

## Features

- Ultra High Efficiency (Up to 93%)
- Full Power at 70-100% Max Current (Constant Power)
- 0-10V/PWM/Timer Dimmable (3 Timer Modes)
- Dim-to-Off with Standby Power  $\leq 1$  W
- Output Lumen Compensation
- Input Surge Protection: 4kV line-line, 6kV line-earth
- All-Around Protection: OVP, SCP, OTP
- Waterproof (IP67)
- SELV Output
- Suitable for Independent Use
- 5 Years Warranty



## Description

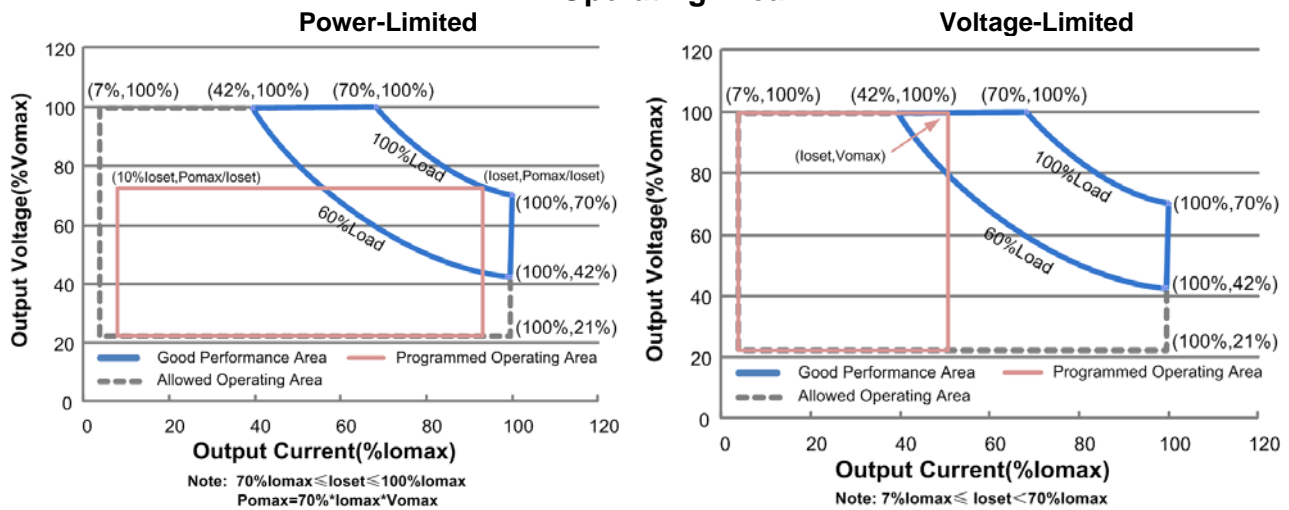
The EUD-240SxxxDV series is a 240W, constant-current, programmable LED driver that operates from 90-305 Vac input with excellent power factor. Created for high bay, high mast, arena and roadway lights, it provides a dim-to-off mode with low standby power. The high efficiency of these drivers and compact 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)	Power Factor		Model Number (4)
							120Vac	220Vac	
70-1000mA	700-1000mA	700 mA	90~305 Vac/ 127~250 Vdc	72~343Vdc	240 W	93.0%	0.99	0.96	EUD-240S100DV
105-1500mA	1050-1500mA	1400 mA	90~305 Vac/ 127~250 Vdc	50~229Vdc	240 W	93.0%	0.99	0.96	EUD-240S150DV
154-2200mA	1540-2200mA	2100 mA	90~305 Vac/ 127~250 Vdc	33~156Vdc	240 W	93.0%	0.99	0.96	EUD-240S220DV
224-3200mA	2240-3200mA	2800 mA	90~305 Vac/ 127~250 Vdc	23~107Vdc	240 W	92.5%	0.99	0.96	EUD-240S320DV <sup>(5)</sup>
322-4600mA	3220-4600mA	4200 mA	90~305 Vac/ 127~250 Vdc	16 ~ 75Vdc	240 W	92.5%	0.99	0.96	EUD-240S460DV <sup>(5)</sup>
462-6600mA	4620-6600mA	4900 mA	90~305 Vac/ 127~250 Vdc	11 ~ 52Vdc	240 W	92.0%	0.99	0.96	EUD-240S660DV <sup>(5)</sup>

- Notes:** (1) Output current range with constant power at 240W  
 (2) Certified input voltage range: 100-240Vac or 127-250Vdc (except CCC and KS)  
 (3) Measured at a 220Vac input with 70% maximum output current and 100% maximum output voltage.  
 (4) All the models are certificated to KS, except EUD-240S100DV and EUD-240S150DV  
 (5) SELV output

