

40.0 x 7.0 x 3.0 (mm) LTE Full Band Chip PCB Substrate Antenna(EVB+CC40D7J) Engineering Specification

1. Product Number

H 2 B 1 M H 4 A 2 F 0 1 0 0



2. Features

- * Compatible with LTE full-band/ 3G/ 2G
- * Stable and reliable in performances
- * Compact size
- * RoHS2.0 compliance
- * SMT processes compatible

3. Applications

- * LTE full-band/ 3G/ 2G.
- * LTE / GSM / CDMA /DCS /PCS / WCDMA / UMTS / HSDPA / GPRS / EDGE /IMT.



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Prepared by : Wen

Designed by : James

Checked by : Mike

Approved by : Herbert

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4. Description

Unictron's CC40D7J ceramic chip antenna is designed for cellular 2G/ 3G/ LTE bands applications, covering frequencies 698~960 MHz & 1710~2690 MHz. Fabricated with proprietary design and processes, CC40D7J shows excellent performance and is fully compatible with SMT processes which can decrease the assembly cost and improve device's quality and consistency.

5. Layout Guide & Electrical Specifications

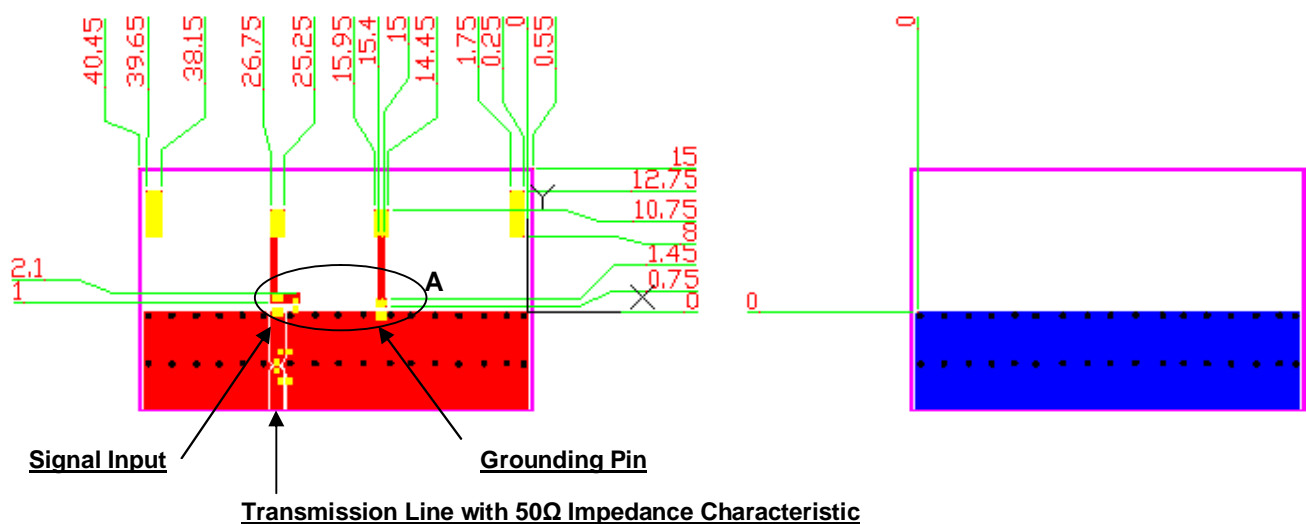
5-1. Layout Guide (Unit: mm)

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.

Top View

Bottom View



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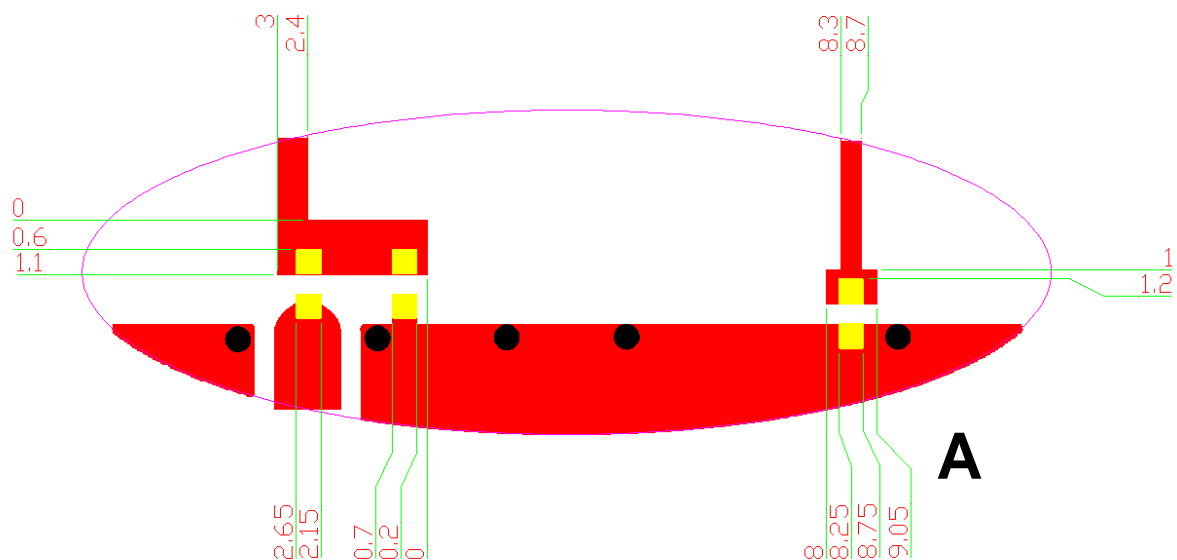
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5-2. Electrical Specifications (with 135 x 41 mm² Evaluation Board)

