240W Constant Voltage PWM Output LED Driver SPWM-240-MA series

User's Manual
Click Me



DC Input: 176~280VDC

Note.10

Features

- Matter over thread, Matter 1.5 specification
- Supports multiple output modes including dimming, color temperature, RGBW
- Constant voltage PWM style output with 1 to 4 channels
- Flicker free, complying with CE ErP directive
- Plastic housing with class II and PFC design
- Standby power consumption <0.5W
- Minimum dimming level 0.1%
- Dimming frequency selectable 3.2 kHz, 20 kHz
- Cooling by free air convection
- 5 years warranty

Applications

- LED strip lighting(CW/WW/Tunable /RGBW)
- LED decorative lighting
- LED architecture lighting
- Household lighting control system
- Matter Building automation

Description

SPWM-240-MA series is a 240W AC/DC LED driver featuring the constant voltage mode with PWM style output.Which is able to maintain the color temperature and the brightness homogeneity when driving all kinds of LED strips. SPWM-240-MA operates from 180~305VAC and offers models with different rated voltage ranging include 24V and 48V. Thanks to the high efficiency up to 94%,with the fanless design,the entire series is able to operate for -20~+90℃ case temperature under free air convention.SPWM-240-MA equipped with various function options, such as dimming methodologies with Matter , so as to provide the optimal design flexibility for LED lighting system.

Model Encoding

SPWM - 240 - 24 ☐

- Function options(MA)
- Rated output voltage(24V/48V)
- Rated wattage
- Series name

Type	Function	Note
MA	Based on Matter over Thread technology	In stock

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240W Constant Voltage PWM Output LED Driver SPWM-240-MA series

SPECIFICATION	SPWM-240-24☐	SPWM-240-48☐
OUTPUT		
DC VOLTAGE	24V	48V
RATED CURRENT(Max.)	10A	5A
RATED POWER(Max.)	240W	240W
VOLTAGE ADJ. RANGE	23~26V	47~50V
PWM FREQUENCY (Typ.)	3.2kHz or 20kHz, Set by Dip Switch	
SETUP, RISE TIME Note.3	2500ms, 80ms/230VAC	
HOLD UP TIME (Typ.)	10ms/230VAC	
INPUT		
VOLTAGE RANGE Note.2	180 ~ 305VAC 255 ~ 410VDC (Please refer to "STATIC CHARACTERISTIC" section)	
FREQUENCY RANGE	47 ~ 63Hz	
POWER FACTOR (Typ.)	PF>0.95/230VAC, PF>0.92/277VAC @ full load (Please refer to "POWER FACTOR (PF) CHARACTERISTIC" section)	
TOTAL HARMONIC DISTORTION	THD<10%@load≧50%, 230VAC; @load≧75%/277VAC (Please refer to "TOTAL HARMONIC DISTORTION" section)	
EFFICIENCY (Typ.)	93%	94%
AC CURRENT (Typ.)	1.3A / 230VAC 1.1A / 277VAC	
INRUSH CURRENT (Typ.)	COLD START 60A(twidth=700μs measured at 50% Ipeak) at 230VAC; Per NEMA 410	
MAX. NO. of PSUs on 16A CIRCUIT BREAKER	3 units (circuit breaker of type B) / 5 units (circuit breaker of type C) at 230VAC	
LEAKAGE CURRENT	<0.25mA / 277VAC	
STANDBY POWER CONSUMPTION	standby power consumption<0.5W (Dimming off)	
PROTECTION		
OVERLOAD	105~150%, hiccup mode, recovers automatically after fault condition is removed	
SHORT CIRCUIT	Hiccup mode, recovers automatically after fault condition is removed	
OVER VOLTAGE	27 ~ 36V	52~ 63V
	Shut down O/P voltage, re-power on to recover after fault condition is removed	
OVER TEMPERATURE	Shut down O/P voltage, re-power on to recover after fault condition is removed	
ENVIRONMENT		
WORKING TEMP.	Tcase=-20~+90℃ (Please refer to " OUTPUT LOAD vs TEMPERATURE" section)	
MAX. CASE TEMP.	Tcase=90℃	
WORKING HUMIDITY	20 ~ 95% RH non-condensing	
STORAGE TEMP., HUMIDITY	-40 ~ +80℃, 10 ~ 95% RH	
TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)	
VIBRATION	5 ~ 100Hz, 2G 12min./1cycle, each along X,Y,Z axes according to EN50090-2-2	
SAFETY & EMC		
SAFETY STANDARDS	ENEC BS EN/EN61347-1, BS EN/EN61347-2-13(EL) appendix J suitable for emergency installations(DC input 176-280VDC), BS EN/EN62384; GB/T19510.1,GB/T19510.213; EAC TP TC 004 approved; Design refer to AS/NZS 61347-1, AS/NZS 61347-2-13	
WITHSTAND VOLTAGE	I/P-O/P:3.75kVAC	
ISOLATION RESISTANCE	I/P-O/P:100M Ohms / 500VDC / 25℃/ 70% RH	

