SD53

Low profile shielded power inductors

Product description

- Octagonal shape utilizes board space
- Shielded drum core
- Inductance range from 1.1 uH to 100 uH
- Current range from 0.44 A to 4.8 A
- 5.7 mm x 5.2 mm footprint surface mount package in a 3.0 mm height
- Ferrite core material
- Halogen free, lead free, RoHS compliant

Applications

- Desktop computers
- Notebook and laptop regulators
- LED and White LED drivers
- Digital cameras, media devices
- Battery power systems

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-020D compliant

Pb HALOGEN HF FREE RoHS

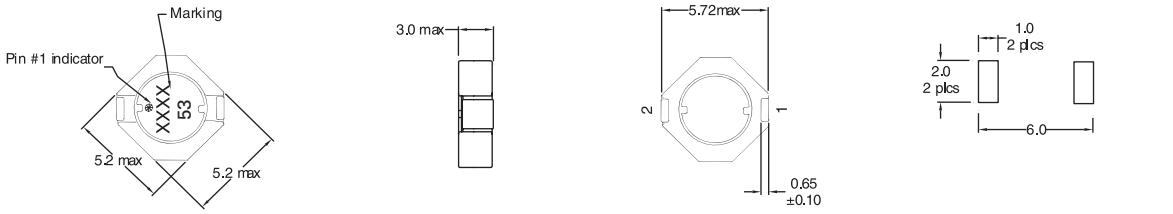
Powering Business Worldwide

Product Specifications

Part Number[5]	OCL1 (µH) ±20%	Part marking	I_{rms}[2] (A)	I_{sat}[3] (A)	DCR (Ω) typical @ 20 °C	DCR (Ω) maximum @ 20 °C	K-factor[4]
SD53-1R1-R	1.10	A	3.25	4.80	0.017	0.020	48
SD53-2R0-R	2.00	B	2.64	3.30	0.023	0.027	35
SD53-3R3-R	3.30	C	2.26	2.60	0.029	0.034	28
SD53-4R7-R	4.70	D	2.01	2.10	0.039	0.045	21
SD53-6R8-R	6.80	E	1.65	1.85	0.059	0.068	20
SD53-100-R	10.0	F	1.41	1.40	0.077	0.090	15
SD53-150-R	15.0	G	1.10	1.10	0.122	0.142	12
SD53-220-R	22.0	H	0.81	0.94	0.179	0.208	10
SD53-330-R	33.0	I	0.75	0.76	0.221	0.257	8
SD53-470-R	47.0	J	0.64	0.64	0.303	0.352	7
SD53-680-R	68.0	K	0.52	0.58	0.452	0.525	6
SD53-101-R	100	L	0.44	0.45	0.689	0.801	5

1. 1. Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 0.1 Vrms, 0.0 Adc.
2. Irms: 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. Isat: Peak current for approximately 30% rolloff @ 25 °C.
4. K-factor: Used to determine B p-p for core loss (see graph). B p-p = K*L*ΔI, B p-p(mT), K: (K factor from table), L: (Inductance in uH), ΔI (Peak to peak ripple current in Amps).
5. Part Number Definition: SD53-xxx-R
   SD53 = Product code and size; -xxx = Inductance value in uH; R = decimal point;
   If no R is present then third character equals the number of zeros.
   -R suffix = RoHS compliant.

Dimensions (mm)

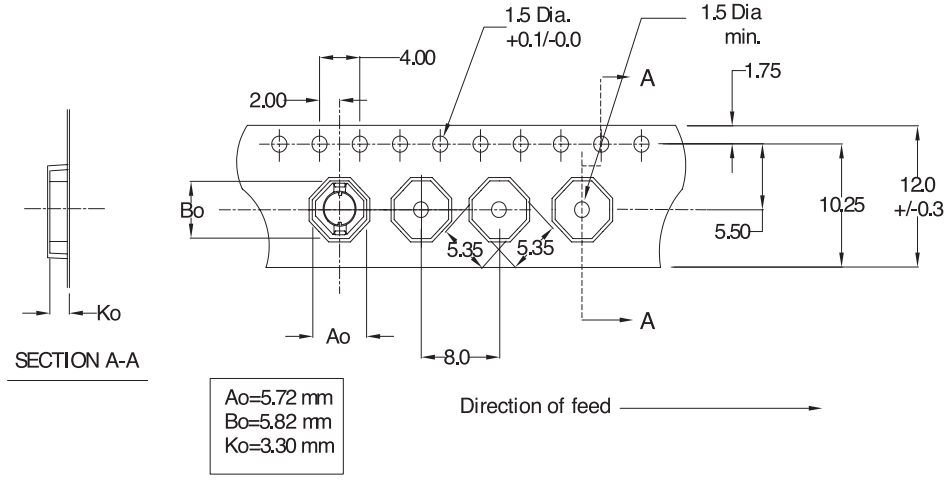


Part Marking: Line 1: (1st digit= inductance value per Part Marking Designator); (2nd digit= Bi-weekly production date code); (3rd digit= Last digit of the year produced), (4th digit= Internal manufacturing code). Line 2: 53=product size code)

