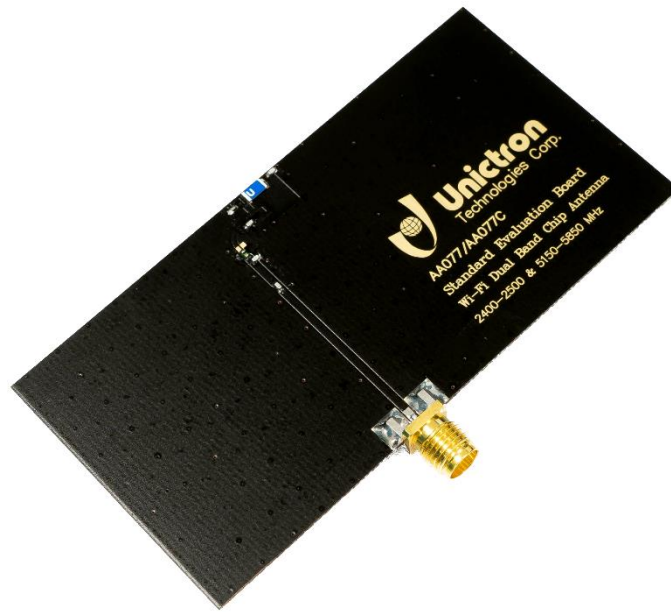




Evaluation Board of WiFi Dual Band Ceramic Chip Antenna
Model: AA077
TELA chip antenna
Product Number: H2B1PG1A1C0200

REFERENCE SPECIFICATION

Table of Contents

1	Introduction.....	3
2	Electrical Characteristics	4
2.1	Table with electrical properties:	4
2.2	Return Loss (S_{11})	5
2.3	VSWR (S_{11})	5
2.4	Efficiency Table.....	6
2.5	Efficiency vs. Frequency.....	6
2.6	Radiation Pattern (with 80x40mm ² Evaluation Board).....	7
3	Layout.....	11
3.1	Antenna Dimensions.....	11
3.2	Evaluation Board with Antenna	12
3.3	Solder Land Pattern	12
4	Frequency tuning.....	13
5	Packing	14
6	Notes	15
6.1	Typical Soldering Profile for Lead-free Process	15
6.2	Operating and storage conditions:	16
6.3	Installation guide:	16
6.4	Reminders for users of Unictron’s AA077 ceramic chip antennas.....	16

1 Introduction

Unictron's AA077 ceramic chip antenna is designed for Wi-Fi CERTIFIED ac applications, covering both 2400–2484 MHz & 5150–5850 MHz frequency bands. Fabricated with proprietary design and processes, AA077 shows excellent performance and is fully compatible with SMT processes which can decrease the assembly cost and improve device's quality and consistency.

Features

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

Applications

- *Wi-Fi CERTIFIED ac applications
- * Wireless communication devices when IEEE802.11 a/b/g/n/ac functions are needed.
- *IoT applications
- * Wireless PCMCIA cards or USB dongles

2 Electrical Characteristics

2.1 Table with electrical properties:

Electrical Table (2400–2500 MHz Band)

Characteristics		Specifications	Unit
Outline Dimensions		3.2x1.6x0.5	mm
Ground Plane Dimensions		80x40	mm
Working Frequency		2400–2500	MHz
VSWR (@center frequency)*		2 Max.	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@2442MHz)	1.4 (typical)	dBi
Efficiency		76 (typical)	%

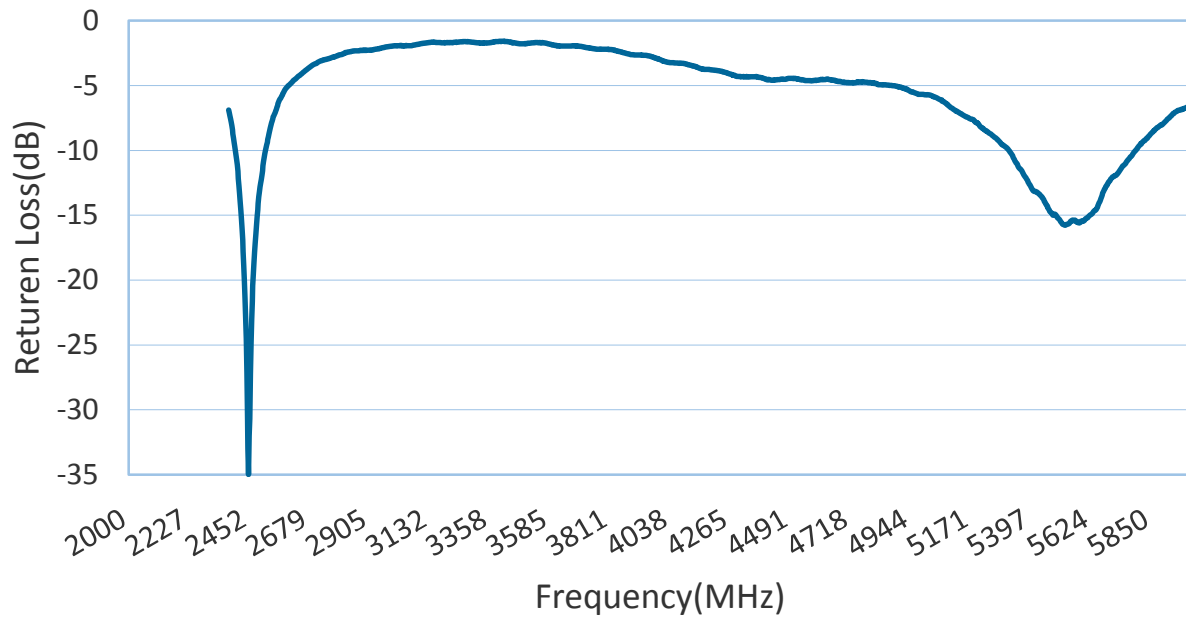
* Center frequency means the frequency with the lowest value in return loss of the chip antenna on the evaluation board.

