



# Antenna Datasheet

**Product OC:** YEGM011BA

**Version:** 2.0

**Date:** 2023-09-05

**Status:** Released

**Product Name:** Active GNSS L1/L2/L5

**Key Features:**

Frequency Band: 1164–1238 MHz, 1559–1606 MHz

RG58 (SMA to TNC Male) length: 4000 ±50 mm

Magnetic and suction cup support (bracket length: 75 ±1 mm)

Dimensions:  $\Phi$  146.41 mm × 65.03 mm

Efficiency: Up to 65 %

RoHS Compliant

LNA Gain: 30 ±3 dB

IP67

# 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	1164–1238 MHz, 1559–1606 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

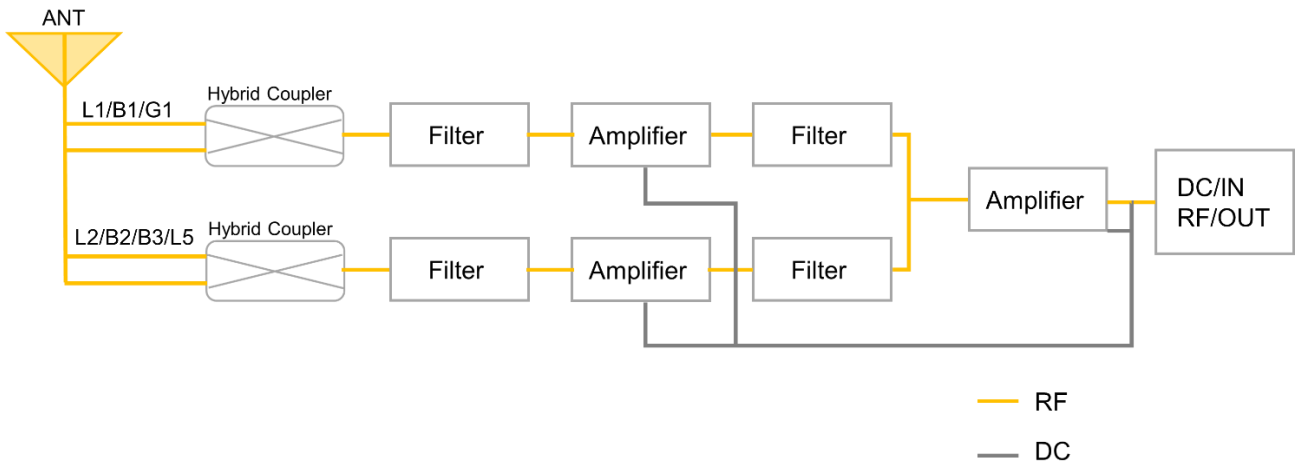
Band	GPS L5	GALILEO	GPS L2	GLONASS	BEIDOU	BEIDOU	GPS L1	
	GALILEO E5a	GALILEO E5b	GPS L2 QZSS L2C	GLONASS G2	BEIDOU B3	BEIDOU B1I	GALILEO E1	GLONASS G1
Frequency (MHz)	BEIDOU B2a-B2I	BEIDOU B2b					BEIDOU B1C	
	QZSS L5						QZSS L1	
	IRNSS L5							
	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.15	1.1	1.12	-	-	1.16	1.17	1.18
Return Loss (dB)	-23	-26.1	-25.0	-	-	-22.4	-22.1	-21.7
Efficiency (%)	60	72	62	-	-	66	67	58
Peak Gain (dBi)	4.47	5.7	5.25	-	-	5.64	5.74	5.14
Axial Ratio (dB)	1.03	0.35	0.53	-	-	1.12	0.99	0.61

LNA Electrical	
LNA Gain	30 ±3 dB
Noise Figure	≤ 1.5 dB
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	≥ 30 dB f0 ± 100 MHz f0 (1164 MHz, 1278 MHz) & (1525MHz, 1606 MHz)
Working Voltage	DC 3–12 V
Working Current	17.6 ±4 mA
Impedance	50 Ω

