

# Antenna Datasheet

**Product OC:** YEBT038WFA

**Version:** 0.1

**Date:** 2024-05-08

**Status:** Preliminary

**Product Name:** External Wi-Fi/BT Antenna

**Key Features:**

Frequency band: 2400–2500 MHz, 5150–5850 MHz, 5925–7125 MHz

Peak efficiency: 50.12 %

Dimensions:  $\Phi 13$  mm  $\times$  195 mm

RoHS Compliant

# Overview

Quectel Wi-Fi/BT antenna covers BT, 2.4 GHz, 5 GHz, and up to 7 GHz bands, fully satisfying customers' requirements for BT, 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.

# Contents

|                                           |           |
|-------------------------------------------|-----------|
| Overview.....                             | 1         |
| Contents .....                            | 2         |
| <b>1 Specification.....</b>               | <b>3</b>  |
| 1.1. Electrical.....                      | 3         |
| 1.2. Mechanical & Environmental .....     | 4         |
| <b>2 Drawing .....</b>                    | <b>5</b>  |
| <b>3 Detailed Performance .....</b>       | <b>6</b>  |
| 3.1. S-Parameter Test .....               | 6         |
| 3.1.1. VSWR.....                          | 6         |
| 3.1.2. Return Loss .....                  | 8         |
| 3.2. Radiation Performance Test.....      | 9         |
| 3.2.1. Efficiency .....                   | 9         |
| 3.2.2. Average Gain .....                 | 10        |
| 3.2.3. Peak Gain.....                     | 11        |
| 3.2.4. 3D & 2D Radiation Pattern.....     | 12        |
| 3.2.4.1. Test Condition: Free Space ..... | 12        |
| <b>4 Packaging .....</b>                  | <b>15</b> |
| Contact Us.....                           | 17        |
| Legal Notices .....                       | 18        |
| Revision History .....                    | 20        |

# 1 Specification

Test Condition: Free Space

## 1.1. Electrical

| Electrical        |                                             |
|-------------------|---------------------------------------------|
| Frequency Range   | 2400–2500 MHz, 5150–5850 MHz, 5925–7125 MHz |
| Impedance         | 50 $\Omega$                                 |
| Polarization      | Linear                                      |
| Radiation Pattern | Omni-directional                            |
| Antenna Type      | Dipole                                      |

| Specification         | Band           | Wi-Fi 2G<br>BT   | Wi-Fi 5G          |                   |                   |                   | Wi-Fi 7G         |
|-----------------------|----------------|------------------|-------------------|-------------------|-------------------|-------------------|------------------|
|                       | Freq.<br>(MHz) | 2400 - 2500      | 5150 - 5250       | 5250 - 5350       | 5470 - 5725       | 5725 - 5850       | 5925-7125        |
| Max. VSWR             |                | 2.0              | 2.8               | 2.8               | 2.7               | 2.4               | 2.3              |
| Max. Return Loss (dB) |                | -9.3             | -6.6              | -6.4              | -6.7              | -7.6              | -8.0             |
| AVG Eff. (%)          |                | 40.6             | 40.6              | 38.6              | 33.8              | 28.7              | 33.4             |
| AVG Gain (dB)         |                | -4.0             | -3.9              | -4.1              | -4.7              | -5.4              | -4.8             |
| Max. Peak Gain (dBi)  |                | 0.2<br>(2500MHz) | -0.7<br>(5155MHz) | -0.8<br>(5260MHz) | -1.2<br>(5480MHz) | -1.5<br>(5820MHz) | 1.6<br>(6915MHz) |
| VSWR                  |                | $\leq 2.8$       |                   |                   |                   |                   |                  |
| Return Loss           |                | $\leq -6.4$ dB   |                   |                   |                   |                   |                  |
| Peak Gain             |                | $\leq 1.6$ dBi   |                   |                   |                   |                   |                  |

## 1.2. Mechanical & Environmental

| Mechanical            |                  |
|-----------------------|------------------|
| Antenna Dimensions    | Φ13 mm × 195 mm  |
| Material & Color      | TPEE & Black     |
| Connector Type        | RP SMA Male      |
| Mounting Type         | Terminal         |
| Weight                | Typ. 18 g        |
| Environmental         |                  |
| Operation Temperature | -40 °C to +85 °C |
| Storage Temperature   | -40 °C to +85 °C |
| RoHS Compliant        | Yes              |

