



Antenna Datasheet

Product OC (Antenna Only): YC0010AA
(Antenna + Rectangular EVB): YC0010AAEVB

Version: 2.0

Date: 2023-11-06

Status: Released

Product Name: Wi-Fi Chip Antenna

Key Features:

Frequency band: 2400–2500 MHz

Efficiency: Up to 68 %

Dimensions: 5.2 mm × 2 mm × 1.2 mm

ROHS and REACH Compliant

Overview

Quectel Wi-Fi 2.4G antenna covers 2.4–2.5 GHz bands, fully satisfying customers' requirements for Wi-Fi/Zigbee/BT antennas. 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 90 mm × 50 mm EVB

1.1. Electrical

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

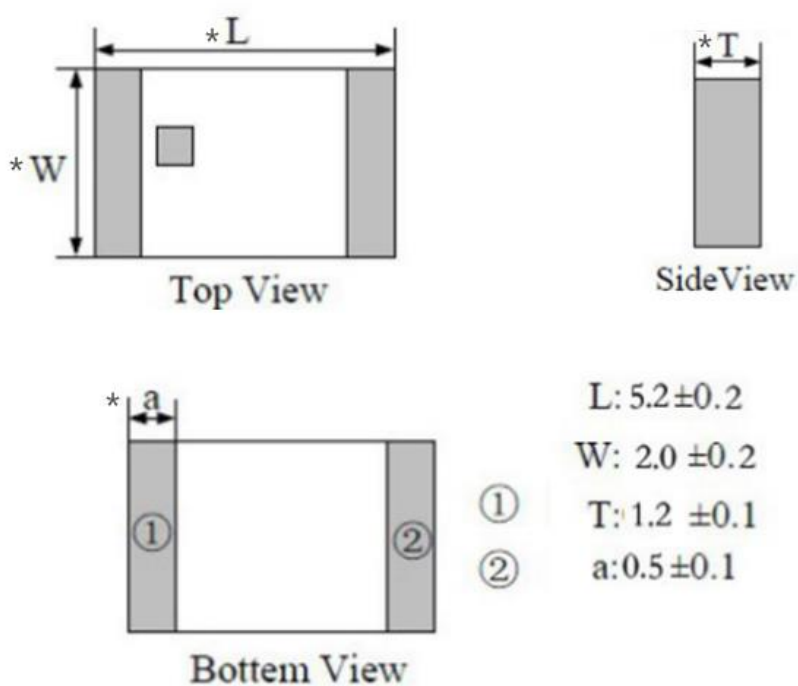
Electrical - Detail													
SPEC	Band	Band	B71	B12 /B13 /B28	B5 /B8 /B26	N74 /N75 /N76	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B42 /B48 /N77	N79	Wi-Fi 5G
	Freq. (MHz)		600– 700	700– 810	820– 960	1420– 1520	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3300– 4200	4400– 5000	5150– 5850
Max. VSWR			-	-	-	-	-	-	1.7	-	-	-	-
Max. Return Loss (dB)			-	-	-	-	-	-	-11.6	-	-	-	-
AVG Eff. (%)			-	-	-	-	-	-	64.3	-	-	-	-
AVG AVG Gain (dB)			-	-	-	-	-	-	-1.9	-	-	-	-
Max. Peak Gain (dBi)			-	-	-	-	-	-	3.4	-	-	-	-
VSWR							≤ 1.7						
Return Loss							≤ -11.6 dB						
Peak Gain							≤ 3.4 dBi						

1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	5.2 mm × 2 mm × 1.2 mm
Material & Color	Ceramic & Natural
Mounting Type	SMD
Weight	Typ. 0.04 g
Recommended EVB Size	Rectangular EVB: 90 × 50 mm
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

