



# Antenna Datasheet

**Product OC:** YFBP001WWC

**Version:** 1.1

**Date:** 2024-12-06

**Status:** Released

**Product Name:** Wi-Fi SMT Mount PCB Chip Monopole Antenna

**Key Features:**

Frequency band: 2400–2500 MHz, 5150–5850 MHz

Peak efficiency: 84.1 %

Dimensions: 5.0 × 3.6 × 0.5 mm

RoHS Compliant

# Overview

Quectel YFBP001WWC is a compact form factor SMT mount PCB chip antenna for WIFI applications. Due to the dimensions of  $5.0 \times 3.6 \times 0.5$  mm, it is designed for very small space requirements for smart metering, remote monitoring, vehicle tracking and telematics, and many other IoT devices. YFBP001WWC is a ground-depended monopole antenna, uses main PCB as its ground plane. It is delivered on tape and reel.

YFBP001WWC is a PCB chip antenna, which can be mounted on super compact space require terminals. Despite of this small factor, it has up to 84.1 % efficiency in working bands. This antenna is developed on an  $80 \times 40$  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.

YFBP001WWC allows high efficiency, stable signal transmission and reception for WIFI working bands in 2400–2500 MHz, 5150–5850 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.

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# 1 Specification

Test Condition: Assembled on 80 mm × 40 mm EVB

## 1.1. Electrical

Electrical	
Frequency Range	2400–2500 MHz, 5150–5850 MHz
Impedance	50 $\Omega$
Polarization	Linear
Radiation Pattern	Omni-directional

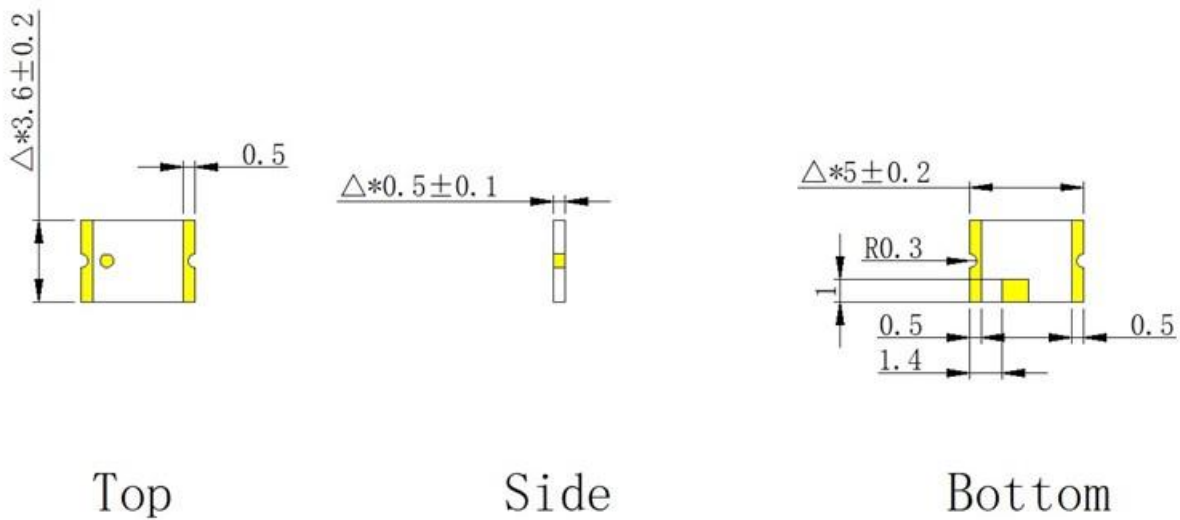
Specification \ Band	Wi-Fi 2G	Wi-Fi 5G	Wi-Fi 7G
	2400–2500 MHz	5150–5850 MHz	5925–7125 MHz
Max. VSWR	1.9	1.5	-
Max. Return Loss (dB)	-9.9	-13.3	-
AVG Eff. (%)	67.4	78.8	-
AVG Gain (dB)	-1.7	-1.0	-
Max. Peak Gain (dBi)	2.2	3.8	-
VSWR	$\leq 1.9$		
Return Loss	$\leq -9.9$ dB		
Peak Gain	$\leq 3.8$ dBi		

