



# Antenna Datasheet

**Product OC:** YFGA005AA

**Version:** 2.0

**Date:** 2023-07-15

**Status:** Released

**Product Name:** Passive GNSS L1 Antenna

**Key Features:**

Frequency Band: 1559–1606 MHz

Efficiency: Up to 68.9 %

Dimensions: 61.15 mm × 11.24 mm

RoHS and REACH Compliant

# Overview

This Quectel GNSS antenna adopts a diversity of forms to guarantee the most suitable polarization type. Quectel's positioning products support single-band or multi-band operation modes to meet various high-precision positioning requirements of customers' products. Quectel also provides both passive and active antennas to satisfy the customer demand for high gain. Such antenna supports different installation or connection methods such as pin mount, surface mount, magnetic mount, internal cable, and external SMA. Customized connector type and cable length are provided according to requirements.

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# 1 Specification

Test Condition: Free Space

## 1.1. Electrical

| Electrical        |                  |
|-------------------|------------------|
| Frequency Range   | 1559–1606 MHz    |
| Impedance         | 50 $\Omega$      |
| Polarization      | Linear           |
| Radiation Pattern | Omni-directional |

| <div>Band</div> <div>Frequency (MHz)</div> | GPS L5<br>GALILEO<br>E5a<br>BEIDOU<br>B2a-B2I<br>QZSS L5<br>IRNSS L5 | GALILEO<br>E5b<br>BEIDOU<br>B2b | GPS L2<br>QZSS L2C | GLONASS<br>G2 | BEIDOU<br>B3 | BEIDOU<br>B1I | GPS L1<br>GALILEO<br>E1<br>BEIDOU<br>B1C<br>QZSS L1 | GLONASS<br>G1 |
|--|--|---------------------------------|--------------------|---------------|--------------|---------------|---|---------------|
|  | 1176   | 1207                            | 1227               | 1248          | 1268         | 1561          | 1575  | 1602          |
| VSWR                                       |  |                                 |                    |               |              | 1.2           | 1.2   | 1.2           |
| Return Loss (dB)                           |  |                                 |                    |               |              | -21.7         | -21.5   | -20.8         |
| Efficiency (%)                             |  |                                 |                    |               |              | 67.0          | 62.4  | 59.6          |
| Peak Gain (dBi)                            |  |                                 |                    |               |              | 2.8           | 2.5   | 2.1           |

