# AC/DC 750W Enclosed Switching Power Supply

LMF750-23BxxUH(-C) Series

MORNSUN®

RoHS

Report EN62368-1 | GB4943.1 | BS EN62368-1 | UL62368-1

## FEATURES

- Universal 85 - 305VAC or 120 - 430VDC input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Semi-potted process, fanless design
- Operating ambient temperature range: -40℃ to +85℃
- Low Ripple & Noise, high efficiency
- Active PFC
- 150% peak load output for 1 second
- High I/O isolation test voltage up to 4000VAC
- Output short circuit, over-current, over-voltage, over-temperature protection
- 3 years warranty
- Operating altitude up to 5000m
- Safety according to IEC62368, IS13252 (Part1), IEC60335, EN61558

*LMF750-23BxxUH(-C) series is one of Mornsun's enclosed fanless semi-potted ultra narrow AC-DC switching power supply, it is suitable for industrial and outdoor occasions where the application environment is relatively harsh. It features 305VAC all operating conditions, universal AC input and at the same time accepts DC input voltage, cost-effective, high PF value, high efficiency, high reliability, 150% peak load output and operating altitude up to 5000m. These converters offer excellent EMC performance and meet UL/EN62368, EN60335, EN61558, GB4943 standards and they are widely used in areas of industrial, lighting, electricity, security, telecommunications, smart home etc.*

## Selection Guide

| Certification | Part No.* | Rated Output Power (W)* | Nominal Output Voltage and Current (Vo/Io) | Output Voltage Adjustable Range (V) | Efficiency at 230VAC (%) Typ. | 25℃ Max. Capacitive Load (μF) | Low Temperature Max. Capacitive Load (μF) |
|---|---|---|---|---|---|---|---|
| EN CCC BS UL BIS | LMF750-23B12UH | 720.0 | 12V/60A | 12-14.4 | 94 | 12000 | 6000 |
| | LMF750-23B24UH | 751.2 | 24V/31.3A | 24-28.8 | 95 | 10000 | 4000 |
| | LMF750-23B28UH | 750.4 | 28V/26.8A | 28-33.6 | 95 | 9000 | 3500 |
| | LMF750-23B36UH | 752.4 | 36V/20.9A | 36-43.2 | 95 | 8000 | 3000 |
| | LMF750-23B48UH | 753.6 | 48V/15.7A | 48-57.6 | 96 | 6000 | 2000 |

Note: 1.*Use suffix "C" for terminal with protective cover;
2.*Under any conditions, the total power of the product should not exceed the rated output power, and the output current should not exceed the rated output current.

## Input Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Input Voltage Range | Rated input (Certified voltage) | | 100 | -- | 277 | VAC |
| | AC input | | 85 | -- | 305 | |
| | DC input | | 120 | -- | 430 | VDC |
| Input Voltage Frequency | | | 47 | -- | 63 | Hz |
| Input Current | 115VAC | | -- | -- | 7.5 | A |
| | 230VAC | | -- | -- | 3.8 | |
| Inrush Current | 115VAC | Cold start | -- | -- | 20 | |
| | 230VAC | | -- | -- | 40 | |
| Power Factor | 115VAC | Full load, 25℃ | 0.98 | -- | -- | -- |
| | 230VAC | | 0.95 | -- | -- | |
| Leakage Current | 277VAC, 50Hz | Contact leakage current | <0.5mA | | | |
| Hot Plug | | | Unavailable | | | |

## Output Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Output Voltage Accuracy | Full load range | | -- | ±1.0 | -- | % |
| Line Regulation | Rated load | | -- | ±0.5 | -- | |
| Load Regulation | 0% - 100% load | | -- | ±0.5 | -- | |
| Ripple & Noise* | 20MHz bandwidth (peak-to-peak value), 25℃ | 12V | -- | -- | 150 | mV |
| | | 24V/28V/36V/48V | -- | -- | 200 | |
| Minimum Load | | | 0 | -- | -- | % |
| Stand-by Power Consumption | 25℃, 230VAC input | | -- | -- | 5 | W |
| Peak Load Output | 100 - 277VAC, test for 1s | | -- | 150% | -- | |
| Hold-up Time | 25℃, full load, 115VAC/230VAC | | 12 | -- | -- | ms |
| Short Circuit Protection | Recover time <5S after the short circuit disappear | | Constant current hiccup protection, continuous, self-recover | | | |
| Over-current Protection | | | >110% - 170% Io, constant current hiccup protection, self-recover | | | |
| Over-voltage Protection | 12V | | ≤17VDC | | Hiccup, self-recover | |
| | 24V | | ≤33VDC | | | |
| | 28V | | ≤38VDC | | | |
| | 36V | | ≤49VDC | | | |
| | 48V | | ≤63VDC | | | |
| Over-temperature Protection | | | Output voltage turn off, self-recover after the temperature drops | | | |

Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 0.1uF ceramic capacitor, please refer to enclosed Switching Power Supply Application Notes for specific information. When the product is working at a light load (<10% of rated load), the product is in a green working mode to improve efficiency, and the ripple & noise specification is ≤2.0 times of the rated specification.

## General Specifications

| Item | | Operating Conditions | | | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|---|---|
| Isolation | Input - ⏚ | Electric strength test for 1min., leakage current <5mA | | | | 2000 | -- | -- | VAC |
| | Input - output | | | | | 4000 | -- | -- | |
| | Output - ⏚ | | | | | 1750 | -- | -- | |
| Insulation Resistance | Input - ⏚ | Environment temperature: 25±5℃<br>Relative humidity: <95%RH, non-condensing<br>Testing voltage: 500VDC | | | | 50 | -- | -- | MΩ |
| | Input - output | | | | | | -- | -- | |
| | Output - ⏚ | | | | | | -- | -- | |
| Operating Temperature | | | | | | -40 | -- | +85 | ℃ |
| Storage Temperature | | | | | | -40 | -- | +85 | |
| Operating Humidity | | Non-condensing | | | | 20 | -- | 90 | %RH |
| Storage Humidity | | | | | | 10 | -- | 95 | |
| Power Derating | | Operating temperature derating | With aluminum plate or 23.5CFM fan* | 12V | -40℃ to +45℃ | 0 | -- | -- | %/℃ |
| | | | | | +45℃ to +85℃ | 2 | -- | -- | |
| | | | | 24V/28V/36V/48V | -40℃ to +50℃ | 0 | -- | -- | |
| | | | | | +50℃ to +85℃ | 2.5 | -- | -- | |
| | | | Without aluminum plate | 12V/24V/28V/36V/48V (70% start derating) | -40℃ to +45℃ | 0 | -- | -- | |
| | | | | | +45℃ to +85℃ | 1.58 | -- | -- | |
| | | Input voltage derating | | | 85VAC - 180VAC | 0.33 | -- | -- | %/VAC |
| | | | | | 180VAC - 305VAC | 0 | -- | -- | |
| Safety Standard | | | | | | GB4943.1, UL62368-1, IEC60950-1 safety approved & EN62368-1(Report); Design refer to IEC62368-1, IS13252 (Part1), IEC60335-1, EN61558-1 | | | |

| | | |
|---|---|---|
| Safety Class | | CLASS I |
| MTBF | MIL-HDBK-217F@25℃ | ⩾300,000 h |

Note: *In order to optimize the heat dissipation performance, when the aluminum plate is used for auxiliary heat dissipation, please note: 1. The size of the aluminum plate is 450mm x 450mm x 3mm; 2. The surface of the aluminum plate mast be coated with thermal grease; 3. The product must be tightly attached to the aluminum plate.

## Mechanical Specifications

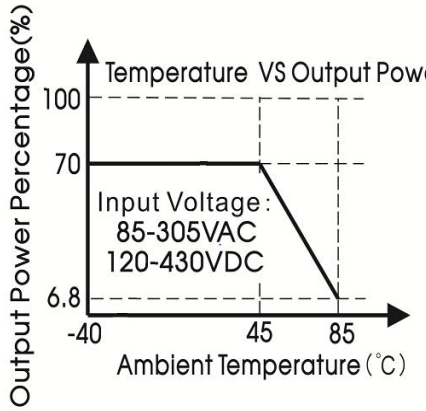
| | |
|---|---|
| Case Material | Metal (AL6063, SGCC) |
| Dimensions | 237.00mm x 100.00mm x 41.00mm |
| Weight | 1300g (Typ.) |
| Cooling Method | Free air convection |