## **2** Drawing

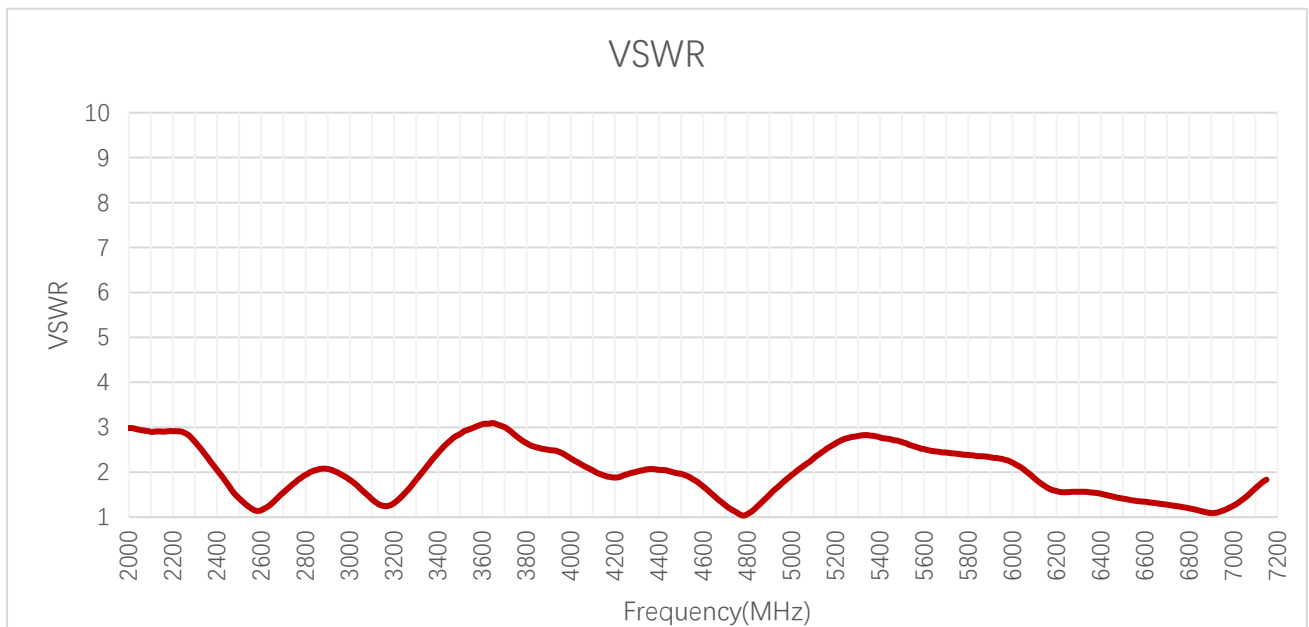
Refer to test photos

## 3 Detailed Performance

- Network Analyzer: Keysight E5071C (Device number: QTB6331E; Calibration date: 2023-12-27; Due date:2025-06-26)
- Chamber: OTA RayZone 2800 GTS (Device number: QTA0709; Calibration date: 2023-07-14; Due date:2024-07-13)
- Testing Software: Libra
- Manufacturer: Quectel Wireless Solutions (Changzhou) Co., Ltd.  
Address: No.8 Nanhu West Road, Wujin District, Changzhou City, Jiangsu Province, China

