

## 1. Scope

This specification applies to the HPIA 252010 series of SMD power inductors.

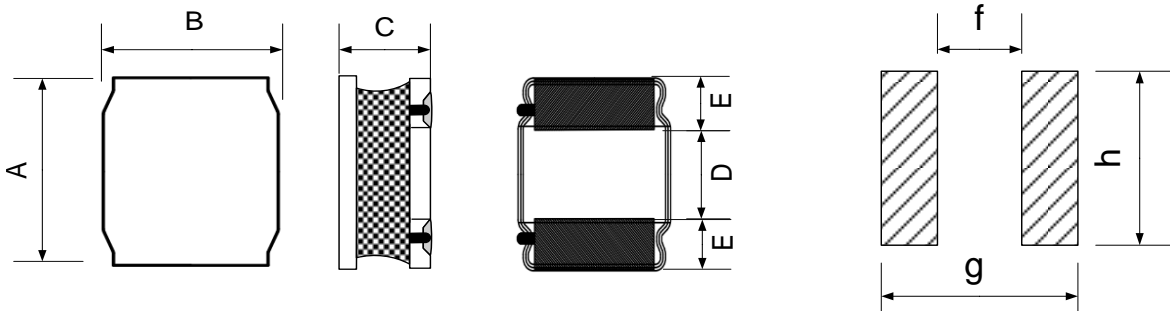
## 2. Product Identification

$\frac{\text{HPIA}}{\text{①}}$ 
 $\frac{252010}{\text{②}}$ 
 $\frac{-}{\text{③}}$ 
 $\frac{1R0}{\text{④}}$ 
 $\frac{M}{\text{④}}$ 
 $\frac{-}{\text{④}}$ 
 $\frac{LF}{\text{⑤}}$

- ① Series name
- ② Product dimensions
- ③ Inductance Value: (1R0: 1.0uH 100: 10uH; )
- ④ Inductance Tolerance: (K: 10% ; M: 20% ; N: 30%)
- ⑤ Lead free products.

## 3. Appearance, Dimensions and Material

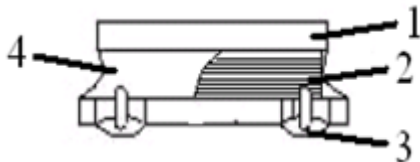
### 3.1 Appearance and dimensions



Recommended Pattern

(mm) Dimensions in mm							
A	B	C	D	E	f	g	h
2.50±0.20	2.00±0.20	1.00Max.	0.80±0.2	0.80±0.2	0.80 Typ.	2.50 Typ.	2.00 Typ.

### 3.2 Material List



No.	Item	Material
1	Core	Mixed Alloy Material
2	Wire	Enameled Copper Wire
3	Terminal Electrode	Ag/Ni/Sn/Cu
4	Magnetic Glue	Epoxy resin and magnetic powder

#### 4. Testing Conditions

Unless otherwise specified

Temperature : Ordinary Temperature ( 5 to 35°C)

Humidity : Ordinary Humidity (25 to 85% RH)

