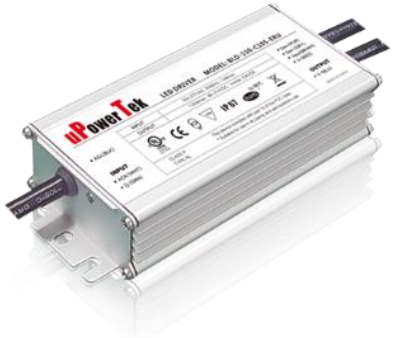
240W, 200-480Vac Input, Isolated Dimming LED Driver

# Product Datasheet



The global certified TLD-240-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
- 100,000Hour Life @ Tc=75℃
- 7 Year Warranty @ Tc<=75℃
- Airset™ NFC Programmability
- +/-2% Output Current Accuracy
- Isolated 0-10V/PWM/Time/DALI2.0 (Optional) 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 | Certification |
|---|---|---|---|---|---|---|
| TLD-240-C140-XYZ-AC0000 | 180-528Vac | 250 W | 107-238Vdc | 1050mA | 1400mA | UL/FCC/CB/RCM/ EAC/CE/RoHs |
| TLD-240-C210-XYZ-AC0000 | 180-528Vac | 250 W | 71-179Vdc | 1400mA | 2100mA | |
| TLD-240-C420-XYZ-AC0000 | 180-528Vac | 250 W | 36-89Vdc | 2800mA | 4200mA | |
| TLD-240-C690-XYZ-AC0000 | 180-528Vac | 250 W | 22-56Vdc | 4500mA | 6900mA | |

| XY= | Dimming Method | Programmable | 12Vaux | Dim-off |
|---|---|---|---|---|
| NN | - | - | - | - |
| DN | 0-10V | Cable | - | **No** Dim-off as **default status**, programmed to have Dim-off |
| EN | 0-10V | Cable | 300mA | √ |
| TR | Time/Set Current | NFC Wireless | - | - |
| DR | 0-10V | 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 | - | √ |

**Z** = **U**, UL cable with ground wire (green) **S**, VDE cable/Class I **D**, VDE cable/Class II

**Note**: See the **Output Operation Range Section** for programmable model details

## Technical Data

| | |
|---|---|
| Input Voltage | 180-528Vac or 250-740Vdc |
| Input Frequency | 47～63Hz |
| Power Factor | >0.9@60-100%load, refer to PF vs. Load curve |
| THD | <15%@60-100%load, refer to THD vs. Load curve |
| Input Current | 1.1Amax@277Vac & Full-Load,<br>0.65Amax@480Vac & Full-Load |
| Inrush Current | See Inrush Current Section in the datasheet |
| Leakage Current | 1mA max @480Vac 60Hz, UL8750,0.75mAmax @220Vac 50Hz, IEC61347-1 |
| 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=-60℃～+90℃； 10%RH～100%RH |
| Storage Temperature | -60℃～+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

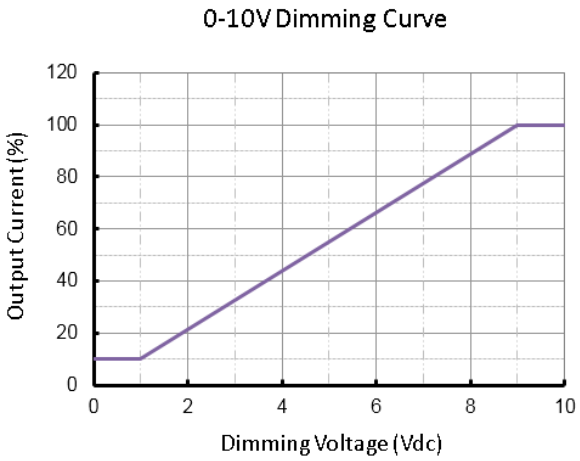
| Safety Standard | Description |
|---|---|
| UL8750 | Light emitting diode(LED) equipment for use in lighting products |
| UL1012 | Power units other than class 2 |
| IEC 61347-1 | Lamp control gear Part 1: general and safety requirements |
| IEC 61347-2-13 | Lamp control gear Part 2-13: particular requirement for d.c. or a.c. supplied electronic control gear for LED modules |
| EMI Standards | Description |
| IEC 55015 | Conducted emission test & radiated emission test |
| IEC 61000-3-2 | Harmonic current emissions; Class C |
| IEC 61000-3-3 | Voltage fluctuations & flicker |
| FCC Part 15 | ANSI C63.4:2009 Class B |
| EMS Standards | Description |
| 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 |

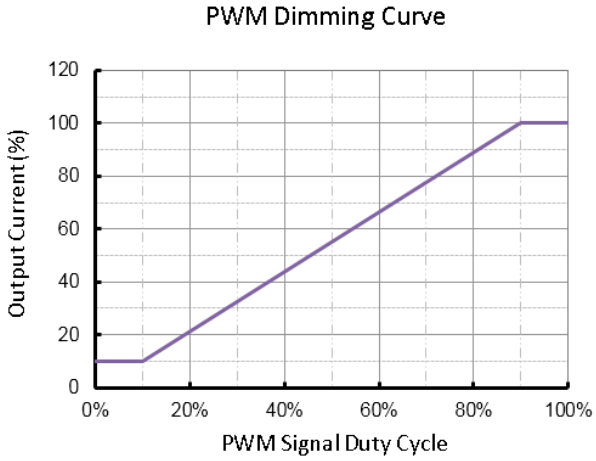
## Dimming

| 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%) |
| Dim off threshold | 0.4V or 4% | 0.5V or 5% | 0.6V or 6% |
| Dim on threshold | 0.6V or 6% | 0.7V or 7% | 0.8V or 8% |
| PWM High | 3.8V | | 10V |
| PWM Low | 0V | | 0.6V |
| PWM Frequency | 300Hz | | 2kHz |
| External PWM Controller Current Sinking Capability | 300uA | | |
| 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 |

