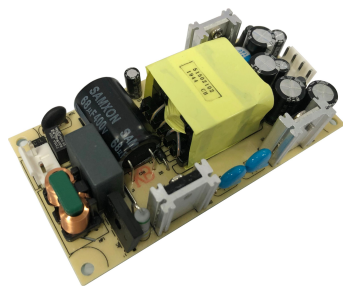


40W, AC-DC converter



CE Report EN62368-1 UK RoHS BS EN62368-1

FEATURES

- Universal 85-264VAC or 100-370VDC input voltage
- Operating ambient temperature range: -25°C to +70°C
- Output short circuit, over-current, over-voltage protection
- High efficiency, high reliability
- Regulated output, low output ripple & noise
- EMI performance meets CISPR32 / EN55032 CLASS B
- Safety according to UL/IEC62368
- 2 years warranty

LO45-10Cxx 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 and CISPR32/EN55032 and meets UL/EN/IEC62368 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) | (-Vo3/Io3) | | Vo1 | Vo2 | -Vo3 |
| EN | LO45-10C050512-20 | 40.5W | 5V/3.00A | 12V/2.00A | -5V/0.30A | 78 | 7200 | 2000 | 220 |
| | LO45-10C051212-20 | 42.6W | 5V/3.00A | 12V/2.00A | -12V/0.30A | 78 | 7200 | 2000 | 300 |
| | LO45-10C051515-16 | 43.5W | 5V/3.00A | 15V/1.60A | -15V/0.30A | 78 | 7200 | 1500 | 220 |

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 | -- | -- | 1.2 | A |
| | 230VAC | -- | -- | 0.7 | |
| Inrush Current | 115VAC | -- | 35 | -- | |
| | 230VAC | -- | 50 | -- | |
| Leakage Current | 240VAC/50Hz | 0.5mA Max. | | | |
| Hot Plug | | Unavailable | | | |

Output Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|----------------------------|--|---|-------|------|------|
| Output Voltage Accuracy | Vo1 | -- | ±2 | -- | % |
| | Vo2, -Vo3 | -- | ±10 | -- | |
| Line Regulation | Vo1 | -- | ±0.5 | -- | |
| | Vo2, -Vo3 | -- | ±1.5 | -- | |
| Load Regulation | Balanced load | Vo1 | ±2 | -- | mV |
| | | Vo2, -Vo3 | ±5 | -- | |
| Ripple & Noise* | 20MHz bandwidth (peak-to-peak value), room temperature | Vo1 | -- | 120 | |
| | | Vo2, -Vo3 | -- | 200 | |
| Stand-by Power Consumption | 230VAC | -- | -- | 0.5 | W |
| Temperature Coefficient | Vo1 | -- | ±0.02 | -- | %/°C |
| Short Circuit Protection | | Hiccup or turn off, continuous, self-recovery | | | |

| | | | | | |
|-------------------------|--------------|---|----|----|----|
| Over-current Protection | | $\geq 120\%$ Io, self-recovery | | | |
| Over-voltage Protection | 5VDC output | $\leq 7.5V$ (Output voltage hiccup clamp or turn off) | | | |
| Minimum Load | | 10 | -- | -- | % |
| Hold-up Time | 115VAC input | -- | 8 | -- | ms |
| | 230VAC input | -- | 50 | -- | |

Note: *The "parallel cable" method is used for ripple and noise test, please refer to AC-DC Converter Application Notes for specific information.

General Specifications

| Item | | Operating Conditions | Min. | Typ. | Max. | Unit |
|-----------------------|----------------|--|-------|------|------|--------|
| Isolation | Input - output | Electric Strength Test for 1min., leakage current <5mA | 3000 | -- | -- | VAC |
| Operating Temperature | | | -25 | -- | +70 | ℃ |
| Storage Temperature | | | -25 | -- | +85 | |
| Storage Humidity | | | -- | -- | 90 | %RH |
| Altitude | | | -- | -- | 2000 | m |
| Switching Frequency | | | -- | 65 | -- | kHz |
| Power Derating | | -25℃ to -10℃ | 2.0 | -- | -- | % /℃ |
| | | +50℃ to +70℃ | 2.5 | -- | -- | |
| | | 85VAC-165VAC | 0.375 | -- | -- | % /VAC |
| | | 240VAC-264VAC | 0.833 | -- | -- | |
| Safety Standard | | EN62368-1, BS EN62368-1 (Report); Design refer to UL/IEC62368-1 | | | | |
| Safety Class | | CLASS II | | | | |
| MTBF | | MIL-HDBK-217F@25℃ >300,000 h | | | | |

