

### FEATURES

- ◆ Encapsulated compact AC-DC power supply
- ◆ Over Load and Over Voltage Protection
- ◆ 3 Mounting Package Versoin:
  - Solder pins for direct PCB mount
  - Screw terminal block for chassis mount
  - DIN-Rail Mount
- ◆ Universal Input voltage range 85-264 VAC, 47-440 Hz
- ◆ 3kVAC Isolatoion, Protection Class II level
- ◆ UL/IEC/EN 60950-1 Certified , CE Marked
- ◆ UL508 Approval
- ◆ Lead free, RoHs Compliant
- ◆ 3 Year Product Warranty



The AA60S series , isolated fully encapsulated 60W AC/DC power module with 3,000VAC isolation. With Universal input voltage 85-264VAC and International safety approvals, these power modules are ideal for applications in commercial and industrial electronic equipment. These isolated AC/DC converters are the latest offering from a world leader in power systems technology and manufacturing — Delta Electronics, Inc. With creative design technology and optimization of component placement, these converters possess outstanding electrical and thermal performance, as well as extremely high reliability under highly stressful operating conditions. industrial electronic equipment.

### Model List

| Model Number | Output Voltage | Output Current | Input Current       |                   | Max. capacitive Load | Efficiency (typ.) |
|--------------|----------------|----------------|---------------------|-------------------|----------------------|-------------------|
|              |                |                | 115VAC, 60Hz        |                   |                      |                   |
|              | VDC            | Max. mA        | @Max. Load mA(typ.) | @No Load mA(typ.) | μF                   | @Max. Load %      |
| AA60S0500A   | 5.1            | 10,000         | 936                 | 50                | 8000                 | 79                |
| AA60S1200A   | 12             | 5000           | 1060                | 50                | 3900                 | 82                |
| AA60S1500A   | 15             | 4000           | 1047                | 50                | 3300                 | 83                |
| AA60S2400A   | 24             | 2500           | 1035                | 50                | 1500                 | 84                |
| AA60S3600A   | 36             | 1666           | 1035                | 50                | 1000                 | 84                |
| AA60S4800A   | 48             | 1250           | 1035                | 50                | 680                  | 84                |

### Input Characteristics

| Parameter                           | Model      | Min. | Typ. | Max. | Unit |
|-------------------------------------|------------|------|------|------|------|
| Input Voltage Range                 | All Models | 85   | ---  | 264  | VAC  |
| Input Frequency Range               |            | 47   | ---  | 63   | Hz   |
| Input Voltage Range                 |            | 120  | ---  | 370  | VDC  |
| Inrush Current (Cold Start at 25°C) | 115VAC     | ---  | ---  | 30   | A    |
|                                     | 230VAC     | ---  | ---  | 50   | A    |

## Output Characteristics

| Parameter                    | Conditions   | Min. | Typ.  | Max. | Unit                |
|------------------------------|--|------|-------|------|---------------------|
| Output Voltage Accuracy      |  | ---  | ±1.0  | ±2.0 | %                   |
| Line Regulation              | Vin=Min. to Max.   | ---  | ±0.2  | ±1.0 | %                   |
| Load Regulation              | Iout=Min. to Max.  | ---  | ±0.5  | ±1.0 | %                   |
| Ripple & Noise (20MHz)       | 5.1VDC Output Models   | ---  | 2.0   | 3.0  | %V <sub>PP</sub> of |
|                              | Other Output Models  | ---  | 1.0   | 1.3  | %V <sub>PP</sub> of |
| Minimum Load                 |  | ---  | 10    | ---  | %Inom.              |
| Over Voltage Protection      | Zener diode clamp  | ---  | 120   | ---  | % of Vo             |
| Transient Response Deviation | (Iout=100% to Iout=50%)  |      | ±3    | ±6   | %                   |
| Temperature Coefficient      |  | ---  | ±0.02 | ---  | %/°C                |
| Overshoot                    |  | ---  | ---   | 5    | % Vout              |
| Current Limitation           | Foldback, auto-recovery<br>(long term overload condition may cause damage) | 105  | ---   | ---  | %Inom.              |
| Short Circuit Protection     | Hiccup mode, indefinite (automatic recovery)                               |      |       |      |                     |

