

### APPLICATIONS



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

### FEATURES

- Size 5.5mmx5.3mmx4.8mm
- Low DCR
- Low AC Losses
- Low Audible Noise
- Molded Construction
- Soft Saturation
- Stable Over High Temperatures
- Max Operating Temp +155°C
- RoHS/REACH-Compliant, Halogen-Free

### ELECTRICAL CHARACTERISTICS

Parameter			Value	Unit
Inductance <sup>(1)</sup>	$L$	±20%	5.6	μH
Resistance	$R_{DC}$	typ	20	mΩ
Resistance <sub>MAX</sub>	$R_{DC\ MAX}$	max	24.2	mΩ
Rated Current <sup>(2)</sup>	$I_R$	typ	6.8	A
Saturation Current <sub>25°C</sub> <sup>(3)</sup>	$I_{SAT\ 25°C}$	typ	8	A
Saturation Current <sub>100°C</sub> <sup>(4)</sup>	$I_{SAT\ 100°C}$	typ	8	A
Resonance Frequency	$f_r$	typ	19	MHz

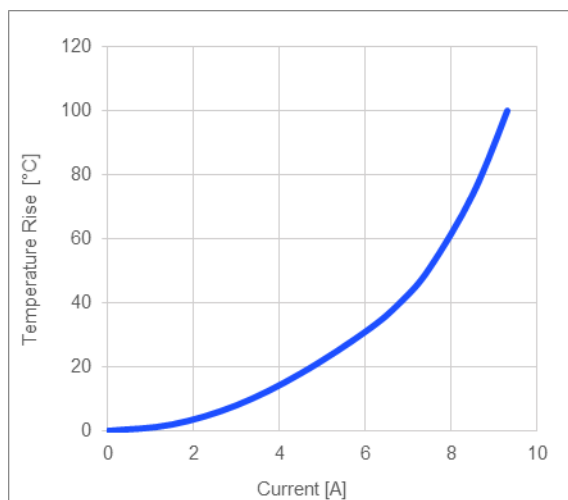
### GENERAL SPECIFICATIONS

<sup>(1)</sup> Inductance	Measured at 100kHz, 100mA
<sup>(2)</sup> Rated Current	Rated current will cause the coil temperature rise ΔT of 40K $I_R$ 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 given differently
Operating Condition	Operating temperature: -40°C to +155°C (including temp rise) Should not exceed +155°C under worst-case operation conditions
Storage Condition	Tape and Reel packaging: -10°C to +40°C Humidity: <50% RH

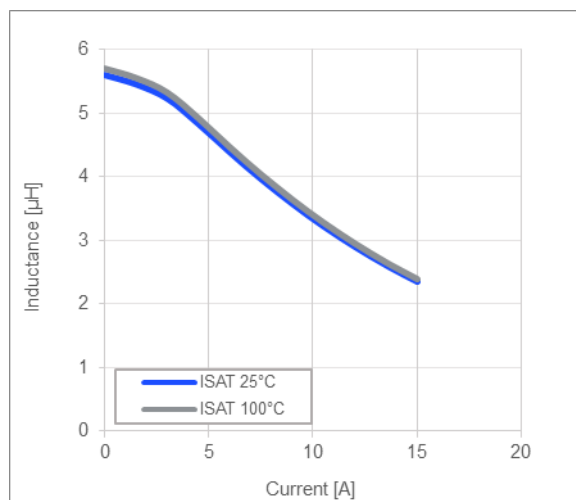
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**TYPICAL PERFORMANCE CURVES**

