

The IT 0-10 50/100-277 P67 V DP is a 50W, constant-current, programmable and IP66/IP67 rated LED driver that operates from 90-305Vac input with excellent power factor. It is created for many lighting applications including street and area, etc. The high efficiency of these drivers and compact metal case enables them to run cooler, significantly improving reliability and extending product life. To ensure trouble-free operation, protection is provided against input surge, output over voltage, short circuit, and over temperature.



Features

- Compact Metal Case with Excellent Thermal Performance
- Full Power at Wide Output Current Range (Constant Power)
- Adjustable Output Current (AOC) with T4T(Tuner4TRONIC)
- Isolated 1(0)-5V/1(0)-10V/PWM/Resistor/AstroDIM(Timer) Dimmable
- Dim-to-Off with Standby Power ≤ 0.5 W
- Adjustable Dimming Curve
- Dimming Port Withstand 240Vac
- End-of-Life Indicator
- Override Dimming
- Constant Lumen
- Input Surge Protection: DM 6kV, CM 6kV
- All-Around Protection: OTP, OVP, SCP
- SELV output.
- 5 Years Warranty

Application

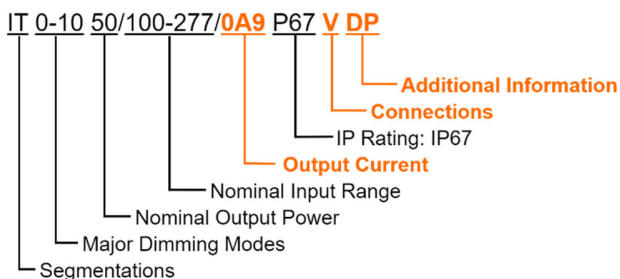
- IP66/IP67
- Suitable for Luminaires with Protection Class I

Models

| Adjustable Output Current Range(mA) | Full Power Current Range (mA) ⁽¹⁾ | Default Output Current (mA) | Nominal Output Voltage Range(Vdc) | Maximum Output Power(W) | Typical Efficiency ⁽²⁾ | Power Factor λ | | Product Name ⁽³⁾ |
|-------------------------------------|--|-----------------------------|-----------------------------------|-------------------------|-----------------------------------|------------------------|--------|--|
| | | | | | | 120Vac | 230Vac | |
| 30-530 | 300-530 | 530 | 47-167 | 50 | 92.0% | 0.99 | 0.96 | IT 0-10 50/100-277/0A53 P67 V DP |
| 55-900 | 550-900 | 700 | 28-91 | 50 | 91.0% | 0.99 | 0.96 | IT 0-10 50/100-277/0A9 P67 V DP ⁽⁴⁾ |
| 92-1500 | 920-1500 | 1050 | 17-54 | 50 | 91.0% | 0.99 | 0.96 | IT 0-10 50/100-277/1A5 P67 V DP ⁽⁴⁾ |

- Notes:** (1) Output current range with constant power at 50W.
 (2) Measured at 100% load and 230Vac input (see below "General Specifications" for details).
 (3) Certified input voltage range: 100-277Vac.
 (4) SELV output

Product Version Description



| Markers | Value | Definition | Notes |
|------------------------|-------|--------------------|-------|
| Output Current | 0A53 | 0.53A | |
| | 0A9 | 0.90A | |
| | 1A5 | 1.50A | |
| Connections | V | VDE Cable | |
| Additional Information | DP | Dimming Protection | |

Input Specifications

| Parameter | Min. | Typ. | Max. | Notes |
|--|---------|------|---------|--|
| Input Voltage AC | 90 Vac | - | 305 Vac | |
| Input Voltage DC | 127 Vdc | - | 300 Vdc | |
| Mains Frequency | 47 Hz | - | 63 Hz | |
| Leakage Current | - | - | 0.70 mA | IEC 60598-1; 277Vac/60Hz |
| Nominal Input Current | - | - | 0.53 A | Measured at 100% load and 120 Vac input. |
| | - | - | 0.27 A | Measured at 100% load and 230 Vac input. |
| Power Factor λ | 0.9 | - | - | At 100-277Vac, 50-60Hz, 60%-100% Load (30-50W) |
| Total Harmonic Distortion | - | - | 20% | |
| Total Harmonic Distortion Extended Range | - | - | 10% | At 220-240Vac, 50-60Hz, 60%-100% Load (30-50W) |

