

# 6.24 ~ 8.50 GHz UWB - Chip Antenna



ACR0301U

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3.2 x 1.6 x 1.1 mm  
RoHS/RoHS II Compliant  
MSL Level = 1

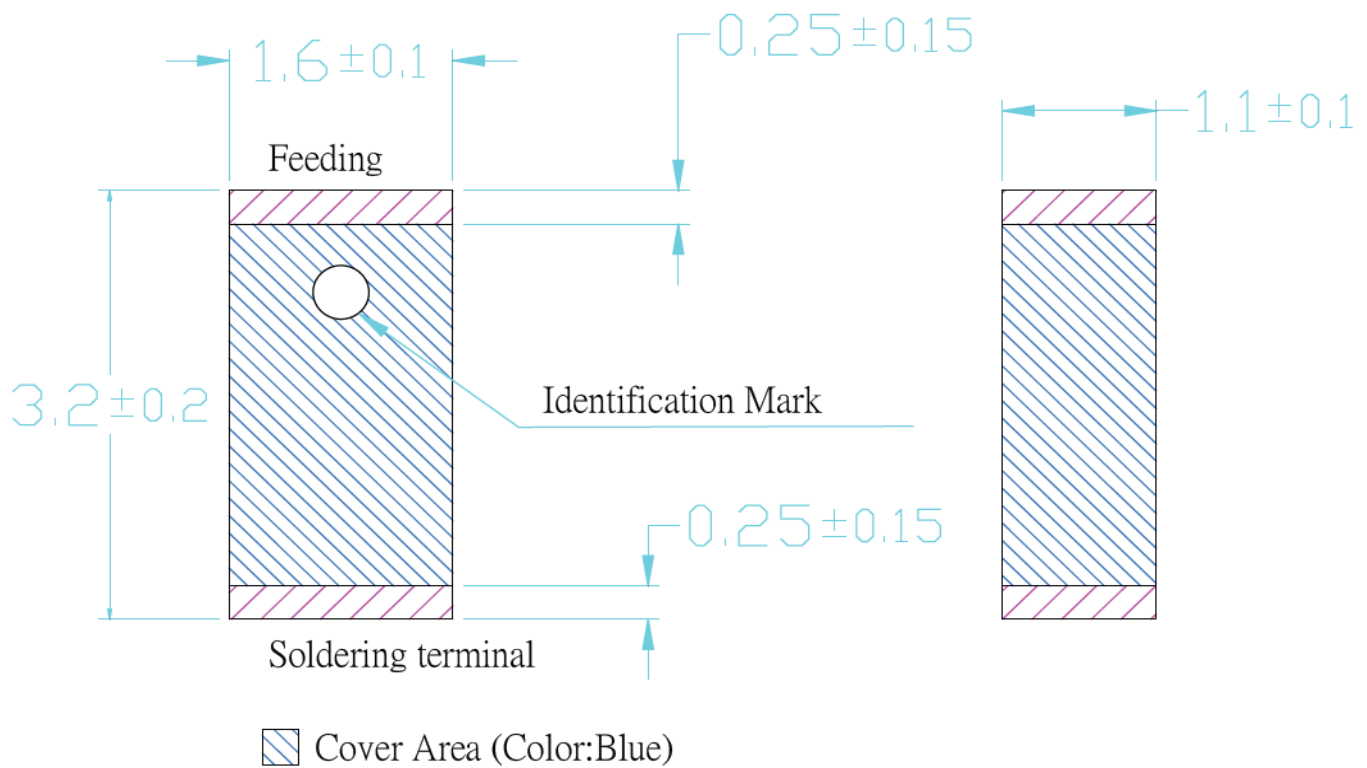
## Features

- Compact size
- UWB Bands in 6.24 GHz ~ 8.5 GHz
- Manufactured using LTCC technology
- High Gain of 4.5 dBi
- Omni-directional Pattern
- High Efficiency of 70 ~ 80 %
- Surface mount component

## Applications

- UWB Applications
- IoT
- M2M
- Real time tracking
- Location based services
- Personal Area Networks (PAN)
- Short range, high speed data links for Medical and Commercial equipment

## Product Dimensions



Unit : mm

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## Electrical Specification

Parameter	Specification			Unit
	Min	Typ	Max	
Operating Frequency	6.24		8.5	GHz
Center Frequency		7.37		
VSWR			2.0	
Polarization	Linear			
Peak Gain			4.5	dBi
Efficiency		70 ~ 80		%
Impedance		50		$\Omega$
Azimuthal Beamwidth	Omni-directional			
Input Power	Continuous		3	W
	Up to 5 minutes		5	

Note: All test measurements were conducted with the antenna on a 42.6x22.6 mm Evaluation board. Please note that the performance is dependent on the ground plane dimensions, matching network and application environment.

