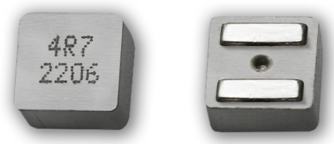
EXLA1V10

Automotive high current molded inductor



Product features

- High current carrying capacity
- AEC-Q200
- Low DCR, high efficiency
- Magnetically shielded, low EMI
- Soft saturation
- Inductance range from 0.28 μH to 15 μH
- Current range from 9 A to 58 A
- EXLA1V1003: 12.2 mm x 11.3 mm footprint surface mount package in a 3.1 mm height
- EXLA1V1006: 12.2 mm x 11.3 mm footprint surface mount package in a 6.0 mm height
- EXLA1V1010: 12.2 mm x 11.3 mm footprint surface mount package in a 10.0 mm height
- Alloy powder core material
- Moisture Sensitivity Level (MSL) 1

Applications

- LED lighting
- Advanced driver assistance systems (ADAS)
- Adaptive cruise control (ACC)
- Collision avoidance
- Infotainment and cluster electronics
- Battery management systems (BMS)
- Electric pumps, motor control and auxiliaries
- Powertrain control module (PCU)/Engine control module (ECM)
- Electronic Control Units (ECU)

Environmental compliance and general specifications

- Operating temperature range: -55 °C to +155 °C (ambient plus self-temperature rise)
- Storage temperature range (component): -55 °C to +155 °C
- Solder reflow temperature: J-STD-020 (latest revision) compliant

Pb HALOGEN HF FREE RoHS

EATON
Powering Business Worldwide

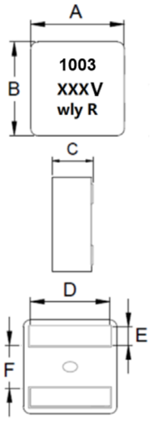
Product specifications

Part number[4]	OCL[1] (μH) ± 20%	I_{rms}[2] (A)	I_{sat}[3] (A)	DCR (mΩ) typical @ +25 °C	DCR (mΩ) maximum @ +25 °C	D (mm) ±0.3
EXLA1V1003						
EXLA1V1003-R28-R	0.28	35	58	1.45	1.6	9.0
EXLA1V1003-R56-R	0.56	32	39	2.5	2.75	9.0
EXLA1V1003-R82-R	0.82	25	32	3.7	4.1	9.0
EXLA1V1003-R90-R	0.9	24	31	3.8	4.2	9.0
EXLA1V1003-1R0-R	1.0	23	30	4.5	4.95	9.0
EXLA1V1003-1R5-R	1.5	18	25	6.0	6.6	9.0
EXLA1V1006						
EXLA1V1006-2R2-R	2.20	20	30.0	4.40	4.84	9.0
EXLA1V1006-3R3-R	3.30	16.8	25.0	7.00	7.70	9.0
EXLA1V1006-4R7-R	4.70	14.0	22.0	9.70	10.72	9.0
EXLA1V1006-5R6-R	5.60	12.0	17.0	10.8	11.9	8.8
EXLA1V1006-6R8-R	6.80	10.5	15.5	11.8	13.0	8.8
EXLA1V1006-8R2-R	8.20	9.5	14.0	15.0	16.5	8.8
EXLA1V1006-100-R	10	9.0	13.0	16.5	18.2	8.8
EXLA1V1010						
EXLA1V1010-3R3-R	3.3	25	23.4	3.7	4.1	9.3
EXLA1V1010-4R7-R	4.7	24	21.4	5.2	5.7	9.3
EXLA1V1010-5R6-R	5.6	21.2	19.6	6.5	7.2	9.3
EXLA1V1010-6R8-R	6.8	18.5	18.5	8.1	8.9	9.0
EXLA1V1010-8R2-R	8.2	17.1	16.3	10.8	12.4	9.0
EXLA1V1010-100-R	10	15.5	14.6	12.5	13.75	9.0
EXLA1V1010-150-R	15	13.8	12.5	17.5	19.3	9.0

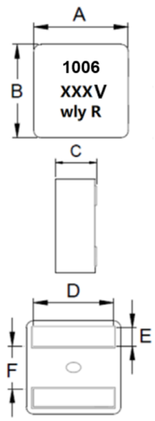
1. Open circuit inductance (OCL) test parameters: 100 kHz, 0.1 V_{rms}, 0.0 Adc, +25 °C
2. I_{rms}: Heat rated current (I_{rms}) will cause the part temperature rise approximately ΔT of 40 °C. Circuit design, component, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application. The part temperature (ambient + temp rise) should not exceed +155 °C under worst case operating conditions.
3. I_{sat}: Peak current for approximately 30% rolloff @ +25 °C
4. Part number definition: EXLA1V10XX-xxx-R
   EXLA1V10XX = Product code and size
   xxx= inductance value in μH, R= decimal point,
   If no R is present then third digit equals the number of zeros
   -R suffix = RoHS compliant
5. EXLA1V1006 & EXLA1V1010 Rated operating voltage (across inductor) 40 V ref;
   EXLA1V1003 Rated operating voltage (across inductor) 15 V ref

Mechanical parameters, schematic, pad layout (mm)

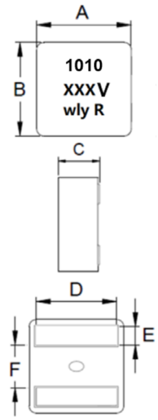
EXLA1V1003



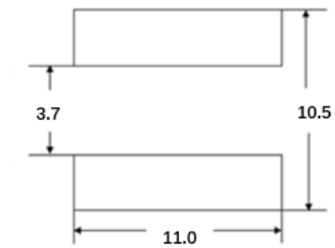
EXLA1V1006



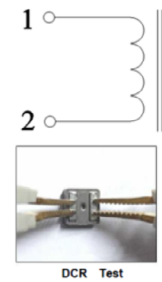
EXLA1V1010



Recommended pad layout



Schematic



Part number	A	B	C	D	E	F
EXLA1V1003-xxx-R	11.9 ± 0.30	11.0 ± 0.30	2.9 ± 0.20	See spec table	2.4 ± 0.20	4.4 ± 0.3
EXLA1V1006-xxx-R	11.9 ± 0.30	11.0 ± 0.30	5.7 ± 0.30	See spec table	2.4 ± 0.20	4.5 ± 0.3
EXLA1V1010-xxx-R	11.9 ± 0.30	11.0 ± 0.30	9.7 ± 0.30	See spec table	2.4 ± 0.20	4.4 ± 0.3

Part marking: 1003 or 1006 or 1010

xxx= = Inductance value in µH (R= decimal point, if no R is present last digit equals number of zeros, V= vehicle, wly R= lot code

All soldering surfaces to be coplanar within 0.1 millimeters

Tolerances are ± 0.3 millimeters unless stated otherwise

Dimensions of recommended PCB layout are reference only.

