

SDCL1V30

Semi-shielded power inductors



Product features

- High current carrying capacity
- High power density, low core losses
- Magnetically semi-shielded
- 3.2 mm x 3.2 mm surface mount package in 1.3 mm and 1.5 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 ⁵ | OCL ¹ (μ H) | FLL ² (μ H) minimum | I _{DC} ³ (A) | I _{pk} ⁴ (A) | DCR (m Ω) @ +20 °C nominal | DCR (m Ω) @ +20 °C maximum |
|--------------------------|--------------------------------|--|-------------------------------------|-------------------------------------|--|--|
| SDCL1V3012 | | | | | | |
| SDCL1V3012-1R0N-R | 1.0 \pm 30% | 0.46 | 1.9 | 2.0 | 50 | 58 |
| SDCL1V3012-1R5N-R | 1.5 \pm 30% | 0.68 | 1.5 | 1.62 | 57 | 66 |
| SDCL1V3012-2R2M-R | 2.2 \pm 20% | 1.14 | 1.4 | 1.55 | 85 | 105 |
| SDCL1V3012-3R3M-R | 3.3 \pm 20% | 1.72 | 0.9 | 1.05 | 96 | 111 |
| SDCL1V3012-4R7M-R | 4.7 \pm 20% | 2.44 | 0.8 | 0.95 | 135 | 156 |
| SDCL1V3012-6R8M-R | 6.8 \pm 20% | 3.54 | 0.7 | 0.8 | 185 | 213 |
| SDCL1V3012-100M-R | 10 \pm 20% | 5.2 | 0.5 | 0.6 | 300 | 345 |
| SDCL1V3012-150M-R | 15 \pm 20% | 7.8 | 0.35 | 0.45 | 410 | 471 |
| SDCL1V3012-220M-R | 22 \pm 20% | 11.44 | 0.3 | 0.42 | 700 | 805 |
| SDCL1V3012-330M-R | 33 \pm 20% | 17.16 | 0.29 | 0.36 | 880 | 1020 |
| SDCL1V3012-470M-R | 47 \pm 20% | 24.44 | 0.22 | 0.27 | 1500 | 1750 |
| SDCL1V3012-680M-R | 68 \pm 20% | 35.36 | 0.2 | 0.24 | 1700 | 2000 |
| SDCL1V3012-101M-R | 100 \pm 20% | 52.0 | 0.15 | 0.21 | 2900 | 3400 |
| SDCL1V3015 | | | | | | |
| SDCL1V3015-1R0N-R | 1.0 \pm 30% | 0.46 | 2.3 | 2.4 | 32 | 38 |
| SDCL1V3015-1R5N-R | 1.5 \pm 30% | 0.68 | 2.2 | 2.3 | 52 | 61 |
| SDCL1V3015-2R2M-R | 2.2 \pm 20% | 1.14 | 1.8 | 1.9 | 66 | 76 |
| SDCL1V3015-3R3M-R | 3.3 \pm 20% | 1.72 | 1.3 | 1.4 | 94 | 109 |
| SDCL1V3015-4R7M-R | 4.7 \pm 20% | 2.44 | 1.0 | 1.1 | 126 | 145 |
| SDCL1V3015-6R8M-R | 6.8 \pm 20% | 3.54 | 0.8 | 0.85 | 180 | 207 |
| SDCL1V3015-100M-R | 10 \pm 20% | 5.2 | 0.7 | 0.78 | 270 | 311 |
| SDCL1V3015-150M-R | 15 \pm 20% | 7.8 | 0.6 | 0.7 | 340 | 391 |
| SDCL1V3015-220M-R | 22 \pm 20% | 11.44 | 0.45 | 0.52 | 500 | 575 |
| SDCL1V3015-330M-R | 33 \pm 20% | 17.16 | 0.4 | 0.48 | 860 | 1000 |
| SDCL1V3015-470M-R | 47 \pm 20% | 24.44 | 0.3 | 0.35 | 1200 | 1380 |
| SDCL1V3015-680M-R | 68 \pm 20% | 35.36 | 0.25 | 0.33 | 2000 | 2300 |
| SDCL1V3015-101M-R | 100 \pm 20% | 52 | 0.22 | 0.27 | 2500 | 2880 |

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_{DC}, +25 °C

3. I_{DC}: 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_{pk}: Peak current for approximately 35% maximum rolloff @ +25 °C

