AC/DC 35W Enclosed Switching Power Supply
LM35-20Bxx Series

FEATURES
- Universal 85 - 264VAC or 120 - 373VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -30°C ~ +70°C
- Low standby power consumption, high efficiency
- High I/O isolation test voltage up to 4000VAC
- Low ripple & noise
- Output short circuit, over-current, over-voltage protection
- Safety according to IEC/EN/UL62368, EN60335, GB4943
- Withstand 300VAC surge input for 5s
- Over-voltage class III (designed to meet EN61558)
- Operating altitude up to 5000m

LM35-20Bxx series is one of Mornsun’s enclosed AC-DC switching power supply. It features universal AC input and at the same time accepts DC input voltage, cost-effective, low no load power consumption, high efficiency and high reliability. These converters offer excellent EMC performance and meet IEC/EN61000-4, CISPR32/EN55032, IEC/UL/EN62368, EN60335, GB4943 standards and they are widely used in areas of industrial, LED, street light control, electricity, security, telecommunications, smart home etc.

Selection Guide

<table>
<thead>
<tr>
<th>Certification</th>
<th>Part No.</th>
<th>Output Power(W)</th>
<th>Nominal Output Voltage and Current (Vo/Lo)</th>
<th>Output Voltage Adjustable Range(V)</th>
<th>Efficiency at 230VAC (%) Typ.</th>
<th>Max. Capacitive Load (µF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE, CCC</td>
<td>LM35-20B05</td>
<td>35</td>
<td>5V/7A</td>
<td>4.5-5.5</td>
<td>82</td>
<td>8000</td>
</tr>
<tr>
<td></td>
<td>LM35-20B12</td>
<td>36</td>
<td>12V/3A</td>
<td>10.2-13.8</td>
<td>86</td>
<td>1500</td>
</tr>
<tr>
<td></td>
<td>LM35-20B15</td>
<td></td>
<td>15V/2.4A</td>
<td>13.5-18</td>
<td>87</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>LM35-20B24</td>
<td></td>
<td>24V/1.5A</td>
<td>21.6-28.8</td>
<td>88</td>
<td>750</td>
</tr>
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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>120</td>
<td>--</td>
<td>373</td>
<td>VDC</td>
</tr>
<tr>
<td>Input Voltage 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>0.8</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>230VAC</td>
<td>--</td>
<td>--</td>
<td>0.4</td>
<td>A</td>
</tr>
<tr>
<td>Inrush Current</td>
<td>115VAC</td>
<td>--</td>
<td>30</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>230VAC</td>
<td>--</td>
<td>45</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>leakage current</td>
<td>240VAC</td>
<td>--</td>
<td>&lt;0.75mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot Plug</td>
<td></td>
<td></td>
<td>Unavailable</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>Full load range</td>
<td>5V</td>
<td>--</td>
<td>±2</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>12V/15V/24V</td>
<td>--</td>
<td>±1</td>
<td>--</td>
<td>%</td>
</tr>
<tr>
<td>Line Regulation</td>
<td>Rated load</td>
<td>--</td>
<td>±0.5</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Load Regulation</td>
<td>0% - 100% load</td>
<td>5V</td>
<td>--</td>
<td>±1</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>12V/15V/24V</td>
<td>--</td>
<td>±0.5</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Ripple &amp; Noise*</td>
<td>20MHz bandwidth</td>
<td>5V</td>
<td>--</td>
<td>80</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td>(peak-to-peak value)</td>
<td>12V/15V</td>
<td>--</td>
<td>120</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td>24V</td>
<td>--</td>
<td>180</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td></td>
<td>--</td>
<td>±0.03</td>
<td>--</td>
<td>%/°C</td>
</tr>
</tbody>
</table>
AC/DC 35W Enclosed Switching Power Supply
LM35-20Bxx Series

Minimum Load | 0 | -- | -- | %
Stand-by Power Consumption | -- | -- | 0.3 | W
Hold-up Time | 115VAC | 12 | -- | -- | ms
230VAC | 30 | -- | -- |
Short Circuit Protection | Recovery time <5s after the short circuit disappear.
Over-current Protection | 5V | $\leq$ | 6.3VDC (Clamping protection)
12V | $\leq$ | 16.2VDC (Clamping protection)
15V | $\leq$ | 21.75VDC (Clamping protection)
24V | $\leq$ | 33.6VDC (Clamping protection)