5-2-1. Electrical Table

Characteristics	Specifications				
Outline Dimension (mm)	40.0 x 7.0 x 3.0				
Ground Plane Dimension (mm)	119.4 x 41				
Working Frequency (MHz)	698 ~ 798	824 ~ 960	1710 ~ 2170	2300 ~ 2400	2490 ~ 2690
Peak Gain (dBi) (typical)**	2.3	2.1	6.4	6.8	5.8
Efficiency (%) (typical)**	75	67	76	77	74
VSWR (@ center frequency)*	<3.5 : 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.



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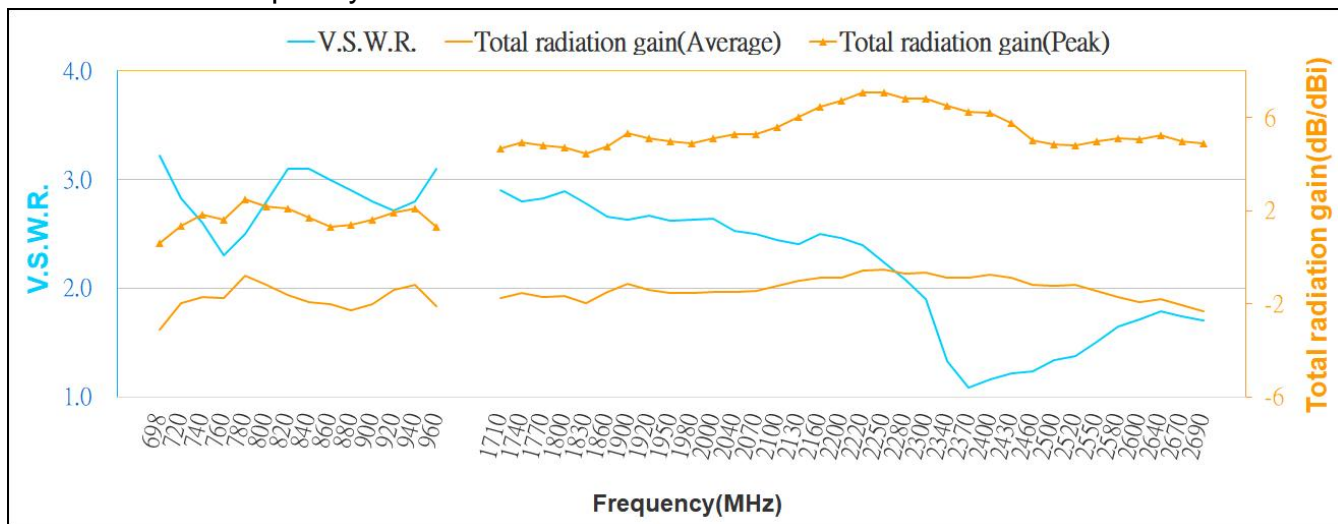
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5-2-2. Frequency vs. V.S.W.R. and Total Radiation Gain



