

Features

- Ultra High Efficiency (Up to 95.0%)
- Full Power at Wide Output Current Range (Constant Power)
- Thermal Sensing and Protection for LED Module
- Isolated 0-10V/PWM/3-Timer-Modes Dimmable
- Digital Dimming
- Dim-to-Off with Standby Power ≤ 0.5 W
- Always-on Auxiliary Power: 12Vdc, 200mA (Transient Peak Current up to 400mA)
- Output Lumen Compensation
- Input Surge Protection: DM 6kV, CM 10kV
- All-Around Protection: OVP, SCP, OTP
- IP67 and UL Dry / Damp / Wet Location
- SELV Output
- TYPE HL, for use in a Class I, Division 2 hazardous (Classified) location
- 7 Years Warranty



Description

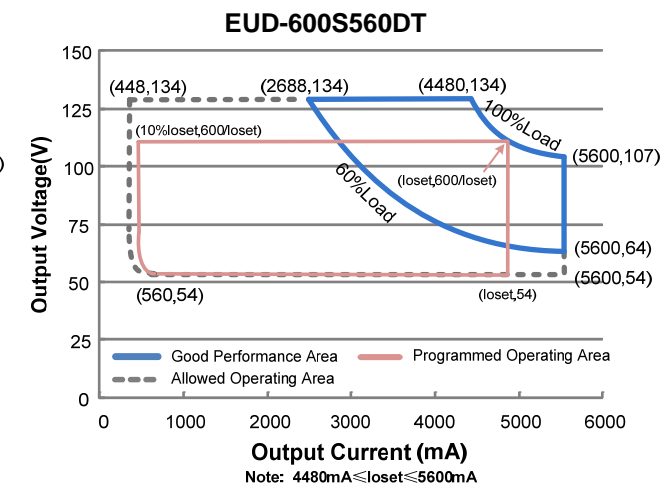
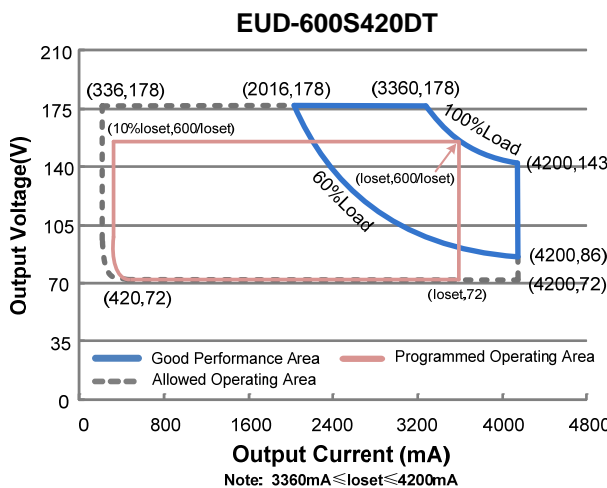
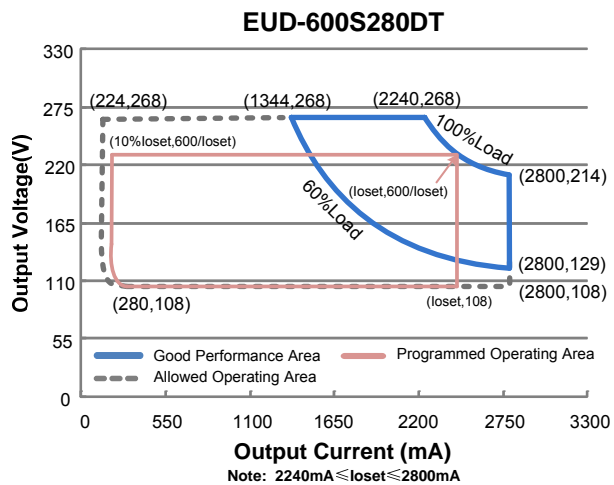
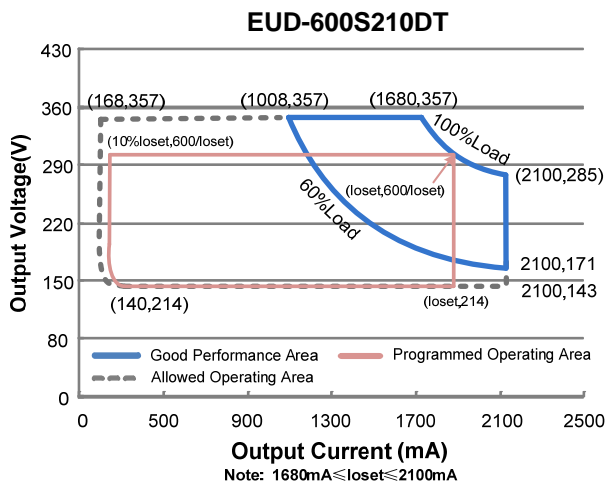
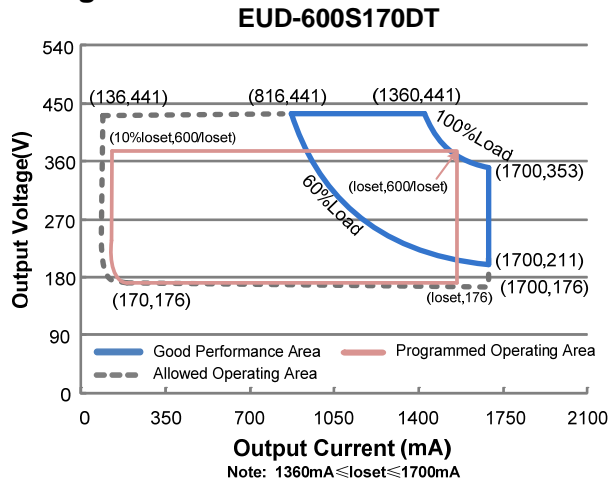
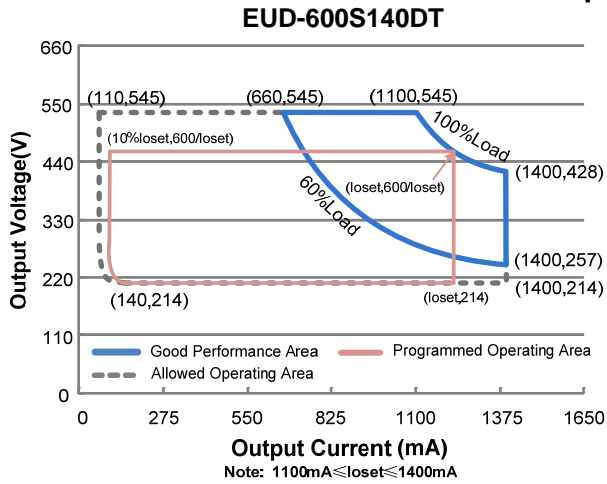
The EUD-600SxxxDT series is a 600W, constant-current, programmable LED driver that operates from 90-305 Vac input with excellent power factor. It is created for many lighting applications including high bay, high mast, aquaculture and sports, etc. It provides a dim-to-off mode with low standby power. 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.

