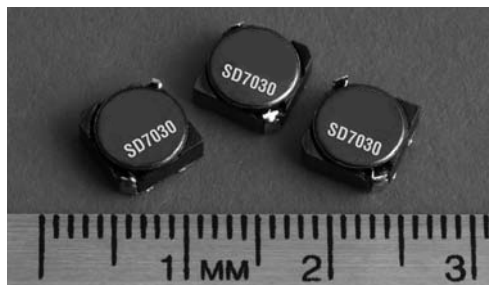


# SD7030

## Low profile shielded drum core power inductors



### Product features

- Low profile 7.0 mm x 7.0 mm x 3.0 mm surface mount package
- Ferrite material shielded drum core
- Inductance range from 1.5  $\mu$ H to 680  $\mu$ H
- Current range from 0.21A to 5.5 A
- Frequency range up to 1 MHz

### Applications

- Notebook, laptop computers
- Digital cameras
- LED Drivers
- TFT LCD Bias supplies
- Wireless handsets
- Handheld instruments
- Gaming consoles
- GPS devices
- Battery power, Li-Ion, 2-cell

### Environmental data

- 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>6</sup> | OCL <sup>1</sup> $\mu\text{H} \pm 30\%$ | I <sub>rms</sub> <sup>2</sup> (A) | I <sub>sat</sub> <sup>3</sup> (A) | Typ. DCR m $\Omega$ @ +25 °C | Max DCR m $\Omega$ @ +25 °C | K-factor <sup>4</sup> |
|--------------------------|-----------------------------------------|-----------------------------------|-----------------------------------|------------------------------|-----------------------------|-----------------------|
| 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: 100 kHz, 0.1 Vrms, 0.0 Adc.

2.  $I_{rms}$ : DC current for an approximate  $\Delta T$  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.

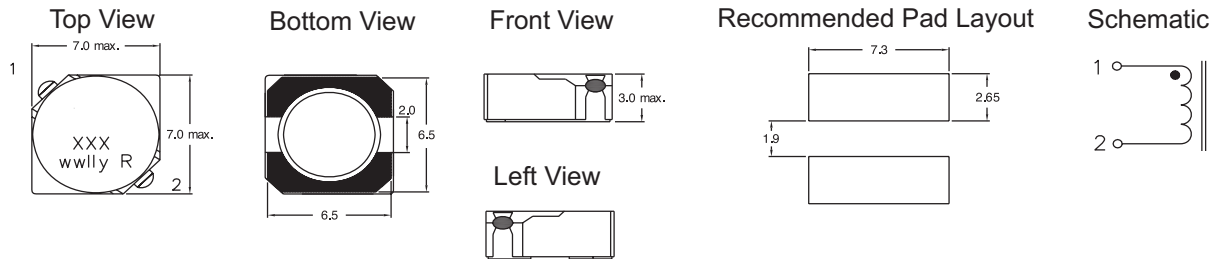
3  $I_{\text{sat}}$  Amps peak for approximately 35% rolloff (@ +25 °C)

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  $\mu H$ ),  $\Delta I$  (Peak-to-peak ripple current in Amps).

5 Part Number Definition: SD7030-xxx-R

SD7030 = Product code and size; -xxx = Inductance value in  $\mu\text{H}$ ;  
R = decimal point; If no R is present, third character equals number of zeros.  
-R suffix = RoHS compliant

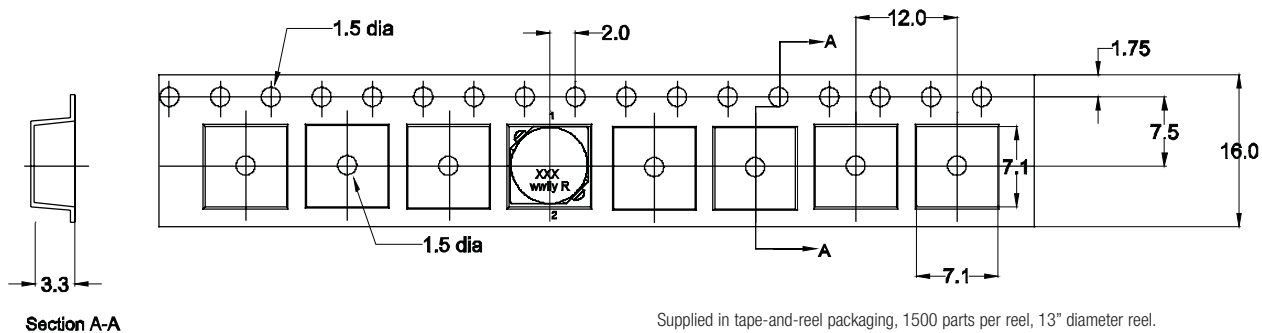
### Dimensions-mm



Part Marking: xxx = inductance value in  $\mu\text{H}$ . R = decimal point. If no "R" is present, third character = # of zeros. wwly or wwlyy = date code. R = revision level

