

# SDCL1V40

## Semi-shielded power inductors



### Product features

- High current carrying capacity
- High power density, low core losses
- Magnetically semi-shielded
- 4.2 mm x 4.2 mm surface mount package in 1.85 mm, 2.0 mm and 3.0 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

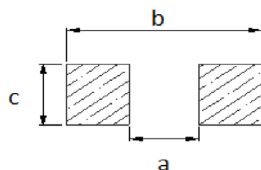
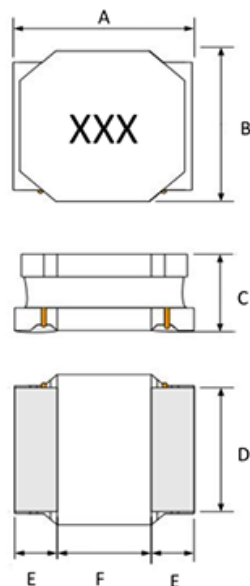
Part number <sup>5</sup>	OCL <sup>1</sup> (µH)	FLL <sup>2</sup> (µH) minimum	I <sub>DC</sub> <sup>3</sup> (A)	I <sub>pk</sub> <sup>4</sup> (A)	DCR (mΩ) @ +20 °C nominal	DCR (mΩ) @ +20 °C maximum
<b>SDCL1V4018</b>						
SDCL1V4018-1R0N-R	1.0±30%	0.46	3.3	4.5	26	30
SDCL1V4018-1R5N-R	1.5±30%	0.68	3.0	3.3	39	46
SDCL1V4018-2R2M-R	2.2±20%	1.14	2.5	3.0	47	54
SDCL1V4018-3R3M-R	3.3±20%	1.72	2.0	2.15	70	81
SDCL1V4018-4R7M-R	4.7±20%	2.44	1.75	2	88	102
SDCL1V4018-6R8M-R	6.8±20%	3.54	1.5	1.6	110	126
SDCL1V4018-100M-R	10±20%	5.2	1.3	1.4	170	196
SDCL1V4018-150M-R	15±20%	7.8	0.9	0.95	270	311
SDCL1V4018-220M-R	22±20%	11.44	0.75	0.8	365	420
SDCL1V4018-330M-R	33±20%	17.16	0.7	0.73	550	633
SDCL1V4018-470M-R	47±20%	24.44	0.55	0.65	780	898
SDCL1V4018-680M-R	68±20%	35.36	0.5	0.55	1000	1150
SDCL1V4018-101M-R	100±20%	52	0.35	0.42	1500	1725
SDCL1V4018-221M-R	220±20%	114.4	0.25	0.3	4200	4830
<b>SDCL1V4020</b>						
SDCL1V4020-R47N-R	0.47±30%	0.21	7.0	10	15	20
SDCL1V4020-1R0M-R	1.0±20%	0.52	5.8	8.7	22	26
SDCL1V4020-1R5M-R	1.5±20%	0.78	4.5	7.7	32	36
SDCL1V4020-2R2M-R	2.2±20%	1.14	4.2	6.1	44	48
SDCL1V4020-3R3M-R	3.3±20%	1.72	3.5	4.7	65	72
SDCL1V4020-4R7M-R	4.7±20%	2.44	2.5	4.0	95	108
SDCL1V4020-6R8M-R	6.8±20%	3.54	2.1	3.0	135	156
SDCL1V4020-100M-R	10±20%	5.2	1.7	2.8	195	216
<b>SDCL1V4030</b>						
SDCL1V4030-R68N-R	0.68±30%	0.31	4.3	8	11	15
SDCL1V4030-1R0N-R	1.0±30%	0.46	3.8	5.9	20	24
SDCL1V4030-1R5N-R	1.5±30%	0.68	3.3	5.8	28	33
SDCL1V4030-2R2M-R	2.2±20%	1.14	2.8	5	34	39
SDCL1V4030-3R3M-R	3.3±20%	1.72	2.4	3.9	45	52
SDCL1V4030-4R7M-R	4.7±20%	2.44	1.9	3.2	67	77
SDCL1V4030-6R8M-R	6.8±20%	3.54	1.6	2.8	100	115
SDCL1V4030-100M-R	10±20%	5.2	1.5	2.2	120	138
SDCL1V4030-150M-R	15±20%	7.8	1.2	1.85	180	207
SDCL1V4030-220M-R	22±20%	11.44	1.0	1.55	265	305
SDCL1V4030-330M-R	33±20%	17.16	0.8	1.0	400	460
SDCL1V4030-470M-R	47±20%	24.44	0.72	0.95	500	575
SDCL1V4030-680M-R	68±20%	35.36	0.5	0.85	980	1127
SDCL1V4030-101M-R	100±20%	52	0.4	0.6	1300	1495
SDCL1V4030-221M-R	220±20%	114.4	0.3	0.4	2600	2990
SDCL1V4030-331M-R	330±20%	171.6	0.25	0.38	4400	5060
SDCL1V4030-471M-R	470±20%	244.4	0.17	0.32	7200	8300

1. Open circuit inductance (OCL) test parameters: 100 kHz, 0.25 Vrms, 0.0 Adc, +25 °C (SDCL1V4020 1.0 MHz, 1.0 Vrms)  
 2. Full load inductance (FLL) test parameters: 100 kHz, 0.25 Vrms, Isat, +25 °C (SDCL1V4020 100 kHz, 1.0 Vrms)  
 3. I<sub>DC</sub>: 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<sub>pk</sub>: Peak current for approximately 35% maximum rolloff @ +25 °C  
 5. Part number definition: SDCL1Vxxxx-yyyz-R  
 SDCL1V = Product code  
 xxxx= size code  
 yyy= Inductance value in µH, R=decimal point  
 z= Inductance tolerance  
 -R suffix = RoHS compliant

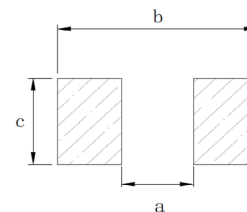
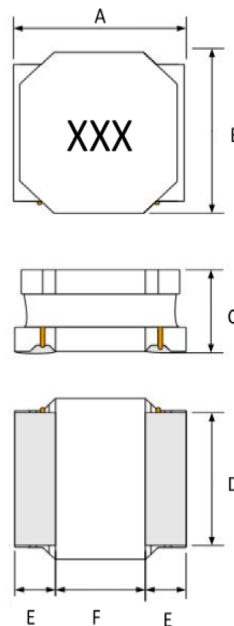
Dimensions-mm

SDCL1V4018



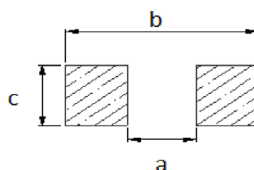
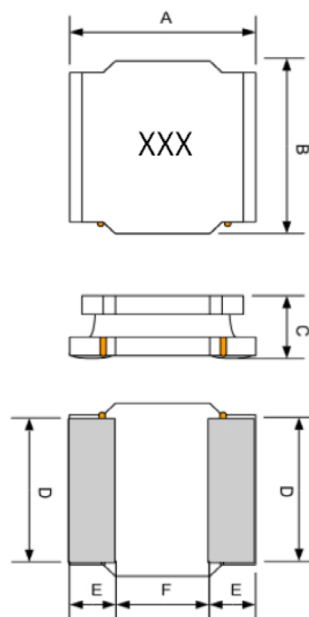
Dimension	Value
A	4.0 + 0.2
B	4.0 + 0.2
C	1.85 maximum
D	3.4 ± 0.2
E	1.2 ± 0.3
F	1.6 ± 0.3
a	1.3 TYP
b	4.3 TYP
c	3.7 TYP

