Features

- 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 4kV, CM 6kV
- All-Around Protection: OVP, SCP, OTP
- IP66/IP67
- SELV Output
- Suitable for Luminaires with Protection Class I and II
- 5 Years Warranty

Description

The *EUM-050SxxxDE* series is a 50W, constant-current, programmable and IP66/IP67 rated LED driver that operates from 90-305Vac input with excellent power factor. It is created for many lighting applications including low bay, tunnel and street, 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.

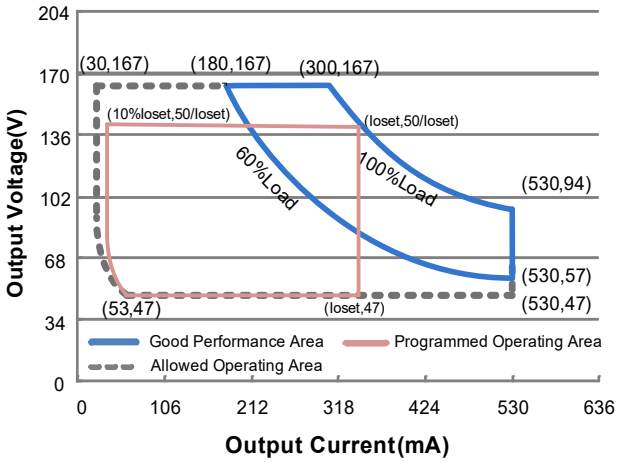
Models

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 (4)
							120Vac	220Vac	
30-530mA	300-530mA	530 mA	90~305Vac/ 127~300 Vdc	47~167 Vdc	50W	90.5%	0.99	0.96	EUM-050S053DE(5)
55-900mA	550-900mA	700 mA	90~305 Vac/ 127~300 Vdc	28~91 Vdc	50W	89.0%	0.99	0.96	EUM-050S090DE
92-1500mA	920-1500mA	1050 mA	90~305 Vac/ 127~300 Vdc	17~54 Vdc	50W	88.0%	0.99	0.96	EUM-050S150DE

Notes: (1) Output current range with constant power at 50W
(2) Certified input voltage range: 100-240Vac.
(3) Measured at 100% load and 220Vac input (see below “General Specifications” for details).
(4) SELV output.
(5) Only with ENEC, UKCA, CE, CB and KS certificates.

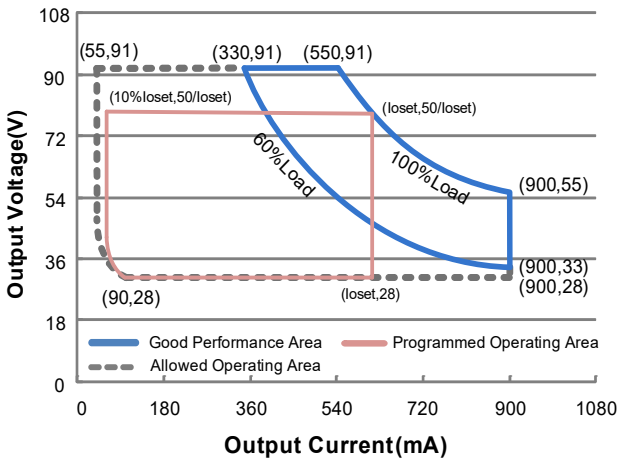
I-V Operation Area

EUM-050S053DE



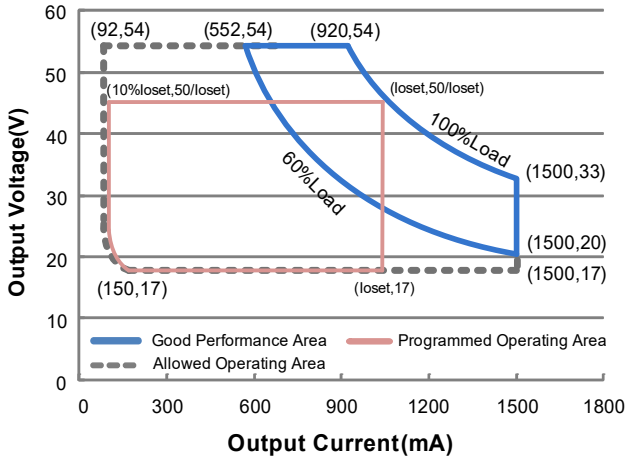
Note: 300mA≤loset≤530mA

EUM-050S090DE



Note: 550mA≤loset≤900mA

EUM-050S150DE



Note: 920mA≤loset≤1500mA

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	-	-	0.70 mA	IEC 60598-1; 240Vac/ 60Hz
Input AC Current	-	-	0.55 A	Measured at 100% load and 120 Vac input.
	-	-	0.30 A	Measured at 100% load and 220 Vac input.

