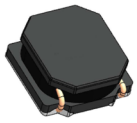
Technical Data **ELX1098** Effective September 2021

SDCLA1V40

Automotive grade semi-shielded power inductors



Product features

- AEC-Q200 qualified
- High current carrying capacity
- High power density, low core losses
- Magnetically semi-shielded
- Inductance range from 1 µH to 22 µH
- Current range from 0.72 A to 3.2 A
- 4.2 mm x 4.2 mm surface mount package in a maximum 1.8 mm height
- NiZn ferrite magnetic material
- Moisture sensitivity level (MSL): 1

Applications

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

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

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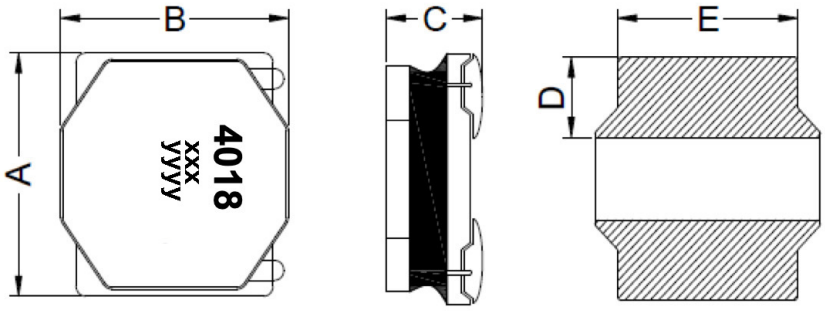
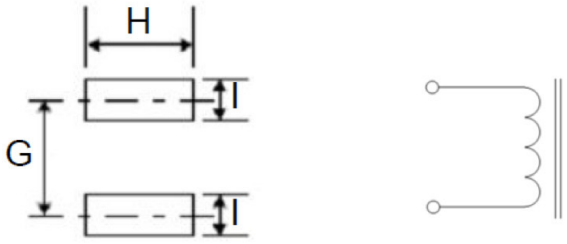
Product specifications

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
SDCLA1V4018-1R0-R	1.0	±30%	0.49	3.2	4.0	27	90
SDCLA1V4018-1R5-R	1.5	±30%	0.74	2.4	3.3	37	75
SDCLA1V4018-2R2-R	2.2	±20%	1.23	2.2	3.0	42	60
SDCLA1V4018-3R3-R	3.3	±20%	1.85	2.0	2.3	55	46
SDCLA1V4018-4R7-R	4.7	±20%	2.63	1.7	2.0	70	35
SDCLA1V4018-6R8-R	6.8	±20%	3.81	1.45	1.6	98	30
SDCLA1V4018-100-R	10	±20%	5.6	1.2	1.3	150	25
SDCLA1V4018-150-R	15	±20%	8.4	0.85	1.1	210	18
SDCLA1V4018-220-R	22	±20%	12.32	0.72	0.9	290	15

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: SDCLA1V4018-xxx-R
   SDCLA1V4018 = 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. Absolute maximum voltage 20 V DC Buck

Dimensions-mm





Recommended PCB Layout

Schematic

Dimension	SDCLA1V4018-xxx-R
A	4.0 ± 0.2
B	4.0 ± 0.2
C	1.6 ± 0.2
D	1.1 ± 0.2
E	3.5 ± 0.3
G	2.8 REF
H	3.7 REF
I	1.2 REF

