# 60W Single Output LED Power Supply — PLN-60 series

## Features :

- Universal AC input / Full range (up to 295VAC)
- High efficiency up to 89%
- Protections: Short circuit / Over current / Over voltage / Over temperature
- Cooling by free air convection
- Built-in constant current limiting circuit with adjustable OCP level
- Fully isolated plastic case with IP64 level
- Built-in active PFC function
- IP64 design for indoor or outdoor installations
- Pass LPS
- Class 2 power unit
- 100% full load burn-in test
- High reliability
- Suitable for LED lighting and moving sign applications (Note.2)
- Suitable for dry / damp locations
- Compliance to worldwide safety regulations for lighting
- 2 years warranty

SELV LPS ( for 48V only ) ( except for 48V ) IP64

## SPECIFICATION

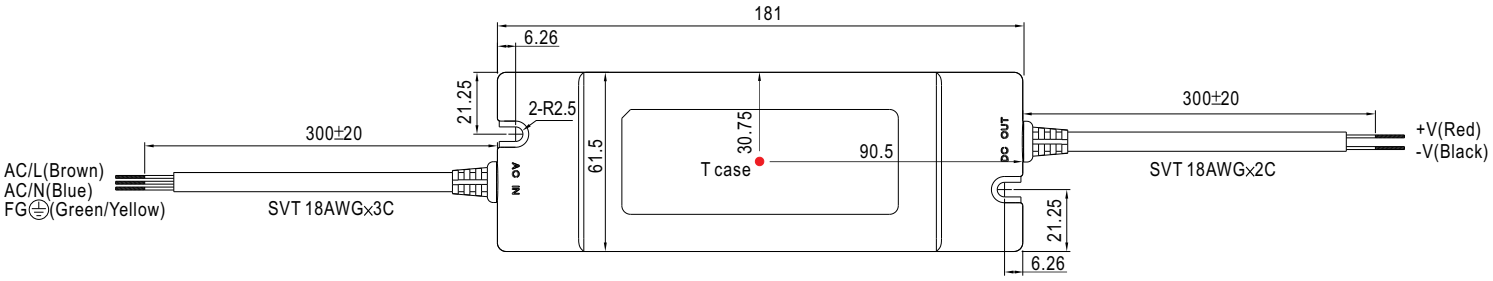
| MODEL | | PLN-60-12 | PLN-60-15 | PLN-60-20 | PLN-60-24 | PLN-60-27 | PLN-60-36 | PLN-60-48 |
|---|---|---|---|---|---|---|---|---|
| OUTPUT | DC VOLTAGE | 12V | 15V | 20V | 24V | 27V | 36V | 48V |
| | CONSTANT CURRENT REGION Note.6 | 8.4 ~ 12V | 10.5 ~15V | 14 ~ 20V | 16.8 ~24V | 18.9 ~27V | 25.2 ~ 36V | 33.6 ~ 48V |
| | RATED CURRENT | 5A | 4A | 3A | 2.5A | 2.3A | 1.7A | 1.3A |
| | CURRENT RANGE | 0 ~ 5A | 0 ~ 4A | 0 ~ 3A | 0 ~ 2.5A | 0 ~ 2.3A | 0 ~ 1.7A | 0 ~ 1.3A |
| | RATED POWER | 60W | 60W | 60W | 60W | 62.1W | 61.2W | 62.4W |
| | RIPPLE & NOISE (max.) Note.2 | 2Vp-p | 2.4Vp-p | 1.8Vp-p | 2.7Vp-p | 2.7Vp-p | 3.6Vp-p | 4.6Vp-p |
| | VOLTAGE ADJ. RANGE Note.5 | 11.5 ~ 13V | 14.5 ~ 16.2V | 19.5 ~ 22V | 24 ~ 26V | 25 ~ 30V | 32.5 ~ 39V | 43.6 ~ 51.8V |
| | | Can be adjusted by internal potentiometer SVR1 | | | | | | |
| | CURRENT ADJ. RANGE Note.5 | 3% ~ -25%. Can be adjusted by internal potentiometer SVR2 | | | | | | |
| | VOLTAGE TOLERANCE Note.3 | ±10% | | | | | | |
| | LINE REGULATION | ±3.0% | | | | | | |
| | LOAD REGULATION | ±5.0% | | | | | | |
| | SETUP TIME | 1500ms / 230VAC 3000ms / 115VAC at full load | | | | | | |
| INPUT | VOLTAGE RANGE Note.4 | 90 ~ 295VAC 127 ~ 417VDC | | | | | | |
| | FREQUENCY RANGE | 47 ~ 63Hz | | | | | | |
| | POWER FACTOR (Typ.) | PF>0.98/115VAC, PF>0.9/230VAC, PF>0.9/277VAC at full load (Please refer to "Power Factor Characteristic" curve) | | | | | | |
| | EFFICIENCY (Typ.) | 85% | 86% | 87.5% | 87% | 88% | 89% | 89% |
| | AC CURRENT (Typ.) | 0.8A/115VAC 0.4A/230VAC 0.3A/277VAC | | | | | | |
| | INRUSH CURRENT (max.) | 40A/230VAC | | | | | | |
| | LEAKAGE CURRENT | <0.75mA / 240VAC | | | | | | |
| PROTECTION | OVER CURRENT | 95 ~ 110% | | | | | | |
| | | Protection type : Constant current limiting, recovers automatically after fault condition is removed | | | | | | |
| | SHORT CIRCUIT | Hiccup mode, recovers automatically after fault condition is removed. | | | | | | |
| | OVER VOLTAGE | 13.8 ~ 16V | 17.5 ~ 21V | 23 ~ 26V | 28 ~ 32V | 31 ~ 35V | 41 ~ 46V | 54 ~ 60V |
| | | Protection type : Shut down o/p voltage, re-power on to recover | | | | | | |
| | OVER TEMPERATURE | 95℃ ±10℃ (TSW1) detect on heatsink of power transistor | | | | | | |
| | | Protection type : Shut down o/p voltage, recovers automatically after temperature goes down | | | | | | |
| ENVIRONMENT | WORKING TEMP. | -30 ~ +50℃ (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, 2G 12min./1cycle, period for 72min. each along X, Y, Z axes | | | | | | |
| SAFETY & EMC | SAFETY STANDARDS | UL879, UL1310, UL8750, CSA C22.2 No. 207-M89(except for 48V), TUV EN61347-1, EN61347-2-13 independent, CAN/CSA C22.2 No. 223-M91(except for 48V), CSA C22.2 No. 250.0-08(except for 48V), IP64, J61347-1, J61347-2-13 approved ; design refer to UL60950-1 | | | | | | |
| | WITHSTAND VOLTAGE | I/P-O/P:3.75KVAC I/P-FG:1.88KVAC O/P-FG:0.5KVAC | | | | | | |
| | ISOLATION RESISTANCE | I/P-O/P:100M Ohms / 500VDC / 25℃/ 70% RH | | | | | | |
| | EMC EMISSION | Compliance to EN55015, EN55022 (CISPR22) Class B, EN61000-3-2 Class C (≧75% load) ; EN61000-3-3 | | | | | | |
| | EMC IMMUNITY | Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024,EN61547, light industry level, criteria A | | | | | | |
| OTHERS | MTBF | 497.8Khrs min. MIL-HDBK-217F (25℃) | | | | | | |
| | DIMENSION | 181*61.5*35mm (L*W*H) | | | | | | |
| | PACKING | 0.5Kg; 24pcs/13Kg/0.75CUFT | | | | | | |

