SDCHA1V80

Automotive grade semi-shielded power inductors

Applications

- LED lighting
- Advanced driver assistance systems (ADAS)
- Adaptive cruise control (ACC)
- Collision avoidance
- Infotainment and cluster electronics
- Electronic control unit (ECU)

Product features

- AEC-Q200 qualified
- High current carrying capacity
- High power density, low core losses
- Magnetically semi-shielded
- Inductance range from 1 µH to 100 µH
- Current range from 1.2 A to 8.5 A
- 8.3 mm x 8.3 mm surface mount package in a maximum 4.0 mm height
- NiZn ferrite magnetic material
- Moisture sensitivity level (MSL): 1

Environmental compliance and general specifications

- Storage temperature range (component): -55 °C to +125 °C
- Operating temperature range: -55 °C to +125 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant

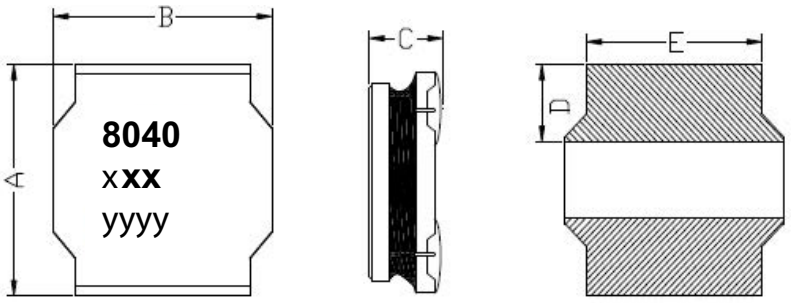
Powering Business Worldwide

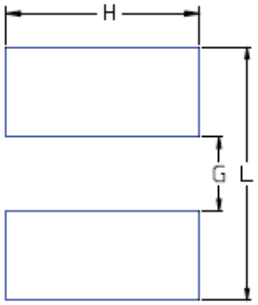
Product specifications

Part number[5]	OCL[1] (µH)	Tolerance	FLL[2] (µH) minimum	I_{rms}[3] (A)	I_{sat}[4] (A)	DCR (mΩ) ±20% @ +25 °C	SRF (MHz) typical
SDCHA1V8040-1R0-R	1.0	±20%	0.56	8.5	13.8	8.2	85
SDCHA1V8040-1R5-R	1.5	±20%	0.84	8.0	11.5	10	66
SDCHA1V8040-2R2-R	2.2	±20%	1.23	7.4	9.8	11.5	57
SDCHA1V8040-3R3-R	3.3	±20%	1.85	6.6	8.0	15	48
SDCHA1V8040-4R7-R	4.7	±20%	2.63	5.8	6.7	19.5	38
SDCHA1V8040-5R6-R	5.6	±20%	3.14	5.4	6.2	22	33
SDCHA1V8040-6R8-R	6.8	±20%	3.81	5.1	5.6	25	29
SDCHA1V8040-100-R	10	±20%	5.60	4.6	5.0	33	25
SDCHA1V8040-150-R	15	±20%	8.40	3.6	4.0	50	20
SDCHA1V8040-220-R	22	±20%	12.32	2.9	3.1	73	18
SDCHA1V8040-330-R	33	±20%	18.48	2.3	2.6	100	15
SDCHA1V8040-470-R	47	±20%	26.32	2.0	2.2	135	12
SDCHA1V8040-560-R	56	±20%	31.36	1.75	1.9	160	10.5
SDCHA1V8040-680-R	68	±20%	38.08	1.65	1.75	205	9.5
SDCHA1V8040-820-R	82	±20%	45.92	1.4	1.6	230	8.5
SDCHA1V8040-101-R	100	±20%	56	1.2	1.45	300	8.0

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, I_{sat}, +25 °C
3. I_{rms}: 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 +125 °C under worst case operating conditions verified in the end application.
4. I_{sat} : Peak current for approximately 30% maximum rolloff @ +25 °C
5. Part number definition: SDCHA1V8040-xxx-R
   SDCHA1V8040 = Product code and size
   xxx= Inductance value in µH, R=decimal point, If no R is present last digit indicates number of zeros
   -R suffix = RoHS compliant
6. Rated operating voltage (across inductor) 20 V ref.

Dimensions-mm





Recommended PCB Layout

Schematic

Dimension	SDCHA1V8040-xxx-R
A	8.0 ± 0.3
B	8.0 ± 0.3
C	3.7 ± 0.3
D	2.4 ± 0.3
E	6.3 ± 0.3
L	8.5
G	2.8
H	6.6

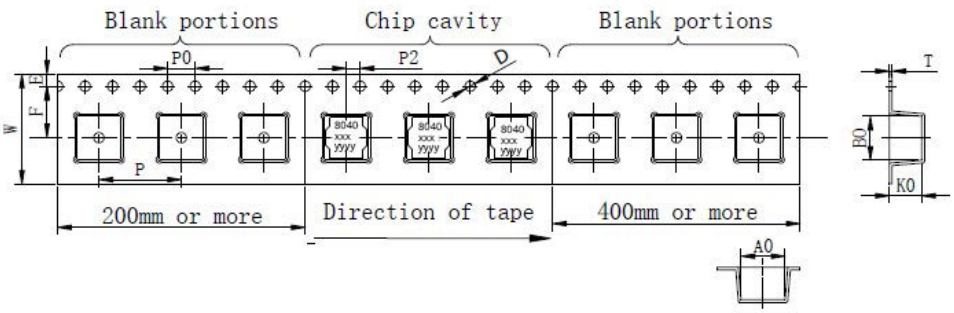
Part marking: 8040, xxx= inductance value in uH, R= decimal point. If no R is present then last character equals number of zeros, yyyy= lot code
All soldering surfaces to be coplanar within 0.1 millimeters
PCB layout reference only
Recommend solder paste thickness at 0.15 mm and above
Traces or vias underneath the inductor is not recommended

