

# 3.2X1.6X0.25(mm) WiFi/Bluetooth Ceramic Chip Antenna (YF300E)

## Engineering Specification

### 1. Product Number

YF 3216 FE P 2G45 02  
1 2 3 4 5 6



(1)Product Type	Chip Antenna
(2)Size Code	3.2x1.6mm
(3)Type Code	FE
(4)Packing	Paper Tape
(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

## 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

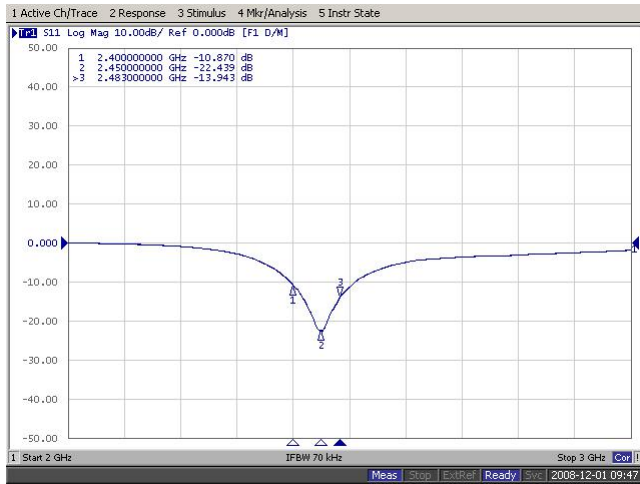
Yingfeng chip antenna series are specially designed for WiFi/Bluetooth applications. Based on yingfeng proprietary design and processes, this chip antenna has excellent stability and sensitivity to consistently provide high signal reception efficiency.

## 5. Electrical Specifications (80 x 40 mm<sup>2</sup> ground plane)

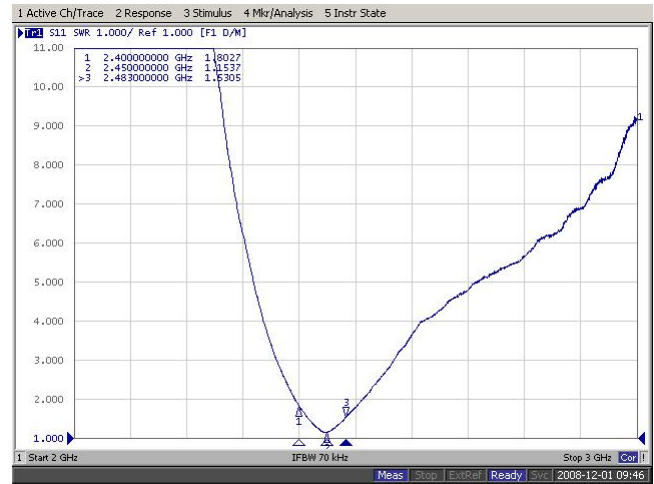
5-1. Electrical Table

Characteristics		Specifications	Unit
Outline Dimensions		3.2x1.6x0.2	mm
Working Frequency		2400~2500	MHz
VSWR		2 Max.	
Impedance		50	Ω
Polarization		Linear Polarization	
Gain	Peak	2.5(typical)	dBi
	Efficiency	75 (typical)	%

