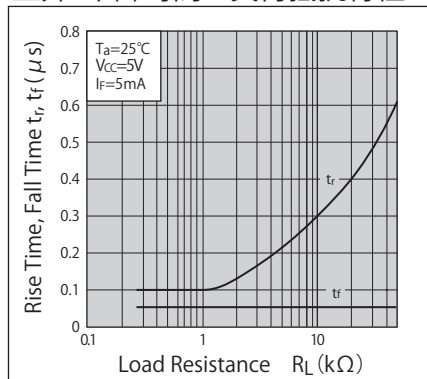
供給電流－周囲温度特性 (代表例)



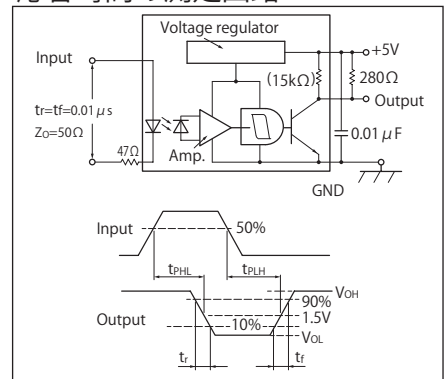
伝搬遅延時間－順電流特性



上昇・下降時間－負荷抵抗特性



応答時間の測定回路



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## KI3664

業界標準準拠 Industry Standard Compliant



透過型フォトセンサ

Photo Interrupter



## 概要 Description

KI3664 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した小型透過型フォトセンサです。

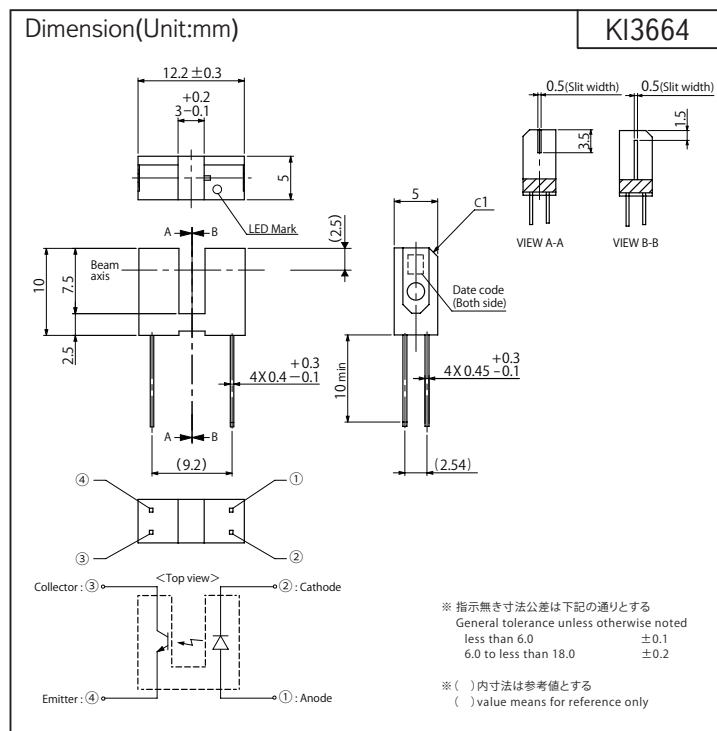
Model KI3664 consist of an Infrared LED and a High sensitive Photo transistor.

## 特長 Feature

- ・ フロー半田付け対応
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ その他シリーズ  
フォト IC 出力タイプ・・・KI3662/3663
- ・ Suitable for flow soldering.
- ・ High resolution: slit width 0.5mm.
- ・ The other model; Photo IC output type・・・KI3662/3663

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           | Symbol                                 | Rating     | Unit  |
|--------------------------------|----------------------------------------|------------|-------|
| 入力<br>Input                    | 順電流 Forward Current ※1                 | IF         | 50 mA |
|                                | せん頭順電流 Peak Forward Current ※1,2       | IFM        | 1 A   |
|                                | 逆電圧 Reverse Voltage                    | VR         | 6 V   |
|                                | 許容損失 Power Dissipation                 | P          | 75 mW |
| 出力<br>Output                   | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO       | 35 V  |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO       | 6 V   |
|                                | コレクタ電流 Collector Current               | IC         | 20 mA |
|                                | コレクタ損失 Collector Power Dissipation ※1  | Pc         | 75 mW |
| 動作温度 Operating Temperature     | T <sub>opr</sub>                       | -25 ~ +85  | °C    |
| 保存温度 Storage Temperature       | T <sub>stg</sub>                       | -40 ~ +100 | °C    |
| 半田付温度 Soldering Temperature ※3 | T <sub>sol</sub>                       | 260        | °C    |

- ※1. 定格・特性曲線参照  
 ※2. パルス幅  $t_w \leq 100\mu s$  Duty比=0.01  
 ※3. フロー半田付けの場合：5秒以内。  
 手半田付けの場合：350°C以下。3秒以内。

- ※1. Refer to Characteristics graphs.  
 ※2. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01  
 ※3. Flow soldering condition less than 5s.  
 Hand soldering condition less than 3s at 350°C.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            | Symbol                                              | Condition       | min.                            | typ. | max. | Unit       |
|-----------------|-----------------------------------------------------|-----------------|---------------------------------|------|------|------------|
| 入力<br>Input     | 順電圧 Forward Voltage                                 | VF              | IF=20mA                         | —    | 1.25 | 1.4 V      |
|                 | せん頭順電圧 Peak Forward Voltage                         | VFM             | IFM=0.5A                        | —    | 3    | 4 V        |
|                 | 逆電流 Reverse Current                                 | IR              | VR=3V                           | —    | —    | 10 $\mu A$ |
| 出力<br>Output    | 暗電流 Dark Current                                    | ICEO            | VCE=20V                         | —    | 1    | 100 nA     |
| 伝達特性<br>Coupled | 光電流 Light Current                                   | IC              | VCE=5V, IF=20mA                 | 0.5  | —    | 5 mA       |
|                 | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat)        | IF=40mA, IC=0.5mA               | —    | —    | 0.4 V      |
|                 | 応答時間<br>Response Time                               | 上昇<br>Rise Time | VCE=2V, IC=2mA, RL=100 $\Omega$ | —    | 3    | $\mu s$    |
|                 |                                                     | 下降<br>Fall Time |                                 | —    | 4    |            |

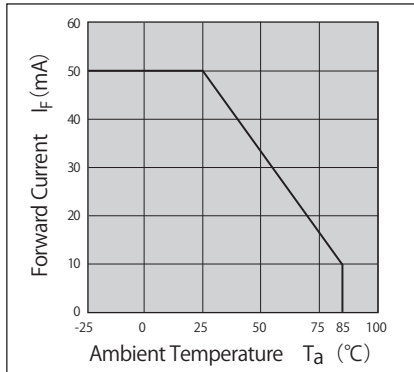
\*\* : Ta=25°C unless otherwise noted

# KI3664

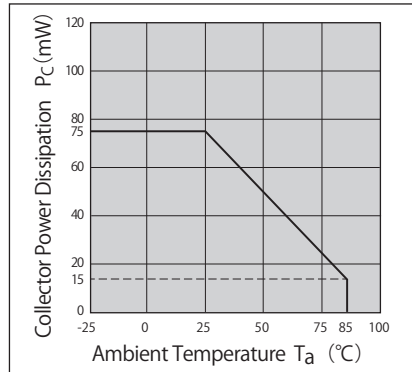
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

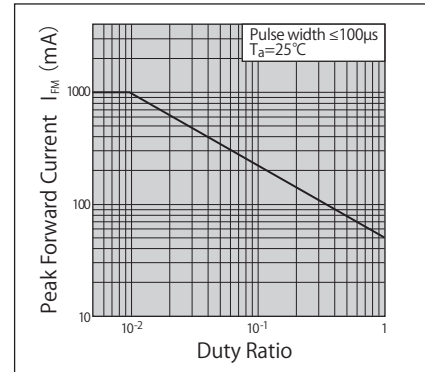
順電流低減曲線



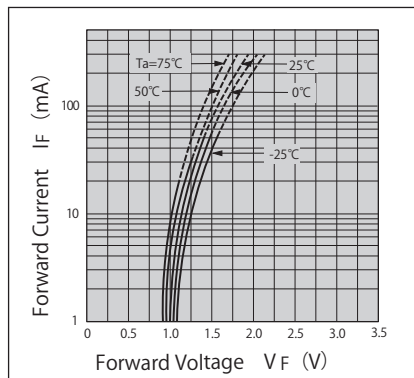
コレクタ損失低減曲線



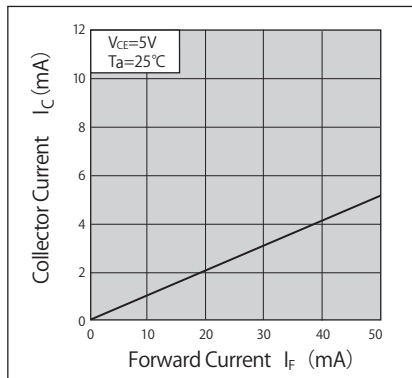
せん頭順電流一デューティ比



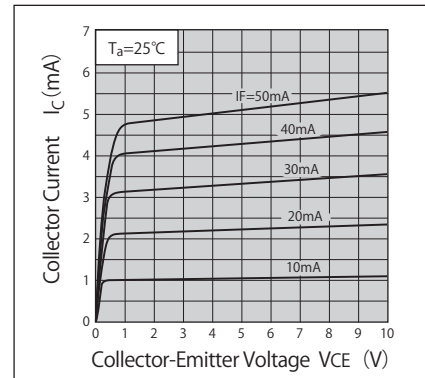
順電流一順電圧特性 (代表例)



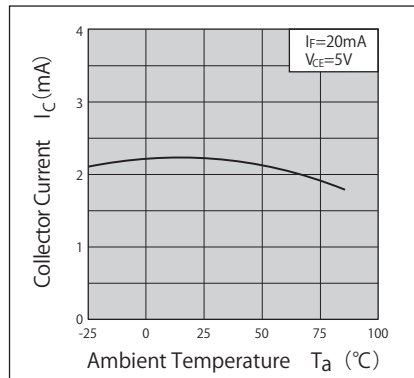
光電流一順電流特性 (代表例)



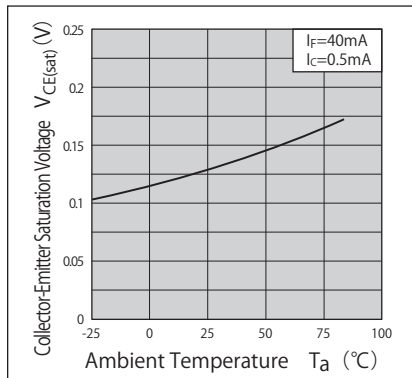
光電流一コレクタ・エミッタ間電圧特性 (代表例)



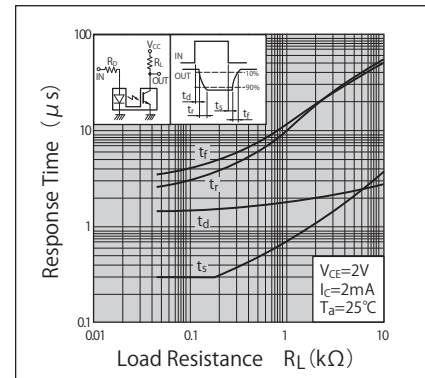
光電流一周囲温度特性 (代表例)



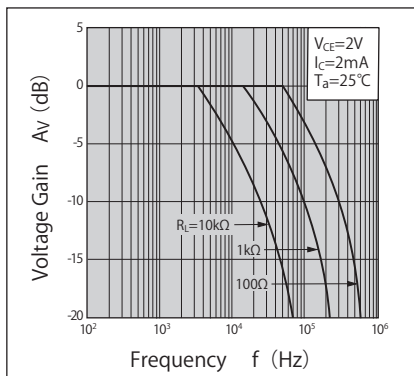
コレクタ・エミッタ間飽和電圧一周囲温度特性 (代表例)



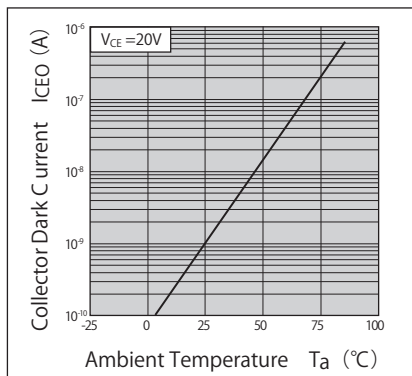
応答時間一負荷抵抗特性 (代表例)



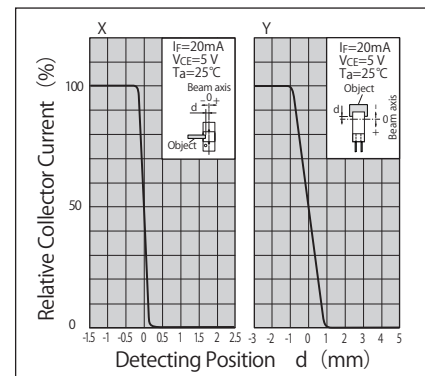
周波数特性 (代表例)



暗電流一周囲温度特性 (代表例)



検出位置特性 (代表例)



・カスタマイズも承ります。お気軽にお問合せください  
・A Customized design available on request.

・この仕様は改良のため予告なく変更する場合があります  
・Specifications are subject to change without notice.

KI3674

業界標準準拠 Industry Standard Compliant



透過型フォトセンサ

Photo Interrupter



## 概要 Description

KI3674 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した小型透過型フォトセンサです。

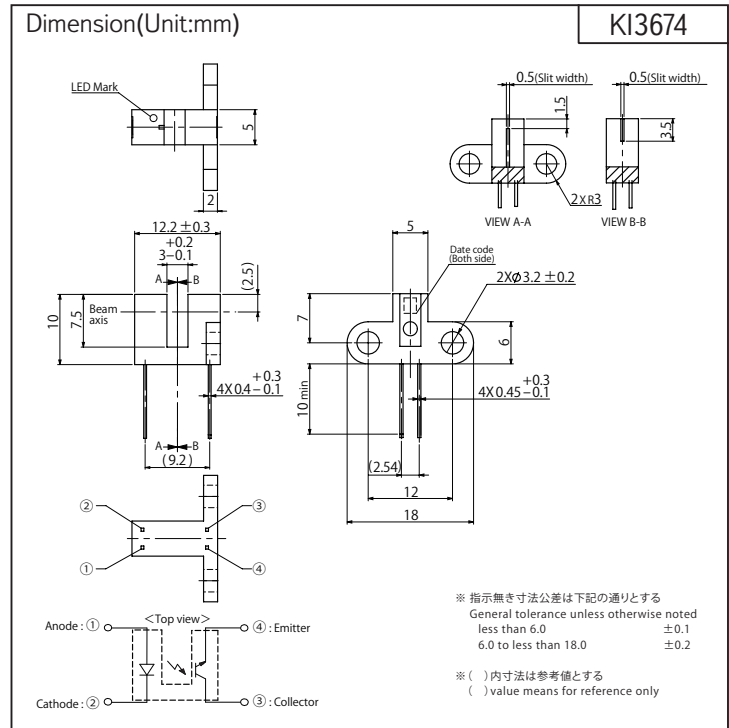
Model KI3674 consist of an Infrared LED and a High sensitive Photo transistor.

## 特長 Feature

- ・ フロー半田付け対応
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ Suitable for flow soldering.
- ・ High resolution: slit width 0.5mm.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                            |                                        | Symbol           | Rating     | Unit |
|---------------------------------|----------------------------------------|------------------|------------|------|
| 入力<br>Input                     | 順電流 Forward Current ※ 1                | IF               | 50         | mA   |
|                                 | せん頭順電流 Peak Forward Current ※ 1,2      | IFM              | 1          | A    |
|                                 | 逆電圧 Reverse Voltage                    | VR               | 6          | V    |
|                                 | 許容損失 Power Dissipation                 | P                | 75         | mW   |
| 出力<br>Output                    | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 35         | V    |
|                                 | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 6          | V    |
|                                 | コレクタ電流 Collector Current               | IC               | 20         | mA   |
|                                 | コレクタ損失 Collector Power Dissipation ※ 1 | Pc               | 75         | mW   |
| 動作温度 Operating Temperature      |                                        | T <sub>opr</sub> | -25 ~ +85  | °C   |
| 保存温度 Storage Temperature        |                                        | T <sub>stg</sub> | -40 ~ +100 | °C   |
| 半田付温度 Soldering Temperature ※ 3 |                                        | T <sub>sol</sub> | 260        | °C   |

※ 1. 定格・特性曲線参照

※ 2. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01

※ 3. フロー半田付けの場合：5 秒以内。  
手半田付けの場合：350°C 以下。3 秒以内。

※ 1. Refer to Characteristics graphs.

※ 2. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

※ 3. Flow soldering condition less than 5s.  
Hand soldering condition less than 3s at 350°C .

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*]

| Item            |                                                     | Symbol               | Condition                                                      | min. | typ. | max. | Unit |
|-----------------|-----------------------------------------------------|----------------------|----------------------------------------------------------------|------|------|------|------|
| 入力<br>Input     | 順電圧 Forward Voltage                                 | V <sub>F</sub>       | I <sub>F</sub> =20mA                                           | —    | 1.25 | 1.4  | V    |
|                 | せん頭順電圧 Peak Forward Voltage                         | V <sub>FM</sub>      | I <sub>FM</sub> =0.5A                                          | —    | 3    | 4    | V    |
|                 | 逆電流 Reverse Current                                 | I <sub>R</sub>       | V <sub>R</sub> =3V                                             | —    | —    | 10   | μA   |
| 出力<br>Output    | 暗電流 Dark Current                                    | I <sub>CEO</sub>     | V <sub>CE</sub> =20V                                           | —    | 1    | 100  | nA   |
| 伝達特性<br>Coupled | 光電流 Light Current                                   | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                      | 0.5  | —    | 5    | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =40mA, I <sub>C</sub> =0.5mA                    | —    | —    | 0.4  | V    |
|                 | 応答時間<br>Response Time                               | 上昇<br>Rise Time      | V <sub>CE</sub> =2V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω | —    | 3    | 15   | μs   |
|                 |                                                     | 下降<br>Fall Time      |                                                                | —    | 4    | 20   |      |

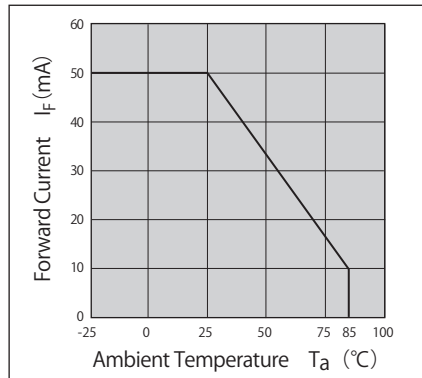
\*\* : Ta=25°C unless otherwise noted

# KI3674

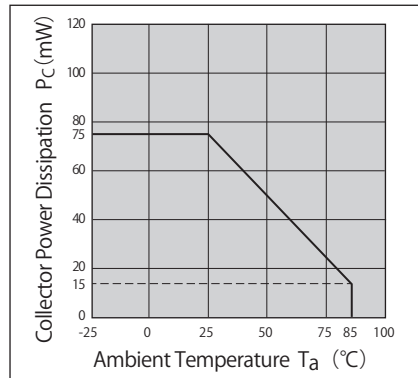
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

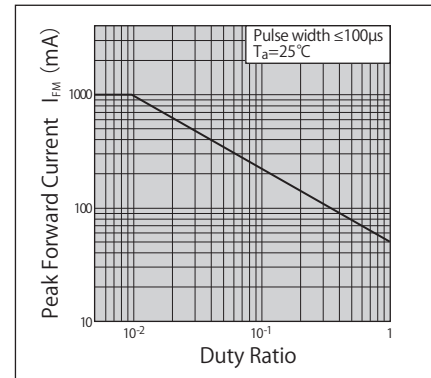
順電流低減曲線



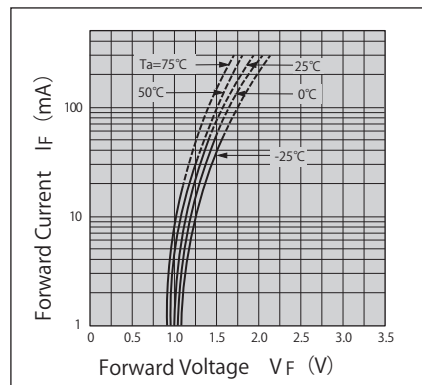
コレクタ損失低減曲線



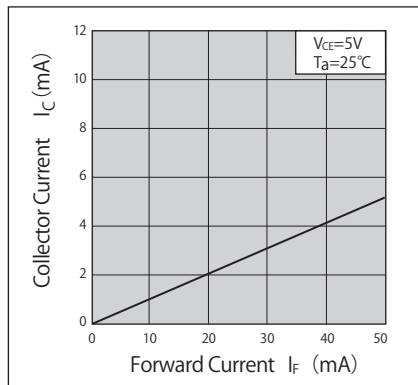
せん頭順電流一デューティ比



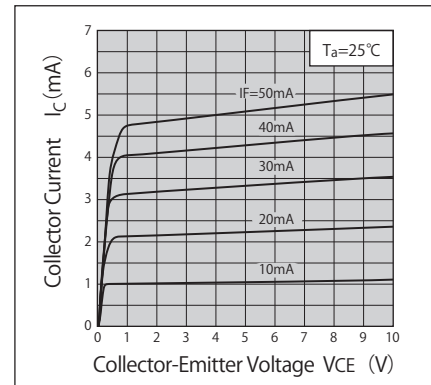
順電流一順電圧特性 (代表例)



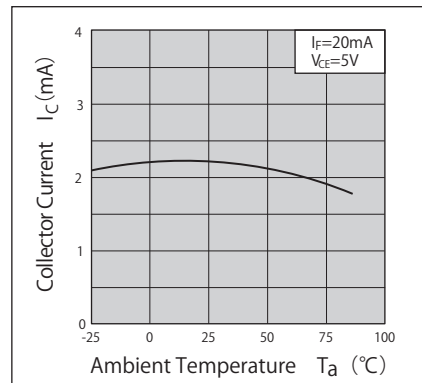
光電流一順電流特性 (代表例)



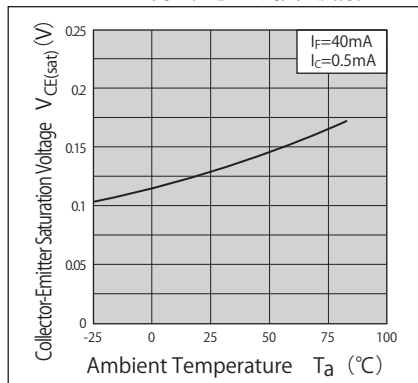
光電流一コレクタ・エミッタ間電圧特性 (代表例)



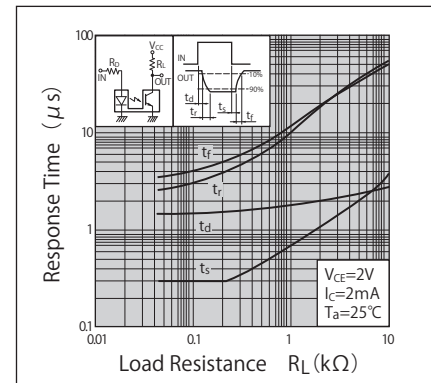
光電流一周囲温度特性 (代表例)



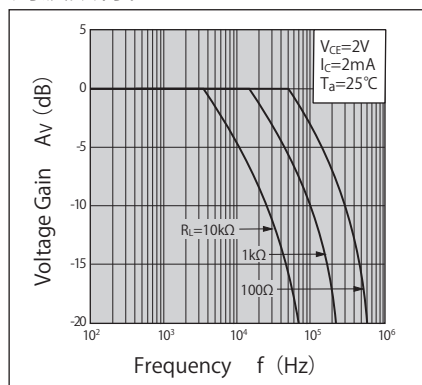
コレクタ・エミッタ間飽和電圧一周囲温度特性 (代表例)



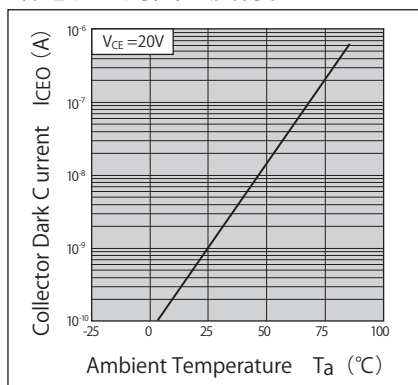
応答時間一負荷抵抗特性 (代表例)



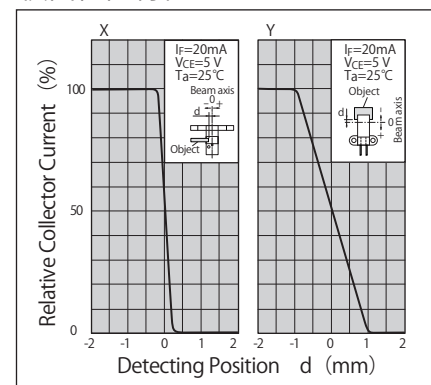
周波数特性 (代表例)



暗電流一周囲温度特性 (代表例)



検出位置特性 (代表例)



・ カスタマイズも承ります。お気軽にお問合せください  
・ A Customized design available on request.

・ この仕様は改良のため予告なく変更する場合があります  
・ Specifications are subject to change without notice.

# KI3700/3701/3710/3711

透過型フォトセンサ 防塵・防滴タイプ Photo Interrupter - Dust/Drip proof type



## 概要 Description

KI3700/3701/3710/3711 は、赤外発光ダイオードと受光素子にフォト IC (デジタル出力) を組合せ防滴・防塵性能を達成した透過型フォトセンサです。

Model KI3700/3701/3710/3711 consist of an Infrared LED and a High sensitive Photo IC (Digital Output).

## 特長 Feature

- 防塵・防滴構造 (IP64 相当)  
※コネクタ部 - AALF 非防滴仕様  
AA02LF 防滴仕様
- FA センサより安価
- 可視光カット樹脂使用の防塵構造
- 抜け防止強口ロック機構付きコネクタ採用
- 検出ギャップが8mm、深さ18mm で大きな物でも検出可能
- Dust and Drip proof type : IP64 equivalent.  
Note) AALF model connector-Non drip proof.  
AA02LF model connector-Drip proof.
- High cost performance to FA sensor
- Dust proof: Visible Light cut resin
- with secure locking structure connector.
- Slot width-8mm, Slot depth-18mm

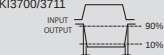
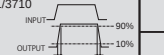
## 用途 Application

- FA システム
- 医療機器、アミューズメント、自動販売機等の液体使用箇所への物体検知
- FA system
- Object passing at sweating area in Medical equipments, Amusement machine and Auto vending machine

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating      |             | Unit |
|------------------------------------|------------------|-------------|-------------|------|
|                                    |                  | KI3700/3701 | KI3710/3711 |      |
| 電源電圧 Supply Voltage                | VCC              | 13.5        | 6           | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50          |             | mA   |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75   |             | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80   |             | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V or 12V, Ta=25°C \*\*] ※1

| Item                                   |              | Symbol | Condition                                                                            |                 | min.             |                  | typ.             |                  | max.             |                  | Unit |    |
|----------------------------------------|--------------|--------|--------------------------------------------------------------------------------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------|----|
|                                        |              |        |                                                                                      |                 | KI3700<br>KI3701 | KI3710<br>KI3711 | KI3700<br>KI3701 | KI3710<br>KI3711 | KI3700<br>KI3701 | KI3710<br>KI3711 |      |    |
| 動作電源電圧 Supply Voltage                  |              | VCC    | —                                                                                    |                 | 10.8             | 4.5              | 12.0             | 5.0              | 13.2             | 5.5              | V    |    |
| ローレベル供給電流 Low-Level Supply Current     |              | ICCL   | KI3700/3711                                                                          | 入光時 w/o Shutter | —                |                  | —                |                  | 25               |                  | mA   |    |
|                                        |              |        | KI3701/3710                                                                          | 遮光時 Shutter in  | —                |                  | —                |                  | 25               |                  |      |    |
| ハイレベル供給電流 High-Level Supply Current    |              | ICCH   | KI3700/3711                                                                          | 遮光時 Shutter in  | —                |                  | —                |                  | 25               |                  | mA   |    |
|                                        |              |        | KI3701/3710                                                                          | 入光時 w/o Shutter | —                |                  | —                |                  | 25               |                  |      |    |
| ローレベル出力電圧 Low-Level Output Voltage ※ 2 |              | VOL    | KI3700/3711                                                                          | 入光時 w/o Shutter | —                |                  | —                |                  | 0.4              |                  | V    |    |
|                                        |              |        | KI3701/3710                                                                          | 遮光時 Shutter in  | —                |                  | —                |                  | 0.4              |                  |      |    |
| ハイレベル出力電圧 High-Level Output Voltage    |              | VOH    | KI3700/3711                                                                          | 遮光時 Shutter in  | VCCx0.9          |                  | —                |                  | —                |                  | V    |    |
|                                        |              |        | KI3701/3710                                                                          | 入光時 w/o Shutter | VCCx0.9          |                  | —                |                  | —                |                  |      |    |
| 応答時間<br>Response Time                  | 上昇 Rise Time | tr     |   |                 | KI3701/3710      | —                |                  | 0.86             |                  | —                |      | μs |
|                                        | 下降 Fall Time | tf     |  |                 | —                |                  | 0.03             |                  | —                |                  |      |    |

\*\* : Ta=25°C unless otherwise noted

※1. 電源電圧条件 : KI3700/3701- 12V  
Vcc condition KI3710/3711- 5V

※2. IOL=16mA

# KI3700/3701/3710/3711

定格・特性曲線

Characteristics

※注意 最大定格を超えないようにご使用ください

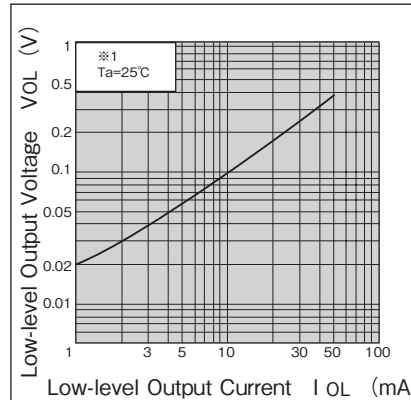
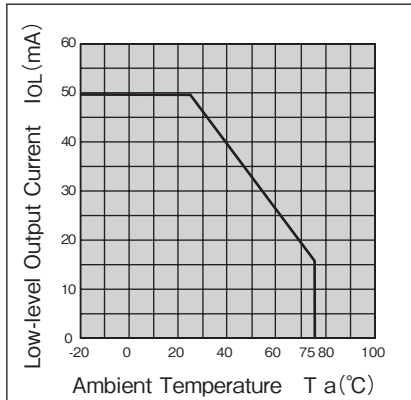
Note: Operation never exceeds each value of Maximum Ratings.

ローレベル出力電流低減曲線

ローレベル出力電圧ー

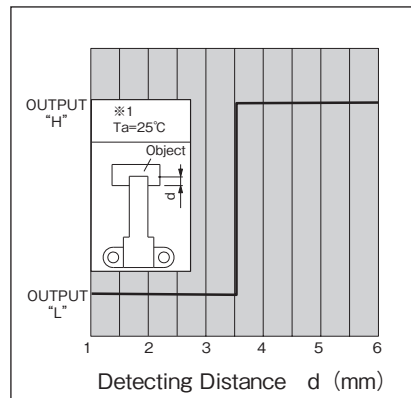
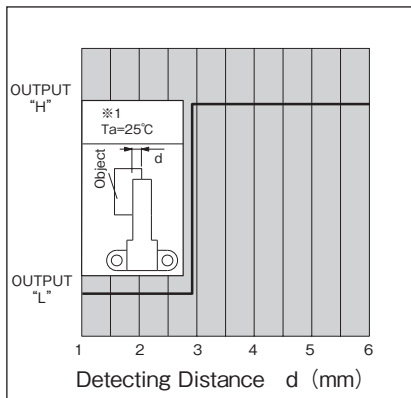
ローレベル出力電流特性 (代表例)

※1- 電源電圧条件 Vcc condition  
KI3700/3701 - 12V  
KI3710/3711 - 5V



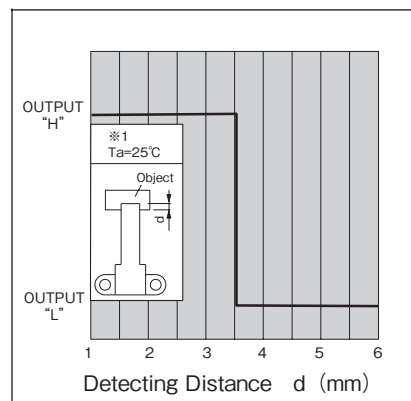
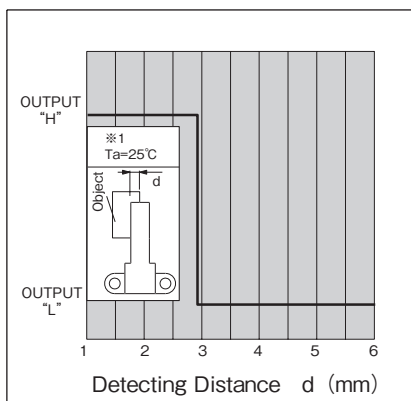
検出位置特性1 (代表例) KI3700/3711

検出位置特性2 (代表例) KI3700/3711



検出位置特性1 (代表例) KI3701/3710

検出位置特性2 (代表例) KI3701/3710



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- ・ Specifications are subject to change without notice.

## KI3720



透過型フォトセンサ 横スリットタイプ Photo Interrupter - Sideways slit type



## 概要 Description

KI3720 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した透過型フォトセンサです。

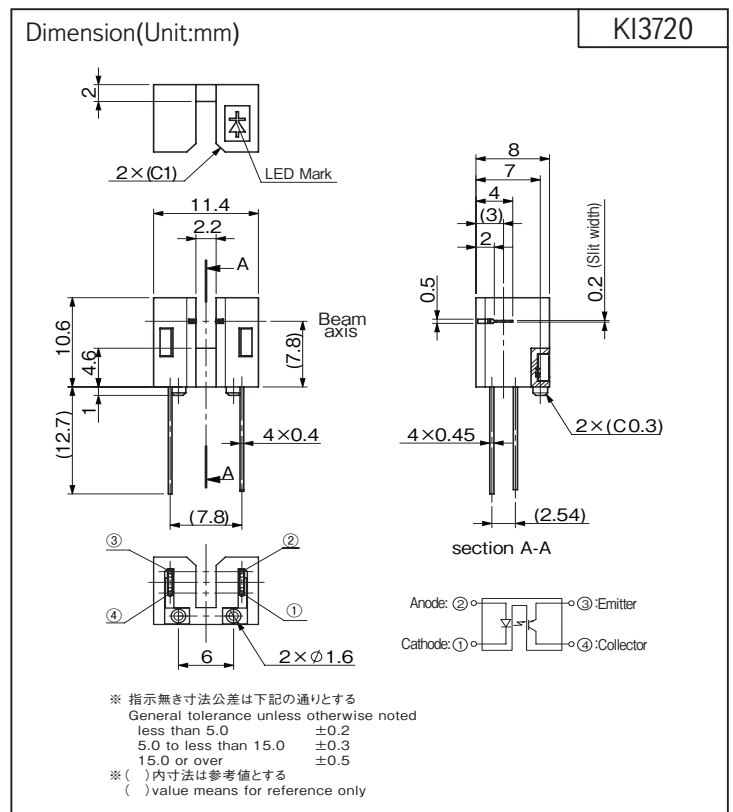
Model KI3720 consists of an Infrared LED and a High sensitive Photo transistor.

## 特長 Feature

- 検出精度が高い：横スリット幅 0.2mm
- 位置決めボス付き
- High resolution to object position. Sideways slit 0.2mm
- Boss to fix the accurate position.

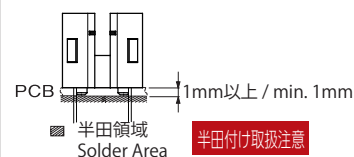
## 用途 Application

- カード機器、両替機の物体通過検出
- 自動販売機、アミューズメント機器のコイン通過検出
- OA 機器、その他
- Object passing for Card reader, Bill exchanger.
- Coin-passing for Auto vending machine and Amusement.
- Paper detection for O.A. equipment



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           |                                        | Symbol           | Rating    | Unit |
|--------------------------------|----------------------------------------|------------------|-----------|------|
| 発光側<br>Emitter                 | 順電流 Forward Current                    | IF               | 50        | mA   |
|                                | パルス順電流 Pulse Forward Current ※1        | IFP              | 1         | A    |
|                                | 逆電圧 Reverse Voltage                    | VR               | 5         | V    |
|                                | 許容損失 Power Dissipation                 | P                | 75        | mW   |
| 受光側<br>Detector                | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 30        | V    |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 5         | V    |
|                                | コレクタ電流 Collector Current               | IC               | 20        | mA   |
|                                | コレクタ損失 Collector Power Dissipation     | Pc               | 75        | mW   |
| 動作温度 Operating Temperature     |                                        | T <sub>opr</sub> | -20 ~ +85 | °C   |
| 保存温度 Storage Temperature       |                                        | T <sub>stg</sub> | -30 ~ +85 | °C   |
| 半田付温度 Soldering Temperature ※2 |                                        | T <sub>sol</sub> | 330       | °C   |



- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
 ※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)
- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01  
 ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                   | Symbol               | Condition                                                       | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|----------------------|-----------------------------------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | V <sub>F</sub>       | I <sub>F</sub> =20mA                                            | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | I <sub>R</sub>       | V <sub>R</sub> =3V                                              | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | I <sub>CEO</sub>     | V <sub>CE</sub> =10V, 0 lx                                      | —    | —    | 0.1  | μA   |
|                 | 光電流 Light Current                 | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                       | 0.3  | —    | —    | mA   |
| 伝達特性<br>Coupled | コレクタ・エミッタ間飽和電圧 Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =20mA, I <sub>C</sub> =0.15mA                    | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                | 上昇 Rise Time         | V <sub>CC</sub> =5V, I <sub>C</sub> =0.3mA, R <sub>L</sub> =1kΩ | —    | 22   | —    | μs   |
|                 |                                   | 下降 Fall Time         |                                                                 | —    | 24   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI3720

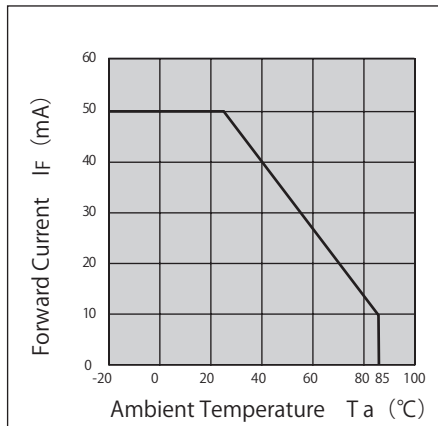
## 定格・特性曲線

Characteristics

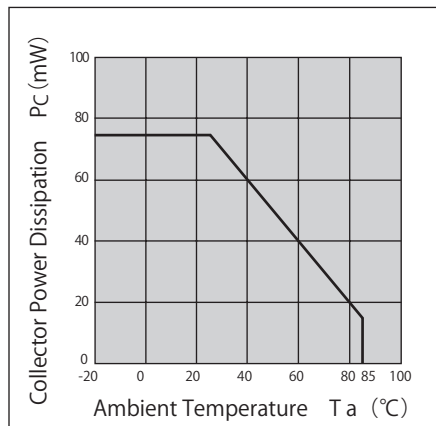
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

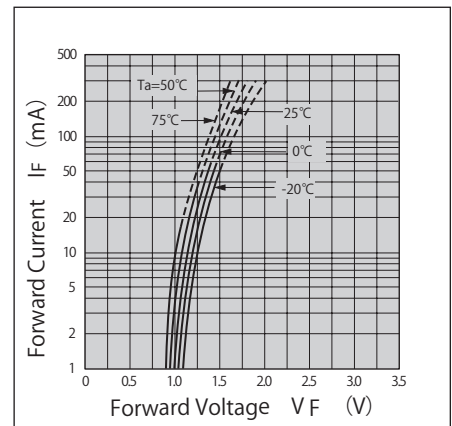
### 順電流低減曲線



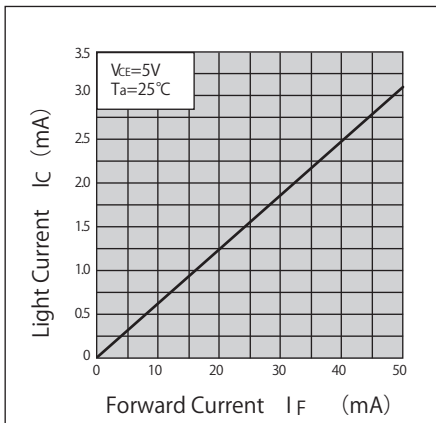
### コレクタ損失低減曲線



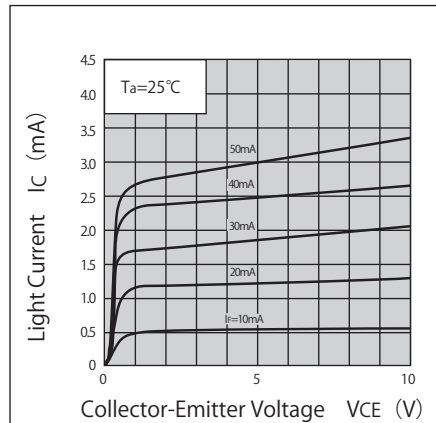
### 順電流一順電圧曲線 (代表例)



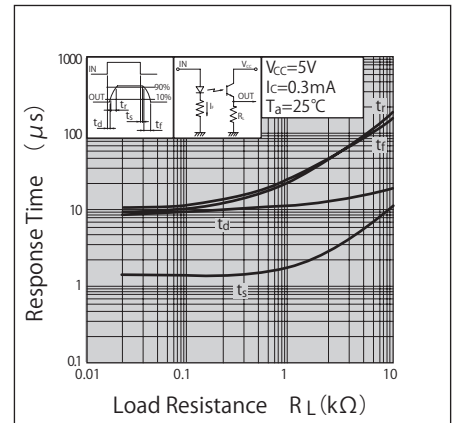
### 光電流一順電流特性 (代表例)



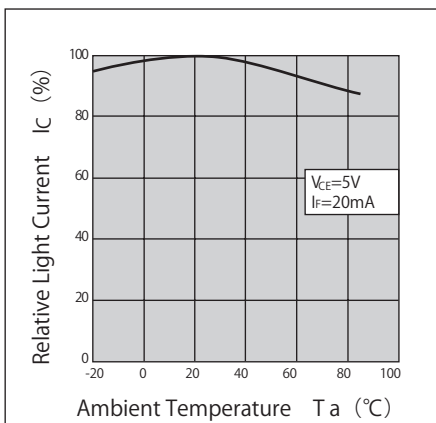
### 光電流一コレクタ・エミッタ間電圧特性 (代表例)



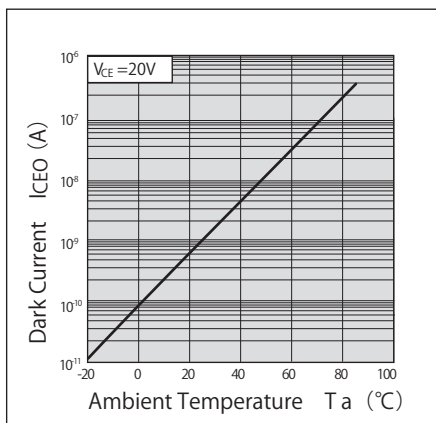
### 応答時間一負荷抵抗特性 (代表例)



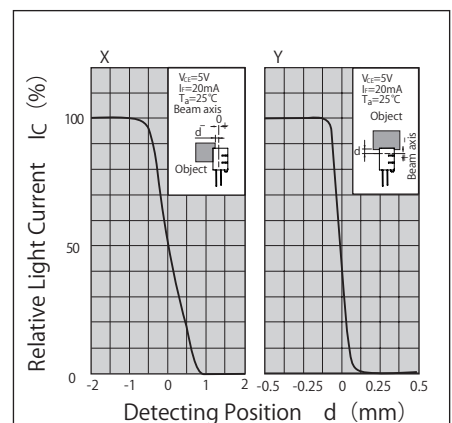
### 光電流一周囲温度特性 (代表例)



### 暗電流一周囲温度特性 (代表例)



### 検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3740/3741



透過型フォトセンサ 横スリットタイプ

Photo Interrupter - Sideways slit type



## 概要 Description

KI3740/3741 は、発光側に赤外発光ダイオード、受光側にフォト IC 出力を採用した透過型フォトセンサです。

Model KI3740/3741 consist of an Infrared LED and a High sensitive Photo IC (Digital Output).

## 特長 Feature

- ・ フロー半田付け対応
- ・ アンプ内蔵型
- ・ 検出溝幅 5mm、横スリット幅 0.5mm
- ・ その他シリーズ  
フォトトランジスタタイプ・・・KI3744
- ・ Suitable for flow soldering.
- ・ Built-in amplifier.
- ・ Wide Slot width-5mm. Sideways slit width-0.5mm
- ・ The other model; Phototransistor type・・・KI3744

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           | Symbol                             | Rating    | Unit   |
|--------------------------------|------------------------------------|-----------|--------|
| 発光側<br>Emitter                 | 順電流 Forward Current                | IF        | 50 mA  |
|                                | パルス順電流 Pulse Forward Current ※1    | IFP       | 1 A    |
|                                | 逆電圧 Reverse Voltage                | VR        | 5 V    |
| 受光側<br>Detector                | 電源電圧 Supply Voltage                | VCC       | 17 V   |
|                                | ローレベル出力電流 Low-Level Output Current | IOL       | 16 mA  |
|                                | 出力許容損失 Output Power Dissipation    | PO        | 175 mW |
| 動作温度 Operating Temperature     | T <sub>opr</sub>                   | -20 ~ +85 | °C     |
| 保存温度 Storage Temperature       | T <sub>stg</sub>                   | -30 ~ +85 | °C     |
| 半田付温度 Soldering Temperature ※2 | T <sub>sol</sub>                   | 330       | °C     |

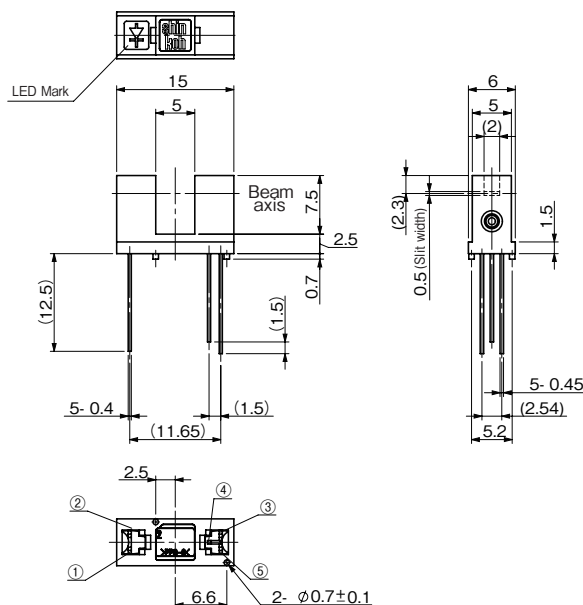
## 電気的光学的特性 Electro-Optical Characteristics [VCC=5V, Ta=25°C \*\*] ( )=KI3741

| Item            | Symbol                                | Condition                | min.    | typ. | max. | Unit |
|-----------------|---------------------------------------|--------------------------|---------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage                   | IF=20mA                  | —       | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current                   | VR=3V                    | —       | —    | 10   | μA   |
| 受光側<br>Detector | ローレベル出力電圧 Low-Level Output Voltage    | IOL=16mA, IF=0 (IF=15mA) | —       | 0.15 | 0.4  | V    |
|                 | ハイレベル出力電圧 High-Level Output Voltage   | RL=47kΩ, IF=15mA (IF=0)  | VCC×0.9 | —    | —    | V    |
|                 | ローレベル供給電流 Low-Level Supply Current    | VCC=5V, IF=0 (IF=15mA)   | —       | —    | 3.4  | mA   |
|                 | ハイレベル供給電流 High-Level Supply Current   | VCC=5V, IF=15mA (IF=0)   | —       | —    | 2.2  | mA   |
| 伝達特性<br>Coupled | スレッシュホールド入力電流 Threshold Input Current | IFLH KI3740 Low → High   | —       | —    | 10   | mA   |
|                 |                                       | IFHL KI3741 High → Low   | —       | —    | 10   |      |
|                 | ヒステリシス Hysteresis                     | VCC=5V                   | —       | 0.65 | —    | —    |
|                 | 応答時間 Response Time                    | 上昇 Rise Time             | —       | 0.1  | —    | μs   |
|                 |                                       | 下降 Fall Time             | —       | 0.05 | —    |      |

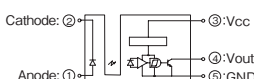
\*\*: Ta=25°C unless otherwise noted

Dimension(Unit:mm)

KI3740/3741



※ 指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5  
※ ( ) 内寸法は参考値とする  
( ) value means for reference only



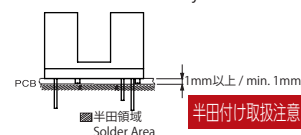
| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI3740 | High | 入光時 at Beam detecting |
| KI3741 | Low  | 入光時 at Beam detecting |

## &lt; ご使用上の注意 &gt;

センサ近くの VCC-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with min. 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.



- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
手半田の場合：パッケージ下面より 1mm 以上の位置で 2 秒以内。  
フロー半田の場合：260°C 以下。パッケージ下面より 1mm 以上の位置で 5 秒以内 (上図参照)

- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01  
※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering should be less than 5s. at 1mm over from body at 260 degree C or less.

# KI3740/3741

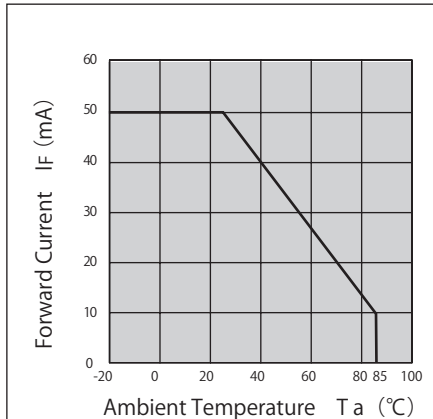
## 定格・特性曲線

Characteristics

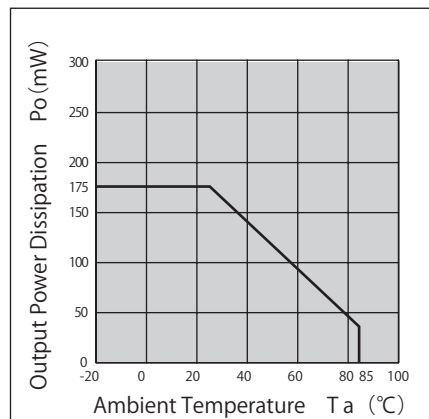
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

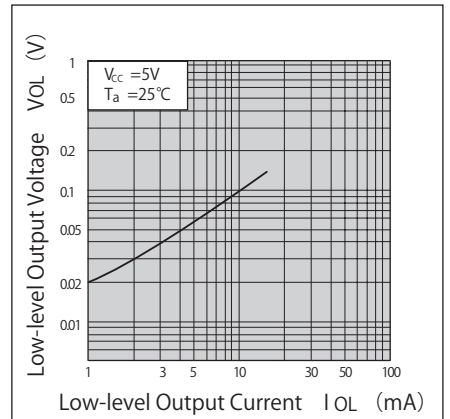
順電流低減曲線



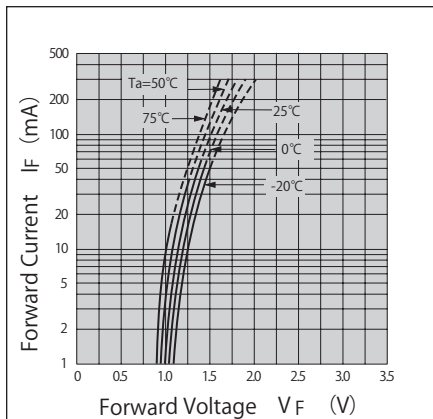
出力許容損失低減曲線



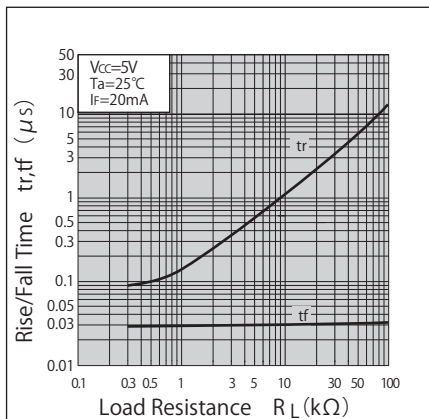
ローレベル出力電圧ー  
ローレベル出力電流特性(代表例)



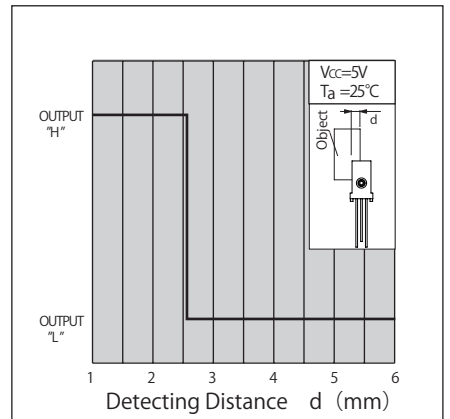
順電流ー順電圧曲線(代表例)



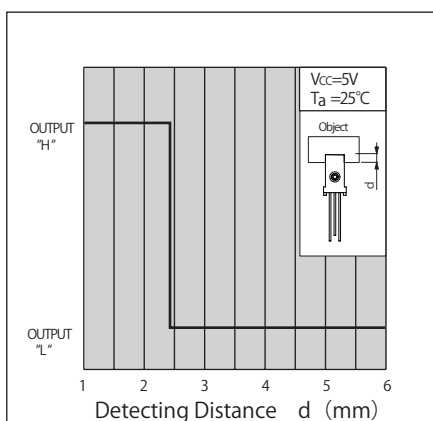
上昇、下降時間ー負荷抵抗特性(代表例)



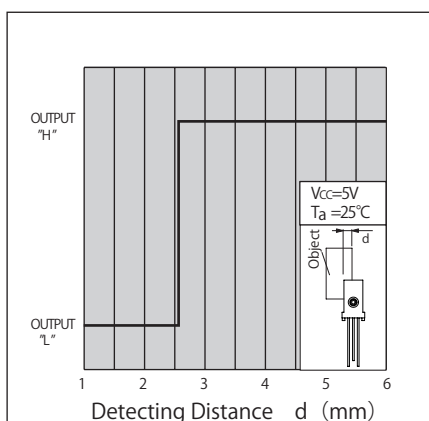
検出位置特性1(代表例) KI3740



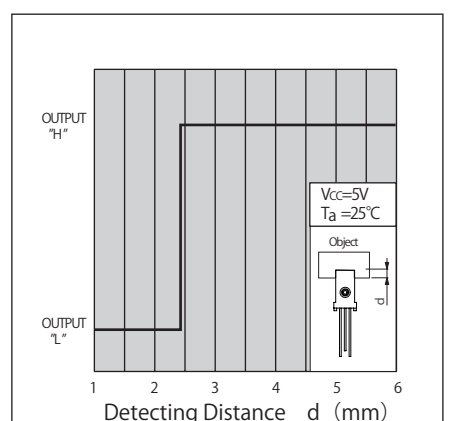
検出位置特性2(代表例) KI3740



検出位置特性1(代表例) KI3741



検出位置特性2(代表例) KI3741



- ・ カスタマイズも承ります。お気軽にお問合せください
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- ・ Specifications are subject to change without notice.

## KI3744



透過型フォトセンサ 横スリットタイプ

Photo Interrupter - Sideways slit type



## 概要 Description

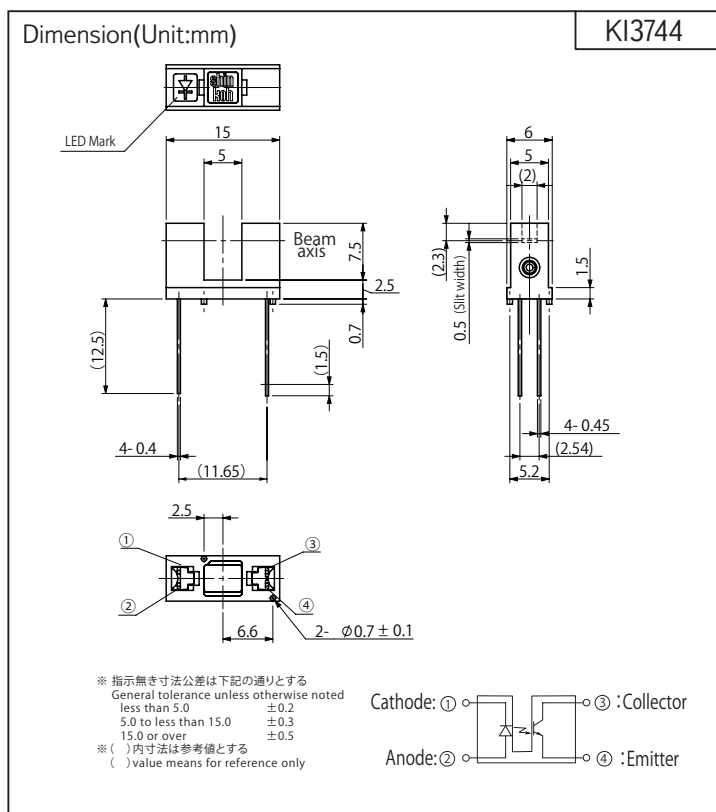
KI3744 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した透過型フォトセンサです。  
Model KI3744 consists of an Infrared LED and a High sensitive Photo transistor(Analog output).

## 特長 Feature

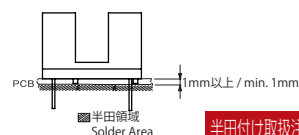
- ・ フロー半田付け対応
- ・ 検出溝幅 5mm、横スリット幅 0.5mm
- ・ その他シリーズ  
フォト 出力タイプ・・・KI3740/3741
- ・ Suitable for flow soldering.
- ・ Wide Slot width-5mm. Sideways slit width-0.5mm
- ・ The other model; Photo IC output type・・・KI3740/KI3741

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.

最大定格 Maximum Ratings [ $T_a=25^\circ\text{C}$  \*\*]

| Item                           |                                        | Symbol    | Rating         | Unit             |
|--------------------------------|----------------------------------------|-----------|----------------|------------------|
| 発光側<br>Emitter                 | 順電流 Forward Current                    | $I_F$     | 50             | mA               |
|                                | パルス順電流 Pulse Forward Current ※1        | $I_{FP}$  | 1              | A                |
|                                | 逆電圧 Reverse Voltage                    | $V_R$     | 5              | V                |
|                                | 許容損失 Power Dissipation                 | $P$       | 75             | mW               |
| 受光側<br>Detector                | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | $V_{CEO}$ | 30             | V                |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | $V_{ECO}$ | 5              | V                |
|                                | コレクタ電流 Collector Current               | $I_C$     | 20             | mA               |
|                                | コレクタ損失 Collector Power Dissipation     | $P_C$     | 75             | mW               |
| 動作温度 Operating Temperature     |                                        | $T_{opr}$ | $-20 \sim +85$ | $^\circ\text{C}$ |
| 保存温度 Storage Temperature       |                                        | $T_{stg}$ | $-30 \sim +85$ | $^\circ\text{C}$ |
| 半田付温度 Soldering Temperature ※2 |                                        | $T_{sol}$ | 330            | $^\circ\text{C}$ |



- ※ 1. パルス幅  $t_w \leq 100\mu\text{s}$  Duty 比  $=0.01$   
 ※ 2. 手半田の場合：パッケージ下面より 1mm 以上の位置で 2 秒以内。  
 フロー半田の場合：260 $^\circ\text{C}$ 以下。パッケージ下面より 1mm 以上の位置で 5 秒以内（上図参照）

- ※ 1. Pulse width  $t_w \leq 100\mu\text{s}$  Duty ratio  $=0.01$   
 ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering should be less than 5s. at 1mm over from body at 260 degree C or less.

電気的光学的特性 Electro-Optical Characteristics [ $T_a=25^\circ\text{C}$  \*\*]

| Item            |                                   | Symbol        | Condition                                                 | min. | typ. | max. | Unit          |
|-----------------|-----------------------------------|---------------|-----------------------------------------------------------|------|------|------|---------------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | $V_F$         | $I_F=20\text{mA}$                                         | —    | 1.2  | 1.5  | V             |
|                 | 逆電流 Reverse Current               | $I_R$         | $V_R=3\text{V}$                                           | —    | —    | 10   | $\mu\text{A}$ |
| 受光側<br>Detector | 暗電流 Dark Current                  | $I_{CEO}$     | $V_{CE}=10\text{V}, 0\text{lx}$                           | —    | —    | 0.1  | $\mu\text{A}$ |
| 伝達特性<br>Coupled | 光電流 Light Current                 | $I_C$         | $V_{CE}=5\text{V}, I_F=20\text{mA}$                       | 0.5  | —    | —    | mA            |
|                 | コレクタ・エミッタ間飽和電圧 Saturation Voltage | $V_{CE(sat)}$ | $I_F=20\text{mA}, I_C=0.25\text{mA}$                      | —    | —    | 0.4  | V             |
|                 | 応答時間 Response Time                | 上昇 Rise Time  | $V_{CC}=5\text{V}, I_C=0.5\text{mA}, R_L=1\text{k}\Omega$ | —    | 15   | —    | $\mu\text{s}$ |
|                 |                                   | 下降 Fall Time  |                                                           | —    | 17   | —    |               |

\*\* :  $T_a=25^\circ\text{C}$  unless otherwise noted

# KI3744

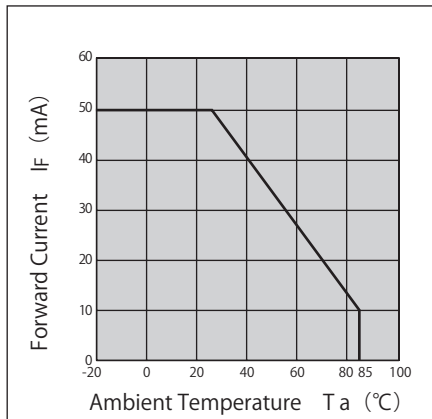
## 定格・特性曲線

Characteristics

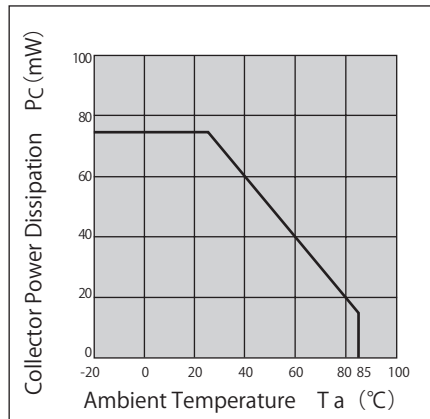
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

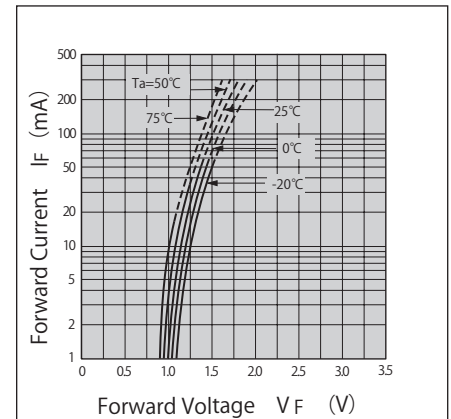
### 順電流低減曲線



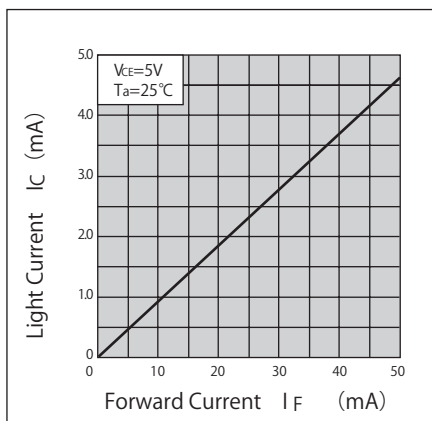
### コレクタ損失低減曲線



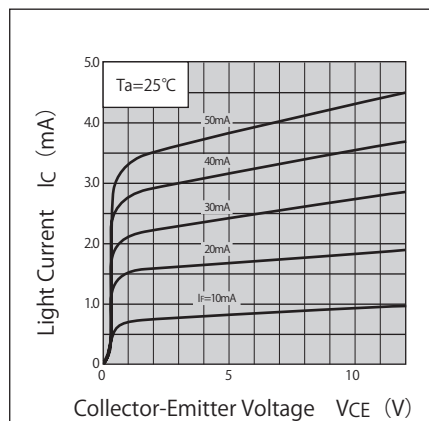
### 順電流一順電圧特性 (代表例)



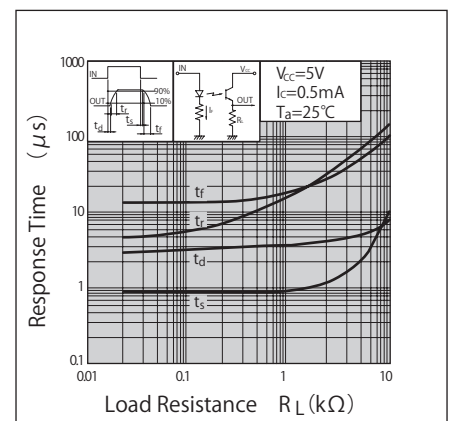
### 光電流一順電流特性 (代表例)



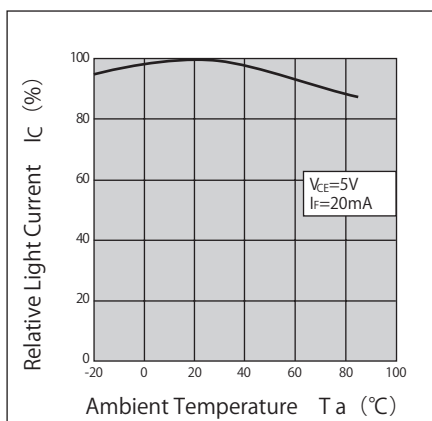
### 光電流一コレクタ・エミッタ間電圧 (代表例)



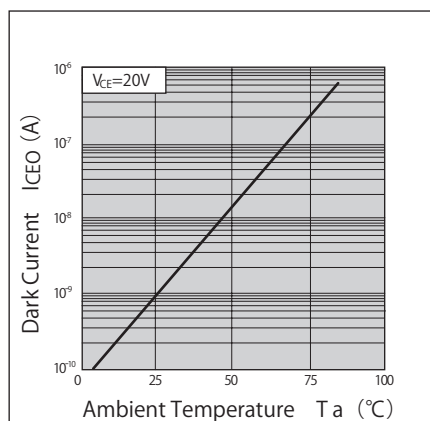
### 応答時間一負荷抵抗特性 (代表例)



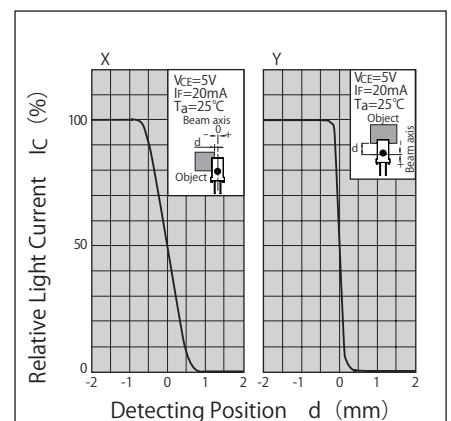
### 光電流一周囲温度特性 (代表例)



### 暗電流一周囲温度特性 (代表例)



### 検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3750/3751



透過型フォトセンサ Photo Interrupter



## 概要 Description

KI3750/3751 は、赤外発光ダイオードと受光素子にフォト IC(デジタル出力)を組合せた小型透過型フォトセンサです。

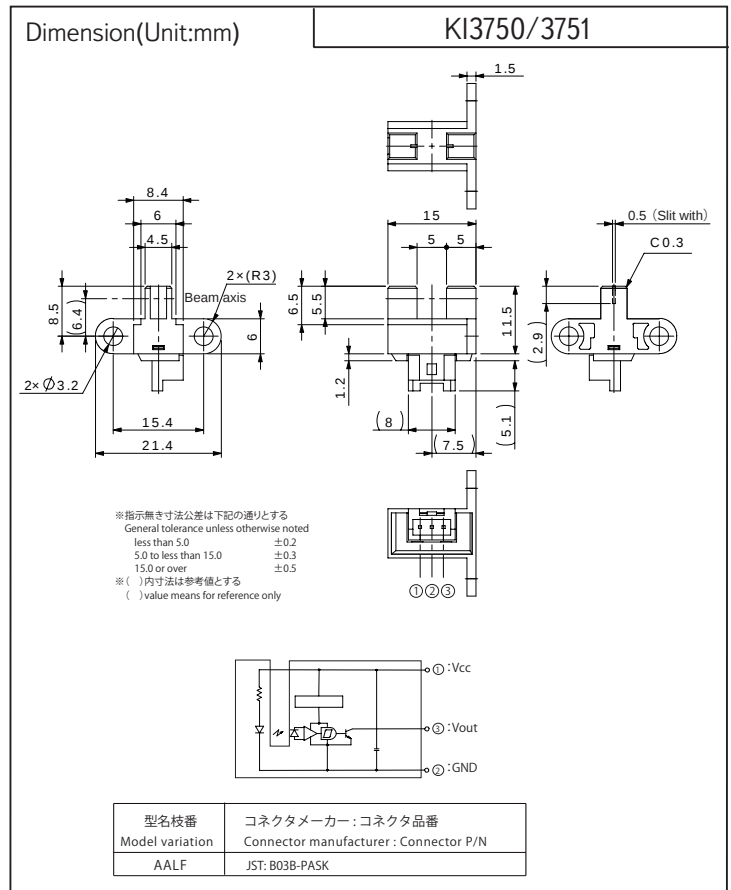
Model KI3750/3751 are compact size of Photo Interrupter and consist of an Infrared LED and a Photo IC.

## 特長 Feature

- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ 抜け防止強ロック機構付きコネクタ採用
- ・ Built-in amplifier, Open collector output type.
- ・ with secure locking structure connector.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の用紙通過検出
- ・ O.A.機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI3750 | High | 入光時 at Beam detecting |
| KI3751 | Low  | 入光時 at Beam detecting |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating      | Unit |
|------------------------------------|------------------|-------------|------|
|                                    |                  | KI3750/3751 |      |
| 電源電圧 Supply Voltage                | VCC              | 6           | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50          | mA   |
| 出力電圧 Output Voltage                | VO               | 28          | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75   | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80   | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                        | min.                        | typ.             | max.             | Unit |
|-------------------------------------|--------------|----------------------------------|-----------------------------|------------------|------------------|------|
|                                     |              |                                  | KI3750<br>KI3751            | KI3750<br>KI3751 | KI3750<br>KI3751 |      |
| 動作電源電圧 Supply Voltage               | VCC          | —                                | 4.5                         | 5.0              | 5.5              | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI3750 遮光時 Shutter in            | —                           | —                | 25               | mA   |
|                                     |              | KI3751 入光時 w/o Shutter           | —                           | —                | 25               |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI3750 入光時 w/o Shutter           | —                           | —                | 25               | mA   |
|                                     |              | KI3751 遮光時 Shutter in            | —                           | —                | 25               |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI3750 遮光時, IOL=16mA Shutter in  | —                           | —                | 0.4              | V    |
|                                     |              | KI3751 入光時, IOL=16mA w/o Shutter | —                           | —                | 0.4              |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI3750 入光時, RL=47kΩ w/o Shutter  | VCC×0.9                     | —                | —                | V    |
|                                     |              | KI3751 遮光時, RL=47kΩ Shutter in   | VCC×0.9                     | —                | —                |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                               | KI3750 INPUT OUTPUT RL=15kΩ |                  | —                | μs   |
|                                     | 下降 Fall Time | tf                               | KI3751 INPUT OUTPUT RL=15kΩ |                  | 1.47             |      |

\*\* : Ta=25°C unless otherwise noted

# KI3750/3751

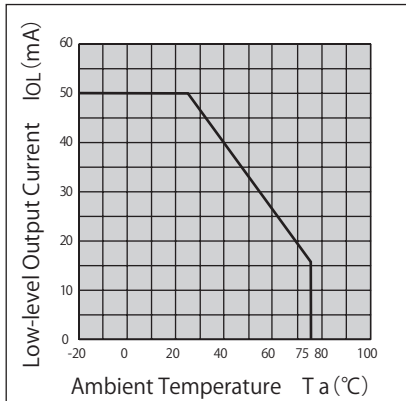
## 定格・特性曲線

Characteristics

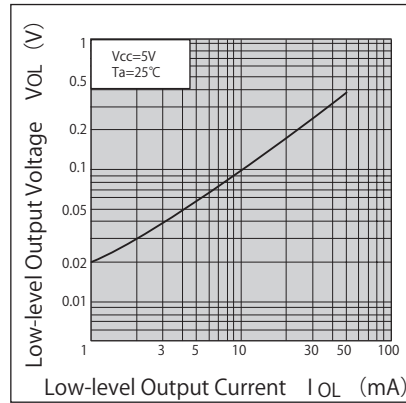
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

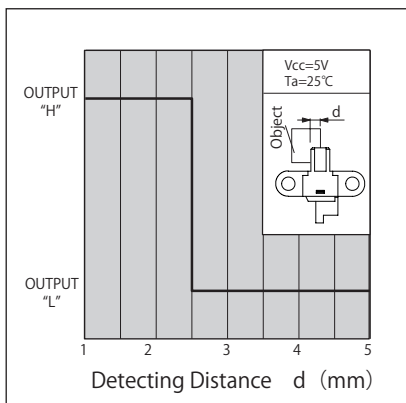
### ローレベル出力電流低減曲線



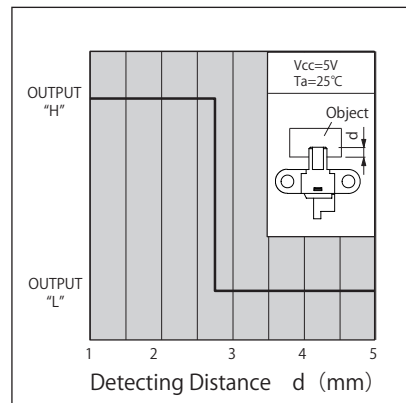
### ローレベル出力電圧ー ローレベル出力電流特性 (代表例)



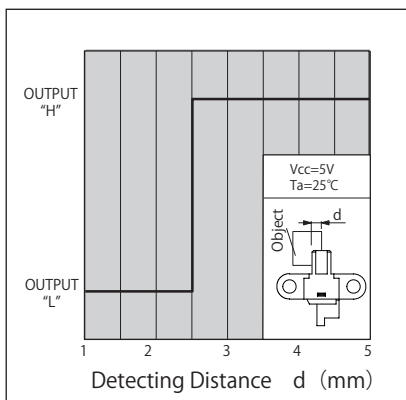
### 検出位置特性1 (代表例) KI3750



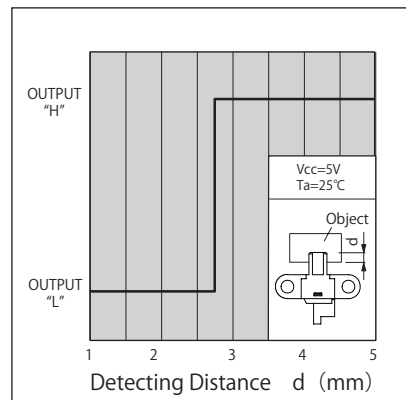
### 検出位置特性2 (代表例) KI3750



### 検出位置特性1 (代表例) KI3751



### 検出位置特性2 (代表例) KI3751



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- ・ Specifications are subject to change without notice.

## KI3780/3781



透過型フォトセンサ スナップインタイプ Photo Interrupter - Snap-in type



## 概要 Description

KI3780/3781 は、発光側に赤外発光ダイオード、受光側にフォト IC (デジタル出力) を組合わせた透過型フォトセンサです。

Model KI3780/KI3781 consist of an Infrared LED and a High sensitive Photo IC(Digital Output).

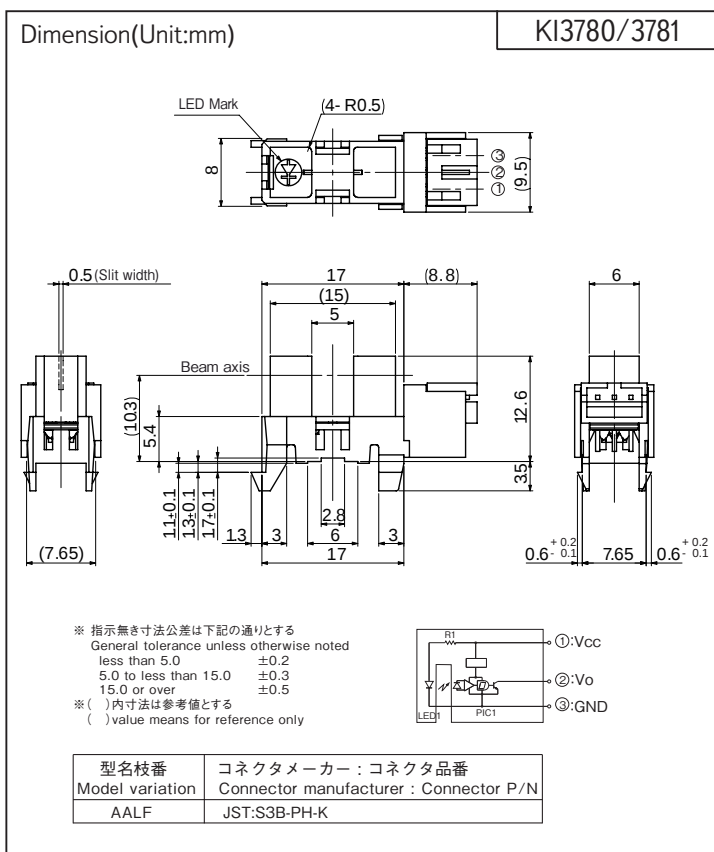
## 特長 Feature

- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ LED 制限抵抗内蔵タイプ
- ・ Built-in amplifier, Open collector output type
- ・ High-resolution : slit width 0.5mm (Detector side)
- ・ Built in resistor for LED drive

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ O.A 機器、その他

- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI3780 | High | 入光時 at Beam detecting |
| KI3781 | Low  | 入光時 at Beam detecting |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI3780 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI3781 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI3780 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI3781 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI3780 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI3781 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI3780 入光時、RL=47kΩ w/o Shutter  | VCC×0.9 | —    | —    | V    |
|                                     |              | KI3781 遮光時、RL=47kΩ Shutter in   | VCC×0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                              | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time | tf                              | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI3780/3781

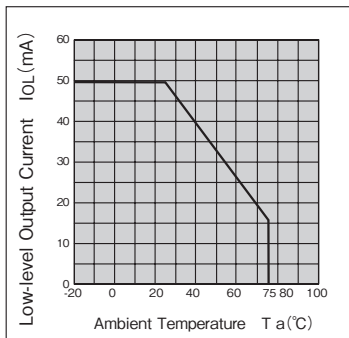
## 定格・特性曲線

Characteristics

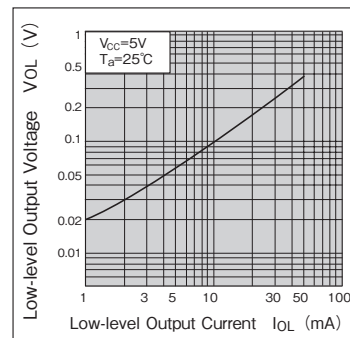
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

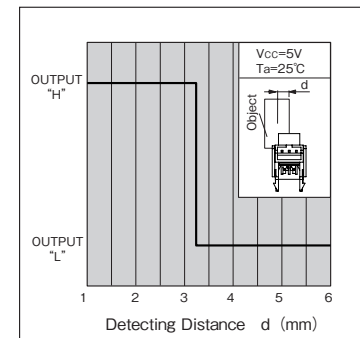
ローレベル出力電流低減曲線



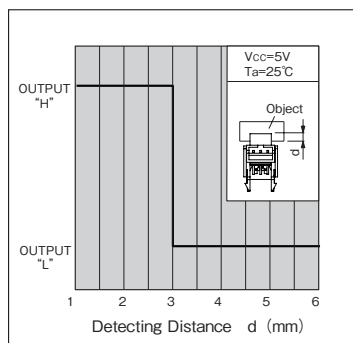
ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)



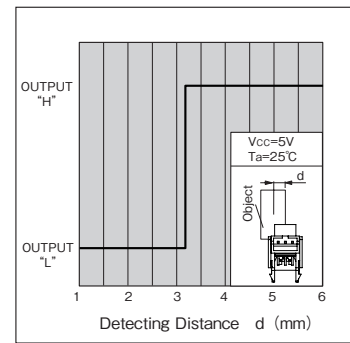
検出位置特性1 (代表特性) KI3780



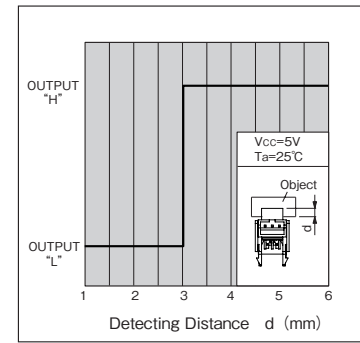
検出位置特性2 (代表特性) KI3780



検出位置特性1 (代表特性) KI3781

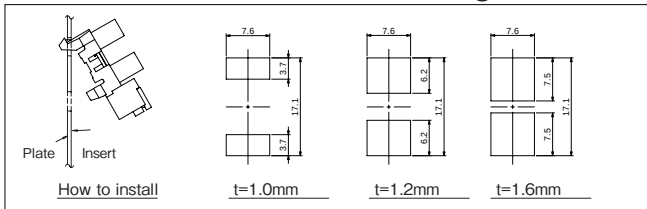


検出位置特性2 (代表特性) KI3781



## 推奨取付穴寸法図

Recommended installation to mounting holes



- ・取付板のプレス側から取付けを推奨します。
- ・We recommend to mount the sensor from pressed surface of plate.
- ・実際に取り付けてガタツキ度合いをご確認され取り付け方法を決定下さい。
- ・The actual tolerance should be confirmed after setting of sensor

- ・カスタマイズも承ります。お気軽にお問合せください
- ・この仕様は改良のため予告なく変更する場合があります
- ・A Customized design available on request.
- ・Specifications are subject to change without notice.

## KI3890



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

KI3890は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した防塵タイプ透過型フォトセンサです。

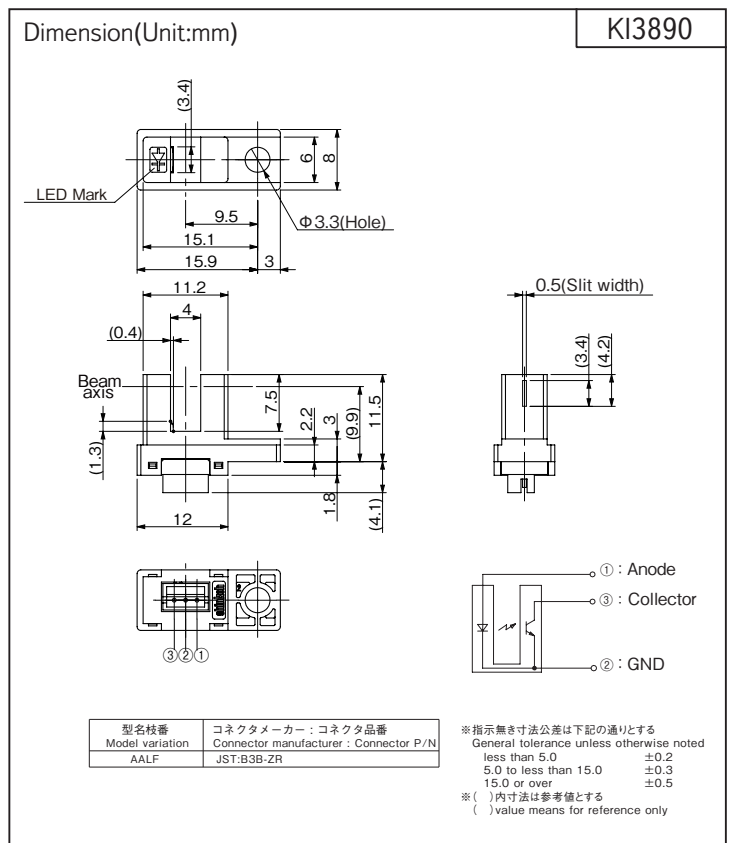
Model KI3890 consists of an Infrared LED and a High sensitive Photo transistor. Outer package has no aperture on the both light pass surfaces of the emitter and detector.

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：内蔵スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ Easy removing paper dust.
- ・ High-resolution : slit width 0.5mm.
- ・ Visible Light cut filter.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                        |                                        | Symbol           | Rating    | Unit |
|-----------------------------|----------------------------------------|------------------|-----------|------|
| 発光側<br>Emitter              | 順電流 Forward Current                    | IF               | 50        | mA   |
|                             | パルス順電流 Pulse Forward Current ※1        | IFP              | 1         | A    |
|                             | 逆電圧 Reverse Voltage                    | VR               | 5         | V    |
|                             | 許容損失 Power Dissipation                 | P                | 75        | mW   |
| 受光側<br>Detector             | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 30        | V    |
|                             | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 5         | V    |
|                             | コレクタ電流 Collector Current               | IC               | 20        | mA   |
|                             | コレクタ損失 Collector Power Dissipation     | PC               | 75        | mW   |
| 動作温度度 Operating Temperature |                                        | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度度 Storage Temperature   |                                        | T <sub>stg</sub> | -30 ~ +80 | °C   |

※1. パルス幅  $t_w \leq 100\mu s$  Duty比=0.01  
 ※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                   | Symbol               | Condition                                                       | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|----------------------|-----------------------------------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | V <sub>F</sub>       | I <sub>F</sub> =20mA                                            | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | I <sub>R</sub>       | V <sub>R</sub> =3V                                              | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | I <sub>CEO</sub>     | V <sub>CE</sub> =20V, 0 lx                                      | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流 Light Current                 | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                       | 0.5  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =20mA, I <sub>C</sub> =0.25mA                    | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                | 上昇 Rise Time         | V <sub>CC</sub> =5V, I <sub>C</sub> =0.1mA, R <sub>L</sub> =1kΩ | —    | 50   | —    | μs   |
|                 |                                   | 下降 Fall Time         |                                                                 | —    | 50   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI3890

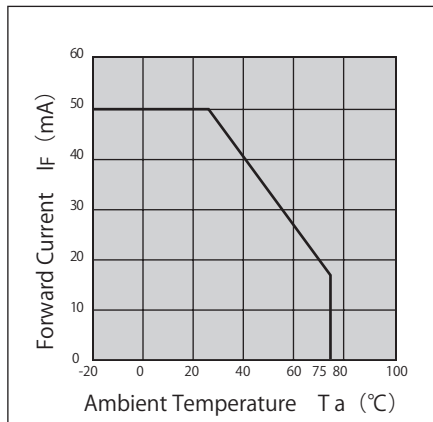
## 定格・特性曲線

Characteristics

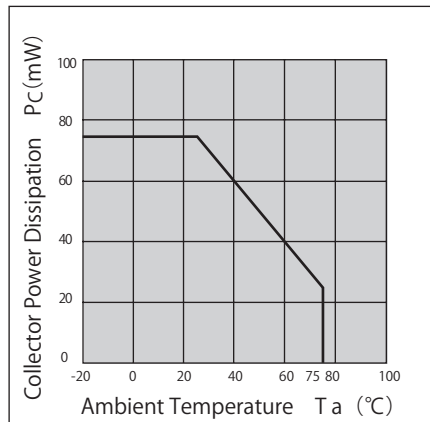
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

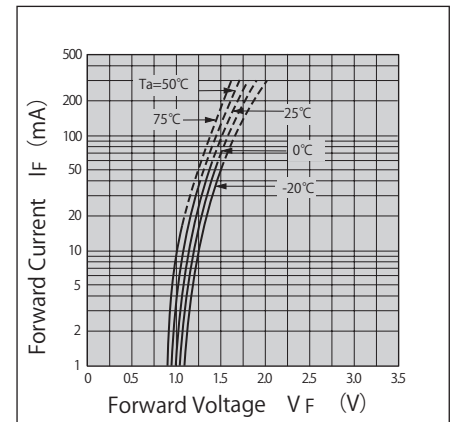
### 順電流低減曲線



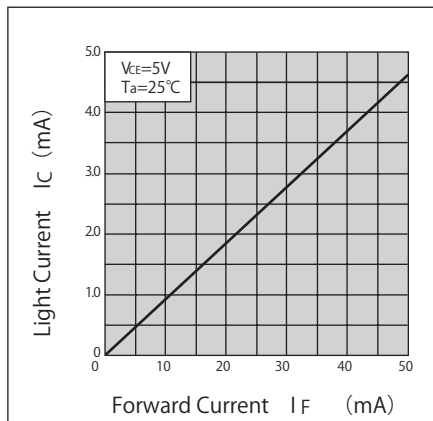
### コレクタ損失低減曲線



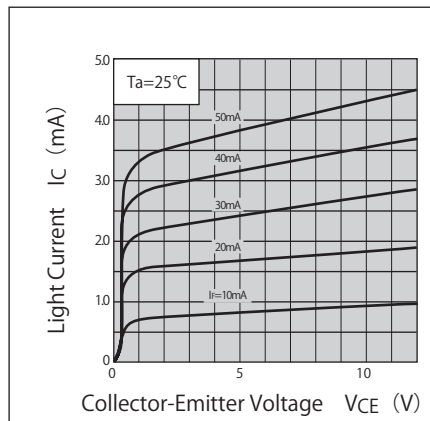
### 順電流－順電圧曲線 (代表例)



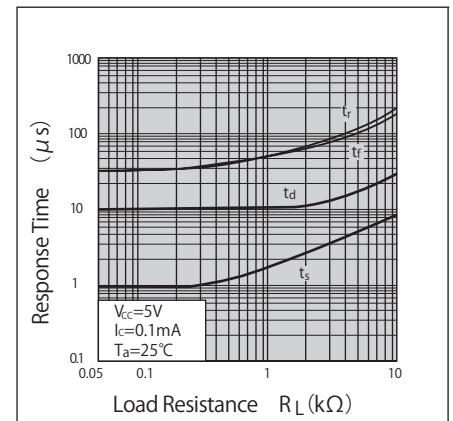
### 光電流－順電流特性 (代表例)



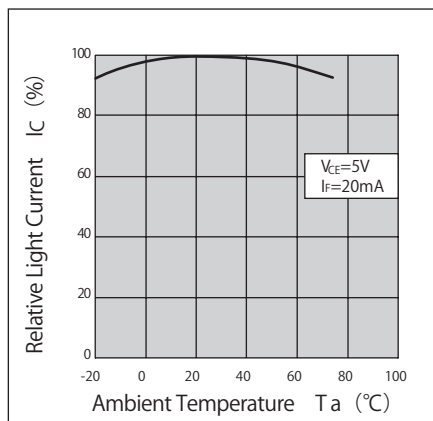
### 光電流－コレクタ・エミッタ間電圧特性 (代表例)



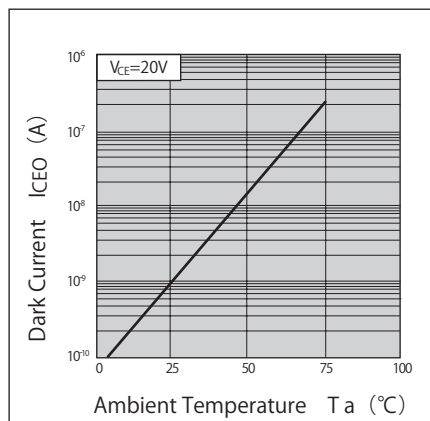
### 応答時間－負荷抵抗特性 (代表例)



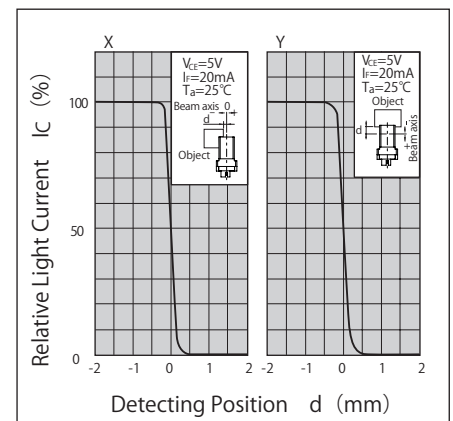
### 光電流－周囲温度特性 (代表例)



### 暗電流－周囲温度特性 (代表例)



### 検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3940



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

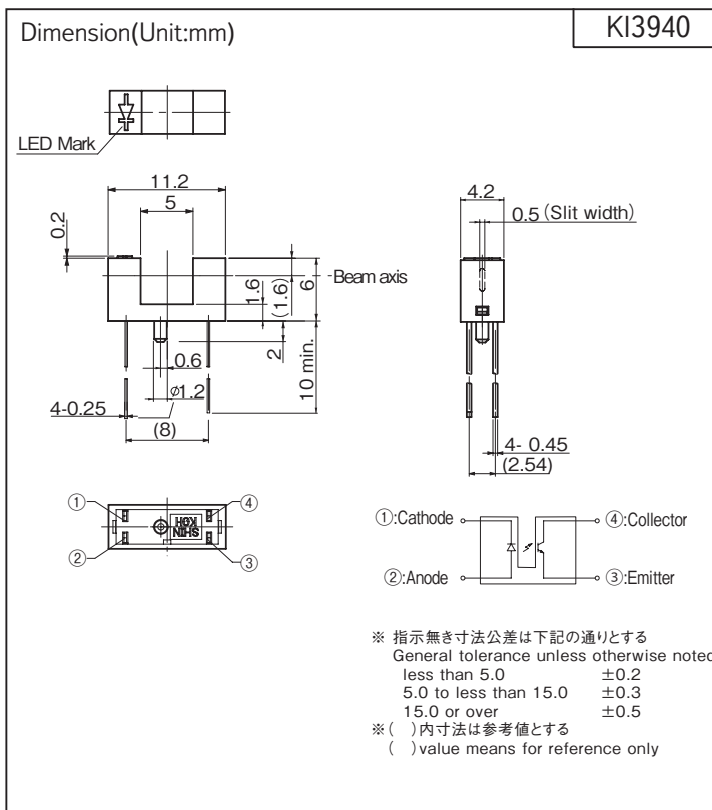
KI3940 は、外側にケースカバー、内側に検出用スリットを持つ2重構造の防塵タイプの小型透過型フォトセンサです。  
Model KI3940 consist of an Infrared LED and a High sensitive Photo transistor. These sensors have slitless plastic housing.

## 特長 Feature

- ・ 小型タイプ
- ・ ローコスト
- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：内蔵スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ Compact Package
- ・ Low Cost
- ・ Easy removing paper dust.
- ・ High resolution: slit width 0.5mm.
- ・ Visible Light cut filter.

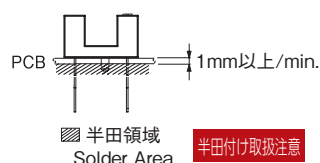
## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ O.A機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol                                  | Rating    | Unit  |
|------------------------------------|-----------------------------------------|-----------|-------|
| 発 光 側<br>Emitter                   | 順 電 流 Forward Current                   | IF        | 50 mA |
|                                    | パ ル ス 順 電 流 Pulse Forward Current ※1    | IFP       | 1 A   |
|                                    | 逆 電 圧 Reverse Voltage                   | VR        | 5 V   |
|                                    | 許 容 損 失 Power Dissipation               | P         | 75 mW |
| 受 光 側<br>Detector                  | コレクタ・エミッタ間電圧 Collector-Emitter Voltage  | VCEO      | 30 V  |
|                                    | エミッタ・コレクタ間電圧 Emitter-Collector Voltage  | VECO      | 5 V   |
|                                    | コ レ ク タ 電 流 Collector Current           | IC        | 20 mA |
|                                    | コ レ ク タ 損 失 Collector Power Dissipation | Pc        | 75 mW |
| 動 作 温 度 Operating Temperature      | T <sub>opr</sub>                        | -20 ~ +85 | °C    |
| 保 存 温 度 Storage Temperature        | T <sub>stg</sub>                        | -30 ~ +85 | °C    |
| 半 田 付 温 度 Soldering Temperature ※2 | T <sub>sol</sub>                        | 330       | °C    |



- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比=0.01  
 ※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照)  
 手半田付けのみ可 (フロー半田付け不可)
- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01  
 ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item               | Symbol                                              | Condition    | min. | typ. | max. | Unit |
|--------------------|-----------------------------------------------------|--------------|------|------|------|------|
| 発 光 側<br>Emitter   | 順 電 圧 Forward Voltage                               | VF           | —    | 1.2  | 1.5  | V    |
|                    | 逆 電 流 Reverse Current                               | IR           | —    | —    | 10   | μA   |
| 受 光 側<br>Detector  | 暗 電 流 Dark Current                                  | ICEO         | —    | —    | 0.1  | μA   |
| 伝 達 特 性<br>Coupled | 光 電 流 Light Current                                 | IC           | 0.1  | —    | —    | mA   |
|                    | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat)     | —    | —    | 0.4  | V    |
|                    | 応 答 時 間 Response Time                               | 上昇 Rise Time | tr   | —    | 14   | μs   |
|                    |                                                     | 下降 Fall Time | tf   | —    | 14   | μs   |

\*\* : Ta=25°C unless otherwise noted

# KI3940

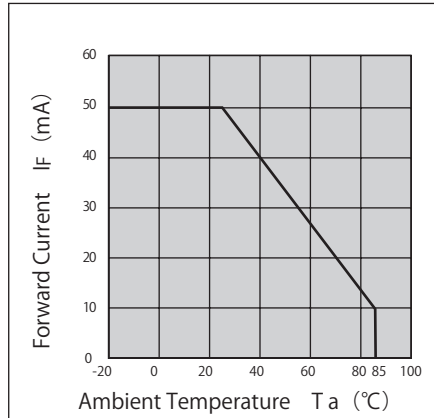
## 定格・特性曲線

Characteristics

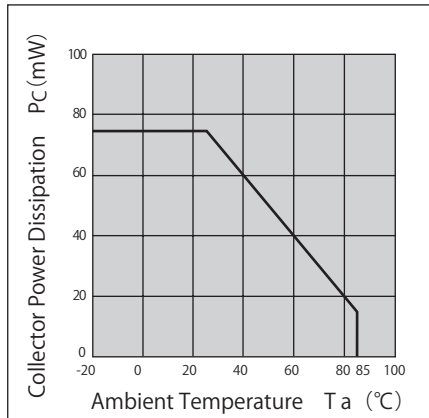
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

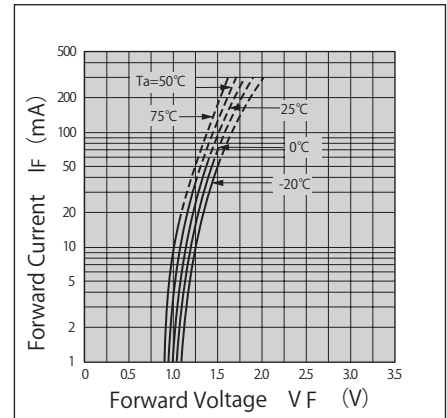
### 順電流低減曲線



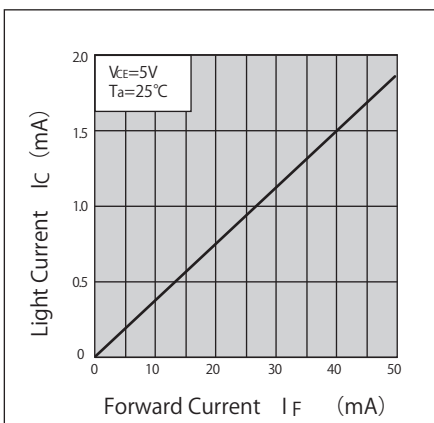
### コレクタ損失低減曲線



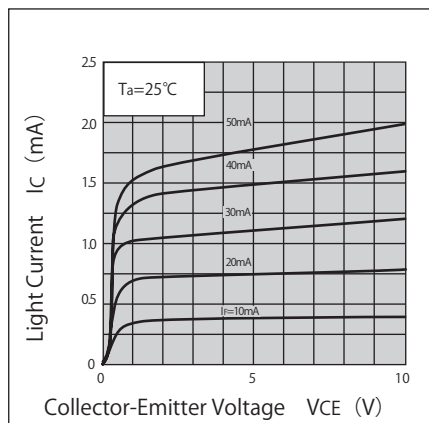
### 順電流一順電圧曲線 (代表例)



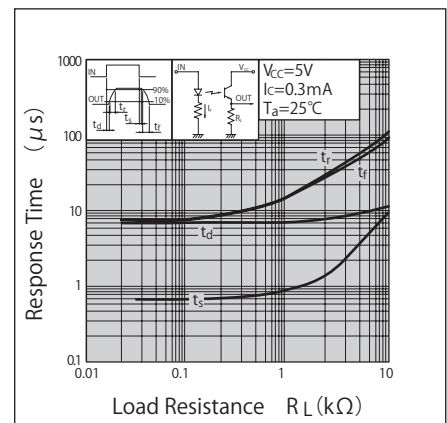
### 光電流一順電流特性 (代表例)



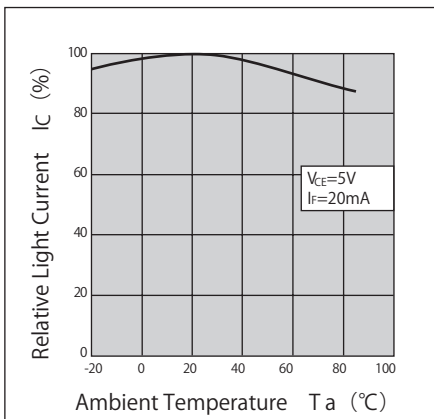
### 光電流一コレクタ・エミッタ間電圧特性 (代表例)



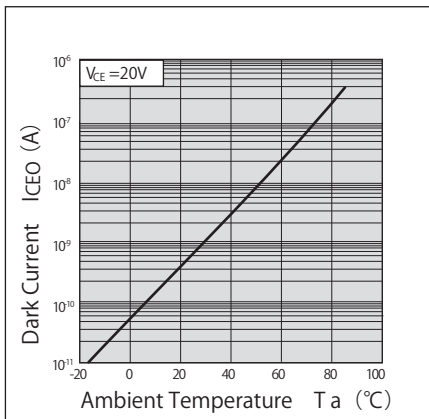
### 応答時間一負荷抵抗特性 (代表例)



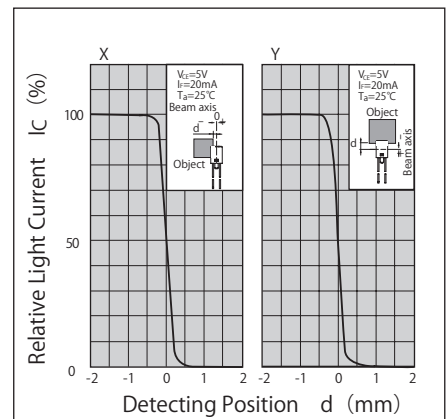
### 光電流一周囲温度特性 (代表例)



### 暗電流一周囲温度特性 (代表例)



### 検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3990/3991



透過型フォトセンサ

Photo Interrupter



## 概要 Description

KI3990/3991 は、発光側に赤外発光ダイオード、受光側にフォト IC 出力を採用した透過型フォトセンサです。

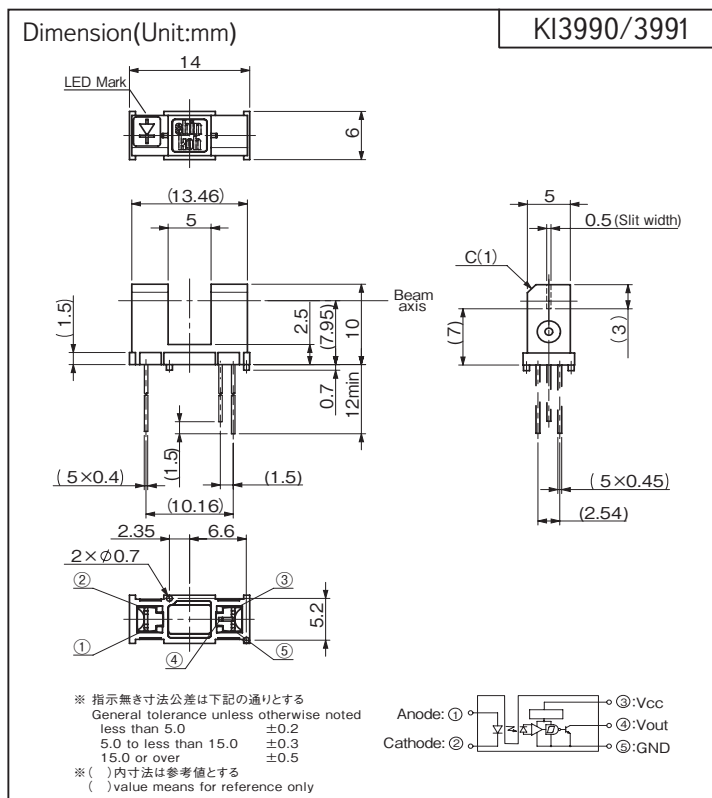
Model KI3990/3991 consist of an Infrared LED and a High sensitive Photo IC(Digital Output).

