



APPLICATIONS

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

FEATURES

- Size 3.5mmx3.2mmx1.8mm
- Molded Construction
- Low Audible Noise
- Soft Saturation
- Stable Over High Temperatures
- Max Operating Temp +125°C
- RoHS/REACH-Compliant, Halogen-Free

ELECTRICAL CHARACTERISTICS

| Parameter | | | Value | Unit |
|--|------------------|------------|-------|------------|
| Inductance ⁽¹⁾ | L | $\pm 20\%$ | 10 | μ H |
| Resistance | R_{DC} | typ | 370 | m Ω |
| Resistance _{MAX} | $R_{DC\ MAX}$ | max | 425 | m Ω |
| Rated Current ⁽²⁾ | I_R | typ | 1.3 | A |
| Saturation Current _{25°C} ⁽³⁾ | $I_{SAT\ 25°C}$ | typ | 1.75 | A |
| Saturation Current _{100°C} ⁽⁴⁾ | $I_{SAT\ 100°C}$ | typ | 1.75 | A |
| Resonance Frequency | f_r | typ | 21 | MHz |

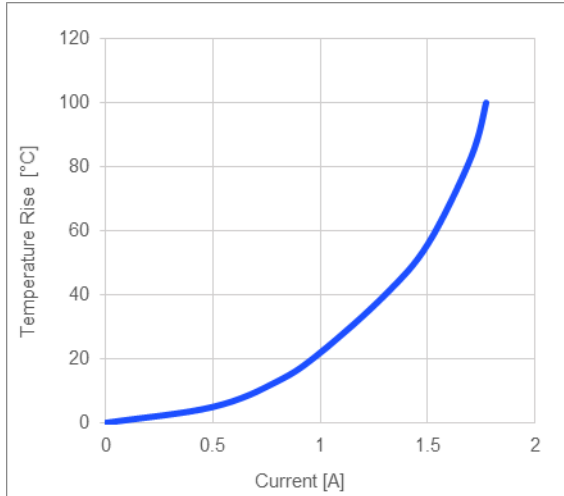
GENERAL SPECIFICATIONS

| | |
|--|--|
| ⁽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 μ m 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 |

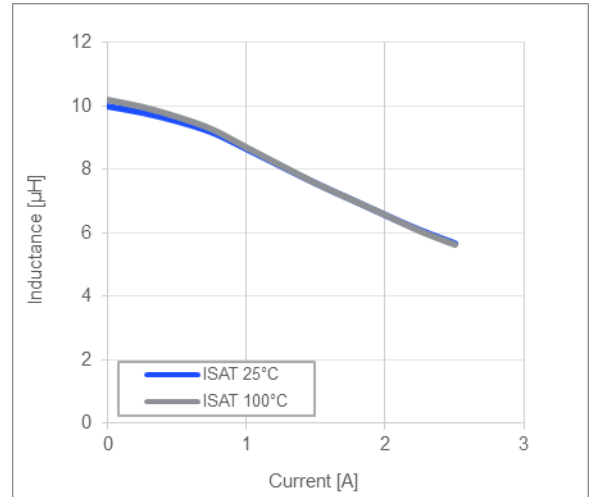
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TYPICAL PERFORMANCE CURVES