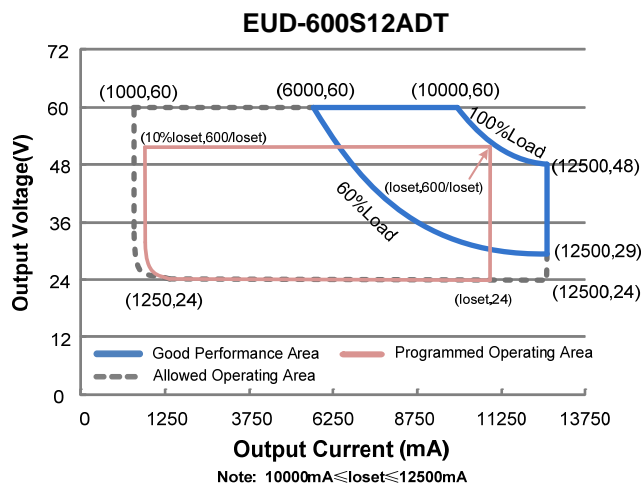
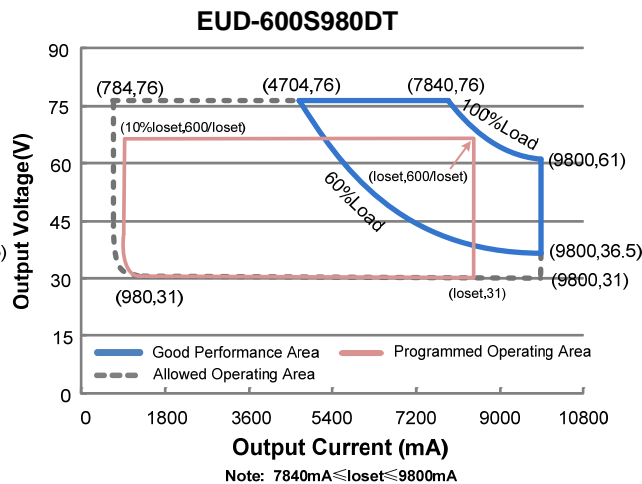
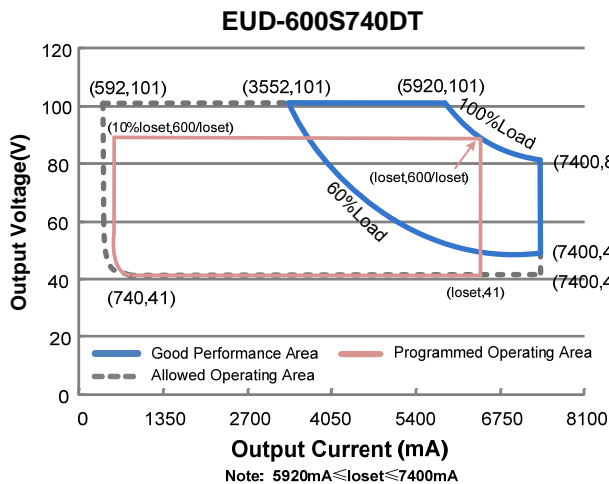
Models

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
							120Vac	220Vac	
0.11–1.40A	1.10–1.40A	1.4 A	90~305Vac/ 127~300Vdc	214 ~ 545Vdc	600 W	95.0%	0.99	0.96	EUD-600S140DT
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-600S170DT
0.168–2.10A	1.68–2.10A	2.1A	90~305Vac/ 127~300Vdc	143 ~ 357Vdc	600 W	94.5%	0.99	0.96	EUD-600S210DT
0.224-2.80A	2.24–2.80A	2.8 A	90~305Vac/ 127~300Vdc	108 ~ 268Vdc	600 W	95.0%	0.99	0.96	EUD-600S280DT
0.336-4.20A	3.36–4.20A	4.2 A	90~305Vac/ 127~300Vdc	72 ~ 178Vdc	600 W	94.5%	0.99	0.96	EUD-600S420DT
0.448-5.60A	4.48–5.60A	5.6 A	90~305Vac/ 127~300Vdc	54 ~ 134Vdc	600 W	94.5%	0.99	0.96	EUD-600S560DT
0.592-7.40A	5.92–7.40A	7.0 A	90~305Vac/ 127~300Vdc	41 ~ 101Vdc	600 W	94.0%	0.99	0.96	EUD-600S740DT ⁽⁴⁾
0.784-9.80A	7.84–9.80A	9.8 A	90~305Vac/ 127~300Vdc	31 ~ 76Vdc	600 W	94.0%	0.99	0.96	EUD-600S980DT ⁽⁴⁾
1.0 – 12.5 A	10 – 12.5 A	12.5 A	90~305Vac/ 127~300Vdc	24 ~ 60Vdc	600 W	94.0%	0.99	0.96	EUD-600S12ADT ⁽⁴⁾

- Notes:** (1) Output current range with constant power at 600W.
 (2) Certified input voltage range: UL, FCC 100-277Vac or 127-300Vdc; otherwise 100-240Vac or 127-250Vdc.
 (3) Measured at 100% load and 220Vac input (see below "General Specifications" for details).
 (4) SELV output.

I-V Operating Area





Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	90 Vac	-	305 Vac	127-300Vdc
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.75 MIU	UL8750; 277Vac/ 60Hz, grounding effectively
	-	-	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^2t)	-	-	4.70 A ² 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 100-277Vac, 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-600S140DT	110 mA	-	1400 mA	
EUD-600S170DT	136 mA	-	1700 mA	
EUD-600S210DT	168mA	-	2100 mA	
EUD-600S280DT	224 mA	-	2800 mA	
EUD-600S420DT	336 mA	-	4200 mA	
EUD-600S560DT	448 mA	-	5600 mA	
EUD-600S740DT	592 mA	-	7400 mA	
EUD-600S980DT	784 mA	-	9800 mA	
EUD-600S12ADT	1000 mA	-	12500 mA	
Output Current Setting Range with Constant Power				
EUD-600S140DT	1100 mA	-	1400 mA	
EUD-600S170DT	1360 mA	-	1700 mA	
EUD-600S210DT	1680 mA	-	2100 mA	
EUD-600S280DT	2240 mA	-	2800 mA	
EUD-600S420DT	3360 mA	-	4200 mA	
EUD-600S560DT	4480 mA	-	5600 mA	
EUD-600S740DT	5920 mA	-	7400 mA	
EUD-600S980DT	7840 mA	-	9800 mA	
EUD-600S12ADT	10000 mA	-	12500 mA	
Total Output Current Ripple (pk-pk)	-	5%lomax	10%lomax	100% load, 20 MHz BW
Output Current Ripple at < 200 Hz (pk-pk)	-	2%lomax	-	100% load
Startup Overshoot Current	-	-	10%lomax	100% load
No Load Output Voltage				
EUD-600S140DT	-	600 V	605V	
EUD-600S170DT	-	475 V	480 V	
EUD-600S210DT	-	410 V	415 V	
EUD-600S280DT	-	290 V	295 V	
EUD-600S420DT	-	190 V	200 V	
EUD-600S560DT	-	150 V	155 V	
EUD-600S740DT	-	118 V	120 V	
EUD-600S980DT	-	87 V	95 V	
EUD-600S12ADT	-	70 V	80 V	
Line Regulation	-	-	±0.5%	100% load
Load Regulation	-	-	±1.5%	
Turn-on Delay Time	-	-	0.5 s	Measured at 120Vac input, 60%-100% Load
	-	-	0.5 s	Measured at 220Vac input, 60%-100% Load
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	-	200 mA	Return terminal is "Dim"
12V Auxiliary Output Transient Peak Current	-	-	400 mA	400mA peak for a maximum duration of 300ms in a 2s period during which time the average should not exceed 200mA.

