

## Features

- Full Power at Wide Output Current Range (Constant Power)
- Adjustable Output Current (AOC) with Programmability
- Isolated 0-10V/PWM/3-Timer-Modes Dimmable
- INV Digital Dimming, UART Based Communication Protocol
- Dim-to-Off with Low Standby Power
- Always-on Auxiliary Power: 12Vdc, 250mA, 3W (Transient Peak Power up to 10W)
- End-of-Life Indicator
- Input Surge Protection: DM 6kV, CM 10kV
- All-Around Protection: IUVP, IOVP, OVP, SCP, OTP
- IP66 / IP67 and UL Dry / Damp / Wet Location
- TYPE HL, for Use in a Class I, Division 2 Hazardous (Classified) Location
- 5 Years Warranty



## Description

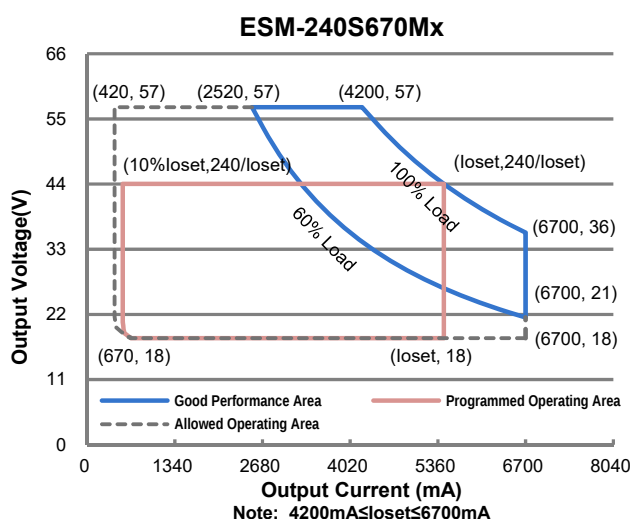
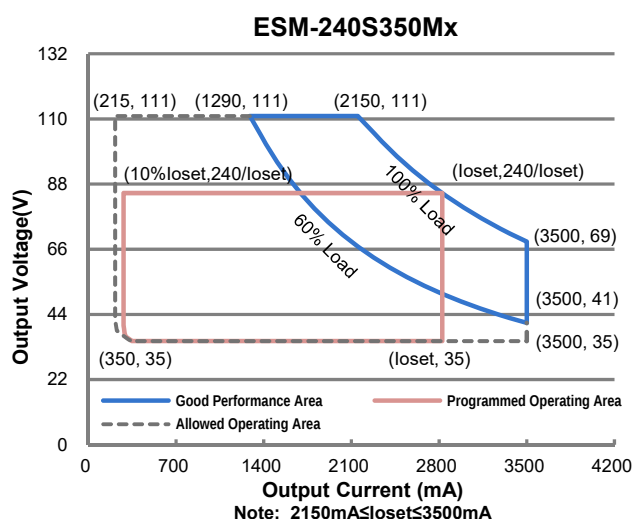
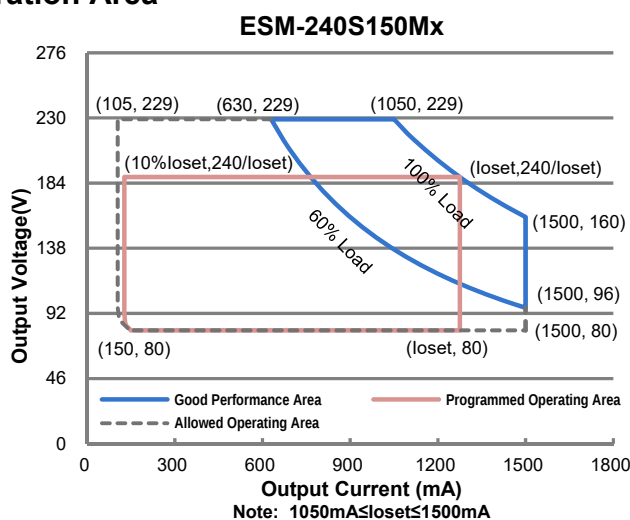
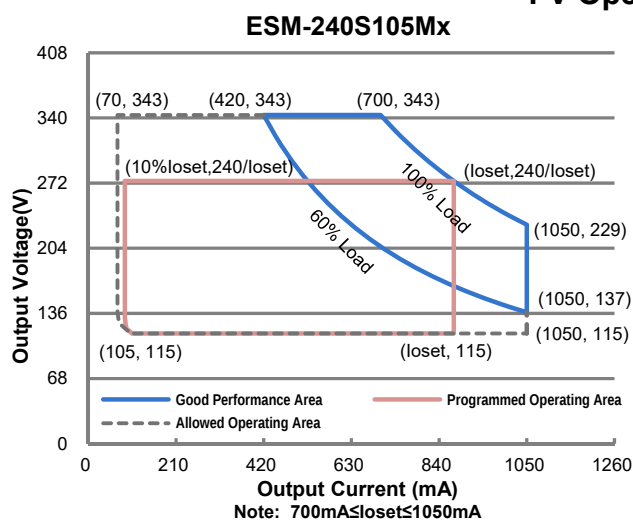
The ESM-240SxxxMx series is a 240W, constant-current, programmable and IP66/IP67 rated LED driver that operates from 249-528Vac input with excellent power factor. Created for smart lighting application, this family provides an auxiliary voltage and dim-to-off functionality for powering low voltage, wireless controls. The dimming control supports 0-10V dimming as well as two-way communication via Digital Dimming, a UART based communication protocol. 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, input under voltage, input over voltage, output over voltage, short circuit, and over temperature.

## Models

| Adjustable Output Current Range | Full-Power Current Range(1) | Default Output Current | Input Voltage Range(2)      | Output Voltage Range | Max. Output Power | Typical Efficiency (3) | Typical Power Factor |        | Model Number (5)             |
|---------------------------------|-----------------------------|------------------------|-----------------------------|----------------------|-------------------|------------------------|----------------------|--------|------------------------------|
|                                 |                             |                        |                             |                      |                   |                        | 277Vac               | 480Vac |                              |
| 70-1050mA                       | 700-1050mA                  | 700 mA                 | 249~528 Vac/<br>352~500 Vdc | 115~343Vdc           | 240 W             | 94.0%                  | 0.99                 | 0.95   | ESM-240S105Mx                |
| 105-1500mA                      | 1050-1500mA                 | 1050 mA                | 249~528 Vac/<br>352~500 Vdc | 80~229 Vdc           | 240 W             | 93.5%                  | 0.99                 | 0.95   | ESM-240S150Mx                |
| 215-3500mA                      | 2150-3500mA                 | 2150 mA                | 249~528 Vac/<br>352~500 Vdc | 35~111 Vdc           | 240 W             | 93.0%                  | 0.99                 | 0.95   | ESM-240S350Mx <sup>(4)</sup> |
| 420-6700mA                      | 4200-6700mA                 | 4900 mA                | 249~528 Vac/<br>352~500 Vdc | 18 ~ 57 Vdc          | 240 W             | 92.5%                  | 0.99                 | 0.95   | ESM-240S670Mx <sup>(4)</sup> |

- Notes:** (1) Output current range with constant power at 240W  
 (2) Certified input voltage range: 277-480Vac.  
 (3) Measured at 100% load and 480Vac input (see below "General Specifications" for details).  
 (4) SELV output.  
 (5) x = G are UL Recognized and ENEC, etc. models; x = T are UL Class P models.

