1.Scope

This specification applies to the HDSL series of SMD power inductors.

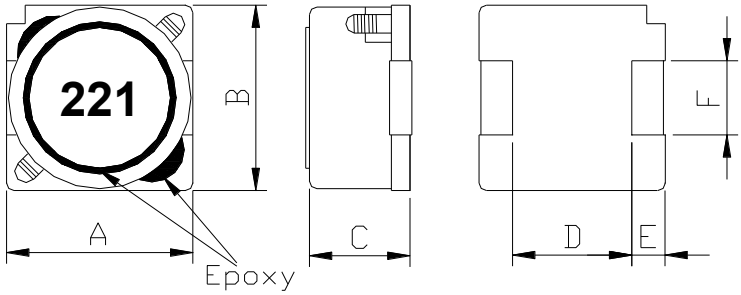
2. Product Identification

HDSL	12555 –	220	M	-	LF
①	②	③	④		⑤

① Series name
② Product dimensions
③ Inductance Value ： (5R6:5.6uH 330:33uH; 101:100uH)
④ Inductance Tolerance：(K:10% ; M:20% ; N:30%)
⑤ ROHS complaint / REACH complaint

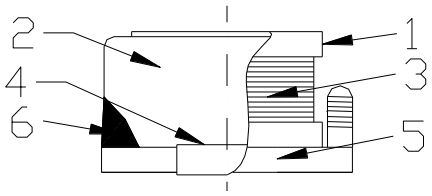
3. Construction

3.1Shape And Dimensions



Dimensions in mm						
Model	A	B	C	D	E	F
HDSL12555	12.5±0 .3	12.5±0.3	5.8 Max.	8.5 ref.	2.0 ref.	3.0 ref.

3.2 Material List



No.	Item	Material
1	DRore	Ferrite
2	RI Core	Ferrite
3	Wire	Enameled Copper Wire
4	Terminal Electrode	Tin Covered Copper
5	Base	Plastic
6	Epoxy	Epoxy Adhesive

5.Testing Conditions

Unless otherwise specified
Temperature : Ordinary Temperature (5 to 35℃)
Humidity : Ordinary Humidity (<70% RH)
Atmospheric Pressure : 86 to 106 kPa

In case of doubt
Temperature : 20±2℃
Humidity : 50 to 65% RH
Atmospheric Pressure : 86 to 106 kPa

6.Electrical Characteristics and Test Instruments

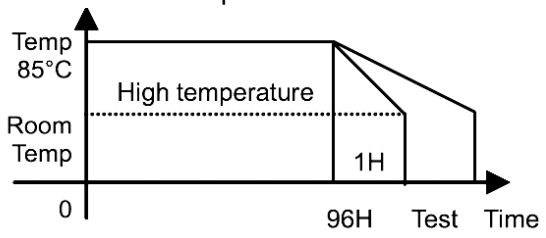
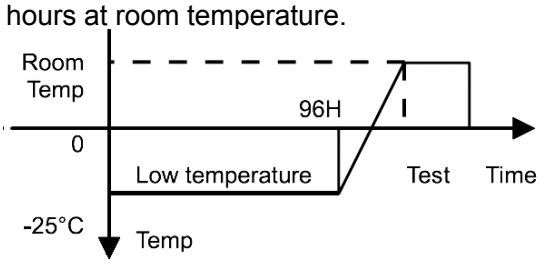
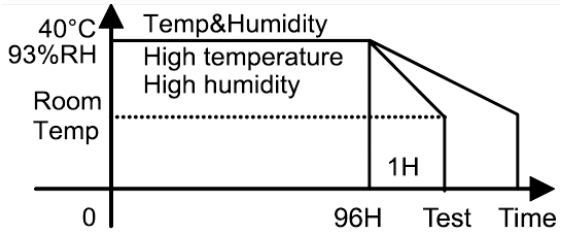
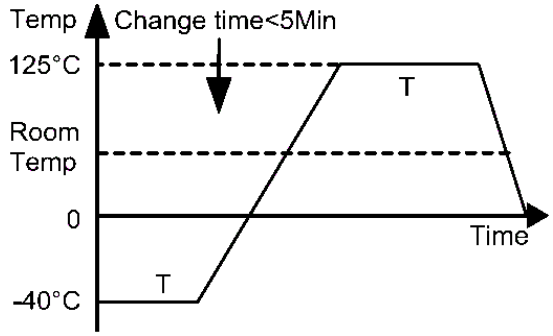
Operating temperature:-40~85℃
Storage temperature and Humidity Range: -40~125℃ & 30% to 70% .