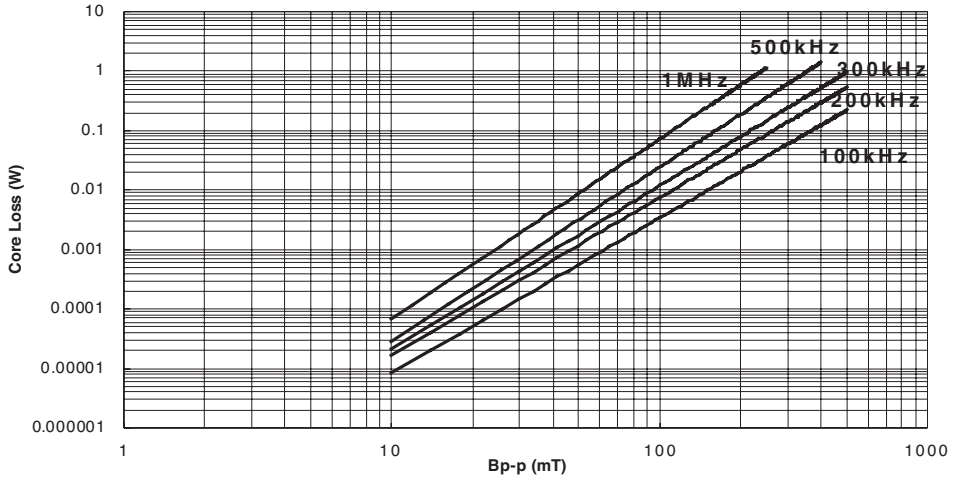
Do not route traces or vias underneath the inductor

Packaging information (mm)

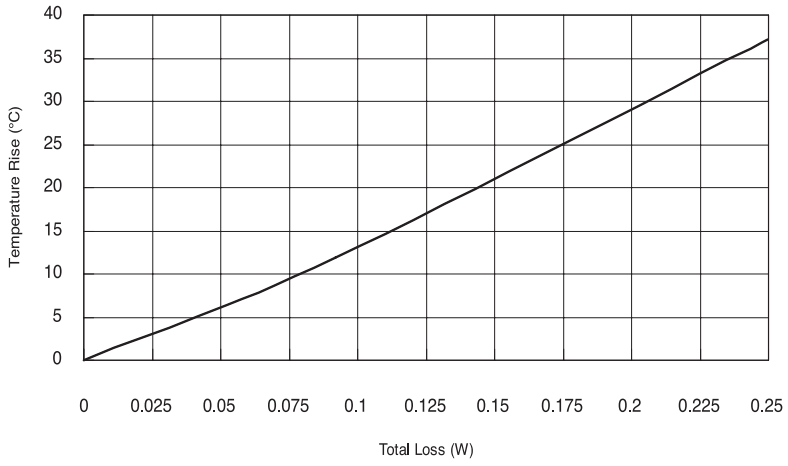
Parts packaged on 13" diameter reel, 2,600 parts per reel.



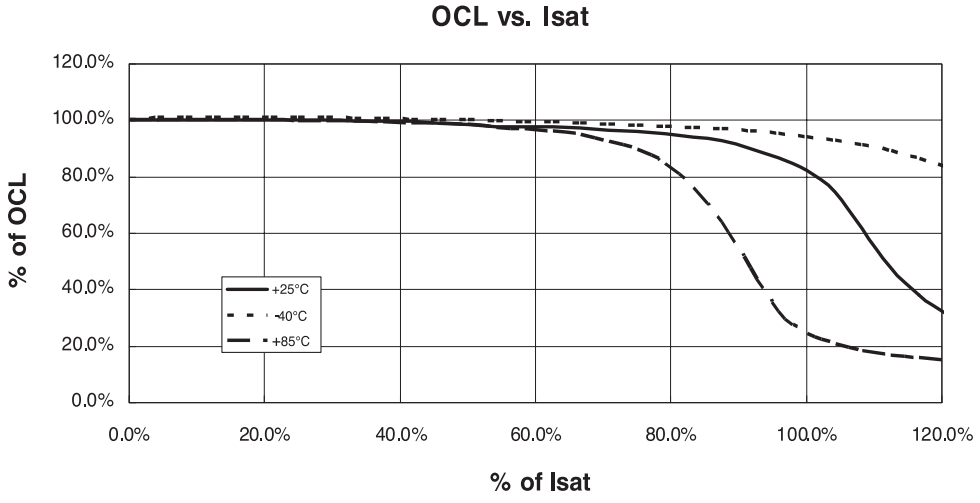
Core loss vs. Bp-p



Temperature rise vs. total loss



Inductance characteristics



Solder reflow profile

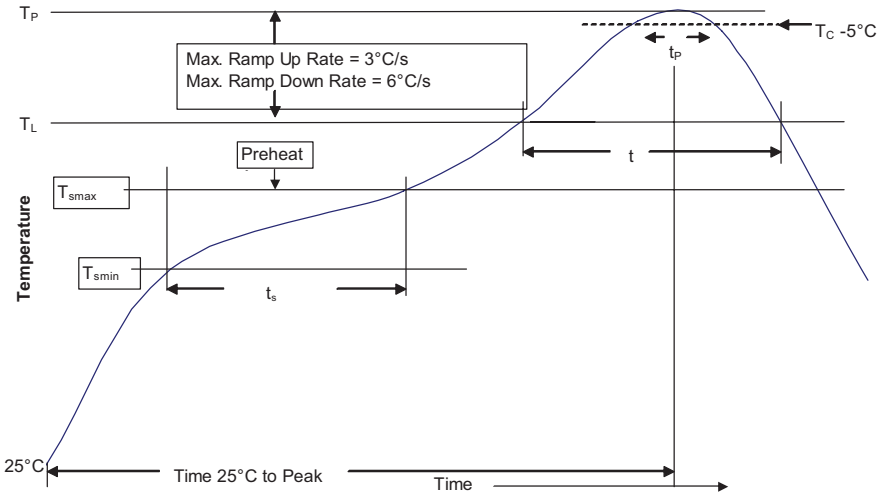


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume 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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