# AC/DC 50W Enclosed Switching Power Supply

## LM50-22Bxx, LM50-22Bxx-C, LM50-22Bxx-Q Series

MORNSUN®

Report EN62368-1 EN60335-1 EN61558-1 | GB4943.1 | CB IEC62368-1 | UK CA BS EN 62368-1 | RoHS

## FEATURES

- 165 - 264VAC or 180 - 370VDC input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -30℃ to +70℃
- Low standby power consumption, high efficiency
- High I/O isolation test voltage up to 4000VAC
- Low ripple & noise
- Output short circuit, over-current, over-voltage protection
- OVC Ⅲ (designed to meet EN61558)
- Operating altitude up to 5000m
- 3 years warranty

*LM50-22Bxx series is one of Mornsun's enclosed AC-DC switching power supply. It features 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/EN61000-4, CISPR32/EN55032, IEC/UL/EN62368, IEC/EN60335, GB4943, IEC/EN61558 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/IEC/CCC/ BIS | LM50-22B05 | 50 | 5V/10A | 4.5-5.5 | 86 | 8500 |
| | LM50-22B12 | 50.4 | 12V/4.2A | 10.2-13.8 | 87 | 2000 |
| | LM50-22B15 | 51 | 15V/3.4A | 13.5-18 | 88 | 1500 |
| | LM50-22B24 | 52.8 | 24V/2.2A | 21.6-28.8 | 89 | 1000 |
| | LM50-22B36 | 52.2 | 36V/1.45A | 32.4-39.6 | 89 | 800 |
| | LM50-22B48 | 52.8 | 48V/1.1A | 43.2-52.8 | 90 | 680 |

Note: 1. *Use suffix "C" for terminal with protective cover, suffix "Q" for conformal coating.
2. 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 | AC input | | 165 | -- | 264 | VAC |
| | DC input | | 180 | -- | 370 | VDC |
| Input Voltage Frequency | | | 47 | -- | 63 | Hz |
| Input Current | 230VAC | | -- | -- | 0.8 | A |
| Inrush Current | 230VAC | Cold start | -- | 45 | -- | |
| Leakage Current | 240VAC | | <0.75mA | | | |
| Hot Plug | | | Unavailable | | | |

## Output Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Output Voltage Accuracy | Full load range | 5V | -- | ±2 | -- | % |
| | | 12V/15V/24V/36V/48V | -- | ±1 | -- | |
| Line Regulation | Rated load | | -- | ±0.5 | -- | |
| Load Regulation | 0% - 100% load | 5V | -- | ±1 | -- | |
| | | 12V/15V/24V/36V/48V | -- | ±0.5 | -- | |
| Ripple & Noise* | 20MHz bandwidth (peak-to-peak value) | 5V | -- | 80 | -- | mV |
| | | 12V/15V | -- | 120 | -- | |


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| | | | | | | |
|---|---|---|---|---|---|---|
| | | 24V | -- | 150 | -- | |
| | | 36V/48V | -- | 200 | -- | |
| Temperature Coefficient | | | -- | ±0.03 | -- | %/℃ |
| Minimum Load | | | 0 | -- | -- | % |
| Stand-by Power Consumption | | | -- | -- | 0.3 | W |
| Hold-up Time | 230VAC | | 30 | -- | -- | ms |
| Short Circuit Protection | Recovery time <5s after the short circuit disappear. | | Hiccup, continuous, self-recovery | | | |
| Over-current Protection | | | 110%-200% Io, self-recovery | | | |
| Over-voltage Protection | 5V | | ≤6.3VDC (Output voltage clamp or hiccup) | | | |
| | 12V | | ≤16.2VDC (Output voltage clamp or hiccup) | | | |
| | 15V | | ≤21.75VDC (Output voltage clamp or hiccup) | | | |
| | 24V | | ≤33.6VDC (Output voltage clamp or hiccup) | | | |
| | 36V | | ≤48.6VDC (Output voltage clamp or hiccup) | | | |
| | 48V | | ≤60.0VDC (Output voltage clamp or hiccup) | | | |

