Product Datasheet

The global certified TLD-160-C is a dual stage extremely wide input smart LED driver. 10kV surge protection level, 100khour long life and 7-year warranty provide high confidence to luminaire users. It supports not only traditional 4-in-1 control, but also DALI2.0 and other protocols. NFC and cable programming are both available for users. All around protections including digital OTP (internal and external by NTC) with auto-recovery secure 24hour non-stop operation for luminaires.

☑ Road ☑ High-bay ☑ Horticultural ☑ Stadium ☑ Flood

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Features

- Supply Voltage: 180-528Vac or 250-740Vdc
- Great Surge Immunity 10kV
- -60℃ Cold Ambient Startup (Optional)
- 100,000Hour Life @ Tc=75℃
- 7 Year Warranty @ Tc<=75℃
- Airset™ NFC Programmability
- +/-2% Output Current Accuracy
- Isolated 0-10V/PWM/Time/DALI2.0/ DMX/RDM Dimmable
- Dim Off with 1.5W Standby Power
- 12V 300mA Auxiliary Power to Power Controllers and Fans (Optional)
- UL Class P, ENEC/CB/CCC SELV Output
- Global Certified Model Available
- Safety according to EN 61347-1, 61347-2-3, 61347-2-13, 62384

Model List

Model Number	Input Voltage Range	Output Power	Output Voltage	Full Power Settable Current Min	Full Power Settable Current Max
TLD-160-C105-XYZ	180-528Vac	160 W	91-229Vdc	700mA	1050mA
TLD-160-C140-XYZ	180-528Vac	160 W	69-152Vdc	1050mA	1400mA
TLD-160-C210-XYZ	180-528Vac	160 W	46-114Vdc	1400mA	2100mA
TLD-160-C420-XYZ	180-528Vac	160 W	23-57Vdc	2800mA	4200mA
TLD-160-C630-XYZ	180-528Vac	160 W	14-36Vdc	4400mA	6300mA

XY=	Dimming Method	Programmable	12Vaux	Dim-off
NN	-	-	-	-
DN	0-10V/PWM/Time	Cable	-	**No** Dim-off as **default status**, programmed to have Dim-off
EN	0-10V/PWM/Time	Cable	300mA	√
TR	Time/Set Current	NFC Wireless	-	-
DR	0-10V/PWM/Time	NFC Wireless	-	**No** Dim-off as **default status**, programmed to have Dim-off
ER	0-10V/PWM/Time	NFC Wireless	300mA	√
AR	DALI2.0	NFC Wireless	-	√
MR	DMX512 + RDM	NFC Wireless	-	√

Z=	U	V	S	S-GLB000	W	D
Input Cable	3 pin UL cable with ground	3 pin UL cable with ground	3 pin VDE cable with ground	3 pin Global cable with ground	3 pin VDE cable with ground	2 pin VDE cable without ground
Output Cable	2 pin UL cable without Ground	3 pin UL cable with ground	2 pin VDE cable without ground	2 pin Global cable with ground	3 pin VDE cable with ground	2 pin VDE cable without ground
Certified Input Voltage Range	UL Listed Class P 200-480Vac	UL Listed Class P 200-480Vac	ENEC CB RCM Class I 200-480Vac	UL Recognized ENEC CB RCM Class I 200-480Vac	Class I 200-480Vac	Class II 200-480Vac

Technical Data

Input Voltage	180-528Vac or 250-740Vdc
Input Frequency	47～63Hz
Power Factor	>0.9@70-100%load, refer to PF vs. Load curve
THD	<15%@70-100%load, refer to THD vs. Load curve
Input Current	0.90Amax@277Vac & Full-Load, 0.45Amax@480Vac & Full-Load
Inrush Current	See Inrush Current Section in the datasheet
Leakage Current	0.75MIU max @480Vac 60Hz, UL8750 0.7mA max @400Vac 50/60Hz, IEC60598-1
Input Under Voltage	Shut down and auto-restart
Surge Protection	Line to line 6kV, line to ground 10kV, IEC 61000-4-5
Current Accuracy	±2%Io for programmable model, ±5%Io for non-programmable model
Ripple Current	Ip-p:5%Io max
Setup Time	1.2s max
Overshoot	10% Io max & LED Load
Output Over Voltage	120% Vomax, typ.
Short Circuit	Auto recovery. The output recovers when short is removed.
Over Temperature	Lower the output current when Tc≧105±10℃; Auto Recovery When Tc≦70±10℃
Auxiliary Power (Vaux)	12V+/-5%, 300mA max
Operating Temperature	Case Temperature Tc=-40℃～+90℃； 10%RH～100%RH
Storage Temperature	-40℃～+85℃； 5%RH～100%RH
MTBF	≥280,000 hours, 75℃ case temperature (MIL-HDBK-217F)
Lifetime	≥100,000 hours, 75℃ case temperature, refer to life vs. Tc curve
Case Temperature	90℃ max, marked in the Tc point of label
Dimensions	8.85x2.68x1.31 by inch (body), 9.88x2.68x1.31 by inch (endcaps included)
	225 x 68 x 33.5 by mm (body), 251 x 68 x 33.5 by mm (endcaps included)
Net Weight	1100g
Packing	See Package Information Section in the datasheet

Notes: Unless specified, all the test results are measured in 25℃ room temperature.

Safety/EMC Compliance

Safety Standards	Description
UL8750	Light emitting diode(LED) equipment for use in lighting products
UL1012/1310	Power units other than class 2 / Class 2 power units
IEC 61347-1	Lamp control gear Part 1: general and safety requirements
IEC 61347-2-13	Lamp control gear Part 2-13: particular requirement for d.c. or a.c. supplied electronic control gear for LED modules
IEC 62384	DC or AC supplied electronic control gear for LED modules - Performance requirements
IEC 55015/FCC Part 15	Conducted emission test & radiated emission test; ANSI C63.4:2009 Class B
IEC 61000-3-2	Harmonic current emissions; Class C
IEC 61000-3-3	Voltage fluctuations & flicker
IEC 61000-4-2	Electrostatic discharge (ESD): 8 kV air discharge, 4 kV contact discharge
IEC 61000-4-3	Radio frequency electromagnetic field susceptibility test (RS)
IEC 61000-4-4	Electrical fast transient (EFT)
IEC 61000-4-5	Surge immunity test
IEC 61000-4-6	Conducted radio frequency disturbances test (CS)
IEC 61000-4-8	Power frequency magnetic field test
IEC 61000-4-11	Voltage dips
IEC 61547	Electromagnetic immunity requirements applies to lighting equipment

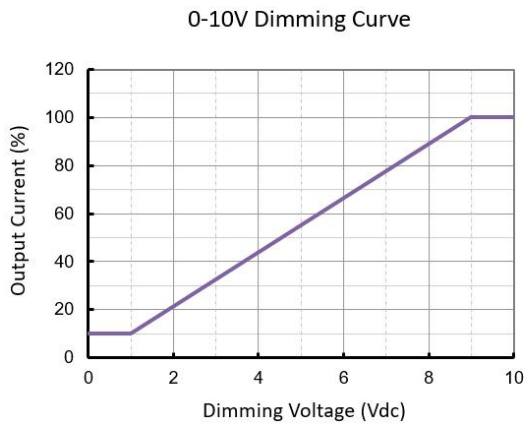
Dimming

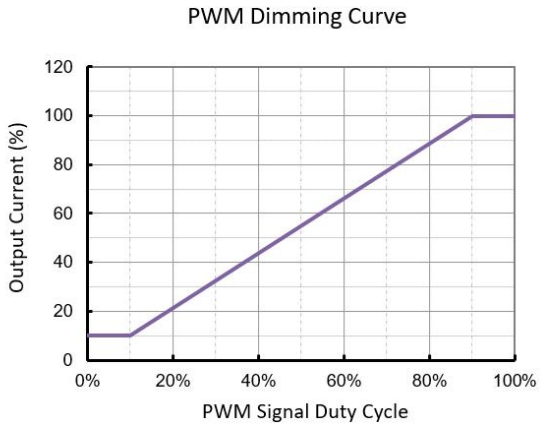
Parameter	Min.	Typ.	Max.
Vdim Sourcing Current	100uA	150uA	200uA
Vdim Allowed Input Voltage	-20 V		20 V
0-10V Dimming Range	10% (Vdim=1V)	Linear	100% (Vdim=9~10V)
PWM Dimming Range	10% (Duty=10%)	Linear	100% (Duty=90-100%)
Default Dim off Threshold	0.4V or 4%	0.5V or 5%	0.6V or 6%
Default Dim off Threshold	0.6V or 6%	0.7V or 7%	0.8V or 8%
PWM High	3.8V		9V
PWM Low	0V		0.6V
PWM Frequency	300Hz		2kHz
DALI Interface Standard		IEC62386, part 101,102,207	
DA1,DA2 High Level	9.5	16	22.5
DA1,DA2 Low Level	-6.5	0	6.5
DA1,DA2 Current	0		2mA
DMX+ & DMX- Voltage	-6V		6V
DMX to Ground Resistance	25Mohm		
Logic 0/1 (DMX+ to DMX-) Threshold		0.2V	
Communication Baud Rate		250kbps	
Fast Dimming[1] On-Off Transition		300ms	
Fast Dimming 10-100% Io Transition		70ms	

