

# Antenna Datasheet

**Product OC** (Antenna Only)**:** YFBP001WWB
**Product OC** (Antenna + Rectangular EVB)**:** YFBP001WWBEVB
**Version:** 1.1
**Date:** 2025-04-16
**Status:** Released

**Product Name:** Wi-Fi SMT Mount PCB Chip IFA Embedded Antenna
**Key Features:**
Frequency Band: 2400–2500 MHz
Dimensions: 5.0 mm × 3.6 mm × 0.6 mm
Efficiency: Up to 81.1 %
RoHS Compliant

# Overview

The Quectel YFBP001WWB is a compact form factor SMT mount PCB chip antenna for Wi-Fi applications. Due to the dimensions of 5.0 × 3.6 × 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 YFBP001WWB is a ground-depended IFA antenna, uses main PCB as its ground plane. It is delivered on tape and reel.

The YFBP001WWB is a PCB chip antenna, which can be mounted on super compact space require terminals. Despite of this small factor, it has up to 81.1 % 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 YFBP001WWB 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.

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# 1 Specification

**Test Condition: Assembled on 80 mm × 40 mm EVB**

## 1.1. Electrical

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

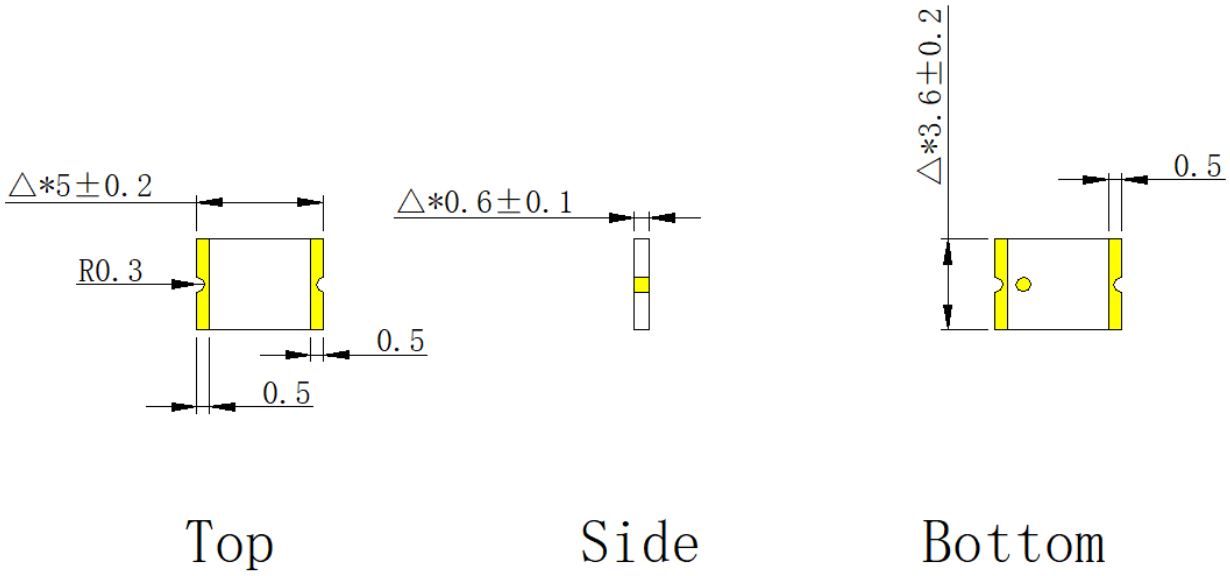
| Band / Specification | Wi-Fi 2.4G | Wi-Fi 5G | Wi-Fi 6G |
|---|---|---|---|
| | 2400–2500 | 5150–5850 | 5925–7125 |
| **Max. VSWR** | 1.9 | - | - |
| **Max. Return Loss (dB)** | -10.4 | - | - |
| **AVG Eff. (%)** | 74.8 | - | - |
| **AVG Gain (dB)** | -1.3 | - | - |
| **Max. Peak Gain (dBi)** | 1.7 | - | - |

