Antenna Datasheet

Product OC (Antenna Only)**:** YFBP001WWA
Product OC (Antenna + Rectangular EVB)**:** YFBP001WWAEVB
Version: 1.0
Date: 2024-03-27
Status: Released

Product Name: Wi-Fi SMT Mount PCB Chip IFA Antenna
Key Features:
Frequency Band: 2400–2500 MHz
Dimensions: 3.2 × 1.6 × 0.6 mm
Efficiency: Up to 70.4%
RoHS Compliant

Overview

The Quectel YFBP001WWA is a compact form factor SMT mount PCB chip antenna for Wi-Fi applications. Due to the dimensions of 3.2 × 1.6 × 0.6 mm, it is designed for very small space requirements for smart metering, remote monitoring, vehicle tracking and telematics, and many other IoT devices. The YFBP001WWA is a ground-depended IFA antenna, uses main PCB as its ground plane. It is delivered on tape and reel.

The YFBP001WWA is a PCB chip antenna, which can be mounted on super compact space require terminals. Despite of this small factor, it has up to 70.4 % efficiency in working bands. This antenna is developed on an 80 × 40 mm evaluation board. If the devices have different ground sizes, matching circuit can be used to tune the resonant frequency correctly. We also offer gerber file, 2D & 3D documents for PCB layout.

The YFBP001WWA allows high efficiency, stable signal transmission and reception for Wi-Fi working bands in 2400–2500 MHz. This product is RoHS compliant.

Typical applications include:

- Asset Tracking
- Smart Metering
- Fleet Management
- IoT Sensors and Modules

Quectel provides comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs. We have regional R & D centers to offer quick response to meet your requirements. Please contact our sales & FAEs if you have any requests.

Contents

1 Specification

Test Condition: Assembled on 80 × 40 mm EVB

1.1. Electrical

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

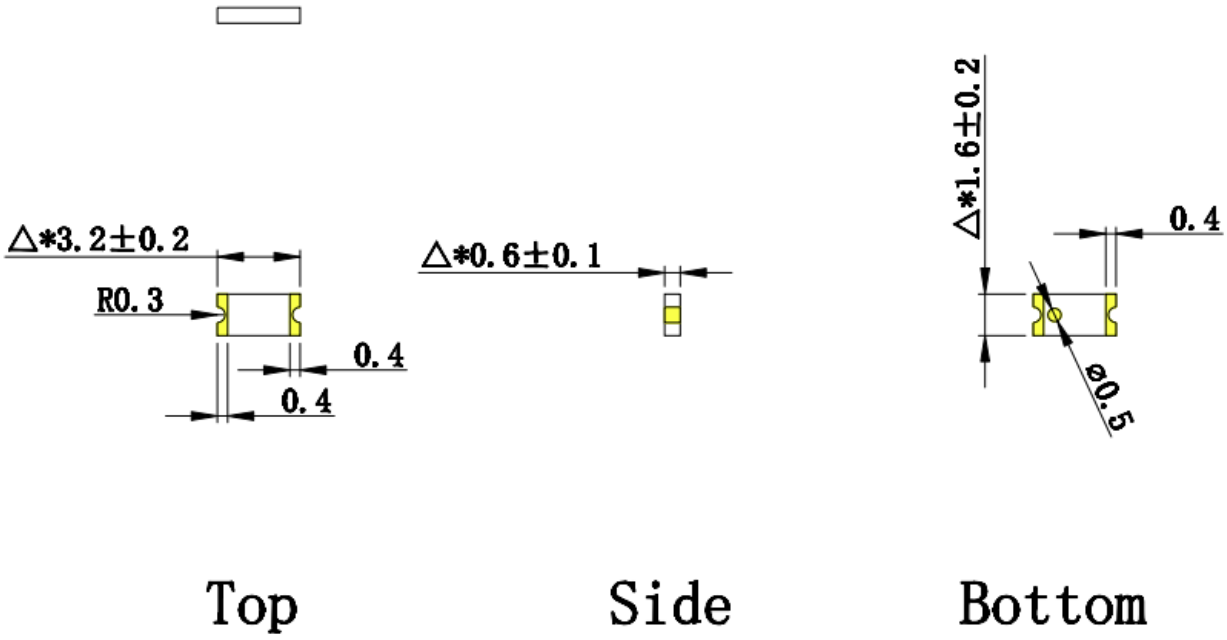
Band / Specification	Wi-Fi 2.4G	Wi-Fi 5G	Wi-Fi 6e
	2400–2500	**5150–5850**	**5925–7125**
Max. VSWR	2.1	-	-
Max. Return Loss (dB)	-9.1	-	-
AVG Eff. (%)	63.5	-	-
AVG Gain (dB)	-2.0	-	-
Max. Peak Gain (dBi)	1.1	-	-

