# 16W Single Output Switching Power Supply LPF-16D series



TAIWAN EXCELLENCE 2012

## Features :

- Universal AC input / Full range (up to 305VAC)
- Protections: Short circuit / Over current / Over voltage / Over temperature
- Built-in active PFC function
- Cooling by free air convection
- Fully isolated plastic case with IP30 level (Note.9)
- Class II power unit, no FG
- Class 2 power unit
- IP67(optional , model NO. : LPF-16D-12 P)
- Built-in 3 in 1 dimming function (1~10Vdc or PWM signal or resistance)
- Suitable for LED lighting and moving sign applications
- Compliance to worldwide safety regulations for lighting
- Suitable for dry / damp location(wet location for LPF-16D-12 P)
- 5 years warranty

## SPECIFICATION

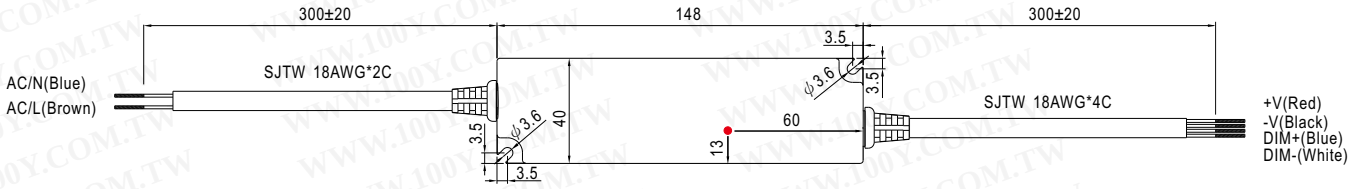
| MODEL | | LPF-16D-12 | LPF-16D-15 | LPF-16D-20 | LPF-16D-24 | LPF-16D-30 | LPF-16D-36 | LPF-16D-42 | LPF-16D-48 | LPF-16D-54 |
|---|---|---|---|---|---|---|---|---|---|---|
| OUTPUT | DC VOLTAGE | 12V | 15V | 20V | 24V | 30V | 36V | 42V | 48V | 54V |
| | CONSTANT CURRENT REGION Note.4 | 6.6 ~12V | 8.25 ~ 15V | 11 ~ 20V | 13.2 ~ 24V | 16.5 ~ 30V | 19.8 ~ 36V | 23.1 ~ 42V | 26.4 ~ 48V | 29.7 ~ 54V |
| | RATED CURRENT | 1.34A | 1.07A | 0.8A | 0.67A | 0.54A | 0.45A | 0.39A | 0.34A | 0.3A |
| | RATED POWER | 16.08W | 16.05W | 16W | 16.08W | 16.2W | 16.2W | 16.38W | 16.32W | 16.2W |
| | RIPPLE & NOISE (max.) Note.2 | 150mVp-p | 150mVp-p | 150mVp-p | 150mVp-p | 200mVp-p | 250mVp-p | 250mVp-p | 250mVp-p | 350mVp-p |
| | VOLTAGE TOLERANCE Note.3 | ±4.0% | ±4.0% | ±4.0% | ±4.0% | ±4.0% | ±4.0% | ±4.0% | ±4.0% | ±4.0% |
| | LINE REGULATION | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% |
| | LOAD REGULATION | ±2.0% | ±1.5% | ±1.0% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% |
| | SETUP, RISE TIME Note.6 | 1500ms, 80ms / 115VAC at full load 500ms, 80ms / 230VAC | | | | | | | | |
| | HOLD UP TIME (Typ.) | 16ms at full load 230VAC /115VAC | | | | | | | | |
| INPUT | VOLTAGE RANGE Note.5 | 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) | | | | | | | | |
| | EFFICIENCY (Typ.) | 83% | 83% | 84.5% | 84.5% | 84.5% | 85% | 85% | 85% | 84.5% |
| | AC CURRENT | 0.4A / 115VAC 0.25A / 230VAC 0.2A/277VAC | | | | | | | | |
| | INRUSH CURRENT (Typ.) | COLD START 45A(twidth=200μs measured at 50% Ipeak) at 230VAC | | | | | | | | |
| | LEAKAGE CURRENT | <0.75mA / 240VAC | | | | | | | | |
| PROTECTION | OVER CURRENT Note.4 | 95 ~ 108% | | | | | | | | |
| | | 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 | 15 ~ 18V | 17.5 ~ 21V | 23 ~ 27V | 28 ~ 35V | 34 ~ 40V | 41 ~ 49V | 46 ~ 54V | 54 ~ 63V | 59 ~ 66V |
| | | Protection type :Shut down and latch off o/p voltage, re-power on to recover | | | | | | | | |
| | OVER TEMPERATURE | Shut down o/p voltage, recovers automatically after temperature goes down | | | | | | | | |
| ENVIRONMENT | WORKING TEMP. | -35 ~ +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, 2G 12min./1cycle, period for 72min. each along X, Y, Z axes | | | | | | | | |
| SAFETY & EMC | SAFETY STANDARDS | UL8750, CSA C22.2 No. 250.0-08, EN61347-1, EN61347-2-13 independent,EN62384,J61347-1, J61347-2-13 approved, IP67(optional); Design refer to UL60950-1, TUV EN60950-1 | | | | | | | | |
| | 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 (≧55% load) ; EN61000-3-3 | | | | | | | | |
| | EMC IMMUNITY | Compliance to EN61000-4-2,3,4,5,6,8,11; EN61547,light industry level(surge 2KV), criteria A | | | | | | | | |
| OTHERS | MTBF | 420.1Khrs min. MIL-HDBK-217F (25℃) | | | | | | | | |
| | DIMENSION | 148*40*32mm (L*W*H) | | | | | | | | |
| | PACKING | 0.21Kg;40pcs/9.4Kg/ 1.02CUFT | | | | | | | | |

