



## FEATURES

- Universal 80 - 277VAC or 110- 390VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40°C to +70°C
- Low standby power consumption, high efficiency, active PFC
- High I/O isolation test voltage up to 4000VAC
- The base plate with conformal coating
- Output short circuit, over-current, over-voltage over-temperature protection
- Remote sense compensation, remote ON/OFF function
- DC\_OK function
- Suitable for BF application
- With 5V/1A standby power
- Operating altitude up to 5000m
- Safety according to IEC62368, EN60335, EN61558

LMF600-20Bxx series is one of Mornsun's enclosed AC-DC switching 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/EN/UL62368, EN60335, EN61558, IEC/EN60601, GB4943 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) | Remote Sense Compensation (mV) | Standby (Vo/Io)* |
|----------------|--------------|------------------|---|-------------------------------------|-------------------------------|---------------------------|--------------------------------|------------------|
| UL/EN/CCC /IEC | LMF600-20B12 | 600              | 12V/50A                                     | 11.8-12.6                           | 92                            | 50000                     | 500                            | 5V/1A            |
|                | LMF600-20B15 |                  | 15V/40A                                     | 14.7-15.8                           |                               |                           |                                |                  |
|                | LMF600-20B24 |                  | 24V/25A                                     | 23.5-25.2                           | 94                            |                           |                                |                  |
|                | LMF600-20B27 |                  | 27V/22.3A                                   | 26.4-28.5                           |                               |                           |                                |                  |
|                | LMF600-20B36 |                  | 36V/16.7A                                   | 35.3-37.8                           |                               |                           |                                |                  |
|                | LMF600-20B48 |                  | 48V/12.6A                                   | 47.0-50.4                           |                               |                           |                                |                  |

Note: 1.\*Under any conditions, the total power of the product should not exceed the 600W rated power, and the output current cannot exceed the rated output current;

2.\*Standby power: provide 5V/1A independent output, it is recommended to use with the main circuit.

## Input Specifications

| Item                    | Operating Conditions |            | Min.        | Typ. | Max. | Unit |
|-------------------------|----------------------|------------|-------------|------|------|------|
| Input Voltage Range     | AC input             |            | 80          | --   | 277  | VAC  |
|                         | DC input             |            | 110         | --   | 390  | VDC  |
| Input Voltage Frequency |                      |            | 47          | --   | 63   | Hz   |
| Input Current           | 115VAC               |            | --          | --   | 7.5  | A    |
|                         | 230VAC               |            | --          | --   | 3.5  |      |
| Inrush Current          | 115VAC/230VAC        | Cold start | --          | --   | 15   |      |
| Power Factor            | 115VAC               | Full load  | --          | 0.99 | --   | --   |
|                         | 230VAC               |            | --          | 0.99 | --   |      |
| Leakage Current         | 240VAC               |            | <0.1mA      |      |      |      |
| Hot Plug                |                      |            | Unavailable |      |      |      |

Output Specifications

| Item                        | Operating Conditions                                 |                         | Min.  | Typ. | Max. | Unit |
|-----------------------------|--|-------------------------|---|------|------|------|
| Output Voltage Accuracy     | Full load range                                      | 12V/15V/24V/27V/36V/48V | --  | ±1   | --   |      |
|                             |  | 5V Standby              | --  | ±2   | --   |      |
| Line Regulation             | Rated load   | 12V/15V/24V/27V/36V/48V | --  | ±0.3 | --   | %    |
|                             |  | 5V Standby              | --  | ±0.5 | --   |      |
| Load Regulation             | 0% - 100% load                                       | 12V/15V/24V/27V/36V/48V | --  | ±0.5 | --   |      |
|                             |  | 5V Standby              | --  | ±2   | --   |      |
| Ripple & Noise*             | 20MHz bandwidth<br>(peak-to-peak value)              | 12V/15V                 | --  | 150  | --   | mV   |
|                             |  | 24V/27V/36V/48V         | --  | 200  | --   |      |
| Minimum Load                |  |                         | --  | 0    | --   | %    |
| Stand-by Power Consumption  | Room temperature, 230VAC, RC+/RC- add +5V signal     |                         | --  | 0.5  | --   | W    |
| Hold-up Time                | 230VAC   |                         | 15  | --   | --   | ms   |
| Short Circuit Protection    | Recovery time 10s after the short circuit disappear. |                         | Hiccup mode, constant current works 1s, turn off 10s, continuous, self-recover    |      |      |      |
| Over-current Protection     |  |                         | 110% - 250% Io, the output turned off after working normally for 1s, self-recover |      |      |      |
| Over-voltage Protection     | 12V  |                         | ≤16VDC (Hiccup, self-recover)   |      |      |      |
|                             | 15V  |                         | ≤20VDC (Hiccup, self-recover)   |      |      |      |
|                             | 24V  |                         | ≤32VDC (Hiccup, self-recover)   |      |      |      |
|                             | 27V  |                         | ≤35VDC (Hiccup, self-recover)   |      |      |      |
|                             | 36V  |                         | ≤47VDC (Hiccup, self-recover)   |      |      |      |
|                             | 48V  |                         | ≤60VDC (Hiccup, self-recover)   |      |      |      |
| 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.

