



LTE Full-Band Ceramic Chip Antenna  
Model: CC35D8  
Product Number: H2UE3P2D2G0100

## REFERENCE SPECIFICATION

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# 1 Introduction

Unictron's CC35D8 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, CC35D8 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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## Features

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

## Applications

- \* Machine-to-machine wireless communication.
- \* LTE full-band/ 3G/ 2G.
- \* LTE / GSM / CDMA /DCS /PCS / WCDMA / UMTS / HSDPA / GPRS / EDGE /IMT.

## 2 Electrical Characteristics

### 2.1 Table with electrical properties:

Electrical Specifications (Evaluation Board Dimensions: 118.5 x 37 mm<sup>2</sup>)

Electrical Table (698 ~ 798 MHz Band)			
Characteristics		Specifications	Unit
Outline Dimensions		35.0 x 5.0 x 4.0	mm
Ground Plane Dimensions		107.1 x 37	mm
Working Frequency		698 ~ 798	MHz
VSWR		3.5 Max. (typical)	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@895 MHz)	1.3 (typical)	dBi
Efficiency		54 (typical)	%

Electrical Table (824 ~ 960 MHz Band)			
Characteristics		Specifications	Unit
Working Frequency		824 ~ 960	MHz
VSWR		3.5 Max. (typical)	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@900 MHz)	0.5 (typical)	dBi
Efficiency		56 (typical)	%

**Electrical Table (1710 ~ 2170 MHz Band)**

Characteristics		Specifications	Unit
Working Frequency		1710 ~ 2170	MHz
VSWR		3.5 Max. (typical)	
Characteristic Impedance		50	$\Omega$
Polarization		Linear Polarization	
Peak Gain	(@1950 MHz)	2.6 (typical)	dBi
Efficiency		54 (typical)	%

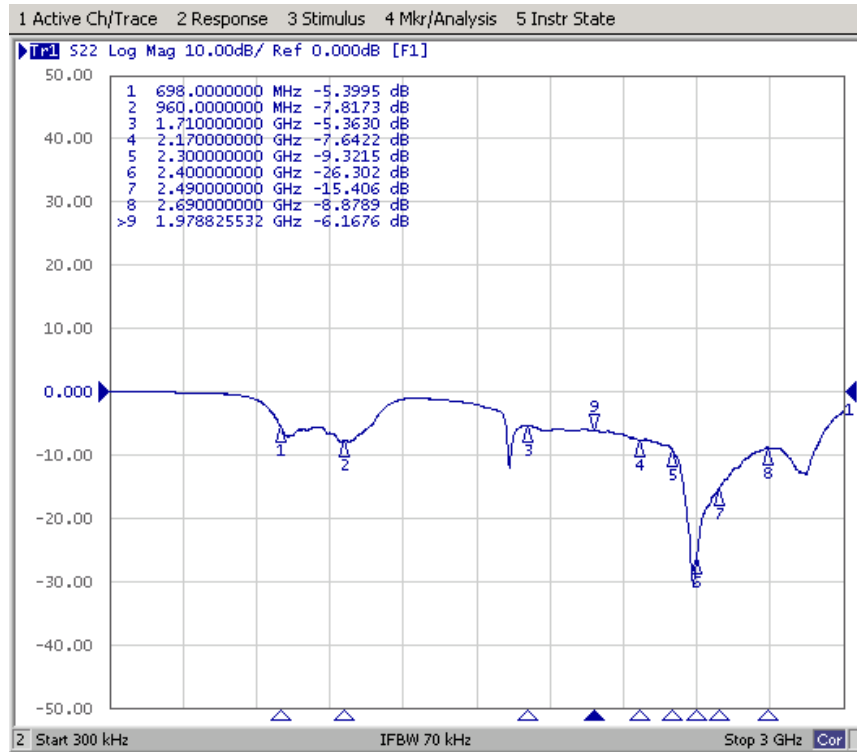
**Electrical Table (2300 ~ 2400 MHz Band)**

Characteristics		Specifications	Unit
Working Frequency		2300 ~ 2400	MHz
VSWR		3.0 Max. (typical)	
Characteristic Impedance		50	$\Omega$
Polarization		Linear Polarization	
Peak Gain	(@2350 MHz)	3.0 (typical)	dBi
Efficiency		65 (typical)	%

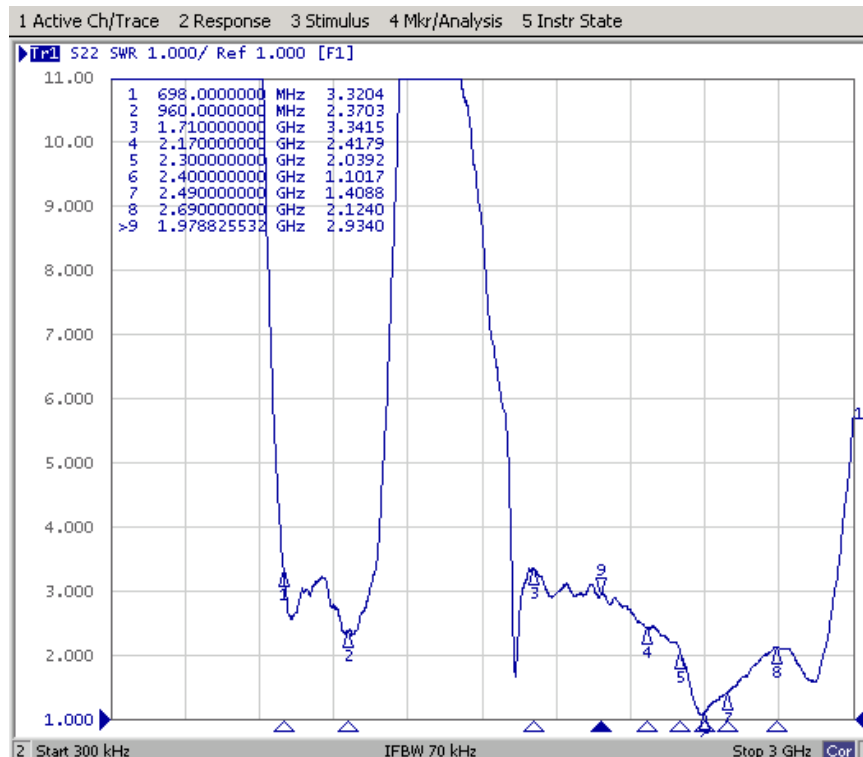
**Electrical Table (2490 ~ 2690 MHz Band)**

