

## Features

- Compact Metal Case with Excellent Thermal Performance
- Full Power at Wide Output Current Range (Constant Power)
- Adjustable Output Current (AOC) with Programmability
- Isolated 1-5V/1-10V/10V PWM/3-Timer-Modes Dimmable
- Output Lumen Compensation
- Input Surge Protection: DM 6kV, CM 10kV
- All-Around Protection: OVP, SCP, OTP
- IP66 / IP67 and UL Dry / Damp / Wet Location
- SELV Output
- TYPE HL, for use in a Class I, Division 2 hazardous (Classified) location
- 5 Years Warranty



## Description

The EUM-200SxxxDx series is a 200W, 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 high bay, high mast and roadway, 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.

## 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) (6)         |
|---------------------------------|------------------------------|------------------------|----------------------------|----------------------|-------------------|------------------------|----------------------|--------|------------------------------|
|                                 |                              |                        |                            |                      |                   |                        | 120Vac               | 220Vac |                              |
| 70-1050mA                       | 700-1050mA                   | 700 mA                 | 90~305 Vac/<br>127~300 Vdc | 95~286 Vdc           | 200 W             | 93.5%                  | 0.99                 | 0.96   | EUM-200S105Dx                |
| 105-1500mA                      | 1050-1500mA                  | 1050 mA                | 90~305 Vac/<br>127~300 Vdc | 67~190 Vdc           | 200 W             | 93.0%                  | 0.99                 | 0.96   | EUM-200S150Dx                |
| 180-2800mA                      | 1800-2800mA                  | 2100 mA                | 90~305 Vac/<br>127~300 Vdc | 36~111 Vdc           | 200 W             | 92.5%                  | 0.99                 | 0.96   | EUM-200S280Dx <sup>(4)</sup> |
| 350-5600mA                      | 3500-5600mA                  | 4200 mA                | 90~305 Vac/<br>127~300 Vdc | 18 ~ 57 Vdc          | 200 W             | 92.0%                  | 0.99                 | 0.96   | EUM-200S560Dx <sup>(4)</sup> |

**Notes:** (1) Output current range with constant power at 200W

(2) Certified input voltage range: UL, FCC 100-277Vac; otherwise 100-240Vac.

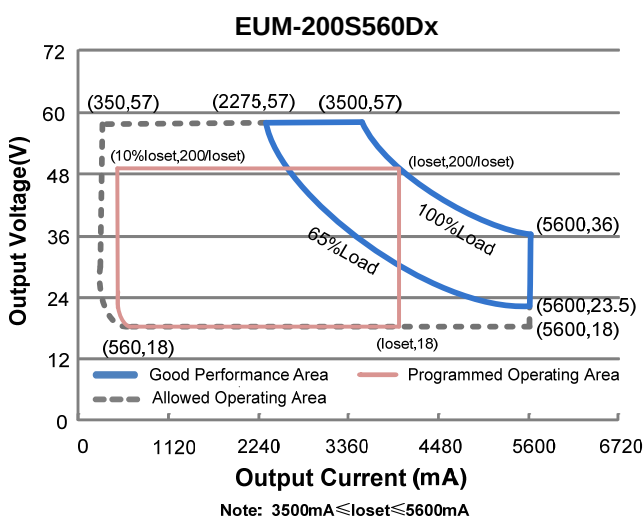
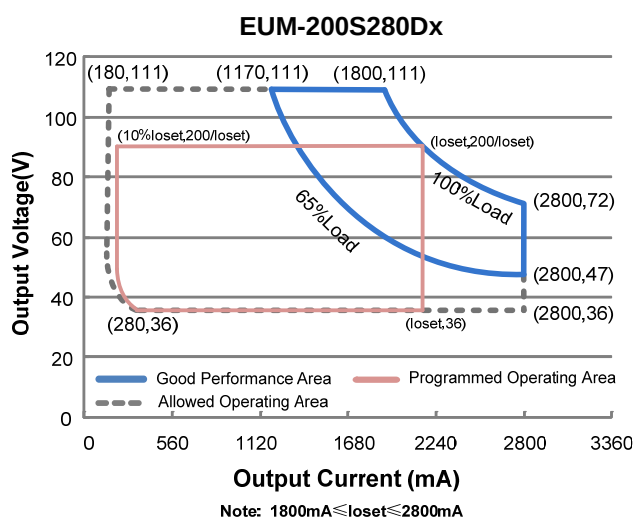
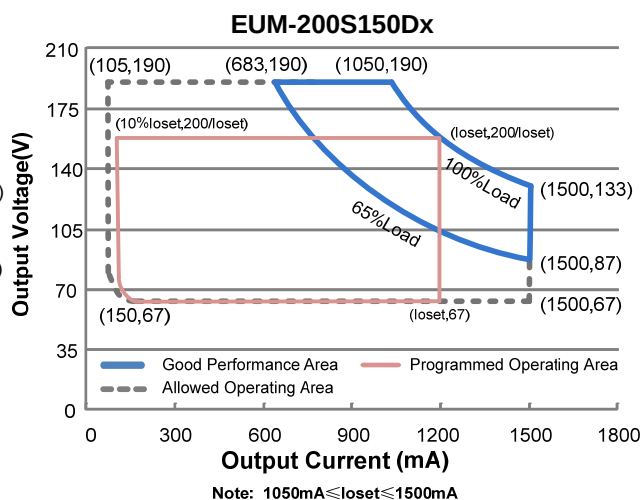
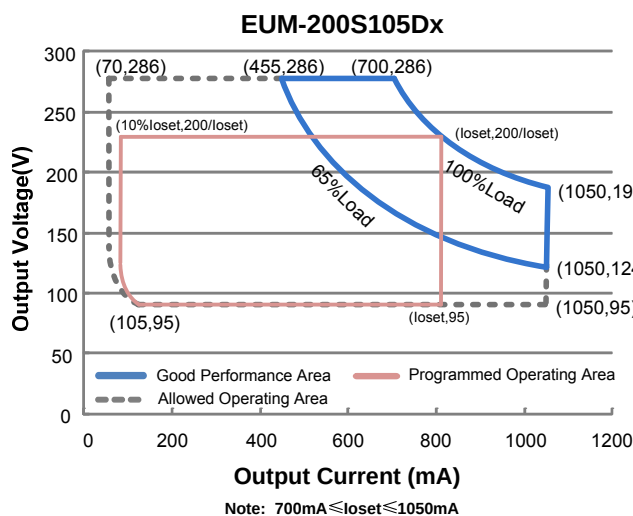
(3) Measured at 100% load and 220Vac input (see below "General Specifications" for details).

(4) SELV output.

(5) x = G are UL Recognized, ENEC and CCC, etc. models; x = T are UL Class P models; x = B are BIS models.

(6) All the models are certificated to KS, except EUM-200S105Dx.

## I-V Operation Area



## Input Specifications

| Parameter        | Min.    | Typ. | Max.     | Notes                                    |
|------------------|---------|------|----------|------------------------------------------|
| Input AC Voltage | 90 Vac  | -    | 305 Vac  |                                          |
| Input DC Voltage | 127 Vdc | -    | 300 Vdc  |                                          |
| Input Frequency  | 47 Hz   | -    | 63 Hz    |                                          |
| Leakage Current  | -       | -    | 0.75 MIU | UL8750; 277Vac/ 60Hz                     |
|                  | -       | -    | 0.70 mA  | IEC60598-1; 240Vac/ 60Hz,                |
| Input AC Current | -       | -    | 2.00 A   | Measured at 100% load and 120 Vac input. |
|                  | -       | -    | 1.05 A   | Measured at 100% load and 220 Vac input. |

## Input Specifications (Continued)

| Parameter                | Min. | Typ. | Max.                  | Notes                                                                                                               |
|--------------------------|------|------|-----------------------|---------------------------------------------------------------------------------------------------------------------|
| Inrush Current( $I^2t$ ) | -    | -    | 4.20 A <sup>2</sup> s | At 220Vac input, 25°C cold start, duration=848 $\mu$ s, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details. |
| PF                       | 0.9  | -    | -                     | At 100-277Vac, 50-60Hz, 65%-100% Load (130-200W)                                                                    |
| THD                      | -    | -    | 20%                   |                                                                                                                     |
| THD                      | -    | -    | 10%                   | At 220-240Vac, 50-60Hz, 75%-100% Load (150-200W)                                                                    |

