# AC/DC 35W Enclosed Switching Power Supply

## LM35-10Cxx, LM35-10Cxx-Q Series

MORNSUN®

Report EN62368-1 | UKCA BS EN 62368-1 | IECEE CB IEC 60950-1:2005 R-41202500 www.bis.gov.in | RoHS | 3 years Warranty

## FEATURES

- Universal 85 - 264VAC or 120 - 370VDC Input voltage
- Operating ambient temperature range: -30℃ to +70℃
- High efficiency, high reliability and long lifetime
- LED indicator for power on
- Output short circuit, over-current, over-voltage protection
- High I/O isolation test voltage up to 3000VAC
- Emissions compliant to CISPR32/EN55032 CLASS B
- Withstand 5G vibration test
- Operating altitude up to 5000m
- Design refer to UL/IEC62368-1, EN60335-1, GB4943.1

*This LM35-10Cxx series of power converter design features triple 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℃ to +70℃, without the need of the 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 and high cost-effective 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 (W) | Nominal Output Voltage and Current | | | Working Current Range* | | | Efficiency * (%) Typ. | Max. Capacitive Load(μF) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Vo1/Io1 | Vo2/Io2 | Vo3/Io3 | Io1 | Io2 | Io3 | | Vo1 | Vo2 | Vo3 |
| EN UKCA BIS | LM35-10C 051212-10 | 33 | +5V/3.0A | +12V/1.0A | -12V/0.5A | 0.3-4.0A | 0.1-1.5A | 0.05-0.5A | 81 | 3000 | 1000 | 470 |
| | LM35-10C 051515-10 | 35 | +5V/2.5A | +15V/1.0A | -15V/0.5A | 0.25-3.5A | 0.1-1.5A | 0.05-0.5A | 81 | 2500 | 1000 | 470 |
| | LM35-10C 052412-05 | 36.5 | +5V/2.5A | +24V/0.5A | +12V/1.0A | 0.25-3.5A | 0.05-1.0A | 0.1-1.0A | 81 | 2500 | 470 | 1000 |

Note:1.*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;
2.*The typical efficiency tested under input voltage at 230VAC;
3.*Use suffix "Q" for conformal coating.

## Input Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Input Voltage Range | AC input | | 85 | -- | 264 | VAC |
| | DC input | | 120 | -- | 370 | VDC |
| Input Frequency | | | 47 | -- | 63 | Hz |
| Input Current | 115VAC | | -- | -- | 0.75 | A |
| | 230VAC | | -- | -- | 0.5 | |
| Inrush Current | 115VAC | Cold start | -- | 30 | -- | |
| | 230VAC | | -- | 50 | -- | |
| Leakage Current | 240VAC | | <2.0mA | | | |
| Hot Plug | | | Unavailable | | | |

## Output Specifications

| Item | Operating Conditions | | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage Accuracy | Full load range | Vo1 | | -- | ±2.0 | -- | % |
| | | Vo2 | LM35-10C051212-10 | -- | ±6.0 | -- | |
| | | | LM35-10C051515-10 | -- | ±8.0 | -- | |
| | | | LM35-10C052412-05 | -- | ±8.0 | -- | |
| | | Vo3 | LM35-10C051212-10 | -- | ±6.0 | -- | |
| | | | LM35-10C051515-10 | -- | ±8.0 | -- | |
| | | | LM35-10C052412-05 | -- | ±8.0 | -- | |


MORNSUN Guangzhou Science & Technology Co., Ltd. reserves the copyright and right of final interpretation