Packaging information- mm

SDCHA1V8040

Supplied in tape and reel packaging, 1000 parts per 13" diameter reel (EIA-481 compliant)

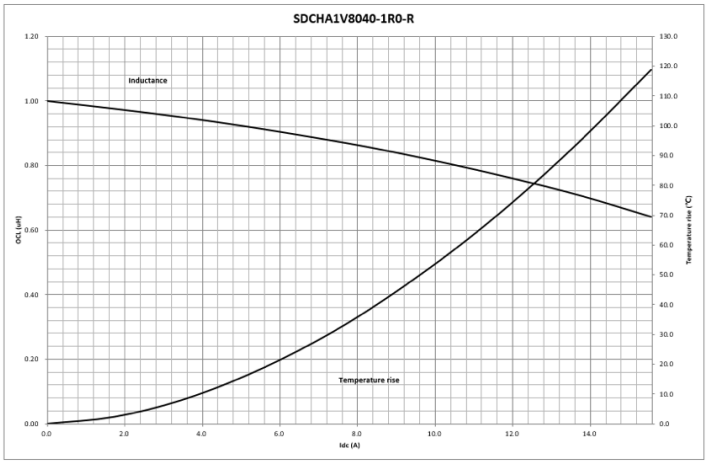
Drawing not to scale

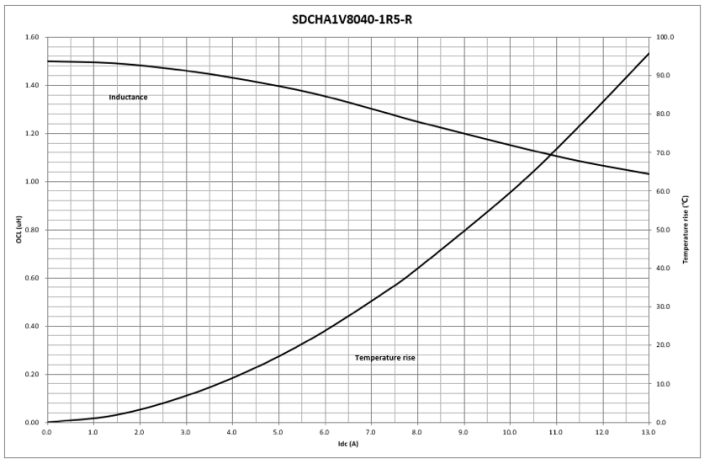


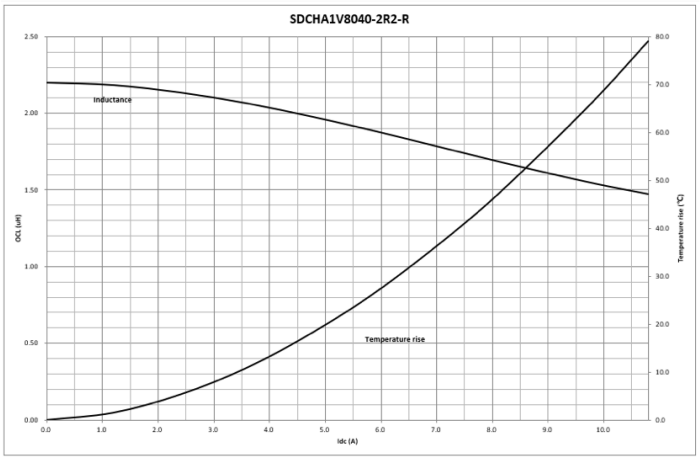
Dimension	Value
W	16.0 ± 0.3
F	7.5 ± 0.1
E	1.75 ± 0.1
P0	4.0 ± 0.1
P	12.0 ± 0.1
P2	2.0 ± 0.1
D	1.5 ± 0.1
A0	8.4 ± 0.1
B0	8.4 ± 0.1
K0	4.3 ± 0.1
T	0.4 ± 0.1

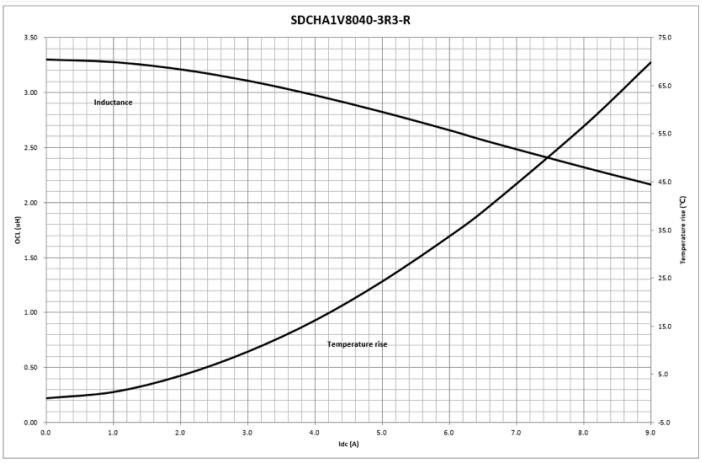
Inductance and temperature rise vs current