Output Specifications

| Parameter | Min. | Typ. | Max. | Notes |
|----------------------------------|-------|----------|-------------|---|
| Programmable Output Current | | | | |
| IT 0-10 50/100-277/0A53 P67 V DP | 30 mA | - | 530 mA | |
| IT 0-10 50/100-277/0A9 P67 V DP | 55 mA | - | 900 mA | |
| IT 0-10 50/100-277/1A5 P67 V DP | 92 mA | - | 1500 mA | |
| Nominal Output Voltage | | | | |
| IT 0-10 50/100-277/0A53 P67 V DP | 47 V | - | 167 V | |
| IT 0-10 50/100-277/0A9 P67 V DP | 28 V | - | 91 V | |
| IT 0-10 50/100-277/1A5 P67 V DP | 17 V | - | 54 V | |
| Output Current Tolerance | -5% | - | +5% | At 100% load condition |
| Total Output Current Ripple HF | - | 5%Iomax | 10%Iomax | At 100% load condition, 20 MHz BW |
| Output Current Ripple LF | - | 2%Iomax | - | At 100% load condition, <200Hz (pk-pk) |
| P_{stLM} | - | - | 1.0 | |
| SVM | - | - | 0.4 | |
| Startup Overshoot Current | - | - | 10%Iomax | At 100% load condition |
| U_{out} | | | | |
| IT 0-10 50/100-277/0A53 P67 V DP | - | - | 200 V | |
| IT 0-10 50/100-277/0A9 P67 V DP | - | - | 120 V | |
| IT 0-10 50/100-277/1A5 P67 V DP | - | - | 60 V | |
| Line Regulation | - | - | $\pm 1.5\%$ | Measured at 100% load |
| Load Regulation | - | - | $\pm 5.0\%$ | |
| Turn-on Delay Time | - | - | 0.5 s | Measured at 120-277Vac input, 60%-100% load |
| Temperature Coefficient | - | 0.06%/°C | - | Case temperature = 0°C ~Tc max |

General Specifications

| Parameter | Min. | Typ. | Max. | Notes | |
|--|--|---------------|-------|---|--|
| Efficiency at 120Vac Input IT 0-10 50/100-277/0A53 P67 V DP | | | | Measured at 100% load and Steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) | |
| Io=300 mA | 87.5% | 89.5% | - | | |
| Io=530 mA | 87.5% | 89.5% | - | | |
| IT 0-10 50/100-277/0A9 P67 V DP | | | | | |
| Io=550 mA | 87.5% | 89.5% | - | | |
| Io=900 mA | 87.0% | 89.0% | - | | |
| IT 0-10 50/100-277/1A5 P67 V DP | | | | Measured at 100% load and Steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) | |
| Io=920 mA | 87.0% | 89.0% | - | | |
| Io=1500 mA | 86.5% | 88.5% | - | | |
| Efficiency at 230Vac Input IT 0-10 50/100-277/0A53 P67 V DP | | | | | |
| Io=300 mA | 90.0% | 92.0% | - | | |
| Io=530 mA | 89.5% | 91.5% | - | | |
| IT 0-10 50/100-277/0A9 P67 V DP | | | | Measured at 100% load and Steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) | |
| Io=550 mA | 89.0% | 91.0% | - | | |
| Io=900 mA | 89.0% | 91.0% | - | | |
| IT 0-10 50/100-277/1A5 P67 V DP | | | | | |
| Io=920 mA | 89.0% | 91.0% | - | | |
| Io=1500 mA | 88.5% | 90.5% | - | | |
| Efficiency at 277Vac Input IT 0-10 50/100-277/0A53 P67 V DP | | | | Measured at 100% load and Steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) | |
| Io=300 mA | 89.5% | 91.5% | - | | |
| Io=530 mA | 89.5% | 91.5% | - | | |
| IT 0-10 50/100-277/0A9 P67 V DP | | | | | |
| Io=550 mA | 89.0% | 91.0% | - | | |
| Io=900 mA | 89.0% | 91.0% | - | | |
| IT 0-10 50/100-277/1A5 P67 V DP | | | | Measured at 100% load and Steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) | |
| Io=920 mA | 88.5% | 90.5% | - | | |
| Io=1500 mA | 88.0% | 90.0% | - | | |
| Networked Standby Power | - | - | 0.5 W | | Measured at 230Vac/50Hz; Dimming off |
| MTBF | - | 708,000 Hours | - | | Measured at 230Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F) |
| Operating Case Temperature for Safety Tc_s | -40°C | - | +90°C | | |
| Operating Case Temperature for Warranty Tc_w | -40°C | - | +80°C | Case temperature for 5 years warranty Humidity: 10% RH to 95% RH | |
| Lifetime | - | 104,000 Hours | - | Measured at 230Vac input, 80%Load and 70°C case temperature; See lifetime vs. Tc curve for the details | |
| Ambient Temperature | -40°C | - | +65°C | Measured at 230Vac input, 100% load | |
| Permitted rel. Humidity During Operation | 5% | - | 95% | | |
| Temperature at Storage | -40°C | - | +85°C | Humidity: 5%RH to 95%RH | |
| Mains Switching Cycles | 100,000 | - | - | | |
| IP Rating | IP66/IP67 | | | | |
| Dimensions (L × W ×H) | 3.74 x 2.52 x 1.26 Inches 95 x 64 x 32 mm | | | With mounting ear 4.41 x 2.52 x 1.26 Inches 112 x 64 x 32 mm | |
| Net Weight | - | 497 g | - | | |

