

## Features

- Ultra High Efficiency (Up to 93.5%)
- Full Power at Wide Output Current Range (Constant Power)
- 0-5V/0-10V/PWM/Timer Dimmable
- Input Surge Protection: 6kV line-line, 10kV line-earth
- All-Around Protection: OVP, SCP, OTP
- Waterproof (IP67) and UL Dry / Damp / Wet Location  
In Wet Locations must be Built-In
- SELV Output
- TYPE HL, for use in a Class I, Division 2 hazardous (Classified) location



## Description

The EUG-150SxxxDT series is a 150W, constant-current, programmable outdoor LED driver that operates from 90-305 Vac input with excellent power factor. It is created for high bay, tunnel and roadway lights. 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

Output Current Range	Full-Power Current Range (1)	Default Output Current	Input Voltage Range(2)	Output Voltage Range	Max. Output Power	Typical Efficiency (3)	Power Factor		Model Number
							120Vac	220Vac	
70-1050mA	700-1050mA	700 mA	90~305 Vac 100~300 Vdc	75~214Vdc	150 W	93.5%	0.99	0.96	EUG-150S105DT
140-2100mA	1400-2100mA	1400 mA	90~305 Vac 100~300 Vdc	38~107Vdc	150 W	92.5%	0.99	0.96	EUG-150S210DT(4)
245-3500mA	2450-3500mA	3150 mA	90~305 Vac 100~300 Vdc	22 ~ 61Vdc	150 W	92.0%	0.99	0.96	EUG-150S350DT(4)
385-5600mA	3850-5600mA	4200 mA	90~305 Vac 100~300 Vdc	14 ~ 39Vdc	150 W	92.0%	0.99	0.96	EUG-150S560DT(4)

**Notes:** (1) Output current range with constant power at 150W

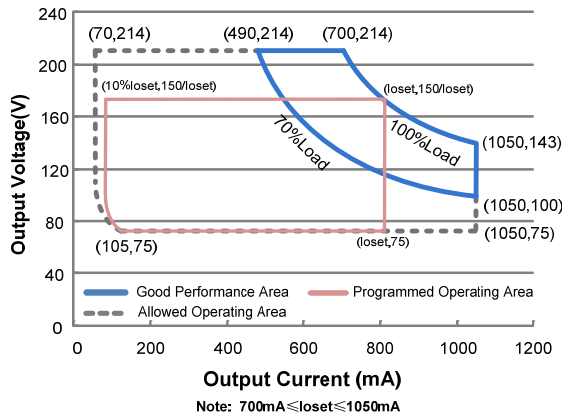
(2) UL, FCC certified input voltage range: 100-277Vac or 100-300Vdc; other certified input voltage range except UL & FCC: 100-240Vac or 100-250Vdc.

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

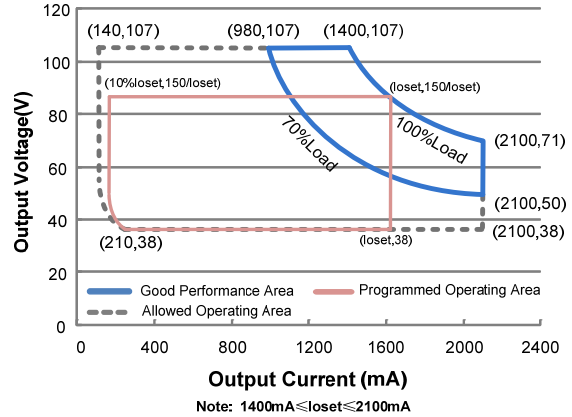
(4) SELV Output.