Electrical Table (5150–5850 MHz Band)

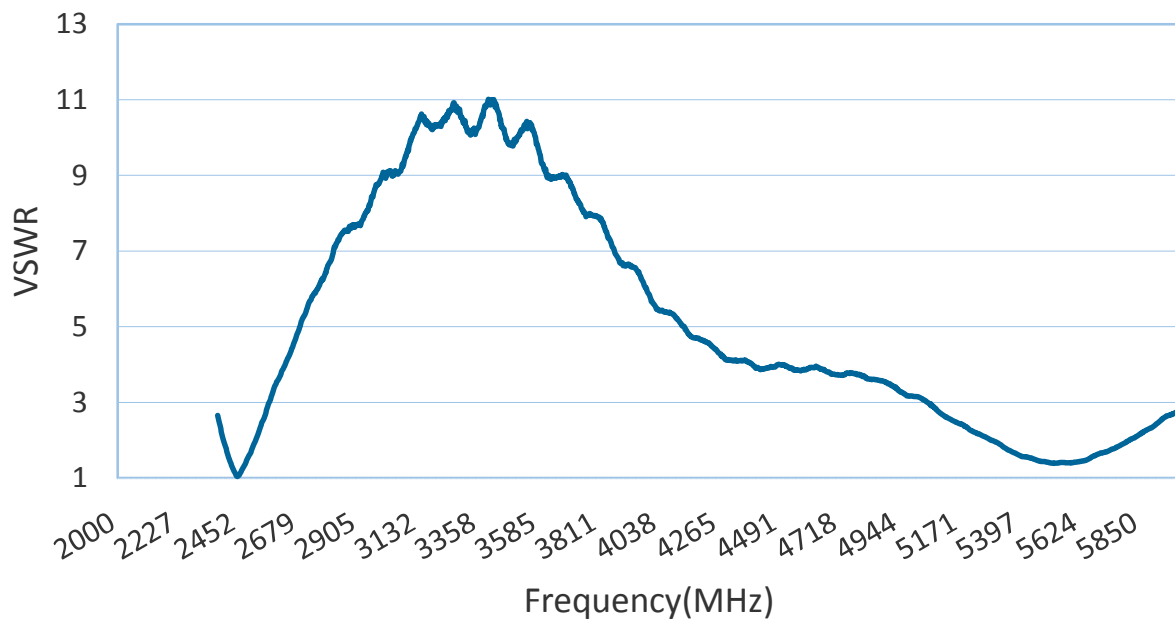
Characteristics		Specifications	Unit
Outline Dimensions		3.2x1.6x0.5	mm
Ground Plane		80x40	mm
Working Frequency		5150–5850	MHz
VSWR (@center frequency)*		2 Max.	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@5500MHz)	2.3 (typical)	dBi
Efficiency		67 (typical)	%