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

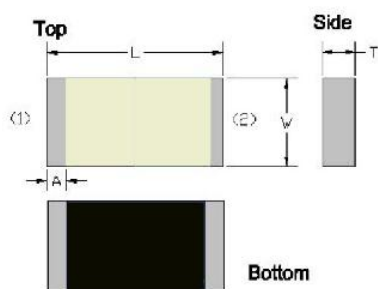


## VSWR( $S_{11}$ )



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

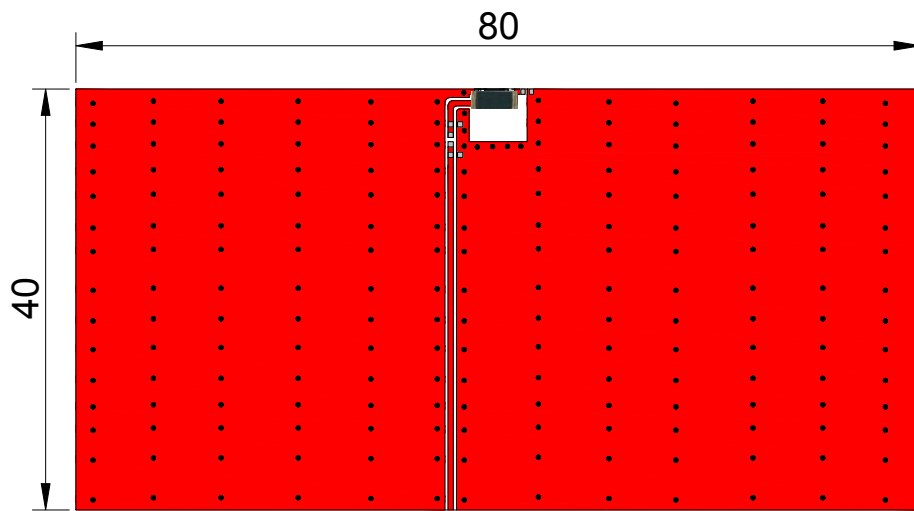
### a. Antenna Dimensions



Dimension (mm)	
L	3.15+/-0.15
W	1.55+/-0.15
T	0.25+/-0.10
A	0.35+/-0.10

No.	Terminal Name
1	Feeding point
2	GND

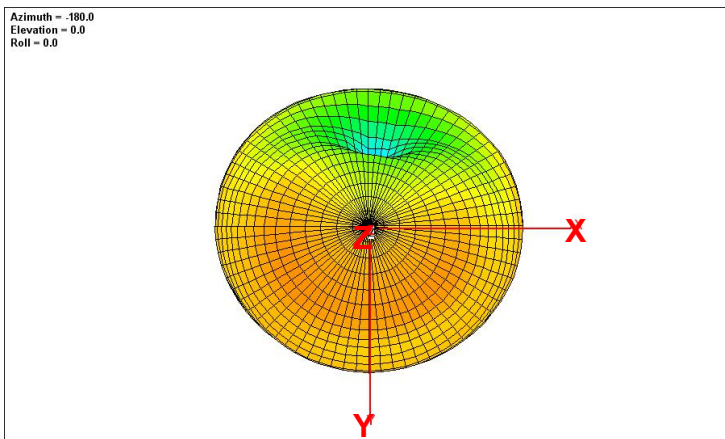
### b. Test Board with Antenna



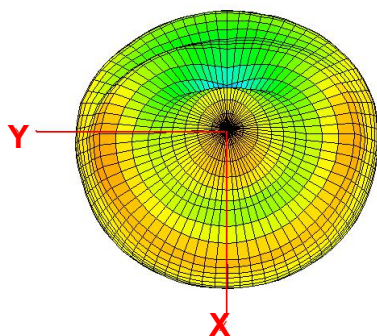
Unit: mm

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

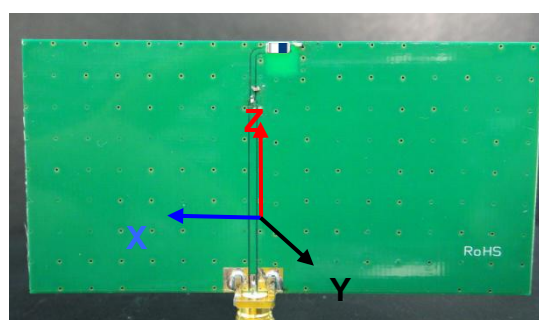
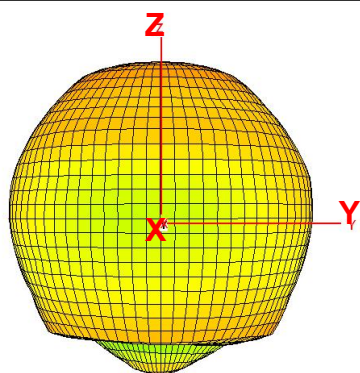
### 7-1. 3D Gain Pattern @ 2442 MHz



