Features

- Ultra High Efficiency (Up to 96%)
- Full Power at Wide Output Current Range (Constant Power)
- Adjustable Output Current (AOC) with Programmability
- Isolated 0-10V/PWM/3-Timer-Modes Dimmable
- Adjustable Dimming Curve
- INV Digital Dimming, UART Based Communication Protocol
- Dim-to-Off with Standby Power ≤ 0.5W
- Minimum Dimming Level with 5% or 10% Selectable
- Hold Time Adjustable
- Fade Time Adjustable
- Always-on Auxiliary Power: 12Vdc, 250mA
- Low Inrush Current
- Output Lumen Compensation
- End-of-Life Indicator
- Input Surge Protection: DM 6kV, CM 10kV
- All-Around Protection: IOVP, IUVP, OVP, SCP, OTP
- IP66/IP67 and UL Dry/Damp/Wet Location
- TYPE HL, for Use in a Class I, Division 2 Hazardous (Classified) Location
- 5 Years Warranty

Description

The *EUM-880SxxxMx* series is an 880W, constant-current, programmable and IP66/IP67 rated LED driver that operates from 90-305 Vac input with excellent power factor. Created for many lighting applications including high mast, sports, UV-LED, aquaculture and horticulture, 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.

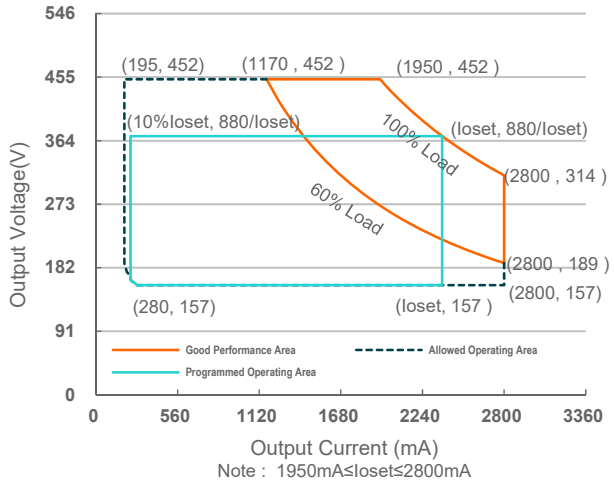
Models

Adjustable Output Current Range (A)	Full-Power Current Range (A)(1)	Default Output Current (A)	Output Voltage Range (Vdc)	Max. Output Power (W)	Typical Efficiency (2)	Typical Power Factor		Model Number (3) (4)
						120Vac	220Vac	
0.195-2.8	1.95-2.8	2.1	157-452	880	95.0%	0.99	0.96	EUM-880S280Mx
0.300-4.2	3.0-4.2	4.2	104-294	880	95.5%	0.99	0.96	EUM-880S420Mx
0.490-7.0	4.9-7.0	5.6	63.0-180	880	96.0%	0.99	0.96	EUM-880S700Mx
0.800-11.5	8.0-11.5	8.4	38.0-110	880	95.5%	0.99	0.96	EUM-880S11AMx(5)
1.630-20.0	16.3-20.0	20.0	22.0-54	880	95.5%	0.99	0.96	EUM-880S20AMx(5)

Notes: (1) Output current range with constant power at 880W.
(2) Measured at 100% load and 220Vac input (see below "General Specifications" for details).
(3) Certified input voltage range: UL, FCC 100-277Vac; otherwise 100-240Vac
(4) x = G are UL Recognized, ENEC and CCC, etc. models; x = T are UL Class P models, x = B are BIS models.
(5) SELV output

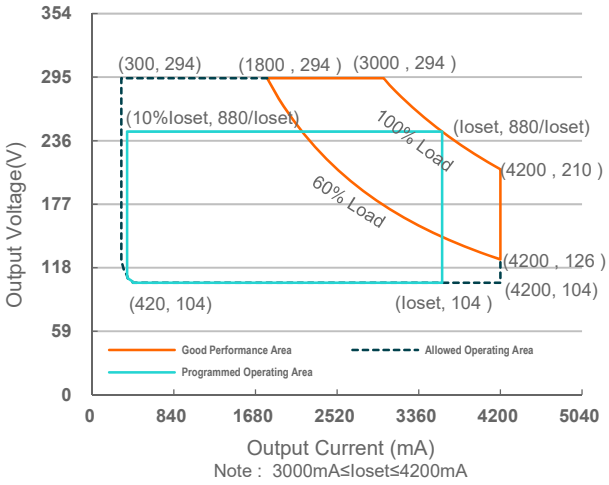
I-V Operation Area

EUM-880S280Mx



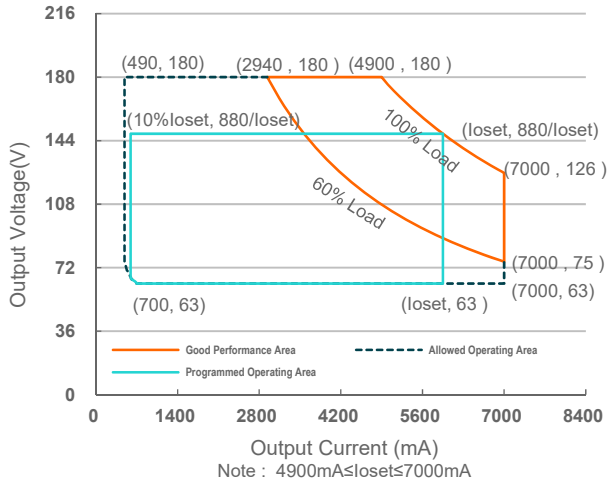
Note : 1950mA≤Ioset≤2800mA

EUM-880S420Mx



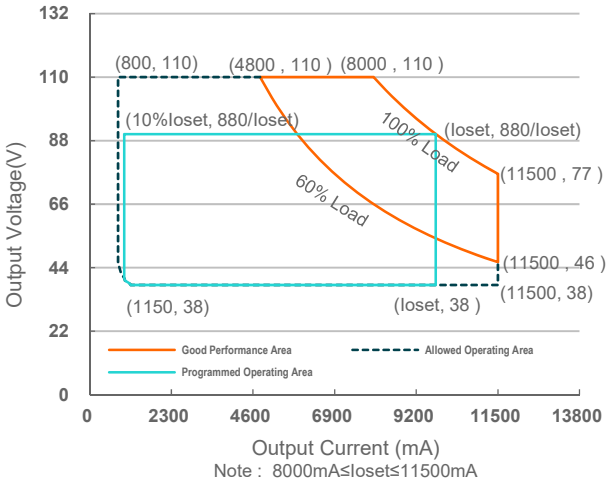
Note : 3000mA≤Ioset≤4200mA

EUM-880S700Mx



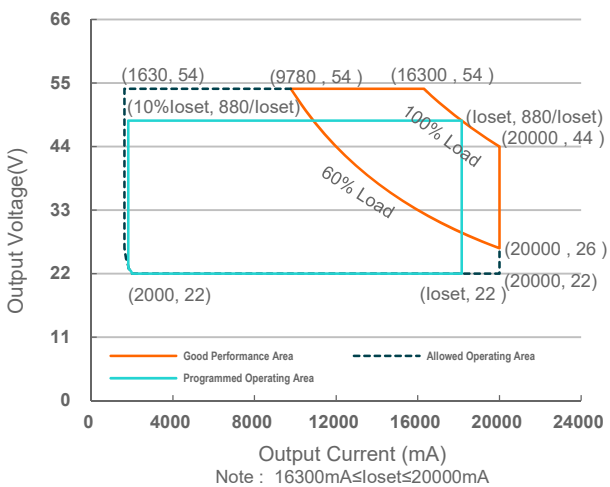
Note : 4900mA≤Ioset≤7000mA

EUM-880S11AMx



Note : 8000mA≤Ioset≤11500mA

EUM-880S20AMx



Note : 16300mA≤Ioset≤20000mA

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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	-	-	0.75 MIU	UL 8750; 277Vac/ 60Hz
			0.70 mA	IEC 60598-1; 240Vac/ 60Hz
Input AC Current	-	-	7.80 A	Measured at 90% load and 120 Vac input.
	-	-	4.72 A	Measured at 100% load and 220 Vac input.
Inrush Current(I^2t)	-	-	2.11 A^2s	At 220Vac input, 25℃ cold start, duration=15.2 ms, 10%Ipeak-10%Ipeak.
PF	0.90	-	-	At 100-277Vac, 50-60Hz, 60%-100% Load (528 - 880W)
THD	-	-	20%	
			10%	At 220-240Vac, 50-60Hz, 75%-100% Load (660 - 880W)

