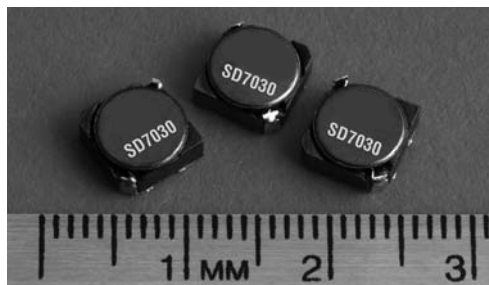


# SD7030

## 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



| Part Number <sup>a</sup> | OCL <sup>1</sup> $\mu\text{H} \pm 30\%$ | $I_{\text{rms}}^2$ (A) | $I_{\text{sat}}^3$ (A) | Typ. DCR $\text{m}\Omega$ @ +25 °C | Max DCR $\text{m}\Omega$ @ +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                   |

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

[illegible]

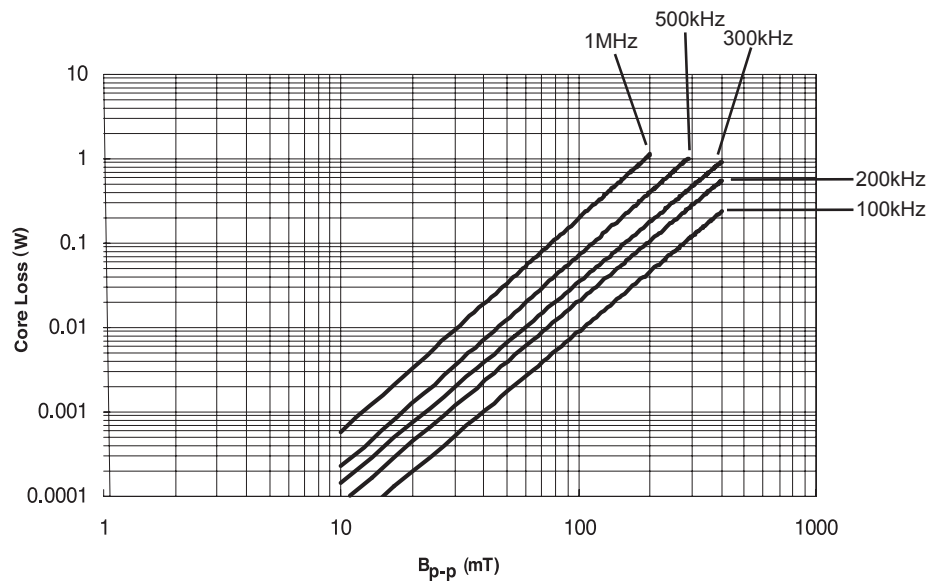
Do not route traces or vias underneath the inductor

Section A-A

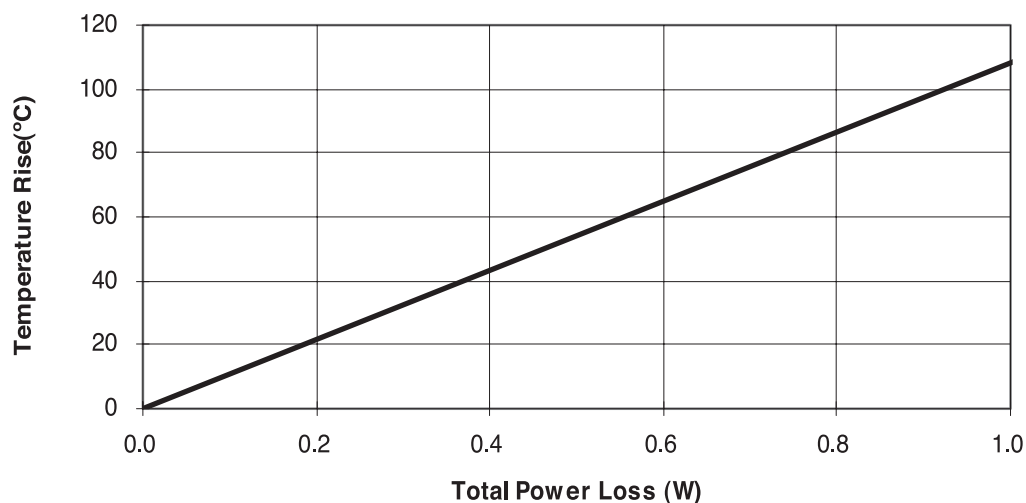
Supplied in tape-and-reel packaging, 1500 parts per reel, 13" diameter reel.

