

### 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	μH
Resistance	$R_{DC}$	Typ	33	mΩ
Resistance <sub>MAX</sub>	$R_{DC\ MAX}$	Max	40	mΩ
Rated Current <sup>(2)</sup>	$I_R$	Typ	4.1	A
Saturation Current <sub>25°C</sub> <sup>(3)</sup>	$I_{SAT\ 25°C}$	Typ	5.2	A
Saturation Current <sub>100°C</sub> <sup>(4)</sup>	$I_{SAT\ 100°C}$	Typ	5.2	A
Resonance Frequency	$f_r$	Typ	65	MHz

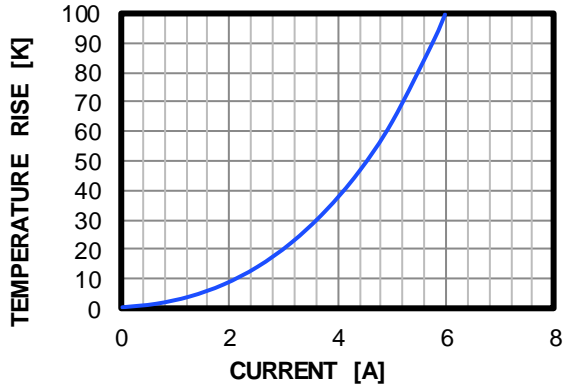
### GENERAL SPECIFICATIONS

<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 <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) Should not exceed +125°C under worst-case operation conditions
Storage Condition	Tape and Reel packaging: -10°C to +40°C Humidity: <50% RH

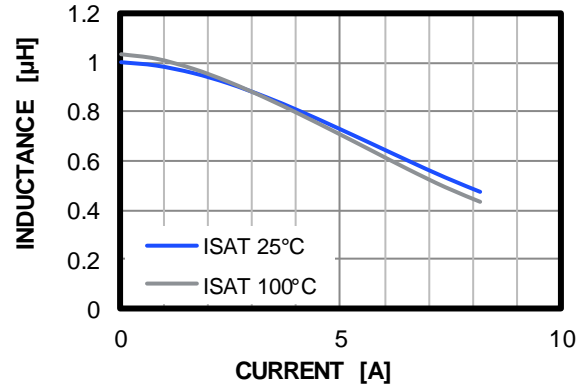
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TYPICAL PERFORMANCE CURVES

