

15W, AC-DC converter



RoHS



EN62368-1

FEATURES

- 85-264 VAC and 100 - 370VDC input voltage range
- Operating ambient temperature range: -25°C to +70°C
- Output short circuit, over-current, over-voltage protection
- High reliability, regulated output, low output ripple & noise
- EMI performance meets CISPR32 / EN55032 CLASS B

LO15-10A/Dxx series is one of Mornsun's compact size power converter. It features universal AC input and at the same time accepts DC input voltage, low power consumption, high efficiency, high reliability, reinforced isolation. It offers good EMC performance compliant to IEC/EN61000-4, CISPR32/EN55032, UL/EN/IEC62368, and meets IEC/EN60335 standards. The converters are widely used in industrial, office and civil applications. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

| Certification | Part No.* | Output Power | Nominal Output Voltage and Current | | Efficiency at 230VAC (%) Typ. | Capacitive Load (μF) Max. | |
|---------------|-----------------|--------------|------------------------------------|------------|-------------------------------|---------------------------|------|
| | | | (Vo1/Io1) | (Vo2/Io2) | | Vo1 | Vo2 |
| EN | LO15-10D0512-07 | 15W | 5V/1260mA | 12V/720mA | 80 | 10000 | 1200 |
| | LO15-10D0524-05 | | 5V/720mA | 24V/480mA | 80 | 3000 | 1000 |
| | LO15-10D0505-15 | | 5V/1500mA | 5V/1500mA | 76 | 10000 | 2000 |
| | LO15-10A12 | | +12V/625mA | -12V/625mA | 79 | 2600 | 2600 |
| | LO15-10A15 | | +15V/500mA | -15V/500mA | 81 | 2400 | 2400 |

Note: *LO15-10AXX takes positive and negative output as sampling feedback; LO15-10DXX takes Vo1 as sampling feedback and is defined as the main output.

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 | -- | -- | 370 | mA |
| | 230VAC | -- | -- | 220 | |
| Inrush Current | 115VAC | -- | 20 | -- | A |
| | 230VAC | -- | 30 | -- | |
| Leakage Current | 240VAC | 0.25mA Max. | | | |
| Hot Plug | | Unavailable | | | |

Output Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit | |
|----------------------------|--|-----------------|------|------|------|----|
| Output Voltage Accuracy | Vo1 | -- | ±2 | -- | | |
| | Vo2 (LO15-10Axx) | -- | ±4 | -- | | |
| | Vo2 (LO15-10Dxx) | -- | ±6 | -- | | |
| Line Regulation | Vo1 | LO15-10D0505-15 | ±1 | -- | % | |
| | | others | ±0.5 | -- | | |
| Load Regulation | Balanced load | LO15-10Axx | ±2 | -- | | |
| | | LO15-10Dxx | Vo1 | ±1 | | -- |
| | | | Vo2 | ±4 | | -- |
| Ripple & Noise* | 20MHz bandwidth (peak-to-peak value), room temperature | Vo1 | -- | 50 | mV | |
| | | Vo2 | -- | 200 | | |
| Stand-by Power Consumption | 230VAC | -- | -- | 0.5 | W | |

| | | | | | |
|--------------------------|--------------|-----------------------------------|-------|--------------------------------|------|
| Temperature Coefficient | Vo1 | -- | ±0.02 | -- | %/°C |
| Short Circuit Protection | | Hiccup, continuous, self-recovery | | | |
| Over-current Protection | | ≥110%Io, self-recovery | | | |
| Over-voltage Protection | 5VDC output | ≤7.5V | | Output voltage hiccup or clamp | |
| | 12VDC output | ≤20V | | | |
| | 15VDC output | ≤22V | | | |
| Minimum Load | | 10 | -- | -- | % |
| Hold-up Time | 115VAC input | -- | 10 | -- | ms |
| | 230VAC input | -- | 60 | -- | |

Note: *The "Tip and barrel method" is used for ripple and noise test, with a 0.1uf ceramic capacitor & 47uf parallel capacitor, please refer to AC-DC Converter Application Notes for specific information.

General Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|--|----------------------|--|------|------|--------|
| Isolation | Input-output | 3000 | -- | -- | VAC |
| | Vo1-Vo2 (LO15-10Dxx) | 500 | -- | -- | VDC |
| Electric Strength Test for 1min., leakage current <5mA | | | | | |
| Operating Temperature | | -25 | -- | +70 | °C |
| Storage Temperature | | -25 | -- | +85 | |
| Storage Humidity | | -- | -- | 90 | %RH |
| Altitude | | -- | -- | 2000 | m |
| Power Derating | -25°C to -10°C | 1.0 | -- | -- | % / °C |
| | +50°C to +70°C | 3.0 | -- | -- | |
| | 85VAC-100VAC | 1.67 | -- | -- | %/VAC |
| Safety Standard | | EN62368-1 (Report); Design refer to UL/IEC62368-1, EN/ IEC60335-1 | | | |
| Safety Class | | CLASS II | | | |
| MTBF | | MIL-HDBK-217F@25°C >300,000 h | | | |

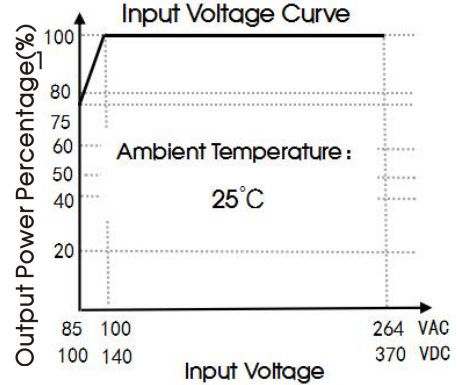
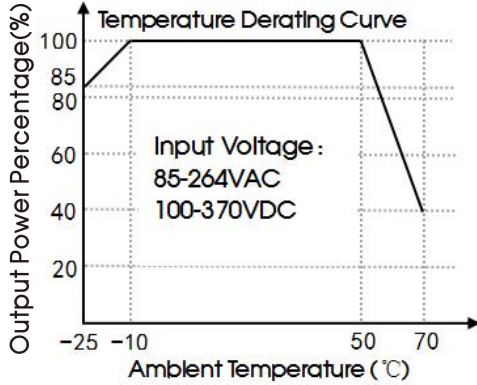
Mechanical Specifications

| | |
|----------------|-------------------------|
| Dimension | 63.50 x 45.70 x 21.00mm |
| Weight | 40g (Typ.) |
| Cooling method | Free air convection |

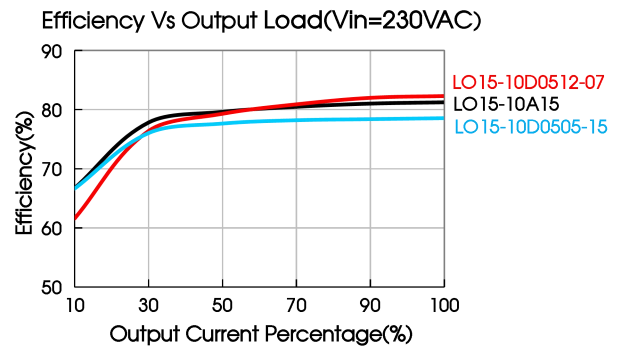
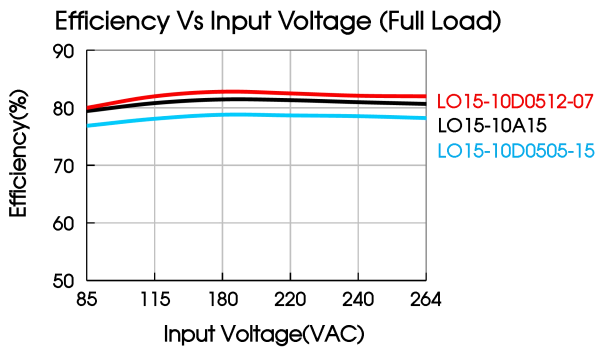
Electromagnetic Compatibility (EMC)

| Emissions | CE | CISPR32/EN55032 | CLASS B |
|-----------|---|------------------|--|
| | RE | CISPR32/EN55032 | CLASS B |
| Immunity | ESD | IEC/EN61000-4-2 | Contact ±6KV perf. Criteria B |
| | RS | IEC/EN61000-4-3 | 10V/m perf. Criteria A |
| | EFT | IEC/EN61000-4-4 | ±2KV perf. Criteria B |
| | Surge | IEC/EN61000-4-5 | line to line ±1KV perf. Criteria B |
| | CS | IEC/EN61000-4-6 | 10Vr.m.s perf. Criteria A |
| | Voltage dips, short interruption and voltage variations | IEC/EN61000-4-11 | 100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods perf. Criteria B |

Product Characteristic Curve



Note: ① With an AC input between 85-100VAC and a DC input between 100-140VDC, the output power must be derated as per temperature derating curves;
② This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.



