SMD Power Inductors

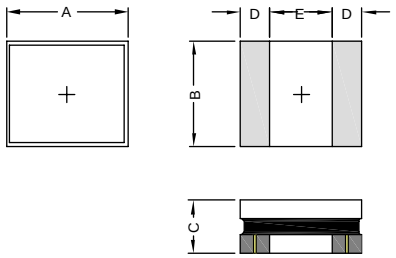
SDS252012D SERIES

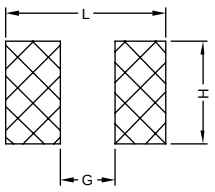
1. PART NO. EXPRESSION :

S D S	2 5 2 0 1 2	D	1 0 0	M	F
(a)	(b)	(c)	(d)	(e)	(f)

(a) Series code
(b) Dimension code
(c) Material code
(d) Inductance code : 100 = 10.0uH
(e) Tolerance code : M = ± 20%
(f) F : RoHS Compliant

2. CONFIGURATION & DIMENSIONS :



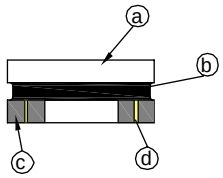


Recommended PCB Pattern

Unit:m/m

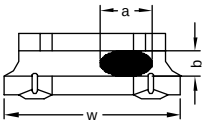
A	B	C	D	E	L	G	H
2.5 -0.1/+0.2	2.0 -0.05/+0.35	1.2 Max.	0.85 Ref.	0.80 Ref.	2.9 Ref.	0.8 Ref.	2.4 Ref.

3. MATERIALS :



(a) Core : Ferrite Core
(b) Coating : Epoxy with magnetic powder
(c) Termination : Tin Pb Free
(d) Wire : Enameled Copper Wire

Exposed wire tolerance limit of coating resin part on product side.
Size of exposed wire occurring to coating resin is specified below.
1. Width direction（dimension a）: Acceptable when a≦w/2
Nonconforming when a＞w/2
2. Length direction（dimension b）: Dimension b is not specified.
3. The total area of exposed wire occurring to each sides is
not greater than 50% of coating resin area, and is acceptable.



RoHS Compliant

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4. GENERAL SPECIFICATION :

a) ambient temp. : 25° C

b) Isat : Based on inductance change (ΔL/L0 : ≦-30%)

c) Irms : Based on temperature rise (ΔT : 40°C) Max

d) Operating temp. : -55° C to 125° C(for products in unopened tape package, less than 40° C)

5. ELECTRICAL CHARACTERISTICS :

Part No.	Inductance (uH)	Test Frequency (Hz)	DCR (Ω)±20%	Isat (A) Typ.	Irms (A) Typ.
SDS252012D100MF	10± 20%	0.1V/1M	0.410	0.85	0.75
SDS252012D220MF	22± 20%	0.1V/1M	0.850	0.56	0.50

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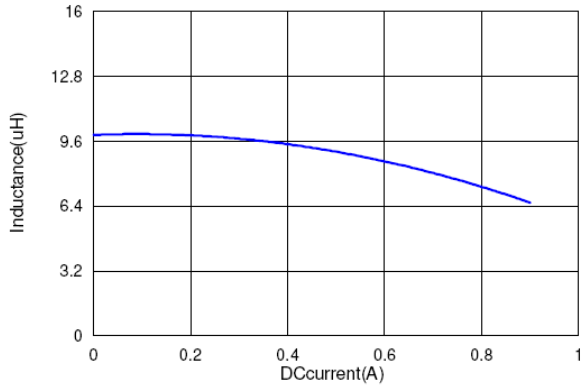
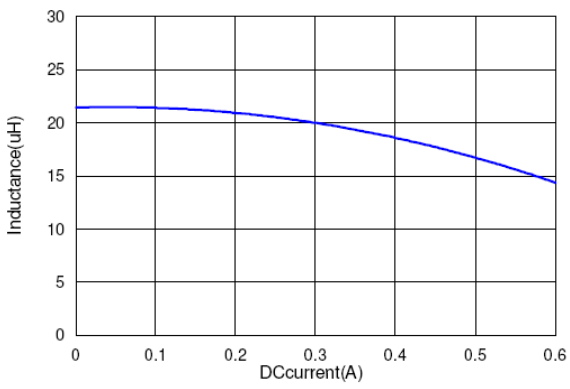
6. CHARACTERISTICS CURVES :