## 特長 Feature

- ・ フロー半田付け対応
- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ その他シリーズ  
フォトトランジスタタイプ・・・KI3994
- ・ Suitable for flow soldering.
- ・ Built-in amplifier, Open Collector output type.
- ・ The other model; Phototransistor type・・・KI3994

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI3990 | High | 入光時 at Beam detecting |
| KI3991 | Low  | 入光時 at Beam detecting |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

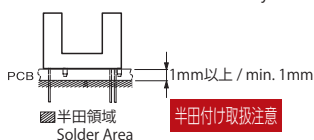
| Item                           | Symbol                             | Rating    | Unit   |
|--------------------------------|------------------------------------|-----------|--------|
| 発光側<br>Emitter                 | 順電流 Forward Current                | IF        | 50 mA  |
|                                | パルス順電流 Pulse Forward Current ※1    | IFP       | 1 A    |
|                                | 逆電圧 Reverse Voltage                | VR        | 5 V    |
| 受光側<br>Detector                | 電源電圧 Supply Voltage                | VCC       | 17 V   |
|                                | ローレベル出力電流 Low-Level Output Current | IOL       | 16 mA  |
|                                | 出力許容損失 Output Power Dissipation    | Po        | 175 mW |
| 動作温度 Operating Temperature     | T <sub>opr</sub>                   | -20 ~ +85 | °C     |
| 保存温度 Storage Temperature       | T <sub>stg</sub>                   | -30 ~ +85 | °C     |
| 半田付温度 Soldering Temperature ※2 | T <sub>sol</sub>                   | 330       | °C     |

## &lt; ご使用上の注意 &gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with min. 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.



- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
 ※ 2. 手半田の場合: パッケージ下面より 1mm 以上の位置で 2 秒以内。  
 フロー半田の場合: 260°C 以下。パッケージ下面より 1mm 以上の位置で 5 秒以内 (上図参照)

- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01  
 ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering should be less than 5s. at 1mm over from body at 260 degree C or less.

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*] ( ) = KI3991

| Item            | Symbol                                | Condition             | min.                     | typ.       | max.    | Unit |
|-----------------|---------------------------------------|-----------------------|--------------------------|------------|---------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage                   | VF                    | IF=20mA                  |            | —       | V    |
|                 | 逆電流 Reverse Current                   | IR                    | VR=3V                    |            | —       | μA   |
| 受光側<br>Detector | ローレベル出力電圧 Low-Level Output Voltage    | VOL                   | IOL=16mA, IF=0 (IF=15mA) |            | —       | V    |
|                 | ハイレベル出力電圧 High-Level Output Voltage   | VOH                   | RL=47kΩ, IF=15mA (IF=0)  |            | VCC×0.9 | V    |
|                 | ローレベル供給電流 Low-Level Supply Current    | ICCL                  | VCC=5V, IF=0 (IF=15mA)   |            | —       | mA   |
|                 | ハイレベル供給電流 High-Level Supply Current   | ICCH                  | VCC=5V, IF=15mA (IF=0)   |            | —       | mA   |
| 伝達特性<br>Coupled | スレッシュホールド入力電流 Threshold Input Current | IFLH                  | KI3990                   | Low → High | VCC=5V  | mA   |
|                 |                                       | IFHL                  | KI3991                   | High → Low |         |      |
|                 | ヒステリシス Hysteresis                     | IFHL/IFLH (IFHL/IFLH) | VCC=5V                   |            | —       | —    |
|                 | 応答時間 Response Time                    | 上昇 Rise Time          | VCC=5V, IF=20mA, RL=280Ω |            | —       | μs   |
|                 |                                       | 下降 Fall Time          |                          |            | —       |      |

\*\* : Ta=25°C unless otherwise noted

# KI3990/3991

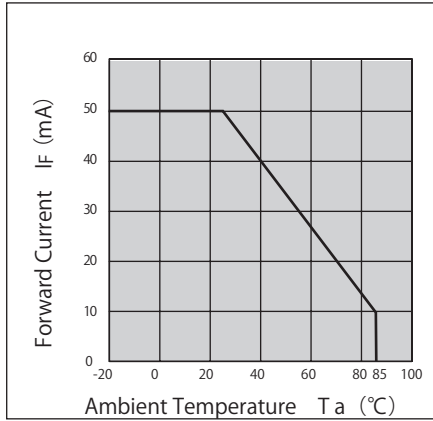
## 定格・特性曲線

Characteristics

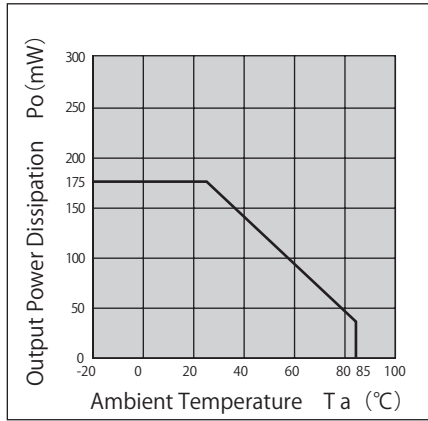
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

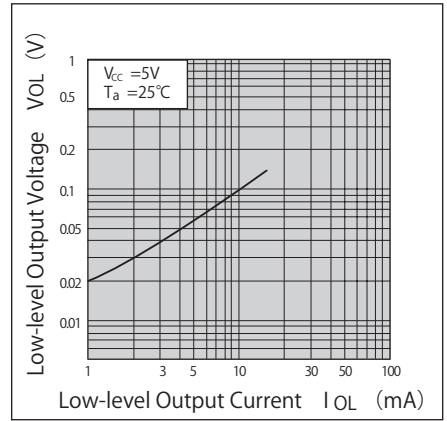
### 順電流低減曲線



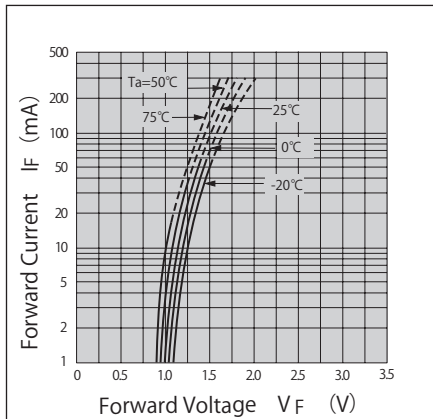
### 出力許容損失低減曲線



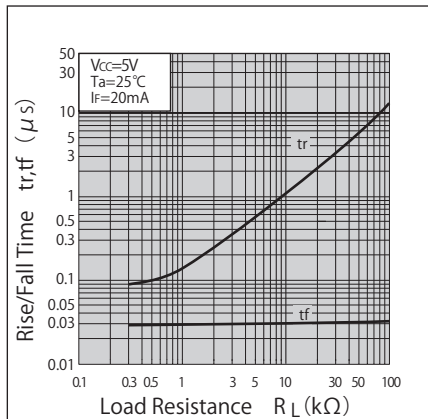
### ローレベル出力電圧ー ローレベル出力電流特性(代表例)



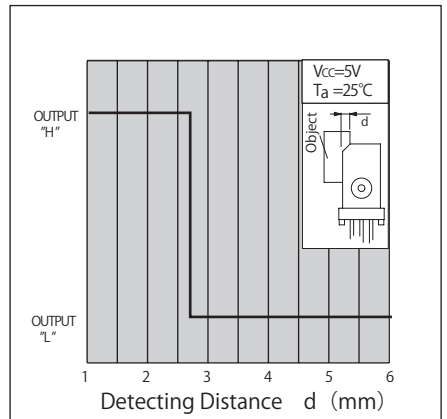
### 順電流ー順電圧曲線(代表例)



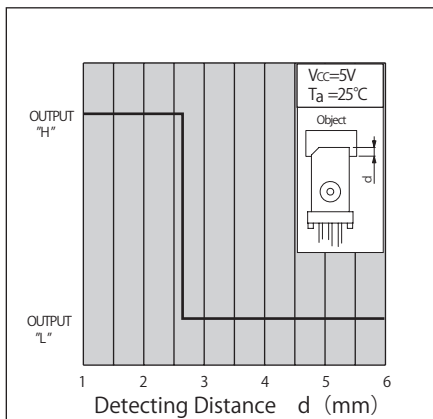
### 上昇、下降時間ー負荷抵抗特性(代表例)



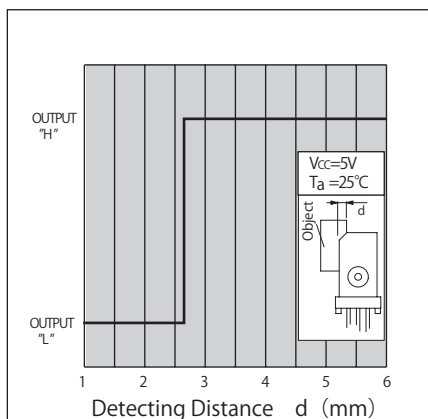
### 検出位置特性1(代表例) KI3990



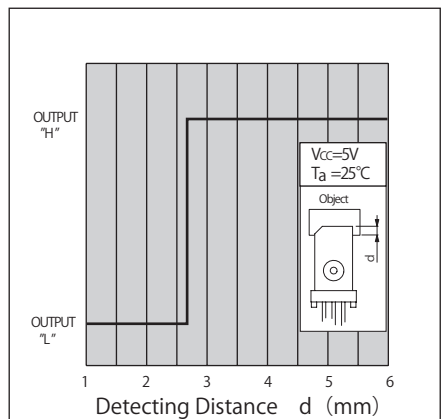
### 検出位置特性2(代表例) KI3990



### 検出位置特性1(代表例) KI3991



### 検出位置特性2(代表例) KI3991



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI3994



透過型フォトセンサ

Photo Interrupter



## 概要 Description

KI3994 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した透過型フォトセンサです。

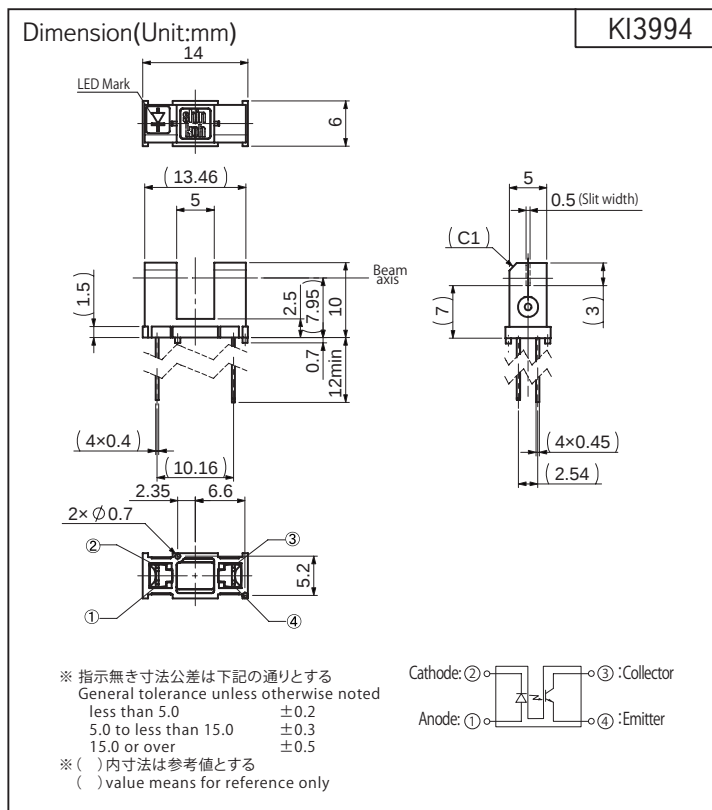
Model KI3994 consists of an Infrared LED and a High sensitive Photo transistor.

## 特長 Feature

- ・ フロー半田付け対応
- ・ その他シリーズ  
フォト IC 出力タイプ・・・KI3990/3991
- ・ Suitable for flow soldering.
- ・ The other model;  
Photo IC output type・・・KI3990/KI3991

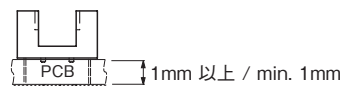
## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Paper detection for O.A. equipment



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                           | Symbol                                 | Rating    | Unit  |
|--------------------------------|----------------------------------------|-----------|-------|
| 発光側<br>Emitter                 | 順電流 Forward Current                    | IF        | 50 mA |
|                                | パルス順電流 Pulse Forward Current ※1        | IFP       | 1 A   |
|                                | 逆電圧 Reverse Voltage                    | VR        | 5 V   |
|                                | 許容損失 Power Dissipation                 | P         | 75 mW |
| 受光側<br>Detector                | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO      | 30 V  |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO      | 5 V   |
|                                | コレクタ電流 Collector Current               | IC        | 20 mA |
|                                | コレクタ損失 Collector Power Dissipation     | Pc        | 75 mW |
| 動作温度 Operating Temperature     | Topr                                   | -20 ~ +85 | °C    |
| 保存温度 Storage Temperature       | Tstg                                   | -30 ~ +85 | °C    |
| 半田付温度 Soldering Temperature ※2 | Tsol                                   | 330       | °C    |



半田領域 Solder Area 半田付け取扱注意

- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
 ※ 2. 手半田の場合：パッケージ下面より 1mm 以上の位で 2 秒以内。  
 フロー半田の場合：260°C 以下。パッケージ下面より 1mm 以上の位置で 5 秒以内（上図参照）
- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01  
 ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering should be less than 5s. at 1mm over from body at 260 degree C or less.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            | Symbol                            | Condition          | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|--------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | IF=20mA            | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | VR=3V              | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | VCE=10V, 0 lx      | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流 Light Current                 | VCE=5V, IF=20mA    | 0.5  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Saturation Voltage | IF=20mA, IC=0.25mA | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                | 上昇 Rise Time       | tr   | 15   | —    | μs   |
|                 |                                   | 下降 Fall Time       | tf   | 17   | —    | μs   |

\*\* : Ta=25°C unless otherwise noted

# KI3994

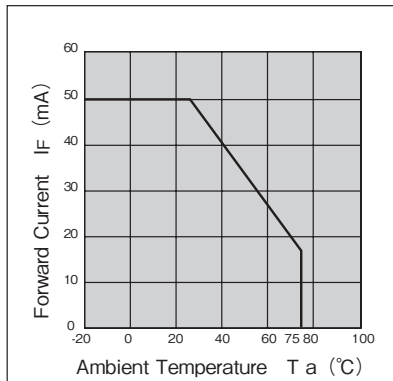
## 定格・特性曲線

Characteristics

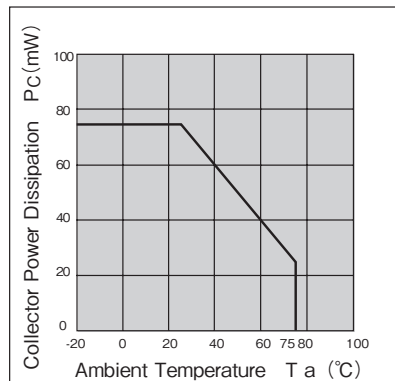
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

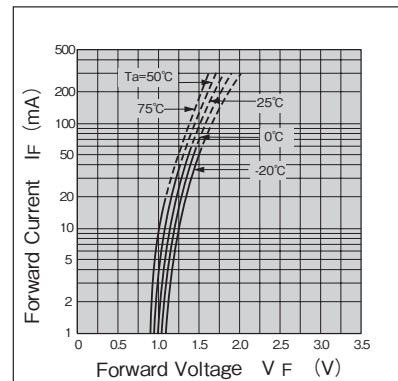
### 順電流低減曲線



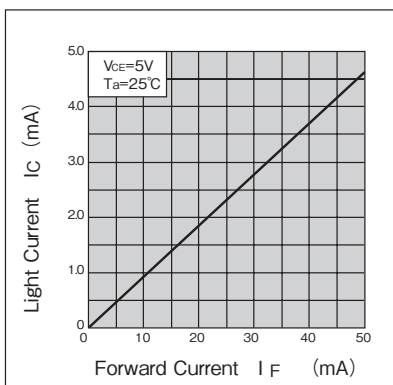
### コレクタ損失低減曲線



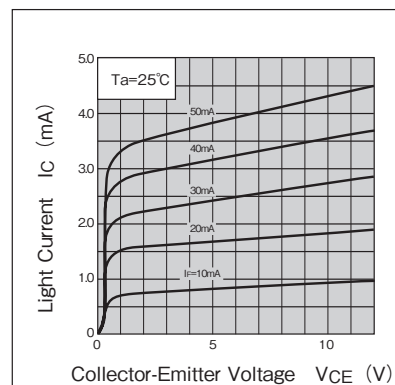
### 順電流－順電圧曲線 (代表例)



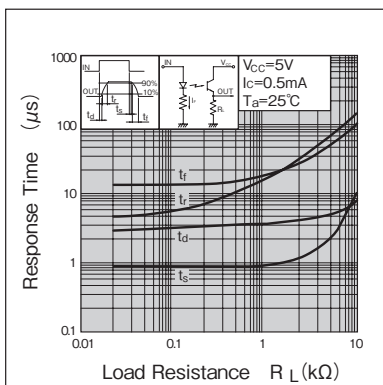
### 光電流－順電流特性 (代表例)



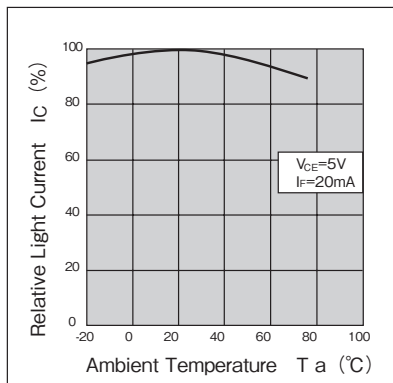
### 光電流－コレクタ・エミッタ間電圧 (代表例)



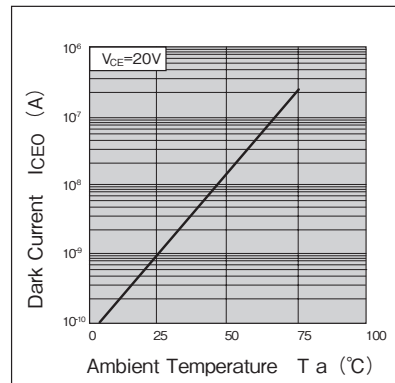
### 応答時間－負荷抵抗特性 (代表例)



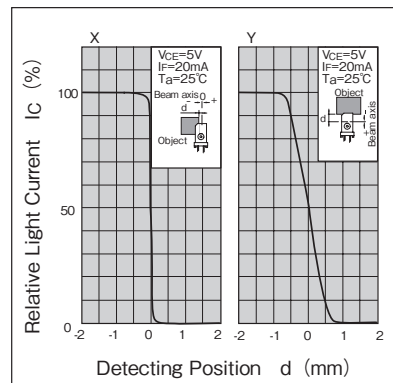
### 光電流－周囲温度特性 (代表例)



### 暗電流－周囲温度特性 (代表例)



### 検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

# KI5110/5111



透過型フォトセンサ    Photo Interrupter



概要    Description

KI5110/5111 は、フォト IC 出力の小型透過型フォトセンサです。  
Model KI5110/5111 are compact size of Photo Interrupter and consist of an Infrared LED and a Photo IC.

特長    Feature

- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ LED 制限抵抗内蔵タイプ
- ・ Built-in amplifier, Open collector output type.
- ・ Built in resistor for LED drive.

用途    Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の用紙通過検出
- ・ O A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.

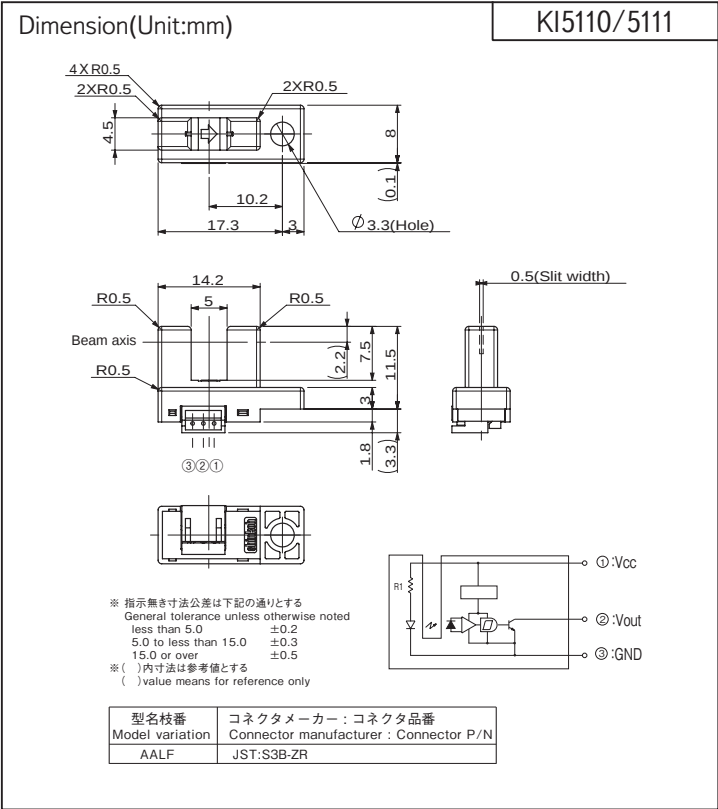
最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                                          | Symbol | Rating    | Unit |
|-----------------------------------------------|--------|-----------|------|
| 電 源 電 圧    Supply Voltage                     | VCC    | 6         | V    |
| ロ ー レ ベ ル 出 力 電 流    Low-Level Output Current | IOL    | 50        | mA   |
| 出 力 電 圧    Output Voltage                     | VO     | 28        | V    |
| 動 作 温 度    Operating Temperature              | Topr   | -20 ~ +75 | °C   |
| 保 存 温 度    Storage Temperature                | Tstg   | -40 ~ +80 | °C   |

電気的光学的特性 Electro-Optical Characteristics [Vcc=5V,Ta=25°C \*\*]

| Item                                           | Symbol          | Condition                               | min.    | typ. | max. | Unit |
|------------------------------------------------|-----------------|-----------------------------------------|---------|------|------|------|
| 動 作 電 源 電 圧    Supply Voltage                  | Vcc             | —                                       | 4.5     | 5.0  | 5.5  | V    |
| ロ ー レ ベ ル 供 給 電 流    Low-Level Supply Current  | ICCL            | KI5110    遮光時    Shutter in             | —       | —    | 25   | mA   |
|                                                |                 | KI5111    入光時    w/o Shutter            | —       | —    | 25   |      |
| ハ イ レ ベ ル 供 給 電 流    High-Level Supply Current | ICCH            | KI5110    入光時    w/o Shutter            | —       | —    | 25   | mA   |
|                                                |                 | KI5111    遮光時    Shutter in             | —       | —    | 25   |      |
| ロ ー レ ベ ル 出 力 電 圧    Low-Level Output Voltage  | VOL             | KI5110    遮光時、IOL=16mA    Shutter in    | —       | —    | 0.4  | V    |
|                                                |                 | KI5111    入光時、IOL=16mA    w/o Shutter   | —       | —    | 0.4  |      |
| ハ イ レ ベ ル 出 力 電 圧    High-Level Output Voltage | VOH             | KI5110    入光時、RL=47kΩ    w/o Shutter    | VCCx0.9 | —    | —    | V    |
|                                                |                 | KI5111    遮光時、RL=47kΩ    Shutter in     | VCCx0.9 | —    | —    |      |
| 応 答 時 間    Response Time                       | 上昇    Rise Time | RL=15kΩ    KI5110 INPUT    KI5111 INPUT | —       | 1.47 | —    | μs   |
|                                                | 下降    Fall Time |                                         | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI5110 | High | 入光時 at Beam detecting |
| KI5111 | Low  | 入光時 at Beam detecting |

< ご使用上の注意 >  
センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。  
<Operation Notice>  
We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

# KI5110/5111

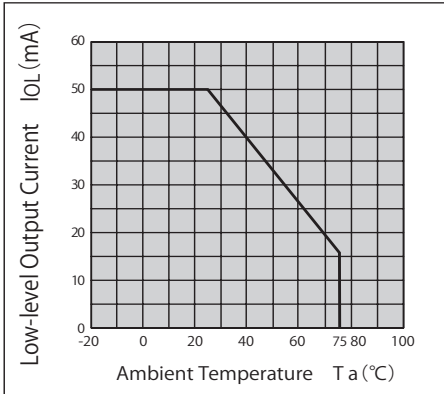
定格・特性曲線

Characteristics

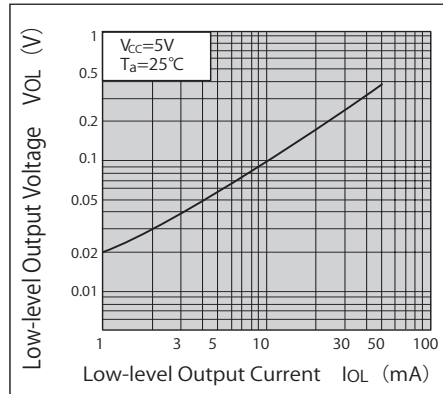
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

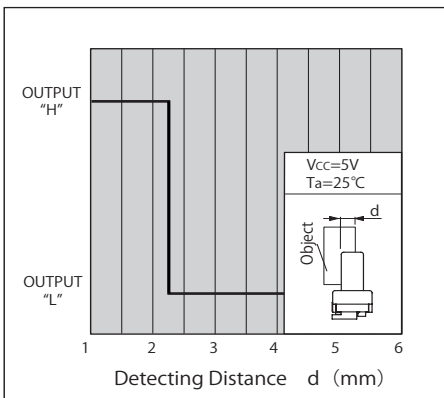
ローレベル出力電流低減曲線



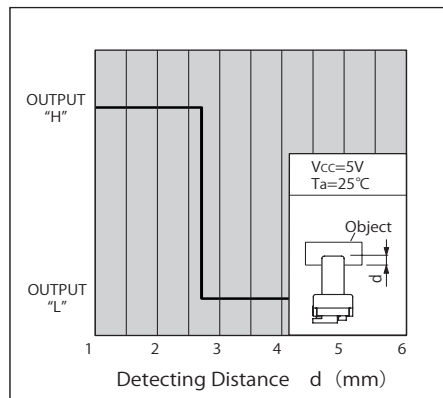
ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)



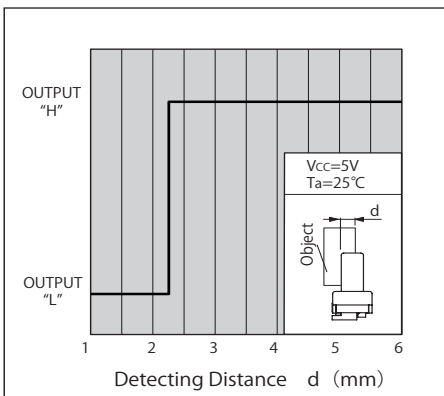
検出位置特性1 (代表例) KI5110



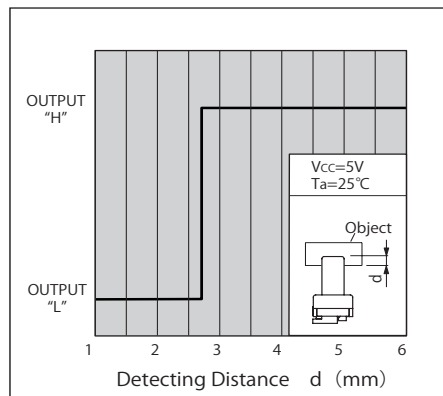
検出位置特性2 (代表例) KI5110



検出位置特性1 (代表例) KI5111



検出位置特性2 (代表例) KI5111

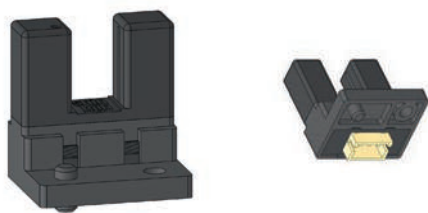


- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI5140/5141



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

KI5140/5141 は、防塵型のフォト IC 出力の小型透過型フォトセンサです。

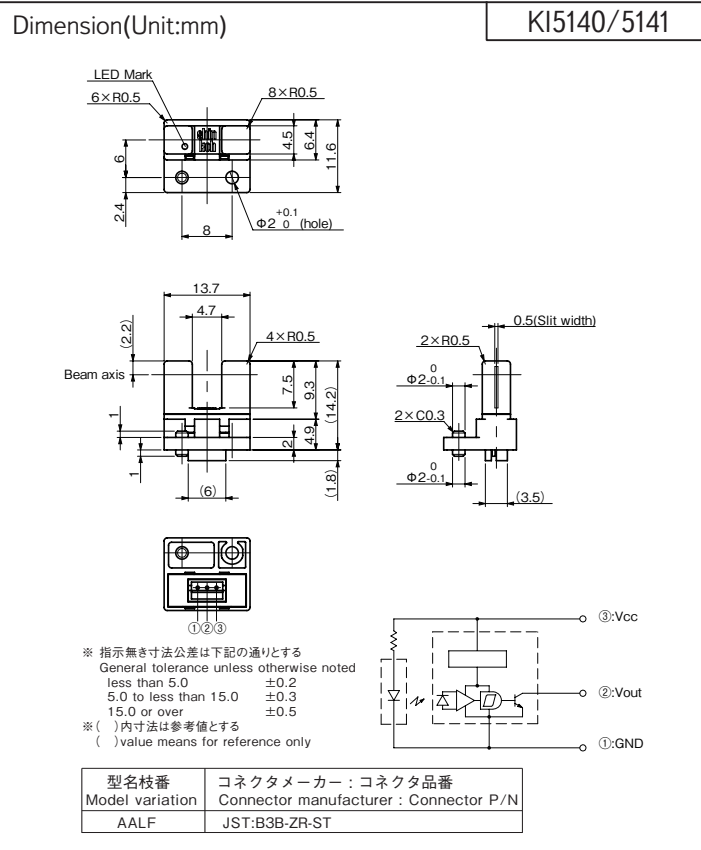
Model KI5140/5141 are compact size of Photo Interrupter and consist of an Infrared LED and a Photo IC. Outer package has no aperture on the both light pass surfaces of the emitter and detector.

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ LED 制限抵抗内蔵タイプ
- ・ Easy removing paper dust.
- ・ Visible Light cut filter.
- ・ Built-in amplifier, Open collector output type.
- ・ Built in resistor for LED drive.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の用紙通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI5140 | High | 入光時 at Beam detecting |
| KI5141 | Low  | 入光時 at Beam detecting |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

## &lt; ご使用上の注意 &gt;

センサ近くの VCC-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt; Operation Notice &gt;

We recommend to use with min. 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | Vcc          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI5140 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI5141 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI5140 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI5141 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI5140 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI5141 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI5140 入光時、RL=47kΩ w/o Shutter  | VCC×0.9 | —    | —    | V    |
|                                     |              | KI5141 遮光時、RL=47kΩ Shutter in   | VCC×0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | RL=15kΩ<br>KI5140<br>KI5141     | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time |                                 | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI5140/5141

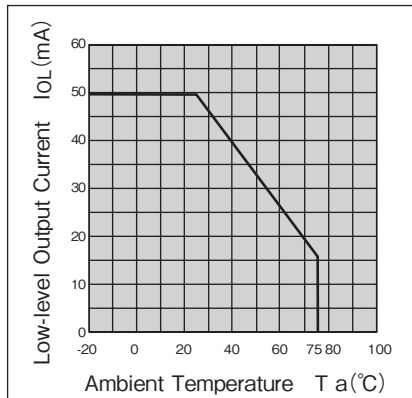
定格・特性曲線

Characteristics

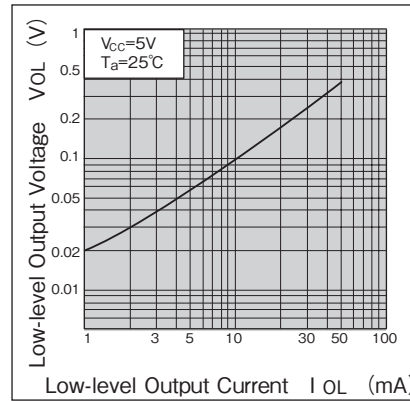
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

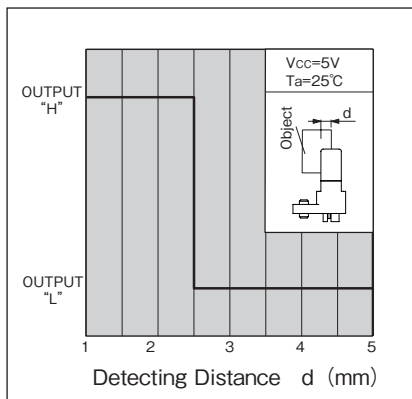
ローレベル出力電流低減曲線



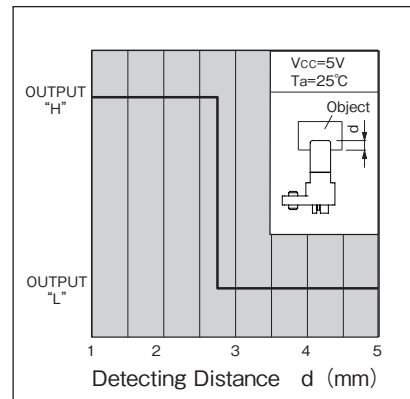
ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)



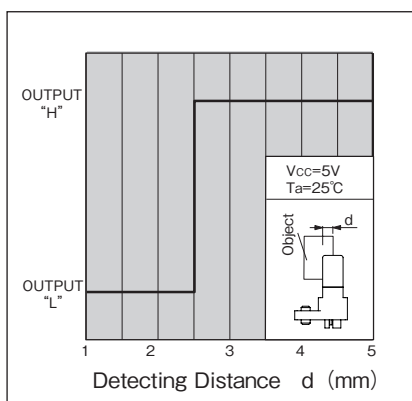
検出位置特性 1 (代表例) KI5140



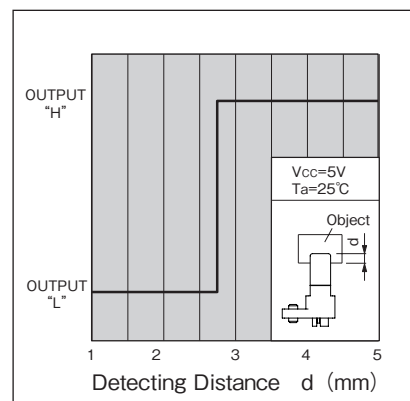
検出位置特性 2 (代表例) KI5140



検出位置特性 1 (代表例) KI5141



検出位置特性 2 (代表例) KI5141

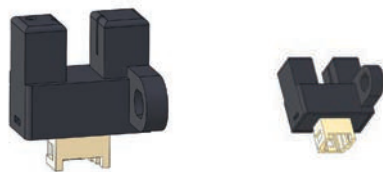


- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI5220/5221



透過型フォトセンサ Photo Interrupter



## 概要 Description

KI5220/5221 は、フォト IC 出力の小型透過型フォトセンサです。

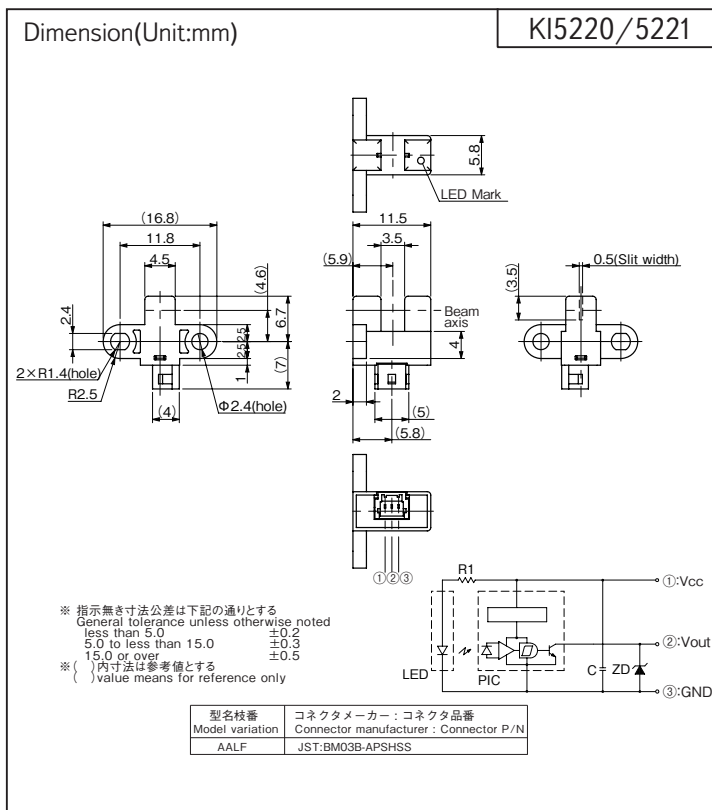
Model KI5220/5221 are compact size of Photo Interrupter and consist of an Infrared LED and a Photo IC.

## 特長 Feature

- ・ 小型、検出溝幅 3.5mm
- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ ツェナーダイオード内蔵タイプ (Vout-GND 間)
- ・ 抜け防止強ロック機構付きコネクタ採用
- ・ Small size, slot width-3.5mm.
- ・ Built-in amplifier, Open collector output type.
- ・ Built in zener diode between Vout and GND.
- ・ with secure locking structure connector.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI5220 | High | 入光時 at Beam detecting |
| KI5221 | Low  | 入光時 at Beam detecting |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 13.5      | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | Vcc          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI5220 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI5221 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI5220 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI5221 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI5220 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI5221 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI5220 入光時、RL=47kΩ w/o Shutter  | VCCx0.9 | —    | —    | V    |
|                                     |              | KI5221 遮光時、RL=47kΩ Shutter in   | VCCx0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                              | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time | tf                              | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI5220/5221

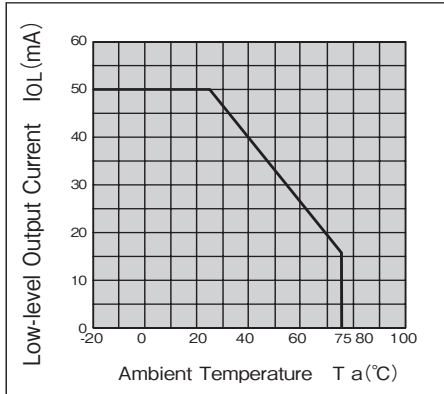
## 定格・特性曲線

Characteristics

※注意 最大定格を超えないようにご使用ください

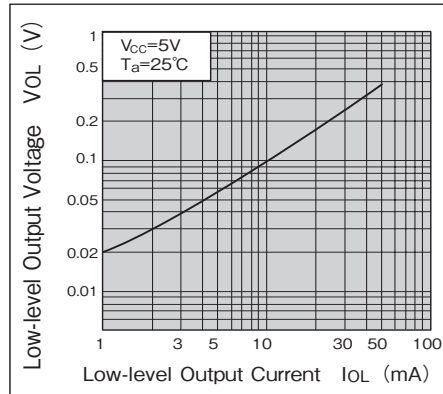
Note: Operation never exceeds each value of Maximum Ratings.

### ローレベル出力電流低減曲線

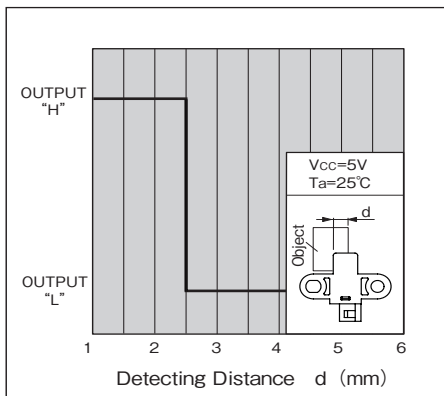


### ローレベル出力電圧ー

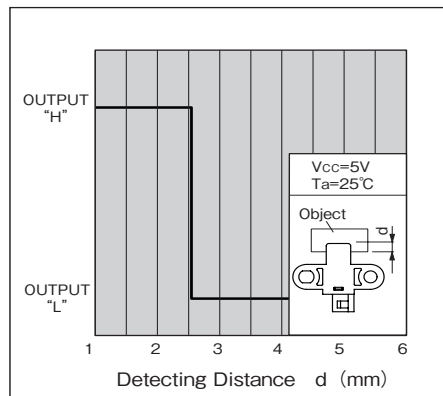
### ローレベル出力電流特性 (代表例)



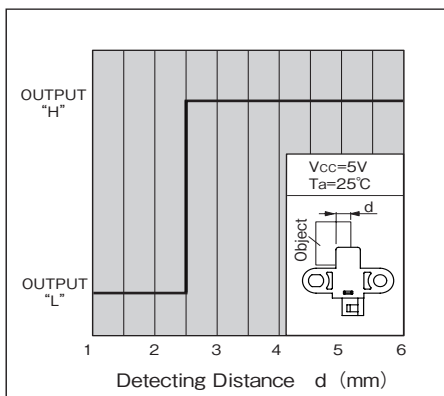
### 検出位置特性1 (代表例) KI5220



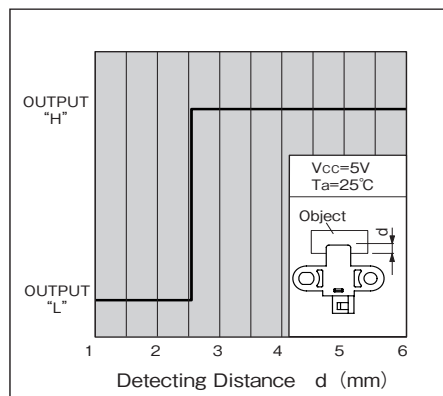
### 検出位置特性2 (代表例) KI5220



### 検出位置特性1 (代表例) KI5221



### 検出位置特性2 (代表例) KI5221



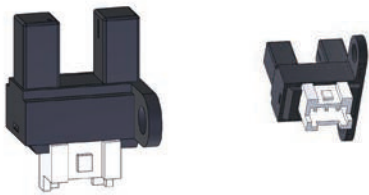
- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

# KI5230/5231



透過型フォトセンサ 防塵タイプ

Photo Interrupter - Dust proof type



概要    Description

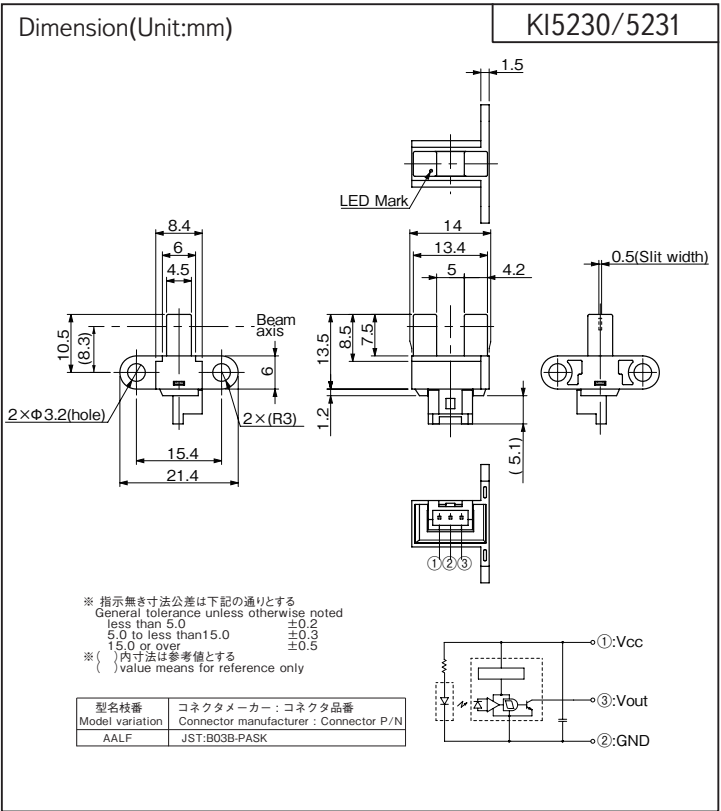
KI5230/5231 は、防塵型のフォト IC 出力の小型透過型フォトセンサです。  
Model KI5230/5231 are compact size of Photo Interrupter and consist of an Infrared LED and a Photo IC(Digital Output).

特長    Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ LED 制限抵抗内蔵タイプ
- ・ 抜け防止強ロック機構付きコネクタ採用
- ・ その他シリーズ  
    フォトトランジスタタイプ・・・KI5234
- ・ Easy removing paper dust.
- ・ Visible Light cut filter.
- ・ Built-in amplifier, Open collector output type.
- ・ Built in resistor for LED drive.
- ・ with secure locking structure connector.
- ・ The other model; Phototransistor type・・・KI5234

用途    Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の利用紙通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI5230 | High | 入光時 at Beam detecting |
| KI5231 | Low  | 入光時 at Beam detecting |

最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol | Rating    | Unit |
|------------------------------------|--------|-----------|------|
| 電源電圧 Supply Voltage                | VCC    | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL    | 50        | mA   |
| 出力電圧 Output Voltage                | VO     | 28        | V    |
| 動作温度 Operating Temperature         | Topr   | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | Tstg   | -40 ~ +80 | °C   |

電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | Vcc          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI5230 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI5231 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI5230 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI5231 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI5230 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI5231 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI5230 入光時、RL=47kΩ w/o Shutter  | VCCx0.9 | —    | —    | V    |
|                                     |              | KI5231 遮光時、RL=47kΩ Shutter in   | VCCx0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                              |         |      | —    | μs   |
|                                     | 下降 Fall Time | tf                              |         |      | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI5230/5231

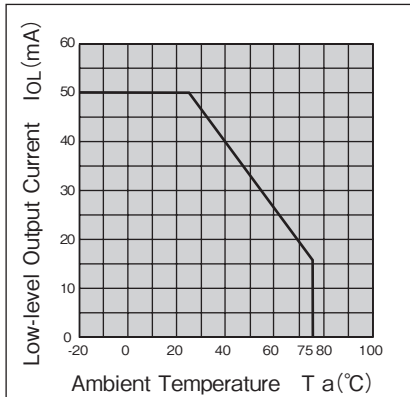
## 定格・特性曲線

Characteristics

※注意 最大定格を超えないようにご使用ください

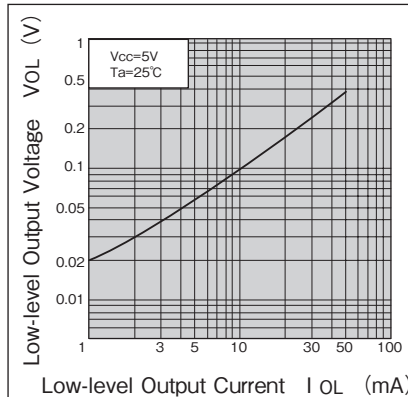
Note: Operation never exceeds each value of Maximum Ratings.

### ローレベル出力電流低減曲線

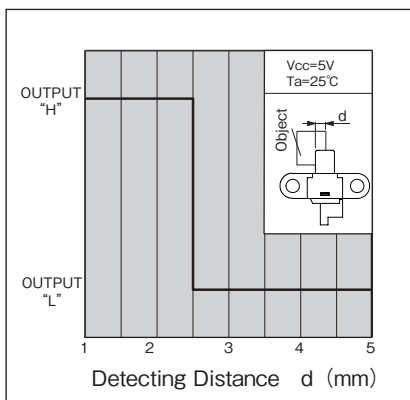


### ローレベル出力電圧ー

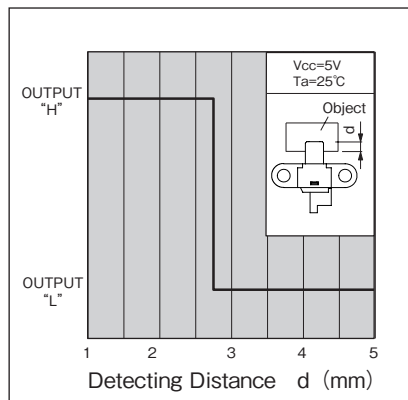
### ローレベル出力電流特性 (代表例)



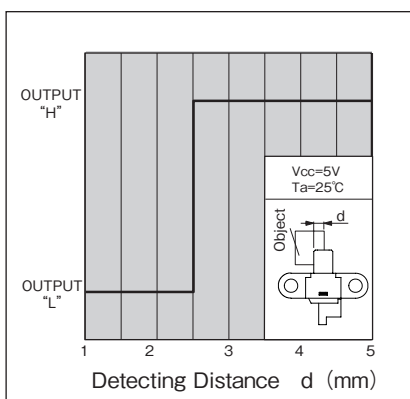
### 検出位置特性1 (代表例) KI5230



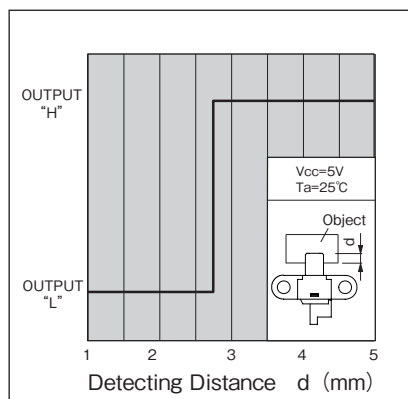
### 検出位置特性2 (代表例) KI5230



### 検出位置特性1 (代表例) KI5231



### 検出位置特性2 (代表例) KI5231

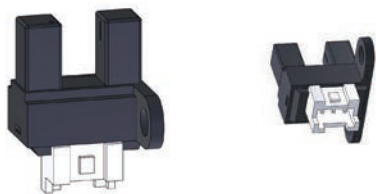


- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI5234



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

KI5234 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用した小型透過型フォトセンサです。  
Model KI5234 consists of an Infrared LED and a High sensitive Photo transistor (Analog output).

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ LED 制限抵抗内蔵タイプ
- ・ 抜け防止強ロック機構付きコネクタ採用
- ・ その他シリーズ

フォト IC タイプ・・・KI5230/5231

※電源電圧 12V タイプもご相談下さい。

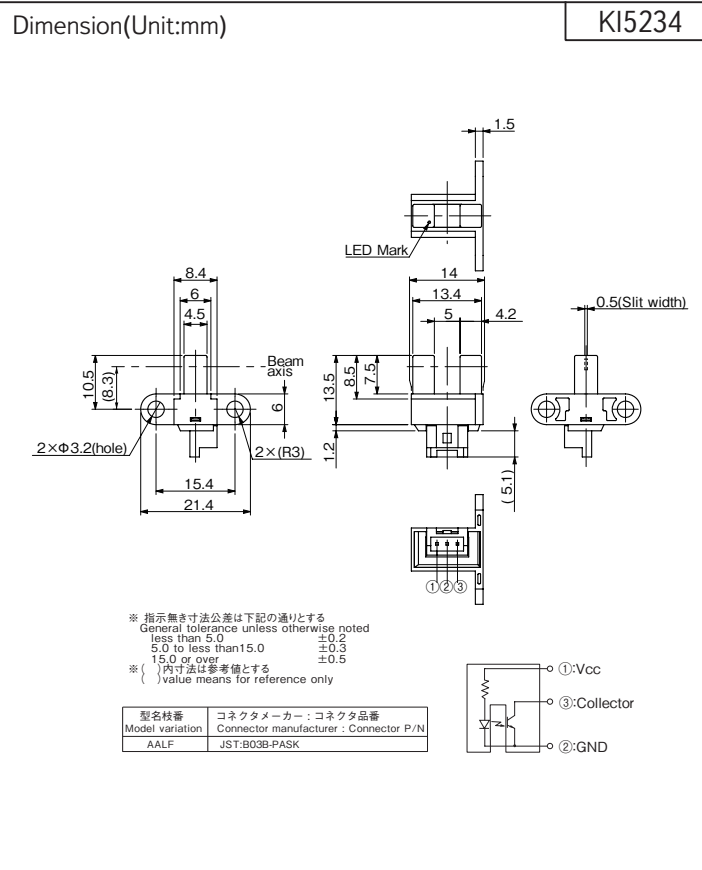
- ・ Easy removing paper dust.
- ・ Visible Light cut filter.
- ・ Built in resistor for LED drive.
- ・ with secure locking structure connector.
- ・ The other model;

Photo IC type・・・KI5230/5231

※ Please Contact us about supply voltage 12V type.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の用紙通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item              |              |                             | Symbol | Rating    | Unit |
|-------------------|--------------|-----------------------------|--------|-----------|------|
| 発 光 側<br>Emitter  | 電 源 電 圧      | Supply Voltage              | VCC    | 6         | V    |
|                   | 逆 電 圧        | Reverse Voltage             | VR     | 5         | V    |
| 受 光 側<br>Detector | コレクタ・エミッタ間電圧 | Collector-Emitter Voltage   | VCEO   | 30        | V    |
|                   | エミッタ・コレクタ間電圧 | Emitter-Collector Voltage   | VECO   | 5         | V    |
|                   | コ レ ク タ 電 流  | Collector Current           | Ic     | 20        | mA   |
|                   | コ レ ク タ 損 失  | Collector Power Dissipation | Pc     | 75        | mW   |
| 動 作 温 度           |              | Operating Temperature       | Topr   | -20 ～ +75 | ℃    |
| 保 存 温 度           |              | Storage Temperature         | Tstg   | -40 ～ +80 | ℃    |

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*]

| Item               |                                   | Symbol       | Condition                | min. | typ. | max. | Unit |
|--------------------|-----------------------------------|--------------|--------------------------|------|------|------|------|
| 発 光 側<br>Emitter   | 動 作 電 源 電 圧 Supply Voltage        | VCC          | —                        | 4.5  | 5.0  | 5.5  | V    |
| 受 光 側<br>Detector  | 暗 電 流 Dark Current                | ICEO         | VCE=20V, 0 lx            | —    | —    | 0.1  | μA   |
| 伝 達 特 性<br>Coupled | 光 電 流 Light Current               | Ic           | VCC=5V, VCE=5V           | 0.3  | —    | —    | mA   |
|                    | コレクタ・エミッタ間飽和電圧 Saturation Voltage | VCE(sat)     | VCC=5V, Ic=0.15mA        | —    | —    | 0.4  | V    |
|                    | 応 答 時 間 Response Time             | 上昇 Rise Time | VCC=5V, Ic=0.5mA, RL=1kΩ | —    | 15   | —    | μs   |
|                    |                                   | 下降 Fall Time |                          | —    | 17   | —    |      |

\*\*: Ta=25°C unless otherwise noted

# KI5234

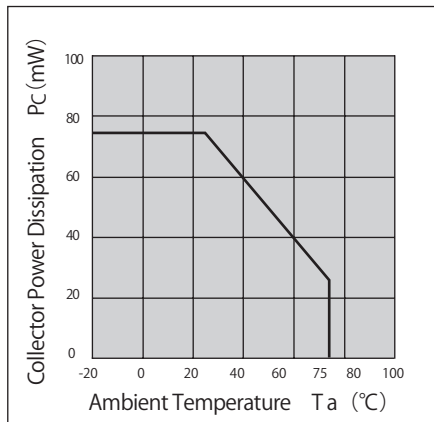
## 定格・特性曲線

Characteristics

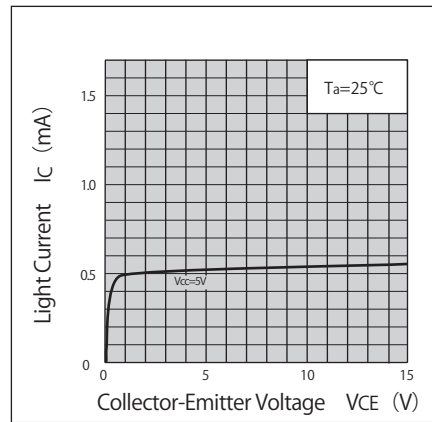
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

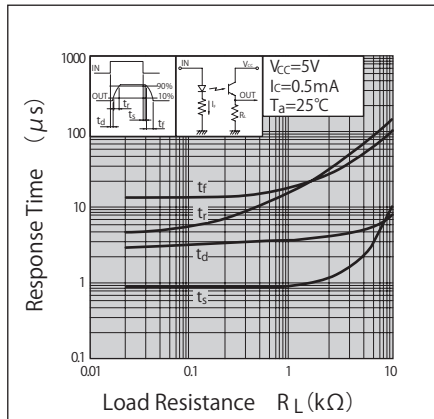
### コレクタ損失低減曲線



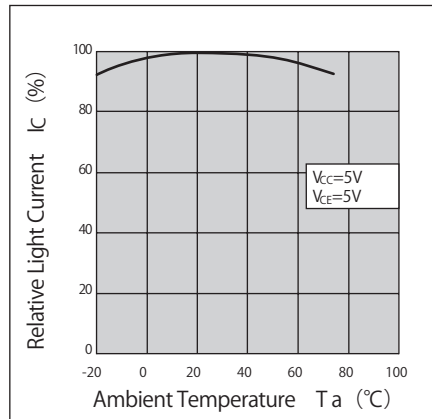
### 光電流-コレクタ・エミッタ間電圧特性 (代表例)



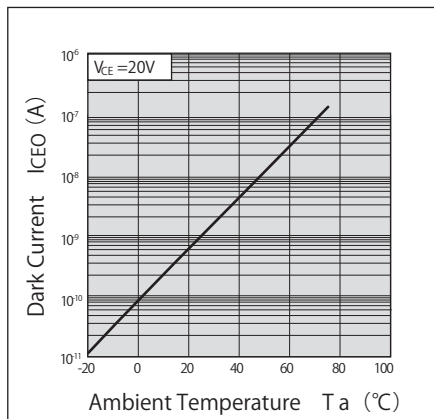
### 応答時間-負荷抵抗特性 (代表例)



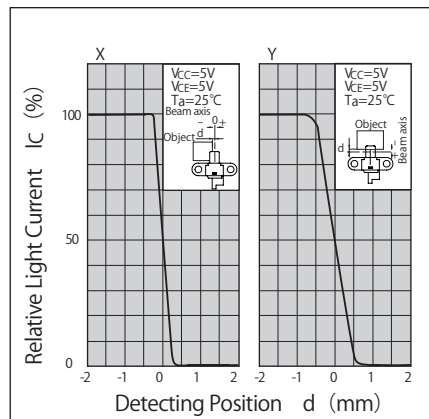
### 光電流-周囲温度特性 (代表例)



### 暗電流-周囲温度特性 (代表例)



### 検出位置特性 (代表例)

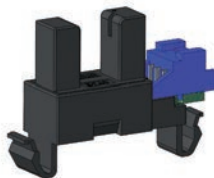


- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI5240



透過型フォトセンサ Photo Interrupter



## 概要 Description

KI5240 は、発光側に赤外発光ダイオード、受光側にフォト IC (デジタル出力) を組合わせた透過型フォトセンサです。

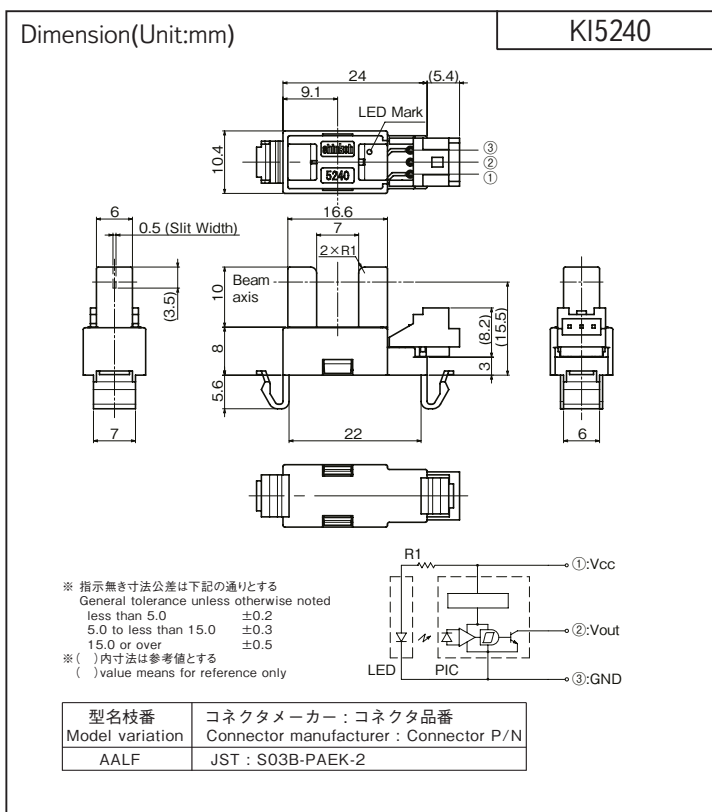
Model KI5240 consist of an Infrared LED and a High sensitive Photo IC(Digital Output).

## 特長 Feature

- ・ スナップ構造で取付が容易
- ・ 検出溝幅が広い: 7mm
- ・ 検出溝が深い: 10mm
- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ LED 制限抵抗内蔵タイプ
- ・ 抜け防止強ロック機構付きコネクタ採用
- ・ Easy to install by snap in.
- ・ Wide Slot width-7mm.
- ・ Slot depth-10mm.
- ・ Built-in amplifier, Open collector output type.
- ・ Built in resistor for LED drive
- ・ with secure locking structure connector.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ O.A機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI5240 | High | 入光時 at Beam detecting |

<ご使用上の注意>

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

<Operation Notice>

We recommend to use with 0.01 μF of bypass capacitor between Vcc and GND and nearby of sensor.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                                       | Symbol | Rating    | Unit |
|--------------------------------------------|--------|-----------|------|
| 電 源 電 圧 Supply Voltage                     | VCC    | 6         | V    |
| ロ ー レ ベ ル 出 力 電 流 Low-Level Output Current | IOL    | 50        | mA   |
| 出 力 電 圧 Output Voltage                     | VO     | 28        | V    |
| 動 作 温 度 Operating Temperature              | Topr   | -20 ~ +75 | °C   |
| 保 存 温 度 Storage Temperature                | Tstg   | -40 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                        | Symbol       | Condition                | min.    | typ. | max. | Unit |
|---------------------------------------------|--------------|--------------------------|---------|------|------|------|
| 動 作 電 源 電 圧 Supply Voltage                  | VCC          | —                        | 4.5     | 5.0  | 5.5  | V    |
| ロ ー レ ベ ル 供 給 電 流 Low-Level Supply Current  | ICCL         | 遮光時 Shutter in           | —       | —    | 25   | mA   |
| ハ イ レ ベ ル 供 給 電 流 High-Level Supply Current | ICCH         | 入光時 w/o Shutter          | —       | —    | 25   | mA   |
| ロ ー レ ベ ル 出 力 電 圧 Low-Level Output Voltage  | VOL          | 遮光時, IOL=16mA Shutter in | —       | —    | 0.4  | V    |
| ハ イ レ ベ ル 出 力 電 圧 High-Level Output Voltage | VOH          | 入光時, RL=47kΩ w/o Shutter | VCCx0.9 | —    | —    | V    |
| 応 答 時 間 Response Time                       | 上昇 Rise Time |                          | —       | 1.47 | —    | μs   |
|                                             | 下降 Fall Time |                          | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI5240

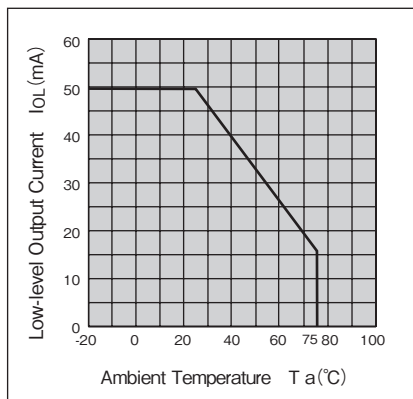
## 定格・特性曲線

Characteristics

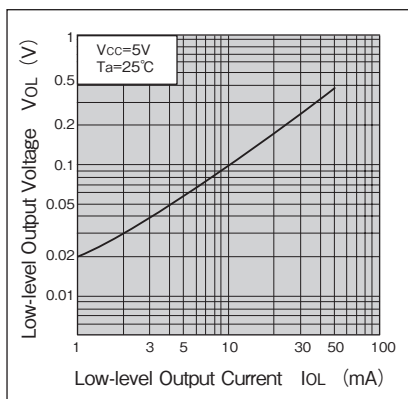
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

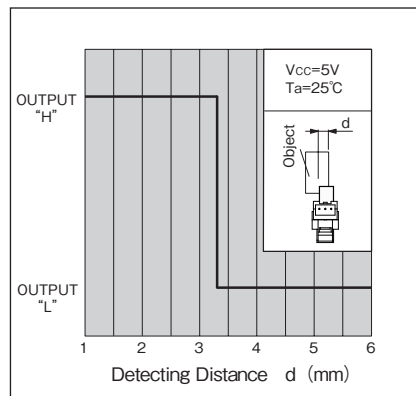
### ローレベル出力電流低減曲線



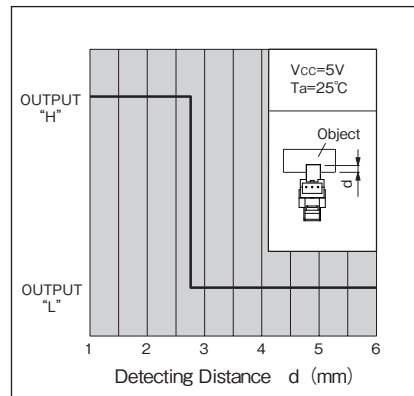
### ローレベル出力電圧ー ローレベル出力電流特性 (代表例)



### 検出位置特性1 (代表例) KI5240

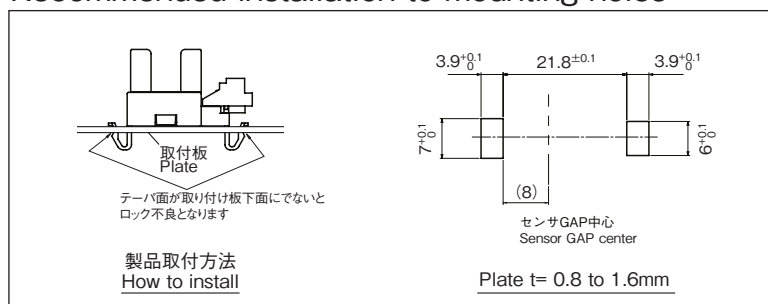


### 検出位置特性2 (代表例) KI5240



## 推奨取付穴寸法図

### Recommended installation to mounting holes



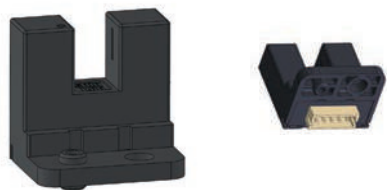
- ・取付板のプレス側から取り付けを推奨します。  
We recommend to mount the sensor from pressed surface of plate.
- ・実際に取付けてガタツキ度合いをご確認され  
取付方法を決定ください。  
The actual tolerance should be confirmed after setting of sensor

- ・カスタマイズも承ります。お気軽にお問合せください
- ・この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI5264



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

KI5264 は、アナログ出力の防塵タイプ小型透過型フォトセンサです。

Model KI5264 is compact size of Photo Interrupter.  
(Analog output)

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 耐薬品性のケース (材質：POM)
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ その他シリーズ

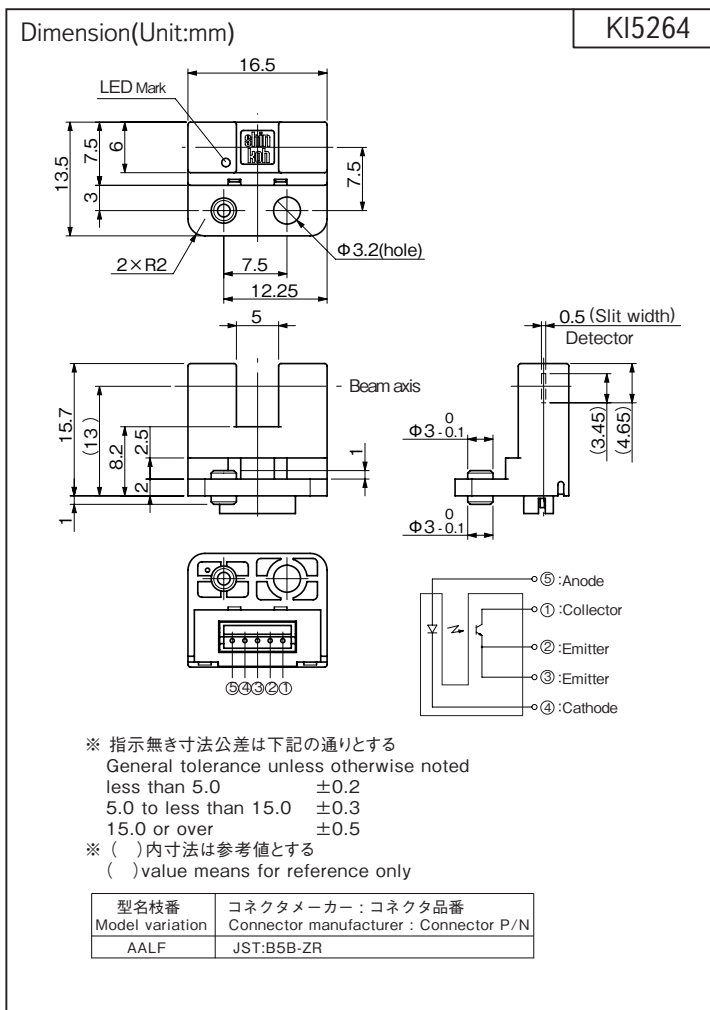
横出しコネクタタイプ・・・KI5365

フォト IC タイプ・・・KI5260/KI5261

- ・ Easy removing paper dust.
- ・ Chemical resistant outer package.(material : POM)
- ・ Visible Light cut filter.
- ・ The other models; Side connector type・・・KI5365
- ・ Photo IC type・・・KI5260/KI5261

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の用紙通過検出
- ・ OA 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25℃ \*\*]

| Item                        |                                        | Symbol | Rating    | Unit |
|-----------------------------|----------------------------------------|--------|-----------|------|
| 発光側<br>Emitter              | 順電流 Forward Current                    | IF     | 50        | mA   |
|                             | パルス順電流 Pulse Forward Current ※1        | IFP    | 1         | A    |
|                             | 逆電圧 Reverse Voltage                    | VR     | 5         | V    |
|                             | 許容損失 Power Dissipation                 | P      | 75        | mW   |
| 受光側<br>Detector             | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO   | 30        | V    |
|                             | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO   | 5         | V    |
|                             | コレクタ電流 Collector Current               | IC     | 20        | mA   |
|                             | コレクタ損失 Collector Power Dissipation     | PC     | 75        | mW   |
| 動作温度度 Operating Temperature |                                        | Topr   | -20 ~ +75 | ℃    |
| 保存温度度 Storage Temperature   |                                        | Tstg   | -30 ~ +85 | ℃    |

※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01

※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25℃ \*\*]

| Item            |                                                     | Symbol       | Condition                | min. | typ. | max. | Unit |
|-----------------|-----------------------------------------------------|--------------|--------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage                                 | VF           | IF=20mA                  | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current                                 | IR           | VR=3V                    | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                                    | ICEO         | VCE=10V, 0 lx            | —    | —    | 0.2  | μA   |
| 伝達特性<br>Coupled | 光電流 Light Current                                   | IC           | VCE=5V, IF=20mA          | 0.3  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat)     | IF=20mA, IC=0.15mA       | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                                  | 上昇 Rise Time | VCC=5V, IC=0.1mA, RL=1kΩ | —    | 50   | —    | μs   |
|                 |                                                     | 下降 Fall Time |                          | —    | 50   | —    |      |

\*\* : Ta=25℃ unless otherwise noted

# KI5264

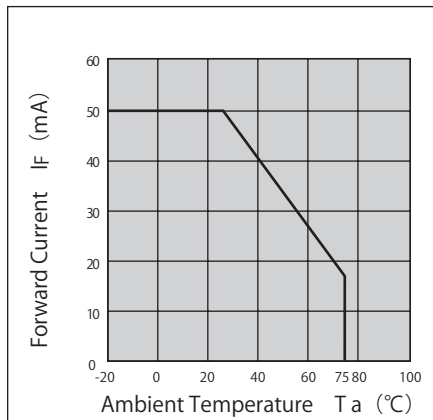
## 定格・特性曲線

Characteristics

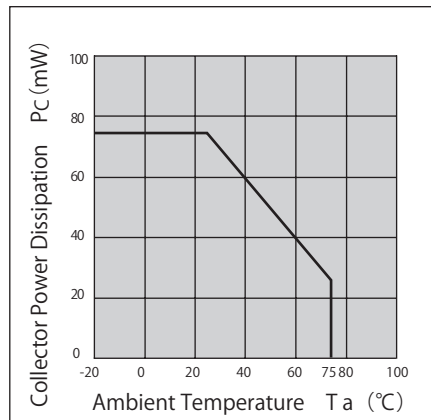
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

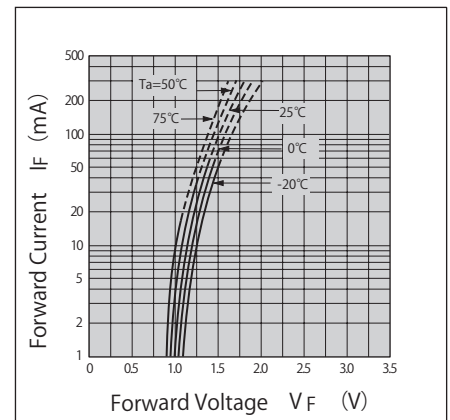
### 順電流低減曲線



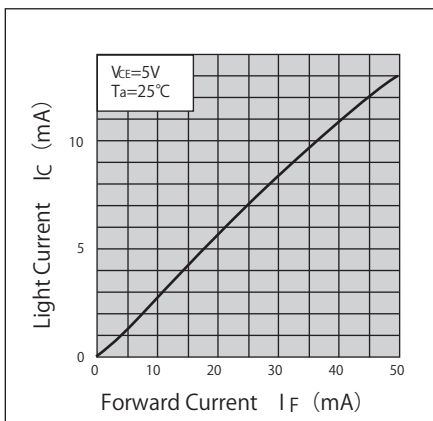
### コレクタ損失低減曲線



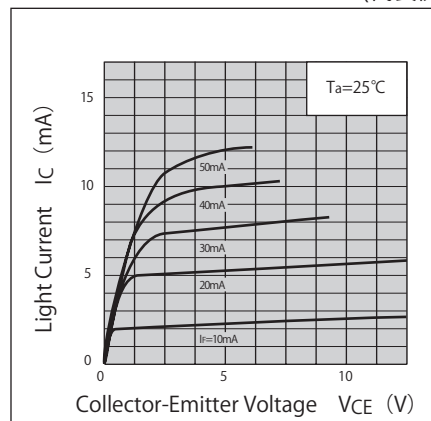
### 順電流一順電圧特性(代表例)



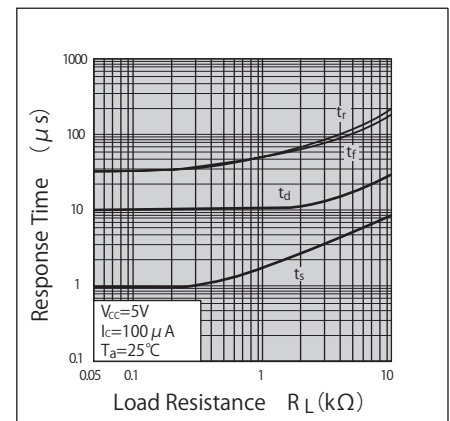
### 光電流一順電流特性(代表例)



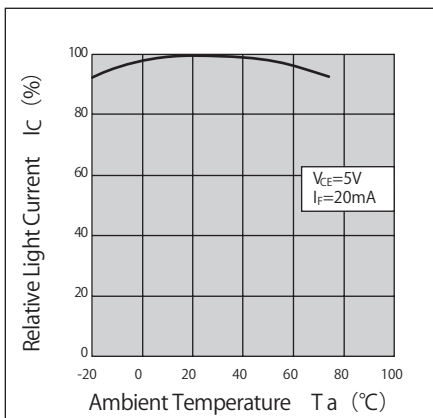
### 光電流一コレクタ・エミッタ間電圧特性(代表例)



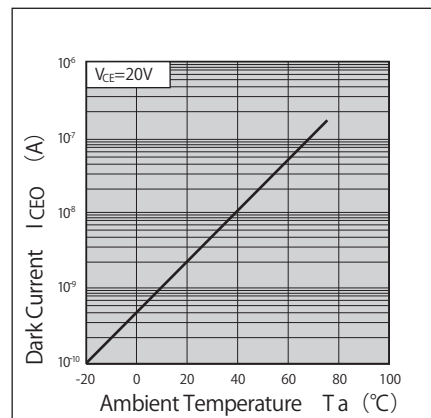
### 応答時間一負荷抵抗特性(代表例)



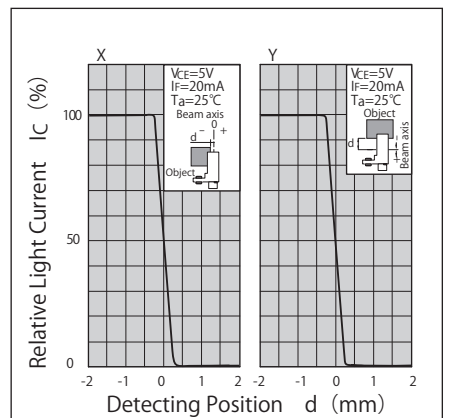
### 光電流一周囲温度特性(代表例)



### 暗電流一周囲温度特性(代表例)



### 検出位置特性(代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI5274



透過型フォトセンサ 防塵タイプ

Photo Interrupter - Dust proof type



## 概要 Description

KI5274 は、アナログ出力の防塵タイプ透過型フォトセンサです。

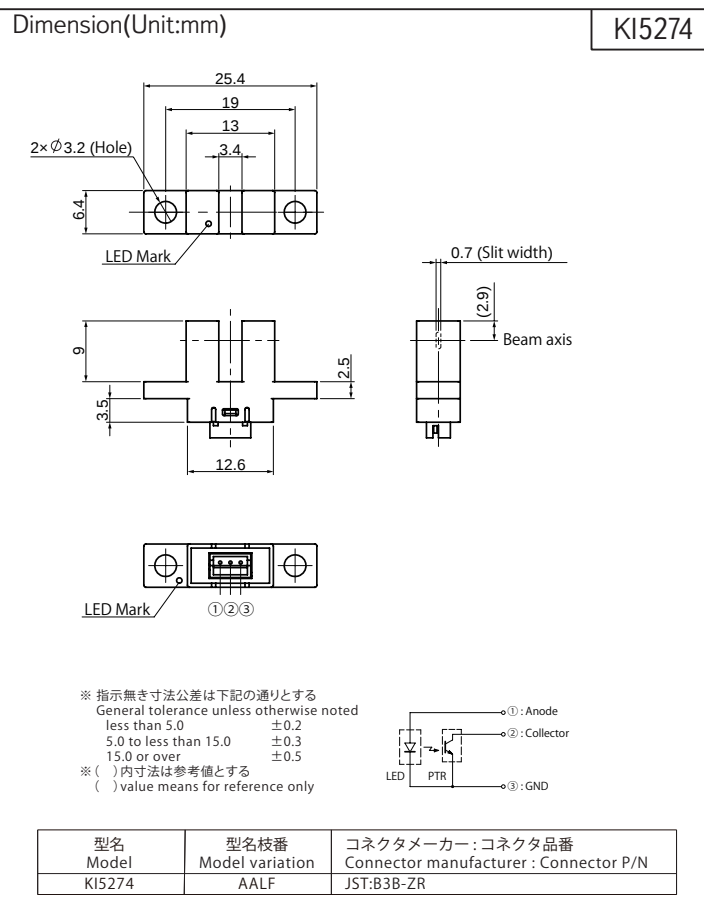
Model KI5274 consists of an Infrared LED and a High sensitive Photo transistor (Analog output).

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ Easy removing paper dust.
- ・ Visible Light cut filter.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ O.A機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       |                                        | Symbol | Rating    | Unit |
|----------------------------|----------------------------------------|--------|-----------|------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF     | 50        | mA   |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP    | 1         | A    |
|                            | 逆電圧 Reverse Voltage                    | VR     | 5         | V    |
|                            | 許容損失 Power Dissipation                 | P      | 75        | mW   |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO   | 30        | V    |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO   | 5         | V    |
|                            | コレクタ電流 Collector Current               | IC     | 20        | mA   |
|                            | コレクタ損失 Collector Power Dissipation     | Pc     | 75        | mW   |
| 動作温度 Operating Temperature |                                        | Topr   | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature   |                                        | Tstg   | -30 ~ +80 | °C   |

※1. パルス幅  $tw \leq 100\mu s$  Duty比=0.01※1. Pulse width  $tw \leq 100\mu s$  Duty ratio=0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                   | Symbol       | Condition                | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|--------------|--------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | VF           | IF=20mA                  | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | IR           | VR=3V                    | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | ICEO         | VCE=20V, 0 lx            | —    | —    | 0.1  | μA   |
|                 | 光電流 Light Current                 | IC           | VCE=5V, IF=20mA          | 0.5  | —    | —    | mA   |
| 伝達特性<br>Coupled | コレクタ・エミッタ間飽和電圧 Saturation Voltage | VCE(sat)     | IF=20mA, IC=0.15mA       | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                | 上昇 Rise Time | VCC=5V, IC=0.1mA, RL=1kΩ | —    | 50   | —    | μs   |
|                 |                                   | 下降 Fall Time |                          | —    | 50   | —    |      |

\*\*: Ta=25°C unless otherwise noted

# KI5274

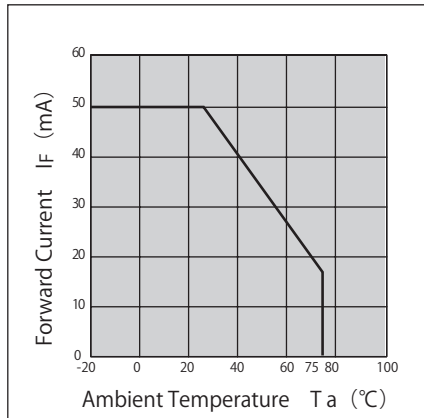
定格・特性曲線

Characteristics

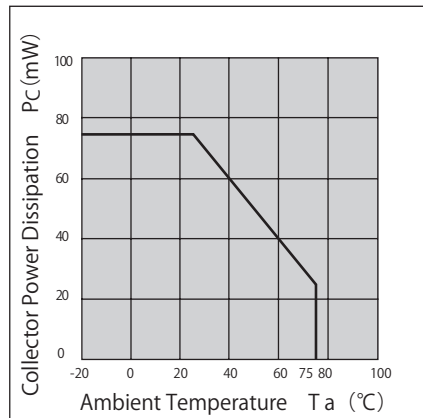
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

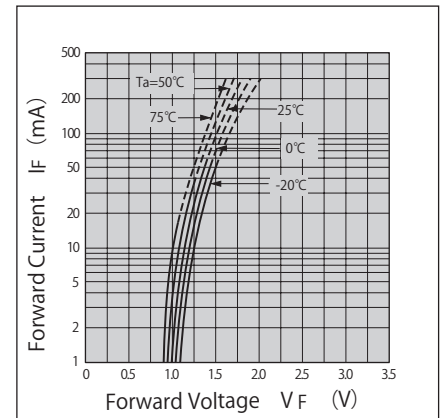
順電流低減曲線



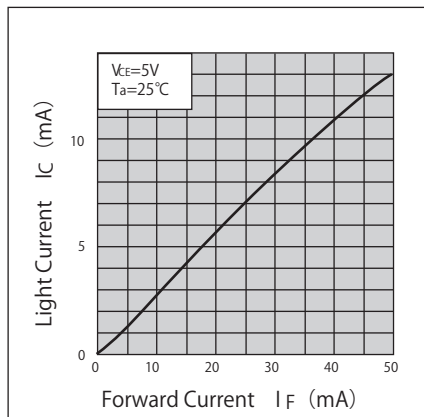
コレクタ損失低減曲線



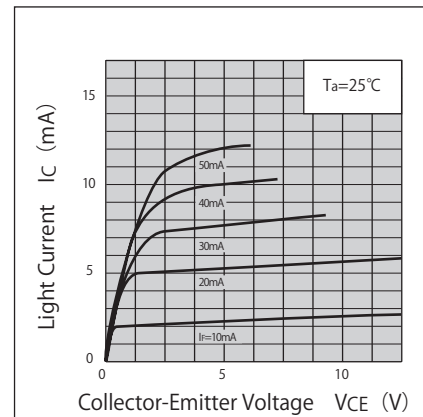
順電流－順電圧曲線 (代表例)



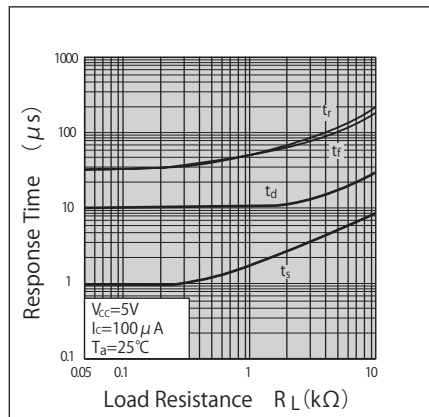
光電流－順電流特性 (代表例)



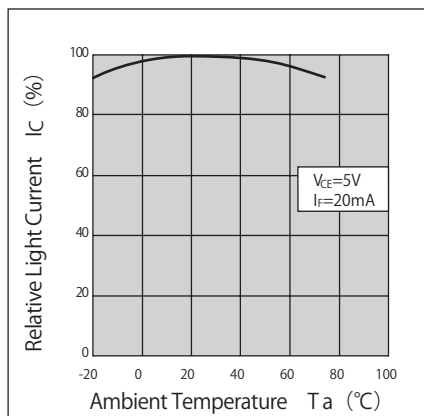
光電流－コレクタ・エミッタ間電圧特性 (代表例)



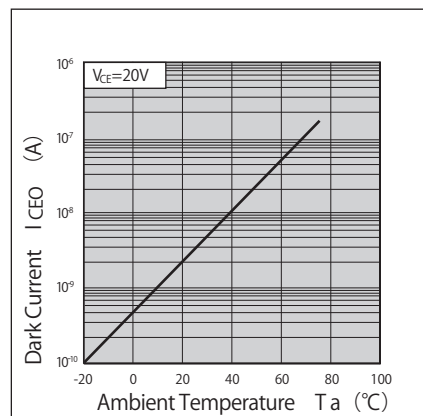
応答時間－負荷抵抗特性 (代表例)



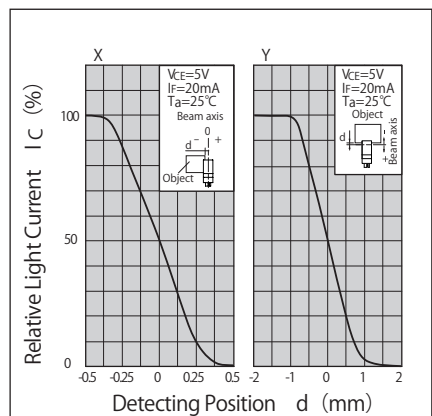
光電流－周囲温度特性 (代表例)



暗電流－周囲温度特性 (代表例)



検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

# KI5350/5351



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



### 概要 Description

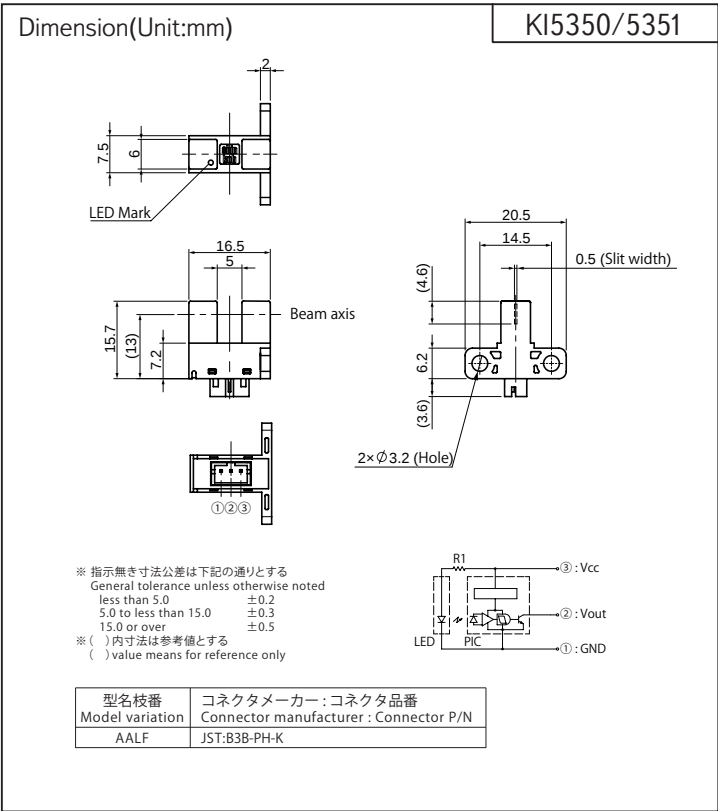
KI5350/5351 は、防塵型のフォト IC 出力の小型透過型フォトセンサです。  
Model KI5350/5351 are compact size of Photo Interrupter and consist of an Infrared LED and a Photo IC(Digital Output).

### 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ LED 制限抵抗内蔵タイプ
- ・ その他シリーズ  
    フォトトランジスタタイプ・・・KI5354
- ・ Easy removing paper dust.
- ・ Visible Light cut filter.
- ・ Built-in amplifier, Open collector output type.
- ・ Built in resistor for LED drive.
- ・ The other model; Phototransistor type・・・KI5354

### 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI5350 | High | 入光時 at Beam detecting |
| KI5351 | Low  | 入光時 at Beam detecting |

### 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol | Rating    | Unit |
|------------------------------------|--------|-----------|------|
| 電源電圧 Supply Voltage                | VCC    | 7         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL    | 50        | mA   |
| 出力電圧 Output Voltage                | VO     | 28        | V    |
| 動作温度 Operating Temperature         | Topr   | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | Tstg   | -40 ~ +85 | °C   |

### 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V,Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | Vcc          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI5350 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI5351 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI5350 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI5351 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI5350 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI5351 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI5350 入光時、RL=47kΩ w/o Shutter  | VCCx0.9 | —    | —    | V    |
|                                     |              | KI5351 遮光時、RL=47kΩ Shutter in   | VCCx0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                              | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time | tf                              | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI5350/5351

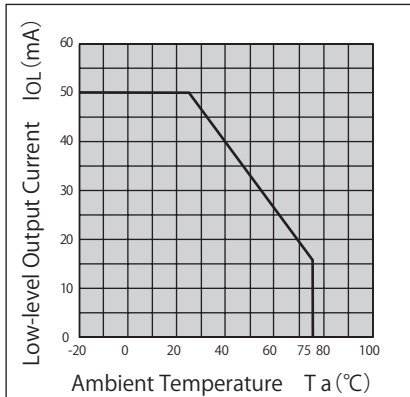
## 定格・特性曲線

Characteristics

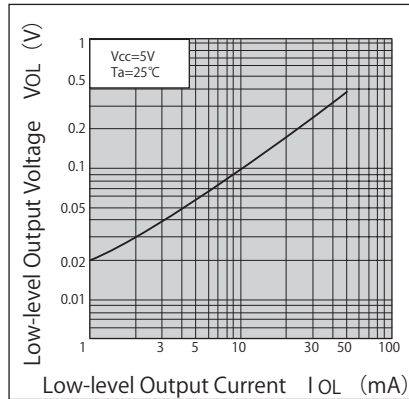
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

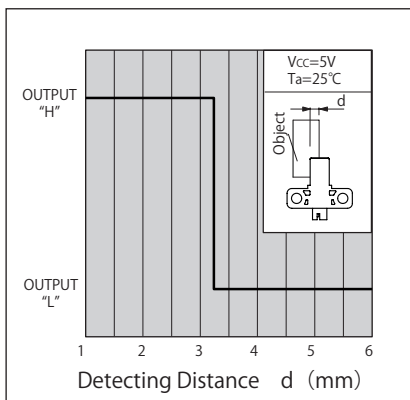
### ローレベル出力電流低減曲線



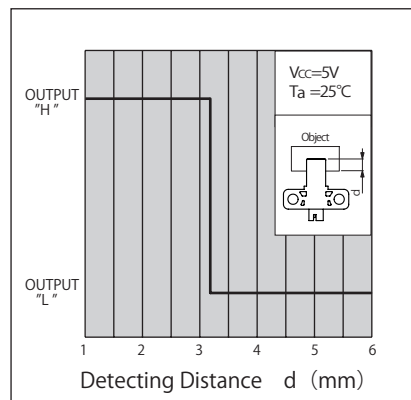
### ローレベル出力電圧ー ローレベル出力電流特性 (代表例)



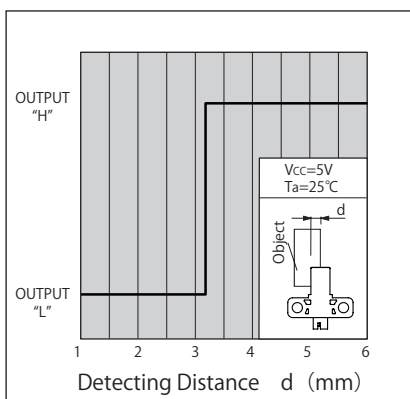
### 検出位置特性1 (代表例) KI5350



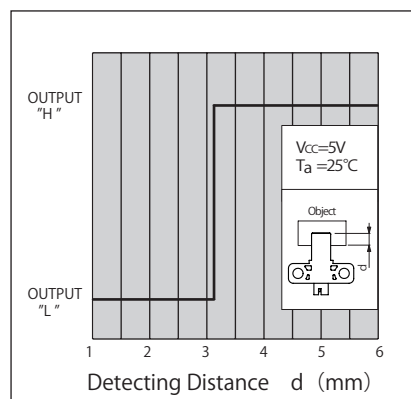
### 検出位置特性2 (代表例) KI5350



### 検出位置特性1 (代表例) KI5351



### 検出位置特性2 (代表例) KI5351



- ・ カスタマイズも承ります。お気軽にお問合せください
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- ・ Specifications are subject to change without notice.

# KI5354



透過型フォトセンサ 防塵タイプ

Photo Interrupter - Dust proof type



## 概要 Description

KI5354 は、アナログ出力の防塵タイプ透過型フォトセンサです。

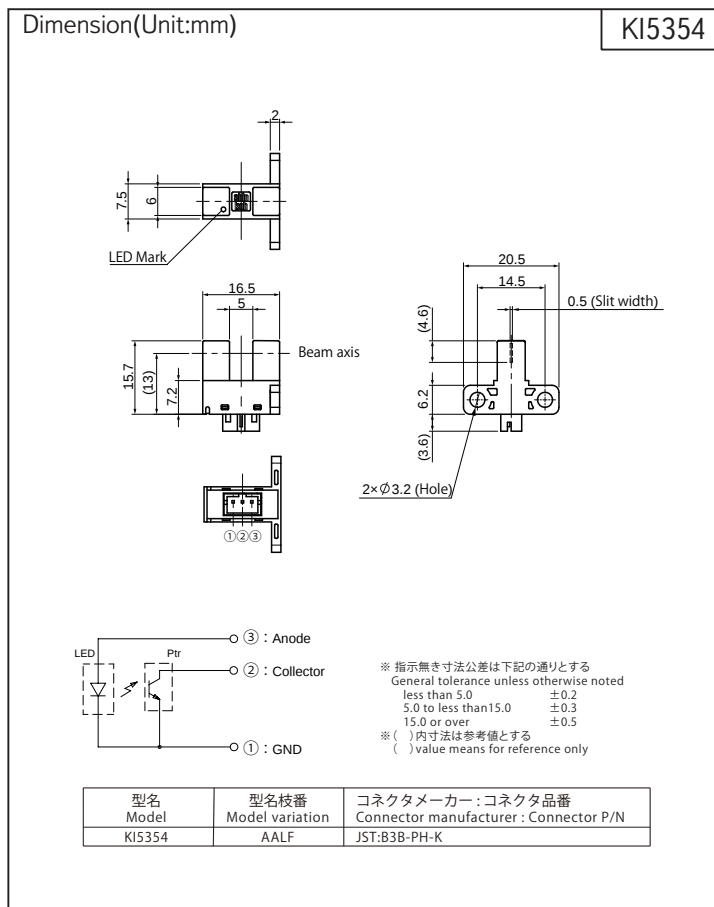
Model KI5354 consists of an Infrared LED and a High sensitive Photo transistor (Analog output).

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ その他シリーズ  
フォト IC 出力タイプ・・・KI5350/5351
- ・ Easy removing paper dust.
- ・ High-resolution : slit width 0.5mm.
- ・ Visible Light cut filter.
- ・ The other model :  
Photo IC output type・・・KI5350/KI5351

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の利用紙通過検出
- ・ O.A機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25℃ \*\*]

| Item                          |                                         | Symbol    | Rating | Unit |
|-------------------------------|-----------------------------------------|-----------|--------|------|
| 発 光 側<br>Emitter              | 順 電 流 Forward Current                   | IF        | 50     | mA   |
|                               | パ ル ス 順 電 流 Pulse Forward Current ※ 1   | IFP       | 1      | A    |
|                               | 逆 電 圧 Reverse Voltage                   | VR        | 5      | V    |
|                               | 許 容 損 失 Power Dissipation               | P         | 75     | mW   |
| 受 光 側<br>Detector             | コレクタ・エミッタ間電圧 Collector-Emitter Voltage  | VCEO      | 30     | V    |
|                               | エミッタ・コレクタ間電圧 Emitter-Collector Voltage  | VECO      | 5      | V    |
|                               | コ レ ク タ 電 流 Collector Current           | Ic        | 20     | mA   |
|                               | コ レ ク タ 損 失 Collector Power Dissipation | Pc        | 75     | mW   |
| 動 作 温 度 Operating Temperature | Topr                                    | -20 ~ +75 | ℃      |      |
| 保 存 温 度 Storage Temperature   | Tstg                                    | -40 ~ +85 | ℃      |      |

- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 =0.01
- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25℃ \*\*]

| Item               |                                                     | Symbol          | Condition                | min. | typ. | max. | Unit |
|--------------------|-----------------------------------------------------|-----------------|--------------------------|------|------|------|------|
| 発 光 側<br>Emitter   | 順 電 圧 Forward Voltage                               | VF              | IF=20mA                  | —    | 1.2  | 1.5  | V    |
|                    | 逆 電 流 Reverse Current                               | IR              | VR=3V                    | —    | —    | 10   | μA   |
| 受 光 側<br>Detector  | 暗 電 流 Dark Current                                  | ICEO            | VCE=20V, 0 lx            | —    | —    | 0.1  | μA   |
|                    | 光 電 流 Light Current                                 | IC              | VCE=5V, IF=20mA          | 0.5  | —    | —    | mA   |
| 伝 達 特 性<br>Coupled | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat)        | IF=20mA, IC=0.15mA       | —    | —    | 0.4  | V    |
|                    | 応 答 時 間<br>Response Time                            | 上昇<br>Rise Time | VCC=5V, IC=0.5mA, RL=1kΩ | —    | 15   | —    | μs   |
|                    |                                                     | 下降<br>Fall Time |                          | —    | 17   | —    |      |

\*\* : Ta=25℃ unless otherwise noted

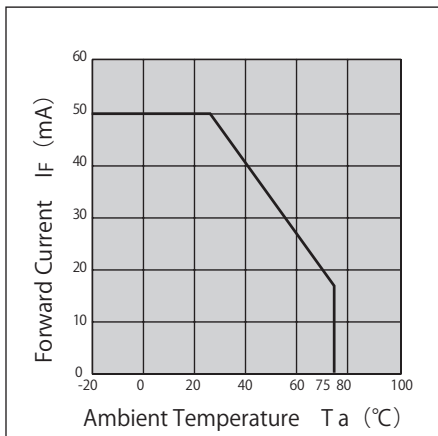
# KI5354

定格・特性曲線  
Characteristics

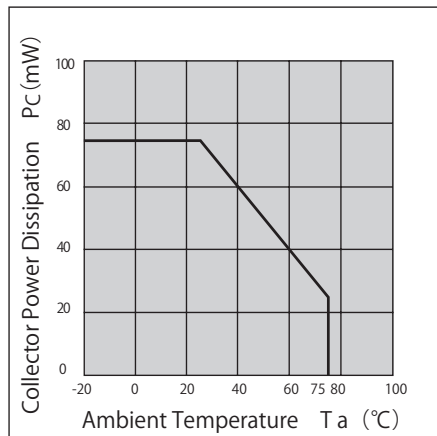
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

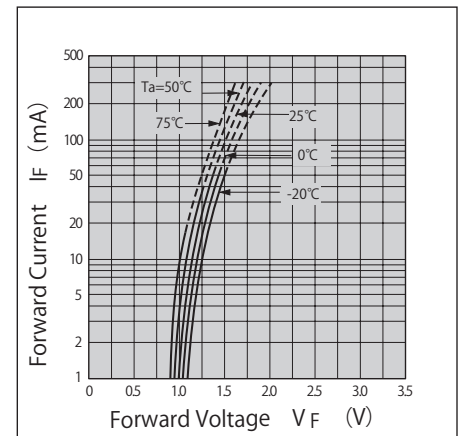
順電流低減曲線



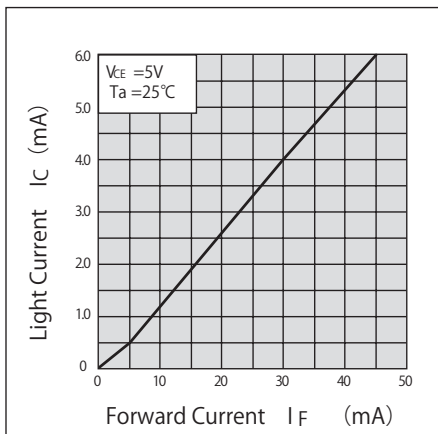
コレクタ損失低減曲線



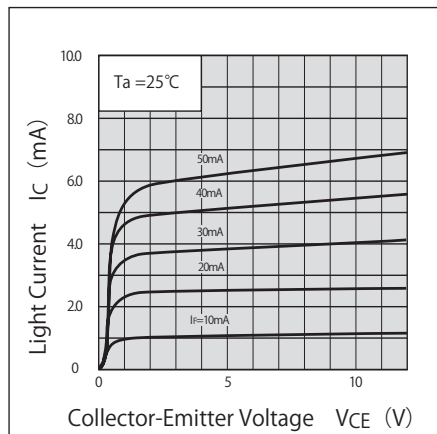
順電流－順電圧曲線 (代表例)



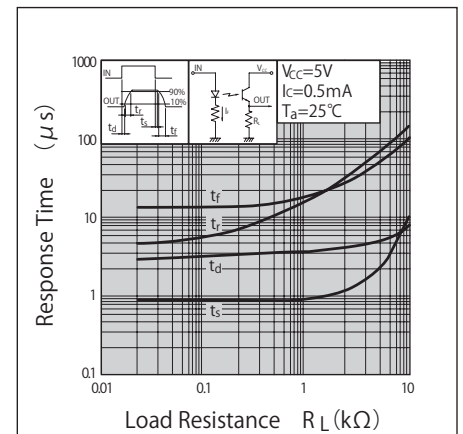
光電流－順電流特性 (代表例)



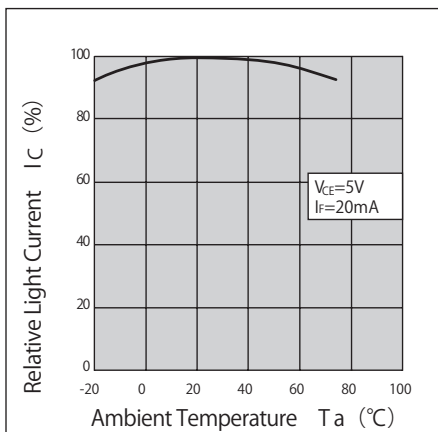
光電流－コレクタ・エミッタ間電圧特性 (代表例)



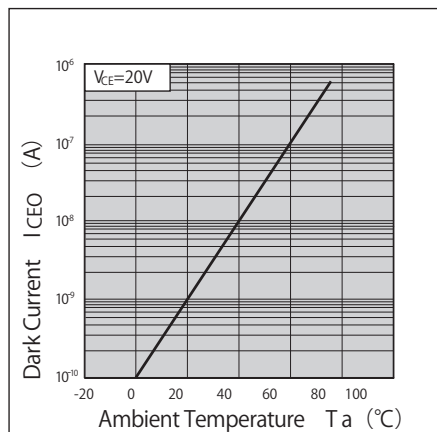
応答時間－負荷抵抗特性 (代表例)



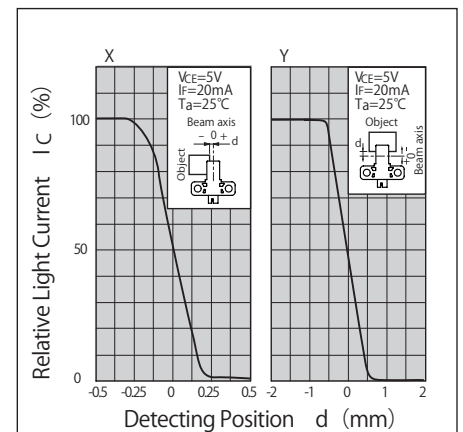
光電流－周囲温度特性 (代表例)



暗電流－周囲温度特性 (代表例)



検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

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# KI5365

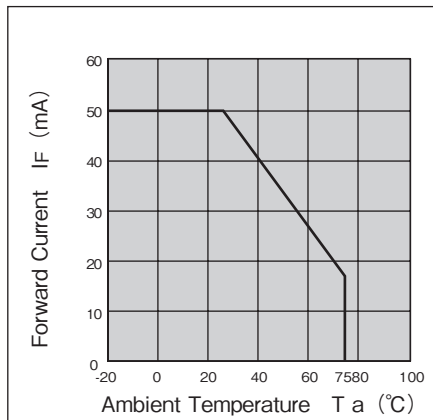
## 定格・特性曲線

Characteristics

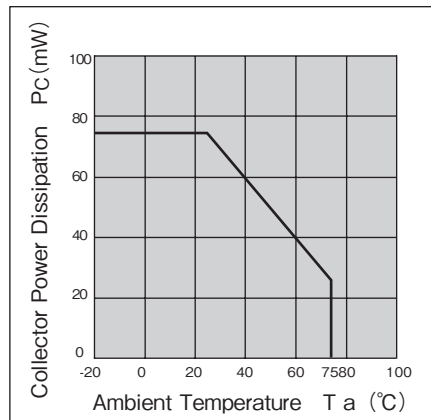
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

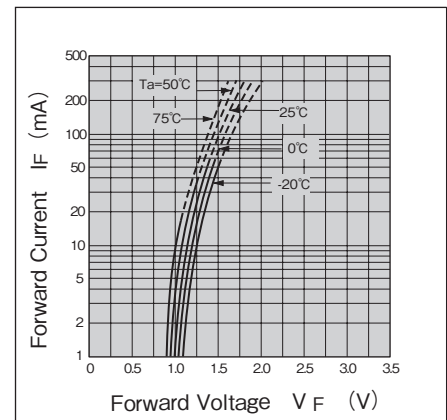
### 順電流低減曲線



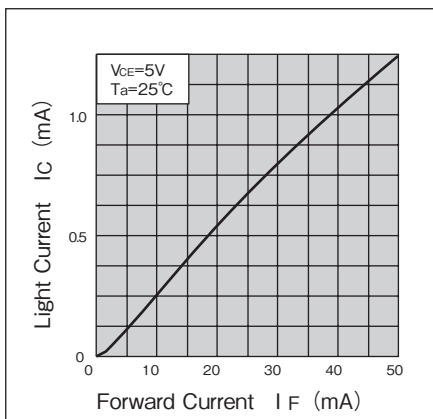
### コレクタ損失低減曲線



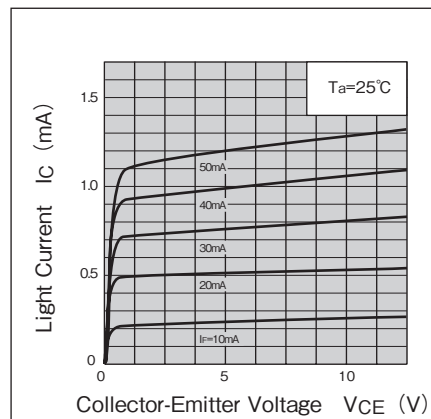
### 順電流－順電圧特性(代表例)



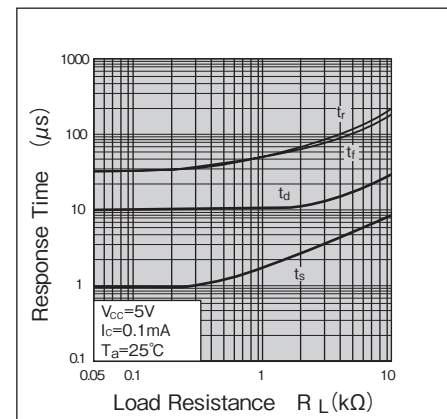
### 光電流－順電流特性(代表例)



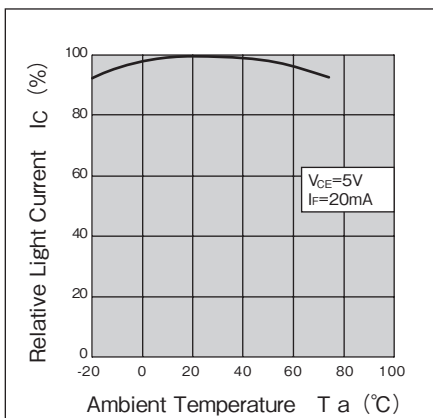
### 光電流－コレクタ・エミッタ間電圧特性 (代表例)



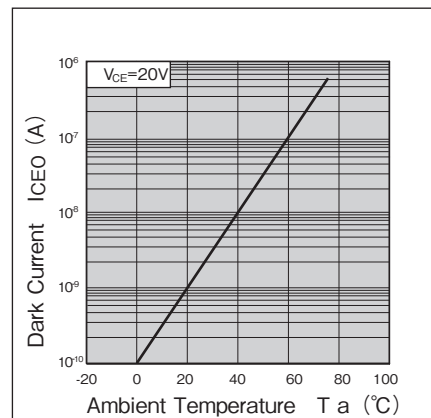
### 応答時間－負荷抵抗特性(代表例)



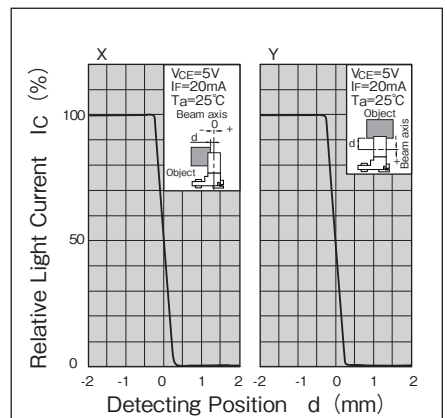
### 光電流－周囲温度特性(代表例)



### 暗電流－周囲温度特性(代表例)



### 検出位置特性(代表例)



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- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI5510/5511



透過型フォトセンサ 防塵・防滴タイプ Photo Interrupter - Dust/Drip proof type

NEW



## 概要 Description

KI5510/5511 は、赤外発光ダイオードと受光素子にフォト IC (デジタル出力) を組合せ防滴・防塵性能を達成した透過型フォトセンサです。

Model KI5510/5511 consist of an Infrared LED and a High sensitive Photo IC (Digital Output).

