

# 3.2 x 1.6 x 1.6 (mm) WiFi Dual Band Chip Antenna (CU325)

## Engineering Specification

### 1. Product Number

H 2 U 8 6 D 1 K 1 P 0 1 0 0



### 2. Features

- \*Stable and reliable performances in both 2.4 and 5 GHz bands
- \*Low profile and compact size
- \*RoHS compliance
- \*SMT processes compatible

### 3. Applications

- \*Wi-Fi CERTIFIED ac applications
- \*Wireless communication devices when IEEE802.11 a/b/g/n/ac functions are needed.
- \*IoT applications

### 4. Description

Unictron's CU325 chip antenna is designed for Wi-Fi CERTIFIED ac applications, covering both 2400~2500 MHz & 5150~5850 MHz frequency bands. Fabricated with proprietary design and processes, CU325 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 : Jane

Designed by : Allen

Checked by : Mike

Approved by : Herbert

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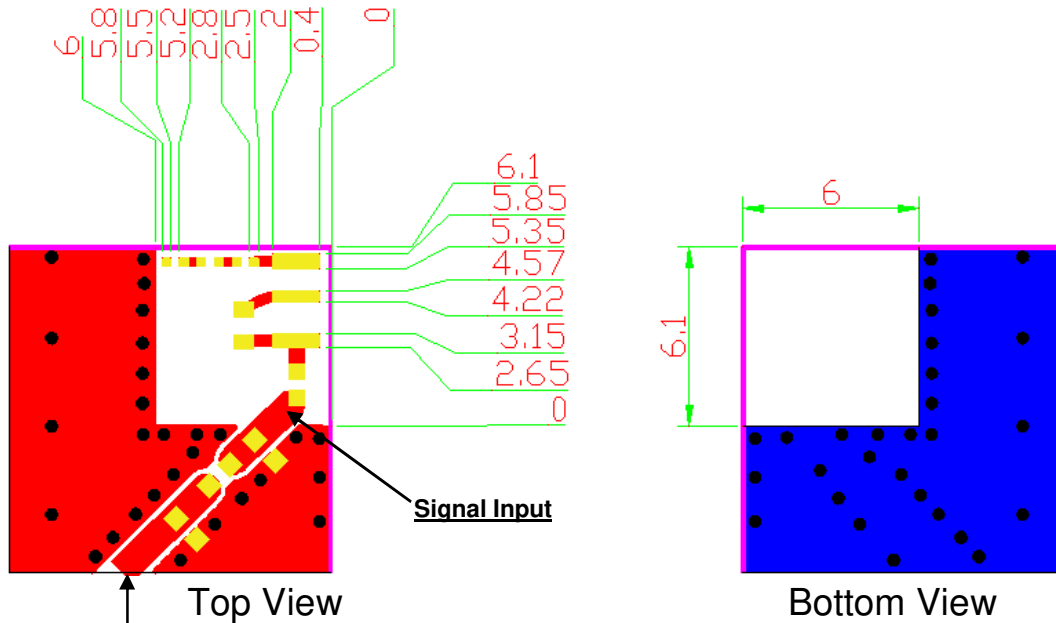
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## 5. Layout Guide & Electrical Specifications

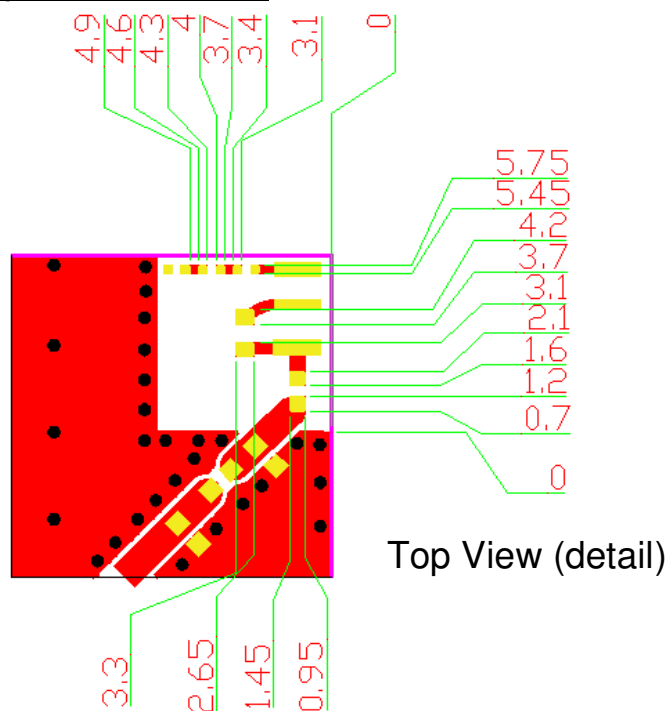
### 5-1. Layout Guide (unit : mm)

Solder Land Pattern:

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



Transmission Line with 50Ω Impedance Characteristic



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

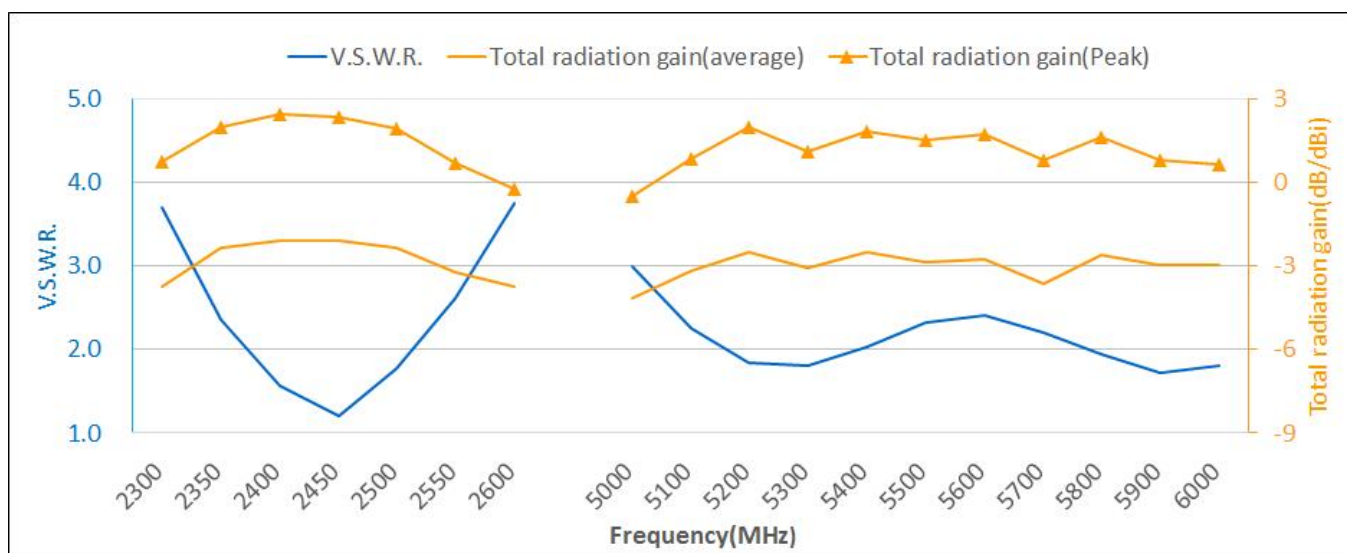
### 5-2-1. Electrical Table

Characteristics	Specifications	
Outline Dimension (mm)	3.2 x 1.6 x 1.6	
Working Frequency (MHz)	2400 ~ 2500	5150 ~ 5850
Peak Gain (dBi) (typical)**	2.4	1.8
Radiation Efficiency (%) (typical)**	61	56
VSWR (@ center frequency)*	< 2 : 1	< 2.5 : 1
Characteristic Impedance (Ω)	50	
Polarization	Linear Polarization	

\*Center frequency means the frequency with the lowest value in return loss of the chip antenna on the evaluation board.

\*\*A typical value is for reference only, not guaranteed.

### 5-2-3. Frequency vs. V.S.W.R. and Total Radiation Gain



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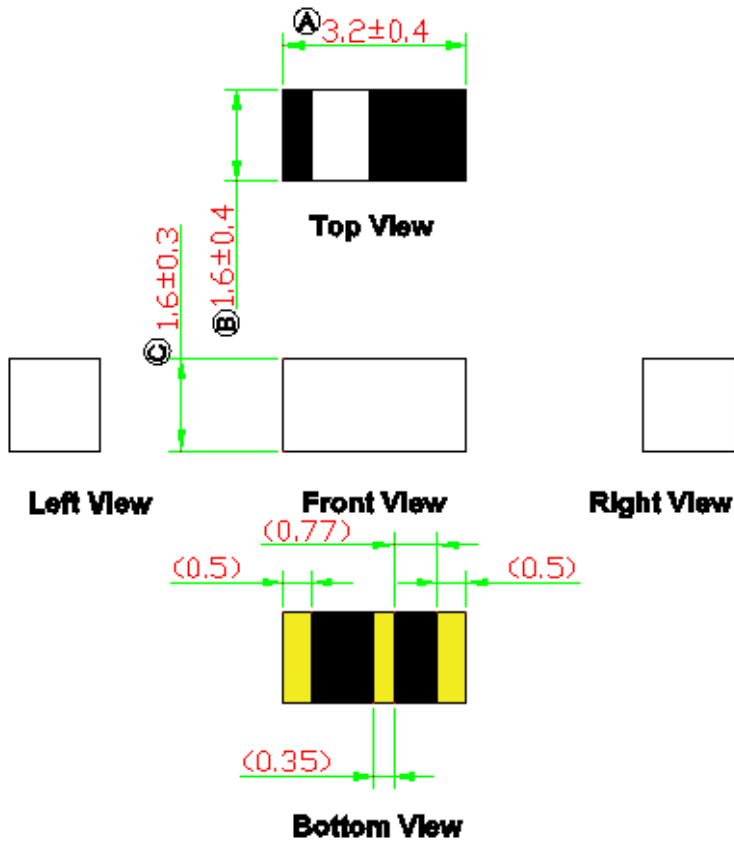
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## 6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

