



FEATURES

- Universal 85 - 264VAC or 120 - 373VDC Input voltage
- Operating ambient temperature range: -30°C ~ +70°C
- High efficiency, high reliability and long life
- LED indicator for power on
- Output short circuit, over-current, over-voltage protection
- Withstand 300VAC surge input for 5s
- High I/O isolation test voltage up to 3000VAC
- Safety according to IEC/EN/UL62368, EN60335, GB4943 (CE pending)
- Emissions compliant to CISPR32/EN55032 CLASS B
- Withstand 5G vibration test
- Operating altitude up to 5000m

This LM50-10Cxx series of power converter design features 3 output versions, which can independently supply 3 different loads in the system. The products can be used in harsh working environments with an ambient temperature range from -30°C ~ +70°C, without the need of a fan for further heat dissipation. In addition, the converters EMC immunity performance meets the requirements of IEC61000 standard and meet emission standard CISPR32/EN55032, class B without any external components, thus providing excellent EMC protection. The products also meet IEC/EN/UL62368, EN60335, GB4943 safety standards. The converters integrate a variety of protection features and offer a high-performance to low-cost ratio providing the best power solution for a variety of industries such as industrial control equipment, instrumentation and smart home and building equipment application.

Selection Guide

| Certification | Part No. | Output Power | Nominal Output Voltage and Current (Vo/Io) | | | Working Current Range* | | | Efficiency at 230VAC (%) Typ. | Max. Capacitive Load (μF) | | |
|---------------|-------------------|--------------|--|-----------|-----------|------------------------|-----------|----------|-------------------------------|---------------------------|------|------|
| | | | Vo1/Io1 | Vo2/Io2 | Vo3/Io3 | Io1 | Io2 | Io3 | | Vo1 | Vo2 | Vo3 |
| CE (Pending) | LM50-10C051212-20 | 50W | +5V/4.0A | +12V/2.0A | -12V/0.5A | 0.4-5.0A | 0.2-2.5A | 0.1-1.0A | 81 | 4000 | 2000 | 470 |
| | LM50-10C051515-15 | 50W | +5V/4.0A | +15V/1.5A | -15V/0.5A | 0.4-5.0A | 0.15-2.0A | 0.1-1.0A | 83 | 4000 | 1500 | 470 |
| | LM50-10C052412-10 | 51W | +5V/3.0A | +24V/1.0A | +12V/1.0A | 0.3-5.0A | 0.1-1.5A | 0.1-1.5A | 85 | 3000 | 1000 | 1000 |

Note: * Working current range: If any one of the 3 outputs arrive at the maximum current, the total output power cannot exceed the rated power and working time < 3s.

Input Specifications





| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|---------------------|----------------------|-------------|------|------|------|
| Input Voltage Range | AC input | 85 | -- | 264 | VAC |
| | DC input | 120 | -- | 373 | VDC |
| Input Frequency | | 47 | -- | 63 | Hz |
| Input Current | 115VAC | -- | -- | 1.3 | A |
| | 230VAC | -- | -- | 0.8 | |
| Inrush Current | 115VAC | -- | 30 | -- | |
| | 230VAC | -- | 50 | -- | |
| Hot Plug | | Unavailable | | | |

Output Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit | | |
|-------------------------|----------------------|------|-------------------|------|------|---|------|
| Output Voltage Accuracy | Full load range | Vo1 | -- | ±2.0 | -- | % | |
| | | Vo2 | LM50-10C051212-20 | -- | ±6.0 | | -- |
| | | | LM50-10C051515-15 | -4.0 | -- | | +8.0 |
| | | | LM50-10C052412-10 | -4.0 | -- | | +8.0 |
| | | Vo3 | LM50-10C051212-20 | -- | ±3.0 | | ±5.0 |
| | | | LM50-10C051515-15 | -- | ±3.0 | | ±5.0 |
| LM50-10C052412-10 | -- | | ±6.0 | -- | | | |