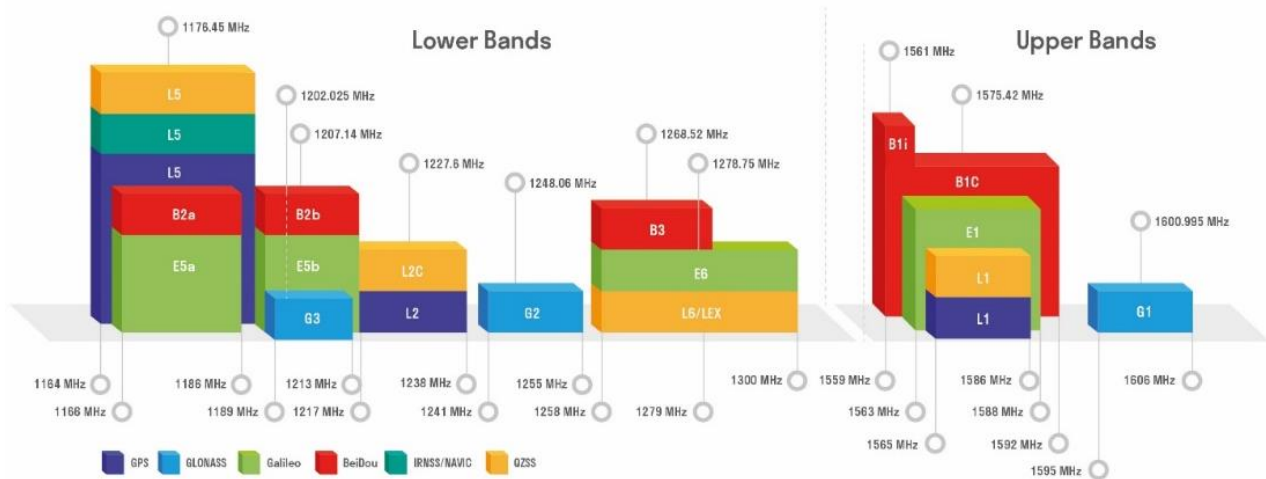
## 1.2. Mechanical & Environmental

| Mechanical             |                           |
|------------------------|---------------------------|
| Antenna Dimensions     | 61.15 mm × 11.24 mm       |
| Material & Color       | FPC & Black               |
| Cable Type & Length    | Φ 1.13 & Black & 100.5 mm |
| Connector Type         | IPEX MHF 1                |
| Mounting Type          | Adhesive                  |
| Weight                 | Typ. 0.6 g                |
| Environmental          |                           |
| Operation Temperature  | -40 °C to +85 °C          |
| Storage Temperature    | -40 °C to +85 °C          |
| RoHS & REACH Compliant | Yes                       |

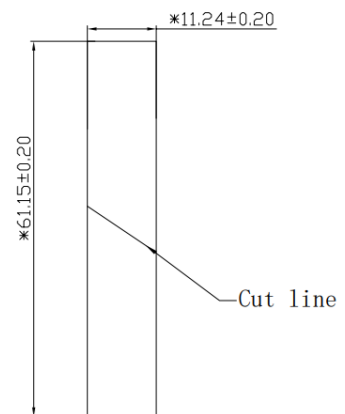
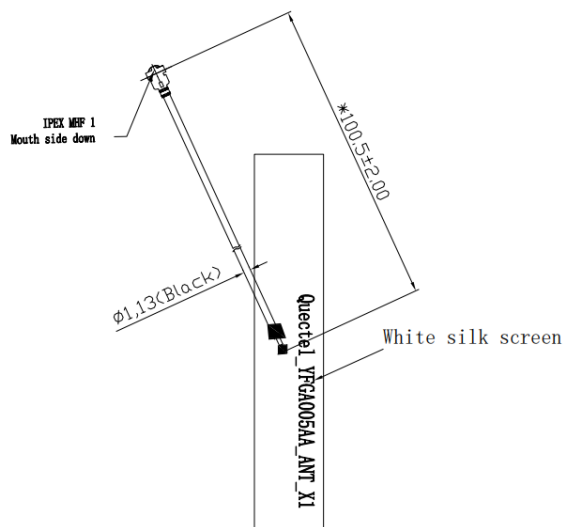
### 1.3. Supported GNSS Frequency Bands

| GNSS Frequency Bands (MHz) |   |  |  |   |  |
|----------------------------|---|--|--|---|--|
| <b>GPS</b>                 | <b>L1</b><br>Centre 1575.42<br>(1565–1586)        | <b>L2</b><br>Centre 1227.6<br>(1217–1238)              | <b>L5</b><br>Centre 1176.45<br>(1164–1189)       |   |  |
|                            | √   | -  | √  |   |  |
| <b>GLONASS</b>             | <b>G1-L10C-L10F</b><br>Centre 1601<br>(1595–1606) | <b>G2-L20C-L20F</b><br>Centre 1248.06<br>(1241–1255)   | <b>G3-L30C</b><br>Centre 1202.025<br>(1189–1213) |   |  |
|                            | √   | -  | -  |   |  |
| <b>GALILEO</b>             | <b>E1</b><br>Centre 1575.42<br>(1563–1588)        | <b>E5a</b><br>Centre 1176.45<br>(1166–1187)            | <b>E5b</b><br>Centre 1207.14<br>(1197–1218)      | <b>E6</b><br>Centre 1278.75<br>(1258–1300)      |  |
|                            | √   | -  | -  | -   |  |
| <b>BEIDOU</b>              | <b>B1I</b><br>Centre 1561.098<br>(1559–1564)      | <b>B1C (BeiDou-3)</b><br>Centre 1575.42<br>(1559–1592) | <b>B2a</b><br>Centre 1176.45<br>(1166–1187)      | <b>B2b-B2I</b><br>Centre 1207.14<br>(1197–1217) | <b>B3</b><br>Centre 1268.52<br>(1258–1279) |
|                            | √   | √  | -  | -   | -  |
| <b>QZSS</b>                | <b>L1</b><br>Centre 1575.42<br>(1573–1578)        | <b>L2C</b><br>Centre 1227.6<br>(1226–1229)             | <b>L5</b><br>Centre 1176.45<br>(1166–1187)       | <b>L6</b><br>Centre 1278.75<br>(1257–1300)      |  |
|                            | √   | -  | -  | -   |  |
| <b>IRNSS</b>               | <b>L5</b><br>Centre 1176.45<br>(1164–1189)        |  |  |   |  |
|                            | -   |  |  |   |  |