In case of doubt

Temperature : 20±2 °C

Humidity : 60 to 75% RH

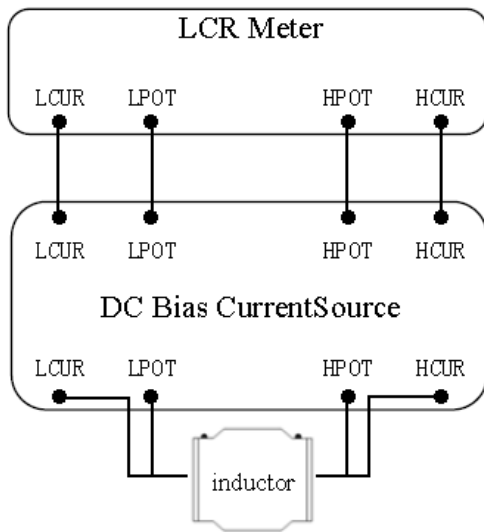
Atmospheric Pressure : 86 to 106 kPa

#### 5. Electrical Characteristics And Test Instruments

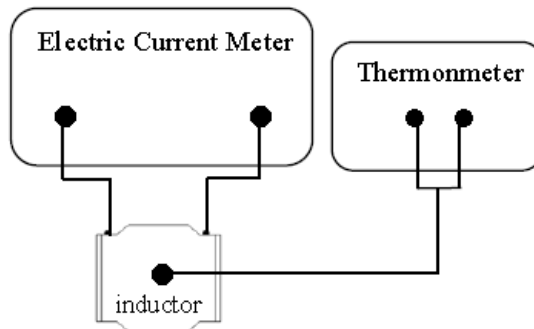
HONGDA Part No.	Inductance (uH)	DCR(Ω)		Isat (A)		Irms (A)	
		Max	Typ	Max	Typ	Max	Typ
HPIA252010 -R24M-LF	0.24±20%	0.030	0.025	5.70	6.55	3.85	4.20
HPIA252010 -R33M-LF	0.33±20%	0.026	0.022	6.00	6.50	4.50	5.00
HPIA252010 -R47M-LF	0.47±20%	0.038	0.032	5.50	6.00	3.60	4.00
HPIA2520 10-R68M-LF	0.68±20%	0.050	0.040	3.60	4.15	3.20	3.90
HPIA252010 -1R0M-LF	1.0±20%	0.065	0.054	3.20	3.55	2.80	3.20
HPIA252010 -1R5M-LF	1.5±20%	0.100	0.080	2.70	3.00	2.00	2.35
HPIA252010 -2R2M-LF	2.2±20%	0.130	0.108	1.90	2.30	1.80	2.00
HPIA252010 -3R3M-LF	3.3±20%	0.225	0.187	1.80	2.00	1.40	1.52
HPIA252010 -4R7M-LF	4.7±20%	0.310	0.260	1.50	1.60	1.15	1.35
HPIA252010 -100M-LF	10±20%	0.600	0.500	0.95	1.10	0.90	1.00

**Test instruments and remarks**

CHROMA 3302 meter for L.  
 Tonghui TH2516B meter for DCR  
 CHROMA 3302 and 1320meter for IDC.  
 L test condition: 1.0MHz/1V.  
 Isat:Based on inductance change ( $|L_I-L|/L \leq 30\%$ )  
 Irms:Based on temperature rise( $\Delta T:40^\circ\text{C}$  TYP).



Isat test schematic diagram

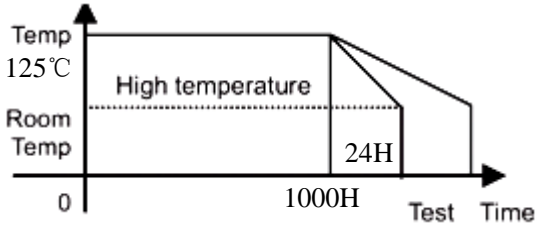
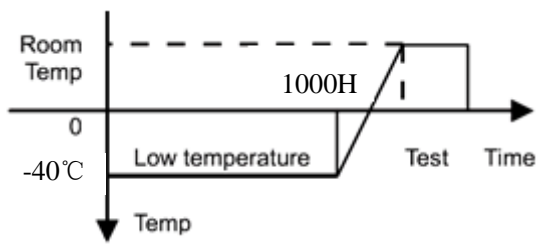
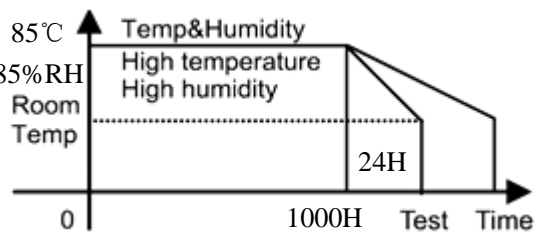
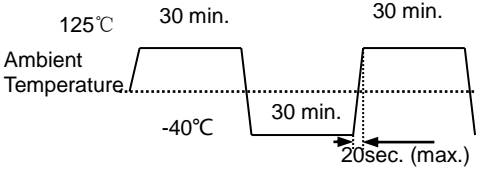