Characteristics		Specifications	Unit
Working Frequency		2490 ~ 2690	MHz
VSWR		3.0 Max. (typical)	
Characteristic Impedance		50	$\Omega$
Polarization		Linear Polarization	
Peak Gain	(@2590 MHz)	2.4 (typical)	dBi
Efficiency		69 (typical)	%

## 2.2 Return Loss ( $S_{11}$ )



## 2.3 VSWR ( $S_{11}$ )



## 2.4 3D Efficiency Table

Frequency(MHz)	698	708	718	728	738	748	758	768	778	788	798
Efficiency(dB)	-3.3	-2.8	-2.8	-2.7	-2.6	-2.7	-2.9	-2.9	-2.6	-2.8	-2.9
Efficiency(%)	46.5	52.0	52.3	53.7	54.7	54.2	51.8	51.5	54.4	52.0	51.3
Gain(dBi)	-0.4	-0.1	-0.1	0.6	1.2	1.3	0.9	0.8	0.8	0.5	0.3

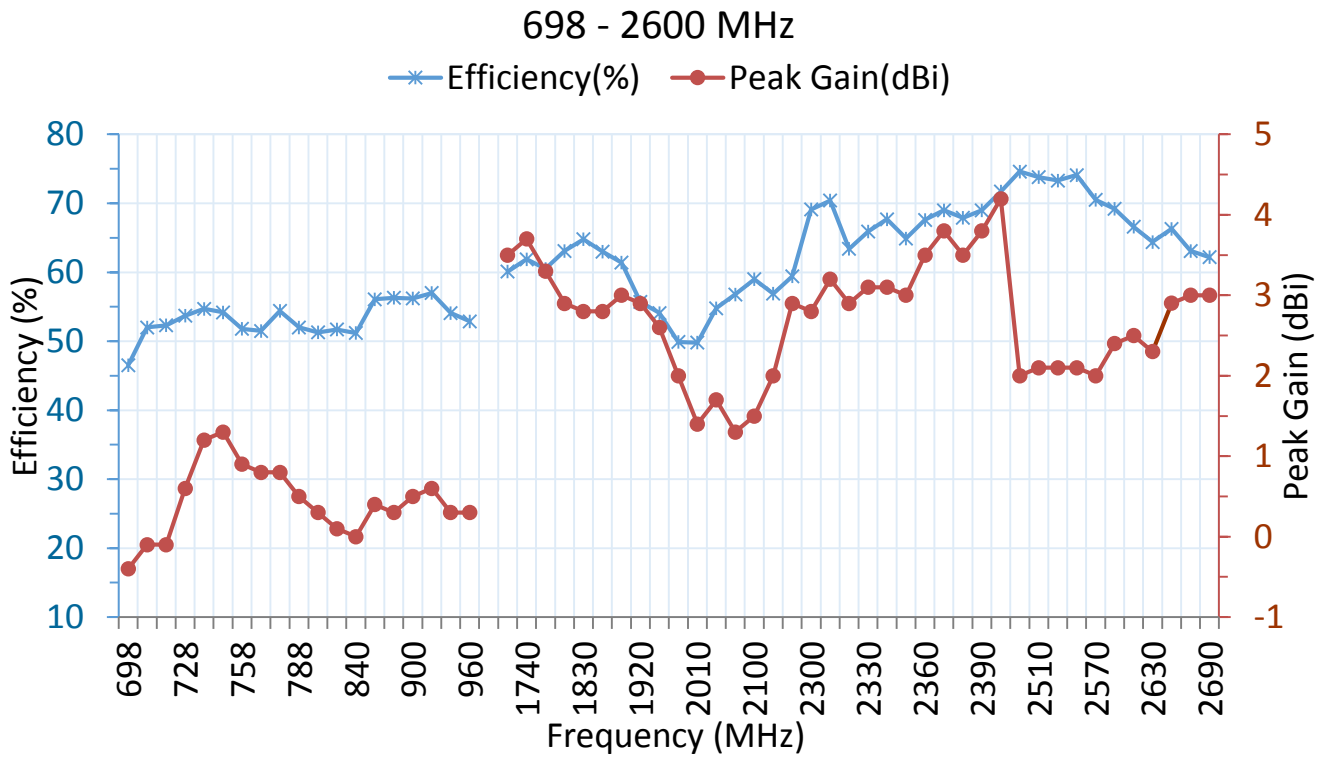
Frequency(MHz)	824	840	860	880	900	920	940	960
Efficiency(dB)	-2.9	-2.9	-2.5	-2.5	-2.5	-2.4	-2.7	-2.8
Efficiency(%)	51.7	51.2	56.1	56.3	56.2	57.0	54.1	52.9
Gain(dBi)	0.1	0.0	0.4	0.3	0.5	0.6	0.3	0.3

Frequency(MHz)	1710	1740	1770	1800	1830	1860	1890	1920	1950	1980	2010	2040	2070	2100	2130	2170
Efficiency(dB)	-2.2	-2.1	-2.2	-2.0	-1.9	-2.0	-2.1	-2.5	-2.7	-3.0	-3.0	-2.6	-2.5	-2.3	-2.4	-2.3
Efficiency(%)	60.1	61.9	60.5	63.1	64.8	63.0	61.4	55.7	54.1	49.9	49.8	54.8	56.8	59.0	56.9	59.4
Gain(dBi)	3.5	3.7	3.3	2.9	2.8	2.8	3.0	2.9	2.6	2.0	1.4	1.7	1.3	1.5	2.0	2.9

Frequency(MHz)	2300	2310	2320	2330	2340	2350	2360	2370	2380	2390	2400
Efficiency(dB)	-1.6	-1.5	-2.0	-1.8	-1.7	-1.9	-1.7	-1.6	-1.7	-1.6	-1.4
Efficiency(%)	69.1	70.4	63.4	65.9	67.7	64.9	67.6	69.0	67.9	69.0	71.7
Gain(dBi)	2.8	3.2	2.9	3.1	3.1	3.0	3.5	3.8	3.5	3.8	4.2

Frequency(MHz)	2490	2510	2530	2550	2570	2590	2610	2630	2650	2670	2690
Efficiency(dB)	-1.3	-1.3	-1.3	-1.3	-1.5	-1.6	-1.8	-1.9	-1.8	-2.0	-2.1
Efficiency(%)	74.6	73.8	73.3	74.1	70.5	69.2	66.6	64.4	66.3	63.1	62.2
Gain(dBi)	2.0	2.1	2.1	2.1	2.0	2.4	2.5	2.3	2.9	3.0	3.0