[www.eaton.com/electronics](http://www.eaton.com/electronics)

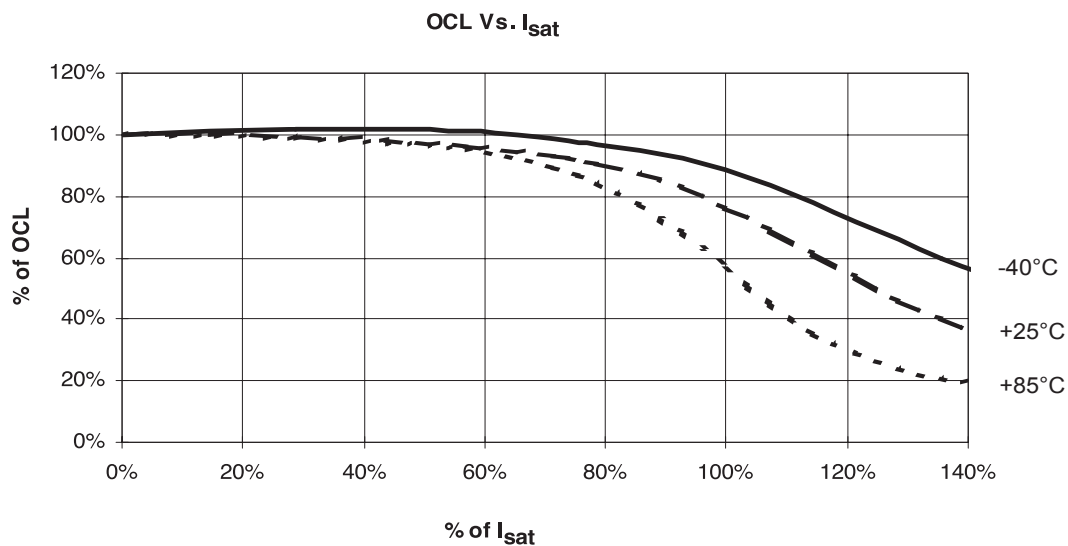
## Core loss vs Bp-p



## Temperature rise vs total loss



## Inductance characteristics



## Solder Reflow Profile

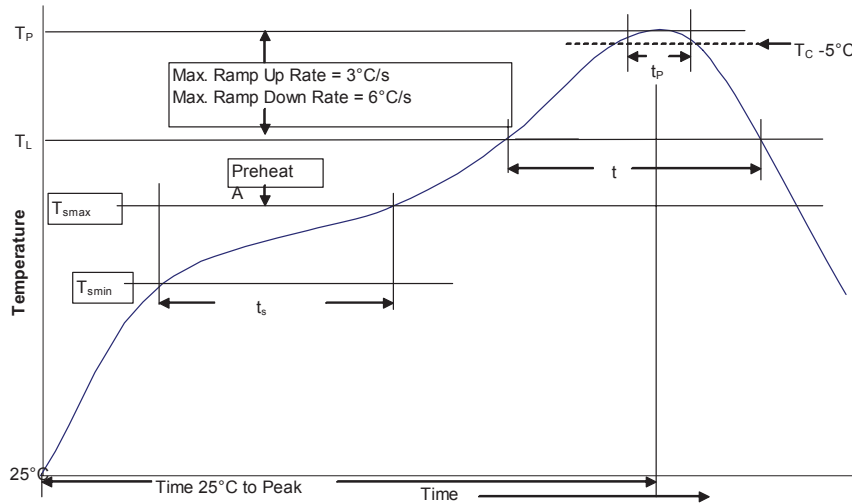


Table 1 - Standard SnPb Solder ( $T_p$ )

| 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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