

**Specification for Approval**



Customer: 立创

Customer P/N: \_\_\_\_\_

Product Name: Power Inductors

Coilank P/N: ABG10A50 Series

[  New Released,  Revised ]

| Approved by | Checked by | Prepared by |
|-------------|------------|-------------|
|             | Emie.luo   | Lijun.lan   |

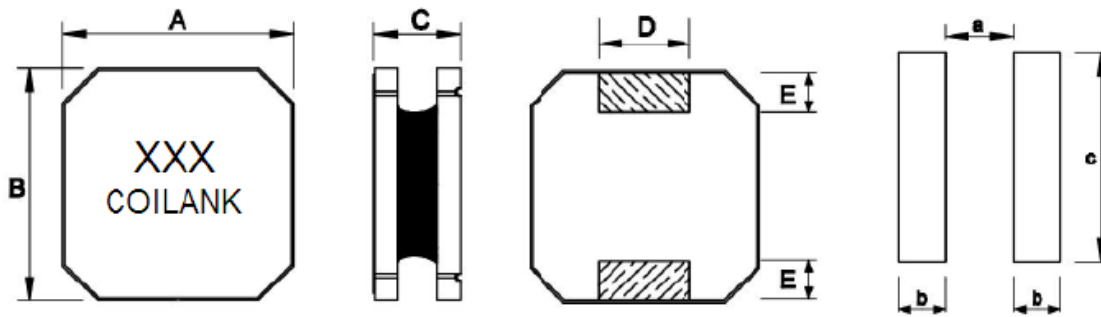
**Coilank Technology Co., Ltd**

ADD: No.39, Chingao Rd.,(305)Hsinpu, Hs inchu Hsien Taiwan, R.O.C  
 TEL : 00886-3-5894523 FAX : 00886-3-5894415  
 ADD: Unit D, 16/F Cheuk Nang Plaze 250 Hennessy Road, Wanchai HongKong  
 TEL : 00852-31135161 FAX : 00852-31121631  
 SZ Office TEL : 0755-29452870/3 FAX : 0755-61658369  
 HTTP : www.coilank.com E-mail : [sales@coilank.com](mailto:sales@coilank.com)

|                                     |                               |   |
|-------------------------------------|-------------------------------|---|
| <b>【For Customer approval Only】</b> |                               | Date: _____   |
| Qualification Status:               | <input type="checkbox"/> Full | <input type="checkbox"/> Restricted <input type="checkbox"/> Rejected |
| <b>Approved By</b>                  | <b>Verified By</b>            | <b>Checked By</b>   |
|                                     |                               |   |
| Comments: _____                     |                               |   |



### 1. External Dimensions (Unit:m/m)



| Type     | A        | B        | C      | D      | E      | a      | b      | c      | Q'TY/Reel |
|----------|----------|----------|--------|--------|--------|--------|--------|--------|-----------|
| ABG10A50 | 10.0±0.3 | 10.0±0.3 | 5.1Max | 4.2Ref | 1.7Ref | 6.2Ref | 2.0Ref | 5.5Ref | 700       |

### 2. Part Number Code

$\frac{ABG}{A}$      $\frac{10}{B}$      $\frac{A}{C}$      $\frac{50}{D}$      $\frac{M}{E}$      $\frac{1R0}{F}$

A: Series Name                      Power Inductors  
 B: Dimensions(mm)                10: 10.0x10.0  
 C: Materials                         NO use  
 D: Thickness(mm)                 50: 5.1 Max  
 E: Tolerance                         M: ±20%  
 F: Inductance                        1R0=1.0uH

### 3. Electrical Characteristics

| Part Number  | Inductance (μH) | Test Frequency (KHz) | DC Resistance (mΩ)±30% | Heat Rating Current I <sub>rms</sub> (A)Typ. | Saturation Current I <sub>sat</sub> (A)Typ. |
|--------------|-----------------|----------------------|------------------------|--|---|
| ABG10A50M1R0 | 1.0             | 100KHz/1V            | 10.0                   | 10.0   | 12.0  |
| ABG10A50M1R5 | 1.5             | 100KHz/1V            | 11.0                   | 9.0  | 11.8  |
| ABG10A50M2R2 | 2.2             | 100KHz/1V            | 12.0                   | 8.0  | 11.3  |
| ABG10A50M3R3 | 3.3             | 100KHz/1V            | 14.0                   | 7.5  | 10.7  |
| ABG10A50M4R7 | 4.7             | 100KHz/1V            | 15.0                   | 6.8  | 10.0  |
| ABG10A50M6R8 | 6.8             | 100KHz/1V            | 24.0                   | 5.9  | 9.5   |
| ABG10A50M100 | 10.0            | 100KHz/1V            | 35.0                   | 4.4  | 8.2   |