## 1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	Φ 146.41 mm × 65.03 mm
Material & Color	ASA & White
Cable Type & Length	RG58 & Black & 4000 mm
Connector Type	Antenna: TNC Female Cable: SMA Male to TNC Male
Mounting Type	Thread and Magnet
Weight	Typ. 1258 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Ingress Protection (IP) Rating	IP67
RoHS Compliant	Yes

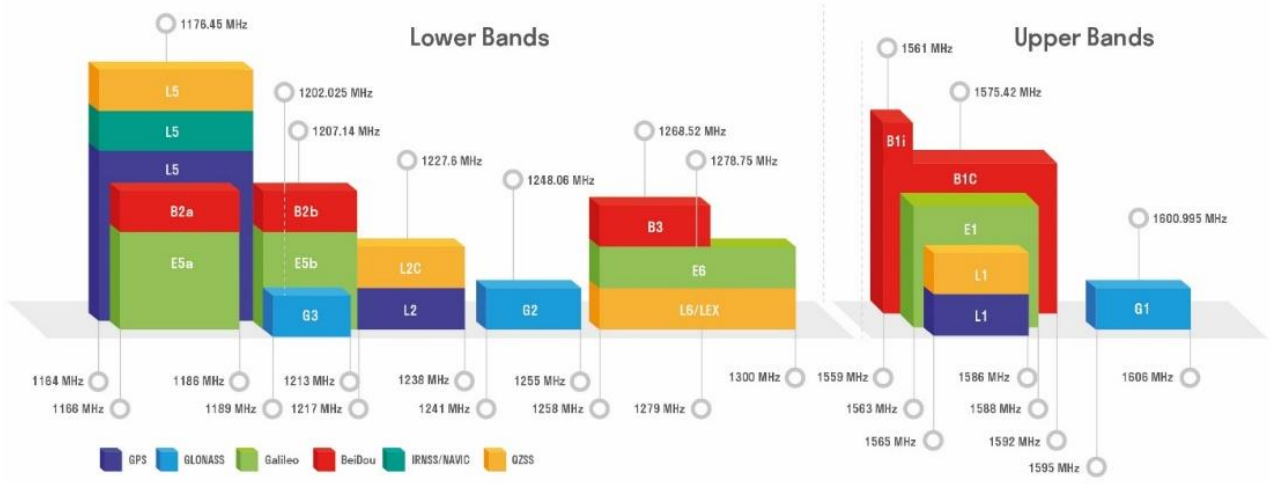
### 1.3. Block Diagram (Active Antenna)



