

# 1.6X0.8X0.5 (mm) WiFi/Bluetooth Ceramic Chip Antenna (MB1608H1) Engineering

## Specification1. Product Number

|    |      |    |     |    |
|----|------|----|-----|----|
| MB | 1608 | H1 | -01 | -R |
| 1  | 2    | 3  | 4   | 5  |

## 2. Features

|                 |               |
|-----------------|---------------|
| (1)Product Type | Chip Antenna  |
| (2)Size Code    | 1.6x0.8x0.5mm |
| (3)Type Code    | H1            |
| (4)Packing      | Paper &Reel   |
| (5)Frequency    | 2.45GHz       |



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LOTUS ANTENNA TECHNOLOGYCO.,LTD

Address:Room 613, Building 2, Dori International E-commerce Industrial Park, Futian, Shenzhen

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- \*Stable and reliable in performances
- \*Low temperature coefficient of frequency
- \*Low profile, compact size
- \*RoHS compliance
- \*SMT processes compatible

### 3. Applications

- \*Bluetooth earphone systems
- \*Hand-held devices when WiFi /Bluetooth functions are needed, e.g., Smart phone.
- \*IEEE802.11 b/g/n
- \*ZigBee
- \*Wireless PCMCIA cards or USB dongle

### 4. Description

MINGBO chip antenna series are specially designed for WiFi/Bluetooth applications. Based on MINGBO proprietary design and processes, this chip antenna has excellent stability and sensitivity to consistently provide high signal reception efficiency.

### 5. Electrical Specifications (40 x 40 mm<sup>2</sup> ground plane)

5-1. Electrical Table

| Characteristics    |            | Specifications      | Unit |
|--------------------|------------|---------------------|------|
| Outline Dimensions |            | 1.6x0.8x0.5         | mm   |
| Working Frequency  |            | 2400~2500           | MHz  |
| VSWR               |            | 2 Max.              |      |
| Impedance          |            | 50                  | Ω    |
| Polarization       |            | Linear Polarization |      |
| Gain               | Peak       | 1.5 (typical)       | dBi  |
|                    | Efficiency | 65 (typical)        | %    |



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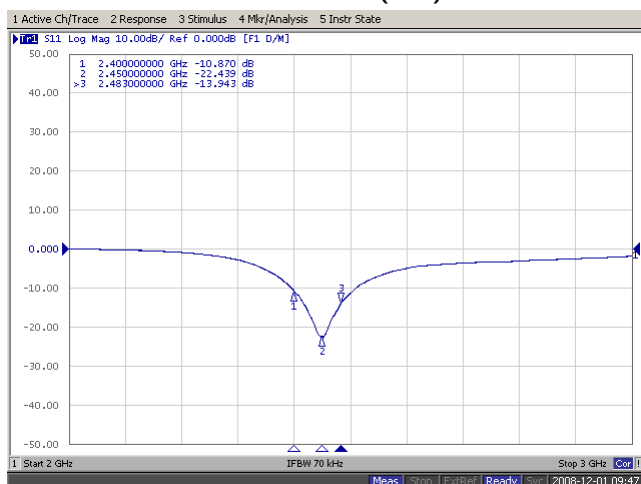
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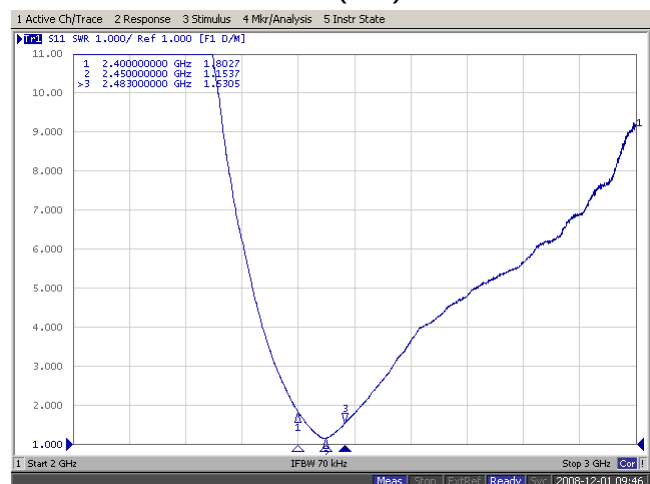
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## 5-2. Return Loss & VSWR

