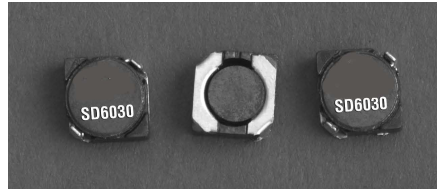


SD6030

Low profile shielded drum core power inductors



Product features

- 6.0 mm x 6.0 mm x 3.0 mm surface mount package
- Ferrite core material
- Shielded drum core reduces EMI
- Inductance range from 2.7 μH to 660 μH
- Current range from 0.16 A to 4.08 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 backup/power

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 ⁵ | OCL ¹ $\mu\text{H} \pm 30\%$ | I_{rms}^2 (A) | I_{sat}^3 (A) | Typ. DCR $\text{m}\Omega @ +20^\circ\text{C}$ | Max DCR $\text{m}\Omega @ +20^\circ\text{C}$ | K-factor ⁴ |
|--------------------------|---|------------------------|------------------------|---|--|-----------------------|
| SD6030-2R7-R | 2.7 | 4.08 | 2.60 | 13 | 18 | 34 |
| SD6030-3R3-R | 3.3 | 3.54 | 2.40 | 18 | 24 | 30 |
| SD6030-4R2-R | 4.1 | 3.11 | 2.20 | 23 | 31 | 27 |
| SD6030-5R0-R | 4.9 | 2.81 | 1.90 | 28 | 38 | 24 |
| SD6030-5R8-R | 5.8 | 2.58 | 1.80 | 33 | 45 | 22 |
| SD6030-7R8-R | 7.8 | 2.38 | 1.60 | 39 | 53 | 19 |
| SD6030-100-R | 9.3 | 2.15 | 1.30 | 48 | 65 | 17 |
| SD6030-120-R | 11.3 | 1.99 | 1.20 | 56 | 76 | 16 |
| SD6030-150-R | 14.1 | 1.71 | 1.10 | 76 | 103 | 14 |
| SD6030-180-R | 17.1 | 1.65 | 1.00 | 82 | 110 | 13 |
| SD6030-220-R | 20.4 | 1.57 | 0.90 | 90 | 122 | 12 |
| SD6030-270-R | 26.0 | 1.31 | 0.85 | 130 | 175 | 11 |
| SD6030-330-R | 32.4 | 1.26 | 0.75 | 140 | 189 | 9.3 |
| SD6030-360-R | 34.4 | 1.19 | 0.70 | 157 | 212 | 8.7 |
| SD6030-440-R | 44.0 | 1.10 | 0.62 | 185 | 250 | 7.9 |
| SD6030-520-R | 52.0 | 0.99 | 0.58 | 226 | 305 | 7.2 |
| SD6030-680-R | 65.6 | 0.92 | 0.52 | 263 | 355 | 6.5 |
| SD6030-820-R | 81.6 | 0.80 | 0.46 | 343 | 463 | 5.9 |
| SD6030-101-R | 94.4 | 0.76 | 0.42 | 385 | 520 | 5.6 |
| SD6030-121-R | 110.1 | 0.70 | 0.40 | 517 | 620 | 5.6 |
| SD6030-151-R | 144.5 | 0.64 | 0.35 | 608 | 730 | 5.0 |
| SD6030-181-R | 175.7 | 0.55 | 0.32 | 817 | 980 | 4.5 |
| SD6030-221-R | 210.9 | 0.50 | 0.30 | 1000 | 1200 | 4.0 |
| SD6030-271-R | 264.2 | 0.44 | 0.27 | 1300 | 1560 | 3.6 |
| SD6030-331-R | 313.5 | 0.38 | 0.25 | 1733 | 2080 | 3.3 |
| SD6030-391-R | 373.7 | 0.35 | 0.22 | 2083 | 2500 | 3.0 |
| SD6030-471-R | 460.0 | 0.33 | 0.20 | 2250 | 2700 | 2.8 |
| SD6030-561-R | 546.2 | 0.30 | 0.18 | 2767 | 3320 | 2.5 |
| SD6030-681-R | 659.4 | 0.27 | 0.16 | 3458 | 4150 | 2.3 |

1) Open Circuit Inductance Test Parameters: 100 kHz, 0.1 V_{rms}, 0.0 Adc.