## 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>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)				
	√				

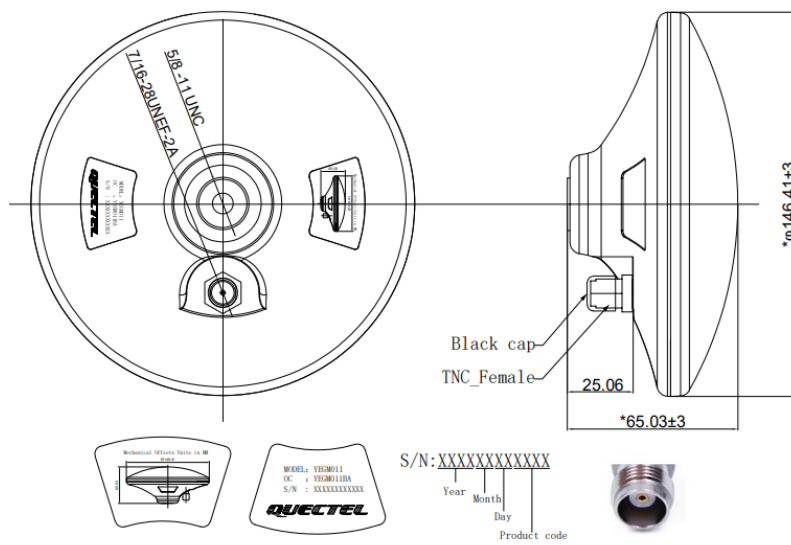
