



### APPLICATIONS

- Battery-powered devices
- High switching frequency SMPS
- IoT
- Wearable
- Portable devices
- Input filters

### FEATURES

- Size 2.5mmx2.0mmx1.2mm
- Low Profile
- Low Audible Noise
- Molded Construction
- Soft Saturation
- Stable Over High Temperatures
- Low DCR
- 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 $_{MAX}$                                 | $R_{DC MAX}$           | max  | 42    | mΩ   |
| Rated Current <sup>(2)</sup>                        | $I_R$                  | typ  | 4.0   | A    |
| Saturation Current $_{25^{\circ}C}$ <sup>(3)</sup>  | $I_{SAT 25^{\circ}C}$  | typ  | 5.2   | A    |
| Saturation Current $_{100^{\circ}C}$ <sup>(4)</sup> | $I_{SAT 100^{\circ}C}$ | typ  | 5.2   | A    |
| Resonance Frequency                                 | $f_r$                  | typ  | 64    | MHz  |

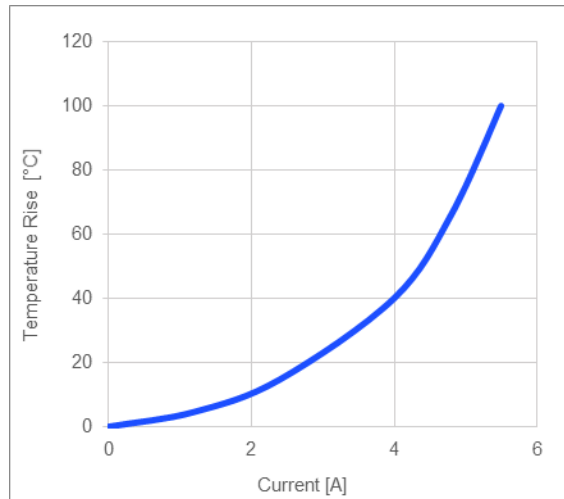
### GENERAL SPECIFICATIONS

|                                                     |                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 $_{25^{\circ}C}$  | Saturation current will cause L to drop from 30% at 25°C ambient temperature                                                                                                                                                                                                                                                 |
| <sup>(4)</sup> 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)<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                                                                                                                                                                                                                                                                 |

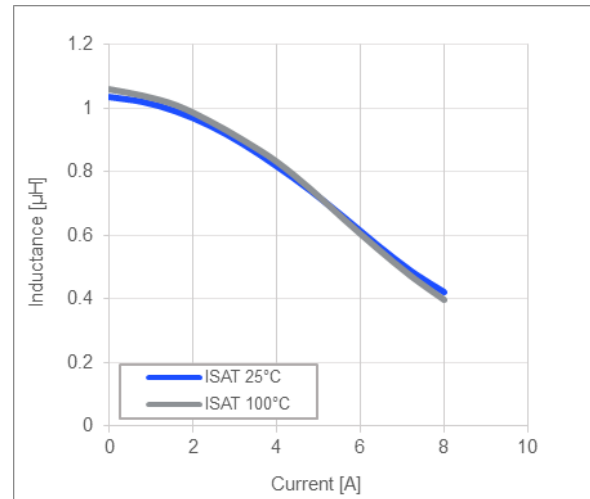
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**TYPICAL PERFORMANCE CURVES**