Notes [1]: Fast dimming feature is only available by models with -FD0000 suffix.

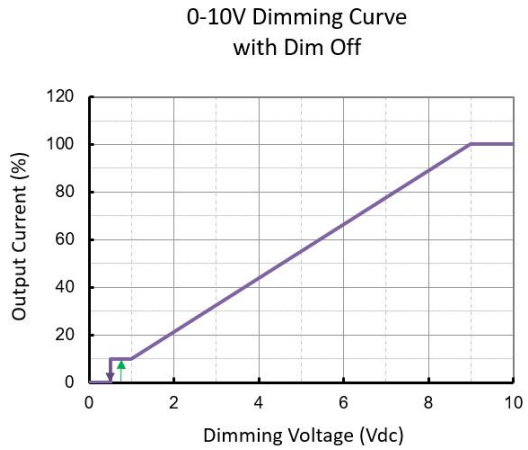
- **Default Dimming Curves**

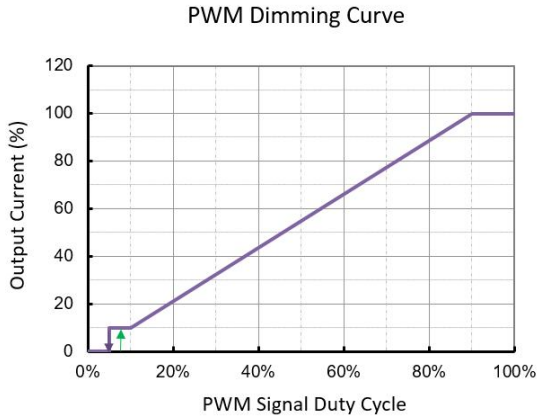
a. 0-10V dimming without dim-off



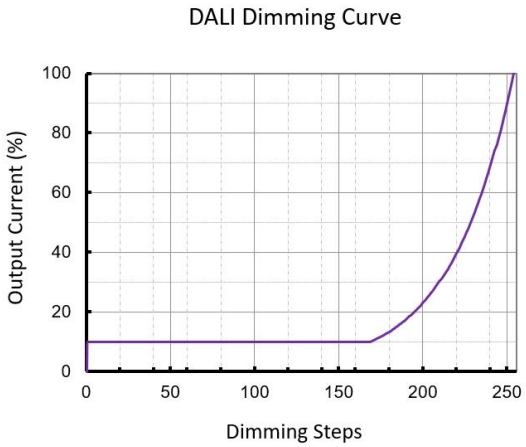


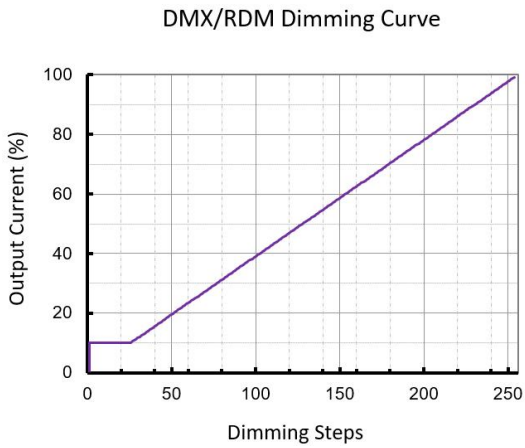
b. 0-10V dimming with dim-off





c. DALI and DMX dimming curves



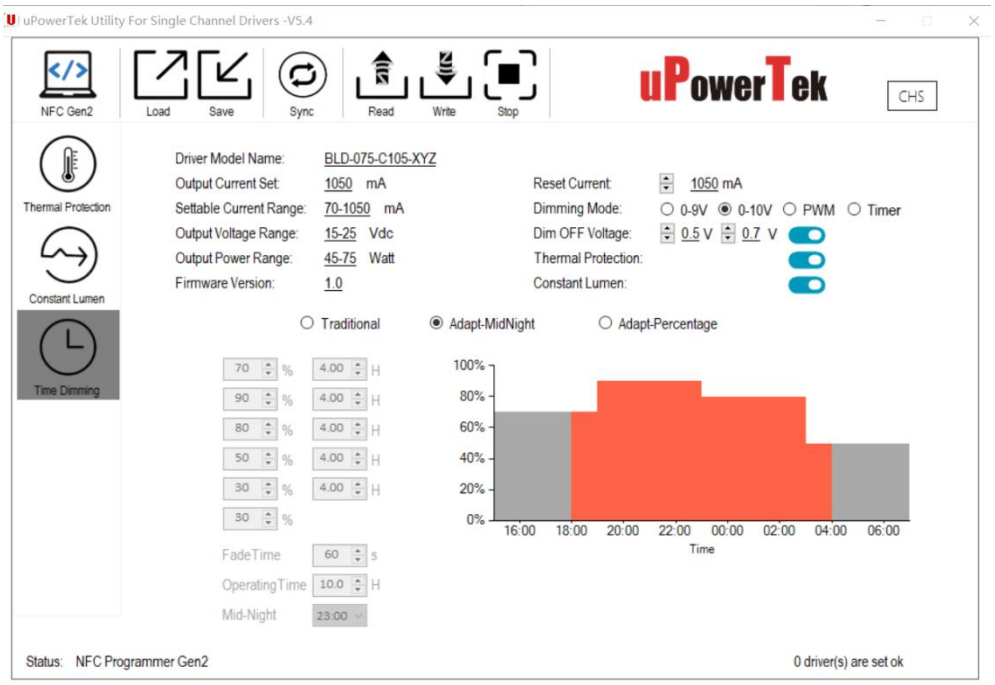


Note: Both DALI and DMX dimming curves can be customized to be linear or logarithmic as default.

Programming

- **Programmable Functions**

  uPowerTek LED drivers offer a range of configurable functions to meet specific lighting requirements. The Output Current, Dimming Mode, Dim Off/On Voltage Threshold, and Timer Dimming can be set as basic programming functions. Constant Lumen Output (CLO) can also be customized to ensure consistent light performance. Additionally, depending on the different product model numbers, users can benefit from programming Thermal Protection by external NTC (with extra cable), DALI/D4i Features, and DMX addressing.



uPowreTek Programming Software Interface

- **Required Equipment**

  To program uPowerTek LED drivers, users will need specific equipment based on their preferred method. For wired programming, the uPowerTek Cable Programmer is essential. For NFC wireless programming, users can use a smartphone with either IOS or Android, the uPowerTek NFC Programmer, or the FEIG NFC Programmers. These tools ensure a seamless and efficient setup process, realizing precise customization of the LED driver settings.

