



# Antenna Datasheet

**Product OC:** YFGN000H1AC

**Version:** 1.1

**Date:** 2025-07-28

**Status:** Released

**Product Name:** GNSS Full Band Screw Mount Air Dielectric + Cable  
Active Embedded Antenna

**Key Features:**

Frequency Band: 1164–1300 MHz, 1525–1606 MHz

RG174 (SMA Male) length: 300 ±10 mm

Dimensions:  $\Phi$  122 mm × 22.5 mm

RoHS and REACH Compliant

LNA Gain: 35 ±4 dB

# Overview

**Multi-GNSS Support:** Covers all major global navigation systems, including BDS-3 (B1C) and QZSS, ensuring compatibility worldwide.

**High-Gain LNA:** Delivers  $35 \pm 4$  dB gain with a low noise figure ( $\leq 4$  dB), ideal for weak-signal environments like urban canyons or dense foliage.

**Superior RF Performance:** Features RHCP polarization, directional radiation pattern, and outstanding peak gain (up to 5.7 dBi) for reliable signal acquisition.

**Robust Design:**  $\Phi$  122 mm  $\times$  22.5 mm housing with screw mounting, suitable for vehicular or fixed installations.

**Environmental Resilience:** Operates in  $-40$  °C to  $+85$  °C temperatures and complies with RoHS/REACH standards.

## Technical Highlights:

- Low VSWR and high efficiency minimize signal loss.
- Low axial ratio ensures consistent circular polarization for precision applications.
- 3D radiation pattern optimization for stable performance across elevations.

## Target Applications:

- **Autonomous Vehicles:** Provides centimeter-level accuracy for ADAS and navigation.
- **Geodetic Surveying:** Supports RTK/PPK systems with multi-frequency compatibility.
- **Maritime:** Ensures reliable positioning for vessels with L-Band support.
- **Military/Defense:** Resilient performance in harsh environments.
- **Telematics & Fleet Management:** Enables real-time tracking for logistics and heavy equipment.

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: Free Space

## 1.1. Electrical

Electrical	
Frequency Range	1164–1300MHz, 1525–1606 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

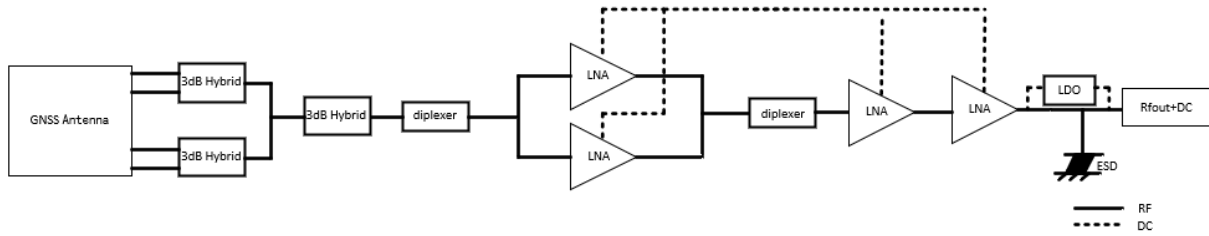
Band Frequency (MHz)	GPS L5	GALILEO E5a	GALILEO E5b	GPS L2	GLONASS G2	BDS B3	GALILEO E6	L-Band	BDS B1I	GPS L1	GLONASS G1
	BDS B2a-B2I	BDS B2b	QZSS L5	QZSS L2C	QZSS L6	QZSS L1					
	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602	
VSWR	1.83	1.86	1.68	1.35	1.19	1.16	1.38	1.51	1.53	1.59	
Return Loss (dB)	-10.6	-10.3	-11.7	-16.5	-21.1	-22.4	-16	-13.7	-13.4	-12.6	
Efficiency (%)	40.6	42	54.9	56.1	46.6	38.8	58.5	65.6	60.5	52.9	
Peak Gain (dBi)	3.68	3.88	4.81	5.02	4.14	3.36	5.02	5.54	5.19	5.17	
Axial Ratio (dB)	1.4	0.9	0.6	0.3	0.6	0.8	0.6	1.1	1.2	1.3	

LNA Electrical	
LNA Gain	35 ±4 dB
Noise Figure	≤ 4 dB
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	≥ 60dB f0&f1 ±100 MHz f0 (1164 MHz, 1300 MHz) f1 (1525 MHz, 1609 MHz)
Working Voltage	3–12 V
Working Current	23.6 ±4 mA
Impedance	50 Ω

## 1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	Φ 122 mm × 22.5 mm
Material	FR4
Cable Type & Color & Length	RG174 & Black & 300 mm
Connector Type	SMA Male
Mounting Type	Screw
Weight	Typ. 62.0 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

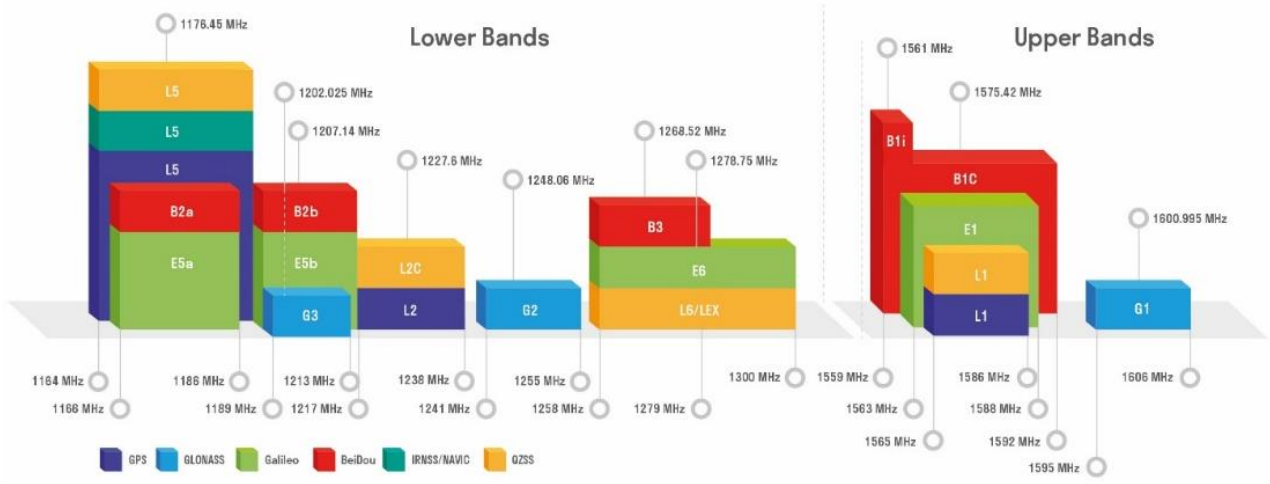
### 1.3. Block Diagram (Active Antenna)