## I-V Operating Area



## Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	90 Vac	-	305 Vac	127~250 Vdc
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.70 mA	IEC60598-1; 240Vac/ 60Hz
Input AC Current	-	-	3.2 A	Measured at full load and 100 Vac input.
	-	-	1.45 A	Measured at full load and 220 Vac input.
Inrush Current( $I^2t$ )	-	-	2.5 A <sup>2</sup> s	At 220Vac input, 25°C cold start, duration=368 μs, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details.
PF	0.90	-	-	At 100-277Vac, 50-60Hz, 60%-100% Load (144-240W)
THD	-	-	20%	

## Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%Ioset	-	5%Ioset	At full load condition
Output Current Setting(Ioset) Range	7%Iomax	-	100%Iomax	
Output Current Setting Range with Constant Power	70%Iomax	-	100%Iomax	
Total Output Current Ripple (pk-pk)	-	5%Iomax	10%Iomax	At full load condition, 20 MHz BW
Output Current Ripple at < 200 Hz (pk-pk)	-	1%Iomax	-	At full load condition. Only this component of ripple is associated with visible flicker.
Startup Overshoot Current	-	-	10%Iomax	At full load condition

## Output Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
No Load Output Voltage				
EUD-240S100DV	-	-	370V	
EUD-240S150DV	-	-	260V	
EUD-240S220DV	-	-	180V	
EUD-240S320DV	-	-	120V	
EUD-240S460DV	-	-	85V	
EUD-240S660DV	-	-	60V	
Line Regulation	-	-	±0.5%	Measured at full load
Load Regulation	-	-	±1.5%	
Turn-on Delay Time	-	0.8 s	1.5 s	Measured at 120Vac and 220Vac input, 60%-100% Load
Temperature Coefficient of Isolet	-	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	-	200 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:				
EUD-240S100DV				
Io=700 mA	89.0%	91.0%	-	
Io=1000mA	88.5%	90.5%	-	
EUD-240S150DV				
Io=1050mA	89.0%	91.0%	-	
Io=1500mA	88.5%	90.5%	-	
EUD-240S220DV				
Io=1540mA	89.0%	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=2200mA	88.5%	90.5%	-	
EUD-240S320DV				
Io=2240mA	88.5%	90.5%	-	
Io=3200mA	87.5%	89.5%	-	
EUD-240S460DV				
Io=3220mA	88.5%	90.5%	-	
Io=4600mA	87.5%	89.5%	-	
EUD-240S660DV				
Io=4620mA	87.5%	89.5%	-	
Io=6600mA	86.0%	88.0%	-	

## General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 220 Vac input: EUD-240S100DV				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	91.0%	93.0%	-	
I <sub>o</sub> =1000mA	90.5%	92.5%	-	
EUD-240S150DV				
I <sub>o</sub> =1050mA	91.0%	93.0%	-	
I <sub>o</sub> =1500mA	90.5%	92.5%	-	
EUD-240S220DV				
I <sub>o</sub> =1540mA	91.0%	93.0%	-	
I <sub>o</sub> =2200mA	90.5%	92.5%	-	
EUD-240S320DV				
I <sub>o</sub> =2240mA	90.5%	92.5%	-	
I <sub>o</sub> =3200mA	90.0%	92.0%	-	
EUD-240S460DV				
I <sub>o</sub> =3220mA	90.5%	92.5%	-	
I <sub>o</sub> =4600mA	89.5%	91.5%	-	
EUD-240S660DV				
I <sub>o</sub> =4620mA	90.0%	92.0%	-	
I <sub>o</sub> =6600mA	88.5%	90.5%	-	
Efficiency at 277 Vac input: EUD-240S100DV				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	91.0%	93.0%	-	
I <sub>o</sub> =1000mA	90.5%	92.5%	-	
EUD-240S150DV				
I <sub>o</sub> =1050mA	91.0%	93.0%	-	
I <sub>o</sub> =1500mA	90.5%	92.5%	-	
EUD-240S220DV				
I <sub>o</sub> =1540mA	91.0%	93.0%	-	
I <sub>o</sub> =2200mA	90.5%	92.5%	-	
EUD-240S320DV				
I <sub>o</sub> =2240mA	90.5%	92.5%	-	
I <sub>o</sub> =3200mA	90.0%	92.0%	-	
EUD-240S460DV				
I <sub>o</sub> =3220mA	90.5%	92.5%	-	
I <sub>o</sub> =4600mA	89.5%	91.5%	-	
EUD-240S660DV				
I <sub>o</sub> =4620mA	90.0%	92.0%	-	
I <sub>o</sub> =6600mA	88.5%	90.5%	-	
Standby power	-	1 W	-	Measured at 230Vac/50Hz; Dimming off
MTBF	-	234,000 Hours	-	Measured at 220Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	97,000 Hours	-	Measured at 220Vac input, 80%Load and 60°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	-	+70°C	Case temperature for 5 years warranty
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 100%RH
Dimensions				With mounting ear
Inches (L × W × H)	9.10 × 2.66 × 1.56			9.92 × 2.66 × 1.56
Millimeters (L × W × H)	231 × 67.5 × 39.7			252 × 67.5 × 39.7
Net Weight	-	1370 g	-	

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

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Specifications are subject to changes without notice.

