

30W AC to DC Converter PCB Mount

multicomp PRO

30W, AC-DC converter



**RoHS
Compliant**

Features

- Input voltage range: 85V AC to 305V AC and 100V DC to 430V DC
- Operating ambient temperature range: -40°C to +85°C
- Up to 90% efficiency
- No-load power consumption <0.1W
- 5000m altitude application
- EMI performance meets CISPR32/EN55032 CLASS B, EN55014
- Meets surge $\pm 2\text{KV}$ without additional circuits
- Overvoltage category OVCIII (meet EN61558)
- IEC/EN/UL62368/EN60335/EN61558 safety approval

Description

MP-LD30-23BxxR2 series AC-DC converters is one of new generation compact size power converter. It features wide 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 IEC/EN/UL62368/EN60335/EN61558 standards. The converters are widely used in industrial, power, home appliances, instrumentation, communication 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 Number | Output Power | Nominal Output Voltage and Current (Vo/Io) | Efficiency at 230V AC (%) Typ. | Capacitive Load (μF) Max. |
|---------------|-----------------|--------------|--|--------------------------------|--|
| UL/CE/CB | MP-LD30-23B03R2 | 19.8 | 3.3V/6000mA | 85 | 6600 |
| | MP-LD30-23B05R2 | 30 | 5V/6000mA | 86 | |
| | MP-LD30-23B12R2 | | 12V/2500mA | 90 | 4400 |
| | MP-LD30-23B15R2 | | 15V/2000mA | | 3300 |
| | MP-LD30-23B24R2 | 31.2 | 24V/1300mA | 88 | 1000 |
| | MP-LD30-23B48R2 | | 48V/630mA | 90 | 470 |

Input Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|---------------------|----------------------|--------------------|------|------|------|
| Input Voltage Range | AC input | 85 | -- | 305 | V AC |
| | DC input | 100 | -- | 430 | V DC |
| Input Frequency | | 47 | -- | 63 | Hz |
| Input Current | 115V AC | -- | -- | 0.75 | A |
| | 230V AC | -- | -- | 0.5 | |
| Inrush Current | 115V AC | -- | 25 | -- | |
| | 230V AC | -- | 50 | -- | |
| Leakage Current | 277V AC/50Hz | 0.1mA RMS Max. | | | |
| Built In Fuse | | 2A/300V, slow-blow | | | |
| Hot Plug | | Unavailable | | | |

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Output Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|----------------------------|---|---------------------|-----------------------------------|-------|------|------|
| Output Voltage Accuracy | 3.3V | | - | ±3 | - | % |
| | 5V/9V/12V/15V/24V/48V | | | ±2 | | |
| Line Regulation | Full load | | | ±0.5 | | |
| Load Regulation | 0%-100% load | 3.3V | | ±2 | | |
| | | 5V | | ±1.5 | | |
| | | 12V/15V/24V/48V | | ±1 | | |
| Ripple & Noise* | 20MHz bandwidth (peak-to-peak value) | 3.3V/5V/9V/12V/15V | | - | 100 | mV |
| | | 24V/48V | | 100 | 150 | |
| Stand-by Power Consumption | 230V AC | 3.3V/5V/12V/15V/24V | | 0.075 | 0.1 | W |
| | | 48V | | 0.12 | 0.15 | |
| Temperature Coefficient | | | ±0.02 | -- | %/°C | |
| Short Circuit Protection | | | Hiccup, continuous, self-recovery | | | |
| Over-current Protection | | | ≥110%Io, self-recovery | | | |
| Over-voltage Protection | 3.3VDC Output | | ≤6.3VDC (Output voltage hiccup) | | | |
| | 5VDC Output | | ≤16VDC (Output voltage hiccup) | | | |
| | 12VDC Output | | ≤16VDC (Output voltage hiccup) | | | |
| | 15VDC Output | | ≤25VDC (Output voltage hiccup) | | | |
| | 24VDC Output | | ≤35VDC (Output voltage hiccup) | | | |
| | 48VDC Output | | ≤60VDC (Output voltage hiccup) | | | |
| Minimum Load | | | 0 | - | - | % |
| Hold-up Time | 115V AC input | | - | 10 | - | ms |
| | 230V AC input | | - | 50 | - | |

Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor, please refer to AC-DC Converter Application Notes for specific information.