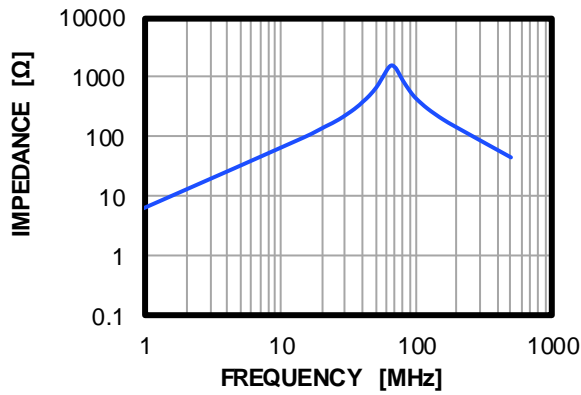
Temperature Rise vs. Current



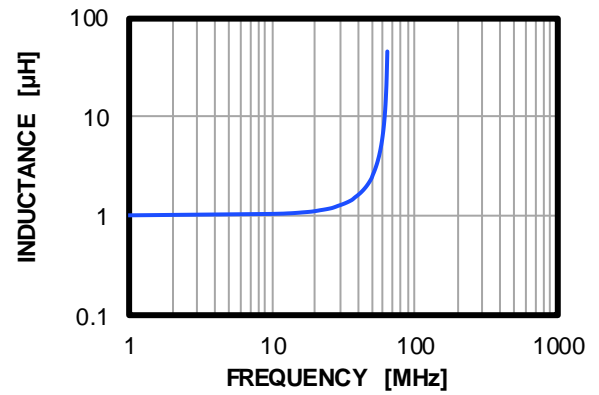
Inductance vs. Current



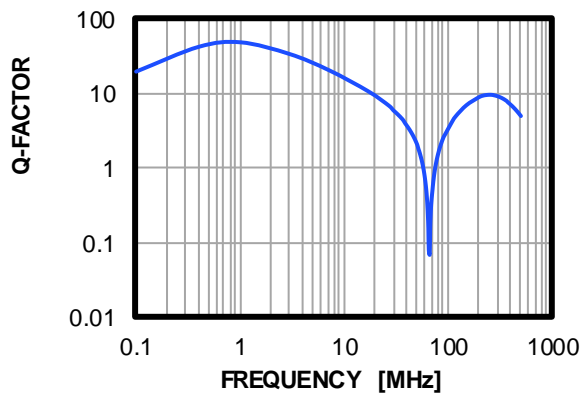
Impedance vs. Frequency



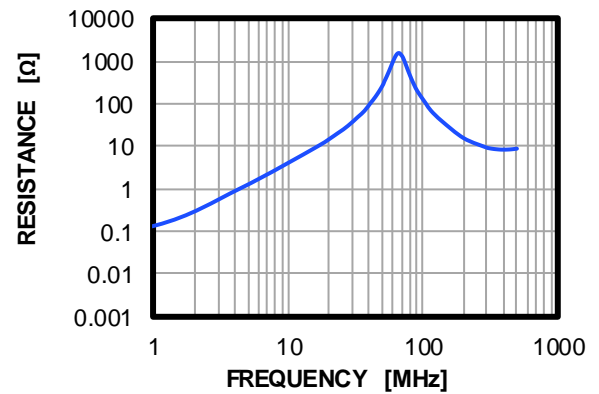
Inductance vs. Frequency



Quality Factor vs. Frequency

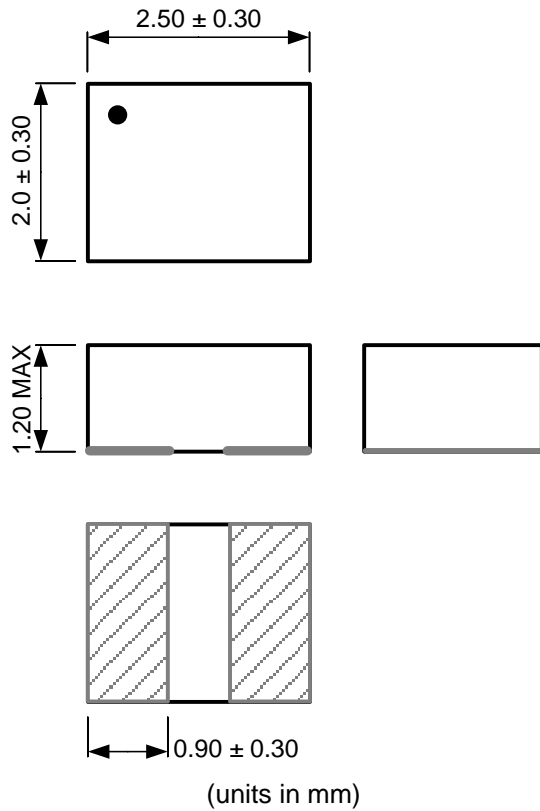


AC Resistance vs. Frequency

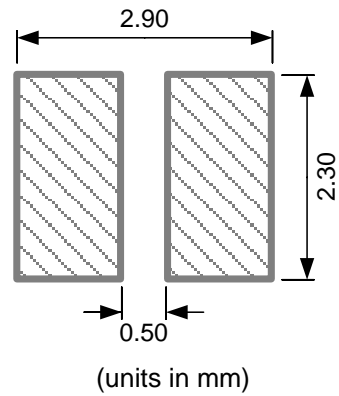


**DIMENSIONS**

**PRODUCT PACKAGE**



**RECOMMENDED LAND PATTERN**



**TOP MARKING**

**Marking**

Start of Winding . (dot)

**ORDERING INFORMATION**

Part Number	$L^{(1)}$ ±20% (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-AT2512-R33	0.33	13	6.4	7.8	7.8
MPL-AT2512-R47	0.47	14	5.8	6.4	6.4
MPL-AT2512-R68	0.68	23	4.8	6	6
MPL-AT2512-1R0	1	33	4.1	5.2	5.2
MPL-AT2512-1R5	1.5	43	3.4	4.2	4.2
MPL-AT2512-2R2	2.2	68	2.8	3.4	3.4
MPL-AT2512-3R3	3.3	116	2.2	3	3
MPL-AT2512-4R7	4.7	170	1.8	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

**REVISION HISTORY**

Revision #	Revision Date	Description	Pages Updated
1.0	7/11/2019	Initial Release	-
1.1	8/1/2019	Updated Impedance vs. Frequency Curve	2
1.2	7/6/2023	Updated the $R_{DC}$ (Typ), $R_{DC\ MAX}$ , $I_R$ (Typ), and $f_r$ (Typ) values, and made minor formatting edits in the Electrical Characteristics section	1
		Updated all the Typical Performance Curves	2
		Reordered the Dimensions section; updated the Product Package and Recommended Land Pattern images	3
		Made minor formatting edits and updated the following values in the Ordering Information section: <ul style="list-style-type: none"> <li>• Replaced the MPL-AT2514-2R2 and MPL-AT2514-4R7 with the MPL-AT2512-2R2 and MPL-AT2512-4R7, respectively</li> <li>• MPL-AT2512-R33: Updated <math>R_{DC}</math> (Typ), <math>I_{SAT\ 25^{\circ}C}</math> (Typ), and <math>I_{SAT\ 100^{\circ}C}</math> (Typ)</li> <li>• MPL-AT2512-R47: Updated <math>R_{DC}</math> (Typ) and <math>I_R</math> (Typ)</li> <li>• MPL-AT2512-R68: Updated <math>R_{DC}</math> (Typ) and <math>I_R</math> (Typ)</li> <li>• MPL-AT2512-1R0: Updated <math>R_{DC}</math> (Typ) and <math>I_R</math> (Typ)</li> <li>• MPL-AT2512-1R5: Updated <math>R_{DC}</math> (Typ) and <math>I_R</math> (Typ)</li> <li>• MPL-AT2512-3R3: Updated <math>R_{DC}</math> (Typ), <math>I_R</math> (Typ), <math>I_{SAT\ 25^{\circ}C}</math> (Typ), and <math>I_{SAT\ 100^{\circ}C}</math> (Typ)</li> </ul>	4

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