Return Loss (S<sub>11</sub>)



VSWR(S<sub>11</sub>)



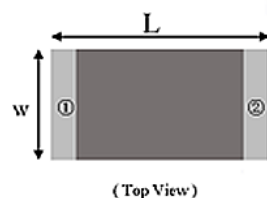
## 6. Antenna Dimensions (unit: mm)

### a. Antenna Dimensions

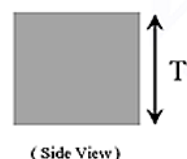
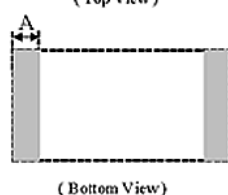
#### Applications

1. Bluetooth
2. Wireless LAN
3. ISM band 2.4GHz wireless applications

#### Dimensions (Unit: mm)



| Number | Terminal Name |
|--------|---------------|
| ①      | INPUT         |
| ②      | NC            |



| Symbols    | L           | W           | T          | A           |
|------------|-------------|-------------|------------|-------------|
| Dimensions | 1.60 ± 0.20 | 0.80 ± 0.20 | 0.5 ± 0.20 | 0.30 ± 0.10 |



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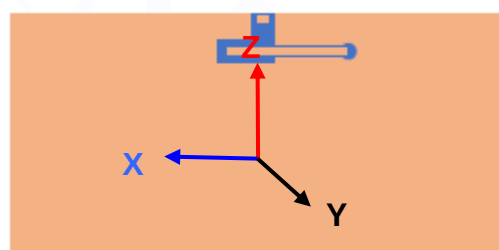
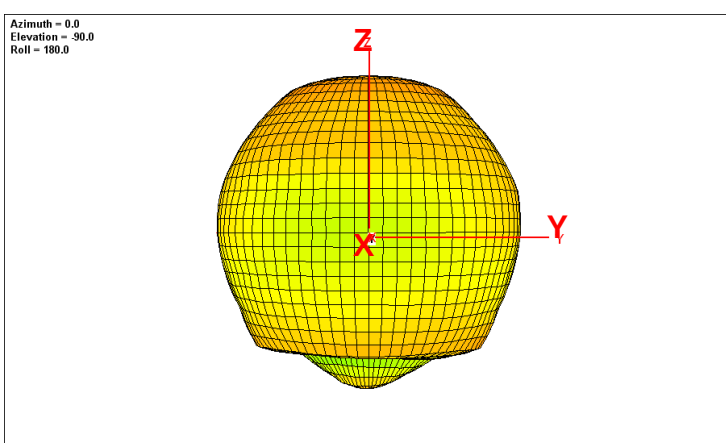
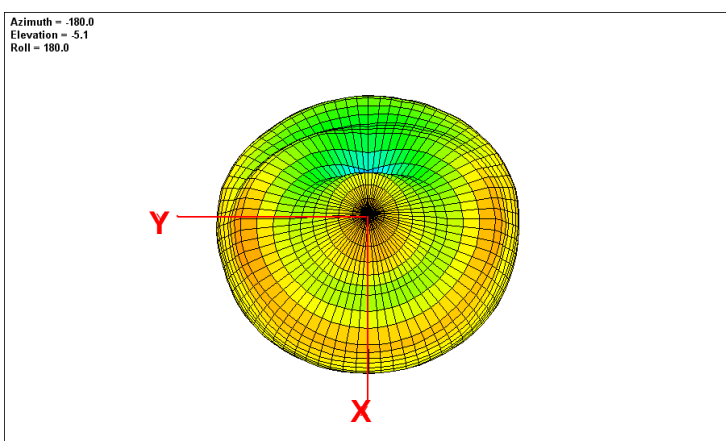
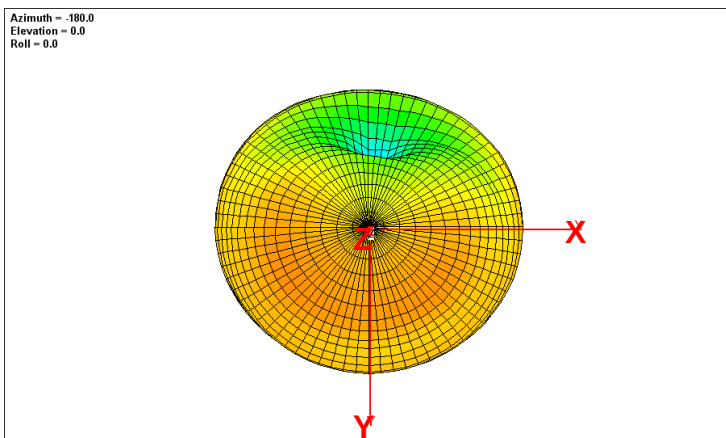
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## 7. Radiation Pattern (80 x 40 mm<sup>2</sup> ground plane)

