

APPLICATIONS



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

FEATURES

- Size 2.5mmx2.0mmx1.2mm
- 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

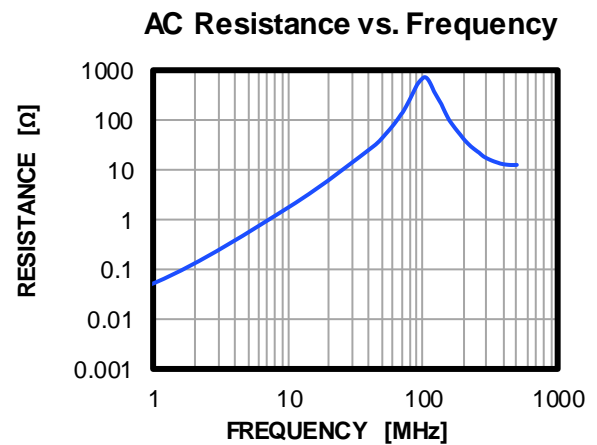
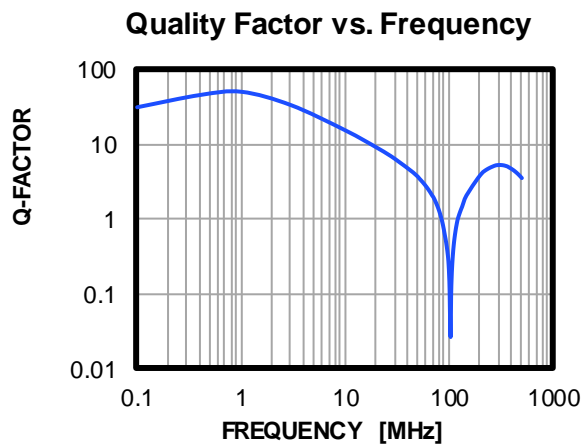
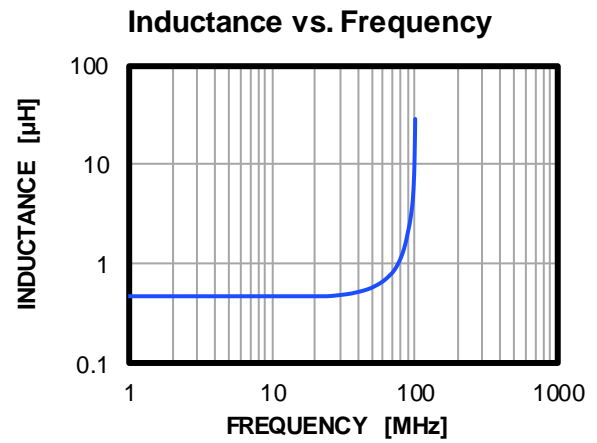
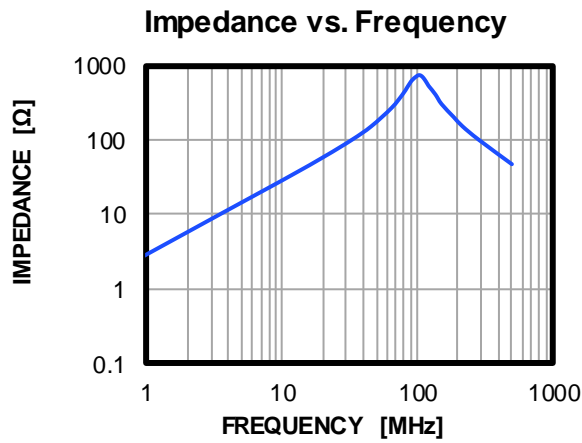
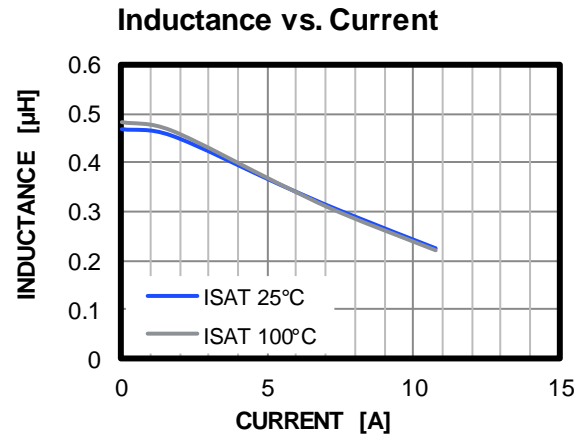
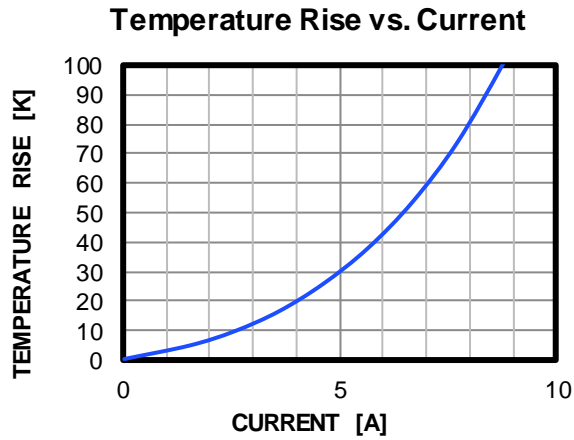
| Parameter | | | Value | Unit |
|---|------------------------------|------|-------|------|
| Inductance ⁽¹⁾ | <i>L</i> | ±20% | 0.47 | μH |
| Resistance | <i>R_{DC}</i> | Typ | 14 | mΩ |
| Resistance _{MAX} | <i>R_{DC MAX}</i> | Max | 18 | mΩ |
| Rated Current ⁽²⁾ | <i>I_R</i> | Typ | 5.8 | A |
| Saturation Current 25°C ⁽³⁾ | <i>I_{SAT 25°C}</i> | Typ | 6.4 | A |
| Saturation Current 100°C ⁽⁴⁾ | <i>I_{SAT 100°C}</i> | Typ | 6.4 | A |
| Resonance Frequency | <i>f_r</i> | Typ | 102 | MHz |