## I-V Operation Area



## Input Specifications

| Parameter                        | Min.    | Typ. | Max.                  | Notes                                                                                                                                    |
|----------------------------------|---------|------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Input AC Voltage                 | 249 Vac | -    | 528 Vac               |                                                                                                                                          |
| Input DC Voltage                 | 352 Vdc | -    | 500 Vdc               |                                                                                                                                          |
| Input Frequency                  | 47 Hz   | -    | 63 Hz                 |                                                                                                                                          |
| Leakage Current                  | -       | -    | 0.75 MIU              | UL 8750; 480Vac/ 60Hz                                                                                                                    |
|                                  | -       | -    | 0.70 mA               | IEC 60598-1; 480Vac/ 60Hz                                                                                                                |
| Input AC Current                 | -       | -    | 1.08 A                | Measured at 100% load and 277 Vac input.                                                                                                 |
|                                  | -       | -    | 0.64 A                | Measured at 100% load and 480 Vac input.                                                                                                 |
| Inrush Current(I <sub>2t</sub> ) | -       | -    | 2.10 A <sup>2</sup> s | At 480Vac input, 25°C cold start, duration=520 μs, 10%I <sub>pk</sub> -10%I <sub>pk</sub> . See Inrush Current Waveform for the details. |

## Input Specifications (Continued)

| Parameter | Min. | Typ. | Max. | Notes                                            |
|-----------|------|------|------|--------------------------------------------------|
| PF        | 0.9  | -    | -    | At 277-480Vac, 50-60Hz, 60%-100% Load (144-240W) |
| THD       | -    | -    | 20%  |                                                  |

## Output Specifications

| Parameter                                           | Min.     | Typ.     | Max.     | Notes                                                                                                                      |
|-----------------------------------------------------|----------|----------|----------|----------------------------------------------------------------------------------------------------------------------------|
| Output Current Tolerance                            | -5%loset | -        | 5%loset  | At 100% load condition                                                                                                     |
| Output Current Setting(loset)<br>Range              |          |          |          |                                                                                                                            |
| ESM-240S105Mx                                       | 70 mA    | -        | 1050 mA  |                                                                                                                            |
| ESM-240S150Mx                                       | 105 mA   | -        | 1500 mA  |                                                                                                                            |
| ESM-240S350Mx                                       | 215 mA   | -        | 3500 mA  |                                                                                                                            |
| ESM-240S670Mx                                       | 420 mA   | -        | 6700 mA  |                                                                                                                            |
| Output Current Setting Range<br>with Constant Power |          |          |          |                                                                                                                            |
| ESM-240S105Mx                                       | 700 mA   | -        | 1050 mA  |                                                                                                                            |
| ESM-240S150Mx                                       | 1050 mA  | -        | 1500 mA  |                                                                                                                            |
| ESM-240S350Mx                                       | 2150 mA  | -        | 3500 mA  |                                                                                                                            |
| ESM-240S670Mx                                       | 4200 mA  | -        | 6700 mA  |                                                                                                                            |
| Total Output Current Ripple<br>(pk-pk)              | -        | 5%lomax  | 10%lomax | At 100% load condition. 20 MHz BW                                                                                          |
| Output Current Ripple at<br>< 200 Hz (pk-pk)        | -        | 2%lomax  | -        | At 100% load condition. Only this<br>component of ripple is associated with<br>visible flicker.                            |
| Startup Overshoot Current                           | -        | -        | 10%lomax | At 100% load condition                                                                                                     |
| No Load Output Voltage                              |          |          |          |                                                                                                                            |
| ESM-240S105Mx                                       | -        | -        | 400 V    |                                                                                                                            |
| ESM-240S150Mx                                       | -        | -        | 290 V    |                                                                                                                            |
| ESM-240S350Mx                                       | -        | -        | 120 V    |                                                                                                                            |
| ESM-240S670Mx                                       | -        | -        | 75 V     |                                                                                                                            |
| Line Regulation                                     | -        | -        | ±0.5%    | Measured at 100% load                                                                                                      |
| Load Regulation                                     | -        | -        | ±3.0%    |                                                                                                                            |
| Turn-on Delay Time                                  | -        | -        | 0.5 s    | Measured at 277-480Vac input,<br>60%-100% Load                                                                             |
| Temperature Coefficient of loiset                   | -        | 0.03%/°C | -        | Case temperature = 0°C ~Tc max                                                                                             |
| 12V Auxiliary Output Voltage                        | 10.8 V   | 12 V     | 13.2 V   |                                                                                                                            |
| 12V Auxiliary Output Source<br>Current              | 0 mA     | -        | 250 mA   | Return terminal is "Dim-"                                                                                                  |
| 12V Auxiliary Output Transient<br>Peak Current@ 6W  | -        | -        | 500 mA   | 500mA peak for a maximum duration of 2.2<br>ms in a 6.0ms period during which time the<br>average should not exceed 250mA. |
| 12V Auxiliary Output Transient<br>Peak Current@10W  | -        | -        | 850 mA   | 850mA peak for a maximum duration of 1.3<br>ms in a 5.2ms period during which time the<br>average should not exceed 250mA. |