5. Part number definition: SDCL1Vxxx-yyyz-R

SDCL1V = Product code

xxx= size code

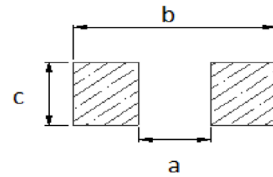
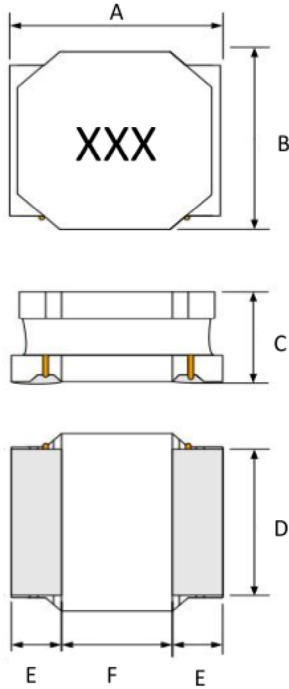
yyy= Inductance value in μ H, R=decimal point

z= Inductance tolerance

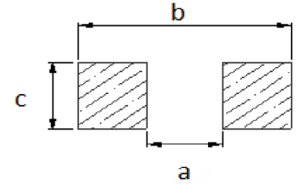
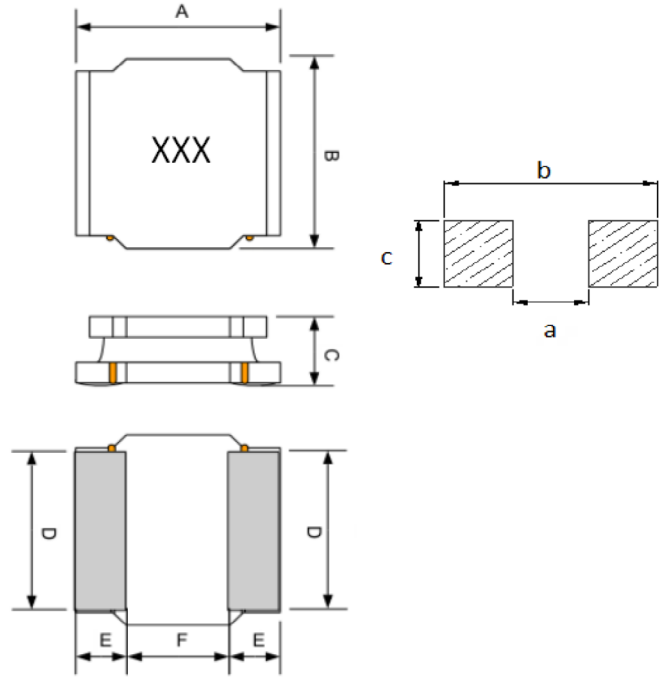
-R suffix = RoHS compliant

Dimensions-mm

SDCL1V3012



SDCL1V3015



| Dimension | Value |
|-----------|-------------|
| A | 3.0 + 0.2 |
| B | 3.0 + 0.2 |
| C | 1.3 maximum |
| D | 2.8 ± 0.2 |
| E | 0.9 ± 0.3 |
| F | 1.2 ± 0.3 |
| a | 0.9 TYP |
| b | 3.3 TYP |
| c | 3.1 TYP |

| Dimension | Value |
|-----------|-------------|
| A | 3.0 + 0.2 |
| B | 3.0 + 0.2 |
| C | 1.5 maximum |
| D | 2.78 ± 0.2 |
| E | 0.9 ± 0.3 |
| F | 1.2 ± 0.3 |
| a | 0.9 TYP |
| b | 3.3 TYP |
| c | 3.08 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