## Output Specifications

| Parameter                                        | Min.     | Typ.     | Max.        | Notes                                                                                     |
|--------------------------------------------------|----------|----------|-------------|-------------------------------------------------------------------------------------------|
| Output Current Tolerance                         | -5%loset | -        | 5%loset     | At 100% load condition                                                                    |
| Output Current Setting(loset) Range              |          |          |             |                                                                                           |
| EUM-200S105Dx                                    | 70 mA    | -        | 1050 mA     |                                                                                           |
| EUM-200S150Dx                                    | 105 mA   | -        | 1500 mA     |                                                                                           |
| EUM-200S280Dx                                    | 180 mA   | -        | 2800 mA     |                                                                                           |
| EUM-200S560Dx                                    | 350 mA   | -        | 5600 mA     |                                                                                           |
| Output Current Setting Range with Constant Power |          |          |             |                                                                                           |
| EUM-200S105Dx                                    | 700 mA   | -        | 1050 mA     |                                                                                           |
| EUM-200S150Dx                                    | 1050 mA  | -        | 1500 mA     |                                                                                           |
| EUM-200S280Dx                                    | 1800 mA  | -        | 2800 mA     |                                                                                           |
| EUM-200S560Dx                                    | 3500 mA  | -        | 5600 mA     |                                                                                           |
| Total Output Current Ripple (pk-pk)              | -        | 5%lomax  | 10%lomax    | At 100% load condition. 20 MHz BW                                                         |
| Output Current Ripple at < 200 Hz (pk-pk)        | -        | 2%lomax  | -           | At 100% load condition. Only this component of ripple is associated with visible flicker. |
| Startup Overshoot Current                        | -        | -        | 10%lomax    | At 100% load condition                                                                    |
| No Load Output Voltage                           |          |          |             |                                                                                           |
| EUM-200S105Dx                                    | -        | -        | 320 V       |                                                                                           |
| EUM-200S150Dx                                    | -        | -        | 210 V       |                                                                                           |
| EUM-200S280Dx                                    | -        | -        | 120 V       |                                                                                           |
| EUM-200S560Dx                                    | -        | -        | 65 V        |                                                                                           |
| Line Regulation                                  | -        | -        | $\pm 0.5\%$ | Measured at 100% load                                                                     |
| Load Regulation                                  | -        | -        | $\pm 1.5\%$ |                                                                                           |
| Turn-on Delay Time                               | -        | -        | 0.5 s       | Measured at 120-277Vac input, 65%-100% Load                                               |
| Temperature Coefficient of loset                 | -        | 0.03%/°C | -           | Case temperature = 0°C ~Tc max                                                            |

## General Specifications

| Parameter                                                                                                                                                                                                                                                                                                                | Min.                                                                 | Typ.                                                                 | Max.                                 | Notes                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Efficiency at 120 Vac input:<br>EUM-200S105Dx<br>I <sub>o</sub> = 700 mA<br>I <sub>o</sub> =1050 mA<br>EUM-200S150Dx<br>I <sub>o</sub> =1050 mA<br>I <sub>o</sub> =1500 mA<br>EUM-200S280Dx<br>I <sub>o</sub> =1800 mA<br>I <sub>o</sub> =2800 mA<br>EUM-200S560Dx<br>I <sub>o</sub> =3500 mA<br>I <sub>o</sub> =5600 mA | 88.5%<br>89.0%<br>88.5%<br>88.5%<br>87.0%<br>87.0%<br>87.5%<br>87.0% | 90.5%<br>91.0%<br>90.5%<br>90.5%<br>89.0%<br>89.0%<br>89.5%<br>89.0% | -<br>-<br>-<br>-<br>-<br>-<br>-<br>- | Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) |
| Efficiency at 220 Vac input:<br>EUM-200S105Dx<br>I <sub>o</sub> = 700 mA<br>I <sub>o</sub> =1050 mA<br>EUM-200S150Dx<br>I <sub>o</sub> =1050 mA<br>I <sub>o</sub> =1500 mA<br>EUM-200S280Dx<br>I <sub>o</sub> =1800 mA<br>I <sub>o</sub> =2800 mA<br>EUM-200S560Dx<br>I <sub>o</sub> =3500 mA<br>I <sub>o</sub> =5600 mA | 91.5%<br>91.5%<br>91.0%<br>91.0%<br>90.5%<br>90.0%<br>90.0%<br>89.5% | 93.5%<br>93.5%<br>93.0%<br>93.0%<br>92.5%<br>92.0%<br>92.0%<br>91.5% | -<br>-<br>-<br>-<br>-<br>-<br>-<br>- | Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) |
| Efficiency at 277 Vac input:<br>EUM-200S105Dx<br>I <sub>o</sub> = 700 mA<br>I <sub>o</sub> =1050 mA<br>EUM-200S150Dx<br>I <sub>o</sub> =1050 mA<br>I <sub>o</sub> =1500 mA<br>EUM-200S280Dx<br>I <sub>o</sub> =1800 mA<br>I <sub>o</sub> =2800 mA<br>EUM-200S560Dx<br>I <sub>o</sub> =3500 mA<br>I <sub>o</sub> =5600 mA | 92.0%<br>92.0%<br>91.5%<br>91.5%<br>91.0%<br>90.5%<br>90.5%<br>90.0% | 94.0%<br>94.0%<br>93.5%<br>93.5%<br>93.0%<br>92.5%<br>92.5%<br>92.0% | -<br>-<br>-<br>-<br>-<br>-<br>-<br>- | Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) |
| MTBF                                                                                                                                                                                                                                                                                                                     | -                                                                    | 267,000 Hours                                                        | -                                    | Measured at 220Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)                                                                   |
| Lifetime                                                                                                                                                                                                                                                                                                                 | -                                                                    | 100,000 Hours                                                        | -                                    | Measured at 220Vac input, 80%Load and 70°C case temperature; See lifetime vs. T <sub>c</sub> curve for the details                               |
| Operating Case Temperature for Safety T <sub>c_s</sub>                                                                                                                                                                                                                                                                   | -40°C                                                                | -                                                                    | +90°C                                |                                                                                                                                                  |
| Operating Case Temperature for Warranty T <sub>c_w</sub>                                                                                                                                                                                                                                                                 | -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)                                                                                                                                                                                                                                                              | 6.73 × 2.36 × 1.44<br>171 × 60 × 36.5                                |                                                                      |                                      | With mounting ear<br>7.40 × 2.36 × 1.44<br>188 × 60 × 36.5                                                                                       |
| Net Weight                                                                                                                                                                                                                                                                                                               | -                                                                    | 780 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                         | EUM-200S105Dx<br>EUM-200S150Dx<br>EUM-200S280Dx<br>EUM-200S560Dx | 10%loset                            | -           | loset       | 700 mA $\leq$ loset $\leq$ 1050 mA<br>1050 mA $\leq$ loset $\leq$ 1500 mA<br>1800 mA $\leq$ loset $\leq$ 2800 mA<br>3500 mA $\leq$ loset $\leq$ 5600 mA |
|                                              | EUM-200S105Dx<br>EUM-200S150Dx<br>EUM-200S280Dx<br>EUM-200S560Dx | 70 mA<br>105 mA<br>180 mA<br>350 mA | -           | loset       | 70 mA $\leq$ loset < 700 mA<br>105 mA $\leq$ loset < 1050 mA<br>180 mA $\leq$ loset < 1800 mA<br>350 mA $\leq$ loset < 3500 mA                          |
| Recommended Dimming Range for 1-5V           |                                                                  | 0.25 V                              | -           | 4.75 V      | Dimming mode set to 1-5V in PC interface.                                                                                                               |
| Recommended Dimming Range for 1-10V          |                                                                  | 1 V                                 | -           | 9 V         | Default 1-10V dimming mode with positive logic.                                                                                                         |
| PWM_in High Level                            |                                                                  | -                                   | 10V         | -           |                                                                                                                                                         |
| PWM_in Low Level                             |                                                                  | -                                   | 0V          | -           |                                                                                                                                                         |
| PWM_in Frequency Range                       |                                                                  | 200 Hz                              | -           | 2 KHz       |                                                                                                                                                         |
| PWM_in Duty Cycle                            |                                                                  | 0%                                  | -           | 100%        |                                                                                                                                                         |

