



# Antenna Datasheet

**Product OC** (Antenna Only): YXU00A0AA

**Product OC** (Antenna + Rectangular EVB): YXU00A0EVBAA

**Version:** 2.0

**Date:** 2023-10-20

**Status:** Released

**Product Name:** Wi-Fi SMD Antenna

**Key Features:**

Frequency Band: 2400–2500 MHz; 5150–7125 MHz

Dimensions: 8.0 mm × 6.6 mm × 1.6 mm

Efficiency: Up to 71%

RoHS and Compliant

# Overview

Quectel Wi-Fi antenna covers 2.4 GHz, 5 GHz, and up to 7 GHz bands, fully satisfying customers' requirements for Wi-Fi 5, Wi-Fi 6, and Wi-Fi 6E/Wi-Fi 7. There are various antenna types, including built-in FPC/PCB antenna, ceramic patch antenna, and other external antennas of different shapes or sizes. The antenna performance meets the customers' demands for efficiency, gain, and radiation and ensures the superior experience of the customers' products in use.

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# 1 Specification

Test Condition: Assembled on 60 × 50 mm EVB

## 1.1. Electrical

Electrical	
Frequency Range	2400–2500 MHz; 5150–7125 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omni-directional

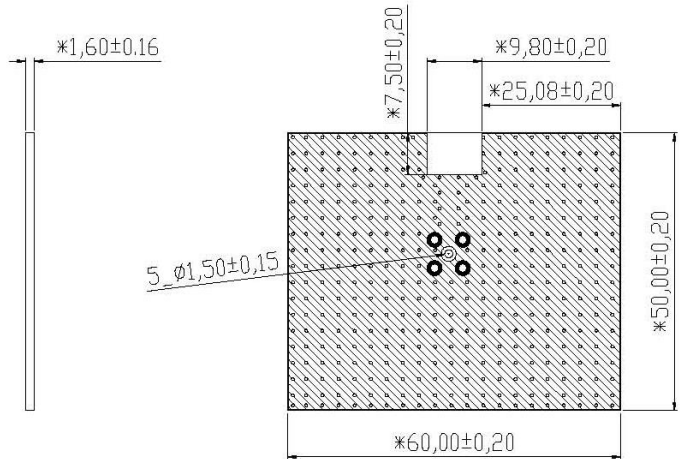
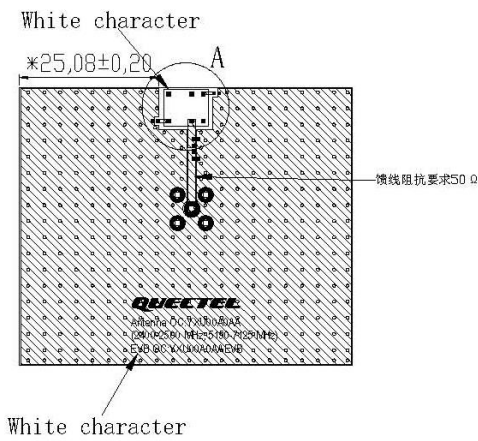
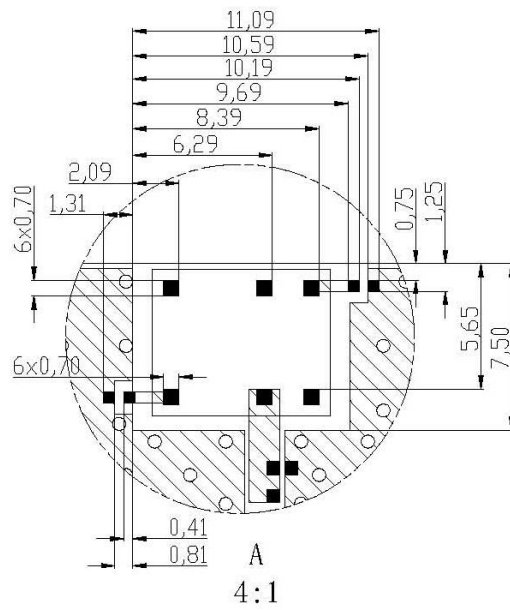
Specification	Band	Band	Wi-Fi 2.4G	Wi-Fi 5G	Wi-Fi 6e
		Freq. (MHz)	2400–2500	5150–5850	5925–7125
Max. VSWR	FS		2.1	2.4	3.3
Max. Return Loss (dB)	FS		-9.0	-7.6	-5.4
AVG Eff. (%)	FS		54.4	67.0	50.8
AVG Gain (dB)	FS		-2.6	-1.7	-3.0
Max. Peak Gain (dBi)	FS		0.5	2.4	3.6
VSWR	FS		≤ 3.3		
Return Loss	FS		≤ -5.4 dB		
Peak Gain	FS		≤ 3.6 dBi		

## 1.2. Mechanical & Environmental

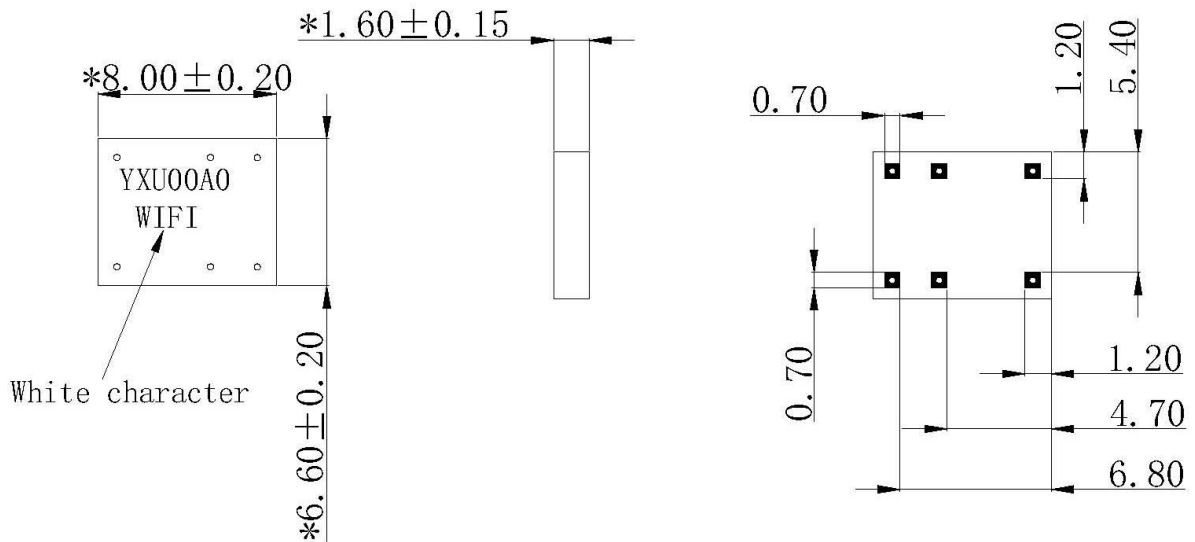
Mechanical	
Antenna Size	8.0 × 6.6 × 1.6 mm
Antenna Material & Color	PCB & Black
Antenna Weight	Typ. 0.18 g
Mounting Type	SMD
Recommended EVB Size	60 × 50 × 1.6mm
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS & Compliant	Yes

