FEATURES
- Size 3.5mm x 3.2mm x 1.8mm
- Molded Construction
- Low Audible Noise
- Soft Saturation
- Stable Over High Temperatures
- Max Operating Temp +125°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</td>
<td>±20%</td>
</tr>
<tr>
<td>Resistance</td>
<td>R_{DC} typ</td>
<td>345 mΩ</td>
</tr>
<tr>
<td>Resistance MAX</td>
<td>R_{DC MAX} max</td>
<td>395 mΩ</td>
</tr>
<tr>
<td>Rated Current (2)</td>
<td>I_R typ</td>
<td>1.4 A</td>
</tr>
<tr>
<td>Saturation Current 25°C (3)</td>
<td>I_{SAT 25°C} typ</td>
<td>1.95 A</td>
</tr>
<tr>
<td>Saturation Current 100°C (4)</td>
<td>I_{SAT 100°C} typ</td>
<td>1.95 A</td>
</tr>
<tr>
<td>Resonance Frequency</td>
<td>f_r typ</td>
<td>22 MHz</td>
</tr>
</tbody>
</table>

GENERAL SPECIFICATIONS

(1) Inductance
- Measured at 100kHz, 100mA
- Rated current will cause the coil temperature rise ΔT of 40K at 25°C
- 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.

(2) Rated Current
- I_R typ
- Saturation current will cause L to drop from 30% at 25°C ambient temperature

(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 +125°C (including temp rise)
- Should not exceed +125°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

AC Resistance vs. Frequency
## GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Part Number</th>
<th>L (^{(1)}) typ (µH)</th>
<th>R(_{DC}) typ (mΩ)</th>
<th>I(_R) (^{(2)}) typ (A)</th>
<th>I(_{SAT,25°C}^{(3)}) typ (A)</th>
<th>I(_{SAT,100°C}^{(4)}) typ (A)</th>
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<tbody>
<tr>
<td>MPL-AY3020-R47</td>
<td>0.47</td>
<td>19.5</td>
<td>6.3</td>
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<td>MPL-AY3020-R68</td>
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<td>MPL-AY3020-1R5</td>
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<td>370</td>
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<td>1.75</td>
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</tbody>
</table>

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

### (2) Rated Current
Rated current will cause the coil temperature rise \(\Delta T\) of 40K

\[ I_R \text{ measured with the inductor soldered in a single-layer PCB. Copper layer thickness } 35\mu m \text{ Cu / PCB size } 30\times50mm. \text{ Temperature behavior dependent on circuit design, PCB layout, proximity to other components, and trace dimensions and thickness.} \]

### (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 +125°C (including temp rise)

Should not exceed +125°C under worst-case operation conditions

### Storage Condition
Tape and Reel packaging: -10°C to +40°C

Humidity: <50% RH

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