EMC EMISSION Note.4

Parameter	Standard	Test Level/Note
Conducted	BS EN/EN55015(CISPR15) ,GB/T17743	-----
Radiated	BS EN/EN55015(CISPR15) ,GB/T17743	-----
Harmonic Current	BS EN/EN61000-3-2, GB 17625.1	Class C @load≧50%
Voltage Flicker	BS EN/EN61000-3-3	-----

EMC IMMUNITY

BS EN/EN61547

Parameter	Standard	Test Level/Note
ESD	BS EN/EN61000-4-2	Level 3, 8kV air ; Level 2, 4kV contact
Radiated	BS EN/EN61000-4-3	Level 2
EFT/Burst	BS EN/EN61000-4-4	Level 2
Surge	BS EN/EN61000-4-5	Level 4, 2kV/Line-Line
Conducted	BS EN/EN61000-4-6	Level 2
Magnetic Field	BS EN/EN61000-4-8	Level 2
Voltage Dips and Interruptions	BS EN/EN61000-4-11:2020	30% dip 10 periods 100% interrruption 0.5 periods

OTHERS		
MATTER STANDARD	Matter 1.5 Specification	
FLICKER Note.9	PstLM ⩽ 1, SVM ⩽ 0.4	
MTBF	1801.3k hrs min. Telcordia SR-332 (Bellcore) ; 155.5k hrs min. MIL-HDBK-217F (25℃)	
DIMENSION	380*38*28.5mm (L*W*H)	
PACKING	0.58kg; 24 pcs/14.98kg/0.61CUFT	

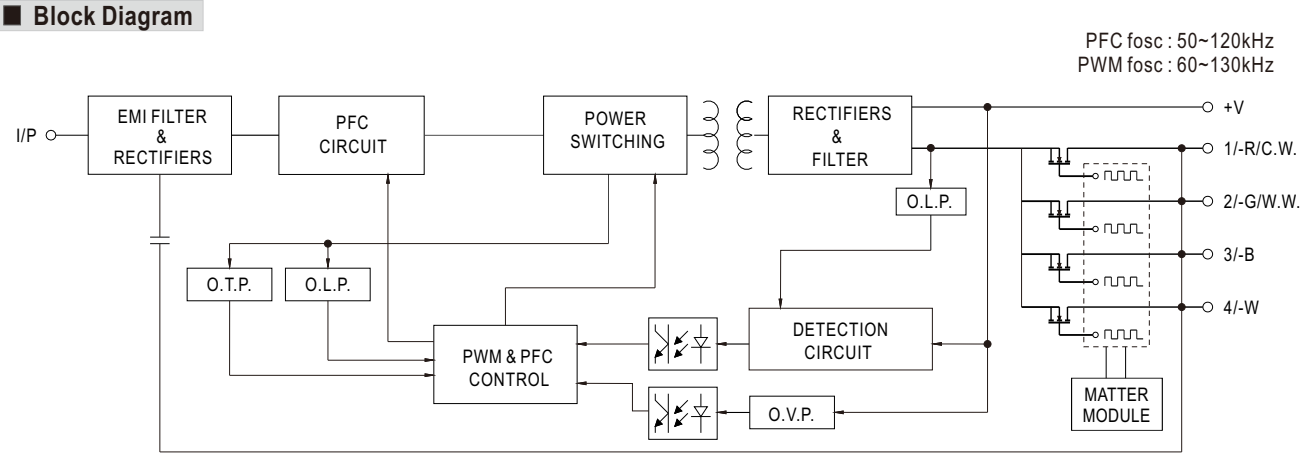
NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated current and 25°C of ambient temperature.
2. De-rating may be needed under low input voltages. Please refer to "STATIC CHARACTERISTIC" 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°C 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°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft).
8. It is not recommended to connect to capacitive loads
9. Flicker is measured at full load with the light source provided by MEAN WELL.
10. RCM is on a voluntary basis. Non IC classification Independent LED control gear is not suitable for resisdential installations.