## I-V Operation Area

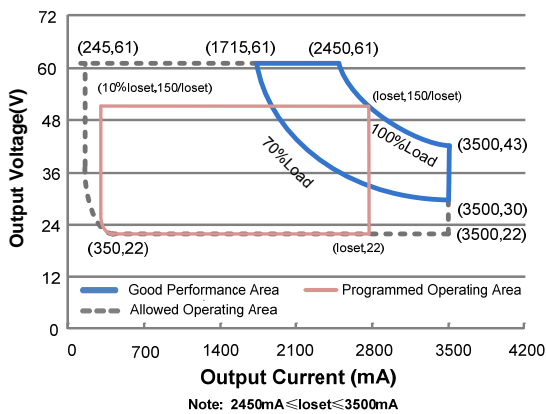
EUG-150S105DT



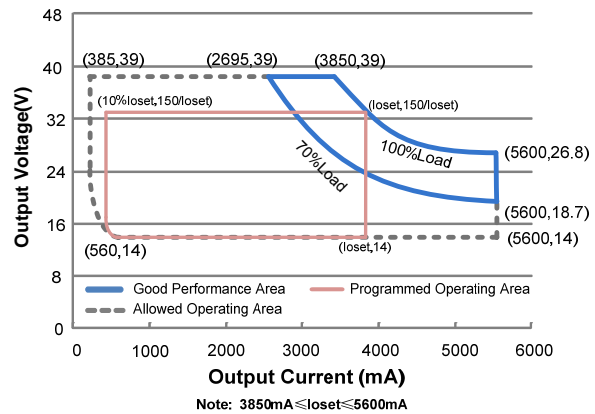
EUG-150S210DT



EUG-150S350DT



EUG-150S560DT



## Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	90 Vac	-	305 Vac	100-300Vdc
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.75 MIU	UL8750; 277Vac/ 60 Hz
	-	-	0.70 mA	IEC60598-1; 240Vac/ 60 Hz
Input AC Current	-	-	1.87 A	Measured at full load and 100 Vac input.
	-	-	0.92 A	Measured at full load and 220 Vac input.
Inrush Current(I <sup>2</sup> t)	-	-	1.98 A <sup>2</sup> s	At 220Vac input, 25°C cold start, duration=712 μs, 10%I <sub>pk</sub> -10%I <sub>pk</sub> . See Inrush Current Waveform for the details.
PF	0.9	-	-	At 100-277Vac, 70%-100% Load (105-150 W)
THD	-	-	20%	
THD	-	-	10%	At 220-240Vac, 50-60Hz, 75%-100%load

## Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%loset	-	5%loset	At full load condition
Output Current Setting(loset) Range				
EUG-150S105DT	70 mA	-	1050 mA	
EUG-150S210DT	140 mA	-	2100 mA	
EUG-150S350DT	245 mA	-	3500 mA	
EUG-150S560DT	385 mA	-	5600 mA	
Output Current Setting Range with Constant Power				
EUG-150S105DT	700 mA	-	1050 mA	
EUG-150S210DT	1400 mA	-	2100 mA	
EUG-150S350DT	2450 mA	-	3500 mA	
EUG-150S560DT	3850 mA	-	5600 mA	
Total Output Current Ripple (pk-pk)	-	5%lomax	10%lomax	At full load condition, 20 MHz BW
Output Current Ripple at < 200 Hz (pk-pk)	-	2%lomax	-	At full load condition. Only this component of ripple is associated with visible flicker.
Startup Overshoot Current	-	-	10%lomax	At full load condition
No Load Output Voltage				
EUG-150S105DT	-	-	235 V	
EUG-150S210DT	-	-	120 V	
EUG-150S350DT	-	-	75 V	
EUG-150S560DT	-	-	48 V	
Line Regulation	-	-	±0.5%	Measured at full load
Load Regulation	-	-	±1.5%	
Turn-on Delay Time	-	-	1.0 s	Measured at 120 Vac input.
	-	-	0.5 s	Measured at 220 Vac input.
Temperature Coefficient of loset	-	-	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 Current	0 mA	-	20 mA	Return terminal is "Dim-"

**Note:** All specifications are typical at 25°C unless otherwise stated.

## General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120 Vac input:				
EUG-150S105DT				
Io= 700 mA	88.0%	91.0%	-	Measured at full load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Io=1050 mA	87.0%	90.0%	-	
EUG-150S210DT				
Io=1400 mA	87.0%	90.0%	-	
Io=2100 mA	87.0%	90.0%	-	
EUG-150S350DT				
Io=2450 mA	87.0%	90.0%	-	
Io=3500 mA	86.5%	89.5%	-	
EUG-150S560DT				
Io=3850 mA	86.5%	89.5%	-	
Io=5600 mA	85.0%	88.0%	-	

## General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 220 Vac input: EUG-150S105DT				Measured at full load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
I <sub>o</sub> = 700 mA	91.5%	93.5%	-	
I <sub>o</sub> =1050 mA	90.5%	92.5%	-	
EUG-150S210DT				
I <sub>o</sub> =1400 mA	90.5%	92.5%	-	
I <sub>o</sub> =2100 mA	90.0%	92.0%	-	
EUG-150S350DT				
I <sub>o</sub> =2450 mA	90.0%	92.0%	-	
I <sub>o</sub> =3500 mA	90.0%	92.0%	-	
EUG-150S560DT				
I <sub>o</sub> =3850 mA	90.0%	92.0%	-	
I <sub>o</sub> =5600 mA	88.5%	90.5%	-	
Efficiency at 277 Vac input: EUG-150S105DT				Measured at full load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
I <sub>o</sub> = 700 mA	91.5%	93.5%	-	
I <sub>o</sub> =1050 mA	91.0%	93.0%	-	
EUG-150S210DT				
I <sub>o</sub> =1400 mA	91.0%	93.0%	-	
I <sub>o</sub> =2100 mA	90.0%	92.0%	-	
EUG-150S350DT				
I <sub>o</sub> =2450 mA	90.5%	92.5%	-	
I <sub>o</sub> =3500 mA	90.5%	92.5%	-	
EUG-150S560DT				
I <sub>o</sub> =3850 mA	90.0%	92.0%	-	
I <sub>o</sub> =5600 mA	88.5%	90.5%	-	
MTBF	-	271,000 Hours	-	Measured at 220 Vac input, 80%Load and 25 °C ambient temperature (MIL-HDBK-217F)
Lifetime	-	78,000 Hours	-	Measured at 220 Vac input, 80%Load and 70 °C case temperature; See lifetime vs. Tc 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	-	+75°C	
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 100%RH
Dimensions				
Inches (L × W × H)	7.40 × 2.66 × 1.56			
Millimeters (L × W × H)	188 × 67.5 × 39.5			
Net Weight	-	980 g	-	