## Mechanical Specification

Parameter	Specification
Antenna Dimension	3.2 x 1.6 x 1.1 mm
Antenna Ground Clearance Area	8 x 7.8 mm
Evaluation board Dimension	42.6 x 22.6 x 0.8 mm
Manufacturing Technology	Multilayer LTCC Chip
Mounting Type	Surface Mount

## Environmental Specification

Parameter	Specification
Operating Temperature	-40°C to +85°C
Storage Temperature	+5°C to +40°C
Relative Humidity	30 ~ 70 %
Pb-free	Yes



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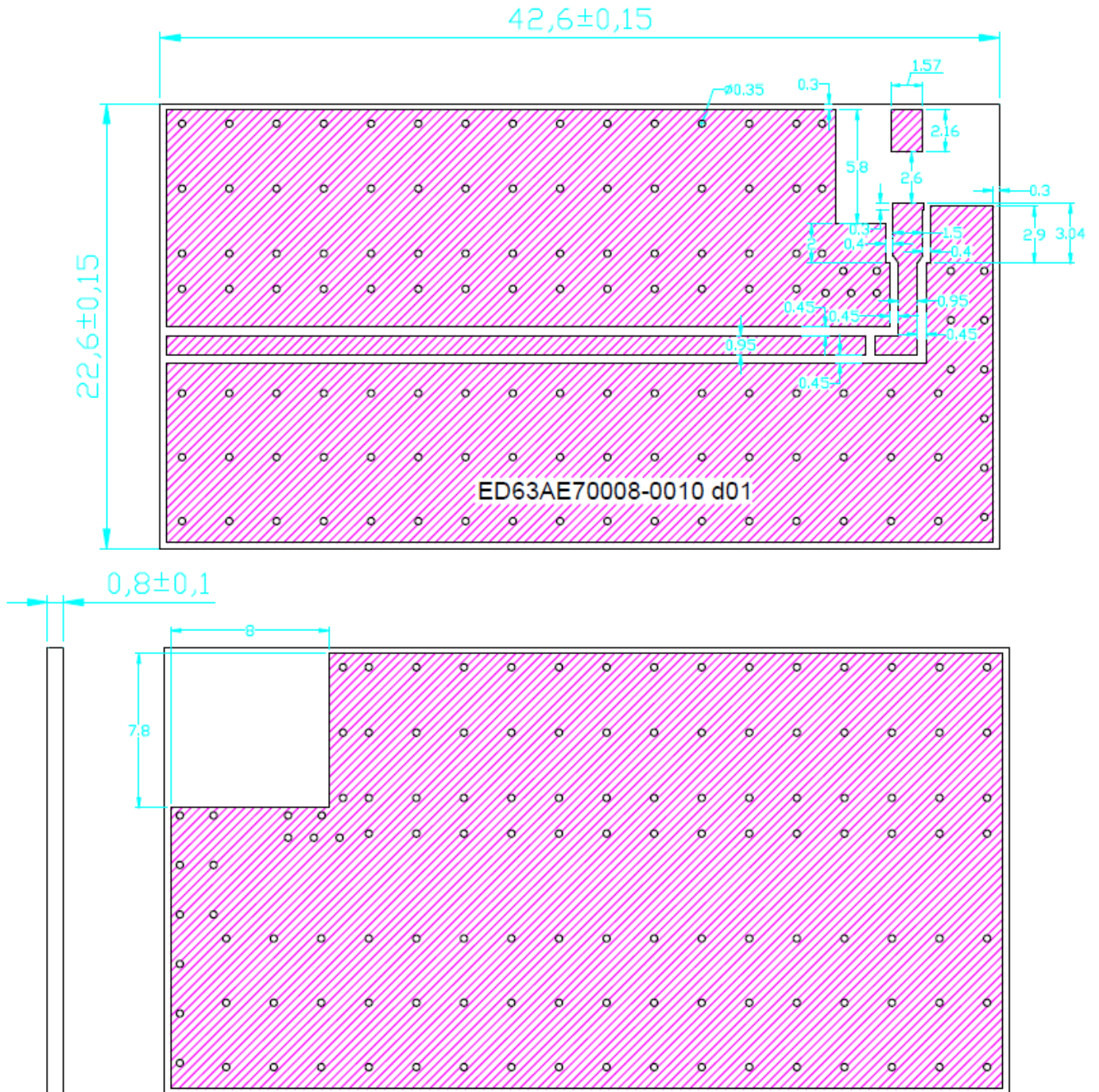


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## Evaluation Board Dimensions



