

UWB (3 GHz ~ 6 GHz) - Chip Antenna

ACR1004U

Request Samples



Check Inventory



10.0 x 4.0 x 1.5 mm
RoHS/RoHS II Compliant
MSL Level = N/A

Features

- UWB 3 GHz ~ 6 GHz
- Compact Profile
- Omni-directional Pattern
- Efficiency > 60%
- Surface Mount (SMD)

Applications

- IoT
- M2M
- PDA/Wearables
- Precision Positioning and Tracking
- Industrial/Medical/Automotive Sensors
- Smart Home/Building

Electrical Specifications

Parameter	Specification			Unit
	Min	Typ	Max	
Operating Frequency	3		6	GHz
Peak Gain*		5.79		dBi
Efficiency	60			%
Impedance		50		Ω
Polarization		Linear		
Radiation Pattern		Omni-directional		

*All test measurements were conducted with antennas on an evaluation board of dimensions 45 x 18 mm.

Mechanical Specifications

Parameter	Specification
Antenna Dimension	10 x 4 x 1.5 mm
Material	Ceramic
Mounting Type*	Surface Mount (SMD)

*Do not mount the antenna on a metal surface.

Environmental Specifications

Parameter	Specification
Operating Temperature	-30°C to +85 °C
Operating Temperature	-30°C to +85 °C
Relative Humidity	0~95%



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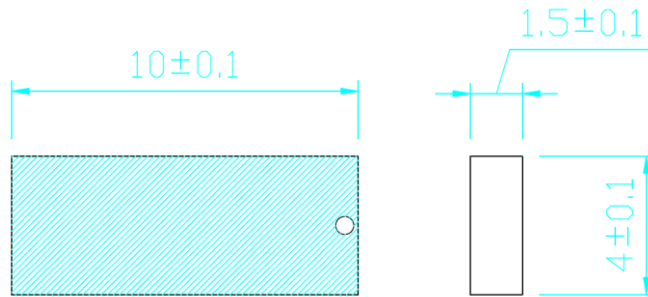


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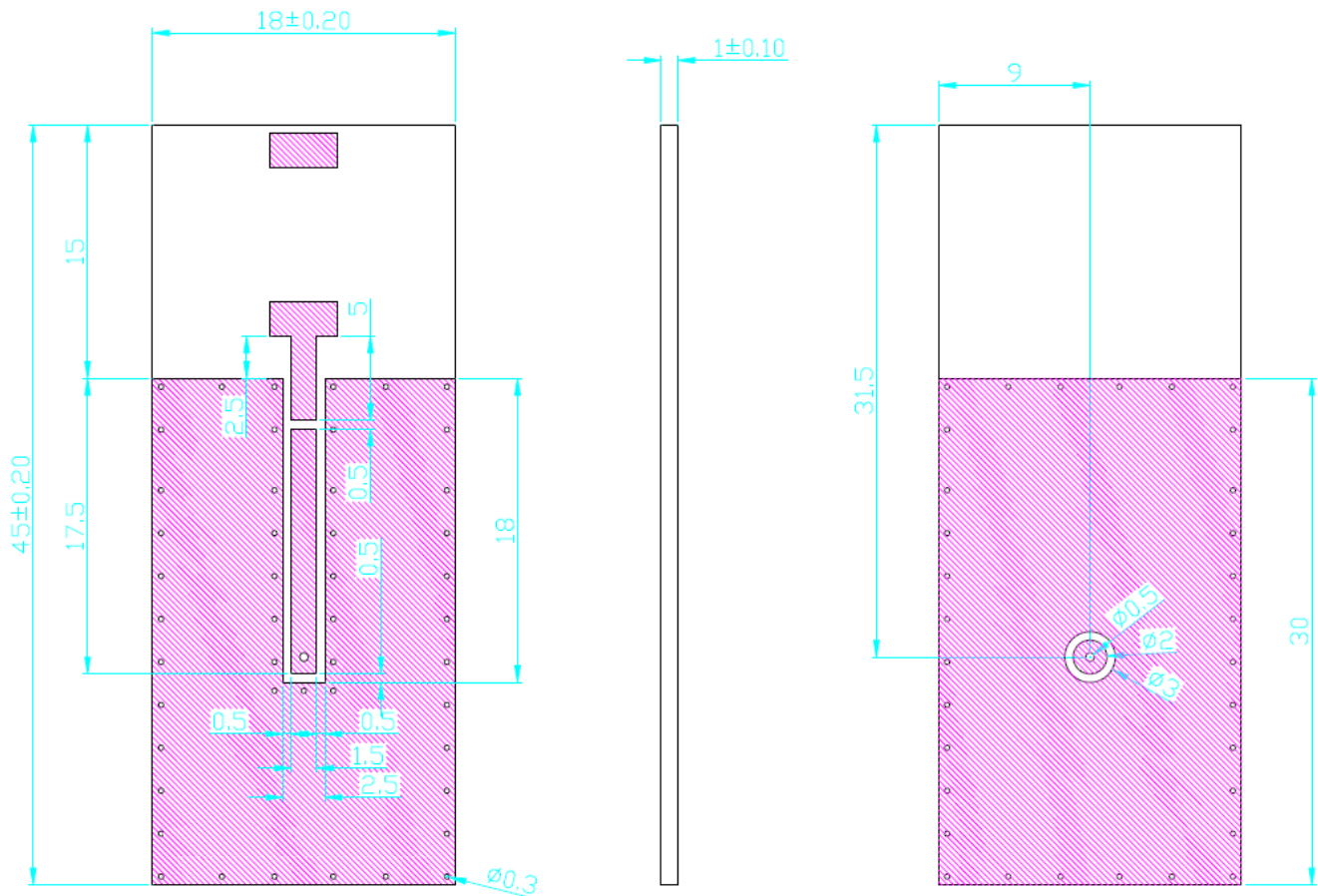
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Antenna Dimensions