## General Specifications

| Parameter                                                                                                                                                                                                        | Min.                                                                 | Typ.                                                                 | Max.                                 | Notes                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Efficiency at 277 Vac input:<br>ESM-240S105Mx<br>Io= 700 mA<br>Io=1050 mA<br>ESM-240S150Mx<br>Io=1050 mA<br>Io=1500 mA<br>ESM-240S350Mx<br>Io=2150 mA<br>Io=3500 mA<br>ESM-240S670Mx<br>Io=4200 mA<br>Io=6700 mA | 90.5%<br>91.0%<br>90.0%<br>90.0%<br>90.0%<br>88.5%<br>89.5%<br>87.5% | 92.5%<br>93.0%<br>92.0%<br>92.0%<br>92.0%<br>90.5%<br>91.5%<br>89.5% | -<br>-<br>-<br>-<br>-<br>-<br>-<br>- | Measured at 100% load and steady-state temperature in 25°C ambient;<br>(Efficiency will be about 2.0% lower if measured immediately after startup.) |
| Efficiency at 400 Vac input:<br>ESM-240S105Mx<br>Io= 700 mA<br>Io=1050 mA<br>ESM-240S150Mx<br>Io=1050 mA<br>Io=1500 mA<br>ESM-240S350Mx<br>Io=2150 mA<br>Io=3500 mA<br>ESM-240S670Mx<br>Io=4200 mA<br>Io=6700 mA | 91.5%<br>91.5%<br>91.5%<br>91.0%<br>91.0%<br>89.5%<br>90.5%<br>88.5% | 93.5%<br>93.5%<br>93.5%<br>93.0%<br>93.0%<br>91.5%<br>92.5%<br>90.5% | -<br>-<br>-<br>-<br>-<br>-<br>-<br>- | Measured at 100% load and steady-state temperature in 25°C ambient;<br>(Efficiency will be about 2.0% lower if measured immediately after startup.) |
| Efficiency at 480 Vac input:<br>ESM-240S105Mx<br>Io= 700 mA<br>Io=1050 mA<br>ESM-240S150Mx<br>Io=1050 mA<br>Io=1500 mA<br>ESM-240S350Mx<br>Io=2150 mA<br>Io=3500 mA<br>ESM-240S670Mx<br>Io=4200 mA<br>Io=6700 mA | 91.5%<br>92.0%<br>91.5%<br>91.0%<br>91.0%<br>89.5%<br>90.5%<br>89.0% | 93.5%<br>94.0%<br>93.5%<br>93.0%<br>93.0%<br>91.5%<br>92.5%<br>91.0% | -<br>-<br>-<br>-<br>-<br>-<br>-<br>- | Measured at 100% load and steady-state temperature in 25°C ambient;<br>(Efficiency will be about 2.0% lower if measured immediately after startup.) |
| Standby Power                                                                                                                                                                                                    | -                                                                    | 1.5 W                                                                | -                                    | Measured at 480Vac/50Hz; Dimming off                                                                                                                |
| MTBF                                                                                                                                                                                                             | -                                                                    | 203,000 Hours                                                        | -                                    | Measured at 480Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)                                                                      |
| Lifetime                                                                                                                                                                                                         | -                                                                    | 106,000 Hours                                                        | -                                    | Measured at 480Vac input, 80%Load and 70°C case temperature; See lifetime vs. Tc curve for the details                                              |
| 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<br>Humidity: 10% RH to 95% RH                                                                                 |
| Storage Temperature                                                                                                                                                                                              | -40°C                                                                | -                                                                    | +85°C                                | Humidity: 5%RH to 95%RH                                                                                                                             |
| Dimensions<br>Inches (L × W × H)<br>Millimeters (L × W × H)                                                                                                                                                      | 7.91 × 3.01 × 1.52<br>201 × 76.5 × 38.5                              |                                                                      |                                      | With mounting ear<br>8.58 × 3.01 × 1.52<br>218 × 76.5 × 38.5                                                                                        |
| Net Weight                                                                                                                                                                                                       | -                                                                    | 1200 g                                                               | -                                    |                                                                                                                                                     |

## Dimming Specifications

| Parameter                                    |                                                                  | Min.                                | Typ.        | Max.        | Notes                                                                                                                                                       |
|----------------------------------------------|------------------------------------------------------------------|-------------------------------------|-------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Absolute Maximum Voltage on the Vdim (+) Pin |                                                                  | -20 V                               | -           | 20 V        |                                                                                                                                                             |
| Source Current on Vdim (+)Pin                |                                                                  | 200 $\mu$ A                         | 300 $\mu$ A | 450 $\mu$ A | Vdim(+) = 0 V                                                                                                                                               |
| Dimming Output Range                         | ESM-240S105Mx<br>ESM-240S150Mx<br>ESM-240S350Mx<br>ESM-240S670Mx | 10%loset                            | -           | loset       | 700 mA $\leq$ loiset $\leq$ 1050 mA<br>1050 mA $\leq$ loiset $\leq$ 1500 mA<br>2150 mA $\leq$ loiset $\leq$ 3500 mA<br>4200 mA $\leq$ loiset $\leq$ 6700 mA |
|                                              | ESM-240S105Mx<br>ESM-240S150Mx<br>ESM-240S350Mx<br>ESM-240S670Mx | 70 mA<br>105 mA<br>215 mA<br>420 mA | -           | loiset      | 70 mA $\leq$ loiset < 700 mA<br>105 mA $\leq$ loiset < 1050 mA<br>215 mA $\leq$ loiset < 2150 mA<br>420 mA $\leq$ loiset < 4200 mA                          |
| Recommended Dimming Input Range              |                                                                  | 0 V                                 | -           | 10 V        | Default 0-10V dimming mode.                                                                                                                                 |
| Dim off Voltage                              |                                                                  | 0.35 V                              | 0.5 V       | 0.65 V      |                                                                                                                                                             |
| Dim on Voltage                               |                                                                  | 0.55 V                              | 0.7 V       | 0.85 V      |                                                                                                                                                             |
| Hysteresis                                   |                                                                  | -                                   | 0.2 V       | -           |                                                                                                                                                             |
| PWM_in High Level                            |                                                                  | 3 V                                 | -           | 10 V        | Dimming mode set to PWM in PC interface.                                                                                                                    |
| PWM_in Low Level                             |                                                                  | -0.3 V                              | -           | 0.6 V       |                                                                                                                                                             |
| PWM_in Frequency Range                       |                                                                  | 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%          | -           |                                                                                                                                                             |

## Safety & EMC Compliance

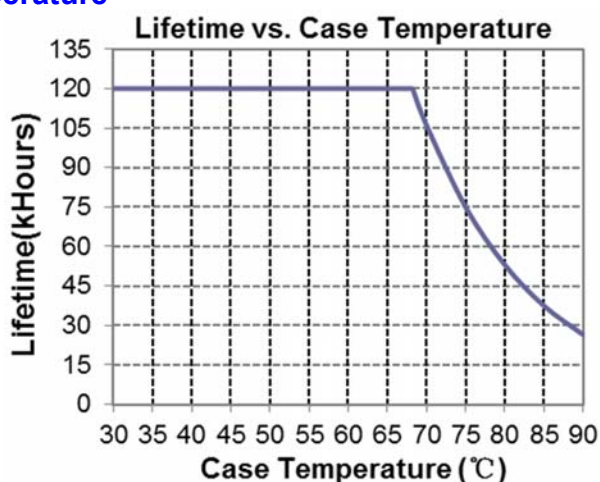
| Safety Category | Standard                                |
|-----------------|-----------------------------------------|
| UL/CUL          | UL 8750,CAN/CSA-C22.2 No. 250.13        |
| ENEC & CE       | EN 61347-1, EN 61347-2-13               |
| UKCA            | BS EN 61347-1, BS EN 61347-2-13         |
| CB              | IEC 61347-1, IEC 61347-2-13             |
| EAC             | ГОСТ Р МЭК 61347-1, ГОСТ IEC 61347-2-13 |