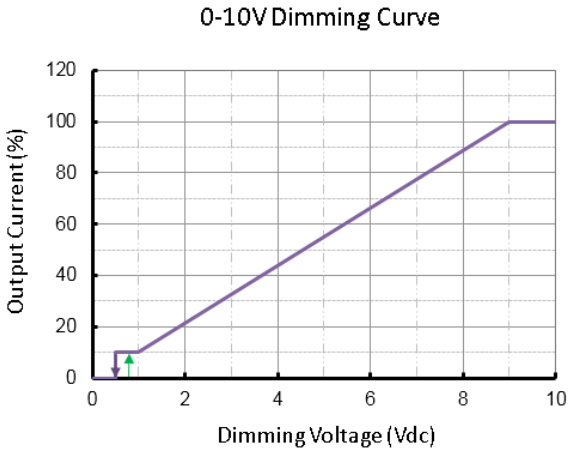
- **Dimming Curve**

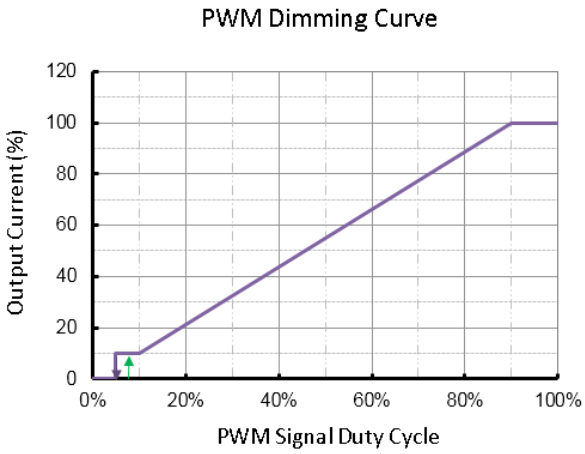
**a. Without dim-off**



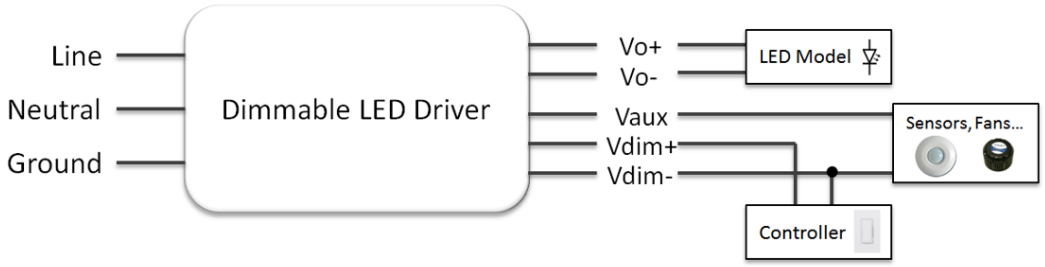




**b. With dim-off**




- **Dimming Wiring**

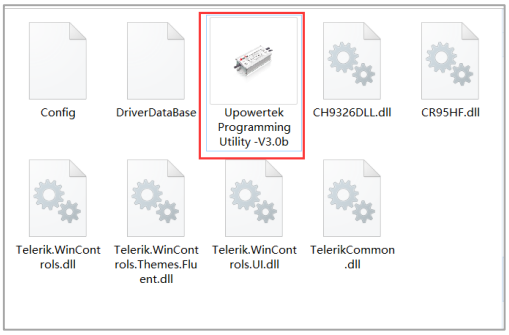


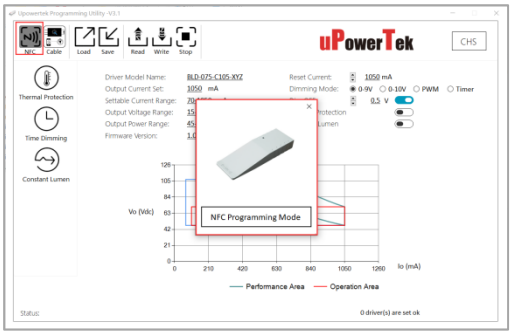
## Programming

- **NFC Programming by PC/Laptop**



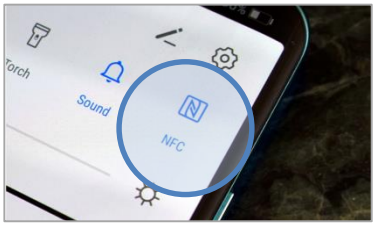

a. Download PC Software at https://www.upowertek.com/download-2/
b. Click Upowertek Programming Utility.exe
c. The GUI start and notify you the programming mode (cable programming or NFC programming)
d. Click “NFC” button if it’s not NFC programming mode.




- **NFC Programming by Smartphone**

a. Download Android APP at https://www.upowertek.com/download-2/
b. Only available on Android cellphone (iPhone is not supported)
c. The cellphone should have NFC function and make sure it is enabled.







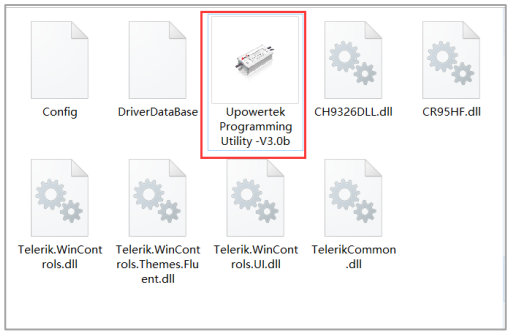
d. Turn on NFC switch of cellphone, then open the APP by icon below.