### 3.1. S-Parameter Test

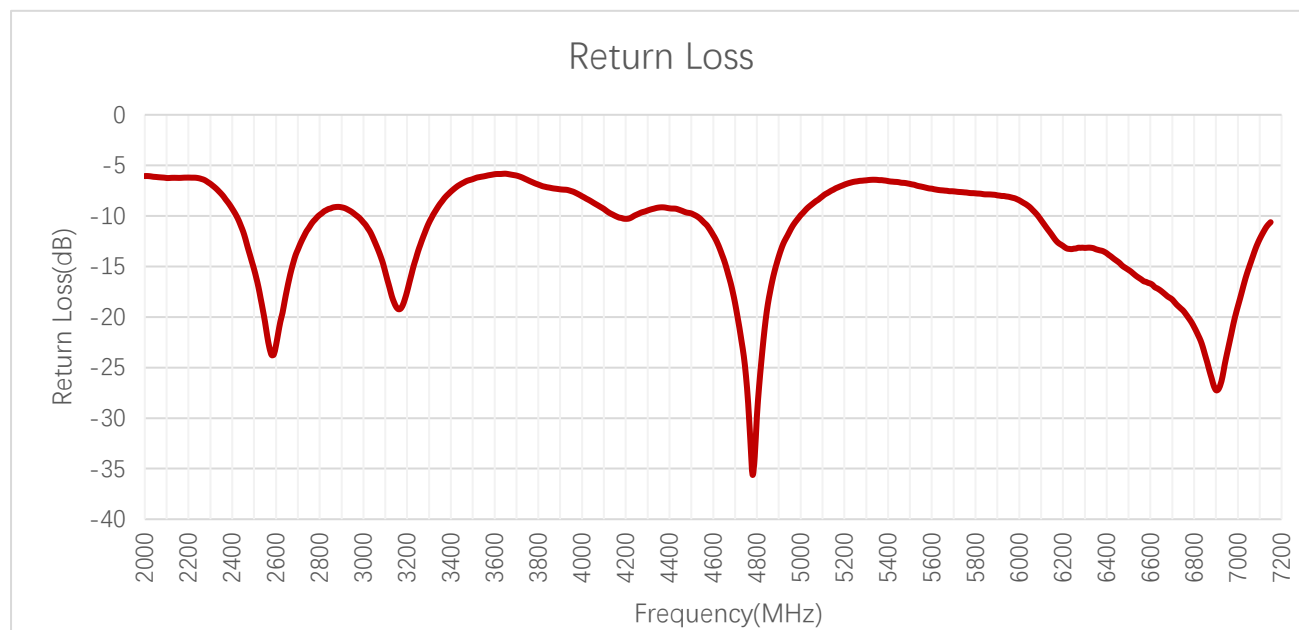
#### 3.1.1. VSWR



VSWR

|                 |      |      |      |      |      |      |      |      |      |
|-----------------|------|------|------|------|------|------|------|------|------|
| Frequency (MHz) | 2400 | 2500 | 5150 | 5155 | 5250 | 5260 | 5350 | 5470 | 5480 |
| VSWR            | 2.0  | 1.4  | 2.5  | 2.5  | 2.8  | 2.8  | 2.8  | 2.7  | 2.7  |
| Frequency (MHz) | 5725 | 5820 | 5850 | 5925 | 6325 | 6725 | 6915 | 7125 |      |
| VSWR            | 2.0  | 2.4  | 2.4  | 2.3  | 1.6  | 1.3  | 1.1  | 1.7  |      |

