

**Specification for Approval**



Customer: 立创

Customer P/N: C328275

Product Name: Power Inductors

Coilank P/N: APD04T30M4R7

[  New Released,  Revised ]

Approved by	Checked by	Prepared by
	Jean.Lin	Bruce.lan

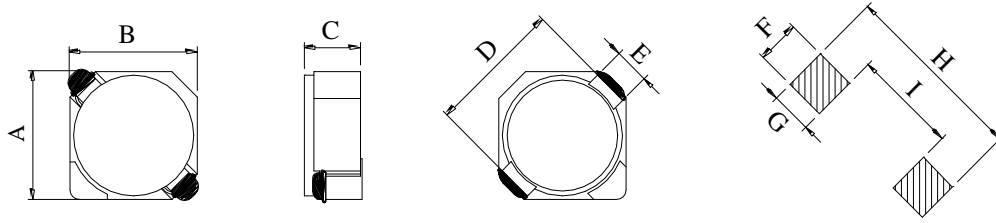
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<b>Approved By</b>	<b>Verified By</b>	<b>Checked By</b>
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### 1. External Dimensions (Unit:m/m)



Type	A	B	C	D	E	F	G	H	I	Q'TY/Reel
APD04T30	3.8±0.3	3.8±0.3	2.8±0.3	5.2Max	1.1Ref	1.5Ref	1.4Ref	5.2Ref	2.4Ref	2000

### 2. Part Number Code

$\frac{APD}{A}$      $\frac{04}{B}$      $\frac{T}{C}$      $\frac{30}{D}$      $\frac{M}{E}$      $\frac{4R7}{F}$

A: Series Name                      Power Inductors  
 B: Dimensions(mm)                04: 3.8x3.8  
 C: Materials                         T: T type  
 D: Thickness(mm)                  30: 2.8  
 E: Tolerance                         M: ±20%  
 F: Inductance                        4R7=4.7uH

### 3. Electrical Characteristics

Part Number	Inductance (uH)	Test Frequency (KHz)	DC Resistance (mΩ)Max.	Saturation Current (A)Max.
APD04T30M4R7	4.7	100KHz/0.25V	88.0	1.65

Notes:

- 1) AEC-Q200 qualified.
- 2) All test data is referenced to 25°C ambient.
- 3) Operating temperature range -40°C to +125°C.
- 4) Isat :DC current(A) that will cause I<sub>o</sub> to drop approximately 35%.
- 5) The part temperature(ambient + temp rise)should not exceed 125°C under worst case operating conditions. circuit design,component placement, PWB trace size and thickness,airflow and other cooling provisions all affect the part temperature,part temperature should be verified in the end application.

## 4. Test Data

ELECTRICAL CHARACTERISTIC				MECHANICAL DIMENSIONS			
SPEC	L(uH)	DCR(mΩ)	Isat(uH)	A(mm)	B(mm)	C(mm)	E(mm)
TOL	4.7	88.0	1.65A	3.8	3.8	2.8	1.1
NO	±20%	Max	(LOA-L1.65A) /LOA≤35%	±0.3	±0.3	±0.3	Ref
1	4.58	62.24	3.63	4.04	4.03	2.87	OK
2	4.45	61.58	3.62	4.02	4.05	2.80	OK
3	4.54	61.26	3.55	4.02	4.01	2.87	OK
4	4.52	61.47	3.63	4.03	4.03	2.86	OK
5	4.35	62.18	3.59	4.04	4.02	2.87	OK
6	4.46	60.59	3.54	4.03	4.04	2.89	OK
7	4.54	61.88	3.62	4.02	4.01	2.80	OK
8	4.35	61.07	3.56	4.06	4.06	2.88	OK
9	4.54	62.91	3.64	4.02	4.07	2.87	OK
10	4.42	62.37	3.61	4.01	4.02	2.81	OK

