

## Features

- Ultra High Efficiency (Up to 95.0%)
- Full Power at Wide Output Current Range (Constant Power)
- Thermal Sensing and Protection for LED Module
- 0-10V/PWM/Timer Dimmable (3 Timer Modes)
- Dim-to-Off with Standby Power  $\leq 0.5$  W
- Always-on Auxiliary Power: 12Vdc, 200mA
- Output Lumen Compensation
- Input Surge Protection: 6kV line-line, 10kV line-earth
- All-Around Protection: OVP, SCP, OTP
- Waterproof (IP67)
- SELV Output
- Suitable for Independent Use
- 7 Years Warranty



## Description

The EUD-600SxxxDV series is a 600W, constant-current, programmable LED driver that operates from 90-305 Vac input with excellent power factor. Created for many lighting applications including high bay, high mast, aquaculture and sports, 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.

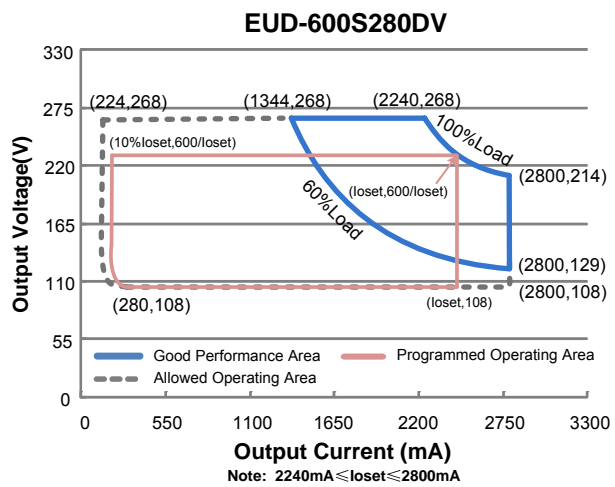
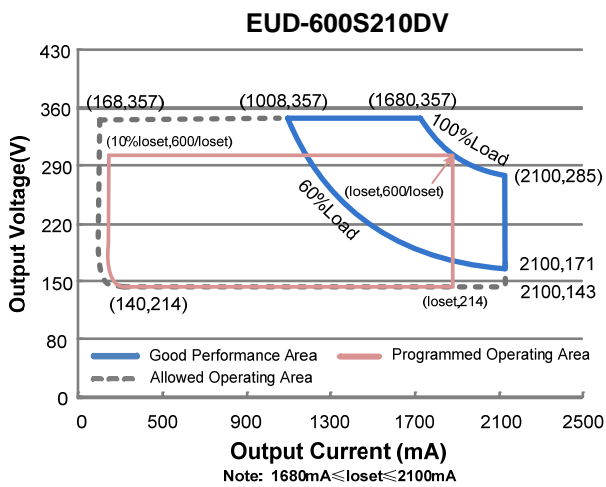
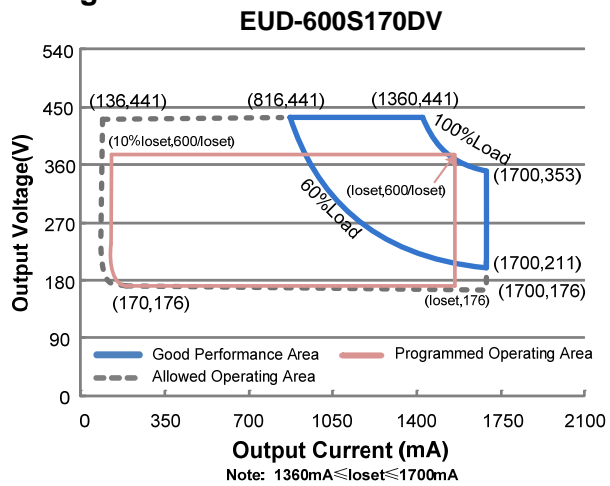
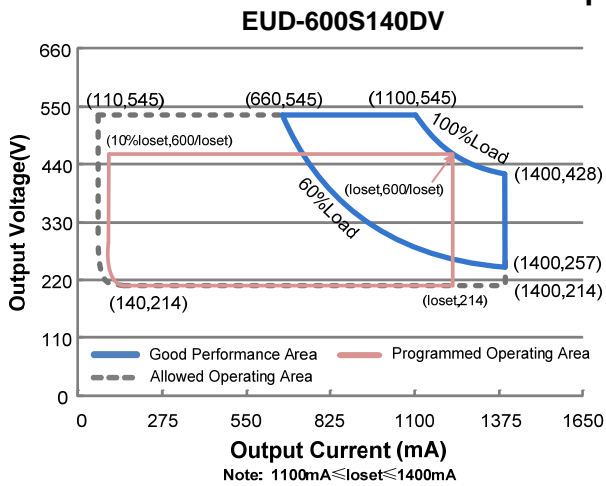
## Models