Azimuth = -180.0  
 Elevation = -5.1  
 Roll = 180.0



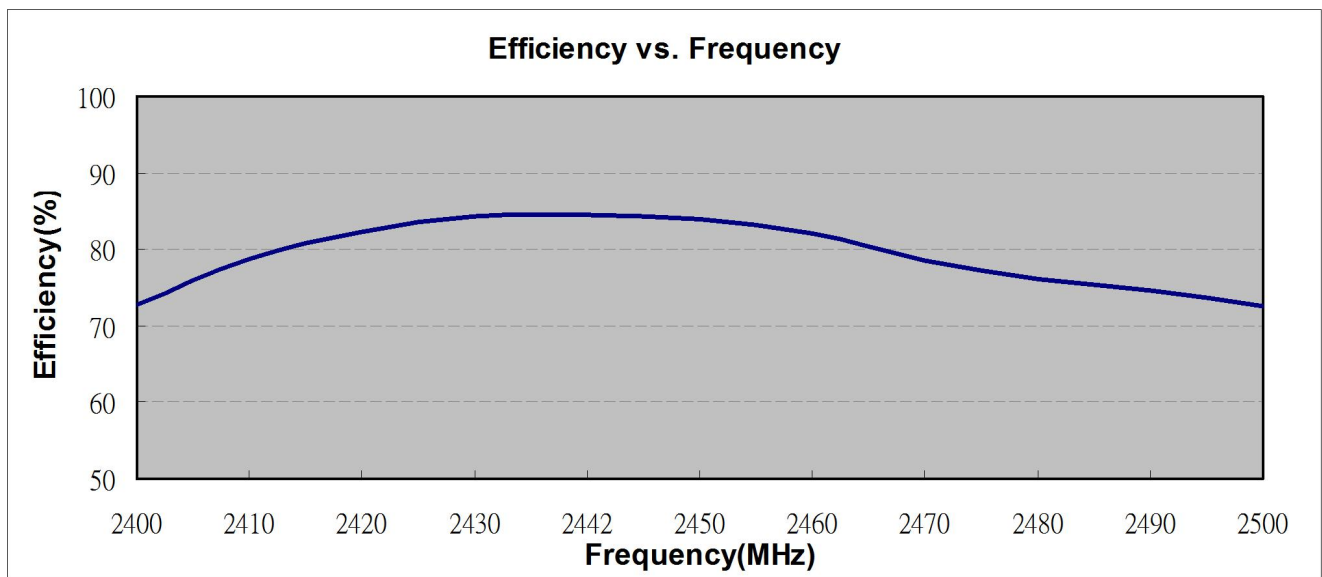
Azimuth = 0.0  
 Elevation = -90.0  
 Roll = 180.0