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120 Vac input:				
EUD-600S140DT				
I _o = 1100 mA	90.5%	92.5%	-	
I _o = 1400 mA	90.0%	92.0%	-	
EUD-600S170DT				
I _o = 1360 mA	90.0%	92.0%	-	
I _o = 1700 mA	89.5%	91.5%	-	
EUD-600S210DT				
I _o = 1680 mA	90.0%	92.0%	-	
I _o = 2100 mA	89.5%	91.5%	-	
EUD-600S280DT				
I _o = 2240 mA	91.0%	93.0%	-	
I _o = 2800 mA	90.0%	92.0%	-	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
EUD-600S420DT				
I _o = 3360 mA	90.5%	92.5%	-	
I _o = 4200 mA	89.5%	91.5%	-	
EUD-600S560DT				
I _o = 4480 mA	90.0%	92.0%	-	
I _o = 5600 mA	89.5%	91.5%	-	
EUD-600S740DT				
I _o = 5920 mA	89.5%	91.5%	-	
I _o = 7400 mA	89.0%	91.0%	-	
EUD-600S980DT				
I _o = 7840 mA	90.0%	92.0%	-	
I _o = 9800 mA	89.5%	91.5%	-	
EUD-600S12ADT				
I _o = 10000 mA	89.5%	91.5%	-	
I _o = 12500 mA	89.0%	91.0%	-	
Efficiency at 220 Vac input:				
EUD-600S140DT				
I _o = 1100 mA	92.5%	94.5%	-	
I _o = 1400 mA	92.0%	94.0%	-	
EUD-600S170DT				
I _o = 1360 mA	92.0%	94.0%	-	
I _o = 1700 mA	92.0%	94.0%	-	
EUD-600S210DT				
I _o = 1680 mA	92.5%	94.5%	-	
I _o = 2100 mA	92.0%	94.0%	-	
EUD-600S280DT				
I _o = 2240 mA	93.0%	95.0%	-	
I _o = 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-600S420DT				
I _o = 3360 mA	92.5%	94.5%	-	
I _o = 4200 mA	92.0%	94.0%	-	
EUD-600S560DT				
I _o = 4480 mA	92.5%	94.5%	-	
I _o = 5600 mA	92.0%	94.0%	-	
EUD-600S740DT				
I _o = 5920 mA	92.0%	94.0%	-	
I _o = 7400 mA	91.5%	93.5%	-	
EUD-600S980DT				
I _o = 7840 mA	92.0%	94.0%	-	
I _o = 9800 mA	91.0%	93.0%	-	
EUD-600S12ADT				
I _o = 10000 mA	91.5%	93.5%	-	
I _o = 12500 mA	91.0%	93.0%	-	

General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes	
Efficiency at 277 Vac input: EUD-600S140DT I _o = 1100 mA I _o = 1400 mA EUD-600S170DT I _o = 1360 mA I _o = 1700 mA EUD-600S210DT I _o = 1680 mA I _o = 2100 mA EUD-600S280DT I _o = 2240 mA I _o = 2800 mA EUD-600S420DT I _o = 3360 mA I _o = 4200 mA EUD-600S560DT I _o = 4480 mA I _o = 5600 mA EUD-600S740DT I _o = 5920 mA I _o = 7400 mA EUD-600S980DT I _o = 7840 mA I _o = 9800 mA EUD-600S12ADT I _o = 10000 mA I _o = 12500 mA	93.0% 92.5% 92.5% 92.0% 92.5% 92.0% 93.0% 92.5% 93.0% 92.0% 92.5% 91.5% 92.5% 91.5% 92.0% 91.5%	95.0% 94.5% 94.5% 94.0% 94.5% 94.0% 95.0% 94.5% 95.0% 94.0% 94.5% 93.5% 94.5% 93.5% 94.0% 93.5%	- - - - - - - - - - - - - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)	
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. T _c curve for the details
Operating Case Temperature for Safety T _{c_s}	-40°C	-	+89°C		
Operating Case Temperature for Warranty T _{c_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 × W × H) Millimeters (L × W × H)	9.84 × 5.67 × 1.91 250 × 144 × 48.5				With mounting ear 10.83 × 5.67 × 1.91 275 × 144 × 48.5
Net Weight	-	3325 g	-		

Dimming Specifications

Parameter	Min.	Typ.	Max.	Notes
Absolute Maximum Voltage on the V _{dim} (+) Pin	-20 V	-	20 V	
Source Current on V _{dim} (+)Pin	200 μA	300 μA	450 μA	V _{dim} (+) = 0 V

Dimming Specifications (Continued)

Parameter		Min.	Typ.	Max.	Notes
Dimming Output Range	EUD-600S140DT EUD-600S170DT EUD-600S210DT EUD-600S280DT EUD-600S420DT EUD-600S560DT EUD-600S740DT EUD-600S980DT EUD-600S12ADT	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-600S140DT EUD-600S170DT EUD-600S210DT EUD-600S280DT EUD-600S420DT EUD-600S560DT EUD-600S740DT EUD-600S980DT EUD-600S12ADT	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
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%	-	

Safety & EMC Compliance

Safety Category	Standard
UL/CUL	UL8750,CAN/CSA-C22.2 No. 250.13
CE	EN 61347-1, EN61347-2-13

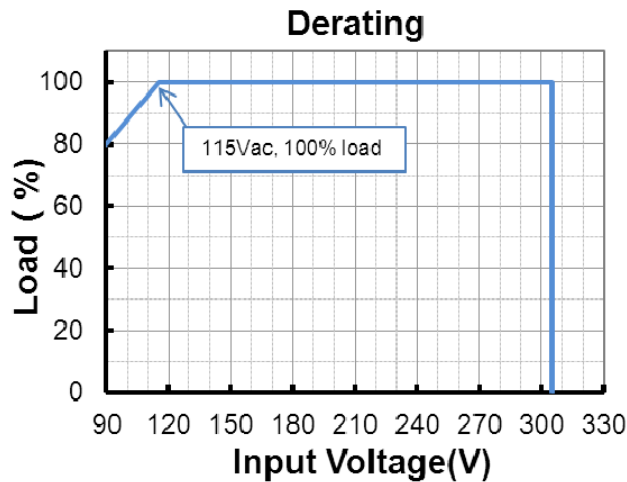
Safety & EMC Compliance (Continued)

EMI Standards	Notes
EN 55015 ⁽¹⁾	Conducted emission Test & Radiated emission Test
EN 61000-3-2	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & flicker
FCC Part 15 ⁽¹⁾	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 ⁽²⁾
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

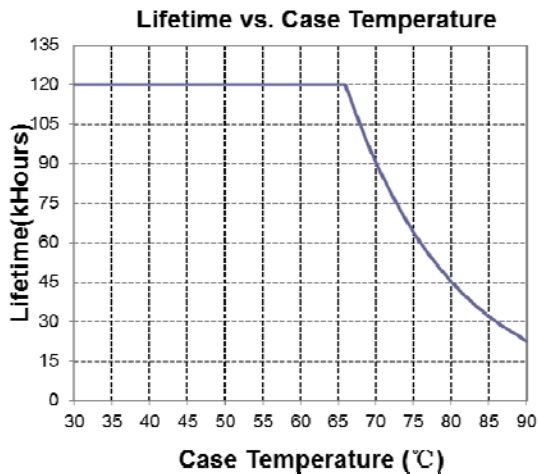
Note: (1) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.