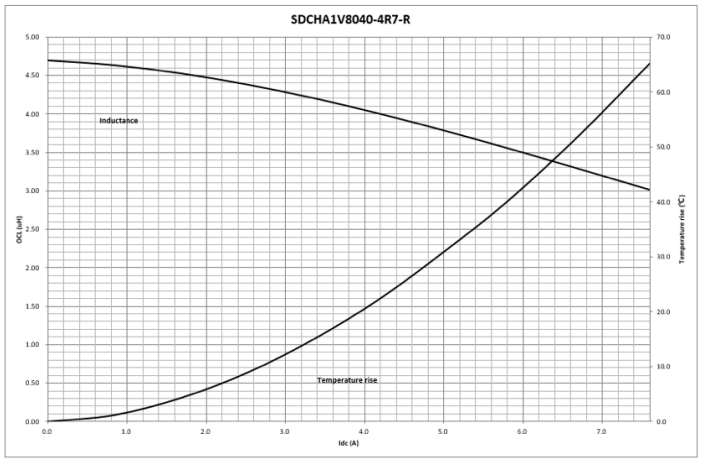
SDCHA1V8040

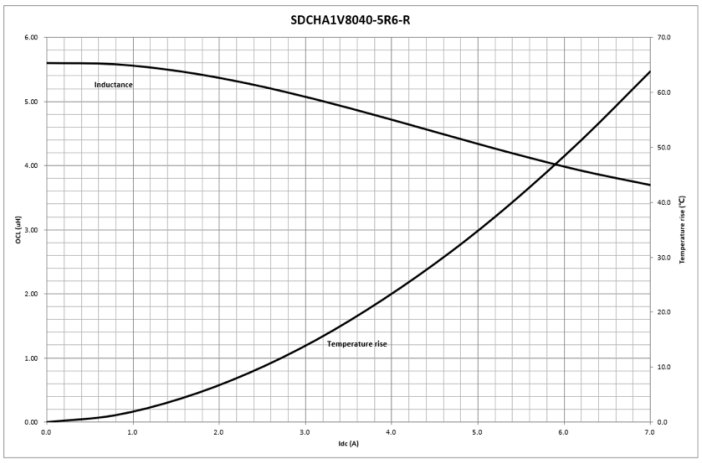




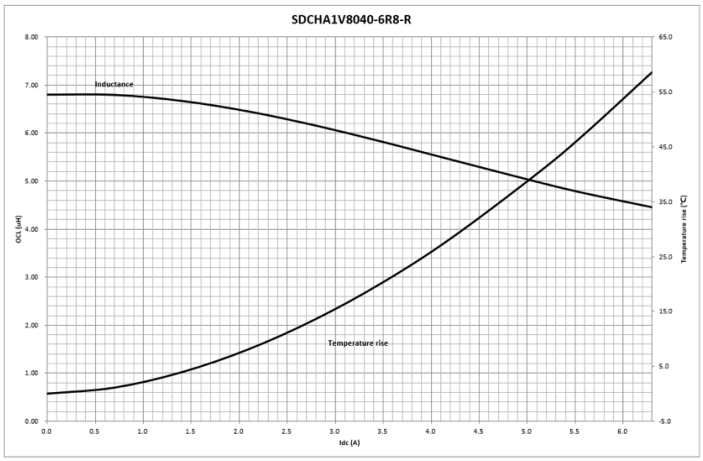


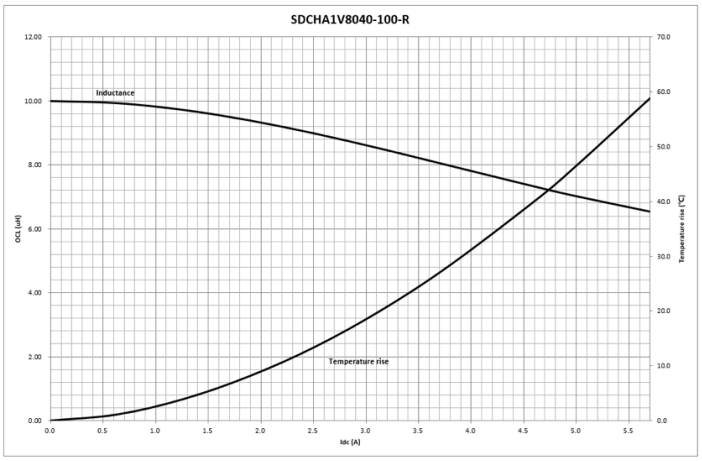