Notes:

- All test data is referenced to 25°C ambient.
- Operating Temperature Range-40°C to +125°C.
- I<sub>rms</sub> :DC current(A) that will cause an approximate ΔT of 40°C.
- I<sub>sat</sub> :DC current(A) that will cause L<sub>o</sub> to drop approximately 40%.

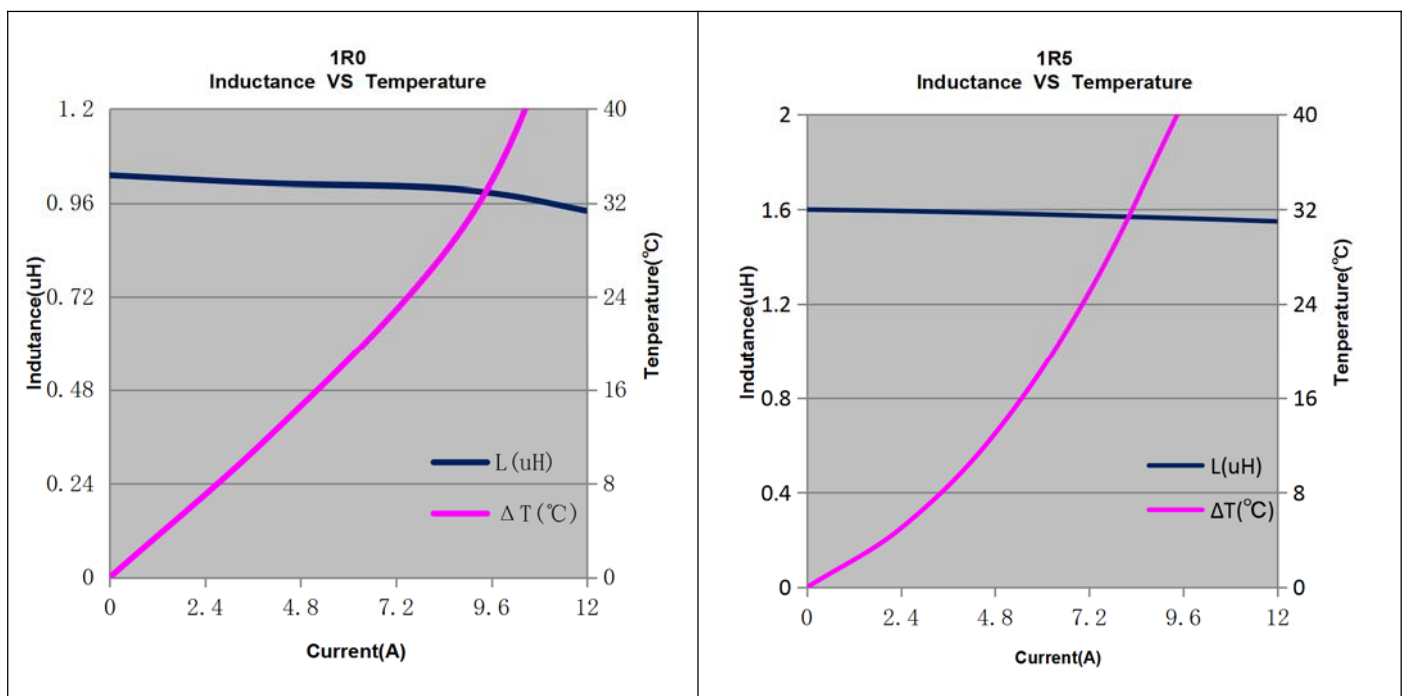
- e. The part temperature(ambient + temp rise)should not exceed 125°C under worst case operating conditions. Circuit design,component placement, PWB trace size and thickness,airflow and other cooling provisions all affect the part temperature, Part temperature should be verified in the end application.

