## Features

- Plastic housing with class II design
- Built-in active PFC function
- Class 2 power unit (except NPF-90D-12/15)
- Standby power consumption <0.5W
- IP67 rating for indoor or outdoor installations
- Function: 3 in 1 dimming (dim-to-off)
- Typical lifetime >50000hours
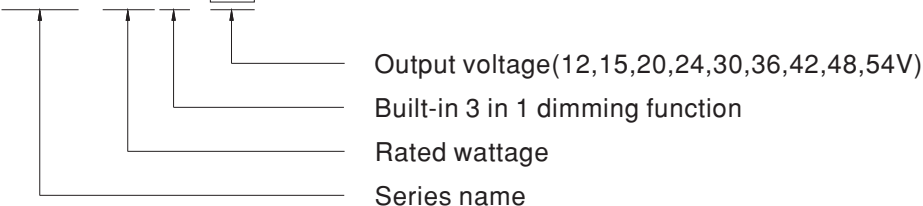- 5 years warranty

## Applications

- LED panel lighting
- LED downlight
- LED decorative lighting
- LED tunnel lighting
- Moving sign

## Description

NPF-90D series is a 90W AC/DC LED driver featuring the constant current mode output. NPF-90D operates from 90~305VAC and offers models with different rated voltage ranging between 12V and 54V. Thanks to the high efficiency up to 90%, with the fanless design, the entire series is able to operate for -40~+85℃ case temperature under free air convection. The entire series is rated with IP67 ingress protection level and is suitable to work for a variety of applications at dry, damp or wet locations. NPF-90D is equipped with the 3 in 1 dimming function so as to provide the design flexibility for LED lighting system.

## Model Encoding

NPF - 90 D - 20

Output voltage(12,15,20,24,30,36,42,48,54V)
Built-in 3 in 1 dimming function
Rated wattage
Series name

## SPECIFICATION

| MODEL | | NPF-90D-12 ☐ | NPF-90D-15 ☐ | NPF-90D-20 ☐ | NPF-90D-24 ☐ | NPF-90D-30 ☐ | NPF-90D-36 ☐ | NPF-90D-42 ☐ | NPF-90D-48 ☐ | NPF-90D-54 ☐ |
|---|---|---|---|---|---|---|---|---|---|---|
| **OUTPUT** | 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 |
| | 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 |
| | CURRENT RIPPLE | 5.0% max. @rated current | | | | | | | | |
| | CURRENT TOLERANCE | ±5.0% | | | | | | | | |
| | SET UP TIME    Note.3 | 500ms/115VAC, 230VAC | | | | | | | | |
| **INPUT** | VOLTAGE RANGE   Note.2 | 90 ~ 305VAC        127 ~ 431VDC<br>(Please refer to "STATIC CHARACTERISTIC" section) | | | | | | | | |
| | FREQUENCY RANGE | 47 ~ 63Hz | | | | | | | | |
| | POWER FACTOR (Typ.) | PF≧0.98/115VAC, PF≧0.96/230VAC, PF≧0.94/277VAC@full load<br>(Please refer to "POWER FACTOR (PF) CHARACTERISTIC" section) | | | | | | | | |
| | TOTAL HARMONIC DISTORTION | THD< 20%(@load≧60%/115VC, 230VAC; @load≧75%/277VAC)<br>(Please refer to "TOTAL HARMONIC DISTORTION(THD)" section) | | | | | | | | |
| | EFFICIENCY(Typ.) | 88% | 89% | 90% | 90% | 89% | 90% | 90% | 90% | 90% |
| | 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; Per NEMA 410 | | | | | | | | |
| | MAX. NO. of PSUs on 16A CIRCUIT BREAKER | 3 units (circuit breaker of type B) / 6 units (circuit breaker of type C) at 230VAC | | | | | | | | |
| | LEAKAGE CURRENT | <0.25mA / 277VAC | | | | | | | | |
| | STANDBY POWER CONSUMPTION | <0.5W | | | | | | | | |
| **PROTECTION** | OVER CURRENT | 95 ~ 108% | | | | | | | | |
| | | 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 |
| | | 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. | Tcase=-40 ~ +85℃ (Please refer to " OUTPUT LOAD vs TEMPERATURE" section) | | | | | | | | |
| | MAX. CASE TEMP. | Tcase=+85℃ | | | | | | | | |
| | WORKING HUMIDITY | 20 ~ 95% RH non-condensing | | | | | | | | |
| | STORAGE TEMP., HUMIDITY | -40 ~ +80℃, 10 ~ 95% RH | | | | | | | | |
| | TEMP. COEFFICIENT | ±0.03%/℃ (0 ~ 50℃) | | | | | | | | |
| | 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 BS EN/EN61347-1, BS EN/EN61347-2-13, BS EN/EN62384 independent,EAC TP TC 004,  GB19510.1,GB19510.14, IP67 approved ;Design refer to BS EN/EN60335-1 | | | | | | | | |
| | WITHSTAND VOLTAGE | I/P-O/P:3.75KVAC | | | | | | | | |
| | ISOLATION RESISTANCE | I/P-O/P:100M Ohms / 500VDC / 25℃/ 70% RH | | | | | | | | |
| | EMC EMISSION | Compliance to BS EN/EN55015, BS EN/EN61000-3-2 Class C (@ load≧60%) ; BS EN/EN61000-3-3; GB17743 and GB17625.1,EAC TP TC 020 | | | | | | | | |
| | EMC IMMUNITY | Compliance to BS EN/EN61000-4-2,3,4,5,6,8,11; BS EN/EN61547, light industry level(surge immunity Line-Line 2KV);EAC TP TC 020 | | | | | | | | |
| **OTHERS** | MTBF | 2749.1K hrs min.    Telcordia SR-332 (Bellcore) ;  231.2K hrs min.    MIL-HDBK-217F (25℃) | | | | | | | | |
| | 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 current and 25℃ of ambient temperature.<br>2. De-rating may be needed under low input voltages. Please refer to "STATIC CHARACTERISTIC" sections for details.<br>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.<br>4. The standby power consumption is specified for 230VAC.<br>5. 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.<br>6. This series meets the typical life expectancy of >50,000 hours of operation when Tcase, particularly ⓣⓒ point (or TMP, per DLC), is about 75℃ or less.<br>7. Please refer to the warranty statement on MEAN WELL's website at http://www.meanwell.com<br>8. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).<br>9. For any application note and IP water proof function installation caution, please refer our user manual before using.<br>   https://www.meanwell.com/Upload/PDF/LED_EN.pdf<br>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.<br>※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx | | | | | | | | |

■ **BLOCK DIAGRAM**

PFC fosc : 50~120KHz
PWM fosc : 60~130KHz
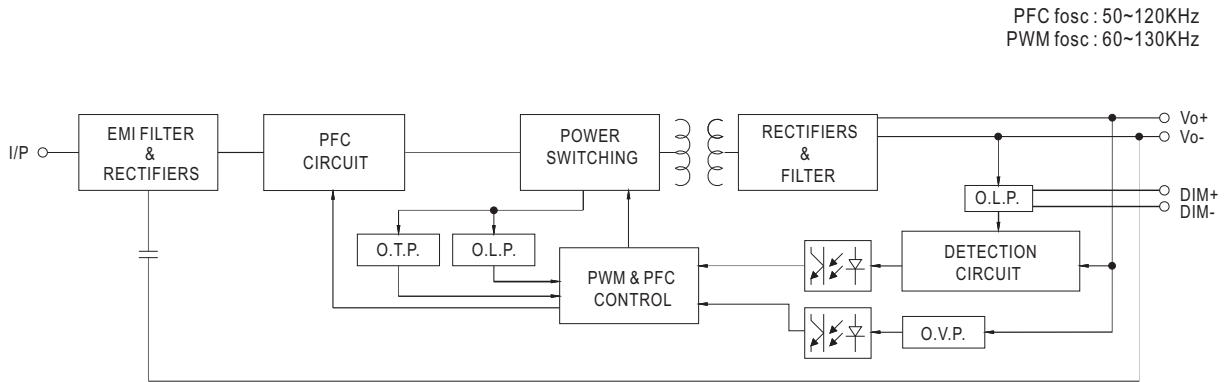


■ **DRIVING METHODS OF LED MODULE**

※ This series works in constant current mode to directly drive the LEDs.
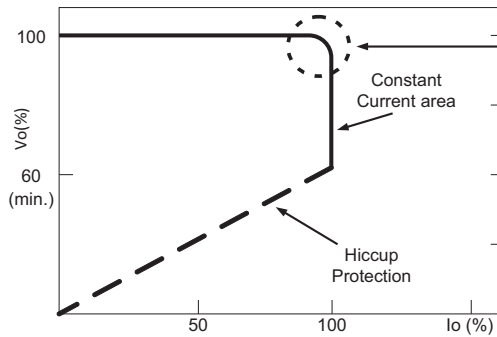