## 2.5 3D Efficiency vs. Frequency

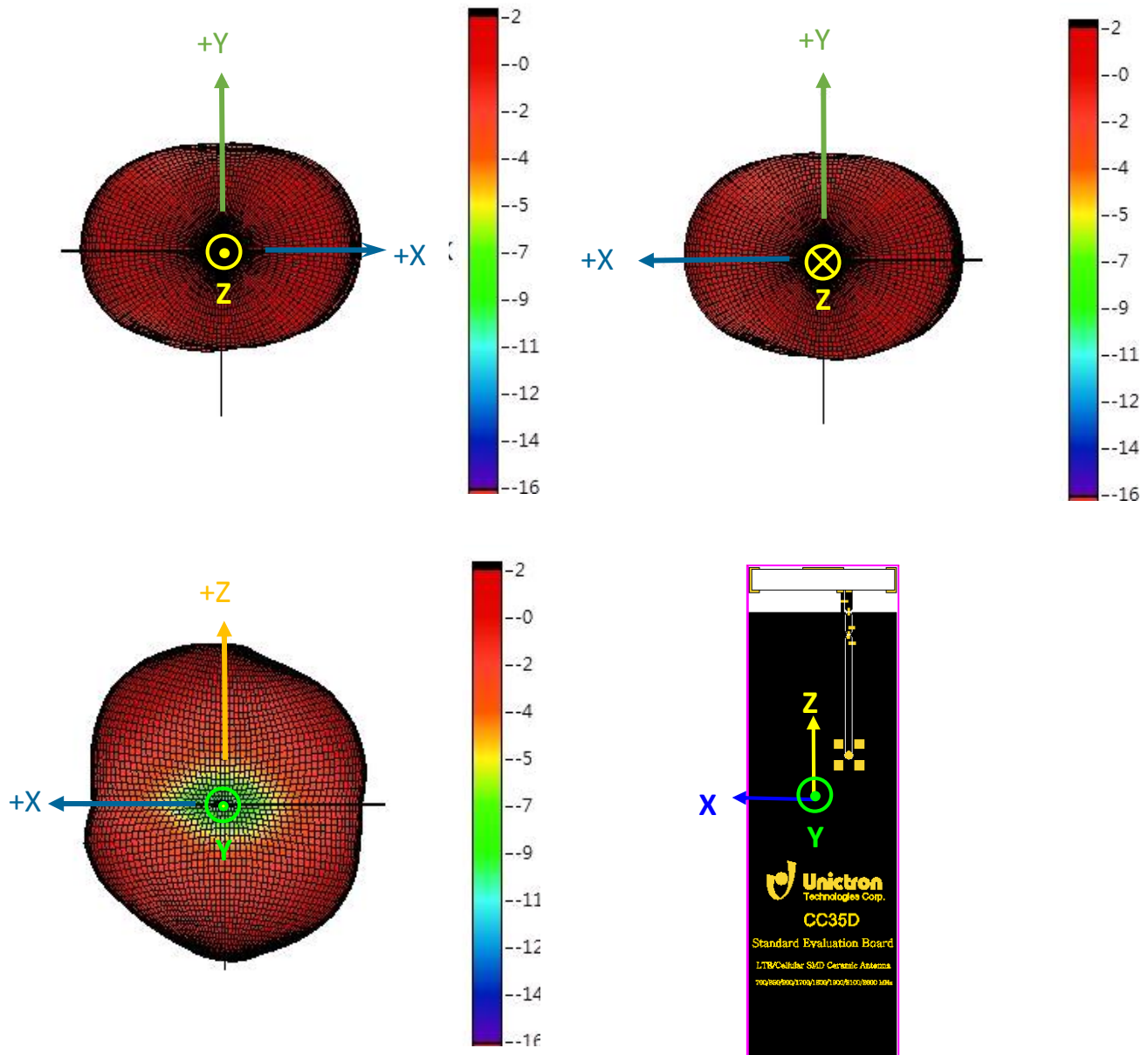




## 2.6 Radiation Pattern (with 118.5 x 37 mm<sup>2</sup> Evaluation Board)

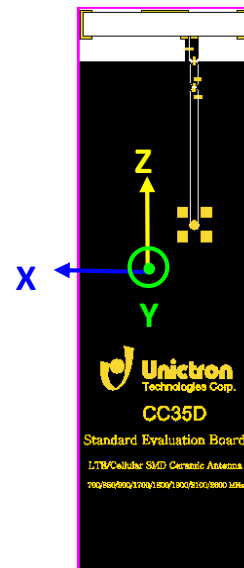
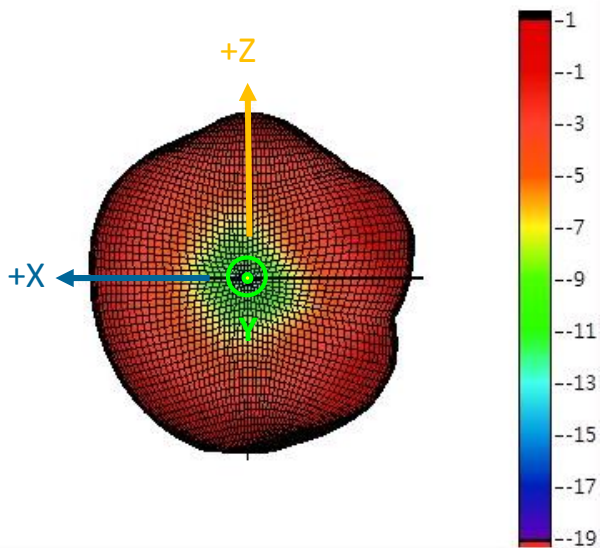
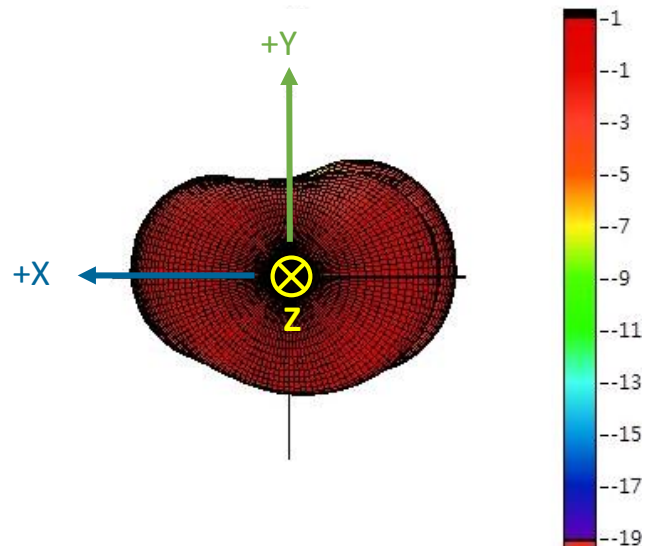
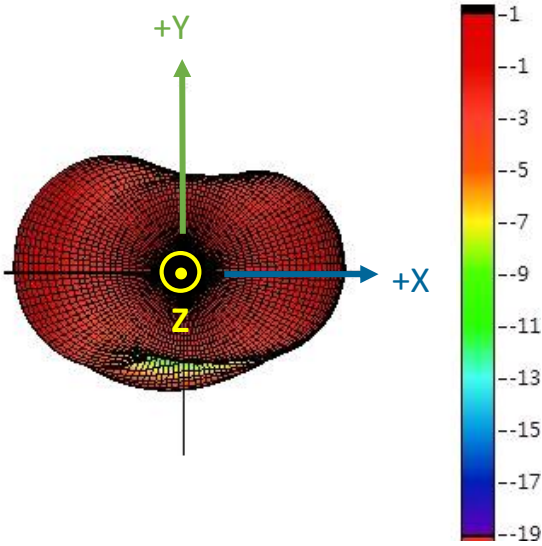
698 – 798MHz Band

