**APPLICATIONS**

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

**FEATURES**

- Size 4.45mm x 4.1mm x 1.8mm
- Molded Construction
- Low Audible Noise
- Soft Saturation
- Stable Over High Temperatures
- Max Operating Temp +155°C
- RoHS/REACH-Compliant, Halogen-Free

**ELECTRICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inductance (1)</td>
<td>L</td>
<td>±20%</td>
</tr>
<tr>
<td>Resistance</td>
<td>R&lt;sub&gt;DC&lt;/sub&gt;</td>
<td>typ</td>
</tr>
<tr>
<td>Resistance&lt;sub&gt;MAX&lt;/sub&gt;</td>
<td>R&lt;sub&gt;DC MAX&lt;/sub&gt;</td>
<td>max</td>
</tr>
<tr>
<td>Rated Current (2)</td>
<td>I&lt;sub&gt;R&lt;/sub&gt;</td>
<td>typ</td>
</tr>
<tr>
<td>Saturation Current 25°C (3)</td>
<td>I&lt;sub&gt;SAT 25°C&lt;/sub&gt;</td>
<td>typ</td>
</tr>
<tr>
<td>Saturation Current 100°C (4)</td>
<td>I&lt;sub&gt;SAT 100°C&lt;/sub&gt;</td>
<td>typ</td>
</tr>
<tr>
<td>Resonance Frequency</td>
<td>f&lt;sub&gt;r&lt;/sub&gt;</td>
<td>typ</td>
</tr>
</tbody>
</table>

**GENERAL SPECIFICATIONS**

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

(2) **Rated Current**
Rated current will cause the coil temperature rise ΔΤ of 40K
I<sub>R</sub> 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°C**
Saturation current will cause L to drop from 30% at 25°C ambient temperature

(4) **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
TYPICAL PERFORMANCE CURVES

Temperature Rise vs. Current

Inductance vs. Current

Impedance vs. Frequency

Inductance vs. Frequency
Quality Factor vs. Frequency

![Graph of Quality Factor vs. Frequency](image1)

AC Resistance vs. Frequency

![Graph of AC Resistance vs. Frequency](image2)
**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: 8R2</td>
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</tbody>
</table>
ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Part Number</th>
<th>L (1) typ (µH)</th>
<th>RDC typ (mΩ)</th>
<th>IR (2) typ (A)</th>
<th>ISAT 25°C (3) typ (A)</th>
<th>ISAT 100°C (4) typ (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPL-AY4020-5R6</td>
<td>5.6</td>
<td>97</td>
<td>2.45</td>
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<tr>
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<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 ΔT of 40K
- Iₚ 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°C
- Saturation current will cause L to drop from 30% at 25°C ambient temperature

(4) 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

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