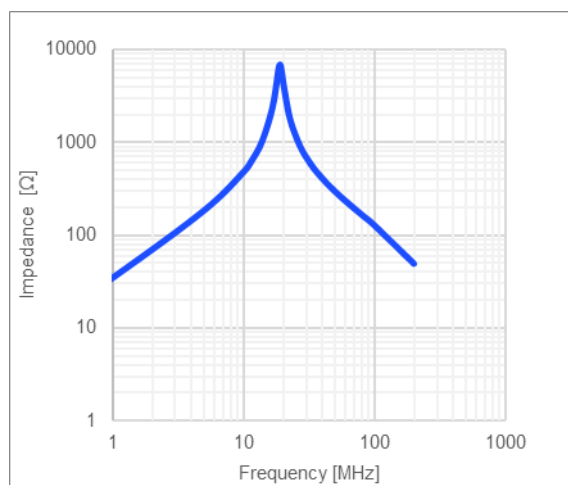
**Temperature Rise vs. Current**



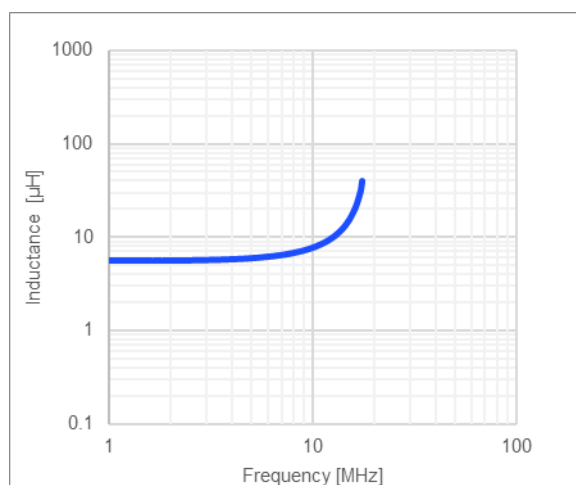
**Inductance vs. Current**



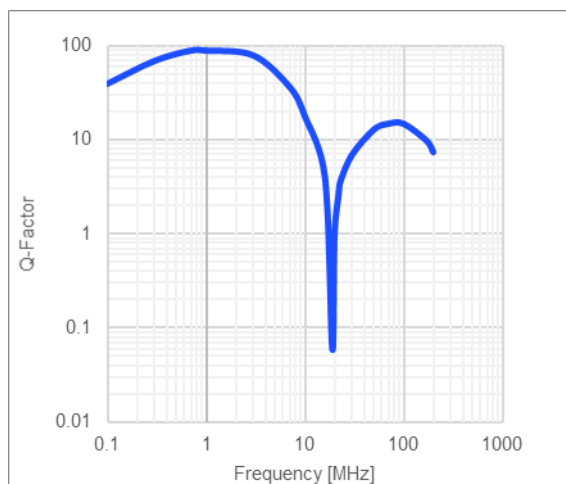
**Impedance vs. Frequency**



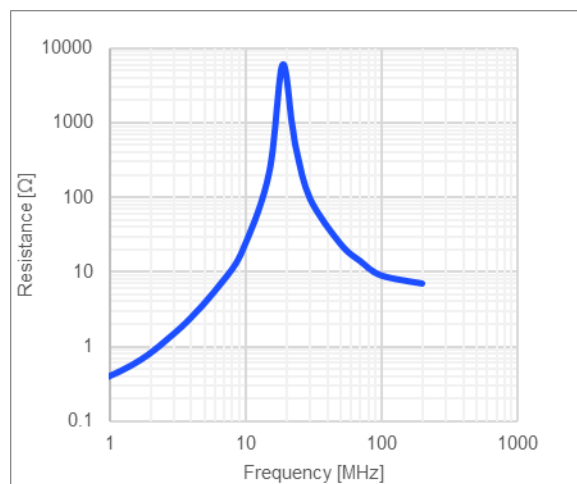
**Inductance vs. Frequency**



**Quality Factor vs. Frequency**



**AC Resistance vs. Frequency**



## LAND PATTERN

### Dimensions

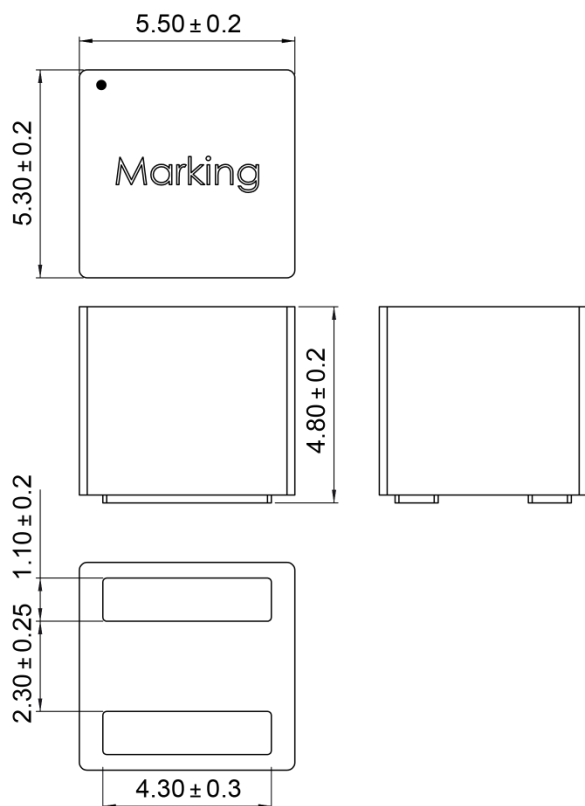
A	4.70 ref.
B	2.0 ref.
C	4.50 ref. (unit in mm)



## PRODUCT PACKAGE AND DIMENSIONS

### Dimensions

(unit in mm)



## TOP MARKING

### Marking

Start of Winding	· (dot)
Inductance Code	5R6
MPS Code	MPS

## 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-AL5050-5R6	5.6	20	6.8	8	8
MPL-AL5050-6R8	6.8	25	6.1	7.6	7.6
MPL-AL5050-8R2	8.2	28	5.8	7.2	7.2
MPL-AL5050-100	10	37	4.8	5.5	5.5

## 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 <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 given differently
<b>Operating Condition</b>	Operating temperature: $-40^{\circ}C$ to $+155^{\circ}C$ (including temp rise) Should not exceed $+155^{\circ}C$ under worst-case operation conditions
<b>Storage Condition</b>	Tape and Reel packaging: $-10^{\circ}C$ to $+40^{\circ}C$ Humidity: <50% RH

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