3D Gain Pattern @ 748 MHz (unit: dBi)



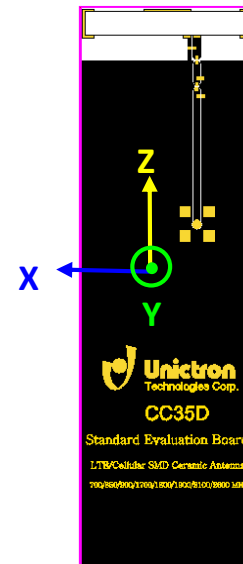
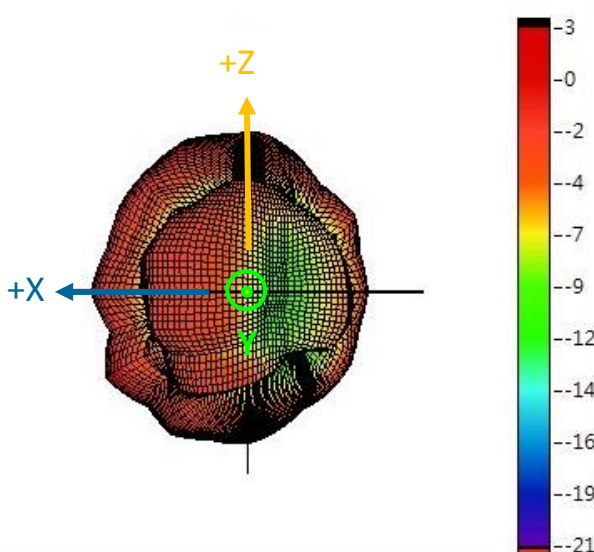
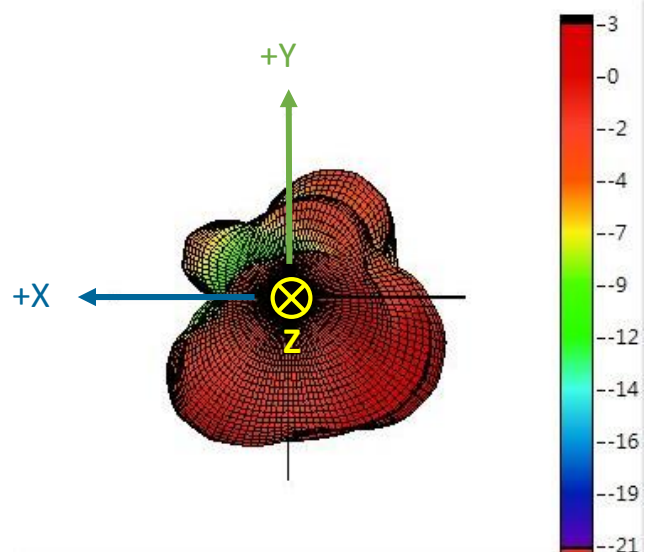
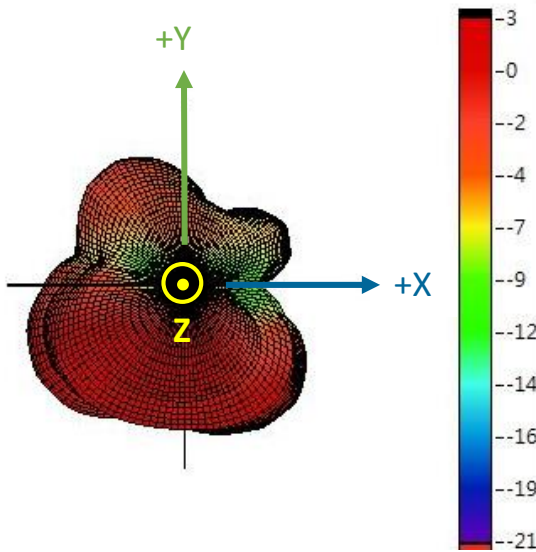
824 – 960 MHz Band

3D Gain Pattern @ 900 MHz (unit: dBi)