Unit: mm



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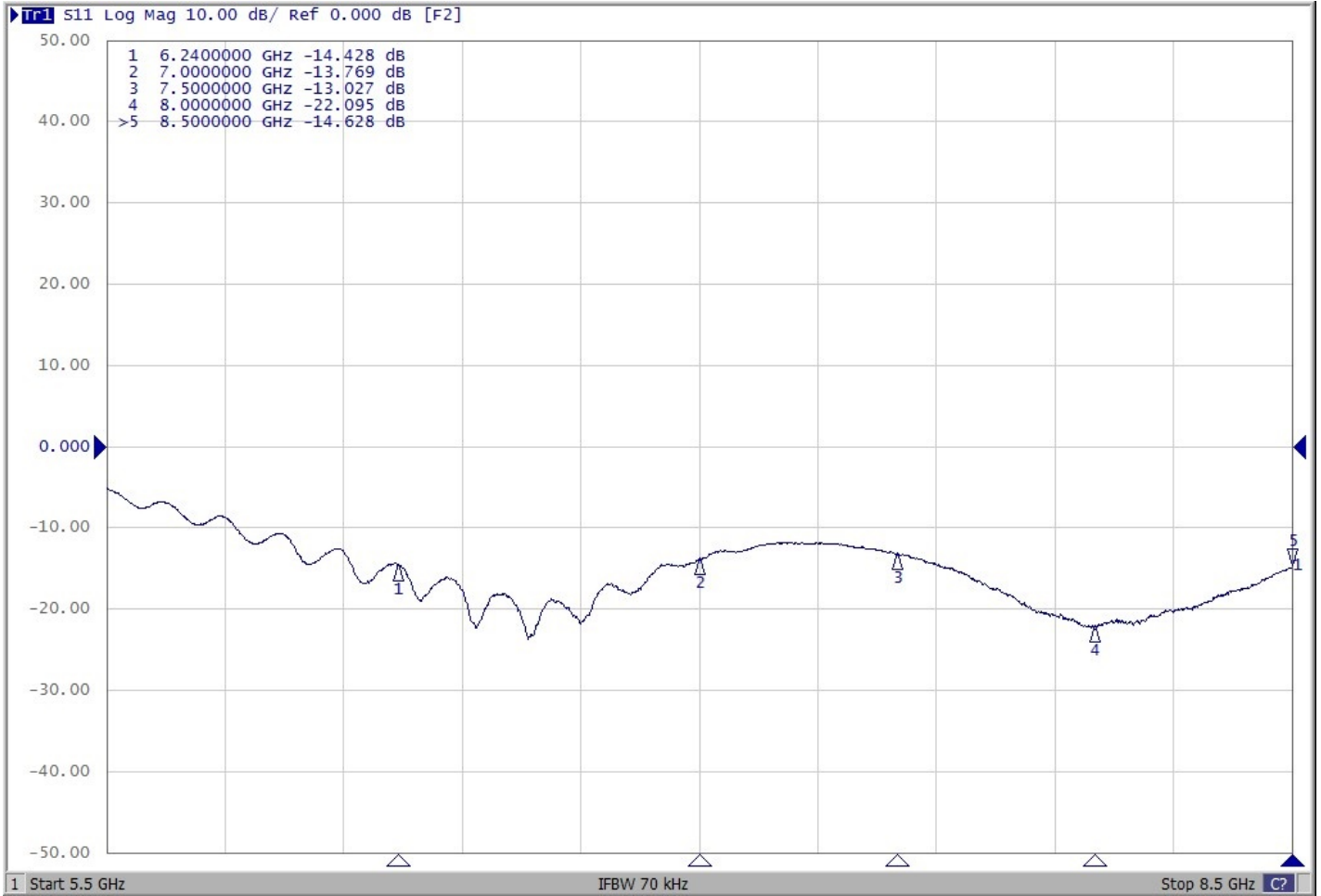


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## Reflection Characteristics - Return Loss





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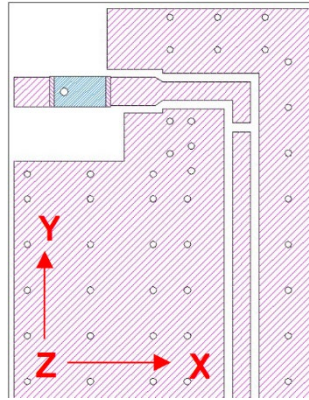


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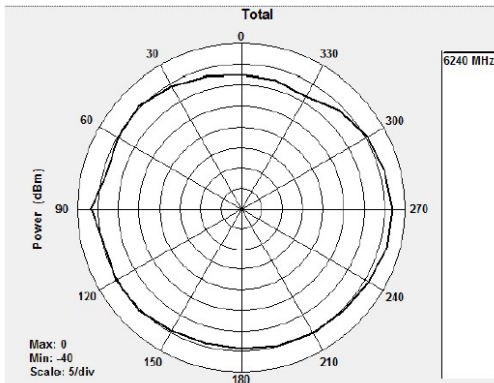


