

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 ⁽¹⁾ | L | $\pm 20\%$ | 10 | μH |
| Resistance | R_{DC} | typ | 19 | m Ω |
| Resistance _{MAX} | $R_{DC\ MAX}$ | max | 21.9 | m Ω |
| Rated Current ⁽²⁾ | I_R | typ | 7.8 | A |
| Saturation Current _{25°C} ⁽³⁾ | $I_{SAT\ 25^\circ\text{C}}$ | typ | 12 | A |
| Saturation Current _{100°C} ⁽⁴⁾ | $I_{SAT\ 100^\circ\text{C}}$ | typ | 12 | A |
| Resonance Frequency | f_r | typ | 8 | MHz |

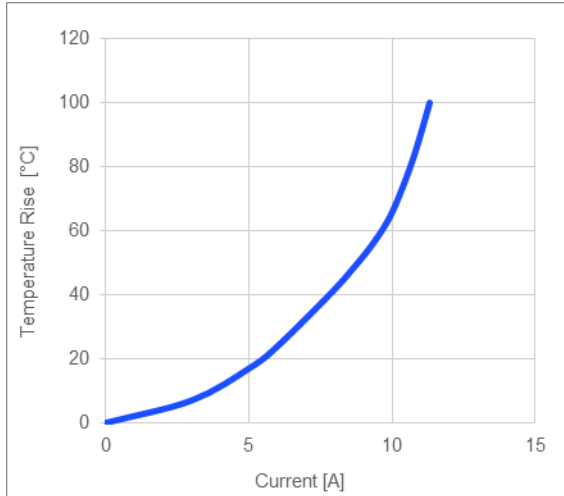
GENERAL SPECIFICATIONS

| | |
|--|--|
| (1) Inductance | Measured at 100kHz, 100mA |
| (2) Rated Current | Rated current will cause the coil temperature rise ΔT of 40K I_R measured with the inductor soldered in a single-layer PCB. Copper layer thickness 35 μm 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 +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: <50% RH |

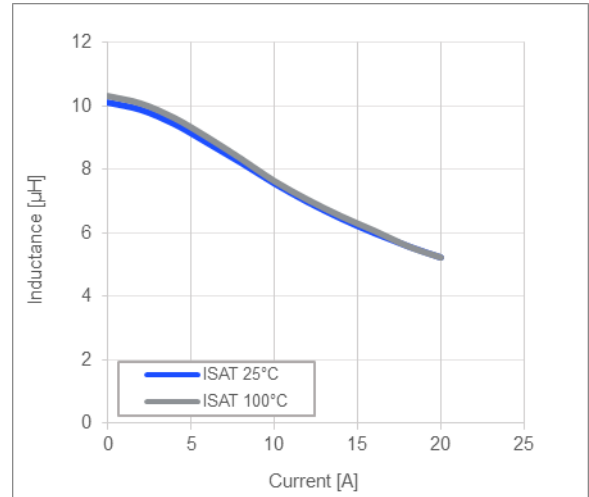
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TYPICAL PERFORMANCE CURVES

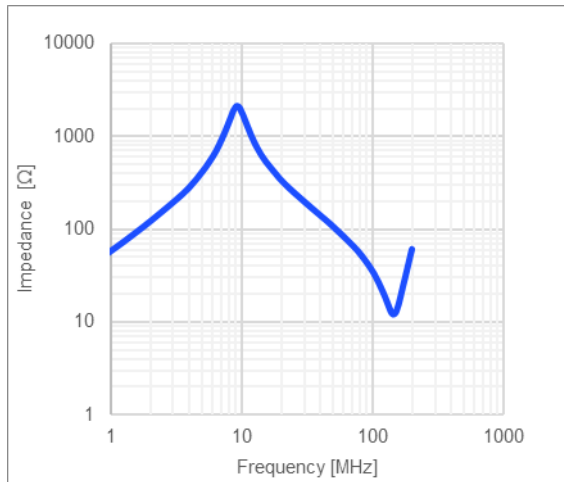
Temperature Rise vs. Current



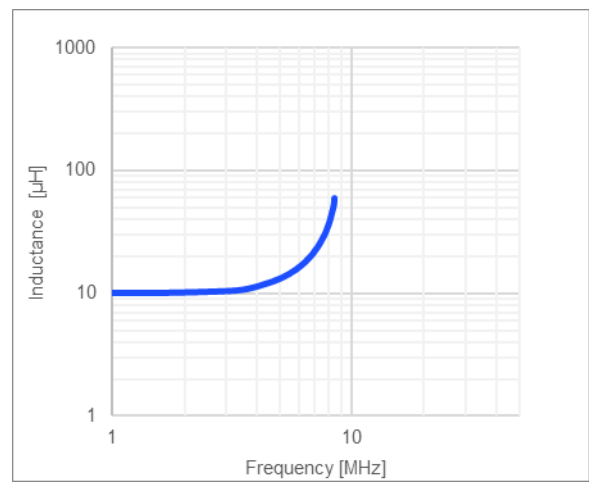
Inductance vs. Current



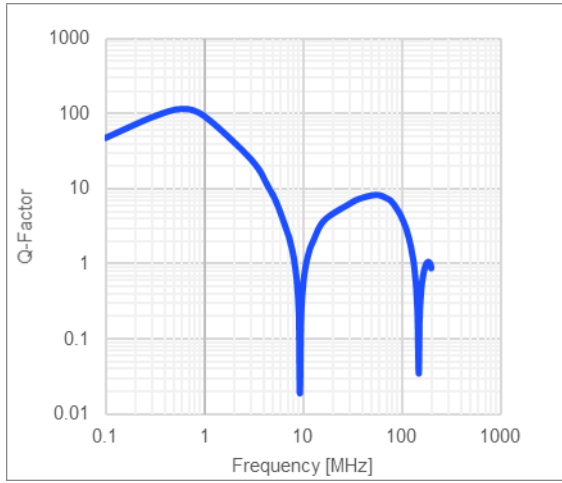
Impedance vs. Frequency



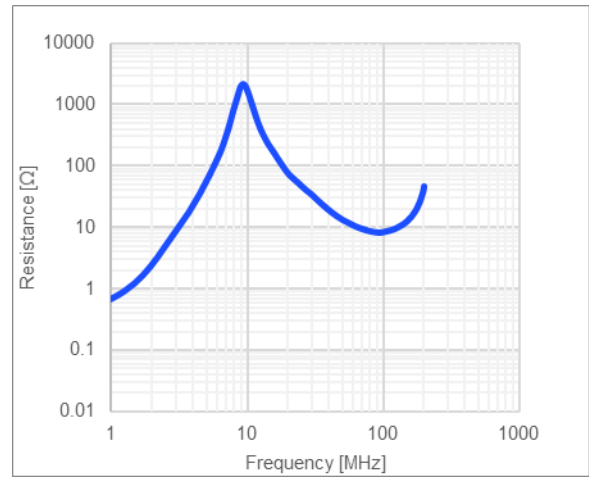
Inductance vs. Frequency



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 | 100 |
| MPS Code | MPS |
| Date Code | YYWW |

ORDERING INFORMATION

| Part Number | $L^{(1)}$ typ (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-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 ΔT 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: <50% RH

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