## Electromagnetic Compatibility (EMC)

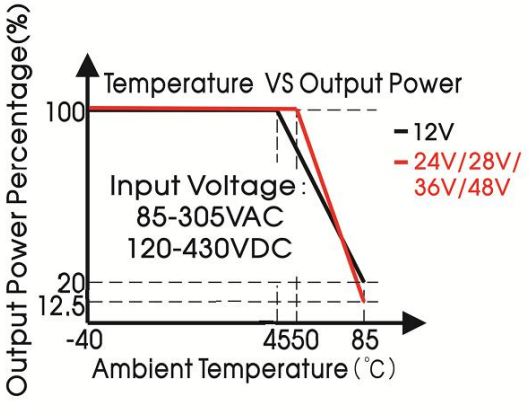
| | | | | |
|---|---|---|---|---|
| Emissions | CE | CISPR32/EN55032 | CLASS B | |
| | RE | CISPR32/EN55032 | CLASS B | |
| | Harmonic current | IEC/EN61000-3-2 | CLASS A | |
| | Voltage flicker | IEC/EN6100-3-3 | | |
| Immunity | ESD | IEC/EN61000-4-2 | Contact ±8KV/Air ±15KV | Perf. Criteria A |
| | RS | IEC/EN61000-4-3 | 10V/m | |
| | EFT (Input port) | IEC/EN61000-4-4 | ±2KV | |
| | EFT (Output port) | IEC/EN61000-4-4 | ±2KV | |
| | Surge (Input port) | IEC/EN61000-4-5 | Line to line ±2KV/line to PE ± 4KV | |
| | Surge (Output port) | IEC/EN61000-4-5 | Line to line ±0.5KV/line to PE ±1KV | |
| | CS (Input port) | IEC/EN61000-4-6 | 10Vr.m.s | |
| | CS (Output port) | IEC/EN61000-4-6 | 10Vr.m.s | |
| | Power frequency magnetic field | IEC/EN61000-4-8 | 10A/m | |
| | Voltage dip, short interruption and voltage variation | IEC/EN61000-4-11 | 0%, 70% | Perf. Criteria B |
| | Intercom interference test | MS-SOP-DQC-007 | | Perf. Criteria B |