1.2. Mechanical & Environmental

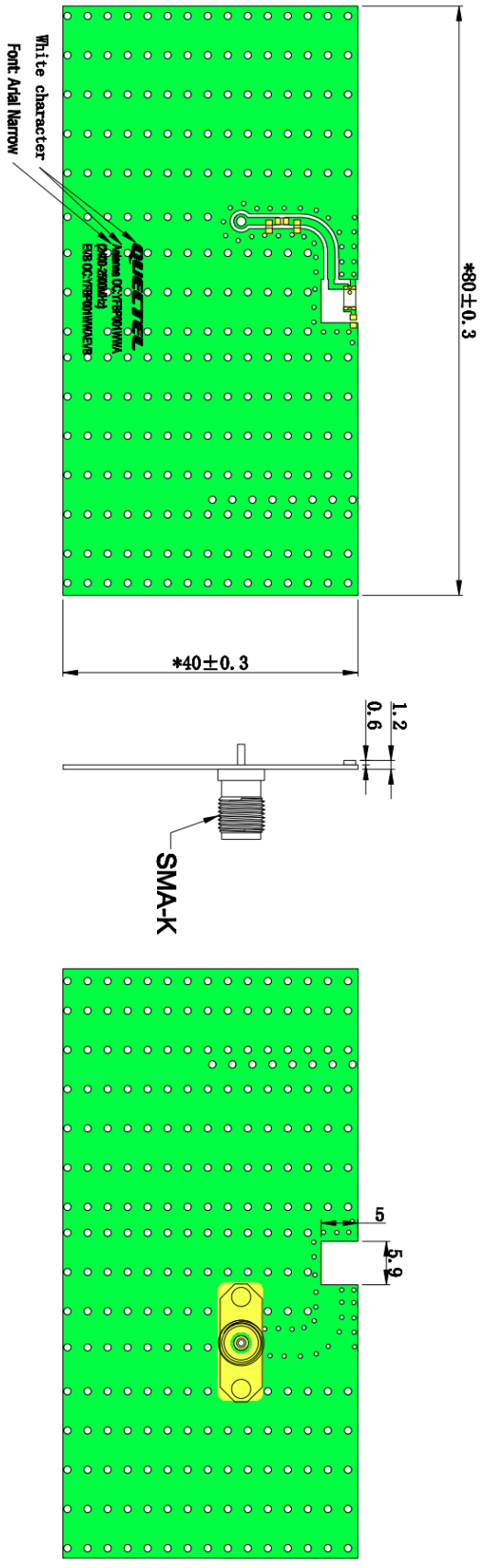
Mechanical	
Antenna Dimensions	3.2 × 1.6 × 0.6 mm
Material & Color	PCB & Black
Mounting Type	SMD
Weight	Typ. 0.01 g
Recommended EVB Size	80 × 40 × 0.6 mm
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS Compliant	Yes