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 <10mA | | 2000 | -- | -- | VAC |
| | Input - output | | | 4000 | -- | -- | |
| | Output - ⏚ | | | 1250 | -- | -- | |
| Insulation Resistance | Input - ⏚ | At 500VDC | | 100 | -- | -- | MΩ |
| | Input - output | | | 100 | -- | -- | |
| | Output - ⏚ | | | 100 | -- | -- | |
| Operating Temperature | | | | -30 | -- | +70 | ℃ |
| Storage Temperature | | | | -40 | -- | +85 | |
| Storage Humidity | | Non-condensing | | -- | -- | 95 | %RH |
| Operating Humidity | | | | 20 | -- | 90 | |
| Switching Frequency | | | | -- | 65 | -- | kHz |
| Power Derating | | Operating temperature derating | +50℃ to +70℃ | 2 | -- | -- | %/℃ |
| | | Input voltage derating | 180VDC - 200VDC | 1 | -- | -- | %/VDC |
| Safety Standard | | | | IEC/EN/BS EN62368-1, GB4943.1, IS13252(Part1) & 62368-1, EN60335-1, EN61558-1 safety approved; Design refer to UL62368-1, IEC60335-1, IEC61558-1 | | | |
| Safety Class | | | | CLASS I | | | |
| MTBF | MIL-HDBK-217F@25℃ | | | >300,000 h | | | |

## Mechanical Specifications

| | |
|---|---|
| Case Material | Metal (AL1100, SGCC) |
| Dimensions | 99.00 x 82.00 x 30.00 mm |
| Weight | 180g (Typ.) |
| Cooling Method | Free air convection |


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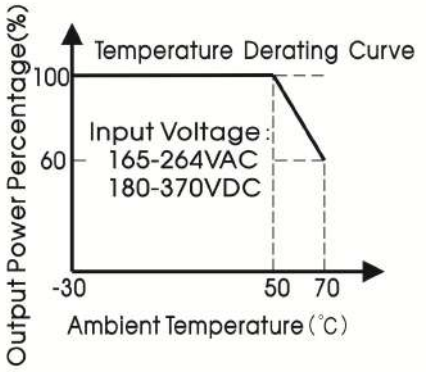
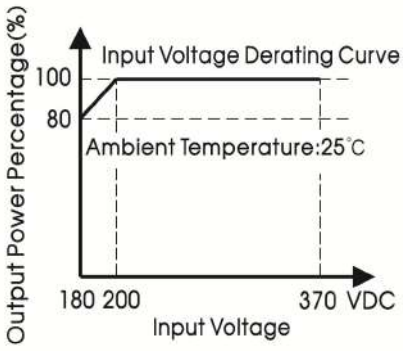
## Electromagnetic Compatibility (EMC)

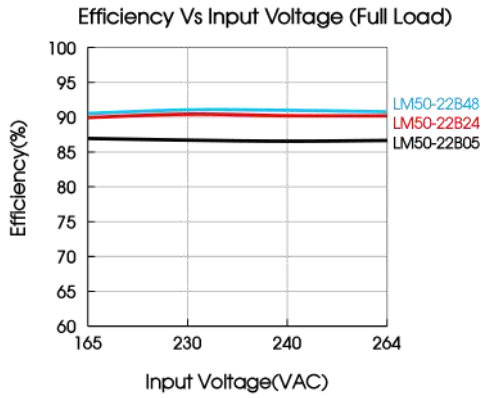
| | | | |
|---|---|---|---|
| Emissions | CE | CISPR32/EN55032 CLASS B | |
| | RE | CISPR32/EN55032 CLASS B | |
| | Harmonic current | IEC/EN61000-3-2 CLASS A | |
| Immunity | ESD | IEC/EN 61000-4-2 Contact ±6KV/Air ±8KV | perf. Criteria A |
| | RS | IEC/EN 61000-4-3 10V/m | perf. Criteria A |
| | EFT | IEC/EN 61000-4-4 ±2KV | perf. Criteria A |
| | Surge | IEC/EN 61000-4-5 line to line ±2KV/line to PE ±4KV | perf. Criteria A |
| | CS | IEC/EN61000-4-6 10 Vr.m.s | perf. Criteria A |
| | Voltage dip, short interruption and voltage variation | IEC/EN61000-4-11 0%, 70% | perf. Criteria B |

