



## ■ Features

- Universal AC input / Full range (up to 305VAC)
- Built-in active PFC function
- High efficiency up to 91%
- Protections: Short circuit / Over current / Over voltage / Over temperature
- Cooling by free air convection
- Fully isolated plastic case
- Fully encapsulated with IP67 level
- Class II power unit, no FG
- Suitable for dry / damp / wet locations
- No load power consumption < 0.15W
- 5 years warranty

## ■ Applications

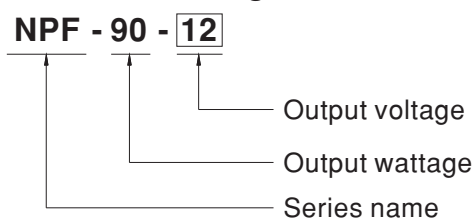
- Indoor LED lighting
- LED decorative lighting
- LED architecture lighting
- Moving sign
- Tunnel lighting

## ■ Description

NPF-90 is one 90W waterproof single-output LED power supply series. It adopts the universal input range from 90VAC to 305VAC and incorporates a built-in PFC function. 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 the power supply to meet the anti-vibration demand up to 5G; it also thus conforms to IP67 level, enabling NPF-90 to be used in a highly dusty and highly humid harsh environment.

Providing a high efficiency up to 91% and a low no load power consumption below 0.15W, NPF-90 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 entire series can operate under the temperature between -40~+70°C and comply with the relevant global lighting safety certification.

