Features

- Full Power at Wide Output Current Range (Constant Power)
- Adjustable Output Current (AOC) with Programmability
- Isolated 0-10V/PWM/3-Timer-Modes Dimmable
- INV Digital Dimming, UART Based Communication Protocol
- Dim-to-Off with Standby Power ≤ 0.5 W
- Always-on Auxiliary Power: 12Vdc, 250mA, 3W (Transient Peak Power up to 10W)
- Output Lumen Compensation
- End-of-Life Indicator
- Input Surge Protection: DM 6kV, CM 10kV
- All-Around Protection: IUVP, IOVP, 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-150SxxxMx* series is a 150W, constant-current, programmable and IP66/IP67 rated LED driver that operates from 90-305Vac input with excellent power factor. Created for smart lighting application, this family provides an auxiliary voltage and dim-to-off functionality for powering low voltage, wireless controls. The dimming control supports 0-10V dimming as well as two-way communication via Digital Dimming, a UART based communication protocol. 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, input under voltage, input over voltage, output over voltage, short circuit, and over temperature.

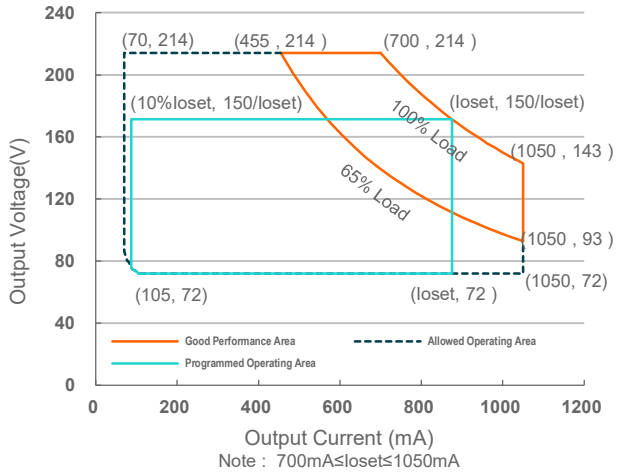
Models

Adjustable Output Current Range(mA)	Full-Power Current Range(mA)(1)	Default Output Current(mA)	Output Voltage Range(Vdc)	Max. Output Power(W)	Typical Efficiency (2)	Typical Power Factor		Model Number (3)(5)(6)
						120Vac	220Vac	
70-1050	700-1050	700	72-214	150	93.5%	0.99	0.96	EUM-150S105Mx
105-1500	1050-1500	1050	50-143	150	93.0%	0.99	0.96	EUM-150S150Mx
140-2100	1400-2100	1400	36-107	150	92.5%	0.99	0.96	EUM-150S210Mx(4)
280-4200	2800-4200	3150	18-54	150	91.5%	0.99	0.96	EUM-150S420Mx(4)

Notes: (1) Output current range with constant power at 150W
(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) SELV output.
(5) x = G are UL Recognized, ENEC and CCC, etc. models; x = T are UL Class P models, x = B are BIS models.
(6) All the models are certificated to BIS, except EUM-150S210MB.

