SD52

High power density, low profile shielded power inductors

Product description

- Octagonal shape shielded drum core
- Inductance range from 1.2 uH to 150 uH
- Current range from 0.28 A to 3.14 A
- 5.6 mm x 5.2 mm footprint surface mount package in a 2.0 mm height
- Ferrite core material
- Halogen free, lead free, RoHS compliant

Applications

- Desktop computers
- Notebook and laptop regulators
- Graphics cards
- Digital cameras, media devices

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

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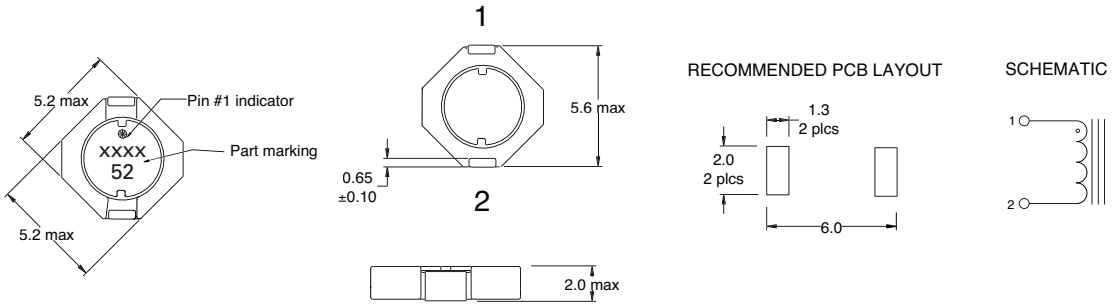
Product Specifications

Part Number[6]	OCL[1] (µH) ±20%	Part marking	I_{rms}[2] (A)	I_{sat}[3] (A)	DCR[4] (Ω) typ.	(V us) typ.
SD52-1R2-R	1.20	A	2.33	3.14	0.0279	1.49
SD52-2R2-R	2.20	B	1.98	2.30	0.0385	2.03
SD52-3R5-R	3.50	C	1.73	1.82	0.0503	2.57
SD52-4R7-R	4.70	D	1.63	1.64	0.0568	2.84
SD52-6R8-R	6.80	E	1.39	1.28	0.0777	3.65
SD52-100-R	10.0	F	1.11	1.11	0.1215	4.19
SD52-150-R	15.0	G	0.97	0.88	0.1618	5.27
SD52-220-R	22.0	H	0.86	0.73	0.2042	6.35
SD52-270-R	27.0	J	0.73	0.65	0.2864	7.16
SD52-330-R	33.0	K	0.70	0.61	0.3074	7.70
SD52-470-R	47.0	L	0.58	0.50	0.4465	9.32
SD52-680-R	68.0	M	0.47	0.42	0.6829	11.21
SD52-101-R	100	N	0.39	0.35	1.0000	13.37
SD52-151-R	150	O	0.31	0.28	1.6100	17.00

1. Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 0.25 Vrms, 0.0 Adc.
2. Irms: DC current for an approximate ΔT of 40 °C without core loss. De-rating is necessary for AC currents. Temperature rise is dependent upon several factors, including the PCB pad layout, trace thickness and width, air-flow and proximity to other heat generating components. It is recommended the part temperature not exceed 125 °C under worst case operating conditions and therefore, the temperature rise should be verified in the end use application.
3. Isat: Peak current for approximately 30% rolloff at +20 °C.
4. DCR limits @ 20°C.
5. Applied Volt-Time product (V-us) across the inductor at 100 kHz necessary to generate a core loss equal to 10% of the total losses for 40 °C temperature rise.
6. Part number definition: SD52-xxx-R
   SD52= Product code and size
   -xxx=Inductance value in µH, R= decimal point - If no R is present, then last character equals the number of zeros

Dimensions (mm)



Part Marking: 1st digit= the inductance value per part marking designator, 2nd digit = bi-weekly production date code, 3rd digit = last digit of the year produced, 4th digit= internal manufacturing code.

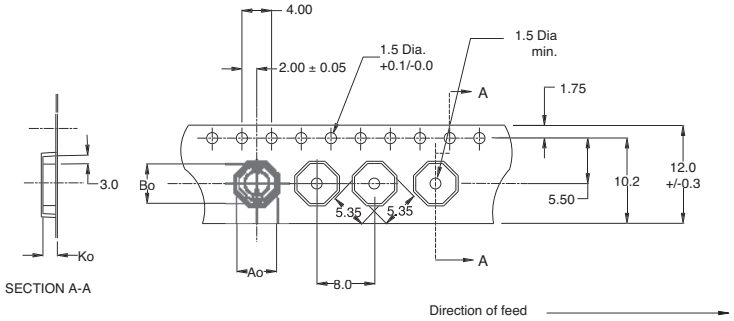
52 = the product size code.

Do not route traces or vias underneath the inductor.