2 Drawing

2.1. Antenna



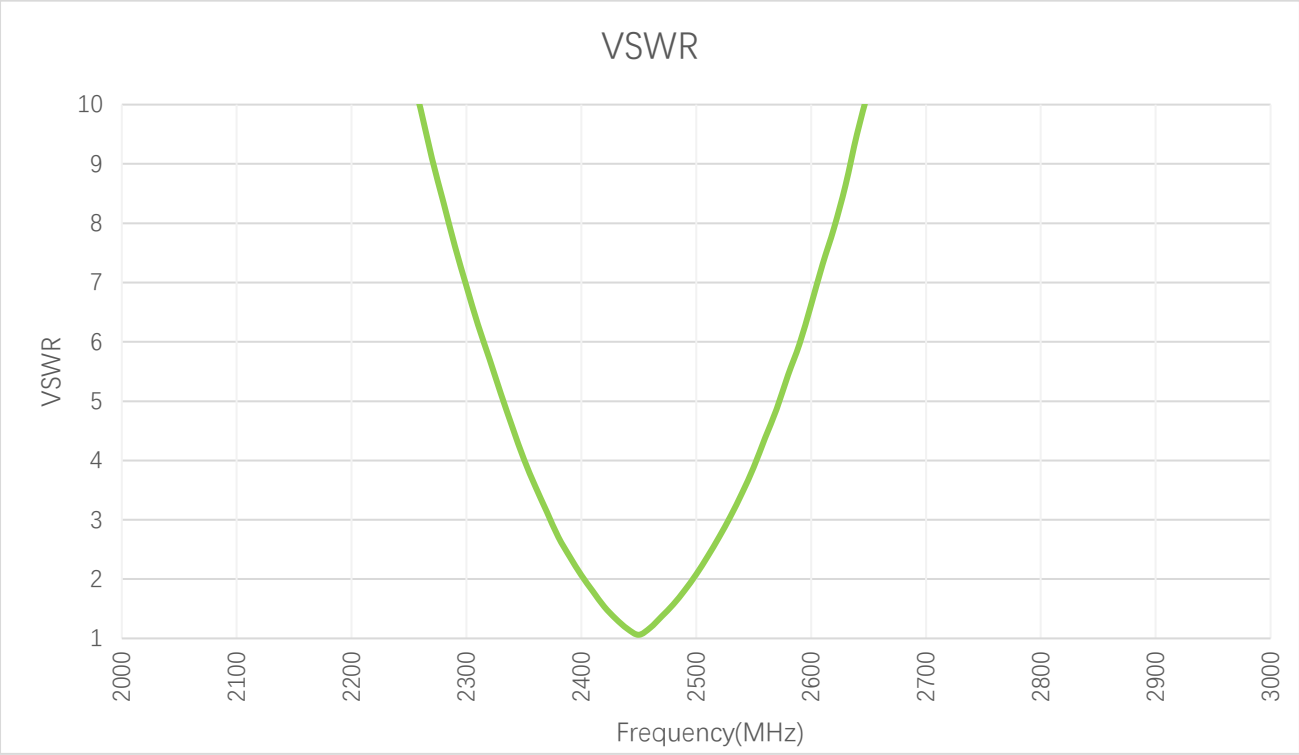
2.2. Rectangular EVB



3 Detailed Performance

3.1. S-Parameter Test

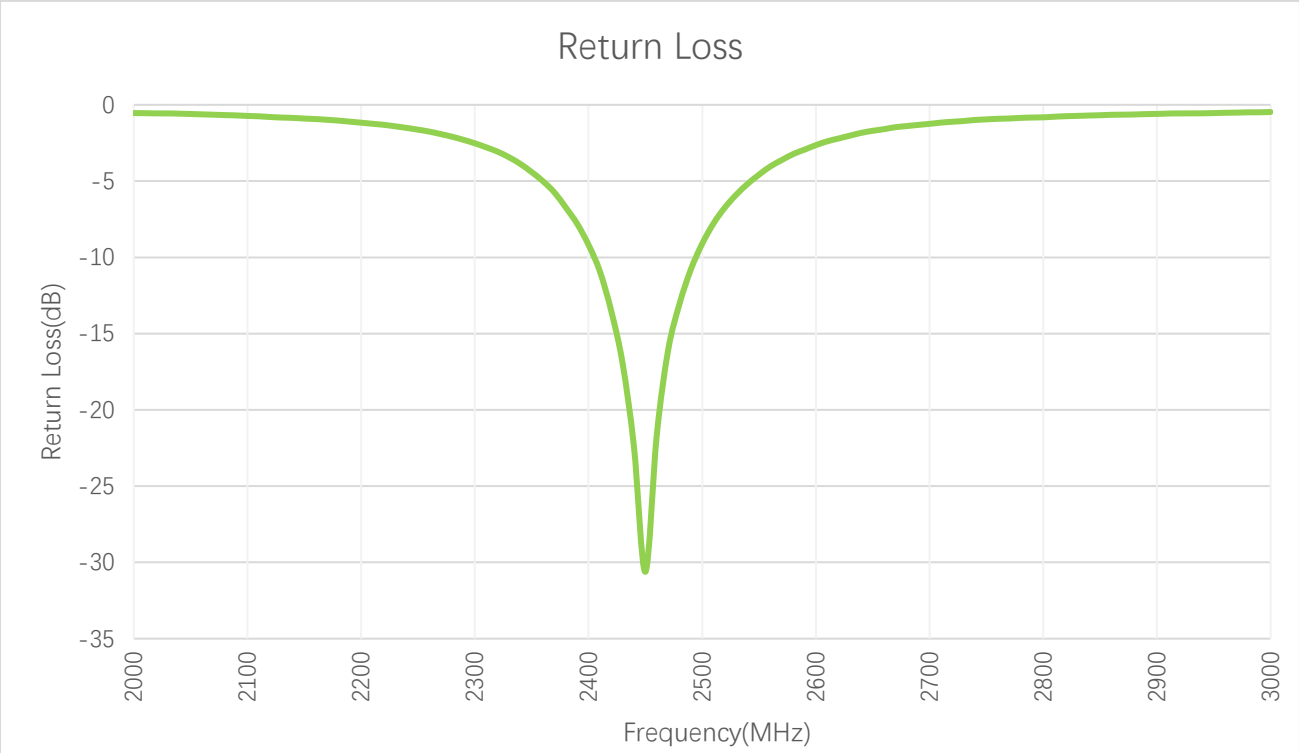
3.1.1. VSWR



VSWR

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
VSWR	2.1	1.1	2.1	-	-	-	-	-	-	-

