



### APPLICATIONS

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

### FEATURES

- Size 6mmx6mmx4mm
- 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>                          | $L$              | ±20% | 15    | μH   |
| Resistance                                         | $R_{DC}$         | typ  | 70    | mΩ   |
| Resistance <sub>MAX</sub>                          | $R_{DC\ MAX}$    | max  | 87    | mΩ   |
| Rated Current <sup>(2)</sup>                       | $I_R$            | typ  | 2.8   | A    |
| Saturation Current <sub>25°C</sub> <sup>(3)</sup>  | $I_{SAT\ 25°C}$  | typ  | 2.7   | A    |
| Saturation Current <sub>100°C</sub> <sup>(4)</sup> | $I_{SAT\ 100°C}$ | typ  | 2.4   | A    |
| Resonance Frequency                                | $f_r$            | typ  | 16    | MHz  |

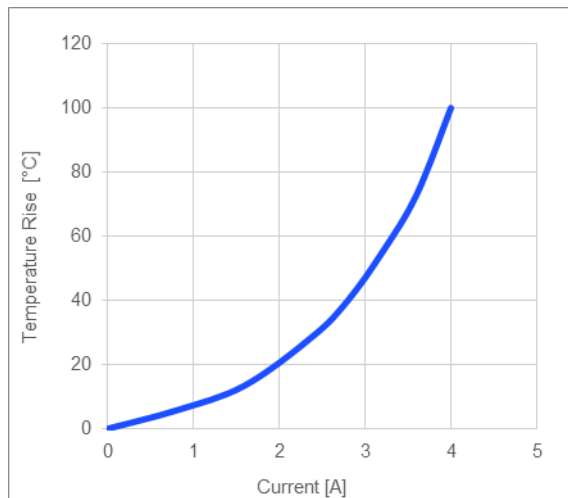
### GENERAL SPECIFICATIONS

|                                                    |                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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> 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> |
| <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                                                                                                                                                                                                                                                                        |

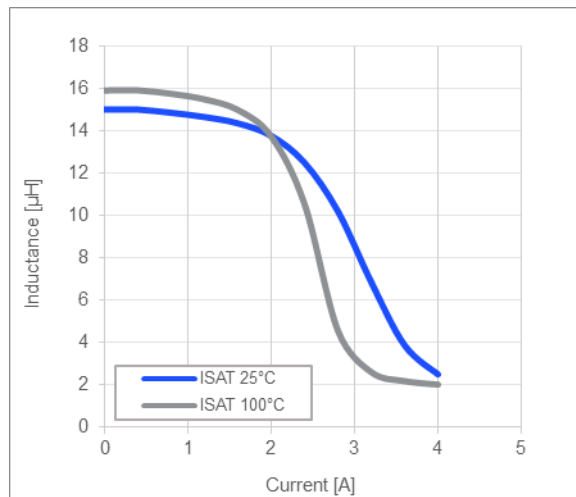
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**TYPICAL PERFORMANCE CURVES**

