The EML15 is a series of open frame and encapsulated AC-DC single output power supplies designed for medical applications. The series provides a number of flexible mechanical options including PCB mount, open frame, chassis mount with screw terminals and a DIN Rail option. With approvals to world-wide medical safety standards, compliance with class B for both conducted and radiated emissions and a 130%, 30s peak load capability, these class II isolation parts benefit system designers with easy integration into the latest healthcare products and applications.

**Models & Ratings**

<table>
<thead>
<tr>
<th>Output Power</th>
<th>Output Voltage</th>
<th>Output Current</th>
<th>Efficiency</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Nominal (A)</td>
<td>Peak (A)</td>
<td></td>
</tr>
<tr>
<td>10 W</td>
<td>3.3 VDC</td>
<td>3.00 A</td>
<td>3.90 A</td>
<td>EML15US03</td>
</tr>
<tr>
<td>15 W</td>
<td>5.0 VDC</td>
<td>3.00 A</td>
<td>3.90 A</td>
<td>EML15US05</td>
</tr>
<tr>
<td>15 W</td>
<td>9.0 VDC</td>
<td>1.67 A</td>
<td>2.17 A</td>
<td>EML15US09</td>
</tr>
<tr>
<td>15 W</td>
<td>12.0 VDC</td>
<td>1.25 A</td>
<td>1.62 A</td>
<td>EML15US12</td>
</tr>
<tr>
<td>15 W</td>
<td>15.0 VDC</td>
<td>1.00 A</td>
<td>1.30 A</td>
<td>EML15US15</td>
</tr>
<tr>
<td>15 W</td>
<td>24.0 VDC</td>
<td>0.63 A</td>
<td>0.82 A</td>
<td>EML15US24</td>
</tr>
<tr>
<td>15 W</td>
<td>36.0 VDC</td>
<td>0.42 A</td>
<td>0.54 A</td>
<td>EML15US36</td>
</tr>
<tr>
<td>15 W</td>
<td>48.0 VDC</td>
<td>0.32 A</td>
<td>0.41 A</td>
<td>EML15US48</td>
</tr>
</tbody>
</table>

**Notes**

1. Peak load lasting <30 s with a maximum duty cycle of 10%, average output power not to exceed nominal.
2. Add suffix to model number to define type: add ‘-P’ for PCB mount, add ‘-T’ for chassis mount, add ‘-E’ for encapsulated, add ‘-S’ for screw terminals.
3. Screw terminal version (S) is available with DIN clip attached, add suffix ‘D’, e.g. EML15US24-SD, DIN rail mounting kit is available as a separate item, order code ECL15 DIN CLIP.

**Summary**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Units</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage Range</td>
<td>85</td>
<td>264</td>
<td>VAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Load Input Power</td>
<td>120</td>
<td>370</td>
<td>VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>75</td>
<td>80</td>
<td>82</td>
<td>%</td>
<td>See Models &amp; Ratings table</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20</td>
<td>80</td>
<td>+70</td>
<td>°C</td>
<td>Derate linearly from 100% at +50 °C to 50% at +70 °C</td>
</tr>
<tr>
<td>EMC</td>
<td>EN55032 Level B Conducted &amp; Radiated, EN61000-4, EN61000-3, EN60601-1-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety Approvals</td>
<td>EN60601-1, ANSI/AAMI ES60601-1, IEC60601-1</td>
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<td></td>
<td></td>
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</table>
## EML15 Series

### AC-DC Power Supplies

#### Input

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Units</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage Range</td>
<td>85</td>
<td>264</td>
<td>VAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Frequency</td>
<td>47</td>
<td>63</td>
<td>Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Current - Full Load</td>
<td>0.32/0.16</td>
<td>A rms</td>
<td>At 115/230 VAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Load Input Power</td>
<td>0.3</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inrush Current</td>
<td>20/40</td>
<td>A</td>
<td>At 115/230 VAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earth Leakage Current</td>
<td></td>
<td></td>
<td></td>
<td>Class II construction no earth</td>
<td></td>
</tr>
<tr>
<td>Input Protection</td>
<td>F2.0A/250 V internal fuse fitted in line and neutral</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Output

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Units</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Voltage</td>
<td>3</td>
<td>48</td>
<td>VDC</td>
<td></td>
<td>See Models and Ratings table</td>
</tr>
<tr>
<td>Initial Set Accuracy</td>
<td>±1</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Voltage Adjustment</td>
<td>±5</td>
<td>%</td>
<td>Not encapsulated units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Load</td>
<td>0</td>
<td>A</td>
<td>No minimum load required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start Up Delay</td>
<td>2</td>
<td>s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start Up Rise Time</td>
<td>14</td>
<td>ms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hold Up Time</td>
<td>12</td>
<td>ms</td>
<td>at full load and 115 VAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line Regulation</td>
<td>±0.5</td>
<td>%</td>
<td></td>
<td></td>
<td>Deviation, recovery within 1% in less than 500 µs for a 25% load change</td>
</tr>
<tr>
<td>Load Regulation</td>
<td>±1</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transient Response</td>
<td>4</td>
<td>%</td>
<td>3.3-5 V versions, 20 MHz bandwidth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ripple &amp; Noise</td>
<td>50</td>
<td>mV pk-pk</td>
<td>12-15 V versions, 20 MHz bandwidth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overvoltage Protection</td>
<td>195</td>
<td>% Vnom</td>
<td>24-48 V versions, 20 MHz bandwidth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overload Protection</td>
<td>120</td>
<td>%</td>
<td>All other versions, recycle input to reset</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short Circuit Protection</td>
<td>Trip &amp; Restart (hiccup mode)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>0.05</td>
<td>%/°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### General

