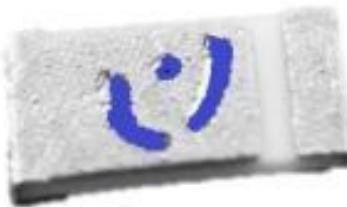


# 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip Antenna (AA077U)

## Engineering Specification

### 1. Product Number

H 2 U 8 4 W 1 H 1 S 0 8 0 0 0



No. 83, Kewang Rd., Longtan Dist., Taoyuan City 325, Taiwan  
詠業科技股份有限公司

### 2. Features

- \*Stable and reliable performances in both 2.4 and 5 GHz bands
- \*Low profile and compact size
- \*RoHS 2.0 compliance
- \*SMT processes compatible
- \*AEC-Q200 compliant

### 3. Applications

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

### 4. Description

Unictron's AA077U ceramic 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, AA077U shows excellent performance and is fully compatible with SMT processes which can decrease the assembly cost and improve device's quality and consistency.

 Unictron Technologies Corp.	Unictron Technologies Corporation Website: <a href="http://www.unictron.com">www.unictron.com</a>	THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION
---	--	--

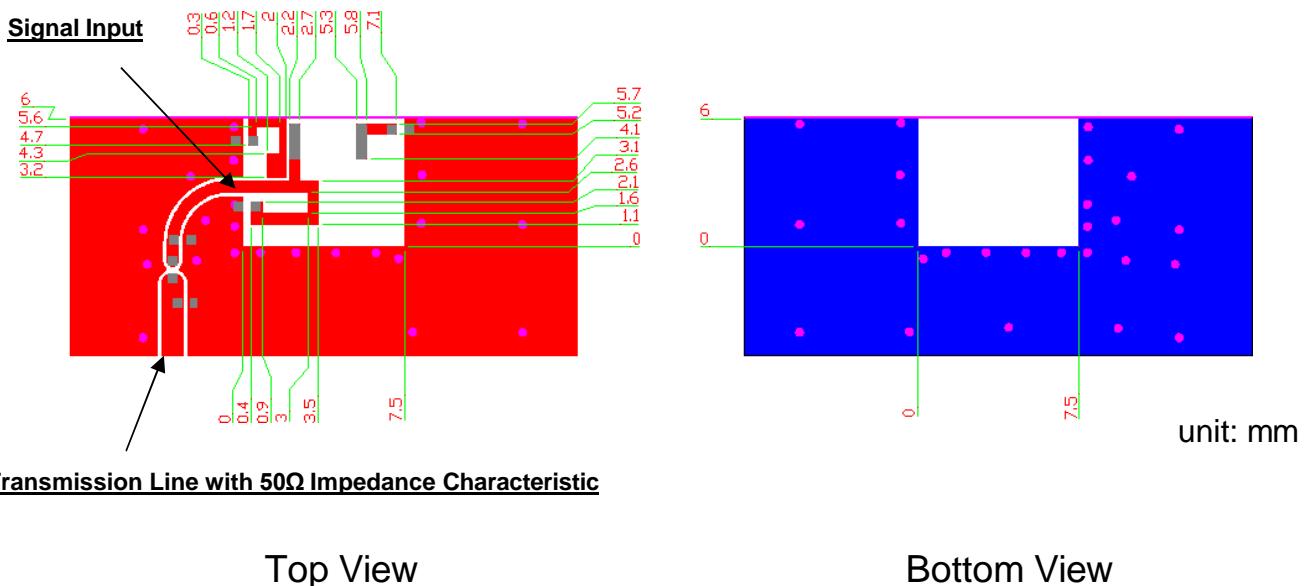
Prepared by : <a href="#">Jane</a>	Designed by : <a href="#">James</a>	Checked by : <a href="#">Mike</a>	Approved by : <a href="#">Herbert</a>
TITLE : 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip Antenna (AA077U) Engineering Specification	DOCUMENT NO.	H2U84W1H1S0800	REV. C

## 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.



## 5-2. Electrical Specifications (Evaluation Board Dimensions: 80 x 40 mm<sup>2</sup>)

## 5-2-1. Electrical Table

Characteristics	Specifications	
Outline Dimension (mm)	3.2 x 1.6 x 0.5	
Working Frequency (MHz)	2400 ~ 2500	5150 ~ 5850
Peak Gain (dBi) (typical)**	1.4	2.3
Radiation Efficiency (%) (typical)**	76	67
VSWR (@ center frequency)*	< 2 : 1	< 2 : 1
Characteristic Impedance ( $\Omega$ )	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.**



Unictron Technologies Corporation  
Website: [www.unictron.com](http://www.unictron.com)

THIS DRAWINGS AND SPECIFICATIONS ARE THE  
PROPERTY OF UNICTRON TECHNOLOGIES  
CORPORATION AND SHALL NOT BE REPRODUCED  
OR USED AS THE BASIS FOR THE MANUFACTURE OR  
SALE OF APPARATUS OR DEVICES WITHOUT  
PERMISSION