Inrush Current Waveform

| Input AC Voltage | Inrush Current I_{peak} | Inrush Current Width t_{width} (@ 50% I_{peak}) | The Number of LED Driver can be Configured (MCB) | | | | | | | |
|------------------|------------------------------|---|--|------|------|------|------|------|------|------|
| | | | B10A | B16A | B20A | B25A | C10A | C16A | C20A | C25A |
| 120Vac | 25.6A | 118 μ s | 12 | 20 | 25 | 32 | 15 | 24 | 30 | 37 |
| 230Vac | 52.0A | 118 μ s | 13 | 21 | 27 | 34 | 22 | 36 | 45 | 56 |
| 277Vac | 82.5A | 88.0 μ s | 11 | 18 | 22 | 28 | 18 | 30 | 37 | 46 |

Notes: The maximum number of units per circuit breaker is an indicative value.

Dimming Specifications

| Parameter | | Min. | Typ. | Max. | Notes |
|--|--|-------------------------|-------------|-------------|--|
| Absolute Maximum Voltage on the Vdim (+) Pin | | -20 V | - | 20 V | |
| Source Current on Vdim (+)Pin | | 95 μ A | 100 μ A | 105 μ A | Vdim(+) = 0 V |
| Dimming Output Range | IT 0-10 50/100-277/0A53 P67 V DP IT 0-10 50/100-277/0A9 P67 V DP IT 0-10 50/100-277/1A5 P67 V DP | 10% loset | - | loset | 300 mA \leq loset \leq 530 mA 550 mA \leq loset \leq 900 mA 920 mA \leq loset \leq 1500 mA |
| | IT 0-10 50/100-277/0A53 P67 V DP IT 0-10 50/100-277/0A9 P67 V DP IT 0-10 50/100-277/1A5 P67 V DP | 30 mA 55 mA 92 mA | - | loset | 30 mA \leq loset < 300 mA 55 mA \leq loset < 550 mA 92 mA \leq loset < 920 mA |
| | AstroDIM (Timer) | 10% | - | 100% | |
| Recommended Dimming for 1(0)-5V | | 0.5 V | - | 4.5V | Default 1-5V dimming mode with negative logic. |
| Dimming for 1(0)-10V | | 1 V | - | 9 V | Dimming mode set to 1(0)-10V in T4T. |
| Dimming Curve Adjustable | | 0 V | - | 10V | Dimming mode set to Adjustable Dimming Curve in T4T. |
| PWM_in High Level | | 3 V | - | 10 V | Dimming mode set to PWM Dimming in T4T. |
| PWM_in Low Level | | -0.3 V | - | 0.6 V | |
| PWM_in Frequency | | 200 Hz | - | 3 KHz | |
| PWM_in Duty Cycle | | 1% | - | 99% | |
| PWM Dimming off (Positive Logic) | | 3% | 5% | 8% | |
| PWM Dimming on (Positive Logic) | | 5% | 7% | 10% | |
| PWM Dimming off (Negative Logic) | | 92% | 95% | 97% | |
| PWM Dimming on (Negative Logic) | | 90% | 93% | 95% | |
| Hysteresis | | - | 2% | - | |