### 7-1. 3D Gain Pattern @ 2442 MHz



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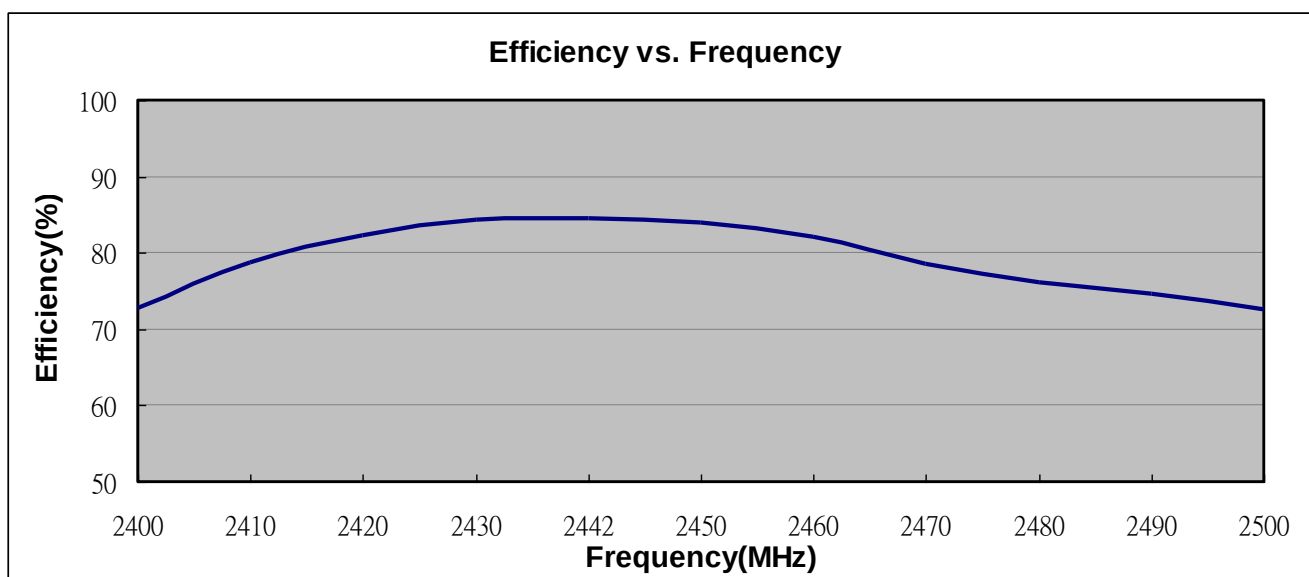
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## 7-2. 3D Efficiency Table

| Frequency( MHz) | 2400 | 2410 | 2420 | 2430 | 2442 | 2450 | 2460 | 2470 | 2480 | 2490 | 2500 |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| Efficiency (dB) | -1.4 | -1.0 | -0.9 | -0.7 | -0.7 | -0.8 | -0.9 | -1.1 | -1.2 | -1.3 | -1.4 |
| Efficiency (%)  | 62.8 | 63.7 | 64.3 | 64.4 | 65.5 | 65.0 | 64.0 | 63.6 | 63.1 | 62.6 | 61.5 |
| Gain (dBi)      | 1.1  | 1.2  | 1.3  | 1.4  | 1.5  | 1.5  | 1.4  | 1.3  | 1.2  | 1.1  | 1.1  |