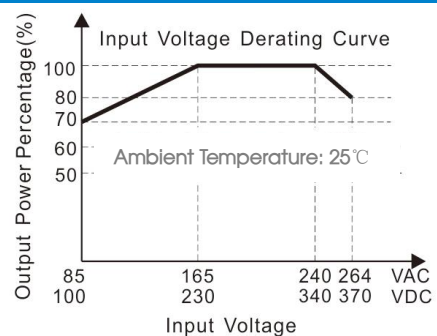
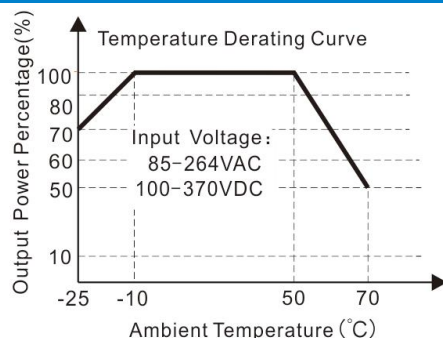
Mechanical Specifications

| | |
|----------------|---------------------------|
| Dimension | 102.00 x 51.00 x 30.00 mm |
| Weight | 105g (Typ.) |
| Cooling Method | Free air convection |

Electromagnetic Compatibility (EMC)

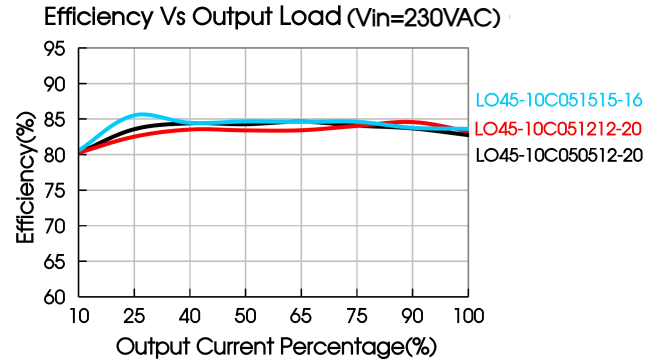
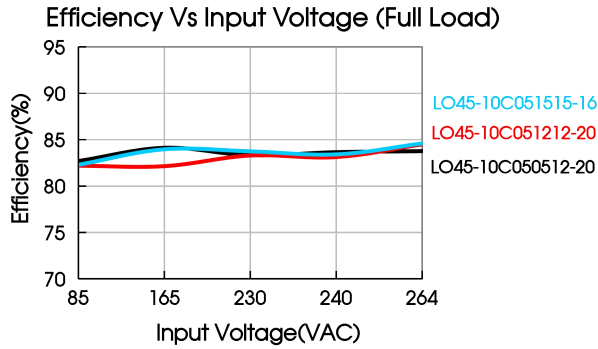
| | | | | |
|-----------|---|------------------|--|------------------|
| Emissions | CE | CISPR32/EN55032 | CLASS B | |
| | RE | CISPR32/EN55032 | CLASS B | |
| Immunity | ESD | IEC/EN61000-4-2 | Contact $\pm 6KV$ | Perf. Criteria B |
| | RS | IEC/EN61000-4-3 | 10V/m | Perf. Criteria A |
| | EFT | IEC/EN61000-4-4 | $\pm 2KV$ | Perf. Criteria B |
| | Surge | IEC/EN61000-4-5 | Line to line $\pm 1KV$ | 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 85-165VAC/240-264VAC and a DC input between 100-230VDC/340-370VDC, 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 Mornsun FAE.



