



RoHS



GB4943.1



EN62368-1



BS EN62368-1

## FEATURES

- Universal 85 - 305VAC or 120 - 430VDC Input voltage
- Accepts AC or DC Input (dual-use of same terminal)
- Operating temperature range: -30°C to +70°C
- Built-in active PFC function
- High I/O isolation test voltage up to 4000VAC
- Output short circuit, over-current, over-voltage, over-temperature protection
- LED indicator for power on
- Built-in DC fan
- 3 years warranty
- Emissions meets CISPR32/EN55032 CLASS B

LMF320-23Bxx series are one of Mornsun's enclosed AC-DC switching power supply. It features universal AC input and at the same time accepts DC input voltage, cost-effective, built-in active PFC function, high efficiency and high reliability. These converters offer excellent EMC performance and meet IEC/UL/EN61000-4, CISPR32/EN55032, IEC/EN62368, GB4943, IEC60950, EN60335 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.*    | Output Power (W) | Nominal Output Voltage and Current (Vo/Io) | Output Voltage Adjustable Range (V) | Efficiency at 230VAC (%) Typ. | Max. Capacitive Load (μF) |
|---------------|--------------|------------------|--|-------------------------------------|-------------------------------|---------------------------|
| EN/CCC        | LMF320-23B04 | 240              | 4V/60A                                     | 3.6-4.4                             | 83                            | 5000                      |
|               | LMF320-23B05 | 300              | 5V/60A                                     | 4.5 - 5.5                           | 84                            | 5000                      |
|               | LMF320-23B12 | 320.4            | 12V/26.7A                                  | 10 - 13.2                           | 87.5                          | 5000                      |
|               | LMF320-23B15 | 321              | 15V/21.4A                                  | 13.5 - 18                           | 89                            | 5000                      |
|               | LMF320-23B24 | 321.6            | 24V/13.4A                                  | 20 - 26.4                           | 91                            | 5000                      |
|               | LMF320-23B27 | 321.3            | 27V/11.9A                                  | 26 - 31.5                           | 91                            | 5000                      |
|               | LMF320-23B36 | 320.4            | 36V/8.9A                                   | 32-40                               | 91.5                          | 5000                      |
|               | LMF320-23B48 | 321.6            | 48V/6.7A                                   | 41 - 56                             | 91.5                          | 5000                      |

Note: \*Use suffix "C" for terminal with protective cover, suffix "Q" for bottom conformal coating and "QQX" for both sides conformal coating.

## Input Specifications

| Item                    | Operating Conditions |            | Min. | Typ. | Max. | Unit        |
|-------------------------|----------------------|------------|------|------|------|-------------|
| Input Voltage Range     | AC input             |            | 85   | --   | 305  | VAC         |
|                         | DC input             |            | 120  | --   | 430  | VDC         |
| Input Voltage Frequency |                      |            | 47   | --   | 63   | Hz          |
| Input Current           | 115VAC               |            | --   | 4    | 4.2  | A           |
|                         | 230VAC               |            | --   | 2    | 2.1  |             |
| Inrush Current          | 115VAC               | Cold start | --   | 35   | --   |             |
|                         | 230VAC               |            | --   | 65   | --   |             |
| Power Factor            | 115VAC               | Full load  | --   | 0.98 | --   | --          |
|                         | 230VAC               |            | --   | 0.95 | --   |             |
| Hot Plug                |                      |            |      |      |      | Unavailable |

