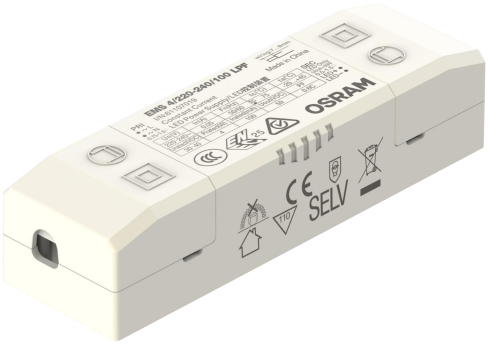
# EMS Low PF Series LED Power Supply

## EMS 4/220-240/100 LPF

### 4W Constant Current LED driver




Housing material: plastic, white

* image for information purpose only

### Applications

LED panel、LED down light、LED spot light

### Approvals

CE CB SELV

## Product Features

- For luminaire of protection class II
- Output current: 100 mA
- SELV, Urated: 30 - 40 V
- For independent use
- Input Voltage：220 - 240 Vac
- Power Factor：0.6C (Typ.)
- Efficiency: ≥ 80 % (Typ.)
- Ta range: -20 ... +45 ℃
- Surge capability: 1 kV
- 5 years guarantee
- Protection: SCP / OLP / OVP / OTP

# Electrical specification

## Input

| Item | Value |
|---|---|
| Rated input voltage (V) | 220 - 240 V |
| Range of input voltage (AC) | 198 - 264 Vac |
| Maximum voltage | 300 Vac @ 1h maximum, the unit may not operate under this abnormal condition |
| Input Current Max. | 50 mA |
| Frequency | 50 / 60 Hz |
| Power factor | 0.6C @ Full load, 230 Vac, 50 Hz. See graphs |
| Displacement Factor | ≥ 0.7 @ Full load, 230 Vac, 50 Hz |
| Start-up time | < 0.5 s |
| No-load power | ≤ 0.5 W @ 220 Vac |

## Output

| Item | Value |
|---|---|
| Constant Current | 100 mA |
| Voltage Range | 30 - 40 Vdc |
| Unload voltage Max. | 59 Vdc |
| Current accuracy | ± 10 % |
| Output current ripple (≤ 120Hz) | ± 5 % |
| Output power range | 4 W |
| SVM | ≤ 0.4 @ Full load, 230 Vac |
| Pst | ≤ 1 @ Full load, 230 Vac |
| Efficiency | ≥ 80 % @ Full load, 230 Vac, 50 Hz. See graphs |
| Galvanic isolation | SELV |

## Protection

| Item | Value |
|---|---|
| Over Load Protection | 103 - 135 % / Auto recovery |
| Over Voltage Protection | 59 Vdc / Auto recovery |
| Short Circuit Protection | Auto recovery |

## Surge capability

| Iem | Value |
|---|---|
| Surge capability (L - N) | 1 kV |
| Surge capability (L / N - Ground) | NA |

## Withstand voltage

| Item | Value |
|---|---|
| Input - Output | 3750 V / 5 mA / 60 s |

## Environment

| Item | Value |
|---|---|
| Ambient temperature range ta | -20 ... +45 ℃ |
| Maximum case temperature tc | 75 ℃ |
| Storage temperature range | -20 ... +75 ℃ |
| Lifetime | > 100,000 h @ tc=65 ℃<br>> 50,000 h @ tc=75 ℃ |
| Noise | ≤ 20 dB(A) @ 20 cm |
| Max. case temperature in fault condition | 110 ℃ |
| Humidity | 20 % - 90 % RH |
| IP protection class | IP 20 |
| Mains switching cycles | > 25000 cycles |
| Max. cable length to lamp / LED module | 0.8 m |

## Dimension

| Item | Value |
|---|---|
| Length | 92 mm |
| Width | 28 mm |
| Height | 21 mm |

