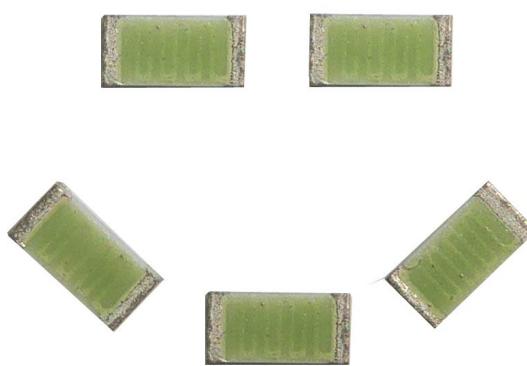


# 3.2 x 1.6 x 0.5 (mm) Wi-Fi / HDMI Ceramic Chip Antenna (AA070)

## Engineering Specification

### 1. Product Number

[H] [2] [U] [3] [4] [W] [1] [H] [1] [B] [0] [8] [0] [0]



### 2. Features

- \*Stable and reliable in performances
- \*Compact size
- \*RoHS compliance
- \*SMT processes compatible

### 3. Applications

- \*IEEE802.11a (5150~5900 MHz).
- \*HDMI PCMCIA cards or USB dongle

### 4. Description

Unictron's AA106 ceramic chip antenna is designed for WiFi/HDMI applications, covering frequencies 5150~5900MHz. Fabricated with proprietary design and processes, AA106 shows excellent performance and is fully compatible with SMT processes which can decrease the assembly cost and improve device's quality and consistency.



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Prepared by : Xenia

Designed by : Phillip

Checked by : Mike

Approved by: Herbert

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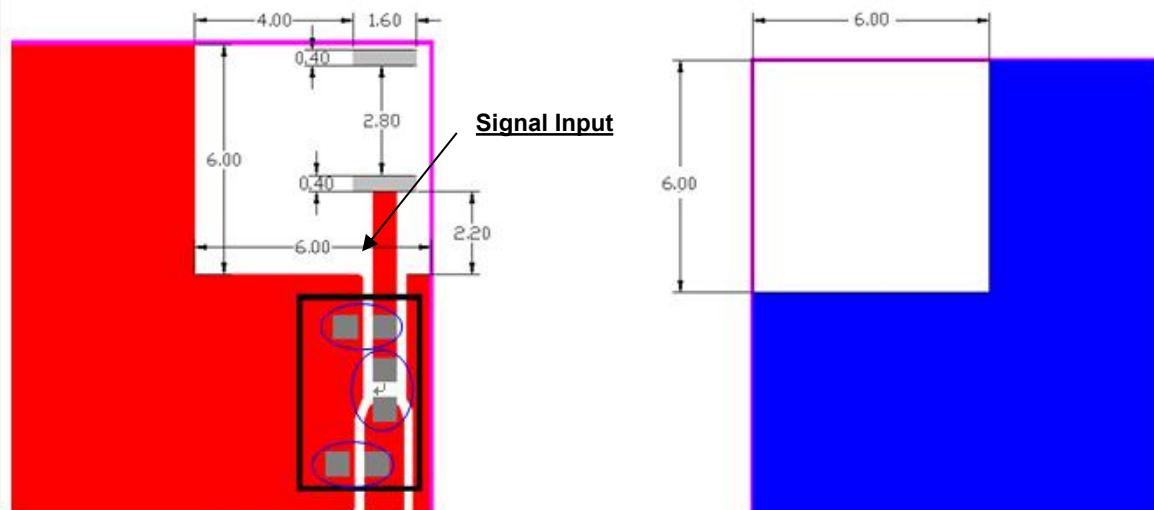
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## 5. Layout Guide & Electrical Specifications

### 5-1. Layout Guide (unit : mm)

#### Solder Land Pattern:

The solder land pattern (gray marking areas) is shown below. Recommendation on matching circuit will be provided according to customer's installation conditions.



#### Transmission Line with 50Ω Impedance Characteristic

Top View

Bottom View

### 5-2. Electrical Specifications (Evaluation Board Dimensions: 40 x 40 mm<sup>2</sup>)

#### 5-2-1. Electrical Table

Characteristics	Specifications	Unit
Outline Dimensions	3.2 x 1.6 x 0.5	mm
Ground Plane Dimensions	40 x 40	mm
Working Frequency	5150~5900	MHz
Bandwidth	750 (typical)	MHz
VSWR	2 Max. (typical)	
Characteristic Impedance	50	Ω
Polarization	Linear Polarization	
Peak Gain (@5550 MHz)	3.4 (typical)	dBi



