

# 3.2X1.6X1.0 (mm) WiFi/Bluetooth Ceramic Chip Antenna

## Engineering Specification

### 1. Product Number

YF 3216 H3 X 2G45

1 2 3 4 5



|                 |                   |
|-----------------|-------------------|
| (1)Product Type | Chip Antenna      |
| (2)Size Code    | 3.2x1.6x1.0mm     |
| (3)Type Code    | H3                |
| (4)Packing      | Plastic Packaging |
| (5)Frequency    | 2.45GHz           |



深圳市迎丰天线技术有限公司

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

Prepared by : JIEXI

Designed by : Jason

Checked by : Jason

Approved by : MR.FANG

TITLE : 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip  
Antenna (YF3216H3) Engineering Specification

DOCUMENT  
NO.

YF3216H3X2G45

REV.

D

## 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 |            | 3.2x1.6x1.0         | mm   |
| Working Frequency  |            | 2400~2500           | MHz  |
| VSWR               |            | 2 Max.              |      |
| Impedance          |            | 50                  | Ω    |
| Polarization       |            | Linear Polarization |      |
| Gain               | Peak       | 2.5(typical)        | dBi  |
|                    | Efficiency | 80 (typical)        | %    |



深圳市迎丰天线技术有限公司

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

Prepared by : JIEXI

Designed by : Jason

Checked by : Jason

Approved by : MR.FANG

TITLE : 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip  
Antenna (YF3216H3) Engineering Specification

DOCUMENT  
NO.

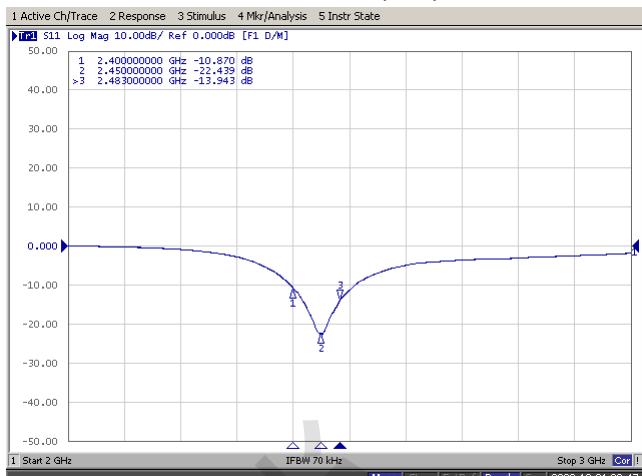
YF3216H3X2G45

REV.

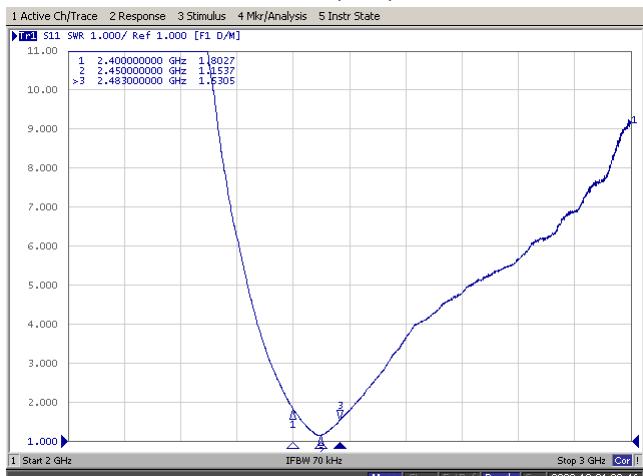
D

## 5-2. Return Loss & VSWR

### Return Loss ( $S_{11}$ )



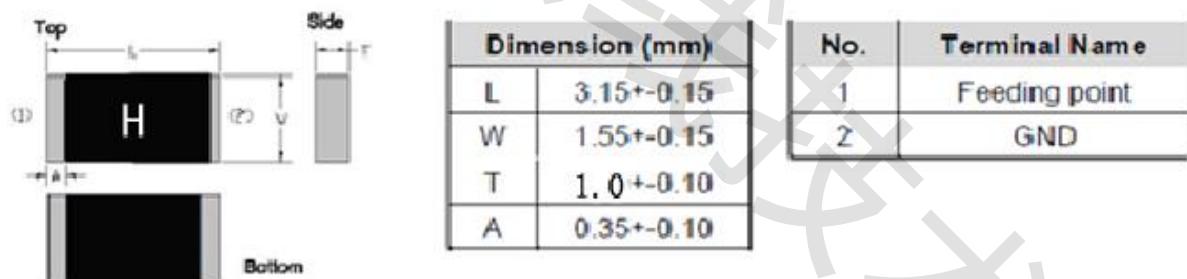
### VSWR( $S_{11}$ )