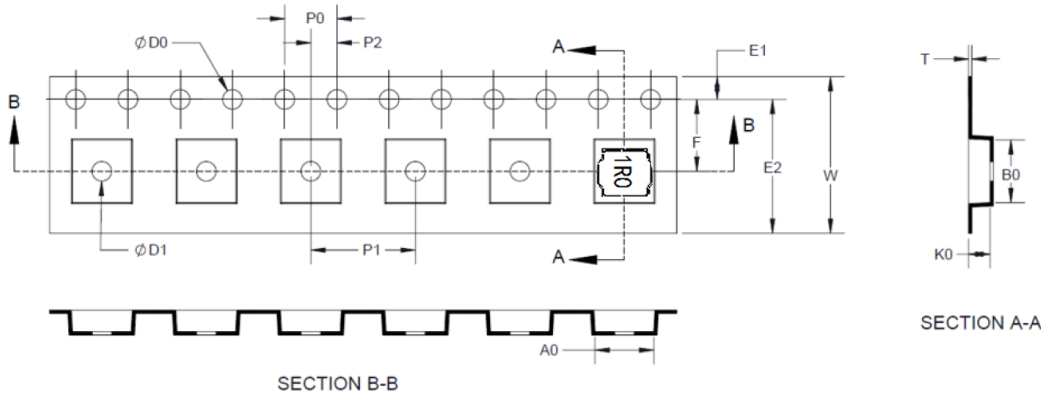
Pad layout tolerances are ±0.1 millimeters unless stated otherwise

Traces or vias underneath the inductor is not recommended

Packaging information- mm

SDCL1V3012

Supplied in tape and reel packaging, 2000 parts per 7" diameter reel (EIA-481 compliant)
Drawing not to scale

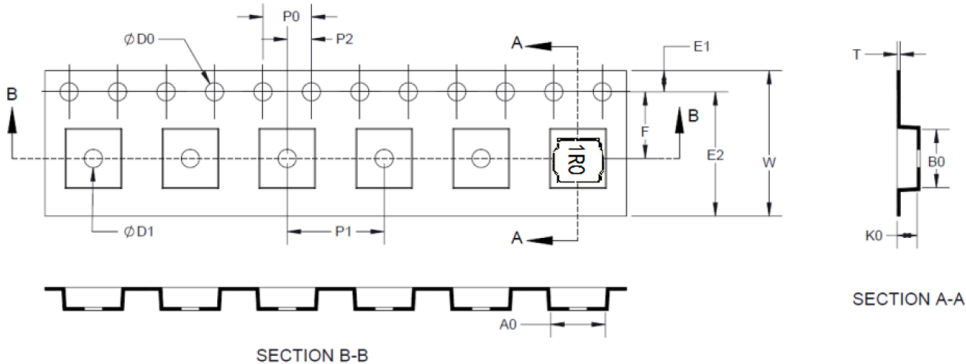


| Dimension | Value |
|-----------|-------------|
| W | 8.00 ± 0.10 |
| F | 3.50 ± 0.05 |
| E1 | 1.75 ± 0.10 |
| E2 | N/A |
| P0 | 4.00 ± 0.10 |
| P1 | 4.00 ± 0.10 |
| P2 | 2.00 ± 0.10 |
| ØD0 | 1.55 ± 0.05 |
| ØD1 | 1.00 ± 0.05 |
| A0 | 3.30 ± 0.10 |
| B0 | 3.30 ± 0.10 |
| K0 | 1.40 ± 0.10 |
| T | 0.23 ± 0.05 |