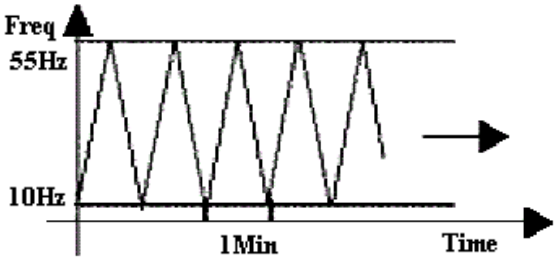
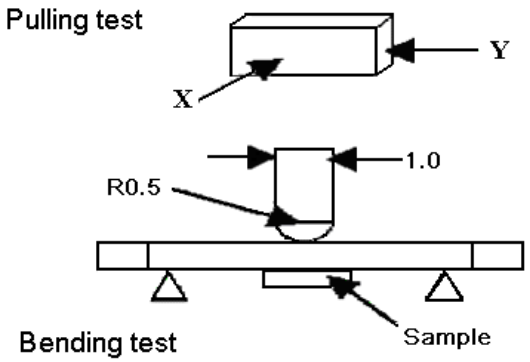
HONGDA Part No.	Customer Part No.	Inductance (uH)	DCR (mΩ)max	IDC (A) max
HDSL12555-221M-LF		220±20%	324	0.72

Test instruments and remarks

* CHROMA 3302 meter for L and DCR/CHROMA 3302 and 1320 meter for IDC;
* Test condition: 100KHz &1V at 20℃ambient;
* Rated current:
IDC direct current at which the inductance drops approximate 30% from its value without current.
and direct current when the temperature of the product rise (△T =40°C) from 20°C ambient.

7. Reliability and Test Condition

<table>
<tr><th>Item</th><th>Required Characteristics</th><th>Test Method/Condition</th></tr>
<tr><td>High temperature storage test</td><td rowspan="3">1. No case deformation or change in appearance.
2. |ΔL|/L≤10%</td><td>Temperature: 85±2℃
Time : 96±2 hours
Tested not less than 1 hours, nor more than 2 hours at room temperature.
 
</td></tr>
<tr><td>Low temperature storage test</td><td>Temperature : -25±2℃
Time : 96±2 hours
Tested not less than 1 hour, nor more than 2 hours at room temperature.
 
</td></tr>
<tr><td>Humidity test</td><td>1. Dry oven at a temperature of 40±5℃ for 24 hours.
2. Measurements at the end of this period.
3. Exposure : Temperature:40±2℃, Humidity : 93±3% RH Time : 96±2 hours.
4. Tested while the specimens are still in the chamber.
5. Tested not less than 1 hour, nor more than 2 hours at room temperature.
 
</td></tr>
<tr><td>Thermal shock test</td><td>1. No case deformation or change in appearance.
2. |ΔL|/L≤10%
For T:
<table>
<tr><th>Weigh</th><th>Time</th></tr>
<tr><td>W≤28g</td><td>15 Minute</td></tr>
<tr><td>28g≤W≤136g</td><td>30 Minute</td></tr>
</table></td><td>First -40℃ for T time, last 125℃ T time as 1 cycle. Go through 20 cycles.
 
</td></tr>
</table>

<table>
<tr><th>Item</th><th>Required Characteristics</th><th>Test Method/Condition</th></tr>
<tr><td>Solderability test</td><td>Terminal area must have 90% min. solder coverage.</td><td>Dip pads in flux then dip in solder pot at 235 ±5℃ for 3 second.
Solder: lead free
Flux: rosin flux.</td></tr>
<tr><td>Heat endurance of reflow soldering</td><td rowspan="3">1. No case deformation or change in appearance.
2. |ΔL|/L≤10%</td><td>Refer to the next page reflow curve Go through 3 times.
The peak temperature: 260±5℃</td></tr>
<tr><td>Vibration test</td><td>Apply frequency 10~55Hz. 0.75mm amplitude in each of perpendicular direction for 2 hours.(total 6 hours)
 
</td></tr>
<tr><td>Drop test</td><td>Packaged & drop down from 1m with 981m/s2(100G) attitude in 1 angle 1 ridges & 2surfaces orientations.</td></tr>
<tr><td>Terminal strength push test</td><td>Pulling test:
Define:
A: sectional area of terminal.
<table><tr><th>A (mm^2)</th><th>Force (N)</th><th>Time (sec.)</th></tr><tr><td>A≤8</td><td>≥5</td><td>30</td></tr><tr><td>8<A≤20</td><td>≥10</td><td>10</td></tr><tr><td>A>20</td><td>≥20</td><td>10</td></tr></table>Bending test:
Soldering the products on PCB, after the pulling test and bending test, terminal should not pull off.</td><td>Bend the testing PCB at middle point, the deflection shall be 2mm.
 