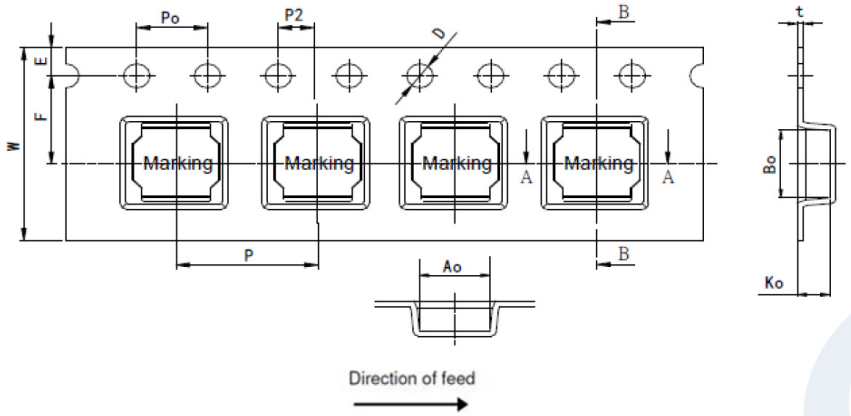
Part marking: 4018, xxx= inductance value in uH, R= decimal point. If no R is present then last character equals number of zeros, yyyy= lot code
Tolerances are ±0.3 millimeters unless stated otherwise
All soldering surfaces to be coplanar within 0.1 millimeters
Pad layout tolerances are ±0.1 millimeters unless stated otherwise
Traces or vias underneath the inductor is not recommended

Packaging information- mm

SDCLA1V4018

Supplied in tape and reel packaging, 3500 parts per 13" diameter reel (EIA-481 compliant)