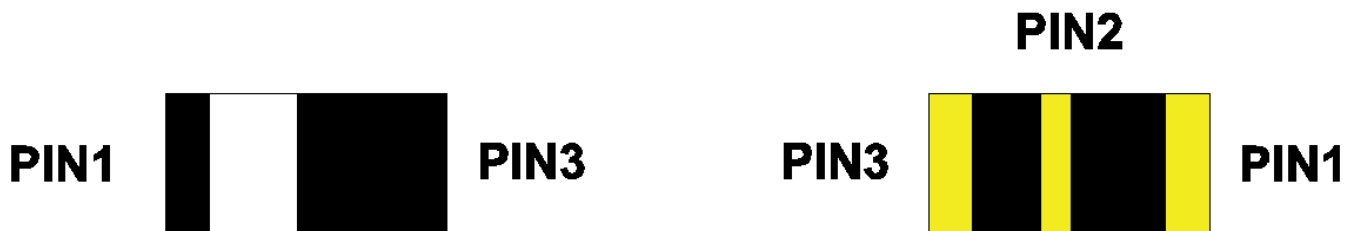
### 6-1. Antenna Dimensions



**NOTE:**

1. All materials are RoHS compliant.
2. "A~C" Critical Dimensions.
3. "( )" Reference Dimensions.

### PIN Definition



PIN	1	2	3
Soldering PAD	Signal	Tuning	Tuning



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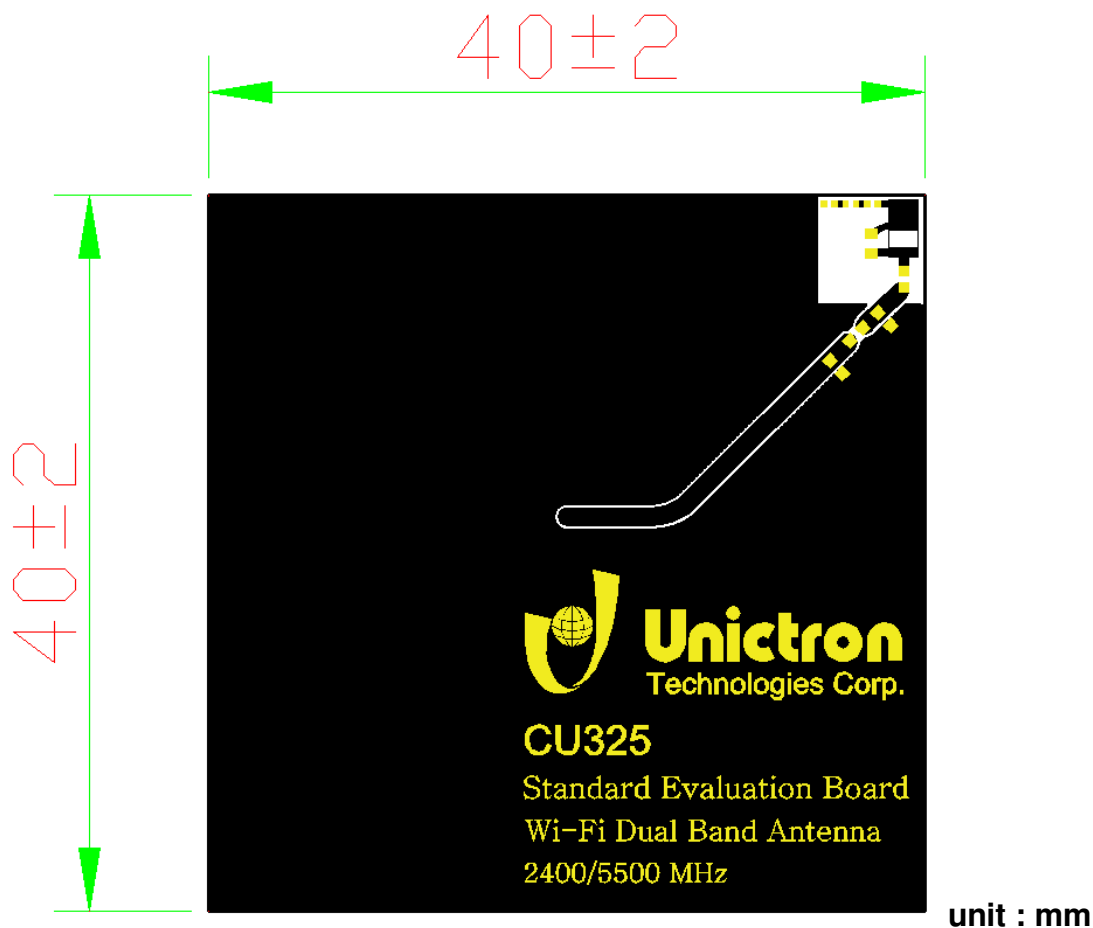
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6-2. Evaluation Board with Antenna