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

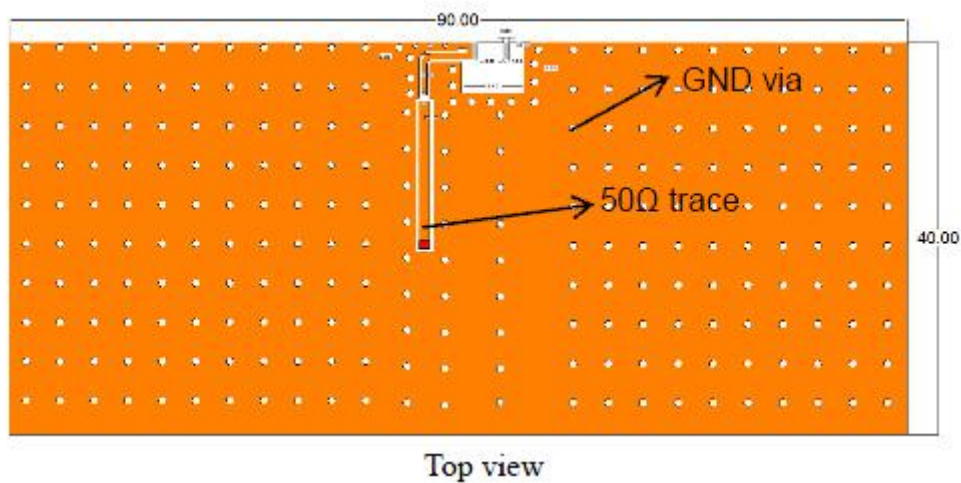
### 7-3. 3D Efficiency vs. Frequency

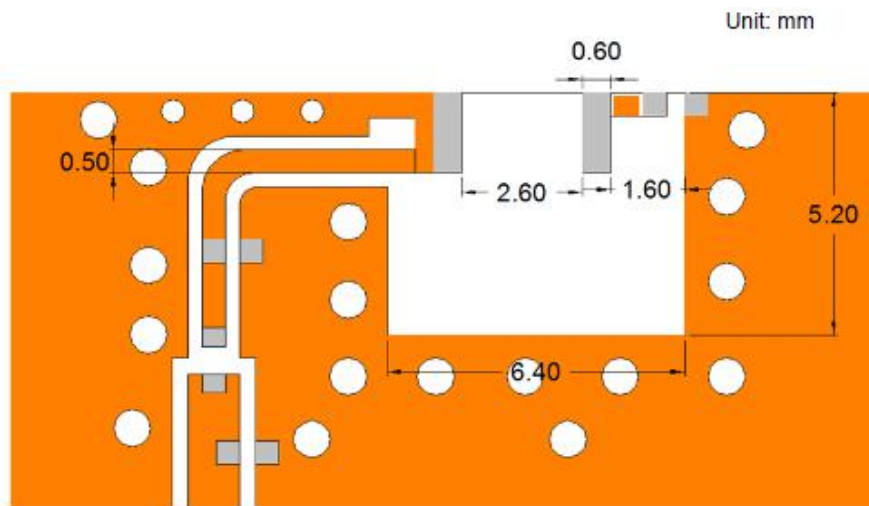


## 8. Layout Guide

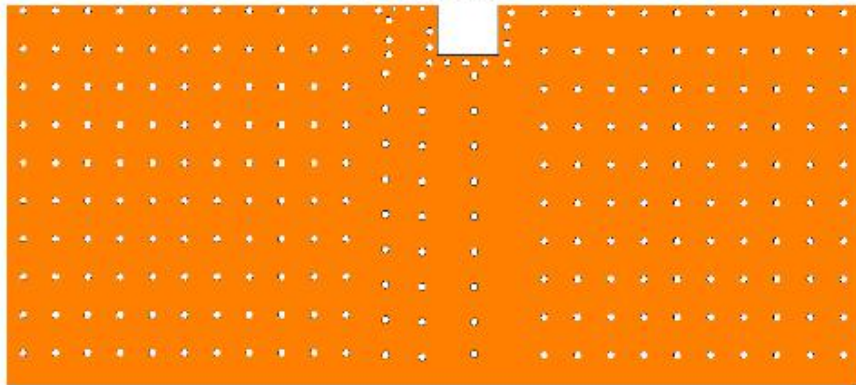
### a. Solder Land Pattern:

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





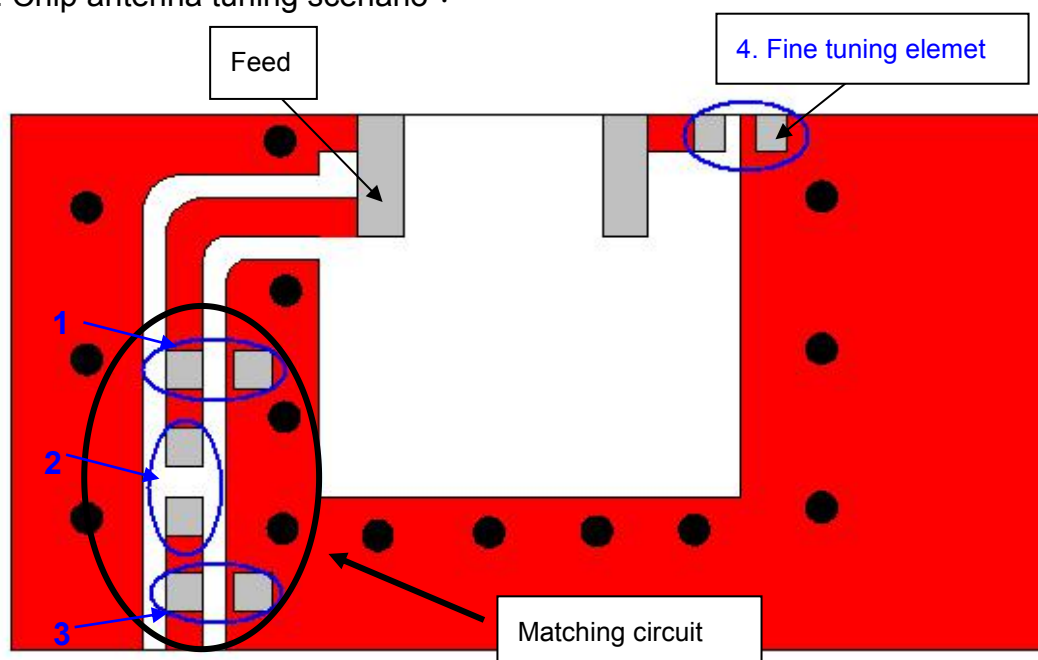
Detail view



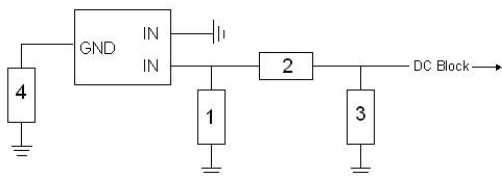
Bottom view

## 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)

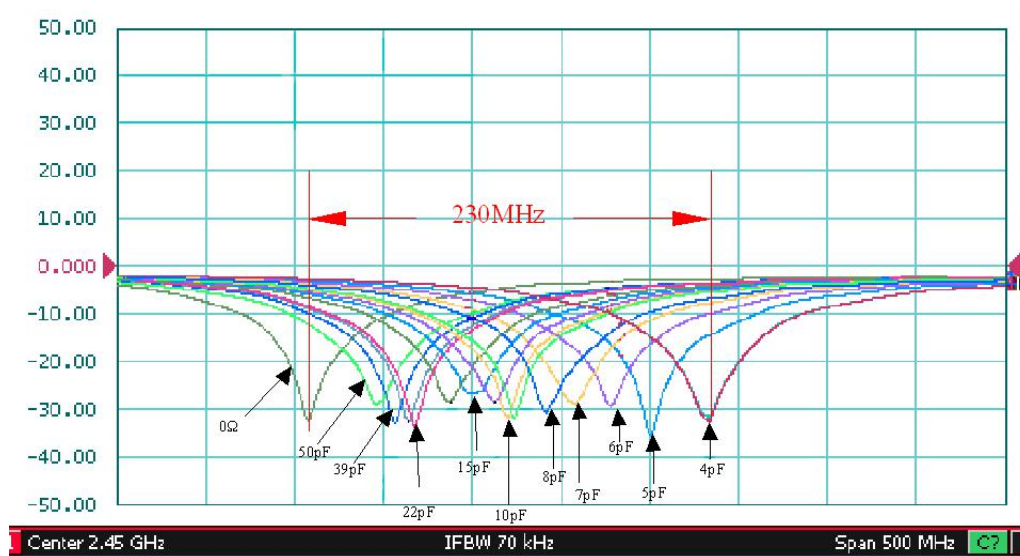


System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	1.2 pF*	Murata (0402)	±0.1 pF
2	10PF*	Murata(0402)	±0.5 PF
3	N/A*	-	-
Fine tuning element 4	1.5 pF*	Murata (0402)	±0.1 pF