(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.

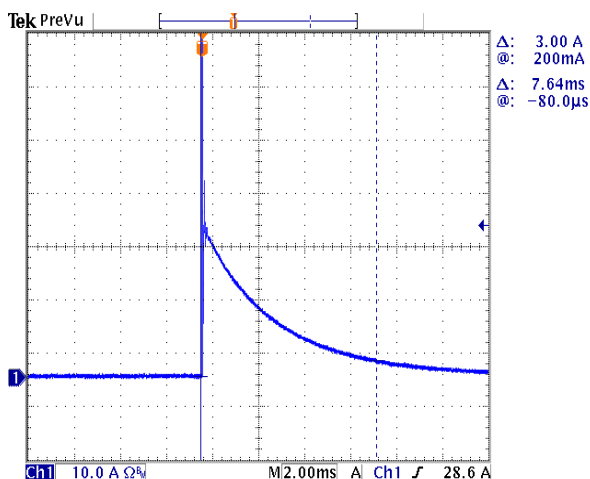
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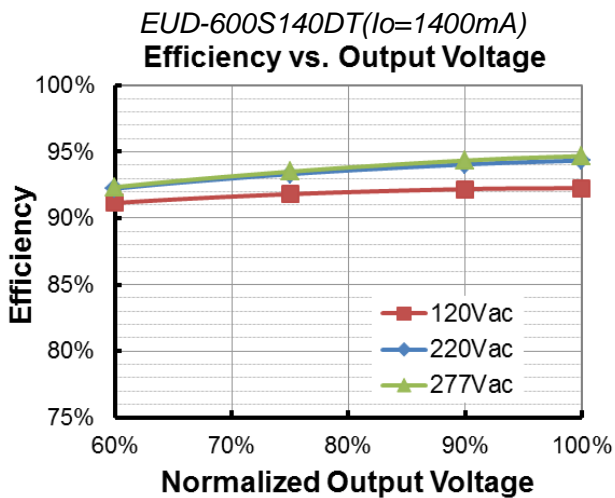
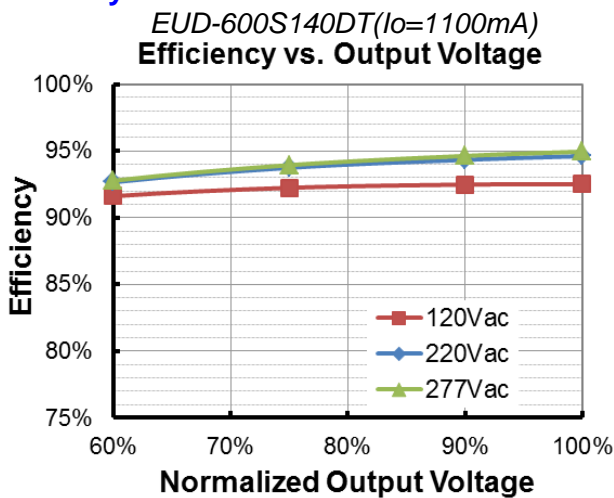
Lifetime vs. Case Temperature

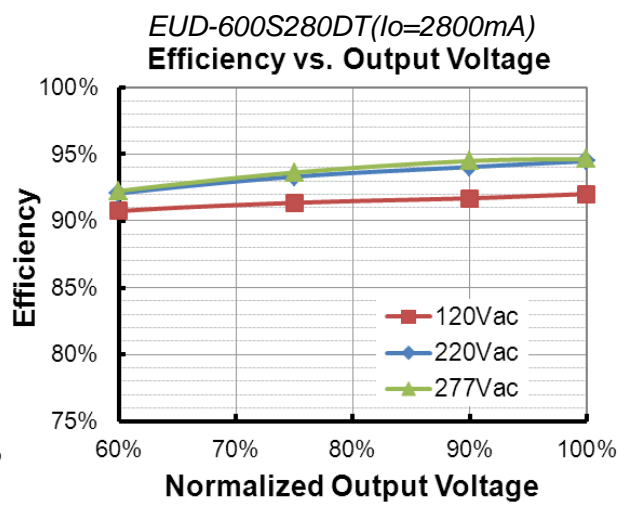
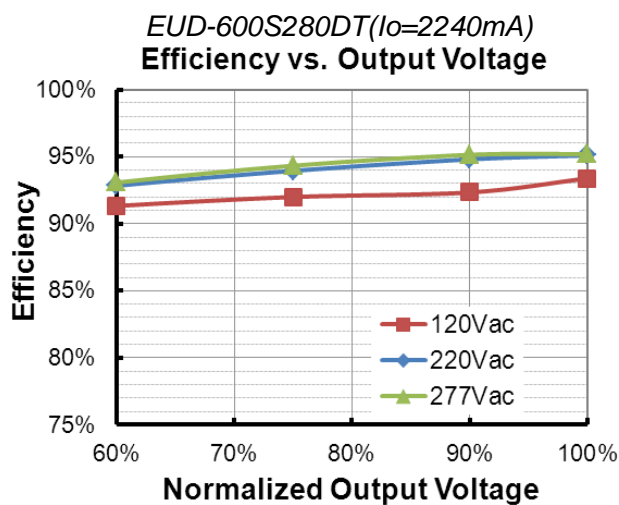
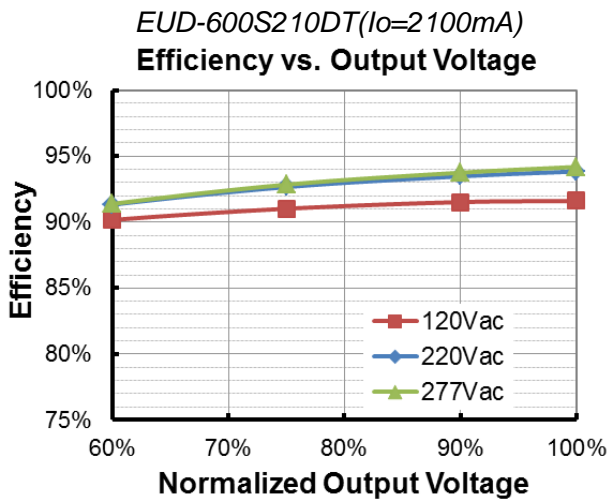
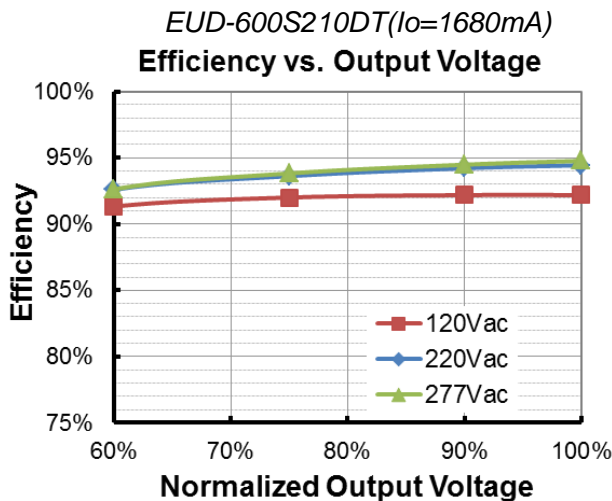
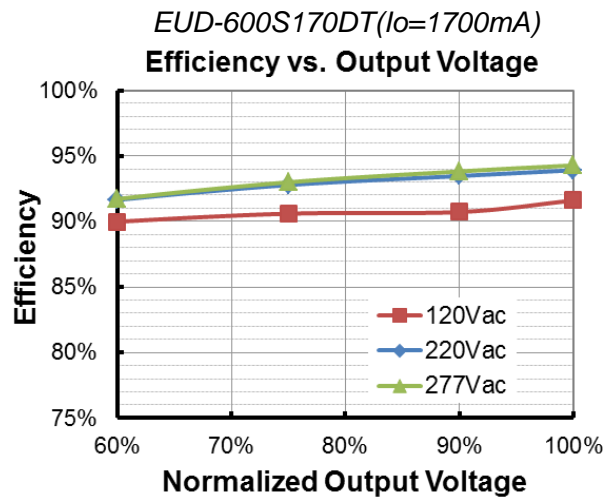
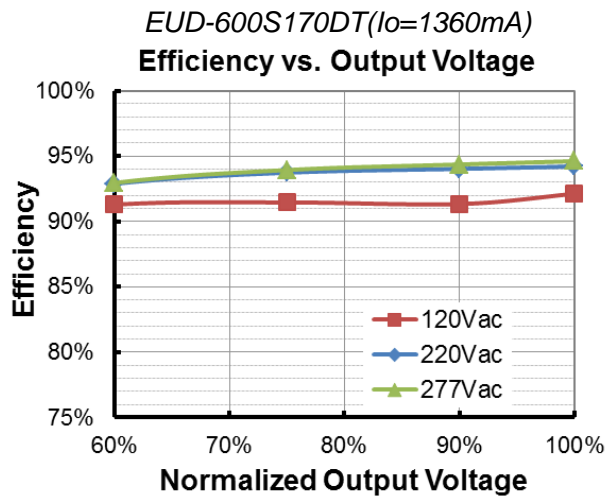