## Safety & EMC Compliance (Continued)

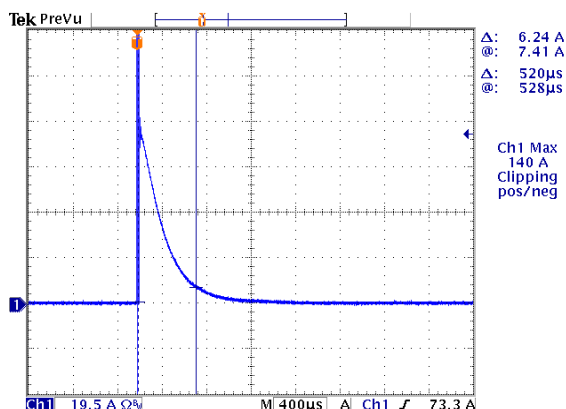
| EMI Standards                 | Notes                                                                                                                                                                                                                                                                               |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BS EN/EN 55015 <sup>(1)</sup> | Conducted emission Test & Radiated emission Test                                                                                                                                                                                                                                    |
| BS EN/EN 61000-3-2            | Harmonic current emissions                                                                                                                                                                                                                                                          |
| BS EN/EN 61000-3-3            | Voltage fluctuations & flicker                                                                                                                                                                                                                                                      |
| FCC Part 15 <sup>(1)</sup>    | ANSI C63.4 Class B                                                                                                                                                                                                                                                                  |
|                               | This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired operation. |
| EMS Standards                 | Notes                                                                                                                                                                                                                                                                               |
| BS EN/EN 61000-4-2            | Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge                                                                                                                                                                                                           |
| BS EN/EN 61000-4-3            | Radio-Frequency Electromagnetic Field Susceptibility Test-RS                                                                                                                                                                                                                        |
| BS EN/EN 61000-4-4            | Electrical Fast Transient / Burst-EFT                                                                                                                                                                                                                                               |
| BS EN/EN 61000-4-5            | Surge Immunity Test: AC Power Line: Differential Mode 6 kV, Common Mode 10 kV                                                                                                                                                                                                       |
| BS EN/EN 61000-4-6            | Conducted Radio Frequency Disturbances Test-CS                                                                                                                                                                                                                                      |
| BS EN/EN 61000-4-8            | Power Frequency Magnetic Field Test                                                                                                                                                                                                                                                 |
| BS EN/EN 61000-4-11           | Voltage Dips                                                                                                                                                                                                                                                                        |
| BS EN/EN 61547                | Electromagnetic Immunity Requirements Applies To Lighting Equipment                                                                                                                                                                                                                 |

**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.

## Lifetime vs. Case Temperature



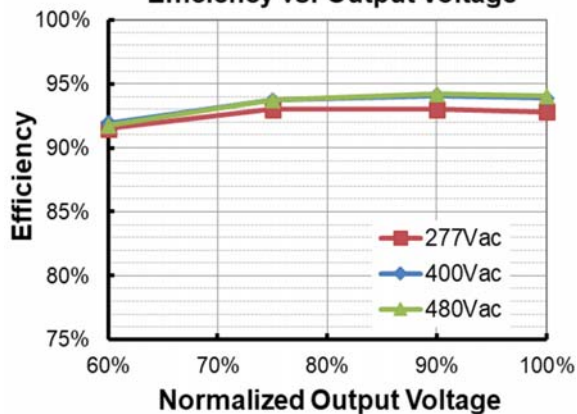
## Inrush Current Waveform



## Efficiency vs. Load

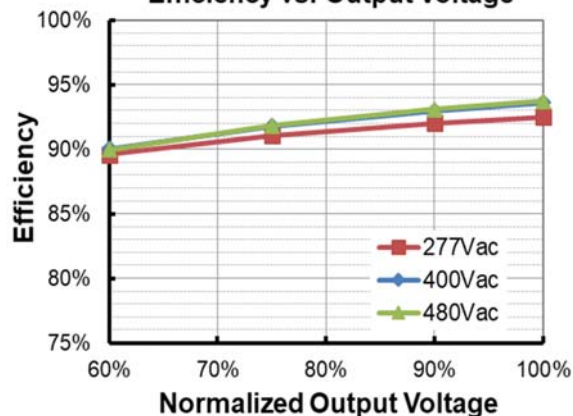
ESM-240S105Mx( $I_o=700\text{mA}$ )

Efficiency vs. Output Voltage



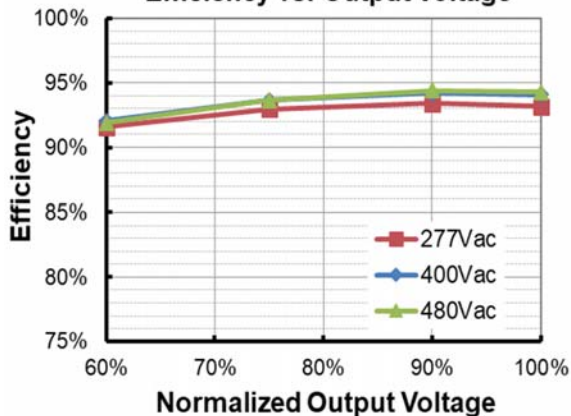
ESM-240S105Mx( $I_o=1050\text{mA}$ )

Efficiency vs. Output Voltage



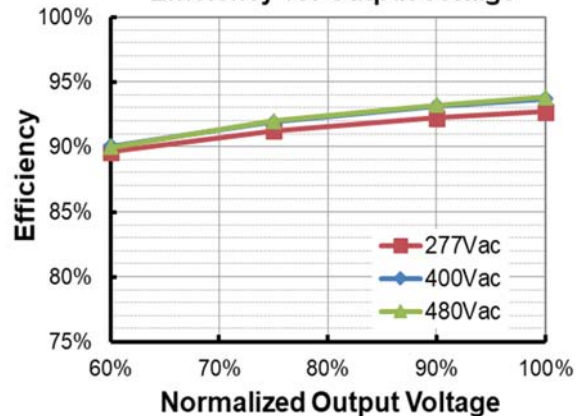
ESM-240S150Mx( $I_o=1050\text{mA}$ )

Efficiency vs. Output Voltage

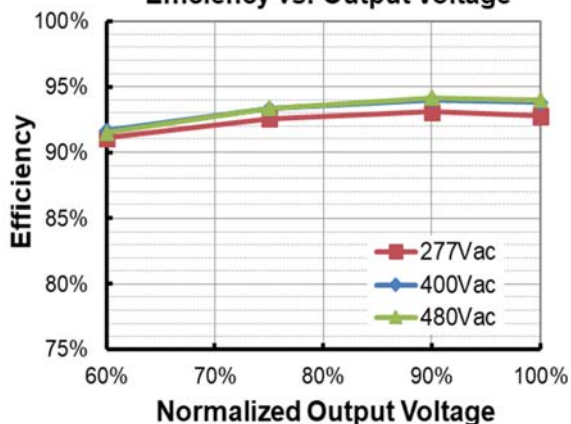


ESM-240S150Mx( $I_o=1500\text{mA}$ )

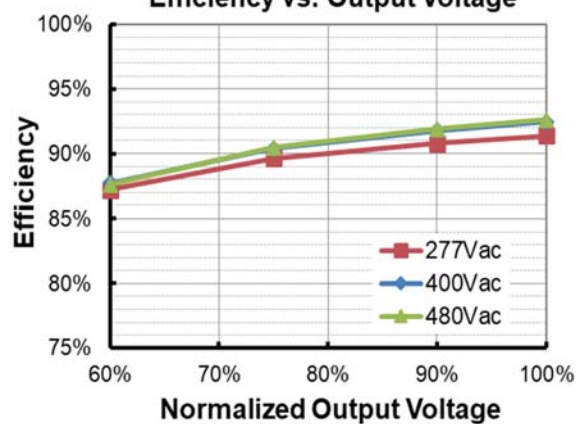
Efficiency vs. Output Voltage



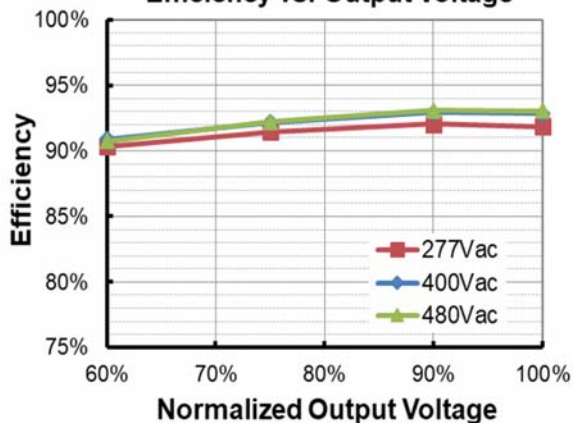
ESM-240S350Mx( $I_o=2150\text{mA}$ )  
Efficiency vs. Output Voltage