## General Characteristics

| Parameter                             | Conditions                        | Min.  | Typ. | Max. | Unit                    |
|---------------------------------------|-----------------------------------|---|------|------|-------------------------|
| I/O Isolation Voltage                 | Input to Output, 60 Seconds       | 3000  | ---  | ---  | VACrms                  |
| I/O Isolation Resistance              | 500 VDC                           | 100   | ---  | ---  | MΩ                      |
| Switching Frequency                   |                                   | ---   | 100  | ---  | KHz                     |
| Hold-up Time                          |                                   | ---   | 20   | ---  | ms                      |
| MTBF (calculated)                     | MIL-HDBK-217F@25°C, Ground Benign | 125,000   | ---  | ---  | Hours                   |
| EMC Emission                          | Conducted and radiated            | EN 55011 class B, EN 55022 class B, FCC part 15 class B |      |      |                         |
| EMC Immunity according<br>EN61000-6-1 | Standard                          | Specification Requirement                               |      |      | Performance<br>Criteria |
|                                       | EN61000-4-2                       | Air ±8KV Cont. ±4KV                                     |      |      | B                       |
|                                       | EN61000-4-3                       | 80~1000MHz, 10V/m 80% AM, 1KHz modulation               |      |      | A                       |
|                                       | EN61000-4-4                       | AC port ±2KV DC, SL, TL ±2KV not less than 1 min.       |      |      | B                       |
|                                       | EN61000-4-5                       | 1.2/50μS(8/20μS) AC dif. ±1KV DC ±0.5KV                 |      |      | B                       |
|                                       | EN61000-4-6                       | 0.15~80MHz, 10Vrms (functional earth ports included)    |      |      | B                       |
|                                       | EN61000-4-8                       | 80% AM, 1KHz modulation<br>50Hz/60Hz, 30A/m             |      |      | A                       |
|                                       | EN61000-4-11                      | 30%, 10ms<br>60%, 100ms, 95%, 5000ms                    |      |      | B<br>C                  |
| Protection Class II                   |                                   | According IEC/EN 60536                                  |      |      |                         |
| Safety Approvals                      |                                   | cUL/UL 60950-1, IEC/EN 60950-1<br>UL508 approval        |      |      |                         |

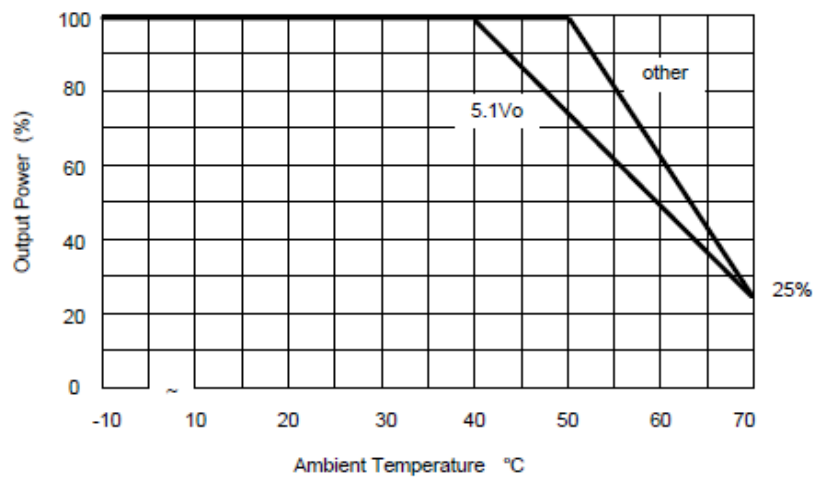
## Input Fuse

| All Models                  |                     |
|-----------------------------|---------------------|
| Built-in Fuse               | 6A / 250VAC         |
| External Fuse (Recommended) | 3A Slow – Blow Type |