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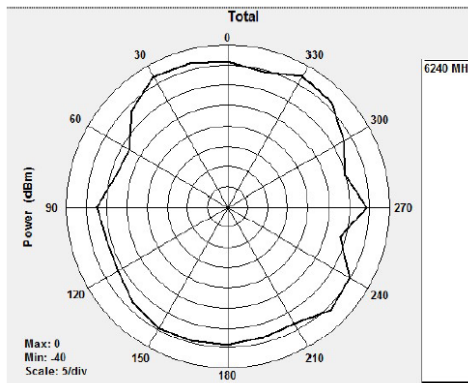
## Radiation Characteristics – 2D Pattern



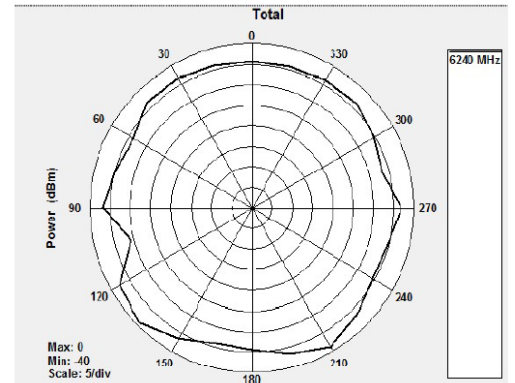
6240 MHz



XY-Plane

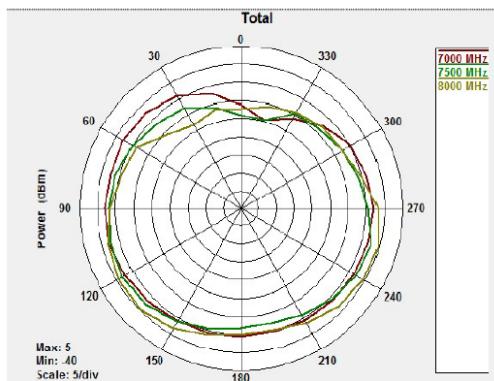


XZ-Plane

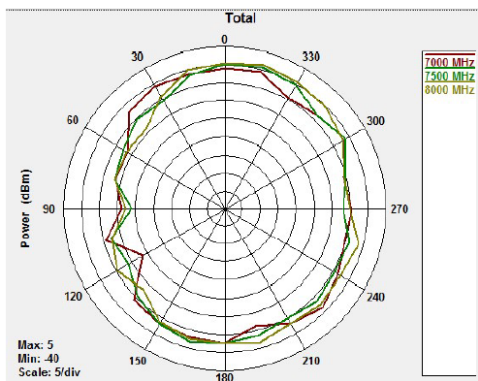


YZ-Plane

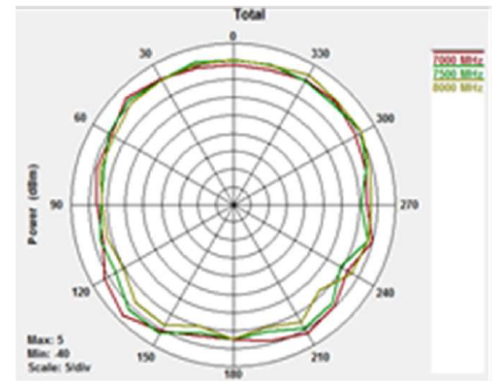
7000/7500/8000 MHz



XY-Plane



XZ-Plane



YZ-Plane



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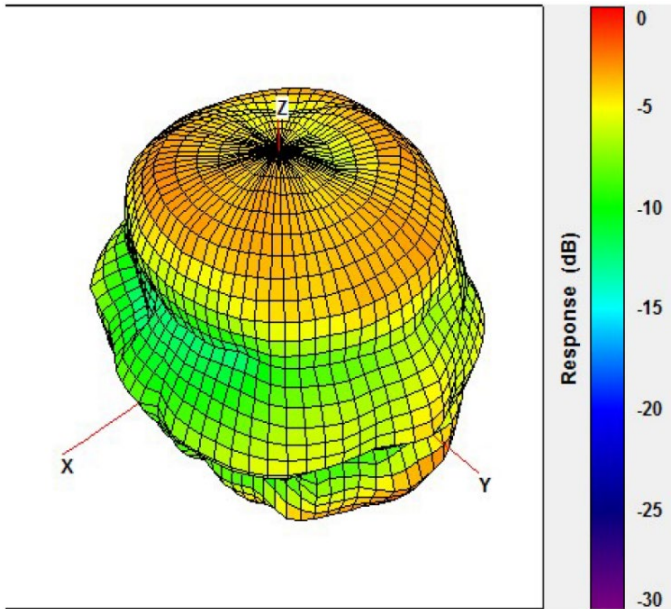