# 2 Drawing

## 2.1. Antenna

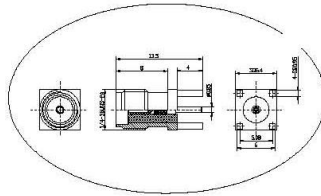


ROHS

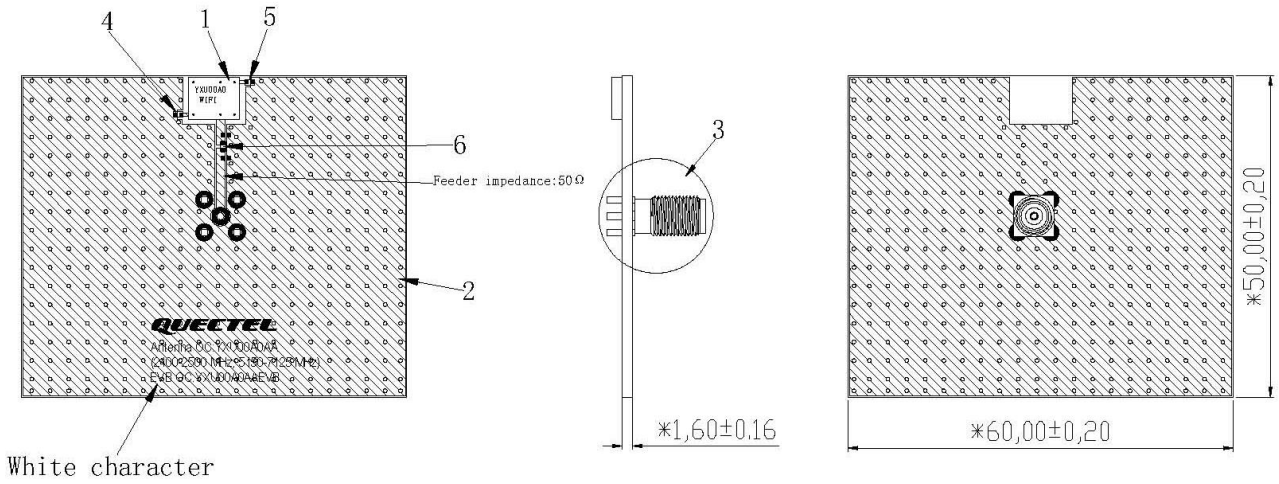


Name	Material	Brand	QTY	Model
Antenna	FR4 1.6t	Quectel	1	YXU00A0AA
PCB	FR4 1.6t	Quectel	1	YXU00A0AA EVB
SMA Female Connector	Brass	Quectel	1	-
1.8 nH	Ceramics	Murata	1	LQG15HS1N8B02D
1.5 pF	Ceramics	Murata	1	GJM1555C1H1R5BB01
0Ω	Ceramics	Murata	1	-