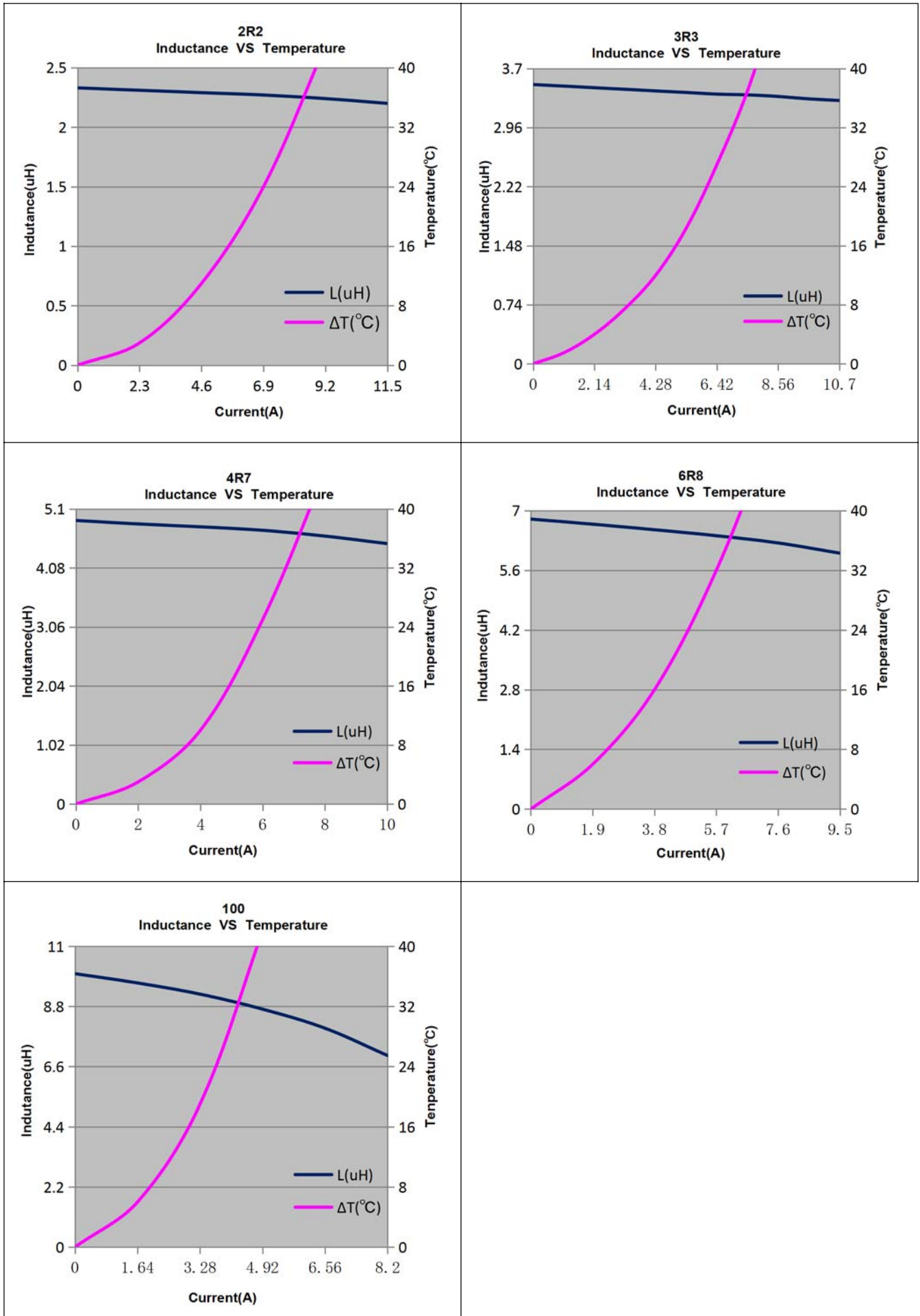
### 4. Test Data

| ELECTRICAL CHARACTERISTIC |       |         |                          | MECHANICAL DIMENSIONS |       |       |       |  |
|---------------------------|-------|---------|--------------------------|-----------------------|-------|-------|-------|--|
| SPEC                      | L(uH) | DCR(mΩ) | Isat(uH)                 | A(mm)                 | B(mm) | C(mm) | D(mm) |  |
| TOL                       | 1.0   | 10.0    | 12.0A                    | 10.0                  | 10.0  | 5.1   | 4.2   |  |
| NO                        | ±20%  | ±30%    | (L0A-L12.0A)<br>/L0A≤40% | ±0.3                  | ±0.3  | Max   | Ref   |  |
| 1                         | 1.03  | 9.65    | 0.94                     | 9.97                  | 9.98  | 4.84  | OK    |  |
| 2                         | 1.05  | 9.55    | 0.92                     | 9.98                  | 9.99  | 4.85  | OK    |  |
| 3                         | 1.06  | 9.46    | 0.92                     | 10.00                 | 10.00 | 4.87  | OK    |  |
| 4                         | 1.02  | 9.56    | 0.94                     | 10.01                 | 9.98  | 4.88  | OK    |  |
| 5                         | 1.05  | 9.53    | 0.92                     | 10.00                 | 10.00 | 4.85  | OK    |  |
| 6                         | 1.01  | 9.62    | 0.94                     | 9.98                  | 9.99  | 4.86  | OK    |  |