| | | | | | | | |
|---|---|------------------------------------|-------------------|------|------|----|------|
| Line Regulation | Full load | Vo1 | -- | ±0.5 | -- | % | |
| | | Vo2 | LM50-10C051212-20 | -- | ±1.5 | | -- |
| | | | LM50-10C051515-15 | -- | ±1.5 | | -- |
| | | | LM50-10C052412-10 | -- | ±2.0 | | -- |
| | | Vo3 | LM50-10C051212-20 | -- | ±0.5 | | -- |
| | | | LM50-10C051515-15 | -- | ±0.5 | | -- |
| LM50-10C052412-10 | -- | | ±2.0 | -- | | | |
| Load Regulation | 10% - 100% load (Balanced load) | Vo1 | -- | ±1.0 | -- | % | |
| | | Vo2 | LM50-10C051212-20 | -- | ±3.0 | | ±5.0 |
| | | | LM50-10C051515-15 | -- | ±3.0 | | ±5.0 |
| | | | LM50-10C052412-10 | -- | ±3.0 | | ±5.0 |
| | | Vo3 | LM50-10C051212-20 | -- | ±1.0 | | -- |
| | | | LM50-10C051515-15 | -- | ±1.0 | | -- |
| LM50-10C052412-10 | -- | | ±4.0 | -- | | | |
| Ripple & Noise* | 20MHz bandwidth (peak-peak value) | Vo1 | -- | 80 | -- | mV | |
| | | Vo2 | LM50-10C051212-20 | -- | 120 | | -- |
| | | | LM50-10C051515-15 | -- | 120 | | -- |
| | | | LM50-10C052412-10 | -- | 150 | | -- |
| | | Vo3 | LM50-10C051212-20 | -- | 120 | | -- |
| | | | LM50-10C051515-15 | -- | 120 | | -- |
| LM50-10C052412-10 | -- | | 120 | -- | | | |
| Temperature Coefficient | Vo1 | -- | ±0.03 | -- | %/°C | | |
| Voltage Adjustable Range* | Rated input voltage | 4.75 | -- | 5.50 | VDC | | |
| Switching Delay Time | Rated input voltage | -- | -- | 3.0 | s | | |
| Output Voltage Rise Time | 115/230VAC | -- | -- | 30 | ms | | |
| Hold-up Time | 115VAC | 5 | -- | -- | | | |
| | 230VAC | 30 | -- | -- | | | |
| Min. Load | | Refer to the working current range | | | | | |
| Short Circuit Protection* | Recovery time <5s after the short circuit disappear | Hiccup, continuous, self-recovery | | | | | |
| Over-current Protection | 3 outputs with equal-scale load | 110%-230% Io, self-recovery | | | | | |
| Over-voltage Protection | | 5.75VDC ≤Vo1 ≤6.75VDC, Clamp | | | | | |
| Note: 1.*The "Tip and barrel method" is used for ripple and noise test, (47uF electrolytic capacitor and 104 ceramic capacitor) please refer to AC-DC Converter Application Notes for specific information. | | | | | | | |
| 2.*When Vo1 working in the adjustable range, the output power please refer to power derating curve and should not be exceed the rated output power. | | | | | | | |
| 3.*Vo3 cannot stay in short circuit for long time. | | | | | | | |

General Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit | |
|-----------------------|--|--------------------------------------|------|------|------|-------|
| Isolation Voltage | Input - output | 3000 | -- | -- | VAC | |
| | Input -  | 2000 | -- | -- | | |
| | Output -  | 500 | -- | -- | | |
| Insulation Resistance | Input - Output | 100 | -- | -- | MΩ | |
| | Input -  | 100 | -- | -- | | |
| | Output -  | 100 | -- | -- | | |
| Operating Temperature | Refer to derating curve | -30 | -- | +70 | °C | |
| Storage Temperature | | -40 | -- | +85 | | |
| Storage Humidity | Non-condensing | -- | -- | 95 | %RH | |
| Power Derating | Input voltage derating | 85VAC - 115VAC | 0.66 | -- | -- | %/VAC |
| | | 115VAC - 264VAC | 0 | -- | -- | |
| | | 120VDC - 160VDC | 0.5 | -- | -- | %/VDC |
| | | 160VDC - 373VDC | 0 | -- | -- | |
| | Operating temperature derating | -30°C ~ +50°C | -- | -- | -- | %/°C |
| | +50°C ~ +70°C | 2.5 | -- | -- | | |
| Safety Standard | | Meet IEC/EN/UL62368, EN60335, GB4943 | | | | |
| Safety Class | | CLASS I | | | | |
| MTBF | MIL-HDBK-217F@25°C | > 300,000 h | | | | |