## 7-3. 3D Efficiency vs. Frequency



## 8. Layout Guide

### a. Solder Land Pattern:

Land pattern for soldering (gray marking areas) is as shown below. Depending on



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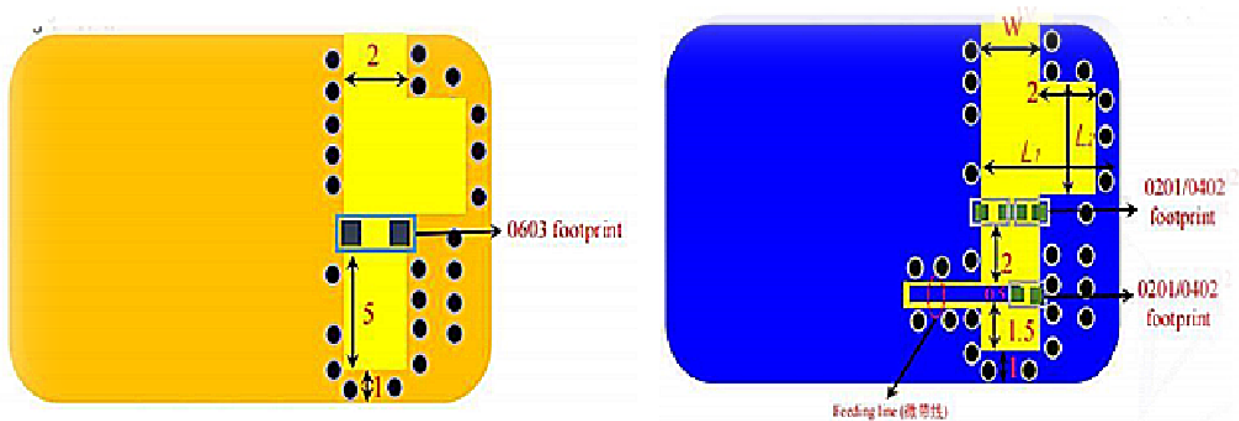
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Customer's requirement, matching circuit as shown below is also recommended.

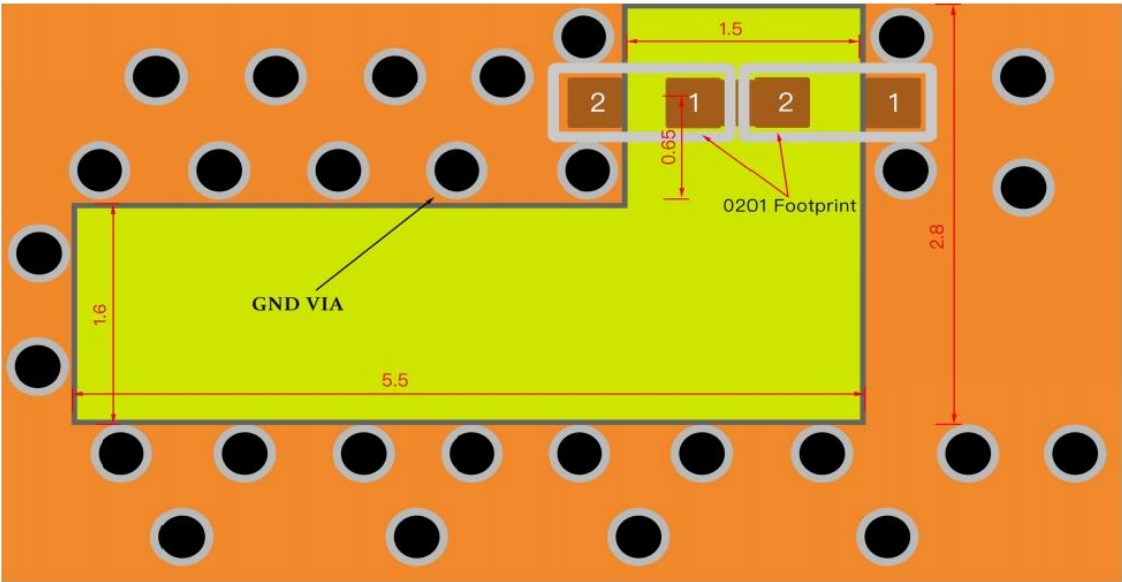
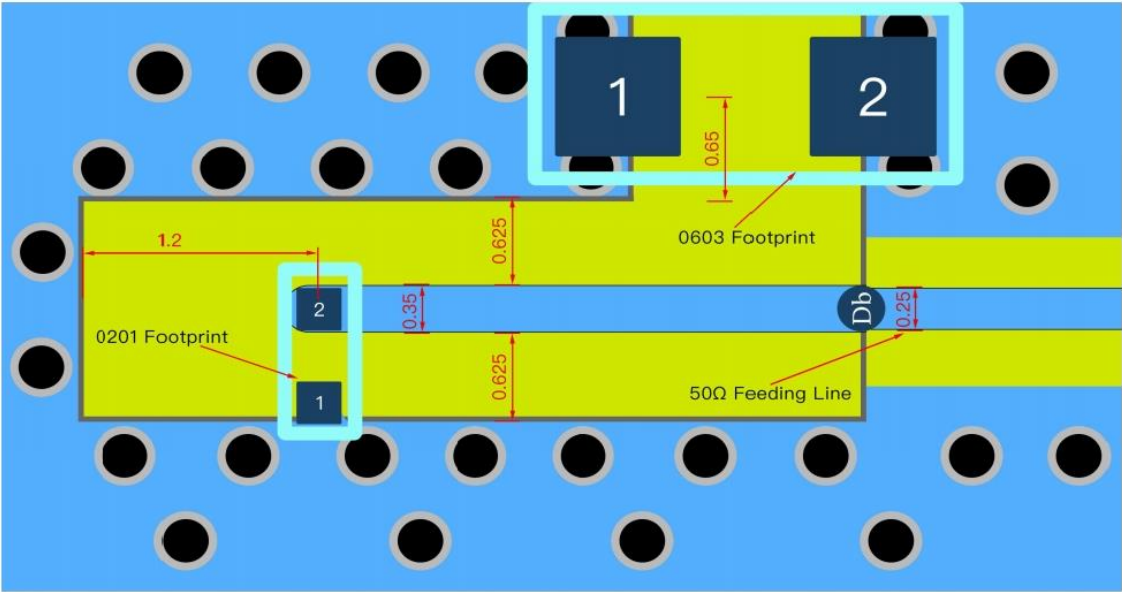