Input Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Inrush Current(I^2t)	-	-	0.48 A^2s	At 220Vac input, 25°C cold start, duration=292 μs, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details.
PF	0.9	-	-	At 100-277Vac, 50-60Hz, 60%-100% Load (30-50W)
THD	-	-	20%	
THD	-	-	10%	At 220-240Vac, 50-60Hz, 60%-100% Load (30-50W)

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%Ioset	-	5%Ioset	At 100% load condition
Output Current Setting(Ioset) Range EUM-050S053DE EUM-050S090DE EUM-050S150DE	 30 mA 55 mA 92 mA	 - - -	 530 mA 900 mA 1500 mA	
Output Current Setting Range with Constant Power EUM-050S053DE EUM-050S090DE EUM-050S150DE	 300 mA 550 mA 920 mA	 - - -	 530 mA 900 mA 1500 mA	
Total Output Current Ripple (pk-pk)	-	5%Iomax	10%Iomax	At 100% load condition. 20 MHz BW
Output Current Ripple at < 200 Hz (pk-pk)	-	2%Iomax	-	At 100% load condition. Only this component of ripple is associated with visible flicker.
Startup Overshoot Current	-	-	10%Iomax	At 100% load condition
No Load Output Voltage EUM-050S053DE EUM-050S090DE EUM-050S150DE	 - - -	 - - -	 200 V 120 V 60 V	
Line Regulation	-	-	±1%	Measured at 100% load
Load Regulation	-	-	±5%	
Turn-on Delay Time	-	-	0.5 s	Measured at 120-277Vac input, 60%-100% Load
Temperature Coefficient of Ioset	-	0.06%/°C	-	Case temperature = 0°C ~Tc max

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120 Vac input: EUM-050S053DE Io= 300 mA Io= 530 mA EUM-050S090DE Io= 550 mA Io= 900 mA EUM-050S150DE Io= 920 mA Io=1500 mA	 85.0% 86.0% 84.0% 85.0% 83.0% 83.5%	 87.0% 88.0% 86.0% 87.0% 85.0% 85.5%	 - - - - - -	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: EUM-050S053DE Io= 300 mA Io= 530 mA EUM-050S090DE Io= 550 mA Io= 900 mA EUM-050S150DE Io= 920 mA Io=1500 mA	 87.5% 88.5% 86.5% 87.0% 85.0% 86.0%	 89.5% 90.5% 88.5% 89.0% 87.0% 88.0%	 - - - - - -	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: EUM-050S053DE Io= 300 mA Io= 530 mA EUM-050S090DE Io= 550 mA Io= 900 mA EUM-050S150DE Io= 920 mA Io=1500 mA	 88.0% 89.0% 87.0% 87.5% 86.0% 86.0%	 90.0% 91.0% 89.0% 89.5% 88.0% 88.0%	 - - - - - -	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	-	548,000 Hours	-	Measured at 220Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	103,000 Hours	-	Measured at 220Vac 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 warrant Humidity: 10% RH to 95% RH;
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 95%RH
Dimensions Inches (L × W × H) Millimeters (L × W × H)	3.75 × 2.52 × 1.44 95 × 64 × 36.5			With mounting ear 4.41 × 2.52 × 1.44 112 × 64 × 36.5
Net Weight	-	490 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 uA	300 uA	450 uA	Vdim(+) = 0 V

Dimming Specifications (Continued)

Parameter		Min.	Typ.	Max.	Notes
Dimming Output Range	EUM-050S053DE EUM-050S090DE EUM-050S150DE	10%Ioset	-	Ioset	300 mA ⩽ Ioset ⩽ 530 mA 550 mA ⩽ Ioset ⩽ 900 mA 920 mA ⩽ Ioset ⩽ 1500 mA
	EUM-050S053DE EUM-050S090DE EUM-050S150DE	30 mA 55 mA 92 mA	-	Ioset	30 mA ⩽ Ioset ＜ 300 mA 55 mA ⩽ Ioset ＜ 550 mA 92 mA ⩽ Ioset ＜ 920 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