**Note:** All specifications are typical at 25°C unless otherwise stated.

## Dimming Specifications

Parameter		Min.	Typ.	Max.	Notes
Absolute Maximum Voltage on the Vdim (+) Pin		-20 V	-	20 V	
Source Current on Vdim (+)Pin		200 uA	300 uA	450 uA	Vdim(+) = 0 V
Dimming Output Range	EUG-150S105DT EUG-150S210DT EUG-150S350DT EUG-150S560DT	10%loset	-	loset	700 mA ≤ loset ≤ 1050 mA 1400 mA ≤ loset ≤ 2100 mA 2450 mA ≤ loset ≤ 3500 mA 3850 mA ≤ loset ≤ 5600 mA
	EUG-150S105DT EUG-150S210DT EUG-150S350DT EUG-150S560DT	70 mA 140 mA 245 mA 385 mA	-	loset	70 mA ≤ loset < 700 mA 140 mA ≤ loset < 1400 mA 245 mA ≤ loset < 2450 mA 385 mA ≤ loset < 3850 mA
Recommended Dimming Range for 0-5 V		0 V	-	5 V	Dimming mode set to 0-5V in PC interface.
Recommended Dimming Range for 0-10 V		0 V	-	10 V	Default 0-10V dimming mode with positive logic.
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	-	2 KHz	
PWM_in Duty Cycle		1%	-	99%	

## Safety & EMC Compliance

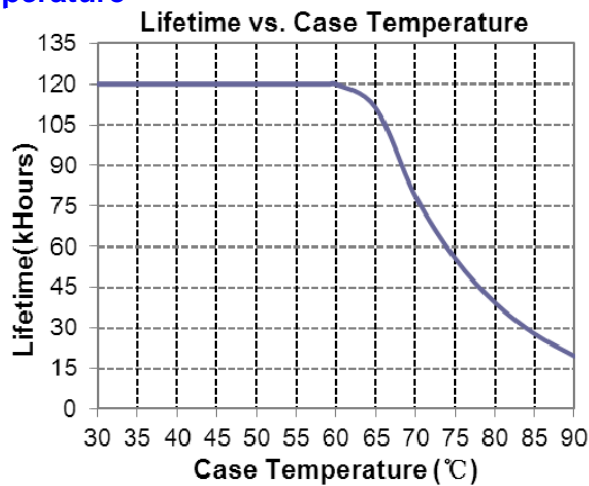
Safety Category	Standard
UL/CUL	UL8750,CAN/CSA-C22.2 No. 250.13-12
CE	EN 61347-1, EN61347-2-13
EMI Standards	Notes
EN 55015	Conducted emission Test & Radiated emission Test
EN 61000-3-2	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & flicker
FCC Part 15	ANSI C63.4:2009 Class B
	This device 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: line to line 6 kV, line to earth 10 kV*

## Safety & EMC Compliance (Continued)

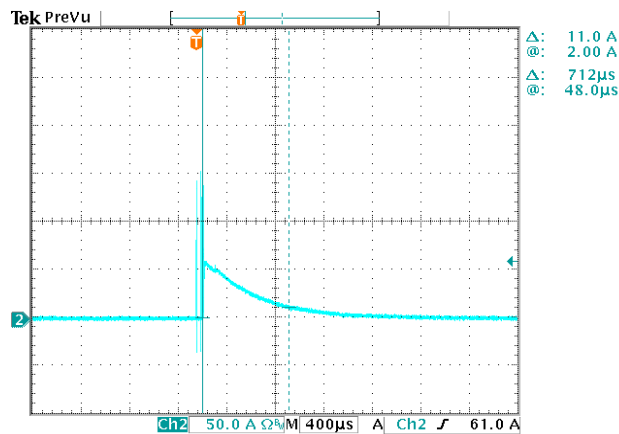
EMS Standards	Notes
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
EN 61000-4-8	Power Frequency Magnetic Field Test
EN 61000-4-11	Voltage Dips
EN 61547	Electromagnetic Immunity Requirements Applies To Lighting Equipment

\* **Note:** To perform electric strength (hi-pot) testing, the “GDT ground disconnect” (nut and metal lock sheet) on the driver end-cap should be removed temporarily to prevent the internal gas discharge tube from conducting (as allowed by IEC 60598-1 Clause 10.2). After testing is completed, these items must be reinstalled to restore line-to-earth surge protection and secure the end cap.