General Specifications

| Item                  | Operating Conditions           |   | Min.  | Typ. | Max. | Unit |
|-----------------------|--------------------------------|---|---|------|------|------|
| Isolation Test        | Input - ⊕                      | Electric strength test for 1min., leakage current <5mA  | 1500  | --   | --   | VAC  |
|                       | Input - output                 |   | 4000  | --   | --   |      |
|                       | Output - ⊕                     |   | 1500  | --   | --   |      |
| Insulation Resistance | Input - ⊕                      | Environment temperature: 25 ± 5°C<br>Relative humidity: <95%RH, non-condensing<br>Testing voltage: 500VDC | 50  | --   | --   | MΩ   |
|                       | Input - output                 |   | 50  | --   | --   |      |
|                       | Output - ⊕                     |   | 50  | --   | --   |      |
| Isolation level       | Input - output                 |   | 2 x MOPP  |      |      |      |
|                       | Input - ⊕                      |   | 1 x MOPP  |      |      |      |
| Operating Temperature |                                |   | -40   | --   | 70   | °C   |
| Storage Temperature   |                                |   | -40   | --   | 85   |      |
| Operating Humidity    | Non-condensing                 |   | 20  | --   | 95   | %RH  |
| Storage Humidity      |                                |   | 10  | --   | 95   |      |
| Power Derating        | Operating temperature derating | +50°C to +70°C  | 2.5   | --   | --   | %/°C |
|                       | Input voltage derating         | 80VAC-85VAC   | 2.0   | --   | --   | %VAC |
|                       |                                | 85VAC-100VAC  | 1.33  | --   | --   |      |
| Safety Standard       |                                |   | UL62368-1, GB4943.1, IEC60601-1 safety approved & EN60601-1, EN62368-1, BS EN62368-1 (Report)<br>Design refer to IEC62368-1, EN61558-2-16, EN61558-1, EN60335-1 |      |      |      |
| MTBF                  | MIL-HDBK-217F@25°C             |   | >300,000 h  |      |      |      |

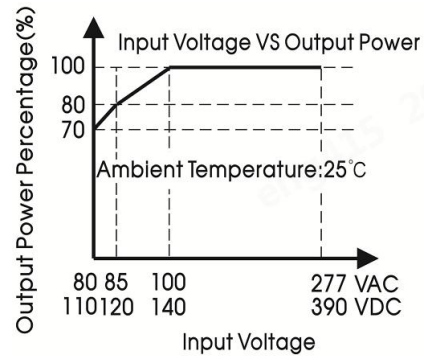
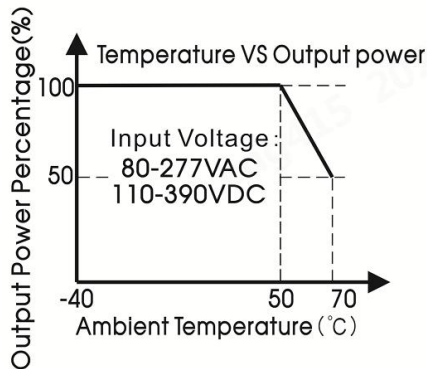
### Mechanical Specifications

|                |                               |
|----------------|-------------------------------|
| Case Material  | Metal (AL1100, SGCC)          |
| Dimensions     | 101.60mm x 203.10mm x 40.60mm |
| Weight         | 950g (Typ.)                   |
| Cooling Method | Forced air convection         |