### 3.1.2. Return Loss

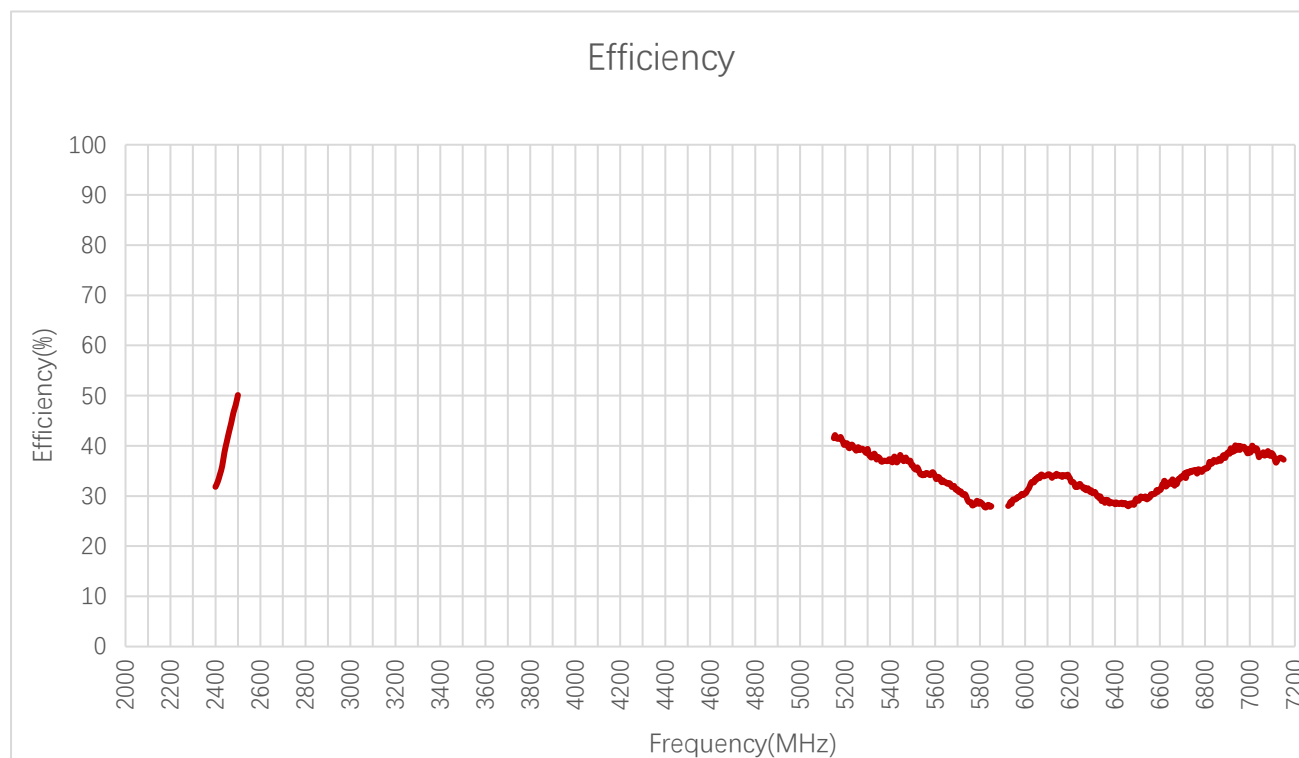


**Return Loss (dB)**

| Frequency (MHz)  | 2400 | 2500  | 5150 | 5155 | 5250  | 5260  | 5350  | 5470  | 5480 |
|------------------|------|-------|------|------|-------|-------|-------|-------|------|
| Return Loss (dB) | -9.3 | -15.3 | -7.4 | -7.4 | -6.6  | -6.6  | -6.4  | -6.7  | -6.7 |
| Frequency (MHz)  | 5725 | 5820  | 5850 | 5925 | 6325  | 6725  | 6915  | 7125  |      |
| Return Loss (dB) | -7.6 | -7.8  | -7.9 | -8.0 | -13.2 | -19.0 | -21.4 | -11.1 |      |

## 3.2. Radiation Performance Test

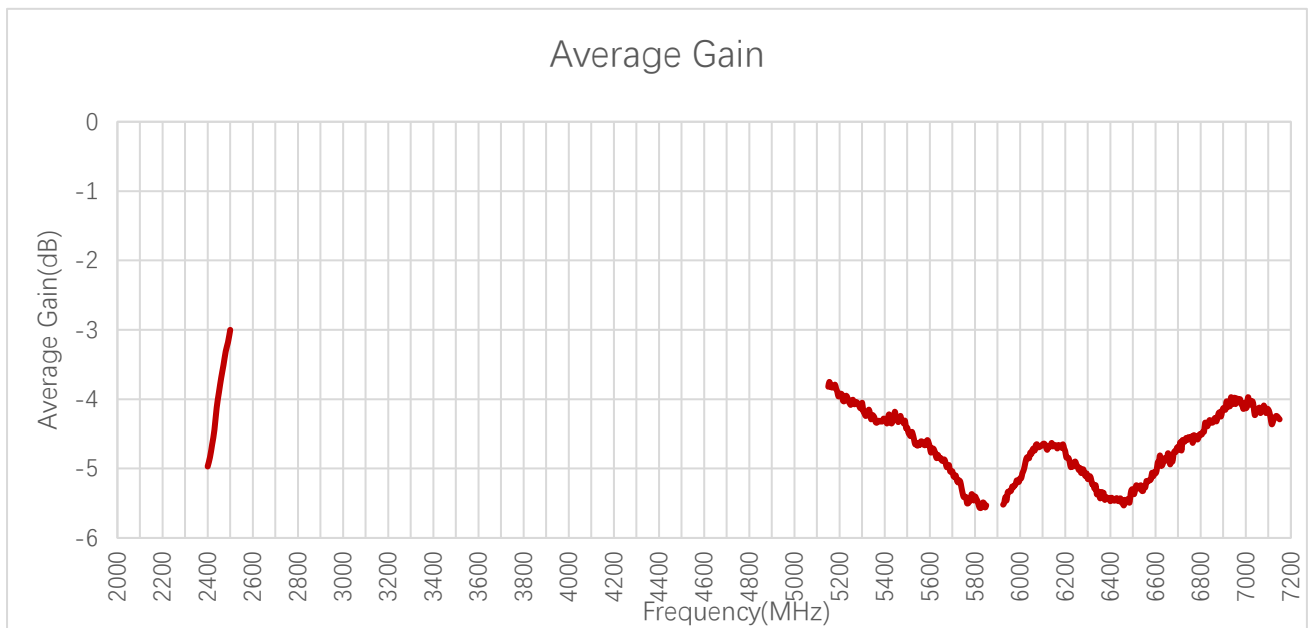
### 3.2.1. Efficiency



**Efficiency (%)**

| Frequency (MHz) | 2400 | 2500 | 5150 | 5155 | 5250 | 5260 | 5350 | 5470 | 5480 |
|-----------------|------|------|------|------|------|------|------|------|------|
| Efficiency (%)  | 31.8 | 50.1 | 41.5 | 42.2 | 39.1 | 39.7 | 37.7 | 37.7 | 37.1 |
| Frequency (MHz) | 5725 | 5820 | 5850 | 5925 | 6325 | 6725 | 6915 | 7125 |      |
| Efficiency (%)  | 30.2 | 27.8 | 28.0 | 28.0 | 30.0 | 34.6 | 39.5 | 37.4 |      |

