

5.0 x 2.0 x 0.6 (mm) WiFi/Bluetooth Ceramic Chip Antenna (YF500A) Engineering Specification

1. Product Number

YF 5020 H1 R 2G4502
1 2 3 4 5



(1) Product Type	Chip Antenna
(2) Size Code	5.0x2.0mm
(3) Type Code	H1
(4) Packing	Tape and reel
(5) Frequency	2.45GHz



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SHEN ZHEN YINGFENG ANTENNA TECHNOLOGY CO., LTD
Room 412, Building 7, Yungu Phase II, No. 2, Pingshan Road, Taoyuan Street, Nanshan District, Shenzhen

Prepared by : harry

Designed by : andy

Checked by : andy

Approved by: oliver

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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

Ying feng 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 (40 x 40 mm² ground plane)

5-1. Electrical Table

Characteristics		Specifications	Unit
Outline Dimensions		5.0x2.0x0.6	mm
Working Frequency		2400~2500	MHz
VSWR		2 Max.	
Impedance		50	Ω
Polarization		Linear Polarization	
Gain	Peak	2 (typical)	dB _i
	Efficiency	75 (typical)	%

5-2. Return Loss & VSWR

Return Loss (S₁₁)

Smith Chart(S₁₁)



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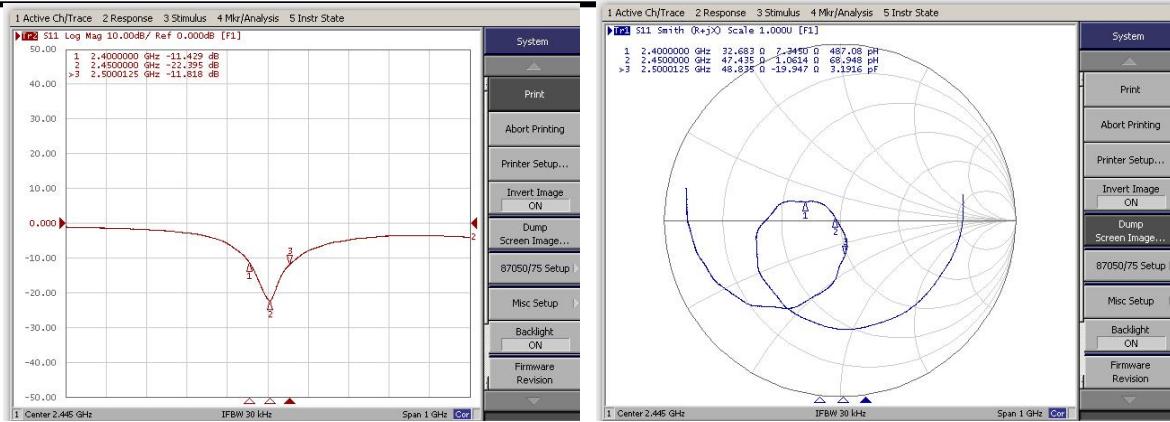
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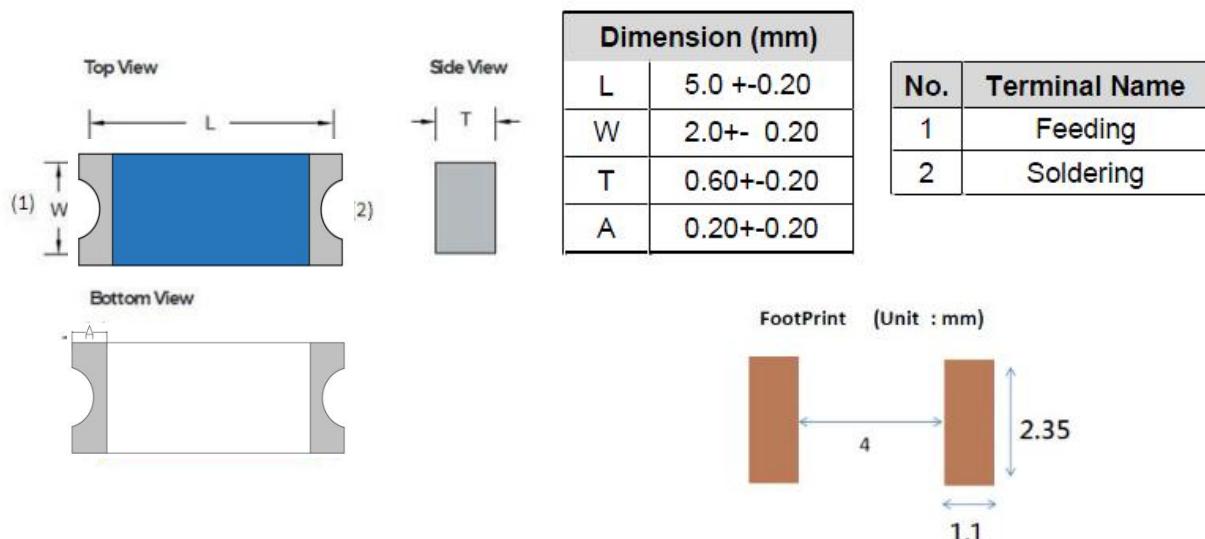
6 Outline Dimensions of Antenna & Evaluation Board (unit: mm)