3.1.2. Return Loss

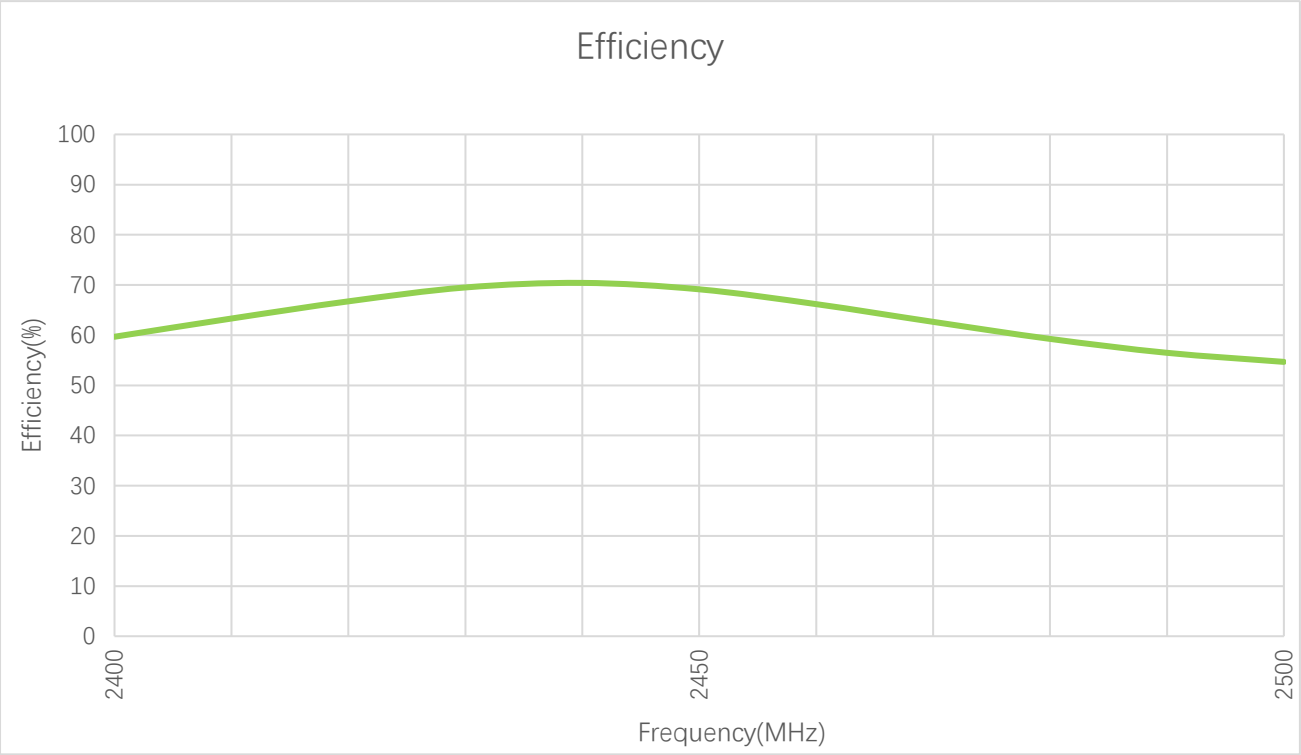


Return Loss (dB)

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Return Loss (dB)	-9.2	-30.6	-9.1	-	-	-	-	-	-	-

3.2. Radiation Performance Test

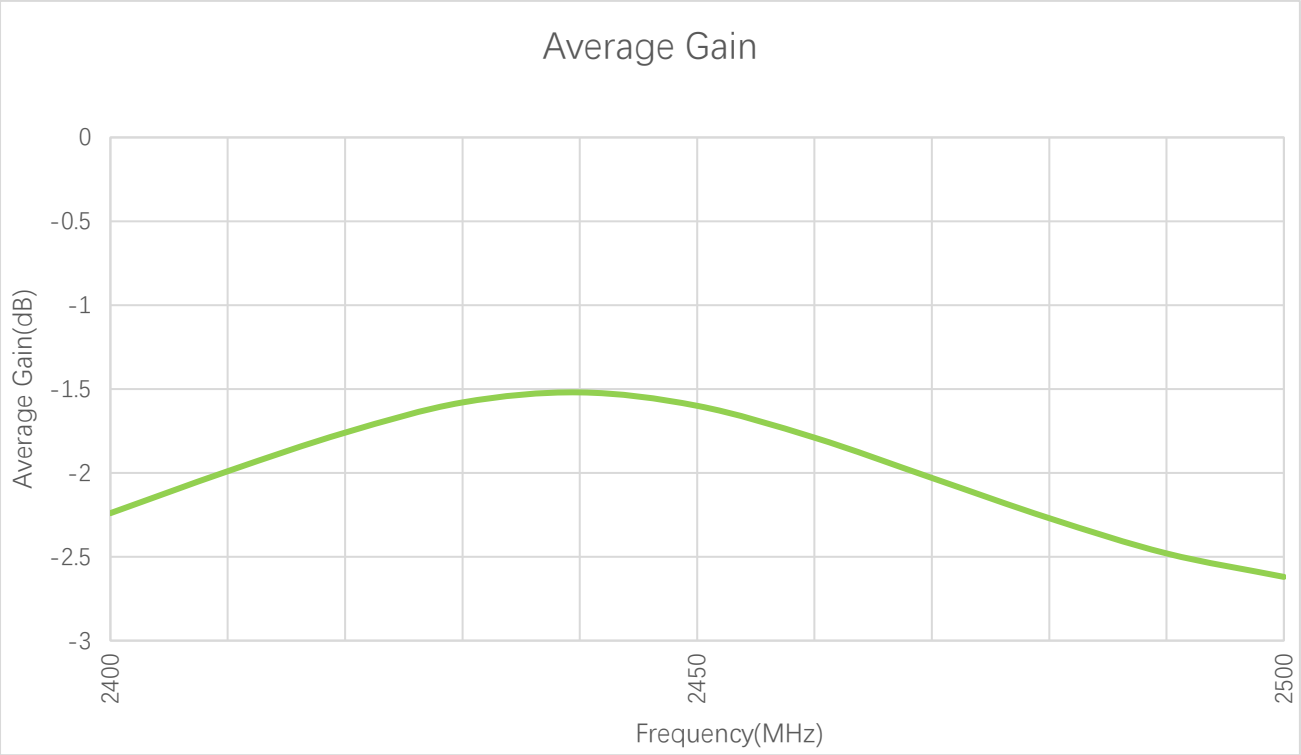
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Efficiency (%)	59.7	69.1	54.7	-	-	-	-	-	-	-