# Technical parameter

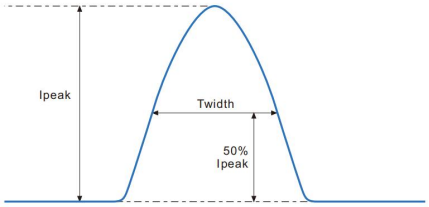
| Model | Output Current (mA) | Output Voltage (Vdc) | Power (W) | Ambient temperature range ta |
|---|---|---|---|---|
| EMS 4/220-240/100 LPF | 100 mA | 30 - 40 Vdc | 4.0 W | -20 ... +45 ℃ |

## Inrush Current & Circuit Breaker

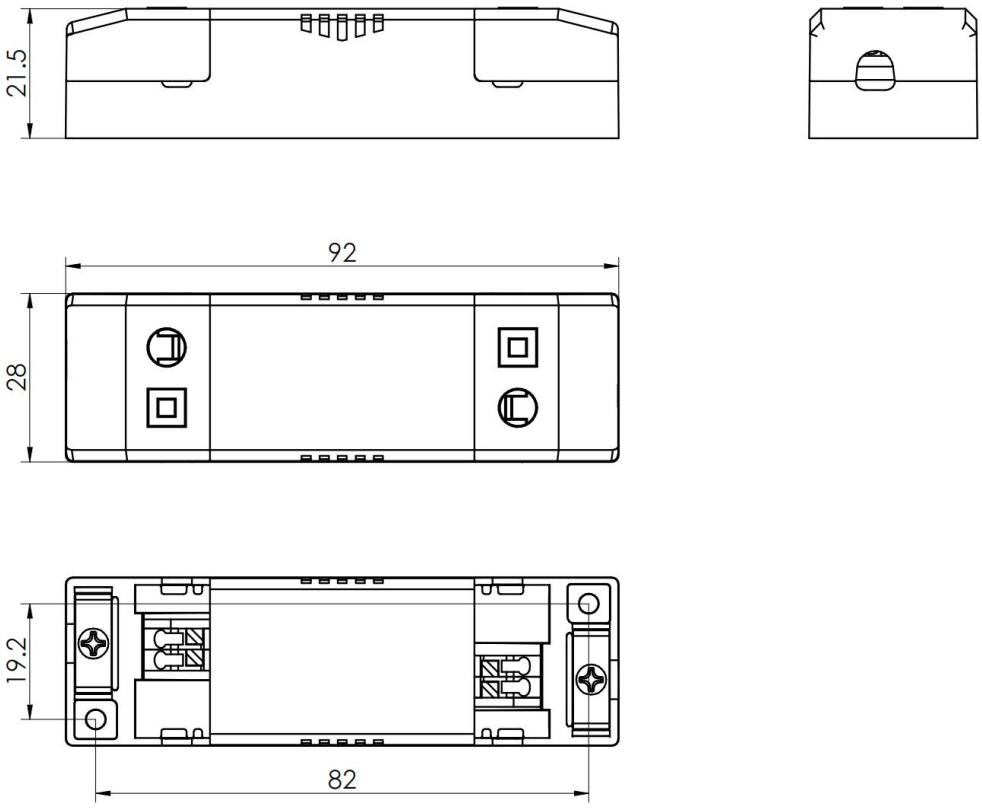
| $I_{peak}$ | $T_{width}$ | B10 | B16 | B20 | C10 | C16 | C20 |
|---|---|---|---|---|---|---|---|
| 4.54 A | 84 µs | 160 pcs | 256 pcs | 320 pcs | 160 pcs | 256 pcs | 320 pcs |

Notes:

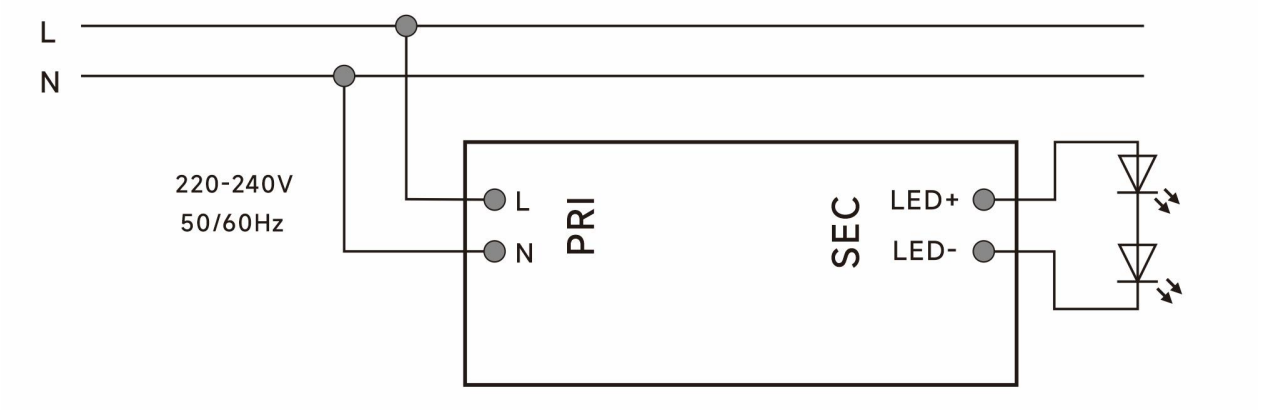
1. The values in the table are the maximum number of drives that can be connected to each type of MCB. Do not exceed these values during installation.
2. The allowable number may vary slightly depending on the brand and model of the miniature circuit breaker (MCB).
3. Ipeak = peak inrush current; Twidth = half-peak pulse width. See the figure below for the waveform.




## 2D diagram



# Wiring diagram




**Notes :**

- To ensure good EMC conditions, the output cables of the LED driver should be routed separately from the mains input connections and mains cables.
- LED wiring should be kept as short as possible to ensure good EMC performance. The max.cable length to lamp / LED module is 0.8 m.
- To comply with EMC regulations, the secondary side wires (connecting to the LED module) shall be routed in parallel.
- The LED driver does not provide reverse polarity protection on the secondary side. Reverse polarity may damage LED modules that lack reverse polarity protection.
- Wrong wiring may cause malfunction or irreparable damage to the LED driver.

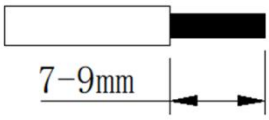
# Wiring & Connections

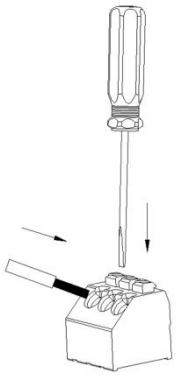
| Specification item | Value (Unit) |
|---|---|
| Input wire cross-section | 0.75 ... 1.5 $mm^2$ |
| Input wire strip length | 7 ... 9 mm |
| Output wire cross-section | 0.5 ... 1.5 $mm^2$ |
| Output wire strip length | 7 ... 9 mm |

# Recommended wire

| Wire cross-section | Wire type |
|---|---|
| 2*0.5 $mm^2$ | H03VVH2-F 2core |
| 2*0.75 $mm^2$ | H03VVH2-F 2core |
| 1.5 $mm^2$ | CCC 08 (RV-90) |
| 16AWG (1.25 $mm^2$) | UL1015 |

Strip the wire insulation to 7–9 mm before connecting to the driver terminals. This ensures proper electrical contact and avoids short circuits caused by exposed conductors. Only one wire per terminal.