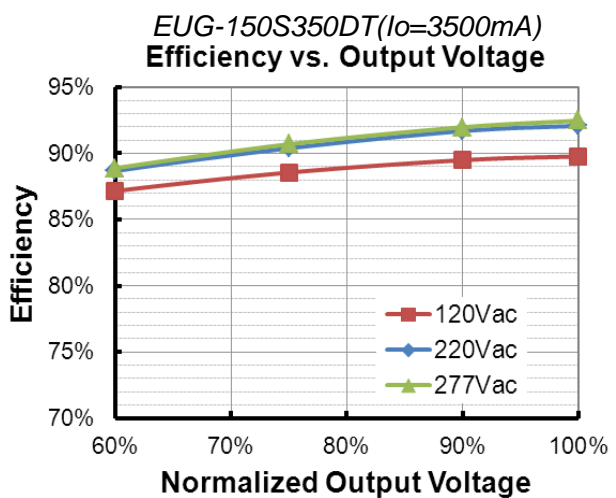
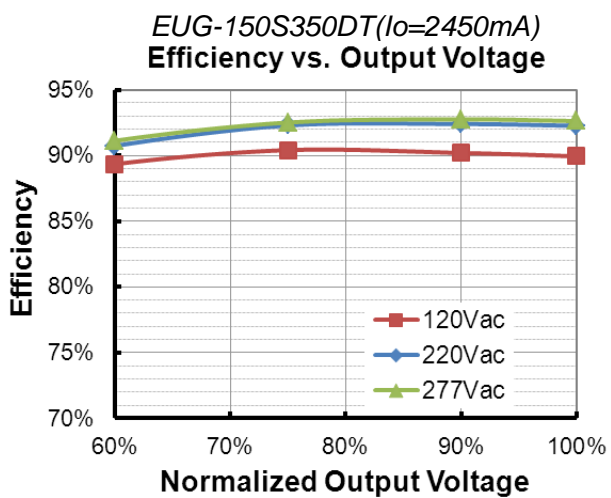
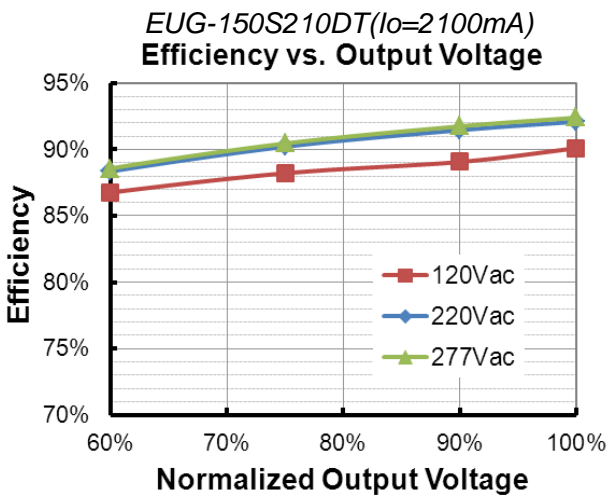
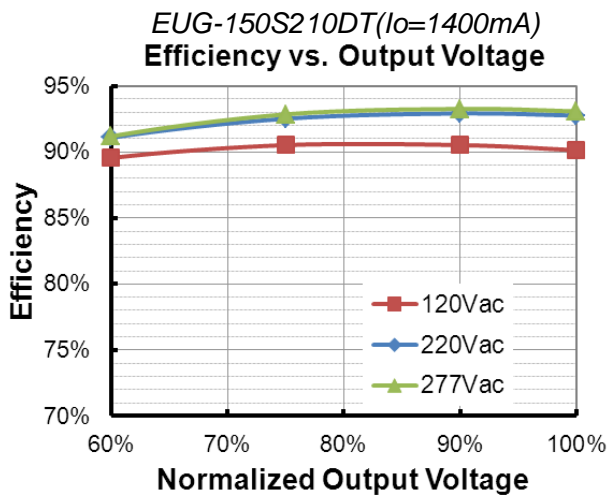
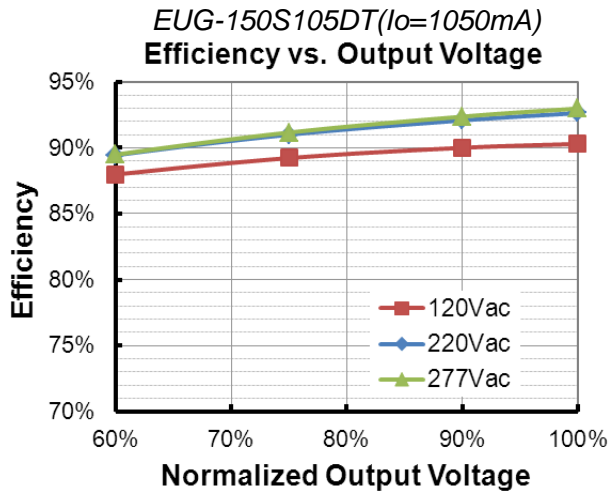
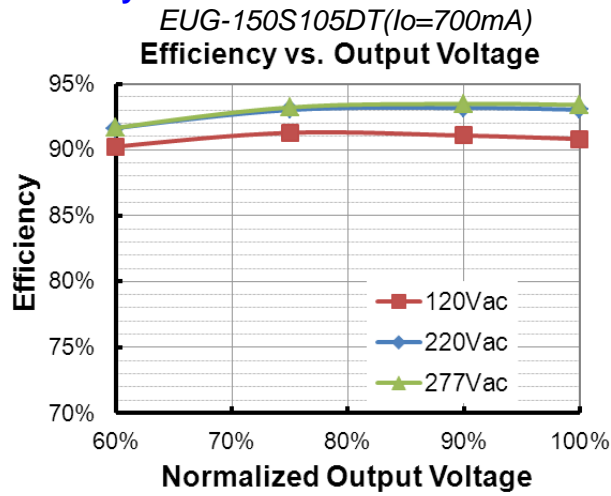
## Lifetime vs. Case Temperature