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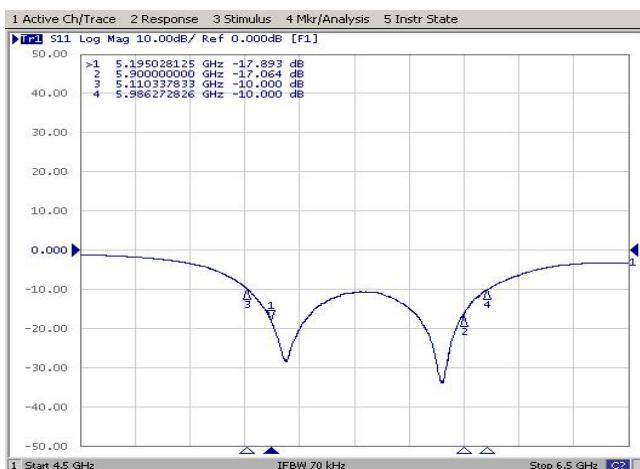
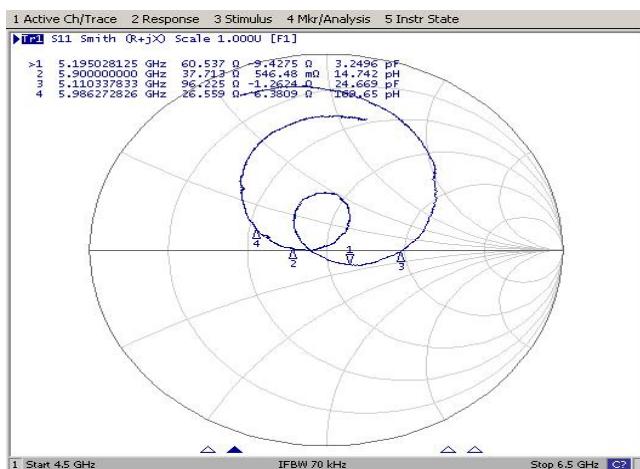
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Efficiency

80 (typical)

%

## 5-2-2. Return Loss &amp; Smith Chart

Return Loss( $S_{11}$ )Smith Chart( $S_{11}$ )