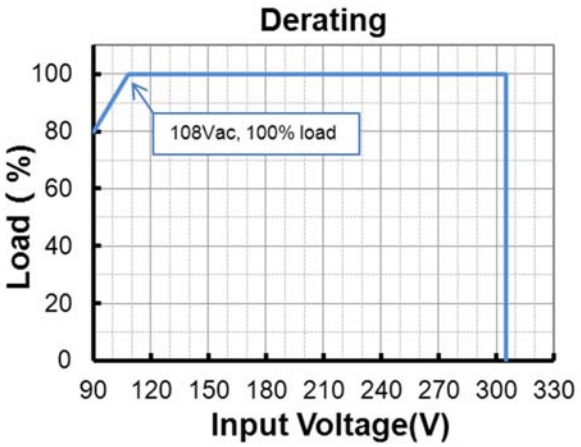
Safety Category	Standard
ENEC & CE	EN 61347-1(1), EN 61347-2-13
UKCA	BS EN 61347-1(1), BS EN 61347-2-13
CB	IEC 61347-1(1), IEC 61347-2-13
KS	KS C 7655
EAC	ГОСТ Р МЭК 61347-1, ГОСТ IEC 61347-2-13
NOM	NOM-058-SCFI
Performance	**Standard**
ENEC	EN 62384
EMI Standards	**Notes**
BS EN/EN IEC 55015(2)	Conducted emission Test &Radiated emission Test
BS EN/EN IEC 61000-3-2	Harmonic current emissions
BS EN/EN 61000-3-3	Voltage fluctuations & flicker
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 4 kV, Common Mode 6 kV

Safety &EMC Compliance (Continued)

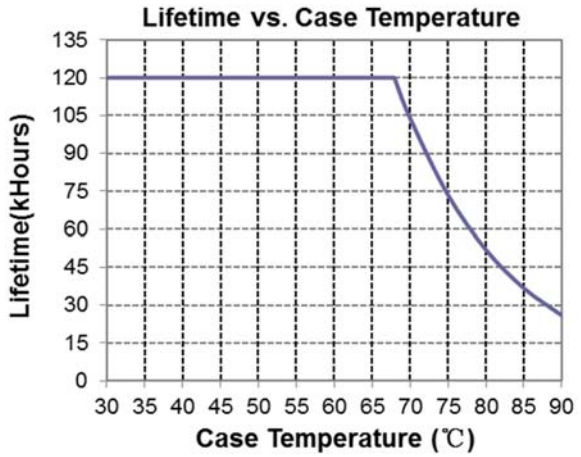
EMS Standards	Notes
BS EN/EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
BS EN/EN 61000-4-8	Power Frequency Magnetic Field Test
BS EN/EN 61000-4-11	Voltage Dips
BS EN/EN 61547	Electromagnetic Immunity Requirements Applies To Lighting Equipment

Note: (1) This product meets the requirements for IEC/BS EN/EN 61347-1(Class II), when the driver is energized, the allowed leakage current is perceptible but harmless.
(2) 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.