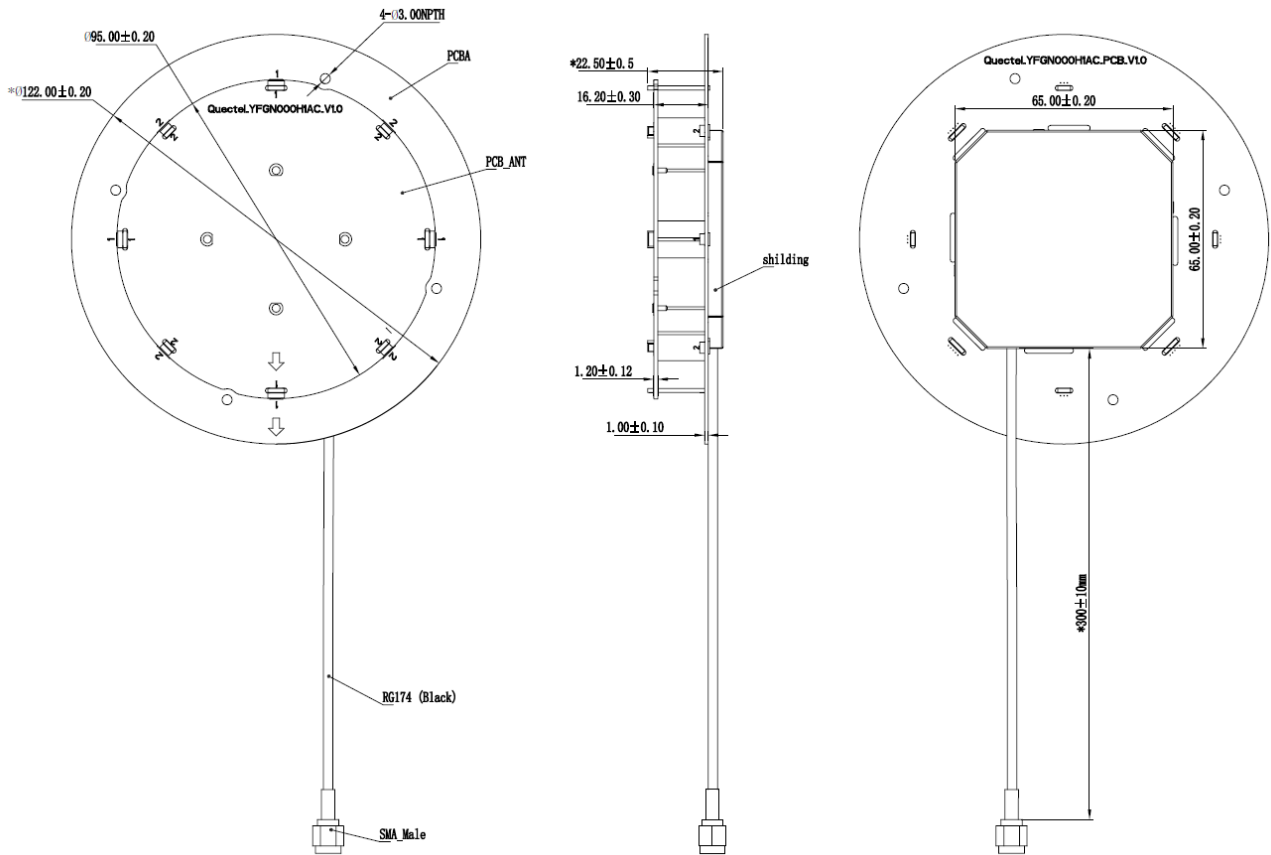
## 1.4. Supported GNSS Frequency Bands

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>BDS</b>	<b>B1I</b> Centre 1561.098 (1559–1564)	<b>B1C (BDS-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



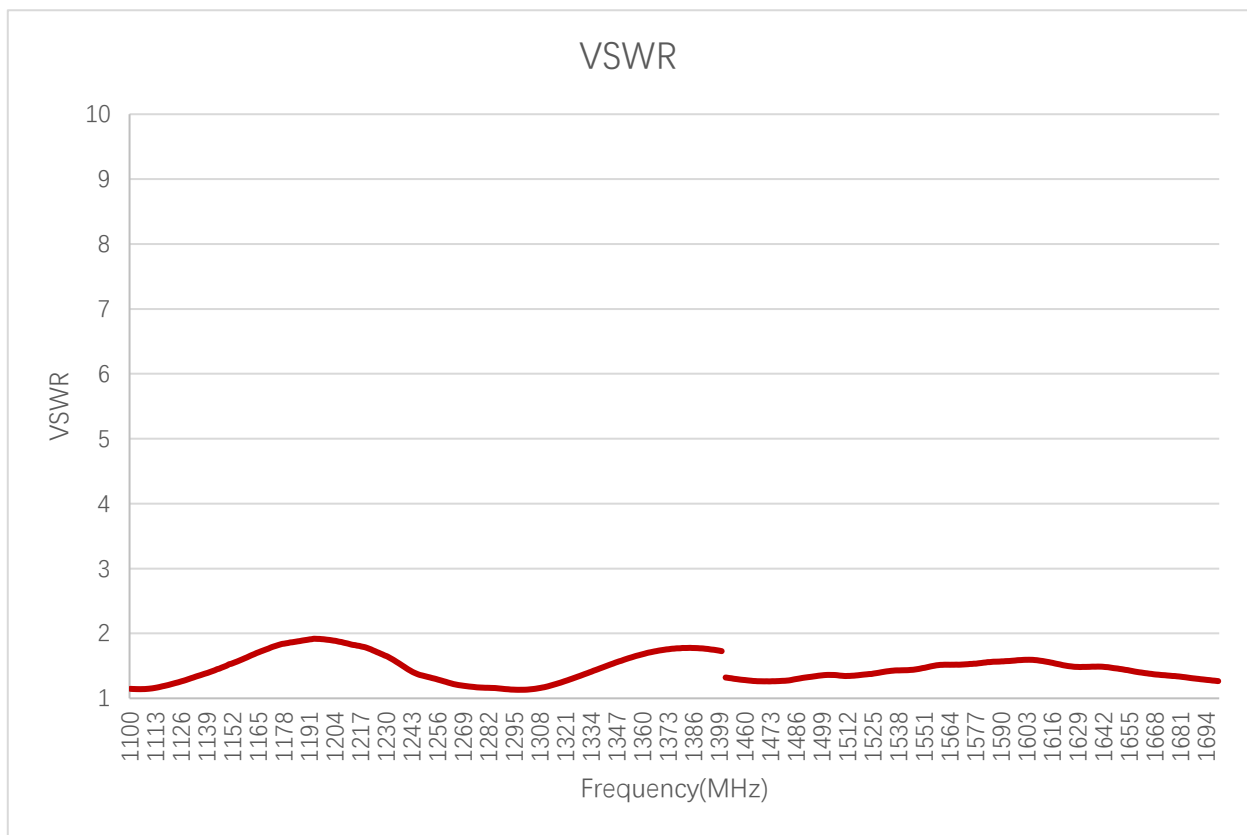
# 2 Drawing



# 3 Detailed Performance

## 3.1. S-Parameter Test

### 3.1.1. VSWR



**VSWR**

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
VSWR	1.83	1.86	1.68	1.35	1.19	1.16	1.38	1.51	1.53	1.59