---

Prepared by : Jane

---

Designed by :James

---

Checked by : **Mike**

Approved by : **Herbert**

**TITLE : 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
Antenna (AA077U) Engineering  
Specification**

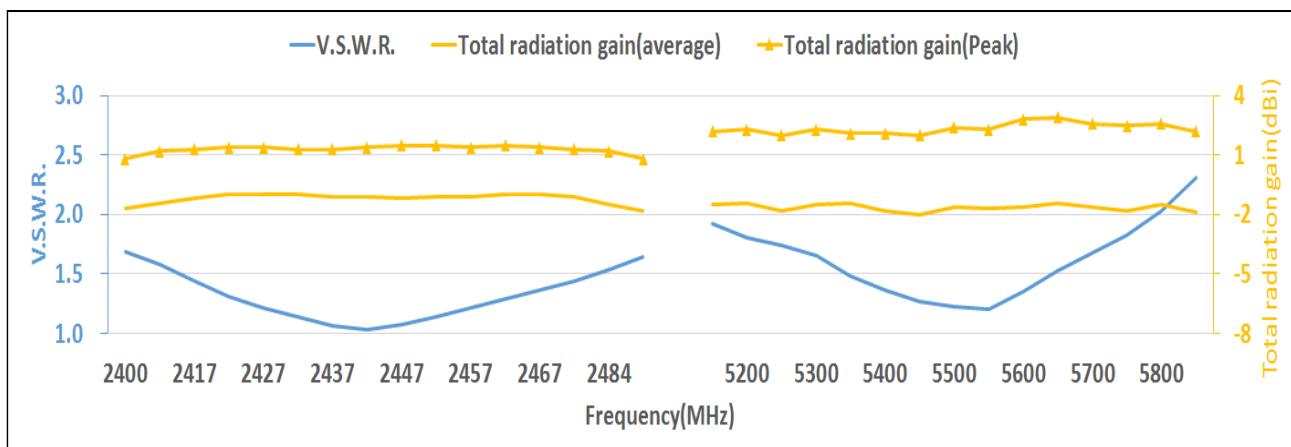
**DOCUMENT**

**H2U84W1H1S0800**

REV

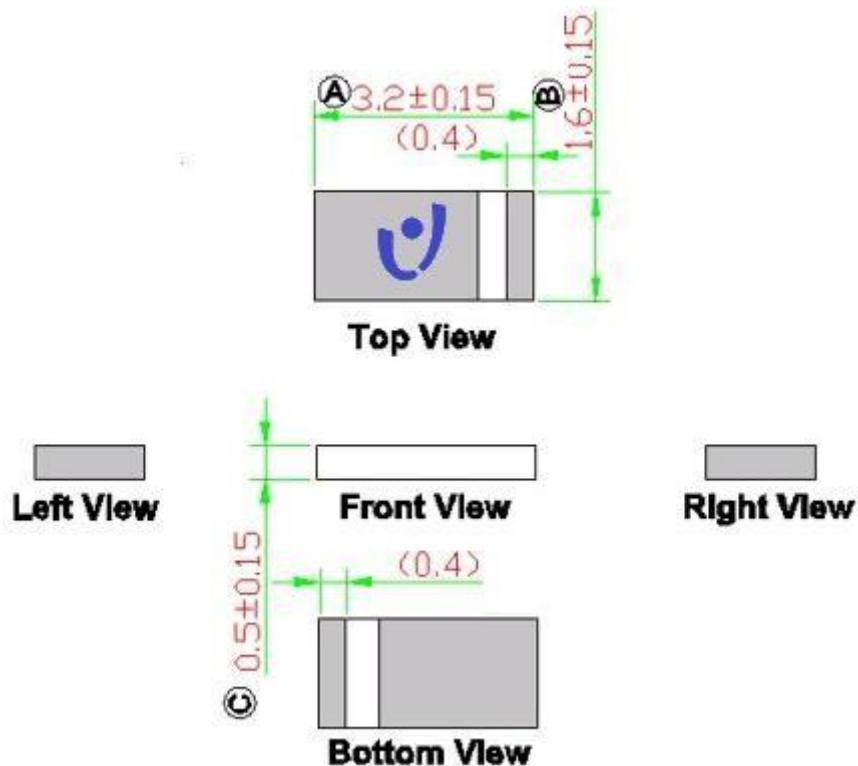
C

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



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

### 6-1. Antenna Dimensions

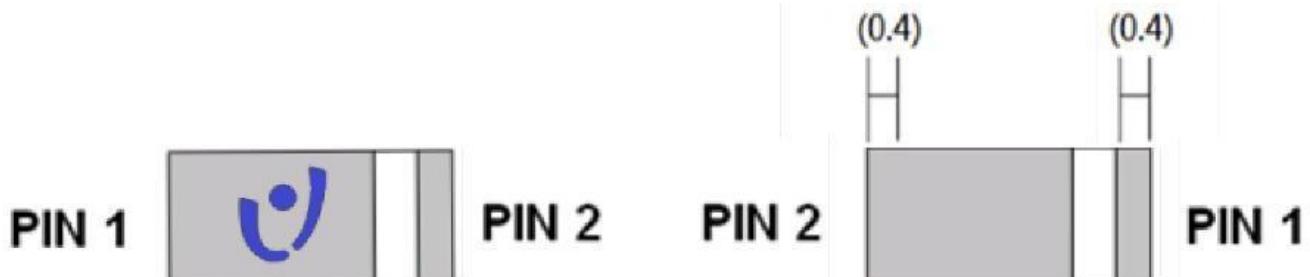


1. All materials are RoHS 2.0 compliant.  
 2. "A~C" Critical Dimensions  
 3. "( )" Reference Dimensions

Unictron  
Technologies Corp.  
2020-07-01

 <b>Unictron</b> Technologies Corp.	Unictron Technologies Corporation Website: <a href="http://www.unictron.com">www.unictron.com</a>	THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION		
		Prepared by : Jane	Designed by : James	Checked by : Mike
<b>TITLE :</b> 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip Antenna (AA077U) Engineering Specification	<b>DOCUMENT</b> NO.	<b>H2U84W1H1S0800</b>		REV.  <b>C</b>
		PAGE	3	OF 19

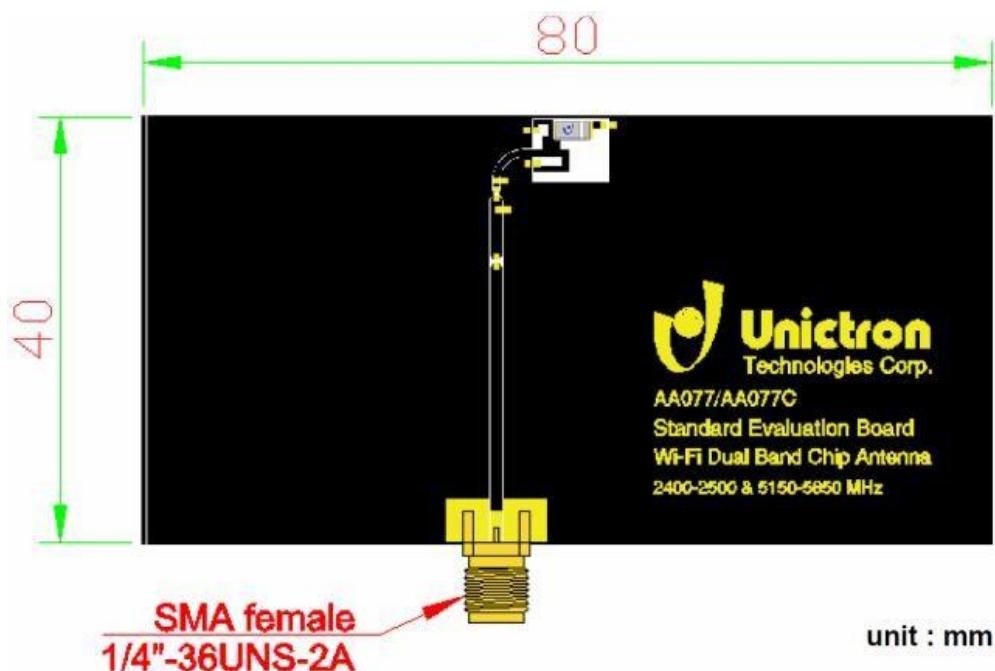
## PIN Definition



Unit : mm

PIN	1	2
Soldering PAD	Signal	Tuning / Ground

## 6-2. Evaluation Board with Antenna



Unictron  
Technologies Corp.  
2020-07-01  
Document  
Control



Unictron Technologies Corporation  
Website: [www.unictron.com](http://www.unictron.com)

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Jane

Designed by : James

Checked by : Mike

Approved by : Herbert

TITLE : 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
Antenna (AA077U) Engineering  
Specification

DOCUMENT  
NO.

