Mean Well PWM-60 series 60W Constant Voltage PWM Output LED Driver User Manual

Contents

MEAN WELL

Mean Well PWM-60 series 60W Constant Voltage PWM Output LED Driver

Features

- Constant Voltage
- PWM style output
- Emergency lighting application is available according to IEC61347-2-13
- Built-in active PFC function and class I/2 design
- No load power consumption <0.5W
- Fully encapsulated with IP67 level
- Function: 3 in 1 dimming(dim-to-off); DALI/DALI-2
- Minimum dimming level 0.2% for DALI type
- Typical lifetime>50000 hours and 5 years warranty

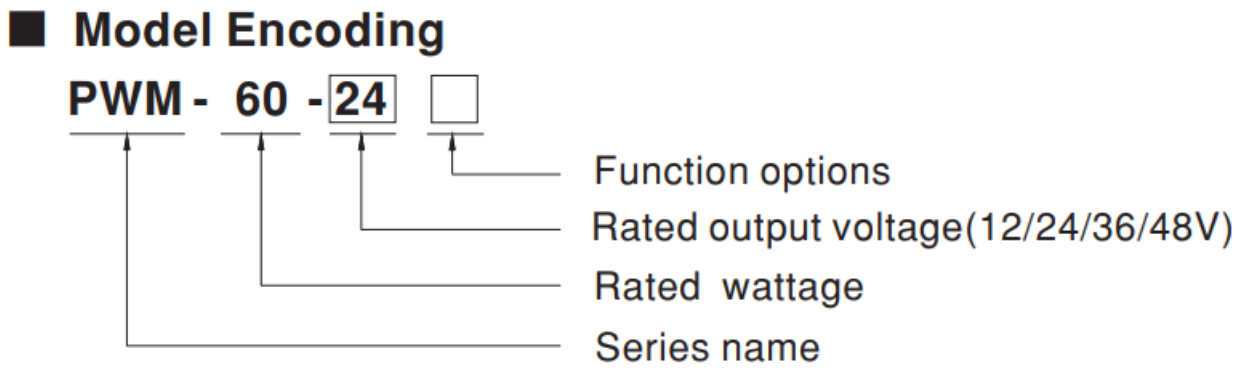
Applications

- LED strip lighting
- Indoor LED lighting
- LED decorative lighting
- LED architecture lighting
- Industrial lighting
- Type “HL” for use in Class I, Division 2 hazardous (Classified) location.

Description

PWM-60 series is a 60W LED AC/DC LED driver featuring the constant voltage mode with PWM style output, which is able to maintain the brightness homogeneity when driving all kinds of LED strips. PWM-60 operates from 90~305VAC and offers models with different rated voltage ranging between 12V and 48V. Thanks to the high efficiency up to 90%, with the fanless design, the entire series is able to operate for -40C~ +85C case temperature under free air convection. The entire series is rated with IP67 ingress protection level and is suitable to work for dry, damp or wet locations. PVWM-60 is equipped with dimming function that varies the duty cycle of the output, providing great flexibility for LED strips applications.

Model Encoding



Type	P Level	Function	Note
Blank	P67	3 in 1 dimming function (0~10 dc, 10 PWM signal and resistance)	n stock
DA	P67	DAL control technology.(for 12 /24 with DA type only)	n stock
DA2	P67	DAL -2 control technology.(for 12 /24 with DA2 type only)	n stock

SPECIFICATION

MODEL		PWM-60-12	PWM-60-24	PWM-60-36	PWM-60-48
OUTPUT	DC VOLTAGE	12V	24V	36V	48V
	RATED CURRENT	5A	2.5A	1.67A	1.25A
	RATED POWER	60W	60W	60.12W	60W
	DIMMING RANGE	0 ~ 100%			
	PWM FREQUENCY (Typ.)	1.47kHz for Blank/DA-Type, 2.5kHz for DA2-Type			
	SETUP, RISE TIME Note.2 Note.9	500ms, 80ms/ 115AC or 230VAC			
	HOLD UP TIME (Typ.)	16ms/115VAC or 230VAC			
	VOLTAGE RANGE Note.3	90 ~ 305VAC 127 ~ 431VDC (Please refer to “STATIC CHARACTERISTIC” section)			