## 1.2. Mechanical & Environmental

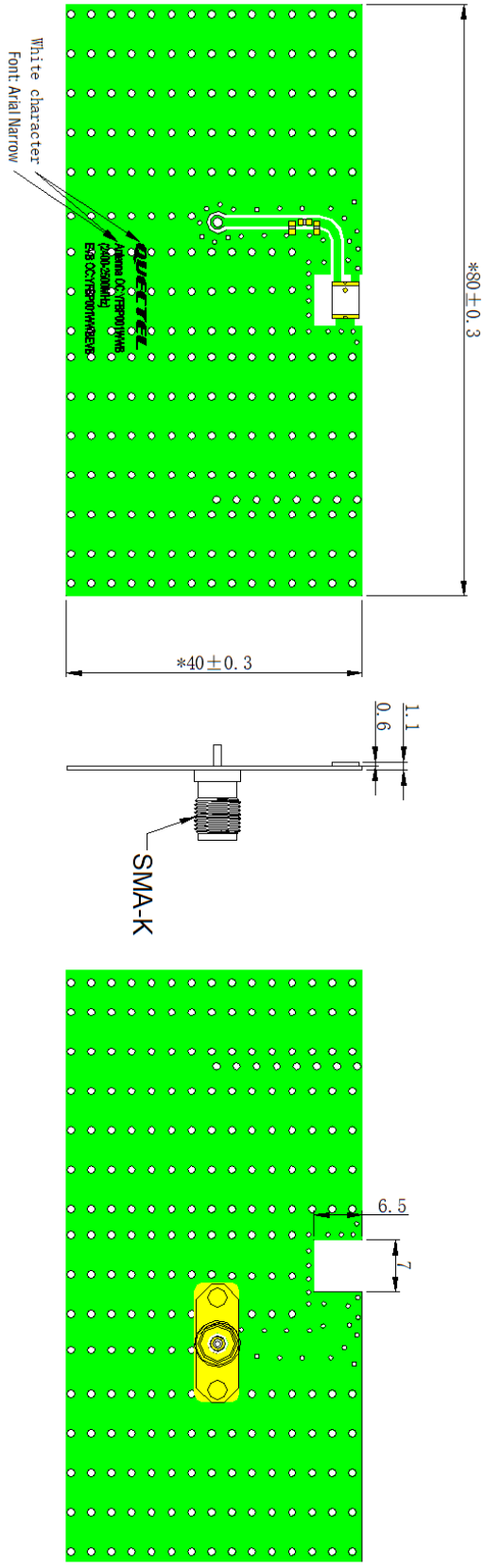
| | |
|---|---|
| **Mechanical** | |
| **Antenna Size** | 5.0 mm × 3.6 mm × 0.6 mm |
| **Antenna Material & Color** | PCB & Black |
| **Antenna Weight** | Typ. 0.04 g |
| **Mounting Type** | SMD |
| **Recommended EVB Size** | 80 × 40 × 0.6 mm |
| **Environmental** | |
| **Operation Temperature** | -40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