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

### a. Antenna Dimensions

#### Dimension and Terminal Configuration



### b. Test Board with Antenna



深圳市迎丰天线技术有限公司

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

Prepared by : JIEXI

Designed by : Jason

Checked by : Jason

Approved by : MR.FANG

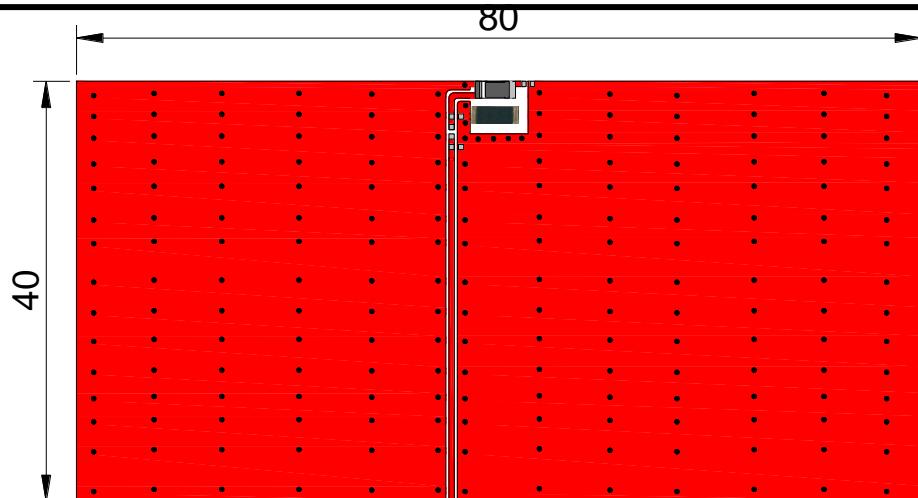
TITLE : 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip  
Antenna (YF3216H3) Engineering Specification

DOCUMENT  
NO.

YF3216H3X2G45

REV.