## GNSS Bands and Constellations



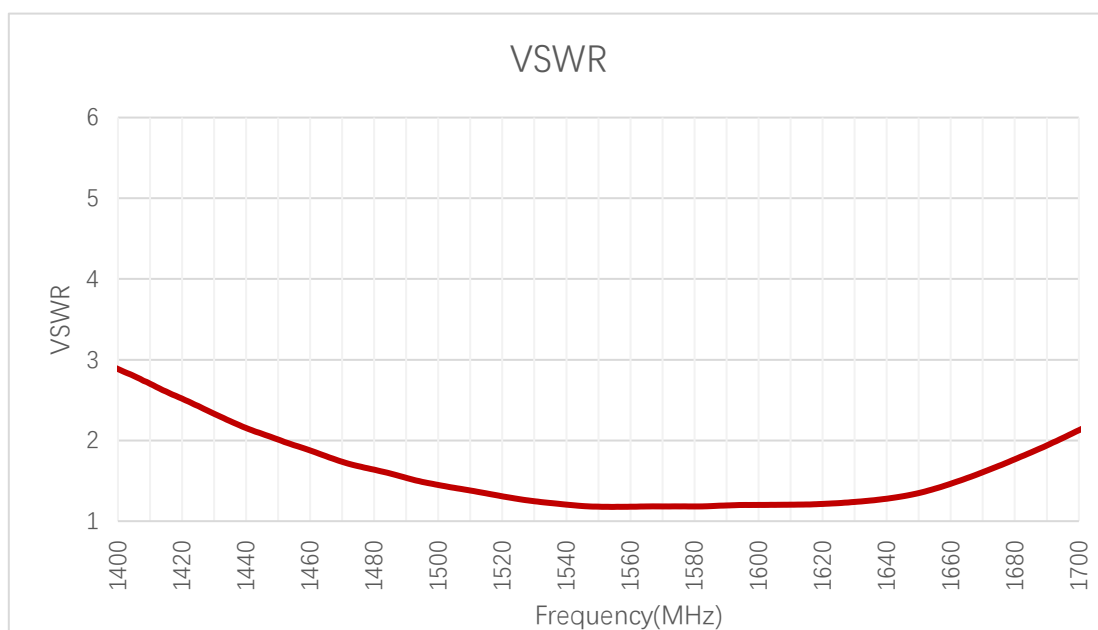
## 2 Drawing



# 3 Detailed Performance

## 3.1. S-Parameter Test

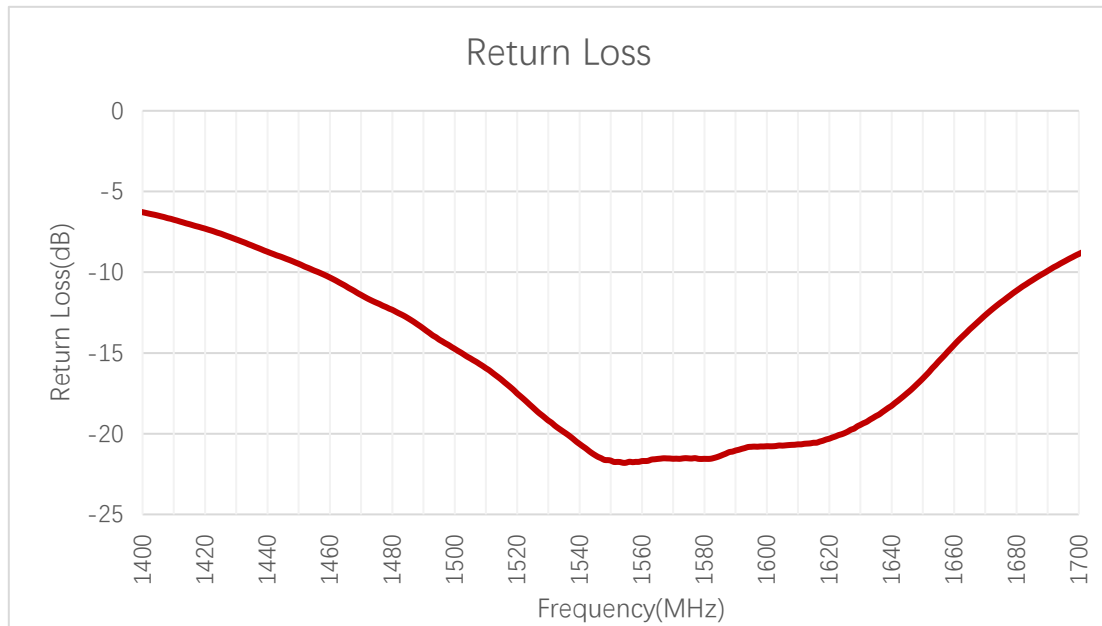
### 3.1.1. VSWR



VSWR

| Frequency (MHz) | 1176 | 1207 | 1227 | 1248 | 1268 | 1561 | 1575 | 1602 |
|-----------------|------|------|------|------|------|------|------|------|
