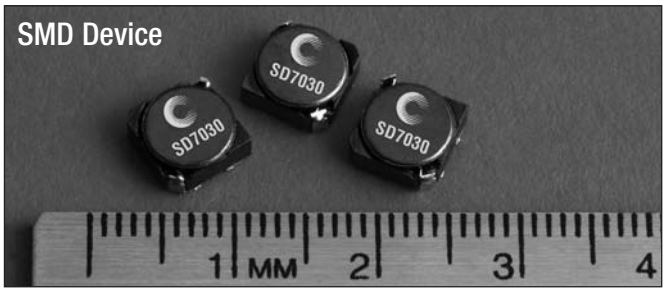
COILTRONICS

# Low-Profile Shielded Drum Inductors

## SD7030 Series




### Description

- 125°C maximum total operating temperature
- Low profile 7.0 x 7.0 x 3.0mm maximum surface mount package
- Ferrite material shielded drum core
- Inductance range from 1.5µH to 680µH
- Current range from 0.21 to 5.5 Amps
- Frequency range up to 1MHz

### Applications

- Notebook computers
- TFT LCD Bias supplies
- Handheld instruments
- Battery power, Li-Ion, 2-cell
- White LED driver
- Wireless handsets
- GPS Receivers
- ADSL/DSL/Cable modems
- Digital still camera
- Buck and boost inductor

### Environmental Data

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

### Packaging

- Supplied in tape and reel packaging, 1500 parts per 13" diameter. reel

### Product Specifications

| Part Number[5] | OCL[1] µH ± 30% | $I_{rms}$[2] Amps | $I_{sat}$[3] Amps | Typ. DCR mΩ @ 25°C | Max DCR mΩ @ 25°C | K-factor [4] |
|---|---|---|---|---|---|---|
| SD7030-1R5-R | 1.5 | 5.5 | 4.5 | 10 | 12 | 32 |
| SD7030-3R3-R | 3.3 | 3.7 | 3.00 | 20 | 24 | 22 |
| SD7030-3R9-R | 4.1 | 3.4 | 2.60 | 22 | 27 | 19 |
| SD7030-5R0-R | 4.9 | 3.2 | 2.40 | 26 | 31 | 17 |
| SD7030-6R0-R | 5.8 | 2.8 | 2.25 | 29 | 35 | 16 |
| SD7030-7R3-R | 7.0 | 2.3 | 2.10 | 45 | 54 | 13 |
| SD7030-8R0-R | 7.8 | 2.2 | 1.85 | 48 | 58 | 12 |
| SD7030-100-R | 10.0 | 2.1 | 1.70 | 54 | 65 | 11 |
| SD7030-120-R | 11.5 | 1.9 | 1.55 | 58 | 70 | 10 |
| SD7030-150-R | 14.6 | 1.7 | 1.40 | 70 | 84 | 9.3 |
| SD7030-180-R | 17.3 | 1.7 | 1.32 | 79 | 95 | 8.8 |
| SD7030-220-R | 21.0 | 1.4 | 1.20 | 107 | 128 | 7.6 |
| SD7030-260-R | 24.9 | 1.3 | 1.05 | 118 | 142 | 6.9 |
| SD7030-300-R | 30.0 | 1.2 | 0.97 | 138 | 165 | 6.4 |
| SD7030-390-R | 39.7 | 1.1 | 0.86 | 175 | 210 | 5.7 |
| SD7030-440-R | 43.4 | 1.1 | 0.80 | 198 | 238 | 5.3 |
| SD7030-560-R | 54.4 | 0.99 | 0.73 | 231 | 277 | 4.9 |
| SD7030-680-R | 66.6 | 0.85 | 0.65 | 253 | 304 | 4.3 |
| SD7030-820-R | 81.4 | 0.82 | 0.60 | 325 | 390 | 4.0 |
| SD7030-101-R | 95.5 | 0.70 | 0.54 | 446 | 535 | 3.6 |
| SD7030-121-R | 115.2 | 0.67 | 0.50 | 629 | 755 | 3.3 |
| SD7030-151-R | 145 | 0.57 | 0.44 | 715 | 858 | 2.9 |
| SD7030-181-R | 174 | 0.54 | 0.40 | 805 | 966 | 2.7 |
| SD7030-221-R | 211 | 0.51 | 0.36 | 1102 | 1322 | 2.4 |
| SD7030-271-R | 264 | 0.44 | 0.33 | 1259 | 1475 | 2.2 |
| SD7030-331-R | 317 | 0.38 | 0.30 | 1438 | 1725 | 2.0 |
| SD7030-391-R | 381 | 0.36 | 0.27 | 1857 | 2228 | 1.8 |
| SD7030-471-R | 460 | 0.34 | 0.25 | 2150 | 2581 | 1.7 |
| SD7030-561-R | 561.0 | 0.29 | 0.23 | 2857 | 3428 | 1.5 |
| SD7030-681-R | 677.2 | 0.28 | 0.21 | 3206 | 3847 | 1.4 |