GENERAL SPECIFICATIONS

| | |
|---|---|
| ⁽¹⁾ Inductance | Measured at 100kHz, 100mA |
| ⁽²⁾ Rated Current | Rated current will cause the coil temperature rise ΔT of 40K <i>I_R</i> 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°C | Saturation current will cause L to drop from 30% at 25°C ambient temperature |
| ⁽⁴⁾ Saturation Current 100°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: <50% RH |

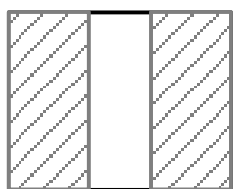
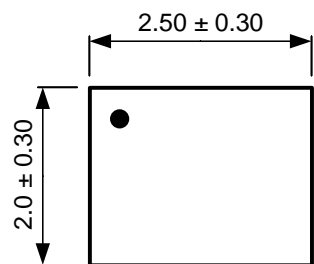
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TYPICAL PERFORMANCE CURVES



DIMENSIONS

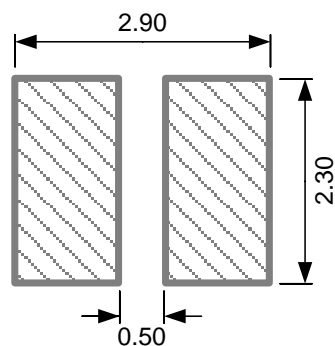
PRODUCT PACKAGE



0.90 ± 0.30

(units in mm)

RECOMMENDED LAND PATTERN



(units in mm)

TOP MARKING

Marking

Start of Winding . (dot)

ORDERING INFORMATION

| Part Number | $L^{(1)}$ ±20% (μH) | R_{DC} Typ (mΩ) | $I_R^{(2)}$ Typ (A) | $I_{SAT\ 25^{\circ}C}^{(3)}$ Typ (A) | $I_{SAT\ 100^{\circ}C}^{(4)}$ 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 | 6 |
| MPL-AT2512-1R0 | 1 | 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 | 3 |
| 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 |

GENERAL SPECIFICATIONS

| | |
|--|--|
| (1) Inductance | Measured at 100kHz, 100mA |
| (2) Rated Current | Rated current will cause the coil temperature rise ΔT of 40K <i>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.</i> |
| (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: <50% RH |

REVISION HISTORY

| Revision # | Revision Date | Description | Pages Updated |
|------------|---------------|--|---------------|
| 1.0 | 7/11/2019 | Initial Release | - |
| 1.1 | 8/1/2019 | Updated Impedance vs. Frequency Curve | 2 |
| 1.2 | 7/6/2023 | Updated the R_{DC} (Typ), $R_{DC\ MAX}$, I_R (Typ), and f_r (Typ) values, and made minor formatting edits in the Electrical Characteristics section | 1 |
| | | Updated all the Typical Performance Curves | 2 |
| | | Reordered the Dimensions section; updated the Product Package and Recommended Land Pattern images | 3 |
| | | Made minor formatting edits and updated the following values in the Ordering Information section: <ul style="list-style-type: none"> • Replaced the MPL-AT2514-2R2 and MPL-AT2514-4R7 with the MPL-AT2512-2R2 and MPL-AT2512-4R7, respectively • MPL-AT2512-R33: Updated R_{DC} (Typ), $I_{SAT\ 25^{\circ}C}$ (Typ), and $I_{SAT\ 100^{\circ}C}$ (Typ) • MPL-AT2512-R47: Updated R_{DC} (Typ) and I_R (Typ) • MPL-AT2512-R68: Updated R_{DC} (Typ) and I_R (Typ) • MPL-AT2512-1R0: Updated R_{DC} (Typ) and I_R (Typ) • MPL-AT2512-1R5: Updated R_{DC} (Typ) and I_R (Typ) • MPL-AT2512-3R3: Updated R_{DC} (Typ), I_R (Typ), $I_{SAT\ 25^{\circ}C}$ (Typ), and $I_{SAT\ 100^{\circ}C}$ (Typ) | 4 |

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