



# Antenna Datasheet

**Product OC:** YFGC225WWA

**Version:** 1.0

**Date:** 2024-01-31

**Status:** Released

**Product Name:** Passive GPS L1 & L5 Antenna

**Key Features:**

Frequency Band: 1565–1586 MHz; 1164–1189 MHz

Dimensions: 25 mm × 25 mm × 4 mm + 18 mm × 18 mm × 4 mm

Efficiency: Up to 60.6 %

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: on 50 mm x 50 mm PCB

## 1.1. Electrical

Electrical	
Frequency Range	1565–1586 MHz; 1164–1189 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

Band	GPS L5 GALILEO E5a BEIDOU B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BEIDOU B2b	GPS L2 QZSS L2C	GLONASS G2	BEIDOU B3	BEIDOU B1I	GPS L1 GALILEO E1 BEIDOU B1C QZSS L1	GLONASS G1
Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.3	-	-	-	-	-	1.2	-
Return Loss (dB)	-18.7	-	-	-	-	-	-20.8	-
Efficiency (%)	52.7	-	-	-	-	-	58.7	-
Peak Gain (dBi)	1.1	-	-	-	-	-	1.2	-
Axial Ratio (dB)	1.4	-	-	-	-	-	2.3	

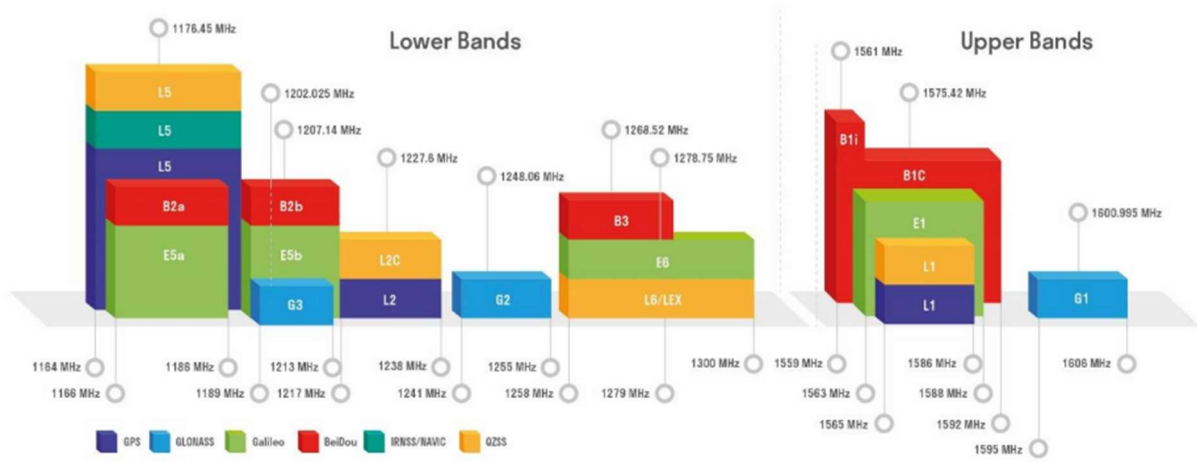
## 1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	25 mm × 25 mm × 4 mm + 18 mm × 18 mm × 4 mm
Material	Ceramic
Mounting Type	Adhesive & Soldering
Weight	Typ. 14 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Recommended reflow temperature and time	260 °C & 5s
RoHS and REACH Compliant	Yes