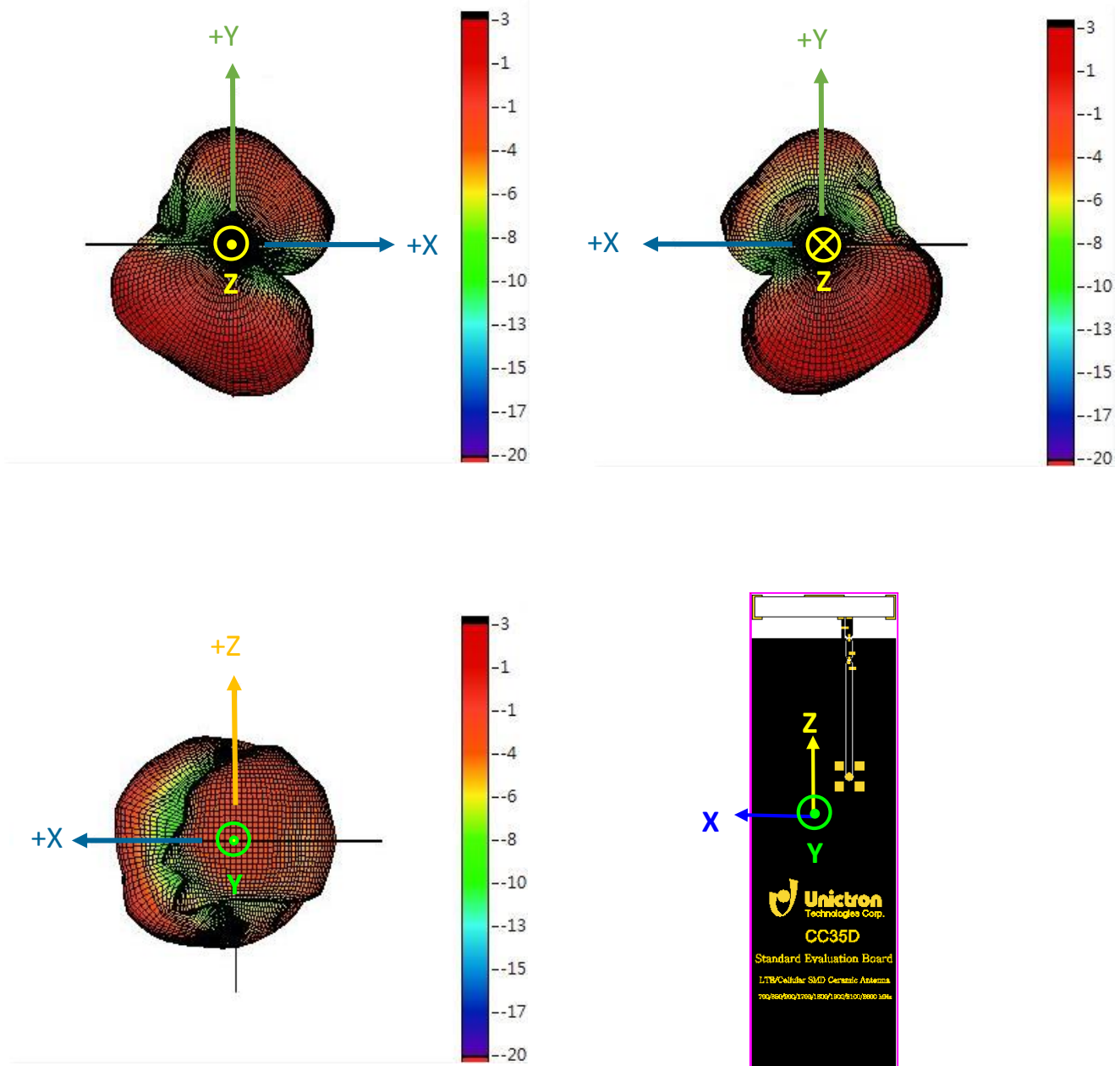
1710 – 2170 MHz Band

3D Gain Pattern @ 1950 MHz (unit: dBi)



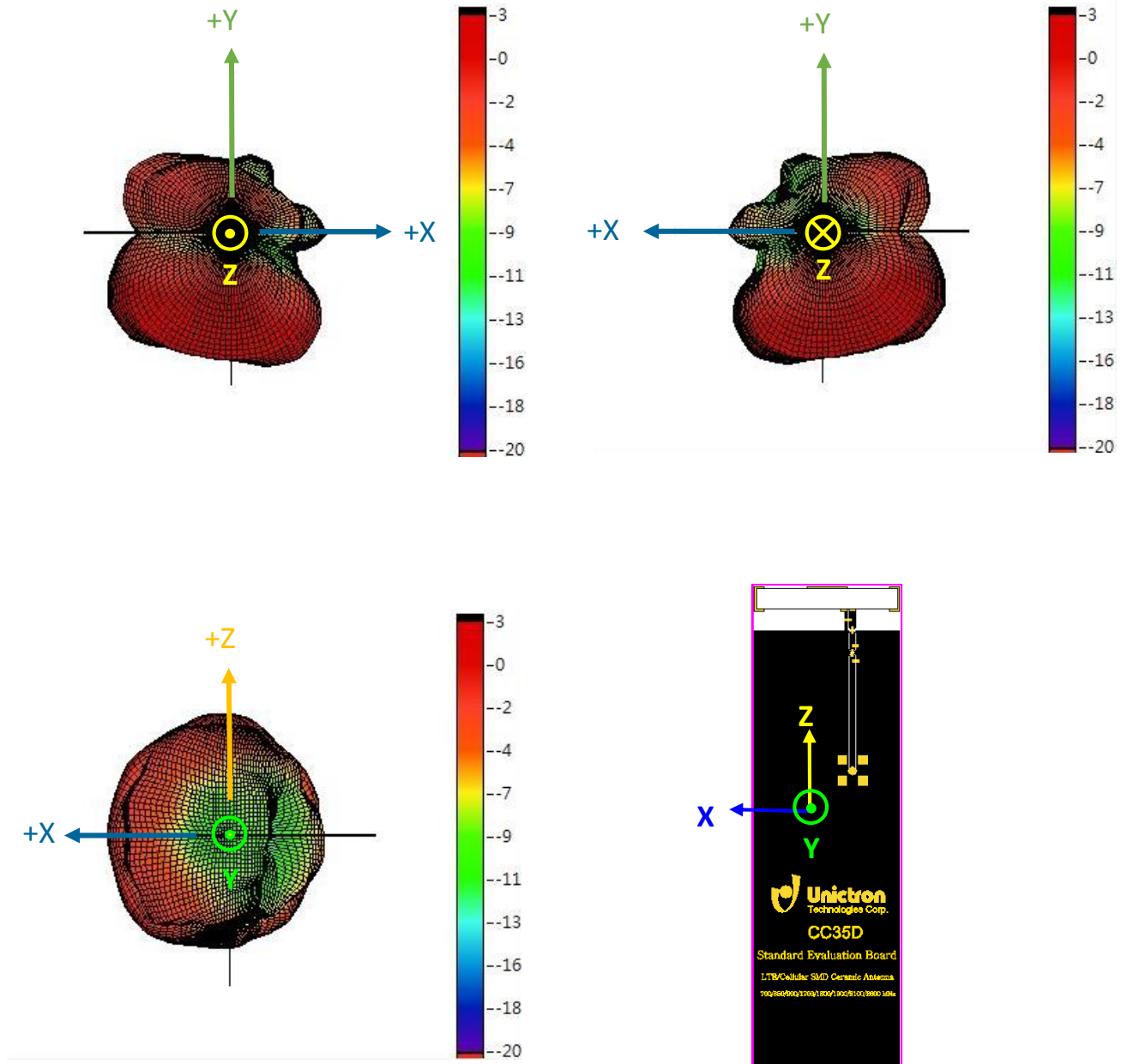
2300 – 2400 MHz Band

3D Gain Pattern @ 2350 MHz (unit: dBi)