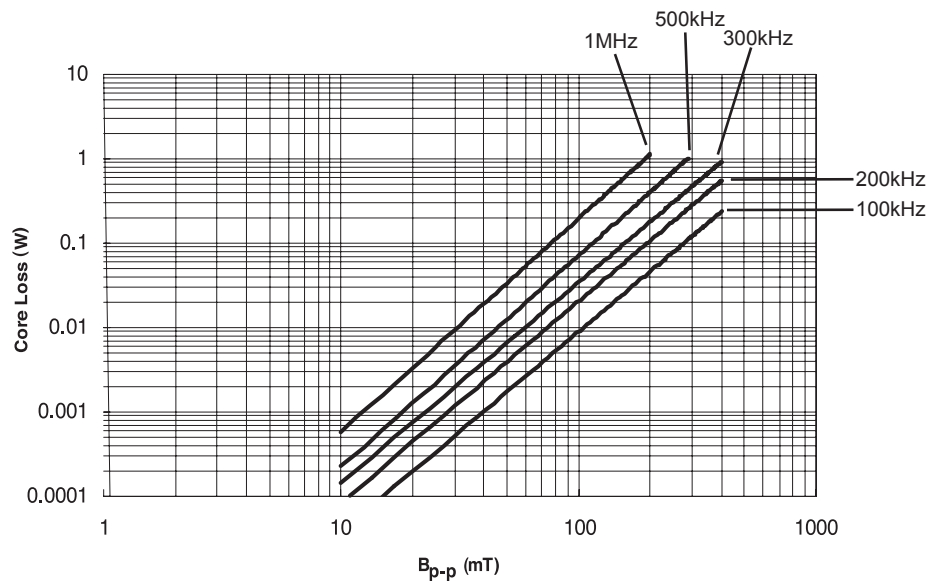
Do not route traces or vias underneath the inductor

## Packaging information-mm

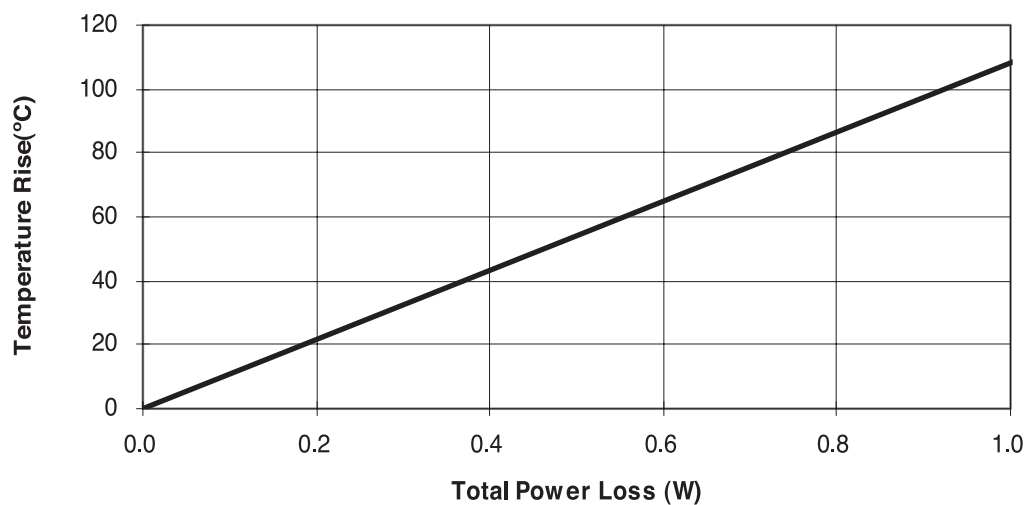


Supplied in tape-and-reel packaging, 1500 parts per reel, 13" diameter reel.

