MTA3V

Automotive high current molded through-hole power inductor

Photo is representative

Product features

- AEC-Q200
- Shielded construction
- Ideal for high transient current spikes without saturation
- Ultra low buzz noise due to composite construction
- Isolation voltage, terminal to core: 500 Vac, 60 s, 1 mA maximum
- Termination finish: tin dipped
- Core material: Alloy powder

Applications

- Digital instrument cluster
- Electronic stability control system (ESC)
- Engine and Powertrain systems
- Electric pumps, motor control and auxiliaries
- Powertrain control unit (PCU)/Engine control unit (ECU)
- Transmission control unit (TCU)
- LED lighting
- Heating ventilation and air conditioning controllers (HVAC)
- High current and high temperature applications
- DC/DC converters
- High current motor and switching noise suppression
- Inverters

Environmental compliance and general specifications

- Storage temperature (component): -55 °C to +155 °C
- Operating temperature range: -55 °C to +155 °C (ambient plus self-temperature rise)

Powering Business Worldwide

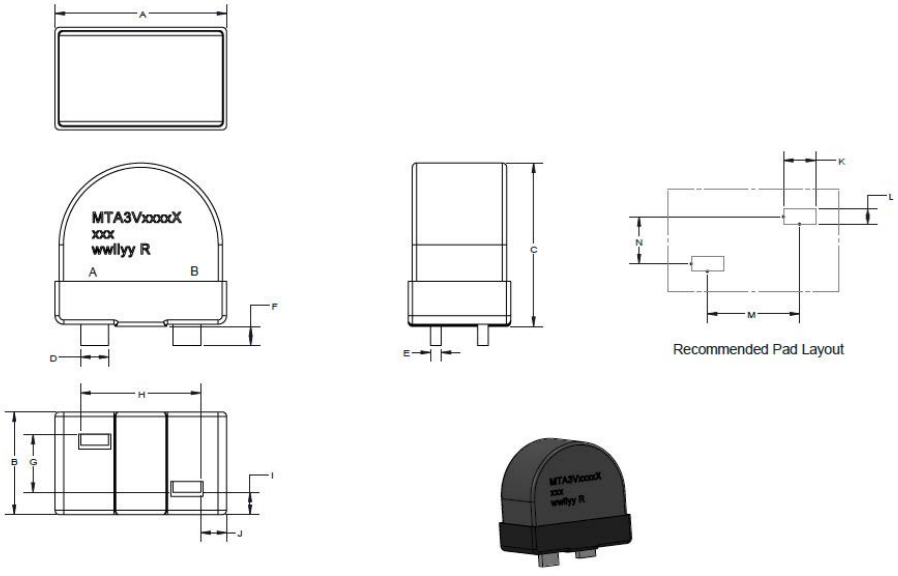
Product specifications

Part number[7]	OCL[1] (µH) ±20%	FLL[2] (µH) minimum	I_{rms}[3] (A)	I_{sat}[4] (A)	DCR (mΩ) typical @ +25 °C	DCR (mΩ) maximum @ +25 °C	SRF[5] (MHz) typical	K-factor[6]
MTA3V3822H-R82-R	0.82	0.46	153	440	0.16	0.18	38.8	18.18
MTA3V3822H-2R2-R	2.20	1.23	137	205	0.24	0.27	21.4	13.13
MTA3V3822H-3R3-R	3.30	1.85	114	170	0.31	0.36	16.6	10.79
MTA3V3944S-1R5-R	1.50	0.84	140	205	0.21	0.24	23.4	14.81
MTA3V3944S-2R2-R	2.20	1.23	140	120	0.21	0.24	18.2	14.81
MTA3V5153H-2R2-R	2.20	1.23	160	390	0.21	0.24	16.6	7.56
MTA3V5153H-2R8-R	2.80	1.57	160	300	0.21	0.24	13.4	7.56
MTA3V5153H-3R3-R	3.30	1.85	160	260	0.21	0.24	12.8	7.56