## Output Specifications

| Item   | Operating Conditions                                 |                         | Min.                                 | Typ.  | Max. | Unit |
|--|--|-------------------------|--------------------------------------|-------|------|------|
| Output Voltage Accuracy  | Full load range                                      | 4V/5V                   | --                                   | ±2    | --   | %    |
|  |  | 12V/15V/24V/27V/36V/48V | --                                   | ±1    | --   |      |
| Line Regulation  | Rated load   | 4V/5V                   | --                                   | ±0.5  | --   | %    |
|  |  | 12V/15V                 | --                                   | ±0.3  | --   |      |
|  |  | 24V/27V/36V/48V         | --                                   | ±0.2  | --   |      |
| Load Regulation  | 0% - 100% load                                       | 4V/5V                   | --                                   | ±1    | --   | mV   |
|  |  | 12V/15V/24V/27V/36V/48V | --                                   | ±0.5  | --   |      |
| Output Ripple & Noise*   | 20MHz bandwidth<br>(peak-to-peak value)              | 4V/5V/12V/15V/24V       | --                                   | 60    | 150  | mV   |
|  |  | 27V/36V/48V             | --                                   | 60    | 200  |      |
| Temperature Coefficient  |  |                         | --                                   | ±0.03 | --   | %/°C |
| Minimum Load*  |  |                         | 0                                    | --    | --   | %    |
| Hold-up Time   | 115VAC/230VAC  |                         | --                                   | 12    | --   | ms   |
| Short Circuit Protection   | Recovery time <5s after the short circuit disappear. |                         | Hiccup, continuous, self-recover     |       |      |      |
| Over-current Protection*   |  |                         | 105% - 180% Io, hiccup, self-recover |       |      |      |
| Over-voltage Protection  | 4V   |                         | ≤5.8V (Hiccup, self-recover)         |       |      |      |
|  | 5V   |                         | ≤7.0V (Hiccup, self-recover)         |       |      |      |
|  | 12V  |                         | ≤16.2V (Hiccup, self-recover)        |       |      |      |
|  | 15V  |                         | ≤21.8V (Hiccup, self-recover)        |       |      |      |
|  | 24V  |                         | ≤32.4V (Hiccup, self-recover)        |       |      |      |
|  | 27V  |                         | ≤35.0V (Hiccup, self-recover)        |       |      |      |
|  | 36V  |                         | ≤45.0V (Hiccup, self-recover)        |       |      |      |
|  | 48V  |                         | ≤60.0V (Hiccup, self-recover)        |       |      |      |
| Over-temperature Protection*   |  |                         | Hiccup, self-recover                 |       |      |      |
| Note: 1. 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.<br>2. Minimum load: When the product is working at a temperature above 50°C, the minimum load is 5% of the rated load, so that the fan could work at high temperature to reduce the temperature rise of the product.<br>3. Over-current Protection: Test at rated output voltage, Io is rated output current load.<br>4. Over-temperature Protection needs to be tested under rated full load conditions. |  |                         |                                      |       |      |      |

## General Specifications

| Item                  | Operating Conditions   |  | Min. | Typ. | Max. | Unit  |
|-----------------------|--|--|------|------|------|-------|
| Isolation Test        | Input -   | Electric strength test for 1min., leakage current <3mA | 2000 | --   | --   | VAC   |
|                       | Input - output   | Electric strength test for 1min., leakage current <5mA | 4000 | --   | --   |       |
|                       | Output -  | Electric strength test for 1min., leakage current <3mA | 500  | --   | --   |       |
| Insulation Resistance | Input -   | Ambient temperature: 25±5°C,                           | 100  | --   | --   | MΩ    |
|                       | Input - output   | Relative humidity : < 95%RH, non-condensing            | 100  | --   | --   |       |
|                       | Output -  | Test voltage: 500VDC,                                  | 100  | --   | --   |       |
| Operating Temperature |  |  | -30  | --   | +70  | °C    |
| Storage Temperature   |  |  | -40  | --   | +85  |       |
| Storage Humidity      | Non-condensing   |  | 10   | --   | 95   | %RH   |
| Operating Humidity    |  |  | 20   | --   | 90   |       |
| Switching Frequency   |  |  | --   | --   | --   | kHz   |
| Power Derating        | Operating temperature derating   | +50°C to +70°C   | 2.5  | --   | --   | %/°C  |
|                       | Input voltage derating   | 85VAC - 100VAC@50Hz                                    | 2.0  | --   | --   | %/VAC |

|                 |                        |                     |      |    |    |   |
|-----------------|------------------------|---------------------|------|----|----|---|
|                 |                        | 85VAC - 100VAC@60Hz | 1.33 | -- | -- |   |
|                 |                        | 120VDC - 140VDC     | 1.25 | -- | -- | %/VDC   |
| Safety Standard | 4/5/12/15/24/27/36/48V |                     |      |    |    | GB4943.1, IIS 13252 (Part1) safety approved & EN62368-1 |
| Safety Class    |                        |                     |      |    |    | Design refer to IEC/UL62368-1, IEC60950-1, EN60335-1    |
| MTBF            | MIL-HDBK-217F@25°C     |                     |      |    |    | >250,000 h  |