H2U84W1H1S0800

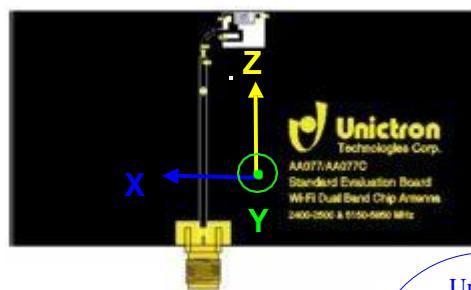
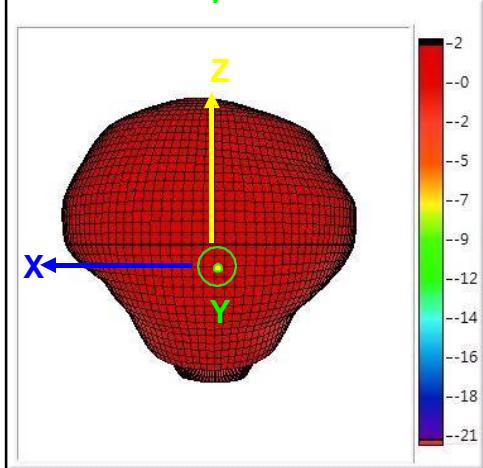
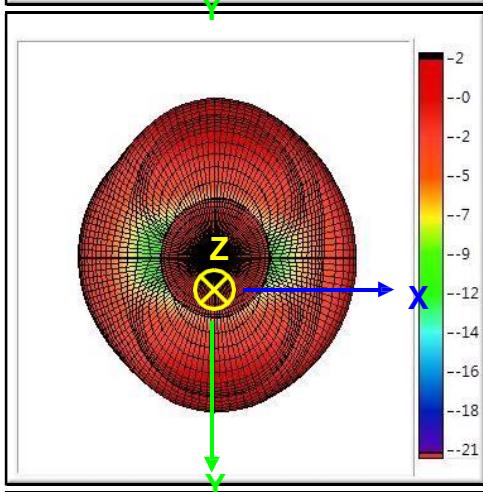
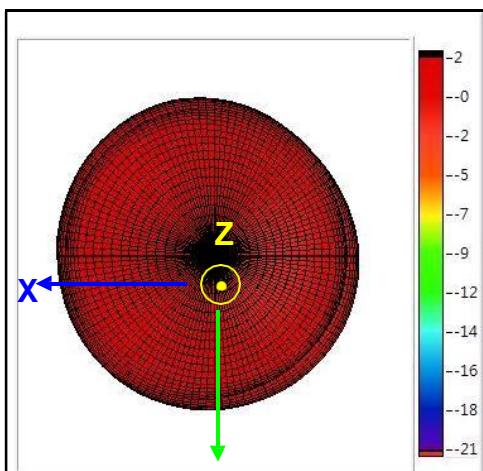
REV.

C

## 7. 3D Radiation Gain Pattern (with 80 x 40 mm<sup>2</sup> Evaluation Board)

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

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



Unictron Technologies Corporation  
Website: [www.unictron.com](http://www.unictron.com)

THIS DRAWINGS AND SPECIFICATIONS ARE  
PROPERTY OF UNICTRON TECHNOLOGIES  
CORPORATION AND SHALL NOT BE REPRODUCED  
OR USED AS THE BASIS FOR THE MANUFACTURE OR  
SALE OF APPARATUS OR DEVICES WITHOUT  
PERMISSION

Prepared by : Jane

Designed by : James

Checked by : Mike

Approved by : Herbert

**TITLE :** 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
Antenna (AA077U) Engineering  
Specification

DOCUMENT  
NO.

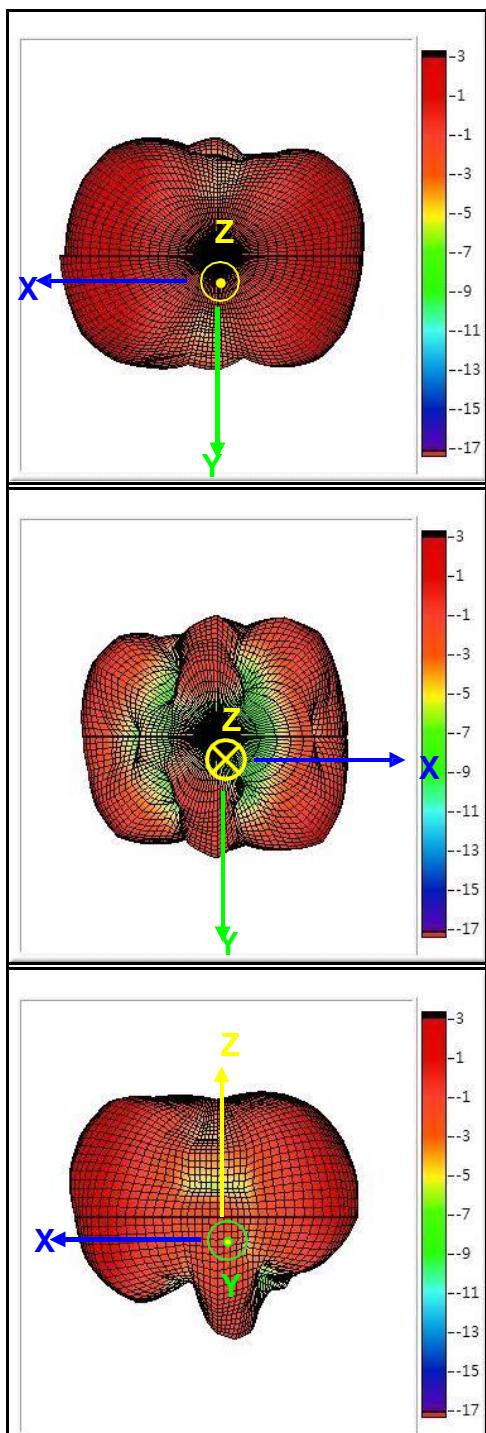
**H2U84W1H1S0800**

REV.  
**C**

Unictron  
Technologies Corp.  
2020-07-01

## 7-2. 5150~5850 MHz Band

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



Z

X

Y

Unictron  
Technologies Corp.

