**AC/DC Converter**  
**LO03-10B12-C**

3W, AC-DC converter

**Features**
- 85 - 264V Universal AC or wide 100 - 370V DC input
- Operating ambient temperature range: -25°C ~ +70°C
- High I/O isolation test voltage up to 3000VAC
- Output short circuit, over-current protection
- High efficiency, high reliability
- Regulated output, low ripple & noise
- EMI performance meets CISPR32 / EN55032 CLASS B
- 2 years warranty

**LO03-10B12-C** 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 IEC/EN/UL62368 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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LO03-10B12-C</td>
<td>3W</td>
<td>12V/250mA</td>
<td>75</td>
<td>1000</td>
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</table>

### Input Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Operating Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage Range</td>
<td>AC Input</td>
<td>85</td>
<td>--</td>
<td>264</td>
<td>VAC</td>
</tr>
<tr>
<td></td>
<td>DC Input</td>
<td>100</td>
<td>--</td>
<td>370</td>
<td>VDC</td>
</tr>
<tr>
<td>Input Frequency</td>
<td></td>
<td>47</td>
<td>--</td>
<td>63</td>
<td>Hz</td>
</tr>
<tr>
<td>Input Current</td>
<td>115VAC</td>
<td>--</td>
<td>--</td>
<td>90</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td>230VAC</td>
<td>--</td>
<td>--</td>
<td>55</td>
<td>mA</td>
</tr>
<tr>
<td>Inrush Current</td>
<td>115VAC</td>
<td>--</td>
<td>10</td>
<td>--</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>230VAC</td>
<td>--</td>
<td>20</td>
<td>--</td>
<td>A</td>
</tr>
<tr>
<td>Leakage Current</td>
<td>240VAC/50Hz</td>
<td>--</td>
<td>0.25mA RMS Max.</td>
<td></td>
<td></td>
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<tr>
<td>Recommended External Input Fuse</td>
<td></td>
<td></td>
<td>1A/250V slow-blow required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot Plug</td>
<td></td>
<td></td>
<td>Unavailable</td>
<td></td>
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### Output Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Operating Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Voltage Accuracy</td>
<td></td>
<td>--</td>
<td>±5</td>
<td>--</td>
<td>%</td>
</tr>
<tr>
<td>Line Regulation</td>
<td>Full load</td>
<td>--</td>
<td>±2.5</td>
<td>--</td>
<td>%</td>
</tr>
<tr>
<td>Load Regulation</td>
<td>10% to 100% Load</td>
<td>--</td>
<td>±5</td>
<td>--</td>
<td>%</td>
</tr>
<tr>
<td>Ripple &amp; Noise*</td>
<td>20MHz bandwidth (peak-to-peak value)</td>
<td>--</td>
<td>100</td>
<td>200</td>
<td>mV</td>
</tr>
<tr>
<td>Stand-by Power Consumption</td>
<td></td>
<td>--</td>
<td>--</td>
<td>0.5</td>
<td>W</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td></td>
<td>--</td>
<td>±0.02</td>
<td>--</td>
<td>%/°C</td>
</tr>
<tr>
<td>Short Circuit Protection</td>
<td></td>
<td></td>
<td>Hiccup, continuous, self-recovery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over-current Protection</td>
<td></td>
<td></td>
<td>≥150%, self-recovery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Load</td>
<td></td>
<td>10</td>
<td>--</td>
<td>--</td>
<td>%</td>
</tr>
<tr>
<td>Hold-up Time</td>
<td>115VAC input</td>
<td>--</td>
<td>5</td>
<td>--</td>
<td>ms</td>
</tr>
<tr>
<td></td>
<td>230VAC input</td>
<td>--</td>
<td>20</td>
<td>--</td>
<td>ms</td>
</tr>
</tbody>
</table>