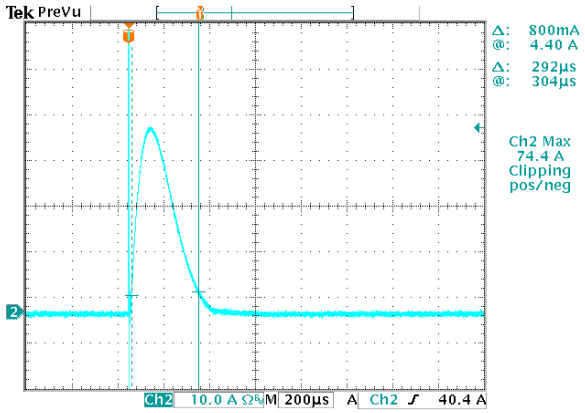
Derating



Lifetime vs. Case Temperature

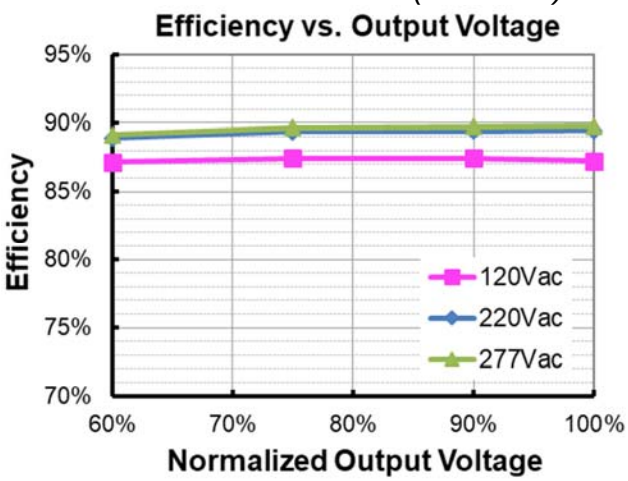


Inrush Current Waveform

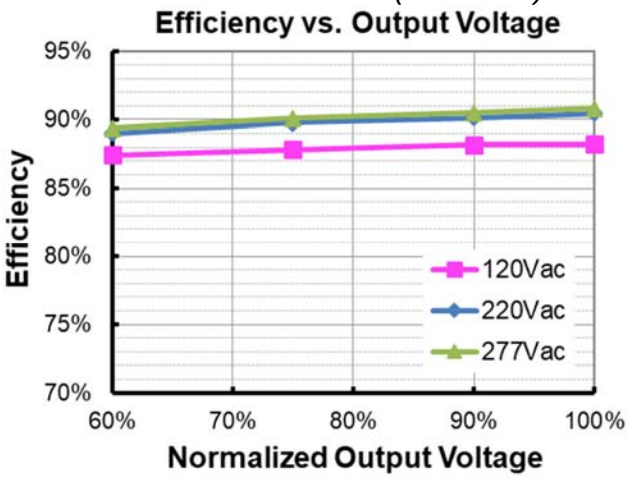


Efficiency vs. Load

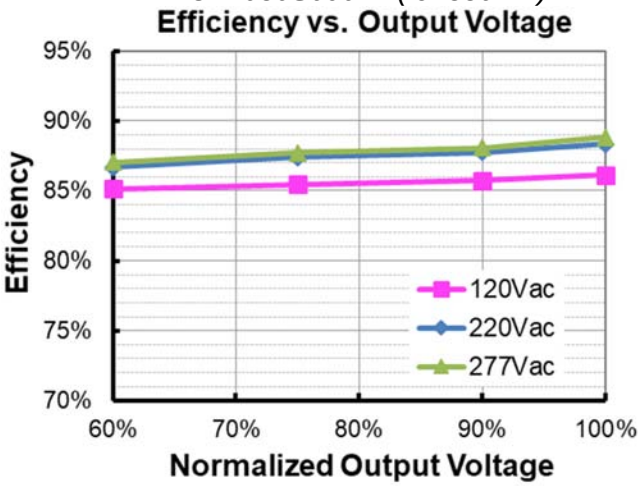
EUM-050S053DE(Io=300mA)



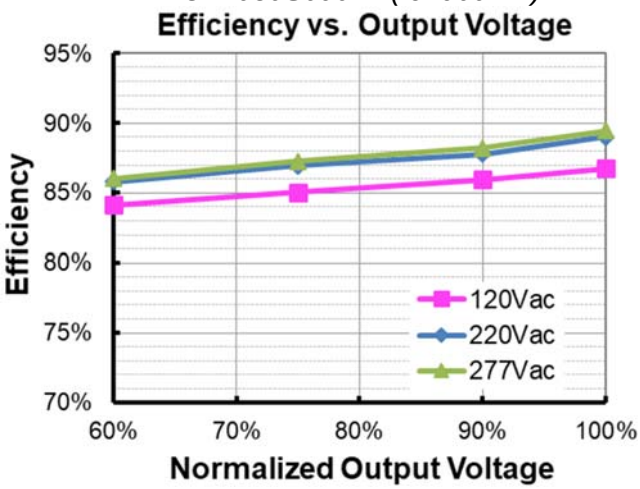
EUM-050S053DE(Io=530mA)



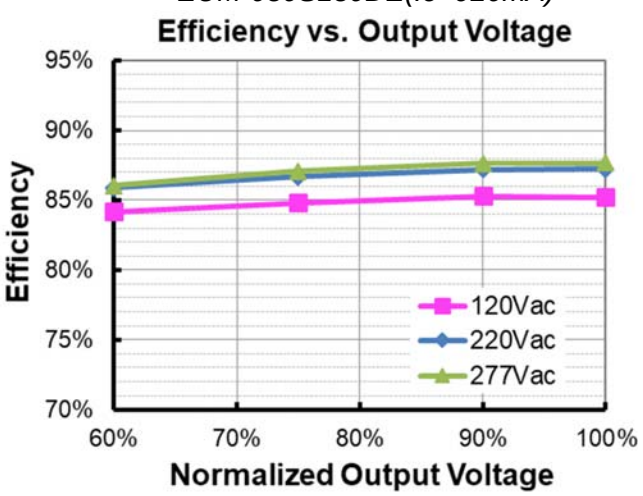
EUM-050S090DE(Io=550mA)