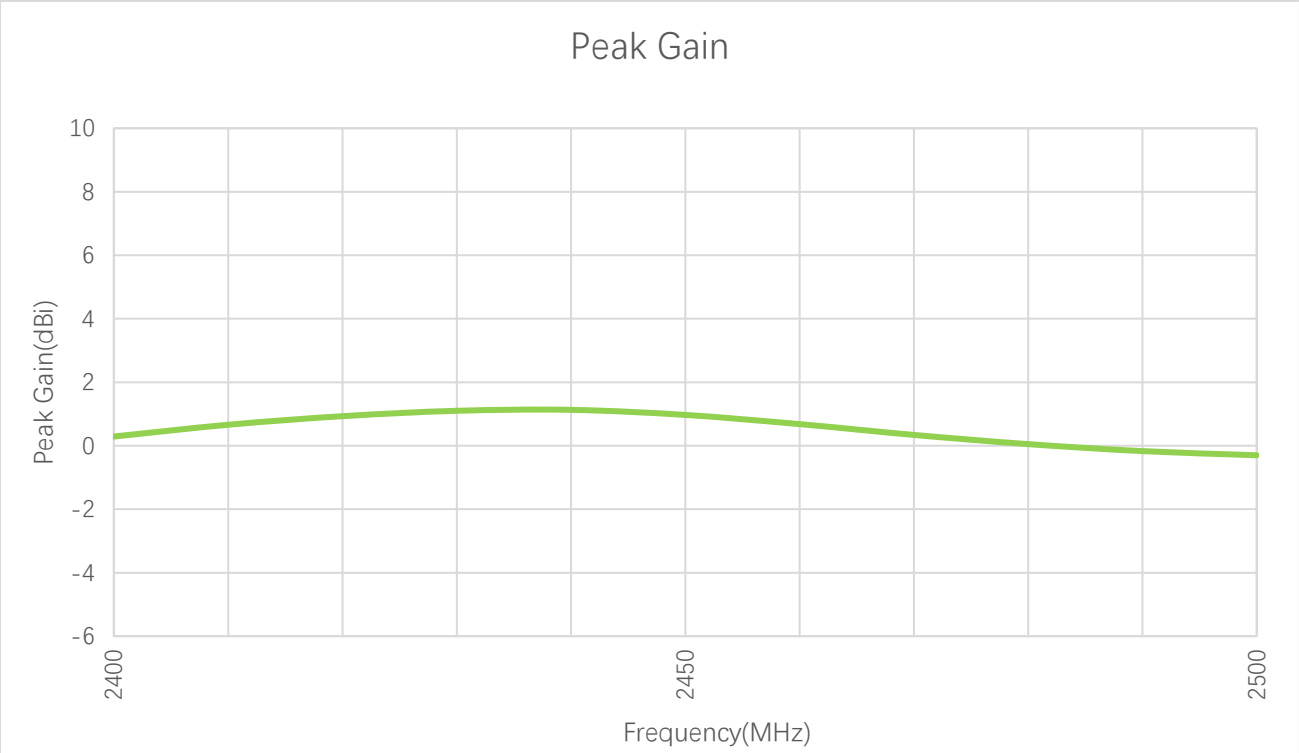
3.2.2. Average Gain



Average Gain (dB)

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Average Gain (dB)	-2.2	-1.6	-2.6	-	-	-	-	-	-	-

