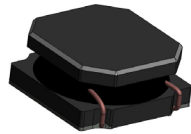


# SDCH1V50

## Semi-shielded power inductors



### Product features

- High current carrying capacity
- High power density, low core losses
- Magnetically semi-shielded
- 5.2 mm x 5.2 mm surface mount package in 2.0 mm and 4.1 mm heights
- NiZn ferrite magnetic material
- Moisture sensitivity level (MSL): 1

### Applications

- DC-DC converters
- Switching controllers
- Industrial IoT equipment
- Game consoles
- Portable electronics
- Laptops, notebooks, and netbooks
- Desktops and workstations
- Battery backup
- LED lighting
- HD televisions and displays

### Environmental compliance and general specifications

- Storage temperature range (component): -40 °C to +125 °C
- Operating temperature range: -40 °C to +125 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant



Product specifications

Part number <sup>5</sup>	OCL <sup>1</sup> ( $\mu$ H)	FLL <sup>2</sup> ( $\mu$ H) minimum	$I_{rms}^3$ (A)	$I_{sat}^4$ (A)	DCR (m $\Omega$ ) @ +20 °C nominal	DCR (m $\Omega$ ) @ +20 °C maximum
<b>SDCH1V5020</b>						
SDCH1V5020-1R0N-R	1.0 $\pm$ 30%	0.46	4.2	4.33	23	26
SDCH1V5020-1R5N-R	1.5 $\pm$ 30%	0.68	3.6	4.2	27	31
SDCH1V5020-2R2M-R	2.2 $\pm$ 20%	1.14	3.0	3.8	39	45
SDCH1V5020-3R3M-R	3.3 $\pm$ 20%	1.72	2.5	3.2	50	58
SDCH1V5020-4R7M-R	4.7 $\pm$ 20%	2.44	2.2	2.6	68	78
SDCH1V5020-6R8M-R	6.8 $\pm$ 20%	3.54	1.9	2.2	85	98
SDCH1V5020-100M-R	10 $\pm$ 20%	5.2	1.5	1.6	124	143
SDCH1V5020-150M-R	15 $\pm$ 20%	7.8	1.3	1.5	180	207
SDCH1V5020-220M-R	22 $\pm$ 20%	11.44	1.05	1.15	280	322
SDCH1V5020-330M-R	33 $\pm$ 20%	17.16	0.9	1.0	390	449
SDCH1V5020-470M-R	47 $\pm$ 20%	24.44	0.75	0.82	530	610
SDCH1V5020-680M-R	68 $\pm$ 20%	35.36	0.55	0.59	630	725
SDCH1V5020-101M-R	100 $\pm$ 20%	52.0	0.5	0.55	1110	1277
SDCH1V5020-221M-R	220 $\pm$ 20%	114.4	0.3	0.36	2400	2760
SDCH1V5020-331M-R	330 $\pm$ 20%	171.6	0.25	0.27	3200	3680
SDCH1V5020-471M-R	470 $\pm$ 20%	244.4	0.21	0.26	6400	7360
SDCH1V5020-681M-R	680 $\pm$ 20%	353.6	0.16	0.2	9800	11270
<b>SDCH1V5040</b>						
SDCH1V5040-1R0N-R	1.0 $\pm$ 30%	0.46	4.7	8.0	14	18
SDCH1V5040-1R5N-R	1.5 $\pm$ 30%	0.68	4.5	5.3	20	24
SDCH1V5040-2R2M-R	2.2 $\pm$ 20%	1.14	4.2	4.9	22	25
SDCH1V5040-3R3M-R	3.3 $\pm$ 20%	1.72	4.0	4.2	28	32
SDCH1V5040-4R7M-R	4.7 $\pm$ 20%	2.44	3.1	3.5	34	39
SDCH1V5040-6R8M-R	6.8 $\pm$ 20%	3.54	2.8	2.9	46	53
SDCH1V5040-100M-R	10 $\pm$ 20%	5.2	2.2	2.3	63	72
SDCH1V5040-150M-R	15 $\pm$ 20%	7.8	1.8	2	95	109
SDCH1V5040-220M-R	22 $\pm$ 20%	11.44	1.4	1.6	140	161
SDCH1V5040-330M-R	33 $\pm$ 20%	17.16	1.2	1.3	190	219
SDCH1V5040-470M-R	47 $\pm$ 20%	24.44	1.0	1.1	310	357
SDCH1V5040-680M-R	68 $\pm$ 20%	35.36	0.75	0.85	440	506
SDCH1V5040-101M-R	100 $\pm$ 20%	52.0	0.65	0.75	550	633
SDCH1V5040-221M-R	220 $\pm$ 20%	114.4	0.42	0.48	1750	2013
SDCH1V5040-331M-R	330 $\pm$ 20%	171.6	0.35	0.4	2200	2530
SDCH1V5040-471M-R	470 $\pm$ 20%	244.4	0.3	0.33	2750	3163
SDCH1V5040-681M-R	680 $\pm$ 20%	353.6	0.23	0.28	4850	5578

1. Open circuit inductance (OCL) test parameters: 100 kHz, 0.25 Vrms, 0.0 Adc, +25 °C

2. Full load inductance (FLL) test parameters: 100 kHz, 0.25 Vrms,  $I_{sat}$ , +25 °C

3.  $I_{max}$ : 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 35% maximum rolloff @ +25 °C

5. Part number definition: SDCH1Vxxx-yyyz-R

SDCH1V = Product code

xxx= size code

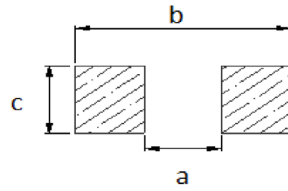
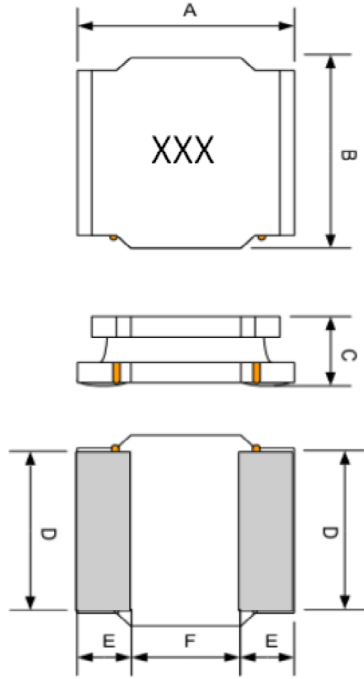
yyy= Inductance value in  $\mu$ H, R=decimal point

z= Inductance tolerance

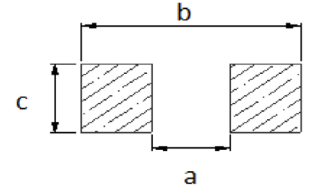
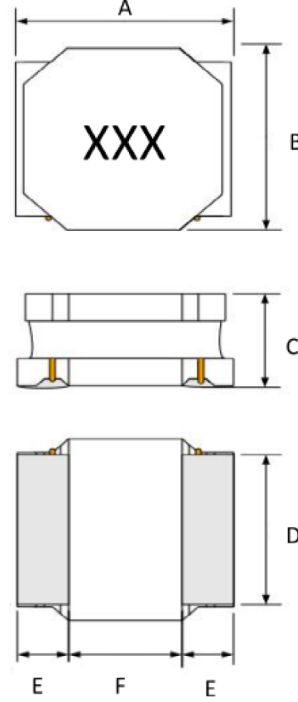
-R suffix = RoHS compliant

