



## ■ Features

- Universal AC input / Full range (up to 305VAC)
- Built-in active PFC function
- Constant voltage PWM style output
- 0~10Vdc or PWM input signal dimming function
- Dimming range : 0~100%
- High efficiency up to 90%
- Protections: Short circuit / Over load / Over voltage / Over temperature
- Class II power unit, no FG
- Suitable for dry / damp / wet locations
- No load power consumption<0.5W
- 5 years warranty

## ■ Applications

- LED strip lighting
- Indoor LED lighting
- LED decorative lighting
- Architecture lighting

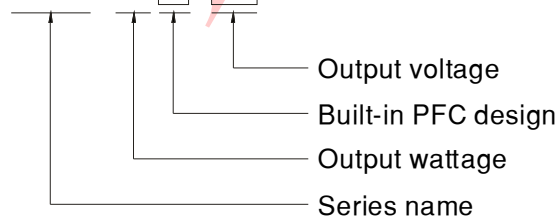
## ■ Description

PWM-60P is one 60W waterproof constant-voltage-output LED power supply series. Differentiating from general DC-output power supplies, PWM-60P transmits the output in the form of PWM, adapting to directly driving all kinds of LED lighting strips so that the color temperature can be maintained and the brightness homogeneity can be assured. Adopting a universal input range between 90VAC and 305VAC and incorporating a built-in PFC function, this series is also designed with a 2-in-1 dimming function (0~10Vdc or PWM signals) that simplifies the brightness adjustment for system designers so as to achieve light reduction and energy saving.

Providing a high efficiency up to 90% and a low no load power consumption below 0.5W, PWM-60P can meet the energy saving demand for the new generation LED lighting. The class II design (without FG pin) and the double insulation weather-resistant cable (SJTW) make it convenient for users to flexibly install on various types of lighting systems. The plastic case with 94V-0 fire prevention level and the fully-potted silicone enhance the heat dissipation and meet the anti-vibration demand up to 5G; moreover, it thus meets the IP67 level, allowing this series to be used in a highly dusty and highly humid harsh environment. The entire series can operate under the temperature between -40~+70℃ and comply with the relevant global lighting safety certification.