## 特長 Feature

- ・防塵・防滴構造 (IP64 相当)  
※コネクタ部 - AALF 非防滴仕様  
AA02LF 防滴仕様
- ・アンプ内蔵、オープンコレクタ出力タイプ
- ・検出精度が高い: 内蔵スリット 0.5mm
- ・可視光カットタイプの為、外乱光の影響を受けにくい
- ・LED 制限抵抗内蔵タイプ
- ・Dust and Drip proof type : IP64 equivalent.  
Note) AALF model connector-Non drip proof.  
AA02LF model connector-Drip proof.
- ・Built-in amplifier, Open collector output type.
- ・High-resolution : slit width 0.5mm.
- ・Visible Light cut filter.
- ・Built in resistor for LED drive.

## 用途 Application

- ・カード機器、両替機の物体通過検出
- ・医療機器、自動販売機などの液体使用箇所の物体検出
- ・券売機用の紙通過検出
- ・Object passing for Card reader, Bill exchanger.
- ・Object passing at sweating area in Medical equipments and Auto vending machine.
- ・Object passing in Auto vender and Ticket vending machine.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

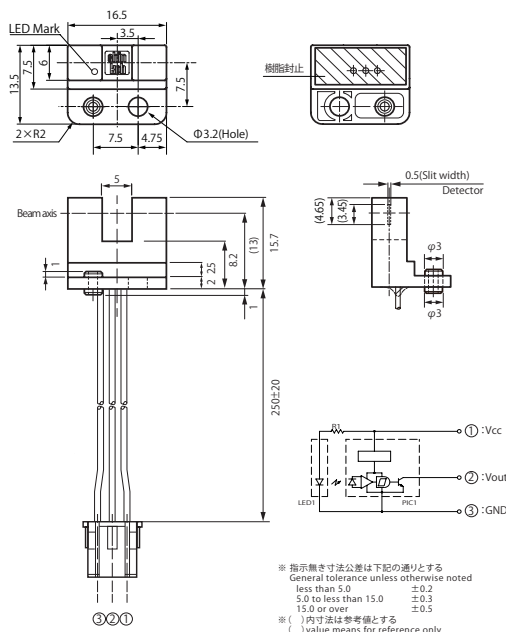
## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI5510 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI5511 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI5510 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI5511 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI5510 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI5511 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI5510 入光時、RL=47kΩ w/o Shutter  | VCCx0.9 | —    | —    | V    |
|                                     |              | KI5511 遮光時、RL=47kΩ Shutter in   | VCCx0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                              |         |      | —    | μs   |
|                                     | 下降 Fall Time | tf                              |         |      | —    | μs   |

\*\* : Ta=25°C unless otherwise noted

## Dimension(Unit:mm)

KI5510/5511



| 型名検査<br>Model Variation | コネクタメーカー:コネクタ品番<br>Connector manufacturer: Connector P/N | ハーネス長<br>Harness | リード線<br>Wire  |
|-------------------------|----------------------------------------------------------|------------------|---------------|
| AALF                    | JST: XAP-03V-1                                           | 100mm            | UL1061 AWG#26 |
| AALF25                  | JST: XAP-03V-1                                           | 250mm            | UL1061 AWG#26 |
| AA02LF                  | JST: 03T-JWPF-VSLE-S                                     | 100mm            | UL1007 AWG#24 |
| AA02LF25                | JST: 03T-JWPF-VSLE-S                                     | 250mm            | UL1007 AWG#24 |

※当該図面は【KI5510 - AALF25】の図面となります。

| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI5510 | High | 入光時 at Beam detecting |
| KI5511 | Low  | 入光時 at Beam detecting |

## &lt;ご使用上の注意&gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

当センサは防滴構造ですが、光軸面に結露または水滴が付着しますと動作が不安定になる可能性があります。  
光軸面に結露、水滴が付着しましたら、十分に拭き取ってからご使用下さい。

## &lt;Operation Notice&gt;

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

Although this sensor has a drip-proof structure, condensation or water droplets on the optical axis surface may cause unstable operation.  
If condensation or water droplets are on the optical axis surface, wipe them off thoroughly before use.

# KI5510/5511

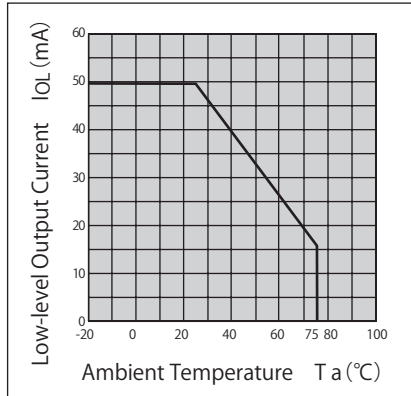
## 定格・特性曲線

Characteristics

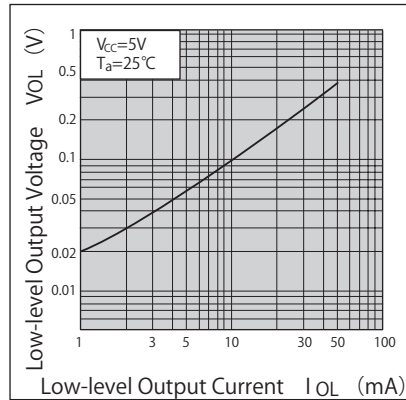
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

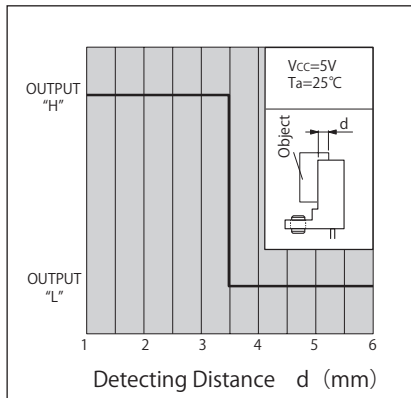
### ローレベル出力電流低減曲線



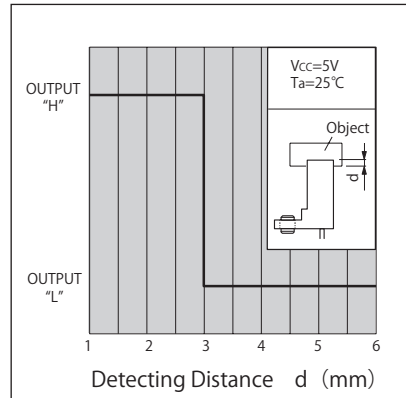
### ローレベル出力電圧ー ローレベル出力電流特性(代表例)



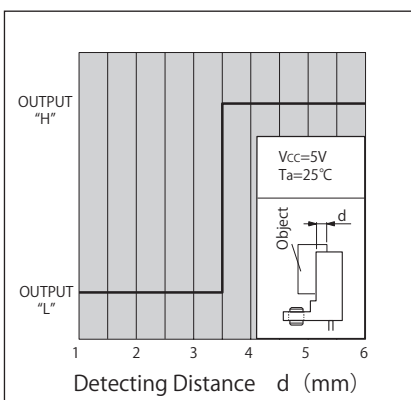
### 検出位置特性 1 (代表例) KI5510



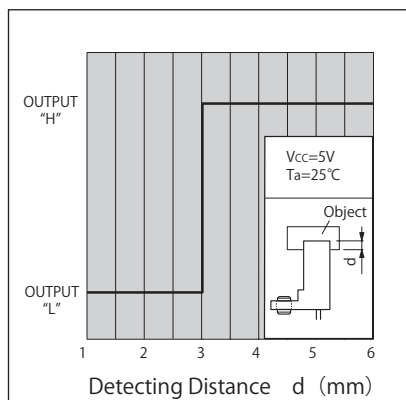
### 検出位置特性2 (代表例) KI5510



### 検出位置特性 1 (代表例) KI5511



### 検出位置特性2 (代表例) KI5511



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KI5530/5531/5540/5541



透過型フォトセンサ Photo Interrupter

NEW



## 概要 Description

KI5530/5531/5540/5541 は、赤外発光ダイオードと受光素子にフォト IC (デジタル出力) を組合せた小型透過型フォトセンサです。

Model KI5530/5531/5540/5541 are compact size of Photo Interrupter and consist of an Infrared LED and a Photo IC.

## 特長 Feature

- ・ アンプ内蔵、オープンコレクタ出力タイプ
- ・ 抜け防止強ロック機構付きコネクタ採用
- ・ 小型
- ・ 検出溝幅: 5mm、スリット幅: 0.5mm
- ・ 2 点ネジ止め
- ・ Built-in amplifier, Open collector output type.
- ・ with secure locking structure connector.
- ・ Compact
- ・ Gap 5mm, Slit width: 0.5mm
- ・ Double sided Screw mount

## 用途 Application

- ・ アミューズメント機器の物体通過検出、ヤクモノの位置検出
- ・ 自動釣銭機、自動販売機のコイン通過検出
- ・ 医療分析機器、その他

- ・ Detection of passing objects in amusement machines, position detection of gimmick.
- ・ Detection of passing coins in automatic change machines and vending machines.
- ・ Medical analysis equipment, etc.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                                       | Symbol           | Rating      |             | Unit |
|--------------------------------------------|------------------|-------------|-------------|------|
|                                            |                  | KI5530/5531 | KI5540/5541 |      |
| 電 源 電 圧 Supply Voltage                     | VCC              | 6           | 13.5        | V    |
| ロ ー レ ベ ル 出 力 電 流 Low-Level Output Current | IOL              | 16          |             | mA   |
| 出 力 電 圧 Output Voltage                     | Vo               | ≤ VCC ※ 1   |             | V    |
| 出 力 許 容 損 失 Output power dissipation       | PO               | 150         |             | mW   |
| 動 作 温 度 Operating Temperature              | T <sub>opr</sub> | -20 ~ +75   |             | °C   |
| 保 存 温 度 Storage Temperature                | T <sub>stg</sub> | -30 ~ +80   |             | °C   |

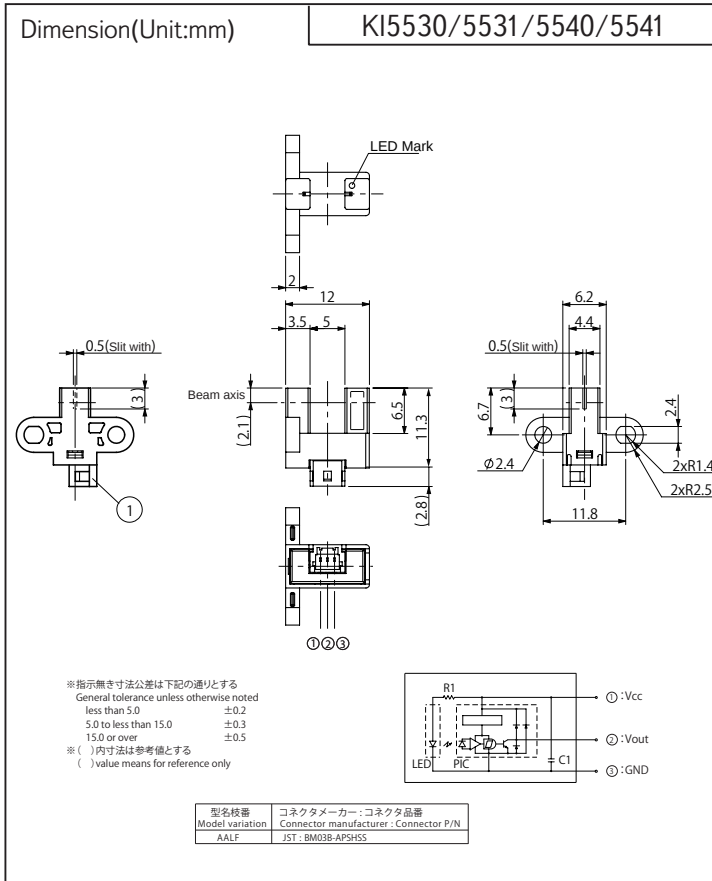
※ 1. Vout 端子に保護回路を内蔵している為、出力電圧は電源電圧より低く設定してご使用ください。  
出力電圧を電源電圧より高く設定すると、正常に動作しません。  
As protection circuit is included in Vout terminal, please set output voltage lower than supply voltage.  
If output voltage is set higher than supply voltage, sensors will not operate properly.

- ※ 1. 電源電圧条件: KI5530/5531-5V  
Vcc Condition KI5540/5541-12V
- ※ 2. IOL=16mA
- ※ 3. RL=47kΩ

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V or 12V, Ta=25°C \*\*] ※ 1

| Item                                    |              | Symbol | Condition   |                 | min.             |                  | typ.             |                  | max.             |                  | Unit |
|-----------------------------------------|--------------|--------|-------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------|
|                                         |              |        |             |                 | KI5530<br>KI5531 | KI5540<br>KI5541 | KI5530<br>KI5531 | KI5540<br>KI5541 | KI5530<br>KI5531 | KI5540<br>KI5541 |      |
| 動作電源電圧 Supply Voltage                   |              | VCC    | —           |                 | 4.5              | 10.8             | 5                | 12.0             | 5.5              | 13.2             | V    |
| ローレベル供給電流 Low-Level Supply Current      |              | ICCL   | KI5530/5540 | 遮光時 Shutter in  | —                |                  | —                |                  | 20               |                  | mA   |
|                                         |              |        | KI5531/5541 | 入光時 w/o Shutter | —                |                  | —                |                  | 20               |                  |      |
| ハイレベル供給電流 High-Level Supply Current     |              | ICCH   | KI5530/5540 | 入光時 w/o Shutter | —                |                  | —                |                  | 20               |                  | mA   |
|                                         |              |        | KI5531/5541 | 遮光時 Shutter in  | —                |                  | —                |                  | 20               |                  |      |
| ローレベル出力電圧 Low-Level Output Voltage ※ 2  |              | VOL    | KI5530/5540 | 遮光時 Shutter in  | —                |                  | —                |                  | 0.4              |                  | V    |
|                                         |              |        | KI5531/5541 | 入光時 w/o Shutter | —                |                  | —                |                  | 0.4              |                  |      |
| ハイレベル出力電圧 High-Level Output Voltage ※ 3 |              | VOH    | KI5530/5540 | 入光時 w/o Shutter | VCC×0.9          |                  | —                |                  | —                |                  | V    |
|                                         |              |        | KI5531/5541 | 遮光時 Shutter in  | VCC×0.9          |                  | —                |                  | —                |                  |      |
| 応答時間<br>Response Time                   | 上昇 Rise Time | tr     |             |                 |                  |                  |                  |                  |                  |                  |      |

\*\* : Ta=25°C unless otherwise noted



# KI5530/5531/5540/5541

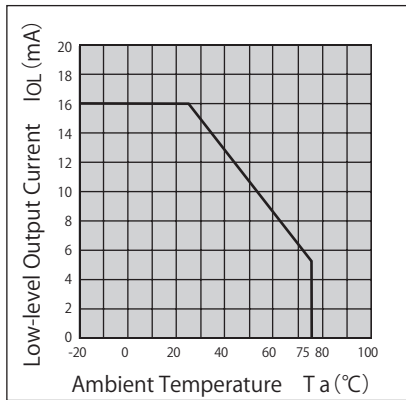
定格・特性曲線

Characteristics

※注意 最大定格を超えないようにご使用ください

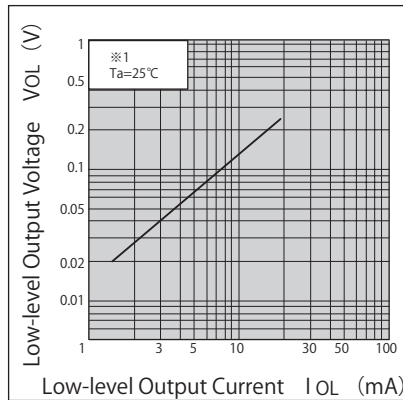
Note: Operation never exceeds each value of Maximum Ratings.

ローレベル出力電流低減曲線

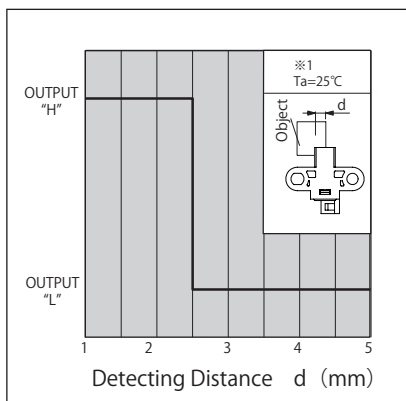


ローレベル出力電圧ー  
ローレベル出力電流特性 (代表例)

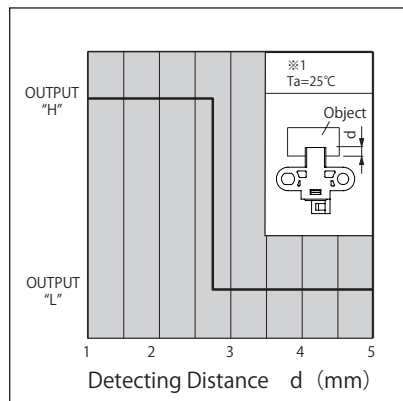
※1- 電源電圧条件 KI5530/5531 - 5V  
Vcc condition KI5540/5541 - 12V



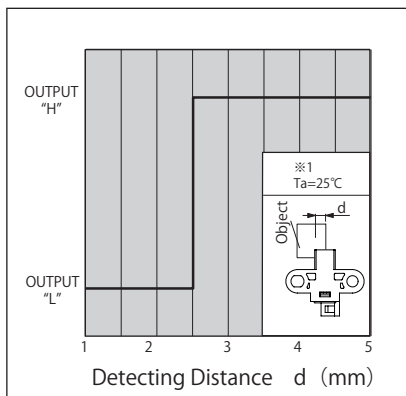
検出位置特性1 (代表例) KI5530/5540



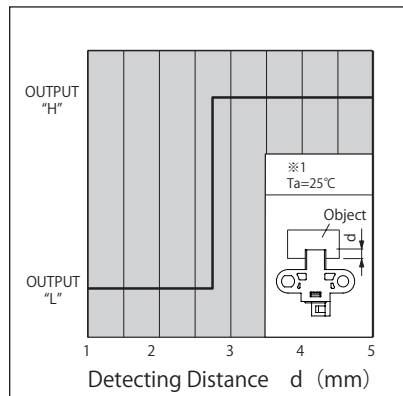
検出位置特性2 (代表例) KI5530/5540



検出位置特性1 (代表例) KI5531/5541



検出位置特性2 (代表例) KI5531/5541

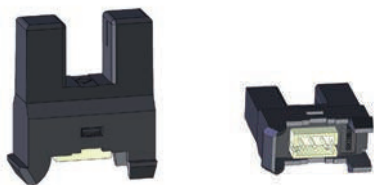


- ・ カスタマイズも承ります。お気軽にお問合せください
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- ・ Specifications are subject to change without notice.

## KI5770/5771



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

KI5770/5771 は、デジタル出力の防塵タイプ透過型フォトセンサです。

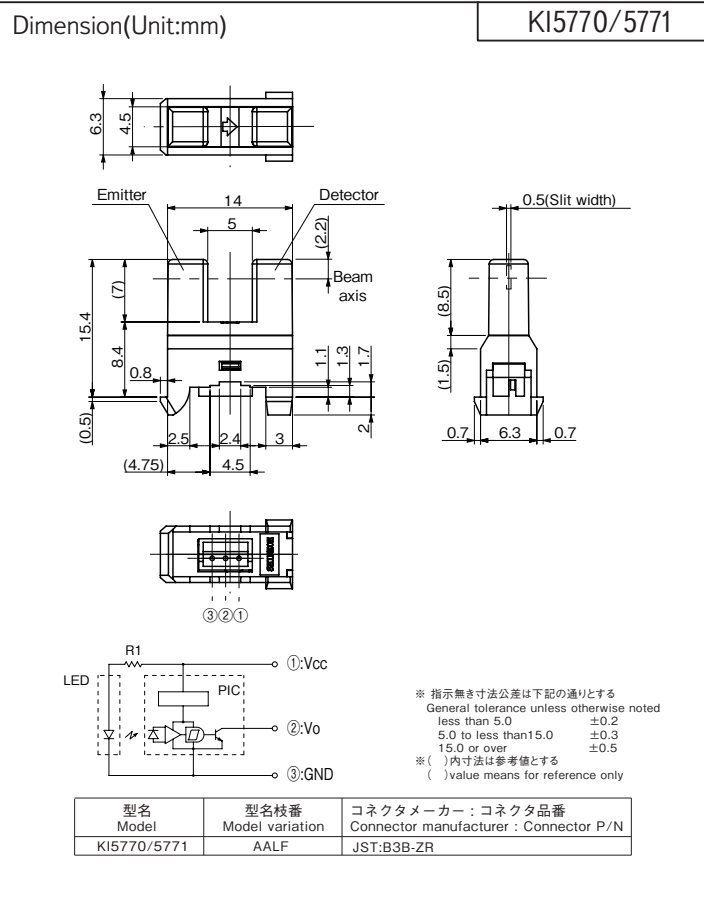
Model KI5770/5771 consist of an Infrared LED and a Photo IC (Digital Output).

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ LED 制限抵抗内蔵タイプ
- ・ Easy removing paper dust.
- ・ High-resolution : slit width 0.5mm.
- ・ Visible Light cut filter.
- ・ Built in resistor for LED drive.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

| Model       | Output type             |
|-------------|-------------------------|
| KI5770/5771 | オープンコレクタ Open collector |

| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI5770 | High | 入光時 at Beam detecting |
| KI5771 | Low  | 入光時 at Beam detecting |

< ご使用上の注意 >  
センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

<Operation Notice>  
We recommend to use with 0.01 μF of bypass capacitor between Vcc and GND and nearby of sensor.

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | Vcc          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI5770 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI5771 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI5770 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI5771 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI5770 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI5771 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI5770 入光時、RL=47kΩ w/o Shutter  | VCC×0.9 | —    | —    | V    |
|                                     |              | KI5771 遮光時、RL=47kΩ Shutter in   | VCC×0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                              | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time | tf                              | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI5770/5771

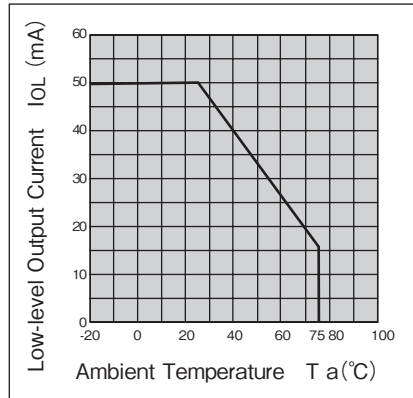
## 定格・特性曲線

Characteristics

※注意 最大定格を超えないようにご使用ください

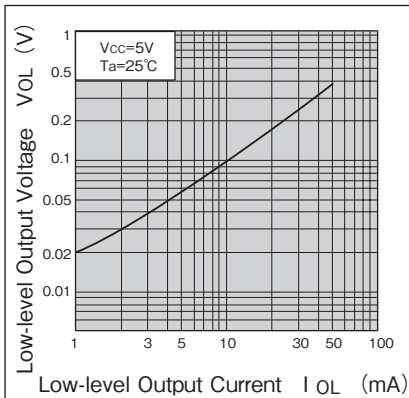
Note: Operation never exceeds each value of Maximum Ratings.

### ローレベル出力電流低減曲線

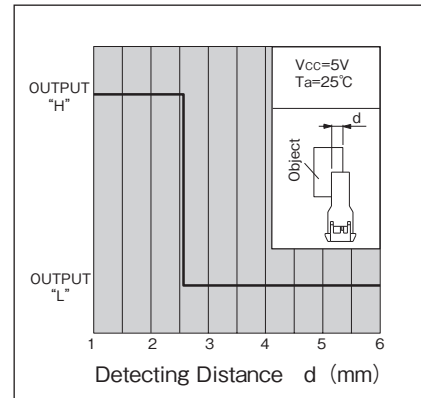


### ローレベル出力電圧

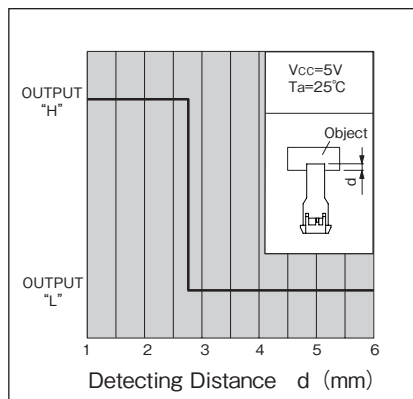
－ローレベル出力電流特性（代表例）



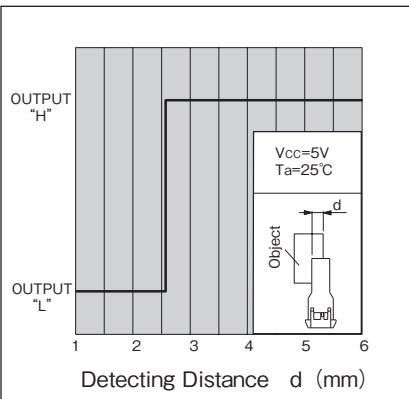
### 検出位置特性1 (代表例) KI5770



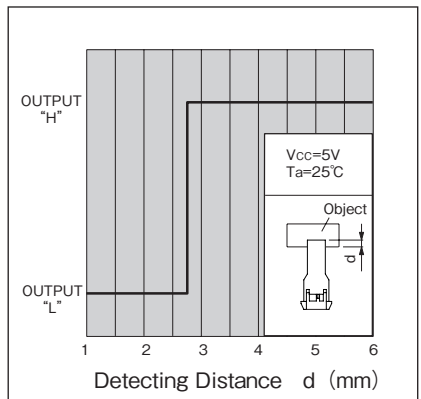
### 検出位置特性2 (代表例) KI5770



### 検出位置特性1 (代表例) KI5771

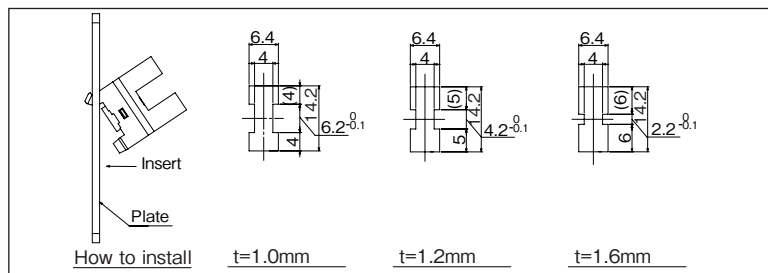


### 検出位置特性2 (代表例) KI5771



## 推奨取付穴寸法図

### Recommended installation to mounting holes



・取付板のプレス側から取付けを推奨します。

・We recommend to mount the sensor from pressed surface of plate.

・実際に取り付けてガタツキ度合いをご確認され取り付け方法を決定下さい。

・The actual tolerance should be confirmed after setting of sensor

・カスタマイズも承ります。お気軽にお問合せください

・ A Customized design available on request.

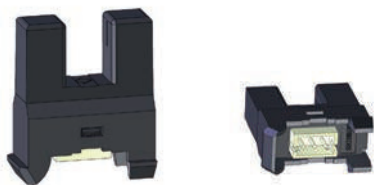
・この仕様は改良のため予告なく変更する場合があります

・ Specifications are subject to change without notice.

## KI5774



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

KI5774 は、アナログ出力の防塵タイプ透過型フォトセンサです。

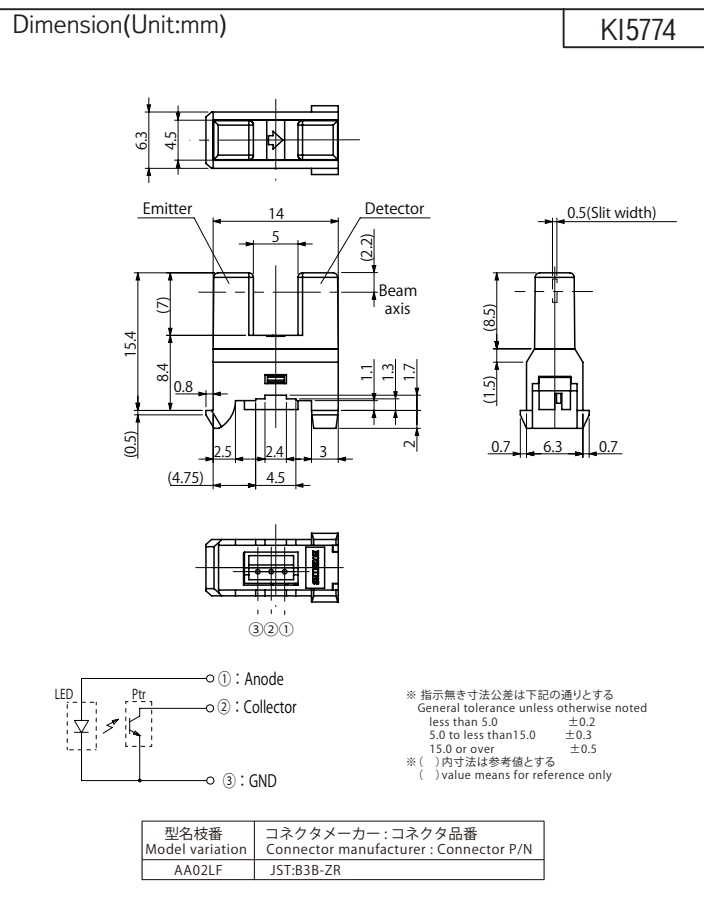
Model KI5774 consists of an Infrared LED and a High sensitive Photo transistor (Analog output).

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ Easy removing paper dust.
- ・ High-resolution : slit width 0.5mm.
- ・ Visible Light cut filter.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ O.A機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       |                                        | Symbol           | Rating    | Unit |
|----------------------------|----------------------------------------|------------------|-----------|------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF               | 50        | mA   |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP              | 1         | A    |
|                            | 逆電圧 Reverse Voltage                    | VR               | 5         | V    |
|                            | 許容損失 Power Dissipation                 | P                | 75        | mW   |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 30        | V    |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 5         | V    |
|                            | コレクタ電流 Collector Current               | IC               | 20        | mA   |
|                            | コレクタ損失 Collector Power Dissipation     | PC               | 75        | mW   |
| 動作温度 Operating Temperature |                                        | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature   |                                        | T <sub>stg</sub> | -30 ~ +80 | °C   |

※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
 ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                                     | Symbol               | Condition                                                       | min. | typ. | max. | Unit |
|-----------------|-----------------------------------------------------|----------------------|-----------------------------------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage                                 | V <sub>F</sub>       | I <sub>F</sub> =20mA                                            | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current                                 | I <sub>R</sub>       | V <sub>R</sub> =3V                                              | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                                    | I <sub>CEO</sub>     | V <sub>CE</sub> =20V, 0 lx                                      | —    | —    | 0.1  | μA   |
|                 | 光電流 Light Current                                   | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                       | 0.5  | —    | —    | mA   |
| 伝達特性<br>Coupled | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =20mA, I <sub>C</sub> =0.15mA                    | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                                  | 上昇 Rise Time         | V <sub>CC</sub> =5V, I <sub>C</sub> =0.5mA, R <sub>L</sub> =1kΩ | —    | 15   | —    | μs   |
|                 |                                                     | 下降 Fall Time         |                                                                 | —    | 17   | —    |      |

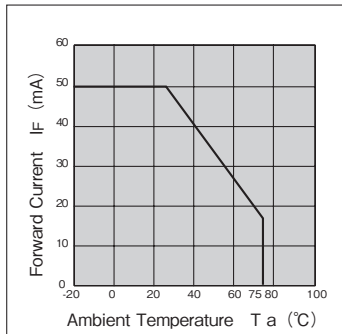
\*\* : Ta=25°C unless otherwise noted

# KI5774

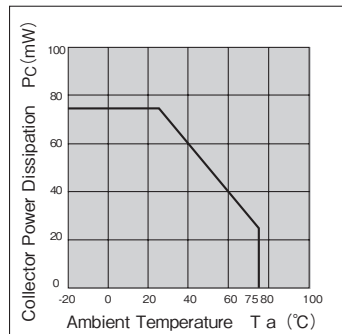
## 定格・特性曲線 Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

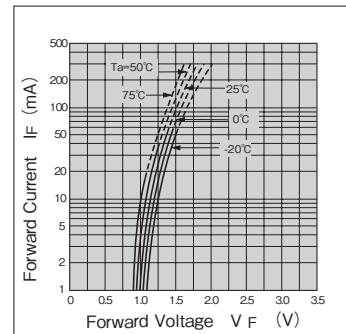
順電流低減曲線



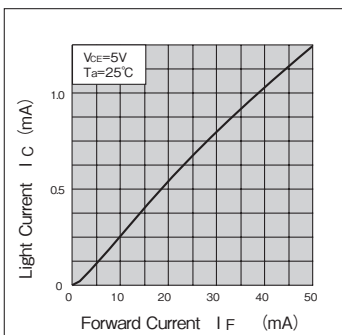
コレクタ損失低減曲線



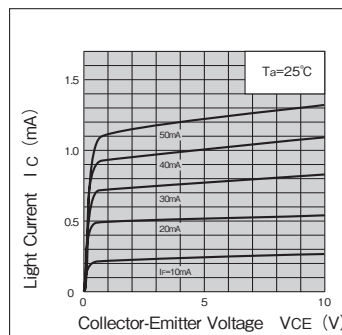
順電流－順電圧曲線 (代表例)



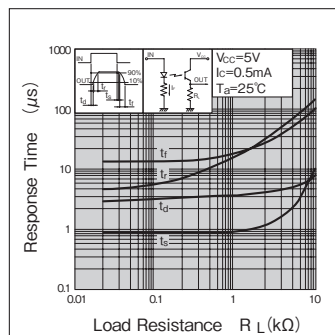
光電流－順電流特性 (代表例)



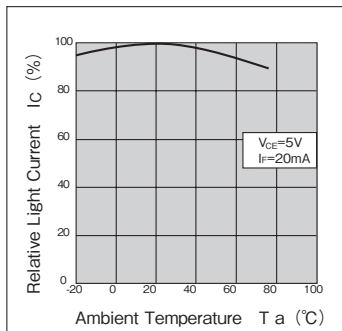
光電流－コレクタ・エミッタ間電圧特性 (代表例)



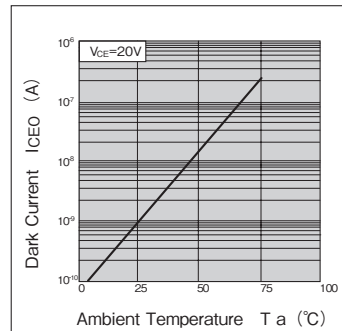
応答時間－負荷抵抗特性 (代表例)



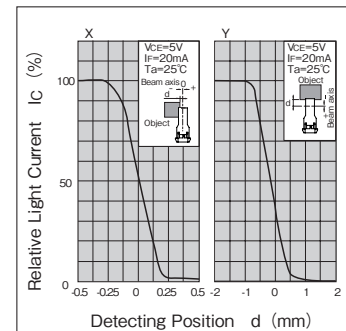
光電流－周囲温度特性 (代表例)



暗電流－周囲温度特性 (代表例)

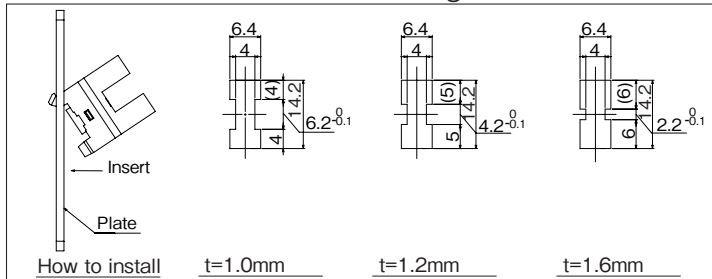


検出位置特性 (代表例)



## 推奨取付穴寸法図

### Recommended installation to mounting holes



- ・取付板のプレス側から取付けを推奨します。
- ・We recommend to mount the sensor from pressed surface of plate.
- ・実際に取り付けてガタツキ度合いをご確認され取り付け方法を決定下さい。
- ・The actual tolerance should be confirmed after setting of sensor

- ・カスタマイズも承ります。お気軽にお問合せください
- ・この仕様は改良のため予告なく変更する場合があります
- ・A Customized design available on request.
- ・Specifications are subject to change without notice.

## KI5780/5781



透過型フォトセンサ 防塵タイプ Photo Interrupter - Dust proof type



## 概要 Description

KI5780/5781 は、デジタル出力の防塵タイプ透過型フォトセンサです。

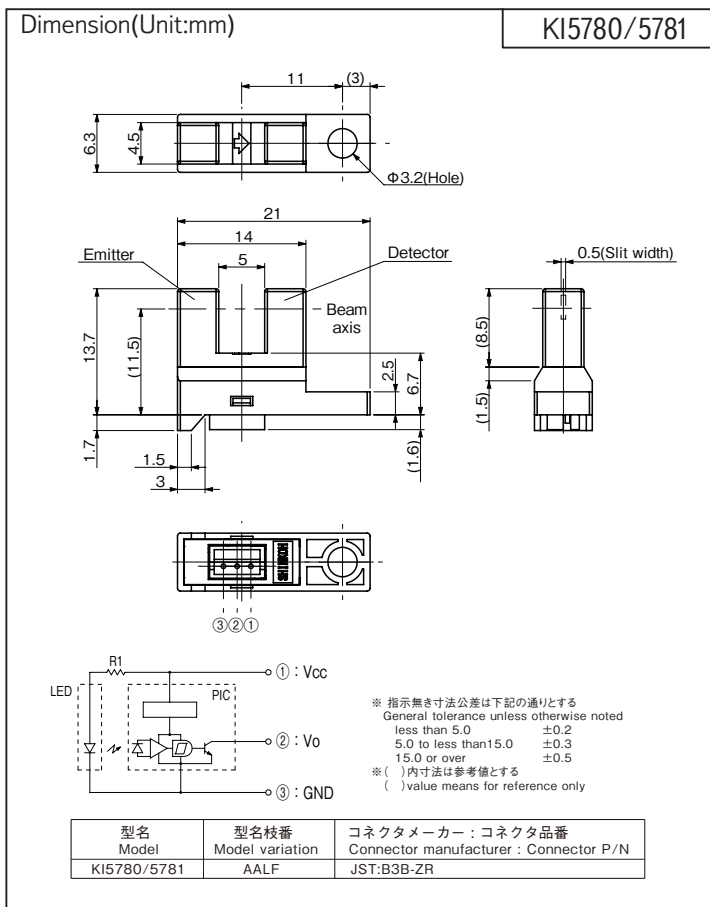
Model KI5780/5781 consist of an Infrared LED and a Photo IC (Digital Output).

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ LED 制限抵抗内蔵タイプ
- ・ Easy removing paper dust.
- ・ High-resolution : slit width 0.5mm.
- ・ Visible Light cut filter.
- ・ Built in resistor for LED drive.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機の用紙通過検出
- ・ O.A 機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



| Model       | Output type             |
|-------------|-------------------------|
| KI5780/5781 | オープンコレクタ Open collector |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

| Model  | Mode | Condition             |
|--------|------|-----------------------|
| KI5780 | High | 入光時 at Beam detecting |
| KI5781 | Low  | 入光時 at Beam detecting |

< ご使用上の注意 >  
センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

< Operation Notice >  
We recommend to use with 0.01 μF of bypass capacitor between Vcc and GND and nearby of sensor.

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol       | Condition                       | min.    | typ. | max. | Unit |
|-------------------------------------|--------------|---------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | Vcc          | —                               | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL         | KI5780 遮光時 Shutter in           | —       | —    | 25   | mA   |
|                                     |              | KI5781 入光時 w/o Shutter          | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH         | KI5780 入光時 w/o Shutter          | —       | —    | 25   | mA   |
|                                     |              | KI5781 遮光時 Shutter in           | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL          | KI5780 遮光時、IOL=16mA Shutter in  | —       | —    | 0.4  | V    |
|                                     |              | KI5781 入光時、IOL=16mA w/o Shutter | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH          | KI5780 入光時、RL=47kΩ w/o Shutter  | VCC×0.9 | —    | —    | V    |
|                                     |              | KI5781 遮光時、RL=47kΩ Shutter in   | VCC×0.9 | —    | —    |      |
| 応答時間 Response Time                  | 上昇 Rise Time | tr                              | —       | 1.47 | —    | μs   |
|                                     | 下降 Fall Time | tf                              | —       | 0.02 | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KI5780/5781

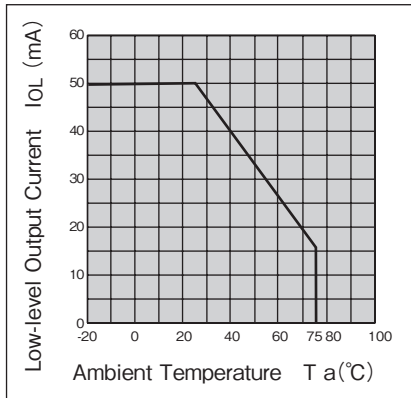
定格・特性曲線

Characteristics

※注意 最大定格を超えないようにご使用ください

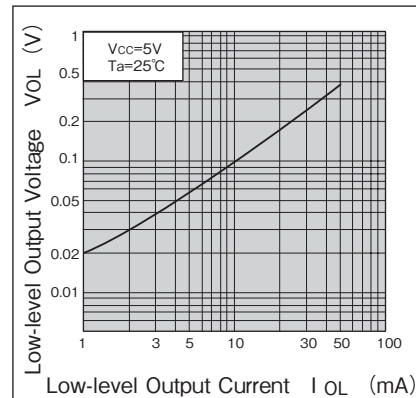
Note: Operation never exceeds each value of Maximum Ratings.

ローレベル出力電流低減曲線

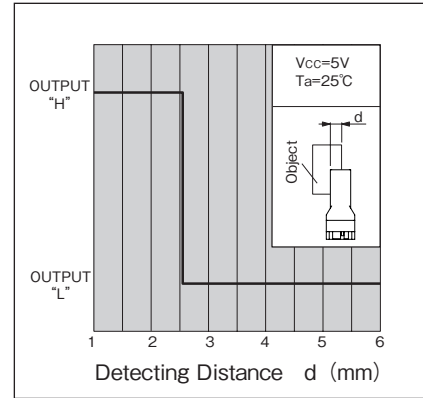


ローレベル出力電圧ー

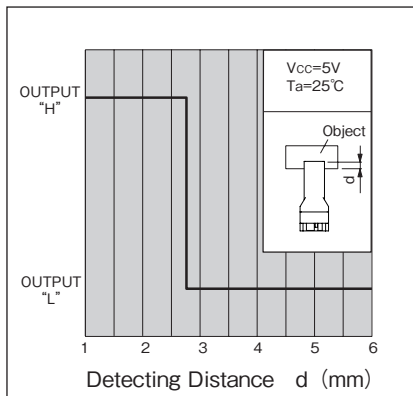
ローレベル出力電流特性 (代表例)



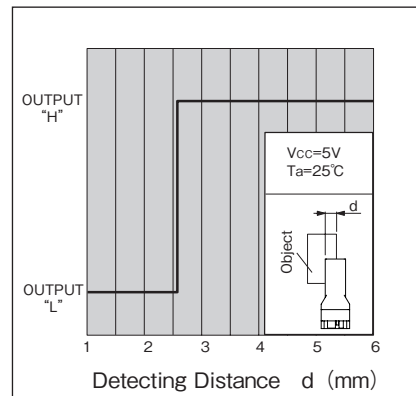
検出位置特性1 (代表例) KI5780



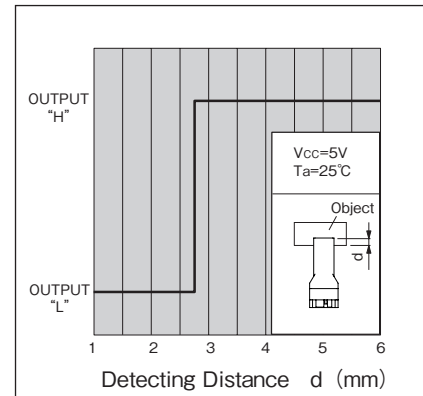
検出位置特性2 (代表例) KI5780



検出位置特性1 (代表例) KI5781

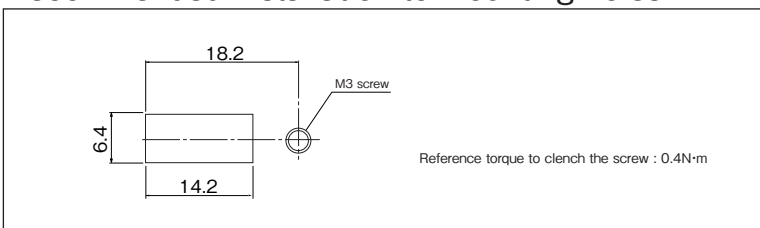


検出位置特性2 (代表例) KI5781



## 推奨取付穴寸法図

Recommended installation to mounting holes



・取付板のプレス側から取付けを推奨します。

・We recommend to mount the sensor from pressed surface of plate.

・実際に取り付けてガタツキ度合いをご確認され取り付け方法を決定下さい。

・The actual tolerance should be confirmed after setting of sensor.

・カスタマイズも承ります。お気軽にお問合せください

・ A Customized design available on request.

・この仕様は改良のため予告なく変更する場合があります

・ Specifications are subject to change without notice.

## KI5784



透過型フォトセンサ 防塵タイプ

Photo Interrupter - Dust proof type



## 概要 Description

KI5784 は、アナログ出力の防塵タイプ透過型フォトセンサです。

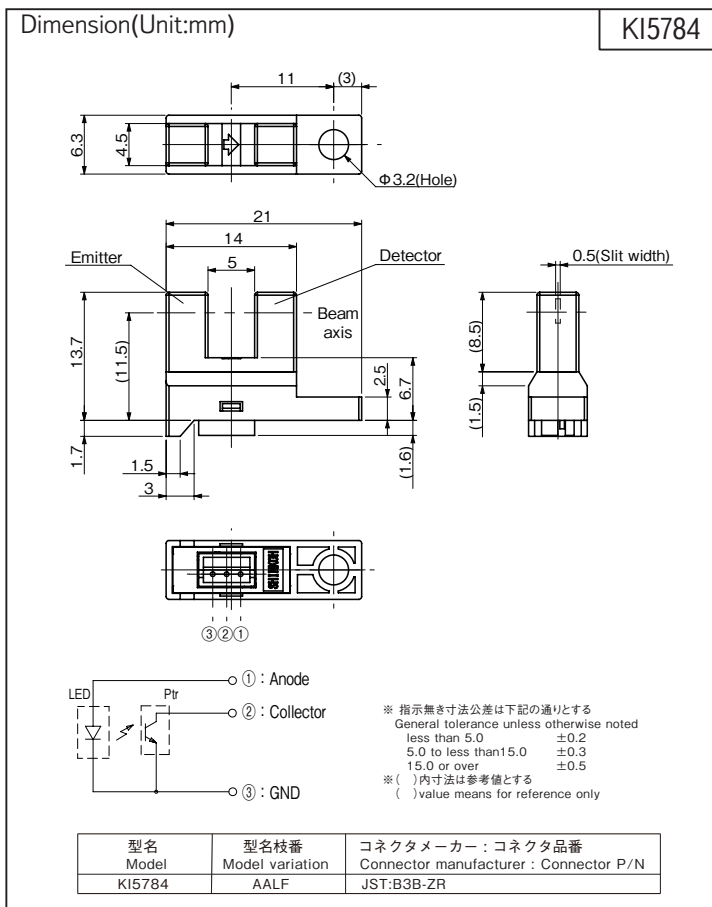
Model KI5784 consists of an Infrared LED and a High sensitive Photo transistor (Analog output).

## 特長 Feature

- ・ 防塵構造：粉塵の影響を受けにくい
- ・ 検出精度が高い：スリット幅 0.5mm
- ・ 可視光カットタイプの為、外乱光の影響を受けにくい
- ・ Easy removing paper dust.
- ・ High-resolution : slit width 0.5mm.
- ・ Visible Light cut filter.

## 用途 Application

- ・ カード機器、両替機の物体通過検出
- ・ 自動販売機、アミューズメント機器のコイン通過検出
- ・ 券売機用の紙通過検出
- ・ O.A.機器、その他
- ・ Object passing for Card reader, Bill exchanger.
- ・ Coin-passing for Auto vending machine and Amusement.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection for O.A. equipment.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       |                                        | Symbol | Rating    | Unit |
|----------------------------|----------------------------------------|--------|-----------|------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF     | 50        | mA   |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP    | 1         | A    |
|                            | 逆電圧 Reverse Voltage                    | VR     | 5         | V    |
|                            | 許容損失 Power Dissipation                 | P      | 75        | mW   |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO   | 30        | V    |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO   | 5         | V    |
|                            | コレクタ電流 Collector Current               | IC     | 20        | mA   |
|                            | コレクタ損失 Collector Power Dissipation     | Pc     | 75        | mW   |
| 動作温度 Operating Temperature |                                        | Topr   | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature   |                                        | Tstg   | -30 ~ +80 | °C   |

※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                   | Symbol       | Condition                | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|--------------|--------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | VF           | IF=20mA                  | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | IR           | VR=3V                    | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | ICEO         | VCE=20V, 0 lx            | —    | —    | 0.1  | μA   |
|                 | 光電流 Light Current                 | IC           | VCE=5V, IF=20mA          | 0.5  | —    | —    | mA   |
| 伝達特性<br>Coupled | コレクタ・エミッタ間飽和電圧 Saturation Voltage | VCE(sat)     | IF=20mA, IC=0.15mA       | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                | 上昇 Rise Time | VCC=5V, IC=0.5mA, RL=1kΩ | —    | 15   | —    | μs   |
|                 |                                   | 下降 Fall Time |                          | —    | 17   | —    |      |

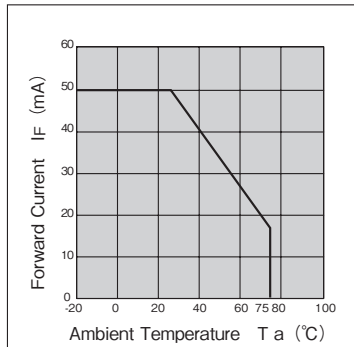
\*\*: Ta=25°C unless otherwise noted

# KI5784

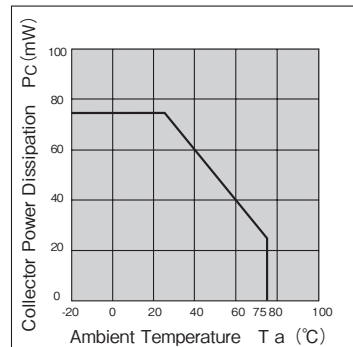
## 定格・特性曲線 Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

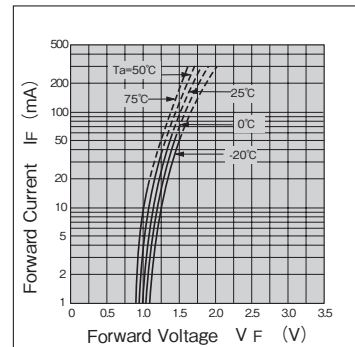
順電流低減曲線



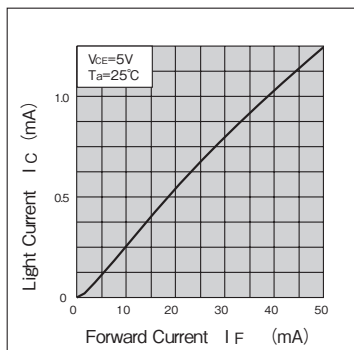
コレクタ損失低減曲線



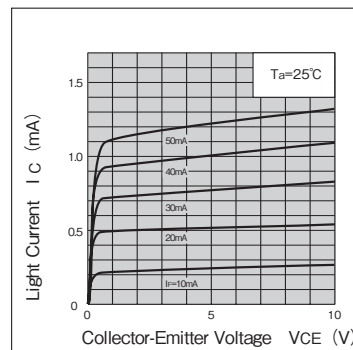
順電流－順電圧曲線 (代表例)



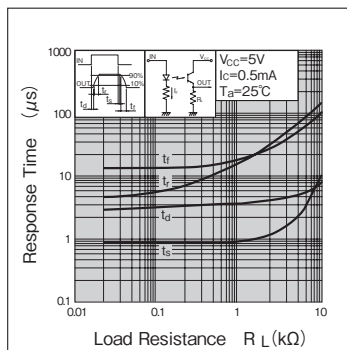
光電流－順電流特性 (代表例)



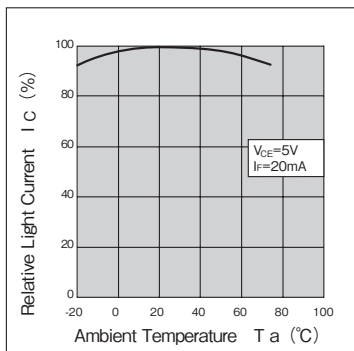
光電流－コレクタ・エミッタ間電圧特性 (代表例)



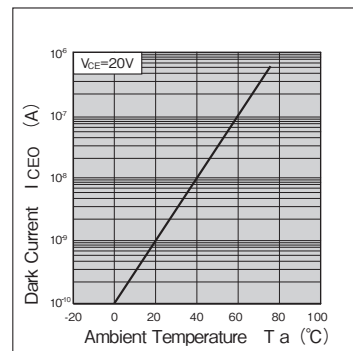
応答時間－負荷抵抗特性 (代表例)



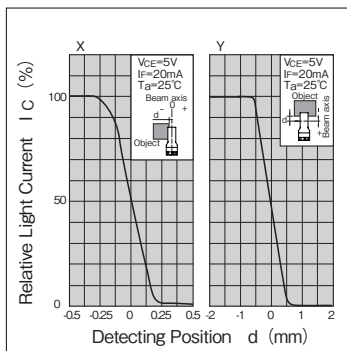
光電流－周囲温度特性 (代表例)



暗電流－周囲温度特性 (代表例)

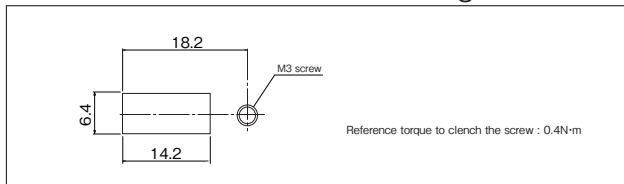


検出位置特性 (代表例)



## 推奨取付穴寸法図

### Recommended installation to mounting holes



・取付板のプレス側から取付けを推奨します。  
・We recommend to mount the sensor from pressed surface of plate.

・実際に取り付けてガタツキ度合いをご確認され  
取り付け方法を決定下さい。  
・The actual tolerance should be confirmed  
after setting of sensor.

- ・カスタマイズも承ります。お気軽にお問合せください
- ・この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB1240/1241



分離型フォトセンサ

Photo Interrupter - Separate type



## 概要 Description

KB1240/1241 は、発光側に赤外発光ダイオード、受光側にフォト IC (デジタル出力) を採用した分離型フォトセンサです。

Model KB1240/1241 consist of an Infrared LED and a Photo IC (Digital Output).

## 特長 Feature

- ・発光、受光間ギャップを任意に設定可能 (1~100mm)
- ・ローコストタイプ
- ・その他シリーズ フォトトランジスタ出力・・・KB1242
- ・Distance between Emitter and Detector can be set within 1mm to 100mm.
- ・Low Cost.
- ・The other model; Phototransistor output type・・・KB1242

## 用途 Application

- ・自動販売機、券売機の物体通過検出
- ・複写機・印刷機の用紙有無、タイミング検出
- ・各種自動機の物体通過検出
- ・Object passing in Auto vender and Ticket vending machine.
- ・Paper detection/Timing detection in Copy machine and Printing machine.
- ・Object passing for Card reader, Auto vending machine, Amusement machine, Printing machine

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol                             | Rating    | Unit   |
|----------------------------|------------------------------------|-----------|--------|
| 発光側<br>Emitter             | 順電流 Forward Current                | IF        | 50 mA  |
|                            | パルス順電流 Pulse Forward Current ※1    | IFP       | 1 A    |
|                            | 逆電圧 Reverse Voltage                | VR        | 5 V    |
|                            | 許容損失 Power Dissipation             | P         | 75 mW  |
| 受光側<br>Detector            | 電源電圧 Supply Voltage                | VCC       | 17 V   |
|                            | ローレベル出力電流 Low-Level Output Current | IOL       | 50 mA  |
|                            | 出力許容損失 Output Power Dissipation    | PO        | 175 mW |
| 動作温度 Operating Temperature | Topr                               | -20 ~ +75 | °C     |
| 保存温度 Storage Temperature   | Tstg                               | -30 ~ +85 | °C     |

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

( )=KB1241

| Item               |               |                           | Symbol     | Condition                        |                                   |                   | min. | typ. | max. | Unit |     |   |
|--------------------|---------------|---------------------------|------------|----------------------------------|-----------------------------------|-------------------|------|------|------|------|-----|---|
| 発 光 側<br>Emitter   | 順電圧           | Forward Voltage           | VF         | IF=20mA                          |                                   |                   | —    | 1.2  | 1.5  | V    |     |   |
|                    | 逆電流           | Reverse Current           | IR         | VR=3V                            |                                   |                   | —    | —    | 10   | μA   |     |   |
| 受 光 側<br>Detector  | 動作電源電圧        | Supply Voltage            | VCC        | —                                |                                   |                   | 4.5  | —    | 15.0 | V    |     |   |
|                    | ローレベル出力電圧     | Low-Level Output Voltage  | VOL        | VCC=5V, IF=0 (IF=15mA), IOL=16mA |                                   |                   | —    | —    | 0.4  | V    |     |   |
|                    | ハイレベル出力電圧     | High-Level Output Voltage | VOH        | VCC=5V, IF=15mA (IF=0)           |                                   |                   | 4.5  | —    | —    | V    |     |   |
|                    | ローレベル供給電流     | Low-Level Supply Current  | ICCL       | VCC=5V, IF=0 (IF=15mA)           |                                   |                   | —    | 1.7  | 3.8  | mA   |     |   |
|                    | ハイレベル供給電流     | High-Level Supply Current | ICCH       | VCC=5V, IF=15mA (IF=0)           |                                   |                   | —    | 0.7  | 2.2  | mA   |     |   |
| 伝 達 特 性<br>Coupled | スレッシュホールド入力電流 |                           | IFLH       | KB1240                           | Low → High                        | VCC=5V<br>d=100mm | —    | —    | 15   | mA   |     |   |
|                    |               |                           | IFHL       | KB1241                           | High → Low                        |                   |      |      |      |      |     |   |
|                    | ヒステリシス        |                           | Hysteresis | IFHL / IFLH  ( IFHL / IFLH )     |                                   | VCC=5V            |      |      | 0.5  | 0.65 | 0.9 | — |
|                    | 応 答 時 間       | 上昇                        | Rise Time  | tr                               | VCC=5V, IF=15mA, d=100mm, RL=280Ω |                   |      | —    | 0.1  | —    | μs  |   |
|                    |               | Response Time             | 下降         | Fall Time                        |                                   |                   |      | tf   | —    | 0.05 |     | — |

\*\* : Ta=25°C unless otherwise noted

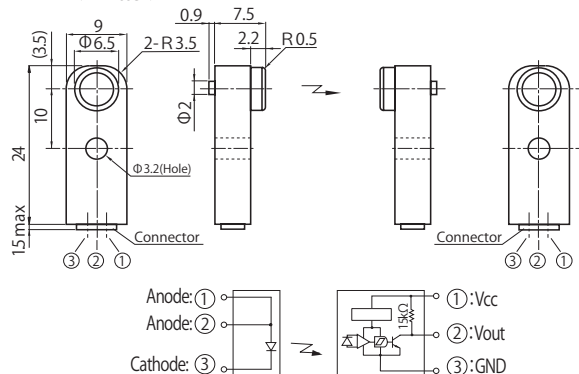
## Dimension (Unit:mm)

## KB1240/1241

| 品番 / Model | 発光側 / Emitter | 受光側 / Detector |
|------------|---------------|----------------|
| KB1240     | KB1242-AA14LF | KB1240-AA23LF  |
| KB1241     | KB1242-AA14LF | KB1241-AA23LF  |

## &lt;Emitter&gt;

## &lt;Detector&gt;



※ 指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5

※ { } 内寸法は参考値とする  
value means for reference only

(注) KB1241は逆論理回路となります  
Note: KB1241 has reverse logic

|                         |                                                            |
|-------------------------|------------------------------------------------------------|
| 型名枝番<br>Model variation | コネクタメーカー: コネクタ品番<br>Connector manufacturer : Connector P/N |
| AA14LF<br>AA23LF        | JST:B3B-ZR                                                 |

| 形式<br>Model | 動作モード<br>Mode                    | 検出距離<br>Detecting distance |
|-------------|----------------------------------|----------------------------|
| KB1240      | High<br>入光時<br>at Beam detecting | 100mm                      |
| KB1241      | Low<br>入光時<br>at Beam detecting  | 100mm                      |

## &lt;ご使用上の注意&gt;

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## &lt;Operation Notice&gt;

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01

※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

# KB1240/1241

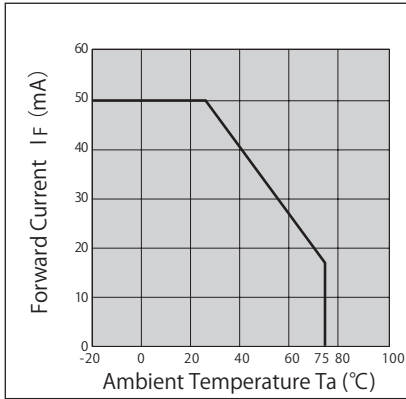
定格・特性曲線

Characteristics

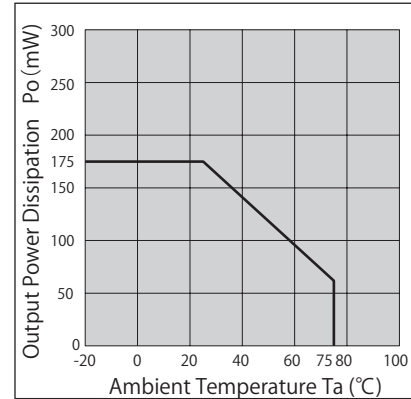
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

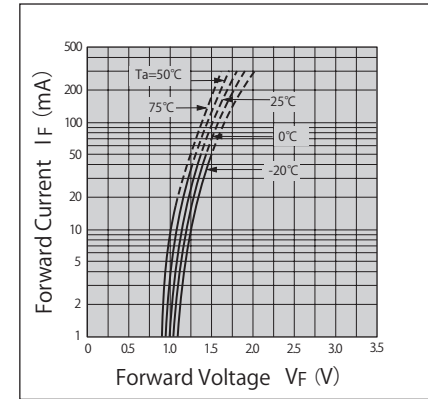
順電流低減曲線



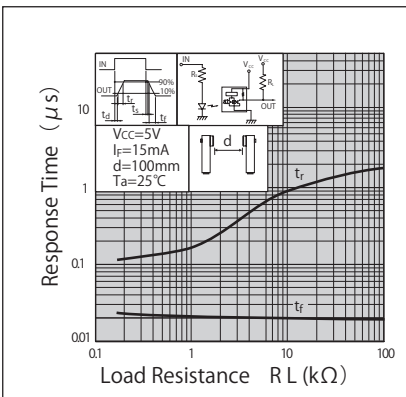
出力許容損失低減曲線



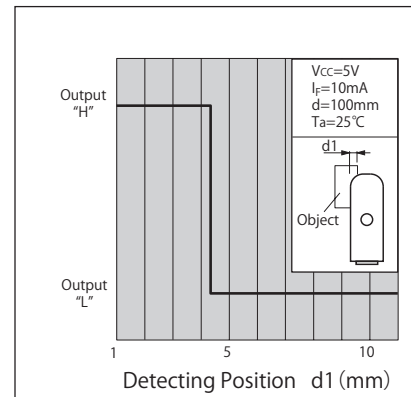
順電圧－順電流特性 (代表例)



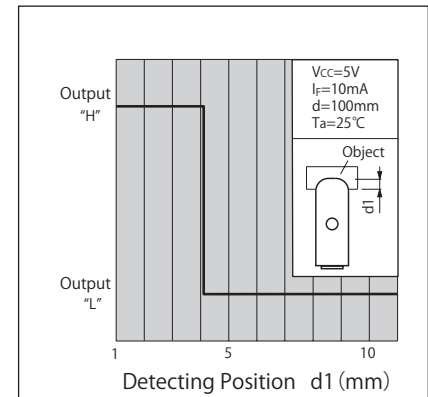
応答時間－負荷抵抗特性 (代表例)



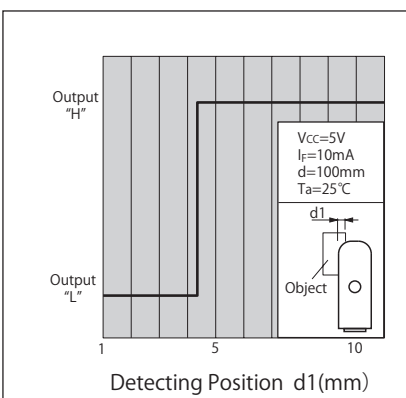
検出位置特性1 (代表例) KB1240



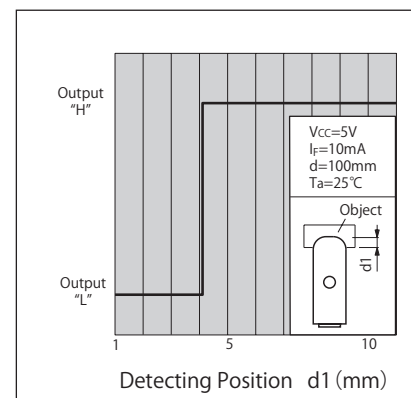
検出位置特性2 (代表例) KB1240



検出位置特性1 (代表例) KB1241



検出位置特性2 (代表例) KB1241



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB1242



分離型フォトセンサ

Photo Interrupter - Separate type



## 概要 Description

KB1242 は、発光側に赤外発光ダイオード、受光側に高感度フォトトランジスタを採用した分離型フォトセンサです。受光側、発光側単体としても使用可能です。

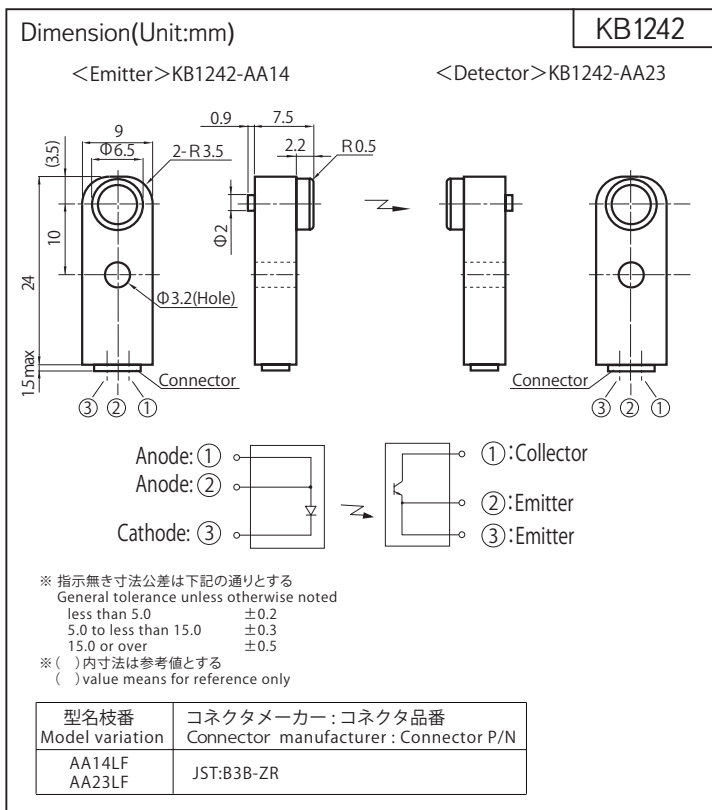
Model KB1242 consists of an Infrared LED and a Phototransistor, and has one piece seamless plastic housing.

## 特長 Feature

- ・発光、受光間ギャップを任意に設定可能 (1~100mm)
- ・ローコストタイプ
- ・その他シリーズ  
フォト IC 出力 (デジタル出力) ...KB1240/KB1241
- ・Distance between Emitter and Detector can be set within 1mm to 100mm.
- ・Low Cost.
- ・The other model; Photo IC output type ...KI1240/KB1241

## 用途 Application

- ・自販機・券売機等の物体通過検出
- ・複写機・印刷機用の紙有無、タイミング検出
- ・各種自動機の物体通過検出
- ・Object passing in Auto vender and Ticket vending machine.
- ・Paper detection/Timing detection in Copy machine and Printing machine.
- ・Object passing for Card reader, Auto vending machine.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       |                                        | Symbol | Rating    | Unit |
|----------------------------|----------------------------------------|--------|-----------|------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF     | 50        | mA   |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP    | 1         | A    |
|                            | 逆電圧 Reverse Voltage                    | VR     | 5         | V    |
| 許容損失 Power Dissipation     |                                        | P      | 75        | mW   |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO   | 30        | V    |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO   | 5         | V    |
|                            | コレクタ電流 Collector Current               | IC     | 20        | mA   |
|                            | コレクタ損失 Collector Power Dissipation     | PC     | 75        | mW   |
| 動作温度 Operating Temperature |                                        | Topr   | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature   |                                        | Tstg   | -30 ~ +85 | °C   |

※1. パルス幅  $t_w \leq 100\mu s$  Duty比=0.01※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                   | Symbol          | Condition                           | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|-----------------|-------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | VF              | IF=20mA                             | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | IR              | VR=3V                               | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | ICEO            | VCE=20V, 0 lx                       | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流 Light Current                 | IC              | IF=20mA, VCE=5V, d=100mm            | 0.2  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Saturation Voltage | VCE(sat)        | IF=20mA, IC=0.1mA, d=100mm          | —    | —    | 0.4  | V    |
|                 | 応答時間<br>Response Time             | 上昇<br>Rise Time | VCC=5V, IC=0.2mA<br>RL=1kΩ, d=100mm | —    | 19   | —    | μs   |
|                 |                                   | 下降<br>Fall Time |                                     | —    | 28   | —    |      |

\*\*: Ta=25°C unless otherwise noted

## KB1242

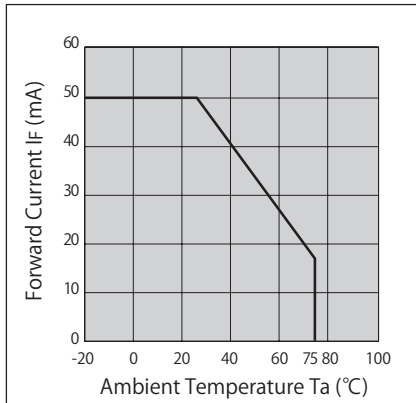
## 定格・特性曲線

Characteristics

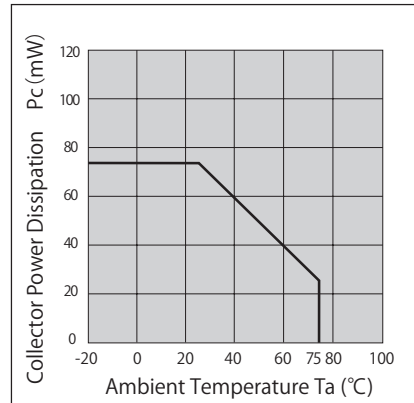
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

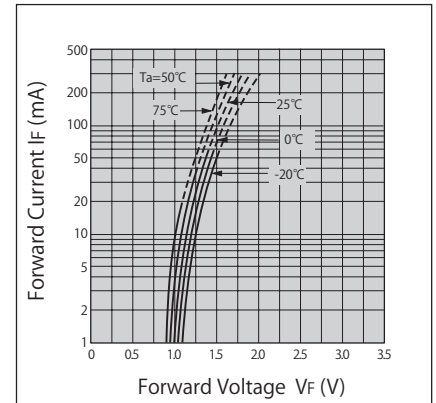
## 順電流低減曲線



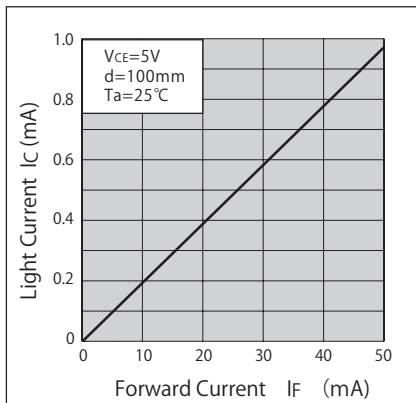
## コレクタ損失低減曲線



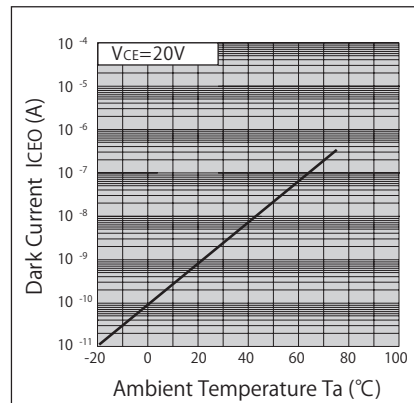
## 順電流－順電圧特性 (代表例)



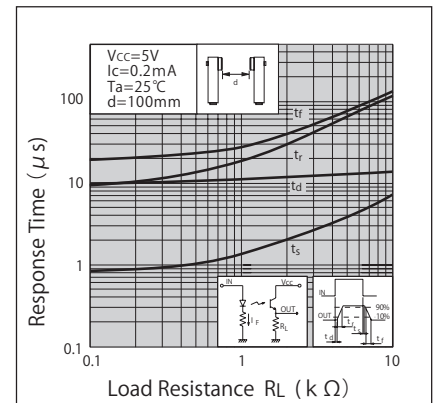
## 光電流－順電流特性 (代表例)



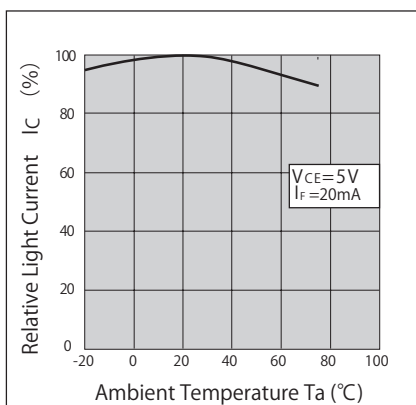
## 暗電流－周囲温度特性 (代表例)



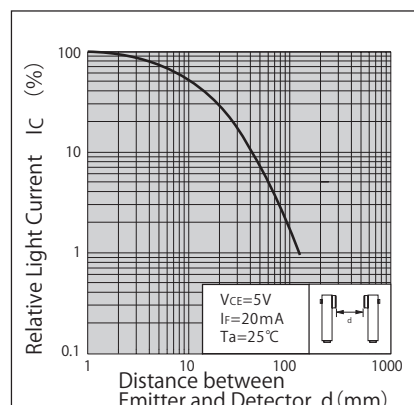
## 応答時間－負荷抵抗特性 (代表例)



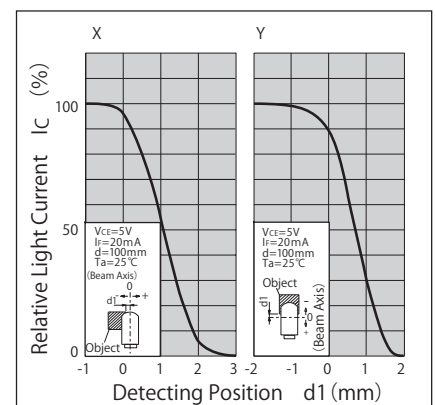
## 光電流－周囲温度特性 (代表例)



## 距離特性 (代表例)



## 検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB1246



分離型フォトセンサ 光変調タイプ

Photo Interrupter - Separate type - Light modulation type



## 概要 Description

KB1246 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC を採用した光同期検出型フォトセンサです。

Model KB1246 consists of an Infrared LED and a Light-modulation Photo IC (Digital Output).

## 特長 Feature

- ・ 発光、受光間ギャップを任意に設定可能 (max.400mm)
- ・ ローコストタイプ
- ・ KB892 より小型化
- ・ 光変調方式の為、外乱光等のノイズに強い
- ・ リード線長、コネクタ形式の指定可
- ・ 長距離検出が可能
- ・ 抜け防止強ロック機構付きコネクタ採用
- ・ その他シリーズ  
コネクタタイプ・・・KB1281  
スリット内蔵の高精度検出タイプも有り

- ・ Distance between Emitter and Detector can be max. 400mm.
- ・ Low Cost.
- ・ Compact Package.
- ・ Resistant to Ambient Illumination noise. (Light-modulation type)
- ・ Customized wire length or connector model is available.
- ・ Long distance detection.
- ・ with secure locking structure connector.
- ・ The other model; Connector type・・・KB1281  
High resolution type is available.

## 用途 Application

- ・ アミューズメント機器の物体通過検知
- ・ 自動化ラインにおけるワークの検出、位置決め
- ・ 各種自動機の物体通過検知
- ・ Object passing for Amusement machine.
- ・ Position/work detection at automatic line.
- ・ Object passing for Card reader, Auto vending machine.

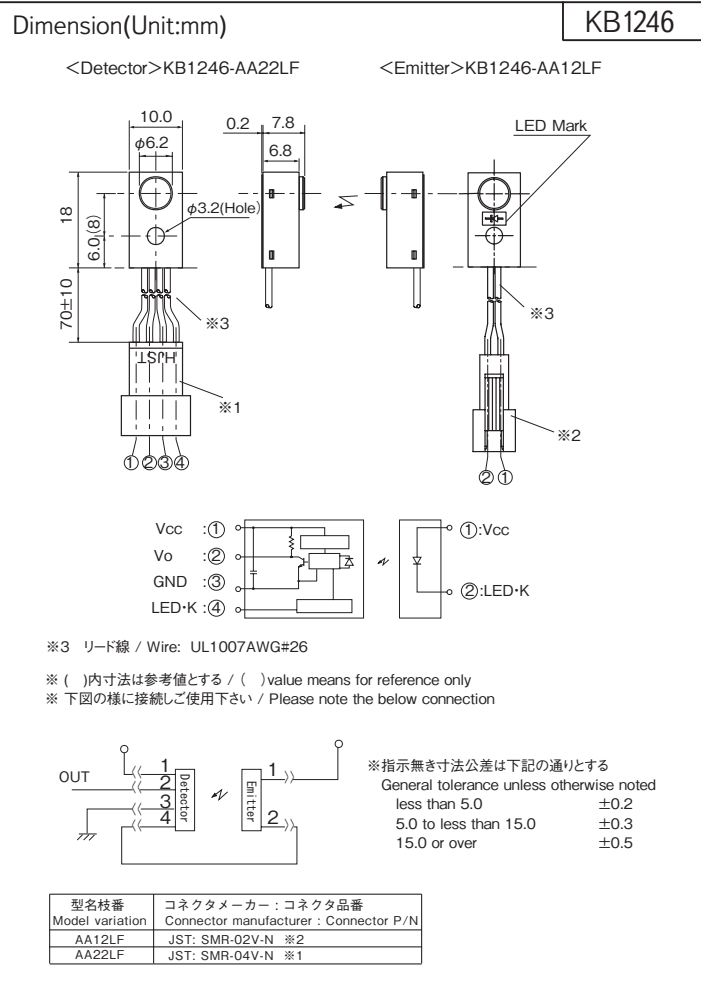
## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                          | Symbol           | Rating    | Unit |
|-------------------------------|------------------|-----------|------|
| 電 源 電 圧 Supply Voltage        | VCC              | 7         | V    |
| 出 力 電 流 Output Current        | IO               | 50        | mA   |
| 動 作 温 度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保 存 温 度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                           | min.    | typ. | max. | Unit |
|-------------------------------------|--------|-------------------------------------|---------|------|------|------|
| 動 作 電 源 電 圧 Supply Voltage          | VCC    | —                                   | 4.75    | 5.0  | 5.25 | V    |
| 消 費 電 流 Current Consumption         | ICCP   | パルスせん頭値、RL=∞ Pulse Serge            | —       | —    | 150  | mA   |
|                                     | ICC    | 平滑値、RL=∞ Average                    | —       | —    | 20   | mA   |
| ローレベル出力電圧 Low Level Output Voltage  | VOL    | 入光時、IOL=16mA at Beam detecting      | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High Level Output Voltage | VOH    | 遮光時 Light block by object           | VCC×0.9 | —    | —    | V    |
| 検 出 距 離 Detecting Distance          | d      | VCC=5V                              | 400     | —    | —    | mm   |
| 外 乱 光 許 容 照 度 Ambient Illumination  | —      | CIE 標準 A 光源 CIE STD. A light source | 2000    | —    | —    | lx   |
| 応 答 時 間 Response Time               | —      | VCC=5V                              | —       | —    | 1    | ms   |

\*\* : Ta=25°C unless otherwise noted



## KB1246

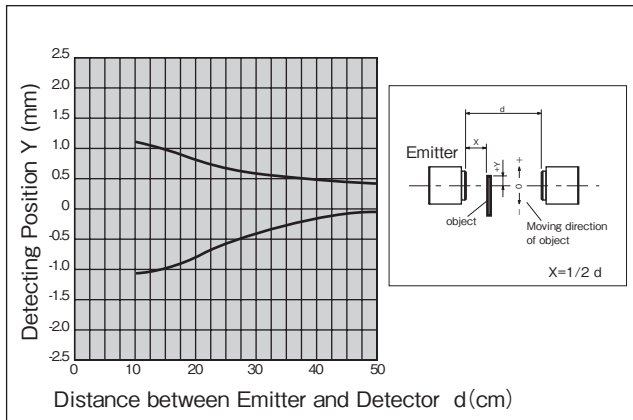
定格・特性曲線

※注意 最大定格を超えないようにご使用ください

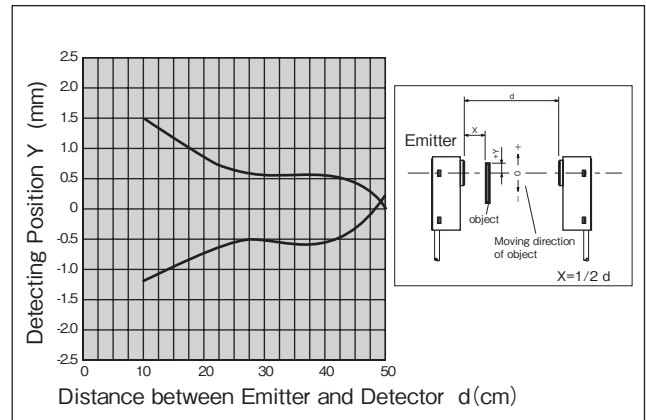
Characteristics

Note: Operation never exceeds each value of Maximum Ratings.

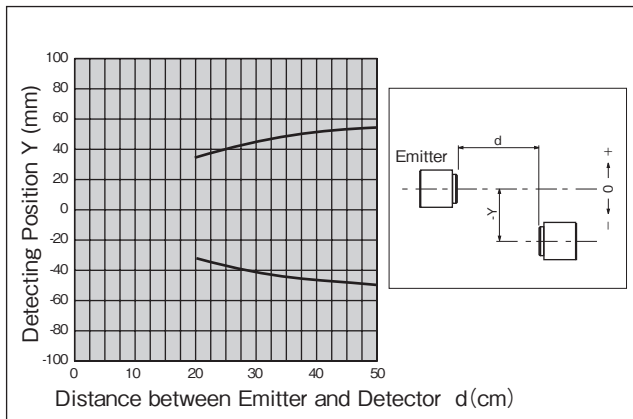
## 検出位置特性1 (代表例)



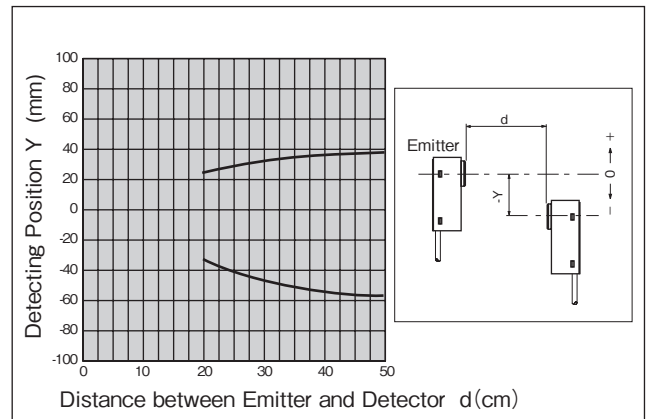
## 検出位置特性2 (代表例)



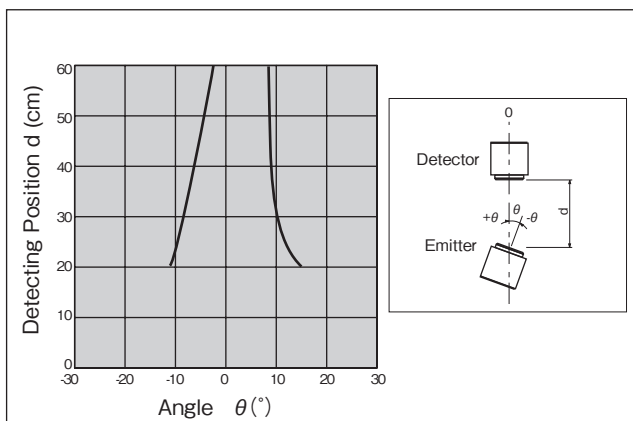
## 平行移動特性1 (代表例)



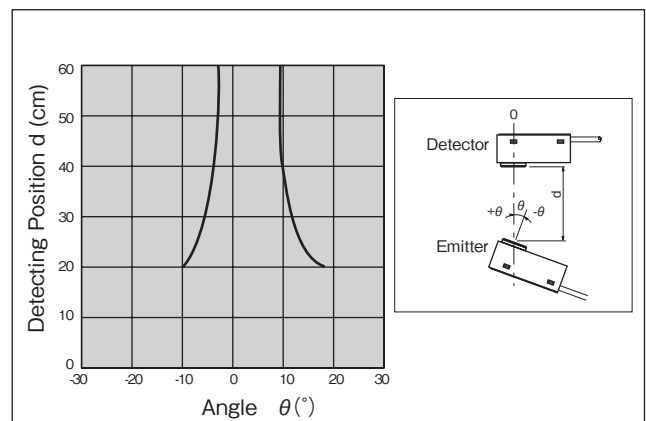
## 平行移動特性2 (代表例)



## 角度特性1 (代表例)



## 角度特性2 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB1281/1581



分離型フォトセンサ 光変調タイプ

Photo Interrupter - Separate type - Light modulation type



## 概要 Description

KB1281/1581 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC を採用した光同期検出型の分離型フォトセンサです。

Model KB1281/1581 consists of an Infrared LED and a Light-modulation Photo IC (Synchronous type).

## 特長 Feature

- ・ 発光、受光間ギャップを長距離で設置可能 (1~400 又は 800mm)
  - ・ ローコストタイプ
  - ・ 光変調方式の為、外乱光等のノイズに強い
  - ・ その他シリーズ
    - ハーネスタイプ・・・KB1246
    - フォトトランジスタタイプ・・・KB1284
- KB1581 の外乱光許容照度 5000lx タイプもあり
- ・ Distance between Emitter and Detector can be set long. (max.400 or 800mm)
  - ・ Low Cost.
  - ・ Resistant to Ambient Illumination noise.(Light-modulation type)
  - ・ The other model; Harness type・・・KB1246  
Phototransistor type・・・KB1284  
KB1581 has Ambient Illumination 5000lx type.

## 用途 Application

- ・ アミューズメント機器の物体通過検知
- ・ 自動化ラインにおけるワークの検出、位置決め
- ・ 各種自動機の物体通過検知
- ・ Object passing for Amusement machine.
- ・ Position/work detection at automatic line.
- ・ Object passing for Card reader, Auto vending machine.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                          | Symbol           | Rating    | Unit |
|-------------------------------|------------------|-----------|------|
| 電 源 電 圧 Supply Voltage        | VCC              | 7         | V    |
| 出 力 電 流 Output Current        | IO               | 50        | mA   |
| 動 作 温 度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保 存 温 度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

| 形式 Model | 動作モード Mode                | 検出距離 Detecting distance |
|----------|---------------------------|-------------------------|
| KB1281   | Low 入光時 at Beam detecting | 400mm                   |
| KB1581   |                           | 800mm                   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                           | min.    | typ. | max. | Unit |
|-------------------------------------|--------|-------------------------------------|---------|------|------|------|
| 動 作 電 源 電 圧 Supply Voltage          | VCC    | —                                   | 4.75    | 5.0  | 5.25 | V    |
| 消 費 電 流 Current Consumption         | ICCP   | パルスせん頭値、RL=∞ Pulse Surge            | —       | —    | 150  | mA   |
|                                     | ICC    | 平滑値、RL=∞ Average                    | —       | —    | 20   | mA   |
| ローレベル出力電圧 Low Level Output Voltage  | VOL    | 入光時、IOL=16mA at Beam detecting      | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High Level Output Voltage | VOH    | 遮光時 Light block by object           | VCC×0.9 | —    | —    | V    |
| 検 出 距 離 Detecting Distance          | d      | KB1281 VCC=5V                       | 400     | —    | —    | mm   |
|                                     |        | KB1581 VCC=5V                       | 800     | —    | —    | mm   |
| 外 乱 光 許 容 照 度 Ambient Illumination  | —      | CIE 標準 A 光源 CIE STD. A light source | 2000    | —    | —    | lx   |
| 応 答 時 間 Response Time               | —      | VCC=5V                              | —       | —    | 1    | ms   |

\*\* : Ta=25°C unless otherwise noted

# KB1281/1581

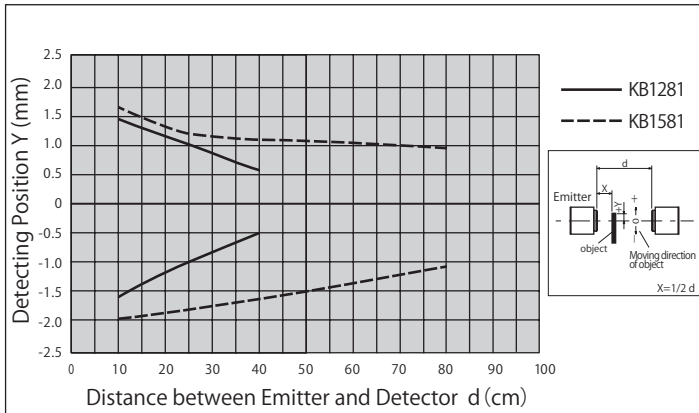
定格・特性曲線

Characteristics

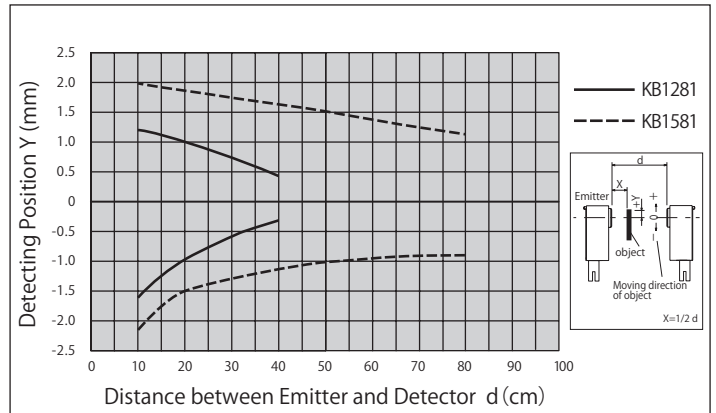
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

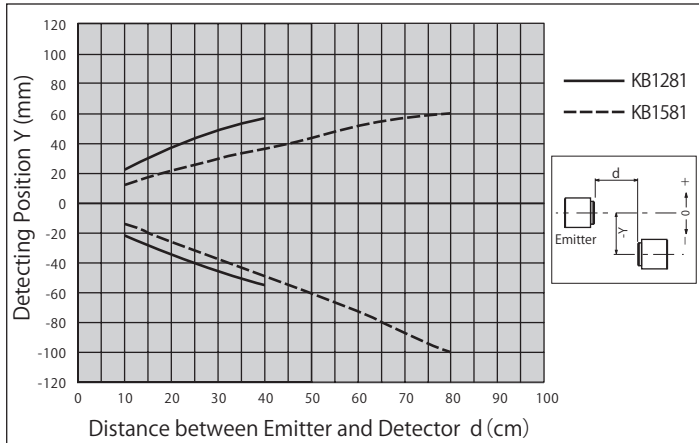
検出位置特性1 (代表例)



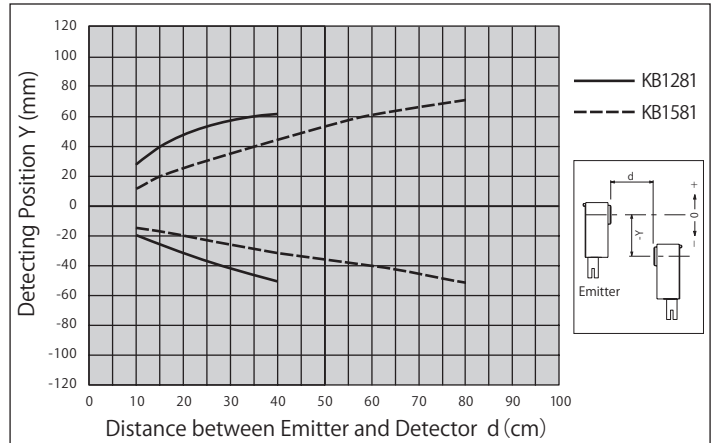
検出位置特性2 (代表例)



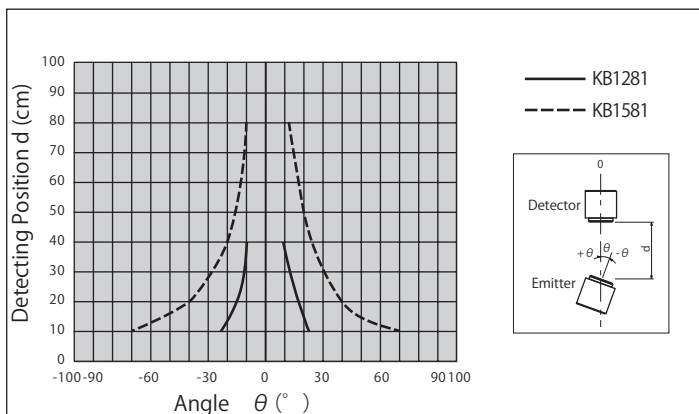
平行移動特性1 (代表例)



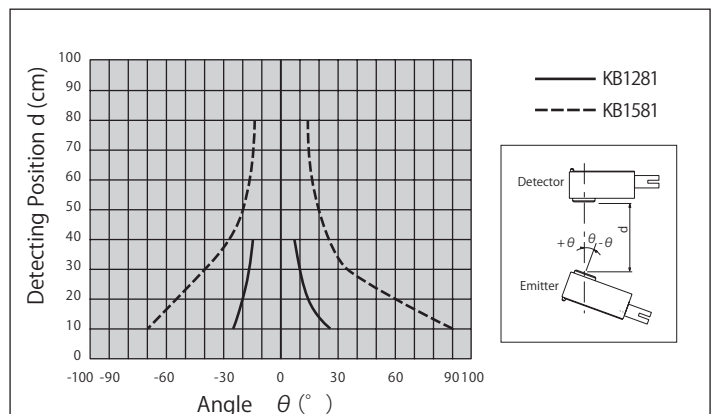
平行移動特性2 (代表例)



角度特性1 (代表例)



角度特性2 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB1284



分離型フォトセンサ

Photo Interrupter - Separate type



## 概要 Description

KB1284 は、発光側に赤外発光ダイオード、受光側に高感度フォトトランジスタを採用した分離型フォトセンサです。受光側、発光側単体としても使用可能です。

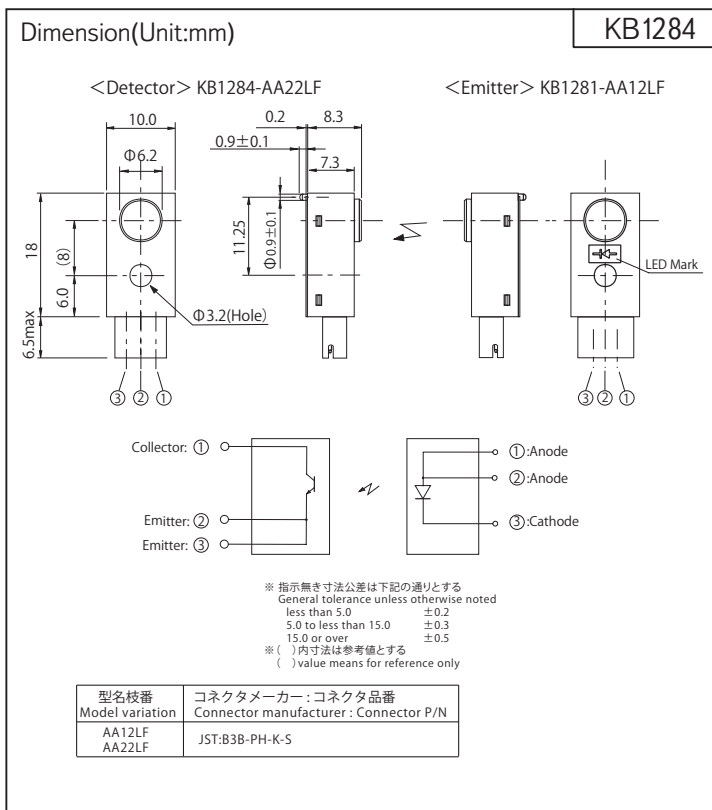
Model KB1284 consists of an Infrared LED and a Phototransistor.