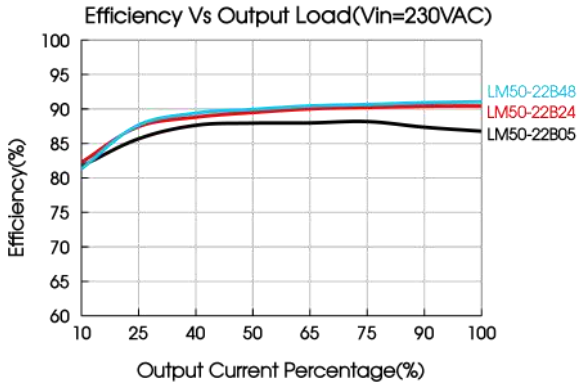
## Product Characteristic Curve




Note: 1. For input voltage of 180 - 200VDC, input voltage derating is required based on temperature derating;
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.





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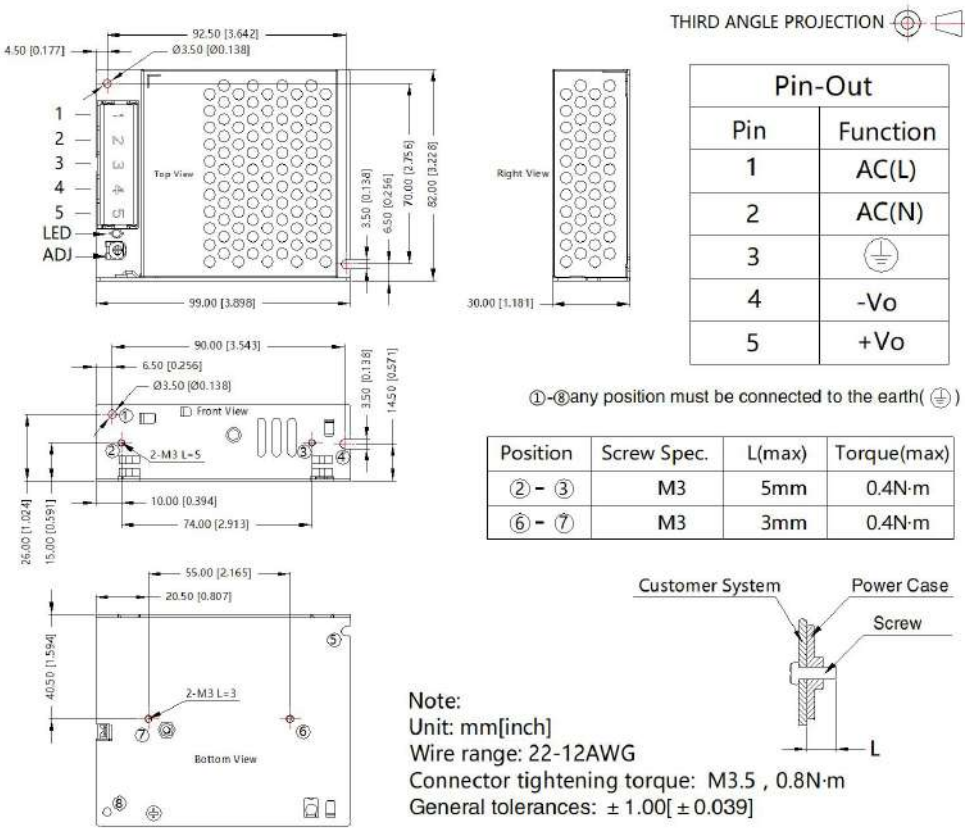
## Dimensions and Recommended Layout