## Environmental Specifications

| Parameter                       | Conditions                           |       |             |
|---------------------------------|--------------------------------------|-------|-------------|
| Temperature Range (operational) | Ambient                              | -10°C | +70°C       |
| Power Derating (5.1Vout)        | +40°C to +70°C                       |       | 2.25W / °C  |
| Storage Temperature Range       |                                      | -40°C | +85°C       |
| Over Temperature Protection     | at 90°C (automatic recovery at 67°C) |       |             |
| Cooling                         | Free-Air convection                  |       |             |
| Humidity (non condensing)       |                                      | ---   | 95 % rel. H |

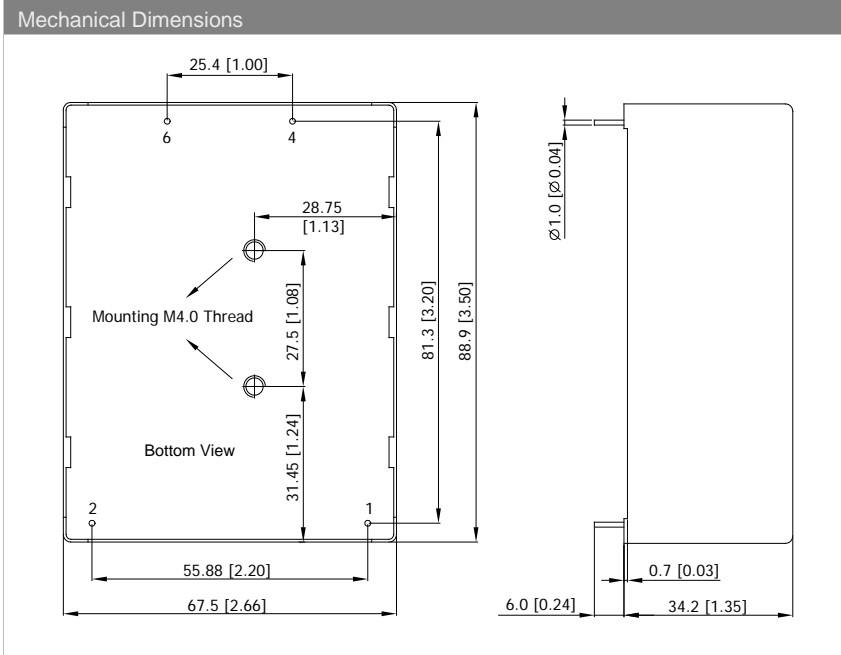
## Power Derating Curve



## Notes

- 1 All specifications typical at  $T_a=+25^\circ\text{C}$ , resistive load, 115VAC, 60Hz input voltage and after warm-up time rated output current unless otherwise noted.
- 2 Ripple & Noise measurement bandwidth is 0~20 MHz
- 3 These power modules require a minimum output loading to maintain specified regulation, operation under no-load conditions will not damage the power supplies however they may not meet all listed specifications.
4. Other input and output voltage may be available, please contact us for custom solution.
- 5 Long term short circuit operation may cause damage to the unit.
- 6 Specifications are subject to change without notice

## Mechanical Drawing PCB Mounting



**Pin Connections**

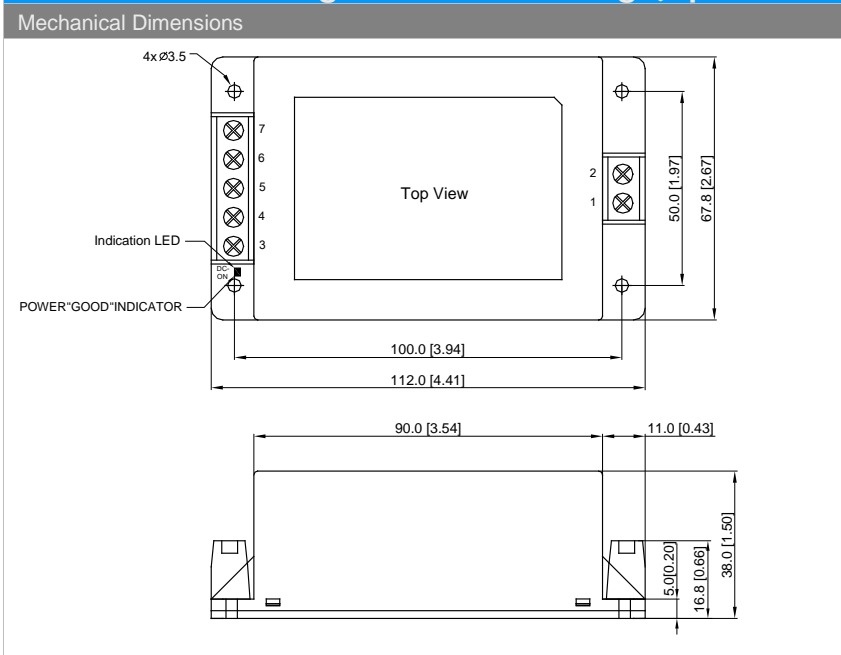
| Pin | Function           |
|-----|--------------------|
| 1   | AC(N) – AC Neutral |
| 2   | AC(L) – AC Line    |
| 4   | +Vout              |
| 6   | -Vout              |