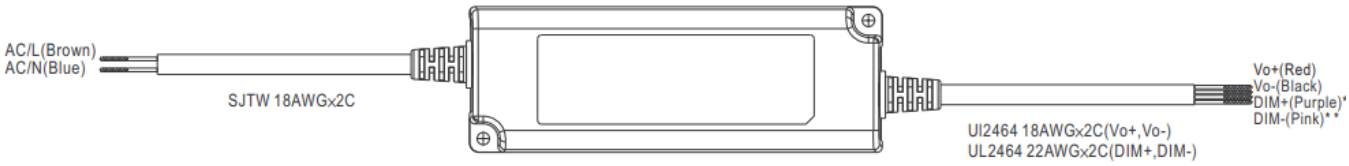
INPUT	**FREQUENCY RANGE**	47 ~ 63Hz			
	POWER FACTOR (Typ.)	PF>0.97/115VAC, PF>0.95/230VAC, PF>0.92/277VAC @ full load (Please refer to “POWER FACTOR (PF) CHARACTERISTIC” section)			
	TOTAL HARMONIC DISTORTION	THD< 20%(@load≧60%/115VAC, 230VAC; @load≧75%/277VAC) (Please refer to “TOTAL HARMONIC DISTORTION” section)			
	EFFICIENCY (Typ.)	86%	89%	90%	90%
	AC CURRENT (Typ.)	0.8A / 115VAC 0.4A / 230VAC 0.32A / 277VAC			
	INRUSH CURRENT (Typ.)	COLD START 50A(twidth=270μs measured at 50% Ipeak) at 230VAC*;* Per NEMA 410			
	MAX. NO. of PSUs on 16A CIRCUIT BREAKER	9 units (circuit breaker of type B) / 16 units (circuit breaker of type C) at 230VAC			
	LEAKAGE CURRENT	<0.25mA / 277VAC			
	NO LOAD POWER CONSUMPTION	<0.5W			

<table>
<tr><td rowspan="5">PROTECTION</td><td rowspan="2">OVERLOAD</td><td colspan="4">108 ~ 130% rated output power</td></tr>
<tr><td colspan="4">Hiccup mode, recovers automatically after fault condition is removed</td></tr>
<tr><td>SHORT CIRCUIT</td><td colspan="4">Shut down o/p voltage, re-power on to recover(except for DA2-type)
Hiccup mode,recovers automatically after fauit condition is removed (only for DA2-type)</td></tr>
<tr><td rowspan="2">OVER VOLTAGE</td><td>15 ~ 17V</td><td>28 ~ 34V</td><td>41 ~ 46V</td><td>54 ~ 60V</td></tr>
<tr><td colspan="4">Shut down o/p voltage, re-power on to recover</td></tr>
<tr><td>OVER TEMPERATURE</td><td colspan="4">Shut down o/p voltage, re-power on to recover</td></tr>
<tr><td rowspan="5">ENVIRONMENT</td><td>WORKING TEMP.</td><td colspan="4">Tcase=-40 ~ +85℃ (Please refer to “ OUTPUT LOAD vs TEMPERATURE” section)</td></tr>
<tr><td>MAX. CASE TEMP.</td><td colspan="4">Tcase=+85℃</td></tr>
<tr><td>WORKING HUMIDITY</td><td colspan="4">20 ~ 95% RH non-condensing</td></tr>
<tr><td>STORAGE TEMP., HUMIDITY</td><td colspan="4">-40 ~ +80℃, 10 ~ 95% RH</td></tr>
<tr><td></td><td colspan="4"></td></tr>
</table>