## 1.2. Mechanical & Environmental

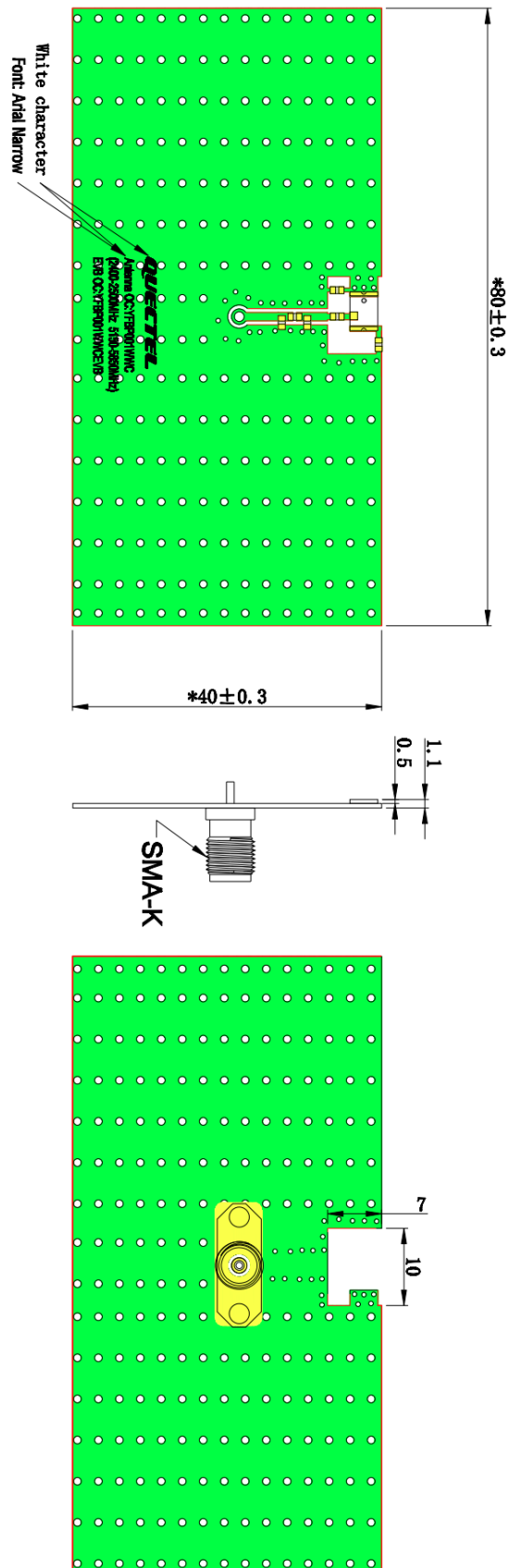
Mechanical	
Antenna Size	5.0 × 3.6 × 0.5 mm
Antenna Material & Color	PCB & Black
Antenna Weight	Typ. 0.04 g
Mounting Type	SMD
Recommended EVB Size	80 × 40 × 0.6 mm
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS Compliant	Yes