※ Product Liability Disclaimer: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

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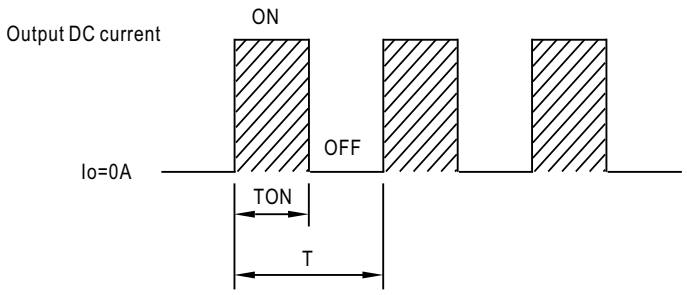
■ Block Diagram



■ DIMMING OPERATION

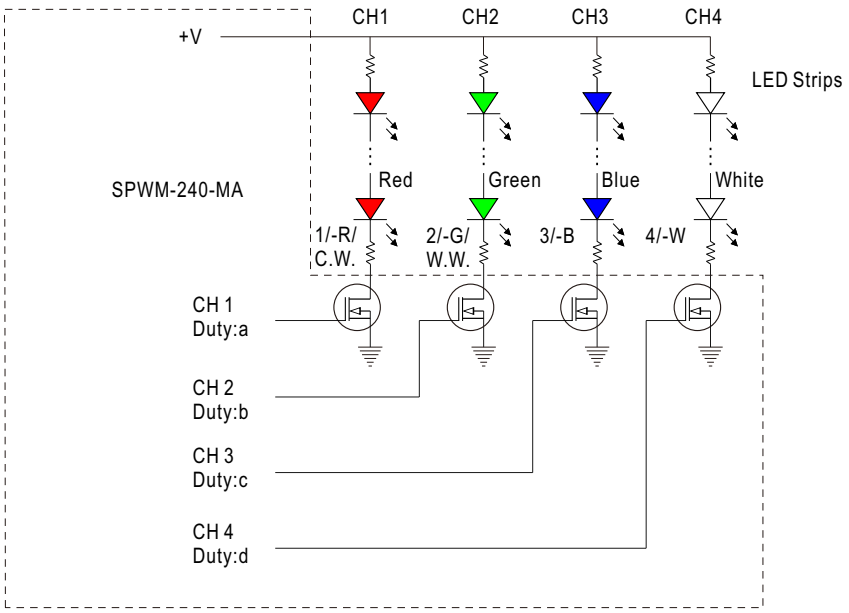
※ Dimming principle for PWM style output