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%Ioset	-	5%Ioset	100% load
Output Current Setting(Ioset) Range				
EUM-880S280Mx	195 mA	-	2800 mA	
EUM-880S420Mx	300 mA	-	4200 mA	
EUM-880S700Mx	490 mA	-	7000 mA	
EUM-880S11AMx	800 mA	-	11500 mA	
EUM-880S20AMx	1630 mA	-	20000 mA	
Output Current Setting Range with Constant Power				
EUM-880S280Mx	1950 mA	-	2800 mA	
EUM-880S420Mx	3000 mA	-	4200 mA	
EUM-880S700Mx	4900 mA	-	7000 mA	
EUM-880S11AMx	8000 mA	-	11500 mA	
EUM-880S20AMx	16300 mA	-	20000 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	70%-100% load
Startup Overshoot Current	-	-	10%Iomax	100% load
No Load Output Voltage				
EUM-880S280Mx	-	-	500 V	
EUM-880S420Mx	-	-	350 V	
EUM-880S700Mx	-	-	210 V	
EUM-880S11AMx	-	-	120 V	
EUM-880S20AMx	-	-	60 V	
Line Regulation	-	-	±0.5%	100% load

Output Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Load Regulation	-	-	±1.5%	
Turn-on Delay Time	-	-	0.5 s	Measured at 120-277Vac input, 60%-100% Load
Temperature Coefficient of Ioset	-	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	-	250 mA	Return terminal is "Dim−"
12V Auxiliary Output Transient Peak Current@6W	-	-	500 mA	500mA peak for a maximum duration of 2.2ms in a 6.0ms period during which time the average should not exceed 250mA.
12V Auxiliary Output Transient Peak Current@10W	-	-	850 mA	850mA peak for a maximum duration of 1.3ms in a 5.2ms period during which time the average should not exceed 250mA.

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120 Vac input:				Measured at 90% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
EUM-880S280Mx				
Io= 1950 mA	92.0%	94.0%	-	
Io= 2800 mA	91.5%	93.5%	-	
EUM-880S420Mx				
Io= 3000 mA	92.0%	94.0%	-	
Io= 4200 mA	91.5%	93.5%	-	
EUM-880S700Mx				
Io= 4900 mA	92.5%	94.5%	-	
Io= 7000 mA	92.0%	94.0%	-	
EUM-880S11AMx				
Io= 8000 mA	92.0%	94.0%	-	
Io= 11500 mA	91.0%	93.0%	-	
EUM-880S20AMx				
Io= 16300 mA	92.0%	94.0%	-	
Io= 20000 mA	91.5%	93.5%	-	
Efficiency at 220 Vac input:				Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
EUM-880S280Mx				
Io= 1950 mA	93.0%	95.0%	-	
Io= 2800 mA	93.0%	95.0%	-	
EUM-880S420Mx				
Io= 3000 mA	93.5%	95.5%	-	
Io= 4200 mA	93.5%	95.5%	-	
EUM-880S700Mx				
Io= 4900 mA	94.0%	96.0%	-	
Io= 7000 mA	93.5%	95.5%	-	
EUM-880S11AMx				
Io= 8000 mA	93.5%	95.5%	-	
Io= 11500 mA	93.0%	95.0%	-	
EUM-880S20AMx				
Io= 16300 mA	93.5%	95.5%	-	
Io= 20000 mA	93.5%	95.5%	-	

General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 277 Vac input: EUM-880S280Mx Io= 1950 mA Io= 2800 mA EUM-880S420Mx Io= 3000 mA Io= 4200 mA EUM-880S700Mx Io= 4900 mA Io= 7000 mA EUM-880S11AMx Io= 8000 mA Io= 11500 mA EUM-880S20AMx Io= 16300 mA Io= 20000 mA	 93.5% 93.5% 94.0% 93.5% 94.0% 94.0% 93.0% 93.0% 93.5% 93.5%	 95.5% 95.5% 96.0% 95.5% 96.0% 96.0% 95.5% 95.0% 95.5% 95.5%	 - - - - - - - - - -	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	-	105,000 Hours	-	Measured at 220Vac input, 80%Load and 70°C case temperature; See lifetime vs. Tc curve for the details
	-	83,000 Hours	-	Measured at 220Vac input, 100%Load and 40°C ambient temperature
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 warranty 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)	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	-	3500 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 Output Range with 10%-100% (Default)	EUM-880S280Mx EUM-880S420Mx EUM-880S700Mx EUM-880S11AMx EUM-880S20AMx	10%Ioset	-	Ioset	1950 mA ≤ Ioset ≤ 2800 mA 3000 mA ≤ Ioset ≤ 4200 mA 4900 mA ≤ Ioset ≤ 7000 mA 8000 mA ≤ Ioset ≤ 11500 mA 16300 mA ≤ Ioset ≤ 20000 mA
	EUM-880S280Mx EUM-880S420Mx EUM-880S700Mx EUM-880S11AMx EUM-880S20AMx	195 mA 300 mA 490 mA 800 mA 1630 mA	-	Ioset	195 mA ≤ Ioset ＜1950 mA 300 mA ≤ Ioset ＜3000 mA 490 mA ≤ Ioset ＜4900 mA 800 mA ≤ Ioset ＜8000 mA 1630 mA ≤ Ioset ＜16300 mA

Dimming Specifications (Continued)

Parameter		Min.	Typ.	Max.	Notes
Dimming Output Range with 5%-100% (Settable)	EUM-880S280Mx EUM-880S420Mx EUM-880S700Mx EUM-880S11AMx EUM-880S20AMx	5%Ioset	-	Ioset	1950 mA ≤ Ioset ≤ 2800 mA 3000 mA ≤ Ioset ≤ 4200 mA 4900 mA ≤ Ioset ≤ 7000 mA 8000 mA ≤ Ioset ≤ 11500 mA 16300 mA ≤ Ioset ≤ 20000 mA
	EUM-880S280Mx EUM-880S420Mx EUM-880S700Mx EUM-880S11AMx EUM-880S20AMx	98 mA 150 mA 245 mA 400 mA 815 mA	-	Ioset	195 mA ≤ Ioset ＜1950 mA 300 mA ≤ Ioset ＜3000 mA 490 mA ≤ Ioset ＜4900 mA 800 mA ≤ Ioset ＜8000 mA 1630 mA ≤ Ioset ＜16300 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 Inventronics Programming Software.
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	UL 8750, CAN/CSA-C22.2 No. 250.13
ENEC & CE	EN 61347-1, EN 61347-2-13
UKCA	BS EN 61347-1, BS EN 61347-2-13
CB	IEC 61347-1, IEC 61347-2-13
CCC	GB 19510.1, GB 19510.14
KC	K 61347-1, K 61347-2-13
NOM	NOM-058-SCFI
BIS	IS 15885(Part2/Sec13)

Safety & EMC Compliance (Continued)

Safety Category	Standard
SAA	AS/NZS 61347.1, AS/NZS 61347.2.13
Performance	**Standard**
ENEC	EN 62384
EMI Standards	**Notes**
BS EN/EN IEC 55015/GB/T 17743/KS C 9815(1)	Conducted emission Test &Radiated emission Test
BS EN/EN IEC 61000-3-2/GB 17625.1	Harmonic current emissions
BS EN/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**
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 6 kV, Common Mode 10 kV
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/KS C 9547	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.

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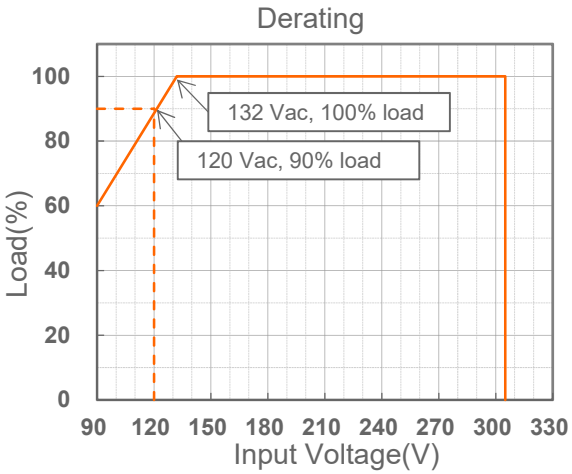
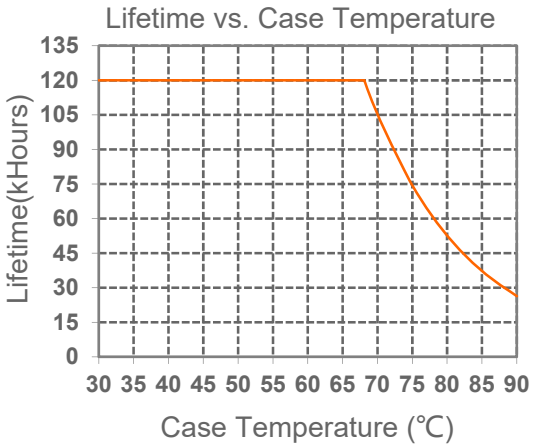
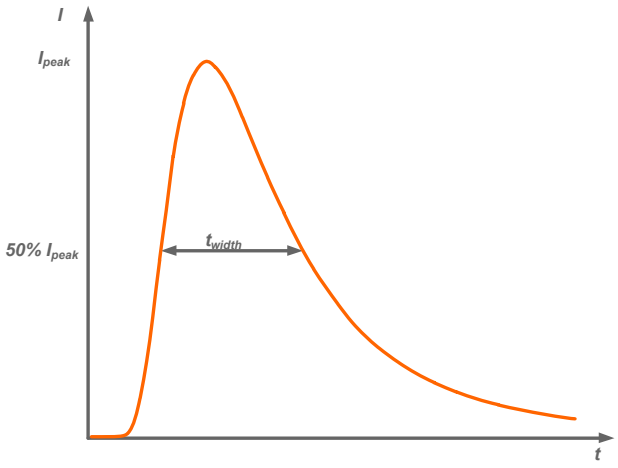
Derating