## 2.2. Rectangular EVB



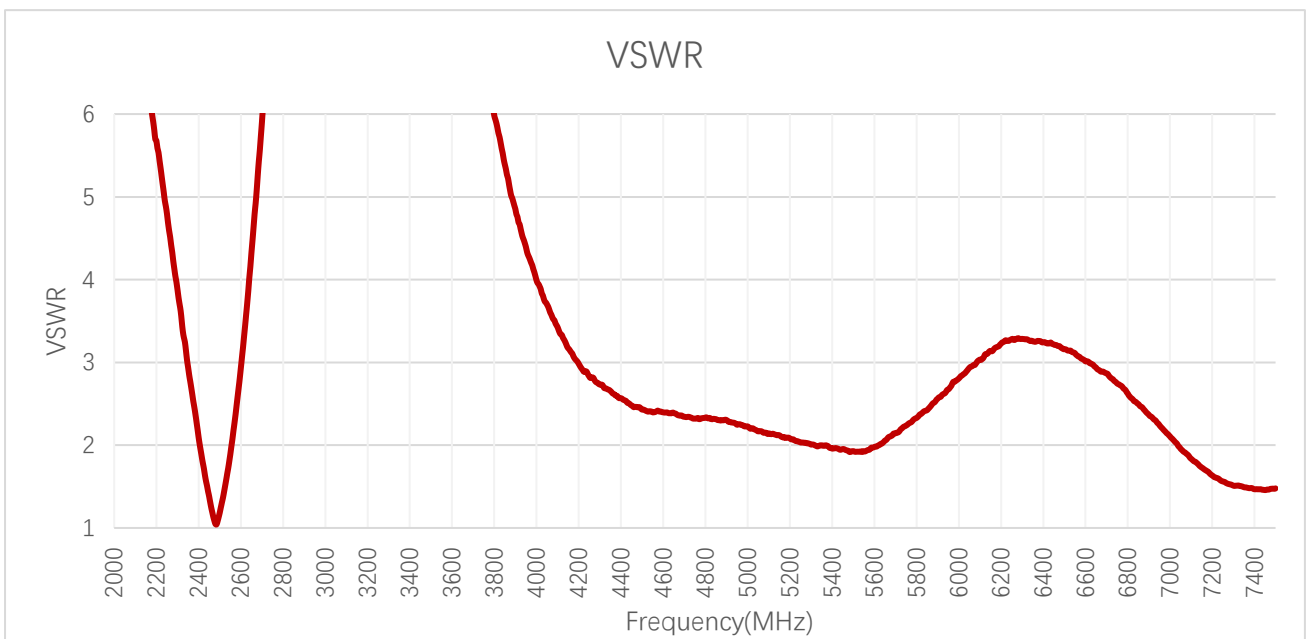
Frequency range: 0~8 GHz



# 3 Detailed Performance

## 3.1. S-Parameter Test

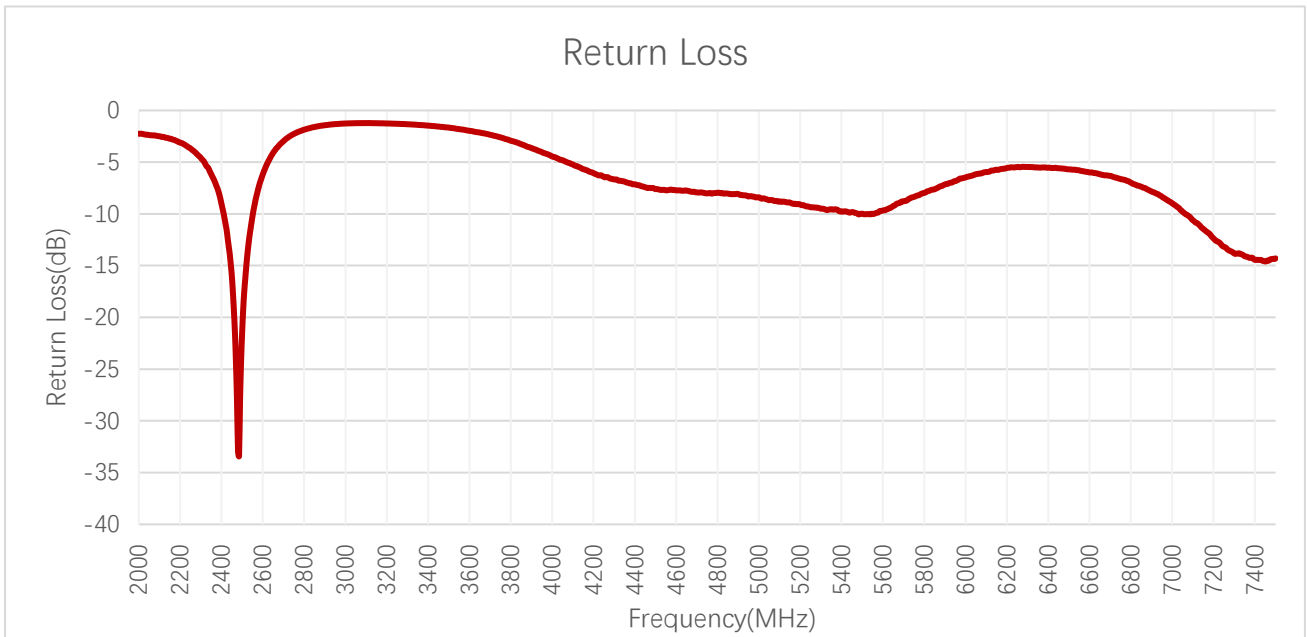
### 3.1.1. VSWR



**VSWR**

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
<b>VSWR</b>	2.1	1.4	1.2	2.1	1.9	2.4	2.6	3.3	2.8	1.8

**3.1.2. Return Loss**

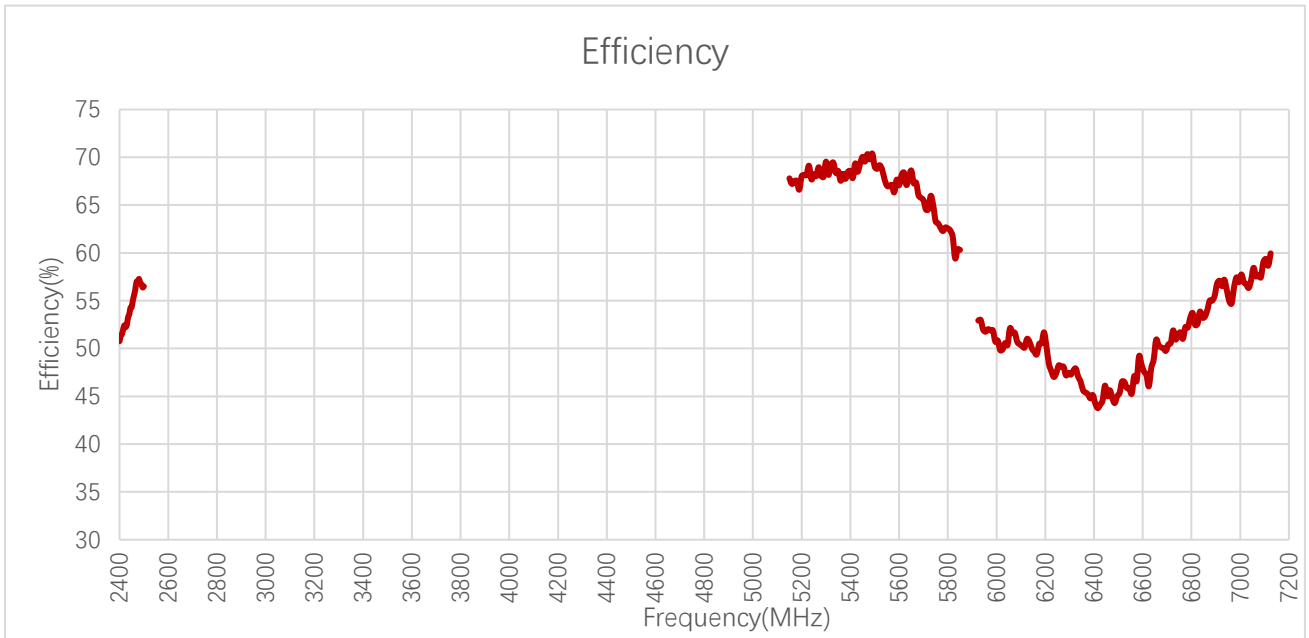


**Return Loss (dB)**

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Return Loss (dB)	-9.0	-16.0	-21.5	-8.9	-10.0	-7.6	-7.0	-5.5	-6.5	-11.0

### 3.2. Radiation Performance Test

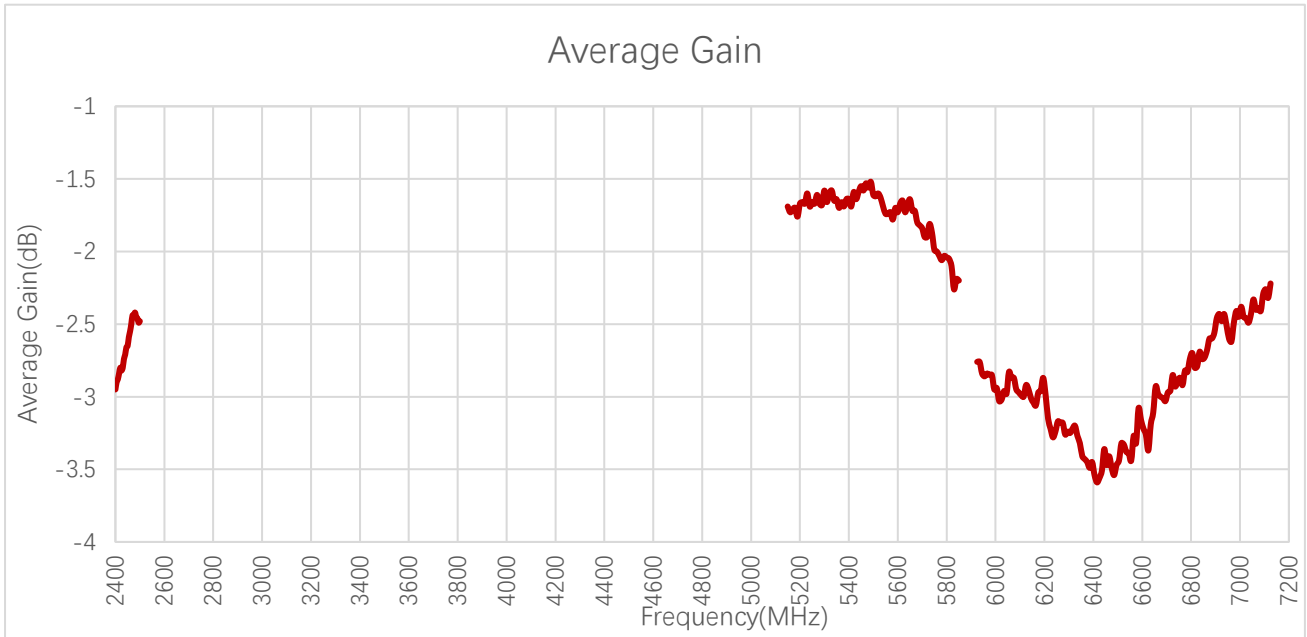
#### 3.2.1. Efficiency



**Efficiency (%)**

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Efficiency (%)	50.8	54.3	56.5	67.8	69.0	60.3	52.9	47.9	51.9	60.0