3.2.3. Peak Gain

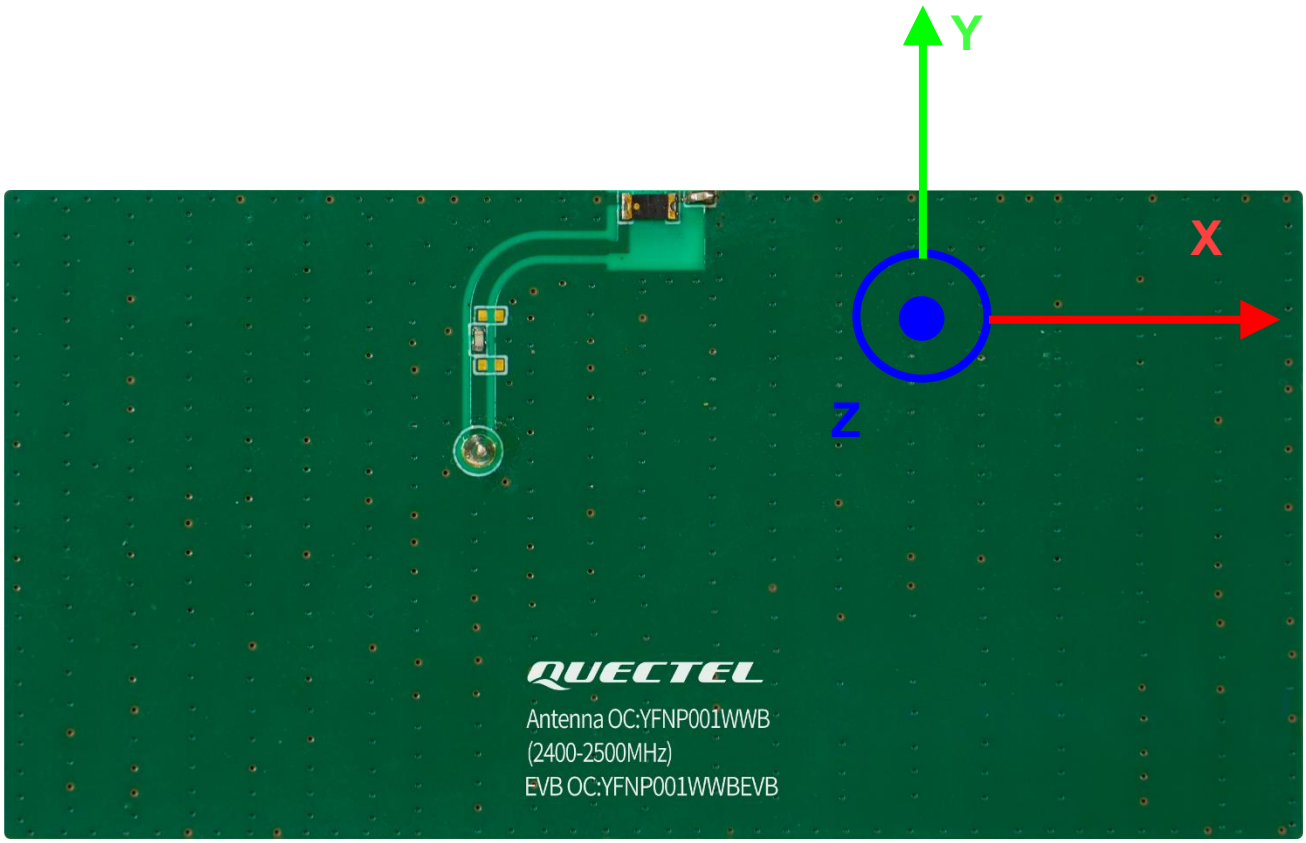


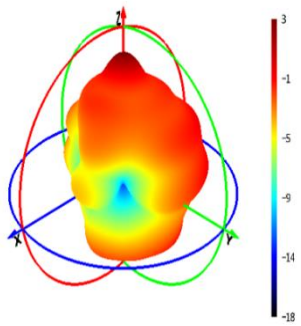
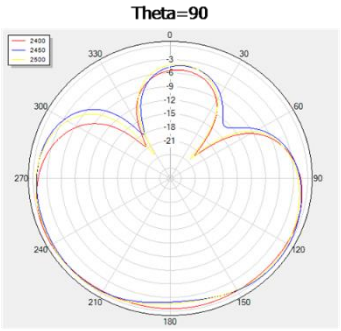
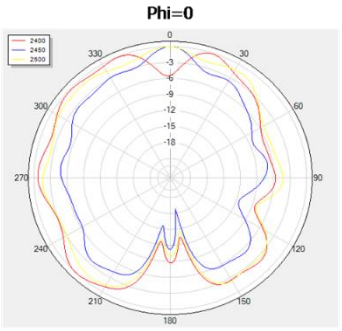
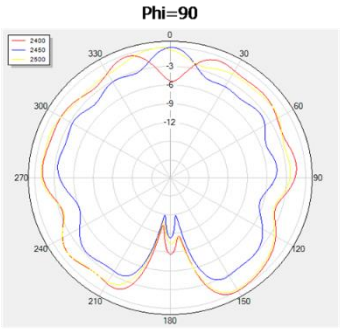
Peak Gain (dBi)

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Peak Gain (dBi)	0.3	1.0	-0.3	-	-	-	-	-	-	-

3.2.4. 3D & 2D Radiation Pattern

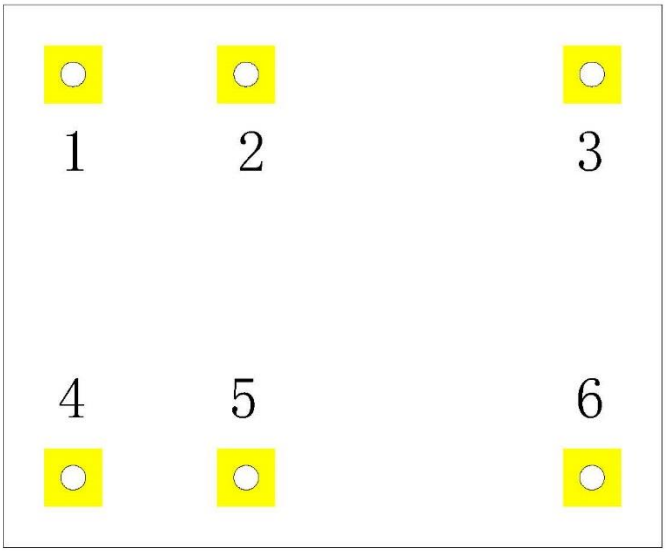
- Test condition: Assembled on 80 × 40 mm EVB
- Test Chamber: HF-S-1



2450 MHz	
	
	

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

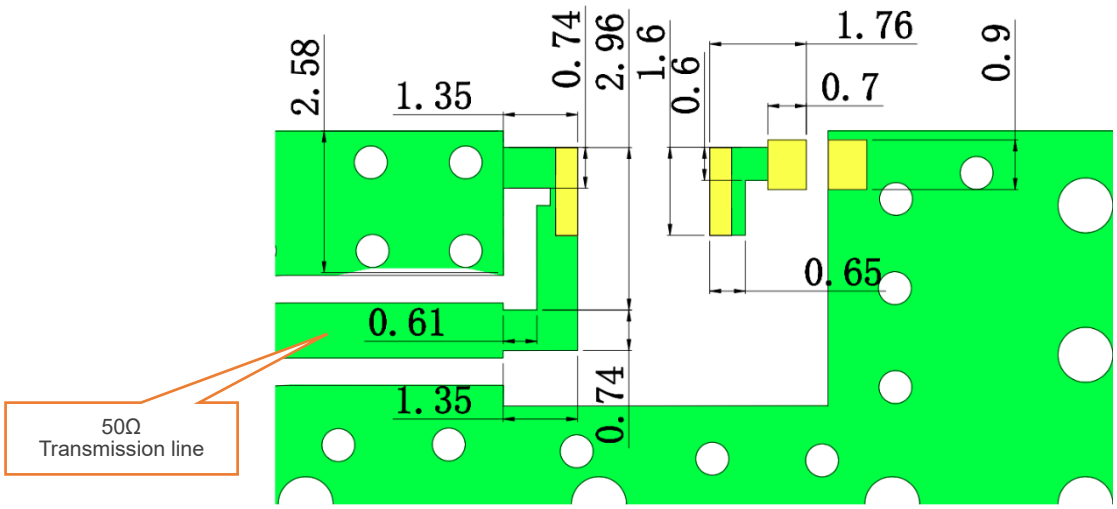
The characteristic impedance of all transmission lines shall be designed as 50 Ω.