Lifetime vs. Case Temperature



Inrush Current Waveform



Input AC Voltage	I_{peak}	t_{width} (@ 50% Ipeak)
220Vac	13.6A	4.32ms

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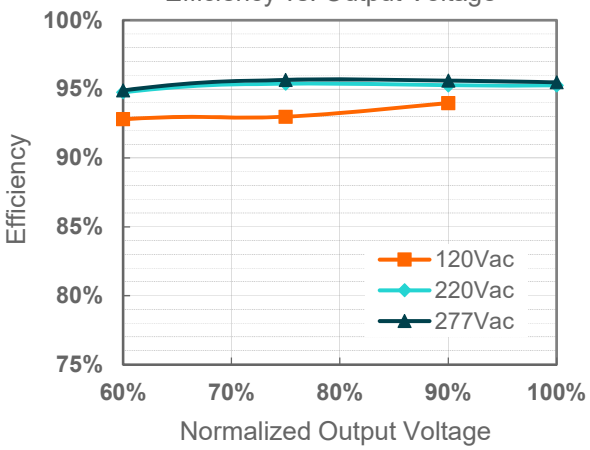
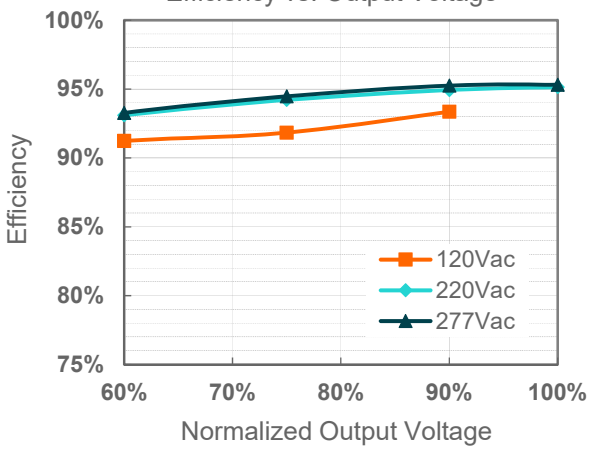
Efficiency vs. Load

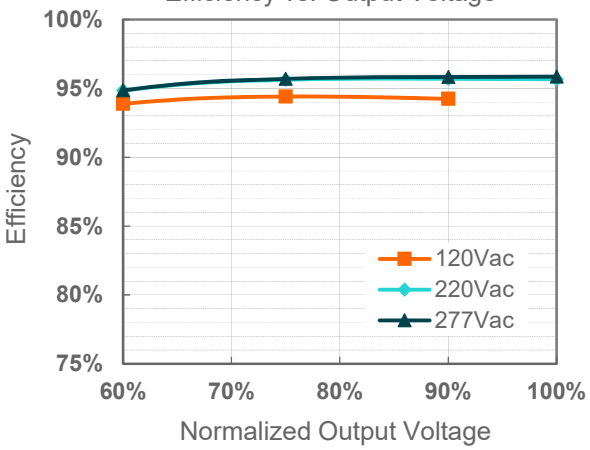
EUM-880S280Mx(Io=1950mA)



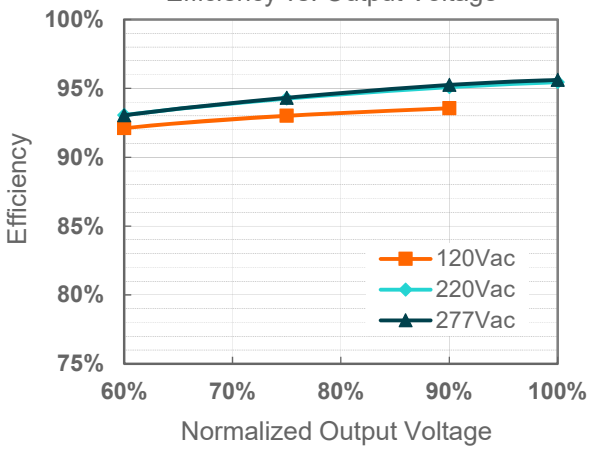
EUM-880S280Mx(Io=2800mA)



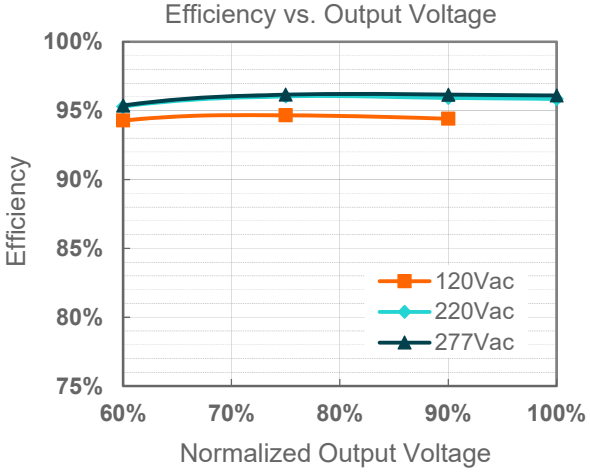
EUM-880S420Mx(Io=3000mA)



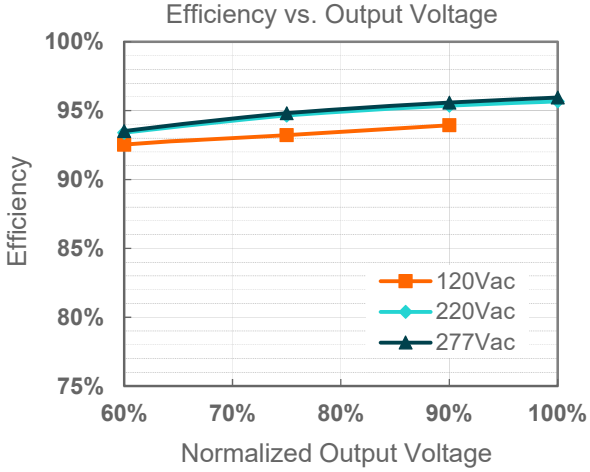
EUM-880S420Mx(Io=4200mA)



EUM-880S700Mx(Io=4900mA)



EUM-880S700Mx(Io=7000mA)