## Mechanical Specifications

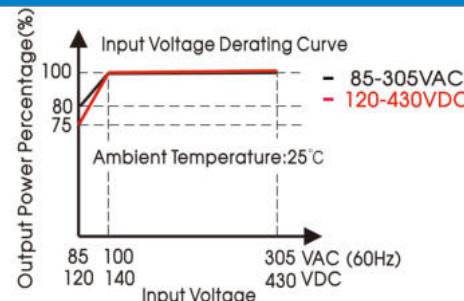
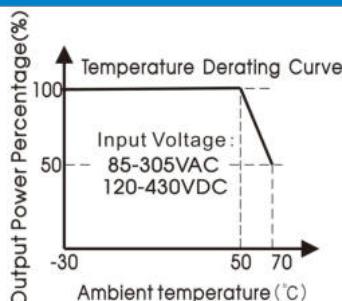
|                |                               |
|----------------|-------------------------------|
| Case Material  | Metal (AL1100, SGCC)          |
| Dimensions     | 215.00mm x 115.00mm x 30.00mm |
| Weight         | 620.00g (Typ.)                |
| Cooling Method | Forced air cooling            |

## Electromagnetic Compatibility (EMC)

|           |                  |                   |  |
|-----------|------------------|-------------------|--|
| Emissions | CE*              | CISPR32/EN55032   | CLASS B  |
|           | RE*              | CISPR32/EN55032   | CLASS B  |
|           | Harmonic current | IEC/EN161000-3-2  | CLASS A and CLASS D                            |
|           | Voltage flicker  | IEC/EN161000-3-3  |  |
| Immunity  | ESD              | IEC/EN 61000-4-2  | Contact $\pm 6\text{KV}$ /Air $\pm 8\text{KV}$ |
|           | RS               | IEC/EN 61000-4-3  | 10V/m  |
|           | EFT              | IEC/EN 61000-4-4  | $\pm 4\text{KV}$                               |
|           | Surge*           | IEC/EN 61000-4-5  | $\pm 2\text{KV}/\pm 4\text{KV}$                |
|           | CS               | IEC/EN 61000-4-6  | 10 Vr.m.s                                      |
|           | DIP              | IEC/EN 61000-4-11 | 0%, 70%  |

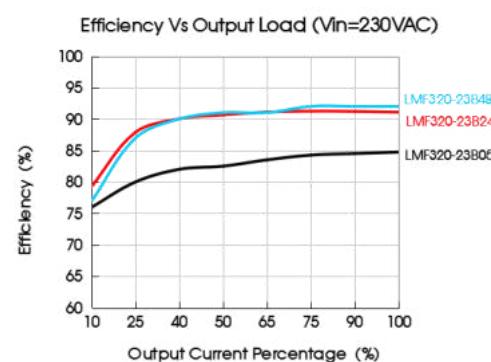
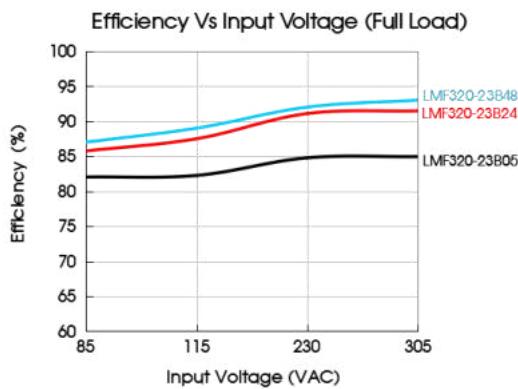
Note: \*\*By adding Mornsun EMC filter FC-L06Wx can improve the surge level to meet 4KV/6KV.