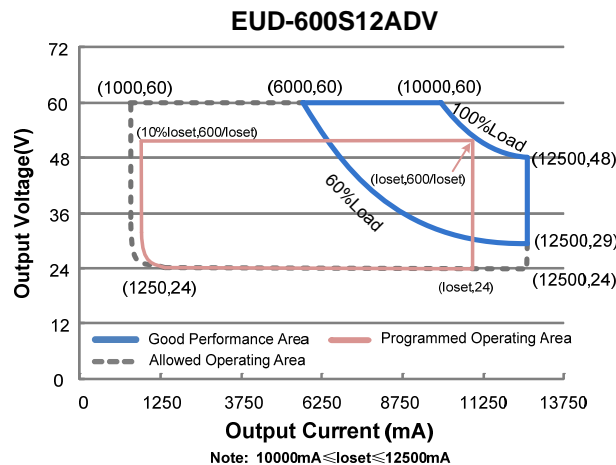
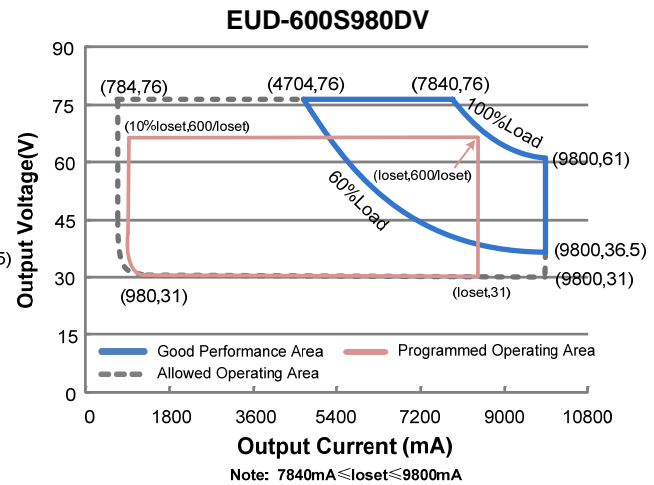
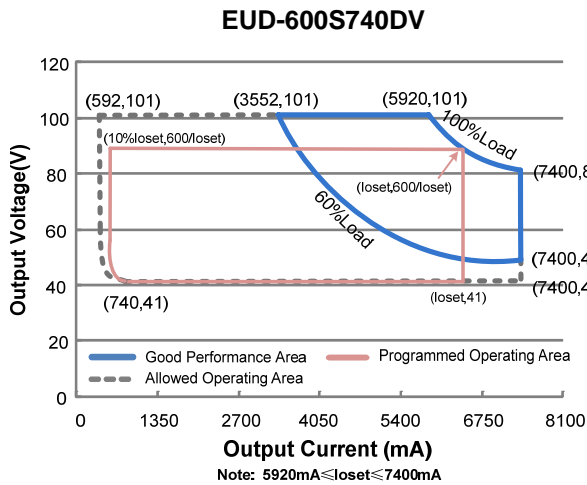
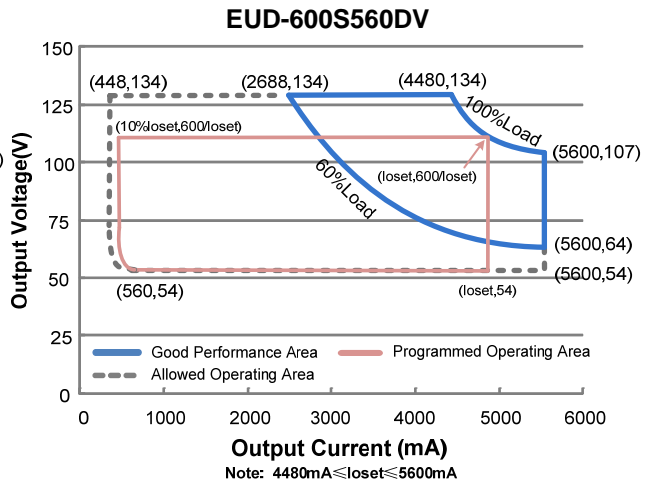
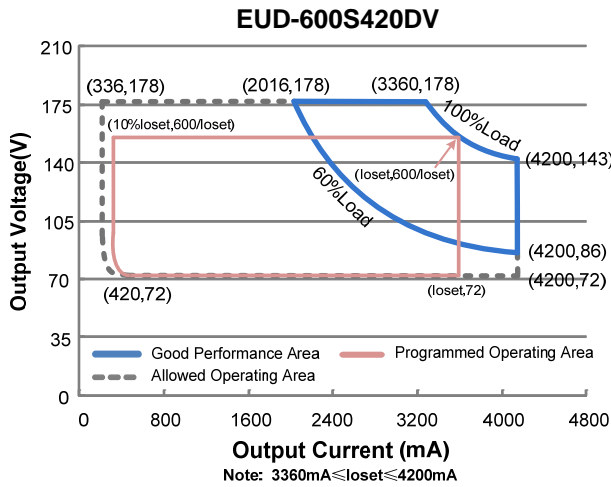
Adjustable Output Current Range	Full-Power Current Range(1)	Default Output Current	Input Voltage Range(2)	Output Voltage Range	Max. Output Power	Typical Efficiency (3)	Power Factor		Model Number (4)
							120Vac	220Vac	
0.11–1.40A	1.10–1.40A	1.4 A	90~305Vac/ 127~250Vdc	214 ~ 545Vdc	600 W	95.0%	0.99	0.96	EUD-600S140DV
0.136-1.70A	1.36–1.70A	1.7A	90~305Vac/ 127~300Vdc	176 ~ 441Vdc	600 W	94.0%	0.96	0.95	EUD-600S170DV
0.168–2.10A	1.68–2.10A	2.1A	90~305Vac/ 127~250Vdc	143 ~ 357Vdc	600 W	94.5%	0.99	0.96	EUD-600S210DV
0.224-2.80A	2.24–2.80A	2.8 A	90~305Vac/ 127~250Vdc	108 ~ 268Vdc	600 W	95.0%	0.99	0.96	EUD-600S280DV
0.336-4.20A	3.36–4.20A	4.2 A	90~305Vac/ 127~250Vdc	72 ~ 178Vdc	600 W	94.5%	0.99	0.96	EUD-600S420DV
0.448-5.60A	4.48–5.60A	5.6 A	90~305Vac/ 127~250Vdc	54 ~ 134Vdc	600 W	94.5%	0.99	0.96	EUD-600S560DV
0.592-7.40A	5.92–7.40A	7.0 A	90~305Vac/ 127~250Vdc	41 ~ 101Vdc	600 W	94.0%	0.99	0.96	EUD-600S740DV <sup>(6)</sup>
0.784-9.80A	7.84–9.80A	9.8 A	90~305Vac/ 127~250Vdc	31 ~ 76Vdc	600 W	94.0%	0.99	0.96	EUD-600S980DV <sup>(6)</sup>
1.0 – 12.5 A	10 – 12.5 A	12.5 A	90~305Vac/ 127~250Vdc	24 ~ 60Vdc	600 W	94.0%	0.99	0.96	EUD-600S12ADV <sup>(5)(6)</sup>

**Notes:** (1) Output current range with constant power at 600W

- (2) Certified input voltage range: 100-240Vac or 127-250Vdc (except CCC, PSE, BIS and KCC)
- (3) Measured at 100% load and 220Vac input (see below “General Specifications” for details)
- (4) All the models are certificated to BIS and PSE, except EUD-600S140/170/210/12ADV
- (5) All the models are certificated to Global-mark, except EUD-600S170/12ADV
- (6) SELV Output

## I-V Operating Area





## Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	90 Vac	-	305 Vac	127-250Vdc
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.70 mA	IEC60598-1; 240Vac/ 60Hz, grounding effectively
Input AC Current	-	-	6.0 A	Measured at 100% load and 120 Vac input.
	-	-	3.5 A	Measured at 100% load and 220 Vac input.
Inrush Current(I <sup>2</sup> t)	-	-	4.70 A <sup>2</sup> s	At 220Vac input, 25°C cold start, duration=7.64 ms, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details.
PF	0.90	-	-	At 100-240Vac, 50-60Hz, 60%-100% Load (360 - 600W)
THD	-	-	20%	
THD	-	-	10%	At 220-240Vac, 50-60Hz, 75%-100% Load (450 - 600W)

## Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%loset	-	5%loset	100% load
Output Current Setting(loset) Range				
EUD-600S140DV	110 mA	-	1400 mA	
EUD-600S170DV	136 mA	-	1700 mA	
EUD-600S210DV	168mA	-	2100 mA	
EUD-600S280DV	224 mA	-	2800 mA	
EUD-600S420DV	336 mA	-	4200 mA	
EUD-600S560DV	448 mA	-	5600 mA	
EUD-600S740DV	592 mA	-	7400 mA	
EUD-600S980DV	784 mA	-	9800 mA	
EUD-600S12ADV	1000 mA	-	12500 mA	
Output Current Setting Range with Constant Power				
EUD-600S140DV	1100 mA	-	1400 mA	
EUD-600S170DV	1360 mA	-	1700 mA	
EUD-600S210DV	1680 mA	-	2100 mA	
EUD-600S280DV	2240 mA	-	2800 mA	
EUD-600S420DV	3360 mA	-	4200 mA	
EUD-600S560DV	4480 mA	-	5600 mA	
EUD-600S740DV	5920 mA	-	7400 mA	
EUD-600S980DV	7840 mA	-	9800 mA	
EUD-600S12ADV	10000 mA	-	12500 mA	
Total Output Current Ripple (pk-pk)	-	5%Iomax	10%Iomax	100% load, 20 MHz BW
Output Current Ripple at < 200 Hz (pk-pk)	-	2%Iomax	-	100% load.
Startup Overshoot Current	-	-	10%Iomax	100% load