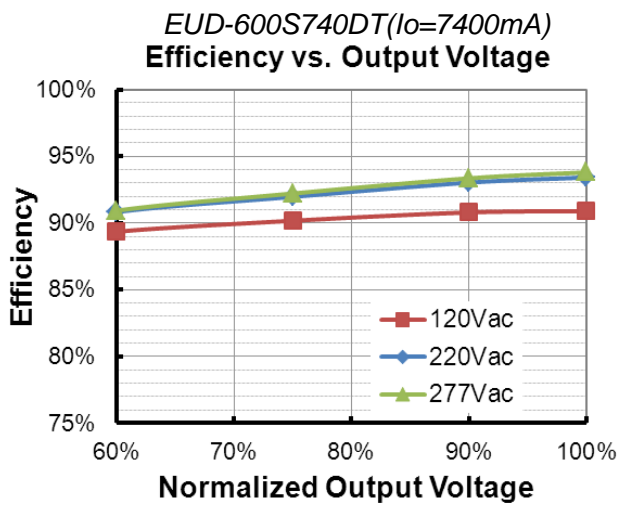
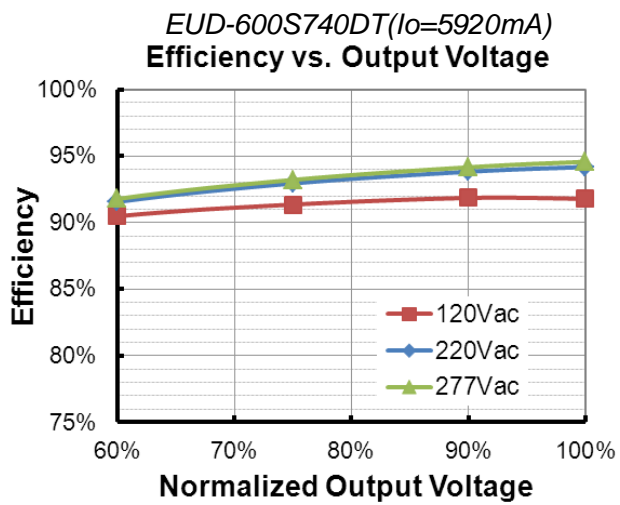
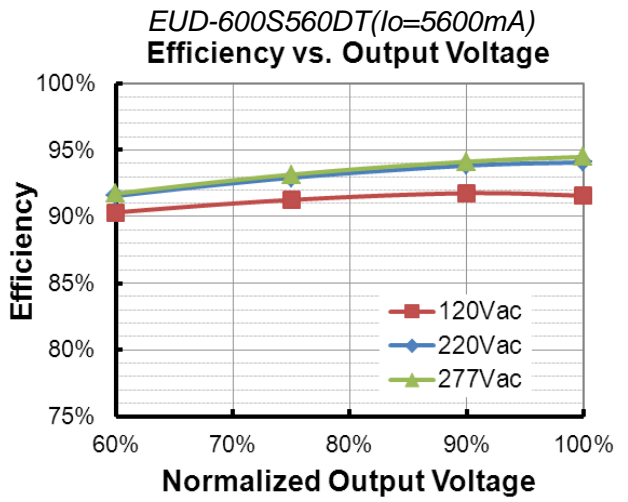
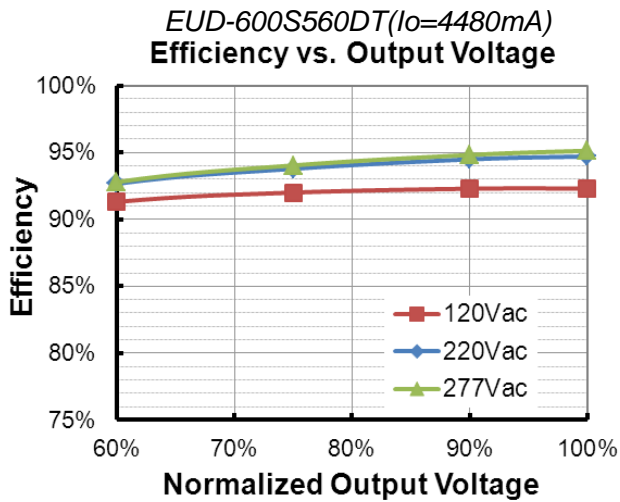
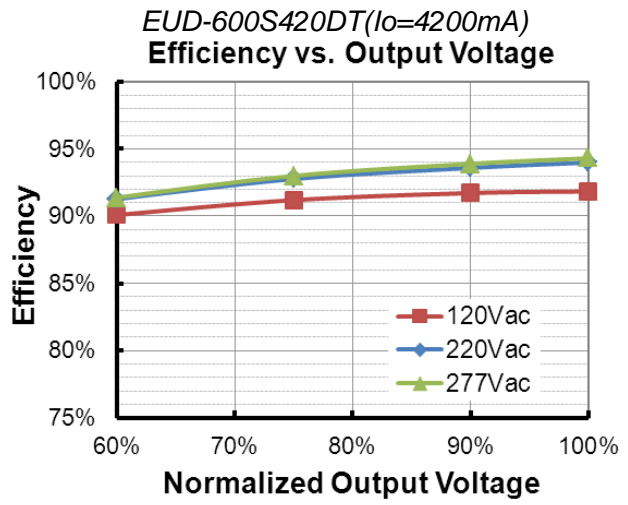
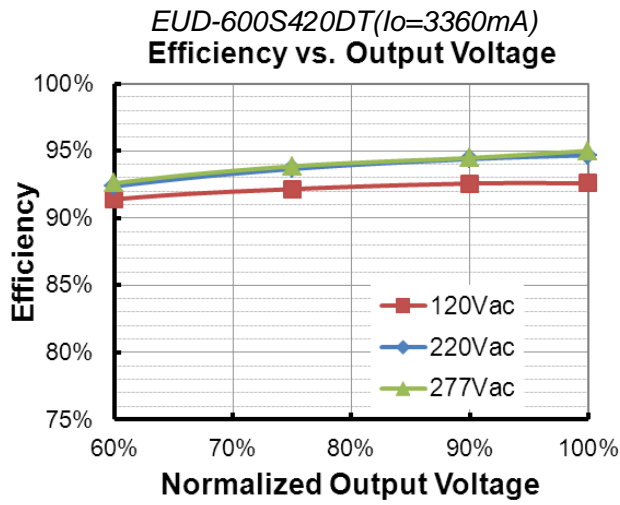
Inrush Current Waveform