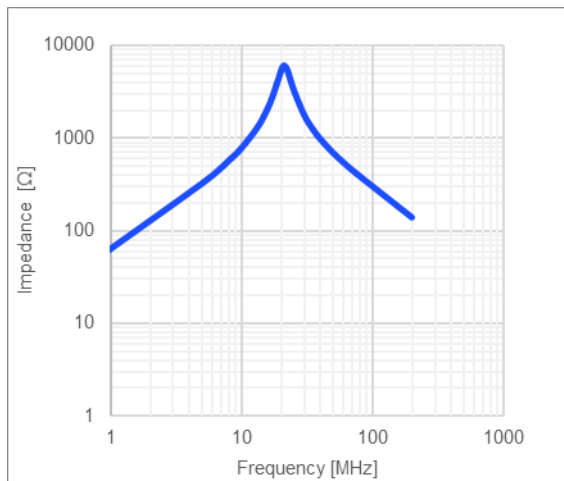
Temperature Rise vs. Current



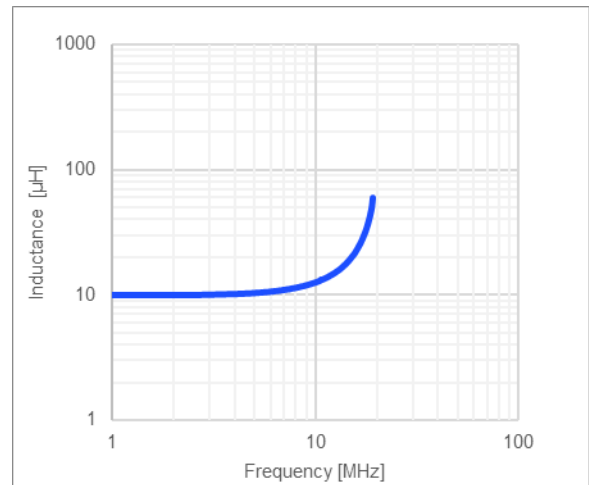
Inductance vs. Current



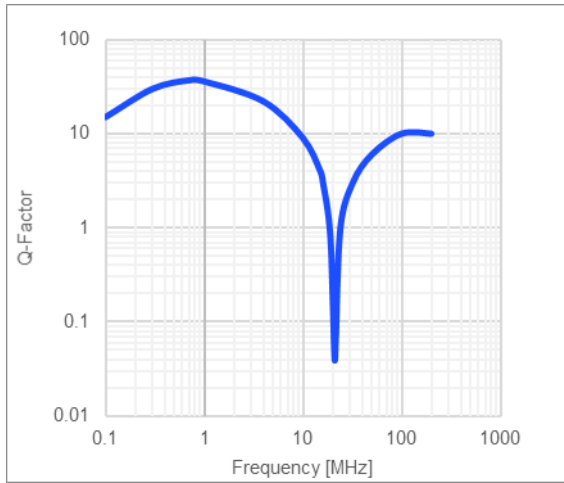
Impedance vs. Frequency



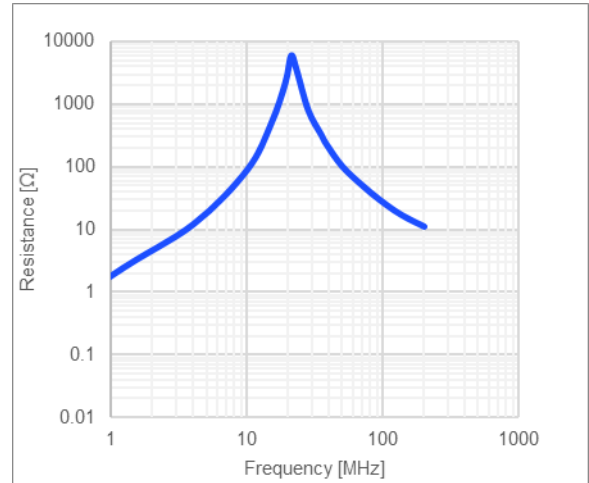
Inductance vs. Frequency



Quality Factor vs. Frequency



AC Resistance vs. Frequency



LAND PATTERN

Dimensions

| | |
|---|-----------|
| A | 1.45 ref. |
| B | 1.90 ref. |
| C | 4.10 ref. |

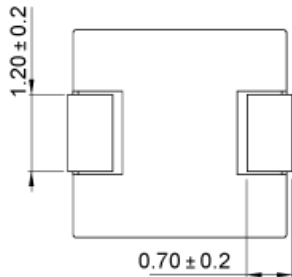
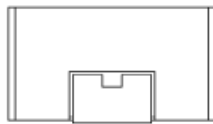
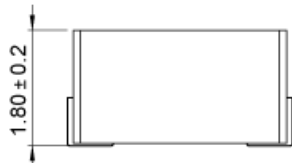
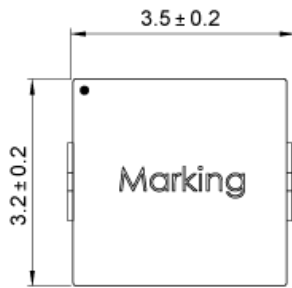
(unit in mm)



PRODUCT PACKAGE AND DIMENSIONS

Dimensions

(unit in mm)



TOP MARKING

Marking

| | |
|------------------|---------|
| Start of Winding | · (dot) |
| Inductance Code | 10 |

ORDERING INFORMATION

| Part Number | $L^{(1)}$ | R_{DC} | $I_R^{(2)}$ | $I_{SAT\ 25^\circ C}^{(3)}$ | $I_{SAT\ 100^\circ C}^{(4)}$ |
|----------------|----------------|-------------------|-------------|-----------------------------|------------------------------|
| | typ (μ H) | typ (m Ω) | typ (A) | typ (A) | typ (A) |
| MPL-AY3020-R47 | 0.47 | 19.5 | 6.3 | 9 | 9 |
| MPL-AY3020-R68 | 0.68 | 26 | 5.15 | 8.6 | 8.6 |
| MPL-AY3020-R82 | 0.82 | 28 | 4.7 | 8 | 8 |
| MPL-AY3020-1R0 | 1.0 | 30 | 4.3 | 6.2 | 6.2 |
| MPL-AY3020-1R5 | 1.5 | 35 | 3.4 | 5.9 | 5.9 |
| MPL-AY3020-2R2 | 2.2 | 64 | 3.0 | 5.3 | 5.3 |
| MPL-AY3020-3R3 | 3.3 | 121 | 2.5 | 3.7 | 3.7 |
| MPL-AY3020-4R7 | 4.7 | 173 | 2.0 | 3.1 | 3.1 |
| MPL-AY3020-5R6 | 5.6 | 209 | 1.8 | 2.8 | 2.8 |
| MPL-AY3020-6R8 | 6.8 | 250 | 1.65 | 2.6 | 2.6 |
| MPL-AY3020-8R2 | 8.2 | 345 | 1.4 | 1.95 | 1.95 |
| MPL-AY3020-100 | 10 | 370 | 1.3 | 1.75 | 1.75 |

GENERAL SPECIFICATIONS

| | |
|---|---|
| (1) Inductance | Measured at 100kHz, 100mA |
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| (3) Saturation Current $_{25^\circ C}$ | Saturation current will cause L to drop from 30% at 25 $^\circ$ C ambient temperature |
| (4) Saturation Current $_{100^\circ C}$ | Saturation current will cause L to drop from 30% at 100 $^\circ$ C ambient temperature |
| Temperature Test Condition | Electrical specifications measured at 25 $^\circ$ C, 35% RH if not given differently |
| Operating Condition | Operating temperature: -40 $^\circ$ C to +125 $^\circ$ C (including temp rise) Should not exceed +125 $^\circ$ C under worst-case operation conditions |
| Storage Condition | Tape and Reel packaging: -10 $^\circ$ C to +40 $^\circ$ C Humidity: <50% RH |

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