## Safety & EMC Compliance

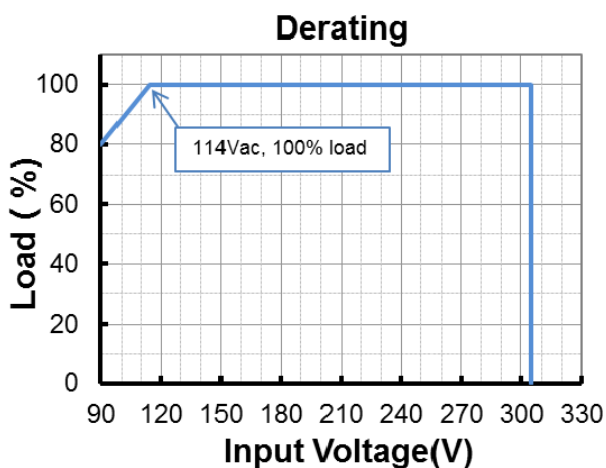
| Safety Category                        | Standard                                        |
|----------------------------------------|-------------------------------------------------|
| UL/CUL                                 | UL8750,CAN/CSA-C22.2 No. 250.13                 |
| ENEC & CE                              | EN 61347-1, EN 61347-2-13                       |
| CB                                     | IEC 61347-1, IEC 61347-2-13                     |
| CCC                                    | GB 19510.1, GB 19510.14                         |
| PSE                                    | J 61347-1, J 61347-2-13                         |
| KS                                     | KS C 7655                                       |
| BIS                                    | IS 15885(Part2/Sec13)                           |
| EAC                                    | ГОСТ Р МЭК 61347-1, ГОСТ IEC 61347-2-13         |
| NOM                                    | NOM-058-SCFI                                    |
| EMI Standards                          | Notes                                           |
| EN 55015/GB 17743/KN 15 <sup>(1)</sup> | Conducted emission Test &Radiated emission Test |
| EN 61000-3-2/GB 17625.1                | Harmonic current emissions                      |
| EN 61000-3-3                           | Voltage fluctuations & flicker                  |

## Safety & EMC Compliance (Continued)

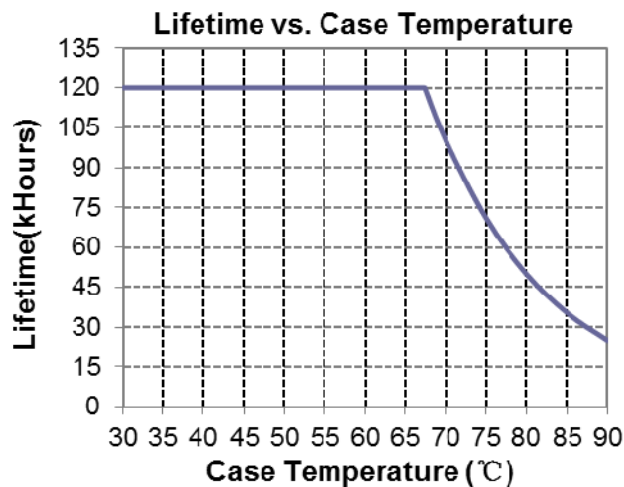
| EMI Standards              | Notes                                                                                                                                                                                                                                                                               |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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                                                                                                                                                                                                                                                                               |
| EN 61000-4-2               | Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge                                                                                                                                                                                                           |
| EN 61000-4-3               | Radio-Frequency Electromagnetic Field Susceptibility Test-RS                                                                                                                                                                                                                        |
| EN 61000-4-4               | Electrical Fast Transient / Burst-EFT                                                                                                                                                                                                                                               |
| EN 61000-4-5               | Surge Immunity Test: AC Power Line: Differential Mode 6 kV, Common Mode 10 kV                                                                                                                                                                                                       |
| EN 61000-4-6               | Conducted Radio Frequency Disturbances Test-CS                                                                                                                                                                                                                                      |
| EN 61000-4-8               | Power Frequency Magnetic Field Test                                                                                                                                                                                                                                                 |
| EN 61000-4-11              | Voltage Dips                                                                                                                                                                                                                                                                        |
| 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.

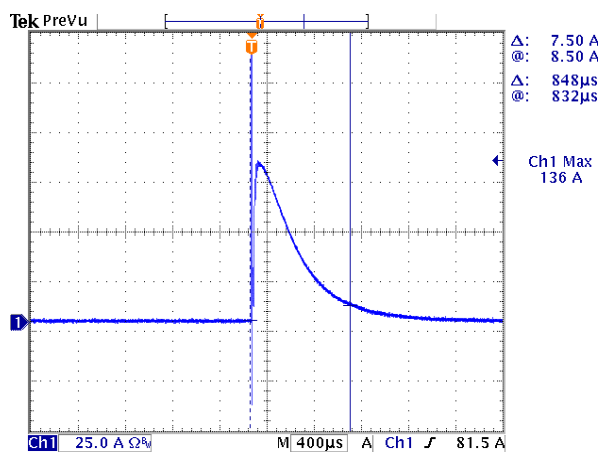
## Derating



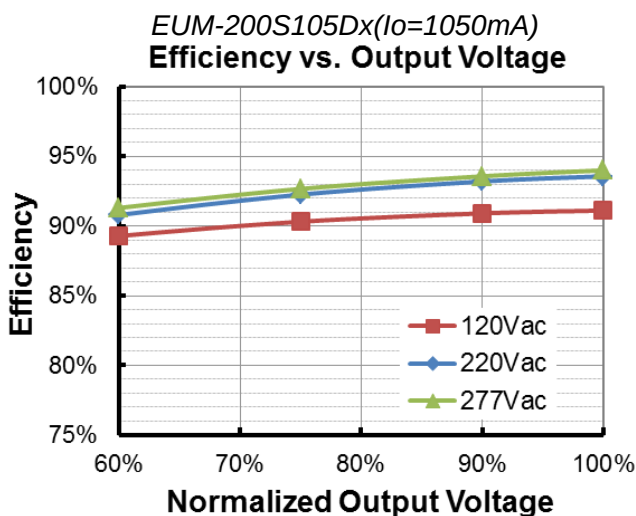
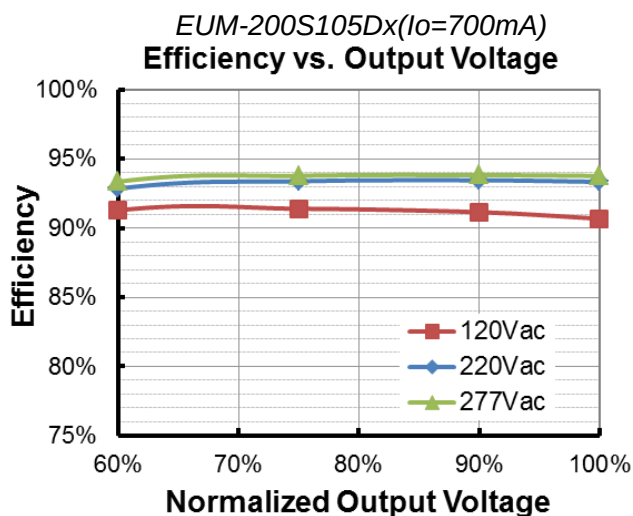
## Lifetime vs. Case Temperature