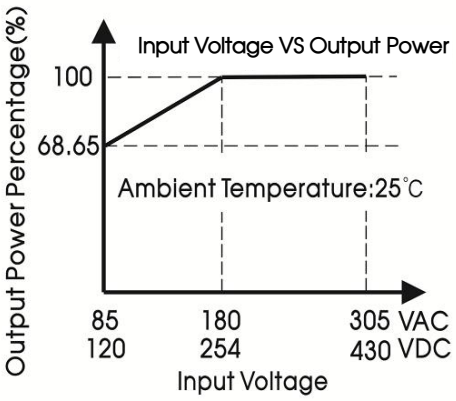
## Product Characteristic Curve

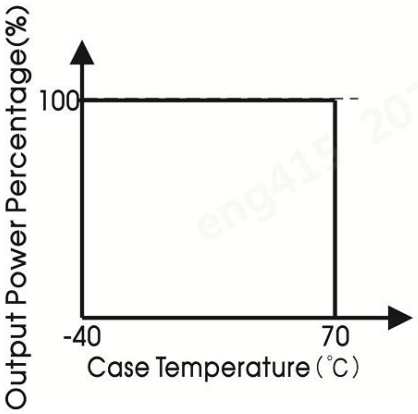
No aluminum plate for heat dissipation




With aluminum plate for heat dissipation or 23.5CFM

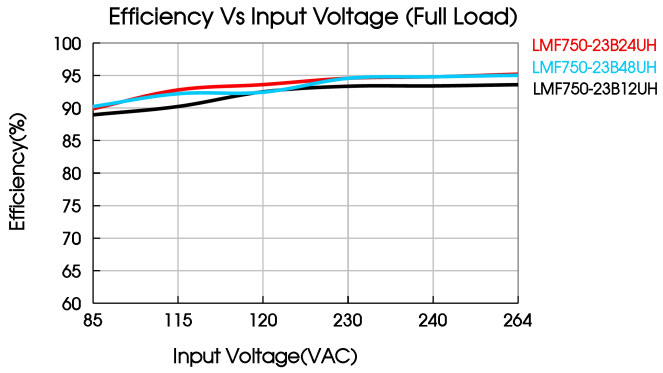


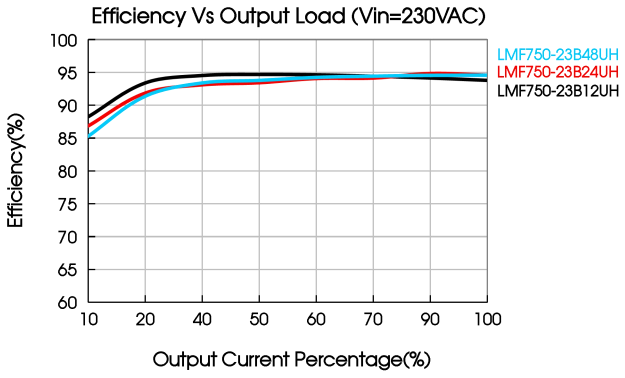



Note: 1. With an AC input voltage between 85 -180VAC and a DC input between 120 - 254VDC the output power must be derated as per the temperature derating curves;

2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.

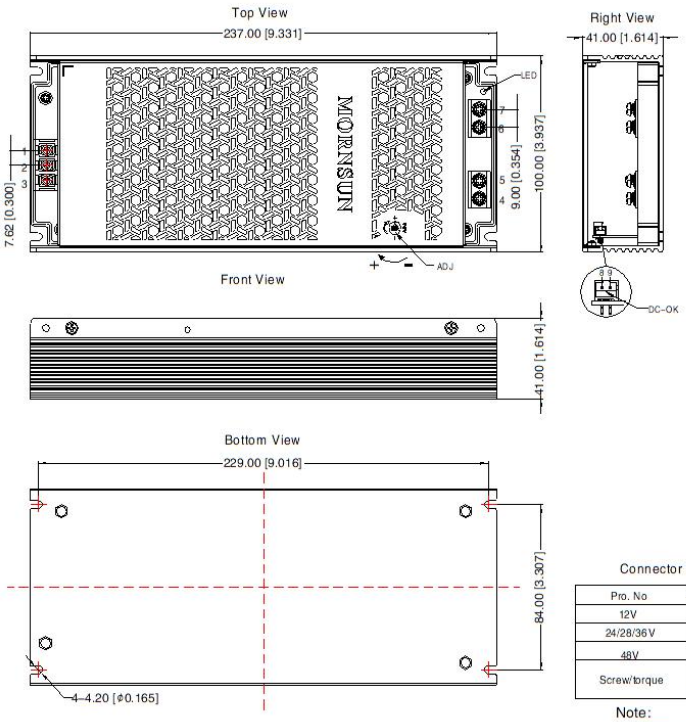



## Dimensions and Recommended Layout

### LMF750-23BxxUH

THIRD ANGLE PROJECTION




| Pin-Out | |
|---|---|
| Pin | Mark |
| 1 | ⏚ |
| 2 | AC/N |
| 3 | AC/L |
| 4 | -Vo |
| 5 | -Vo |
| 6 | +Vo |
| 7 | +Vo |
| 8 | DC-OK- |
| 9 | DC-OK+ |