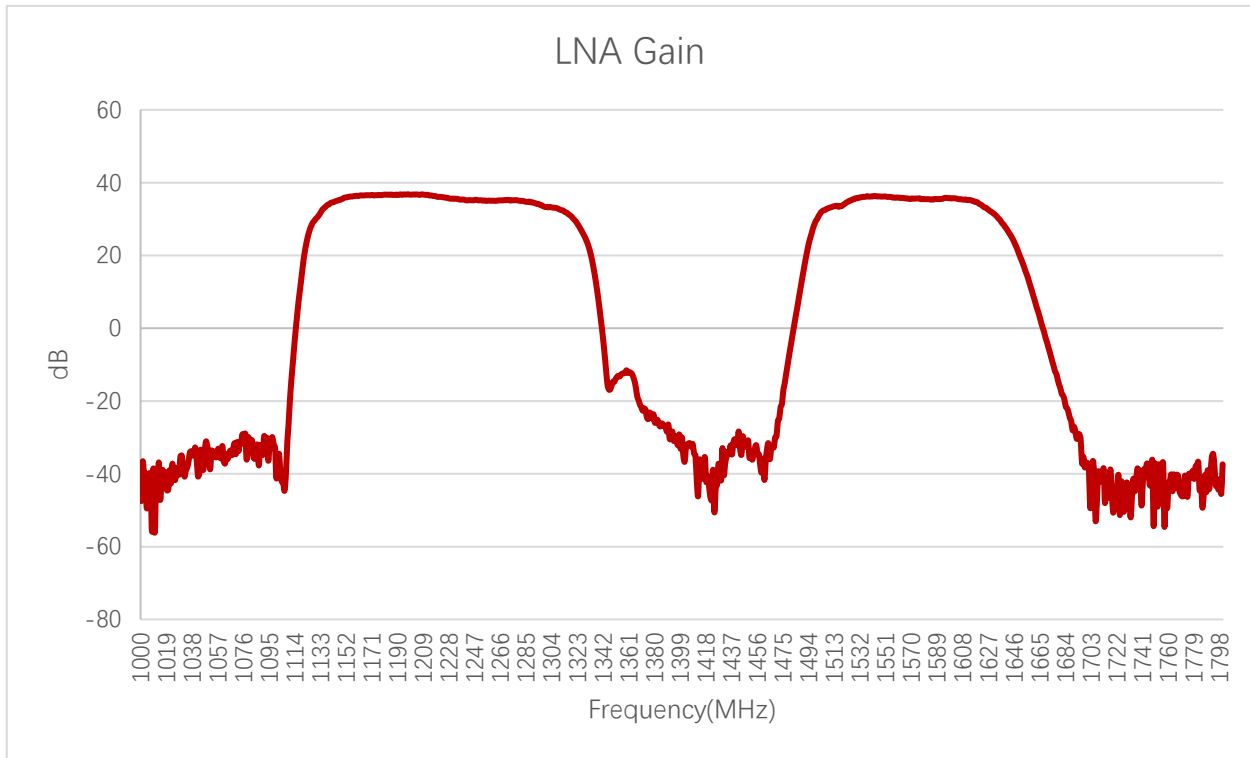
**3.1.2. Return Loss**



**Return Loss (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Return Loss (dB)	-10.6	-10.3	-11.7	-16.5	-21.1	-22.4	-16	-13.7	-13.4	-12.6

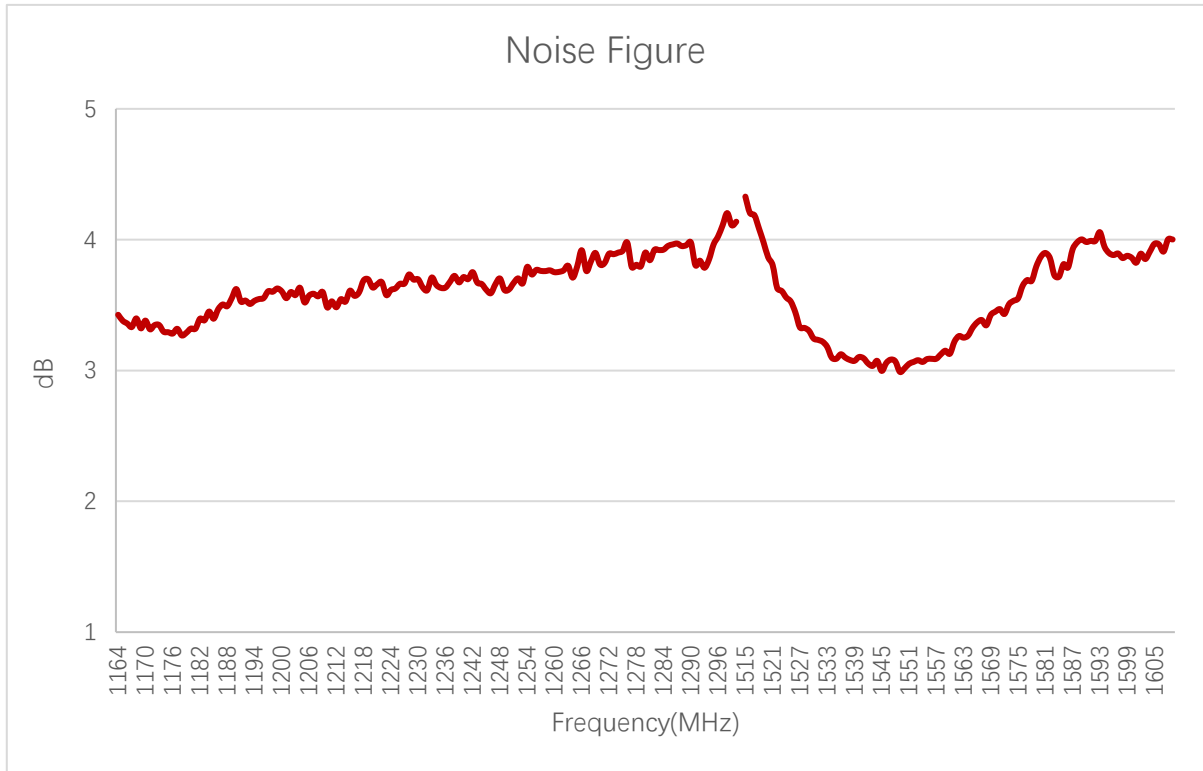
**3.1.3. GNSS LNA Gain**



**LNA Gain (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
LNA Gain (dB)	36.6	36.7	35.7	35.2	35.1	35.1	35	35.8	35.6	35.7