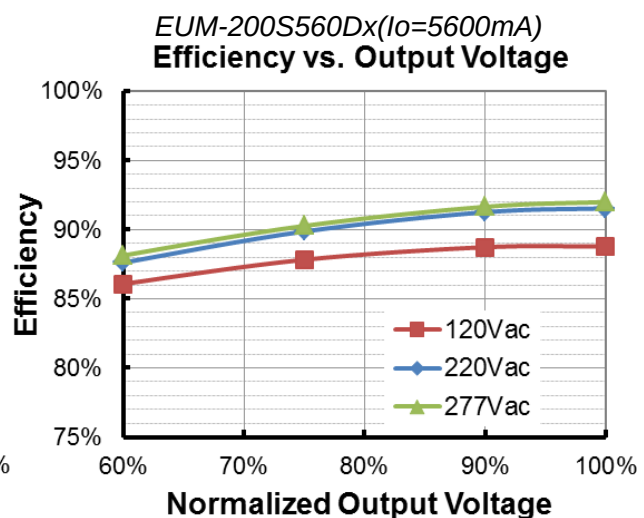
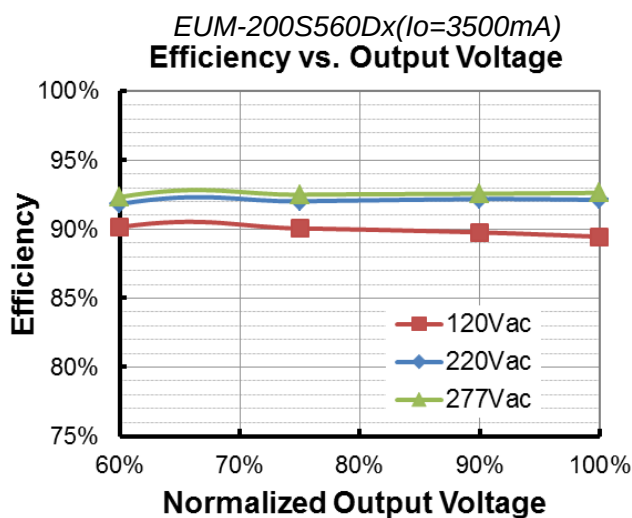
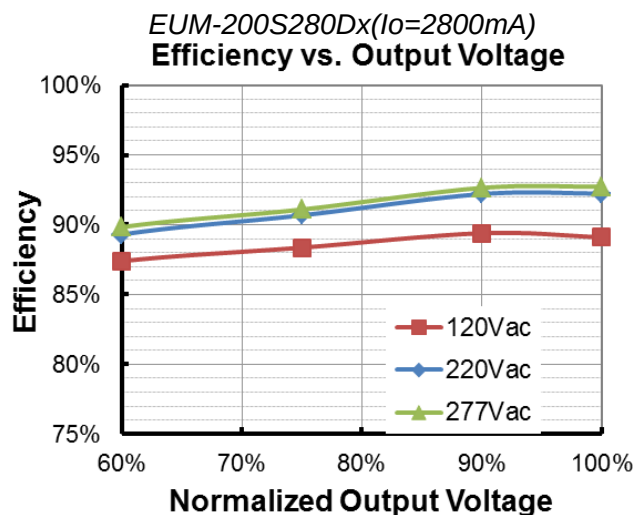
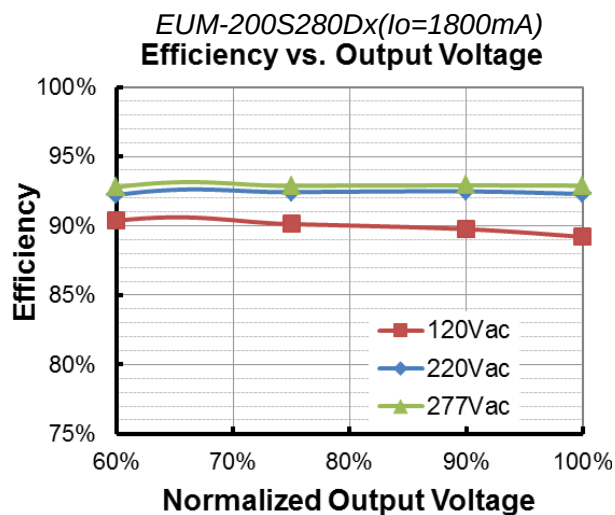
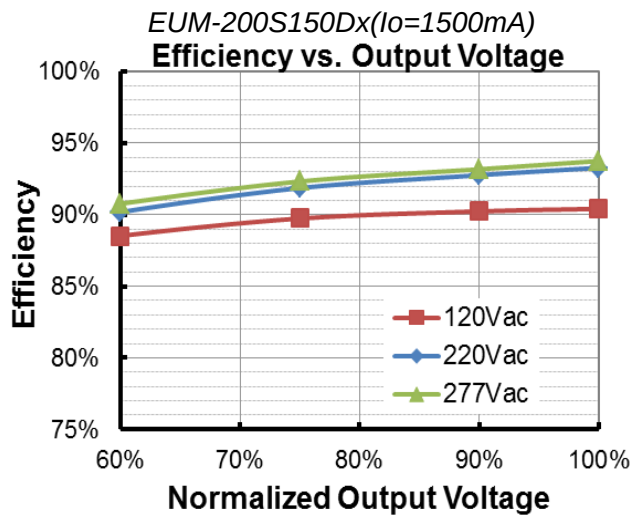
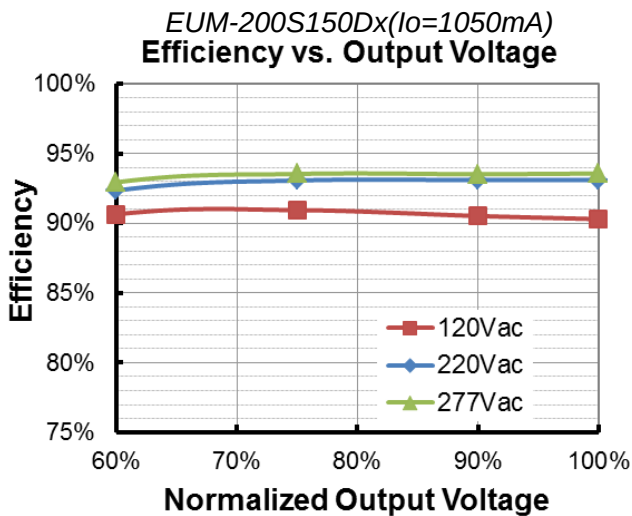
## Inrush Current Waveform