**NOTE**

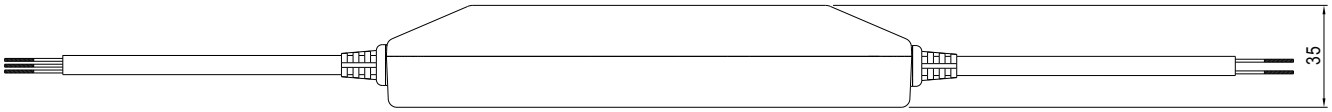
1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. Derating may be needed under low input voltage. Please check the static characteristics for more details.
5. Output voltage can be adjusted through the SVR1 on the PCB ; limit of output constant current level can be adjusted through the SVR2 on the PCB.
6. Constant current operation region is within 70% ~100% rated output voltage. This is the suitable operation region for LED related applications, but please reconfirm special electrical requirements for some specific system design.
7. 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.
8. Direct connecting to LEDs is suggested, but is not suitable for using additional drivers.

## ■ Mechanical Specification

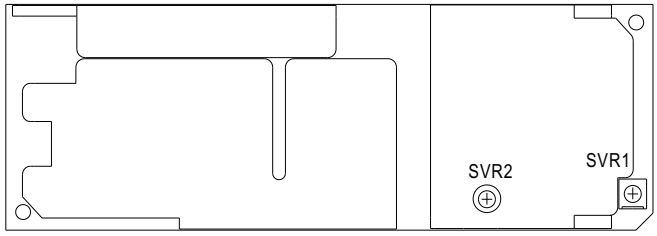
Case No.960A Unit:mm




※ T case: Max. Case Temperature.