Typical LED power supply I-V curve

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

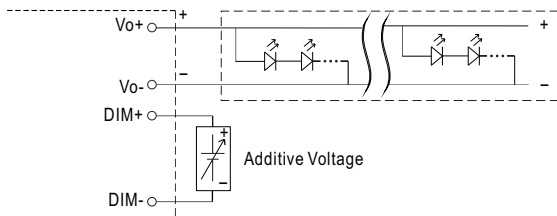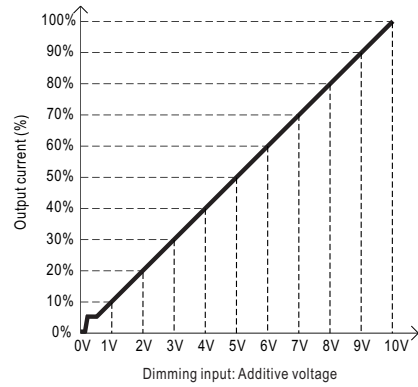Should there be any compatibility issues, please contact MEAN WELL.

## ■ DIMMING OPERATION

AC/L(Brown)
AC/N(Blue)

NPF-90D

DIM+(Purple)
DIM-(Pink)
Vo+(Red)
Vo-(Black)
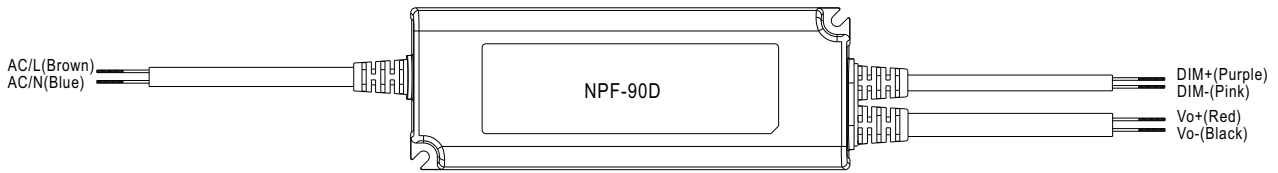
### ※ **3 in 1 dimming function**

· Output constant current level can be adjusted by applying one of the three methodologies between DIM+ and DIM-:
  0 ~ 10VDC, or 10V PWM signal or resistance.
· Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.
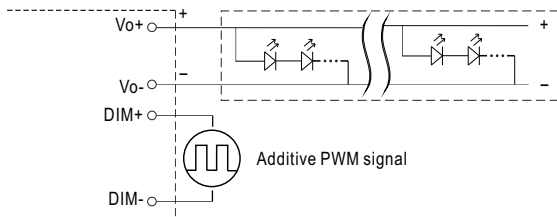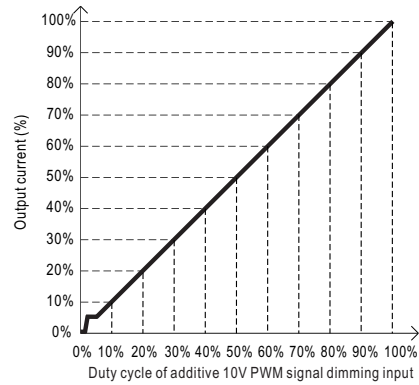· Dimming source current from power supply: 100μA (typ.)
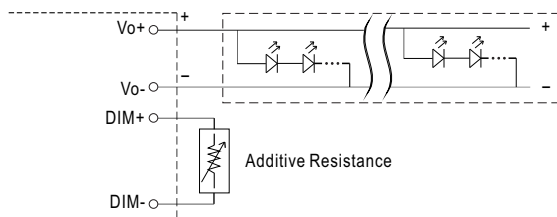
◎ Applying additive 0 ~ 10VDC

Vo+
Vo-
DIM+          Additive Voltage
DIM-

"DO NOT connect "DIM- to Vo-"

Output current (%) vs Dimming input: Additive voltage (0V ~ 10V)

◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):

Vo+
Vo-
DIM+          Additive PWM signal
DIM-

"DO NOT connect "DIM- to Vo-"

Output current (%) vs Duty cycle of additive 10V PWM signal dimming input (0% ~ 100%)

◎ Applying additive resistance:

Vo+
Vo-
DIM+          Additive Resistance
DIM-

"DO NOT connect "DIM- to Vo-"

Output current (%) vs Dimming input: Additive resistance
Short 10K/N 20K/N 30K/N 40K/N 50K/N 60K/N 70K/N 80K/N 90K/N 100K/N
(N=driver quantity for synchronized dimming operation)
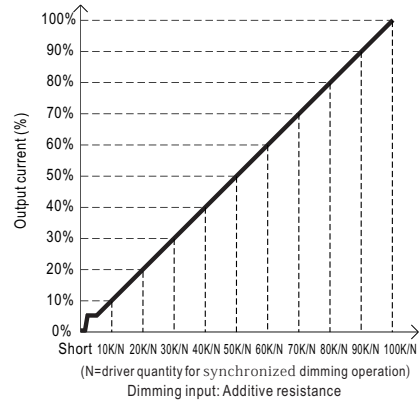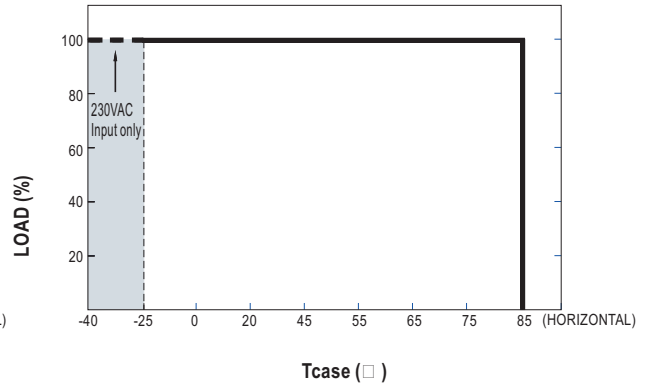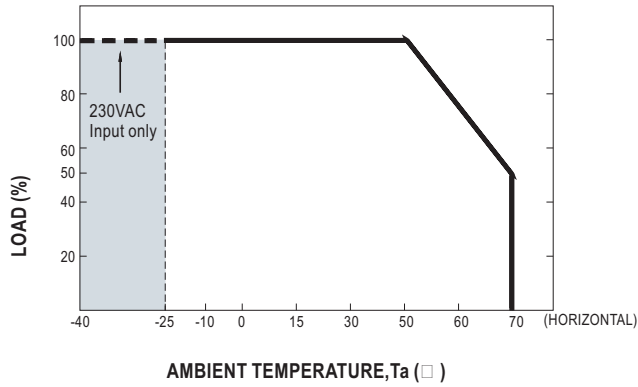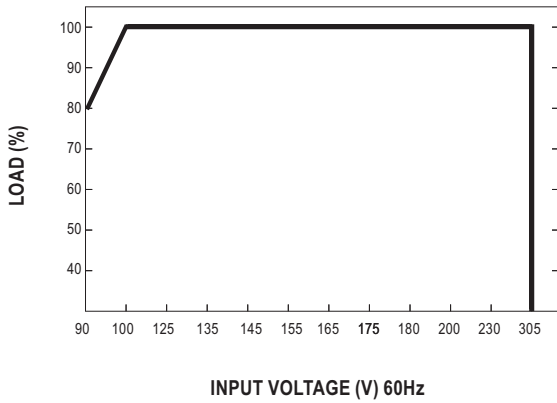
Note : 1. Min. dimming level is about 6% and the output current is not defined when 0%< Iout<6%.
       2. The output current could drop down to 0% when dimming input is about 0kΩ or 0Vdc, or 10V PWM signal with 0% duty cycle.

File Name:NPF-90D-SPEC 2022-02-18
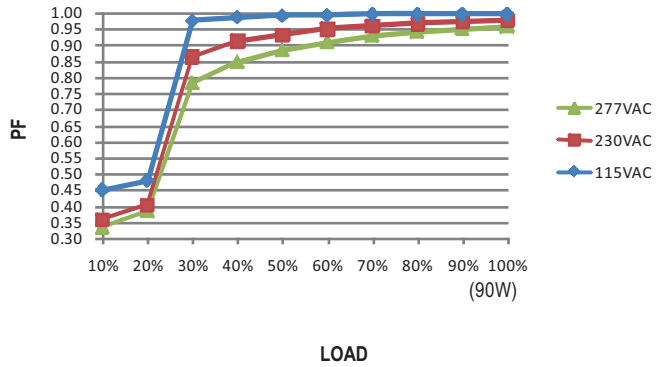
### ■ OUTPUT LOAD vs TEMPERATURE



230VAC
Input only

AMBIENT TEMPERATURE,Ta (□ )



230VAC
Input only

Tcase (□ )

### ■ STATIC CHARACTERISTIC



INPUT VOLTAGE (V) 60Hz

※De-rating is needed under low input voltage.