| 7                         | 0.99  | 9.61    | 0.89                     | 9.99                  | 10.01 | 4.87  | OK    |  |
| 8                         | 1.03  | 9.65    | 0.93                     | 10.01                 | 9.99  | 4.86  | OK    |  |
| 9                         | 0.98  | 9.59    | 0.88                     | 9.98                  | 10.00 | 4.88  | OK    |  |
| 10                        | 0.99  | 9.57    | 0.89                     | 10.00                 | 10.01 | 4.86  | OK    |  |

Test Equipmets: IM3536,VR126,VR7210,Calipers

Curve:





## 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:  $20 \pm 15^\circ\text{C}$
- Relative Humidity:  $65\% \pm 20\%$
- 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:  $20 \pm 2^\circ\text{C}$
- Relative Humidity:  $65\% \pm 5\%$
- 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 Saturation Current ( $I_{\text{sat}}$ )

- Refer to the third item.
- Test equipment: Saturation current meter
- Definition of saturation current ( $I_{\text{sat}}$ ): DC current at which the inductance drops approximate 40% from its value without current.

5.3.4 Temperature rise current ( $I_{\text{rms}}$ )

- Refer to the third item.
- Test equipment (see Fig.5.3.4-1): Electric Power, Electric current meter, Thermometer.
- Measurement method (see Fig. 5.3.4-1):
  - Set test current to be 0mA.
  - Measure initial temperature of choke surface.
  - Gradually increase current and measure choke temperature for corresponding current.
  - 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. 5.3.4-2).