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

2.2 Return Loss (S_{11})



2.3 VSWR (S_{11})



2.4 Efficiency Table

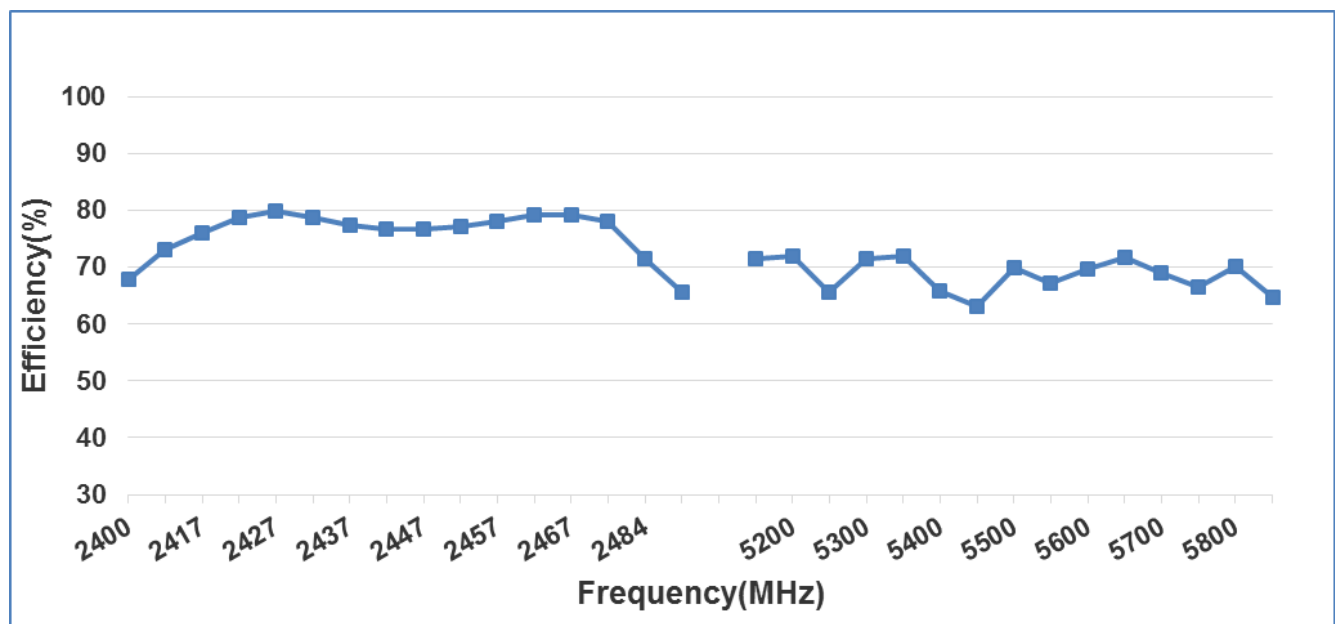
2400–2500 MHz

Frequency(MHz)	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484	2500
Efficiency(dB)	-1.7	-1.4	-1.2	-1.0	-1.0	-1.0	-1.1	-1.1	-1.2	-1.1	-1.1	-1.0	-1.0	-1.1	-1.5	-1.8
Efficiency(%)	67.9	73.2	76.1	78.7	79.9	78.8	77.4	76.8	76.8	77.2	78.1	79.3	79.2	78.1	71.5	65.5
Peak Gain(dBi)	0.8	1.2	1.3	1.4	1.4	1.3	1.3	1.4	1.5	1.5	1.4	1.5	1.4	1.3	1.2	0.8

5150–5850 MHz

Frequency(MHz)	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700	5750	5800	5850
Efficiency(dB)	-1.5	-1.4	-1.8	-1.5	-1.4	-1.8	-2.0	-1.6	-1.7	-1.6	-1.4	-1.6	-1.8	-1.5	-1.9
Efficiency(%)	71.5	71.9	65.7	71.6	71.9	65.8	63.2	69.9	67.3	69.6	71.7	68.9	66.6	70.1	64.6
Gain(dBi)	2.2	2.3	2.0	2.3	2.1	2.1	2.0	2.4	2.3	2.8	2.9	2.6	2.5	2.6	2.2

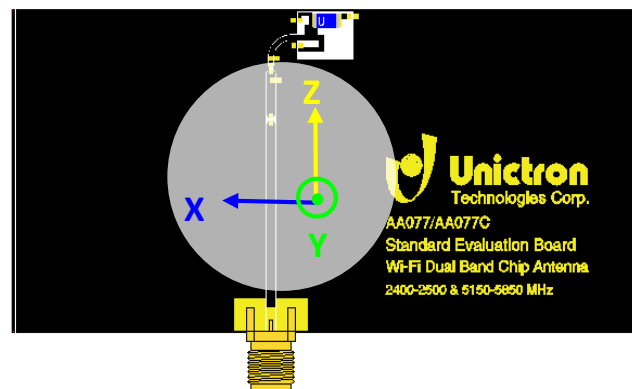
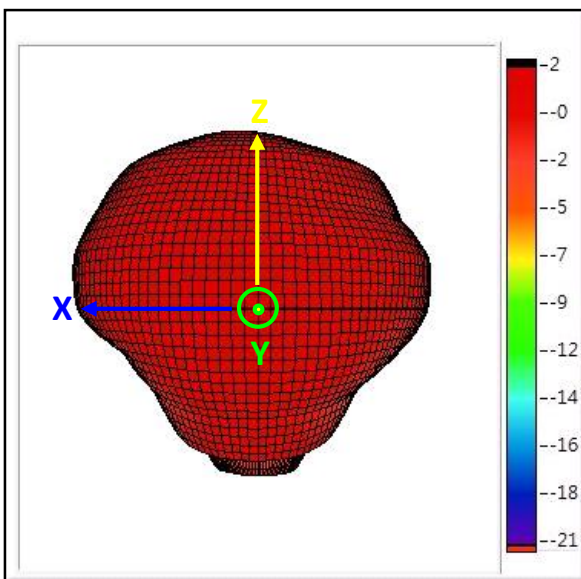
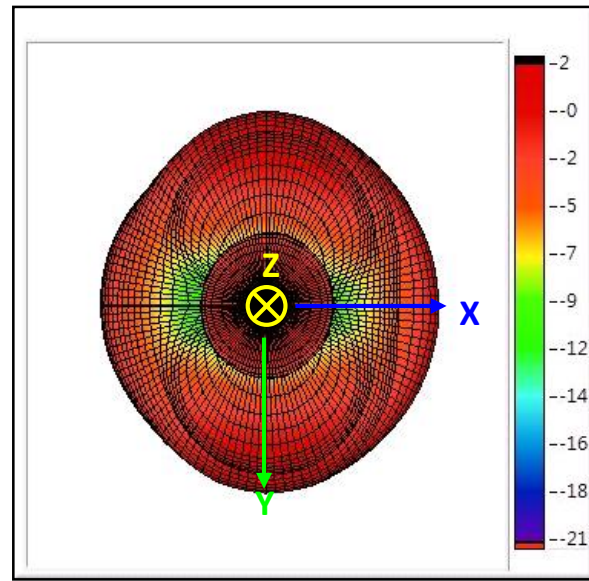
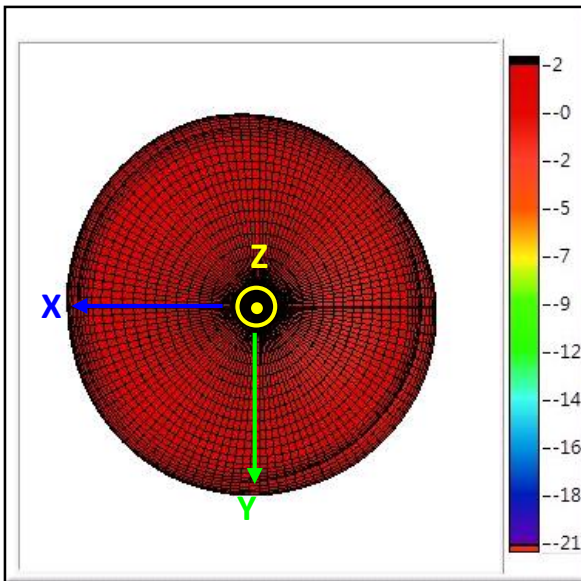
2.5 Efficiency vs. Frequency