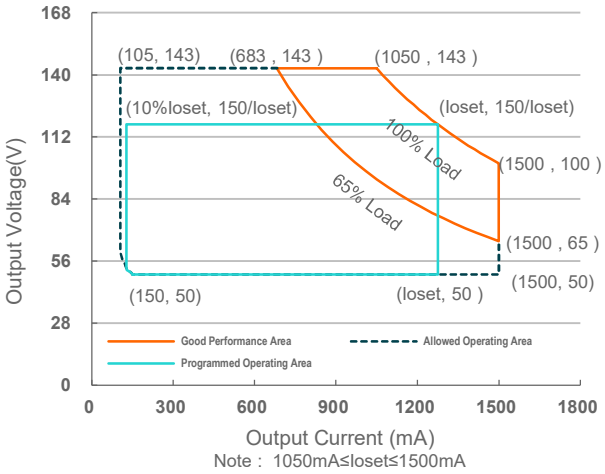
I-V Operation Area

EUM-150S105Mx



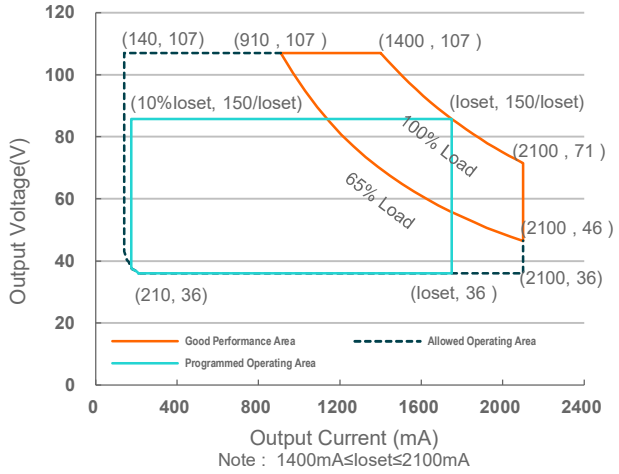
Note : 700mA≤Ioset≤1050mA

EUM-150S150Mx



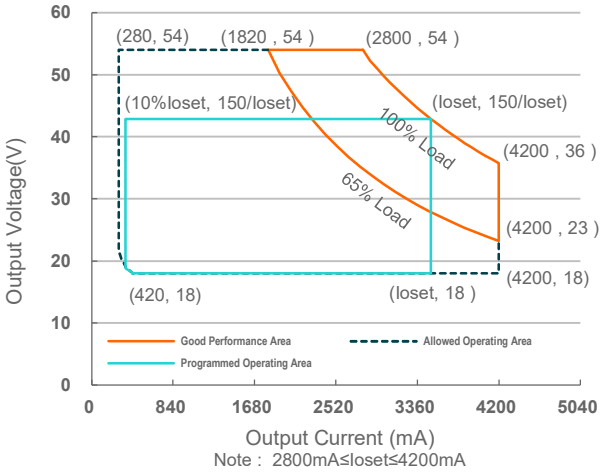
Note : 1050mA≤Ioset≤1500mA

EUM-150S210Mx



Note : 1400mA≤Ioset≤2100mA

EUM-150S420Mx



Note : 2800mA≤Ioset≤4200mA

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	-	-	1.61 A	Measured at 100% load and 120 Vac input.
	-	-	0.86 A	Measured at 100% load and 220 Vac input.
Inrush Current(I^2t)	-	-	3.49 A^2s	At 220Vac input, 25°C cold start, duration=244 μs, 10%Ipk-10%Ipk.

Input Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
PF	0.9	-	-	At 100-277Vac, 50-60Hz, 65%-100%load (97.5-150W)
THD	-	-	20%	
THD	-	-	10%	At 220-240Vac, 50-60Hz, 75%-100%load (112.5-150W)

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%Ioset	-	5%Ioset	At 100% load condition
Output Current Setting(Ioset) Range EUM-150S105Mx EUM-150S150Mx EUM-150S210Mx EUM-150S420Mx	 70 mA 105 mA 140 mA 280 mA	 - - - -	 1050 mA 1500 mA 2100 mA 4200 mA	
Output Current Setting Range with Constant Power EUM-150S105Mx EUM-150S150Mx EUM-150S210Mx EUM-150S420Mx	 700 mA 1050 mA 1400 mA 2800 mA	 - - - -	 1050 mA 1500 mA 2100 mA 4200 mA	
Total Output Current Ripple (pk-pk)	-	5%Iomax	10%Iomax	At 100% load condition. 20 MHz BW
Output Current Ripple at < 200 Hz (pk-pk)	-	2%Iomax	-	At 100% load condition. Only this component of ripple is associated with visible flicker.
Startup Overshoot Current	-	-	10%Iomax	At 100% load condition
No Load Output Voltage EUM-150S105Mx EUM-150S150Mx EUM-150S210Mx EUM-150S420Mx	 - - - -	 - - - -	 270 V 180 V 120 V 70 V	
Line Regulation	-	-	±0.5%	Measured at 100% load
Load Regulation	-	-	±3.0%	
Turn-on Delay Time	-	-	0.5 s	Measured at 120-277Vac input, 65%-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 2.2 ms 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 1.3 ms 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: EUM-150S105Mx Io= 700 mA Io=1050 mA EUM-150S150Mx Io=1050 mA Io=1500 mA EUM-150S210Mx Io=1400 mA Io=2100 mA EUM-150S420Mx Io=2800 mA Io=4200 mA	 89.0% 89.5% 88.5% 89.0% 88.0% 88.0% 87.5% 87.0%	 91.0% 91.5% 90.5% 91.0% 90.0% 90.0% 89.5% 89.0%	 - - - - - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Efficiency at 220 Vac input: EUM-150S105Mx Io= 700 mA Io=1050 mA EUM-150S150Mx Io=1050 mA Io=1500 mA EUM-150S210Mx Io=1400 mA Io=2100 mA EUM-150S420Mx Io=2800 mA Io=4200 mA	 91.0% 91.5% 90.5% 91.0% 90.5% 90.5% 89.5% 89.0%	 93.0% 93.5% 92.5% 93.0% 92.5% 92.5% 91.5% 91.0%	 - - - - - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Efficiency at 277 Vac input: EUM-150S105Mx Io= 700 mA Io=1050 mA EUM-150S150Mx Io=1050 mA Io=1500 mA EUM-150S210Mx Io=1400 mA Io=2100 mA EUM-150S420Mx Io=2800 mA Io=4200 mA	 91.5% 91.5% 91.0% 91.0% 91.0% 91.0% 90.0% 89.5%	 93.5% 93.5% 93.0% 93.0% 93.0% 93.0% 92.0% 91.5%	 - - - - - - - -	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	-	287,000 Hours	-	Measured at 220Vac input, 80%load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	104,000 Hours	-	Measured at 220Vac input, 80%load and 70°C case temperature; See lifetime vs. Tc curve for the details
Operating Case Temperature for Safety Tc_s	-40°C	-	+90°C	
Operating Case Temperature for Warranty Tc_w	-40°C	-	+80°C	Case temperature for 5 years 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)	6.34 × 2.66 × 1.44 161 × 67.5 × 36.5			With mounting ear 7.01 × 2.66 × 1.44 178 × 67.5 × 36.5
Net Weight	-	790 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 μA	300 μA	450 μA	Vdim(+) = 0 V
Dimming Output Range	EUM-150S105Mx EUM-150S150Mx EUM-150S210Mx EUM-150S420Mx	10%Ioset	-	Ioset	700 mA ⩽ Ioset ⩽ 1050 mA 1050 mA ⩽ Ioset ⩽ 1500 mA 1400 mA ⩽ Ioset ⩽ 2100 mA 2800 mA ⩽ Ioset ⩽ 4200 mA
	EUM-150S105Mx EUM-150S150Mx EUM-150S210Mx EUM-150S420Mx	70 mA 105 mA 140 mA 280 mA	-	Ioset	70 mA ⩽ Ioset < 700 mA 105 mA ⩽ Ioset < 1050 mA 140 mA ⩽ Ioset < 1400 mA 280 mA ⩽ Ioset < 2800 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 Programing 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