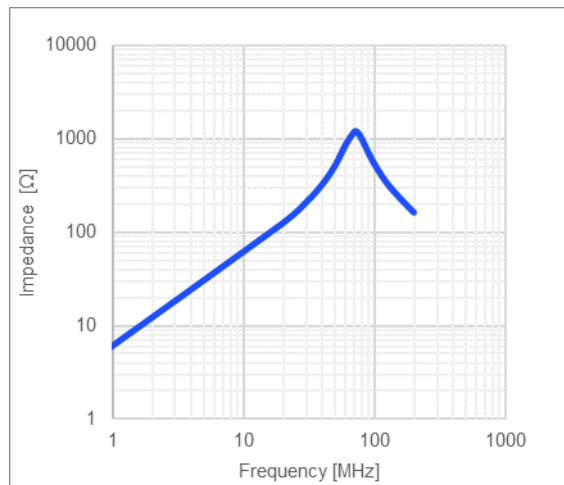
**Temperature Rise vs. Current**



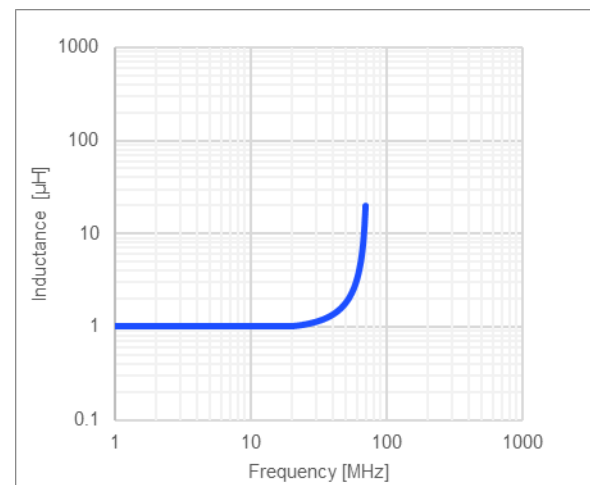
**Inductance vs. Current**



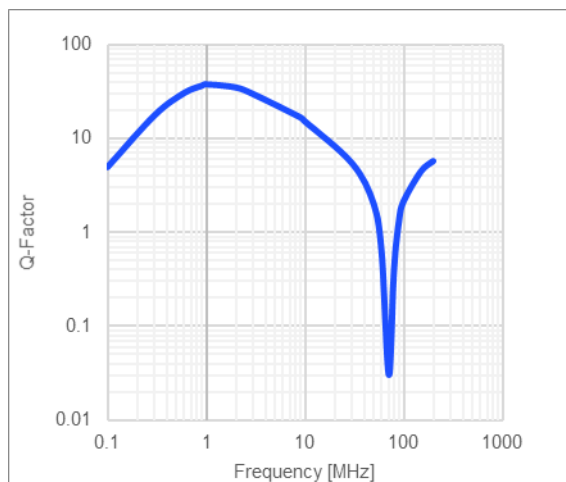
**Impedance vs. Frequency**



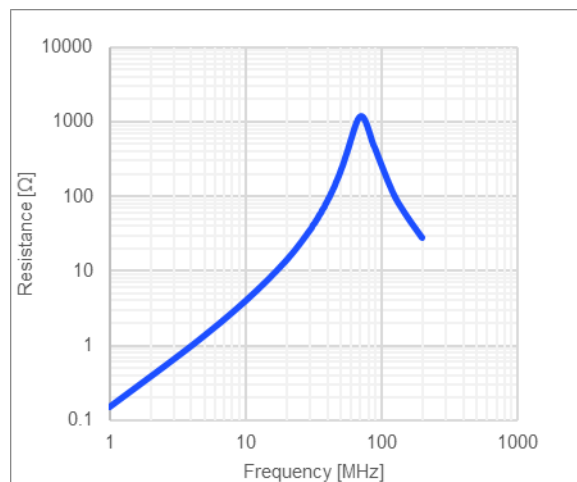
**Inductance vs. Frequency**



**Quality Factor vs. Frequency**



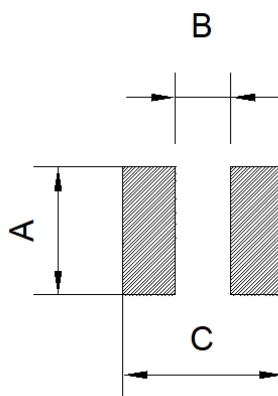
**AC Resistance vs. Frequency**



# LAND PATTERN

## Dimensions

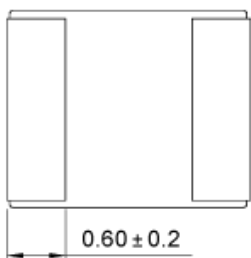
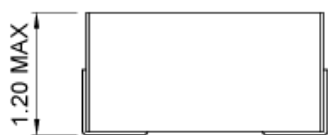
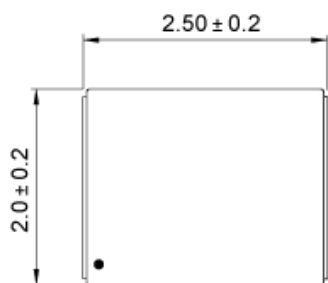
|   |                           |
|---|---------------------------|
| A | 2.0 ref.                  |
| B | 1.20 ref.                 |
| C | 2.80 ref.<br>(unit in mm) |



# PRODUCT PACKAGE AND DIMENSIONS

## Dimensions

(unit in mm)



# TOP MARKING

## Marking

Start of Winding · (dot)

## 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-AT2512-R33 | 0.33                  | 13.5                 | 6.4                    | 8.5                                    | 8.5                                     |
| MPL-AT2512-R47 | 0.47                  | 19                   | 5.5                    | 6.4                                    | 6.4                                     |
| MPL-AT2512-R68 | 0.68                  | 26                   | 4.7                    | 6                                      | 6                                       |
| MPL-AT2512-1R0 | 1.0                   | 35                   | 4.0                    | 5.2                                    | 5.2                                     |
| MPL-AT2512-1R5 | 1.5                   | 56                   | 3.2                    | 4.2                                    | 4.2                                     |
| MPL-AT2514-2R2 | 2.2                   | 70                   | 2.6                    | 3.4                                    | 3.4                                     |
| MPL-AT2512-3R3 | 3.3                   | 121                  | 2.0                    | 2.7                                    | 2.7                                     |
| MPL-AT2514-4R7 | 4.7                   | 180                  | 1.7                    | 2.4                                    | 2.4                                     |
| MPL-AT2512-6R8 | 6.8                   | 280                  | 1.4                    | 2.2                                    | 2.2                                     |
| MPL-AT2512-100 | 10                    | 355                  | 1.2                    | 1.7                                    | 1.7                                     |

## 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: <50% RH

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