Unit : mm

Layout Dimensions on Evaluation Board



Unit : mm



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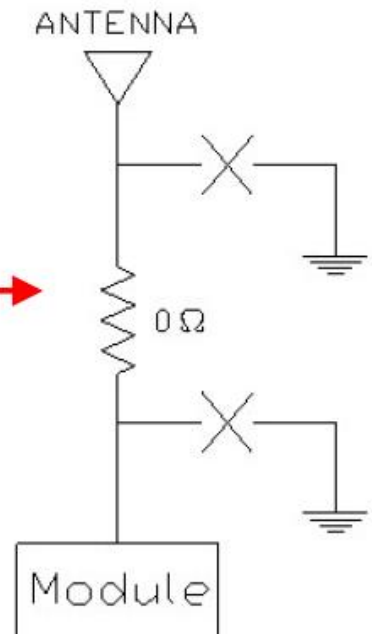
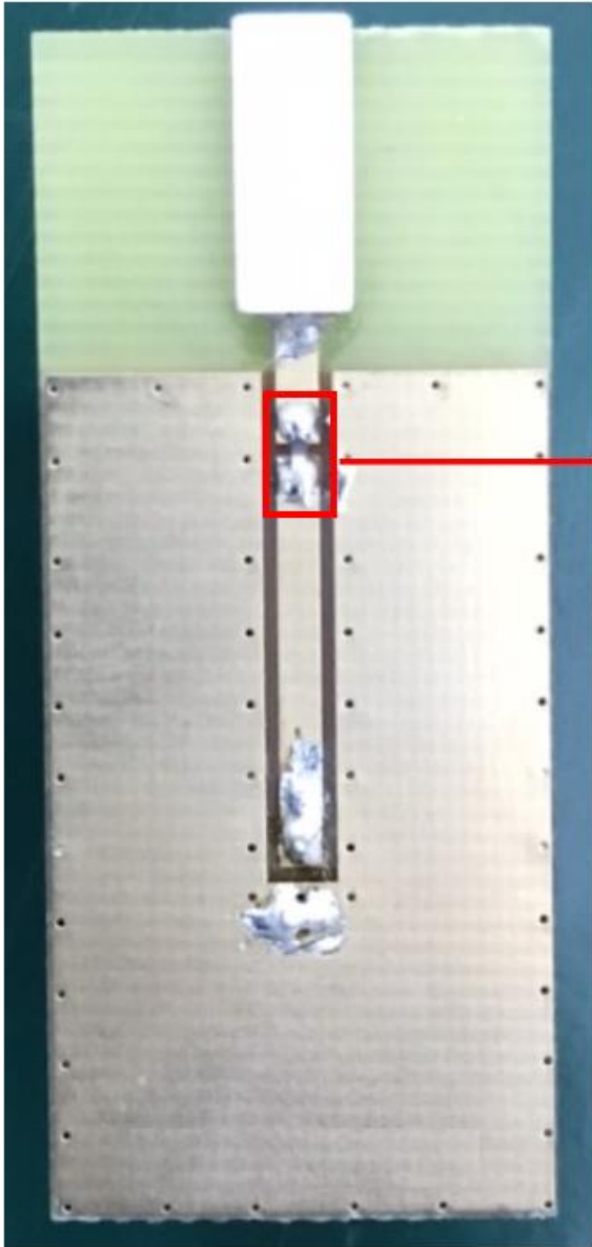