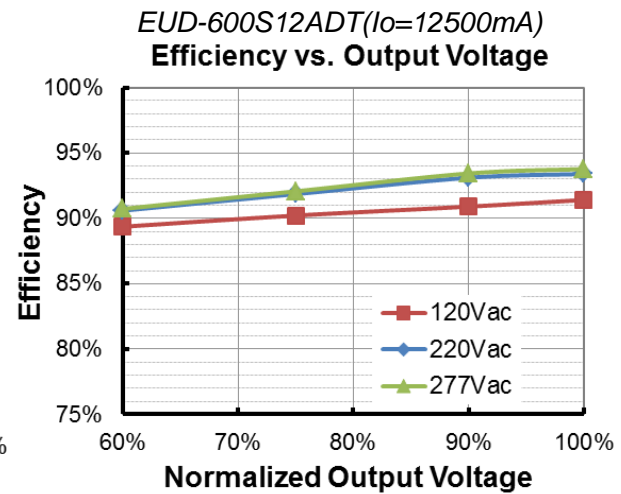
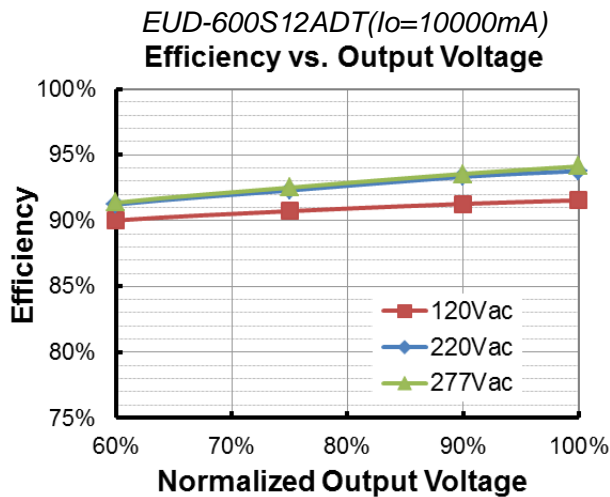
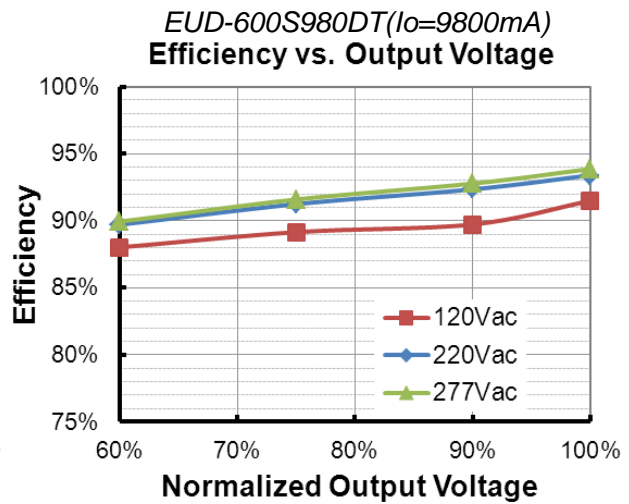
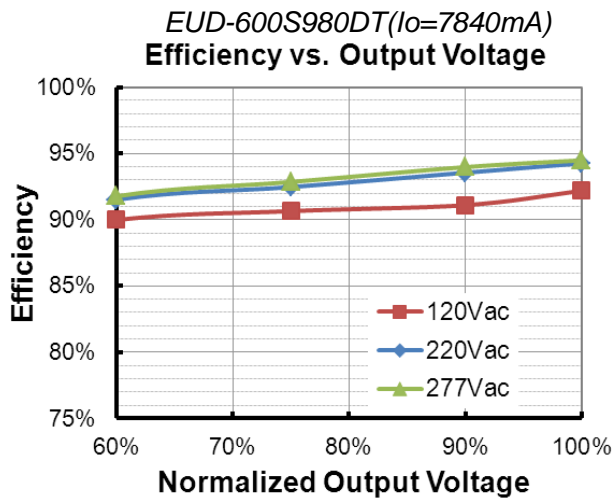