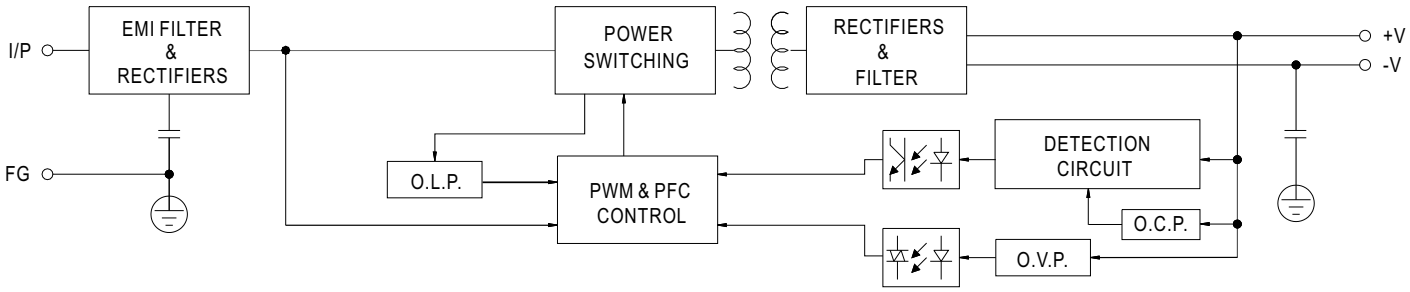

Output voltage and current adjustment : remove the upper case and adjust through SVR1 & SVR2 shown in the diagram.



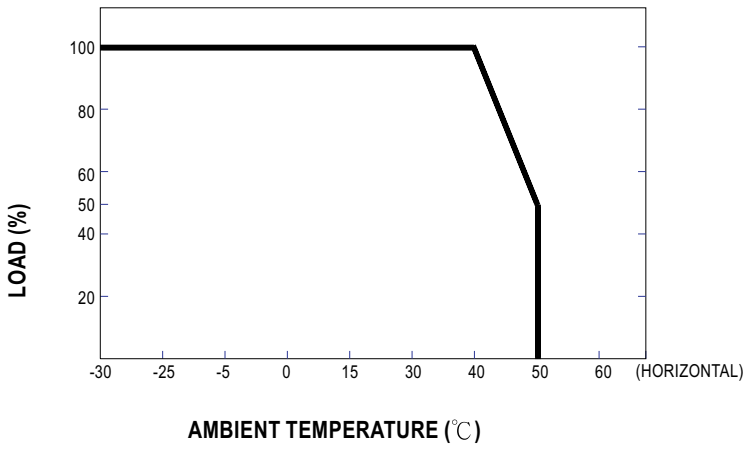

| | |
|---|---|
| SVR1 | Output voltage adjustment |
| SVR2 | Output current adjustment |

## ■ Block Diagram

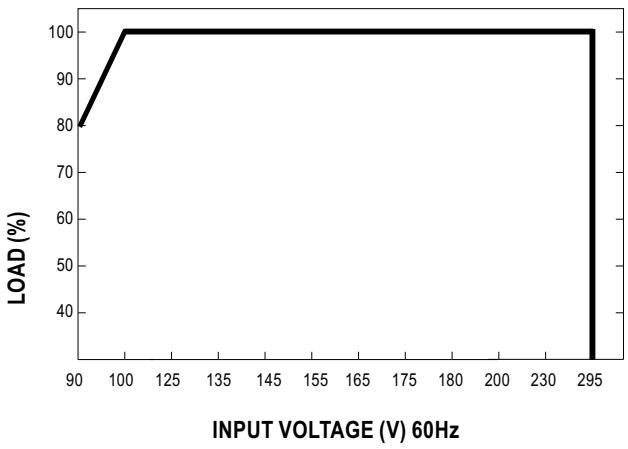
fosc : 90KHz(115VAC)
120KHz(230VAC)