Cable Programmer

NFC Programmer V1

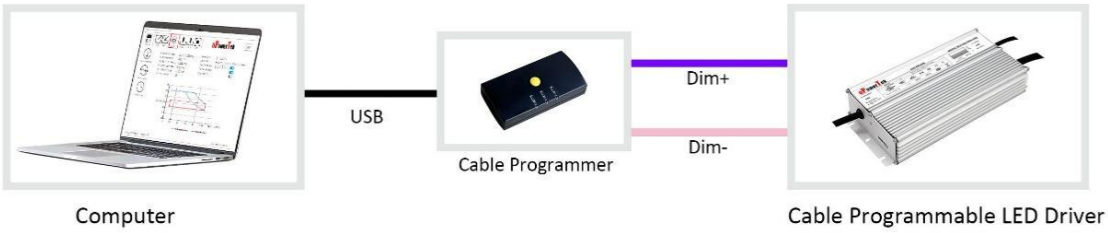
NFC Programmer V2

FEIG NFC Programmer

Android or iPhone

- **Connection Guide**

  This guide provides simple connection diagrams to help users understand the programming system. For more detailed operating instructions, including step-by-step procedures and additional configurations, please visit our website. You can download the comprehensive user manual and necessary software from the following link: https://www.upowertek.com/download-2/.

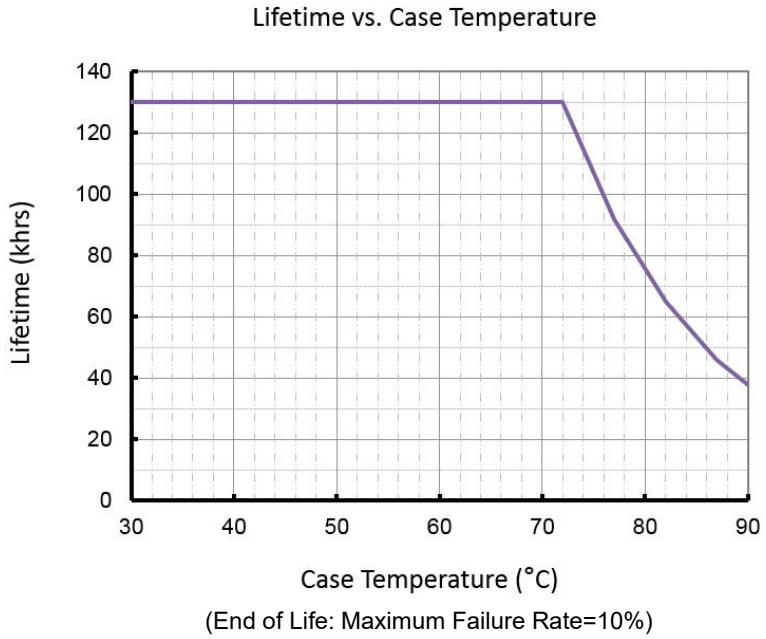


Wired Programming

Wireless Programming

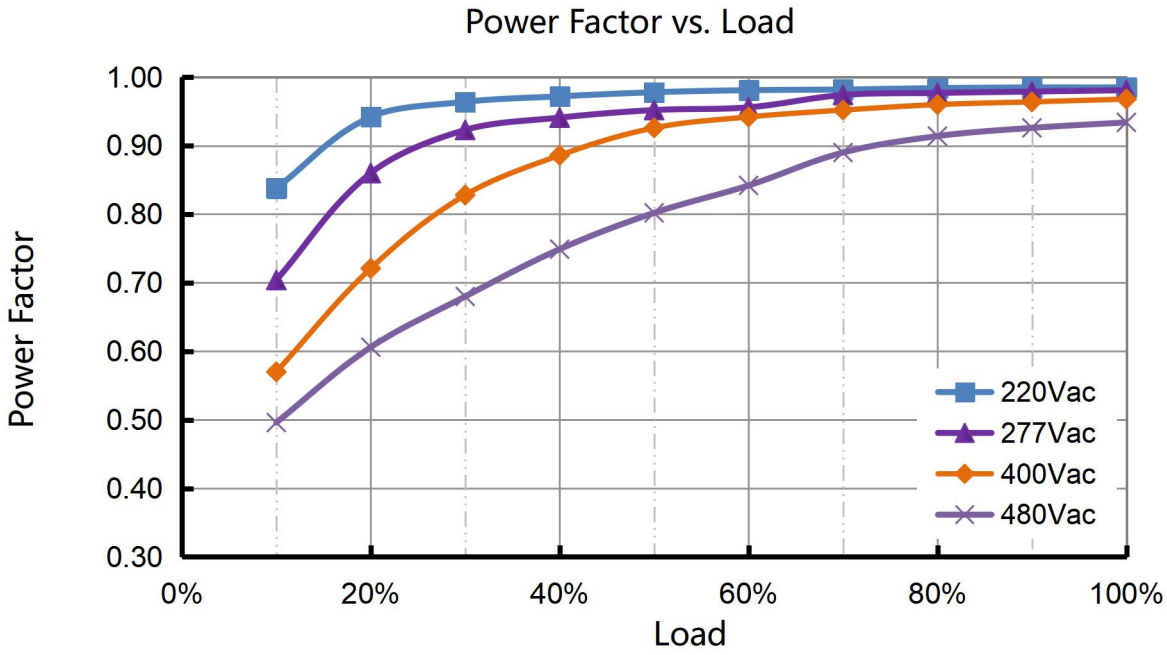
Cellphone Programming

Lifetime vs. Case Temperature

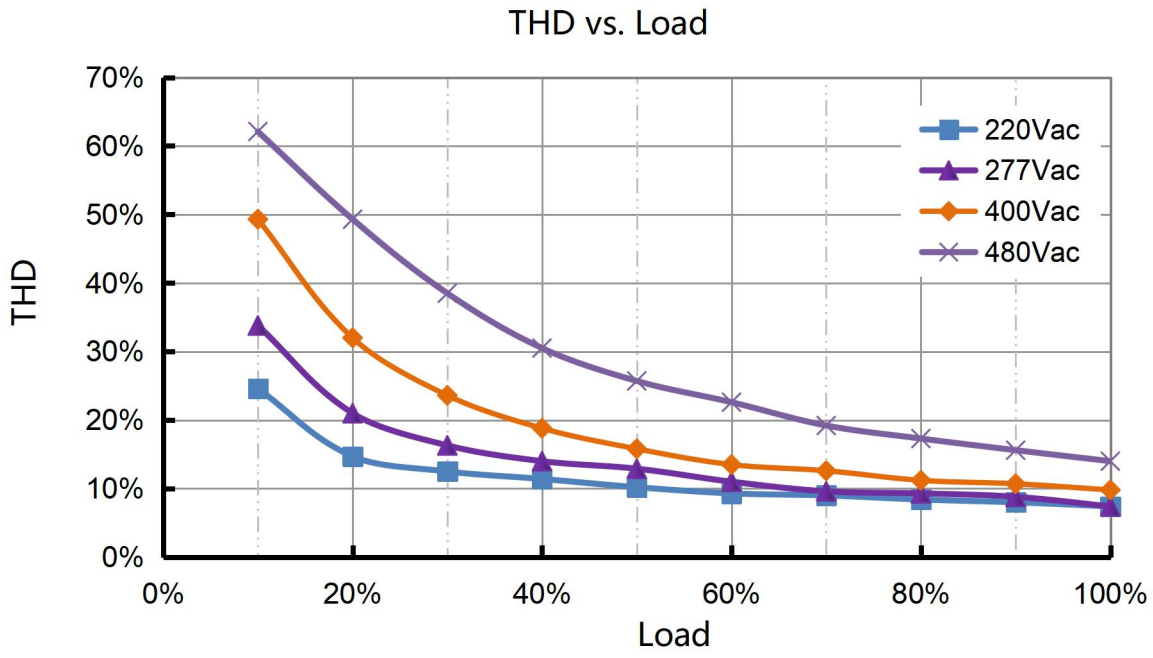


(End of Life: Maximum Failure Rate=10%)