### Electromagnetic Compatibility (EMC)

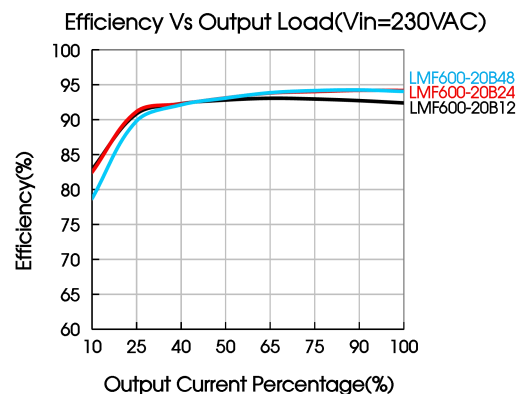
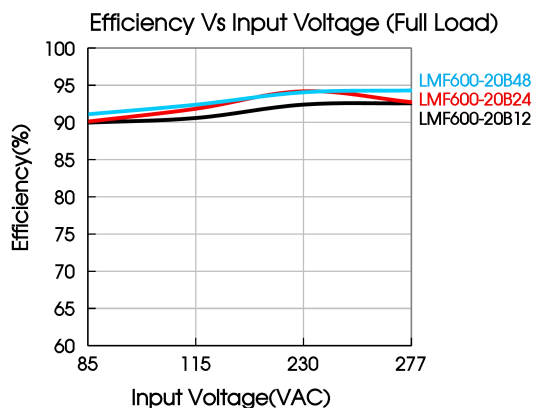
|           |   |                  |                                       |                  |
|-----------|---|------------------|---------------------------------------|------------------|
| Emissions | CE  | CISPR32/EN55032  | CLASS B                               |                  |
|           | RE  | CISPR32/EN55032  | CLASS B                               |                  |
|           | Harmonic current  | IEC/EN61000-3-2  | CLASS A and CLASS D                   |                  |
|           | Voltage flicker   | IEC/EN61000-3-3  |                                       |                  |
| Immunity  | ESD   | IEC/EN 61000-4-2 | Contact ±8KV/Air ±15KV                | perf. Criteria A |
|           | RS  | IEC/EN 61000-4-3 | 10V/m                                 | perf. Criteria A |
|           | EFT   | IEC/EN 61000-4-4 | ±4KV                                  | perf. Criteria A |
|           | Surge   | IEC/EN 61000-4-5 | line to line ±2KV/line to ground ±4KV | perf. Criteria A |
|           | CS  | IEC/EN61000-4-6  | 10 Vr.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



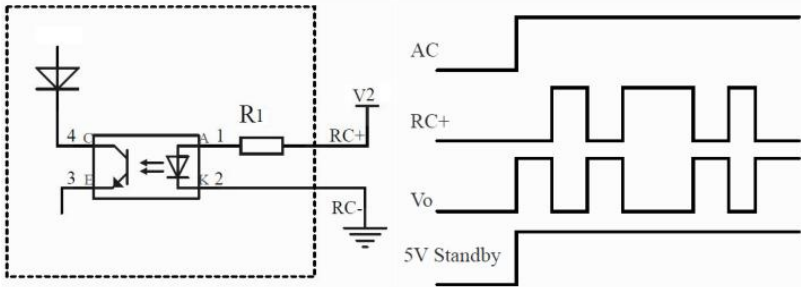
Note: 1. With an AC input voltage between 80-100VAC and a DC input between 110-140VDC the output power must be derated as per the temperature derating curves;

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



Typical Application

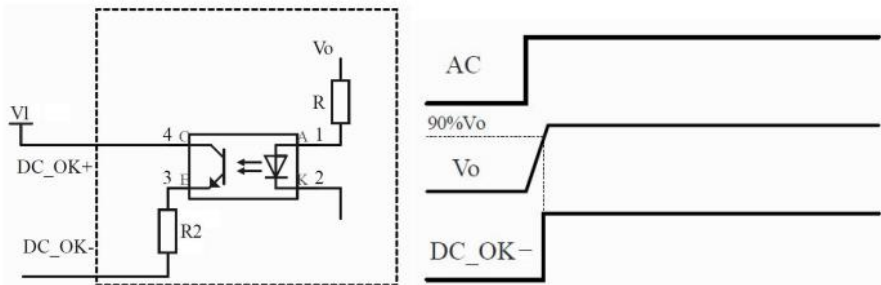
1. Remote ON/OFF



|                        |                       |
|------------------------|-----------------------|
| R1<br>(Product inside) | 2KΩ, $\frac{1}{12}$ W |
| V2<br>(User side)      | 5V-15V                |

Note: 1. When the product is working normally, apply voltage (5-15V) to RC+ and RC- to trigger the remote ON/OFF function, and the output voltage will be off. Withdraw the voltage, the output voltage will be re-established;  
2. 5V standby power supply is not controlled by remote ON/OFF function.

