



APPLICATIONS

- Battery-powered devices
- High-efficiency SMPS
- Embedded computing
- Input filters

FEATURES

- Size 4.9mmx4.9mmx4mm
- Semi-Shielded Construction
- Low DCR
- Low Stray Field
- Max Operating Temp +125°C
- RoHS/REACH-Compliant, Halogen-Free

ELECTRICAL CHARACTERISTICS

| Parameter | | | Value | Unit |
|--|-----------------|------|-------|------|
| Inductance ⁽¹⁾ | L | ±20% | 0.47 | μH |
| Resistance | R_{DC} | typ | 7.3 | mΩ |
| Resistance _{MAX} | $R_{DC MAX}$ | max | 9 | mΩ |
| Rated Current ⁽²⁾ | I_R | typ | 8 | A |
| Saturation Current _{25°C} ⁽³⁾ | $I_{SAT 25°C}$ | typ | 16 | A |
| Saturation Current _{100°C} ⁽⁴⁾ | $I_{SAT 100°C}$ | typ | 13.5 | A |
| Resonance Frequency | f_r | typ | 170 | MHz |

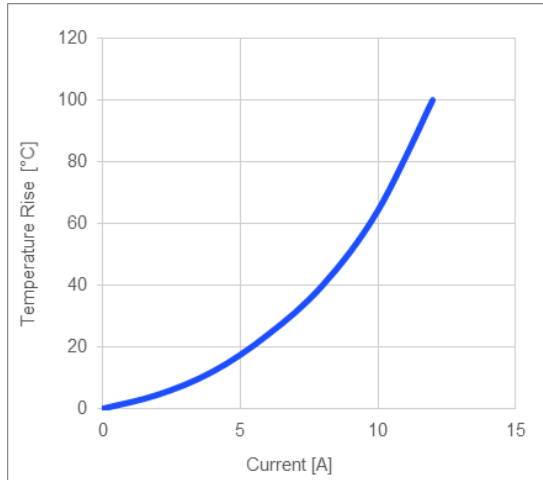
GENERAL SPECIFICATIONS

| | |
|--|---|
| (1) Inductance | Measured at 100kHz, 100mA |
| (2) Rated Current | Rated current will cause the coil temperature rise ΔT of 40K <i>I_R 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°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 |

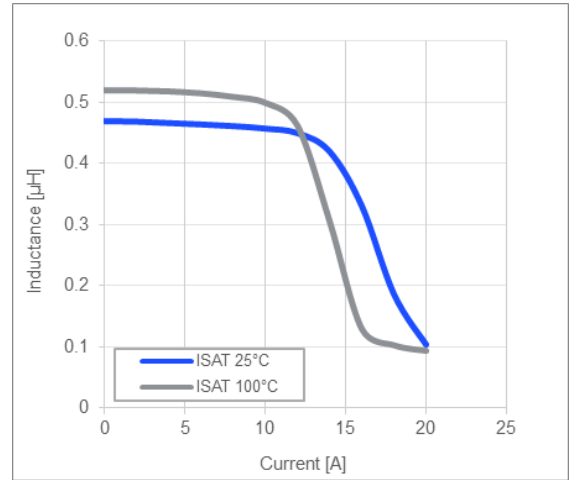
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TYPICAL PERFORMANCE CURVES