# 2 Drawing

## 2.1. Antenna



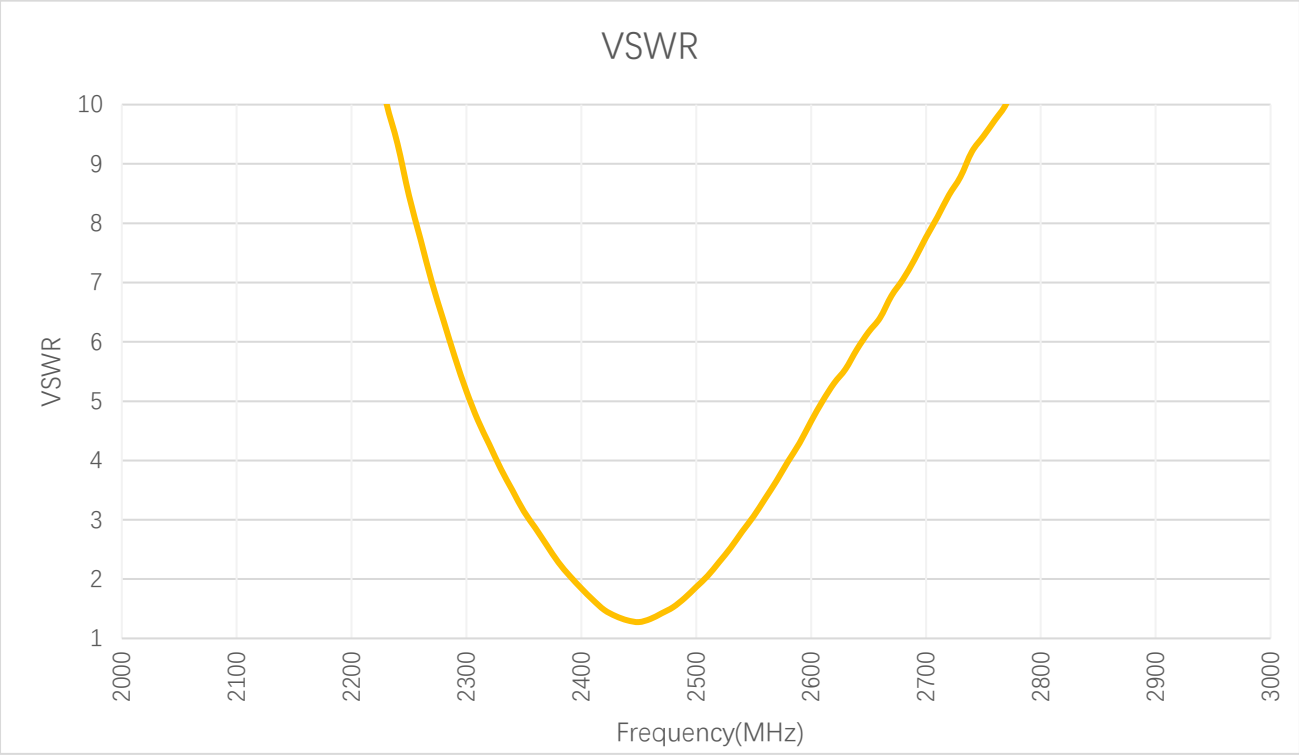
## 2.2. Rectangular EVB



# 3 Detailed Performance

## 3.1. S-Parameter Test

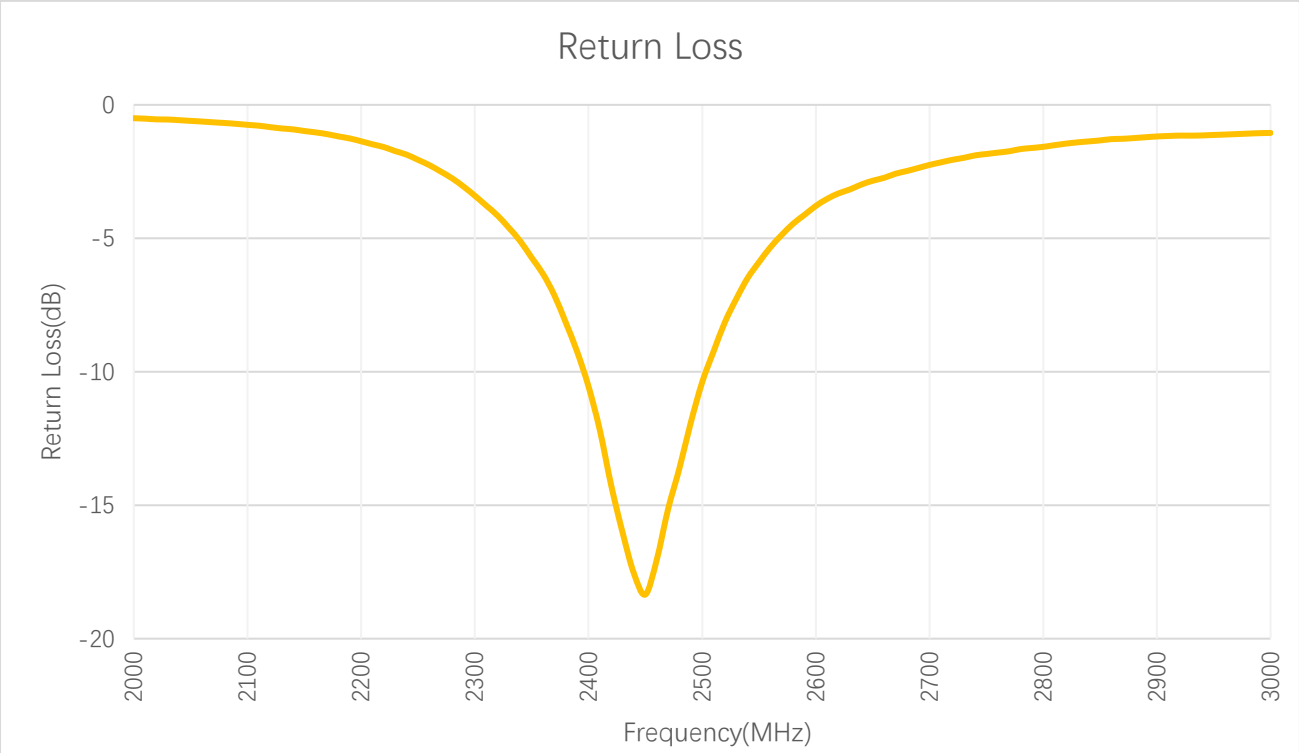
### 3.1.1. VSWR




**VSWR**

| Frequency (MHz) | 2400 | 2450 | 2500 | 5150 | 5500 | 5850 | 5925 | 6325 | 6725 | 7125 |
|---|---|---|---|---|---|---|---|---|---|---|
| **VSWR** | 1.8 | 1.3 | 1.9 | - | - | - | - | - | - | - |