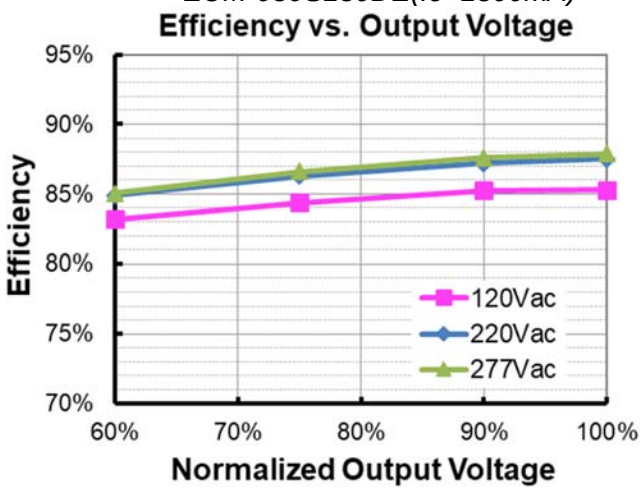
EUM-050S090DE(Io=900mA)



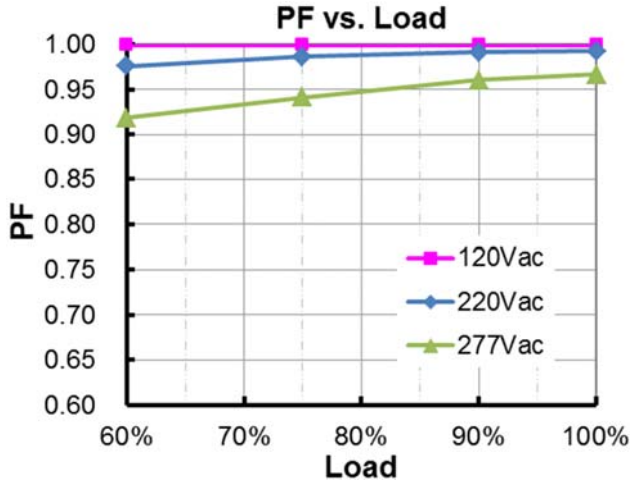
EUM-050S150DE(Io=920mA)



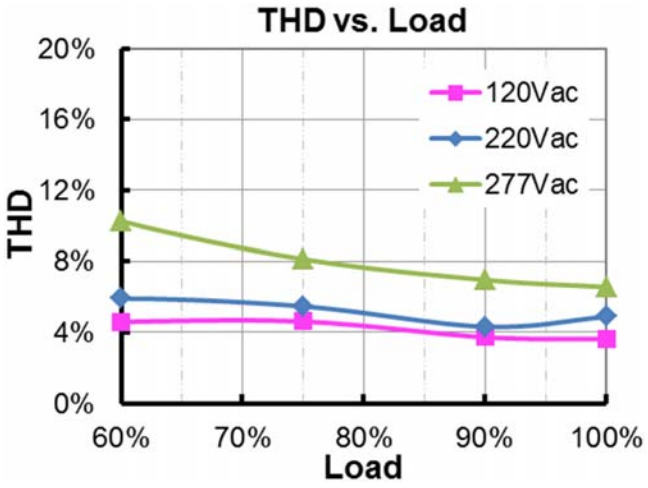
EUM-050S150DE(Io=1500mA)



Power Factor



Total Harmonic Distortion



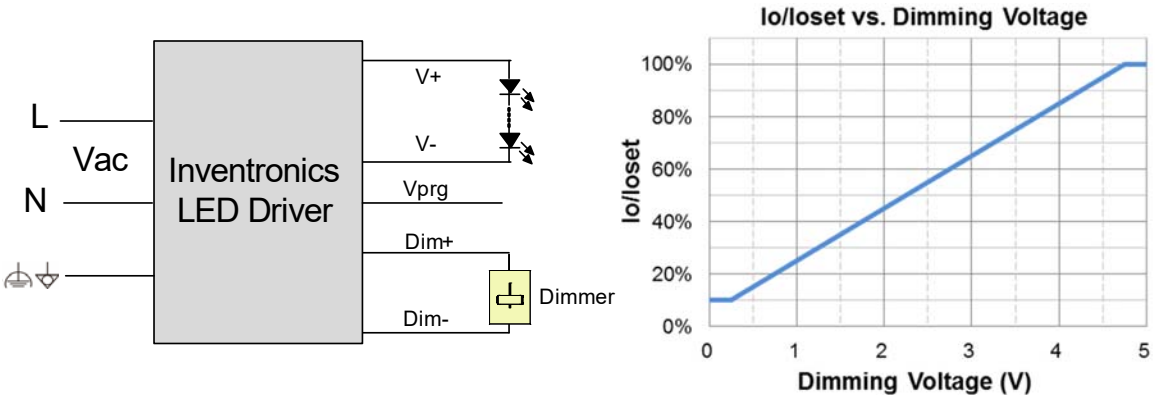
Protection Functions

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.