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Evaluation Board with Matching Circuit



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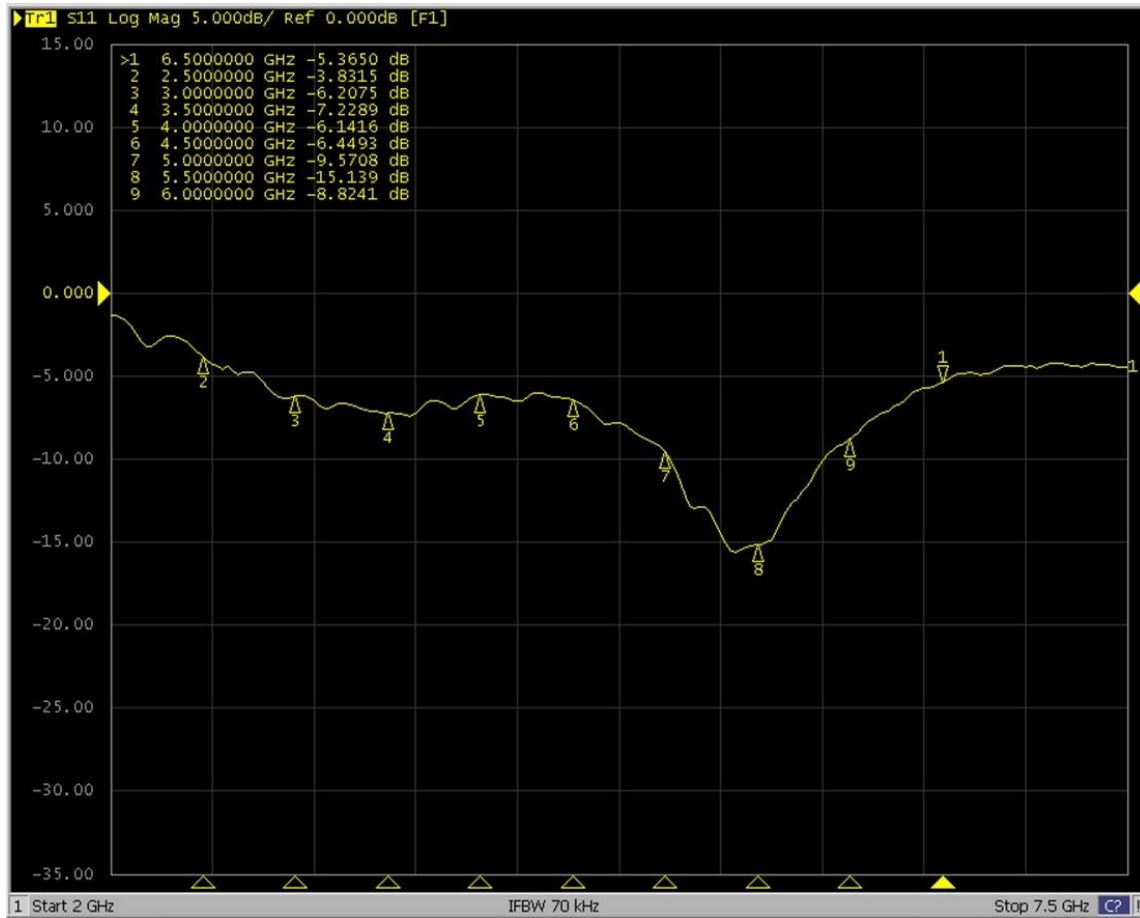