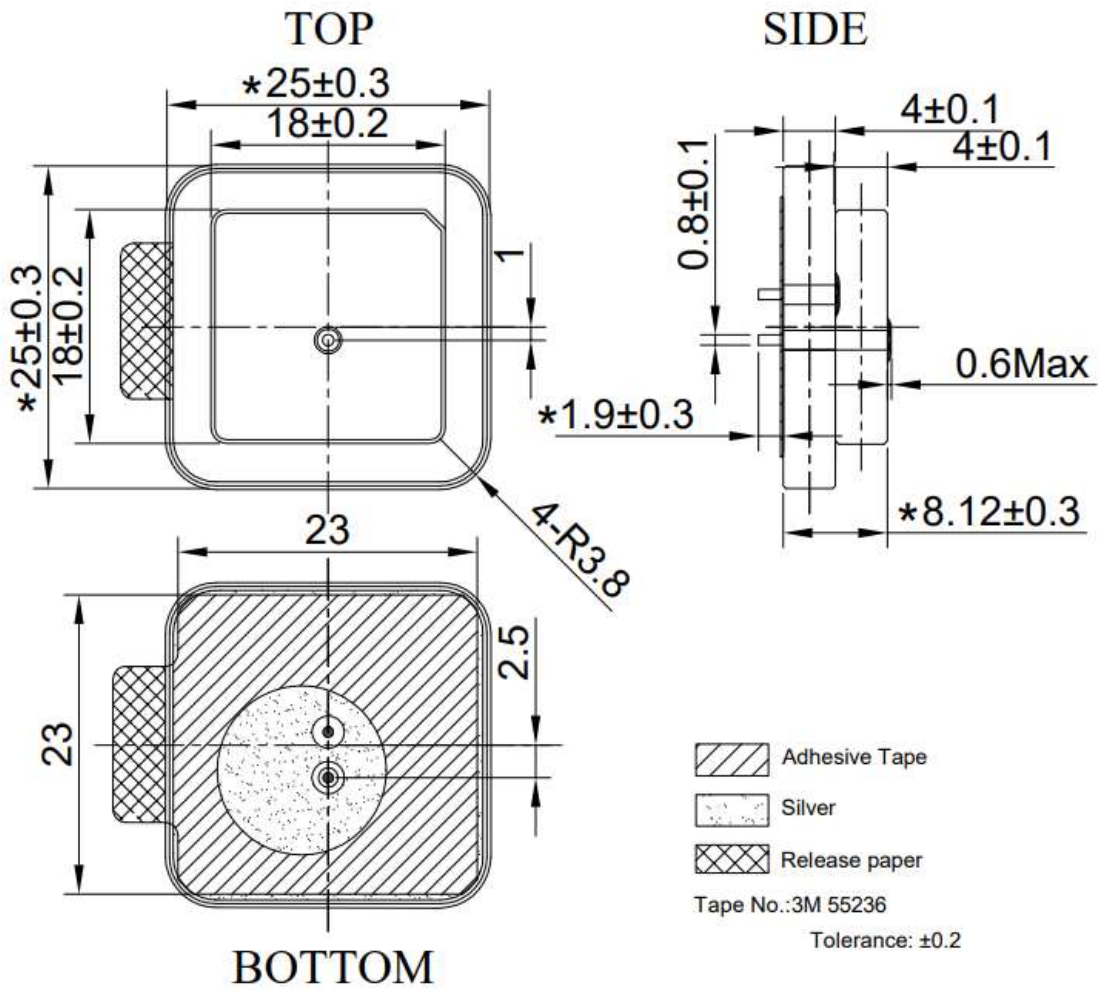
### 1.3. Supported GNSS Frequency Bands

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

**GNSS Bands and Constellations**



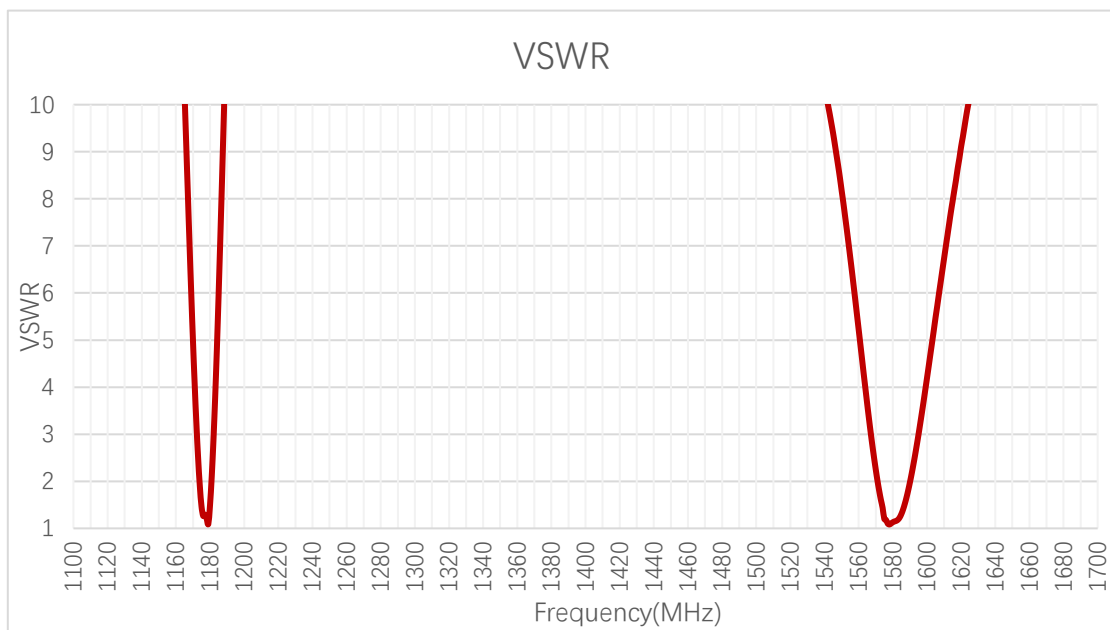