| VSWR            | -    | -    | -    | -    | -    | 1.2  | 1.2  | 1.2  |

### 3.1.2. Return Loss

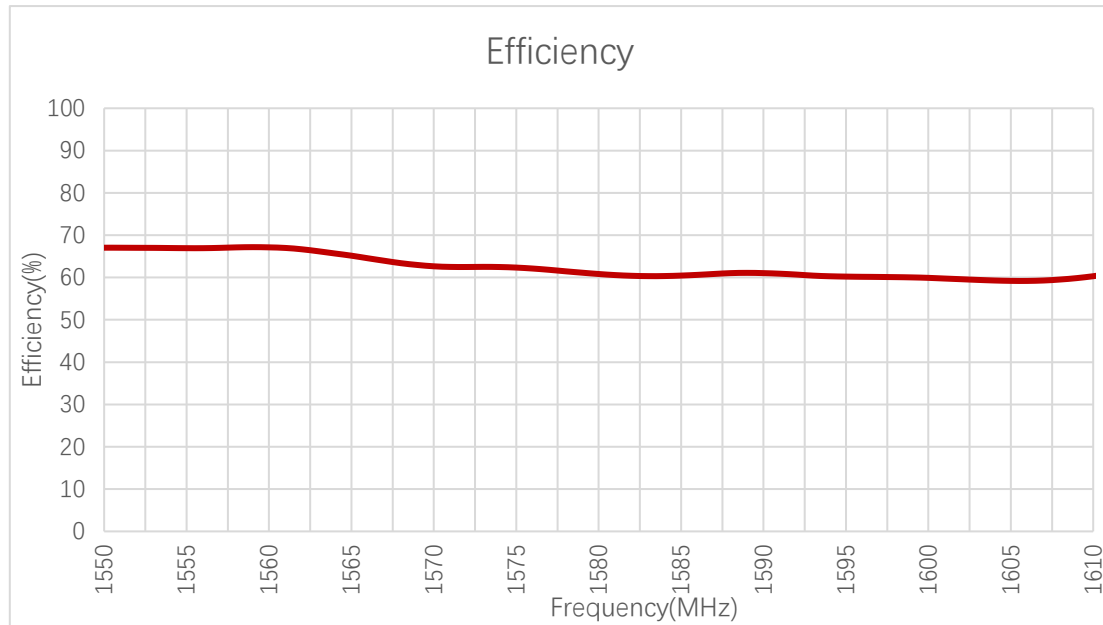


**Return Loss (dB)**

| Frequency (MHz)  | 1176 | 1207 | 1227 | 1248 | 1268 | 1561  | 1575  | 1602  |
|------------------|------|------|------|------|------|-------|-------|-------|
| Return Loss (dB) | -    | -    | -    | -    | -    | -21.7 | -21.5 | -20.8 |

