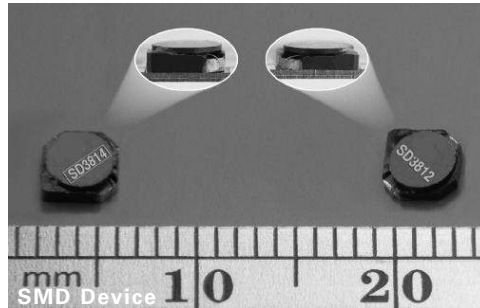


# SD38

## Low profile metalized shielded drum core power inductors



### Applications

- Mobile phones
- Digital cameras
- Media players
- Small LCD displays
- LED driver and LED flash circuits
- Hard disk drives
- LCD Backlighting

### 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: STD-020 (latest revision) compliant

### Product features

- 3.8 mm x 3.8 mm shielded drum cores available 1.2 mm and 1.4 mm heights
- Current range from 0.1 A to 4 A
- Inductance range from 0.47 uH to 680 uH
- Ferrite shielded, low EMI
- Ferrite core material

RoHS



Powering Business Worldwide

Discontinued, Effective July 2016 (SD3812) and August 2016 (SD3814) or until inventory is depleted. Please review MPI4012-V2, SD14, or MPI2512-V2 as an alternate replacement.

**Product specifications**

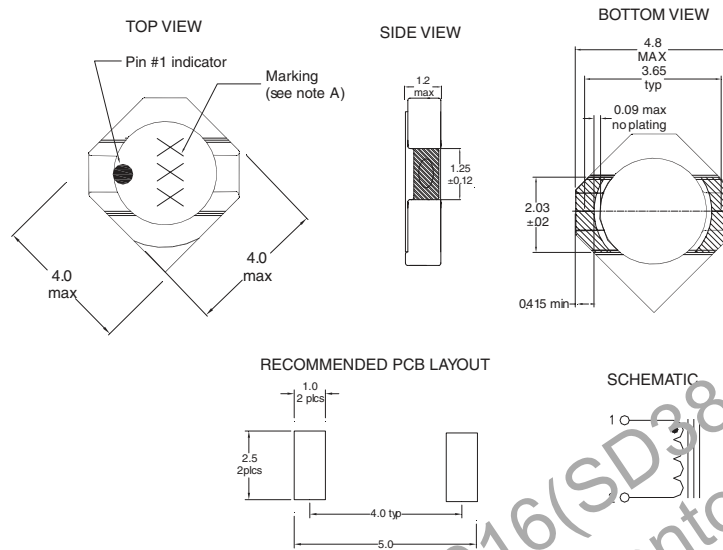
Part Number	Rated Inductance (μH)	OCL (1) +/-15% (μH)	Part Marking Designator	Irms (2) (A)	Isat (3) (A)	DCR (4) (Ω) Typ.	Volt (5) u-sec Typ.
SD3812-R47-R	0.47	0.405	A	2.53	3.89	0.030	2.52
SD3812-1R0-R	1.0	0.845	B	2.00	2.69	0.048	3.64
SD3812-1R2-R	1.2	1.125	C	1.71	2.33	0.066	4.20
SD3812-1R5-R	1.5	1.445	D	1.58	2.06	0.078	4.76
SD3812-2R2-R	2.2	2.205	E	1.32	1.67	0.111	5.88
SD3812-3R3-R	3.3	3.125	F	1.10	1.40	0.159	7.0
SD3812-4R7-R	4.7	4.805	G	0.87	1.13	0.256	8.7
SD3812-6R8-R	6.8	6.845	H	0.80	0.95	0.299	10.4
SD3812-8R2-R	8.2	8.405	I	0.690	0.854	0.406	11.5
SD3812-100-R	10.0	10.125	J	0.662	0.778	0.441	12.6
SD3812-150-R	15.0	15.125	K	0.539	0.636	0.665	15.4
SD3812-220-R	22.0	21.125	L	0.499	0.538	0.776	18.2
SD3812-330-R	33.0	32.805	M	0.399	0.432	1.212	22.7
SD3812-470-R	47.0	47.045	N	0.327	0.361	1.879	27.2
SD3812-680-R	68.0	68.445	O	0.269	0.299	2.666	32.8
SD3812-820-R	82.0	80.645	P	0.259	0.276	2.885	36
SD3812-101-R	100.0	99.405	Q	0.217	0.248	4.090	39
SD3812-151-R	150.0	149.645	R	0.178	0.202	6.130	43
SD3812-221-R	220.0	218.405	S	0.160	0.167	7.585	59
SD3814-R47-R	0.47	0.360	A	2.81	4.44	0.020	2.16
SD3814-R82-R	0.82	0.752	B	2.18	3.06	0.033	3.12
SD3814-1R2-R	1.2	1.001	C	1.85	2.67	0.046	3.60
SD3814-1R5-R	1.5	1.286	D	1.76	2.35	0.051	4.08
SD3814-2R2-R	2.2	1.962	E	1.43	1.90	0.077	5.04
SD3814-3R3-R	3.3	2.781	F	1.21	1.60	0.093	6.0
SD3814-4R7-R	4.7	4.276	G	1.06	1.29	0.141	7.4
SD3814-6R8-R	6.8	6.768	H	0.87	1.03	0.207	9.4
SD3814-8R2-R	8.2	8.228	I	0.753	0.930	0.279	10.3
SD3814-100-R	10.0	9.830	J	0.713	0.851	0.311	11.3
SD3814-150-R	15.0	14.453	K	0.574	0.702	0.481	13.7
SD3814-220-R	22.0	21.186	L	0.519	0.580	0.589	16.6
SD3814-330-R	33.0	32.151	M	0.418	0.471	0.908	20.4
SD3814-470-R	47.0	47.210	N	0.346	0.388	1.322	24.7
SD3814-680-R	68.0	67.324	O	0.285	0.325	1.951	29.5
SD3814-820-R	82.0	81.101	P	0.270	0.296	2.174	32
SD3814-101-R	100.0	98.794	Q	0.228	0.268	3.048	36
SD3814-151-R	150.0	149.026	R	0.191	0.219	4.359	44
SD3814-221-R	220.0	217.342	S	0.170	0.181	5.480	53
SD3814-331-R	330.0	326.812	T	0.136	0.148	8.59	65
SD3814-471-R	470.0	470.031	U	0.111	0.123	12.85	78
SD3814-681-R	680.0	680.320	V	0.100	0.102	15.78	94

