# 3.2X1.6X0.5 (mm) WiFi/Bluetooth Ceramic Chip Antenna Engineering Specification

#### 1. Product Number

YF 3216 H2 X 2G45 1 2 3 4 5



(1)Product Type	Chip Antenna
(2)Size Code	3.2x1.6x0.5mm
(3)Type Code	H2
(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 TECHNOLOYCO.,LTD

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Prepared by : JIEXI	Designed by : Jason	Checked by : Jason	Approved by : MR.FANG

TITLE: 3.2 x 1.6 x 0.5(mm) WiFi/Bluetooth Ceramic Chip	DOCUMENT	YF3216H2X2G45	REV.
Antenna (YF3216H2) Engineering Specification	NO.	11 0210112/2010	В

#### 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 D	Dimensions	3.2x1.6x0.5	mm
Working	Frequency	2400~2500	MHz
VSWR		2 Max.	
Impedan	ce	50	Ω
Polarizat	ion	Linear Polarization	
Peak 2.5		2.5 (typical)	dBi
Gain	Efficiency	78 (typical)	%



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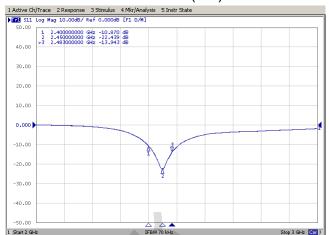
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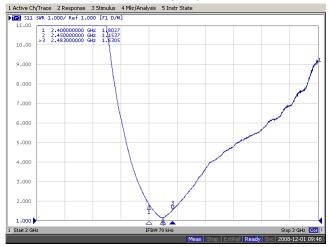
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#### 5-2. Return Loss & VSWR

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



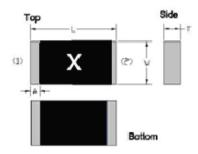




#### 6. Antenna Dimensions & Test Board (unit: mm)

a. Antenna Dimensions

#### **Dimension and Terminal Configuration**



Dim	ension (mm)
L	3.15+-0.15
W	1.55+-0.15
Т	0.50+-0.10
Α	0.35+-0.10

No.	Terminal Name
1	Feeding point
2	GND

#### b. Test Board with Antenna



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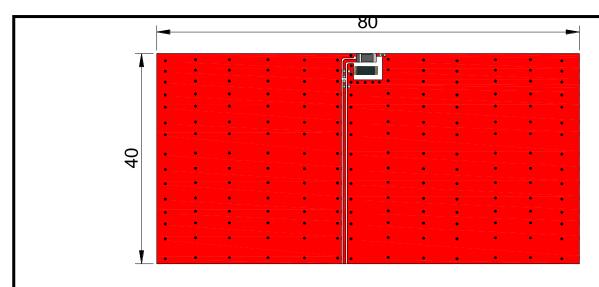
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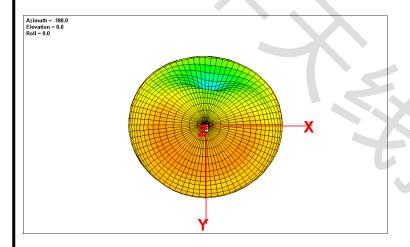
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Unit: mm

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

7-1. 3D Gain Pattern @ 2442 MHz





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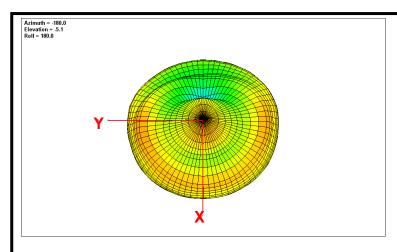
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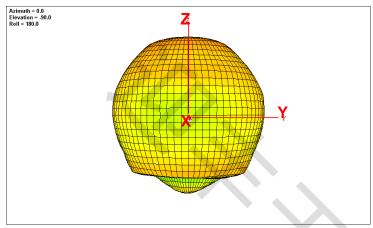
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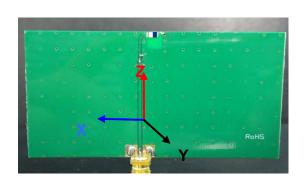
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#### 7-2. 3D Efficiency Table

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 (%)	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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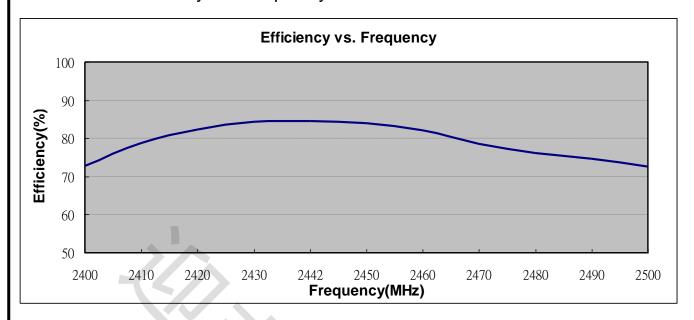
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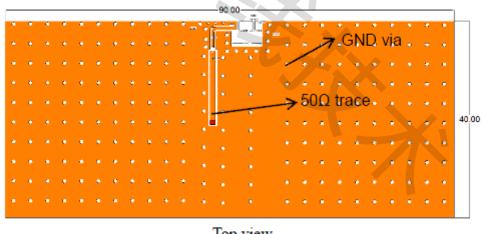
#### 7-3. 3D Efficiency vs. Frequency