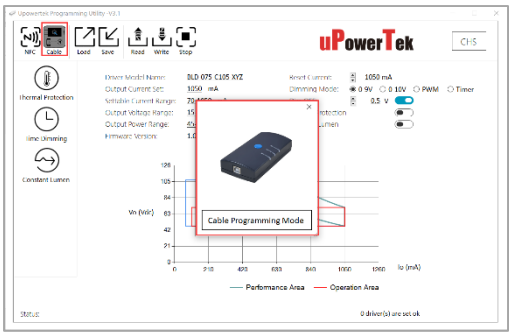
uPowerTek
Airset

- **Cable Programming**




a. Download PC Software at https://www.upowertek.com/download-2/
b. Click Upowertek Programming Utility.exe
c. The GUI start and notify you the programming mode (cable programming or NFC programming)

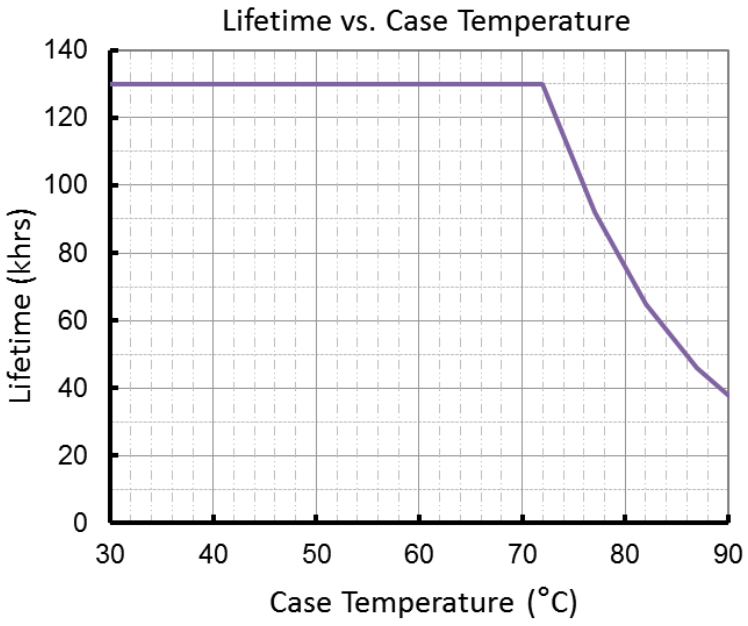



d. Click “Cable” button if it’s not cable programming mode.
e. Connect the Vdim+ and Vdim- wires to the right ones (the same color) of the programmer.

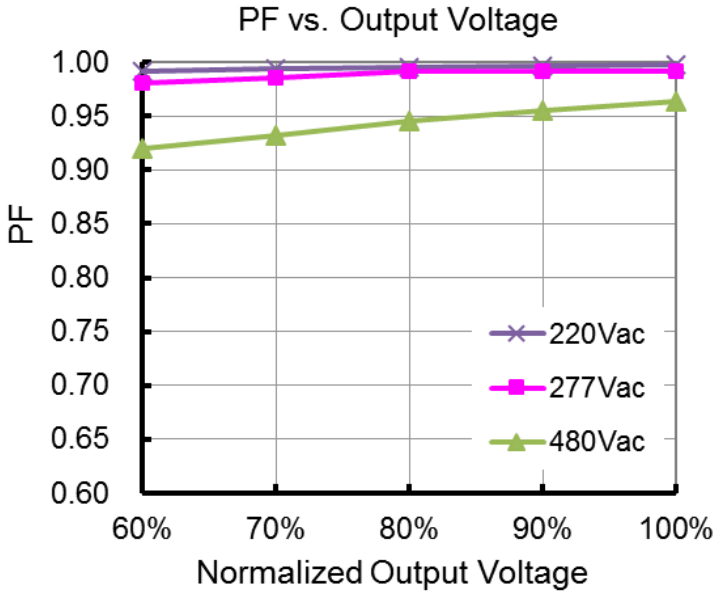
- **Please contact with us for product user manual and more information such as:**
  a. Output Lumen Compensation
  b. Luminaire Thermal Protection by External NTC (with extra cable)
  c. Dimming Curve Customization (dim off threshold, minimum dimming level, maximum dimming voltage etc.)
  d. Adjustable Startup Time
  e. Time Dimming (adaptive mid-night, percentage, etc.)
  f. Customized Control Protocol

## Lifetime vs. Case Temperature

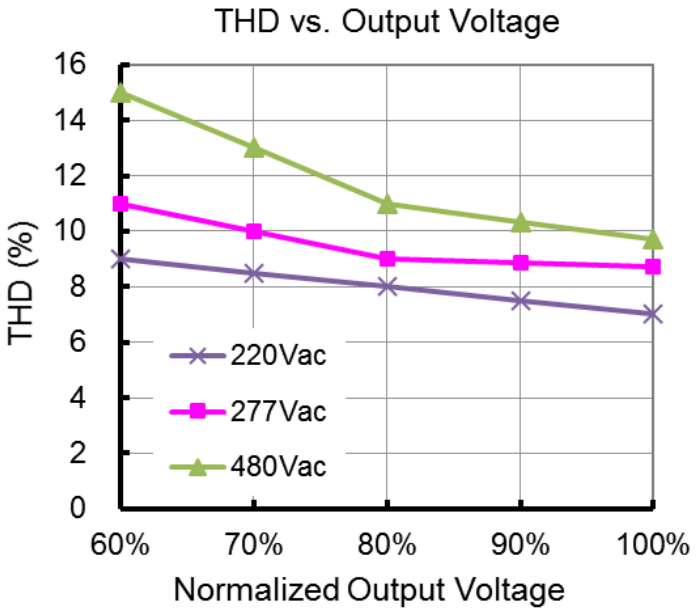



(End of Life: Maximum Failure Rate=10%)