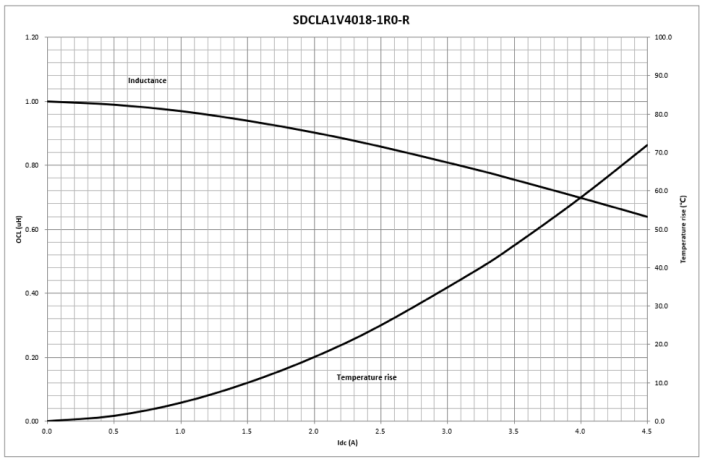
Drawing not to scale

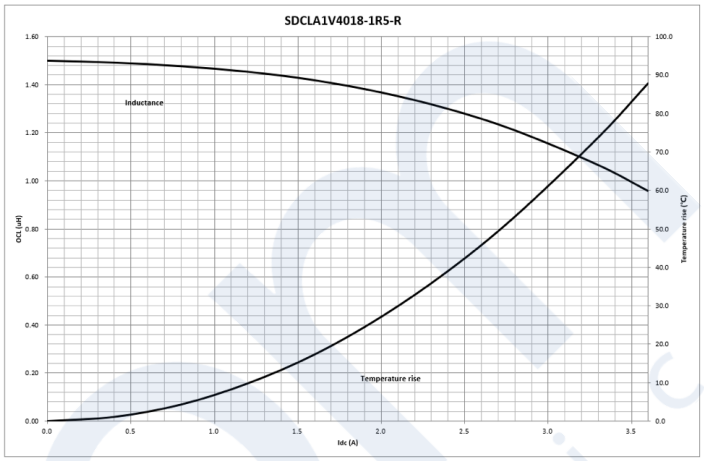


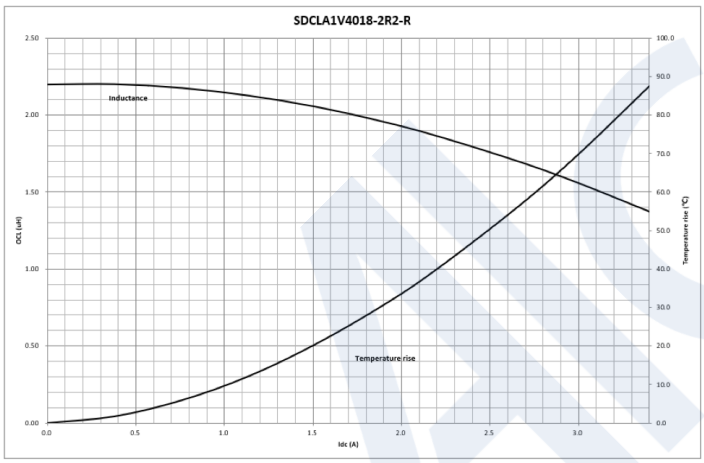
Dimension	Value
W	12.0 ± 0.3
F	5.5 ± 0.1
E	1.75 ± 0.1
P0	4.0 ± 0.1
P	8.0 ± 0.1
P2	2.0 ± 0.1
D	1.5 ± 0.1
A0	4.4 ± 0.1
B0	4.4 ± 0.1
K0	2.0 ± 0.1
t	0.35 ± 0.1

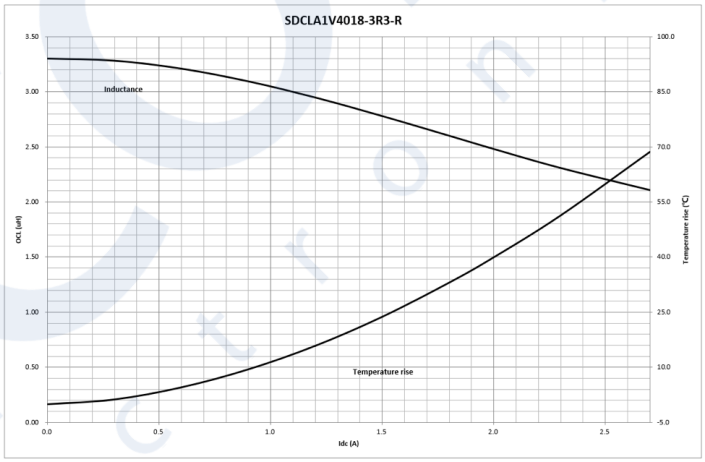
Inductance and temperature rise vs current