**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. Constant current operation region is within 55% ~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.
5. Derating may be needed under low input voltages. Please check the static characteristics for more details.
6. 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.
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.
9. Suitable for indoor use.
10. To fulfill requirements of the latest ErP regulation for lighting fixtures, this LED power supply can only be used behind a switch without permanently connected to the mains.

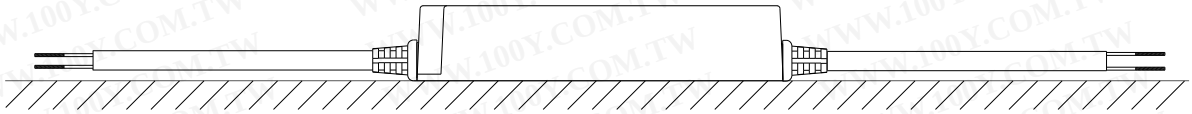
## Mechanical Specification

Case No.: LPF-16A Unit:mm

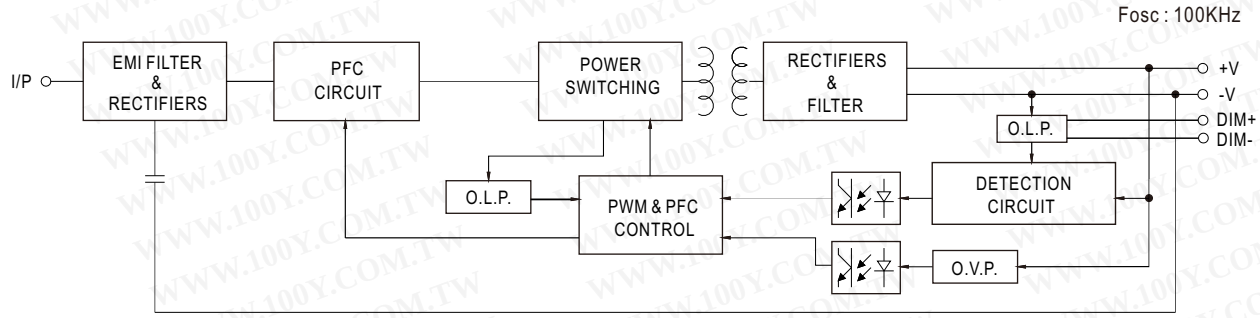



※ T case: Max. Case Temperature.