## Output Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
No Load Output Voltage				
EUD-600S140DV	-	600 V	605V	
EUD-600S170DV	-	475 V	480 V	
EUD-600S210DV	-	410 V	415 V	
EUD-600S280DV	-	290 V	295 V	
EUD-600S420DV	-	190 V	200 V	
EUD-600S560DV	-	150 V	155 V	
EUD-600S740DV	-	118 V	120 V	
EUD-600S980DV	-	87 V	95 V	
EUD-600S12ADV	-	70 V	80 V	
Line Regulation	-	-	±0.5%	100% load
Load Regulation	-	-	±1.5%	
Turn-on Delay Time	-	-	1.0 s	Measured at 120Vac input, 60%-100% Load
	-	-	0.5 s	Measured at 220Vac input, 60%-100% Load
Temperature Coefficient of Iset	-	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-600S140DV				
I <sub>o</sub> = 1100 mA	90.5%	92.5%	-	
I <sub>o</sub> = 1400 mA	90.0%	92.0%	-	
EUD-600S170DV				
I <sub>o</sub> = 1360 mA	90.0%	92.0%	-	
I <sub>o</sub> = 1700 mA	89.5%	91.5%	-	
EUD-600S210DV				
I <sub>o</sub> = 1680 mA	90.0%	92.0%	-	
I <sub>o</sub> = 2100 mA	89.5%	91.5%	-	
EUD-600S280DV				
I <sub>o</sub> = 2240 mA	91.0%	93.0%	-	
I <sub>o</sub> = 2800 mA	90.0%	92.0%	-	
EUD-600S420DV				
I <sub>o</sub> = 3360 mA	90.5%	92.5%	-	
I <sub>o</sub> = 4200 mA	89.5%	91.5%	-	
EUD-600S560DV				
I <sub>o</sub> = 4480 mA	90.0%	92.0%	-	
I <sub>o</sub> = 5600 mA	89.5%	91.5%	-	
EUD-600S740DV				
I <sub>o</sub> = 5920 mA	89.5%	91.5%	-	
I <sub>o</sub> = 7400 mA	89.0%	91.0%	-	
EUD-600S980DV				
I <sub>o</sub> = 7840 mA	90.0%	92.0%	-	
I <sub>o</sub> = 9800 mA	89.5%	91.5%	-	
EUD-600S12ADV				
I <sub>o</sub> = 10000 mA	89.5%	91.5%	-	
I <sub>o</sub> = 12500 mA	89.0%	91.0%	-	

## General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 220 Vac input:				
EUD-600S140DV				
I <sub>o</sub> = 1100 mA	92.5%	94.5%	-	
I <sub>o</sub> = 1400 mA	92.0%	94.0%	-	
EUD-600S170DV				
I <sub>o</sub> = 1360 mA	92.0%	94.0%	-	
I <sub>o</sub> = 1700 mA	92.0%	94.0%	-	
EUD-600S210DV				
I <sub>o</sub> = 1680 mA	92.5%	94.5%	-	
I <sub>o</sub> = 2100 mA	92.0%	94.0%	-	
EUD-600S280DV				
I <sub>o</sub> = 2240 mA	93.0%	95.0%	-	
I <sub>o</sub> = 2800 mA	92.5%	94.5%	-	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
EUD-600S420DV				
I <sub>o</sub> = 3360 mA	92.5%	94.5%	-	
I <sub>o</sub> = 4200 mA	92.0%	94.0%	-	
EUD-600S560DV				
I <sub>o</sub> = 4480 mA	92.5%	94.5%	-	
I <sub>o</sub> = 5600 mA	92.0%	94.0%	-	
EUD-600S740DV				
I <sub>o</sub> = 5920 mA	92.0%	94.0%	-	
I <sub>o</sub> = 7400 mA	91.5%	93.5%	-	
EUD-600S980DV				
I <sub>o</sub> = 7840 mA	92.0%	94.0%	-	
I <sub>o</sub> = 9800 mA	91.0%	93.0%	-	
EUD-600S12ADV				
I <sub>o</sub> = 10000 mA	91.5%	93.5%	-	
I <sub>o</sub> = 12500 mA	91.0%	93.0%	-	
Efficiency at 277 Vac input:				
EUD-600S140DV				
I <sub>o</sub> = 1100 mA	93.0%	95.0%	-	
I <sub>o</sub> = 1400 mA	92.5%	94.5%	-	
EUD-600S170DV				
I <sub>o</sub> = 1360 mA	92.5%	94.5%	-	
I <sub>o</sub> = 1700 mA	92.0%	94.0%	-	
EUD-600S210DV				
I <sub>o</sub> = 1680 mA	92.5%	94.5%	-	
I <sub>o</sub> = 2100 mA	92.0%	94.0%	-	
EUD-600S280DV				
I <sub>o</sub> = 2240 mA	93.0%	95.0%	-	
I <sub>o</sub> = 2800 mA	92.5%	94.5%	-	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
EUD-600S420DV				
I <sub>o</sub> = 3360 mA	93.0%	95.0%	-	
I <sub>o</sub> = 4200 mA	92.0%	94.0%	-	
EUD-600S560DV				
I <sub>o</sub> = 4480 mA	93.0%	95.0%	-	
I <sub>o</sub> = 5600 mA	92.5%	94.5%	-	
EUD-600S740DV				
I <sub>o</sub> = 5920 mA	92.5%	94.5%	-	
I <sub>o</sub> = 7400 mA	91.5%	93.5%	-	
EUD-600S980DV				
I <sub>o</sub> = 7840 mA	92.5%	94.5%	-	
I <sub>o</sub> = 9800 mA	91.5%	93.5%	-	
EUD-600S12ADV				
I <sub>o</sub> = 10000 mA	92.0%	94.0%	-	
I <sub>o</sub> = 12500 mA	91.5%	93.5%	-	

## General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Standby power	-	-	0.5 W	Measured at 230Vac/50Hz; Dimming off
MTBF	-	200,000 Hours	-	Measured at 220Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	90,000 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	-	+89°C	
Operating Case Temperature for Warranty Tc_w	-40°C	-	+75°C	Case temperature for 7 years warranty. <i>Please see Inventronics Warranty Statement for complete details.</i>
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 100%RH
Dimensions Inches (L x W x H) Millimeters (L x W x H)	9.84 x 5.67 x 1.91 250 x 144 x 48.5			With mounting ear 10.83x 5.67 x 1.91 275 x 144 x 48.5
Net Weight	-	3515 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	EUD-600S140DV EUD-600S170DV EUD-600S210DV EUD-600S280DV EUD-600S420DV EUD-600S560DV EUD-600S740DV EUD-600S980DV EUD-600S12ADV	10%loset	-	loset	1100 mA ≤ loset ≤ 1400 mA 1360 mA ≤ loset ≤ 1700 mA 1680 mA ≤ loset ≤ 2100 mA 2240 mA ≤ loset ≤ 2800 mA 3360 mA ≤ loset ≤ 4200 mA 4480 mA ≤ loset ≤ 5600 mA 5920 mA ≤ loset ≤ 7400 mA 7840 mA ≤ loset ≤ 9800 mA 10000 mA ≤ loset ≤ 12500 mA
	EUD-600S140DV EUD-600S170DV EUD-600S210DV EUD-600S280DV EUD-600S420DV EUD-600S560DV EUD-600S740DV EUD-600S980DV EUD-600S12ADV	110 mA 136 mA 168 mA 224 mA 336 mA 448 mA 592 mA 784 mA 1000 mA	-	loset	110 mA ≤ loset < 1100 mA 136 mA ≤ loset < 1360 mA 168 mA ≤ loset < 1680 mA 224 mA ≤ loset < 2240 mA 336 mA ≤ loset < 3360 mA 448 mA ≤ loset < 4480 mA 592 mA ≤ loset < 5920 mA 784 mA ≤ loset < 7840 mA 1000 mA ≤ loset < 10000 mA



## Dimming Specifications

Parameter	Min.	Typ.	Max.	Notes
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.