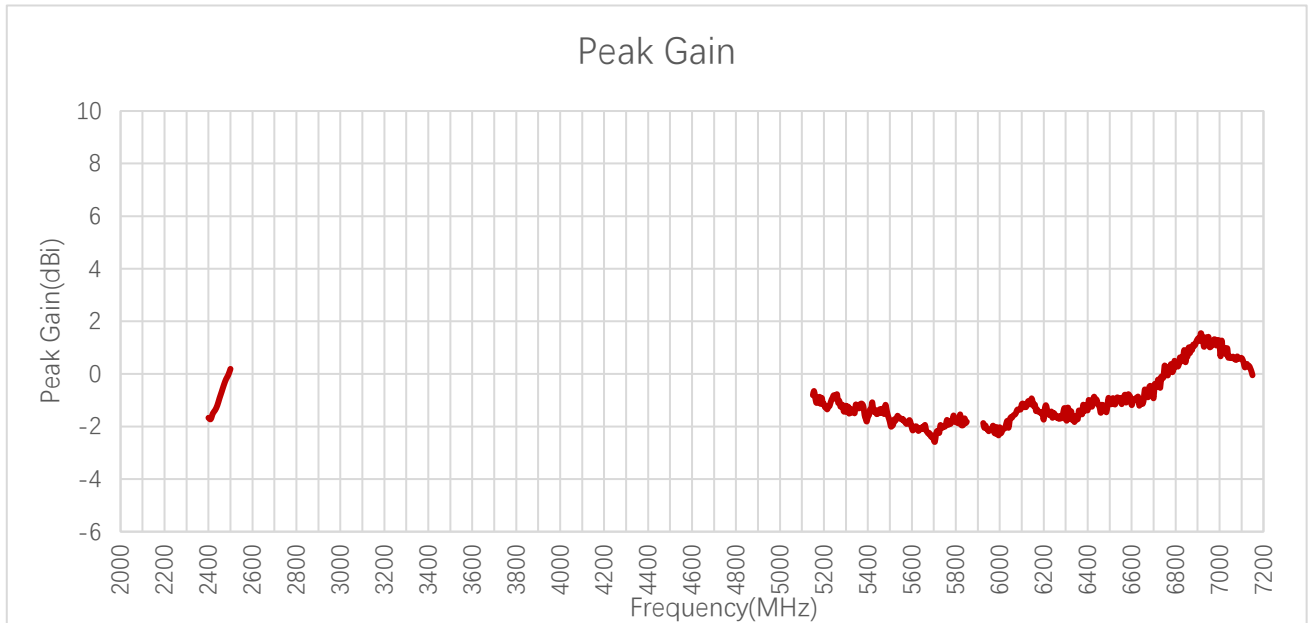
### 3.2.2. Average Gain



**Average Gain (dB)**

| Frequency (MHz)   | 2400 | 2500 | 5150 | 5155 | 5250 | 5260 | 5350 | 5470 | 5480 |
|-------------------|------|------|------|------|------|------|------|------|------|
| Average Gain (dB) | -5.0 | -3.0 | -3.8 | -3.8 | -4.1 | -4.0 | -4.2 | -4.2 | -4.3 |
| Frequency (MHz)   | 5725 | 5820 | 5850 | 5925 | 6325 | 6725 | 6915 | 7125 |      |
| Average Gain (dB) | -5.2 | -5.6 | -5.5 | -5.5 | -5.2 | -4.6 | -4.0 | -4.3 |      |

