



### APPLICATIONS

- Battery-Powered Devices
- IoT
- Wearable
- Portable Devices
- Input Filters

### FEATURES

- Size 2mmx2.5mmx1.2mm
- Semi-Shielded Construction
- Low DCR
- Low Profile
- Low Stray Field
- Max Operating Temp +125°C
- RoHS/REACH-Compliant, Halogen-Free

### ELECTRICAL CHARACTERISTICS

| Parameter  |                  |      | Value | Unit |
|--|------------------|------|-------|------|
| Inductance <sup>(1)</sup>                          | $L$              | ±20% | 1.0   | μH   |
| Resistance   | $R_{DC}$         | Typ  | 35    | mΩ   |
| Resistance <sub>MAX</sub>                          | $R_{DC\ MAX}$    | Max  | 43    | mΩ   |
| Rated Current <sup>(2)</sup>                       | $I_R$            | Typ  | 3.4   | A    |
| Saturation Current <sub>25°C</sub> <sup>(3)</sup>  | $I_{SAT\ 25°C}$  | Typ  | 4.2   | A    |
| Saturation Current <sub>100°C</sub> <sup>(4)</sup> | $I_{SAT\ 100°C}$ | Typ  | 4.2   | A    |
| Resonance Frequency                                | $f_r$            | Typ  | 74    | MHz  |

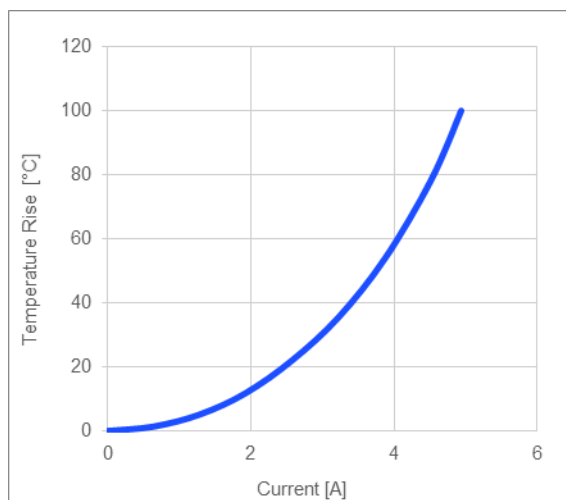
### GENERAL SPECIFICATIONS

|  |  |
|--|--|
| <sup>(1)</sup> Inductance                          | Measured at 100kHz, 100mA  |
| <sup>(2)</sup> Rated Current                       | Rated current will cause the coil temperature rise $\Delta T$ of 40K<br>$I_R$ 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. |
| <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 otherwise noted  |
| 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   |

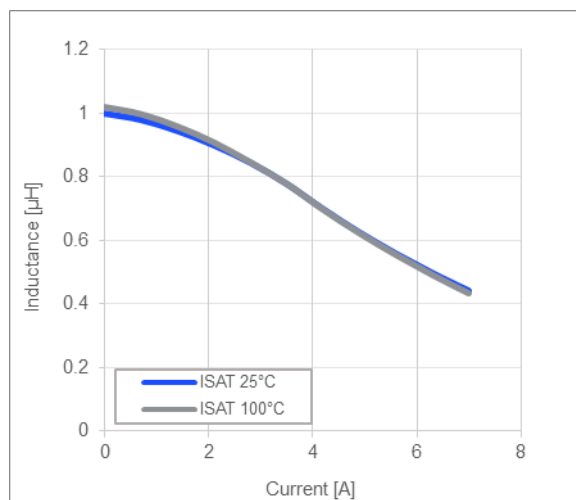
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## TYPICAL PERFORMANCE CURVES