Irms test schematic diagram

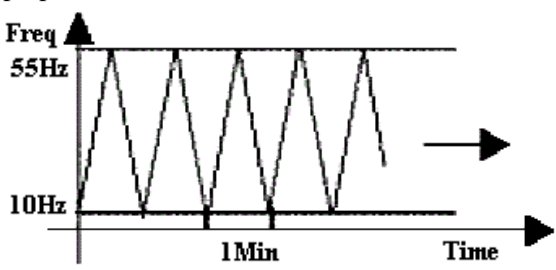
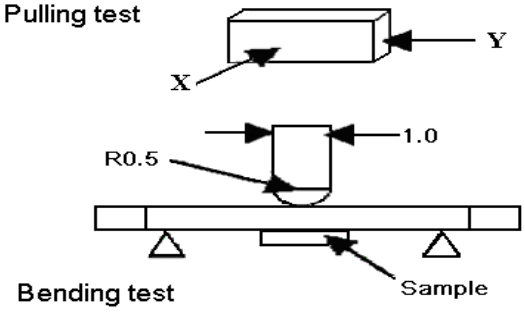
**6. Condition of work**

The part normal work be allowed ambient temperature:  $-40^\circ\text{C} \sim +125^\circ\text{C}$ .

## 7. Reliability and Test Condition

Item	Required Characteristics	Test Method/Condition
High temperature storage test		Temperature: $125 \pm 2^\circ\text{C}$ Time : 1000 hours Measurement at $24 \pm 4$ hours after test conclusion. 
Low temperature storage test		Temperature : $-40 \pm 2^\circ\text{C}$ Time : 1000 hours Measurement at $24 \pm 4$ hours after test conclusion. 
Humidity test		Temperature: $85^\circ\text{C}$ , Humidity :85% RH Time : 1000 hours. Measurement at $24 \pm 4$ hours after test conclusion. 
Thermal shock test		First $-40^\circ\text{C}$ for 30min. time, last $125^\circ\text{C}$ 30min. time as 1 cycle. Go through 1000 cycles. 

1. No case deformation or change in appearance.
2.  $\Delta L/L \leq 10\%$

Item	Required Characteristics	Test Method/Condition
Solderability test	Terminal area must have 90% min. solder coverage.	Dip pads in flux then dip in solder pot at $245 \pm 5^\circ\text{C}$ for $5 \pm 0.1$ second. Solder: Sn96.5%、Ag3%、Cu0.5% Flux: rosin flux.
Heat endurance of reflow soldering		Refer to the next page reflow curve , Go through 3 times. The peak temperature: $260 + 5 / - 0^\circ\text{C}$
Vibration test	1. No case deformation or change in appearance. 2. $\Delta L/L \leq 10\%$	Apply frequency 10~55Hz. 1.5mm amplitude in each of perpendicular direction for 2 hours in each 3 mutually perpendicular directions.(total 6 hours) 
Drop test		Drop 10 times on a concrete floor from a height of 1m.
Terminal strength push test	Pulling test: Solder the products on testing PCB using eutectic solder. Then apply a force in the direction of the arrow. 17.64N force. Keep time $\geq 10\text{s}$ Bending test: Soldering the products on PCB, after the pulling test and bending test, terminal should not pull off.	Pulling test: The application of force X、 Y direction Bend the testing PCB at middle point, the deflection shall be 2mm. Pressurizing Speed: 0.5mm/sec, Keep time: $60 \pm 1\text{s}$ , 
Loading at High Temperature	1. No case deformation or change in appearance. 2. $ \Delta L/L  \leq 10\%$	1. Temperature: $85 \pm 2^\circ\text{C}$ 2. Time : 1000 hours 3. Apply rated current 4. Measurement at $24 \pm 4$ hours after test conclusion