Dimensions-mm

SDCH1V5020



SDCH1V5040



Dimension	Value
A	5.0 ± 0.2
B	5.0 ± 0.2
C	2.0 MAX
D	4.0 ± 0.2
E	1.35 ± 0.3
F	2.3 ± 0.3
a	2.0 TYP
b	5.3 TYP
c	4.3 TYP

Dimension	Value
A	5.0 ± 0.2
B	5.0 ± 0.2
C	4.1 MAX
D	4.0 ± 0.2
E	1.5 ± 0.3
F	2.0 ± 0.3
a	1.7 TYP
b	5.3 TYP
c	4.3 TYP

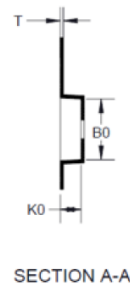
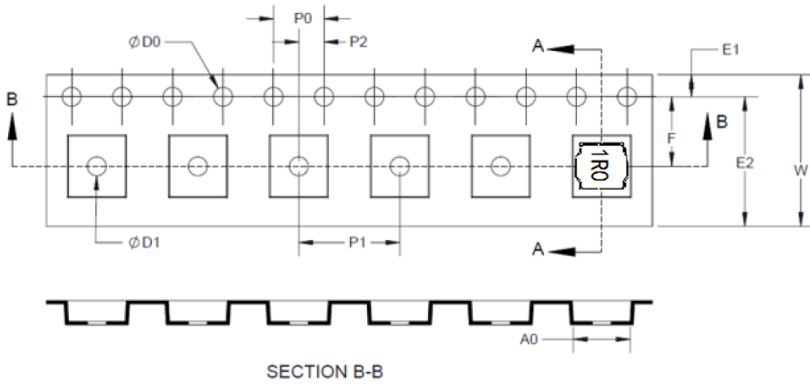
Part marking: xxx= inductance value in uH, R= decimal point. If no R is present then last character equals number of zeros.  
Tolerances are ±0.3 millimeters unless stated otherwise  
All soldering surfaces to be coplanar within 0.1 millimeters  
Pad layout tolerances are ±0.1 millimeters unless stated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

**Packaging information- mm**

**SDCH1V5020**

Supplied in tape and reel packaging, 2500 parts per 13" diameter reel (EIA-481 compliant)

Drawing not to scale



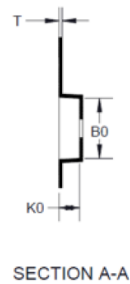
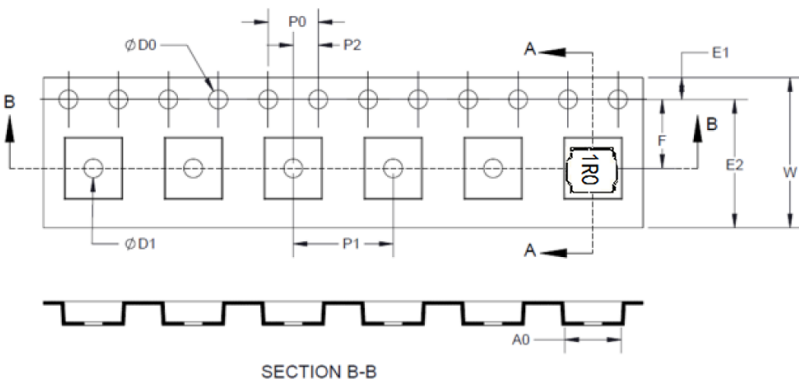
Dimension	Value
W	12.00 ± 0.30
F	5.50 ± 0.10
E1	1.75 ± 0.10
E2	N/A
P0	4.00 ± 0.10
P1	8.00 ± 0.10
P2	2.00 ± 0.10
ØD0	1.50 + 0.10/-0
ØD1	N/A
A0	5.3 ± 0.1
B0	5.3 ± 0.1
K0	2.3 ± 0.1
T	0.35 ± 0.05

