

AC/DC 600W Enclosed Switching Power Supply

LM600-20Bxx (-C, -Q, -CQ, -QQ, -CQQ) Series

MORNSUN®



FEATURES

- Universal 90 - 132VAC/180 - 264VAC or 255 - 370VDC 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, low ripple & noise
- High I/O isolation test voltage up to 4000VAC
- Output short circuit, over-current, over-voltage, over-temperature protection
- Operating altitude up to 5000m
- Meets pollution degree 3
- 3 years warranty
- Safety according to IEC62368, EN/IEC60335, EN61558



EN62368-1

GB4943.1

BS EN62368-1

UL62368-1

LM600-20Bxx series is 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, low no load power consumption, high efficiency, high reliability and double or reinforced insulation. These converters offer excellent EMC performance and meet UL/EN/BS EN/IEC62368, EN/IEC60335, EN61558, 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.* | Cooling Method | Output Power (W)* | Nominal Output Voltage and Current (Vo/Io) | Output Voltage Adjustable Range (V) | Efficiency at 230VAC (%) Typ.* | Max. Capacitive Load (µF) |
|----------------|-------------|--------------------|-------------------|--|-------------------------------------|--------------------------------|---------------------------|
| BIS/EN/CQC /UL | LM600-20B12 | Forced air cooling | 600 | 12V/50A | 11.4-13.2 | 90 | 30000 |
| | LM600-20B15 | | 600 | 15V/40A | 14.25-16.5 | 90 | 20000 |
| | LM600-20B24 | | 600 | 24V/25A | 22.8-26.4 | 91 | 10000 |
| | LM600-20B27 | | 599.4 | 27V/22.2A | 25.65-29.7 | 91 | 8000 |
| | LM600-20B36 | | 597.6 | 36V/16.6A | 34.2-39.6 | 92 | 8000 |
| EN/CQC/UL | LM600-20B42 | | 596.4 | 42V/14.2A | 39.9-46.2 | 92 | 5000 |
| BIS/EN/CQC /UL | LM600-20B48 | | 600 | 48V/12.5A | 45.6-52.8 | 92 | 6000 |

Note: 1.*Use suffix "C" for terminal with protective cover, suffix "Q" for bottom conformal coating and "QQ" for both sides conformal coating;
 2. *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.
 3. *The product picture is for reference only. For details, please refer to the actual product.

Input Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|-------------------------|---------------------------------|--|------|------|------|
| Input Voltage Range | Rated input (Certified voltage) | 100 | -- | 120 | VAC |
| | | 200 | -- | 240 | |
| | AC input | Low voltage (switch in position of 115) | 90 | -- | 132 |
| | | High voltage (switch in position of 230) | 180 | -- | 264 |
| | DC input | 255 | -- | 370 | VDC |
| Input Voltage Frequency | AC input | 47 | -- | 63 | Hz |
| Input Current | 115VAC | -- | 12 | -- | A |
| | 230VAC | -- | 7.5 | -- | |
| Inrush Current | Cold start | 115VAC | -- | 35 | |
| | | 230VAC | -- | 60 | |
| Start-up Delay Time | 115VAC/230VAC, rated load | -- | 1300 | -- | ms |
| Input Fuse | Built-in fuse | -- | 16 | -- | A |
| Hot Plug | | Unavailable | | | |