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Line Regulation | Full load | Vo1 | | -- | ±0.5 | -- | % |
| | | Vo2 | LM35-10C051212-10 | -- | ±1.0 | -- | |
| | | | LM35-10C051515-10 | -- | ±1.0 | -- | |
| | | | LM35-10C052412-05 | -- | ±1.0 | -- | |
| | | Vo3 | LM35-10C051212-10 | -- | ±1.0 | -- | |
| | | | LM35-10C051515-10 | -- | ±1.0 | -- | |
| | | | LM35-10C052412-05 | -- | ±1.0 | -- | |
| Load Regulation | 10% - 100% load (Balanced load) | Vo1 | | -- | ±1.5 | -- | % |
| | | Vo2 | LM35-10C051212-10 | -- | ±3.0 | -- | |
| | | | LM35-10C051515-10 | -- | ±3.0 | -- | |
| | | | LM35-10C052412-05 | -- | ±3.0 | -- | |
| | | Vo3 | LM35-10C051212-10 | -- | ±3.0 | -- | |
| | | | LM35-10C051515-10 | -- | ±3.0 | -- | |
| | | | LM35-10C052412-05 | -- | ±3.0 | -- | |
| Ripple & Noise* | 20MHz bandwidth (peak-peak value) | Vo1 | | -- | 80 | -- | mV |
| | | Vo2 | LM35-10C051212-10 | -- | 120 | -- | |
| | | | LM35-10C051515-10 | -- | 150 | -- | |
| | | | LM35-10C052412-05 | -- | 150 | -- | |
| | | Vo3 | LM35-10C051212-10 | -- | 120 | -- | |
| | | | LM35-10C051515-10 | -- | 150 | -- | |
| | | | LM35-10C052412-05 | -- | 120 | -- | |
| Temperature Coefficient | Vo1 | | | -- | ±0.03 | -- | %/℃ |
| Voltage Adjustable Range (Vo1)* | Rated input voltage | | | 4.75 | -- | 5.50 | VDC |
| Start-up Delay Time | Rated input voltage | | | -- | -- | 2.0 | S |
| Output Voltage Rise Time | The output Vo1/Vo2/Vo3 rise time from 10%Vo to 90%Vo at rated voltage 115V/60Hz & 230V/50Hz, rated output load, ambient temperature | | | -- | -- | 30 | mS |
| Hold-up Time | 115VAC | | | -- | 5 | -- | |
| | 230VAC | | | -- | 30 | -- | |
| Minimum Load | | | | Refer to the working current range | | | |
| Short Circuit Protection | Recovery time <5s after the short circuit disappear | | | Hiccup, continuous, self-recover | | | |
| Over-current Protection | 3 outputs with balanced load | | | 110% - 180%Io, self-recover | | | |
| Over-voltage Protection | | | | 5.75VDC≤Vo1≤6.75VDC (Output clamp) | | | |

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;
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.

## General Specifications

| Item | | Operating Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Isolation Voltage | Input - Output | Electric Strength Test for 1min, leakage current <10mA | | 3000 | -- | -- | VAC |
| | Input - ⏚ | | | 2000 | -- | -- | |
| | Output - ⏚ | | | 500 | -- | -- | |
| Insulation Resistance | Input - Output | Environment temperature: 25±5℃, Relative humidity: <95%RH, non-condensing Testing voltage: 500VDC | | 100 | -- | -- | MΩ |
| | Input - ⏚ | | | 100 | -- | -- | |
| | Output - ⏚ | | | 100 | -- | -- | |
| Operating Temperature | | | | -30 | -- | +70 | ℃ |
| Storage Temperature | | | | -40 | -- | +85 | |
| Operating Humidity | | Non-condensing | | 20 | -- | 90 | %RH |
| Storage Humidity | | | | 10 | -- | 95 | |
| Power Derating | | Input voltage derating | 85VAC - 115VAC | 0.667 | -- | -- | %/VAC |
| | | | 115VAC - 264VAC | 0 | -- | -- | |
| | | | 120VDC - 160VDC | 0.5 | -- | -- | %/VDC |
| | | | 160VDC - 370VDC | 0 | -- | -- | |


MORNSUN Guangzhou Science & Technology Co., Ltd. reserves the copyright and right of final interpretation

| | | | | | | |
|---|---|---|---|---|---|---|
| | Operating temperature derating | +50℃ to +70℃ | 2.5 | -- | -- | %/℃ |
| Safety Standard | | | EN62368-1, IS13252 (Part1) safety approved & BS EN 62368-1(Report) Design refer to UL/IEC62368-1, EN60335-1, GB4943.1 | | | |
| Safety Class | | | CLASS I | | | |
| MTBF | MIL-HDBK-217F@25℃ | | >300,000 h | | | |