	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)
	VIBRATION	10 ~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes
SAFETY & EMC	**SAFETY STANDARDS Note.5**	UL8750(type ”HL”)(except for DA-Type), UL879(for 12V,24V Blank Type only), CSA C22.2 No. 250.13-12; ENEC BS EN/EN61347-1, BS EN/EN61347-2-13 independent, BS EN/EN62384, IP67,BIS IS15885(for 12,24, 48 Blank Type only), EAC TP TC 004, GB19510.1,GB19510.14 approved; Design refer to BS EN/EN60335-1; According to BS EN/EN61347-2-13 appendix J suitable for emergency installations
	DALI STANDARDS	IEC62386-101, 102, 207,251 for DA/DA2-Type only,Device type 6(DT6)
	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC; I/P-DA:1.5KVAC; O/P-DA:1.5KVAC
	ISOLATION RESISTANCE	I/P-O/P:100M Ohms / 500VDC / 25℃/ 70% RH
	EMC EMISSION Note.6	Compliance to BS EN/EN55015, BS EN/EN61000-3-2 Class C (@load≧60%) ; BS EN/EN61000-3-3,GB17743 and GB17625.1,EAC TP TC 020
	EMC IMMUNITY	Compliance to BS EN/EN61000-4-2,3,4,5,6,8,11; BS EN/EN61547, light industry level (surge immunity Line-Line 2KV),EAC TP TC 020
	MTBF	996K hrs min. Telcordia SR-332 (Bellcore) ; 271.03K hrs min. MIL-HDBK-217F (25℃)

OTHERS	**DIMENSION**	150*53*35mm (L*W*H)
	PACKING	0.49Kg;30pcs/15.7Kg/1.0CUFT
NOTE	1. All parameters NOT specially mentioned are measured at 230 AC input, rated current and 25℃ of ambient temperature. 2. De-rating may be needed under low input voltages. Please refer to “STAT C CHARACTER ST C” sections for details. 3. Length of set up time is measured at first cold start. Turning ON/OFF the driver may lead to increase of the set up time. 4. The driver is considered as a component that will be operated in combination with final equipment. Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC Directive on the complete installation again. 5. This series meets the typical life expectancy of >50,000 hours of operation when Tcase, particularly tc point (or TMP, per DLC), is about 75℃ or less. 6. Please refer to the warranty statement on MEAN WELL’s website at **http://www.meanwell.com** 7. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft). 8. For any application note and P water proof function installation caution, please refer our user manual before using. h**ttps://www.meanwell.com/Upload/PDF/LED_EN.pdf** 9. Based on EC 62386-101/102 DAL power on timing and interruption regulations, the set up time needs to test with a DAL controller which can support for DAL power on function, otherwise the set up time will be higher than 0.5 second for DA type. ※ Product Liability Disclaimer For detailed information, please refer to https:// **www.meanwell.com/serviceDisclaimer.aspx**	

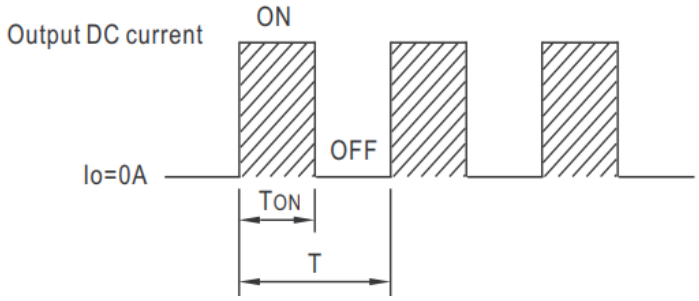
DIMMING OPERATION



* DIM+ for Blank-Type
DA+ for DA/DA2-type
** DIM- for Blank-Type
DA- for DA/DA2-type
NOTE: DA/DA2 Type is no distinction between "+" and "-" poles

※ Dimming principle for PWM style output

- Dimming is achieved by varying the duty cycle of the output current.