## 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	10%I <sub>oSet</sub>	-	I <sub>oSet</sub>	70%I <sub>oMax</sub> ≤ I <sub>oSet</sub> ≤ 100%I <sub>oMax</sub>
	7%I <sub>oMax</sub>	-	I <sub>oSet</sub>	7%I <sub>oMax</sub> ≤ I <sub>oSet</sub> < 70%I <sub>oMax</sub>
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%	-	

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

## Safety & EMC Compliance

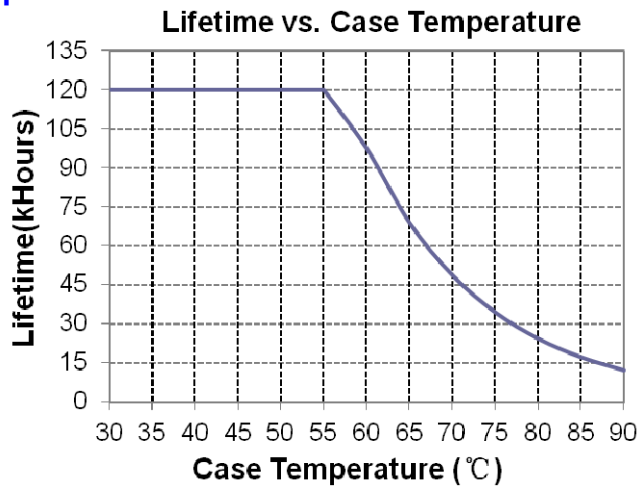
Safety Category	Standard
CE	EN 61347-1, EN61347-2-13
KS	KS C 7655
EMI Standards	Notes
EN 55015 <sup>(1)</sup>	Conducted emission Test & Radiated emission Test
EN 61000-3-2	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & flicker
EMS Standards	Notes
EN 61000-4-2	Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS

## Safety & EMC Compliance (Continued)

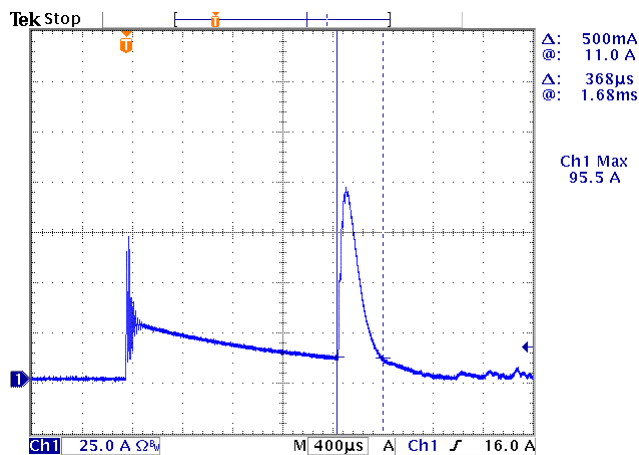
EMS Standards	Notes
EN 61000-4-4	Electrical Fast Transient / Burst-EFT
EN 61000-4-5	Surge Immunity Test: AC Power Line: line to line 4 kV, line to earth 6 kV <sup>(2)</sup>
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
EN 61000-4-8	Power Frequency Magnetic Field Test
EN 61000-4-11	Voltage 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.
- (2) 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