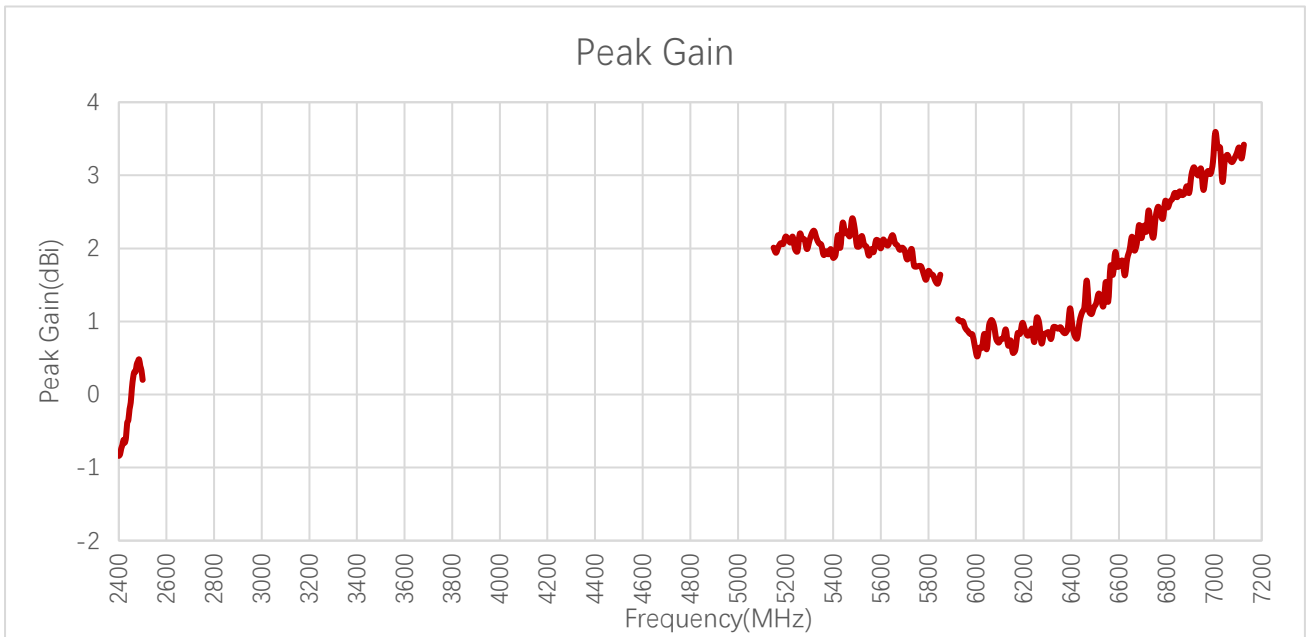
**3.2.2. Average Gain**



**Average Gain (dB)**

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Average Gain (dB)	-3.0	-2.7	-2.5	-1.7	-1.6	-2.2	-2.8	-3.2	-2.9	-2.2

