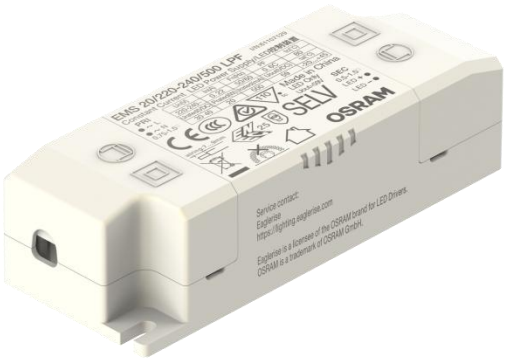
EMS Low PF Series LED Power Supply

EMS 20/220-240/500 LPF

20W Constant Current LED driver



Applications

LED panel、LED down light、LED spot light

Approvals

CE CB SELV

Housing material: plastic, white

* image for information purpose only

Product Features

- For luminaire of protection class II
- Output current: 500 mA
- SELV, Urated: 30 - 40 V
- For independent use
- Input Voltage：220 - 240 Vac
- Power Factor：0.6C (Typ.)
- Efficiency: ≥85 % (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 (Vac)	198 - 264 Vac
Maximum voltage	300 Vac @ 1h maximum,the unit may not operate under this abnormal condition
Input Current Max.	220 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	500 mA
Voltage Range	30 - 40 Vdc
Unload voltage Max.	59 Vdc
Current accuracy	± 5 %
Output current ripple (≤ 120Hz)	± 5 %
Output power range	15 - 20W
SVM	≤ 0.4 @ Full load, 230 Vac
Pst	≤ 1 @ Full load, 230 Vac
Efficiency	≥ 85 % @ Full load, 230 Vac, 50 Hz. See graphs
Galvanic isolation	SELV

Protection

Item	Value
Over Load Protection	103 - 120 % / Auto recovery
Over Voltage Protection	59 Vdc / Auto recovery
Short Circuit Protection	Auto recovery

Surge capability

Item	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 ℃ > 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	2 m

Dimension

Item	Value
Length	92 mm
Width	36 mm
Height	25 mm

Technical parameter

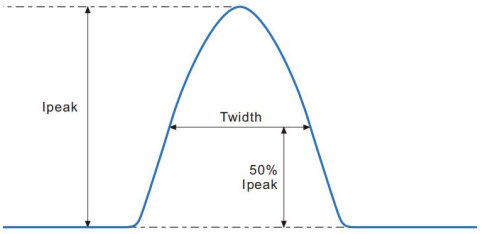
Model	Output Current (mA)	Output Voltage (Vdc)	Power (W)	Ambient temperature range ta
EMS 20/220-240/500 LPF	500 mA	30 - 40 Vdc	20.0 W	-20 ... +45 ℃

Inrush Current & Circuit Breaker

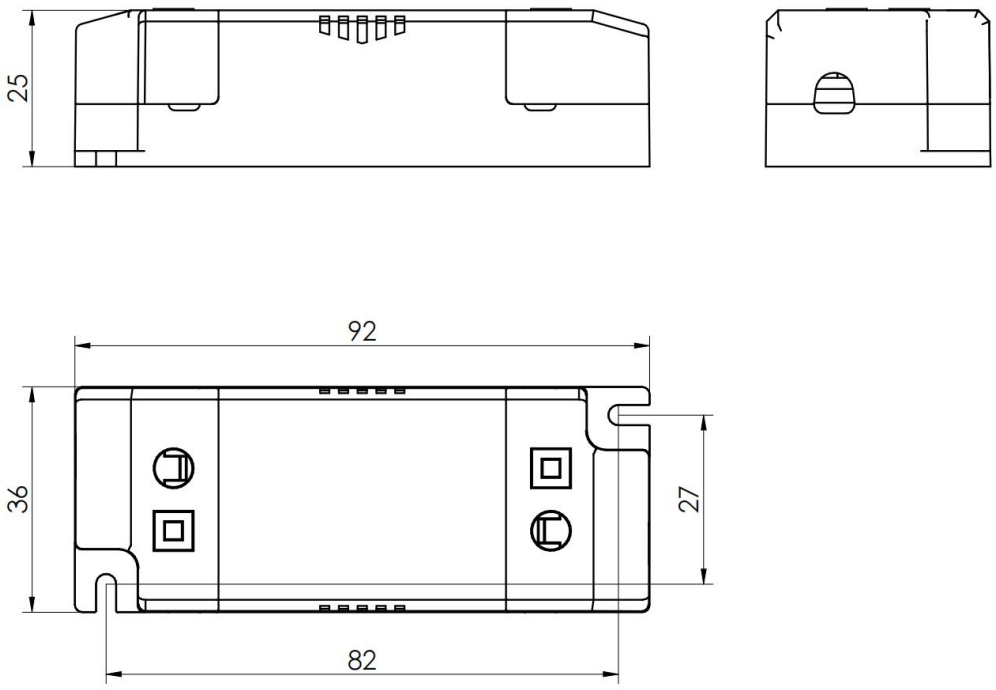
I_{peak}	T_{width}	B10	B16	B20	C10	C16	C20
12.6 A	94 µs	36 pcs	58 pcs	72 pcs	36 pcs	58 pcs	72 pcs