## 特長 Feature

- ・発光、受光間ギャップを任意に設定可能 (1~100mm)
- ・ローコストタイプ
- ・その他シリーズ  
光変調型フォト IC 出力 (デジタル出力) ...KB1281
- ・Distance between Emitter and Detector can be set within 1mm to 100mm.
- ・Low Cost.
- ・The other model; Photo IC output type ...KB1281

## 用途 Application

- ・自販機・券売機等の物体通過検出
- ・複写機・印刷機用の紙有無、タイミング検出
- ・各種自動機の物体通過検出
- ・Object passing in Auto vender and Ticket vending machine.
- ・Paper detection/Timing detection in Copy machine and Printing machine.
- ・Object passing for Card reader, Auto vending machine.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       |                                        | Symbol           | Rating    | Unit |
|----------------------------|----------------------------------------|------------------|-----------|------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF               | 50        | mA   |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP              | 1         | A    |
|                            | 逆電圧 Reverse Voltage                    | VR               | 5         | V    |
|                            | 許容損失 Power Dissipation                 | P                | 75        | mW   |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 30        | V    |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 5         | V    |
|                            | コレクタ電流 Collector Current               | IC               | 20        | mA   |
|                            | コレクタ損失 Collector Power Dissipation     | PC               | 75        | mW   |
| 動作温度 Operating Temperature |                                        | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature   |                                        | T <sub>stg</sub> | -30 ~ +85 | °C   |

※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01

※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                   | Symbol               | Condition                                                                  | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|----------------------|----------------------------------------------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | V <sub>F</sub>       | I <sub>F</sub> =20mA                                                       | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | I <sub>R</sub>       | V <sub>R</sub> =3V                                                         | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | I <sub>CEO</sub>     | V <sub>CE</sub> =20V, 0 lx                                                 | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流 Light Current                 | I <sub>C</sub>       | I <sub>F</sub> =20mA, V <sub>CE</sub> =5V, d=100mm                         | 0.2  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =20mA, I <sub>C</sub> =0.1mA, d=100mm                       | —    | —    | 0.4  | V    |
|                 | 応答時間<br>Response Time             | 上昇<br>Rise Time      | V <sub>CC</sub> =5V, I <sub>C</sub> =0.2mA<br>R <sub>L</sub> =1kΩ, d=100mm | —    | 19   | —    | μs   |
|                 |                                   | 下降<br>Fall Time      |                                                                            | —    | 28   | —    |      |

\*\* : Ta=25°C unless otherwise noted

## KB1284

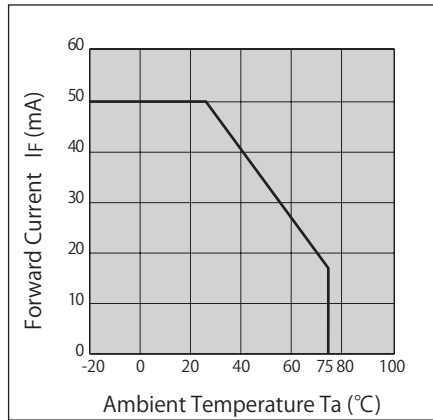
## 定格・特性曲線

Characteristics

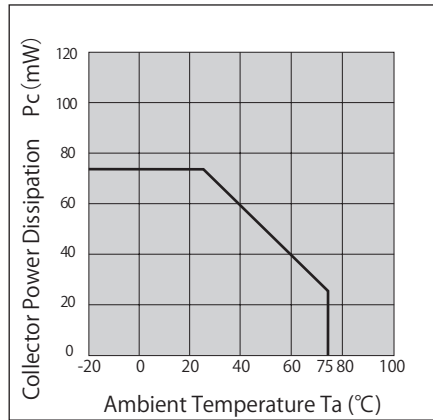
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

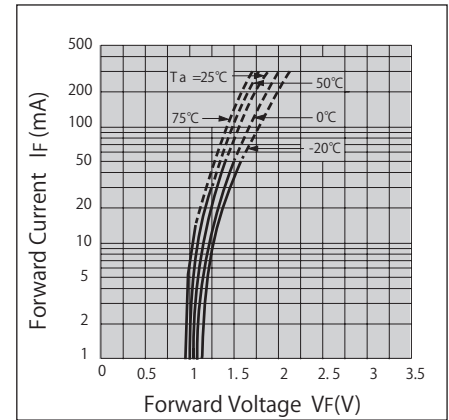
## 順電流低減曲線



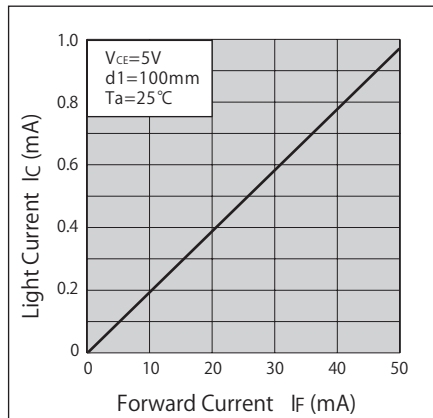
## コレクタ損失低減曲線



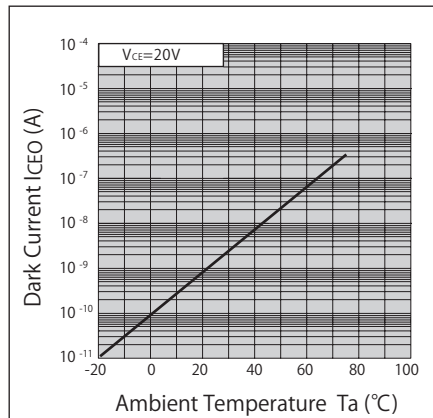
## 順電流－順電圧特性 (代表例)



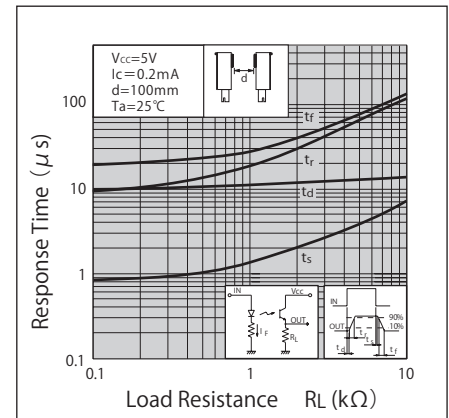
## 光電流－順電流特性 (代表例)



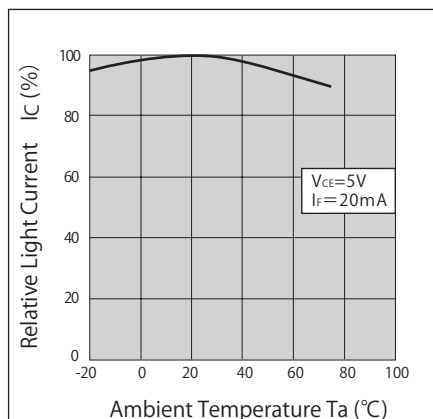
## 暗電流－周囲温度特性 (代表例)



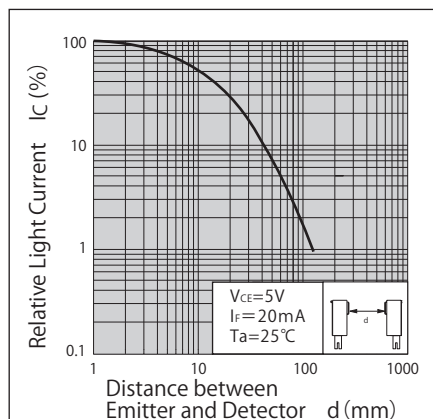
## 応答時間－負荷抵抗特性 (代表例)



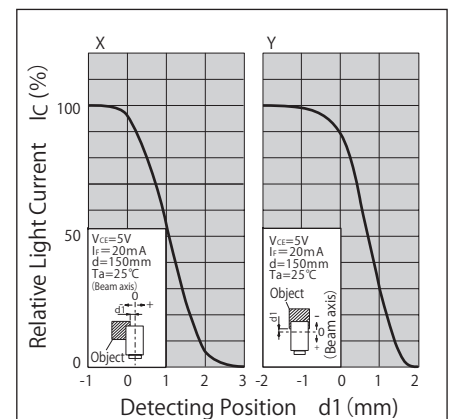
## 光電流－周囲温度特性 (代表例)



## 距離特性 (代表例)



## 検出位置特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB1700



分離型フォトセンサ 光変調タイプ

Photo Interrupter - Separate type - Light modulation type



## 概要 Description

KB1700 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC を採用した光同期検出型の分離型フォトセンサです。

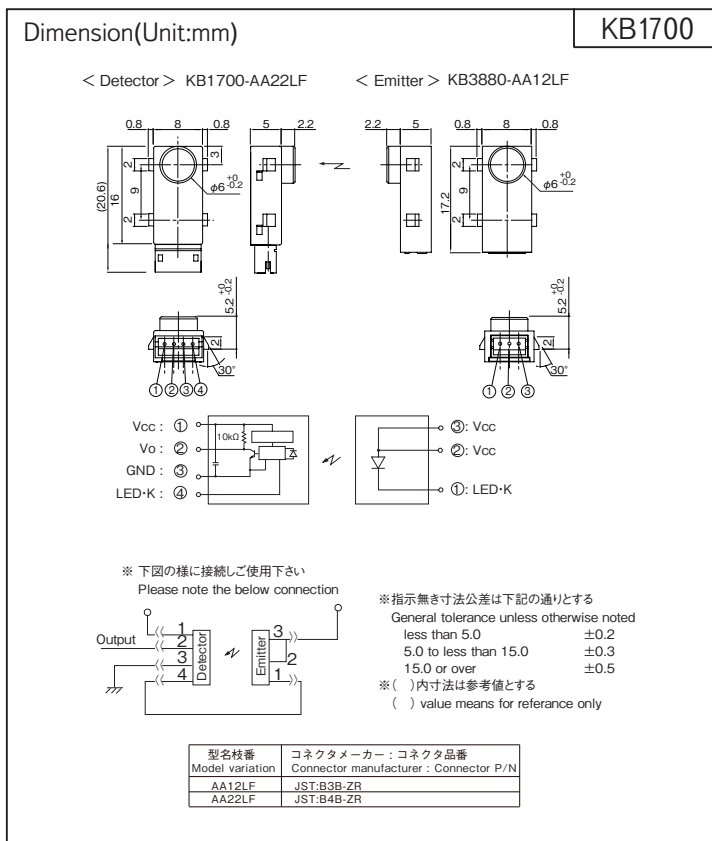
Model KB1700 consist of an Infrared LED and a Light-modulation Photo IC(Synchronous type).

## 特長 Feature

- ・ 発光、受光間ギャップを任意に設定可能 (max.400mm)
- ・ ローコストタイプ
- ・ 光変調方式の為、外乱光等のノイズに強い
- ・ 長距離検出が可能
- ・ Distance between Emitter and Detector can be max. 400mm.
- ・ Low Cost.
- ・ Resistant to Ambient Illumination noise.  
(Light-modulation type)
- ・ Long distance detection.

## 用途 Application

- ・ 金融機器の物体通過検知
- ・ 自動化ラインにおけるワークの検出、位置決め
- ・ 各種自動機の物体通過検知
- ・ Object passing for Banking machine like ATM.
- ・ Position/work detection at automatic line.
- ・ Object passing for Card reader, Auto vending machine.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                          | Symbol | Rating    | Unit |
|-------------------------------|--------|-----------|------|
| 電 源 電 圧 Supply Voltage        | VCC    | 7         | V    |
| 出 力 電 流 Output Current        | IO     | 50        | mA   |
| 動 作 温 度 Operating Temperature | Topr   | -10 ~ +60 | °C   |
| 保 存 温 度 Storage Temperature   | Tstg   | -20 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V,Ta=25°C \*\*]

| Item                                 | Symbol | Condition                           | min.    | typ. | max. | Unit |
|--------------------------------------|--------|-------------------------------------|---------|------|------|------|
| 動 作 電 源 電 圧 Supply Voltage           | VCC    | —                                   | 4.75    | 5.0  | 5.25 | V    |
| 消 費 電 流 Current Consumption          | ICCP   | パルスせん頭値、RL=∞ Pulse Surge            | —       | —    | 150  | mA   |
|                                      | ICC    | 平滑値、RL=∞ Average                    | —       | —    | 20   | mA   |
| ロ ー レベル出力電圧 Low Level Output Voltage | VOL    | 入光時、IOL=16mA at Beam detecting      | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High Level Output Voltage  | VOH    | 遮光時 Light block by object           | VCCx0.9 | —    | —    | V    |
| 検 出 距 離 Detecting Distance           | d      | VCC=5V                              | 400     | —    | —    | mm   |
| 外 乱 光 許 容 照 度 Ambient Illumination   | —      | CIE 標準 A 光源 CIE STD. A light source | 2000    | —    | —    | lx   |
| 応 答 時 間 Response Time                | —      | VCC=5V                              | —       | —    | 1    | ms   |

\*\* : Ta=25°C unless otherwise noted

# KB1700

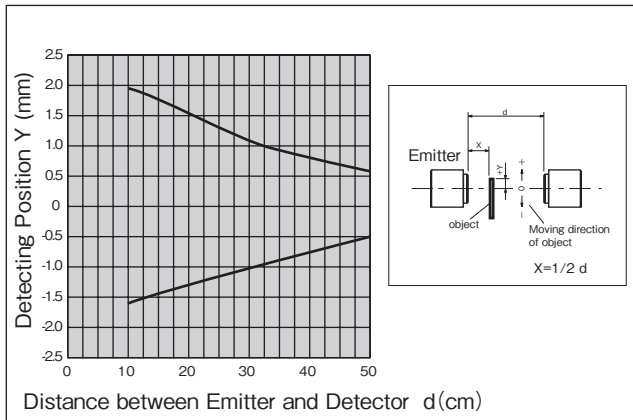
## 定格・特性曲線

Characteristics

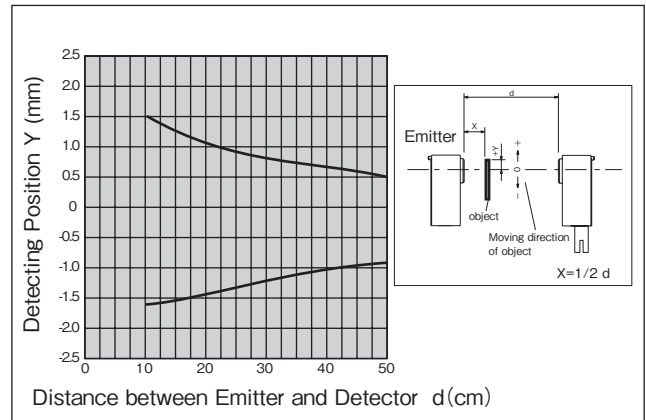
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

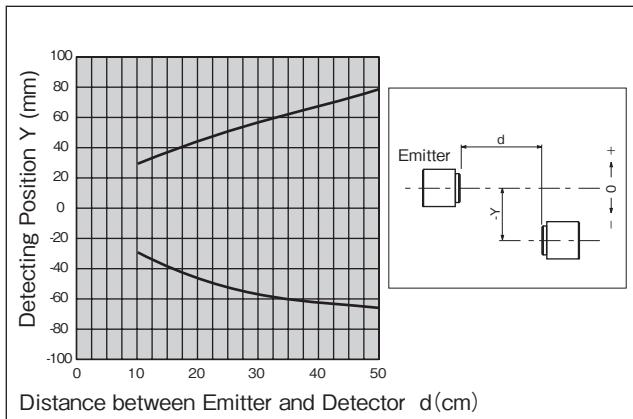
### 検出位置特性1 (代表例)



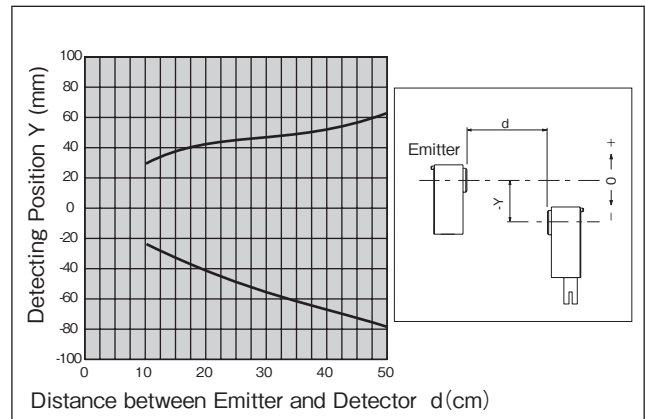
### 検出位置特性2 (代表例)



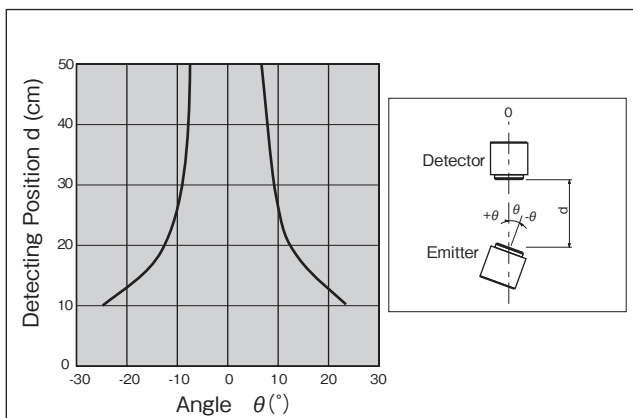
### 平行移動特性1 (代表例)



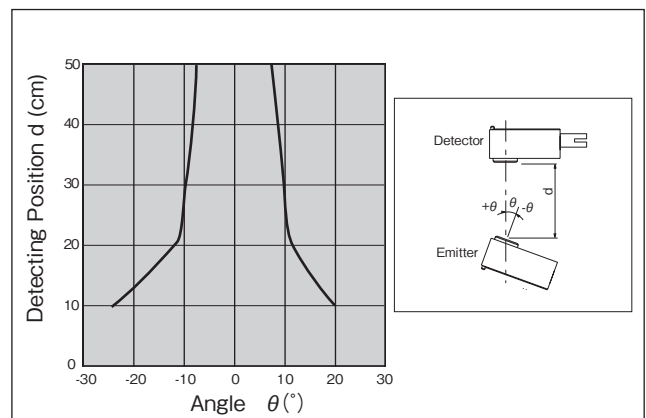
### 平行移動特性2 (代表例)



### 角度特性1 (代表例)



### 角度特性2 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB3290



分離型フォトセンサ

Photo Interrupter - Separate type



## 概要 Description

KB3290 は、発光側に赤外発光ダイオード、受光側に高感度フォトトランジスタを採用した分離型フォトセンサです。受光側、発光側単体としても使用可能です。

Model KB3290 consists of an Infrared LED and a Phototransistor, and has one piece seamless plastic housing.

## 特長 Feature

- ・ 発光、受光間ギャップを任意に設定可能 (1~100mm)
- ・ ローコストタイプ
- ・ Distance between Emitter and Detector can be set within 1mm to 100mm.
- ・ Low Cost

## 用途 Application

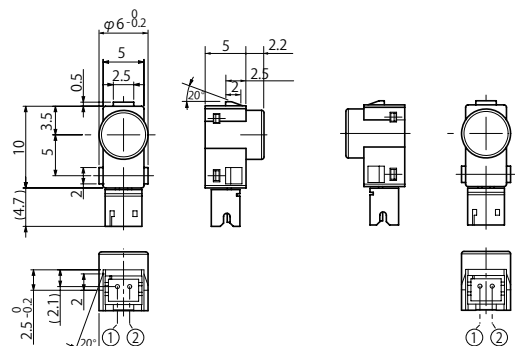
- ・ 金融機器の物体通過検知
- ・ 自動販売機、券売機の物体通過検出
- ・ 複写機・印刷機用の紙有無、タイミング検出
- ・ 各種自動機の物体通過検出
- ・ Object passing for Banking machine like ATM.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection/Timing detection in Copy machine and Printing machine.
- ・ Object passing for Card reader, Auto vending machine.

Dimension(Unit:mm)

KB3290

&lt; Emitter &gt; KB3290-AA12LF

&lt; Detector &gt; KB3290-AA22LF



Anode: ① Collector

Cathode: ② Emitter

※ 指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted

|                       |      |
|-----------------------|------|
| less than 5.0         | ±0.2 |
| 5.0 to less than 15.0 | ±0.3 |
| 15.0 or over          | ±0.5 |

※ ( ) 内寸法は参考値とする  
( ) value means for reference only

|                         |                                                             |
|-------------------------|-------------------------------------------------------------|
| 型名枝番<br>Model variation | コネクタメーカー : コネクタ品番<br>Connector manufacturer : Connector P/N |
| AA12LF<br>AA22LF        | JST:B2B-ZR                                                  |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       |                                        | Symbol | Rating    | Unit |
|----------------------------|----------------------------------------|--------|-----------|------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF     | 50        | mA   |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP    | 0.3       | A    |
|                            | 逆電圧 Reverse Voltage                    | VR     | 5         | V    |
|                            | 許容損失 Power Dissipation                 | P      | 75        | mW   |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO   | 30        | V    |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO   | 5         | V    |
|                            | コレクタ電流 Collector Current               | IC     | 20        | mA   |
|                            | コレクタ損失 Collector Power Dissipation     | PC     | 75        | mW   |
| 動作温度 Operating Temperature |                                        | Topr   | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature   |                                        | Tstg   | -30 ~ +85 | °C   |

※1. パルス幅  $t_w \leq 100\mu s$  Duty比=0.01※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                   | Symbol          | Condition                           | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|-----------------|-------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | VF              | IF=20mA                             | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | IR              | VR=3V                               | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | ICEO            | VCE=10V, 0 lx                       | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流 Light Current                 | IC              | VCE=5V, IF=20mA, d=100mm            | 0.3  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Saturation Voltage | VCE(sat)        | IF=20mA, IC=0.1mA, d=100mm          | —    | —    | 0.4  | V    |
|                 | 応答時間<br>Response Time             | 上昇<br>Rise Time | VCC=5V, IC=0.3mA<br>RL=1kΩ, d=100mm | —    | 24   | —    | μs   |
|                 |                                   | 下降<br>Fall Time |                                     | —    | 25   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KB3290

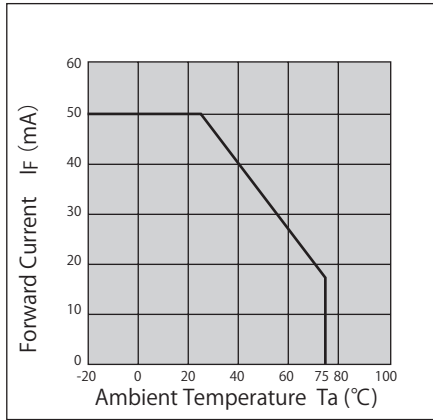
定格・特性曲線

Characteristics

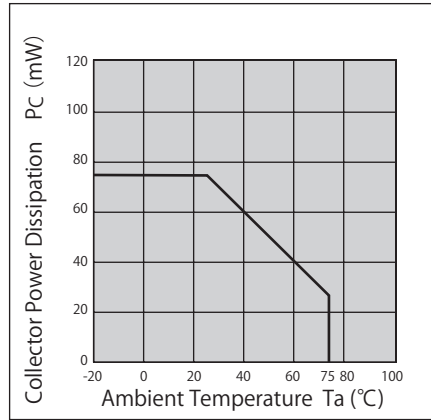
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

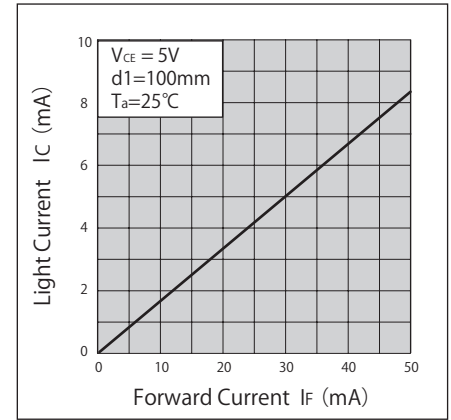
順電流低減曲線



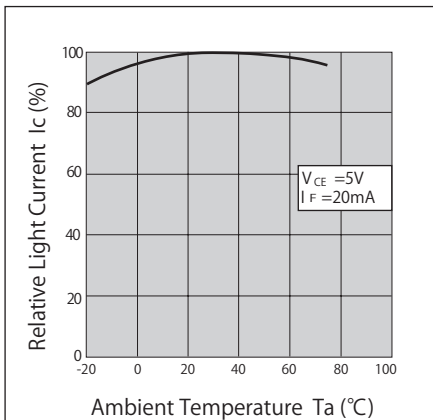
コレクタ損失低減曲線



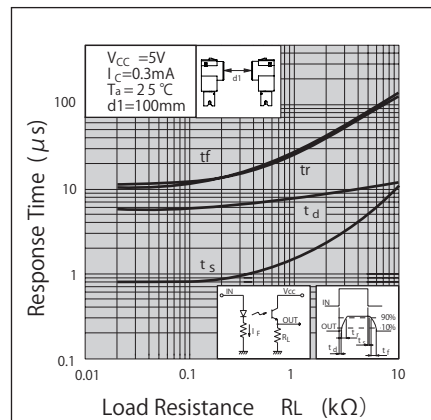
光電流－順電流特性(代表例)



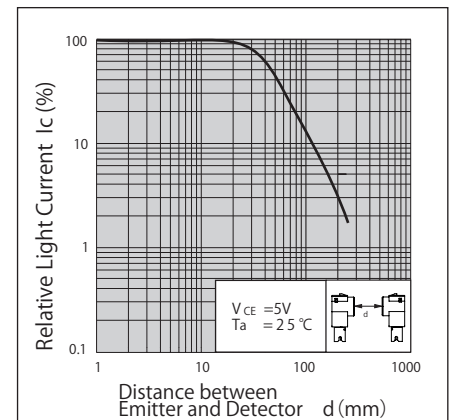
光電流－周囲温度特性(代表例)



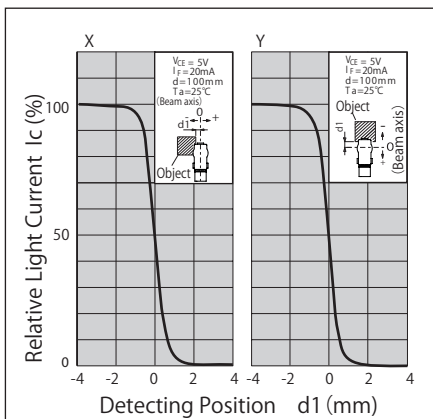
応答時間－負荷抵抗特性(代表例)



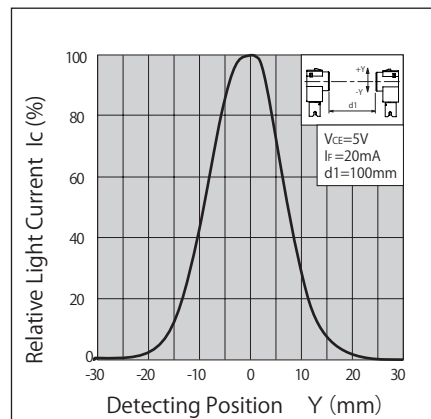
距離特性(代表例)



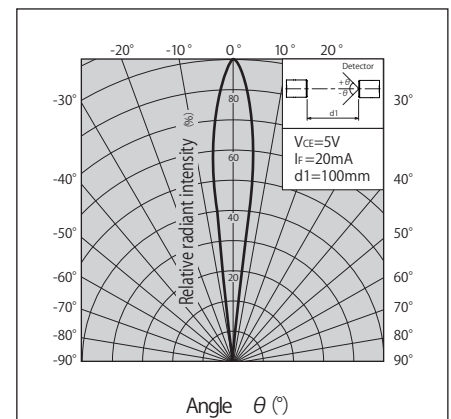
検出位置特性(代表例)



平行移動特性(代表例)



角度特性(代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB3390



分離型フォトセンサ 完全防塵タイプ

Photo Interrupter - Separate type Super Dust Proof type



## 概要 Description

KB3390 は、発光側に赤外発光ダイオード、受光側に高感度フォトトランジスタを採用した分離型フォトセンサです。受光側、発光側単体としても使用可能です。

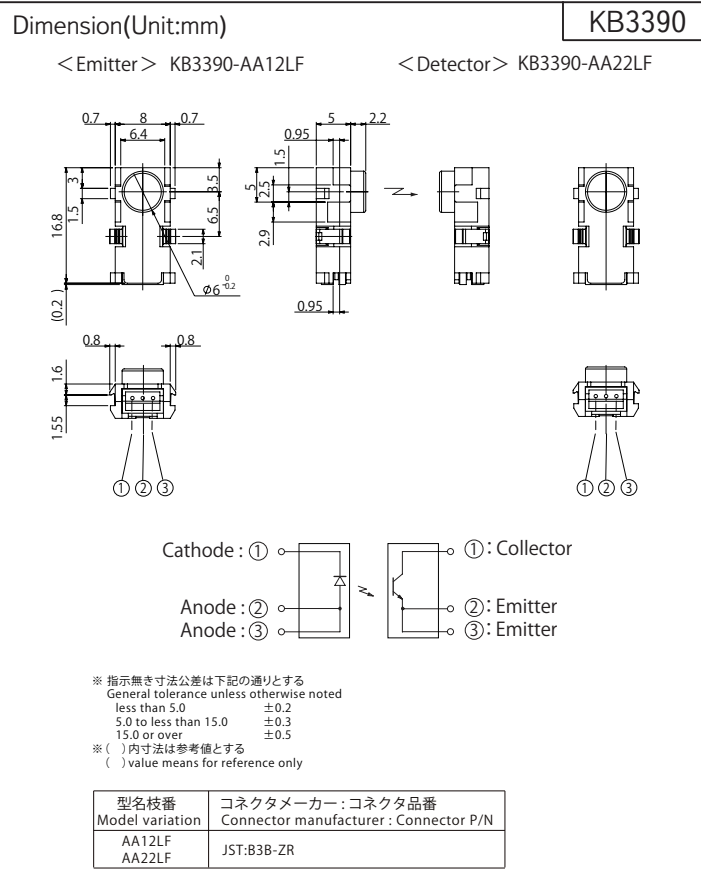
Model KB3390 consists of an Infrared LED and a Phototransistor, and has one piece seamless plastic housing.

## 特長 Feature

- ・発光、受光間ギャップを任意に設定可能 (1~100mm)
- ・完全防塵型。レンズ内部への粉塵対策構造
- ・スナップインタイプ
- ・Distance between Emitter and Detector can be set within 1mm to 100mm.
- ・Super Dust proof type. Structure to prevent intrusion of paper dust into lens room.
- ・Snap-in installation

## 用途 Application

- ・金融機器の物体通過検知
- ・自動販売機、券売機の物体通過検出
- ・複写機・印刷機用の紙有無、タイミング検出
- ・各種自動機の物体通過検出
- ・Object passing for Banking machine like ATM.
- ・Object passing in Auto vender and Ticket vending machine.
- ・Paper detection/Timing detection in Copy machine and Printing machine.
- ・Object passing for Card reader, Auto vending machine.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                          |                                         | Symbol | Rating    | Unit |
|-------------------------------|-----------------------------------------|--------|-----------|------|
| 発 光 側<br>Emitter              | 順 電 流 Forward Current                   | IF     | 50        | mA   |
|                               | パ ル ス 順 電 流 Pulse Forward Current ※1    | IFP    | 0.3       | A    |
|                               | 逆 電 圧 Reverse Voltage                   | VR     | 5         | V    |
|                               | 許 容 損 失 Power Dissipation               | P      | 75        | mW   |
| 受 光 側<br>Detector             | コレクタ・エミッタ間電圧 Collector-Emitter Voltage  | VCEO   | 30        | V    |
|                               | エミッタ・コレクタ間電圧 Emitter-Collector Voltage  | VECO   | 5         | V    |
|                               | コ レ ク タ 電 流 Collector Current           | IC     | 20        | mA   |
|                               | コ レ ク タ 損 失 Collector Power Dissipation | PC     | 75        | mW   |
| 動 作 温 度 Operating Temperature |                                         | Topr   | -20 ~ +75 | °C   |
| 保 存 温 度 Storage Temperature   |                                         | Tstg   | -30 ~ +85 | °C   |

※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*]

| Item               |                                                     | Symbol       | Condition                           | min. | typ. | max. | Unit |
|--------------------|-----------------------------------------------------|--------------|-------------------------------------|------|------|------|------|
| 発 光 側<br>Emitter   | 順 電 圧 Forward Voltage                               | VF           | IF=20mA                             | —    | 1.2  | 1.5  | V    |
|                    | 逆 電 流 Reverse Current                               | IR           | VR=3V                               | —    | —    | 10   | μA   |
| 受 光 側<br>Detector  | 暗 電 流 Dark Current                                  | ICEO         | VCE=20V, 0 lx                       | —    | —    | 0.1  | μA   |
| 伝 達 特 性<br>Coupled | 光 電 流 Light Current                                 | IC           | VCE=5V, IF=20mA, d=100mm            | 0.5  | —    | —    | mA   |
|                    | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat)     | IF=20mA, IC=0.1mA, d=100mm          | —    | —    | 0.4  | V    |
|                    | 応 答 時 間<br>Response Time                            | 上昇 Rise Time | VCC=5V, IC=0.3mA<br>RL=1kΩ, d=100mm | —    | 24   | —    | μs   |
|                    |                                                     | 下降 Fall Time |                                     | —    | 25   | —    |      |

\*\*: Ta=25°C unless otherwise noted

# KB3390

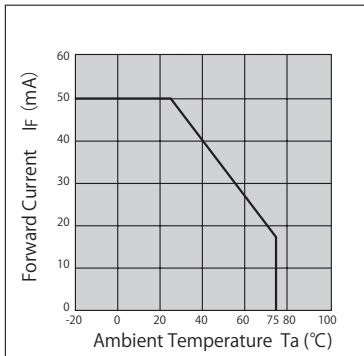
## 定格・特性曲線

### Characteristics

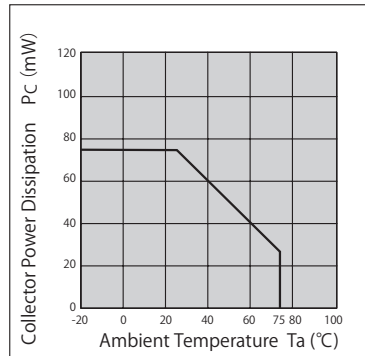
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

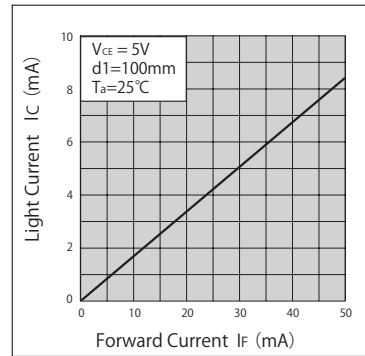
### 順電流低減曲線



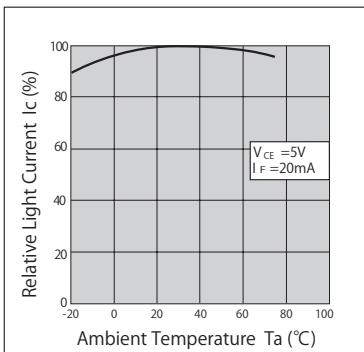
### コレクタ損失低減曲線



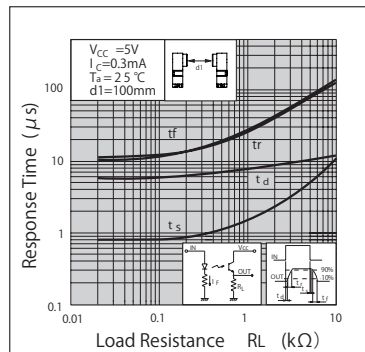
### 光電流－順電流特性(代表例)



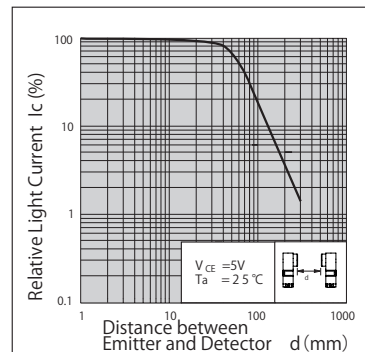
### 光電流－周囲温度特性(代表例)



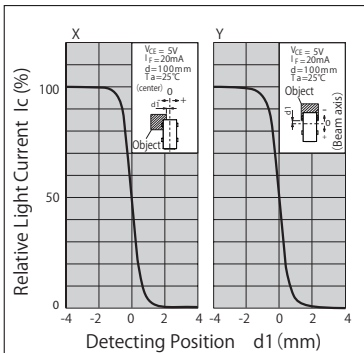
### 応答時間－負荷抵抗特性(代表例)



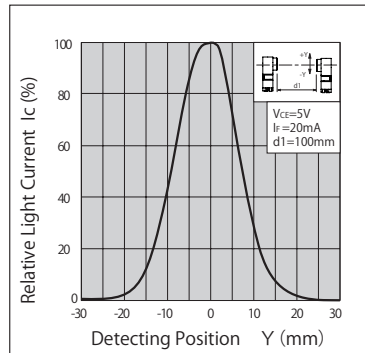
### 距離特性(代表例)



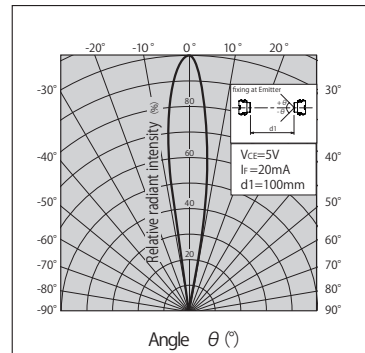
### 検出位置特性(代表例)



### 平行移動特性(代表例)

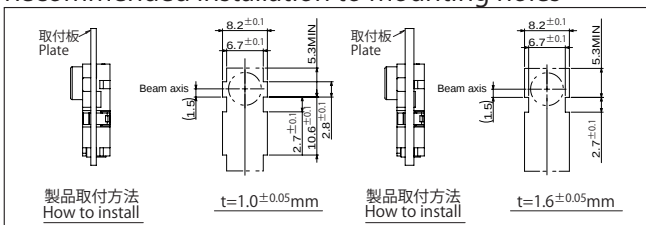


### 角度特性(代表例)



## 推奨取付穴寸法図

### Recommended installation to mounting holes



・取付板のプレス側から取付けを推奨します。  
・We recommend to mount the sensor from pressed surface of plate.

・実際に取り付けてガタツキ度合いをご確認され  
取り付け方法を決定下さい。  
・The actual tolerance should be confirmed  
after setting of sensor

・カスタマイズも承ります。お気軽にお問合せください

・ A Customized design available on request.

・ この仕様は改良のため予告なく変更する場合があります

・ Specifications are subject to change without notice.

## KB3820



分離型フォトセンサ 完全防塵タイプ

Photo Interrupter - Separate type Super Dust Proof type



## 概要 Description

KB3820 は、発光側に赤外発光ダイオード、受光側に高感度フォトトランジスタを採用した分離型フォトセンサです。受光側、発光側単体としても使用可能です。

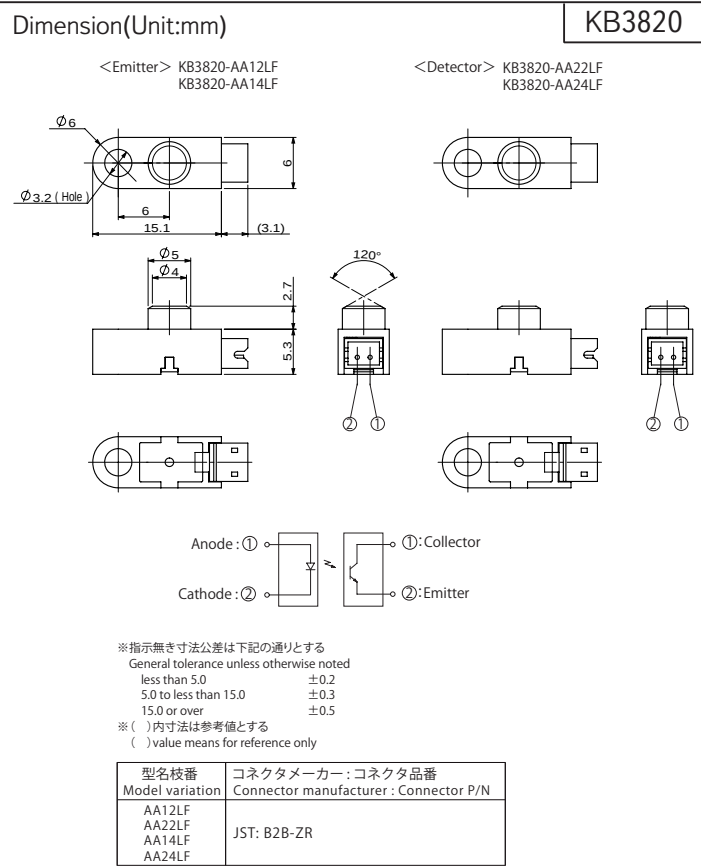
Model KB3820 is compact size of Photo Interrupter and consists of an Infrared LED and a Phototransistor.

## 特長 Feature

- ・ 長距離検出が可能 (max.200mm)
- ・ 防塵型。レンズ内部への粉塵対策構造 (樹脂封止タイプ)
- ・ ローコストタイプ
- ・ Long distance detection.(max.200mm)
- ・ Dust proof type. Structure to prevent intrusion of paper dust into lens room
- ・ Low Cost.

## 用途 Application

- ・ 金融機器の物体通過検知
- ・ 自動販売機、券売機の物体通過検出
- ・ 複写機・印刷機用の紙有無、タイミング検出
- ・ 各種自動機の物体通過検出
- ・ Object passing for Banking machine like ATM.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection/Timing detection in Copy machine and Printing machine.
- ・ Object passing for Card reader, Auto vending machine.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                          |                                         | Symbol | Rating    | Unit |
|-------------------------------|-----------------------------------------|--------|-----------|------|
| 発 光 側<br>Emitter              | 順 電 流 Forward Current                   | IF     | 50        | mA   |
|                               | パ ル ス 順 電 流 Pulse Forward Current ※1    | IFP    | 0.3       | A    |
|                               | 逆 電 圧 Reverse Voltage                   | VR     | 5         | V    |
|                               | 許 容 損 失 Power Dissipation               | P      | 75        | mW   |
| 受 光 側<br>Detector             | コレクタ・エミッタ間電圧 Collector-Emitter Voltage  | VCEO   | 30        | V    |
|                               | エミッタ・コレクタ間電圧 Emitter-Collector Voltage  | VECO   | 5         | V    |
|                               | コ レ ク タ 電 流 Collector Current           | IC     | 20        | mA   |
|                               | コ レ ク タ 損 失 Collector Power Dissipation | PC     | 75        | mW   |
| 動 作 温 度 Operating Temperature |                                         | Topr   | -20 ~ +75 | °C   |
| 保 存 温 度 Storage Temperature   |                                         | Tstg   | -30 ~ +85 | °C   |

| 形式<br>Model      | 検出距離<br>Detecting distance |
|------------------|----------------------------|
| KB3820-AA12/22LF | 100 mm                     |
| KB3820-AA14/24LF | 200 mm                     |

※1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*] ( ) = KB3820-AA14/24LF

| Item               |                                                     | Symbol          | Condition                                    | min. | typ. | max. | Unit    |
|--------------------|-----------------------------------------------------|-----------------|----------------------------------------------|------|------|------|---------|
| 発 光 側<br>Emitter   | 順 電 圧 Forward Voltage                               | VF              | IF=20mA                                      | —    | 1.2  | 1.5  | V       |
|                    | 逆 電 流 Reverse Current                               | IR              | VR=3V                                        | —    | —    | 10   | $\mu A$ |
| 受 光 側<br>Detector  | 暗 電 流 Dark Current                                  | ICEO            | VCE=10V, 0 lx                                | —    | —    | 0.1  | $\mu A$ |
| 伝 達 特 性<br>Coupled | 光 電 流 Light Current                                 | IC              | IF=20mA, VCE=5V, d=100(200)mm                | 0.5  | —    | —    | mA      |
|                    | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat)        | IF=20mA, IC=0.1mA, d=100mm                   | —    | —    | 0.4  | V       |
|                    | 応 答 時 間<br>Response Time                            | 上昇<br>Rise Time | VCC=5V, IC=0.3mA<br>RL=1k $\Omega$ , d=100mm | —    | 24   | —    | $\mu s$ |
|                    |                                                     | 下降<br>Fall Time |                                              | —    | 25   | —    |         |

\*\*: Ta=25°C unless otherwise noted

# KB3820

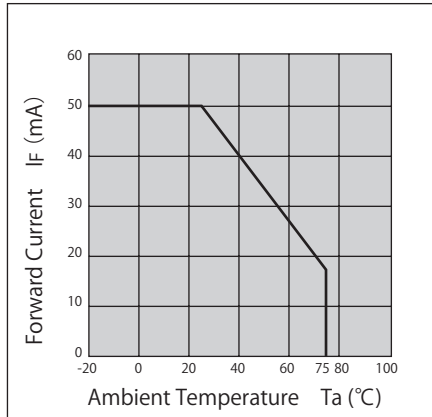
## 定格・特性曲線

Characteristics

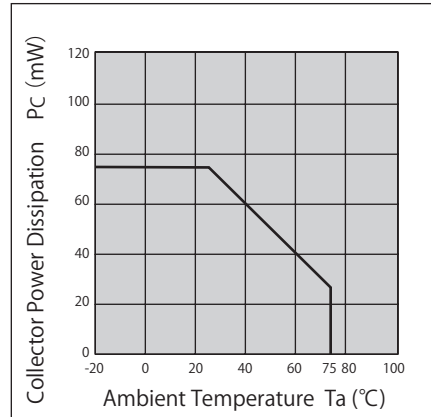
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

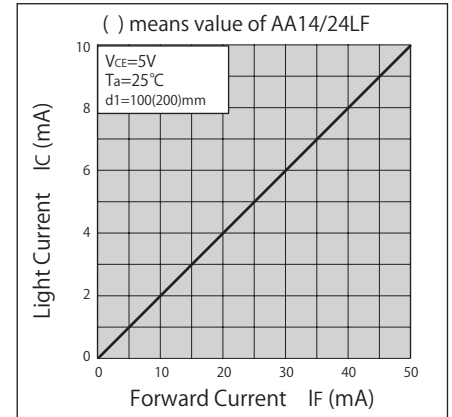
### 順電流低減曲線



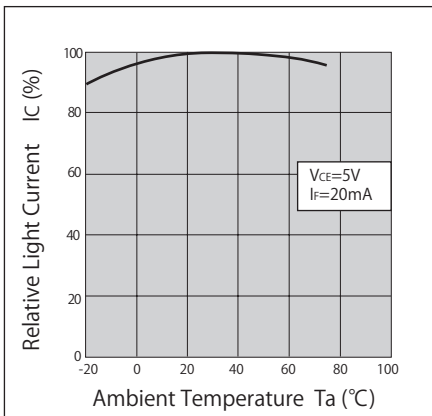
### コレクタ損失低減曲線



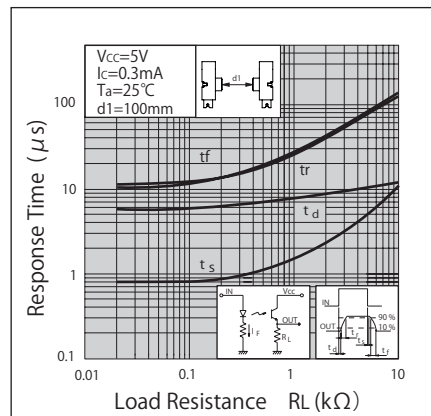
### 光電流－順電流特性 (代表例)



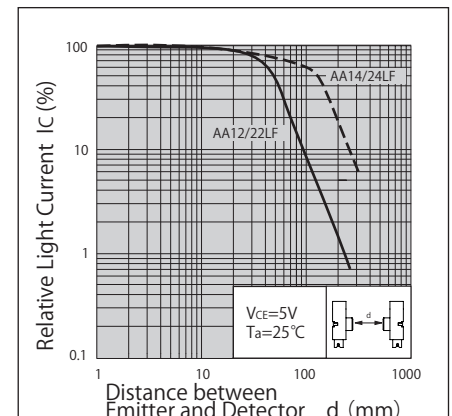
### 光電流－周囲温度特性 (代表例)



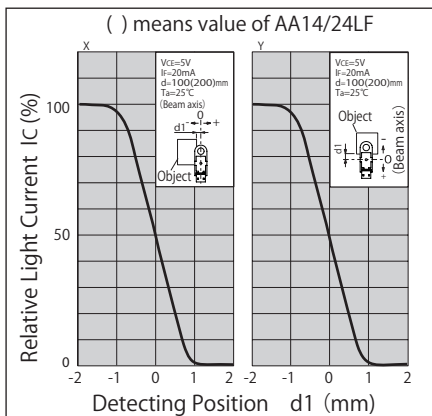
### 応答時間－負荷抵抗特性 (代表例)



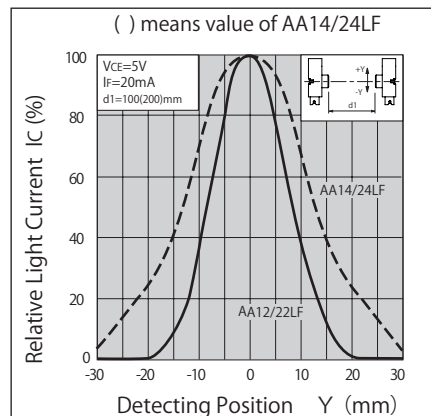
### 距離特性 (代表例)



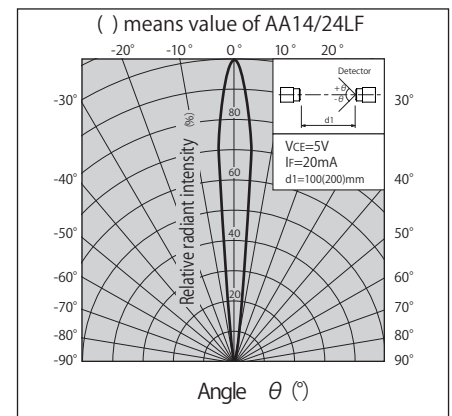
### 検出位置特性 (代表例)



### 平行移動特性 (代表例)



### 角度特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB3830



分離型フォトセンサ 完全防塵タイプ

Photo Interrupter - Separate type Super Dust Proof type



## 概要 Description

KB3830 は、発光側に赤外発光ダイオード、受光側に高感度フォトトランジスタを採用した分離型フォトセンサです。受光側、発光側単体としても使用可能です。

Model KB3830 is compact size of Photo Interrupter and consists of an Infrared LED and a Phototransistor.

## 特長 Feature

- ・ 発光、受光間ギャップを任意に設定可能 (1~100mm)
- ・ 防塵型。レンズ内部への粉塵対策構造 (樹脂封止タイプ)
- ・ ローコストタイプ
- ・ Distance between Emitter and Detector can be set within 1mm to 100mm.
- ・ Dust proof type. Structure to prevent intrusion of paper dust into lens room.
- ・ Low Cost.

## 用途 Application

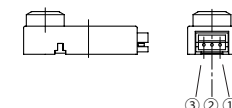
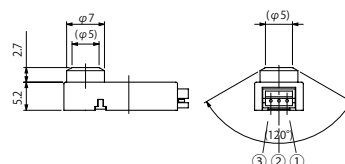
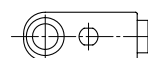
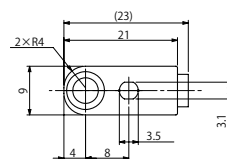
- ・ 金融機器の物体通過検知
- ・ 自動販売機、券売機の物体通過検出
- ・ 複写機・印刷機用の紙有無、タイミング検出
- ・ 各種自動機の物体通過検出
- ・ Object passing for Banking machine like ATM.
- ・ Object passing in Auto vender and Ticket vending machine.
- ・ Paper detection/Timing detection in Copy machine and Printing machine.
- ・ Object passing for Card reader, Auto vending machine.

## Dimension(Unit:mm)

KB3830

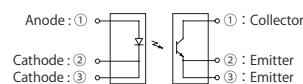
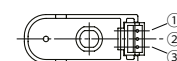
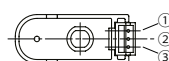
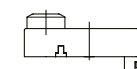
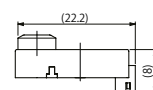
&lt;Emitter&gt; KB3830-AA12LF

&lt;Detector&gt; KB3830-AA22LF



&lt;Emitter&gt; KB3830-AA13LF

&lt;Detector&gt; KB3830-AA23LF



※指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5  
※ ( ) 内寸法は参考値とする  
( ) value means for reference only

| 型名校番<br>Model variation | コネクタメーカー:コネクタ品番<br>Connector manufacturer: Connector P/N |
|-------------------------|----------------------------------------------------------|
| AA12LF                  | JST: B3B-ZR                                              |
| AA22LF                  | JST: B3B-ZR                                              |
| AA13LF                  | JST: S3B-ZR                                              |
| AA23LF                  | JST: S3B-ZR                                              |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol                                 | Rating    | Unit  |
|----------------------------|----------------------------------------|-----------|-------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF        | 50 mA |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP       | 0.3 A |
|                            | 逆電圧 Reverse Voltage                    | VR        | 5 V   |
|                            | 許容損失 Power Dissipation                 | P         | 75 mW |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO      | 30 V  |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO      | 5 V   |
|                            | コレクタ電流 Collector Current               | IC        | 20 mA |
|                            | コレクタ損失 Collector Power Dissipation     | PC        | 75 mW |
| 動作温度 Operating Temperature | T <sub>opr</sub>                       | -20 ~ +75 | °C    |
| 保存温度 Storage Temperature   | T <sub>stg</sub>                       | -30 ~ +85 | °C    |

※1. パルス幅  $t_w \leq 100\mu s$  Duty比=0.01※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            | Symbol                            | Condition                           | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|-------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | IF=20mA                             | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | VR=3V                               | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | VCE=20V, 0 lx                       | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流 Light Current                 | IF=20mA, VCE=5V, d=100mm            | 0.5  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Saturation Voltage | IF=20mA, IC=0.1mA, d=100mm          | —    | —    | 0.4  | V    |
|                 | 応答時間 Response Time                | VCC=5V, IC=0.3mA<br>RL=1kΩ, d=100mm | —    | 24   | —    | μs   |
|                 |                                   |                                     | —    | 25   | —    |      |

\*\*: Ta=25°C unless otherwise noted

# KB3830

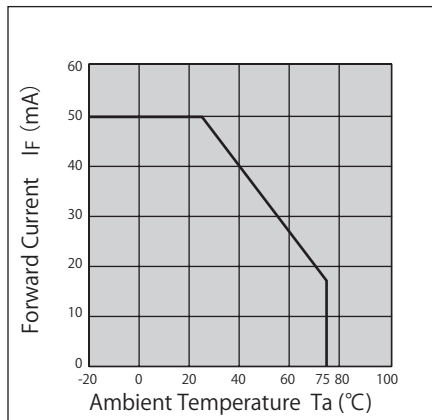
## 定格・特性曲線

Characteristics

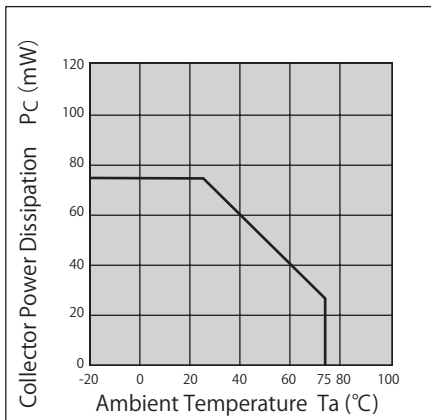
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

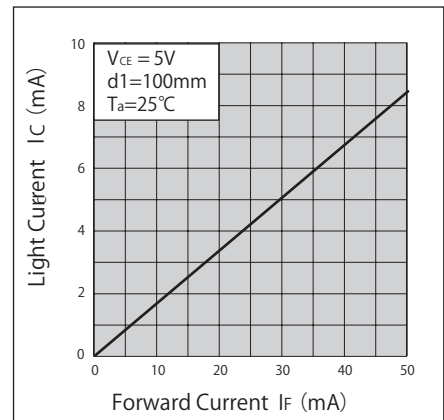
### 順電流低減曲線



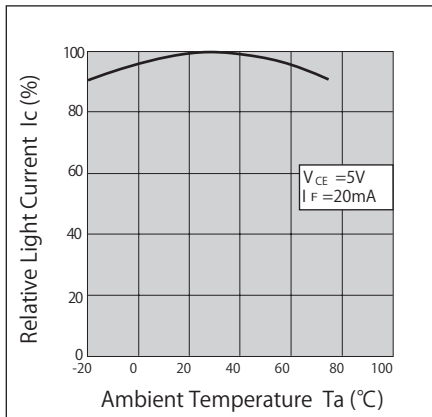
### コレクタ損失低減曲線



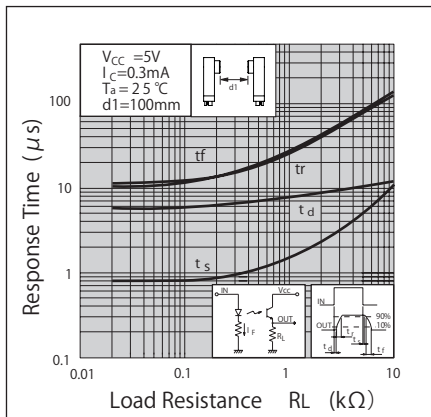
### 光電流－順電流特性(代表例)



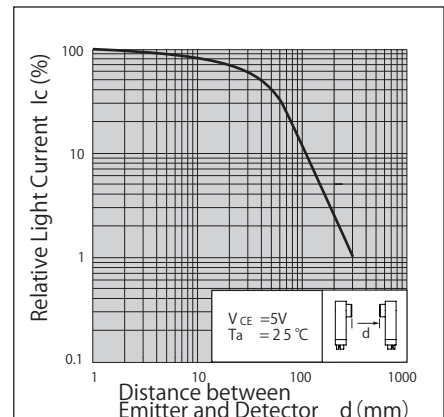
### 光電流－周囲温度特性(代表例)



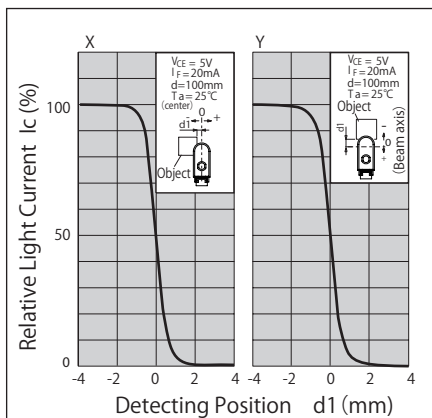
### 応答時間－負荷抵抗特性(代表例)



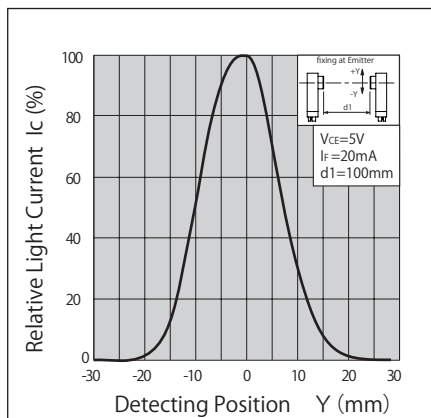
### 距離特性(代表例)



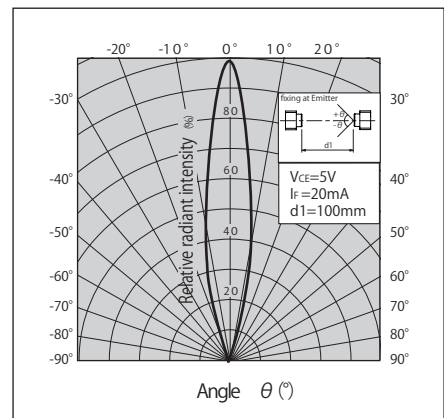
### 検出位置特性(代表例)



### 平行移動特性(代表例)



### 角度特性(代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB3870



分離型フォトセンサ 完全防塵タイプ

Photo Interrupter - Separate type Super Dust Proof type



## 概要 Description

KB3870 は、発光側に赤外発光ダイオード、受光側に高感度フォトトランジスタを採用した分離型フォトセンサです。受光側、発光側単体としても使用可能です。

Model KB3870 is compact size of Photo Interrupter and consists of an Infrared LED and a Phototransistor.

## 特長 Feature

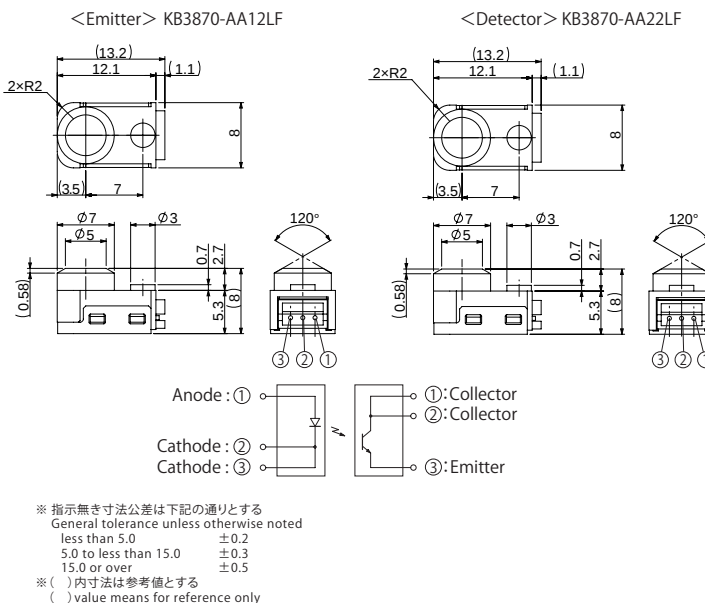
- ・発光、受光間ギャップを任意に設定可能 (1~100mm)
- ・防塵型。レンズ内部への粉塵対策構造
- ・ローコストタイプ
- ・Distance between Emitter and Detector can be set within 1mm to 100mm.
- ・Dust proof type. Structure to prevent intrusion of paper dust into lens room
- ・Low Cost.

## 用途 Application

- ・金融機器の物体通過検知
- ・自動販売機、券売機の物体通過検出
- ・複写機・印刷機の用紙有無、タイミング検出
- ・各種自動機の物体通過検出
- ・Object passing for Banking machine like ATM.
- ・Object passing in Auto vender and Ticket vending machine.
- ・Paper detection/Timing detection in Copy machine and Printing machine.
- ・Object passing for Card reader, Auto vending machine.

## Dimension(Unit:mm)

KB3870



| 型名枝番<br>Model variation | コネクタメーカー : コネクタ品番<br>Connector manufacturer : Connector P/N |
|-------------------------|-------------------------------------------------------------|
| AA12LF<br>AA22LF        | JST: B3B-ZR                                                 |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol                                 | Rating    | Unit  |
|----------------------------|----------------------------------------|-----------|-------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF        | 50 mA |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP       | 0.3 A |
|                            | 逆電圧 Reverse Voltage                    | VR        | 5 V   |
|                            | 許容損失 Power Dissipation                 | P         | 75 mW |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO      | 30 V  |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO      | 5 V   |
|                            | コレクタ電流 Collector Current               | IC        | 20 mA |
|                            | コレクタ損失 Collector Power Dissipation     | PC        | 75 mW |
| 動作温度 Operating Temperature | T <sub>opr</sub>                       | -20 ~ +75 | °C    |
| 保存温度 Storage Temperature   | T <sub>stg</sub>                       | -30 ~ +85 | °C    |

※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            | Symbol                            | Condition                           | min. | typ. | max. | Unit |
|-----------------|-----------------------------------|-------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | IF=20mA                             | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current               | VR=3V                               | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                  | VCE=10V, 0 lx                       | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流 Light Current                 | IF=20mA, VCE=5V, d=100mm            | 1.0  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Saturation Voltage | IF=20mA, IC=0.1mA, d=100mm          | —    | —    | 0.4  | V    |
|                 | 応答時間<br>Response Time             | VCC=5V, IC=0.3mA<br>RL=1kΩ, d=100mm | —    | 24   | —    | μs   |
|                 |                                   |                                     | —    | 25   | —    |      |

\*\* : Ta=25°C unless otherwise noted

## KB3870

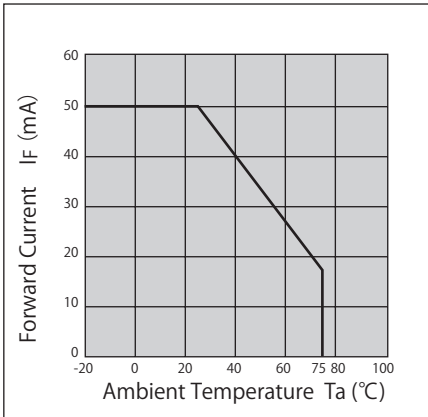
## 定格・特性曲線

Characteristics

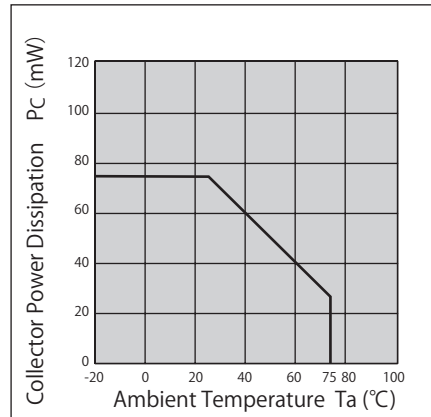
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

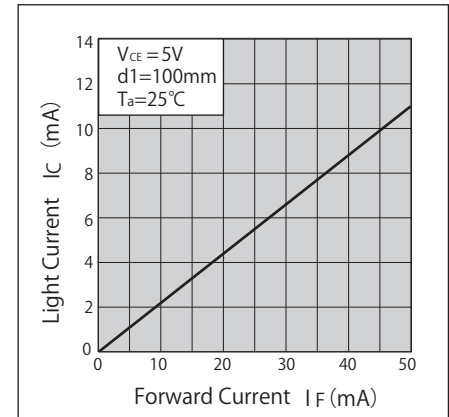
## 順電流低減曲線



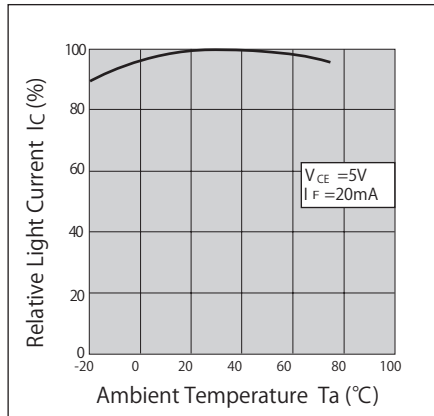
## コレクタ損失低減曲線



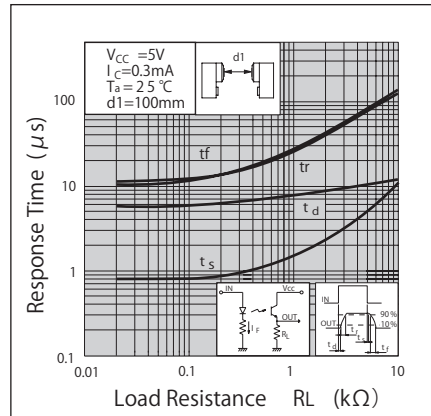
## 光電流—順電流特性 (代表例)



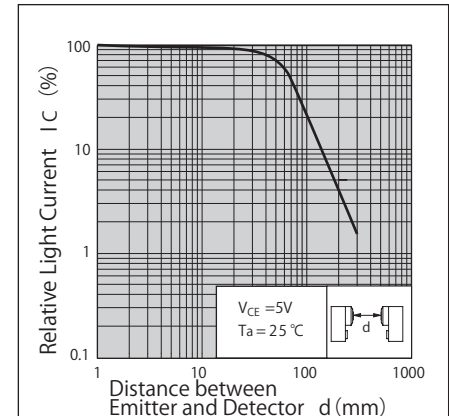
## 光電流—周囲温度特性 (代表例)



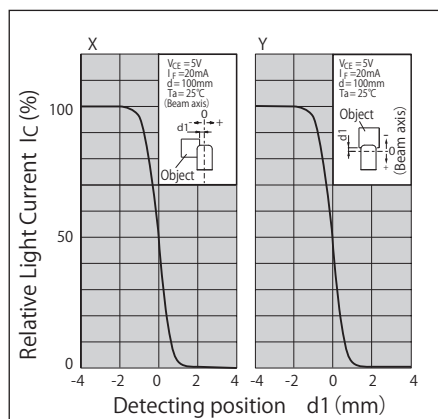
## 応答時間—負荷抵抗特性 (代表例)



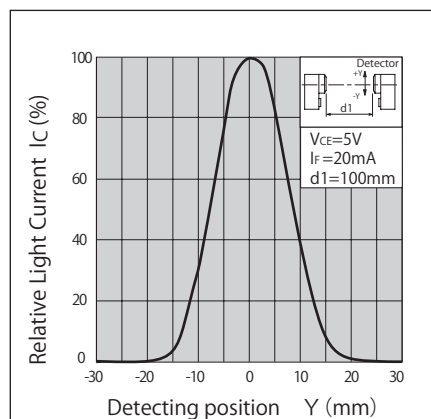
## 距離特性 (代表例)



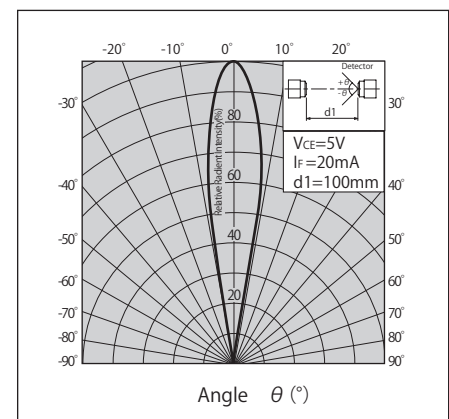
## 検出位置特性 (代表例)



## 平行移動特性 (代表例)



## 角度特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB3880



分離型フォトセンサ 完全防塵タイプ Photo Interrupter - Separate type Super Dust Proof type



## 概要 Description

KB3880 は、発光側に赤外発光ダイオード、受光側に高感度フォトトランジスタを採用した分離型フォトセンサです。受光側、発光側単体としても使用可能です。

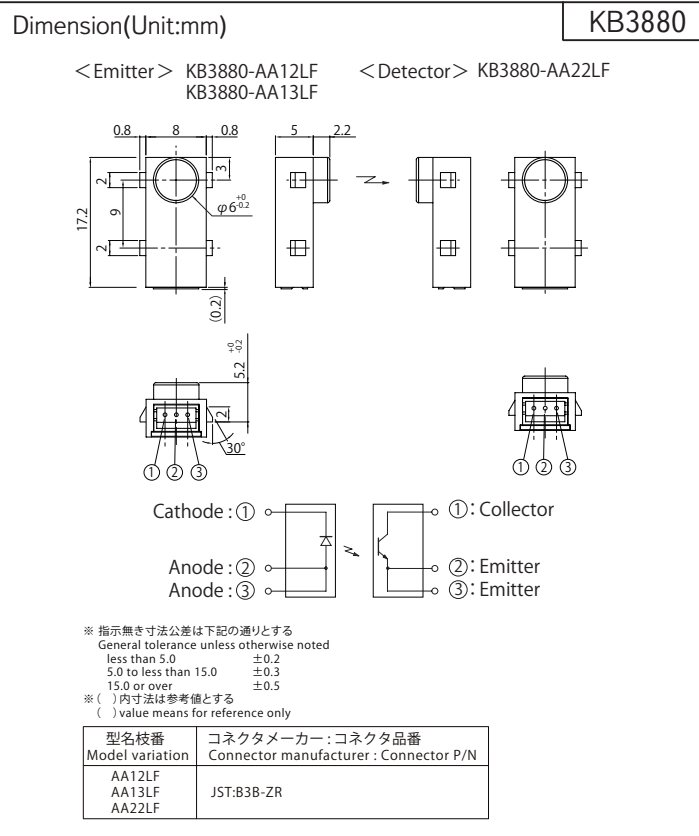
Model KB3880 consists of an Infrared LED and a Phototransistor, and has one piece seamless plastic housing.

## 特長 Feature

- ・発光、受光間ギャップを任意に設定可能 (1~100mm)
- ・完全防塵型。レンズ内部への粉塵対策構造
- ・高出力タイプ・・・KB3880-AA13LF
- ・その他シリーズ：フォト IC 出力・・・KB3881/KB3882
- ・Distance between Emitter and Detector can be set within 1mm to 100mm.
- ・Super Dust proof type. Structure to prevent intrusion of paper dust into lens room.
- ・High output type・・・KB3880-AA13LF
- ・The other model; Photo IC output type・・・KB3881/KB3882

## 用途 Application

- ・金融機器の物体通過検知
- ・自動販売機、券売機の物体通過検出
- ・複写機・印刷機用の紙有無、タイミング検出
- ・各種自動機の物体通過検出
- ・Object passing for Banking machine like ATM.
- ・Object passing in Auto vender and Ticket vending machine.
- ・Paper detection/Timing detection in Copy machine and Printing machine.
- ・Object passing for Card reader, Auto vending machine.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                          |                                         | Symbol | Rating    | Unit |
|-------------------------------|-----------------------------------------|--------|-----------|------|
| 発 光 側<br>Emitter              | 順 電 流 Forward Current                   | IF     | 50        | mA   |
|                               | パ ル ス 順 電 流 Pulse Forward Current ※1    | IFP    | 0.3       | A    |
|                               | 逆 電 圧 Reverse Voltage                   | VR     | 5         | V    |
|                               | 許 容 損 失 Power Dissipation               | P      | 75        | mW   |
| 受 光 側<br>Detector             | コレクタ・エミッタ間電圧 Collector-Emitter Voltage  | VCEO   | 30        | V    |
|                               | エミッタ・コレクタ間電圧 Emitter-Collector Voltage  | VECO   | 5         | V    |
|                               | コ レ ク タ 電 流 Collector Current           | IC     | 20        | mA   |
|                               | コ レ ク タ 損 失 Collector Power Dissipation | PC     | 75        | mW   |
| 動 作 温 度 Operating Temperature |                                         | Topr   | -20 ~ +75 | °C   |
| 保 存 温 度 Storage Temperature   |                                         | Tstg   | -30 ~ +85 | °C   |

※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

( ) = KB3880-AA13/22LF

| Item               |                                                     | Symbol       | Condition                           | min.     | typ.      | max.     | Unit |
|--------------------|-----------------------------------------------------|--------------|-------------------------------------|----------|-----------|----------|------|
| 発 光 側<br>Emitter   | 順 電 圧 Forward Voltage                               | VF           | IF=20mA                             | —        | 1.2(1.35) | 1.5(1.6) | V    |
|                    | 逆 電 流 Reverse Current                               | IR           | VR=3V                               | —        | —         | 10(100)  | μA   |
| 受 光 側<br>Detector  | 暗 電 流 Dark Current                                  | ICEO         | VCE=20V, 0 lx                       | —        | —         | 0.1      | μA   |
| 伝 達 特 性<br>Coupled | 光 電 流 Light Current                                 | IC           | VCE=5V, IF=20mA, d=100mm            | 0.5(1.2) | —         | —        | mA   |
|                    | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat)     | IF=20mA, IC=0.1mA, d=100mm          | —        | —         | 0.4      | V    |
|                    | 応 答 時 間<br>Response Time                            | 上昇 Rise Time | VCC=5V, IC=0.3mA<br>RL=1kΩ, d=100mm | —        | 23        | —        | μs   |
|                    |                                                     | 下降 Fall Time |                                     | —        | 28        | —        |      |

\*\* : Ta=25°C unless otherwise noted

# KB3880

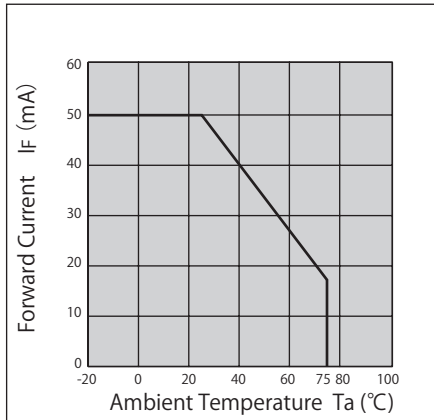
## 定格・特性曲線

Characteristics

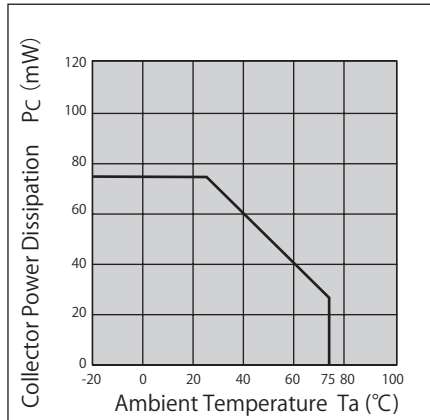
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

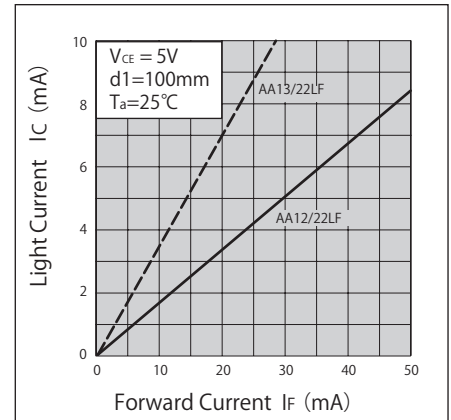
### 順電流低減曲線



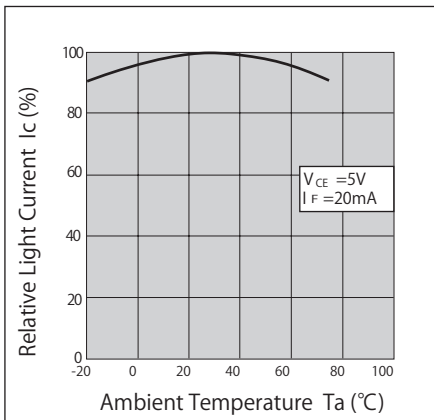
### コレクタ損失低減曲線



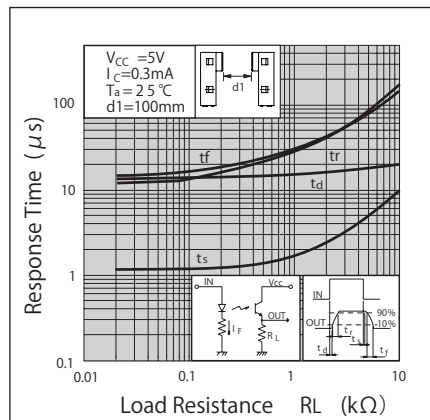
### 光電流－順電流特性(代表例)



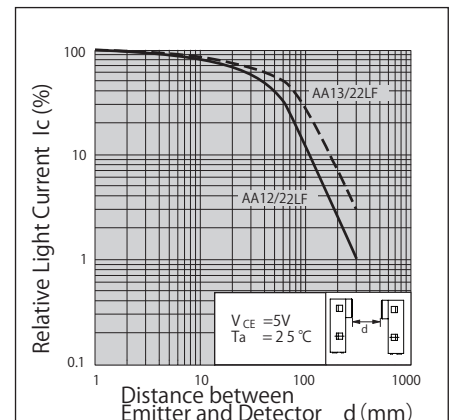
### 光電流－周囲温度特性(代表例)



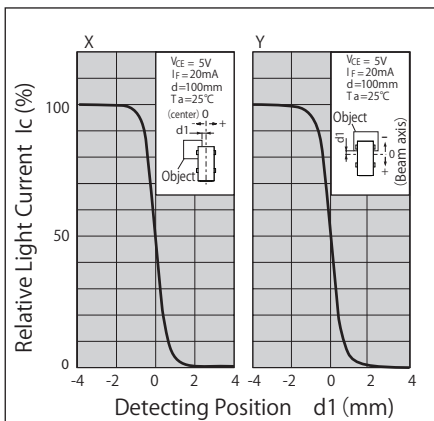
### 応答時間－負荷抵抗特性(代表例)



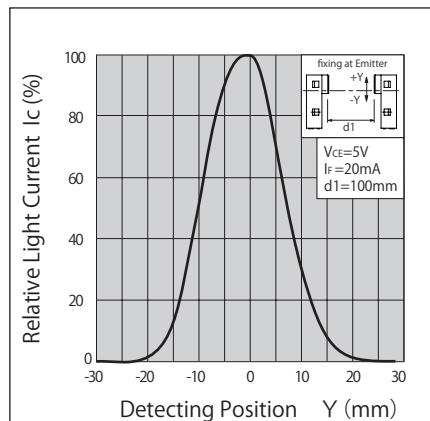
### 距離特性(代表例)



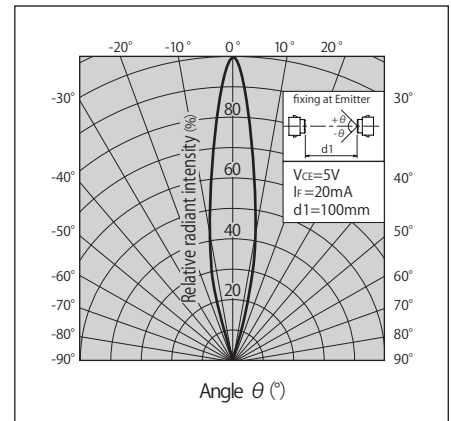
### 検出位置特性(代表例)



### 平行移動特性(代表例)



### 角度特性(代表例)



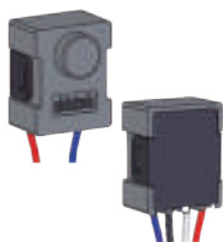
- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB5280



分離型フォトセンサ 光変調タイプ

Photo Interrupter - Separate type - Light modulation type



## 概要 Description

KB5280 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC を採用した光同期検出型の分離型フォトセンサです。

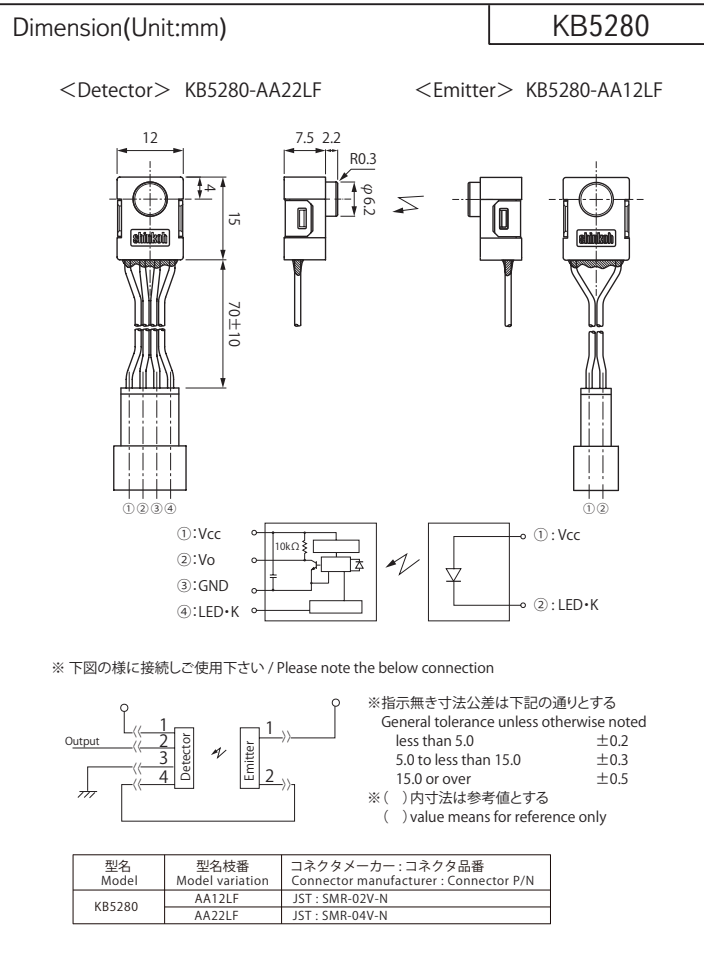
Model KB5280 consist of an Infrared LED and a Light-modulation Photo IC(Synchronous type).

## 特長 Feature

- ・ 発光、受光間ギャップを長距離で設置可能 (1~800mm)
- ・ 防塵・防滴構造 (IP64 相当)
- ・ 光変調方式の為、外乱光等のノイズに強い
- ・ Distance between Emitter and Detector can be set long. (max.800mm)
- ・ Dust and Drip proof type: IP64 equivalent.
- ・ Resistant to Ambient Illumination noise.(Light-modulation type)

## 用途 Application

- ・ アミューズメント機器の物体通過検知
- ・ 自動化ラインにおけるワークの検出、位置決め
- ・ 各種自動機の物体通過検知
- ・ Object passing for Amusement machine.
- ・ Position/work detection at automatic line.
- ・ Object passing for Card reader, Auto vending machine.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                          | Symbol           | Rating    | Unit |
|-------------------------------|------------------|-----------|------|
| 電 源 電 圧 Supply Voltage        | VCC              | 7         | V    |
| 出 力 電 流 Output Current        | IO               | 50        | mA   |
| 動 作 温 度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保 存 温 度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                           | min.    | typ. | max. | Unit |
|-------------------------------------|--------|-------------------------------------|---------|------|------|------|
| 動 作 電 源 電 圧 Supply Voltage          | VCC    | —                                   | 4.75    | 5.0  | 5.25 | V    |
| 消 費 電 流 Current Consumption         | ICCP   | パルスせん頭値、RL=∞ Pulse Surge            | —       | —    | 150  | mA   |
|                                     | ICC    | 平滑値、RL=∞ Average                    | —       | —    | 20   | mA   |
| ローレベル出力電圧 Low Level Output Voltage  | VOL    | 入光時、IOL=16mA at Beam detecting      | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High Level Output Voltage | VOH    | 遮光時 Light block by object           | VCC×0.9 | —    | —    | V    |
| 検 出 距 離 Detecting Distance          | d      | VCC=5V                              | 800     | —    | —    | mm   |
| 外 乱 光 許 容 照 度 Ambient Illumination  | —      | CIE 標準 A 光源 CIE STD. A light source | 2000    | —    | —    | lx   |
| 応 答 時 間 Response Time               | —      | VCC=5V                              | —       | —    | 1    | ms   |

\*\* : Ta=25°C unless otherwise noted

| 形式<br>Model | 動作モード<br>Mode                | 検出距離<br>Detecting distance |
|-------------|------------------------------|----------------------------|
| KB5280      | Low 入光時<br>at Beam detecting | 800mm                      |

## &lt;ご使用上の注意&gt;

当センサは防滴構造ですが、光軸面に結露または水滴が付着しますと動作が不安定になる可能性があります。光軸面に結露、水滴が付着しましたら、十分に拭き取ってからご使用下さい。

## &lt;Operation Notice&gt;

Although this sensor has a drip-proof structure, condensation or water droplets on the optical axis surface may cause unstable operation.

If condensation or water droplets are on the optical axis surface, wipe them off thoroughly before use.

# KB5280

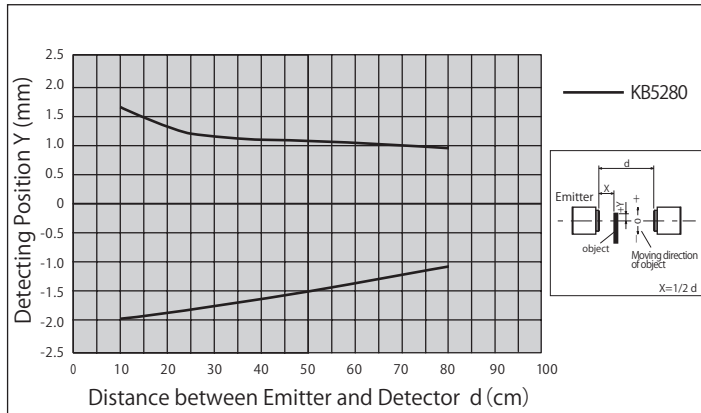
定格・特性曲線

Characteristics

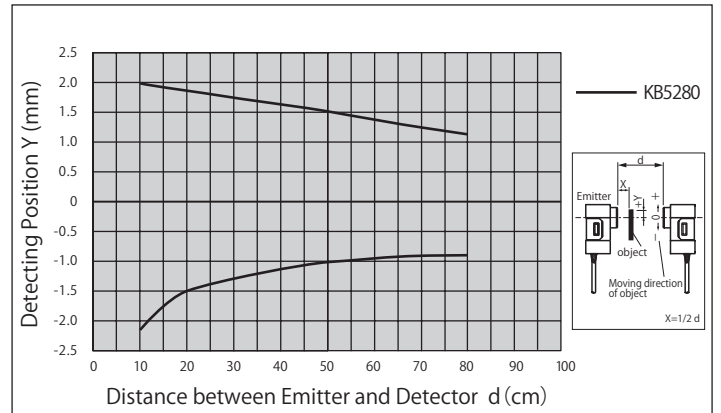
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

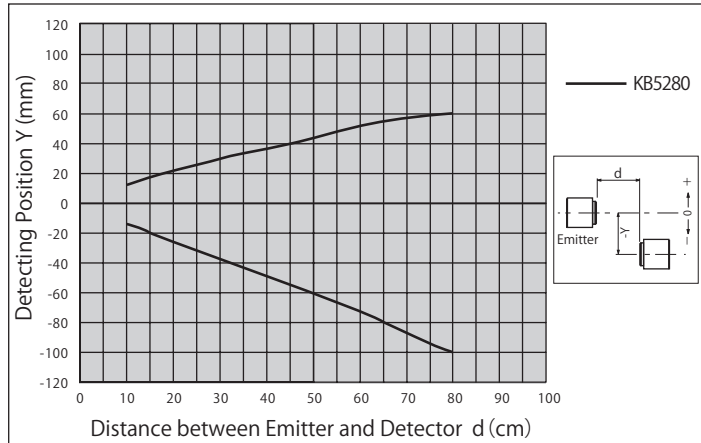
検出位置特性1 (代表例)



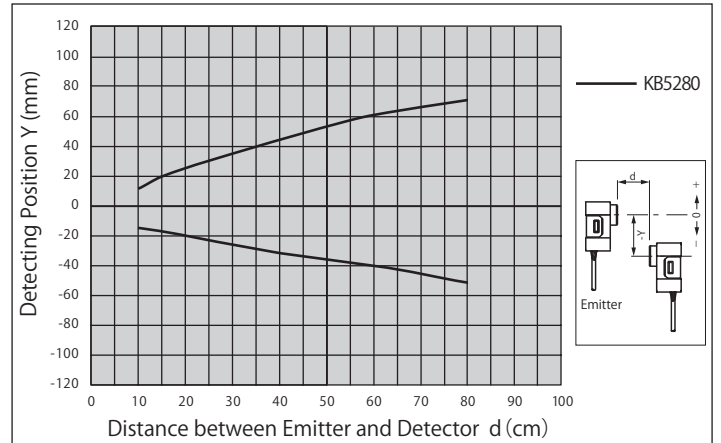
検出位置特性2 (代表例)



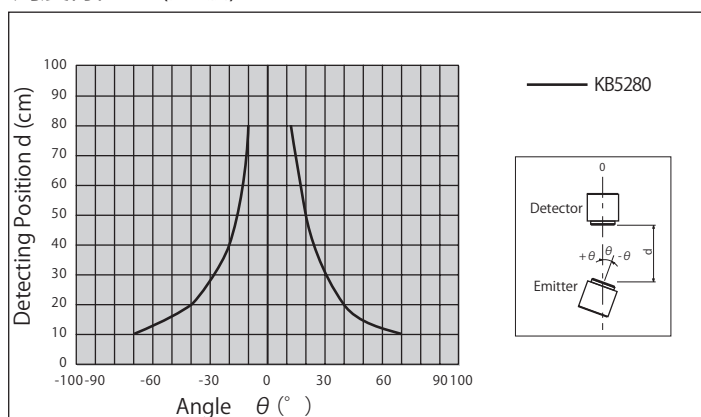
平行移動特性1 (代表例)



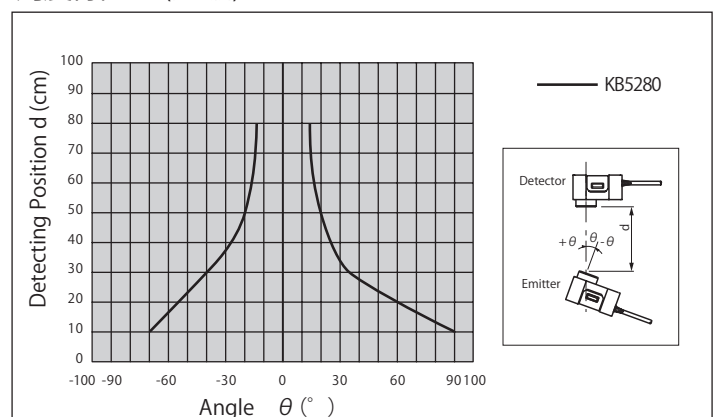
平行移動特性2 (代表例)



角度特性1 (代表例)



角度特性2 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB5900/5901



分離型フォトセンサ 光変調タイプ

Photo Interrupter - Separate type- Light modulation type

NEW



## 概要 Description

KB5900/5901 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC を採用した分離型フォトセンサです。

Model KB5900/5901 consist of an Infrared LED and a Light modulation Photo IC(Digital Output).

## 特長 Feature

- ・ 変調光方式の為、外乱光等のノイズに強い
- ・ リード線長、コネクタ形式の指定可
- ・ 長距離 (max. 2 m) 検出が可能
- ・ オープンコレクタ出力
- ・ 抜け防止ロック機構付きコネクタ採用
- ・ Resistant to Ambient Illumination noise. (Light-modulation type)
- ・ Customized wire length or connector model is available.
- ・ Long distance detection. (max.2m)
- ・ Open collector output type.
- ・ with secure locking structure connector.

## 用途 Application

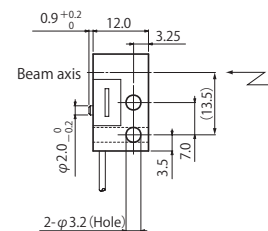
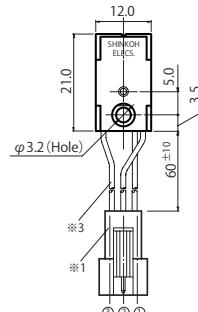
- ・ 人体通過検出
- ・ 自動化ラインに於けるワークの検出、位置決め
- ・ 各種自動機の物体通過検出
- ・ Detection of human passing.
- ・ Position/work detection at automatic line.
- ・ Object passing for Card reader, Auto vending machine, Amusement machine.

## Dimension(Unit:mm)

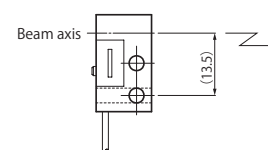
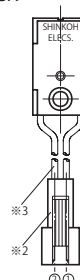
## KB5900/5901

| 品番 / Model | 発光側 / Emitter | 受光側 / Detector |
|------------|---------------|----------------|
| KB5900     | KB5900-AA12LF | KB5900-AA22LF  |
| KB5901     | KB5900-AA12LF | KB5901-AA22LF  |

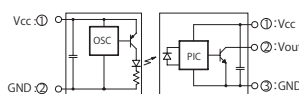
## &lt;Detector&gt;



## &lt;Emitter&gt;



※3 リード線 / Wire  
UL認定線/UL registered  
(注) ハーネス結線部は形式により異なる  
Note: Pin connection should be confirmed by model  
※指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5  
※ ( ) 内寸法は参考値とする  
( ) value means for reference only



| 型名枝番<br>Model variation | コネクタメーカー: コネクタ品番<br>Connector manufacturer: Connector P/N |
|-------------------------|-----------------------------------------------------------|
| AA12LF                  | JST: SMR-02V-N ※2                                         |
| AA22LF                  | JST: SMR-03V-N ※1                                         |

| 形式<br>Model | 動作モード<br>Mode |                       | 検出距離<br>Detecting distance |
|-------------|---------------|-----------------------|----------------------------|
| KB5900      | High          | 入光時 at Beam detecting | 2 m                        |
| KB5901      | Low           | 入光時 at Beam detecting |                            |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | IO               | 25        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -25 ~ +55 | °C   |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -40 ~ +70 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

※1. IOL=16mA ※2. RL=4.7kΩ

| Item                                | Symbol | Condition                           | min.    | typ. | max. | Unit |
|-------------------------------------|--------|-------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC    | —                                   | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption            | ICC    | 平滑値、RL=∞ Average                    | —       | —    | 50   | mA   |
| ローレベル出力電圧 Low Level Output Voltage  | VOL    | KB5900 遮光時 Light block by object ※1 | —       | —    | 0.5  | V    |
|                                     |        | KB5901 入光時 at Beam detecting ※1     | —       | —    | 0.5  | V    |
| ハイレベル出力電圧 High Level Output Voltage | VOH    | KB5900 入光時 at Beam detecting ※2     | VCC×0.9 | —    | —    | V    |
|                                     |        | KB5901 遮光時 Light block by object ※2 | VCC×0.9 | —    | —    | V    |
| 検出距離 Detecting Distance             | d      | VCC=5V                              | 2       | —    | —    | m    |
| 指向角 Spectral Sensitivity            | θ      | VCC=5V                              | —       | ±3   | —    | deg  |
| 外乱光許容照度 Ambient Illumination        | —      | CIE 標準 A 光源 CIE STD. A light source | 2000    | —    | —    | lx   |
| 応答時間 Response Time                  | —      | VCC=5V, RL=4.7kΩ                    | —       | —    | 1    | ms   |

\*\*: Ta=25°C unless otherwise noted

# KB5900/5901

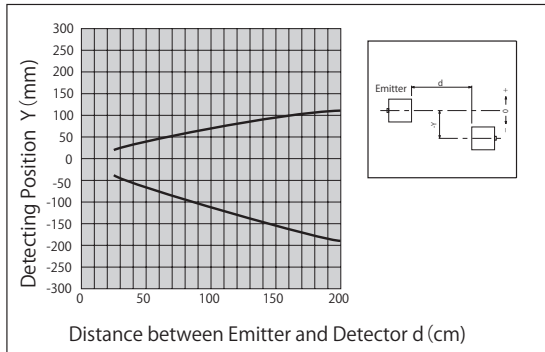
定格・特性曲線

Characteristics

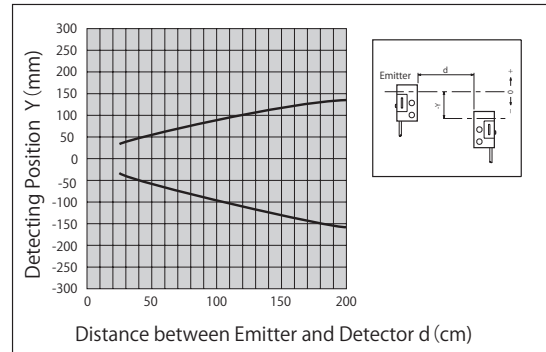
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

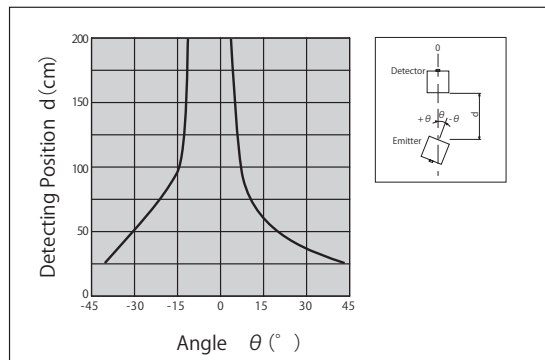
平行移動特性1 (代表例)



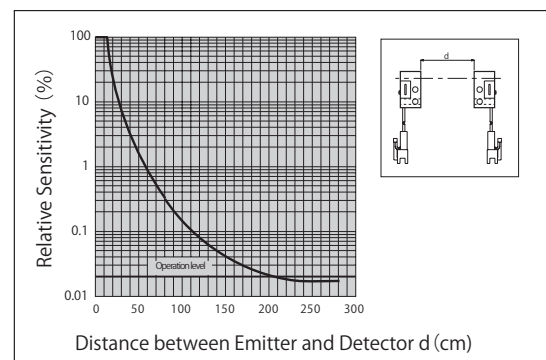
平行移動特性2 (代表例)



角度特性 (代表例)



相対受光出力－設定距離特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KB5921



分離型フォトセンサ 光変調タイプ

Photo Interrupter - Separate type - Light modulation type

NEW



## 概要 Description

KB5921 は、発光側に赤外発光ダイオード、受光側に  
変調式フォト IC を採用した光同期検出型の分離型フォト  
センサです。

Model KB5921 consist of an Infrared LED and a Light modulation Photo  
IC(Digital Output).

## 特長 Feature

- ・ 光変調方式の為、外乱光等のノイズに強い
- ・ カスタム対応によりリード線長、コネクタ形式の変更可能
- ・ 長距離検出 (max.1.5m) が可能
- ・ 抜け防止強ロック機構付きコネクタ採用
- ・ Resistant to Ambient Illumination noise.  
(Light-modulation type)
- ・ Customized wire length or connector model is available.
- ・ Long distance detection(max.1.5m).
- ・ with secure locking structure connector.

## 用途 Application

- ・ 人体通過検出
- ・ 自動化ラインにおけるワークの検出、位置決め
- ・ 各種自動機の物体通過検知
- ・ Detection of human passing.
- ・ Position/work detection at automatic line.
- ・ Object passing for Card reader, Auto vending machine,  
Amusement machine.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                          | Symbol           | Rating    | Unit |
|-------------------------------|------------------|-----------|------|
| 電 源 電 圧 Supply Voltage        | VCC              | 7         | V    |
| 出 力 電 流 Output Current        | IO               | 25        | mA   |
| 動 作 温 度 Operating Temperature | T <sub>opr</sub> | -25 ~ +55 | °C   |
| 保 存 温 度 Storage Temperature   | T <sub>stg</sub> | -40 ~ +70 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

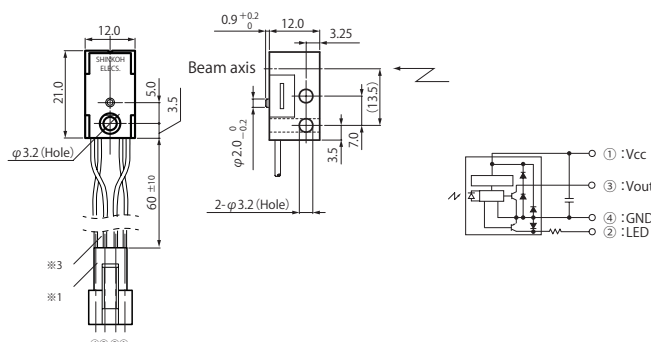
| Item                                | Symbol | Condition                                        | min.    | typ. | max. | Unit |
|-------------------------------------|--------|--------------------------------------------------|---------|------|------|------|
| 動 作 電 源 電 圧 Supply Voltage          | VCC    | —                                                | 4.75    | 5.0  | 5.25 | V    |
| 消 費 電 流 Current Consumption         | ICC    | 平滑値、 R <sub>L</sub> =∞ Average                   | —       | —    | 50   | mA   |
| ローレベル出力電圧 Low Level Output Voltage  | VOL    | 入光時、 IOL=16mA at Beam detecting                  | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High Level Output Voltage | VOH    | 遮光時、 R <sub>L</sub> =4.7kΩ Light block by object | VCC×0.9 | —    | —    | V    |
| 検 出 距 離 Detecting Distance          | d      | KB5921 VCC=5V                                    | 1.5     | —    | —    | m    |
| 指 向 角 Spectral Sensitivity          | θ      | VCC=5V                                           | —       | ±3   | —    | deg  |
| 外 乱 光 許 容 照 度 Ambient Illumination  | —      | CIE 標準 A 光源 CIE STD. A light source              | 2000    | —    | —    | lx   |
| 応 答 時 間 Response Time               | —      | VCC=5V, R <sub>L</sub> =4.7kΩ                    | —       | —    | 1    | ms   |

\*\* : Ta=25°C unless otherwise noted

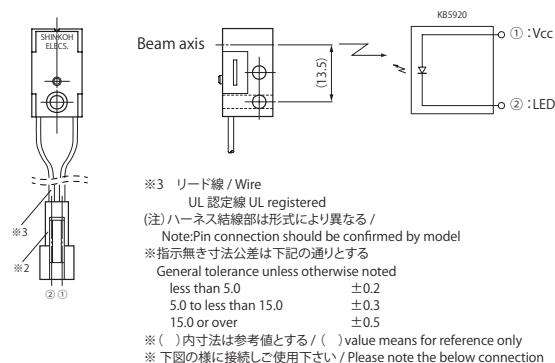
Dimension(Unit:mm)

KB5921

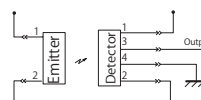
&lt;Detector&gt; KB5921-AA22LF



&lt;Emitter&gt; KB5920-AA12LF



~KB5921~



|                         |                                                           |
|-------------------------|-----------------------------------------------------------|
| 型名校番<br>Model variation | コネクタメーカー: コネクタ品番<br>Connector manufacturer: Connector P/N |
| AA12LF                  | JST: SMR-02V-N ※2                                         |
| AA22LF                  | JST: SMR-04V-N ※1                                         |

# KB5921

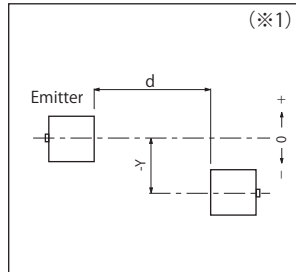
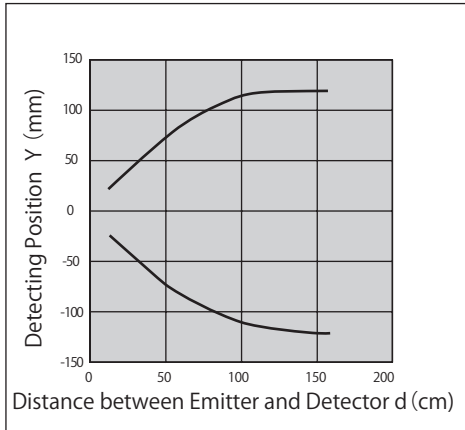
定格・特性曲線

Characteristics

※注意 最大定格を超えないようにご使用ください

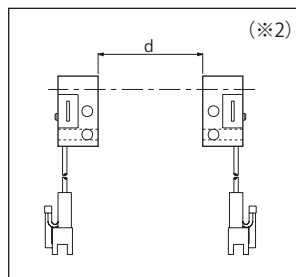
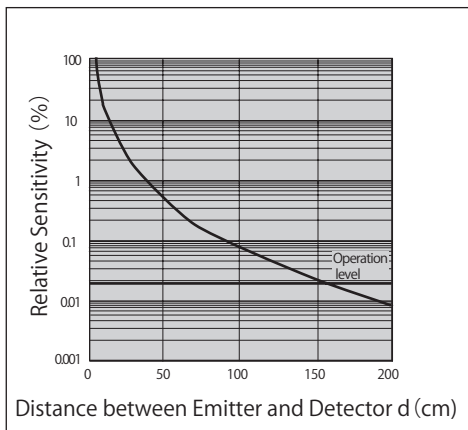
Note: Operation never exceeds each value of Maximum Ratings.

## 平行移動特性(代表例) KB5921 ※1



相対受光出力ー

設定距離特性(代表例) KB5921 ※2



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

# KR864/865/866

Dust Proof

反射型フォトセンサ 光変調タイプ (865/866)

Photo Reflector - Light modulation type(865/866)



## 概要 Description

KR864/865/866 は、発光側に赤外発光ダイオード、受光側にフォト IC を採用した防塵型の反射型フォトセンサです。  
Model KR864/865/866 consist of an Infrared LED and a Photo IC, and has one piece seamless plastic housing.

## 特長 Feature

- ・ 防塵構造なので紙粉等の除去が容易
- ・ 反射の少ない黒紙、OHP フィルム等の検出も可能
- ・ 光変調方式の為、外乱光等のノイズに強い (KR865/866)
- ・ Easy removing in paper-dust.
- ・ Available for detection of dark paper/OHP film.
- ・ Resistant to Ambient Illumination noise. (Light-modulation type・・・KR865/866)

## 用途 Application

- ・ 複写機・印刷機・プリンタ等の用紙検出
- ・ 各種自動機の物体通過検出
- ・ その他
- ・ Paper detection in Copying machine, Printer, and Facsimile.
- ・ Object passing for Card reader, Auto vending machine.