## 6. Outline Dimensions of Antenna &amp; Evaluation Board (unit: mm)

## 6-1. Antenna Dimensions



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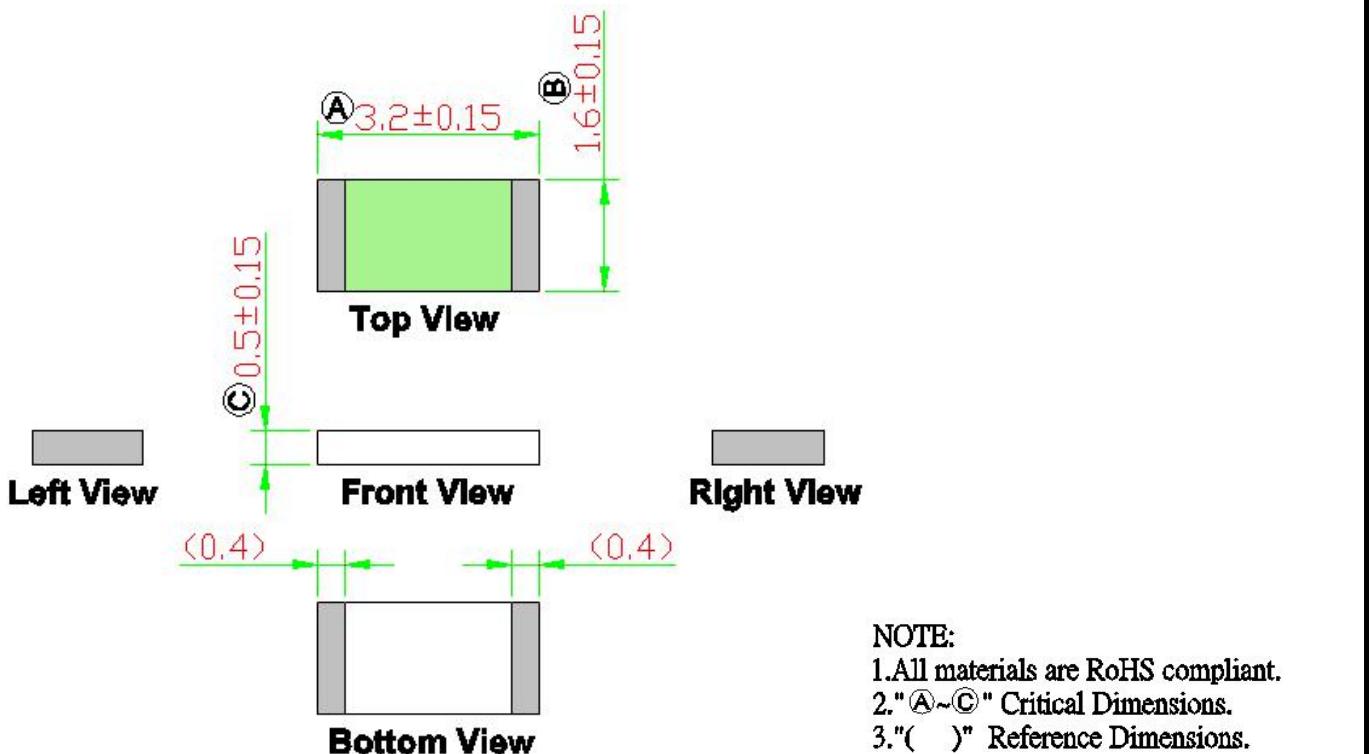
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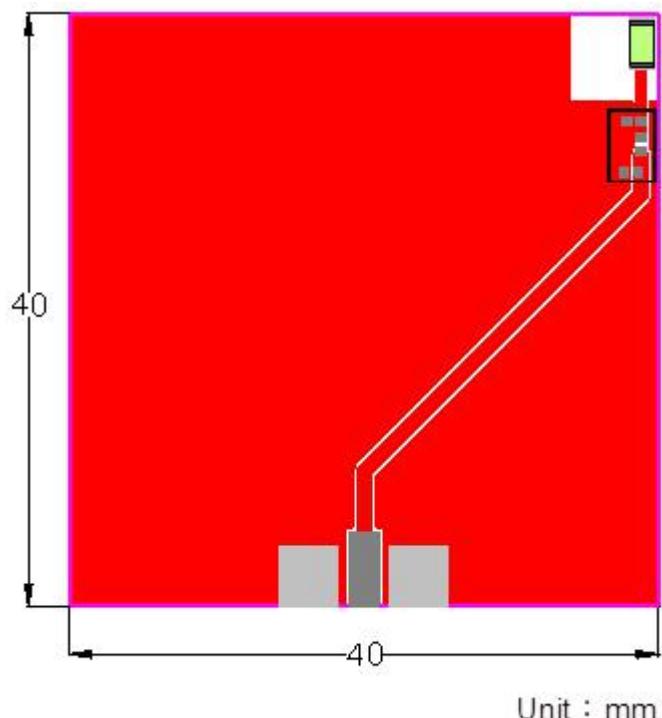
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6-2. Evaluation Board with Antenna



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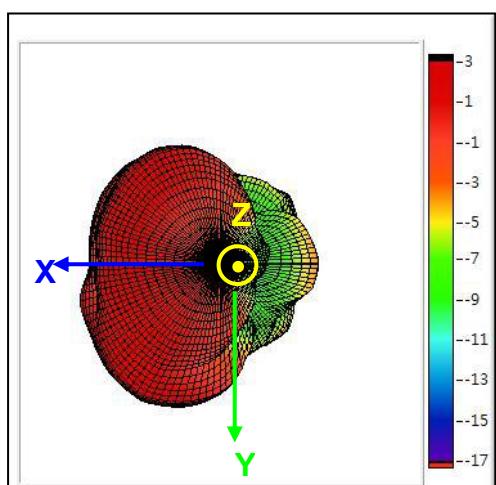
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## 7. Radiation Pattern (with 40 x 40 mm<sup>2</sup> Evaluation Board)