2.6 Radiation Pattern (with 80x40mm² Evaluation Board)

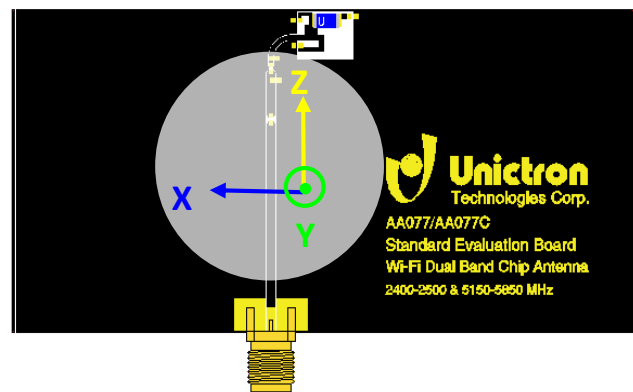
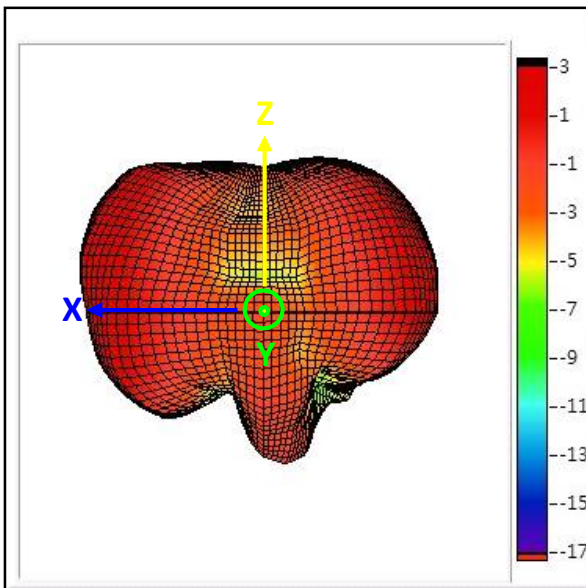
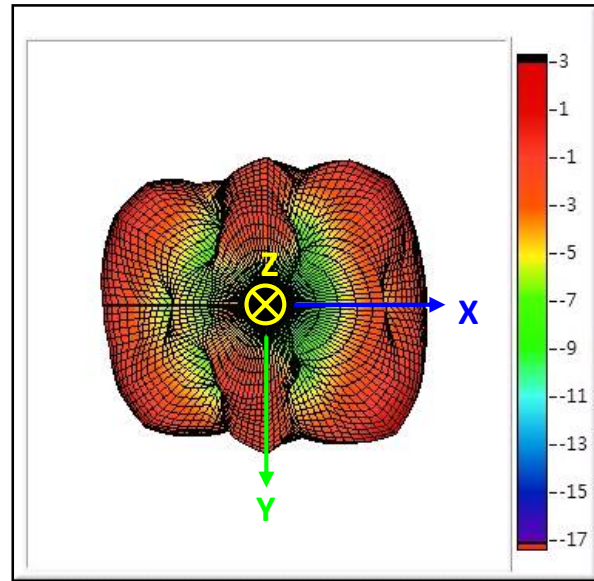
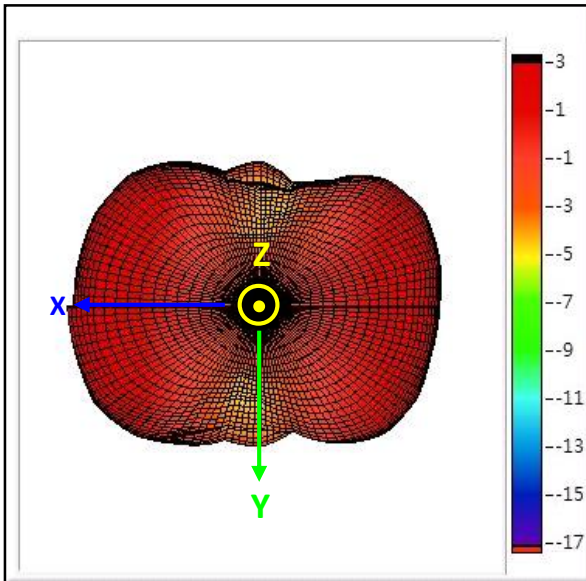
2400~2500 MHz Band