Test Equipments: IM3536,VR126,VR7210,Calipers

## 5. Test and Measurement Procedures

### 5.1 Test Conditions

5.1.1 Unless otherwise specified, the standard atmospheric conditions for measurement/test as:

- Ambient Temperature: 20±15℃
- Relative Humidity: 65%±20%
- Air Pressure: 86KPa to 106KPa

5.1.2 If any doubt on the results, measurements/tests should be made within the following limits:

- Ambient Temperature: 20±2℃
- Relative Humidity: 65%±5%
- Air Pressure: 86KPa to 106Kpa

### 5.2 Visual Examination

- Inspection Equipment: 10X magnifier

### 5.3 Electrical Test

#### 5.3.1 Inductance (L)

- Refer to the third item.
- Test equipment: IM3536 LCR meter or equivalent.
- Test Frequency and Voltage: Refer to the third item.

#### 5.3.2 Direct Current Resistance (DCR)

- Refer to the third item.
- Test equipment: VR126 or equivalent.

#### 5.3.3 Current

- Refer to the third item.
- Test equipment (see Fig.5.3.3-1): Electric Power, Electric current meter, Thermometer.
- Measurement method (see Fig. 5.3.3-1):

1. Set test current to be 0 mA.
  2. Measure initial temperature of chip surface.
  3. Gradually increase voltage and measure chip temperature for corresponding current.
- d. Definition of Temperature rise current: DC current that causes the temperature rise ( $\Delta T = 40^\circ\text{C}$ ) from  $20^\circ\text{C}$  ambient (see Fig. 5.3.3-2).

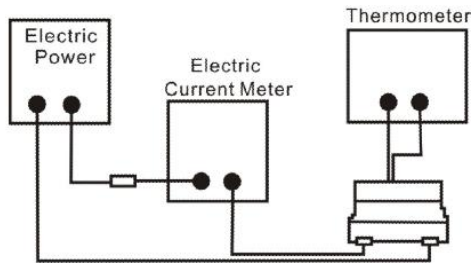


Fig.5.3.3-1

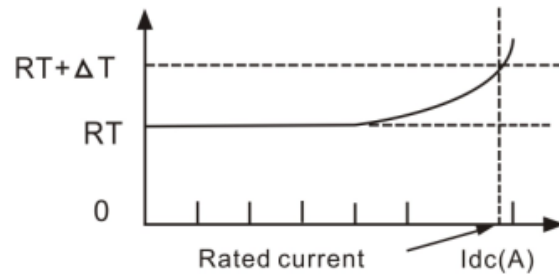
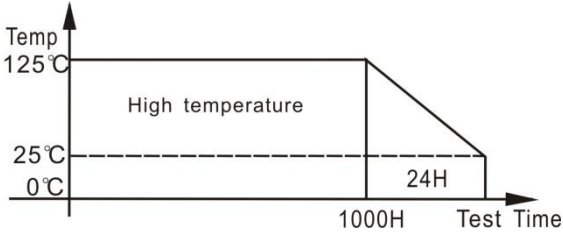
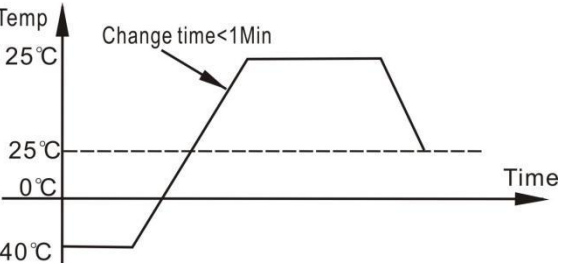
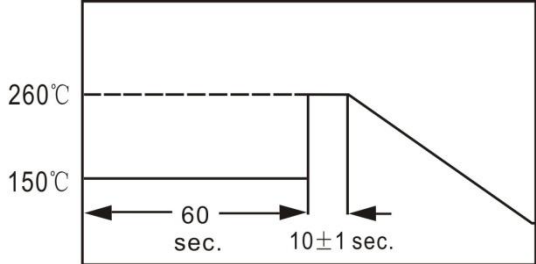
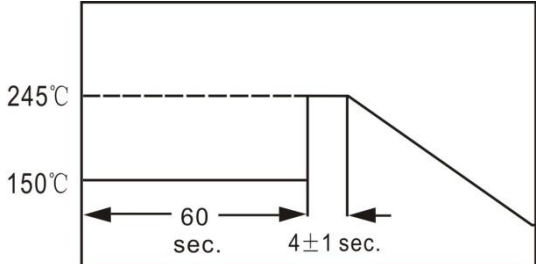