## 2 Drawing

### 2.1. Antenna



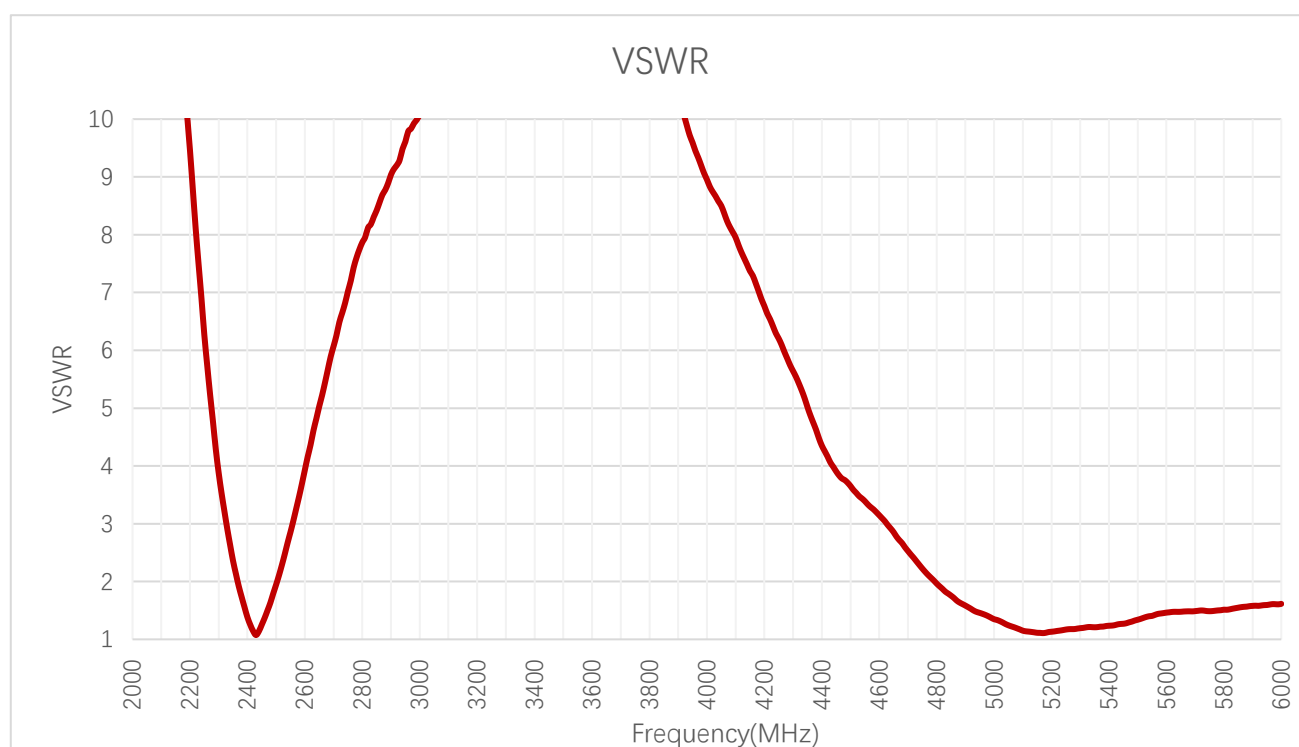
### 2.2. EVB



## 3 Detailed Performance

### 3.1. S-Parameter Test

#### 3.1.1. VSWR

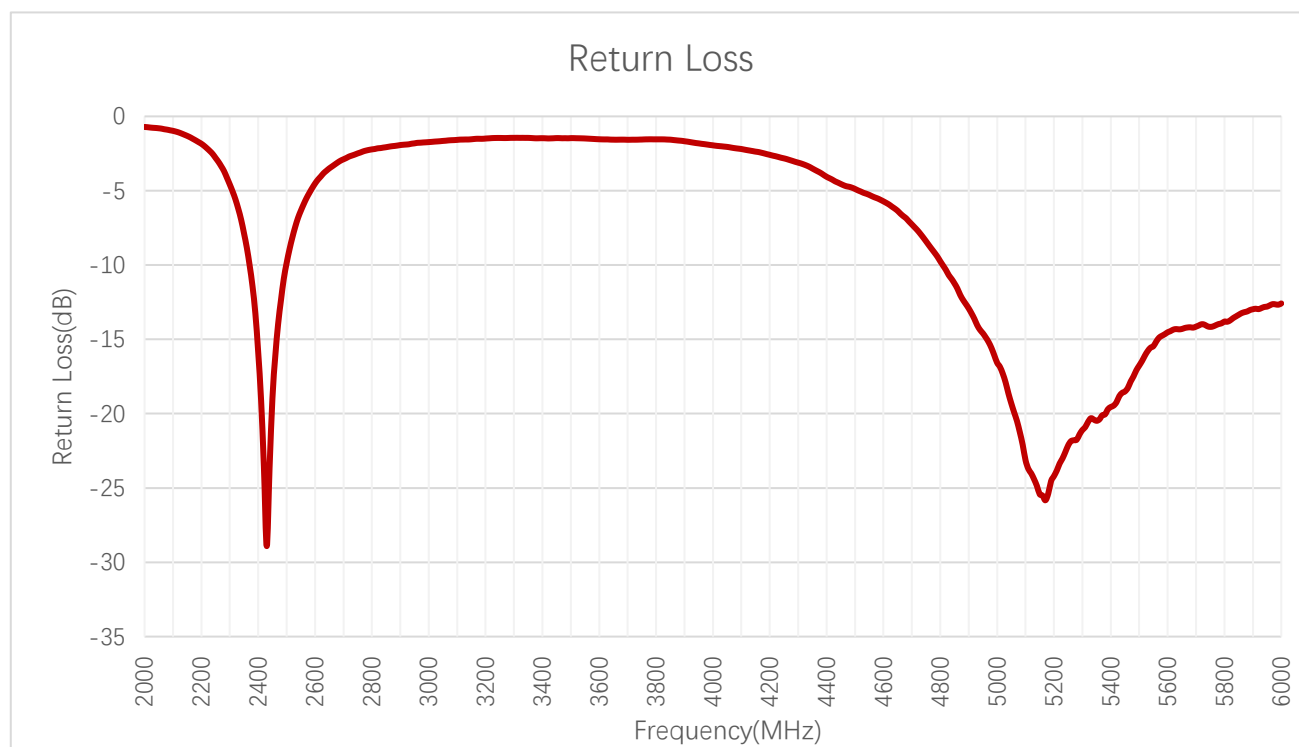


**VSWR**

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5920	6520	7120
VSWR	1.4	1.3	1.9	1.1	1.3	1.5	-	-	-