2 Drawing

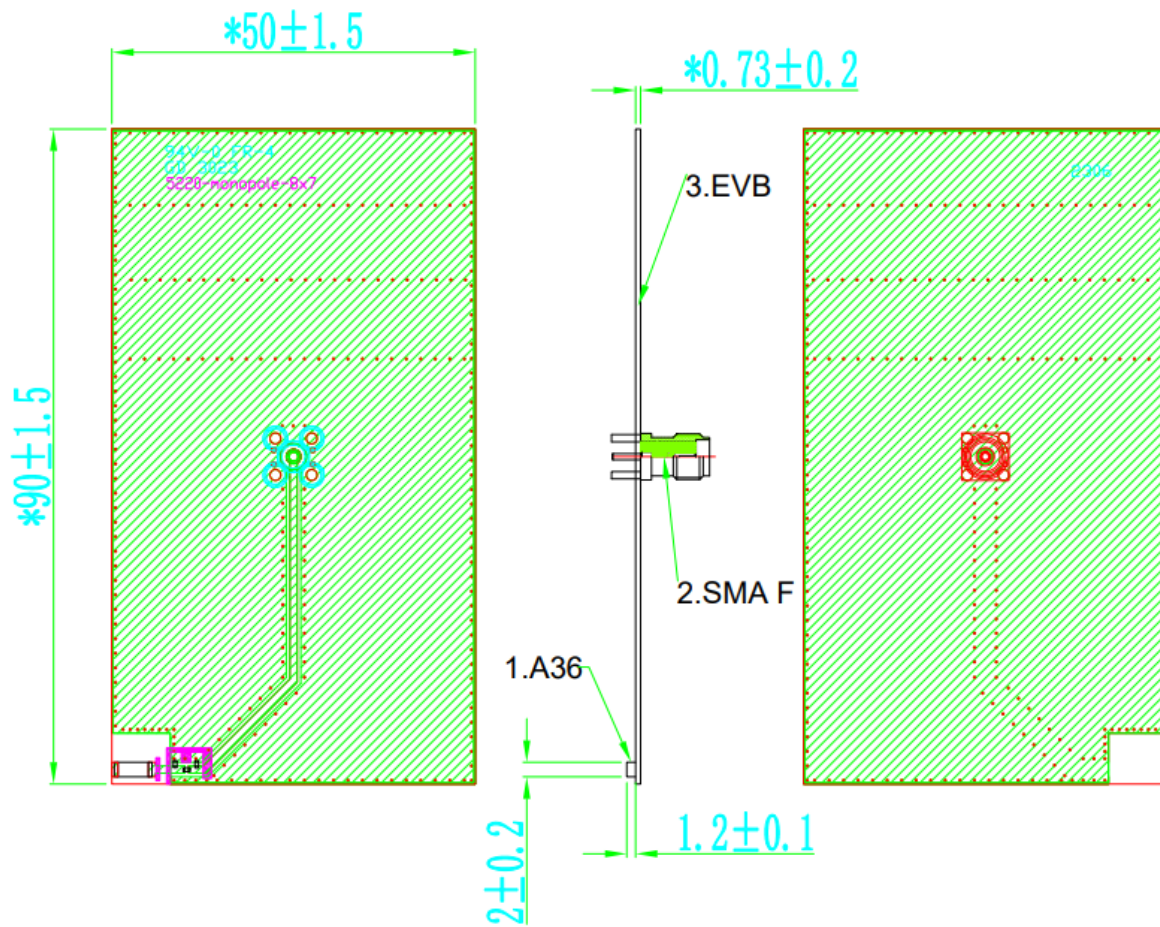
2.1. Antenna



Unit: mm

All dimensions in (mm)