6-1. Antenna Dimensions

Configuration and Dimensions:

A

Dimension and Terminal Configuration



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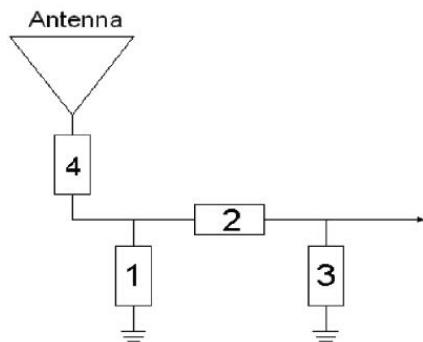
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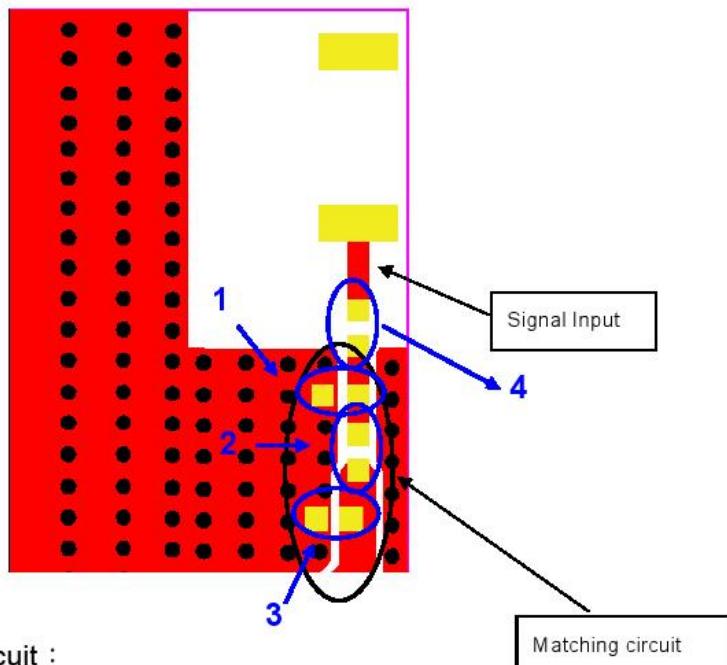
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6-2-2. Matching Circuit:

With the following recommended values of matching and tuning components, the center frequencies will be about 2450 MHz at our standard 40x40 mm² evaluation board. However, these are reference values, may need to be changed when the circuit boards or part vendors are different.



System Matching Circuit Component		
Location	Description	Vendor
1	N/A*	-
2	3.3nH, (0402)	DARFON
3	1.5pF, (0402)	MURATA
4	0Ω, (0402)	-



8-2. Matching circuit :