# 2 Drawing



# 3 Detailed Performance

## 3.1. S-Parameter Test

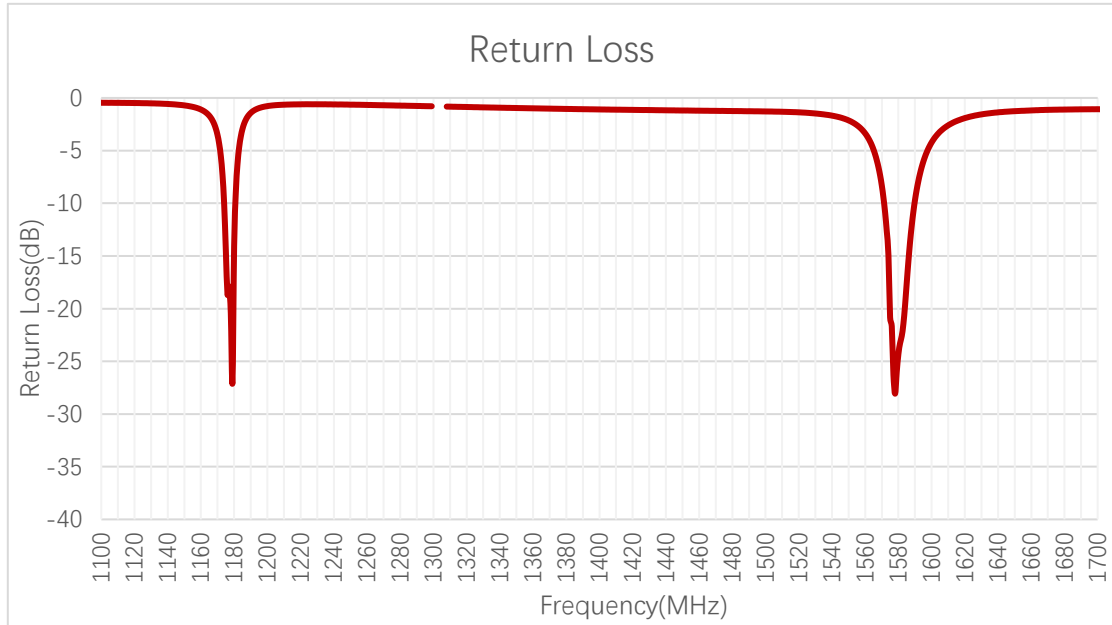
### 3.1.1. VSWR



**VSWR**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.3	-	-	-	-	-	1.2	-

**3.1.2. Return