**GNSS Bands and Constellations**



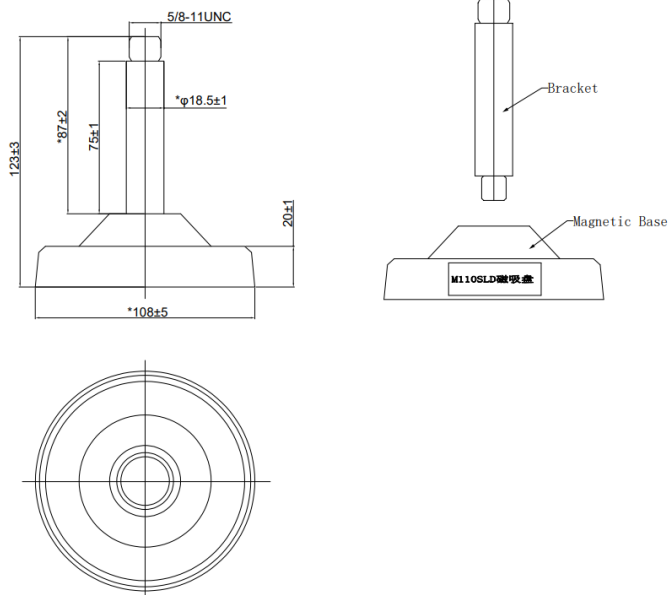


# 2 Drawing

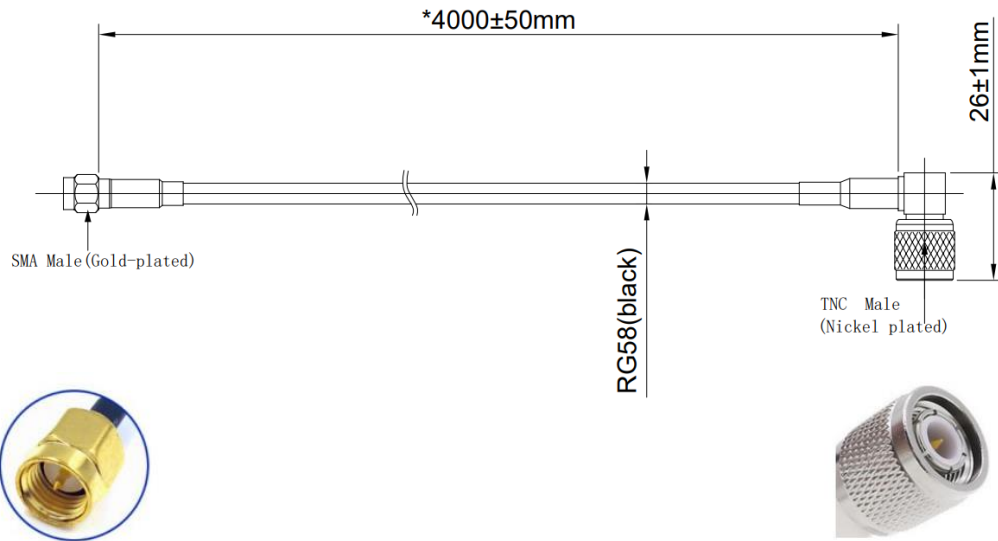
## Antenna



## Magnetic and suction cup support