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Test Measurement – Return Loss



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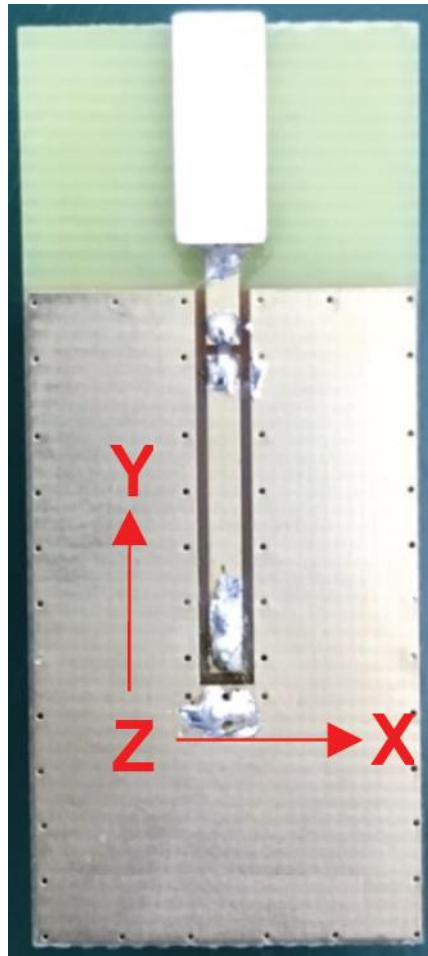


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Radiation Measurement - Set-up



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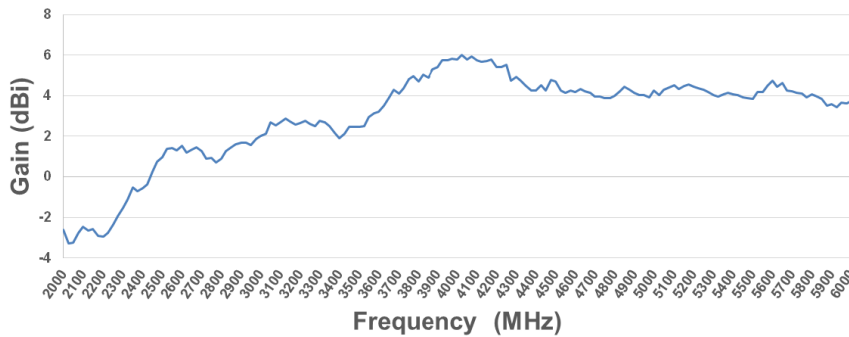


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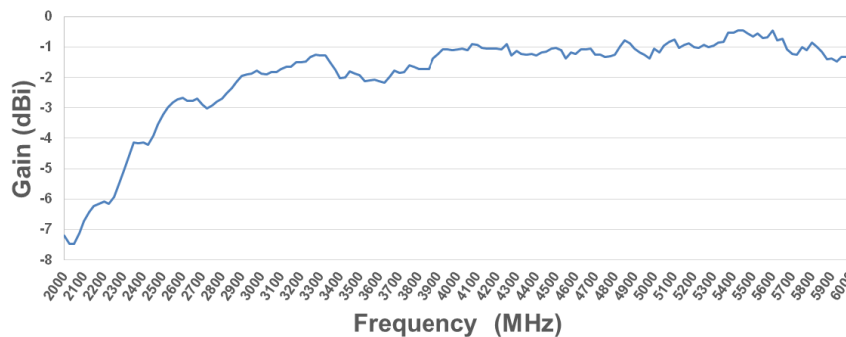