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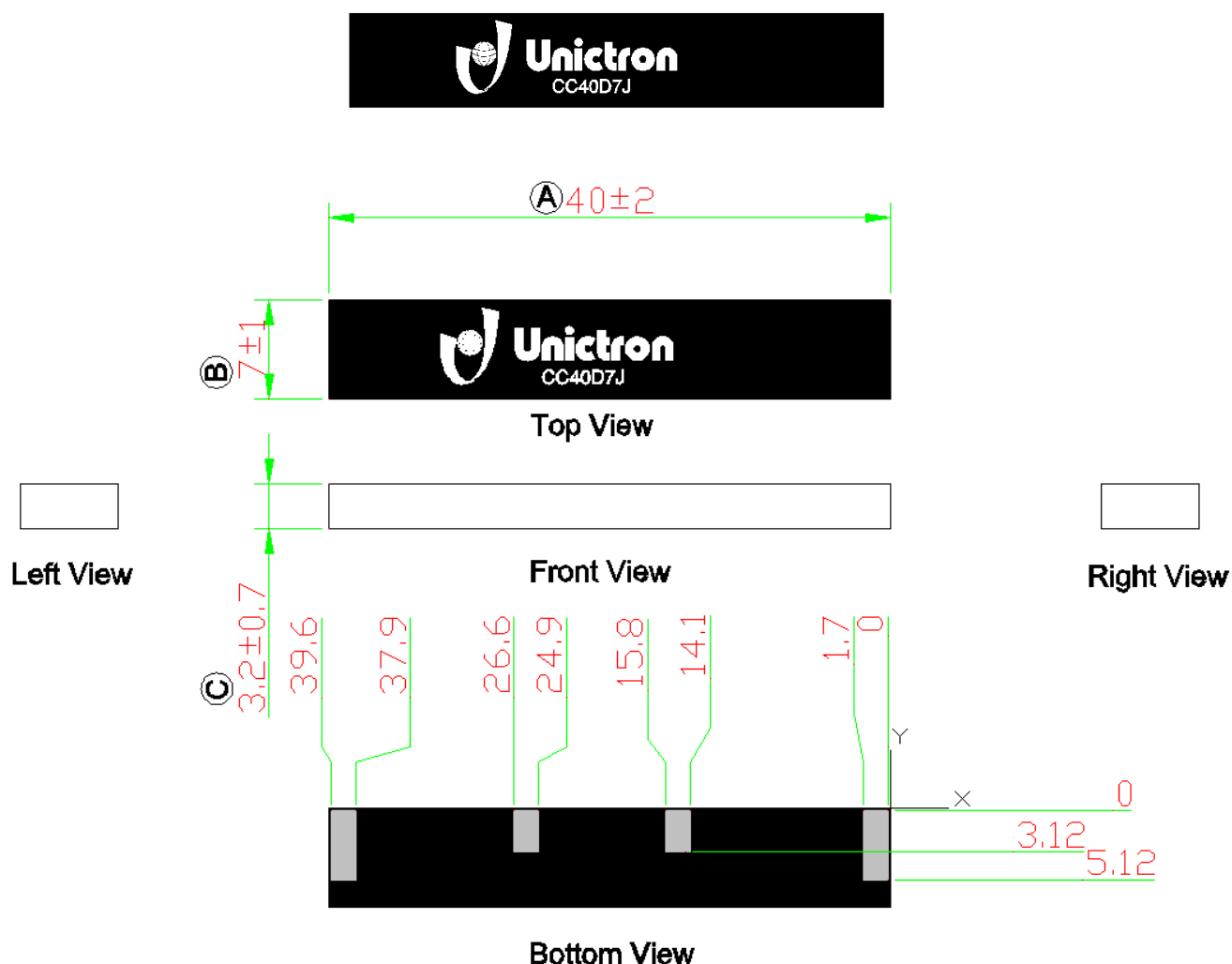
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6. Outline Dimensions of Antenna & Evaluation Board (Unit: mm)

6-1. Antenna Dimensions



NOTE:

1. All materials are RoHS 2.0 compliant.
2. "A~C" Critical Dimensions.
3. "()" Reference Dimensions.



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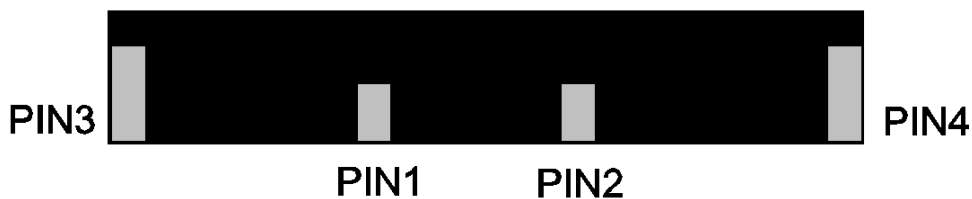
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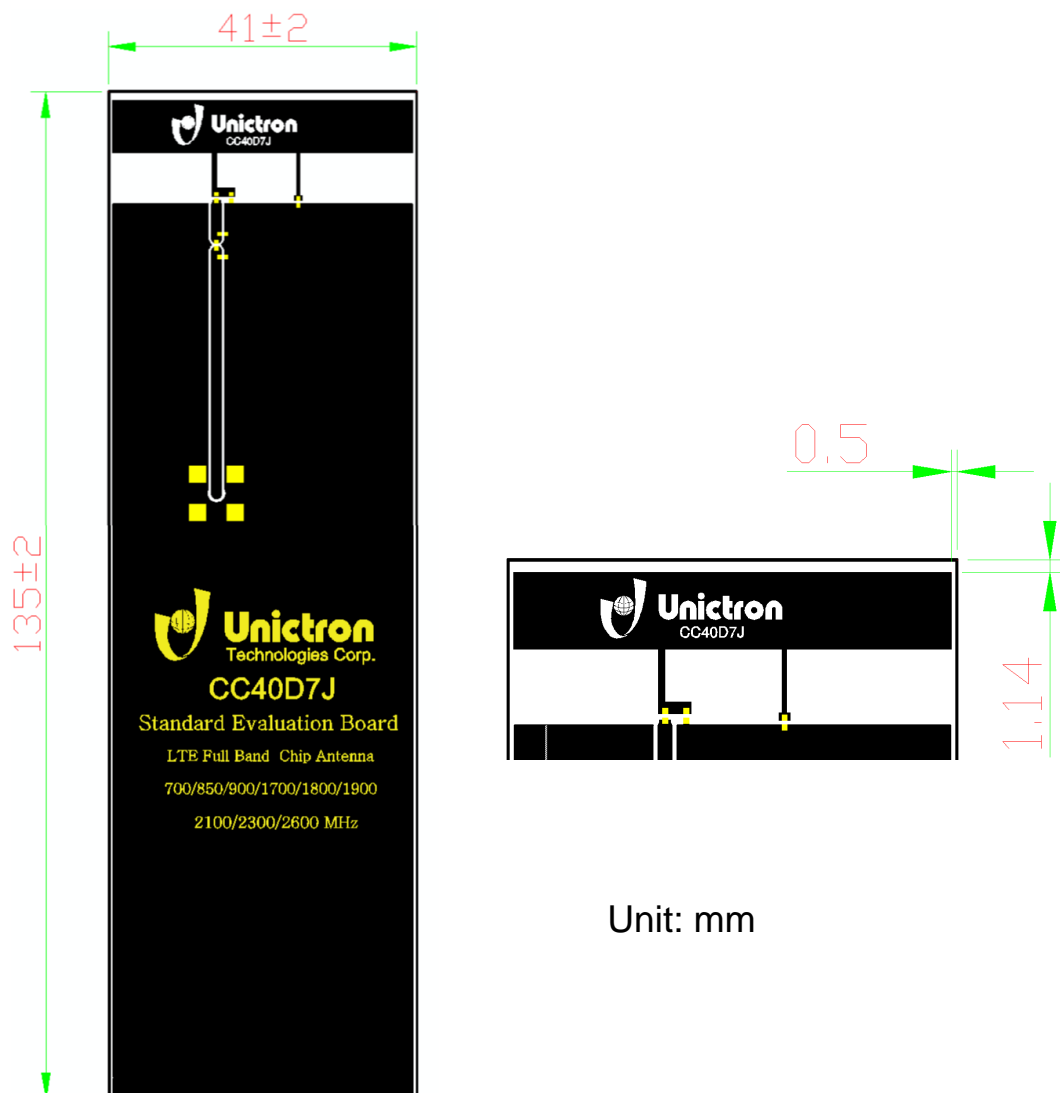
PIN Definition