SDCL1V4020



Dimension	Value
A	4.0 + 0.2
B	4.0 + 0.2
C	2.0 maximum
D	3.5 ± 0.2
E	1.0 ± 0.3
F	2.0 ± 0.3
a	1.7 TYP
b	4.3 TYP
c	3.8 TYP

SDCL1V4030



Dimension	Value
A	4.0 + 0.2
B	4.0 + 0.2
C	3.0 maximum
D	3.2 ± 0.2
E	0.95 ± 0.3
F	2.0 ± 0.3
a	1.7 TYP
b	4.3 TYP
c	3.5 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

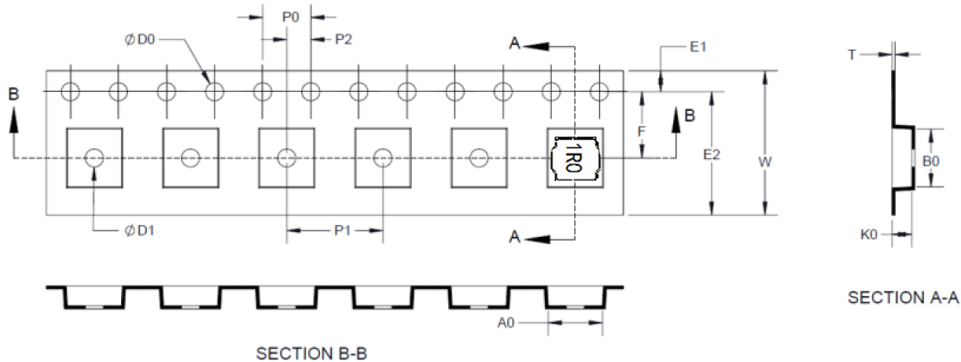
Traces or vias underneath the inductor is not recommended

**Packaging information- mm**

**SDCL1V4018**

Supplied in tape and reel packaging, 3000 parts per 13" diameter reel (EIA-481 compliant)

Drawing not to scale



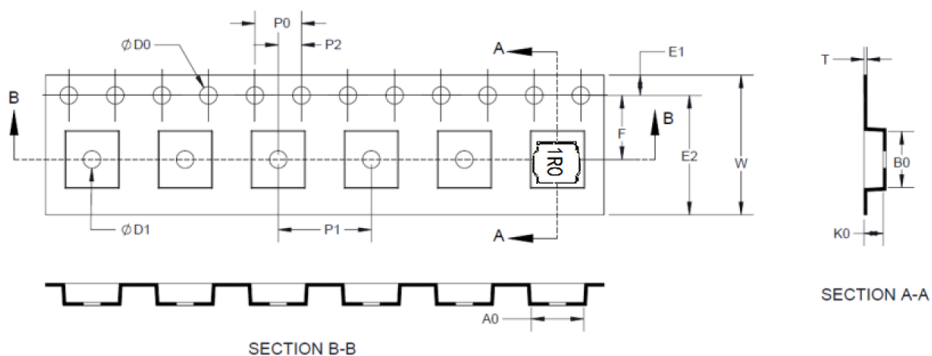
Dimension	Value
W	12.00 ± 0.30
F	5.50 ± 0.10
E1	1.75 ± 0.10
E2	N/A
P0	4.00 ± 0.10
P1	8.00 ± 0.10
P2	2.00 ± 0.10
ØD0	1.50 + 0.10/-0
ØD1	1.50 + 0.10/-0
A0	4.30 ± 0.10
B0	4.30 ± 0.10
K0	2.25 ± 0.10
T	0.30 ± 0.05

**Packaging information- mm**

**SDCL1V4020**

Supplied in tape and reel packaging, 3000 parts per 13" diameter reel (EIA-481 compliant)

Drawing not to scale



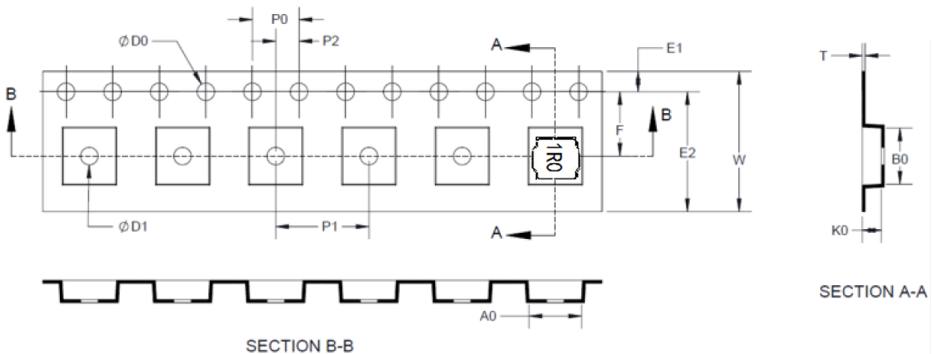
Dimension	Value
W	12.00 ± 0.30
F	5.50 ± 0.10
E1	1.75 ± 0.10
E2	N/A
P0	4.00 ± 0.10
P1	8.00 ± 0.10
P2	2.00 ± 0.10
ØD0	1.50 + 0.10/-0
ØD1	1.50 + 0.10/-0
A0	4.30 ± 0.10
B0	4.30 ± 0.10
K0	2.25 ± 0.10
T	0.30 ± 0.05