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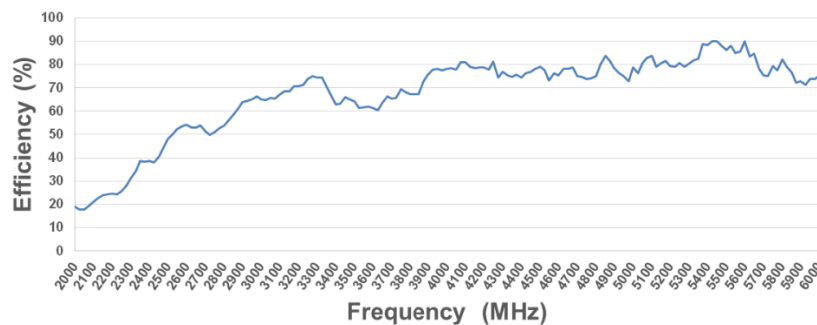
Peak Gain



Average Gain



Efficiency



Frequency (GHz)	3	3.5	4	4.5	5	5.5	6
Efficiency (%)	65.03	64.11	78.21	79.03	78.62	86.07	75.20
Average Gain (dBi)	-1.86	-1.93	-1.06	-1.02	-1.04	-0.65	-1.23
Peak Gain (dBi)	2.01	2.48	5.79	4.70	4.24	3.83	3.72



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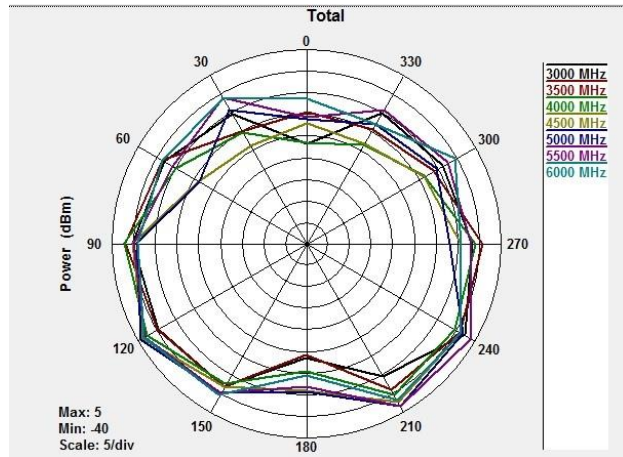
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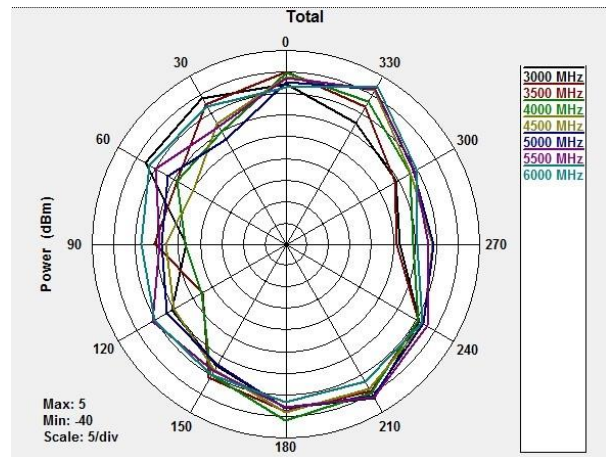
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Radiation Characteristics – 2D Pattern