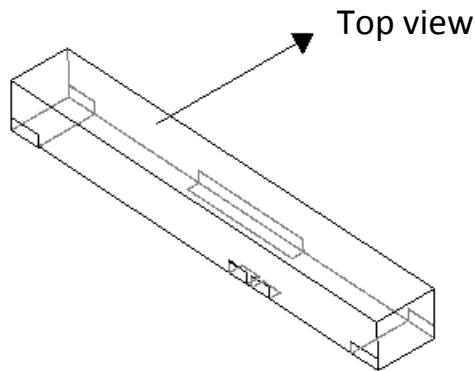
2490 – 2690 MHz Band

3D Gain Pattern @ 2590 MHz (unit: dBi)



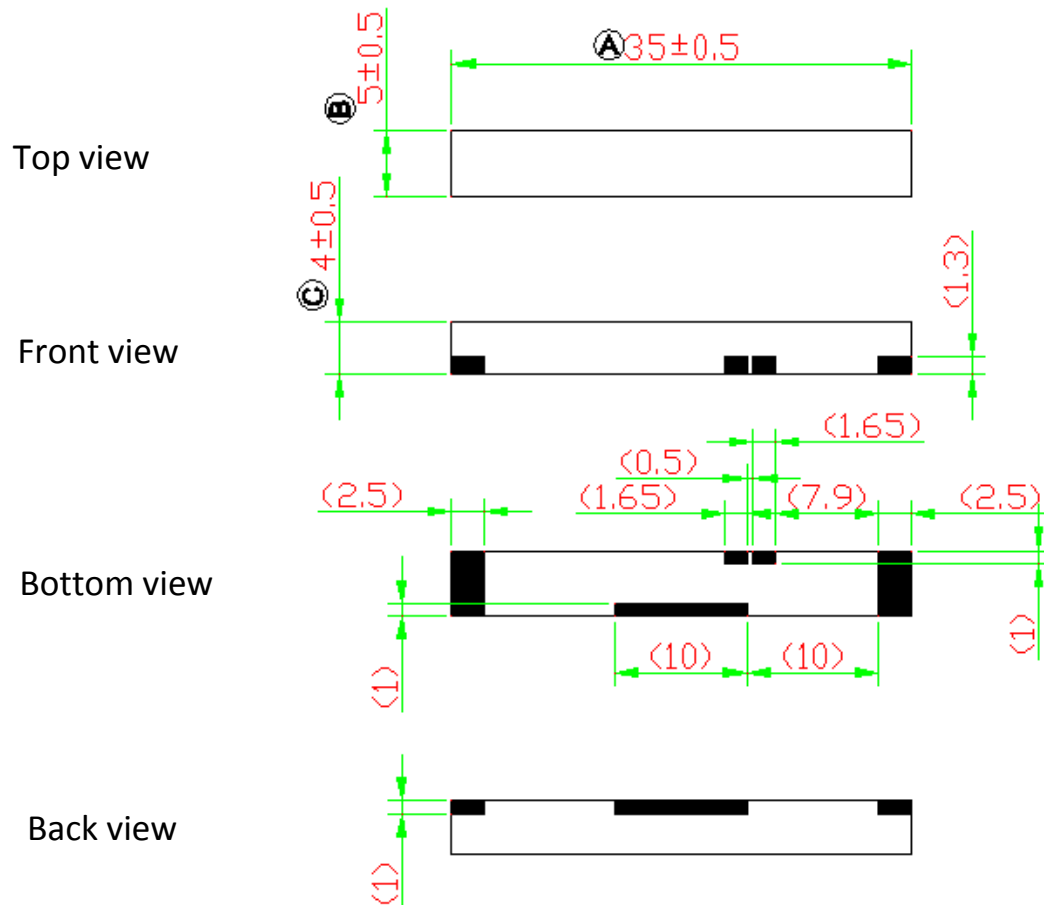
# 3 Layout

## 3.1 Antenna Dimensions



NOTE:

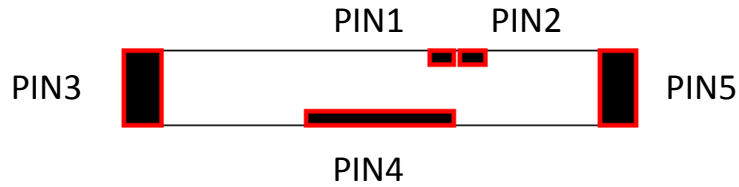
1. All materials are RoHS compliant
2. "Ⓐ - Ⓒ" Critical dimensions
3. "( )" Reference dimensions