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Evaluation Board and Matching Circuits



Bottom View

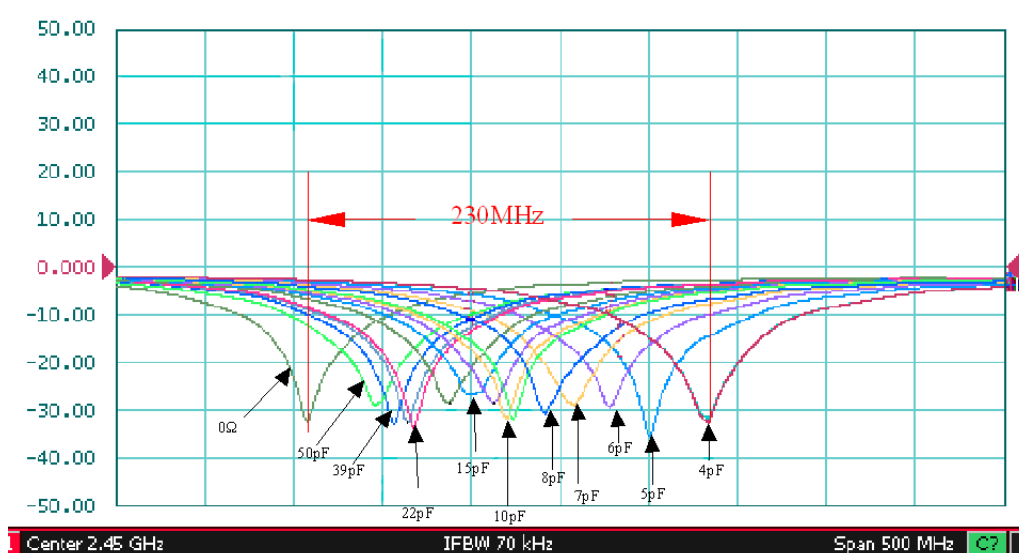
Unit : mm

c. Fine tuning element vs. Center frequency



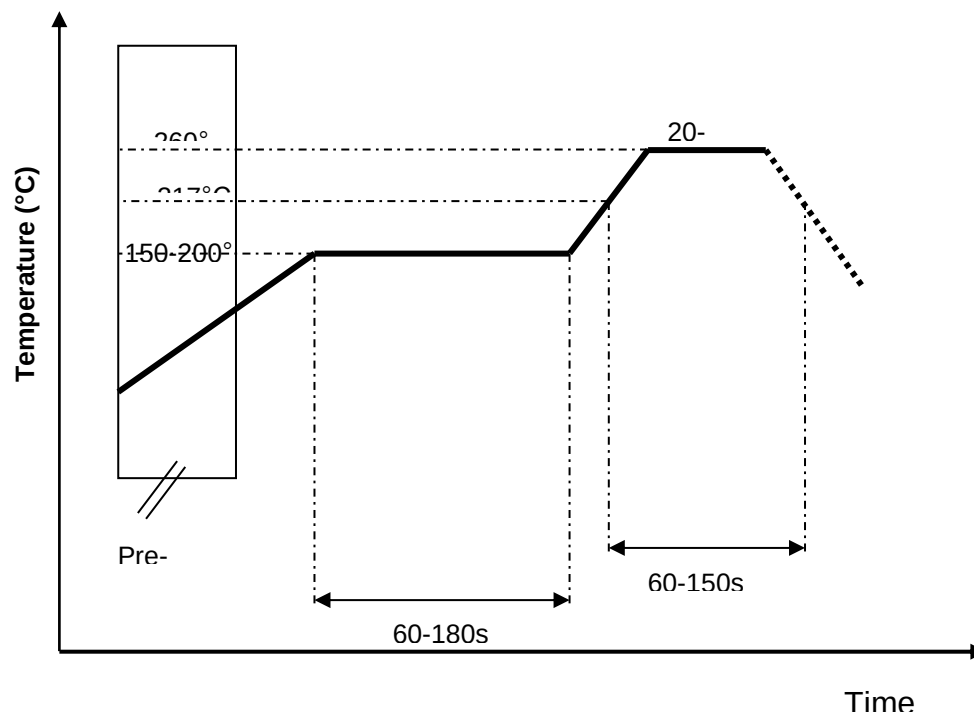
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## 9. Soldering Conditions

### a. Typical Soldering Profile for Lead-free Process



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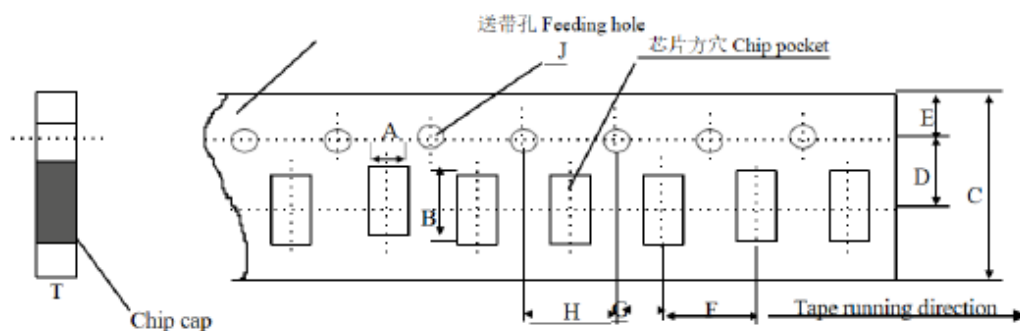
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## Packing