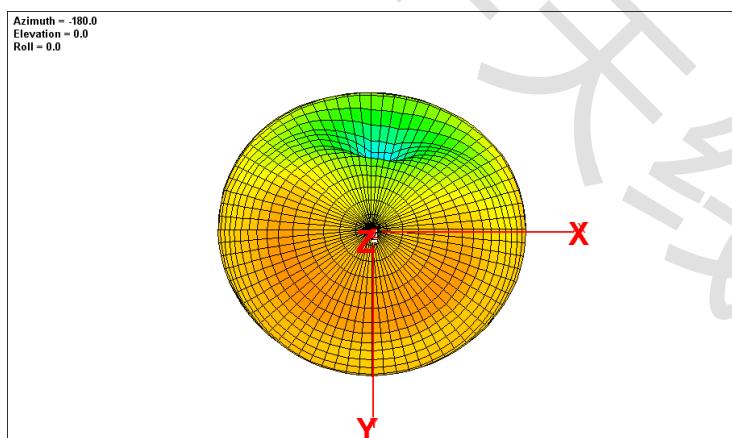
D



Unit: mm

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

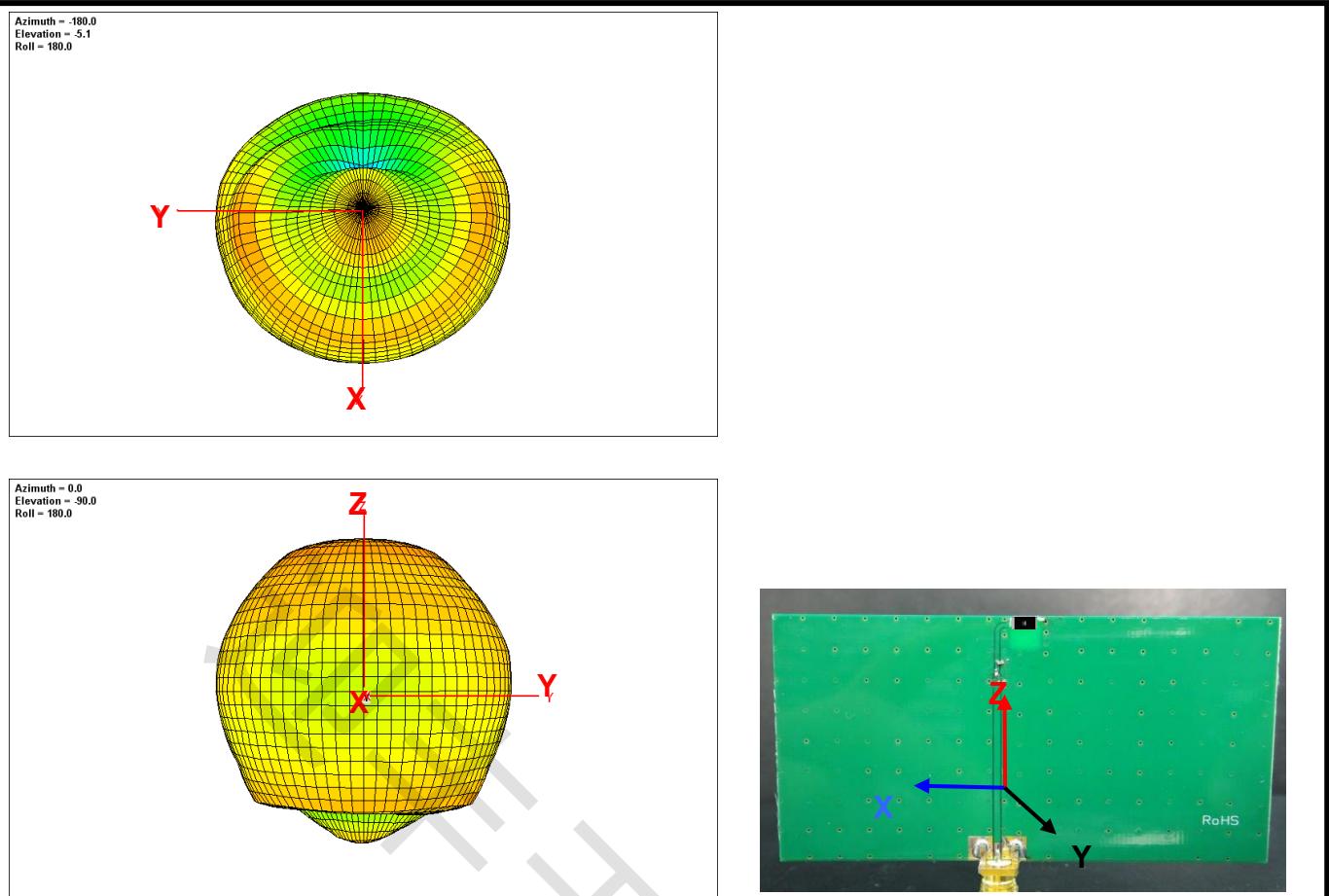
### 7-1. 3D Gain Pattern @ 2442 MHz



深圳市迎丰天线技术有限公司

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

| Prepared by : JIEXI   | Designed by : Jason | Checked by : Jason | Approved by : MR.FANG |
|---|---------------------|--------------------|-----------------------|
| <b>TITLE :</b> 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip Antenna (YF3216H3) Engineering Specification | DOCUMENT NO.        | YF3216H3X2G45      | REV.<br>D             |