Notes:

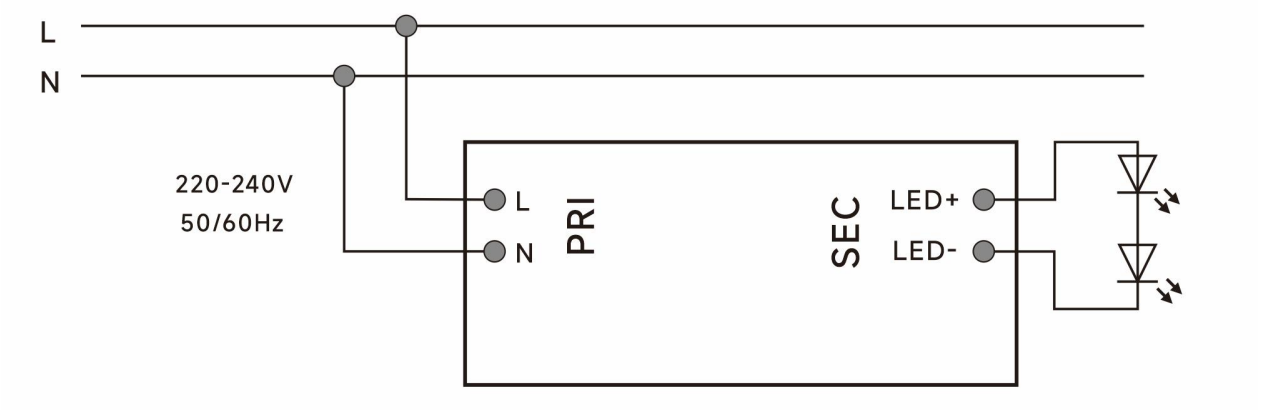
1. The values in the table are the maximum number of drives that can be connected to each type of MCB. Do not exceed these values during installation.
2. The allowable number may vary slightly depending on the brand and model of the miniature circuit breaker (MCB).
3. Ipeak = peak inrush current; Twidth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

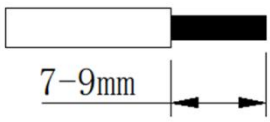
Wiring & Connections

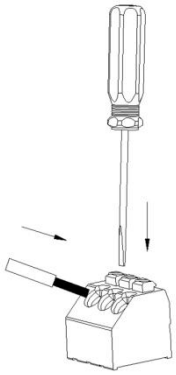
Specification item	Value (Unit)
Input wire cross-section	0.75 ... 1.5 mm^2
Input wire strip length	7 ... 9 mm
Output wire cross-section	0.5 ... 1.5 mm^2
Output wire strip length	7 ... 9 mm

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

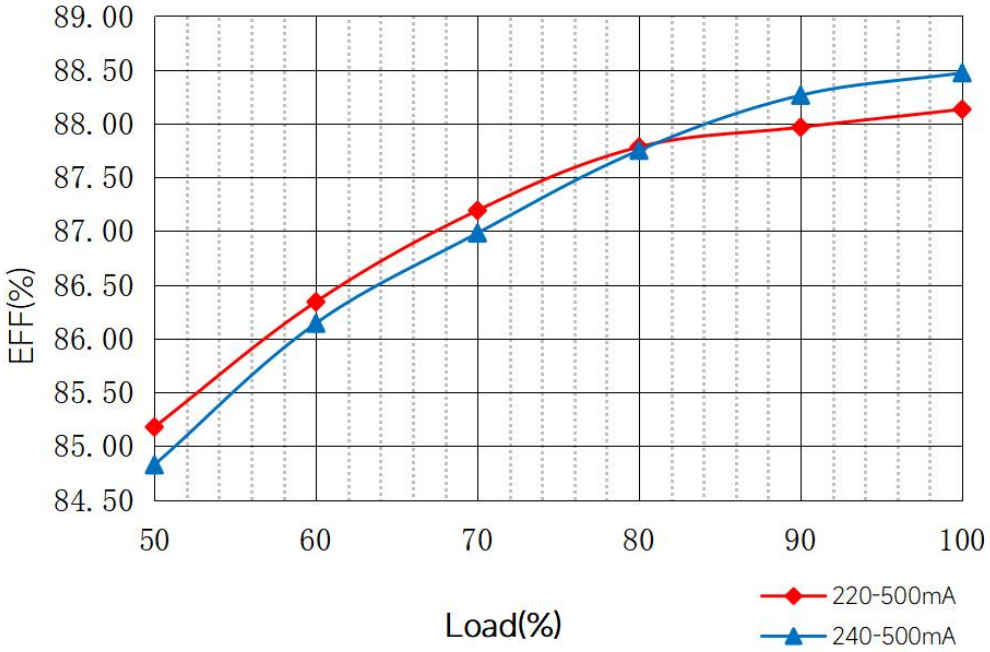
Output current	ta (℃)	30	35	40	45	50
500mA	tc (℃)	58	62	66	70	74
	Lifetime	> 100,000 h	> 95,000 h	> 75,000 h	> 55,000 h	> 40,000 h