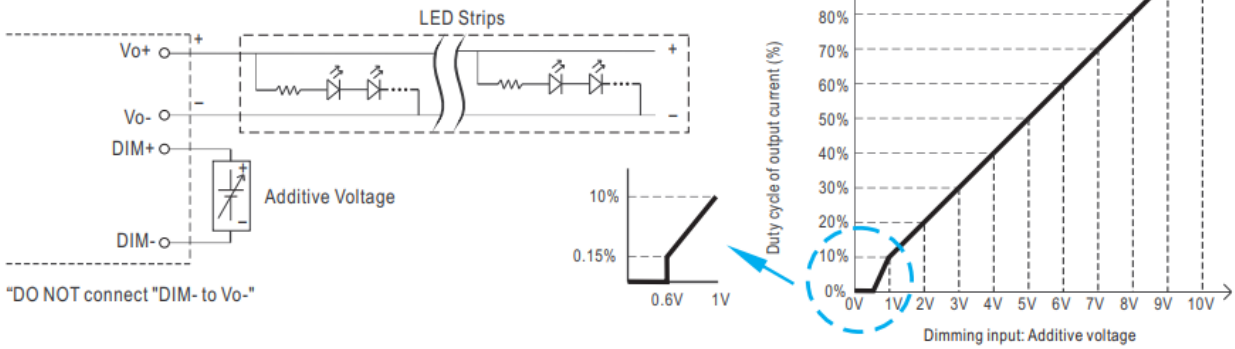
$$\text{Duty cycle}(\%) = \frac{T_{ON}}{T} \times 100\%$$

Output PWM frequency :
1.47kHz for Blank/DA-Type fixed (Typ.)
2.5kHz for DA2-Type fixed (Typ.)

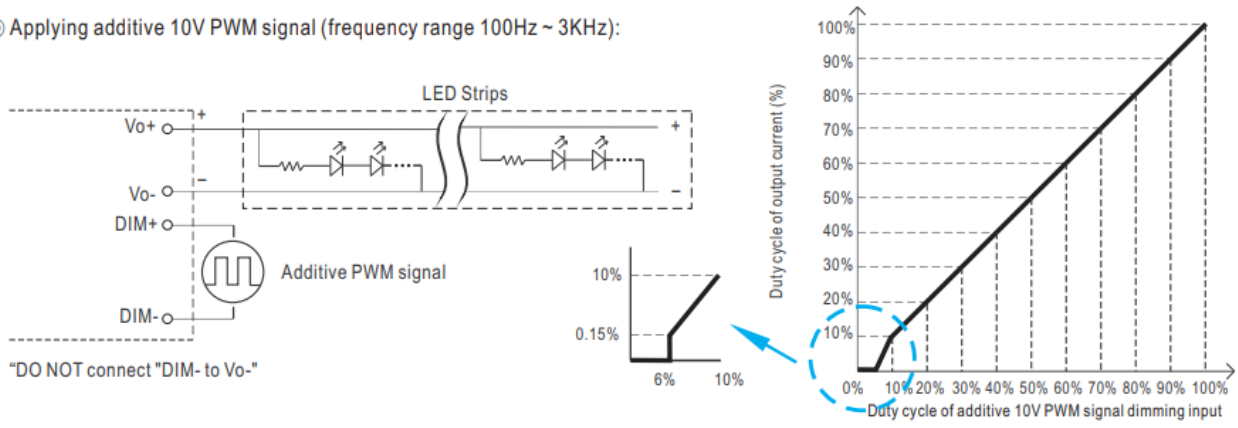
3 in 1 dimming function (for Blank-Type)

- Apply one of the three methodologies between DIM+ and DIM-: 0- 10VDC, or 10V PWM signal or resistance.
- Dimming source current from power supply: 100guA (typ.)

◎ Applying additive 0 ~ 10VDC



◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



Applying additive resistance

Note

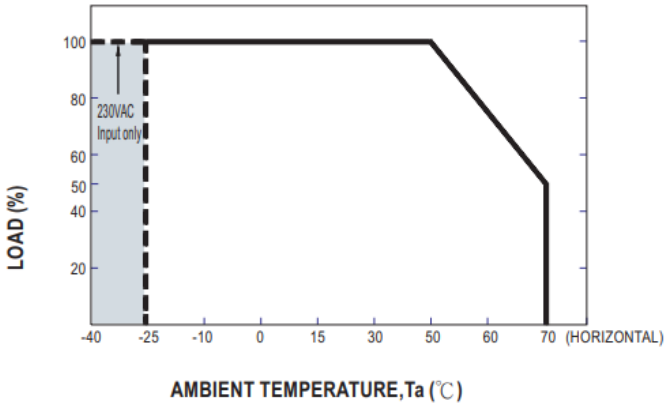
1. Min. duty cycle of output current is about 6% and the output current is not defined when 0%< Iout<6%.