30W AC to DC Converter PCB Mount

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| General Specifications | | | | | | |
|------------------------|--------------|---|---|------|------|----------|
| Item | | Operating Conditions | Min. | Typ. | Max. | Unit |
| Isolation Test | Input-output | Electric Strength Test for 1min., leakage current <5mA | 4200 | - | -- | V AC |
| Insulation Resistance | Input-output | At 500V DC | 100 | | -- | MΩ |
| Operating Temperature | | | -40 | | 85 | °C |
| Storage Temperature | | | -40 | | 85 | |
| Storage Humidity | | | - | | 95 | %RH |
| Soldering 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 -25°C (<115V AC) | 1.33 | - | -- | % / °C |
| | | +50°C to +70°C | 2.5 | | -- | |
| | | +70°C to +85°C | 0.67 | | -- | |
| | | 85V AC - 100V AC | 1.33 | | -- | % / V AC |
| | | 277V AC - 305V AC | 0.72 | | | |
| | | 2000m - 5000m | 6.7 | | | |
| Safety Standard | | | IEC/EN/UL62368/EN60335/EN61558 | | | |
| Safety Certification | | | IEC/EN/UL62368/EN60335/EN61558 | | | |
| Safety Class | | | CLASS II | | | |
| Vibration | | | 10 ~ 500Hz, 5G 10min./1cycle, period for 60min. Each along X, Y, Z axes | | | |
| MTBF | | | MIL-HDBK-217F@25°C > 500,000 h | | | |

| Mechanical Specifications | | |
|---------------------------|---|-------------------|
| Case Material | Black plastic, flame-retardant and heat-resistant (UL94V-0)/Metal | |
| Dimension | DIP package | 69.5 × 39 × 24 mm |
| Weight | DIP package | 100g (Typ.) |
| Cooling method | Free air convection | |

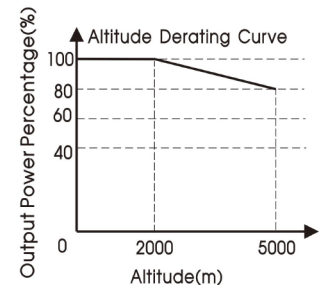
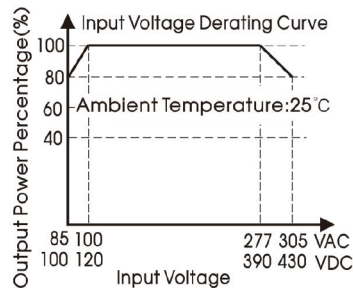
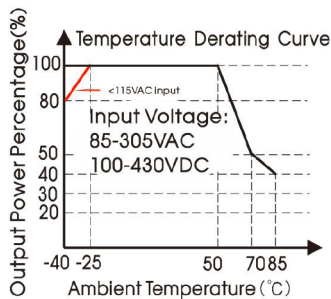
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Electromagnetic Compatibility (EMC)

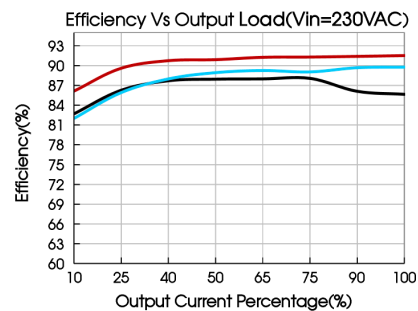
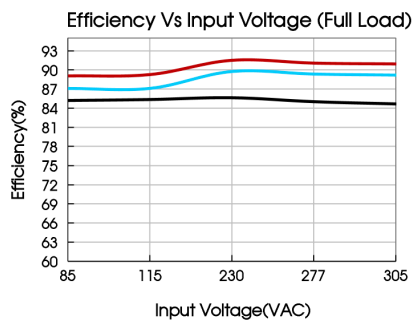
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|---|--------------------------|--|------------------|
| Emissions | CE | CISPR32/EN55032 CLASS B | |
| | RE | EN55014-1 | |
| Immunity | ESD | IEC/EN 61000-4-2 Contact $\pm 8KV$ / Air $\pm 15KV$ | Perf. Criteria A |
| | | IEC/EN55014-2 | Perf. Criteria A |
| | RS | IEC/EN61000-4-3 10V/m | Perf. Criteria A |
| | | IEC/EN55014-2 | Perf. Criteria A |
| | EFT | IEC/EN61000-4-4 $\pm 2KV$ | Perf. Criteria A |
| | | IEC/EN61000-4-4 $\pm 4KV$ (See Fig.2 for recommended circuit) | Perf. Criteria A |
| | | IEC/EN55014-2 | perf. Criteria A |
| | Surge | IEC/EN61000-4-5 line to line $\pm 2KV$ | Perf. Criteria A |
| | | IEC/EN61000-4-5 line to line $\pm 2KV$ /line to ground $\pm 4KV$ (See Fig.2 for recommended circuit) | Perf. Criteria A |
| | | IEC/EN55014-2 | Perf. Criteria A |
| | CS | IEC/EN61000-4-6 10Vr.m.s | Perf. Criteria A |
| | | IEC/EN55014-2 | Perf. Criteria A |
| Voltage dip, short interruption and voltage variation | IEC/EN61000-4-11 0%, 70% | perf. Criteria B | |
| | IEC/EN55014-2 | perf. Criteria B | |