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



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

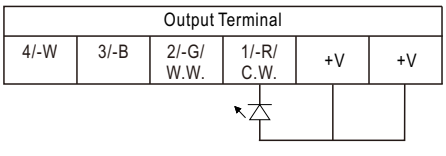
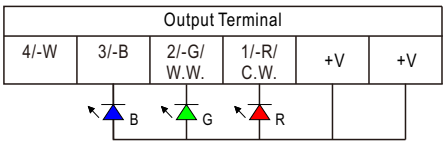
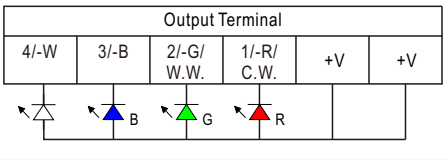
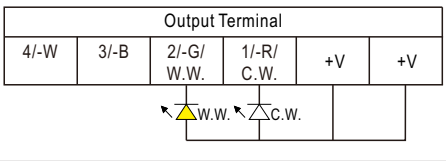
Output PWM frequency : 3.2kHz or 20kHz fixed



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※ Operating Model

• The color types supported by the driver can be set via the DIP-switch

Dip Switch			Application	Output channels	Output connections schematic diagram
1	2	3			
ON	ON	--	1 logic unit of LED (Dimmable light)	1 channel	
OFF	OFF	--	1 logic unit of colour type (RGB) (Factory default settings)	3 channels	
OFF	ON	--	2 logic units (RGB) (Dimmable light)	4 channels	
ON	OFF	--	1 logic unit of colour type Tc (Color temperature light)	2 channels	

• The output frequency of the driver can be set via the DIP switch

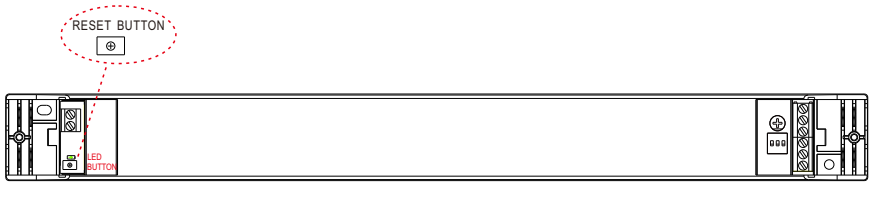
Dip Switch			Application
1	2	3	
--	--	OFF	PWM frequency: 3.2 kHz(AC restart required)
--	--	ON	PWM frequency: 20 kHz(AC restart required)

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※ Factory reset

◎ By RESET BUTTON

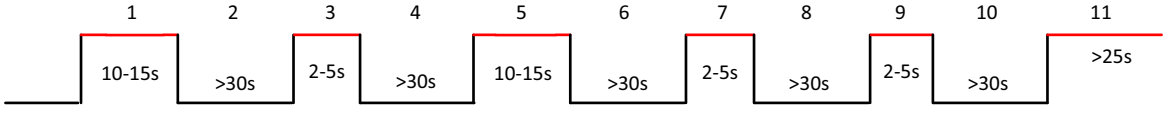
Press and hold the reset button for 10 seconds. When the LED indicator flashes quickly, release the button. The factory reset will then be completed.



◎ By AC ON/OFF

To perform factory reset through AC ON/OFF, the following process must be strictly followed. If the AC ON/OFF process is correct, the output light will flash for 15 seconds. When the flashing stop, it means the factory reset is completed. This operation is consistent with thefactory reset effect performed by long-pressing the reset button.

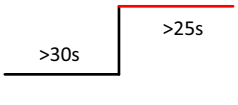
AC ON/OFF process to executes factory reset:



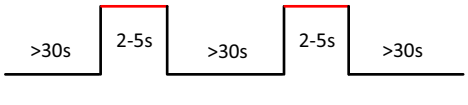
Phase	Duration	AC status
1	10-15s	ON
2	>30s	OFF
3	2-5s	ON
4	>30s	OFF
5	10-15s	ON
6	>30s	OFF
7	2-5s	ON
8	>30s	OFF
9	2-5s	ON
10	>30s	OFF
11	>25s	ON (should wait until output light stop flashing)

If there is a malfunction in the 'AC ON/OFF process', the process can be reset by the following method, starting from stage 1 again.

