



### APPLICATIONS

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

### FEATURES

- Size 4.1mmx4.1mmx1.9mm
- 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%	0.47	μH
Resistance	$R_{DC}$	typ	6.2	mΩ
Resistance $_{MAX}$	$R_{DC\ MAX}$	max	6.9	mΩ
Rated Current <sup>(2)</sup>	$I_R$	typ	9.2	A
Saturation Current $_{25^{\circ}C}$ <sup>(3)</sup>	$I_{SAT\ 25^{\circ}C}$	typ	12.5	A
Saturation Current $_{100^{\circ}C}$ <sup>(4)</sup>	$I_{SAT\ 100^{\circ}C}$	typ	12.5	A
Resonance Frequency	$f_r$	typ	123	MHz

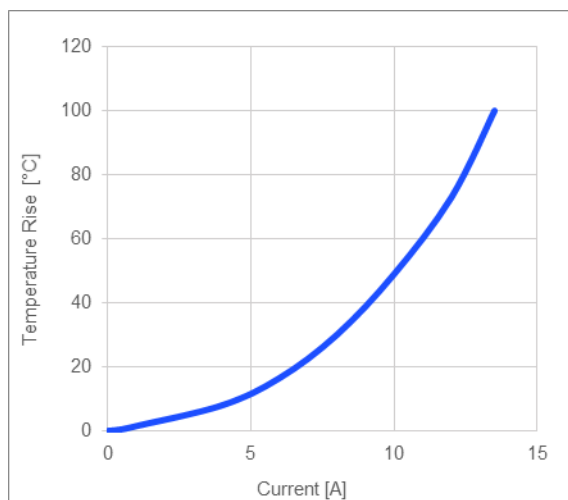
### GENERAL SPECIFICATIONS

<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 $I_R$ 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 +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

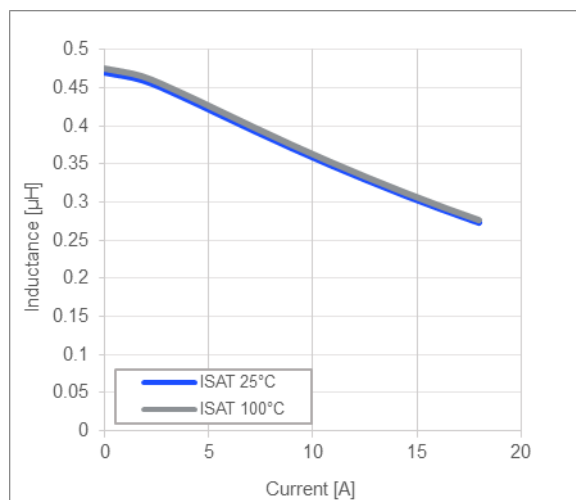
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**TYPICAL PERFORMANCE CURVES**