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  |

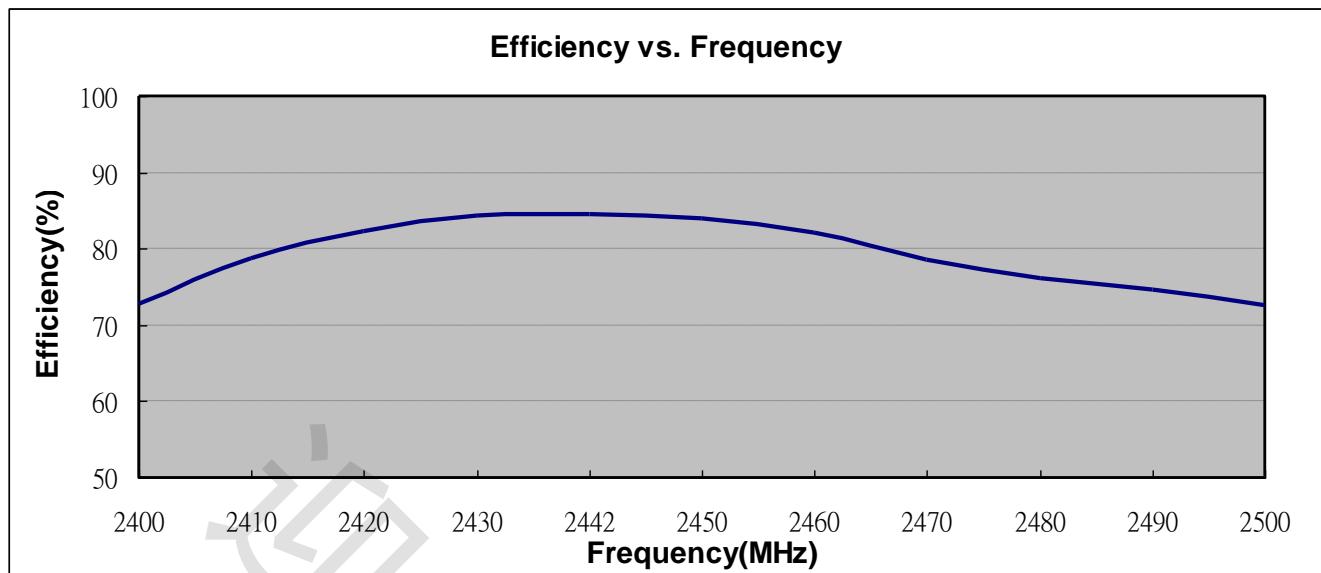


深圳市迎丰天线技术有限公司

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

| Prepared by : JIEXI   | Designed by : Jason | Checked by : Jason   | Approved by : MR.FANG |
|---|---------------------|----------------------|-----------------------|
| <b>TITLE :</b> 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip Antenna (YF3216H3) Engineering Specification | <b>DOCUMENT NO.</b> | <b>YF3216H3X2G45</b> | <b>REV.</b>           |

