



APPLICATIONS

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

FEATURES

- Size 3.5mmx3.2mmx1.8mm
- Molded Construction
- Low Audible Noise
- Soft Saturation
- Stable Over High Temperatures
- Max Operating Temp +125°C
- RoHS/REACH-Compliant, Halogen-Free

ELECTRICAL CHARACTERISTICS

Parameter			Value	Unit
Inductance ⁽¹⁾	L	±20%	1.0	μH
Resistance	R_{DC}	typ	30	mΩ
Resistance _{MAX}	$R_{DC\ MAX}$	max	39	mΩ
Rated Current ⁽²⁾	I_R	typ	4.3	A
Saturation Current _{25°C} ⁽³⁾	$I_{SAT\ 25°C}$	typ	6.2	A
Saturation Current _{100°C} ⁽⁴⁾	$I_{SAT\ 100°C}$	typ	6.2	A
Resonance Frequency	f_r	typ	68	MHz

GENERAL SPECIFICATIONS

⁽¹⁾ Inductance Measured at 100kHz, 100mA

⁽²⁾ 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.

⁽³⁾ Saturation Current _{25°C}

Saturation current will cause L to drop from 30% at 25°C ambient temperature

⁽⁴⁾ Saturation Current _{100°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

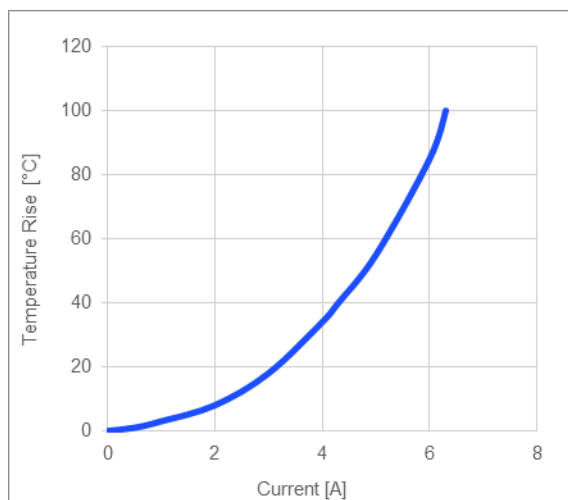
Operating temperature: -40°C to +125°C (including temp rise)
 Should not exceed +125°C under worst-case operation conditions

Storage Condition

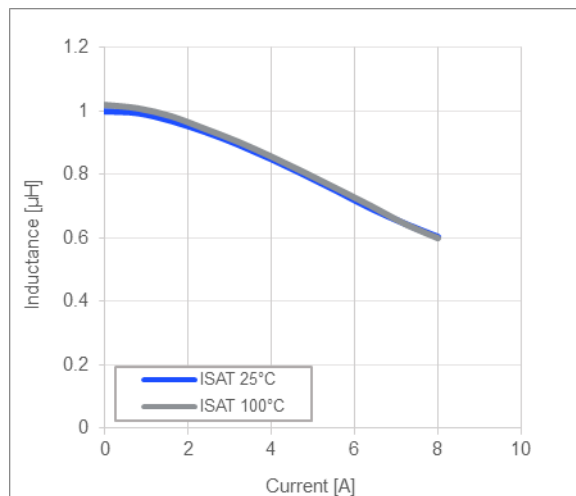
Tape and Reel packaging: -10°C to +40°C
 Humidity: <50% RH

