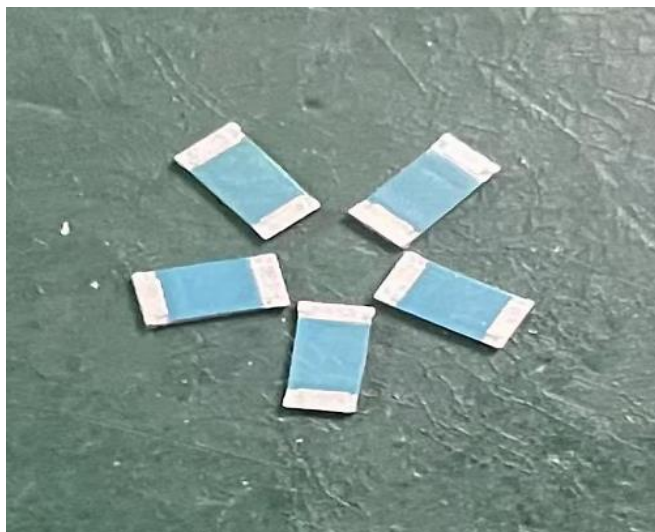


## 3.2X1.6X0.4 (mm) WiFi/Bluetooth Ceramic Chip Antenna (YF300B-1) Engineering Specification

### 1. Product Number

DY-3216Y1P2G45(LT)



|              |
|--------------|
| Chip Antenna |
| 3.2x1.6mm    |
| Y1           |
| Paper Tape   |
| 2.45GHz      |



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Checked by : Jason

Approved by : MR.FANG

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Antenna (YF300B-1) Engineering Specification

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## 2. Features

- \*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

Yingfeng 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 (80 x 40 mm<sup>2</sup> ground plane)

### 5-1. Electrical Table

| Characteristics    |            | Specifications      | Unit |
|--------------------|------------|---------------------|------|
| Outline Dimensions |            | 3.2x1.6x0.4         | mm   |
| Working Frequency  |            | 2400~2500           | MHz  |
| VSWR               |            | 2 Max.              |      |
| Impedance          |            | 50                  | Ω    |
| Polarization       |            | Linear Polarization |      |
| Gain               | Peak       | 2.5(typical)        | dBi  |
|                    | Efficiency | 78 (typical)        | %    |

### 5-2. Return Loss & VSWR



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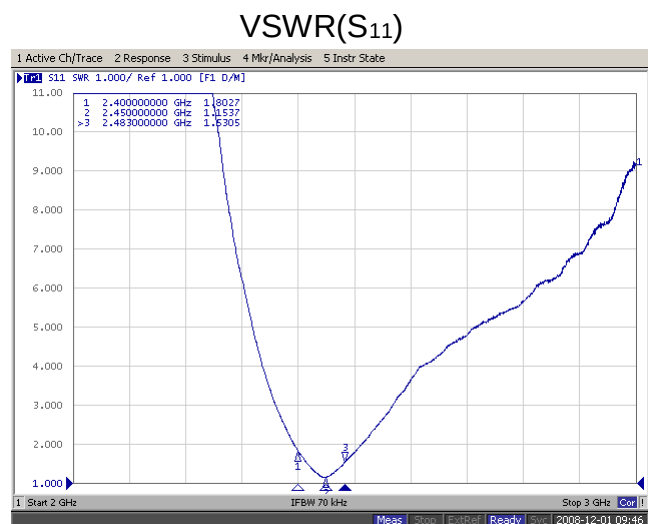
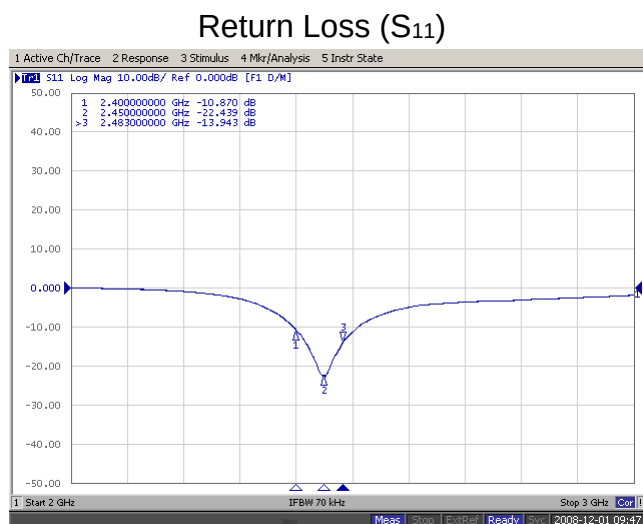
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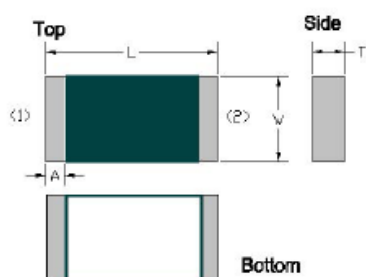
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## 6. Antenna Dimensions & Test Board (unit: mm)