## Product Characteristic Curve



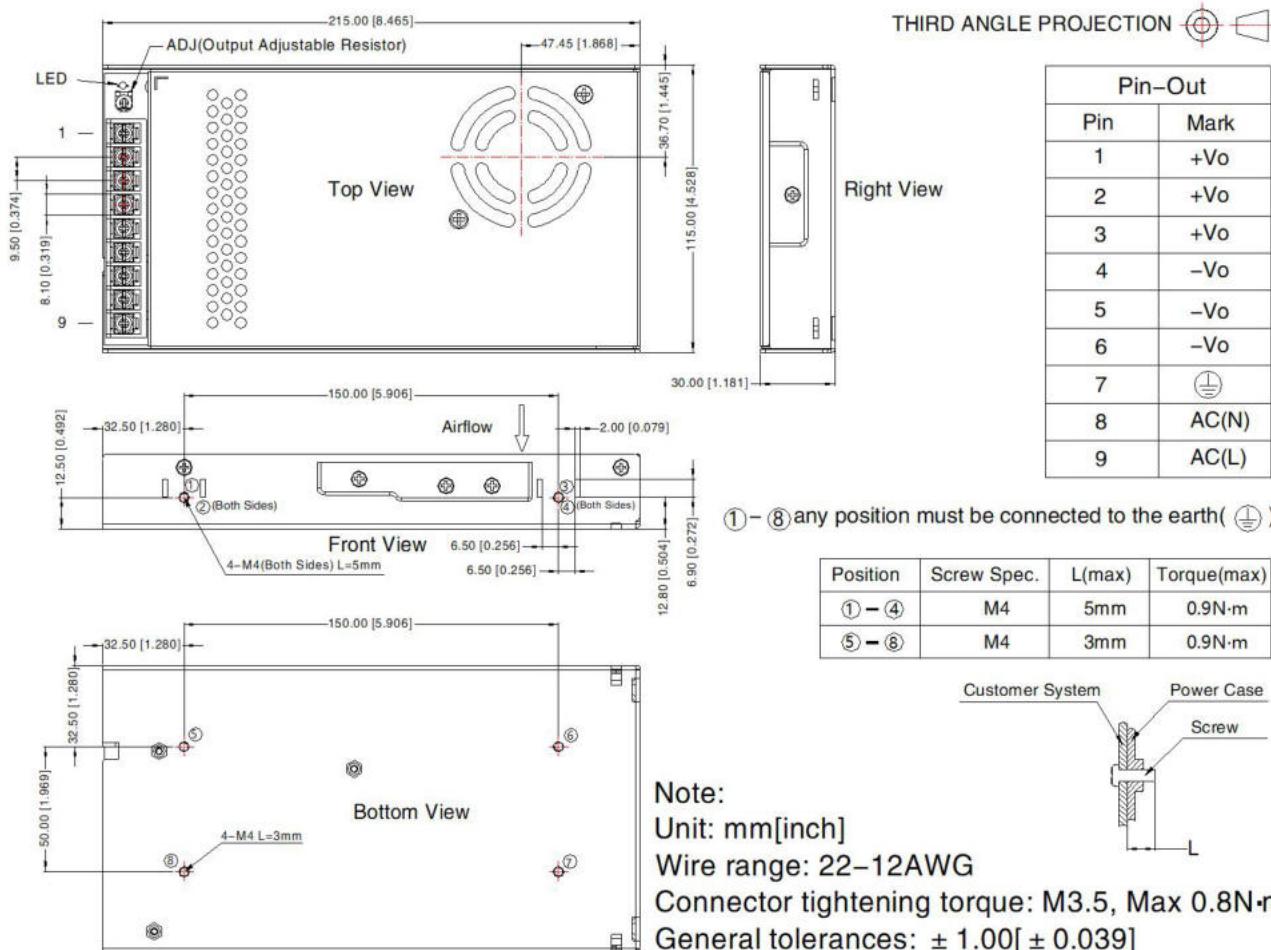
Note: 1. With an AC input voltage between 85-100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves;