Method 1: AC ON time exceeds 25 seconds



Method 2: AC ON times for 2-5s and twice

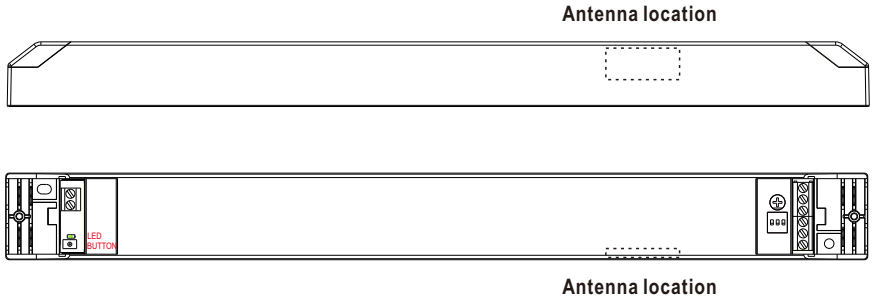


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◎ PLACEMENT

Matter device has an integrated antenna for easy integration. In order to maximize the range in every direction, some design guidelines should be taken into consideration when mounting the device.

The antenna positions of the device are shown in the figure below:



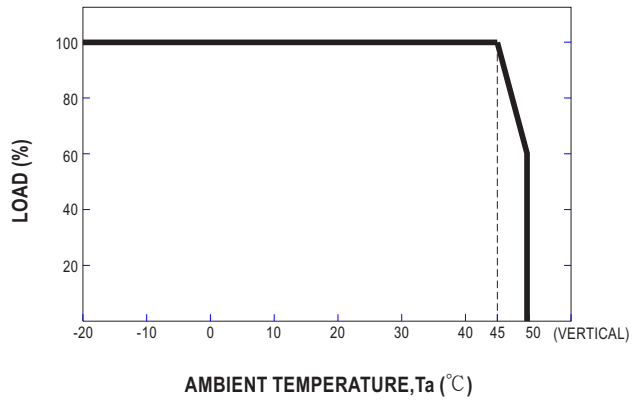
⚠ Keep the device as far away as possible from vertical metal structures.

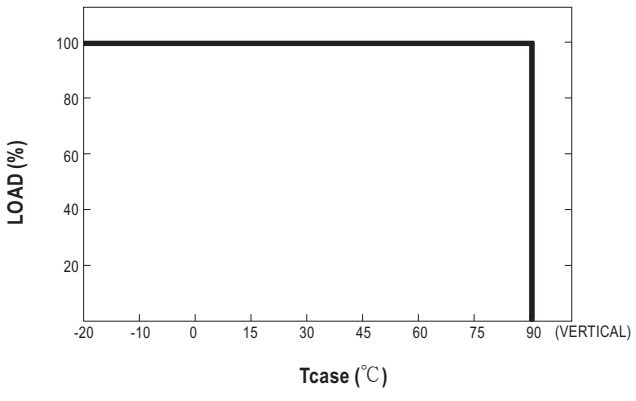
⚠ When the device is mounted on a metal plate, the antenna should not be obscured, and there needs to be a cutout under the antenna to ensure that the RF signal can be transmitted.

⚠ The device's communication range may be influenced by environmental factors and installation positioning, necessitating on-site adjustments and testing.

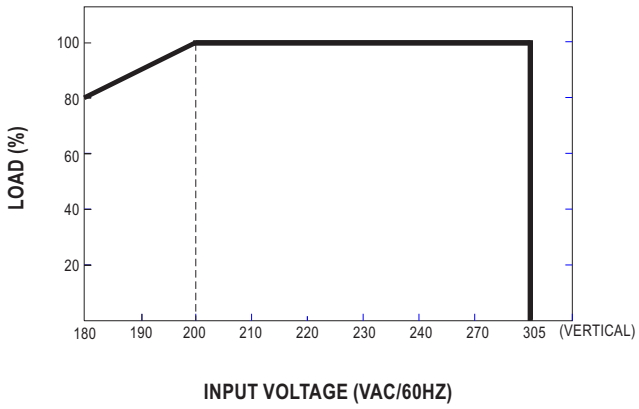
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■ OUTPUT LOAD vs TEMPERATURE