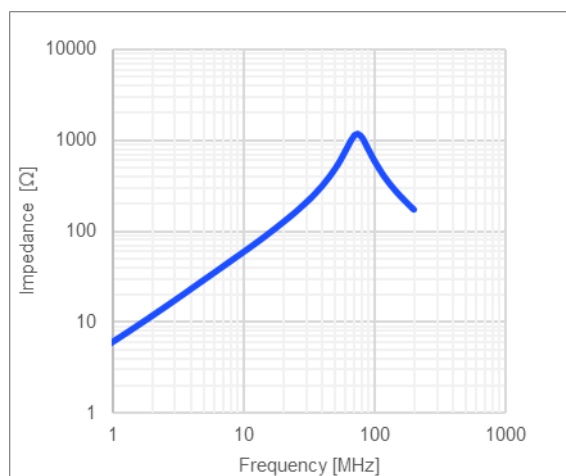
Temperature Rise vs. Current



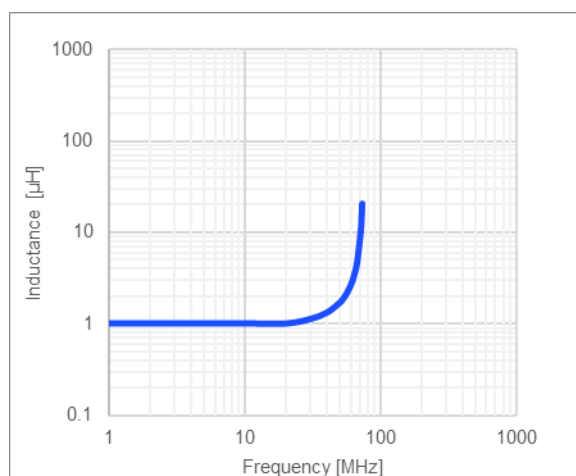
Inductance vs. Current



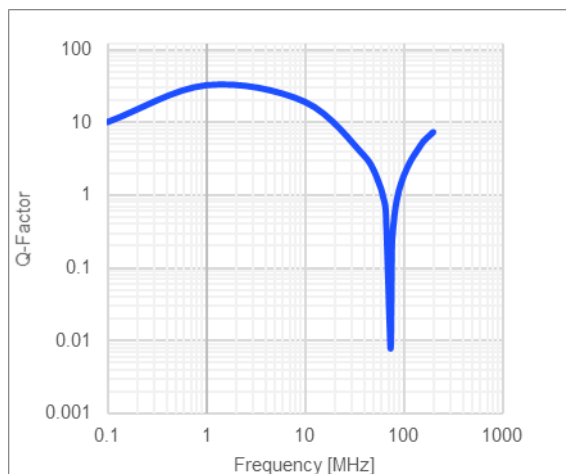
Impedance vs. Frequency



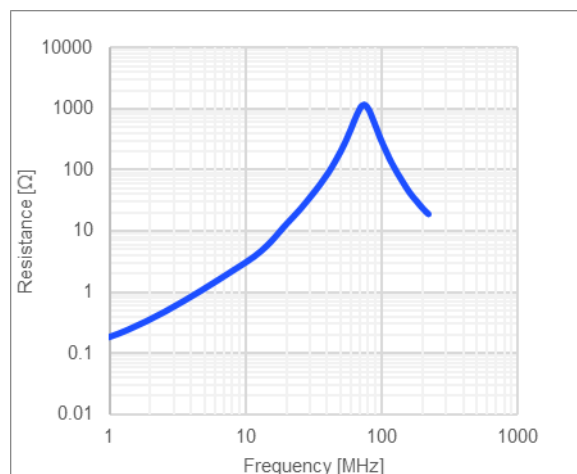
Inductance vs. Frequency



**Quality Factor vs. Frequency**

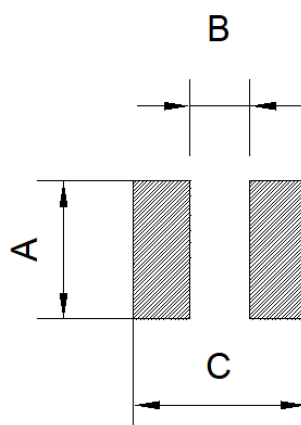


**AC Resistance vs. Frequency**



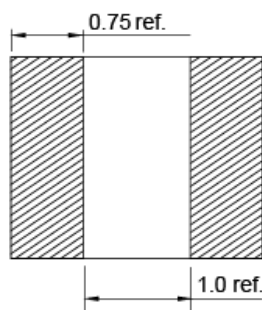
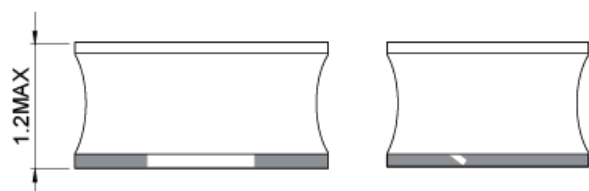
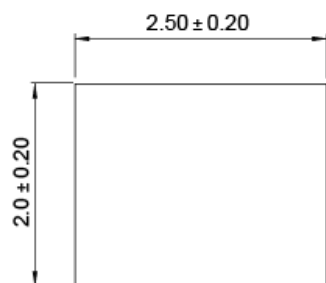
## LAND PATTERN

| Dimensions |                            |
|------------|----------------------------|
| A          | 2.40 ref.                  |
| B          | 1.00 ref.                  |
| C          | 2.90 ref.<br>(units in mm) |



## PRODUCT PACKAGE AND DIMENSIONS

| Dimensions    |
|---------------|
| (units in mm) |



## 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-SE2512-R47 | 0.47      | 20       | 4.5         | 6.5                          | 6.5                           |
| MPL-SE2512-R68 | 0.68      | 28       | 3.9         | 5                            | 5                             |
| MPL-SE2512-1R0 | 1         | 35       | 3.4         | 4.2                          | 4.2                           |
| MPL-SE2512-1R5 | 1.5       | 50       | 2.9         | 3.2                          | 3.2                           |
| MPL-SE2512-2R2 | 2.2       | 72       | 2.5         | 2.7                          | 2.7                           |
| MPL-SE2512-3R3 | 3.3       | 90       | 2.1         | 2.4                          | 2.4                           |
| MPL-SE2512-4R7 | 4.7       | 165      | 1.6         | 1.9                          | 1.9                           |
| MPL-SE2512-6R8 | 6.8       | 305      | 1.2         | 1.6                          | 1.6                           |
| MPL-SE2512-100 | 10        | 410      | 1.1         | 1.3                          | 1.3                           |
