



### 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 <sup>(1)</sup>                          | <i>L</i>                     | ±20% | 6.8   | μH   |
| Resistance   | <i>R<sub>DC</sub></i>        | typ  | 45    | mΩ   |
| Resistance <sub>MAX</sub>                          | <i>R<sub>DC MAX</sub></i>    | max  | 51    | mΩ   |
| Rated Current <sup>(2)</sup>                       | <i>I<sub>R</sub></i>         | typ  | 3.5   | A    |
| Saturation Current <sub>25°C</sub> <sup>(3)</sup>  | <i>I<sub>SAT 25°C</sub></i>  | typ  | 4.6   | A    |
| Saturation Current <sub>100°C</sub> <sup>(4)</sup> | <i>I<sub>SAT 100°C</sub></i> | typ  | 4     | A    |
| Resonance Frequency                                | <i>f<sub>r</sub></i>         | typ  | 25    | MHz  |

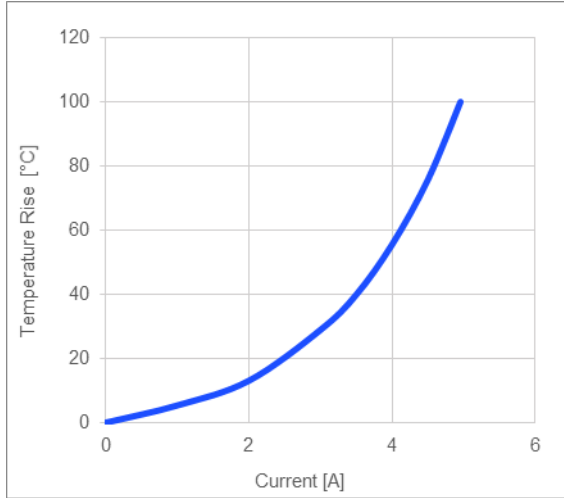
### GENERAL SPECIFICATIONS

|  |   |
|--|---|
| <sup>(1)</sup> Inductance                          | Measured at 100kHz, 100mA   |
| <sup>(2)</sup> Rated Current                       | Rated current will cause the coil temperature rise ΔT of 40K<br><i>I<sub>R</sub></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. |
| <sup>(3)</sup> Saturation Current <sub>25°C</sub>  | Saturation current will cause L to drop from 30% at 25°C ambient temperature  |
| <sup>(4)</sup> Saturation Current <sub>100°C</sub> | 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)<br>Should not exceed +125°C under worst-case operation conditions  |
| Storage Condition                                  | Tape and Reel packaging: -10°C to +40°C<br>Humidity: <50% RH  |

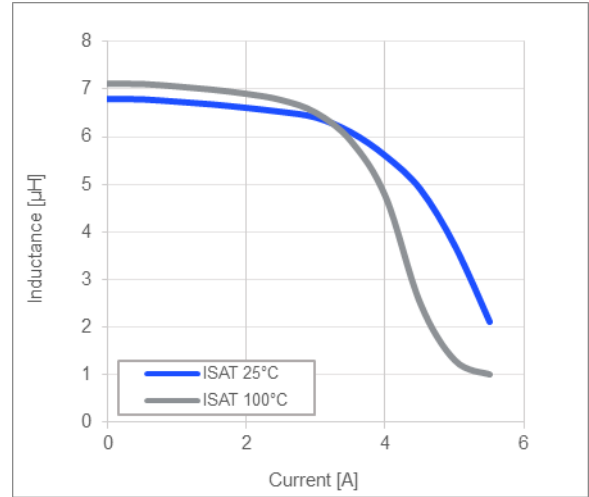
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**TYPICAL PERFORMANCE CURVES**