1 Open Circuit Inductance Test Parameters: 100kHz, 0.1V, 0.0Adc.

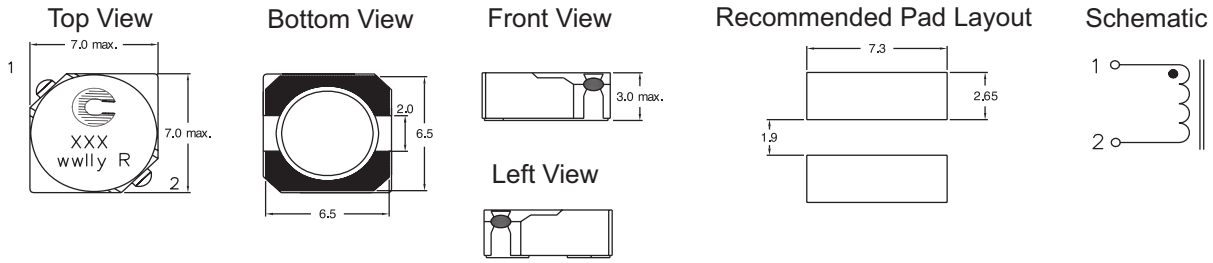
2 $I_{rms}$: DC current for an approximate ΔT of 40°C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part not exceed 125°C under worst case operating conditions verified in the end application.

3 $I_{sat}$ Amps peak for approximately 35% rolloff (@25°C)

4 K-factor: Used to determine $B_{p-p}$ for core loss (see graph). $B_{p-p} = K*L*\Delta I$, $B_{p-p}$(mT), K: (K factor from table), L: (Inductance in µH), ΔI (Peak-to-peak ripple current in Amps).

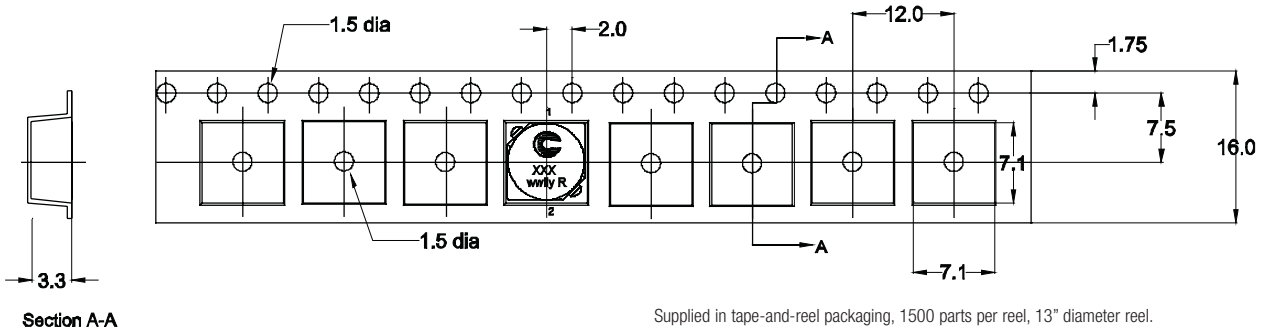
5 Part Number Definition: SD7030-xxx-R
SD7030 = Product code and size; -xxx = Inductance value in µH;
R = decimal point; If no R is present, third character = # of zeros.
-R suffix = RoHS compliant