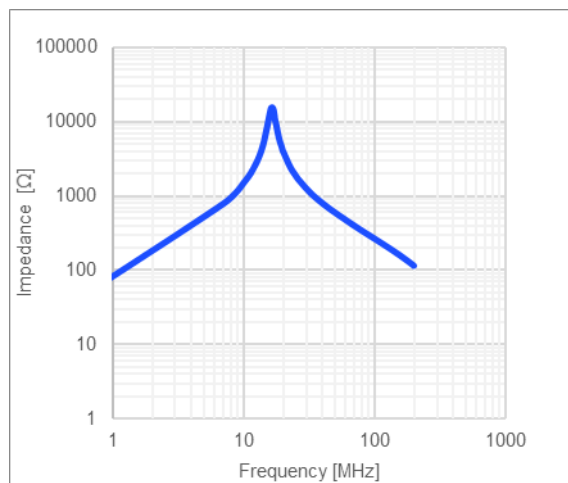
**Temperature Rise vs. Current**



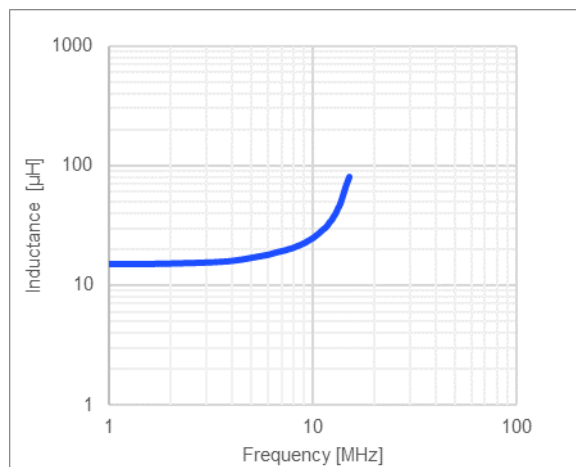
**Inductance vs. Current**



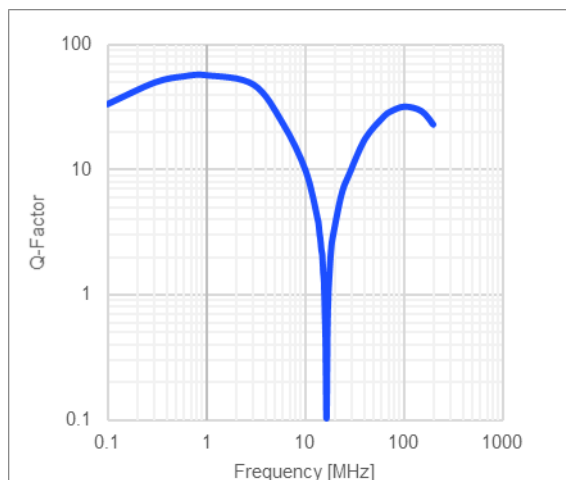
**Impedance vs. Frequency**



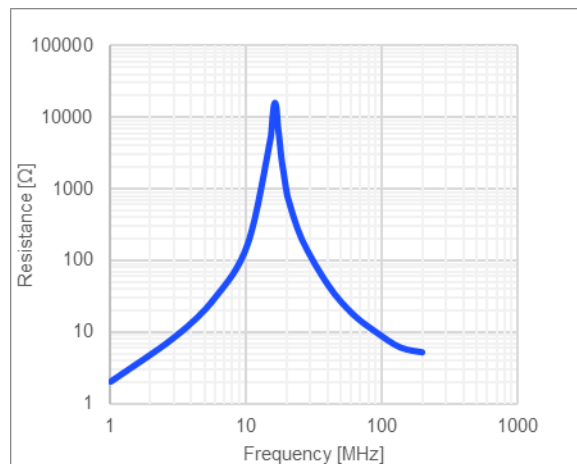
**Inductance vs. Frequency**



Quality Factor vs. Frequency



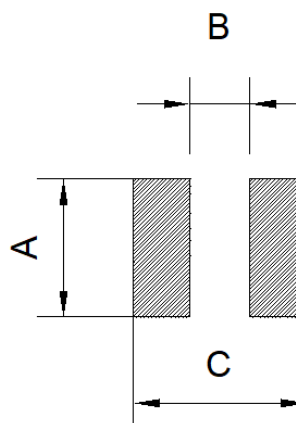
AC Resistance vs. Frequency



# LAND PATTERN

## Dimensions

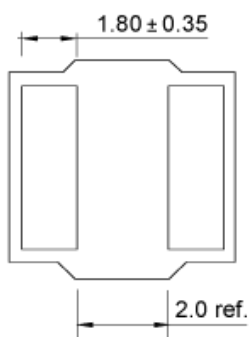
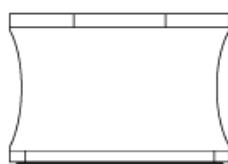
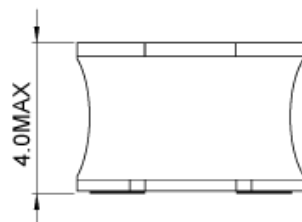
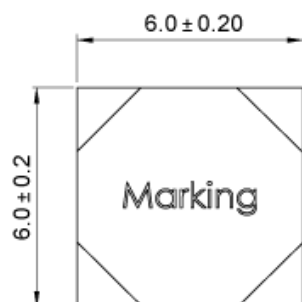
|   |                           |
|---|---------------------------|
| A | 4.50 ref.                 |
| B | 2.20 ref.                 |
| C | 6.50 ref.<br>(unit in mm) |



# PRODUCT PACKAGE AND DIMENSIONS

## Dimensions

(unit in mm)



# TOP MARKING

## Marking

Inductance Code 150

## 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-SE6040-1R5 | 1.5       | 11.5     | 6.8         | 8.9                          | 7.8                           |
| MPL-SE6040-2R2 | 2.2       | 14.5     | 6.3         | 7.2                          | 6.7                           |
| MPL-SE6040-3R3 | 3.3       | 19.5     | 5.6         | 5.6                          | 4.9                           |
| MPL-SE6040-4R7 | 4.7       | 23       | 5.2         | 5                            | 4.5                           |
| MPL-SE6040-6R8 | 6.8       | 33       | 4.4         | 4.1                          | 3.7                           |
| MPL-SE6040-8R2 | 8.2       | 39       | 4.0         | 3.6                          | 3.2                           |
| MPL-SE6040-100 | 10        | 41       | 3.8         | 3.4                          | 2.8                           |
| MPL-SE6040-150 | 15        | 70       | 2.8         | 2.7                          | 2.4                           |
| MPL-SE6040-220 | 22        | 97       | 2.35        | 2.25                         | 2                             |

## GENERAL SPECIFICATIONS

|                                                            |                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>(1) Inductance</b>                                      | Measured at 100kHz, 100mA                                                                                                                                                                                                                                                                                                                      |
| <b>(2) Rated Current</b>                                   | Rated current will cause the coil temperature rise $\Delta T$ of 40K<br><i><math>I_R</math> 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> |
| <b>(3) Saturation Current <math>_{25^{\circ}C}</math></b>  | Saturation current will cause L to drop from 30% at 25°C ambient temperature                                                                                                                                                                                                                                                                   |
| <b>(4) Saturation Current <math>_{100^{\circ}C}</math></b> | Saturation current will cause L to drop from 30% at 100°C ambient temperature                                                                                                                                                                                                                                                                  |
| <b>Temperature Test Condition</b>                          | Electrical specifications measured at 25°C, 35% RH if not given differently                                                                                                                                                                                                                                                                    |
| <b>Operating Condition</b>                                 | Operating temperature: -40°C to +125°C (including temp rise)<br>Should not exceed +125°C under worst-case operation conditions                                                                                                                                                                                                                 |
| <b>Storage Condition</b>                                   | Tape and Reel packaging: -10°C to +40°C<br>Humidity: <50% RH                                                                                                                                                                                                                                                                                   |

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