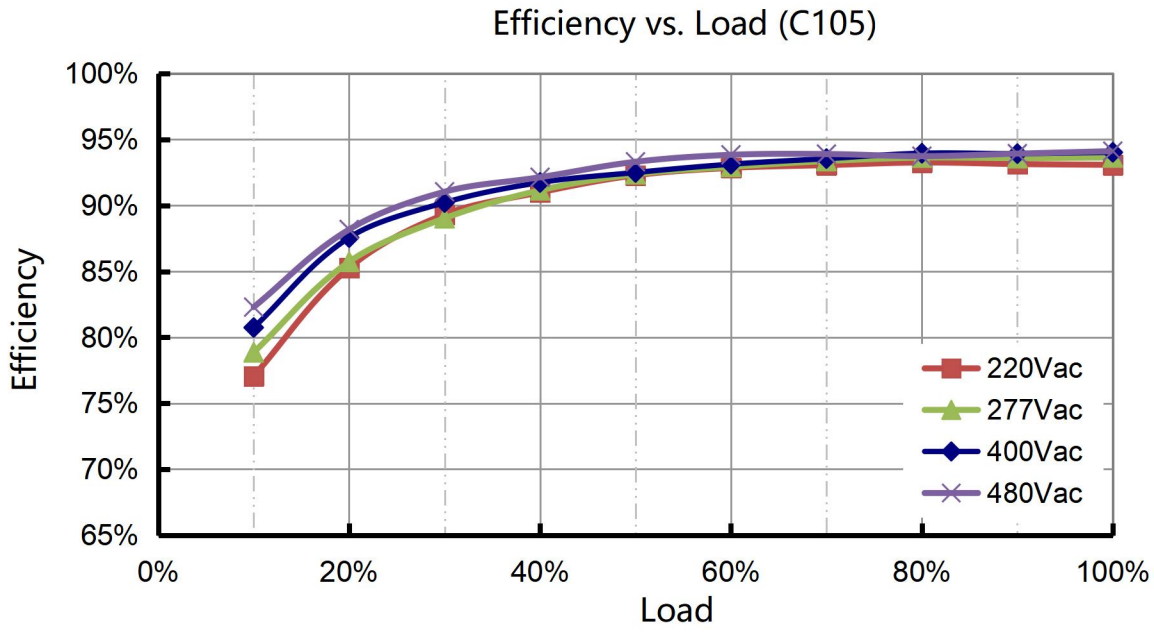
Power Factor vs. Load

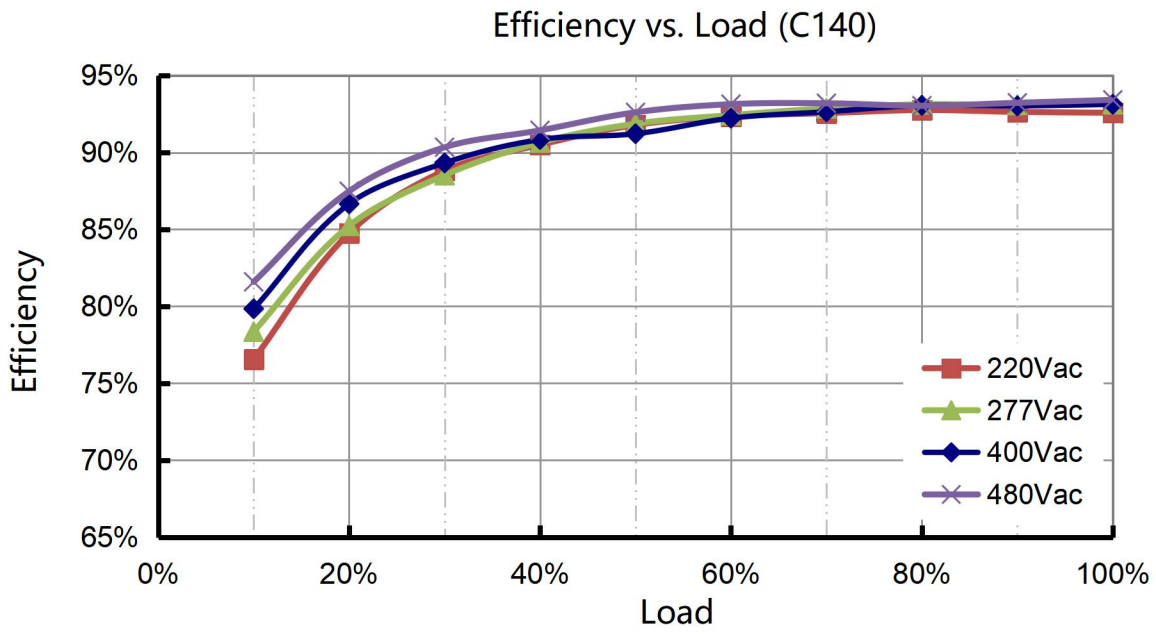


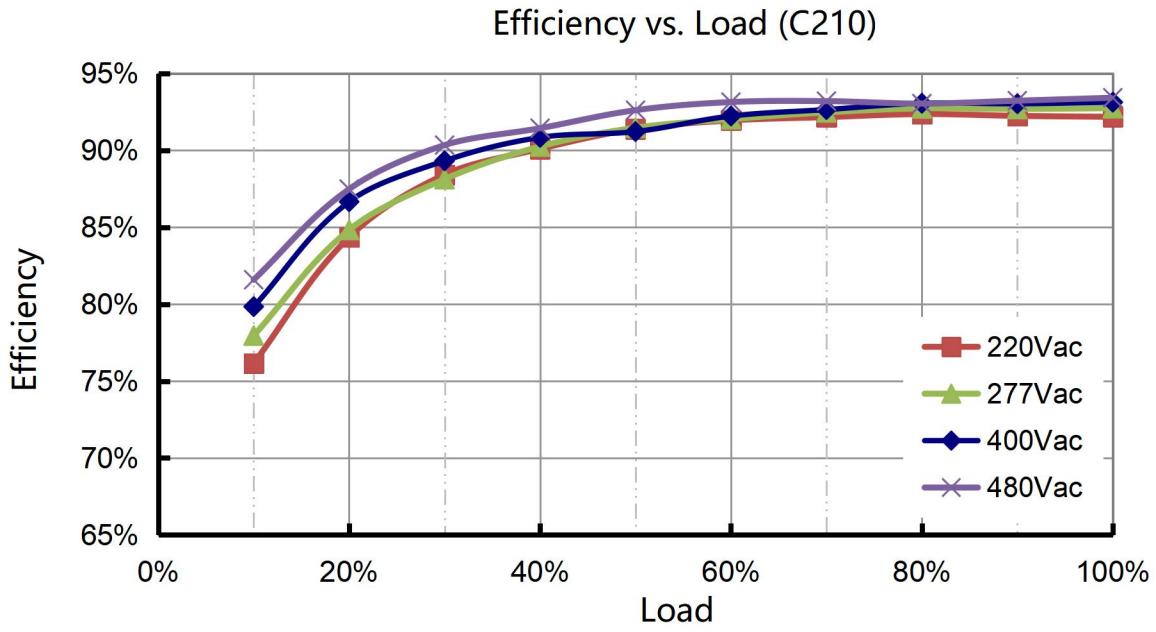
THD vs. Load

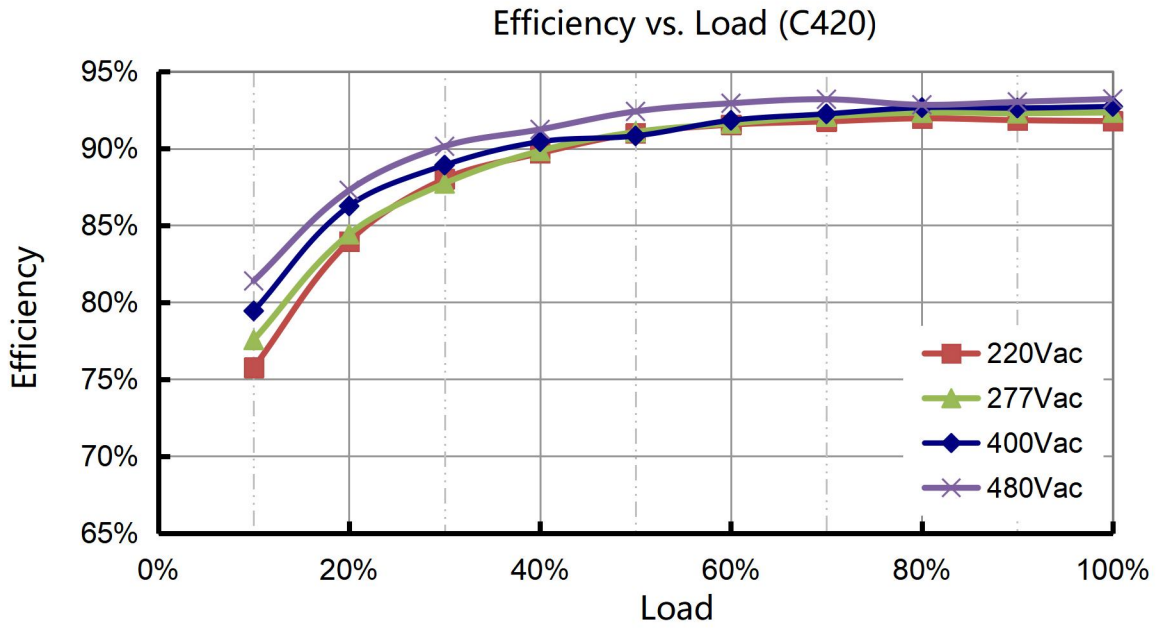


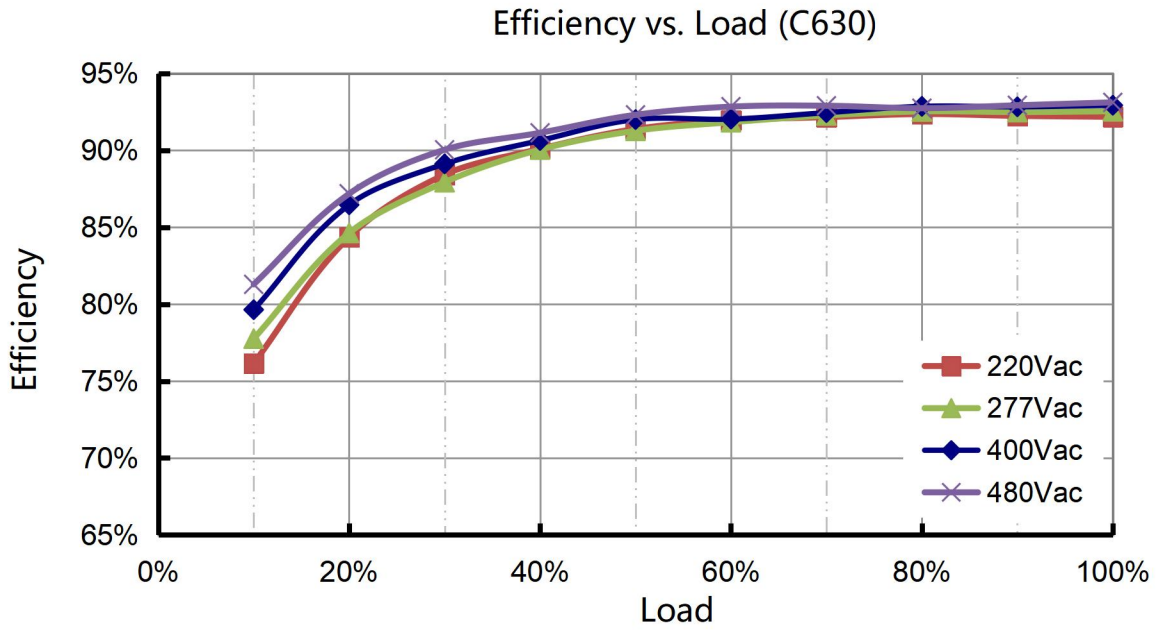
Efficiency vs. Load



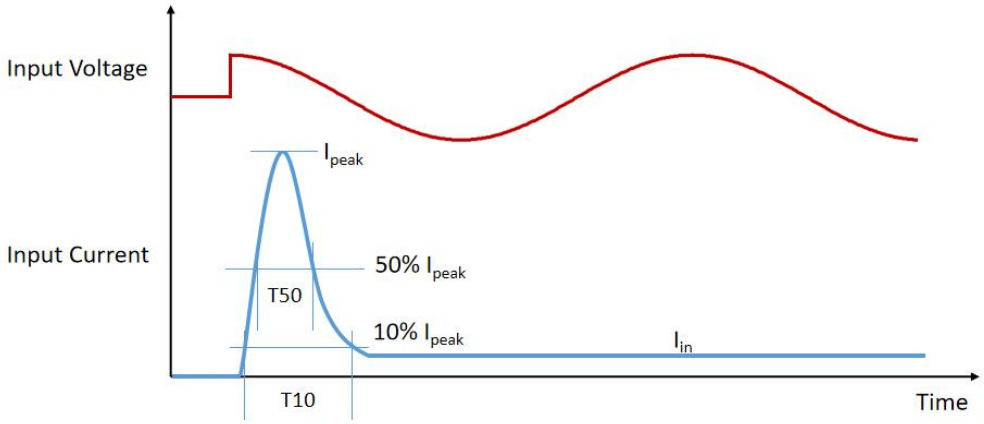

Efficiency vs. Load (C140)
Efficiency
95%
90%
85%
80%
75%
70%
65%
0%
20%
40%
60%
80%
100%
Load
220Vac
277Vac
400Vac
480Vac


Efficiency vs. Load (C210)
Efficiency
95%
90%
85%
80%
75%
70%
65%
0%
20%
40%
60%
80%
100%
Load
220Vac
277Vac
400Vac
480Vac


Efficiency vs. Load (C420)
Efficiency
95%
90%
85%
80%
75%
70%
65%
0%
20%
40%
60%
80%
100%
Load
220Vac
277Vac
400Vac
480Vac


Efficiency vs. Load (C630)
Efficiency