## Dimensions - mm



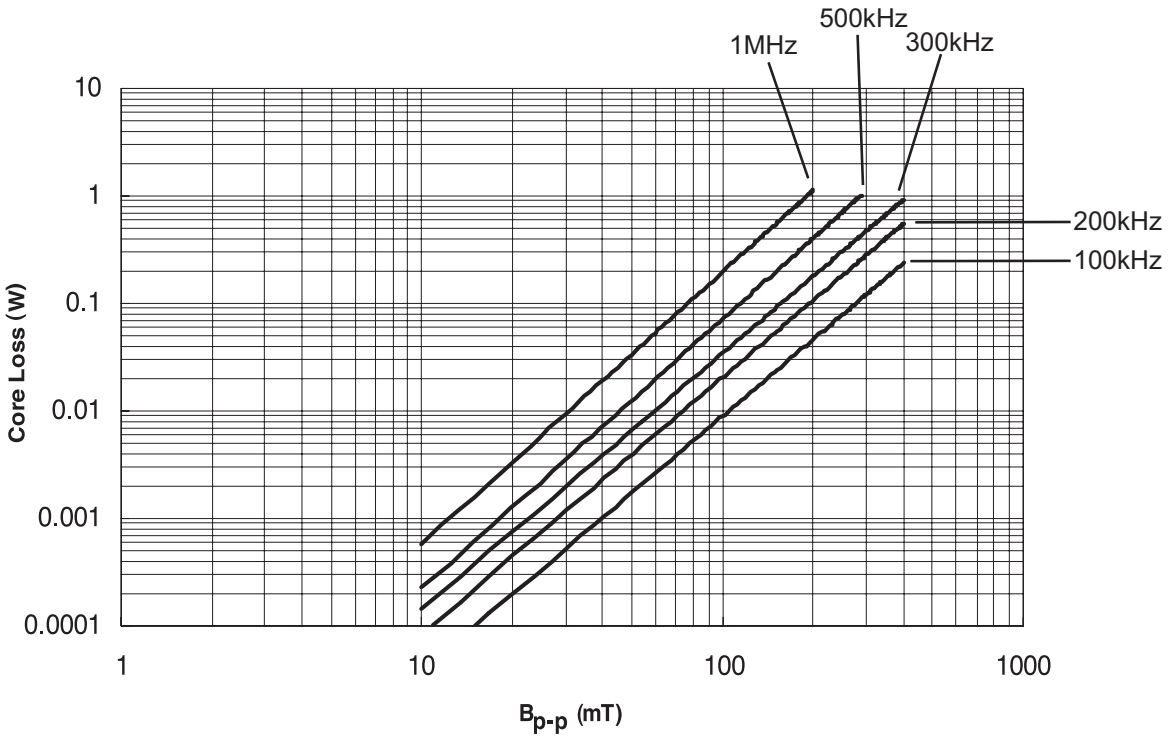

Part Marking: Coiltronics Logo  xxx = inductance value in µH. R = decimal point. If no "R" is present, third character = # of zeros. wwlly or wwllyy = date code. R = revision level