Bottom View

PIN	1	2	3~4
Soldering Pad	Tuning/Ground	Signal	N/C

6-2. Evaluation Board & Antenna Location



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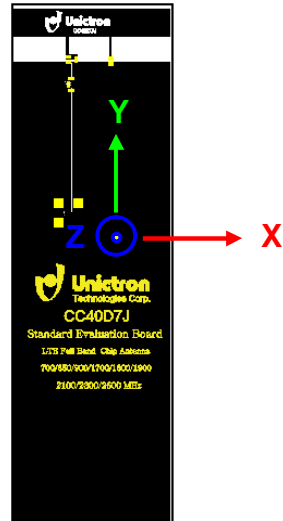
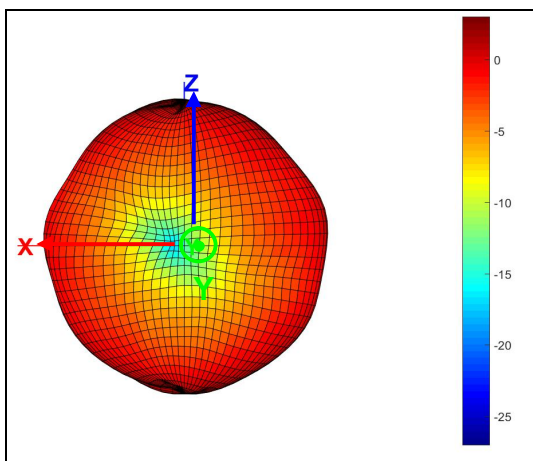
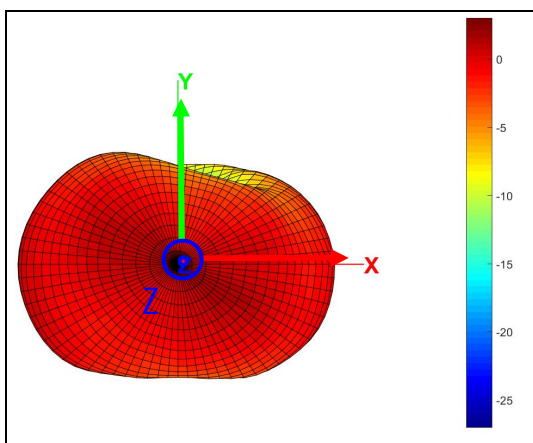
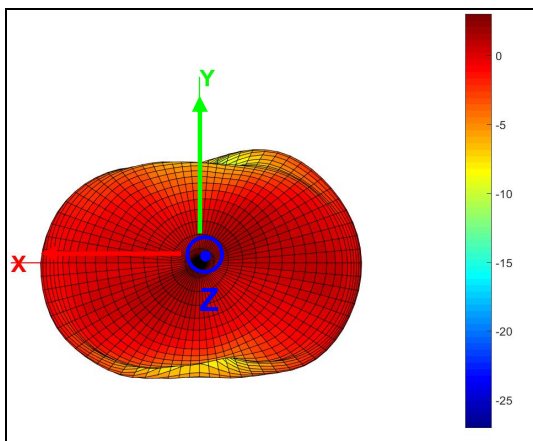
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7. 3D Radiation Gain Pattern (with 135 x 41 mm² Evaluation Board)