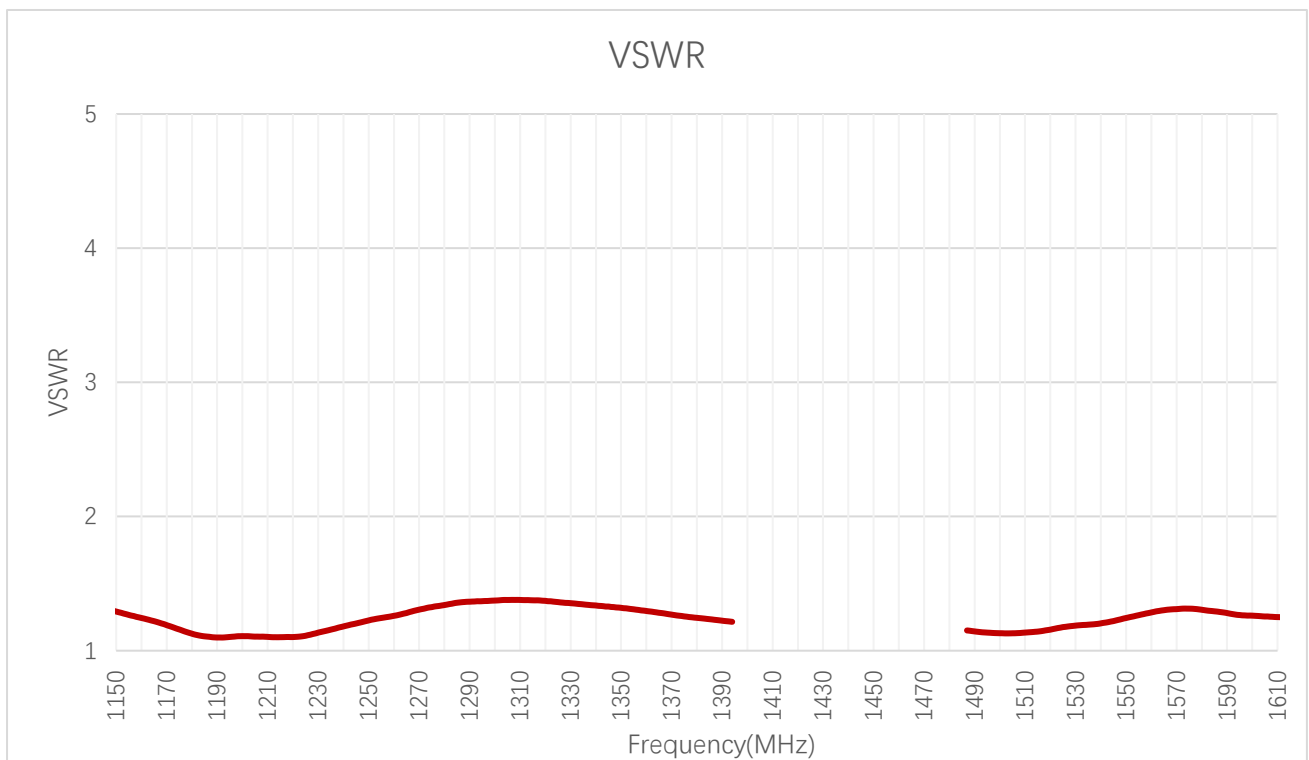
# Cable



# 3 Detailed Performance

## 3.1. S-Parameter Test

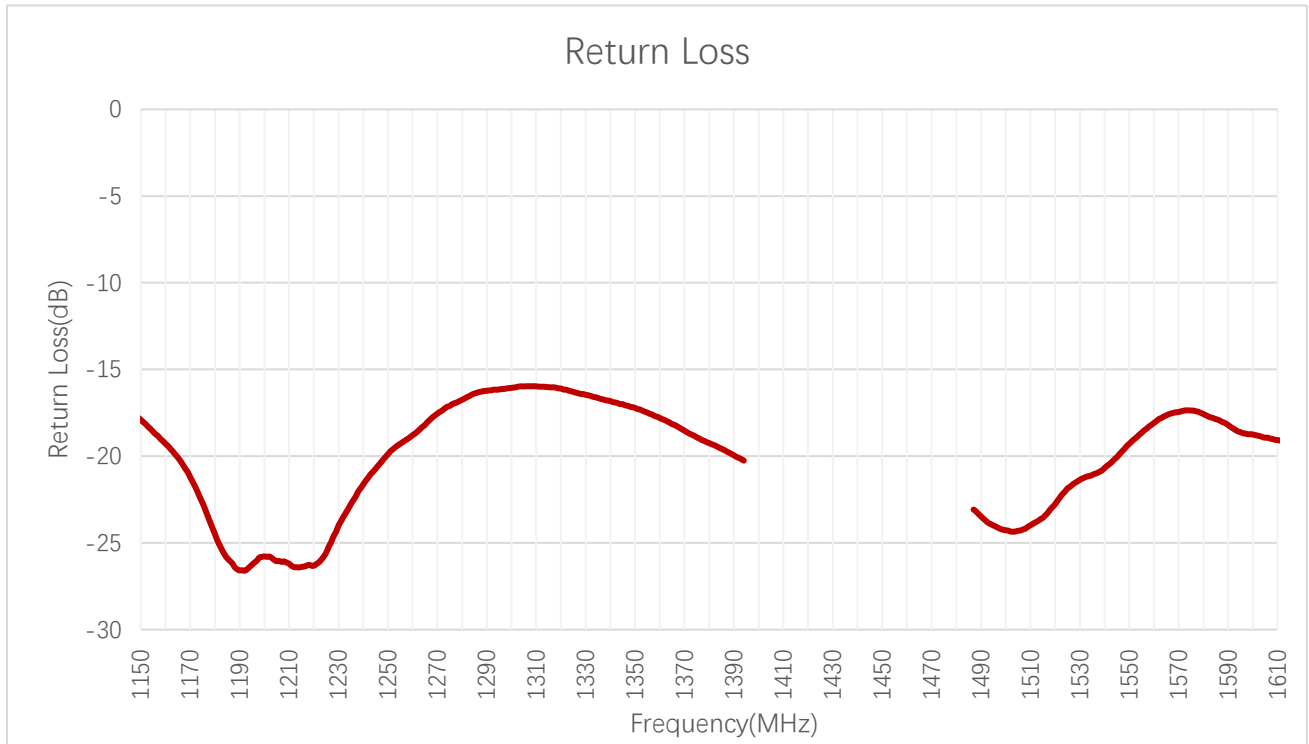
### 3.1.1. VSWR



