50W Single Output Switching Power Supply

LRS-50 series

- **Features**
  - Universal AC input / Full range
  - Withstand 300VAC surge input for 5 second
  - No load power consumption<0.2W
  - Miniature size and 1U low profile
  - High operating temperature up to 70°C
  - Protections: Short circuit / Overload / Over voltage
  - Cooling by free air convection
  - Compliance to IEC/EN 60335-1(PD3) and IEC/EN61558-1, -2-16 for household appliances
  - Operating altitude up to 5000 meters (Note.8)
  - Withstand 5G vibration test
  - High efficiency, long life and high reliability
  - LED indicator for power on
  - Over voltage category III
  - 100% full load burn-in test
  - 3 years warranty

- **Description**
  LRS-50 series is a 50W single-output enclosed type power supply with 30mm of low profile design. Adopting the full range 85~264VAC input, the entire series provides an output voltage line of 3.3V, 5V, 12V, 15V, 24V, 36V and 48V.

  In addition to the high efficiency up to 90%, the design of metallic mesh case enhances the heat dissipation of LRS-50 that the whole series operates from -30°C through 70°C under air convection without a fan. Delivering an extremely low no load power consumption (less than 0.2W), it allows the end system to easily meet the worldwide energy requirement. LRS-50 has the complete protection functions and 5G anti-vibration capability; it is complied with the international safety regulations such as TUV EN62368-1, EN60335-1,EN61558-1/-2-16, UL62368-1 and GB4943. LRS-50 series serves as a high price-to-performance power supply solution for various industrial applications.

- **Model Encoding**

  LRS - 50 - [3.3]

  - Output voltage
  - Rated wattage
  - Series name

  File Name: LRS-50-SPEC  2019-07-23
### SPECIFICATION

**MODEL**

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<tr>
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<tbody>
<tr>
<td>DC VOLTAGE</td>
<td>3.3V</td>
<td>5V</td>
<td>12V</td>
<td>15V</td>
<td>24V</td>
<td>36V</td>
</tr>
<tr>
<td>RATED CURRENT</td>
<td>10A</td>
<td>10A</td>
<td>4.2A</td>
<td>3.4A</td>
<td>2.2A</td>
<td>1.45A</td>
</tr>
<tr>
<td>CURRENT RANGE</td>
<td>0 – 10A</td>
<td>0 – 10A</td>
<td>0 – 4.2A</td>
<td>0 – 3.4A</td>
<td>0 – 2.2A</td>
<td>0 – 1.45A</td>
</tr>
<tr>
<td>RATED POWER</td>
<td>33W</td>
<td>50W</td>
<td>50.4W</td>
<td>51W</td>
<td>52.8W</td>
<td>52.2W</td>
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<tr>
<td>RIPPLE &amp; NOISE (max.)</td>
<td>80mVp-p</td>
<td>80mVp-p</td>
<td>120mVp-p</td>
<td>120mVp-p</td>
<td>150mVp-p</td>
<td>200mVp-p</td>
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<tr>
<td>VOLTAGE ADJ. RANGE</td>
<td>2.97 ~ 3.6V</td>
<td>4.5 ~ 5.5V</td>
<td>10.2 ~ 13.8V</td>
<td>13.5 ~ 18V</td>
<td>21.6 ~ 28.8V</td>
<td>32.4 ~ 39.6V</td>
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<tr>
<td>VOLTAGE TOLERANCE</td>
<td>±3.0%</td>
<td>±2.0%</td>
<td>±1.0%</td>
<td>±1.0%</td>
<td>±1.0%</td>
<td>±1.0%</td>
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<tr>
<td>LINE REGULATION Note.3</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td>±0.5%</td>
</tr>
<tr>
<td>LOAD REGULATION Note.5</td>
<td>±0.2%</td>
<td>±1.0%</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td>±0.5%</td>
</tr>
</tbody>
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**OUTPUT**

- **Setup, Rise Time**: 1000ms, 30ms/230VAC 2000ms, 30ms/115VAC at full load
- **Hold Up Time (Typ.)**: 30ms/230VAC 12ms/115VAC at full load

