

### APPLICATIONS



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

### FEATURES

- Size 11mmx10mmx4.8mm
- Molded Construction
- Low Audible Noise
- 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>                          | $L$              | $\pm 20\%$ | 2.2   | $\mu$ H    |
| Resistance   | $R_{DC}$         | typ        | 4.9   | m $\Omega$ |
| Resistance <sub>MAX</sub>                          | $R_{DC\ MAX}$    | max        | 5.7   | m $\Omega$ |
| Rated Current <sup>(2)</sup>                       | $I_R$            | typ        | 15    | A          |
| Saturation Current <sub>25°C</sub> <sup>(3)</sup>  | $I_{SAT\ 25°C}$  | typ        | 19.5  | A          |
| Saturation Current <sub>100°C</sub> <sup>(4)</sup> | $I_{SAT\ 100°C}$ | typ        | 19.5  | A          |
| Resonance Frequency                                | $f_r$            | typ        | 22    | MHz        |

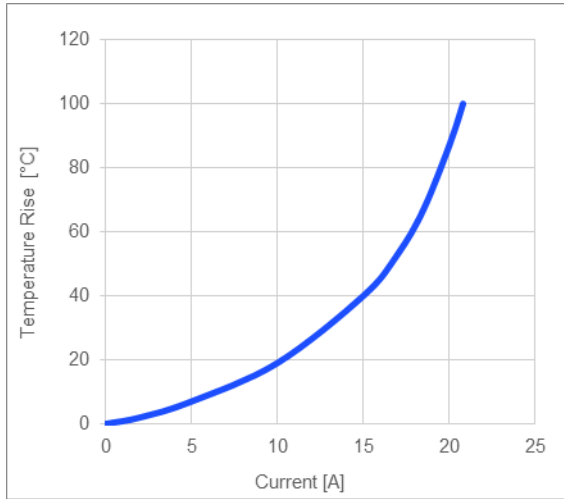
### GENERAL SPECIFICATIONS

|  |  |
|--|--|
| <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 35 $\mu$ m 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 +155°C (including temp rise)<br>Should not exceed +155°C under worst-case operation conditions   |
| <b>Storage Condition</b>                       | Tape and Reel packaging: -10°C to +40°C<br>Humidity: <50% RH   |

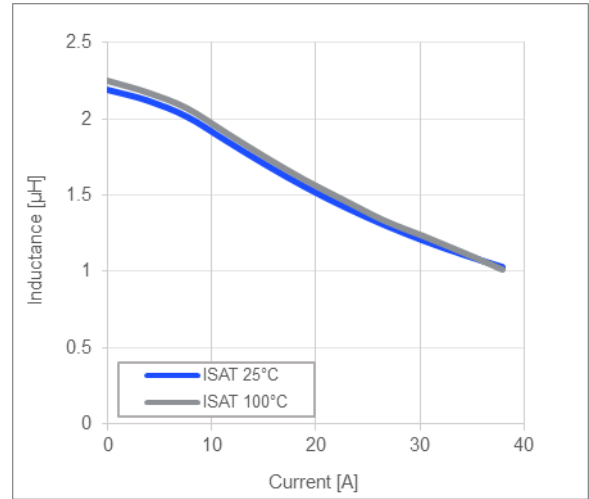
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**TYPICAL PERFORMANCE CURVES**