Packaging information- mm

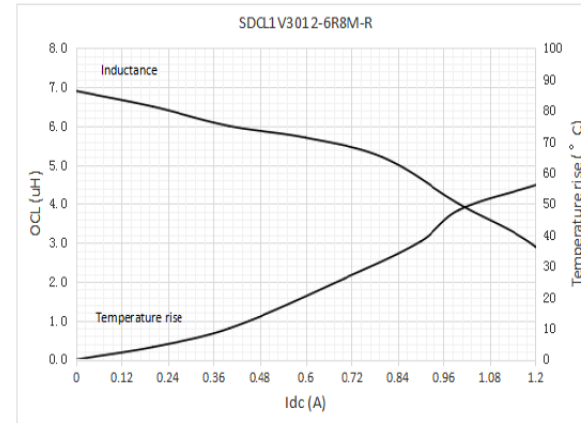
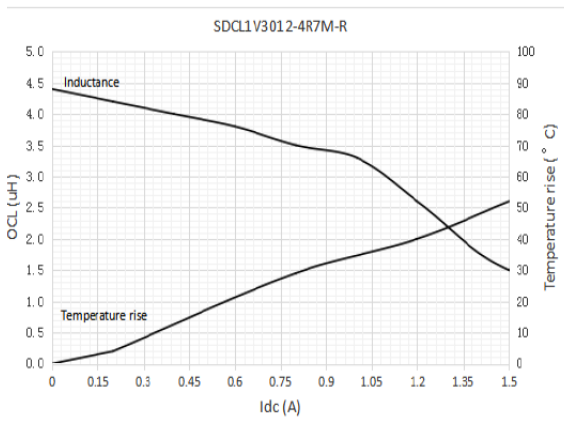
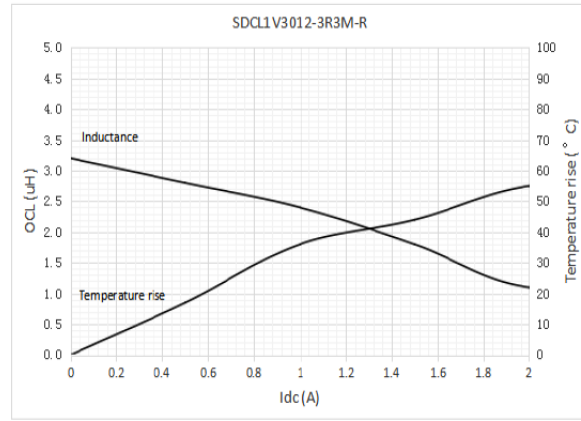
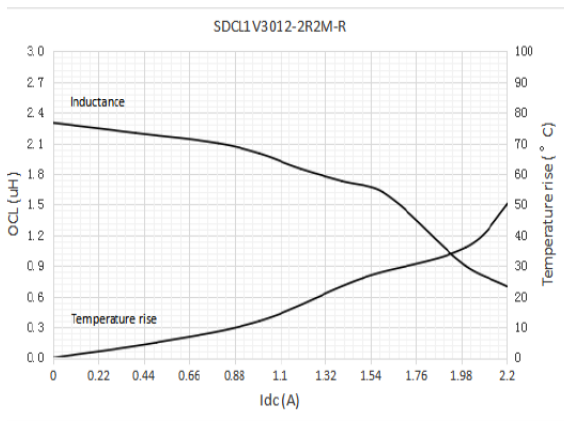
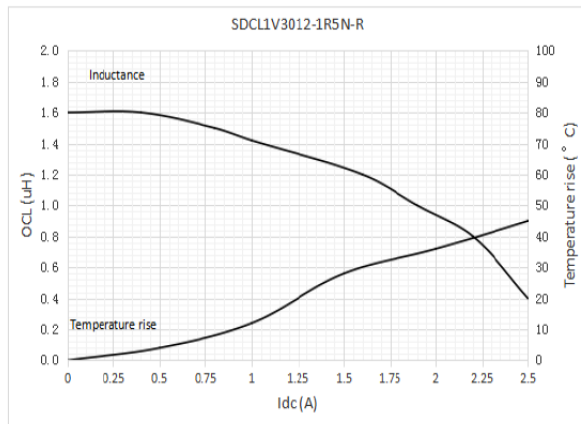
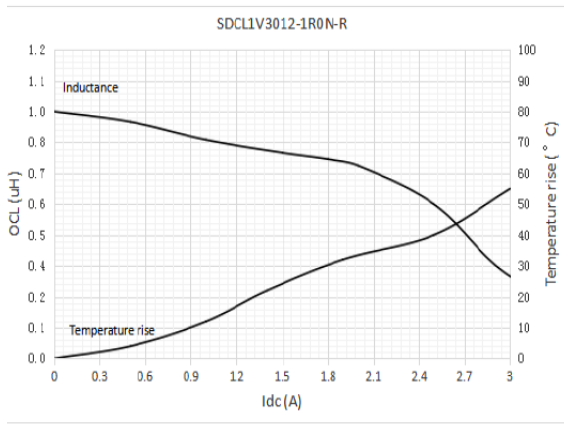
SDCL1V3015

Supplied in tape and reel packaging, 2000 parts per 7" diameter reel (EIA-481 compliant)
Drawing not to scale