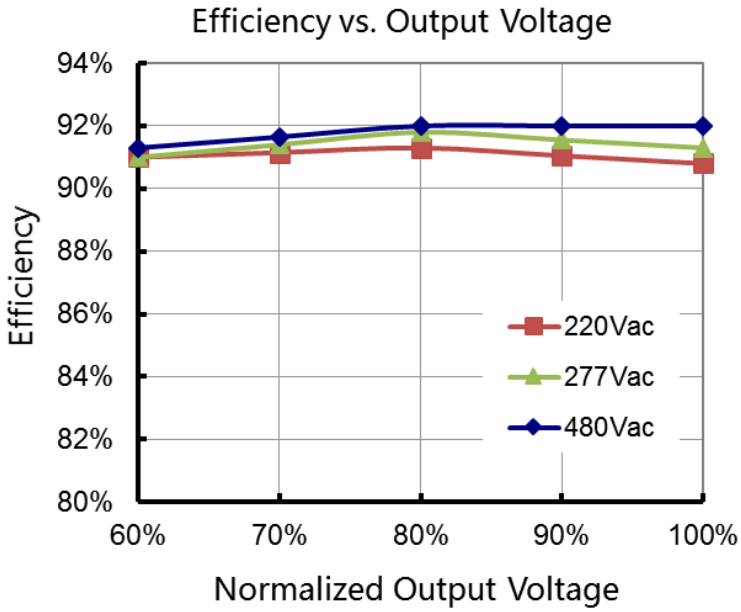
## Power Factor vs. Load



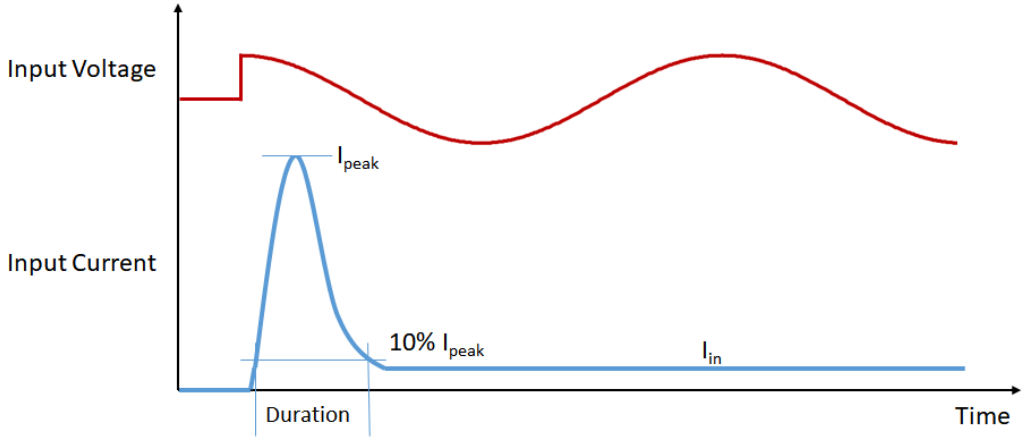
## THD vs. Load




## Efficiency vs. Load (2.1A Model)



## Inrush Current



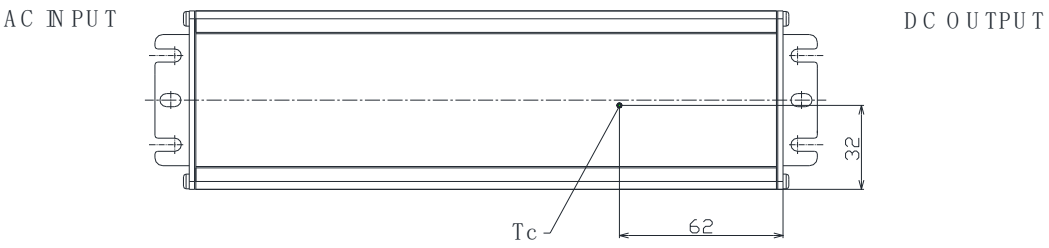

| Input Voltage | $I_{peak}$ | Duration |
|---|---|---|
| 277Vac | 82.8A | 492us |
| 380Vac | 100.4A | 376us |
| 480Vac | 120.4A | 356us |

Please contact with us for MCB calculation and waveforms.

## Dielectric Strength

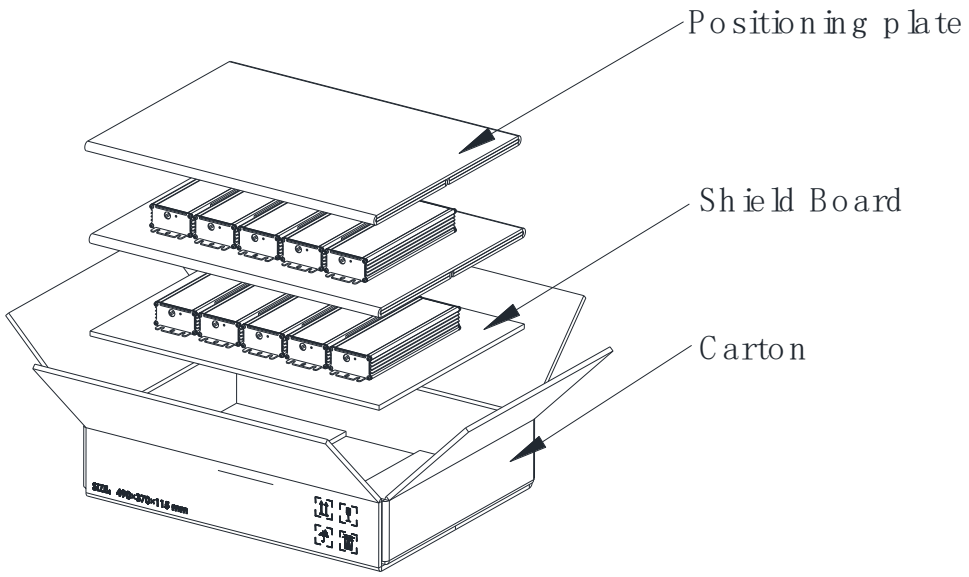
| Unit: Vac | Input | Output | Dimming | Case |
|---|---|---|---|---|
| Input | - | 3920 | 3920 | 1960 |
| Output | 3920 | - | 1960 | 1960 |
| Dimming | 3920 | 1960 | - | 1960 |
| Case | 1960 | 1960 | 1960 | - |