### 3.2.3. Peak Gain



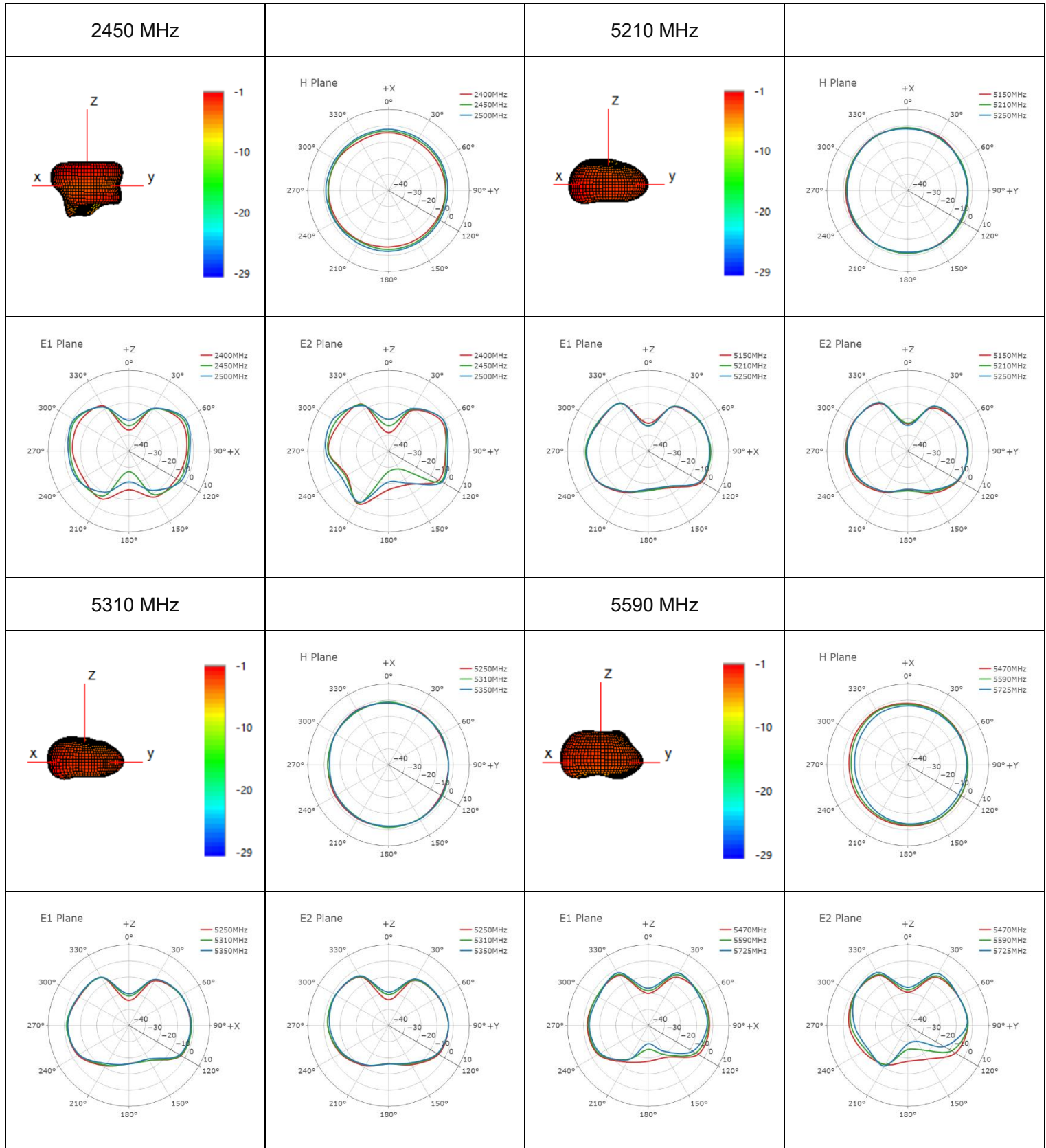
**Peak Gain (dBi)**

| Frequency (MHz) | 2400 | 2500 | 5150 | 5155  | 5250 | 5260 | 5350 | 5470 | 5480 |
|-----------------|------|------|------|-------|------|------|------|------|------|
| Peak Gain (dBi) | -1.7 | 0.2  | -0.8 | --0.7 | -0.9 | -0.8 | -1.3 | -1.4 | -1.2 |
| Frequency (MHz) | 5725 | 5820 | 5850 | 5925  | 6325 | 6725 | 6915 | 7125 |      |
| Peak Gain (dBi) | -2.2 | -1.5 | -1.8 | -1.9  | -1.4 | -0.3 | 1.6  | 0.4  |      |