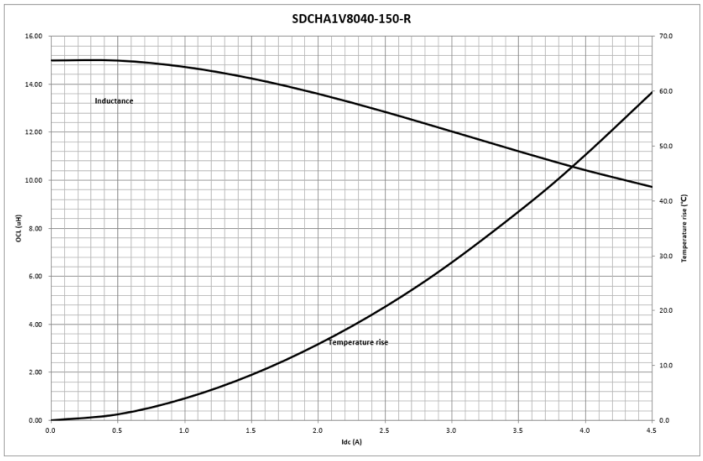


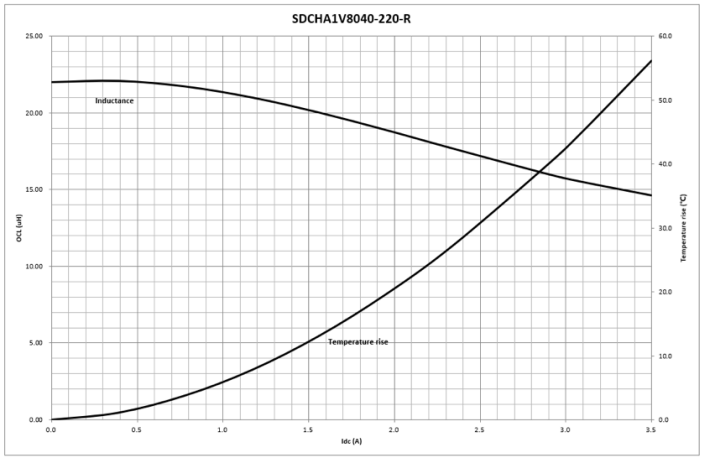


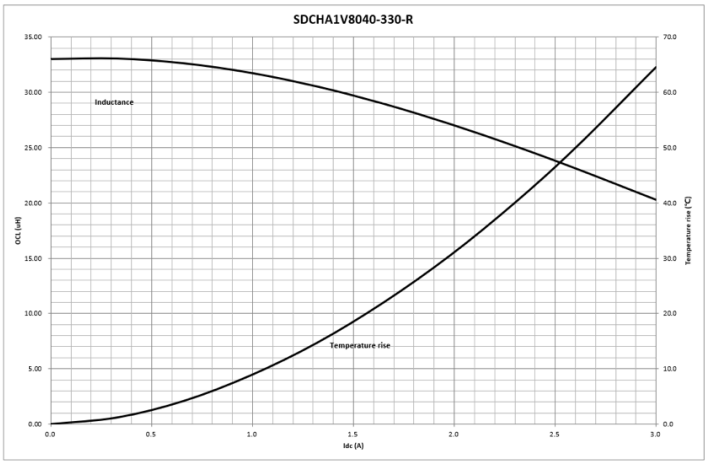
Inductance and temperature rise vs current