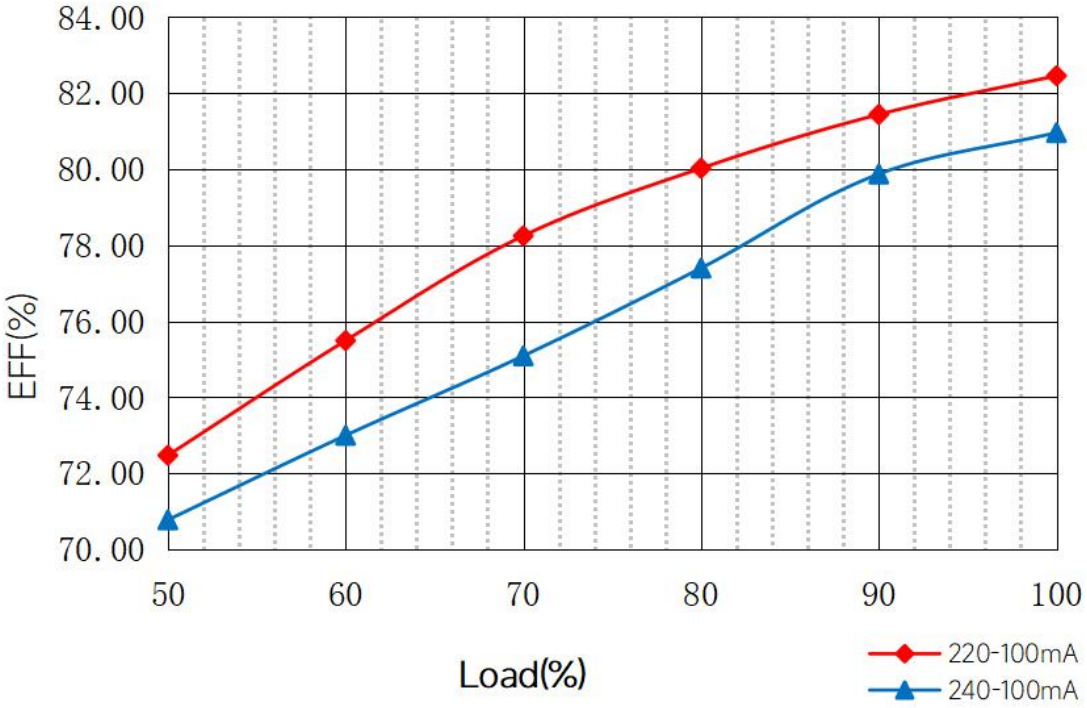
# Expected lifetime

| Output current | ta (℃) | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|
| 100mA | tc (℃) | 47 | 51 | 56 | 60 | 65 |
| | Lifetime | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h |

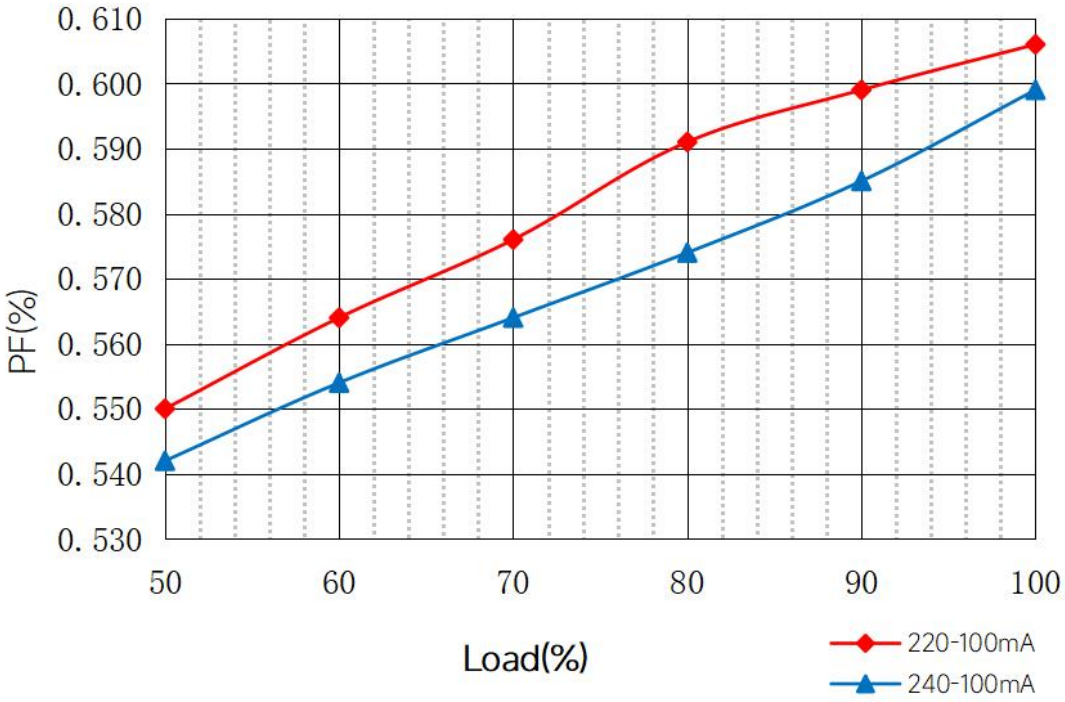
1. The LED driver achieves the above-specified lifetime under reference operating conditions.
2. The correlation between case temperature tc and ambient temperature ta is also affected by luminaire design.