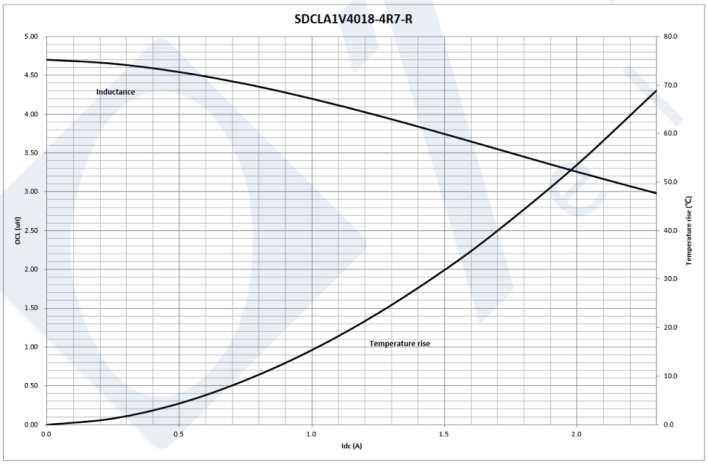
SDCLA1V4018

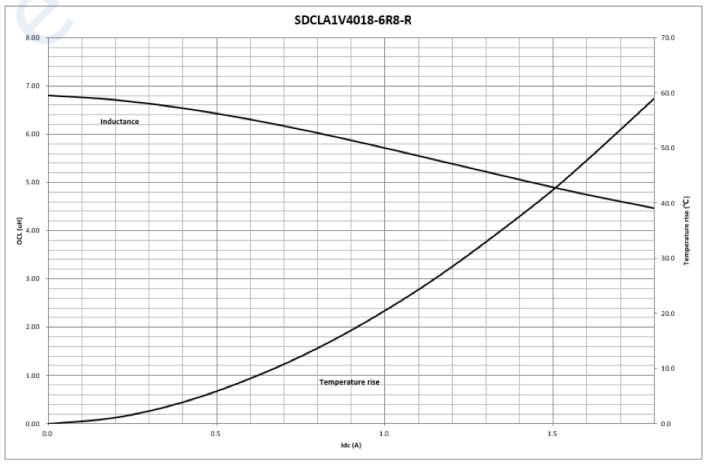




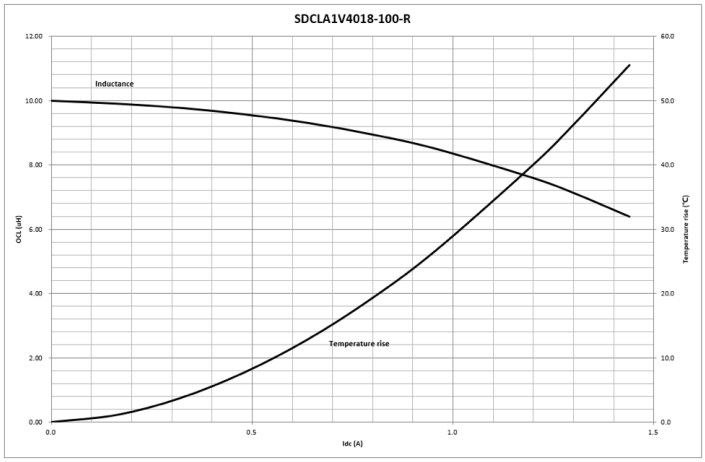