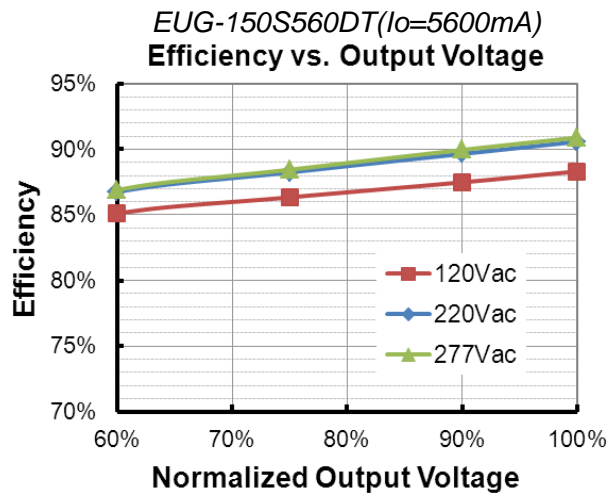
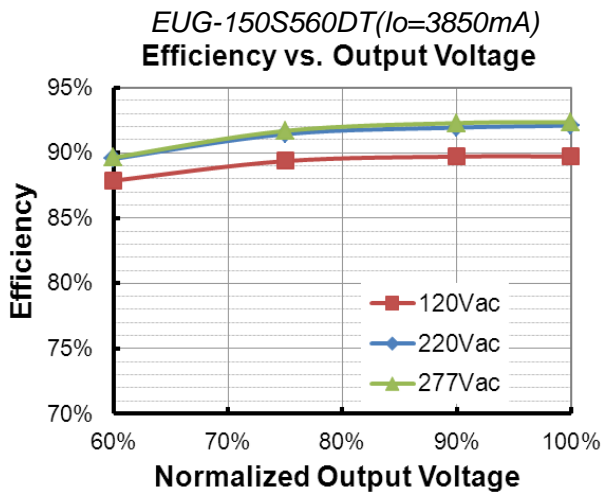
## Inrush Current Waveform