**Packaging information- mm**

**SDCH1V5040**

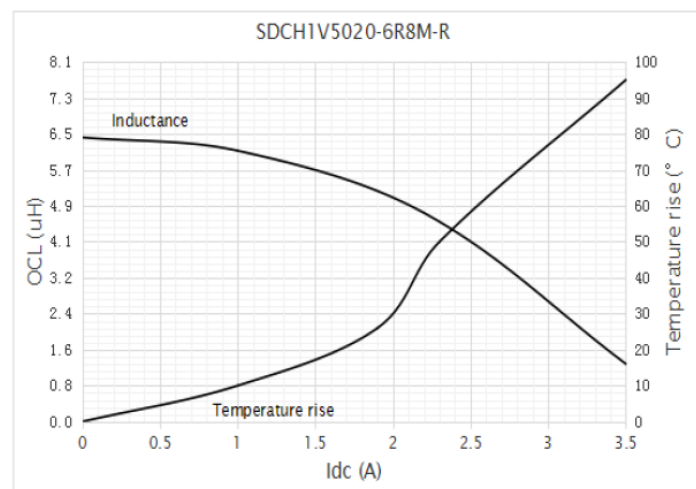
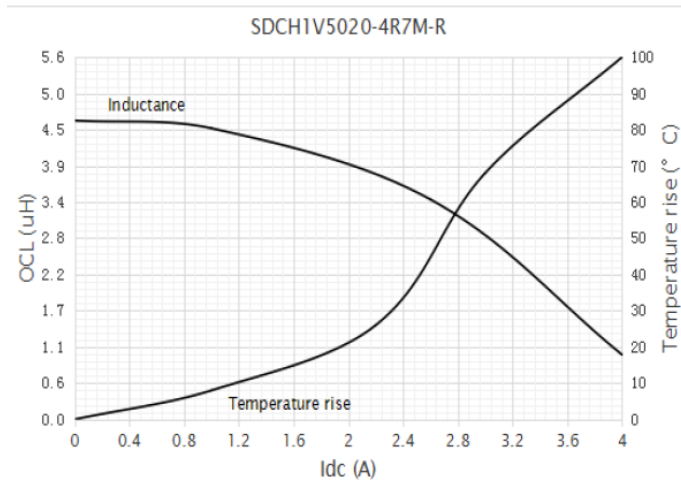
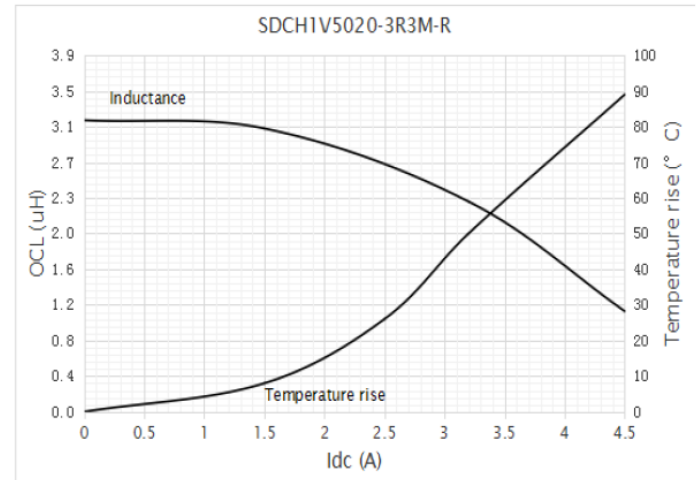
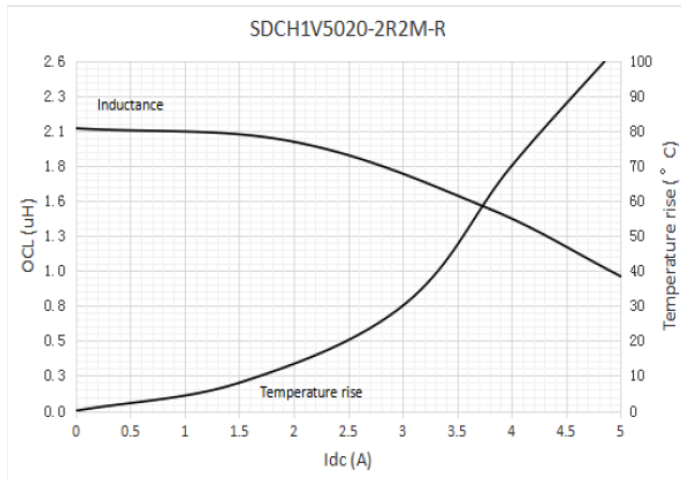
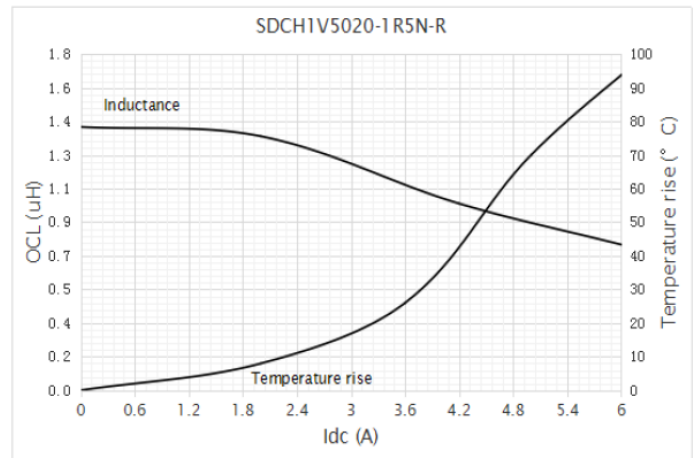
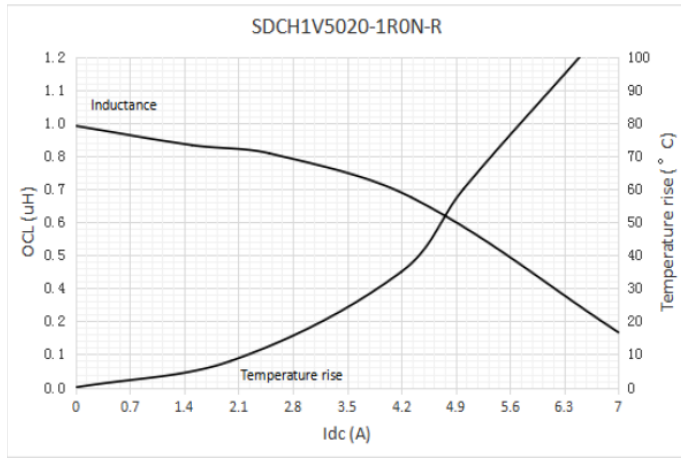
Supplied in tape and reel packaging, 1500 parts per 13" diameter reel (EIA-481 compliant)