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

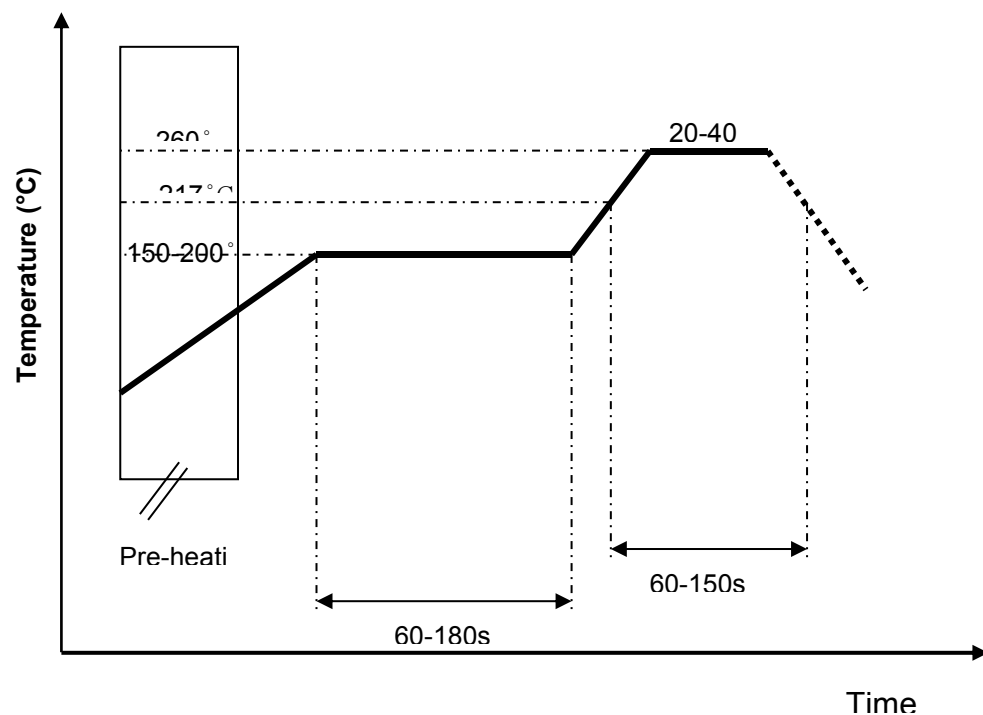


### c. Fine tuning element vs. Center frequency



## 10. Soldering Conditions

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



# 11. Packing

(1) Quantity/Reel: 5000 pcs/Reel:

## Reel and Taping Specification

### Reel Specification

The diagram shows a top view and a side view of a reel. The top view is a circle with a central hub and four spokes. Dimensions labeled are: A (radius from center to outer edge), φB (inner diameter of the hub), φC (outer diameter of the reel), and φD (diameter of the central hole). The side view shows the reel's profile with dimensions W (width), φD (inner diameter), and φM (outer diameter).

TYPE	SIZE		A	φ B	φ C	φ D	W	φ M
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

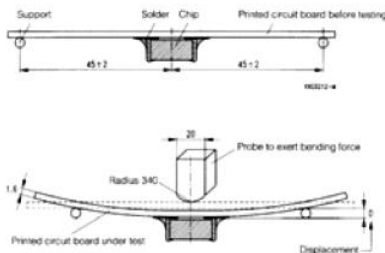
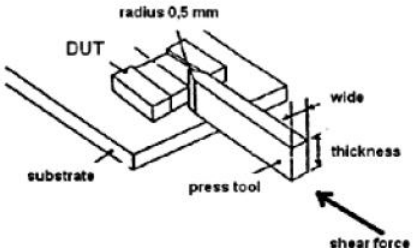
### Tapping Specification

The diagram shows a side view of a carrier tape with five components. Dimensions labeled are: A (pitch between components), B (width of the tape), P (pitch between components), W (width of the tape), E (height of the tape), F (height of the tape), G (pitch between components), H (pitch between components), I (pitch between components), and φD (diameter of the central hole).

Packaging	Type	A	B	W	E	F	G	H	T	φ 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 <sup>+0.10</sup> <sub>-0</sub>	4.0±0.1

## 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	1. Initial measure: Spec: refer Initial spec. 2. 100 Cycles (-30°C to +85°C), Soak Mode=1 (2 Cycle/hours). 3. 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 60384-21/22 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
Vibration	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.	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) Peak value: 1,500g's Duration: 0.5ms Velocity change: 15.4 ft/s Waveform: Half-sine	No Visible Damage.	MIL-STD-202 Method 213
Humidity Bias	1. Humidity: 85% R.H., Temperature: 85 ± 2 °C. 2. Time: 500 ± 24 hours. 3. Measurement at 24 ± 2hrs after test condition.	No Visible Damage. Fulfill the electrical specification.	MIL-STD-202 Method 106

Board Flex (SMD)	<p>1. Mounting method: 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 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

## 12. Manufacture

Manufacturer: Xinwei Electronic Co., Ltd., Quanzhou

Address: Wan An Tang Xi Industrial Area, Luo Jiang, Quanzhou City, Fujian Province, China