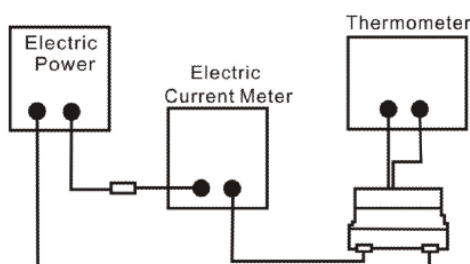


Fig.5.3.4-1

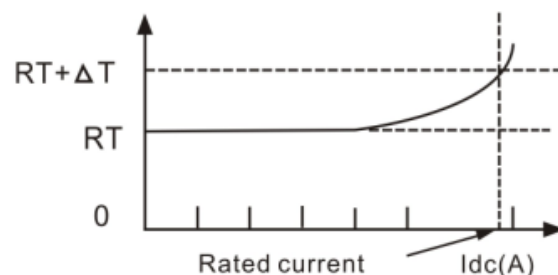
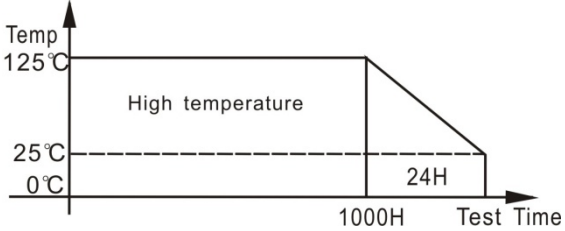
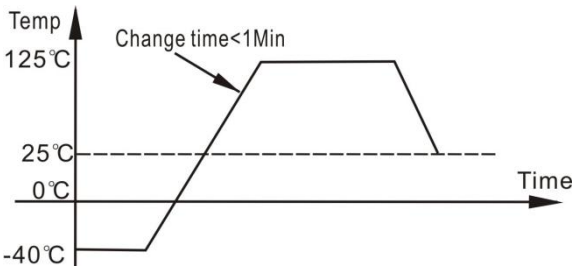
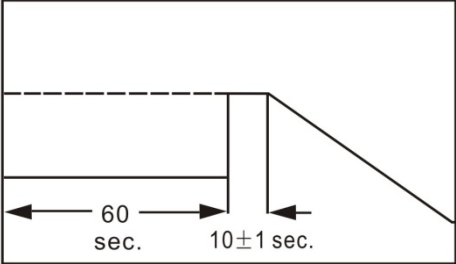
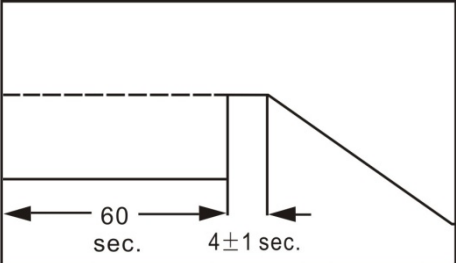


Fig.5.3.4-2

### 5.4 Reliability Test

| Item   | Specifications  | Test conditions  |
|--|---|--|
| <p>5.4.1<br/>High temperature storage test</p> | <p>No visible mechanical damage.<br/>Inductance change: Within <math>\pm 10\%</math>.</p> | <p>Temperature: <math>125 \pm 2^\circ\text{C}</math>.<br/>Duration: 1000hrs.<br/>Measured at room temperature after placing for <math>24 \pm 4</math> hrs.</p>   |
| <p>5.4.2<br/>Temperature cycling test</p>      | <p>No visible mechanical damage.<br/>Inductance change: Within <math>\pm 10\%</math>.</p> | <p>Condition for 1 cycle.<br/>Step1: <math>-40 \pm 2^\circ\text{C}</math> 30min Min.<br/>Step2: High temp, transition time 1min Max.<br/>Step3: <math>125 \pm 2^\circ\text{C}</math> 30min Min.<br/>Step4: Low temp, transition time 1min Max.<br/>Number of cycles: 1000.<br/>Measured at room temperature after placing for <math>24 \pm 4</math> hrs.</p>  |
| <p>5.4.3<br/>Biased humidity test</p>          | <p>No visible mechanical damage.<br/>Inductance change: Within <math>\pm 10\%</math>.</p> | <p>Humidity : <math>85\% \pm 3</math> RH.<br/>Temperature: <math>85^\circ\text{C} \pm 2^\circ\text{C}</math>.<br/>Duration : 1000hrs.<br/>Measured at room temperature after placing for <math>24 \pm 4</math> hrs.</p>  |
| <p>5.4.4<br/>Operational life test</p>         | <p>No visible mechanical damage.<br/>Inductance change: Within <math>\pm 10\%</math>.</p> | <p>Temperature: <math>105 \pm 2^\circ\text{C}</math>.<br/>Duration : 1000hrs.<br/>Measured at room temperature after placing for <math>24 \pm 4</math> hrs.</p>  |
| <p>5.4.5<br/>Resistance to solvent test</p>    | <p>No visible mechanical damage.<br/>Inductance change: Within <math>\pm 10\%</math>.</p> | <p>Add aqueous wash chemical - OKEM clean or equivalent.</p>   |
| <p>5.4.6<br/>Vibration test</p>                | <p>No visible mechanical damage.<br/>Inductance change: Within <math>\pm 10\%</math>.</p> | <p>Oscillation Frequency: <math>10 \sim 2\text{K} \sim 10\text{Hz}</math> for 20 minute.<br/>Total Amplitude: <math>1.52\text{mm} \pm 10\%</math>.<br/>Testing Time : 12 hours (20 minutes, 12 cycles each of 3 orientations).</p>   |