## ■ Model Encoding

**PWM - 60P - 12**

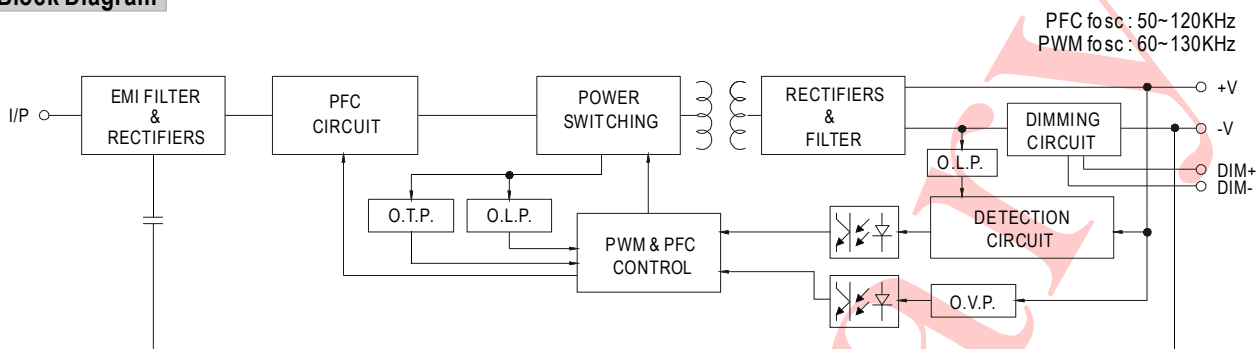




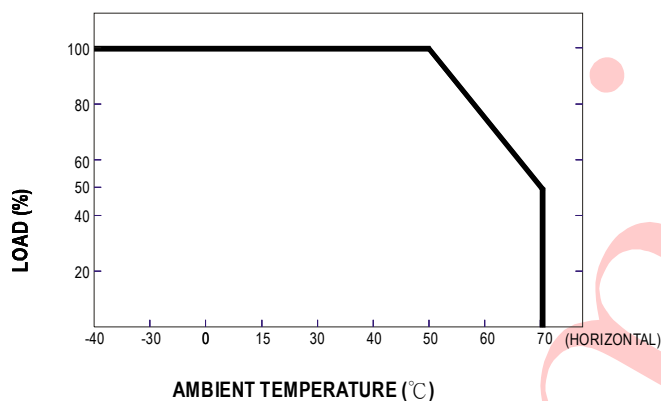
## SPECIFICATION

MODEL		PWM-60P-12	PWM-60P-24	PWM-60P-36	PWM-60P-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.)	300Hz			
	RIPPLE & NOISE (max.) <small>Note.2</small>	100mVp-p	100mVp-p	200mVp-p	200mVp-p
	VOLTAGE TOLERANCE <small>Note.3</small>	±4.0%	±3.0%	±2.0%	±1.0%
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION	±1.0%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME <small>Note.4</small>	500ms, 80ms 230VAC / 115VAC at full load			
HOLD UP TIME (Typ.)	16ms/230VAC      16ms/115VAC at full load				
INPUT	VOLTAGE RANGE	90 ~ 305VAC      127 ~ 431VDC			
	FREQUENCY RANGE	47 ~ 63Hz			
	POWER FACTOR (Typ.)	PF>0.97/115VAC, PF>0.96/230VAC, PF>0.95/277VAC at full load (Please refer to "Power Factor Characteristic" curve)			
	TOTAL HARMONIC DISTORTION	THD<20% when output loading ≥ 60% at 115VAC/230VAC input and output loading ≥ 75% at 277VAC input			
	EFFICIENCY (Typ.)	86%	89%	90%	90%
	AC CURRENT (Typ.)	0.8A / 115VAC	0.4A / 230VAC	0.32A / 277VAC	
	INRUSH CURRENT (Typ.)	COLD START 30A(twidth=      μs measured at 50% Ipeak) at 230VAC			
	LEAKAGE CURRENT	<0.75mA / 277VAC			
PROTECTION	OVER LOAD	105 ~ 135% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed			
	OVER VOLTAGE	15 ~ 17V	28 ~ 34V	41 ~ 46V	54 ~ 60V
		Protection type : Shut down and latch off o/p voltage, re-power on to recover			
	OVER TEMPERATURE	90℃ ±10℃ (RTH2) Protection type : Shut down o/p voltage, recover automatically after temperature goes down			
ENVIRONMENT	WORKING TEMP.	-40 ~ +70℃ (Refer to "Derating Curve")			
	WORKING HUMIDITY	20 ~ 95% RH non-condensing			
	STORAGE TEMP., HUMIDITY	-40 ~ +80℃, 10 ~ 95% RH			
	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	UL8750, CSA C22.2 No. 250.13-12(except for 48V), ENEC EN61347-1, EN61347-2-13, EN62384 independent, IP67 approved			
	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC			
	ISOLATION RESISTANCE	I/P-O/P:100M Ohms / 500VDC / 25℃ / 70% RH			
	EMC EMISSION	Compliance to EN55015, EN61000-3-2 Class C (≥ 60% load) ; EN61000-3-3			
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; EN61547, EN55024, light industry level(surge L-N : 2KV), criteria A			
OTHERS	MTBF	K hrs min.      MIL-HDBK-217F (25℃)			
	DIMENSION	150*51*35mm (L*W*H)			
	PACKING	Kg			
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. Length of set up time is measured at cold first start. Turning ON/OFF the power supply may lead to increase of the set up time.				