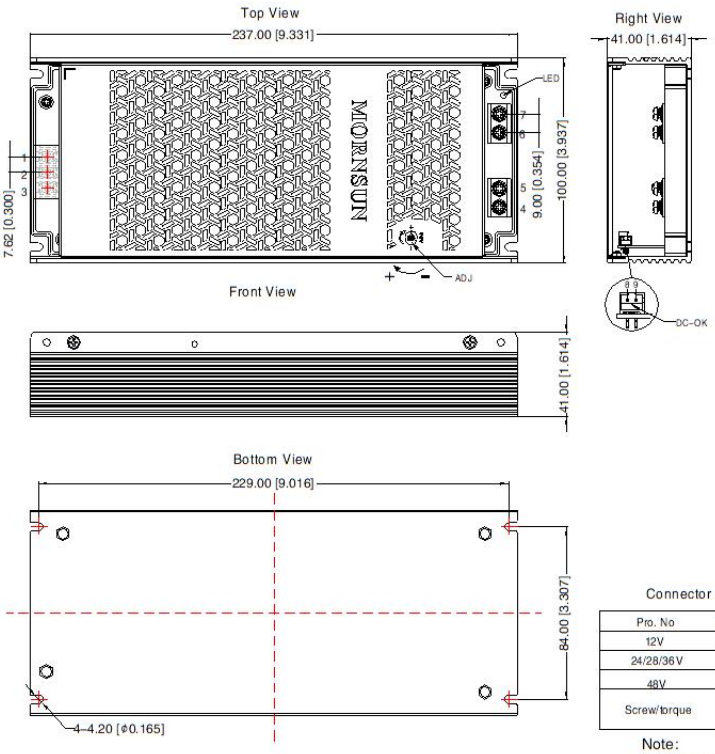
Connector wires range

| Pro. No | Input connector | Output connector | Output connector (double wires) Pic. |
|---|---|---|---|
| 12V | 22-14AWG | 12AWG | +Vo double wires |
| 24/28/36V | | 16-12AWG | |
| 48V | | 18-12AWG | -Vo double wires |
| Screw/torque | M3.0, Max 0.5N・m | M4.0, Max 0.9N・m | |

Note:
Unit: mm[inch]
LED: Output status indicator LED
ADJ: Output adjustable resistor
DC-OK: JST SPH-002T-P0.5S or equivalent
General tolerances: ± 1.00[± 0.039]

## LMF750-23BxxUH-C

THIRD ANGLE PROJECTION

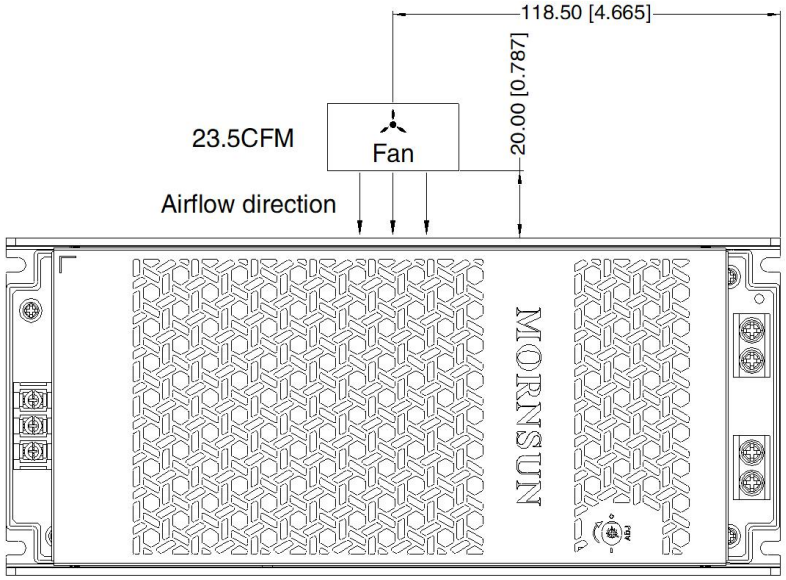



| Pin-Out | |
|---|---|
| Pin | Mark |
| 1 | ⏚ |
| 2 | AC/N |
| 3 | AC/L |
| 4 | -V0 |
| 5 | -V0 |
| 6 | +V0 |
| 7 | +V0 |
| 8 | DC-OK- |
| 9 | DC-OK+ |