**VSWR**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.15	1.1	1.12	-	-	1.16	1.17	1.18

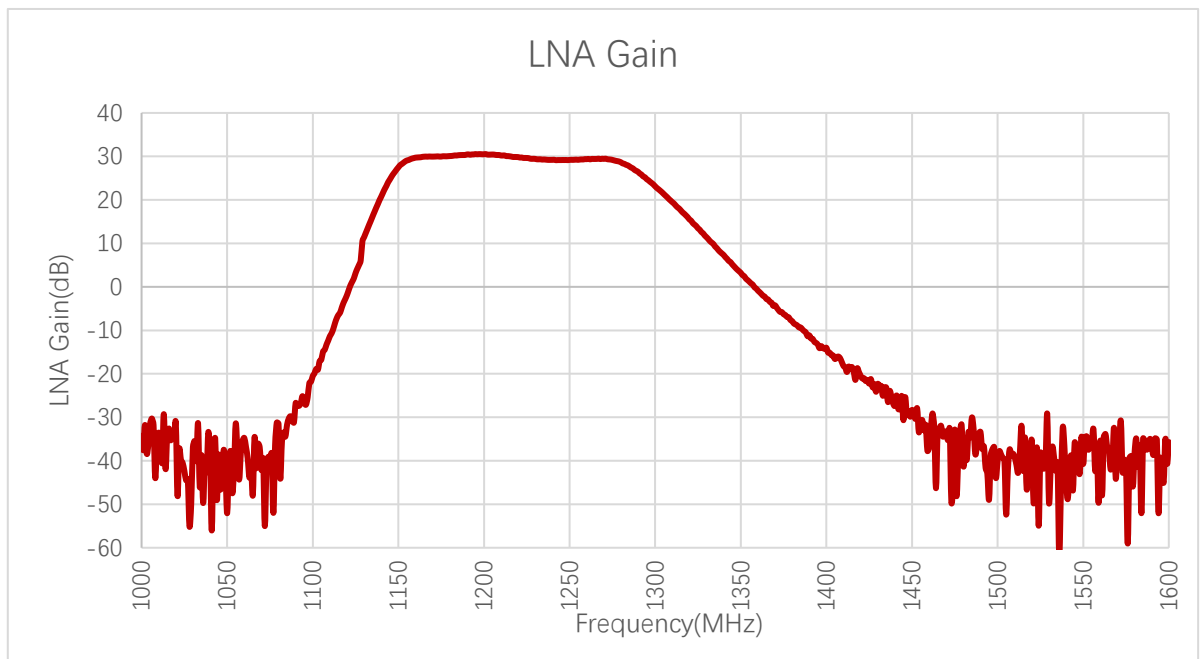
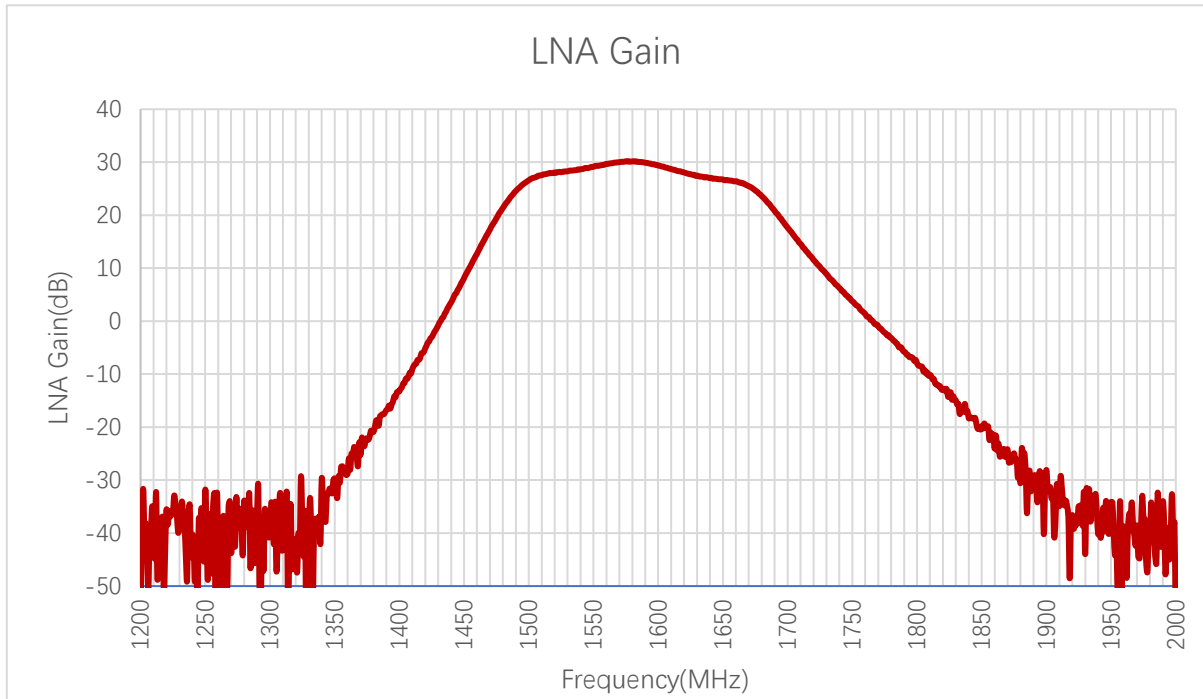
**3.1.2. Return Loss**