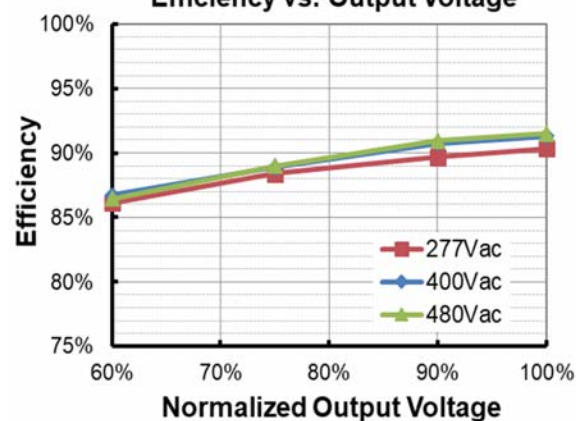
ESM-240S350Mx( $I_o=3500\text{mA}$ )  
Efficiency vs. Output Voltage



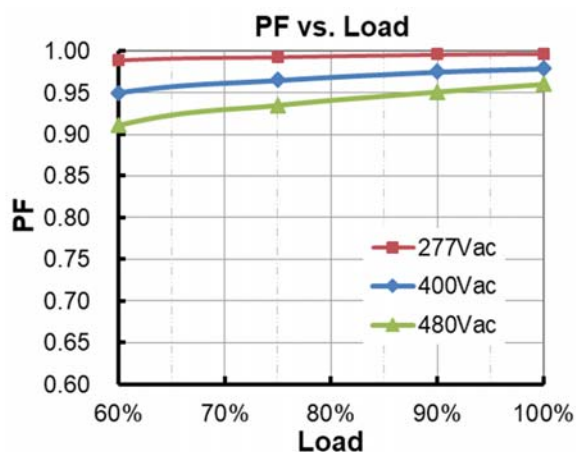
ESM-240S670Mx( $I_o=4200\text{mA}$ )  
Efficiency vs. Output Voltage



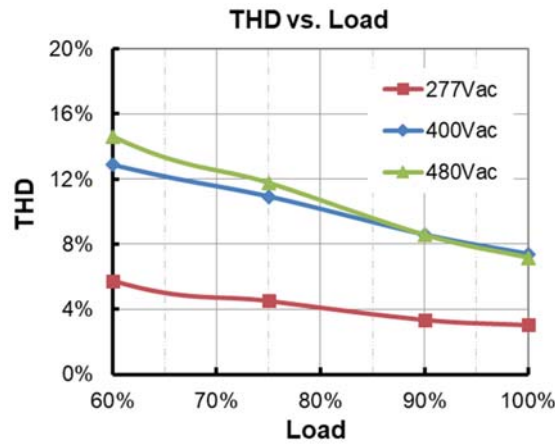
ESM-240S670Mx( $I_o=6700\text{mA}$ )  
Efficiency vs. Output Voltage