SDS252012D100MF



SDS252012D220MF



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7. RELIABILITY AND TEST CONDITION :

<table>
<tr><th>ITEM</th><th>PERFORMANCE</th><th>TEST CONDITION</th></tr>
<tr><td colspan="3">Electrical Characteristics Test</td></tr>
<tr><td>Inductance L</td><td rowspan="4">Refer to standard electrical characteristics list</td><td>Agilent-4291, Agilent-4287
Agilent-4192, Agilent-4285</td></tr>
<tr><td>Q</td></tr>
<tr><td>SRF</td><td>Agilent-4291</td></tr>
<tr><td>DC Resistance</td><td>Agilent-4338</td></tr>
<tr><td>Rated Current</td><td>Base on temp. rise & ΔL/L0A≦30%.</td><td>Saturation DC Current (Isat) will cause L0
to drop approximately ΔL(%).</td></tr>
<tr><td>Temperature Rise Test</td><td>ΔT 40°CMax</td><td>Heat Rated Current (Irms) will cause the coil temperature rise approximately ΔT(°C) without core loss.
1.Applied the allowed DC current.
2.Temperature measured by digital surface thermometer</td></tr>
<tr><td colspan="3">Mechanical Performance Test</td></tr>
<tr><td>Solder Heat Resistance</td><td>Appearance : No damage.
Inductance : within± 10% of initial value
Q : Shall not exceed the specification value.
RDC : within ± 15% of initial value and shall not exceed the specification value</td><td><table><tr><th>Temperature (° C)</th><th>Time (s)</th><th>Temperature ramp/immersion and emersion rate</th><th>Number of heat cycles</th></tr><tr><td>260± 5 (solder temp)</td><td>10± 1</td><td>25mm/s± 6 mm/s</td><td>1</td></tr></table>Depth: completely cover the termination</td></tr>
<tr><td>Solderability Test</td><td>More than 95% of terminal electrode should be covered with solder.</td><td>Preheat : 150° C,60sec
Solder : Sn99.5%-Cu0. 5%
Temperature : 245± 5° C
Flux for lead free : Rosin. 9.5%
Dip time : 4± 1sec
Depth : completely cover the termination</td></tr>
<tr><td colspan="3">Reliability Test</td></tr>
<tr><td>Life Test</td><td rowspan="4">Appearance : No damage.
Inductance : within± 10% of initial value
Q : Shall not exceed the specification value.
RDC : within ± 15% of initial value and shall not exceed the specification value</td><td>Preconditioning:Run through IR reflow for 2 times.(IPC/ JEDEC J-STD-020DClassification Reflow Profiles
Temperature : 85± 2° C(Inductor)
Applied current : rated current
Duration : 1000± 12hrs
Measured at room temperature after placing for 24± 2 hrs</td></tr>
<tr><td>Thermal shock</td><td>Preconditioning:Run through IR reflow for 2 times.(IPC/ JEDEC J-STD-020DClassification Reflow Profiles
Step1 : -40± 2° C 30± 5min
Step2 : 25±2°C ≦0.5min
Step3 : 105± 2° C 30± 5min
Number of cycles : 500
Measured at room fempraturc after placing for 24± 2 hrs</td></tr>
<tr><td>Humidity Resistance Test</td><td>Preconditioning:Run through IR reflow for 2 times.(IPC/ JEDEC J-STD-020DClassification Reflow Profiles
Humidity : 85±2％R.H
Temperature : 85° C± 2° C
Duration : 1000hrs Min. with 100% rated current
Measured at room temperature after placing for 24± 2 hrs</td></tr>
<tr><td>Vibration Test</td><td>Preconditioning:Run through IR reflow for 2 times.(IPC/ JEDEC J-STD-020DClassification Reflow Profiles
Oscillation Frequency : 10～2K～10Hz for 20 minutes
Equipment : Vibration checker
Total Amplitude : 1.52mm± 10%
Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)</td></tr>
</table>

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8. SOLDERING AND MOUNTING :

8-1. Soldering

Mildly activated rosin fluxes are preferred. Our terminations are suitable for all wave and re-flow soldering systems.
If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

8-1.1 Lead Free Solder Re-flow :

Recommended temperature profiles for re-flow soldering in Figure 1.