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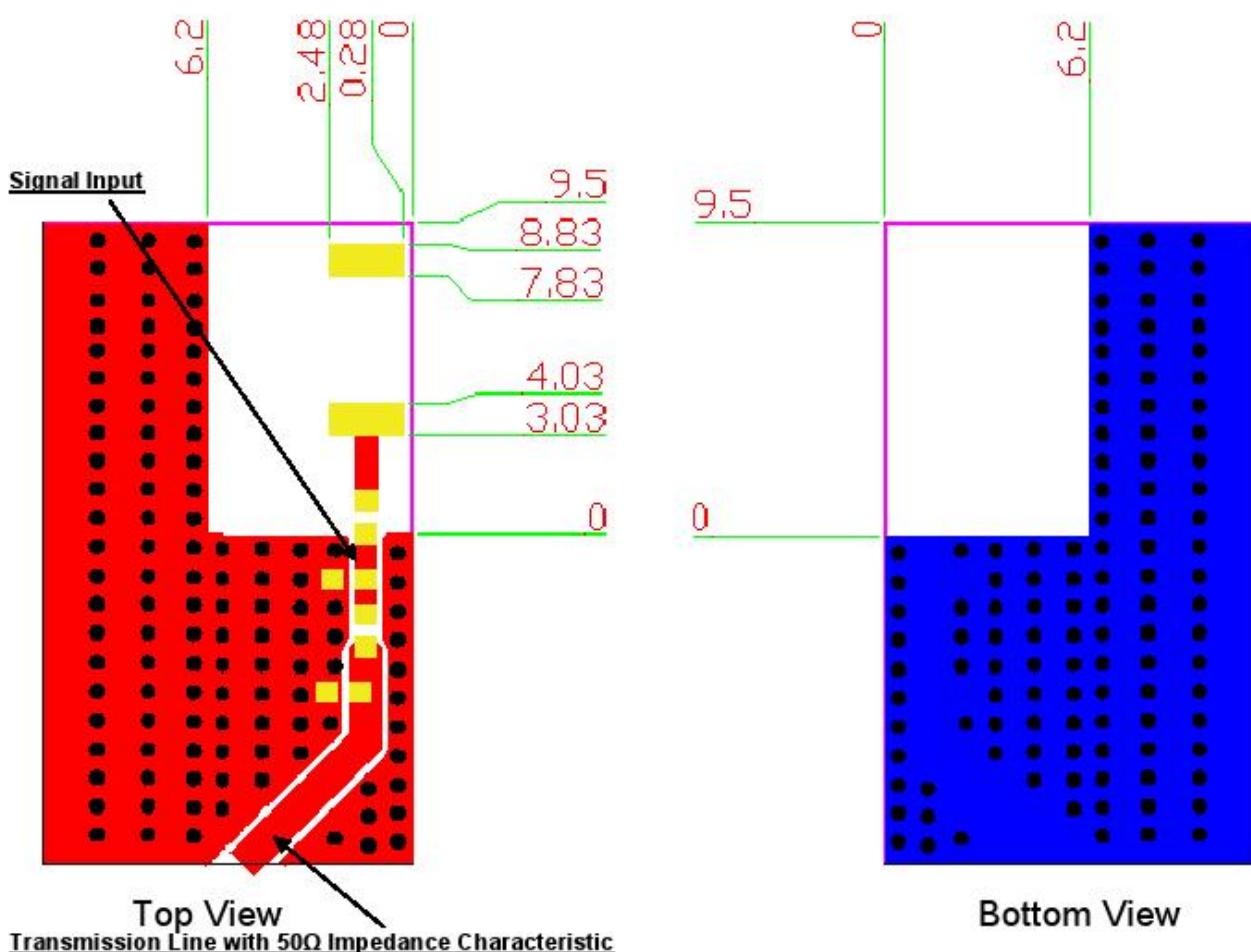
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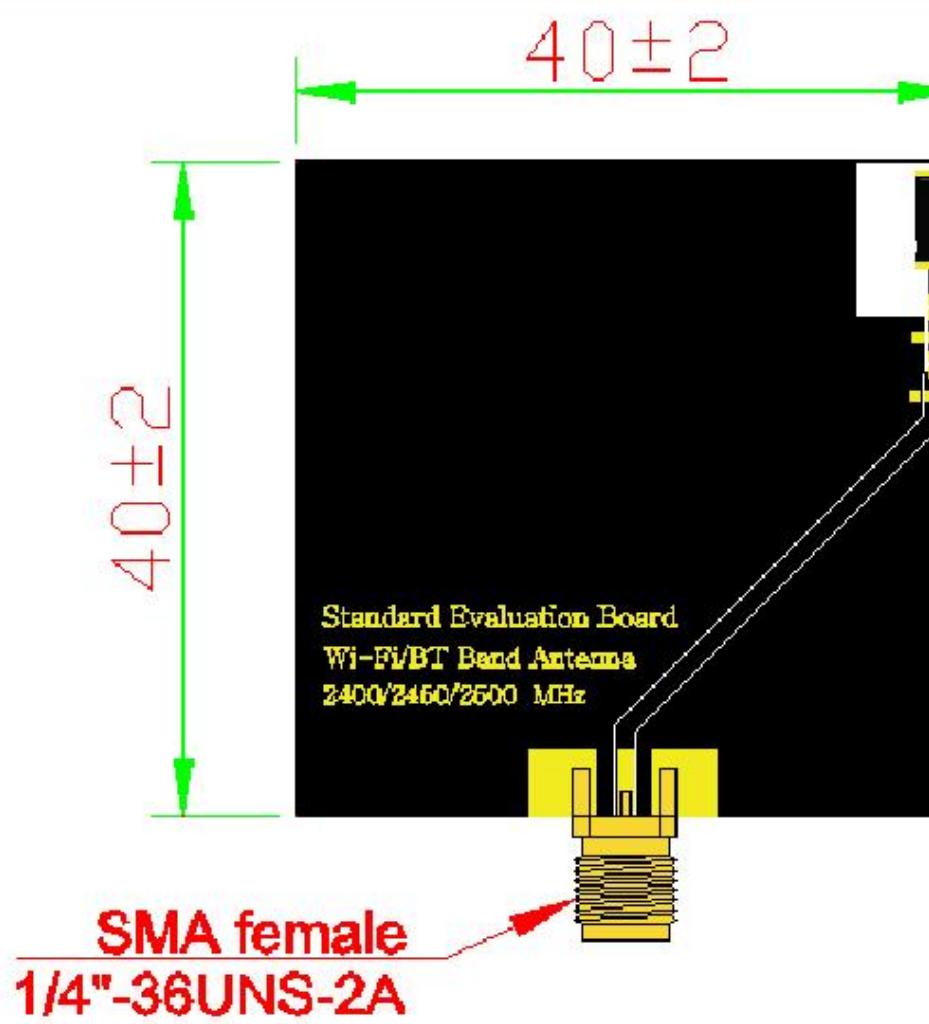
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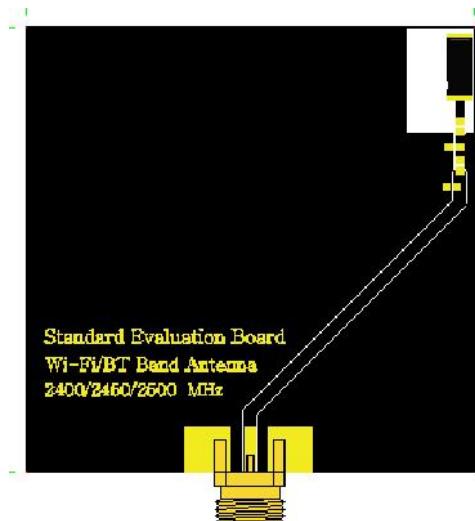