Drawing not to scale

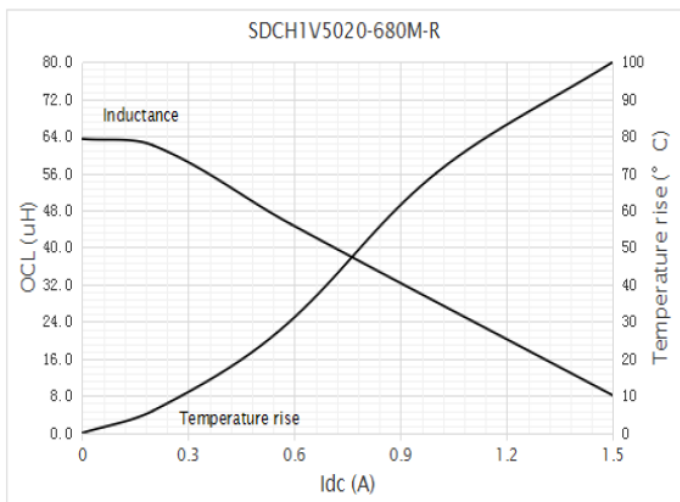
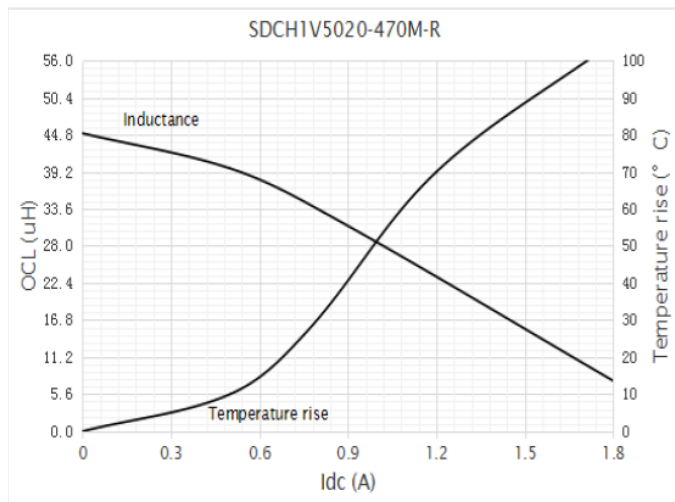
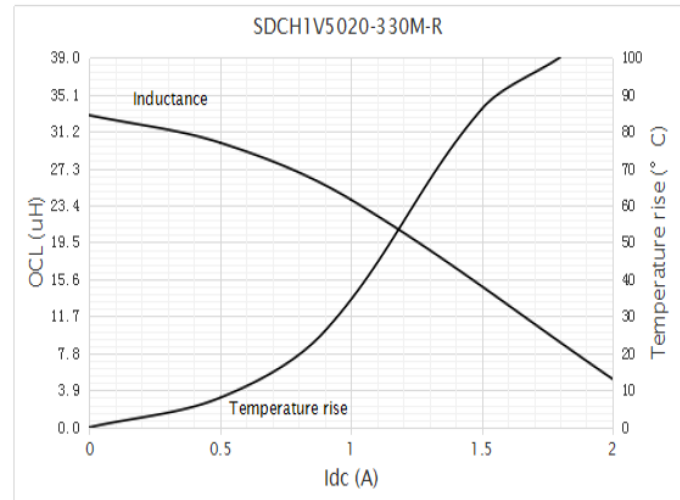
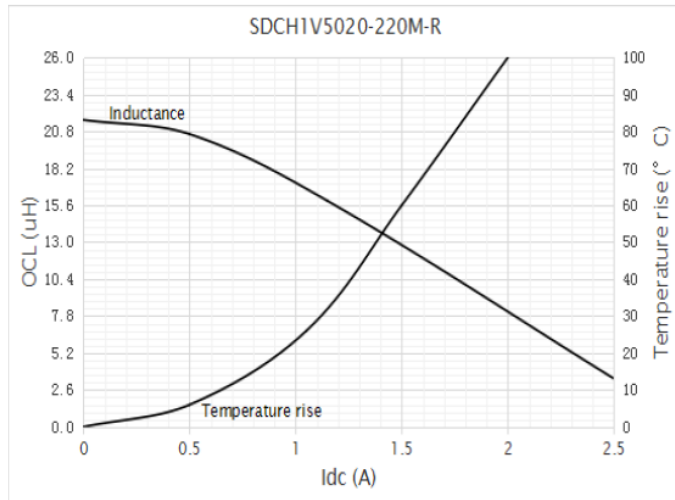
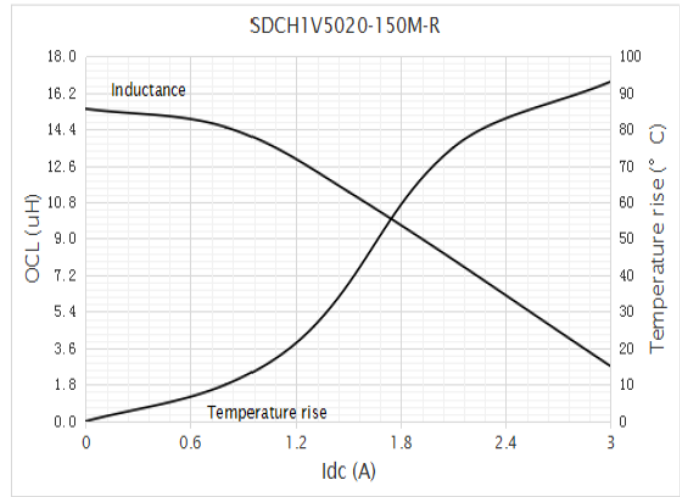
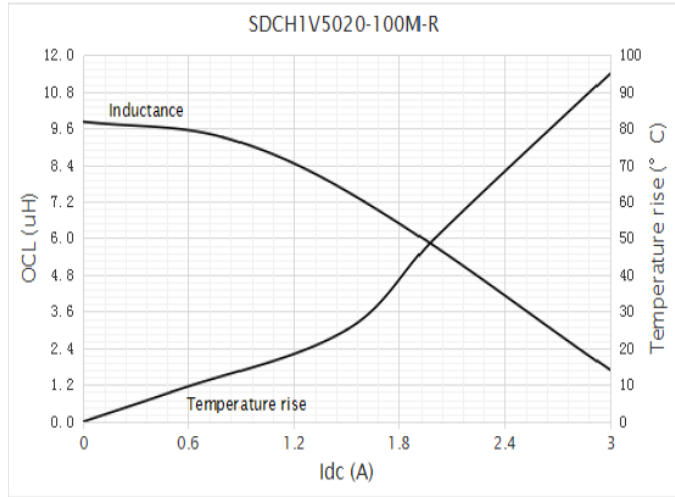


Dimension	Value
W	12.00 ± 0.30
F	5.50 ± 0.10
E1	1.75 ± 0.10
E2	N/A
P0	4.00 ± 0.10
P1	8.00 ± 0.10
P2	2.00 ± 0.10
ØD0	1.50 + 0.10/-0
ØD1	N/A
A0	5.30 ± 0.10
B0	5.30 ± 0.10
K0	4.30 ± 0.10
T	0.40 ± 0.05