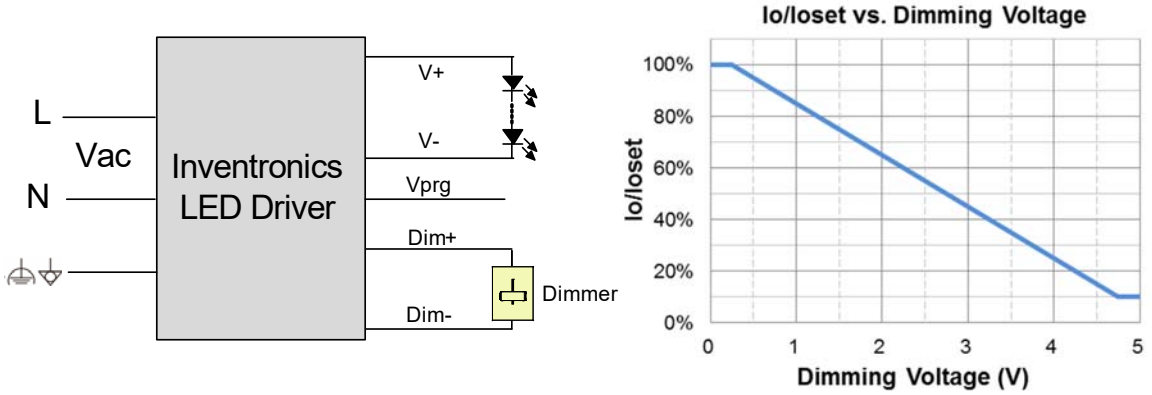
Dimming

- **1-5V Dimming**

The recommended implementation of the dimming control is provided below.



Implementation 1: Positive logic



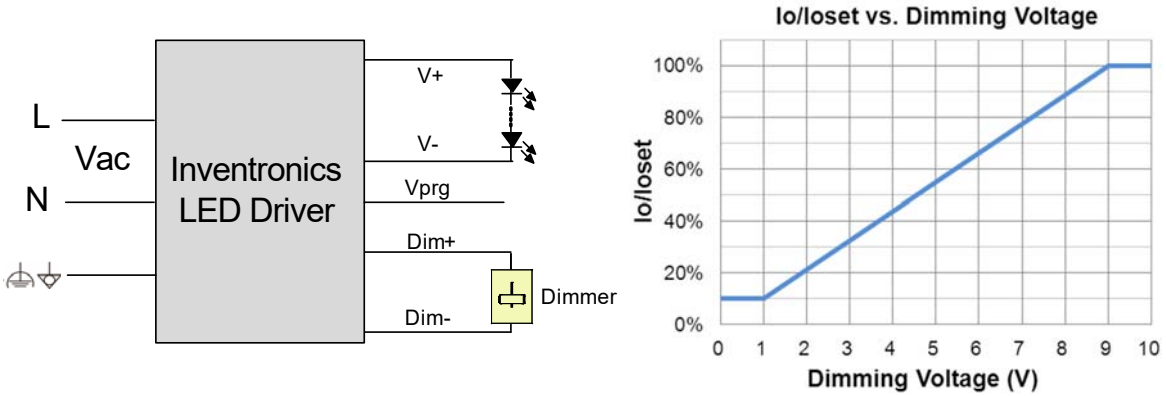
Implementation 2: Negative logic

Notes:

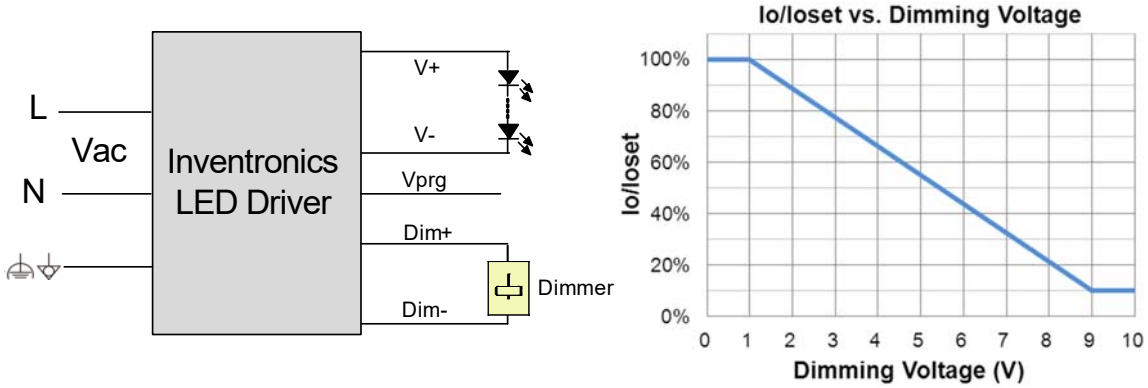
1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. The dimmer can also be replaced by an active 1-5V voltage source signal or passive components like zener.
3. When 1-5V negative logic dimming mode and Dim+ is open, the driver will output maximum current.