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Output Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|-----------------------------|---|-------------------------|---|-------|------|------|
| Output Voltage Accuracy | Full load range | 12V | -- | ±1.5 | -- | |
| | | 15V/24V/27V/36V/42V/48V | -- | ±1 | -- | |
| Line Regulation | Rated load | | -- | ±0.5 | -- | % |
| Load Regulation | 0% - 100% load | 12V | -- | ±1.0 | -- | |
| | | 15V/24V/27V/36V/42V/48V | -- | ±0.5 | -- | |
| Minimum Load | | | -- | 0 | -- | |
| Stand-by Power Consumption | 230VAC input at normal temperature | | -- | 5 | -- | W |
| Ripple & Noise* | 20MHz bandwidth (peak-peak value) | 12V/15V | -- | -- | 200 | mV |
| | | 24V | -- | -- | 240 | |
| | | 27V | -- | -- | 270 | |
| | | 36V/42V/48V | -- | -- | 360 | |
| Temperature Coefficient | | | -- | ±0.03 | -- | %/°C |
| Hold-up Time | 115VAC, rated load | | -- | 16 | -- | ms |
| | 230VAC, rated load | | -- | 20 | -- | |
| Short Circuit Protection | Recovery time <10s after the short circuit disappear. | | Hiccup or turn off, continuous, self-recover | | | |
| Over-current Protection | 230VAC | | 105% - 200%Io, constant current mode, shut down after 1S, self-recover, Io is the load point without derating | | | |
| Over-voltage Protection | 12V | | 13.8-18V (Hiccup, self-recover) | | | |
| | 15V | | 18-21V (Hiccup, self-recover) | | | |
| | 24V | | 27.6-32.4V (Hiccup, self-recover) | | | |
| | 27V | | 31-36.5V (Hiccup, self-recover) | | | |
| | 36V | | 41.4-48.6V (Hiccup, self-recover) | | | |
| | 42V | | 52-60V (Hiccup, self-recover) | | | |
| | 48V | | 55.2-64.8V (Hiccup, self-recover) | | | |
| Over-temperature Protection | | | Hiccup, self-recover | | | |

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 | 2000 | -- | -- | VAC |
| | Input - output | | 4000 | -- | -- | |
| | Output - ⊕ | | 500 | -- | -- | |
| Insulation Resistance | Input - ⊕ | Ambient temperature: 25 ± 5°C Relative humidity: < 95%RH, no condensation Test voltage: 500VDC | 50 | -- | -- | MΩ |
| | Input - output | | 50 | -- | -- | |
| | Output - ⊕ | | 50 | -- | -- | |
| Operating Temperature | | | -40 | -- | +70 | °C |
| Storage Temperature | | | -40 | -- | +85 | |
| Operating Humidity | Non-condensing | | 10 | -- | 95 | %RH |
| Storage Humidity | | | 20 | -- | 90 | |
| Power Derating | Operating temperature derating | -40°C to -20°C | 3 | -- | -- | % / °C |
| | | +45°C to +70°C | 2 | -- | -- | |
| | Input voltage derating | 90VAC-100VAC | 2 | -- | -- | % / VAC |
| | | 180VAC-200VAC | 1 | -- | -- | |
| Leakage Current | 240VAC, 60Hz | Touch current | <0.75mA | | | |
| Safety Standards | 12V/15V/24V/27V/36V/48V | | GB4943.1, UL62368-1, IS13252 (Part1) safety approved & EN62368-1, BS EN62368-1(Report) | | | |

| | | |
|--------------|----------------------------|--|
| | 42V | Design refer to IEC62368-1, EN/IEC60335-1, EN61558-1 GB4943.1, UL62368-1 safety approved & EN62368-1, BS EN62368-1(Report) Design refer to IEC62368-1, EN/IEC60335-1, EN61558-1, IS13252 (Part1) |
| Safety Class | | CLASS I |
| MTBF | MIL-HDBK-217F@25°C | ≥311,000 h |
| Warranty | Ambient temperature: <70°C | 3 years |

General Specifications

| | |
|----------------|-------------------------------|
| Case Material | Metal (AL5052, SGCC) |
| Dimensions | 225.00mm x 124.00mm x 41.00mm |
| Weight | 910g (Typ.) |
| Cooling Method | Forced air cooling |

