SMD Power Inductors

SPS252010C SERIES

1. PART NO. EXPRESSION :

S P S 2 5 2 0 1 0 C 4 R 7 Y F
(a) (b) (c) (d)(e)

(a) Series code

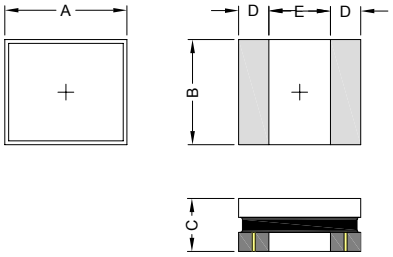
(b) Dimension code

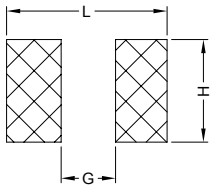
(c) Inductance code : 4R7 = 4.70uH

(d) Tolerance code : Y=±30%

(e) F : RoHS Compliant

2. CONFIGURATION & DIMENSIONS :



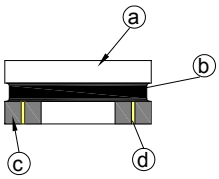


Recommended PCB Pattern

Unit:m/m

A	B	C	D	E	L	G	H
2.5 -0.1/+0.3	2.0 -0.05/+0.35	1.02 Max.	0.85 Ref.	0.80 Ref.	2.9 Ref.	0.8 Ref.	2.4 Ref.

3. MATERIALS :



(a) Core : Ferrite N4 Core

(b) Coating : Epoxy

(c) Termination : Tin Pb Free

(d) Wire : Enameled Copper Wire

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)

d) Operating temp. : -40°C to 85°C(for products in unopened tape package, less than 40°C)

RoHS Compliant

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26.02.2013

5. ELECTRICAL CHARACTERISTICS :

Part No.	Inductance (uH)	Test Frequency (Hz)	RDC (Ω)±20%	Isat (A) Typ.	Isat (A) Max.	Irms (A) Typ.	Irms (A) Max.
SPS252010CR47YF	0.47±30%	0.1V/1M	0.030	2.85	2.57	2.80	2.50
SPS252010CR68YF	0.68±30%	0.1V/1M	0.039	2.70	2.45	2.40	2.20
SPS252010C1R0YF	1.0±30%	0.1V/1M	0.055	2.20	1.89	2.20	1.80
SPS252010C1R5YF	1.5±30%	0.1V/1M	0.075	1.90	1.58	1.80	1.50
SPS252010C2R2MF	2.2±20%	0.1V/1M	0.100	1.62	1.39	1.68	1.30
SPS252010C3R3MF	3.3±20%	0.1V/1M	0.145	1.30	1.17	1.34	1.10
SPS252010C4R7MF	4.7±20%	0.1V/1M	0.215	1.20	1.08	1.10	1.00
SPS252010C6R8MF	6.8±20%	0.1V/1M	0.315	0.90	0.77	0.90	0.80
SPS252010C100MF	10±20%	0.1V/1M	0.420	0.73	0.65	0.82	0.65
SPS252010C150MF	15±20%	0.1V/1M	0.600	0.55	0.50	0.55	0.50
SPS252010C220MF	22±20%	0.1V/1M	0.830	0.50	0.40	0.40	0.35

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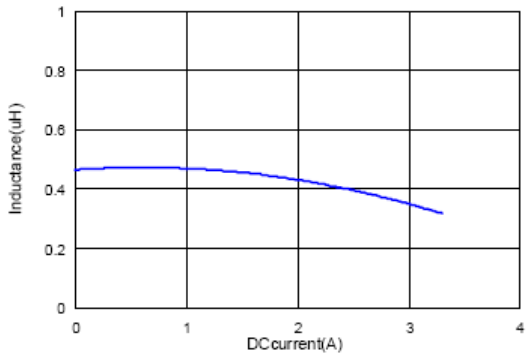
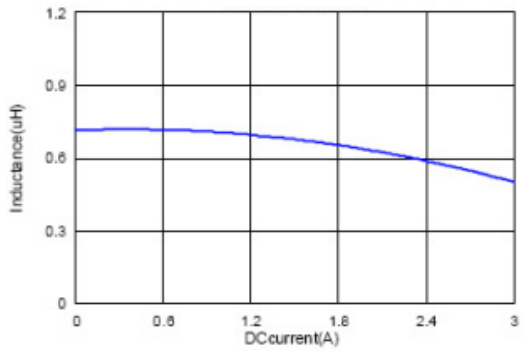
6. CHARACTERISTICS CURVES :