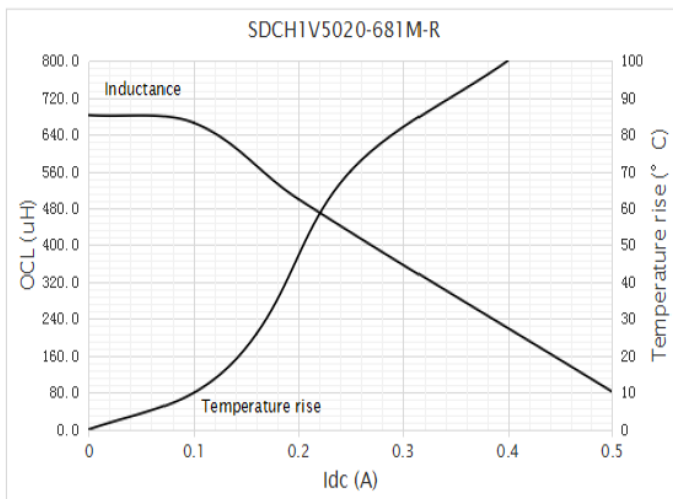
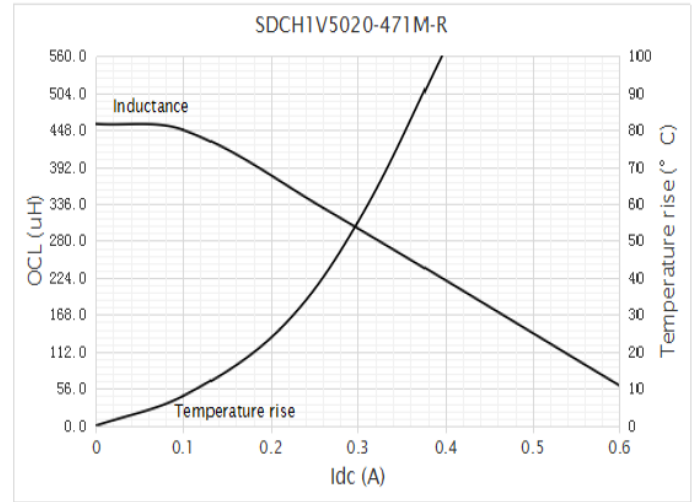
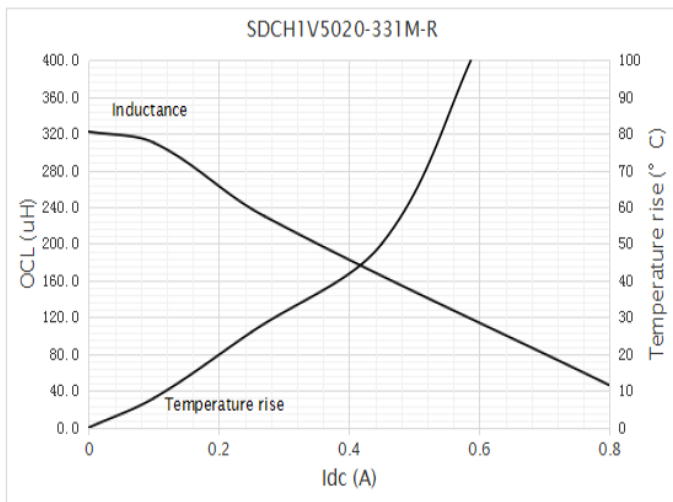
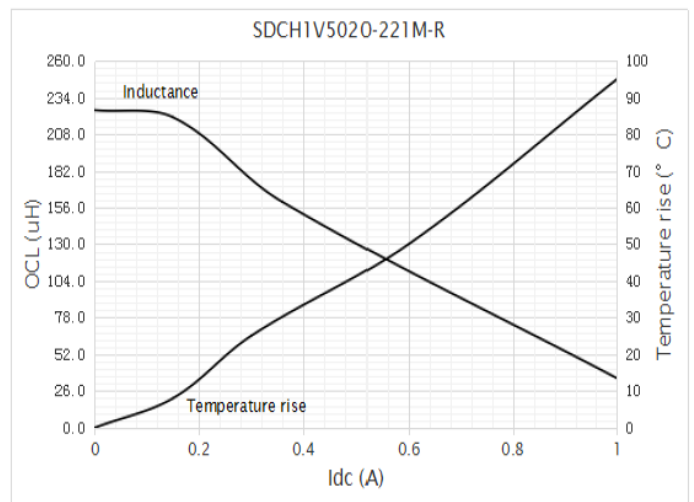
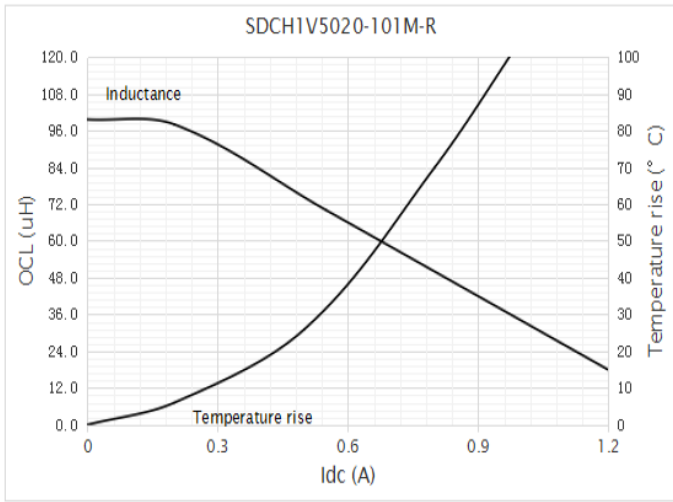
**Inductance and temperature rise vs current**  
**SDCH1V5020**