Product Characteristic Curve



Note:

1. With an AC input between 85-100V/277-305VAC and a DC input between 100-120V/390-430VDC, 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.



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Design Reference

1. Typical application

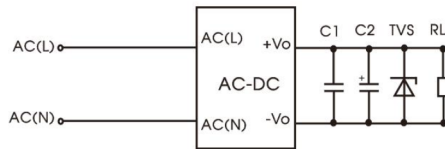


Fig. 1: Typical circuit diagram

| Part No. | C1 | C2 | TVS |
|-----------------|----------|----------|----------|
| MP-LD30-23B03R2 | 1uF/100V | 10uF/50V | SMBJ7.0A |
| MP-LD30-23B05R2 | | 10uF/50V | SMBJ7.0A |
| MP-LD30-23B12R2 | | 10uF/50V | SMBJ20A |
| MP-LD30-23B15R2 | | 10uF/50V | SMBJ20A |
| MP-LD30-23B24R2 | | 10uF/50V | SMBJ30A |
| MP-LD30-23B48R2 | | 10uF/63V | SMBJ64A |

Output Filter Components:

1. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure;
2. This circuit is recommended for indoor use.

2. EMC compliance recommended circuit

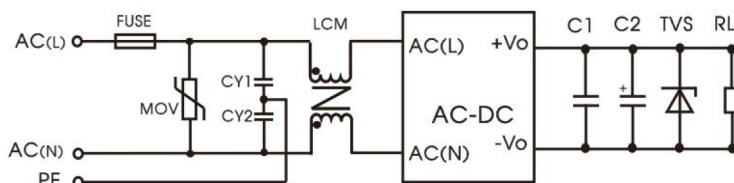


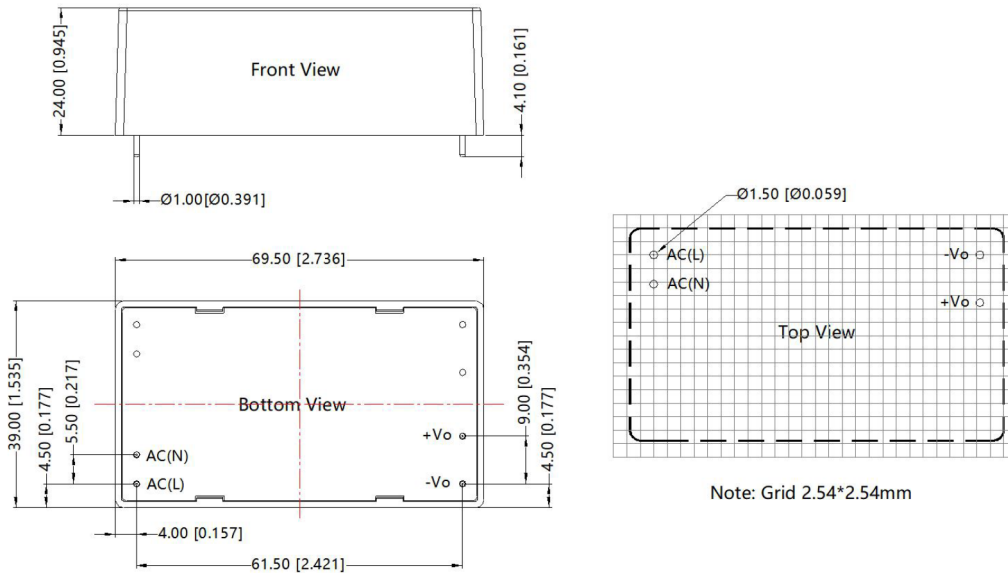
Fig 2: EMC application circuit with higher requirements

| Component | Recommended value |
|-----------|------------------------------|
| FUSE | 2A/300V, slow-blow, required |
| MOV | S14K350 |
| CY1/CY2 | 1nF/400V AC |
| LCM | 10mH |

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Dimensions and Recommended Layout



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

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