2.2. EVB

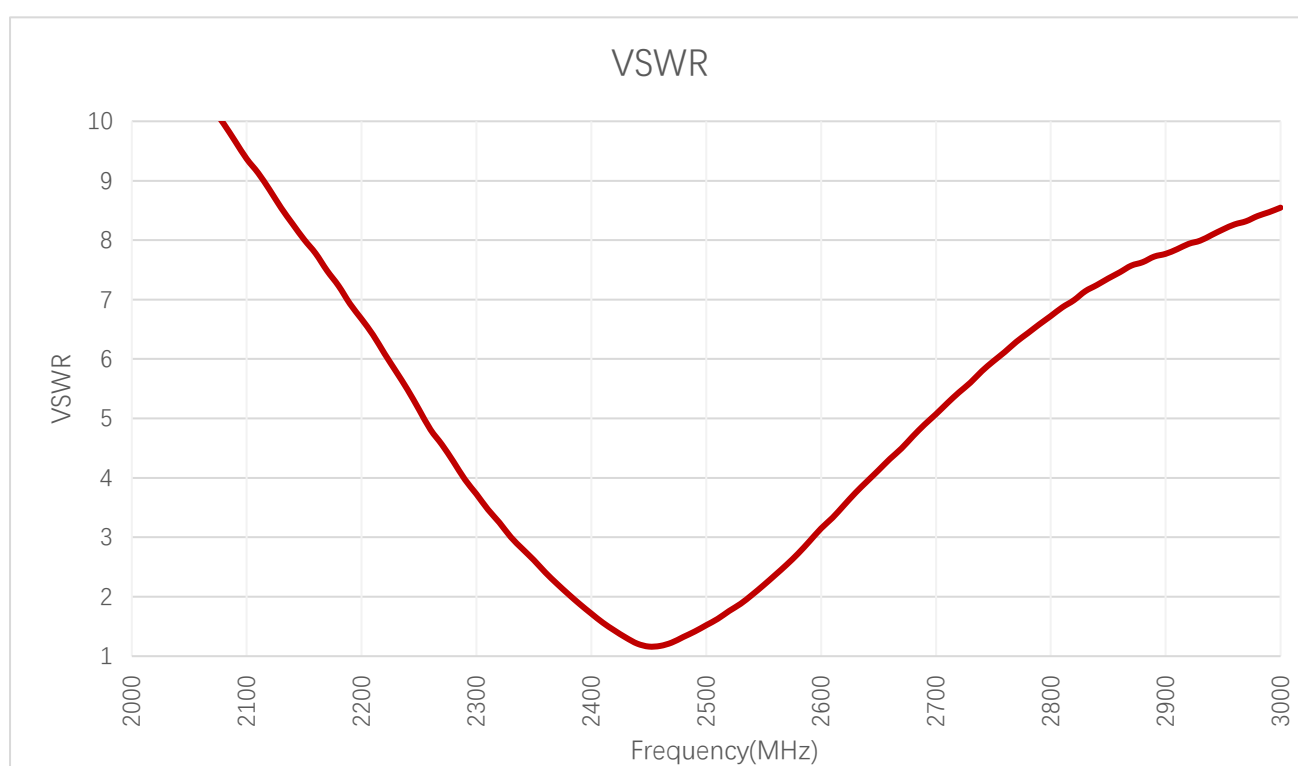


All dimensions in (mm)

3 Detailed Performance

3.1. S-Parameter Test

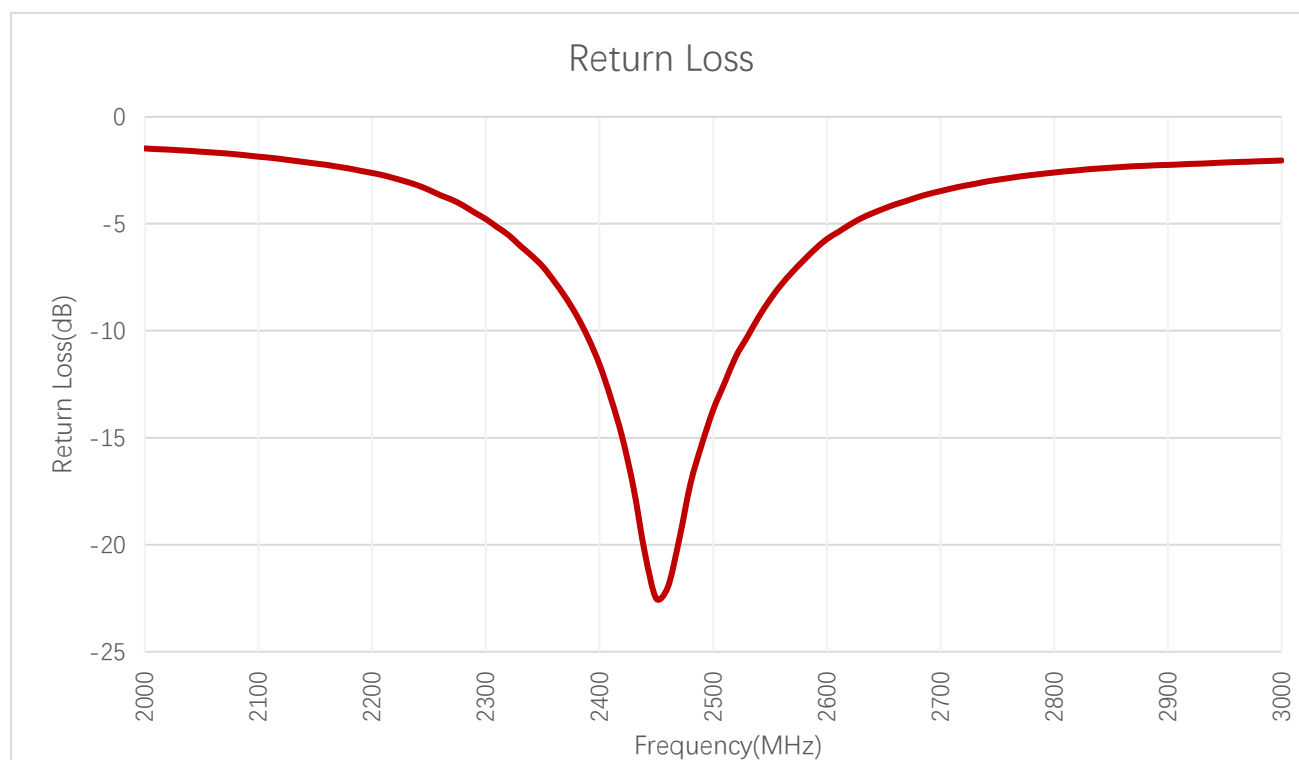
3.1.1. VSWR



VSWR

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
VSWR	1.7	1.2	1.5	-	-	-	-	-	-	-