**Packaging information- mm**

**SDCL1V4030**

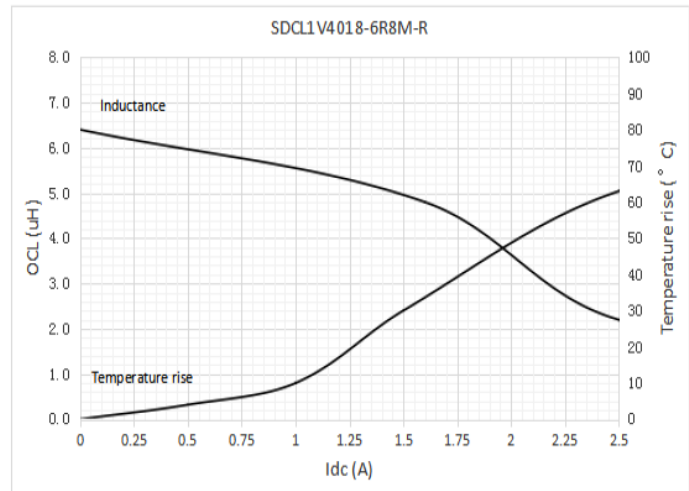
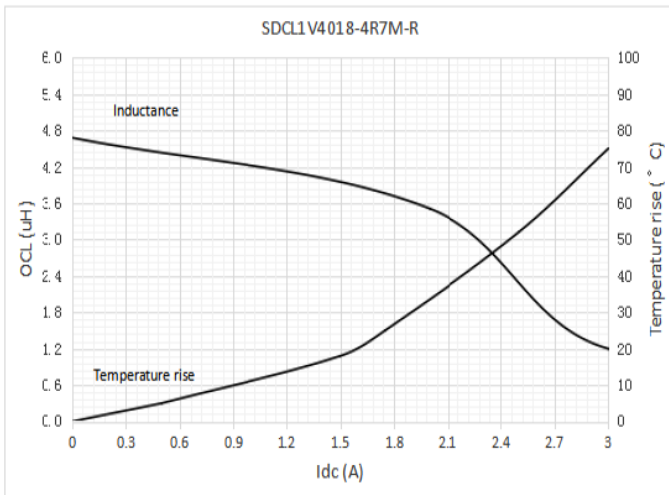
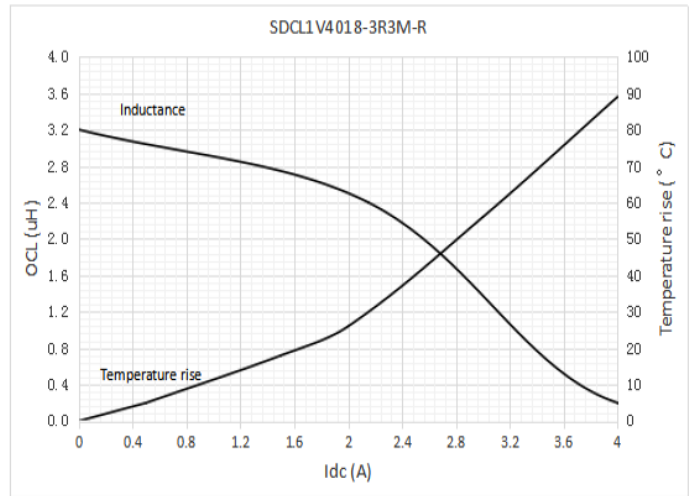
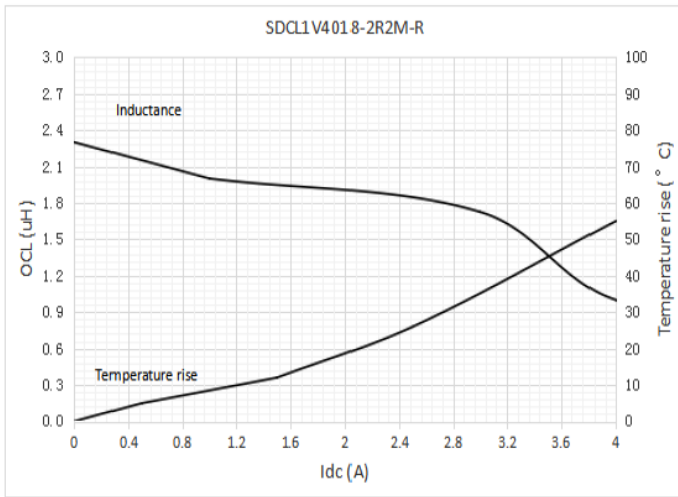
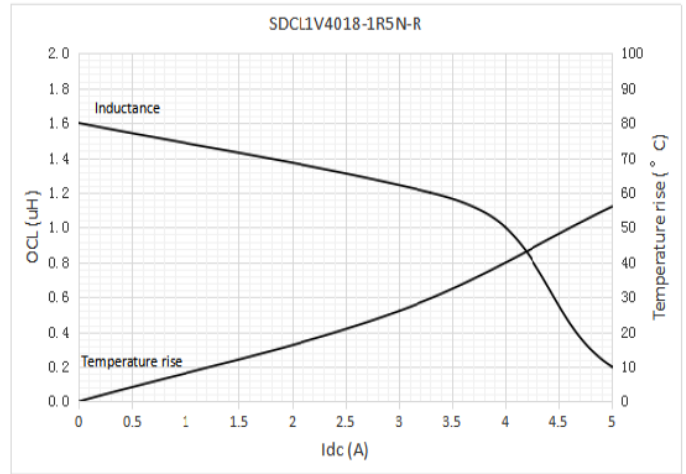
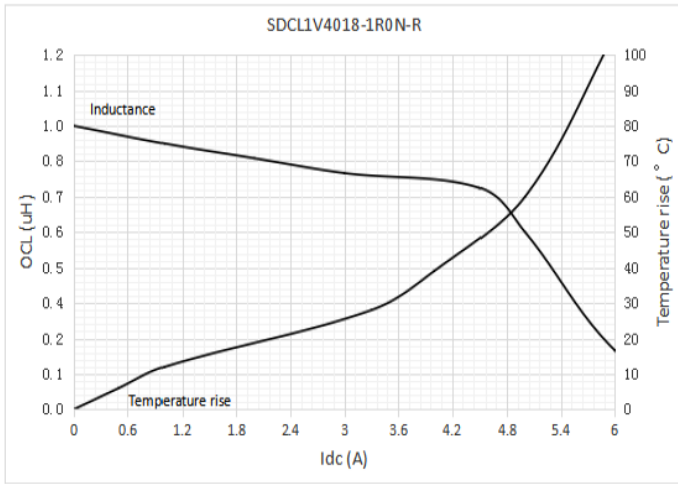
Supplied in tape and reel packaging, 2000 parts per 13" diameter reel (EIA-481 compliant)