## Power Factor



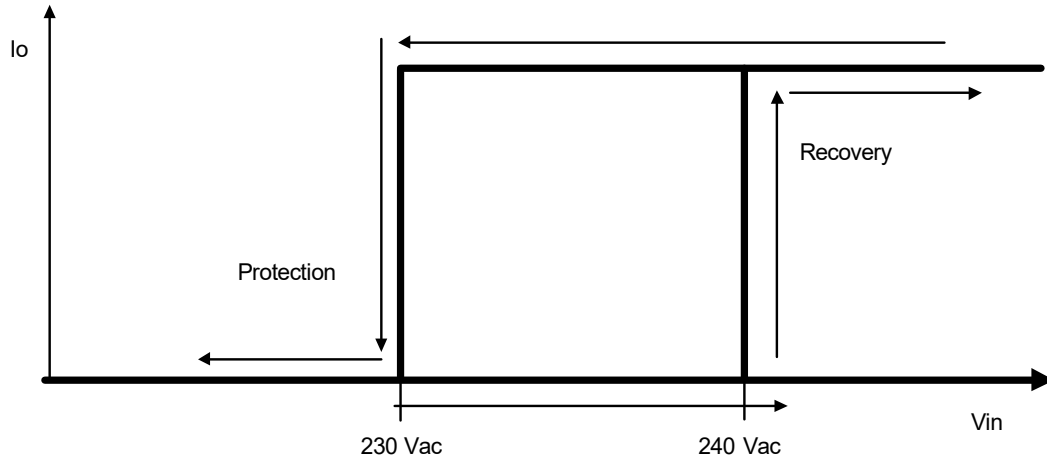
## Total Harmonic Distortion



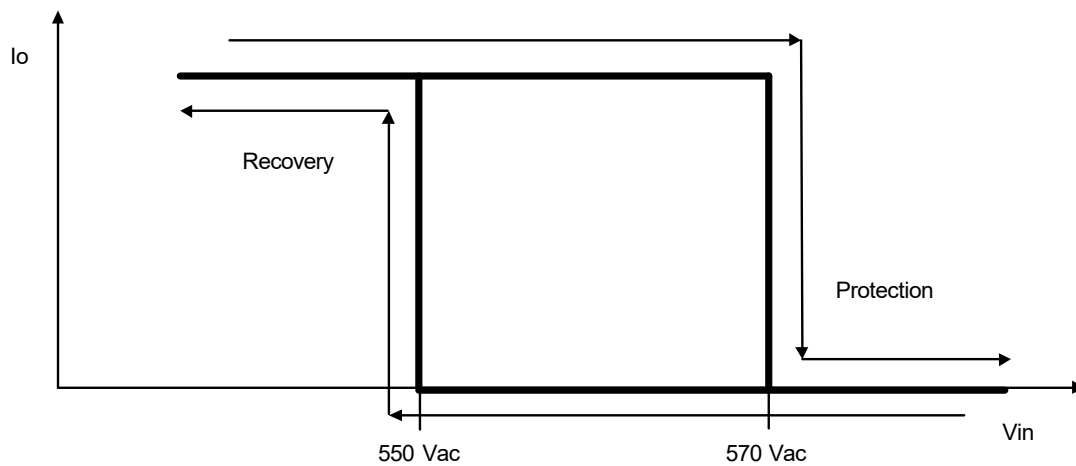
## Protection Functions

| Parameter                             |                                | Min.                                                                                                                                           | Typ.    | Max.    | Notes                                                                                       |
|---------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|---------------------------------------------------------------------------------------------|
| Over Voltage Protection               |                                | Limits output voltage at no load and in case the normal voltage limit fails.                                                                   |         |         |                                                                                             |
| Short Circuit Protection              |                                | Auto Recovery. No damage will occur when any output is short circuited. The output shall return to normal when the fault condition is removed. |         |         |                                                                                             |
| Over Temperature Protection           |                                | Decreases output current, returning to normal after over temperature is removed.                                                               |         |         |                                                                                             |
| Input Under Voltage Protection (IUVP) | Input Under Voltage Protection | 220 Vac                                                                                                                                        | 230 Vac | 240 Vac | Turn off the output when the input voltage falls below protection voltage.                  |
|                                       | Input Under Voltage Recovery   | 230 Vac                                                                                                                                        | 240 Vac | 250 Vac | Auto Recovery. The driver will restart when the input voltage exceeds recovery voltage.     |
| Input Over Voltage Protection (IOVP)  | Input Over Voltage Protection  | 550 Vac                                                                                                                                        | 570 Vac | 590 Vac | Turn off the output when the input voltage exceeds protection voltage.                      |
|                                       | Input Over Voltage Recovery    | 530 Vac                                                                                                                                        | 550 Vac | 570 Vac | Auto Recovery. The driver will restart when the input voltage falls below recovery voltage. |
|                                       | Max. of Input Over Voltage     | -                                                                                                                                              | -       | 590 Vac | The driver can survive for 8 hours with input voltage stress of 590Vac.                     |

## ● Input Under Voltage Protection Diagram



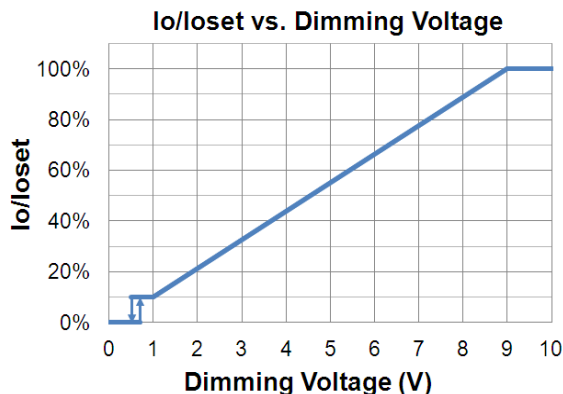
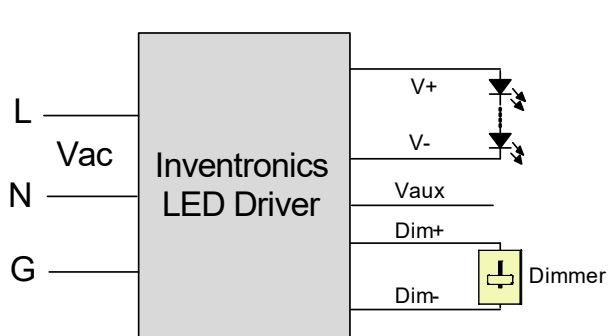
## ● Input Over Voltage Protection Diagram



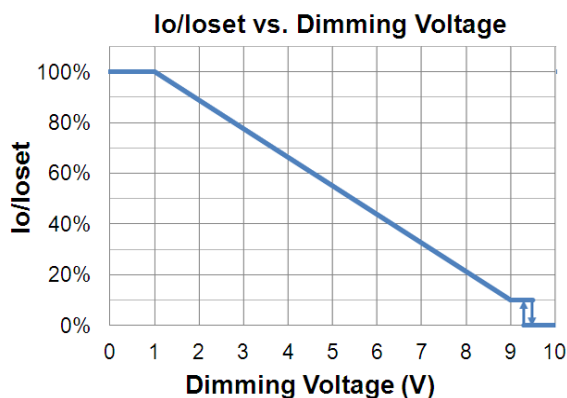
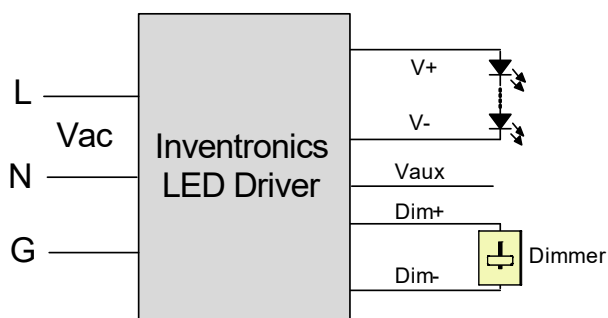
## Dimming

### ● 0-10V Dimming

The recommended implementation of the dimming control is provided below.



**Implementation 1: Positive logic**



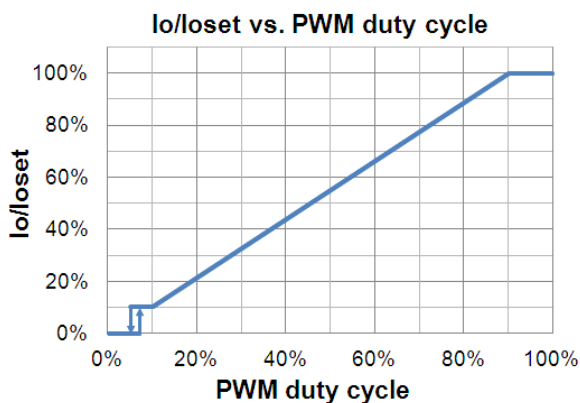
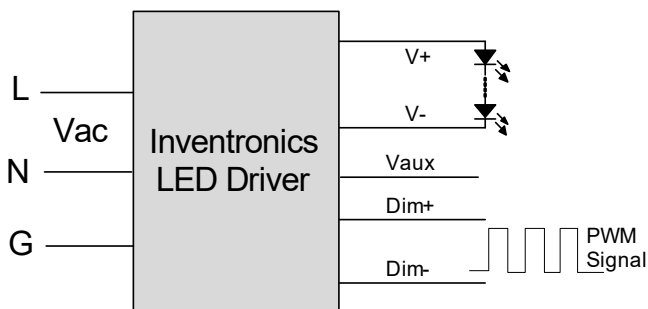
**Implementation 2: Negative logic**

## Notes:

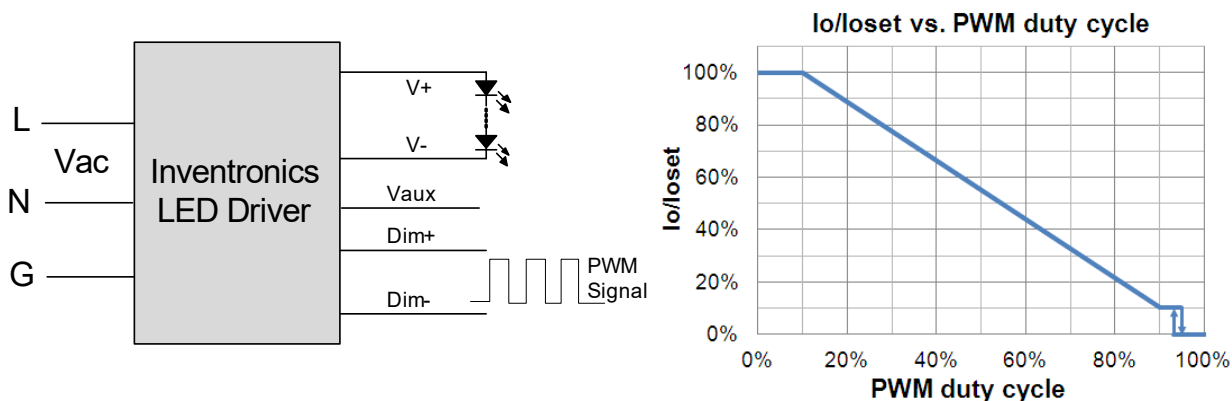
1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. The dimmer can also be replaced by an active 0-10V voltage source signal or passive components like zener.
3. When 0-10V negative logic dimming mode and Dim+ is open, the driver will dim to off and be standby.