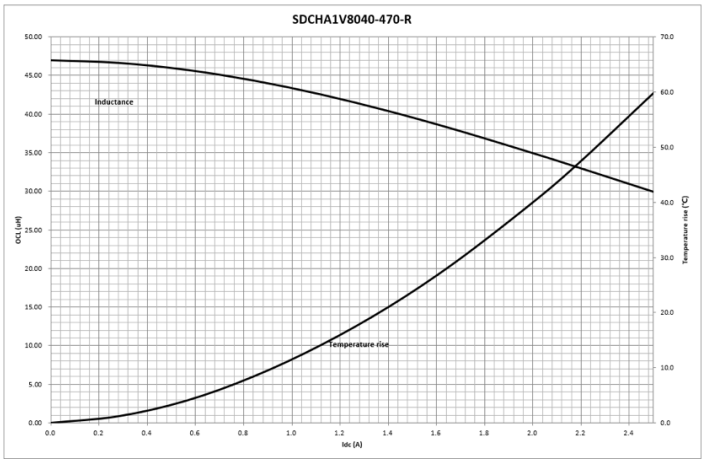




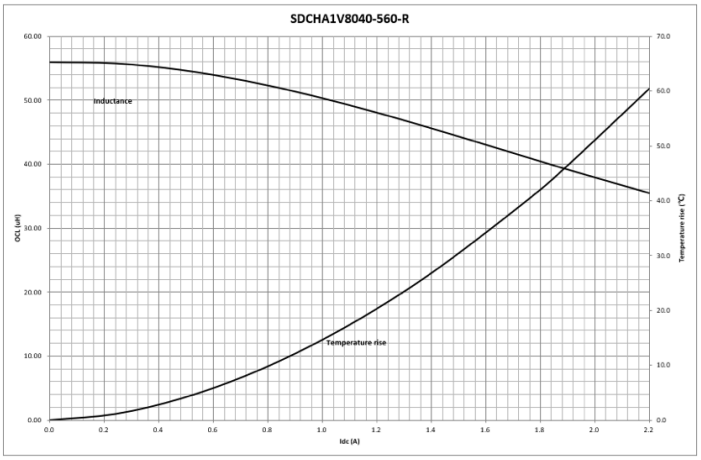


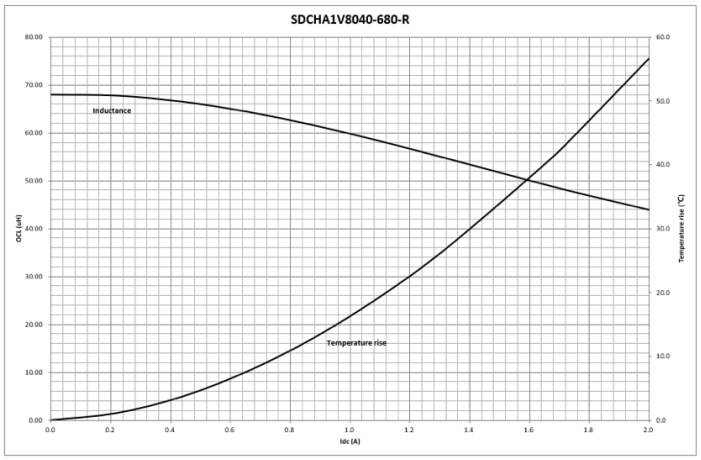


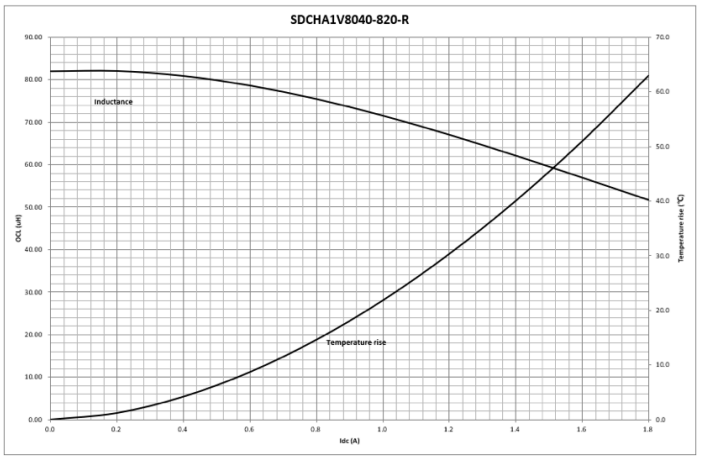


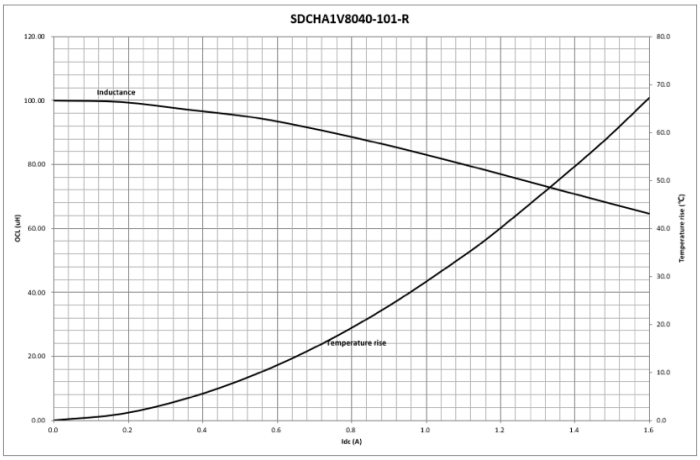


Inductance and temperature rise vs current