Certificates & Standards

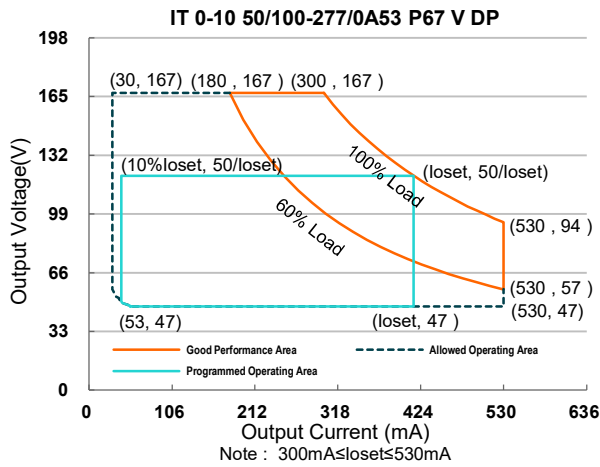
| Safety Category | Standard |
|-----------------|--|
| CCC | GB/T 19510.1, GB/T 19510.213, GB/T 17743, GB 17625.1 |

Note: (1) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.

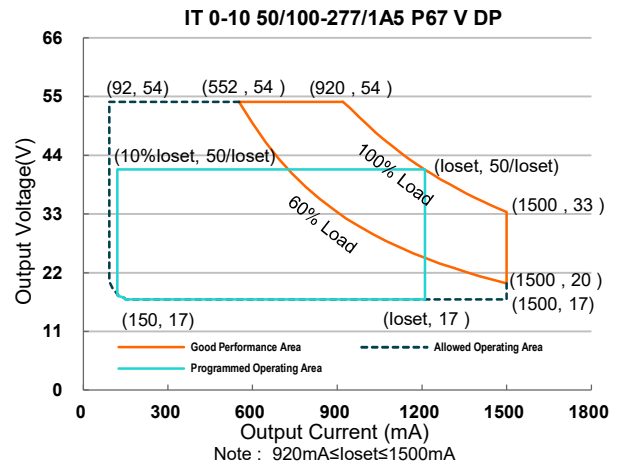
Isolation Levels

| | Input | Output | Dimming | Housing |
|---------|------------|------------|------------|---------|
| Input | N/A | Reinforced | Reinforced | Basic |
| Output | Reinforced | N/A | Reinforced | Basic |
| Dimming | Reinforced | Reinforced | N/A | Basic |
| Housing | Basic | Basic | Basic | N/A |