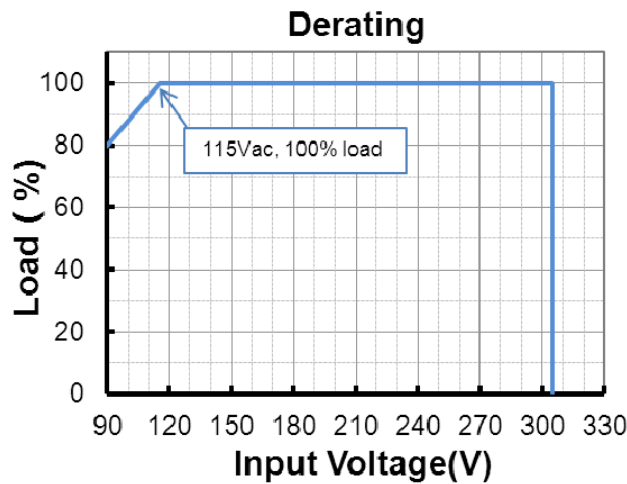
## Safety & EMC Compliance

Safety Category	Standard
CE	EN 61347-1, EN61347-2
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
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 <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

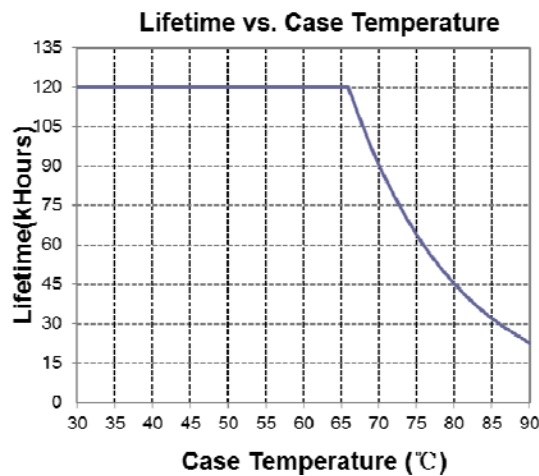


- Note:** (1) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.
- (2) To perform electric strength (hi-pot) testing, the "GDT ground disconnect" (nut and metal lock 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.

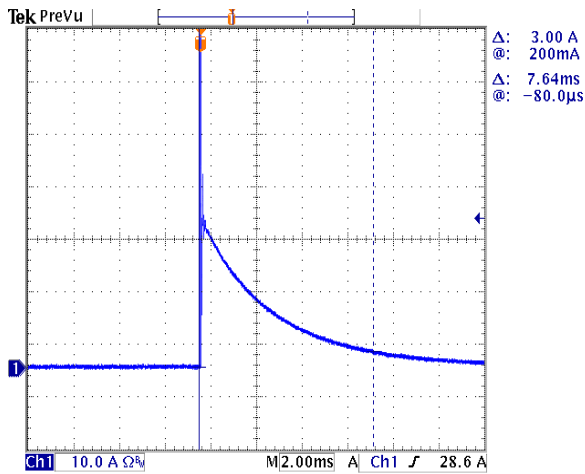
## Derating



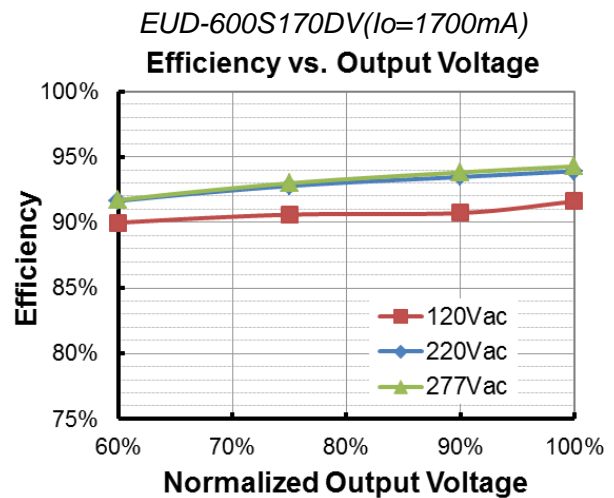
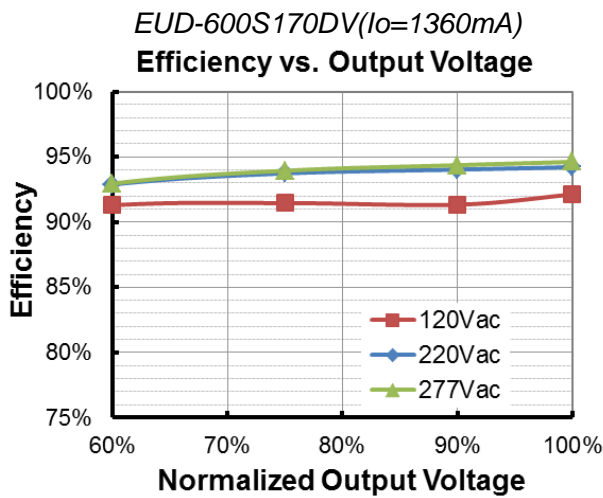
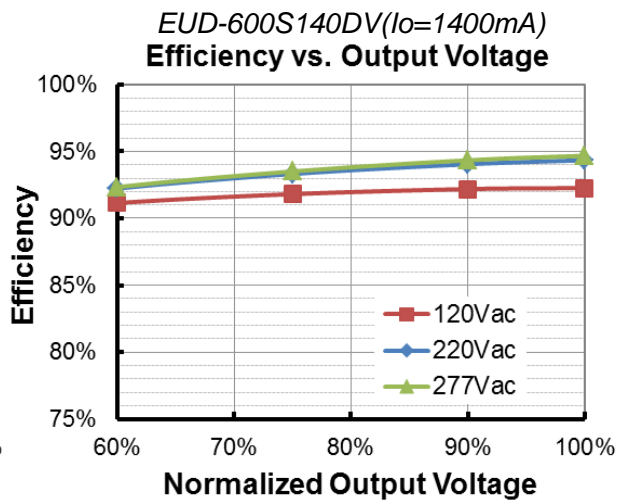
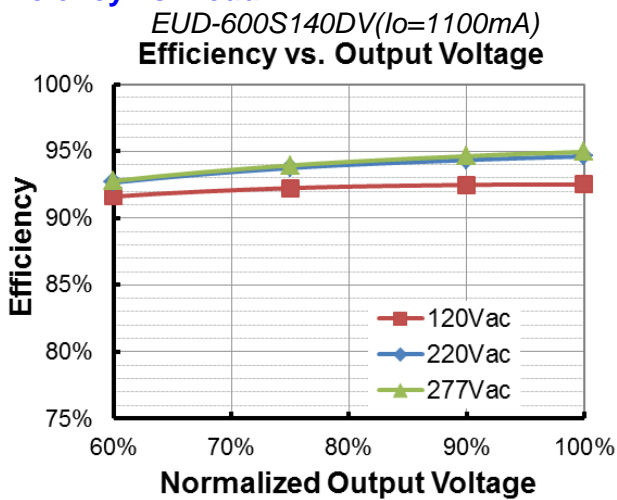
## Lifetime vs. Case Temperature

