

# 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

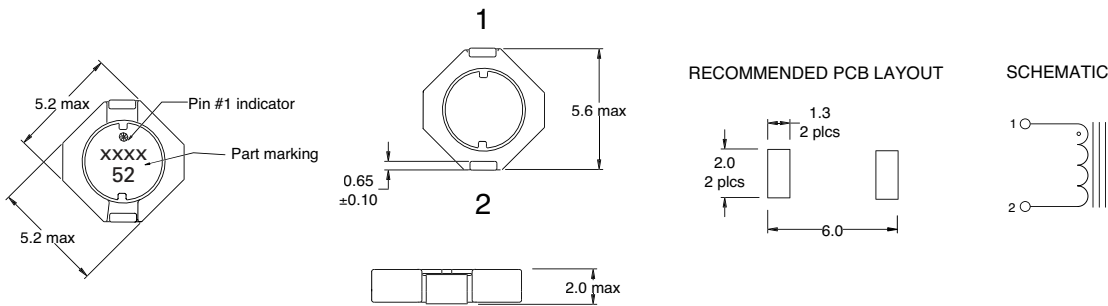


Product Specifications

Part Number <sup>6</sup>	OCL <sup>1</sup> (µH) ±20%	Part marking	$I_{rms}^2$ (A)	$I_{sat}^3$ (A)	DCR <sup>4</sup> (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

- Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 0.25 Vrms, 0.0 Adc.
- 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.
- Isat: Peak current for approximately 30% rolloff at +20 °C.
- DCR limits @ 20°C.
- 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.
- 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)



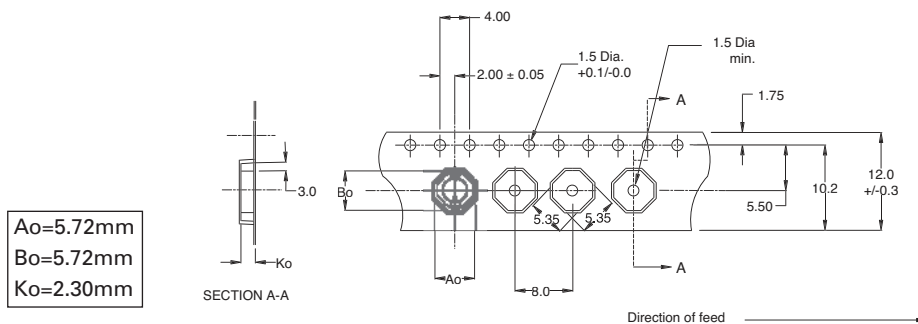
Part Marking: 1st digit= the inductance value per part marking designator, 2nd digit = bi-weekly production date code, 3rd digit = last digit of the year produced, 4th digit= internal manufacturing code.

52 = the product size code.

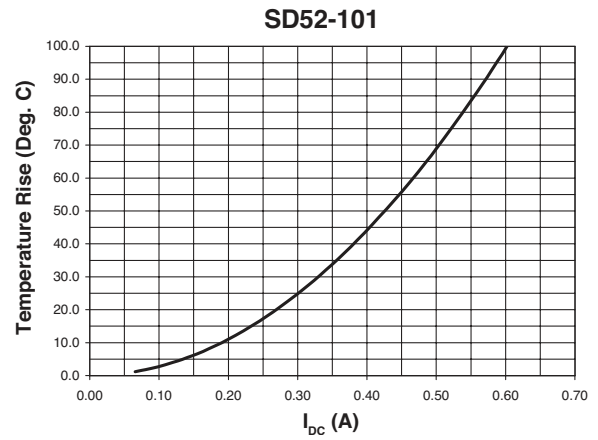
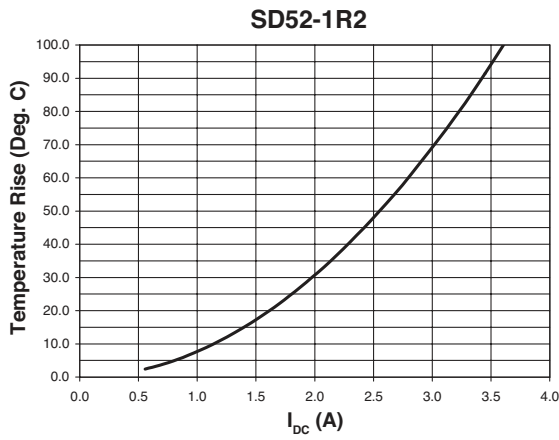
Do not route traces or vias underneath the inductor.