Loss**

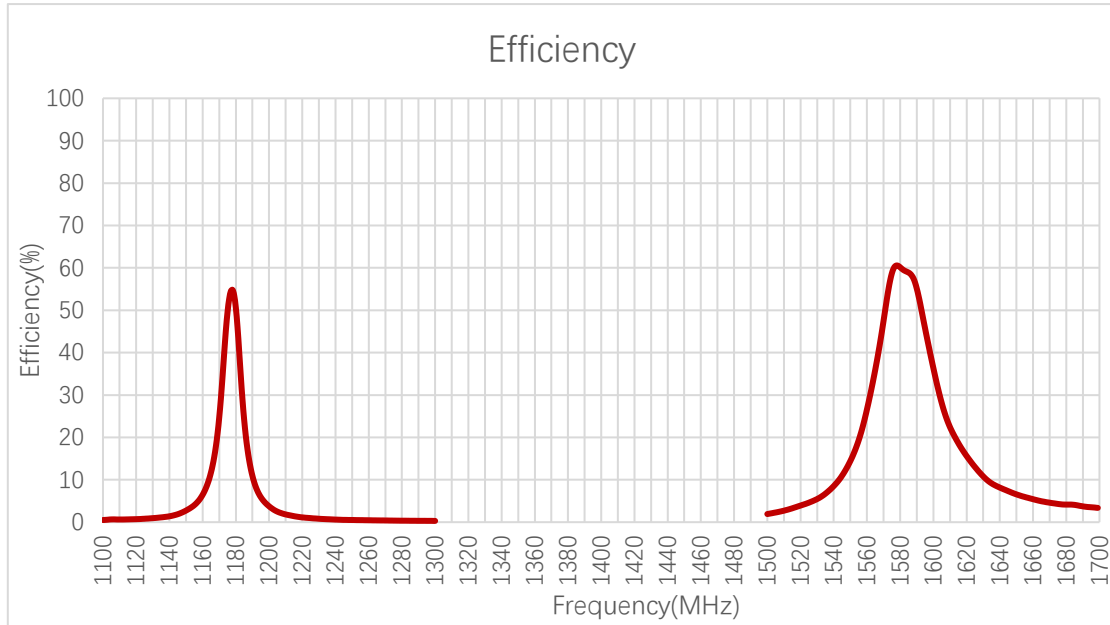


**Return Loss (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-18.7	-	-	-	-	-	-20.8	-

### 3.2. Radiation Performance Test

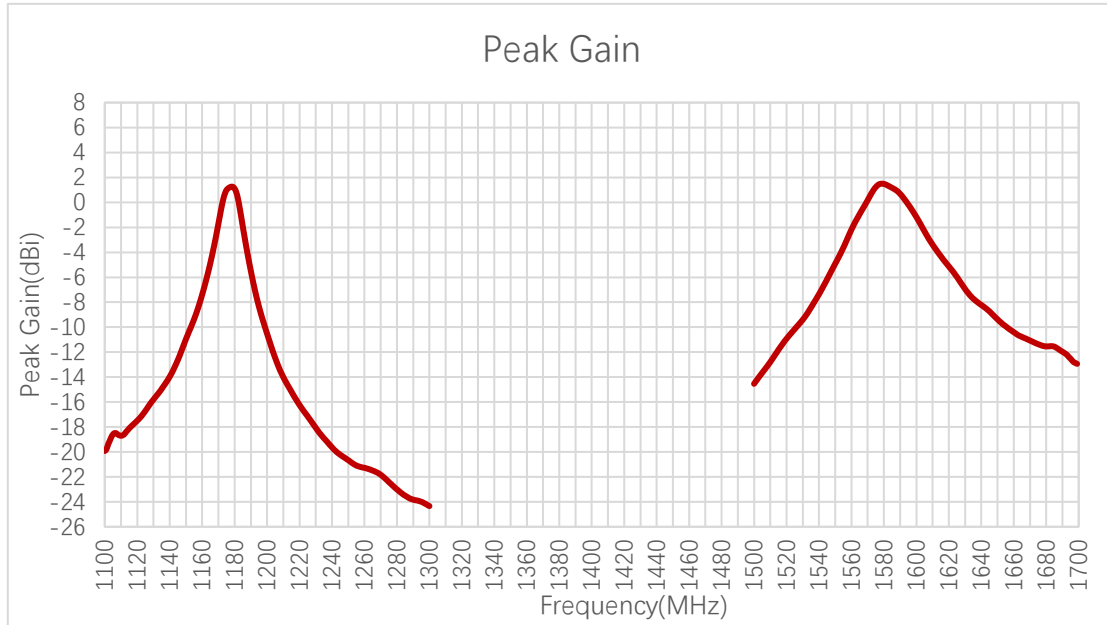