● 1-10V Dimming

The recommended implementation of the dimming control is provided below.



Implementation 3: Positive logic



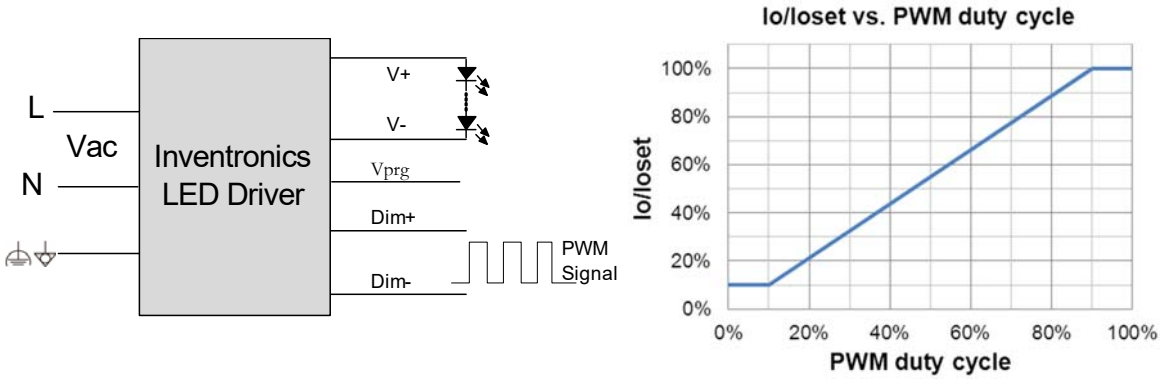
Implementation 4: Negative logic

Notes:

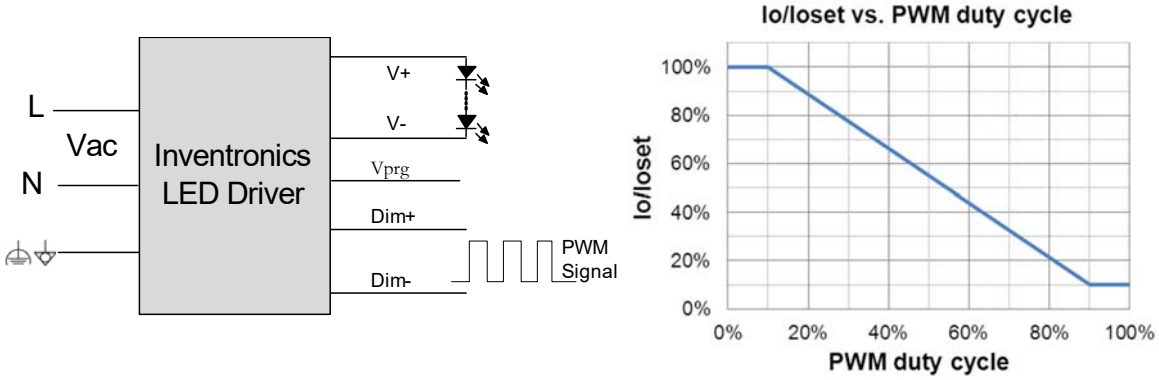
1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly
2. The dimmer can also be replaced by an active 1-10V voltage source signal or passive components like zener.
3. When 1-10V negative logic dimming mode and Dim+ is open, the driver will output minimum current.

● 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 10V PWM negative logic dimming mode and Dim+ is open, the driver will output minimum current.

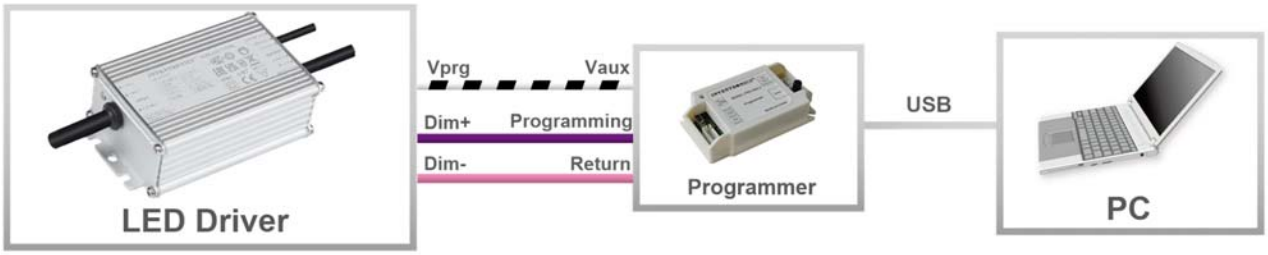
- **Time Dimming**

  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.

