AC/DC Converter
LO10-24BxxK Series

Ultra wide input voltage range switched-mode power supply for electric-meter

**Features**
- Wide input voltage range: 30~280VAC/30~400VDC
- Output short circuit, over-voltage protections
- High efficiency, high reliability, low ripple & noise, low standby power consumption
- Long-life low-impedance electrolytic capacitors
- Gild pin, customized available

LO10-24BxxK — is designed for electric-meter application and operates over a very wide input voltage range: 30-280V/30-400VDC, single output. The isolation voltage is 4000VAC between input and output. The product meets IEC/EN61000. So it supplies with the requirement of high isolation voltage and rigorous EMC.

### Selection Guide

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Output Power</th>
<th>Nominal Output Voltage and Current(Vo/Io)</th>
<th>Efficiency (220VAC, %/Typ.)</th>
<th>Max. Capacitive Load (µF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LO10-24B05K</td>
<td>6W</td>
<td>5V/1200mA</td>
<td>71</td>
<td>6000</td>
</tr>
<tr>
<td>LO10-24B12K</td>
<td>6.6W</td>
<td>12V/550mA</td>
<td>77</td>
<td>2000</td>
</tr>
<tr>
<td>LO10-24B13K</td>
<td>6.5W</td>
<td>13V/500mA</td>
<td>77</td>
<td>1500</td>
</tr>
</tbody>
</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>30</td>
<td></td>
<td>280</td>
<td>VAC</td>
</tr>
<tr>
<td></td>
<td>DC Input</td>
<td>30</td>
<td></td>
<td>400</td>
<td>VDC</td>
</tr>
<tr>
<td>Input Frequency</td>
<td></td>
<td>47</td>
<td></td>
<td>440</td>
<td>Hz</td>
</tr>
<tr>
<td>Input Current</td>
<td>115VAC</td>
<td></td>
<td></td>
<td>0.3</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>220VAC</td>
<td></td>
<td></td>
<td>0.1</td>
<td>A</td>
</tr>
<tr>
<td>Inrush Current</td>
<td>115VAC</td>
<td></td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>220VAC</td>
<td></td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot Plug</td>
<td></td>
<td></td>
<td></td>
<td>Unavailable</td>
<td></td>
</tr>
</tbody>
</table>

### 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>±1</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Line Regulation</td>
<td>Full load</td>
<td></td>
<td>±0.5</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Load Regulation</td>
<td>10%-100% load</td>
<td></td>
<td>±1</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Ripple &amp; Noise*</td>
<td>20MHz bandwidth (peak-peak value)</td>
<td></td>
<td>130</td>
<td>mV</td>
<td></td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td></td>
<td></td>
<td>±0.02</td>
<td>%/°C</td>
<td></td>
</tr>
<tr>
<td>Stand-by Power Consumption</td>
<td></td>
<td></td>
<td>0.2</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>Short Circuit Protection</td>
<td></td>
<td></td>
<td></td>
<td>Hiccup, continuous, self-recovery</td>
<td></td>
</tr>
<tr>
<td>Over-voltage Protection</td>
<td>LO10-24B05K</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Feedback-clamp) Voltage limited ≤7.5V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LO10-24B12K/LO10-24B13K</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Feedback-clamp) Voltage limited ≤15V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. Load</td>
<td>10</td>
<td></td>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Starting Time</td>
<td>220VAC input, Io=100%</td>
<td></td>
<td>50</td>
<td>ms</td>
<td></td>
</tr>
<tr>
<td>Hold-up Time</td>
<td>220VAC input, Io=100%</td>
<td></td>
<td>200</td>
<td>ms</td>
<td></td>
</tr>
</tbody>
</table>

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

### General 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>Isolation Voltage</td>
<td>Input-output</td>
<td>4000</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>
</tbody>
</table>
AC/DC Converter
LO10-24BxxK Series

Storage Humidity
---
---
90
%

Altitude
Operating altitude
---
---
3000
m

Storage altitude
---
---
3000
m

Welding Temperature
Wave-soldering
260±5°C; time: 5~10s

Manual-welding
360±10°C; time: 3~5s

Switching Frequency
---
60
---
KHz

Power Derating
-25°C~10°C
3.3
---
---
%

Leakage current(mA)
0.3Typ @Vin=220Vac

Safety Standard
IEC60950

Safety Class
CLASS II

MTBF
MIL-HDBK-217F@25°C > 300,000 h

Physical Specifications

Dimension
80.00*40.00*30.00 mm

Weight
55g (Typ.)

Cooling Method
Free convection

EMC Specifications

EMI
CE
CISPR22/EN55022, CLASS B

RE
CISPR22/EN55022, CLASS B

ESD
IEC/EN61000-4-2 ±6KV/8KV

RS
IEC/EN61000-4-3 10V/m

EFT
IEC/EN61000-4-4 ±4KV

Surge
IEC/EN61000-4-5 ±2KV

CS
IEC/EN61000-4-6 10 Vr.m.s

PFM
IEC/EN61000-4-8 10A/m

Voltage dips, short interruptions and voltage variations immunity
IEC/EN61000-4-11 0%-70%

Product Characteristic Curve

Note: ① Input voltage should be derated based on temperature derating when it is 30~50VAC/30~70VDC;
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

![Circuit Diagram]

Fig. 1

Note: Output filtering capacitor C2 is electrolytic capacitor. It is recommended to use high frequency and low impedance electrolytic capacitor. Capacitor withstand voltage derating should be 80% or above. C1 is ceramic capacitor, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails.

2. For more information about Mornsun EMC Filter products, please visit [www.mornsun-power.com](http://www.mornsun-power.com) to download the Selection Guide of EMC Filter

Dimensions and Recommended Layout

![Dimension Diagram]

Note: Grid: 2.54*2.54mm

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from [www.mornsun-power.com](http://www.mornsun-power.com). Packing bag number: 58220010;
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 Ta=25 °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. The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
6. We can provide product customization service;
7. Specifications are subject to change without prior notice.

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