



CE Report  
EN62368-1  
EN60601-1

UK  
BS EN62368-1

RoHS



## FEATURES

- Universal 90 - 264VAC or 127 - 370VDC input voltage
- Compact size 5" x 3"
- Operating ambient temperature range: -40°C to +70°C
- Built-in active PFC function
- Operating altitude up to 5000m
- Output short circuit, over-current, over-voltage, over-temperature protection
- 450W with air cooling, 750W with 25CFM
- 5VDC standby output, 5VDC fan supply
- PG signal and remote sensing function
- Design to meet medical approvals and be suitable for BF type applications
- The base plate with conformal coating
- 3 years warranty
- Safety according to IEC62368, ES60601, EN60335, GB4943

LOF750-20Bxx series is one of Mornsun's AC-DC miniaturize open frame power supply and suitable for all kinds of BF type (be accessible to patients) medical system equipment. It features universal AC input and at the same time accepts DC input voltage, cost-effective, low no load power consumption, high efficiency, high reliability and double or reinforced insulation. These converters offer excellent EMC performance and meet IEC/EN62368-1, EN/ES60601-1, EN60335-1, GB4943.1 standards and they are widely used in areas of industrial, LED, street light control, electricity, security, telecommunications, smart home, etc.

## Selection Guide

| Certification | Part No.     | Cooling Method | Input Voltage Range (V) | Output Power (W)* | Nominal Output Voltage and Current (Vo/Io) | Output Adjustable Range ADJ (V) | Efficiency at 230VAC (%) Typ. * | Capacitive Load (μF) Max. |
|---------------|--------------|----------------|-------------------------|-------------------|--------------------------------------------|---------------------------------|---------------------------------|---------------------------|
| EN            | LOF750-20B12 | Air cooling    | Full voltage range      | 399.6             | 12V/33.3                                   | 11.4-12.6                       | 92                              | 5000                      |
|               |              | 25CFM          |                         | 699.6             | 12V/58.3                                   |                                 |                                 |                           |
|               | LOF750-20B15 | Air cooling    | Full voltage range      | 400.5             | 15V/26.7                                   | 14.25-15.75                     | 92                              | 5000                      |
|               |              | 25CFM          |                         | 700.5             | 15V/46.7                                   |                                 |                                 |                           |
|               | LOF750-20B24 | Air cooling    | 115VAC                  | 400.8             | 24V/16.7                                   | 22.8-25.2                       | 94                              | 3000                      |
|               |              |                | 230VAC                  | 451.2             | 24V/18.8                                   |                                 |                                 |                           |
|               |              | 25CFM          | Full voltage range      | 748.8             | 24V/31.2                                   |                                 |                                 |                           |
|               | LOF750-20B27 | Air cooling    | 115VAC                  | 399.6             | 27V/14.8                                   | 25.65-28.35                     | 94                              | 3000                      |
|               |              |                | 230VAC                  | 450.9             | 27V/16.7                                   |                                 |                                 |                           |
|               |              | 25CFM          | Full voltage range      | 750.6             | 27V/27.8                                   |                                 |                                 |                           |
|               | LOF750-20B36 | Air cooling    | 115VAC                  | 399.6             | 36V/11.1                                   | 34.2-37.8                       | 94.5                            | 2000                      |
|               |              |                | 230VAC                  | 450.0             | 36V/12.5                                   |                                 |                                 |                           |
|               |              | 25CFM          | Full voltage range      | 748.8             | 36V/20.8                                   |                                 |                                 |                           |
|               | LOF750-20B48 | Air cooling    | 115VAC                  | 398.4             | 48V/8.3                                    | 45.6-50.4                       | 95                              | 2000                      |
|               |              |                | 230VAC                  | 451.2             | 48V/9.4                                    |                                 |                                 |                           |
|               |              | 25CFM          | Full voltage range      | 748.8             | 48V/15.6                                   |                                 |                                 |                           |
|               | LOF750-20B54 | Air cooling    | 115VAC                  | 399.6             | 54V/7.4                                    | 51.3-56.7                       | 95                              | 1000                      |
|               |              |                | 230VAC                  | 449.8             | 54V/8.33                                   |                                 |                                 |                           |
|               |              | 25CFM          | Full voltage range      | 750.0             | 54V/13.89                                  |                                 |                                 |                           |

Notes: 1.\*Under any conditions, the total power of the product should not exceed the rated power. When the output voltage is increased, the total output power cannot exceed the rated output power, when the output voltage is decreased, the output current cannot exceed the rated output current;  
2.\*When measuring the full load efficiency, the fan should be connected to an external power supply. Fan loss is not included in the input power.