## 3.2. Radiation Performance Test

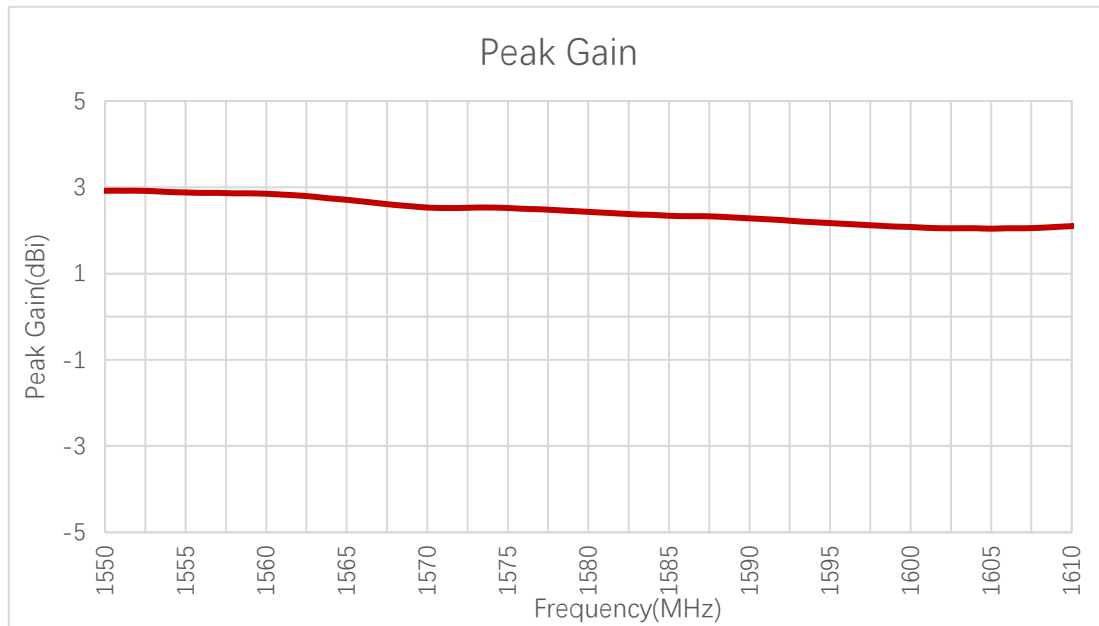
### 3.2.1. Efficiency



**Efficiency (%)**

| Frequency (MHz) | 1176 | 1207 | 1227 | 1248 | 1268 | 1561 | 1575 | 1602 |
|-----------------|------|------|------|------|------|------|------|------|
| Efficiency (%)  | -    | -    | -    | -    | -    | 67.0 | 62.4 | 59.6 |