## Tc Point



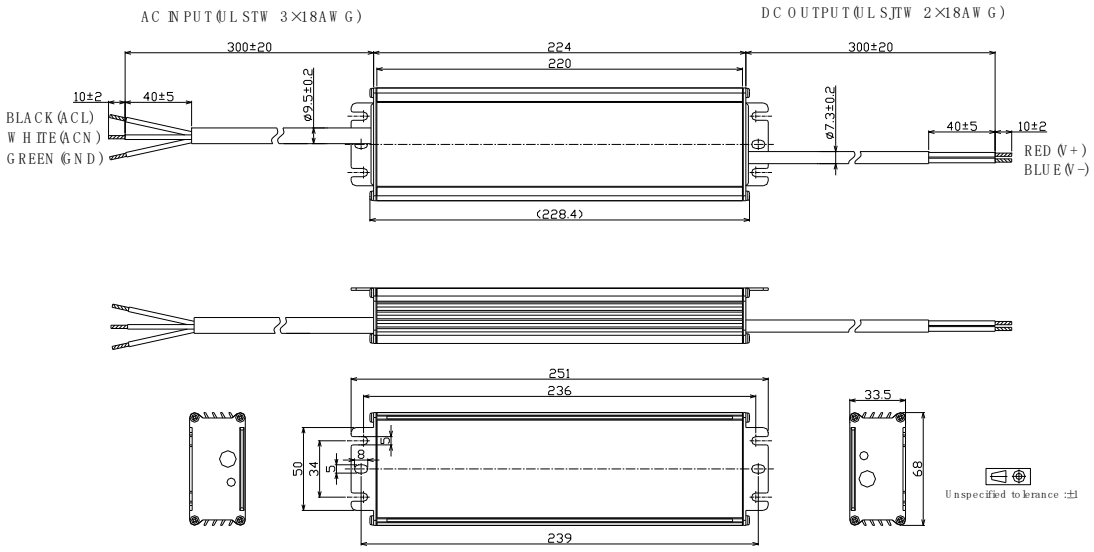
## Packaging Information

| | |
|---|---|
| Typical Carton Dimension(L×W×H) | 490×370×115 mm |
| Positioning plate | 2pcs/carton |
| Shield Board | 1pcs/carton |
| LED Drivers | 10pcs/carton |

