

15W, AC/DC converter



RoHS

FEATURES

- Universal Input: 85 - 264VAC, 50/60Hz
- Regulated output, Low ripple & noise
- High efficiency up to 80%
- Output short circuit, over-current, over-voltage protection
- Plastic case, meets UL94V-0

LH15-10D0512-09 is a compact AC-DC module power supply, which has advantages such as universal input voltage, accept either AC or DC input, high efficiency, high reliability, low power consumption and high safety isolation. It offers good EMC performance, meets IEC/EN61000-4, UL60950 and EN60950 standards. The series products are widely used in industries such as industrial control, office. Note: Please refer to Design Reference when module being used in a bad EMC environment.

Selection Guide

| Part No. | Output Power | Nominal Output Voltage and Current | | Efficiency (230VAC, %/Typ.) | Max. Capacitive Load(μF) | |
|-----------------|--------------|------------------------------------|-----------|-----------------------------|--------------------------|------|
| | | (Vo1/Io1) | (Vo2/Io2) | | Vo1 | Vo2 |
| LH15-10D0512-09 | 15.8W | 5V/1000mA | 12V/900mA | 80 | 4000 | 2000 |

Input Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|---------------------------------|----------------------|----------------------------|------|------|------|
| Input Voltage Range | AC input | 85 | -- | 264 | VAC |
| | DC input | 100 | -- | 370 | VDC |
| Input frequency | | 47 | -- | 63 | Hz |
| Input current | 115VAC | -- | -- | 0.37 | A |
| | 230VAC | -- | -- | 0.22 | |
| Inrush current | 115VAC | -- | 10 | -- | |
| | 230VAC | -- | 20 | -- | |
| Leakage current | | 0.3mA RMS typ./230VAC/50Hz | | | |
| Recommended External Input Fuse | | 2A/250V, slow fusing | | | |
| Hot Plug | | Unavailable | | | |

Output Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|--------------------------|-------------------------------------|--------------------------------------|---------|------|------|
| Output Voltage Accuracy | Primary output | -- | ±2 | -- | % |
| Line Regulation | Full load | Primary output | ±0.5 | -- | |
| | | Secondary output | ±1.5 | -- | |
| Load Regulation | 10%-100% load | Isolation dual output (Balance load) | ±3 | -- | |
| | | Secondary output | ±5 | -- | |
| Ripple & Noise* | 20MHz bandwidth (peak-peak value) | -- | 50 | 100 | mV |
| Temperature Coefficient | Primary output | -- | ±0.02 | -- | %/°C |
| Short Circuit Protection | | Continuous, self-recovery | | | |
| Over-current Protection | | ≥110%Io self-recovery | | | |
| Over-voltage Protection | Primary output | 5VDC Output | ≤7.5VDC | | |
| Min. Load | Dual isolated output (Balance load) | 10 | -- | -- | % |
| Hold-up Time | 115VAC input | -- | 15 | -- | ms |
| | 230VAC input | -- | 80 | -- | |

Note: * Ripple and noise are measured by "parallel cable" method, please see AC-DC Converter Application Notes for specific operation.

General Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|-----------------------|----------------------|-------------------------------|------|------|--------|
| Isolation Voltage | Input-output | 3000 | -- | -- | VAC |
| | Output-output | 500 | -- | -- | |
| Operating Temperature | | -40 | -- | +70 | °C |
| Storage Temperature | | -40 | -- | +105 | |
| Storage Humidity | | -- | -- | 95 | %RH |
| Welding Temperature | Wave-soldering | 260 ± 5°C; time: 5 - 10s | | | |
| | Manual-welding | 360 ± 10°C; time: 3 - 5s | | | |
| Switching Frequency | | -- | 65 | -- | kHz |
| Power Derating | -40°C to -10°C | 2.0 | -- | -- | % / °C |
| | 55°C to +70°C | 3.75 | -- | -- | |
| MTBF | | MIL-HDBK-217F@25°C >300,000 h | | | |

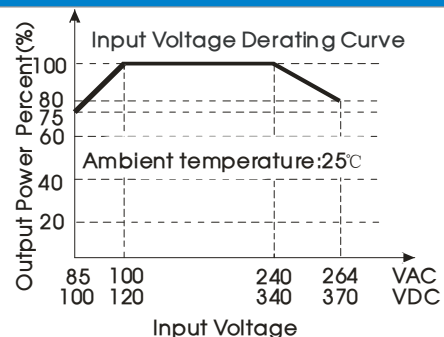
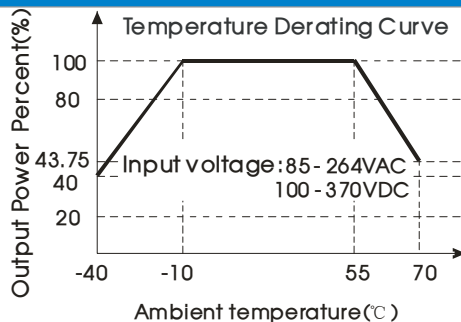
Physical Specifications

| | |
|-----------------|--|
| Casing Material | Black flame-retardant and heat-resistant plastic (UL94V-0) |
| Dimensions | 62.00*45.00*22.50 mm |
| Weight | 90g (Typ.) |
| Cooling Method | Free air convection |

EMC Specifications

| | | | | |
|---|-------|------------------|---|------------------|
| EMI | CE | CISPR22/EN55022 | CLASS B | |
| | RE | CISPR22/EN55022 | CLASS B | |
| EMS | ESD | IEC/EN61000-4-2 | Contact ±6KV / Air ±8KV | Perf. Criteria B |
| | RS | IEC/EN61000-4-3 | 10V/m | perf. Criteria A |
| | EFT | IEC/EN61000-4-4 | ±2KV | perf. Criteria B |
| | | IEC/EN61000-4-4 | ±4KV (See Fig. 2 for recommended circuit) | perf. Criteria B |
| | Surge | IEC/EN61000-4-5 | line to line ±1KV | perf. Criteria B |
| | | IEC/EN61000-4-5 | line to line ±2KV/line to ground ±4KV (See Fig. 2 for recommended circuit) | perf. Criteria B |
| | CS | IEC/EN61000-4-6 | 10Vr.m.s | perf. Criteria A |
| | PFM | IEC/EN61000-4-8 | 10A/m | 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 Input voltage should be derated based on temperature derating when it is 85-100VAC/240-264 VAC /100-120VDC/340-370 VDC;
② This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.

