

# 3.2 x 1.6 x 0.5(mm) WiFi/Bluetooth Ceramic Chip Antenna (YF300K) Engineering Specification

## 1. Product Number

YF 3216 F8 R 2G4502

1 2 3 4 5



|                 |                     |
|-----------------|---------------------|
| (1)Product Type | Chip Antenna        |
| (2)Size Code    | 3.2x1.6x0.5mm       |
| (3)Type Code    | F8                  |
| (4)Packing      | Paper bag packaging |
| (5)Frequency    | 2.45GHz             |

## 2. Features

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

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Designed by : [andy](#)

Checked by : [andy](#)

Approved by : [oliver](#)

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### 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

Ying feng chip antenna series are specially designed for WiFi/Bluetooth applications. Based on yingfeng 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 |            | 3.2x1.6x0.5         | mm   |
| Working Frequency  |            | 2400~2500           | MHz  |
| VSWR               |            | 2 Max.              |      |
| Impedance          |            | 50                  | Ω    |
| Polarization       |            | Linear Polarization |      |
| Gain               | Peak       | 5.29 (typical)      | dBi  |
|                    | Efficiency | 73 (typical)        | %    |

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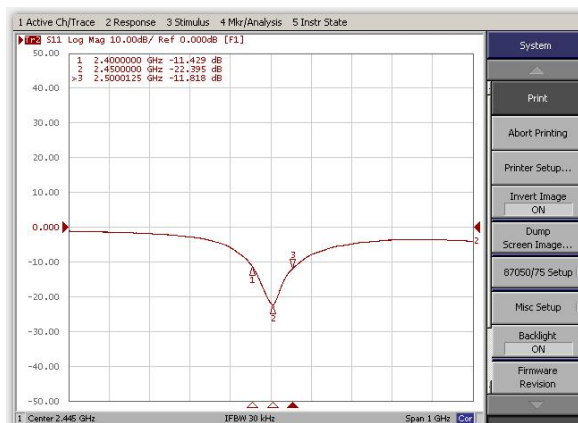
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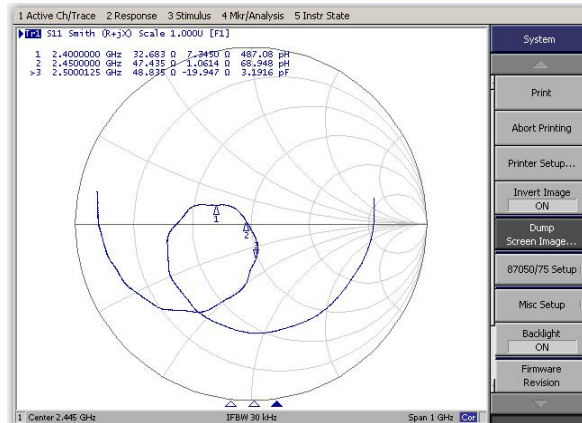
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## 5-2. Return Loss & VSWR

Return Loss ( $S_{11}$ )



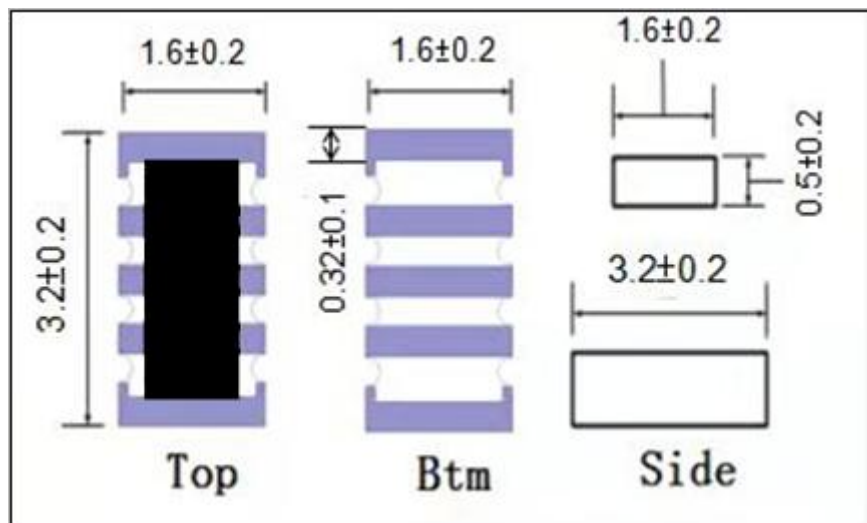
Smith Chart( $S_{11}$ )



