

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

1. Product Number

YF 3216 H1 X 2G45
1 2 3 4 5



(1)Product Type	Chip Antenna
(2)Size Code	3.2x1.6x0.5mm
(3)Type Code	H1
(4)Packing	Plastic Packaging
(5)Frequency	2.45GHz



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SHEN ZHEN YINGFENG ANTENNA TECHNOLOYCO.,LTD

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
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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 mm² 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	3.5 (typical)	dBi
	Efficiency	78 (typical)	%



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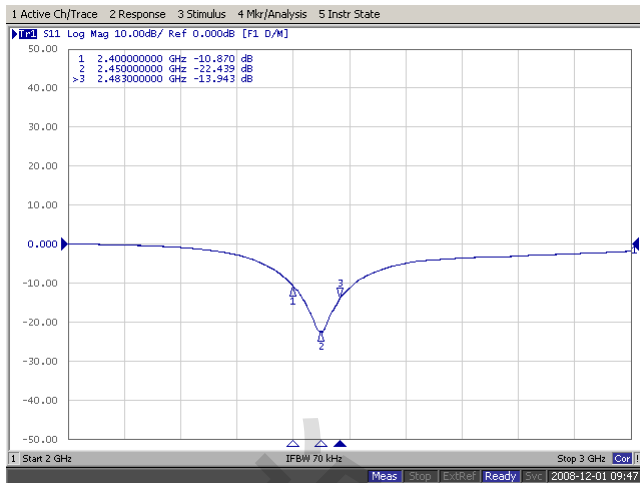
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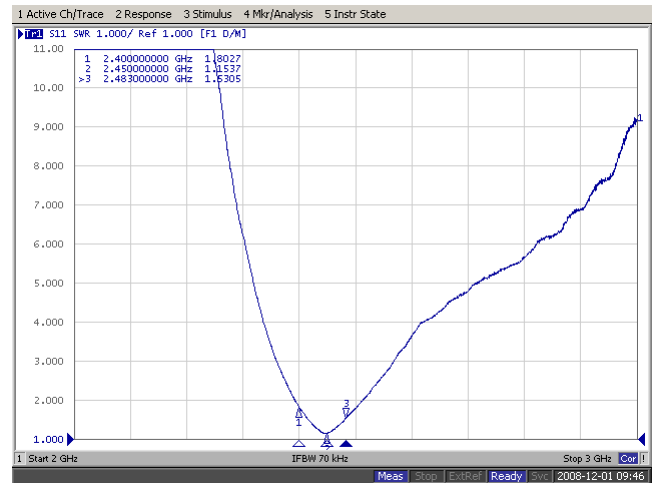
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5-2. Return Loss & VSWR

Return Loss (S₁₁)



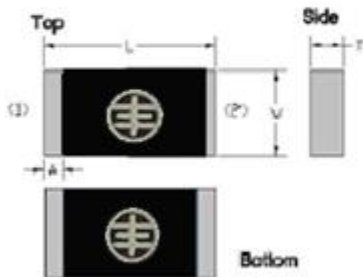
VSWR(S₁₁)