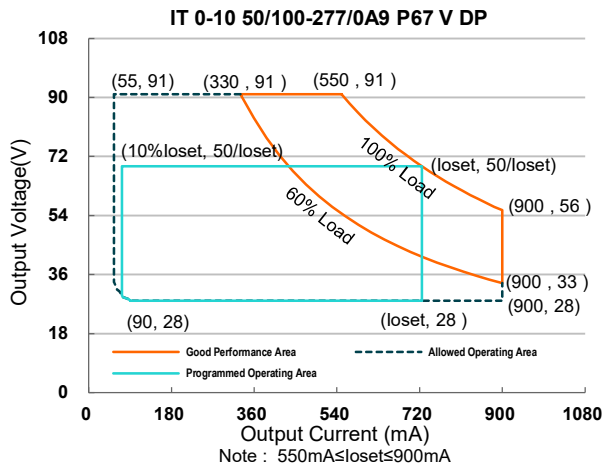
Operating Window



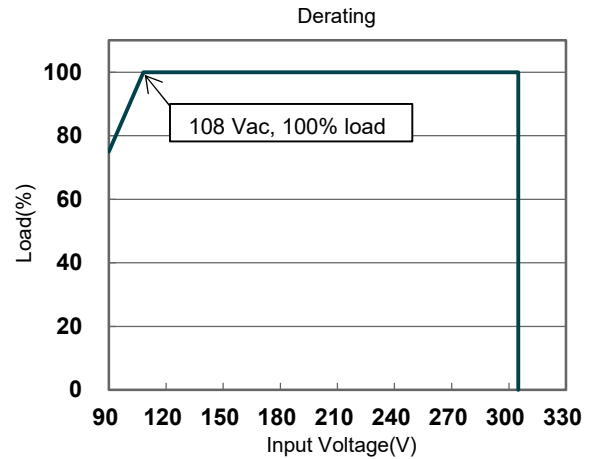
Operating Window



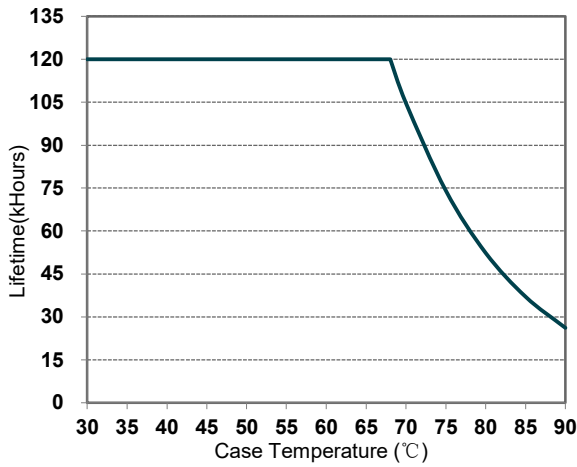
Operating Window



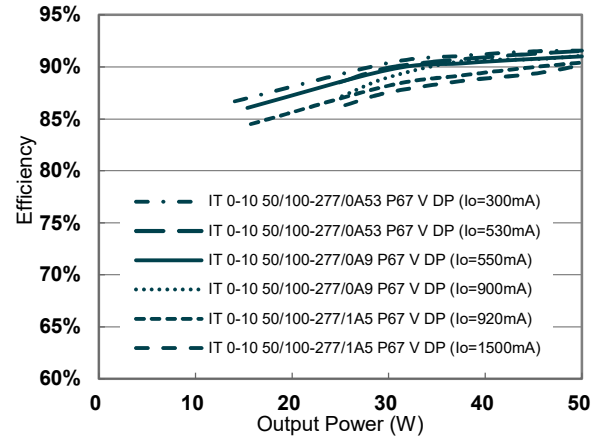
Derating



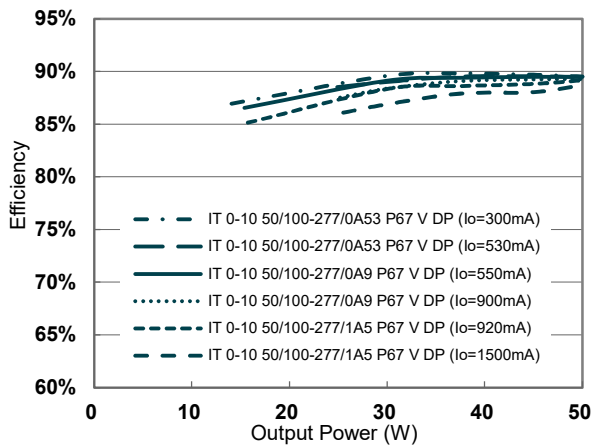
Lifetime vs. Case Temperature



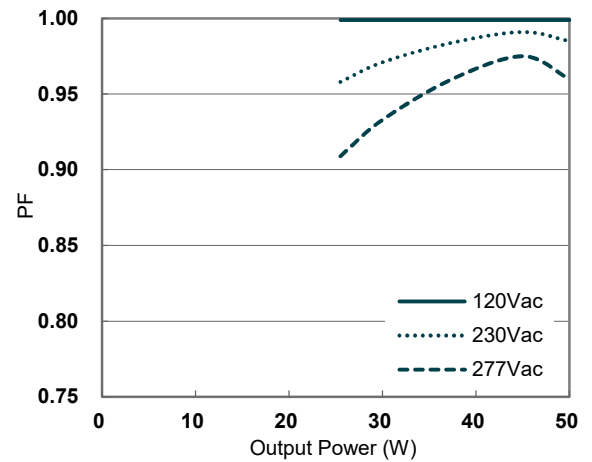
Efficiency vs. Load@277Vac



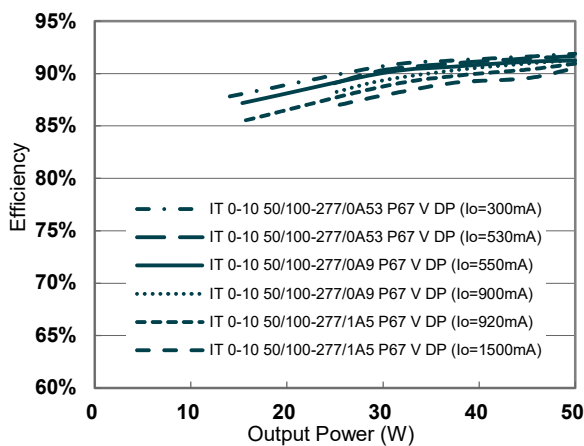
Efficiency vs. Load@120Vac



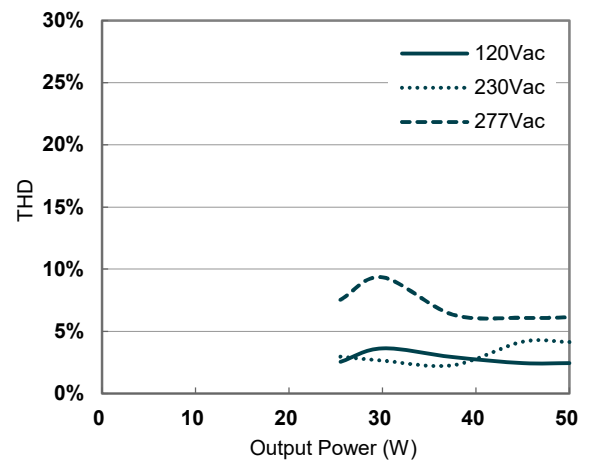
Power Factor



Efficiency vs. Load@230Vac



Total Harmonic Distortion



Protection Functions

Over Temperature Protection(OTP)

Protection based on safety: decreases output current if maximum internal temperature is reached, returning to normal value after over temperature is removed.

When output current reaches 20%, switch-off until over temperature is removed.

Driver Guard

Default setting: disabled.

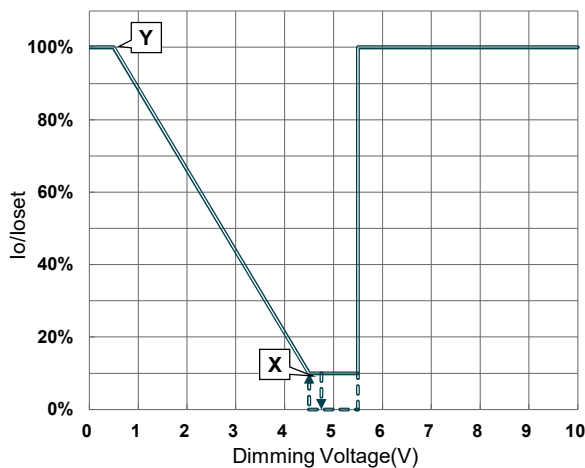