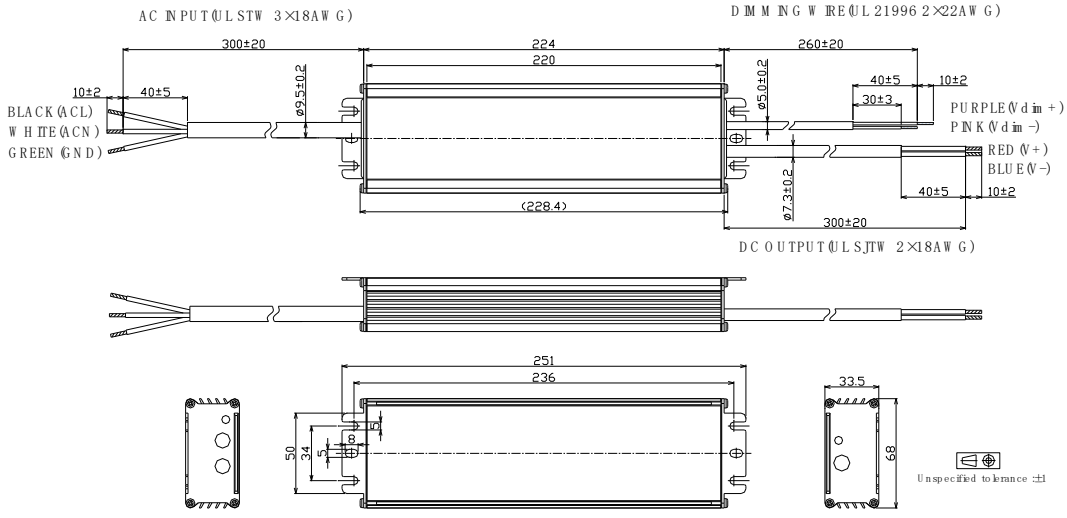


## Mechanical Design

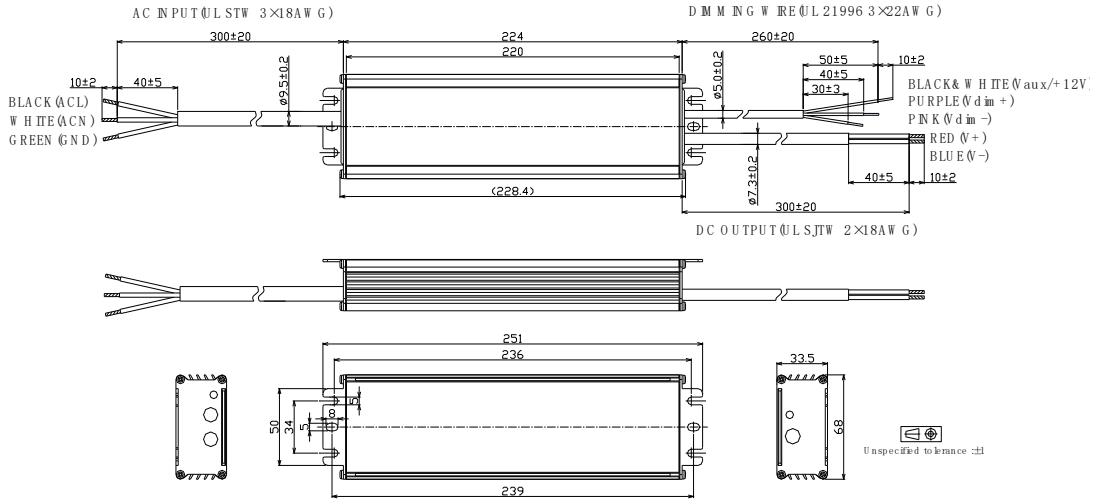
- **TLD-240-Cxxx-NN/TRU (UL Cable)**



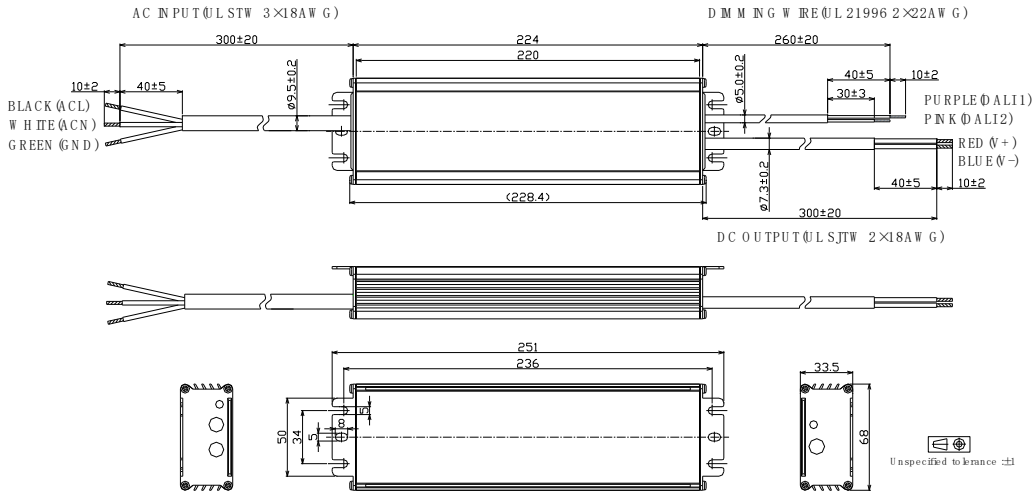

- **TLD-240-Cxxx-DN/DRU (UL Cable)**



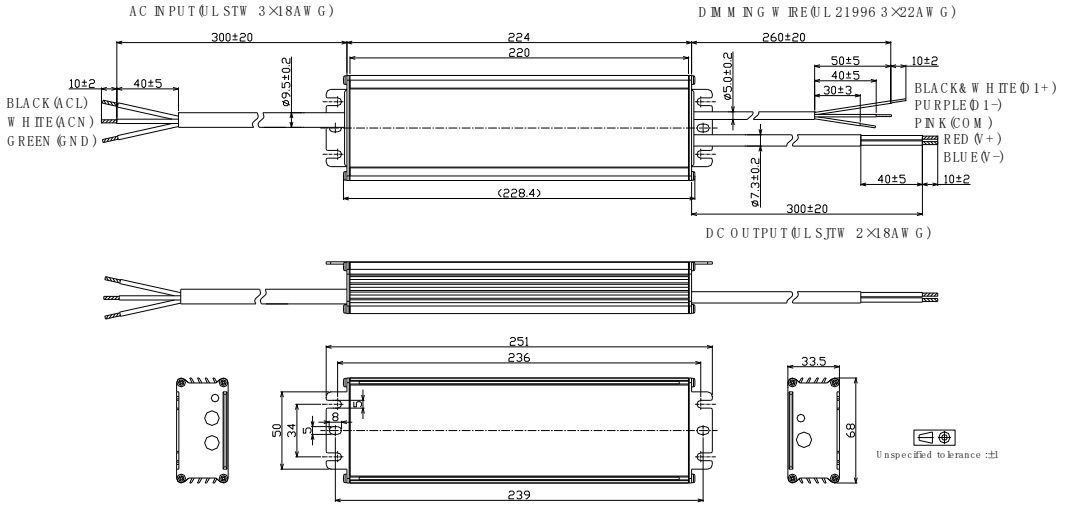
- **TLD-240-Cxxx-ER/ENU (UL Cable)**



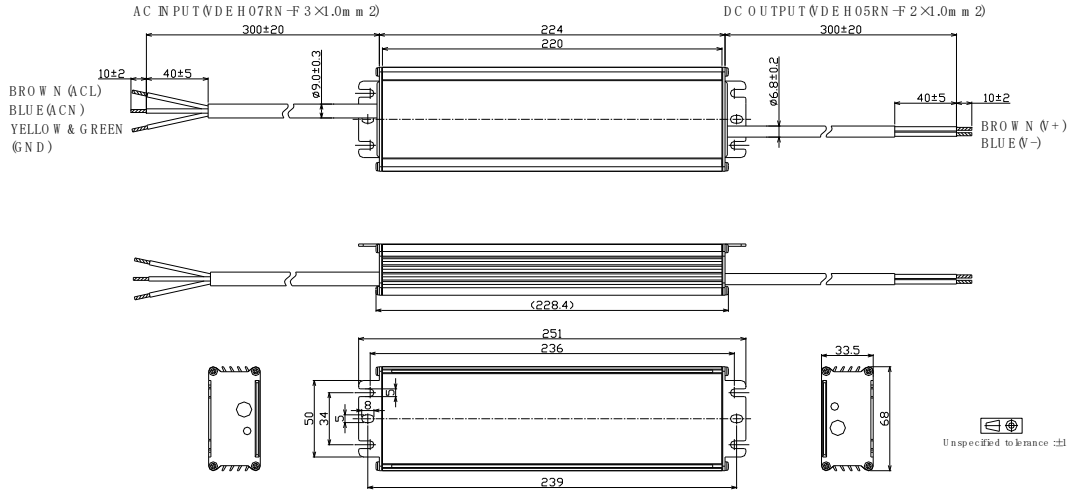

- **TLD-240-Cxxx-ARU (UL Cable)**



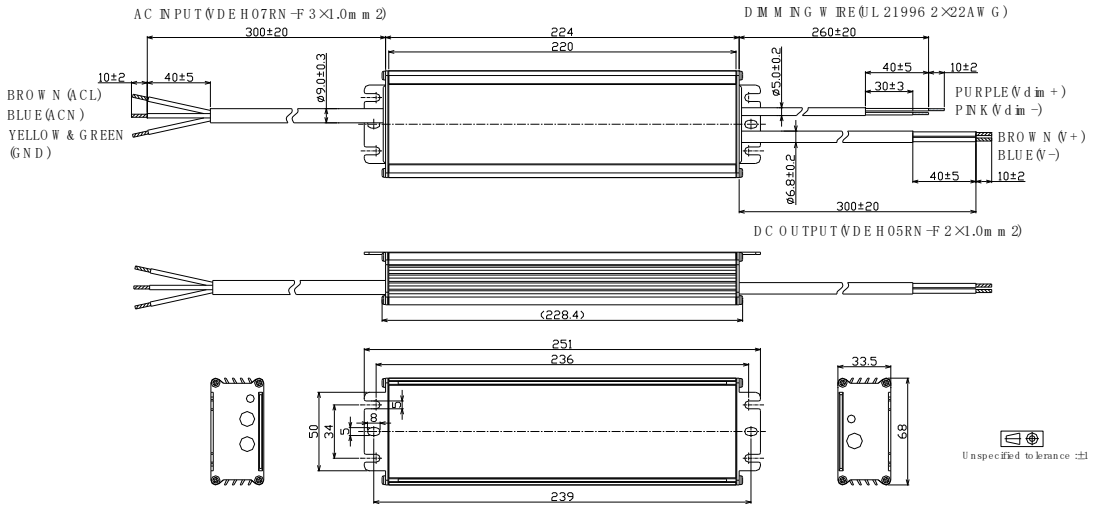
- **TLD-240-Cxxx-MRU (UL Cable)**



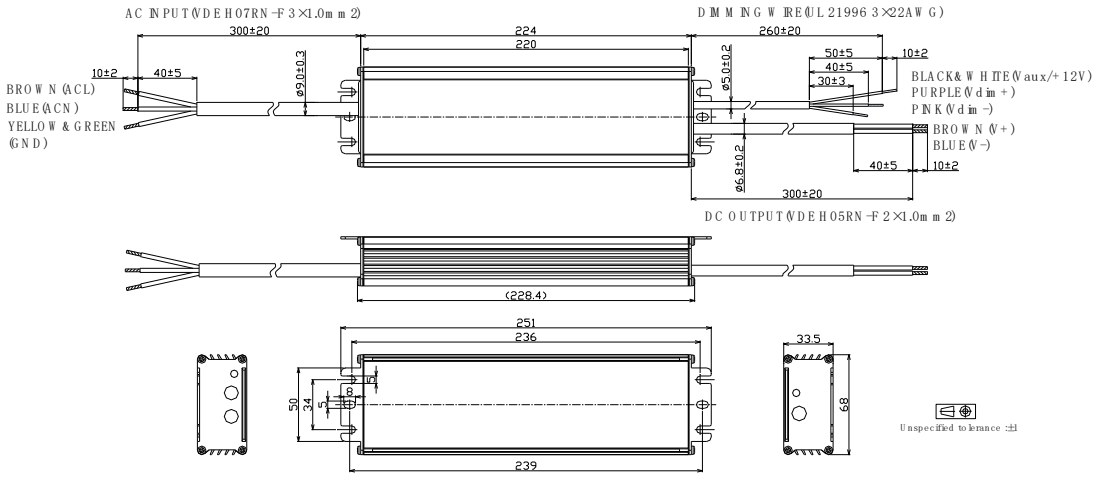

- **TLD-240-Cxxx-NN/TRS (VDE Cable)**



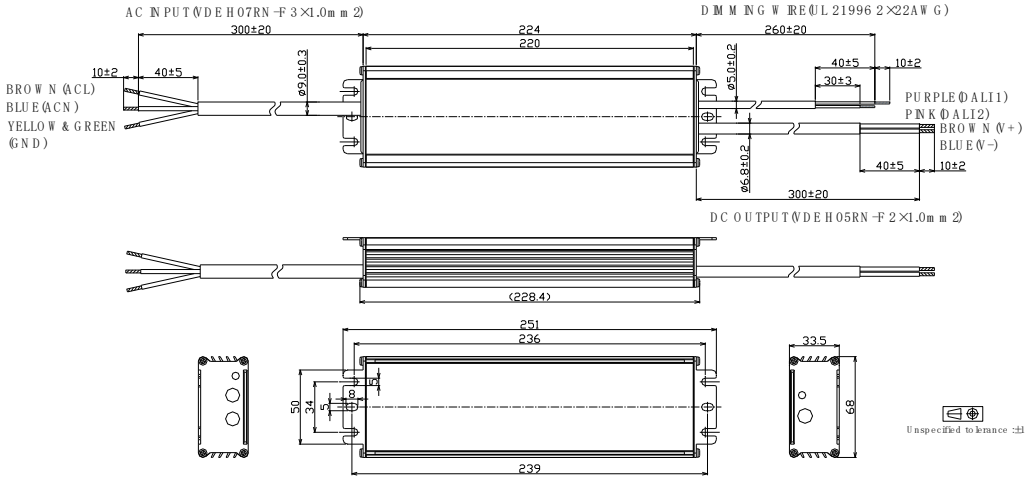
- **TLD-240-Cxxx-DN/DRS (VDE Cable)**



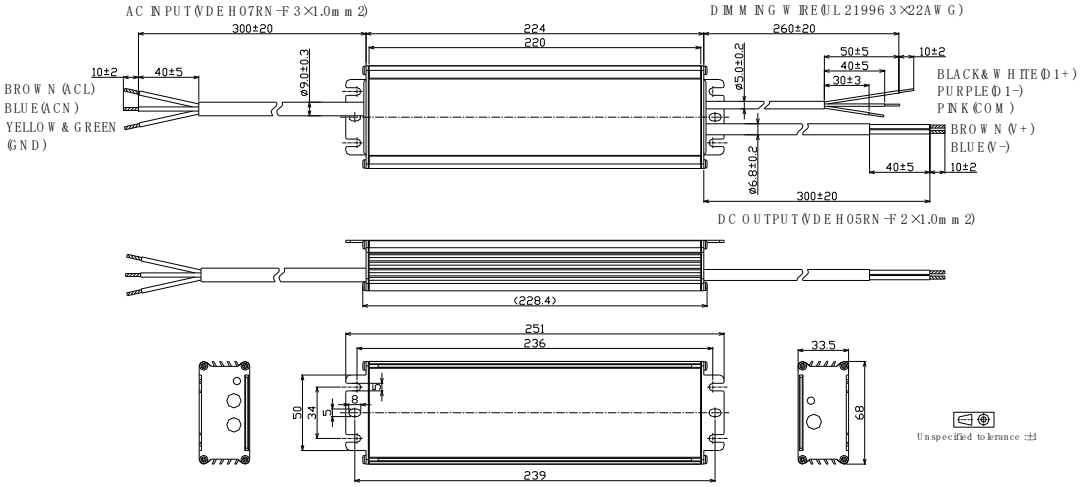

- **TLD-240-Cxxx-EN/ERS (VDE Cable)**



- **TLD-240-Cxxx-ARS (VDE Cable)**




- **TLD-240-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) |
|---|---|---|---|---|---|
| -C140 | 1400 | 250 | 107 | 179 | 140 |
| | 1300 | 250 | 115 | 192 | 130 |
| | 1200 | 250 | 125 | 208 | 120 |
| | 1100 | 250 | 136 | 227 | 110 |
| | 1050 | 250 | 143 | 238 | 105 |
| | 1000 | 238 | 143 | 238 | 105 |
| | 950 | 226 | 143 | 238 | 105 |
| | 900 | 214 | 143 | 238 | 105 |
| | 850 | 202 | 143 | 238 | 105 |
| | 800 | 190 | 143 | 238 | 105 |