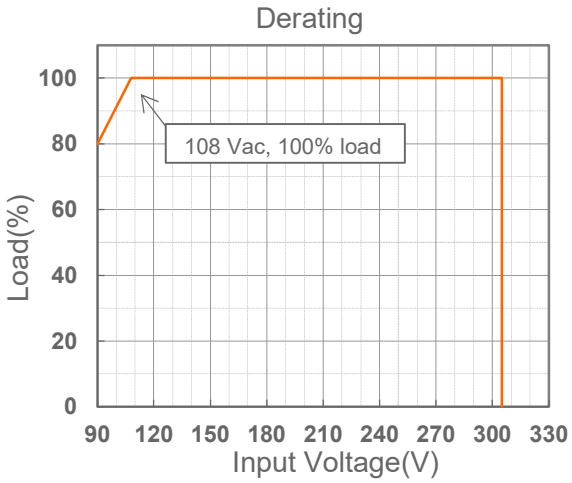
Safety Category	Standard
UL/CUL	UL 8750,CAN/CSA-C22.2 No. 250.13
ENEC & CE	EN 61347-1, EN 61347-2-13
CB	IEC 61347-1, IEC 61347-2-13
CCC	GB 19510.1, GB 19510.14
PSE	J 61347-1, J 61347-2-13
KS	KS C 7655
BIS	IS 15885(Part2/Sec13)

Safety & EMC Compliance (Continued)

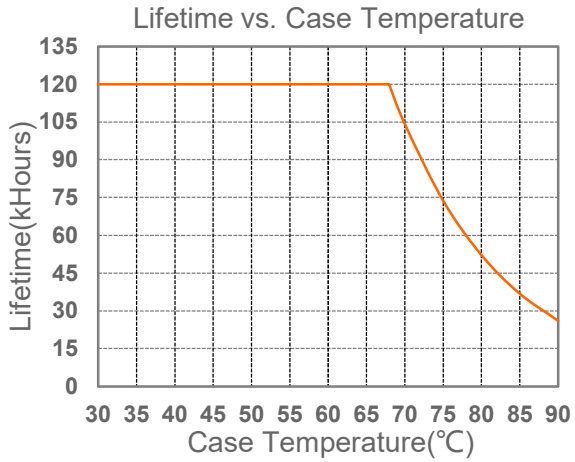
Safety Category	Standard
NOM	NOM-058-SCFI
EAC	TP TC 004, TP TC 020
SAA	AS/NZS 61347.1, AS/NZS 61347.2.13
Performance	**Standard**
ENEC	EN IEC 62384
EMI Standards	**Notes**
EN IEC 55015/GB/T 17743/KS C 9815(1)	Conducted emission Test &Radiated emission Test
EN IEC 61000-3-2/GB 17625.1	Harmonic current 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
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/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.

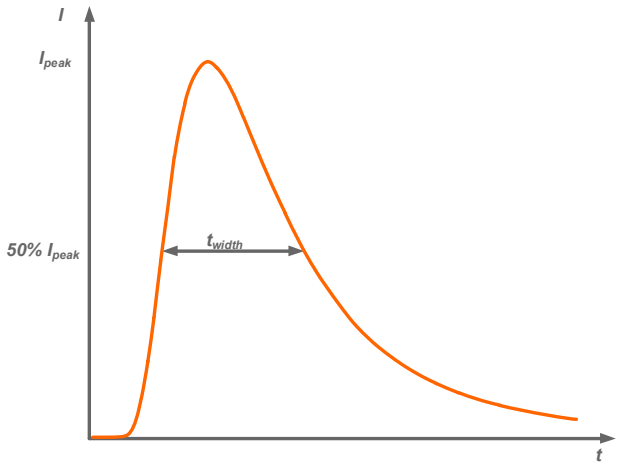
Derating



Lifetime vs. Case Temperature



Inrush Current Waveform



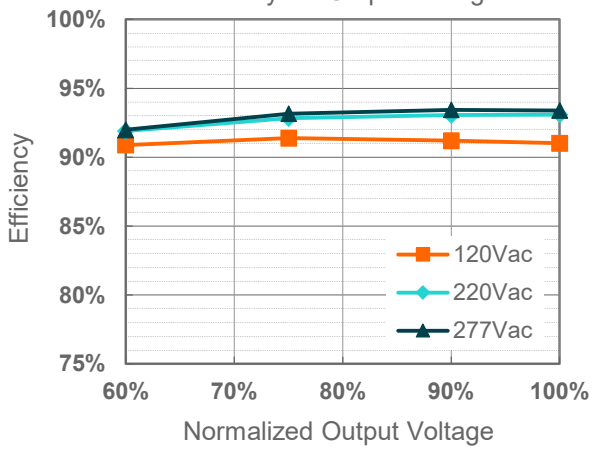
Input AC Voltage	I_{peak}	t_{width} (@ 50% Ipeak)
120Vac	74.0 A	108 μs
220Vac	138 A	108 μs
277Vac	172 A	112 μs

Inrush Current Waveform (Continued)