95%
90%
85%
80%
75%
70%
65%
0%
20%
40%
60%
80%
100%
Load
220Vac
277Vac
400Vac
480Vac

Inrush Current

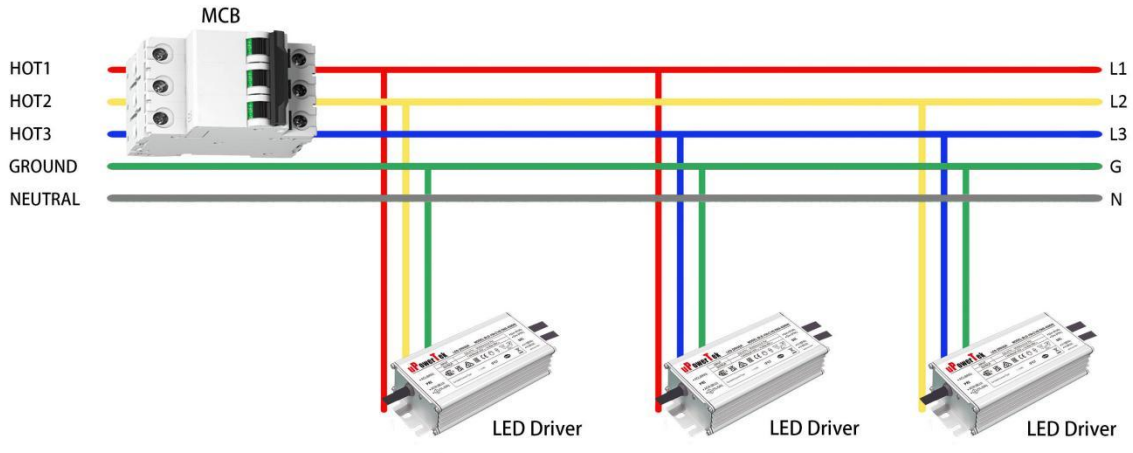


Input Voltage	I_{peak}	10% -10% T10 Duration	50% -50% T50 Duration
220Vac	60A	540μs	250μs
277Vac	82.8A	492us	240us
400Vac	100.4A	376us	180us
480Vac	120.4A	356us	170us

- **MCB Suggestion**

Type	B10	B16	B25	B32	C10	C16	C25	C32	D10	D16	D25	D32
220Vac	5	8	13	16	8	13	21	27	9	15	24	31
277Vac	3	6	9	12	6	10	16	21	12	20	31	40
400Vac	5(x3)	8(x3)	13(x3)	16(x3)	8(x3)	13(x3)	21(x3)	27(x3)	9(x3)	15(x3)	24(x3)	31(x3)
480Vac	3(x3)	6(x3)	9(x3)	12(x3)	6(x3)	10(x3)	16(x3)	21(x3)	12(x3)	20(x3)	31(x3)	40(x3)

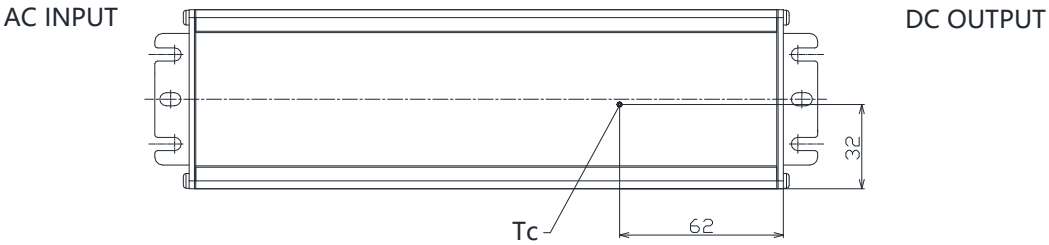
Three phase wiring suggestion.