## Packaging Information - mm

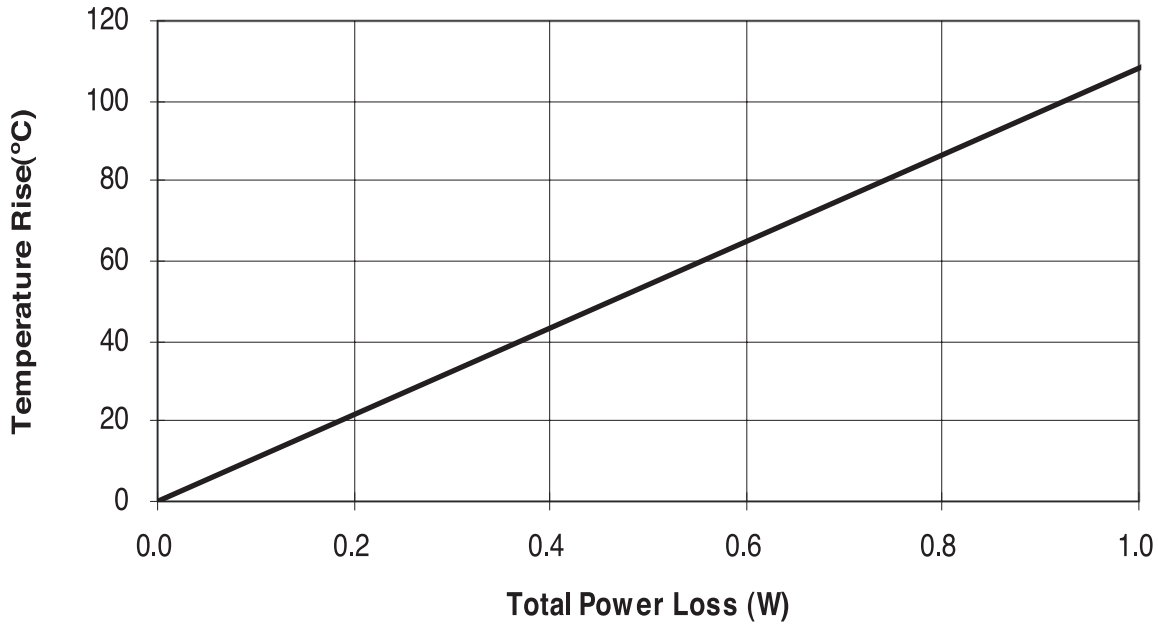



Supplied in tape-and-reel packaging, 1500 parts per reel, 13" diameter reel.