## 6 Outline Dimensions of Antenna & Evaluation Board (unit: mm)

### 6-1. Antenna Dimensions

Configuration and Dimensions:



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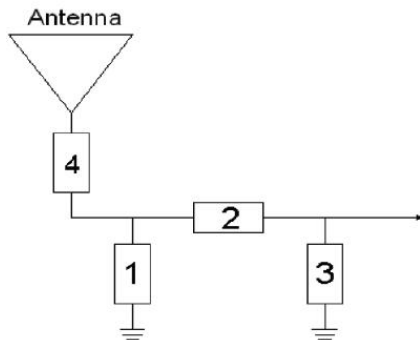
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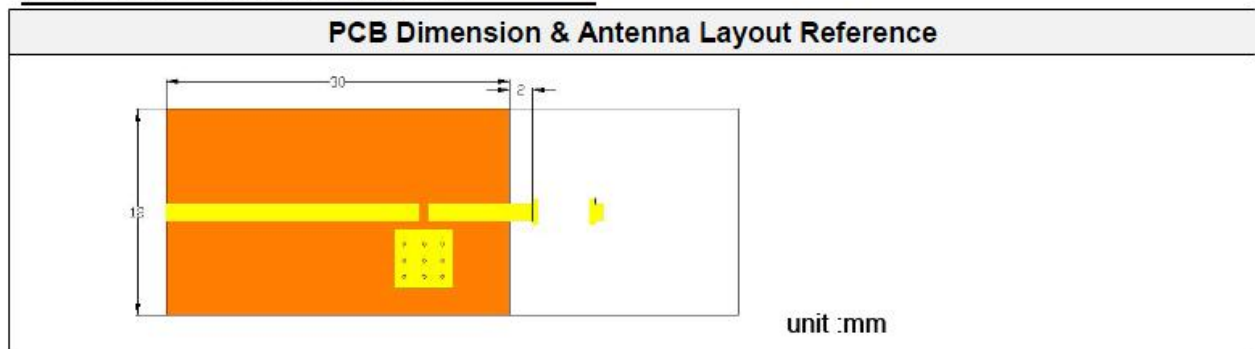
### 6-2-2. Matching Circuit:

With the following recommended values of matching and tuning components, the center frequencies will be about 2450 MHz at our standard 40x40 mm<sup>2</sup> evaluation board. However, these are reference values, may need to be changed when the circuit boards or part vendors are different.



| System Matching Circuit Component |               |        |
|-----------------------------------|---------------|--------|
| Location                          | Description   | Vendor |
| 1                                 | N/A*          | -      |
| 2                                 | 3.3nH, (0402) | DARFON |
| 3                                 | 1.5pF, (0402) | MURATA |
| 4                                 | 0Ω, (0402)    | -      |

### Evaluation Board Reference



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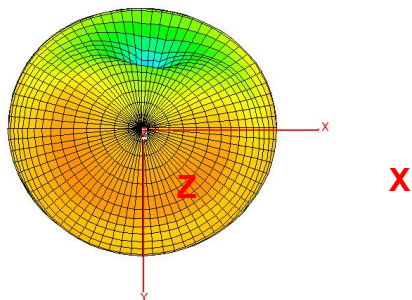
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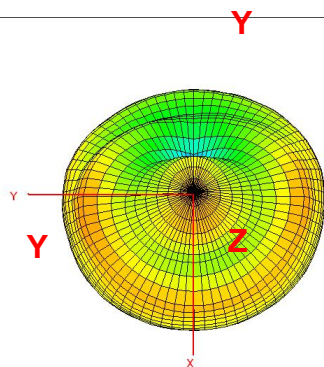
## 7.Radiation Pattern (40x 40 mm<sup>2</sup> ground plane)