### 3.1.2. Return Loss

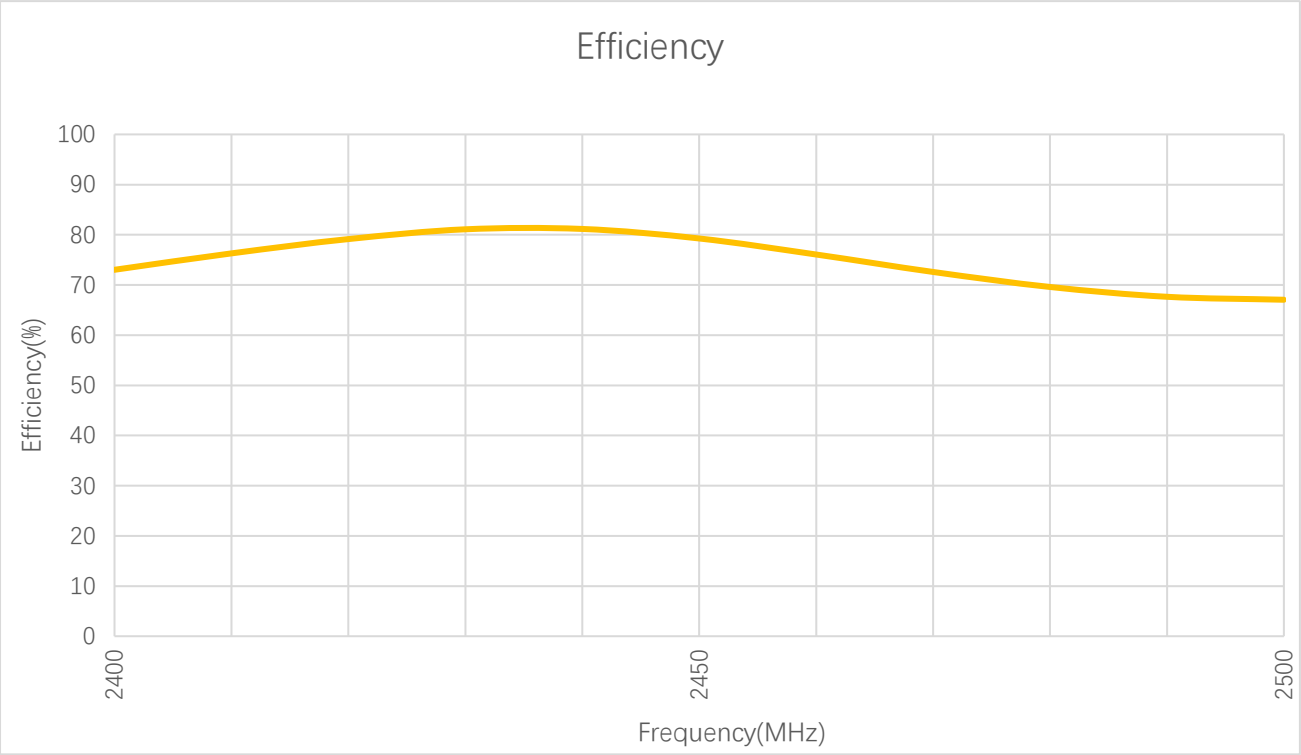



**Return Loss (dB)**

| Frequency (MHz) | 2400 | 2450 | 2500 | 5150 | 5500 | 5850 | 5925 | 6325 | 6725 | 7125 |
|---|---|---|---|---|---|---|---|---|---|---|
| Return Loss (dB) | -10.6 | -18.3 | -10.4 | - | - | - | - | - | - | - |

## 3.2. Radiation Performance Test

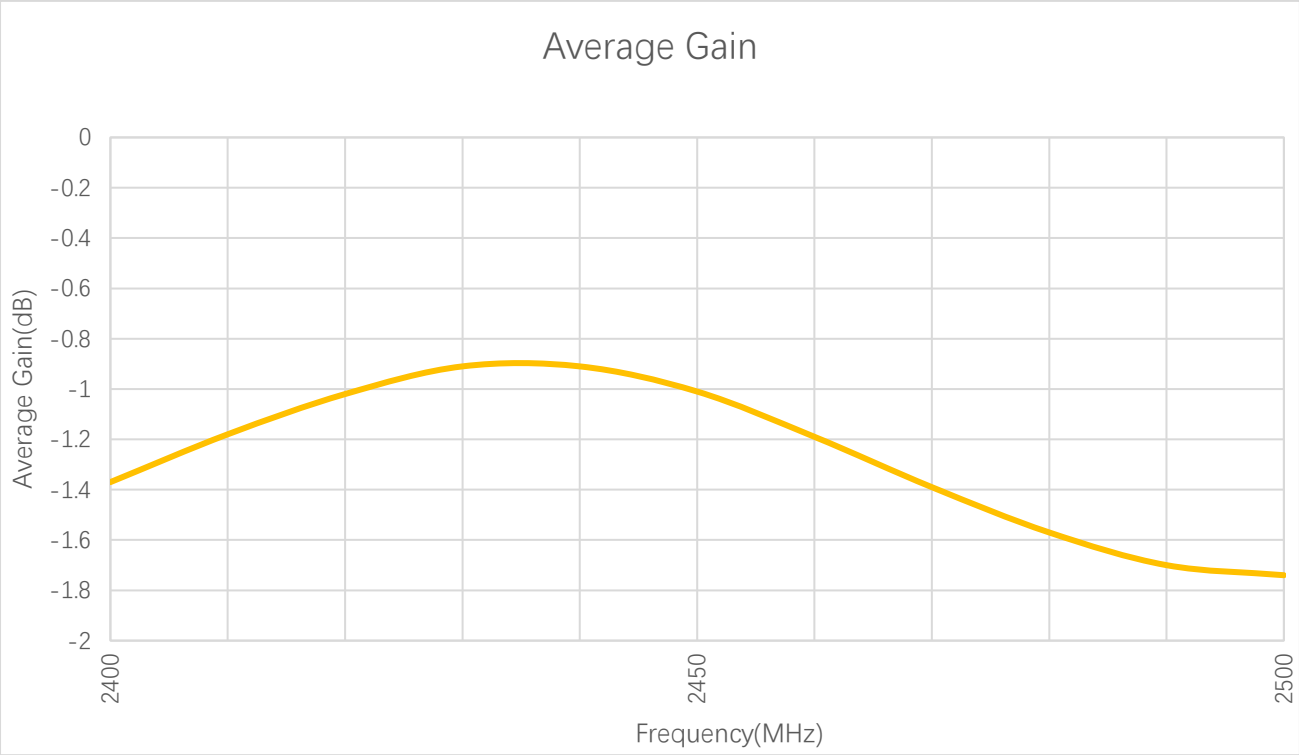
### 3.2.1. Efficiency




**Efficiency (%)**

| Frequency (MHz) | 2400 | 2450 | 2500 | 5150 | 5500 | 5850 | 5925 | 6325 | 6725 | 7125 |
|---|---|---|---|---|---|---|---|---|---|---|
| Efficiency (%) | 73.0 | 79.3 | 67.1 | - | - | - | - | - | - | - |