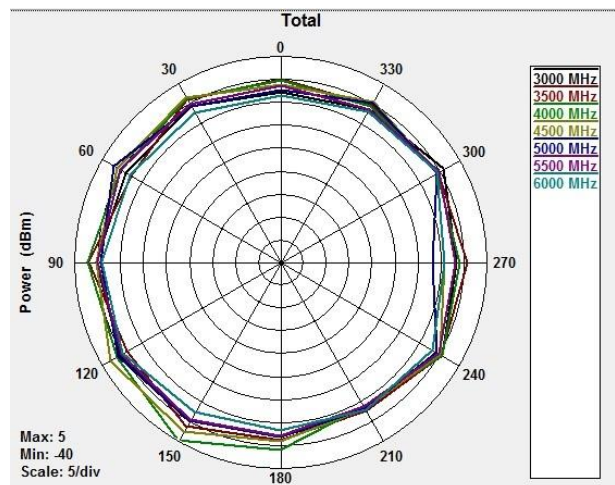
XY - Plane



XZ - Plane



YZ - Plane



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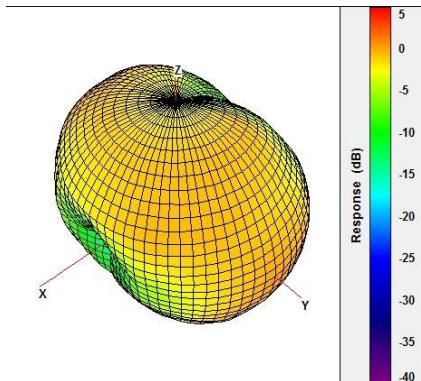
Check Inventory



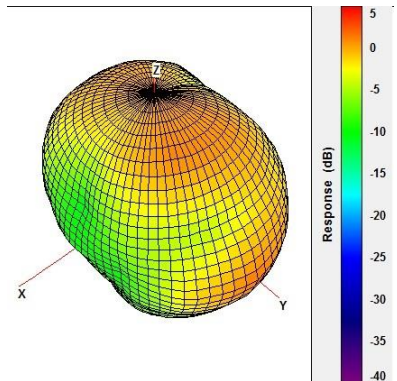
10.0 x 4.0 x 1.5 mm
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MSL Level = N/A