## ■ Model Encoding

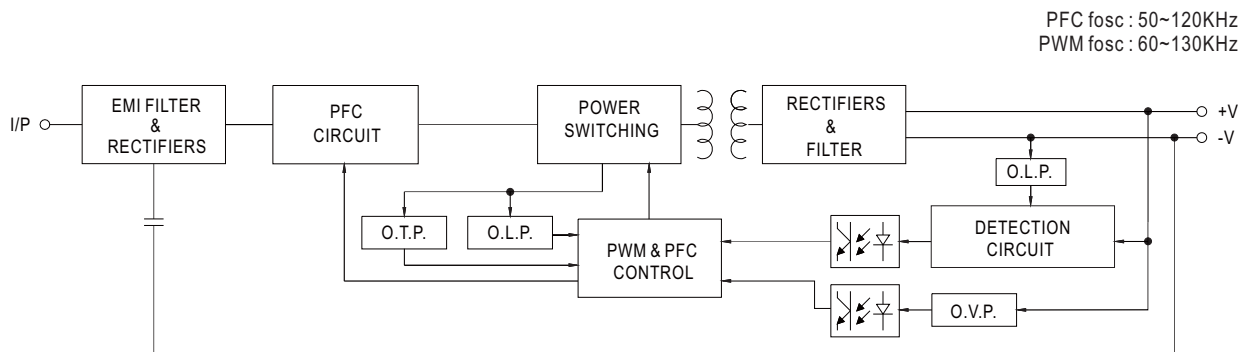




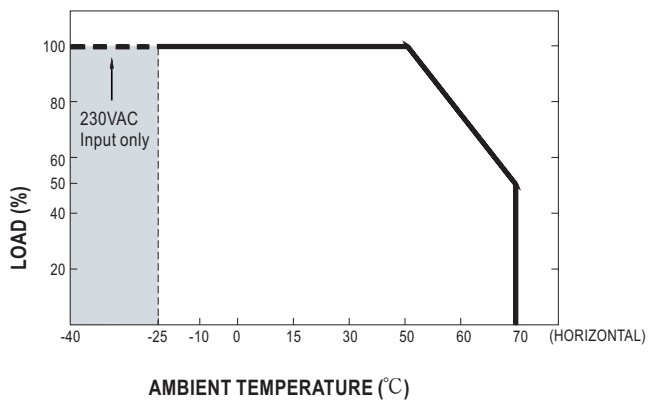
## SPECIFICATION

| MODEL               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | NPF-90-12                                                                                                                     | NPF-90-15  | NPF-90-20 | NPF-90-24  | NPF-90-30 | NPF-90-36  | NPF-90-42  | NPF-90-48  | NPF-90-54  |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------|-----------|------------|-----------|------------|------------|------------|------------|
| OUTPUT              | DC VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 12V                                                                                                                           | 15V        | 20V       | 24V        | 30V       | 36V        | 42V        | 48V        | 54V        |
|                     | CONSTANT CURRENT REGION                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 7.2 ~ 12V                                                                                                                     | 9 ~ 15V    | 12 ~ 20V  | 14.4 ~ 24V | 18 ~ 30V  | 21.6 ~ 36V | 25.2 ~ 42V | 28.8 ~ 48V | 32.4 ~ 54V |
|                     | RATED CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 7.5A                                                                                                                          | 6A         | 4.5A      | 3.75A      | 3A        | 2.5A       | 2.15A      | 1.88A      | 1.67A      |
|                     | RATED POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 90W                                                                                                                           | 90W        | 90W       | 90W        | 90W       | 90W        | 90.3W      | 90.24W     | 90.18W     |
|                     | RIPPLE & NOISE (max.) Note.2                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 150mVp-p                                                                                                                      | 150mVp-p   | 150mVp-p  | 150mVp-p   | 200mVp-p  | 200mVp-p   | 250mVp-p   | 250mVp-p   | 350mVp-p   |
|                     | VOLTAGE TOLERANCE Note.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ±4.0%                                                                                                                         | ±4.0%      | ±4.0%     | ±3.0%      | ±3.0%     | ±2.0%      | ±1.0%      | ±1.0%      | ±1.0%      |
|                     | LINE REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ±0.5%                                                                                                                         | ±0.5%      | ±0.5%     | ±0.5%      | ±0.5%     | ±0.5%      | ±0.5%      | ±0.5%      | ±0.5%      |
|                     | LOAD REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ±1.5%                                                                                                                         | ±1.0%      | ±0.5%     | ±0.5%      | ±0.5%     | ±0.5%      | ±0.5%      | ±0.5%      | ±0.5%      |
|                     | SETUP, RISE TIME Note.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 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>0.98/115VAC, PF>0.96/230VAC, PF>0.94/277VAC 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.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 89%                                                                                                                           | 89.5%      | 90.5%     | 91%        | 89.5%     | 90.5%      | 90.5%      | 90.5%      | 90.5%      |
|                     | AC CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.95A / 115VAC        0.5A / 230VAC        0.4A / 277VAC                                                                      |            |           |            |           |            |            |            |            |
|                     | INRUSH CURRENT(Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | COLD START 60A(twidth=550μs measured at 50% Ipeak) at 230VAC                                                                  |            |           |            |           |            |            |            |            |
|                     | LEAKAGE CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <0.25mA / 277VAC                                                                                                              |            |           |            |           |            |            |            |            |
| PROTECTION          | OVER CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 95 ~ 108%<br>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 ~ 17V                                                                                                                      | 17.5 ~ 21V | 23 ~ 27V  | 28 ~ 34V   | 34 ~ 40V  | 41 ~ 46V   | 46 ~ 54V   | 54 ~ 60V   | 59 ~ 66V   |
|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Protection type : Shut down o/p voltage, re-power on to recover                                                               |            |           |            |           |            |            |            |            |
|                     | 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)                                                                                                          |            |           |            |           |            |            |            |            |
|                     | 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, 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, EN55022 (CISPR22) Class B, 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 292.8K hrs min.    MIL-HDBK-217F (25°C)                                                                                       |            |           |            |           |            |            |            |            |
|                     | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 171*63*37.5mm (L*W*H)                                                                                                         |            |           |            |           |            |            |            |            |
|                     | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.77Kg; 18pcs/14.9Kg/0.82CUFT                                                                                                 |            |           |            |           |            |            |            |            |
| NOTE                | 1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.<br>2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.<br>3. Tolerance : includes set up tolerance, line regulation and load regulation.<br>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. |                                                                                                                               |            |           |            |           |            |            |            |            |