## 8. Recommended Soldering Conditions

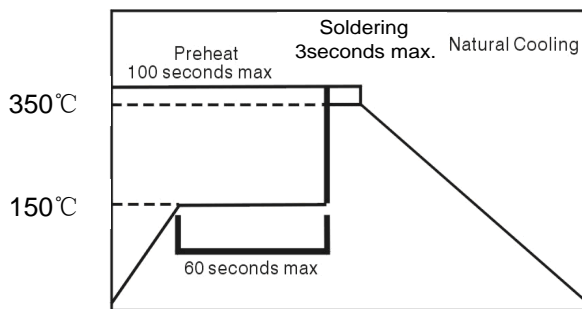
Product can be applied to flow and reflow soldering.

### [1] Flux, Solder

- ① Use rosin-based flux. Don't use highly acidic flux with halide content exceeding 0.2wt% (chlorine conversion value).
- ② Use Sn solder.

### [2] Flow soldering conditions

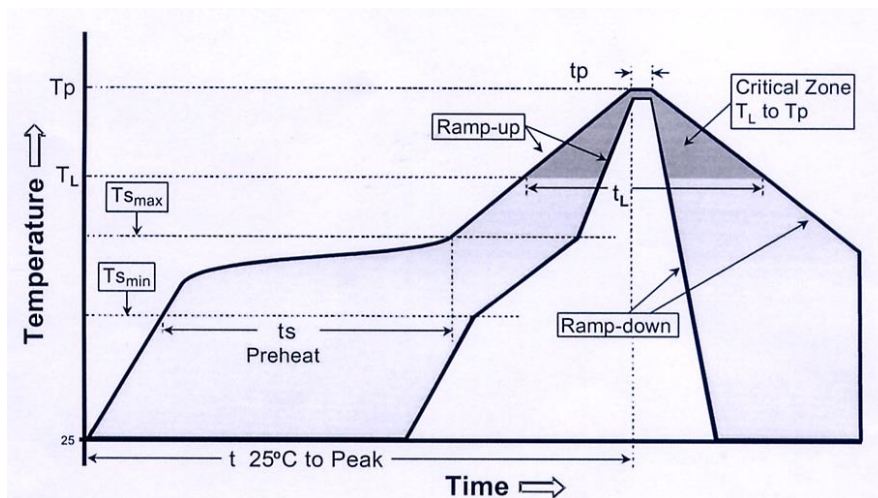
- ① Pre-heating should be in such a way that the temperature difference between solder and product surface is limited to 150°C max. Cooling into solvent after soldering also should be in such a way that temperature difference is limited to 100°C max. Unwrought pre-heating may cause cracks on the product, resulting in the deterioration of products quality.
- ② Standard soldering profile.



Pre-heating	150°C, 1 minute max.
Peak	350°C, 3 seconds max

### [3] Reflow soldering conditions

Reflow curve





Profile Feature		Lead-Free Assembly
Average Ramp-Up Rate (Ts max. to Tp)		3°C/second max.
Preheat	Temperature Min (Ts min.)	150 °C
	Temperature Max (Ts max.)	200 °C
	Time (ts min to ts max.)	60-180 seconds
Time maintained above	Temperature (TL)	217 °C
	Time (tL)	60-150 seconds
Peak/Classification Temperature (Tp)		260 °C
Peak/Classification Time (Tp)		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 : All temperatures refer to topside of the package, measured on the package body surface.

[4] The method on Re-work with using the iron:

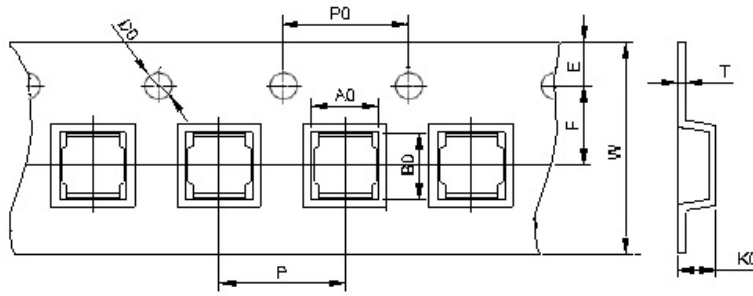
The following conditions must be strictly followed when using a soldering iron

Pre-heating	150°C, 1 minute
Tip temperature	350°C max
Soldering iron output	80w max
End of soldering iron	φ1 mm max
Soldering time	3 seconds max

Product once removes from the circuit board may not be used again.

