



## ■ Features

- Universal AC input / Full range (up to 305VAC)
- Built-in active PFC function
- Constant voltage PWM style output
- Built-in 3 in 1 dimming function  
(0~10Vdc or PWM signal or resistance)
- Dimming range : 0~100%
- High efficiency up to 90%
- Protections: Short circuit / Over load / Over voltage  
/ Over temperature
- Class II power unit, no FG
- Class 2 power unit
- 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
- LED architecture lighting

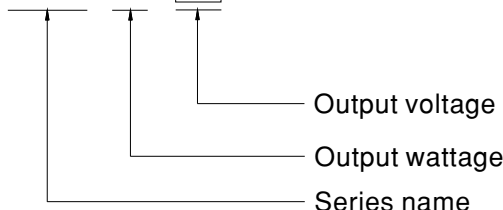
## ■ Description

PWM-60 is one 60W waterproof constant-voltage output LED power supply series. Differentiating from general DC output power supplies, PWM-60 transmits PWM style output, adapting to directly driving all kinds of LED strips 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 the built-in PFC function, this series is also designed with a 3 in 1 dimming function (0~10Vdc or PWM signal or resistance) that simplifies the brightness adjustment for system designers so as to achieve light reduction and energy conservation.

Providing a high efficiency up to 90% and a low no load power consumption below 0.5W, PWM-60 can satisfy 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) on the input side make it convenient for users to flexibly install on various types of lighting systems. The enclosure design is a 94V-0 flame retardant plastic case. The interior is fully potted with silicone that enhances the heat dissipation and allows PWM-60 to meet the anti-vibration demand up to 5G; it also thus conforms to IP67 level, enabling PWM-60 to be used in a highly dusty and highly humid harsh environment. The entire series can operate under the temperature between -40~+70°C and comply with the relevant global lighting safety certification.