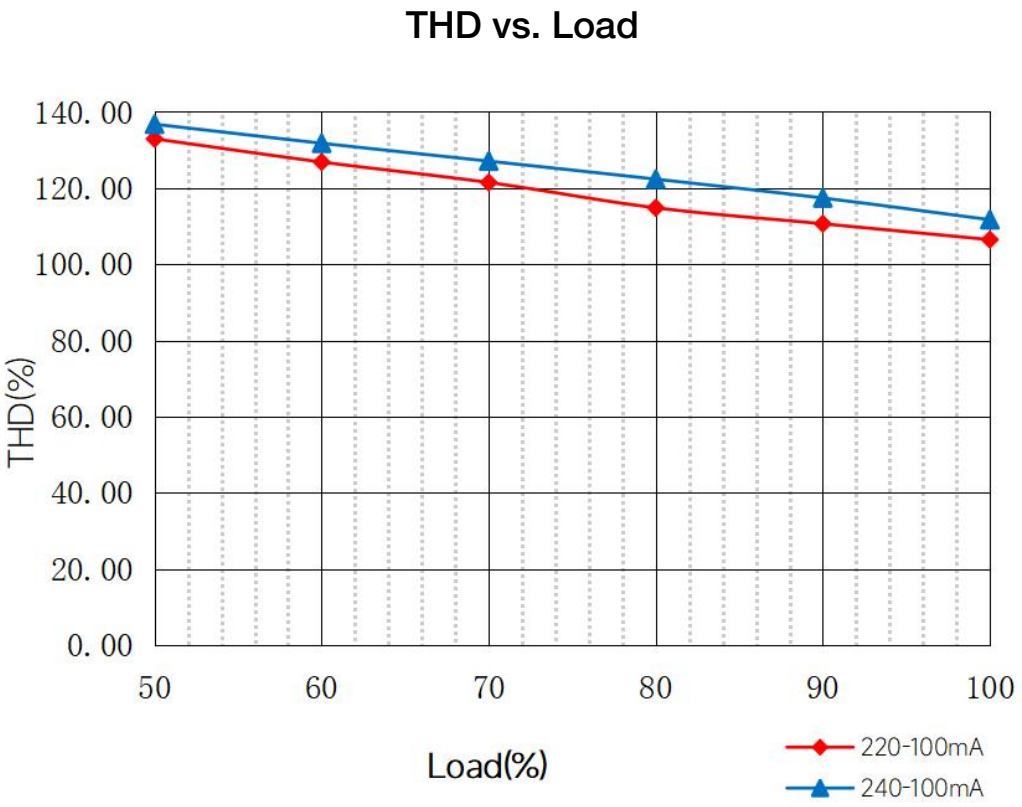
## Electrical characteristics

### Efficiency vs. Load

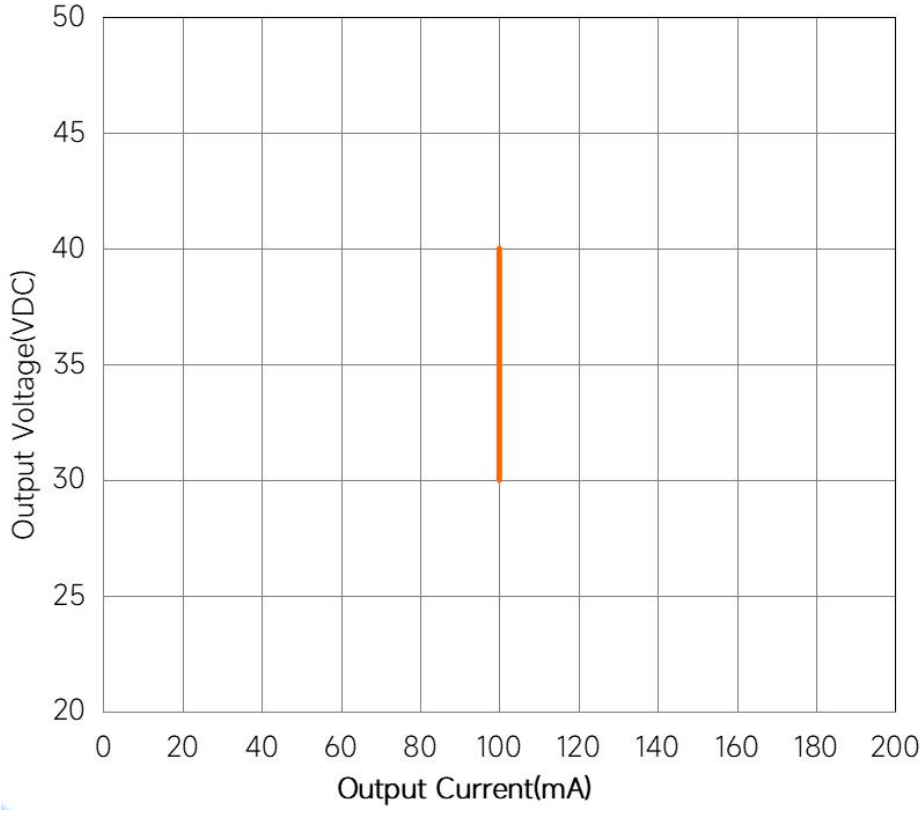



### Power Factor Characteristics






## Operating window



# Remarks

- All parameters not specially mentioned are measured at 230 Vac input , full load and 25 ℃ of ambient temperature.
- Ripple & Noise are measured at 20 MHz of bandwidth by using a 300 mm twisted pair-wire terminated with a 0.1 µF & 47 µF parallel capacitor.
- The driver withstands an input voltage of up to 300 Vac for maximum 1 hour. Shut down of output load might occur in case the supply voltage exceeds the declared input voltage range.
- Shut down of output load happens if the input voltage of the load is below the minimum allowed voltage level.
- Hot plugging of the load or external switching on the secondary side is not permitted.
- Output short circuit protection: if the LED output is short-circuited, the driver shuts down output; normal operation resumes automatically after fault is removed.
- Output over load protection: The driver shuts off the output if the load exceeds the internal preset limit. If the overload persists after restart, the driver shuts down again. Normal operation resumes automatically after the fault is removed.
- Output over voltage protection: If the output voltage exceeds the specified limit, the driver shuts down the output, and automatically returns to normal after the fault is removed.
- Output over temperature protection: The over-temperature protection of the product is provided by the IC. If the temperature exceeds the preset limit, the driver reduces the output current and resumes normal operation after temperature drops.

# Packaging information

| Item NO.(I/N) | Product name | Weight /piece (kg) | Outer carton dimension (mm) | Quantity /carton | Net weight /carton (kg) | Gross weight /carton (kg) |
|---|---|---|---|---|---|---|
| 61107019 | EMS 4/220-240/100 LPF | 0.0349 | 393 x 165 x 196 | 100 | 3.49 | 4 |

# Standards

GB 19510.1

GB 19510.213

IEC 61347-1

IEC 61347-2-13

EN 61347-1

EN 61347-2-13

AS/NZS 61347.1

AS 61347.2.13

EN 62384

GB/T 17743

GB 17625.1

EN 55015

EN 61000-3-2

EN 61000-3-3

EN 61547

EN 62493

EN 61000-4-2, -3, -4, -5, -6, -8, -11

Erp2.0 EU 2019/2020

RoHS (2011/65/EU)  (EU)2015/863

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