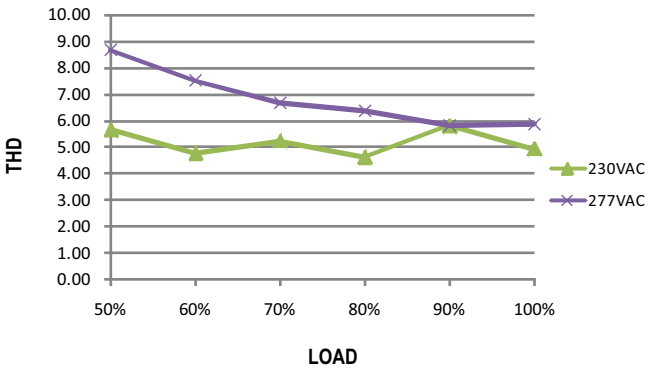


■ STATIC CHARACTERISTICS



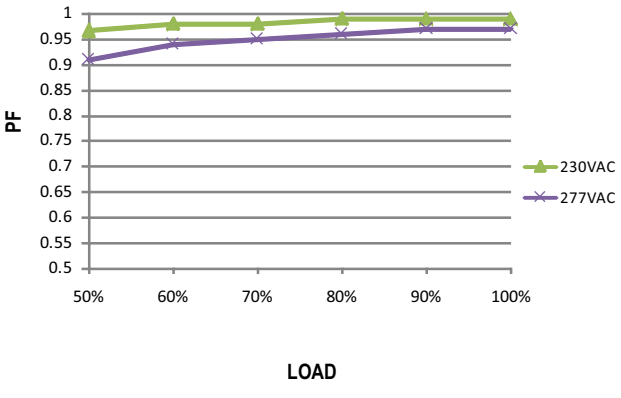
■ TOTAL HARMONIC DISTORTION (THD)

※ 48V Model, Tcase at 70℃



■ POWER FACTOR (PF) CHARACTERISTIC

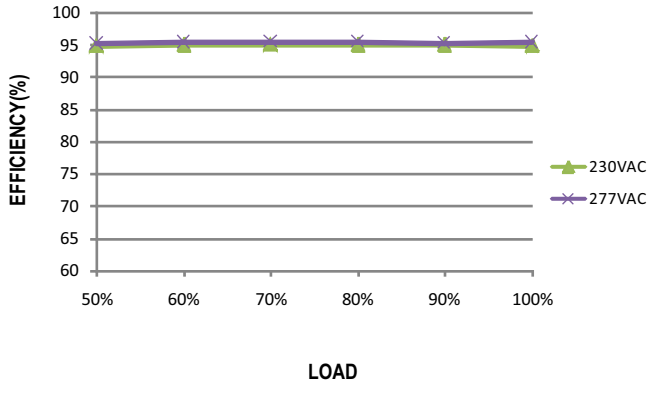
※ Tcase at 70℃



■ EFFICIENCY vs LOAD

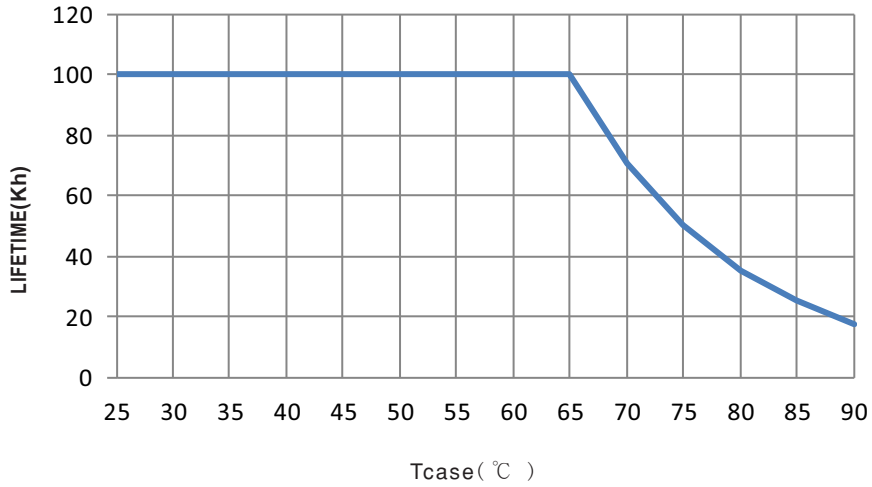
SPWM-240-MA series possess superior working efficiency that up to 94% can be reached in field applications.