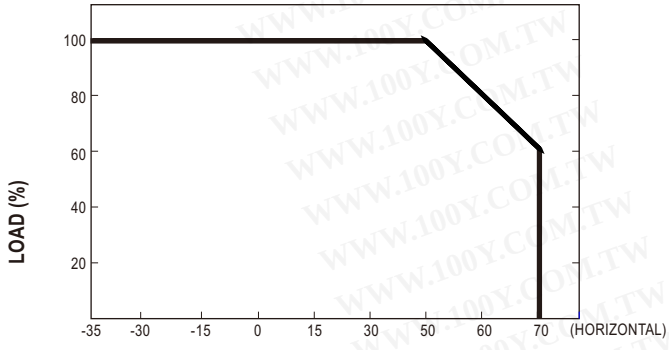

## Recommend Mounting Direction



## Block Diagram

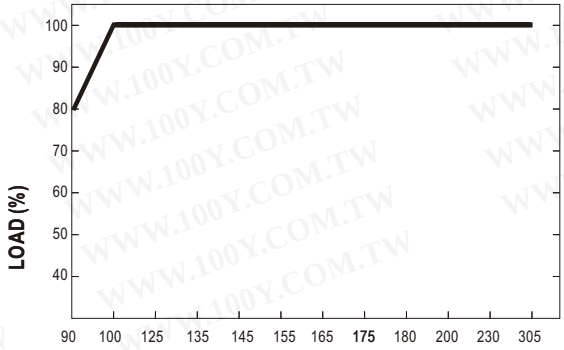



## Derating Curve



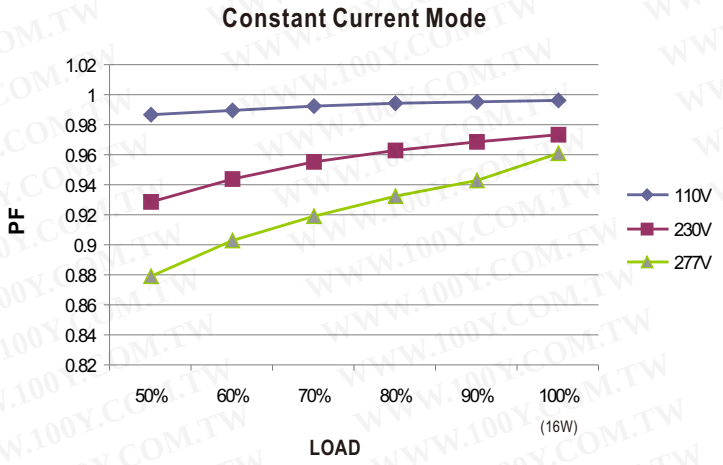

AMBIENT TEMPERATURE (℃)

## Static Characteristics



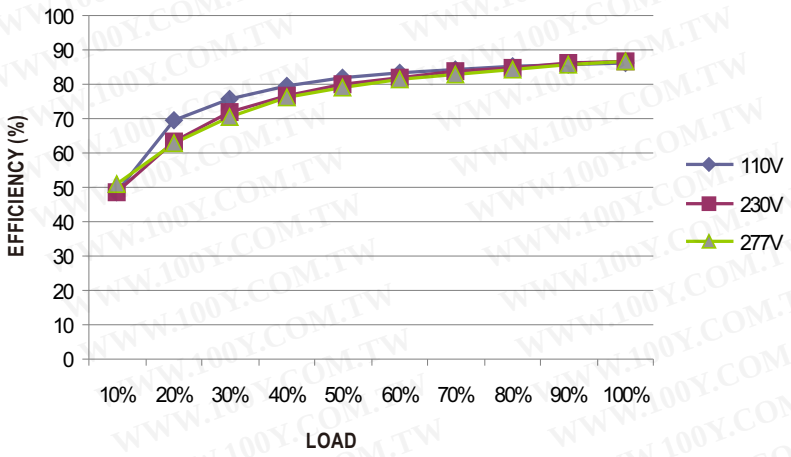

INPUT VOLTAGE (V) 60Hz

## Power Factor Characteristic



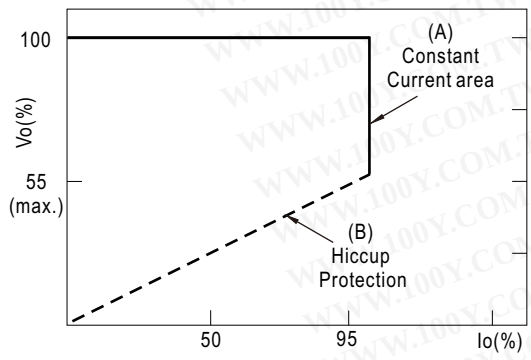

## EFFICIENCY vs LOAD (48V Model)

LPF-16D series possess superior working efficiency that up to 85% can be reached in field applications.