### 7-1. 3D Gain Pattern @ 5150 MHz (unit: dBi)



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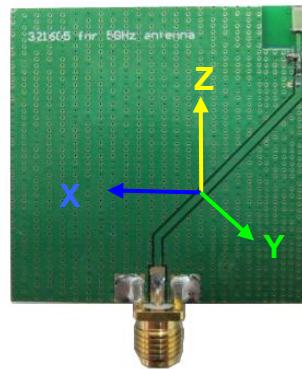
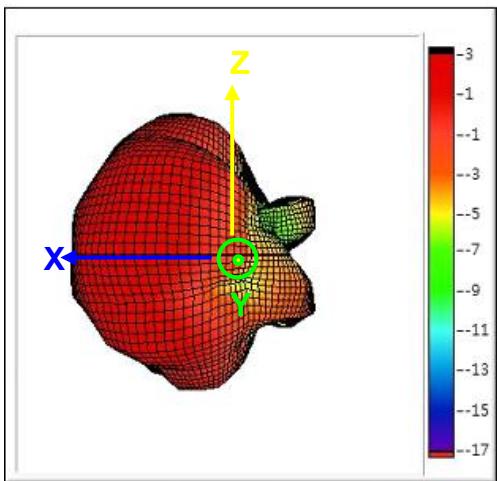
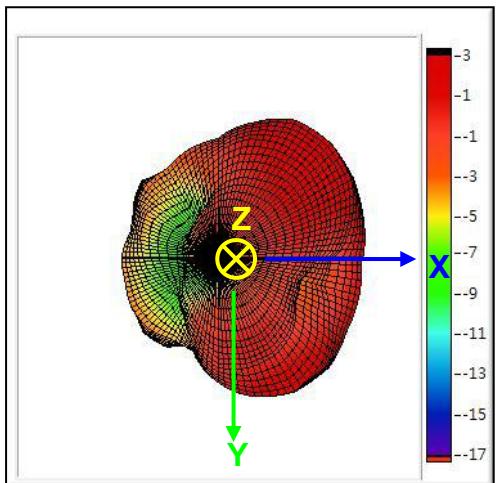
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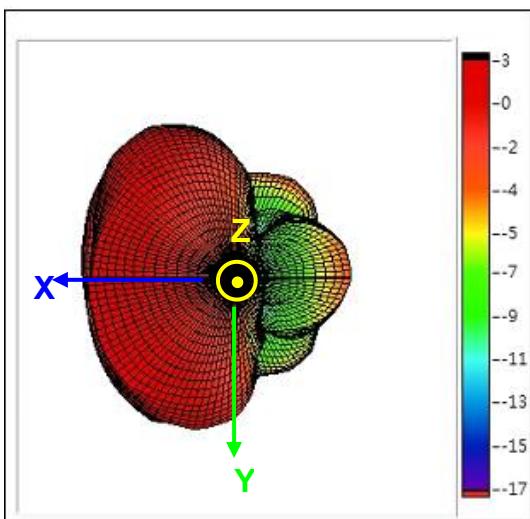
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7-2. 3D Gain Pattern @ 5350 MHz (unit: dBi)



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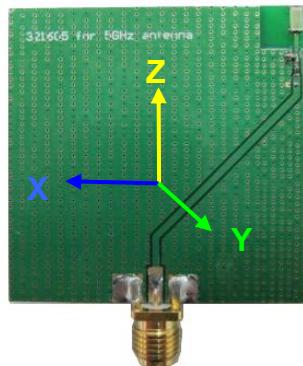
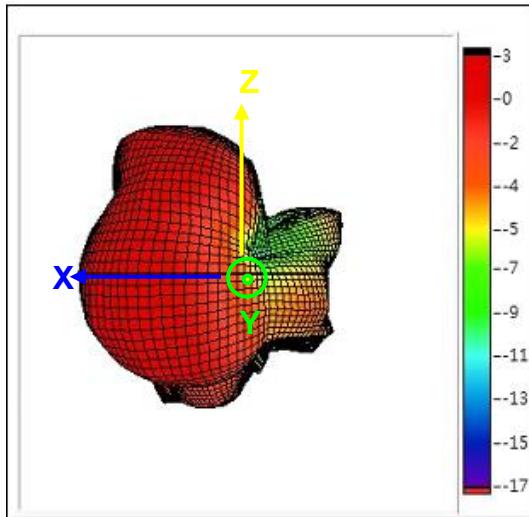
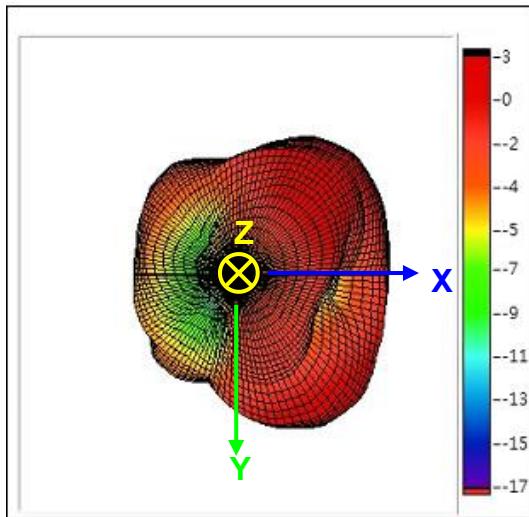
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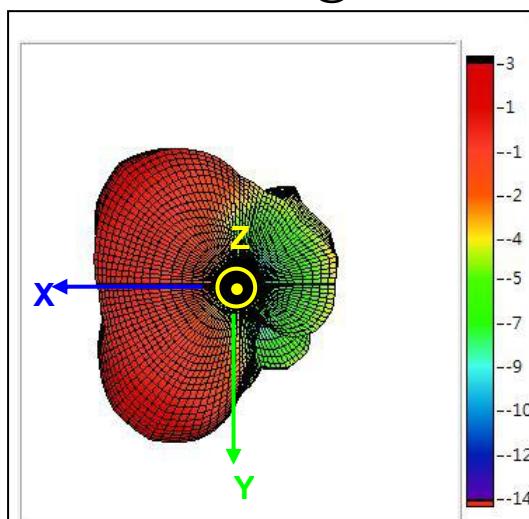
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7-3. 3D Gain Pattern @ 5700 MHz (unit: dBi)