SPS252010CR47YF



SPS252010CR68YF



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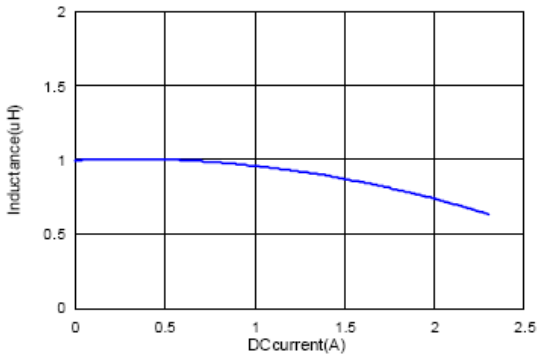

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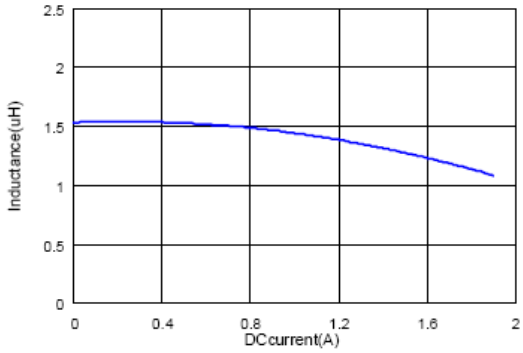
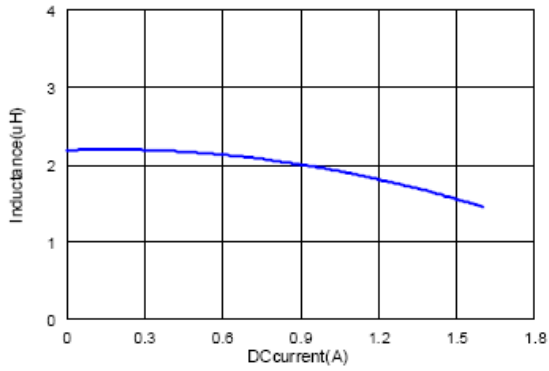
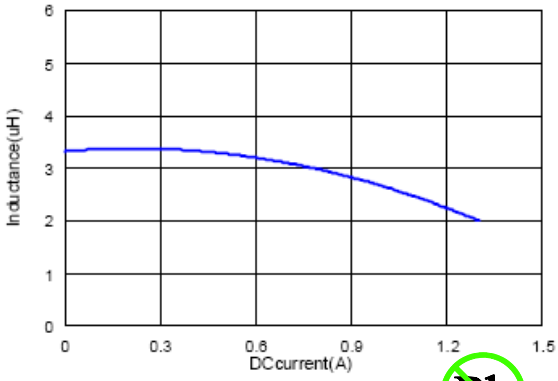


SPS252010C2R2MF



SPS252010C3R3MF



Pb

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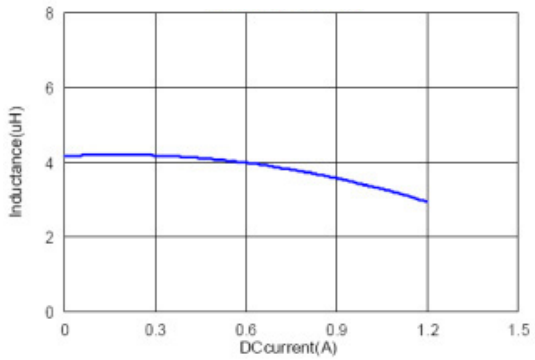
6. CHARACTERISTICS CURVES :