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

b. Test Board with Antenna



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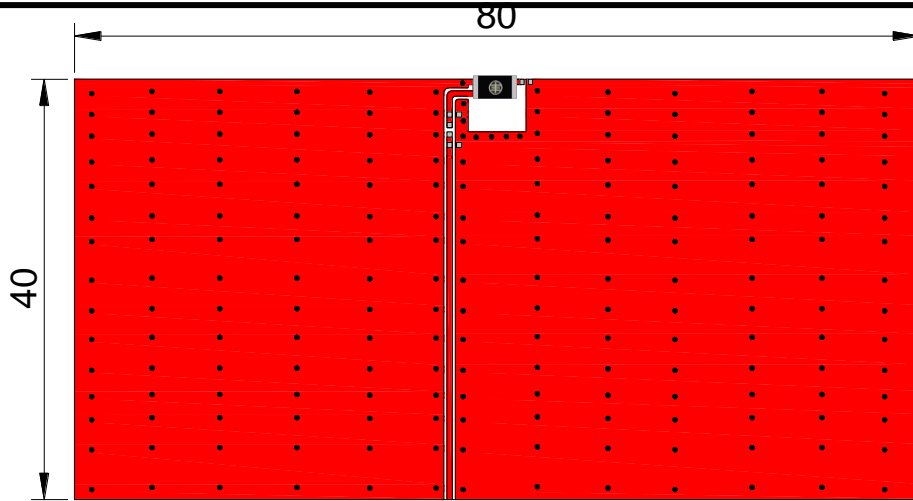
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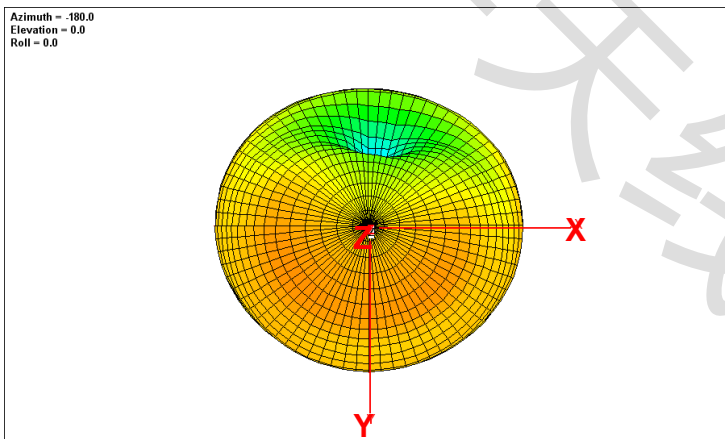
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Unit: mm

7. Radiation Pattern (80 x 40 mm² ground plane)

7-1. 3D Gain Pattern @ 2442 MHz



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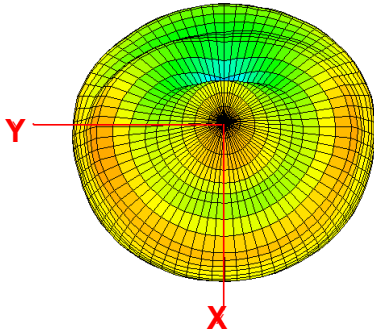
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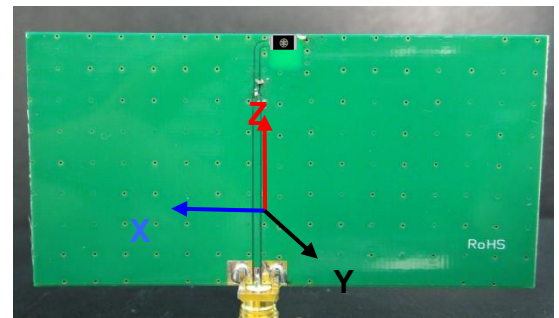
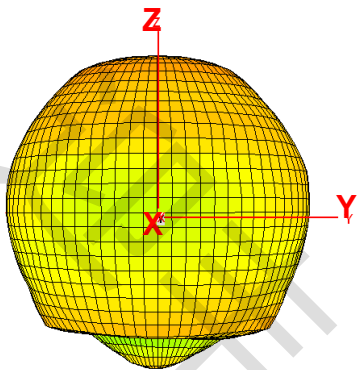
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Azimuth - 180.0
Elevation - 5.1
Roll - 180.0



Azimuth - 0.0
Elevation - 50.0
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)	3.3	3.4	3.3	3.4	3.5	3.5	3.4	2.8	2.9	2.6	2.4