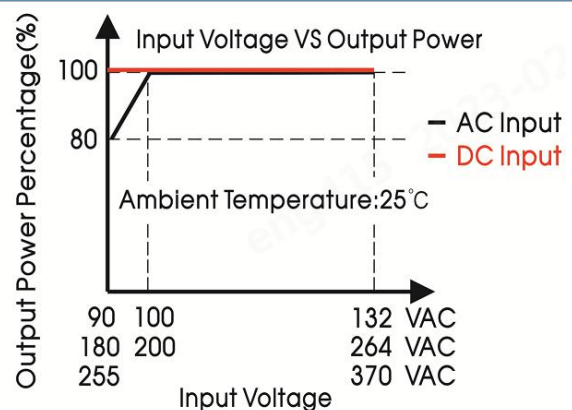
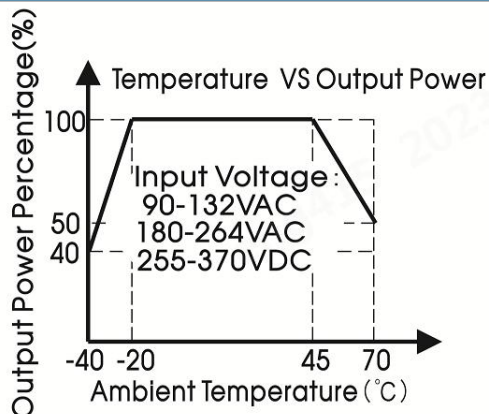
Note: *Cooling method and power derating refer to typical characteristic curves.

Electromagnetic Compatibility (EMC)

| | | | |
|-----------|---------------------|---|------------------|
| Emissions | CE (Input port)* | CISPR32 EN55032 150K - 30MHz | CLASS A |
| | RE | CISPR32 EN55032 30MHz - 1GHz | CLASS A |
| Immunity | ESD | IEC/EN61000-4-2 Contact ±6KV/Air ±8KV | perf. Criteria A |
| | RS | IEC/EN61000-4-3 10V/m | |
| | EFT (Input port) | IEC/EN61000-4-4 ±4KV | |
| | EFT (Output port) | IEC/EN61000-4-4 ±2KV | |
| | Surge (Input port) | IEC/EN61000-4-5 line to line ±2KV/line to ground ±4KV | |
| | Surge (Output port) | IEC/EN61000-4-5 line to line ±0.5KV/line to ground ±1KV | |
| | MS | IEC/EN61000-4-8 30A/m | |
| | CS | IEC/EN61000-4-6 0.15 - 80MHz 10Vr.m.s | |
| | Voltage dips | IEC/EN61000-4-11 0%, 70% | perf. Criteria B |

Note: 1. *With Mornsun filters FC-L10/16Wx, the conducted emissions meet EN55032, CLASS B;
 2. *With Mornsun filters FC-L10W2, the Surge (Input port) meet line to line ±4KV/line to ground ±6KV;
 3. *The power supply does not meet the requirements of harmonic current stipulated in EN61000-3-2; This power supply is not suitable for the following situations.
 1) The terminal equipment is used in the European Union.
 2) The terminal equipment is connected to public mains supply with 220VAC or greater rated nominal voltage that mandatory to meet the requirements of EN61000-3-2.
 3) The power supply is installed in terminal equipment with average or continuous input power greater than 75W.
 4) The power supply belong to a part of lighting system.
 In addition, the power supply can be used in the following terminals which do not need to meet EN61000-3-2;
 (1) Professional equipment with total fixed input power greater than 1000W;
 (2) symmetrical controlled heating element with rated power less than or equal to 200W.
 4. *If no harmonic current is required or customers can solve harmonic current problems by themselves, this product can be used.