(1) Test Parameters: 100 kHz, 0-100 Vrms, 0.0 Adc.  
 (2) RMS current for an approximate ΔT of 40 °C without core loss. It is recommended that the temperature of the part not exceed +125 °C. Derating is necessary for AC current.  
 (3) 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. De-rating of the Irms is required to prevent excessive temperature rise.

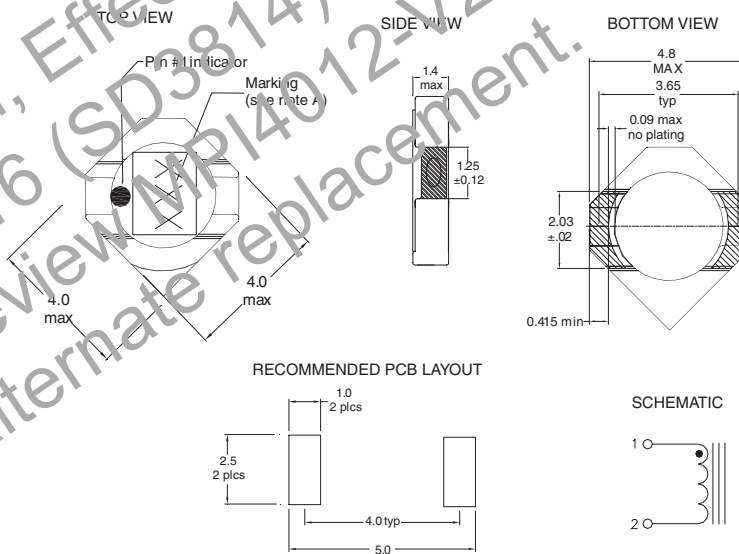
Dimensions- mm

SD3812



Note A: 3 digit marking. First digit indicates inductance value per chart above.  
 Second digit indicates bi-weekly date code.  
 Third digit of year produced. Box indicates SD3814 part.  
 Do not route traces or vias underneath the inductor