## Efficiency vs. Load

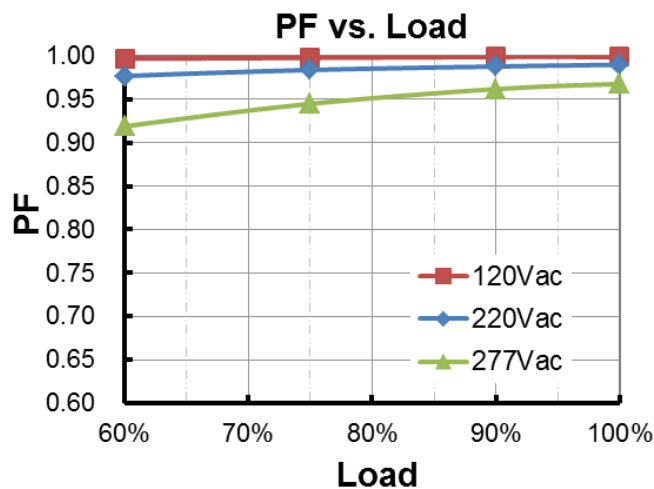




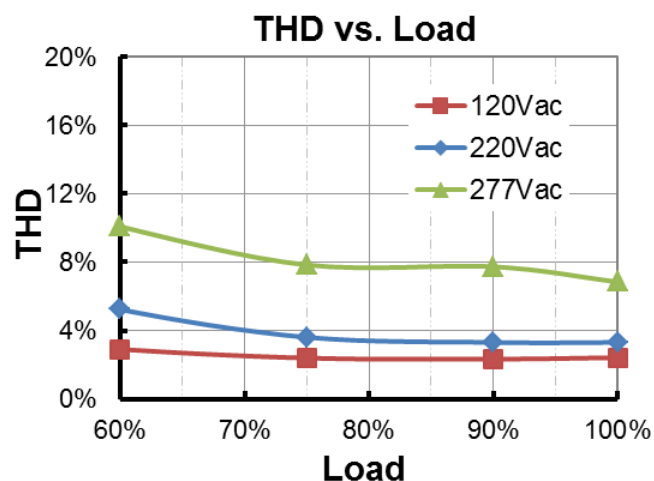




## Power Factor



## Total Harmonic Distortion



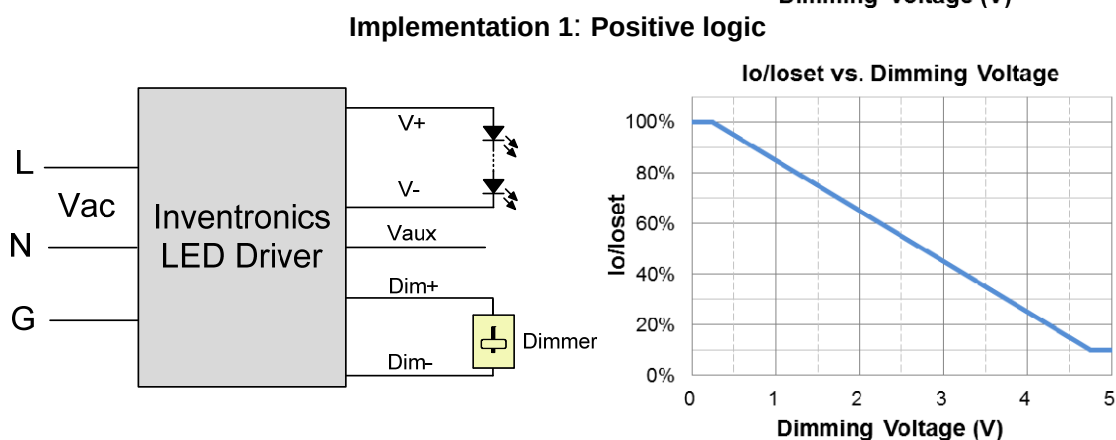
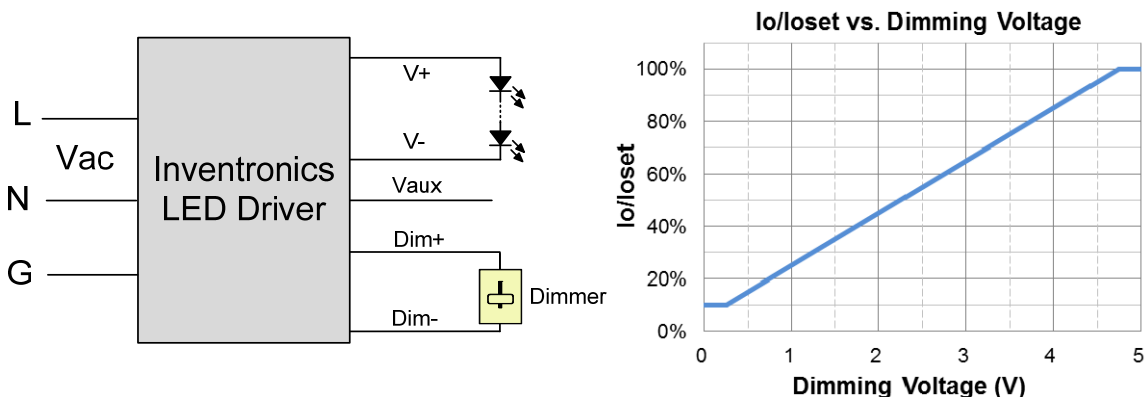
## Protection Functions

| Parameter                   | Notes                                                                                                                                          |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Over Temperature Protection | Decreases output current, returning to normal after over temperature is removed.                                                               |
| 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 Voltage Protection     | Limits output voltage at no load and in case the normal voltage limit fails.                                                                   |

## Dimming

### ● 1-5V Dimming

The recommended implementation of the dimming control is provided below.

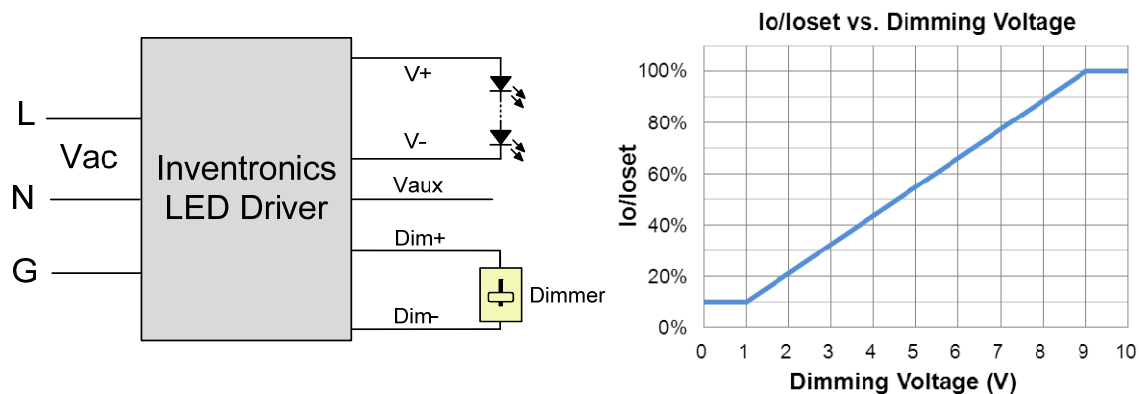


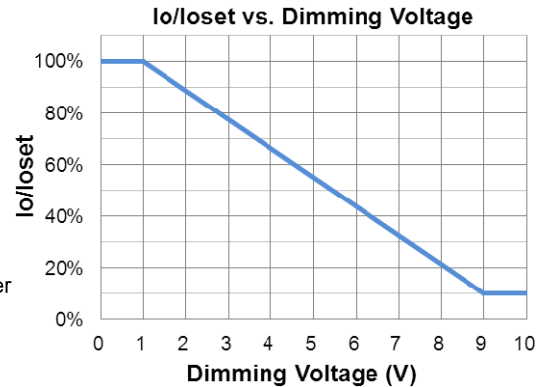
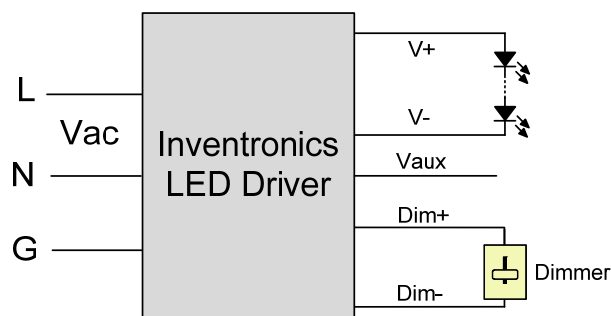
**Notes:**

1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. The dimmer can also be replaced by an active 1-5V voltage source signal or passive components like zener.
3. When 1-5V negative logic dimming mode and Dim+ is open, the driver will output maximum current.

● **1-10V Dimming**

The recommended implementation of the dimming control is provided below.





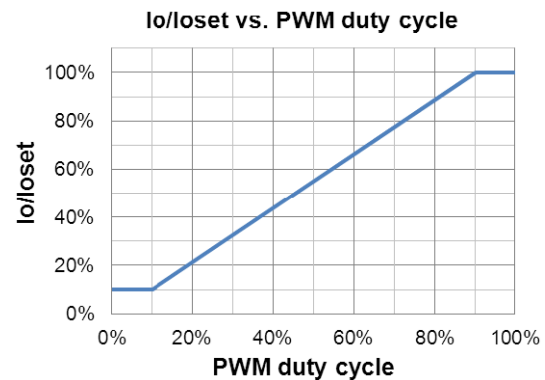
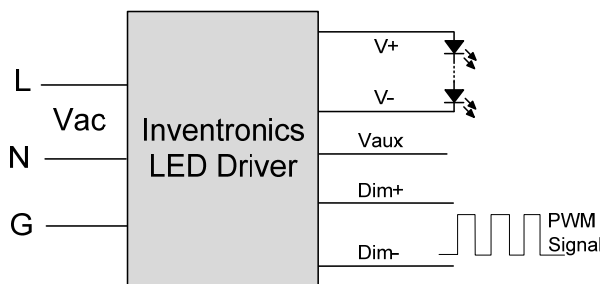
## Implementation 4: Negative logic