### a. Antenna Dimensions

#### Dimension and Terminal Configuration



| Dimension (mm) |           |
|----------------|-----------|
| L              | 3.15+0.15 |
| W              | 1.55+0.15 |
| T              | 0.50+0.10 |
| A              | 0.35+0.10 |

| No. | Terminal Name |
|-----|---------------|
| 1   | Feeding point |
| 2   | GND           |



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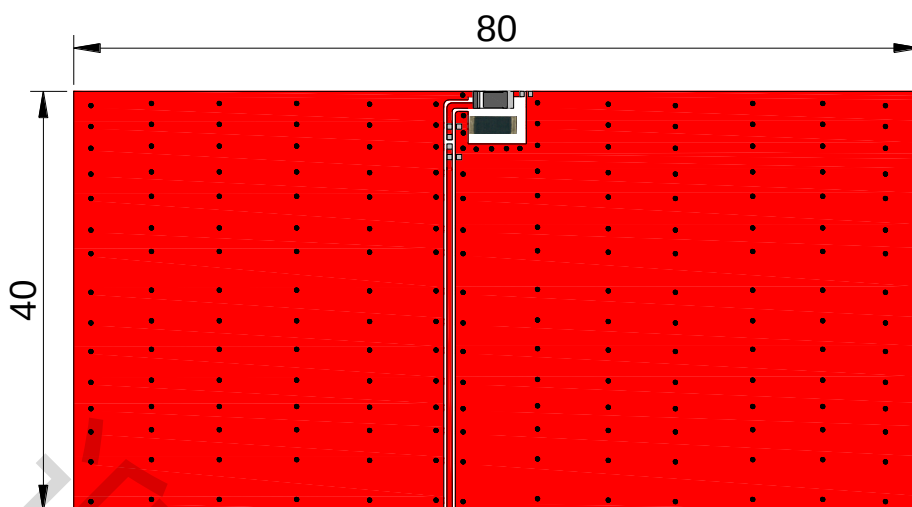
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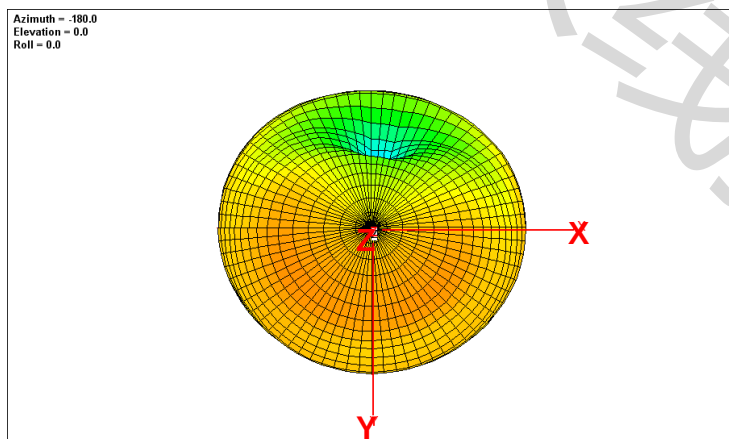
b. Test Board with Antenna