## ■ Model Encoding

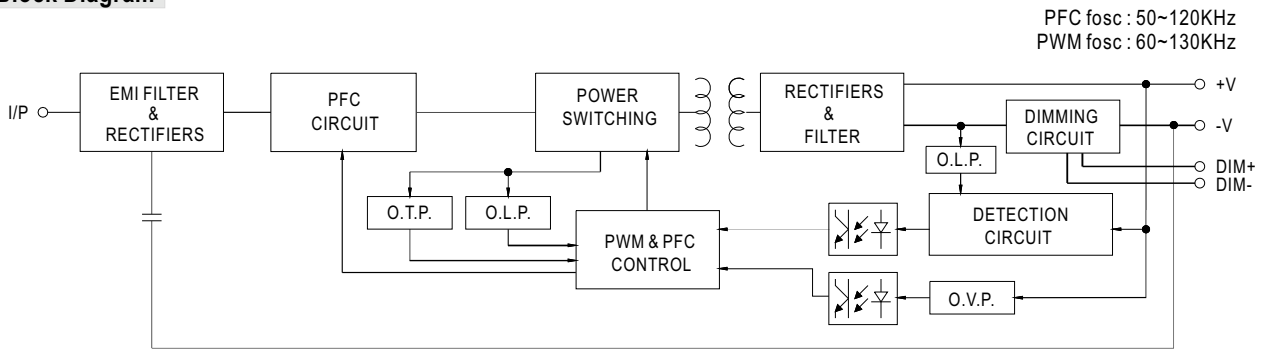
PWM - 60 - 12



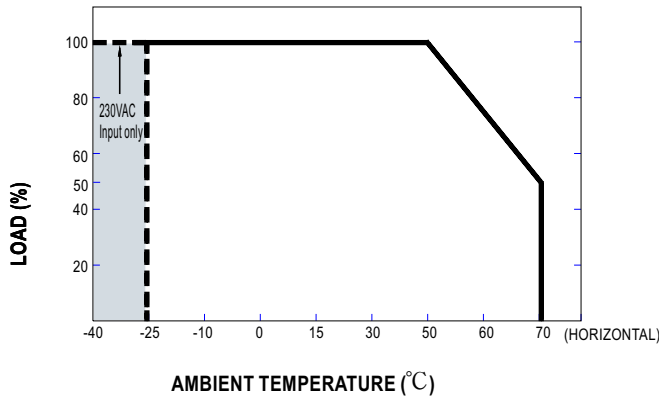
**SPECIFICATION**

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.)	300Hz			
	VOLTAGE TOLERANCE	±4.0%	±3.0%	±2.0%	±1.0%
	SETUP, RISE TIME Note.2	500ms, 80ms at 95% load 115VAC / 230VAC			
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>0.95/230VAC, PF>0.92/277VAC 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 50A(twidth=270μs measured at 50% Ipeak) at 230VAC			
	MAX. NO. of PSUs on 16A CIRCUIT BREAKER	9 units (circuit breaker of type B) / 16 units (circuit breaker of type C) at 230VAC			
PROTECTION	LEAKAGE CURRENT	<0.25mA / 277VAC			
	SHORT CIRCUIT	Hiccup mode, recovers automatically after fault condition is removed			
	OVER LOAD	108 ~ 120% rated output power			
		Protection type : Hiccup mode, recovers automatically after fault condition is removed			
	OVER VOLTAGE	15 ~ 17V	28 ~ 34V	41 ~ 46V	54 ~ 60V
OVER TEMPERATURE	Shut down o/p voltage, re-power on to recover				
ENVIRONMENT	WORKING TEMP.	-40 ~ +70°C (Refer to "Derating Curve")			
	WORKING HUMIDITY	20 ~ 95% RH non-condensing			
	STORAGE TEMP., HUMIDITY	-40 ~ +80°C, 10 ~ 95% RH			
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)			
SAFETY & EMC	VIBRATION	10 ~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes			
	SAFETY STANDARDS	UL8750(type"HL"), CSA C22.2 No. 250.13-12, ENEC EN61347-1, EN61347-2-13, EN62384 independent, IP67 approved; Design refer to EN60335-1			
	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC			
	ISOLATION RESISTANCE	I/P-O/P:100M Ohms / 500VDC / 25°C / 70% RH			
	EMC EMISSION	Compliance to EN55015, EN61000-3-2 Class C (≥60% load) ; EN61000-3-3			
OTHERS	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; EN61547, light industry level(surge L-N: 2KV), criteria A			
	MTBF	271.03K hrs min. MIL-HDBK-217F (25°C)			
	DIMENSION	150*53*35mm (L*W*H)			
NOTE	PACKING	0.49Kg;30pcs/15.7Kg/1.0CUFT			
		1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature. 2. 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.			