### Input Specifications

| Item                | Operating Conditions |                         | Min.        | Typ. | Max. | Unit |
|---------------------|----------------------|-------------------------|-------------|------|------|------|
| Input Voltage Range | AC input             |                         | 90          | --   | 264  | VAC  |
|                     | DC input             |                         | 127         | --   | 370  | VDC  |
| Input Frequency     |                      |                         | 47          | --   | 63   | Hz   |
| Input Current       | 115VAC               |                         | --          | --   | 8    | A    |
|                     | 230VAC               |                         | --          | --   | 4    |      |
| Inrush Current      | 115VAC               | Cold start              | --          | 50   | --   |      |
|                     | 230VAC               |                         | --          | 80   | --   |      |
| Power Factor        | 115VAC               | Full load               | 0.98        | --   | --   | --   |
|                     | 230VAC               |                         | 0.95        | --   | --   |      |
| Leakage Current     | 264VAC               | Contact leakage current | <0.1mA      |      |      |      |
|                     |                      | Earth leakage current   | <0.5mA      |      |      |      |
| Hot Plug            |                      |                         | Unavailable |      |      |      |

### Output Specifications\*

| Item                        | Operating Conditions                                                             |                                                                             | Min.                                                                                                                                 | Typ.  | Max. | Unit                                             |
|-----------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------|------|--------------------------------------------------|
| Output Voltage Accuracy*    | Full load                                                                        | 12V/15V/24V/27V                                                             | --                                                                                                                                   | ±2.0  | --   | %                                                |
|                             |                                                                                  | 36V/48V/54V                                                                 | --                                                                                                                                   | ±1.0  | --   |                                                  |
| Line Regulation             | Rated load                                                                       |                                                                             | --                                                                                                                                   | ±0.5  | --   |                                                  |
| Load Regulation             | 0%-100% load                                                                     |                                                                             | --                                                                                                                                   | ±1.0  | --   |                                                  |
| Ripple & Noise*             | 20MHz band width (peak-to-peak value)                                            |                                                                             | --                                                                                                                                   | --    | 200  | mV                                               |
| Temperature Coefficient     |                                                                                  |                                                                             | --                                                                                                                                   | ±0.03 | --   | %/°C                                             |
| Minimum Load                |                                                                                  |                                                                             | 0                                                                                                                                    | --    | --   | %                                                |
| Hold-up Time                | 25℃, 115VAC/230VAC                                                               |                                                                             | 10                                                                                                                                   | --    | --   | ms                                               |
| Stand-by Power Consumption  | Room temperature, 230VAC input (PS_ON Low and 5Vsb without load (including fan)) |                                                                             | --                                                                                                                                   | --    | 0.5  | W                                                |
| Short Circuit Protection    | Recovery time <5s after the short circuit disappear                              |                                                                             | Hiccup, continuous, self-recover                                                                                                     |       |      |                                                  |
| Over-current Protection     |                                                                                  |                                                                             | ≥ 105%Io, hiccup, self-recover                                                                                                       |       |      |                                                  |
| Over-voltage Protection     | 12V                                                                              |                                                                             | ≤15.6V                                                                                                                               |       |      | Output voltage turn off, re-power on for recover |
|                             | 15V                                                                              |                                                                             | ≤19.5V                                                                                                                               |       |      |                                                  |
|                             | 24V                                                                              |                                                                             | ≤31.2V                                                                                                                               |       |      |                                                  |
|                             | 27V                                                                              |                                                                             | ≤35.1V                                                                                                                               |       |      |                                                  |
|                             | 36V                                                                              |                                                                             | ≤46.8V                                                                                                                               |       |      |                                                  |
|                             | 48V                                                                              |                                                                             | ≤60.0V                                                                                                                               |       |      |                                                  |
|                             | 54V                                                                              |                                                                             | ≤64.0V                                                                                                                               |       |      |                                                  |
| Over-temperature Protection |                                                                                  |                                                                             | Protection when over-temperature, recover automatically after the temperature drops                                                  |       |      |                                                  |
| Fan Power*                  |                                                                                  |                                                                             | The 5Vsb serves as the standby power supply and also supplies power to the fan, the maximum output current of the fan and 5Vsb is 2A |       |      |                                                  |
| PS_ON Input Signal*         | Power on                                                                         | PS_ON High                                                                  | 2                                                                                                                                    | --    | 5    | V                                                |
|                             | Power off                                                                        | PS_ON Low                                                                   | 0                                                                                                                                    | --    | 0.6  |                                                  |
| PG Signal*                  | Power on                                                                         | The PG signal goes high with 10ms to 500ms delay after power set up         | 10                                                                                                                                   | --    | 500  | ms                                               |
|                             | Power off/Power fail                                                             | The TTL signal goes low at least 1ms before output below 90% of rated value | 1                                                                                                                                    | --    | --   |                                                  |
|                             | High level                                                                       | High                                                                        | 2                                                                                                                                    | --    | 6    | V                                                |
|                             | Low level                                                                        | Low                                                                         | 0                                                                                                                                    | --    | 0.6  |                                                  |