### 7-1. 3D Gain Pattern @ 2450 MHz

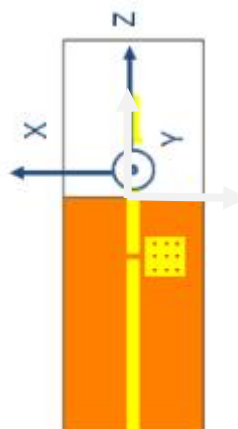
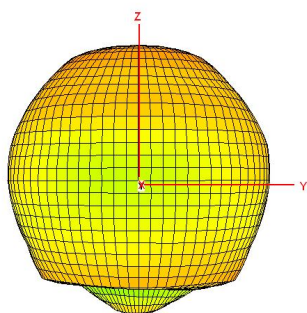
Azimuth = -180.0  
Elevation = 0.0  
Roll = 0.0



Azimuth = -180.0  
Elevation = -5.1  
Roll = 180.0



Azimuth = 0.0  
Elevation = -90.0  
Roll = 180.0



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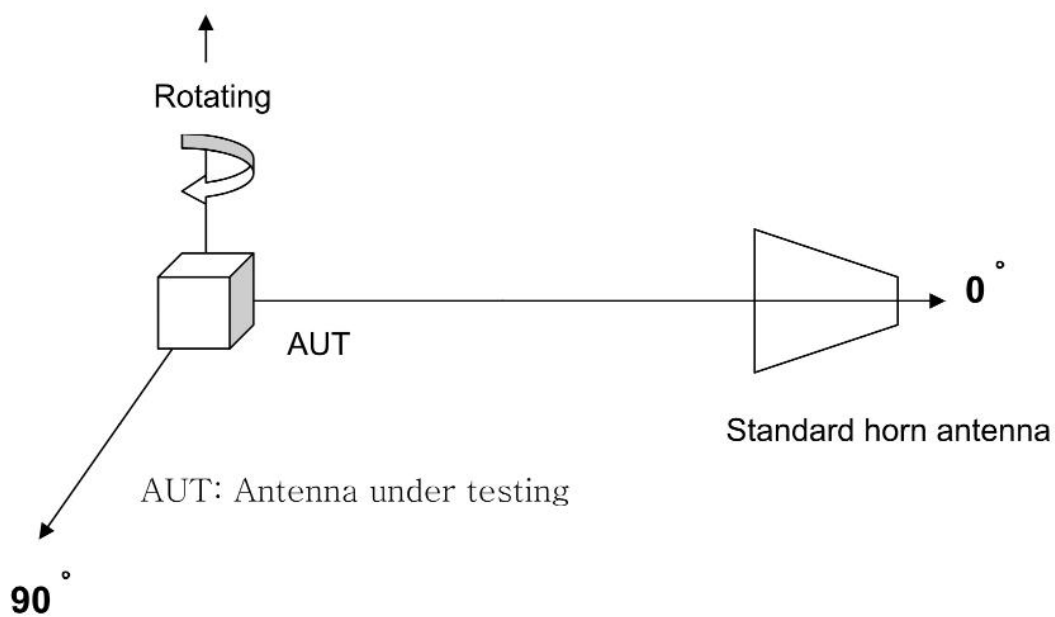
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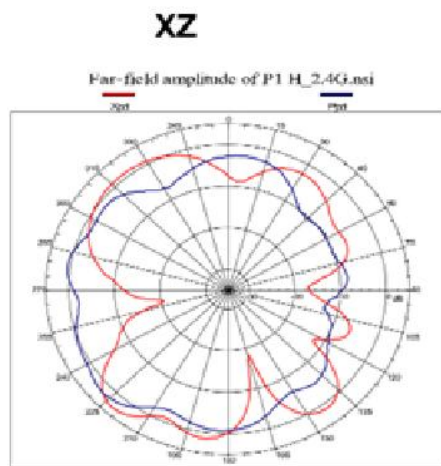
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## 8. Radiation Pattern (On 100x55 mm ground plane)