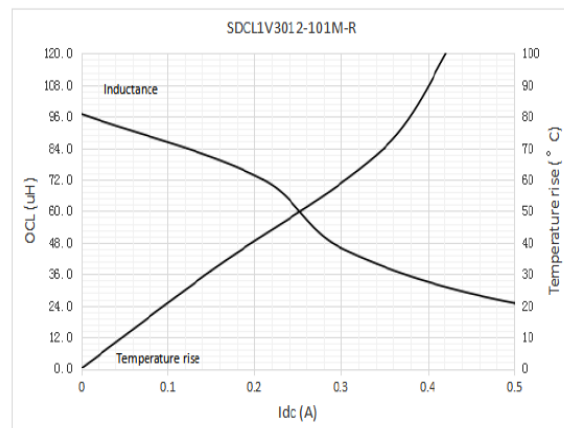
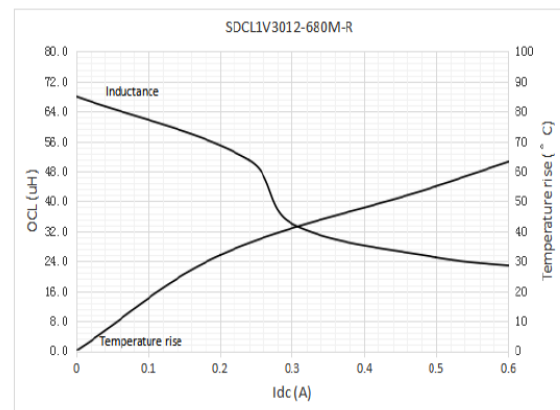
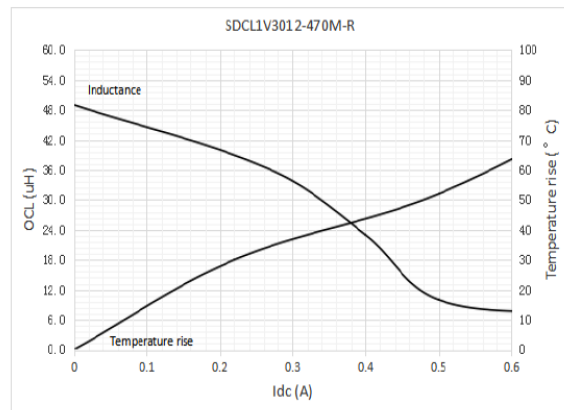
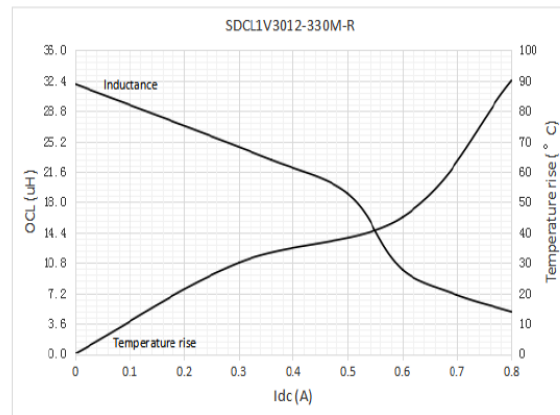
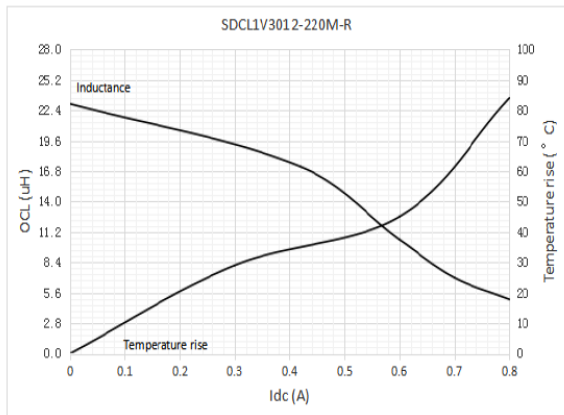
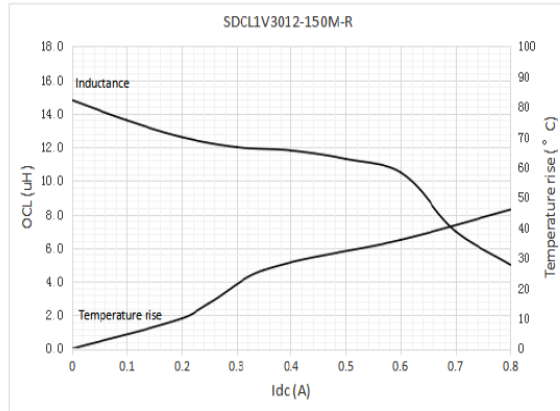
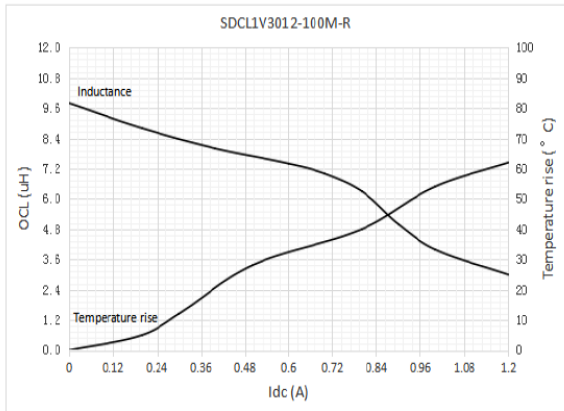