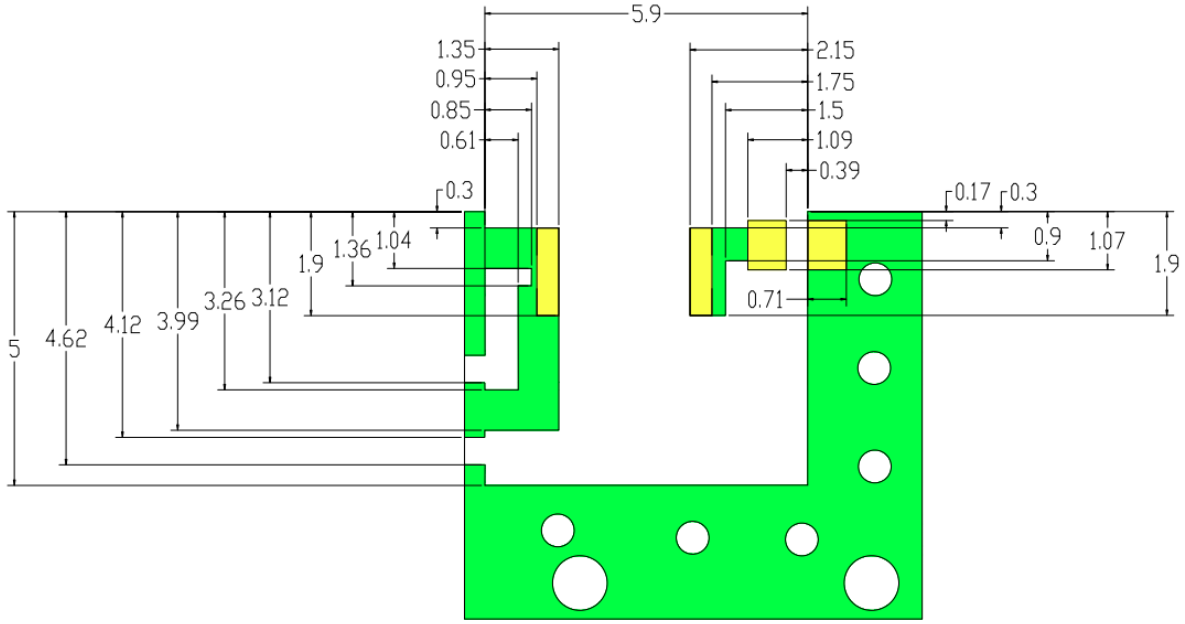
- The length of the transmission lines should be kept as short as possible.
- Any other part of the RF system, such as transceiver, power amplifiers, etc., shall also be designed with an impedance of 50 Ω.

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

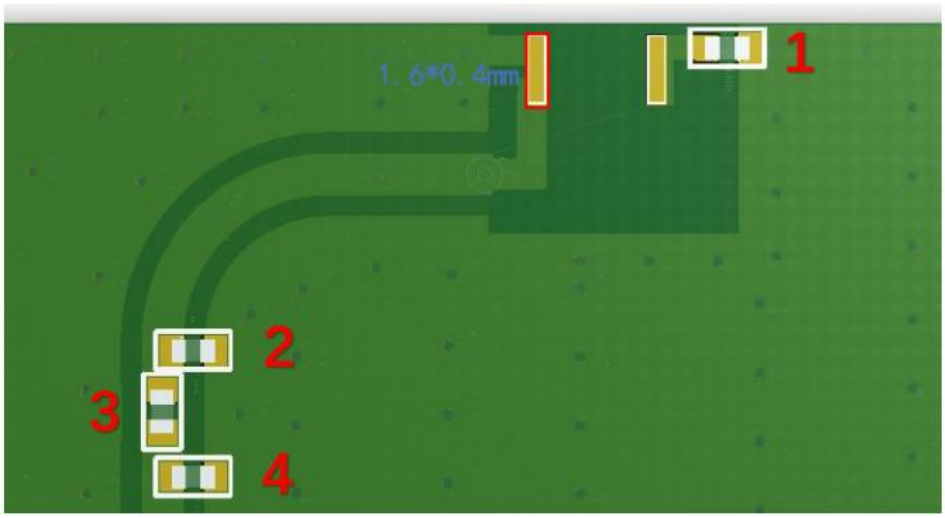
The host PCB must be designed using the PCB footprint shown with the correct clearances. An example of the PCB layout shows the antenna footprint. Please note this clearance area is critical to the performance of the antenna and must be applied through all layers of the PCB.