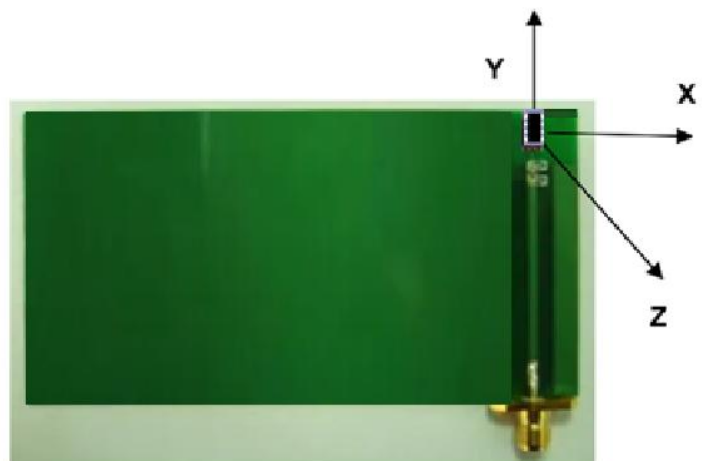


a. Type A

a. Type A



(Peak Gain =5.29 dBi, Average Gain -1.1dBi )



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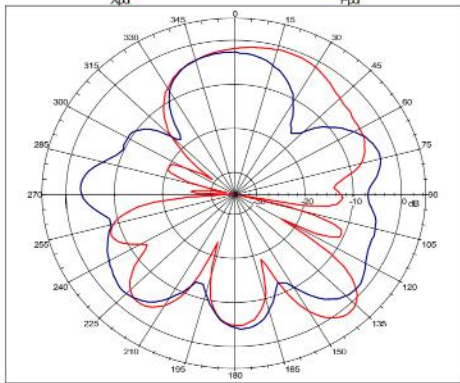
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## YZ

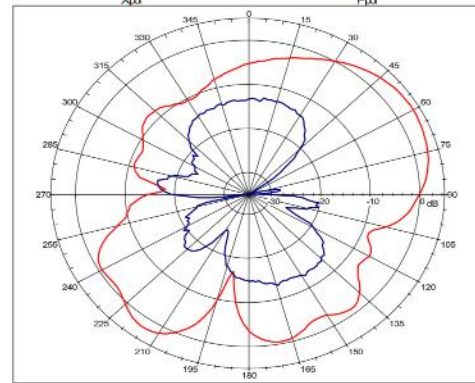
Far-field amplitude of P1 E\_2.4G02.nsi



(Peak Gain =2.29 dBi, Average Gain -3.97dBi )

## XY

Far-field amplitude of P1 E1\_2.4G.nsi



(Peak Gain =3.35 dBi, Average Gain -4.11dBi )

Source signal: Linearly polarized signal  $f_0 = 2450$  MHz

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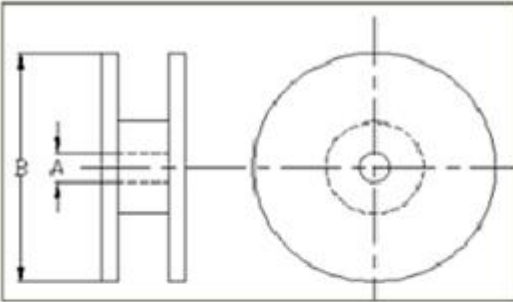
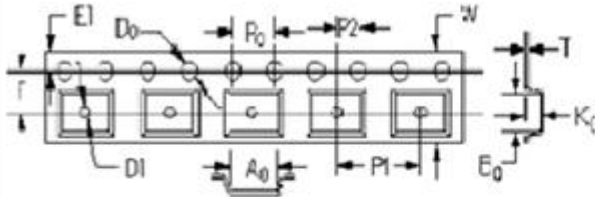
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## Taping Specifications