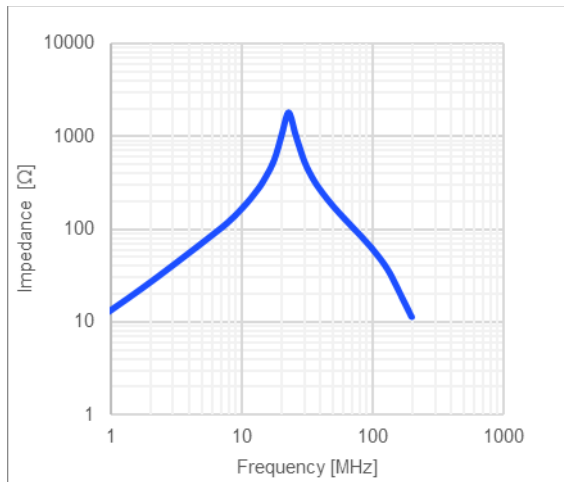
**Temperature Rise vs. Current**



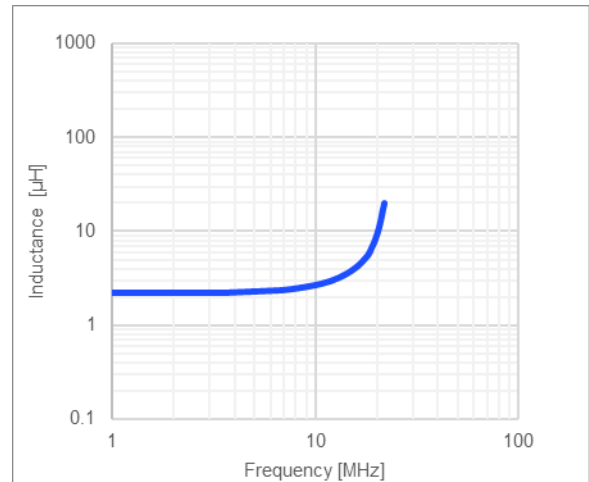
**Inductance vs. Current**



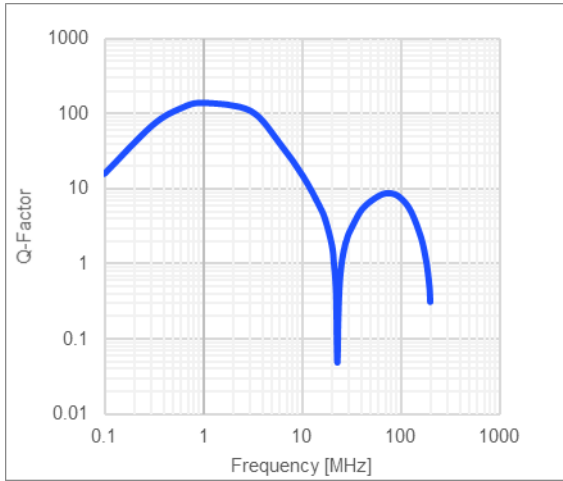
**Impedance vs. Frequency**



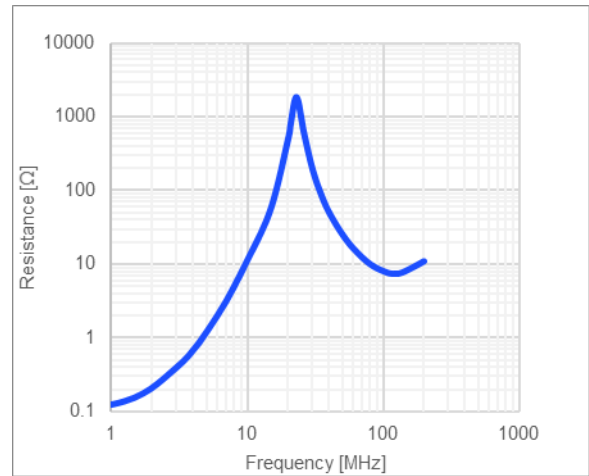
**Inductance vs. Frequency**



Quality Factor vs. Frequency



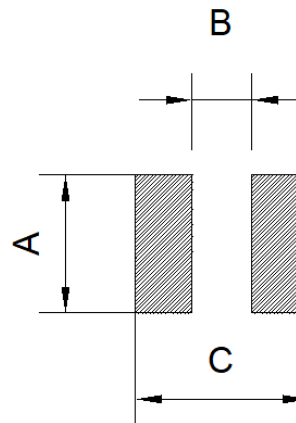
AC Resistance vs. Frequency



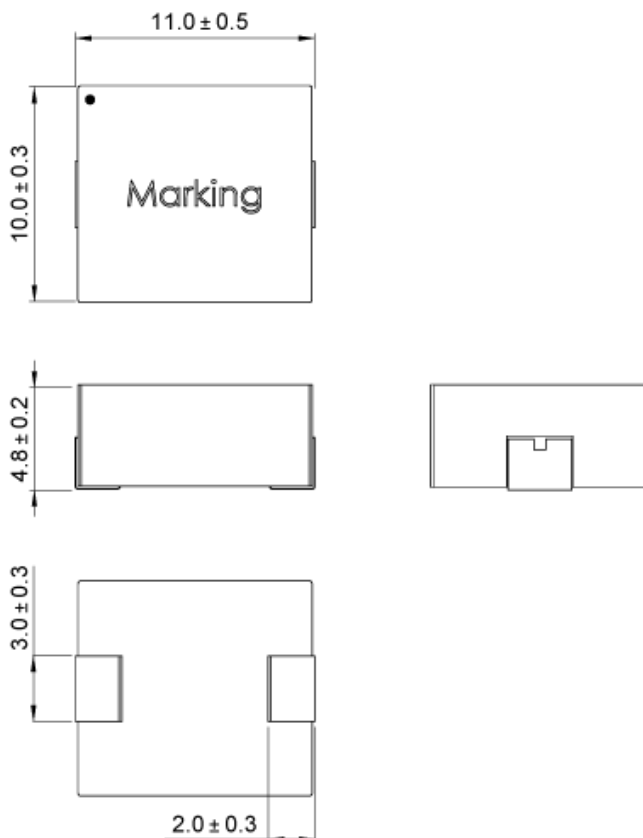
**LAND PATTERN**
**Dimensions**

|   |            |
|---|------------|
| A | 3.50 ref.  |
| B | 5.40 ref.  |
| C | 12.50 ref. |

(unit in mm)


**PRODUCT PACKAGE AND DIMENSIONS**
**Dimensions**

(unit in mm)


**TOP MARKING**
**Marking**

|                  |         |
|------------------|---------|
| Start of Winding | · (dot) |
| Inductance Code  | 2R2     |
| MPS Code         | MPS     |
| Date Code        | YYWW    |

**ORDERING INFORMATION**

| Part Number    | $L^{(1)}$<br>typ (μH) | $R_{DC}$<br>typ (mΩ) | $I_R^{(2)}$<br>typ (A) | $I_{SAT\ 25^{\circ}C}^{(3)}$<br>typ (A) | $I_{SAT\ 100^{\circ}C}^{(4)}$<br>typ (A) |
|----------------|-----------------------|----------------------|------------------------|---|--|
| MPL-AY1050-R47 | 0.47                  | 1.25                 | 25                     | 41                                      | 41                                       |
| MPL-AY1050-R68 | 0.68                  | 1.75                 | 23                     | 36                                      | 36                                       |
| MPL-AY1050-1R0 | 1.0                   | 2.6                  | 19                     | 33                                      | 33                                       |
| MPL-AY1050-1R5 | 1.5                   | 3.4                  | 17                     | 26.5                                    | 26.5                                     |
| MPL-AY1050-2R2 | 2.2                   | 4.9                  | 15                     | 19.5                                    | 19.5                                     |
| MPL-AY1050-3R3 | 3.3                   | 8                    | 12.5                   | 17                                      | 17                                       |
| MPL-AY1050-4R7 | 4.7                   | 9.5                  | 11.5                   | 15                                      | 15                                       |
| MPL-AY1050-5R6 | 5.6                   | 13                   | 9.8                    | 14                                      | 14                                       |
| MPL-AY1050-6R8 | 6.8                   | 15                   | 9                      | 13                                      | 13                                       |
| MPL-AY1050-100 | 10                    | 19                   | 7.8                    | 12                                      | 12                                       |

**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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