### Notes:

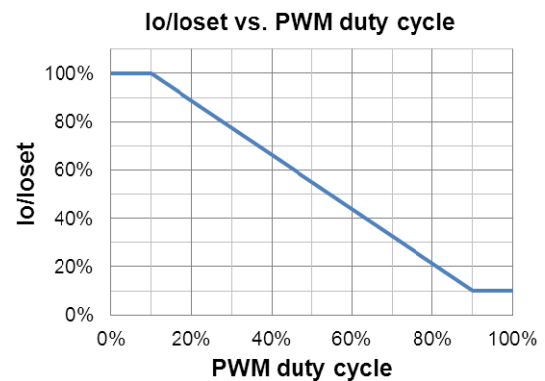
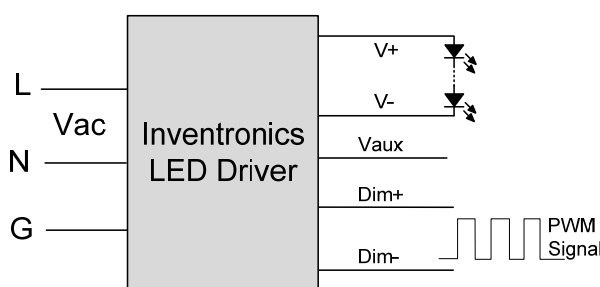
1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. The dimmer can also be replaced by an active 1-10V voltage source signal or passive components like zener.
3. When 1-10V negative logic dimming mode and Dim+ is open, the driver will output minimum current.

## ● 10V PWM Dimming

The recommended implementation of the dimming control is provided below.



## Implementation 5: Positive logic



## Implementation 6: Negative logic

### 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 output minimum current.

## ● Time Dimming

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

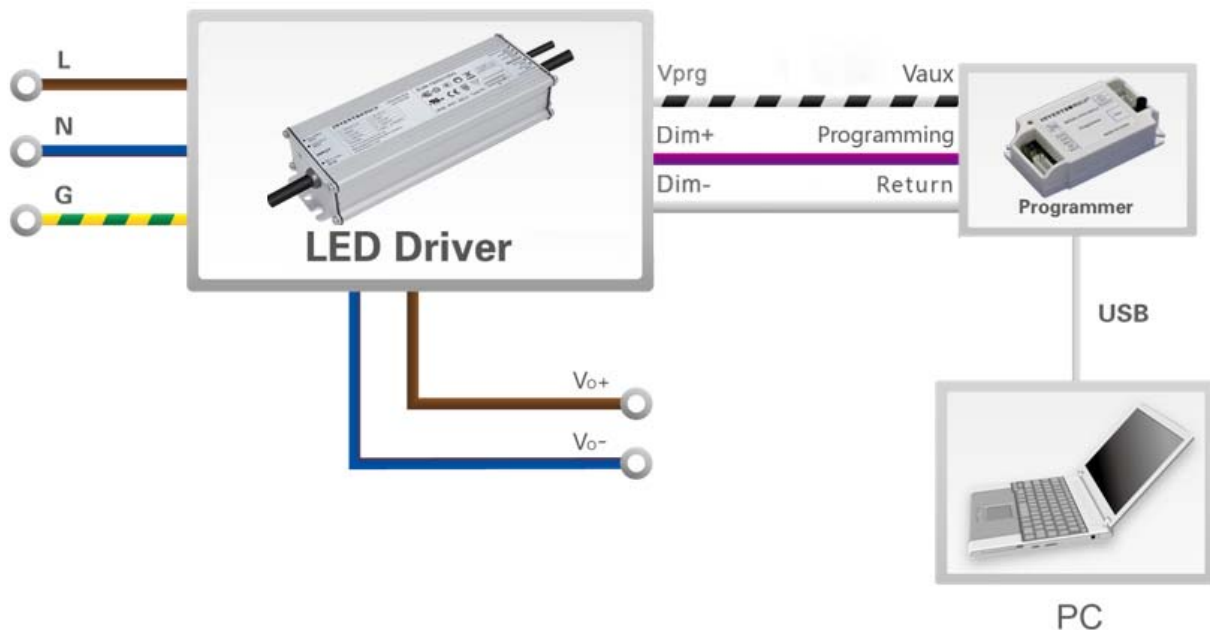
- **Self Adapting-Midnight:** Automatically adjusts the dimming curve based on the on-time of past two days (if difference <15 minutes), assuming that the center point of the dimming curve is midnight local time.
- **Self Adapting-Percentage:** Automatically adjusts the on-time of each step by a constant 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

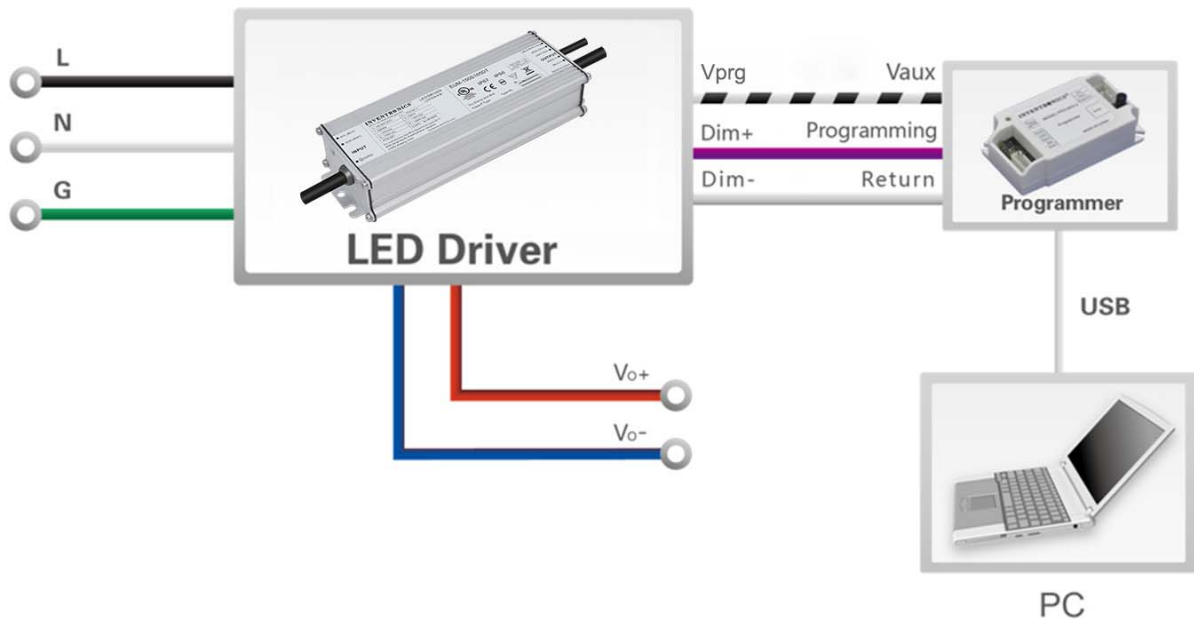
Output Lumen Compensation (OLC) may be used to maintain constant light output over the life of the LEDs by driving them at a reduced current when new, then gradually increasing the drive current over time to counteract LED lumen degradation.