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

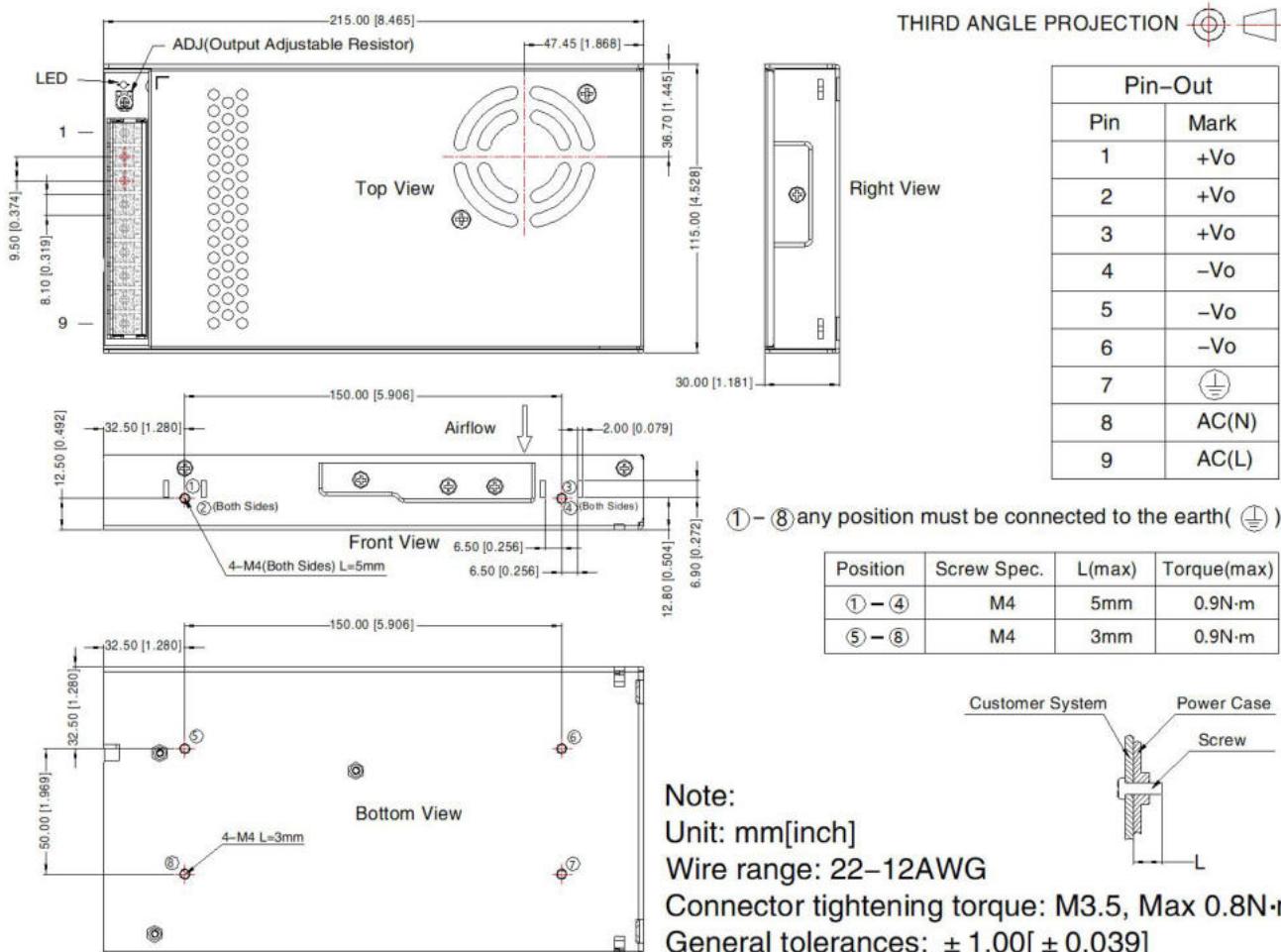


## Dimensions and Recommended Layout

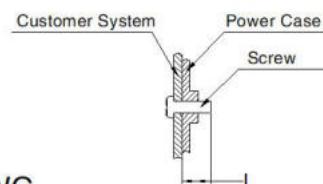
LMF320-23Bxx, LMF320-23Bxx-Q, LMF320-23Bxx-QQX Series



## LMF320-23Bxx-C, LMF320-23Bxx-CQ Series



① - ⑧ any position must be connected to the earth (  $\ominus$  )



## Note:

Unit: mm[inch]

Wire range: 22-12AWG

Connector tightening torque: M3.5, Max 0.8N·m

General tolerances:  $\pm 1.00$  [ $\pm 0.039$ ]

## Note:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220115;
- 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 ambient 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 at high input voltage, there will be audible noise generated, 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";
- The out case needs to be connected to PE (  $\ominus$  ) of system when the terminal equipment in operating;
- The output voltage can be adjusted by the ADJ, clockwise to decrease;
- 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.

## Mornsun Guangzhou Science &amp; Technology Co., Ltd.

Address: No. 8 Nanyun 4th Road, Huangpu District, Guangzhou, China

Tel: 86-20-38601850

Fax: 86-20-38601272

E-mail: [info@mornsun.cn](mailto:info@mornsun.cn)

[www.mornsun-power.com](http://www.mornsun-power.com)

**MORNSUN®**

MORNSUN Guangzhou Science & Technology Co., Ltd.