Design Reference

1. Typical application

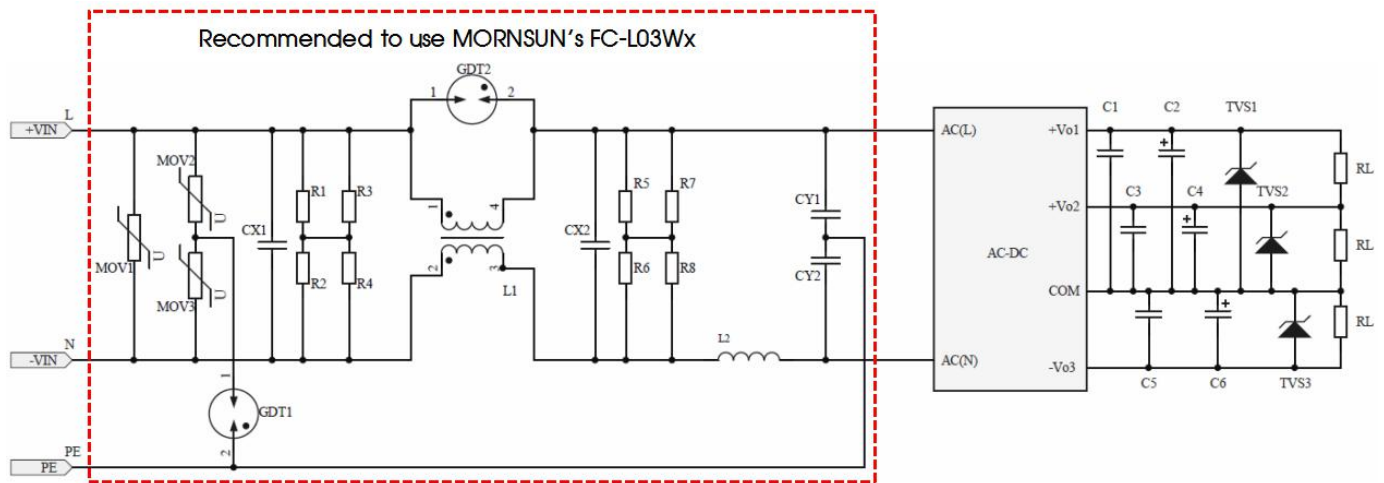


Fig. 1: Typical circuit diagram

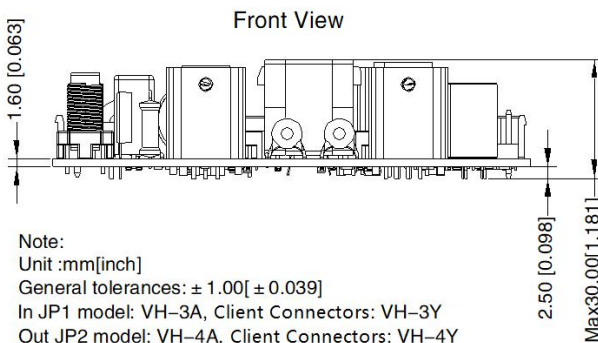
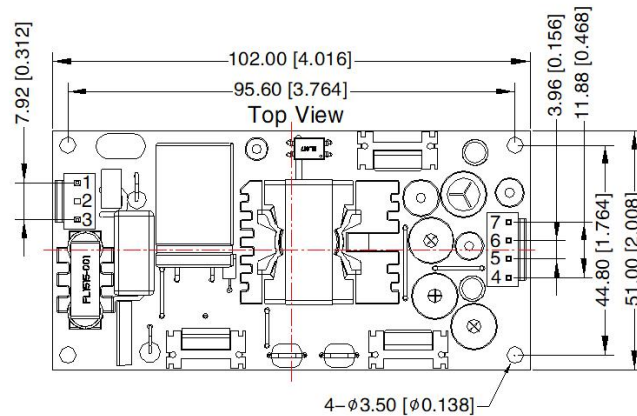
| Part no. | C1/C3/C5 | C2/C4/C6 | TVS 1 | TVS 2 | TVS 3 |
|-------------------------|----------|-----------------------|----------|---------|----------|
| LO45-10C050512-20 | 1μF/25V | 10μF/25V | SMBJ7.0A | SMBJ20A | SMBJ7.0A |
| LO45-10C051212-20 | | | SMBJ7.0A | SMBJ20A | SMBJ20A |
| LO45-10C051515-16 | | | SMBJ7.0A | SMBJ20A | SMBJ20A |
| FC-L03Wx | | | | | |
| Model | | Recommended value | | | |
| MOV1 | | 561K/6000A | | | |
| MOV2/MOV3 | | 561K/3500A | | | |
| CX1 | | 105K/310VAC | | | |
| CX2 | | 334K/310VAC | | | |
| R1/R2/R3/R4/R5/R6/R7/R8 | | 120KΩ/4W//1206 | | | |
| CY1/CY2 | | 472M/400VAC | | | |
| L1 | | Common Mode Choke 5mH | | | |
| L2 | | 2uH/12A | | | |
| GDT1 | | 3.6KV/3KA | | | |
| GDT2 | | 90V/500A/1206 | | | |

Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2, C4, C6 (refer to manufacture's datasheet). Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1, C3, C5 are ceramic capacitors used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure.

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

Dimensions and Recommended Layout



Note:
Unit :mm[inch]
General tolerances: ± 1.00 [± 0.039]
In JP1 model: VH-3A, Client Connectors: VH-3Y
Out JP2 model: VH-4A, Client Connectors: VH-4Y
Mounting hole screwing torque: Max 0.4 N · m
The layout of the device is for reference only, please refer to the actual product

THIRD ANGLE PROJECTION

| Pin-Out | | | |
|---------|-------|--|---|
| Pin | Mark | Product Connectors | Client Connectors |
| 1 | AC(L) | VH-3A or B2P3-VH or the same Spec. | VH-3Y or VHR-3N or the same Spec. |
| 2 | NoPin | | |
| 3 | AC(N) | | |
| 4 | -Vo3 | VH-4A or B4P-VH or the same Spec. | VH-4Y or VHR-4N or the same Spec. |
| 5 | COM | | |
| 6 | +Vo2 | | |
| 7 | +Vo1 | | |

Note:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220192;
- 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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