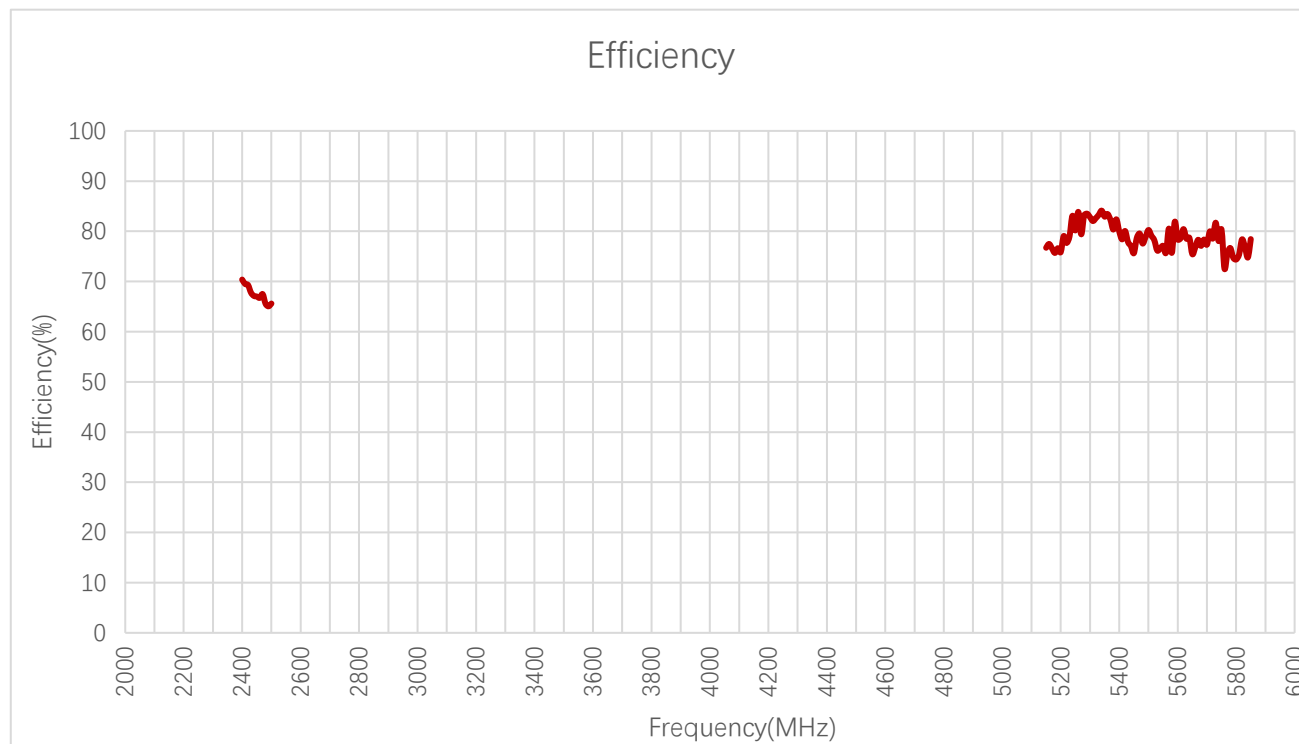
### 3.1.2. Return Loss



Return Loss (dB)									
Frequency (MHz)	2400	2450	2500	5150	5500	5850	5920	6520	7120
Return Loss (dB)	-15.9	-19.0	-9.9	-25.4	-16.8	-13.3	-	-	-