### 3.2.2. Peak Gain

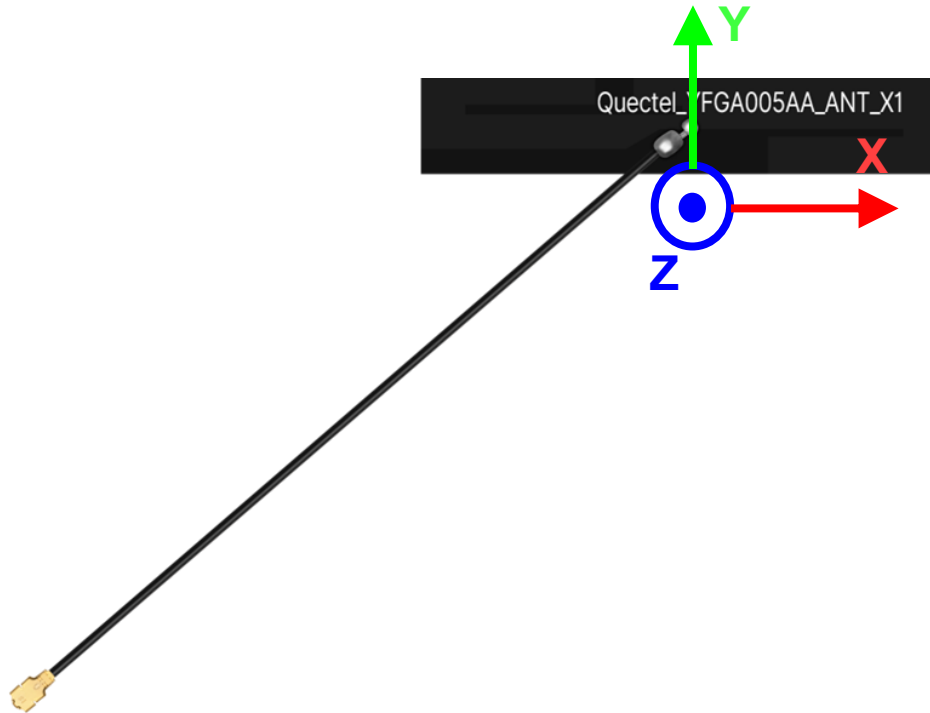


**Peak Gain (dBi)**

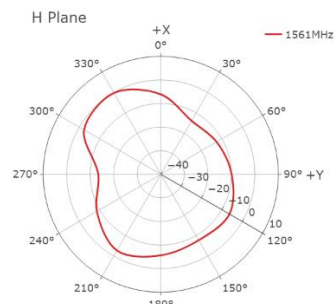
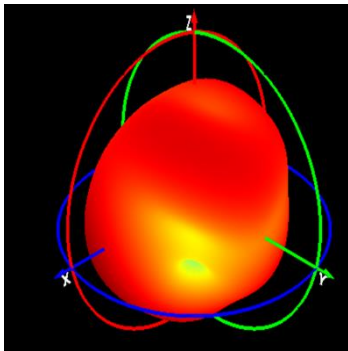
| Frequency (MHz) | 1176 | 1207 | 1227 | 1248 | 1268 | 1561 | 1575 | 1602 |
|-----------------|------|------|------|------|------|------|------|------|
| Peak Gain (dBi) | -    | -    | -    | -    | -    | 2.8  | 2.5  | 2.1  |

### 3.2.3. 3D & 2D Radiation Pattern

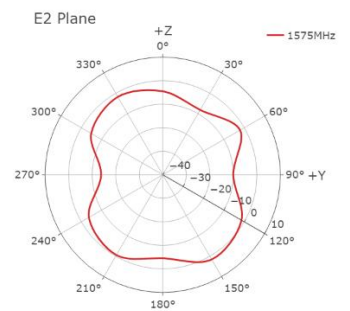
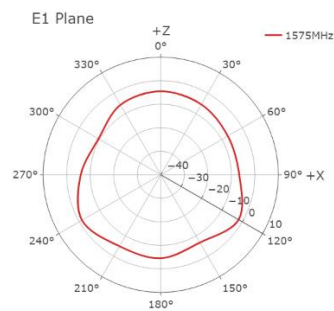
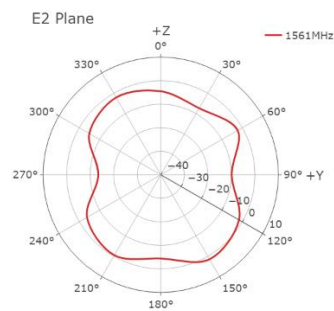
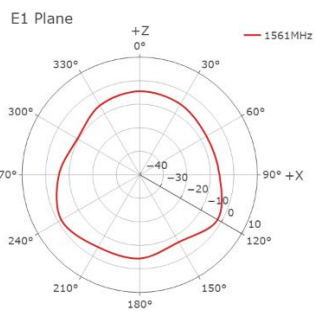
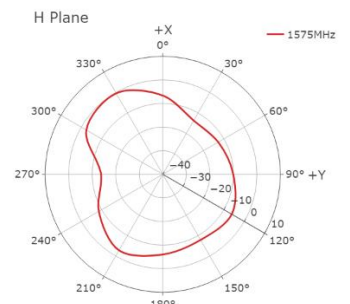
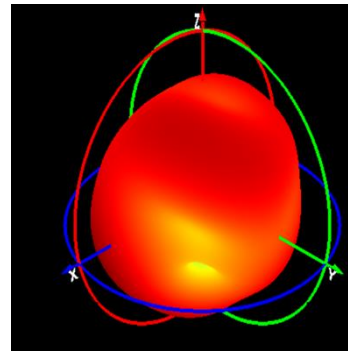
- Test Condition: Free Space
- Test Chamber: GL-S-1