Protection based on lifetime: It can be activated via T4T. Set a lower internal temperature threshold (Thermal Settings: reduce the temperature threshold by 5°C, 10°C, 15°C or 20°C) to activate the over temperature protection.

Dimming

Adjustable Dimming Curve

0-10V curve can be set as corresponding dimming voltage by Inventronics Multi Programmer. The default negative logic 1-5V dimming control is provided below.

When X point is set to be bigger than Y point, the dimming curve is negative logic, and dimming voltage > 5.5V, the driver will output maximum current. If Dim+ is open, the driver will output maximum current.



Notes:

1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. The dimmer can also be replaced by an active 0-10V voltage source signal or passive components like zener.
3. For best dimming accuracy, the difference between X point and Y point is advised not less than 4V.

PWM Dimming

The recommended implementation of the dimming control is provided below:

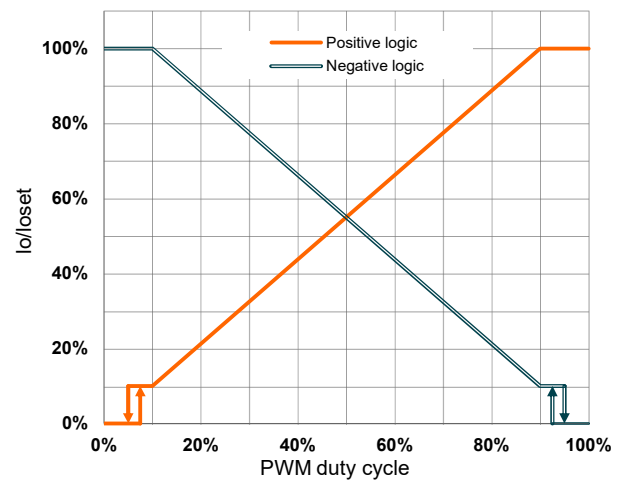
The driver is protected against temporary overheating by automatically reduction of the output current.