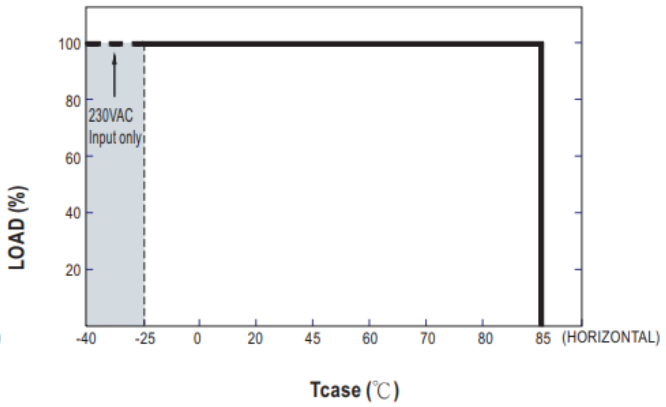
2. The duty cycle of output current could drop down to 0% when dimming input is about OkQ or OVdc, or 10V PWM signal with 0% duty cycle.

* DALI Interface (primary side; for DA/DA2-Type)

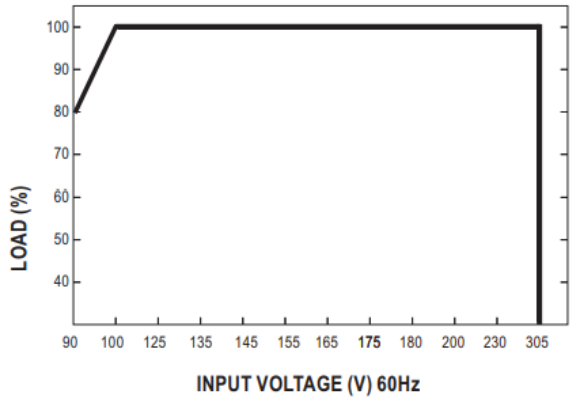
- Apply DALI signal between DA+ and DA-
- DALI protocol comprises 16 groups and 64 addresses.
- First step is fixed at 0.2% of output