Pad layout tolerances are ± 0.1 millimeters unless stated otherwise

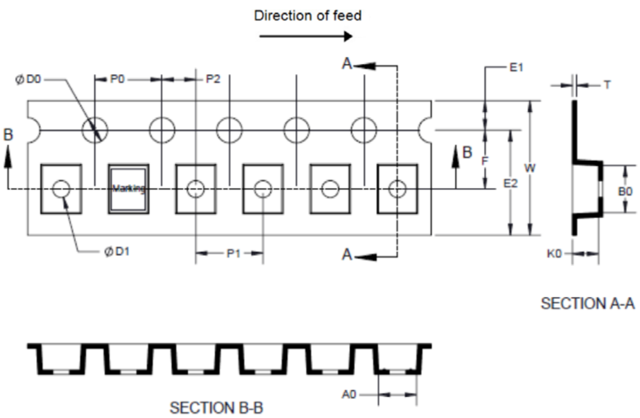
Four terminal kelvin-clip recommended for DCR testing

Traces or vias underneath the inductor is not recommended.

Packaging information (mm)

Supplied in tape and reel packaging (EIA-481 compliant)
EXLA1V1003: 1000 parts per 13” diameter reel
EXLA1V1006: 500 parts per 13” diameter reel
EXLA1V1010: 300 parts per 13” diameter reel

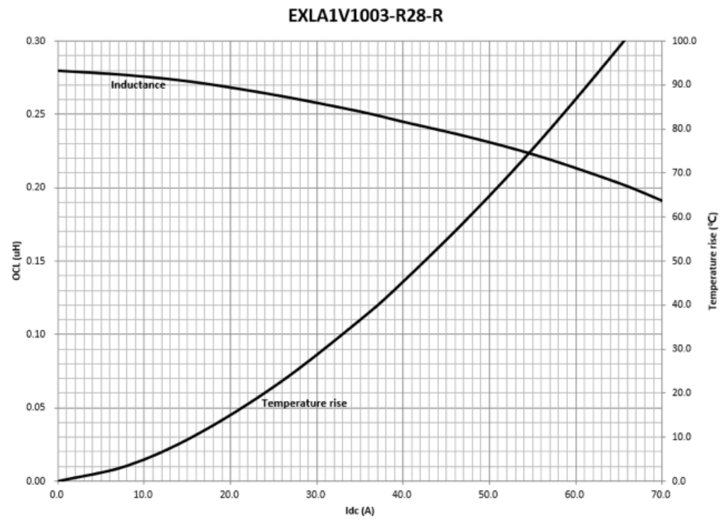
Drawing not to scale

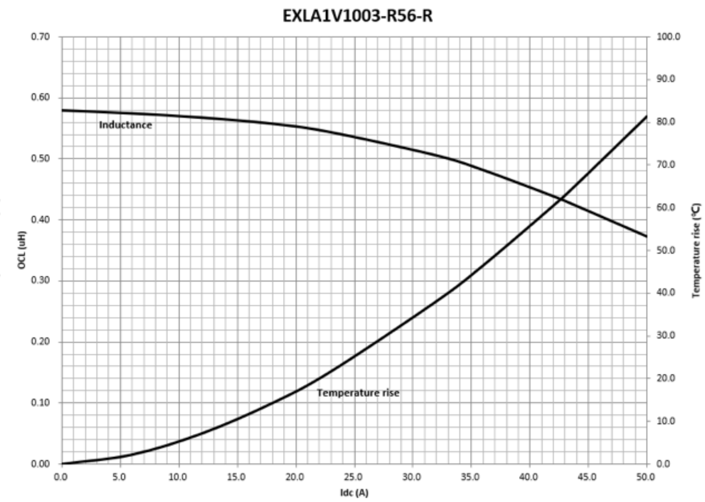


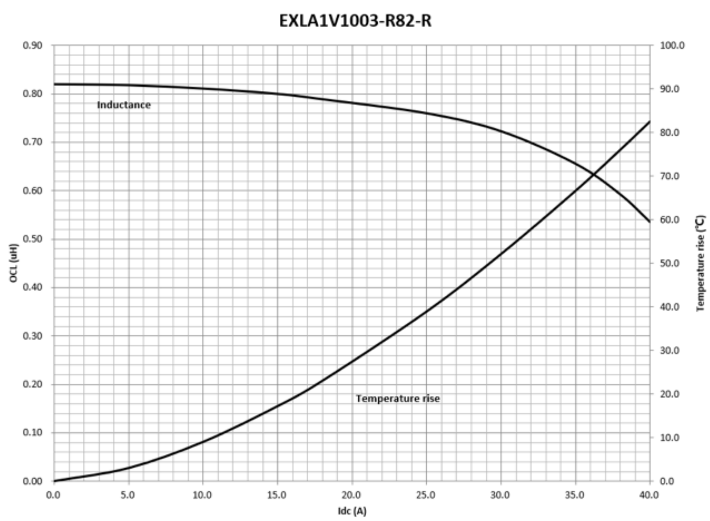
	EXLA1V1003	EXLA1V1006	EXLA1V1010
W±0.30	24	24	24
F±0.10	11.5	11.5	11.5
E1±0.10	1.75	1.75	1.75
E2 Min	22.25	22.25	22.25
P0±0.10	4	4	4
P1±0.10	16	16	16
P2±0.1	2	2	2
D0+0.10/-0	1.5	1.5	1.5
D1+0.10/-0	1.5	1.5	1.5
A0±0.10	12.4	12.4	12.4
B0±0.10	11.5	11.5	11.5
K0±0.10	3.3	6.3	10.3
T±0.05	0.35	0.35	0.35

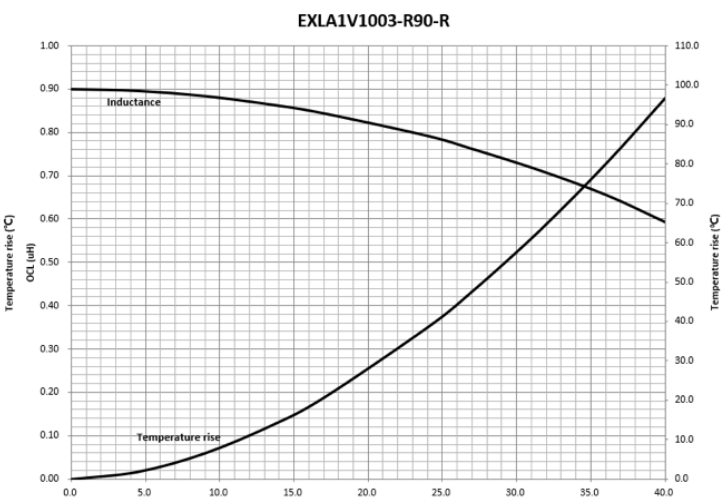
Inductance and temperature rise vs. current