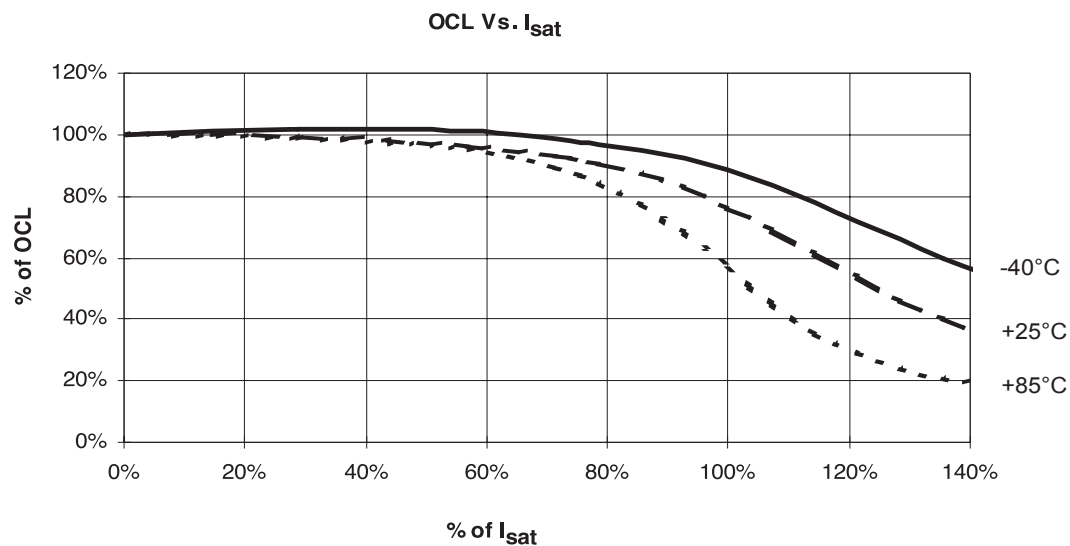
## Core loss vs Bp-p



## Temperature rise vs total loss



## Inductance characteristics



## Solder Reflow Profile

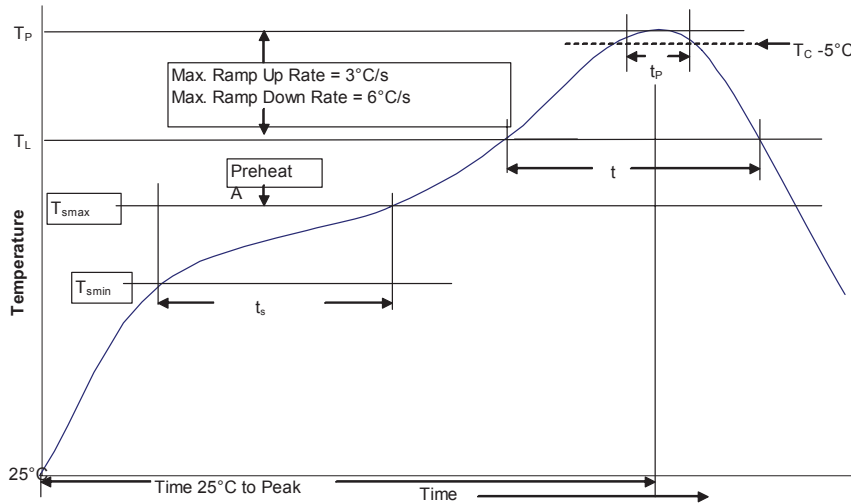


Table 1 - Standard SnPb Solder ( $T_p$ )

| Package Thickness | Volume $mm^3$ <350 | Volume $mm^3$ $\geq 350$ |
|-------------------|--------------------|--------------------------|
| <2.5mm            | 235°C              | 220°C                    |
| $\geq 2.5mm$      | 220°C              | 220°C                    |

Table 2 - Lead (Pb) Free Solder ( $T_p$ )

| Package Thickness | Volume $mm^3$ <350 | Volume $mm^3$ 350 - 2000 | Volume $mm^3$ >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-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        |
| Average ramp up rate $T_{smax}$ to $T_p$                                           | 3°C/ Second Max.     | 3°C/ Second Max.      |
| Liquidous temperature ( $T_L$ )                                                    | 183°C                | 217°C                 |
| Time at liquidous ( $t_L$ )                                                        | 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**          |
| 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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