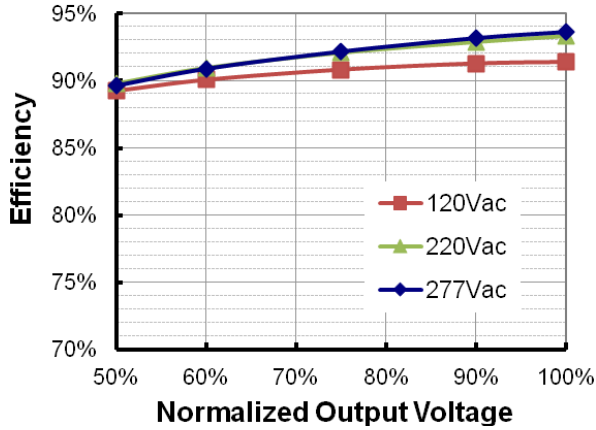


## Inrush Current Waveform

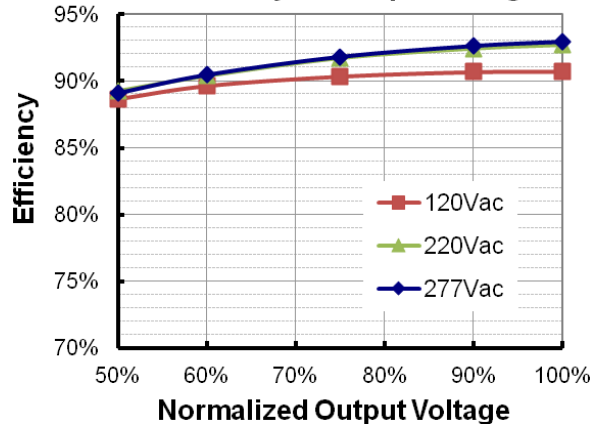


## Efficiency vs. Load

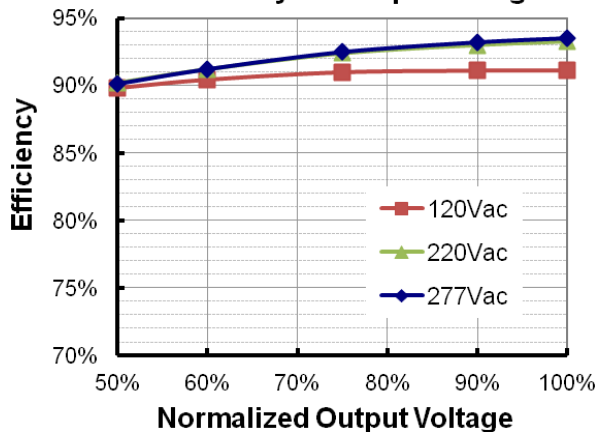
*EUD-240S100DV* ( $I_o=700mA$ )  
Efficiency vs. Output Voltage



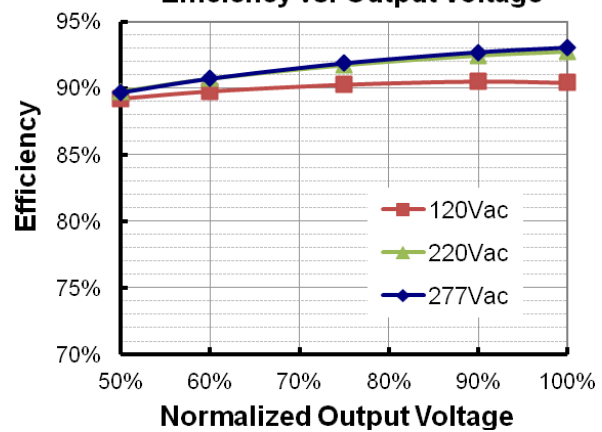
*EUD-240S100DV* ( $I_o=1000mA$ )  
Efficiency vs. Output Voltage



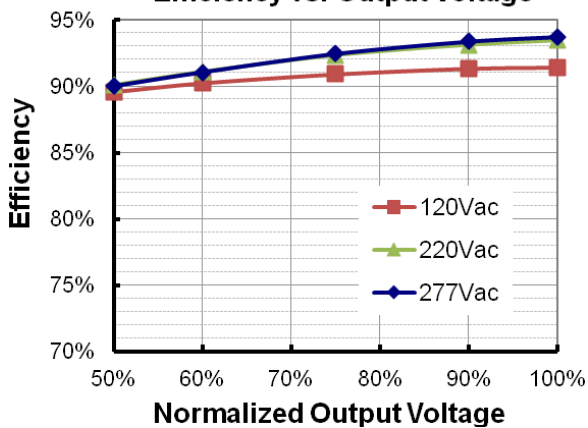
*EUD-240S150DV* ( $I_o=1050mA$ )  
Efficiency vs. Output Voltage



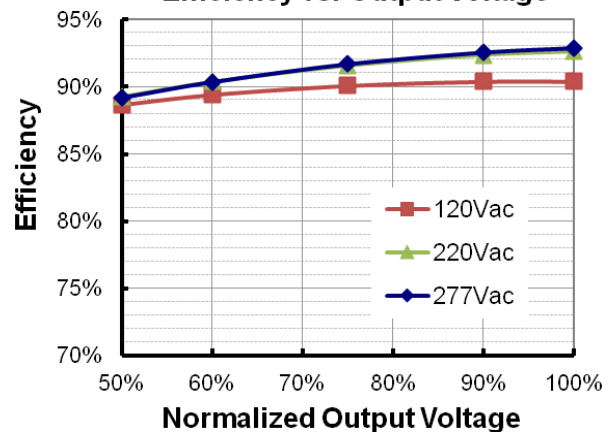
*EUD-240S150DV* ( $I_o=1500mA$ )  
Efficiency vs. Output Voltage

