

APPLICATIONS



- Battery-Powered Devices
- High Switching Frequency SMPS
- IoT
- Wearables
- Portable Devices
- Input Filters

FEATURES

- Size 2.5mmx2mmx1.2mm
- Low Profile
- Low Audible Noise
- Molded Construction
- Soft Saturation
- Stable across High Temperatures
- Low DCR
- Max Operating Temp +125°C
- RoHS/REACH-Compliant, Halogen-Free

ELECTRICAL CHARACTERISTICS

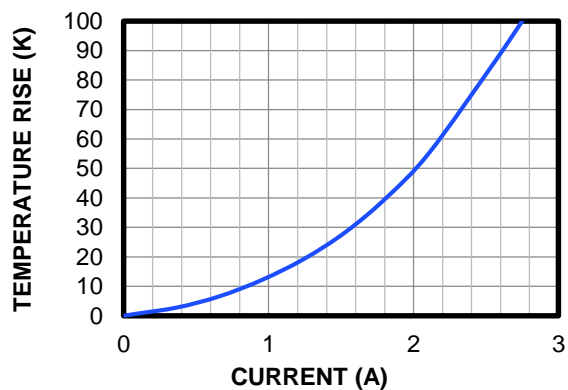
| Parameter | | | Value | Unit |
|---|------------------------------|------|-------|------|
| Inductance ⁽¹⁾ | <i>L</i> | ±20% | 4.7 | μH |
| Resistance | <i>R_{DC}</i> | Typ | 170 | mΩ |
| Resistance <i>MAX</i> | <i>R_{DC MAX}</i> | Max | 205 | mΩ |
| Rated Current ⁽²⁾ | <i>I_R</i> | Typ | 1.8 | A |
| Saturation Current 25°C ⁽³⁾ | <i>I_{SAT 25°C}</i> | Typ | 2.4 | A |
| Saturation Current 100°C ⁽⁴⁾ | <i>I_{SAT 100°C}</i> | Typ | 2.4 | A |
| Resonance Frequency | <i>f_r</i> | Typ | 28 | MHz |

GENERAL SPECIFICATIONS

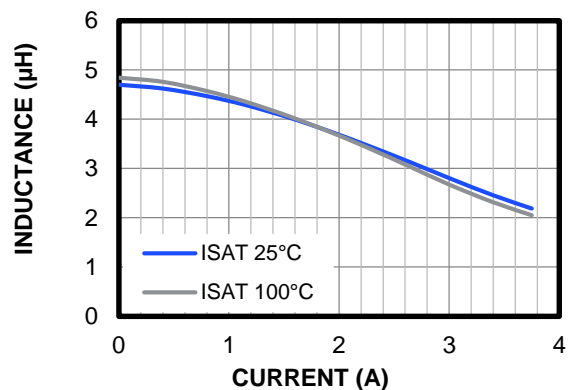
| | |
|-------------------------------------|--|
| (1) Inductance | Measured at 100kHz, 100mA |
| (2) Rated Current | The rated current causes a coil temperature rise ΔT of 40K. <i>I_R</i> is measured with the inductor soldered in a 1-layer PCB, with a copper layer thickness of 35μm Cu, and a PCB size of 30mmx50mm. The temperature behavior is dependent on circuit design, PCB layout, proximity to other components, and trace dimensions and thickness. |
| (3) Saturation Current 25°C | The saturation current causes L to drop 30% at a 25°C ambient temperature |
| (4) Saturation Current 100°C | The saturation current causes L to drop 30% at a 100°C ambient temperature |
| Temperature Test Condition | Electrical specifications measured at 25°C, 35% relative humidity (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