Packaging information (mm)

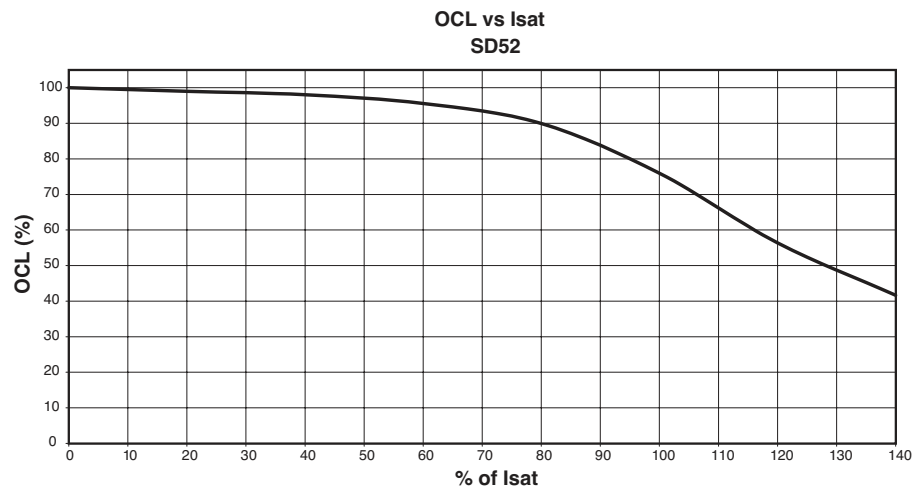
Parts packaged on 13" Diameter reel, 3,500 parts per reel.



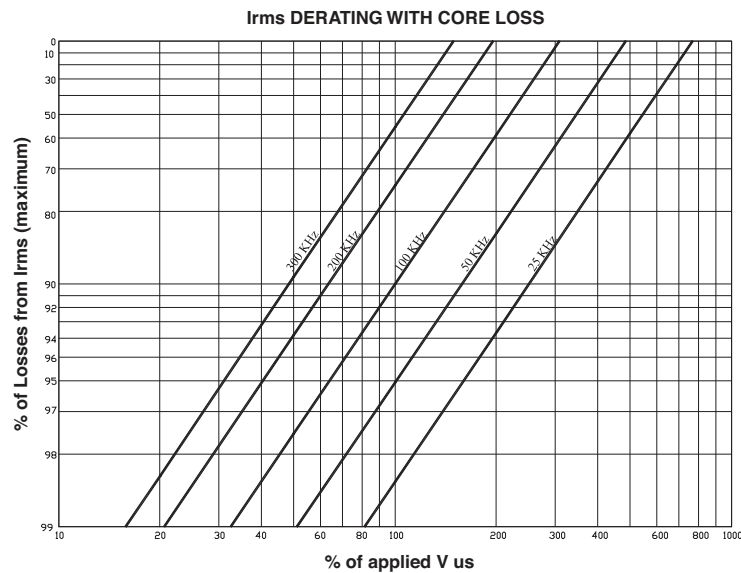
DC current vs. temperature



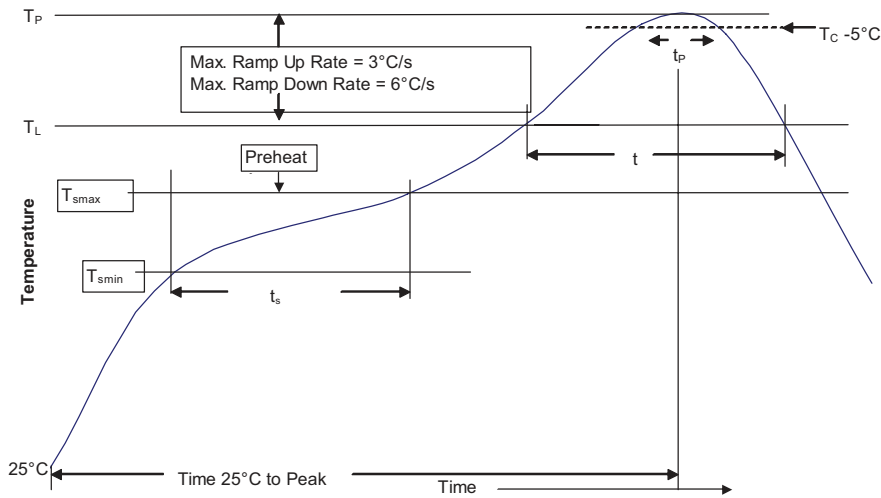
Inductance characteristics



Core loss



**Solder reflow profile**



**Table 1 - Standard SnPb Solder (T<sub>c</sub>)**

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5mm)	235°C	220°C
≥2.5mm	220°C	220°C

**Table 2 - Lead (Pb) Free Solder (T<sub>c</sub>)**

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >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 <sub>smin</sub> )	100°C	150°C
• Temperature max. (T <sub>smax</sub> )	150°C	200°C
• Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )	60-120 Seconds	60-120 Seconds
Average ramp up rate T <sub>smax</sub> to T <sub>p</sub>	3°C/ Second Max.	3°C/ Second Max.
Liquidous temperature (T <sub>L</sub> )	183°C	217°C
Time at liquidous (t <sub>L</sub> )	60-150 Seconds	60-150 Seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )** within 5 °C of the specified classification temperature (T <sub>c</sub> )	20 Seconds**	30 Seconds**
Average ramp-down rate (T <sub>p</sub> to T <sub>smax</sub> )	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<sub>p</sub>) is defined as a supplier minimum and a user maximum.

\*\* Tolerance for time at peak profile temperature (t<sub>p</sub>) is defined as a supplier minimum and a user maximum.

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