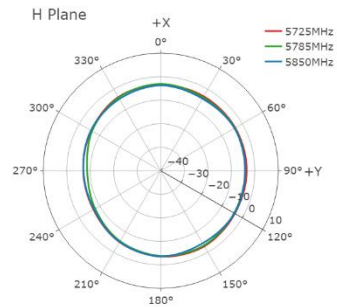
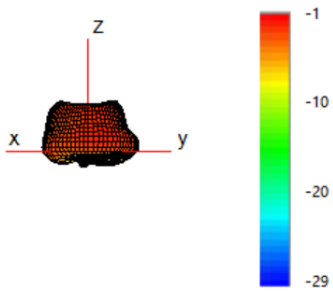
### **3.2.4. 3D & 2D Radiation Pattern**

#### **3.2.4.1. Test Condition: Free Space**

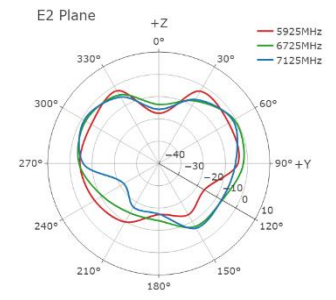
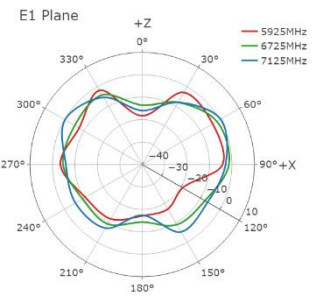
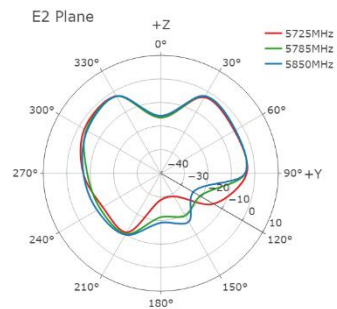
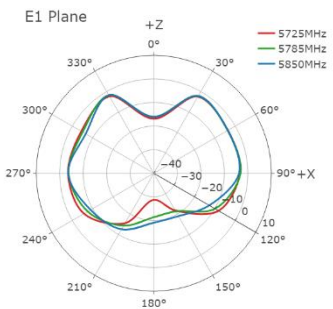
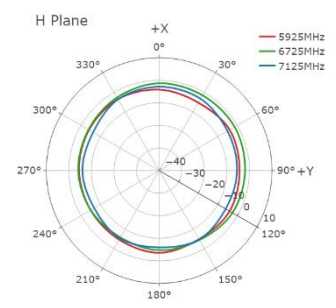
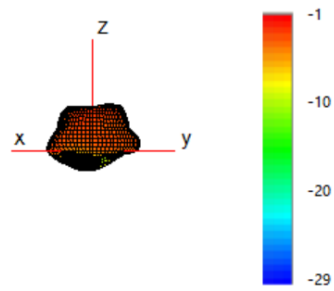
- Test Chamber: HF-G-1



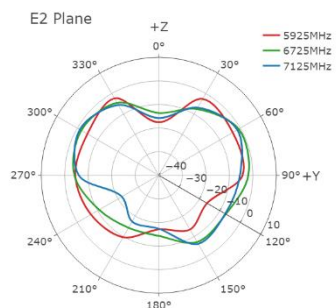
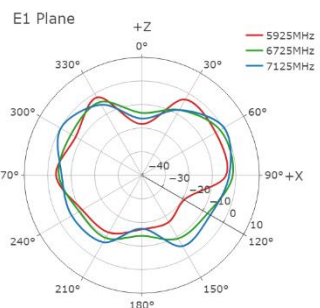
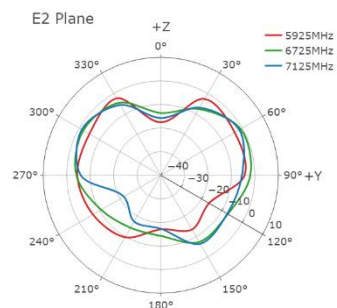
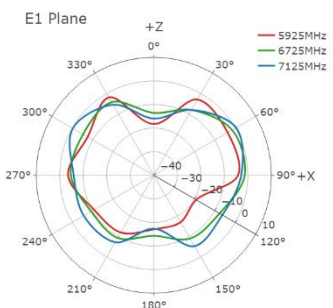
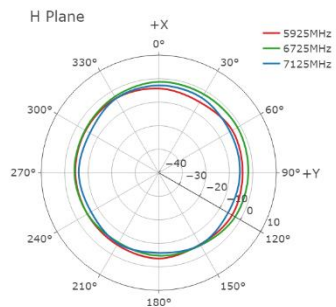
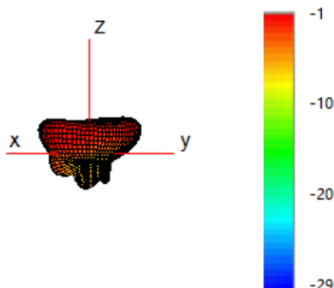
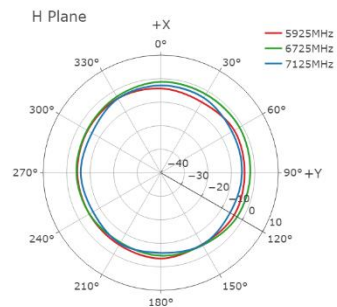
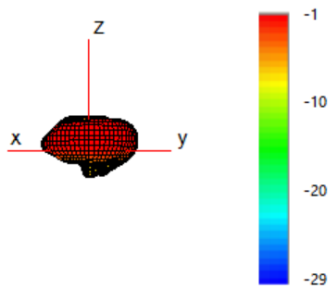
**5785 MHz**