2020-07-01

Document

Control Center

THIS DRAWINGS AND SPECIFICATIONS ARE THE  
PROPERTY OF UNICTRON TECHNOLOGIES  
CORPORATION AND SHALL NOT BE REPRODUCED OR  
USED AS THE BASIS FOR THE MANUFACTURE OR  
SALE OF APPARATUS OR DEVICES WITHOUT  
PERMISSION

□ □ নেক্টেল

Unictron Technologies Corporation  
Website: [www.unictron.com](http://www.unictron.com)

Prepared by : Jane

Designed by : James

Checked by : Mike

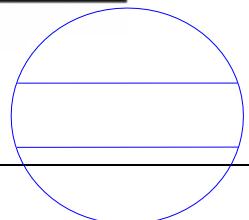
Approved by : Herbert

**TITLE : 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
Antenna (AA077U) Engineering**

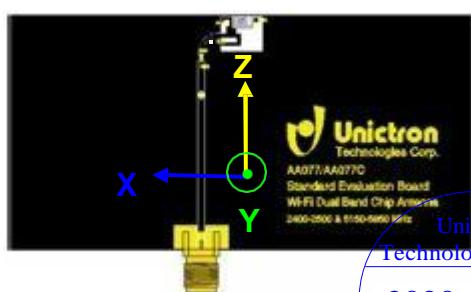
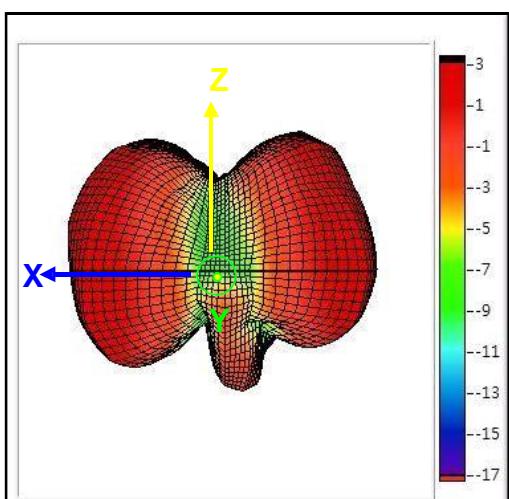
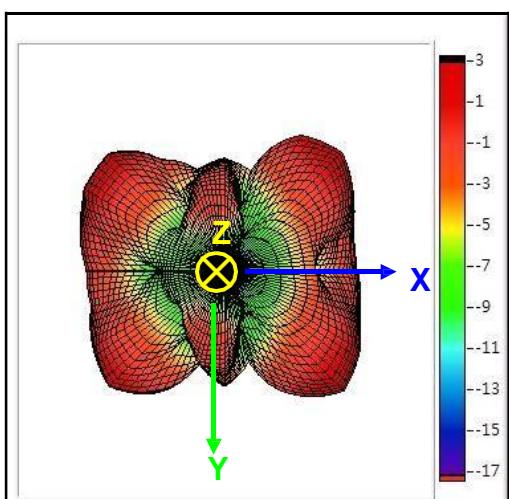
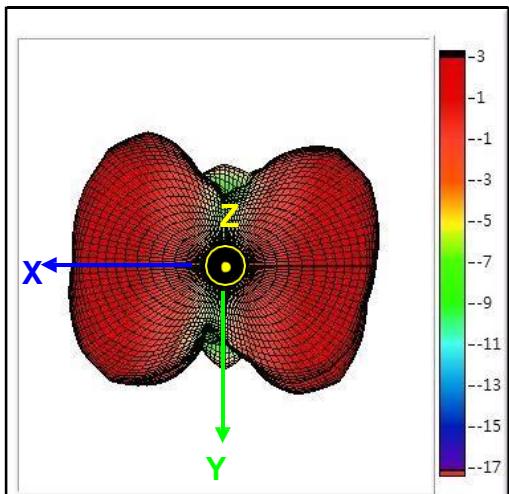
DOCUMENT

**H2U84W1H1S0800**

REV.



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



Unictron  
Technologies Corp.  
2020-07-01

Document  
Control  
Centre



□ □ নেক্টেল

Unictron Technologies Corporation  
Website: [www.unictron.com](http://www.unictron.com)

THIS DRAWINGS AND SPECIFICATIONS ARE  
PROPERTY OF UNICTRON TECHNOLOGIES  
CORPORATION AND SHALL NOT BE REPRODUCED  
OR USED AS THE BASIS FOR THE MANUFACTURE OR  
SALE OF APPARATUS OR DEVICES WITHOUT  
PERMISSION

Prepared by : Jane

Designed by : James

Checked by : Mike

Approved by : Herbert

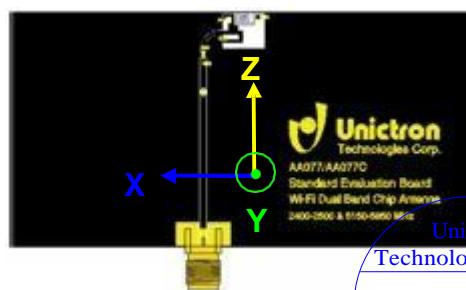
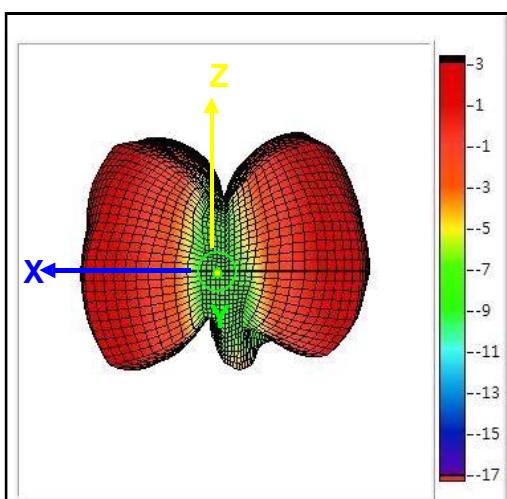
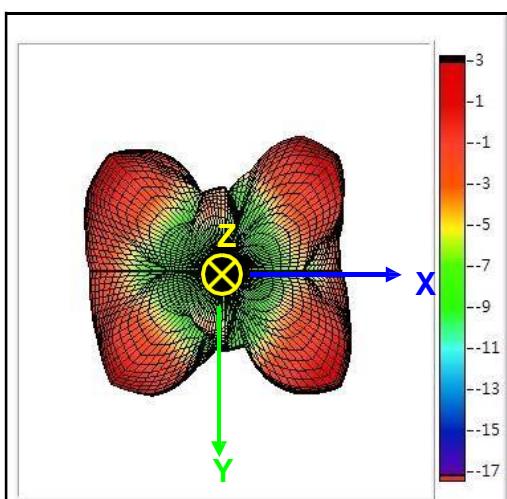
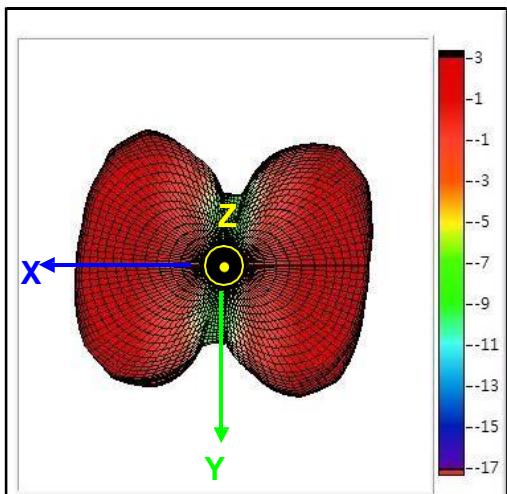
**TITLE :** 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
Antenna (AA077U) Engineering  
Specification

DOCUMENT  
NO.

