



### APPLICATIONS

- Battery-powered devices
- High switching frequency SMPS
- IoT
- Wearable
- Portable devices
- Input filters

### FEATURES

- Size 2.0mmx1.6mmx1.0mm
- Low Profile
- Low Audible Noise
- Molded Construction
- Soft Saturation
- Stable Over High Temperatures
- Low DCR
- Max Operating Temp +125°C
- RoHS/REACH-Compliant, Halogen-Free

### ELECTRICAL CHARACTERISTICS

| Parameter  |                 |      | Value | Unit |
|--|-----------------|------|-------|------|
| Inductance <sup>(1)</sup>                          | $L$             | ±20% | 2.2   | μH   |
| Resistance   | $R_{DC}$        | typ  | 137   | mΩ   |
| Resistance <sub>MAX</sub>                          | $R_{DC MAX}$    | max  | 155   | mΩ   |
| Rated Current <sup>(2)</sup>                       | $I_R$           | typ  | 2.2   | A    |
| Saturation Current <sub>25°C</sub> <sup>(3)</sup>  | $I_{SAT 25°C}$  | typ  | 2.7   | A    |
| Saturation Current <sub>100°C</sub> <sup>(4)</sup> | $I_{SAT 100°C}$ | typ  | 2.7   | A    |
| Resonance Frequency                                | $f_r$           | typ  | 53    | MHz  |

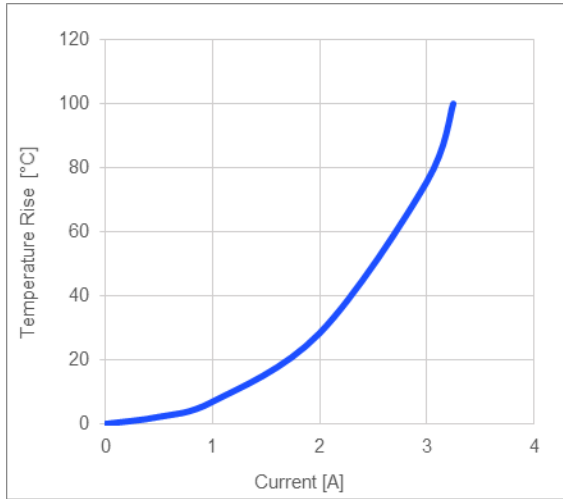
### GENERAL SPECIFICATIONS

|  |  |
|--|--|
| <b>(1) Inductance</b>                          | Measured at 100kHz, 100mA  |
| <b>(2) Rated Current</b>                       | Rated current will cause the coil temperature rise $\Delta T$ 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. |
| <b>(3) Saturation Current <sub>25°C</sub></b>  | Saturation current will cause L to drop from 30% at 25°C ambient temperature   |
| <b>(4) Saturation Current <sub>100°C</sub></b> | Saturation current will cause L to drop from 30% at 100°C ambient temperature  |
| <b>Temperature Test Condition</b>              | Electrical specifications measured at 25°C, 35% RH if not given differently  |
| <b>Operating Condition</b>                     | Operating temperature: -40°C to +125°C (including temp rise)<br>Should not exceed +125°C under worst-case operation conditions   |
| <b>Storage Condition</b>                       | Tape and Reel packaging: -10°C to +40°C<br>Humidity: <50% RH   |

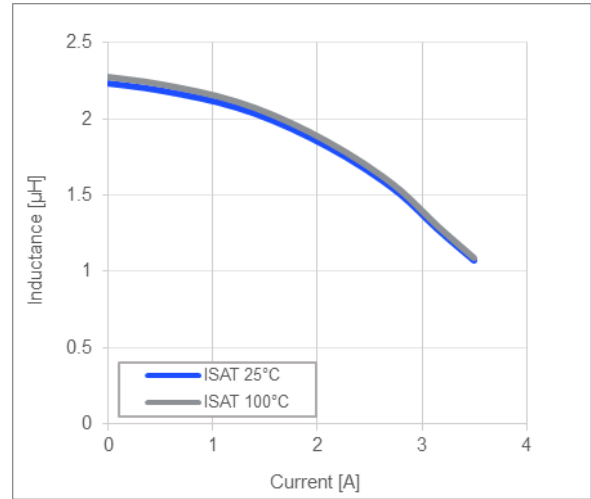
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TYPICAL PERFORMANCE CURVES