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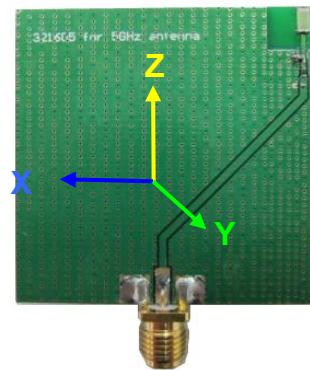
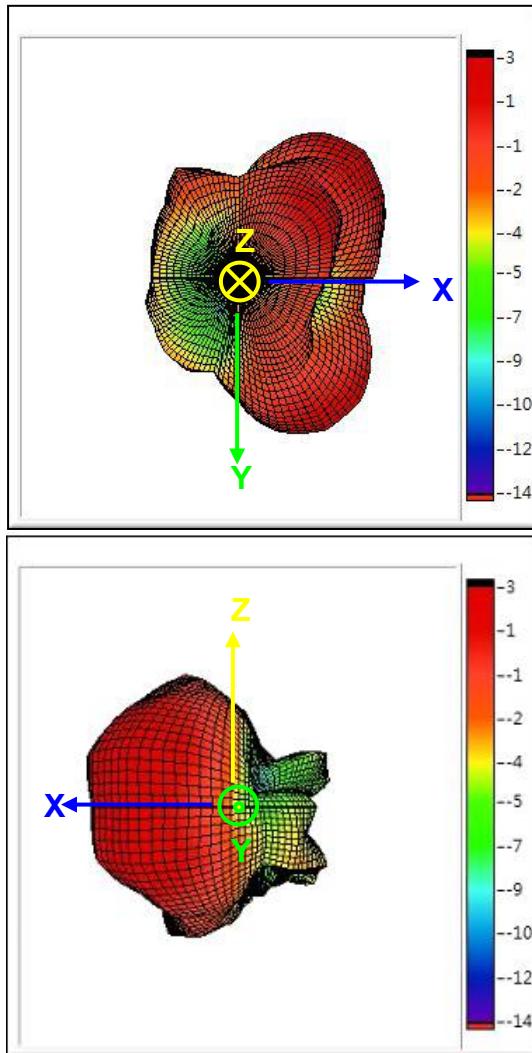
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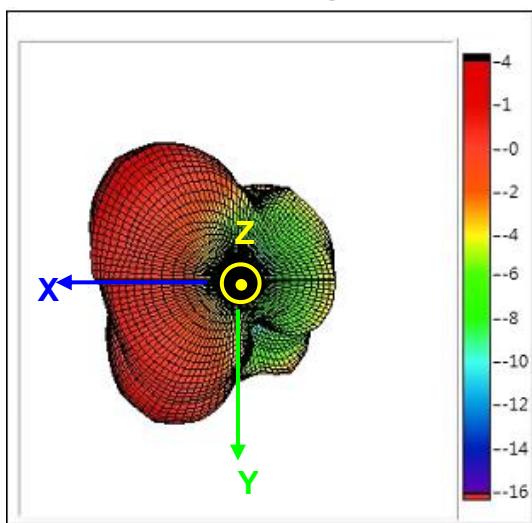
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7-4. 3D Gain Pattern @ 5850 MHz (unit: dBi)