TYPICAL PERFORMANCE CURVES

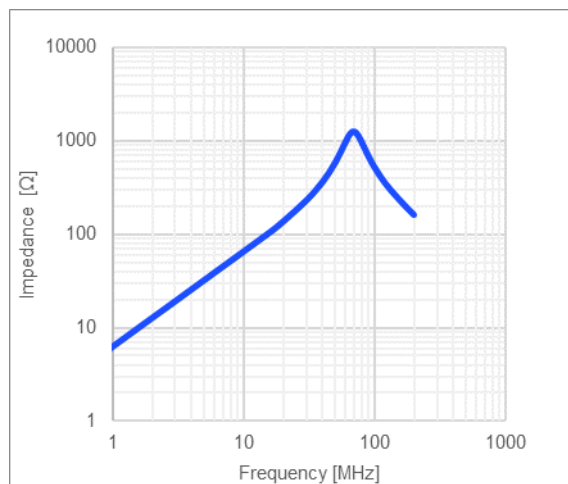
Temperature Rise vs. Current



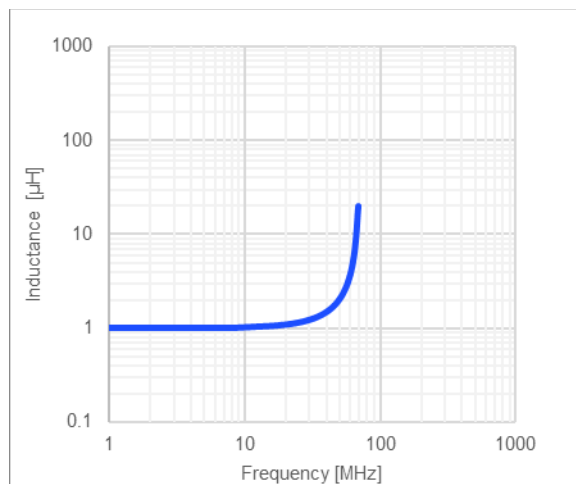
Inductance vs. Current



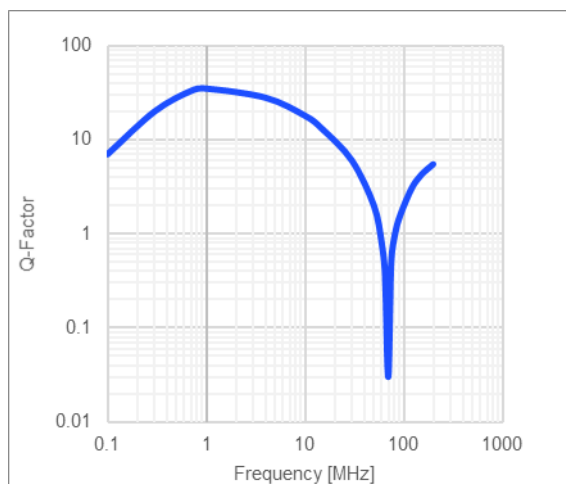
Impedance vs. Frequency



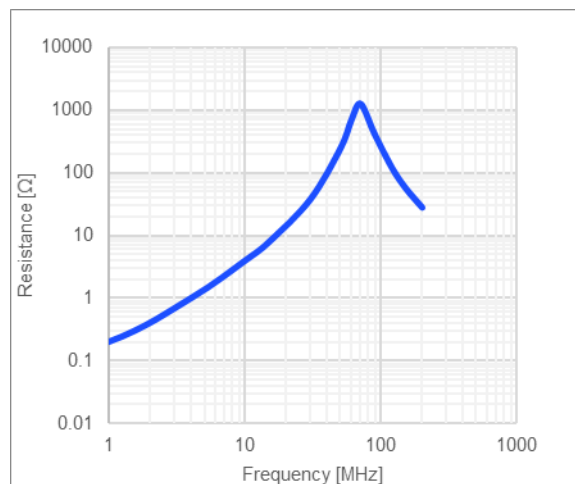
Inductance vs. Frequency



Quality Factor vs. Frequency



AC Resistance vs. Frequency



LAND PATTERN

Dimensions

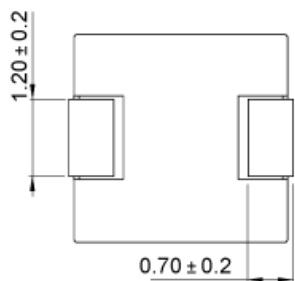
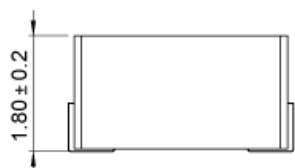
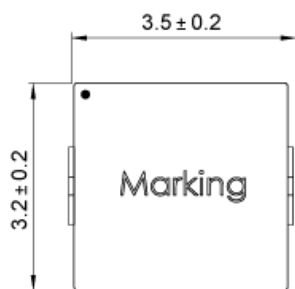
A	1.45 ref.
B	1.90 ref.
C	4.10 ref. (unit in mm)



PRODUCT PACKAGE AND DIMENSIONS

Dimensions

(unit in mm)



TOP MARKING

Marking

Start of Winding	· (dot)
Inductance Code	1.0

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-AY3020-R47	0.47	19.5	6.3	9	9
MPL-AY3020-R68	0.68	26	5.15	8.6	8.6
MPL-AY3020-R82	0.82	28	4.7	8	8
MPL-AY3020-1R0	1.0	30	4.3	6.2	6.2
MPL-AY3020-1R5	1.5	35	3.4	5.9	5.9
MPL-AY3020-2R2	2.2	64	3.0	5.3	5.3
MPL-AY3020-3R3	3.3	121	2.5	3.7	3.7
MPL-AY3020-4R7	4.7	173	2.0	3.1	3.1
MPL-AY3020-5R6	5.6	209	1.8	2.8	2.8
MPL-AY3020-6R8	6.8	250	1.65	2.6	2.6
MPL-AY3020-8R2	8.2	345	1.4	1.95	1.95
MPL-AY3020-100	10	370	1.3	1.75	1.75

GENERAL SPECIFICATIONS

(1) Inductance	Measured at 100kHz, 100mA
(2) Rated Current	Rated current will cause the coil temperature rise ΔT of 40K <i>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.</i>
(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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