**3.1.4. Noise Figure**

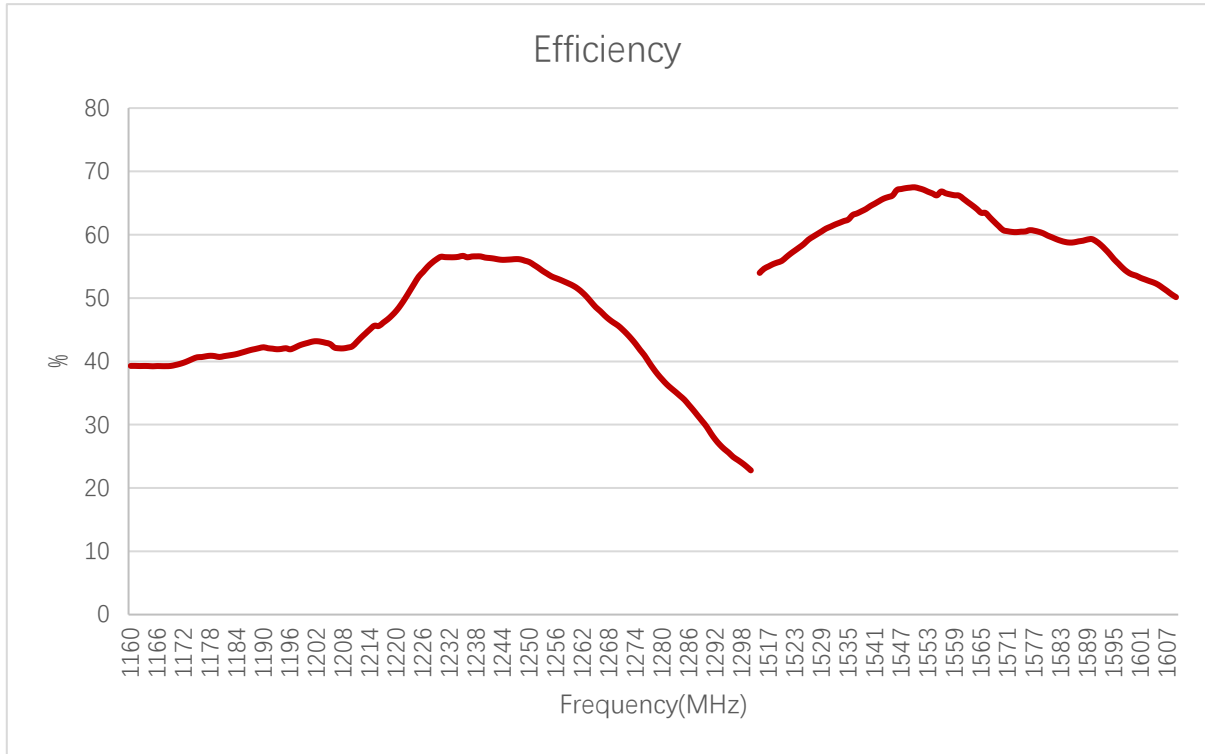


**Noise Figure (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Noise Figure (dB)	3.28	3.58	3.66	3.7	3.83	3.8	3.5	3.2	3.55	3.89

### 3.2. Radiation Performance Test

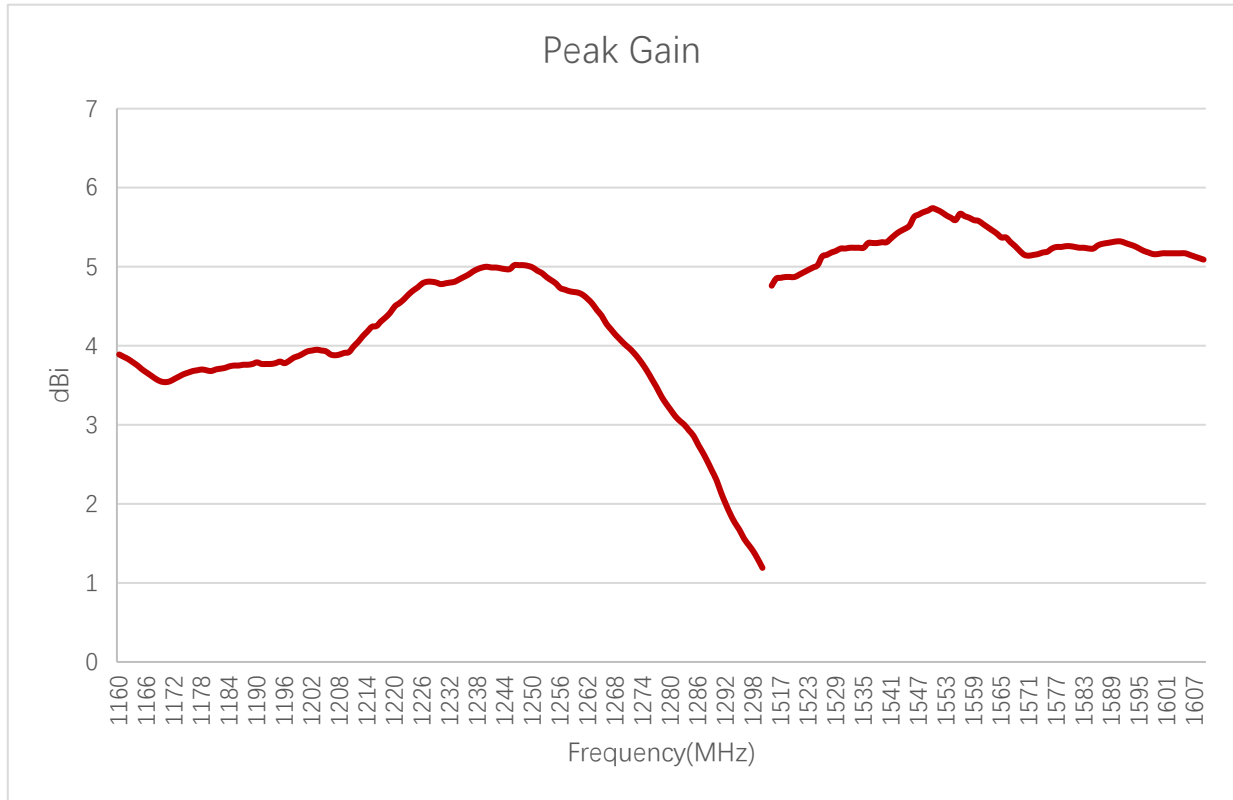
#### 3.2.1. Efficiency



**Efficiency (%)**

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Efficiency (%)	40.6	42	54.9	56.1	46.6	38.8	58.5	65.6	60.5	52.9