# AC/DC 750W Open Frame Power Supply

## LOF750-20Bxx Series

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Remote Sense                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | When RS+ and RS- are connected to the system, with function of remote voltage compensation, if not needed, left RS+ and RS- open |
| 5V Standby                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 5Vsb: The load capacity is 1A without fan, the load capacity is 2A with fan 25CFM; tolerance 2%, ripple: 120mVp-p(max.)          |
| Note: 1. *Output Voltage Accuracy: including setting error, line regulation, load regulation;<br>2. *The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor (Low ESR) and 0.1uF ceramic capacitor, please refer to AC-DC Converter Application Notes for specific information;<br>3. *For fan power supply, please refer to CN5 in the external dimension drawing;<br>4. *For PS_ON, 5V standby connection method, please refer to CN6 in the external dimension drawing;<br>5. *For PG connection method, please refer to CN2 in the external dimension drawing;<br>6. *For all the above test items, please refer to our company standard "AC-DC Black Box Test Specification" for specific test specifications and methods. |                                                                                                                                  |

## General Specifications

| Item                  |                                | Operating Conditions                                                                                   |                           |                        | Min.                                                                                             | Typ.           | Max. | Unit  |    |      |
|-----------------------|--------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------|------------------------|--------------------------------------------------------------------------------------------------|----------------|------|-------|----|------|
| Isolation Test        | Input - output                 | Electric strength test for 1min,<br>leakage current <10mA                                              |                           |                        | 4000                                                                                             | --             | --   | VAC   |    |      |
|                       | Input - ⊕                      |                                                                                                        |                           |                        | 2000                                                                                             | --             | --   |       |    |      |
|                       | Output - ⊕                     |                                                                                                        |                           |                        | 1500                                                                                             | --             | --   |       |    |      |
| Insulation Resistance | Input - output                 | Environment temperature: 25±5℃<br>Relative humidity: <95%RH, non-condensing<br>Testing voltage: 500VDC |                           |                        | 100                                                                                              | --             | --   | MΩ    |    |      |
|                       | Input - ⊕                      |                                                                                                        |                           |                        | 100                                                                                              | --             | --   |       |    |      |
|                       | Output - ⊕                     |                                                                                                        |                           |                        | 100                                                                                              | --             | --   |       |    |      |
| Isolation level       | Input - output                 |                                                                                                        |                           |                        | 2 x MOPP                                                                                         |                |      |       |    |      |
|                       | Input - ⊕                      |                                                                                                        |                           |                        | 1 x MOPP                                                                                         |                |      |       |    |      |
|                       | Output - ⊕                     |                                                                                                        |                           |                        | 1 x MOPP                                                                                         |                |      |       |    |      |
| Operating Temperature |                                |                                                                                                        |                           |                        | -40                                                                                              | --             | +70  | ℃     |    |      |
| Storage Temperature   |                                |                                                                                                        |                           |                        | -40                                                                                              | --             | +85  |       |    |      |
| Storage Humidity      |                                | Non-condensing                                                                                         |                           |                        | 10                                                                                               | --             | 95   | %RH   |    |      |
| Operating Humidity    |                                |                                                                                                        |                           |                        | 20                                                                                               | --             | 90   |       |    |      |
| Power Derating        | Operating temperature derating | 25CFM                                                                                                  | 12V/15V(700W)             |                        | +50℃ to +70℃                                                                                     |                | 2.0  | --    | -- | % /℃ |
|                       |                                |                                                                                                        | 24V/27V/36V/48V/54V(750W) |                        | +50℃ to +70℃                                                                                     |                | 2.0  | --    | -- |      |
|                       |                                | Air cooling                                                                                            | 12V/15V(400W)             |                        | +45℃ to +70℃                                                                                     |                | 7.9  | --    | -- | W /℃ |
|                       |                                |                                                                                                        | 24V/27V/36V/48V/54V(450W) | 90-175VAC(400W)        | +45℃ to +70℃                                                                                     |                | 7.0  | --    | -- |      |
|                       |                                |                                                                                                        |                           | 176-264VAC(450W)       | +45℃ to +70℃                                                                                     |                | 9.0  | --    | -- |      |
|                       |                                |                                                                                                        |                           | Input voltage derating |                                                                                                  | 90VAC - 115VAC |      | 0.8   | -- |      |
|                       |                                |                                                                                                        | 127VDC - 162VDC           |                        | 0.57                                                                                             | --             | --   | %/VDC |    |      |
| Safety Standard       |                                |                                                                                                        |                           |                        | BS EN/EN62368-1, EN60601-1(Report)<br>Design refer to IEC62368-1, ES60601-1, EN60335-1, GB4943.1 |                |      |       |    |      |
| Safety Class          |                                |                                                                                                        |                           |                        | CLASS I/CLASS II                                                                                 |                |      |       |    |      |
| MTBF                  |                                | MIL-HDBK-217F@25℃                                                                                      |                           |                        | >200,000 h                                                                                       |                |      |       |    |      |