### LM50-22Bxx, LM50-22Bxx-Q Series



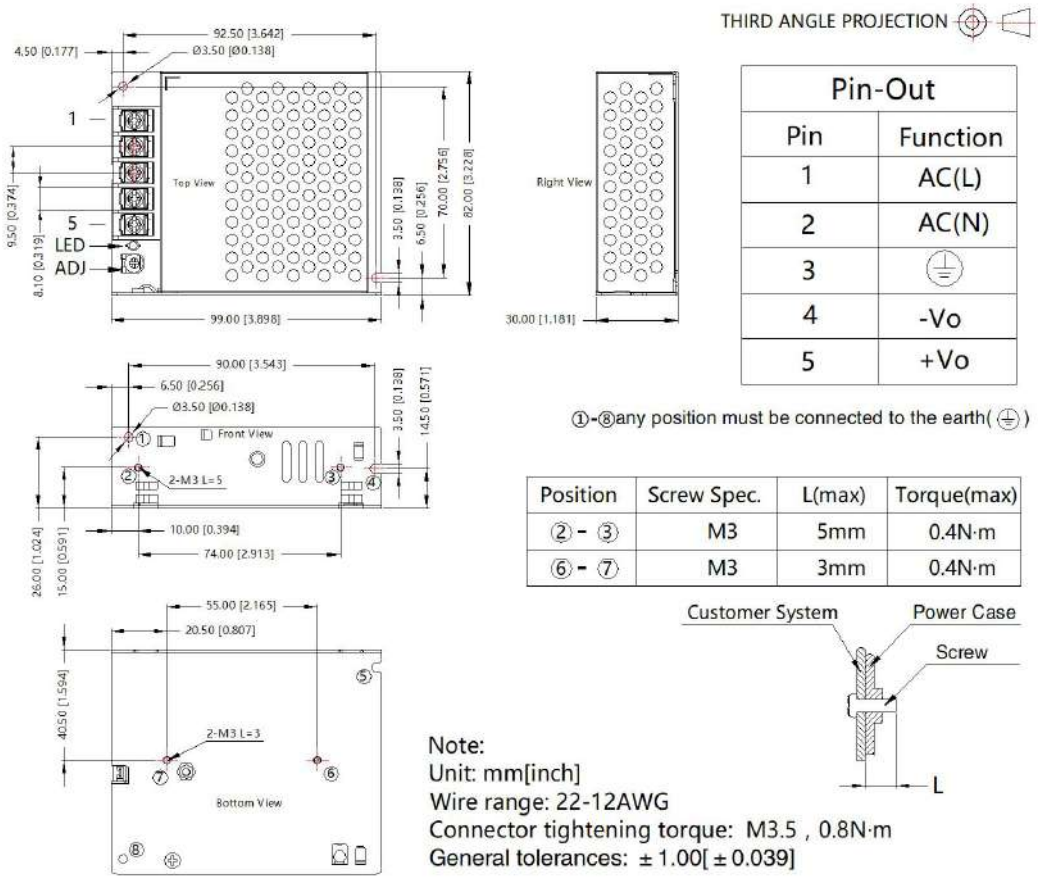

| Pin-Out | |
|---|---|
| Pin | Function |
| 1 | AC(L) |
| 2 | AC(N) |
| 3 | ⏚ |
| 4 | -Vo |
| 5 | +Vo |

①-⑧any position must be connected to the earth(⏚)

| Position | Screw Spec. | L(max) | Torque(max) |
|---|---|---|---|
| ② - ③ | M3 | 5mm | 0.4N·m |
| ⑥ - ⑦ | M3 | 3mm | 0.4N·m |

Note:
Unit: mm[inch]
Wire range: 22-12AWG
Connector tightening torque: M3.5 , 0.8N·m
General tolerances: ±1.00[±0.039]

### LM50-22Bxx-C Series

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Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220118;
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 the earth of system when the terminal equipment in operating;
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

## Mornsun Guangzhou Science & 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 www.mornsun-power.com


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