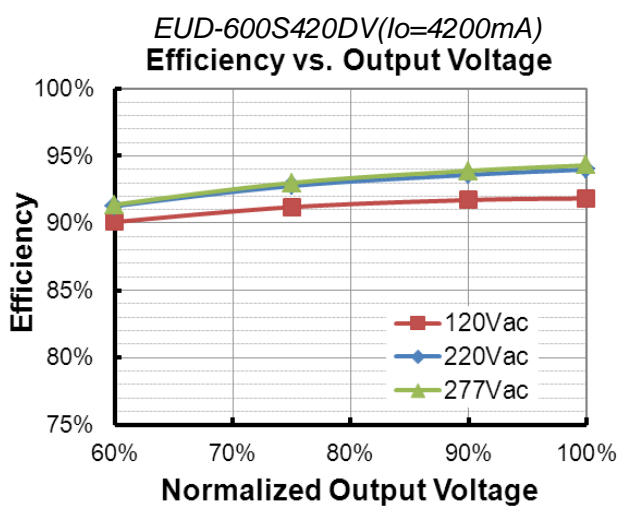
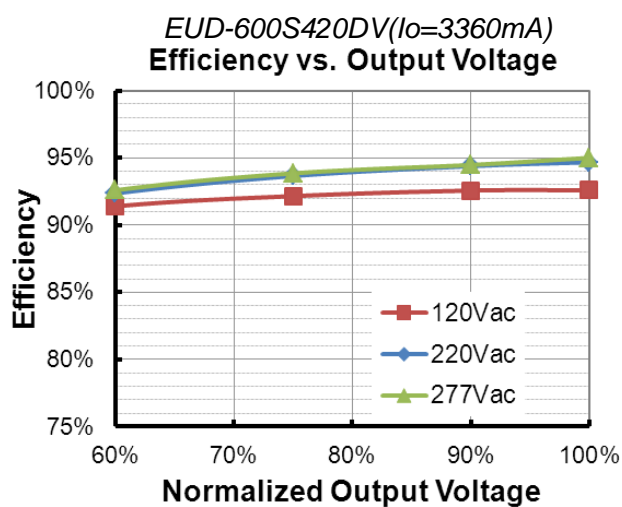
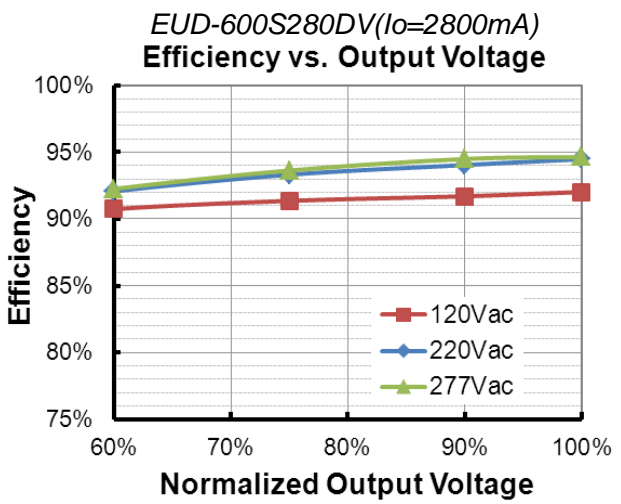
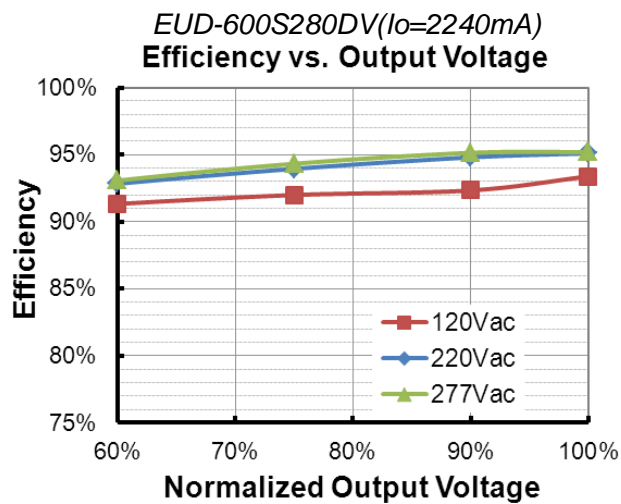
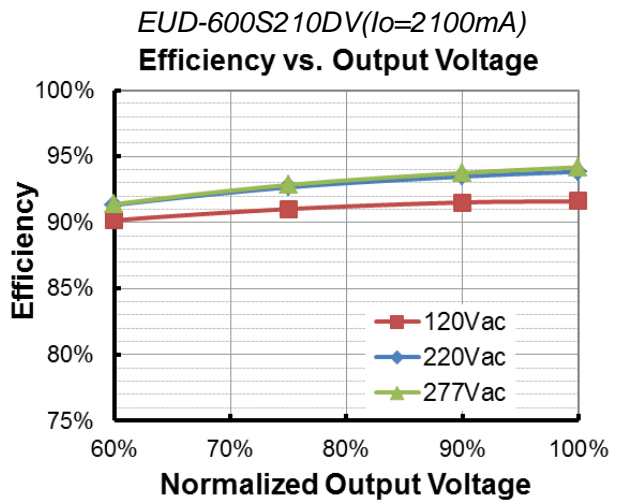
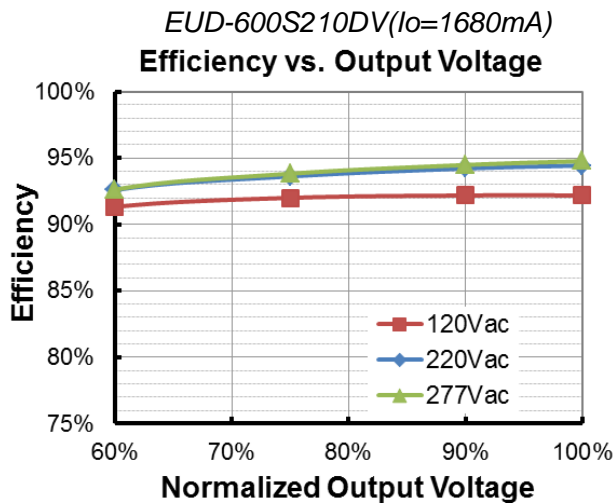