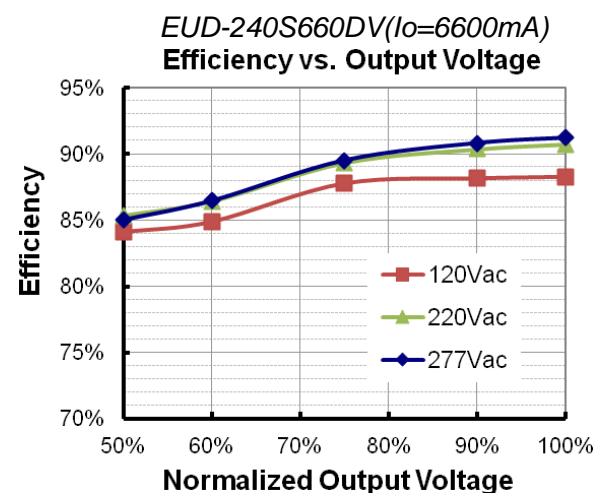
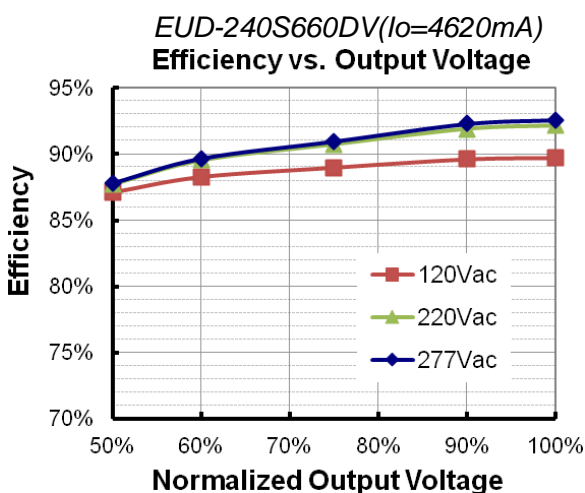
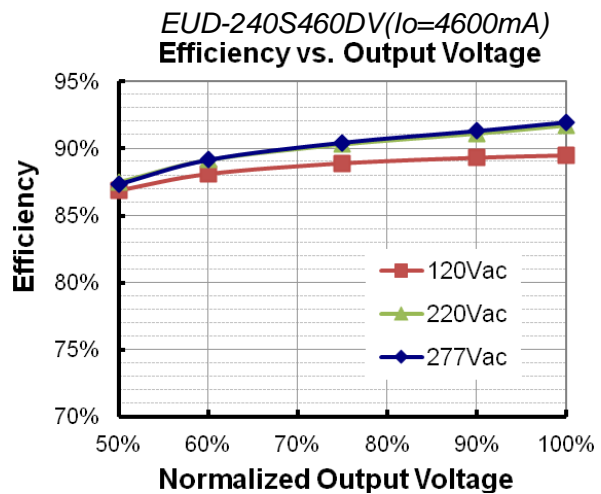
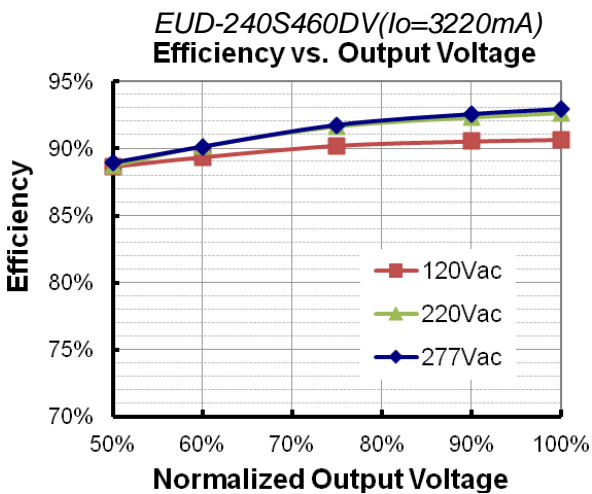
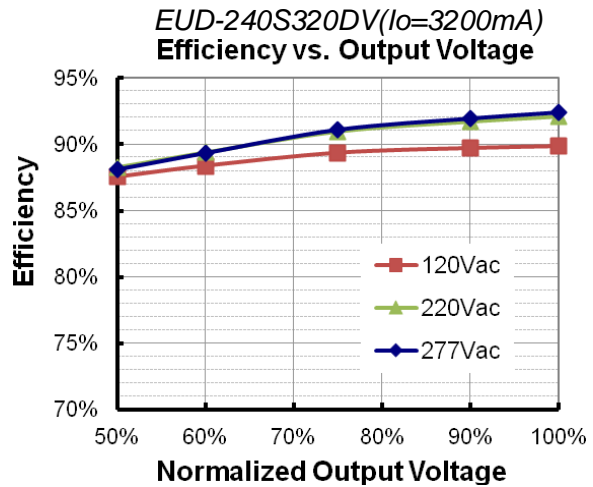
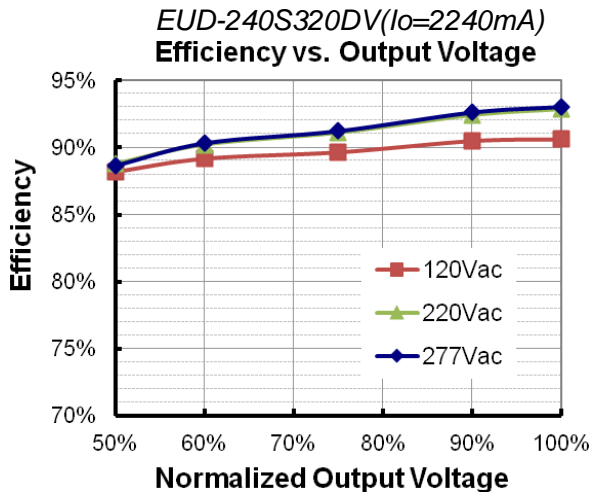