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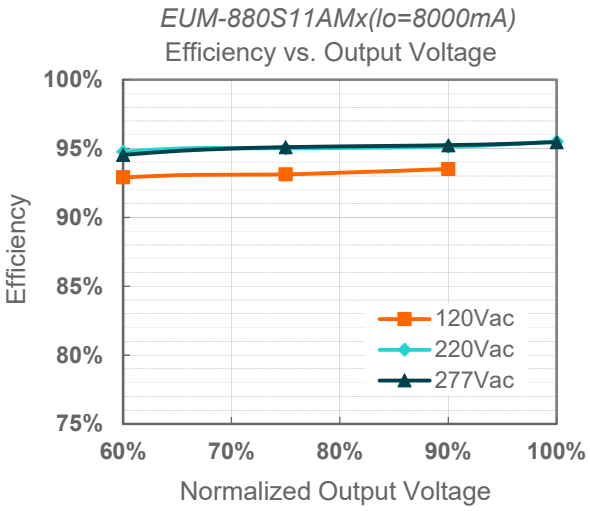
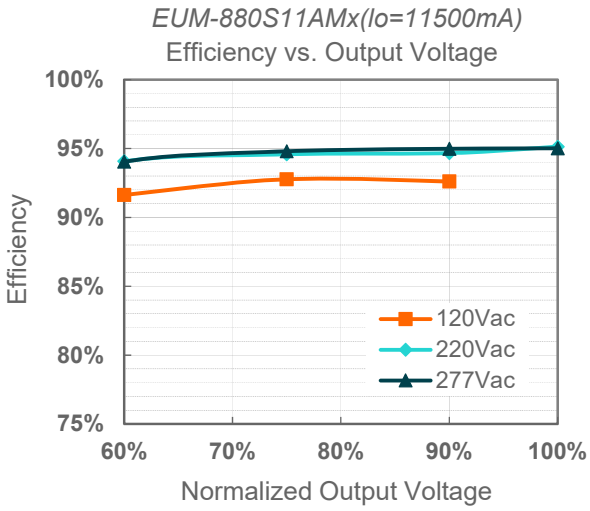
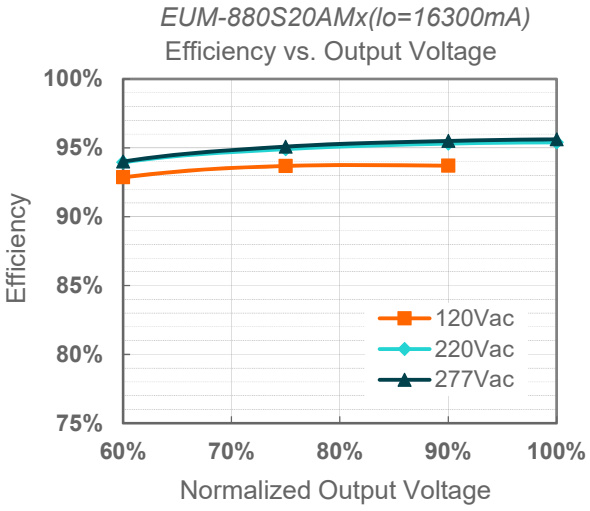
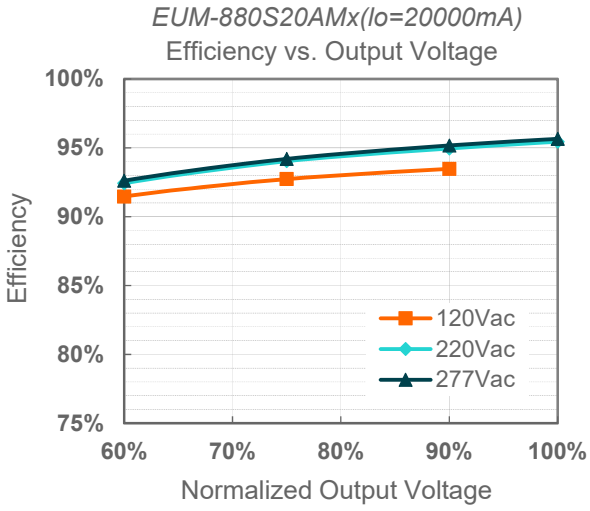
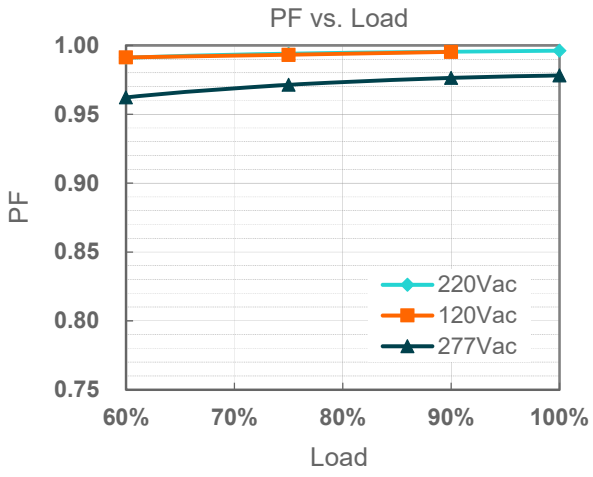








Power Factor



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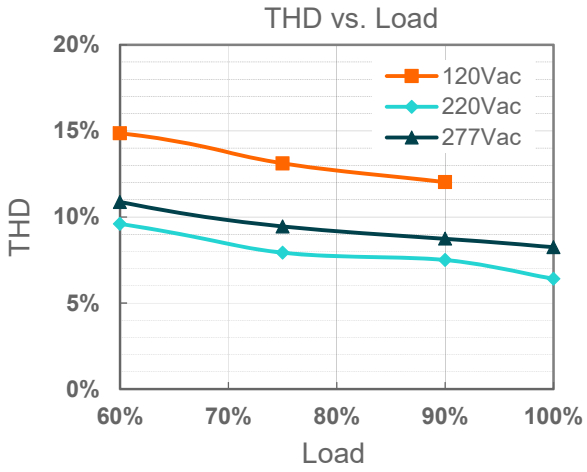
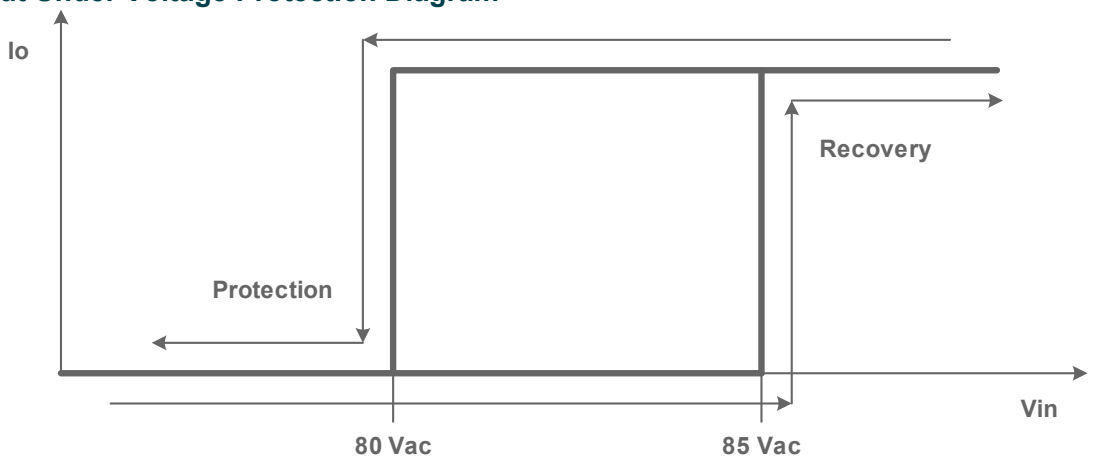
Total Harmonic Distortion



Protection Functions

Parameter		Min.	Typ.	Max.	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.			
Input Under Voltage Protection (IUVP)	Input Protection Voltage	70 Vac	80 Vac	90 Vac	Turn off the output when the input voltage falls below protection voltage.
	Input Recovery Voltage	75 Vac	85 Vac	95 Vac	Auto Recovery. The driver will restart when the input voltage exceeds recovery voltage.
Input Over Voltage Protection (IOVP)	Input Over Voltage Protection	310 Vac	320 Vac	330 Vac	Turn off the output when the input voltage exceeds protection voltage.
	Input Over Voltage Recovery	300 Vac	310 Vac	320 Vac	Auto Recovery. The driver will restart when the input voltage falls below recovery voltage.
	Max. of Input Over Voltage	-	-	350 Vac	The driver can survive for 8 hours with a stable input voltage stress of 350Vac.

- **Input Under Voltage Protection Diagram**



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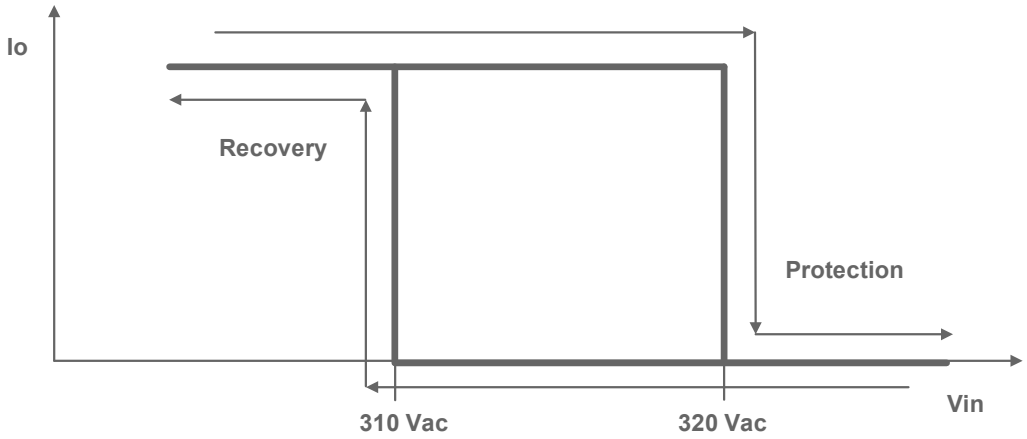
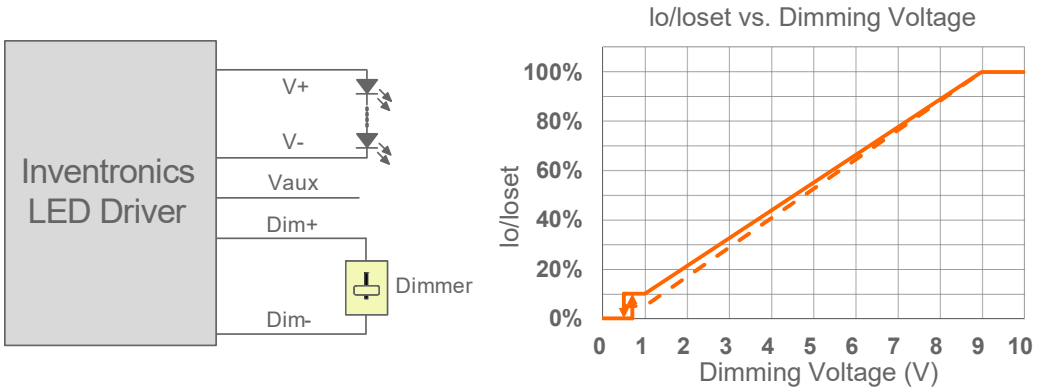
Input Over Voltage Protection Diagram