Fig.5.3.3-2

### 5.4 Reliability Test

Item	Specifications	Test conditions
5.4.1 High temperature storage test	No visible mechanical damage. Inductance change: Within $\pm 10\%$ .	Temperature: $125 \pm 2^\circ\text{C}$ . Duration: 1000hrs. Measured at room temperature after placing for $24 \pm 4$ hrs. 
5.4.2 Temperature cycling test	No visible mechanical damage. Inductance change: Within $\pm 10\%$ .	Condition for 1 cycle. Step1 : $-40 \pm 2^\circ\text{C}$ 30min Min. Step2 : $125 \pm 2^\circ\text{C}$ , transition time 1min Max. Step3 : $125 \pm 2^\circ\text{C}$ 30min Min. Step4 : Low temp, transition time 1min Max. Number of cycles : 1000. Measured at room temperature after placing for $24 \pm 4$ hrs. 
5.4.3 Biased humidity test	No visible mechanical damage. Inductance change: Within $\pm 10\%$ .	Humidity : $85\% \pm 3$ RH. Temperature : $85^\circ\text{C} \pm 2^\circ\text{C}$ . Duration : 1000hrs. Measured at room temperature after placing for $24 \pm 4$ hrs.

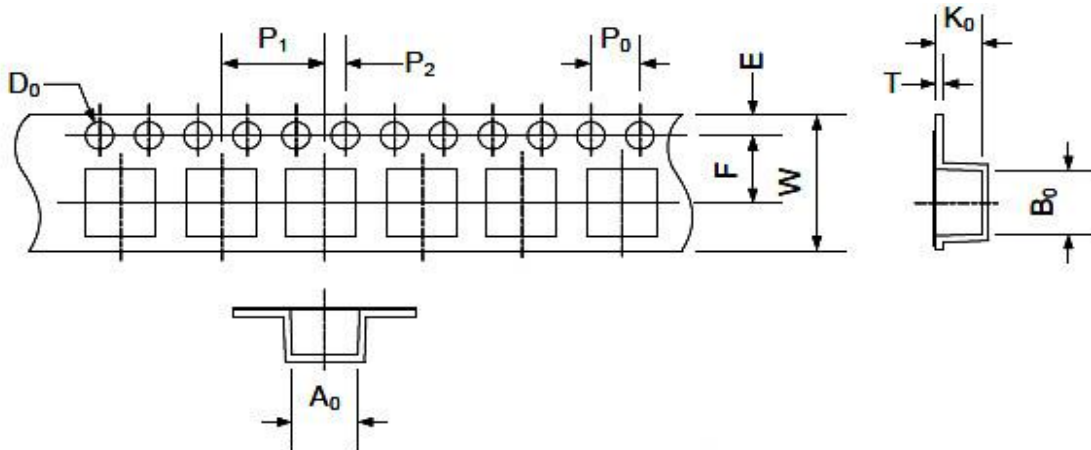
Item	Specifications	Test conditions
5.4.4 Operational life test	No visible mechanical damage. Inductance change: Within $\pm 10\%$ .	Temperature: $105 \pm 2^\circ\text{C}$ . Duration :1000hrs. Measured at room temperature after placing for $24 \pm 4$ hrs.
5.4.5 Resistance to solvent test	No visible mechanical damage. Inductance change: Within $\pm 10\%$ .	Add aqueous wash chemical - OKEM clean or equivalent.
5.4.6 Vibration test	No visible mechanical damage. Inductance change: Within $\pm 10\%$ .	Oscillation Frequency: 10~2K~10Hz for 20 minute. Total Amplitude: $1.52\text{mm} \pm 10\%$ . Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations).
5.4.7 Resistance to soldering heat test	No visible mechanical damage. Inductance change: Within $\pm 10\%$ .	Temperature ( $^\circ\text{C}$ ): $260 \pm 5$ (solder temp). Time (s): $10 \pm 1$ . ramp/immersion and emersion rate: $25\text{mm/s} \pm 6 \text{mm/s}$ . Number of heat cycles:1. 
5.4.8 Solderability test	More than 95% of the terminal electrode should be covered with solder.	Steam Aging: 8 hours $\pm$ 15 min. Preheat: $150^\circ\text{C}$ , 60sec. Solder: Sn99.5%-Cu0. 5%. Temperature: $245 \pm 5^\circ\text{C}$ . Flux for lead free: Rosin. 9.5%. Dip time: $4 \pm 1$ sec. Depth: completely cover the termination. 
5.4.9 Terminal strength (SMD) test	No visible mechanical damage.	With the component mounted on a PCB with the device to be tested, apply a 17.7 N (1.8 Kg) force to the side of a device being tested. This force shall be applied for $60 \pm 1$ seconds. Also the force shall be applied radually as not to apply a shock to the component being tested.