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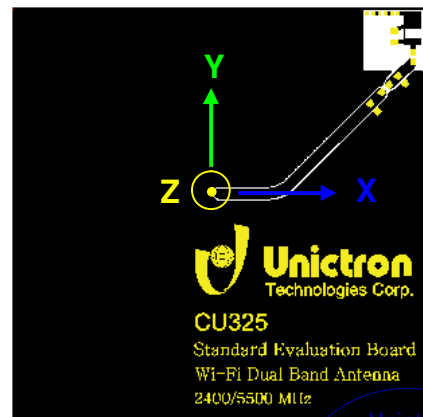
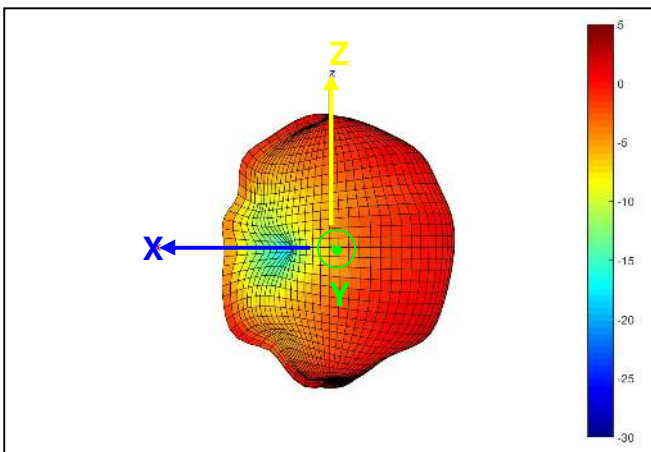
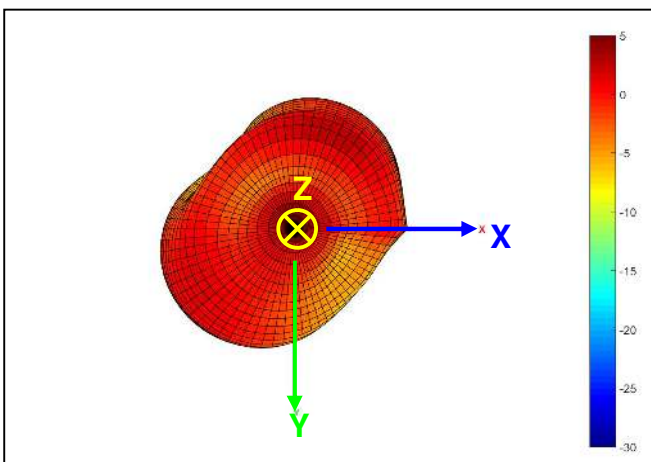
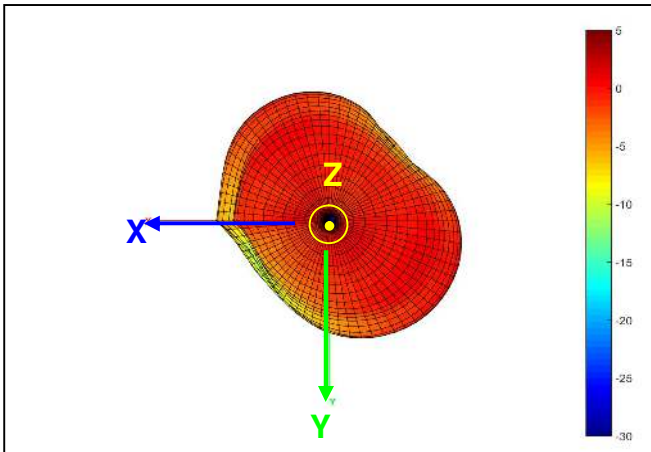
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## 7. 3D Radiation Gain Pattern (with 40 x 40 mm<sup>2</sup> Evaluation Board)