- ▶ All dimensions in mm (inches)
- ▶ Tolerance:  $\pm 0.5$  ( $\pm 0.02$ )
- ▶ Pin diameter  $\varnothing 1.0 \pm 0.1$  ( $0.04 \pm 0.004$ )

## Physical Outline

|               |   |
|---------------|---|
| Case Size     | : 88.9x67.5x34.2mm (3.50x2.66x1.35 inches)                    |
| Case Material | : Plastic resin + Fiberglass (flammability to UL 94V-0 rated) |
| Pin Material  | : Copper Alloy with Gold Plate Over Nickel Subplate           |
| Weight        | : 345g  |

## Mechanical Drawing Chassis Mounting (Option code, suffix C)



**Connections**

| Terminal | Function           |
|----------|--------------------|
| 1        | AC(N) – AC Neutral |
| 2        | AC(L) – AC Line    |
| 3        | NC                 |
| 4        | +Vout              |
| 5        | NC                 |
| 6        | -Vout              |
| 7        | NC                 |

NC: No Connection

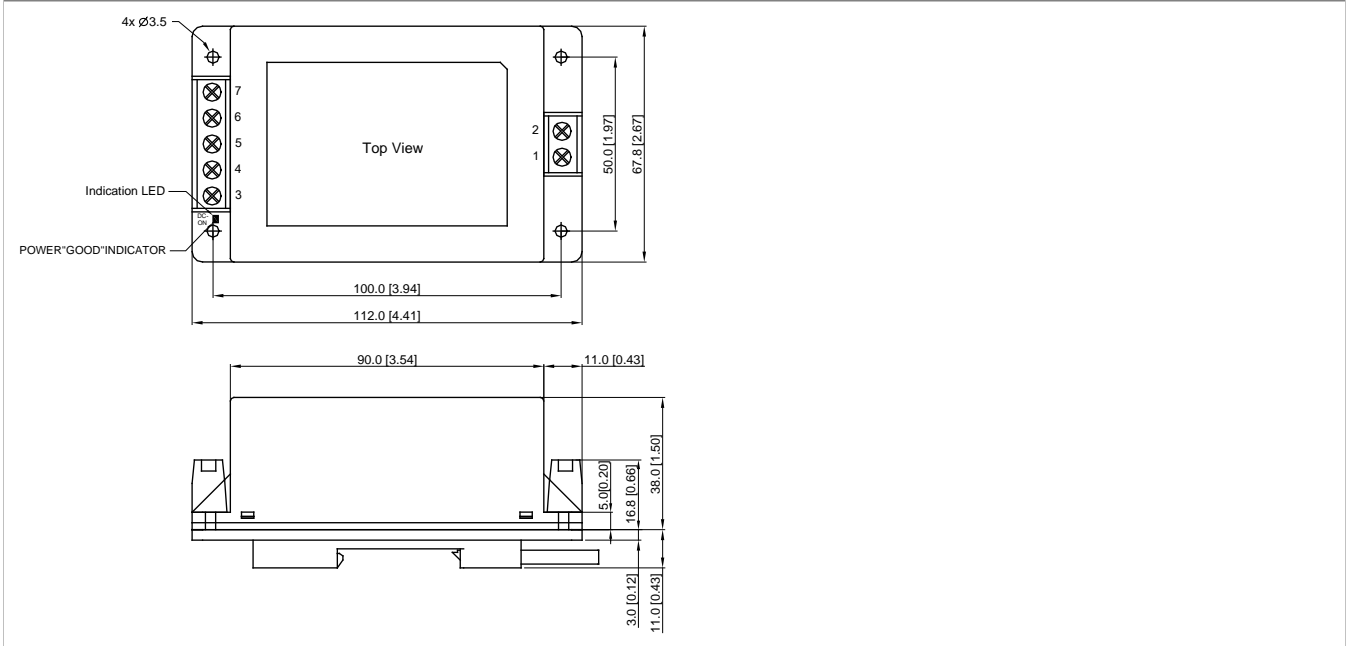
- ▶ All dimensions in mm (inches)
- ▶ Tolerance:  $\pm 0.5$  ( $\pm 0.02$ )