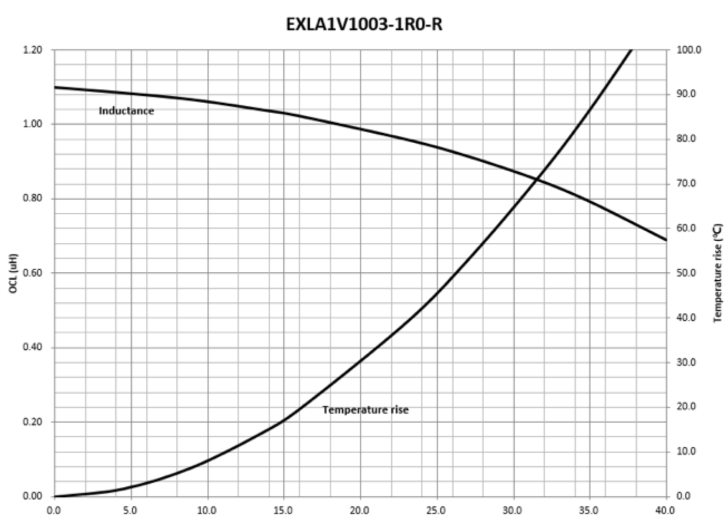
EXLA1V1003

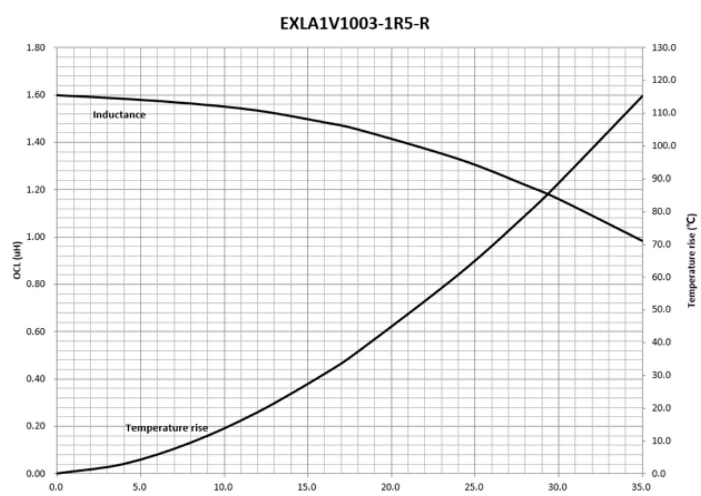






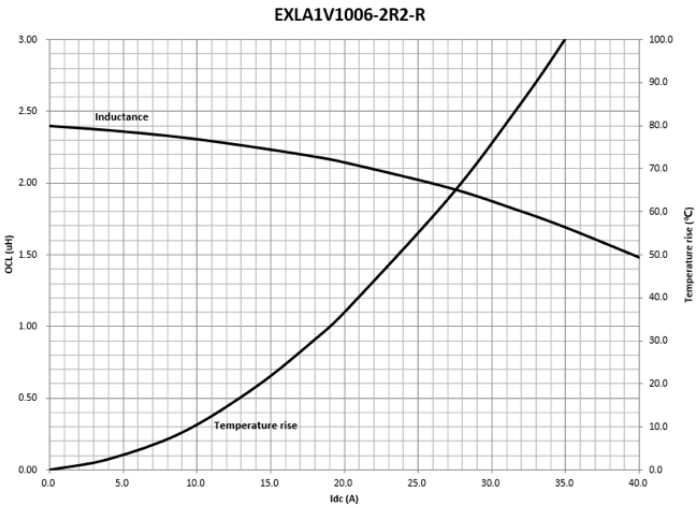


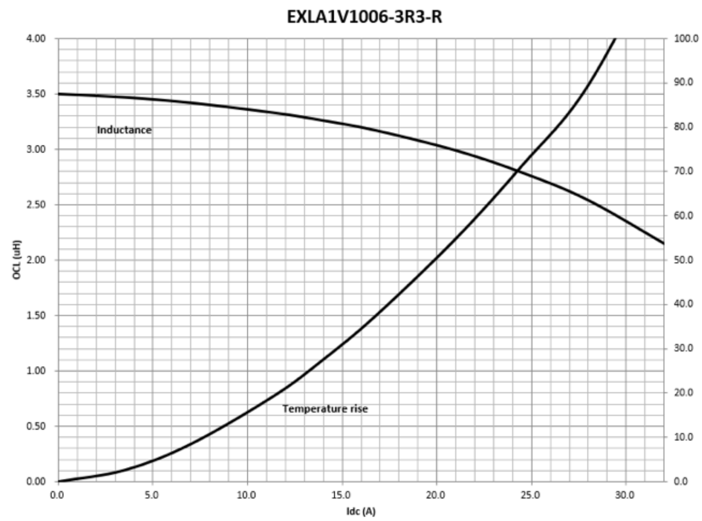


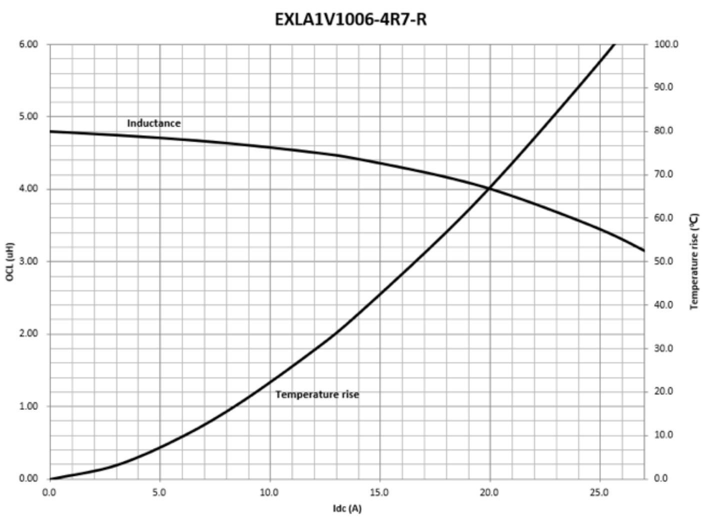


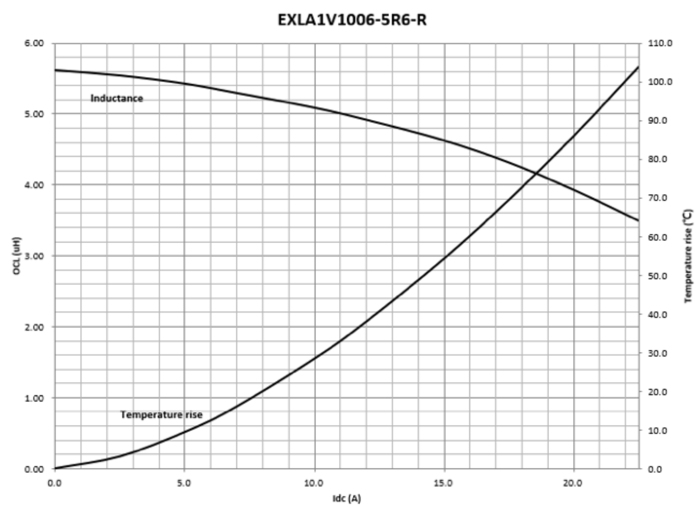
Inductance and temperature rise vs. current