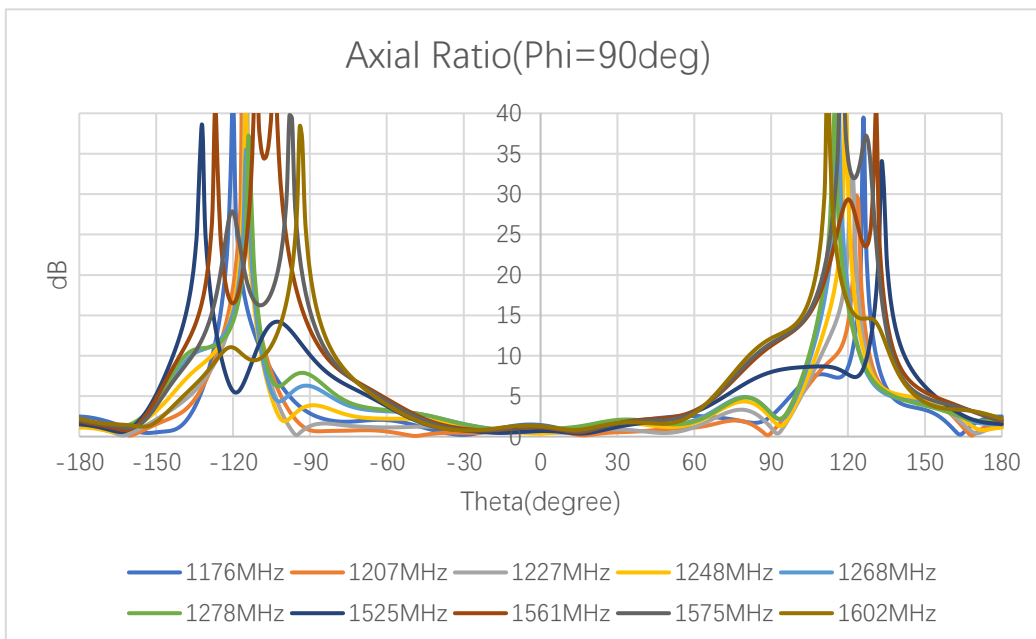
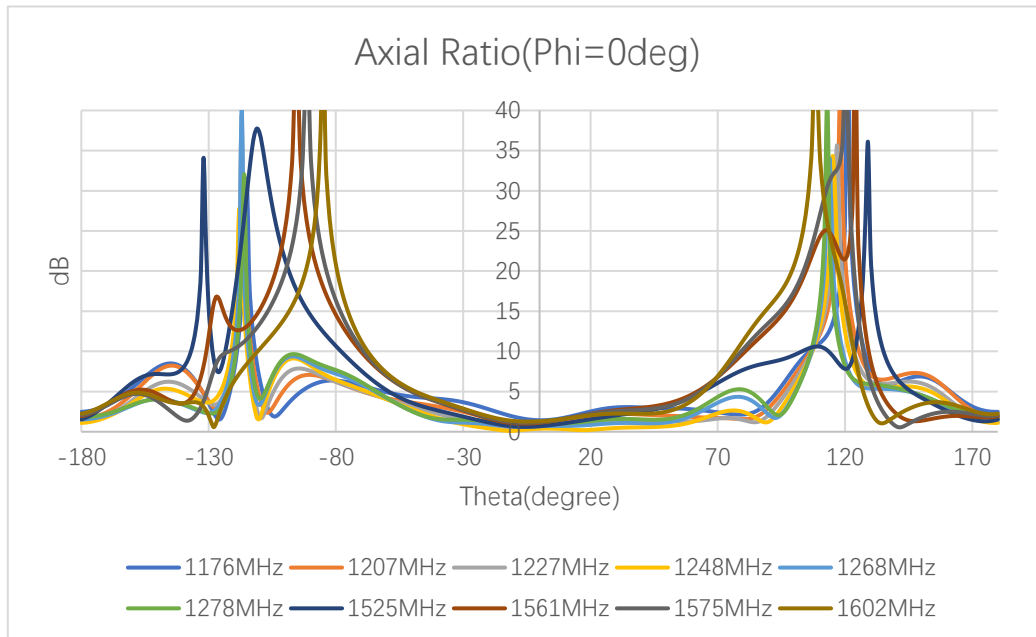
**3.2.2. Peak Gain**



**Peak Gain (dBi)**

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Peak Gain (dBi)	3.68	3.88	4.81	5.02	4.14	3.36	5.02	5.54	5.19	5.17