3D Gain Pattern @ 2442 MHz (unit: dBi)

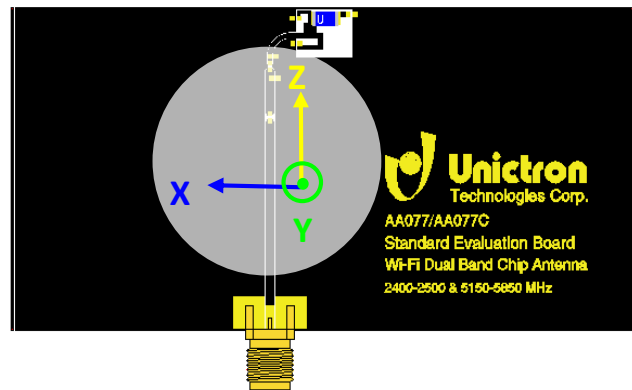
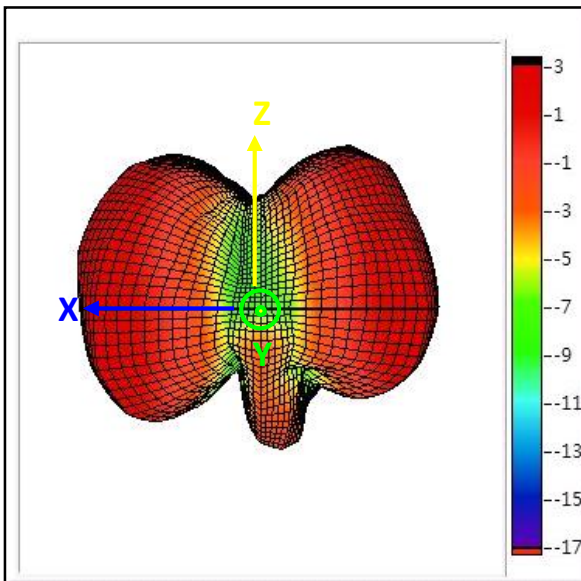
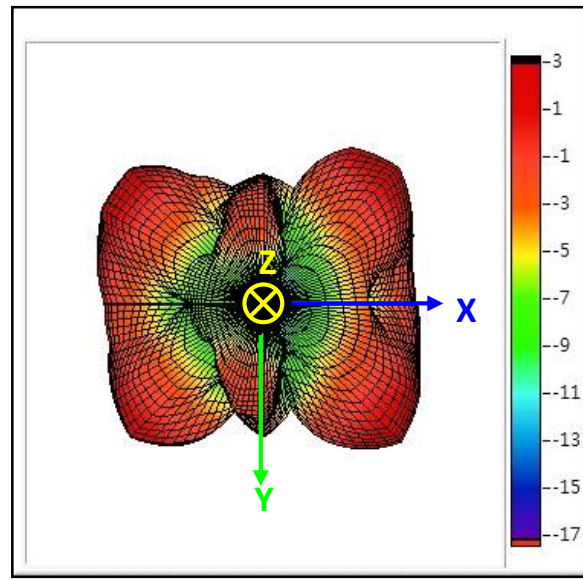
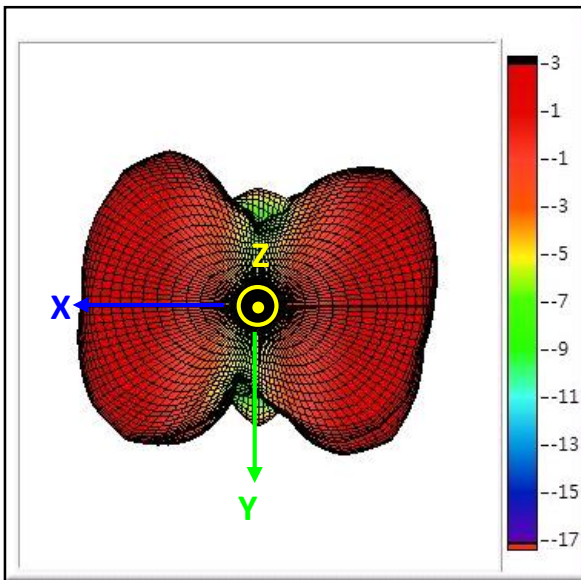