EXLA1V1006



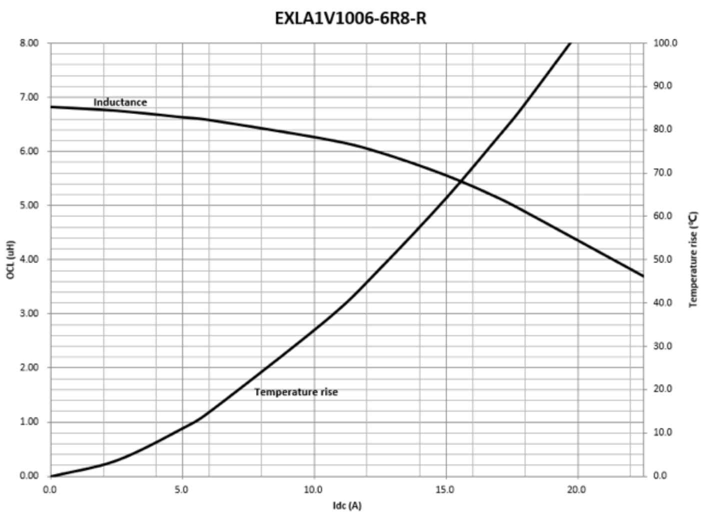


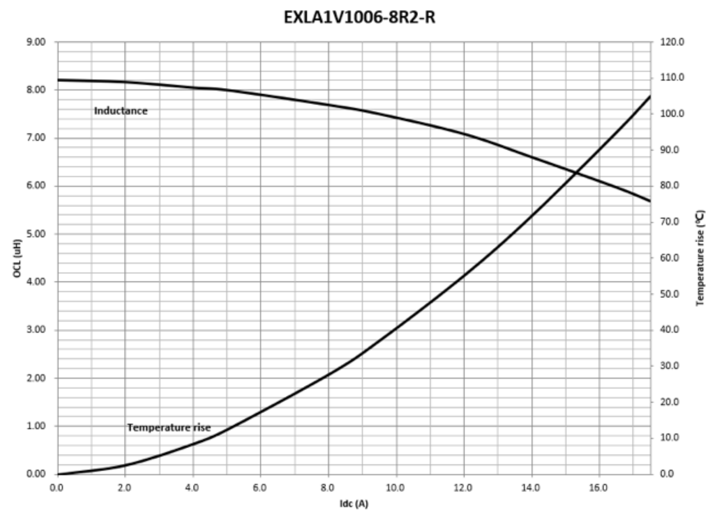


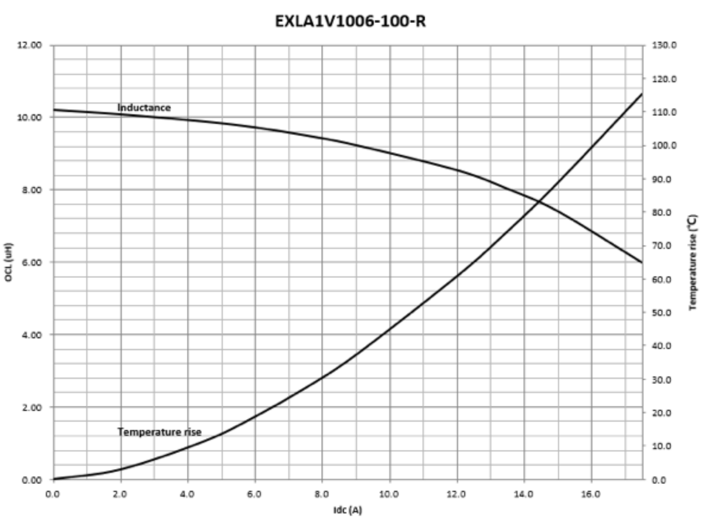


Inductance and temperature rise vs. current, continued

EXLA1V1006

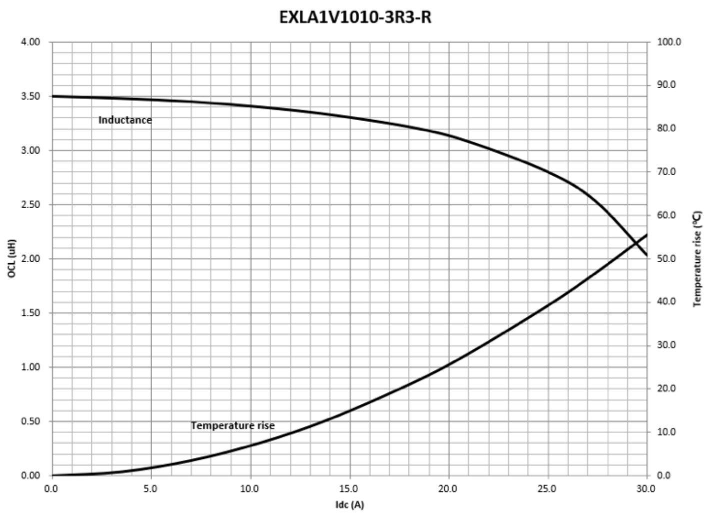


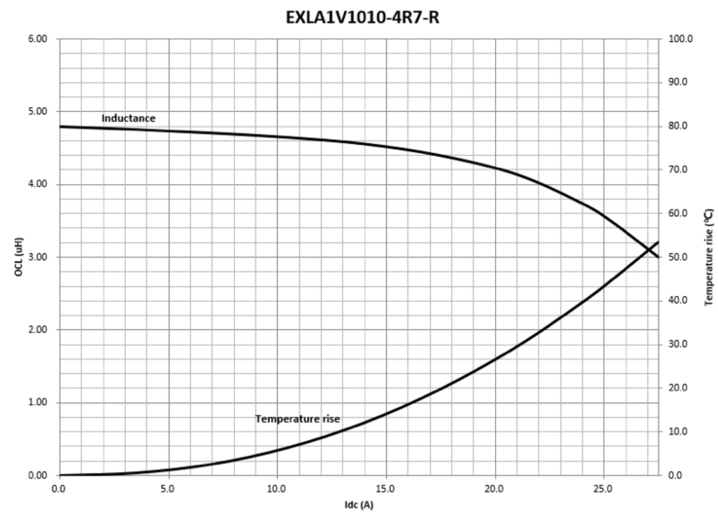


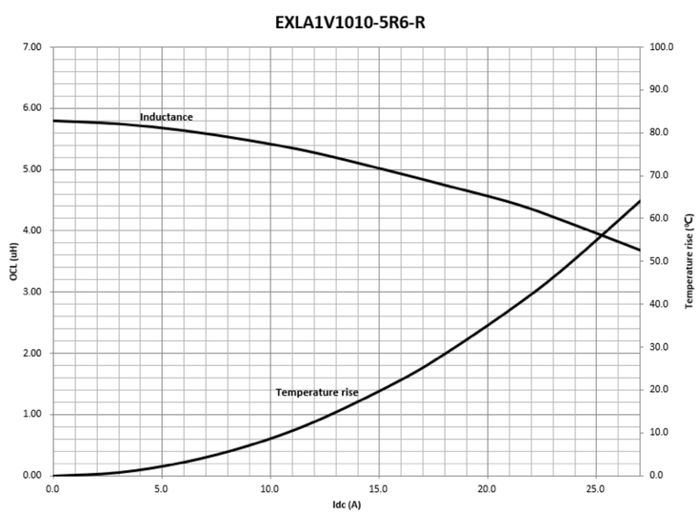


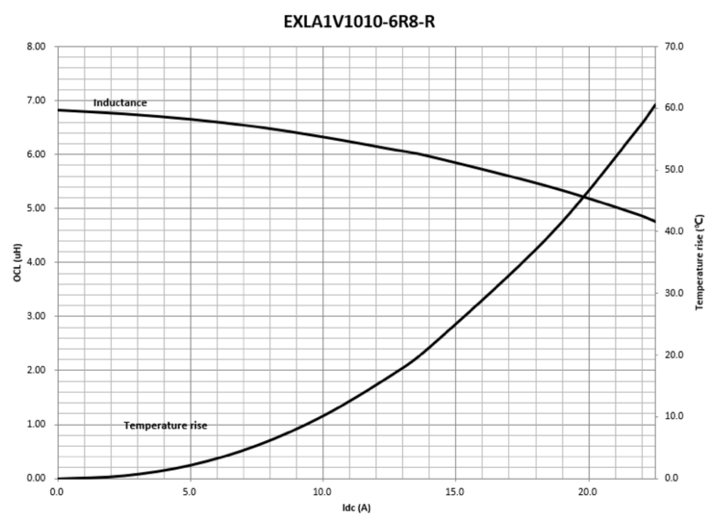
Inductance and temperature rise vs. current