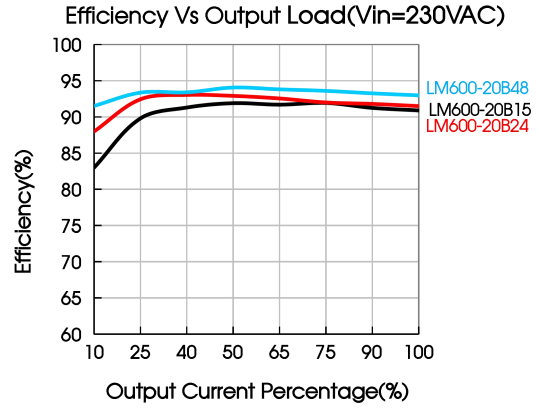
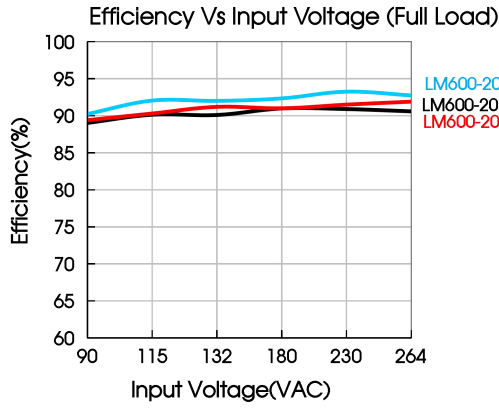
Product Characteristic Curve



Note: 1. With an AC input voltage between 90 - 100VAC/180 - 200VAC and a DC input 255 - 370VDC 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.

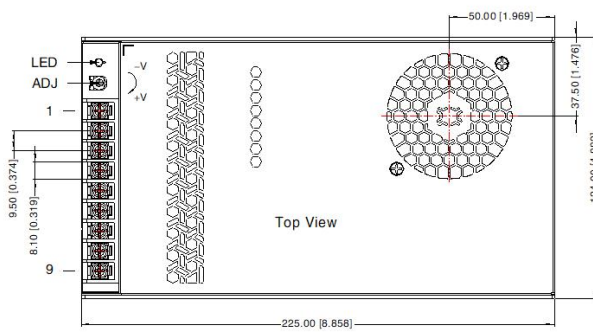
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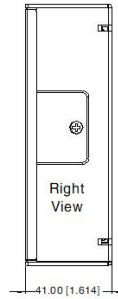


Dimensions and Recommended Layout

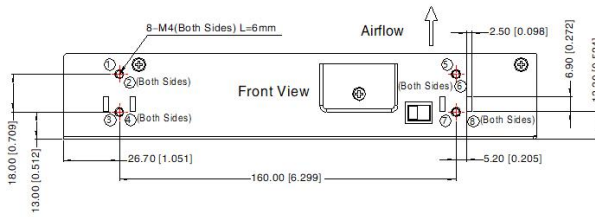
LM600-20Bxx, LM600-20Bxx-Q, LM600-20Bxx-QQ Series



THIRD ANGLE PROJECTION



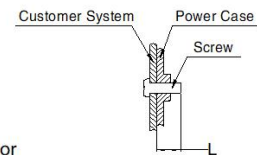
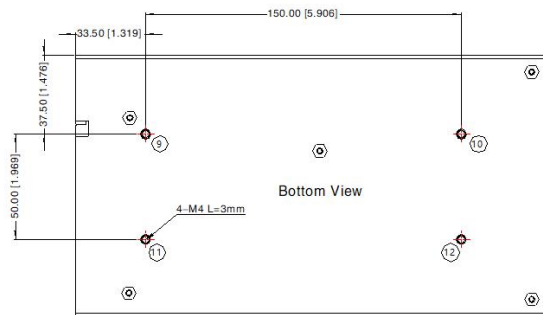
| Pin | Mark |
|-----|-------|
| 1 | +Vo |
| 2 | +Vo |
| 3 | +Vo |
| 4 | -Vo |
| 5 | -Vo |
| 6 | -Vo |
| 7 | ⊥ |
| 8 | AC(N) |
| 9 | AC(L) |



①-⑩ any position must be connected to the earth (⊥)

| Switch | AC Input | DC Input |
|--------|------------|------------|
| 115V | 90-132VAC | --- |
| 230V | 180-264VAC | 255-370VDC |

| Position | Screw Spec. | L(max) | Torque(max) |
|----------|-------------|--------|-------------|
| ①-⑧ | M4 | 6mm | 0.9N · m |
| ⑨-⑩ | M4 | 3mm | 0.9N · m |