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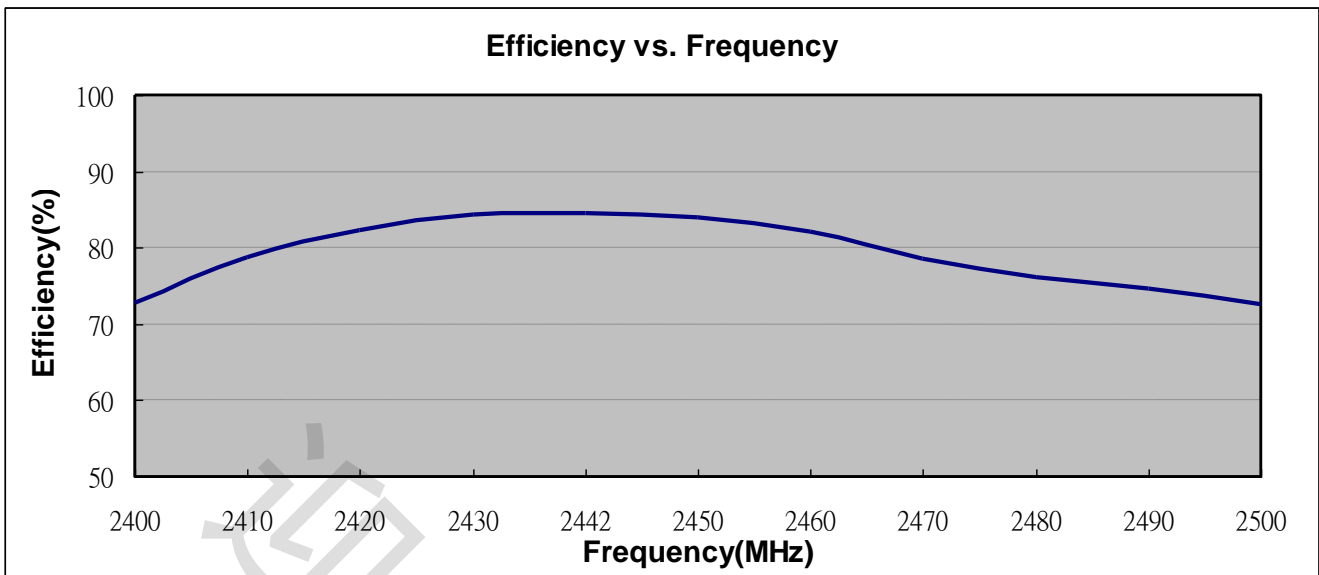
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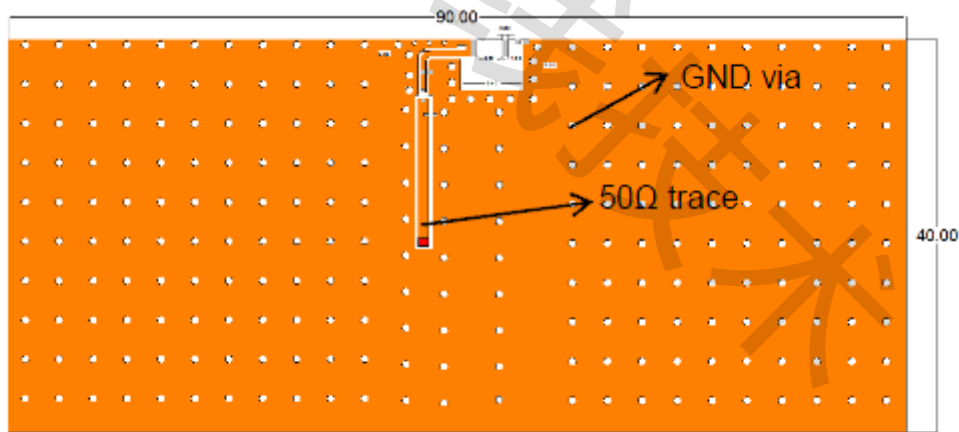
7-3. 3D Efficiency vs. Frequency



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.