5150~5850 MHz Band

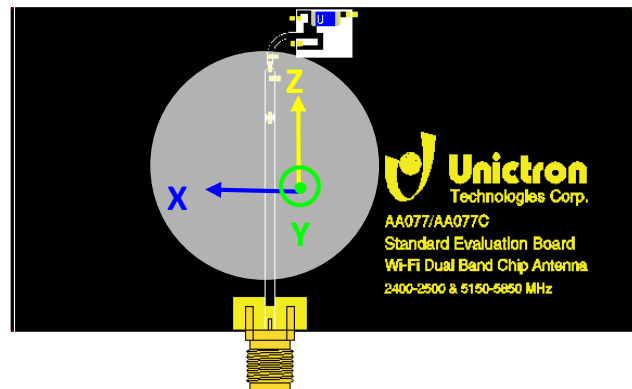
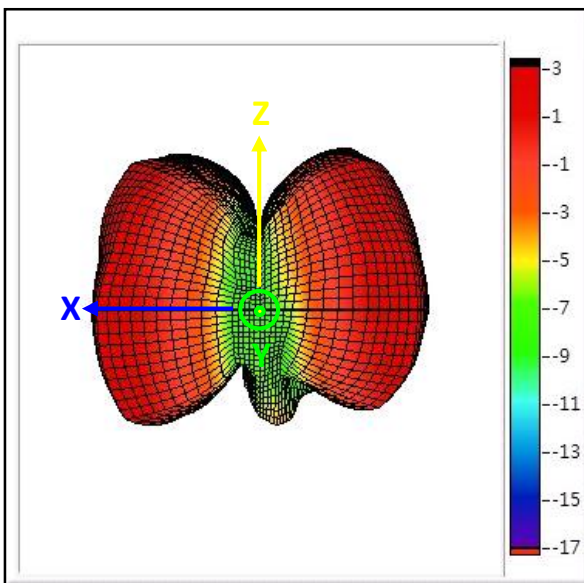
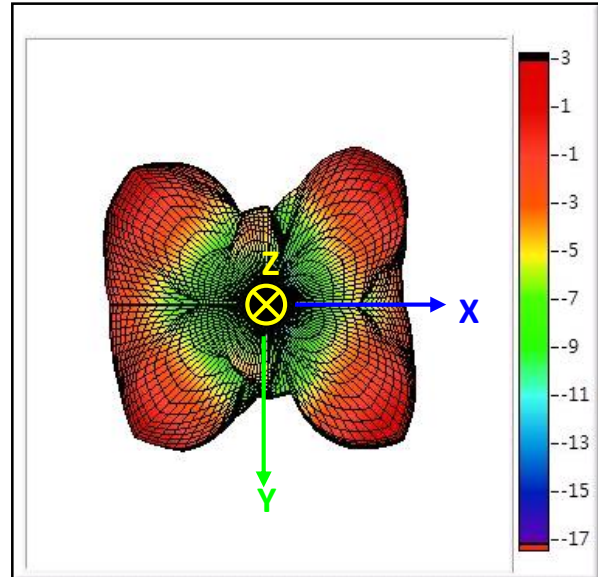
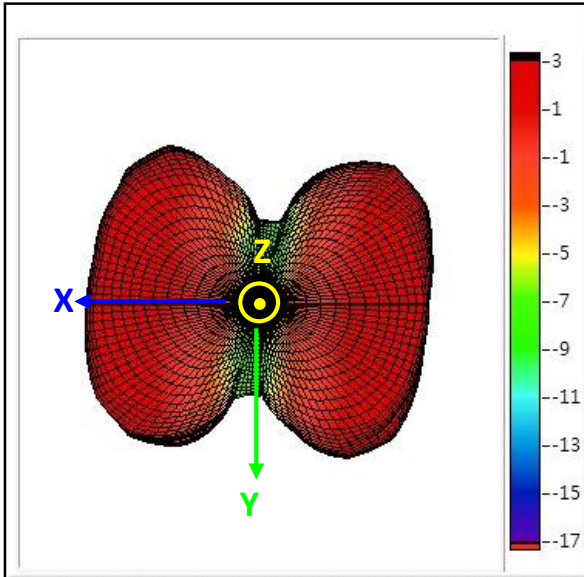
3D Gain Pattern @ 5150 MHz (unit: dBi)



3D Gain Pattern @ 5500 MHz (unit: dBi)

