

APPLICATIONS



- Battery-powered devices
- Portable devices
- Embedded computing
- High-current SMPS
- High-frequency SMPS
- POL converters
- FPGA

FEATURES

- Size 4.45mmx4.1mmx1.8mm
- 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 | 163 | m Ω |
| Resistance _{MAX} | $R_{DC\ MAX}$ | max | 215 | m Ω |
| Rated Current ⁽²⁾ | I_R | typ | 1.9 | A |
| Saturation Current _{25°C} ⁽³⁾ | $I_{SAT\ 25^\circ\text{C}}$ | typ | 2 | A |
| Saturation Current _{100°C} ⁽⁴⁾ | $I_{SAT\ 100^\circ\text{C}}$ | typ | 2 | A |
| Resonance Frequency | f_r | typ | 16 | MHz |

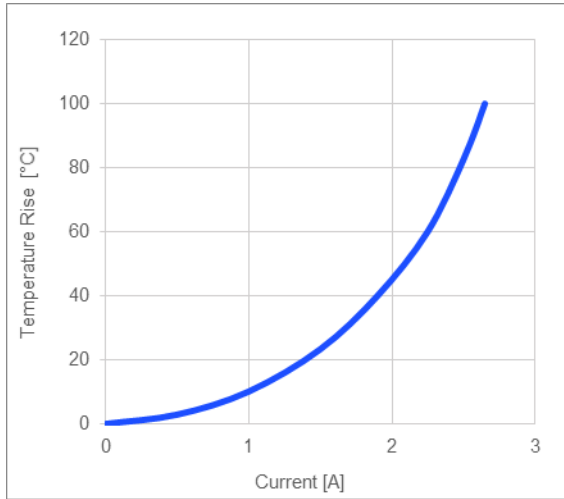
GENERAL SPECIFICATIONS

| | |
|--|--|
| (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 |

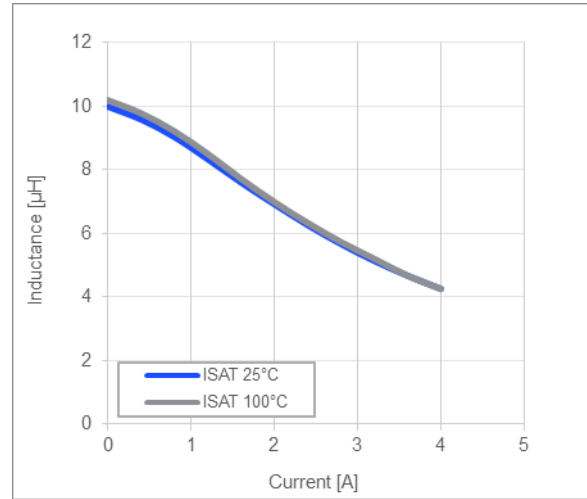
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TYPICAL PERFORMANCE CURVES