Drawing not to scale



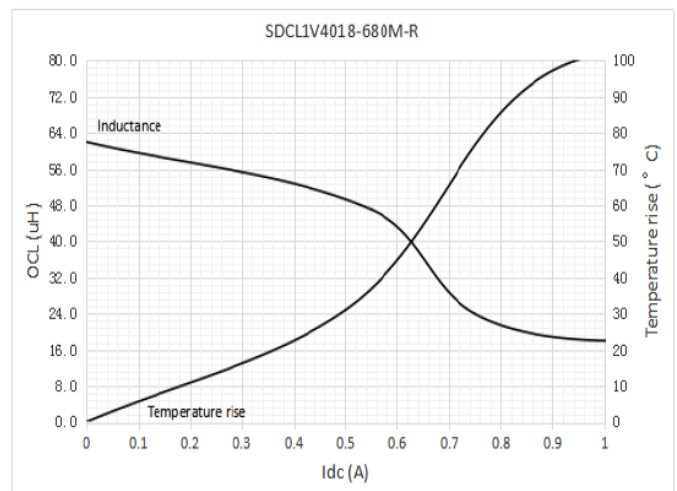
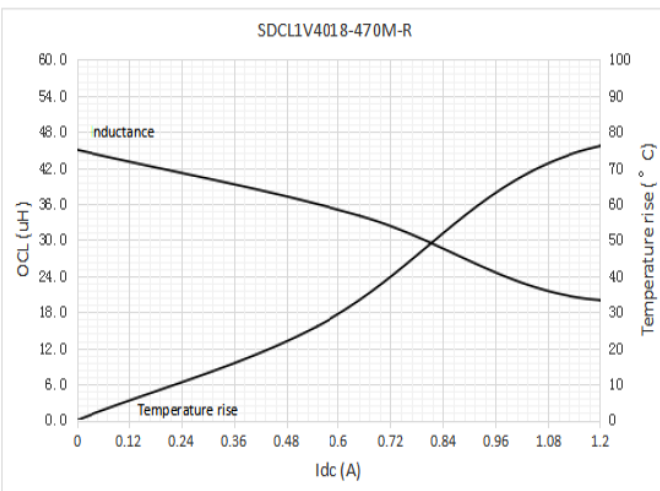
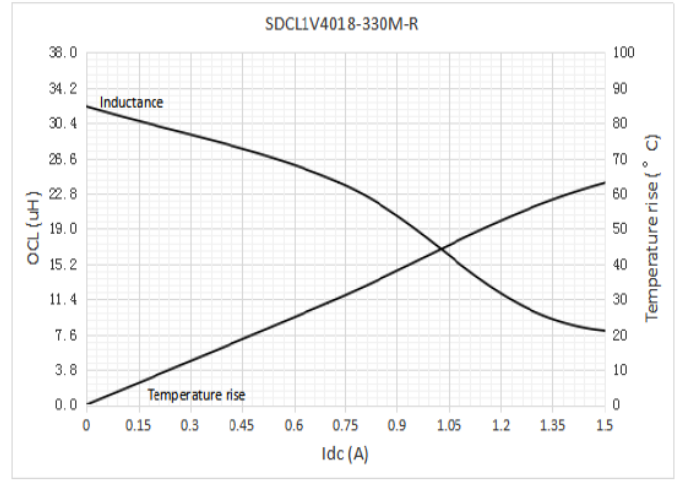
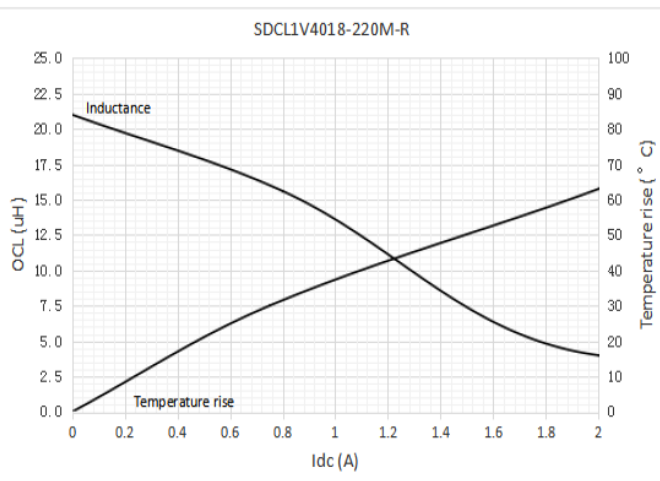
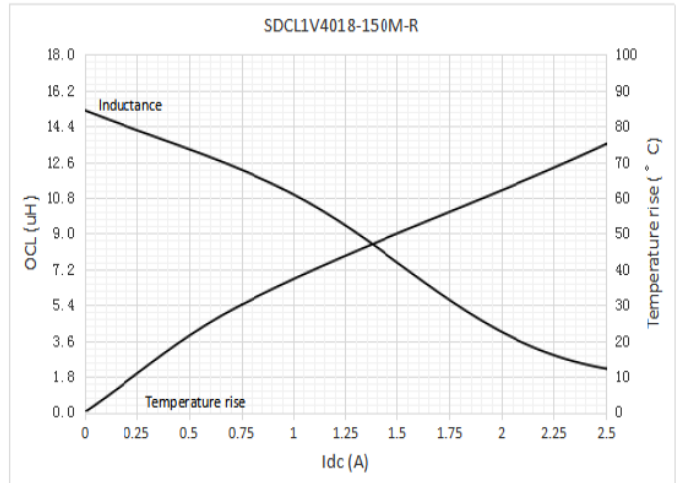
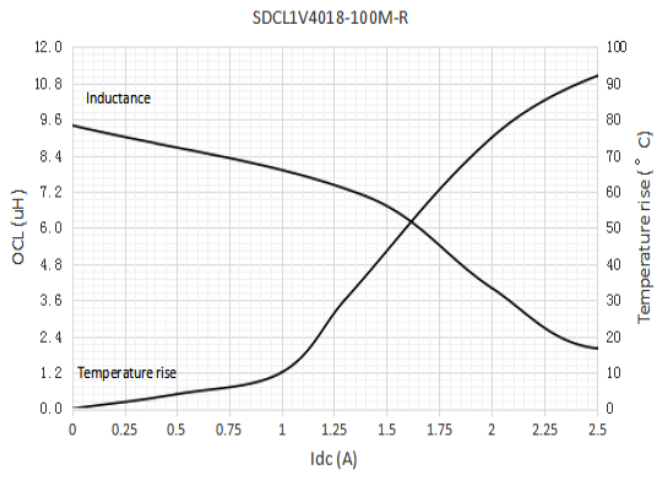
Dimension	Value
W	12.00 ± 0.30
F	5.50 ± 0.10
E1	1.75 ± 0.10
E2	N/A
P0	4.00 ± 0.10
P1	8.00 ± 0.10
P2	2.00 ± 0.10
ØD0	1.50 + 0.10/-0
ØD1	1.50 + 0.10/-0
A0	4.25 + 0.10/-0
B0	4.25 + 0.10/-0
K0	3.25 ± 0.10
T	0.40 ± 0.05

**Inductance and temperature rise vs current**  
**SDCL1V4018**

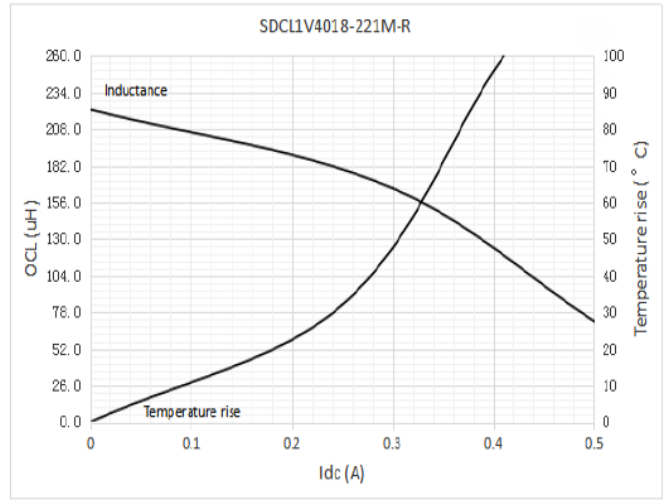
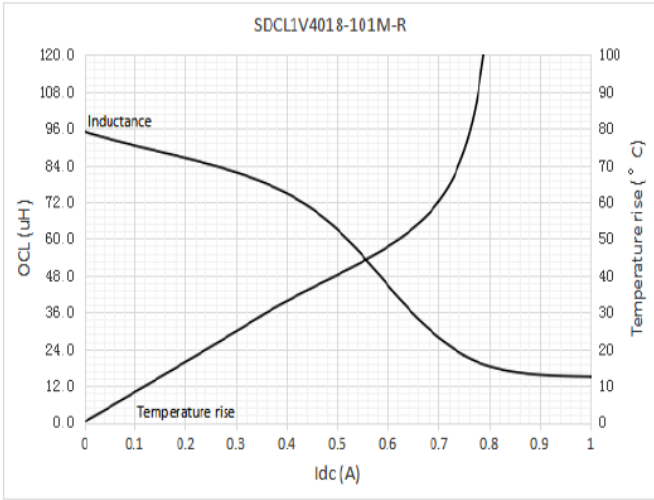