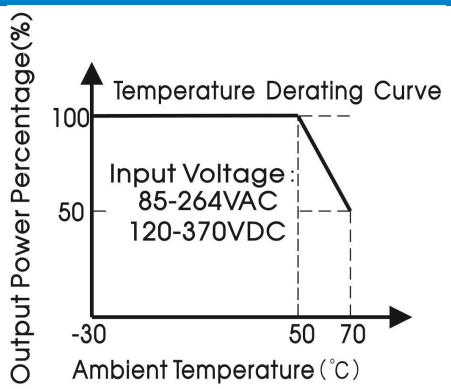
## Physical Specifications

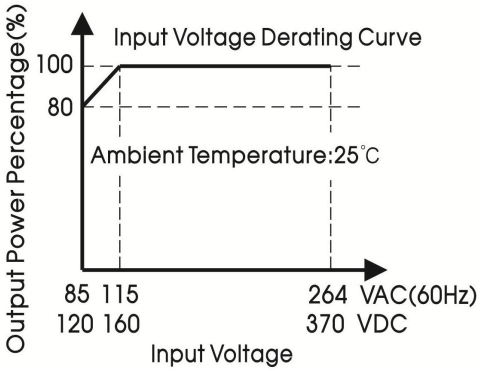
| | |
|---|---|
| Case Material | Metal (AL1100, SGCC) |
| Dimension | 99.00 x 97.00 x 30.00 mm |
| Weight | 210g (Typ.) |
| Cooling Method | Free air convection |

## EMC Specifications

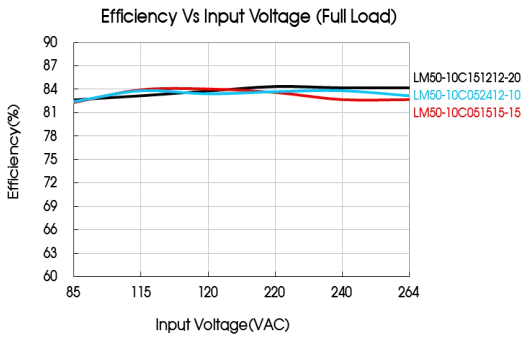
| | | | | |
|---|---|---|---|---|
| Emissions | CE | CISPR32/EN55032 | CLASS B | |
| | RE | CISPR32/EN55032 | CLASS B | |
| | Harmonic current | IEC/EN61000-3-2 | CLASS A | |
| Immunity | ESD | IEC/EN61000-4-2 | Contact ±6KV/Air ±8KV | perf. Criteria A |
| | RS | IEC/EN61000-4-3 | 10V/m | perf. Criteria A |
| | EFT | IEC/EN61000-4-4 | ±2KV | perf. Criteria A |
| | Surge | IEC/EN61000-4-5 | 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 |

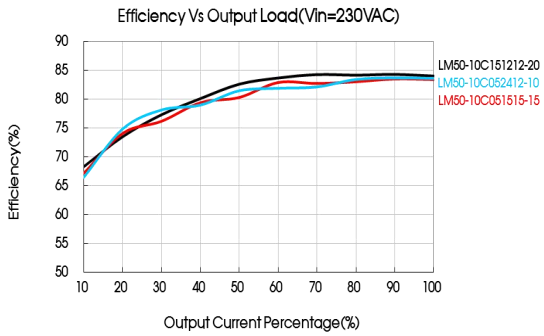
## Product Characteristic Curve




Note: 1. With an AC input voltage between 85 -115VAC and a DC input between 120 -160VDC the output power must be derated as per the temperature derating curves;
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.