| | 750 | 179 | 143 | 238 | 105 |
| | 700 | 167 | 143 | 238 | 105 |
| | … | … | … | … | … |
| | 105 | 25 | 143 | 238 | 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 | 250 | 71 | 119 | 210 |
| | 2000 | 250 | 75 | 125 | 200 |
| | 1900 | 250 | 79 | 132 | 190 |
| | 1800 | 250 | 83 | 139 | 180 |
| | 1700 | 250 | 88 | 147 | 170 |
| | 1600 | 250 | 94 | 156 | 160 |
| | 1500 | 250 | 100 | 167 | 150 |
| | 1400 | 250 | 107 | 179 | 140 |
| | 1300 | 232 | 107 | 179 | 140 |
| | 1200 | 214 | 107 | 179 | 140 |
| | 1100 | 196 | 107 | 179 | 140 |
| | 1000 | 179 | 107 | 179 | 140 |
| | … | … | … | … | … |
| | 140 | 25 | 107 | 179 | 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 | 250 | 36 | 60 | 420 |
| | 4100 | 250 | 37 | 61 | 410 |
| | 4000 | 250 | 38 | 63 | 400 |
| | 3900 | 250 | 38 | 64 | 390 |
| | 3800 | 250 | 39 | 66 | 380 |
| | 3700 | 250 | 41 | 68 | 370 |
| | 3600 | 250 | 42 | 69 | 360 |
| | 3500 | 250 | 43 | 71 | 350 |
| | 3400 | 250 | 44 | 74 | 340 |
| | 3300 | 250 | 45 | 76 | 330 |
| | 3200 | 250 | 47 | 78 | 320 |
| | 3100 | 250 | 48 | 81 | 310 |
| | 3000 | 250 | 50 | 83 | 300 |
| | 2900 | 250 | 52 | 86 | 290 |
| | 2800 | 250 | 54 | 89 | 280 |
| | 2700 | 241 | 54 | 89 | 280 |
