

### APPLICATIONS



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

### FEATURES

- Size 5.5mmx5.3mmx2.9mm
- Low DCR
- Low AC Losses
- Low Audible Noise
- Molded Construction
- Soft Saturation
- Stable Over High Temperatures
- Max Operating Temp +155°C
- RoHS/REACH-Compliant, Halogen-Free

### ELECTRICAL CHARACTERISTICS

| Parameter  |                 |      | Value | Unit |
|--|-----------------|------|-------|------|
| Inductance <sup>(1)</sup>                          | $L$             | ±20% | 0.56  | μH   |
| Resistance   | $R_{DC}$        | typ  | 3.92  | mΩ   |
| Resistance <sub>MAX</sub>                          | $R_{DC MAX}$    | max  | 4.55  | mΩ   |
| Rated Current <sup>(2)</sup>                       | $I_R$           | typ  | 13.2  | A    |
| Saturation Current <sub>25°C</sub> <sup>(3)</sup>  | $I_{SAT 25°C}$  | typ  | 22    | A    |
| Saturation Current <sub>100°C</sub> <sup>(4)</sup> | $I_{SAT 100°C}$ | typ  | 22    | A    |
| Resonance Frequency                                | $f_r$           | typ  | 67    | MHz  |

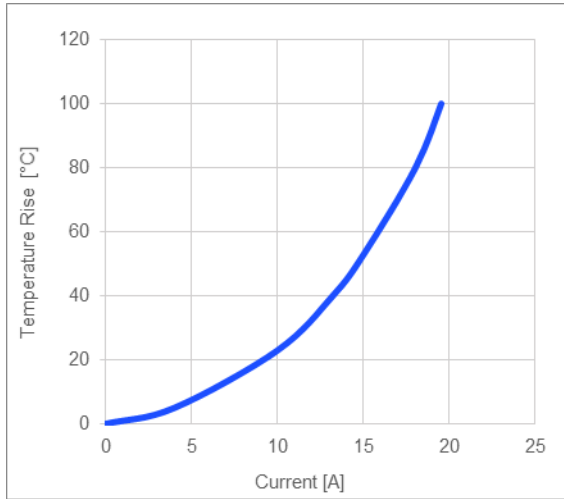
### GENERAL SPECIFICATIONS

|  |  |
|--|--|
| <sup>(1)</sup> Inductance                          | Measured at 100kHz, 100mA  |
| <sup>(2)</sup> Rated Current                       | Rated current will cause the coil temperature rise ΔT of 40K<br>$I_R$ 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. |
| <sup>(3)</sup> Saturation Current <sub>25°C</sub>  | Saturation current will cause L to drop from 30% at 25°C ambient temperature   |
| <sup>(4)</sup> Saturation Current <sub>100°C</sub> | 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)<br>Should not exceed +155°C under worst-case operation conditions   |
| Storage Condition                                  | Tape and Reel packaging: -10°C to +40°C<br>Humidity: <50% RH   |

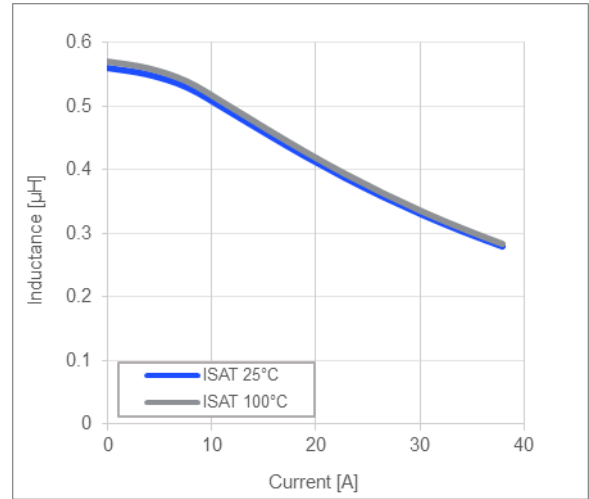
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TYPICAL PERFORMANCE CURVES