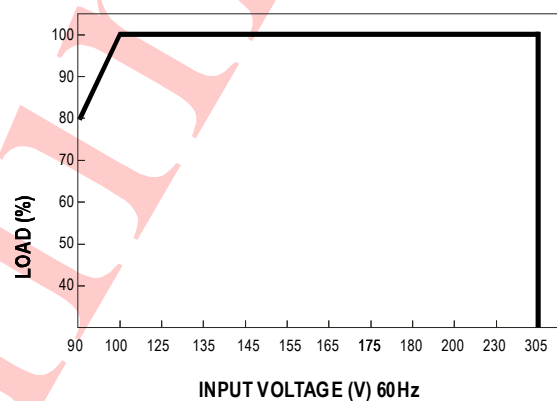
## Block Diagram



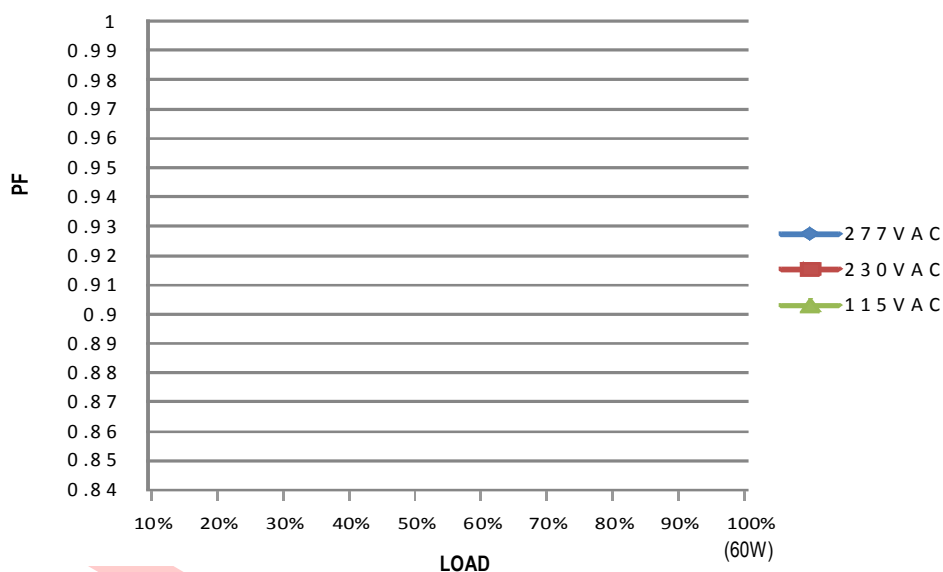
## Derating Curve



## Static Characteristics

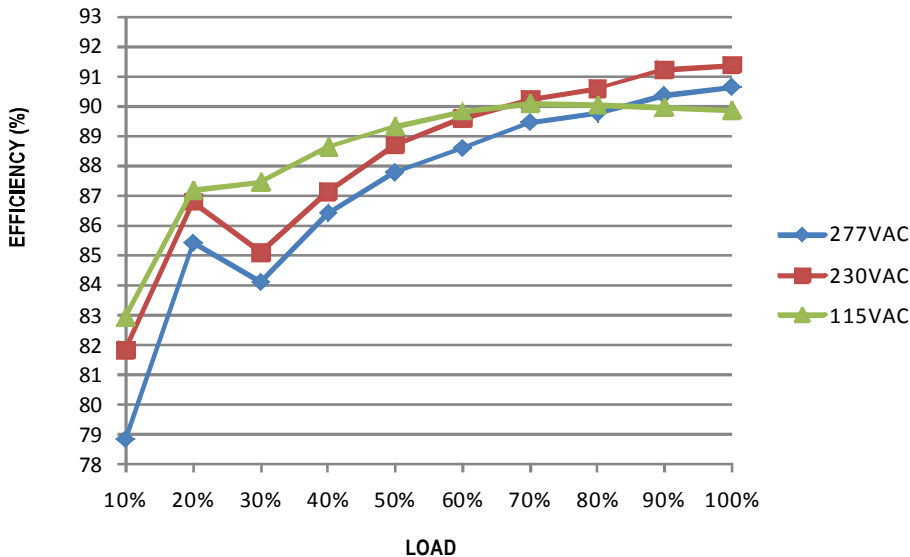


## Power Factor Characteristic



## ■ EFFICIENCY vs LOAD (48V Model)

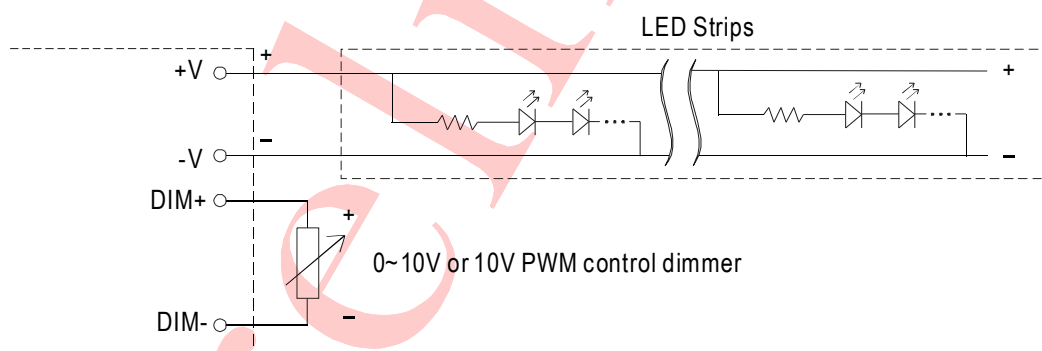
PWM-60P series possess superior working efficiency that up to 90% can be reached in field applications.



## ■ DIMMING OPERATION

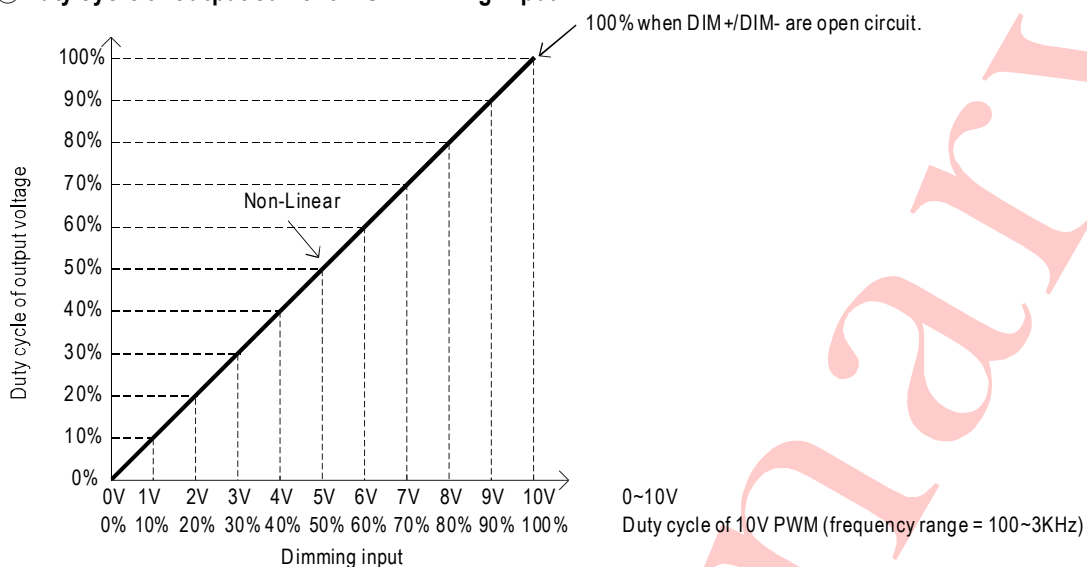
Output PWM control is simple switching of output voltage on/off at a rate so fast that the human eye cannot see led flickering. Duty cycle describes the proportion of time when output voltage is on relative to the entire period of time. It's expressed in percent, 100% being full on (max. brightness) and low duty cycle corresponding to lower brightness. Output PWM control built-in 2 in 1 dimming function, output constant voltage PWM duty can be adjusted through output cable by 0~10Vdc or 10V PWM signal between DIM+ and DIM-.

### ◎ Connection



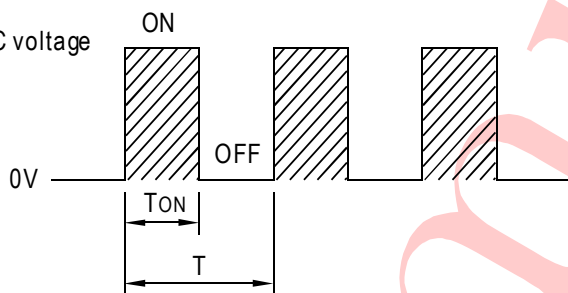
※DO NOT connect "DIM- to -V"