Dielectric Strength

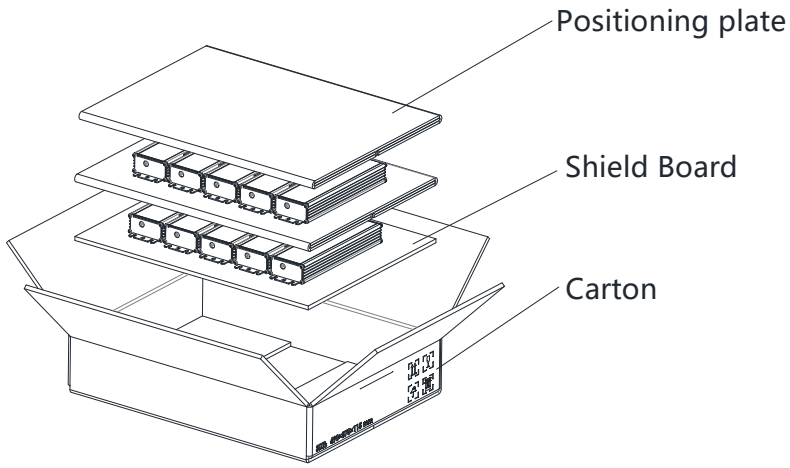
Unit: Vac	Input	Output	Dimming	Case
Input	-	3920	3920	1960
Output	3920	-	1960	1960
Dimming	3920	1960	-	1960
Case	1960	1960	1960	-

Tc Point



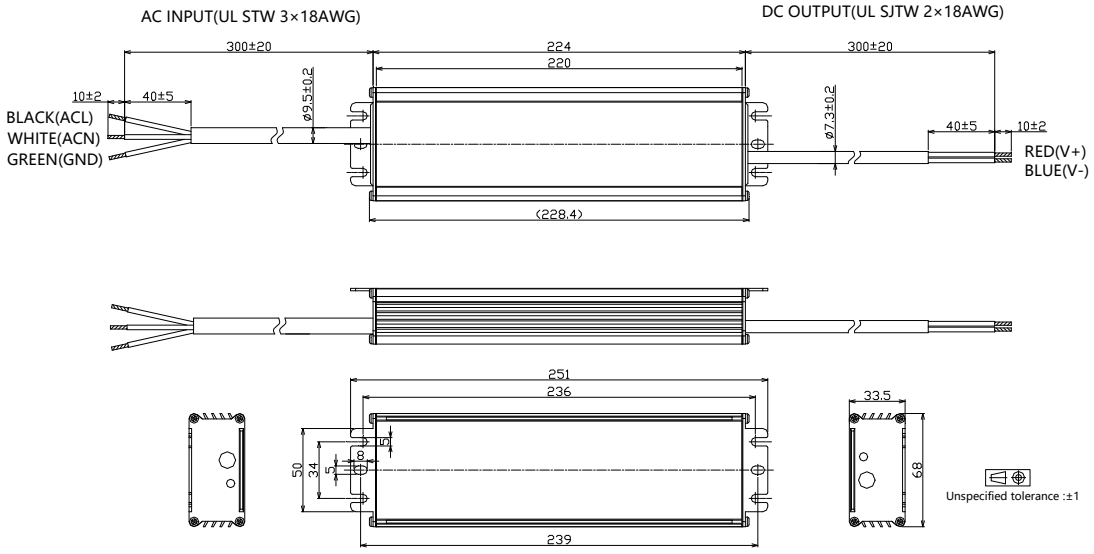
Packaging Information

Typical Carton Dimension(L×W×H)	490×370×115 mm
Positioning plate	2pcs/carton
Shield Board	1pcs/carton
LED Drivers/LED	10pcs/carton
Net Weight	10.4 kg/carton
Gross Weight	11.3 kg/carton