Over Voltage Protection(OVP)

Limits output voltage at no load and in case the normal voltage limit fails.

Short Circuit Protection(SCP)

Auto Recovery. No damage will occur when any output is short circuited. The output shall return to normal when the fault condition is removed.

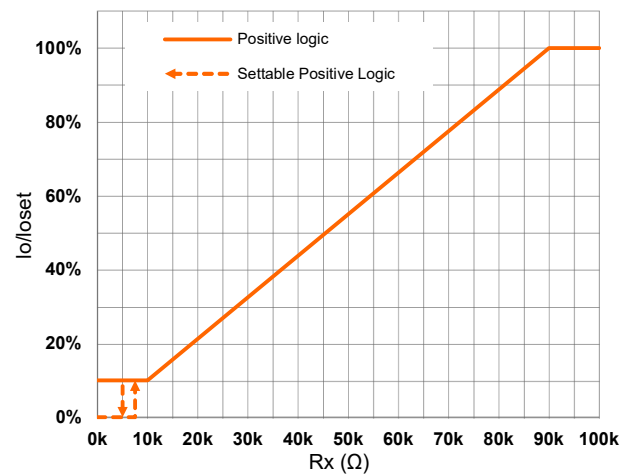


Notes:

1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. When PWM negative logic dimming mode and Dim+ is open, the driver will dim to off and be standby.

Resistor Dimming

The recommended implementation of the dimming control is provided below:



Notes:

1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.

AstroDIM(Timer)

AstroDIM (Timer) includes 2 kinds of modes, they are Astro Based and Time Based.

- **Astro Based:** The benchmark for the dimming profile is based on the average midnight each year, which is precisely calculated using theoretical sunrise and sunset times. The LED driver strictly adheres to daily power-on and power-off times to execute the corresponding dimming configuration file. Furthermore, the adjustment of the dimming schedule is dynamic, automatically adapting according to the actual length of the night to ensure that the lighting effect aligns with nighttime environmental needs.
- **Time Based:** The dimming profile defined in the reference schedule is referenced to the switch-on time of the LED driver.
- **Override Dimming:** When the integrated "AstroDIM(Timer)+Override" is enabled, it is possible to override the dimming mode from 'AstroDIM' into 'Adjustable Dimming Curve' mode by applying a voltage of 1(0)-10V between DIM+ and DIM-. Once a voltage ≤ 10.5 Vdc is detected the output current will coincide with the dimming voltage. By opening the

DIM+ and DIM- circuitry, the LED driver will switch again to AstroDIM mode. During override, our product continues to count while the AstroDIM is being overridden. Once the override is removed, the output current returns to the same point in its AstroDIM cycle.

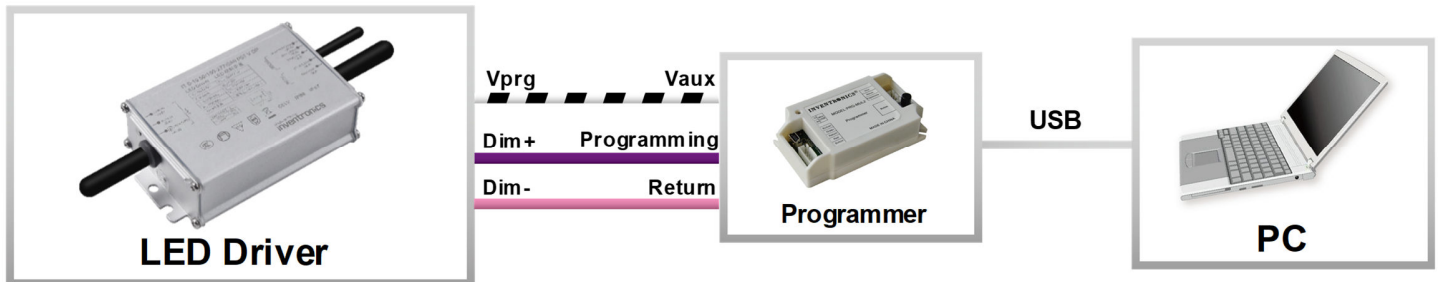
Constant Lumen

Constant lumen function may be used to maintain constant light output over the life of the LEDs by driving them at a reduced current when new, then gradually increasing the drive current over time to counteract LED lumen degradation. This function is disabled by default.