**3.2.3. Peak Gain**

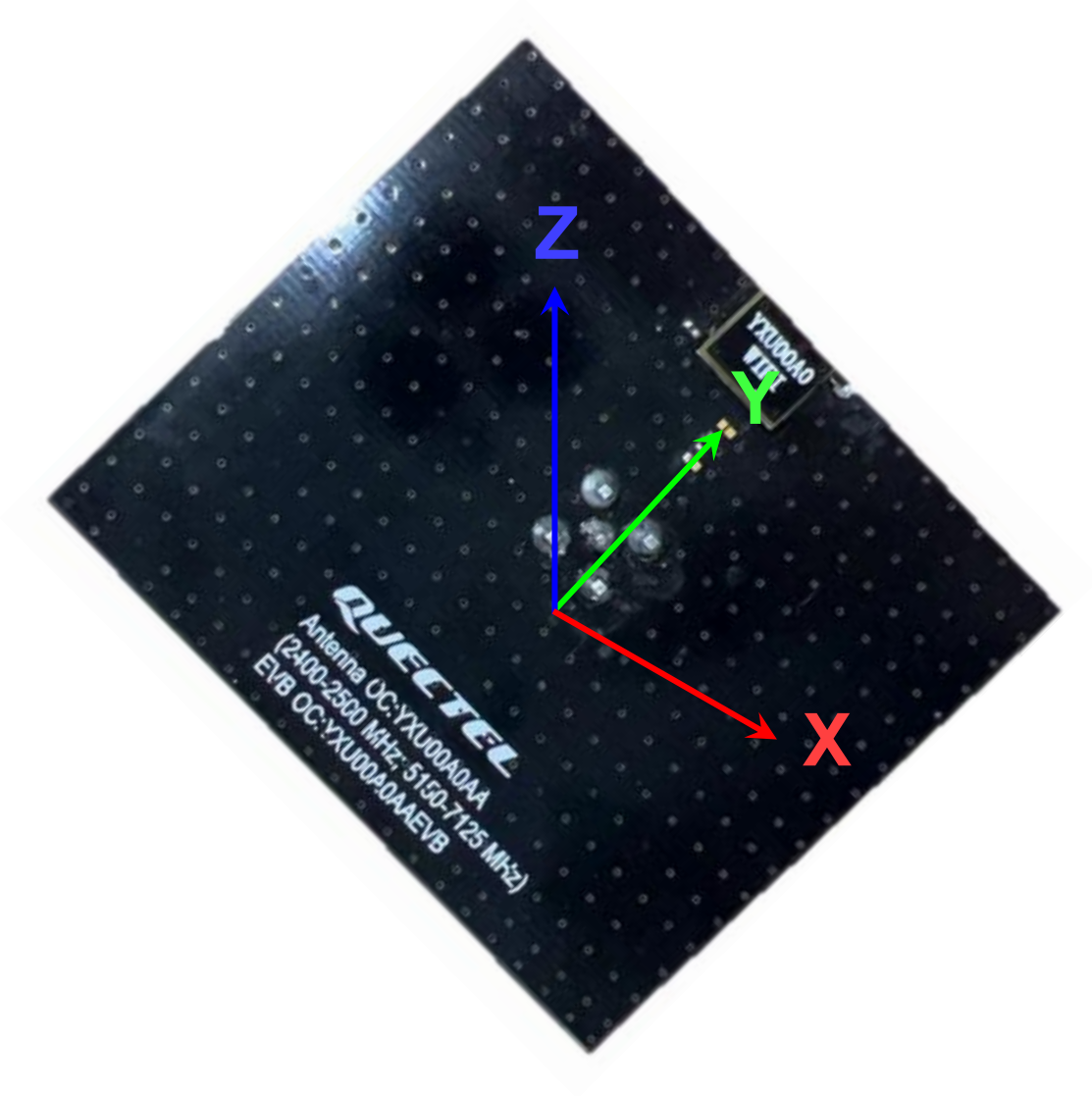


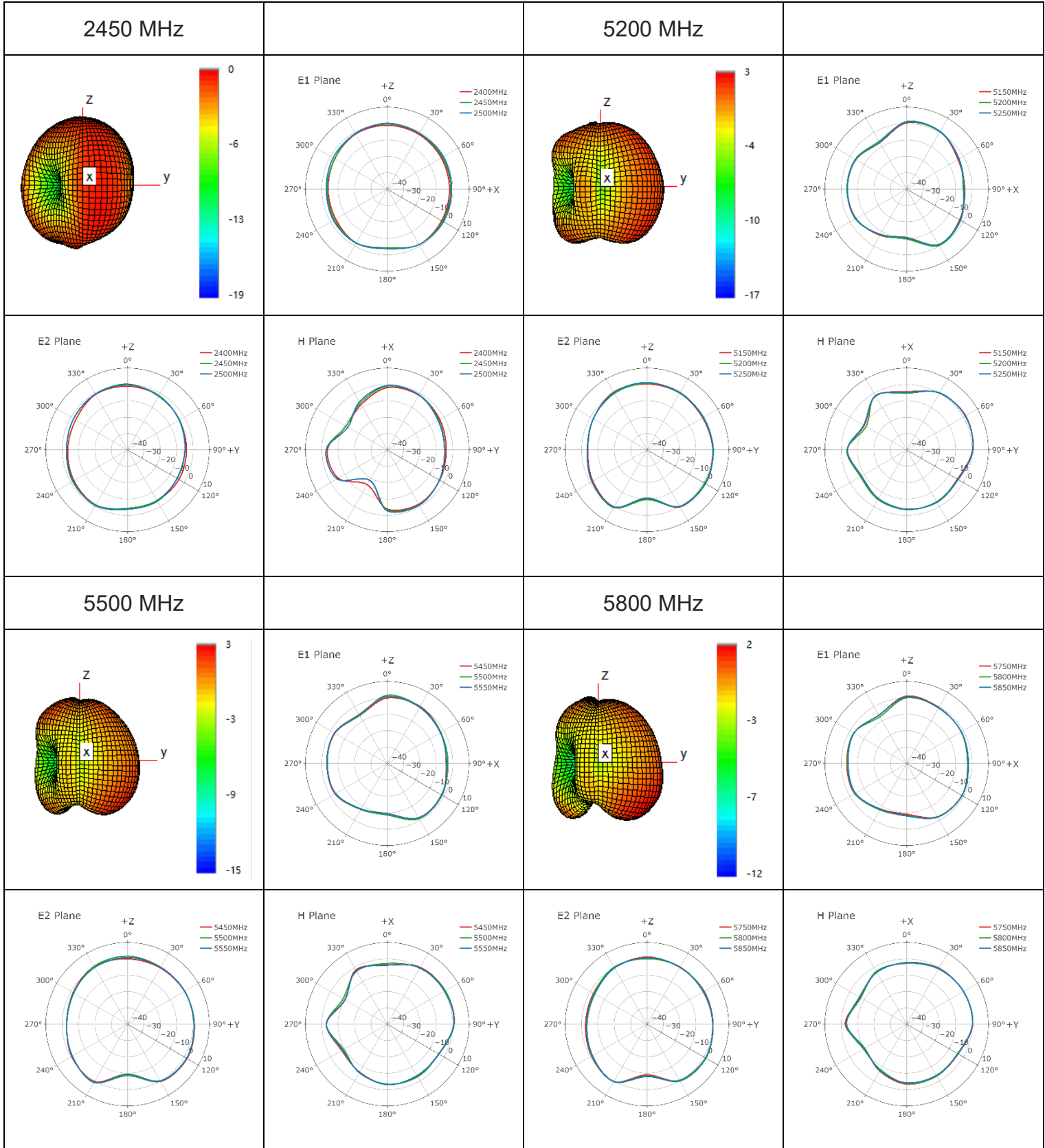
**Peak Gain (dBi)**

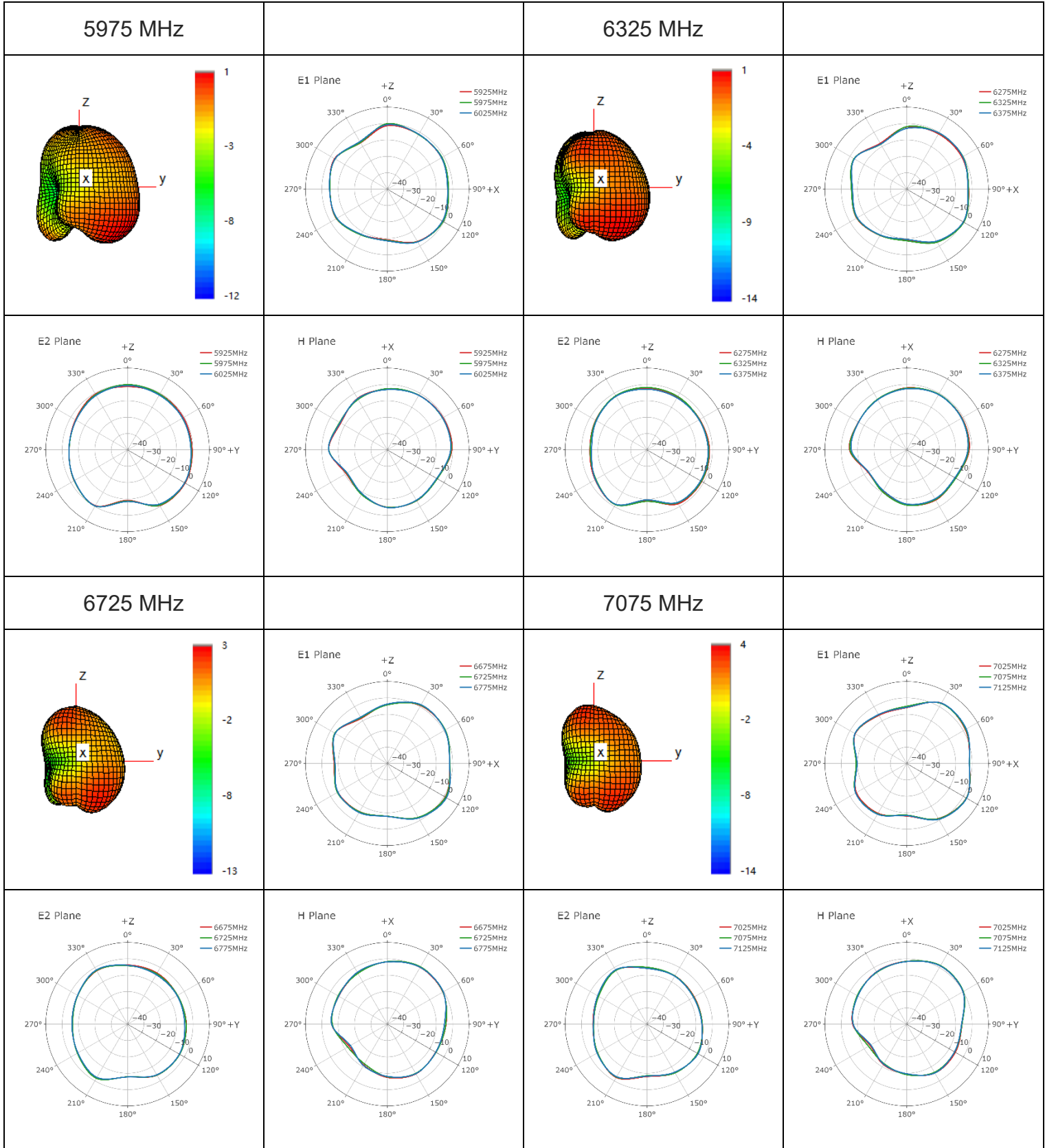
Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Peak Gain (dBi)	-0.8	-0.1	0.2	2.0	2.0	1.6	1.0	0.9	2.5	3.4

### 3.3.4. 3D & 2D Radiation Pattern

- Test Status: Assembled on 60 × 50 mm EVB

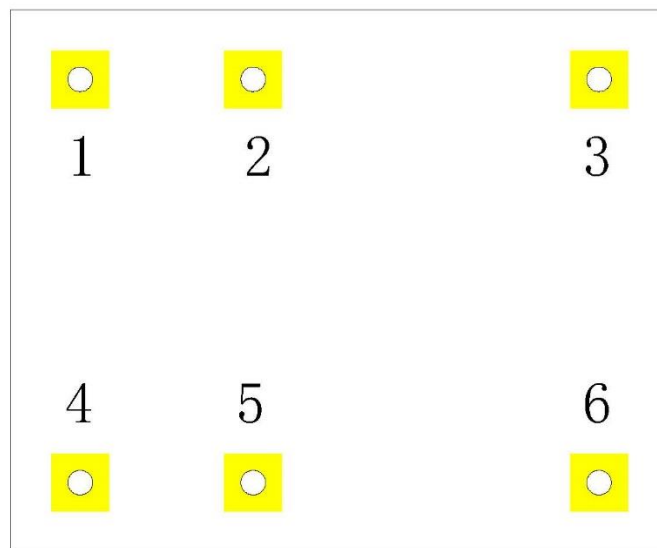