Check Inventory

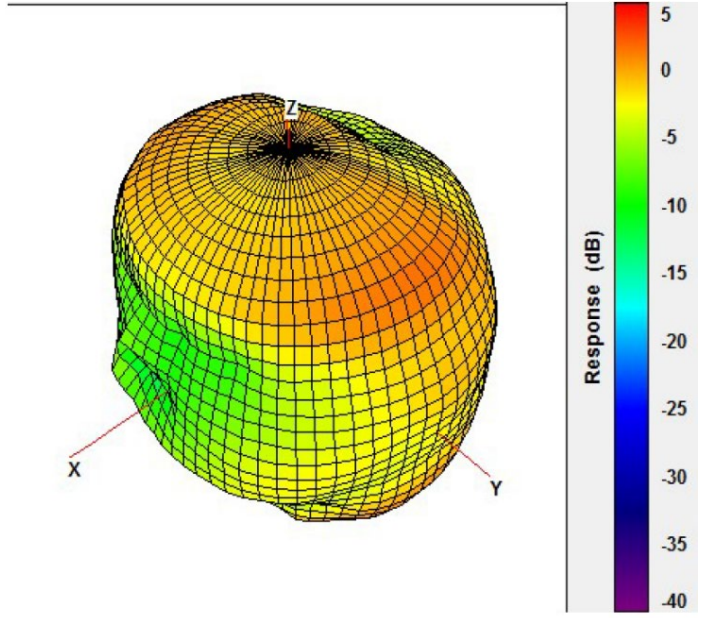


3.2 x 1.6 x 1.1 mm  
RoHS/RoHS II Compliant  
MSL Level = 1

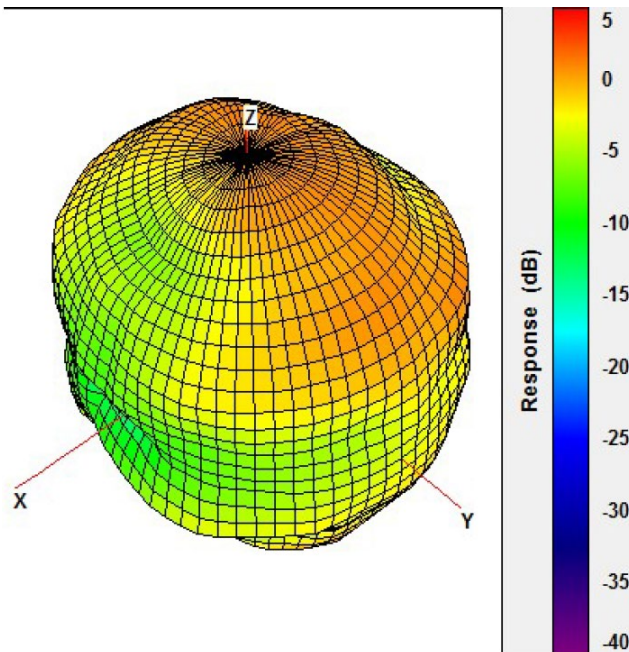
## Radiation Characteristics – 3D Pattern



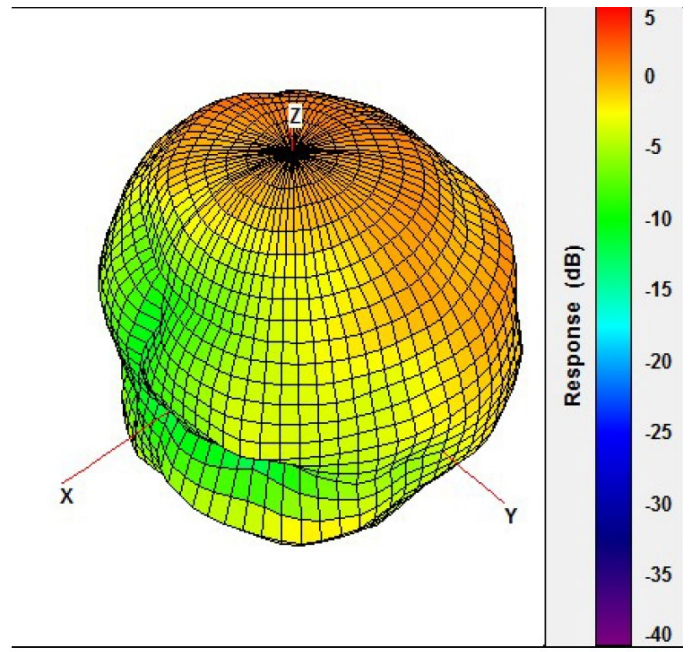
6240 MHz



7000 MHz



7500 MHz



8000 MHz

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**3.2 x 1.6 x 1.1 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