Note: *The "tip and barrel method" is used for ripple and noise test, please refer to AC-DC Converter Application Notes for specific information.*
### General Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Operating Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
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</thead>
<tbody>
<tr>
<td>Isolation</td>
<td>Input-Output</td>
<td>3000</td>
<td>--</td>
<td>--</td>
<td>VAC</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td></td>
<td>-25</td>
<td>--</td>
<td>+70</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td></td>
<td>-25</td>
<td>--</td>
<td>+85</td>
<td></td>
</tr>
<tr>
<td>Storage Humidity</td>
<td></td>
<td>--</td>
<td>--</td>
<td>90</td>
<td>%RH</td>
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<tr>
<td>Soldering Temperature</td>
<td>Wave-soldering</td>
<td>260 ± 5°C; time: 5 - 10s</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Manual-welding</td>
<td>360 ± 10°C; time: 3 - 5s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching Frequency</td>
<td></td>
<td>--</td>
<td>--</td>
<td>1.0 - 120</td>
<td>kHz</td>
</tr>
<tr>
<td>Power Derating</td>
<td>-25°C ~ -10°C</td>
<td>1.0</td>
<td>--</td>
<td>--</td>
<td>%/°C</td>
</tr>
<tr>
<td></td>
<td>+50°C ~ +70°C</td>
<td>3.0</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>85VAC - 100VAC</td>
<td>1.67</td>
<td>--</td>
<td>--</td>
<td>%/VAC</td>
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<tr>
<td>Safety Standard</td>
<td></td>
<td>IEC62368/UL62368/EN62368</td>
<td></td>
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<tr>
<td>Safety Class</td>
<td></td>
<td>CLASS II</td>
<td></td>
<td></td>
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<tr>
<td>MTBF</td>
<td></td>
<td>MIL-HDBK-217F@25°C &gt; 300,000 h</td>
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</tbody>
</table>

### Mechanical Specifications

- **Dimension**: 41.00 x 18.00 x 20.00 mm
- **Weight**: 10g (typ.)
- **Cooling method**: Free air convection

### Electromagnetic Compatibility (EMC)

<table>
<thead>
<tr>
<th>Emissions</th>
<th>CE</th>
<th>CISPR32/EN55032</th>
<th>CLASS B (Input Voltage Range 200 - 240VAC)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>RE</td>
<td>CISPR32/EN55032</td>
<td>CLASS B (Input Voltage Range 200 - 240VAC)</td>
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<tr>
<td></td>
<td>ESD</td>
<td>IEC/EN61000-4-2</td>
<td>Contact ±6 KV</td>
</tr>
<tr>
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<td>RS</td>
<td>IEC/EN61000-4-3</td>
<td>10V/m</td>
</tr>
<tr>
<td></td>
<td>EFT</td>
<td>IEC/EN61000-4-4</td>
<td>± 2KV</td>
</tr>
<tr>
<td></td>
<td>Surge</td>
<td>IEC/EN61000-4-5</td>
<td>line to line ±1 KV</td>
</tr>
<tr>
<td></td>
<td>CS</td>
<td>IEC/EN61000-4-6</td>
<td>10Vt.m.s</td>
</tr>
<tr>
<td></td>
<td>Voltage dips, short interruption and voltage variations</td>
<td>IEC/EN61000-4-11</td>
<td>0%, 70%</td>
</tr>
</tbody>
</table>

### Product Characteristic Curve

- **Temperature Derating Curve**
  - Input Voltage: 85 - 264VAC
  - 100 - 370VDC

- **Input Voltage Derating Curve**
  - Ambient temperature: 25°C

**Note:**
1. With an AC input between 85-100VAC and a DC input between 100-120VDC, 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

![Typical circuit diagram](image)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>C1(µF)</th>
<th>C2(µF)</th>
<th>FUSE</th>
<th>MOV</th>
<th>TVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LO03-10B12-C</td>
<td>1</td>
<td>120</td>
<td>1A/250V slow-blow required</td>
<td>S14K300</td>
<td>SMBJ20A</td>
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</tbody>
</table>

Output Filter Components:
We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacturer’s datasheet). Choose a Capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. 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. For additional information please refer to application notes on [www.mornsun-power.com](http://www.mornsun-power.com).
Dimensions and Recommended Layout

Note:
- Unit: mm [inch]
- Connect pin size: ±0.64±0.045
- Pin section tolerances: ±0.10±0.004
- General tolerances: ±0.50±0.020

Pin-Out

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AC(N)</td>
<td>3</td>
<td>+Vo</td>
</tr>
<tr>
<td>2</td>
<td>AC(L)</td>
<td>4</td>
<td>-Vo</td>
</tr>
</tbody>
</table>

Note:
1. For additional information on Product Packaging please refer to www.mornsun-power.com, Packaging bag number: 58220058;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75% with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations; see "Features" and "EMC";
6. 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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