7-1. 698~798MHz Band

3D Radiation Gain Pattern @ 748 MHz (Unit: dBi)



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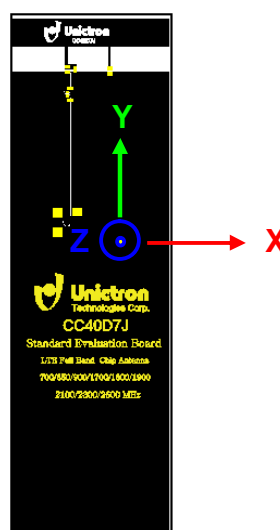
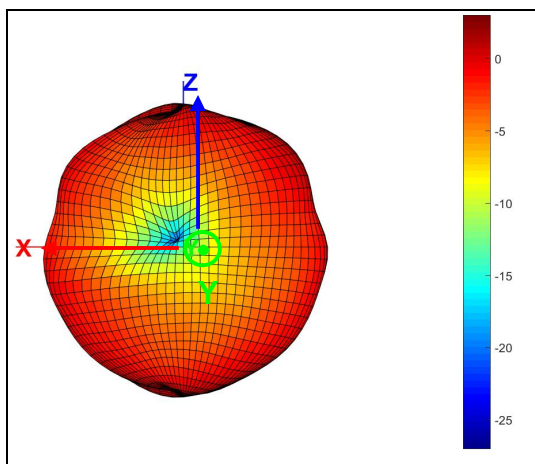
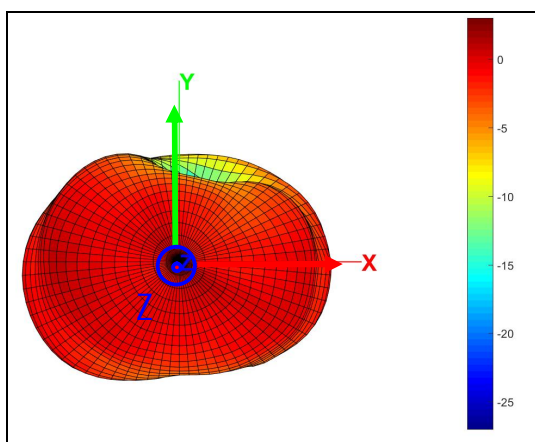
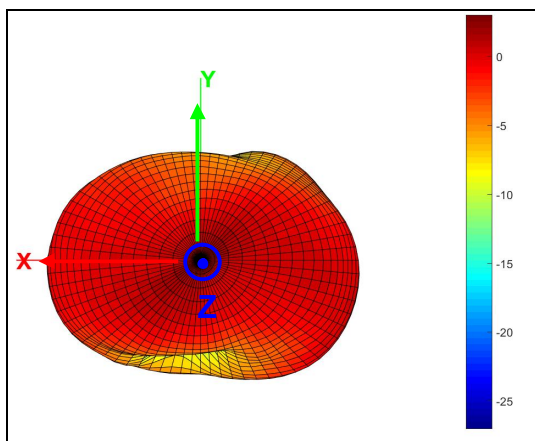
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7-2. 824~960MHz Band

3D Radiation Gain Pattern @ 890 MHz (Unit: dBi)



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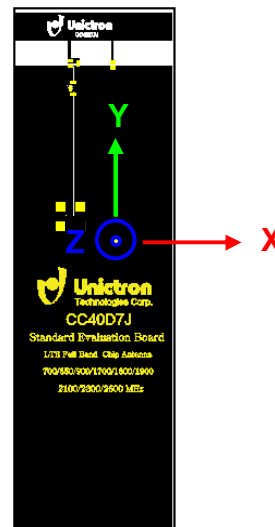
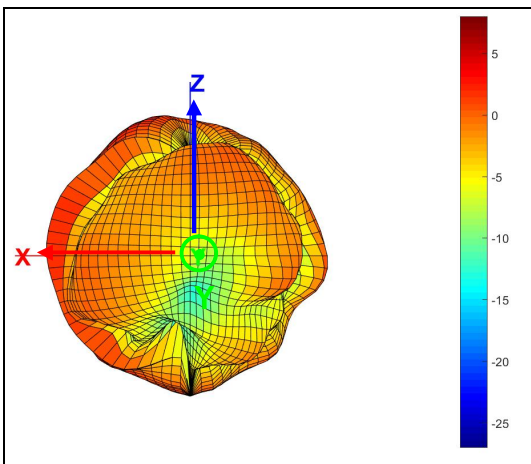
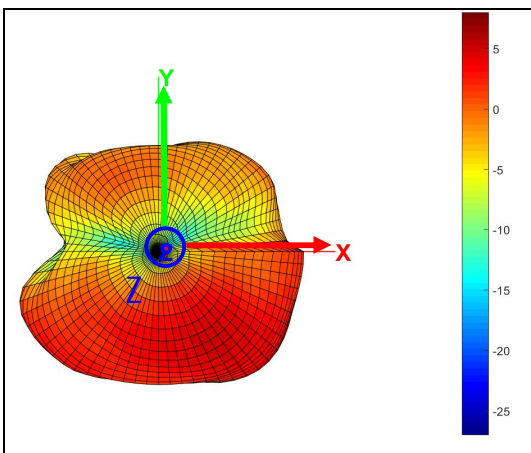
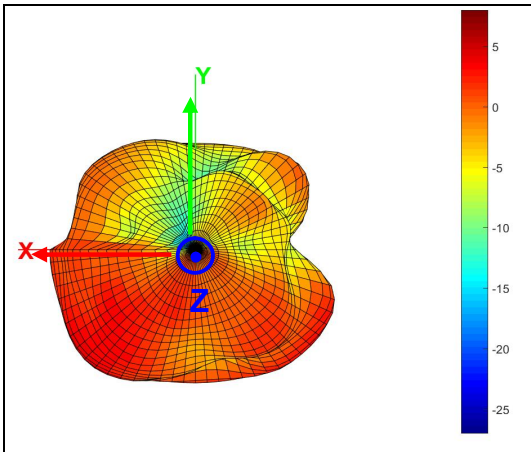
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7-3. 1710~2170MHz Band