### ■ POWER FACTOR (PF) CHARACTERISTIC

※ Tcase at 75℃



- 277VAC
- 230VAC
- 115VAC

(90W)

LOAD

### ■ TOTAL HARMONIC DISTORTION (THD)

※ 48V Model, Tcase at 75℃



- 277VAC
- 230VAC
- 115VAC
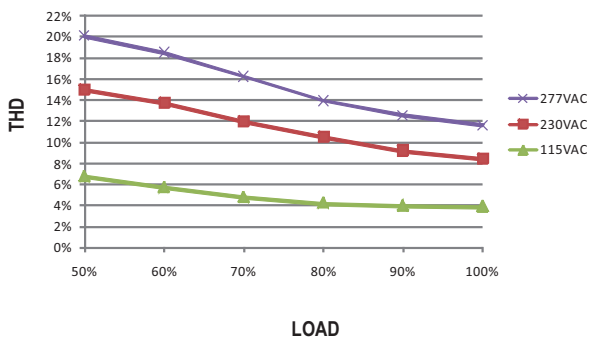
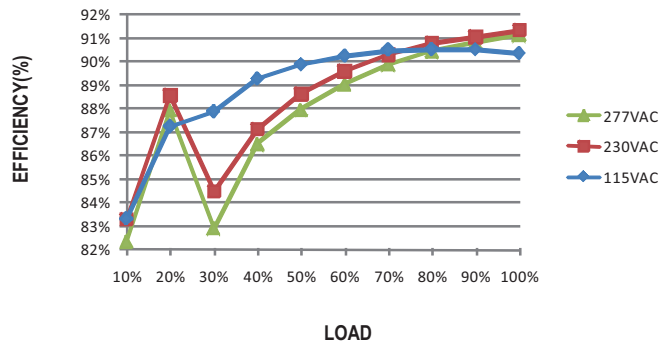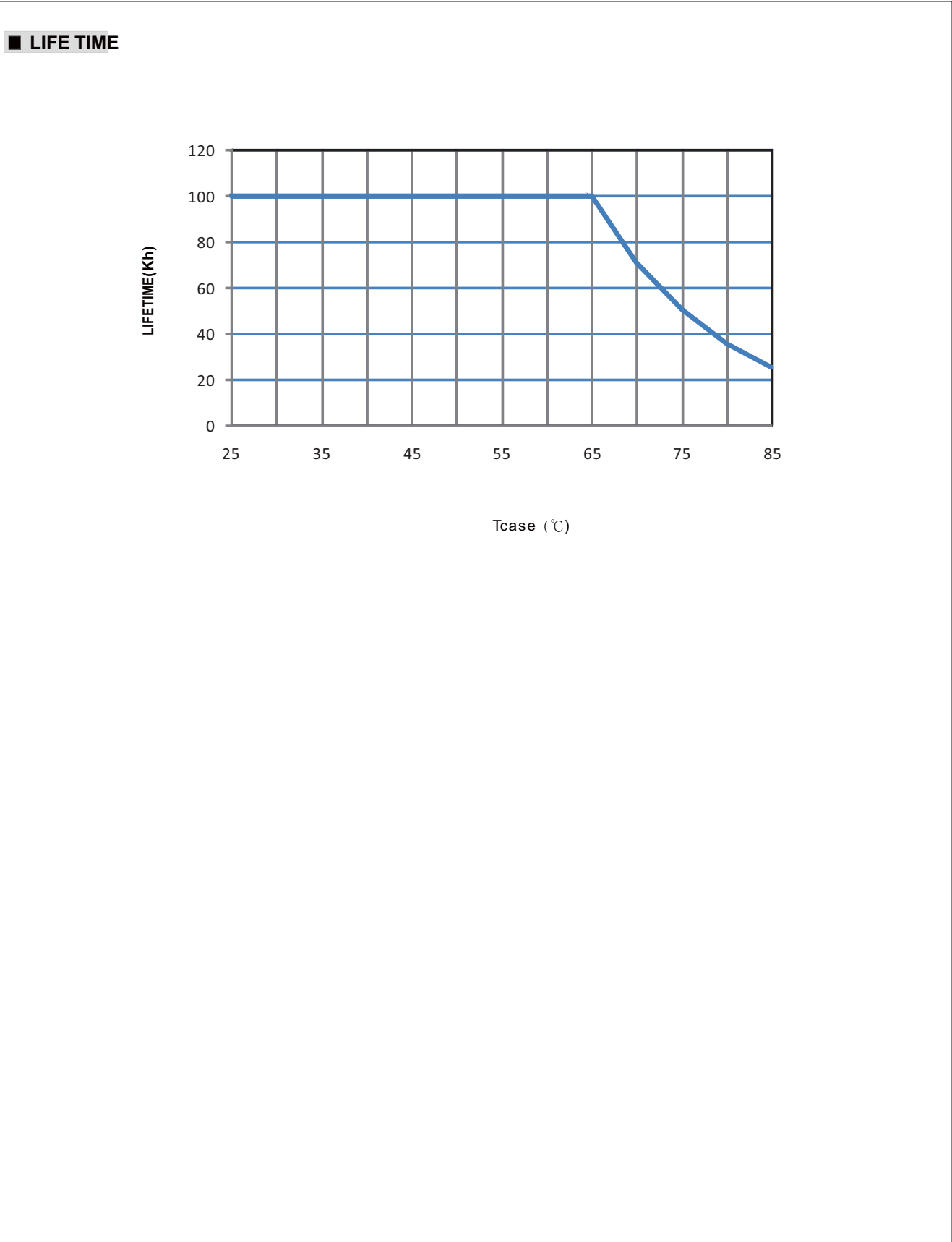LOAD