3.1.2. Return Loss

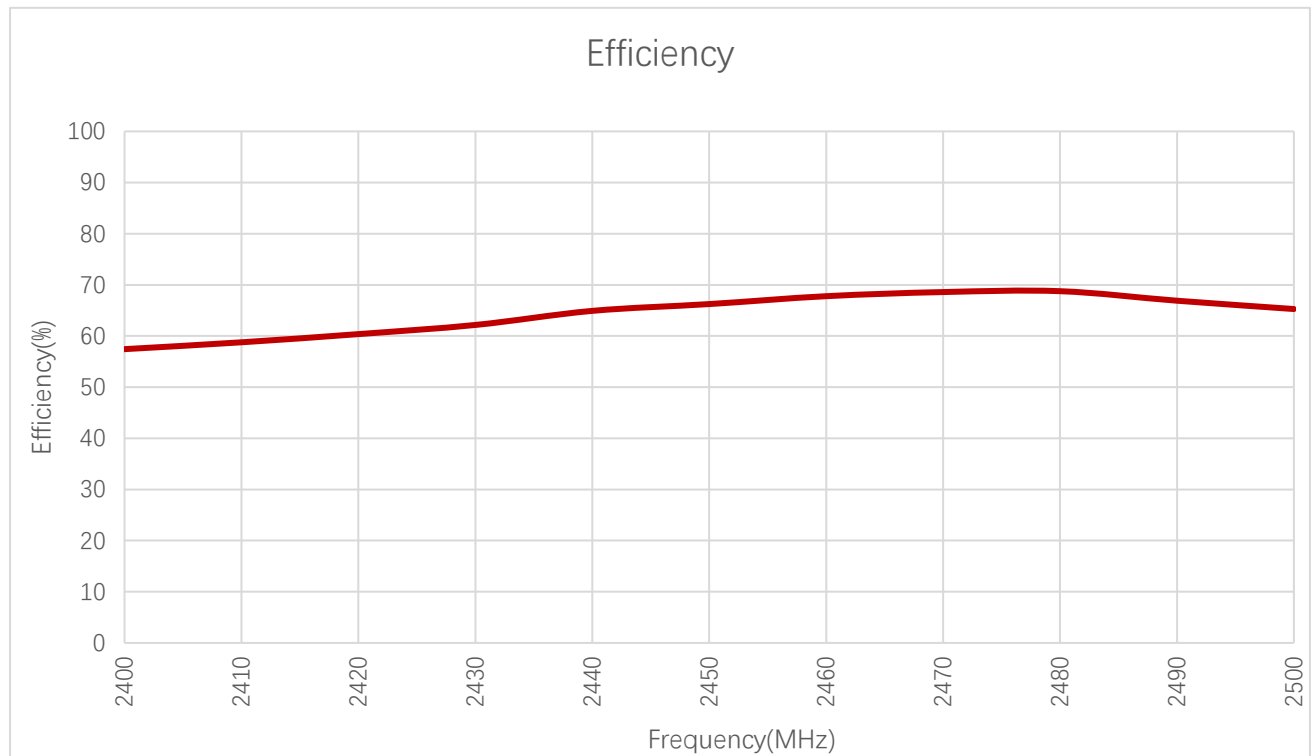


Return Loss (dB)

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Return Loss (dB)	-11.6	-22.5	-13.7	-	-	-	-	-	-	-

3.2. Radiation Performance Test

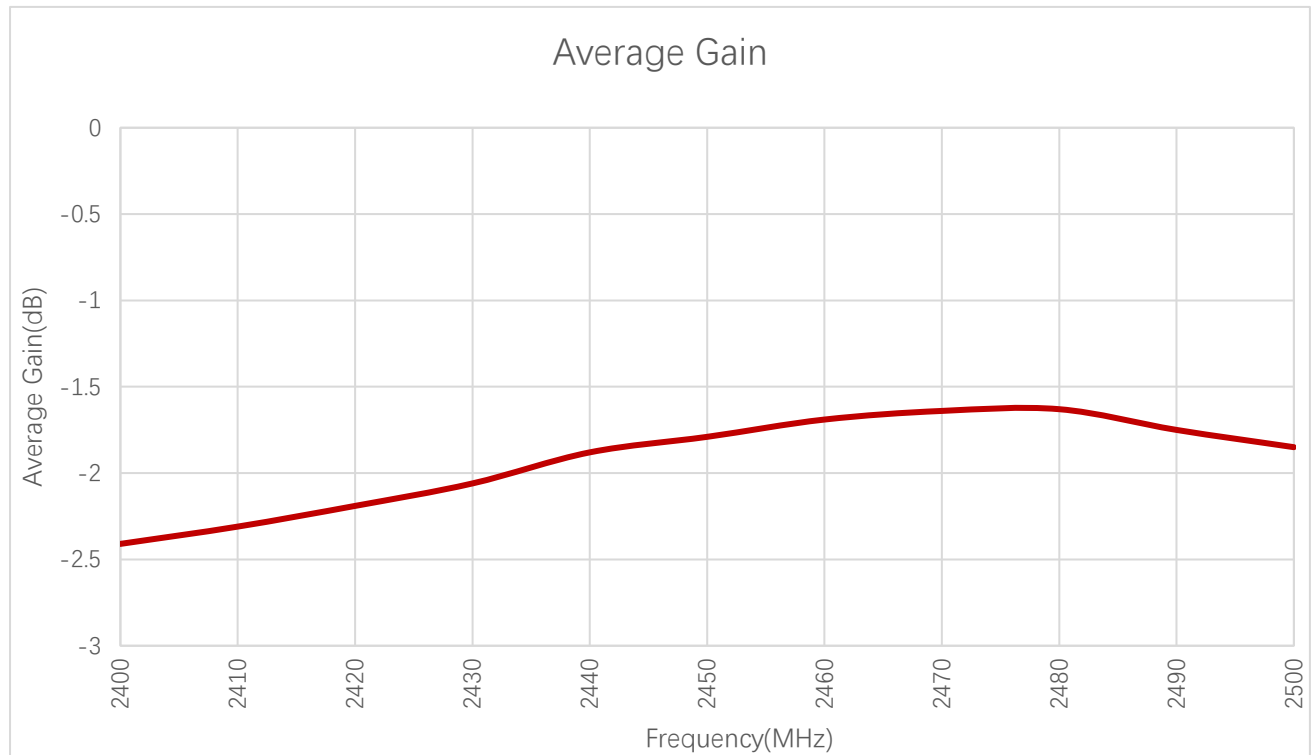
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Efficiency (%)	57.4	66.2	65.3	-	-	-	-	-	-	-