</td></tr>
<tr><td>Resistance to solvent test</td><td>No case deformation or change in appearance, or obliteration of marking</td><td>To dip parts into IPA solvent for 50.5Min, then drying them at room temp for 5Min., at last, to brushing marking 10 times.</td></tr>
</table>

8. Recommended Soldering Conditions

Product can be applied to flow and reflow soldering.

⑴ Flux, Solder

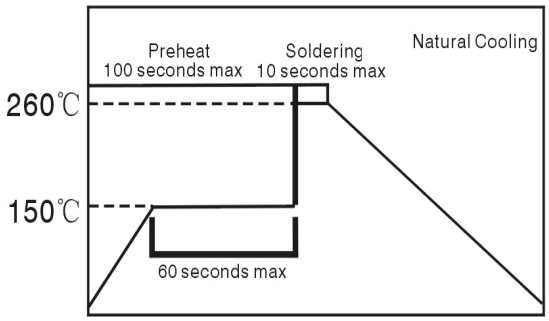
· Use rosin-based flux. Don't use highly acidic flux with halide content exceeding 0.2wt% (chlorine conversion value).

② Use Sn solder.

⑵ Flow soldering conditions

· Pre-heating should be in such a way that the temperature difference between solder and product surface is limited to 150℃ max. Cooling into solvent after soldering also should be in such a way that temperature difference is limited to 100℃ max. Unwrought pre-heating may cause cracks on the product, resulting in the deterioration of products quality.

· Standard soldering profile.



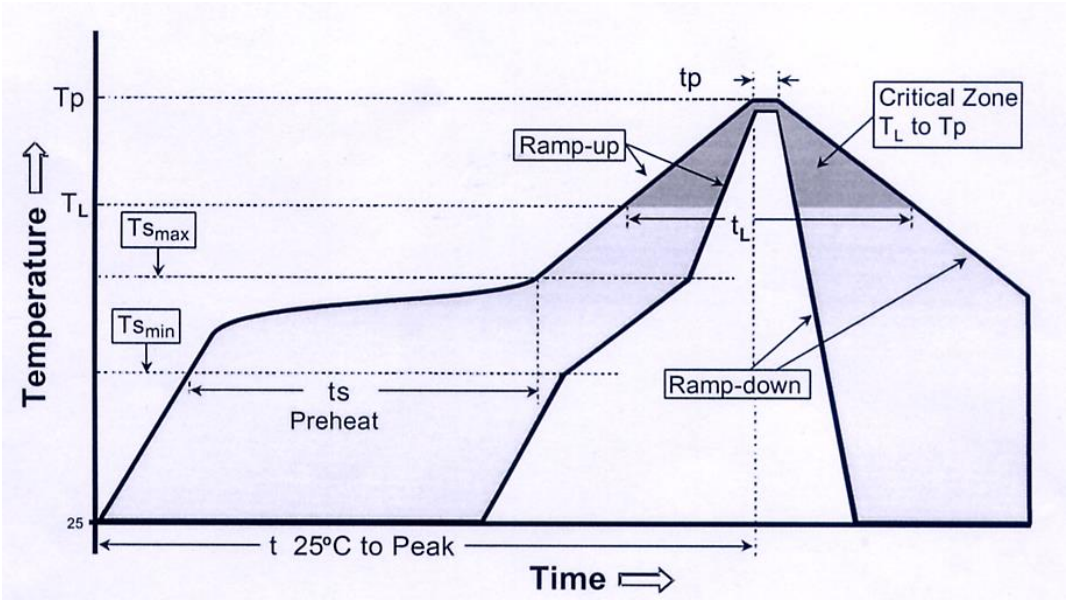
Pre-heating	150℃,1 minute min
Peak	260℃,10 seconds max

(3)Reflow soldering conditions

Profile Feature		Lead-Free Assembly
Average Ramp-Up Rate (Ts max. to Tp)		3℃ C/second max.
Preheat	– Temperature Min (Ts min.) – Temperature Max (Ts max.) – Time (ts min to ts max.)	150 ℃ 200 ℃ 60-180 seconds
Time maintained above	– Temperature (TL) – Time (tL)	217 ℃ 60-150 seconds
Peak/Classification Temperature (Tp) Peak/Classification Time (Tp)		260 ℃ 3-4 seconds
Time within 5 °C of actual Peak Temperature (tp)		20-40 seconds
Ramp-Down Rate		6°C/second max.
Time 25 °C to Peak Temperature		8 minutes max.

