FEATURES

- Size 4.45mmx4.1mmx1.8mm
- Molded Construction
- Low Audible Noise
- Soft Saturation
- Stable Over High Temperatures
- Max Operating Temp +155°C
- RoHS/REACH-Compliant, Halogen-Free

APPLICATIONS

- Battery-powered devices
- Portable devices
- Embedded computing
- High-current SMPS
- High-frequency SMPS
- POL converters
- FPGA

ELECTRICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inductance (1)</td>
<td>$L\pm20%$</td>
<td>10 µH</td>
</tr>
<tr>
<td>Resistance</td>
<td>$R_{DC,typ}$</td>
<td>163 mΩ</td>
</tr>
<tr>
<td>Resistance MAX</td>
<td>$R_{DC,max}$</td>
<td>215 mΩ</td>
</tr>
<tr>
<td>Rated Current (2)</td>
<td>$I_R,typ$</td>
<td>1.9 A</td>
</tr>
<tr>
<td>Saturation Current 25°C (3)</td>
<td>$I_{SAT,25^\circ C},typ$</td>
<td>2 A</td>
</tr>
<tr>
<td>Saturation Current 100°C (4)</td>
<td>$I_{SAT,100^\circ C},typ$</td>
<td>2 A</td>
</tr>
<tr>
<td>Resonance Frequency</td>
<td>$f_r,typ$</td>
<td>16 MHz</td>
</tr>
</tbody>
</table>

GENERAL SPECIFICATIONS

- Inductance
  Measured at 100kHz, 100mA

- Rated Current
  Rated current will cause the coil temperature rise $\Delta T$ of 40K
  $I_R$ measured with the inductor soldered in a single-layer PCB. Copper layer thickness
  35µm Cu / PCB size 30x50mm. Temperature behavior dependent on circuit design,
  PCB layout, proximity to other components, and trace dimensions and thickness.

- Saturation Current 25°C
  Saturation current will cause $L$ to drop from 30% at 25°C ambient temperature

- Saturation Current 100°C
  Saturation current will cause $L$ to drop from 30% at 100°C ambient temperature

- Temperature Test Condition
  Electrical specifications measured at 25°C, 35% RH if not given differently

- Operating Condition
  Operating temperature: -40°C to +155°C (including temp rise)
  Should not exceed +155°C under worst-case operation conditions

- Storage Condition
  Tape and Reel packaging: -10°C to +40°C
  Humidity: <50% RH

All MPS parts are lead-free, halogen-free, and adhere to the RoHS directive. For MPS green status, please visit the MPS website under Quality Assurance. “MPS”, the MPS logo, and “Simple, Easy Solutions” are registered trademarks of Monolithic Power Systems, Inc. or its subsidiaries.
TYPICAL PERFORMANCE CURVES

- **Temperature Rise vs. Current**
- **Inductance vs. Current**
- **Impedance vs. Frequency**
- **Inductance vs. Frequency**
Quality Factor vs. Frequency

AC Resistance vs. Frequency
**LAND PATTERN**

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
</tbody>
</table>

*(unit in mm)*

**PRODUCT PACKAGE AND DIMENSIONS**

*(unit in mm)*

**TOP MARKING**

<table>
<thead>
<tr>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start of Winding · (dot)</td>
</tr>
<tr>
<td>Inductance Code 100</td>
</tr>
</tbody>
</table>
## ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Part Number</th>
<th>$L^{(1)}$</th>
<th>$R_{DC}$</th>
<th>$I_R^{(2)}$</th>
<th>$I_{SAT\ 25^\circ C}^{(3)}$</th>
<th>$I_{SAT\ 100^\circ C}^{(4)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPL-AY4020-5R6</td>
<td>5.6</td>
<td>97</td>
<td>2.45</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>MPL-AY4020-6R8</td>
<td>6.8</td>
<td>129</td>
<td>2.20</td>
<td>2.4</td>
<td>2.4</td>
</tr>
<tr>
<td>MPL-AY4020-8R2</td>
<td>8.2</td>
<td>136</td>
<td>2.10</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td>MPL-AY4020-100</td>
<td>10</td>
<td>163</td>
<td>1.90</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

## GENERAL SPECIFICATIONS

(1) **Inductance**
Measured at 100kHz, 100mA

(2) **Rated Current**
Rated current will cause the coil temperature rise $\Delta T$ of 40K $I_R$ measured with the inductor soldered in a single-layer PCB. Copper layer thickness 35µm Cu / PCB size 30x50mm. Temperature behavior dependent on circuit design, PCB layout, proximity to other components, and trace dimensions and thickness.

(3) **Saturation Current $25^\circ C$**
Saturation current will cause $L$ to drop from 30% at $25^\circ C$ ambient temperature

(4) **Saturation Current $100^\circ C$**
Saturation current will cause $L$ to drop from 30% at $100^\circ C$ ambient temperature

**Temperature Test Condition**
Electrical specifications measured at $25^\circ C$, 35% RH if not given differently

**Operating Condition**
Operating temperature: -40°C to +155°C (including temp rise)
Should not exceed +155°C under worst-case operation conditions

**Storage Condition**
Tape and Reel packaging: -10°C to +40°C
Humidity: <50% RH

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