Unit: mm

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

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



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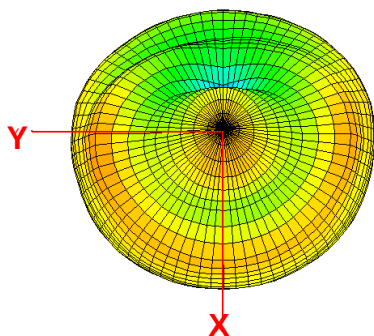
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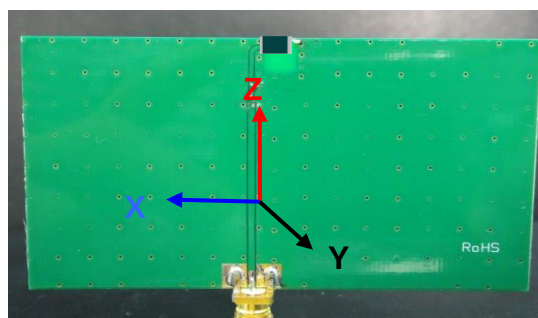
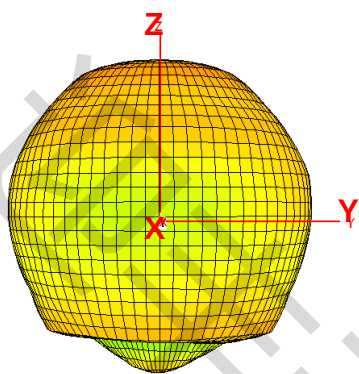
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Azimuth = -180.0  
Elevation = -5.1  
Roll = 180.0



Azimuth = 0.0  
Elevation = -90.0  
Roll = 180.0



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 (%)  | 72.8 | 73.7 | 74.3 | 74.4 | 75.5 | 75.0 | 74.0 | 73.6 | 73.1 | 72.6 | 71.5 |
| Gain (dBi)      | 2.1  | 2.2  | 2.3  | 2.4  | 2.5  | 2.5  | 2.4  | 1.8  | 1.7  | 1.6  | 1.4  |



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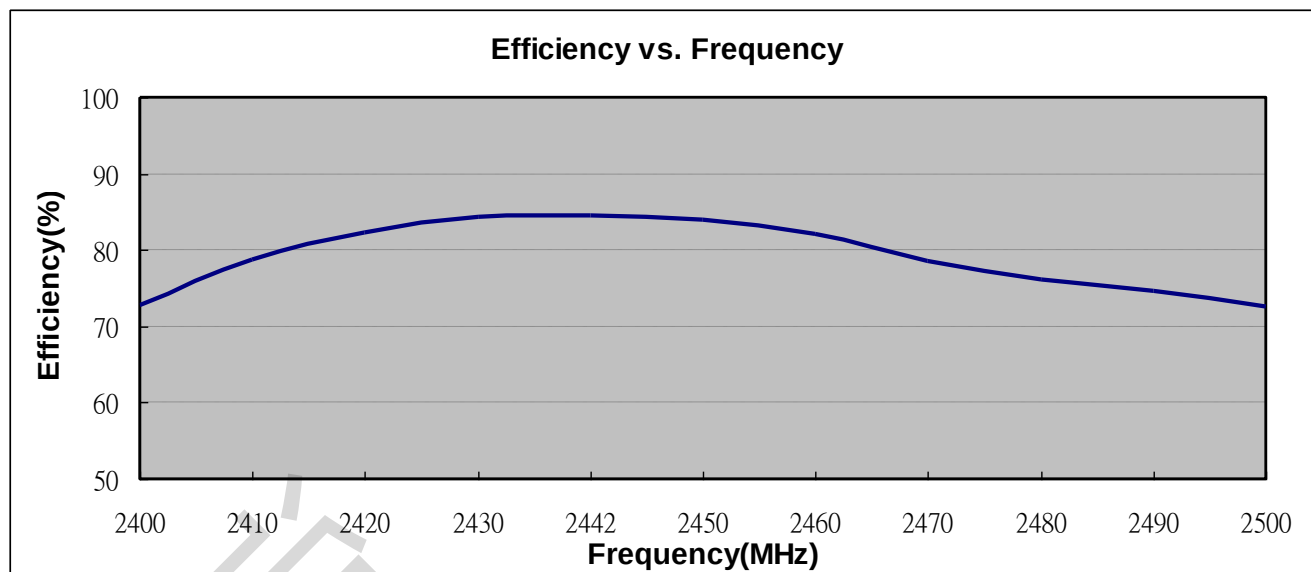
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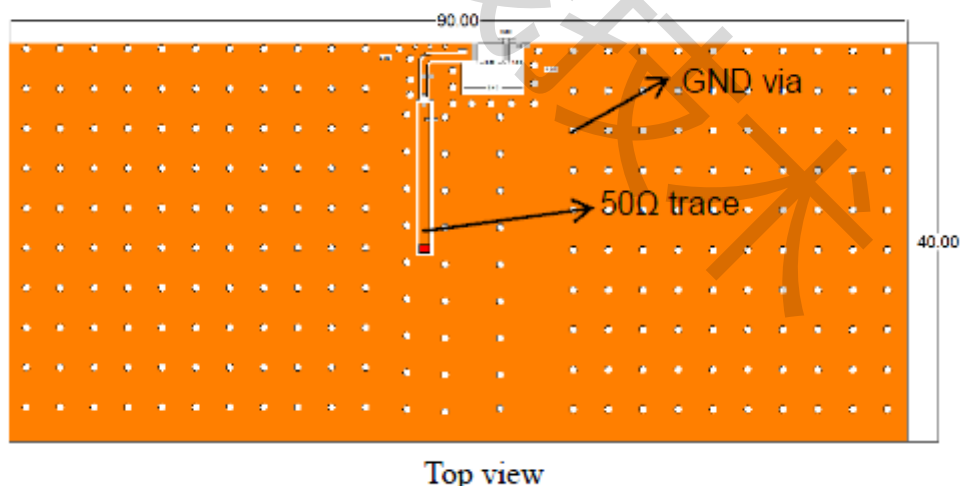
### 7-3. 3D Efficiency vs. Frequency