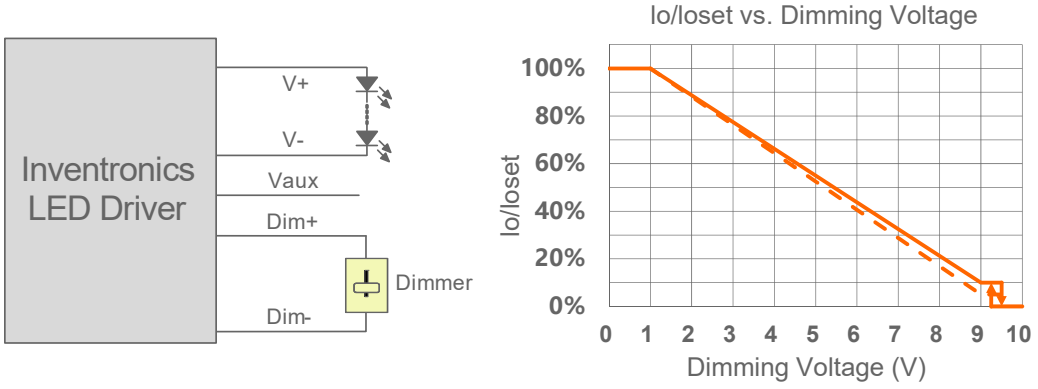
Dimming

0-10V Dimming

The recommended implementation of the dimming control is provided below.



Implementation 1: Positive logic



Implementation 2: Negative logic

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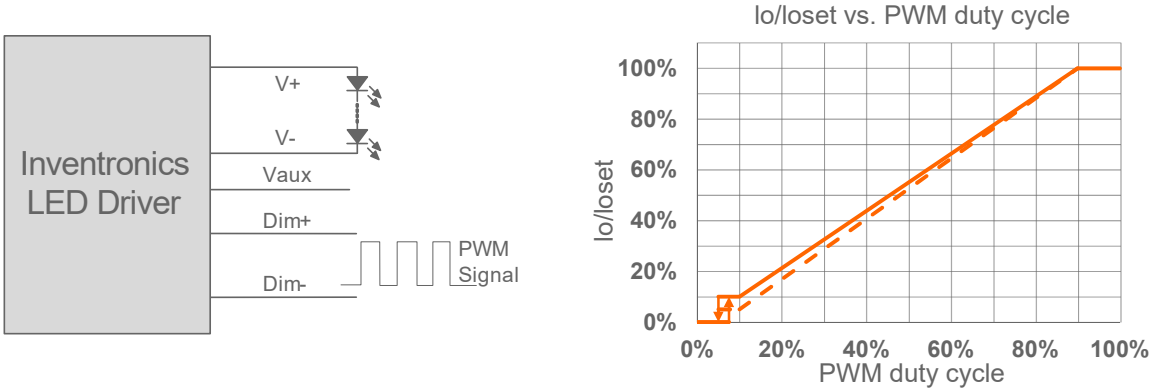
Notes:

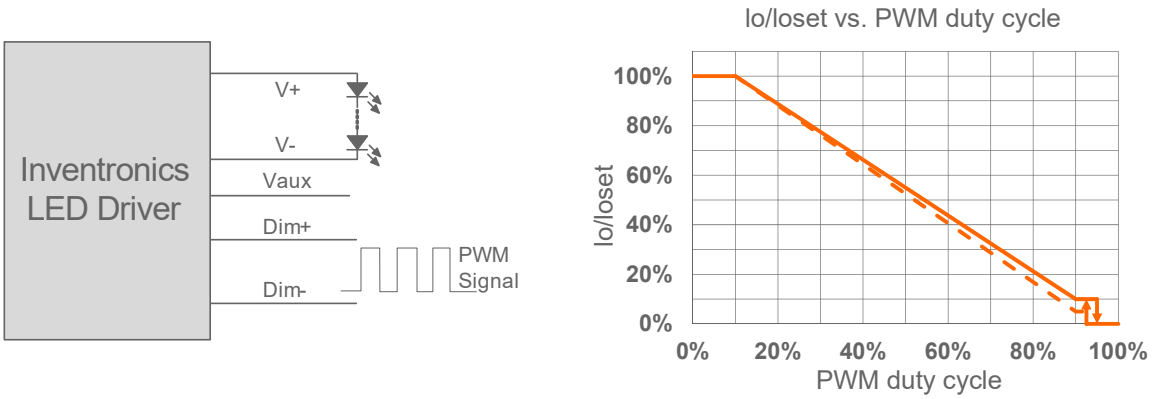
1. Do NOT connect Dim− to the output V− or V+, otherwise the driver will not work properly.
2. The dimmer can also be replaced by an active 0-10V voltage source signal or passive components like zener.
3. When 0-10V negative logic dimming mode and Dim+ is open, the driver will dim to off and be standby.

● PWM Dimming

The recommended implementation of the dimming control is provided below.



Implementation 3: Positive logic



Implementation 4: Negative logic

Note:

1. Do NOT connect Dim− to the output V− or V+, otherwise the driver will not work properly.
2. When PWM negative logic dimming mode and Dim+ is open, the driver will dim to off and be standby.

● Adjustable Dimming Curve

0-10V dimming curve can be set as corresponding dimming voltage by Inventronics Multi Programmer. Take the positive logic dimming as an example, the recommended implementation of the dimming control is provided below.

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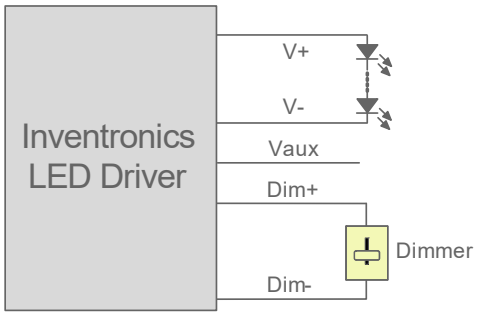

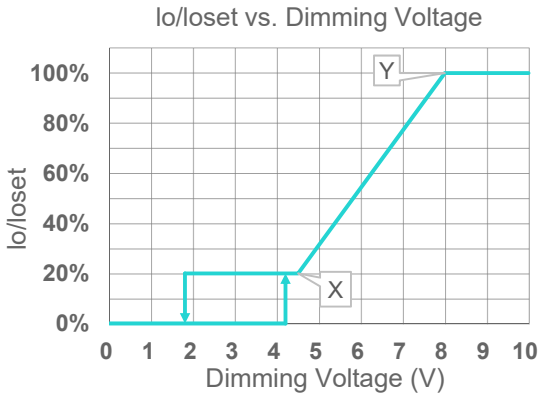

Implementation 5: Positive logic

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 0-10V voltage source signal or passive components like zener.
3. When dimming voltage X point is set to be smaller than Y point, the dimming curve is positive logic, conversely, when X point is set to be bigger than Y point, the dimming curve is negative logic.
4. For best dimming accuracy, the difference between X point and Y point is advised more than 4V.
5. Dimming off voltage adjustable.

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.

Minimum Dimming Level with 5% or 10% Selectable

The minimum dimming level can be set as 5% or 10% by Inventronics Multi Programmer,10% is default.