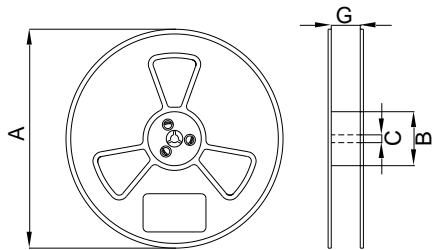
## 9. Package Information

### 9.1 Dimension of tape (Unit: mm)



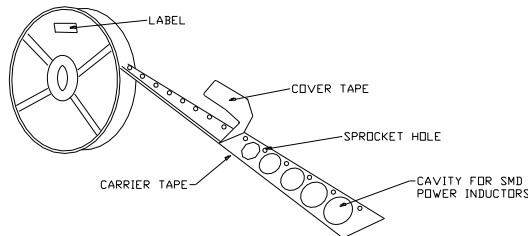
W	A0	B0	K0	E	F	P	P0	D0	T
8.0±0.3	2.40±0.10	2.80±0.10	1.35±0.1	1.75±0.1	3.5±0.05	4.0±0.1	4.0±0.1	1.5+0.1/-0.0	0.18±0.03

### 9.2 Dimension of reel (Unit: mm)



A	178±2
B	58±2
C	13.5±0.2
G	10±1.5

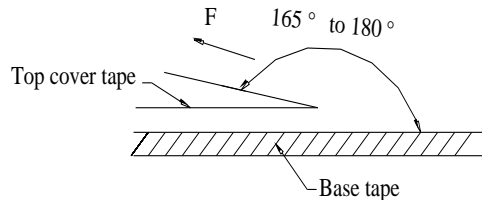
### 9.3 Taping figure and drawing direction



### 9.4 Packaging quantities:2000PCS/Reel.

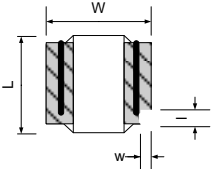
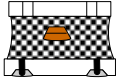
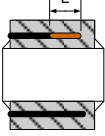
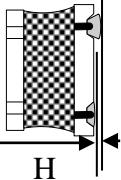
### 9.5 Peeling strength of cover tape:

The peel force of top cover tape shall be between 0.1N to 1.3N



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

## 10. Visual inspection standard of product

No.	Defect Item	Graphic	Rejection identification	Acceptance
1	Core defect		$l > L/6$ or $w > W/6$ , NG.	AQL=0.65
2	Missing resin		The area of missing resin more than single face, NG	AQL=0.65
3	Cold solder		L more than 1 mm, NG.	AQL=0.65
4	Solder uneven		$H > 0.1\text{mm}$ . NG.	AQL=0.65

## 11. Storage

### (1) Storage period

Products which inspected in HONGDA over 12 months ago should be examined and used, which can be confirmed with inspection No. marked on the container. Solder ability should be checked if this period is exceeded.

### (2) Storage conditions

#### ① Products should be storage in the warehouse on the following conditions

Temperature:  $-10^{\circ}\text{C}$   $40^{\circ}\text{C}$  ~

Humidity :  $\leq 70\%$  relative humidity

No rapid change on temperature and humidity

- ② Don't keep products in corrosive gases such as sulfur, chlorine gas or acid, or it may cause oxidization of electrode, resulting in poor solder ability.
- ③ Products should be storage on the palette for the prevention of the influence from humidity, dust and so on.
- ④ Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.
- ⑤ Products should be storage under the airtight packaged condition.