※ 48V Model, Tcase at 70℃



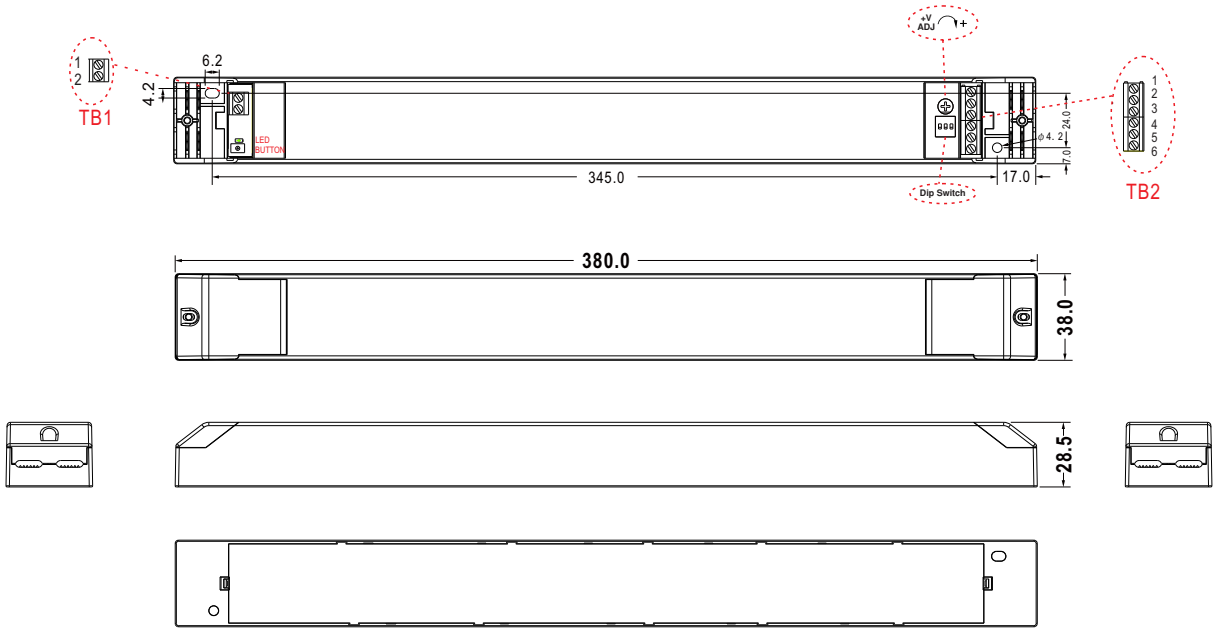
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■ LIFE TIME



■ Mechanical Specification

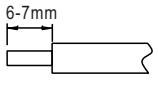
Case No. SPWM-240-MA Unit:mm Tolerance:±1



Terminal Pin No. Assignment (TB1) :

Pin No.	Assignment
1	AC/L
2	AC/N

TB1 wiring:

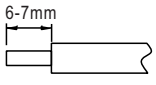


☐ **0.75-2.50mm²**

Terminal Pin No. Assignment (TB2) :

Pin No.	Assignment
1	+V
2	+V
3	1/-R/C.W.
4	2/-G/W.W.
5	3/-B
6	4/-W

TB2 wiring:



☐ **0.75-2.50mm²**

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