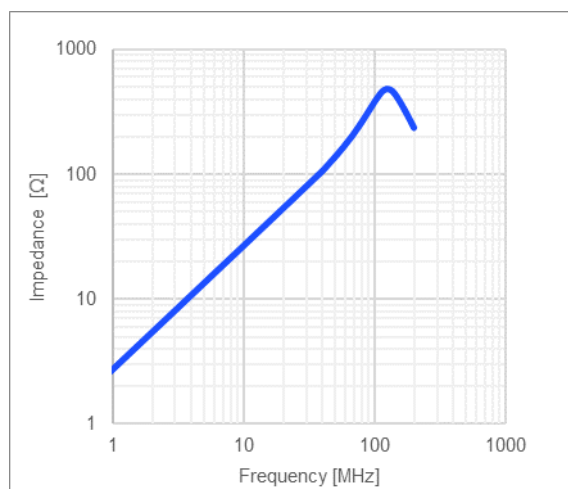
**Temperature Rise vs. Current**



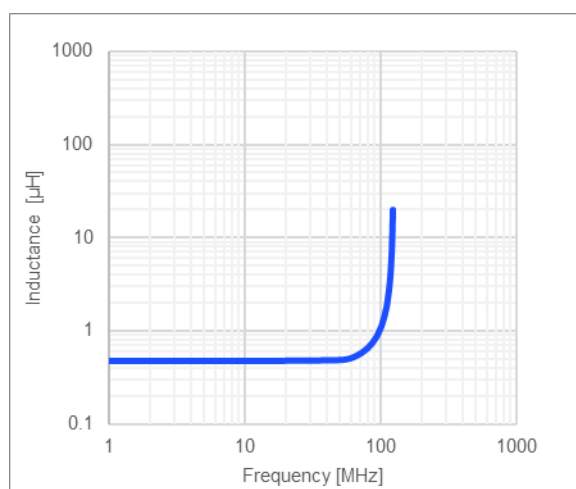
**Inductance vs. Current**



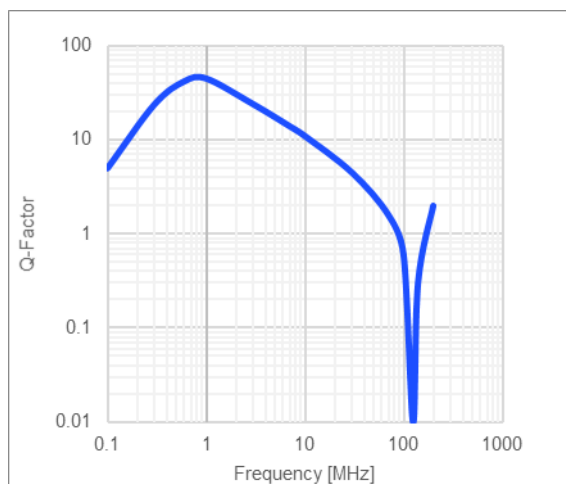
**Impedance vs. Frequency**



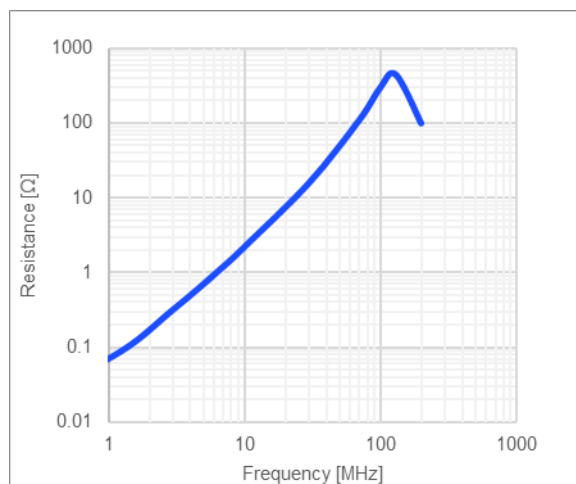
**Inductance vs. Frequency**



**Quality Factor vs. Frequency**



**AC Resistance vs. Frequency**

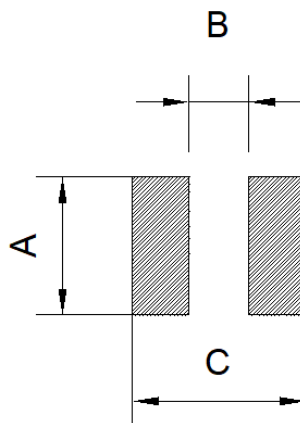


## LAND PATTERN

### Dimensions

A	3.80 ref.
B	1.40 ref.
C	3.40 ref.

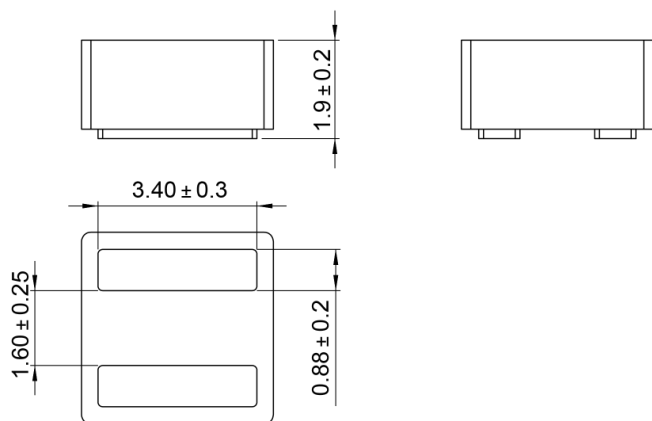
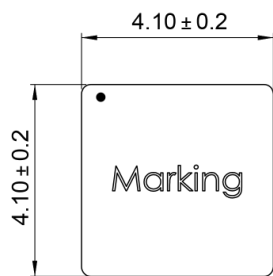
(unit in mm)



## PRODUCT PACKAGE AND DIMENSIONS

### Dimensions

(unit in mm)



## TOP MARKING

### Marking

Start of Winding	· (dot)
Inductance Code	R47
MPS Code	MPS

## ORDERING INFORMATION

Part Number	$L^{(1)}$ typ (μH)	$R_{DC}$ typ (mΩ)	$I_R^{(2)}$ typ (A)	$I_{SAT\ 25^{\circ}C}^{(3)}$ typ (A)	$I_{SAT\ 100^{\circ}C}^{(4)}$ typ (A)
MPL-AL4020-R47	0.47	6.2	9.2	12.5	12.5
MPL-AL4020-R68	0.68	7.5	8.7	11	11
MPL-AL4020-R82	0.82	9.0	8.4	9.5	9.5
MPL-AL4020-1R0	1.0	10.1	7.9	8.6	8.6
MPL-AL4020-1R2	1.2	12.2	7.4	7.5	7.5
MPL-AL4020-1R5	1.5	14.5	6.4	7.1	7.1
MPL-AL4020-2R2	2.2	21.5	5.5	6.2	6.2
MPL-AL4020-3R3	3.3	34.5	4.4	5.2	5.2
MPL-AL4020-4R7	4.7	52.2	3.65	4.2	4.2

## GENERAL SPECIFICATIONS

<b>(1) Inductance</b>	Measured at 100kHz, 100mA
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<b>(3) Saturation Current 25°C</b>	Saturation current will cause L to drop from 30% at 25°C ambient temperature
<b>(4) Saturation Current 100°C</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 +155°C (including temp rise) Should not exceed +155°C under worst-case operation conditions
<b>Storage Condition</b>	Tape and Reel packaging: -10°C to +40°C Humidity: <50% RH

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