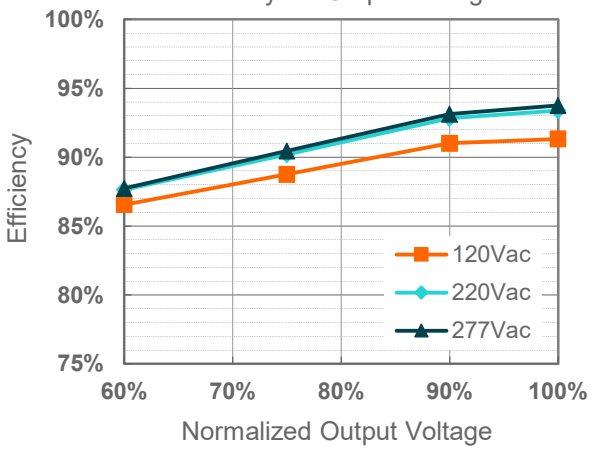
MCB	Tripping Curves	B	B	B	B	C	C	C	C
	Rated Current	10A	16A	20A	25A	10A	16A	20A	25A
The Number of LED Driver can be Configured	120	4	7	8	10	5	8	10	12
	220	5	8	10	13	8	14	17	22
	277	4	6	8	10	7	11	14	17

Efficiency vs. Load

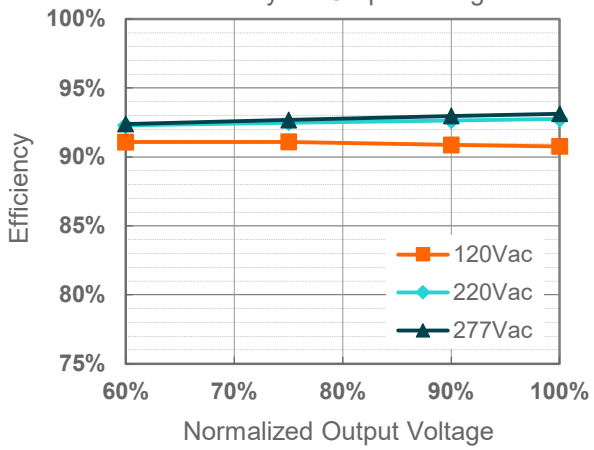
EUM-150S105Mx(Io=700mA)



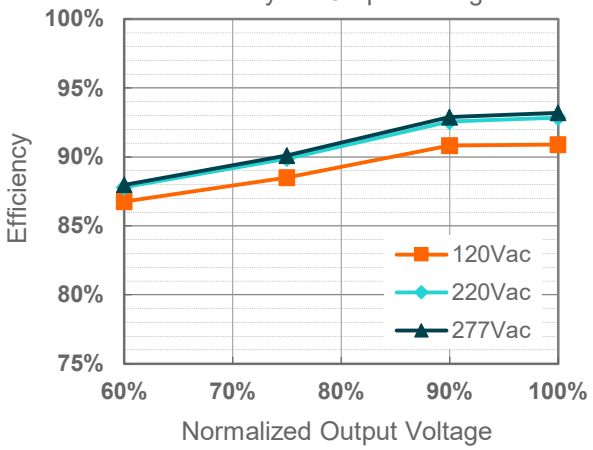
EUM-150S105Mx(Io=1050mA)

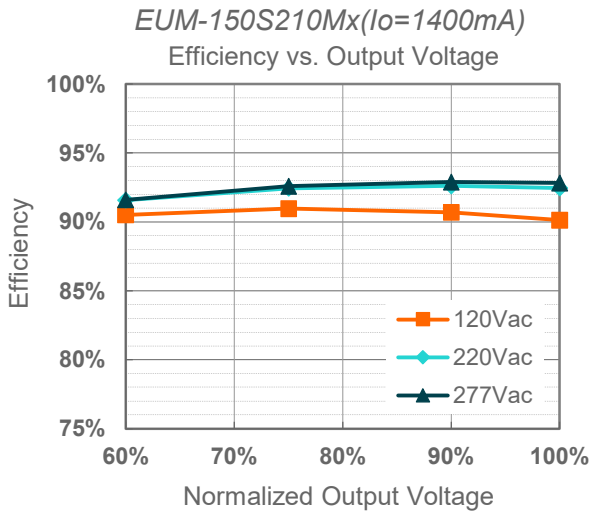


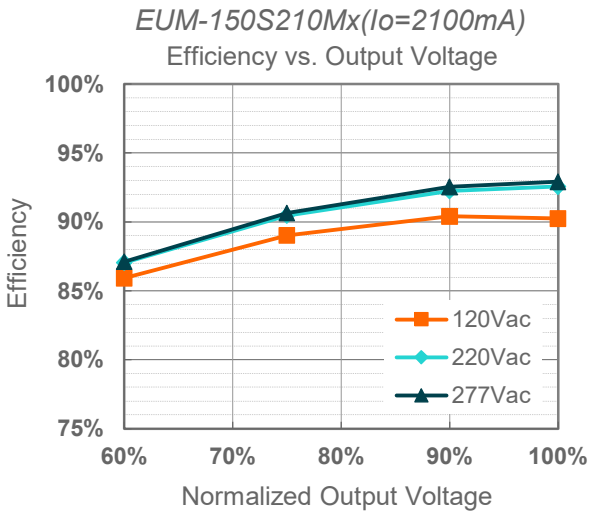
EUM-150S150Mx(Io=1050mA)