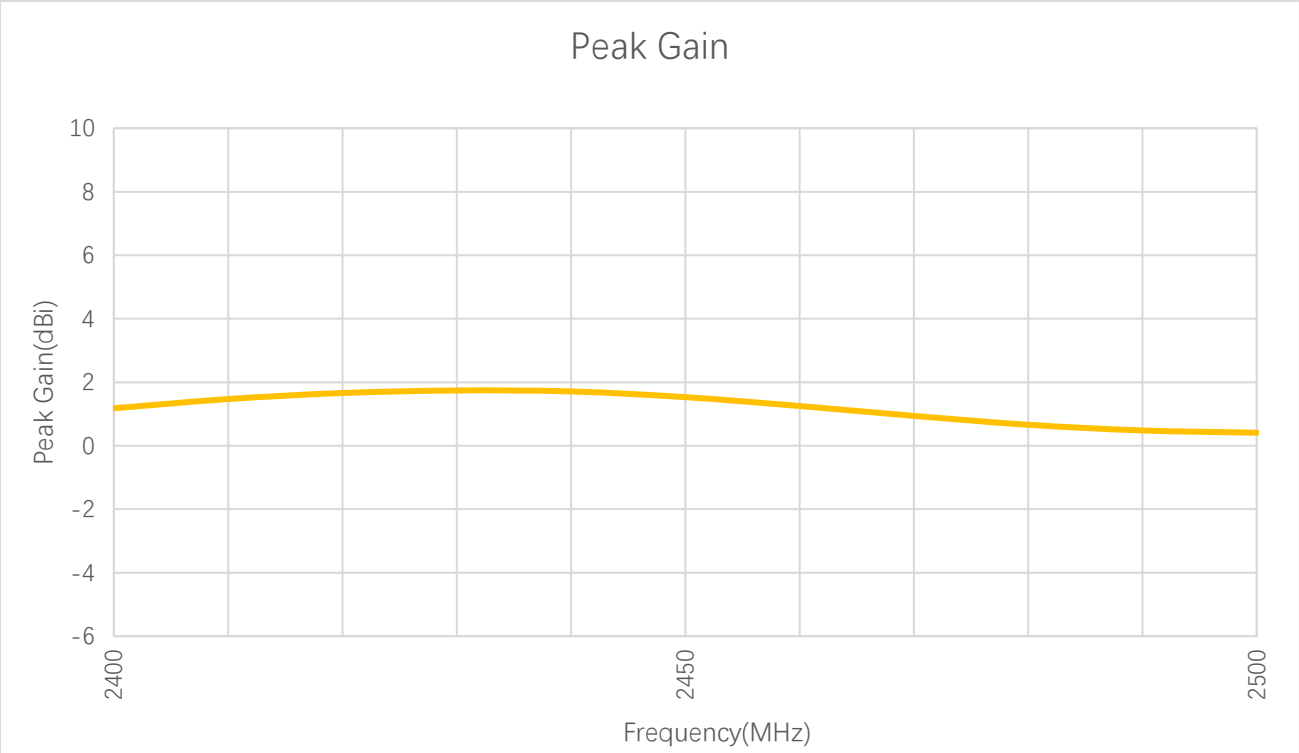
### 3.2.2. Average Gain




**Average Gain (dB)**

| Frequency (MHz) | 2400 | 2450 | 2500 | 5150 | 5500 | 5850 | 5925 | 6325 | 6725 | 7125 |
|---|---|---|---|---|---|---|---|---|---|---|
| Average Gain (dB) | -1.4 | -1.0 | -1.7 | - | - | - | - | - | - | - |