## ● PWM Dimming

The recommended implementation of the dimming control is provided below.



**Implementation 3: Positive logic**



## Implementation 4: Negative logic

### Note:

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.

### ● Time Dimming

Time dimming control includes 3 kinds of modes, they are Self Adapting-Midnight, Self Adapting-Percentage and Traditional Timer.

- **Self Adapting-Midnight:** Automatically adjusts the dimming curve based on the on-time of past two days (if difference <15 minutes), assuming that the center point of the dimming curve is midnight local time.
- **Self Adapting-Percentage:** Automatically adjusts the on-time of each step by a constant percentage = (actual on-time for the past 2 days if difference <15 min) / (programmed on-time from the dimming curve).
- **Traditional Timer:** Follows the programmed timing curve after power on with no changes.

### ● Output Lumen Compensation

Output Lumen Compensation (OLC) 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.

### ● End Of Life

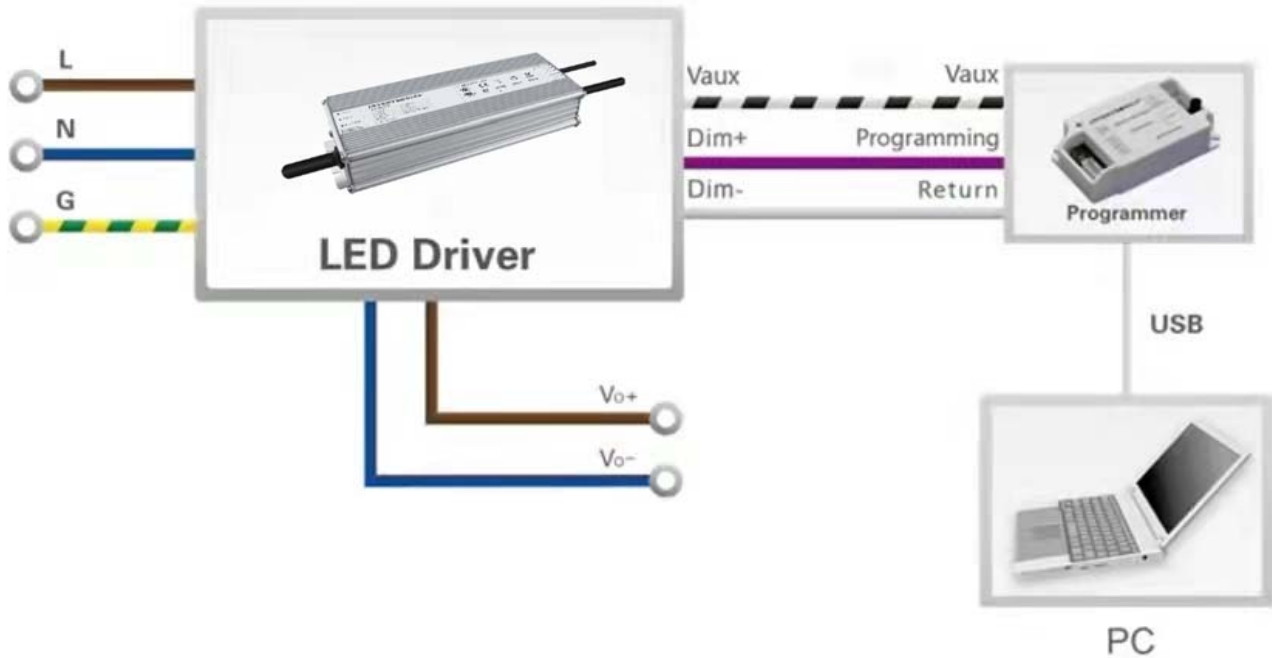
End-of-Life (EOL) is providing a visual notification to a user that the LED module has reached the end of manufacturer-specified life and that the replacement is recommended. Once active, an indication is given at each power-up of the driver, which the driver indicates this through a lower light output during the first 1 minute before normal operation is continued.

### ● Digital Dimming

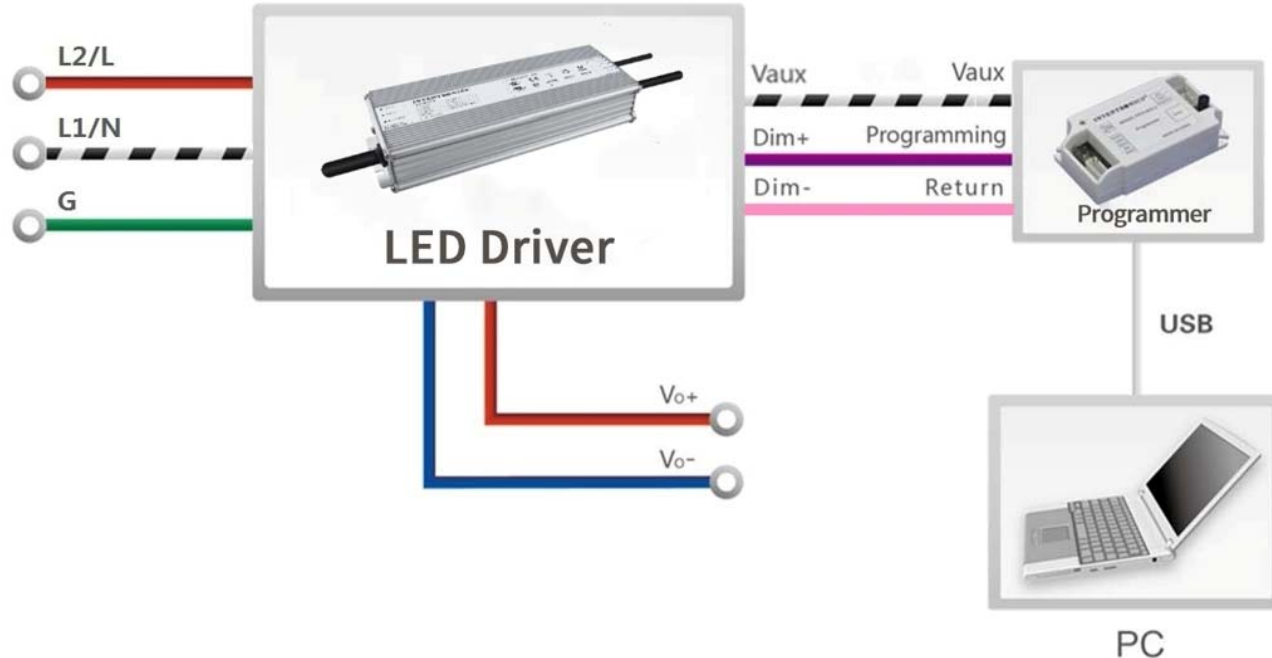
Inventronics Digital Dimming is a UART (Universal Asynchronous Receive Transmitter) based communication protocol. Please refer to [Inventronics Digital Dimming](#) file for details.