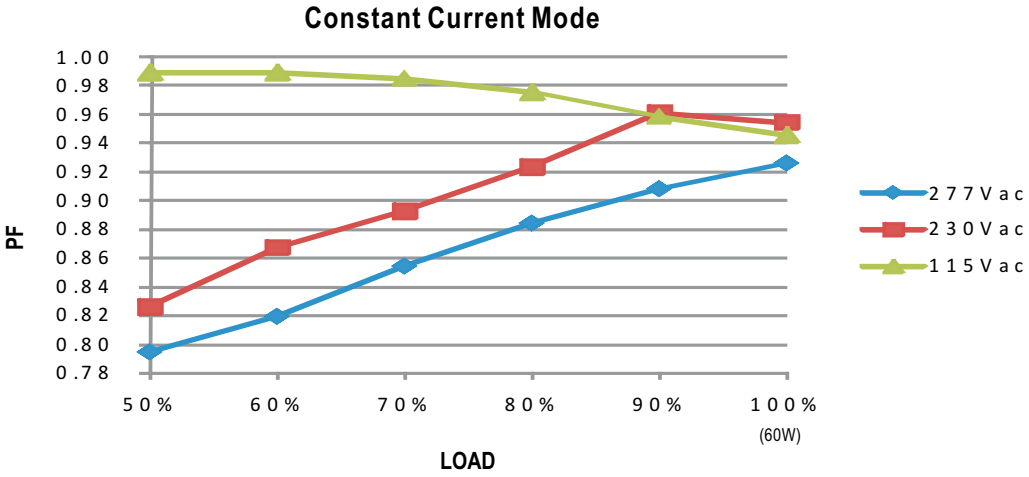

## ■ Derating Curve




## ■ Static Characteristics

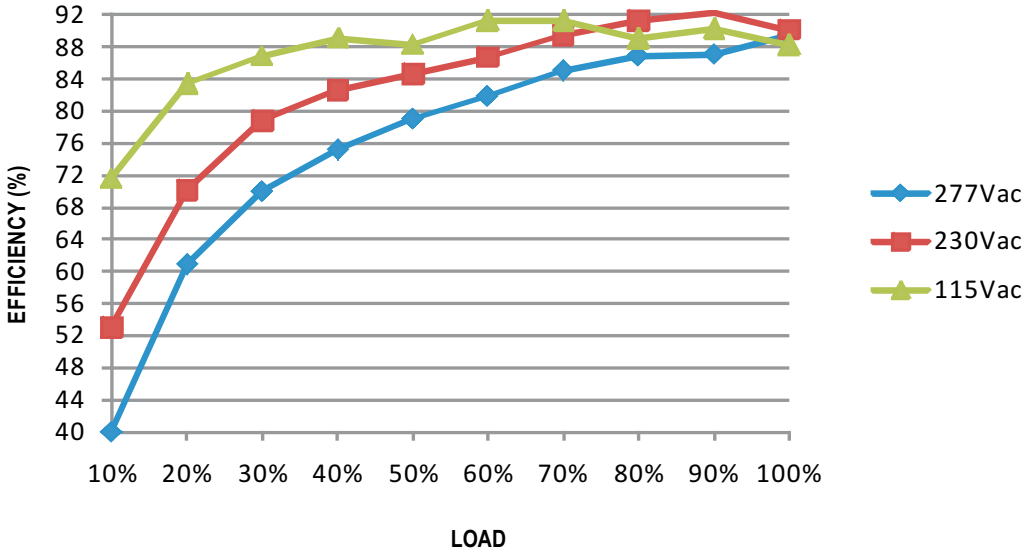


## ■ Power Factor Characteristic



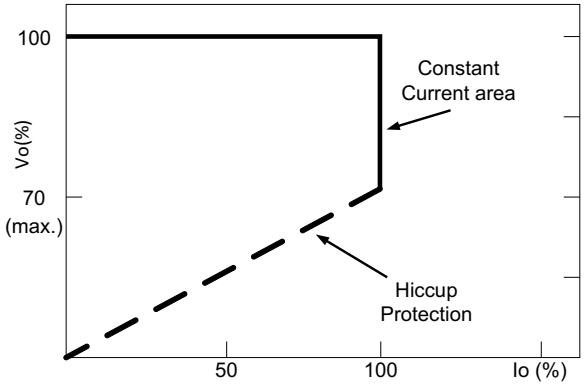

## ■ EFFICIENCY vs LOAD (48V Model)

PLN-60 series possess superior working efficiency that up to 89% can be reached in field applications.




## ■ DRIVING METHODS OF LED MODULE

This LED power supply is suggested to work in constant current mode area (CC) to drive the LEDs.




Typical LED power supply I-V curve