| Item   | Specifications  | Test conditions   |
|--|---|---|
| <p>5.4.7<br/>Resistance to soldering heat test</p> | <p>No visible mechanical damage.<br/>Inductance change: Within <math>\pm 10\%</math>.</p> | <p>Temperature (<math>^{\circ}\text{C}</math>): <math>260 \pm 5</math> (solder temp).<br/>Time (s): <math>10 \pm 1</math>.<br/>ramp/immersion and emersion rate:<br/><math>25\text{mm/s} \pm 6 \text{ mm/s}</math>.<br/>Number of heat cycles:1.</p>    |
| <p>5.4.8<br/>Solderability test</p>                | <p>More than 95% of the terminal electrode should be covered with solder.</p>             | <p>Steam Aging: 8 hours <math>\pm</math> 15 min.<br/>Preheat: <math>150^{\circ}\text{C}</math>, 60sec.<br/>Solder: Sn99.5%-Cu0. 5%.<br/>Temperature: <math>245 \pm 5^{\circ}\text{C}</math>.<br/>Flux for lead free: Rosin. 9.5%.<br/>Dip time: <math>4 \pm 1</math>sec.<br/>Depth: completely cover the termination.</p>  |
| <p>5.4.9<br/>Terminal strength (SMD) test</p>      | <p>No visible mechanical damage.</p>  | <p>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 <math>60 \pm 1</math> seconds. Also the force shall be applied radually as not to apply a shock to the component being tested.</p>   |



### 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

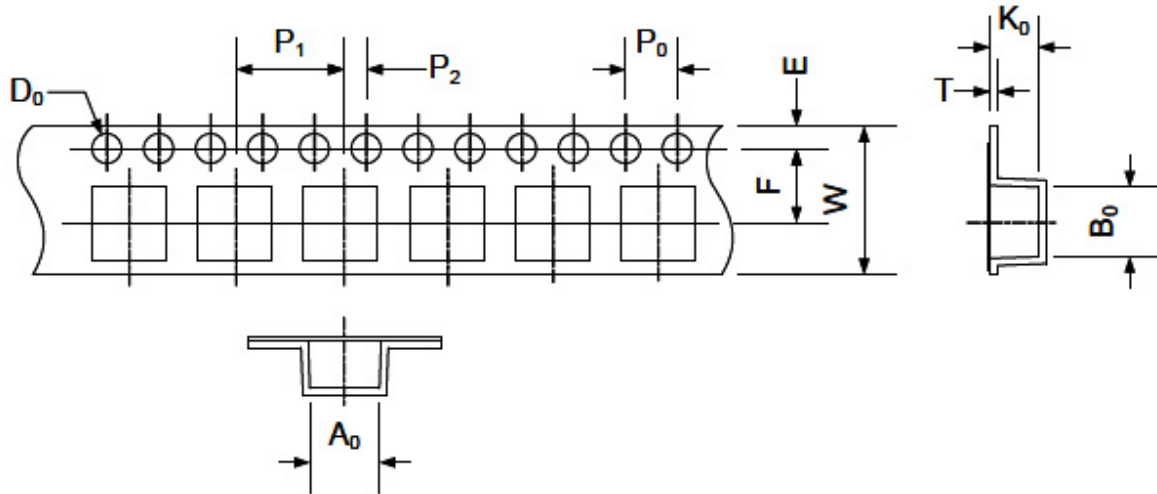


Fig. 6.1.1-1

| TYPE     | A0       | B0       | W        | E        | F        | P0      | P1       | P2      | D0      | T       | K0      |
|----------|----------|----------|----------|----------|----------|---------|----------|---------|---------|---------|---------|
| ABG10A50 | 10.5±0.1 | 10.5±0.1 | 24.0±0.3 | 1.75±0.1 | 11.5±0.1 | 4.0±0.1 | 16.0±0.1 | 2.0±0.1 | 1.5±0.1 | 0.4±0.1 | 5.3±0.1 |

#### 6.1.2 Direction of rolling

Please refer to Fig. 6.1.2-1.