Design Reference

1. Typical application

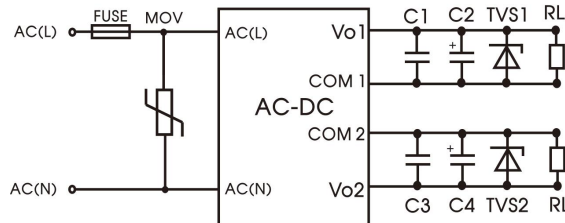


Fig. 1: Typical circuit diagram (LO15-10Axx Series)

| Part No. | FUSE | MOV | C1, C3 (μF) | C2, C4 (μF) | TVS1, TVS2 |
|------------|----------------------|---------|-------------|-------------|------------|
| LO15-10A12 | 2A/250V slow-blow | S14K300 | 0.1 | 47 | SMBJ20A |
| LO15-10A15 | | | | | SMBJ20A |

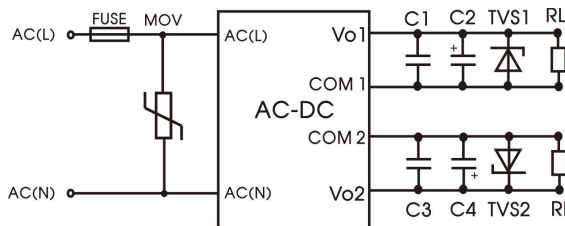


Fig. 2: Typical circuit diagram (LO15-10Dxx Series)


| Part No. | FUSE | MOV | C1, C3 (μF) | C2, C4 (μF) | TVS1 | TVS2 |
|-----------------|----------------------|---------|-------------|-------------|----------|----------|
| LO15-10D0505-15 | 2A/250V slow-blow | S14K300 | 0.1 | 47 | SMBJ7.0A | SMBJ7.0A |
| LO15-10D0512-07 | | | | | SMBJ7.0A | SMBJ20A |
| LO15-10D0524-05 | | | | | SMBJ7.0A | SMBJ30A |

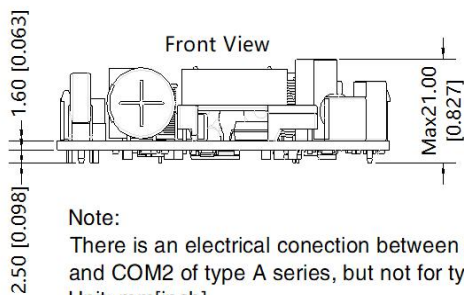
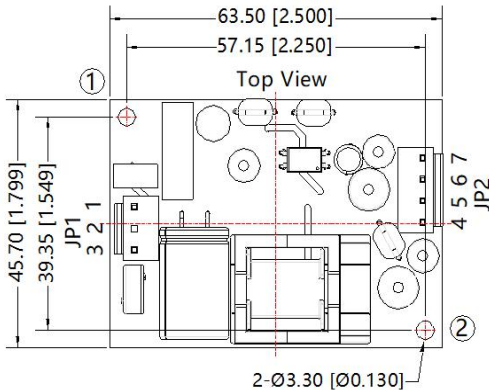
Output Filter Components:

- We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2, C4 (refer to manufacture's datasheet). C1, C3 are ceramic capacitors used for filtering high-frequency noise. Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. And TVS is a recommended suppressor diode to protect the application in case of a converter failure.
- For LO15-10Axx series, COM1 and COM2 are electrically connected, but not for LO15-10Dxx series.

2. For additional information please refer to application notes on www.mornsun-power.com.

Dimensions and Recommended Layout

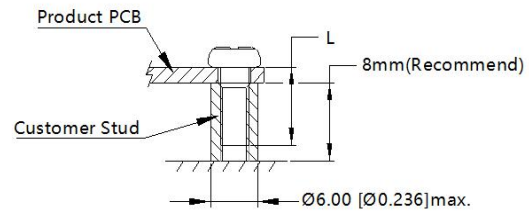
THIRD ANGLE PROJECTION 



Note:
There is an electrical connection between COM1 and COM2 of type A series, but not for type D series
Unit: mm[inch]
General tolerances: $\pm 0.50[\pm 0.020]$
The layout of the device is for reference only, please refer to the actual product

| Pin-Out | | | |
|------------|-----|--------|---|
| Connectors | Pin | Mark | Client Connectors |
| JP1 | 1 | AC(L) | Housing: JST VHR Contact: JSTSVH-21T-P1.1 or equivalent |
| | 2 | No Pin | |
| | 3 | AC(N) | |
| JP2 | 4 | Vo2 | Housing: JST VHR Contact: JSTSVH-21T-P1.1 or equivalent |
| | 5 | COM2 | |
| | 6 | COM1 | |
| | 7 | Vo1 | |

| Position | Screw Spec. | L(Recommend) | Torque(max) |
|----------|-------------|--------------|-------------|
| ① - ② | M3 | 6mm | 0.4N·m |



- Note:
- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220006;
 - 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;
 - All index testing methods in this datasheet are based on our company corporate standards;
 - 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.

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