### 3.2.3. Peak Gain

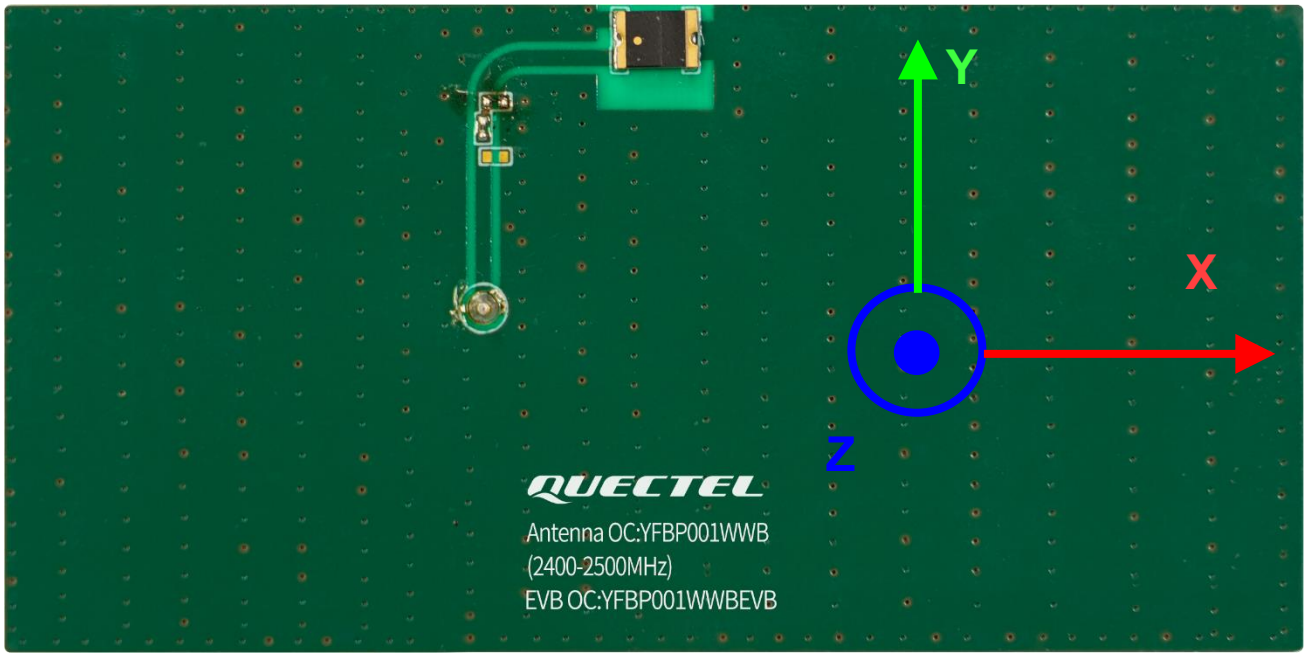


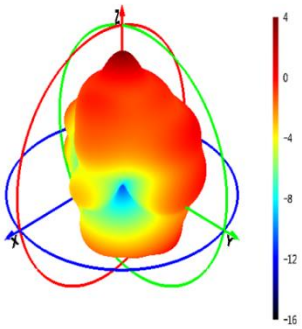
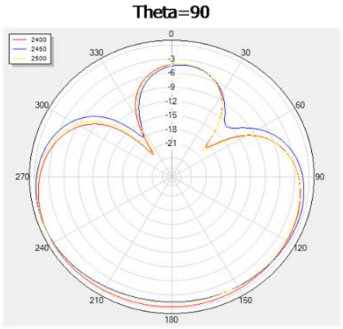
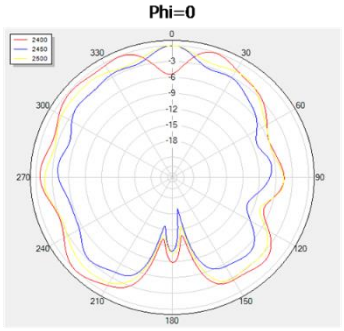
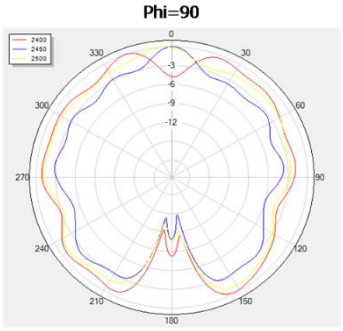

**Peak Gain (dBi)**

| Frequency (MHz) | 2400 | 2450 | 2500 | 5150 | 5500 | 5850 | 5925 | 6325 | 6725 | 7125 |
|---|---|---|---|---|---|---|---|---|---|---|
| Peak Gain (dBi) | 1.2 | 1.5 | 0.4 | - | - | - | - | - | - | - |

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

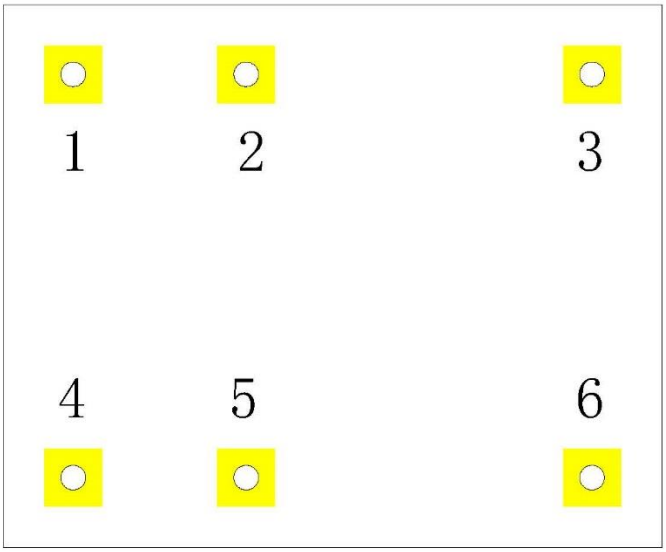
- Test condition: Assembled on 80 mm × 40 mm EVB
- Test Chamber: HF-S-1