| Dimension | Value |
|-----------|----------------|
| W | 8.00 ± 0.10 |
| F | 3.50 ± 0.05 |
| E1 | 1.75 ± 0.10 |
| E2 | N/A |
| P0 | 4.00 ± 0.10 |
| P1 | 4.00 ± 0.10 |
| P2 | 2.00 ± 0.10 |
| ØD0 | 1.55 ± 0.05 |
| ØD1 | N/A |
| A0 | 3.20 ± 0.05/-0 |
| B0 | 3.20 ± 0.05/-0 |
| K0 | 1.70 ± 0.10 |
| T | 0.28 ± 0.05 |

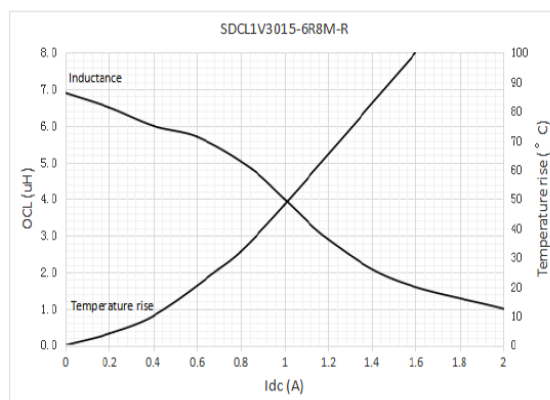
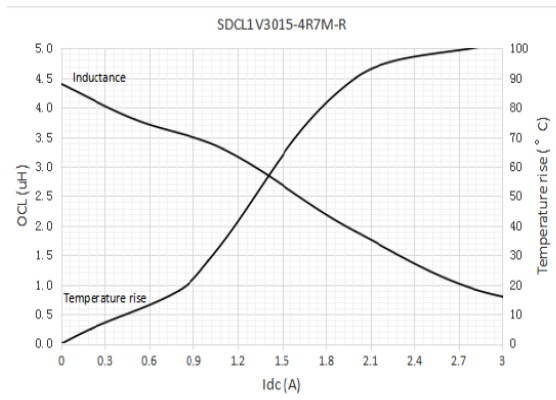
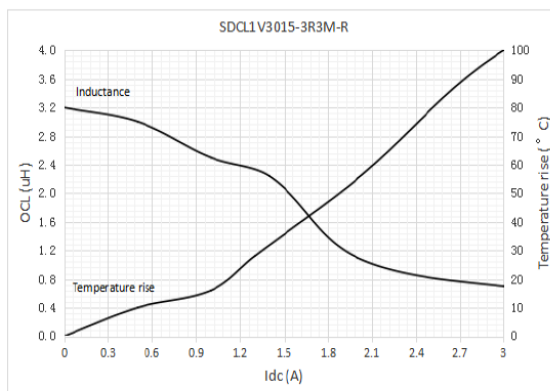
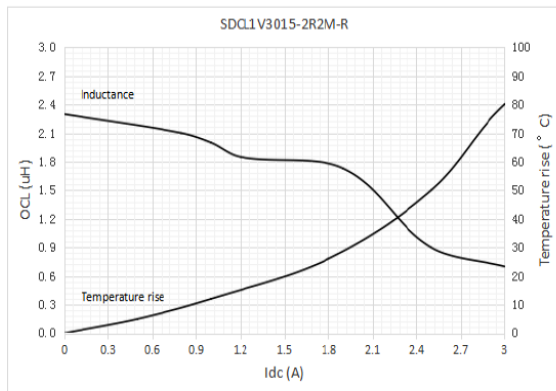
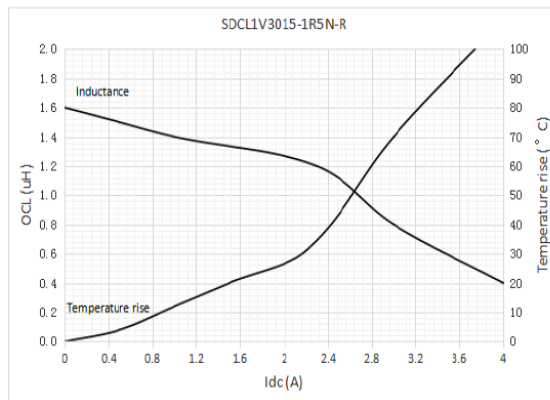
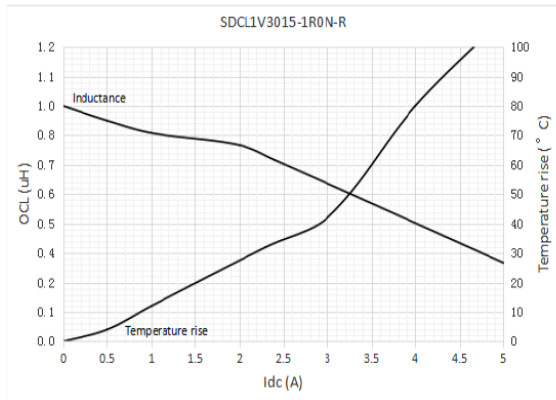
Inductance and temperature rise vs current
SDCL1V3012