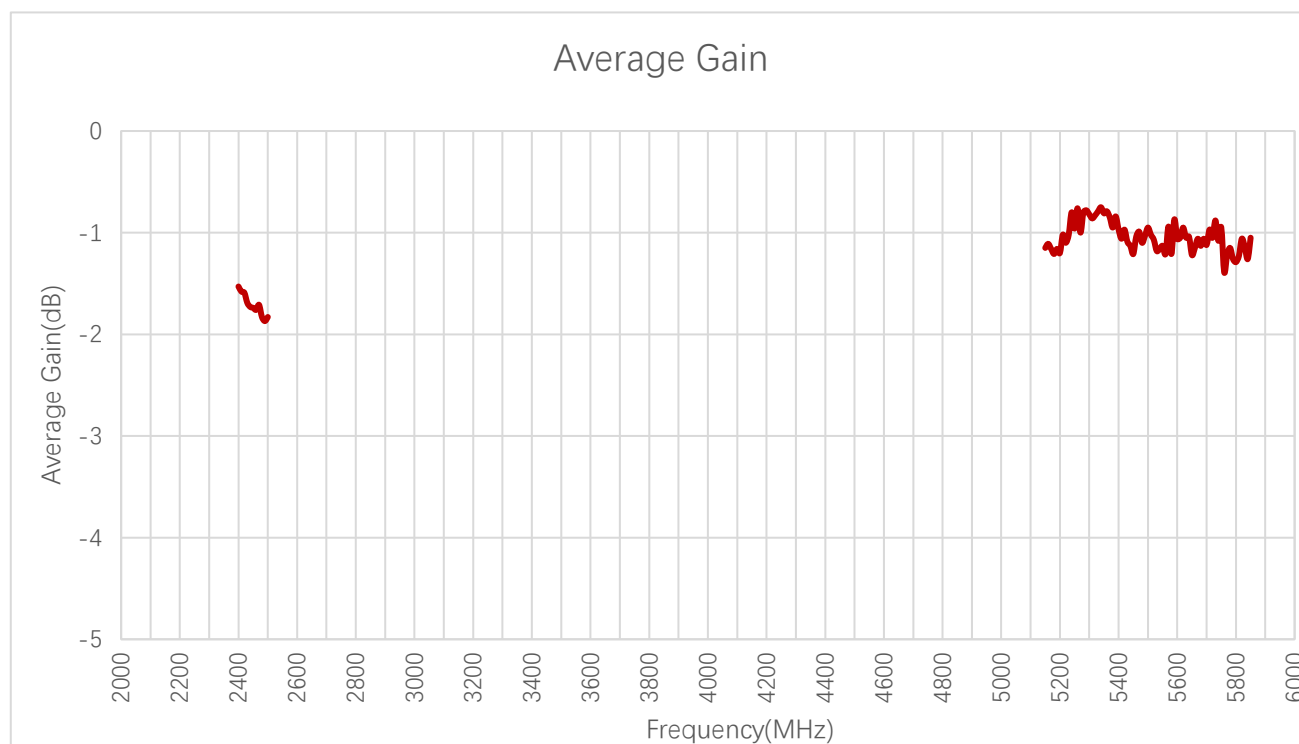
## 3.2. Radiation Performance Test

### 3.2.1. Efficiency



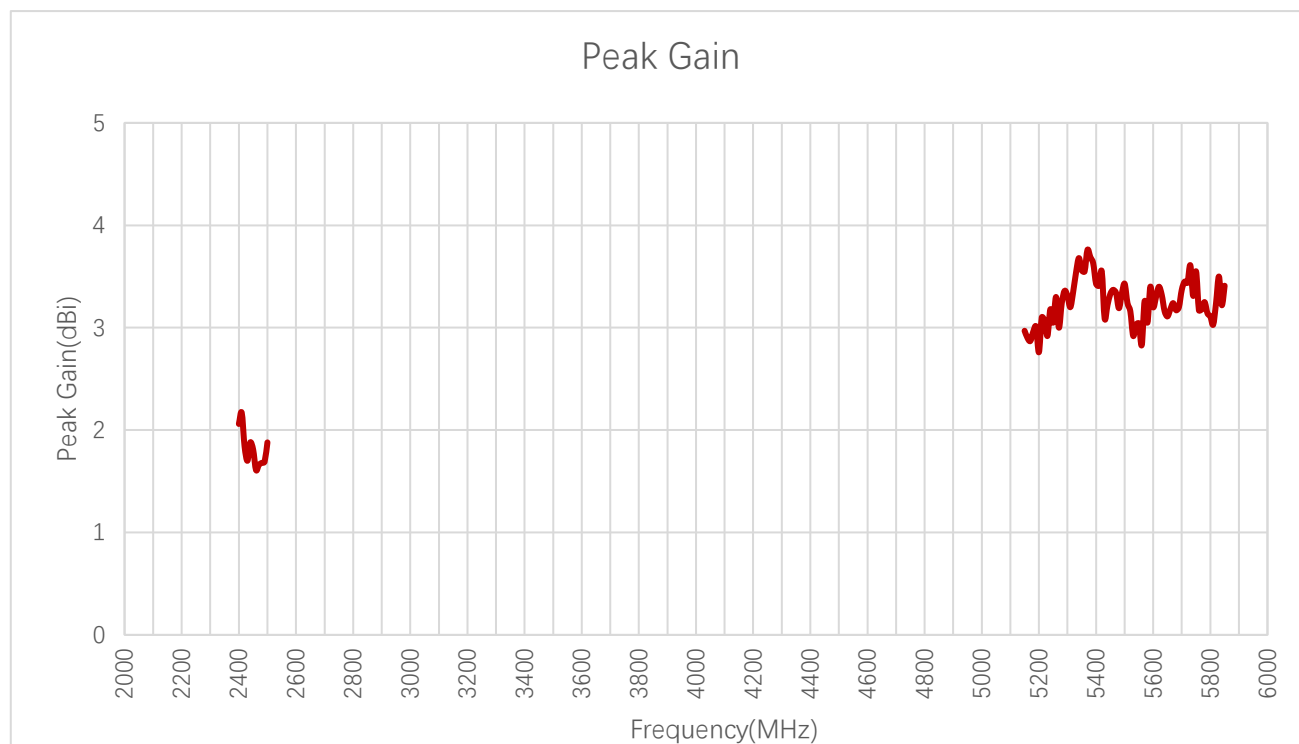
Efficiency (%)									
Frequency (MHz)	2400	2450	2500	5150	5500	5850	5920	6520	7120
Efficiency (%)	70.4	67.0	65.6	76.7	80.3	78.4	-	-	-

### 3.2.2. Average Gain



Average Gain (dB)									
Frequency (MHz)	2400	2450	2500	5150	5500	5850	5920	6520	7120
Average Gain (dB)	-1.5	-1.7	-1.8	-1.2	-1.0	-1.1	-	-	-