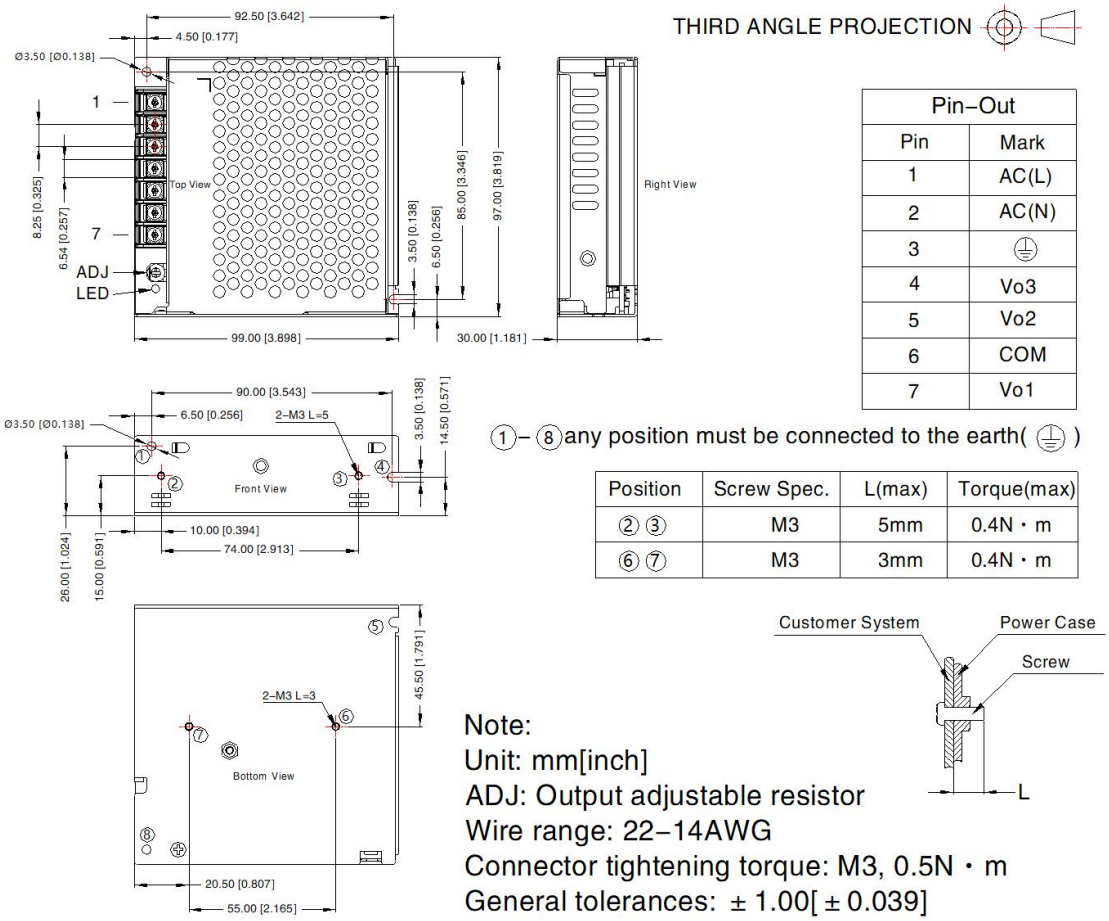





MORNSUN Guangzhou Science & Technology Co., Ltd. reserves the copyright and right of final interpretation

## Dimensions and Recommended Layout

### LM35-10Cxx, LM35-10Cxx-Q Series




| Pin-Out | |
|---|---|
| Pin | Mark |
| 1 | AC(L) |
| 2 | AC(N) |
| 3 | ⏚ |
| 4 | Vo3 |
| 5 | Vo2 |
| 6 | COM |
| 7 | Vo1 |

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]
ADJ: Output adjustable resistor
Wire range: 22–14AWG
Connector tightening torque: M3, 0.5N・m
General tolerances: ± 1.00[ ± 0.039]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220066 ;
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. All index testing methods in this datasheet are based on our company corporate standards;
4. In order to improve the efficiency, there will be audible noise generated when work at light load, but it does not affect product performance and reliability;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. The out case needs to be connected to PE (⏚) of system when the terminal equipment in operating;
8. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing."/"ATTENTION: Double pôle/fusible sur le neutre. Débrancher lalimentation avant lentretien;
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
10. 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 & Technology Co., Ltd.
Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com


MORNSUN Guangzhou Science & Technology Co., Ltd. reserves the copyright and right of final interpretation