### 7-1. 2400~2500 MHz Band

#### 7-1-1. 3D Radiation Gain Pattern @ 2450 MHz (unit: dBi)



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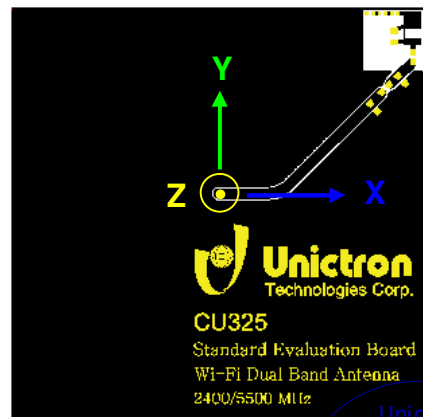
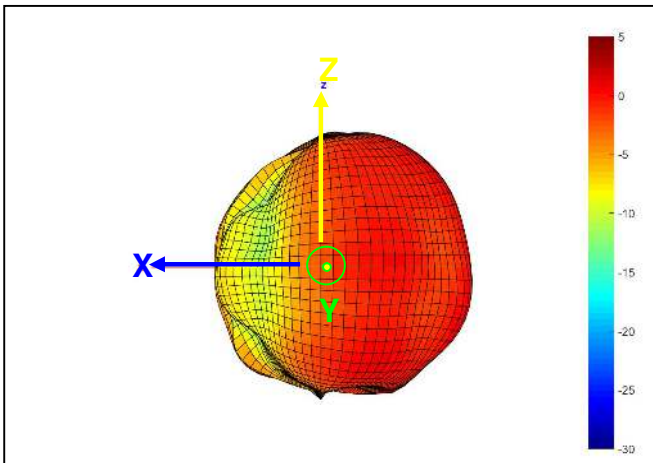
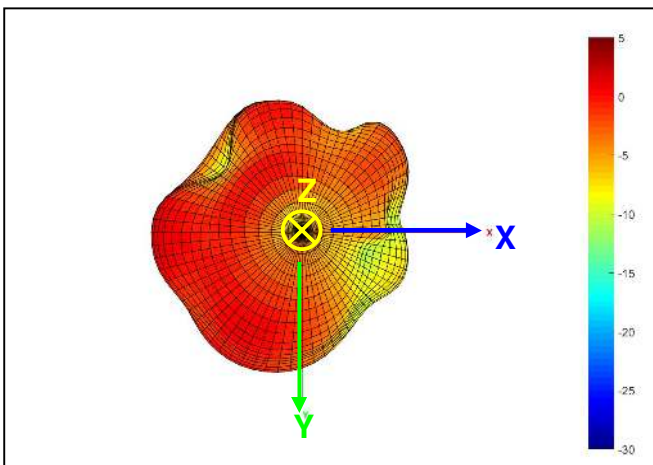
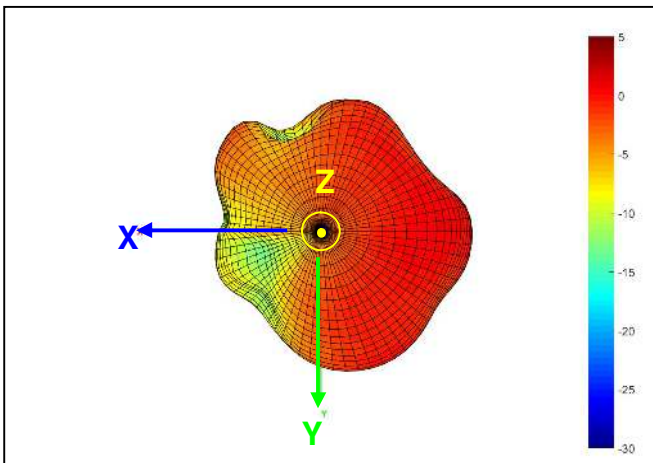
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## 7-2. 5150~5850 MHz Band

### 7-2-1. 3D Radiation Gain Pattern @ 5150 MHz (unit: dBi)



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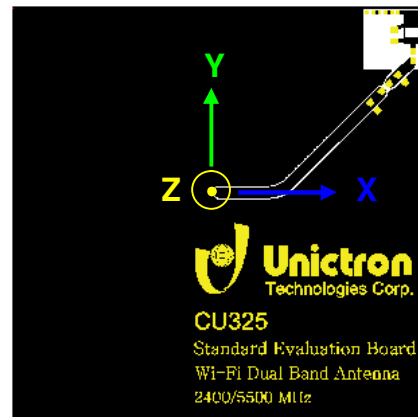
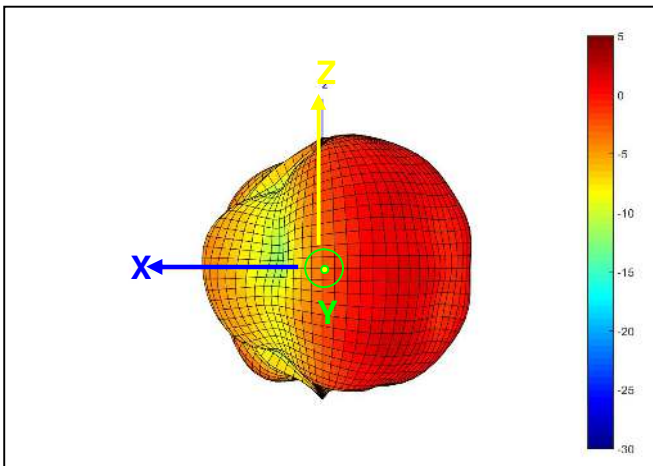
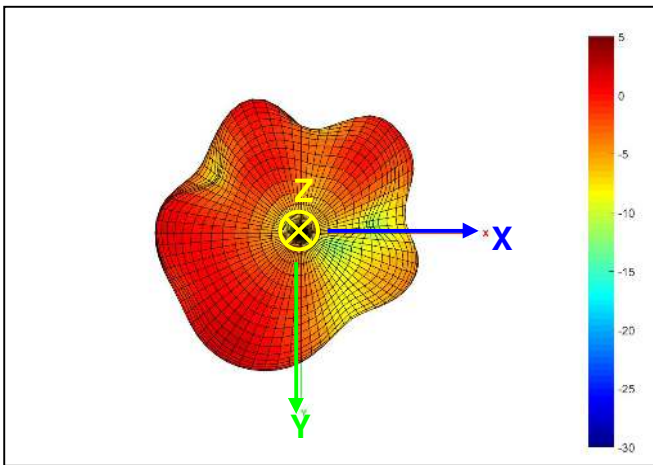
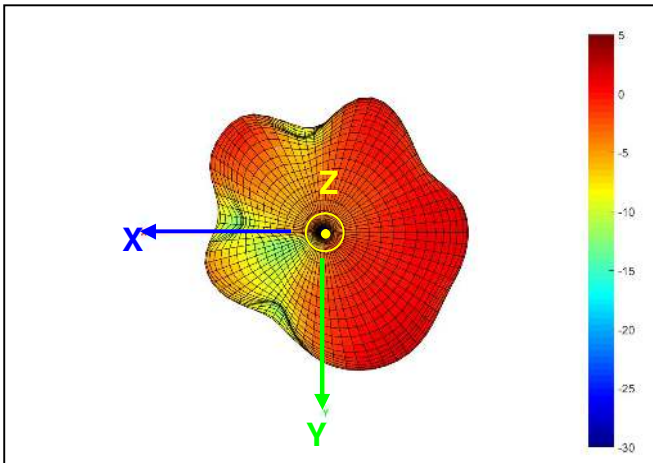
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7-2-2. 3D Radiation Gain Pattern @ 5550 MHz (unit: dBi)