### 3.2.3. Peak Gain

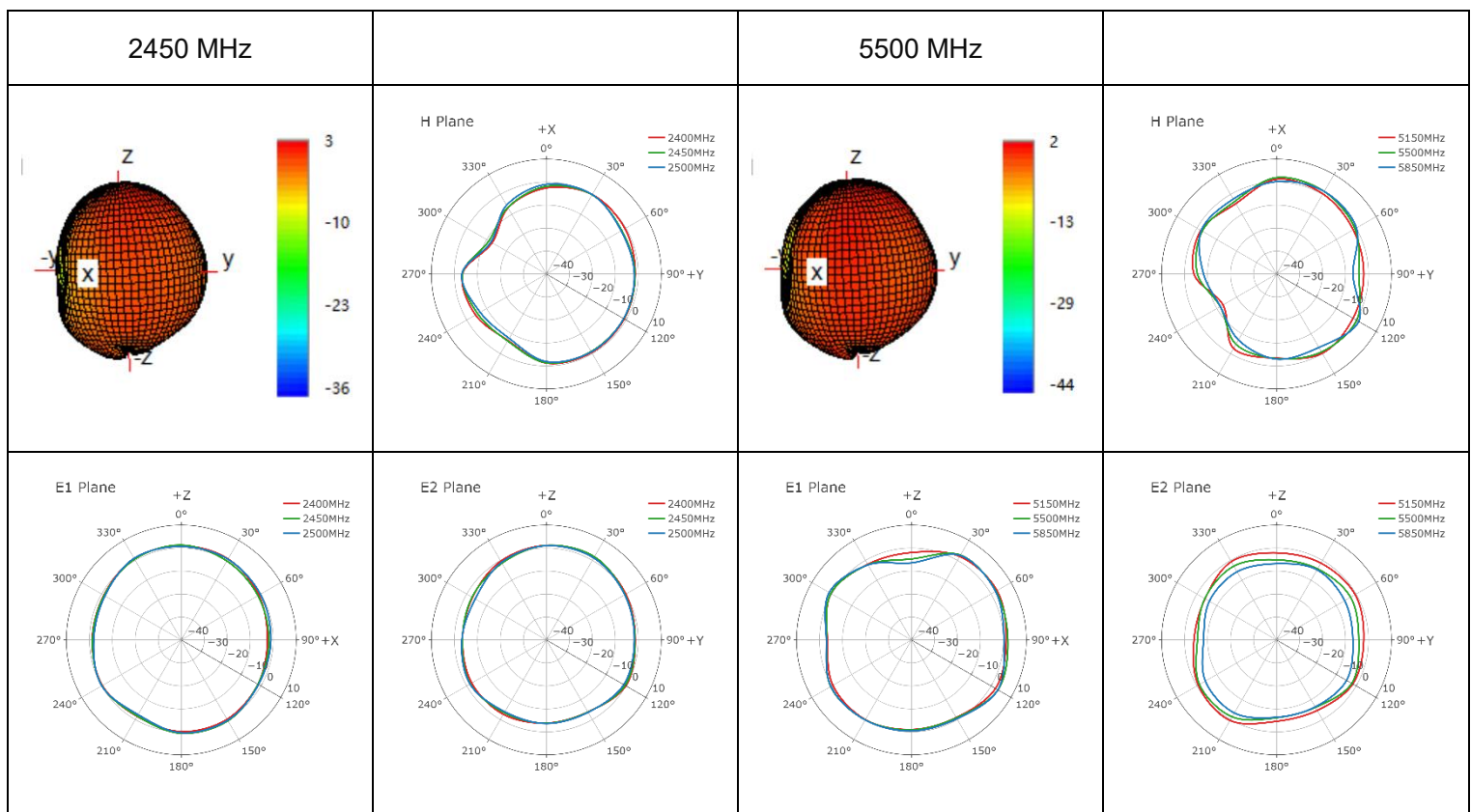
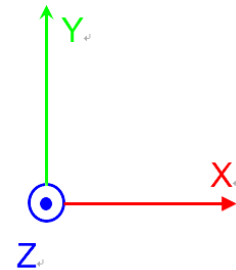
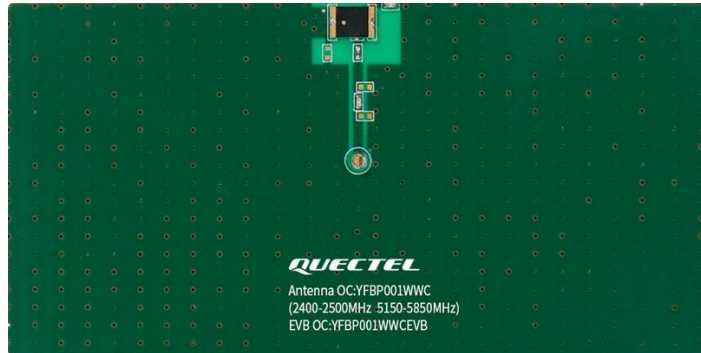


**Peak Gain (dBi)**

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5920	6520	7120
Peak Gain (dBi)	2.1	1.8	1.9	3.0	3.4	3.4	-	-	-

### 3.2.4. 3D & 2D Radiation Pattern

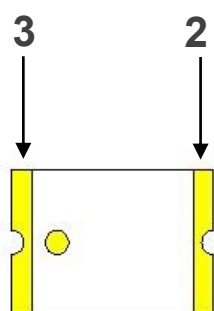
- Test Condition: Assembled on 80 × 40 mm EVB
- Test Chamber: GL-G-1



## 4 Schematic Symbol and Pin Definition

- The pin assignment for the antenna is as follows.
- The antenna has 3 pins, only one of which works.
- All other pins are designed for mechanical strength.