## Reliability Test

Items	Test Method	Standard
Resistance to soldering heat JIS C 0050-5.4	<ol style="list-style-type: none"> <li>1. Preheating temperature: 120 ~ 150 °C</li> <li>2. Duration: 1 min</li> <li>3. Solder Temperature: 270 ± 5 °C</li> <li>4. Immersion Time: 10 ± 1 s</li> <li>5. Solder: Sn3Ag0.5Cu for lead free</li> <li>6. Measurement to be made after keeping at room temperature for 24 ± 2 hrs</li> </ol>	<ol style="list-style-type: none"> <li>1. Specimens shall be free of any traffic discontinuities during the test. (No mechanical damage)</li> <li>2. The appearance of the product, and electrical properties to meet the requirements under operational temperature range within -40 ~ +85 °C</li> <li>3. Loss of metallization on the edges of each electrode shall not exceed 25%</li> </ol>
Solderability JIS C 0050-4.6 JESD22-B102D	<ol style="list-style-type: none"> <li>1. Solder bath temperature : 235 +/- 5 C</li> <li>2. Immersion time : 2 ± 0.5 sec</li> <li>3. Solder : Sn3Ag0.5Cu for lead-free</li> </ol>	At least 95% of a surface of each terminal electrode must be covered by fresh solder.
Adhesive Strength of Termination JIS C 0051- 7.4.3	<ol style="list-style-type: none"> <li>1. Pressurizing force : 5N (LGA terminal series) ; 5N(≤0603) ; 10N(&gt;0603)</li> <li>2. Test time : 10±1 s</li> </ol>	No remarkable damage or removal of the termination.
Vibration JIS C 0040	<ol style="list-style-type: none"> <li>1. Vibration Frequency: 10~50~10 Hz (1min)</li> <li>2. Amplitude:1.5 mm</li> <li>3. Sweep Direction: 6 Hrs = X(2H), Y(2H), Z(2H)</li> <li>4. Examine the appearance and functions after the test.</li> </ol>	<ol style="list-style-type: none"> <li>1. Specimens shall be free of any traffic discontinuities during the test. (No mechanical damage)</li> <li>2. The appearance of the product, and electrical properties to meet the requirements under operational temperature range within -40 ~ +85 °C</li> </ol>
Drop Test JIS C 0044	<ol style="list-style-type: none"> <li>1. Drop the object onto a concrete surface or steel surface from a height of 75 cm.</li> <li>2. Number of Times : 6 surfaces for each unit – 2 times each side.</li> <li>3. Examine the appearance and functions after the test.</li> </ol>	
Bending test JIS C 0051- 7.4.1	<ol style="list-style-type: none"> <li>1. The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1 mm/s per second until the deflection becomes 1mm/s and then pressure shall be maintained for 5±1 sec.</li> <li>2. Measurement to be made after keeping at room temperature for 24±2 hours</li> </ol>	



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Temperature cycle JIS C 0025	<ol style="list-style-type: none"> <li>1. 30±3 minutes at -40°C±3°C</li> <li>2. 10~15 minutes at room temperature</li> <li>3. 30±3 minutes at +85°C±3°C</li> <li>4. 10~15 minutes at room temperature</li> <li>5. Number of cycles: 100 continuous cycles</li> <li>6. Measurement to be made after keeping at room temperature for 24±2 hrs</li> </ol>	<ol style="list-style-type: none"> <li>1. Specimens shall be free of any traffic discontinuities during the test. (No mechanical damage)</li> <li>2. The appearance of the product, and electrical properties to meet the requirements under operational temperature range within -40 ~ +85 °C</li> </ol>
High Temperature JIS C 0021	<ol style="list-style-type: none"> <li>1. Temperature: 85°C±2°C</li> <li>2. Time: 1000+24/-0 H</li> <li>3. Examine the appearance and functions after taken out at room temperature for 24±2H.</li> </ol>	
Low Temperature JIS C 0020	<ol style="list-style-type: none"> <li>1. Temperature: -40°C±2°C</li> <li>2. Time: 1000+24/-0 H</li> <li>3. Examine the appearance and functions after taken out at room temperature for 24±2H.</li> </ol>	
Humidity (Steady conditions) JIS C 0022	<ol style="list-style-type: none"> <li>1. Temperature range: 40°C±2°C</li> <li>2. Humidity Range: 90%~95% R.H.</li> <li>3. Cycle times: 1000+24/-0 H</li> <li>4. Examine the appearance and functions after taken out at room temperature for 24H±2H. 500 hrs measuring the first data then 1000 hrs data.</li> </ol>	