**INPUT**

- **Voltage Range**: 50 ~ 235VAC 47 ~ 63Hz
- **Frequency Range**: 106 ~ 121Hz
- **Efficiency (Typ.)**: 80% 83% 86% 88% 88% 89% 90%
- **AC Current (Typ.)**: 0.95A/115VAC 0.56A/230VAC
- **Inrush Current (Typ.)**: COLD START 45A/230VAC
- **Leakage Current**: <0.75mA/240VAC

**PROTECTION**

- **Over Load**: 110 ~ 150% rated output power Protection type: Hiccup mode, recovers automatically after fault condition is removed
- **Over Voltage**: 3.8 ~ 4.45V 5.9 ~ 7.3V 13.8 ~ 16.2V 18.75 ~ 21.75V 28.8 ~ 33.6V 41.4 ~ 48.6V 55.2 ~ 64.8V Protection type: Shut down o/p voltage, re-power on to recover

**ENVIRONMENT**

- **Working Temp.**: -30 ~ +70°C (Refer to "Derating Curve")
- **Working Humidity**: 20 ~ 90% RH non-condensing
- **Storage Temp. & Humidity**: -40 ~ +85°C, 10 ~ 95% RH non-condensing
- **Temp. Coefficient**: ±0.03%/°C (0 ~ 50°C)
- **Vibration**: 10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes
- **Over Voltage Category**: III; Compliance to EN61558, EN50178, EN60664-1, EN62477-1; altitude up to 2000 meters

**SAFETY & EMC (Note 9)**

- **Safety Standards**: UL62368-1, TUV EN62368-1, EN60335-1, EN61558-1/-2/16, CCC GB4943.1, BSMI CNS14336-1, EAC TP TC 004, AS/NZS 60950.1(by CB) approved
- **Withstand Voltage**: ±1500V AC 1min.
- **Isolation Resistance**: >10GΩ 500VDC 1min.
- **EMC Emission**: Compliance to EN55032 (CISPR32) Class B, EN55011, EN61000-3-2,-3, GB/T 9254, BSMI CNS13438, EAC TP TC 020
- **EMC Immunity**: Compliance to EN61000-4-2,4.5,8.11, EN61000-6-2 (EN50082-2), heavy industry level, criteria A, EAC TP TC 020

**OTHERS**

- **MTBF**: 645K hrs min. MIL-HDBK-217F (25°C)
- **Dimension**: 99*82*30mm (L*W*H)
- **Packing**: 0.23kg; 80pcs/14.8Kg/0.88CUFT

**Note**

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. Line regulation is measured from low line to high line at rated load.
5. Load regulation is measured from 0% to 100% rated load.
6. Length of set up time is measured at cold start. Turning ON/OFF the power supply very quickly may lead to increase of the set up time.
7. 3.3V,5V when the load factor 0 ~ 50%, the switching power less is reduced by burst operation, which will cause ripple and ripple noise to go beyond the specifications.
8. The ambient temperature derating of 5°C/1000m is needed for operating altitude greater than 2000m (6500ft).
9. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are being executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to “EMI testing of component power supplies.” (as available on http://www.meanwell.com)
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**Block Diagram**

- EMI FILTER
- RECTIFIERS & FILTER
- POWER SWITCHING
- O.V.P.
- CONTROL
- O.L.P.
- DETECTION CIRCUIT

**Derating Curve**

- AMBIENT TEMPERATURE (°C)
- LOAD (%)

**Static Characteristics**

- INPUT VOLTAGE (VAC) 60Hz
- LOAD (%)
50W Single Output Switching Power Supply

**Mechanical Specification**

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>1</td>
<td>AC/L</td>
<td>4</td>
<td>DC OUTPUT -V</td>
</tr>
<tr>
<td>2</td>
<td>AC/N</td>
<td>5</td>
<td>DC OUTPUT +V</td>
</tr>
<tr>
<td>3</td>
<td>FG</td>
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**Installation Manual**