## Mechanical Specifications

|                                                                                  |                                            |
|----------------------------------------------------------------------------------|--------------------------------------------|
| Case Material                                                                    | Open frame                                 |
| Dimension                                                                        | 127.0mm x 76.2mm x 43.0 mm                 |
| Weight                                                                           | 625g (Typ.)                                |
| Cooling Method*                                                                  | Air cooling(400W/450W) / 25CFM (700W/750W) |
| Note: *Cooling method and power derating refer to typical characteristic curves. |                                            |

## Electromagnetic Compatibility (EMC)

|           |                  |                                     |                        |                  |
|-----------|------------------|-------------------------------------|------------------------|------------------|
| Emissions | CE               | CISPR32/EN55032 CLASS B             |                        |                  |
|           | RE               | CISPR32/EN55032 CLASS B             |                        |                  |
|           | Harmonic current | IEC/EN61000-3-2 CLASS A and CLASS D |                        |                  |
| Immunity  | ESD              | IEC/EN61000-4-2                     | Contact ±8KV/Air ±15KV | perf. Criteria A |

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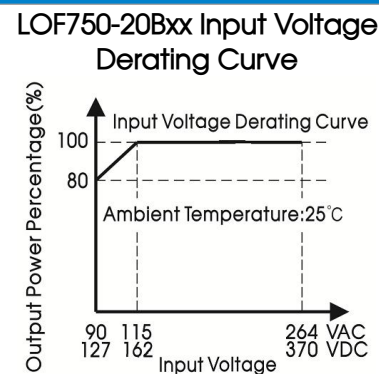
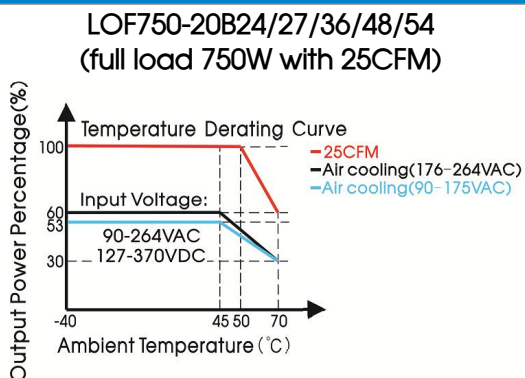
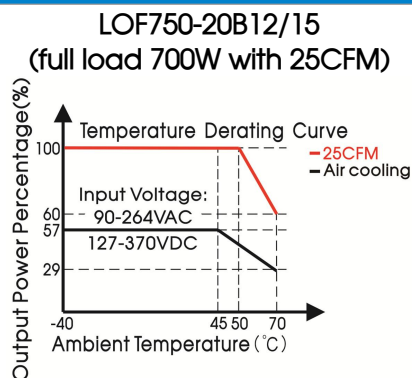
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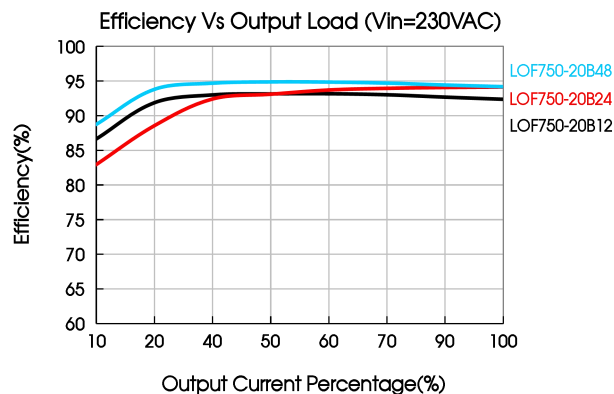
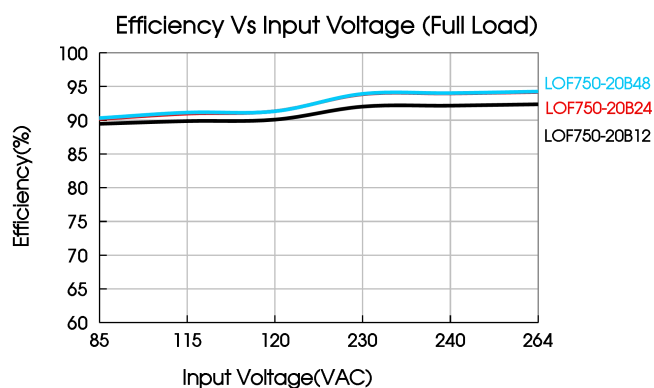
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|                                                                   |                  |                                       |                  |
|-------------------------------------------------------------------|------------------|---------------------------------------|------------------|
| RS                                                                | IEC/EN61000-4-3  | 10V/m                                 | perf. Criteria A |
| EFT                                                               | IEC/EN61000-4-4  | ±2KV                                  | perf. Criteria A |
| Surge                                                             | IEC/EN61000-4-5  | line to line ±2KV/line to ground ±4KV | perf. Criteria A |
| CS                                                                | IEC/EN61000-4-6  | 10 V.r.m.s                            | perf. Criteria A |
| Voltage dips, short interruptions and voltage variations immunity | IEC/EN61000-4-11 | 0%, 70%                               | perf. Criteria B |

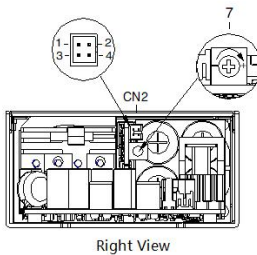
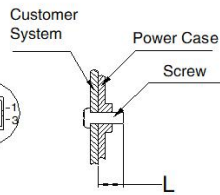
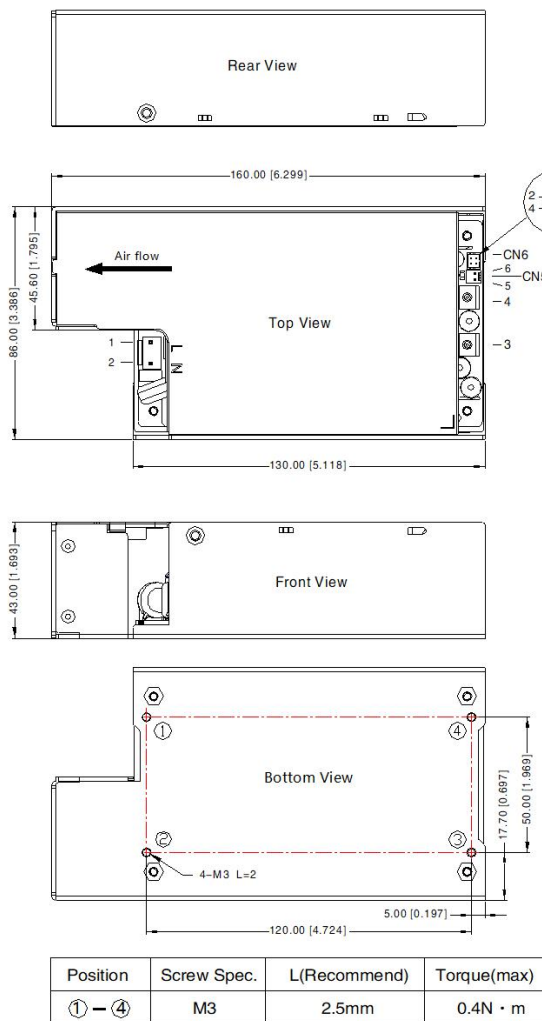
## Product Characteristic Curve