Inductance and temperature rise vs current

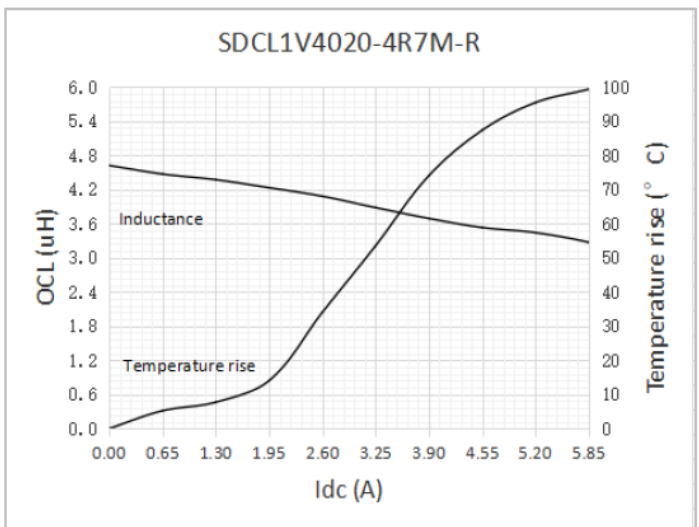
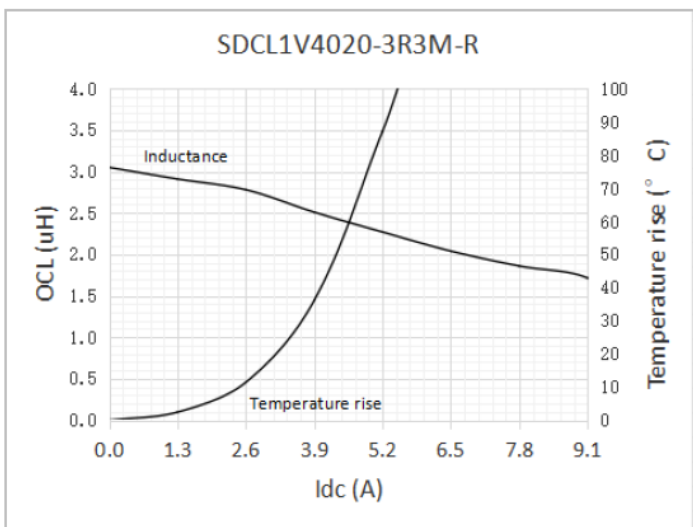
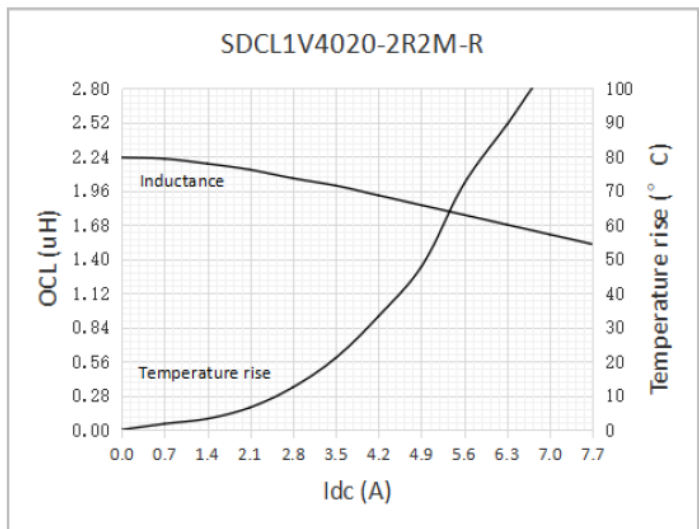
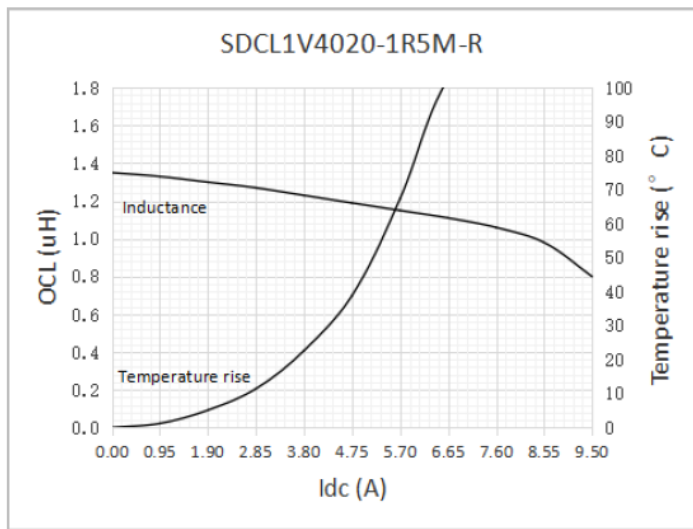
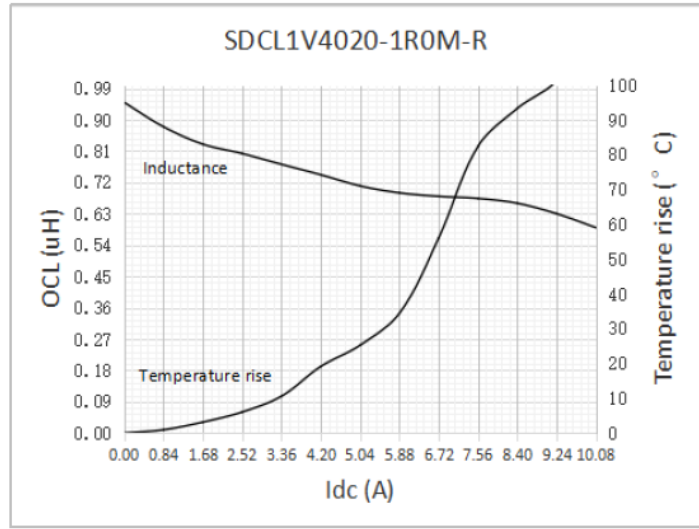
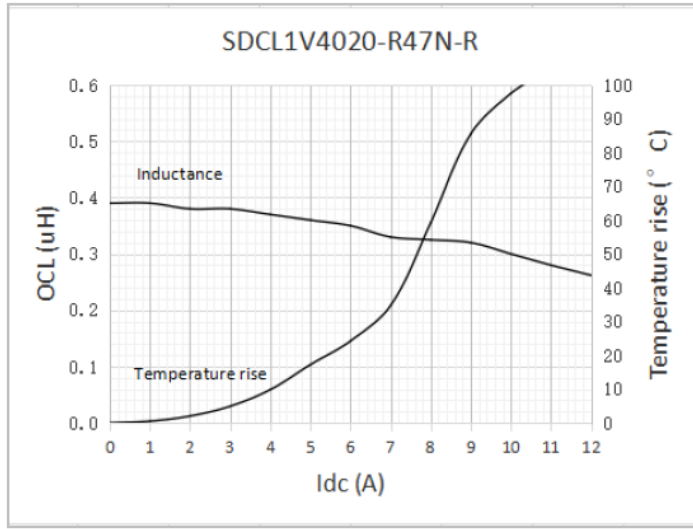
SDCL1V4018



**Inductance and temperature rise vs current**  
**SDCL1V4018**

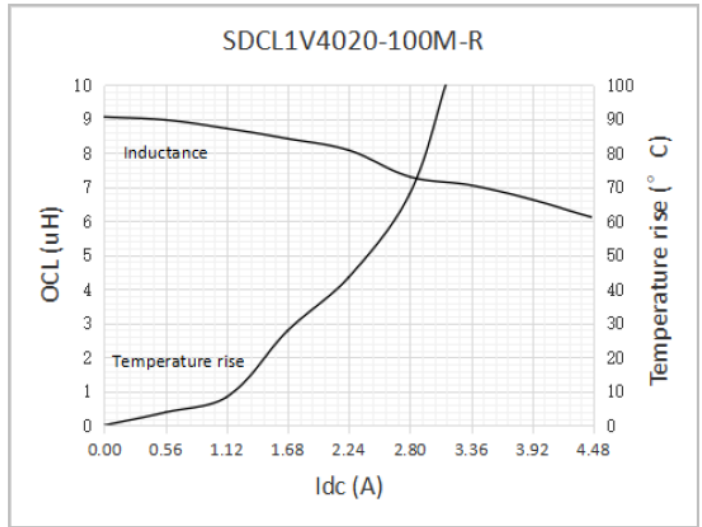
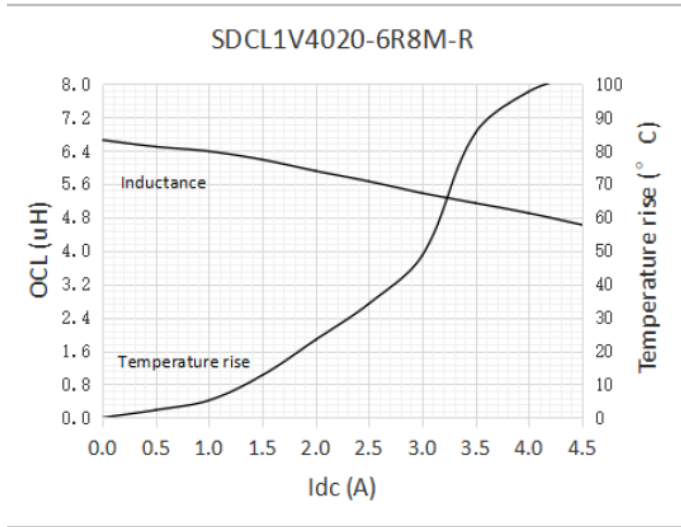