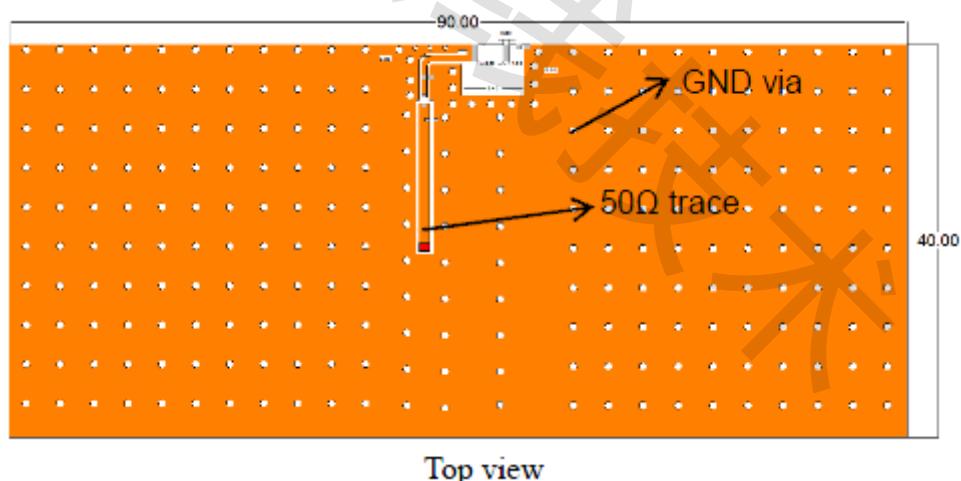
### 7-3. 3D Efficiency vs. Frequency



## 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.



深圳市迎丰天线技术有限公司

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

Prepared by : **JIEXI**

Designed by : **Jason**

Checked by : **Jason**

Approved by : **MR.FANG**

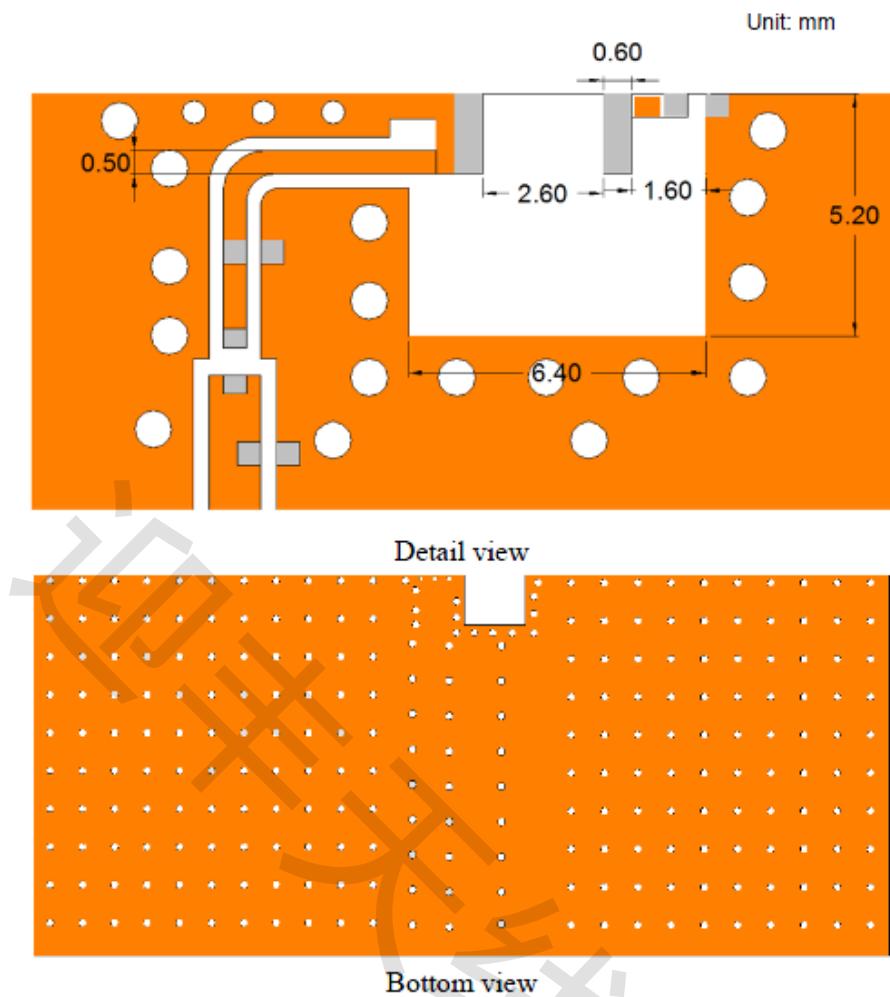
**TITLE :** 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip  
Antenna (YF3216H3) Engineering Specification

DOCUMENT  
NO.

**YF3216H3X2G45**

REV.

**D**



深圳市迎丰天线技术有限公司

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

Prepared by : JIEXI

Designed by : Jason

Checked by : Jason

Approved by : MR.FANG

**TITLE :** 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip  
Antenna (YF3216H3) Engineering Specification

DOCUMENT  
NO.