## 8. Layout Guide

### a. Solder Land Pattern:

Land pattern for soldering (gray marking areas) is as shown below. Depending on Customer's requirement, matching circuit as shown below is also recommended.



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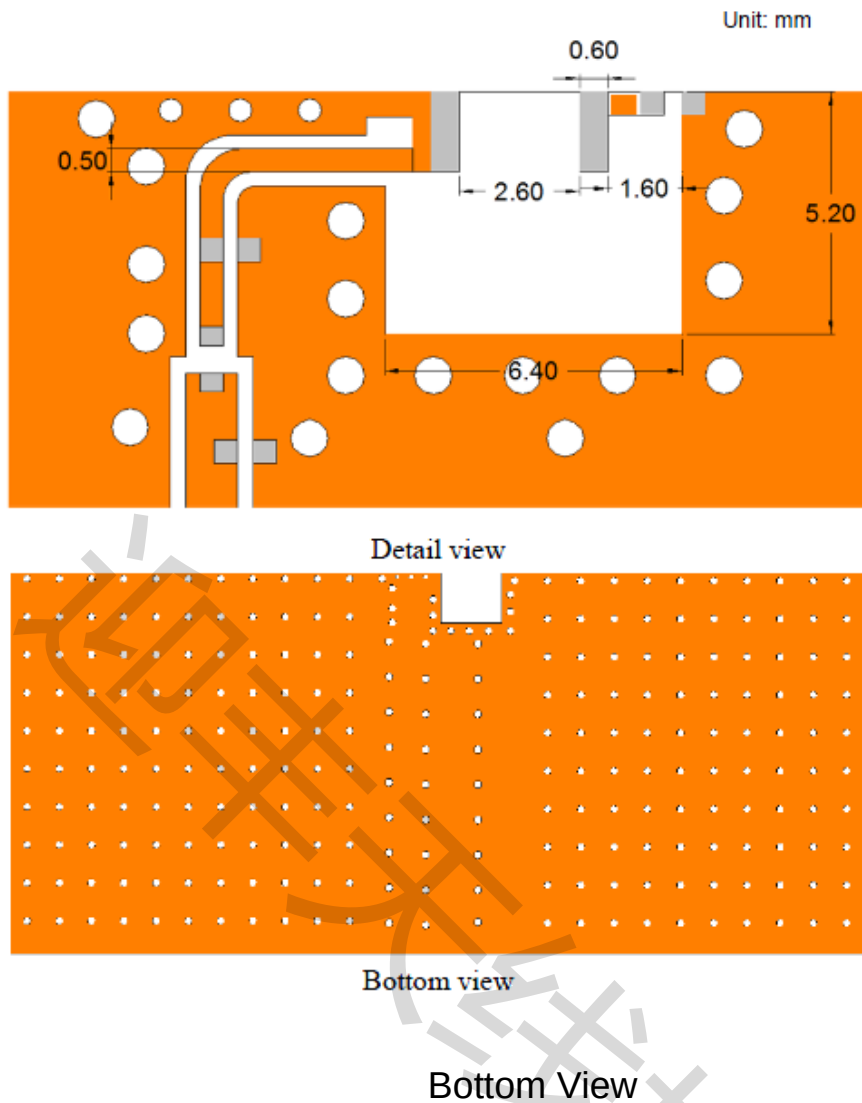
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Unit : mm