*EUD-240S220DV* ( $I_o=1540mA$ )  
Efficiency vs. Output Voltage



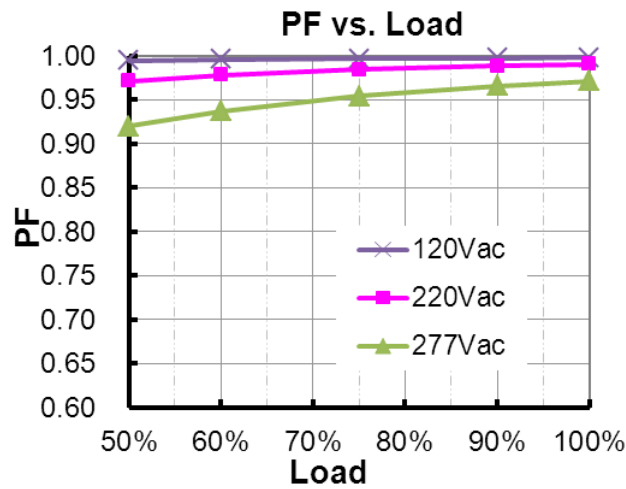
*EUD-240S220DV* ( $I_o=2200mA$ )  
Efficiency vs. Output Voltage



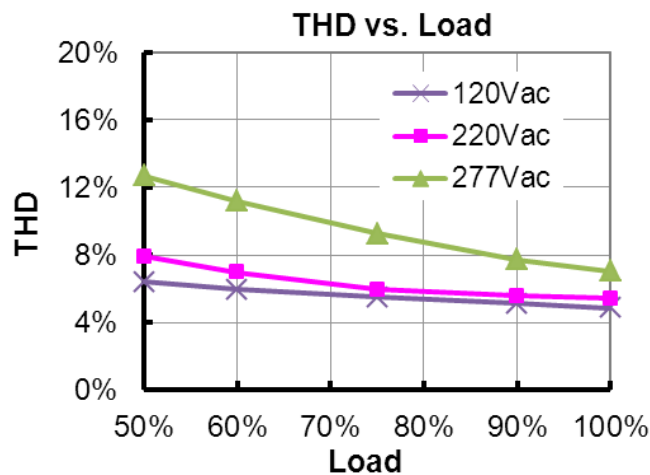




## Power Factor



## Total Harmonic Distortion



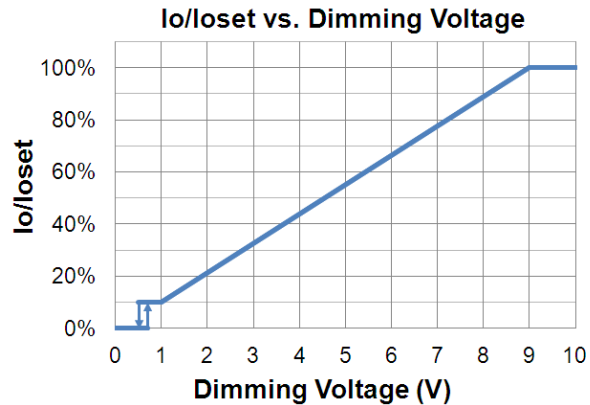
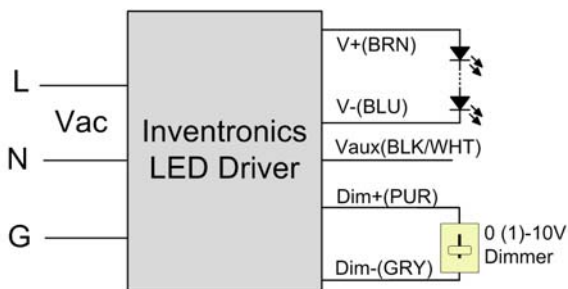
## Protection Functions

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

### ● 0-10V Dimming

The recommended implementation of the dimming control is provided below.