Hold Time Adjustable

When AC power is first applied to the LED driver, enabling a “Hold” period can allow devices powered by the Auxiliary voltage to stabilize before the driver fades up to the maximum dimming level. During this period, the driver will not respond to external dimming commands but will respond again after the hold time ends. Both the initial dimming percentage and the duration of this hold period can be adjusted by the Inventronics Multi Programmer. This function is disabled by default

Fade Time Adjustable

There is a “Fade” period after the “Hold” period. The soft-start time and dimming slope applied to all dimming transitions can be adjusted individually. It is adjusted by the Inventronics Multi Programmer. This function is disabled by default.

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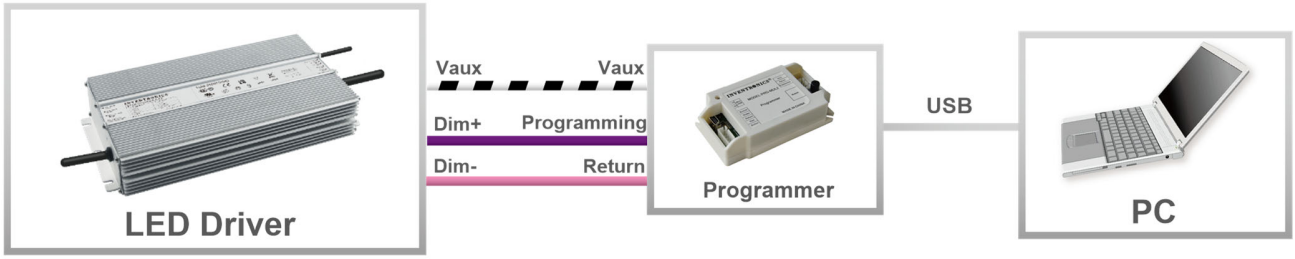
- **End Of Life**

  End-of-Life (EOL) is providing a visual notification to a user that the LED module has reached the end of manufacturer-specified life and that the replacement is recommended. Once active, an indication is given at each power-up of the driver, which the driver indicates this through a lower light output during the first 1 minute before normal operation is continued.

- **Digital Dimming**

  Inventronics Digital Dimming is a UART (Universal Asynchronous Receive Transmitter) based communication protocol. Please refer to **Inventronics Digital Dimming** file for details.

Programming Connection Diagram

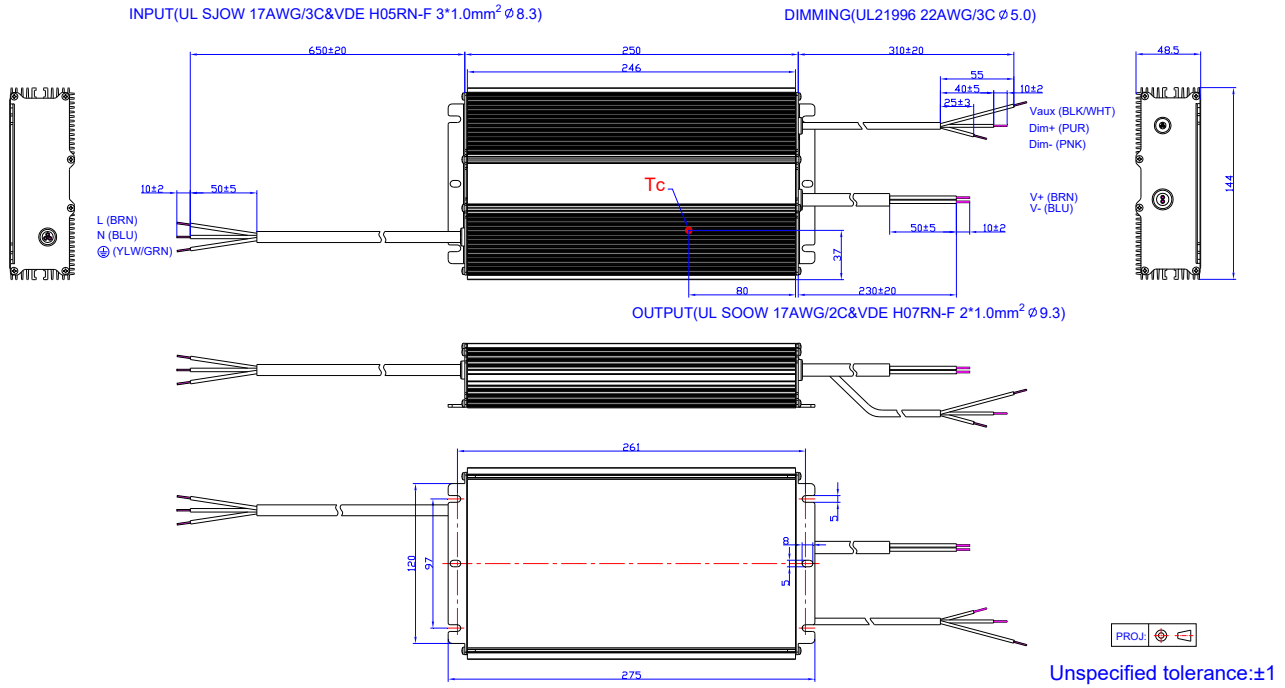


Note: The driver does not need to be powered on during the programming process.

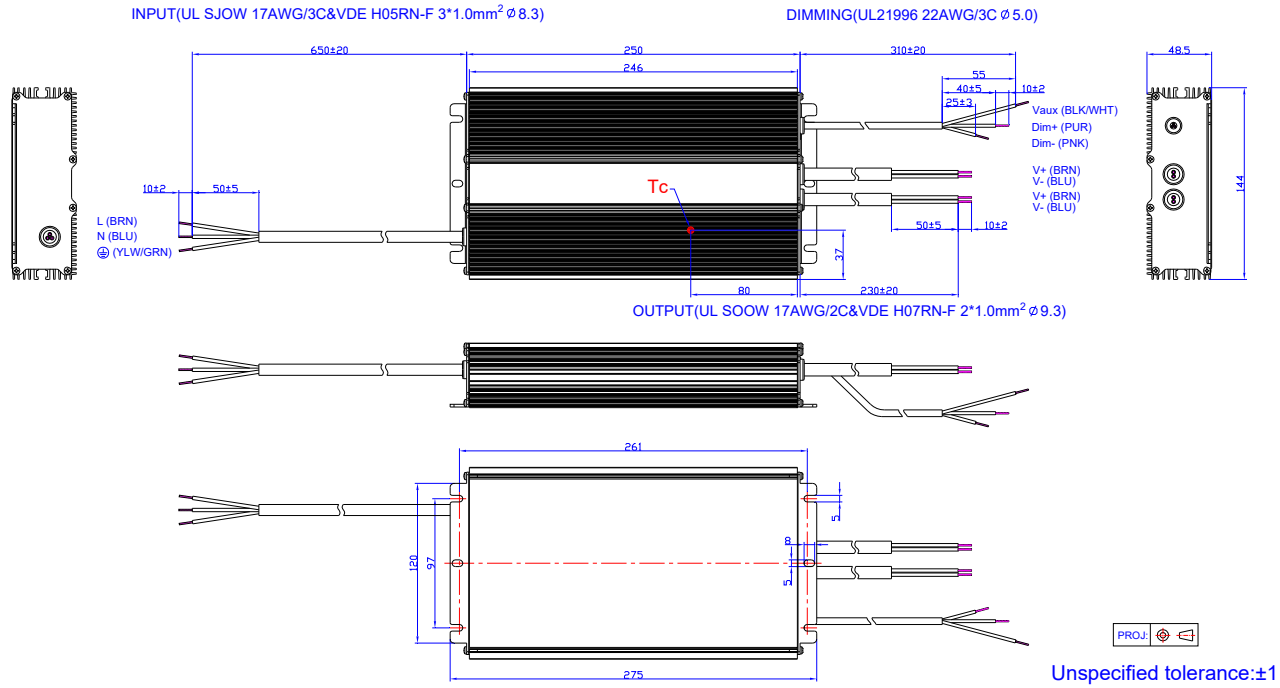
- **Please refer to PRG-MUL2 (Programmer) datasheet for details.**