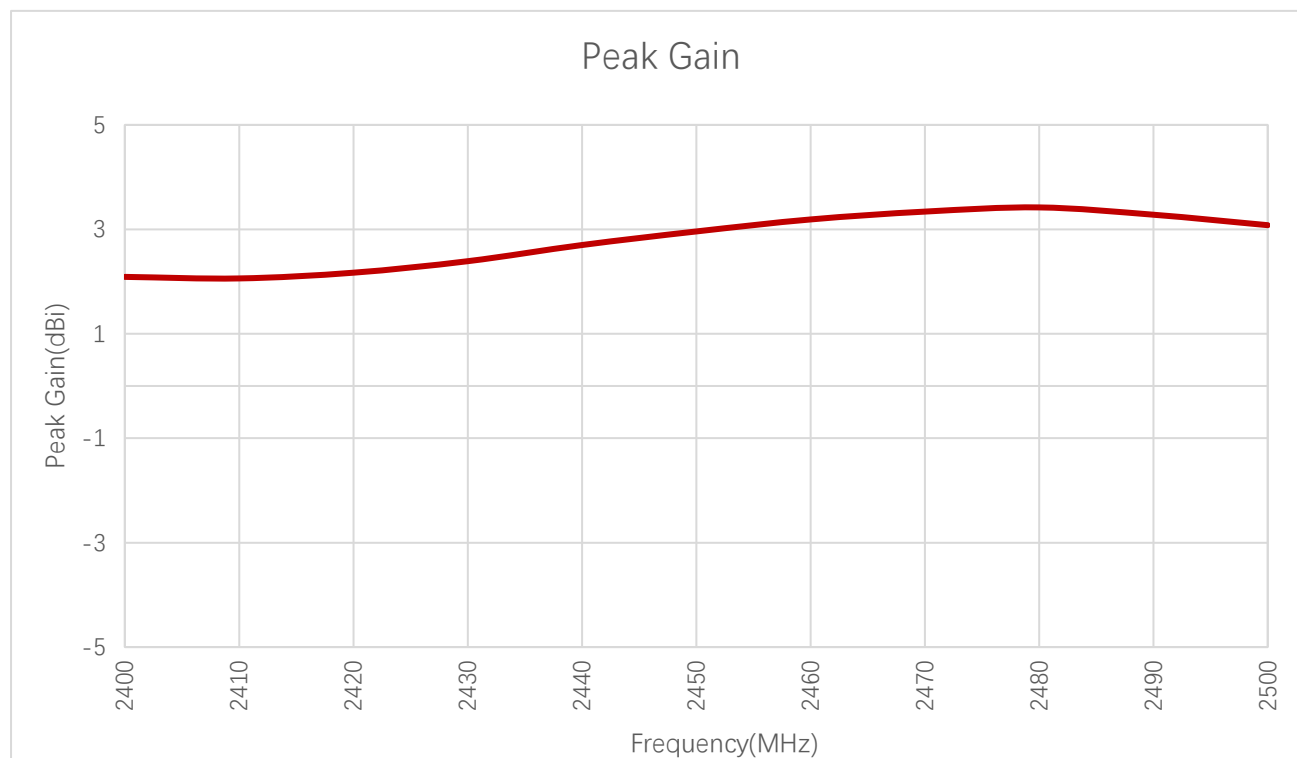
3.2.2. Average Gain



Average Gain (dB)

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Average Gain (dB)	-2.4	-1.8	-1.9	-	-	-	-	-	-	-