3D Radiation Gain Pattern @ 1950 MHz (Unit: dBi)



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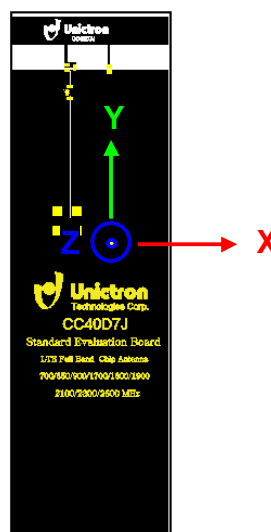
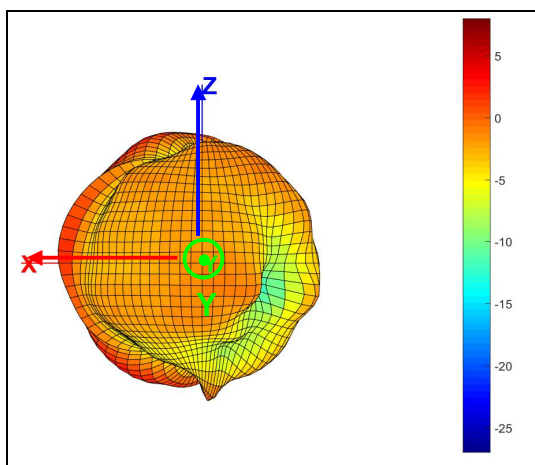
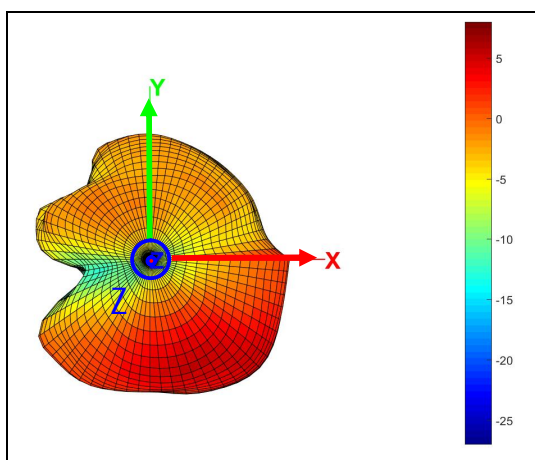
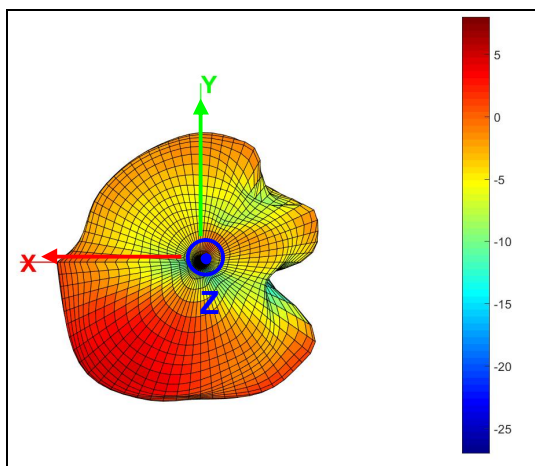
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7-4. 2300~2400MHz Band

3D Radiation Gain Pattern @ 2350 MHz (Unit: dBi)