## 9. Frequency tuning

a. Chip antenna tuning scenario :

Feed

4. Fine tuning element



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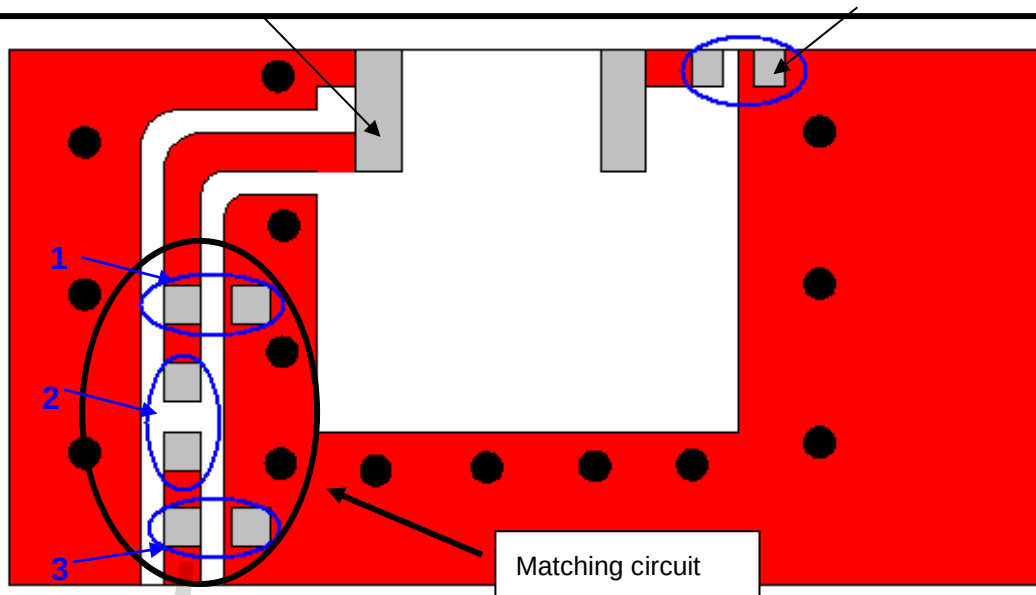
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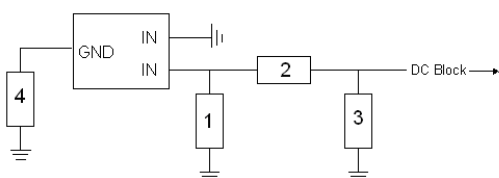
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b. Matching circuit : (Center frequency is about 2442 MHz @ 80 x 40 mm<sup>2</sup> ground plane)



| System Matching Circuit Component |             |               |           |
|-----------------------------------|-------------|---------------|-----------|
| Location                          | Description | Vendor        | Tolerance |
| 1                                 | 1.2 pF*     | Murata (0402) | ±0.1 pF   |
| 2                                 | 10PF*       | Murata(0402)  | ±0.5 PF   |
| 3                                 | N/A*        | -             | -         |
| Fine tuning element 4             | 1.5 pF*     | Murata (0402) | ±0.1 pF   |

\*Typical reference values which may need to be changed when circuit boards or part vendors are different.