**Inductance and temperature rise vs current**  
**SDCL1V4020**

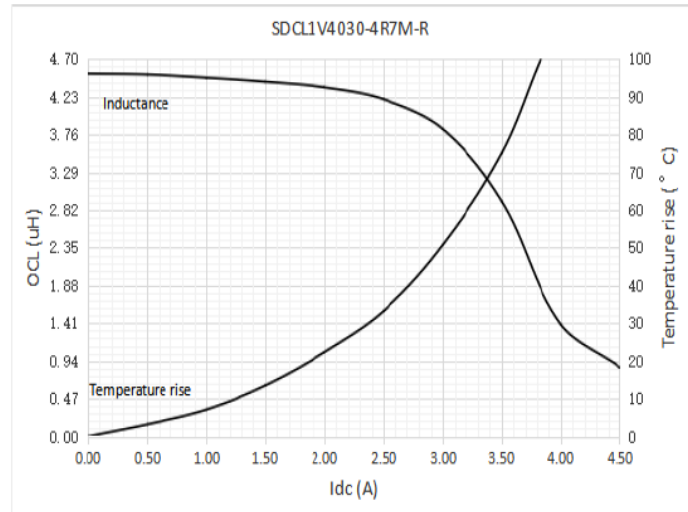
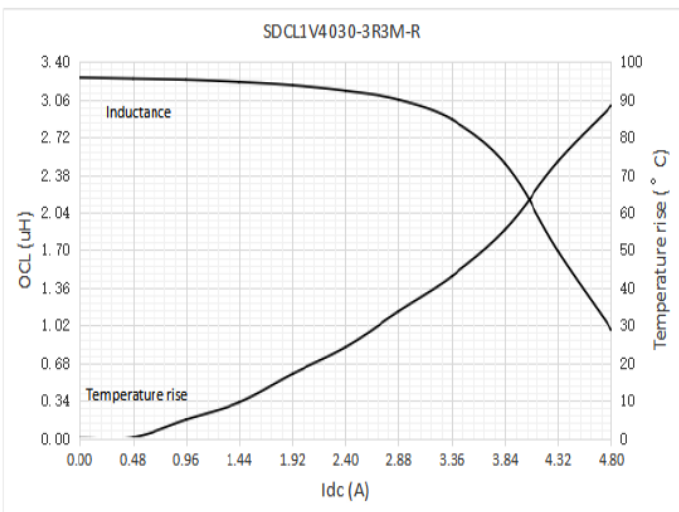
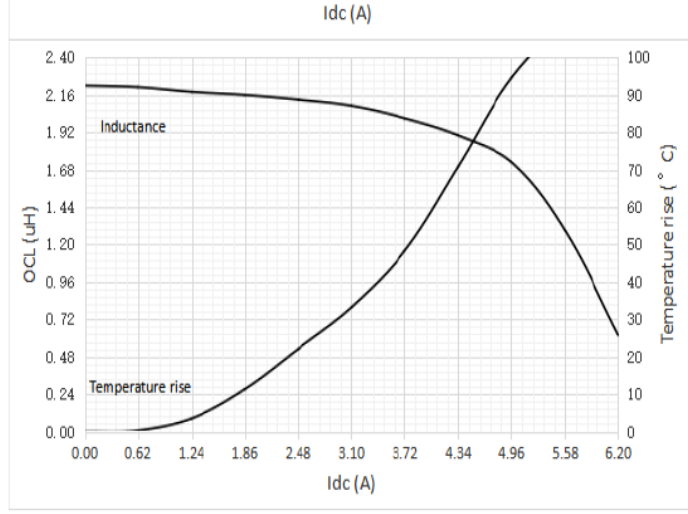
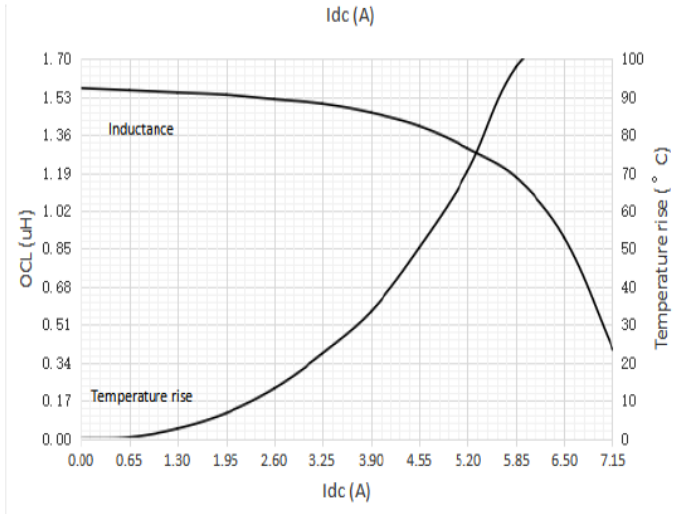
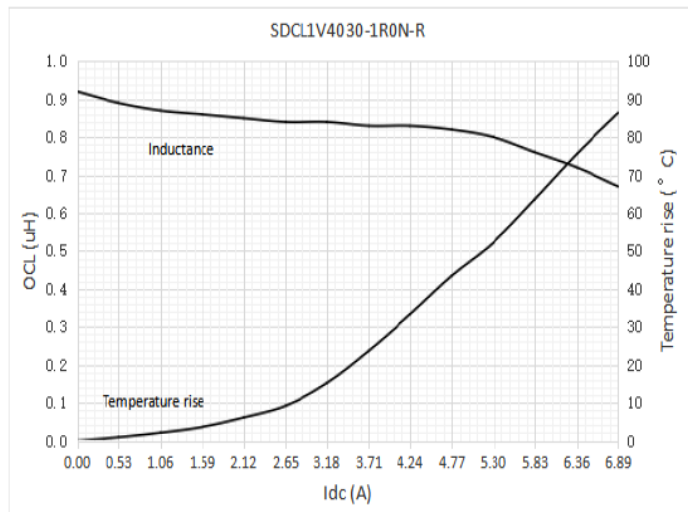
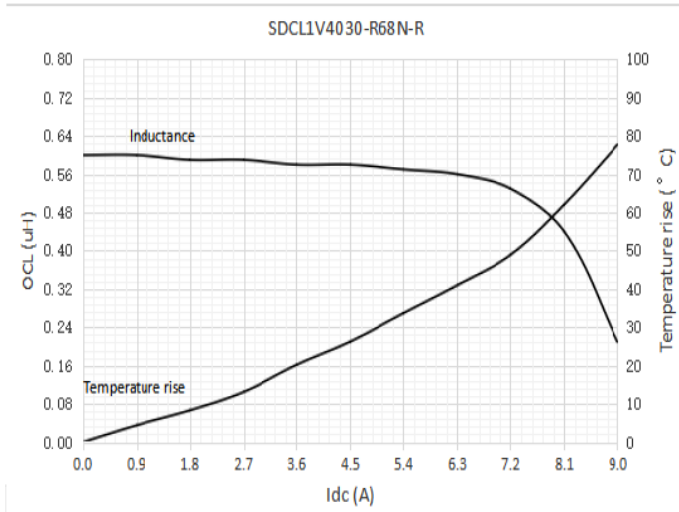




