

### APPLICATIONS



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

### FEATURES

- Size 2.5mmx2.0mmx1.4mm
- 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   | 70 mΩ  |
| Resistance <sub>MAX</sub>                          | $R_{DC MAX}$    | max   | 84 mΩ  |
| Rated Current <sup>(2)</sup>                       | $I_R$           | typ   | 2.6 A  |
| Saturation Current <sub>25°C</sub> <sup>(3)</sup>  | $I_{SAT 25°C}$  | typ   | 3.4 A  |
| Saturation Current <sub>100°C</sub> <sup>(4)</sup> | $I_{SAT 100°C}$ | typ   | 3.4 A  |
| Resonance Frequency                                | $f_r$           | typ   | 45 MHz |

### 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 <sub>25°C</sub>** Saturation current will cause L to drop from 30% at 25°C ambient temperature

**(4) Saturation Current <sub>100°C</sub>** Saturation current will cause L to drop from 30% at 100°C ambient temperature

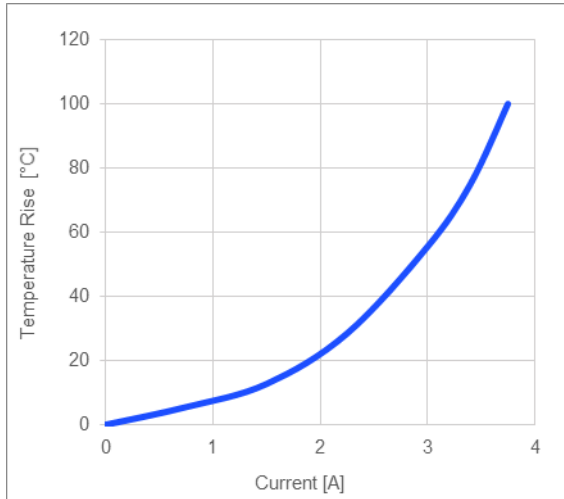
**Temperature Test Condition** Electrical specifications measured at 25°C, 35% RH if not given differently

**Operating Condition** Operating temperature: -40°C to +125°C (including temp rise)  
 Should not exceed +125°C under worst-case operation conditions

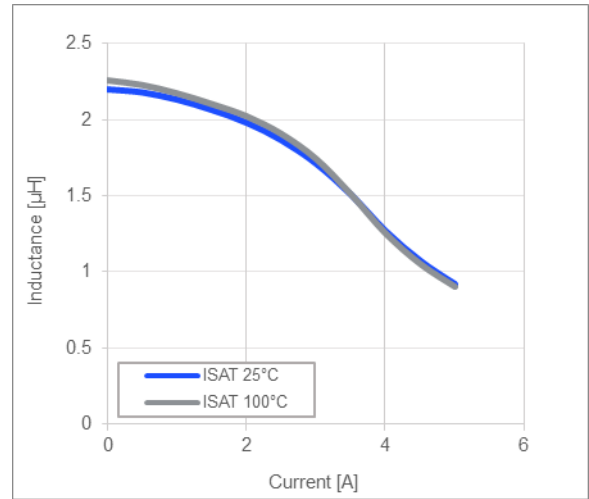
**Storage Condition** Tape and Reel packaging: -10°C to +40°C  
 Humidity: <50% RH