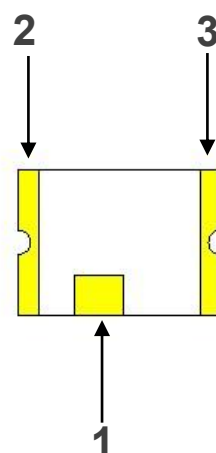
Pin	Description
1	Feed
2,3	Fixed



Top



Side



Bottom

## 5 Transmission Line

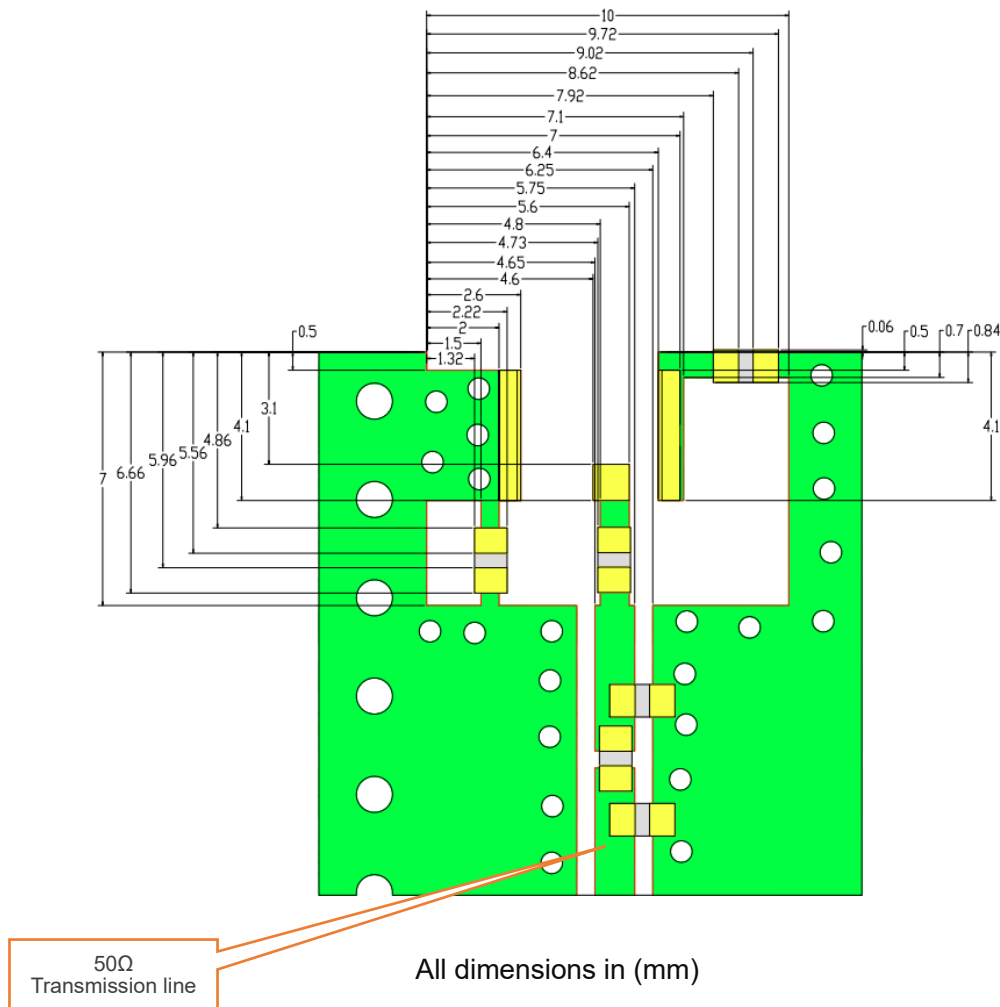
The characteristic impedance of all transmission lines shall be designed as 50  $\Omega$ .