1. Open circuit inductance (OCL) test parameters: 100 kHz, 1.0 Vrms, 0.0 Adc, +25 °C
2. Full load inductance (FLL) test parameters: 100 kHz, 1.0 Vrms, Isat, , +25 °C
3. Irms: DC current for an approximate temperature rise of 40 °C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part not exceed +155 °C under worst case operating conditions verified in the end application.
4. Isat: Peak current for approximately 30% rolloff @ +25 °C
5. SRF measured by an Agilent 4395A impedance analyzer
6. K-factor: Used to determine Bp-ac for core loss (see graph). Bp-p = K * L * ΔI. Bp-ac: (Gauss), K: (K-factor from table), L: (Inductance in µH), ΔI (Peak to peak ripple current in Amps).
7. Part Number Definition: MTA3VxxxxX-xxx-R
   MTA= Product code
   3V= U-shape;
   xxxx= Product size;
   X=Product feature: H= High saturation; S= Special low loss.
   xxx= Inductance value in µH, R= decimal point, if no R is present last digit indicates number of zeros
   -R = RoHS compliant

Mechanical parameters, pad layout (mm)

MTA3V3822H-R82-R, MTA3V3822H-2R2-R, MTA3V3822H-3R3-R

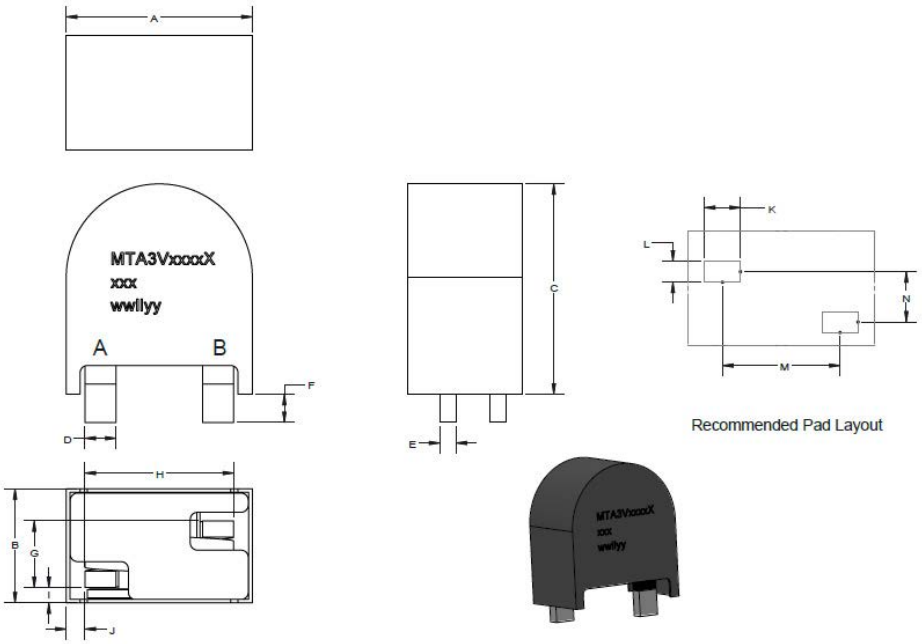


Recommended Pad Layout

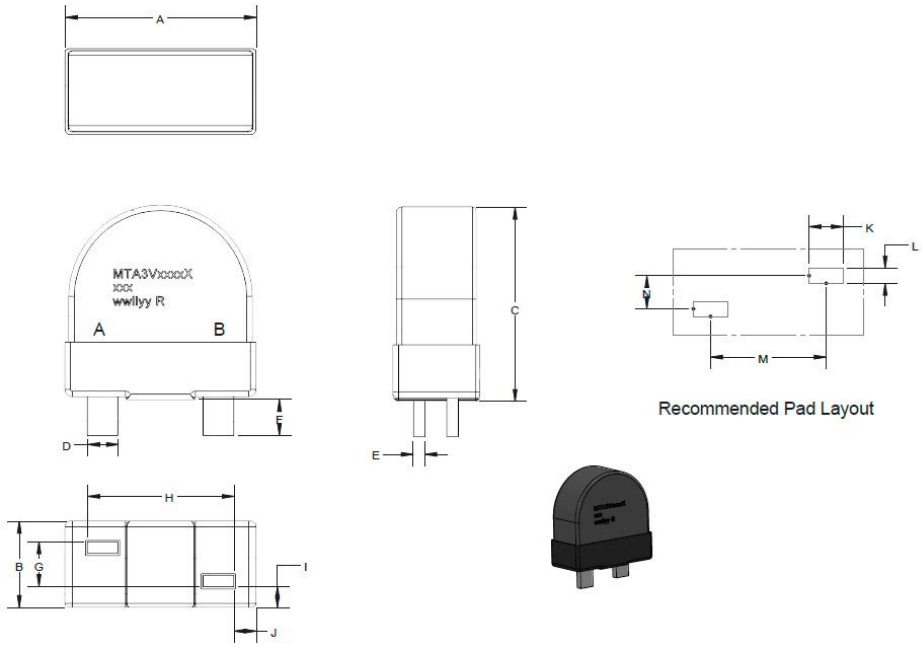
Notes:
Part marking: MTA3V=Product code, xxxx= Product size;
X= product feature: H= High saturation; S=Special low loss. xxx= inductance value in uH, R= decimal point, if no R is present then last digit is the number of zeros, wwllyy R= Lot code
"A" and "B" are the pin location designators