H2U84W1H1S0800

REV.  
C

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



Unictron  
Technologies Corp.  
2020-07-01

Document  
Control  
Centre



□ □ নেক্টেল

Unictron Technologies Corporation  
Website: [www.unictron.com](http://www.unictron.com)

THIS DRAWINGS AND SPECIFICATIONS ARE  
PROPERTY OF UNICTRON TECHNOLOGIES  
CORPORATION AND SHALL NOT BE REPRODUCED  
OR USED AS THE BASIS FOR THE MANUFACTURE OR  
SALE OF APPARATUS OR DEVICES WITHOUT  
PERMISSION

Prepared by : Jane

Designed by : James

Checked by : Mike

Approved by : Herbert

**TITLE :** 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
Antenna (AA077U) Engineering  
Specification

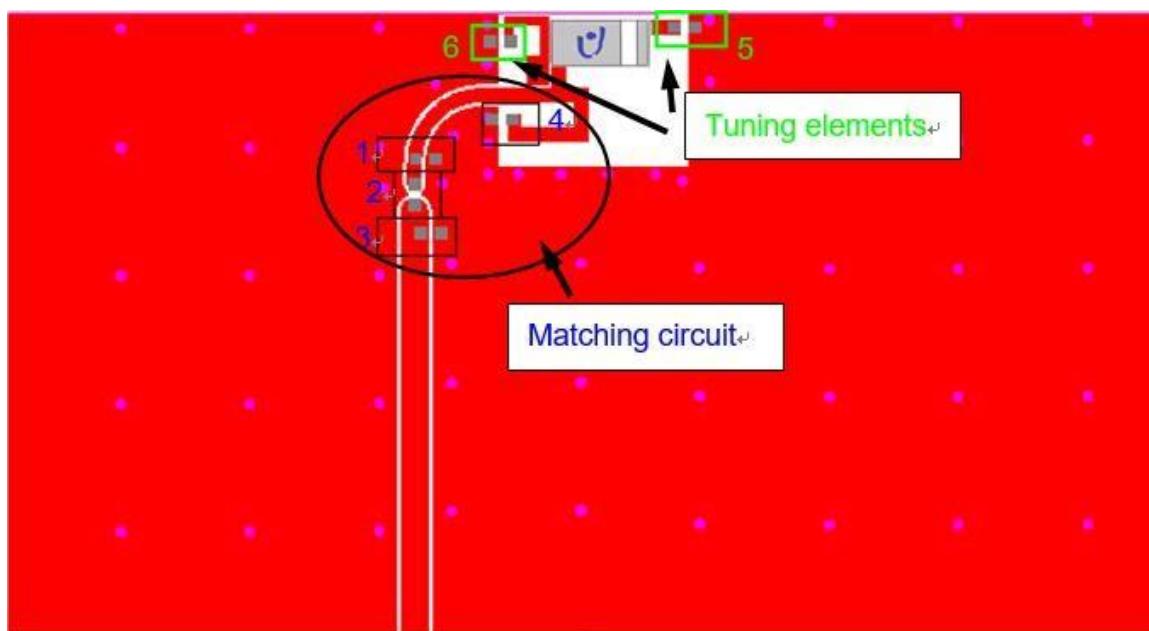
DOCUMENT  
NO.

H2U84W1H1S0800

REV.  
C

## 8. Frequency tuning and Matching circuit

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



@ 80 x 40 mm<sup>2</sup> ground plane)

### 8-2. Matching circuit :

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 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.



નોંધેકાળી

Unictron Technologies Corporation  
Website:www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE  
PROPERTY OF UNICTRON TECHNOLOGIES  
CORPORATION AND SHALL NOT BE REPRODUCED  
OR USED AS THE BASIS FOR THE MANUFACTURE OR  
SALE OF APPARATUS OR DEVICES WITHOUT  
PERMISSION

Prepared by : Jane

Designed by : James

Checked by : Mike

Approved by : Herbert

**TITLE :** 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
Antenna (AA077U) Engineering  
Specification

DOCUMENT  
NO.

H2U84W1H1S0800

REV.  
C

Typical Matching Circuit Components			
Location	Description	Vendor	Tolerance
1	N/A*	(0402)	-
2	1 nH*	DARFON(0402)	$\pm 0.1$ nH
3	0.2 pF*	DARFON(0402)	$\pm 0.1$ pF
4	22 pF*	TDK(0402)	$\pm 2\%$
5	1 pF*	DARFON(0402)	$\pm 0.1$ pF
6	0.2 pF*	DARFON(0402)	$\pm 0.1$ pF

### 8-3. Reference for frequency tuning element 5 (2400~2500 MHz Band)

Unictron  
Technologies Corp.

2020-07-01

Document

THIS DRAWINGS AND SPECIFICATIONS ARE THE  
PROPERTY OF UNICTRON TECHNOLOGIES  
CORPORATION AND SHALL NOT BE REPRODUCED  
OR USED AS THE BASIS FOR THE MANUFACTURE OR  
SALE OF APPARATUS OR DEVICES WITHOUT  
PERMISSION

**Unictron Technologies**

Unictron Technologies Corporation  
Website: [www.unictron.com](http://www.unictron.com)

Prepared by : Jane

Designed by : James

Checked by : Mike

Approved by : Herbert

**TITLE : 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
Antenna (AA077U) Engineering**

DOCUMENT

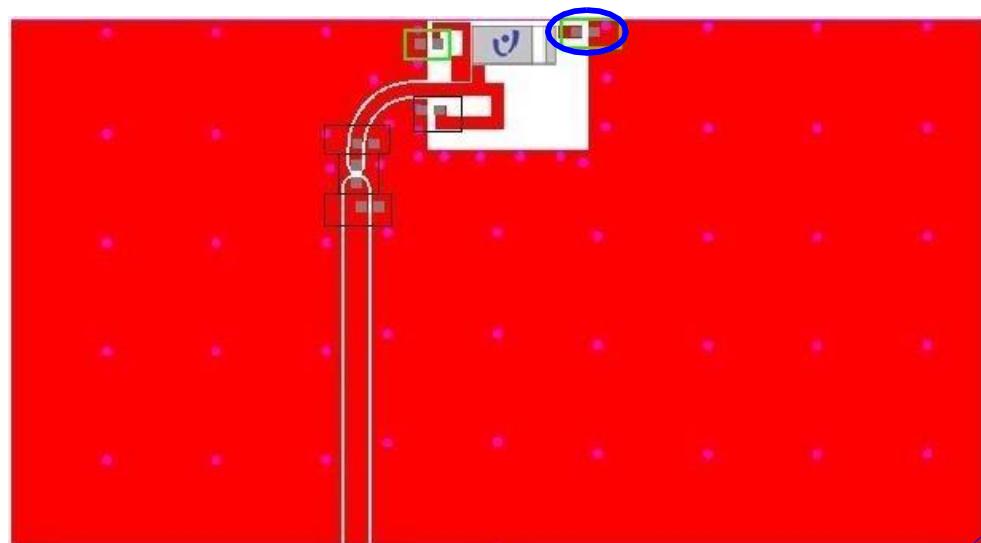
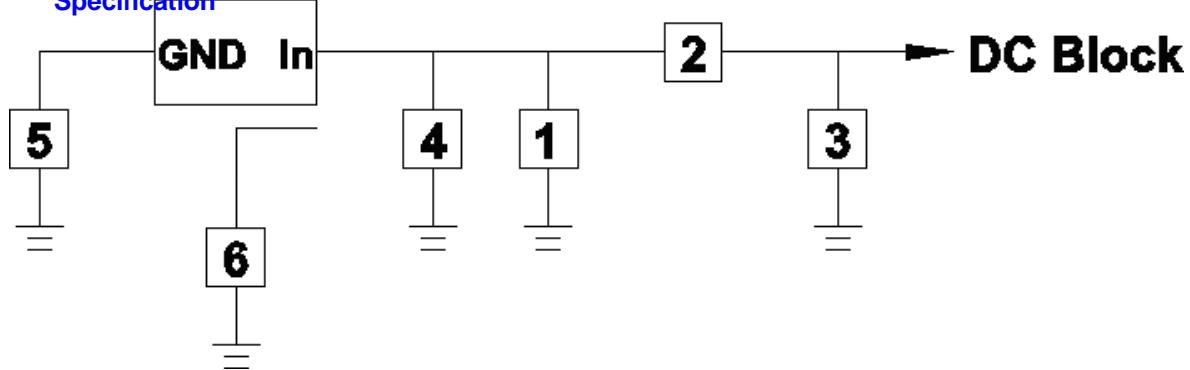
**H2U84W1H1S0800**