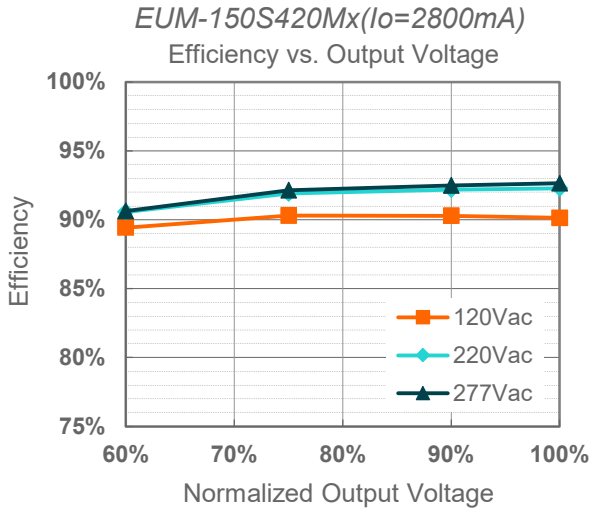


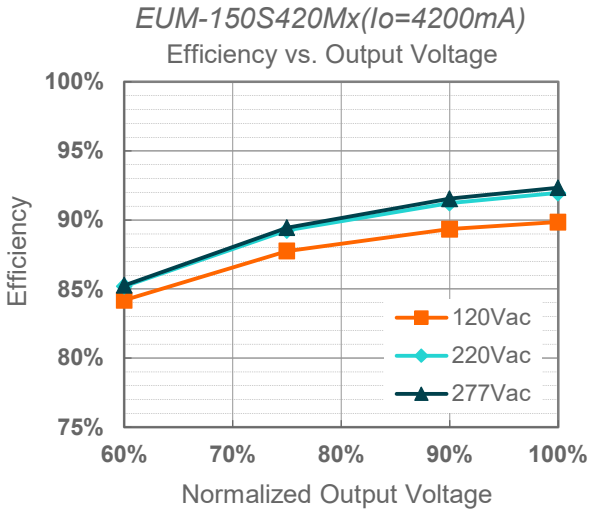
EUM-150S150Mx(Io=1500mA)



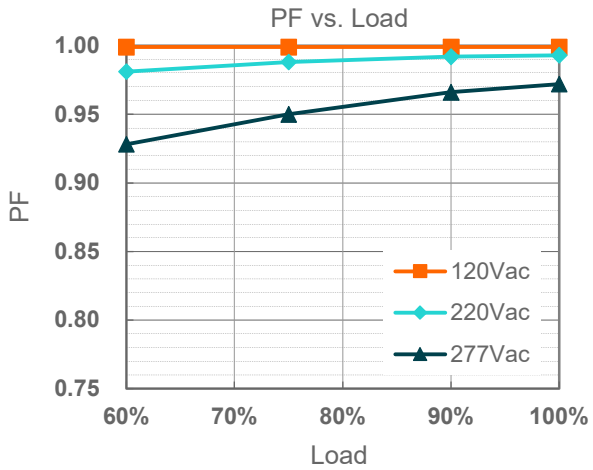








Power Factor



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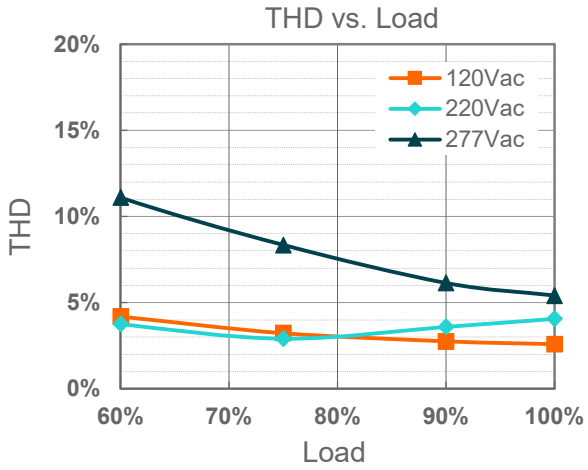
Total Harmonic Distortion



Protection Functions

Parameter		Min.	Typ.	Max.	Notes
Over Voltage Protection		Limits output voltage at no load and in case the normal voltage limit fails.			
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 Temperature Protection		Decreases output current, returning to normal after over temperature is removed.			
Input Under Voltage Protection (IUVP)	Input Under Voltage Protection	70 Vac	80 Vac	90 Vac	Turn off the output when the input voltage falls below protection voltage.
	Input Under Voltage Recovery	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 stabilized input over voltage conditions up to 350Vac for a total of 8 hours.

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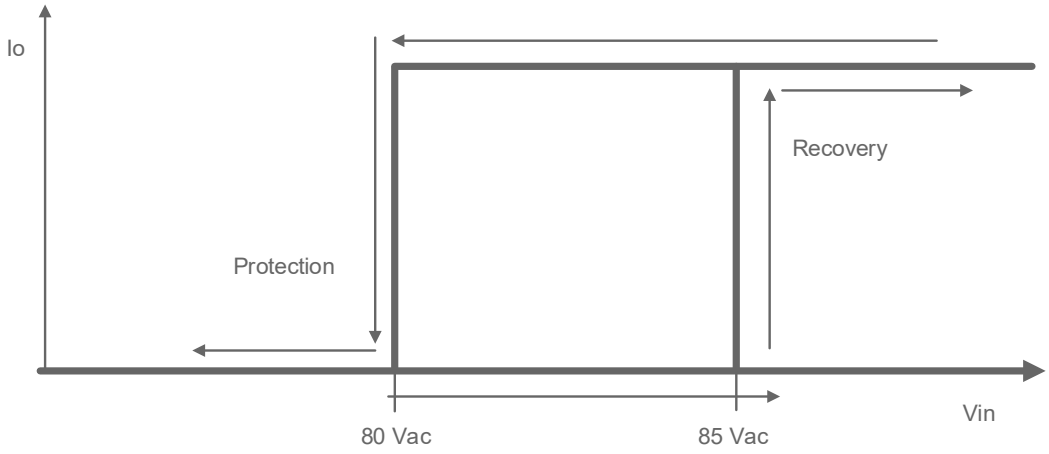
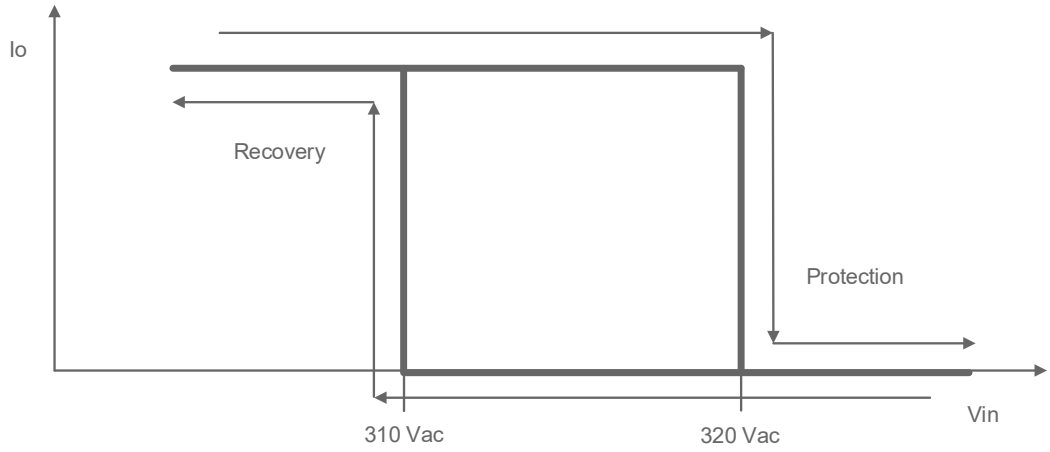
Input Under Voltage Protection Diagram