| 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

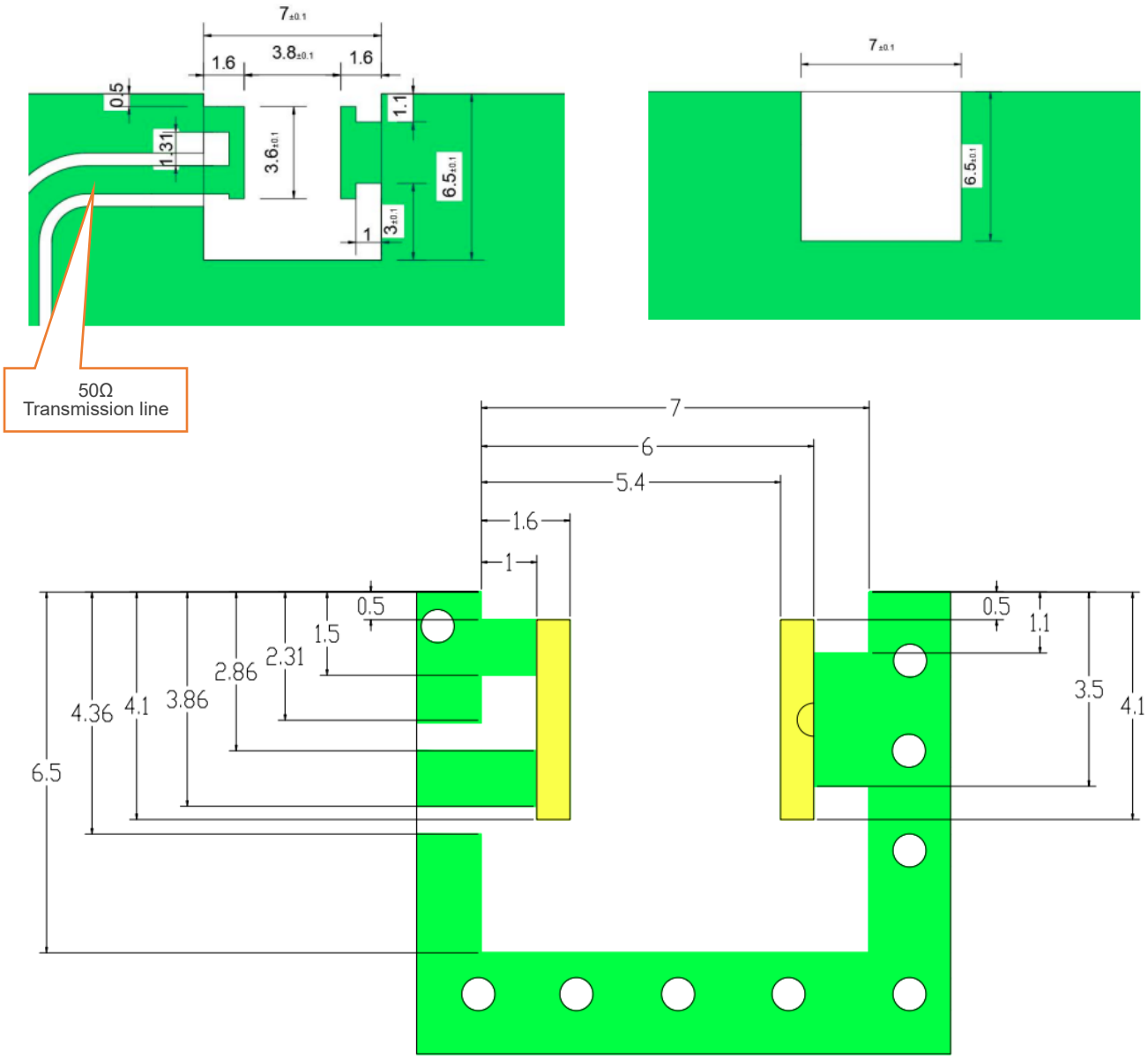
The characteristic impedance of all transmission lines shall be designed as 50 Ω.