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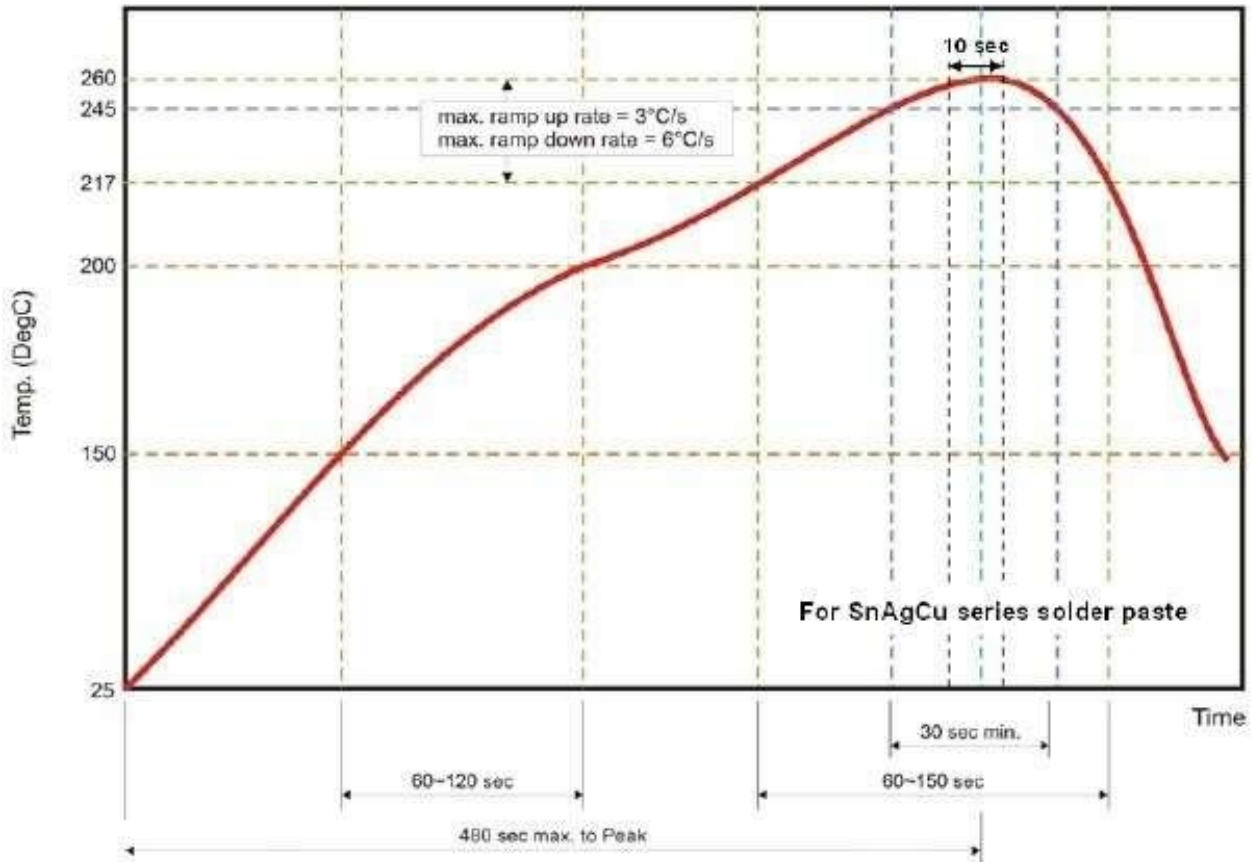
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## Infrared Soldering Profile

A typical example of soldering processes that provides reliable joints without any damage is given below. This product can sustain a reflow process three times, and at temperatures below 260 °C.



## Caution

- Do not place the product in a corrosive or corrosive gas environment as it may cause oxidation of the metal electrode, resulting in poor solderability.
- Products should be stored on the palette for the prevention of the influence from external factors including humidity, dust.
- Products should be stored in an environment without being exposed to but not limited to heat shock, vibration, direct sunlight.
- Products should be stored in an airtight packaged condition.