#### 3.2.1. Efficiency



**Efficiency (%)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	52.7	-	-	-	-	-	58.7	-

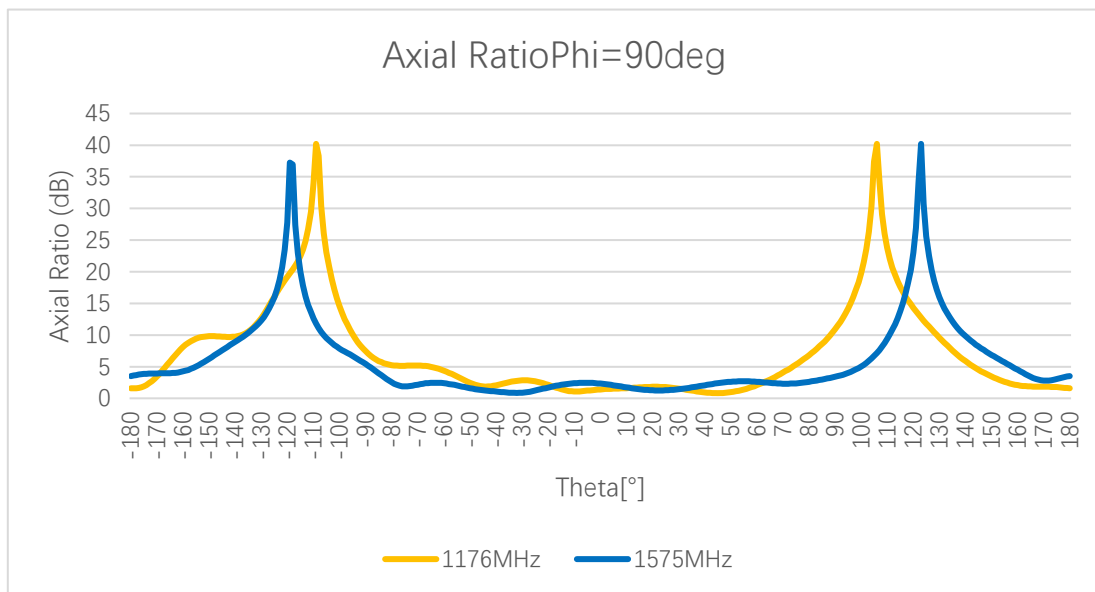
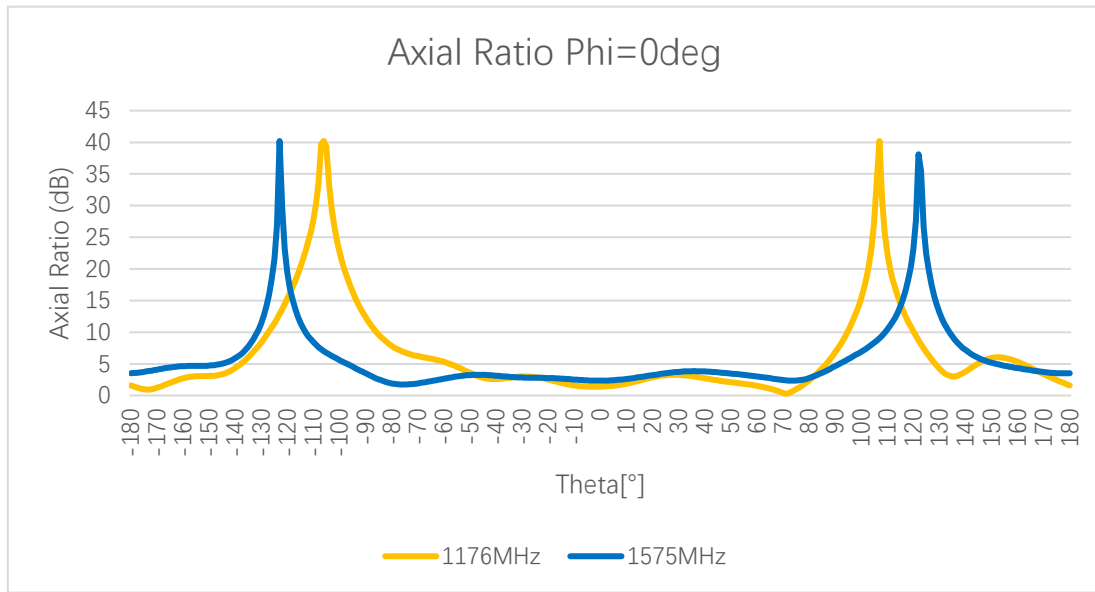
**3.2.2. Peak Gain**