OUTPUT LOAD vs TEMPERATURE

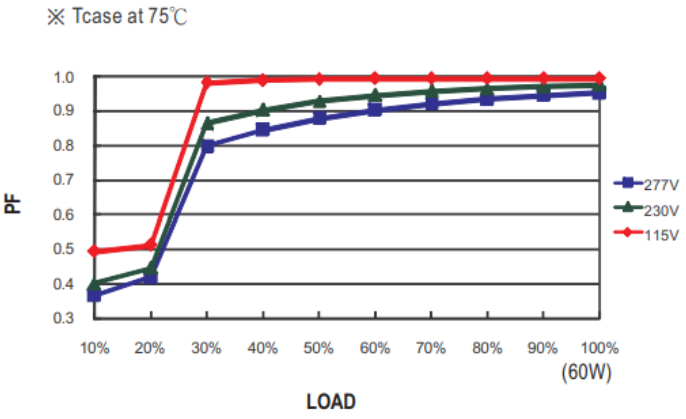




STATIC CHARACTERISTIC

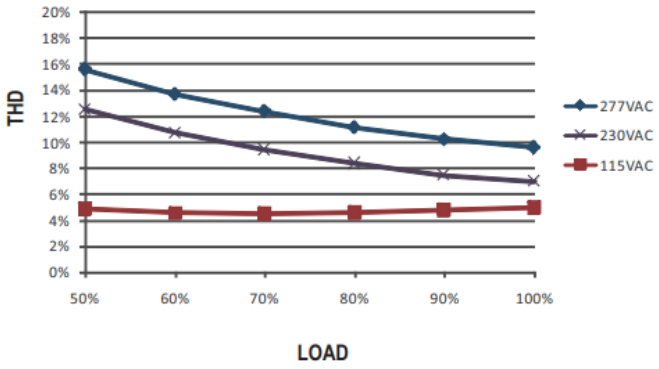


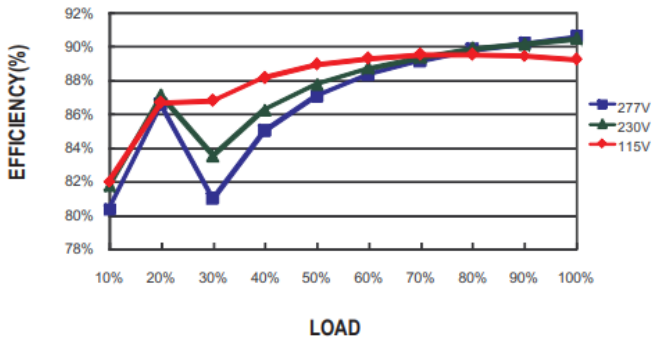
※ De-rating is needed under low input voltage.



POWER FACTOR (PF) CHARACTERISTIC

TOTAL HARMONIC DISTORTION (THD)