# 4 Schematic Symbol and Pin Definition

- The pin assignment for the antenna is as follows.
- The antenna has 6 pins and only three work.
- All other pins are designed for mechanical strength.



Pin No.	Description
1, 6	Antenna Tuning
2, 3, 4	Not used (Mechanical only)
5	FEED

## 5 Transmission Line

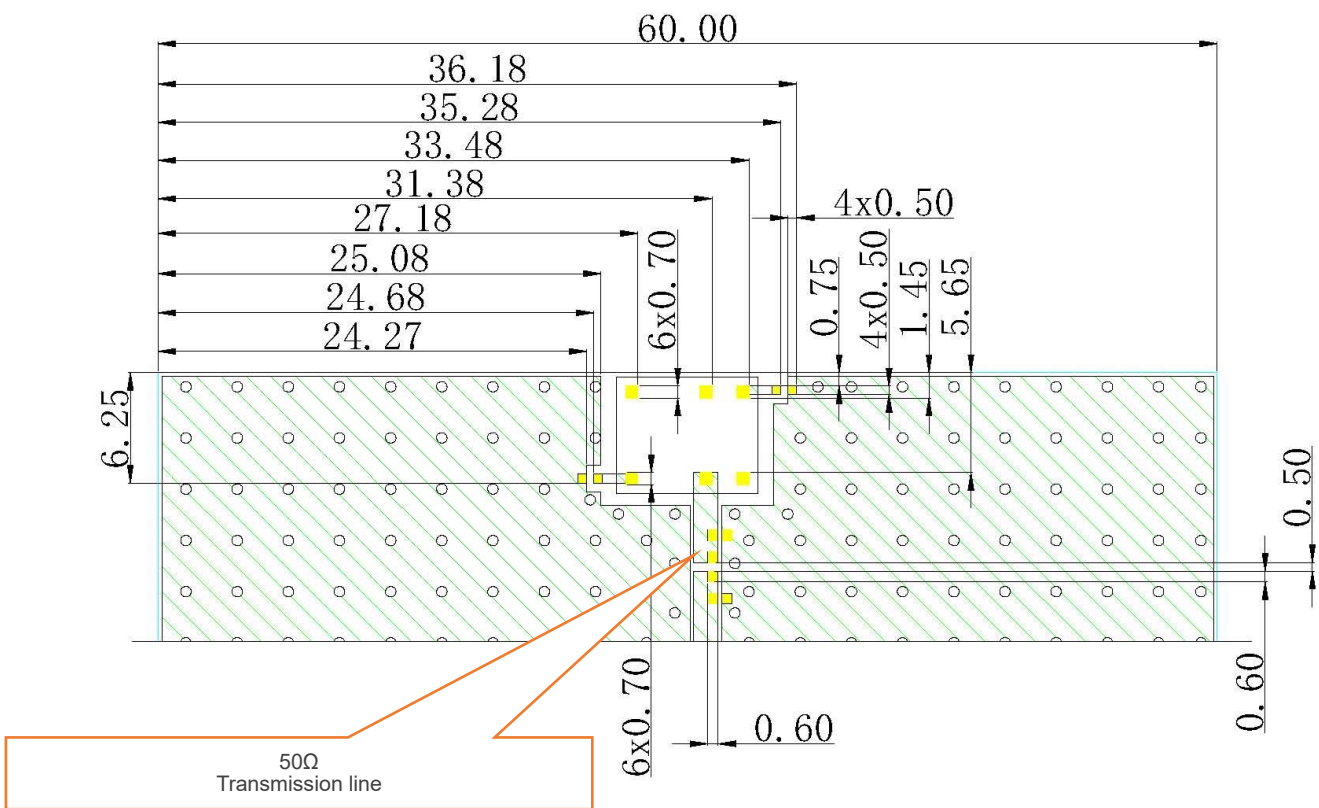
The characteristic impedance of all transmission lines shall be designed as 50  $\Omega$ .