Efficiency vs. Load

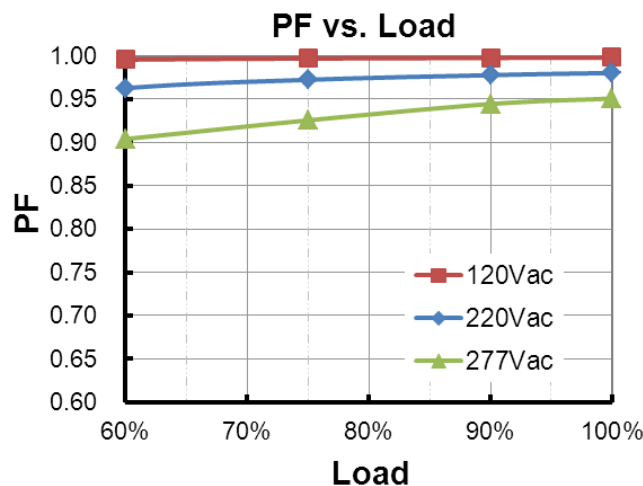




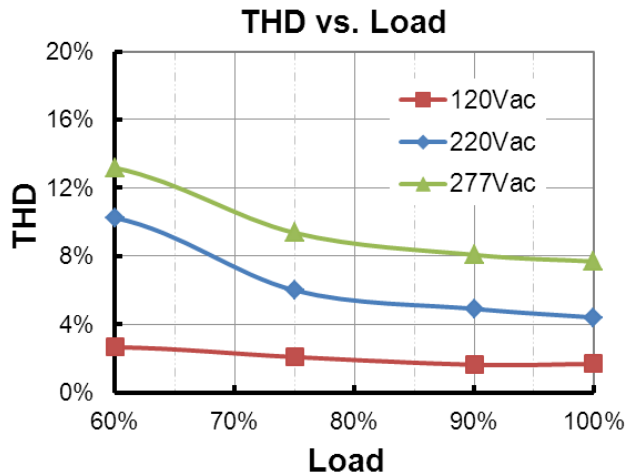




Power Factor



Total Harmonic Distortion



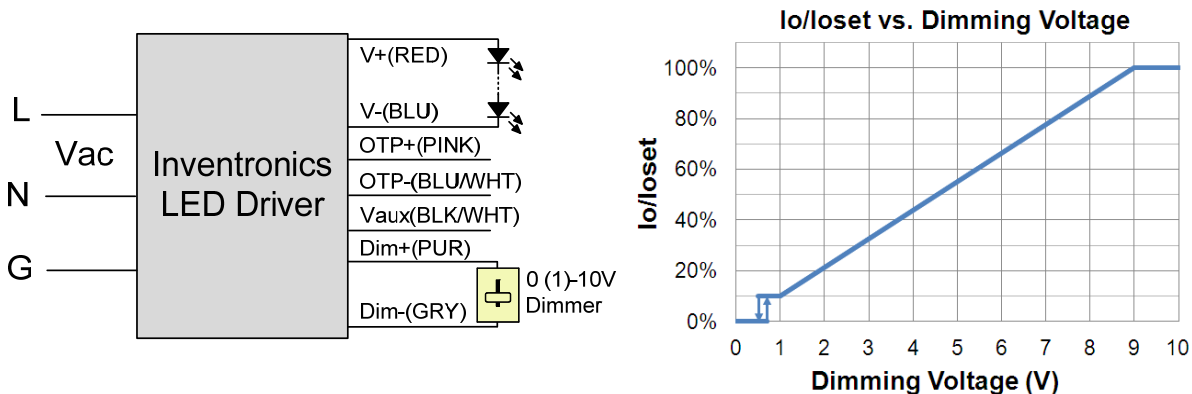
Protection Functions

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 > Iomin (default setting is 60%)
		Iomin	60%loset	100%loset	10%loset ≤ Iomin (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.



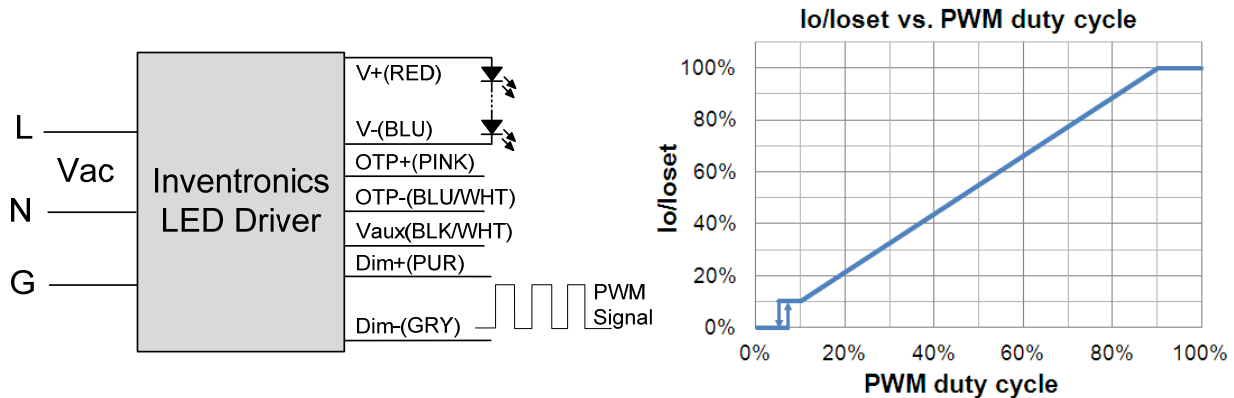
Implementation 1: DC Input

Notes:

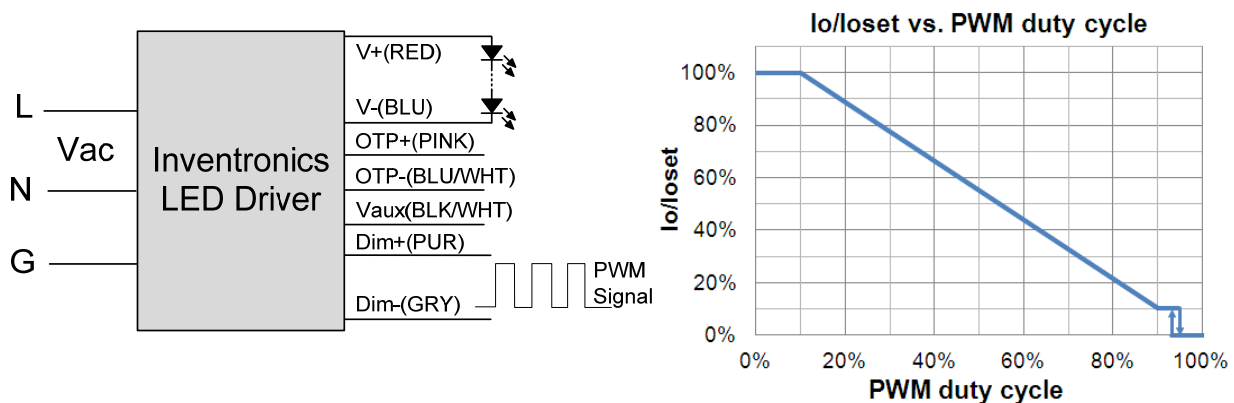
1. The dimmer can also be replaced by an active 0-10V voltage source signal or passive components like resistors and zener.
2. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
3. If 0-10V dimming is not used, Dim + should be open.

● **PWM Dimming**

The recommended implementation of the dimming control is provided below.



Implementation 2: Positive logic



Implementation 3: Negative logic

Notes:

1. If PWM dimming is not used, Dim + should be open.
2. When PWM negative logic dimming mode and Dim+ is open, the driver will output minimum current.