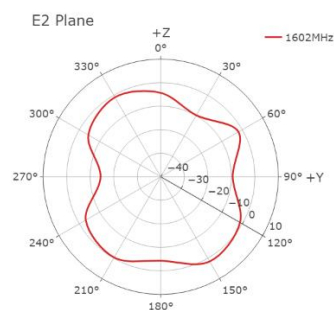
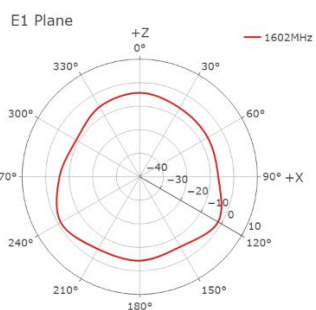
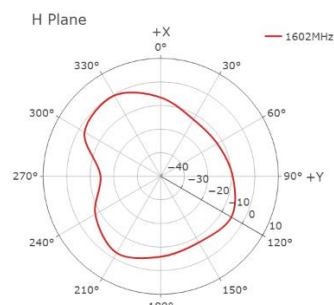
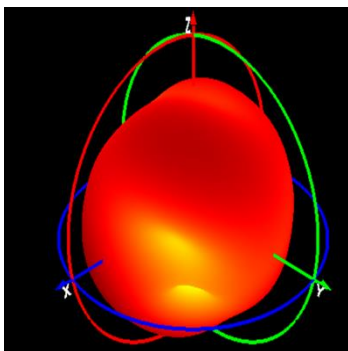
1561 MHz



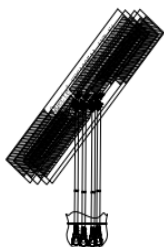
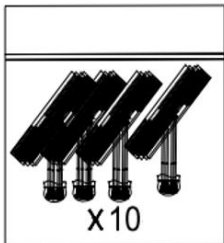
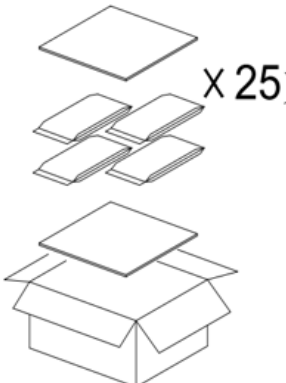
1575 MHz

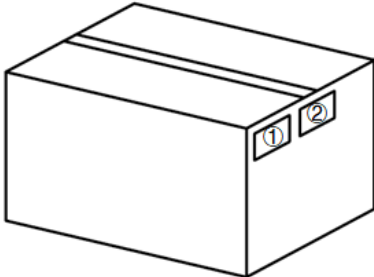
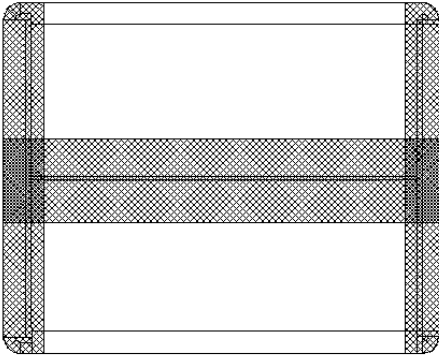


1602 MHz



## 4 Packaging

| Step | Packaging Picture / 2D Picture   | Description  |
|------|--|--|
| 1    |  <p>20 PCS / Bundle</p> | Take 20 products as a bundle and the terminals are wrapped with pearl cotton.  |
| 2    |  <p>200pcs/ bag</p>   | 200 pcs antenna products in a PE bag.<br>(200 PCS / PE Bag)  |
| 3    |  <p>x 25</p>          | <p>(25 Big PE Bags / Carton Box)<br/>(5000 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 = 340 × 260 × 140 mm</u></p> |

|   |   |   |
|---|---|---|
| 4 |    | <p><b>Position for Attaching Labels</b></p> <p>① Carton Label<br/>② Quality Label</p> |
| 5 |    | <p><b>Sealing Cartons</b></p> <p>“Ⅰ” type sealing cartons</p>                         |
| 6 | <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  |
|---------|------------|---|---|
| -       | 2022-09-09 | Knight HU/<br>Joye WANG                               | Creation of the document  |
| 1.0     | 2022-09-09 | Knight HU/<br>Joye WANG                               | First official release  |
| 2.0     | 2023-07-15 | Rainey LIAO/<br>Lucky FENG/<br>David LIU/<br>Aria CHU | Numerous changes were made to this document. It should be read in its entirety. |



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