Top view



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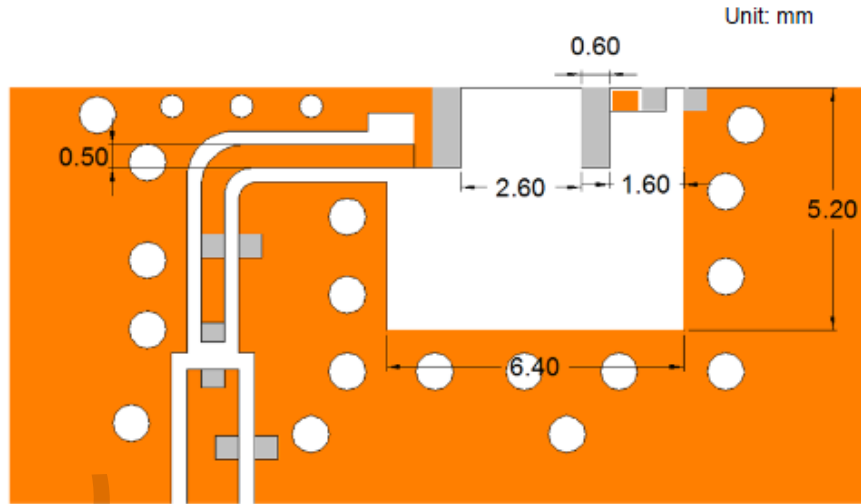
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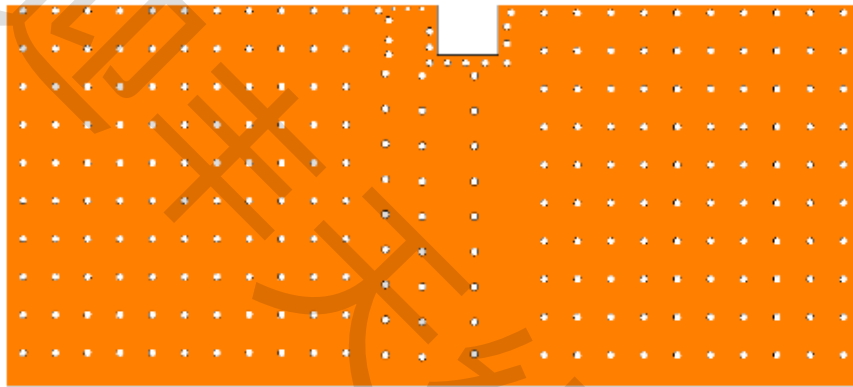
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Detail view



Bottom view



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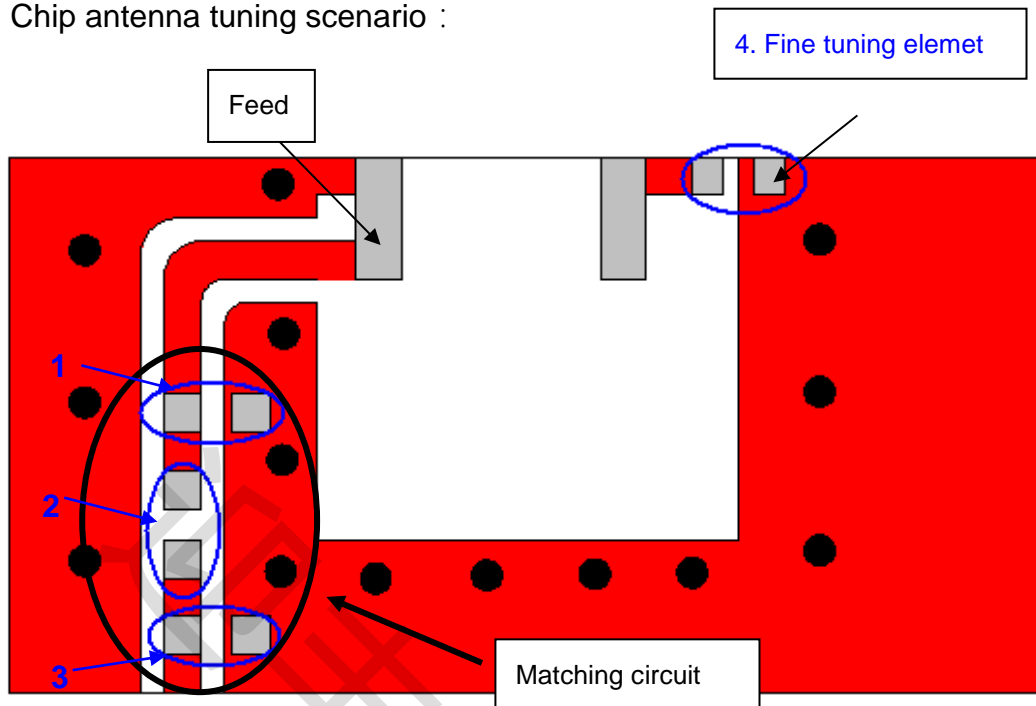
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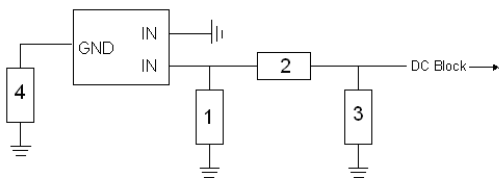
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9. Frequency tuning