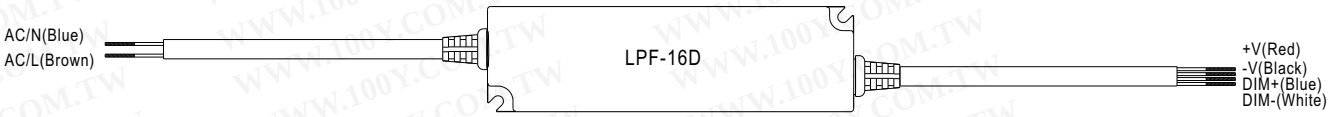

## DRIVING METHODS OF LED MODULE

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

## ■ DIMMING OPERATION




※ Output constant current level can be adjusted through output cable by 1 ~ 10Vdc, 10V PWM signal or resistance between DIM+ and DIM-.

※ Reference resistance value for output current adjustment (Typical)

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Resistance value | Single driver | 10KΩ | 20KΩ | 30KΩ | 40KΩ | 50KΩ | 60KΩ | 70KΩ | 80KΩ | 90KΩ | 100KΩ | OPEN |
| | Multiple drivers (N=driver quantity for synchronized dimming operation) | 10KΩ/N | 20KΩ/N | 30KΩ/N | 40KΩ/N | 50KΩ/N | 60KΩ/N | 70KΩ/N | 80KΩ/N | 90KΩ/N | 100KΩ/N | ----- |
| Percentage of rated current | | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 95%~108% |

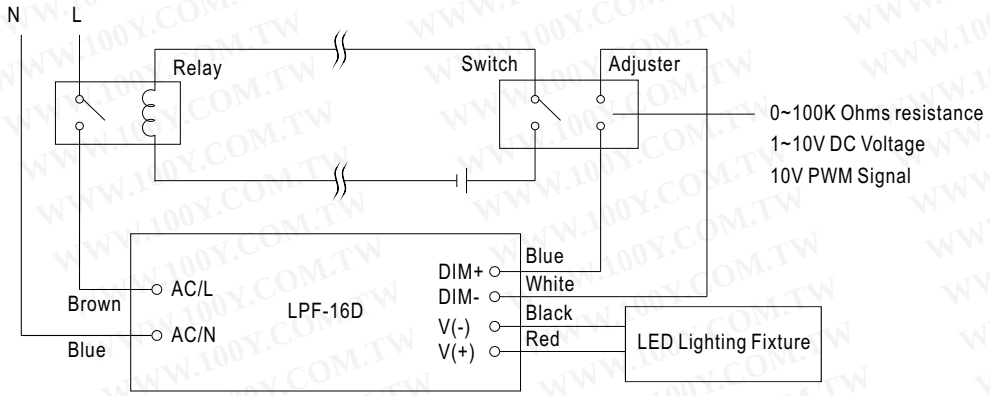
※ 1 ~ 10V dimming function for output current adjustment (Typical)

| Dimming value | 1V | 2V | 3V | 4V | 5V | 6V | 7V | 8V | 9V | 10V | OPEN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Output current | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 95%~108% |

※ 10V PWM signal for output current adjustment (Typical): Frequency range :100~3KHz

| Duty value | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | OPEN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Output current | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 95%~108% |

Dimming connection diagram for turning the lighting fixture ON/OFF :




Using a switch and relay can turn ON/OFF the lighting fixture.

1.Output constant current level can be adjusted through output cable by connecting a resistor or 1~10Vdc or 10V PWM signal between DIM+ and DIM-.

2.The LED lighting fixture can be turned ON/OFF by the switch.