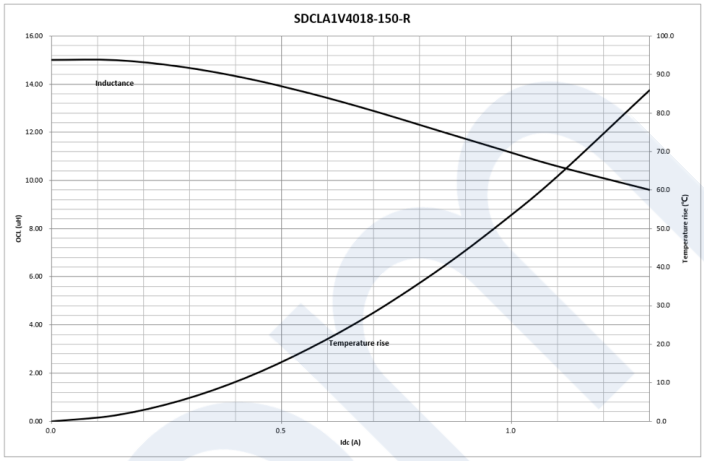


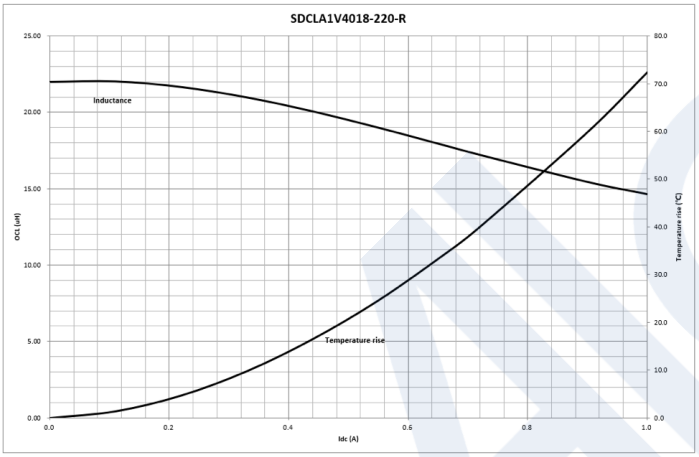




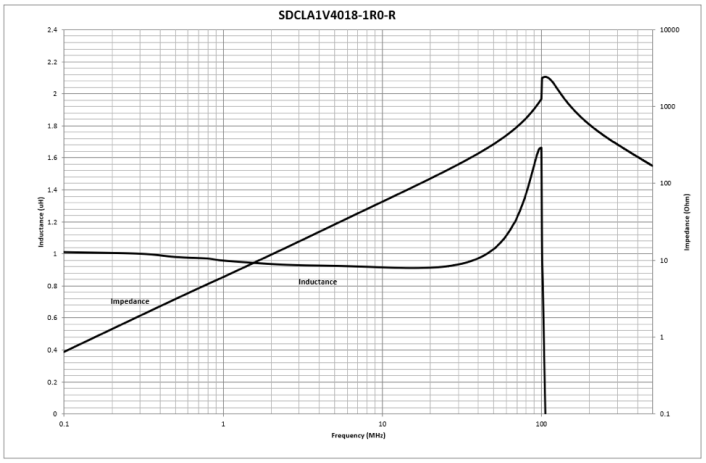
Inductance and temperature rise vs current