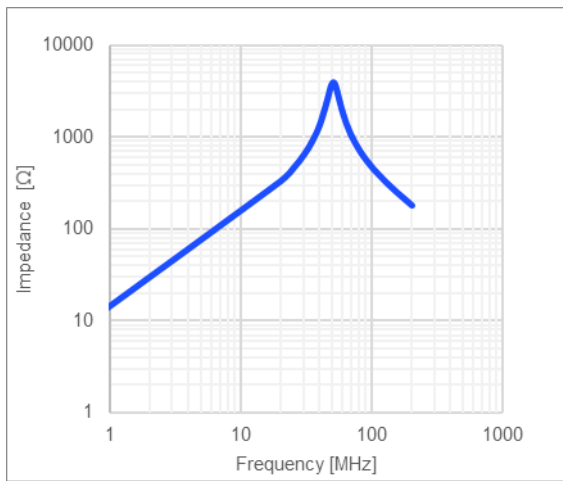
Temperature Rise vs. Current



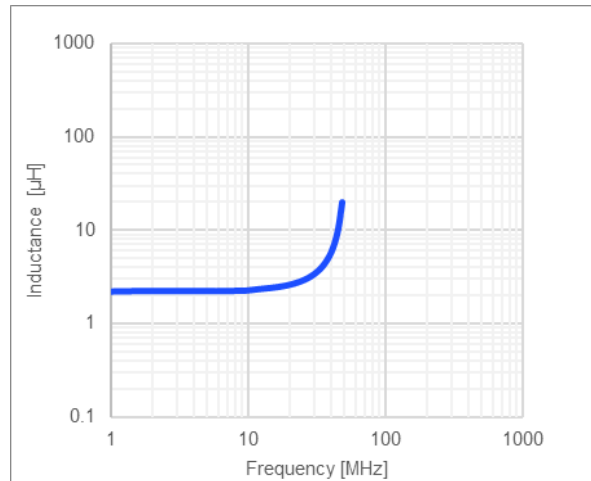
Inductance vs. Current



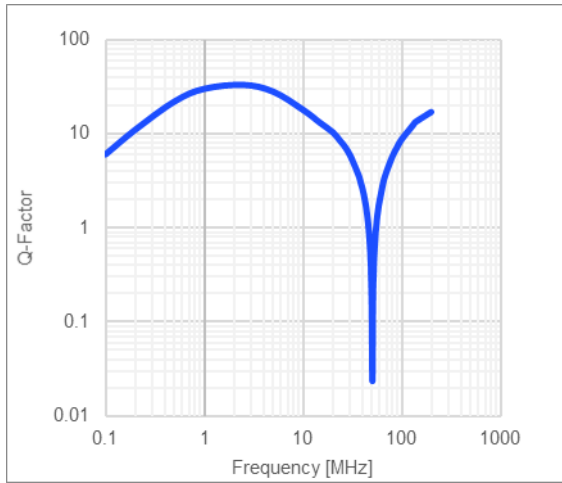
Impedance vs. Frequency



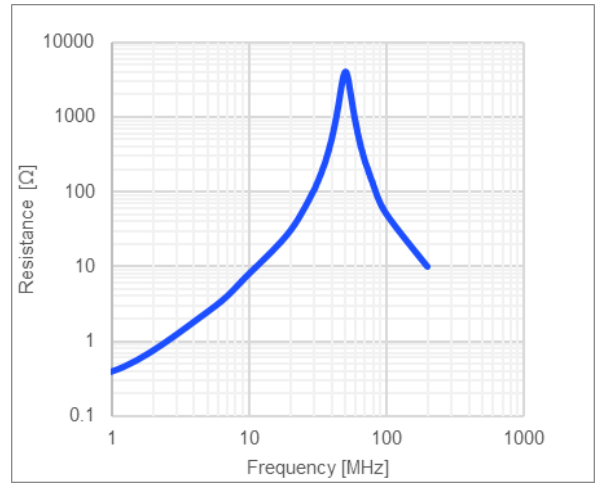
Inductance vs. Frequency



**Quality Factor vs. Frequency**



**AC Resistance vs. Frequency**



**LAND PATTERN**

**Dimensions**

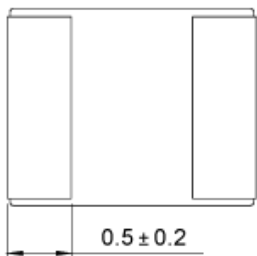
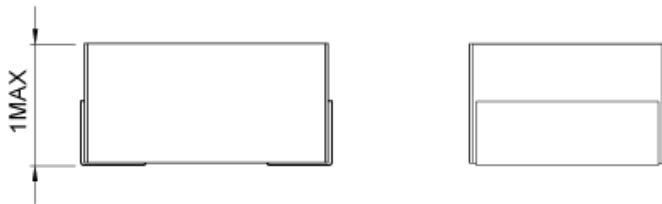
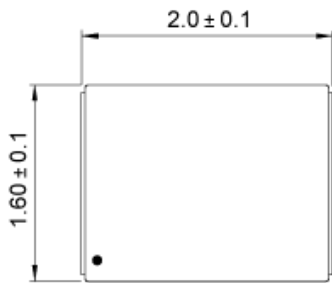
|   |                          |
|---|--------------------------|
| A | 1.60 ref.                |
| B | 0.70 ref.                |
| C | 2.0 ref.<br>(unit in mm) |



**PRODUCT PACKAGE AND DIMENSIONS**

**Dimensions**

(unit in mm)



**TOP MARKING**

**Marking**

Start of Winding      · (dot)

**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-AT2010-R47 | 0.47      | 27       | 4.4         | 5.7                         | 5.7                          |
| MPL-AT2010-R68 | 0.68      | 41       | 3.5         | 4.9                         | 4.9                          |
| MPL-AT2010-1R0 | 1.0       | 50       | 3.2         | 4.2                         | 4.2                          |
| MPL-AT2010-1R5 | 1.5       | 97       | 2.4         | 3.2                         | 3.2                          |
| MPL-AT2010-2R2 | 2.2       | 137      | 2.2         | 2.7                         | 2.7                          |
| MPL-AT2010-4R7 | 4.7       | 215      | 1.5         | 1.9                         | 1.9                          |

**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 +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: &lt;50% RH

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