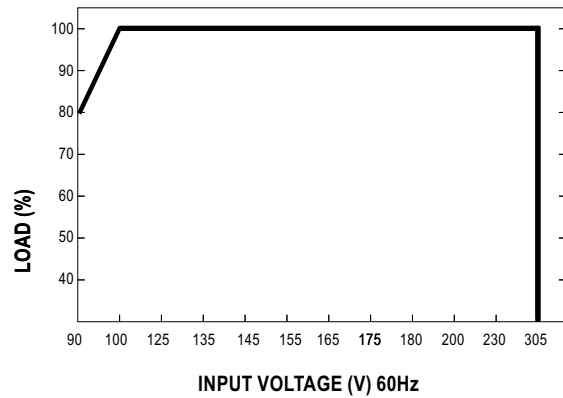
### Block Diagram



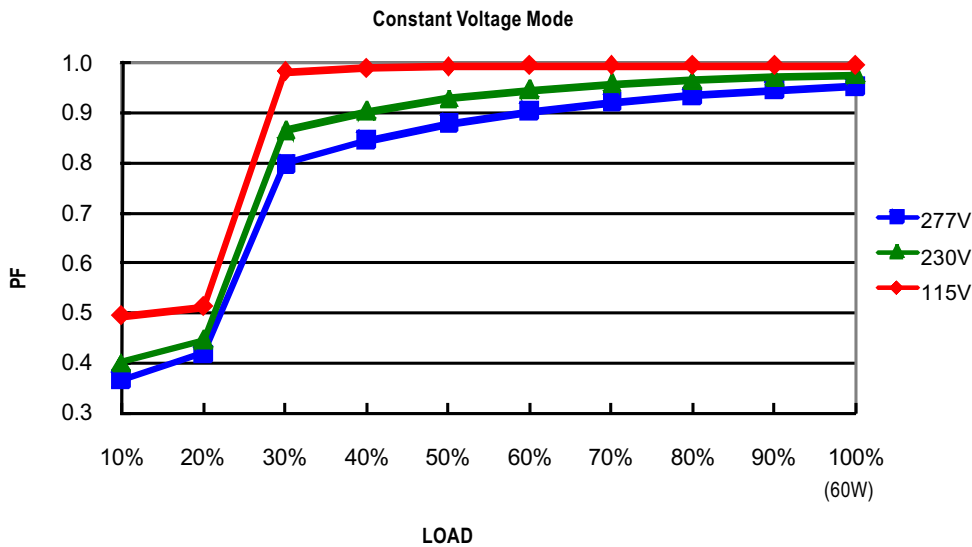
### Derating Curve



### Static Characteristics

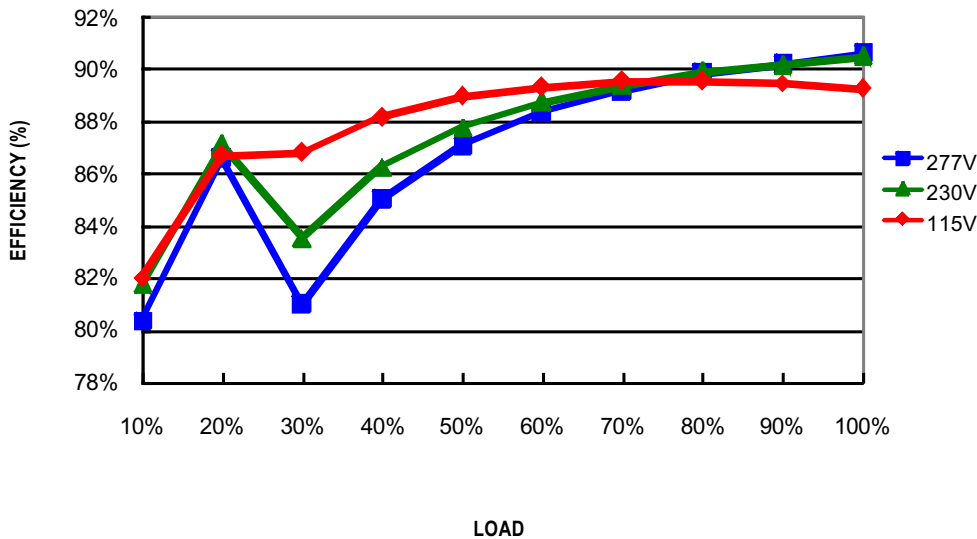


### Power Factor Characteristic



■ **EFFICIENCY vs LOAD (48V Model)**

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

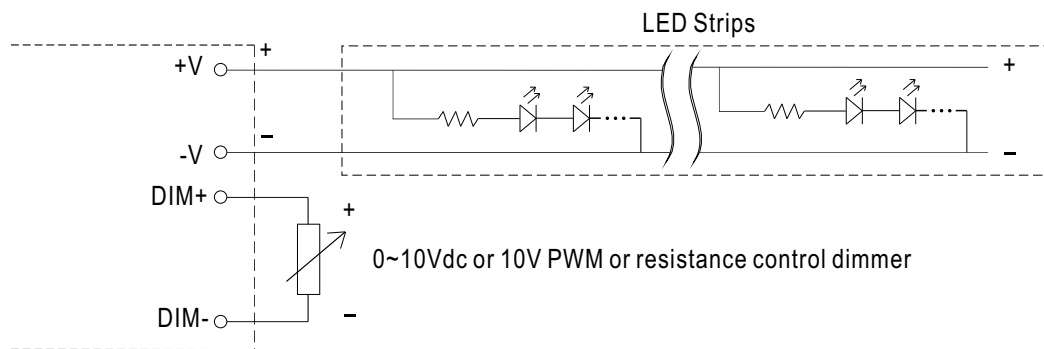


■ **DIMMING OPERATION**

The PWM style output is a simple switching of supply 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 is expressed in percentage, 100% being fully on (maximal brightness) and a low duty cycle corresponding to lower brightness.

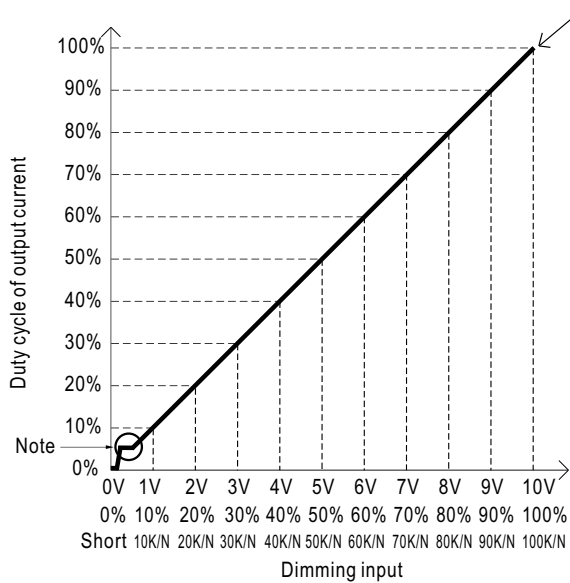
Built-in 3 in 1 dimming function. The duty of the PWM style output can be adjusted through output cable by connecting a 0~10Vdc or 10V PWM signal or resistance between DIM+ and DIM-.