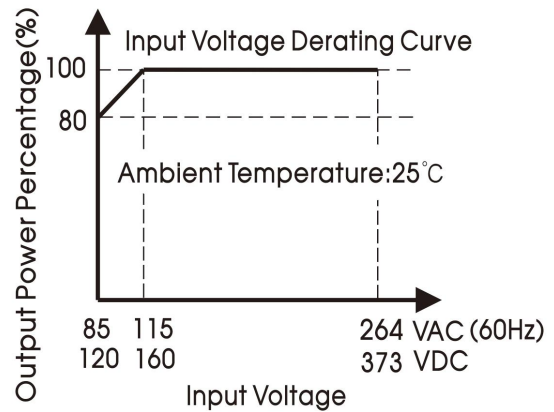
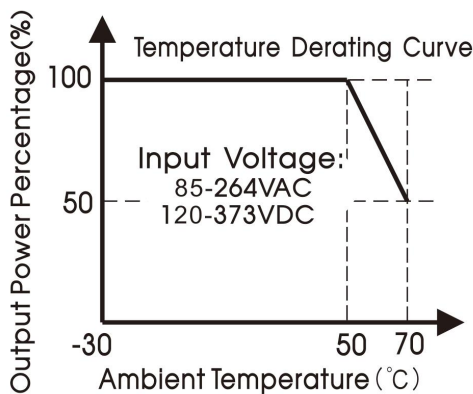
Physical Specifications

| | |
|----------------|--------------------------|
| Case Material | Metal (AL1100, SGCC) |
| Dimension | 99.00 x 97.00 x 30.00 mm |
| Weight | 240g (Typ.) |
| Cooling Method | Free air convection |

EMC Specifications

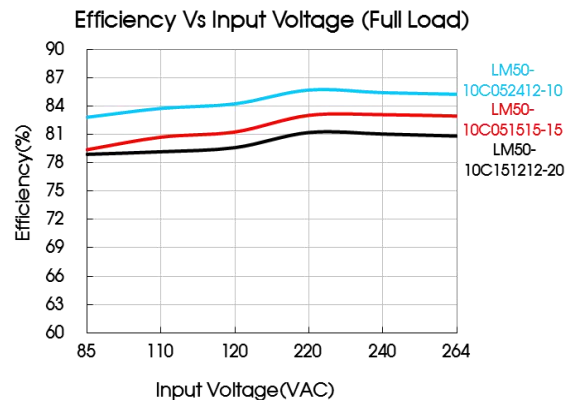
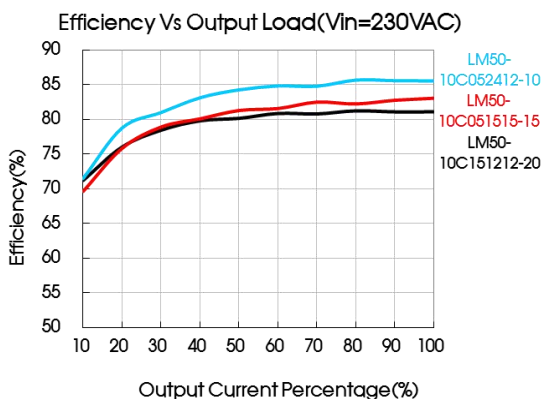
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|-----------|--|-------------------------|--------------------------------------|------------------|
| Emissions | CE | CISPR32/EN55032 CLASS B | | |
| | RE | CISPR32/EN55032 CLASS B | | |
| | Harmonic current | IEC/EN61000-3-2 CLASS A | | |
| Immunity | ESD | IEC/EN61000-4-2 | Contact ±6KV /Air ±8KV | Perf. Criteria A |
| | RS | IEC/EN61000-4-3 | 10V/m | perf. Criteria A |
| | EFT | IEC/EN61000-4-4 | ±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 | IEC/EN61000-4-11 | 0%,70% | perf. Criteria B |