Note: With an AC input voltage between 90 - 115VAC and a DC input between 127 - 162VDC the output power must be derated as per the temperature derating curves.



### Dimensions and Recommended Layout



THIRD ANGLE PROJECTION

| Pin-Out |                                | Customer Connector                                                                                                                    |
|---------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Pin     | Mark                           |                                                                                                                                       |
| 1       | AC(L)                          | Housing: JST VHR-3 or equivalent<br>Contact: JST SVH-21T-P1.1 or equivalent                                                           |
| 2       | AC(N)                          |                                                                                                                                       |
| 3       | +Vo                            |                                                                                                                                       |
| 4       | -Vo                            |                                                                                                                                       |
| 5       | FAN+                           | CN5: Fan power output port<br>Housing: TKP 2502 or Molex0511910200 or equivalent<br>Contact: TKP 54T or Molex0508028100 or equivalent |
| 6       | FAN-                           |                                                                                                                                       |
| 7       | ADJ Output adjustable resistor |                                                                                                                                       |

| Pin-Out |       | Customer Connector                                                                                      |
|---------|-------|---------------------------------------------------------------------------------------------------------|
| Pin     | Mark  |                                                                                                         |
| 1       | +12V  | Housing: TKP DH2-4P or HRS DF11-4DS-2C or equivalent<br>Contact: TKP DHT or HRS DF11-22SC or equivalent |
| 2       | GND   |                                                                                                         |
| 3       | PS-ON |                                                                                                         |
| 4       | GND   |                                                                                                         |

| Pin-Out |      | Customer Connector                                                                                      |
|---------|------|---------------------------------------------------------------------------------------------------------|
| Pin     | Mark |                                                                                                         |
| 1       | RS-  | Housing: TKP DH2-4P or HRS DF11-4DS-2C or equivalent<br>Contact: TKP DHT or HRS DF11-22SC or equivalent |
| 2       | RS+  |                                                                                                         |
| 3       | GND  |                                                                                                         |
| 4       | PG   |                                                                                                         |

Note:  
 1. Unit: mm[inch]  
 2. Pin3, 4 connector tightening torque: M4, 1.2N · m(max)  
 3. General tolerances:  $\pm 1.00[\pm 0.039]$   
 4. The layout of the device is for reference only, please refer to the actual product  
 5. It is recommended 10mm distance between the PCB and other components for safety purpose  
 6. Class I system ①②③④ any one of the four locations can be connected to the earth (⊕)  
 7. Class II system ①②③④ positions not must be connected to the earth (⊕)

Note: The PJA-XXX series is the accessories of products, quotation is available.

#### Note:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220181 ;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^\circ\text{C}$ , humidity<75%RH with nominal input voltage and rated output load;
- The room temperature derating of  $5^\circ\text{C}/1000\text{m}$  is needed for operating altitude greater than 2000m;
- All index testing methods in this datasheet are based on our company corporate standards;
- In order to improve the efficiency, there will be audible noise generated when work at light load, but it does not affect product performance and reliability;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- CAUTION: Double pole, neutral fusing. Disconnect mains before servicing. / "ATTENTION: Double pôle/fusible sur le neutre. Débrancher l'alimentation avant l'entretien;
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
- 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;
- The surface of product should keep a safe distance from the customer system (recommended  $\geq 3\text{mm}$ ), If not, please consult Mornsun FAE.

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