- 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

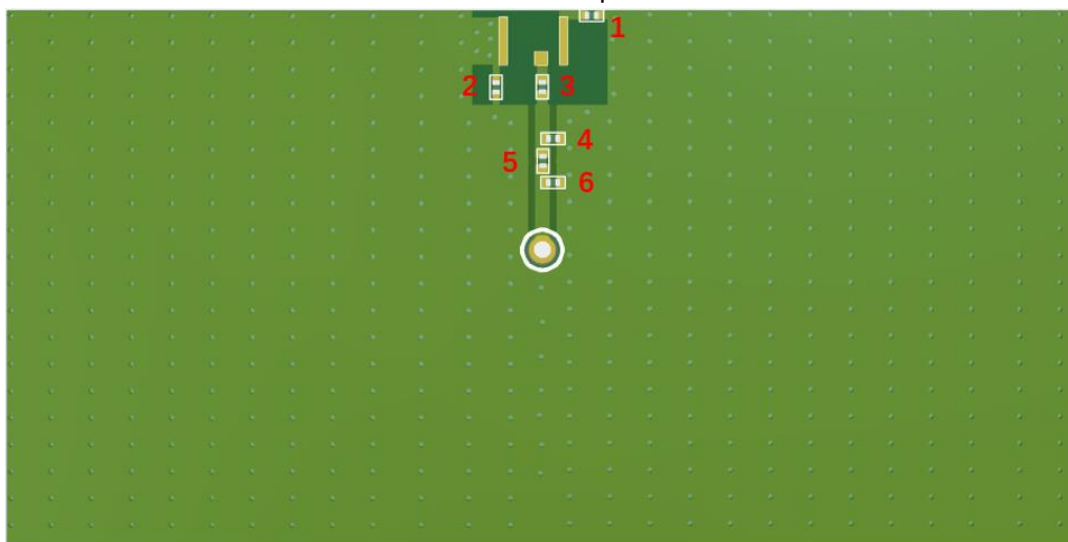
The host PCB must be designed using the PCB footprint shown with the correct clearances. An example of the PCB layout shows the antenna footprint. Please note this clearance area is critical to the performance of the antenna and must be applied through all layers of the PCB.





## 7 Matching Circuit

Demo Board Top View



	1	2	3	4	5	6
Default Matching	5 pF	N/C	0.5 pF	N/C	0 $\Omega$	N/C
Vender	MURATA	N/C	MURATA	N/C	MURATA	N/C



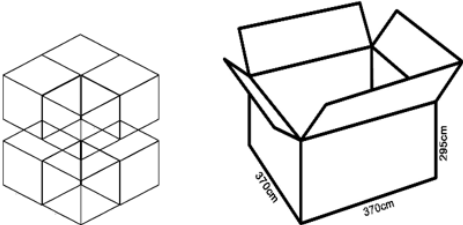
## 8 Soldering Temperature

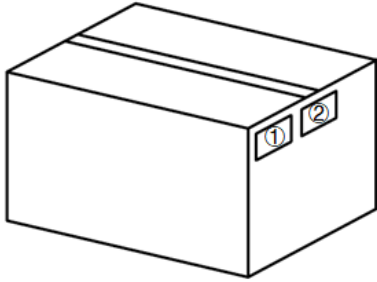
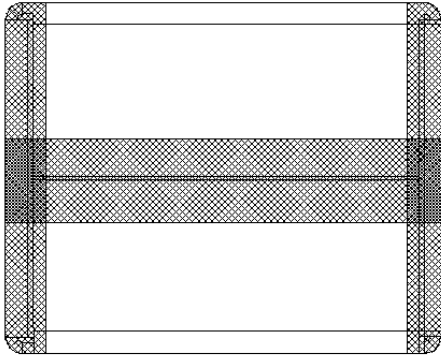
Channels	Name	Heating time 150.0-200.0°C	Above temp 217.0°C	Top temp	Heating slope 150.0-180.0°C	Cooling slope 180.0-150.0°C
1	Pin1	73"	82"	248.7	0.97	-2.92
Refrence value		70.0-95.0s	70.0-90.0s	240.0-250.0°C	0.0-3.0°C/s	-4.0--1.0°C/s

## 9 Reflow Profile



# 10 Packaging

Step	Packaging Picture / 2D Picture	Description
1		Reel
2	<p>X6 reels</p> 	<p>(1000 PCS Antenna Products / Reel) 6 volumes in one inner box.</p>
3		<p>(8 Inner Boxes / Carton Box) (48000 PCS Antennas / Carton Box) Estimated quantity Products that cannot fill the entire carton box are packed in a suitable size carton box. <u>Carton Size:</u> <u>L × W × H = 370 × 370 × 295 mm</u></p>

4		<b>Position for Attaching Labels</b> ① Carton Label ② Quality Label
5		<b>Sealing Cartons</b> H-shaped 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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**Or our local offices. For more information, please visit:**

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# Revision History

Version	Date	Author	Note
-	2024-05-27	Jaden FENG/ Hart HU/ David LIU/ Rainey LIAO	Creation of the document
1.0	2024-05-27	Jaden FENG/ Hart HU/ David LIU/ Rainey LIAO	First official release
1.1	2024-12-06	Jason LONG/ Jaden FENG	Updated the drawings (Chapters 2 and 4).



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