**Return Loss (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-23.0	-26.1	-25.0	-	-	-22.4	-22.1	-21.7

**3.1.3. GNSS LNA Gain**

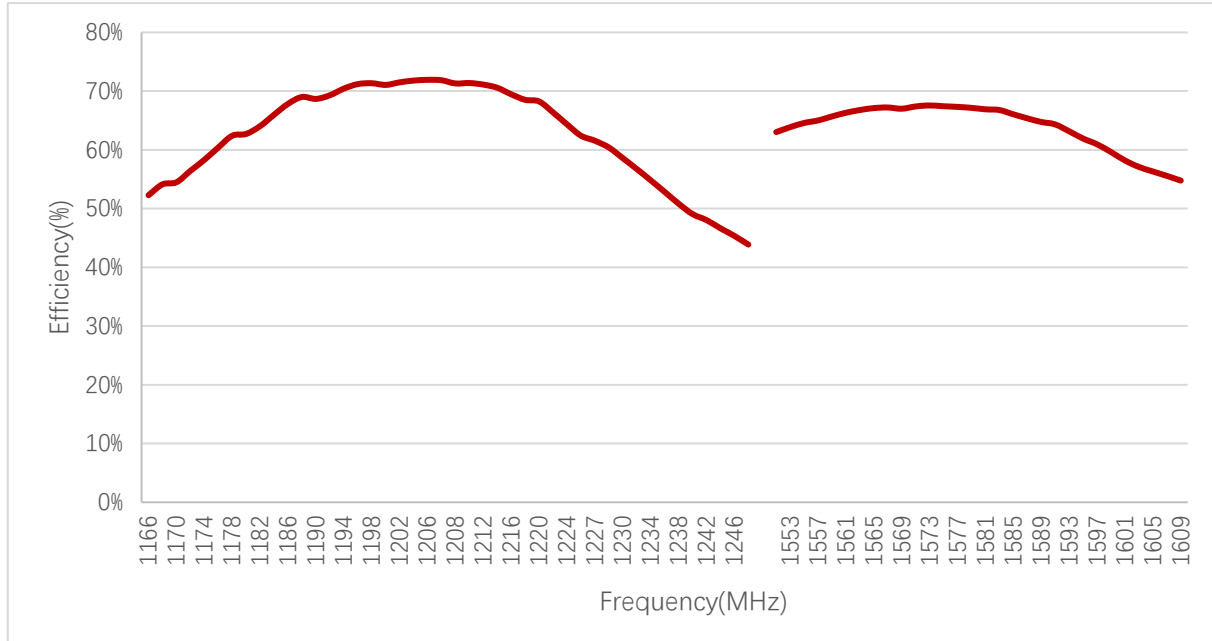


**LNA Gain (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain (dB)	30.0	30.3	