## 最大定格 Maximum Ratings [Ta=25℃ \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | IO               | 50        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | ℃    |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | ℃    |

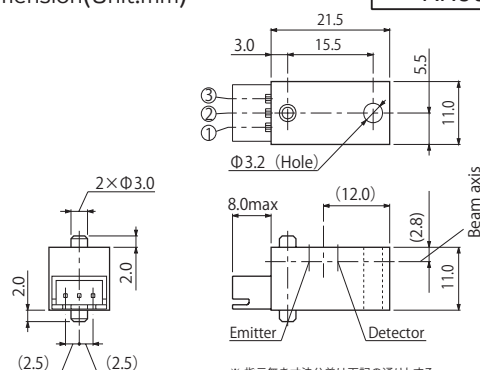
## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25℃ \*\*]

| Item                                   | Symbol                               | Condition                                 | min.    | typ. | max. | Unit |
|----------------------------------------|--------------------------------------|-------------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage                  | VCC                                  | —                                         | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption               | ICC                                  | KR864 RL=∞                                | —       | —    | 40   | mA   |
|                                        | ICCP                                 | KR865 パルスせん頭値、RL=∞ Pulse Serge            | —       | —    | 150  |      |
|                                        | ICC                                  | KR865                                     | —       | —    | 20   |      |
|                                        | ICCP                                 | KR866 平滑値、RL=∞ Average                    | —       | —    | 350  |      |
|                                        | ICC                                  | KR866                                     | —       | —    | 30   |      |
| ローレベル出力電圧 Low Level Output Voltage     | VOL                                  | 検出時、I <sub>OL</sub> =16mA Object existing | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage    | VOH                                  | 非検出時 No object ※4                         | VCC×0.9 | —    | —    | V    |
| 検出距離 Detecting Distance ※1             | d1                                   | KR864 検出物 90% 反射紙                         | 7       | —    | 11   | mm   |
|                                        |                                      | KR865 Object 90% Reflective paper         | 7       | —    | 25   |      |
|                                        |                                      | KR866                                     | 4       | —    | 32   |      |
| 非検出距離 Non-Detecting Distance ※2        | d2                                   | KR864 検出物 90% 反射紙                         | —       | —    | 30   | mm   |
|                                        |                                      | KR865 Object 90% Reflective paper         | —       | —    | 60   |      |
|                                        |                                      | KR866                                     | —       | —    | 75   |      |
| KR865/866 外乱光許容照度 Ambient Illumination | —                                    | CIE 標準 A 光源 CIE STD. A light source       | 2000    | —    | —    | lx   |
| 応答時間 Response Time                     | "High" → "Low" 伝搬時間 t <sub>PHL</sub> | ※3                                        | —       | —    | 1    | ms   |
|                                        | "Low" → "High" 伝搬時間 t <sub>PLH</sub> |                                           | —       | —    | 1    |      |

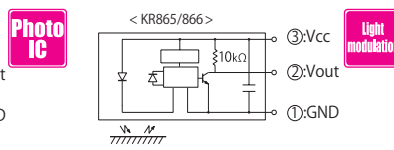
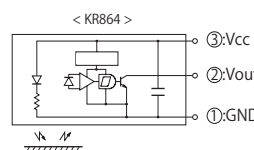
\*\* : Ta=25℃ unless otherwise noted

## Dimension(Unit:mm)

## KR864/865/866

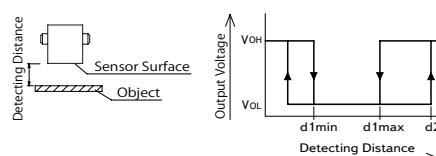


※ 指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5  
※ ( ) 内寸法は参考値とする  
( ) value means for reference only

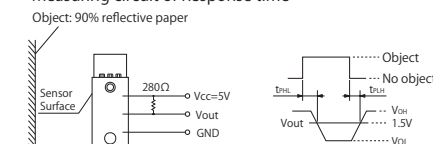


| 型名 Model | 型名枝番 Model variation | コネクタメーカー : コネクタ品番 Connector manufacturer : Connector P/N |
|----------|----------------------|----------------------------------------------------------|
| KR864    | AALF                 | JST: B3B-XH-A                                            |
| KR865    | AALF                 | JST: B3B-XH-A                                            |
| KR866    | AALF                 | JST: B3B-XH-A                                            |

## ※1、※2:検出距離/非検出距離 Detecting /Non-detecting distance



## ※3:応答時間の測定回路 Measuring circuit of Response time

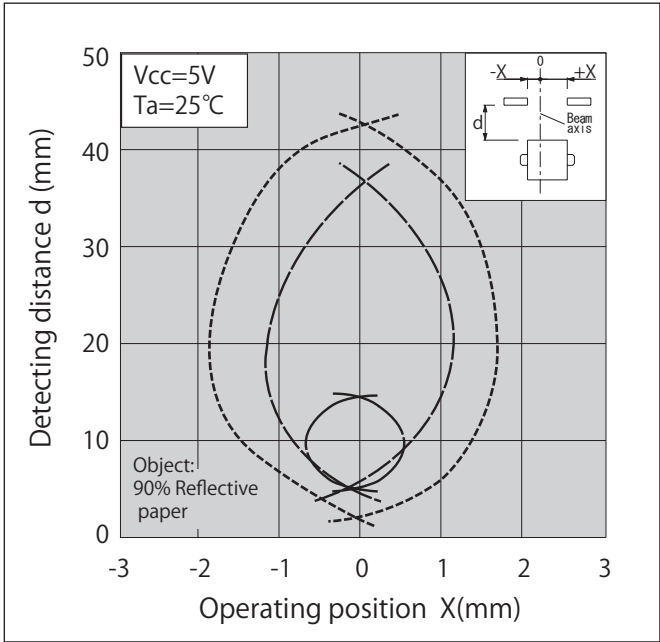


# KR864/865/866

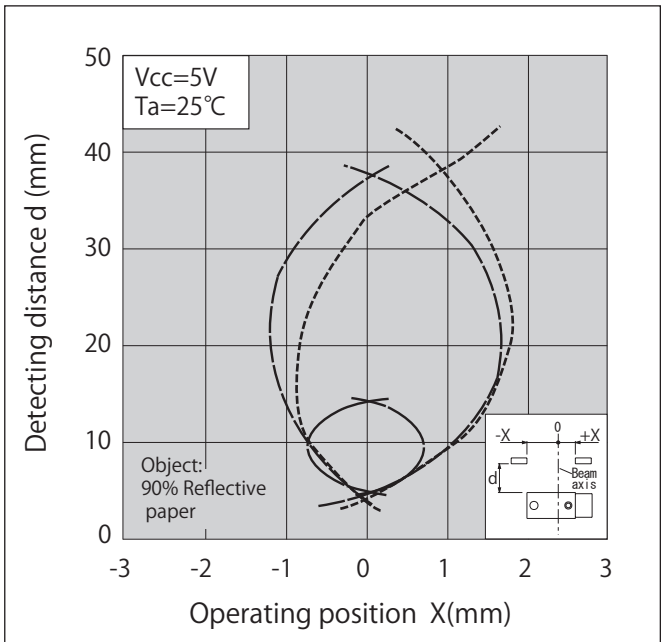
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

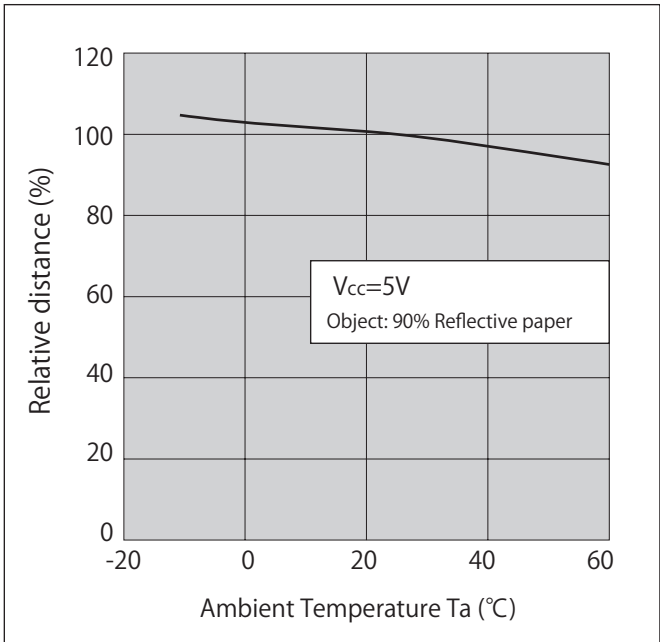
検出距離－動作位置特性1 (代表例)



検出距離－動作位置特性2 (代表例)



検出距離－周囲温度特性 (代表例)



KR864 —————  
KR865 - - - - -  
KR866 ·······

機種ラインアップ / Series Line-Up

(Unit:mm)

| Model No. | Method           | Detecting Distance   |                      |       | Non-Detecting Distance |
|-----------|------------------|----------------------|----------------------|-------|------------------------|
|           |                  | 90% Reflective paper | Black Paper OD=1.2 ※ | OHP ※ |                        |
| KR3320    | Light-Modulation | 4~32                 | 5~25                 | 4~30  | 90                     |
| KR866     |                  | 4~32                 | 10~20                | 8~25  | 75                     |
| KR3630    |                  | 9~25                 | 5~25                 | 4~30  | 90                     |
| KR865     |                  | 7~25                 | 13~17                | 10~20 | 60                     |
| KR3620    |                  | 4~18                 | 2.5~10               | 2~12  | 45                     |
| KR3331    |                  | 4~17                 | 2.5~10               | 2~12  | 45                     |
| KR1207    |                  | 1~15                 | 2.5~4.5              | 2~7   | 55                     |
| KR895     |                  | 1.5~7                | 2.5~5.5              | 2~6   | 30                     |
| KR3380    |                  | 2~7                  | 2.5~4                | 2~5   | 25                     |
| KR3610    |                  | 1~9                  | 2~4                  | 1.5~6 | 35                     |
| KR3330    |                  | 1~7                  | 2~4                  | 1.5~6 | 35                     |
| KR864     | Direct Current   | 7~11                 | 8~9                  | 7~10  | 30                     |
| KR894     |                  | 2~5.5                | 3.5~4.5              | 2~5.5 | 15                     |

※ 黒紙・OHPフィルムの検出距離規格は参考値です。  
Detecting Distance by Black paper and OHP film are reference only.

非検出距離についてご要望がある場合はお問い合わせください。  
Please contact us for non-detection distance requests.

・カスタマイズも承ります。お気軽にお問合せください  
・ A Customized design available on request.

・この仕様は改良のため予告なく変更する場合があります  
・ Specifications are subject to change without notice.

## KR894/895

Dust  
Proof

反射型フォトセンサ 光変調タイプ (895)

Photo Reflector - Light modulation type(895)



## 概要 Description

KR894/895 は、発光側に赤外発光ダイオード、受光側にフォト IC 又は変調式フォト IC を採用した防塵型の反射型フォトセンサです。

Model KR894/895 consist of an Infrared LED and a Photo IC or a light modulation type of Photo IC, and has one piece seamless plastic housing.

## 特長 Feature

- ・ 防塵構造なので紙粉等の除去が容易
  - ・ 反射の少ない黒紙、OHP フィルム等の検出も可能
  - ・ 光変調方式の為、外乱光等のノイズに強い (KR895)
  - ・ Easy removing in paper-dust.
  - ・ Available for detection of dark paper/OHP film.
  - ・ Resistant to Ambient Illumination noise.
- (Light-modulation type・・・KR895)

## 用途 Application

- ・ 複写機・印刷機・プリンタ等の用紙検出
- ・ 各種自動機の物体通過検出
- ・ その他
- ・ Paper detection in Copying machine, Printer, and Facsimile.
- ・ Object passing for Card reader, Auto vending machine.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | IO               | 50        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

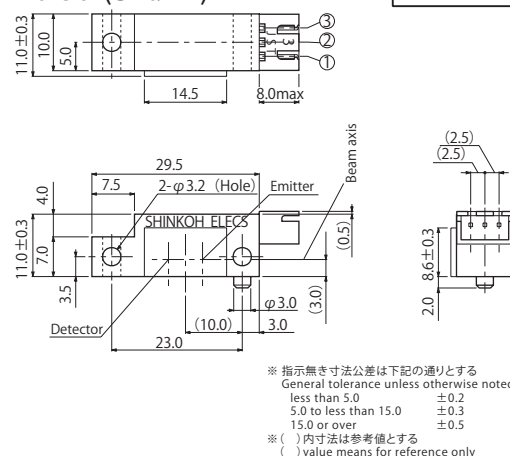
## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                              | min.    | typ. | max. | Unit |
|-------------------------------------|--------|----------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC    | —                                      | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption            | ICC    | KR894 RL=∞                             | —       | —    | 40   | mA   |
|                                     | ICCP   | KR895 ICCP パルスせん頭値、RL=∞<br>Pulse Serge | —       | —    | 150  |      |
|                                     | ICC    | KR895 ICC 平滑値、RL=∞ Average             | —       | —    | 20   |      |
| ローレベル出力電圧 Low Level Output Voltage  | VOL    | 検出時、IOL=16mA Object existing           | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage | VOH    | 非検出時 No object ※4                      | VCCx0.9 | —    | —    | V    |
| 検出距離 Detecting Distance ※1          | d1     | KR894 検出物 90% 反射紙                      | 2       | —    | 5.5  | mm   |
|                                     |        | KR895 Object 90% Reflective paper      | 1.5     | —    | 7    |      |
| 非検出距離 Non-Detecting Distance ※2     | d2     | KR894 検出物 90% 反射紙                      | —       | —    | 15   | mm   |
|                                     |        | KR895 Object 90% Reflective paper      | —       | —    | 30   |      |
| KR895 外乱光許容照度 Ambient Illumination  | —      | CIE 標準 A 光源 CIE STD. A light source    | 2000    | —    | —    | lx   |
| 応答時間 Response Time                  | tPHL   | "High" → "Low" 伝搬時間                    | —       | —    | 1    | ms   |
|                                     | tPLH   | "Low" → "High" 伝搬時間                    | —       | —    | 1    |      |

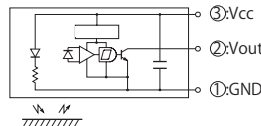
\*\* : Ta=25°C unless otherwise noted

## Dimension(Unit:mm)

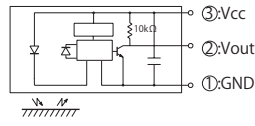
## KR894/895



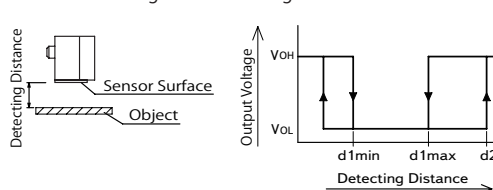
&lt; KR894 &gt;



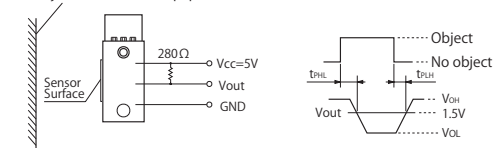
&lt; KR895 &gt;



| 型名<br>Model | 型名枝番<br>Model variation | コネクタメーカー : コネクタ品番<br>Connector manufacturer : Connector P/N |
|-------------|-------------------------|-------------------------------------------------------------|
| KR894       | AALF                    | JST: B3B-XH-A                                               |
| KR895       | AALF                    | JST: B3B-XH-A                                               |

※1、※2:検出距離/非検出距離  
Detecting /Non-detecting distance※3:応答時間の測定回路  
Measuring circuit of Response time

Object: 90% reflective paper

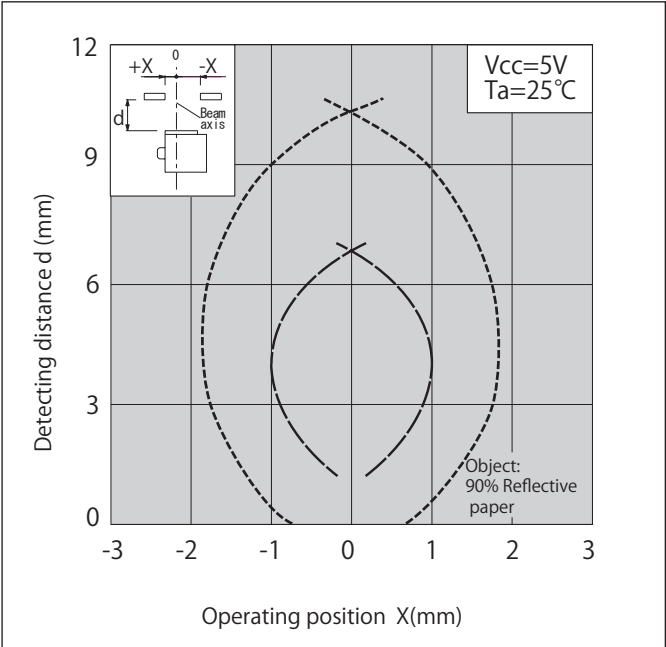


# KR894/895

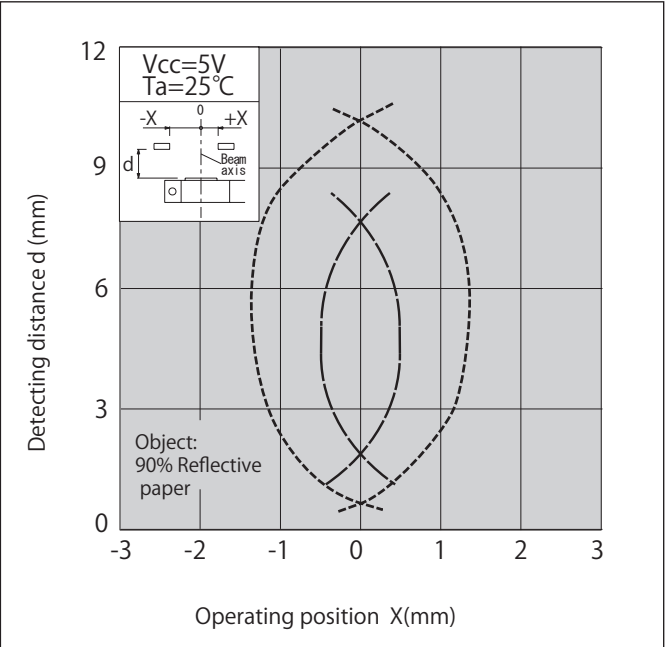
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

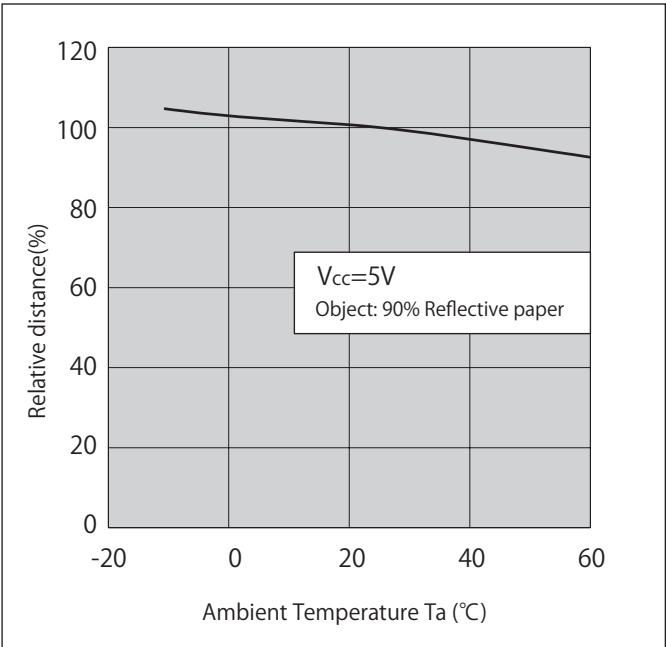
検出距離特性－動作位置1 (代表例)



検出距離特性－動作位置2 (代表例)



相対検出距離－周囲温度特性 (代表例)



KR894 —————  
KR895 - - - - -

機種ラインアップ / Series Line-Up (Unit:mm)

| Model No. | Method           | Detecting Distance   |                      |       | Non-Detecting Distance |
|-----------|------------------|----------------------|----------------------|-------|------------------------|
|           |                  | 90% Reflective paper | Black Paper OD=1.2 ※ | OHP ※ | 90% Reflective paper   |
| KR3320    | Light-Modulation | 4~32                 | 5~25                 | 4~30  | 90                     |
| KR866     |                  | 4~32                 | 10~20                | 8~25  | 75                     |
| KR3630    |                  | 9~25                 | 5~25                 | 4~30  | 90                     |
| KR865     |                  | 7~25                 | 13~17                | 10~20 | 60                     |
| KR3620    |                  | 4~18                 | 2.5~10               | 2~12  | 45                     |
| KR3331    |                  | 4~17                 | 2.5~10               | 2~12  | 45                     |
| KR1207    |                  | 1~15                 | 2.5~4.5              | 2~7   | 55                     |
| KR895     |                  | 1.5~7                | 2.5~5.5              | 2~6   | 30                     |
| KR3380    |                  | 2~7                  | 2.5~4                | 2~5   | 25                     |
| KR3610    |                  | 1~9                  | 2~4                  | 1.5~6 | 35                     |
| KR3330    |                  | 1~7                  | 2~4                  | 1.5~6 | 35                     |
| KR864     | Direct Current   | 7~11                 | 8~9                  | 7~10  | 30                     |
| KR894     |                  | 2~5.5                | 3.5~4.5              | 2~5.5 | 15                     |

※ 黒紙・OHPフィルムの検出距離規格は参考値です。  
Detecting Distance by Black paper and OHP film are reference only.

非検出距離についてご要望がある場合はお問い合わせください。  
Please contact us for non-detection distance requests.

- ・ カスタマイズも承ります。お気軽にお問合せください
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- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KR1207



反射型フォトセンサ 光変調タイプ

Photo Reflector - Light modulation type



## 概要 Description

KR1207 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC 受光素子を採用した防塵型の反射型フォトセンサです。

Model KR1207 consists of a infrared LED and a Light modulation type of Photo IC, and has plastic housing.

## 特長 Feature

- 検出範囲が広い
- ローコストタイプ
- 防塵構造なので紙粉等の除去が容易
- 光変調方式の為、外乱光等のノイズに強い
- 反射の少ない黒紙、OHP フィルム等の検出可能
- Wide detecting distance.
- Low Cost.
- Easy removing in paper-dust.
- Resistant to Ambient Illumination noise.
- (Light-modulation type)
- Available for detection of dark paper/OHP film.

## 用途 Application

- 複写機・印刷機・プリンタ等の用紙検出
- 各種自動機の物体通過検出
- その他
- Paper detection in Copying machine, Printer, and Facsimile.
- Object passing for Card reader, Auto vending machine.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | Io               | 50        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

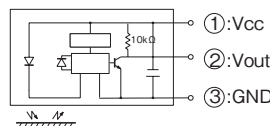
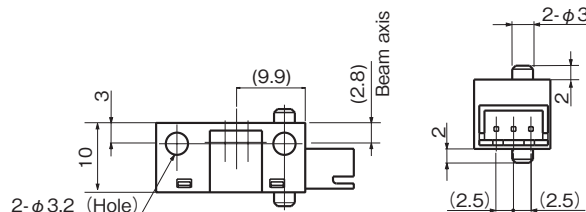
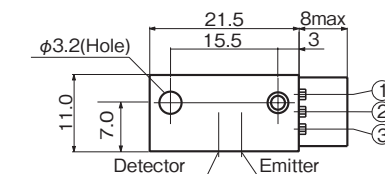
## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                               | min.    | typ. | max. | Unit |
|-------------------------------------|--------|-----------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC    | —                                       | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption            | ICCP   | パルスせん頭値、RL=∞ Pulse Surge                | —       | —    | 150  | mA   |
|                                     | ICC    | 平滑値、RL=∞ Average                        | —       | —    | 20   | mA   |
| ローレベル出力電圧 Low Level Output Voltage  | VOL    | 検出時、IoL=16mA Object existing            | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage | VOH    | 非検出時 No object                          | VCCx0.9 | —    | —    | V    |
| 検出距離 Detecting Distance ※1          | d1     | 検出物 90% 反射紙 Object 90% Reflective paper | 1       | —    | 15   | mm   |
| 非検出距離 Non-Detecting Distance ※2     | d2     | Object 90% Reflective paper             | —       | —    | 55   | mm   |
| 外乱光許容照度 Ambient Illumination        | —      | CIE 標準 A 光源 CIE STD. A light source     | 2000    | —    | —    | lx   |
| 応答時間 Response Time                  | tPHL   | "High" → "Low" 伝搬時間                     | —       | —    | 1    | ms   |
|                                     | tPLH   | "Low" → "High" 伝搬時間                     | —       | —    | 1    | ms   |

\*\* : Ta=25°C unless otherwise noted

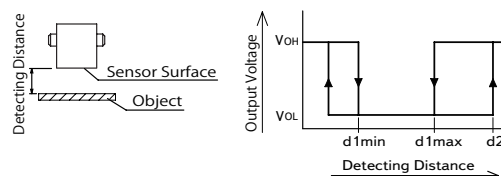
## Dimension(Unit:mm)

KR1207

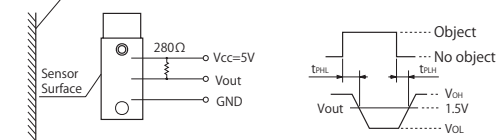


※ 指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5  
※ ( ) 内寸法は参考値とする  
( ) value means for reference only

|                 |                                        |
|-----------------|----------------------------------------|
| 型名枝番            | コネクタメーカー : コネクタ品番                      |
| Model variation | Connector manufacturer : Connector P/N |
| AALF            | JST: B3B-XH-A                          |

※1、※2:検出距離/非検出距離  
Detecting /Non-detecting distance※3:応答時間の測定回路  
Measuring circuit of Response time

Object: 90% reflective paper

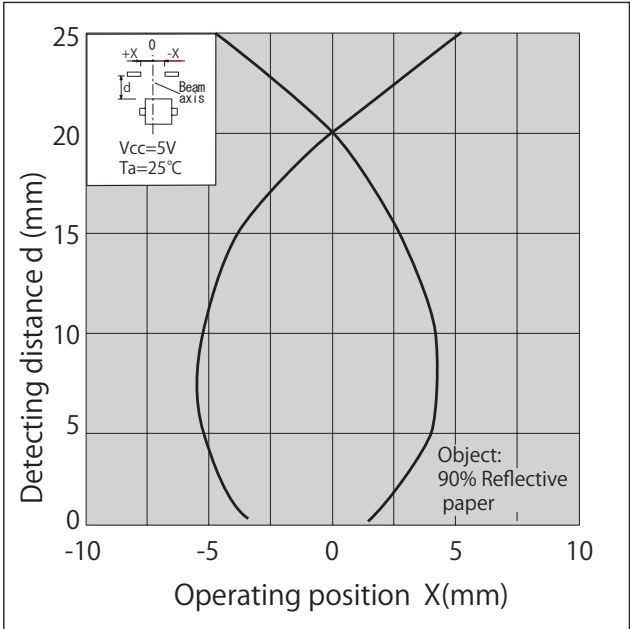


# KR1207

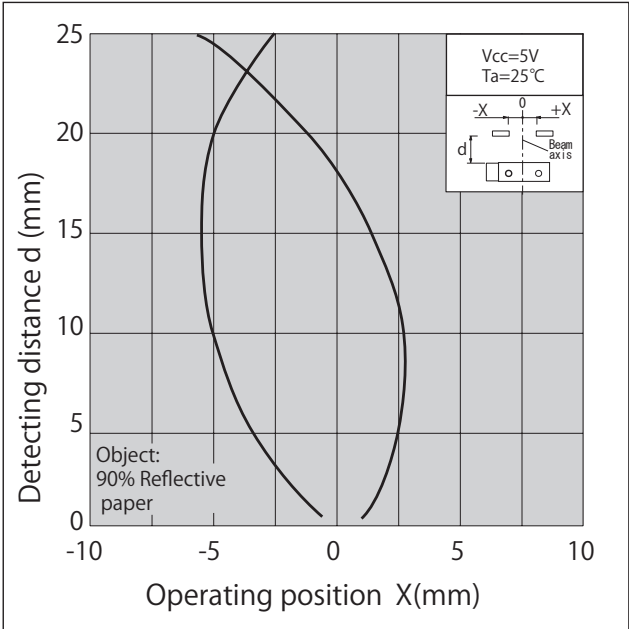
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

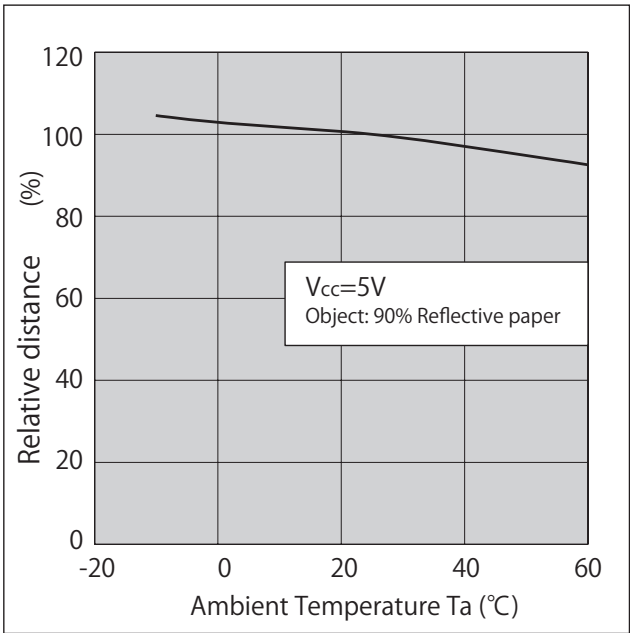
検出距離特性－動作位置1 (代表例)



検出距離特性－動作位置2 (代表例)



検出距離－周囲温度特性 (代表例)



機種ラインアップ / Series Line-Up (Unit:mm)

| Model No. | Method           | Detecting Distance   |                      |       | Non-Detecting Distance |
|-----------|------------------|----------------------|----------------------|-------|------------------------|
|           |                  | 90% Reflective paper | Black Paper OD=1.2 ※ | OHP ※ |                        |
| KR3320    | Light-Modulation | 4～32                 | 5～25                 | 4～30  | 90                     |
| KR866     |                  | 4～32                 | 10～20                | 8～25  | 75                     |
| KR3630    |                  | 9～25                 | 5～25                 | 4～30  | 90                     |
| KR865     |                  | 7～25                 | 13～17                | 10～20 | 60                     |
| KR3620    |                  | 4～18                 | 2.5～10               | 2～12  | 45                     |
| KR3331    |                  | 4～17                 | 2.5～10               | 2～12  | 45                     |
| KR1207    |                  | 1～15                 | 2.5～4.5              | 2～7   | 55                     |
| KR895     |                  | 1.5～7                | 2.5～5.5              | 2～6   | 30                     |
| KR3380    |                  | 2～7                  | 2.5～4                | 2～5   | 25                     |
| KR3610    |                  | 1～9                  | 2～4                  | 1.5～6 | 35                     |
| KR3330    |                  | 1～7                  | 2～4                  | 1.5～6 | 35                     |
| KR864     | Direct Current   | 7～11                 | 8～9                  | 7～10  | 30                     |
| KR894     |                  | 2～5.5                | 3.5～4.5              | 2～5.5 | 15                     |

※ 黒紙・OHPフィルムの検出距離規格は参考値です。  
Detecting Distance by Black paper and OHP film are reference only.

非検出距離についてご要望がある場合はお問い合わせください。  
Please contact us for non-detection distance requests.

- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KR1210

反射型フォトセンサ Photo Reflector



## 概要 Description

KR1210 は、高出力の赤・赤外のLEDとフォトトランジスタを組み合わせた反射型フォトセンサです。

Model KR1210 series consist of Red or Infrared LED and a Photo transistor reflection Photo sensor.

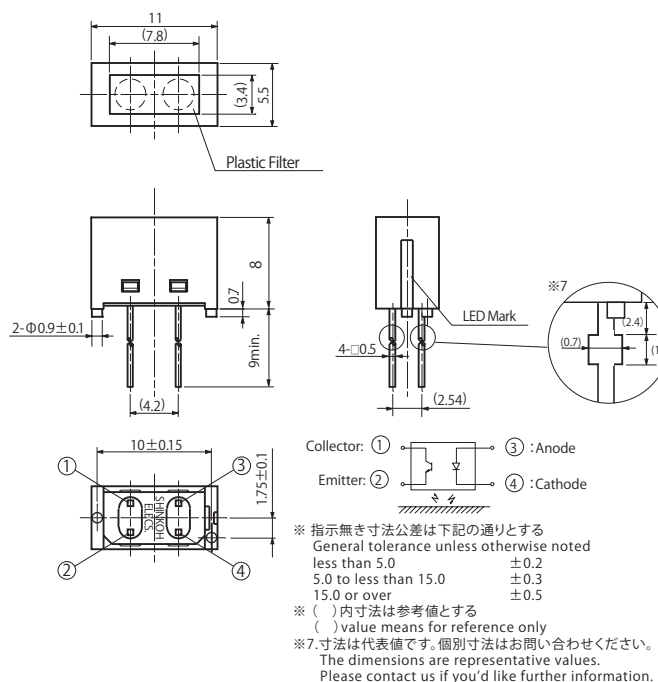
## 用途 Application

- ・印刷物の色判別センサ
- ・紙幣のパターン読みとり用
- ・Scanning for Color-discrimination.
- ・Scanning for Bill Pattern.

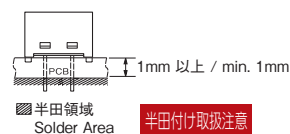
| 品名 Model    | ピーク波長 $\lambda_p$ | Peak wavelength |
|-------------|-------------------|-----------------|
| KR1210-AA04 | R Red             | 655 nm          |
| KR1210-AA05 | IR Infrared       | 940 nm          |

## Dimension(Unit:mm)

KR1210

最大定格 Maximum Ratings [ $T_a=25^\circ\text{C}$  \*\*]

| Item              |              |                             | Symbol | Rating    |     | Unit |
|-------------------|--------------|-----------------------------|--------|-----------|-----|------|
|                   |              |                             |        | R         | IR  |      |
| 発 光 側<br>Emitter  | 順電流          | Forward Current             | IF     | 30        | 50  | mA   |
|                   | パルス順電流       | Pulse Forward Current ※1    | IFP    | 0.5       | 1   | A    |
|                   | 逆電圧          | Reverse Voltage             | VR     | 4         | 5   | V    |
|                   | 許容損失         | Power Dissipation           | P      | 75        | 150 | mW   |
| 受 光 側<br>Detector | コレクタ・エミッタ間電圧 | Collector-Emitter Voltage   | VCEO   | 35        |     | V    |
|                   | エミッタ・コレクタ間電圧 | Emitter-Collector Voltage   | VECO   | 5         |     | V    |
|                   | コレクタ電流       | Collector Current           | Ic     | 20        |     | mA   |
|                   | コレクタ損失       | Collector Power Dissipation | Pc     | 50        |     | mW   |
| 動作温度              |              |                             | Topr   | -20 ～ +75 |     | ℃    |
| 保存温度              |              |                             | Tstg   | -30 ～ +80 |     | ℃    |
| 半田付温度             |              |                             | Tsol   | 330       |     | ℃    |



- ※ 1. パルス幅  $t_w \leq 100\mu\text{s}$  Duty 比 = 0.01
- ※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照) 手半田付けのみ可 (フロー半田付け不可)
- ※ 3. 90% 反射紙  $d=6.5\text{mm}$
- ※ 4. 反射物無し、暗黒中
- ※ 1. Pulse width  $t_w \leq 100\mu\text{s}$  Duty ratio = 0.01
- ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.
- ※ 3. 90% Reflective paper  $d=6.5\text{mm}$
- ※ 4. No Object, in Dark

電気的光学的特性 Electro-Optical Characteristics [ $T_a=25^\circ\text{C}$  \*\*]

| Item               |                             |                 | Symbol            | Condition                                                                  | R    |      |      | IR   |      |      | Unit |
|--------------------|-----------------------------|-----------------|-------------------|----------------------------------------------------------------------------|------|------|------|------|------|------|------|
|                    |                             |                 |                   |                                                                            | min. | typ. | max. | min. | typ. | max. |      |
| 発 光 側<br>Emitter   | 順電圧<br>Forward Voltage      |                 | V <sub>F</sub>    | I <sub>F</sub> =20mA                                                       | —    | 1.85 | 2.5  | —    | 1.2  | 1.5  | V    |
|                    | 逆電流<br>Reverse Current      |                 | I <sub>R</sub>    | V <sub>R</sub> =3V                                                         | —    | —    | 100  | —    | —    | 10   | μA   |
|                    | ピーク発光波長<br>Peak Wavelength  |                 | λ <sub>p</sub>    | I <sub>F</sub> =20mA                                                       | —    | 655  | —    | —    | 940  | —    | nm   |
| 受 光 側<br>Detector  | 暗電流<br>Dark Current         |                 | I <sub>CEO</sub>  | V <sub>CE</sub> =20V, 0 lx                                                 | —    | —    | 0.2  | —    | —    | 0.2  | μA   |
| 伝 達 特 性<br>Coupled | 光電流<br>Light Current<br>※ 3 |                 | I <sub>C</sub>    | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                                  | 40   | 80   | —    | 40   | 400  | —    | μA   |
|                    | 漏れ電流<br>Leak Current<br>※ 4 |                 | I <sub>LEAK</sub> | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                                  | —    | —    | 5    | —    | —    | 5    | μA   |
|                    | 応 答 時 間<br>Response Time    | 上昇<br>Rise Time | t <sub>r</sub>    | V <sub>CC</sub> =5V, I <sub>C</sub> =0.2mA<br>R <sub>L</sub> =1kΩ, d=6.5mm | —    | 18   | —    | —    | 22   | —    | μs   |
|                    |                             | 下降<br>Fall Time | t <sub>f</sub>    |                                                                            | —    | 18   | —    | —    | 22   | —    |      |

\*\* :  $T_a=25^\circ\text{C}$  unless otherwise noted

# KR1210

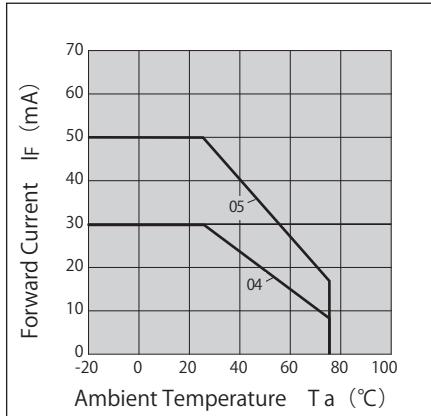
## 定格・特性曲線

Characteristics

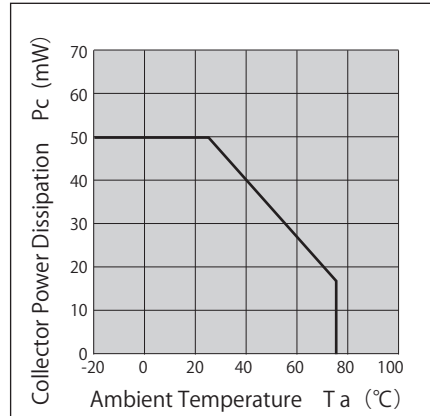
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

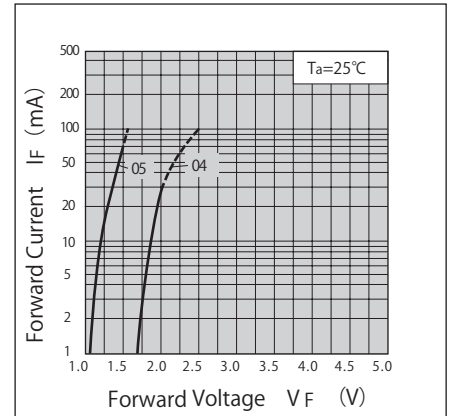
### 順電流低減曲線



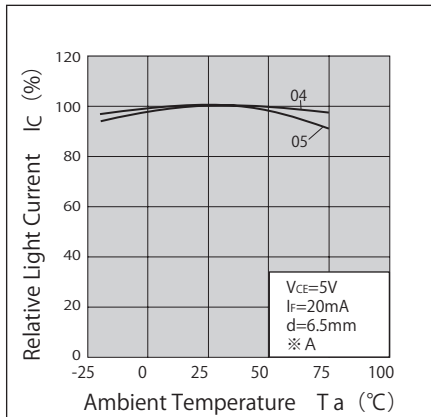
### コレクタ損失低減曲線



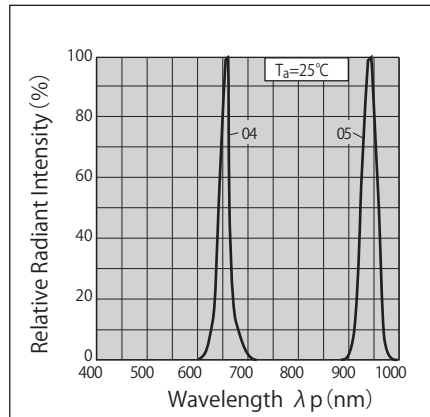
### 順電流－順電圧特性 (代表例)



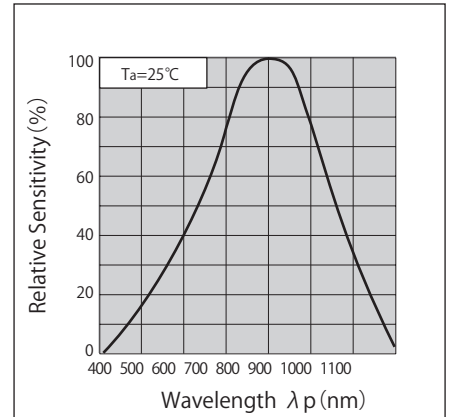
### 光電流－周囲温度特性 (代表例)



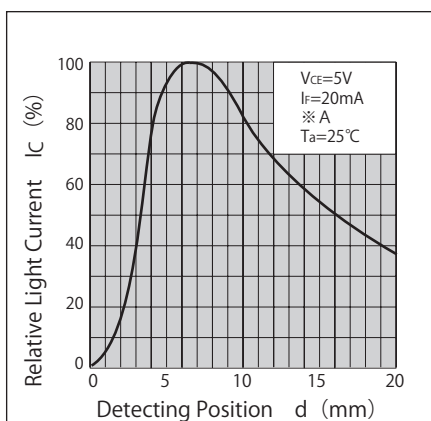
### スペクトル分布 (代表例)



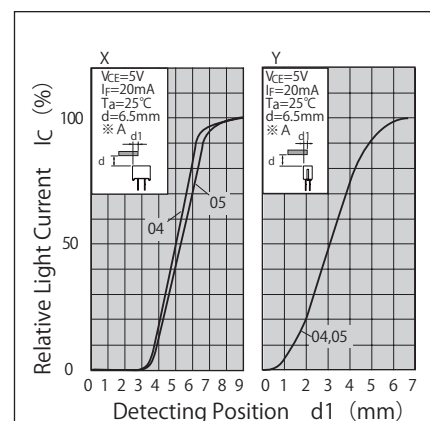
### 分光感度特性 (代表例)



### 検出距離特性 (代表例)



### 検出位置特性 (代表例)



※ A 90% Reflective Paper

- ・ カスタマイズも承ります。お気軽にお問合せください
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- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KR1211

反射型フォトセンサ Photo Reflector



## 概要 Description

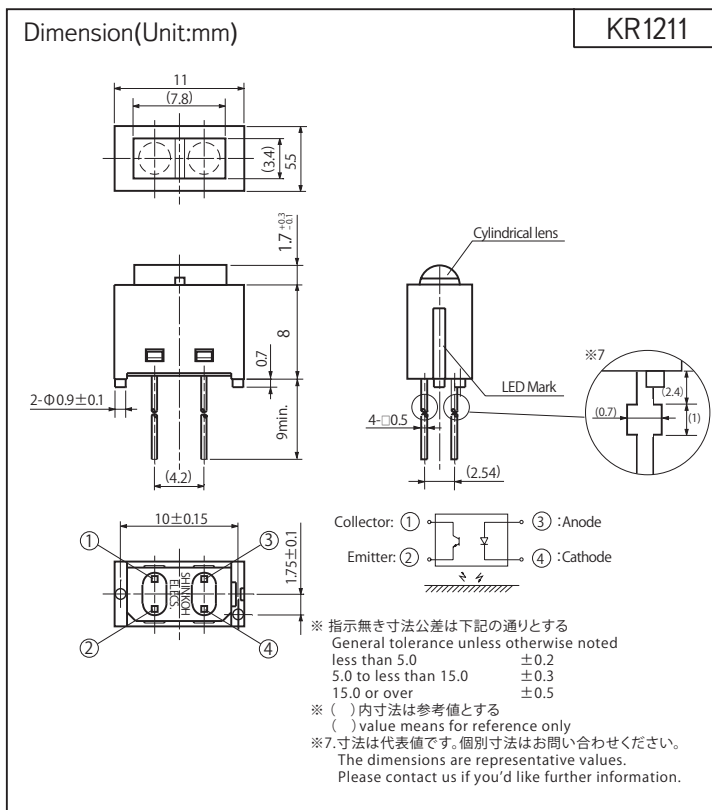
KR1211 は、高出力の赤・赤外のLEDとフォトトランジスタを組み合わせた反射型フォトセンサです。

Model KR1211 series consist of Red or Infrared LED and a Photo transistor reflection Photo sensor.

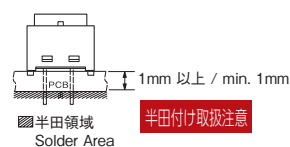
## 用途 Application

- ・印刷物の色判別センサ
- ・紙幣のパターン読みとり用
- ・Scanning for Color-discrimination.
- ・Scanning for Bill Pattern.

| 品名 Model    | ピーク波長 $\lambda_p$ | Peak wavelength |
|-------------|-------------------|-----------------|
| KR1211-AA04 | R Red             | 655 nm          |
| KR1211-AA05 | IR Infrared       | 940 nm          |

最大定格 Maximum Ratings [ $T_a=25^\circ\text{C}$  \*\*]

| Item                           |                                        | Symbol           | Rating    |     | Unit |
|--------------------------------|----------------------------------------|------------------|-----------|-----|------|
|                                |                                        |                  | R         | IR  |      |
| 発光側<br>Emitter                 | 順電流 Forward Current                    | IF               | 30        | 50  | mA   |
|                                | パルス順電流 Pulse Forward Current ※1        | IFP              | 0.5       | 1   | A    |
|                                | 逆電圧 Reverse Voltage                    | VR               | 4         | 5   | V    |
|                                | 許容損失 Power Dissipation                 | P                | 75        | 150 | mW   |
| 受光側<br>Detector                | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 35        |     | V    |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 5         |     | V    |
|                                | コレクタ電流 Collector Current               | IC               | 20        |     | mA   |
|                                | コレクタ損失 Collector Power Dissipation     | PC               | 50        |     | mW   |
| 動作温度 Operating Temperature     |                                        | T <sub>opr</sub> | -20 ~ +75 |     | °C   |
| 保存温度 Storage Temperature       |                                        | T <sub>stg</sub> | -30 ~ +80 |     | °C   |
| 半田付温度 Soldering Temperature ※2 |                                        | T <sub>sol</sub> | 330       |     | °C   |



- ※ 1. パルス幅  $t_w \leq 100\mu\text{s}$  Duty 比 = 0.01  
 ※ 2. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照)  
 手半田付けのみ可 (フロー半田付け不可)  
 ※ 3. 90% 反射紙  $d=4.5\text{mm}$   
 ※ 4. 反射物無し、暗黒中

- ※ 1. Pulse width  $t_w \leq 100\mu\text{s}$  Duty ratio = 0.01  
 ※ 2. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.  
 ※ 3. 90% Reflective paper  $d=4.5\text{mm}$   
 ※ 4. No Object, in Dark

電気的光学的特性 Electro-Optical Characteristics [ $T_a=25^\circ\text{C}$  \*\*]

| Item            |                         | Symbol            | Condition                                    | R    |      |      | IR   |      |      | Unit          |
|-----------------|-------------------------|-------------------|----------------------------------------------|------|------|------|------|------|------|---------------|
|                 |                         |                   |                                              | min. | typ. | max. | min. | typ. | max. |               |
| 発光側<br>Emitter  | 順電圧 Forward Voltage     | V <sub>F</sub>    | IF=20mA                                      | —    | 1.85 | 2.5  | —    | 1.2  | 1.5  | V             |
|                 | 逆電流 Reverse Current     | IR                | VR=3V                                        | —    | —    | 100  | —    | —    | 10   | $\mu\text{A}$ |
|                 | ピーク発光波長 Peak Wavelength | $\lambda_p$       | IF=20mA                                      | —    | 655  | —    | —    | 940  | —    | nm            |
| 受光側<br>Detector | 暗電流 Dark Current        | ICEO              | VCE=20V, 0 lx                                | —    | —    | 0.2  | —    | —    | 0.2  | $\mu\text{A}$ |
| 伝達特性<br>Coupled | 光電流 Light Current ※3    | IC                | VCE=5V, IF=20mA                              | 100  | 200  | —    | 100  | 850  | —    | $\mu\text{A}$ |
|                 | 漏れ電流 Leak Current ※4    | I <sub>LEAK</sub> | VCE=5V, IF=20mA                              | —    | —    | 10   | —    | —    | 10   | $\mu\text{A}$ |
|                 | 応答時間 Response Time      | 上昇 Rise Time      | VCC=5V, IC=0.2mA<br>RL=1k $\Omega$ , d=4.5mm | —    | 18   | —    | —    | 22   | —    | $\mu\text{s}$ |
|                 |                         | 下降 Fall Time      |                                              | —    | 18   | —    | —    | 22   | —    |               |

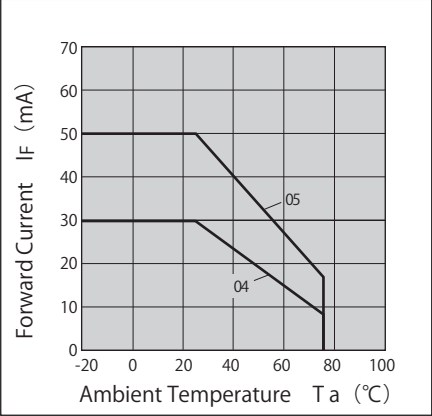
\*\* :  $T_a=25^\circ\text{C}$  unless otherwise noted

# KR1211

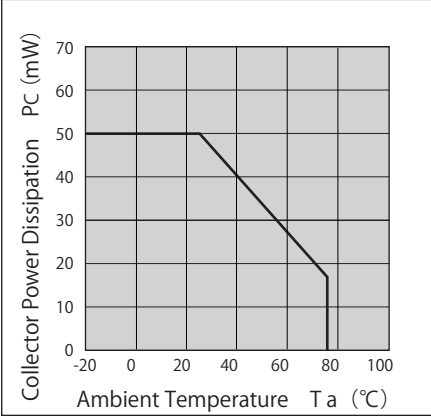
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

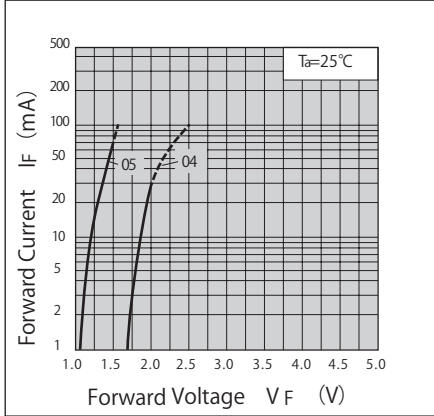
順電流低減曲線



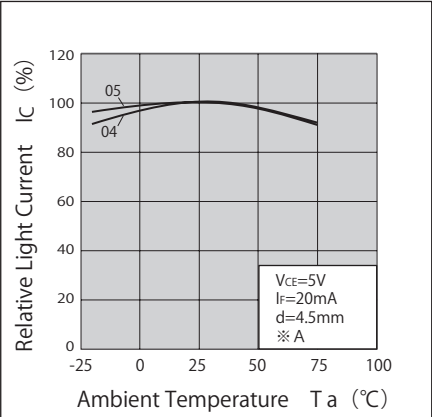
コレクタ損失低減曲線



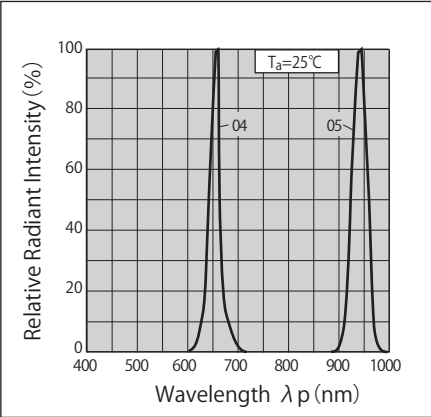
順電流－順電圧特性 (代表例)



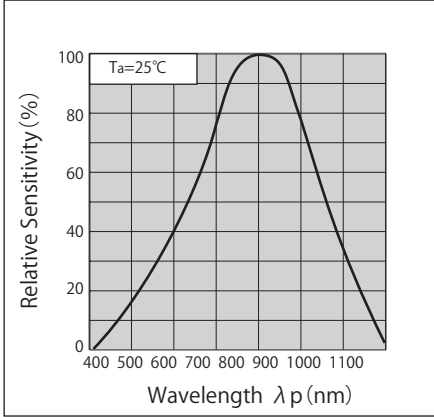
光電流－周囲温度特性 (代表例)



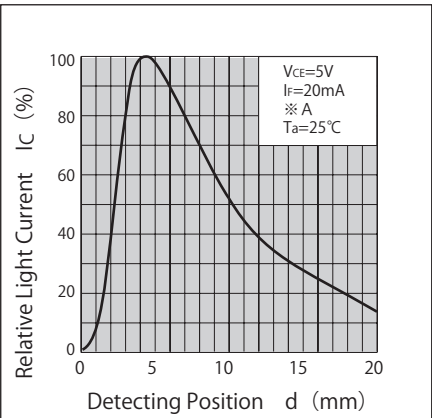
スペクトル分布 (代表例)



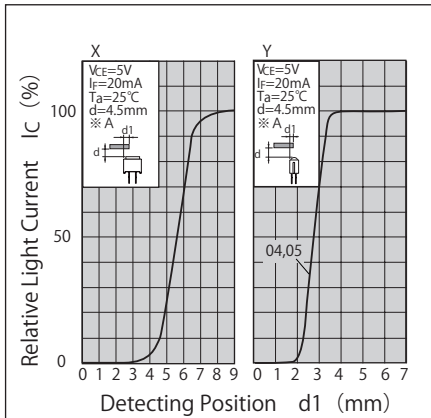
分光感度特性 (代表例)



検出距離特性 (代表例)



検出位置特性 (代表例)



※ A 90% Reflective Paper

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- ・ Specifications are subject to change without notice.

## KR1218/1219/3900/3910/3920/3930



反射型フォトセンサ Photo Reflector



※写真は、リード・フォーミングタイプのもの  
※ Photo is a forming type of leads

## 概要 Description

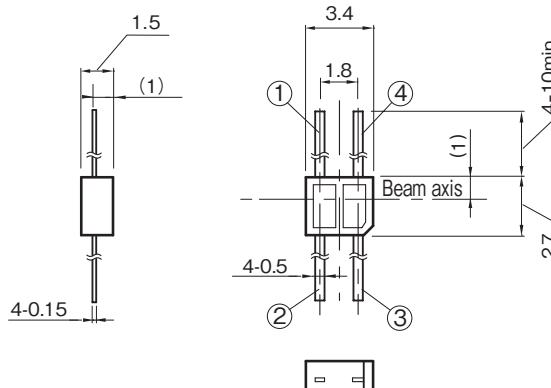
KR1218/1219/3900/3910/3920/3930 は、青色から赤外まで様々な発光ダイオードと高感度フォトトランジスタを組み合わせた反射型フォトセンサです。

Model KR1218/1219/3900/3910/3920/3930 have an LED which emits the light from Blue to Infrared, and a Photo transistor in a transfer mold package with clear resin.

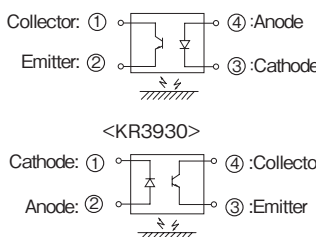
- ・カスタム対応によりリード・フォーミングタイプも選択可能。
- ・ Custom model is available in leads forming.

| 品名     | Model  | ピーク波長 $\lambda_p$ (nm) | Peak wavelength |
|--------|--------|------------------------|-----------------|
| KR3900 | B      | Blue                   | (470 nm)        |
| KR3910 | G      | Green                  | (525 nm)        |
| KR3920 | R 625  | Red                    | (625 nm)        |
| KR1219 | R 655  | Red                    | 655 nm          |
| KR1218 | IR 880 | Infrared               | 880 nm          |
| KR3930 | IR 940 | Infrared               | 940 nm          |

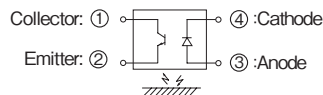
## Dimension(Unit:mm) KR1218/1219/3900/3910/3920/3930



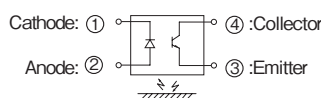
&lt;KR1218/1219/3920&gt;



&lt;KR3900/3910&gt;



&lt;KR3930&gt;



※ 指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5  
※ ( ) 内寸法は参考値とする  
( ) value means for reference only

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item              |              |                             | Symbol | Rating    |     |          |          |           |           | Unit |
|-------------------|--------------|-----------------------------|--------|-----------|-----|----------|----------|-----------|-----------|------|
|                   |              |                             |        | B         | G   | R<br>625 | R<br>655 | IR<br>880 | IR<br>940 |      |
| 発 光 側<br>Emitter  | 順電流          | Forward Current             | IF     | 30        | 30  | 70       | 30       | 40        | 50        | mA   |
|                   | 逆電圧          | Reverse Voltage             | VR     | 5         |     |          |          |           |           | V    |
|                   | 許 容 損 失      | Power Dissipation           | P      | 105       | 105 | 150      | 75       | 75        | 75        | mW   |
| 受 光 側<br>Detector | コレクタ・エミッタ間電圧 | Collector-Emitter Voltage   | VCEO   | 25        |     |          |          |           |           | V    |
|                   | エミッタ・コレクタ間電圧 | Emitter-Collector Voltage   | VECO   | 5         |     |          |          |           |           | V    |
|                   | コレクタ電流       | Collector Current           | IC     | 20        |     |          |          |           |           | mA   |
|                   | コレクタ損失       | Collector Power Dissipation | Pc     | 75        |     |          |          |           |           | mW   |
| 動作温度              |              | Operating Temperature       | Topr   | -20 ～ +75 |     |          |          |           |           | ℃    |
| 保存温度              |              | Storage Temperature         | Tstg   | -30 ～ +80 |     |          |          |           |           | ℃    |
| 半田付温度             |              | Soldering Temperature ※ 1   | Tsol   | 330       |     |          |          |           |           | ℃    |

L=1mm以上(基板上) /  
L=min. 1mm from PC Board surface  
1mm 以上 / min. 1mm

半田領域  
Solder Area

半田付け取扱注意

- ※ 1. パッケージ下面より 1mm 以上の位置で 2 秒以内 (上図参照)。手半田付けのみ可 (フロー半田付け不可)
- ※ 2. 90% 反射紙 d=1mm
- ※ 3. 反射物無し、暗黒中
- ※ 4. ( ) 内波長は  $\lambda_D$
- ※ 1. Soldering condition less than 2s. at 1mm over from body. Flow Soldering unsupported.
- ※ 2. 90% Reflective paper d=1mm
- ※ 3. No Object, in Dark
- ※ 4. ( ) means  $\lambda_D$ .

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                | Symbol                      | Condition                             | B    |       |      | G    |       |      | R625 |       |      | R655 |      |      | IR880 |      |      | IR940 |      |      | Unit |
|-----------------|----------------|-----------------------------|---------------------------------------|------|-------|------|------|-------|------|------|-------|------|------|------|------|-------|------|------|-------|------|------|------|
|                 |                |                             |                                       | min. | typ.  | max. | min. | typ.  | max. | min. | typ.  | max. | min. | typ. | max. | min.  | typ. | max. | min.  | typ. | max. |      |
| 発光側<br>Emitter  | 順電圧            | VF                          | IF=20mA                               | —    | 3.0   | 3.4  | —    | 3.0   | 3.4  | —    | 2.1   | 2.5  | —    | 1.7  | 2.3  | —     | 1.3  | 1.7  | —     | 1.2  | 1.5  | V    |
|                 | 逆電流            | IR                          | VR=5V                                 | —    | —     | 50   | —    | —     | 10   | —    | —     | 10   | —    | —    | 10   | —     | —    | 10   | —     | —    | 10   | μA   |
|                 | ピーク発光波長        | $\lambda_p$ ( $\lambda_D$ ) | IF=20mA                               | —    | (470) | —    | —    | (525) | —    | —    | (625) | —    | —    | 655  | —    | —     | 880  | —    | —     | 940  | —    | nm   |
| 受光側<br>Detector | 暗電流            | ICEO                        | VCE=20V<br>0 lx                       | —    | 1     | 200  | —    | 1     | 200  | —    | 1     | 200  | —    | 1    | 200  | —     | 1    | 200  | —     | 1    | 200  | nA   |
| 伝達特性<br>Coupled | 光電流            | IC                          | VCE=5V<br>IF=10mA                     | 800  | —     | —    | 800  | —     | —    | 800  | —     | —    | 200  | —    | 2000 | 400   | —    | —    | 400   | —    | —    | μA   |
|                 | 漏れ電流           | ILEAK                       | VCE=5V<br>IF=10mA                     | —    | —     | 20   | —    | —     | 20   | —    | —     | 20   | —    | —    | 20   | —     | —    | 20   | —     | —    | 20   | μA   |
|                 | コレクタ・エミッタ間飽和電圧 | VCE(sat)                    |                                       | —    | —     | 0.4  | —    | —     | 0.4  | —    | —     | 0.4  | —    | —    | 0.4  | —     | —    | 0.4  | —     | —    | 0.4  | V    |
|                 | 応答時間           | tr                          | VCC=5V<br>IC=0.4mA<br>RL=1kΩ<br>d=1mm | —    | 24    | —    | —    | 24    | —    | —    | 24    | —    | —    | 24   | —    | —     | 24   | —    | —     | 24   | —    | μs   |
| Response Time   |                | tf                          |                                       | —    | 24    | —    | —    | 24    | —    | —    | 24    | —    | —    | 24   | —    | —     | 24   | —    | —     | 24   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KR1218/1219/3900/3910/3920/3930

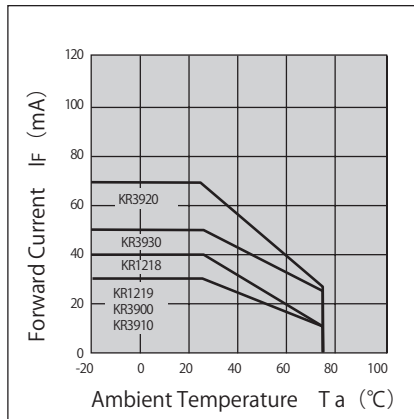
定格・特性曲線

Characteristics

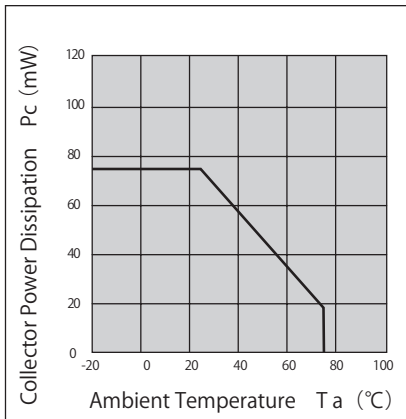
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

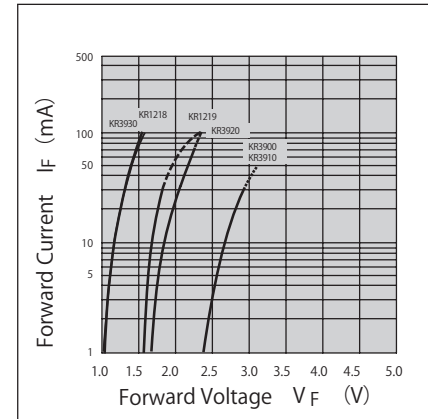
順電流低減曲線



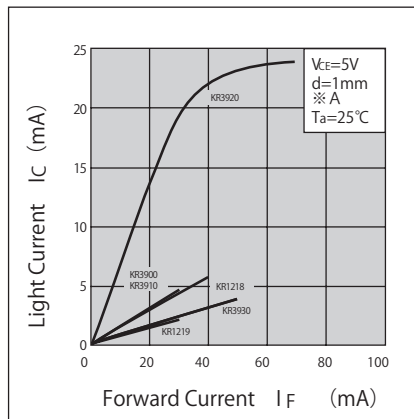
コレクタ損失低減曲線



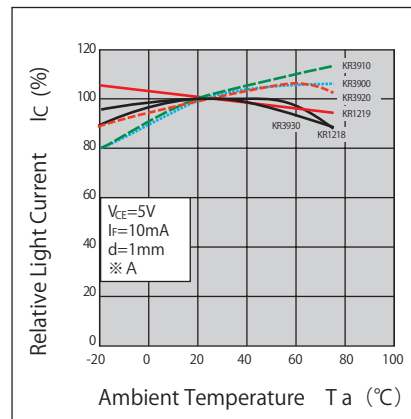
順電流－順電圧特性 (代表例)



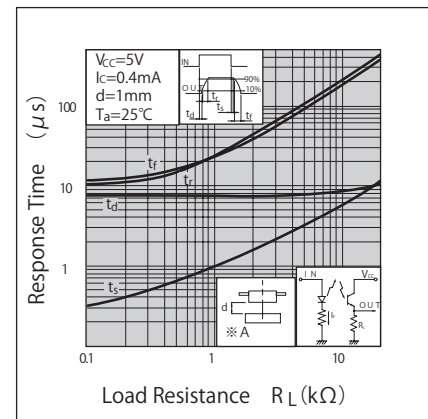
光電流－順電流特性 (代表例)



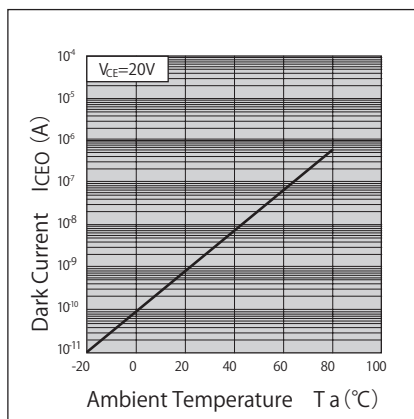
光電流－周囲温度特性 (代表例)



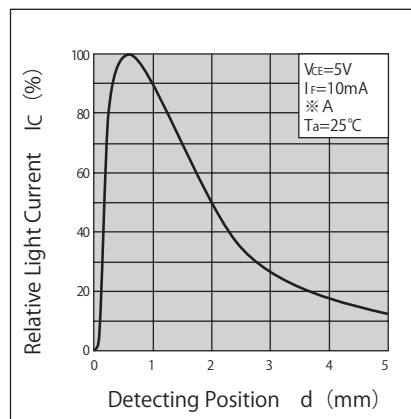
応答時間－負荷抵抗特性 (代表例)



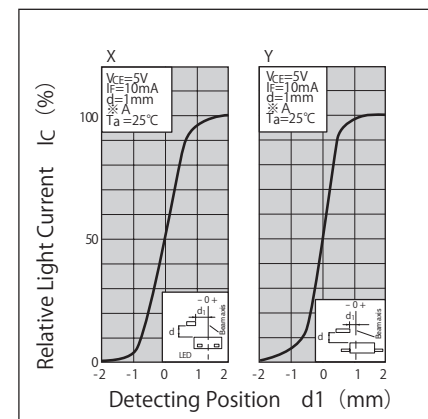
暗電流－周囲温度特性 (代表例)



検出距離特性 (代表例)



検出位置特性 (代表例)



※A 90% Reflective Paper

- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KR1226/1227



反射型フォトセンサ - 赤色 / 赤外 LED タイプ

Photo Reflector - Red/Infrared LED type



## 概要 Description

KR1226 は赤色、KR1227 は赤外の発光ダイオードと高感度フォトトランジスタを組み合わせた高分解能反射型フォトセンサです。

Model KR1226 has a Red LED, KR1227 has an Infrared LED and a Photo transistor with non-sphere lens on emitter and detector. This model can be installed on P.C.Board.

## 特長 Feature

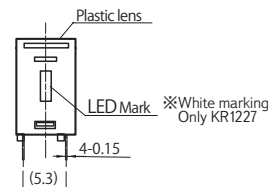
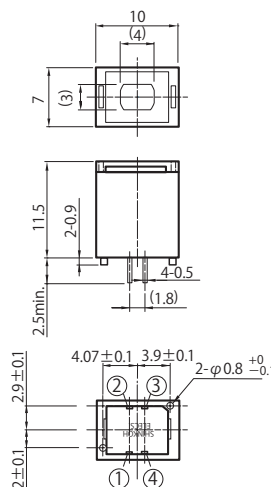
- ・ ローコストタイプ
- ・ 非球面レンズの採用による小型タイプ
- ・ プリント基板取付タイプ
- ・ Low Cost.
- ・ Compact Package.
- ・ Installed on PC board.

## 用途 Application

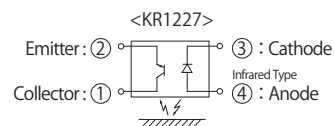
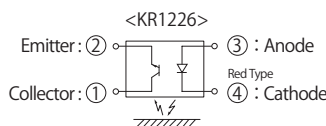
- ・ 簡易バーコードセンサ
- ・ ペーパーエッジセンサ
- ・ OMR, OCR等のマーク検出
- ・ Bar-code Reader.
- ・ Paper edge detection.
- ・ Mark sensor of OMR and OCR.

## Dimension(Unit:mm)

KR1226/1227



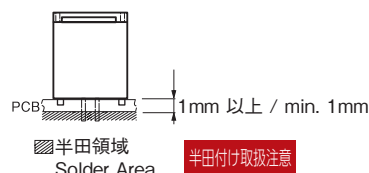
※ 指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5  
※ ( ) 内寸法は参考値とする  
( ) value means for reference only



| Model  | Emitter             | Type        | 分解能 (標準) Resolution (Std.)                                            |
|--------|---------------------|-------------|-----------------------------------------------------------------------|
| KR1226 | 赤色 LED Red LED      | Point light | 0.2mm : Al蒸着ミラー / d=2.7mm 時<br>0.2mm @Al Evaporation Mirror / d=2.7mm |
| KR1227 | 赤外 LED Infrared LED | Point light | 0.2mm : Al蒸着ミラー / d=2.7mm 時<br>0.2mm @Al Evaporation Mirror / d=2.7mm |

## 最大定格 Maximum Ratings [Ta=25°C \*\*] ( )=KR1227

| Item                           | Symbol                                 | Rating    | Unit       |
|--------------------------------|----------------------------------------|-----------|------------|
| 発光側 Emitter                    | 順電流 Forward Current                    | IF        | 30 (40) mA |
|                                | 逆電圧 Reverse Voltage                    | VR        | 5 V        |
|                                | 許容損失 Power Dissipation                 | P         | 75 mW      |
| 受光側 Detector                   | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO      | 20 V       |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO      | 5 V        |
|                                | コレクタ電流 Collector Current               | IC        | 20 mA      |
|                                | コレクタ損失 Collector Power Dissipation     | PC        | 75 mW      |
| 動作温度 Operating Temperature     | T <sub>opr</sub>                       | -10 ~ +65 | °C         |
| 保存温度 Storage Temperature       | T <sub>stg</sub>                       | -20 ~ +75 | °C         |
| 半田付温度 Soldering Temperature ※1 | T <sub>sol</sub>                       | 330       | °C         |



- ※ 1. パッケージ下面から 1mm 以上の位置で 2 秒以内 (上図参照)  
手半田付けのみ可 (フロー半田付け不可)
- ※ 2. 90% 反射紙, d=2.7mm
- ※ 3. 反射物無し、暗黒中
- ※ 1. Soldering condition: less than 2s. at 1mm from housing.  
Flow Soldering unsupported.
- ※ 2. 90% Reflective paper, d=2.7mm
- ※ 3. No Object, in Dark.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*] ( )=KR1227

| Item         | Symbol                            | Condition            | min. | typ.     | max.     | Unit |
|--------------|-----------------------------------|----------------------|------|----------|----------|------|
| 発光側 Emitter  | 順電圧 Forward Voltage               | VF                   |      | 1.8(1.3) | 2.2(1.5) | V    |
|              | 逆電流 Reverse Current               | IR                   |      | —        | 10       | μA   |
|              | ピーク発光波長 Peak Wavelength           | λ <sub>p</sub>       |      | 670(880) | —        | nm   |
| 受光側 Detector | 暗電流 Dark Current                  | ICEO                 |      | 1        | 200      | nA   |
| 伝達特性 Coupled | 光電流 Light Current ※2              | IC                   | 50   | 150(300) | —        | μA   |
|              | 漏れ電流 Leak Current ※3              | I <sub>LEAK</sub>    | —    | —        | 10       | μA   |
|              | コレクタ・エミッタ間飽和電圧 Saturation Voltage | V <sub>CE(sat)</sub> | —    | —        | 0.4      | V    |
|              | 応答時間 Response Time                | 上昇 Rise Time         | —    | 70       | —        | μs   |
|              |                                   | 下降 Fall Time         | —    | 95       | —        |      |

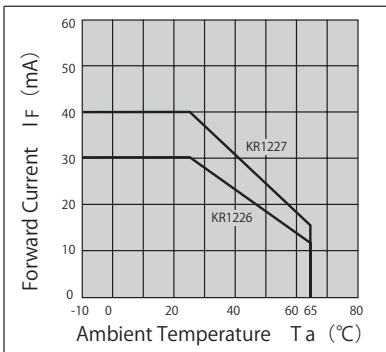
\*\* : Ta=25°C unless otherwise noted

# KR1226/1227

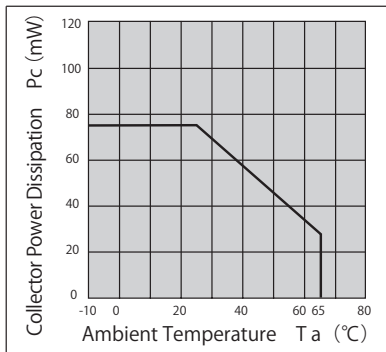
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

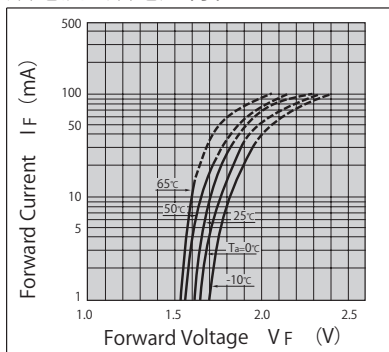
順電流低減曲線



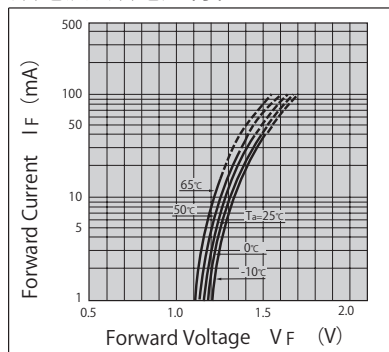
コレクタ損失低減曲線



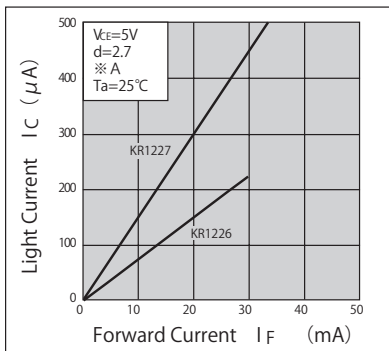
順電流-順電圧特性 (代表例) KR1226



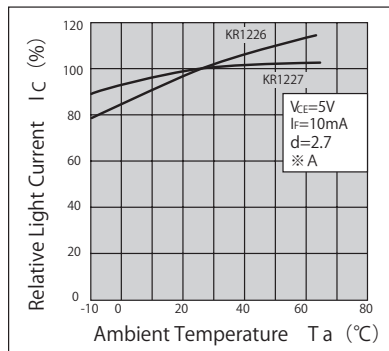
順電流-順電圧特性 (代表例) KR1227



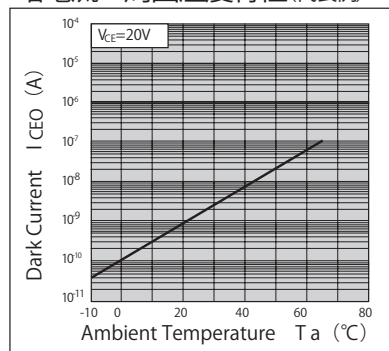
光電流-順電流特性 (代表例)



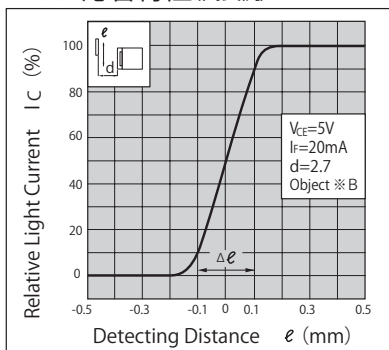
光電流-周囲温度特性 (代表例)



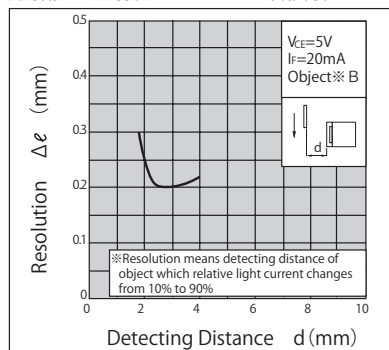
暗電流-周囲温度特性 (代表例)



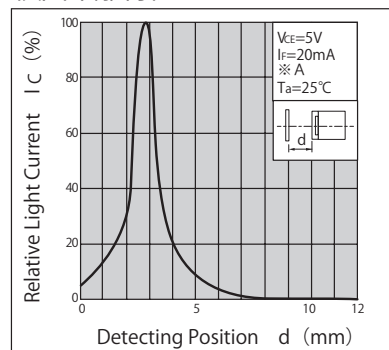
エッジ応答特性 (代表例)



分解能-反射板とセンサとの距離特性 (代表例)



検出距離特性 (代表例)



※ A 90% Reflective Paper  
※ B Al Evaporation Mirror

・カスタマイズも承ります。お気軽にお問合せください  
・A Customized design available on request.

・この仕様は改良のため予告なく変更する場合があります  
・Specifications are subject to change without notice.

## KR1228/1229



反射型フォトセンサ - 赤色 / 赤外 LED タイプ Photo Reflector - Red/Infrared LED type



## 概要 Description

KR1228 は赤色、KR1229 は赤外の発光ダイオードと高感度フォトトランジスタを組み合わせた高分解能反射型フォトセンサです。

Model KR1228 has a Red LED, 1229 has an Infrared LED and a Photo transistor with Cylindrical lens on emitter and detector. This model can be installed on P.C.Board.

## 特長 Feature

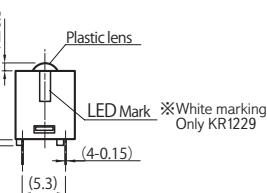
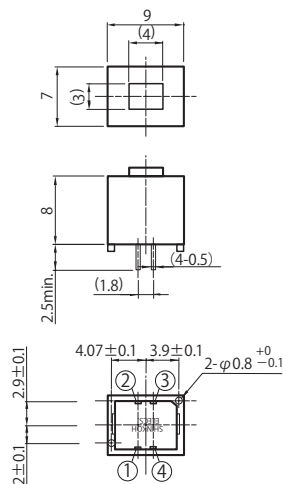
- ・ローコストタイプ
- ・シリンドリカルレンズの採用による小型タイプ
- ・プリント基板取付タイプ
- ・ Low Cost.
- ・ Compact Package.
- ・ Installed on PC board.

## 用途 Application

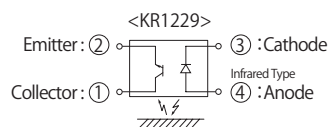
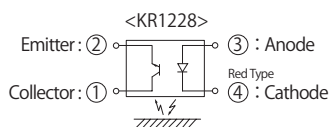
- ・簡易バーコードセンサ
- ・ペーパーエッジセンサ
- ・ OMR, OCR 等のマーク検出
- ・ Bar-code Reader.
- ・ Paper edge detection.
- ・ Mark sensor of OMR and OCR.

## Dimension(Unit:mm)

KR1228/1229



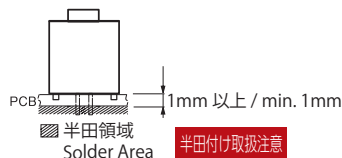
※ 指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5  
※ ( ) 内寸法は参考値とする  
( ) value means for reference only



| Model  | Emitter             | Type      | 分解能 (標準) Resolution (Std.)                                            |
|--------|---------------------|-----------|-----------------------------------------------------------------------|
| KR1228 | 赤色 LED Red LED      | Bar light | 0.2mm : Al蒸着ミラー / d=4.9mm 時<br>0.2mm @Al Evaporation Mirror / d=4.9mm |
| KR1229 | 赤外 LED Infrared LED | Bar light | 0.2mm : Al蒸着ミラー / d=5.1mm 時<br>0.2mm @Al Evaporation Mirror / d=5.1mm |

## 最大定格 Maximum Ratings [Ta=25°C \*\*] ( )=KR1229

| Item                           | Symbol                                 | Rating    | Unit      |
|--------------------------------|----------------------------------------|-----------|-----------|
| 発光側 Emitter                    | 順電流 Forward Current                    | IF        | 30(40) mA |
|                                | 逆電圧 Reverse Voltage                    | VR        | 5 V       |
|                                | 許容損失 Power Dissipation                 | P         | 75 mW     |
| 受光側 Detector                   | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO      | 20 V      |
|                                | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO      | 5 V       |
|                                | コレクタ電流 Collector Current               | IC        | 20 mA     |
|                                | コレクタ損失 Collector Power Dissipation     | PC        | 75 mW     |
| 動作温度 Operating Temperature     | Topr                                   | -10 ~ +65 | °C        |
| 保存温度 Storage Temperature       | Tstg                                   | -20 ~ +75 | °C        |
| 半田付温度 Soldering Temperature ※1 | Tsol                                   | 330       | °C        |



- ※ 1. パッケージ下面から 1mm 以上の位置で 2 秒以内 (上図参照)。  
手半田付けのみ可 (フロー半田付け不可)  
※ 2. 90% 反射紙 d=4.9 (5.1) mm  
※ 3. 反射物無し、暗黒中

- ※ 1. Soldering condition: less than 2s. at 1mm over from body.  
Flow Soldering unsupported.  
※ 2. 90% Reflective paper, d=4.9(5.1)mm  
※ 3. No Object, in Dark.

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*] ( )=KR1229

| Item         | Symbol                                              | Condition | min. | typ. | max. | Unit |
|--------------|-----------------------------------------------------|-----------|------|------|------|------|
| 発光側 Emitter  | 順電圧 Forward Voltage                                 | VF        |      |      |      | V    |
|              | 逆電流 Reverse Current                                 | IR        |      |      |      | μA   |
|              | ピーク発光波長 Peak Wavelength                             | λp        |      |      |      | nm   |
| 受光側 Detector | 暗電流 Dark Current                                    | ICEO      |      |      |      | nA   |
| 伝達特性 Coupled | 光電流 Light Current ※2                                | IC        |      |      |      | μA   |
|              | 漏れ電流 Leak Current ※3                                | ILEAK     |      |      |      | μA   |
|              | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat)  |      |      |      | V    |
|              | 応答時間 Response Time                                  |           |      |      |      | μs   |
|              | 上昇 Rise Time                                        | tr        |      |      |      |      |
|              | 下降 Fall Time                                        | tf        |      |      |      |      |

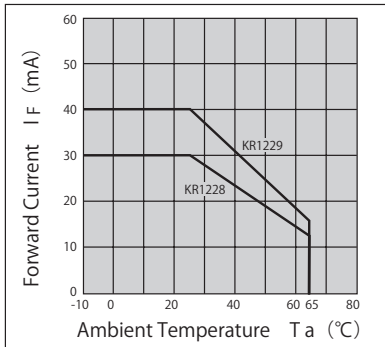
\*\* : Ta=25°C unless otherwise noted

# KR1228/1229

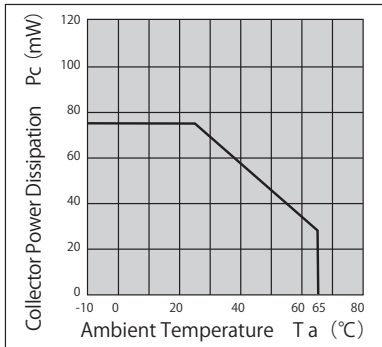
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

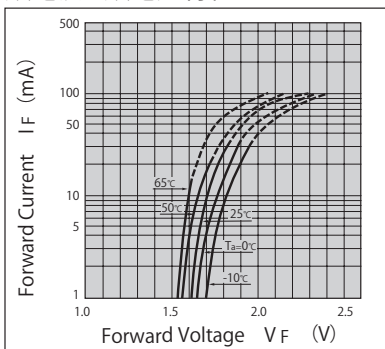
順電流低減曲線



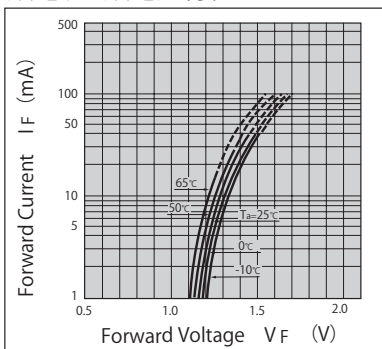
コレクタ損失低減曲線



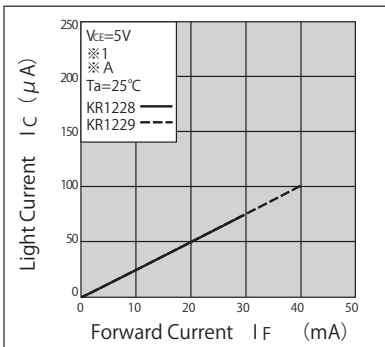
順電流-順電圧特性 (代表例) KR1228



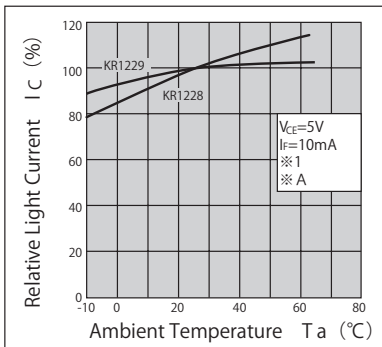
順電流-順電圧特性 (代表例) KR1229



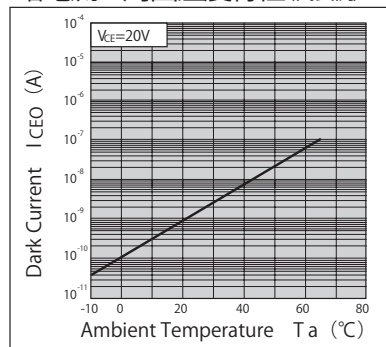
光電流-順電流特性 (代表例)



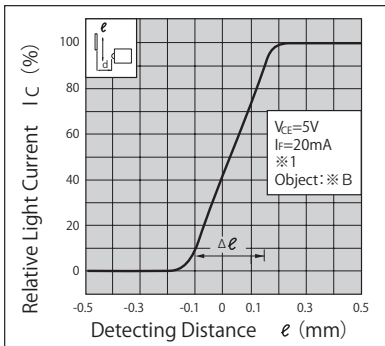
光電流-周囲温度特性 (代表例)



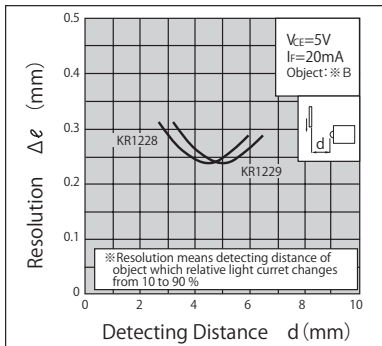
暗電流-周囲温度特性 (代表例)



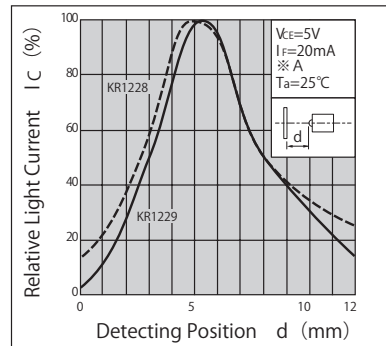
エッジ応答特性 (代表例)



分解能-反射板とセンサとの距離特性 (代表例)



検出距離特性 (代表例)



※1-KR1228 : d = 4.9mm  
KR1229 : d = 5.1mm

※A 90% Reflective Paper  
※B Al Evaporation Mirror

- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KR1570/1571



反射型フォトセンサ -UV LED タイプ Photo Reflector - UV LED type



## 概要 Description

KR1570/1571 は、紫外発光ダイオードとシリコンフォトダイオードを組み合わせた反射型フォトセンサです。

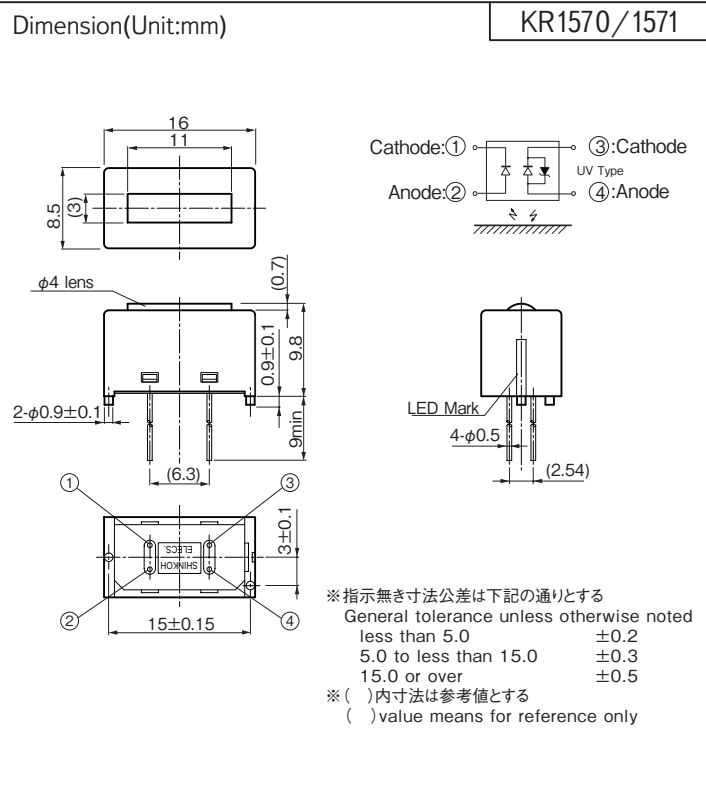
Model KR1570/1571 consist of an ultraviolet LED and a silicon photodiode.

## 特長 Feature

- ・発光素子に UV( 紫外線 )LED を使用 - 365nm
- ・受光側に紫外線カットフィルター付
- ・プリント基板取付タイプ
- ・ UV LED - Peakwavelength: 365nm.
- ・ UV cut filter on detector.
- ・ Installed on PC board.

## 用途 Application

- ・蛍光インキ等を使用した紙幣の鑑別
- ・蛍光発光を利用したカード、有価証券、商品券の識別
- ・その他、紫外線を利用した各種紙検出
- ・ Bill discrimination by fluorescent ink.
- ・ Scanning of Bill for Validator.
- ・ Paper detection by ultraviolet rays .



| 形式<br>Model   | 発光側フィルター<br>Filter on Emitter   | 受光側フィルター<br>Filter on Detector |
|---------------|---------------------------------|--------------------------------|
| KR1570-AA03LF | 無し non                          | 紫外線カット UV cut filter           |
| KR1571-AA03LF | 可視光カット Visible light cut filter | 紫外線カット UV cut filter           |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol                          | Rating    | Unit   |
|------------------------------------|---------------------------------|-----------|--------|
| 発 光 側<br>Emitter                   | 順 電 流 Forward Current           | IF        | 25 mA  |
|                                    | パルス順電流 Pulse Forward Current ※1 | IFP       | 80 mA  |
|                                    | 逆方向許容電流 Reverse Current         | IR        | 85 mA  |
| 受 光 側<br>Detector                  | 許 容 損 失 Power Dissipation       | P         | 100 mW |
|                                    | 逆 電 圧 Reverse Voltage           | VR        | 30 V   |
|                                    | 出力許容損失 Output Power Dissipation | PO        | 100 mW |
| 動 作 温 度 Operating Temperature      | T <sub>opr</sub>                | -10 ~ +65 | °C     |
| 保 存 温 度 Storage Temperature        | T <sub>stg</sub>                | -30 ~ +85 | °C     |
| 半 田 付 温 度 Soldering Temperature ※2 | T <sub>sol</sub>                | 330       | °C     |



- ※1. パルス幅  $t_w \leq 10\text{ms}$  Duty比=0.1以下
- ※2. パッケージ下面より 1.6mm 以上の位置で 2 秒以内 (上図参照)  
手半田付けのみ可 (フロー半田付け不可)
- ※3. 90%反射紙、 $d=2.0\text{mm}$
- ※4. 反射物無し、暗黒中
- ※1. Pulse width  $t_w \leq 10\text{ms}$  Duty ratio=0.1 max.
- ※2. Soldering condition : less than 2s. at 1.6mm over from body.  
Flow Soldering unsupported.
- ※3. 90% Reflective paper,  $d=2.0\text{mm}$
- ※4. No Object, in Dark.

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*] ( )=KR1571

| Item              | Symbol                        | Condition         | min.           | typ. | max.     | Unit  |
|-------------------|-------------------------------|-------------------|----------------|------|----------|-------|
| 発 光 側<br>Emitter  | 順 電 圧 Forward Voltage         | V <sub>F</sub>    | IF=20mA        | —    | 3.4      | 4.0 V |
|                   | ピーク発光波長 Peak Wavelength       | $\lambda_p$       | IF=20mA        | —    | 365      | nm    |
| 受 光 側<br>Detector | 暗 電 流 Dark Current            | ID                | VR=10V, IF=0mA | —    | —        | 10 nA |
| 伝達特性<br>Coupled   | 短絡電流 Short Circuit Current ※3 | ISC               | IF=10mA        | 55   | 400(320) | nA    |
|                   | 漏れ電流 Leak Current ※4          | I <sub>LEAK</sub> | IF=10mA        | —    | —        | 20 nA |

\*\* : Ta=25°C unless otherwise noted

# KR1570/1571

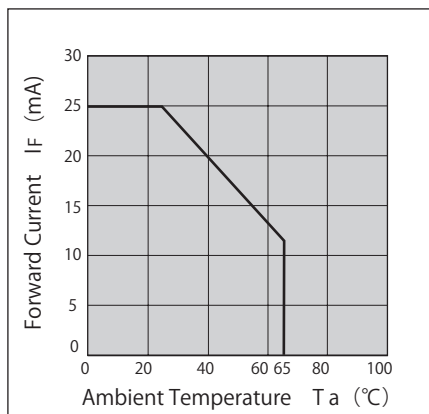
定格・特性曲線

Characteristics

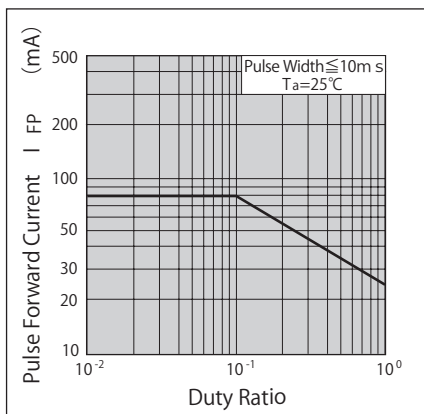
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

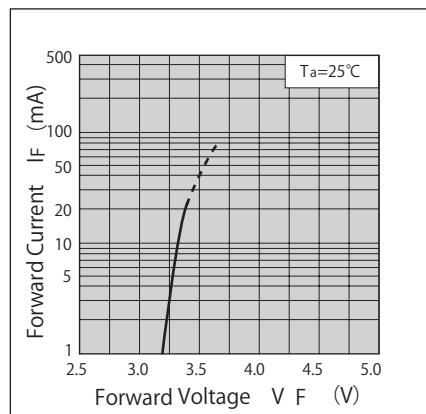
順電流低減曲線



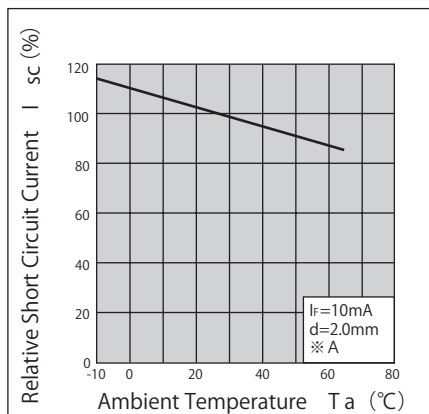
パルス順電流—デューティ比



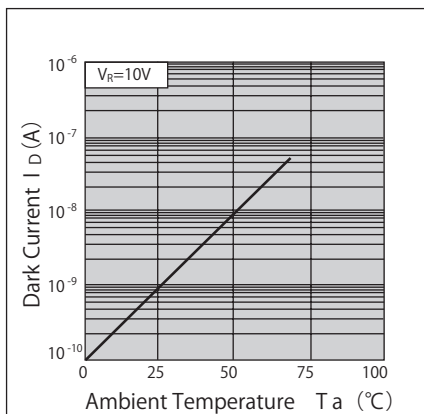
順電流—順電圧特性 (代表例)



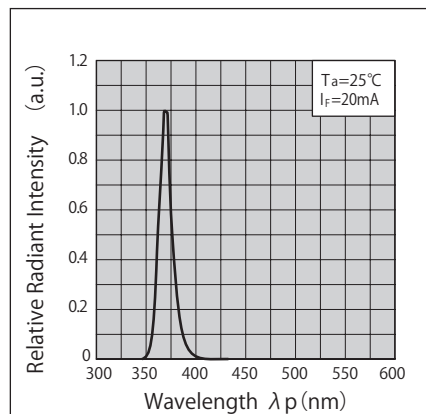
短絡電流—周囲温度特性 (代表例)



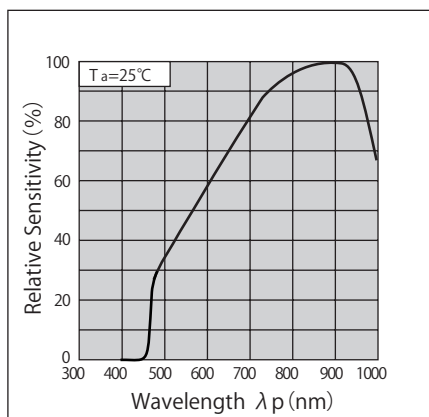
暗電流—周囲温度特性 (代表例)



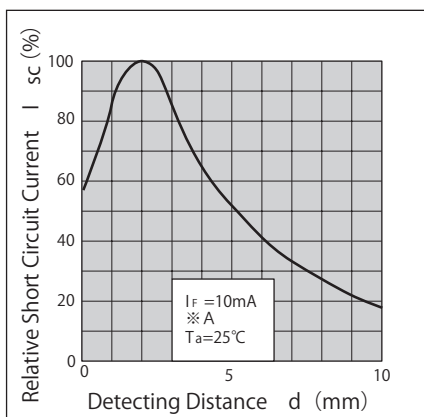
スペクトル分布 (代表例)



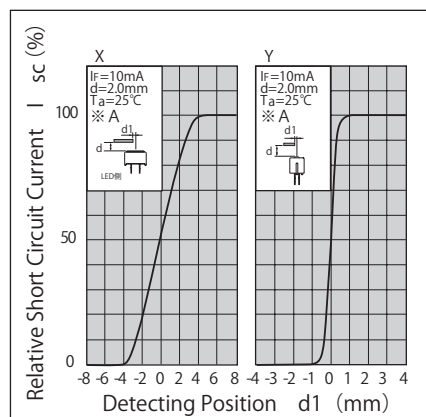
分光感度特性 (代表例)



検出距離特性 (代表例)



検出位置特性 (代表例)



※ A 90% Reflective Paper

- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KR3140



反射型フォトセンサ

Photo Reflector



## 概要 Description

KR3140 は、小型トランジスタ出力の反射型フォトインタラプタです。

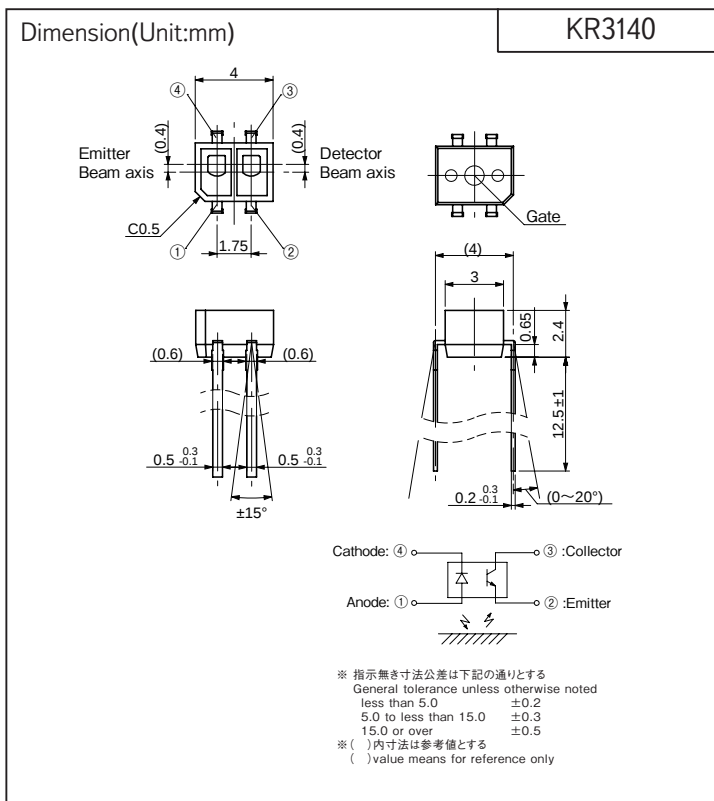
Model KR3140 consist of an Infrared LED and a Photo transistor.

## 特長 Feature

- ・ 小型パッケージ
- ・ 焦点距離：3mm
- ・ フロー半田付け対応
- ・ Ultra compact DIP package
- ・ Focal distance : 3mm
- ・ Suitable for flow soldering.

## 用途 Application

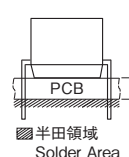
- ・ 媒体のマーク検知
- ・ プリンター、P P C、F A X等の紙の有無検知
- ・ カード機器のカードの有無検知
- ・ ラベル、レシートの有無検知
- ・ Media mark detection.
- ・ Paper detection in Copying machine, Printer, and Facsimile.
- ・ Detection of the presence or absence of a card in card equipment.
- ・ Detect presence / absence of labels and receipts.