End Of Life

End-of-Life (EOL) is providing a visual notification to a user that the LED module has reached the end of manufacturer-specified life and that the replacement is recommended. Once active, an indication is given at each power-up of the driver, which the driver indicates this through a lower light output (minimum output current level) during the first 10 minutes before normal operation is continue.

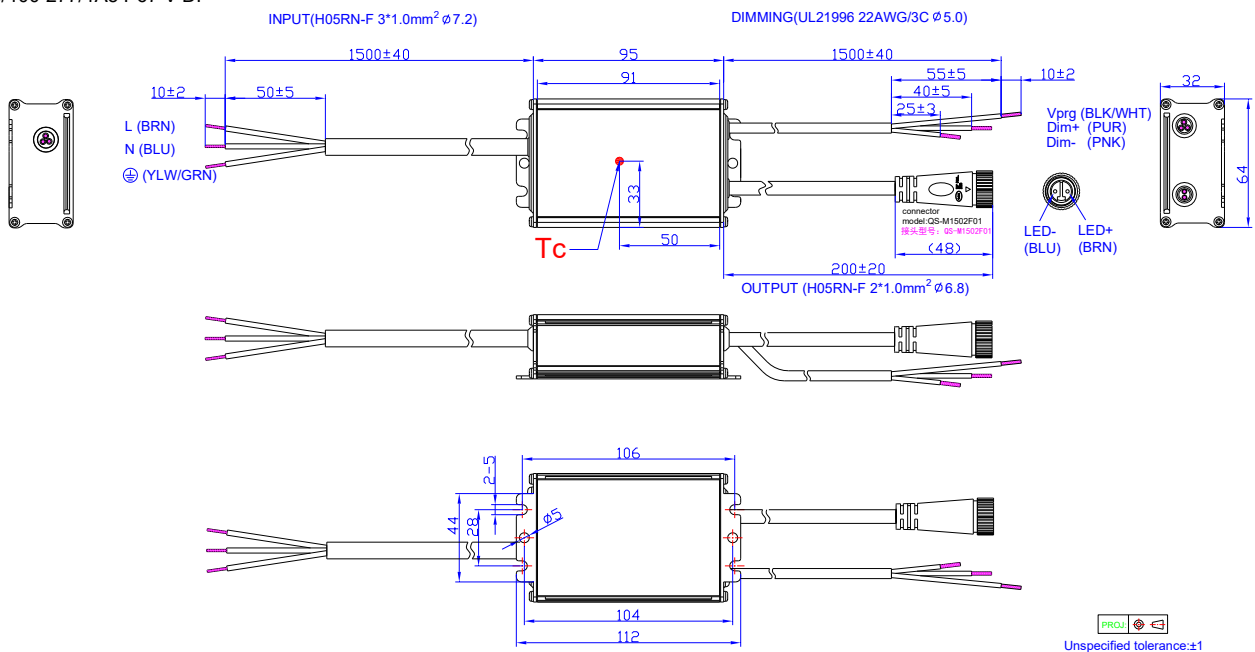
Programming Connection Diagram



- Note:** (1) The driver does not need to be powered on during the programming process.
 (2) Please refer to [PRG-MUL2](#) (Programmer) datasheet for details.
 (3) Supports [T4T](#) functionality.

Mechanical Outline

IT 0-10 50/100-277/0A53 P67 V DP
 IT 0-10 50/100-277/0A9 P67 V DP
 IT 0-10 50/100-277/1A5 P67 V DP



Environmental Compliance

RoHS

Our products comply with reference to RoHS Directive (EU) 2015/863 amending 2011/65/EU, calling for the elimination of lead and other hazardous substances from electronic products.

Product Order Overview

Order Code & Packaging

| Order Code (EAN) | Product Version Name | Certification Markings on Product | Packaging unit (Pieces/Box) | Packing Dimensions (L x W x H)(mm) |
|------------------|----------------------------------|-----------------------------------|-----------------------------|------------------------------------|
| 6937186132635 | IT 0-10 50/100-277/0A53 P67 V DP | CCC | 16 | 490 x 300 x 305 |
| 6937186132659 | IT 0-10 50/100-277/0A9 P67 V DP | CCC | 16 | 490 x 300 x 305 |
| 6937186132673 | IT 0-10 50/100-277/1A5 P67 V DP | CCC | 16 | 490 x 300 x 305 |