| Reel                                                                              |                    |              | Taping Blister Tape                                                                |       |                   |
|-----------------------------------------------------------------------------------|--------------------|--------------|------------------------------------------------------------------------------------|-------|-------------------|
|  |                    |              |  |       |                   |
| Checking note                                                                     | Index              | Spec (mm)    | Checking note                                                                      | Index | Spec (mm)         |
| Internal diameter of reel                                                         | A                  | 60.20 ± 0.50 | Sprocket hole                                                                      | D0    | 1.50 +0.10/-0.00  |
| External diameter of reel                                                         | B                  | 178 ± 1.00   | Distance sprocket hole to outside                                                  | E1    | 1.75 ± 0.10       |
|                                                                                   |                    |              | Distance sprocket hole to pocket                                                   | F     | 5.50 ± 0.05       |
|                                                                                   |                    |              | Distance sprocket hole to sprocket hole                                            | P0    | 4.00 ± 0.10       |
|                                                                                   |                    |              | Distance pocket to pocket                                                          | P1    | 4.00 ± 0.10       |
|                                                                                   |                    |              | Distance sprocket hole to pocket                                                   | P2    | 2.00 ± 0.05       |
|                                                                                   |                    |              | Tape width                                                                         | W     | 12.00 +0.30/-0.10 |
|                                                                                   |                    |              | Pocket width nominal clearance                                                     | A0    | 2.28 ± 0.13       |
|                                                                                   |                    |              | Pocket length nominal clearance                                                    | B0    | 5.70 ± 0.13       |
|                                                                                   |                    |              | Pocket depth minimum clearance                                                     | K0    | 1.58 ± 0.10       |
|                                                                                   |                    |              | Thickness of tape                                                                  | T     | 0.23 ± 0.02       |
| Quantity/per reel                                                                 | 5000 pcs           |              |                                                                                    |       |                   |
| Tape material                                                                     | Plastic (embossed) |              |                                                                                    |       |                   |

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## Reliability Table

| Test Item                          | Procedure                                                                                                                                                                                                                                                                                         | Requirements<br>Ceramic Type                                          | Remark<br>(Reference)     |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------|
| Electrical Characterization        |                                                                                                                                                                                                                                                                                                   | Fulfill the electrical specification                                  | User Spec.                |
| Thermal 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 specification.           | MIL-STD-202<br>107        |
| Temperature 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 specification.           | JESD22<br>JA104           |
| High Temperature 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 specification.           | MIL-STD-202<br>108        |
| Low Temperature 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 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 over 95% of the critical area of bottom side. | IEC 60384-21/22<br>4.10   |
| Soldering Heat 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   |
| Vibration                          | 5g's for 20 min., 12 cycles each of 3 orientations<br>Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz                                                     | No Visible Damage.                                                    | MIL-STD-202<br>Method 204 |
| Mechanical Shock                   | Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks)<br>Peak value: 1,500g's<br>Duration: 0.5ms<br>Velocity change: 15.4 ft/s<br>Waveform: Half-sine                                                                      | No Visible Damage.                                                    | MIL-STD-202<br>Method 213 |
| Humidity Bias                      | 1. Humidity: 85% R.H., Temperature: 85 ± 2 °C.<br>2. Time: 500 ± 24 hours.<br>3. Measurement at 24 ± 2hrs after test condition.                                                                                                                                                                   | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202<br>Method 106 |

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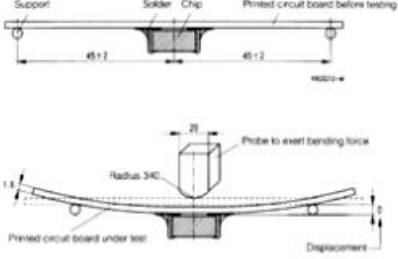
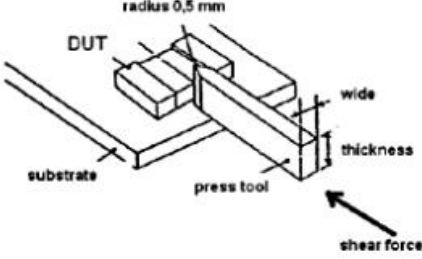
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|                    |                                                                                                                                                                                                                                              |                                                                                                                                                                          |              |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 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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