**Peak Gain (dBi)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	1.1	-	-	-	-	-	1.2	-

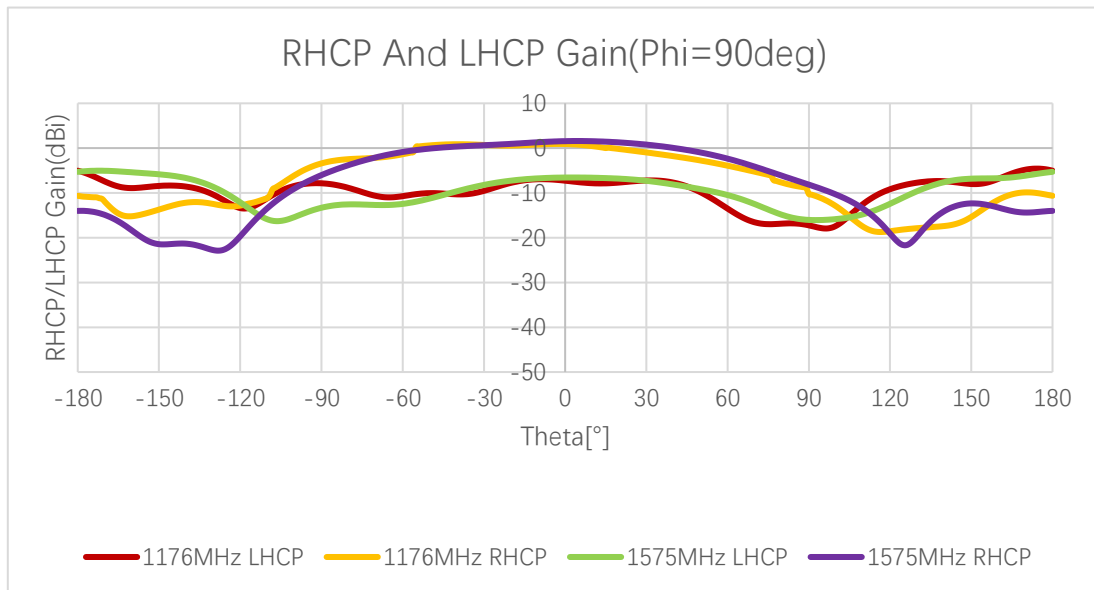
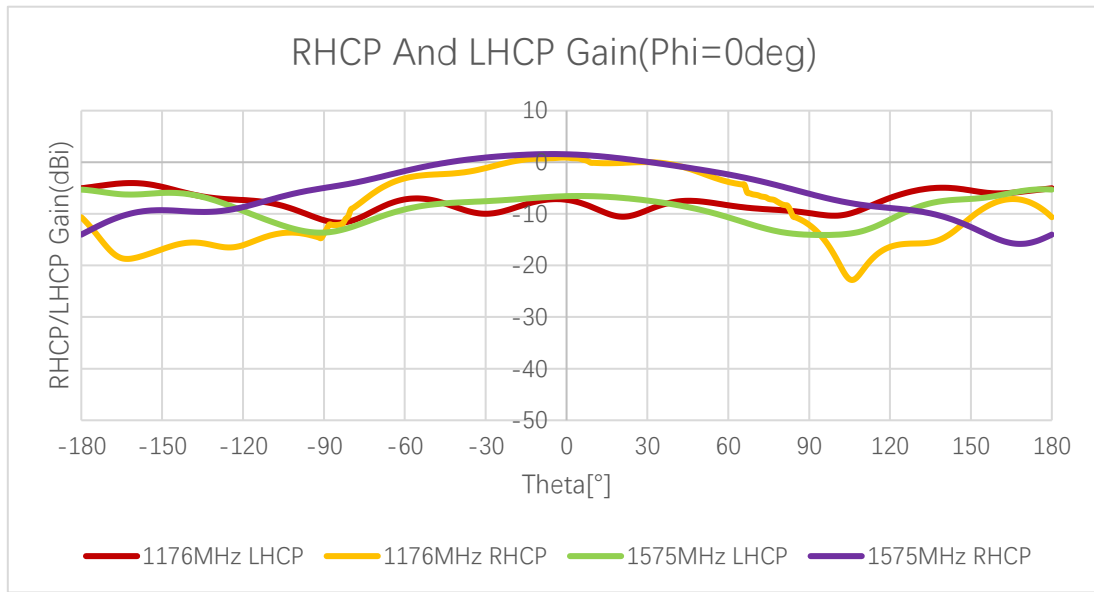
**3.2.3. Axial Ratio**



**Axial Ratio (dB)**

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	1.4	-	-	-	-	-	2.3	-
	Phi = 90 (deg) Theta = 0 (deg)	1.4	-	-	-	-	-	2.3	-