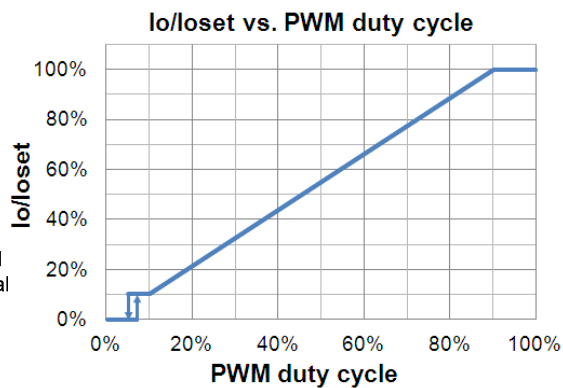
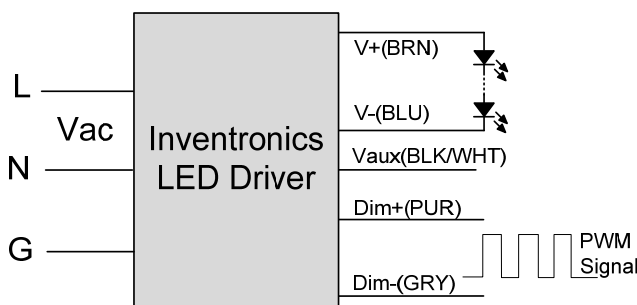


### Implementation 1: DC Input

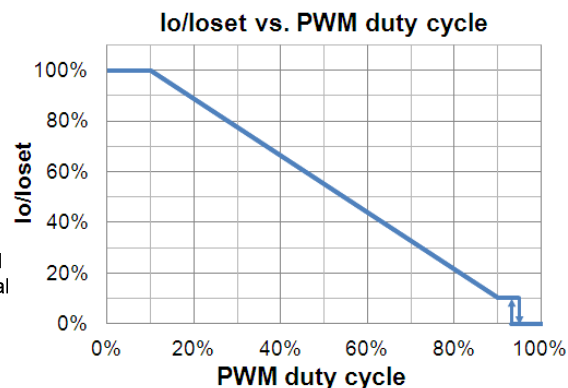
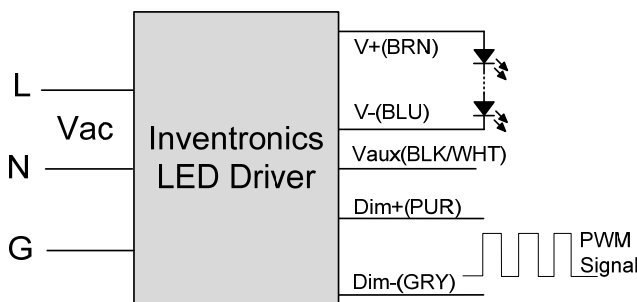
**Notes:**

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.

### ● PWM Dimming



### Implementation 2: Positive logic



### Implementation 3: 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

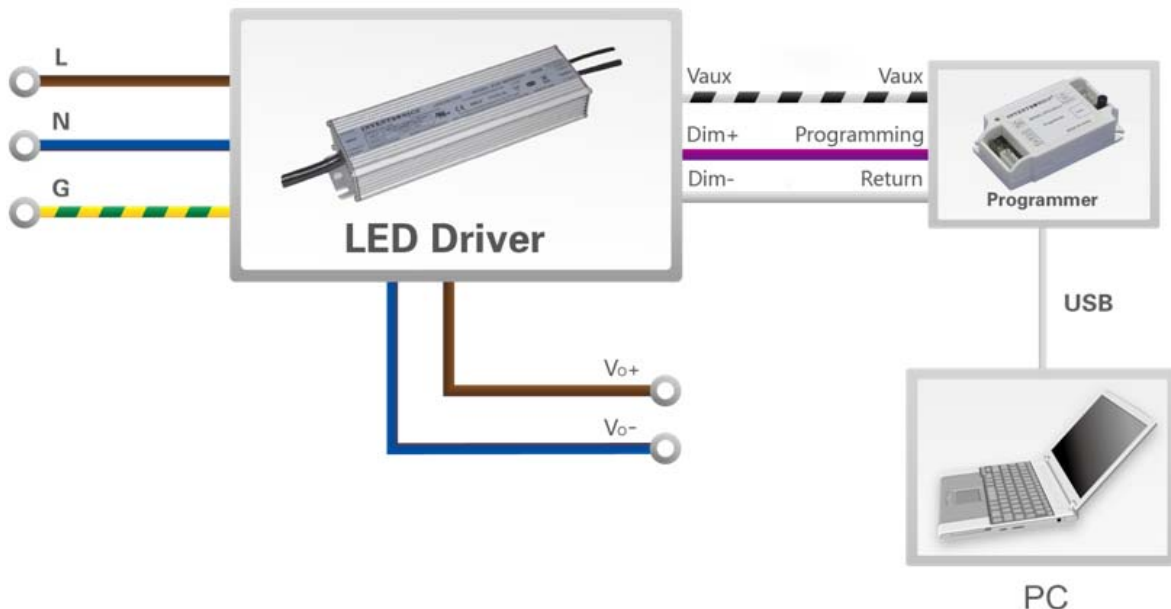
Time dimming control includes 3 kinds of modes, they are Self Adapting-Midnight, Self Adapting-Percentage and Traditional Timer.