Radiation Characteristics – 3D Pattern

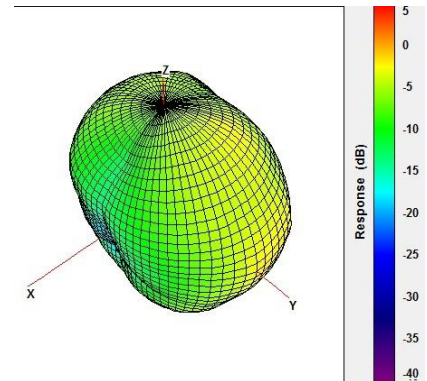
3 GHz



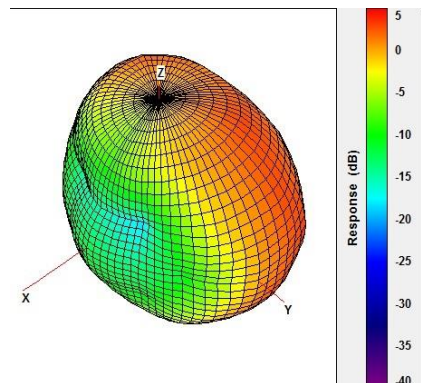
3.5 GHz



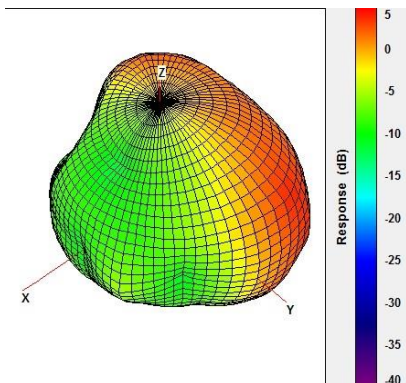
4 GHz



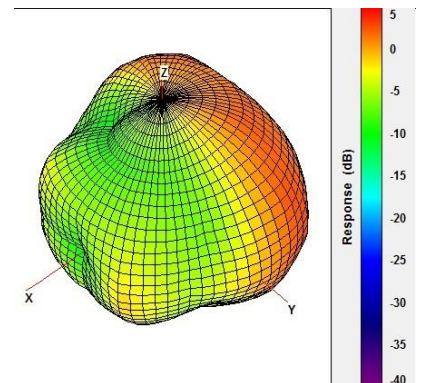
4.5 GHz



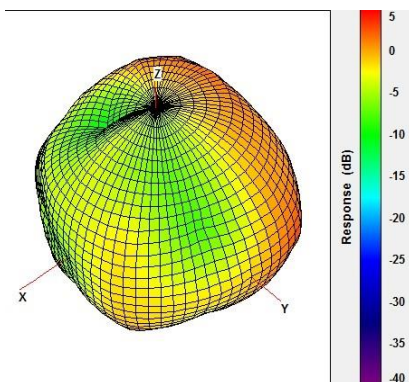
5 GHz



5.5 GHz



6 GHz



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Reliability Test Conditions

Items	Test Method	Standard
Sinusoidal Vibration Test	<ol style="list-style-type: none"> Vibration Frequency: 5-200-5 Hz Peak:4.5G (2 mm amplitude) Sweep Direction: X, Y (2H), Z (4H) Sweep Duration : 10 min/axis Examine the appearance and functions after the test. 	<ol style="list-style-type: none"> Specimens shall be free of any traffic discontinuities during the test. The appearance of the product, and electrical properties to meet the requirements. <p>The appearance of the product, and electrical properties to meet the requirements.</p>
Vibration Test in Packaged Condition	<ol style="list-style-type: none"> Vibration Frequency: 15-60-15 Hz Peak:4G (2 mm amplitude) Sweep Direction: X, Y, Z Sweep Duration : 10 min/axis Examine the appearance and functions after the test. 	
Thermal Shock	<ol style="list-style-type: none"> Low temperature: -30°C High temperature: +85°C Cycle time: 30 min each temperature Number of Cycles: 5 Expose to normal temperature/humidity for 24H or more. 	
Free Fall Test in Packaged Condition	<ol style="list-style-type: none"> Drop the object onto a concrete surface from a height of 90 cm. Test once for one corner, three edges and six faces : 10 times in total. Examine the appearance and functions after the test. 	
High Temperature	<ol style="list-style-type: none"> Temperature: 85°C Time: 16H Examine the appearance and functions after taken out at room temperature for 24H. 	
Low Temperature	<ol style="list-style-type: none"> Temperature: -30°C Time: 16H Examine the appearance and functions after taken out at room temperature for 24H. 	
Solder Heat Resistance	<ol style="list-style-type: none"> Lead pins of the unit are soaked in solder bath. IR Reflow - Temperature: 270±5°C, Time: 10±0.5s. Examine the appearance and functions after the test. 	
High Humidity	<ol style="list-style-type: none"> Temperature range: 85°C Humidity Range: 90%~95% R.H. Cycle times: 96H Examine the appearance and functions after taken out at room temperature for 24H. 	
Adhesion Test	<ol style="list-style-type: none"> Subject the soldered device on test PCB. (Reflow) Then apply 0.5Kg(5N) of force for 10±1 sec in the direction of parallel to the substrate. 	

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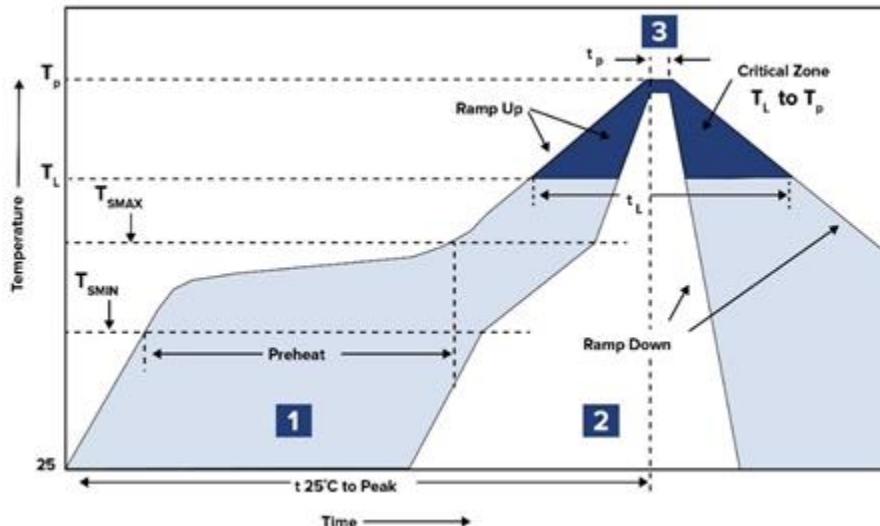
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Reflow Profile