Unit: mm

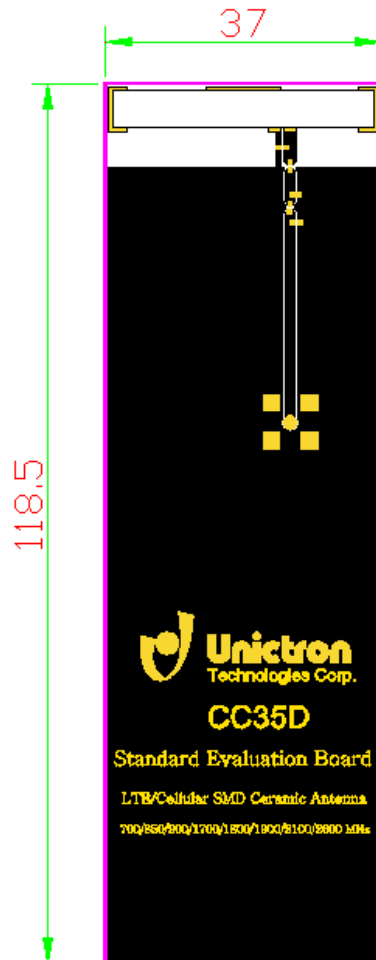


### PIN Definitions



PIN	1	2	3 ~ 10
Soldering Pad	Tuning/Ground	Signal	N/C

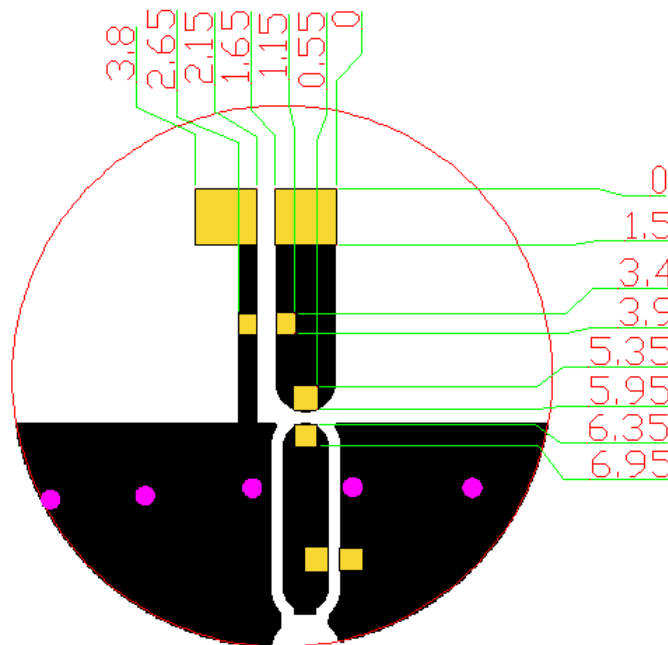
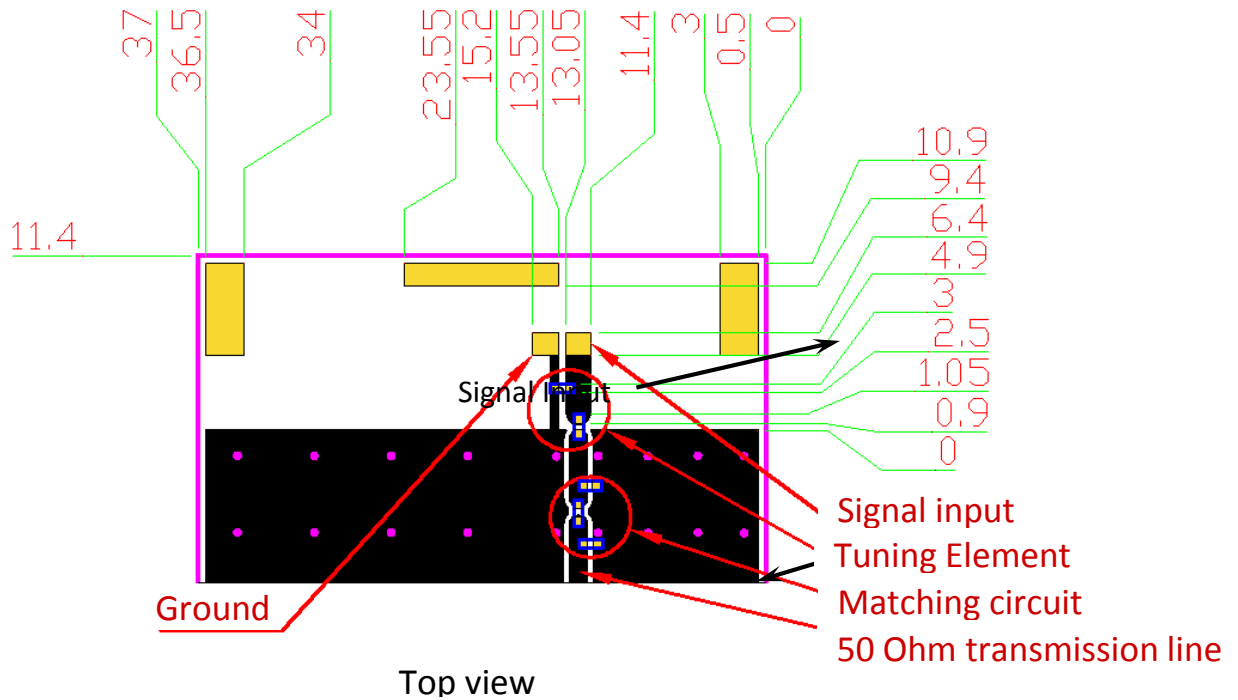
### 3.2 Evaluation Board with Antenna



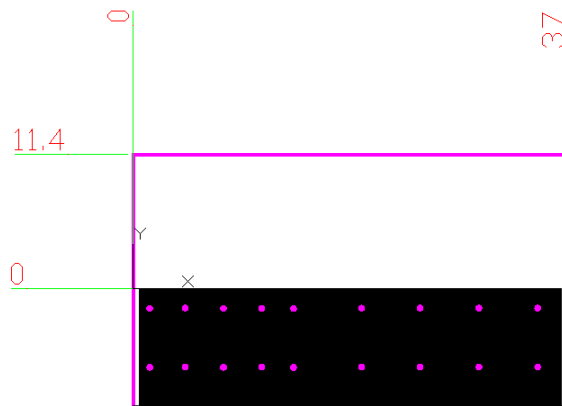
Unit: mm

### 3.3 Solder Land Pattern

The solder land pattern (golden marking areas) is shown below. Depending on Customer's requirement, an additional matching circuit is normally required.