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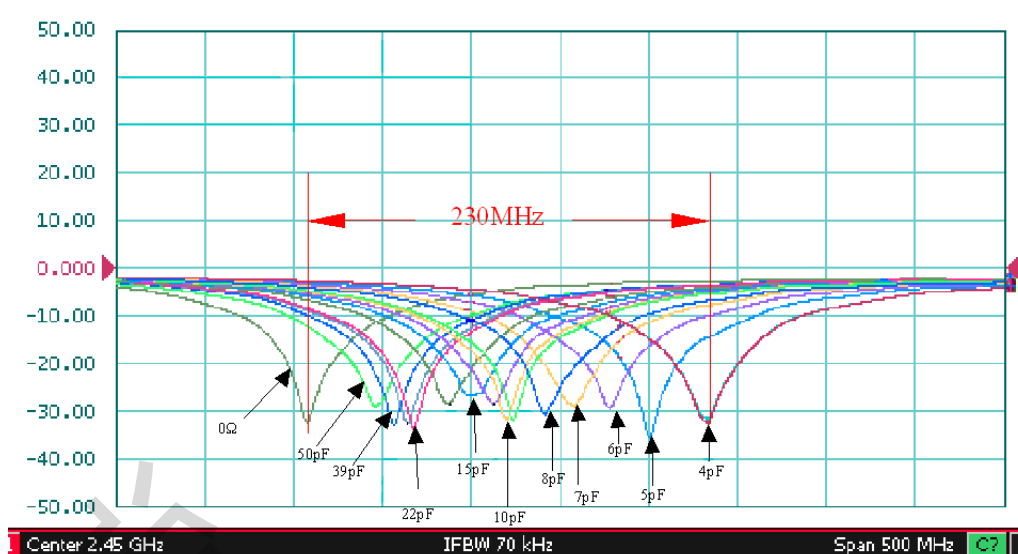
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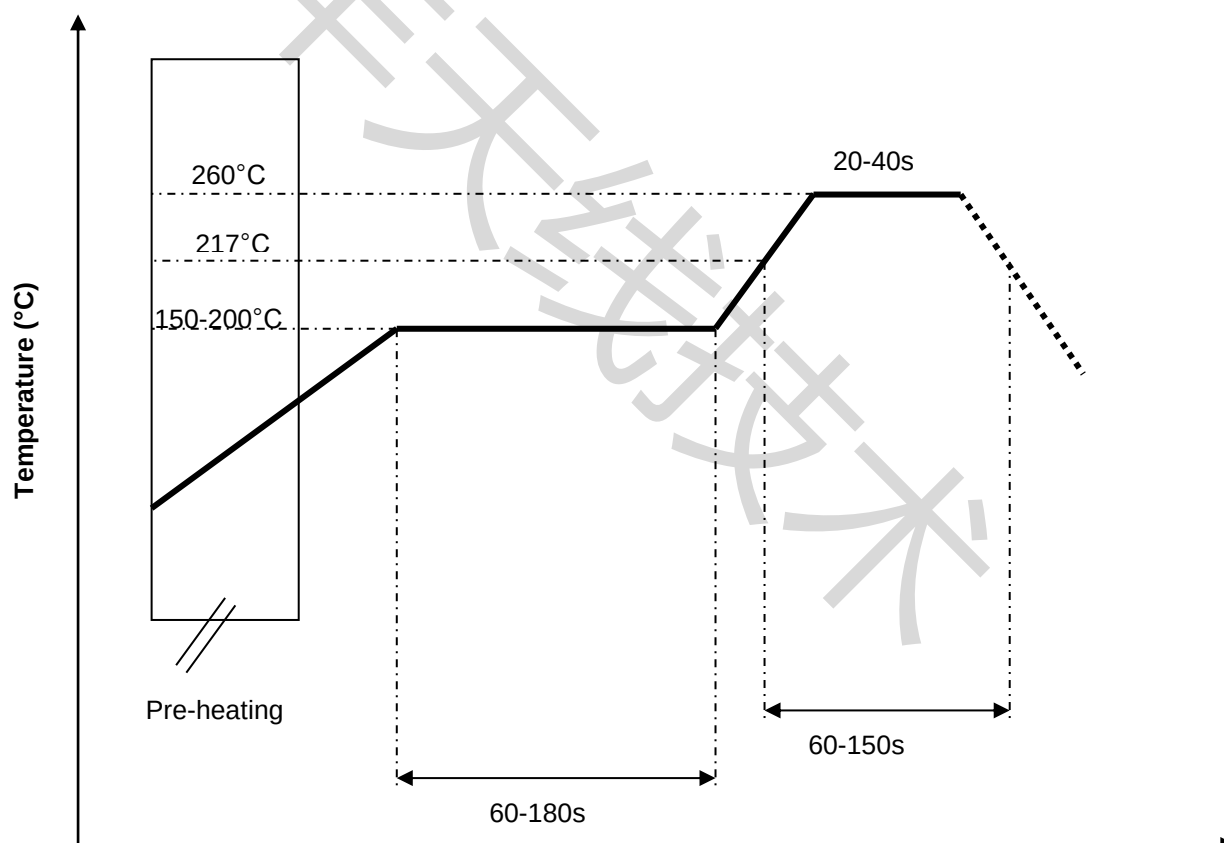
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### c. Fine tuning element vs. Center frequency