### Physical Outline

|               |   |
|---------------|---|
| Case Size     | : 112.0x67.8x38.0mm (4.41x2.67x1.50 inches)                   |
| Case Material | : Plastic resin + Fiberglass (flammability to UL 94V-0 rated) |
| Weight        | : 357g  |

### Mechanical Drawing Chassis Mounting with DIN Rail Kit (Option code, suffix D)

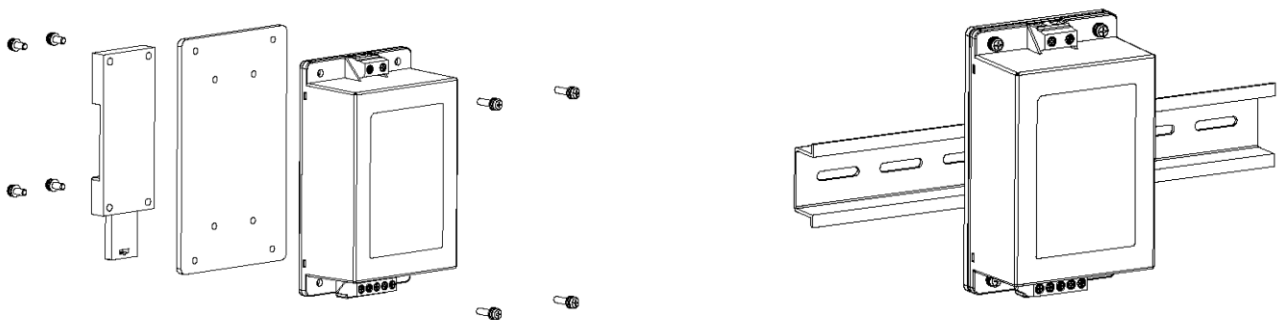
#### Mechanical Dimensions



### Physical Outline

|               |   |
|---------------|---|
| Case Size     | : 112.0x67.8x38.0mm (4.41x2.67x1.50 inches)                   |
| Case Material | : Plastic resin + Fiberglass (flammability to UL 94V-0 rated) |
| Weight        | : 410g  |

### DIN-Rail Mounting Kit





| Part Numbering System |                        |          |                   |                  |                     |                    |
|-----------------------|------------------------|----------|-------------------|------------------|---------------------|--------------------|
| A                     | A                      | 60       | S                 | 15               | 00                  | A                  |
| Product typ           | Family series          | Watt     | Number of Outputs | Output Voltage I | Output Voltage II   | Option Code        |
| AC/DC Power Module    | Industrial application | 60 - 60W | S - Single        | 05 - 5.1V        | 00 - not applicable | A - PCB Mount      |
|                       |                        |          |                   | 12 - 12V         |                     | C - Chassis Mount  |
|                       |                        |          |                   | 15 - 15V         |                     | D - Din Rail Mount |
|                       |                        |          |                   | 24 - 24V         |                     |                    |
|                       |                        |          |                   | 36 - 36V         |                     |                    |
|                       |                        |          |                   | 48 - 48V         |                     |                    |

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**WARRANTY**

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