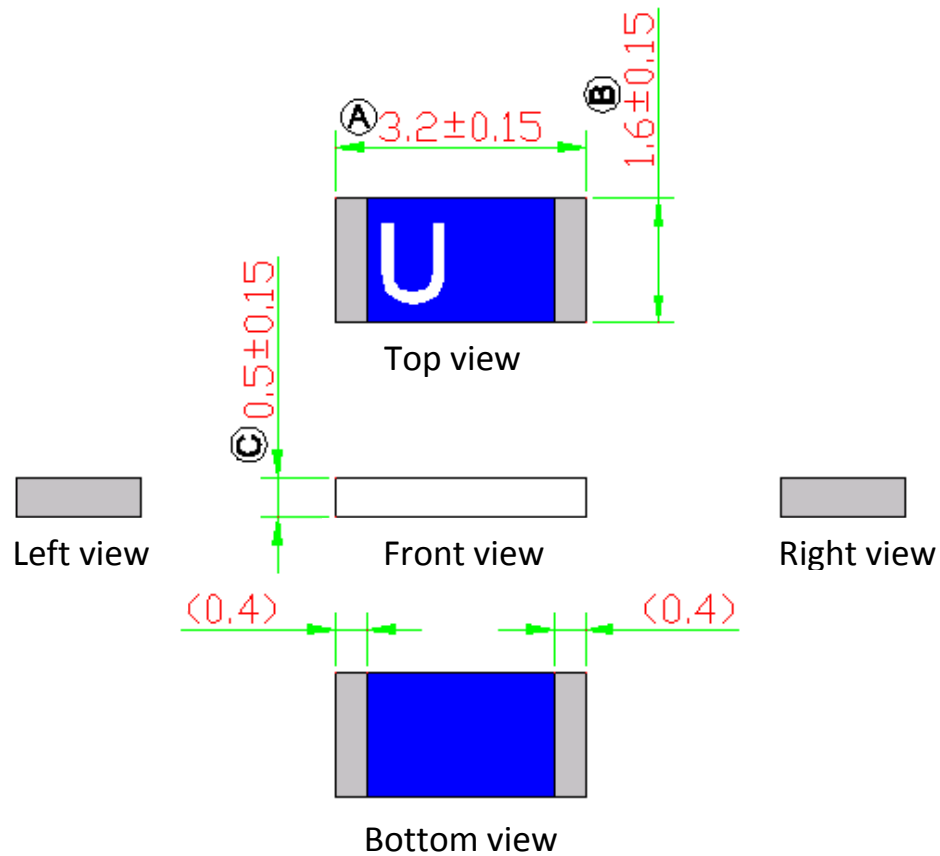


3D Gain Pattern @ 5850 MHz (unit: dBi)