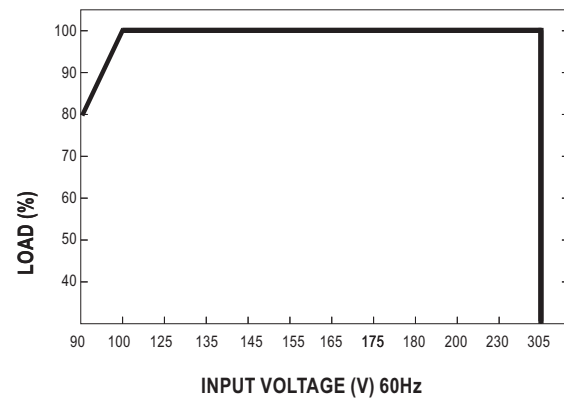
## Block Diagram



## Derating Curve

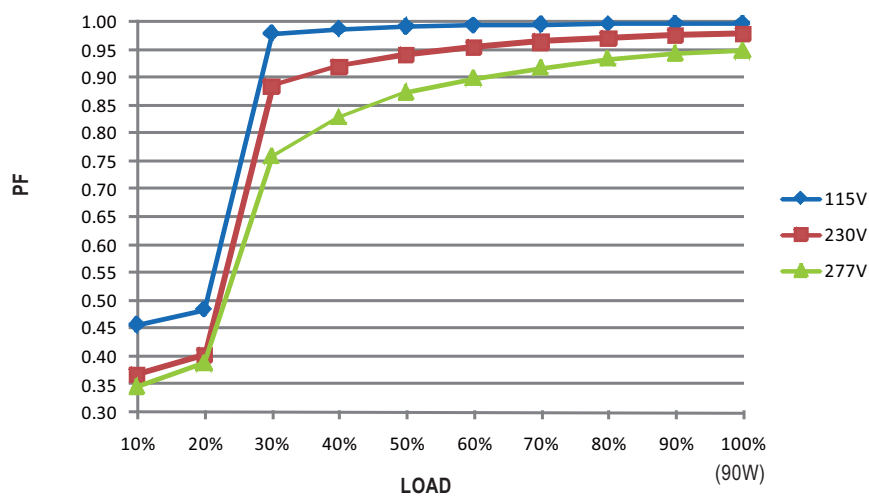


## Static Characteristics



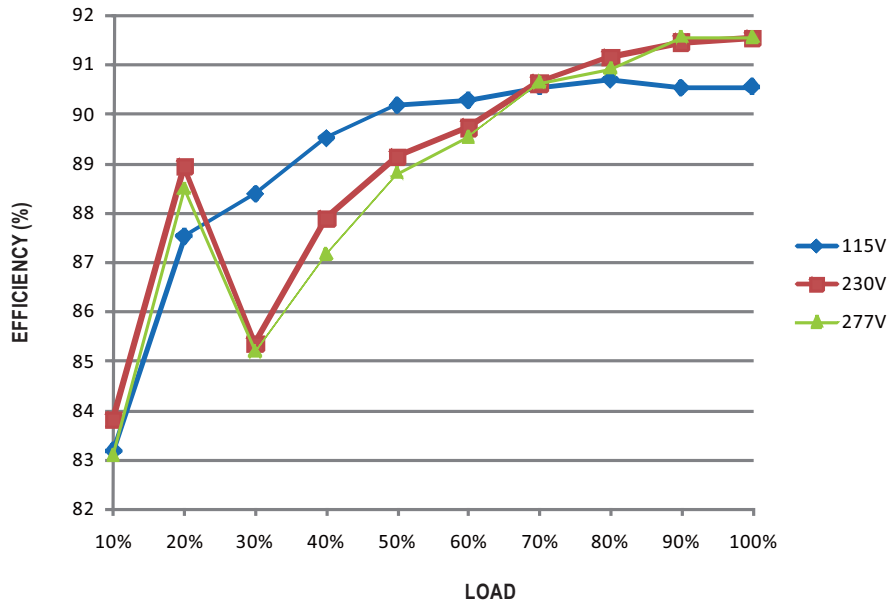
## Power Factor Characteristic

### Constant Current Mode



### ■ EFFICIENCY vs LOAD (48V Model)

NPF-90 series possess superior working efficiency that up to 90.5% can be reached in field applications.