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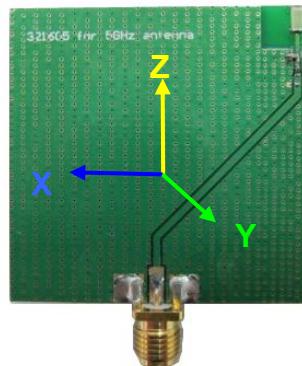
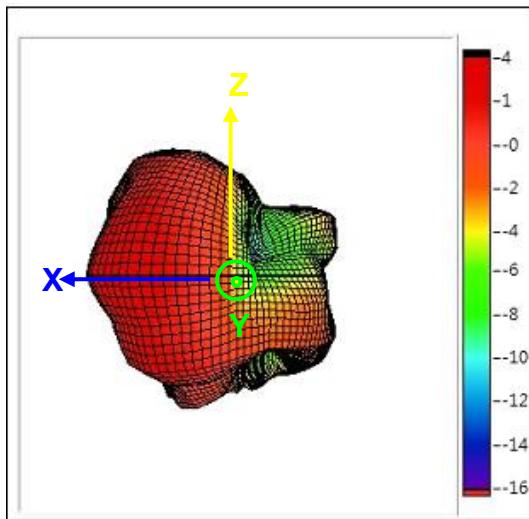
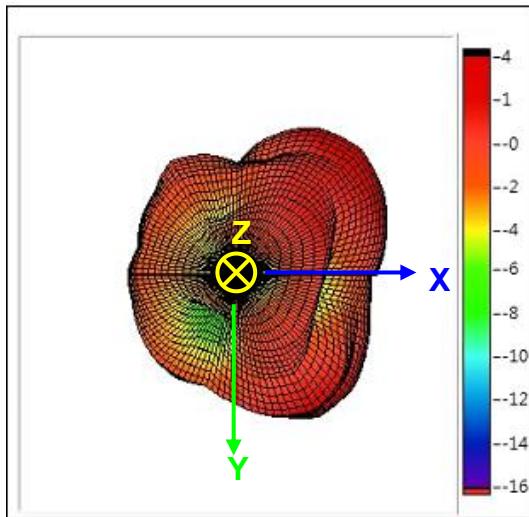
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### 7-5. 3D Efficiency Table

Frequency(MHz)	5000	5050	5100	5150	5200	5250	5300	5350	5400	5450
Efficiency(dB)	-1.8	-1.9	-1.8	-1.8	-1.0	-1.5	-1.8	-1.7	-1.6	-1.4
Efficiency(%)	66.8	64.9	65.8	66.5	78.9	70.2	65.6	67.9	69.7	72.3
Peak Gain(dBi)	2.7	2.2	2.0	2.8	3.2	2.6	2.3	2.5	2.8	3.5

Frequency(MHz)	5500	5550	5600	5650	5700	5750	5800	5850	5900
Efficiency(dB)	-1.0	-1.0	-1.4	-1.8	-1.8	-1.4	-1.3	-1.6	-2.5
Efficiency(%)	80.0	80.0	72.4	65.5	65.6	72.1	74.5	70.0	55.9



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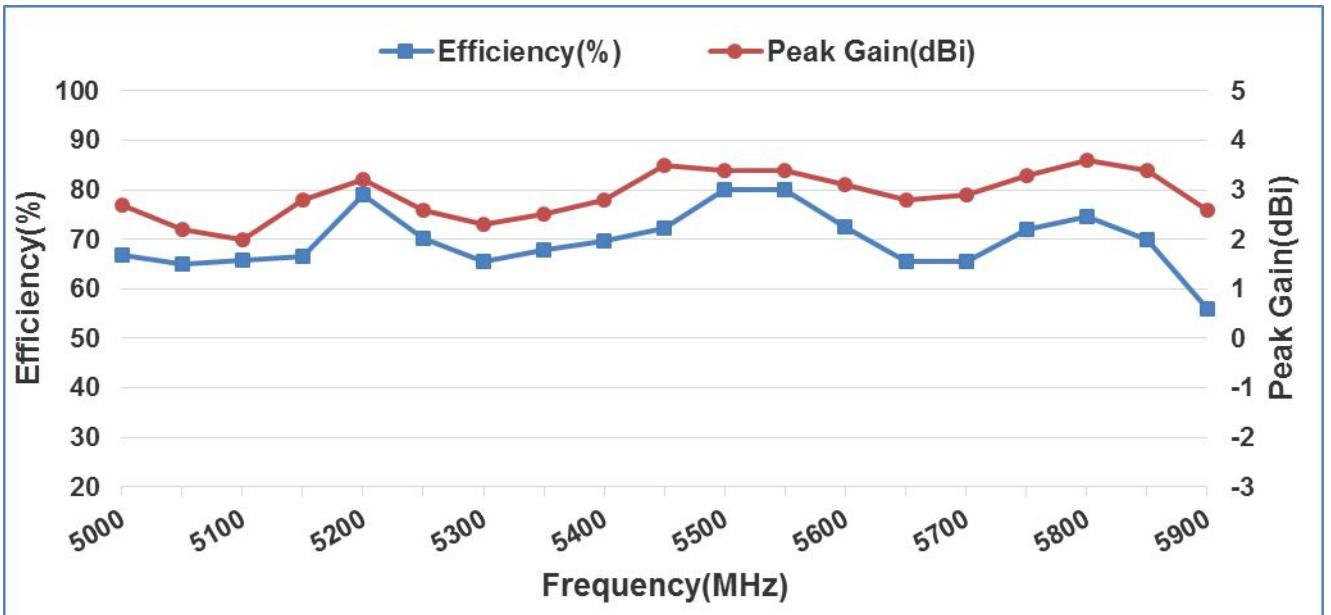
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Peak Gain(dBi)	3.4	3.4	3.1	2.8	2.9	3.3	3.6	3.4	2.6
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## 7-6. 3D Efficiency vs. Frequency