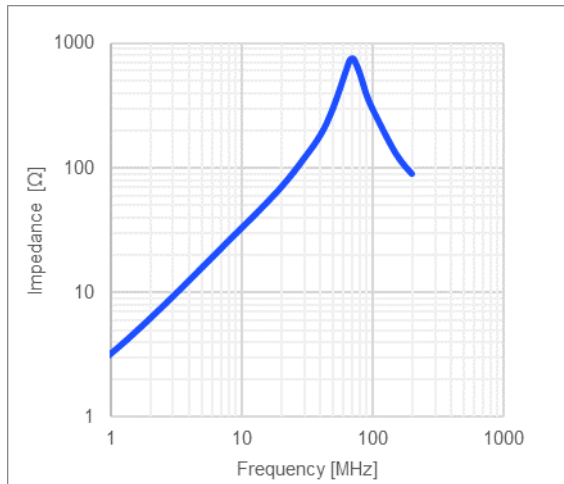
Temperature Rise vs. Current



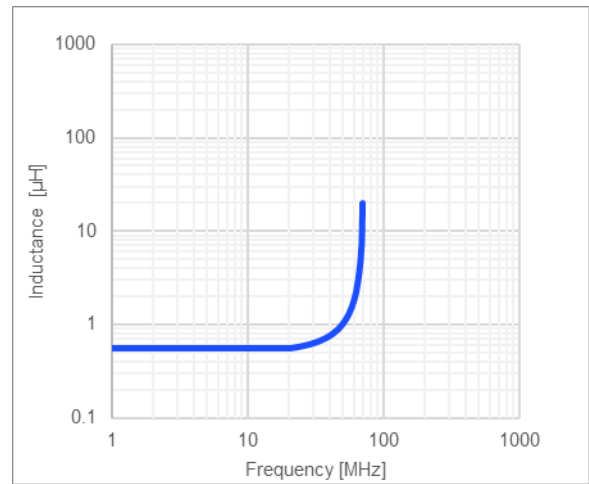
Inductance vs. Current



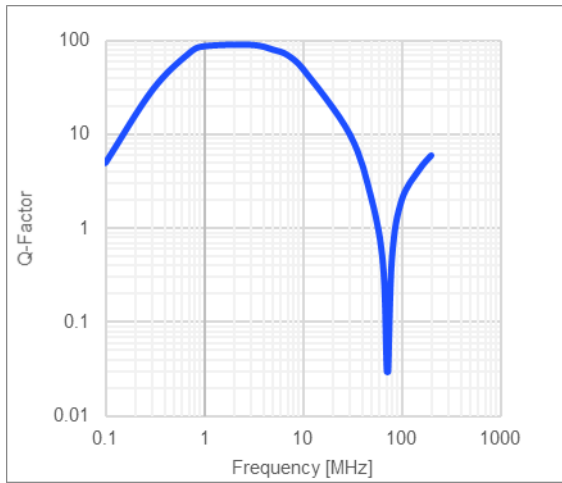
Impedance vs. Frequency



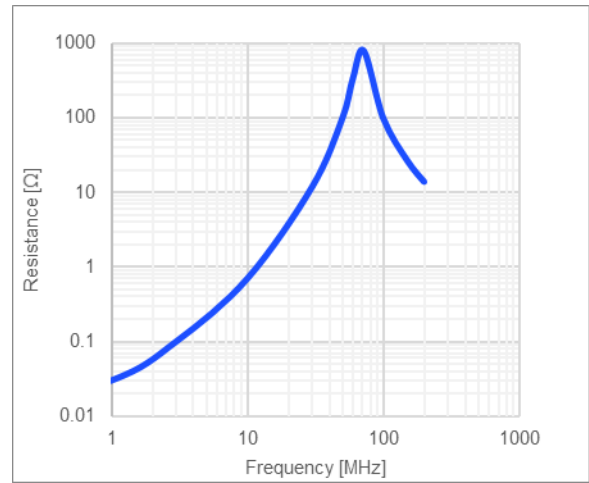
Inductance vs. Frequency



Quality Factor vs. Frequency



AC Resistance vs. Frequency



**LAND PATTERN**

**Dimensions**

|   |           |
|---|-----------|
| A | 4.70 ref. |
| B | 2.0 ref.  |
| C | 4.50 ref. |

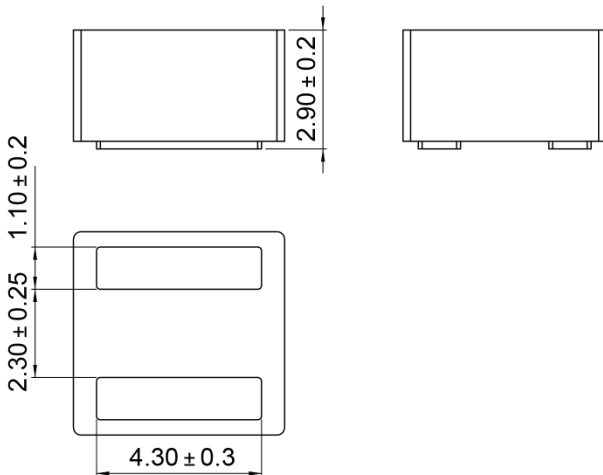
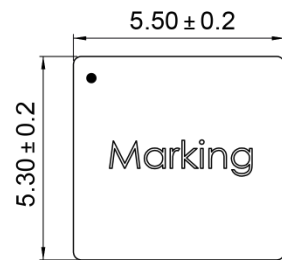
(unit in mm)



**PRODUCT PACKAGE AND DIMENSIONS**

**Dimensions**

(unit in mm)



**TOP MARKING**

**Marking**

|                  |         |
|------------------|---------|
| Start of Winding | · (dot) |
| Inductance Code  | R56     |
| MPS Code         | MPS     |

**ORDERING INFORMATION**

| Part Number    | $L^{(1)}$ | $R_{DC}$ | $I_R^{(2)}$ | $I_{SAT\ 25^\circ C}^{(3)}$ | $I_{SAT\ 100^\circ C}^{(4)}$ |
|----------------|-----------|----------|-------------|-----------------------------|------------------------------|
|                | typ (μH)  | typ (mΩ) | typ (A)     | typ (A)                     | typ (A)                      |
| MPL-AL5030-R47 | 0.47      | 3.78     | 13.6        | 26.5                        | 26.5                         |
| MPL-AL5030-R56 | 0.56      | 3.92     | 13.2        | 22                          | 22                           |
| MPL-AL5030-R82 | 0.82      | 5.0      | 12.8        | 18                          | 18                           |
| MPL-AL5030-1R0 | 1.0       | 6.5      | 11.2        | 16                          | 16                           |
| MPL-AL5030-1R2 | 1.2       | 8.0      | 10.0        | 14                          | 14                           |
| MPL-AL5030-1R5 | 1.5       | 9.7      | 9.0         | 12.5                        | 12.5                         |
| MPL-AL5030-1R8 | 1.8       | 10.5     | 8.8         | 12                          | 12                           |
| MPL-AL5030-2R2 | 2.2       | 12.3     | 8.2         | 11                          | 11                           |
| MPL-AL5030-3R3 | 3.3       | 21       | 6.0         | 10                          | 10                           |
| MPL-AL5030-4R7 | 4.7       | 33       | 5.3         | 8                           | 8                            |

**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°C ambient temperature

**(4) Saturation Current  $_{100^\circ C}$** 

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: &lt;50% RH

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