3.2.3. Peak Gain

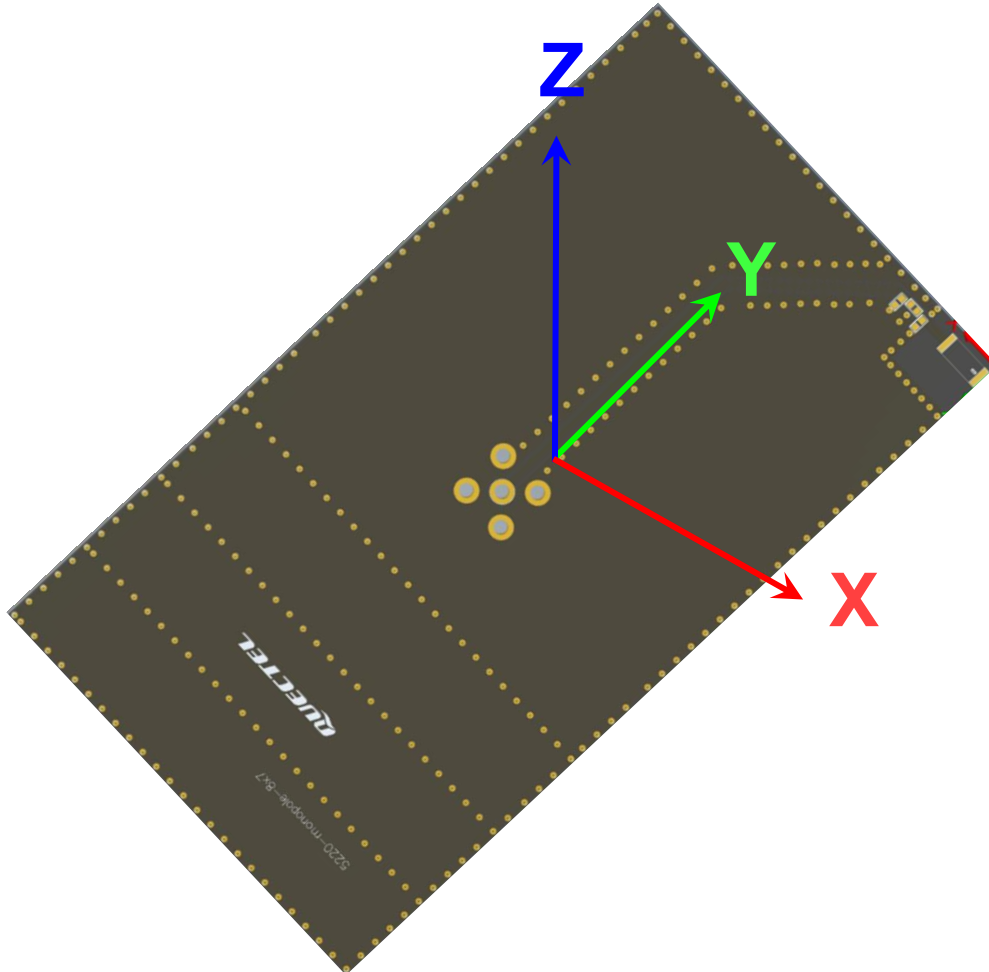


Peak Gain (dBi)

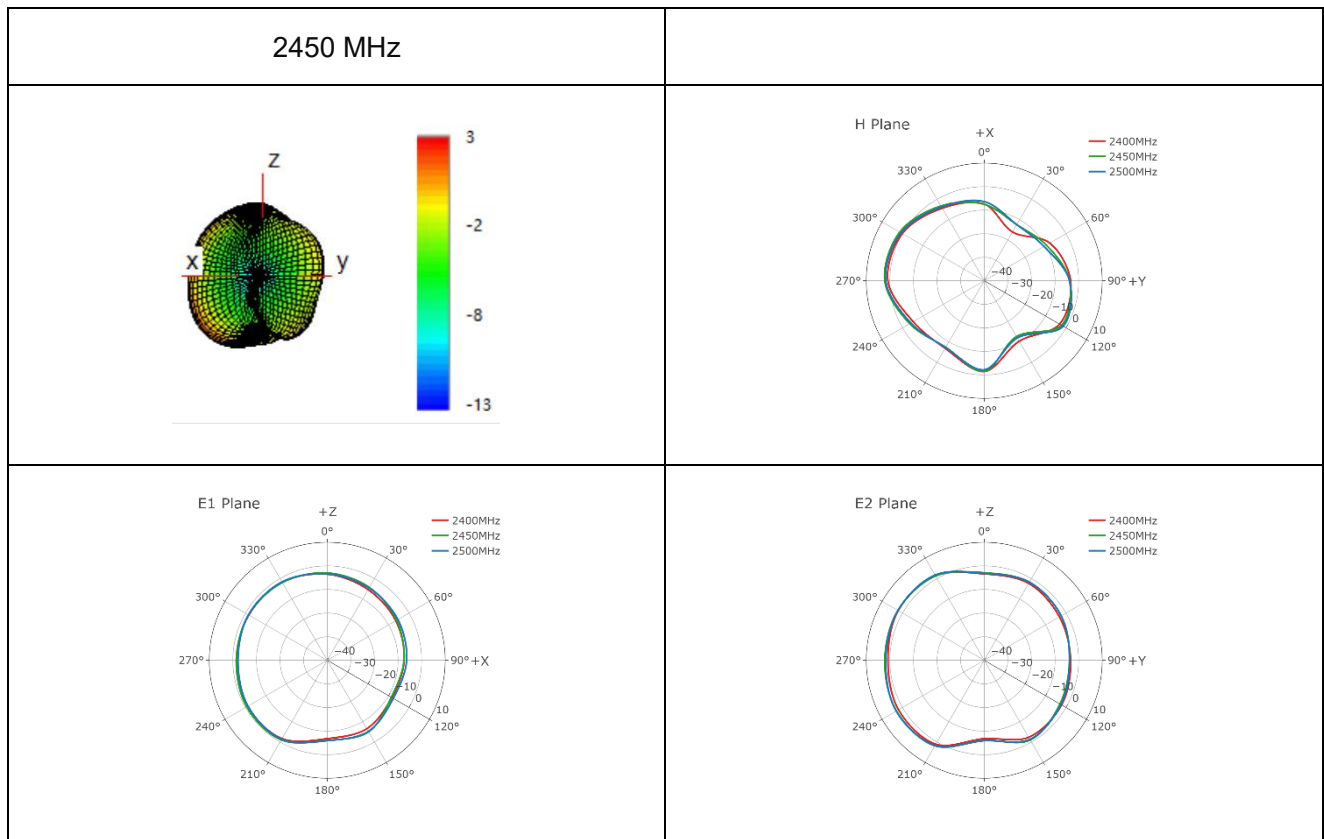
Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Peak Gain (dBi)	2.1	3.0	3.1	-	-	-	-	-	-	-