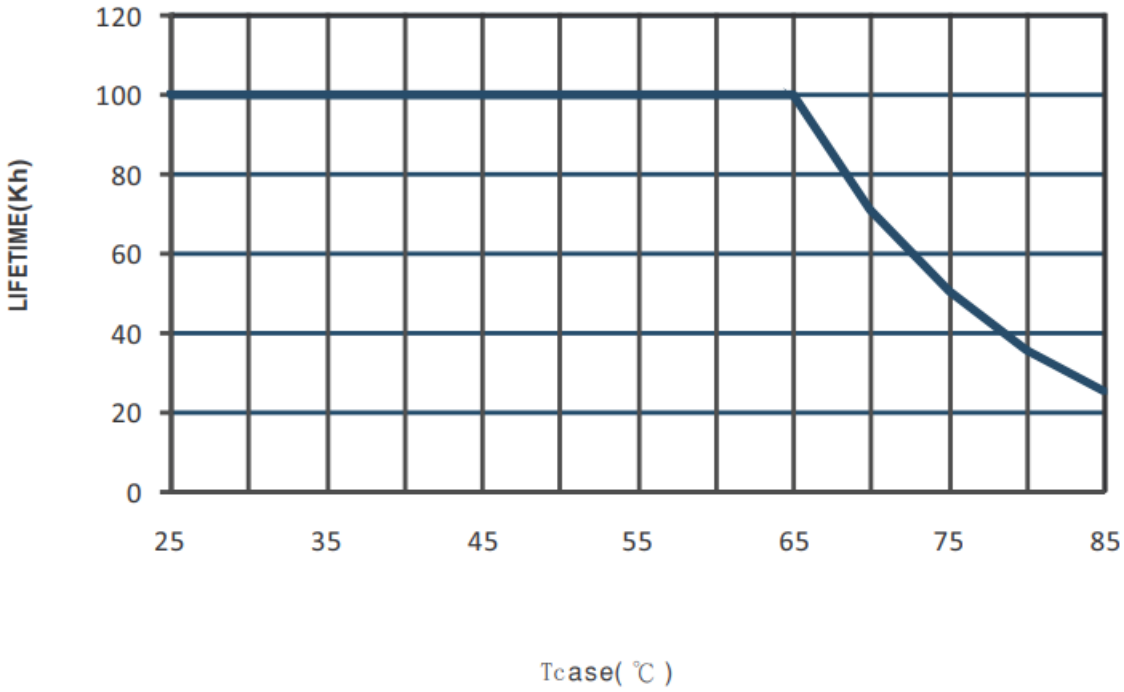


EFFICIENCY vs LOAD

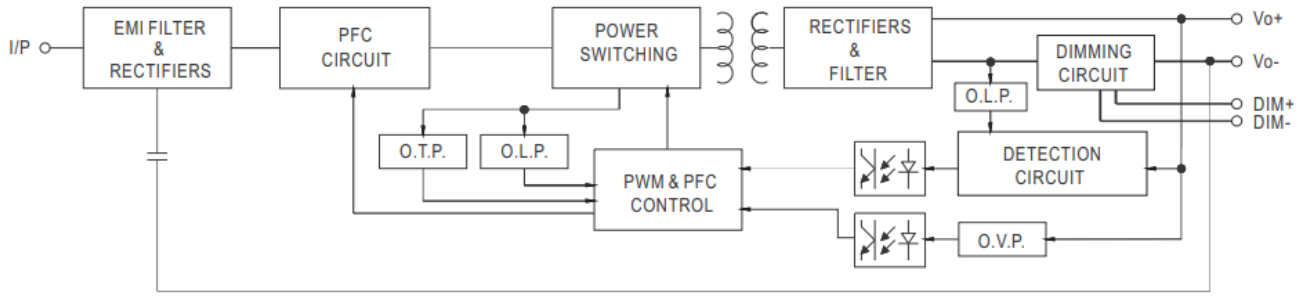
PWM-60 series possess superior working efficiency that up to 90% can be reached in field applications. x 48V Model, Tcase at 75C