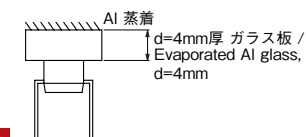
## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               |                                        | Symbol | Rating     | Unit |
|------------------------------------|----------------------------------------|--------|------------|------|
| 発 光 側<br>Emitter                   | 順 電 流 Forward Current                  | IF     | 50         | mA   |
|                                    | 逆 電 圧 Reverse Voltage                  | VR     | 6          | V    |
|                                    | 許 容 損 失 Power Dissipation              | P      | 75         | mW   |
| 受 光 側<br>Detector                  | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO   | 35         | V    |
|                                    | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO   | 6          | V    |
|                                    | コレクタ電流 Collector Current               | IC     | 20         | mA   |
|                                    | コレクタ損失 Collector Power Dissipation     | Pc     | 75         | mW   |
| 全 許 容 損 失 Total power dissipation  |                                        | Ptot   | 100        | mW   |
| 動 作 温 度 Operating Temperature      |                                        | Topr   | -25 ~ +85  | °C   |
| 保 存 温 度 Storage Temperature        |                                        | Tstg   | -40 ~ +100 | °C   |
| 半 田 付 温 度 Soldering Temperature ※1 |                                        | Tsol   | 330        | °C   |

※1. 半田条件



※2. 光電流測定配置図



- ※1. 手半田の場合：パッケージ下面より 1mm 以上の位置で 2 秒以内。  
フロー半田の場合：260°C 以下。  
パッケージ下面より 1mm 以上の位置で 5 秒以内（上図参照）
- ※2. 反射物の条件及び配置は上図による
- ※3. 反射物無し、暗黒中
- ※1. Soldering condition less than 2s. at 1mm over from body.  
Flow Soldering should be less than 5s.  
at 1mm over from body at 260 degree C or less.
- ※2. Refer to the above test arrangement
- ※3. No object, in dark

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item               |                                                     | Symbol          | Condition                         | min. | typ. | max. | Unit |
|--------------------|-----------------------------------------------------|-----------------|-----------------------------------|------|------|------|------|
| 発 光 側<br>Emitter   | 順 電 圧 Forward Voltage                               | VF              | IF=20mA                           | —    | 1.2  | 1.4  | V    |
|                    | 逆 電 流 Reverse Current                               | IR              | VR=3V                             | —    | —    | 10   | μA   |
| 受 光 側<br>Detector  | 暗 電 流 Dark Current                                  | ICEO            | VCE=20V                           | —    | 1    | 100  | nA   |
| 伝 達 特 性<br>Coupled | 光 電 流 Light Current ※2                              | IC              | VCE=5V, IF=20mA                   | 0.4  | —    | —    | mA   |
|                    | 漏 れ 電 流 Leak Current ※3                             | ILEAK           | VCE=5V, IF=20mA                   | —    | —    | 500  | nA   |
|                    | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | VCE(sat)        |                                   | —    | —    | 0.4  | V    |
|                    | 応 答 時 間<br>Response Time                            | 上昇<br>Rise Time | VCE=2V, IC=0.1mA<br>RL=1kΩ, d=4mm | —    | 50   | 150  | μs   |
|                    |                                                     | 下降<br>Fall Time |                                   | —    | 50   | 150  |      |

\*\* : Ta=25°C unless otherwise noted

# KR3140

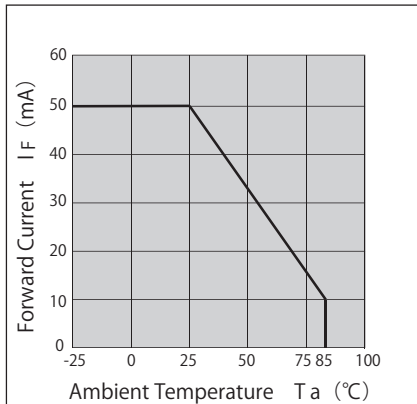
## 定格・特性曲線

Characteristics

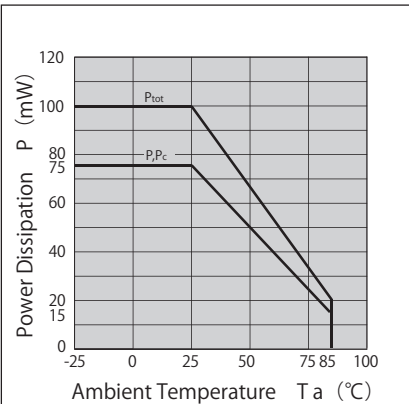
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

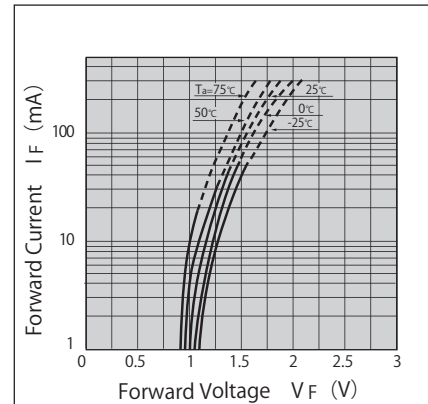
### 順電流低減曲線



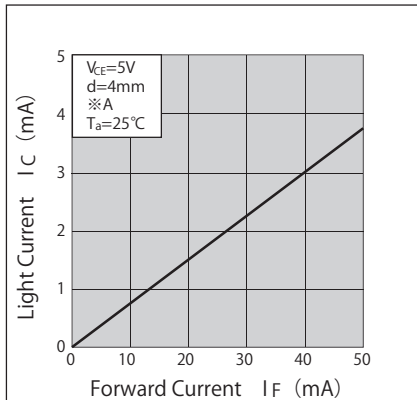
### 許容損失低減曲線



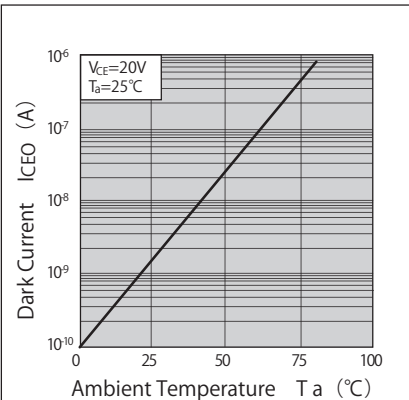
### 順電流－順電圧特性(代表例)



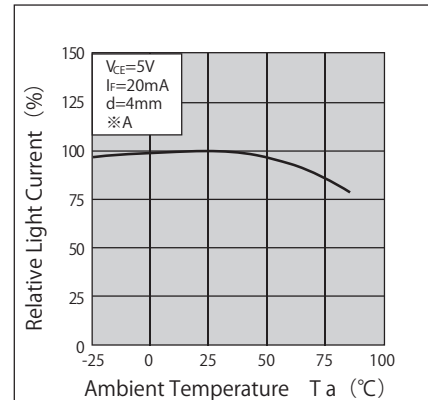
### 光電流－順電流特性(代表例)



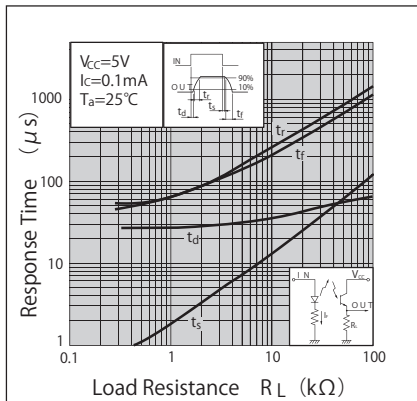
### 暗電流－周囲温度特性(代表例)



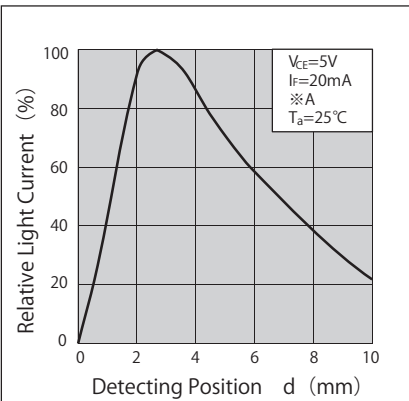
### 光電流－周囲温度特性(代表例)



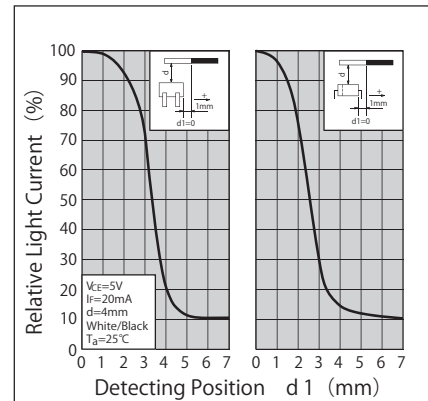
### 応答時間－負荷抵抗特性(代表例)



### 検出距離特性(代表例)



### 検出位置特性(代表例)



※A Evaporated Al glass

- ・ カスタマイズも承ります。お気軽にお問合せください
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- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KR3320



反射型フォトセンサ 光変調タイプ

Photo Reflector - Light modulation type



## 概要 Description

KR3320 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC 受光素子を採用した防塵型の反射型フォトセンサです。

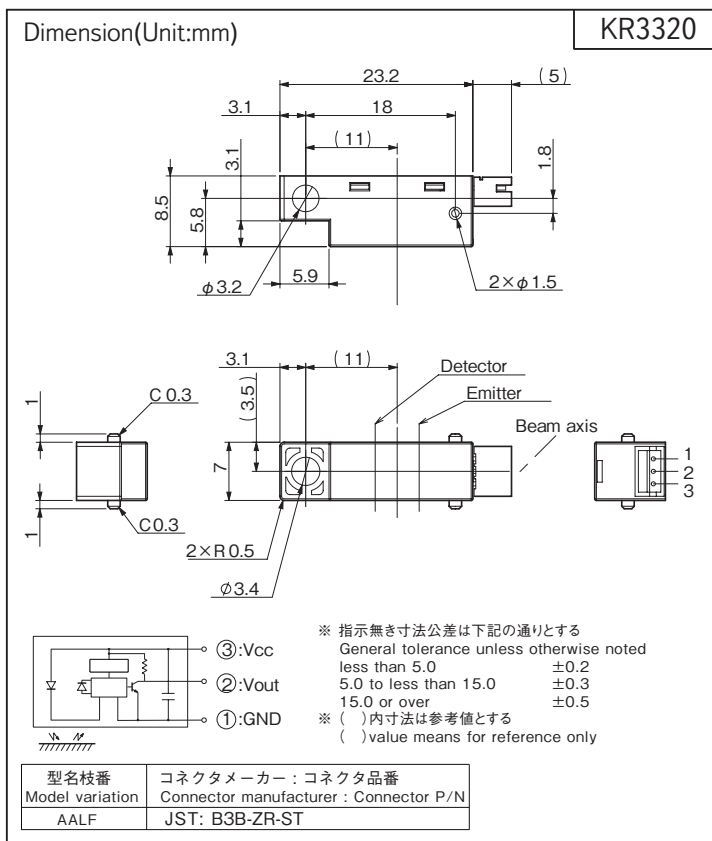
Model KR3320 consists of an Infrared LED and a Light modulation type of Photo IC, and has plastic housing.

## 特長 Feature

- ・検出範囲が広い
- ・ローコストタイプ
- ・防塵構造なので紙粉等の除去が容易
- ・光変調方式の為、外乱光等のノイズに強い
- ・反射の少ない黒紙、OHP フィルム等の検出可能
- ・Wide detecting distance.
- ・Low Cost.
- ・Easy removing in paper-dust.
- ・Resistant to Ambient Illumination noise.
- (Light-modulation type)
- ・Available for detection of dark paper/OHP film.

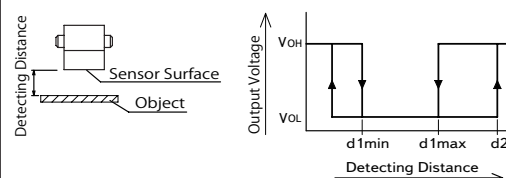
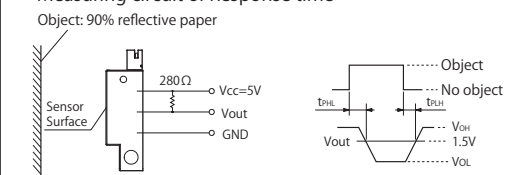
## 用途 Application

- ・複写機・印刷機・プリンタ等の用紙検出
- ・各種自動機の物体通過検出
- ・その他
- ・Paper detection in Copying machine, Printer, and Facsimile.
- ・Object passing for Card reader, Auto vending machine.



## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | Io               | 50        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

※1、※2:検出距離/非検出距離  
Detecting /Non-detecting distance※3:応答時間の測定回路  
Measuring circuit of Response time

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                           | min.    | typ. | max. | Unit |
|-------------------------------------|--------|-------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC    | —                                   | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption            | ICCP   | パルスせん頭値、RL=∞ Pulse Serge            | —       | —    | 150  | mA   |
|                                     | ICC    | 平滑値、RL=∞ Average                    | —       | —    | 20   | mA   |
| ローレベル出力電圧 Low Level Output Voltage  | VOL    | 検出時、IoL=16mA Object existing        | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage | VOH    | 非検出時 No object                      | VCCx0.9 | —    | —    | V    |
| 検出距離 Detecting Distance ※1          | d1     | 検出物 90% 反射紙                         | 4       | —    | 32   | mm   |
| 非検出距離 Non-Detecting Distance ※2     | d2     | Object 90% Reflective paper         | —       | —    | 90   |      |
| 外乱光許容照度 Ambient Illumination        | —      | CIE 標準 A 光源 CIE STD. A light source | 2000    | —    | —    | lx   |
| 応答時間 Response Time                  | tPHL   | "High" → "Low" 伝搬時間                 | —       | —    | 1    | ms   |
|                                     | tPLH   | "Low" → "High" 伝搬時間                 | —       | —    | 1    |      |

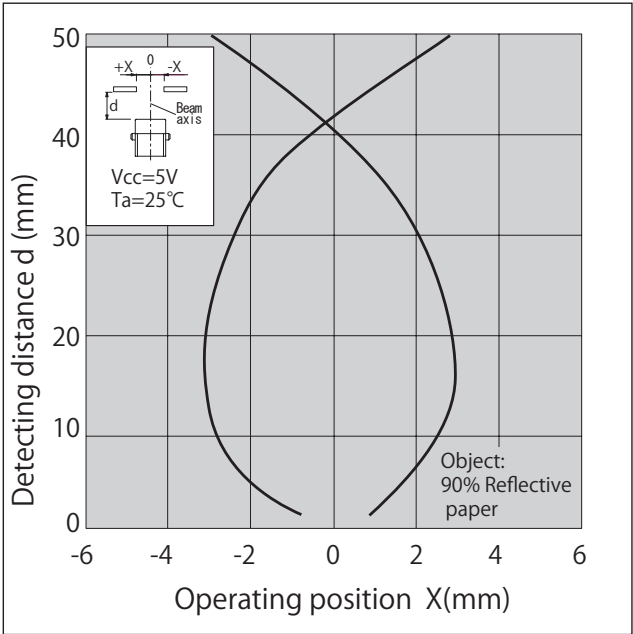
\*\* : Ta=25°C unless otherwise noted

# KR3320

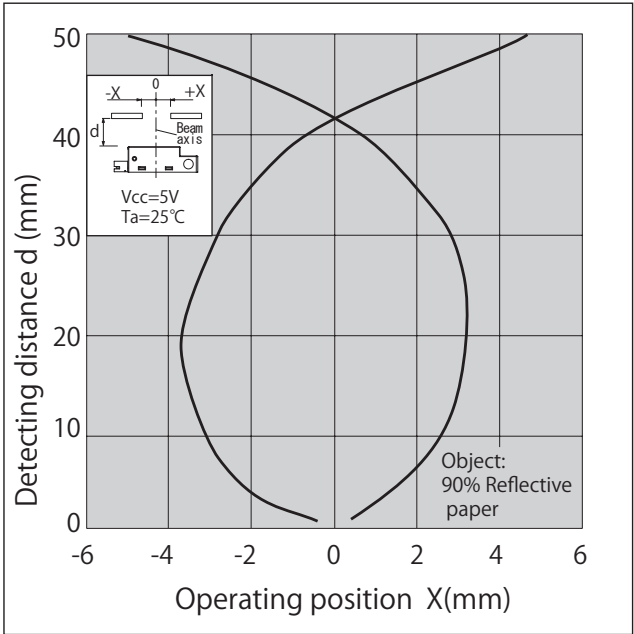
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

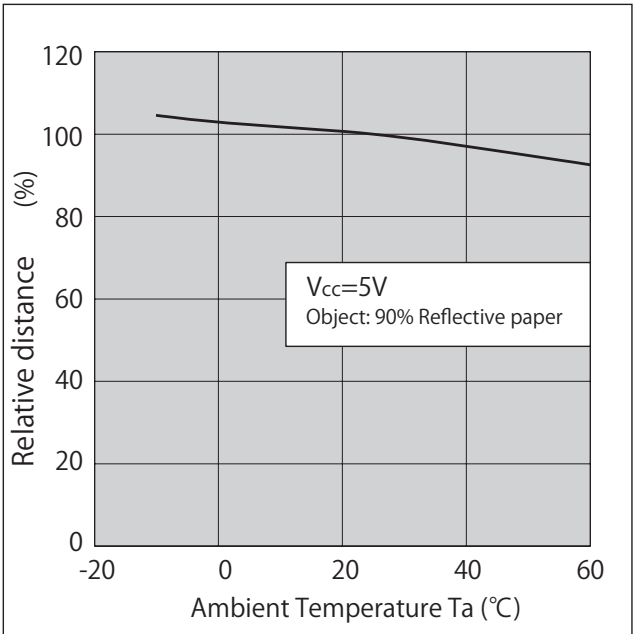
検出距離特性－動作位置1 (代表例)



検出距離特性－動作位置2 (代表例)



検出距離－周囲温度特性 (代表例)



機種ラインアップ / Series Line-Up (Unit:mm)

| Model No. | Method           | Detecting Distance   |                      |       | Non-Detecting Distance |
|-----------|------------------|----------------------|----------------------|-------|------------------------|
|           |                  | 90% Reflective paper | Black Paper OD=1.2 ※ | OHP ※ | 90% Reflective paper   |
| KR3320    | Light-Modulation | 4～32                 | 5～25                 | 4～30  | 90                     |
| KR866     |                  | 4～32                 | 10～20                | 8～25  | 75                     |
| KR3630    |                  | 9～25                 | 5～25                 | 4～30  | 90                     |
| KR865     |                  | 7～25                 | 13～17                | 10～20 | 60                     |
| KR3620    |                  | 4～18                 | 2.5～10               | 2～12  | 45                     |
| KR3331    |                  | 4～17                 | 2.5～10               | 2～12  | 45                     |
| KR1207    |                  | 1～15                 | 2.5～4.5              | 2～7   | 55                     |
| KR895     |                  | 1.5～7                | 2.5～5.5              | 2～6   | 30                     |
| KR3380    |                  | 2～7                  | 2.5～4                | 2～5   | 25                     |
| KR3610    |                  | 1～9                  | 2～4                  | 1.5～6 | 35                     |
| KR3330    |                  | 1～7                  | 2～4                  | 1.5～6 | 35                     |
| KR864     | Direct Current   | 7～11                 | 8～9                  | 7～10  | 30                     |
| KR894     |                  | 2～5.5                | 3.5～4.5              | 2～5.5 | 15                     |

※ 黒紙・OHPフィルムの検出距離規格は参考値です。  
Detecting Distance by Black paper and OHP film are reference only.

非検出距離についてご要望がある場合はお問い合わせください。  
Please contact us for non-detection distance requests.

- ・ カスタマイズも承ります。お気軽にお問合せください  
・ A Customized design available on request.
- ・ この仕様は改良のため予告なく変更する場合があります  
・ Specifications are subject to change without notice.

## KR3330



反射型フォトセンサ 光変調タイプ

Photo Reflector - Light modulation type



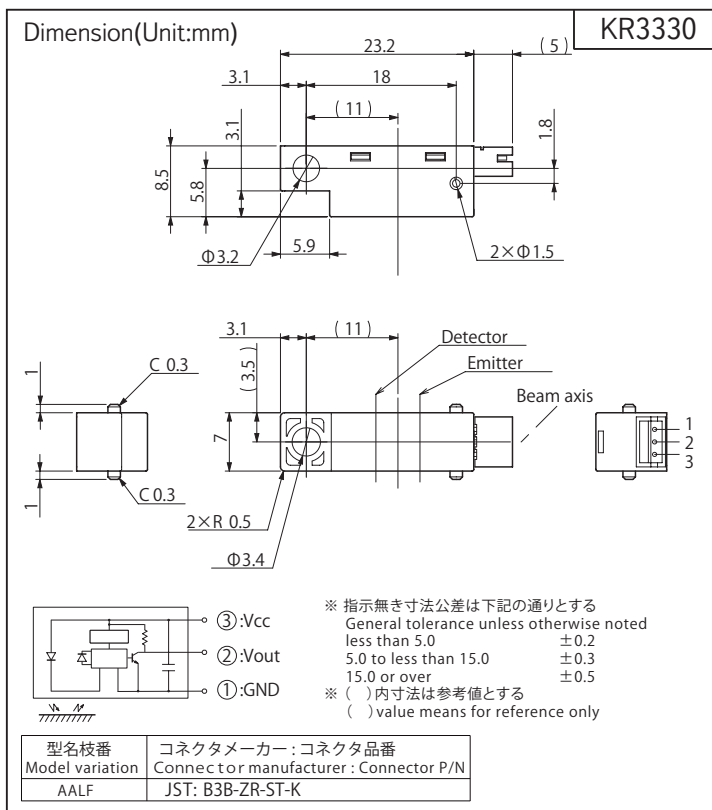
## 概要 Description

KR3330 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC 受光素子を採用した防塵型の反射型フォトセンサです。

Model KR3330 consists of an Infrared LED and a Light modulation type of Photo IC, and has plastic housing.

## 特長 Feature

- 検出範囲が広い
- ローコストタイプ
- 防塵構造なので紙粉等の除去が容易
- 光変調方式の為、外乱光等のノイズに強い
- 反射の少ない黒紙、OHP フィルム等の検出可能
- Wide detecting distance.
- Low Cost.
- Easy removing in paper-dust.
- Resistant to Ambient Illumination noise.
- (Light-modulation type)
- Available for detection of dark paper/OHP film.

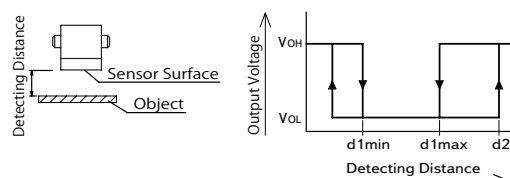
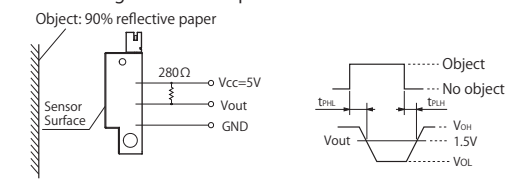


## 用途 Application

- 複写機・印刷機・プリンタ等の用紙検出
- 各種自動機の物体通過検出
- その他
- Paper detection in Copying machine, Printer, and Facsimile.
- Object passing for Card reader, Auto vending machine.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | Io               | 50        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

※1、※2:検出距離/非検出距離  
Detecting /Non-detecting distance※3:応答時間の測定回路  
Measuring circuit of Response time

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                           | min.    | typ. | max. | Unit |
|-------------------------------------|--------|-------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC    | —                                   | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption            | ICCP   | パルスせん頭値、RL=∞ Pulse Surge            | —       | —    | 150  | mA   |
|                                     | ICC    | 平滑値、RL=∞ Average                    | —       | —    | 20   | mA   |
| ローレベル出力電圧 Low Level Output Voltage  | VOL    | 検出時、IoL=16mA Object existing        | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage | VOH    | 非検出時 No object                      | VCCx0.9 | —    | —    | V    |
| 検出距離 Detecting Distance ※1          | d1     | 検出物 90% 反射紙                         | 1       | —    | 7    | mm   |
| 非検出距離 Non-Detecting Distance ※2     | d2     | Object 90% Reflective paper         | —       | —    | 35   | mm   |
| 外乱光許容照度 Ambient Illumination        | —      | CIE 標準 A 光源 CIE STD. A light source | 2000    | —    | —    | lx   |
| 応答時間 Response Time                  | tPHL   | "High" → "Low" 伝搬時間                 | —       | —    | 1    | ms   |
|                                     | tPLH   | "Low" → "High" 伝搬時間                 | —       | —    | 1    | ms   |

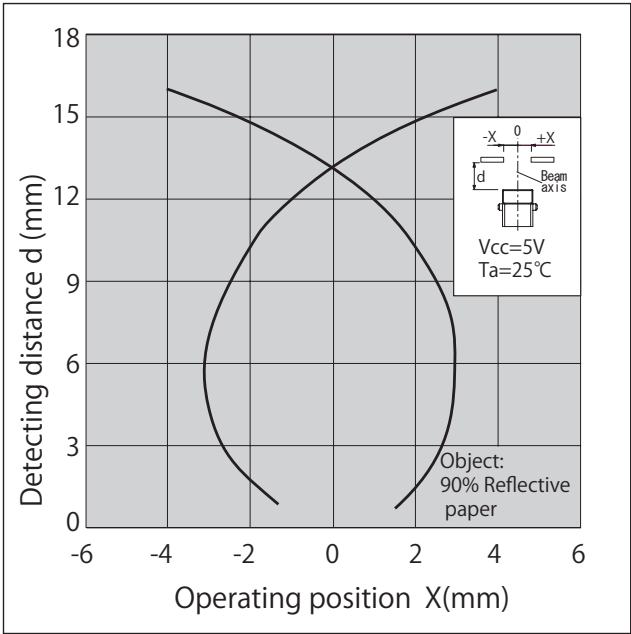
\*\* : Ta=25°C unless otherwise noted

# KR3330

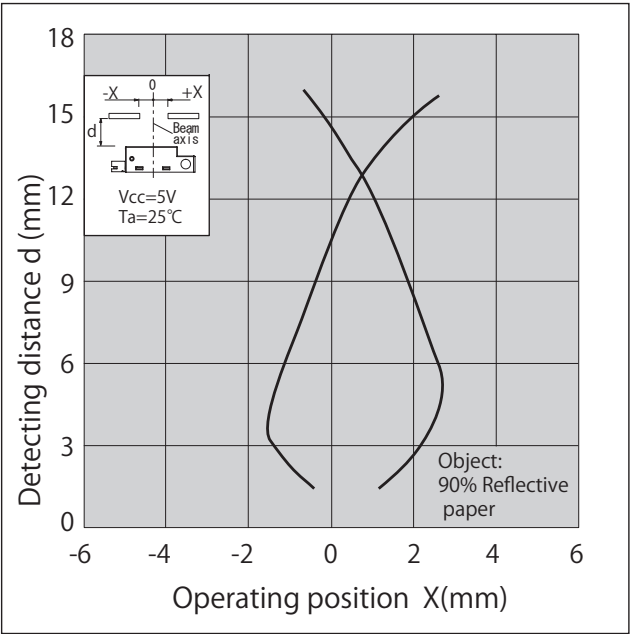
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

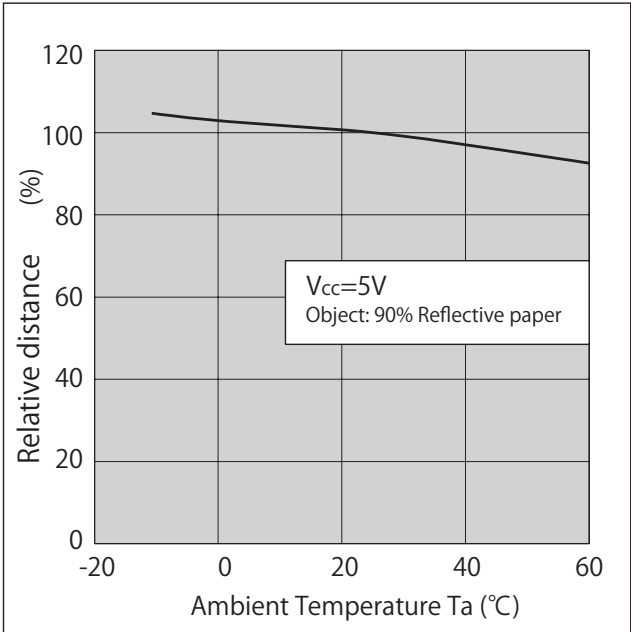
検出距離特性－動作位置1 (代表例)



検出距離特性－動作位置2 (代表例)



検出距離－周囲温度特性 (代表例)



機種ラインアップ / Series Line-Up (Unit:mm)

| Model No. | Method           | Detecting Distance   |                      |       | Non-Detecting Distance |
|-----------|------------------|----------------------|----------------------|-------|------------------------|
|           |                  | 90% Reflective paper | Black Paper OD=1.2 ※ | OHP ※ | 90% Reflective paper   |
| KR3320    | Light-Modulation | 4～32                 | 5～25                 | 4～30  | 90                     |
| KR866     |                  | 4～32                 | 10～20                | 8～25  | 75                     |
| KR3630    |                  | 9～25                 | 5～25                 | 4～30  | 90                     |
| KR865     |                  | 7～25                 | 13～17                | 10～20 | 60                     |
| KR3620    |                  | 4～18                 | 2.5～10               | 2～12  | 45                     |
| KR3331    |                  | 4～17                 | 2.5～10               | 2～12  | 45                     |
| KR1207    |                  | 1～15                 | 2.5～4.5              | 2～7   | 55                     |
| KR895     |                  | 1.5～7                | 2.5～5.5              | 2～6   | 30                     |
| KR3380    |                  | 2～7                  | 2.5～4                | 2～5   | 25                     |
| KR3610    |                  | 1～9                  | 2～4                  | 1.5～6 | 35                     |
| KR3330    |                  | 1～7                  | 2～4                  | 1.5～6 | 35                     |
| KR864     | Direct Current   | 7～11                 | 8～9                  | 7～10  | 30                     |
| KR894     |                  | 2～5.5                | 3.5～4.5              | 2～5.5 | 15                     |

※ 黒紙・OHPフィルムの検出距離規格は参考値です。  
Detecting Distance by Black paper and OHP film are reference only.

非検出距離についてご要望がある場合はお問い合わせください。  
Please contact us for non-detection distance requests.

- ・ カスタマイズも承ります。お気軽にお問合せください  
・ A Customized design available on request.
- ・ この仕様は改良のため予告なく変更する場合があります  
・ Specifications are subject to change without notice.

## KR3331



反射型フォトセンサ 光変調タイプ Photo Reflector - Light modulation type



## 概要 Description

KR3331 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC 受光素子を採用した防塵型の反射型フォトセンサです。

Model KR3331 consists of an Infrared LED and a Light modulation type of Photo IC, and has plastic housing.

## 特長 Feature

- 検出範囲が広い
- ローコストタイプ
- 防塵構造なので紙粉等の除去が容易
- 光変調方式の為、外乱光等のノイズに強い
- 反射の少ない黒紙、OHP フィルム等の検出可能
- Wide detecting distance.
- Low Cost.
- Easy removing in paper-dust.
- Resistant to Ambient Illumination noise.
- (Light-modulation type)
- Available for detection of dark paper/OHP film.

## 用途 Application

- 複写機・印刷機・プリンタ等の用紙検出
- 各種自動機の物体通過検出
- その他
- Paper detection in Copying machine, Printer, and Facsimile.
- Object passing for Card reader, Auto vending machine.

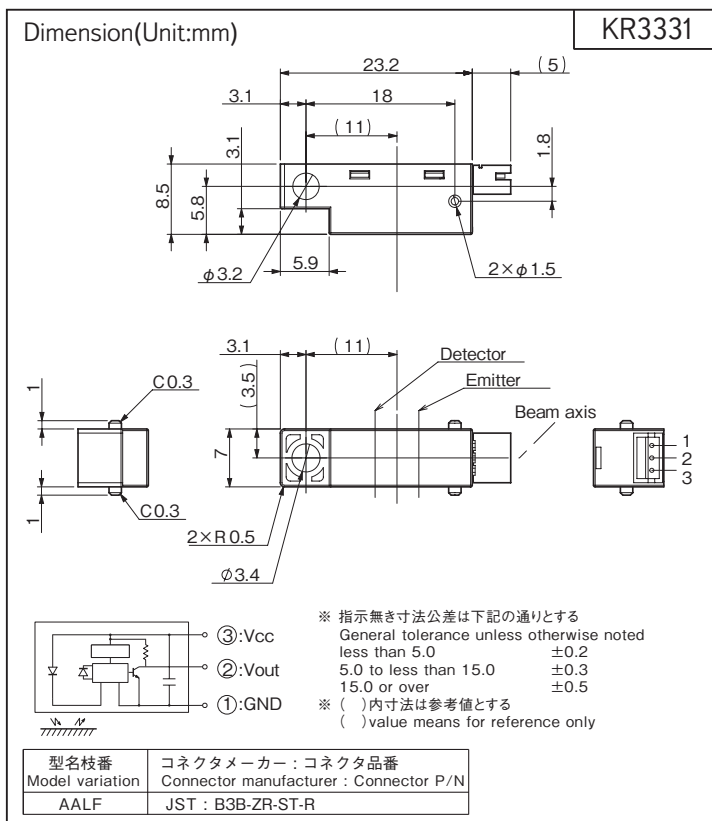
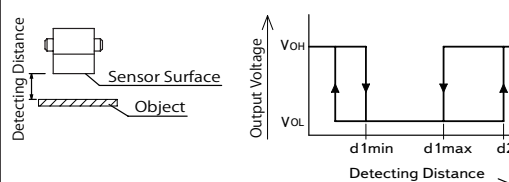
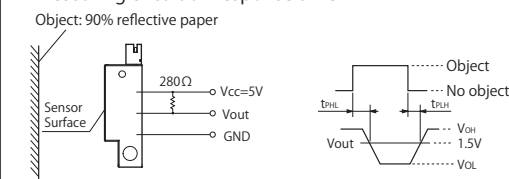
## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | Io               | 50        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                                  | min.    | typ. | max. | Unit |
|-------------------------------------|--------|--------------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC    | —                                          | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption            | ICCP   | パルスせん頭値、RL=∞ Pulse Surge                   | —       | —    | 150  | mA   |
|                                     | ICC    | 平滑値、RL=∞ Average                           | —       | —    | 20   | mA   |
| ローレベル出力電圧 Low Level Output Voltage  | VOL    | 検出時、IoL=16mA Object existing               | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage | VOH    | 非検出時 No object                             | VCCx0.9 | —    | —    | V    |
| 検出距離 Detecting Distance ※1          | d1     | 検出物 90% 反射紙<br>Object 90% Reflective paper | 4       | —    | 17   | mm   |
| 非検出距離 Non-Detecting Distance ※2     | d2     |                                            | —       | —    | 45   |      |
| 外乱光許容照度 Ambient Illumination        | —      | CIE 標準 A 光源 CIE STD. A light source        | 2000    | —    | —    | lx   |
| 応答時間 Response Time                  | tPHL   | "High" → "Low" 伝搬時間                        | —       | —    | 1    | ms   |
|                                     | tPLH   | "Low" → "High" 伝搬時間                        | —       | —    | 1    |      |

\*\* : Ta=25°C unless otherwise noted

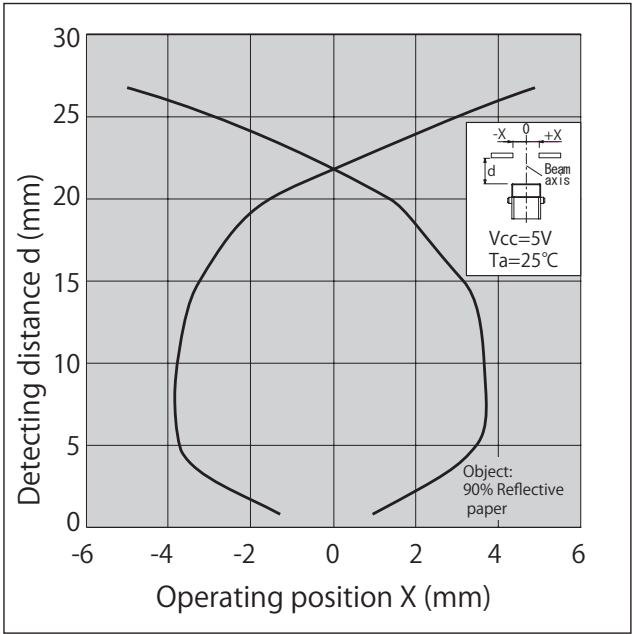
※1、※2:検出距離/非検出距離  
Detecting / Non-detecting distance※3:応答時間の測定回路  
Measuring circuit of Response time

# KR3331

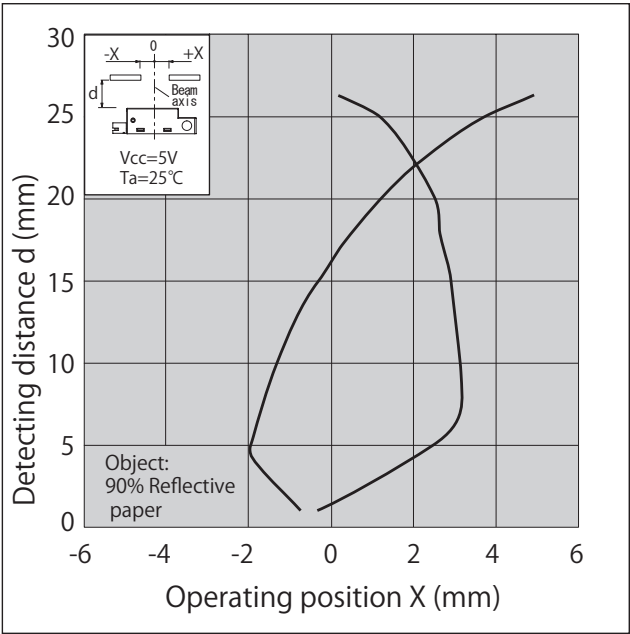
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

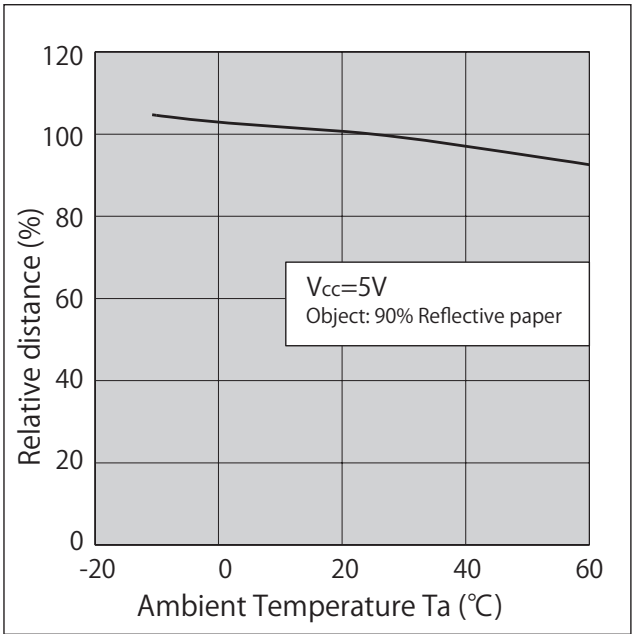
検出距離特性－動作位置1 (代表例)



検出距離特性－動作位置2 (代表例)



検出距離－周囲温度特性 (代表例)



機種ラインアップ / Series Line-Up (Unit:mm)

| Model No. | Method           | Detecting Distance   |                      |       | Non-Detecting Distance |
|-----------|------------------|----------------------|----------------------|-------|------------------------|
|           |                  | 90% Reflective paper | Black Paper OD=1.2 ※ | OHP ※ | 90% Reflective paper   |
| KR3320    | Light-Modulation | 4~32                 | 5~25                 | 4~30  | 90                     |
| KR866     |                  | 4~32                 | 10~20                | 8~25  | 75                     |
| KR3630    |                  | 9~25                 | 5~25                 | 4~30  | 90                     |
| KR865     |                  | 7~25                 | 13~17                | 10~20 | 60                     |
| KR3620    |                  | 4~18                 | 2.5~10               | 2~12  | 45                     |
| KR3331    |                  | 4~17                 | 2.5~10               | 2~12  | 45                     |
| KR1207    |                  | 1~15                 | 2.5~4.5              | 2~7   | 55                     |
| KR895     |                  | 1.5~7                | 2.5~5.5              | 2~6   | 30                     |
| KR3380    |                  | 2~7                  | 2.5~4                | 2~5   | 25                     |
| KR3610    |                  | 1~9                  | 2~4                  | 1.5~6 | 35                     |
| KR3330    |                  | 1~7                  | 2~4                  | 1.5~6 | 35                     |
| KR864     | Direct Current   | 7~11                 | 8~9                  | 7~10  | 30                     |
| KR894     |                  | 2~5.5                | 3.5~4.5              | 2~5.5 | 15                     |

※ 黒紙・OHPフィルムの検出距離規格は参考値です。  
Detecting Distance by Black paper and OHP film are reference only.

非検出距離についてご要望がある場合はお問い合わせください。  
Please contact us for non-detection distance requests.

- ・ カスタマイズも承ります。お気軽にお問合せください  
・ A Customized design available on request.
- ・ この仕様は改良のため予告なく変更する場合があります  
・ Specifications are subject to change without notice.

# KR3380



反射型フォトセンサ 光変調タイプ Photo Reflector - Light modulation type



## 概要 Description

KR3380 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC 受光素子を採用した防塵型の反射型フォトセンサです。

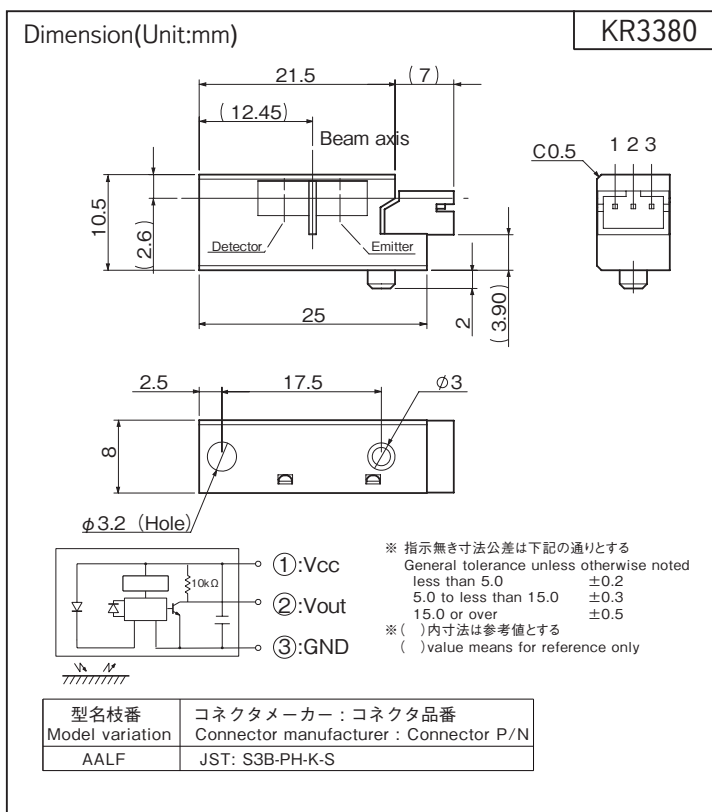
Model KR3380 consists of an Infrared LED and a Light modulation type of Photo IC, and has plastic housing.

## 特長 Feature

- ・ローコストタイプ
- ・防塵構造なので紙粉等の除去が容易
- ・光変調方式の為、外乱光等のノイズに強い
- ・反射の少ない黒紙、OHP フィルム等の検出可能
- ・ Low Cost.
- ・ Easy removing in paper-dust.
- ・ Resistant to Ambient Illumination noise.  
(Light-modulation type)
- ・ Available for detection of dark paper/OHP film.

## 用途 Application

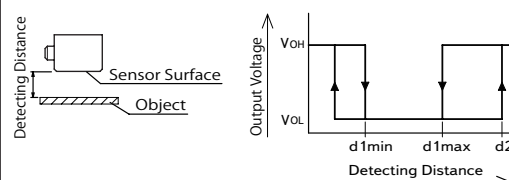
- ・ 複写機・印刷機・プリンタ等の用紙検出
- ・ 各種自動機の物体通過検出
- ・ その他
- ・ Paper detection in Copying machine, Printer, and Facsimile.
- ・ Object passing for Card reader, Auto vending machine.



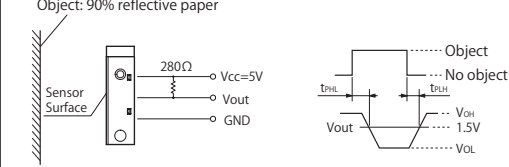
## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | Io               | 50        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

## ※1、※2:検出距離/非検出距離 Detecting /Non-detecting distance



## ※3:応答時間の測定回路 Measuring circuit of Response time



## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V,Ta=25°C \*\*]

| Item                                | Symbol | Condition                           | min.    | typ. | max. | Unit |
|-------------------------------------|--------|-------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC    | —                                   | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption            | ICCP   | パルスせん頭値、RL=∞ Pulse Surge            | —       | —    | 150  | mA   |
|                                     | ICC    | 平滑値、RL=∞ Average                    | —       | —    | 20   | mA   |
| ローレベル出力電圧 Low Level Output Voltage  | VOL    | 検出時、IOL=16mA Object existing        | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage | VOH    | 非検出時 No object                      | VCCx0.9 | —    | —    | V    |
| 検出距離 Detecting Distance ※1          | d1     | 検出物 90% 反射紙                         | 2       | —    | 7    | mm   |
| 非検出距離 Non-Detecting Distance ※2     | d2     | Object 90% Reflective paper         | —       | —    | 25   | mm   |
| 外乱光許容照度 Ambient Illumination        | —      | CIE 標準 A 光源 CIE STD. A light source | 2000    | —    | —    | lx   |
| 応答時間 Response Time                  | tPHL   | "High" → "Low" 伝搬時間                 | —       | —    | 1    | ms   |
|                                     | tPLH   | "Low" → "High" 伝搬時間                 | —       | —    | 1    | ms   |

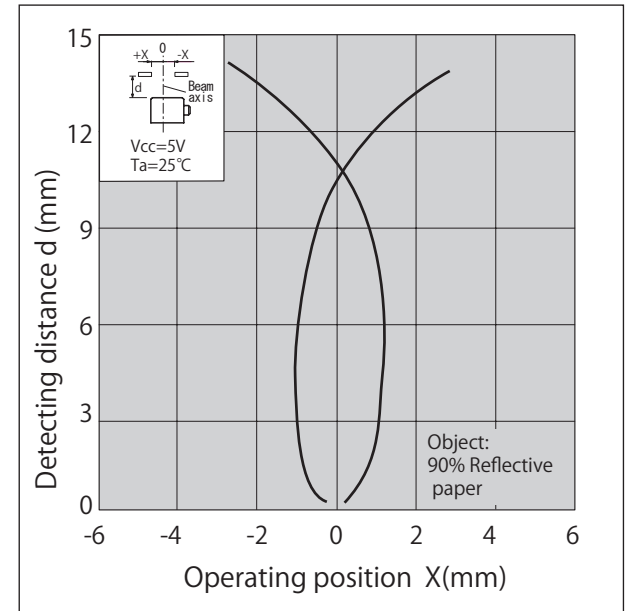
\*\* : Ta=25°C unless otherwise noted

# KR3380

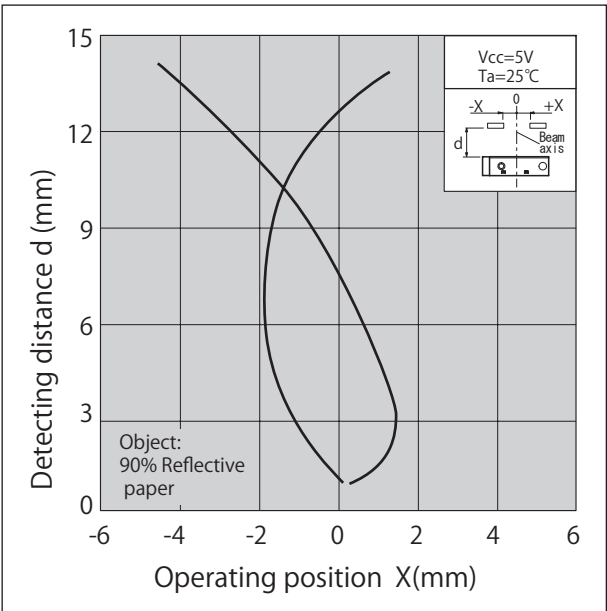
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

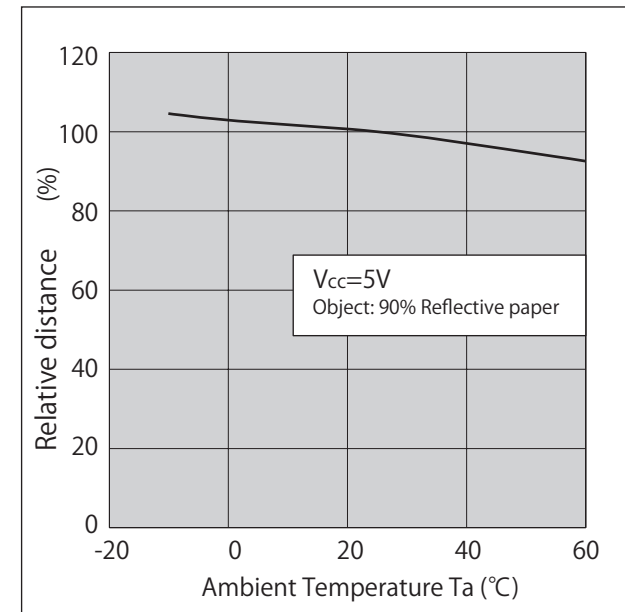
検出距離特性－動作位置1 (代表例)



検出距離特性－動作位置2 (代表例)



検出距離－周囲温度特性 (代表例)



機種ラインアップ / Series Line-Up

(Unit:mm)

| Model No. | Method           | Detecting Distance   |                         |       | Non-Detecting Distance<br>90% Reflective paper |
|-----------|------------------|----------------------|-------------------------|-------|------------------------------------------------|
|           |                  | 90% Reflective paper | Black Paper<br>OD=1.2 ※ | OHP ※ |                                                |
| KR3320    | Light-Modulation | 4~32                 | 5~25                    | 4~30  | 90                                             |
| KR866     |                  | 4~32                 | 10~20                   | 8~25  | 75                                             |
| KR3630    |                  | 9~25                 | 5~25                    | 4~30  | 90                                             |
| KR865     |                  | 7~25                 | 13~17                   | 10~20 | 60                                             |
| KR3620    |                  | 4~18                 | 2.5~10                  | 2~12  | 45                                             |
| KR3331    |                  | 4~17                 | 2.5~10                  | 2~12  | 45                                             |
| KR1207    |                  | 1~15                 | 2.5~4.5                 | 2~7   | 55                                             |
| KR895     |                  | 1.5~7                | 2.5~5.5                 | 2~6   | 30                                             |
| KR3380    |                  | 2~7                  | 2.5~4                   | 2~5   | 25                                             |
| KR3610    |                  | 1~9                  | 2~4                     | 1.5~6 | 35                                             |
| KR3330    |                  | 1~7                  | 2~4                     | 1.5~6 | 35                                             |
| KR864     | Direct Current   | 7~11                 | 8~9                     | 7~10  | 30                                             |
| KR894     |                  | 2~5.5                | 3.5~4.5                 | 2~5.5 | 15                                             |

※ 黒紙・OHPフィルムの検出距離規格は参考値です。  
Detecting Distance by Black paper and OHP film are reference only.

非検出距離についてご要望がある場合はお問い合わせください。  
Please contact us for non-detection distance requests.

- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KR3610



反射型フォトセンサ 光変調タイプ

Photo Reflector - Light modulation type



## 概要 Description

KR3610 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC 受光素子を採用した防塵型の反射型フォトセンサです。

Model KR3610 consists of an Infrared LED and a Light modulation type of Photo IC, and has plastic housing.

## 特長 Feature

- ・検出範囲が広い
- ・ローコストタイプ
- ・防塵構造なので紙粉等の除去が容易
- ・光変調方式の為、外乱光等のノイズに強い
- ・反射の少ない黒紙、OHP フィルム等の検出可能
- ・Wide detecting distance.
- ・Low Cost.
- ・Easy removing in paper-dust.
- ・Resistant to Ambient Illumination noise.
- (Light-modulation type)
- ・ Available for detection of dark paper/OHP film.

## 用途 Application

- ・複写機・印刷機・プリンタ等の用紙検出
- ・各種自動機の物体通過検出
- ・その他
- ・Paper detection in Copying machine, Printer, and Facsimile.
- ・Object passing for Card reader, Auto vending machine.

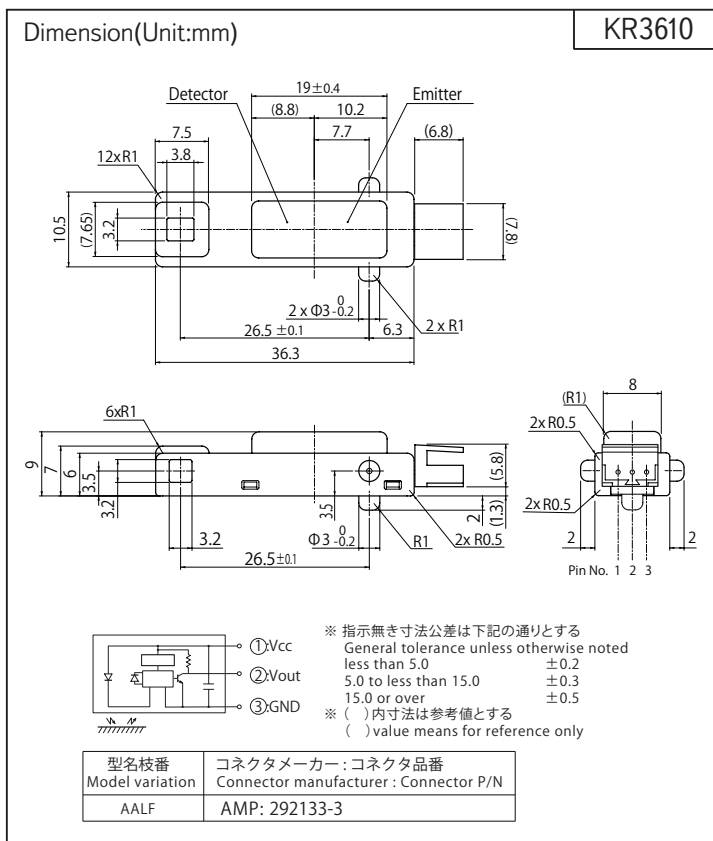
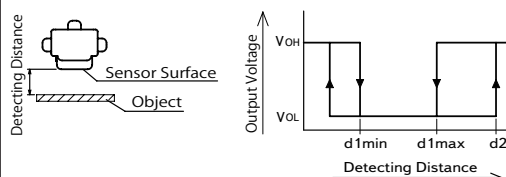
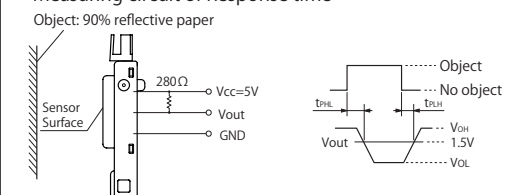
## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | Io               | 50        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                               | min.    | typ. | max. | Unit |
|-------------------------------------|--------|-----------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC    | —                                       | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption            | ICCP   | パルスせん頭値、RL=∞ Pulse Surge                | —       | —    | 150  | mA   |
|                                     | ICC    | 平滑値、RL=∞ Average                        | —       | —    | 20   | mA   |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL    | 検出時、IoL=16mA Object existing            | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage | VOH    | 非検出時 No object                          | VCCx0.9 | —    | —    | V    |
| 検出距離 Detecting Distance ※1          | d1     | 検出物 90% 反射紙 Object 90% Reflective paper | 1       | —    | 9    | mm   |
| 非検出距離 Non-Detecting Distance ※2     | d2     | Object 90% Reflective paper             | —       | —    | 35   | mm   |
| 外乱光許容照度 Ambient Illumination        | —      | CIE 標準 A 光源 CIE STD. A light source     | 2000    | —    | —    | lx   |
| 応答時間 Response Time                  | tPHL   | "High" → "Low" 伝搬時間                     | —       | —    | 1    | ms   |
|                                     | tPLH   | "Low" → "High" 伝搬時間                     | —       | —    | 1    | ms   |

\*\* : Ta=25°C unless otherwise noted

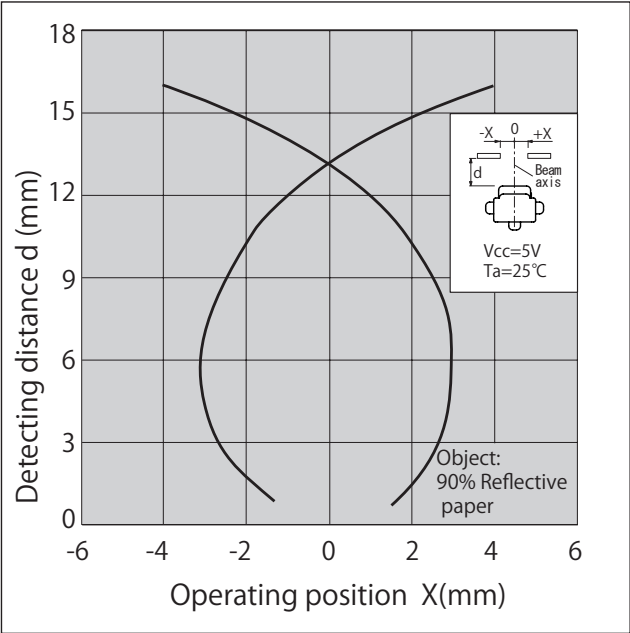
※1、※2:検出距離/非検出距離  
Detecting / Non-detecting distance※3:応答時間の測定回路  
Measuring circuit of Response time

# KR3610

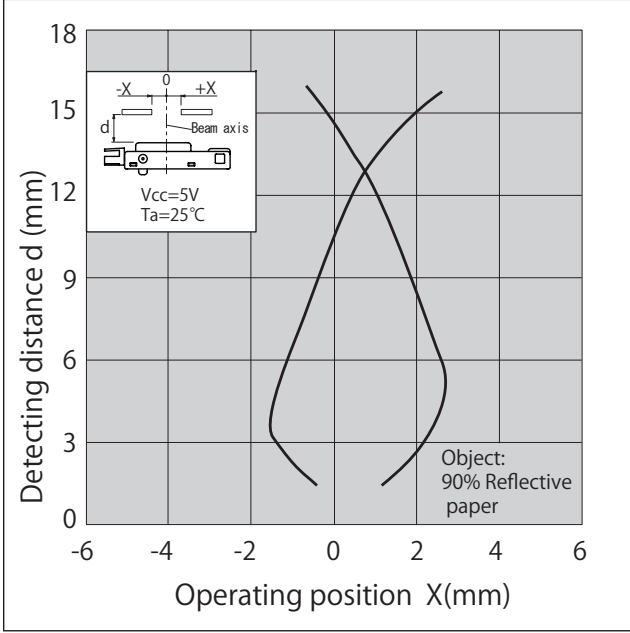
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

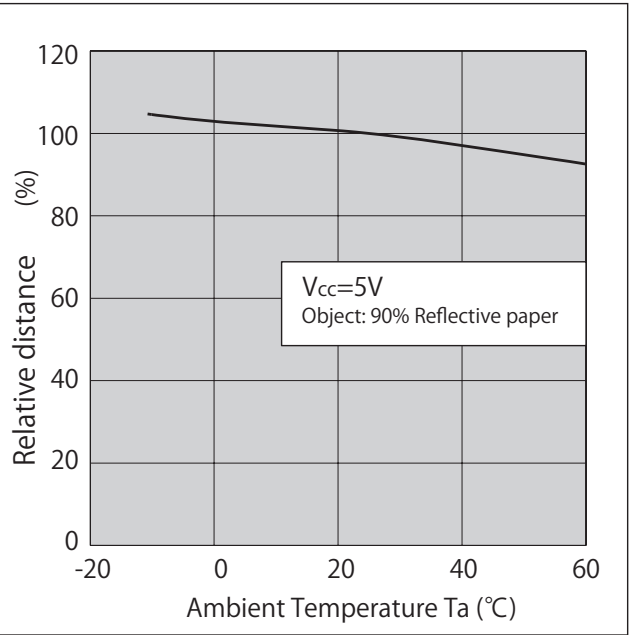
検出距離特性－動作位置1 (代表例)



検出距離特性－動作位置2 (代表例)



検出距離－周囲温度特性 (代表例)



機種ラインアップ / Series Line-Up (Unit:mm)

| Model No. | Method           | Detecting Distance   |                      |       | Non-Detecting Distance |
|-----------|------------------|----------------------|----------------------|-------|------------------------|
|           |                  | 90% Reflective paper | Black Paper OD=1.2 ※ | OHP ※ |                        |
| KR3320    | Light-Modulation | 4～32                 | 5～25                 | 4～30  | 90                     |
| KR866     |                  | 4～32                 | 10～20                | 8～25  | 75                     |
| KR3630    |                  | 9～25                 | 5～25                 | 4～30  | 90                     |
| KR865     |                  | 7～25                 | 13～17                | 10～20 | 60                     |
| KR3620    |                  | 4～18                 | 2.5～10               | 2～12  | 45                     |
| KR3331    |                  | 4～17                 | 2.5～10               | 2～12  | 45                     |
| KR1207    |                  | 1～15                 | 2.5～4.5              | 2～7   | 55                     |
| KR895     |                  | 1.5～7                | 2.5～5.5              | 2～6   | 30                     |
| KR3380    |                  | 2～7                  | 2.5～4                | 2～5   | 25                     |
| KR3610    |                  | 1～9                  | 2～4                  | 1.5～6 | 35                     |
| KR3330    |                  | 1～7                  | 2～4                  | 1.5～6 | 35                     |
| KR864     | Direct Current   | 7～11                 | 8～9                  | 7～10  | 30                     |
| KR894     |                  | 2～5.5                | 3.5～4.5              | 2～5.5 | 15                     |

※ 黒紙・OHPフィルムの検出距離規格は参考値です。  
Detecting Distance by Black paper and OHP film are reference only.

非検出距離についてご要望がある場合はお問い合わせください。  
Please contact us for non-detection distance requests.

- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KR3620



反射型フォトセンサ 光変調タイプ Photo Reflector - Light modulation type



## 概要 Description

KR3620 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC 受光素子を採用した防塵型の反射型フォトセンサです。

Model KR3620 consists of an Infrared LED and a Light modulation type of Photo IC, and has plastic housing.

## 特長 Feature

- ・検出範囲が広い
- ・ローコストタイプ
- ・防塵構造なので紙粉等の除去が容易
- ・光変調方式の為、外乱光等のノイズに強い
- ・反射の少ない黒紙、OHP フィルム等の検出可能
- ・Wide detecting distance.
- ・Low Cost.
- ・Easy removing in paper-dust.
- ・Resistant to Ambient Illumination noise.
- (Light-modulation type)
- ・Available for detection of dark paper/OHP film.

## 用途 Application

- ・複写機・印刷機・プリンタ等の用紙検出
- ・各種自動機の物体通過検出
- ・その他
- ・Paper detection in Copying machine, Printer, and Facsimile.
- ・Object passing for Card reader, Auto vending machine.

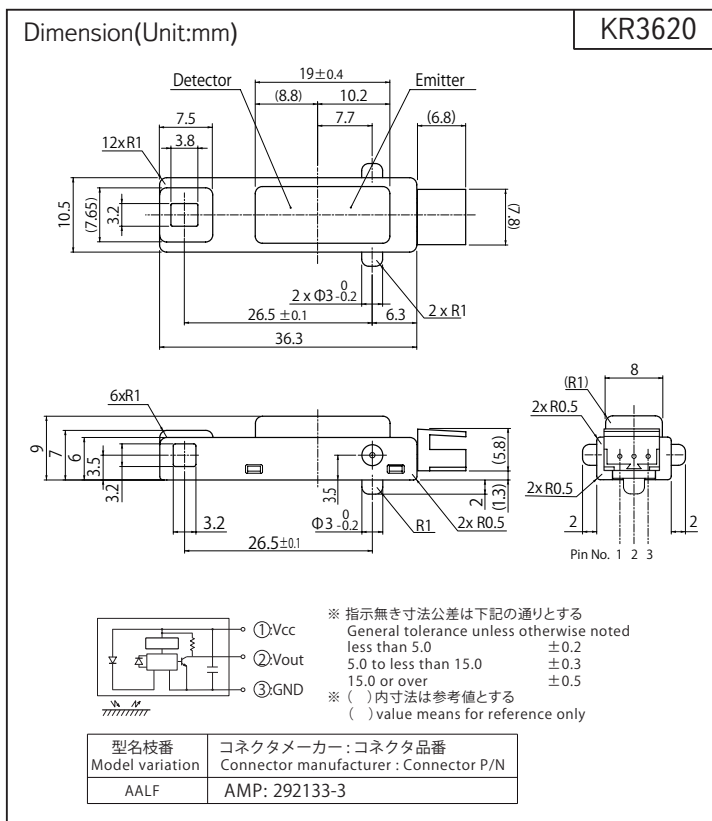
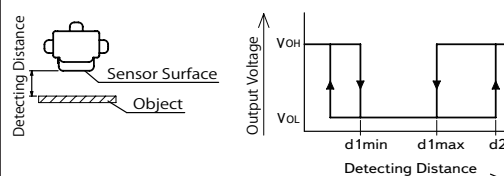
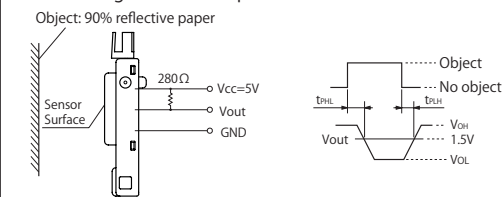
## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | Io               | 50        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                               | min.    | typ. | max. | Unit |
|-------------------------------------|--------|-----------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC    | —                                       | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption            | ICCP   | パルスせん頭値、RL=∞ Pulse Surge                | —       | —    | 150  | mA   |
|                                     | ICC    | 平滑値、RL=∞ Average                        | —       | —    | 20   | mA   |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL    | 検出時、IoL=16mA Object existing            | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage | VOH    | 非検出時 No object                          | VCCx0.9 | —    | —    | V    |
| 検出距離 Detecting Distance ※1          | d1     | 検出物 90% 反射紙 Object 90% Reflective paper | 4       | —    | 18   | mm   |
| 非検出距離 Non-Detecting Distance ※2     | d2     | Object 90% Reflective paper             | —       | —    | 45   | mm   |
| 外乱光許容照度 Ambient Illumination        | —      | CIE 標準 A 光源 CIE STD. A light source     | 2000    | —    | —    | lx   |
| 応答時間 Response Time                  | tPHL   | "High" → "Low" 伝搬時間                     | —       | —    | 1    | ms   |
|                                     | tPLH   | "Low" → "High" 伝搬時間                     | —       | —    | 1    | ms   |

\*\* : Ta=25°C unless otherwise noted

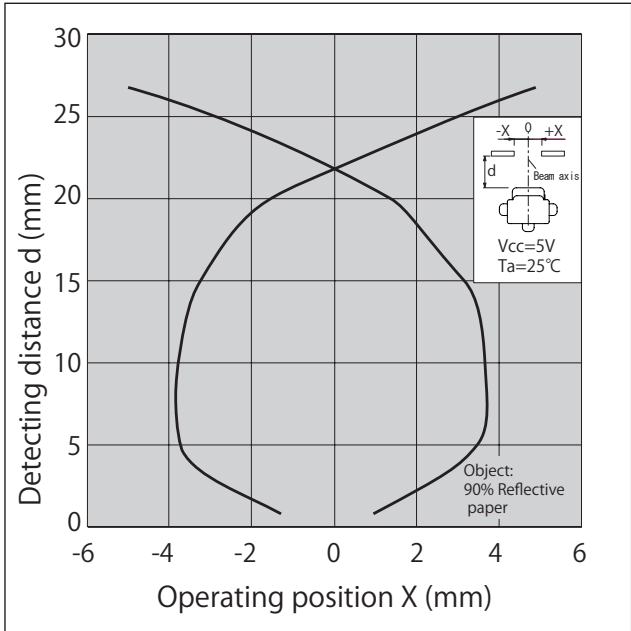
※1、※2:検出距離/非検出距離  
Detecting / Non-detecting distance※3:応答時間の測定回路  
Measuring circuit of Response time

# KR3620

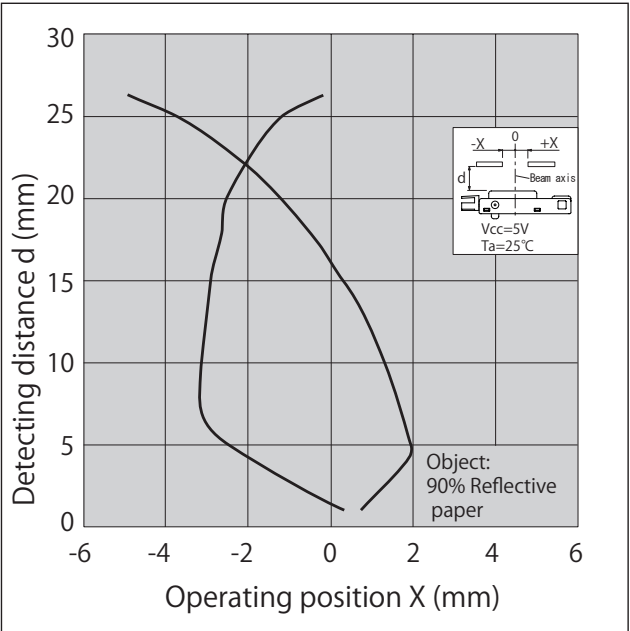
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

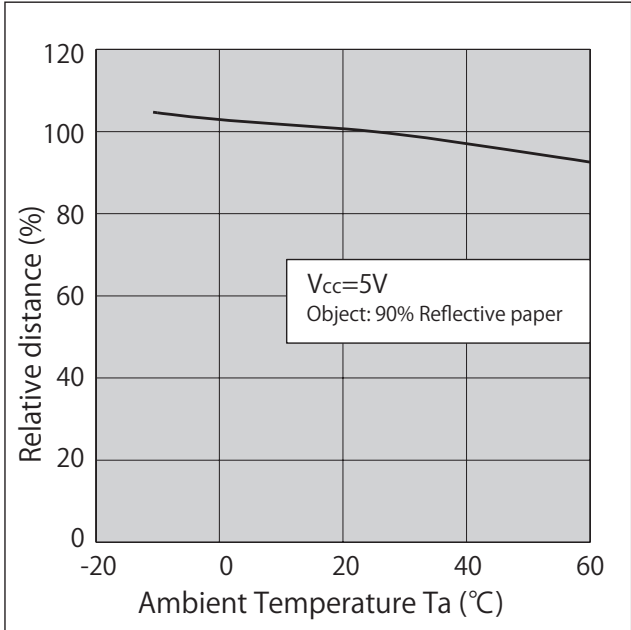
検出距離特性—動作位置1 (代表例)



検出距離特性—動作位置2 (代表例)



検出距離—周囲温度特性 (代表例)



機種ラインアップ / Series Line-Up (Unit:mm)

| Model No. | Method           | Detecting Distance   |                      |       | Non-Detecting Distance |
|-----------|------------------|----------------------|----------------------|-------|------------------------|
|           |                  | 90% Reflective paper | Black Paper OD=1.2 ※ | OHP ※ | 90% Reflective paper   |
| KR3320    | Light-Modulation | 4～32                 | 5～25                 | 4～30  | 90                     |
| KR866     |                  | 4～32                 | 10～20                | 8～25  | 75                     |
| KR3630    |                  | 9～25                 | 5～25                 | 4～30  | 90                     |
| KR865     |                  | 7～25                 | 13～17                | 10～20 | 60                     |
| KR3620    |                  | 4～18                 | 2.5～10               | 2～12  | 45                     |
| KR3331    |                  | 4～17                 | 2.5～10               | 2～12  | 45                     |
| KR1207    |                  | 1～15                 | 2.5～4.5              | 2～7   | 55                     |
| KR895     |                  | 1.5～7                | 2.5～5.5              | 2～6   | 30                     |
| KR3380    |                  | 2～7                  | 2.5～4                | 2～5   | 25                     |
| KR3610    |                  | 1～9                  | 2～4                  | 1.5～6 | 35                     |
| KR3330    | Direct Current   | 1～7                  | 2～4                  | 1.5～6 | 35                     |
| KR864     |                  | 7～11                 | 8～9                  | 7～10  | 30                     |
| KR894     |                  | 2～5.5                | 3.5～4.5              | 2～5.5 | 15                     |

※ 黒紙・OHPフィルムの検出距離規格は参考値です。  
Detecting Distance by Black paper and OHP film are reference only.

非検出距離についてご要望がある場合はお問い合わせください。  
Please contact us for non-detection distance requests.

- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KR3630



反射型フォトセンサ 光変調タイプ

Photo Reflector - Light modulation type



## 概要 Description

KR3630 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC 受光素子を採用した防塵型の反射型フォトセンサです。

Model KR3630 consists of an Infrared LED and a Light modulation type of Photo IC, and has plastic housing.

## 特長 Feature

- ・検出範囲が広い
- ・ローコストタイプ
- ・防塵構造なので紙粉等の除去が容易
- ・光変調方式の為、外乱光等のノイズに強い
- ・反射の少ない黒紙、OHP フィルム等の検出可能
- ・Wide detecting distance.
- ・Low Cost.
- ・Easy removing in paper-dust.
- ・Resistant to Ambient Illumination noise.
- (Light-modulation type)
- ・Available for detection of dark paper/OHP film.

## 用途 Application

- ・複写機・印刷機・プリンタ等の用紙検出
- ・各種自動機の物体通過検出
- ・その他
- ・Paper detection in Copying machine, Printer, and Facsimile.
- ・Object passing for Card reader, Auto vending machine.

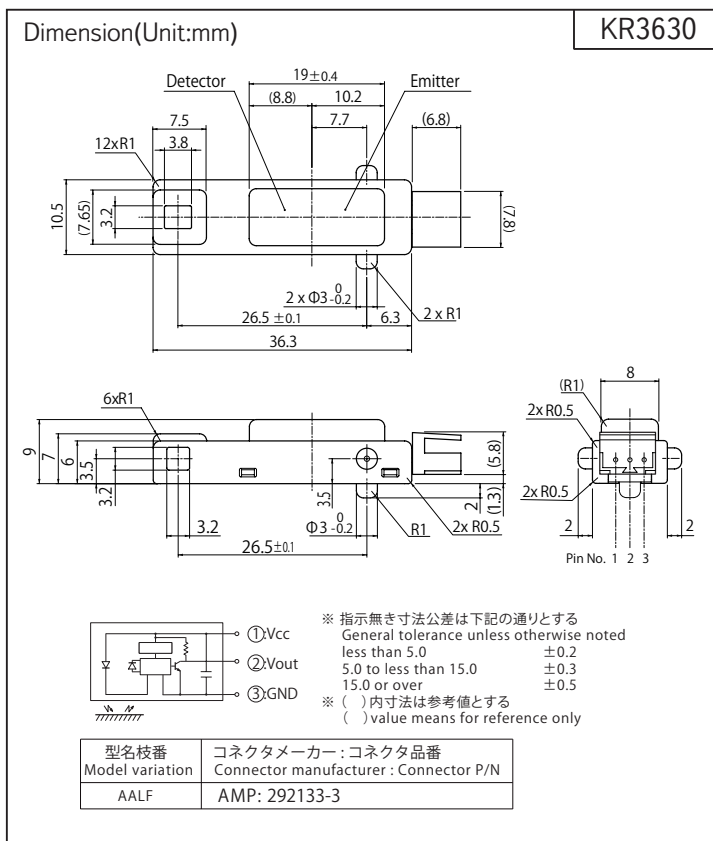
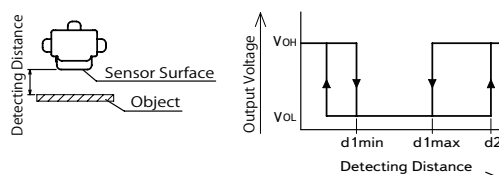
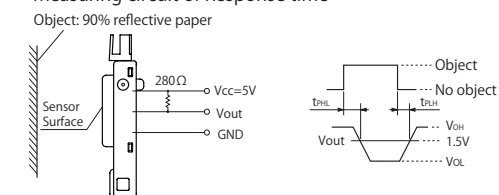
## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | Io               | 50        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | °C   |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | °C   |

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                               | min.    | typ. | max. | Unit |
|-------------------------------------|--------|-----------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC    | —                                       | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption            | ICCP   | パルスせん頭値、RL=∞ Pulse Surge                | —       | —    | 150  | mA   |
|                                     | ICC    | 平滑値、RL=∞ Average                        | —       | —    | 20   | mA   |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL    | 検出時、IoL=16mA Object existing            | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage | VOH    | 非検出時 No object                          | VCCx0.9 | —    | —    | V    |
| 検出距離 Detecting Distance ※1          | d1     | 検出物 90% 反射紙 Object 90% Reflective paper | 9       | —    | 25   | mm   |
| 非検出距離 Non-Detecting Distance ※2     | d2     | Object 90% Reflective paper             | —       | —    | 90   | mm   |
| 外乱光許容照度 Ambient Illumination        | —      | CIE 標準 A 光源 CIE STD. A light source     | 2000    | —    | —    | lx   |
| 応答時間 Response Time                  | tPHL   | "High" → "Low" 伝搬時間                     | —       | —    | 1    | ms   |
|                                     | tPLH   | "Low" → "High" 伝搬時間                     | —       | —    | 1    | ms   |

\*\* : Ta=25°C unless otherwise noted

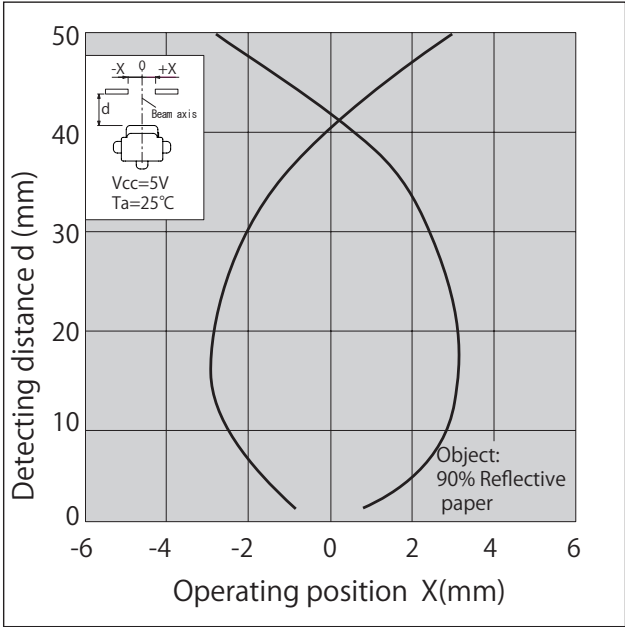
※1、※2:検出距離/非検出距離  
Detecting /Non-detecting distance※3:応答時間の測定回路  
Measuring circuit of Response time

# KR3630

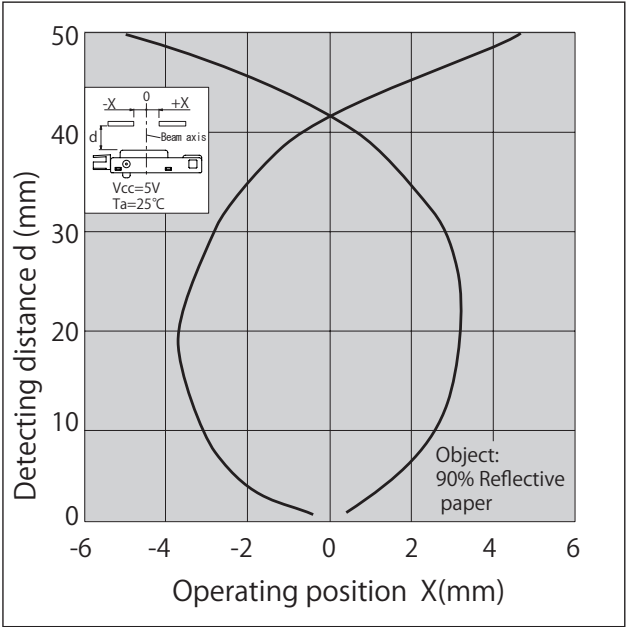
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

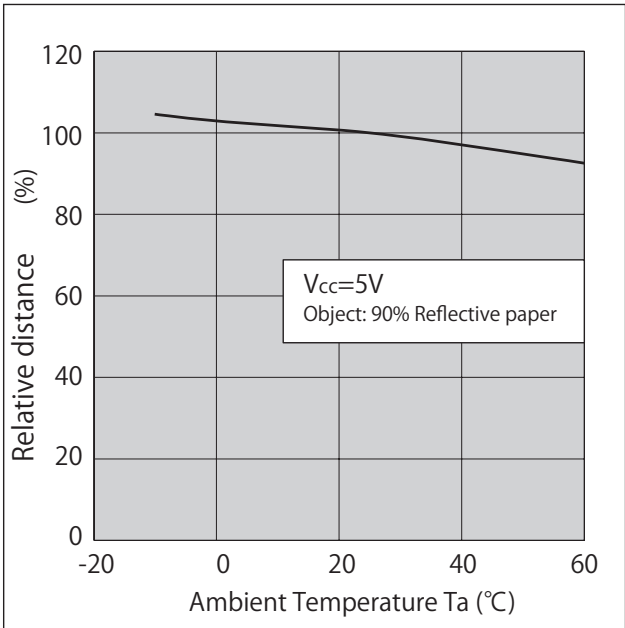
検出距離特性－動作位置1 (代表例)



検出距離特性－動作位置2 (代表例)



検出距離－周囲温度特性 (代表例)



機種ラインアップ / Series Line-Up (Unit:mm)

| Model No. | Method           | Detecting Distance   |                         |       | Non-Detecting Distance<br>90% Reflective paper |
|-----------|------------------|----------------------|-------------------------|-------|------------------------------------------------|
|           |                  | 90% Reflective paper | Black Paper<br>OD=1.2 ※ | OHP ※ |                                                |
| KR3320    | Light-Modulation | 4～32                 | 5～25                    | 4～30  | 90                                             |
| KR866     |                  | 4～32                 | 10～20                   | 8～25  | 75                                             |
| KR3630    |                  | 9～25                 | 5～25                    | 4～30  | 90                                             |
| KR865     |                  | 7～25                 | 13～17                   | 10～20 | 60                                             |
| KR3620    |                  | 4～18                 | 2.5～10                  | 2～12  | 45                                             |
| KR3331    |                  | 4～17                 | 2.5～10                  | 2～12  | 45                                             |
| KR1207    |                  | 1～15                 | 2.5～4.5                 | 2～7   | 55                                             |
| KR895     |                  | 1.5～7                | 2.5～5.5                 | 2～6   | 30                                             |
| KR3380    |                  | 2～7                  | 2.5～4                   | 2～5   | 25                                             |
| KR3610    |                  | 1～9                  | 2～4                     | 1.5～6 | 35                                             |
| KR3330    |                  | 1～7                  | 2～4                     | 1.5～6 | 35                                             |
| KR864     | Direct Current   | 7～11                 | 8～9                     | 7～10  | 30                                             |
| KR894     |                  | 2～5.5                | 3.5～4.5                 | 2～5.5 | 15                                             |

※ 黒紙・OHPフィルムの検出距離規格は参考値です。  
Detecting Distance by Black paper and OHP film are reference only.

非検出距離についてご要望がある場合はお問い合わせください。  
Please contact us for non-detection distance requests.

- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KR5015



反射型フォトセンサ RGB カラーセンサ Photo Reflector - RGB color sensor



## 概要 Description

KR5015は、白色発光ダイオードとRGB カラーセンサを組み合わせた高分解能反射型フォトセンサです。

Model KR5015 is high resolution photo reflector consisted of a white LED and a RGB color sensor.

## 特長 Feature

- ・ RGB 独立アナログ電圧出力
- ・ 小検出スポットライトタイプ (φ2mm @d=6mm、多方向検出可能)
- ・ IRカットフィルタを受光側に搭載
- ・ 抜け防止強ロック機構付きコネクタ採用
- ・ RGB 3ch Analog voltage output.
- ・ Small detecting spot light type.(φ2mm @d=6mm, multi direction detectable)
- ・ IR cut filter on detector.
- ・ with secure locking structure connector.

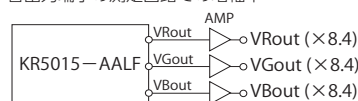
## 用途 Application

- ・ OMR,OCR 等のマーク検出
- ・ Mark sensor of OMR and OCR.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                            | Symbol           | Rating    | Unit |
|---------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage             | VCC              | 6         | V    |
| 順電流 Forward Current             | IF               | 50        | mA   |
| パルス順電流 Pulse Forward Current ※1 | IFP              | 150       | mA   |
| 許容損失 Power Dissipation          | P                | 150       | mW   |
| 逆電圧 Reverse Voltage             | VR               | 5         | V    |
| 出力許容損失 Output Power Dissipation | Po               | 160       | mW   |
| 動作温度 Operating Temperature      | T <sub>opr</sub> | -10 ~ +65 | °C   |
| 保存温度 Storage Temperature        | T <sub>stg</sub> | -20 ~ +75 | °C   |

- ※ 1. パルス幅  $t_w \leq 10\text{ms}$  Duty 比 = 0.1  
 ※ 2. 検出紙は、Kodak Color Control Patches を使用  
 ※ 3. 検出紙は、Kodak Gray Scale 2 を使用  
 ※ 4. 各出力端子の測定回路での増幅率



- ※ 1. Pulse width  $t_w \leq 10\text{ms}$  Duty ratio = 0.1  
 ※ 2. Object : Kodak Color Control Patches  
 ※ 3. Object : Kodak Gray Scale 2  
 ※ 4. Amplification rate at each output terminals in the measurement circuit.

## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25°C \*\*]

| Item                              | Symbol       | Condition                              | min. | typ. | max. | Unit |
|-----------------------------------|--------------|----------------------------------------|------|------|------|------|
| 動作電源電圧 Supply Voltage             | VCC          | —                                      | 4.75 | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption          | ICC          | RL=∞                                   | —    | —    | 2.5  | mA   |
| 順電流 Forward Current               | IF           | —                                      | 6.5  | —    | 50   | mA   |
| 順電圧 Forward Voltage               | VF           | IF=20mA                                | —    | 2.94 | 3.2  | V    |
| 逆電流 Reverse Current               | IR           | VR=5V                                  | —    | —    | 50   | μA   |
| 最大振幅電圧 Maximum Amplitude Voltage  | Vomax        | —                                      | 2.9  | 3.1  | —    | V    |
| 黒色 出力電圧 Black Output Voltage      | VROUT        | 検出紙 黒紙 Object Black paper ※2           | —    | 0.7  | 1.1  | V    |
|                                   | VGOUT        | d=6mm, IF=18mA, IO≤5μA                 | —    | 0.6  | 1.0  |      |
|                                   | VBOUT        | 出力増幅率 8.4 倍 Vout amplifier 8.4times ※4 | —    | 0.6  | 0.9  |      |
| 白色 出力電圧 White Output Voltage      | VROUT        | 検出紙 白紙 Object White paper ※3           | 2.7  | 3.1  | —    | V    |
|                                   | VGOUT        | d=6mm, IF=18mA, IO≤5μA                 | 1.9  | 2.8  | —    |      |
|                                   | VBOUT        | 出力増幅率 8.4 倍 Vout amplifier 8.4times ※4 | 1.3  | 2.7  | —    |      |
| 赤色 出力割合 Red Output Voltage rate   | VROUT        | 検出紙 赤紙 Object Red paper ※2             | —    | —    | 100  | %    |
|                                   | VGOUT        | d=6mm, IF=18mA, IO≤5μA                 | 8    | 17   | 34   |      |
|                                   | VBOUT        |                                        | 7    | 15   | 36   |      |
| 緑色 出力割合 Green Output Voltage rate | VROUT        | 検出紙 緑紙 Object Green paper ※2           | 33   | 47   | 68   | %    |
|                                   | VGOUT        | d=6mm, IF=18mA, IO≤5μA                 | —    | —    | 100  |      |
|                                   | VBOUT        |                                        | 42   | 54   | 75   |      |
| 青色 出力割合 Blue Output Voltage rate  | VROUT        | 検出紙 青紙 Object Blue paper ※2            | 16   | 46   | 92   | %    |
|                                   | VGOUT        | d=6mm, IF=18mA, IO≤5μA                 | 19   | 41   | 81   |      |
|                                   | VBOUT        |                                        | —    | —    | 100  |      |
| 応答時間 Response Time                | 上昇 Rise Time | RL=∞                                   | —    | 10   | —    | μs   |
|                                   | 下降 Fall Time |                                        | —    | 10   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KR5015

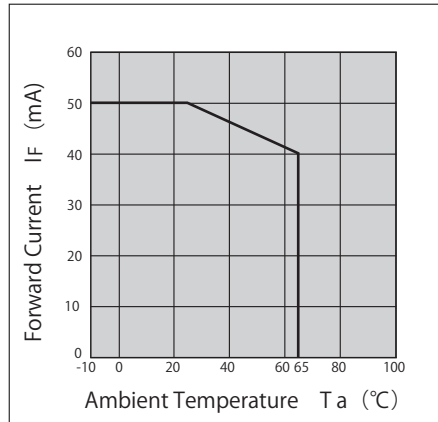
## 定格・特性曲線

Characteristics

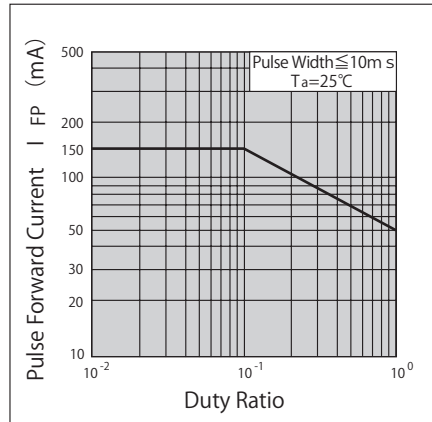
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

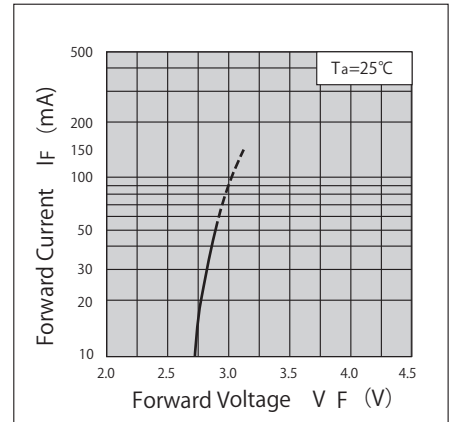
### 順電流低減曲線



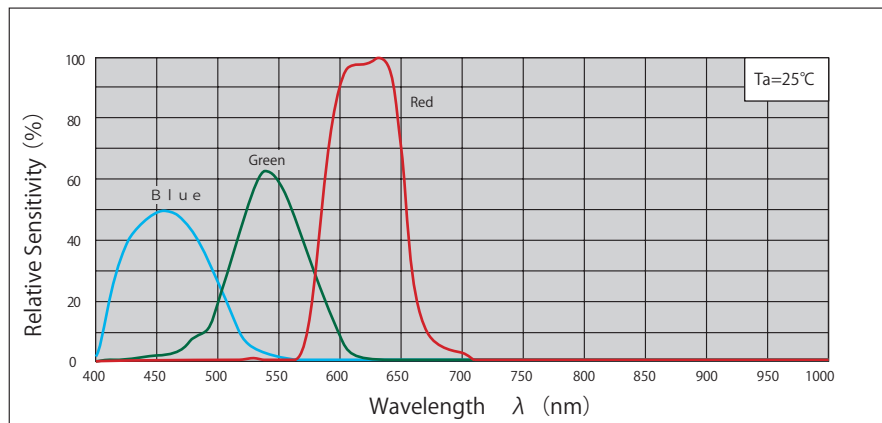
### パルス順電流—デューティ比



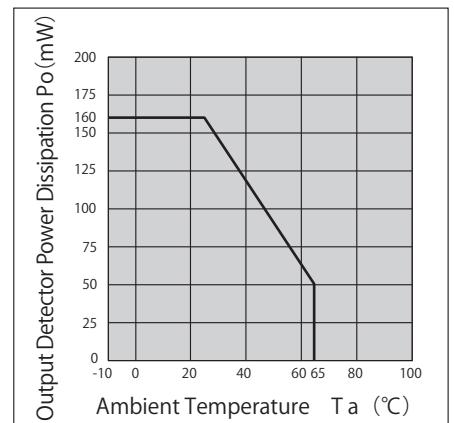
### 順電流—順電圧特性(代表例)



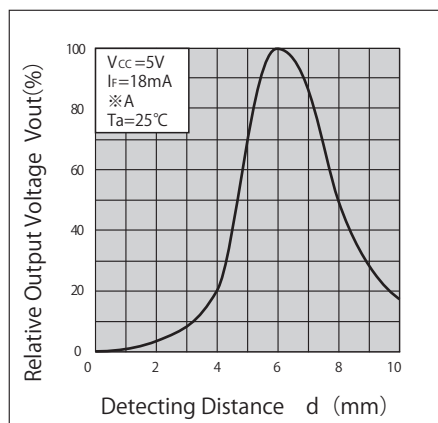
### 分光感度特性(代表例)



### 出力許容損失低減曲線(受光側)

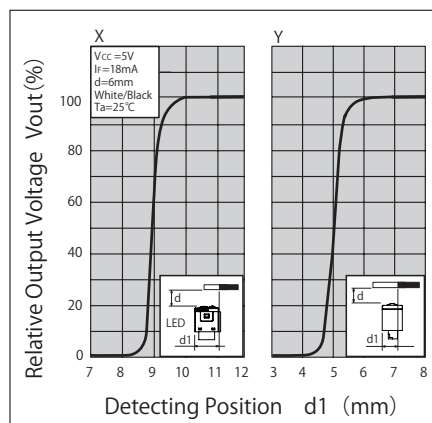


### 検出距離特性(代表例)



※A 90% Reflective Paper

### 検出位置特性(代表例)

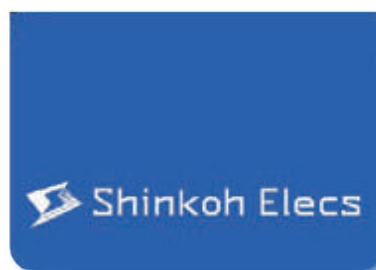


- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

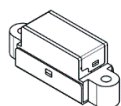


## モーションセンサ (KM シリーズ)

### Motion sensor (KM Series)

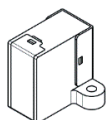


限定  
反射  
型



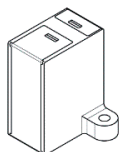
薄型ショートタイプ (V 型)

Thin short type (V type)



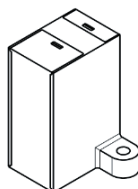
ショートタイプ (H 型)

Short type (H type)



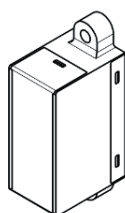
ミドルタイプ (H 型)

Middle type (H type)



ロングタイプ (H 型)

Long type (H type)



ロングタイプ (V 型)

Long type (V type)

## <概要> Over view

対象物の反射率に影響されにくい三角測距式センサです。

Triangular ranging type photo sensor which hardly influenced by reflectivity and color of targeted objects.

## <特長> Features

- 検出対象物の色(反射率)に影響されにくい
- 幅広い検出距離(5 cm～200cm)をラインナップ
- 外乱光対策品

Hardly influenced by reflectivity and color of targeted objects.

Various product lineups available for detection distances from 5 cm to 200 cm.

Highly resistant to ambient light.

## <用途> Applications

トイレの蓋開閉、自動水栓の手検知

ATM、自動釣銭機の人体検知

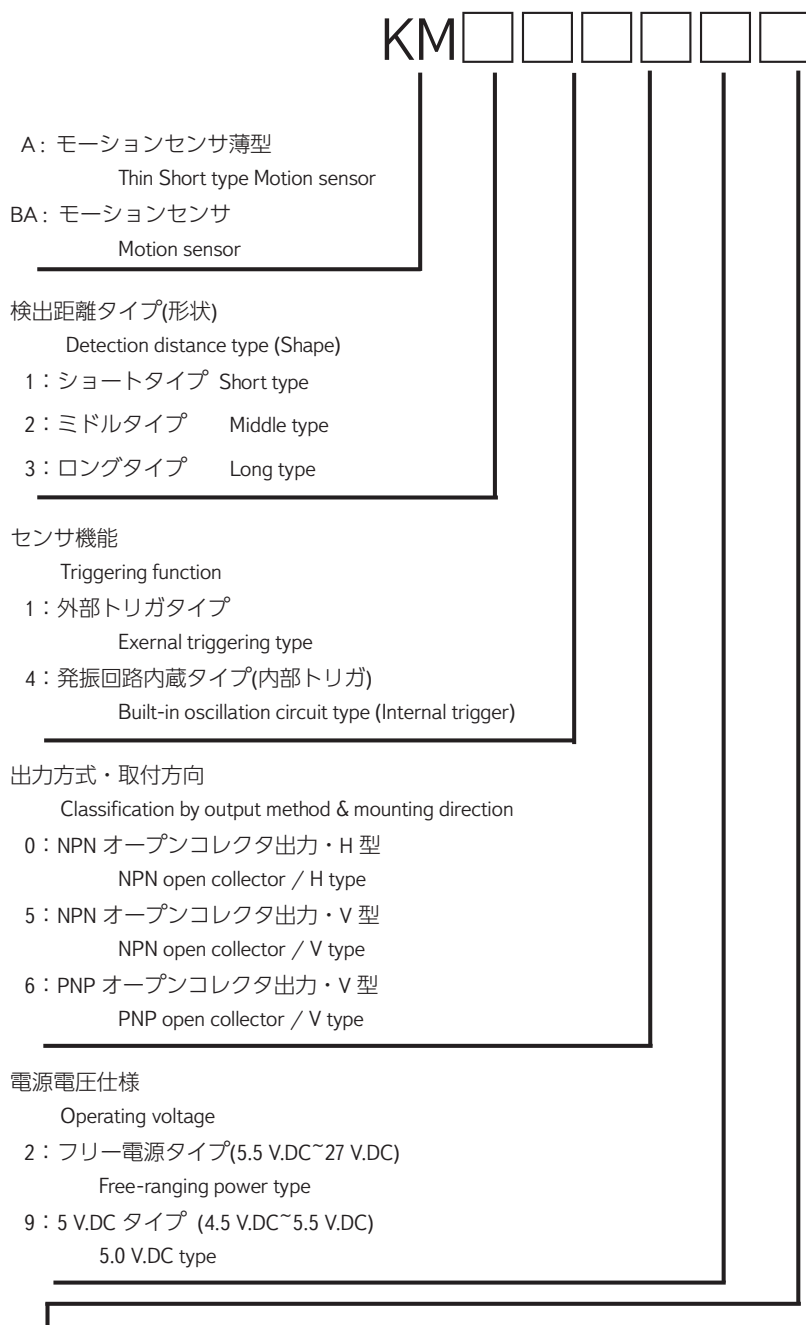
アミューズメント機器の着座検知、非接触スイッチ

医療機器の物体有無検知

Toilet lid open/close detection, automatic faucet hand detection.

Human body detection for ATM, Self check out machines.

## <品番体系> Ordering information



- ・定格検出距離 Rated detection distance

| Part No.                     | 02       | 03       | 04       | 05       | 06       | 07       | 08       | 09       | 10        | 11        | 12        | 13        | 14        | 15        | 16        | 17        | 18        | 19        | 20        |
|------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Type                         | 02       | 03       | 04       | 05       | 06       | 07       | 08       | 09       | 10        | 11        | 12        | 13        | 14        | 15        | 16        | 17        | 18        | 19        | 20        |
| 薄型ショートタイプ<br>Thin short type | —        | —        | —        | 5<br>cm  | —        | —        | —        | —        | 10<br>cm  | —         | —         | —         | —         | —         | —         | —         | —         | —         | —         |
| ショートタイプ<br>Short type        | —        | —        | —        | 5<br>cm  | 6<br>cm  | 7<br>cm  | 8<br>cm  | 9<br>cm  | 10<br>cm  | —         | —         | —         | —         | —         | —         | —         | —         | —         | —         |
| ミドルタイプ<br>Middle type        | 20<br>cm | 30<br>cm | 40<br>cm | 50<br>cm | 60<br>cm | 70<br>cm | 80<br>cm | —        | —         | —         | —         | —         | —         | —         | —         | —         | —         | —         | —         |
| ロングタイプ<br>Long type          | —        | —        | —        | 50<br>cm | 60<br>cm | 70<br>cm | 80<br>cm | 90<br>cm | 100<br>cm | 110<br>cm | 120<br>cm | 130<br>cm | 140<br>cm | 150<br>cm | 160<br>cm | 170<br>cm | 180<br>cm | 190<br>cm | 200<br>cm |

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<品種>Product type

・検出距離タイプ(距離限定) Detection distance type(distance limited)

1】薄型ショートタイプ(V 型) Thin short type(V type)

箱入数：内箱 20 個、外箱 200 個 Standard packing: Carton: 20 pcs.; Case: 200pcs.

| 電源電圧<br>Operating voltage | 出力方式<br>Output method     | 定格検出距離<br>Rated detection distance | 発振回路内蔵タイプ<br>Built-in oscillation circuit type | 外部トリガタイプ<br>External triggering type |
|---------------------------|---------------------------|------------------------------------|------------------------------------------------|--------------------------------------|
|                           |                           |                                    | ご注文品番 Part No                                  | ご注文品番 Part No.                       |
| 4.5 V.DC ~ 5.5 V.DC       | NPN<br>オープンコレクタ出力         | 5cm                                | KMA145905                                      | KMA115905                            |
|                           | NPN open collector output | 10cm                               | KMA1459                                        | KMA1159                              |
|                           | PNP<br>オープンコレクタ出力         | 5cm                                | KMA146905                                      | KMA116905                            |
|                           | PNP open collector output | 10cm                               | KMA1469                                        | KMA1169                              |

注) センサを複数個隣接して使用する場合、または消費電流を抑えたい場合の使用に適した

外部トリガタイプの詳細につきましてはお問い合わせください。

Note: If using multiple sensors adjacently or reducing power consumption, contact us for the optimal external trigger type.

2】ショートタイプ(H 型) Short type(H type)

箱入数：内箱 20 個、外箱 200 個 Standard packing: Carton: 20 pcs.; Case: 200pcs.

| 電源電圧<br>Rated operating voltage | 定格検出距離<br>Rated detection distance | 発振回路内蔵タイプ<br>Built-in oscillation circuit type | 外部トリガタイプ<br>External triggering type |
|---------------------------------|------------------------------------|------------------------------------------------|--------------------------------------|
|                                 |                                    | ご注文品番 Part No.                                 | ご注文品番 Part No.                       |
| 4.5 V.DC ~ 5.5 V.DC             | 5cm                                | KMBA140905                                     | KMBA110905                           |
|                                 | 6cm                                | KMBA140906                                     | KMBA110906                           |
|                                 | 7cm                                | KMBA140907                                     | KMBA110907                           |
|                                 | 8cm                                | KMBA140908                                     | KMBA110908                           |
|                                 | 9cm                                | KMBA140909                                     | KMBA110909                           |
|                                 | 10cm                               | KMBA1409                                       | KMBA1109                             |
| 5.5 V.DC ~ 27 V.DC              | 5cm                                | KMBA140205                                     | KMBA110205                           |
|                                 | 6cm                                | KMBA140206                                     | KMBA110206                           |
|                                 | 7cm                                | KMBA140207                                     | KMBA110207                           |
|                                 | 8cm                                | KMBA140208                                     | KMBA110208                           |
|                                 | 9cm                                | KMBA140209                                     | KMBA110209                           |
|                                 | 10cm                               | KMBA1402                                       | KMBA1102                             |

注) センサを複数個隣接して使用する場合、または消費電流を抑えたい場合の使用に適した

外部トリガタイプの詳細につきましてはお問い合わせください。

Note: If using multiple sensors adjacently or reducing power consumption, contact us for the optimal external trigger type.

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## 3】ミドルタイプ(H型) Middle type(H type)

箱入数：内箱 20 個、外箱 200 個 Standard packing: Carton: 20 pcs.; Case: 200pcs.

| 電源電圧<br>Rated operating voltage | 定格検出距離<br>Rated detection distance | 発振回路内蔵タイプ<br>Built-in oscillation circuit type | 外部トリガタイプ<br>External triggering type |
|---------------------------------|------------------------------------|------------------------------------------------|--------------------------------------|
|                                 |                                    | ご注文品番 Part No.                                 | ご注文品番 Part No.                       |
| 4.5 V.DC ~ 5.5 V.DC             | 20cm                               | KMBA240902                                     | KMBA210902                           |
|                                 | 30cm                               | KMBA240903                                     | KMBA210903                           |
|                                 | 40cm                               | KMBA240904                                     | KMBA210904                           |
|                                 | 50cm                               | KMBA240905                                     | KMBA210905                           |
|                                 | 60cm                               | KMBA240906                                     | KMBA210906                           |
|                                 | 70cm                               | KMBA240907                                     | KMBA210907                           |
|                                 | 80cm                               | KMBA2409                                       | KMBA2109                             |
| 5.5 V.DC ~ 27 V.DC              | 20cm                               | KMBA240202                                     | KMBA210202                           |
|                                 | 30cm                               | KMBA240203                                     | KMBA210203                           |
|                                 | 40cm                               | KMBA240204                                     | KMBA210204                           |
|                                 | 50cm                               | KMBA240205                                     | KMBA210205                           |
|                                 | 60cm                               | KMBA240206                                     | KMBA210206                           |
|                                 | 70cm                               | KMBA240207                                     | KMBA210207                           |
|                                 | 80cm                               | KMBA2402                                       | KMBA2102                             |

注) センサを複数個隣接して使用する場合、または消費電流を抑えたい場合の使用に適した

外部トリガタイプの詳細につきましてはお問い合わせください。

Note: If using multiple sensors adjacently or reducing power consumption, contact us for the optimal external trigger type.