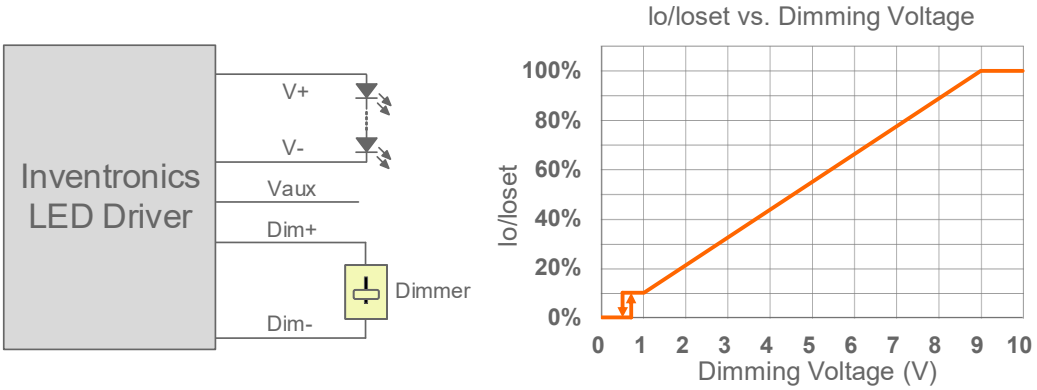
Input Over Voltage Protection Diagram



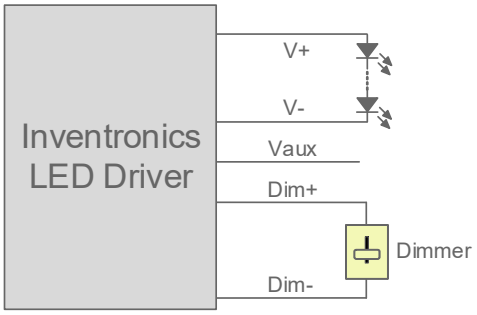
Dimming

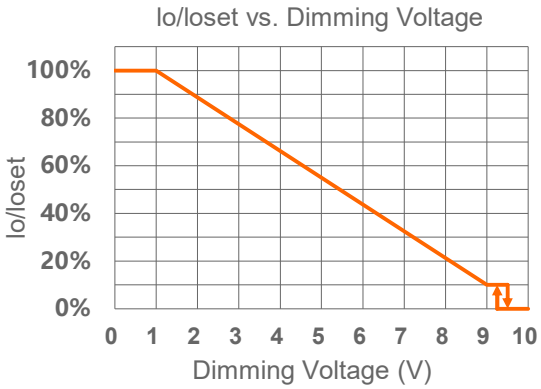
0-10V Dimming

The recommended implementation of the dimming control is provided below.



Implementation 1: Positive logic





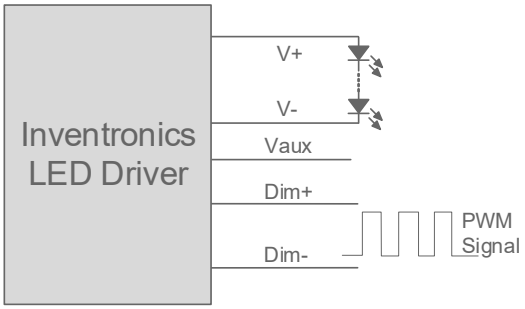
Implementation 2: Negative logic

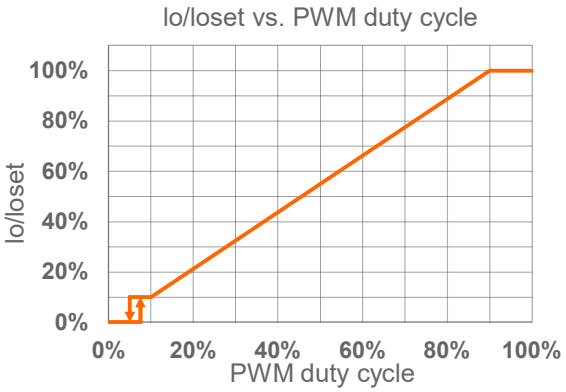
Notes:

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.