## ◎Duty cycle of output current VS Dimming input



## ◎PWM Output

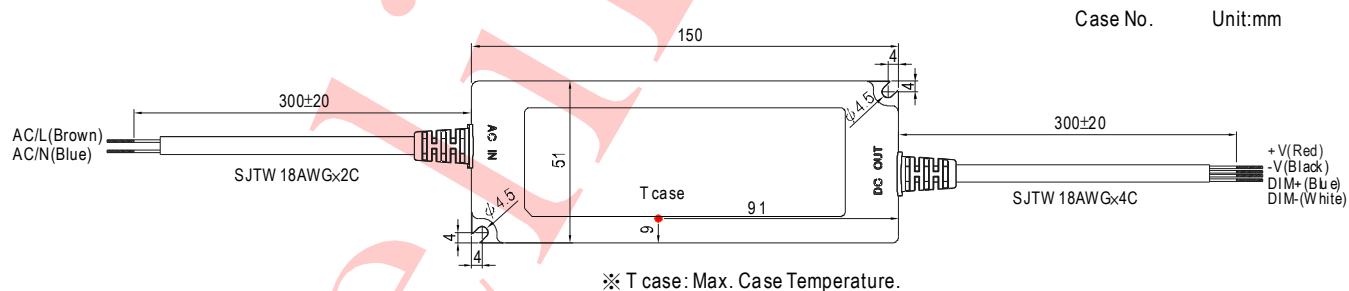
Output DC voltage



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

Output PWM frequency : 300Hz fixed (Typ.)

## ■ Mechanical Specification

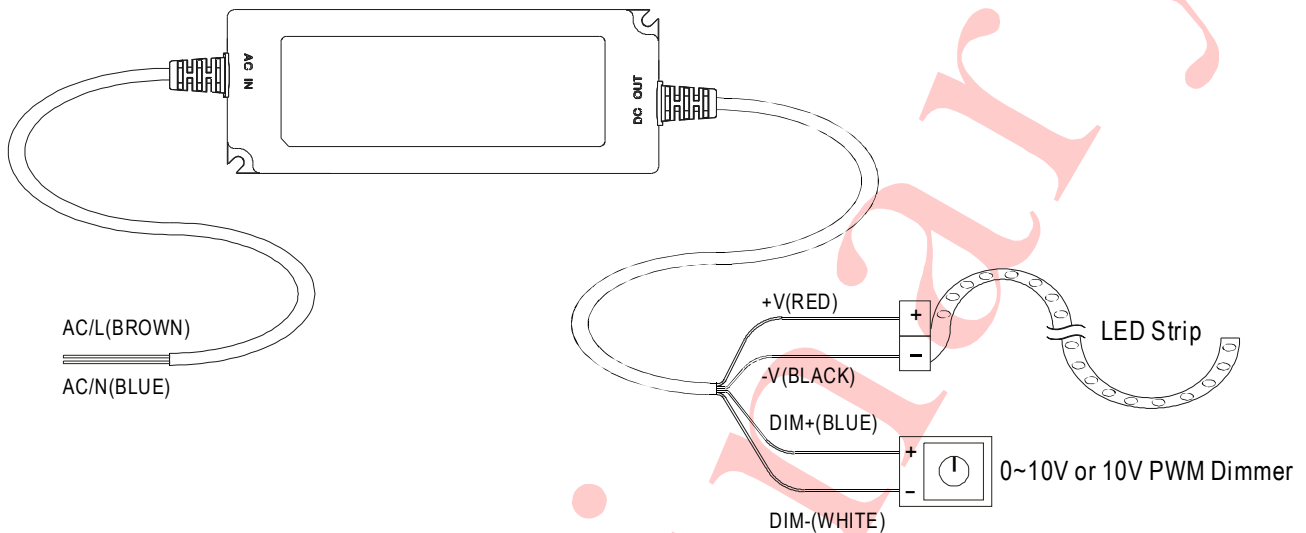


## ■ Recommend Mounting Direction



## ■ Installation Manual

### ◎ Connection



### ◎ 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 power supplies 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 power supplies, 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 temperature of Tc point will not exceed limit.
- DO NOT connect "DIM+ to -V".
- Suitable for indoor use or outdoor use without direct sunlight exposure. Please avoid immerse in the water 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.
- For more information about installation, please refer to [www.meanwell.com/webnet/search/installationsearch.html](http://www.meanwell.com/webnet/search/installationsearch.html) for details.