#### 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.

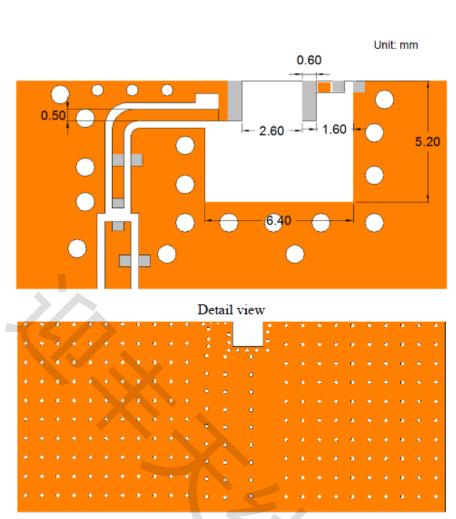






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Antenna (YF321	NO.	52 1 51 127			В	
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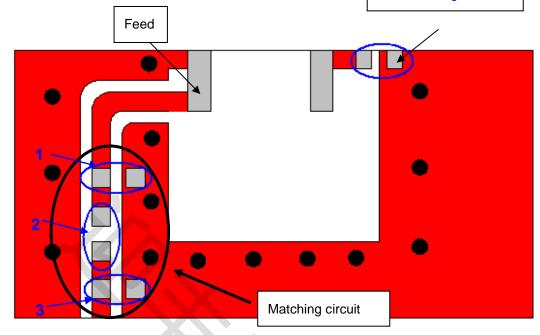
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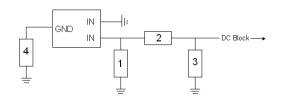
#### 9. Frequency tuning

a. Chip antenna tuning scenario:

4. Fine tuning elemet



b. Matching circuit: (Center frequency is about 2442 MHz @ 80 x 40 mm² ground plane)



System Matching Circuit Component					
Location	tion Description Vendor e				
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		

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

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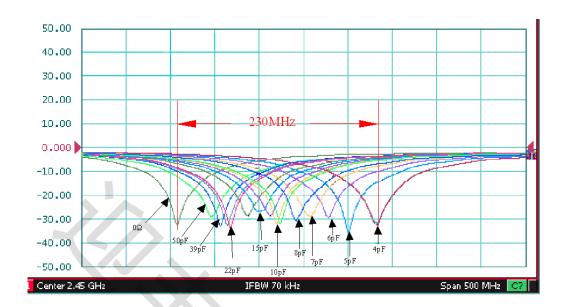
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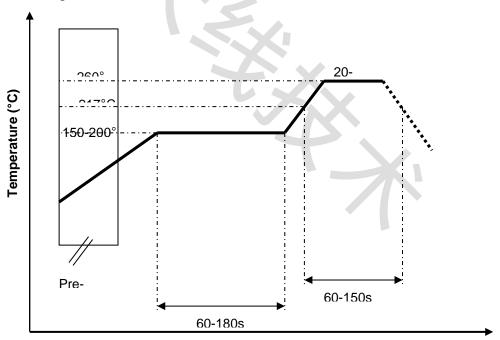
PF3216H2X2G45
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#### c. Fine tuning element vs. Center frequency



## 10. Soldering Conditions

a. Typical Soldering Profile for Lead-free Process





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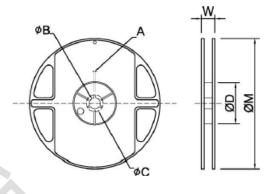
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TITLE: 3.2 x 1.6 x 0.5(m	DOCUMENT	YF3216H	12X2G45	REV.		
Antenna (YF321	NO.			В		

# 11. Packing

(1) Quantity/Reel: 6000 pcs/Reel:

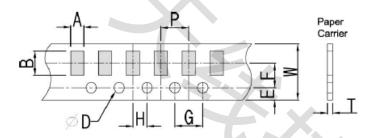
#### Reel and Taping Specification

#### Reel Specification



TYPE	SIZE		Α	φΒ	φC	φD	W	φ <b>M</b>
3216	7" 5K	/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0

#### **Tapping Specification**



Packaging	Type	Α	В	W	E	F	G	Н	T	øD	Р	
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	+0.10 1.50 -0	4.0±0.1	