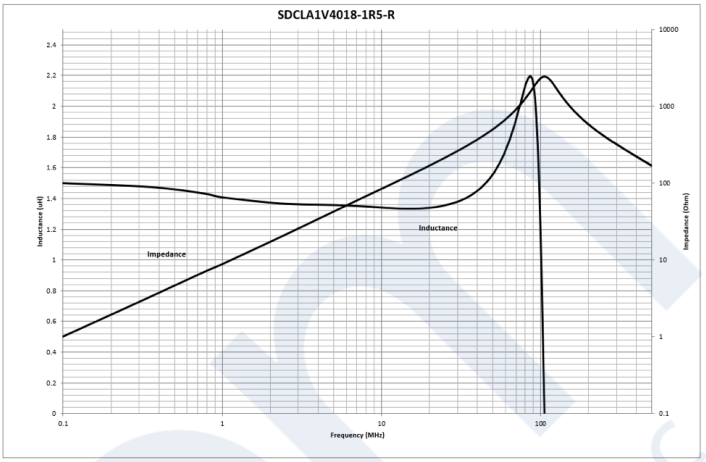


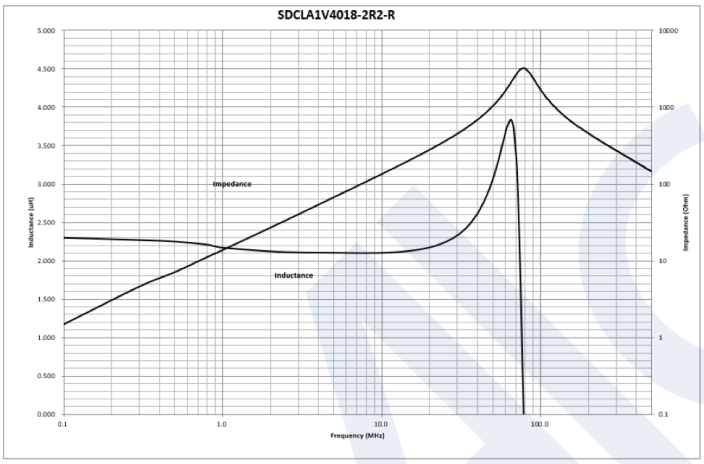


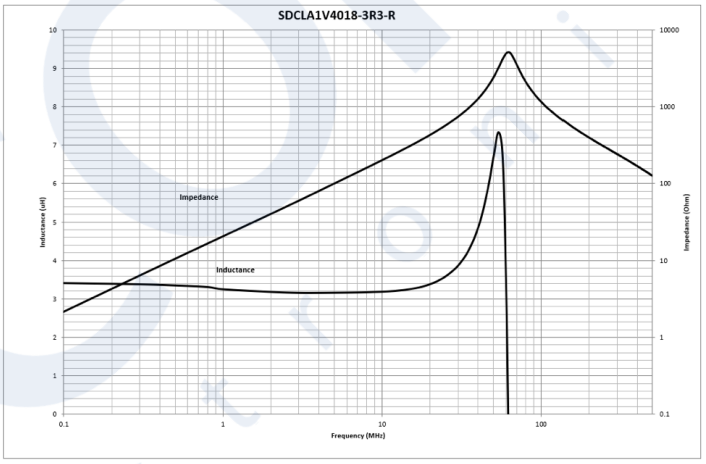


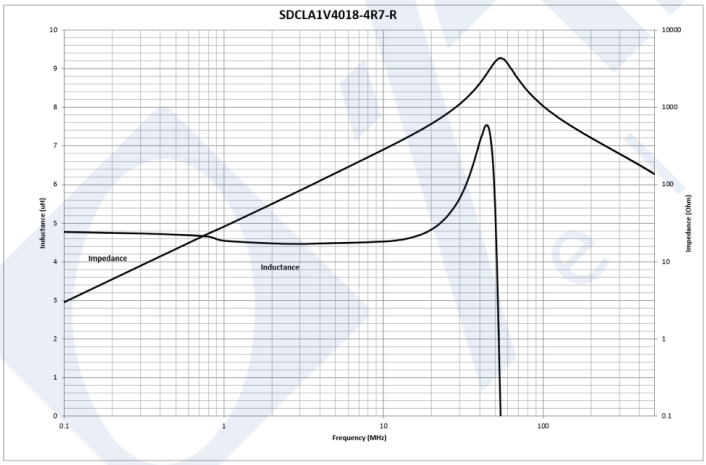
Inductance and impedance vs. frequency curve