Note 1: All temperatures refer to topside of the package, measured on the package body surface.

Reflow curve

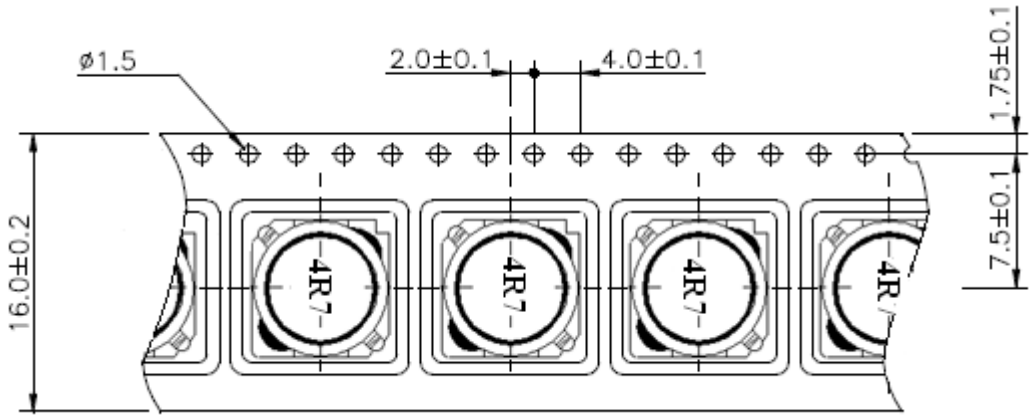


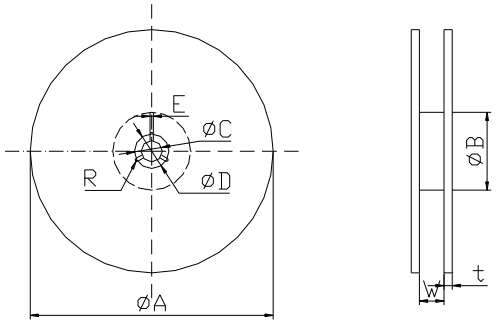
(4) The method on Re-work with using the iron:

The following conditions must be strictly followed when using a soldering iron.

Pre-heating	150℃, 1 minute
Tip temperature	280℃ max
Soldering iron output	20w max
End of soldering iron	φ1mm max
Soldering time	3 seconds max

9. Package Information (Unit: mm)



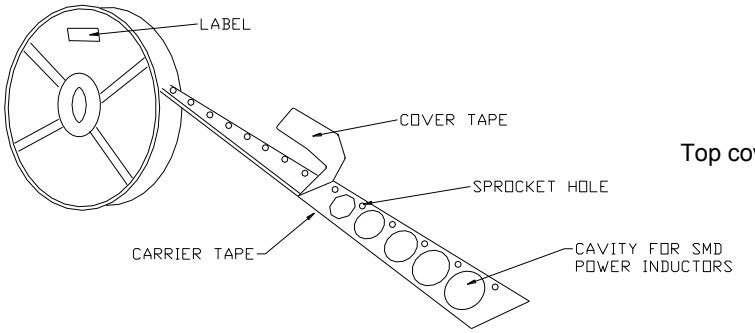


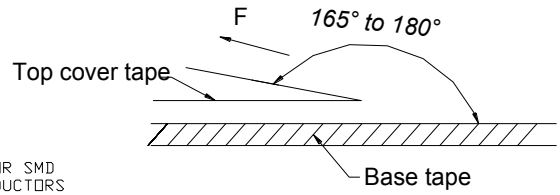
A	330±2.0
B	100±2.0
C	13.5±0.5
D	21±0.5
E	2.2
R	R1.0
W	16.5
t	2.5

9.1 Peeling strength of cover tape:

The force tearing off cover tape is 10 to130 grams in the arrow direction under the following conditions.

Room Temp. (℃)	Room Humidity (%)	Room aim (hpa)	Peel Speed Mm/min
5-35	45-85	860-1060	300





10. Products Storage

(1) Storage period

Products which inspected in HONGDA over 6 months ago should be examined and used, which can be confirmed with inspection No. marked on the container. Solderability should be checked if this period is exceeded.

(2) Storage conditions

Products should be storage in the warehouse on the following conditions:

Temperature: -10 ~+ 40℃

Humidity : Less than 80% relative and humidity

No rapid change on temperature and humidity

(3) Don't keep products in corrosive gases such as sulfur, chlorine gas or acid, or it may cause oxidization of electrode, resulting in poor solderability.

(4) Products should be storage on the palette for the prevention of the influence from humidity, dust and so on.

(5) Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.

Products should be storage under the airtight packaged condition.