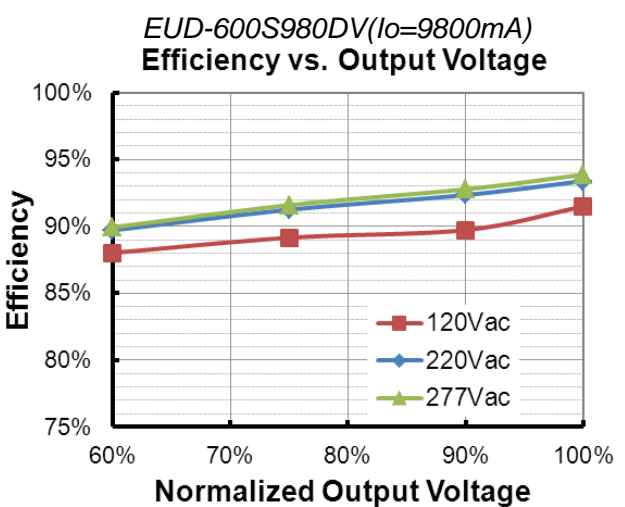
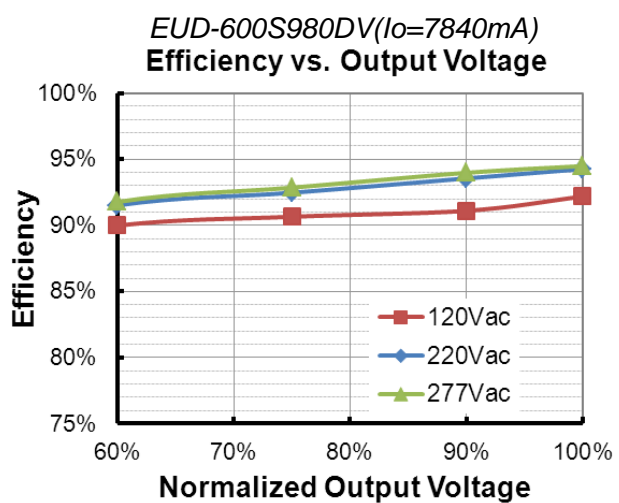
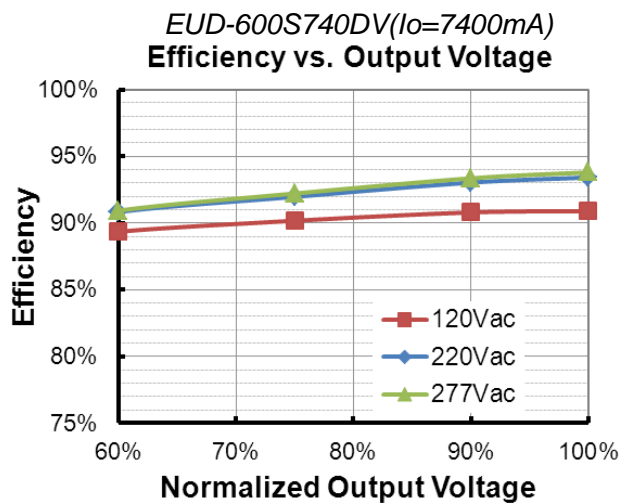
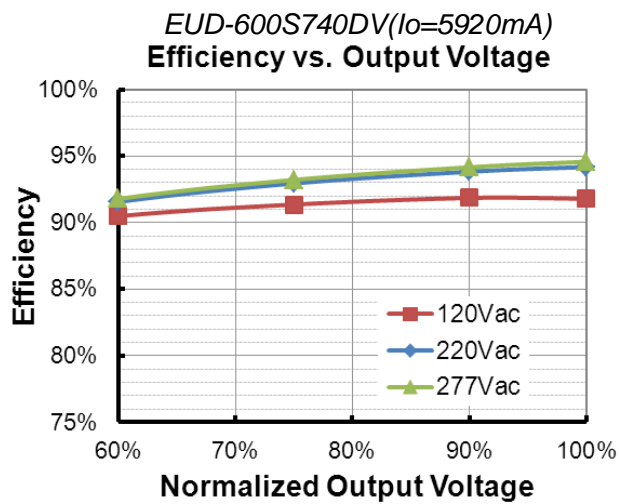
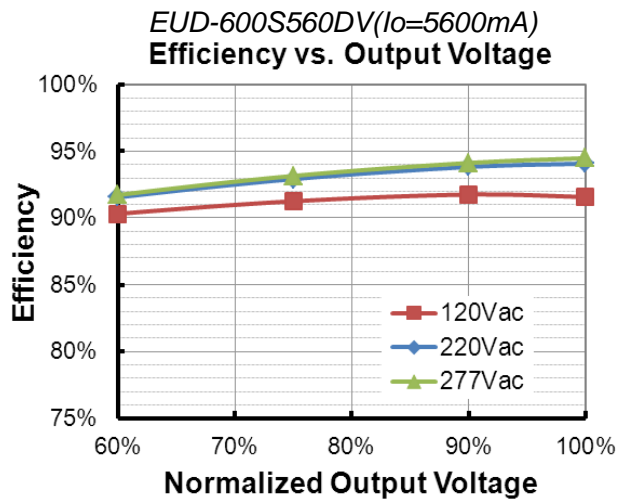
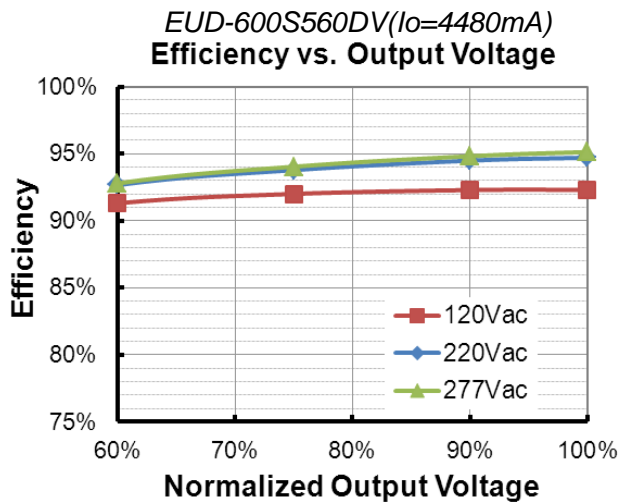
## Inrush Current Waveform

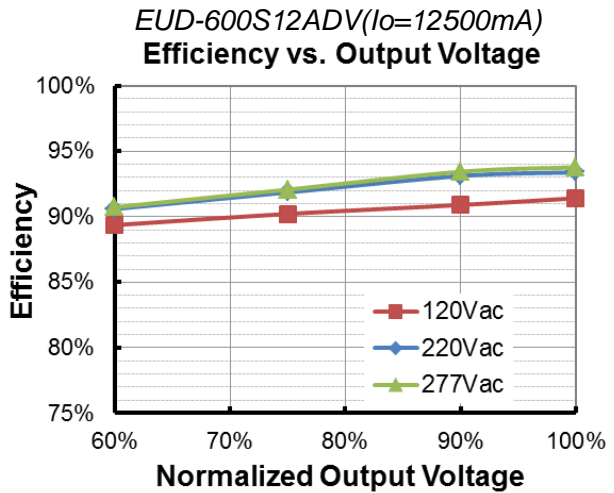
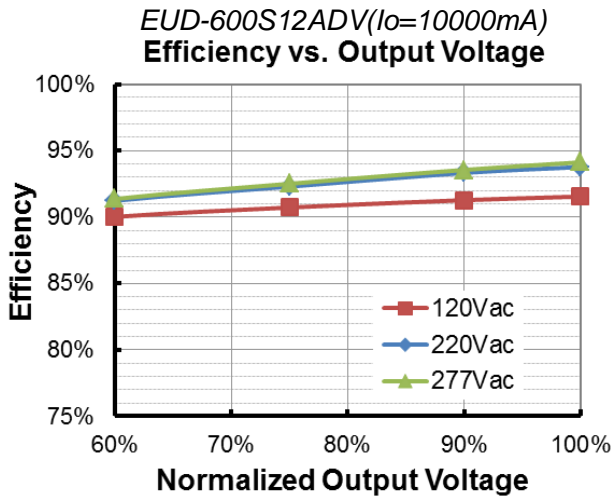