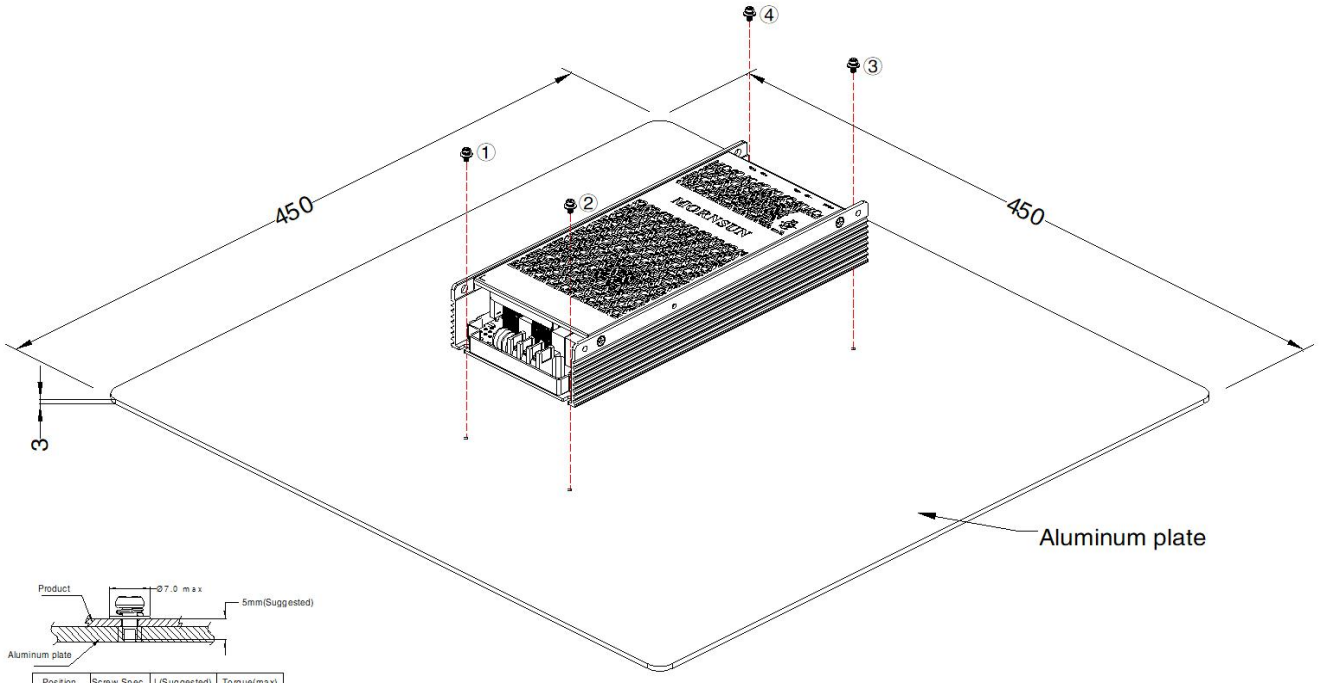
Connector wires range

| Pro. No | Input connector | Output connector | Output connector (double wires) Pic. |
|---|---|---|---|
| 12V | 22-14AWG | 12AWG | +Vo double wires |
| 24/28/36V | | 16-12AWG | |
| 48V | | 18-12AWG | -Vo double wires |
| Screw/torque | M3.0, Max 0.5N・m | M4.0, Max 0.9N・m | |

Note:
Unit: mm[inch]
LED: Output status indicator LED
ADJ: Output adjustable resistor
DC-OK: JST SPH-002T-P0.5S or equivalent
General tolerances: ± 1.00[ ± 0.039]



## Installation Diagram







| Position | Screw Spec. | L(Suggested) | Torque(max) |
|---|---|---|---|
| ① - ④ | M3 | 5MM | 0.4N • m |

**Note:** 1. In order to meet the "Derating Curve", the product testing must be installed onto an aluminum plate. The size of the suggested aluminum plate is shown as above. And for optimizing thermal performance, it is necessary to apply thermal grease on the bottom of the product.
2. It is suggested to install the product with M3 x 6 combination screws, and the product must be firmly installed at the center of the aluminum plate.

Note: This is the schematic diagram of the bottom installation, install with M3 x 6 round head screws, it is necessary to apply thermal grease on the bottom of the product, derating refer to with aluminum plate curve.

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220326;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity <75%RH with nominal input voltage and rated output load;
3. The room temperature derating of 5℃/1000m is needed for operating altitude greater than 2000m;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. The out case needs to be connected to PE (⏚) of system when the terminal equipment in operating;
9. The output voltage can be adjusted by the ADJ, clockwise to increase;
10. If product involves multi-brand materials and there are differences in color etc, please refer to the standards of each manufacturer;
11. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
12. The power supply is considered a component which will be installed into a terminal equipment. All EMC tests should be confirmed with the final equipment. Please consult our FAE for EMC test operation instructions.

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