- **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.

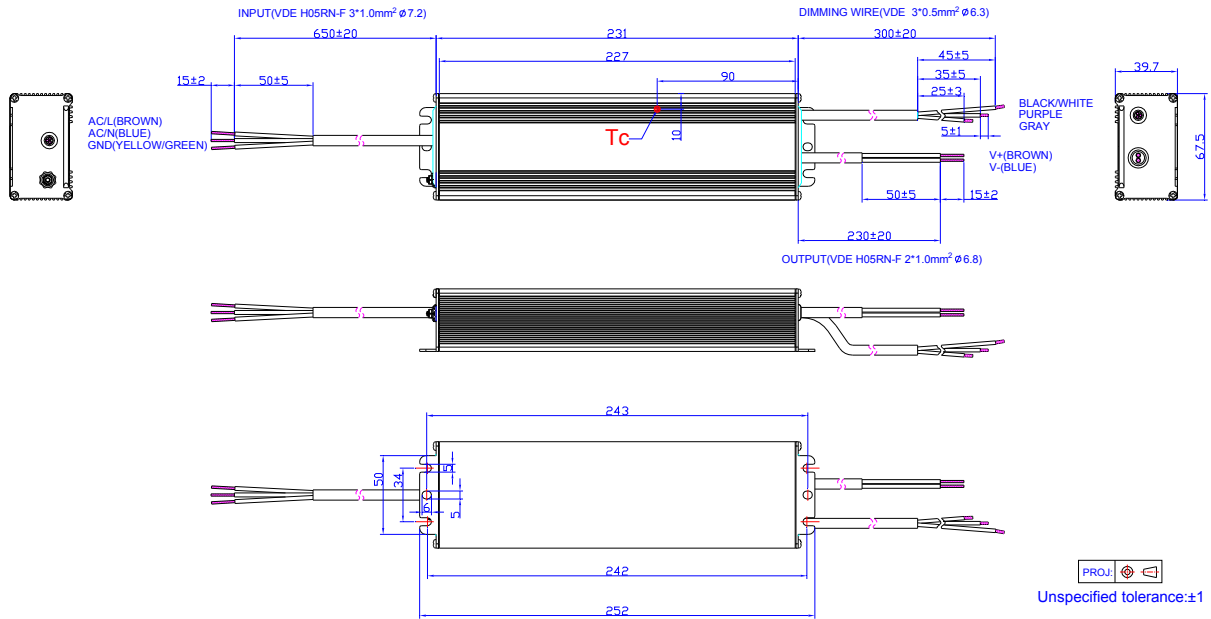
## Programming Connection Diagram



**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



## 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
2015-03-13	A	Datasheets Release	/	/
2015-06-01	B	Description	/	Updated
		Models	/	Updated
		Mechanical Outline	/	Updated
2016-04-08	C	KS	/	Added
		Features	/	Updated
		General Specifications	With mounting ear	Added
		General Specifications	Net Weight	Updated
		Dimming Specifications	/	Updated
		Safety & EMC Compliance	/	Updated
		Time Dimming	/	Updated
2016-11-11	D	Inrush Current(I <sup>2</sup> t)	/	Updated
		Inrush Current Waveform	/	Updated
2017-11-20	E	Features	5 Years Warranty	Updated
		PF/THD	Notes	Updated
		Turn-on Delay Time	/	Updated
		Temperature Coefficient of I <sub>set</sub>	/	Updated
		Standby power	/	Updated
		Dimensions	/	Updated
		Safety & EMC Compliance	/	Updated
		Mechanical Outline	/	Updated