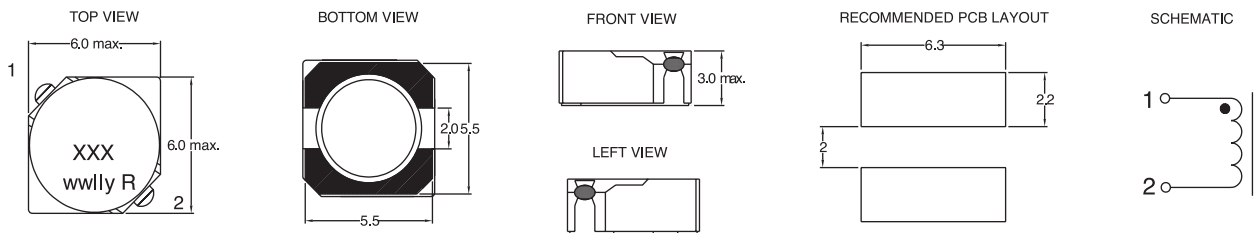
2) I_{rms} : DC current for an approximate ΔT of 40 °C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part not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

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

4) K-factor: Used to determine B_{p-p} for core loss (see graph). $B_{p-p} = K \cdot L \cdot \Delta I$, 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: SD6030-xxx-R
SD6030 = Product code and size; -xxx = Inductance value in μH ; R = decimal point; If no R is present, third character equals number of zeros. -R suffix = RoHS compliant

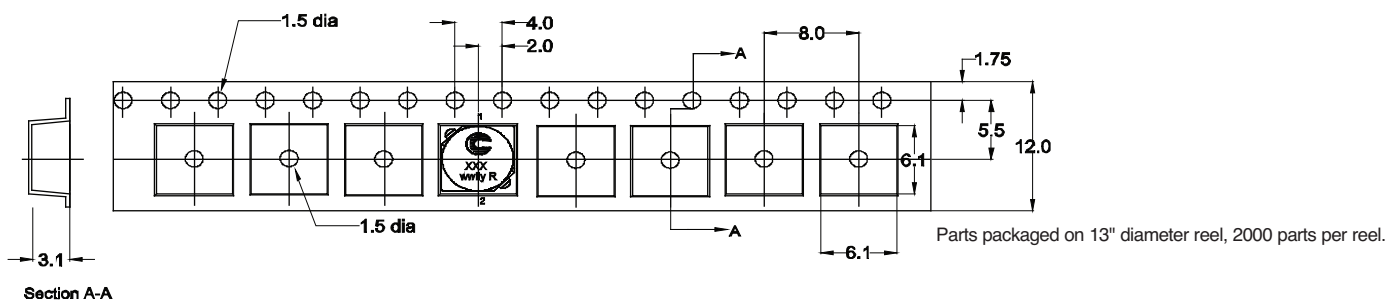
Dimensions-mm



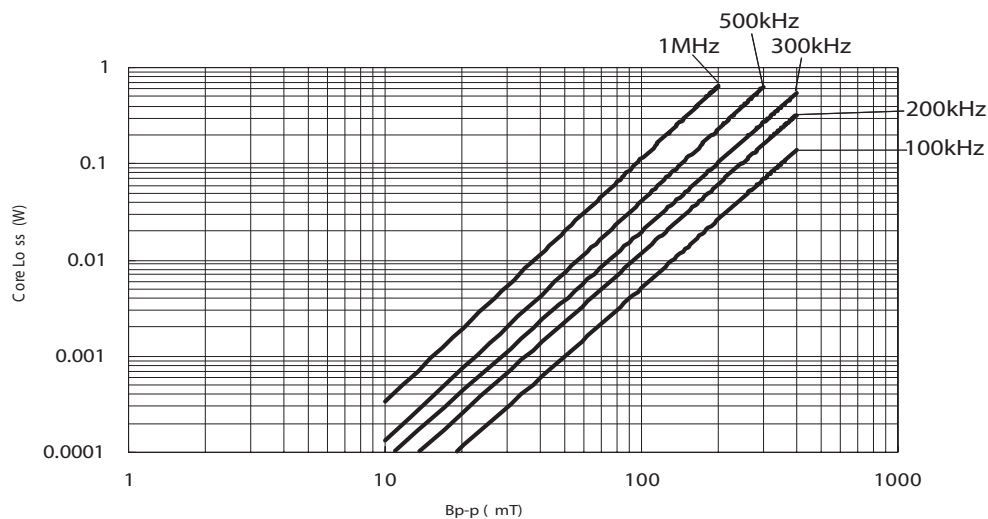
Part Marking: xxx = Inductance value in μH . R = decimal point. If no R is present third character = # of zeros, wwly or wwlyy = Date code, R = Revision level.