## Efficiency vs. Load

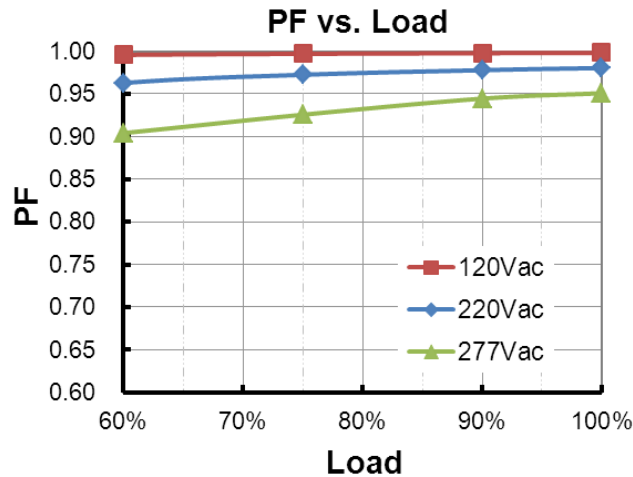




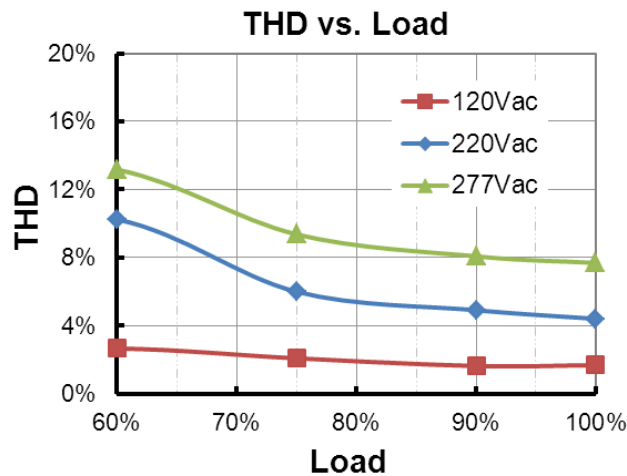




## Power Factor



## Total Harmonic Distortion



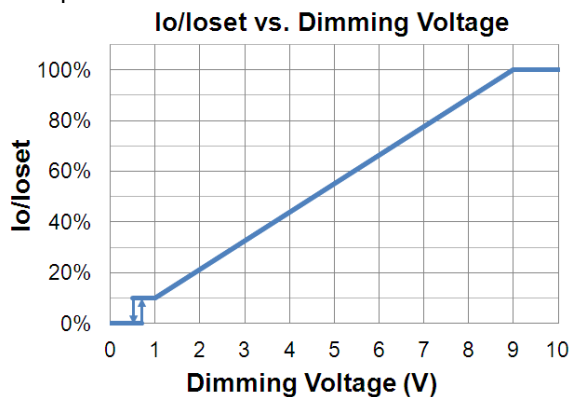
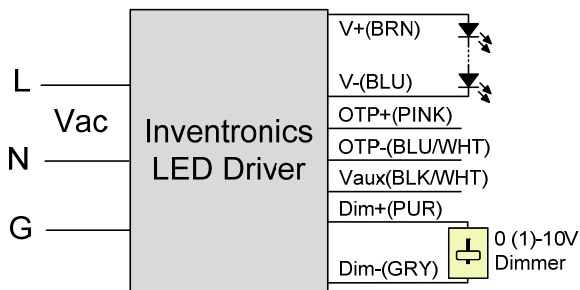
## Protection Functions

Parameter		Min.	Typ.	Max.	Notes
External Thermal Protection NTC	R1	-	7.81 kOhm	-	When R_NTC falls below R1, External Thermal Protection is triggered, reducing output current until R2 is reached.
	R2	-	4.16 kOhm	-	When R_NTC is less than R2, output current is reduced to the programmed "Protection Current Floor."
	Protection Current Floor	10%loset	60%loset	100%loset	10%loset > I <sub>omin</sub> (default setting is 60%)
I <sub>omin</sub>		60%loset	100%loset	10%loset ≤ I <sub>omin</sub> (default setting is 60%)	
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.

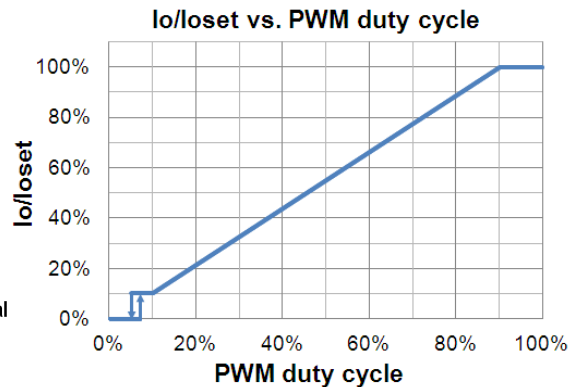
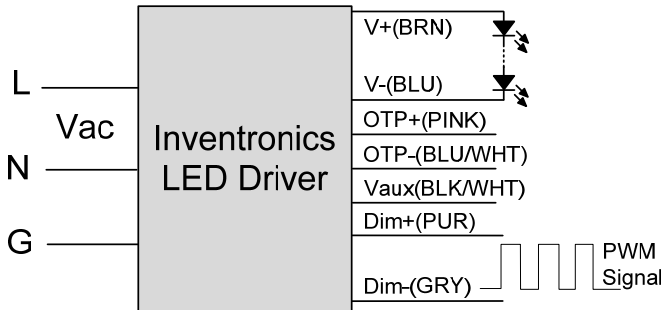


### Implementation 1: DC Input

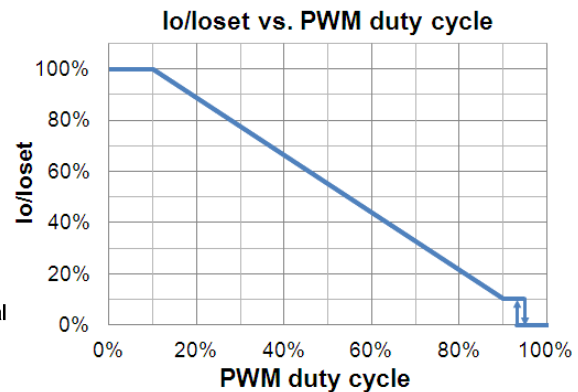
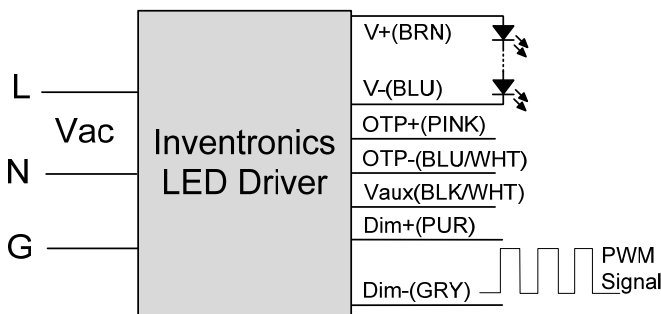
**Notes:**

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

## ● Time Dimming

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

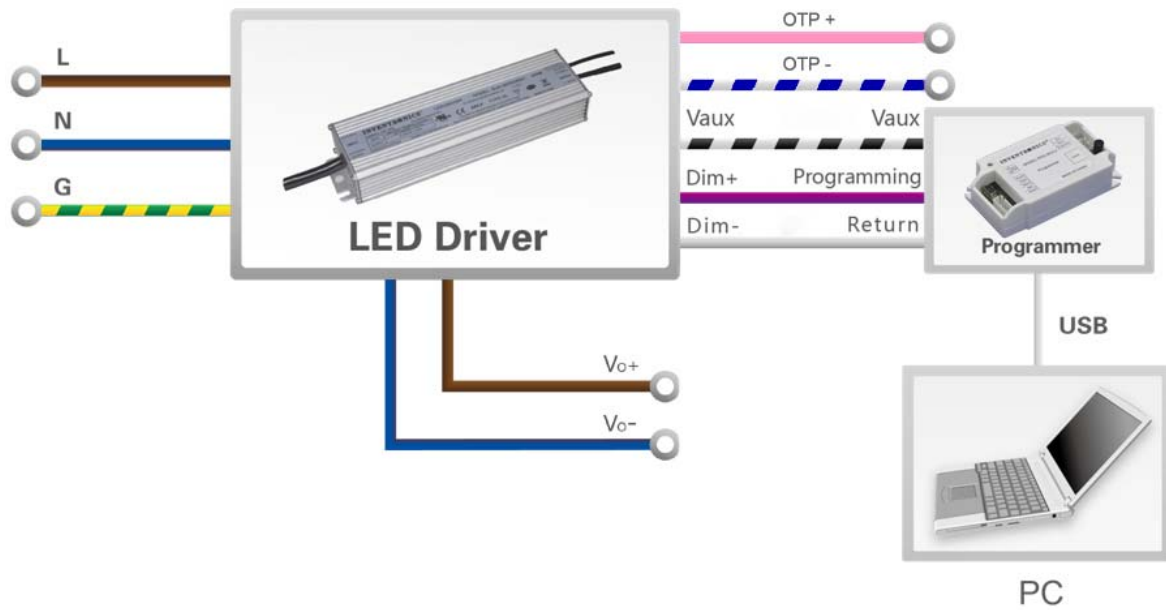
- **Self Adapting-Midnight:** Automatically adjusts the dimming curve based on the on-time of past two days (if difference <15 minutes), assuming that the center point of the dimming curve is midnight local time.
- **Self Adapting-Percentage:** Automatically adjusts the on-time of each step by a constant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