SPS252010C4R7MF



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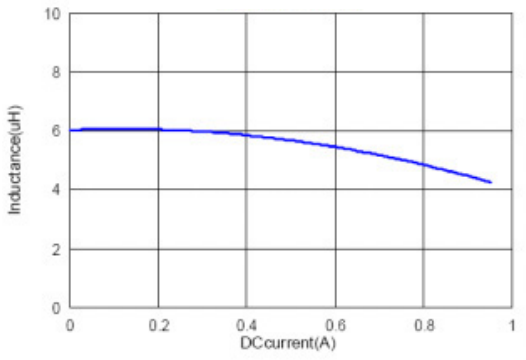
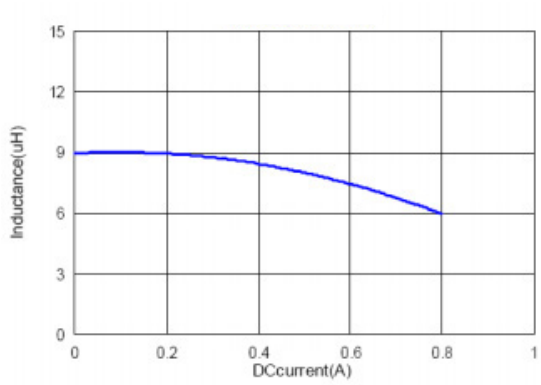
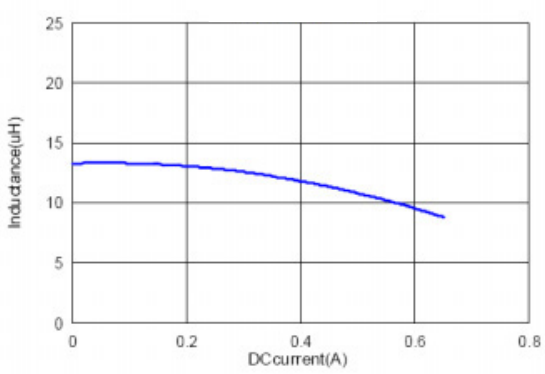


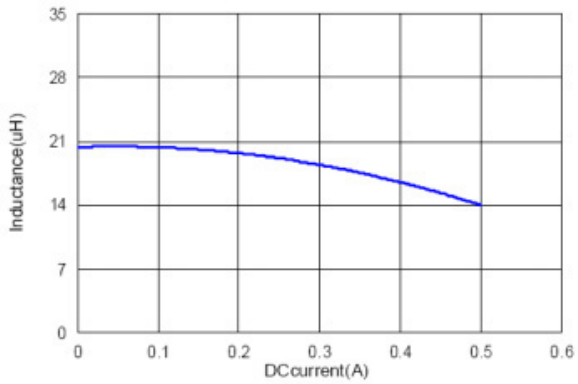
SPS252010C100MF



SPS252010C150MF



SPS252010C220MF



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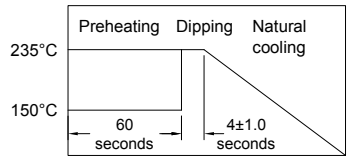
7. RELIABILITY AND TEST CONDITION

<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 rowspan="2">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>Resistance to Soldering Heat
MIL-STD-202
METHOD 210</td><td>1. Inductors shall be no evidence of electrical and and mechanical damage.
2. Inductance : within ±10% of initial value</td><td>Temp. : 260±5°C
Time : 10±1.0 Sec</td></tr>
<tr><td>Solderability Test
ANSI/J-STD-002</td><td>More than 95% of terminal electrode should be covered with solder.</td><td> 

After fluxing,component shall be dipped in a melted solder bath at 235±5°C for 4±1seconds.</td></tr>
<tr><td colspan="3">Reliability Test</td></tr>
<tr><td>Humidity Test
MIL-STD-202
METHOD 103</td><td rowspan="2">1. Visual examination : No mechanical damage
2. Inductance : within±10% of initial value</td><td>Temperature : 40±2°C
Humidity : 90-95%
Time : 500±8 hrs
Measured at room temperature after placing for 2 to 3hrs</td></tr>
<tr><td>Thermal Shock
MIL-STD-202
METHOD 107</td><td>Conditions for 1 cycle.
<table>
<tr><th>Step</th><th>Temperature (°C)</th><th>Times (min.)</th></tr>
<tr><td>1</td><td>-55±2</td><td>30±3</td></tr>
<tr><td>2</td><td>Room Temperature</td><td>Within5</td></tr>
<tr><td>3</td><td>85±5</td><td>30±3</td></tr>
</table>
Total:100 cycles
Measured at room temperature after placing for 2 to 3 hrs</td></tr>
</table>