EXLA1V1010



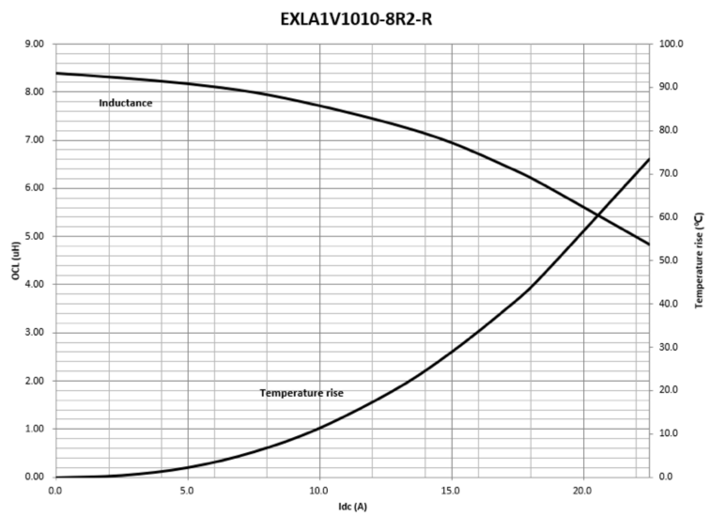


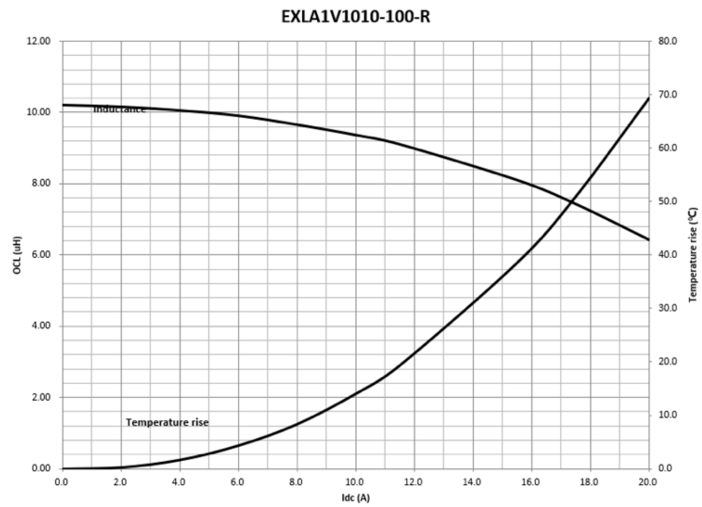


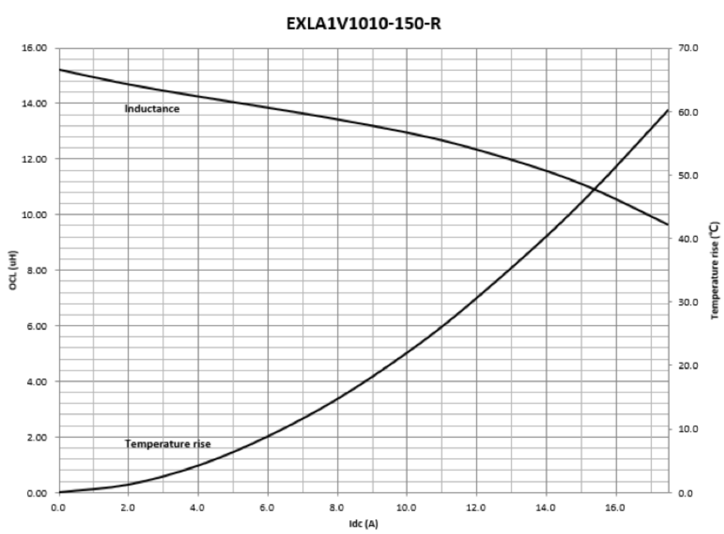


Inductance and temperature rise vs. current, continued

EXLA1V1010

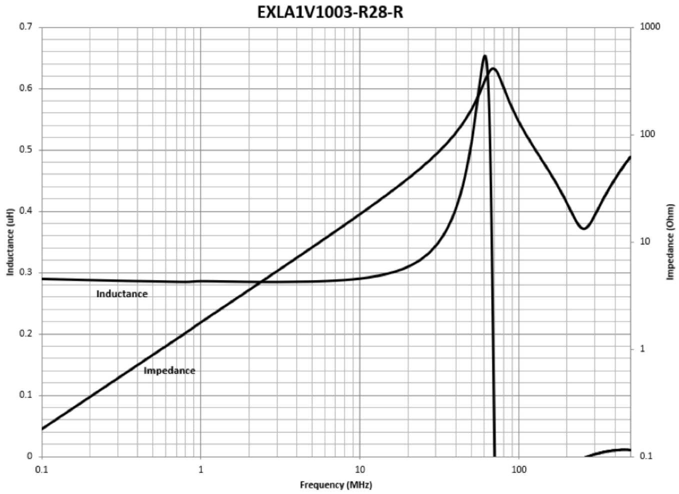


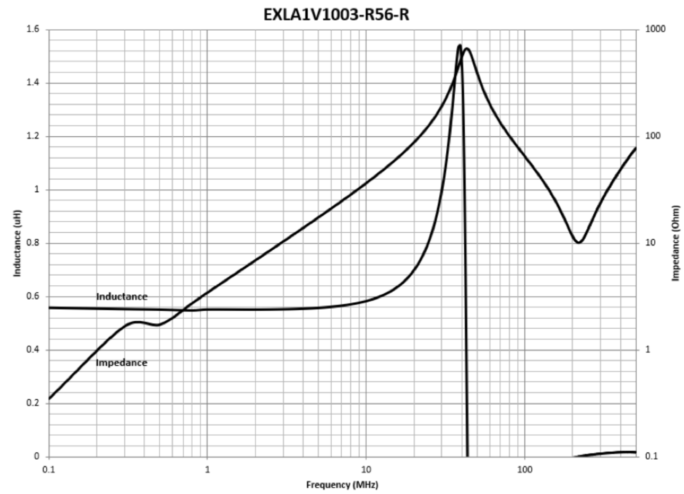


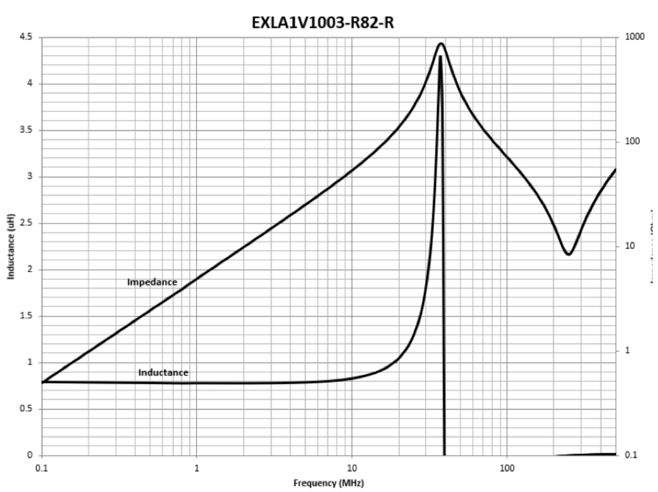


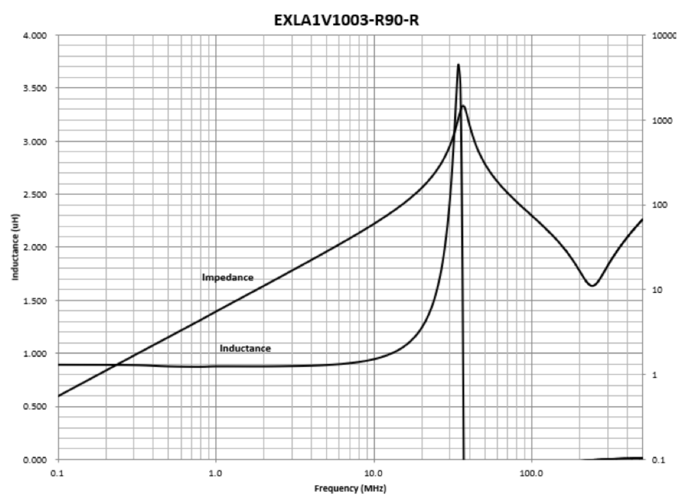
Inductance and impedance vs frequency curve