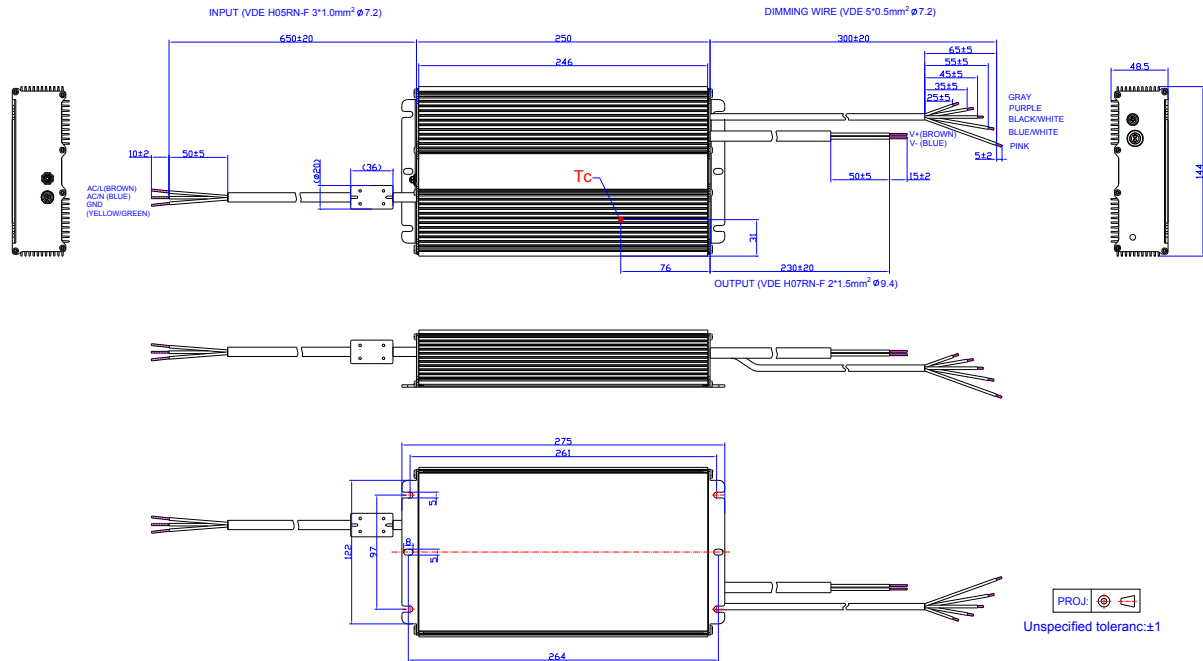


**Note:** The driver does not need to be powered on during the programming process.

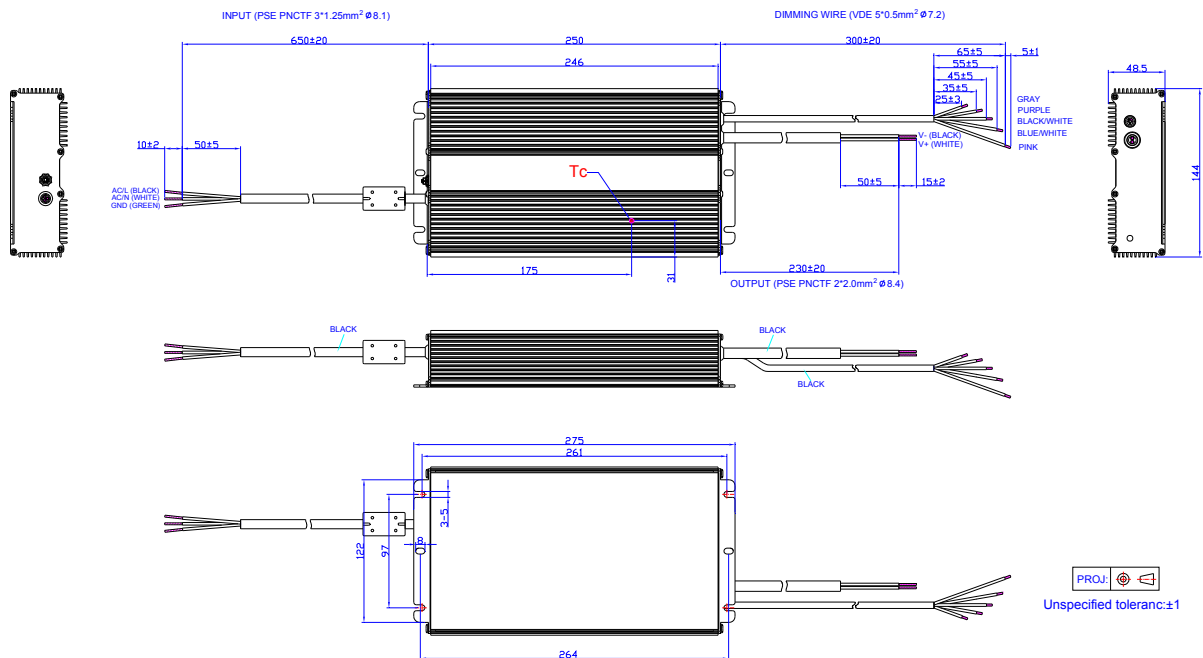
- Please refer to [PRG-MUL2](#) (Programmer) datasheet for details.

## Mechanical Outline

EUD-600SxxxDV



## PSE TYPE 1: EUD-600SxxxDV-00P1



## 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
2016-03-28	A	Datasheets Release	/	/
2017-03-16	B	Output Specifications	Temperature Coefficient of loiset	Updated
		Mechanical Outline	/	Updated
2017-06-15	C	KC/Global-mark	/	Added
		Models	EUD-600S140/12ADV	Added
		Models	Notes	Updated
		Operating Area	EUD-600S140/12ADV	Added
		No Load Output Voltage	EUD-600S140/12ADV	Added
		Efficiency at 120/220/227Vac	EUD-600S140/12ADV	Added
		Dimming Output Range	EUD-600S140/12ADV	Added
		Efficiency vs. Load	EUD-600S140/12ADV	Added
2017-10-25	D	Features	Always-on Auxiliary Power	Added
		Features	7 Years Warranty	Added
		Input Specifications	PF/THD	Updated
		General Specifications	Operating Case Temperature for Warranty Tc_w	Updated
2018-01-10	E	Models	EUD-600S210DV	Added
		Models	Notes (4)	Updated
		I-V Operating Area	EUD-600S210DV	Added
		Output Current Setting(loiset) Range	EUD-600S210DV	Added
		Output Current Setting Range with Constant Power	EUD-600S210DV	Added
		Output Specifications	No Load Output Voltage	Updated
		General Specifications	Lifetime	Updated
		Operating Case Temperature for Warranty Tc_w	+70°C	+75°C
		Efficiency at 120 Vac input	EUD-600S210DV	Added
		Efficiency at 220 Vac input	EUD-600S210DV	Added
		Efficiency at 277 Vac input	EUD-600S210DV	Added
		Dimming Specifications	Dimming Output Range	Updated
		Lifetime vs. Case Temperature	/	Updated
		Efficiency vs. Load	EUD-600S210DV	Added

## Revision History

Change Date	Rev.	Description of Change		
		Item	From	To
2018-05-14	F	Models	EUD-600S170DV	Added
		Models	Note(4)(5)	Updated
		I-V Operating Area	EUD-600S170DV	Added
		Output Current Setting(losset) Range	EUD-600S170DV	Added
		Output Current Setting Range with Constant Power	EUD-600S170DV	Added
		Output Specifications	No Load Output Voltage	Updated
		Efficiency at 120 Vac input	EUD-600S170DV	Added
		Efficiency at 220 Vac input	EUD-600S170DV	Added
		Efficiency at 277 Vac input	EUD-600S170DV	Added
		Dimming Specifications	Dimming Output Range	Updated
		Efficiency vs. Load	EUD-600S170DV	Added