All dimensions in (mm)

7 Matching Circuit

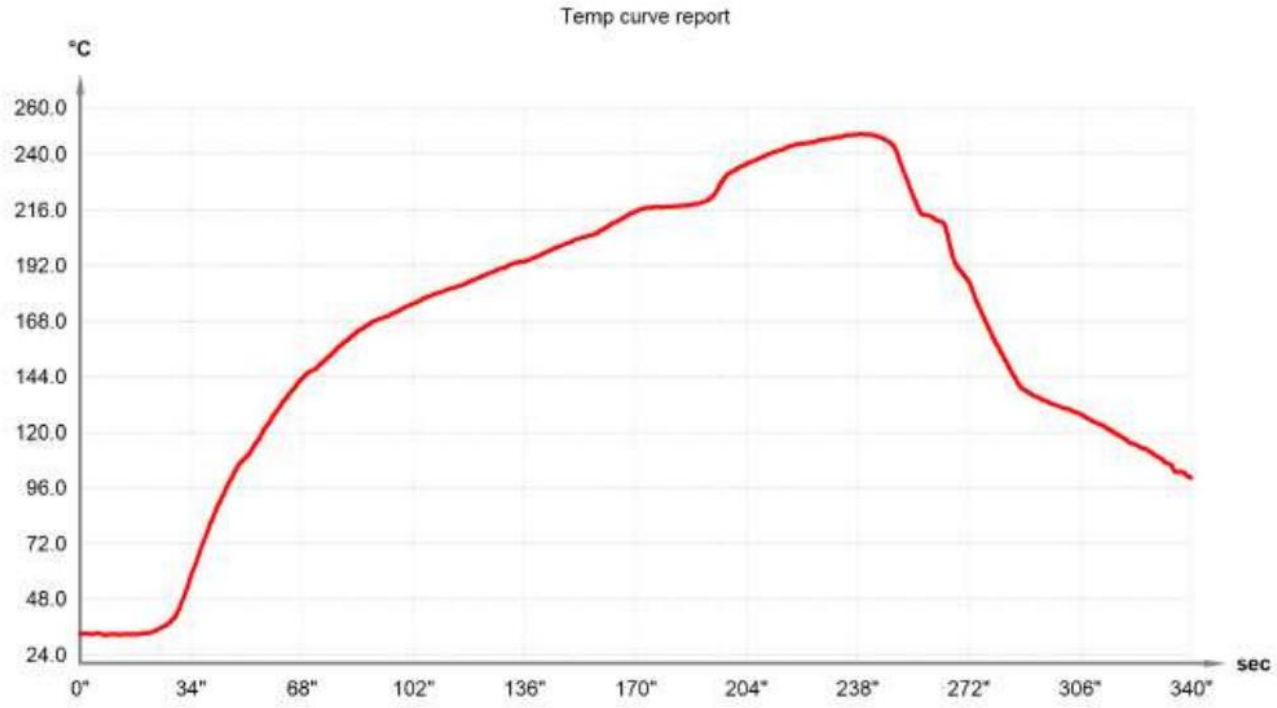


Location	Description	Vendor
1	7pf	MURATA
2	N/C	N/C
3	2pf	MURATA
4	N/C	N/C

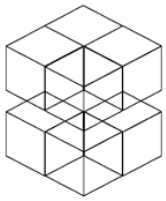
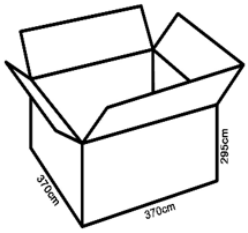
8 Soldering Temperature

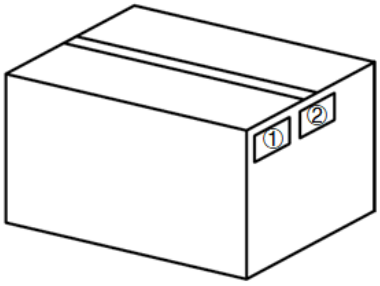
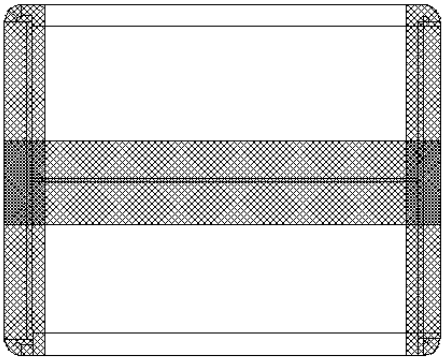
Channels	Name	Heating time 150.0-200.0°C	Above temp 217.0°C	Top temp	Heating slope 150.0-180.0°C	Cooling slope 180.0-150.0°C
1	Pin1	73"	82"	248.7	0.97	-2.92
Refrence value		70.0-95.0s	70.0-90.0s	240.0-250.0°C	0.0-3.0°C/s	-4.0--1.0°C/s

9 Reflow Profile



10 Packaging

Step	Packaging picture / 2D picture	Description
1		Reel
2		3000 antenna products / reel 8 volumes in one inner box.
3	 	8 inner boxes / carton box (192000 pcs / carton box) Estimated quantity Products that are not full will be packaged in suitable cardboard boxes. Carton Size: L × W × H = 370 × 370 × 295 mm

4		**Position for Attaching Labels** ① Carton Label ② Quality Label
5		**Sealing Cartons** "工" type sealing cartons
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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Tel: +86 21 5108 6236
Email: info@quectel.com

Or our local offices. For more information, please visit:
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Revision History

Version	Date	Author	Note
-	2024-03-27	Kane LIU/ Hart HU/ David LIU/ Rainey LIAO	Creation of the document
1.0	2024-03-27	Kane LIU/ Hart HU/ David LIU/ Rainey LIAO	First official release

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