### 6. Packaging, Storage

#### 6.1 Tape and Reel Packaging Dimensions

6.1 .1 Taping Dimensions (Unit: mm)

Please refer to Fig. 6.1.1-1



6.1.1-1

TYPE	A0	B0	W	E	F	P0	P1	P2	T	K0
APD04T30	4.5±0.1	4.5±0.1	12.0±0.3	1.75±0.1	5.5±0.1	4.0±0.1	8.0±0.1	2.0±0.1	0.4±0.1	3.4±0.1

6.1.2 Reel Dimensions (Unit: mm)

Please refer to Fig. 6.1.2-1.

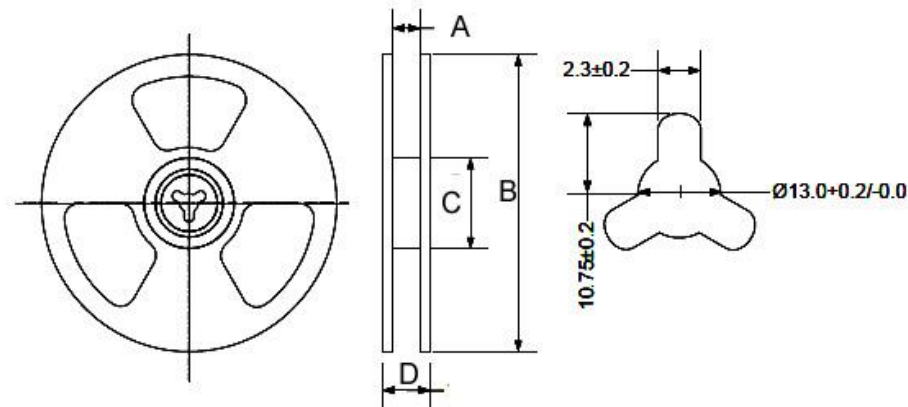


Fig. 6.1.2-1.

TYPE	A	B	C	D
APD04T30	12.5±2.0	330.0±2.0	100.0±2.0	16.5±2.0

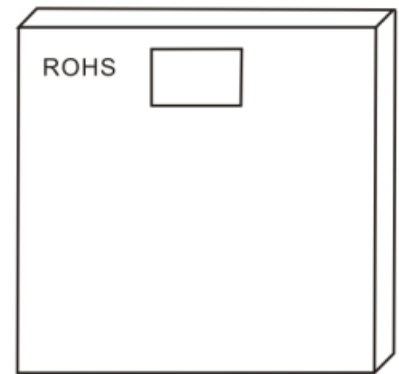
### 6.2 Packaging

6.2.1 The inner box specification: 350\*340\*40MM

Packing quantity: 4000PCS/ box

Bubble bag : 37\*45CM

Job description: putting the air bubble bag products placed inside the box, sealed with scotch tape