## Programming Connection Diagram

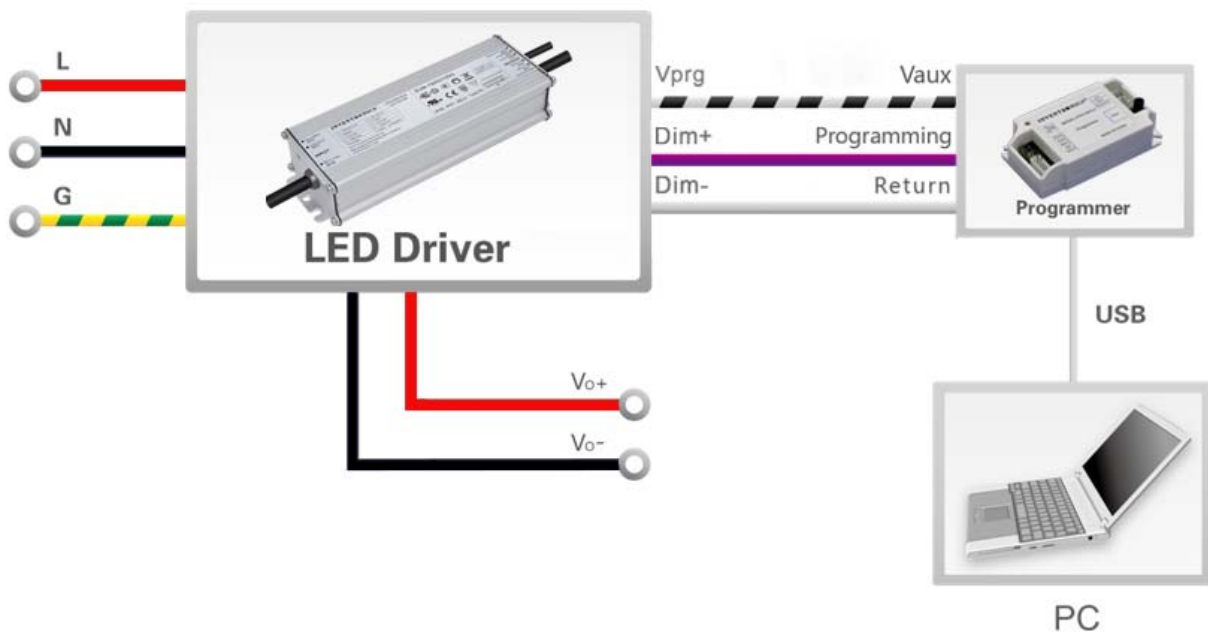
EUM-200SxxxDG



## EUM-200SxxxDT



## EUM-200SxxxDB

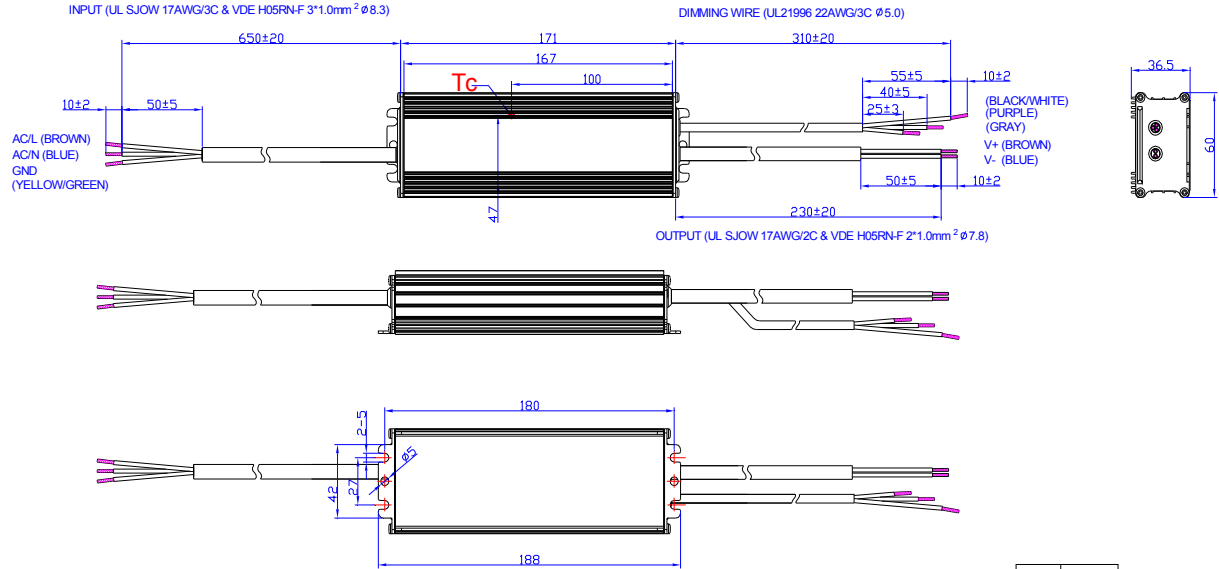


**Note:** The driver does not need to be powered on during the programming process.

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

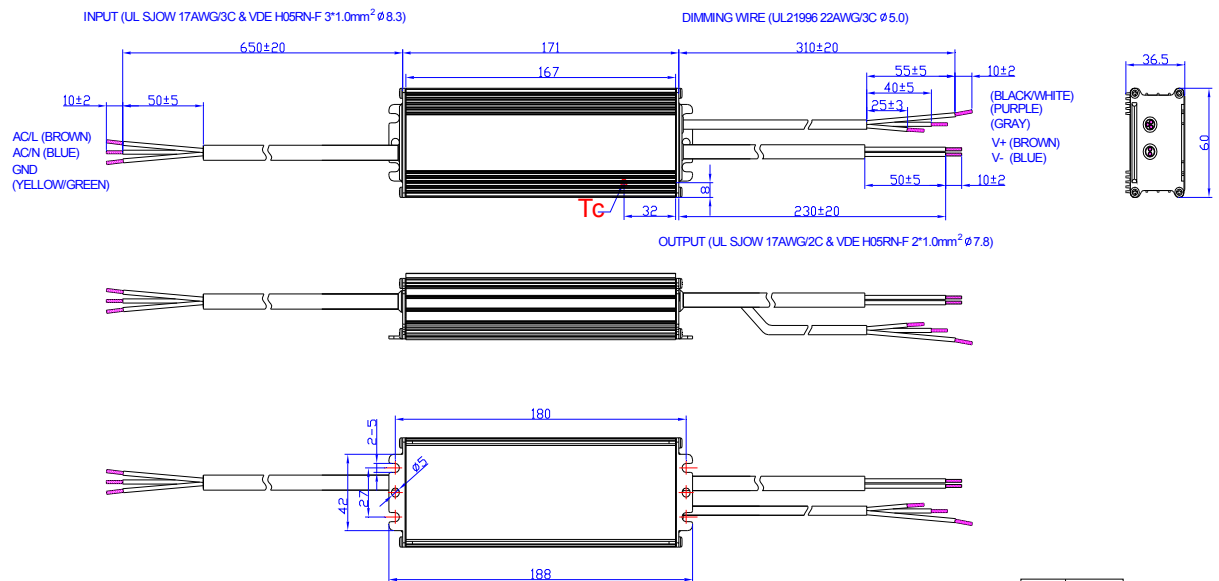
## Mechanical Outline

### EUM-200S105DG/EUM-200S150DG



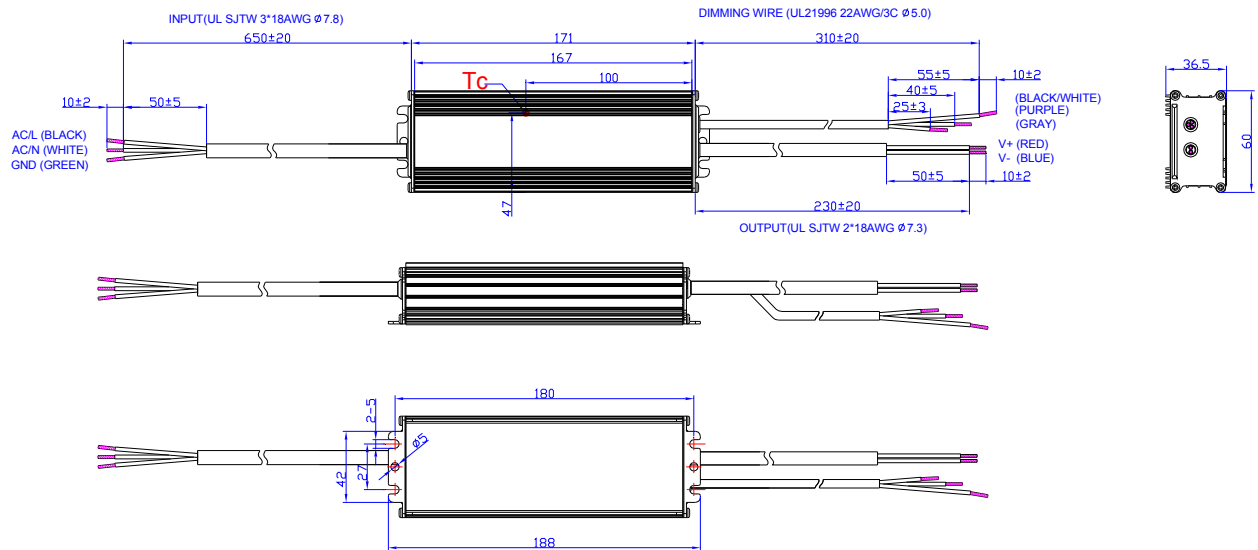
PROJ. Unspecified tolerance:±1