X48V Model, Tcase at 75C

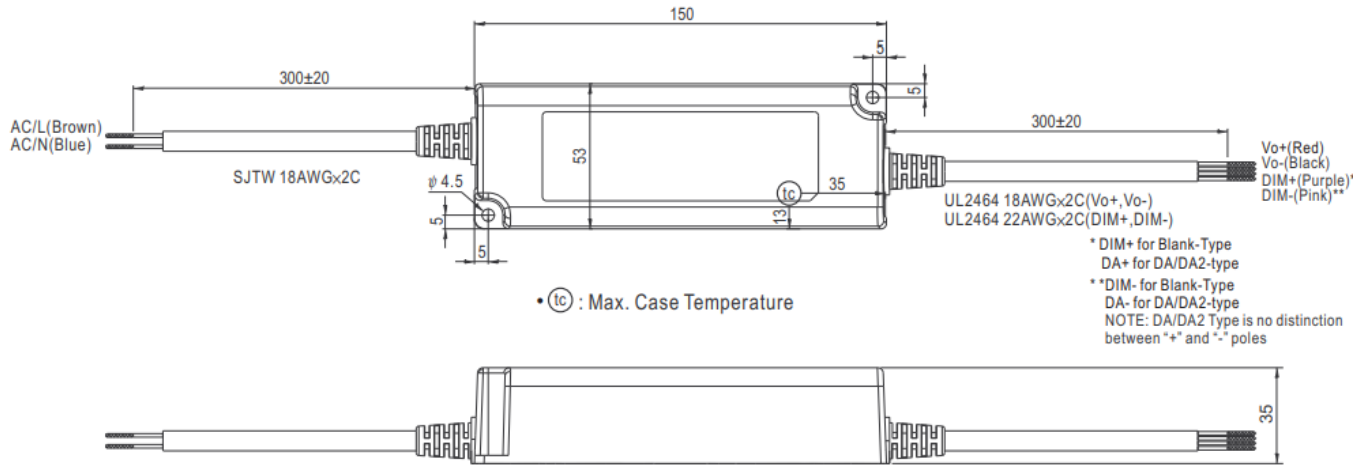
LIFE TIME



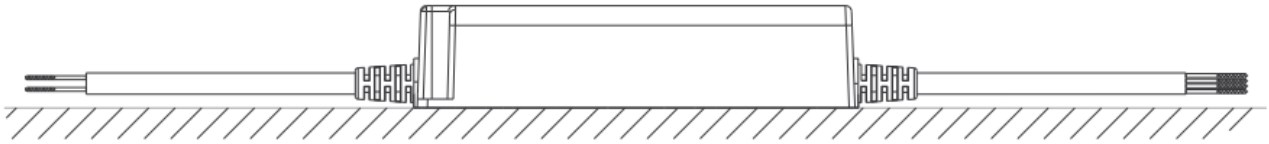
Block Diagram



Mechanical Specification

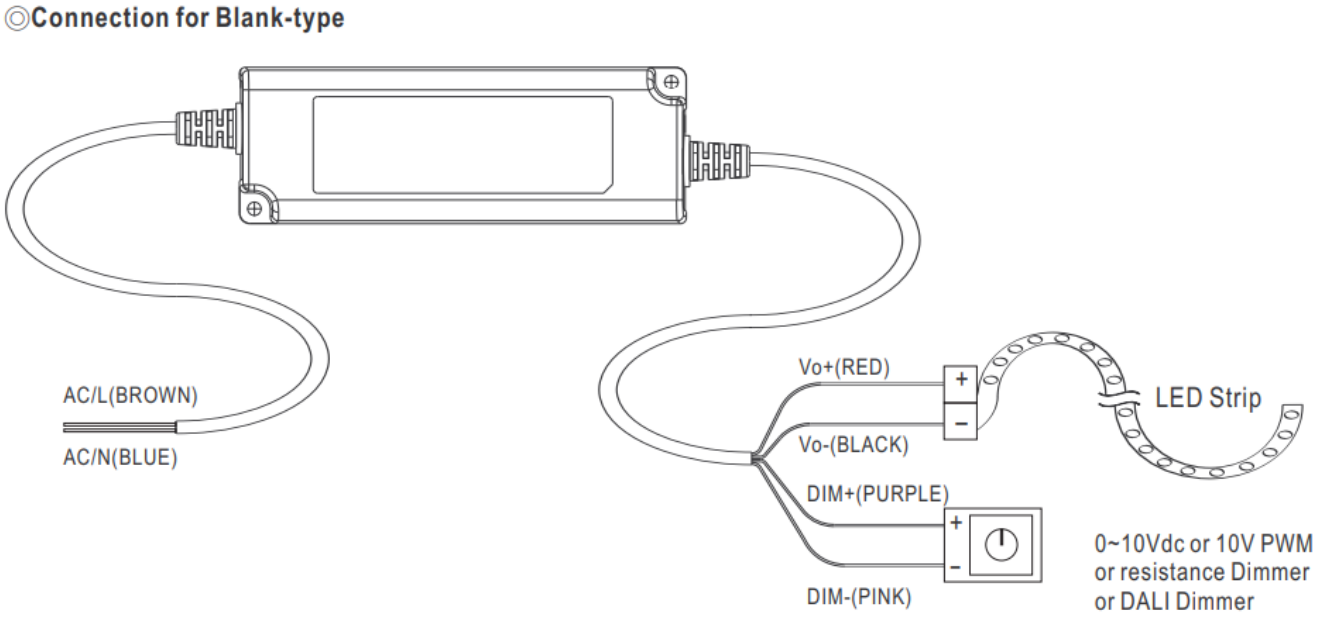


Recommend Mounting Direction



Installation Manual

Connection for Blank-type



Cautions

- Before commencing any installation or maintenance work, please disconnect the power supply from the utility.
- Ensure that it cannot be re-connected inadvertently! Keep proper ventilation around the unit and do not stack any object on it. Also a 10-15 cm clearance must be kept when the adjacent device is a heat source.
- Mounting orientations other than standard orientation or operate under high ambient temperature may increase the internal component temperature and will require a de-rating in output current.

- Current rating of an approved primary /secondary cable should be greater than or equal to that of the unit.
- Please refer to its specification. For LED drivers with waterproof connectors, verify that the linkage between the unit and the lighting fixture is tight so that water cannot intrude into the system.
- For dimmable LED drivers, make sure that your dimming controller is capable of driving these units.
- PWM series require 0.15mA each unit Tc max. is identified on the product label.
- Please make sure that the temperature of Tc point will not exceed limit. DO NOT connect “DIM- to Vo-“.
- Suitable for indoor use or outdoor use without direct sunlight exposure. Please avoid immersing in the water for over 30 minutes.
- The power supply is considered as a component that will be operated in combination with final equipment.
- Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC Directive on the complete installation again.

Documents / Resources

	Mean Well PWM-60 series 60W Constant Voltage PWM Output LED Driver [pdf] User Manual PWM-60 series, 60W Constant Voltage PWM, Output LED Driver, Constant Voltage PWM, LED Driver
	MEAN WELL PWM-60 series 60W Constant Voltage PWM Output LED Driver [pdf] Owner's Manual PWM-60 series 60W Constant Voltage PWM Output LED Driver, PWM-60 series, 60W Constant Voltage PWM Output LED Driver, Voltage PWM Output LED Driver, LED Driver

References

- Product Liability Disclaimer-MEAN WELL Switching Power Supply Manufacturer