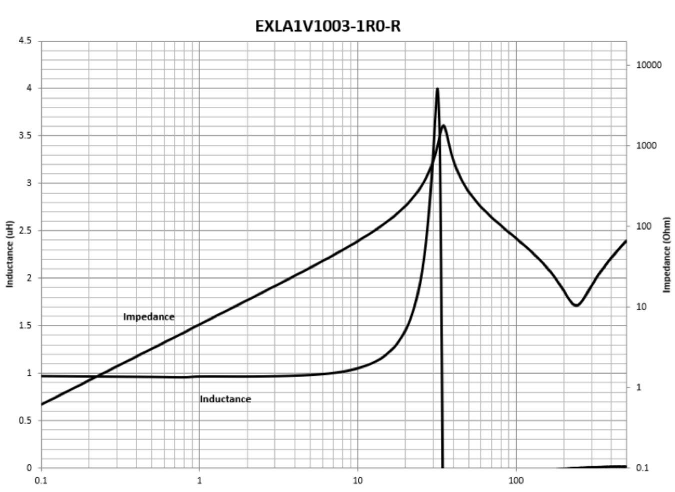
EXLA1V1003

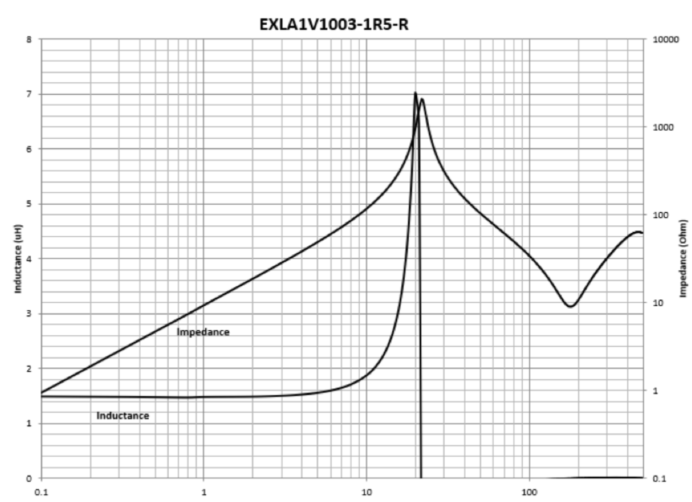






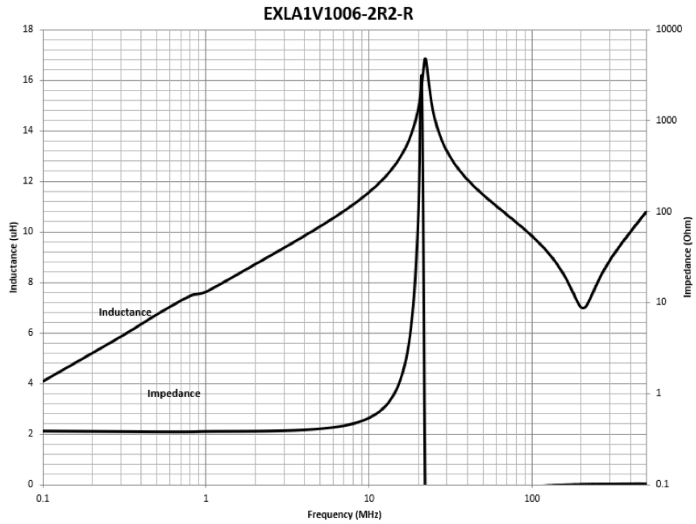


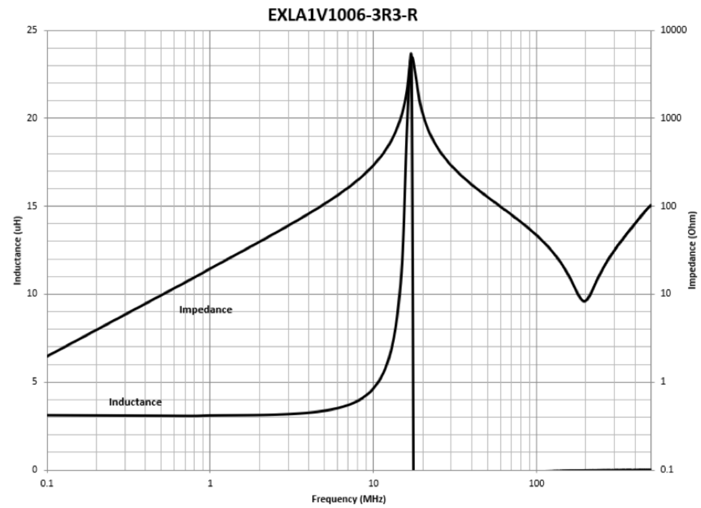


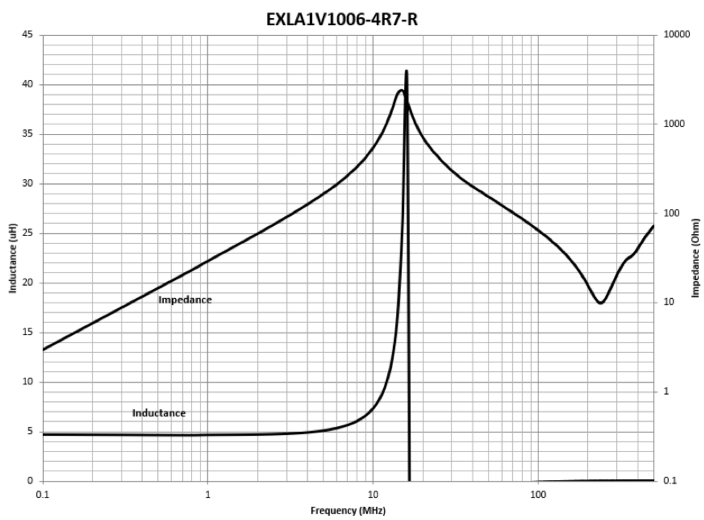


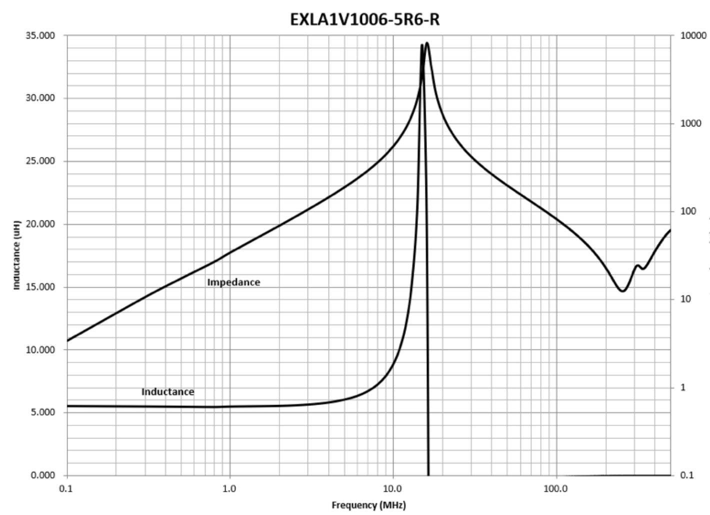
Inductance and impedance vs frequency curve