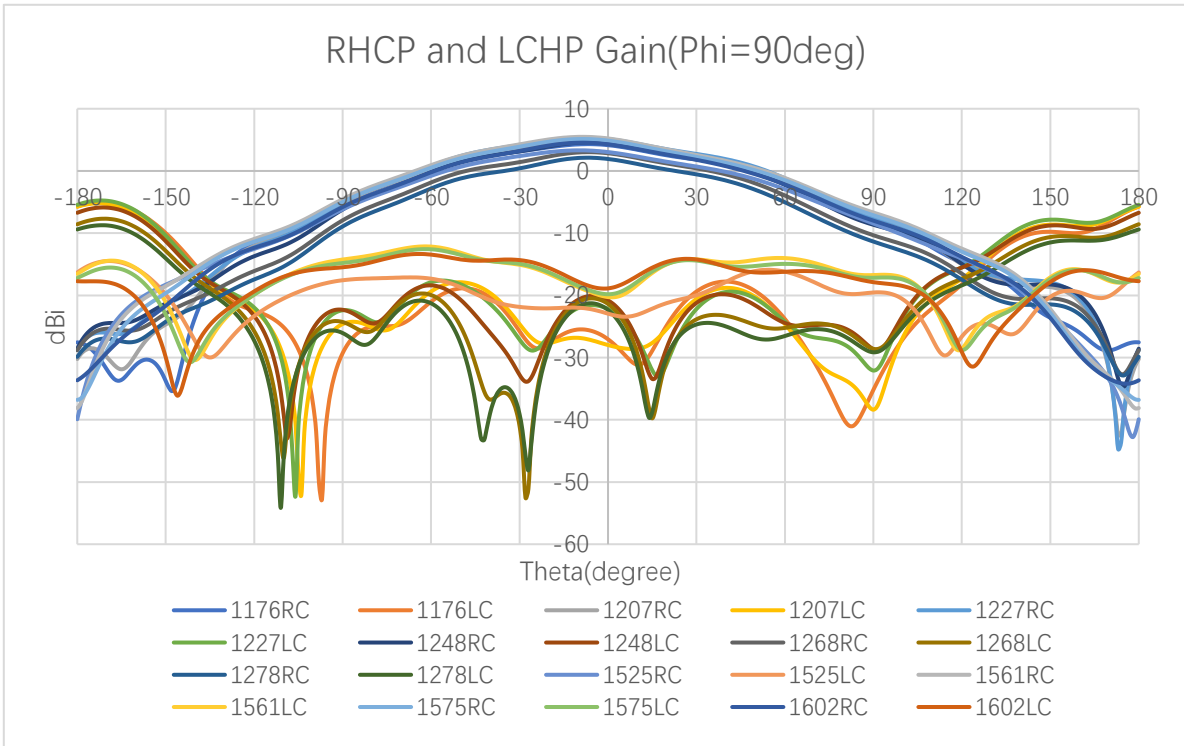
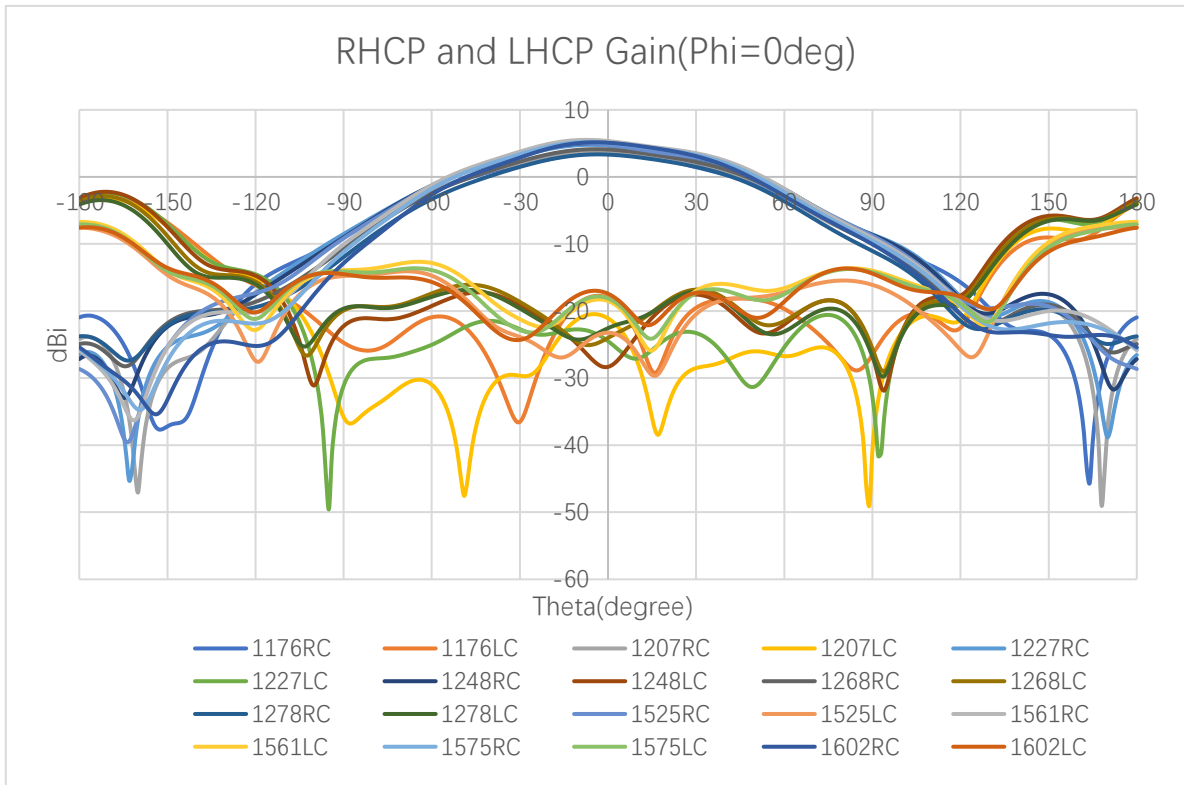
**3.2.3. Axial Ratio**



**Axial Ratio (dB)**

Frequency (MHz)		1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg)										
	Theta = 0 (deg)	1.4	0.9	0.6	0.3	0.6	0.8	0.6	1.1	1.2	1.3
	Phi = 90 (deg)										
	Theta = 0 (deg)	1.4	0.9	0.6	0.3	0.6	0.8	0.6	1.1	1.2	1.3