DCR test points are on the root of pin closed to the core
Traces or vias underneath the inductor is not recommended.

Mechanical parameters, pad layout (mm)
MTA3V3944S-1R5-R, MTA3V3944S-2R2-R



Mechanical parameters, pad layout (mm)
MTA3V5153H-2R2-R, MTA3V5153H-2R8-R, MTA3V5153H-3R3-R



Notes:
Part marking: MTA3V=Product code, xxxx= Product size;
X= product feature: H= High saturation; S=Special low loss. xxx= inductance value in uH, R= decimal point, if no R is present then last digit is the number of zeros, wwllyy R= Lot code
"A" and "B" are the pin location designators

DCR test points are on the root of pin closed to the core
Traces or vias underneath the inductor is not recommended.

Mechanical parameters, pad layout (mm)

Part number	A ±1.0	B ±1.0	C ±1.0	D ±0.4	E ±0.4	F ±1.5	G ±1.0	H ±1.0	I ±1.0	J ±1.0	K typical	L typical	M typical	N typical
MTA3V3822H-R82-R	40.00	23.90	38.10	6.50	2.50	4.45	6.75	28.00	8.58	6.00	7.50	3.50	21.50	4.25
MTA3V3822H-2R2-R	40.00	23.90	38.10	6.50	2.50	4.45	10.10	28.00	6.90	6.00	7.50	3.50	21.50	7.60
MTA3V3822H-3R3-R	40.00	23.90	38.10	6.50	2.50	4.45	13.50	28.00	5.20	6.00	7.50	3.50	21.50	11.00
MTA3V3944S-1R5-R	38.80	23.80	43.90	6.50	3.40	5.90	13.90	31.00	3.20	3.90	7.50	4.40	24.50	10.50
MTA3V3944S-2R2-R	38.80	23.80	43.90	6.50	3.40	5.90	13.90	31.00	3.20	3.90	7.50	4.40	24.50	10.50
MTA3V5153H-2R2-R	52.90	23.90	53.90	8.50	3.20	9.90	12.40	40.60	5.85	6.15	9.50	4.20	32.10	9.20
MTA3V5153H-2R8-R	52.90	23.90	53.90	8.50	3.20	9.90	12.40	40.60	5.85	6.15	9.50	4.20	32.10	9.20
MTA3V5153H-3R3-R	52.90	23.90	53.90	8.50	3.20	9.90	12.40	40.60	5.85	6.15	9.50	4.20	32.10	9.20

Packaging information (mm)