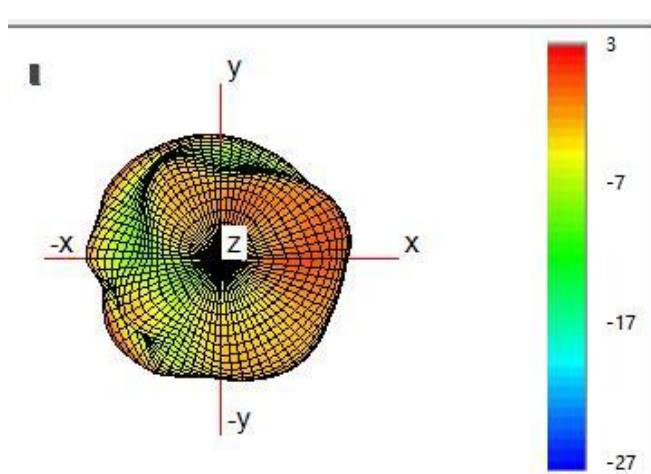
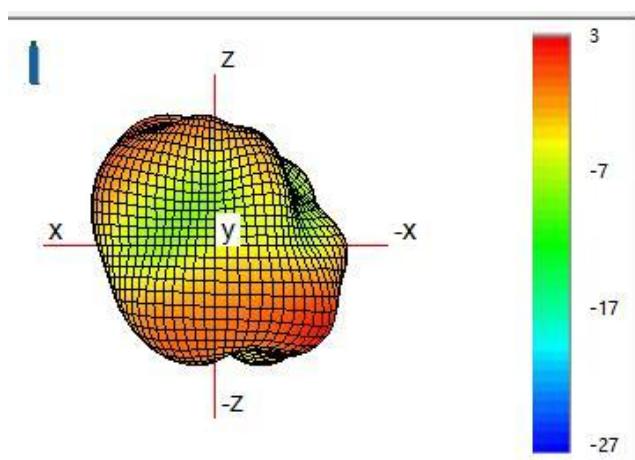
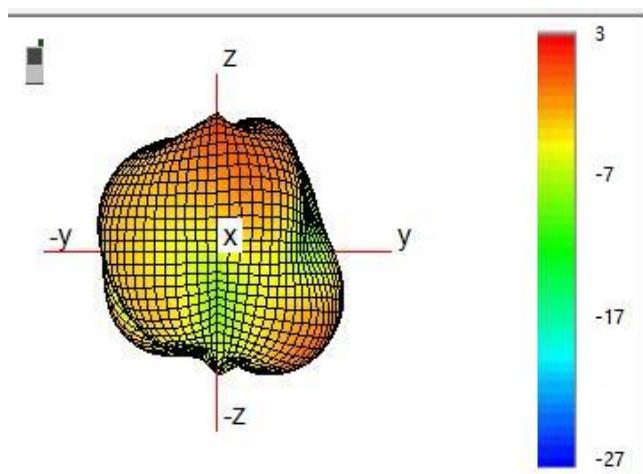
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7.Radiation Pattern (40x 40 mm² ground plane)