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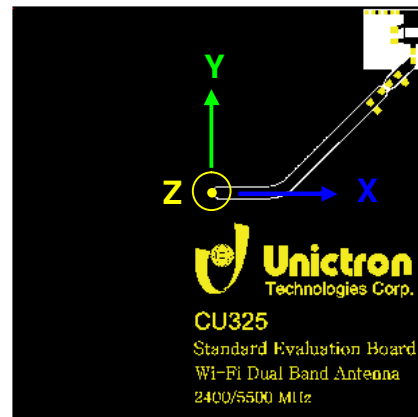
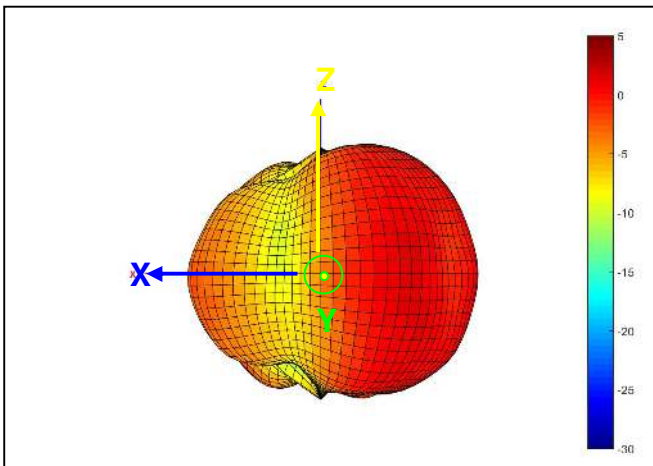
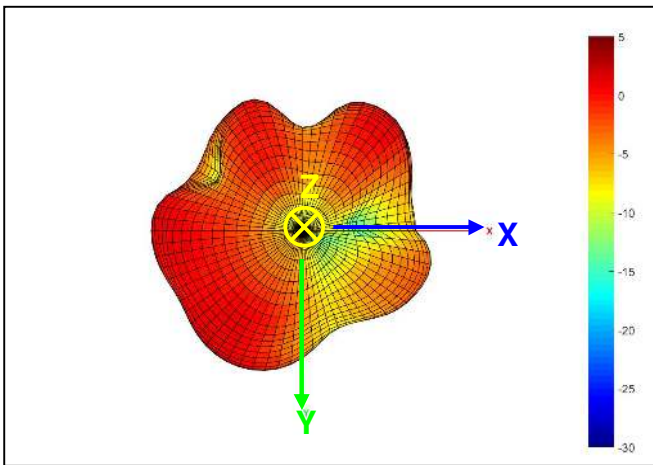
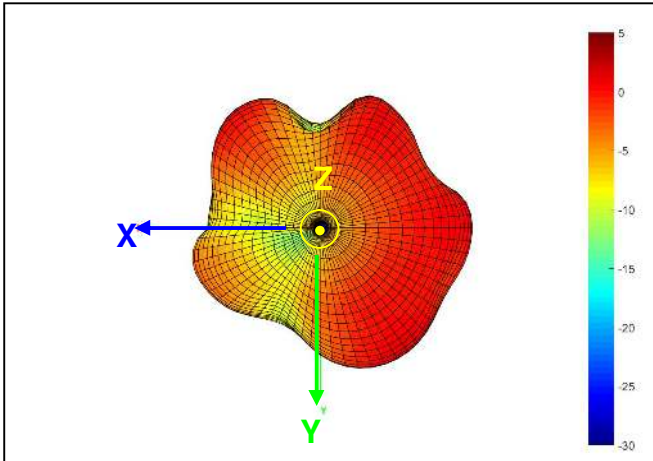
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7-2-3. 3D Radiation Gain Pattern @ 5850 MHz (unit: dBi)