EXLA1V1006



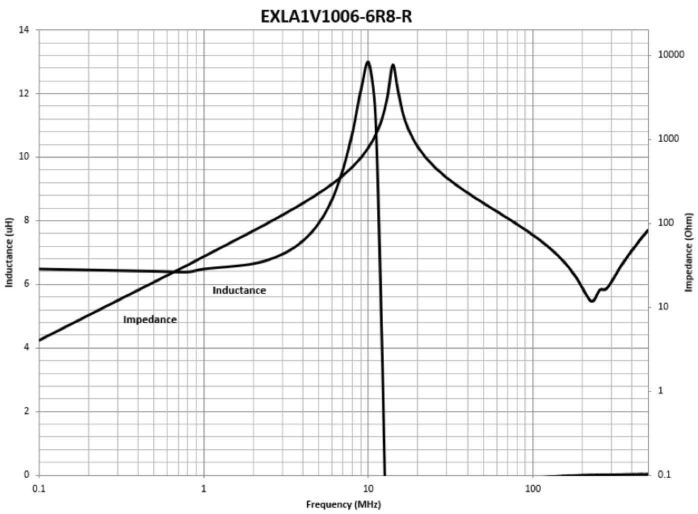


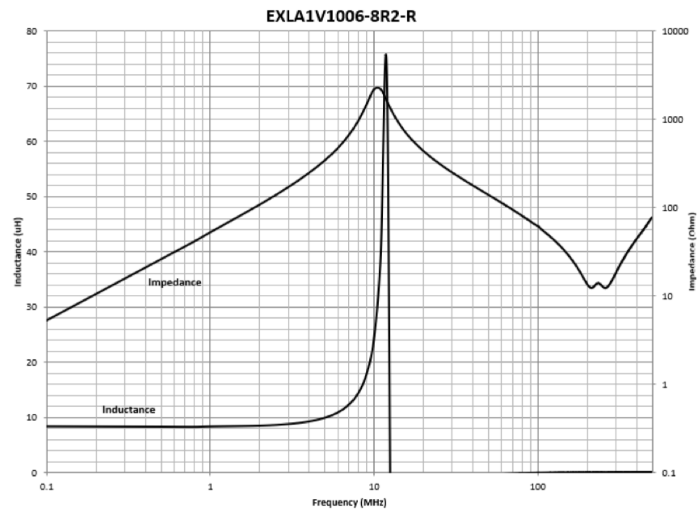


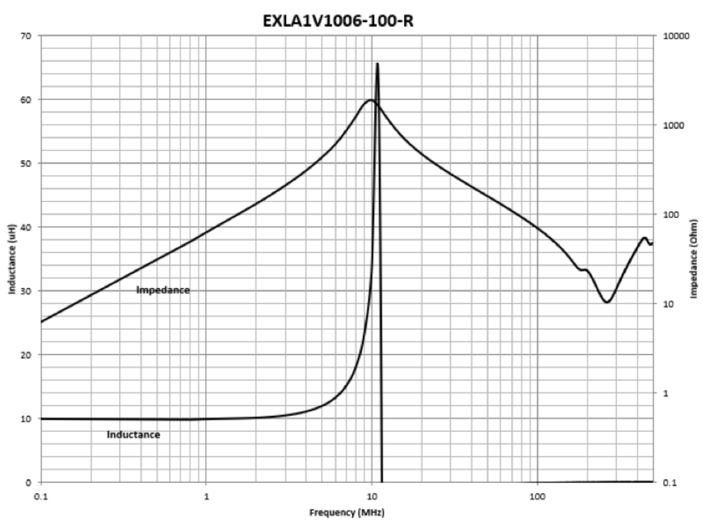


Inductance and impedance vs frequency curve, continued

EXLA1V1006

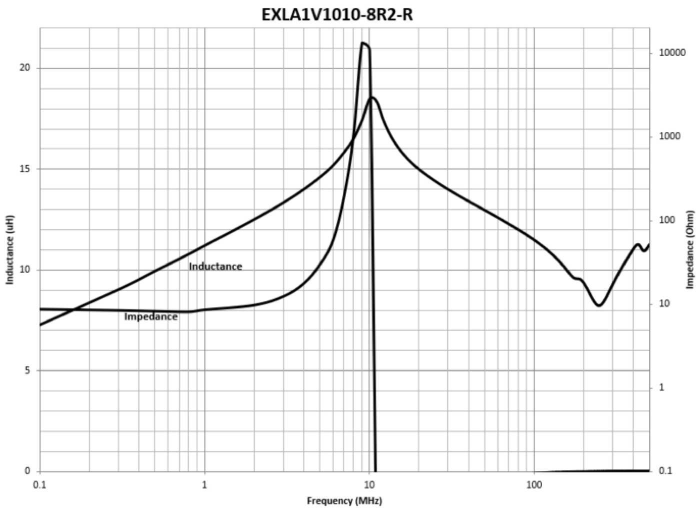


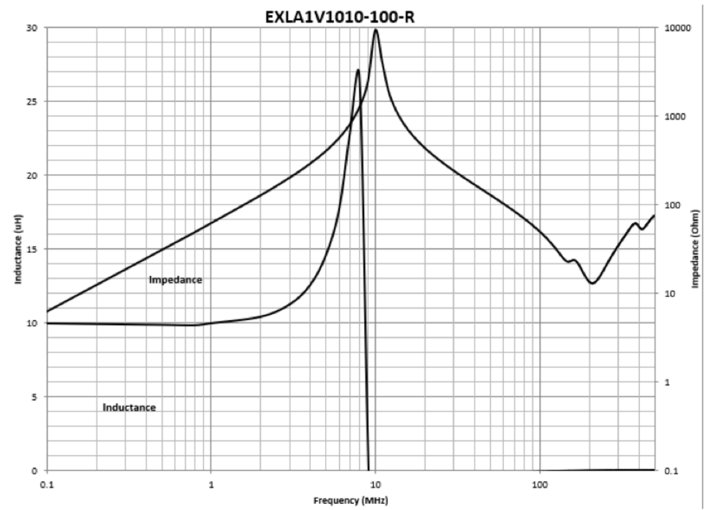




Inductance and impedance vs frequency curve

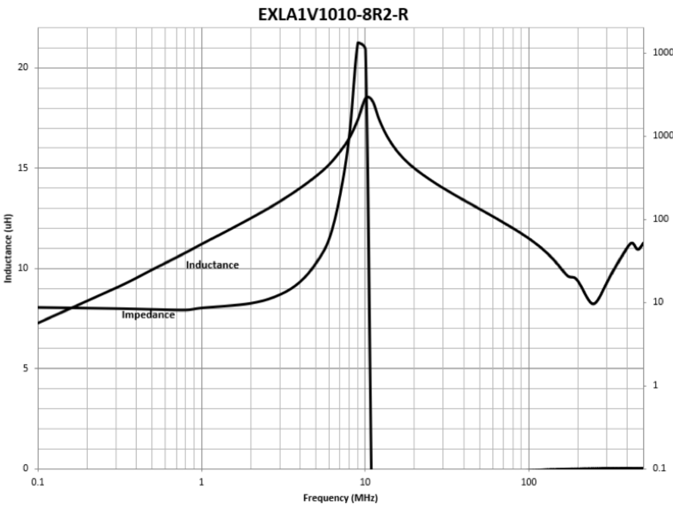
EXLA1V1010

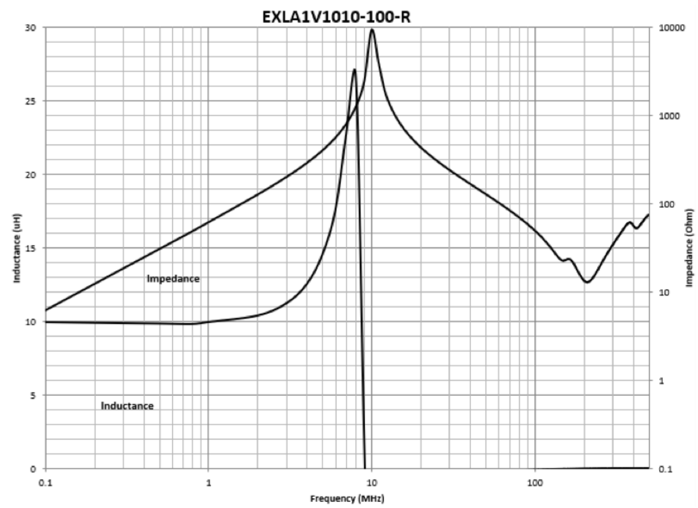


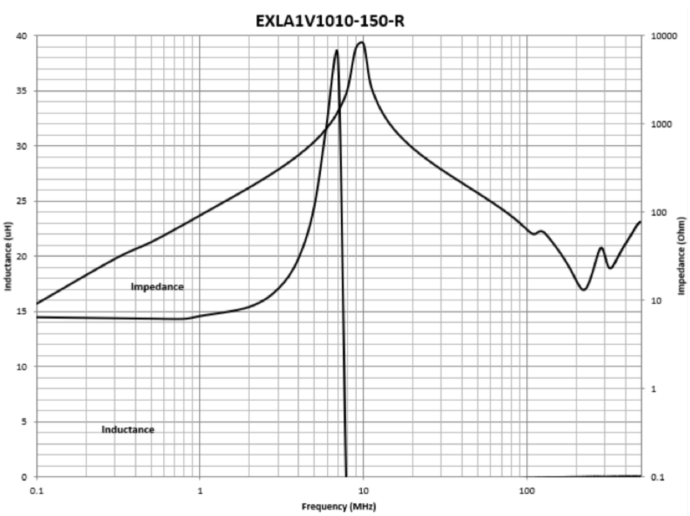


Inductance and impedance vs frequency curve, continued

EXLA1V1010







Solder reflow profile

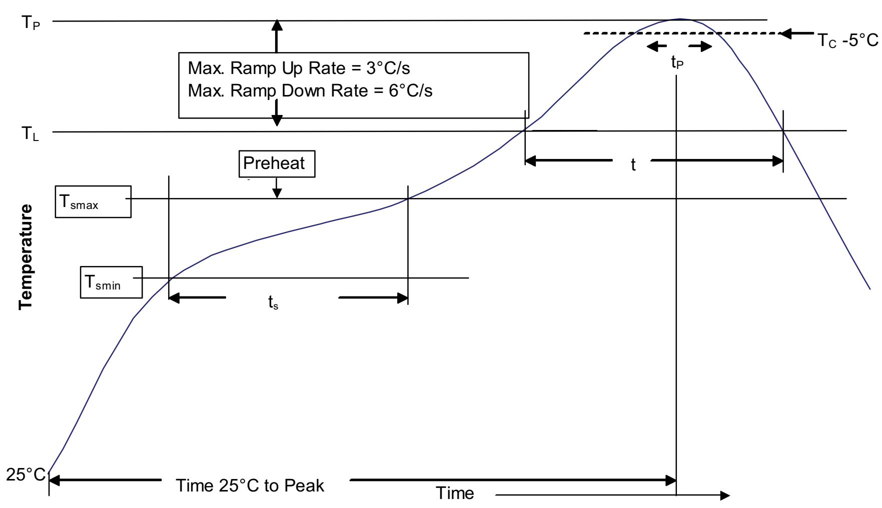


Table 1 - Standard SnPb solder (T_c)

Package thickness	Volume mm3 <350	Volume mm3 ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T_c)

Package thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

Profile feature		Standard SnPb solder	Lead (Pb) free solder
Preheat and soak	• Temperature min. (T_{smin})	100 °C	150 °C
	• Temperature max. (T_{smax})	150 °C	200 °C
	• Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Ramp up rate T_L to T_p		3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L		183 °C 60-150 seconds	217 °C 60-150 seconds
Peak package body temperature (T_P)*		Table 1	Table 2
Time (t_p)* within 5 °C of the specified classification temperature (T_c)		20 seconds*	30 seconds*
Ramp-down rate (T_p to T_L)		6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature		6 minutes max.	8 minutes max.

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
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