a. Chip antenna tuning scenario :



b. Matching circuit : (Center frequency is about 2442 MHz @ 80 x 40 mm² 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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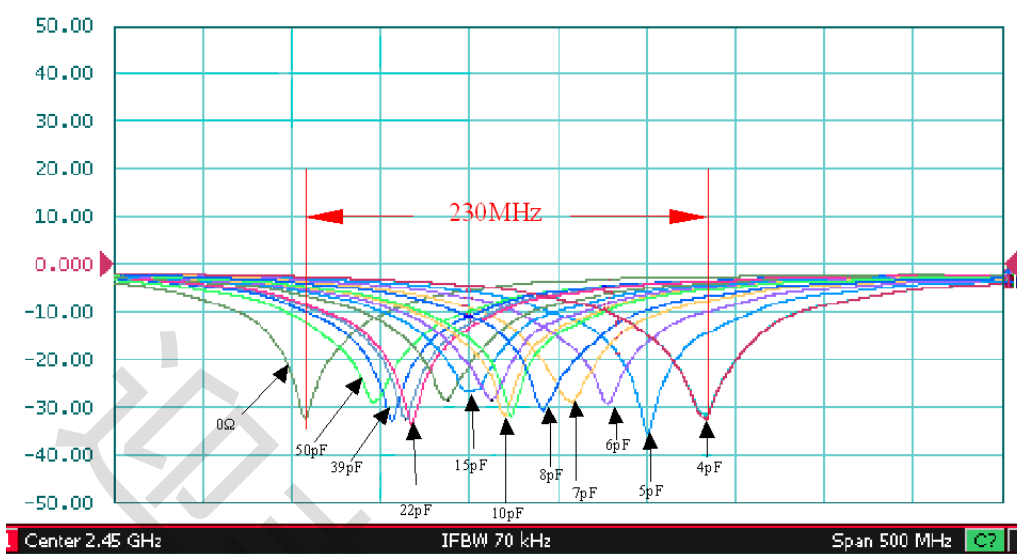
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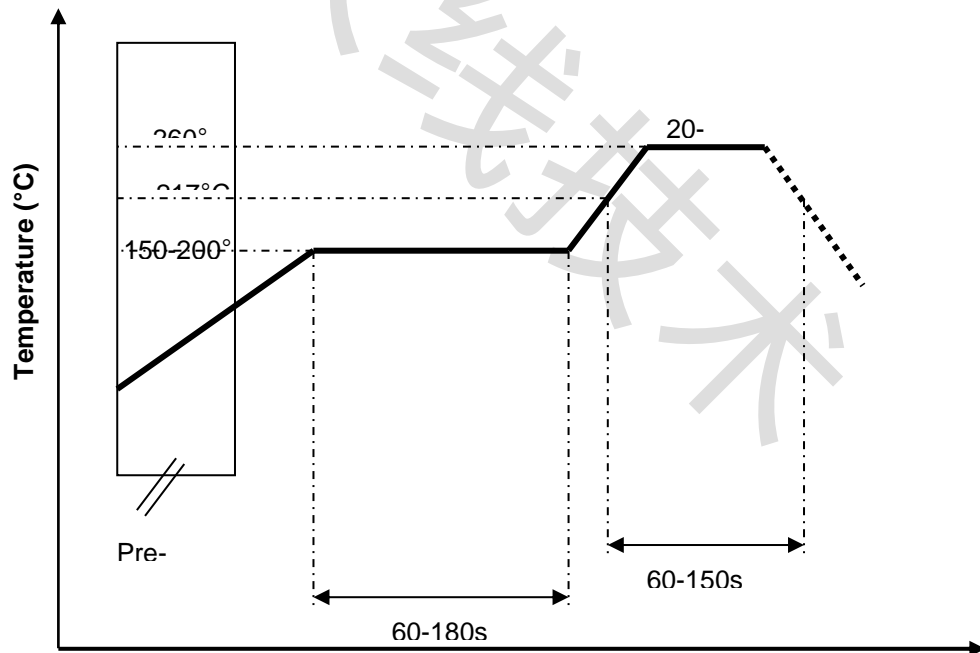
PAGE 8 OF 12