| | 2600 | 232 | 54 | 89 | 280 |
| | … | … | … | … | … |
| | 280 | 25 | 54 | 89 | 280 |

| Model | Typical Set Output Current (mA) | Max Output Power (W) | Output Voltage Min (V) | Output Voltage Max(V) | Minimum Dimming Current (mA) |
|---|---|---|---|---|---|
| -C690 | 6900 | 250 | 22 | 36 | 690 |
| | 6800 | 250 | 22 | 37 | 680 |
| | 6600 | 250 | 23 | 38 | 660 |
| | 6400 | 250 | 23 | 39 | 640 |
| | 6200 | 250 | 24 | 40 | 620 |
| | 6000 | 250 | 25 | 42 | 600 |
| | 5800 | 250 | 26 | 43 | 580 |
| | 5600 | 250 | 27 | 45 | 560 |
| | 5400 | 250 | 28 | 46 | 540 |
| | 5200 | 250 | 29 | 48 | 520 |
| | 5000 | 250 | 30 | 50 | 500 |
| | 4800 | 250 | 31 | 52 | 500 |
| | 4500 | 240 | 33 | 56 | 450 |
| | … | … | … | … | … |
| | 450 | 25 | 33 | 56 | 450 |

## Revision History

| Revision | Date | Contents |
|---|---|---|
| C | 2022-03-22 | 1. Index page added<br>2. Reduced dimming interface sourcing current<br>3. DALI 2.0 compatibility added<br>4. Programming instruction added<br>5. Inrush current data added<br>6. Tc point position indication added<br>7. Dielectric strength level added<br>8. Packaging information added<br>9. Mechanical design change with dimming cable color<br>10. Revision history added |