Do not route traces or vias underneath the inductor

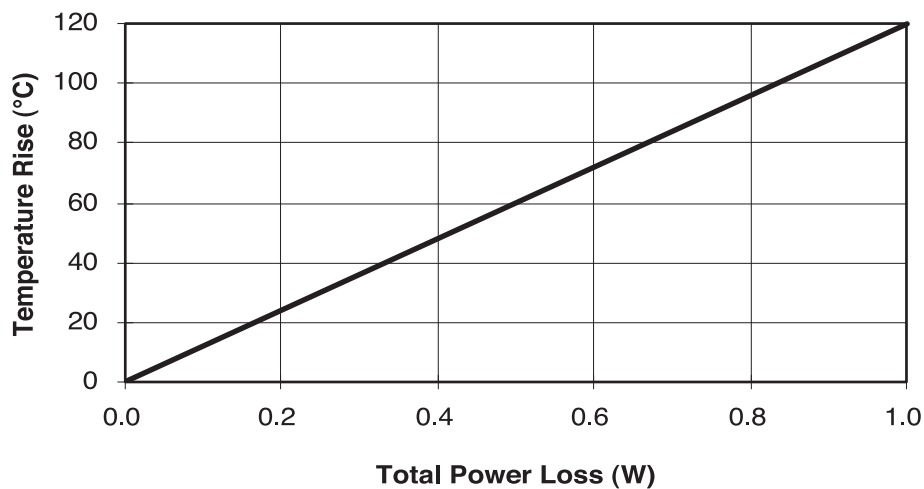
Packaging information-mm



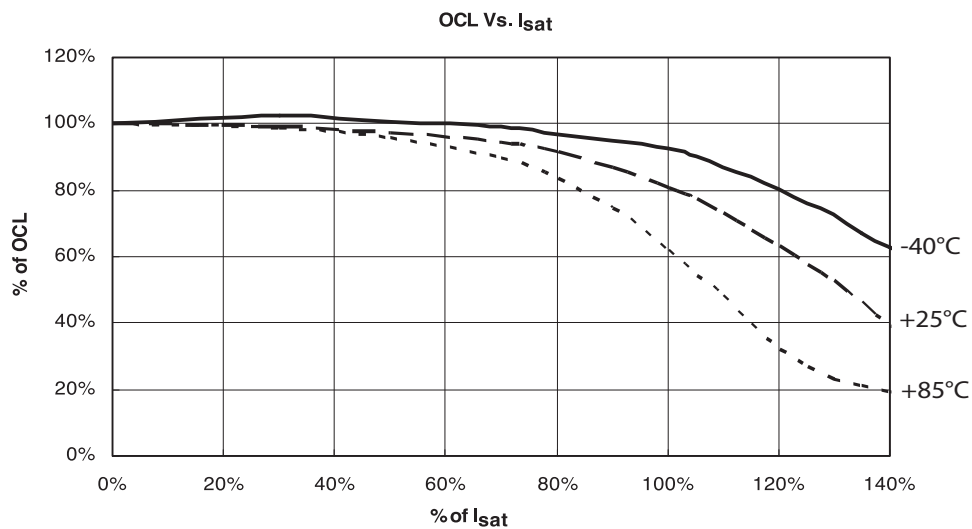
Core loss vs Bp-p



Temperature rise vs total loss



Inductance characteristics



Solder Reflow Profile

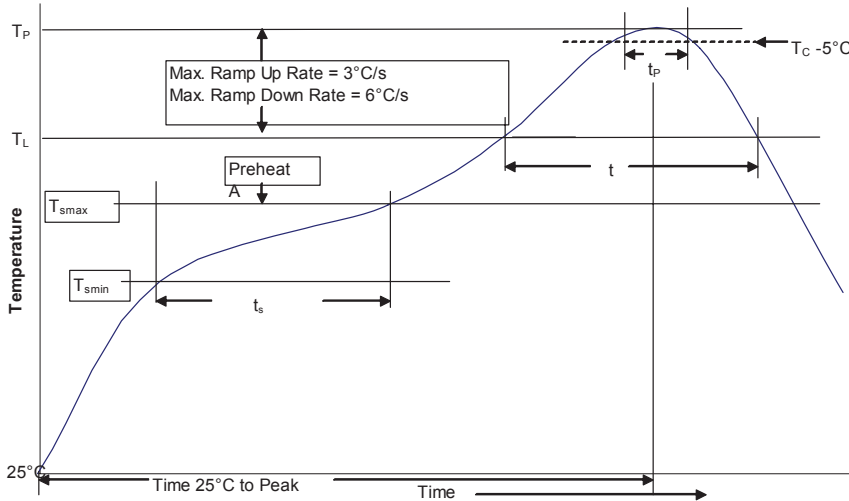


Table 1 - Standard SnPb Solder (T_c)

| Package Thickness | Volume mm^3 <350 | Volume mm^3 ≥ 350 |
|---------------------|---------------------------|---------------------------------|
| <2.5mm | 235°C | 220°C |
| $\geq 2.5\text{mm}$ | 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 |
|-------------------|---------------------------|---------------------------------|----------------------------|
| <1.6mm | 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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