Product Characteristic Curve

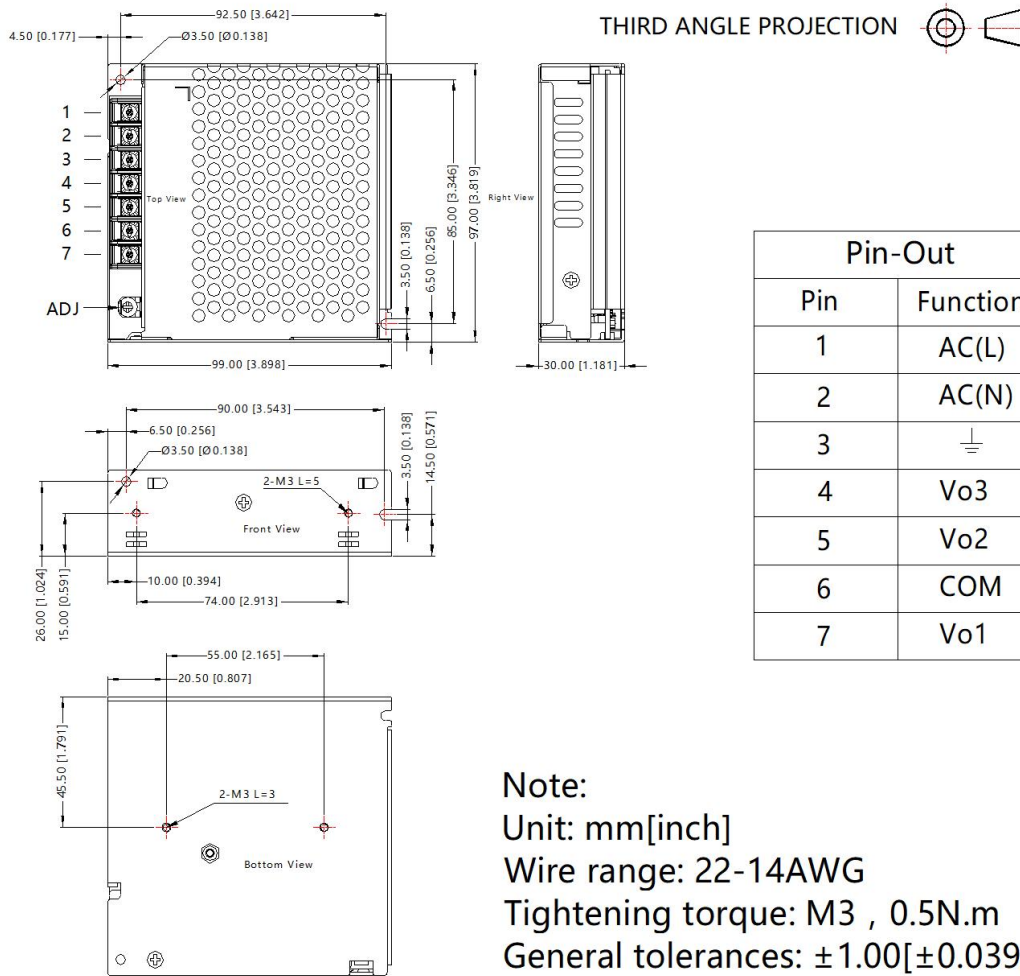


Note: ①With an input voltage between 85 -115VAC and a DC input between 120-160VDC the output power must be derated as per the temperature derating curves;

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



Dimensions and Recommended Layout



- Note:
- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220066;
 - 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";
 - 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 final equipment. All EMC tests should be confirmed with the final equipment. Please consult our FAE for EMC test operation instructions.

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