- The length of the transmission lines should be kept as short as possible.
- Any other part of the RF system, such as transceiver, power amplifiers, etc., shall also be designed with an impedance of 50  $\Omega$ .

Once the material for the PCB has been chosen (PCB thickness and dielectric constant), a coplanar transmission line can easily be designed using any of the commercial software packages for transmission line design. For the chosen PCB thickness, copper thickness and substrate dielectric constant, the program will calculate the appropriate transmission line width and gaps on either side of the track so the characteristic impedance of the coplanar transmission is 50  $\Omega$ .

# 6 Recommended PCB Layout

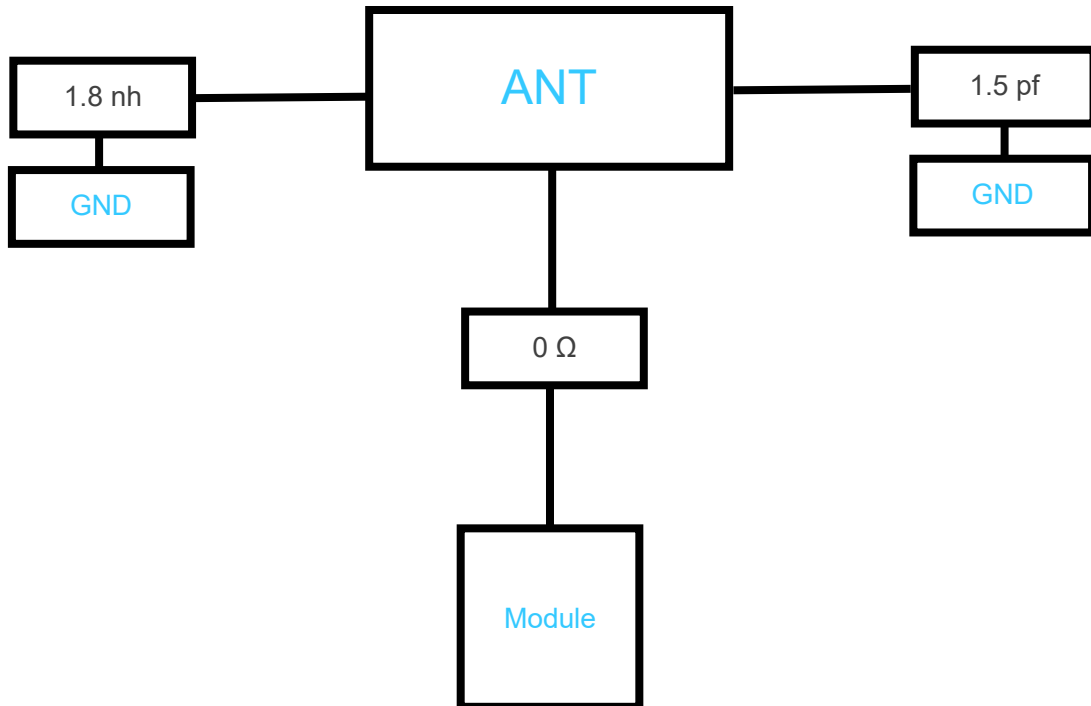
The host PCB must be designed using the PCB footprint shown with the correct clearances. An example of the PCB layout shows the antenna footprint. Please note this clearance area is critical to the performance of the antenna and must be applied through all layers of the PCB.



All dimensions in (mm)

# 7 Matching Circuit

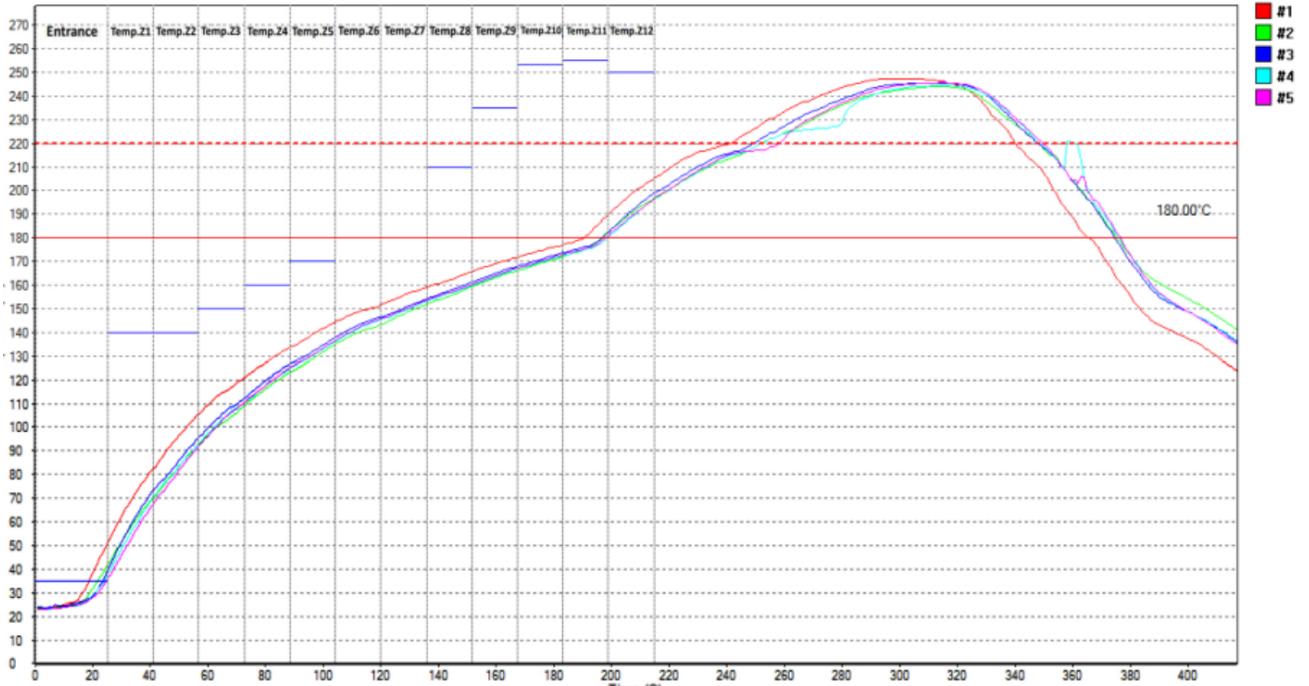
## 7.1. 60 × 50 mm EVB



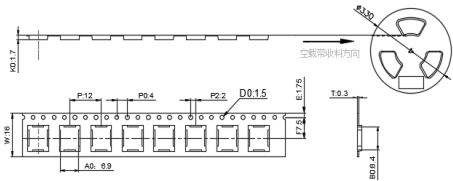
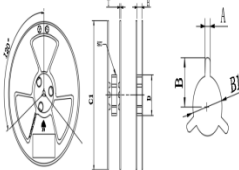