### EUM-200S280DG/EUM-200S560DG



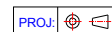
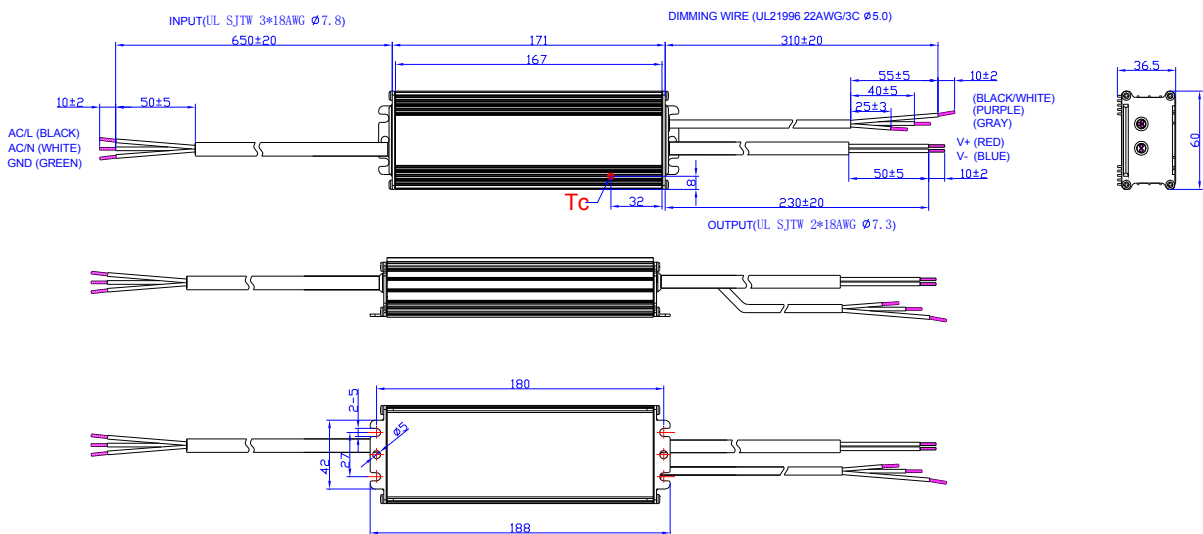
PROJ. Unspecified tolerance:±1

EUM-200S105DT/EUM-200S150DT



Unspecified tolerance:±1

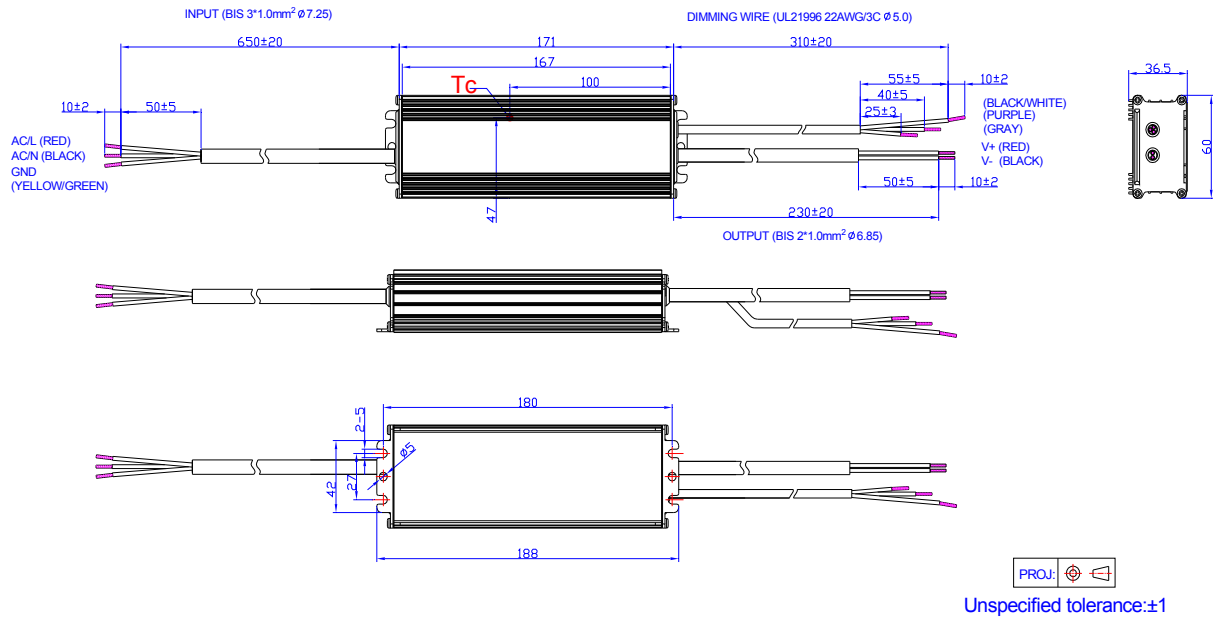
EUM-200S280DT/EUM-200S560DT



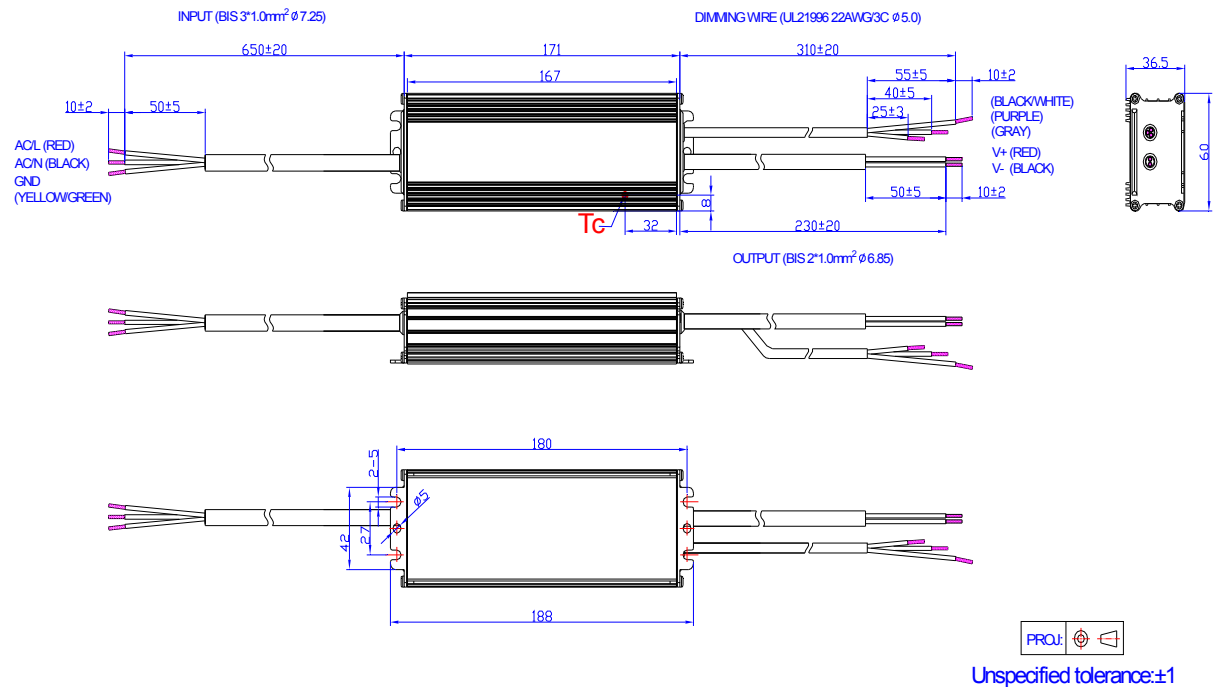
Unspecified tolerance:±1



## EUM-200S105DB/EUM-200S150DB



## EUM-200S280DB/EUM-200S560DB



## 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 |
| 2021-03-09  | A    | Datasheets Release    | /    | /  |