## 8. Frequency tuning and Matching circuit

### 8-1. Chip antenna tuning scenario :



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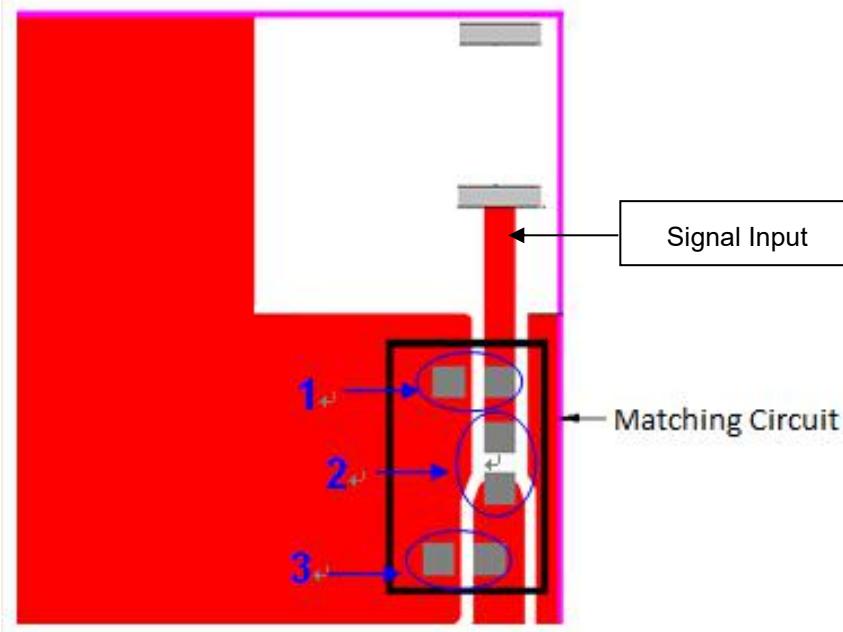
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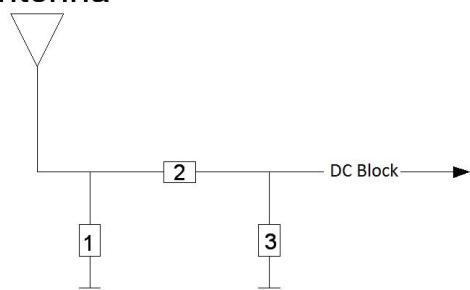
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## 8-2. Matching circuit:

With the following recommended values of matching and tuning components, the center frequencies will be about 5550 MHz at our standard 40x40 mm<sup>2</sup> evaluation board. However, these are typical reference values which may need to be changed when circuit boards or part vendors are different.

### Antenna



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	0.3pF, (0402)	DARFON	±0.05 pF
2	4.7pF, (0402)	DARFON	±0.1 pF
3	0.47pF, (0402)	DARFON	±0.05 pF