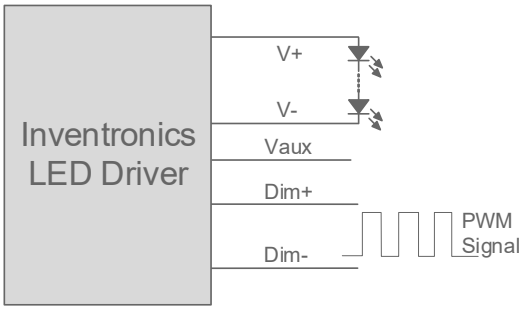
PWM Dimming

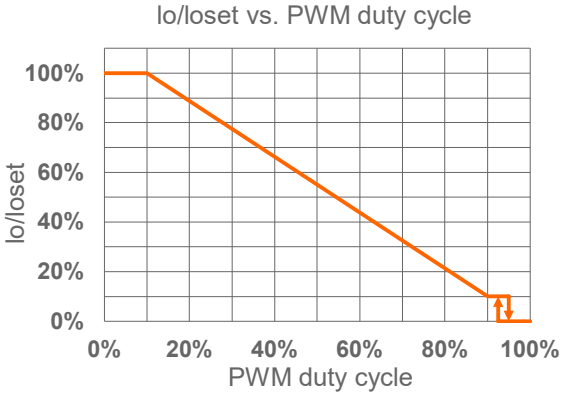
The recommended implementation of the dimming control is provided below.





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.

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.

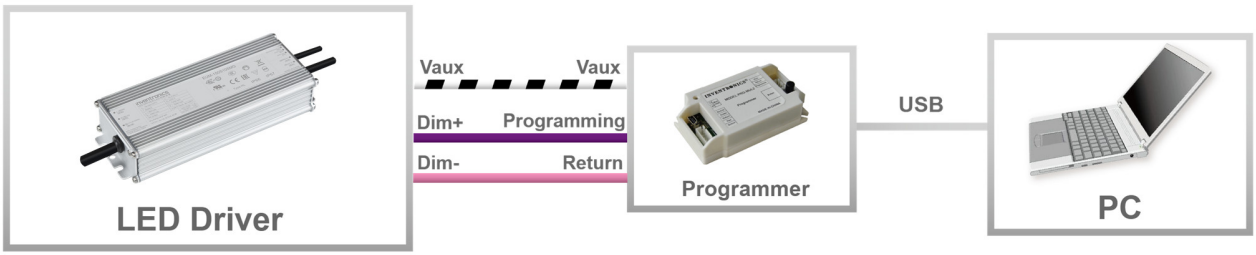
End Of Life

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

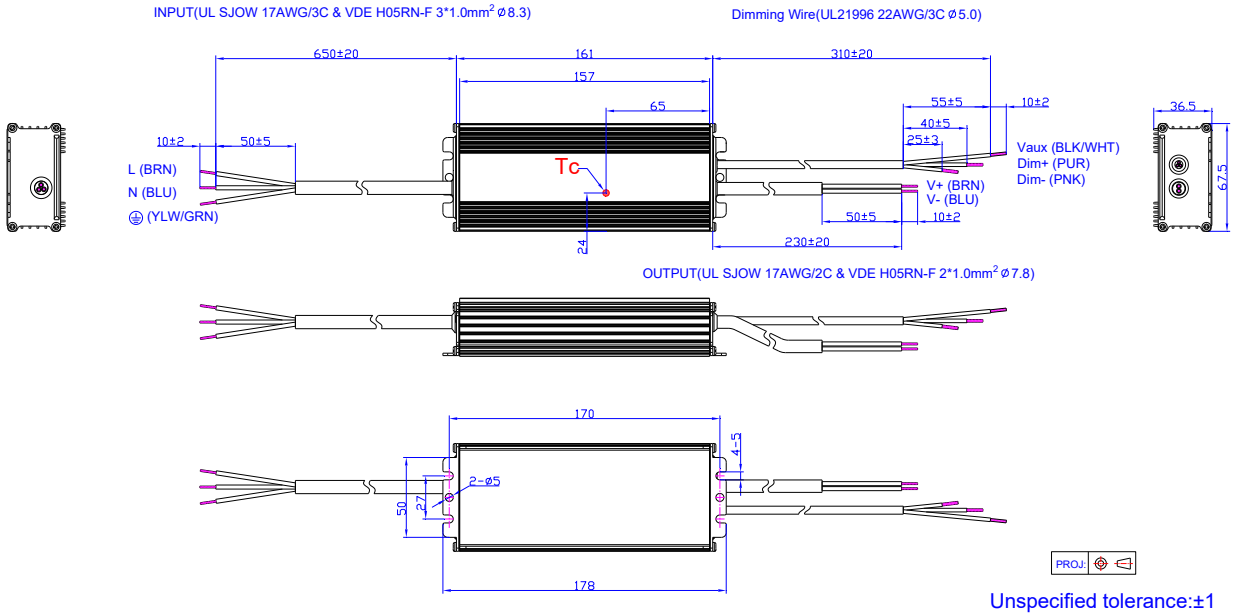


Note: The driver does not need to be powered on during the programming process.