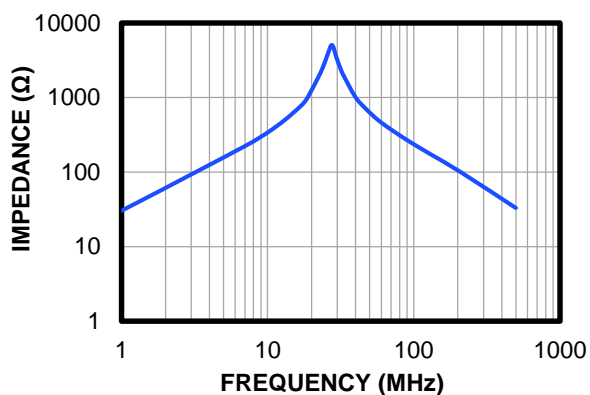
Temperature Rise vs. Current



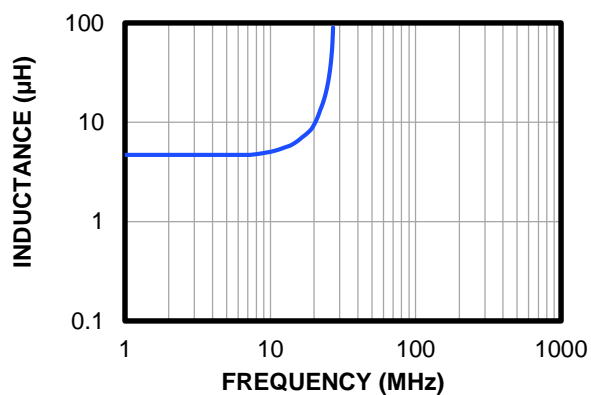
Inductance vs. Current



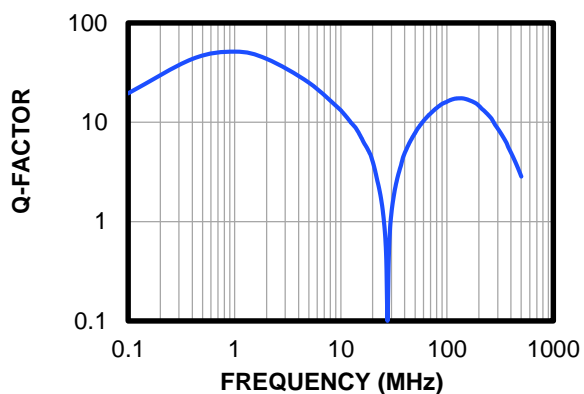
Impedance vs. Frequency



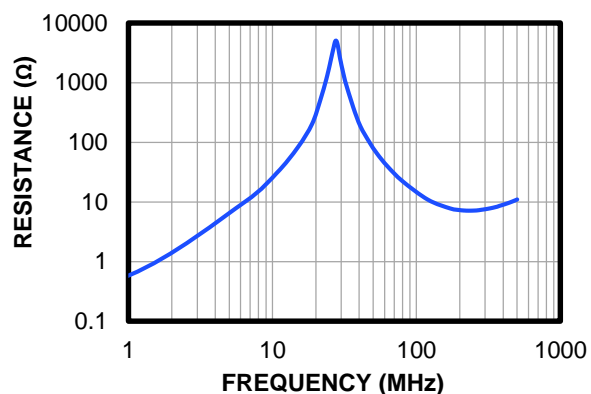
Inductance vs. Frequency



Quality Factor vs. Frequency

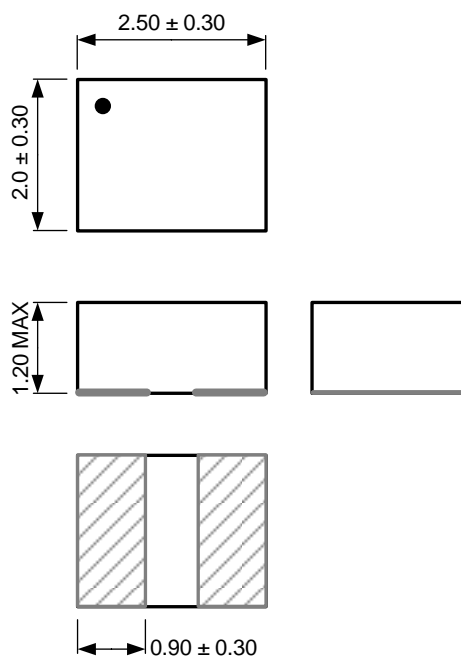


AC Resistance vs. Frequency



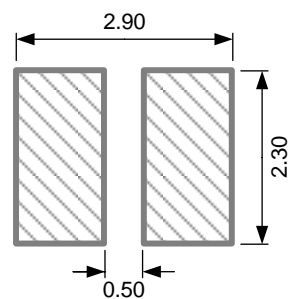
DIMENSIONS

PRODUCT PACKAGE



(units in mm)

RECOMMENDED LAND PATTERN



(units in mm)

TOP MARKING

Marking

Start of Winding . (dot)

ORDERING INFORMATION

| Part Number | $L^{(1)}$ | R_{DC} | $I_R^{(2)}$ | $I_{SAT\ 25^{\circ}C}^{(3)}$ | $I_{SAT\ 100^{\circ}C}^{(4)}$ |
|----------------|-----------|----------|-------------|------------------------------|-------------------------------|
| | ±20% (μH) | Typ (mΩ) | Typ (A) | Typ (A) | Typ (A) |
| MPL-AT2512-R33 | 0.33 | 13 | 6.4 | 7.8 | 7.8 |
| MPL-AT2512-R47 | 0.47 | 14 | 5.8 | 6.4 | 6.4 |
| MPL-AT2512-R68 | 0.68 | 23 | 4.8 | 6.0 | 6.0 |
| MPL-AT2512-1R0 | 1.0 | 33 | 4.1 | 5.2 | 5.2 |
| MPL-AT2512-1R5 | 1.5 | 43 | 3.4 | 4.2 | 4.2 |
| MPL-AT2512-2R2 | 2.2 | 68 | 2.8 | 3.4 | 3.4 |
| MPL-AT2512-3R3 | 3.3 | 116 | 2.2 | 3.0 | 3.0 |
| MPL-AT2512-4R7 | 4.7 | 170 | 1.8 | 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 |

REVISION HISTORY

| Revision # | Revision Date | Description | Pages Updated |
|------------|---------------|-----------------|---------------|
| 1.0 | 9/22/2023 | Initial Release | - |

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