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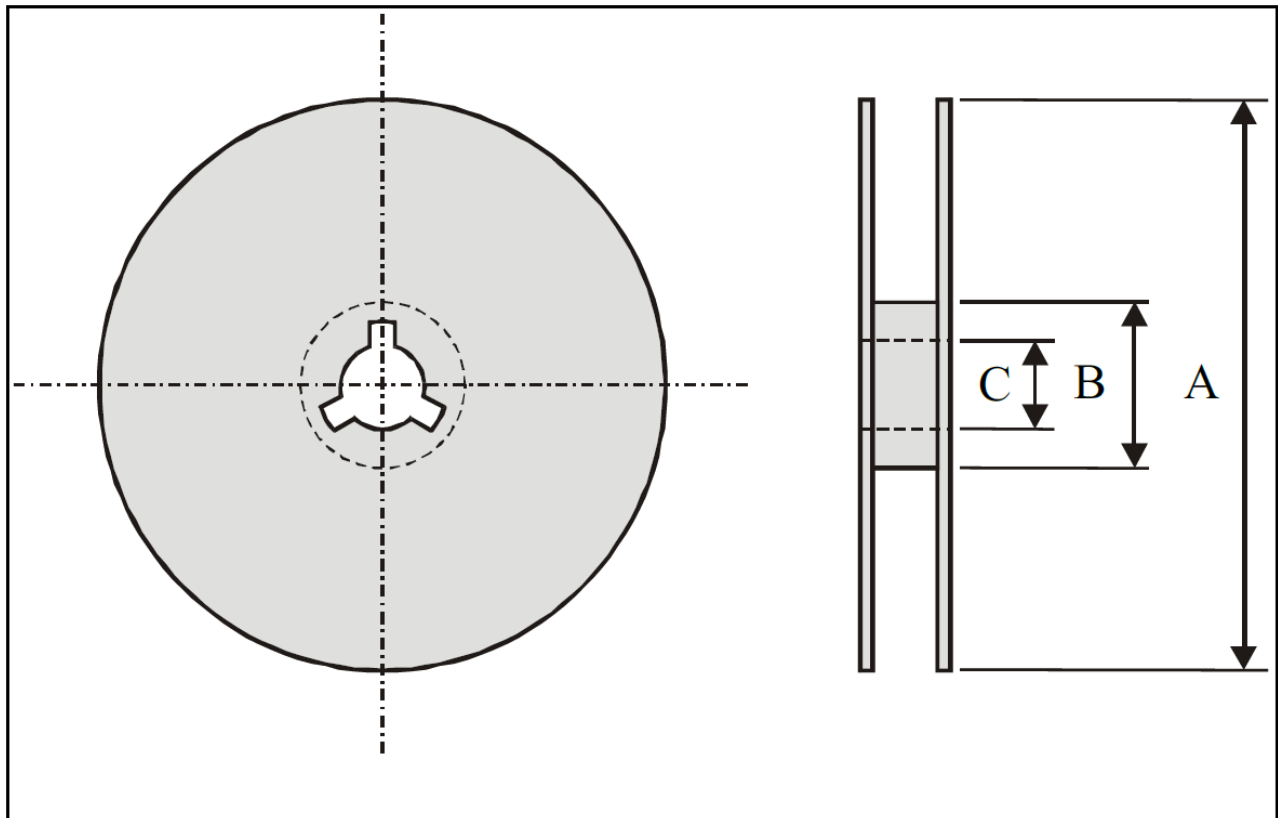


3.2 x 1.6 x 1.1 mm  
**RoHS/RoHS II Compliant**  
 MSL Level = 1

## Packaging

Packaging Type: Tape & Reel  
 Number of Pieces per Reel: 2000

## Reel Specifications



Dimension	Specification (mm)
A	D178
B	D60
C	D13.5

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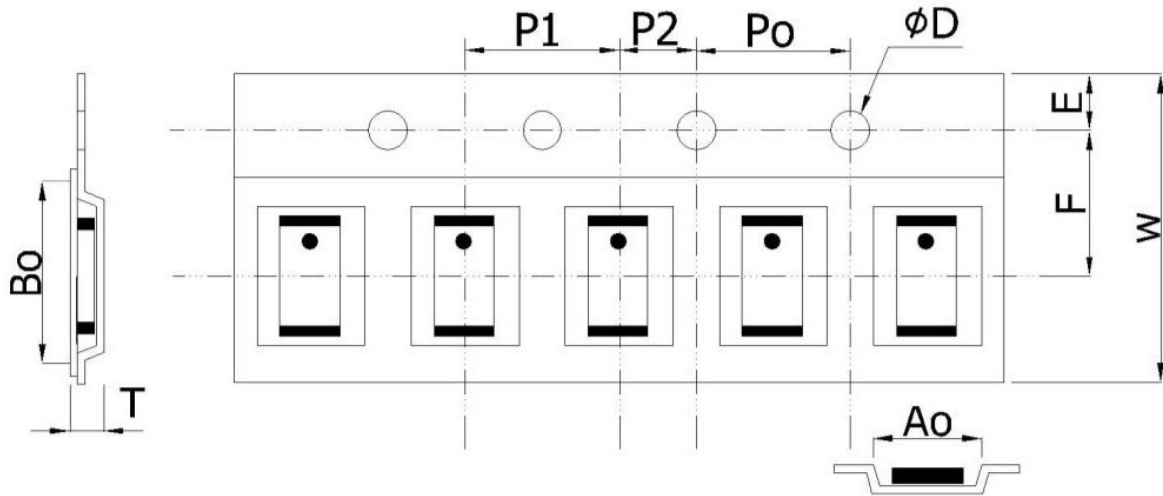
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## Packaging

### Reel Tape Specifications



Dimension	Specification (mm)
Ao	1.81 ± 0.10
Bo	3.42 ± 0.10
φD	1.55 ± 0.05
T	1.26 ± 0.10
W	8.20 +0.10/-0.30
E	1.75 ± 0.10
F	3.50 ± 0.05
Po	4.00 ± 0.10
P1	4.00 ± 0.10
P2	2.00 ± 0.10

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