● **Time Dimming**

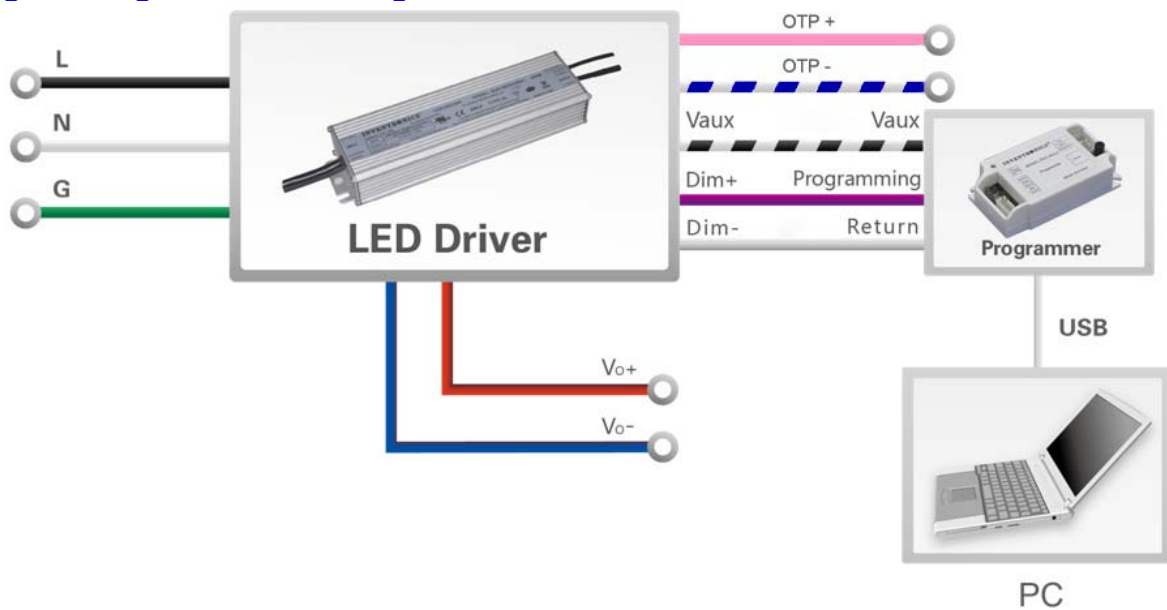
Time dimming control includes 3 kinds of modes, they are Self Adapting-Midnight, Self Adapting-Percentage and Traditional Timer.

- **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.

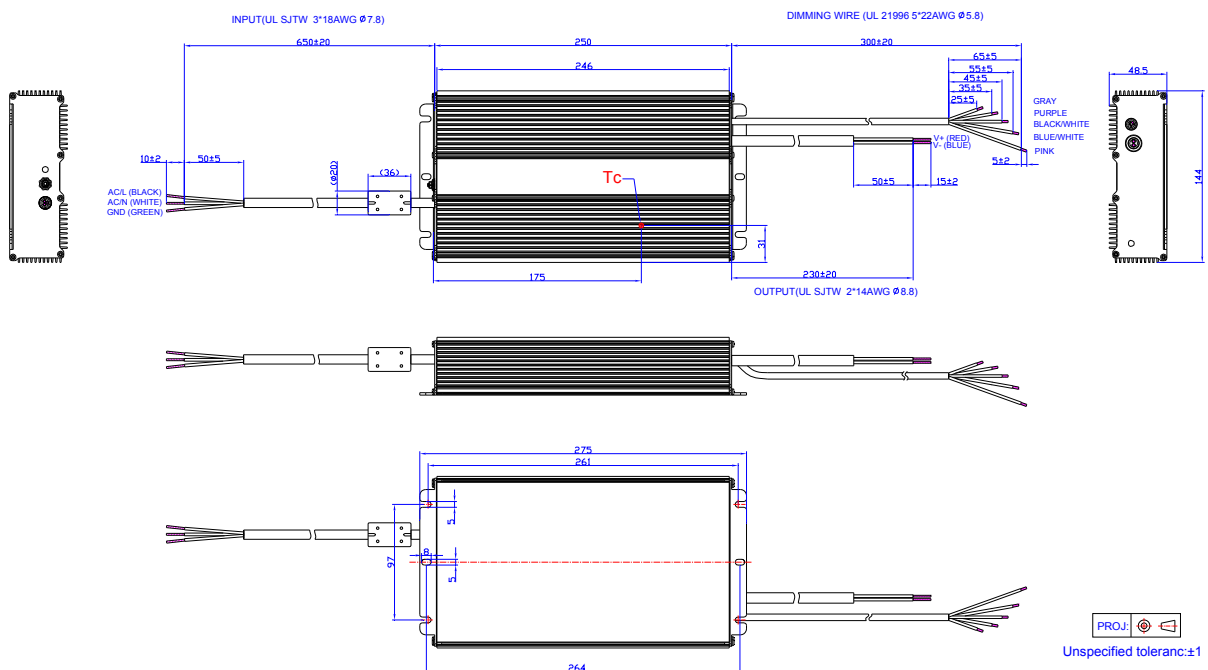
Programming Connection Diagram



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 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
2016-03-28	A	Datasheets Release	/	/
2017-06-15	B	Models	EUD-600S140/12ADT	Added
		Features	/	Updated
		Operating Area	EUD-600S140/12ADT	Added
		Output Current Setting(losset) Range	EUD-600S140/12ADT	Added
		No Load Output Voltage	EUD-600S140/12ADT	Added
		Temperature Coefficient of losset	/	Updated
		Efficiency at 120/220/227Vac	EUD-600S140/12ADT	Added
		Dimming Output Range	EUD-600S140/12ADT	Added
		Efficiency vs. Load	EUD-600S140/12ADT	Added
		Mechanical Outline	/	Updated
2017-10-25	C	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	D	Models	EUD-600S210DT	Added
		I-V Operating Area	EUD-600S210DT	Added
		Output Current Setting(losset) Range	EUD-600S210DT	Added
		Output Current Setting Range with Constant Power	EUD-600S210DT	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-600S210DT	Added
		Efficiency at 220 Vac input	EUD-600S210DT	Added
		Efficiency at 277 Vac input	EUD-600S210DT	Added
		Dimming Specifications	Dimming Output Range	Updated
		Lifetime vs. Case Temperature	/	Updated
		Efficiency vs. Load	EUD-600S210DT	Added

Revision History (Continued)

Change Date	Rev.	Description of Change		
		Item	From	To
2018-05-14	E	Models	EUD-600S170DT	Added
		I-V Operating Area	EUD-600S170DT	Added
		Output Current Setting(losset) Range	EUD-600S170DT	Added
		Output Current Setting Range with Constant Power	EUD-600S170DT	Added
		Output Specifications	No Load Output Voltage	Updated
		Efficiency at 120 Vac input	EUD-600S170DT	Added
		Efficiency at 220 Vac input	EUD-600S170DT	Added
		Efficiency at 277 Vac input	EUD-600S170DT	Added
		Dimming Specifications	Dimming Output Range	Updated
		Efficiency vs. Load	EUD-600S210DT	Added
2020-03-09	F	Features	Dimming	Updated
		Features	Always-on Auxiliary Power	Updated
		Features	Input Surge Protection	Updated
		Output Specifications	Turn-on Delay Time	Updated
		Output Specifications	12V Auxiliary Output Transient Peak Current	Added
		General Specifications	Net Weight	Updated
		Safety &EMC Compliance	/	Updated
		RoHS Compliance	/	Updated
		Format	Page footer	Updated