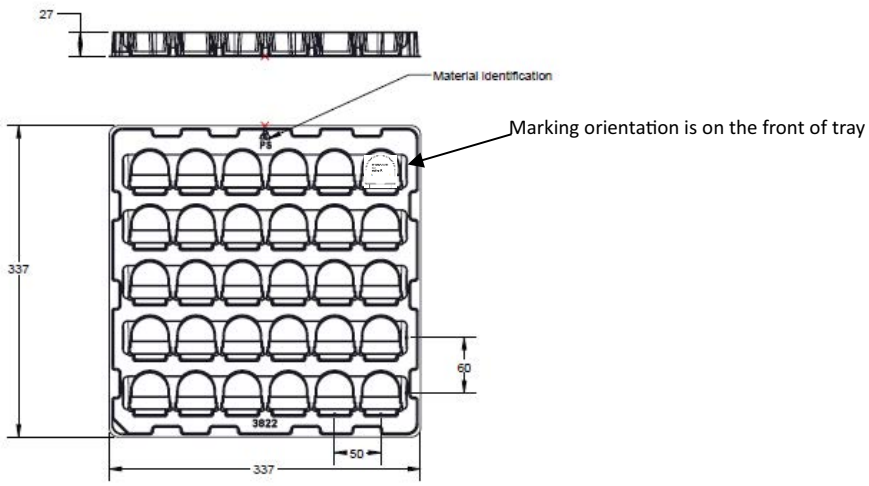
Drawing not to scale

Supplied in tray packaging, place 3 packs of trays in the shipping carton

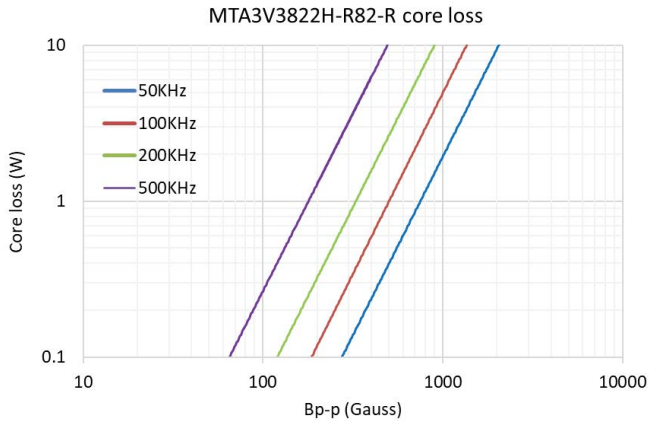
Carton size: 350 x 350 x 140 mm.

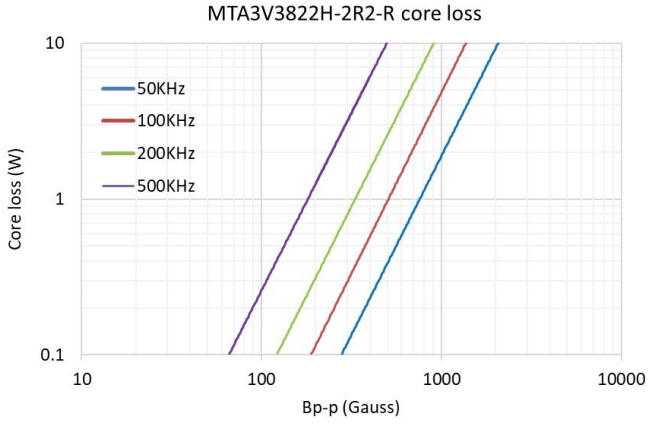
Marking orientation is on the front of tray.

Part number	pcs
MTA3V3822H-R82-R	30
MTA3V3822H-2R2-R	30
MTA3V3822H-3R3-R	30
MTA3V3944S-1R5-R	28
MTA3V3944S-2R2-R	28
MTA3V5153H-2R2-R	15
MTA3V5153H-2R8-R	15
MTA3V5153H-3R3-R	15