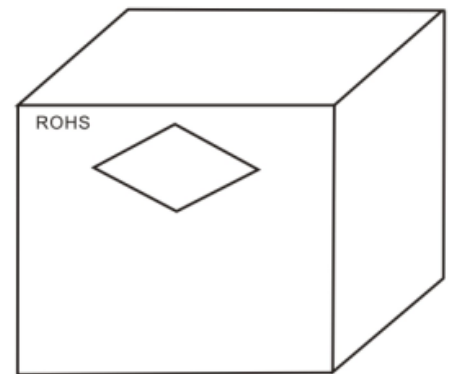


6.2.2 the outside box specification: 370\*360\*255MM

Packing quantity: 20000PCS/ box

Job description: will be outside the box bottom sealed, inner box into the box.

- a. with transparent tape sealed box at the top
- b. the specified location with a box labels in the outer box.
- c. if the mantissa box under a FCL with inner box or filling full



### 6.3 Storage

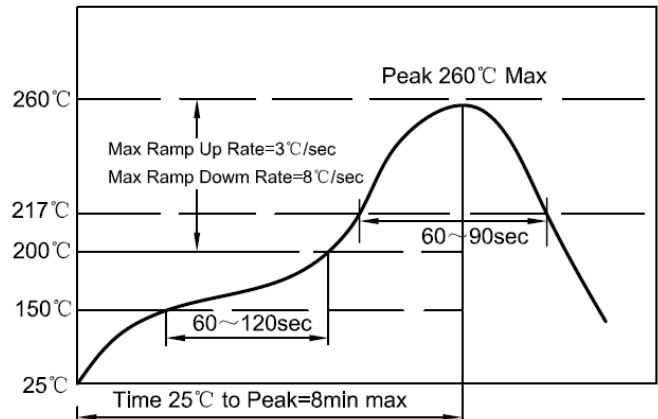
- a. To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled.
- b. Recommended conditions: -10°C~40°C, 70%RH (Max.)
- c. The ambient temperature must be kept below 30°C. Even under ideal storage conditions, solderability of products electrodes may decrease as time passes. For this reason, product should be used with one year from the time of delivery.
- d. In case of storage over 6 months, solderability shall be checked before actual usage.



### 7. Recommended Soldering Technologies

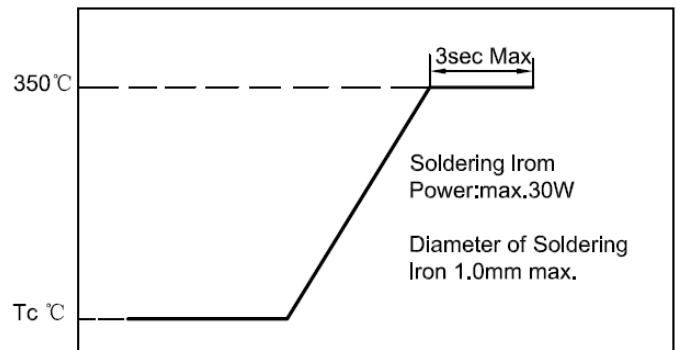
#### 7.1 Re-flowing Profile:

- △ Preheat condition: 150~200°C/60~120sec.
- △ Allowed time above 217°C: 60~90sec.
- △ Max temp: 260°C
- △ Max time at max temp: 5sec.
- △ Solder paste: Sn/3.0Ag/0.5Cu
- △ Allowed Reflow time: 2x max



#### 7.2 Iron Soldering Profile:

- △ Iron soldering power: Max.30W
  - △ Pre-heating: 150°C/60sec.
  - △ Soldering Tip temperature: 350°C Max.
  - △ Soldering time: 3sec Max.
  - △ Solder paste: Sn/3.0Ag/0.5Cu
  - △ Max.1 times for iron soldering
- [Note: Take care not to apply the tip of the soldering iron to the]



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