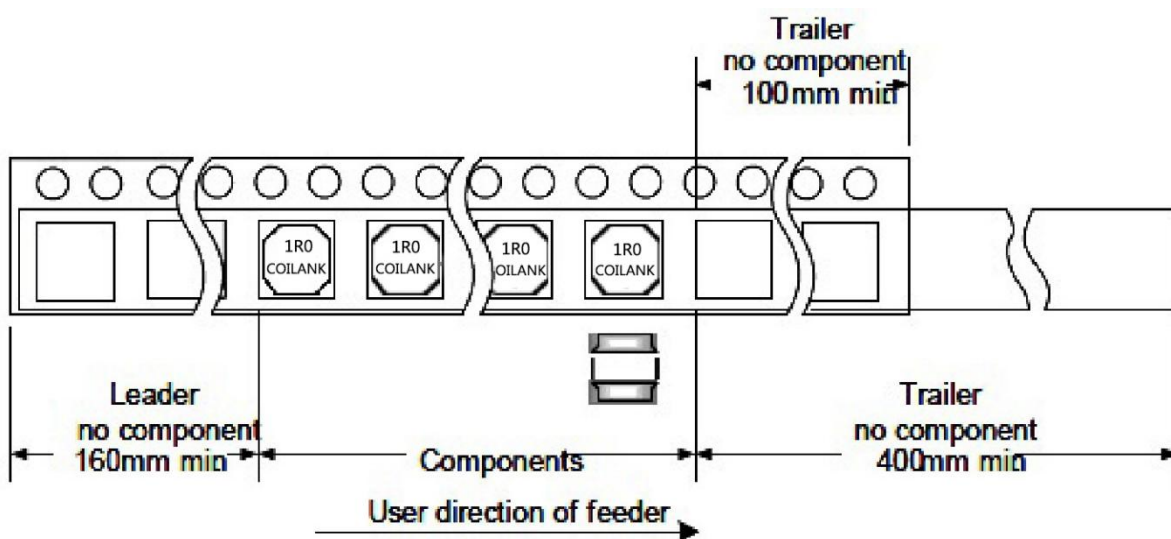


Fig. 6.1.2-1.

### 6.1.3 Reel Dimensions (Unit: mm)

Please refer to Fig. 6.1.3-1.

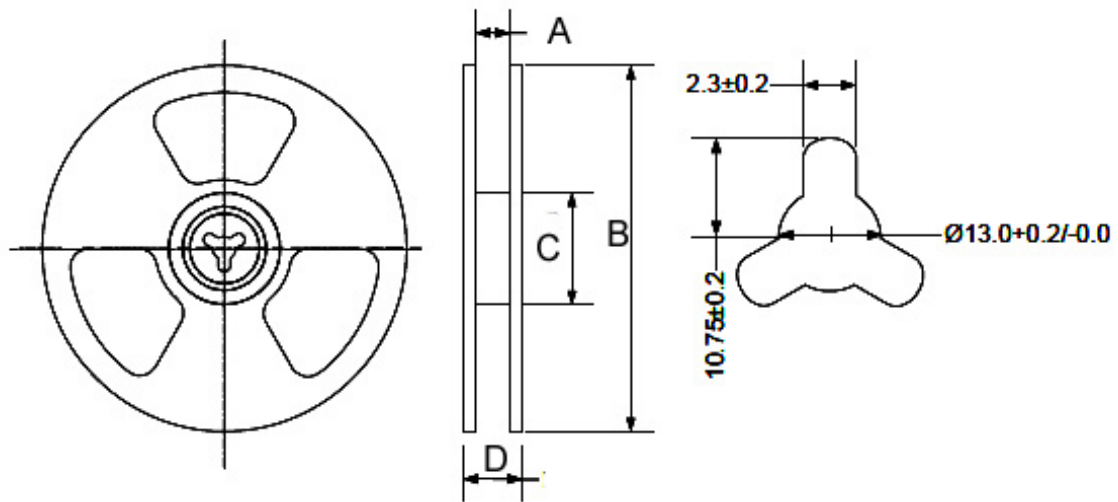


Fig. 6.1.3-1.

| TYPE     | A        | B         | C         | D        |
|----------|----------|-----------|-----------|----------|
| ABG10A50 | 24.5±2.0 | 330.0±2.0 | 100.0±2.0 | 28.5±2.0 |