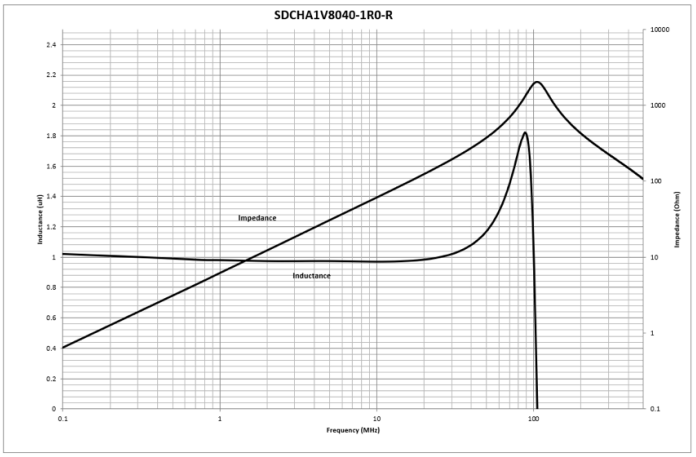


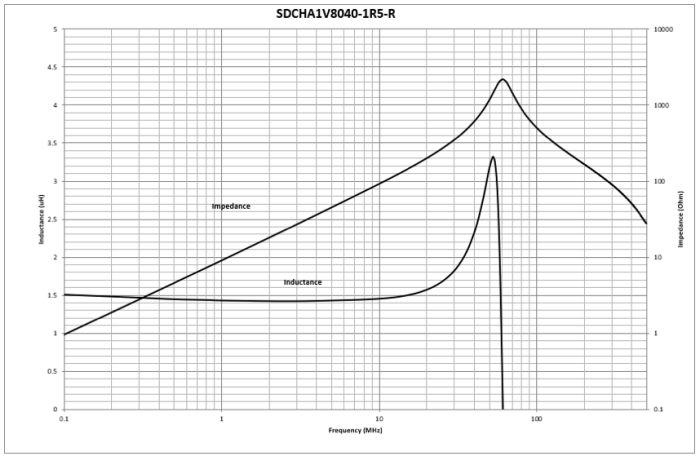


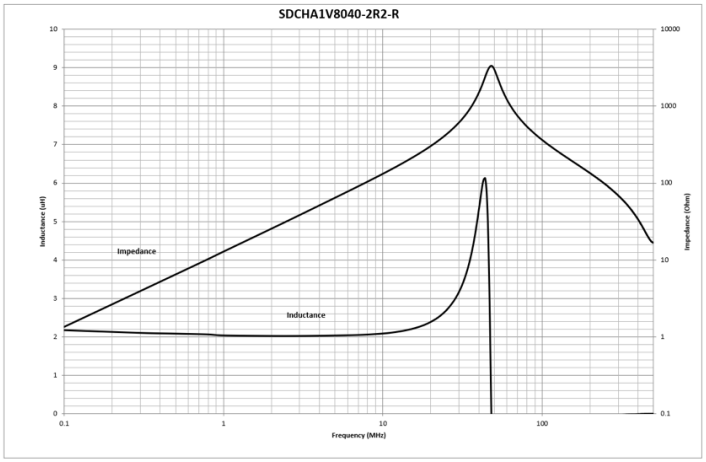


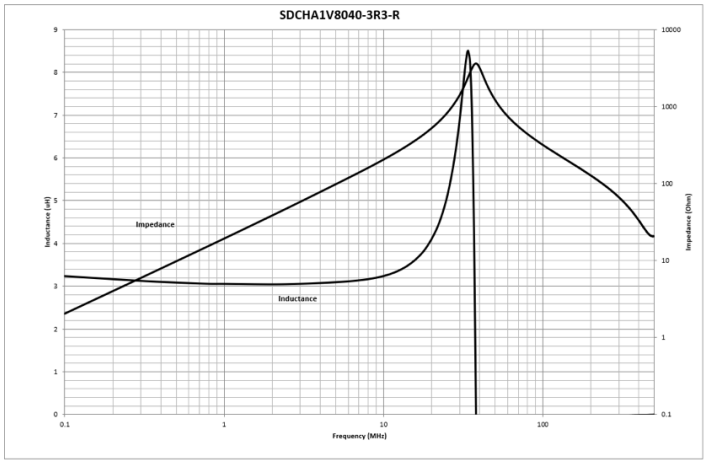


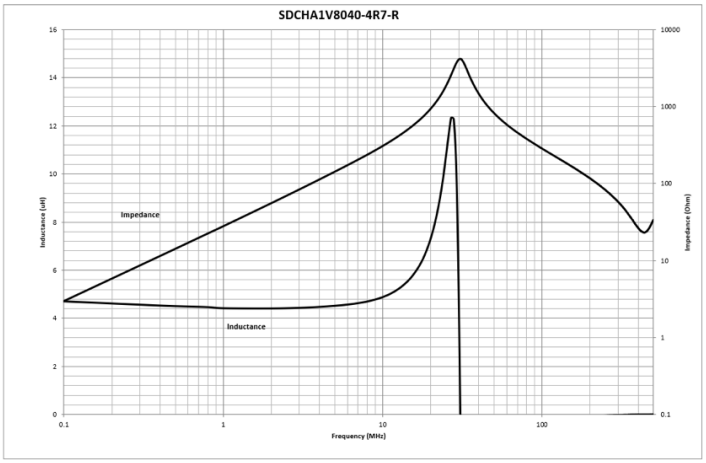
Inductance and impedance vs. frequency curve