Over-voltage Protection

| 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>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation Test</td>
<td>Electric strength test for 1min., leakage current &lt;10mA</td>
<td>2000</td>
<td>--</td>
<td>--</td>
<td>VAC</td>
</tr>
<tr>
<td></td>
<td>Input-output</td>
<td>4000</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Output</td>
<td>1250</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>At 500VDC</td>
<td>50</td>
<td>--</td>
<td>--</td>
<td>MΩ</td>
</tr>
<tr>
<td></td>
<td>Input - output</td>
<td>50</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Output</td>
<td>50</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-30</td>
<td>--</td>
<td>+70</td>
<td>℃</td>
<td></td>
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<tr>
<td>Storage Temperature</td>
<td>-40</td>
<td>--</td>
<td>+85</td>
<td></td>
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<tr>
<td>Storage Humidity</td>
<td>Non-condensing</td>
<td>--</td>
<td>--</td>
<td>95</td>
<td>%RH</td>
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<tr>
<td>Switching Frequency</td>
<td>65</td>
<td>kHz</td>
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<td></td>
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<tr>
<td>Power Derating</td>
<td>Operating temperature derating</td>
<td>-30℃ ~ -25℃</td>
<td>85VAC-100VAC</td>
<td>5</td>
<td>%/℃</td>
</tr>
<tr>
<td></td>
<td>+50℃ ~ +70℃</td>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Input voltage derating</td>
<td>85VAC-100VAC</td>
<td>1.33</td>
<td>%/VAC</td>
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<tr>
<td>Safety Standard</td>
<td>Meet IEC/EN/UL62368, EN60335, GB4943</td>
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<tr>
<td>Safety Class</td>
<td>CLASS I</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>MTBF</td>
<td>MIL-HDBK-217F@25℃</td>
<td>&gt;300,000 h</td>
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</table>

Mechanical Specifications

| Case Material | Metal (AL1100, SGCC) |
| Dimensions | 99.00 x 82.00 x 30.00 mm |
| Weight | 180g (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</th>
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<tbody>
<tr>
<td>RE</td>
<td>CISPR32/EN55032</td>
<td>CLASS B</td>
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<tr>
<td>Harmonic current</td>
<td>IEC/EN61000-3-2</td>
<td>CLASS A</td>
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<tr>
<td>ESD</td>
<td>IEC/EN 61000-4-2</td>
<td>Contact ±6KV / Air ±8KV</td>
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<tr>
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<td>Perf. Criteria A</td>
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<tr>
<td>RS</td>
<td>IEC/EN 61000-4-3</td>
<td>10V/m</td>
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<td></td>
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<td>perf. Criteria A</td>
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<tr>
<td>EFT</td>
<td>IEC/EN 61000-4-4</td>
<td>±2KV</td>
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<td>perf. Criteria A</td>
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<tr>
<td>Surge</td>
<td>IEC/EN 61000-4-5</td>
<td>line to line ±2KV/line to ground ±4KV</td>
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<td>perf. Criteria A</td>
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<tr>
<td>CS</td>
<td>IEC/EN61000-4-6</td>
<td>10 V.t.m.s</td>
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<td>perf. Criteria A</td>
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<tr>
<td>Voltage dips, short interruptions and voltage variations immunity</td>
<td>IEC/EN61000-4-11</td>
<td>0%, 70%</td>
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<tr>
<td></td>
<td></td>
<td>perf. Criteria B</td>
<td></td>
</tr>
</tbody>
</table>
Product Characteristic Curve

Note: ① With an input voltage between 85 - 100VAC and a DC input between 120 - 140VDC the output power must be derated as per the temperature derating curves;
② This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.

Dimensions and Recommended Layout

Pin-Out

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AC(L)</td>
</tr>
<tr>
<td>2</td>
<td>AC(N)</td>
</tr>
<tr>
<td>3</td>
<td>-Vo</td>
</tr>
<tr>
<td>5</td>
<td>+Vo</td>
</tr>
</tbody>
</table>

Note:
Unit: mm [inch]
Wire range: 22-12AWG
Tightening torque: M4, 1.2N.m
General tolerances: ±1.00 [±0.039]
Note:
1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220067;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
3. The room temperature derating of 5℃/1000m is needed for operating altitude greater than 2000m;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations; see “Features” and “EMC”;
8. The out case needs to be connected to PE of system when the terminal equipment in operating;
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.