Mechanical Outline

EUM-880S280MG/EUM-880S420MG/EUM-880S700MG

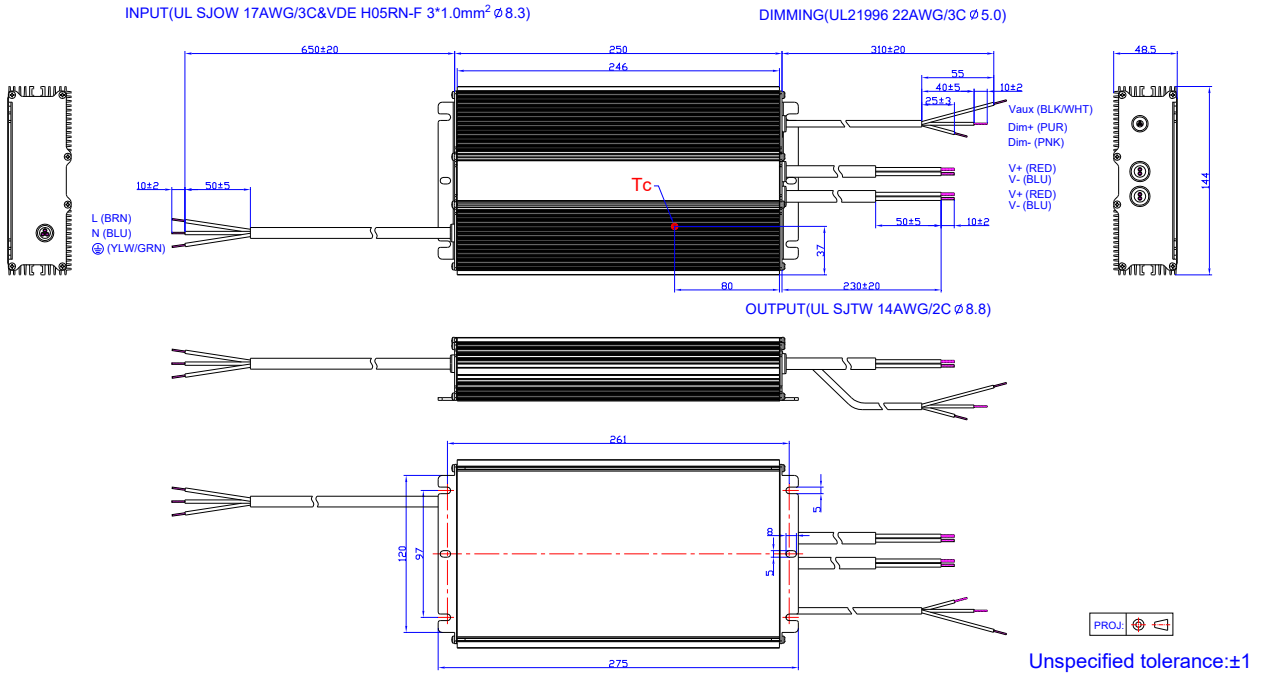


EUM-880S11AMG



Unspecified tolerance:±1

EUM-880S20AMG



Unspecified tolerance:±1

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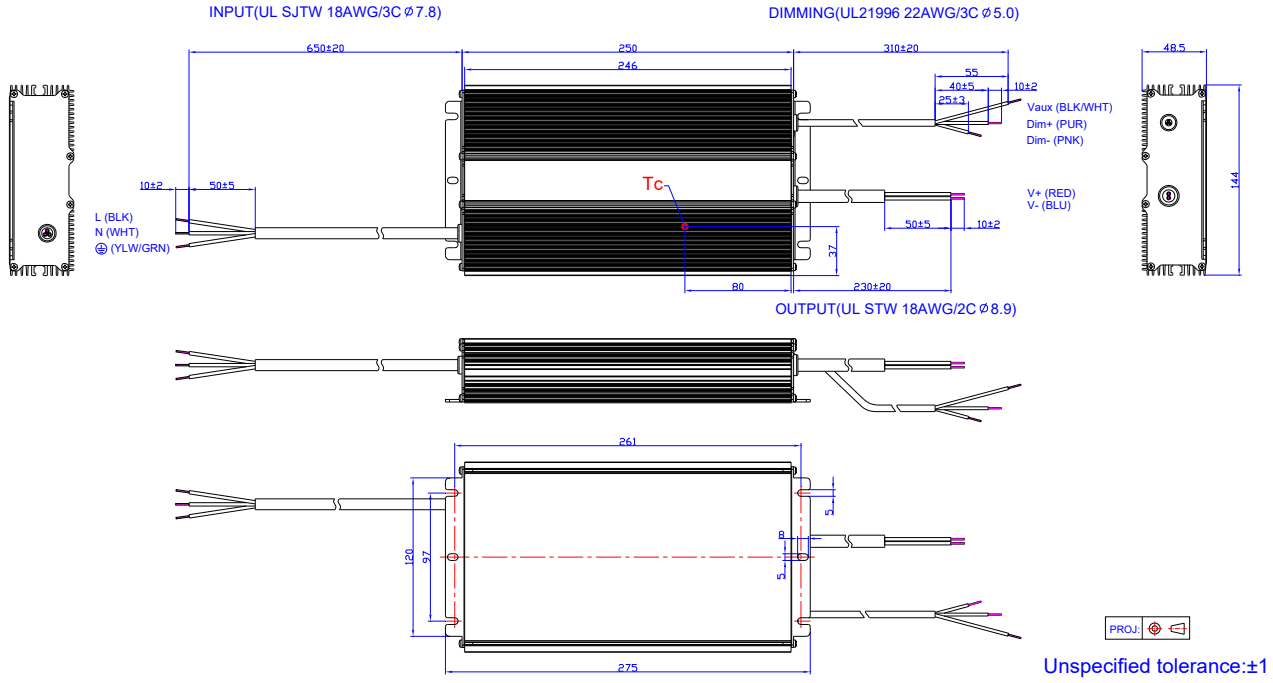
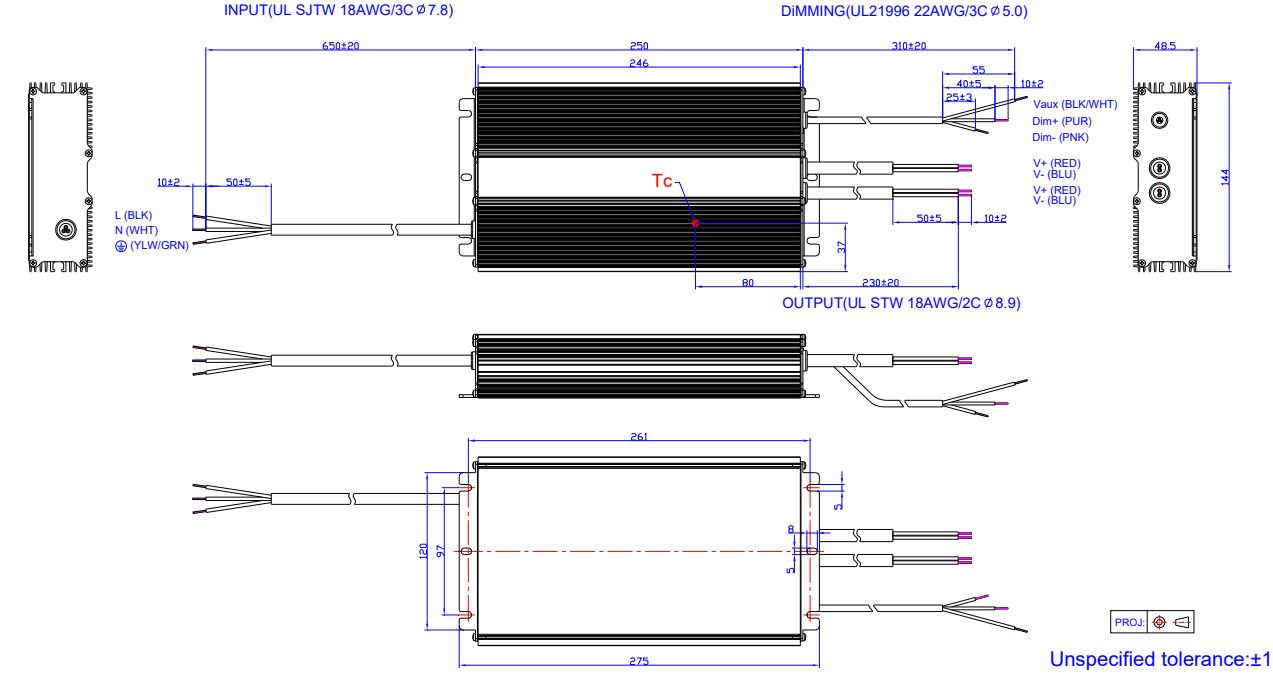
EUM-880S280MT/EUM-880S420MT/EUM-880S700MT