- 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

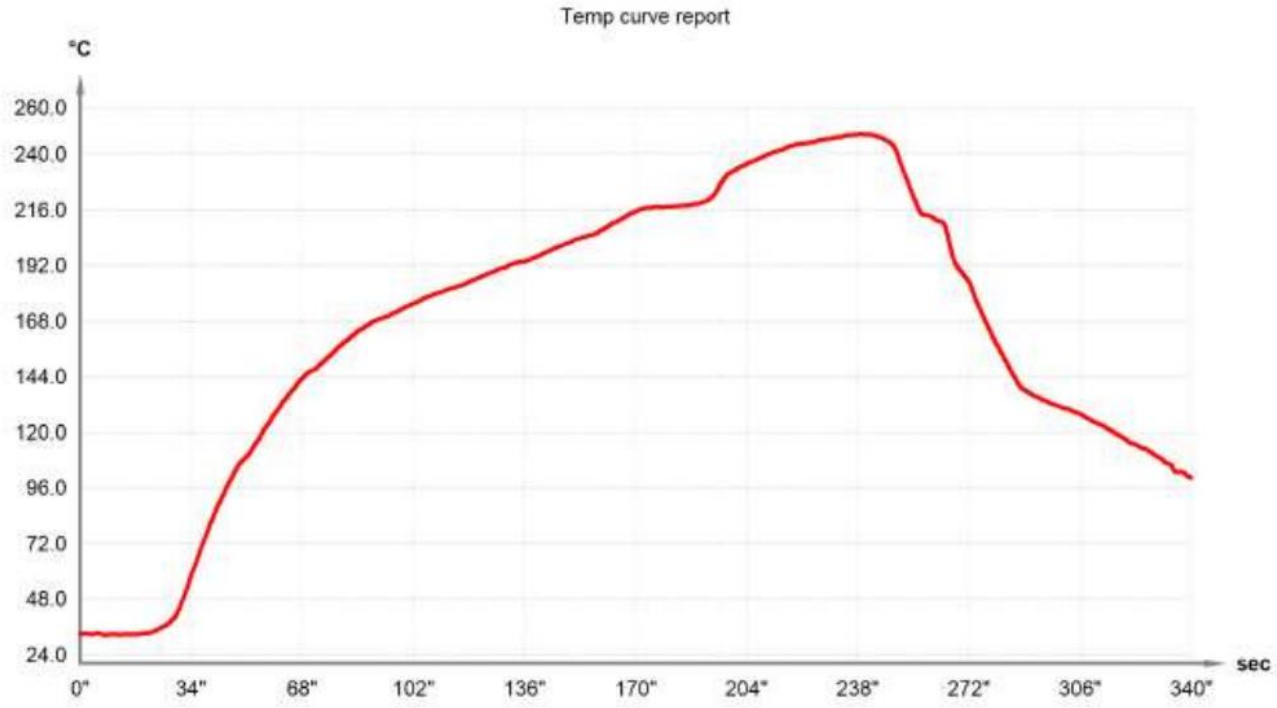



| Location | Description | Vendor |
|---|---|---|
| 1 | N/C | N/C |
| 2 | 0Ω | MURATA |
| 3 | N/C | N/C |

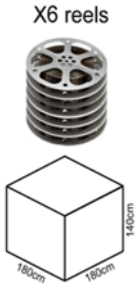
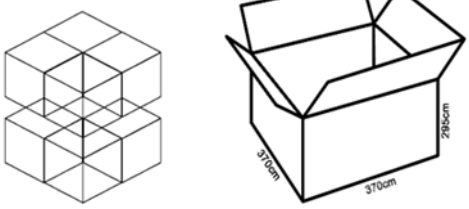
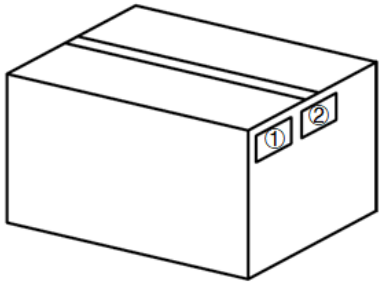
# 8 Soldering Temperature

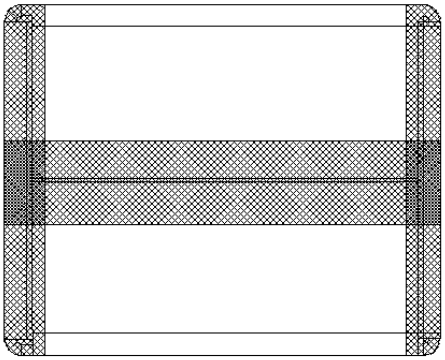
| Channels | Name | Heating time 150.0-200.0°C | Above temp 217.0°C | Top temp | Heating slope 150.0-180.0°C | Cooling slope 180.0-150.0°C |
|---|---|---|---|---|---|---|
| 1 | Pin1 | 73" | 82" | 248.7 | 0.97 | -2.92 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| 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 |  | (1000 Antenna Products / Reel)<br>6 volumes in one inner box. |
| 3 |  | (8 Inner Boxes / carton box)<br>(48000 PCS / Carton Box)<br>Estimated quantity<br>Products that cannot fill the entire carton box are packed in a suitable size carton box.<br>Carton Size:<br>L × W × H = 370 × 370 × 295 mm |
| 4 |  | **Position for Attaching Labels**<br>① Carton Label<br>② Quality Label |

| | | |
|---|---|---|
| 5 |  | **Sealing Cartons**<br>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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Tel: +86 21 5108 6236
Email: info@quectel.com

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# Revision History

| Version | Date | Author | Note |
|---|---|---|---|
| - | 2024-03-27 | Kane LIU/<br>Hart HU/<br>David LIU/<br>Rainey LIAO | Creation of the document |
| 1.0 | 2024-03-27 | Kane LIU/<br>Hart HU/<br>David LIU/<br>Rainey LIAO | First official release |
| 1.1 | 2025-04-16 | Bill MO | Updated the antenna dimensions. |



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