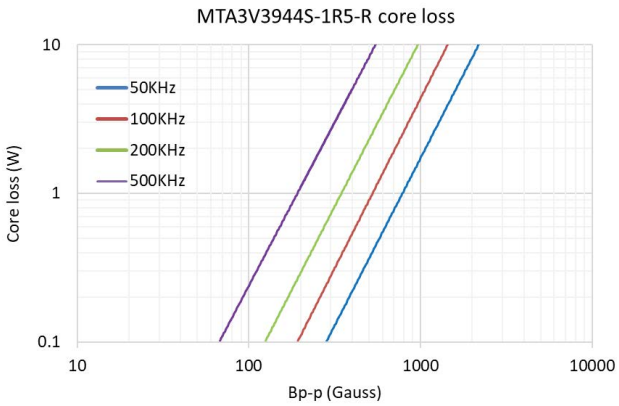


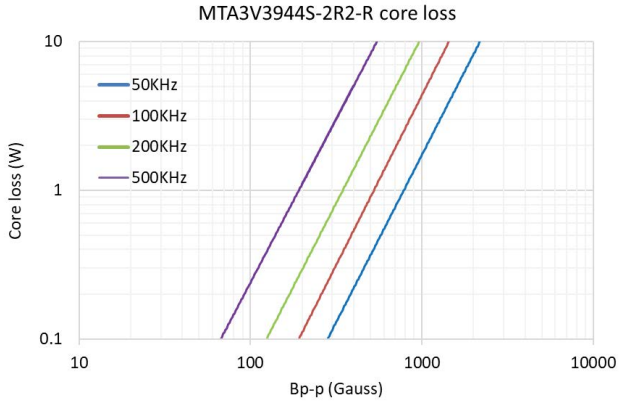
Core loss vs. Bp-p

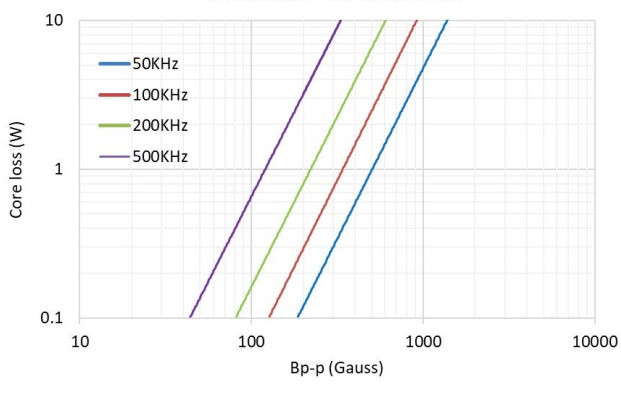


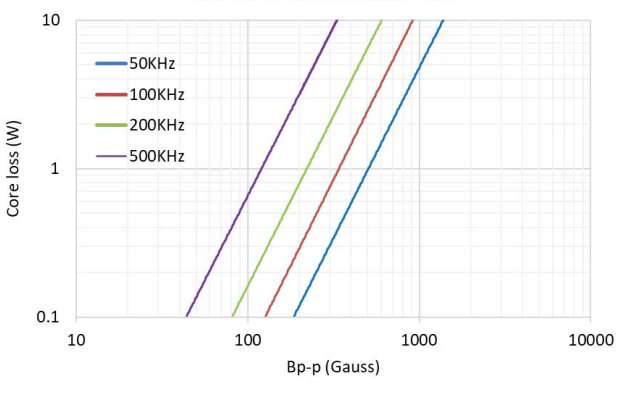


Core loss vs. Bp-p



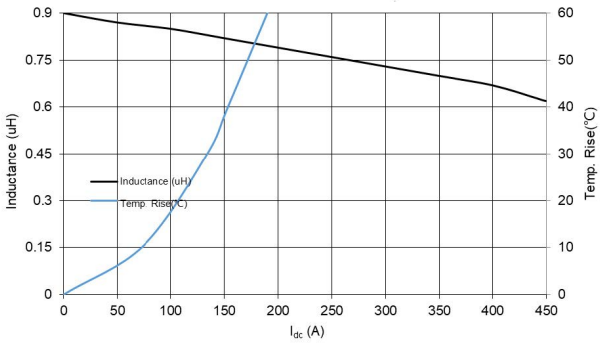




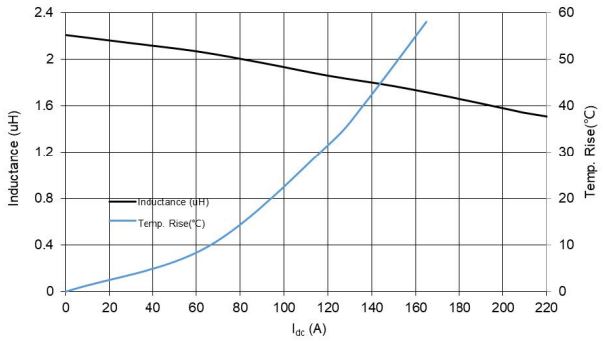


Inductance and temperature rise vs current (+25 °C)