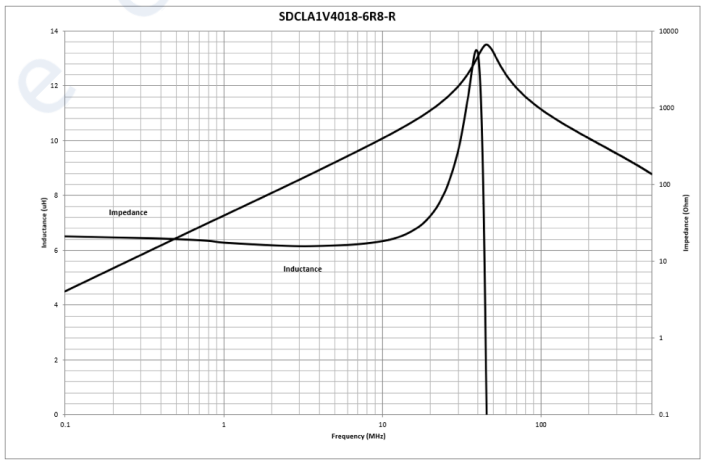


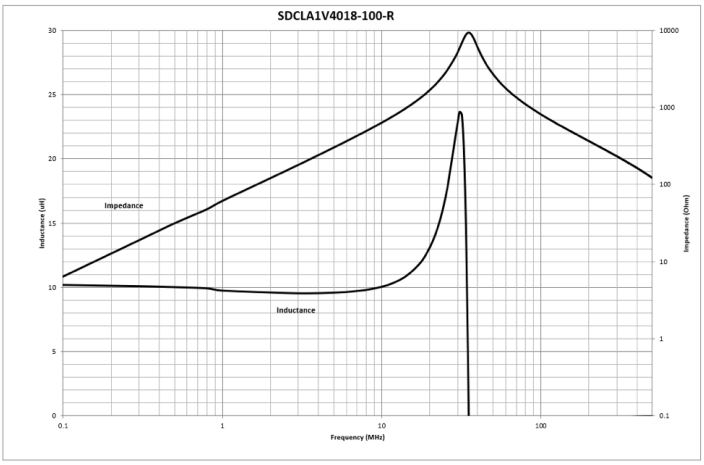


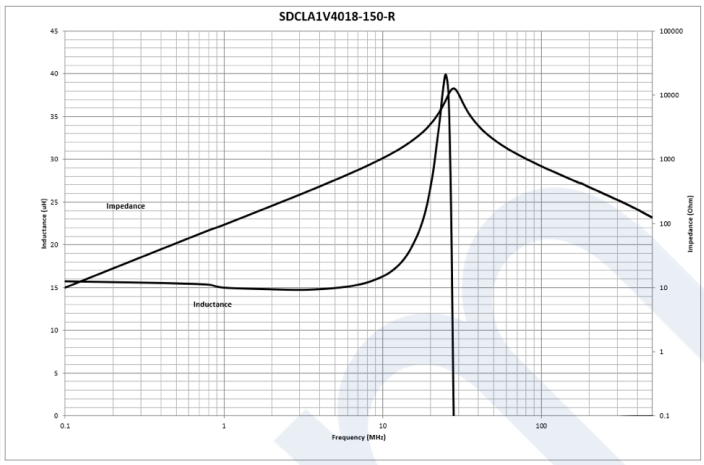


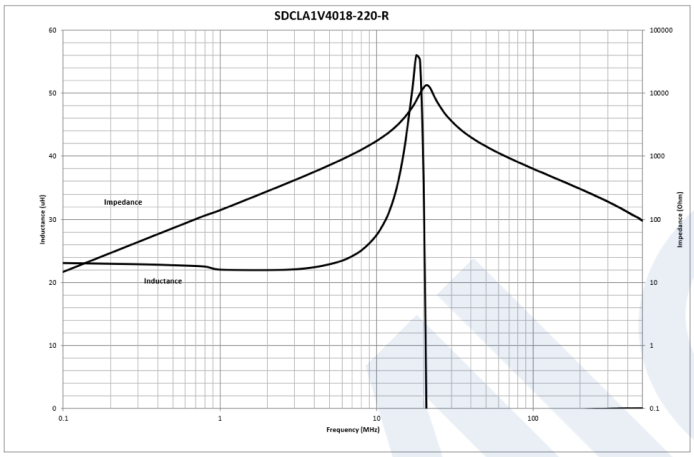







SDCLA1V4018-100-R
Impedance
Inductance
Inductance (uH)
Impedance (Ohm)
Frequency (MHz)


SDCLA1V4018-150-R
Impedance
Inductance
Inductance (uH)
Impedance (Ohm)
Frequency (MHz)


SDCLA1V4018-220-R
Impedance
Inductance
Inductance (uH)
Impedance (Ohm)
Frequency (MHz)

Solder reflow profile

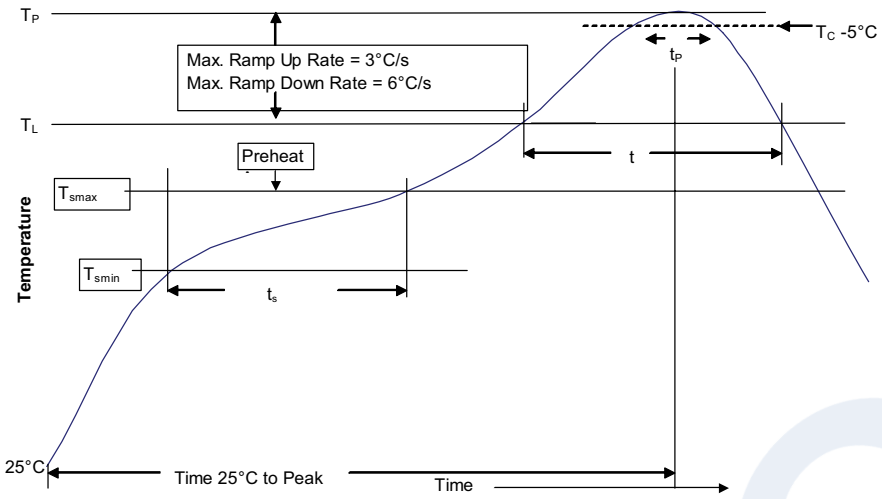


Table 1 - Standard SnPb solder (T_C)

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.

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