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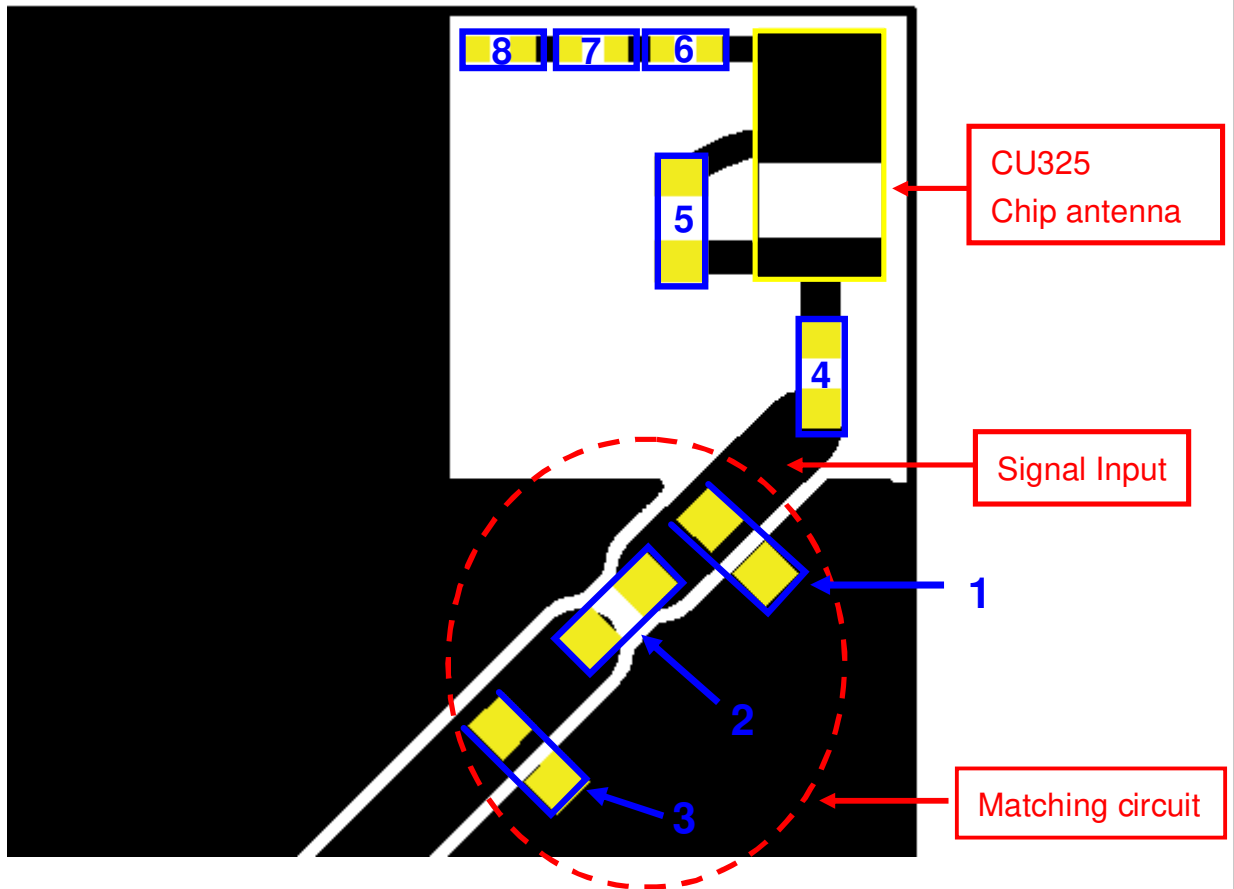
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## 8. Frequency tuning and Matching circuit

8-1. Chip antenna tuning scenario :



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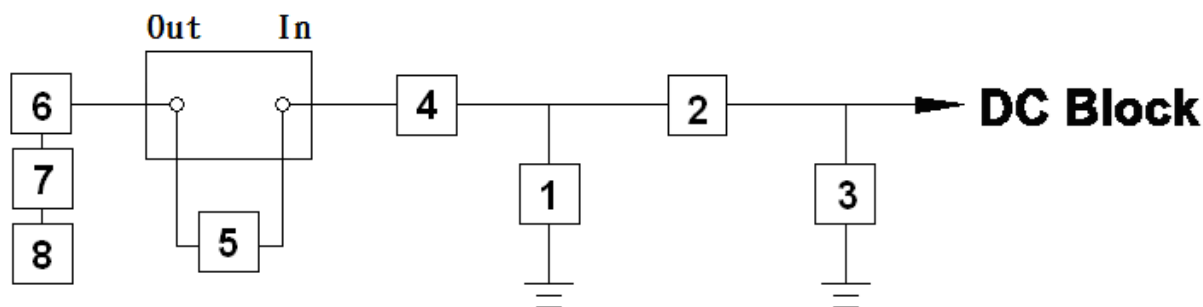
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## 8-2. Matching circuit :

With the following recommended values of matching and tuning components, the center frequencies will be about 2442 MHz in low band & 5500 MHz in high band at our standard 40x40 mm<sup>2</sup> 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	Tolerance
1	0.3 pF, (0402)	MURATA	±0.05 pF
2	15 pF, (0402)	MURATA	±5%
3	2.2 nH, (0402)	MURATA	±0.1nH
4 Fine tuning element	1.5 nH, (0402)	MURATA	±0.1nH
*5 Fine tuning element	7.5 nH, (0402)	MURATA	±2%
6 Fine tuning element	0 Ω, (0201)	-	-
7 Fine tuning element	N/C	-	-
8 Fine tuning element	N/C	-	-

\*For fine tuning element 5, we highly recommend using Murata LQG15WZ\_G02# series inductor which has 2% tolerance in inductance and high Q factor. In general, the inductance of this inductor that can be used for fine tuning element 5 is 5nH ~ 10nH in most circumstances.