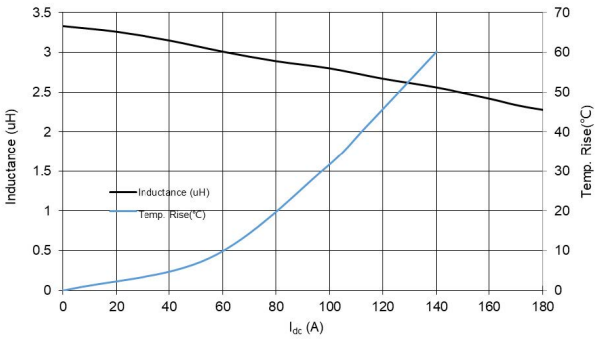
MTA3V3822H-R82-R



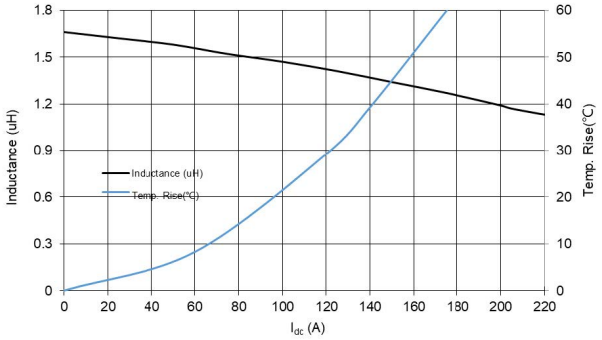
MTA3V3822H-2R2-R



MTA3V3822H-3R3-R



MTA3V3944S-1R5-R



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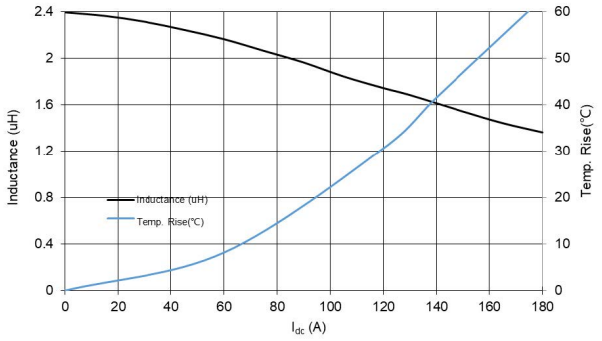
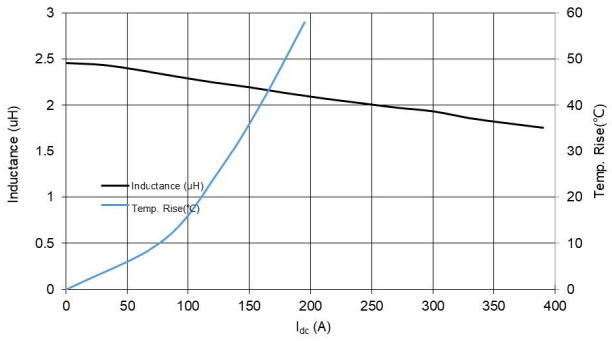
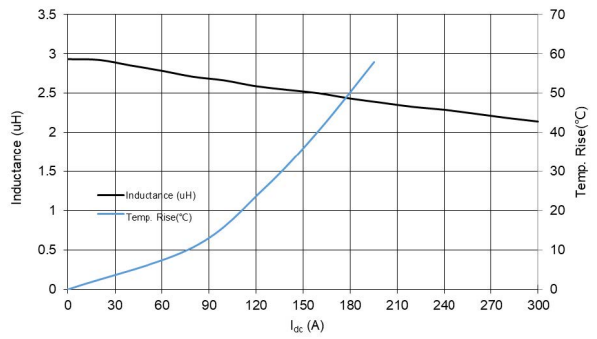


MTA3V5153H-2R2-R



Inductance and temperature rise vs. current (+25 °C)

MTA3V5153H-2R8-R



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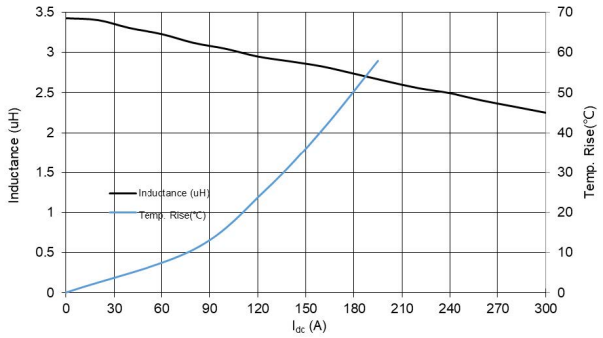
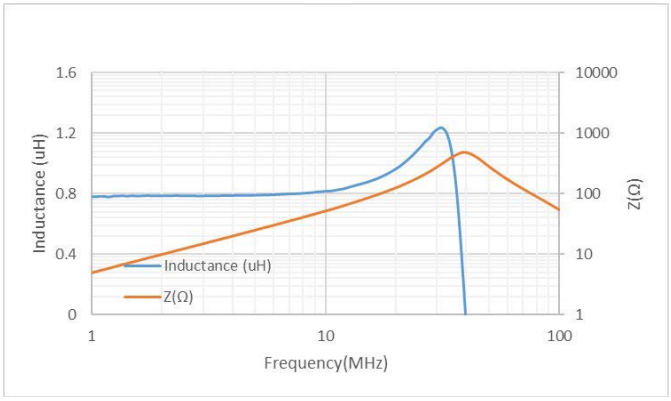