c. Fine tuning element vs. Center frequency



10. Soldering Conditions

a. Typical Soldering Profile for Lead-free Process



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Time

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11. Packing

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

Reel and Taping Specification

Reel Specification

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

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 ^{+0.10} ₋₀	4.0±0.1



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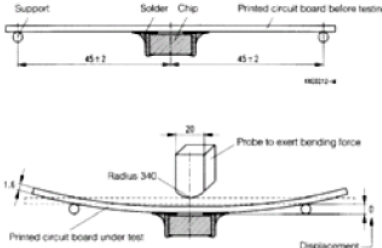
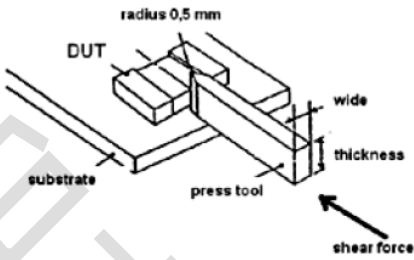
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Board Flex (SMD)	<p>1. Mounting method: IR-Reflow. PCB Size (L:100 × W:40 × T:1.6mm)</p> <p>2. Apply the load in direction of the arrow until bending reaches 2 mm.</p> 	No Visible Damage.	AEC-Q200 005
Adhesion	<p>Force of 1.8Kg for 60 seconds.</p> 	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	<p>Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.</p>	In accordance with specification.	JESD22 JB100
Vibration	<p>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.</p>	No Visible Damage.	MIL-STD-202 Method 204
Mechanical Shock	<p>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</p>	No Visible Damage.	MIL-STD-202 Method 213
Humidity Bias	<p>1. Humidity: 85% R.H., Temperature: 85 ± 2 °C. 2. Time: 500 ± 24 hours. 3. Measurement at 24 ± 2hrs after test condition.</p>	No Visible Damage. Fulfill the electrical specification.	MIL-STD-202 Method 106



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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: $50 \pm 10^\circ\text{C}$ / 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 $+85^\circ\text{C}$; 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 $+85^\circ\text{C}$), Soak Mode=1 (2 Cycle/hours). 3. Measurement at 24 ± 2 Hours 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 @ $T=+85^\circ\text{C}$. 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 @ $T=-30^\circ\text{C}$. 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: $235 \pm 5^\circ\text{C}$ b. Dipping time: $3 \pm 0.5\text{s}$	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: $150 \pm 10^\circ\text{C}$. Preheating time: 1~2 min. Solder temperature: $260 \pm 5^\circ\text{C}$. Dipping time: $5 \pm 0.5\text{s}$	No Visible Damage.	IEC 60384-21/22 4.10



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