**3.2.4. 2D RHCP and LHCP Gain**

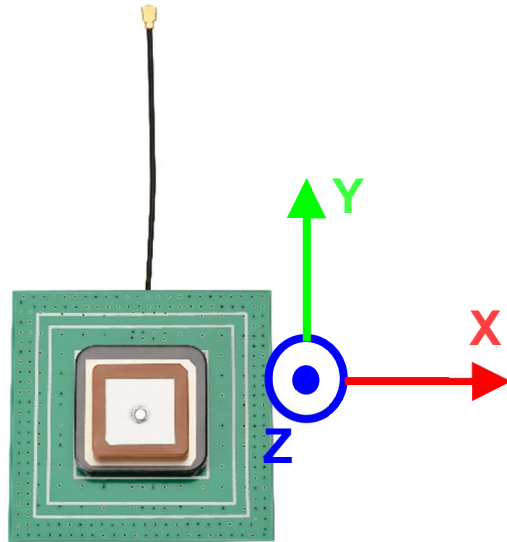


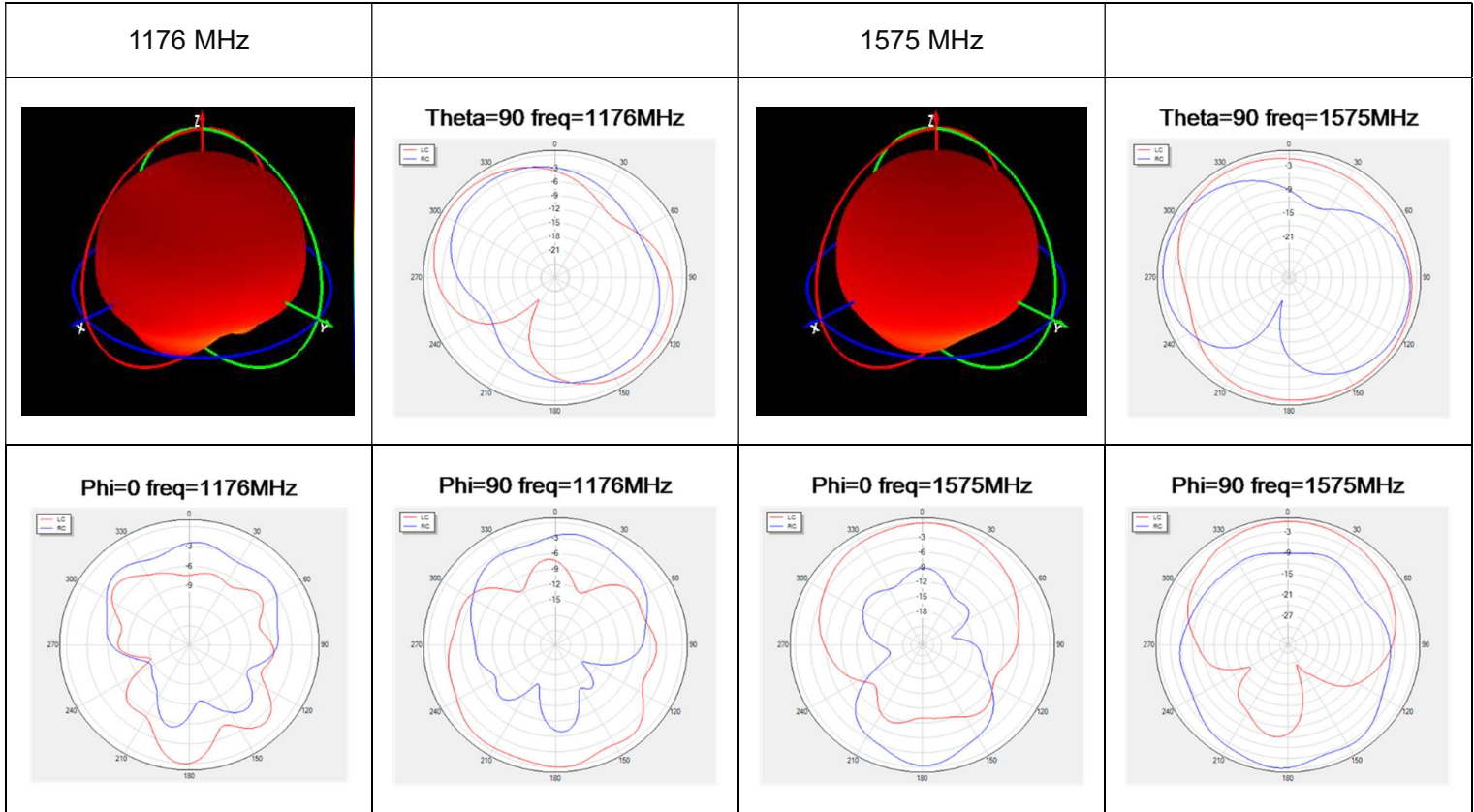
**2D RHCP and LHCP Gain (dBi)**

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
RHCP Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	0.9	-	-	-	-	-	1.5	-
	Phi = 90 (deg) Theta = 0 (deg)	0.9	-	-	-	-	-	1.5	-
LHCP Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-7.3	-	-	-	-	-	-6.6	-
	Phi = 90 (deg) Theta = 0 (deg)	-7.3	-	-	-	-	-	-6.6	-