## 4】 ロングタイプ Long type

箱入数：内箱 20 個、外箱 200 個 Standard packing: Carton: 20 pcs.; Case: 200pcs.

| 電源電圧<br>Rated<br>operating<br>voltage | 定格検出距離<br>Rated<br>detection<br>distance | 取付方向 H 型<br>Mounting direction: H type            |                                      | 取付方向 V 型<br>Mounting direction : V type           |                                      |
|---------------------------------------|------------------------------------------|---------------------------------------------------|--------------------------------------|---------------------------------------------------|--------------------------------------|
|                                       |                                          | 発振回路内蔵タイプ<br>Built-in oscillation<br>circuit type | 外部トリガタイプ<br>External triggering type | 発振回路内蔵タイプ<br>Built-in oscillation<br>circuit type | 外部トリガタイプ<br>External triggering type |
|                                       |                                          | ご注文品番 Part No.                                    | ご注文品番 Part No.                       | ご注文品番 Part No.                                    | ご注文品番 Part No.                       |
| 4.5V.DC～<br>5.5 V.DC                  | 50cm                                     | KMBA340905                                        | KMBA310905                           | KMBA345905                                        | KMBA315905                           |
|                                       | 60cm                                     | KMBA340906                                        | KMBA310906                           | KMBA345906                                        | KMBA315906                           |
|                                       | 70cm                                     | KMBA340907                                        | KMBA310907                           | KMBA345907                                        | KMBA315907                           |
|                                       | 80cm                                     | KMBA340908                                        | KMBA310908                           | KMBA345908                                        | KMBA315908                           |
|                                       | 90cm                                     | KMBA340909                                        | KMBA310909                           | KMBA345909                                        | KMBA315909                           |
|                                       | 100cm                                    | KMBA340910                                        | KMBA310910                           | KMBA345910                                        | KMBA315910                           |
|                                       | 110cm                                    | KMBA340911                                        | KMBA310911                           | KMBA345911                                        | KMBA315911                           |
|                                       | 120cm                                    | KMBA340912                                        | KMBA310912                           | KMBA345912                                        | KMBA315912                           |
|                                       | 130cm                                    | KMBA340913                                        | KMBA310913                           | KMBA345913                                        | KMBA315913                           |
|                                       | 140cm                                    | KMBA340914                                        | KMBA310914                           | KMBA345914                                        | KMBA315914                           |
|                                       | 150cm                                    | KMBA340915                                        | KMBA310915                           | KMBA345915                                        | KMBA315915                           |
|                                       | 160cm                                    | KMBA340916                                        | KMBA310916                           | KMBA345916                                        | KMBA315916                           |
|                                       | 170cm                                    | KMBA340917                                        | KMBA310917                           | KMBA345917                                        | KMBA315917                           |
|                                       | 180cm                                    | KMBA340918                                        | KMBA310918                           | KMBA345918                                        | KMBA315918                           |
|                                       | 190cm                                    | KMBA340919                                        | KMBA310919                           | KMBA345919                                        | KMBA315919                           |
|                                       | 200cm                                    | KMBA3409                                          | KMBA3109                             | KMBA3459                                          | KMBA3159                             |
| 5.5V.DC～<br>27 V.DC                   | 50cm                                     | KMBA340205                                        | KMBA310205                           | KMBA345205                                        | KMBA315205                           |
|                                       | 60cm                                     | KMBA340206                                        | KMBA310206                           | KMBA345206                                        | KMBA315206                           |
|                                       | 70cm                                     | KMBA340207                                        | KMBA310207                           | KMBA345207                                        | KMBA315207                           |
|                                       | 80cm                                     | KMBA340208                                        | KMBA310208                           | KMBA345208                                        | KMBA315208                           |
|                                       | 90cm                                     | KMBA340209                                        | KMBA310209                           | KMBA345209                                        | KMBA315209                           |
|                                       | 100cm                                    | KMBA340210                                        | KMBA310210                           | KMBA345210                                        | KMBA315210                           |
|                                       | 110cm                                    | KMBA340211                                        | KMBA310211                           | KMBA345211                                        | KMBA315211                           |
|                                       | 120cm                                    | KMBA340212                                        | KMBA310212                           | KMBA345212                                        | KMBA315212                           |
|                                       | 130cm                                    | KMBA340213                                        | KMBA310213                           | KMBA345213                                        | KMBA315213                           |
|                                       | 140cm                                    | KMBA340214                                        | KMBA310214                           | KMBA345214                                        | KMBA315214                           |
|                                       | 150cm                                    | KMBA340215                                        | KMBA310215                           | KMBA345215                                        | KMBA315215                           |
|                                       | 160cm                                    | KMBA340216                                        | KMBA310216                           | KMBA345216                                        | KMBA315216                           |
|                                       | 170cm                                    | KMBA340217                                        | KMBA310217                           | KMBA345217                                        | KMBA315217                           |
|                                       | 180cm                                    | KMBA340218                                        | KMBA310218                           | KMBA345218                                        | KMBA315218                           |
|                                       | 190cm                                    | KMBA340219                                        | KMBA310219                           | KMBA345219                                        | KMBA315219                           |
|                                       | 200cm                                    | KMBA3402                                          | KMBA3102                             | KMBA3452                                          | KMBA3152                             |

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## &lt;定格&gt;Rating

- 検出性能 Detection performance

## 1】薄型ショートタイプ(測定条件 周囲温度：25℃ 動作電圧：5 V.DC)

Thin short type (Measuring conditions: ambient temp.:25℃ 77°F; operating voltage: 5V.DC)

| 項目 Items                                                                              |                                              |      | 単位<br>Unit | 薄型ショートタイプ<br>Thin short type |     | 測定条件<br>Measured conditions                                     |
|---------------------------------------------------------------------------------------|----------------------------------------------|------|------------|------------------------------|-----|-----------------------------------------------------------------|
|                                                                                       |                                              |      | cm         | 5                            | 10  |                                                                 |
| 定格検出距離<br>Rated detection distance                                                    |                                              | min. | mm         | 45                           | 90  | 標準反射板にて ※1<br>With a standard reflection board                  |
|                                                                                       |                                              | typ. |            | 50                           | 100 |                                                                 |
|                                                                                       |                                              | max. |            | 55                           | 110 |                                                                 |
| 測距誤差 Measuring tolerance                                                              |                                              | typ. | %          | 10                           | 25  | 反射率 90%～18%<br>Reflection rate: 90% to 18%                      |
| 最大使用周囲照度<br>(耐外乱光) ※2<br>Usable ambient<br>brightness(Resistance to<br>ambient light) | センサ面照度<br>Brightness of<br>sensor surface    | max. | lx         | 30,000                       |     | 図 1.参照<br>See the drawing(Fig.1)on<br>the Brightness next page. |
|                                                                                       | 反射面照度<br>Brightness of<br>reflection surface | max. |            | 24,000                       |     |                                                                 |

注) ※1. 周囲照度 500lx。

※2. 直射光(センサ光軸に対し 30°以内の光)が入らないようにしてください。

センサの検出動作可能な照度を示します。

Note: \*1. Ambient brightness: 500lx

\*2. Prevent direct light (within 30° against the optical axis of the sensor) from entering into the sensor.

## 2】ショートタイプ(測定条件 周囲温度：25℃ 動作電圧：5V.DC タイプ、フリー電源タイプ 24V.DC)

Short type (Measuring conditions: ambient temp.:25℃ 77°F; operating voltage: 5V.DC type 5V.DC,

Free-ranging power type 24 V.DC)

| 項目 Items                                                                          |                                           |      |    | ショートタイプ ※1<br>Short type*1 |    |    |    |    |     | 測定条件<br>Measured conditions                                  |
|-----------------------------------------------------------------------------------|-------------------------------------------|------|----|----------------------------|----|----|----|----|-----|--------------------------------------------------------------|
|                                                                                   |                                           |      |    | 5                          | 6  | 7  | 8  | 9  | 10  |                                                              |
| 定格検出距離<br>Rated detection distance                                                |                                           | min. | mm | 45                         | 54 | 63 | 72 | 81 | 90  | 標準反射板にて<br>With a standard reflection board                  |
|                                                                                   |                                           | typ. |    | 50                         | 60 | 70 | 80 | 90 | 100 |                                                              |
|                                                                                   |                                           | max. |    | 55                         | 66 | 77 | 88 | 99 | 110 |                                                              |
| 測距誤差 Measuring tolerance                                                          |                                           | typ. | %  | 10                         |    | 15 | 20 |    | 25  | 反射率 90%～18%<br>Reflection rate: 90% to 18%                   |
| 最大使用周囲照度<br>(耐外乱光) ※2<br>Usable ambient brightness(Resistance to ambient light)*2 | センサ面照度<br>Brightness of sensor surface    | max. | lx | 30,000                     |    |    |    |    |     | 図 1.参照<br>See the drawing(Fig.1)on the Brightness next page. |
|                                                                                   | 反射面照度<br>Brightness of reflection surface | max. |    | 24,000                     |    |    |    |    |     |                                                              |

注) ※1. 受注後対応で定格検出距離平均 15cm まで可能です。ご相談ください

※2. 直射光(センサ光軸に対し 30°以内の光)が入らないようにしてください。

Note: \*1. After order receipt, the average rated detecting distance can be increased to max 15cm 5.906 inch. Please consult us.

\*2. Prevent direct light (within 30° against the optical axis of the sensor) from entering into the sensor.

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3】ミドルタイプ(測定条件 周囲温度：25℃ 動作電圧：5V.DC タイプ 5V.DC、フリー電源タイプ 24V.DC)

Middle type (Measuring conditions: ambient temp.:25℃ 77°F; operating voltage: 5V.DC type 5V.DC, Free-ranging power type 24 V.DC)

| 項目 Items                                                                         |                                           | 単位<br>Unit | ミドルタイプ ※1<br>Middle type |        |     |     |     |     |     | 測定条件<br>Measured conditions |                                                              |
|----------------------------------------------------------------------------------|-------------------------------------------|------------|--------------------------|--------|-----|-----|-----|-----|-----|-----------------------------|--------------------------------------------------------------|
|                                                                                  |                                           | cm         | 20                       | 30     | 40  | 50  | 60  | 70  | 80  |                             |                                                              |
|                                                                                  |                                           |            |                          |        |     |     |     |     |     |                             |                                                              |
| 定格検出距離<br>Rated detection distance                                               |                                           | min.       | mm                       | 190    | 285 | 380 | 475 | 570 | 665 | 760                         | 標準反射板にて<br>With a standard reflection board                  |
|                                                                                  |                                           | typ.       |                          | 200    | 300 | 400 | 500 | 600 | 700 | 800                         |                                                              |
|                                                                                  |                                           | max.       |                          | 210    | 315 | 420 | 525 | 630 | 735 | 840                         |                                                              |
| 測距誤差 Measuring tolerance                                                         |                                           | typ.       | %                        | 3      |     |     | 5   |     | 10  |                             | 反射率：90～18％<br>Reflection rate : 90% to 18%                   |
|                                                                                  |                                           |            |                          |        |     |     |     |     |     |                             |                                                              |
| 最大使用周囲照度<br>(耐外乱光)※2<br>Usable ambient brightness(Resistance to ambient light)*2 | センサ面照度<br>Brightness of sensor surface    | max.       | lx                       | 30,000 |     |     |     |     |     |                             | 図 1.参照<br>See the drawing(Fig.1)on the Brightness next page. |
|                                                                                  | 反射面照度<br>Brightness of reflection surface | max.       |                          | 24,000 |     |     |     |     |     |                             |                                                              |

注) ※1. 受注後対応で定格検出距離平均 110cm まで可能です。ご相談ください  
※2. 直射光(センサ光軸に対し 30°以内の光)が入らないようにしてください。  
Note: \*1. After order receipt, the average rated detecting distance can be increased to max 110cm 43.307 inch. Please consult us.  
\*2. Prevent direct light (within 30°against the optical axis of the sensor) from entering into the sensor.

4】ロングタイプ(測定条件 周囲温度：25℃ 動作電圧：5 V.DC タイプ 5 V.DC、フリー電源タイプ 24 V.DC)

Long type (Measuring conditions: ambient temp.:25℃ 77°F; operating voltage: 5V.DC type 5V.DC, Free-ranging power type 24 V.DC)

| 項目 Items                                                                              |                                           | 単位<br>Unit | ロングタイプ<br>Long type |        |     |     |     |     |      | 測定条件<br>Measured conditions                |                                                              |                                             |
|---------------------------------------------------------------------------------------|-------------------------------------------|------------|---------------------|--------|-----|-----|-----|-----|------|--------------------------------------------|--------------------------------------------------------------|---------------------------------------------|
|                                                                                       |                                           | cm         | 50                  | 60     | 70  | 80  | 90  | 100 | 110  | 120                                        |                                                              |                                             |
| 定格検出距離<br>Rated detection distance                                                    |                                           | min.       | mm                  | 475    | 570 | 665 | 760 | 855 | 950  | 1045                                       | 1140                                                         | 標準反射板にて<br>With a standard reflection board |
|                                                                                       |                                           | typ.       |                     | 500    | 600 | 700 | 800 | 900 | 1000 | 1100                                       | 1200                                                         |                                             |
|                                                                                       |                                           | max.       |                     | 525    | 630 | 735 | 840 | 945 | 1050 | 1155                                       | 1260                                                         |                                             |
| 測距誤差 Measuring tolerance                                                              |                                           | typ.       | %                   | 3      |     |     | 5   |     |      | 反射率：90%～18%<br>Reflection rate: 90% to 18% |                                                              |                                             |
| 最大使用周囲照度<br>(耐外乱光) ※1<br>Usable ambient brightness<br>(Resistance to ambient light)*2 | センサ面照度<br>Brightness of sensor surface    | max.       | lx                  | 30,000 |     |     |     |     |      |                                            | 図 1.参照<br>See the drawing(Fig.1)on the Brightness next page. |                                             |
|                                                                                       | 反射面照度<br>Brightness of reflection surface | max.       |                     | 24,000 |     |     |     |     |      |                                            |                                                              |                                             |

| 項目 Items                                                                              |                                           | 単位<br>Unit | ロングタイプ<br>Long type |        |      |      |      |      |      |      | 測定条件<br>Measured conditions                 |                                                              |
|---------------------------------------------------------------------------------------|-------------------------------------------|------------|---------------------|--------|------|------|------|------|------|------|---------------------------------------------|--------------------------------------------------------------|
|                                                                                       |                                           | cm         | 130                 | 140    | 150  | 160  | 170  | 180  | 190  | 200  |                                             |                                                              |
|                                                                                       |                                           |            |                     |        |      |      |      |      |      |      |                                             |                                                              |
| 定格検出距離<br>Rated detection distance                                                    | min.                                      | mm         | 1235                | 1330   | 1425 | 1520 | 1615 | 1710 | 1805 | 1900 | 標準反射板にて<br>With a standard reflection board |                                                              |
|                                                                                       | typ.                                      |            | 1300                | 1400   | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 |                                             |                                                              |
|                                                                                       | max.                                      |            | 1365                | 1470   | 1575 | 1680 | 1785 | 1890 | 1995 | 2100 |                                             |                                                              |
| 測距誤差 Measuring tolerance                                                              |                                           | typ.       | %                   | 10     |      |      |      | 15   |      |      | 反射率：90%～18%<br>Reflection rate: 90% to 18%  |                                                              |
| 最大使用周囲照度<br>(耐外乱光) ※1<br>Usable ambient brightness<br>(Resistance to ambient light)*2 | センサ面照度<br>Brightness of sensor surface    | max.       | lx                  | 30,000 |      |      |      |      |      |      |                                             | 図 1.参照<br>See the drawing(Fig.1)on the Brightness next page. |
|                                                                                       | 反射面照度<br>Brightness of reflection surface | max.       |                     | 24,000 |      |      |      |      |      |      |                                             |                                                              |

注) ※1. 直射光(センサ光軸に対し 30°以内の光)が入らないようにしてください。  
Note: \*1. Prevent direct light (within 30°against the optical axis of the sensor) from entering into the sensor.  
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## 薄型ショートタイプ

<標準反射板：サイズ 150mm 角、反射率 90%>

For thin short type:

Standard reflection board: 150mm 5.906 inch square area, 90% reflection rate.

## ショートタイプ

<標準反射板：サイズ 100mm 角、反射率 90%>

For short type:

Standard reflection board: 100mm 3.937 inch square area, 90% reflection rate.

## ミドルタイプ

<標準反射板：サイズ 200mm 角、反射率 90%>

For middle type:

Standard reflection board: 200mm 7.874 inch square area, 90% reflection rate.

## ロングタイプ

<標準反射板：サイズ 500mm 角、反射率 90%>

For long type:

Standard reflection board: 500mm 19.685 inch square area, 90% reflection rate.

注) 1. センサ検出面より定格検出距離までの検出体を検出します。

2. 測距誤差 =  $((a-b) \div a) \times 100(\%)$

反射率 90%の標準検出体での検出距離：a

反射率 18%の標準検出体での検出距離：b

Note: \*1. Detecting an object within the maximum preset detection distance.

\*2. Distance deviation =  $((a-b) \div a) \times 100(\%)$

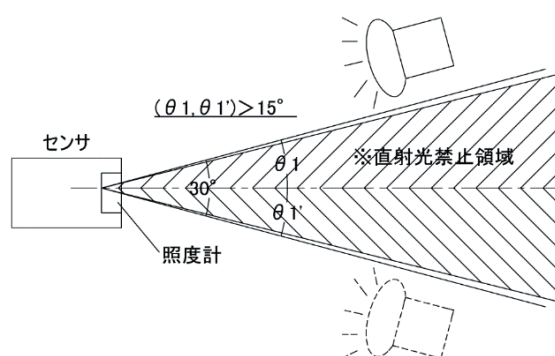
a: detection distance of detection target with reflectance of 90%.

b: detection distance of standard detection target with reflectance of 18%.

【図 1】 <Fig. 1>

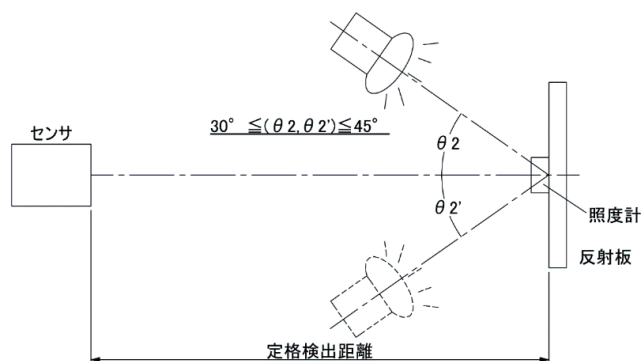
## 【センサ面照度】

(Brightness of sensor surface)



## 【反射面照度】

(Brightness of reflection surface)



注) 直接使用禁止領域からセンサに太陽光、ストロボ光、インバータ照明など(ガラスや鏡などに

反射した正反射光を含む)が直接入射する場合、それらの光によりセンサが誤作動する場合があります。

Note: If sunlight or strobe/inverter light (including the regular reflection light from glasses and mirrors) directly enters from the inhibition area, those lights may cause malfunction of the sensor. sensor) from entering into the sensor.

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<絶対最大定格> Absolute maximum rating

・測定条件 周囲温度：25℃ Measuring condition: ambient.: 25℃

| 項目 Items                              | 絶対最大定格                                         |                         |                                      |                         |
|---------------------------------------|------------------------------------------------|-------------------------|--------------------------------------|-------------------------|
|                                       | Absolute maximum rating                        |                         |                                      |                         |
|                                       | 発振回路内蔵タイプ<br>Built-in oscillation circuit type |                         | 外部トリガタイプ<br>External triggering type |                         |
| 電圧仕様                                  | 5.0 V.DC type                                  | Free-ranging power type | 5.0 V.DC type                        | Free-ranging power type |
| 電源電圧<br>Power supply voltage          | -0.3V.DC ~ 6.0 V.DC                            | -0.3V.DC ~ 30 V.DC      | -0.3V.DC ~ 6.0 V.DC                  | -0.3V.DC ~ 30 V.DC      |
| 出力耐圧<br>Output dielectric strength    | 30 V.DC                                        |                         | 30 V.DC                              |                         |
| 出力流入電流(出力流出電流)<br>Output flow current | 100mA                                          |                         | 10mA ※                               |                         |
| 動作温度範囲<br>Usable ambient temperature  | -25℃ ~ +75℃(No freezing)                       |                         | -25℃ ~ +75℃(No freezing)             |                         |
| 保存温度範囲<br>Storage temperature         | -30℃ ~ +85℃                                    |                         | -30℃ ~ +85℃                          |                         |

注) ※薄型ショートタイプのみ：100mA  
Note: \*Thin short type is only: 100 mA

<電気的特性> Electrical characteristics

・測定条件 周囲温度：25℃ 動作電圧：5.0 V.DC タイプ 5.0 V.DC、フリー電源タイプ 24 V.DC  
Measuring condition: ambient.: 25℃, operating voltage: 5 V.DC type, free-ranging power type 24 V.DC

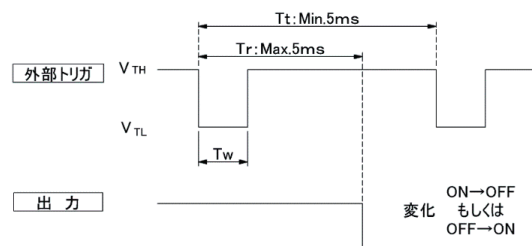
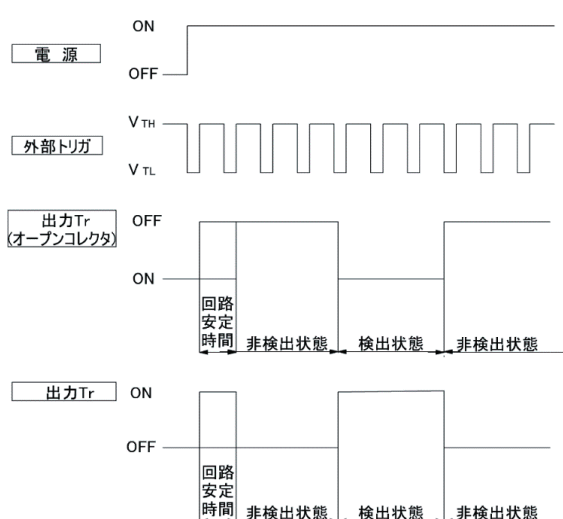
1】発振回路内蔵タイプ Built-in oscillation circuit type

| 項目 Items                                                      |                            | 記号<br>Symbol | 薄型ショートタイプ ※                        |                                    | ショート<br>タイプ<br>Short type | ミドル<br>タイプ<br>Middle type                              | ロング<br>タイプ<br>Long type | 測定条件<br>Measuring<br>condition |
|---------------------------------------------------------------|----------------------------|--------------|------------------------------------|------------------------------------|---------------------------|--------------------------------------------------------|-------------------------|--------------------------------|
|                                                               |                            |              | Thin short type*                   |                                    |                           |                                                        |                         |                                |
|                                                               |                            |              | NPN<br>出力タイプ<br>NPN<br>output type | PNP<br>出力タイプ<br>PNP<br>output type |                           |                                                        |                         |                                |
| 動作電圧<br>Rated operating voltage                               |                            | min.         | VDD                                | 5.0 V.DC type：4.5 V.DC             |                           | Free-ranging power type：5.5 V.DC                       |                         |                                |
|                                                               |                            | typ.         |                                    | —                                  |                           |                                                        |                         |                                |
|                                                               |                            | max.         |                                    | 5.0 V.DC type：5.5 V.DC             |                           | Free-ranging power type：27 V.DC                        |                         |                                |
| 平均<br>消費電力<br>(Iout=0mA)<br>Average<br>current<br>consumption | 非検出時<br>No detection       | min.         | It                                 | —                                  |                           |                                                        |                         |                                |
|                                                               |                            | typ.         |                                    | 4.5mA                              |                           | 5.0 V.DC type：4.5mA<br>Free-ranging power type：5.6mA   |                         |                                |
|                                                               |                            | max.         |                                    | 6.2mA                              |                           | 5.0 V.DC type：6.2mA<br>Free-ranging power type：7.8mA   |                         |                                |
|                                                               | 検出時<br>Detection           | min.         | It                                 | —                                  |                           |                                                        |                         |                                |
|                                                               |                            | typ.         |                                    | 7.0mA                              | 11.0mA                    | 5.0 V.DC type:7.0mA<br>Free-ranging power type：9.1mA   |                         |                                |
|                                                               |                            | max.         |                                    | 11.2mA                             | 15.2mA                    | 5.0 V.DC type：11.2mA<br>Free-ranging power type：14.2mA |                         |                                |
| 測距周期 Measuring cycle                                          |                            | typ.         | T                                  | 8ms/ cycle                         |                           |                                                        |                         |                                |
| 出力特性<br>Output<br>characteristics                             | 残留電圧<br>Remain<br>voltage  | max.         | Vr                                 | 1.0 V.DC                           | 1.2 V.DC                  | 1.0 V.DC                                               |                         | It=100mA                       |
|                                                               | 漏れ電流<br>Leakage<br>current | max.         | II                                 | 5μA                                |                           | 3μA                                                    |                         | V=30<br>V.DC                   |

注) ※薄型ショートタイプは 5.0 V.DC のみです。  
Note: \*The thin short type is only available for 5 V.DC.

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## 2】外部トリガタイプ External triggering type



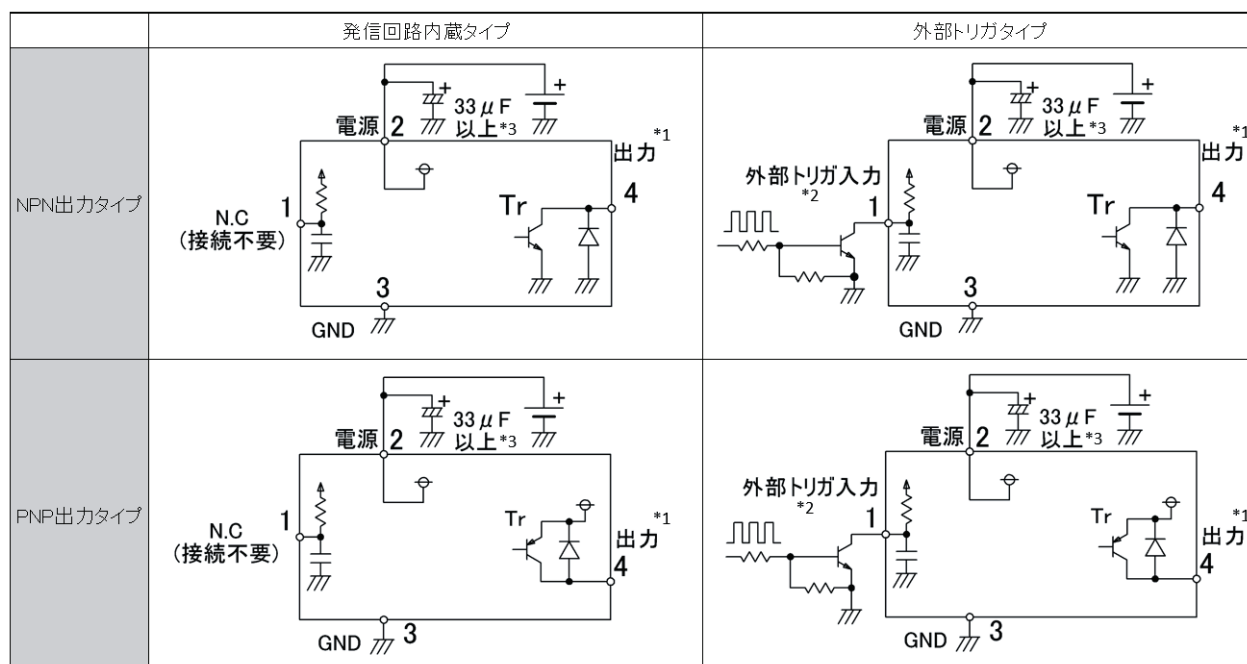
注) 外部トリガの  $V_{TH} \rightarrow V_{TL}$  のエッジでセンサは外部トリガが入力されたことを認識します

注) 1. 回路安定時間: Max. 12ms

2. 電源投入後、回路安定時間中は、センサの検出状態・非検出状態にかかわらず出力 Tr の ON/OFF の状態が定まりません。

## &lt;使用方法&gt;

## ・コネクタ結線図



注) ※1.出力 Tr はオープンコレクタです。

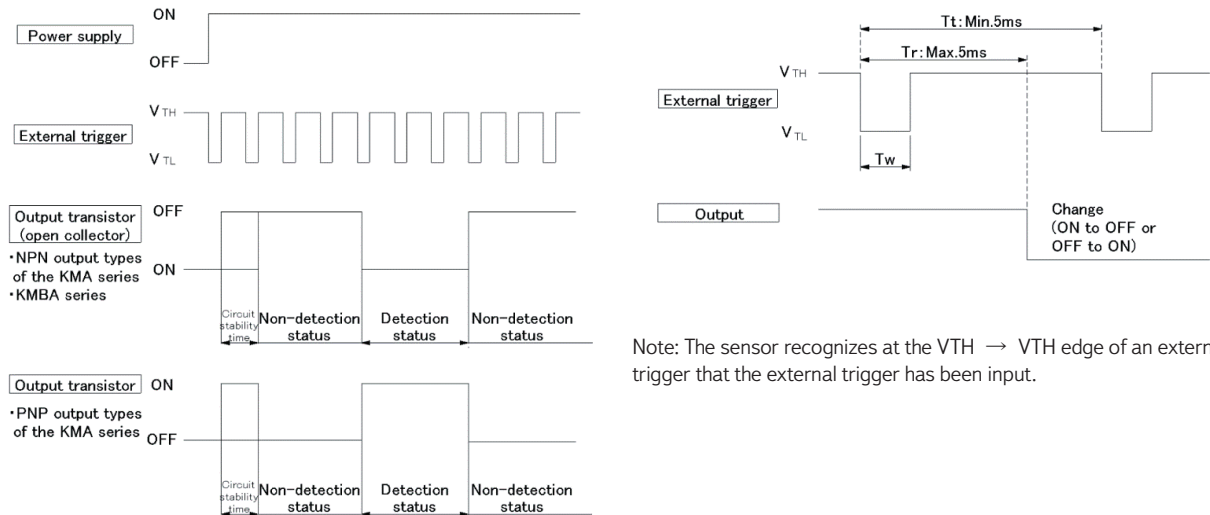
検知状態 : 出力 Tr ON(GND とつながる)

非検知状態 : 出力 Tr OFF(オープン状態)

※2.外部トリガ入力は High レベル: オープン Low レベル: GND(0.8V 以下)とし、High レベルの電圧印加は絶対にしないでください。

※3.耐電源重畳ノイズ性能を確保するため、センサ電源入力端子には必ずコンデンサ(33µF 以上)を設け、電源電圧の安定化を図り、ご使用ください。

2 External triggering type      Note: Please contact us for more information.

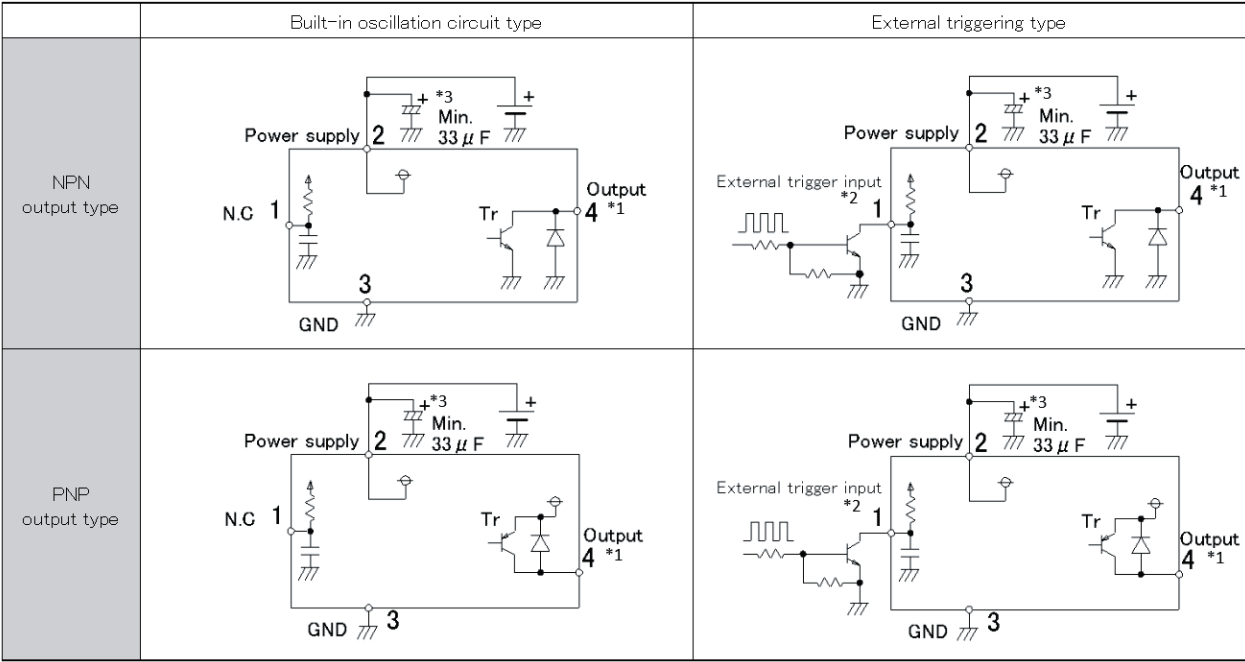


Note: The sensor recognizes at the  $V_{TH} \rightarrow V_{TH}$  edge of an external trigger that the external trigger has been input.

- Note: \*1. Circuit stability time: Max. 12 ms  
\*2. During the time taken for the circuit to stabilize after the power is turned on, the ON/OFF status of the output transistor is not determined by whether the sensor is in the detection status or non-detection status. is not determined by whether the sensor is in the detection status or non-detection status.

<How to use>

• Wiring diagram of connector



- Note: \*1. The output transistor has an open collector structure.  
• Detection status: Output transistor ON (connected to GND)  
• Non-detection status: Output transistor OFF (open state)  
\*2. The status of the external trigger input is as follows:  
• Open at the high level  
• GND (less than 0.8V) at the low level    Do not apply a high voltage.  
\*3. Install capacitor (of 33  $\mu$ F or over) on the power input terminal of the sensor in order to secure power superimposed noise resistance and stabilize the power supply voltage.

## <参考データ> Reference data

- 動作領域特性について Operating region characteristics

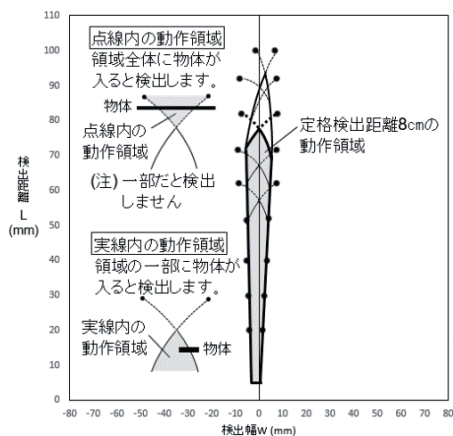
### グラフの見方

ショートタイプの定格検出距離 8cm

(品番 KMBA140□08)の動作領域の例

How to interpret the graph

Example: Operating area of the Short type with rated detection distance of 8cm 3.150 inch.



1.-(1) 薄型ショートタイプ(KMA1□□□□□) ショートタイプ(KMBA1□□□□□)

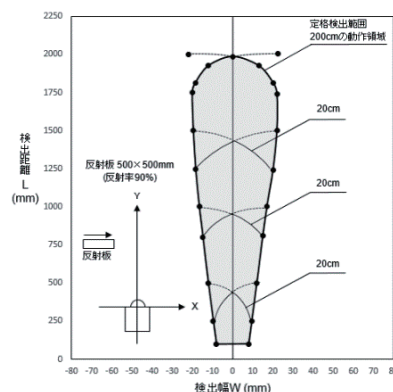
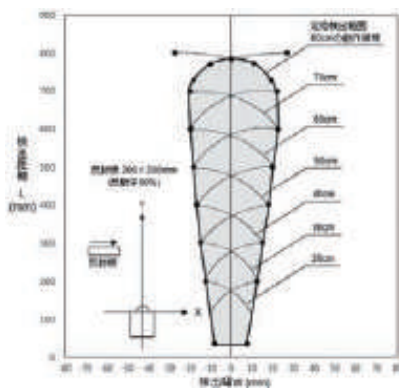
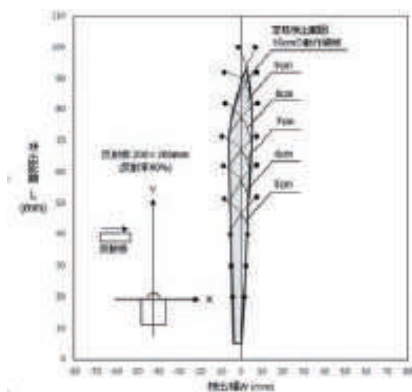
1.-(2) ミドルタイプ(KMBA2□□□□□)

1.-(3) ロングタイプ(KMBA3□□□□□)

1.-(1) Thin short type (KMA1□□□□□) Short type (KMBA1□□□□□)

1.-(2) Middle type (KMBA2□□□□□)

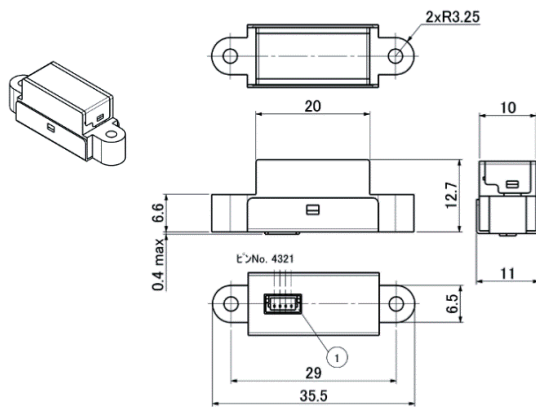
1.-(3) Long type (KMBA3□□□□□)



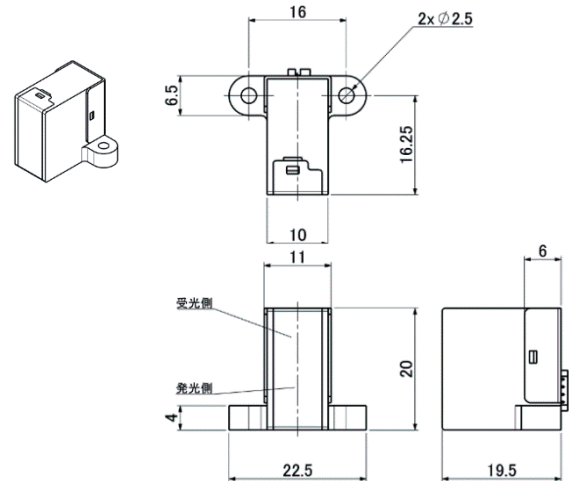
設計・仕様について予告なく変更する場合があります。ご購入及びご使用前に当社の技術仕様書などをお求め願い、それらに基づいて購入及び使用していただきますようお願いいたします。なお、本製品の安全性について疑義が生じたときは、速やかに当社へご通知をいただき、必ず技術検討をしてください。

## &lt;寸法図&gt;Dimensions

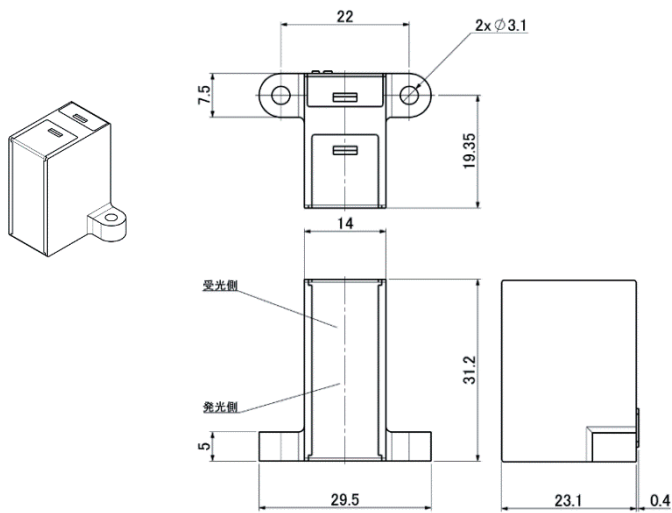
## ●Thin short type (V type)



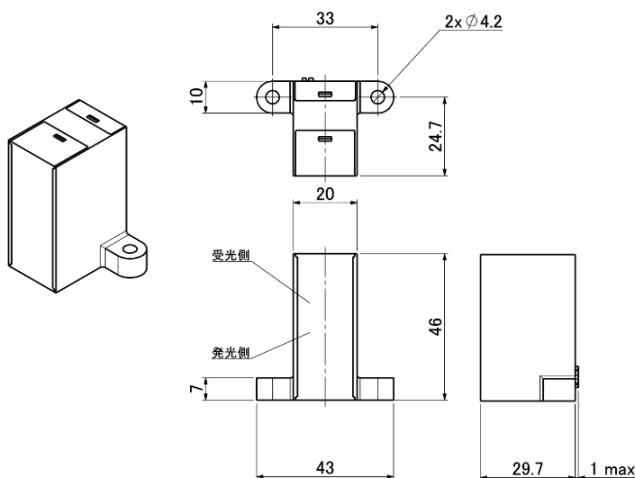
## ●Short type (H type)



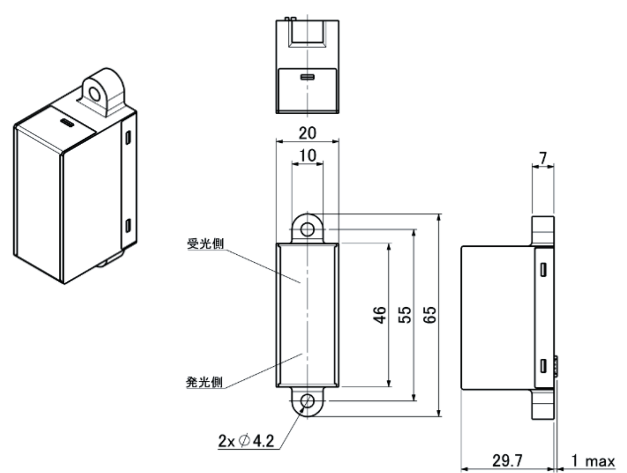
## ●Middle type (H type)



## ●Long type (H type)



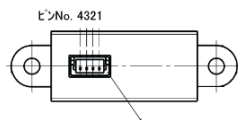
## ●Long type (V type)



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## &lt;コネクタ面矢視図&gt; Wiring diagram (Connector surface view)

## ●Thin short type (V type)

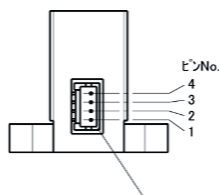


BM04B-SRSS

(日本圧着端子製造(株))

1. 出力
2. GND
3. 電源 VDD
4. 発振回路内蔵タイプ: NC(接続不要)  
外部トリガタイプ: 外部トリガ入力

## ●Short type (H type)

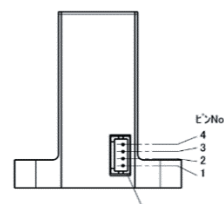


DF13-4P-1.25DS (20)

(ヒロセ電機(株))

4. 出力
3. GND
2. 電源 VDD
1. 発振回路内蔵タイプ: NC(接続不要)  
外部トリガタイプ: 外部トリガ入力

## ●Middle type (H type)

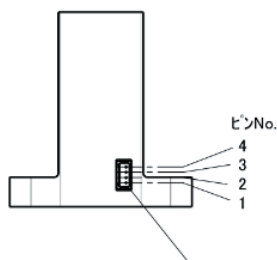


DF13-4P-1.25DSA

(ヒロセ電機(株))

4. 出力
3. GND
2. 電源 VDD
1. 発振回路内蔵タイプ: NC(接続不要)  
外部トリガタイプ: 外部トリガ入力

## ●Long type (V type)

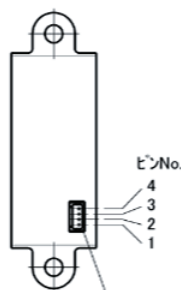


DF13-4P-1.25DSA

(ヒロセ電機(株))

4. 出力
3. GND
2. 電源 VDD
1. 発振回路内蔵タイプ: NC(接続不要)  
外部トリガタイプ: 外部トリガ入力

## ●Long type (H type)



DF13-4P-1.25DSA

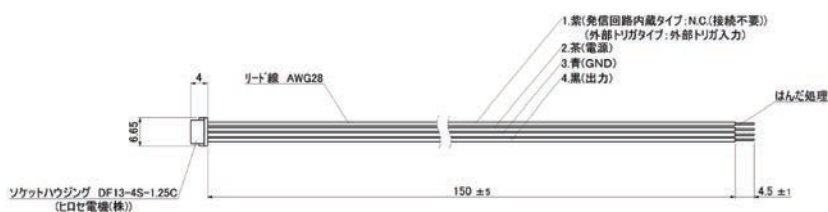
(ヒロセ電機(株))

4. 出力
3. GND
2. 電源 VDD
1. 発振回路内蔵タイプ: NC(接続不要)  
外部トリガタイプ: 外部トリガ入力

## &lt;オプション&gt;Options

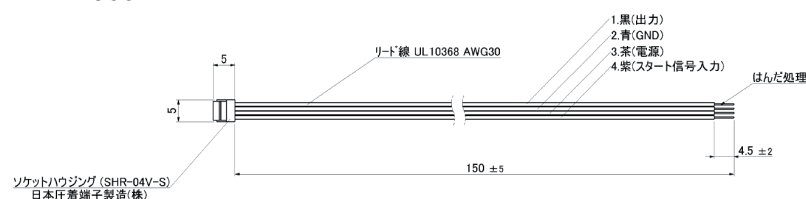
## ●Connector with cable (for Short, Middle and Long type)

KMV9003



## ●Connector with cable (for Thin short type)

KMV9002



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## <使用環境について>

### 1. 使用及び輸送・保管条件

- (1) 温度 : 使用周囲温度 ;  $-25^{\circ}\text{C} \sim 75^{\circ}\text{C}$   
 輸送・保管温度 ;  $-30^{\circ}\text{C} \sim 85^{\circ}\text{C}$
- (2) 湿度 :  $15\% \sim 85\% \text{RH}$   
 (但し、氷結、結露はお避けください)
- (3) 気圧 :  $86 \sim 106 \text{kPa}$

#### ・結露について

高温多湿下で温度が急変するときなどに発生します。センサの検知距離の変動・不動作・絶縁劣化などが発生することがありますのでご注意ください。

#### ・氷結について

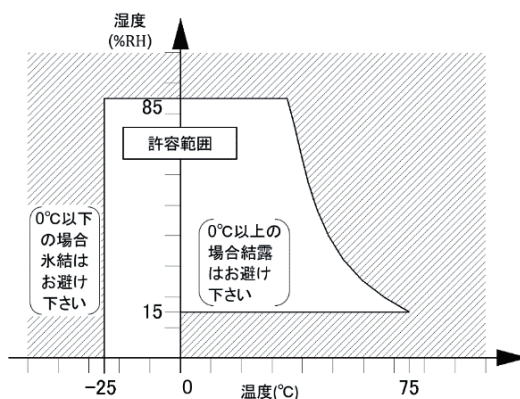
$0^{\circ}\text{C}$ 以下では、結露などの水分が凍りつき、センサの検知距離の変動・不動作・絶縁劣化などが発生することがありますのでご注意ください。

#### ・低温低湿雰囲気について

低温・低温中に長時間さらされると、プラスチックがもろくなることがありますので、ご注意ください。

2. 本製品は、防水・防塵構造ではありません。従いまして使用環境に応じてそれらの対策を講じた上でご使用ください。
3. 電源には、安定化電源をご使用ください。
4. 外部サージ電圧が加わりますと、内部回路が破壊することがありますのでサージ吸収素子をご使用ください。
5. 静電・カミナリや放送局・アマチュア無線・携帯電話などの電氣的雑音が近くにある場合や電源・GNDなどの各端子へのラインに過度のノイズが重畳することにより、誤動作することがあります。
6. 蒸気、ホコリ、腐食ガス等の多い所、有機溶剤の付着する場所での使用はさけてください。
7. ノイズの多い環境で使われる場合、センサ電源入力端子に、コンデンサ( $33\mu\text{F}$ 以上)をつけてご使用下さい。また実機にて事前確認をお願いします。
8. 使用周囲温度(湿度)範囲につきましては、センサを連続的に動作させることのできる温度(湿度)範囲ですが、温度により湿度範囲が異なりますので、下記に示す湿度範囲をお願いします。
- また限界付近での連続使用は避けてください。

- ・この湿度範囲は耐久性能を保证するものではありません。



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## <結線について>

1. 誤結線は、内部回路を破損しますので、電源投入前に配線を確認してください。  
(特に、電源の逆接続には注意してください)
2. 内部回線保護のため、配線の長さは 3m 未満でご利用ください。
3. コネクタの繰り返し着脱は、避けてください。

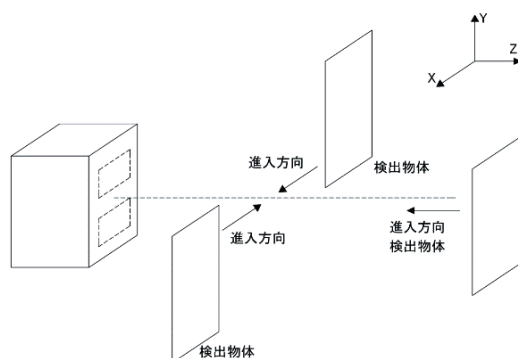
## <検知部について>

1. 検知面のホコリ・ゴミに強い検出方式になっていますが、異常に付着しますと検知距離の余裕度が低下しますので、検知面は清潔に保つようにしてください。
2. 検知面に結露しますと誤動作の原因となりますので注意してください。
3. 本センサは、人体の検知を目的としており、検出物体が、反射率の極めて低い物体(黒ゴムでつや消し加工したもの)の場合、検出できないことがあります。また、反射率の極めて高い物体(鏡、ガラス、光沢紙などの正反射物体)の場合、検出できない場合や、検出距離が不安定になることがあります。
4. レンズの前面とケースは、ポリカーボネイト系です。一般に水、アルコール、油、塩類、弱酸等には、安定していますがアルカリ、芳香族炭化水素、ハロゲン化炭化水素等には、膨潤または、溶解の恐れがあるため注意が必要です。
5. センサ前面に「フィルタ(カバー)等」を置き、透過して検知使用しますと、「前面のフィルタ(カバー)等を検知」「検知距離の変化」「不安定動作」が発生することがあります。
6. 本センサを対向するような位置関係で 사용되는場合、対向するセンサからの光を受けて相互干渉し、誤動作する場合があります。センサの設置条件をご確認の上、ご利用ください。
7. センサ複数個を並行に配置して使用する場合、隣り合うセンサとの間隔は、10cm 以上開けて取付け、相互干渉がないことをご確認の上、ご利用ください。

| 品番           | センサ間隔 |
|--------------|-------|
| KMBA1 series | 5 cm  |
| KMA1 series  | 8 cm  |
| KMBA2 series | 10 cm |
| KMBA3 series | 20 cm |

## <推奨取付け方向について>

検出物体の進入方向に対してセンサの取付方向は、下図のようにしてください。



使用周囲温度及び湿度範囲につきましては、センサを連続的に動作することができる温度、湿度であり耐久性能、耐環境性能を保証するものではありません。

一般的に高温度、高湿度の環境下では電子部品等の劣化が加速されますのでご採用の際は事前に使用される環境を想定した信頼性の確認をお願いします。

弊社モーションセンサ(KM シリーズ)を対向するような位置関係でご利用される場合、相手側のセンサから光を受けて相互干渉し、誤動作する場合があります。センサの設置条件をご確認の上、ご利用ください。

設計・仕様について予告なく変更する場合があります。ご購入及びご使用前に当社の技術仕様書などをお求め願い、それらに基づいて購入及び使用していただきますようお願いいたします。なお、本製品の安全性について疑義が生じたときは、速やかに当社へご通知をいただき、必ず技術検討をしてください。

## <注意事項>

- (1) 当仕様書は部品単体での品質保証をするものです。  
ご使用に際しては貴社製品に実装された状態で必ず評価、確認をしてください。
- (2) 当仕様書の記載内容を逸脱して当製品をご使用にならないでください。また、定格、環境条件など仕様範囲を越えて使用しないでください。仕様範囲を越えて使用した場合、異常発熱、発煙等で回路破損による事故の恐れがあります。
- (3) コネクタの接続につきましては、コネクタ結線図・仕様図等でピン位置をご確認の上、正しく接続してください。誤った接続をされますと、予期せぬ誤動作、異常発熱、発煙等で、回路損傷の原因となる恐れがありますので、ご注意ください。
- (4) モーションセンサを分解もしくは改造して使用しないでください。
- (5) 交通輸送機器(列車、自動車、交通信号機等)、医療機器、航空・宇宙機器、電熱用品、燃焼およびガス機器、回転機器、防災・防犯機器等、各種安全機器や安全装置、列車、自動車などの制御やその安全に関する装置等の機器において、当製品の不具合で人命その他の重大な損害発生が予測される場合は、下記のご検討等でフェールセーフ設計の配慮を十分行い、安全性の確保をお願いいたします。
  - ・保護回路、保護装置を設けてシステムとしての安全を図る
  - ・冗長回路などを設けて単一故障では不安全とならないように、システムとして安全を図る
- (6) 本製品の安全性について疑義が生じたときは、速やかに当社へご通知いただくと共に、貴社にて必ず技術検討をして下さい。
- (7) 当製品は、一般電子機器(AV 製品、家電製品、事務機器、情報・通信機器など)に、汎用標準的な用途使用されることを意図しており、下記の特種環境での使用を考慮した設計はしていません。  
したがって、下記の特種環境でのご使用及び条件では性能に影響を受ける恐れがあり、ご使用に対しては貴社にて十分に性能・信頼性等をご確認の上ご使用ください。
  - ①水、油、薬液、有機溶剤等の液体中でのご使用。
  - ②直射日光、屋外暴露、塵埃中でのご使用。
  - ③潮風、Cl<sub>2</sub>、H<sub>2</sub>S、NH<sub>3</sub>、SO<sub>2</sub>、NO<sub>x</sub> 等の腐食性ガスの多い場所でのご使用。
  - ④静電気や電磁波の強い環境でのご使用。
  - ⑤発熱部品に近接して取り付けの場合及び当製品に近接してビニール配線等可燃物を配置する場合。
  - ⑥当製品を樹脂などで封止してご使用の場合。
  - ⑦本製品が結露するような場所でのご使用。

### <保管時の注意事項>

以下の環境および条件で保管されますと、性能劣化やはんだ付け性等の性能に影響を受ける恐れがありますので、下記の環境での保管は避けてください。

- ①潮風、Cl<sub>2</sub>、H<sub>2</sub>S、NH<sub>3</sub>、SO<sub>2</sub>、NO<sub>x</sub> 等の腐食性ガスの多い場所での保管。
- ②直射日光の当たる場所での保管。
- ③温度：-30～85℃、湿度 15～85%以外での保管。
- ④貴社到着日より 1 年以上経過した保管。

### <法律及び規制>

- ① 当製品は、モントリオール議定書で規制されているオゾン層破壊物質(ODC)を当社の製造工程では一切使用しておりません。
- ② 本製品は RoHS(電気電子機器に含まれる特定有害物質の使用制限に関する)指令(2015/863/EU)に対応しております。
- ③ この製品の仕様材料は“化学物質の審査および製造等の規制に関する法律”に基づき、すべて既存化学物質として記載されている材料です。
- ④ この製品の外国為替および外国貿易管理法・輸出管理令別表第一に基づく該/否判定の書面通知が必要な場合は、当方までご連絡ください。

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## <特記事項>

### 1. 適合規格 EN50081-1

EN50082-1

(本製品は EMC 指令に対応しております)

### 2. 本品の品質管理には最大限の注力をいたしますが、

- (1) 本仕様書記載以外の事項での不足の事態の発生を可能な限り防止するために貴社製品の仕様並びに需要先、本品の使用条件、本品の取り付け部の詳細等をご提示いただきますようお願いいたします。
- (2) 万一、本品の品質不良が原因となり、人命並びに財産に多大の影響が予測される場合には、本仕様書記載の保証特性・性能の数値に対し余裕を持たれ、かつ、二重回路等の安全対策を組み込んでいただくことは、製造物責任の観点からもお勧めします。
- (3) 本品の品質保証期間は貴社納入後 1 年間とし、本仕様書に記載された項目とその範囲に限定させていただきます。  
貴社納入後に万一、本品に弊社の責による瑕疵が明らかになった場合には、誠意をもって代替品の提供または、本品の瑕疵部品の交換、修理を本品の納入場所で速やかに行わせていただきます。

但し、次の場合は、この保証の対象から除かせていただきます。

- ①納入品の故障や瑕疵から誘発された他の損害の場合。
- ②貴社納入後の取扱い、保管、運搬(輸送)等において、本仕様書記載以外の条件が本品に加わった場合。
- ③本製品を貴社の機器に組み込んで使用される際、貴社の機器が業界の通念上備えられている機能、構造などを持っていれば回避できた損害の場合。
- ④貴社納入時までに実用化されていた技術では、予見するが不可能であった現象に起因する場合。
- ⑤地震・洪水・火災・紛争など弊社に責のない自然或いは、人為的災害による場合。

・ご購入または納入品につきましては、速やかに受入検査を行っていただくとともに、本製品の受入検査前または検査中の扱いにつきましては、管理保全に十分なご配慮をお願いします。

### 3. ご注文・ご使用に際してのお願い

本資料に記載された製品および仕様は、製品の改良などで変更(仕様変更、製造中止を含む)することがありますので、記載の製品の量産設計検討やご注文に際しては本資料に記載された情報が最新のものであることを、当社窓口までお問い合わせのうえ、ご確認くださいようお願いします。

#### <安全に関するご注意>

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また、使用環境、使用条件によって耐久性が異なります。ご使用にあたっては、必ず実使用条件にて実機確認を行ってください。性能が劣化した状態で引き続き使用されますと、絶縁劣化により、異常発熱、発煙、発火のおそれがあります。製品の故障もしくは寿命により、結果として人身事故、火災事故、社会的な損害などを生じさせないよう冗長設計、延焼対策設計、誤動作防止設計などの安全設計や定期的な保守の実施をお願いします。

当社は製品の用途に応じて品質水準を「標準水準」、「特別水準」およびお客様に品質保証プログラムを指定頂く「特定水準」に分類しております。各品質水準は、以下に示す用途に製品が使われることを意図しております。

標準水準：コンピュータ、OA 機器、通信機器、AV 機器、家電、工作機械、

パーソナル機器、産業用ロボット

特別水準：輸送機器(自動車、列車、船舶等)、交通用信号機器、防犯・防災装置、

電力機器、各種安全装置、生命維持を直接の目的としない医療機器

特定水準：航空機器、航空宇宙機器、海中継機器、原子力制御システム、

生命維持のための医療機器・装置またはシステム

当社製品を下記の条件にて使用をご検討の場合は、必ず事前に当社窓口へご相談いただき、仕様書の取り交わしをお願いします。

- (1) 上記の「特別水準」、「特定水準」の用途でご使用される場合。
- (2) 「標準水準」であっても本資料に記載された仕様や環境・条件の範囲を越えて使用される可能性のある場合、また記載のない条件や環境での使用をご検討の場合。

設計・仕様について予告なく変更する場合があります。ご購入及びご使用前に当社の技術仕様書などをお求め願い、それらに基づいて購入及び使用していただきますようお願いします。なお、本製品の安全性について疑義が生じたときは、速やかに当社へご通知をいただき、必ず技術検討をしてください。

■ Use environment

- 1) Avoid use in the steamy or dusty environment, the corrosive gas, an environment where organic solvent can be adhered.
- 2) When using in a high-noise environment, perform countermeasures such as installing capacitor (of 33  $\mu$ F or over) on the power input terminal of the sensor. Before use, check the performance under actual use conditions.

■ Wire connection

- 1) Before the power is supplied, recheck wiring as misconnection may damage the internal circuit. (ensure to avoid reverse connection)
- 2) Use wires shorter than 3 m 9.842 ft to protect the internal circuit. Before use, check under actual use conditions if there is no influence by surrounding environments.
- 3) Do not repeatedly attach/detach the connector.

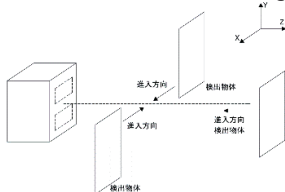
■ Detecting part

- 1) Keep the detecting surface clean. The detecting surface is resistant to trash/ dust, however if an excessive amount of trash/dust adhere to the surface, it may reduce the margin of detecting distance.
- 2) Dew condensation on the detecting surface may cause malfunction.
- 3) The sensor aims to detect human bodies. If the targeted object has extremely low reflectivity (e.g., objects frosted by black rubbers) or extremely high reflectivity (e.g., objects which regularly reflect: mirrors, glasses or glossy papers), the sensor may not be able to detect or the detecting distance may become unstable.
- 4) The front face of the lense and the case are polycarbonate-based. Generally they are stable against water, alcohol, oil, salt and weak acids. However, avoid alkalis, aromatic hydrocarbons and halogenated hydrocarbons as those substances may expand or melt the lense and the case.
- 5) If placing filters (covers) in front of the sensor and perform detection through the filters, following may occur: detection of the filters (covers), changes of the detecting distance or unstable operations.
- 6) If sensors are in facing positions, light from the opposing sensor may cause mutual interferences and malfunction. Before use, check the installation conditions.
- 7) When arranging multiple sensors in parallel, keep the interval of neighboring sensors as below or over. Before use, ensure that there is no mutual interference.

| Part NO.     | Sensor interval |
|--------------|-----------------|
| KMBA1 series | 5 cm            |
| KMA1 series  | 8 cm            |
| KMBA2 series | 10 cm           |
| KMBA3 series | 20 cm           |

■ Recommended mounting direction

As below, install the sensor for the X and Z advancing directions of the targeted object.



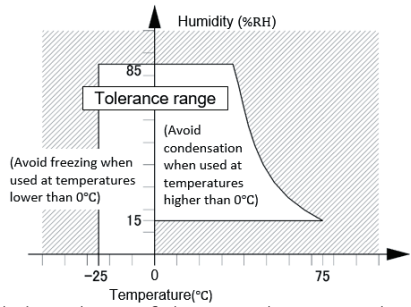
For general precautions, see “General precautions for motion sensor” in the next page.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product. Please be sure to contact us immediately.

■ Ambient operating conditions

- 1) Temperature: Refer to the absolute maximum ratings for the temperature of each individual sensor.
- 2) Humidity : 15 % to 85 % RH  
(No freezing nor condensation at low temperature)
- 3) Atmospheric pressure: 86 to 106 kPa
- 4) Because the humidity range differs depending on the ambient temperature, the humidity range indicated below should be used. Continuous operation of the switch is possible within this range, but continuous use near the limit of the range should be avoided. This humidity range does not guarantee permanent performance.

< Motion sensor >



- In general, degradation of electronic devices accelerates when they are operated under conditions of high temperature or high humidity. Before use, confirm the reliability of the sensors under the expected operating conditions.
- 5) The sensors do not have a water-proof or dust-proof construction. Depending on the ambient operating conditions, some means of providing protection from water and dust and preventing the formation of ice and condensation must be provided prior to using the sensors. If a sensor is used with a cover installed, the initial detection performance specifications may not be able to be met. Confirm the operation under the actual operating conditions.
  - 6) Take care to avoid exposing the sensors to heat, vibration or impact since malfunctioning may result.

■ Concerning external surge voltage

Since the internal circuitry may be destroyed if an external surge voltages is supplied, provide

■ Concerning power supplysuperimposed noise

- 1) Use a regulated power supply as the power supply. Otherwise, power supplysuperimposed noise may cause the sensors to malfunction.
- 2) To maintain the power supply noise performance, be certain to connect a capacitor (33  $\mu$ F or more) to the sensor power supply input terminal in order to stabilize the power supply voltage.

■ Drop damage

If the sensor is dropped, damage can occur resulting in incorrect operation. If dropped, be sure to do a visual check the operation characteristics for faulty operation.

■ Concerning the circuit sides

Since the circuit sides given in this catalog are not protected in terms of circuit design, check out the performance and reliability of the circuits prior to using the sensor.

限定反射型

## Safety precautions

Head the following precautions to prevent injury or accidents.

- Do not use these sensors under any circumstances in which the range of their ratings, environment conditions or other specifications are exceeded. Using the sensors in any way which causes their specifications to be exceeded may generate abnormally high levels of heat, emit smoke, etc., resulting in damage to the circuitry and possibly causing an accident.
- Before connecting a connector, check the pin layout by referring to the connector wiring diagram, specifications diagram, etc., and make sure that the connector is connected properly. Take note that mistakes made in connection may cause unforeseen problems in operation, generate abnormally high levels of heat, emit smoke, etc., resulting in damage to the circuitry.
- Do not use any motion sensor which has been disassembled or remodeled.
- Protection circuit recommended The possible failure mode is either open or short of the output transistor. An excess heat is the cause for short mode failure. For any important and serious application in terms of safety, add protection circuit or any other protection method.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product. Please be sure to contact us immediately.

# KP1430

プリズム フォトセンサ Prism Photo Sensor



## 概要 Description

KP1430 は、赤外発光ダイオードと高感度フォトトランジスタを組み合わせたプリズム対応反射型フォトセンサです。

Model KP1430 is a prism type photo sensor consisted of an Infrared LED and a Photo transistor.

## 特長 Feature

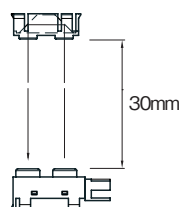
- ・ 物体位置検出精度が高い
- ・ 反射率の低い紙幣、黒紙などの有無検出が可能
- ・ センサ・プリズム間ギャップを任意に設定可能
- ・ 2 連分離型センサとしても使用可能
- ・ High resolution to object position.
- ・ Available for detection of bill/dark paper.
- ・ Distance between sensor and prism can be set.
- ・ For application of dual beam sensor.

## 用途 Application

- ・ 紙幣、コピー用紙等の有無、エッジ検出
- ・ 物体の位置検出
- ・ Paper absence and Paper edge detection on Bill, Copying machine, Printer, and Facsimile.
- ・ Object position detection.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                          |                                        | Symbol | Rating    | Unit |
|-------------------------------|----------------------------------------|--------|-----------|------|
| 発 光 側<br>Emitter              | 順 電 流 Forward Current                  | IF     | 50        | mA   |
|                               | パルス順電流 Pulse Forward Current ※1        | IFP    | 0.3       | A    |
|                               | 逆 電 圧 Reverse Voltage                  | VR     | 5         | V    |
|                               | 許 容 損 失 Power Dissipation              | P      | 75        | mW   |
| 受 光 側<br>Detector             | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO   | 30        | V    |
|                               | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO   | 5         | V    |
|                               | コレクタ電流 Collector Current               | IC     | 20        | mA   |
|                               | コレクタ損失 Collector Power Dissipation     | PC     | 75        | mW   |
| 動 作 温 度 Operating Temperature |                                        | Topr   | -20 ~ +75 | °C   |
| 保 存 温 度 Storage Temperature   |                                        | Tstg   | -30 ~ +85 | °C   |

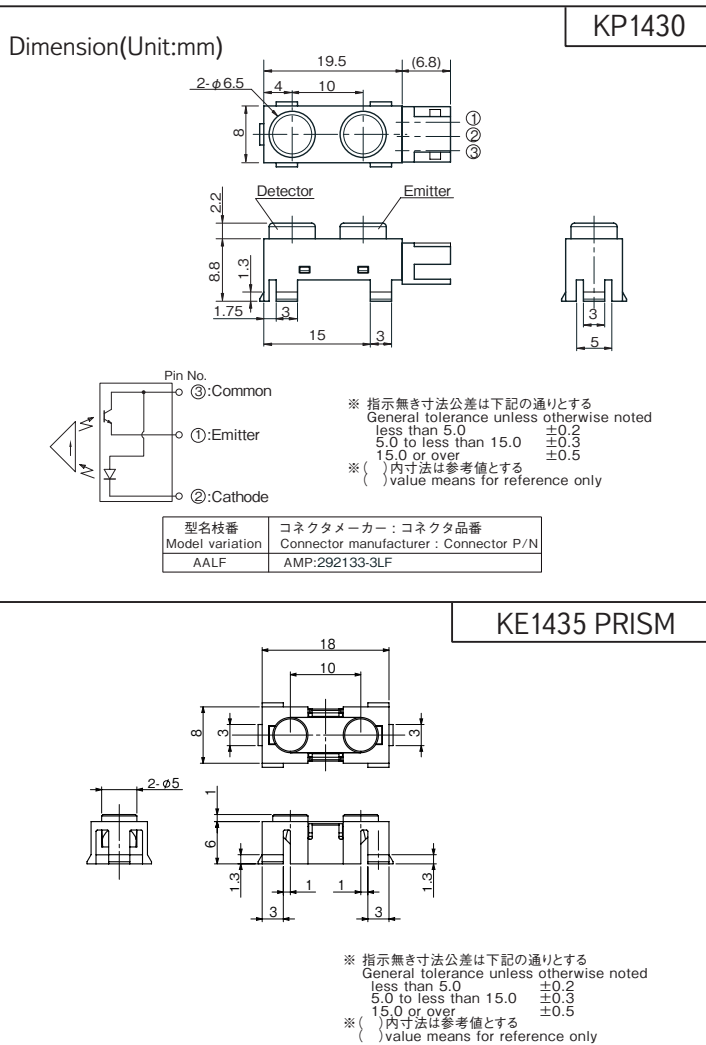


- ※1 パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
 ※2 センサ - プリズム間  $d=30mm$   
 ※3 反射物無し 暗黒中  
 ※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01  
 ※2. KP1430-Prism  $d=30mm$   
 ※3. No prism, No object, in dark

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item               |                                   | Symbol       | Condition                        | min. | typ. | max. | Unit    |
|--------------------|-----------------------------------|--------------|----------------------------------|------|------|------|---------|
| 発 光 側<br>Emitter   | 順 電 圧 Forward Voltage             | VF           | IF=20mA                          | —    | 1.2  | 1.5  | V       |
|                    | 逆 電 流 Reverse Current             | IR           | VR=5V                            | —    | —    | 10   | $\mu A$ |
| 受 光 側<br>Detector  | 暗 電 流 Dark Current                | ICEO         | VCE=20V, 0 lx                    | —    | —    | 0.2  | $\mu A$ |
| 伝 達 特 性<br>Coupled | 光 電 流 Light Current ※2            | IC           | VCE=5V, IF=10mA, d=30mm          | 0.3  | —    | —    | mA      |
|                    | 漏 れ 電 流 Leak Current ※3           | ILEAK        | VCE=5V, IF=10mA                  | —    | —    | 50   | $\mu A$ |
|                    | コレクタ・エミッタ間飽和電圧 Saturation Voltage | VCE(sat)     |                                  | —    | —    | 0.4  | V       |
|                    | 応 答 時 間<br>Response Time          | 上昇 Rise Time | VCC=5V, IC=0.5mA, RL=1k $\Omega$ | —    | 24   | —    | $\mu s$ |
|                    |                                   | 下降 Fall Time |                                  | —    | 27   | —    |         |

\*\* : Ta=25°C unless otherwise noted



# KP1430

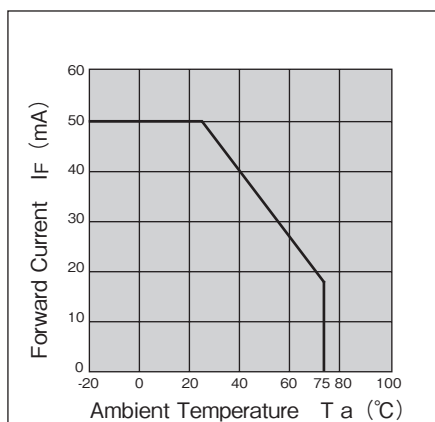
## 定格・特性曲線

Characteristics

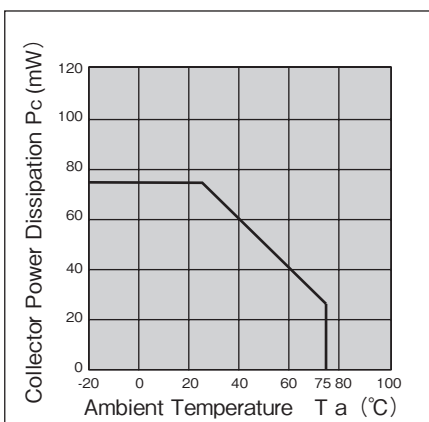
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

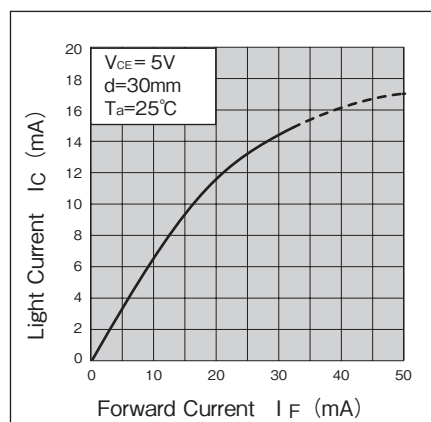
### 順電流低減曲線



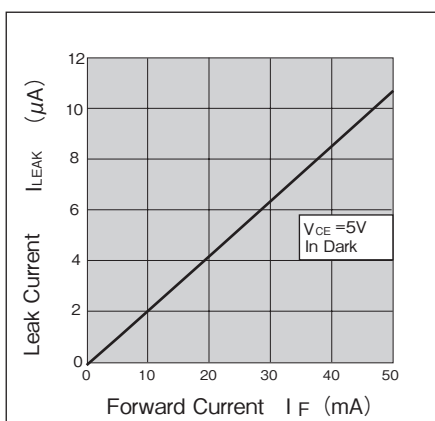
### コレクタ損失低減曲線



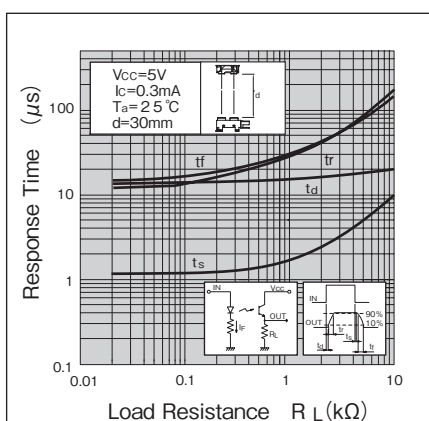
### 光電流—順電流特性(代表例)



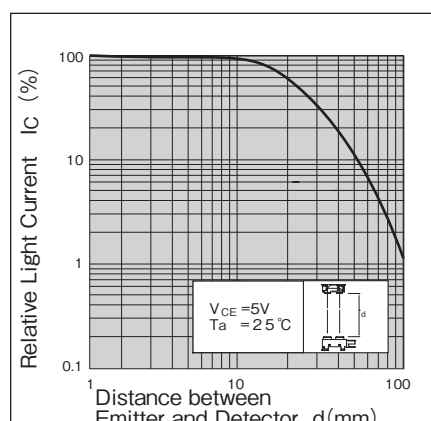
### 漏れ電流—順電流特性(代表例)



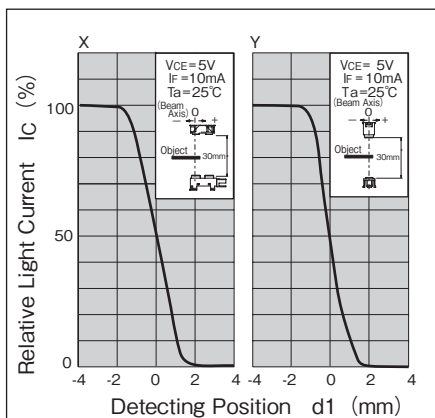
### 応答時間—負荷抵抗特性(代表例)



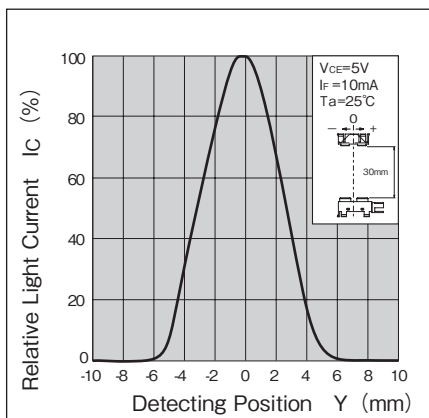
### 距離特性(代表例)



### 検出位置特性(代表例)



### 平行移動特性(代表例)



・ カスタマイズも承ります。お気軽にお問合せください

・ A Customized design available on request.

・ この仕様は改良のため予告なく変更する場合があります

・ Specifications are subject to change without notice.

# KP1650/1651

プリズム フォトセンサ Prism Photo Sensor



## 概要 Description

KP1650/1651 は、赤外発光ダイオードと高感度フォトトランジスタを組み合わせたプリズム対応反射型フォトセンサです。

Model KP1650/1651 are a prism type photo sensor consisted of an Infrared LED and a Photo transistor.

## 特長 Feature

- ・ 物体位置検出精度が高い
- ・ 反射率の低い紙幣、黒紙などの有無検出が可能
- ・ センサ・プリズム間ギャップを任意に設定可能
- ・ 2 連分離型センサとしても使用可能
- ・ High resolution to object position.
- ・ Available for detection of bill/dark paper.
- ・ Distance between sensor and prism can be set.
- ・ For application of dual beam sensor.

## 用途 Application

- ・ 紙幣、コピー用紙等の有無、エッジ検出
- ・ 物体の位置検出
- ・ Paper absence and Paper edge detection on Bill, Copying machine, Printer, and Facsimile.
- ・ Object position detection.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                          |                                        | Symbol           | Rating    | Unit |
|-------------------------------|----------------------------------------|------------------|-----------|------|
| 発 光 側<br>Emitter              | 順 電 流 Forward Current                  | IF               | 50        | mA   |
|                               | パルス順電流 Pulse Forward Current ※1        | IFP              | 0.5       | A    |
|                               | 逆 電 圧 Reverse Voltage                  | VR               | 5         | V    |
|                               | 許 容 損 失 Power Dissipation              | P                | 75        | mW   |
| 受 光 側<br>Detector             | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 30        | V    |
|                               | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 5         | V    |
|                               | コレクタ電流 Collector Current               | IC               | 20        | mA   |
|                               | コレクタ損失 Collector Power Dissipation     | PC               | 75        | mW   |
| 動 作 温 度 Operating Temperature |                                        | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保 存 温 度 Storage Temperature   |                                        | T <sub>stg</sub> | -30 ~ +80 | °C   |



- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01  
 ※ 2. センサ・プリズム間  $d=20mm$   
 ※ 3. 反射物無し 暗黒中  
 ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01  
 ※ 2. KP1650(1651)-Prism  $d=20mm$   
 ※ 3. No prism, No object, in dark

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item               |                                   | Symbol               | Condition                                                       | min. | typ. | max. | Unit |
|--------------------|-----------------------------------|----------------------|-----------------------------------------------------------------|------|------|------|------|
| 発 光 側<br>Emitter   | 順 電 圧 Forward Voltage             | V <sub>F</sub>       | I <sub>F</sub> =20mA                                            | —    | 1.3  | 1.5  | V    |
|                    | 逆 電 流 Reverse Current             | I <sub>R</sub>       | V <sub>R</sub> =5V                                              | —    | —    | 10   | μA   |
| 受 光 側<br>Detector  | 暗 電 流 Dark Current                | I <sub>CEO</sub>     | V <sub>CE</sub> =20V, 0 lx                                      | —    | —    | 0.2  | μA   |
|                    | 光 電 流 Light Current ※2            | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA, d=20mm               | 0.3  | 2.0  | —    | mA   |
| 伝 達 特 性<br>Coupled | 漏 れ 電 流 Leak Current ※3           | I <sub>LEAK</sub>    | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                       | —    | —    | 25   | μA   |
|                    | コレクタ・エミッタ間飽和電圧 Saturation Voltage | V <sub>CE(sat)</sub> |                                                                 | —    | —    | 0.4  | V    |
|                    | 応 答 時 間<br>Response Time          | 上昇<br>Rise Time      | V <sub>CC</sub> =5V, I <sub>C</sub> =0.5mA, R <sub>L</sub> =1kΩ | —    | 22   | —    | μs   |
|                    |                                   | 下降<br>Fall Time      |                                                                 | —    | 22   | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KP1650/1651

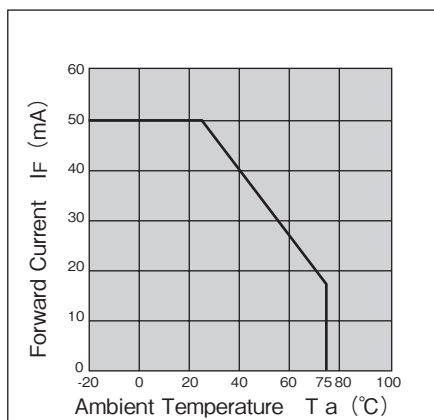
## 定格・特性曲線

Characteristics

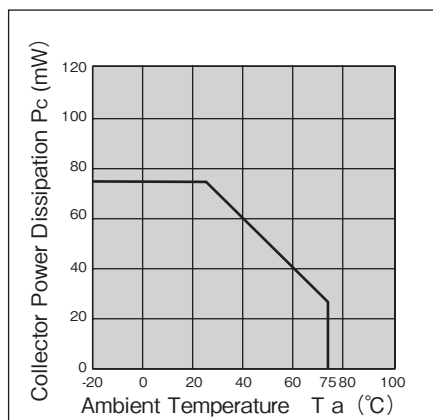
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

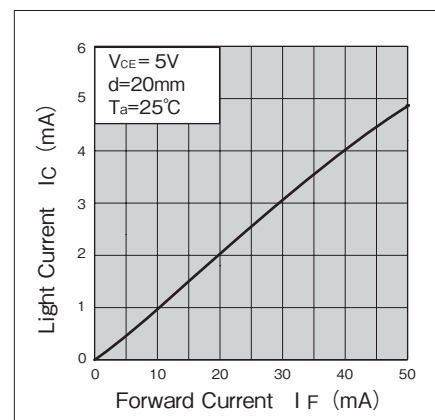
### 順電流低減曲線



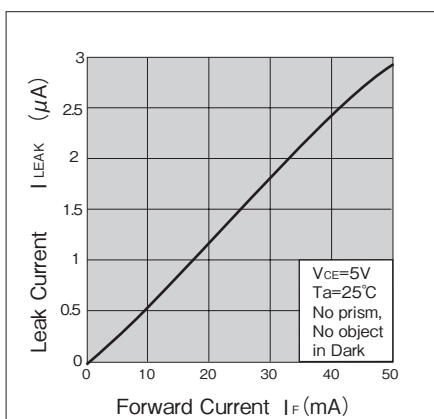
### コレクタ損失低減曲線



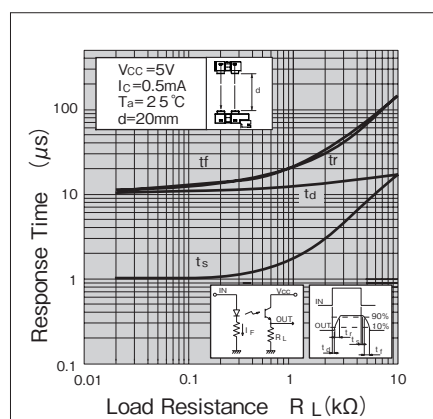
### 光電流－順電流特性(代表例)



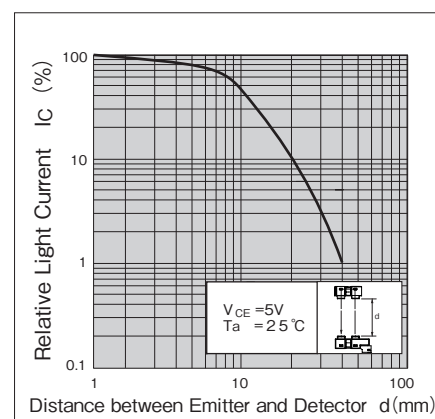
### 漏れ電流－順電流特性(代表例)



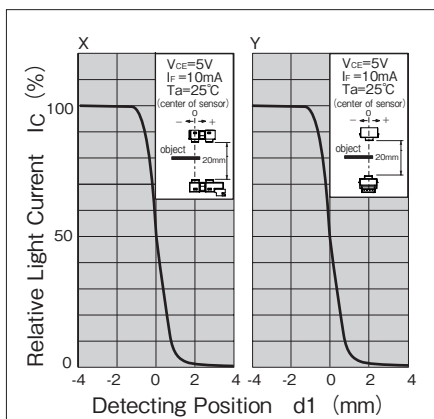
### 応答時間－負荷抵抗特性(代表例)



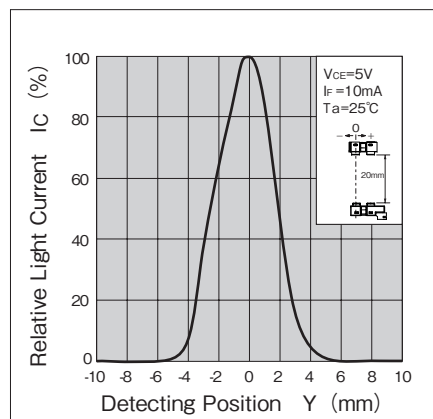
### 距離特性(代表例)



### 検出位置特性(代表例)



### 平行移動特性(代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

# KP1660

プリズム フォトセンサ Prism Photo Sensor



## 概要 Description

KP1660 は、赤外発光ダイオードと高感度フォトトランジスタを組み合わせたプリズム対応反射型フォトセンサです。

Model KP1660 is a prism type photo sensor consisted of an Infrared LED and a Photo transistor.

## 特長 Feature

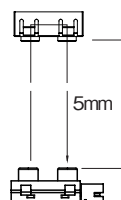
- ・ 物体位置検出精度が高い
- ・ 反射率の低い紙幣、黒紙などの有無検出が可能
- ・ センサ・プリズム間ギャップを任意に設定可能
- ・ 2 連分離型センサとしても使用可能
- ・ High resolution to object position.
- ・ Available for detection of bill/dark paper.
- ・ Distance between sensor and prism can be set.
- ・ For application of dual beam sensor.

## 用途 Application

- ・ 紙幣、コピー用紙等の有無、エッジ検出
- ・ 物体の位置検出
- ・ Paper absence and Paper edge detection on Bill, Copying machine, Printer, and Facsimile.
- ・ Object position detection.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item            |              | Symbol | Rating    | Unit |
|-----------------|--------------|--------|-----------|------|
| 発光側<br>Emitter  | 順電流          | IF     | 50        | mA   |
|                 | パルス順電流       | IFP    | 0.3       | A    |
|                 | 逆電圧          | VR     | 5         | V    |
|                 | 許容損失         | P      | 75        | mW   |
| 受光側<br>Detector | コレクタ・エミッタ間電圧 | VCEO   | 30        | V    |
|                 | エミッタ・コレクタ間電圧 | VECO   | 5         | V    |
|                 | コレクタ電流       | IC     | 20        | mA   |
|                 | コレクタ損失       | PC     | 75        | mW   |
| 動作温度            |              | Topr   | -10 ~ +60 | °C   |
| 保存温度            |              | Tstg   | -10 ~ +60 | °C   |



- ※ 1 パルス幅  $t_w \leq 100\mu s$  Duty 比 = 0.01
- ※ 2 センサ・プリズム間  $d=5mm$
- ※ 3 反射物無し 暗黒中
- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio = 0.01
- ※ 2. KP1660-Prism  $d=5mm$
- ※ 3. No prism, No object, in dark

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                       | Symbol          | Condition                        | min. | typ. | max. | Unit    |
|-----------------|-----------------------|-----------------|----------------------------------|------|------|------|---------|
| 発光側<br>Emitter  | 順電圧                   | VF              | IF=20mA                          | —    | 1.2  | 1.5  | V       |
|                 | 逆電流                   | IR              | VR=5V                            | —    | —    | 10   | $\mu A$ |
| 受光側<br>Detector | 暗電流                   | ICEO            | VCE=20V, 0 lx                    | —    | —    | 0.2  | $\mu A$ |
|                 | 光電流                   | IC              | VCE=5V, IF=10mA, d=5mm           | 0.3  | —    | —    | mA      |
| 伝達特性<br>Coupled | 漏れ電流                  | ILEAK           | VCE=5V, IF=10mA                  | —    | —    | 50   | $\mu A$ |
|                 | コレクタ・エミッタ間飽和電圧        | VCE(sat)        |                                  | —    | —    | 0.4  | V       |
|                 | 応答時間<br>Response Time | 上昇<br>Rise Time | VCC=5V, IC=0.5mA, RL=1k $\Omega$ | —    | 24   | —    | $\mu s$ |
|                 |                       | 下降<br>Fall Time |                                  | —    | 27   | —    |         |

\*\* : Ta=25°C unless otherwise noted



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# KP1660

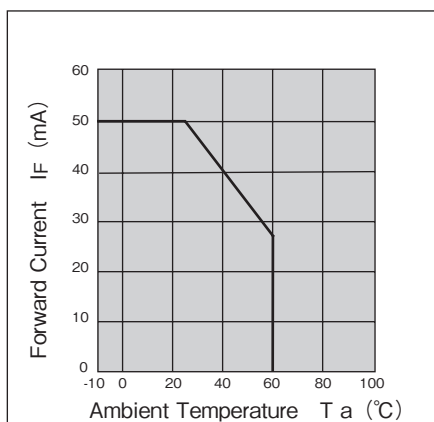
## 定格・特性曲線

Characteristics

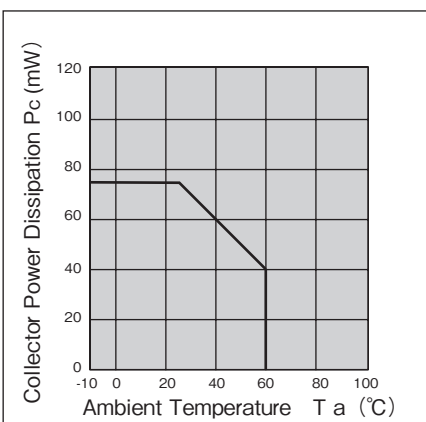
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

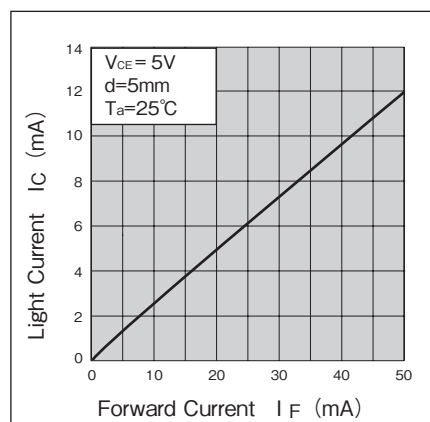
### 順電流低減曲線



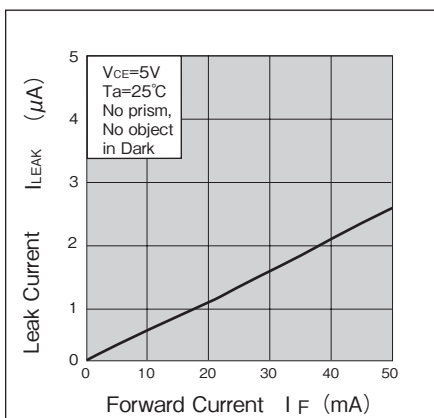
### コレクタ損失低減曲線



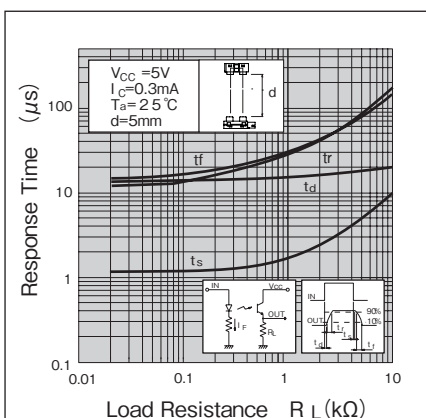
### 光電流－順電流特性(代表例)



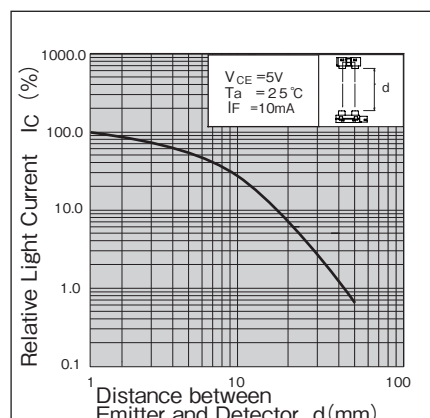
### 漏れ電流－順電流特性(代表例)



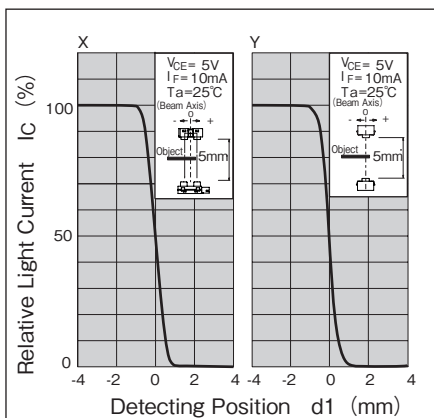
### 応答時間－負荷抵抗特性(代表例)



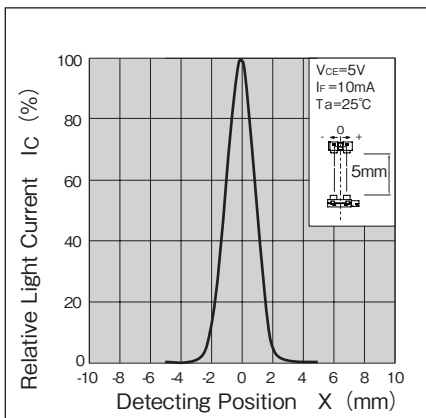
### 距離特性(代表例)



### 検出位置特性(代表例)



### 平行移動特性(代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

# KP1662/1663

プリズム フォトセンサ Prism Photo Sensor



## 概要 Description

KP1662/1663 は、赤外発光ダイオードと高感度フォトトランジスタを組み合わせたプリズム対応反射型フォトセンサです。  
Model KP1662/1663 are prism type photo sensor and consist of an Infrared LED and a Photo transistor.

## 特長 Feature

- ・ スナップ構造で取付が容易
- ・ 物体位置検出精度が高い
- ・ 反射率の低い紙幣、黒紙などの有無検出が可能
- ・ センサ・プリズム間ギャップを任意に設定可能
- ・ 2 連分離型センサとしても使用可能
- ・ Easy to install by snap in.
- ・ High resolution to object position.
- ・ Available for detection of bill/dark paper.
- ・ Distance between sensor and prism can be set.
- ・ For application of dual beam sensor.

## 用途 Application

- ・ 紙幣、コピー用紙等の有無、エッジ検出
- ・ 物体の位置検出
- ・ Paper absence and Paper edge detection on Bill, Copying machine, Printer, and Facsimile.
- ・ Object position detection.

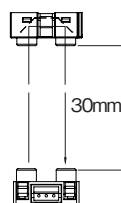
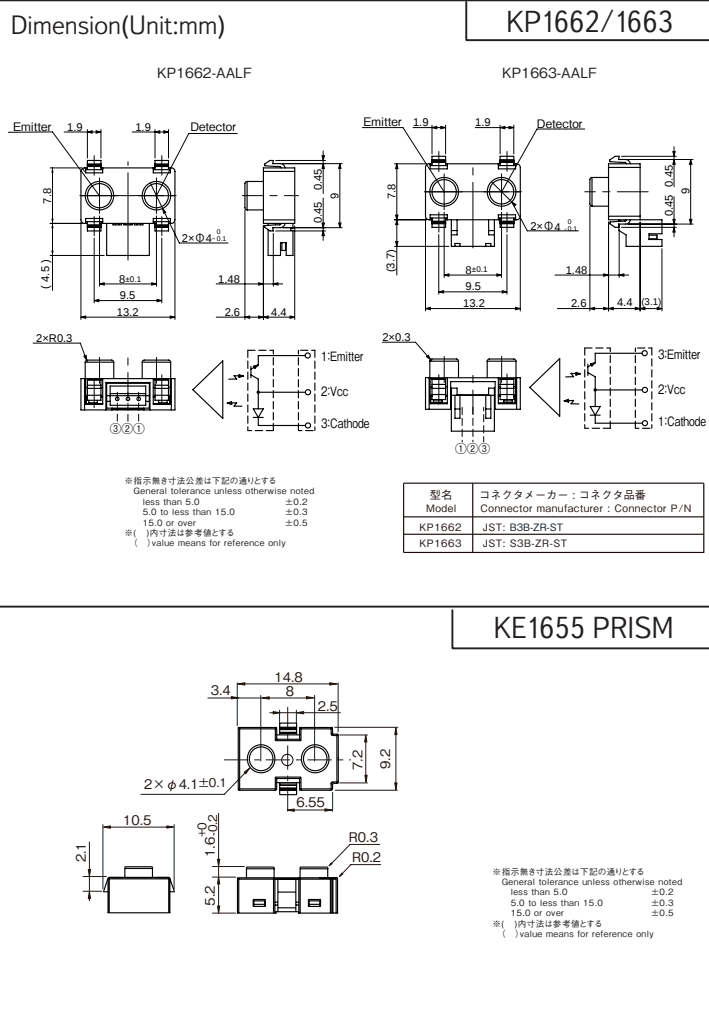
## 最大定格 Maximum Ratings [Ta=25℃ \*\*]

| Item            |              | Symbol           | Rating    | Unit |
|-----------------|--------------|------------------|-----------|------|
| 発光側<br>Emitter  | 順電流          | IF               | 50        | mA   |
|                 | パルス順電流       | IFP              | 0.3       | A    |
|                 | 逆電圧          | VR               | 5         | V    |
|                 | 許容損失         | P                | 75        | mW   |
| 受光側<br>Detector | コレクタ・エミッタ間電圧 | VCEO             | 30        | V    |
|                 | エミッタ・コレクタ間電圧 | VECO             | 5         | V    |
|                 | コレクタ電流       | IC               | 20        | mA   |
|                 | コレクタ損失       | PC               | 75        | mW   |
| 動作温度            |              | T <sub>opr</sub> | -20 ~ +75 | ℃    |
| 保存温度            |              | T <sub>stg</sub> | -30 ~ +80 | ℃    |

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25℃ \*\*]

| Item            |                       | Symbol               | Condition                | min. | typ. | max. | Unit |
|-----------------|-----------------------|----------------------|--------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧                   | VF                   | IF=20mA                  | —    | 1.3  | 1.5  | V    |
|                 | 逆電流                   | IR                   | VR=5V                    | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流                   | ICEO                 | VCE=10V, 0 lx            | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流                   | IC                   | VCE=5V, IF=20mA, d=30mm  | 0.3  | —    | —    | mA   |
|                 | 漏れ電流                  | ILEAK                | VCE=5V, IF=20mA          | —    | —    | 25   | μA   |
|                 | コレクタ・エミッタ間飽和電圧        | V <sub>CE(sat)</sub> |                          | —    | —    | 0.4  | V    |
|                 | 応答時間<br>Response Time | 上昇<br>Rise Time      | VCC=5V, IC=0.3mA, RL=1kΩ | —    | 24   | —    | μs   |
|                 |                       | 下降<br>Fall Time      |                          | —    | 25   | —    |      |

\*\* : Ta=25℃ unless otherwise noted



- ※ 1 パルス幅  $t_w \leq 100\mu s$  Duty比 = 0.01
- ※ 2 センサ - プリズム間  $d=30mm$
- ※ 3 反射物無し 暗黒中

- ※ 1 . Pulse width  $t_w \leq 100\mu s$   
Duty ratio=0.01
- ※ 2 . KP1662(1663)-Prism  $d=30mm$
- ※ 3 . No prism, No object, in dark



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# KP1662/1663

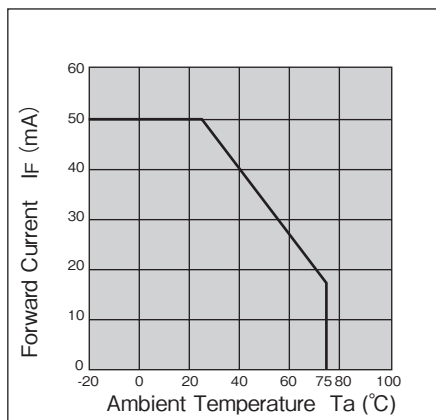
定格・特性曲線

※注意 最大定格を超えないようにご使用ください

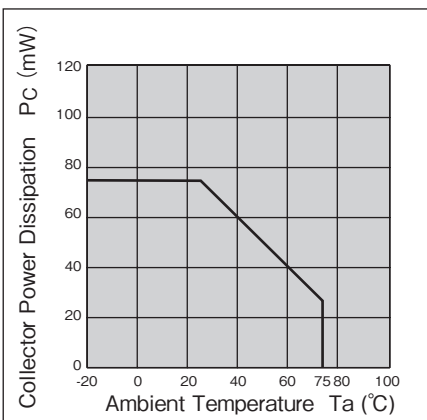
Characteristics

Note: Operation never exceeds each value of Maximum Ratings.

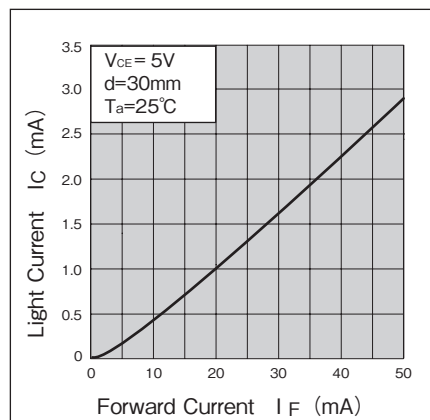
順電流低減曲線



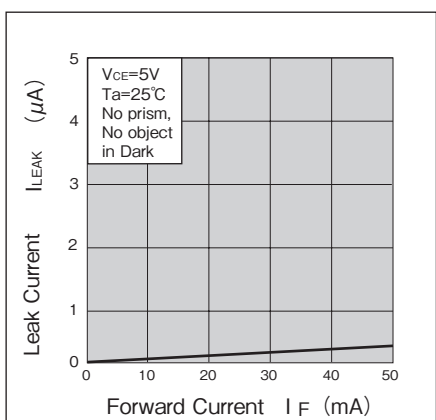
コレクタ損失低減曲線



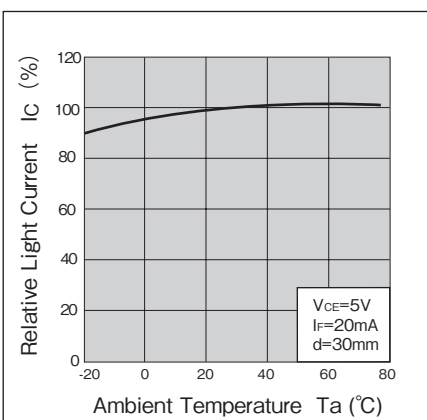
光電流－順電流特性(代表例)



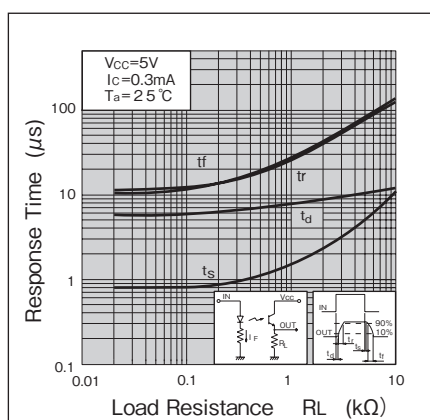
漏れ電流－順電流特性(代表例)



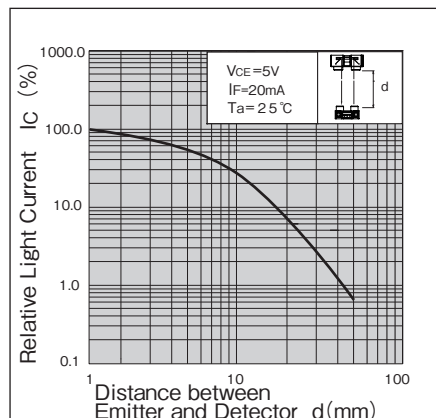
光電流－周囲温度特性(代表例)



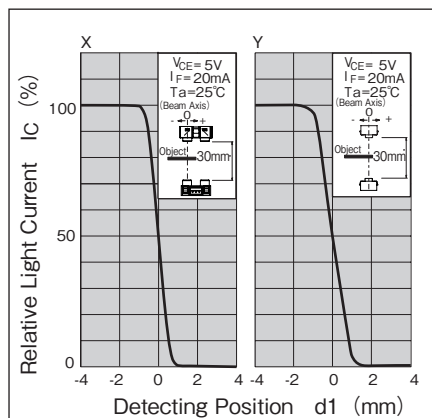
応答時間－負荷抵抗特性(代表例)



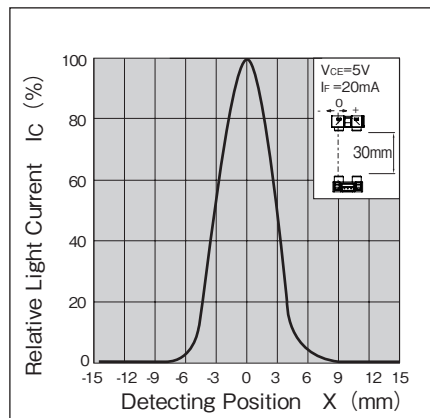
距離特性(代表例)



検出位置特性(代表例)



平行移動特性(代表例)



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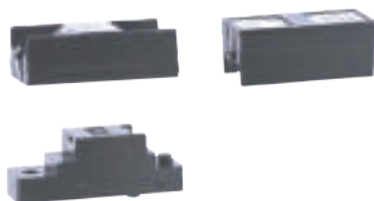
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・ A Customized design available on request.

・ Specifications are subject to change without notice.

# KP1850

プリズム フォトセンサ Prism Photo Sensor



## 概要 Description

KP1850 は、発光側に赤外発光ダイオード、受光側に変調式フォト IC を採用した防塵型のプリズム対応反射型フォトセンサです。

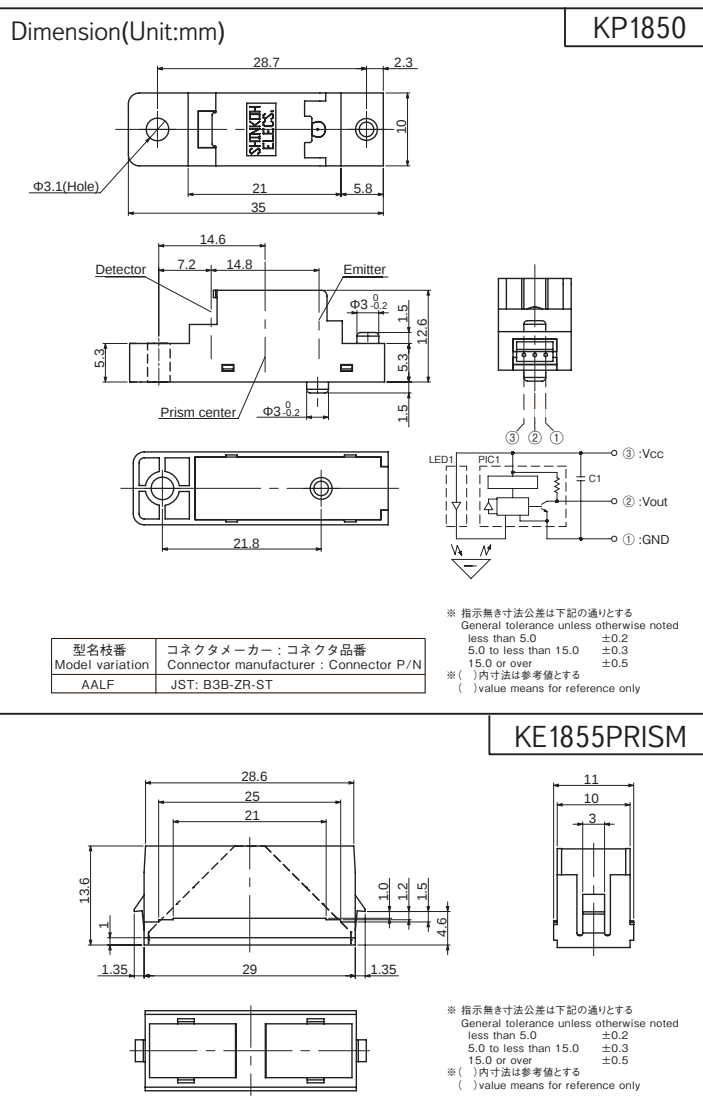
Model KP1850 is a prism type photo sensor consisted of an Infrared LED and a Light modulation type of Photo IC, and has one piece seamless plastic housing.

