AC/DC Converter
Marine power supply: LI150-13B29

150W AC-DC switching power supply
High insulation and ultra-wide AC or DC input

**FEATURES**
- High reliability power supply, specifically designed for Marine Installations (On or Off shore) and electrical gas system
- Ultra-wide 85 - 305V AC and 100 - 430V DC input voltage range
- High isolation test voltages: 3000VAC Input to Output and 1500VAC Input to Ground
- Input undervoltage and overvoltage protection
- Output overvoltage, short circuit and overcurrent protection
- Meets requirements of new salt mist / corrosion standard
- Industrial ambient temperature range: -25°C to +70°C

LI150-13B29 is one of the first MORNSUN power converters for Marine type applications. This product is designed and developed specifically for shipborne satellite communication, navigation and positioning equipment and similar offshore and onshore applications and systems. The converter has such a wide input voltage range that it can easily handle the 220VAC voltage supply of the ship, even when it becomes unstable and reliably provide the applications with stable power. This product offers a high level of insulation, a full set of protection features, high efficiency and excellent EMC performance.

### Selection Guide

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Output Power</th>
<th>Nominal Output Voltage and Current(Vo/Io)</th>
<th>Efficiency (230VAC, %/Typ.)</th>
<th>Max. Capacitive Load (uF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LI150-13B29</td>
<td>150.8W</td>
<td>29V/5.2A</td>
<td>85</td>
<td>4000</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>85</td>
<td>--</td>
<td>305</td>
<td>VAC</td>
</tr>
<tr>
<td></td>
<td>DC input</td>
<td>100</td>
<td>--</td>
<td>430</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>3.0</td>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>230VAC</td>
<td>--</td>
<td>1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inrush Current</td>
<td>115VAC</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>230VAC</td>
<td>--</td>
<td>40</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Input Under-voltage Protection</td>
<td>Underpressure protection point</td>
<td>65</td>
<td>--</td>
<td>--</td>
<td>VAC</td>
</tr>
<tr>
<td></td>
<td>Underpressure release point</td>
<td>--</td>
<td>--</td>
<td>84</td>
<td></td>
</tr>
<tr>
<td>Input Over-voltage Protection</td>
<td>Overpressure protection point</td>
<td>--</td>
<td>--</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overpressure release point</td>
<td>290</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Hot Plug</td>
<td></td>
<td>Unavailable</td>
<td></td>
<td></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>-2.0</td>
<td>--</td>
<td>+4.0</td>
<td>%</td>
</tr>
<tr>
<td>Line Regulation</td>
<td>Full load</td>
<td>--</td>
<td>±1.0</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Load Regulation</td>
<td>Rated Input Voltage</td>
<td>--</td>
<td>±2.0</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Low Ripple &amp; Noise</td>
<td>20MHz bandwidth (peak-to-peak value)</td>
<td>--</td>
<td>--</td>
<td>200</td>
<td>mV</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td></td>
<td>--</td>
<td>±0.1</td>
<td>--</td>
<td>%/°C</td>
</tr>
<tr>
<td>Stand-by Power Consumption</td>
<td></td>
<td>--</td>
<td>--</td>
<td>2.0</td>
<td>W</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-current Protection</td>
<td></td>
<td></td>
<td></td>
<td>≥110% Io, After the overflow exception is lifted self-recovery</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Over-voltage Protection</th>
<th>≤35V, output clamped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Load</td>
<td>0</td>
</tr>
<tr>
<td>Hold-up Time</td>
<td>230VAC - 35 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>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation Test</td>
<td>Electric strength test for 1min., leakage current &lt;5mA</td>
<td>--</td>
<td>3000</td>
<td>--</td>
<td>VAC</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-25°C -- +70°C</td>
<td>--</td>
<td>--</td>
<td>+85</td>
<td>℃</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-25°C -- +85°C</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>℃</td>
</tr>
<tr>
<td>Storage Humidity</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>95%</td>
<td>%RH</td>
</tr>
<tr>
<td>Welding Temperature</td>
<td>Wave-soldering</td>
<td>260 ± 5°C; time: 5 - 10s</td>
<td></td>
<td></td>
<td></td>
</tr>
<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>65</td>
<td>--</td>
<td>kHz</td>
</tr>
<tr>
<td>Power Derating</td>
<td>Operating temperature derating</td>
<td>+50°C to +70°C</td>
<td>2.5</td>
<td>--</td>
<td>%/℃</td>
</tr>
<tr>
<td></td>
<td>Input voltage derating 85VAC-100VAC</td>
<td>1.3</td>
<td>--</td>
<td>--</td>
<td>%/VAC</td>
</tr>
<tr>
<td>Safety Class</td>
<td></td>
<td>CLASS I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt Spray Test</td>
<td></td>
<td>IEC 60068-2-52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTBF</td>
<td></td>
<td>MIL-HDBK-217F@25°C</td>
<td>&gt;300,000 h</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Physical Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Material</td>
<td>Metal</td>
</tr>
<tr>
<td>Dimensions</td>
<td>35.50 x 132.00 x 149.00mm</td>
</tr>
<tr>
<td>Weight</td>
<td>1100g (Typ.)</td>
</tr>
<tr>
<td>Cooling Method</td>
<td>Free air convection</td>
</tr>
</tbody>
</table>

### EMC Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emissions</td>
<td>CE: CISPR32/EN55032 CLASS A</td>
</tr>
<tr>
<td></td>
<td>RE: CISPR32/EN55032 CLASS A</td>
</tr>
<tr>
<td>Immunity</td>
<td>ESD: IEC/EN61000-4-2 Contact ±6KV/Alr ±8KV; Perf. Criteria B</td>
</tr>
<tr>
<td></td>
<td>RS: IEC/EN61000-4-3 10V/m; perf. Criteria A</td>
</tr>
<tr>
<td></td>
<td>EFT: IEC/EN61000-4-4 ±4KV; perf. Criteria B</td>
</tr>
<tr>
<td></td>
<td>Surge: IEC/EN61000-4-5 line to line ±2KV/line to ground ±4KV; perf. Criteria B</td>
</tr>
<tr>
<td></td>
<td>CS: IEC/EN61000-4-6 10 Vt.m.s; perf. Criteria A</td>
</tr>
<tr>
<td></td>
<td>Voltage dips, short interruptions and voltage variations immunity: IEC/EN61000-4-11 0%, 70%; perf. Criteria B</td>
</tr>
</tbody>
</table>

### Product Characteristic Curve

**Temperature Derating Curve**

- Input Voltage: 85 - 305VAC
- 100 - 430VDC

**Input Voltage Derating Curve**

- Ambient temperature: 25°C

Note: ① With an AC input voltage 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’s.
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**Design Reference**

1. Typical application circuit

![Typical application circuit](image)

<table>
<thead>
<tr>
<th>Model</th>
<th>C1(μF)</th>
<th>C2(μF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LI150-13B29</td>
<td>0.1</td>
<td>10</td>
</tr>
</tbody>
</table>

2. For more information, please find the application note on [www.mornsun-power.com](http://www.mornsun-power.com)

**Dimensions and Recommended Layout**

![Dimensions and Layout](image)

Note:
1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220061;
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%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations; see "Features" and "EMC";
7. 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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