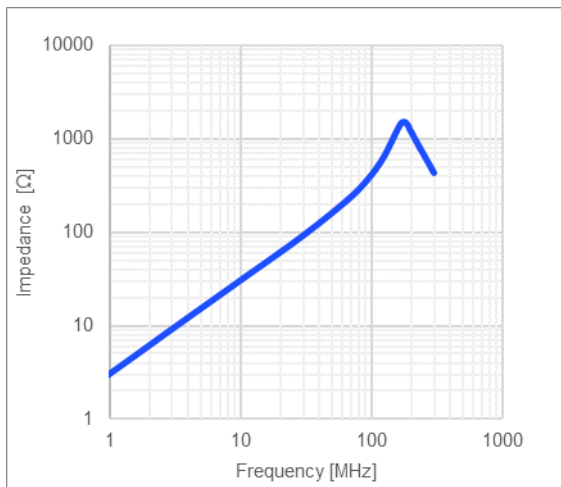
Temperature Rise vs. Current



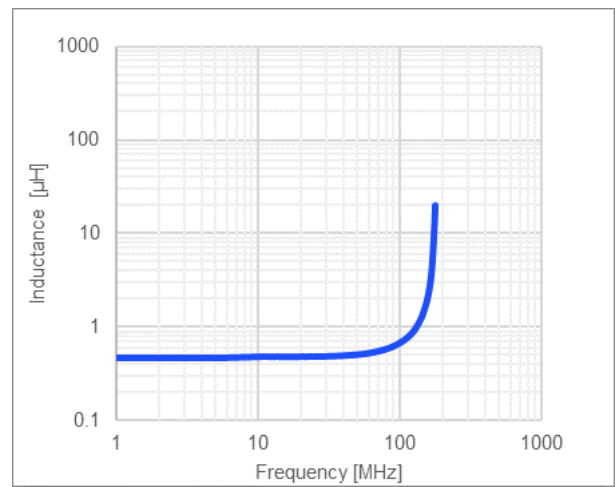
Inductance vs. Current



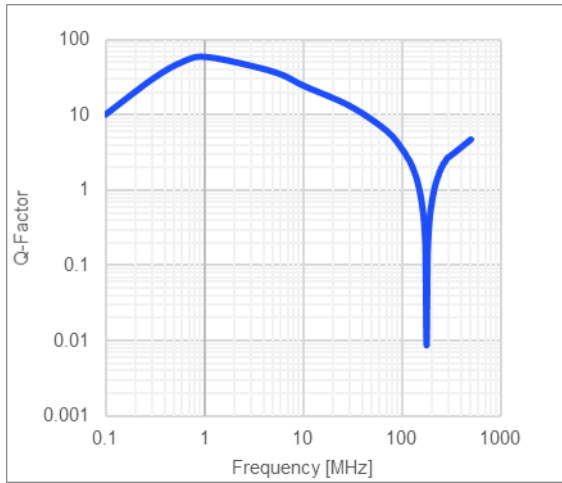
Impedance vs. Frequency



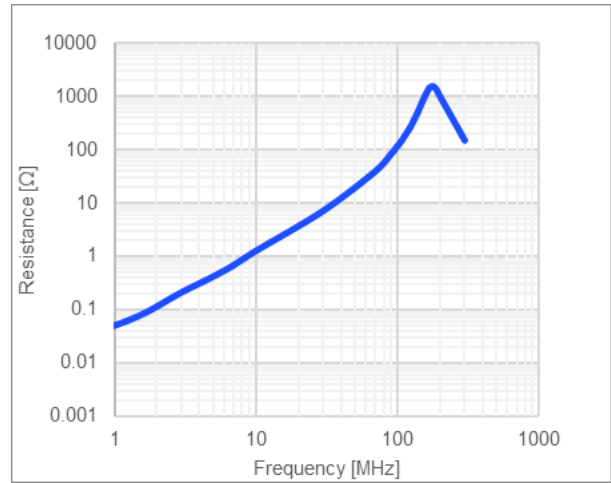
Inductance vs. Frequency



Quality Factor vs. Frequency



AC Resistance vs. Frequency



LAND PATTERN

| Dimensions | |
|------------|-----------|
| A | 4.0 ref. |
| B | 2.10 ref. |
| C | 5.10 ref. |

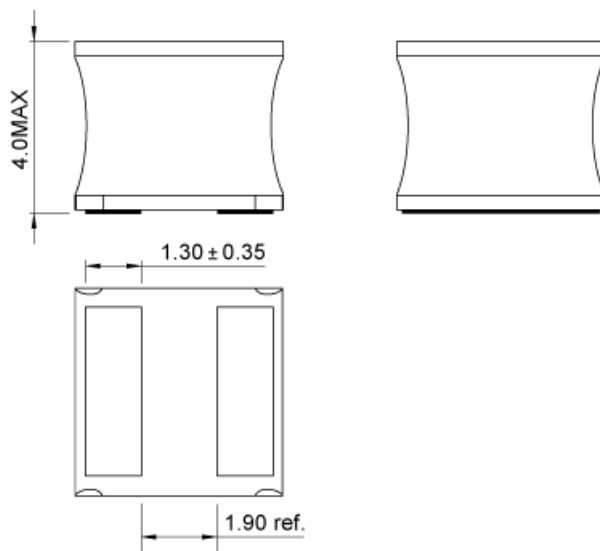
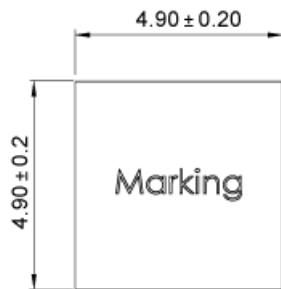
(unit in mm)



PRODUCT PACKAGE AND DIMENSIONS

| Dimensions | |
|------------|--|
|------------|--|

(unit in mm)



TOP MARKING

| Marking | |
|-----------------|-----|
| Inductance Code | R47 |

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-SE5040-R47 | 0.47 | 7.3 | 8.0 | 16 | 13.5 |
| MPL-SE5040-1R0 | 1.0 | 9.4 | 7.6 | 10.5 | 9 |
| MPL-SE5040-1R5 | 1.5 | 14 | 6.2 | 9.3 | 8.4 |
| MPL-SE5040-2R2 | 2.2 | 16 | 5.4 | 7.9 | 7.3 |
| MPL-SE5040-3R3 | 3.3 | 22 | 5.2 | 6.4 | 5.2 |
| MPL-SE5040-4R7 | 4.7 | 33 | 4.3 | 5 | 4.6 |
| MPL-SE5040-6R8 | 6.8 | 45 | 3.5 | 4.6 | 4 |
| MPL-SE5040-100 | 10 | 56 | 3.2 | 3.6 | 3 |
| MPL-SE5040-150 | 15 | 83 | 2.5 | 2.9 | 2.6 |
| MPL-SE5040-220 | 22 | 124 | 2.1 | 2.4 | 2.15 |

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 +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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