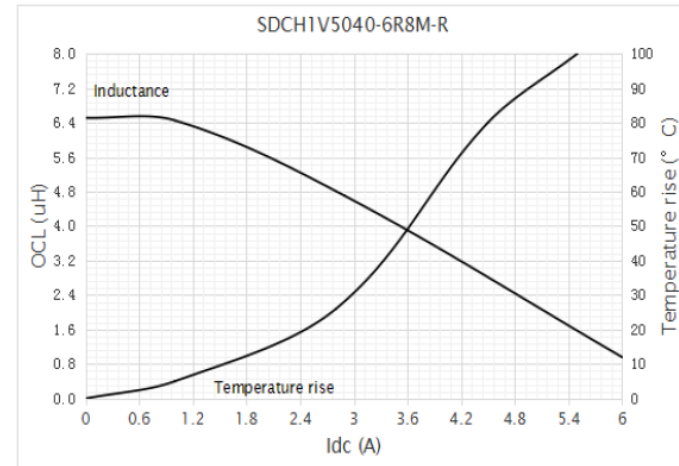
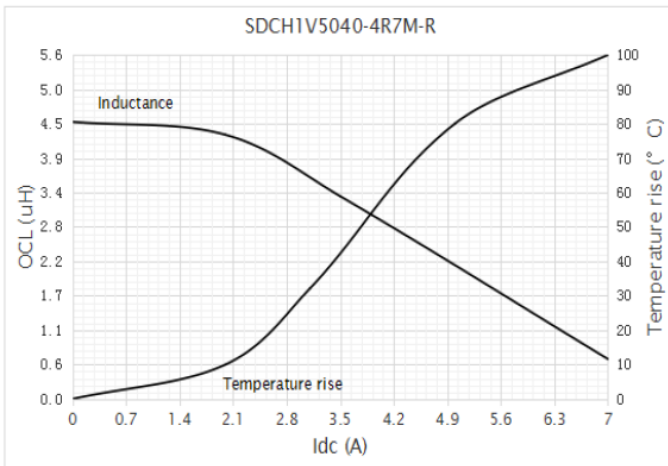
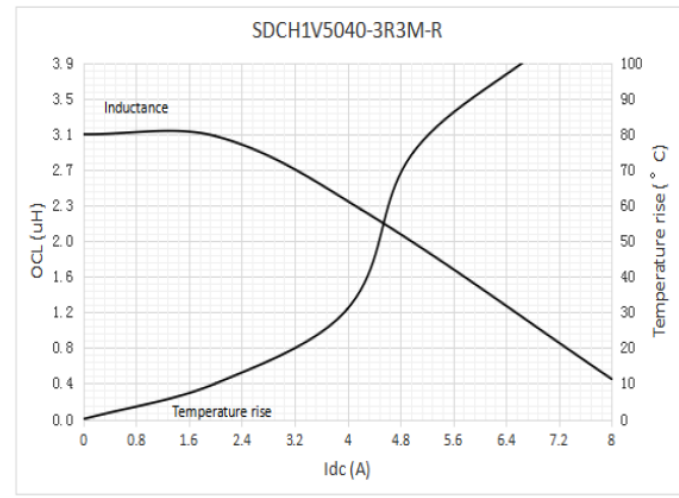
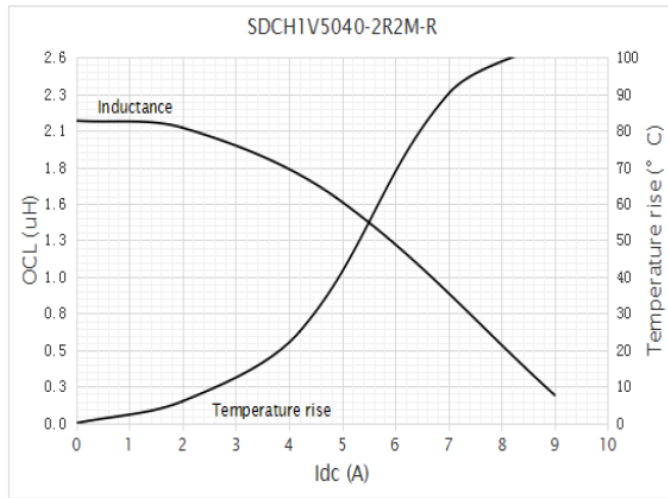
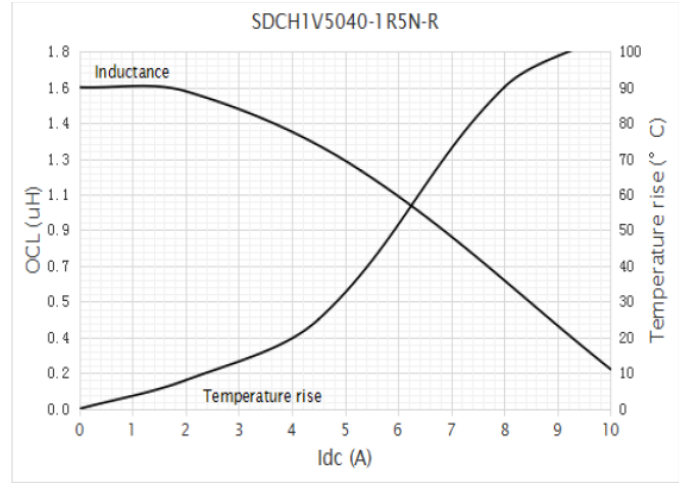
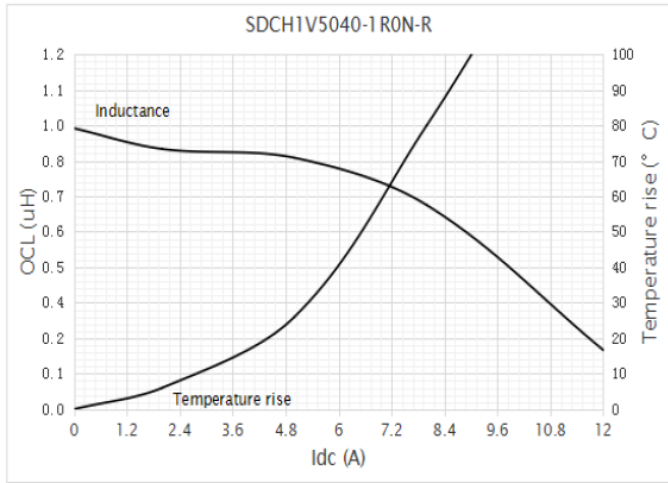
**Inductance and temperature rise vs current**  
**SDCH1V5020**