1.The LED driver achieves the above-specified lifetime under reference operating conditions.

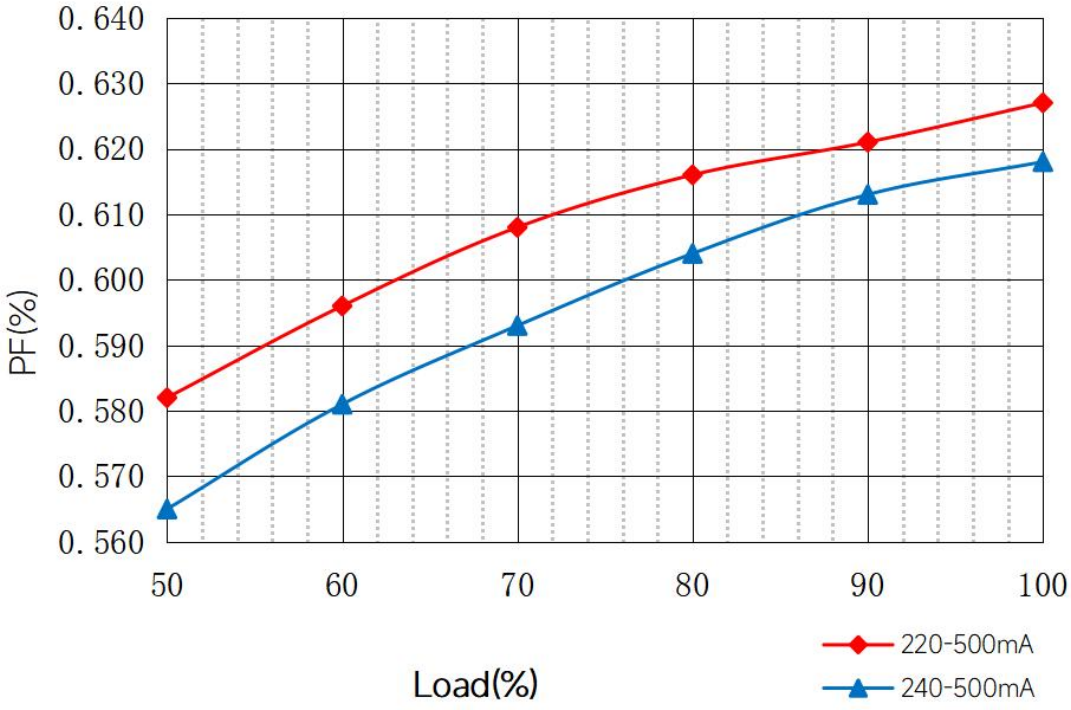
2.The correlation between case temperature tc and ambient temperature ta is also affected by luminaire design.