3.2.4. 3D & 2D Radiation Pattern

- Test Status: Assembled on 90 mm × 50 mm EVB



● Wi-Fi



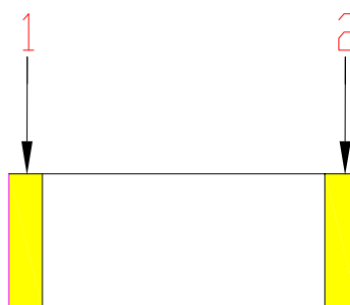
4 Schematic Symbol and Pin Definition

- The pin assignment for the antenna is as follows.
- The circuit symbol for the antenna is shown below. The antenna has 2 pins, only one of which works. All other pins are for mechanical strength.

Pin	Description
1	Not used (Mechanical only)
2	Feed



TOP



BOTTOM

5 Transmission Line

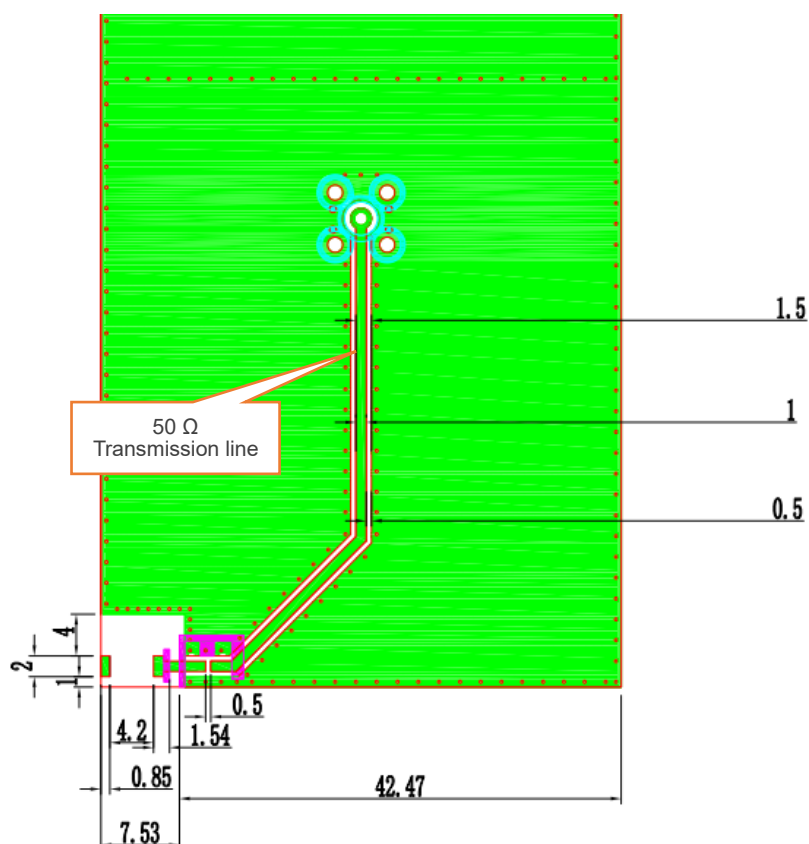
The characteristic impedance of all transmission lines shall be designed as 50 Ω .