**Inductance and temperature rise vs current**  
**SDCH1V5020**

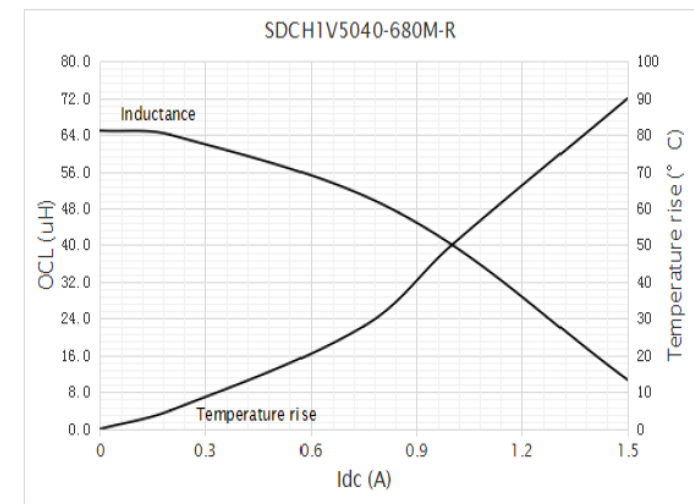
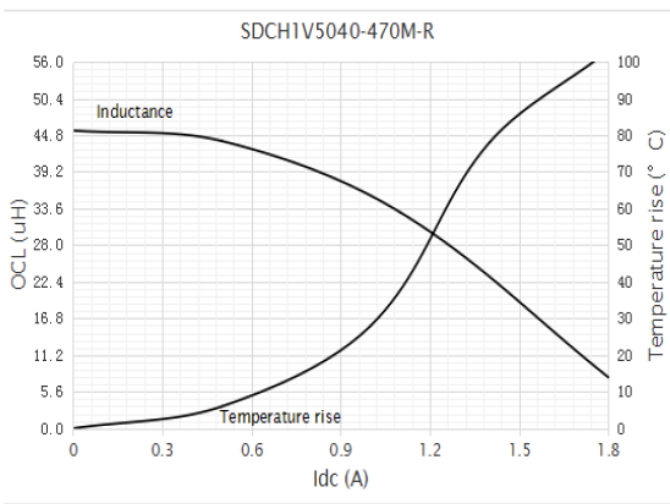
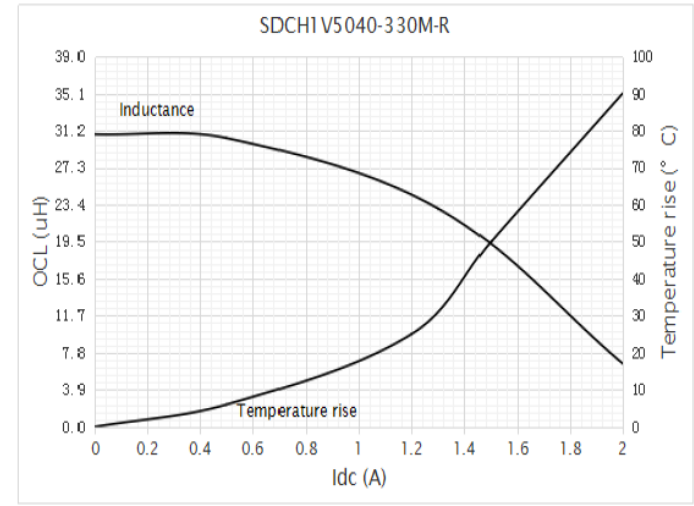
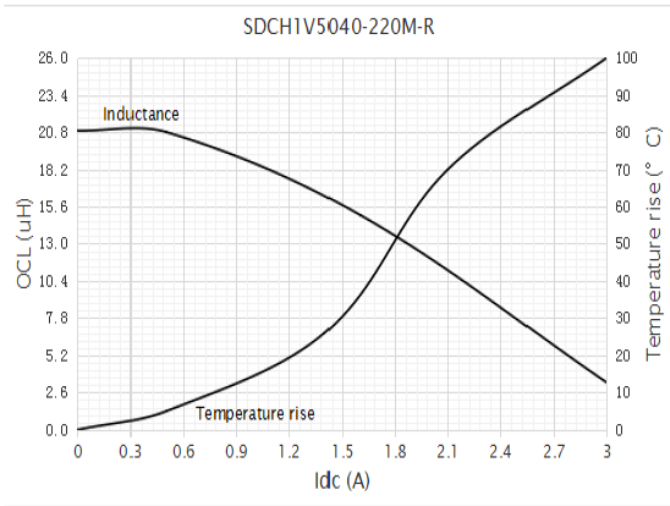
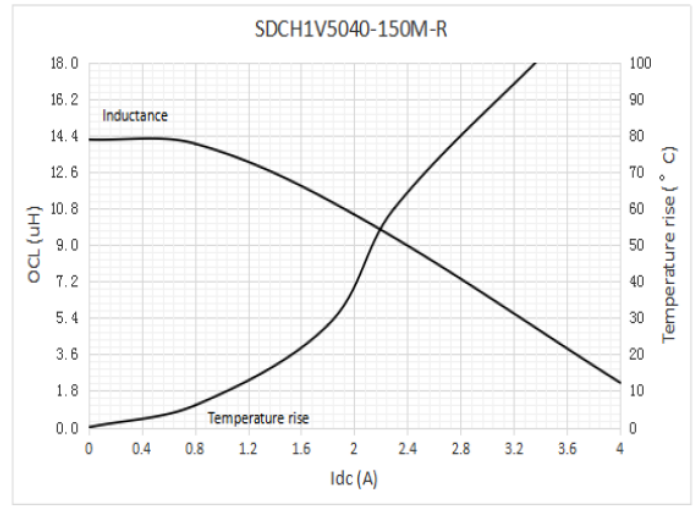
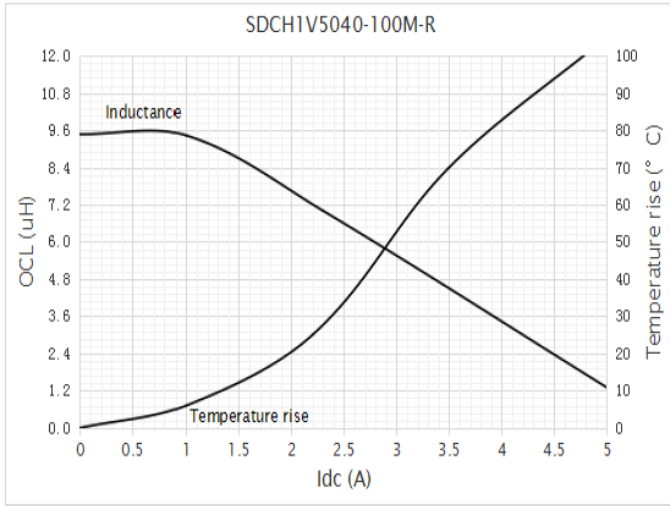