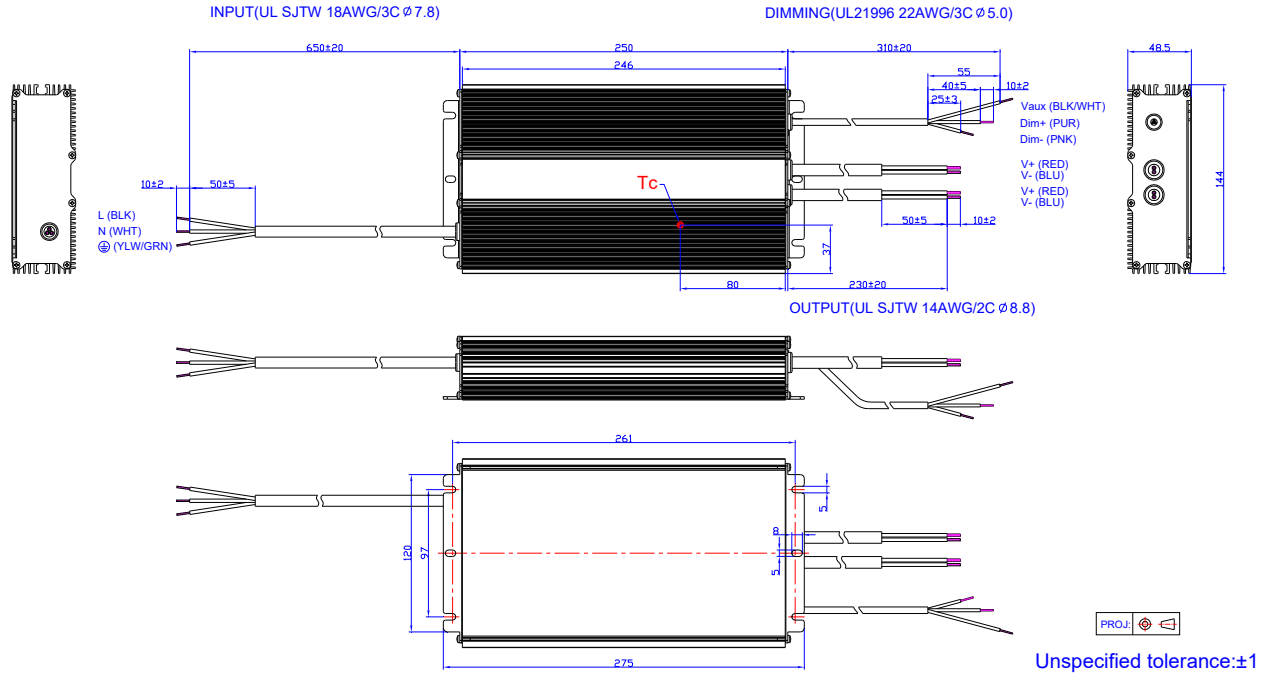
Unspecified tolerance:±1

EUM-880S11AMT



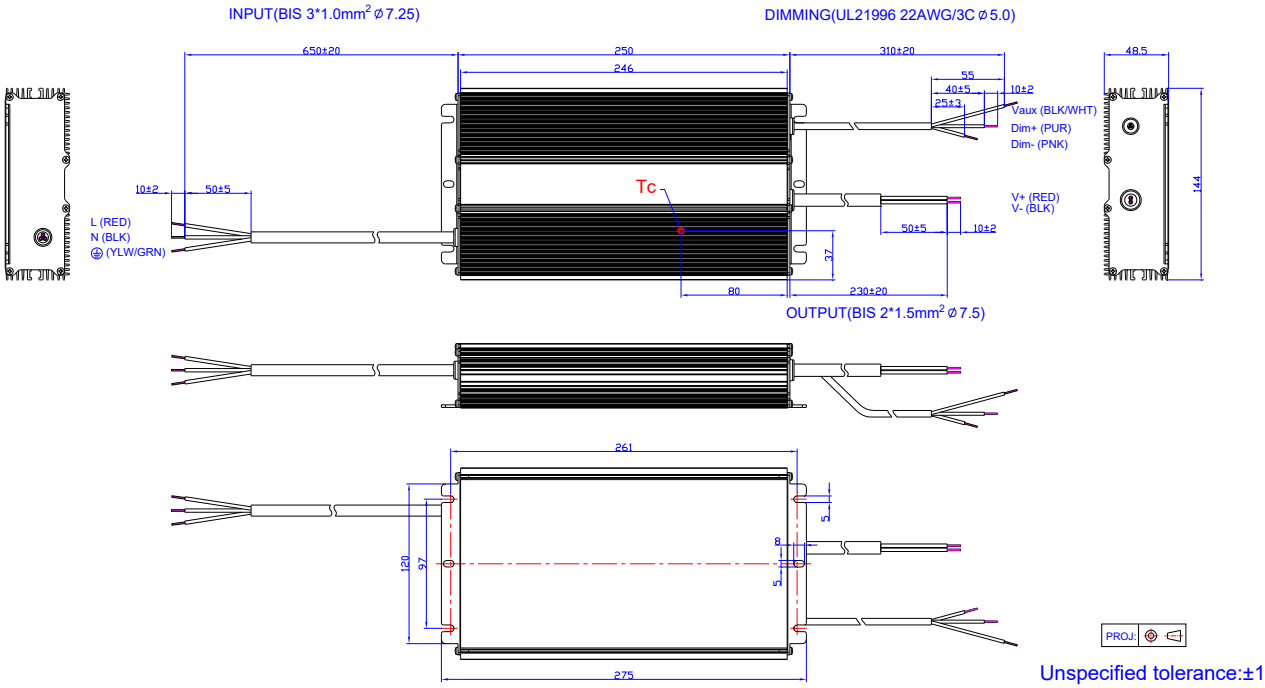
Unspecified tolerance:±1

EUM-880S20AMT



Unspecified tolerance:±1

EUM-880S280MB/EUM-880S420MB/EUM-880S700MB/EUM-880S11AMB



Unspecified tolerance:±1

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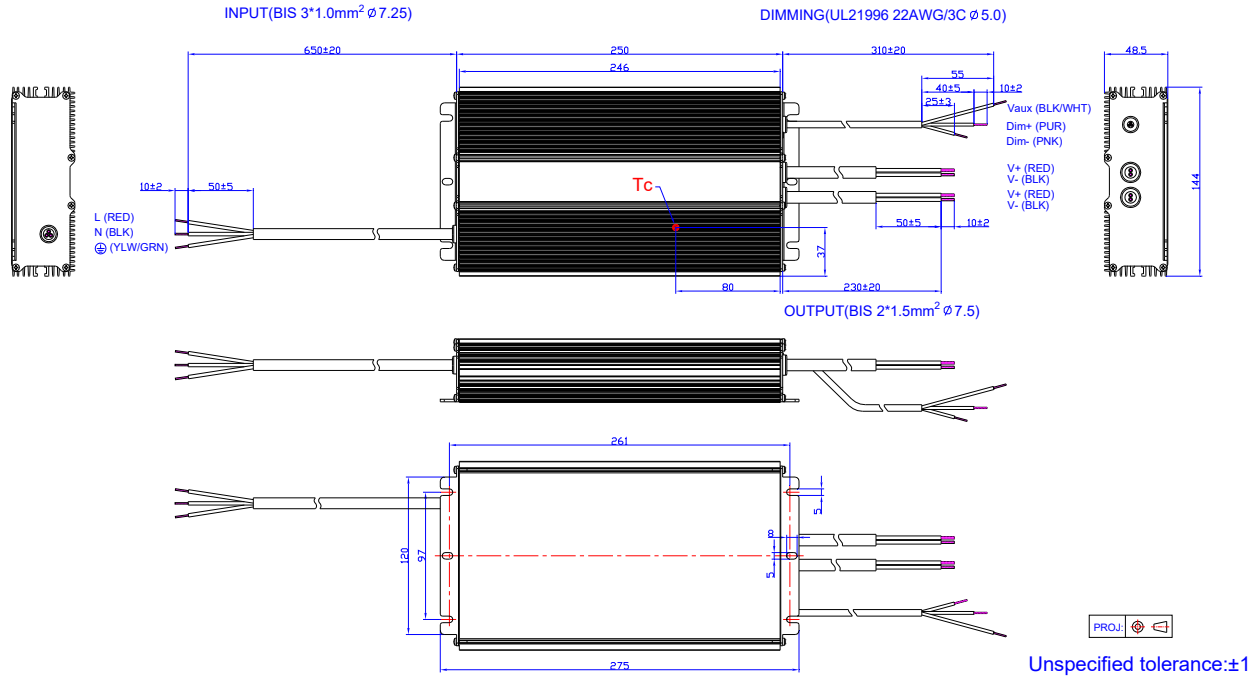
EUM-880S20AMB



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
2021-12-06	A	Datasheet Release	/	/
2023-04-04	B	Product Photograph	/	Updated
		KC/KCC/BIS/SAA logo	/	Added
		Models	/	Updated
		General Specifications	/	Updated
		Safety &EMC Compliance	/	Updated
		Efficiency vs. Load	/	Updated
		Power Factor	/	Updated
		Total Harmonic Distortion	/	Updated
		Dimming	/	Updated
		Programming Connection Diagram	/	Updated
		Mechanical Outline	/	Updated
2024-01-11	C	Format	/	Updated
		Features	/	Updated
		Safety &EMC Compliance	/	Updated
		Inrush Current Waveform	/	Updated
		Dimming	/	Updated