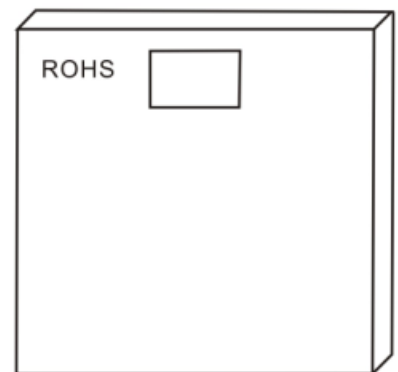
## 6.2 Packaging

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

Packing quantity: 700PCS/ box

Bubble bag : 37\*45CM

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

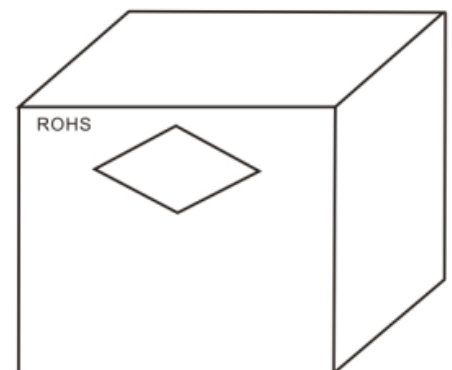


6.2.2 The outside box specification: 370\*360\*255MM

Packing quantity: 2100PCS/ box

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

- With transparent tape sealed box at the top
- The specified location with a box labels in the outer box.
- If the mantissa box under a FCL with inner box or filling full



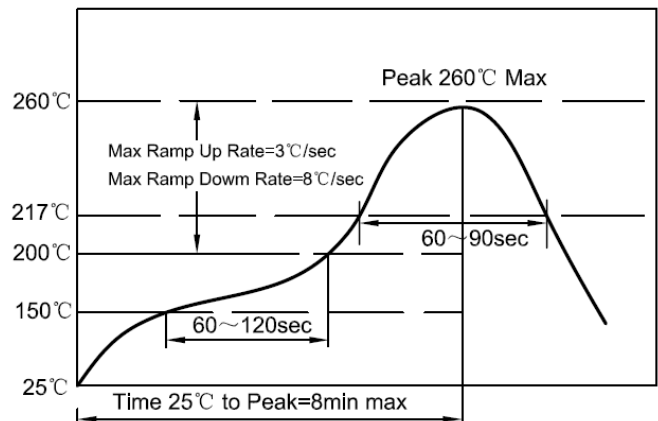
### 6.3 Storage

- 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:  $-10^{\circ}\text{C}\sim 40^{\circ}\text{C}$ , 70%RH (Max.)
- c. The ambient temperature must be kept below  $30^{\circ}\text{C}$ . 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:

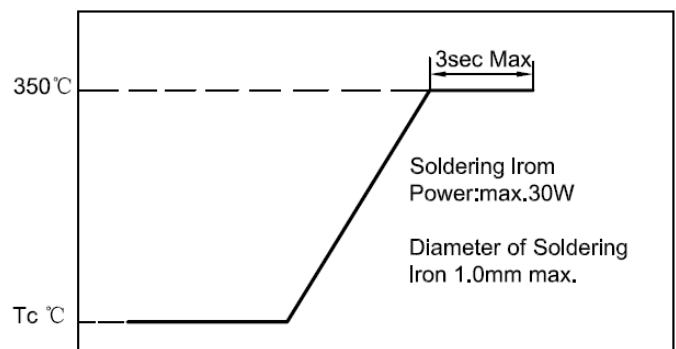
- △ Preheat condition:  $150\sim 200^{\circ}\text{C}/60\sim 120\text{sec}$ .
- △ Allowed time above  $217^{\circ}\text{C}$ :  $60\sim 90\text{sec}$ .
- △ Max temp:  $260^{\circ}\text{C}$
- △ Max time at max temp: 5sec.
- △ Solder paste: Sn/3.0Ag/0.5Cu
- △ Allowed Reflow time: 2x max



### 7.2 Iron Soldering Profile:

- △ Iron soldering power: Max.30W
- △ Pre-heating:  $150^{\circ}\text{C}/60\text{sec}$ .
- △ Soldering Tip temperature:  $350^{\circ}\text{C}$  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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