## Programming Connection Diagram

ESM-240SxxxMG



ESM-240SxxxMT

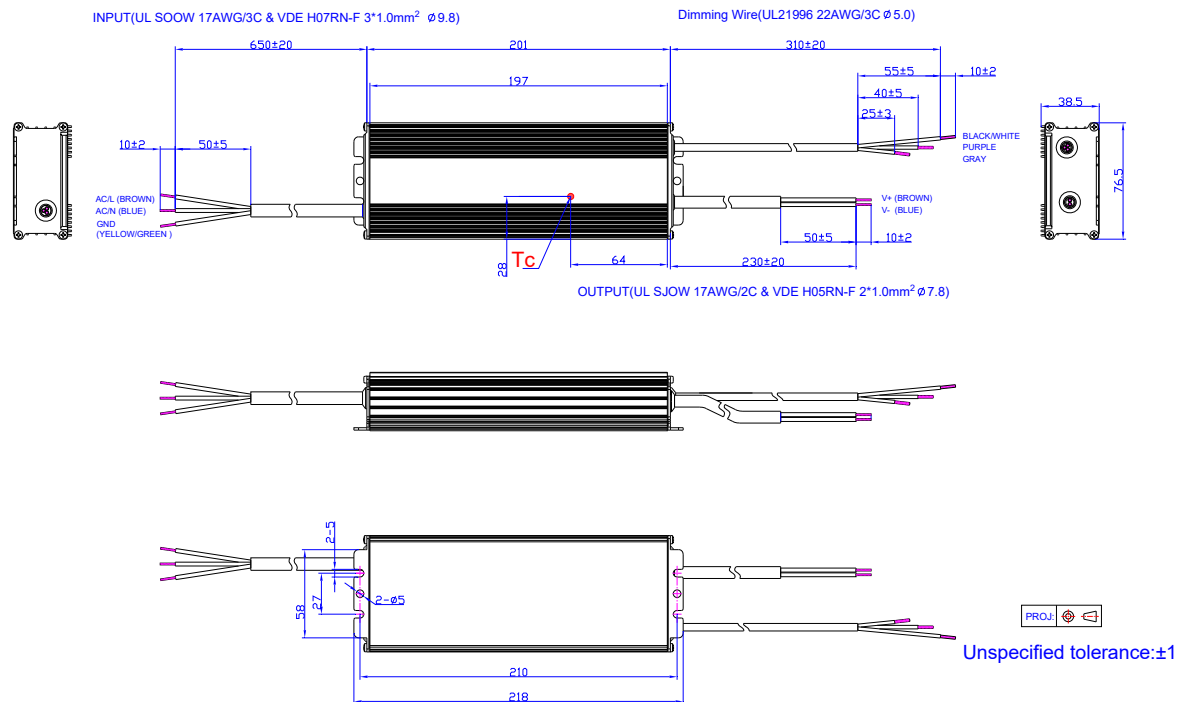


**Note:** The driver does not need to be powered on during the programming process.

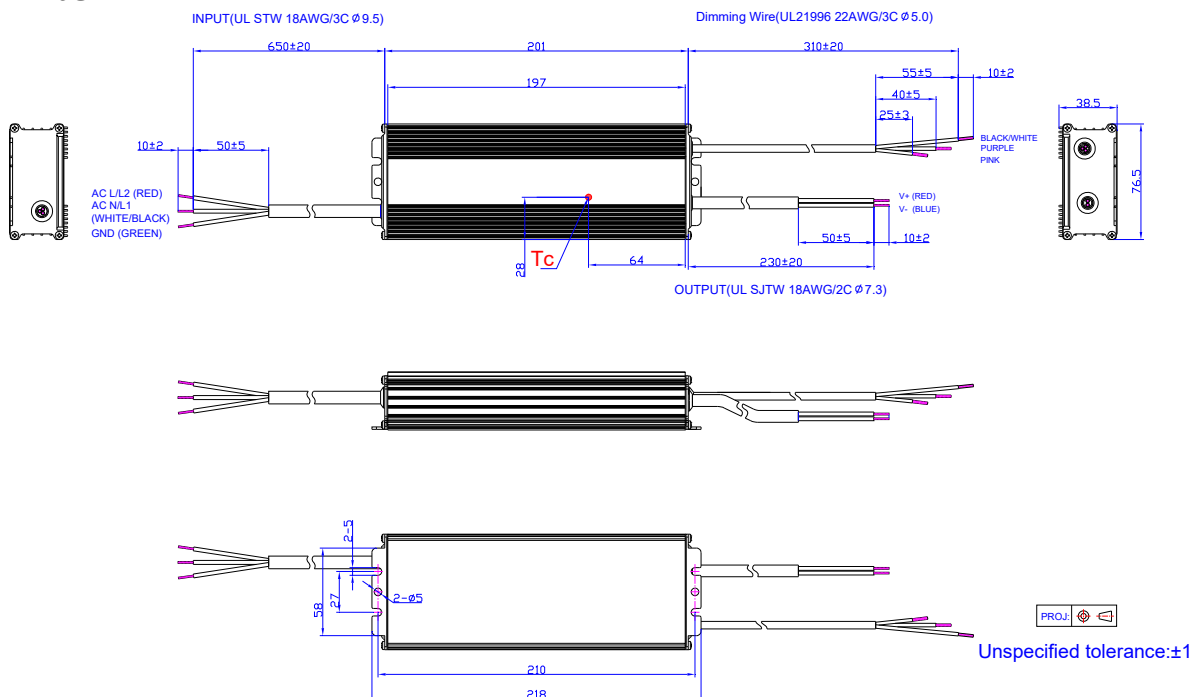
- Please refer to [PRG-MUL2](#) (Programmer) datasheet for details.

## Mechanical Outline

ESM-240SxxxMG



ESM-240SxxxMT



## RoHS Compliance

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.

## Revision History

| Change Date | Rev. | Description of Change          |                    |         |
|-------------|------|--------------------------------|--------------------|---------|
|             |      | Item                           | From               | To      |
| 2021-05-21  | A    | Datasheet Release              | /                  | /       |
| 2021-06-11  | B    | Programming Connection Diagram | /                  | Updated |
|             |      | Mechanical Outline             | /                  | Updated |
| 2021-09-29  | C    | Dimming                        | /                  | Updated |
|             |      | Programming Connection Diagram | /                  | Updated |
| 2022-01-15  | D    | UKCA / EAC logo                | /                  | Added   |
|             |      | Models                         | I-V Operation Area | Updated |
|             |      | Safety & EMC Compliance        | /                  | Updated |
|             |      | Mechanical Outline             | ESM-240SxxxMT      | Updated |
| 2022-04-02  | E    | Product Photograph             | /                  | Updated |
|             |      | Features                       | /                  | Updated |