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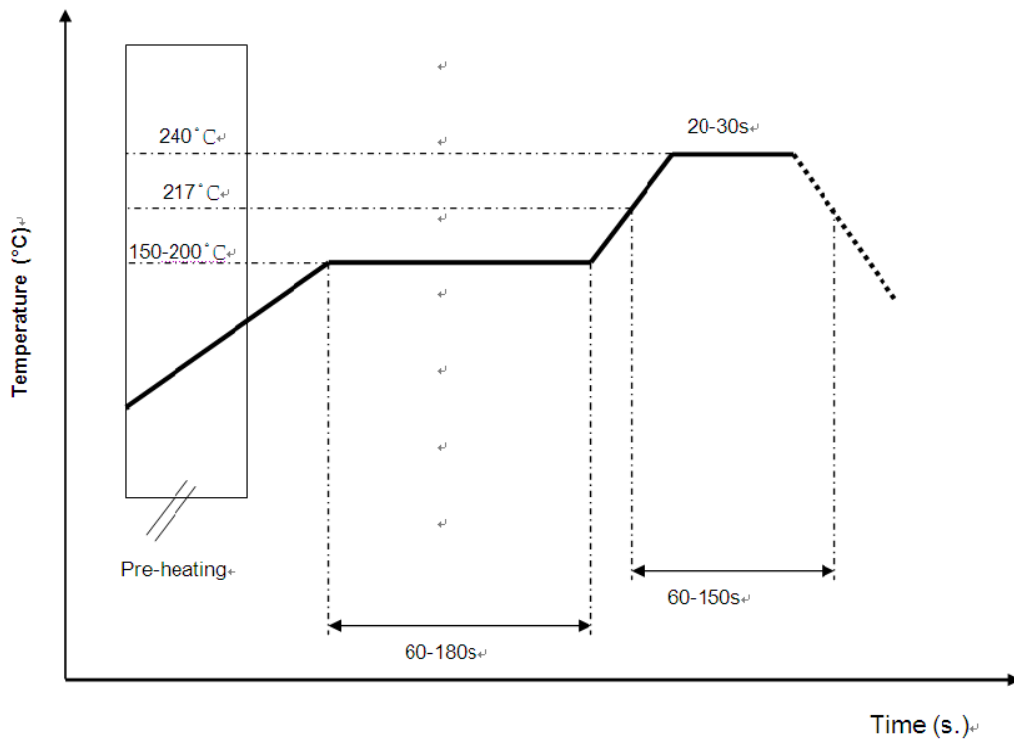
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## 9. Soldering Conditions

Typical Soldering Profile for Lead-free Process



\*Recommended solder paste alloy: SAC305 (Sn96.5 /Ag3 /Cu0.5) Lead Free solder paste.



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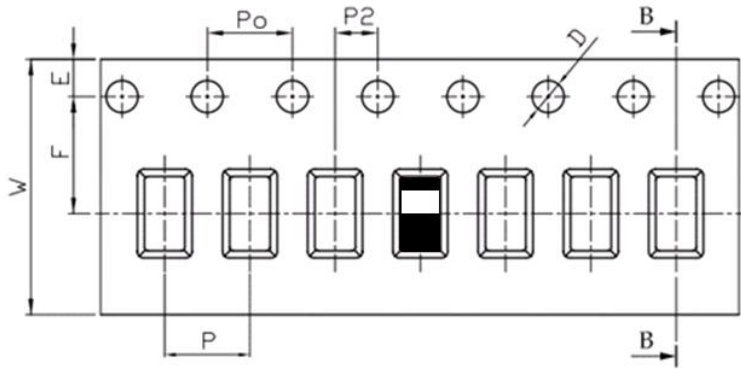
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## 10. Packing

- (1) Quantity/Reel: 2000pcs/Reel
- (2) Plastic tape: Black conductive polystyrene

a. Tape Drawing



b. Tape Dimensions (unit: mm)

Feature	Specifications	Tolerances
W	12.00	±0.30
P	4.00	±0.10
E	1.75	±0.10
F	5.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 -0.00
P0	4.00	±0.10
10P0	40.00	±0.20

## 11. Operating & Storage Conditions

### 11-1. Operating

- (1) Maximum Input Power: 2 W
- (2) Operating Temperature: -40°C to 85°C
- (3) Relative Humidity: 10% to 70%

### 11-2. Storage (sealed)

- (1) Storage Temperature: -5°C to 40°C
- (2) Relative Humidity: 20% to 70%
- (3) Shelf Life: 1 year

### 11-3. Storage (unsealed)

Meet the criteria of J-STD-033 MSL2a

### 11-4. Storage (After mounted on customer's PCB with SMT process)

- (1) Storage Temperature: -40°C to 85°C
- (2) Relative Humidity: 10% to 70%



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## 12. 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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