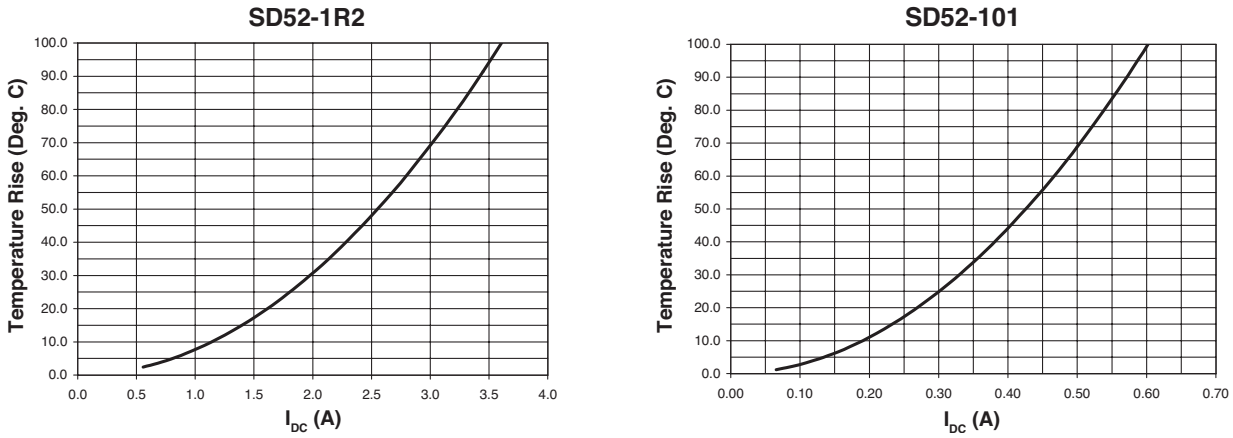
Packaging information (mm)

Parts packaged on 13" Diameter reel, 3,500 parts per reel.

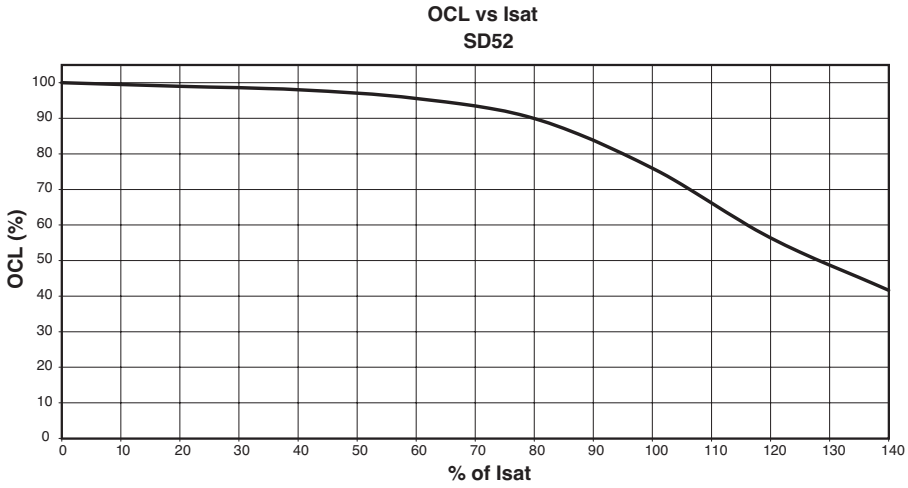
Ao=5.72mm
Bo=5.72mm
Ko=2.30mm



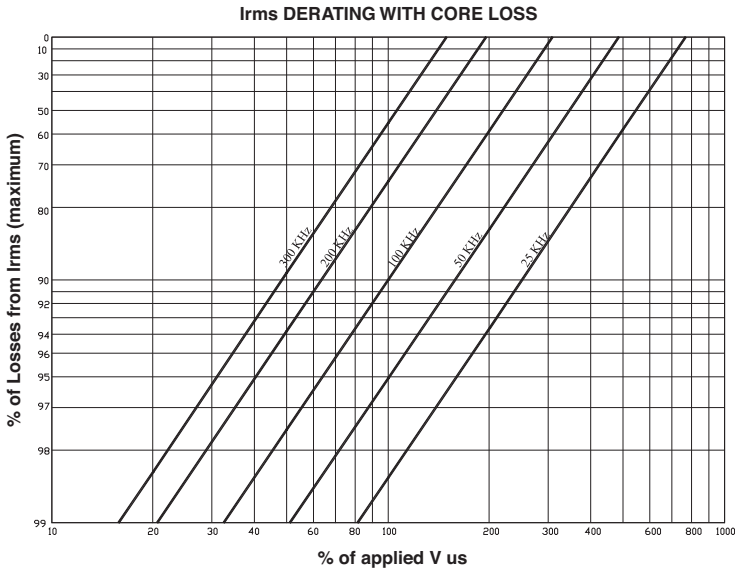
DC current vs.temperature



Inductance characteristics



Core loss



Solder reflow profile

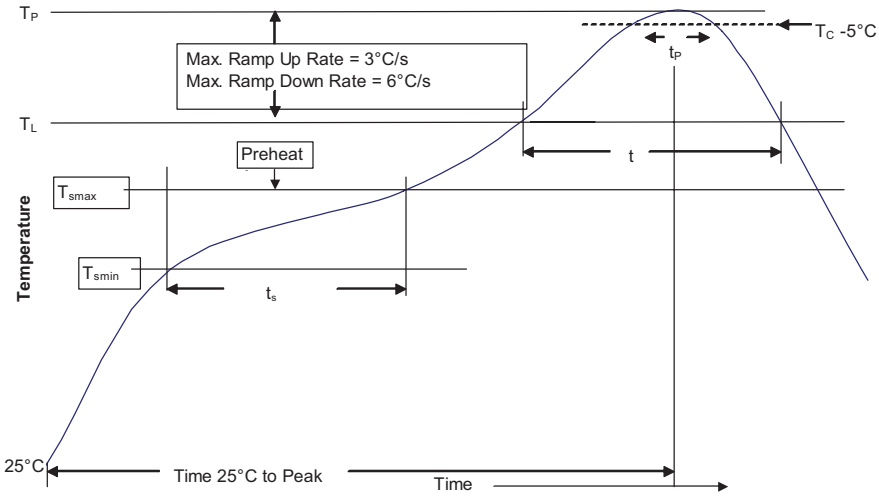


Table 1 - Standard SnPb Solder (T_C)

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 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-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) Time at liquidous (t_L)		183°C 60-150 Seconds	217°C 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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