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

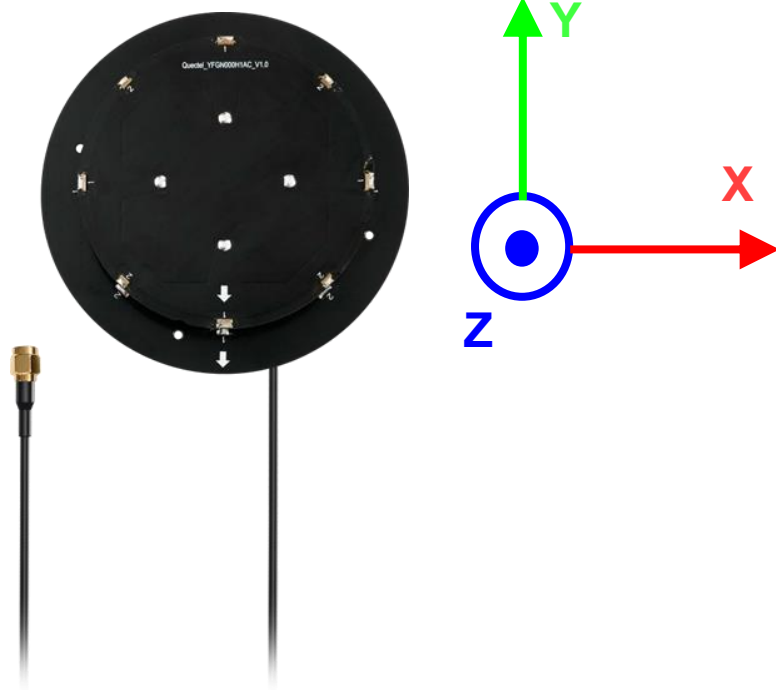


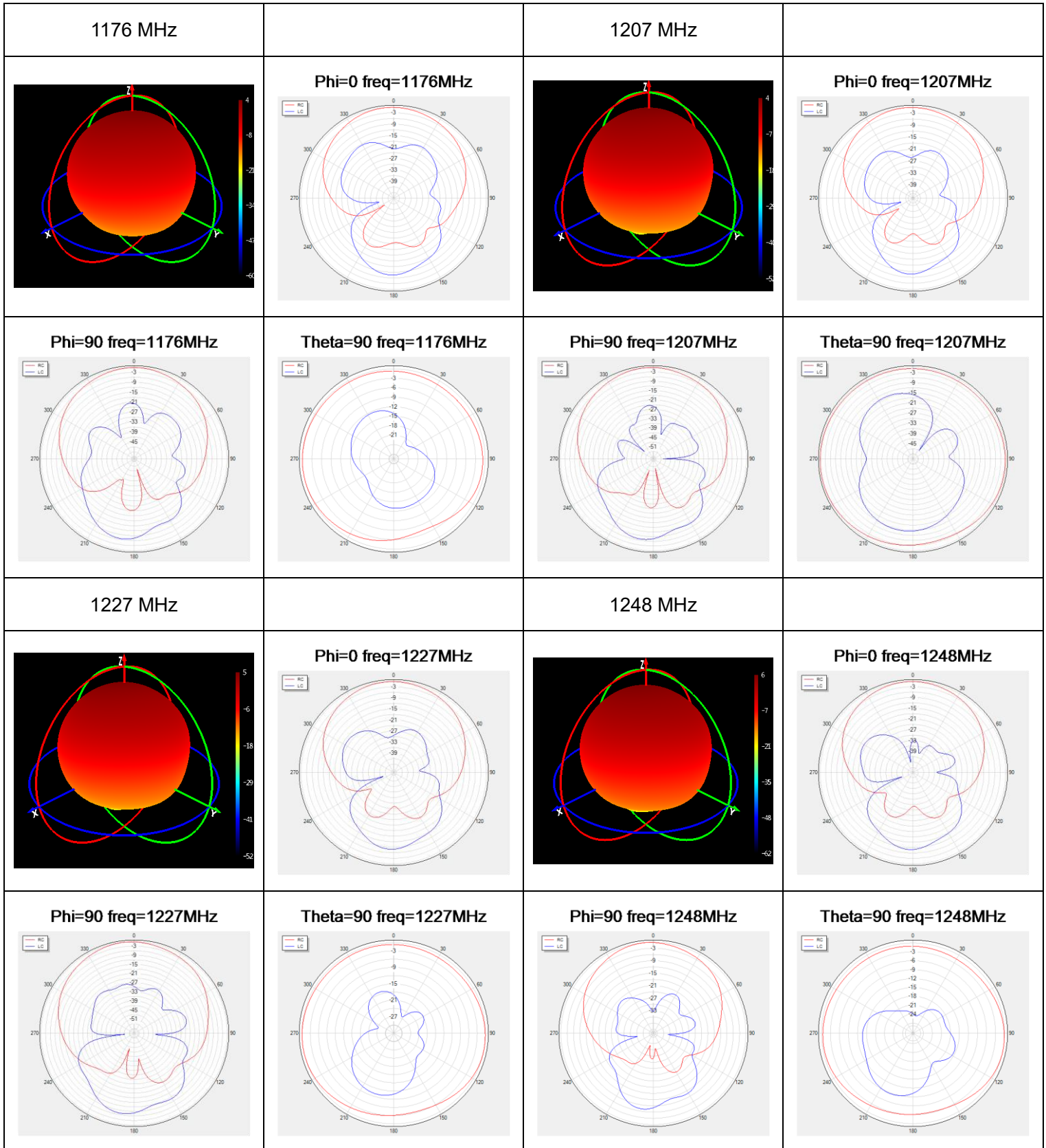
2D RHCP and LHCP Gain (dBi)

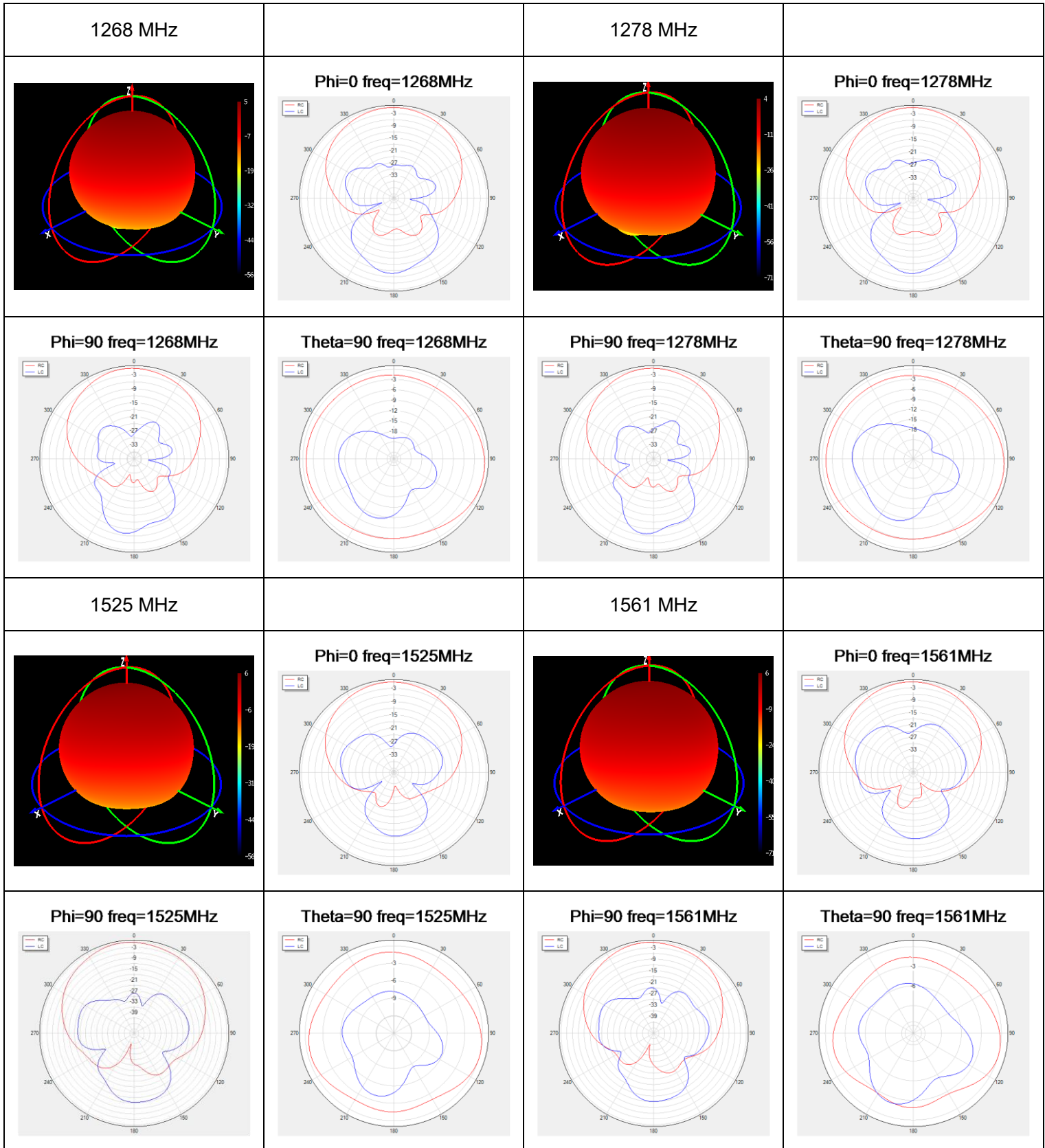
Frequency (MHz)		1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
RC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	3.65	3.78	4.65	4.9	4.08	3.32	4.8	5.35	5.05	5.09
	Phi = 90 (deg) Theta = 0 (deg)	3.65	3.78	4.65	4.9	4.08	3.32	4.8	5.35	5.05	5.09
LC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-18	-21	-24.5	-28.3	-24	-22.5	-23.2	-18.5	-18.1	-17.4
	Phi = 90 (deg) Theta = 0 (deg)	-18	-21	-24.5	-28.3	-24	-22.5	-23.2	-18.5	-18.1	-17.4