Inductance and impedance (Z) vs. frequency

MTA3V3822H-R82-R



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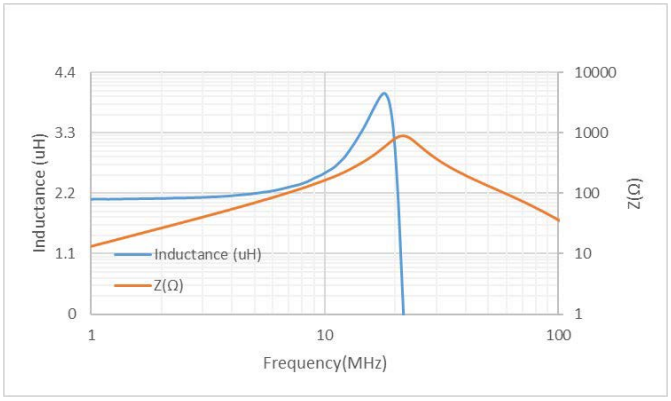

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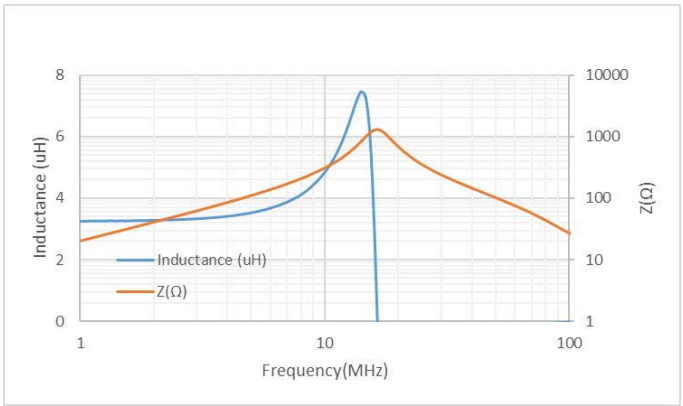

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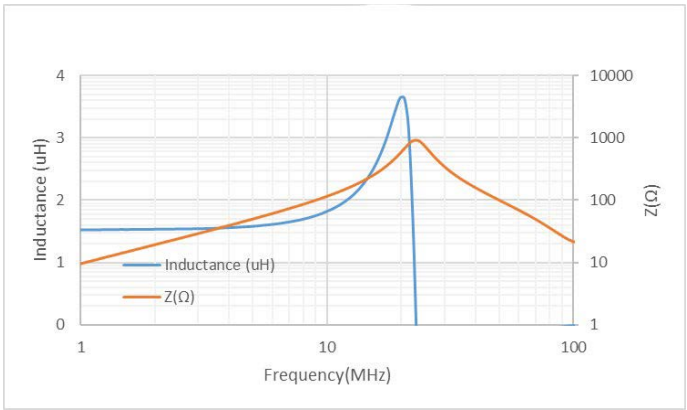
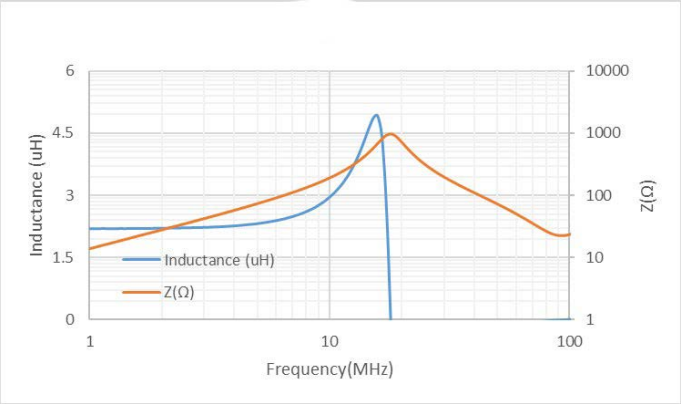