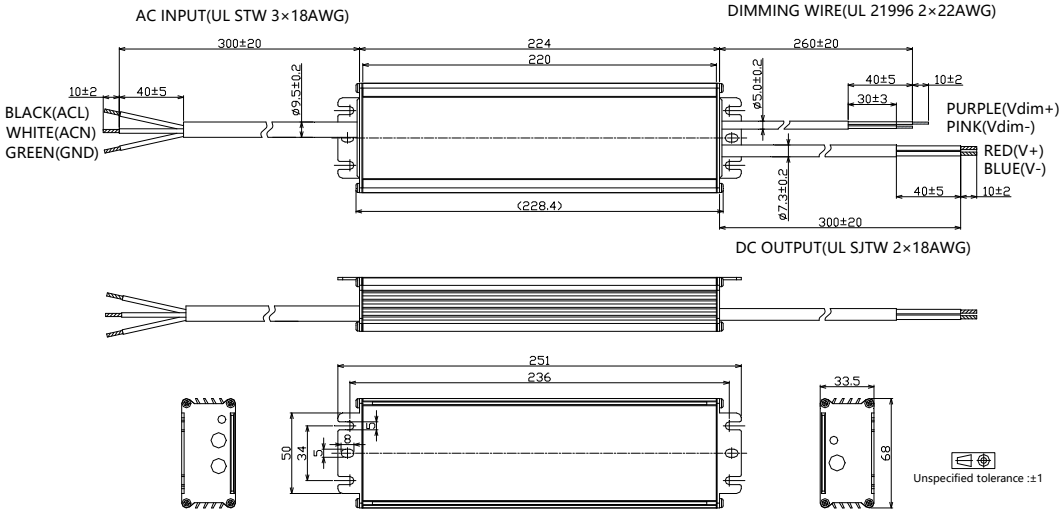


■ Mechanical Design

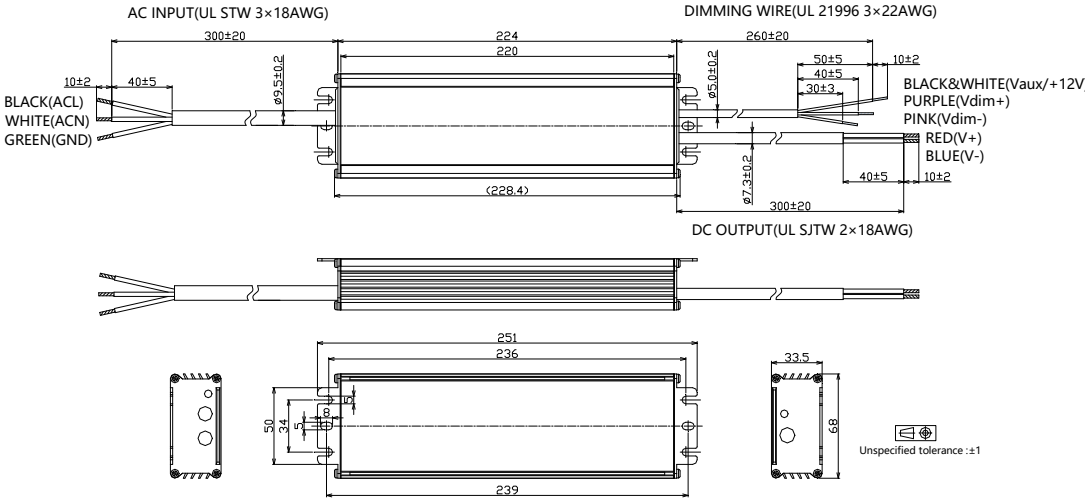
- **TLD-160-Cxxx-NN/TRU (UL Cable)**



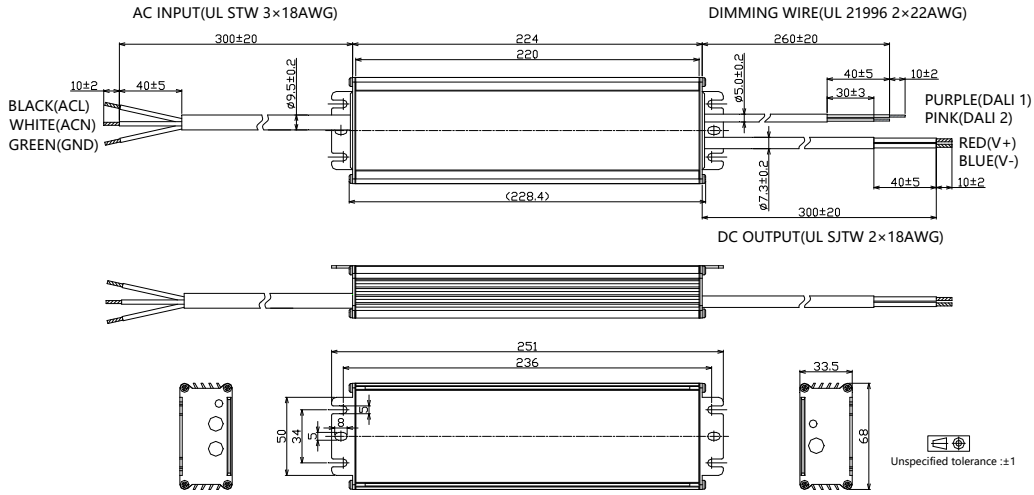
- **TLD-160-Cxxx-DN/DRU (UL Cable)**



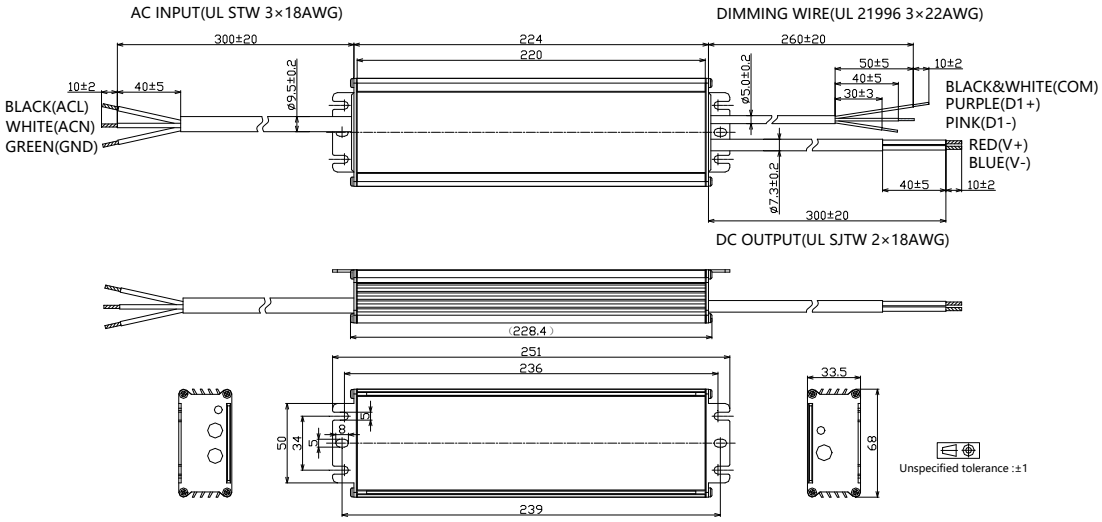
- **TLD-160-Cxxx-ER/ENU (UL Cable)**



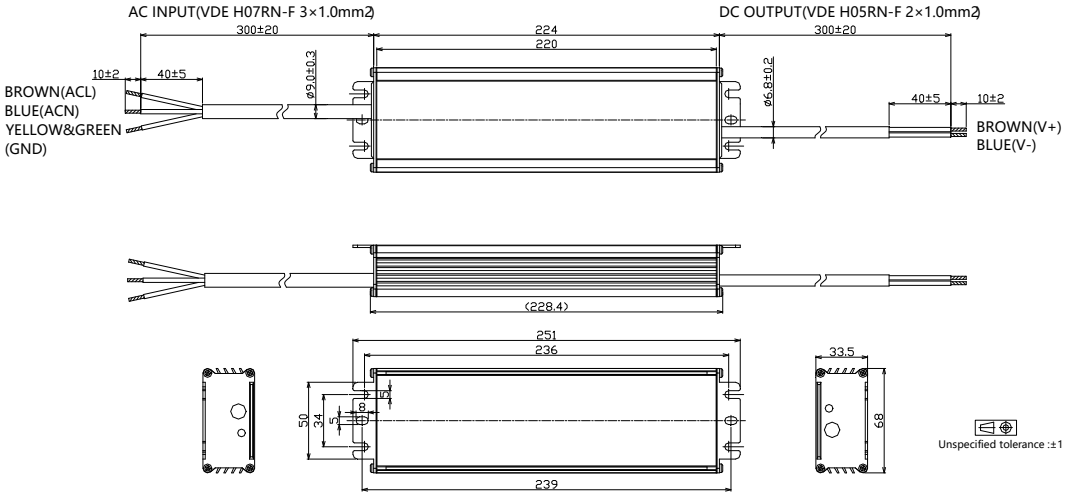
- **TLD-160-Cxxx-ARU (UL Cable)**



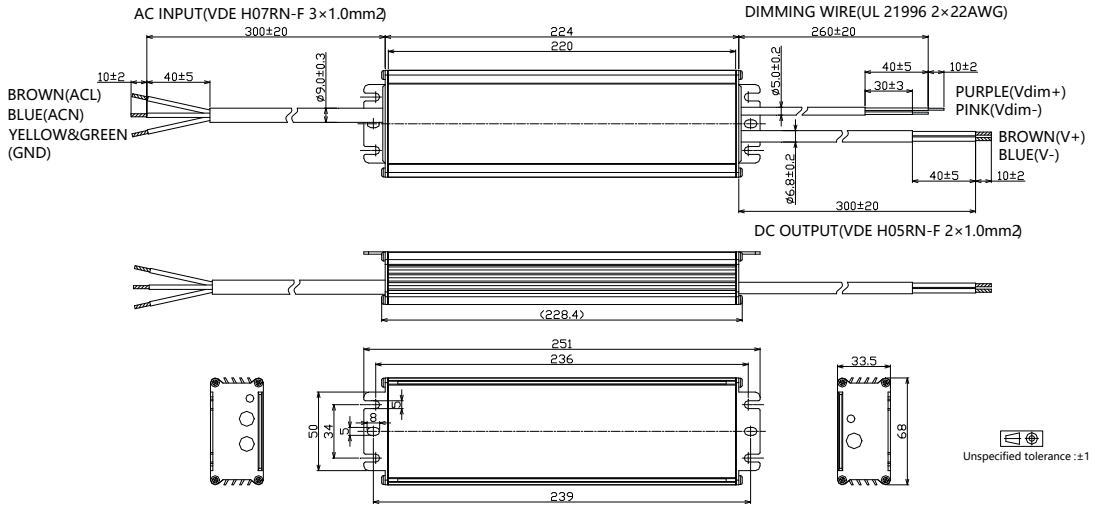
- **TLD-160-Cxxx-MRU (UL Cable)**



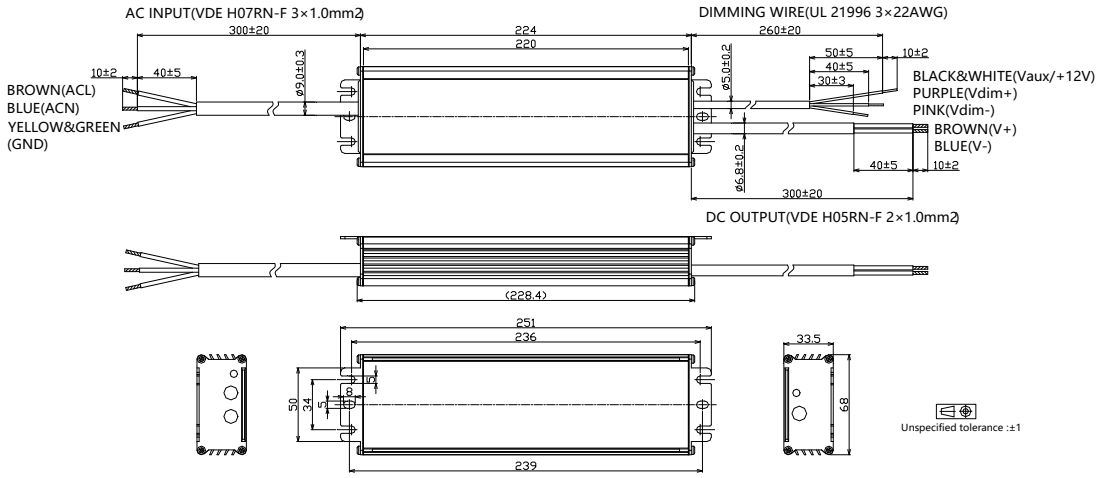
- **TLD-160-Cxxx-NN/TRS (VDE Cable)**



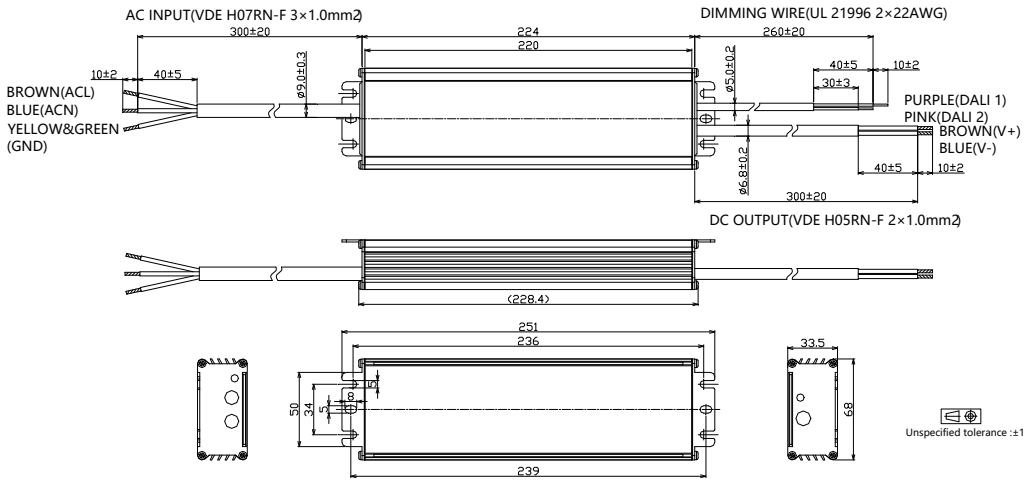
- **TLD-160-Cxxx-DN/DRS (VDE Cable)**



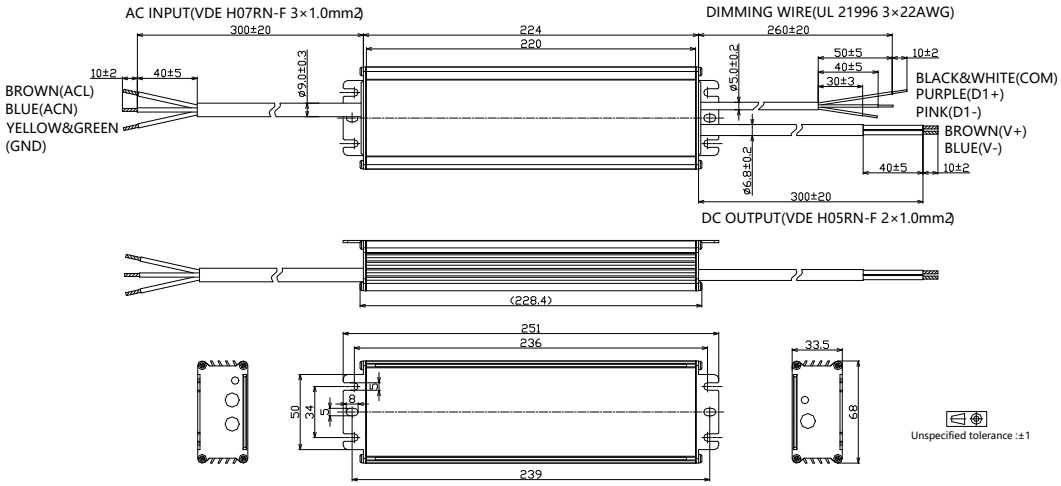
- **TLD-160-Cxxx-EN/ERS (VDE Cable)**



- **TLD-160-Cxxx-ARS (VDE Cable)**



- **TLD-160-Cxxx-MRS (VDE Cable)**



Output Operation Range

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C105	1050	160	91	152	105
	1000	160	96	160	100
	950	160	101	168	95
	900	160	107	178	90
	850	160	113	188	85
	800	160	120	200	80
	750	160	128	213	75
	700	160	137	229	70
	650	149	137	229	70
	600	137	137	229	70
	550	126	137	229	70
	500	114	137	229	70
	…	…	…	…	…
	70	16	137	229	70

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C140	1400	160	69	114	140
	1300	160	74	123	130
	1200	160	80	133	120
	1100	160	87	145	110
	1050	160	91	152	105
	1000	152	91	152	105
	950	145	91	152	105
	900	137	91	152	105
	850	130	91	152	105
	800	122	91	152	105
	750	114	91	152	105
	700	107	91	152	105
	…	…	…	…	…
	105	16	91	152	105

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C210	2100	160	46	76	210
	2000	160	48	80	200
	1900	160	51	84	190
	1800	160	53	89	180
	1700	160	56	94	170
	1600	160	60	100	160
	1500	160	64	107	150
	1400	160	69	114	140
	1300	149	69	114	140
	1200	137	69	114	140