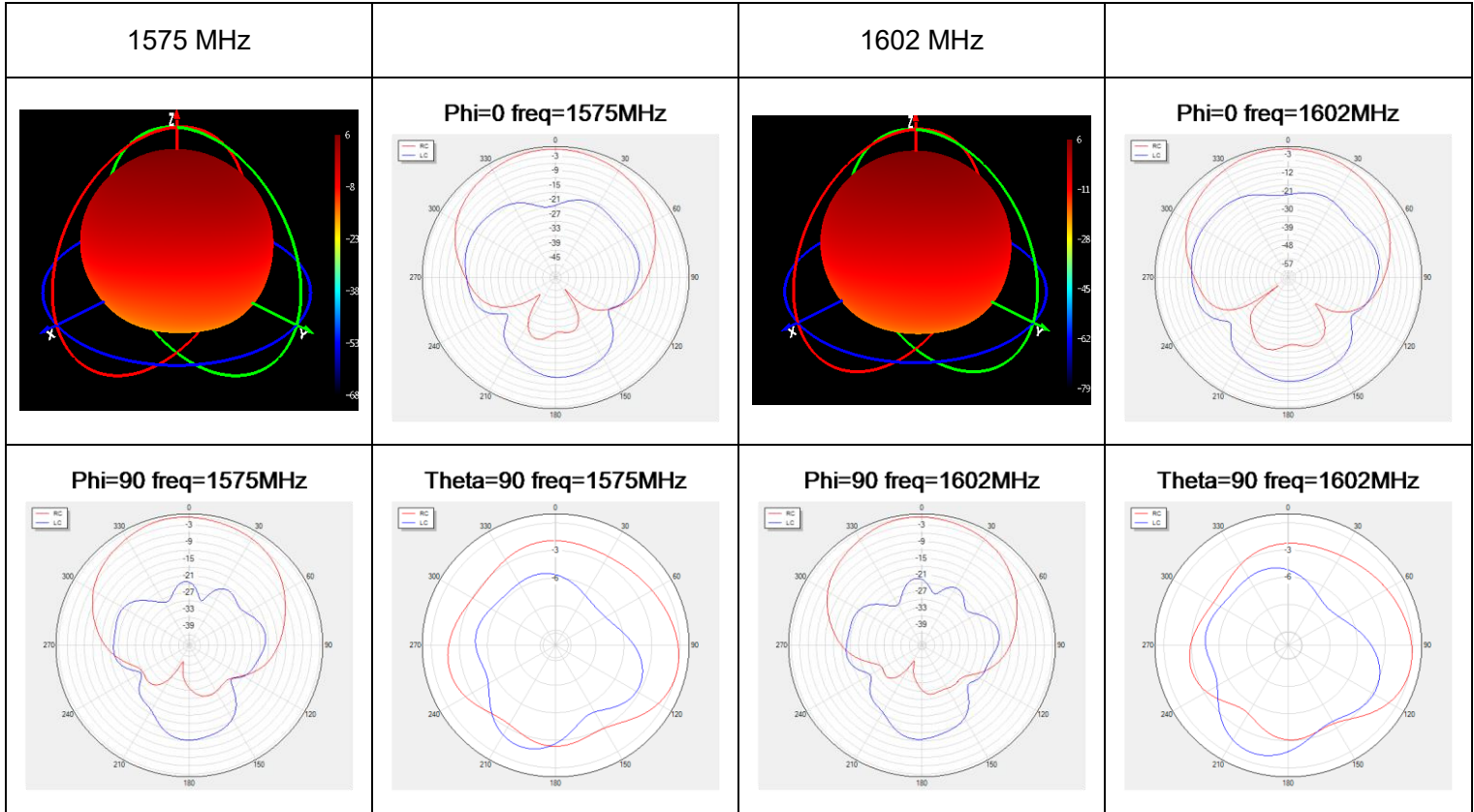
### 3.2.5. 3D & 2D Radiation Pattern

- Test Condition: Free Space
- Test Chamber: SH-SY-16M



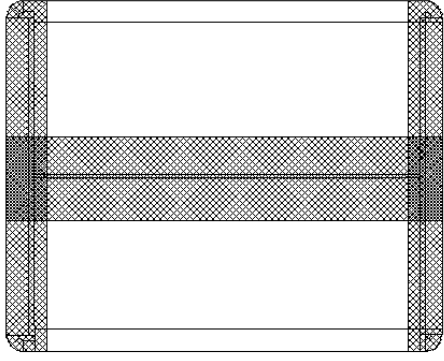






# 4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		<p>1 antenna product in a bubble bag. (1 Antenna / Bubble Bag)</p>
2		<p>2 antenna products in a knife card slot. (2 Antennas / Knife Card Slot)</p>
3		<p>(36 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 x W x H = 500 x 340 x 250 mm</u></p>
4		<p><b>Position for Attaching Labels</b></p> <ul style="list-style-type: none"> <li>① Carton Label</li> <li>② Quality Label</li> </ul>

5	 A technical drawing of an H-shaped sealing carton. It consists of a central horizontal rectangular section with a cross-hatched texture, flanked by two vertical rectangular sections, also with a cross-hatched texture. The corners of the vertical sections are rounded. The entire structure is shown in a perspective view.	<p><b>Sealing Cartons</b> H-shaped 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
-	2025-05-19	Junsen Li/ Mike Guo/ Riva Ren/ Rainey Liao	Creation of the document
1.0	2025-05-19	Junsen Li/ Mike Guo/ Riva Ren/ Rainey Liao	First official release
1.1	2025-07-28	Rainey Liao	Updated the antenna image (Cover page).

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