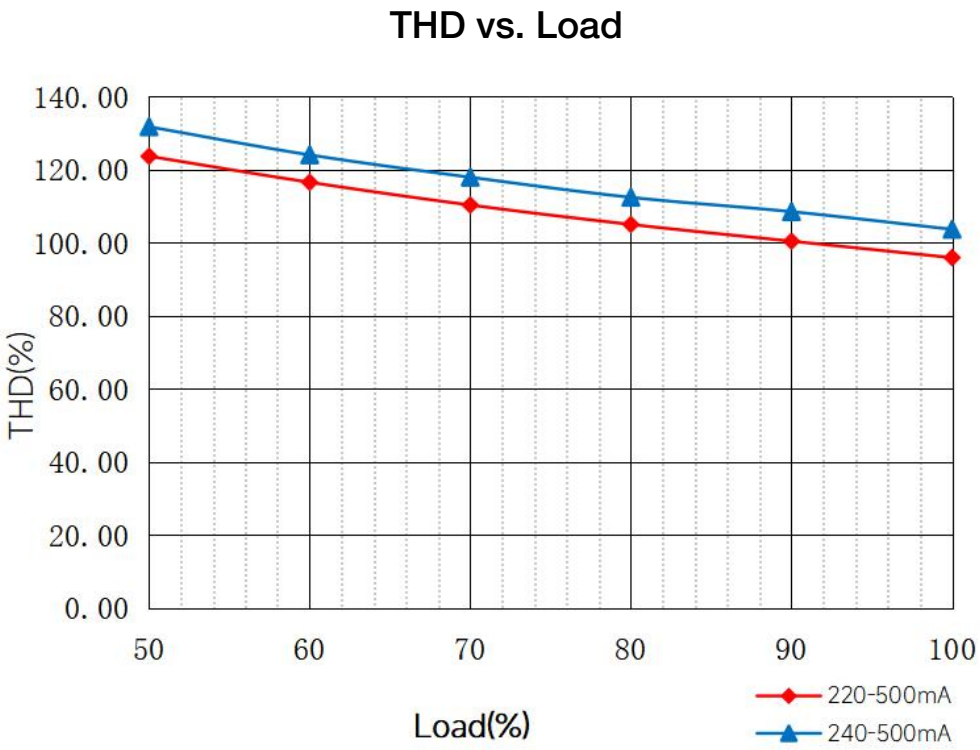
Electrical characteristics

Efficiency vs. Load

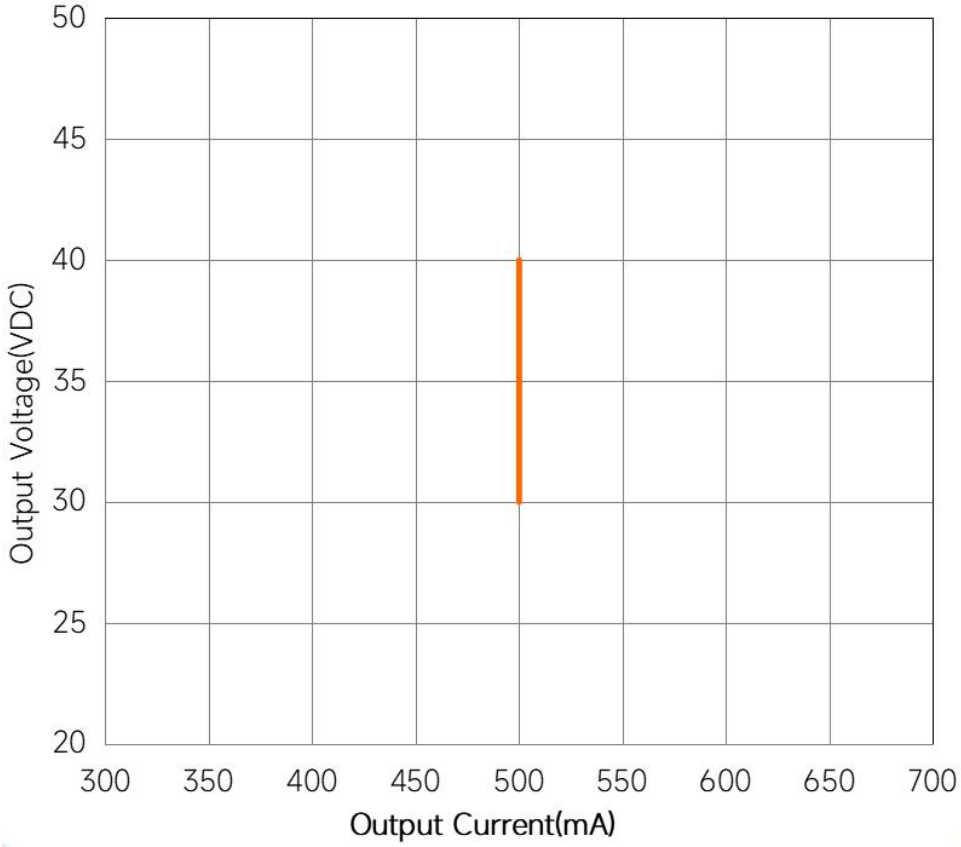


Power Factor Characteristics





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 20MHz 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:lif 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)
61107129	EMS 20/220-240/500 LPF	0.0477	393 x 205 x 225	100	4.77	5.49

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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