◎ **Connection**



"DO NOT connect "DIM- to -V"

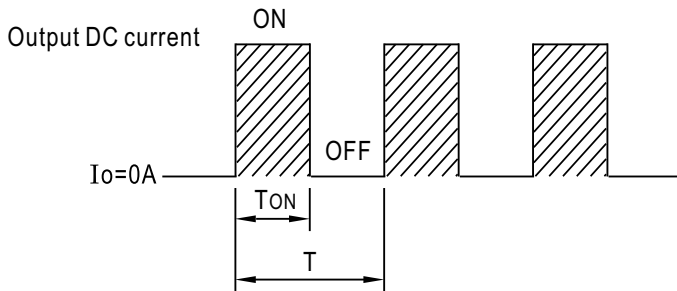
◎Duty cycle of output current VS Dimming input



- ※ Note : 1. Min. dimming level is about 6%
- 2. The output current is not defined when 0%<Iout<6%
- 3. The output current could drop down to 0% when dimming input is about 0KΩ or 0Vdc, or 10V PWM signal with 0% duty cycle

0~10V  
 Duty cycle of 10V PWM (frequency range = 100~3KHz)  
 Short-100KΩ /N resistance (N=driver quantity for synchronized dimming operation )

◎ PWM Style Output

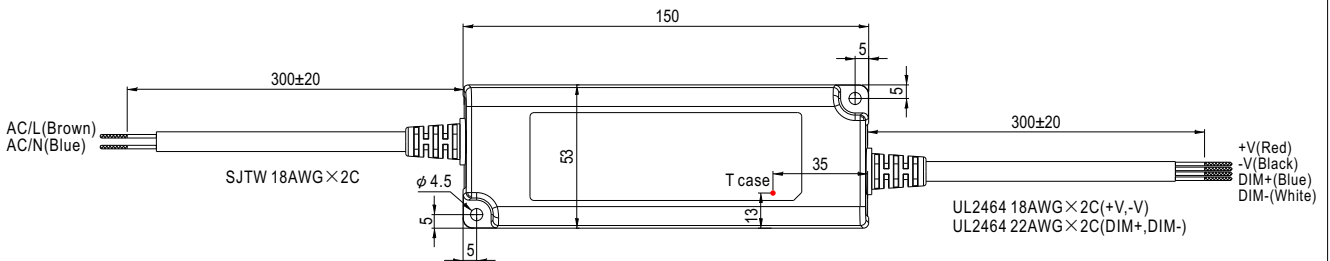


$$\text{Duty cycle(\%)} = \frac{T_{ON}}{T} \times 100\%$$

Output PWM frequency : 300Hz fixed (Typ.)

■ Mechanical Specification

Case No.: NPF-60A Unit:mm



※T case: Max. Case Temperature

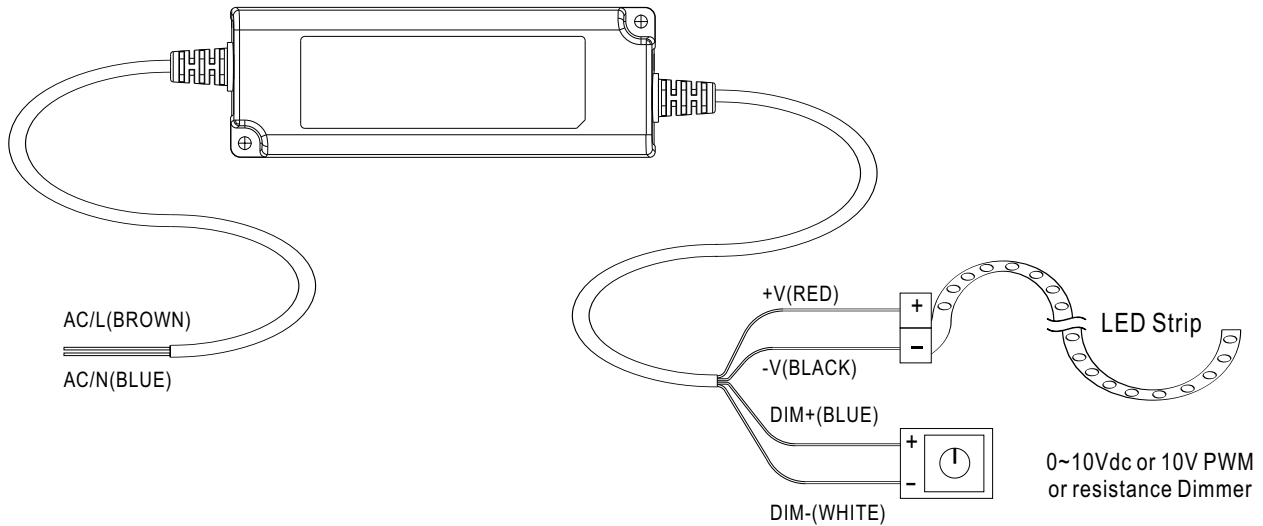


■ Recommend Mounting Direction



■ 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.