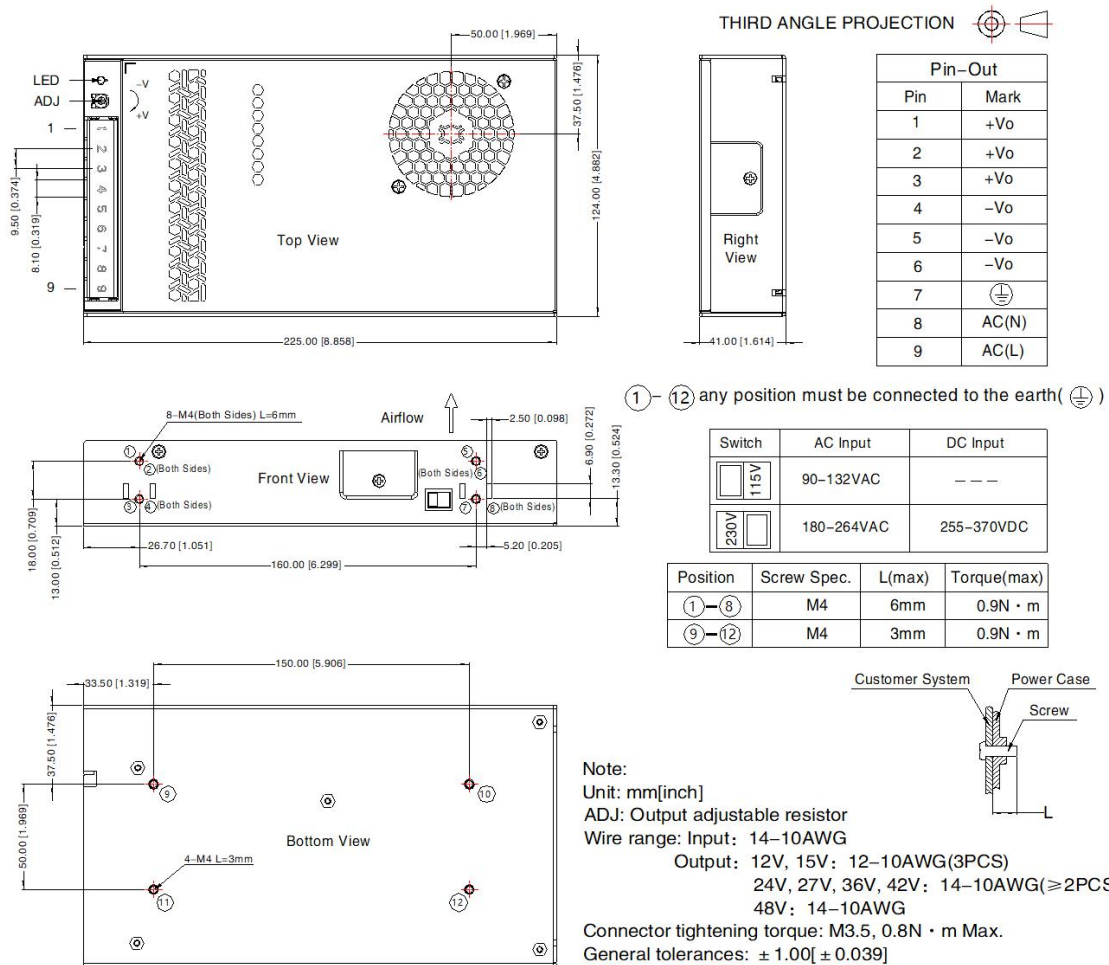
Note:
 Unit: mm[inch]
 ADJ: Output adjustable resistor
 Wire range: Input: 14-10AWG
 Output: 12V, 15V: 12-10AWG(3PCS)
 24V, 27V, 36V, 42V: 14-10AWG(≥2PCS)
 48V: 14-10AWG
 Connector tightening torque: M3.5, 0.8N · m Max.
 General tolerances: ± 1.00 [± 0.039]

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LM600-20Bxx-C, LM600-20Bxx-CQ, LM600-20Bxx-CQQ Series



Note:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220569;
- 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 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;
- 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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