Inductance and impedance (Z) vs. frequency

MTA3V3944S-2R2-R



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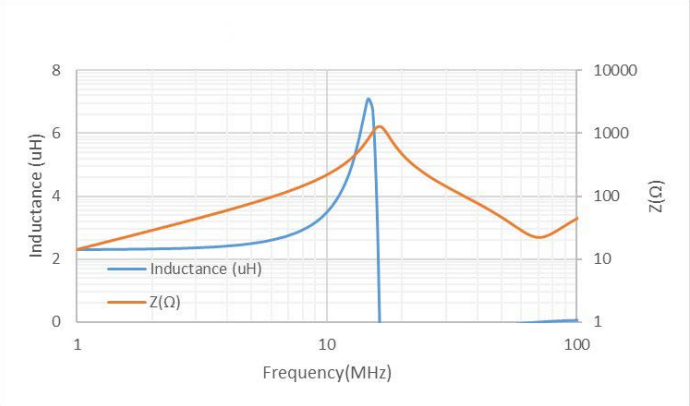
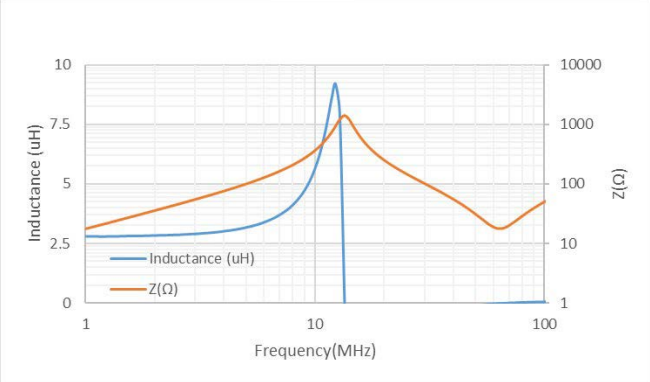


MTA3V5153H-2R8-R



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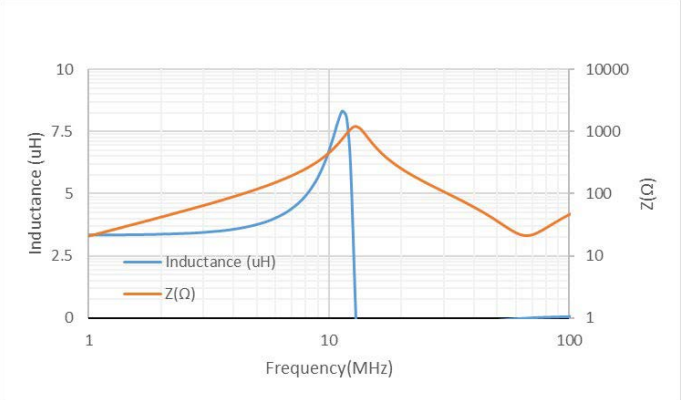
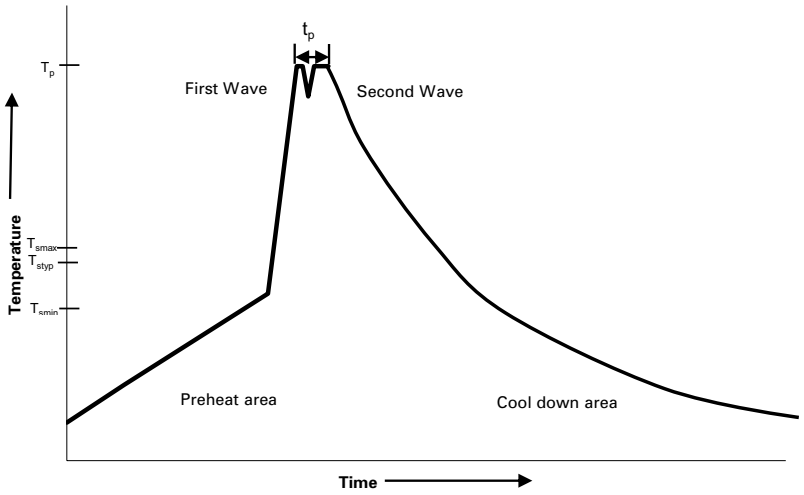


Wave solder profile



Reference EN 61760-1:2006

Profile feature		Standard SnPb solder	Lead (Pb) free solder
Preheat	• Temperature min. (T_{smin})	100 °C	100 °C
	• Temperature typ. (T_{styp})	120 °C	120 °C
	• Temperature max. (T_{smax})	130 °C	130 °C
	• Time (T_{smin} to T_{smax}) (t_s)	70 seconds	70 seconds
Δ preheat to max Temperature		150 °C max.	150 °C max.
Peak temperature (Tp)*		235 °C – 260 °C	250 °C – 260 °C
Time at peak temperature (t_p)		10 seconds max 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate		~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~5 K/s max
Time 25 °C to 25 °C		4 minutes	4 minutes

Manual solder

+350 °C, 4-5 seconds. (by soldering iron), generally manual, hand soldering is not recommended.

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Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics

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