## 8 Soldering Temperature

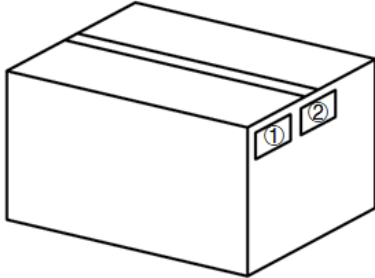
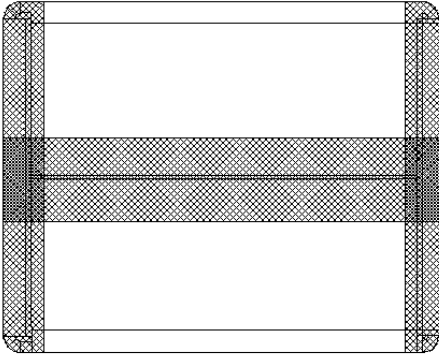
Phase	Profile Features	PB-Free Assembly
RAMP-UP	Avg. Ramp-up Rate (T <sub>smax</sub> to T <sub>p</sub> )	3 °C/second (Max.)
PREHEAT	Temperature Min (T <sub>smin</sub> ) Temperature Max (T <sub>smax</sub> ) Time (t <sub>smin</sub> to t <sub>smax</sub> )	150 °C 190 °C 110 seconds (Max.)
REFLOW	Temperature (TL) Total Time above TL (tl)	220 °C 90 seconds (Max.)
PEAK	Temperature (T <sub>p</sub> )	230–250 °C
RAMP-DOWN	Rate	-1 °C/second (Max.)

# 9 Reflow Profile



# 10 Packaging

Step	Packaging Picture / 2D Picture	Description																																																																																	
1		<p>Each carrier tape packs 3000 products.</p> <p>Place desiccant in vacuum package and vacuum.</p> <p>(3000 Antennas / Reel)</p>																																																																																	
2	<table border="1" data-bbox="323 1104 579 1350"> <thead> <tr> <th></th> <th colspan="8">V</th> </tr> <tr> <th>SPEC</th> <th>12</th> <th>18</th> <th>24</th> <th>32</th> <th>44</th> <th>56</th> <th>72</th> <th>88</th> </tr> </thead> <tbody> <tr> <td>C1±0</td> <td>330</td> <td>330</td> <td>330</td> <td>330</td> <td>330</td> <td>330</td> <td>330</td> <td>330</td> </tr> <tr> <td>H±0.5</td> <td>12.5</td> <td>16.5</td> <td>24.5</td> <td>32.5</td> <td>44.5</td> <td>56.5</td> <td>72.5</td> <td>88.5</td> </tr> <tr> <td>A±0.3</td> <td>2.3</td> <td>2.3</td> <td>2.3</td> <td>2.3</td> <td>2.3</td> <td>2.3</td> <td>2.3</td> <td>2.3</td> </tr> <tr> <td>B±0.3</td> <td>10.75</td> <td>10.75</td> <td>10.75</td> <td>10.75</td> <td>10.75</td> <td>10.75</td> <td>10.75</td> <td>10.75</td> </tr> <tr> <td>B1±0.2</td> <td>φ13.0</td> <td>φ13.0</td> <td>φ13.0</td> <td>φ13.0</td> <td>φ13.0</td> <td>φ13.0</td> <td>φ13.0</td> <td>φ13.0</td> </tr> <tr> <td>T±0.2</td> <td>2.0</td> <td>2.0</td> <td>2.0</td> <td>2.0</td> <td>2.0</td> <td>2.0</td> <td>2.0</td> <td>2.0</td> </tr> <tr> <td>D±1</td> <td>φ100</td> <td>φ100</td> <td>φ100</td> <td>φ100</td> <td>φ100</td> <td>φ100</td> <td>φ100</td> <td>φ100</td> </tr> </tbody> </table> 		V								SPEC	12	18	24	32	44	56	72	88	C1±0	330	330	330	330	330	330	330	330	H±0.5	12.5	16.5	24.5	32.5	44.5	56.5	72.5	88.5	A±0.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	B±0.3	10.75	10.75	10.75	10.75	10.75	10.75	10.75	10.75	B1±0.2	φ13.0	φ13.0	φ13.0	φ13.0	φ13.0	φ13.0	φ13.0	φ13.0	T±0.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	D±1	φ100	φ100	φ100	φ100	φ100	φ100	φ100	φ100	<p>Put the packaged products into the pizza box.</p> <p>Pack 2 carrier tapes on each pizza box.</p> <p>(6000 Antennas / Pizza Box)</p>
	V																																																																																		
SPEC	12	18	24	32	44	56	72	88																																																																											
C1±0	330	330	330	330	330	330	330	330																																																																											
H±0.5	12.5	16.5	24.5	32.5	44.5	56.5	72.5	88.5																																																																											
A±0.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3																																																																											
B±0.3	10.75	10.75	10.75	10.75	10.75	10.75	10.75	10.75																																																																											
B1±0.2	φ13.0	φ13.0	φ13.0	φ13.0	φ13.0	φ13.0	φ13.0	φ13.0																																																																											
T±0.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																																																																											
D±1	φ100	φ100	φ100	φ100	φ100	φ100	φ100	φ100																																																																											
3		<p>One box contains 2 inner boxes, a total of 12000 products.</p> <p>(2 Pizza Boxes / Carton Box)</p> <p>(12000 Antennas / Carton Box)</p> <p>Estimated quantity</p> <p>Products that cannot fill the entire carton box are packed in a suitable size carton box.</p> <p><u>Carton Size:</u></p>																																																																																	

		<u>L × W × H = 390 × 390 × 160 mm</u>
4		<p><b>Position for Attaching Labels</b></p> <ul style="list-style-type: none"> <li>① Carton Label</li> <li>② Quality Label</li> </ul>
5		<p><b>Sealing Cartons</b></p> <p>“I” type sealing cartons</p>
Note	The initial packaging method described above is for reference only, and the final actual packaging method shall be subject to the actual shipping packaging.	

## Contact Us

At Quectel, our aim is to provide timely and comprehensive services to our customers. If you require any assistance, please contact our headquarters:

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# Revision History

Version	Date	Author	Note
-	2022-01-19	Christopher Yao	Creation of the document
1.0	2022-02-11	Toby Wang	First official release
1.1	2023-06-13	Toby Wang	Added Chapter 6 and updated Chapter 5.
2.0	2023-10-20	Christopher YAO/ Toby WANG/ David LIU/ Vinnie LIU	Updated the template and all test data.

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