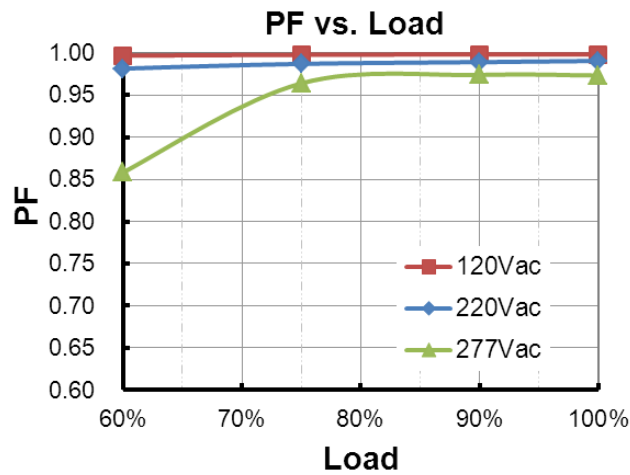
## Efficiency vs. Load



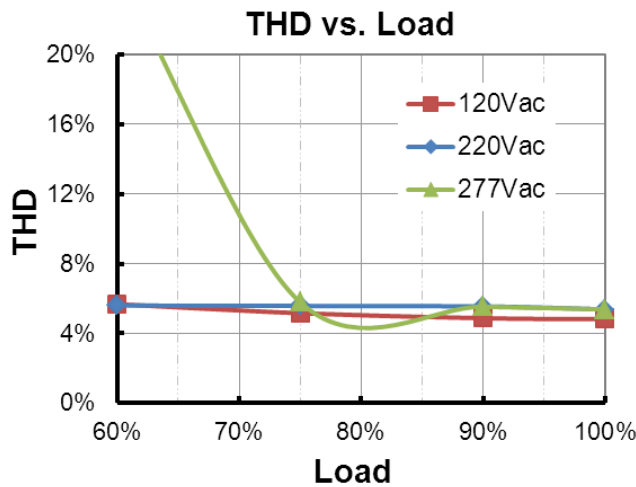




## Power Factor



## Total Harmonic Distortion





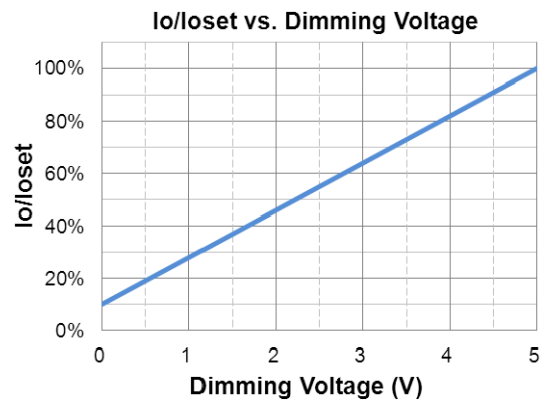
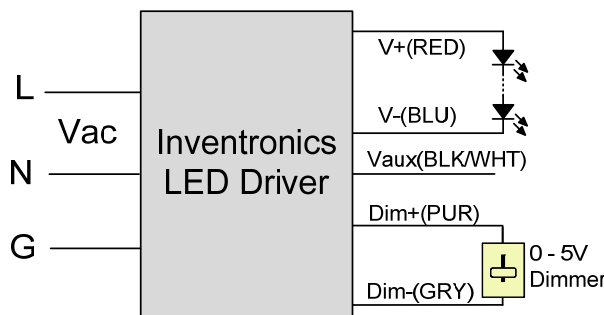
## Protection Functions

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.

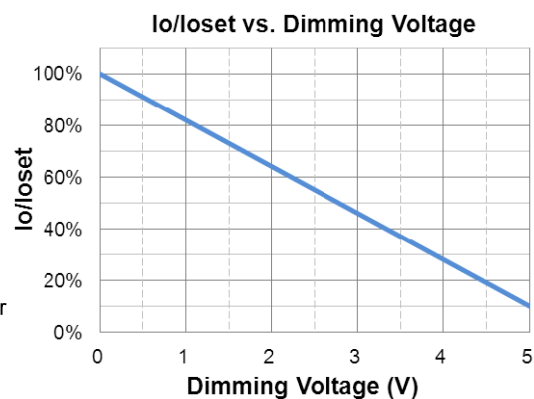
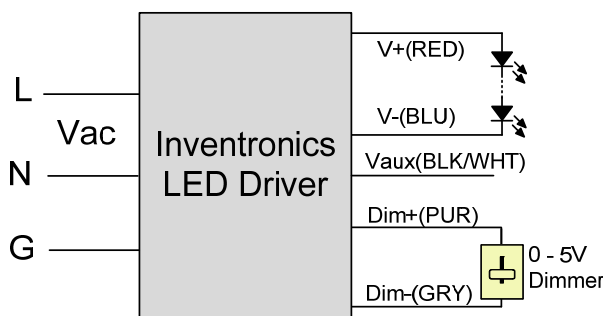
## Dimming

### ● 0-5V Dimming

The recommended implementation of the dimming control is provided below.



**Implementation 1: Positive logic**



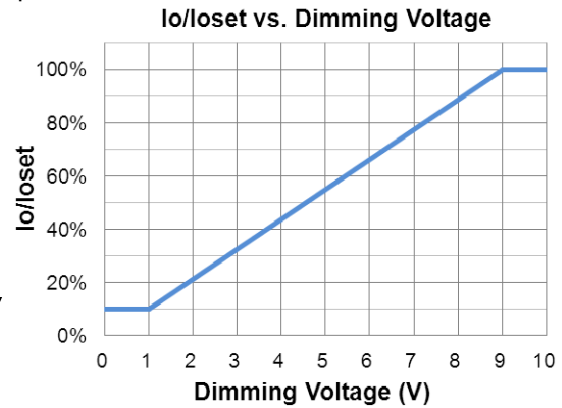
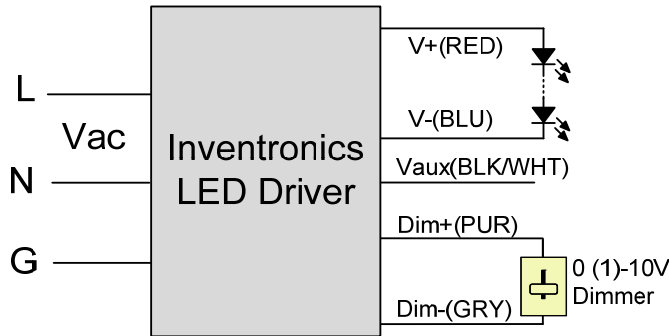
**Implementation 2: Negative logic**