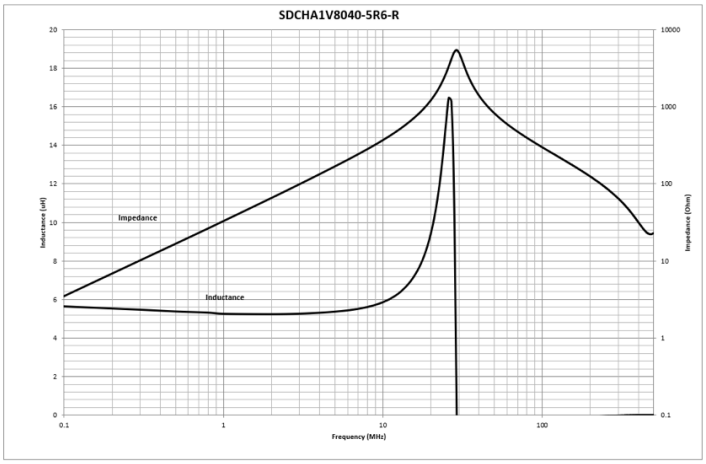




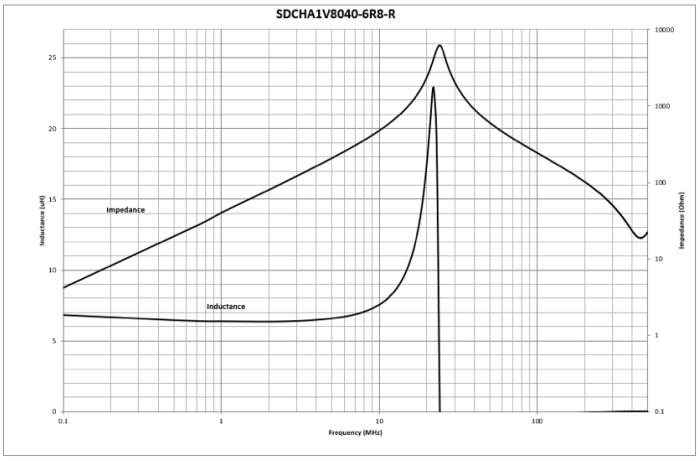


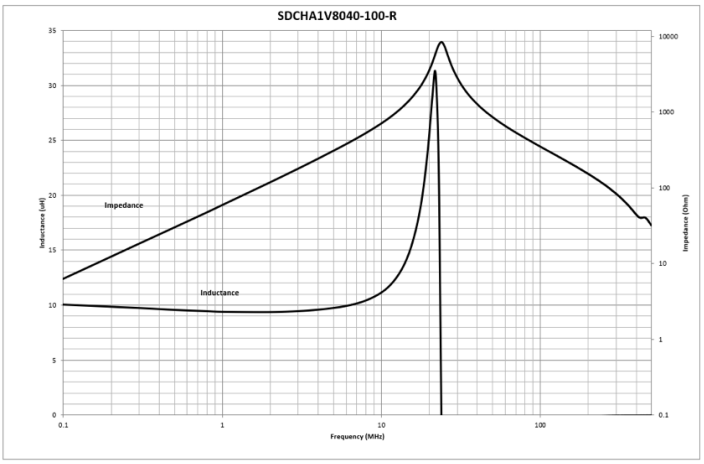


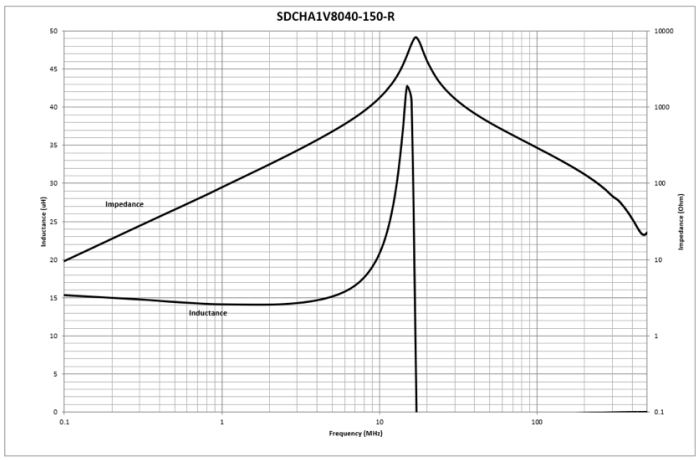


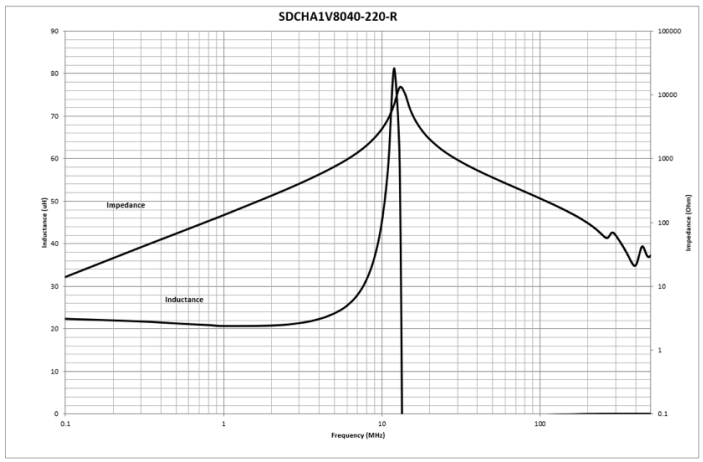


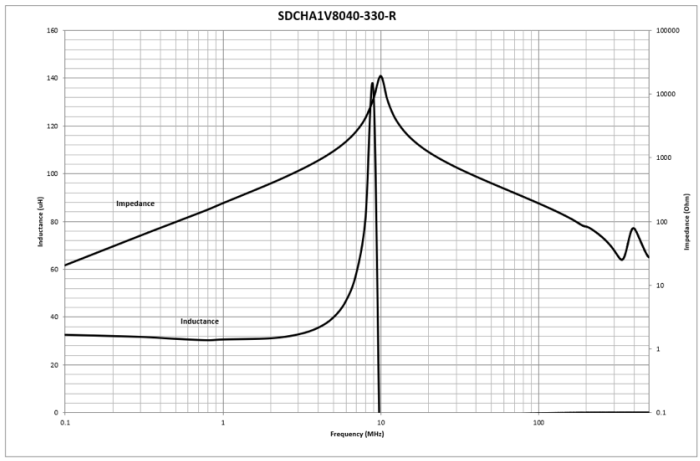
Inductance and impedance vs. frequency curve