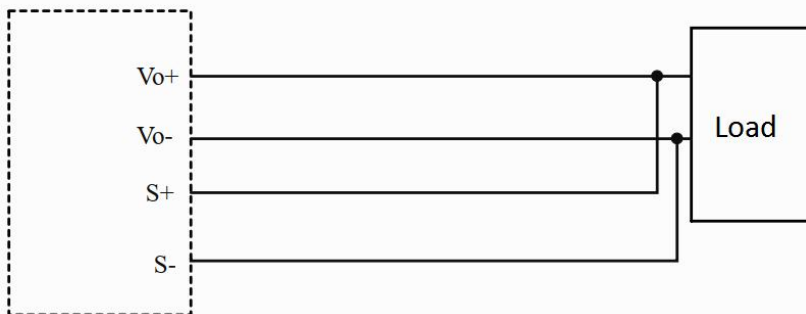
2. DC\_OK



|                        |                       |
|------------------------|-----------------------|
| R2<br>(Product inside) | 1KΩ, $\frac{1}{12}$ W |
| V1<br>(User side)      | 5V-15V                |

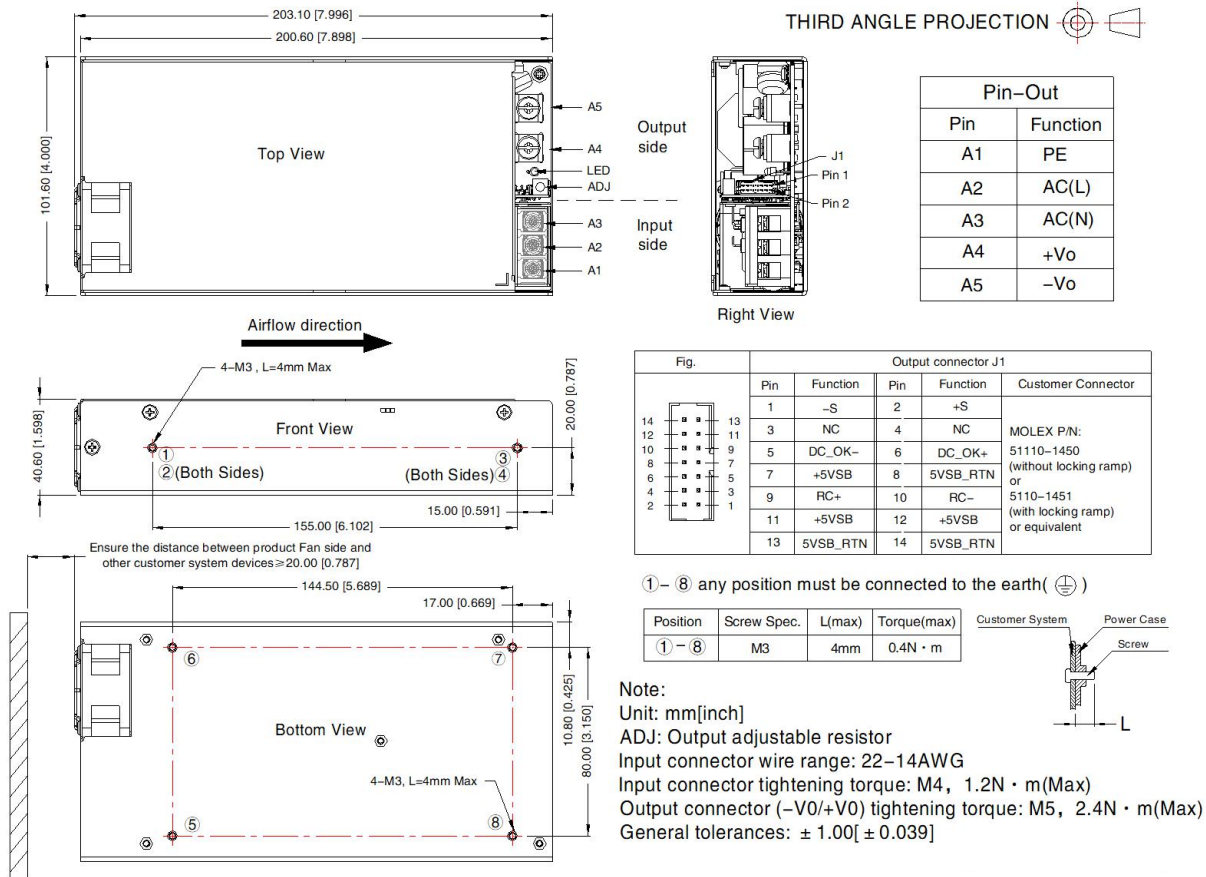
Note: 1. When the output voltage of the product reaches 90% of the rated value, DC\_OK+ will be connected to DC\_OK- ;  
2. It is recommended that users apply a certain voltage between DC\_OK+ and DC\_OK- to detect the signal.

3. Remote Sense Compensation



Note: 1. The left side represents the internal schematic diagram of the product, the right side represents the customer system;  
2. Twisted pair wires are needed for S+/S-;  
3. If the Pin14 terminal function is used for long-term matching, please glue to secure it.

Dimensions and Recommended Layout



Note:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220209;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75% RH with nominal input voltage and rated output load;
- The room temperature derating of 5°C/1000m 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 (⊕) of system when the terminal equipment in operating;
- The output voltage can be adjusted by the ADJ, clockwise to increase;
- 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.

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