### Notes:

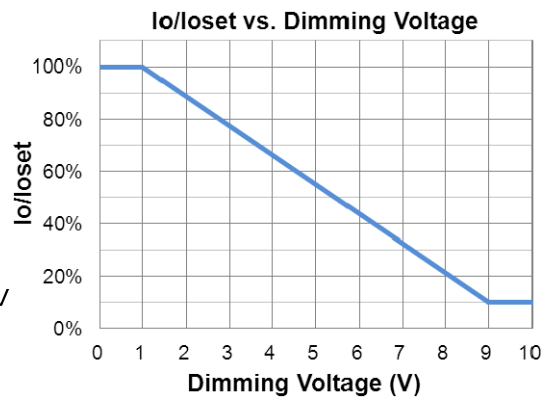
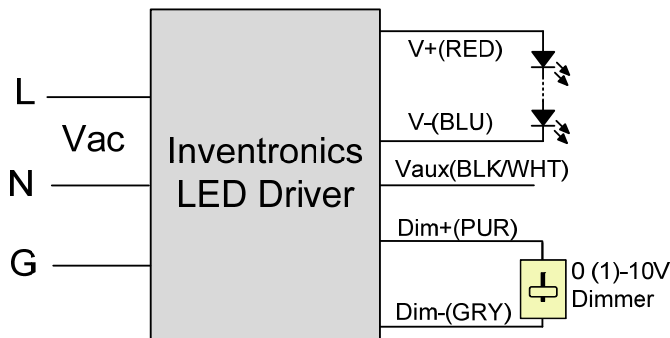
1. The dimmer can also be replaced by an active 0-5V voltage source signal or passive components like resistors and zener.
2. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
3. If 0-5V dimming is not used, Dim + should be open.
4. When 0-5V negative logic dimming mode and Dim+ is open, the driver will output maximum current.

## ● 0-10V Dimming

The recommended implementation of the dimming control is provided below.



**Implementation 3: Positive logic**

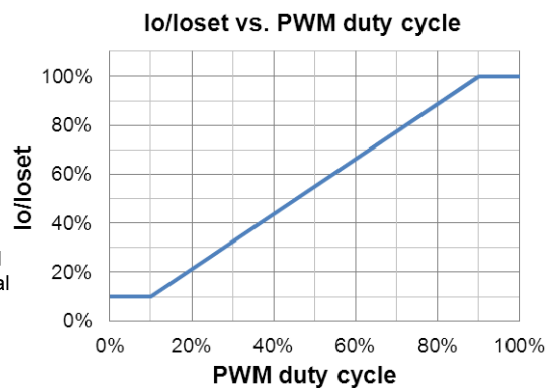
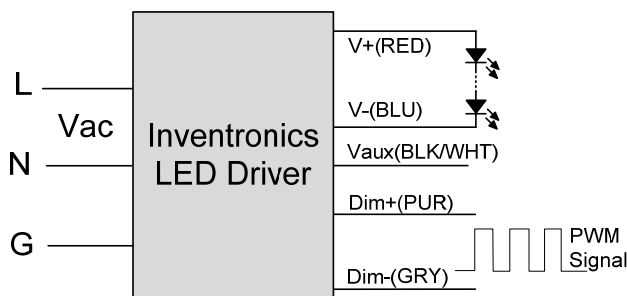


**Implementation 4: Negative logic**

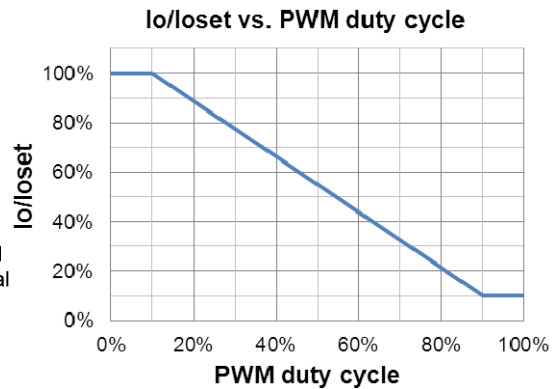
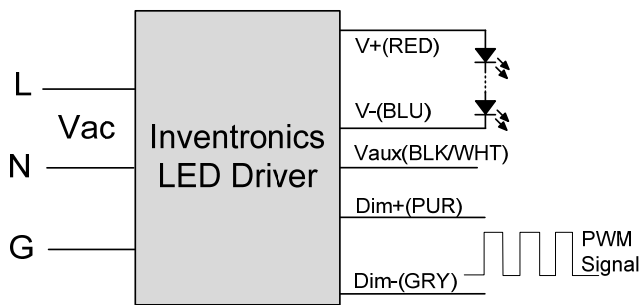
### Notes:

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

## ● PWM Dimming



**Implementation 5: Positive logic**



### Implementation 6: Negative logic

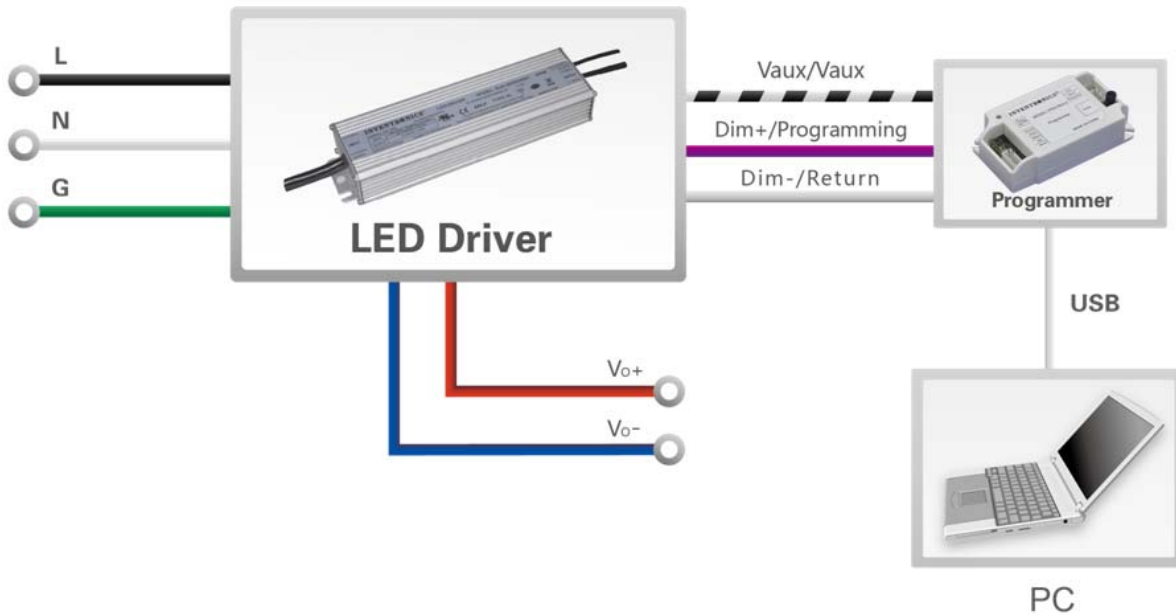
**Notes:**

1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. If PWM dimming is not used, Dim + should be open.
3. When PWM negative logic dimming mode and Dim+ is open, the driver will output minimum current.

● **Time Dimming**

Set the timing curve by pulling the sliders.

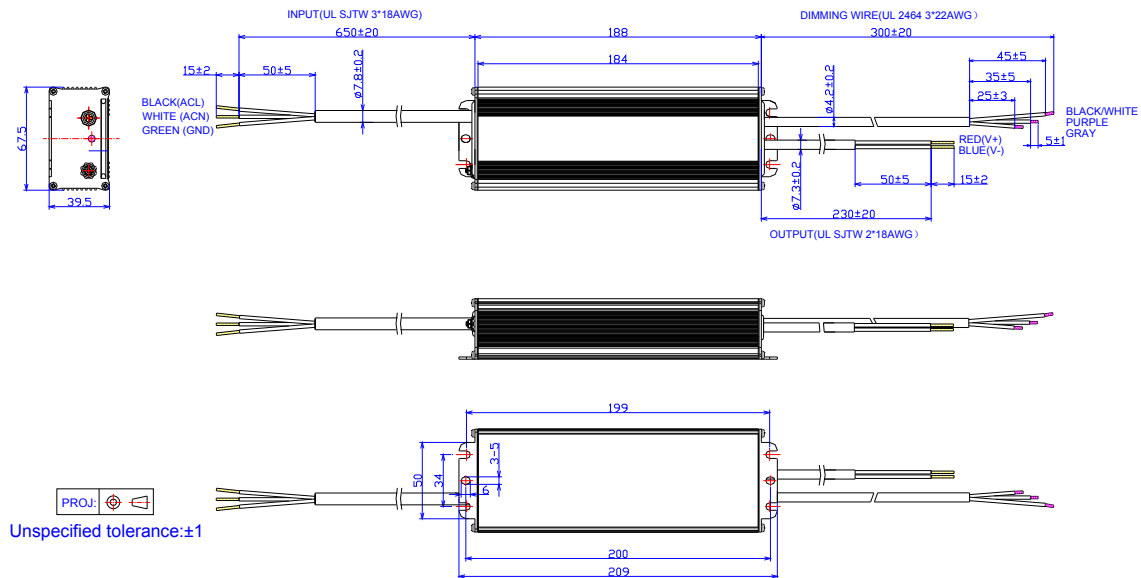
## Programming Connection Diagram



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

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

## Mechanical Outline



## RoHS Compliance

Our products comply with the European Directive 2011/65/EC, calling for the elimination of lead and other hazardous substances from electronic products.

## Revision History

Change Date	Rev.	Description of Change		
		Item	From	To
2015-08-07	A	Datasheets Release	/	/