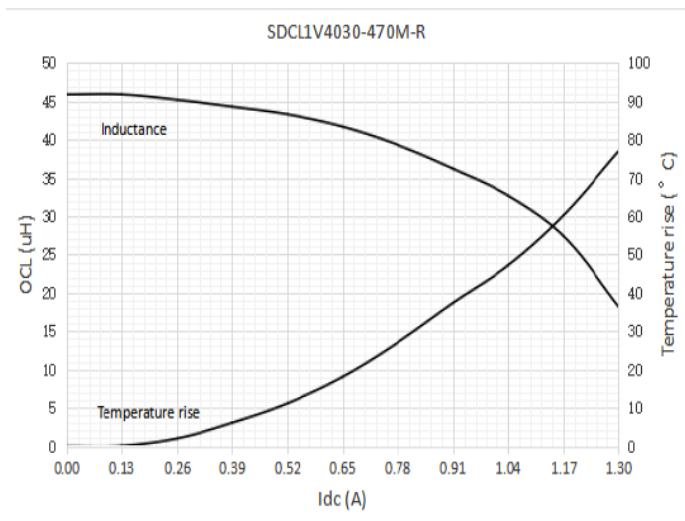
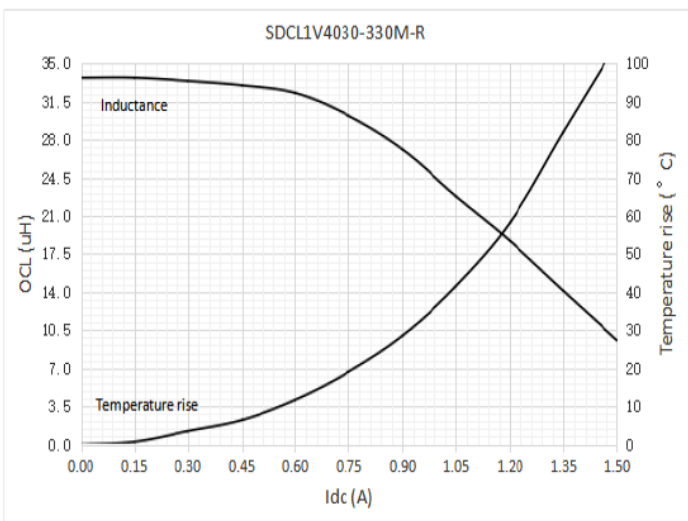
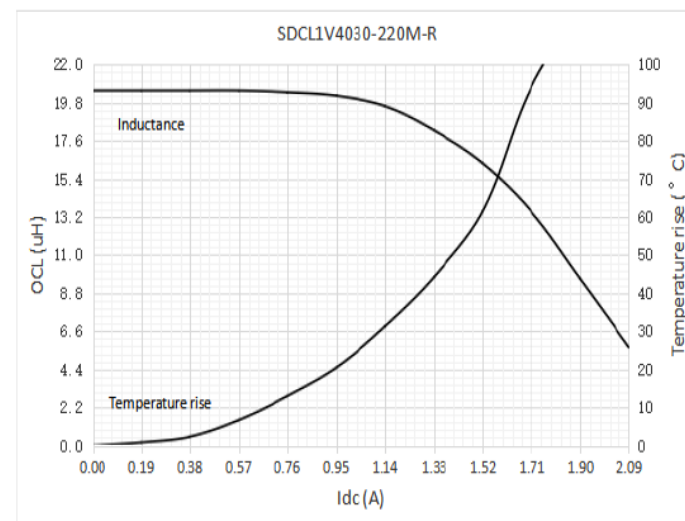
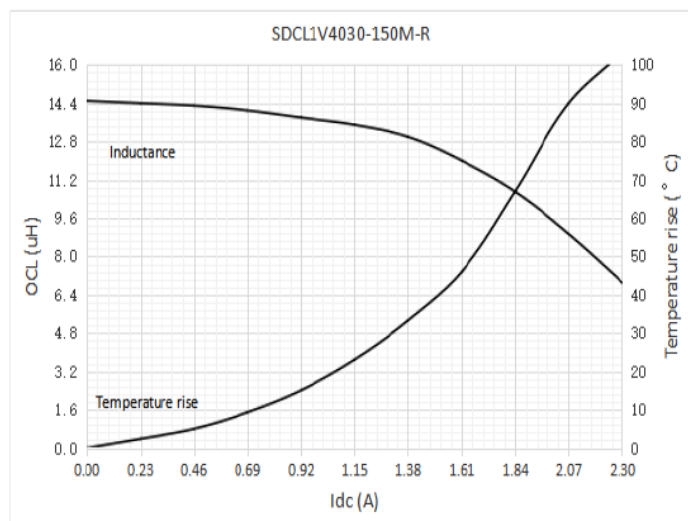
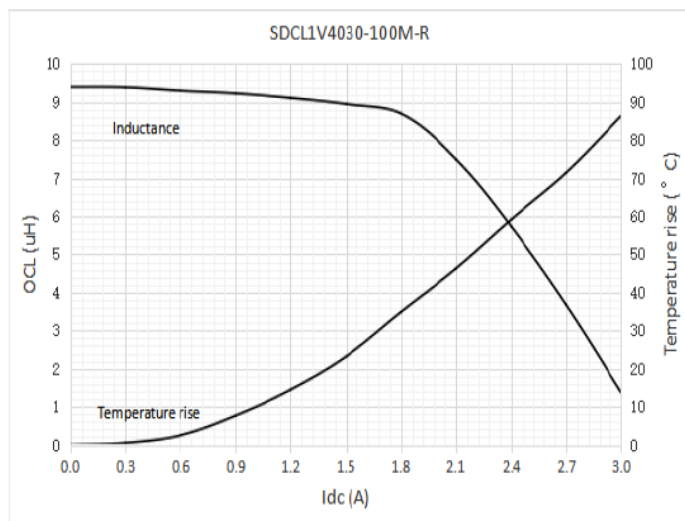
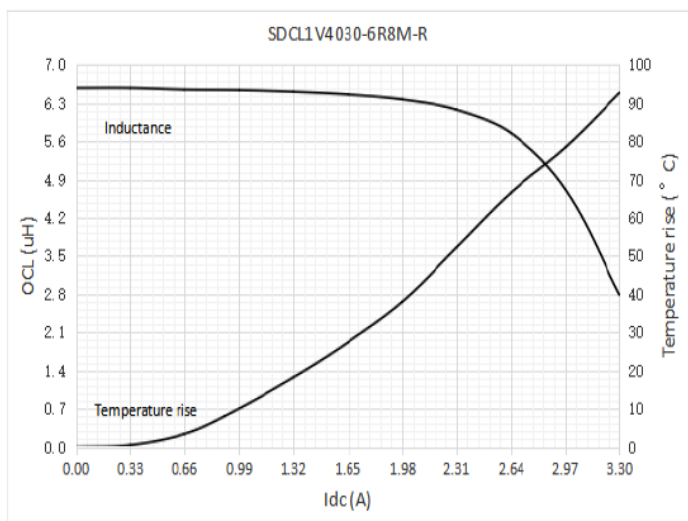
**Inductance and temperature rise vs current**  
**SDCL1V4020**