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Units</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency</td>
<td>75</td>
<td>80</td>
<td>82</td>
<td>%</td>
<td>See Models &amp; Ratings table</td>
</tr>
<tr>
<td>Isolation: Input to Output</td>
<td>4000</td>
<td></td>
<td></td>
<td>VAC</td>
<td></td>
</tr>
<tr>
<td>Switching Frequency</td>
<td>70</td>
<td></td>
<td></td>
<td>kHz</td>
<td></td>
</tr>
<tr>
<td>Power Density</td>
<td>4.8</td>
<td>W/in²</td>
<td></td>
<td>PCB Mount version</td>
<td></td>
</tr>
<tr>
<td>Mean Time Between Failure</td>
<td>&gt;400</td>
<td>kHrs</td>
<td></td>
<td>MIL-HDBK-217F, +25 °C GB</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>0.07 (35)</td>
<td>lb (g)</td>
<td>Open frame versions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.20 (90)</td>
<td>lb (g)</td>
<td>Encapsulated version</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.24 (110)</td>
<td>lb (g)</td>
<td>Screw terminal version</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Environmental

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Units</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>-20</td>
<td>+70</td>
<td>°C</td>
<td>Derate linearly from 100% at +50 °C to 50% at +70 °C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40</td>
<td>+85</td>
<td>°C</td>
<td>Convection-cooled</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>95</td>
<td>%RH</td>
<td>Non-condensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Altitude</td>
<td>3048</td>
<td>m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock</td>
<td>IEC68-2-27, 30 g, 11 ms half sine, 3 times in each of 6 axes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td>IEC68-2-6, 2 g, 10 Hz to 500 kHz, 10 mins/cycle, 60 mins each cycle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[www.xppower.com](http://www.xppower.com)
### EMC: Emissions

<table>
<thead>
<tr>
<th>Phenomenon</th>
<th>Standard</th>
<th>Test Level</th>
<th>Criteria</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducted</td>
<td>EN55032/11</td>
<td>Class B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiated</td>
<td>EN55032/11</td>
<td>Class B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harmonic Current</td>
<td>EN61000-3-2</td>
<td></td>
<td>Class A</td>
<td></td>
</tr>
<tr>
<td>Voltage Flicker</td>
<td>EN61000-3-3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### EMC: Immunity

<table>
<thead>
<tr>
<th>Phenomenon</th>
<th>Standard</th>
<th>Test Level</th>
<th>Criteria</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESD</td>
<td>EN61000-4-2</td>
<td>4</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Radiated</td>
<td>EN61000-4-3</td>
<td>10 V/m</td>
<td>A</td>
<td>80% mod</td>
</tr>
<tr>
<td>EFT</td>
<td>EN61000-4-4</td>
<td>3</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Surges</td>
<td>EN61000-4-5</td>
<td>3</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Conducted</td>
<td>EN61000-4-6</td>
<td>10 Vrms</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Magnetic Fields</td>
<td>EN61000-4-8</td>
<td>10 A/m</td>
<td>A</td>
<td></td>
</tr>
</tbody>
</table>

**Dips and Interruptions**
- EN60601-1-2
  - 70% U: for 500 ms A
  - 40% U: for 100 ms A
  - <5% U: for 10 ms A
  - <5% U: for 5000 ms B

**EN60601-1-2 4th Ed**
- 70% U: for 500 ms A
- 0% U: for 20 ms A
- 0% U: for 5000 ms B

40% of U: dip is performance criteria A if load is reduced to 45% based on 100 VAC.

### Safety Approvals

<table>
<thead>
<tr>
<th>Safety Agency</th>
<th>Safety Standard</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB Report</td>
<td>IEC60601-1 Ed 3 Including Risk Management</td>
<td>Medical</td>
</tr>
<tr>
<td>UL</td>
<td>ANSI/AAMI ES60601-1:2005 &amp; CSA C22.2, No.60601-1:08</td>
<td>Medical</td>
</tr>
<tr>
<td>TUV</td>
<td>EN60601-1/A12:2006</td>
<td>Medical</td>
</tr>
<tr>
<td>CE</td>
<td>Meets all applicable directives</td>
<td></td>
</tr>
<tr>
<td>UKCA</td>
<td>Meets all applicable legislation</td>
<td></td>
</tr>
</tbody>
</table>

### Means of Protection

<table>
<thead>
<tr>
<th>Category</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC60601-1 Ed 3</td>
<td>2 x MOPP (Means of Patient Protection)</td>
</tr>
</tbody>
</table>
### Mechanical Details

**Open Frame – PCB Mount (−P)**

**Encapsulated (−E)**

**Open Frame – Chassis Mount (−T)**

**Screw Terminal (−S)**

**Notes**

1. Dimensions in inches (mm).
2. Weight:
   - P Version: 0.07 lbs (35 g)
   - T Version: 0.07 lbs (35 g)
   - E Version: 0.20 lbs (90 g)
   - S Version: 0.24 lbs (110 g)
3. Tolerances:
   - x.xx = ± 0.02 (x.xx = ± 0.5)
   - x.xxx = ± 0.01 (x.xxx = ± 0.25)

**Mating Connectors (−T version only)**

- Input Connector: JST XHP-3
- Output Connector: JST XHP-4
- Crimps: SXH-001T-P0.6