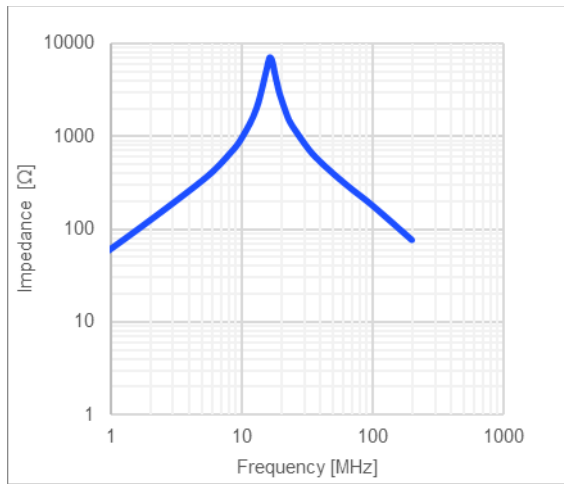
Temperature Rise vs. Current



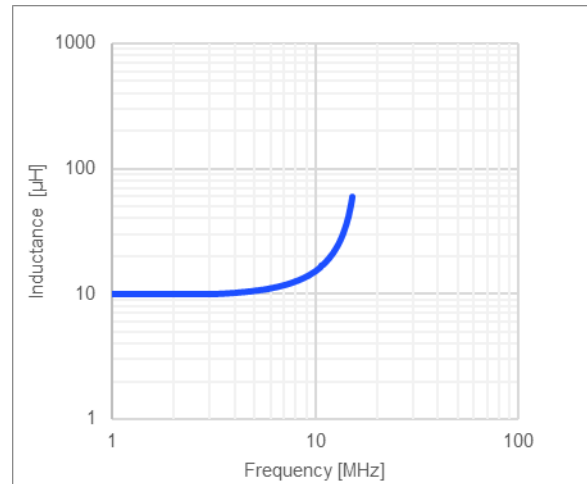
Inductance vs. Current



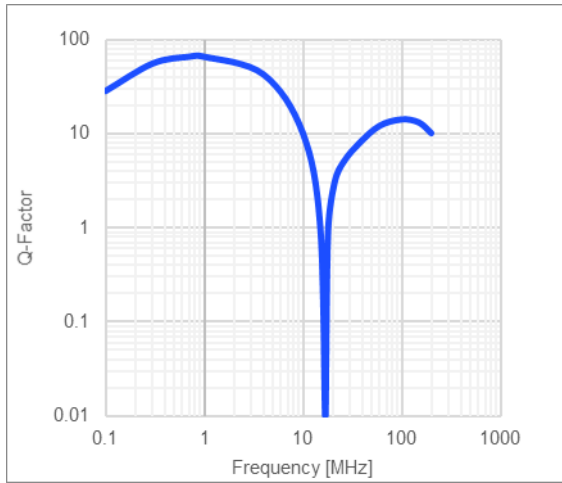
Impedance vs. Frequency



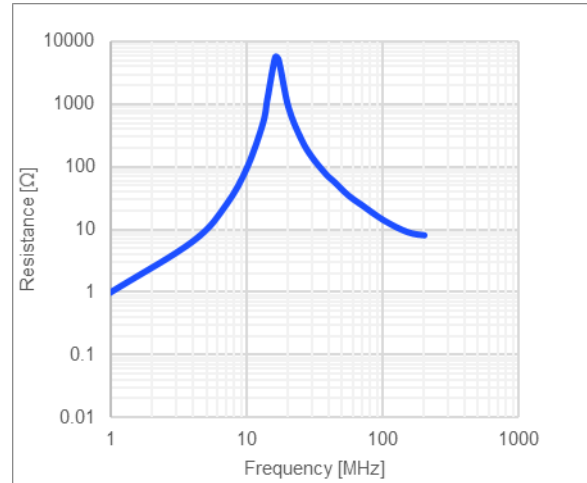
Inductance vs. Frequency



Quality Factor vs. Frequency



AC Resistance vs. Frequency



LAND PATTERN

Dimensions

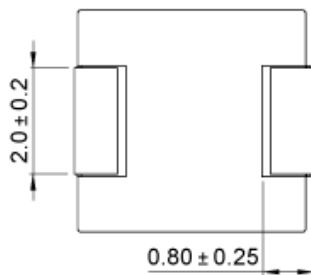
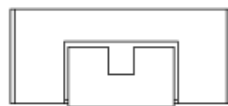
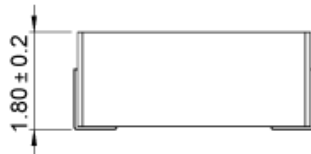
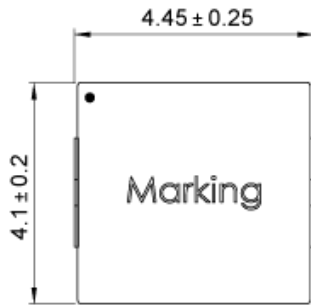
| | |
|---|---------------------------|
| A | 2.50 ref. |
| B | 2.20 ref. |
| C | 5.20 ref. (unit in mm) |



PRODUCT PACKAGE AND DIMENSIONS

Dimensions

(unit in mm)



TOP MARKING

Marking

| | |
|------------------|---------|
| Start of Winding | · (dot) |
| Inductance Code | 100 |

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-AY4020-5R6 | 5.6 | 97 | 2.45 | 2.6 | 2.6 |
| MPL-AY4020-6R8 | 6.8 | 129 | 2.20 | 2.4 | 2.4 |
| MPL-AY4020-8R2 | 8.2 | 136 | 2.10 | 2.1 | 2.1 |
| MPL-AY4020-100 | 10 | 163 | 1.90 | 2 | 2 |

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