### ■ EFFICIENCY vs LOAD

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

※ 48V Model, Tcase at 75℃
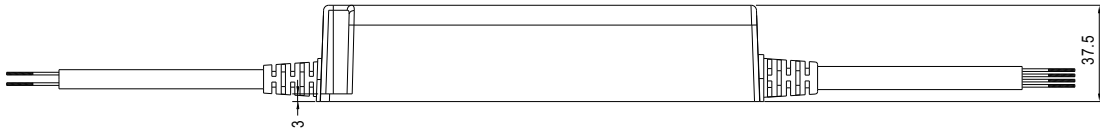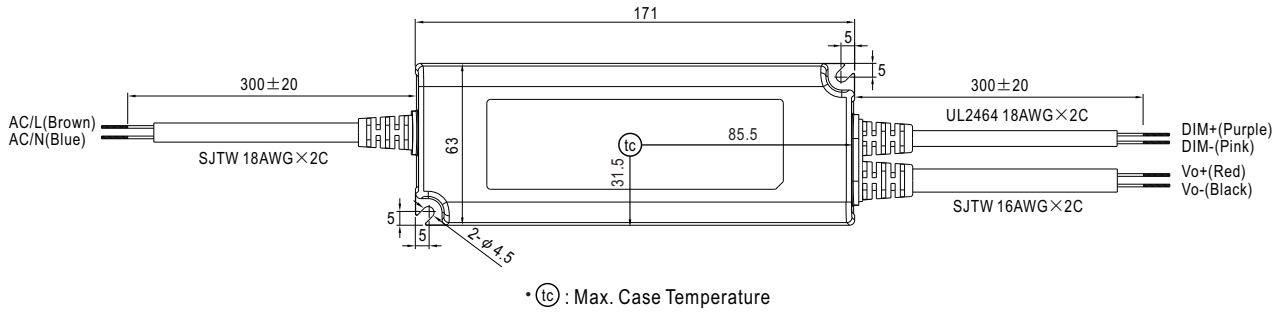


- 277VAC
- 230VAC
- 115VAC

LOAD

File Name:NPF-90D-SPEC 2022-02-18

■ **LIFE TIME**



File Name:NPF-90D-SPEC 2022-02-18

■ **MECHANICAL SPECIFICATION**

Case No. PWM-90P    Unit:mm



171

5

5

300±20

AC/L(Brown)
AC/N(Blue)

SJTW 18AWG×2C

63

31.5

85.5

tc

300±20

UL2464 18AWG×2C

DIM+(Purple)
DIM-(Pink)

Vo+(Red)
Vo-(Black)

SJTW 16AWG×2C

5
5
2- ⌀ 4.5

• tc : Max. Case Temperature

37.5

3

■ **Recommend Mounting Direction**