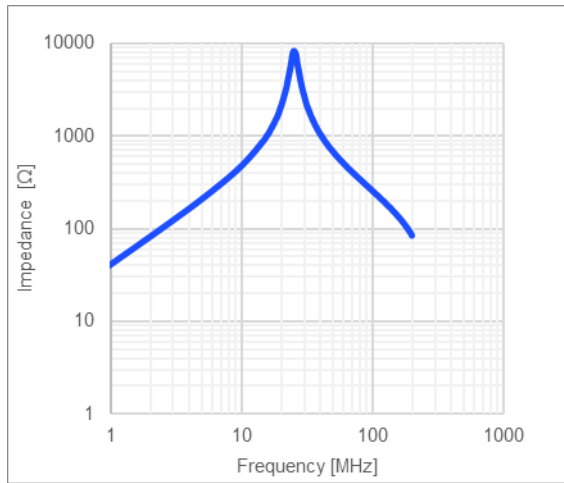
**Temperature Rise vs. Current**



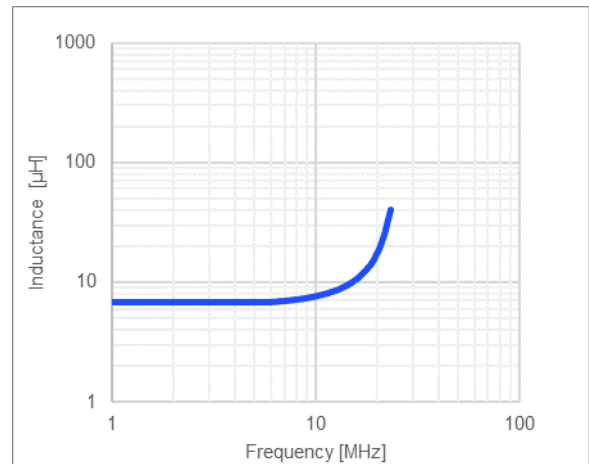
**Inductance vs. Current**



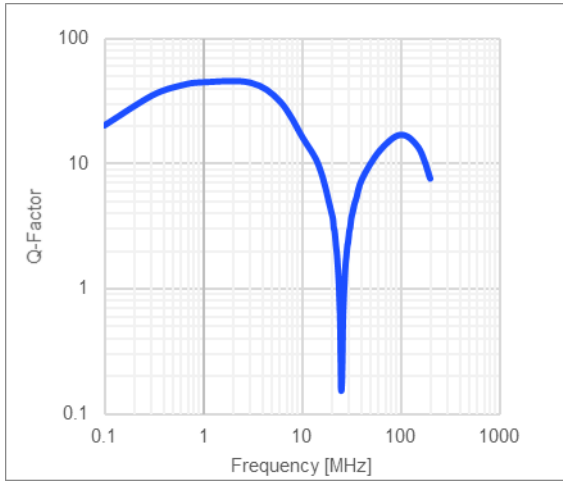
**Impedance vs. Frequency**



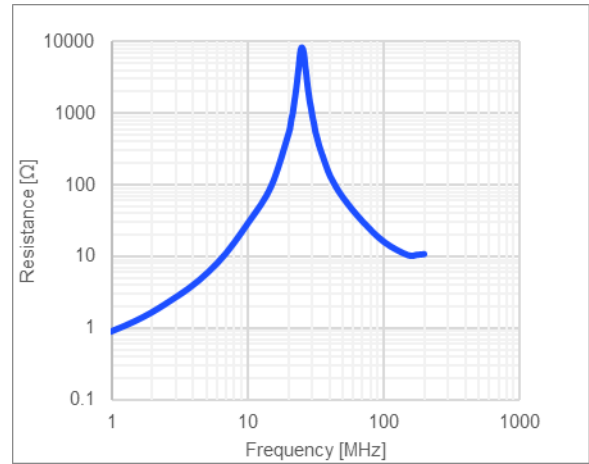
**Inductance vs. Frequency**



Quality Factor vs. Frequency



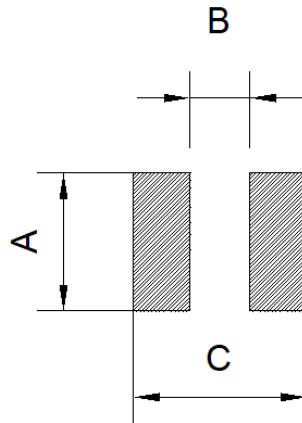
AC Resistance vs. Frequency



**LAND PATTERN**

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

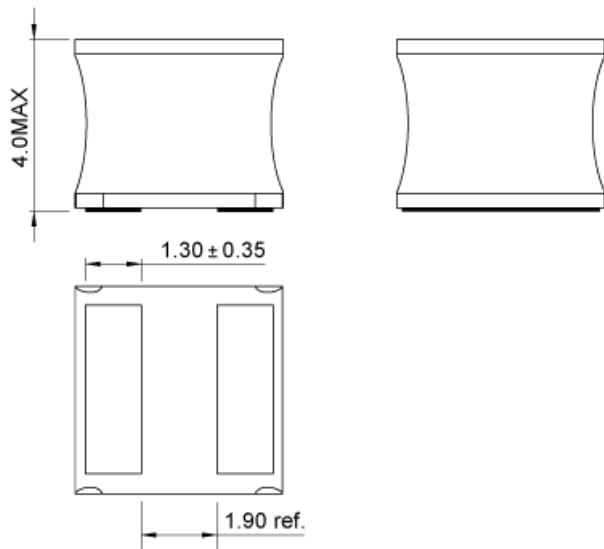
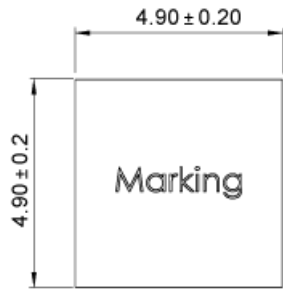
(unit in mm)



**PRODUCT PACKAGE AND DIMENSIONS**

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

(unit in mm)



**TOP MARKING**

| Marking         |     |
|-----------------|-----|
| Inductance Code | 6R8 |

**ORDERING INFORMATION**

| Part Number    | $L^{(1)}$<br>typ (μH) | $R_{DC}$<br>typ (mΩ) | $I_R^{(2)}$<br>typ (A) | $I_{SAT\ 25^{\circ}C}^{(3)}$<br>typ (A) | $I_{SAT\ 100^{\circ}C}^{(4)}$<br>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  $\Delta T$  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: &lt;50% RH

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