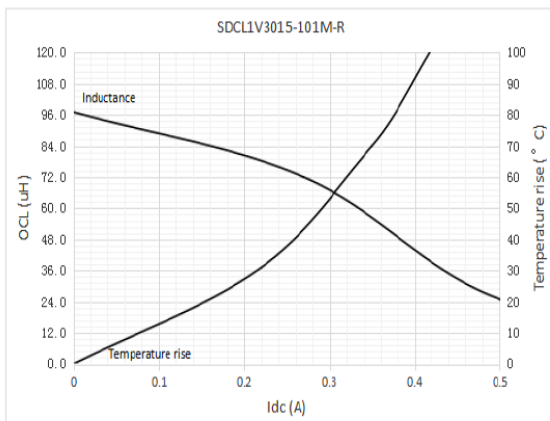
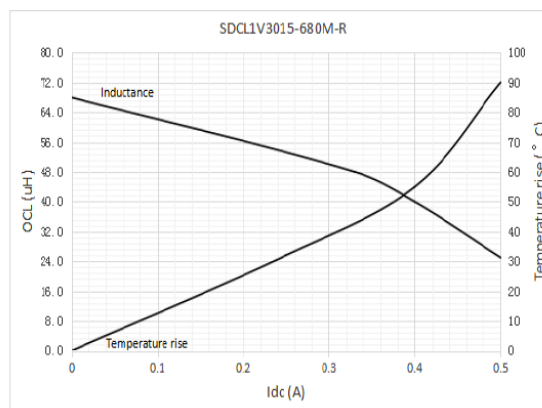
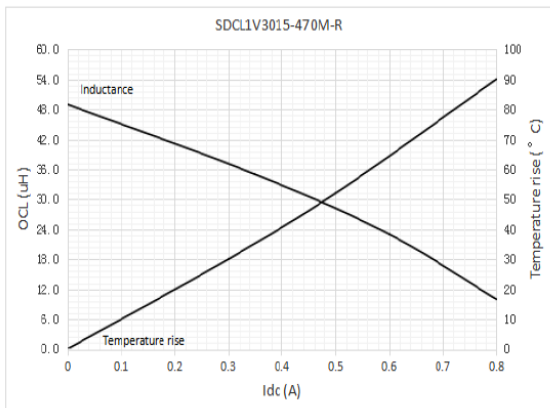
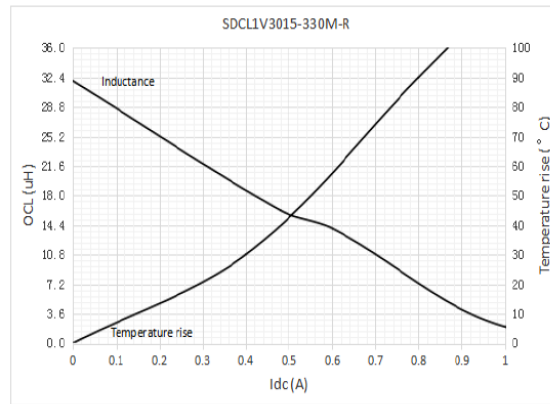
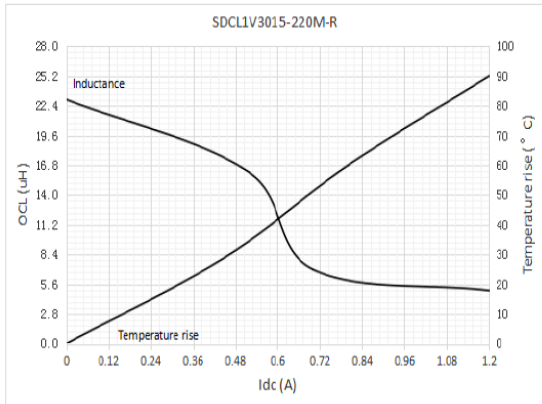
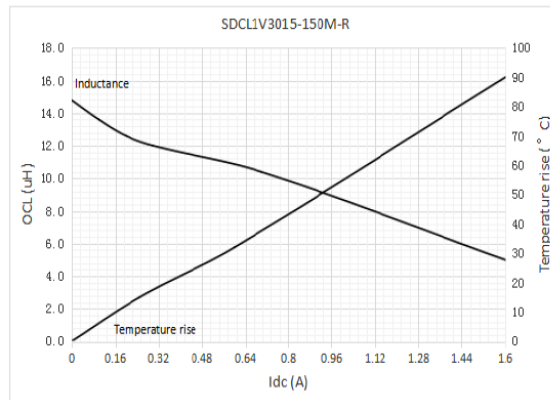
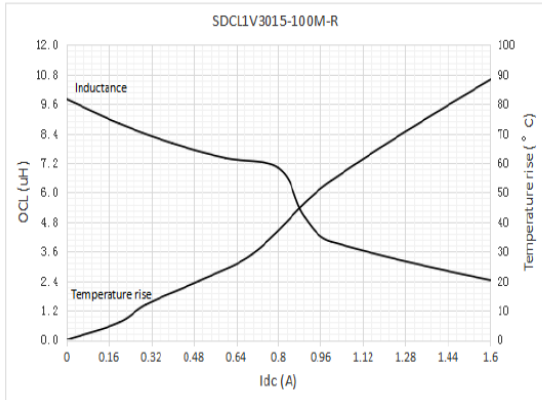
Inductance and temperature rise vs current
SDCL1V3012