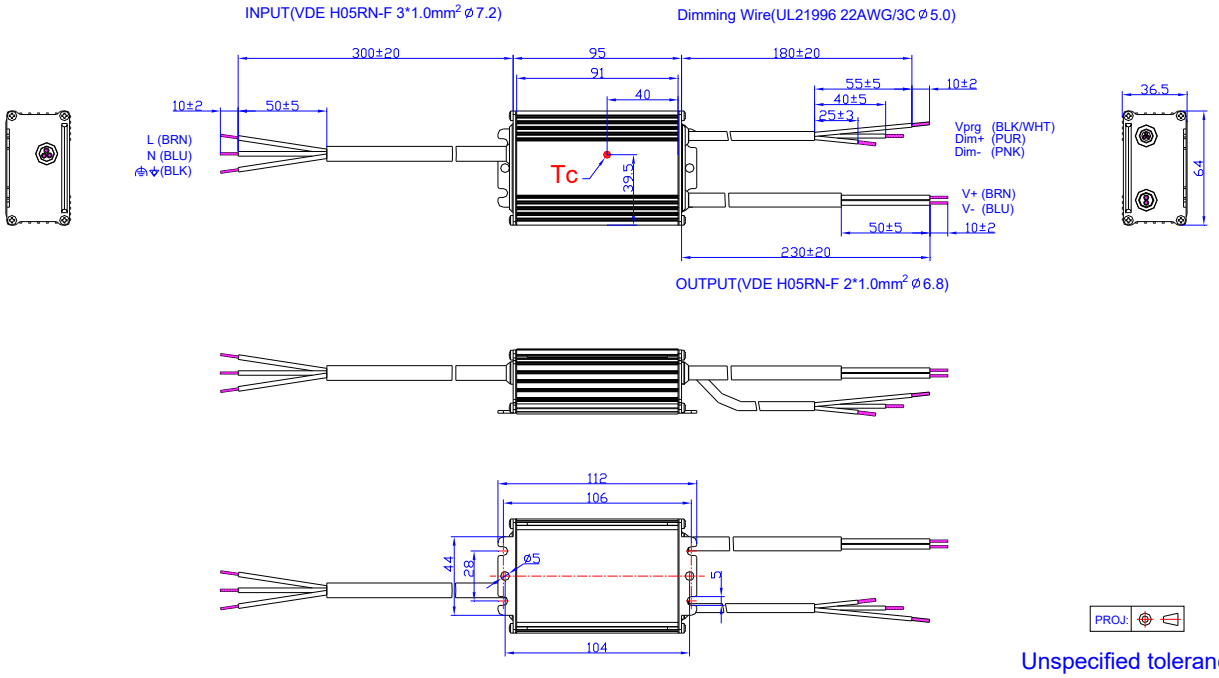
Programming Connection Diagram



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



Unspecified tolerance:±1

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
2021-01-05	A	Datasheets Release	/	/
2021-03-25	B	EAC logo	/	Added
		NOM logo	/	Added
		Safety &EMC Compliance	EAC	Added
			NOM	Added
		Dimming	/	Updated
		Programming Connection Diagram	/	Updated
		Mechanical Outline	/	Updated
2021-12-28	C	UKCA logo	/	Added
		Models	EUM-050S053DE	Added
		Models	Note (5)	Added
		I-V Operation Area	EUM-050S053DE	Added
		Output Current Setting(Ioset) Range	EUM-050S053DE	Added
		Output Current Setting Range with Constant Power	EUM-050S053DE	Added
		No Load Output Voltage	EUM-050S053DE	Added
		Efficiency at 120 Vac input	EUM-050S053DE	Added
		Efficiency at 220 Vac input:	EUM-050S053DE	Added
		Efficiency at 277 Vac input:	EUM-050S053DE	Added
		Dimming Output Range	EUM-050S053DE	Added
		Safety &EMC Compliance	UKCA	Added
		Safety &EMC Compliance	Note (1)	Updated
		Efficiency vs. Load	EUM-050S053DE	Added
2023-06-06	D	Product photograph	/	Updated
		Safety &EMC Compliance	/	Updated
		Dimming	/	Updated
		Programming Connection Diagram	/	Updated
		Mechanical Outline	/	Updated