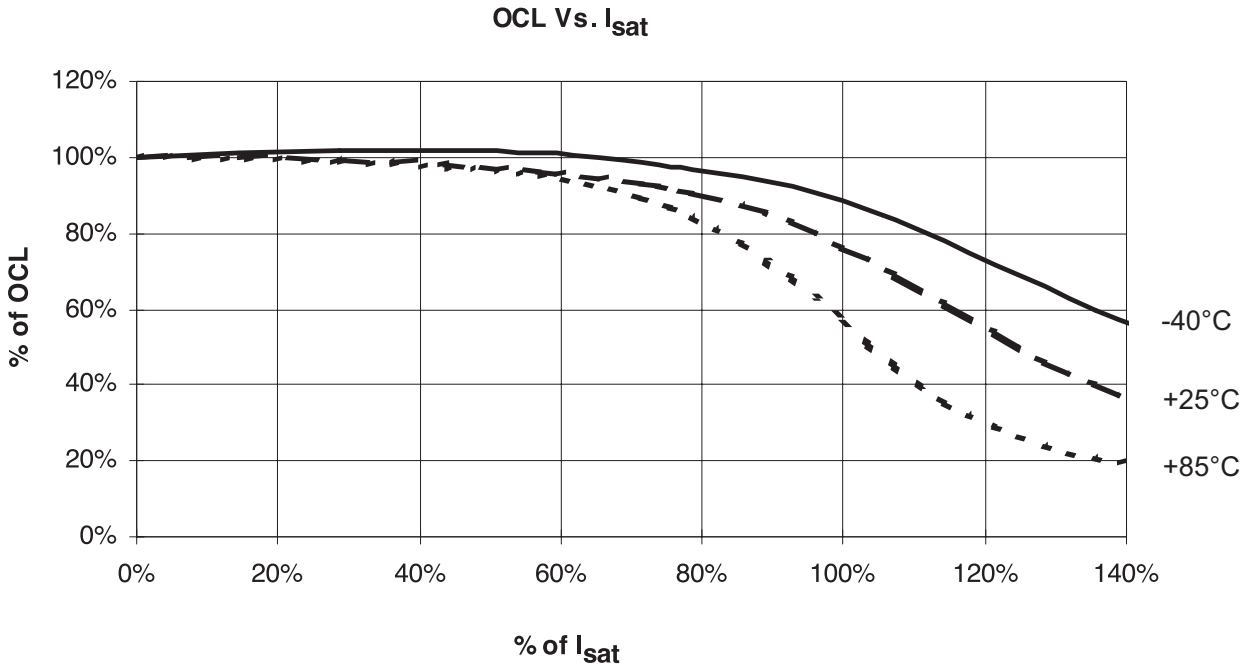
## Core Loss



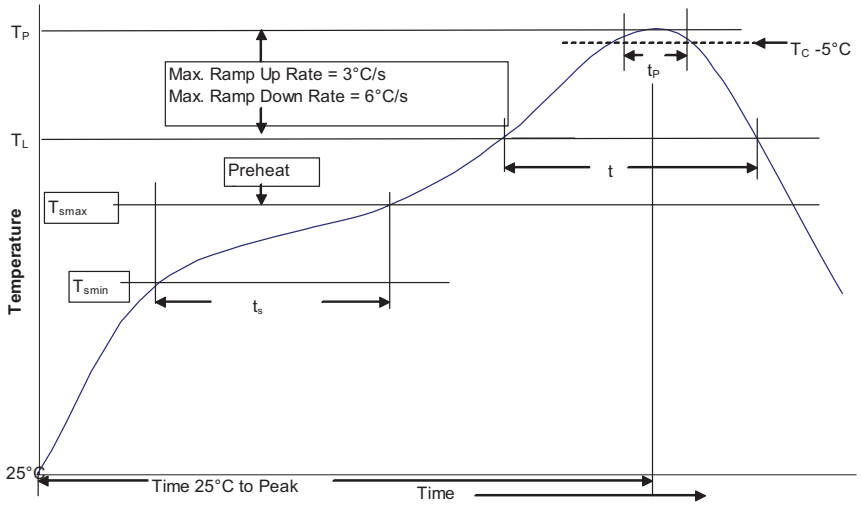
## Temperature Rise vs. Loss




## Inductance Characteristics



## Solder Reflow Profile




### Table 1 - Standard SnPb Solder ($T_C$)

| Package Thickness | Volume mm³ <350 | Volume mm³ ≥350 |
|---|---|---|
| <2.5mm | 235°C | 220°C |
| ≥2.5mm | 220°C | 220°C |

### Table 2 - Lead (Pb) Free Solder ($T_C$)

| Package Thickness | Volume mm³ <350 | Volume mm³ 350 - 2000 | Volume mm³ >2000 |
|---|---|---|---|
| <1.6mm | 260°C | 260°C | 260°C |
| 1.6 – 2.5mm | 260°C | 250°C | 245°C |
| >2.5mm | 250°C | 245°C | 245°C |

## Reference JDEC J-STD-020D

| 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 |
| Average ramp up rate $T_{smax}$ to $T_p$ | | 3°C/ Second Max. | 3°C/ Second Max. |
| Liquidous temperature ($T_L$)<br>Time at liquidous ($t_L$) | | 183°C<br>60-150 Seconds | 217°C<br>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** |
| Average ramp-down rate ($T_p$ to $T_{smax}$) | | 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.

** Tolerance for time at peak profile temperature ($t_p$) is defined as a supplier minimum and a user maximum.

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