	1100	126	69	114	140
	1000	114	69	114	140
	…	…	…	…	…
	140	16	69	114	140
	…	…	…	…	…

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C420	4200	160	23	38	420
	4100	160	23	39	410
	4000	160	24	40	400
	3900	160	25	41	390
	3800	160	25	42	380
	3700	160	26	43	370
	3600	160	27	44	360
	3500	160	27	46	350
	3400	160	28	47	340
	3300	160	29	48	330
	3200	160	30	50	320
	3100	160	31	52	310
	3000	160	32	53	300
	2900	160	33	55	290
	2800	160	34	57	290
	2700	154	34	57	290
	2600	149	34	57	290
	…	…	…	…	…
	290	16	34	57	290

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C630	6300	160	15	25	630
	6100	160	16	26	610
	5900	160	16	27	590
	5700	160	17	28	570
	5500	160	17	29	550
	5300	160	18	30	530
	5100	160	19	31	510
	4900	160	20	33	490
	4700	160	20	34	470
	4500	160	21	36	450
	4400	160	22	36	440
	4300	160	22	36	440
	4200	160	22	36	440
	4100	160	22	36	440
	4000	160	22	36	440
	3900	156	22	36	440
	3800	152	22	36	440
	…	…	…	…	…
	440	18	22	36	440

Revision History

Revision	Date	Contents
C	2022-03-22	1. Index page added 2. Reduced dimming interface sourcing current 3. DALI 2.0 compatibility added 4. Programming instruction added 5. Inrush current data added 6. Tc point position indication added 7. Dielectric strength level added 8. Packaging information added 9. Mechanical design change with dimming cable color 10. Revision history added
D	2022-12-14	1. DMX dimmable models mechanical design updated
E	2023-07-14	1. Update cable selection table in Model List Section
F	2023-09-15	1. Update model selection table with -DN,-EN,DR models
G	2024-07-25	1. Fast dimming description added 2. Power factor, THD, efficiency curves updated by 10-100% load range 3. MCB usage and driver quantity section added 4. Inrush current data updated