## 9. Soldering Conditions

### 9-1. Typical Soldering Profile for Lead-free Process



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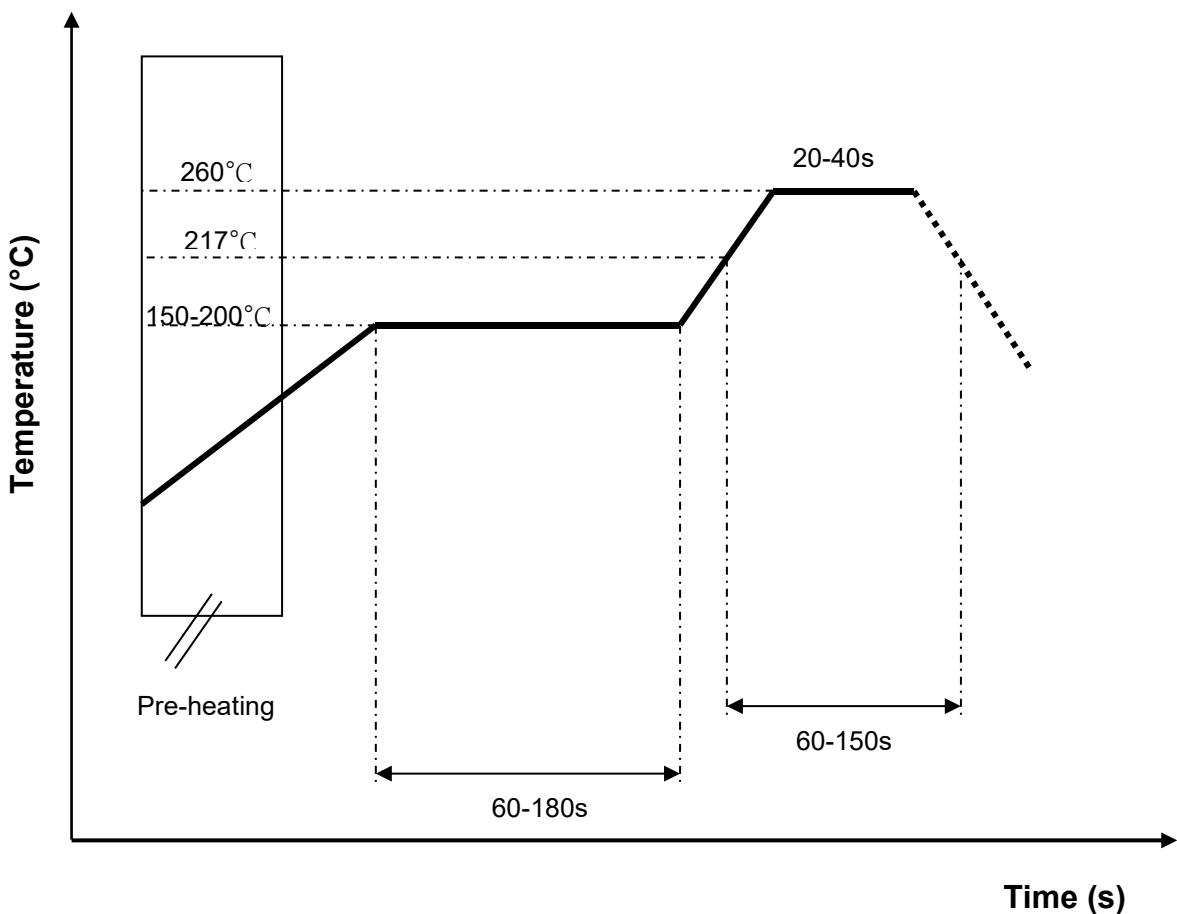
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## 10. Reminders for users of Unictron's AA106 ceramic chip antennas

- 10-1. This chip antenna is made of ceramic materials which are relatively more rigid and brittle compared to printed circuit board materials. Bending of circuit board at the locations where chip antenna is mounted may cause the cracking of solder joints or antenna itself.
- 10-2. Punching/cutting of the break-off tab of PCB panel may cause severe bending of the circuit board which may result in cracking of solder joints or chip antenna itself. Therefore break-off tab shall be located away from the installation site of chip antenna.
- 10-3. Be cautious when ultrasonic welding process needs to be used near the locations where chip antennas are installed. Strong ultrasonic vibration may cause the cracking of chip antenna solder joints.

## 11. Packing



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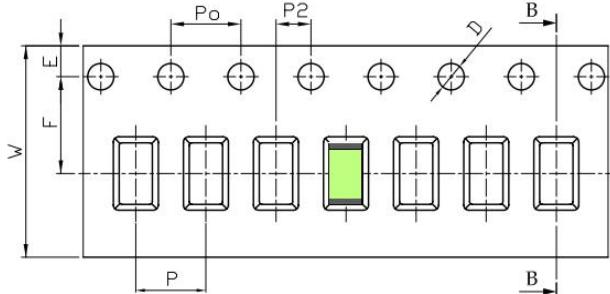
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			<b>C</b>

(1) Quantity/Reel: 5000 pcs/Reel

(2) Plastic tape:



Feature	Specifications	Tolerances
W	12.00	$\pm 0.30$
P	4.00	$\pm 0.10$
E	1.75	$\pm 0.10$
F	5.50	$\pm 0.10$
P2	2.00	$\pm 0.10$
D	1.50	$+0.10$ $-0.00$
Po	4.00	$\pm 0.10$
10Po	40.00	$\pm 0.20$

## 12. Operating & Storage Conditions

### 12-1. Operating

(1) Maximum Input Power: 2 W

(2) Operating Temperature: -40°C to 85°C

### 12-2. Storage

(1) Storage Temperature: -5°C to 40°C

(2) Relative Humidity: 20% to 70%

(3) Shelf Life: 1 year

## 13. Notice

(1) Installation Guide:

Please refer to Unictron's application note "General guidelines for the installation of Unictron's chip antennas" for further information.

(2) All specifications are subject to change without notice.



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