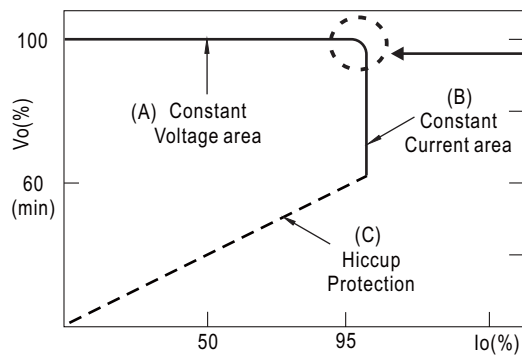


### ■ DRIVING METHODS OF LED MODULE

There are two major kinds of LED drive method, "direct drive" and "with LED driver".

A typical LED power supply may either work in "constant voltage mode (CV)" or "constant current mode (CC)" to drive the LEDs.

Mean Well's LED power supply with CV+ CC characteristic can be operated at both CV mode (with LED driver, at area (A)) and CC mode (direct drive, at area (B)).



Typical LED power supply I-V curve

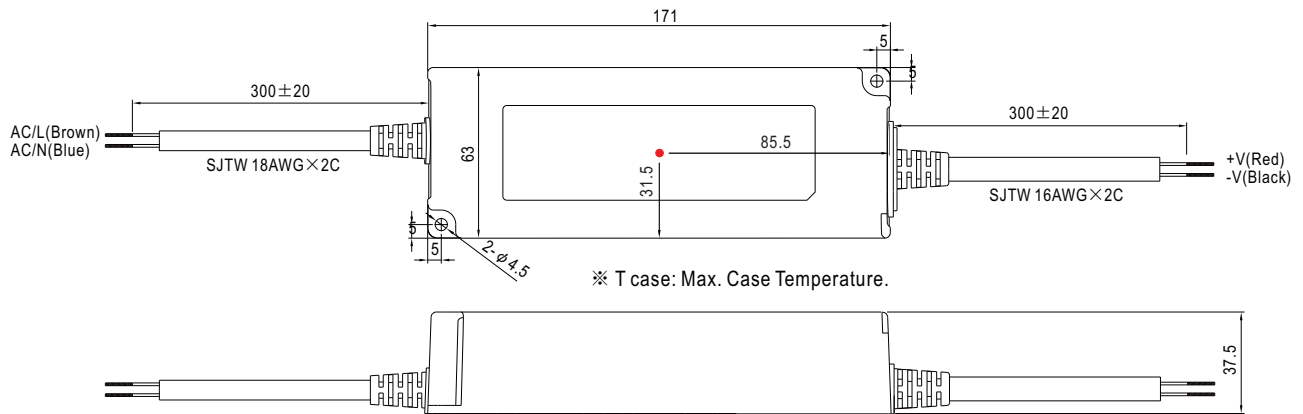
In the constant current region, the highest voltage at the output of the driver depends on the configuration of the end systems.

Should there be any compatibility issues, please contact MEAN WELL.

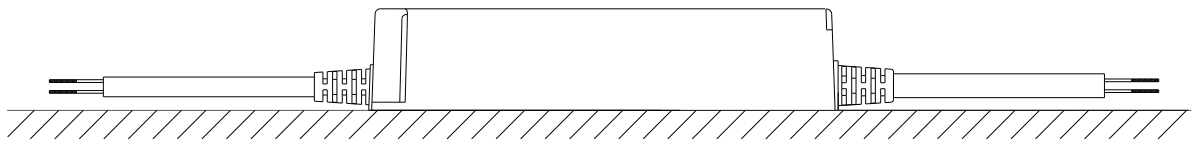
### ■ Mechanical Specification

Case No. PWM-90P

Unit:mm



### ■ Recommend Mounting Direction



### ■ Installation Manual

Please refer to : <http://www.meanwell.com/webnet/search/InstallationSearch.html>