- (1) Quantity/Reel: 5000 pcs/Reel
- (2) Plastic tape:

### Dimensions of paper taping

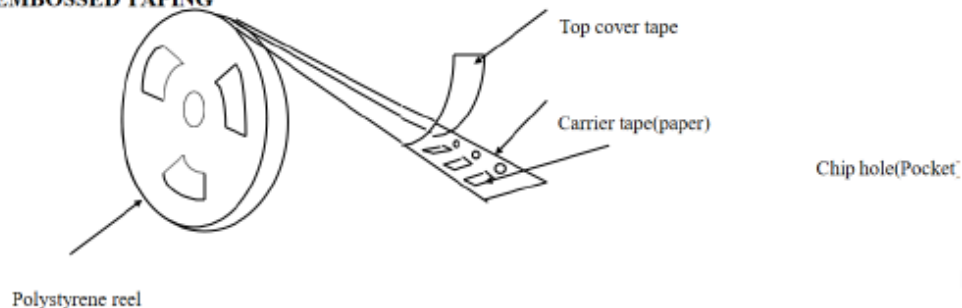


Unit: mm

| 代号 Code<br>纸带规格<br>papersize | A             | B             | C             | D*            | E             | F             | G*            | H             | J             | T           |
|------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------|
| 尺寸                           | 1.10<br>±0.10 | 1.90<br>±0.10 | 8.00<br>±0.10 | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50<br>±0.10 | 1.10<br>Max |