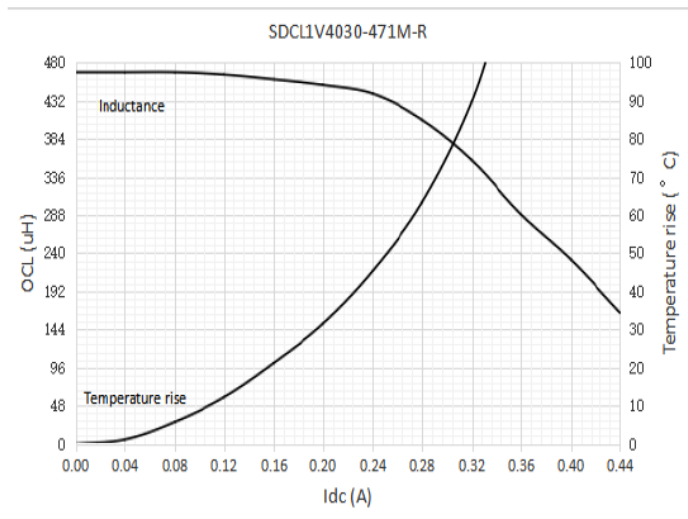
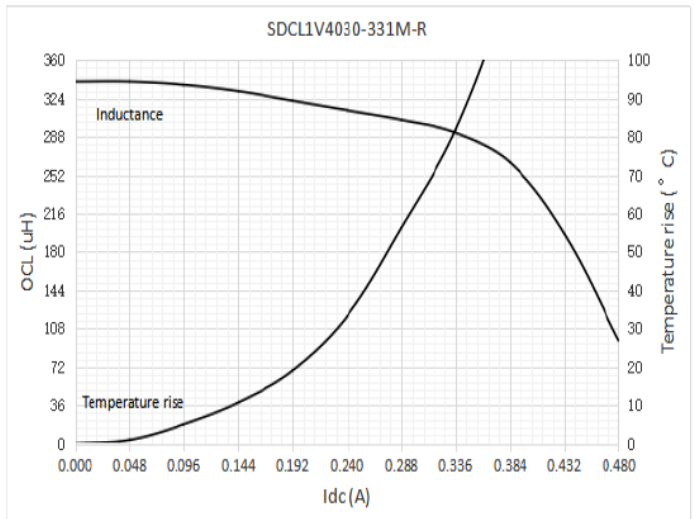
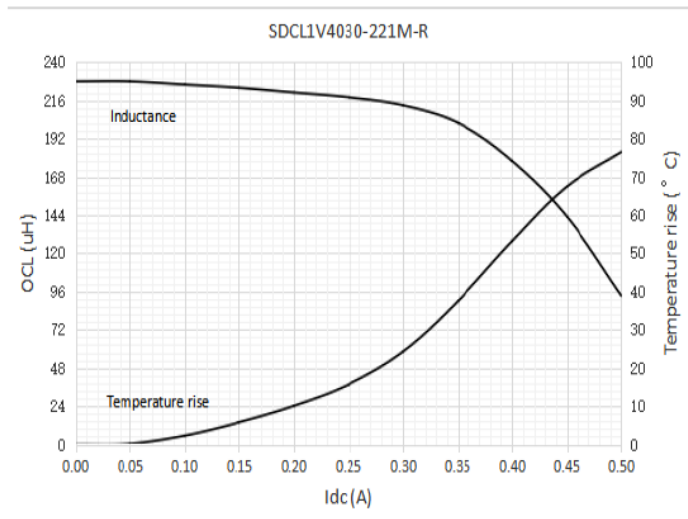
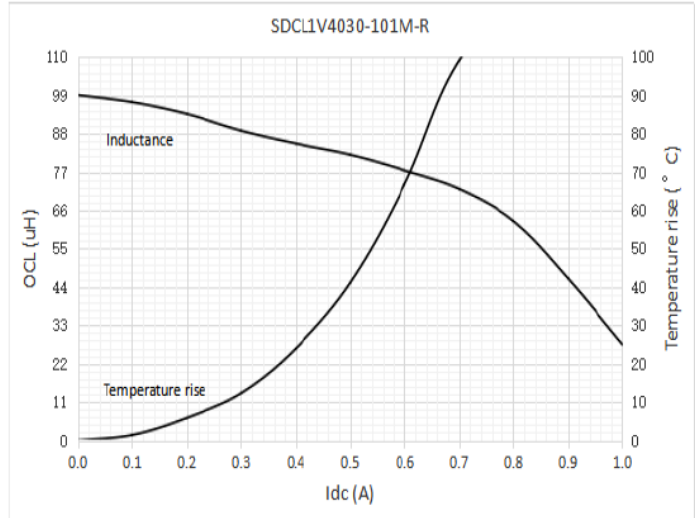
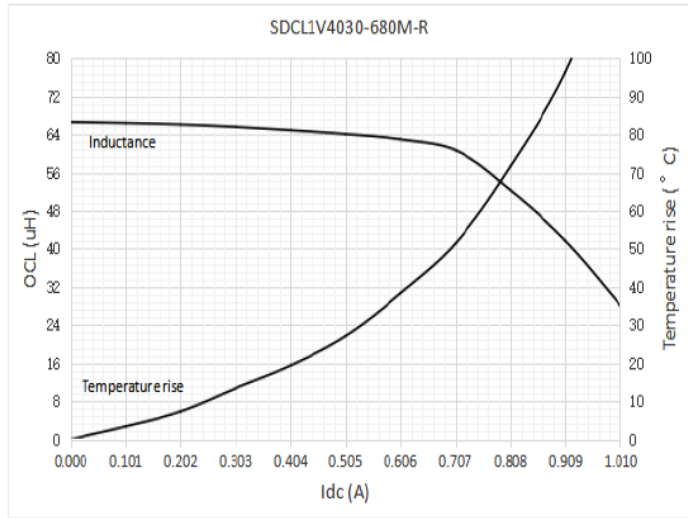
**Inductance and temperature rise vs current**  
**SDCL1V4030**



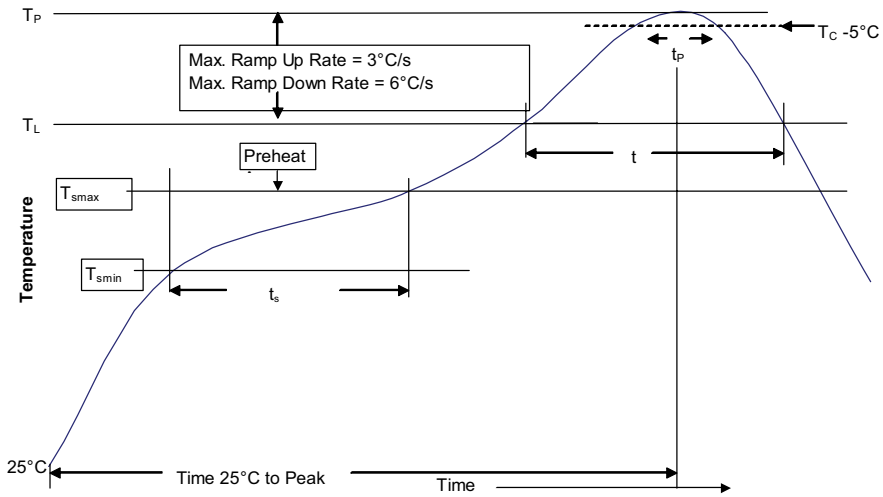
**Inductance and temperature rise vs current**  
**SDCL1V4030**



**Inductance and temperature rise vs current**  
**SDCL1V4030**



**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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