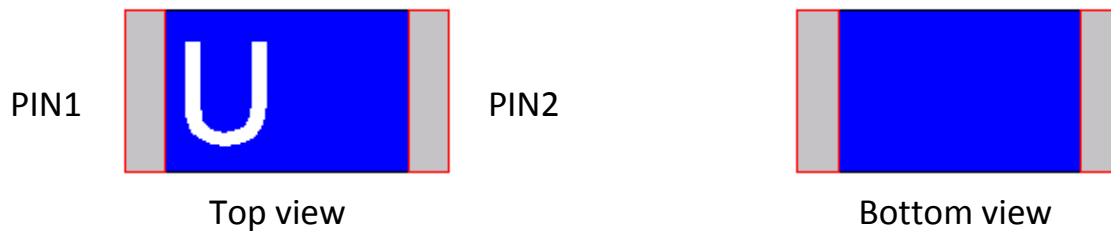


3 Layout

3.1 Antenna Dimensions

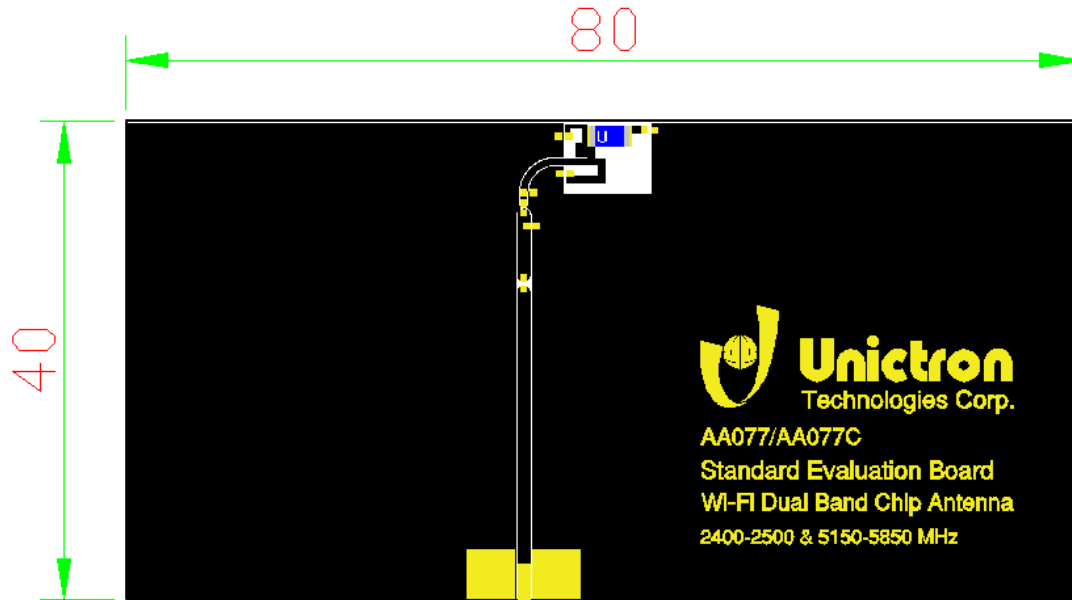


PIN Definitions



PIN	1	2
Soldering Pad	Signal	Tuning/Ground

3.2 Evaluation Board with Antenna



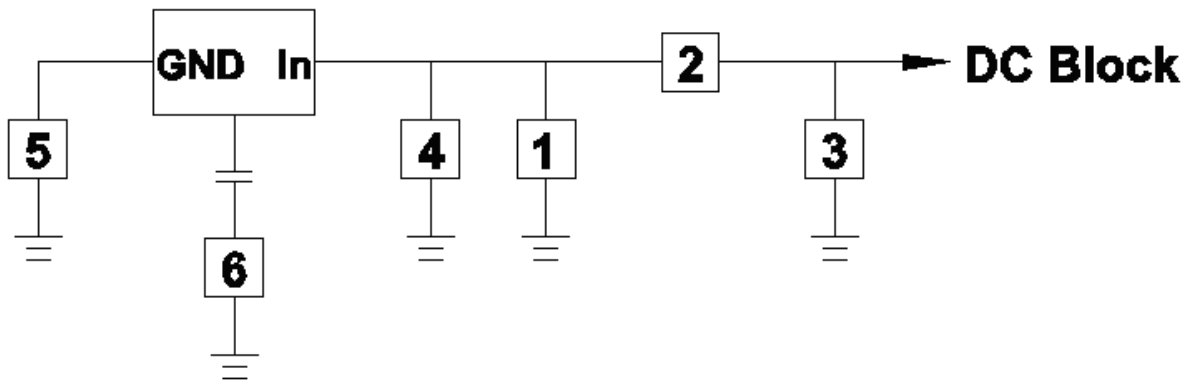
Unit: mm

3.3 Solder Land Pattern

For solder land pattern, please contact Unictron representative at e-sales@unictron.com for layout details and more technical information.

4 Frequency tuning

Regarding the frequency tuning, please contact Unictron representative at e-sales@unictron.com for layout details and technical information.



With the following recommended values of matching and tuning components, the center frequencies will be about 2442 MHz for lower band & 5500 MHz for higher band at our standard 80x40 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	N/A	-	-
2	1 nH, (0402)	MURATA	±0.1 nH
3	0.2 pF, (0402)	MURATA	±0.05 pF
4	22 pF, (0402)	MURATA	±2%
5 Fine tuning element	1 pF, (0402)	MURATA	±0.05 pF
6 Fine tuning element	0.3 pF, (0201)	MURATA	±0.05 pF

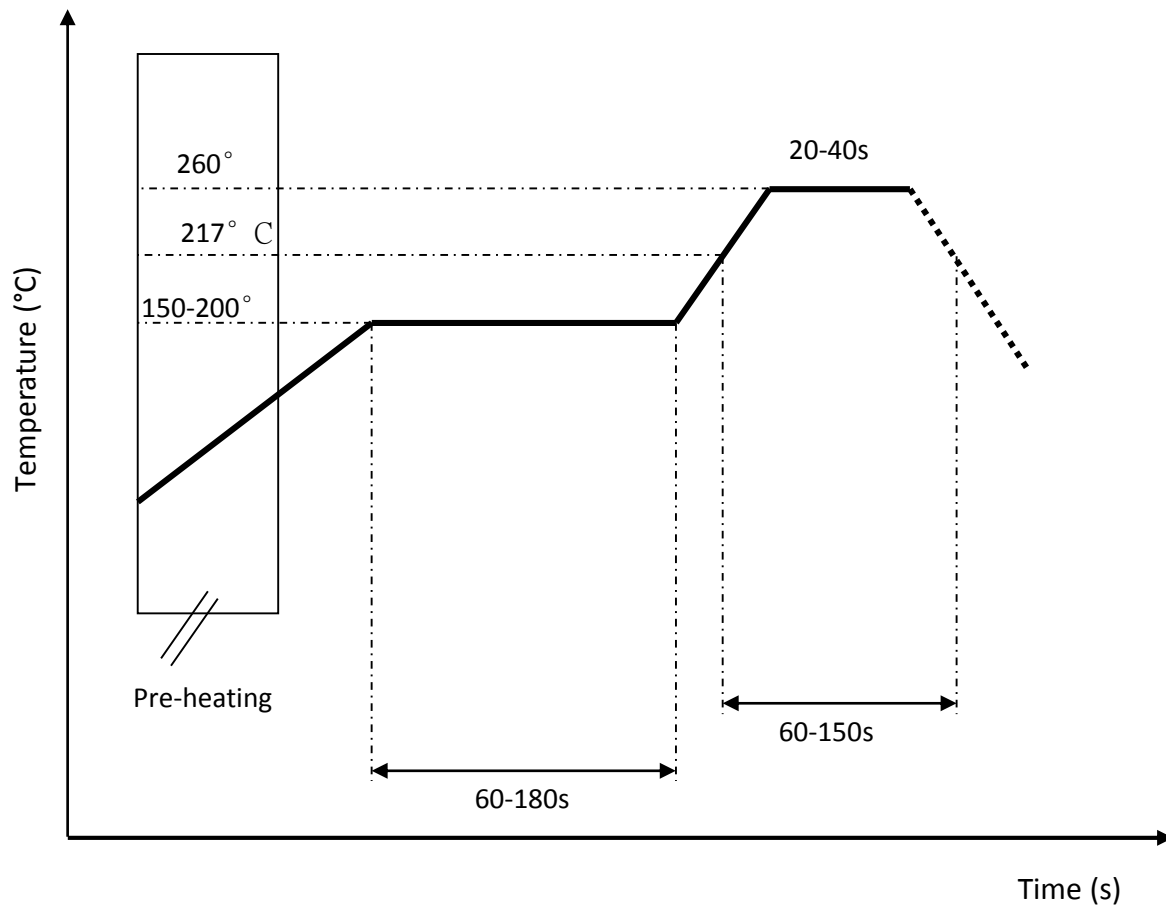
5 Packing

Packing information will be added to the next version of the datasheet.

Meanwhile, feel free to contact e-sales@unictron.com shall you need any further data.

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.

6.4 Reminders for users of Unictron's AA077 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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