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

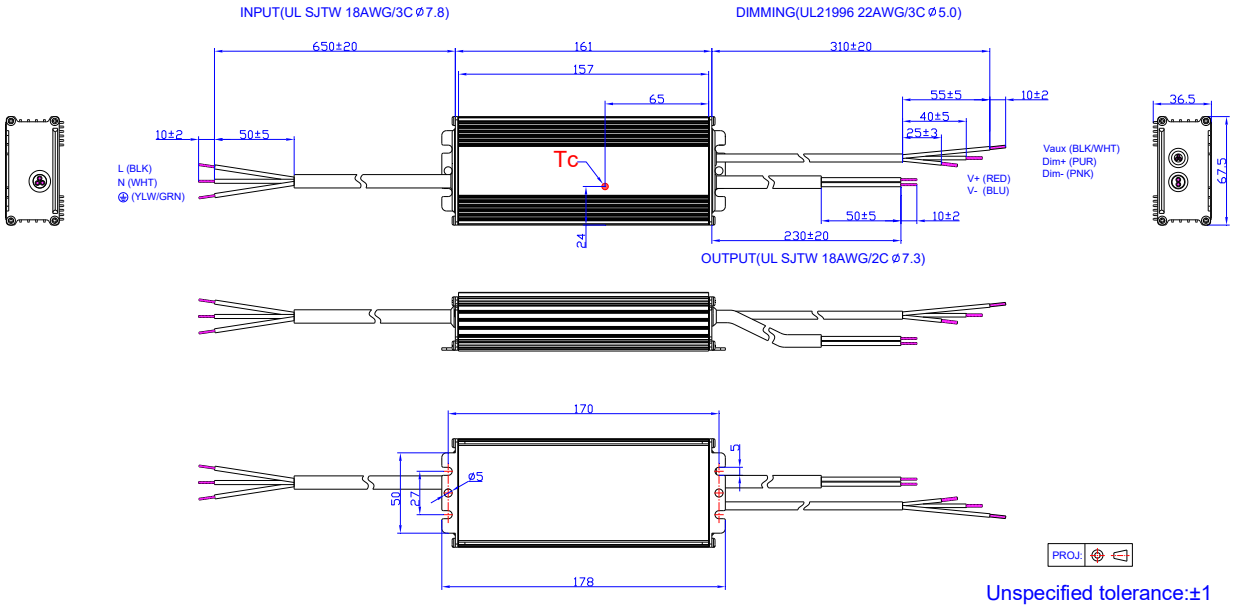
Mechanical Outline

EUM-150SxxxMG



Unspecified tolerance:±1

EUM-150SxxxMT



Unspecified tolerance:±1

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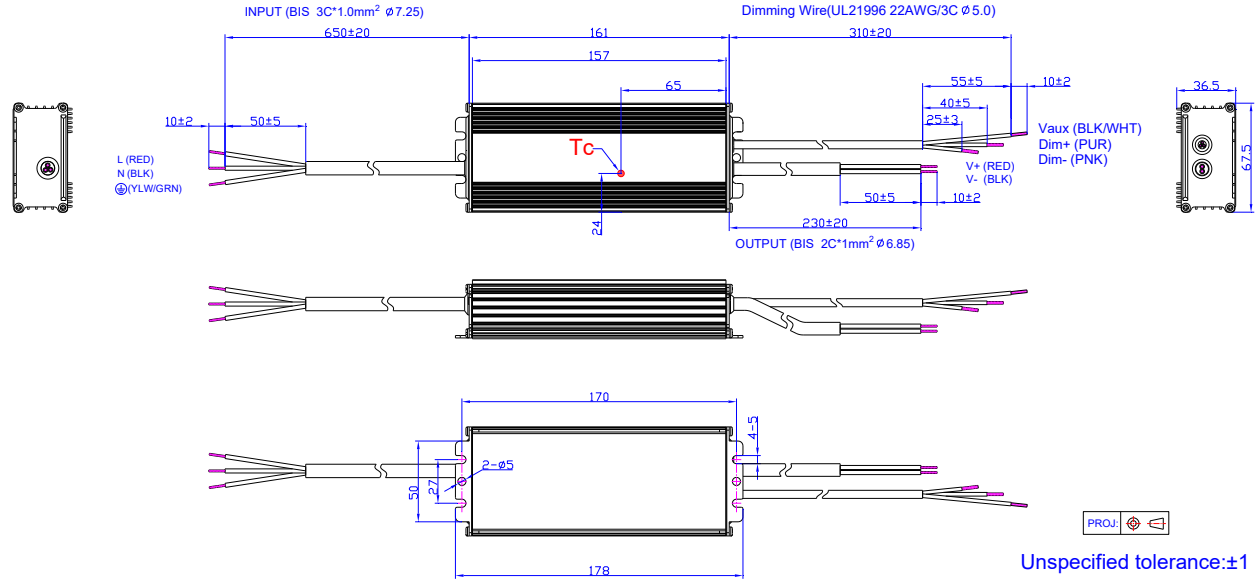
EUM-150S105MB/EUM-150S150MB/EUM-150S420MB



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.

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Revision History

Change Date	Rev.	Description of Change		
		Item	From	To
2020-12-07	A	Datasheet Release	/	/
2021-05-21	B	NOM Logo	/	Added
		Safety & EMC Compliance	/	Updated
2021-10-28	C	UKCA logo	/	Added
		EAC logo	/	Added
		Safety & EMC Compliance	UKCA	Added
		Safety & EMC Compliance	EAC	Added
		Programming Connection Diagram	EUM-150SxxxMT	Updated
		Mechanical Outline	/	Updated
2023-07-14	D	Product Photograph	/	Updated
		SAA logo	/	Added
		Safety &EMC Compliance	/	Updated
		Dimming	/	Updated
		Programming Connection Diagram	/	Updated
		Mechanical Outline	/	Updated
2024-11-26	E	Format	/	Updated
		Product Photograph	/	Updated
		UKCA logo	/	Deleted
		BIS logo	/	Added
		Models	Notes(5)(6)	Updated
		Safety &EMC Compliance	/	Updated
		Inrush Current Waveform	/	Updated
		Mechanical Outline	/	Updated