Design Reference

1. Typical application circuit

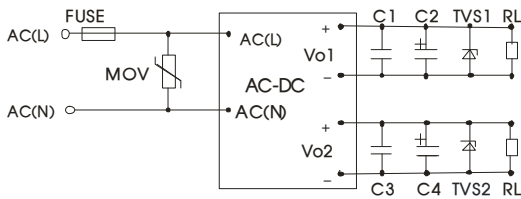


Fig. 1

| FUSE | MOV | C2(μF) | C4(μF) | TVS1 | TVS2 |
|-----------------|---------|--------|--------|----------|---------|
| 2A, slow fusing | S14K350 | 330 | 220 | SMBJ7.0A | SMBJ20A |

Note: Output filtering capacitor C2, C4 is electrolytic capacitor, it is recommended to apply electrolytic capacitor with high frequency and low resistance. For capacitance and current of capacitor please refer to manufacture's datasheet. C1, C3 is ceramic capacitor, which is used to filter high-frequency noise, recommended to use 1μF. Capacitor voltage reduced to at least 80%. TVS is a recommended component to protect post-circuits if converter fails.

2. EMC solution-recommended circuit

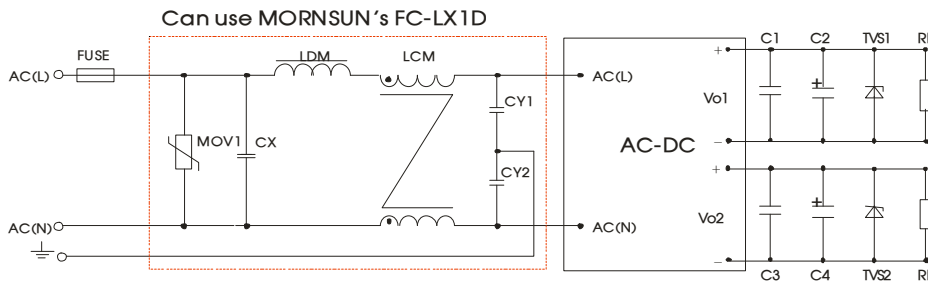


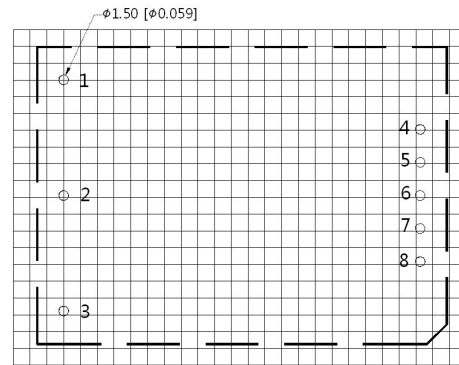
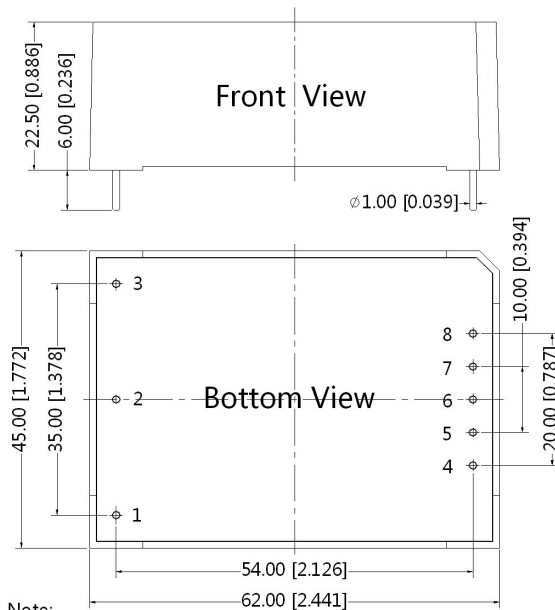
Fig 2 (Output external circuit refer to the typical application circuit)

| Element model | Recommended value |
|---------------|---|
| MOV1 | S14K350 |
| CY1, CY2 | 1000pF/400VAC |
| CX | 0.1μF/275VAC |
| LCM | 10 mH, recommended to use MORNSUN's FL2D-Z5-103 |
| LDM | 4.7μH/2A |
| FC-LX1D | 2KV/4KV EMC filter |
| FUSE | 2A/250V, slow fusing |

3. For more information Please find the application note on www.mornsun-power.com

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

| Pin-Out | |
|---------|----------|
| PIN | LH15-10D |
| 1 | No Pin |
| 2 | AC(N) |
| 3 | AC(L) |
| 4 | -Vo1 |
| 5 | +Vo1 |
| 6 | No Pin |
| 7 | -Vo2 |
| 8 | +Vo2 |

Note:
Unit:mm[inch]
Pin diameter tolerances:±0.10[±0.004]
General tolerances:±0.50[±0.020]

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58220006;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75% with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our Company's corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Specifications are subject to change without prior notice.

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