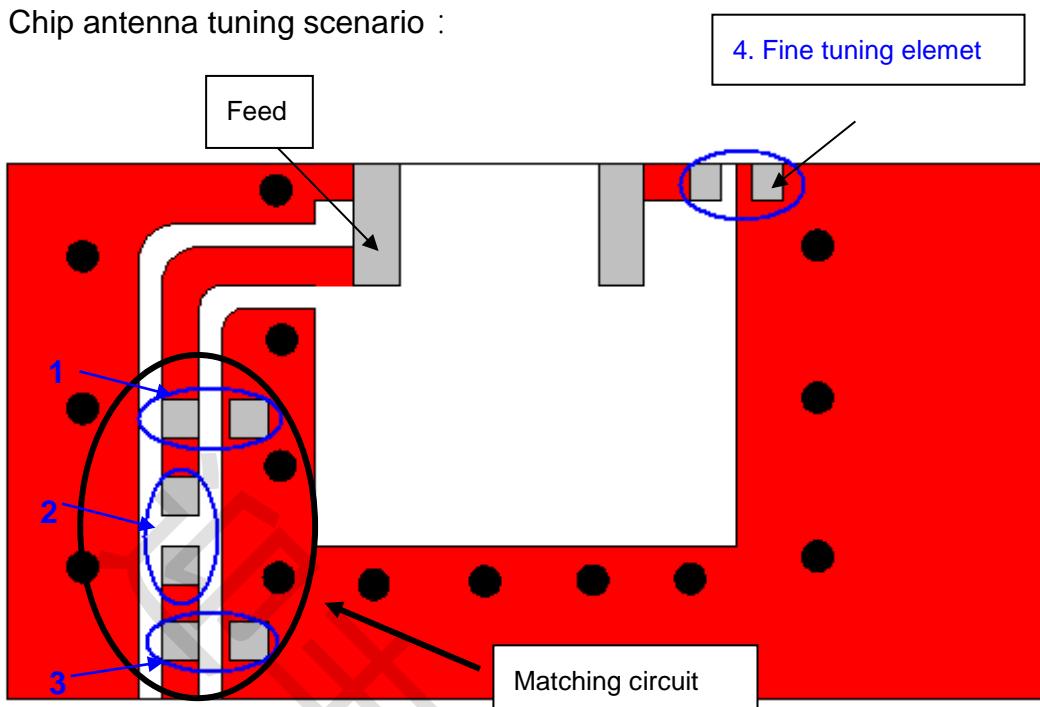
YF3216H3X2G45

REV.

D

## 9. Frequency tuning

a. Chip antenna tuning scenario :



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.



深圳市迎丰天线技术有限公司

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

Prepared by : JIEXI

Designed by : Jason

Checked by : Jason

Approved by : MR.FANG

TITLE : 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip Antenna (YF3216H3) Engineering Specification

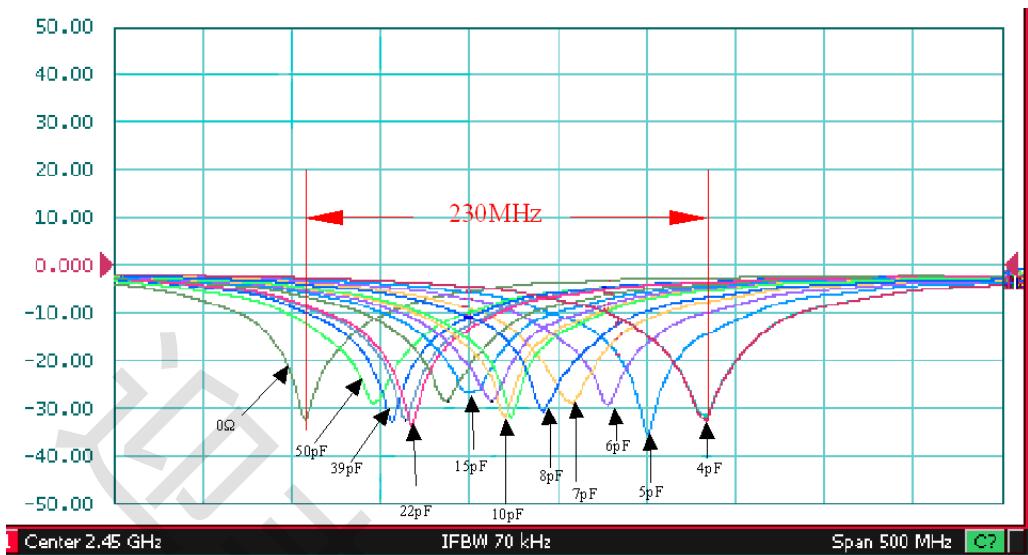
DOCUMENT NO.

YF3216H3X2G45

REV.