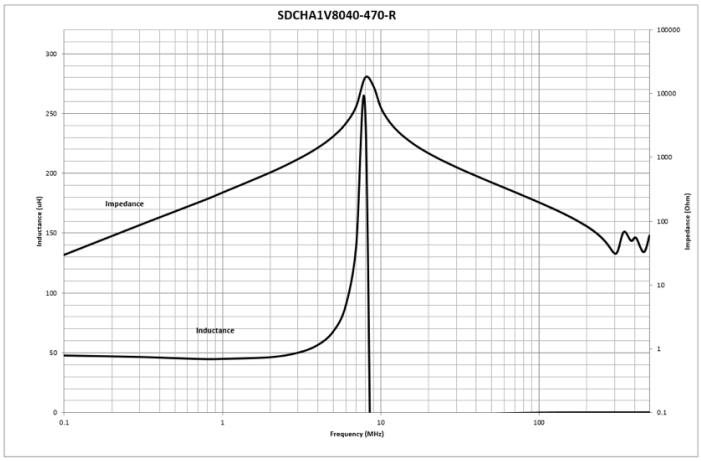




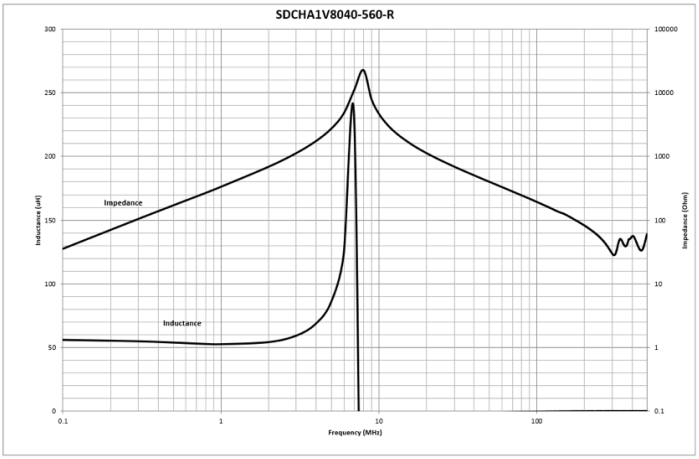


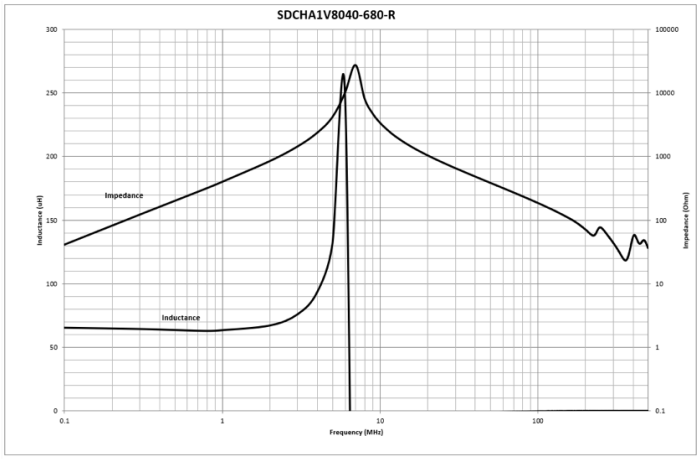


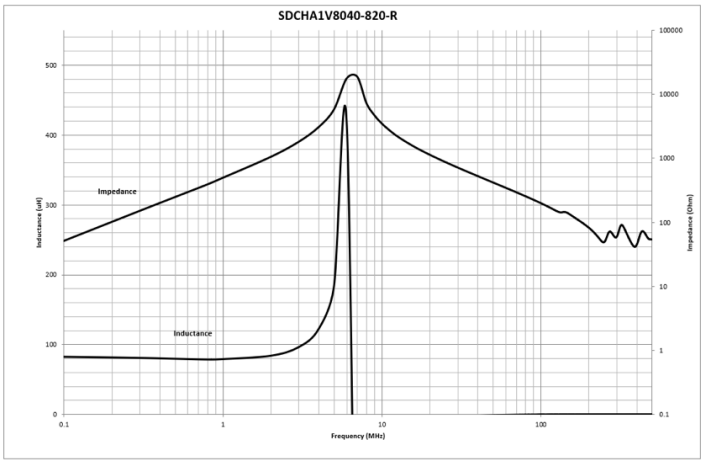


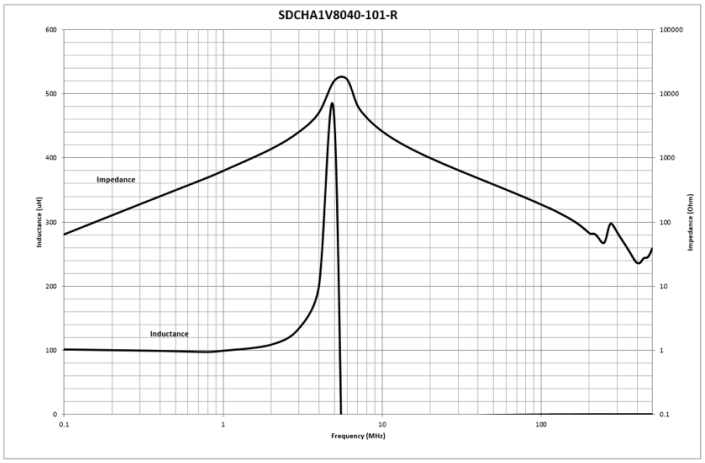


Inductance and impedance vs. frequency curve









Solder reflow profile

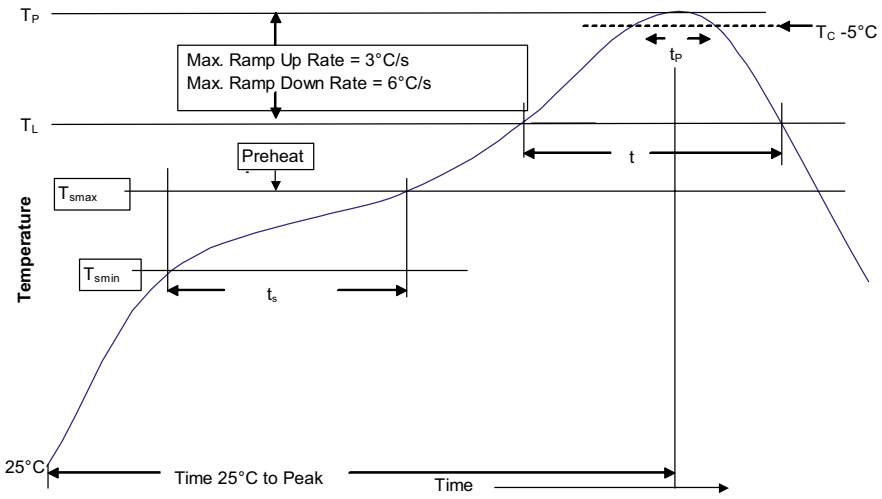


Table 1 - Standard SnPb solder (T_C)

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
Eaton.com/electronics