**Inductance and temperature rise vs current**  
**SDCH1V5040**

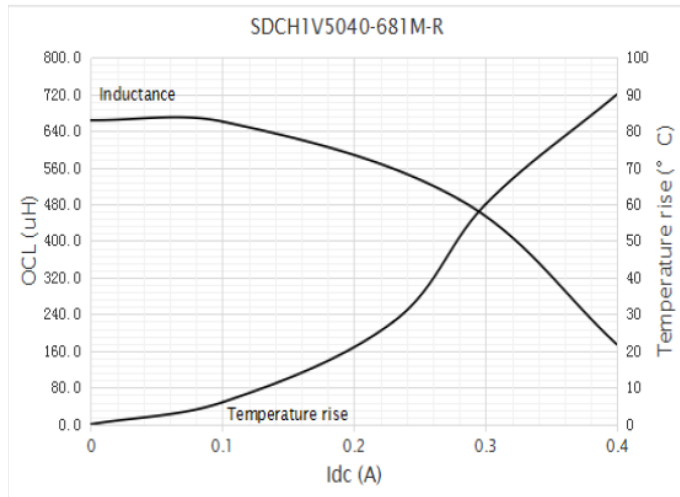
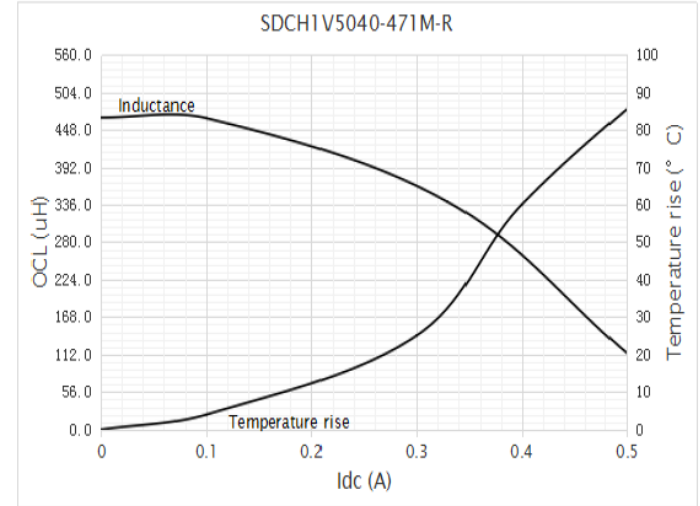
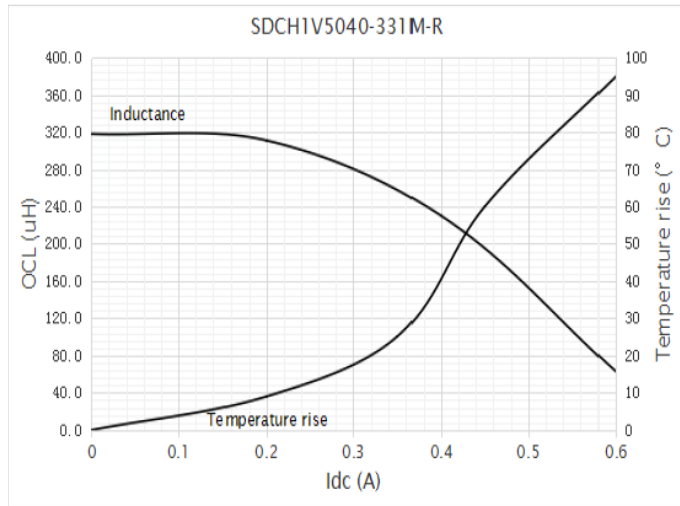
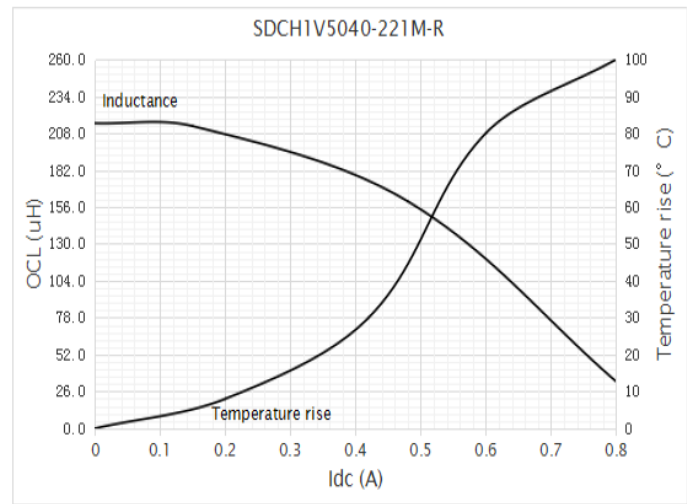
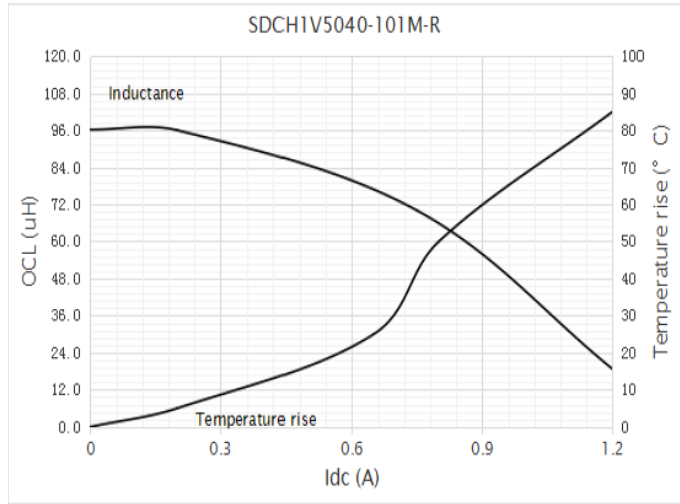




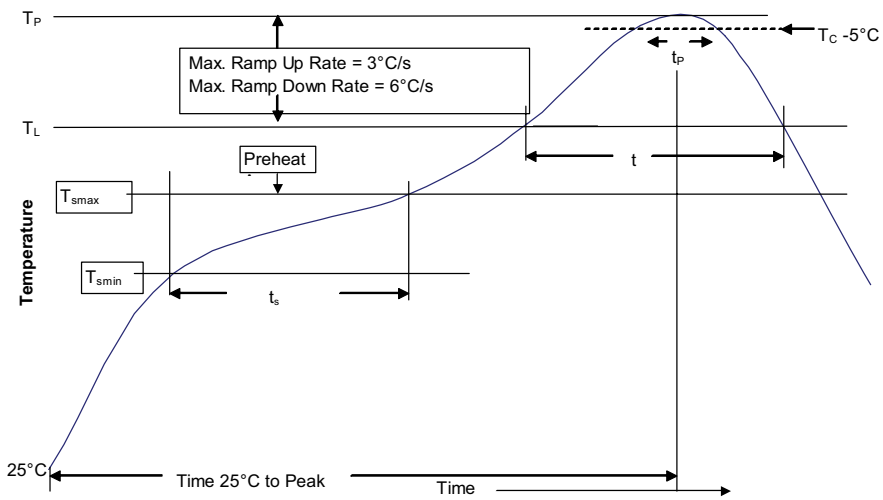
**Inductance and temperature rise vs current**  
**SDCH1V5040**



**Inductance and temperature rise vs current**  
**SDCH1V5040**



**Solder reflow profile**



**Table 1 - Standard SnPb solder (T<sub>C</sub>)**

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

**Table 2 - Lead (Pb) free solder (T<sub>C</sub>)**

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >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 <sub>smin</sub> )	100 °C	150 °C
• Temperature max. (T <sub>smax</sub> )	150 °C	200 °C
• Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )	60-120 seconds	60-120 seconds
Ramp up rate T <sub>L</sub> to T <sub>p</sub>	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T <sub>L</sub> )	183 °C	217 °C
Time (t <sub>L</sub> ) maintained above T <sub>L</sub>	60-150 seconds	60-150 seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )* within 5 °C of the specified classification temperature (T <sub>C</sub> )	20 seconds*	30 seconds*
Ramp-down rate (T <sub>p</sub> to T <sub>L</sub> )	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<sub>p</sub>) is defined as a supplier minimum and a user maximum.

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