## 特長 Feature

- ・ 広範囲の物体検出が可能
- ・ 防塵構造なので紙粉等の除去が容易
- ・ 反射の少ない紙幣、黒紙、トレーシング紙等の検出可能
- ・ 光変調方式の為、外乱光等のノイズに強い
- ・ Wide area detection
- ・ Easy removing in paper-dust
- ・ Available for detection of Bill, Dark paper, tracing paper
- ・ Resistant to Ambient Illumination noise. (Light-modulation type)

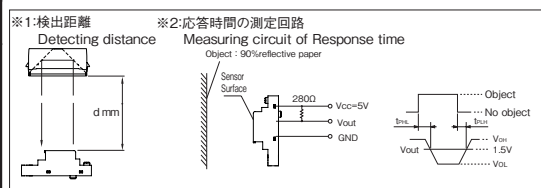
## 用途 Application

- ・ 複写機・印刷機・プリンタ等の用紙検出
- ・ 各種自動機の物体通過検出
- ・ Paper detection in Copying machine, Printer and Printing press
- ・ Object passing for Card reader and Auto machine



## 最大定格 Maximum Ratings [Ta=25℃ \*\*]

| Item                       | Symbol           | Rating    | Unit |
|----------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage        | VCC              | 7         | V    |
| 出力電流 Output Current        | IO               | 16        | mA   |
| 動作温度 Operating Temperature | T <sub>opr</sub> | -10 ~ +60 | ℃    |
| 保存温度 Storage Temperature   | T <sub>stg</sub> | -20 ~ +80 | ℃    |



## 電気的光学的特性 Electro-Optical Characteristics [Vcc=5V, Ta=25℃ \*\*]

| Item                                | Symbol                   | Condition                           | min.    | typ. | max. | Unit |
|-------------------------------------|--------------------------|-------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC                      | —                                   | 4.75    | 5.0  | 5.25 | V    |
| 消費電流 Current Consumption            | ICC                      | 平滑値、RL=∞ Average                    | —       | —    | 15   | mA   |
| ローレベル出力電圧 Low Level Output Voltage  | VoL                      | 入光時、IoL=16mA Object existing        | —       | —    | 0.4  | V    |
| ハイレベル出力電圧 High-Level Output Voltage | VoH                      | 遮光時 No object                       | VCCx0.9 | —    | —    | V    |
| 検出距離 Detecting Distance ※1          | d                        | VCC=5V                              | 100     | —    | —    | mm   |
| 外乱光許容照度 Ambient Illumination        | —                        | CIE 標準 A 光源 CIE STD. A light source | 2000    | —    | —    | lx   |
| 応答時間 Response Time                  | "High" → "Low" 伝搬時間 tPHL | ※2                                  | —       | —    | 1    | ms   |
|                                     | "Low" → "High" 伝搬時間 tPLH |                                     | —       | —    | 1    |      |

\*\* : Ta=25℃ unless otherwise noted

# KP1850

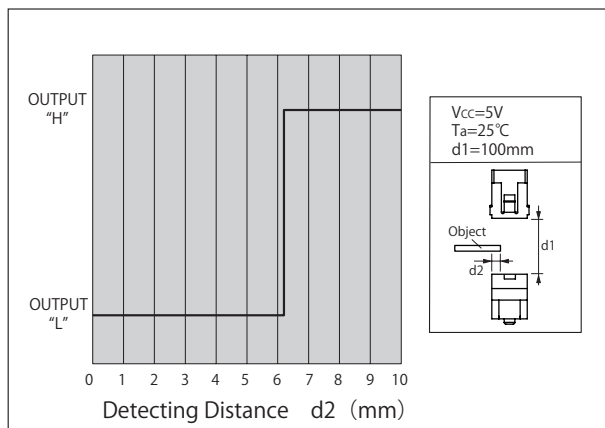
## 定格・特性曲線

Characteristics

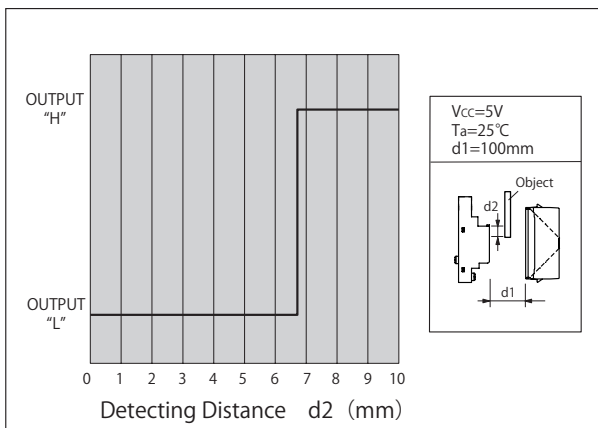
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

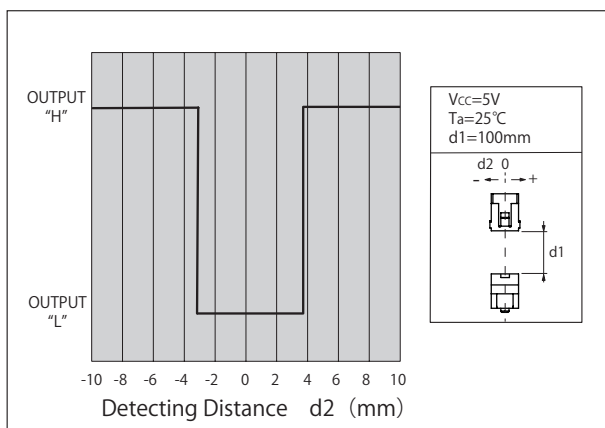
検出位置特性 1 (代表例)



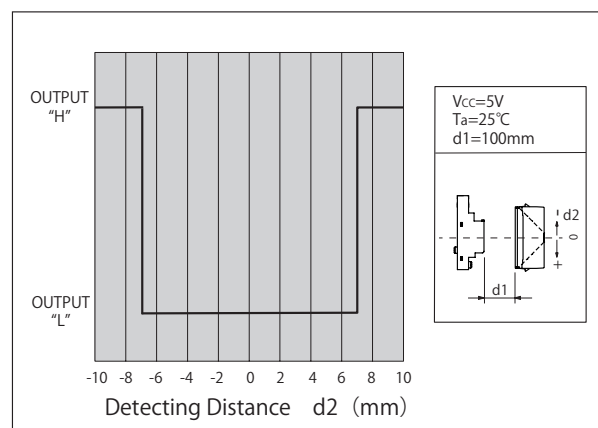
検出位置特性2 (代表例)



平行位置特性 1 (代表例)



平行位置特性2 (代表例)



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- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

# KP3250

プリズム フォトセンサ

Prism Photo Sensor



## 概要 Description

KP3250 は、赤外発光ダイオードと高感度フォトトランジスタを組み合わせたプリズム対応反射型フォトセンサです。

Model KP3250 is a prism type photo sensor consisted of an Infrared LED and a Photo transistor.

## 特長 Feature

- ・ 物体位置検出精度が高い
- ・ 反射率の低い紙幣、黒紙などの有無検出が可能
- ・ センサ・プリズム間ギャップを任意に設定可能
- ・ 2 連分離型センサとしても使用可能

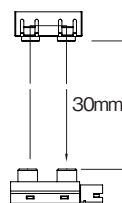
- ・ High resolution to object position.
- ・ Available for detection of bill/dark paper.
- ・ Distance between sensor and prism can be set.
- ・ For application of dual beam sensor.

## 用途 Application

- ・ 紙幣、コピー用紙等の有無、エッジ検出
- ・ 物体の位置検出
- ・ Paper absence and Paper edge detection on Bill, Copying machine, Printer, and Facsimile.
- ・ Object position detection.

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                       |                                        | Symbol | Rating    | Unit |
|----------------------------|----------------------------------------|--------|-----------|------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF     | 50        | mA   |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP    | 0.3       | A    |
|                            | 逆電圧 Reverse Voltage                    | VR     | 5         | V    |
|                            | 許容損失 Power Dissipation                 | P      | 75        | mW   |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO   | 30        | V    |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO   | 5         | V    |
|                            | コレクタ電流 Collector Current               | IC     | 20        | mA   |
|                            | コレクタ損失 Collector Power Dissipation     | Pc     | 75        | mW   |
| 動作温度 Operating Temperature |                                        | Topr   | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature   |                                        | Tstg   | -30 ~ +80 | °C   |



- ※1 パルス幅  $t_w \leq 100\mu s$  Duty比=0.01  
 ※2 センサ・プリズム間  $d=30mm$   
 ※3 反射物無し 暗黒中  
 ※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01  
 ※2. KP3250-Prism  $d=30mm$   
 ※3. No prism, No object, in dark

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25°C \*\*]

| Item            |                                   | Symbol       | Condition                        | min. | typ. | max. | Unit    |
|-----------------|-----------------------------------|--------------|----------------------------------|------|------|------|---------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage               | VF           | IF=20mA                          | —    | 1.35 | 1.6  | V       |
|                 | 逆電流 Reverse Current               | IR           | VR=5V                            | —    | —    | 100  | $\mu A$ |
| 受光側<br>Detector | 暗電流 Dark Current                  | ICEO         | VCE=20V, 0 lx                    | —    | —    | 0.2  | $\mu A$ |
|                 | 光電流 Light Current ※2              | IC           | VCE=5V, IF=10mA, d=30mm          | 0.15 | —    | —    | mA      |
| 伝達特性<br>Coupled | 漏れ電流 Leak Current ※3              | ILEAK        | VCE=5V, IF=10mA                  | —    | —    | 50   | $\mu A$ |
|                 | コレクタ・エミッタ間飽和電圧 Saturation Voltage | VCE(sat)     |                                  | —    | —    | 0.4  | V       |
|                 | 応答時間 Response Time                | 上昇 Rise Time | VCC=5V, IC=0.5mA, RL=1k $\Omega$ | —    | 24   | —    | $\mu s$ |
|                 |                                   | 下降 Fall Time |                                  | —    | 27   | —    |         |

\*\* : Ta=25°C unless otherwise noted

# KP3250

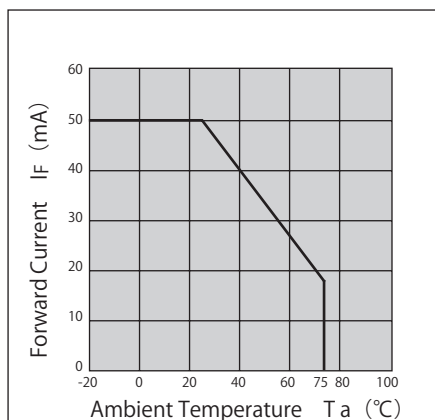
## 定格・特性曲線

Characteristics

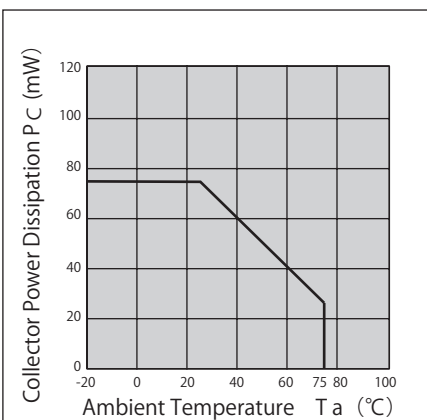
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

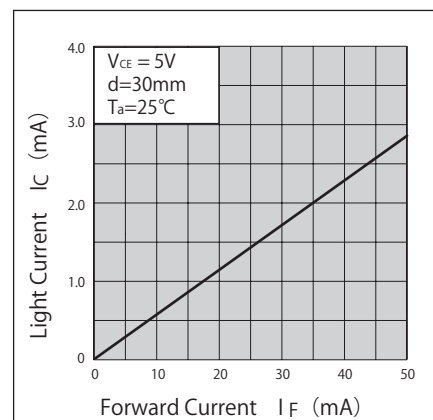
### 順電流低減曲線



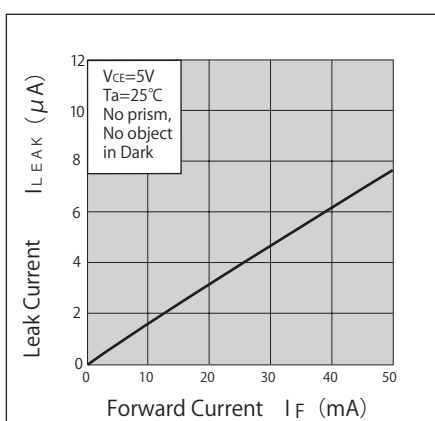
### コレクタ損失低減曲線



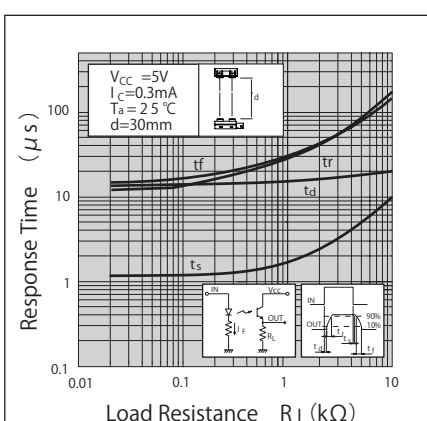
### 光電流—順電流特性(代表例)



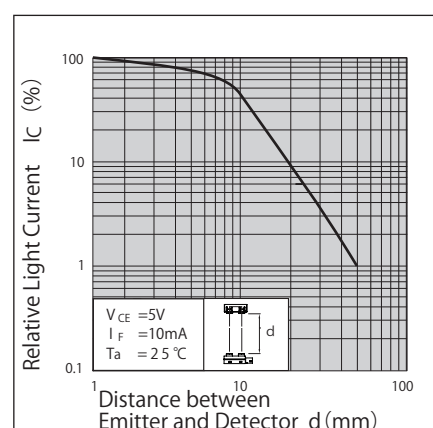
### 漏れ電流—順電流特性(代表例)



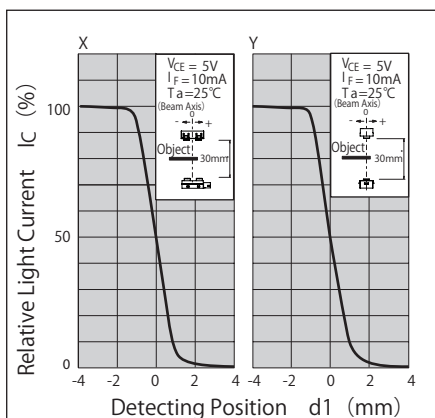
### 応答時間—負荷抵抗特性(代表例)



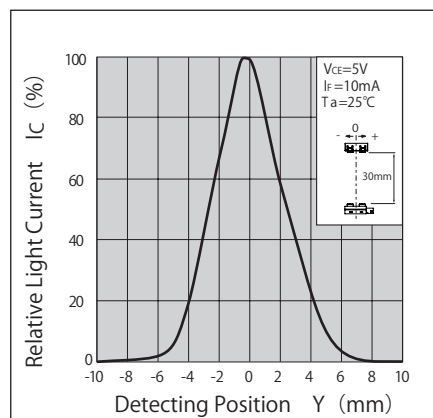
### 距離特性(代表例)



### 検出位置特性(代表例)



### 平行移動特性(代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

# KA1335/1336/1345/1346



アクチュエータタイプ フォトセンサ Photo Interrupter - Actuator type



## 概要 Description

KA1335/1336/1345/1346 は、発光側に赤外発光ダイオード、受光側にフォト IC 出力を組み合わせたアクチュエータータイプの透過型フォトセンサです。

Model KA1335/1336/1345/1346 are Photo Interrupter with actuator and consist of an Infrared LED and a Photo IC(Digital).

## 特長 Feature

- ・ アクチュエータータイプ
- ・ スナッピングタイプ
- ・ その他、カスタムレバーにも対応可能
- ・ Actuator type - Lever bearing type: O figure
- ・ Snap-in installation
- ・ Other Custom designed lever is available.

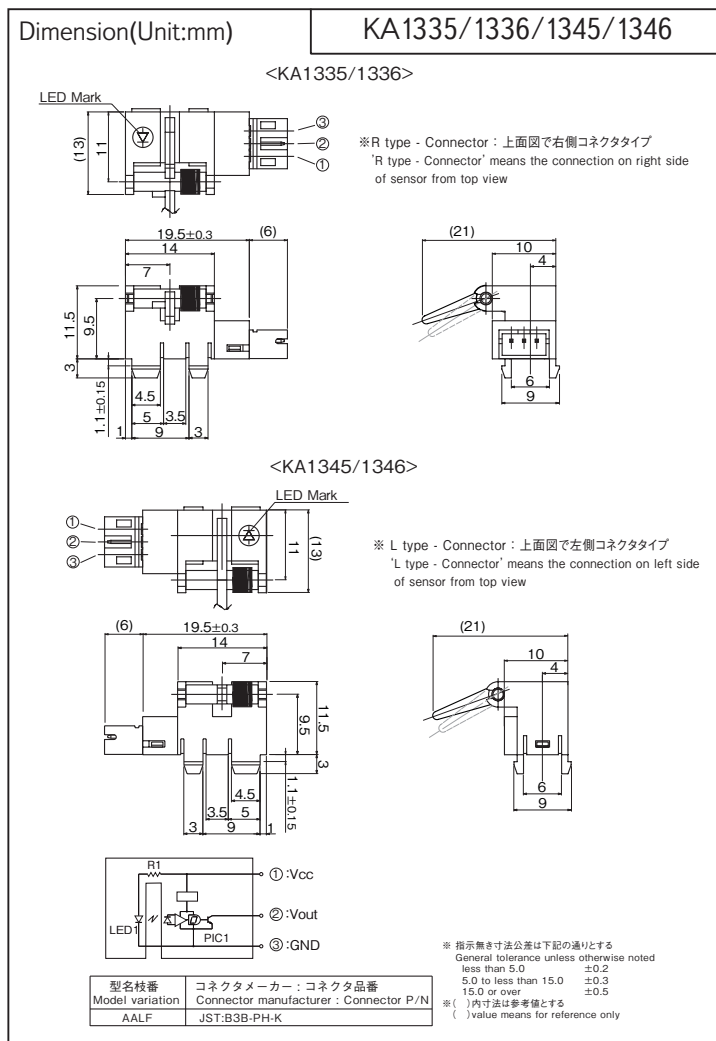
## 用途 Application

- ・ 紙幣、紙の通過検出
- ・ 各種自動機の物体通過検出
- ・ Passing detection of Bill or Papers in Banking machine and Ticket vending machine.
- ・ Object passing in Auto vender and Ticket vending machine.

※レバー形状は2種類からお選びいただけます。

※2 types of lever are available as standard.

| AALF-01 レバー<br>AALF-01 lever type | AALF-02 レバー<br>AALF-02 lever type |
|-----------------------------------|-----------------------------------|
|                                   |                                   |



| Model            | Mode | Condition             |
|------------------|------|-----------------------|
| KA1335<br>KA1345 | High | 入光時 at Beam detecting |
| KA1336<br>KA1346 | Low  | 入光時 at Beam detecting |

## 最大定格 Maximum Ratings [Ta=25°C \*\*]

| Item                               | Symbol           | Rating    | Unit |
|------------------------------------|------------------|-----------|------|
| 電源電圧 Supply Voltage                | VCC              | 6         | V    |
| ローレベル出力電流 Low-Level Output Current | IOL              | 50        | mA   |
| 出力電圧 Output Voltage                | VO               | 28        | V    |
| 動作温度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +80 | °C   |

## <ご使用上の注意>

センサ近くの Vcc-GND 間に 0.01μF 以上のバイパスコンデンサを付けて使用されることを推奨致します。

## <Operation Notice>

We recommend to use with 0.01μF of bypass capacitor between Vcc and GND and nearby of sensor.

## 電気的光学的特性 Electro-Optical Characteristics [ Vcc=5V, Ta=25°C \*\*]

| Item                                | Symbol | Condition                              | min.    | typ. | max. | Unit |
|-------------------------------------|--------|----------------------------------------|---------|------|------|------|
| 動作電源電圧 Supply Voltage               | VCC    | —                                      | 4.5     | 5.0  | 5.5  | V    |
| ローレベル供給電流 Low-Level Supply Current  | ICCL   | KA1335/1345 レバー遮光時 Shutter in          | —       | —    | 25   | mA   |
|                                     |        | KA1336/1346 入光時 w/o Shutter            | —       | —    | 25   |      |
| ハイレベル供給電流 High-Level Supply Current | ICCH   | KA1335/1345 入光時 w/o Shutter            | —       | —    | 25   | mA   |
|                                     |        | KA1336/1346 レバー遮光時 Shutter in          | —       | —    | 25   |      |
| ローレベル出力電圧 Low-Level Output Voltage  | VOL    | KA1335/1345 レバー遮光時、IOL=16mA Shutter in | —       | —    | 0.4  | V    |
|                                     |        | KA1336/1346 入光時、IOL=16mA w/o Shutter   | —       | —    | 0.4  |      |
| ハイレベル出力電圧 High-Level Output Voltage | VOH    | KA1335/1345 入光時、RL=47kΩ w/o Shutter    | VCC×0.9 | —    | —    | V    |
|                                     |        | KA1336/1346 レバー遮光時、RL=47kΩ Shutter in  | VCC×0.9 | —    | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KA1335/1336/1345/1346

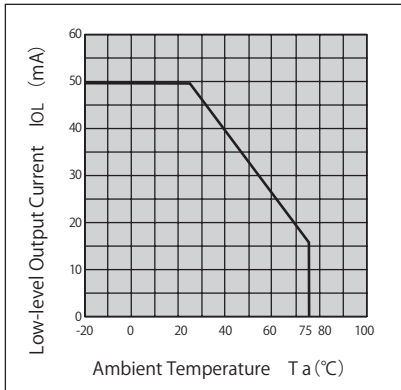
## 定格・特性曲線

Characteristics

※注意 最大定格を超えないようにご使用ください

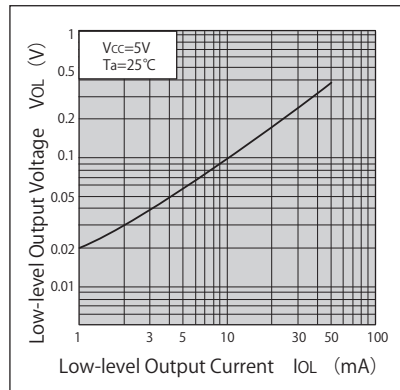
Note: Operation never exceeds each value of Maximum Ratings.

### ローレベル出力電流低減曲線



### ローレベル出力電圧ー

### ローレベル出力電流特性 (代表例)

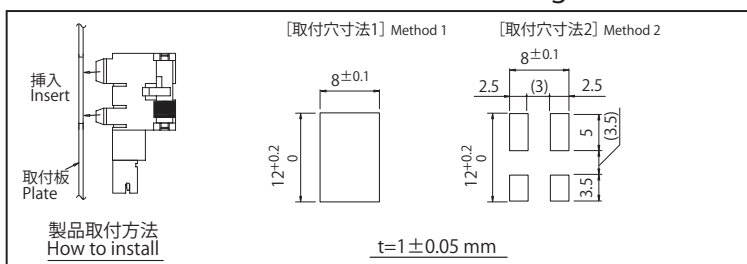


## 機械的特性 Mechanical Characteristics [ $T_a=25^\circ\text{C}^{**}$ ]

| Item                             | Condition                                                                                                                                 | min.   | typ. | max. | Unit    |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------|------|------|---------|
| レバー動作トルク Lever Operation Torque  | レバー回転中心より8mmの位置にて垂直に力を加える。<br>Power is vertically added from the shaft to the lever by 8mm.                                               | 3      | —    | 12   | mN · cm |
| レバー耐久性 Lever Operation Frequency | レバーを静止位置と動作位置の間を往復させる繰り返し動作。<br>Repeated operation of reciprocating the lever between the stationary position and the operating position. | $10^6$ | —    | —    | times   |

## 推奨取付穴寸法図

### Recommended installation to mounting holes



・取付板のプレス側から取付けを推奨します。

・We recommend to mount the sensor from pressed surface of plate.

・実際に取り付けてガタツキ度合いをご確認され取り付け方法を決定下さい。

・The actual tolerance should be confirmed after setting of sensor

・カスタマイズも承ります。お気軽にお問合せください

・ A Customized design available on request.

・この仕様は改良のため予告なく変更する場合があります

・ Specifications are subject to change without notice.

# KA1354



アクチュエータタイプ フォトセンサ Photo Interrupter - Actuator type



## 概要 Description

KA1354 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用したアクチュエータタイプの透過型フォトセンサです。

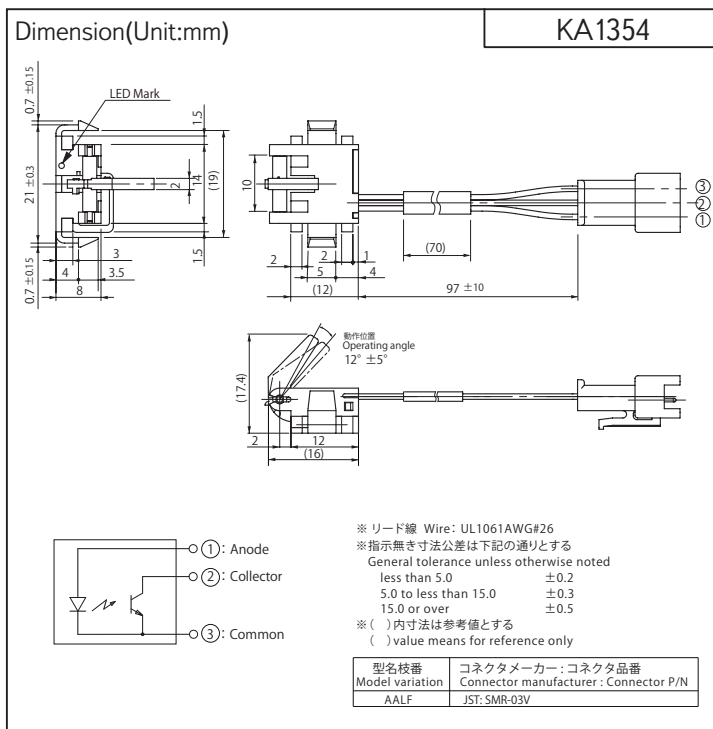
Model KA1354 is Photo Interrupter with actuator and consist of an Infrared LED and a Photo transistor.

## 特長 Feature

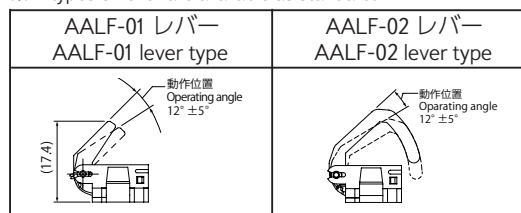
- ・アクチュエータタイプ
- ・ハーネス付きの小型パッケージ
- ・スナップインタイプ
- ・その他、カスタムレバーも対応可能
- ・抜け防止強ロック機構付きコネクタ採用
- ・Actuator type - Lever bearing type : O figure
- ・Compact package with wires & connector.
- ・Snap-in installation
- ・Other Custom designed lever is available.
- ・with secure locking structure connector.

## 用途 Application

- ・紙幣、紙の通過検出
- ・各種自動機の物体通過検出
- ・Passing detection of Bill or Papers in Banking machine and Ticket vending machine.
- ・Object passing in Auto vender and Ticket vending machine.



- ※レバー形状は2種類からお選びいただけます。
- ※ 2 types of lever are available as standard.



## 最大定格 Maximum Ratings [ Ta=25°C \*\*]

| Item                       |                                        | Symbol           | Rating    | Unit |
|----------------------------|----------------------------------------|------------------|-----------|------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF               | 50        | mA   |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP              | 1         | A    |
|                            | 逆電圧 Reverse Voltage                    | VR               | 5         | V    |
|                            | 許容損失 Power Dissipation                 | P                | 75        | mW   |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO             | 30        | V    |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO             | 5         | V    |
|                            | コレクタ電流 Collector Current               | IC               | 20        | mA   |
|                            | コレクタ損失 Collector Power Dissipation     | PC               | 75        | mW   |
| 動作温度 Operating Temperature |                                        | T <sub>opr</sub> | -20 ~ +75 | °C   |
| 保存温度 Storage Temperature   |                                        | T <sub>stg</sub> | -30 ~ +80 | °C   |

- ※ 1. パルス幅  $t_w \leq 100\mu s$  Duty 比=0.01
- ※ 1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*]

| Item            |                                                     | Symbol               | Condition                                    | min. | typ. | max. | Unit |
|-----------------|-----------------------------------------------------|----------------------|----------------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage                                 | V <sub>F</sub>       | I <sub>F</sub> =20mA                         | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current                                 | I <sub>R</sub>       | V <sub>R</sub> =3V                           | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                                    | I <sub>CEO</sub>     | V <sub>CE</sub> =20V, 0 lx                   | —    | —    | 0.1  | μA   |
|                 | 光電流 Light Current                                   | I <sub>C</sub>       | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA    | 0.3  | —    | —    | mA   |
| 伝達特性<br>Coupled | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>F</sub> =20mA, I <sub>C</sub> =0.15mA | —    | —    | 0.4  | V    |

\*\* : Ta=25°C unless otherwise noted

# KA1354

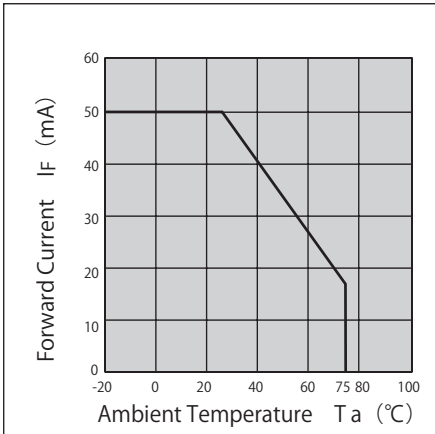
## 定格・特性曲線

Characteristics

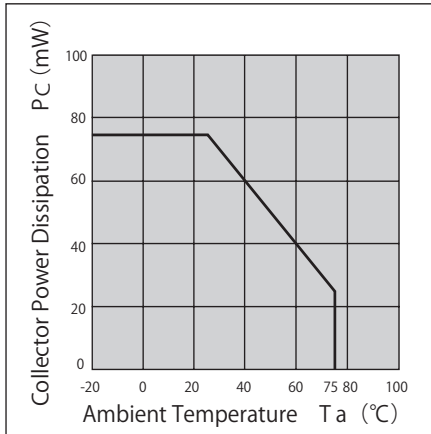
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

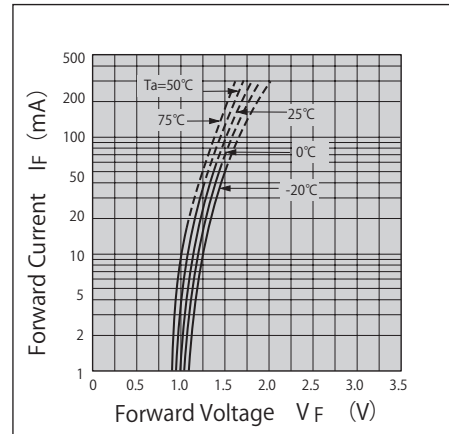
### 順電流低減曲線



### コレクタ損失低減曲線



### 順電流－順電圧特性 (代表例)

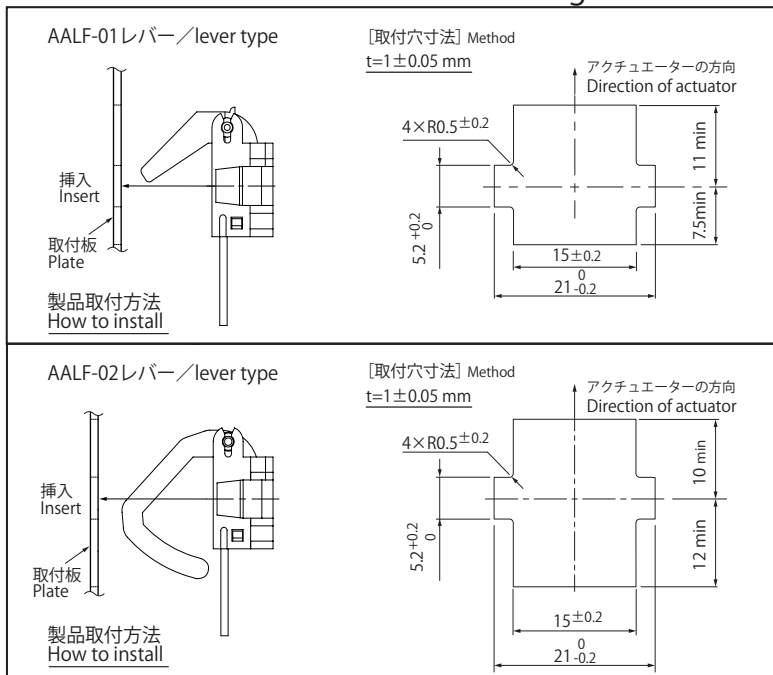


## 機械的特性 Mechanical Characteristics [Ta=25°C\*\*]

| Item                             | Condition                                                                                                                                 | min.            | typ. | max. | Unit  |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|------|-------|
| レバー動作トルク Lever Operation Torque  | レバー回転中心より8mmの位置にて垂直に力を加える。<br>Power is vertically added from the shaft to the lever by 8mm.                                               | 3               | —    | 12   | mN・cm |
| レバー耐久性 Lever Operation Frequency | レバーを静止位置と動作位置の間を往復させる繰り返し動作。<br>Repeated operation of reciprocating the lever between the stationary position and the operating position. | 10 <sup>6</sup> | —    | —    | times |

## 推奨取付穴寸法図

### Recommended installation to mounting holes



- 取付板のプレス側から取付けを推奨します。
- We recommend to mount the sensor from pressed surface of plate.

- 実際に取り付けてガタツキ度合いをご確認され取り付け方法を決定下さい。
- The actual tolerance should be confirmed after setting of sensor

- カスタマイズも承ります。お気軽にお問合せください
- A Customized design available on request.
- この仕様は改良のため予告なく変更する場合があります
- Specifications are subject to change without notice.

# KA3434/3435



アクチュエータタイプ フォトセンサ Photo Interrupter - Actuator type



## 概要 Description

KA3434/3435 は、発光側に赤外発光ダイオード、受光側にフォトトランジスタを採用したアクチュエータタイプの透過型フォトセンサです。

Model KA3434/3435 are Photo Interrupter with actuator and consist of an Infrared LED and a Photo transistor.

## 特長 Feature

- ・ アクチュエータタイプ
- ・ ハーネス付きの小型パッケージ
- ・ スナップインタイプ
- ・ その他、カスタムレバーも対応可能
- ・ KA3434 のみ抜け防止強ロック機構付きコネクタ採用※
- ・ Actuator type - Lever bearing type : O figure
- ・ Compact package with wires & connector.
- ・ Snap-in installation
- ・ Other Custom designed lever is available.
- ・ Only KA3434 is equipped with Locking connector. ※

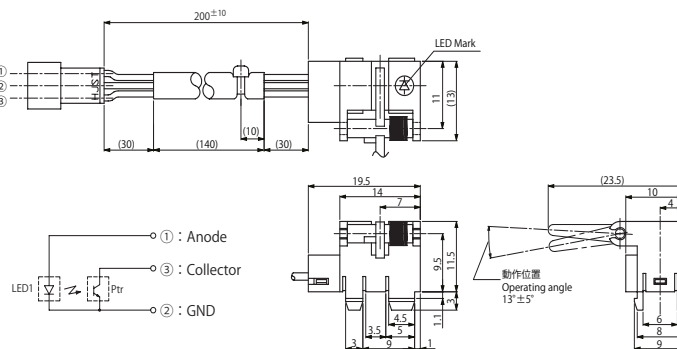
## 用途 Application

- ・ 紙幣、紙の通過検出
- ・ 各種自動機の物体通過検出
- ・ Passing detection of Bill or Papers in Banking machine and Ticket vending machine.
- ・ Object passing in Auto vender and Ticket vending machine.

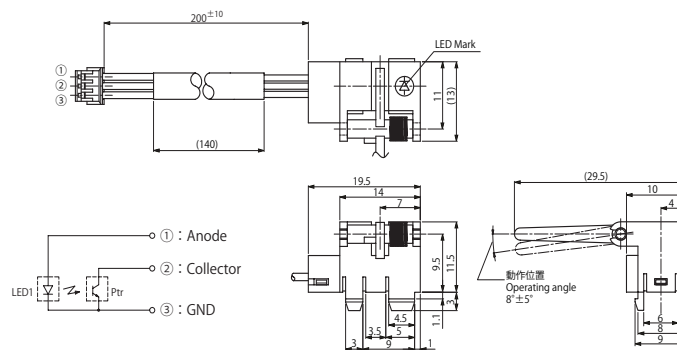
## Dimension(Unit:mm)

## KA3434/3435

### <KA3434>



### <KA3435>



※リード線 Wire : UL1061AWG#26

※指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0 ±0.2  
5.0 to less than 15.0 ±0.3  
15.0 or over ±0.5

※ ( ) 内寸法は参考値とする  
( ) value means for reference only

| 型名・機種           | コネクタメーカー・コネクタ品番                        |
|-----------------|----------------------------------------|
| Model variation | Connector manufacturer : Connector P/N |
| KA3434          | JST:SMR-03V※                           |
| KA3435          | JST:PHR-3                              |

## 最大定格 Maximum Ratings [Ta=25℃ \*\*]

| Item                       | Symbol                                 | Rating    | Unit  |
|----------------------------|----------------------------------------|-----------|-------|
| 発光側<br>Emitter             | 順電流 Forward Current                    | IF        | 50 mA |
|                            | パルス順電流 Pulse Forward Current ※1        | IFP       | 1 A   |
|                            | 逆電圧 Reverse Voltage                    | VR        | 5 V   |
|                            | 許容損失 Power Dissipation                 | P         | 75 mW |
| 受光側<br>Detector            | コレクタ・エミッタ間電圧 Collector-Emitter Voltage | VCEO      | 30 V  |
|                            | エミッタ・コレクタ間電圧 Emitter-Collector Voltage | VECO      | 5 V   |
|                            | コレクタ電流 Collector Current               | IC        | 20 mA |
|                            | コレクタ損失 Collector Power Dissipation     | PC        | 75 mW |
| 動作温度 Operating Temperature | T <sub>opr</sub>                       | -20 ~ +75 | ℃     |
| 保存温度 Storage Temperature   | T <sub>stg</sub>                       | -40 ~ +80 | ℃     |

※1. パルス幅  $t_w \leq 100\mu s$  Duty比=0.01

※1. Pulse width  $t_w \leq 100\mu s$  Duty ratio=0.01

## 電気的光学的特性 Electro-Optical Characteristics [Ta=25℃ \*\*]

| Item            | Symbol                                              | Condition                          | min. | typ. | max. | Unit |
|-----------------|-----------------------------------------------------|------------------------------------|------|------|------|------|
| 発光側<br>Emitter  | 順電圧 Forward Voltage                                 | IF=20mA                            | —    | 1.2  | 1.5  | V    |
|                 | 逆電流 Reverse Current                                 | VR=3V                              | —    | —    | 10   | μA   |
| 受光側<br>Detector | 暗電流 Dark Current                                    | VCE=20V, 0 lx                      | —    | —    | 0.1  | μA   |
| 伝達特性<br>Coupled | 光電流 Light Current                                   | VCE=5V, IF=20mA, 入光時 w/o Shutter   | 0.3  | —    | —    | mA   |
|                 | コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | IF=20mA, IC=0.15mA                 | —    | —    | 0.4  | V    |
|                 | 光路遮断時コレクタ電流 Collector-Current Shutter in            | VCE=5V, IF=20mA, レバー遮光時 Shutter in | —    | —    | 20   | μA   |

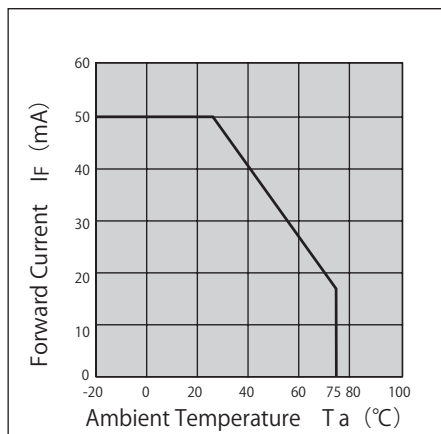
\*\* : Ta=25℃ unless otherwise noted

# KA3434/3435

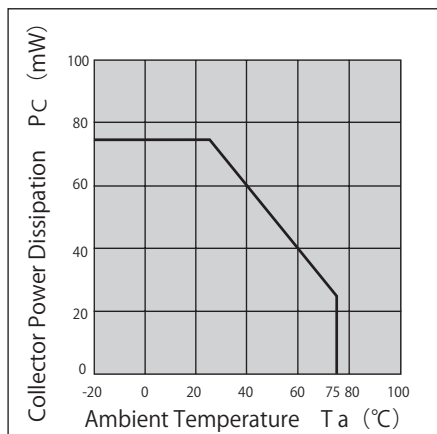
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

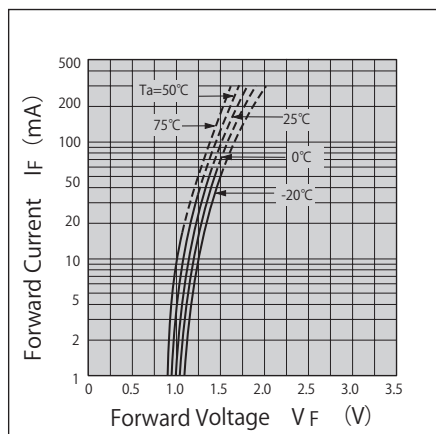
順電流低減曲線



コレクタ損失低減曲線



順電流－順電圧特性 (代表例)

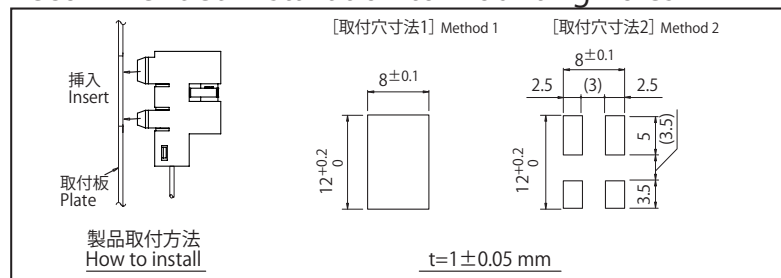


## 機械的特性 Mechanical Characteristics [ $T_a = 25^\circ\text{C}^{**}$ ]

| Item                             | Condition                                                                                                                                 | min.   | typ. | max. | Unit    |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------|------|------|---------|
| レバー動作トルク Lever Operation Torque  | レバー回転中心より8mmの位置にて垂直に力を加える。<br>Power is vertically added from the shaft to the lever by 8mm.                                               | 3      | —    | 12   | mN · cm |
| レバー耐久性 Lever Operation Frequency | レバーを静止位置と動作位置の間を往復させる繰り返し動作。<br>Repeated operation of reciprocating the lever between the stationary position and the operating position. | $10^6$ | —    | —    | times   |

## 推奨取付穴寸法図

### Recommended installation to mounting holes



- 取付板のプレス側から取付けを推奨します。
- We recommend to mount the sensor from pressed surface of plate.
- 実際に取り付けてガタツキ度合いをご確認され取り付け方法を決定下さい。
- The actual tolerance should be confirmed after setting of sensor

- カスタマイズも承ります。お気軽にお問合せください
- A Customized design available on request.

- この仕様は改良のため予告なく変更する場合があります
- Specifications are subject to change without notice.

# KL856



2 波長発光ダイオード 2 Color Wavelength LED Red/IR



## 概要 Description

KL856 は、赤色と赤外の発光ダイオードチップを金属パッケージに組み込んだ2波長発光ダイオードです。

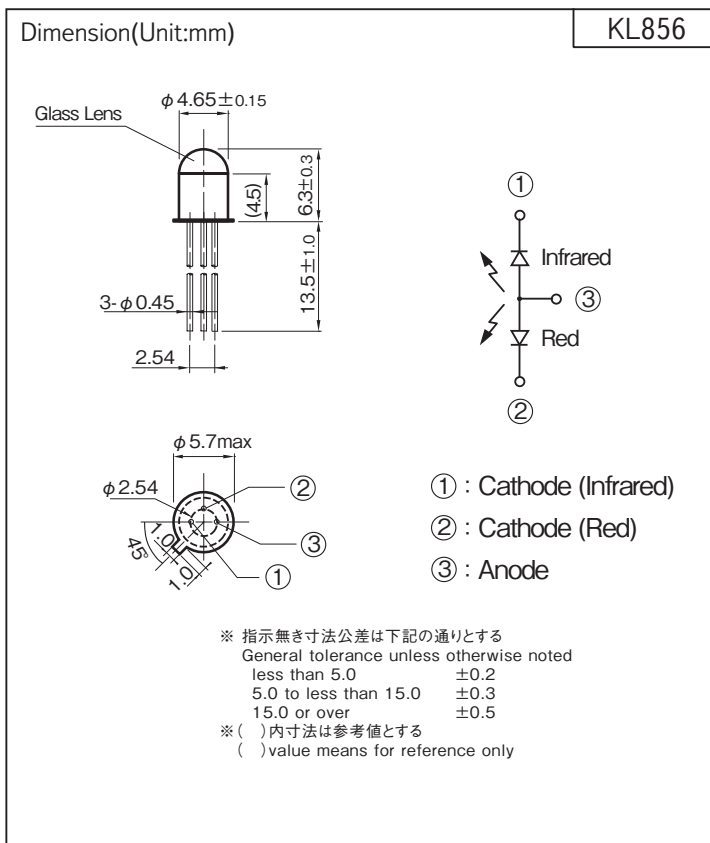
Model KL856 is 2 Color Wavelength (880/660nm) Light Emitting Diode mounted in TO-18 type header with lens can.

## 特長 Feature

- ・ 赤色 ( $\lambda_p$ : 660nm) 及び赤外 ( $\lambda_p$ : 880nm) の2波長LED
- ・ TO-18メタルパッケージで高性能、高信頼性
- ・ 指向角が狭く ( $\theta$ :  $\pm 10^\circ$ )、高出力
- ・ 2 Color Wavelength LED:  
Red ( $\lambda_p$ : 660nm) and Infrared ( $\lambda_p$ : 880nm)
- ・ TO-18 package
- ・ Narrow Beam Angle ( $\theta$ :  $\pm 10^\circ$ ), High power

## 用途 Application

- ・ 印刷パターン識別用光源
- ・ カラーセンサ用光源
- ・ 紙質判別センサ用光源
- ・ Light source for printing discrimination
- ・ Light source for color sensor
- ・ Light source for paper quality discrimination



## 最大定格 Maximum Ratings [ Ta=25°C \*\*]

| Item                                  | Symbol           | Rating     |     | Unit |
|---------------------------------------|------------------|------------|-----|------|
|                                       |                  | Red        | IR  |      |
| 許 容 損 失 Power Dissipation ※ 1         | P                | 100        | 150 | mW   |
| 順 電 流 Forward Current                 | IF               | 50         | 100 | mA   |
| パ ル ス 順 電 流 Pulse Forward Current ※ 2 | IFP              | 0.5        | 1   | A    |
| 逆 電 圧 Reverse Voltage                 | VR               | 5          | 5   | V    |
| 動 作 温 度 Operating Temperature         | T <sub>opr</sub> | -20 ~ +85  |     | °C   |
| 保 存 温 度 Storage Temperature           | T <sub>stg</sub> | -40 ~ +100 |     | °C   |
| 半 田 付 温 度 Soldering Temperature ※ 3   | T <sub>sol</sub> | 330        |     | °C   |

半田付け取扱注意

- ※ 1. 最大許容損失は 150 mW です。  
 ※ 2. パルス幅  $\leq 100 \mu s$ 、デューティ比 = 0.01  
 ※ 3. キャンパッケージ底面より 2.6mm の位置で 2 秒以内  
 手半田付けのみ可 (フロー半田付け不可)

- ※ 1. Power Dissipation is max. 150mW  
 ※ 2. Pulse width  $\leq 100\mu s$  Duty ratio=0.01  
 ※ 3. Soldering condition less than 2s at 2.6 mm over from  
 TO-18 header. Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*]

| Item                         | Symbol           | Condition | min. | typ.     | max. | Unit    |
|------------------------------|------------------|-----------|------|----------|------|---------|
| 順 電 圧 Forward Voltage        | V <sub>F</sub>   | IF=25mA   | —    | 1.75     | 2.3  | V       |
|                              |                  | IF=50mA   | —    | 1.42     | 1.7  |         |
| 逆 電 流 Reverse Current        | IR               | VR=5V     | —    | —        | 10   | $\mu A$ |
| 発 光 出 力 Power Output         | P <sub>o</sub>   | IF=25mA   | 0.17 | 0.35     | —    | mW      |
|                              |                  | IF=50mA   | 1.60 | 3.20     | —    |         |
| ピーク発光波長 Peak Wavelength      | $\lambda_p$      | IF=25mA   | —    | 660      | —    | nm      |
|                              |                  | IF=50mA   | —    | 880      | —    |         |
| スペクトル半値幅 Spectral Half Width | $\Delta \lambda$ | IF=25mA   | —    | 20       | —    | nm      |
|                              |                  | IF=50mA   | —    | 70       | —    |         |
| 指 向 角 半 値 幅 Half Angle       | $\Delta \theta$  | IF=50mA   | —    | $\pm 10$ | —    | deg     |

\*\* : Ta=25°C unless otherwise noted

# KL856

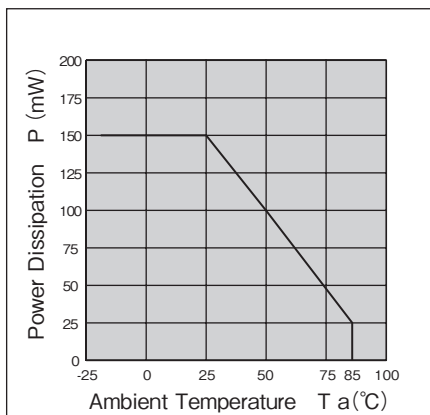
## 定格・特性曲線

Characteristics

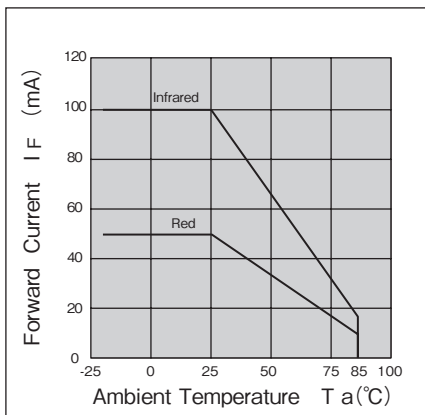
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

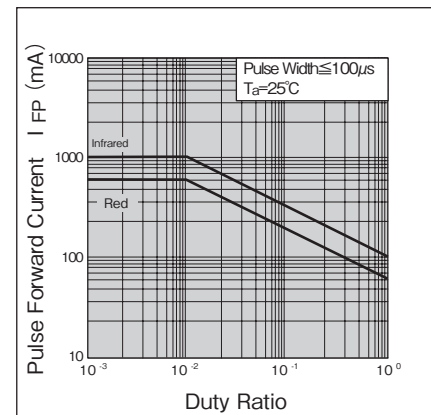
### 許容損失低減曲線 (赤外 + 赤色)



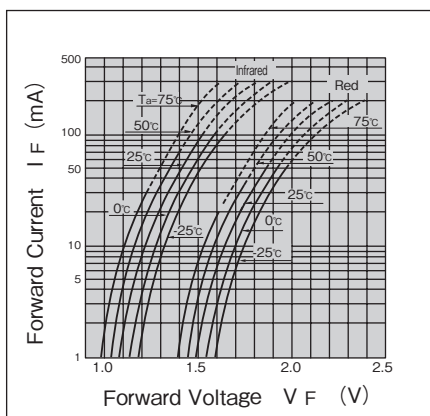
### 順電流低減曲線



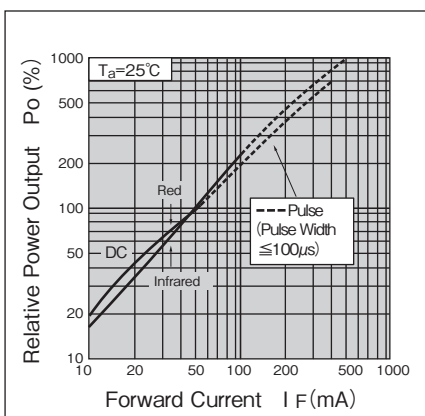
### パルス順電流—デューティ比



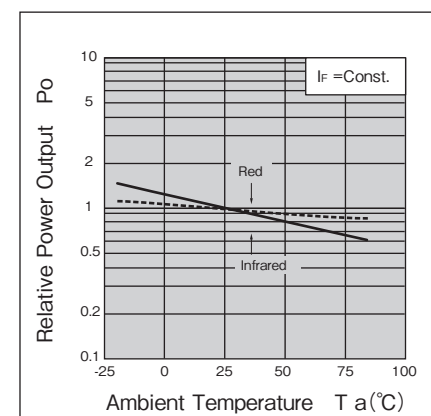
### 順電流—順電圧特性 (代表例)



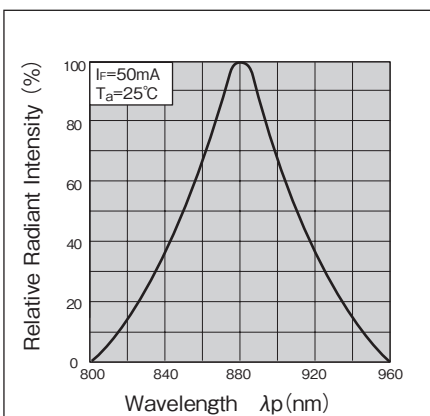
### 発光出力—順電流特性 (代表例)



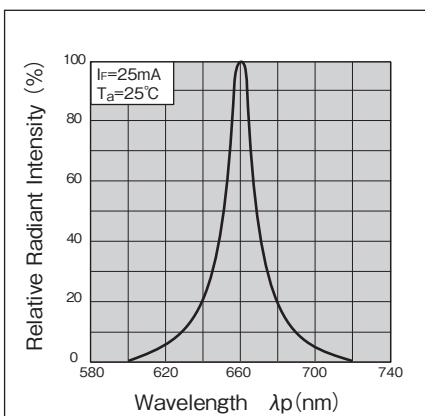
### 発光出力—周囲温度特性 (代表例)



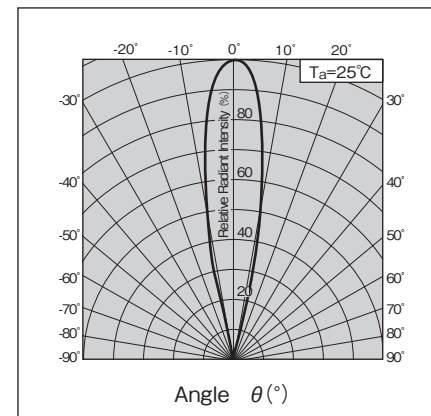
### スペクトル分布 (赤外) (代表例)



### スペクトル分布 (赤色) (代表例)



### 指向特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KL857



赤外発光ダイオード Infrared LED



## 概要 Description

KL857 は、高出力の赤外発光ダイオードチップを金属パッケージに組み込んだ赤外発光ダイオードです。

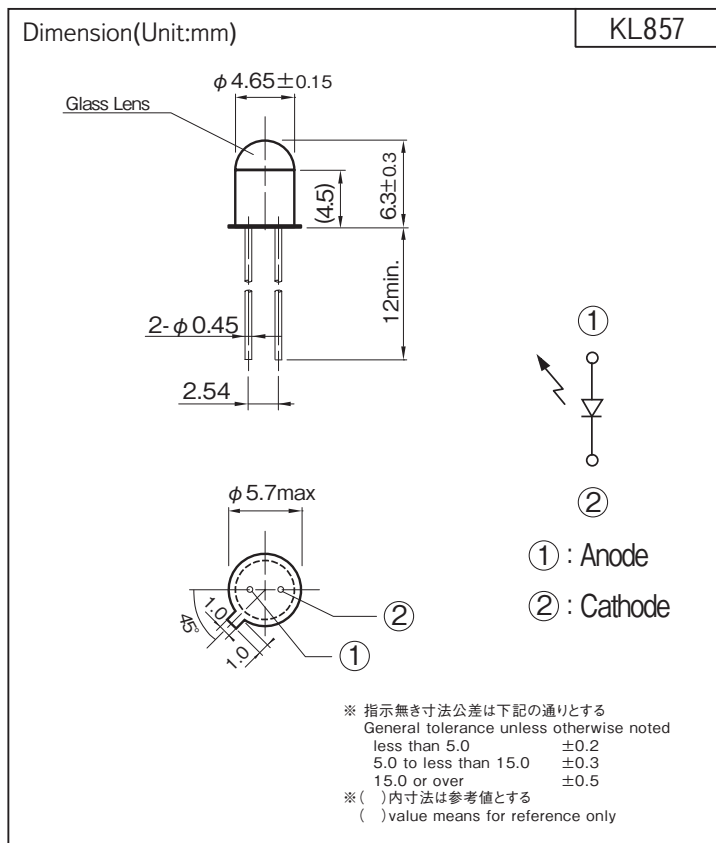
Model KL857 is an Infrared Light Emitting Diode mounted in TO-18 type header with lens can.

## 特長 Feature

- ・ 高出力赤外 LED 使用 (λ p : 940nm)
- ・ TO-18 メタルパッケージで高性能、高信頼性
- ・ High power Infra Red LED ( λ p : 940nm)
- ・ TO-18 package

## 用途 Application

- ・ フォトセンサ用光源
- ・ 光電スイッチ用光源
- ・ LED Light source for Photo sensor
- ・ LED Light source for Photoelectric sensor



## 最大定格 Maximum Ratings [ Ta=25°C \*\*]

| Item                                  | Symbol           | Rating     | Unit |
|---------------------------------------|------------------|------------|------|
| 許 容 損 失 Power Dissipation             | P                | 120        | mW   |
| 順 電 流 Forward Current                 | IF               | 100        | mA   |
| パ ル ス 順 電 流 Pulse Forward Current ※ 1 | IFP              | 1          | A    |
| 逆 電 圧 Reverse Voltage                 | VR               | 5          | V    |
| 動 作 温 度 Operating Temperature         | T <sub>opr</sub> | -40 ~ +125 | °C   |
| 保 存 温 度 Storage Temperature           | T <sub>stg</sub> | -55 ~ +125 | °C   |
| 半 田 付 温 度 Soldering Temperature ※ 2   | T <sub>sol</sub> | 330        | °C   |

## 半田付け取扱注意

- ※ 1 パルス幅 ≤ 100μs、デューティ比 = 0.01  
※ 2 キャンパッケージ底面より 2.6mm の位置で 2 秒以内  
手半田付けのみ可 ( フロー半田付け不可 )

- ※ 1. Pulse width ≤ 100μs Duty ratio = 0.01  
※ 2. Soldering condition less than 2s at 2.6 mm over from  
TO-18 header. Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*]

| Item                         | Symbol         | Condition            | min. | typ. | max. | Unit |
|------------------------------|----------------|----------------------|------|------|------|------|
| 順 電 圧 Forward Voltage        | V <sub>F</sub> | I <sub>F</sub> =50mA | —    | 1.4  | 1.6  | V    |
| 逆 電 流 Reverse Current        | I <sub>R</sub> | V <sub>R</sub> =5V   | —    | —    | 10   | μA   |
| 発 光 出 力 Power Output         | P <sub>o</sub> | I <sub>F</sub> =50mA | 1.0  | 3.3  | —    | mW   |
| ピーク発光波長 Peak Wavelength      | λ <sub>p</sub> | I <sub>F</sub> =50mA | —    | 940  | —    | nm   |
| スペクトル半値幅 Spectral Half Width | Δλ             | I <sub>F</sub> =50mA | —    | 40   | —    | nm   |
| 指向角半値幅 Half Angle            | Δθ             | I <sub>F</sub> =50mA | —    | ±7   | —    | deg  |

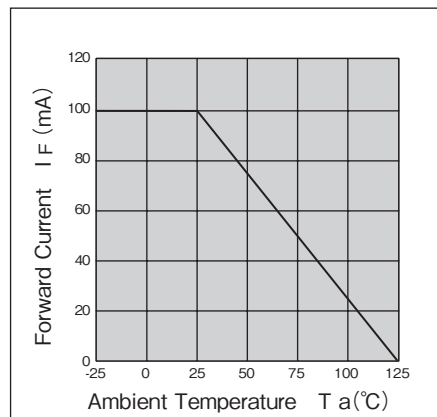
\*\* : Ta=25°C unless otherwise noted

# KL857

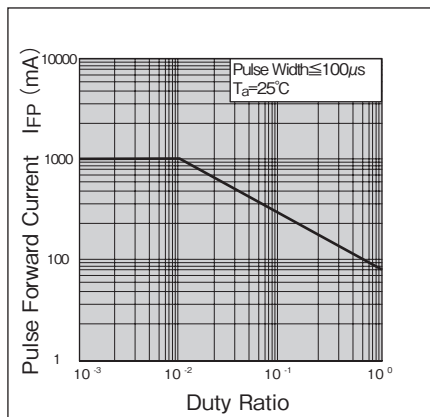
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

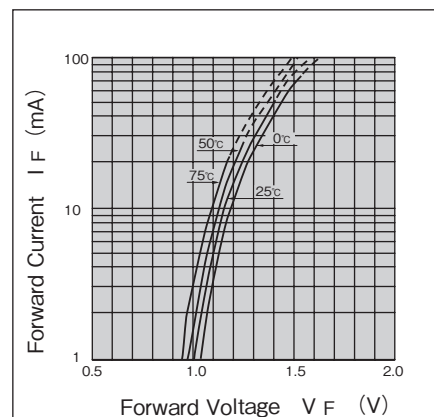
順電流低減曲線



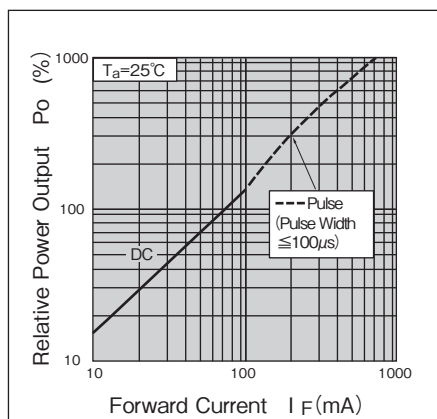
パルス順電流—デューティ比



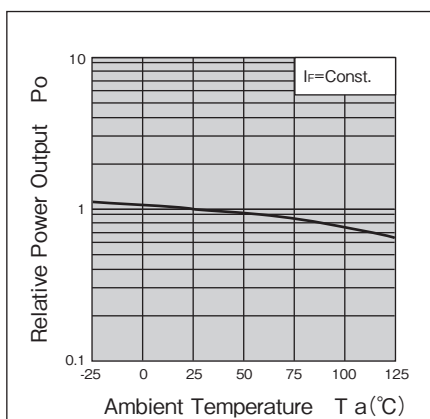
順電流—順電圧特性(代表例)



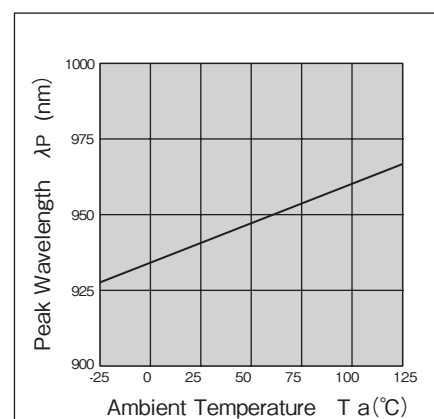
発光出力—順電流特性(代表例)



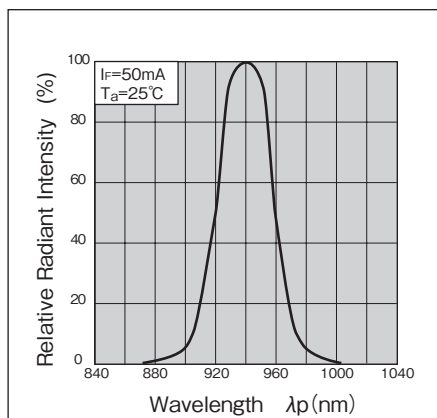
発光出力—周囲温度特性(代表例)



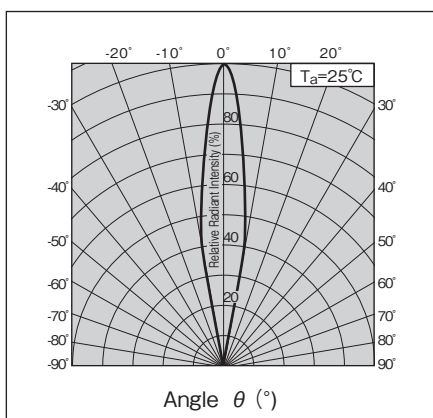
ピーク発光波長—  
周囲温度特性(代表例)



スペクトル分布(代表例)



指向特性(代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KL899



赤外発光ダイオード Infrared LED



## 概要 Description

KL899 は、高出力の赤外発光ダイオードチップをメタルパッケージに組み込んだ赤外発光ダイオードです。

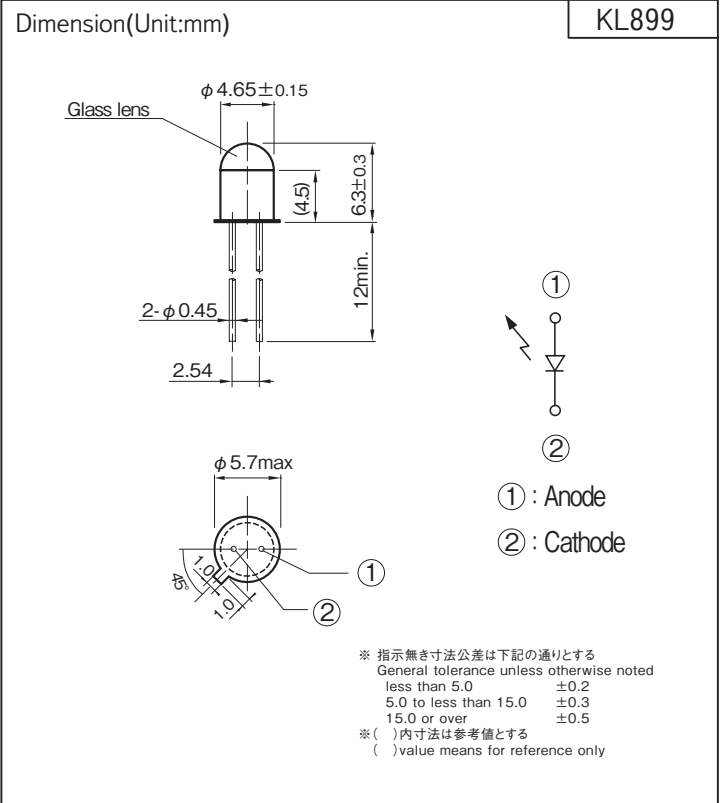
Model KL899 is an Infrared Light Emitting Diode mounted in TO-18 type header with lens can.

## 特長 Feature

- ・ 超高出力赤外 LED 使用 (λ p: 880nm)
- ・ TO-18 メタルパッケージで高性能、高信頼性
- ・ High power Infrared LED (λ p: 880nm)
- ・ TO-18 package

## 用途 Application

- ・ フォトセンサ用光源
- ・ 光電スイッチ用光源
- ・ LED Light source for Photo sensor
- ・ LED Light source for Photoelectric sensor



## 最大定格 Maximum Ratings [ Ta=25°C \*\*]

| Item                                  | Symbol           | Rating     | Unit |
|---------------------------------------|------------------|------------|------|
| 許 容 損 失 Power Dissipation             | P                | 200        | mW   |
| 順 電 流 Forward Current                 | IF               | 100        | mA   |
| パ ル ス 順 電 流 Pulse Forward Current ※ 1 | IFP              | 1          | A    |
| 逆 電 圧 Reverse Voltage                 | VR               | 5          | V    |
| 動 作 温 度 Operating Temperature         | T <sub>opr</sub> | -40 ~ +125 | °C   |
| 保 存 温 度 Storage Temperature           | T <sub>stg</sub> | -55 ~ +125 | °C   |
| 半 田 付 温 度 Soldering Temperature ※ 2   | T <sub>sol</sub> | 330        | °C   |

## 半田付け取扱注意

- ※ 1 パルス幅  $\leq 100\mu\text{s}$ 、デューティ比 = 0.01  
 ※ 2 キャンパッケージ底面より 2.6mm の位置で 2 秒以内  
 手半田付けのみ可 ( フロー半田付け不可 )

- ※ 1. Pulse width  $\leq 100\mu\text{s}$  Duty ratio=0.01  
 ※ 2. Soldering condition less than 2s at 2.6 mm over from  
 TO-18 header. Flow Soldering unsupported.

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*]

| Item                         | Symbol          | Condition            | min. | typ.    | max. | Unit          |
|------------------------------|-----------------|----------------------|------|---------|------|---------------|
| 順 電 圧 Forward Voltage        | V <sub>F</sub>  | I <sub>F</sub> =50mA | —    | 1.4     | 1.8  | V             |
| 逆 電 流 Reverse Current        | I <sub>R</sub>  | V <sub>R</sub> =5V   | —    | —       | 10   | $\mu\text{A}$ |
| 発 光 出 力 Power Output         | P <sub>o</sub>  | I <sub>F</sub> =50mA | 1.3  | 5.5     | —    | mW            |
| ピーク発光波長 Peak Wavelength      | $\lambda_p$     | I <sub>F</sub> =50mA | —    | 880     | —    | nm            |
| スペクトル半値幅 Spectral Half Width | $\Delta\lambda$ | I <sub>F</sub> =50mA | —    | 55      | —    | nm            |
| 指向角半値幅 Half Angle            | $\Delta\theta$  | I <sub>F</sub> =50mA | —    | $\pm 7$ | —    | deg           |

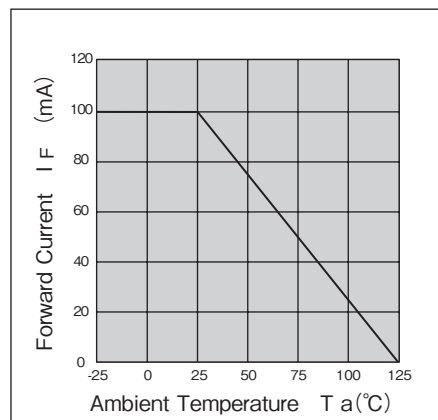
\*\* : Ta=25°C unless otherwise noted

# KL899

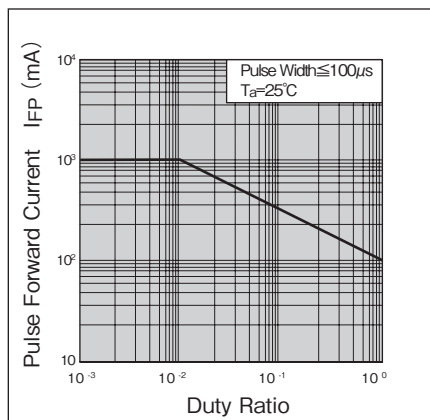
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

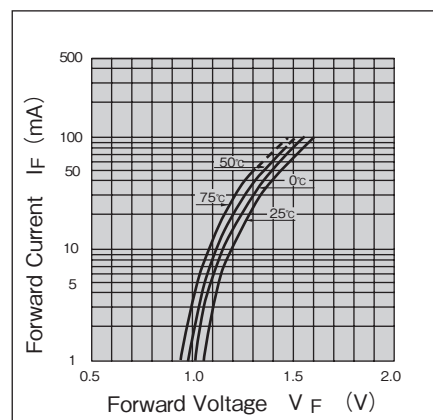
順電流低減曲線



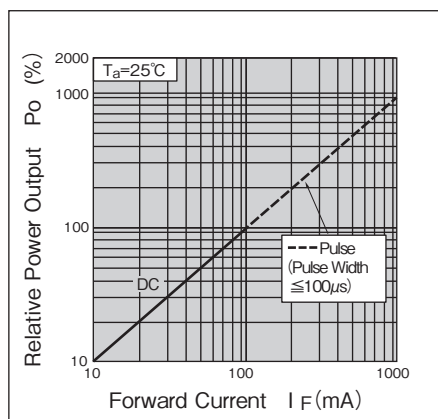
パルス順電流—デューティ比



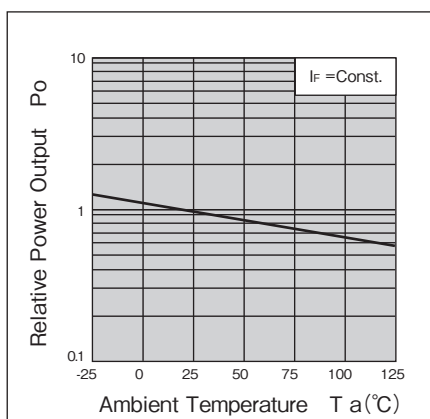
順電流—順電圧特性(代表例)



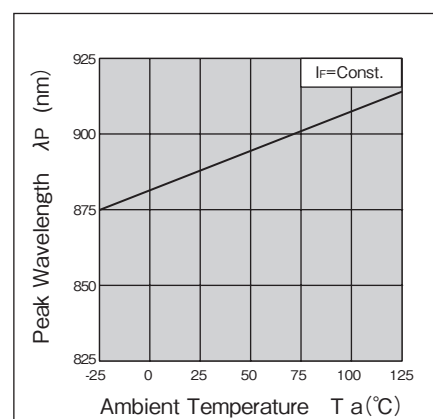
発光出力—順電流特性(代表例)



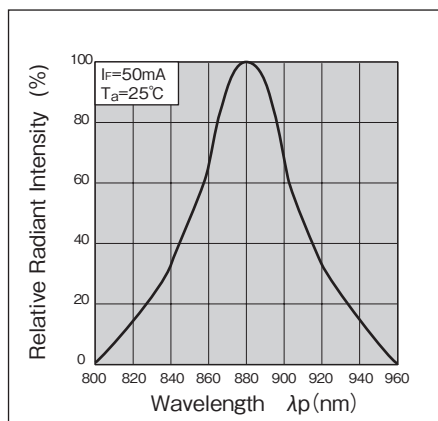
発光出力—周囲温度特性(代表例)



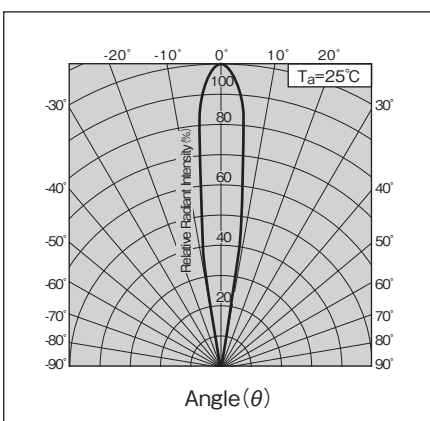
ピーク発光波長—  
周囲温度特性(代表例)



スペクトル分布(代表例)



指向特性(代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KL3095



平行光 赤色発光ダイオード

Parallel Beam Red LED



## 概要 Description

赤色の発光ダイオードチップをメタルパッケージに組み込んだ赤色発光ダイオードです。

This LED is a Red Light Emitting Diode mounted in TO-46 type header with lens can.

## 特長 Feature

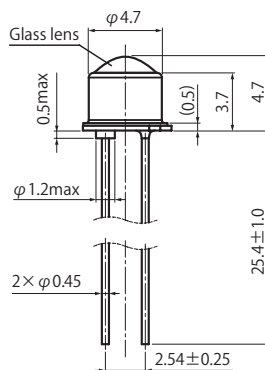
- ・ 平行光 LED
- ・ 超高出力赤色 LED 使用 ( $\lambda_p$ : 660nm)
- ・ TO-46メタルパッケージで高性能、高信頼性
- ・ Parallel beam
- ・ High power Red LED( $\lambda_p$ : 660nm)
- ・ TO-46 package

## 用途 Application

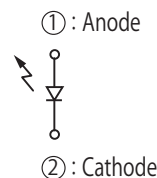
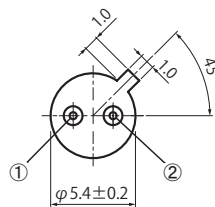
- ・ エンコーダ用光源
- ・ フォトセンサ用光源
- ・ 光電スイッチ用光源
- ・ LED Light source for Encoders
- ・ LED Light source for Photo sensor
- ・ LED Light source for Photoelectric sensor

## Dimension(Unit:mm)

KL3095



※ 指示無き寸法公差は下記の通りとする  
General tolerance unless otherwise noted  
less than 5.0  $\pm 0.2$   
5.0 to less than 15.0  $\pm 0.3$   
15.0 or over  $\pm 0.5$   
※ ( ) 内寸法は参考値とする  
( ) value means for reference only

最大定格 Maximum Ratings [  $T_a=25^\circ\text{C}$  \*\*]

| Item                                  | Symbol    | Rating          | Unit             |
|---------------------------------------|-----------|-----------------|------------------|
| 許 容 損 失 Power Dissipation             | P         | 120             | mW               |
| 順 電 流 Forward Current                 | $I_F$     | 50              | mA               |
| パ ル ス 順 電 流 Pulse Forward Current ※ 1 | $I_{FP}$  | 0.3             | A                |
| 逆 電 圧 Reverse Voltage                 | $V_R$     | 5               | V                |
| 動 作 温 度 Operating Temperature         | $T_{opr}$ | $-30 \sim +100$ | $^\circ\text{C}$ |
| 保 存 温 度 Storage Temperature           | $T_{stg}$ | $-40 \sim +125$ | $^\circ\text{C}$ |
| 半 田 付 温 度 Soldering Temperature ※ 2   | $T_{sol}$ | 330             | $^\circ\text{C}$ |

## 半田付け取扱注意

※ 1. パルス幅  $\leq 10\mu\text{s}$ 、デューティ比 = 0.01  
※ 2. キャンパッケージ底面より 2.6mm の位置で 2 秒以内  
手半田付けのみ可 (フロー半田付け不可)

※ 1. Pulse width  $\leq 10\mu\text{s}$ , Duty ratio = 0.01  
※ 2. Soldering condition less than 2s at 2.6 mm over from  
TO-46 header. Flow Soldering unsupported.

電気的光学的特性 Electro-Optical Characteristics [  $T_a=25^\circ\text{C}$  \*\*]

| Item                         | Symbol          | Condition         | min. | typ. | max. | Unit          |
|------------------------------|-----------------|-------------------|------|------|------|---------------|
| 順 電 圧 Forward Voltage        | $V_F$           | $I_F=20\text{mA}$ | —    | 2.0  | 2.3  | V             |
| 逆 電 流 Reverse Current        | $I_R$           | $V_R=5\text{V}$   | —    | —    | 100  | $\mu\text{A}$ |
| 発 光 出 力 Power Output         | $P_o$           | $I_F=20\text{mA}$ | —    | 4.0  | —    | mW            |
| ピーク発光波長 Peak Wavelength      | $\lambda_p$     | $I_F=20\text{mA}$ | —    | 660  | —    | nm            |
| スペクトル半値幅 Spectral Half Width | $\Delta\lambda$ | $I_F=20\text{mA}$ | —    | 15   | —    | nm            |
| 指向角半値幅 Half Angle            | $\Delta\theta$  | $I_F=20\text{mA}$ | —    | 2.5  | —    | deg           |

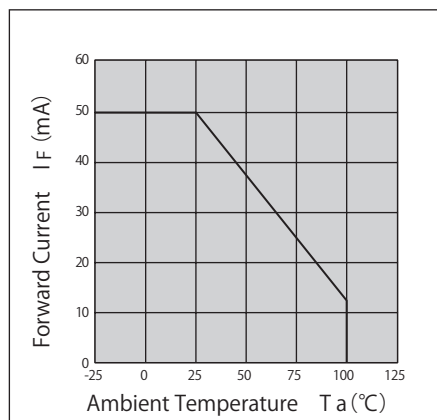
\*\* :  $T_a=25^\circ\text{C}$  unless otherwise noted

# KL3095

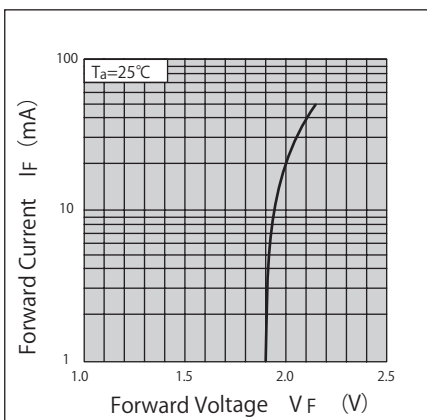
定格・特性曲線  
Characteristics

※注意 最大定格を超えないようにご使用ください  
Note: Operation never exceeds each value of Maximum Ratings.

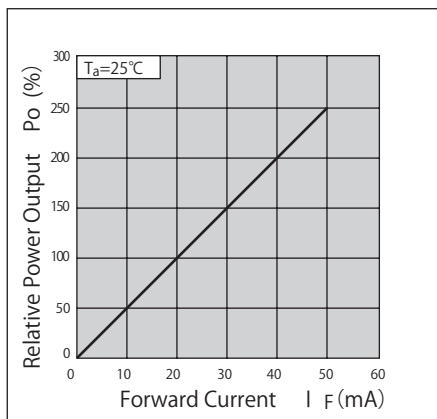
順電流低減曲線



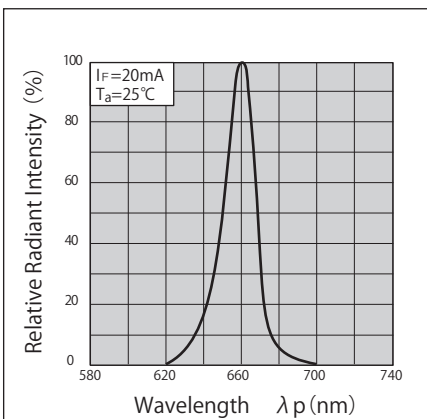
順電流－順電圧特性(代表例)



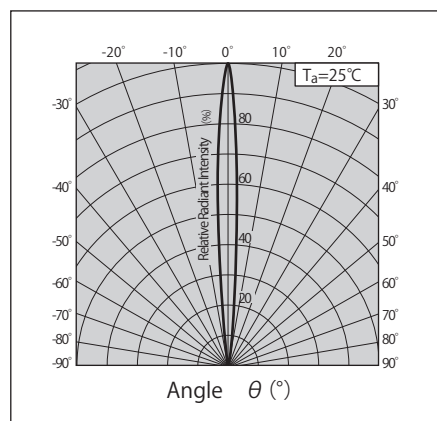
発光出力－順電流特性(代表例)



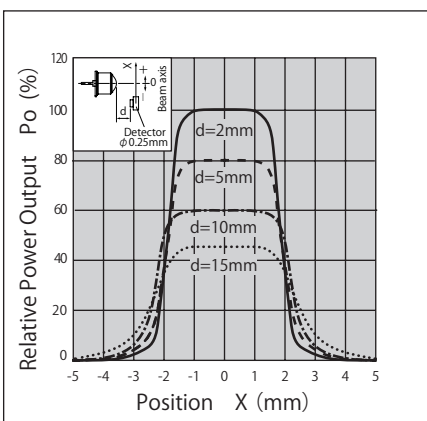
スペクトル分布(代表例)



指向特性(代表例)



相対光強度分布(代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
- ・ この仕様は改良のため予告なく変更する場合があります
- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## KD834



シリコンフォトダイオード

Silicon Photo Diode



## 概要 Description

KD834 は、プレーナタイプのシリコン・フォトダイオードチップをメタルパッケージに組み込んだフォトダイオードです。

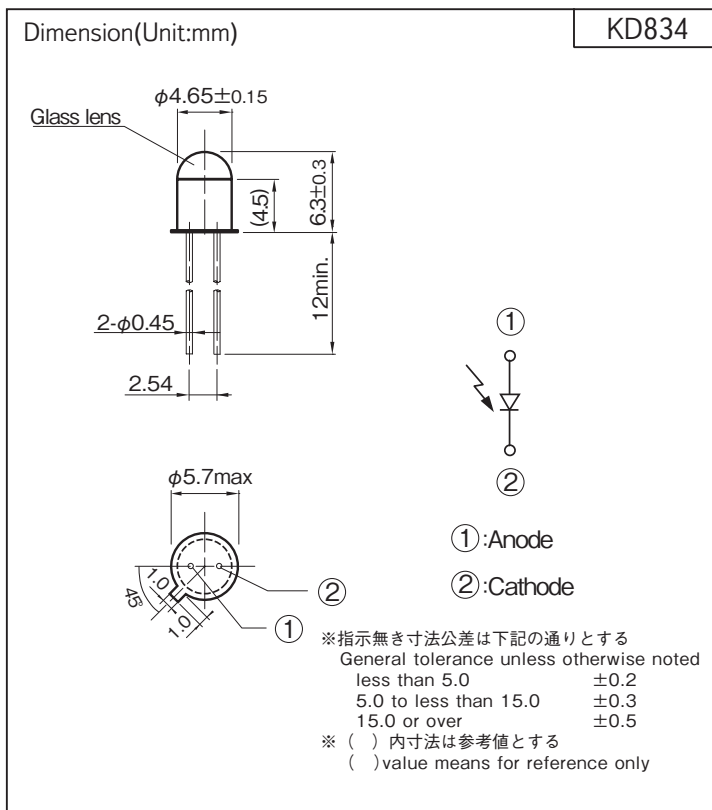
Model KD834 is silicon photodiode mounted in TO-18 type header with lens can.

## 特長 Feature

- ・ 高感度フォトダイオード (λp:900nm)
- ・ TO-18 メタルパッケージで高性能、高信頼性
- ・ Photo diode (λp:900nm)
- ・ TO-18 package

## 用途 Application

- ・ フォトセンサ用受光素子
- ・ 光電スイッチ用受光素子
- ・ Photo detector for Photo sensor
- ・ Photo detector for Photoelectric sensor



## 最大定格 Maximum Ratings [ Ta=25°C \*\*]

| Item                           | Symbol | Rating     | Unit |
|--------------------------------|--------|------------|------|
| 逆電圧 Reverse Voltage            | VR     | 30         | V    |
| 許容損失 Power Dissipation         | Pd     | 100        | mW   |
| 動作温度 Operating Temperature     | Topr   | -25 ~ +125 | °C   |
| 保存温度 Storage Temperature       | Tstg   | -55 ~ +150 | °C   |
| 半田付温度 Soldering Temperature ※1 | Tsol   | 330        | °C   |

## 半田付け取扱注意

※ 1. キャンパッケージ底面より 2.6mm の位置で 2 秒以内  
手半田付けのみ可 ( フロー半田付け不可 )

※ 2. EV : CIE 標準 A 光源

※ 1. Soldering condition less than 2s. at 2.6 mm over  
from TO-18 header. Flow Soldering unsupported.

※ 2. EV : CIE STD. A Light source

## 電気的光学的特性 Electro-Optical Characteristics [ Ta=25°C \*\*]

| Item                       | Symbol          | Condition          | min. | typ. | max. | Unit |
|----------------------------|-----------------|--------------------|------|------|------|------|
| 暗電流 Dark Current           | ID              | VR=10V, EV=0 lx ※2 | —    | —    | 10   | nA   |
| 短絡電流 Short Circuit Current | ISC             | EV=100 lx ※2       | 0.7  | 1.5  | —    | μA   |
| ピーク感度波長 Peak Wavelength    | λp              | —                  | —    | 900  | —    | nm   |
| 指向角半値幅 Half Angle          | Δθ              | —                  | —    | ±8   | —    | deg  |
| 応答時間<br>Response Time      | 上昇<br>Rise Time | VR=5V, RL=1kΩ      | —    | 3    | —    | μs   |
|                            | 下降<br>Fall Time |                    | —    | 3    | —    |      |

\*\* : Ta=25°C unless otherwise noted

# KD834

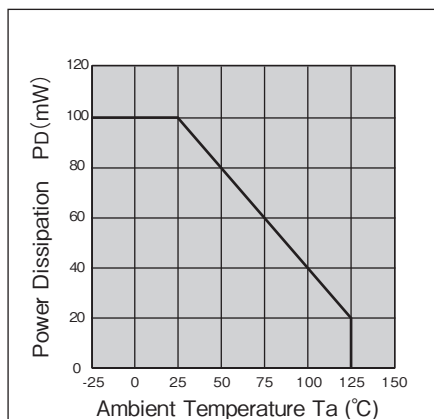
## 定格・特性曲線

Characteristics

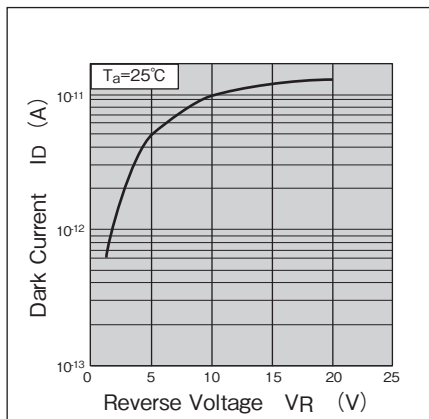
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

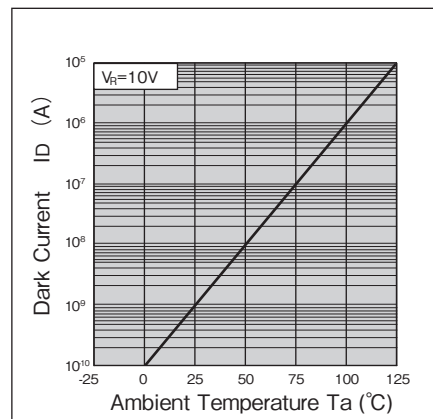
### 許容損失低減曲線



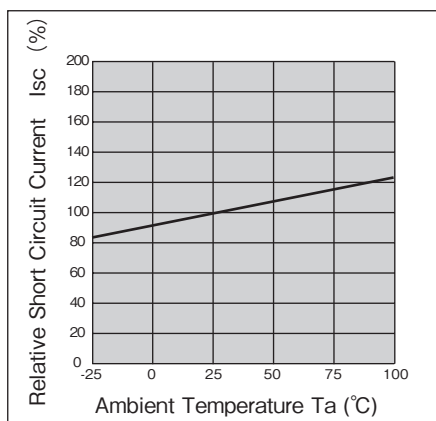
### 暗電流—逆電圧特性 (代表例)



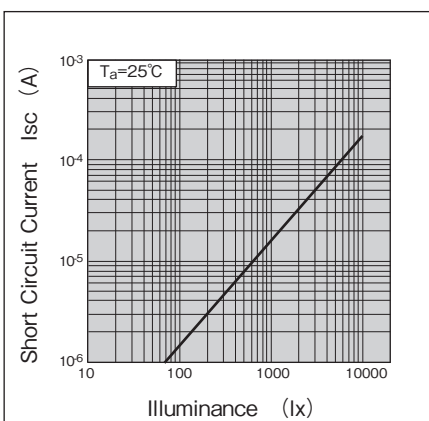
### 暗電流—周囲温度特性 (代表例)



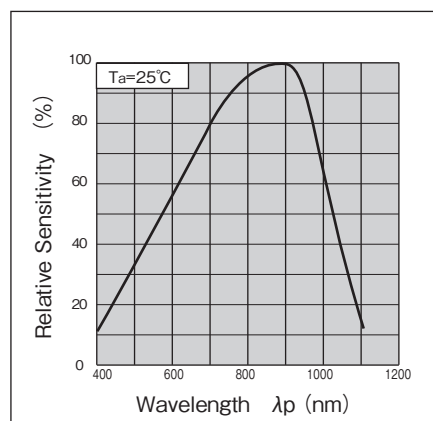
### 短絡電流—周囲温度特性 (代表例)



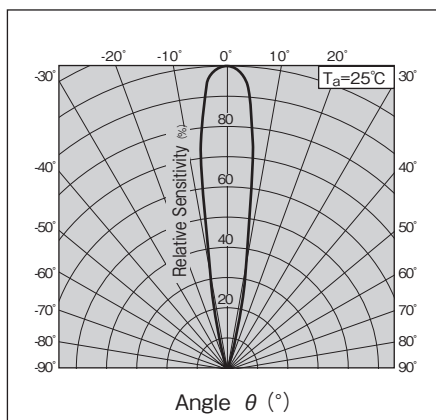
### 短絡電流—照度特性 (代表例)



### 分光感度特性 (代表例)



### 指向特性 (代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
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- ・ Specifications are subject to change without notice.

## KS853



シリコンフォトリランジスタ

Silicon Photo Transistor



## 概要 Description

KS853 は、プレーナータイプの NPN 型シリコン・フォトリランジスタチップをメタルパッケージに組み込んだフォトリランジスタです。

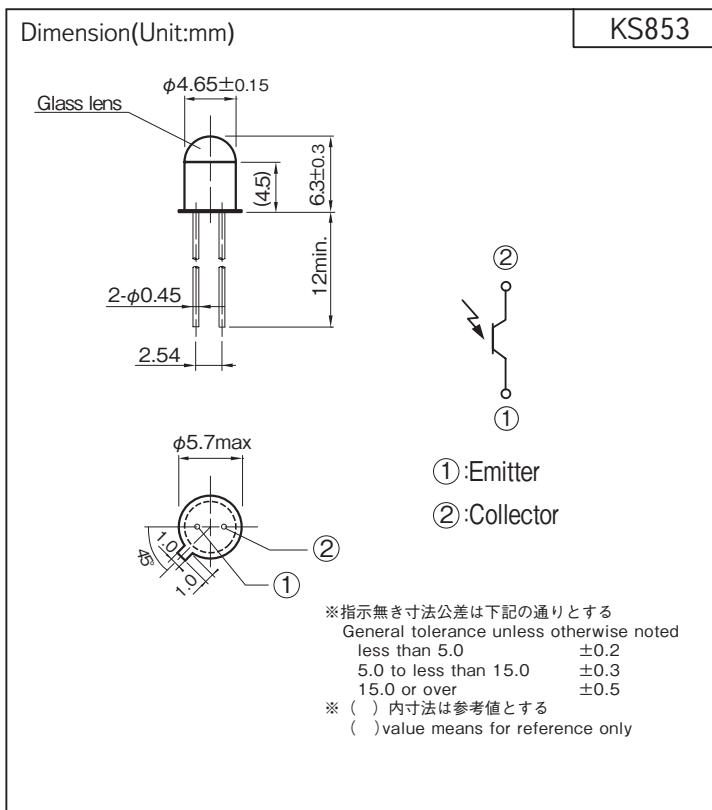
Model KS853 is NPN type of silicon photo transistor in TO-18 type header with epoxy encapsulation.

## 特長 Feature

- ・ 高感度 NPN フォトリランジスタ ( $\lambda_p$ :900nm)
- ・ TO-18 メタルパッケージで高性能、高信頼性
- ・ NPN photo transistor ( $\lambda_p$ :900nm)
- ・ TO-18 package

## 用途 Application

- ・ フォトセンサ用受光素子
- ・ 光電スイッチ用受光素子
- ・ Photo detector for Photo sensor
- ・ Photo detector for Photoelectric sensor

最大定格 Maximum Ratings [ $T_a=25^\circ\text{C}$  \*\*]

| Item                                   | Symbol           | Rating     | Unit |
|----------------------------------------|------------------|------------|------|
| コレクタ・エミッタ間電圧 Collector-Emitter Voltage | V <sub>CEO</sub> | 25         | V    |
| エミッタ・コレクタ間電圧 Emitter-Collector Voltage | V <sub>ECO</sub> | 5          | V    |
| コレクタ電流 Collector Current               | I <sub>C</sub>   | 20         | mA   |
| コレクタ損失 Collector Power Dissipation     | P <sub>C</sub>   | 100        | mW   |
| 動作温度 Operating Temperature             | T <sub>opr</sub> | -25 ~ +125 | °C   |
| 保存温度 Storage Temperature               | T <sub>stg</sub> | -55 ~ +150 | °C   |
| 半田付温度 Soldering Temperature **1        | T <sub>sol</sub> | 330        | °C   |

## 半田付け取扱注意

- ※ 1. キャンパッケージ底面より 2.6mm の位置で 2 秒以内  
手半田付けのみ可 (フロー半田付け不可)
- ※ 2. EV : CIE 標準 A 光源
- ※ 1. Soldering condition less than 2s at 2.6 mm over from  
TO-18 header. Flow Soldering unsupported.
- ※ 2. EV : CIE STD. A Light source

電気的光学的特性 Electro-Optical Characteristics [ $T_a=25^\circ\text{C}$  \*\*]

| Item                                                | Symbol               | Condition                                                      | min. | typ. | max. | Unit |
|-----------------------------------------------------|----------------------|----------------------------------------------------------------|------|------|------|------|
| 光電流 Light Current                                   | I <sub>C</sub>       | V <sub>CE</sub> =5V, E <sub>v</sub> =100 lx ※2                 | 0.55 | 4    | —    | mA   |
| 暗電流 Dark Current                                    | I <sub>CEO</sub>     | V <sub>CE</sub> =10V, E <sub>v</sub> = 0 lx ※2                 | —    | —    | 0.2  | μA   |
| コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> =1mA, E <sub>v</sub> =1000 lx ※2                | —    | 0.25 | 0.5  | V    |
| ピーク感度波長 Peak Wavelength                             | λ <sub>p</sub>       | —                                                              | —    | 900  | —    | nm   |
| 指向角半値幅 Half Angle                                   | Δθ                   | —                                                              | —    | ±8   | —    | deg  |
| 応答時間<br>Response Time                               | 上昇<br>Rise Time      | V <sub>CC</sub> =5V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω | —    | 2    | —    | μs   |
|                                                     | 下降<br>Fall Time      |                                                                | —    | 3    | —    |      |

\*\* :  $T_a=25^\circ\text{C}$  unless otherwise noted

# KS853

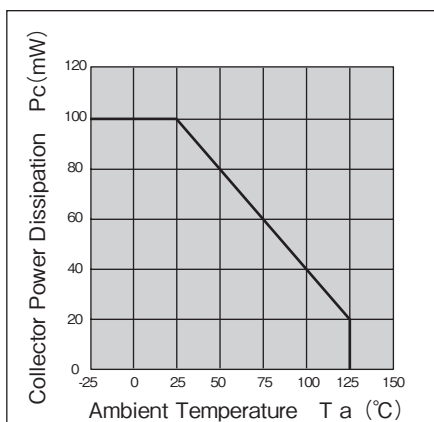
## 定格・特性曲線

Characteristics

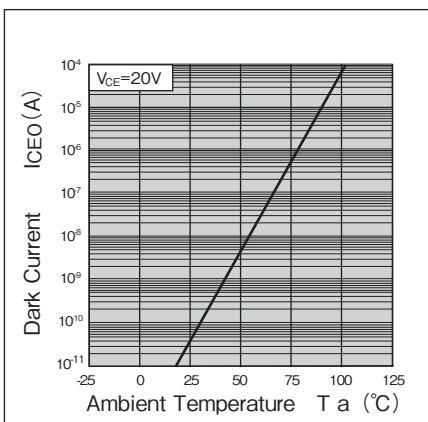
※注意 最大定格を超えないようにご使用ください

Note: Operation never exceeds each value of Maximum Ratings.

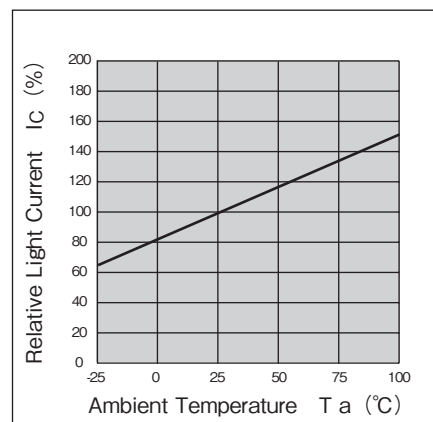
### コレクタ損失低減曲線



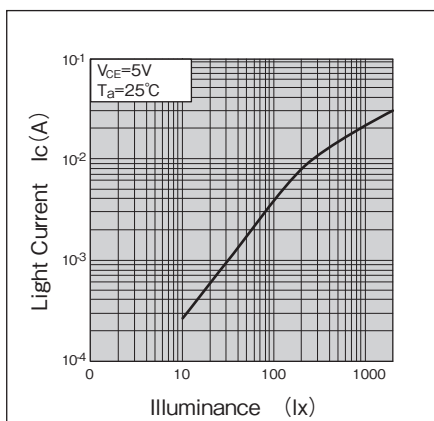
### 暗電流—周囲温度特性(代表例)



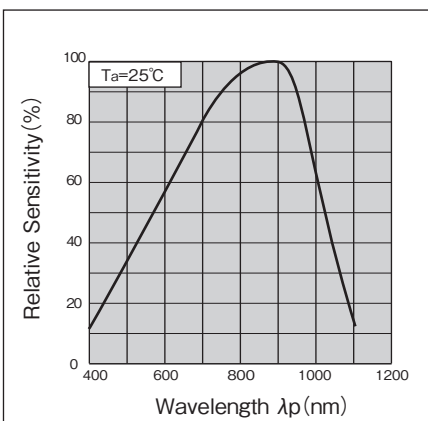
### 相対光電流—周囲温度特性(代表例)



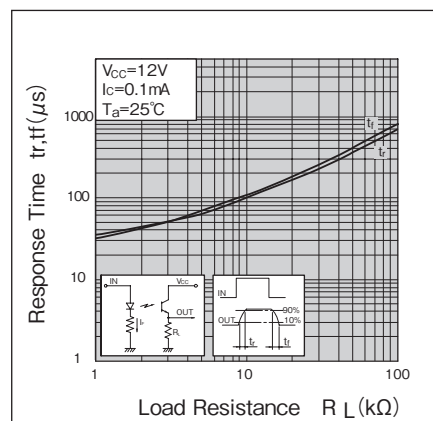
### 光電流—照度特性(代表例)



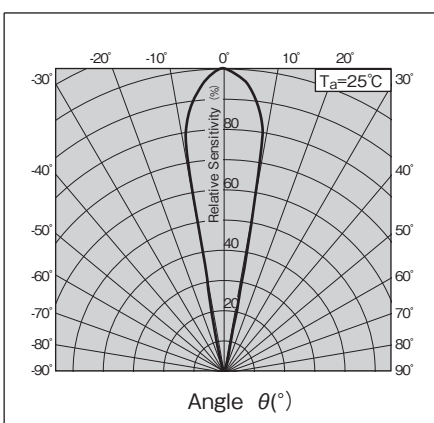
### 分光感度特性(代表例)



### 応答時間—負荷抵抗特性(代表例)



### 指向特性(代表例)



- ・ カスタマイズも承ります。お気軽にお問合せください
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- ・ A Customized design available on request.
- ・ Specifications are subject to change without notice.

## 営業窓口 Contact to Sales

## 【国内窓口】 For Local Customers



東京営業所 東日本地域  
お問合せ：  
Tel. 03-6404-1003

名古屋営業所 中部地域  
お問合せ：  
Tel. 052-229-1003

関西営業所 西日本地域  
お問合せ：  
Tel. 075-352-1003

国内のお客さまは、上記区分をご参照の上  
担当営業所までお問い合わせの程お願い申し上げます。

## 【海外窓口】 For Overseas Customers

東京営業所 Tokyo office  
お問合せ： (International Sales Dept.)  
Tel. 03-6404-1003 Tel. +81 - 3-6404-1003

## 拠点情報 Location of Shinkoh branch

## 【本社 / 営業所】 Branch in Japan

■本社・開発センター  
〒 250-0875 神奈川県小田原市南鴨宮 2-29-30  
総務部 / 技術開発部  
TEL : 0465-45-1212 (代表) / FAX : 0465-45-1213

■管理センター  
〒 250-0875 神奈川県小田原市南鴨宮 3-16-9  
生産本部  
TEL : 0465-45-3311 (代表) / FAX : 0465-45-3312

■東京営業所  
〒 140-0013 東京都品川区南大井 6-20-8  
リードシー大森ビル 8F  
TEL : 03-6404-1003 / FAX : 03-6404-1005

■名古屋営業所  
〒 460-0008 愛知県名古屋市中区栄 1-29-19  
ヤスイビル 3F  
TEL : 052-229-1003 / FAX : 052-229-1006

■関西営業所  
〒 600-8412 京都府京都市下京区二帖半敷町 646  
ダイマルヤ四條烏丸ビル 3F  
TEL : 075-352-1003 / FAX : 075-352-1006

■ Head office  
2-29-30, Minami-Kamonomiya, Odawara, Kanagawa,  
Japan Zip:250-0875

■ Production Control office  
3-16-9, Minami-Kamonomiya, Odawara, Kanagawa,  
Japan Zip:250-0875

■ Tokyo Branch (International Sales Dept.)  
8F, REID-C OMORI building, 6-20-8, Minami-oi,  
Shinagawa, Tokyo, Japan Zip:140-0013

■ Nagoya Branch  
3F, YASUI building, 1-29-19 Sakae,  
Naka-ku, Nagoya, Aichi, Japan Zip:460-0008

■ Kansai Branch  
3F DAIMARUYA-SHIJYOKARASUMA bldg., 646,  
Nijyohanjiki cho, Shimogyo-ku, Kyoto, Japan  
Zip:600-8412

## 【グループ会社】 Group company

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新光電子科技有限公司

■中国 (広東省)  
珠海日嘉新光電子有限公司

■ Hong Kong  
Shinkoh Electronics HK Ltd.

■ China  
Zhuhai Nikka Shinkoh Electronics Ltd.

Autorisierter Distributor

**NEUMÜLLER**

ELEKTRONIK GMBH

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Gewerbegebiet Ost 7 info@neumueller.com  
D-91085 Weisendorf www.neumueller.com

## World Wide Shinkoh

海外拠点情報

Global information of Shinkoh Elecs.



For further information, please feel free to contact our sales (Tokyo office) or distributors.  
We wish our suggestion contributes greatly to the solving of your problem about Photo sensor.  
Please visit our website to check the latest distributors information;  
[www.shinkoh-elecs.jp/en/company/overseas/](http://www.shinkoh-elecs.jp/en/company/overseas/)

MEMO.

# MEMO.



新光電子

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Autorisierter Distributor

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