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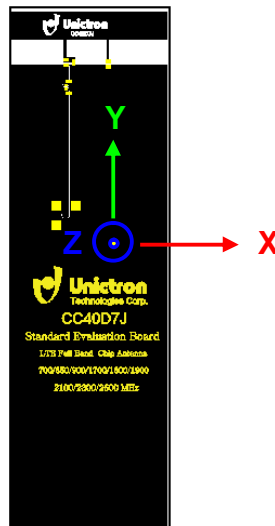
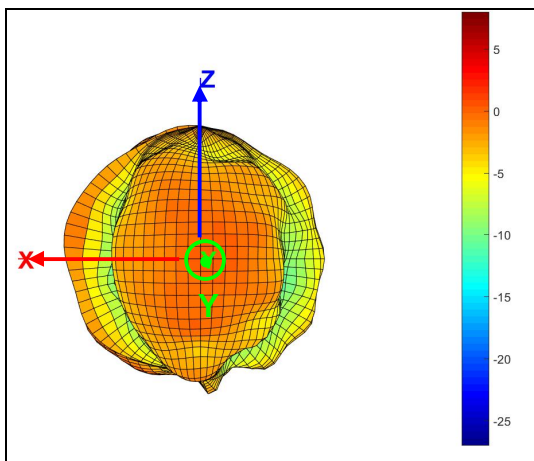
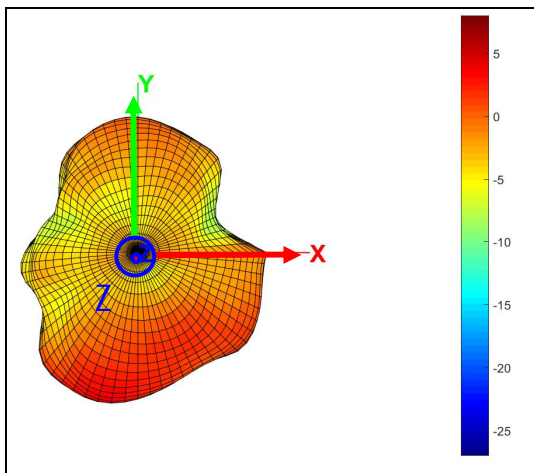
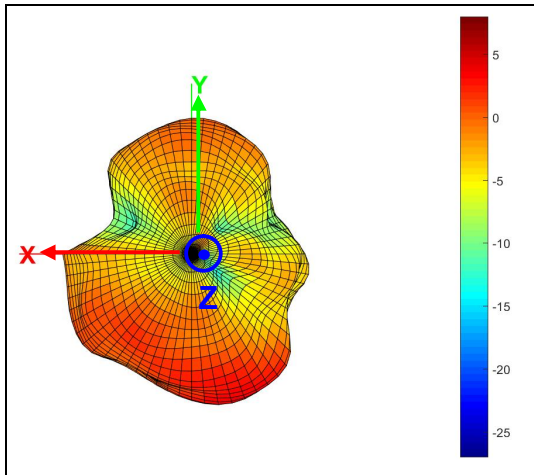
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7-5. 2490~2690MHz Band

3D Radiation Gain Pattern @ 2590 MHz (Unit: dBi)



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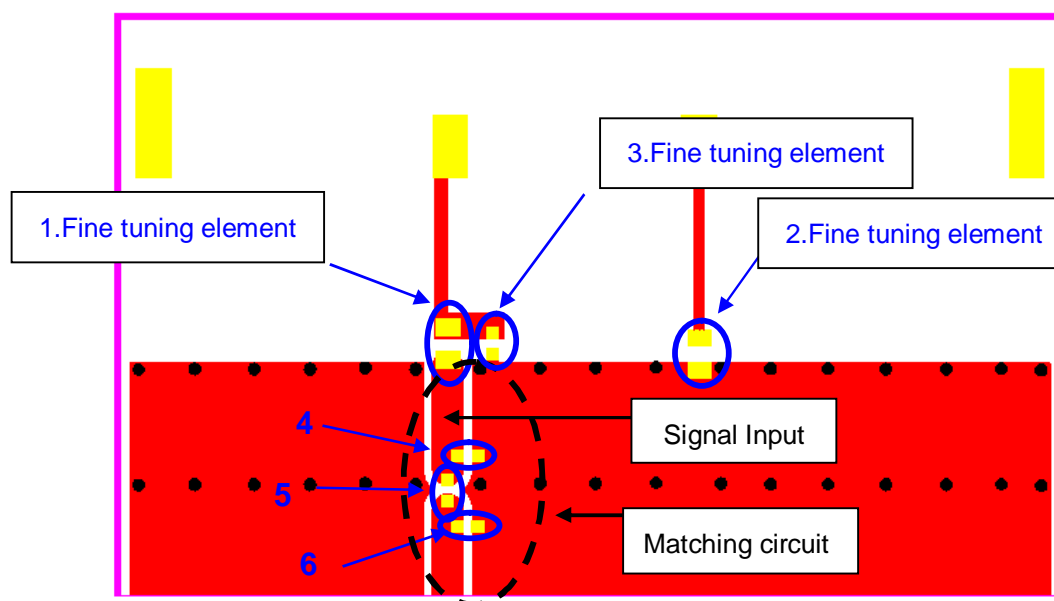
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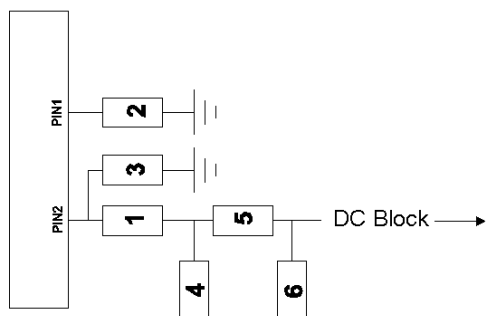
8. Frequency tuning and Matching circuit

8-1. Chip antenna tuning scenario :



8-2. Matching circuit :

With the following recommended values of matching and tuning components, the covering frequencies will be about 698~960 MHz & 1710~2690 MHz at our standard 135 x 41 mm² evaluation board. However, these are typical reference values which may need to be changed when circuit boards or part vendors are different.