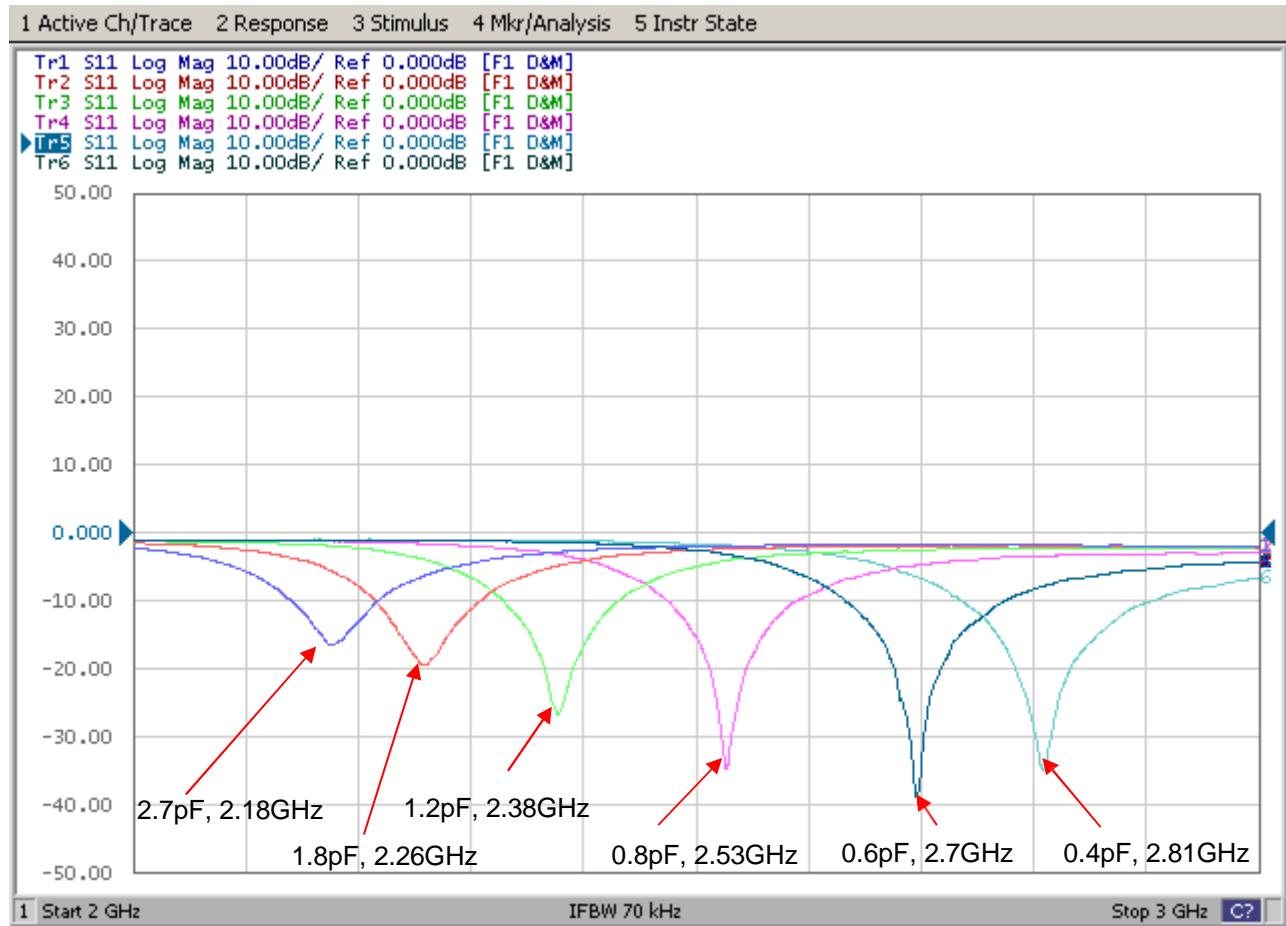
REV.

Specification

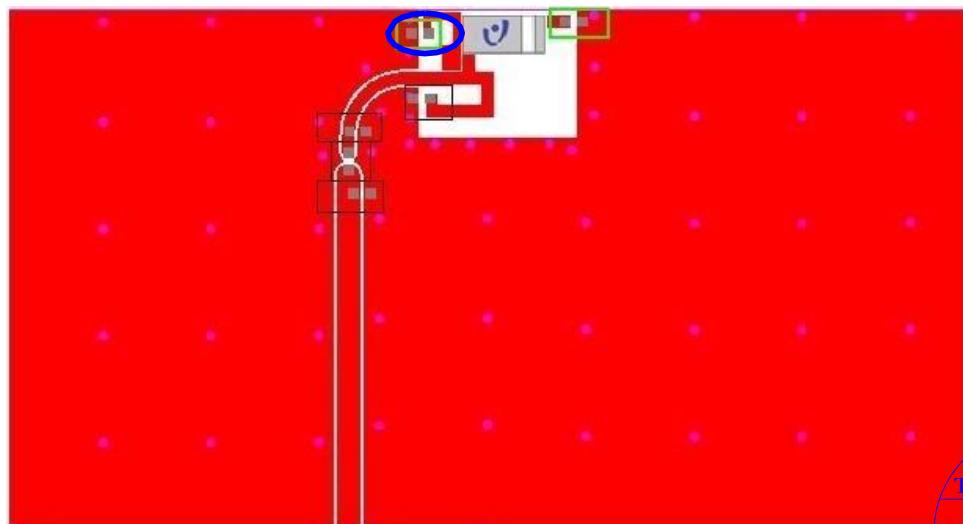
NO.