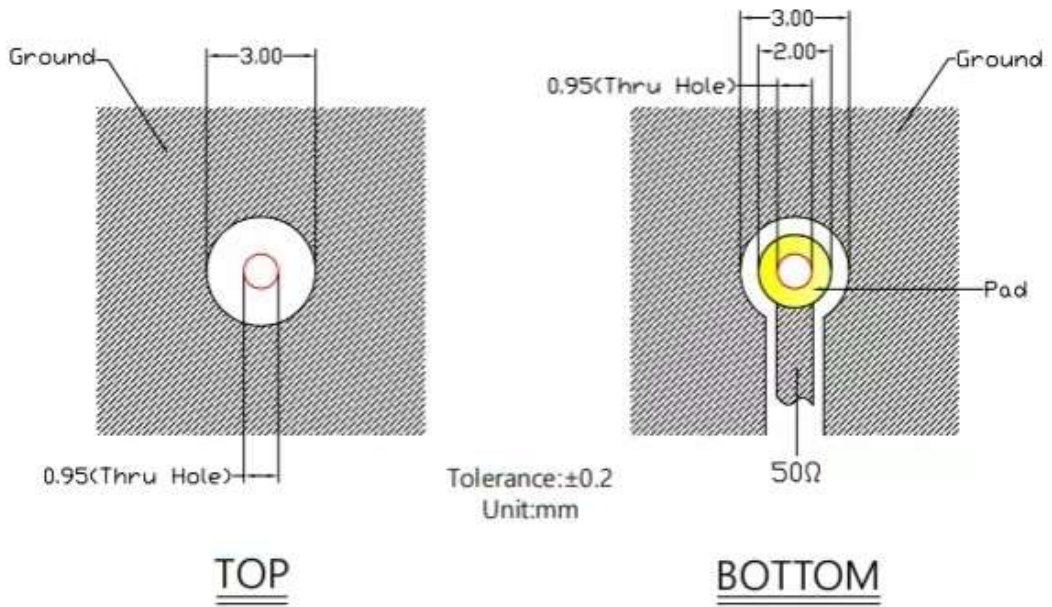
### 3.2.5. 3D & 2D Radiation Pattern

- Test Condition: on 50 mm × 50 mm PCB
- Test Chamber: GL-S-1

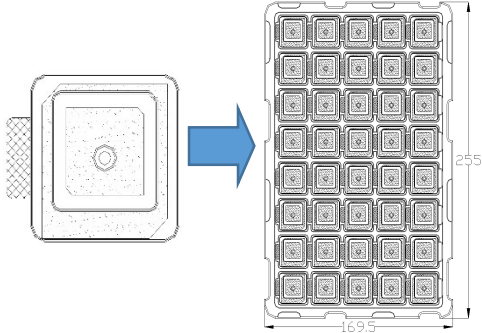
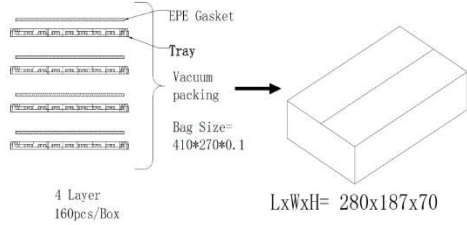
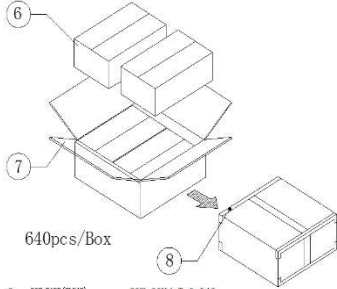


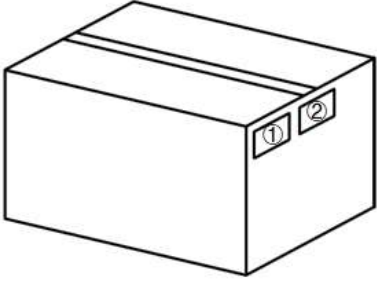
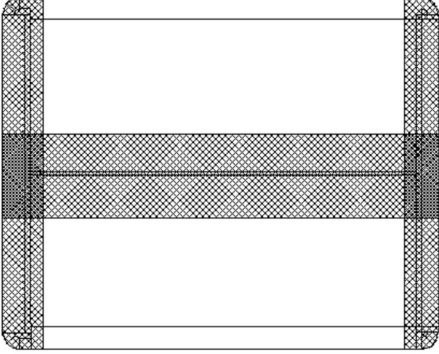


# 4 PCB Footprint Recommendation



# 5 Packaging

Step	Packaging Picture / 2D Picture	Description
1		(40 PCS Antennas / Tray)
2	 <p>4 Layer 160pcs/Box</p> <p>LxWxH= 280x187x70</p>	The inner box contains 4 plastic trays. (160 PCS Antennas / Inner Box)
3	 <p>640pcs/Box</p> <p>8 BOX TAPPS/CLAMP 60*30*4 T=0.046 7 OUTSIDE CARTON BOX 405*293*185 6 INNER CARTON BOX 280*187*70</p> <p>Silk screen No Silk screen</p>	<p>(4 Inner Boxes / Carton Box) (640 pcs Antenna / Per Carton Box) Estimated quantity Products that cannot fill the entire carton box are packed in a suitable size carton box.</p> <p><b>Carton Size:</b> <u>L x W x H = 405 x 293 x 185 mm</u></p>

<p>4</p>		<p><b>Position for Attaching Labels</b></p> <p>① Carton Label ② Quality Label</p>
<p>5</p>		<p><b>Sealing Cartons</b></p> <p>“I” type sealing cartons</p>
<p>Note</p>	<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
-	2024-01-31	Rhone WEI/ Lucky FENG/ David LIU/ Rainey LIAO	Creation of the document
1.0	2024-01-31	Rhone WEI/ Lucky FENG/ David LIU/ Rainey LIAO	First official release

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