Inductance and temperature rise vs current
SDCL1V3015



Inductance and temperature rise vs current
SDCL1V3015



Solder reflow profile

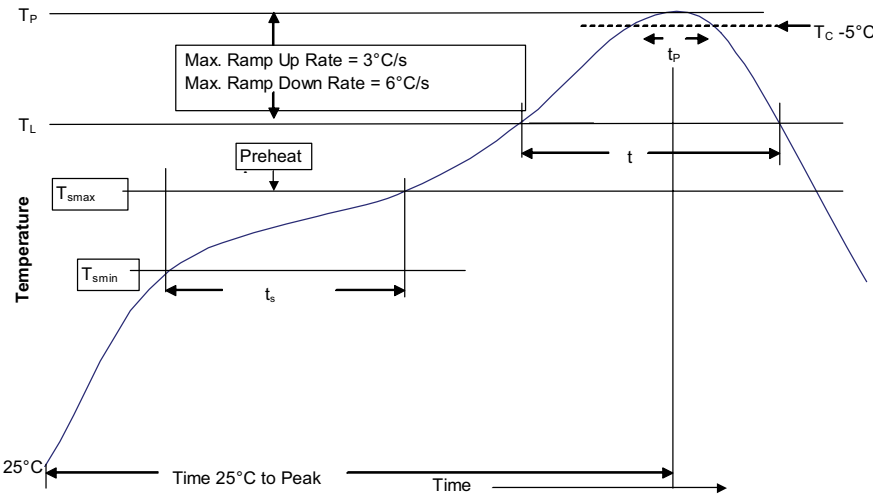


Table 1 - Standard SnPb solder (T_C)

| Package thickness | Volume mm ³ <350 | Volume mm ³ ≥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 mm ³ <350 | Volume mm ³ 350 - 2000 | Volume mm ³ >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) | 183 °C | 217 °C |
| Time (t_L) maintained above T_L | 60-150 seconds | 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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