## 10. Soldering Conditions

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



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11. Packing

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

## Reel and Taping Specification

### Reel Specification

The diagram illustrates the dimensions of a reel. The top view shows a circular reel with an outer diameter  $\phi B$ , an inner diameter  $\phi C$ , and a central hole diameter  $\phi D$ . The radius of the reel is labeled A. The side view shows the reel's width W and the diameter of the central hole  $\phi D$ .

| TYPE | SIZE | A       | $\phi B$ | $\phi C$ | $\phi D$ | W      | $\phi M$ |
|------|------|---------|----------|----------|----------|--------|----------|
| 3216 | 7"   | 3K/Reel | 2.0±0.5  | 13.5±1.0 | 21±1.0   | 60±1.0 | 178±2.0  |

### Tapping Specification

The diagram illustrates the dimensions of a carrier tape. The top view shows a carrier tape with a width B, a pitch A, and a pitch P. The diameter of the hole is labeled  $\phi D$ . The side view shows the carrier tape's width W, the height of the carrier tape T, and the width of the carrier tape E. The carrier tape is labeled "Paper Carrier".

| Packaging  | Type | A         | B         | W        | E         | F        | G        | H        | T         | $\phi D$            | P       |
|------------|------|-----------|-----------|----------|-----------|----------|----------|----------|-----------|---------------------|---------|
| Paper Type | 3216 | 1.90±0.20 | 3.50±0.20 | 8.0±0.20 | 1.75±0.10 | 3.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.75±0.10 | 1.50<br>+0.10<br>-0 | 4.0±0.1 |



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|                                                                                                        |                                |          |
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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   |
| 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<br>side and 2 secure points at corners of opposite sides. Parts<br>mounted within 2" from any secure point. Test from 10-2000<br>Hz.                                           | No Visible Damage.                                                          | MIL-STD-202<br>Method 204 |
| Mechanical<br>Shock                   | Three shocks in each direction shall be applied along the three<br>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<br>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<br>specification.              | MIL-STD-202<br>Method 106 |



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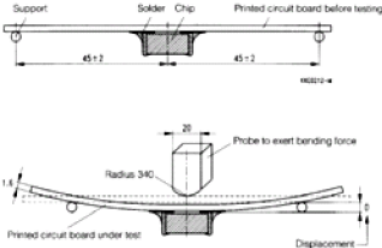
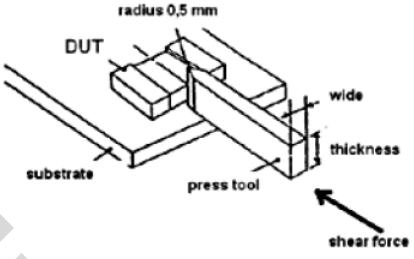
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|                    |                                                                                                                                                                                                                                 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

## Revision History

| Revision | Date      | Content                                   |
|----------|-----------|-------------------------------------------|
| 1        | 2015/8/20 | New issue                                 |
| 2        | 2017/4/20 | Update detail dimension on antenna layout |
| 3        | 2018/3/1  | Part number and coding rule updated       |



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