| MPL-SE2512-150 | 15        | 620      | 0.85        | 0.9                          | 0.9                           |
| MPL-SE2512-220 | 22        | 885      | 0.7         | 0.8                          | 0.8                           |

## 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 $25^{\circ}C$ ambient temperature  |
| <b>(4) Saturation Current <math>100^{\circ}C</math></b> | Saturation current will cause L to drop from 30% at $100^{\circ}C$ ambient temperature   |
| <b>Temperature Test Condition</b>                       | Electrical specifications measured at $25^{\circ}C$ , 35% RH if not otherwise noted  |
| <b>Operating Condition</b>                              | Operating temperature: $-40^{\circ}C$ to $+125^{\circ}C$ (including temp rise)<br>Should not exceed $+125^{\circ}C$ under worst-case operation conditions  |
| <b>Storage Condition</b>                                | Tape and Reel packaging: $-10^{\circ}C$ to $+40^{\circ}C$<br>Humidity: <50% RH   |

## REVISION HISTORY

| Revision # | Revision Date | Description   | Pages Updated |
|------------|---------------|---|---------------|
| 1.0        | 7/26/2019     | Initial Release                                     | -             |
| 1.1        | 8/2/2019      | Updated Impedance vs. Frequency Curve               | 2             |
| 1.2        | 1/19/2022     | Updated Electrical Characteristics                  | 1             |
|            |               | Updated Typical Performance Curves                  | 2–3           |
|            |               | Updated Land Pattern and Product Package Dimensions | 4             |
|            |               | Updated Ordering Information                        | 5             |
|            |               | Grammar and formatting updates                      | All           |

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