7-1. 3D Gain Pattern @ 2450 MHz



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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 (%)	70.8	71.7	72.3	74.4	74.5	75.0	74.0	73.6	72.1	71.6	70.5
Gain (dBi)	1.9	2.1	2.3	2.4	2.5	2.5	2.4	2.3	2.2	2.1	1.8

Taping Specifications

Reel			Taping Blister Tape																																												
<table border="1"> <thead> <tr> <th>Checking note</th> <th>Index</th> <th>Spec (mm)</th> </tr> </thead> <tbody> <tr> <td>Internal diameter of reel</td> <td>A</td> <td>60.20 ± 0.50</td> </tr> <tr> <td>External diameter of reel</td> <td>B</td> <td>178 ± 1.00</td> </tr> </tbody> </table>			Checking note	Index	Spec (mm)	Internal diameter of reel	A	60.20 ± 0.50	External diameter of reel	B	178 ± 1.00	<table border="1"> <thead> <tr> <th>Checking note</th> <th>Index</th> <th>Spec (mm)</th> </tr> </thead> <tbody> <tr> <td>Sprocket hole</td> <td>D0</td> <td>1.50 +0.10/-0.00</td> </tr> <tr> <td>Distance sprocket hole to outside</td> <td>E1</td> <td>1.75 ± 0.10</td> </tr> <tr> <td>Distance sprocket hole to pocket</td> <td>F</td> <td>5.50 ± 0.05</td> </tr> <tr> <td>Distance sprocket hole to sprocket hole</td> <td>P0</td> <td>4.00 ± 0.10</td> </tr> <tr> <td>Distance pocket to pocket</td> <td>P1</td> <td>4.00 ± 0.10</td> </tr> <tr> <td>Distance sprocket hole to pocket</td> <td>P2</td> <td>2.00 ± 0.05</td> </tr> <tr> <td>Pocket width nominal clearance</td> <td>A0</td> <td>2.28 ± 0.13</td> </tr> <tr> <td>Pocket length nominal clearance</td> <td>B0</td> <td>5.70 ± 0.13</td> </tr> <tr> <td>Pocket depth minimum clearance</td> <td>K0</td> <td>1.58 ± 0.10</td> </tr> <tr> <td>Thickness of tape</td> <td>T</td> <td>0.23 ± 0.02</td> </tr> </tbody> </table>			Checking note	Index	Spec (mm)	Sprocket hole	D0	1.50 +0.10/-0.00	Distance sprocket hole to outside	E1	1.75 ± 0.10	Distance sprocket hole to pocket	F	5.50 ± 0.05	Distance sprocket hole to sprocket hole	P0	4.00 ± 0.10	Distance pocket to pocket	P1	4.00 ± 0.10	Distance sprocket hole to pocket	P2	2.00 ± 0.05	Pocket width nominal clearance	A0	2.28 ± 0.13	Pocket length nominal clearance	B0	5.70 ± 0.13	Pocket depth minimum clearance	K0	1.58 ± 0.10	Thickness of tape	T	0.23 ± 0.02
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Thickness of tape	T	0.23 ± 0.02																																													
Quantity/per reel	3000 pcs																																														
Tape material	Plastic (embossed)																																														



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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	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 ± 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°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



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