- 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 Ω .

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 Ω .

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

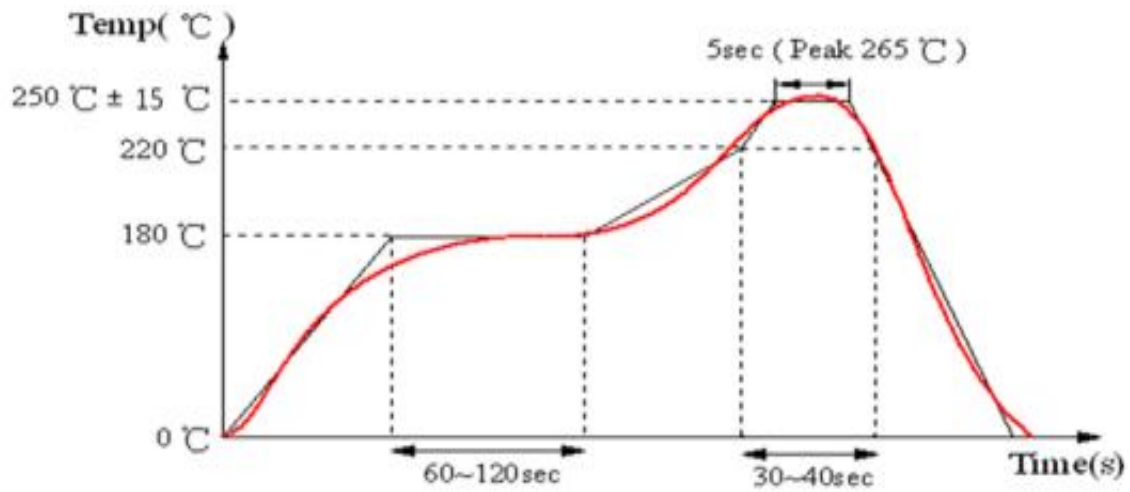


	S1	P1
Default Matching	4.3nH	1.5 pF
Tolerance	±5 %	±5 %

8 Soldering Temperature

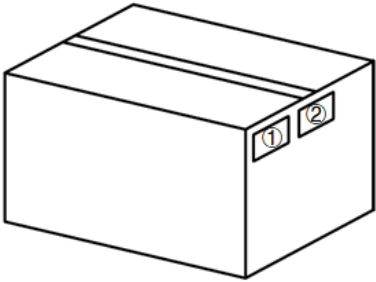
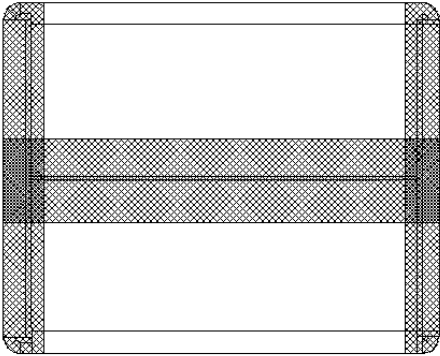
Phase	Profile Features	PB-Free Assembly
RAMP-UP	Avg. Ramp-up Rate (T _{smax} to T _p)	3 °C/second (Max.)
PREHEAT	Temperature Min (T _{smin}) Temperature Max (T _{smax}) Time (t _{smin} to t _{smax})	150 °C 190 °C 110 seconds (Max.)
REFLOW	Temperature (T _L) Total Time above T _L (t _l)	220 °C 90 seconds (Max.)
PEAK	Temperature (T _p)	230–250 °C
RAMP-DOWN	Rate	-1 °C/second (Max.)

9 Reflow Profile



10 Packaging

Step	Packaging Picture / 2D Picture	Description
1		(3000 PCS Antennas / Reel)
2		Product is vacuum packed.
3		(10 Reels / Carton Box) (30000 PCS Antennas / Carton Box) <u>Carton Size:</u> <u>L × W × H = 300 × 250 × 200 mm</u>

4		Position for Attaching Labels ① Carton Label ② Quality Label
5		Sealing Cartons “I” type sealing cartons
6	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
-	2023-01-08	Kane LIU Joye WANG David LIU Vinnie LIU	Creation of the document
1.0	2023-01-08	Kane LIU Joye WANG David LIU Vinnie LIU	First official release
1.1	2021-01-12	Kenny YIN	Updated the antenna image in Chapter 2.
1.2	2021-08-10	Aria CHU	Updated the data (Chapters 3 and 4.5).
1.3	2021-09-28	Aria CHU	Added the new OC YC0010AAEVB on the cover.
1.4	2021-11-30	Aria CHU	Updated the product description in Chapter 1.
1.5	2021-12-23	Aria CHU	Updated the data (Chapter 4.6).
2.0	2023-11-06	Damon ZHANG/ Lucky FENG/ David LIU/ Vinnie LIU	1. Updated the template. 2. Numerous changes were made to this document. It should be read in its entirety.



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