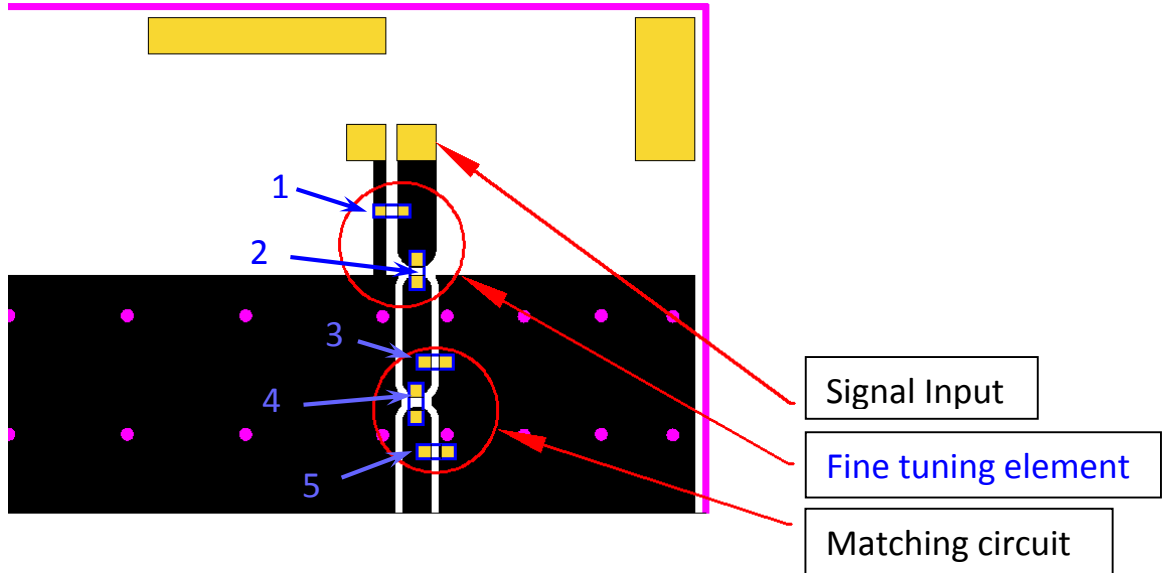




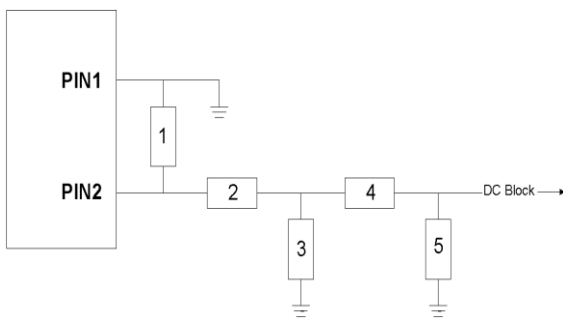


Bottom view

# 4 Frequency Tuning



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 118.5 x 37 mm<sup>2</sup> evaluation board. These are typical reference values which may need to be changed when circuit boards or part vendors are different. Feel free to contact a Unictron’s representative at [e-sales@unictron.com](mailto:e-sales@unictron.com) for further assistance adjusting these components, optimizing PCB layout of your device and antenna’s performance.



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1 Fine tuning element	6.8 nH (0402)	MURATA	±0.1 nH
2 Fine tuning element	3.9 pF (0402)	MURATA	±0.05 pF
3	N/A		
4	0Ω (0402)		
5	N/A		

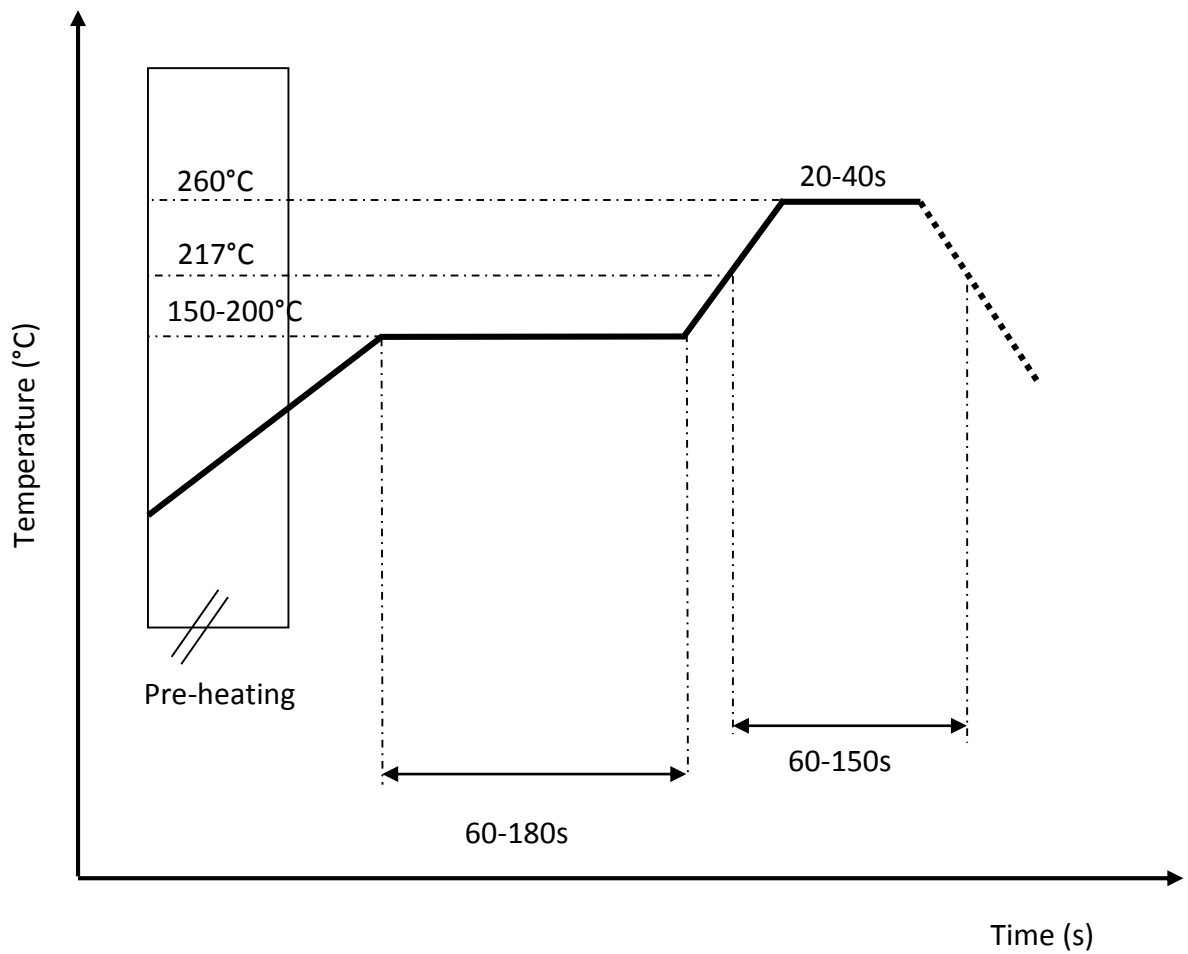
## 5 Packing

Packing data will be added later.

Request an update at [e-sales@unictron.com](mailto:e-sales@unictron.com).

# 6 Notes

## 6.1 Typical Soldering Profile for Lead-free Process



## 6.2 Operating and storage conditions

### Operating:

Maximum Input Power: 2W

Operating Temperature: -40°C to +85°C

### Storage:

Storage Temperature -5°C to +40°C

Relative Humidity: 20% to 70%

Shelf Life: 1 year

## 6.3 Installation guide

Request Unictron's application notes "General guidelines for the installation of Unictron's chip antennas" for further information at [e-sales@unictron.com](mailto:e-sales@unictron.com).

## 6.4 Reminders for users of Unictron's CC35D8 ceramic chip antennas

- 6.4.1. 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.
- 6.4.2. 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.
- 6.4.3. 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.

Presented data were measured on reference PCB (ground) as shown in this specification. When the antenna placement or size of the PCB is changed, antenna performance and values of matching components may differ from data shown here.

Information presented in this Reference Specification is believed to be correct as of the date of publishing. Unictron Technologies Corporation reserves the rights to change the Reference Specification without notice due to technical improvements, etc. Please consult with Unictron's engineering team about the latest information before using this product. Per request, we may provide advice and assistance in implementing this antenna to a customer's device by simulation or real measurement of the interested device in our testing facilities.

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