8-1.2 Soldering Iron (Figure 2) :

Products attachment with soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.
Note :

a) Preheat circuit and products to 150° C.
b) 355° C tip temperature (max)
c) Never contact the ceramic with the iron tip
d) 1.0mm tip diameter (max)
e) Use a 20 watt soldering iron with tip diameter of 1.0mm
f) Limit soldering time to 4-5 secs.

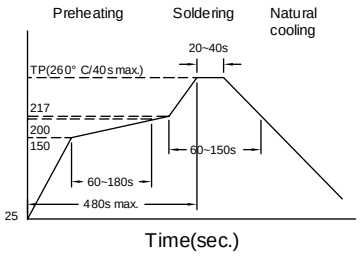

Figure 1. Re-flow Soldering : 3 times max.

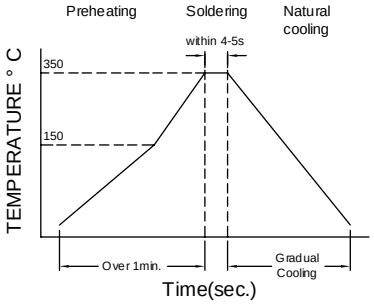

Figure 2. Iron Soldering : 1 times max.

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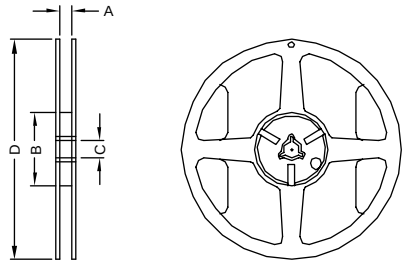
9. PACKAGING INFORMATION :

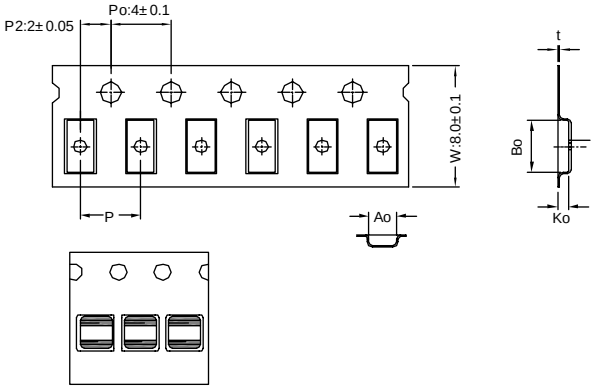
9-1. Reel Dimension



7" x 8mm

Type	A(mm)	B(mm)	C(mm)	D(mm)
7" x 8mm	8.4± 1.0	50 Min.	13± 0.8	178± 2

9-2 Tape Dimension / 8mm



Bottom View

Series	Ao(mm)	Bo(mm)	Ko(mm)	P(mm)	t(mm)
SDS252012D	2.45± 0.1	2.85± 0.1	1.40± 0.1	4.0± 0.1	0.23± 0.05

9-3. Packaging Quantity

Size	SDS252012D
Chip / Reel	2000

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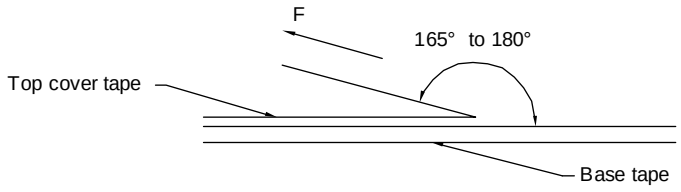
9-4. Tearing Off Force



The force for tearing off cover tape is 15 to 80 grams in the arrow direction under the following conditions.

Room Temp. (° C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed (mm/min)
5~35	45~85	860~1060	300

Application Notice

1. Storage Conditions :
   To maintain the solderabililty of terminal electrodes :
   a) Temperature and humidity conditions : Less than 40° C and 60% RH.
   b) Recommended products should be used within 12 months from the time of delivery.
   c) The packaging material should be kept where no chlorine or sulfur exists in the air.

2. Transportation :
   a) Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
   b) The use of tweezers or vacuum pick up is strongly recommended for individual components.
   c) Bulk handling should ensure that abrasion and mechanical shock are minimized.

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