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7. RELIABILITY & TEST CONDITION :

ITEM	PERFORMANCE	TEST CONDITION
High Temperature Life Test MIL-STD-202 METHOD 108		Temperature : 85±2°C Duration : 500±8 hrs. Measured at room temperature after placing for 2 to 3 hrs
Low Temperature Storage Test JESD22-A119		Temperature : -40±2°C Duration : 500±8 hrs. Measured at room temperature after placing for 2 to 3 hrs
Humidity Resistance Test MIL-STD-202 METHOD 103		Temperature:40±2°C Humidity:90~ 95% Time:500±8hr. Recovery:2 to 3hrs of recovery under the standard condition after the removal from test chamber.
Random Vibration Test MIL-STD-202 Method 204	Appearance: Cracking, shipping and any other defects harmful to the characteristics should not be allowed. Impedance: within±30%	Frequency: 10-55-10Hz for 15 min. Amplitude: 1.52mm Directions and times: X, Y, Z directions for 15 min. This cycle shall be performed 12 times in each of three mutually perpendicular directions (Total 9hours).

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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.

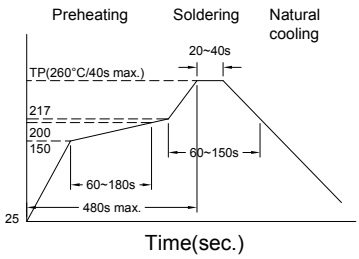

Figure 1. Re-flow Soldering : 3 times max.

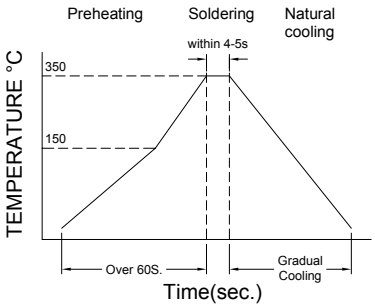

Figure 2. Iron Soldering : 1 times max.

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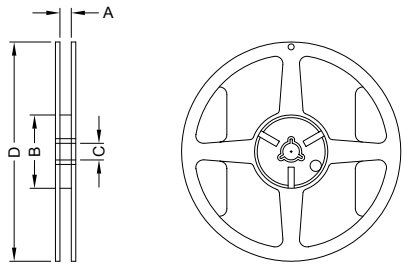
9. PACKAGING INFORMATION :

SPS252010C SERIES

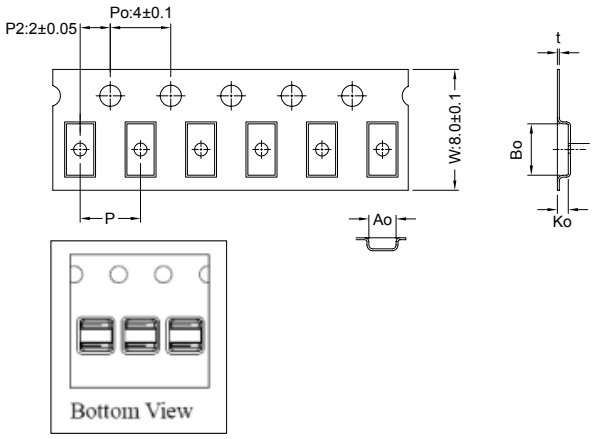
9-1. Reel Dimension



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



Series	Ao(mm)	Bo(mm)	Ko(mm)	P(mm)	t(mm)
SPS252010	2.45±0.1	3.10±0.1	1.40±0.1	4.2±0.05	0.23±0.05

9-3. Packaging Quantity

Size	SPS252010
Chip / Reel	2000

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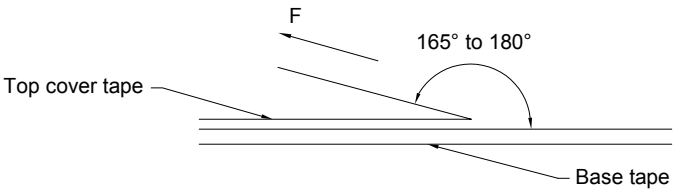
9-4. Tearing Off Force



The force for tearing off cover tape is 15 to 60 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.

Pb

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