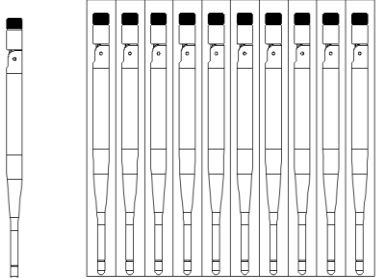
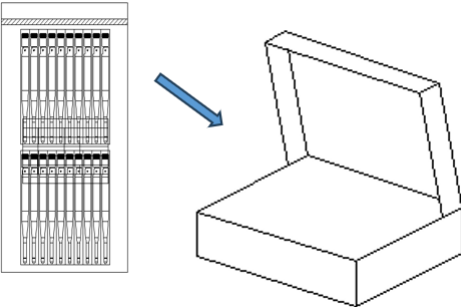
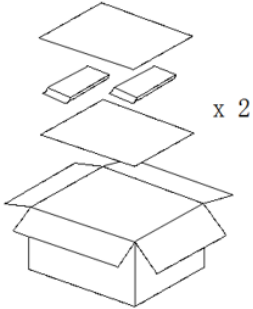
**5925 MHz**

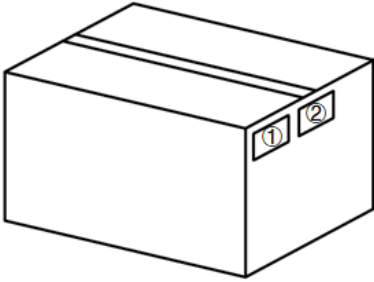
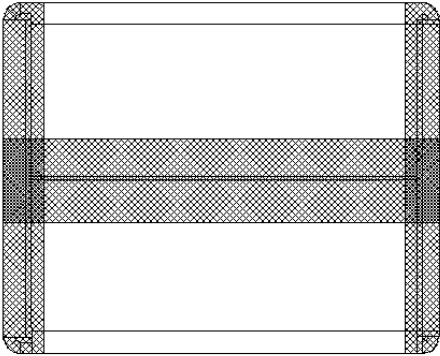


**6725 MHz**



## 4 Packaging

| Step | Packaging Picture / 2D Picture                                                                                                     | Description                                                                                                                                                                                                                                                    |
|------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    |  <p>1 product    10 products / One-piece Bag</p> | The product goes into a one-piece bag.<br>(10 PCS Antennas / One-piece Bag)                                                                                                                                                                                    |
| 2    |                                                 | 40 pcs antenna products in a PE bag.<br>120 pcs antenna products in an inner box.                                                                                                                                                                              |
| 3    |  <p>x 2</p>                                     | <p>(2 Inner Boxes / Carton Box)<br/>(240 PCS Antennas / Carton Box)<br/>Estimated quantity<br/>Products that cannot fill the entire carton box are packed in a suitable size carton box.<br/><u>Carton Size:</u><br/><u>L × W × H = 325 × 325 × 200 mm</u></p> |

|      |                                                                                                                                                                     |                                                                                          |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 4    |                                                                                    | <p><b>Position for Attaching Labels</b></p> <p>① Carton Label</p> <p>② Quality Label</p> |
| 5    |                                                                                    | <p><b>Sealing Cartons</b></p> <p>“Ⅰ” type sealing cartons</p>                            |
| Note | <p>The initial packaging method described above is for reference only, and the final actual packaging method shall be subject to the actual shipping packaging.</p> |                                                                                          |

# 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                     |
|---------|------------|----------------------|--------------------------|
| -       | 2024-05-08 | Sly LIU/<br>Aria CHU | Creation of the document |
| 0.1     | 2023-05-08 | Sly LIU/<br>Aria CHU | First official release   |



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