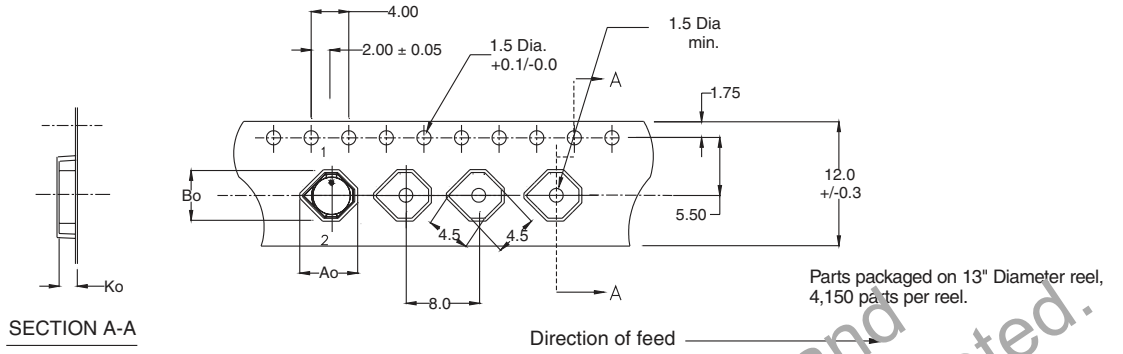
SD3814



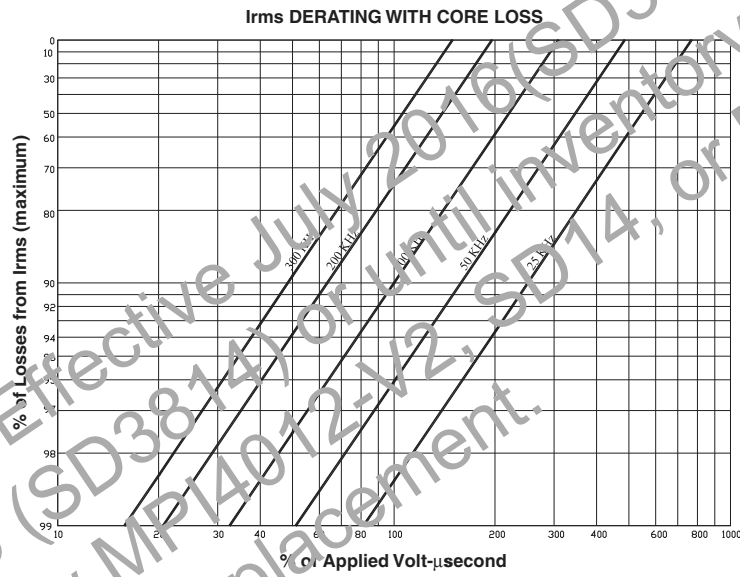
Note A: 3 digit marking. First digit indicates inductance value per chart above.  
 Second digit indicates bi-weekly date code.  
 Third digit of year produced. Box indicates SD3814 part.  
 Do not route traces or vias underneath the inductor

Packaging information- mm

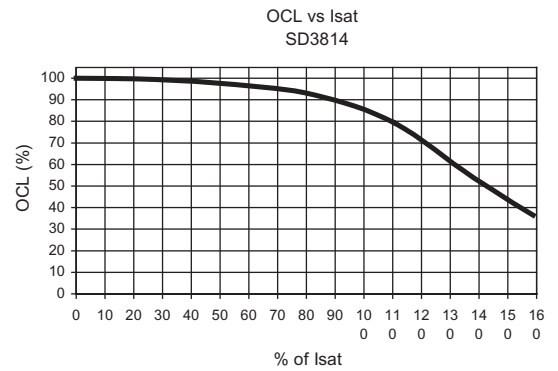
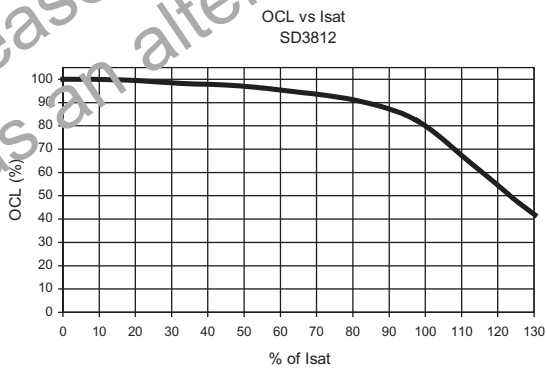
A0=5.1mm  
B0=4.6mm  
K0=1.6mm



Core loss



Inductance characteristics



**Solder Reflow Profile**

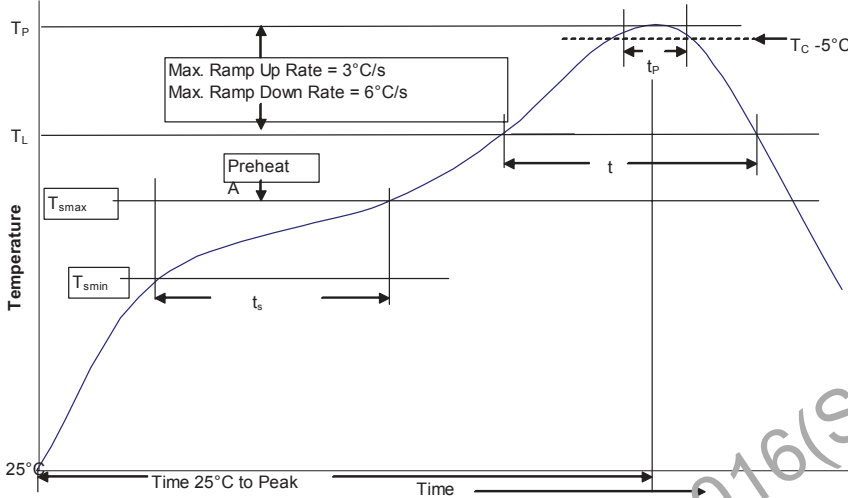


Table 1 - Standard SnPb Solder ( $T_C$ )

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

Table 2 - Lead (Pb) Free Solder ( $T_C$ )

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350 - 2000	Volume $\text{mm}^3$ $\geq$ 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	<ul style="list-style-type: none"> <li>Temperature min. (<math>T_{smin}</math>) 100°C</li> <li>Temperature max. (<math>T_{smax}</math>) 150°C</li> <li>Time (<math>T_{smin}</math> to <math>T_{smax}</math>) (<math>t_s</math>) 60-120 Seconds</li> </ul>	<ul style="list-style-type: none"> <li>150°C</li> <li>200°C</li> <li>60-120 Seconds</li> </ul>
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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