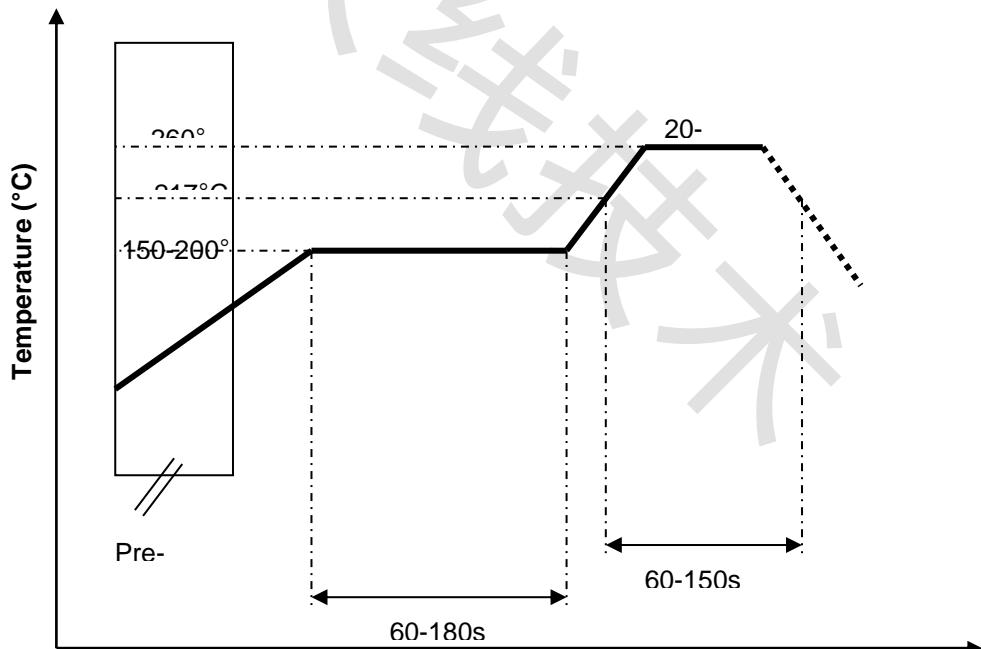
D

c. Fine tuning element vs. Center frequency



## 10. Soldering Conditions

a. Typical Soldering Profile for Lead-free Process



深圳市迎丰天线技术有限公司

Time

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

Prepared by : JIEXI

Designed by : Jason

Checked by : Jason

Approved by : MR.FANG

**TITLE :** 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip  
Antenna (YF3216H3) Engineering Specification

DOCUMENT  
NO.

**YF3216H3X2G45**

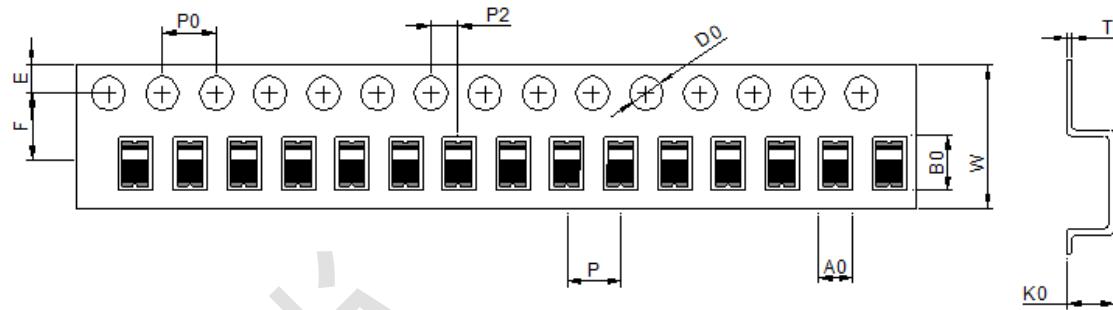
REV.