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	3.9 nH, (0402)	MURATA	±0.1 nH
2	6.8 nH, (0402)	MURATA	±0.1 nH
3	0.7 pF, (0402)	MURATA	±0.05 pF
4	N/C	-	-
5	0Ω, (0402)	-	-
6	N/C		



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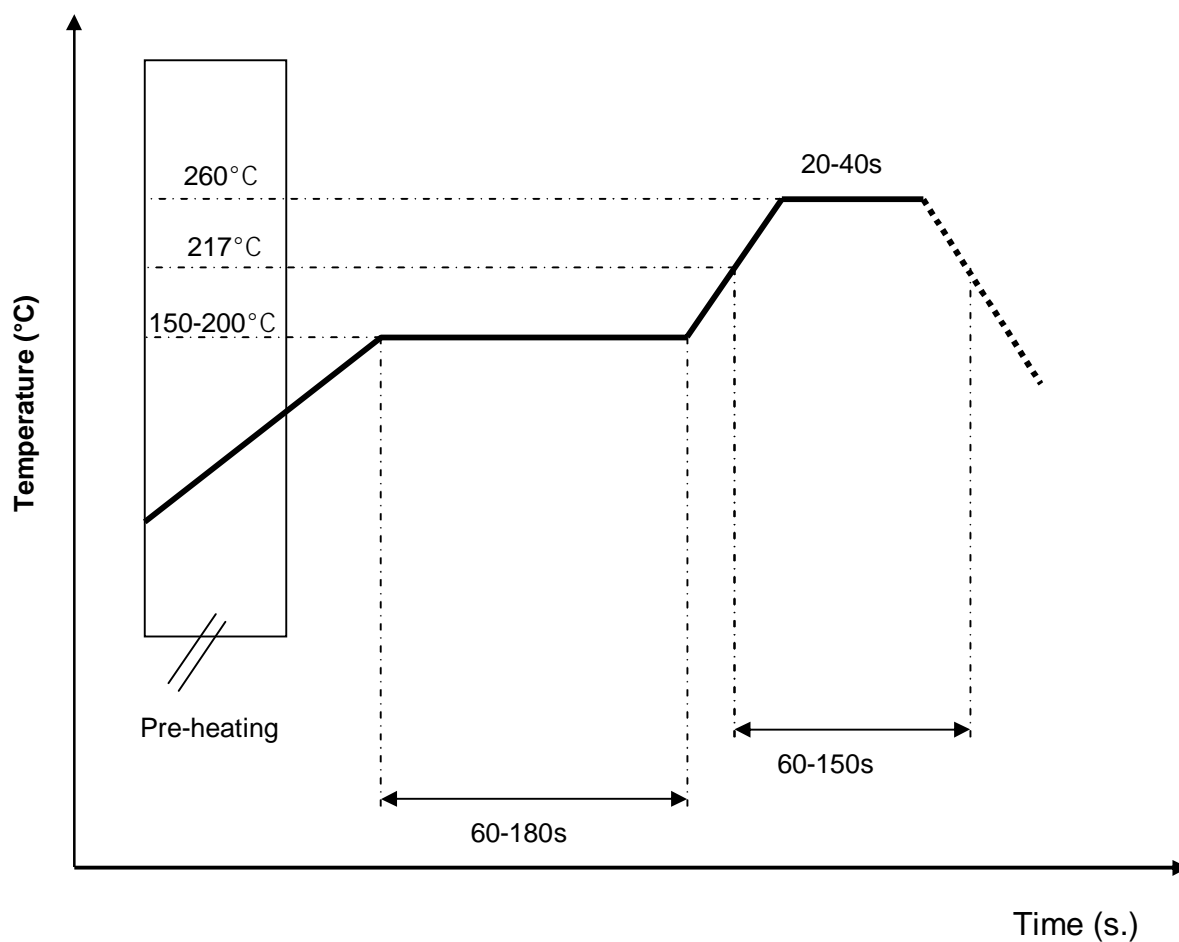
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9. Soldering Conditions

Typical Soldering Profile for Lead-free Process



*Recommended Solder Paste Alloy: SAC305(Sn 96.5/ Ag 3/ Cu 0.5) Lead Free Solder Paste



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10. Operating & Storage Conditions

10.1. Operating

- (1) Operating Temperature: -30°C to 85°C
- (2) Relative Humidity: 10% to 70%

10.2. Storage (sealed)

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

11. 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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