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Antenna (YF3216H2) Engineering Specification NO. B
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Board	1. Mounting method:	No Visible Damage.	AEC-Q200
Flex	IR-Reflow. PCB Size (L:100 × W:40 × T:1.6mm)	_	005
(SMD)	2. Apply the load in direction of the arrow until bending reaches		
	2 mm. Support Solder Chip Printed circuit board before testing		
	Support Solder Chip Printed circuit board before testing		
	45±2 45±2 som2=4		
	Printed circuit board under test		
Adhesion	Force of 1.8Kg for 60 seconds.	No Visible Damage	AEC-Q200
MILESION	Torce of Long for ou seconds.	Magnification of 20X or	006
	radius 0,5 mm	greater may be employed	000
	DUT A	for inspection of the	
	1001	mechanical integrity of the	
	With the state of	device body terminals and	
		body/terminal junction.	
	1	,	
	thickness		
	substrate press tool		
	substrate press tool		
	press tool shear force		
	press tool P		
	press tool shear force		
Physical	Any applicable method using x10 magnification, micrometers,	In accordance with	JESD22
Physical Dimension	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring	In accordance with specification.	JESD22 JB100
•	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen		
Dimension	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.	specification.	JB100
•	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations		JB100 MIL-STD-202
Dimension	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations Note: Use 8"X5" PCB .031" thick 7 secure points on, one long	specification.	JB100
Dimension	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at comers of opposite sides. Parts	specification.	JB100 MIL-STD-202
Dimension	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at comers of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000	specification.	JB100 MIL-STD-202
Dimension	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at comers of opposite sides. Parts	specification.	JB100 MIL-STD-202
Dimension Vibration	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at comers of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.	specification. No Visible Damage.	JB100 MIL-STD-202 Method 204
Dimension  Vibration  Mechanical	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at comers of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.	specification.	JB100  MIL-STD-202  Method 204  MIL-STD-202
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Dimension  Vibration  Mechanical	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations 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.  Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks) Peak value: 1,500g's	specification. No Visible Damage.	JB100  MIL-STD-202  Method 204  MIL-STD-202
Dimension  Vibration  Mechanical	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at comers of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.  Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks) Peak value: 1,500g's Duration: 0.5ms	specification. No Visible Damage.	JB100  MIL-STD-202  Method 204  MIL-STD-202
Dimension  Vibration  Mechanical	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at comers of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.  Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks) Peak value: 1,500g's Duration: 0.5ms Velocity change: 15.4 ft/s	specification. No Visible Damage.	JB100  MIL-STD-202  Method 204  MIL-STD-202
Dimension  Vibration  Mechanical	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at comers of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.  Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks) Peak value: 1,500g's Duration: 0.5ms	specification. No Visible Damage.	JB100  MIL-STD-202  Method 204  MIL-STD-202
Dimension  Vibration  Mechanical Shock	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at comers of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.  Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks) Peak value: 1,500g's Duration: 0.5ms Velocity change: 15.4 ft/s Waveform: Half-sine	No Visible Damage.  No Visible Damage.	MIL-STD-202 Method 204 MIL-STD-202 Method 213
Dimension  Vibration  Mechanical Shock	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.  5g's for 20 min., 12 cycles each of 3 orientations Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at comers of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.  Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks) Peak value: 1,500g's Duration: 0.5ms Velocity change: 15.4 ft/s Waveform: Half-sine	No Visible Damage.  No Visible Damage.  No Visible Damage.	MIL-STD-202 Method 204 MIL-STD-202 Method 213
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#### **Reliability Table**

Test Item	Procedure	Requirements Ceramic Type	Remark (Reference)
Electrical Characterization		Fulfill the electrical specification	User Spec.
Thermal Shock	1. Preconditioning: 50 ± 10°C / 1 hr , then keep for 24 ± 1 hrs at room temp. 2. Initial measure: Spec: refer Initial spec. 3. Rapid change of temperature test: -30°C to +85°C; 100 cycles; 15 minutes at Lower category temperature; 15 minutes at Upper category temperature.	No Visible Damage. Fulfill the electrical specification.	MIL-STD-202 107
Temperature Cycling	I. Initial measure: Spec: refer Initial spec.     2. 100 Cycles (-30°C to +85°C), Soak Mode=1 (2 Cycle/hours).     Measurement at 24 ± 2Hours after test condition.	No Visible Damage. Fulfill the electrical specification.	JESD22 JA104
High Temperature Exposure	1. Initial measure: Spec: refer Initial spec. 2. Unpowered; 500hours @ T=+85°C. 3. Measurement at 24 ± 2 hours after test.	No Visible Damage. Fulfill the electrical specification.	MIL-STD-202 108
Low Temperature Storage	1, Initial measure: Spec: refer Initial spec. 2. Unpowered: 500hours @ T= -30 °C. 3. Measurement at 24 ± 2 hours after test.	No Visible Damage. Fulfill the electrical specification.	MIL-STD-202 108
Solderability (SMD Bottom Side)	Dipping method: a. Temperature: 235 ± 5°C b. Dipping time: 3 ± 0.5s	The solder should cover over 95% of the critical area of bottom side.	IEC 60384-21/23 4.10
Soldering Heat Resistance (RSH)	Preheating temperature: 150 ± 10°C. Preheating time: 1~2 min. Solder temperature: 260 ± 5°C. Dipping time: 5 ± 0.5s	No Visible Damage.	IEC 60384-21/22 4.10

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Antenna (YF321	6H2) Engineering Specification	NO.				В	3
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