The chip antenna can be assembled using the following Pb-free assembly. According to the standard IPC/JEDEC J-STD-020C, the temperature profile suggested is as follows :



Zone	Description	Temperature	Times
1	Preheat	$T_{SMIN} \sim T_{SMAX}$ 150°C ~ 200°C	60 ~ 120 sec
2	Ramp-Up	$T_{SMAX} \sim T_P : 3 \text{ }^\circ\text{C/s}$	
3	Reflow	T_L 217°C	30 ~ 100 sec
	Peak heat	T_P 260°C	5 sec (max)
	Ramp-Down	6 °C/s	
Time from 25°C to Peak Temperature		8 minutes (max)	
Composition of solder paste		96.5Sn/3Ag/0.5Cu	
Solder Paste Model		SHENMAO PF606-P26	

Soldering with Iron

- Soldering Iron Temperature : 270±10 °C
- Apply pre-heating at 120 °C for 2~3 min.
- Complete soldering for each terminal within 3 s .
 - If the soldering iron temperature exceeds 270±10 °C or 3 seconds, it can damage the component.

Note: All temperature measure points are on top surface of the component. If temperature goes over the recommend, it will cause surface peeling or damage to the component.



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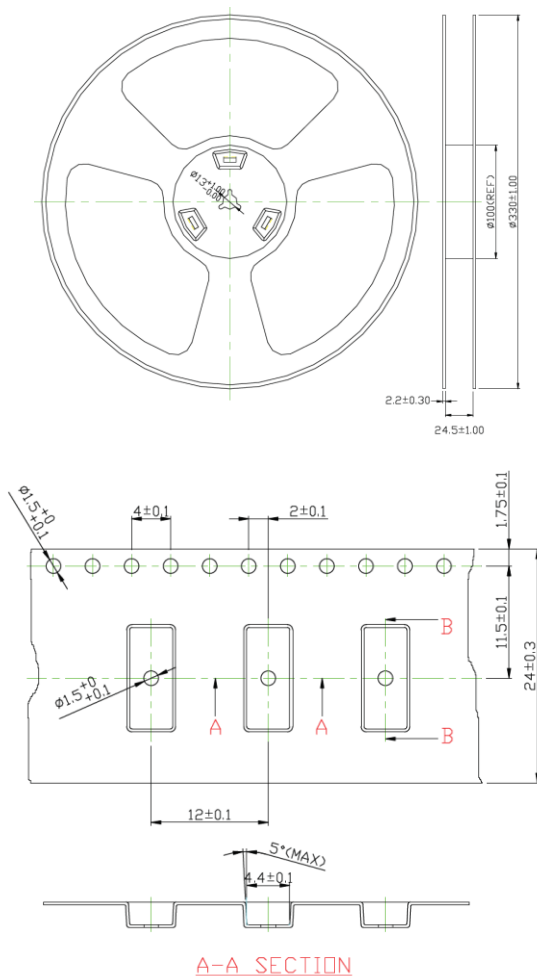
Precautions

- Do not direct solder onto the gold electrode of the antenna pattern.
- Do not use the chip antenna in a corrosive gaseous atmosphere for example sulfur gas, chlorine gas.

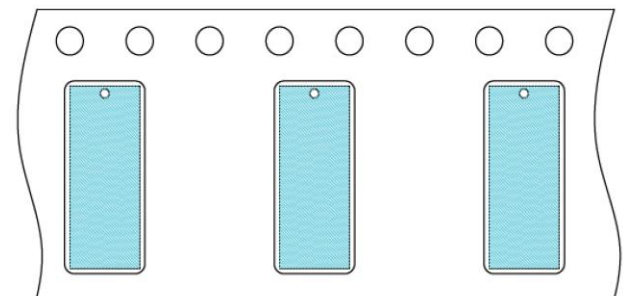
Packaging Information

Number of pieces/tape : 2000

Blister tape to IEC 286-3, Polyester



Unit : mm



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