TYPICAL PERFORMANCE CURVES

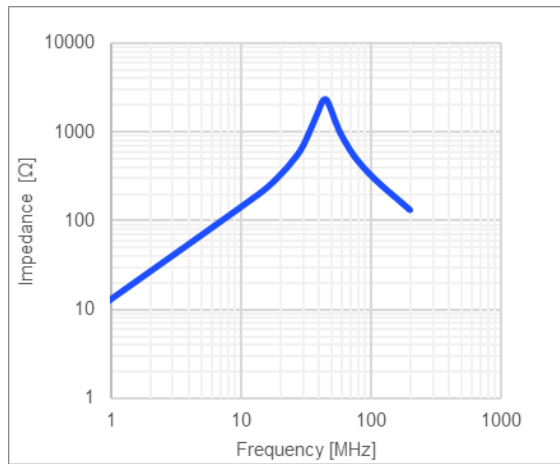
Temperature Rise vs. Current



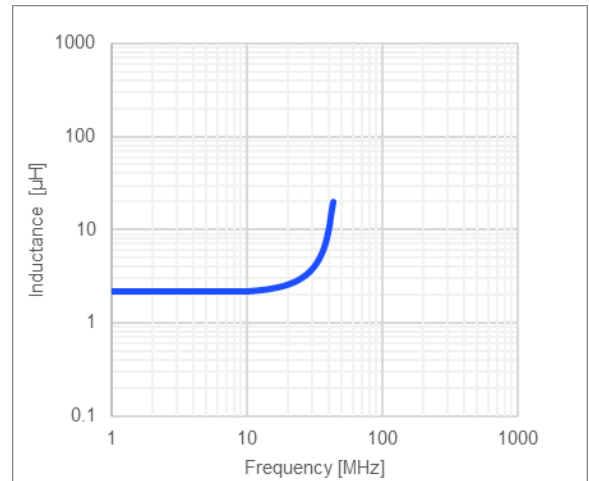
Inductance vs. Current



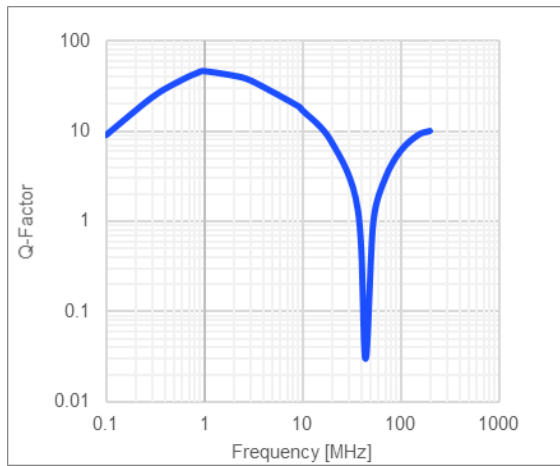
Impedance vs. Frequency



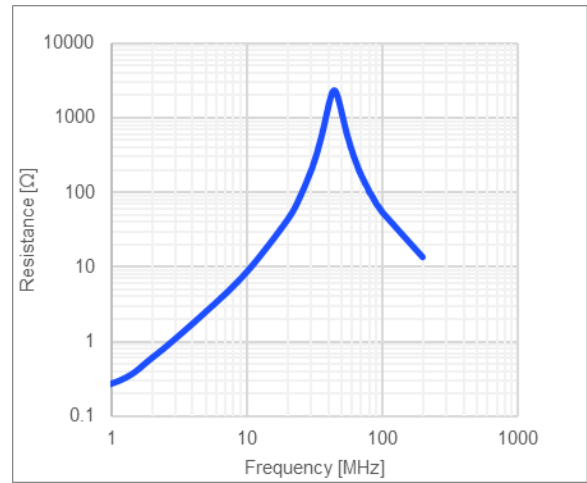
Inductance vs. Frequency



**Quality Factor vs. Frequency**



**AC Resistance vs. Frequency**



**LAND PATTERN**

**Dimensions**

|   |           |
|---|-----------|
| A | 2.0 ref.  |
| B | 1.20 ref. |
| C | 2.80 ref. |

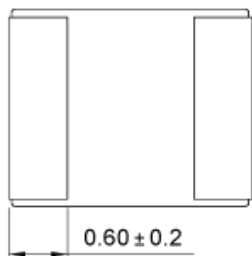
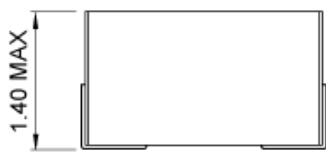
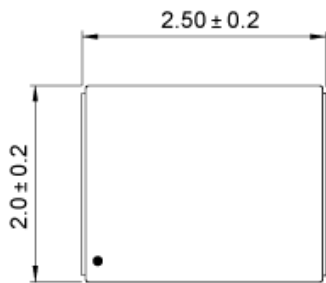
(unit in mm)



**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-AT2512-R33 | 0.33      | 13.5     | 6.4         | 8.5                         | 8.5                          |
| MPL-AT2512-R47 | 0.47      | 19       | 5.5         | 6.4                         | 6.4                          |
| MPL-AT2512-R68 | 0.68      | 26       | 4.7         | 6                           | 6                            |
| MPL-AT2512-1R0 | 1.0       | 35       | 4.0         | 5.2                         | 5.2                          |
| MPL-AT2512-1R5 | 1.5       | 56       | 3.2         | 4.2                         | 4.2                          |
| MPL-AT2514-2R2 | 2.2       | 70       | 2.6         | 3.4                         | 3.4                          |
| MPL-AT2512-3R3 | 3.3       | 121      | 2.0         | 2.7                         | 2.7                          |
| MPL-AT2514-4R7 | 4.7       | 180      | 1.7         | 2.4                         | 2.4                          |
| MPL-AT2512-6R8 | 6.8       | 280      | 1.4         | 2.2                         | 2.2                          |
| MPL-AT2512-100 | 10        | 355      | 1.2         | 1.7                         | 1.7                          |

**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><math>I_R</math> 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.</i> |
| <b>(3) Saturation Current <math>_{25^\circ C}</math></b>  | Saturation current will cause L to drop from 30% at 25°C ambient temperature   |
| <b>(4) Saturation Current <math>_{100^\circ C}</math></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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