C





8-4. Reference for frequency tuning element 6 (5150~5850 MHz Band)



Unictron  
 Technologies Corp.  
 2020-07-01  
 Document  
 C:\...\Unictron\AA077U\AA077U.dwg



ঃ নেক্টেল

Unictron Technologies Corporation  
 Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE  
 PROPERTY OF UNICTRON TECHNOLOGIES  
 CORPORATION AND SHALL NOT BE REPRODUCED  
 OR USED AS THE BASIS FOR THE MANUFACTURE OR  
 SALE OF APPARATUS OR DEVICES WITHOUT  
 PERMISSION

Prepared by : Jane

Designed by : James

Checked by : Mike

Approved by : Herbert

**TITLE :** 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
 Antenna (AA077U) Engineering  
 Specification

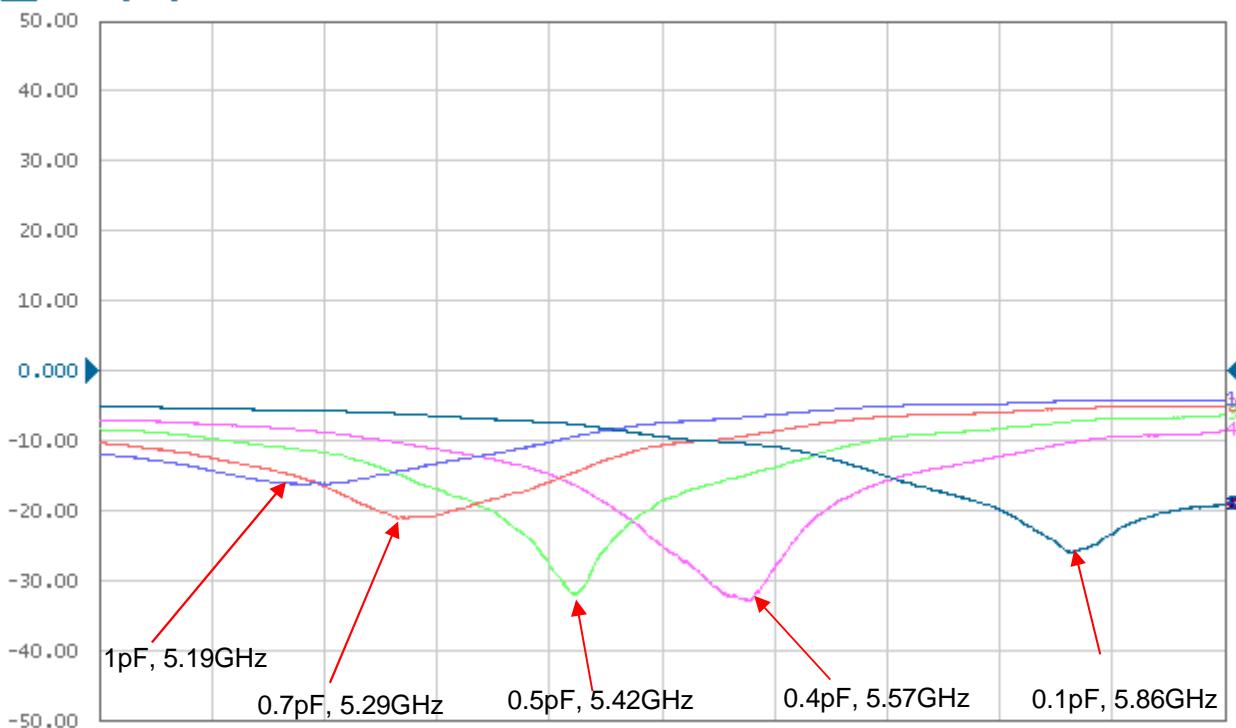
DOCUMENT  
 NO.

H2U84W1H1S0800

REV.  
 C

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State

Tr1 S22 Log Mag 10.00dB/ Ref 0.000dB [F1 D&M]  
Tr2 S22 Log Mag 10.00dB/ Ref 0.000dB [F1 D&M]  
Tr3 S22 Log Mag 10.00dB/ Ref 0.000dB [F1 D&M]  
Tr4 S22 Log Mag 10.00dB/ Ref 0.000dB [F1 D&M]  
► Tr5 S22 Log Mag 10.00dB/ Ref 0.000dB [F1 D&M]



□ □ নোটোৱা

Unictron Technologies Corporation  
Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Jane

Designed by : James

Checked by : Mike

Approved by : Herbert

**TITLE :** 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
Antenna (AA077U) Engineering  
Specification

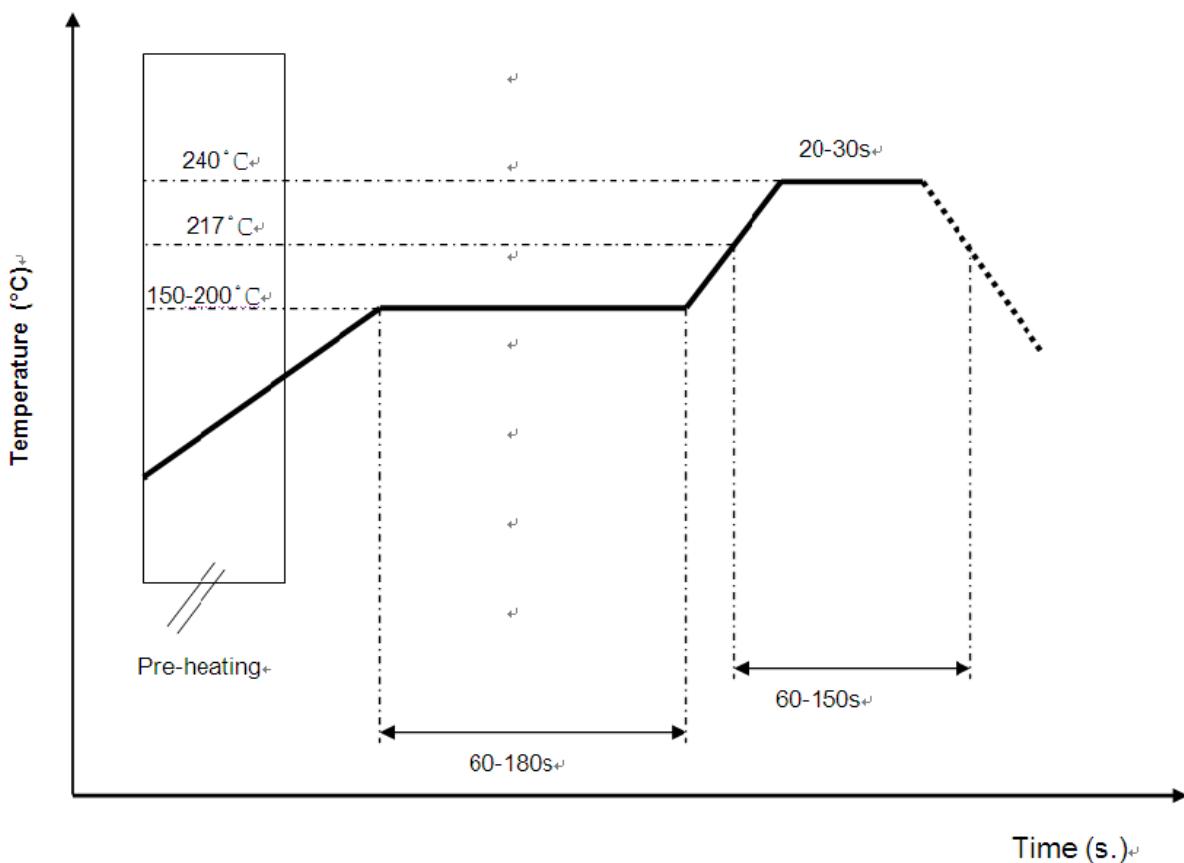
DOCUMENT  
NO.