**D**

## 11. Packing

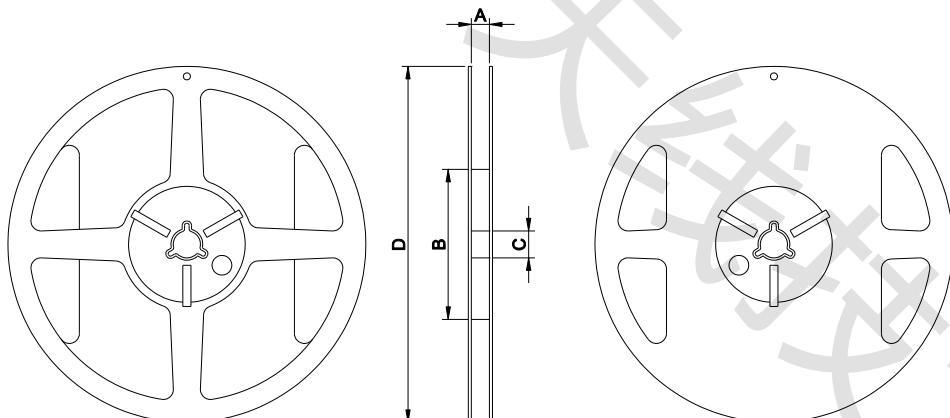
(1) Quantity/Reel: 3000 pcs/Reel:  
**Packaging Information**

### ◆ Tape Specification:



| W            | Ao            | Bo            | Ko            | P             | F             | E             | D             | D1            | Po            | P2            | t             |
|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 8.0<br>±0.30 | 1.80<br>±0.05 | 3.51<br>±0.10 | 1.59<br>±0.10 | 4.00<br>±0.05 | 3.50<br>±0.05 | 1.75<br>±0.10 | 1.50<br>±0.10 | 0.00<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.05 | 0.25<br>±0.05 |

### ◆ Reel Specification: (7", $\Phi 180$ mm)



| Tape Width(mm) | A(mm)   | B(mm) | C(mm)    | D(mm) | Chip/Reel(pcs) |
|----------------|---------|-------|----------|-------|----------------|
| 8              | 9.0±0.5 | 60±2  | 13.5±0.5 | 178±2 | 3000           |



深圳市迎丰天线技术有限公司

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

Prepared by : JIEXI

Designed by : Jason

Checked by : Jason

Approved by : MR.FANG

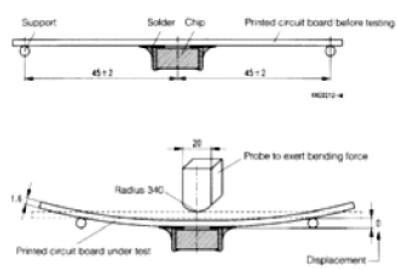
**TITLE : 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip  
Antenna (YF3216H3) Engineering Specification**

DOCUMENT  
NO.

**YF3216H3X2G45**

REV.

**D**

|                    |  |  |                        |
|--------------------|--|--|------------------------|
| Board Flex (SMD)   | <p>1. Mounting method:<br/>IR-Reflow. PCB Size (L:100 x W:40 x 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           | Force of 1.8Kg for 60 seconds.   | 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           |
| 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 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 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 Method 106 |



深圳市迎丰天线技术有限公司

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

Prepared by : JIEXI

Designed by : Jason

Checked by : Jason

Approved by : MR.FANG

**TITLE :** 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip Antenna (YF3216H3) Engineering Specification

DOCUMENT NO.

**YF3216H3X2G45**

REV.

**D**

## Reliability Table

| Test Item                                      | Procedure  | Requirements<br>Ceramic Type  | Remark<br>(Reference)   |
|--|--|---|-------------------------|
| <b>Electrical<br/>Characterization</b>         |  | Fulfill the electrical specification                                  | User Spec.              |
| <b>Thermal<br/>Shock</b>                       | 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      |
| <b>Temperature<br/>Cycling</b>                 | 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 ± 2 Hours after test condition.  | No Visible Damage.<br>Fulfill the electrical specification.           | JESD22<br>JA104         |
| <b>High Temperature<br/>Exposure</b>           | 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      |
| <b>Low Temperature<br/>Storage</b>             | 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      |
| <b>Solderability<br/>(SMD Bottom Side)</b>     | 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 |
| <b>Soldering Heat<br/>Resistance<br/>(RSH)</b> | 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 |



深圳市迎丰天线技术有限公司

SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD

Prepared by : **JIEXI**

Designed by : **Jason**

Checked by : **Jason**

Approved by : **MR.FANG**

**TITLE :** 3.2 x 1.6 x 1.0(mm) WiFi/Bluetooth Ceramic Chip  
Antenna (YF3216H3) Engineering Specification

DOCUMENT  
NO.

**YF3216H3X2G45**

REV.

**D**