Reel (4000 pcs/Reel)

### EMBOSED TAPING



### Storage Period

The guaranteed period for solderability is 6 months (Under deliver package condition).  
Temperature: 5~40°C /Relative Humidity: 20~70%



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## Reliability Table

| Test Item                             | Procedure                                                                                                                                                                                                                                                                                         | Requirements<br>Ceramic Type                                                | Remark<br>(Reference)   |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------|
| Electrical<br>Characterization        |                                                                                                                                                                                                                                                                                                   | Fulfill the electrical<br>specification                                     | User Spec.              |
| Thermal<br>Shock                      | 1. Preconditioning:<br>50 ± 10°C / 1 hr, then keep for 24 ± 1 hrs at room temp.<br>2. Initial measure: Spec: refer Initial spec.<br>3. Rapid change of temperature test:<br>-30°C to +85°C; 100 cycles;<br>15 minutes at Lower category temperature;<br>15 minutes at Upper category temperature. | No Visible Damage.<br>Fulfill the electrical<br>specification.              | MIL-STD-202<br>107      |
| Temperature<br>Cycling                | 1. Initial measure: Spec: refer Initial spec.<br>2. 100 Cycles (-30°C to +85°C), Soak Mode=1 (2 Cycle/hours).<br>3. Measurement at 24 ± 2Hours after test condition.                                                                                                                              | No Visible Damage.<br>Fulfill the electrical<br>specification.              | JESD22<br>JA104         |
| High Temperature<br>Exposure          | 1. Initial measure: Spec: refer Initial spec.<br>2. Unpowered; 500hours @ T=+85°C.<br>3. Measurement at 24 ± 2 hours after test.                                                                                                                                                                  | No Visible Damage.<br>Fulfill the electrical<br>specification.              | MIL-STD-202<br>108      |
| Low Temperature<br>Storage            | 1. Initial measure: Spec: refer Initial spec.<br>2. Unpowered; 500hours @ T= -30°C.<br>3. Measurement at 24 ± 2 hours after test.                                                                                                                                                                 | No Visible Damage.<br>Fulfill the electrical<br>specification.              | MIL-STD-202<br>108      |
| Solderability<br>(SMD Bottom Side)    | Dipping method:<br>a. Temperature: 235 ± 5°C<br>b. Dipping time: 3 ± 0.5s                                                                                                                                                                                                                         | The solder should cover<br>over 95% of the critical<br>area of bottom side. | IEC 60384-21/22<br>4.10 |
| Soldering Heat<br>Resistance<br>(RSH) | Preheating temperature: 150 ± 10°C.<br>Preheating time: 1~2 min.<br>Solder temperature: 260 ± 5°C.<br>Dipping time: 5 ± 0.5s                                                                                                                                                                      | No Visible Damage.                                                          | IEC 60384-21/22<br>4.10 |



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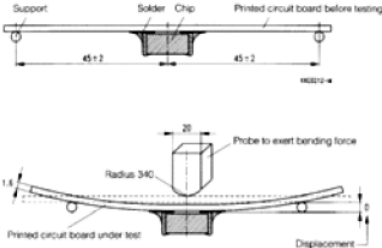
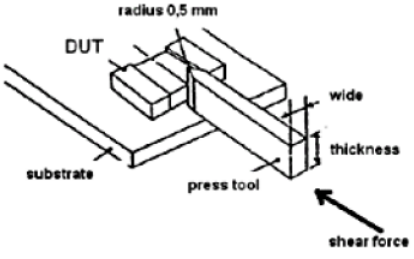
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| Board Flex (SMD)   | <p>1. Mounting method:<br/>IR-Reflow. PCB Size (L:100 × W:40 × T:1.6mm)</p> <p>2. Apply the load in direction of the arrow until bending reaches 2 mm.</p>  | No Visible Damage.                                                                                                                                                       | AEC-Q200 005 |
| Adhesion           | <p>Force of 1.8Kg for 60 seconds.</p>                                                                                                                       | No Visible Damage<br>Magnification of 20X or greater may be employed for inspection of the mechanical integrity of the device body terminals and body/terminal junction. | AEC-Q200 006 |
| Physical Dimension | Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.                                                       | In accordance with specification.                                                                                                                                        | JESD22 JB100 |



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