H2U84W1H1S0800

REV.  
C

## 9. Soldering Conditions

### Typical Soldering Profile for Lead-free Process



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

## 10. Reminders for users of Unictron's AA077U 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.



□ □ নেক্টেল

Unictron Technologies Corporation  
Website: [www.unictron.com](http://www.unictron.com)

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Jane

Designed by : James

Checked by : Mike

Approved by : Herbert

**TITLE :** 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip Antenna (AA077U) Engineering Specification

DOCUMENT  
NO.

H2U84W1H1S0800

REV.  
C

## 11. Packing

(1) Packaging method is implemented according to " MSL 2a ~~ХОЛДУВАНІ~~ "

(2) Quantity/Reel: 5000 pcs/Reel

(3) Plastic tape: Black conductive polystyrene.

a. Tape Drawing

b. Tape Dimensions (unit: mm)

### 2.1 Tape Dimensions(unit: mm)

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	$\pm 0.20$

c. Reel Drawing

Unictron  
Technologies Corp.

2020-07-01

Document  
Control Center

THIS DRAWINGS AND SPECIFICATIONS ARE THE  
PROPERTY OF UNICTRON TECHNOLOGIES  
CORPORATION AND SHALL NOT BE REPRODUCED  
OR USED AS THE BASIS FOR THE MANUFACTURE OR  
SALE OF APPARATUS OR DEVICES WITHOUT  
PERMISSION



Unictron Technologies Corporation  
Website:www.unictron.com

Prepared by : Jane

Designed by : James

Checked by : Mike

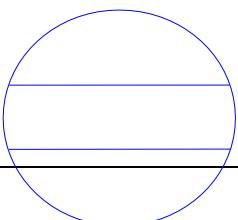
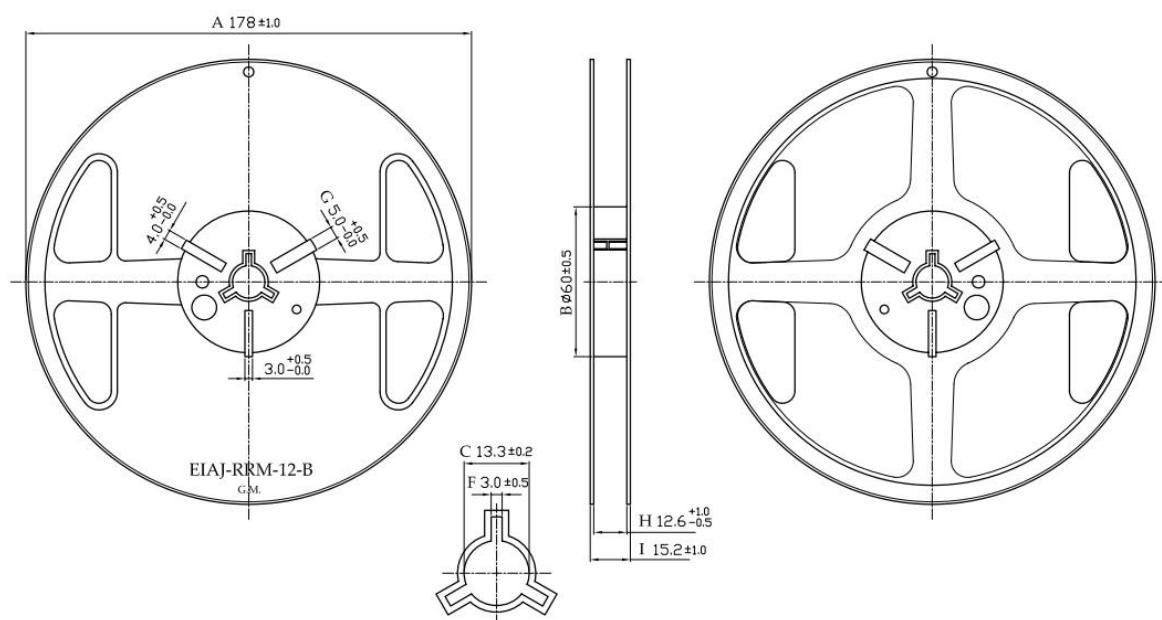
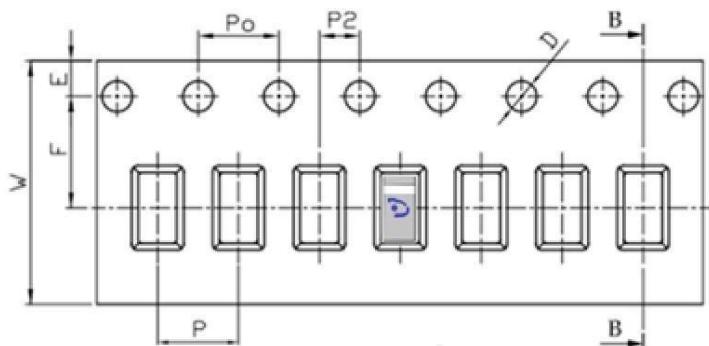
Approved by : Herbert

**TITLE : 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
Antenna (AA077U) Engineering**

DOCUMENT

**H2U84W1H1S0800**

REV.



## 12. Operating & Storage Conditions

### 12-1. Operating

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

### 12-2. Storage (sealed)

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

### 12-3. Storage (unsealed)

Meet the criteria of J-STD-033 MSL2a

### 12-4. Storage (After mounted on customer's PCB with SMT process)

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

## 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.



□ □ নেক্টেল

Unictron Technologies Corporation  
Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Jane

Designed by : James

Checked by : Mike

Approved by : Herbert

**TITLE :** 3.2 x 1.6 x 0.5 (mm) WiFi Dual Band Chip  
Antenna (AA077U) Engineering  
Specification

DOCUMENT  
NO.

H2U84W1H1S0800

REV.

C