29.5	-	-	29.6	30.1	29.2

### 3.2. Radiation Performance Test

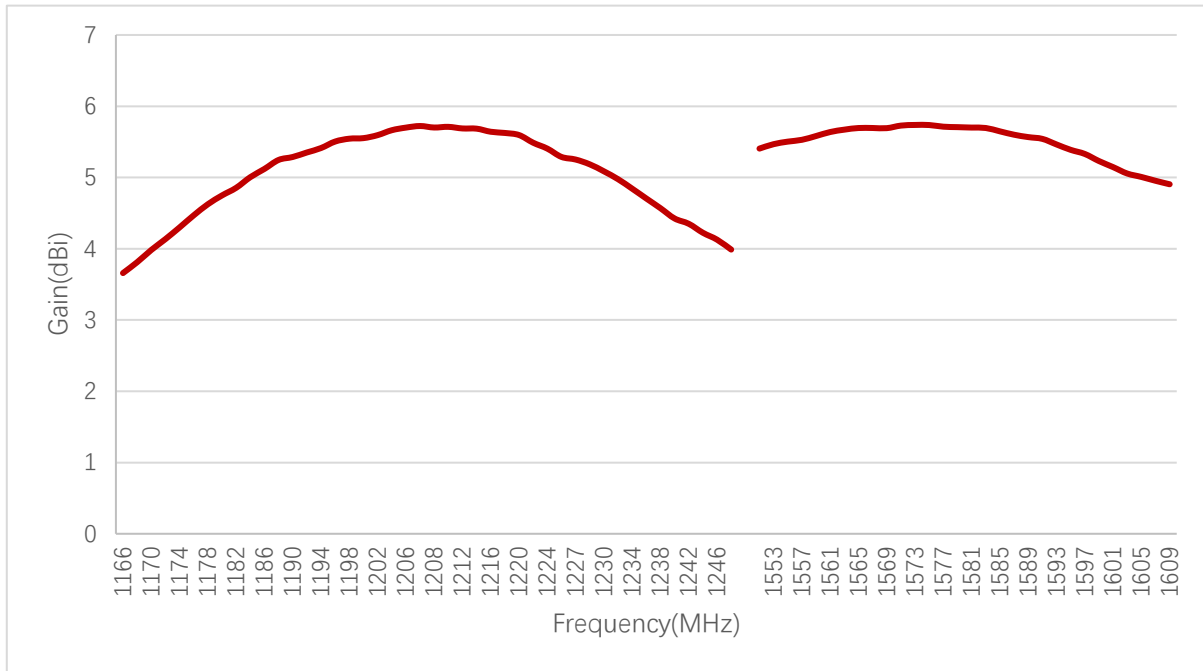
#### 3.2.1. Efficiency



**Efficiency (%)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	60	72	62	-	-	66	67	58

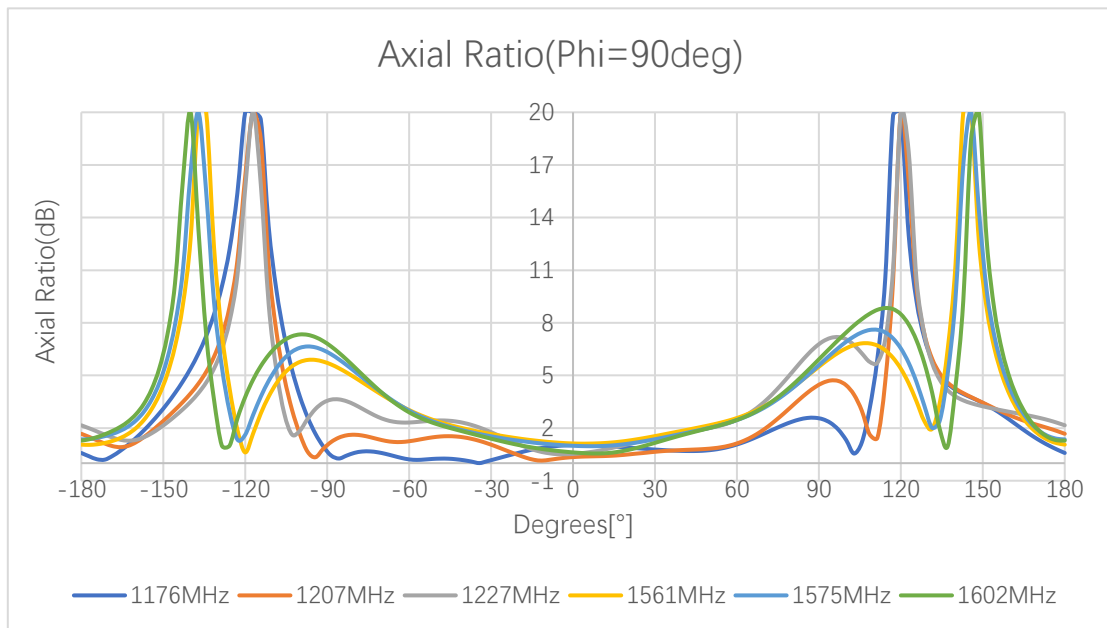
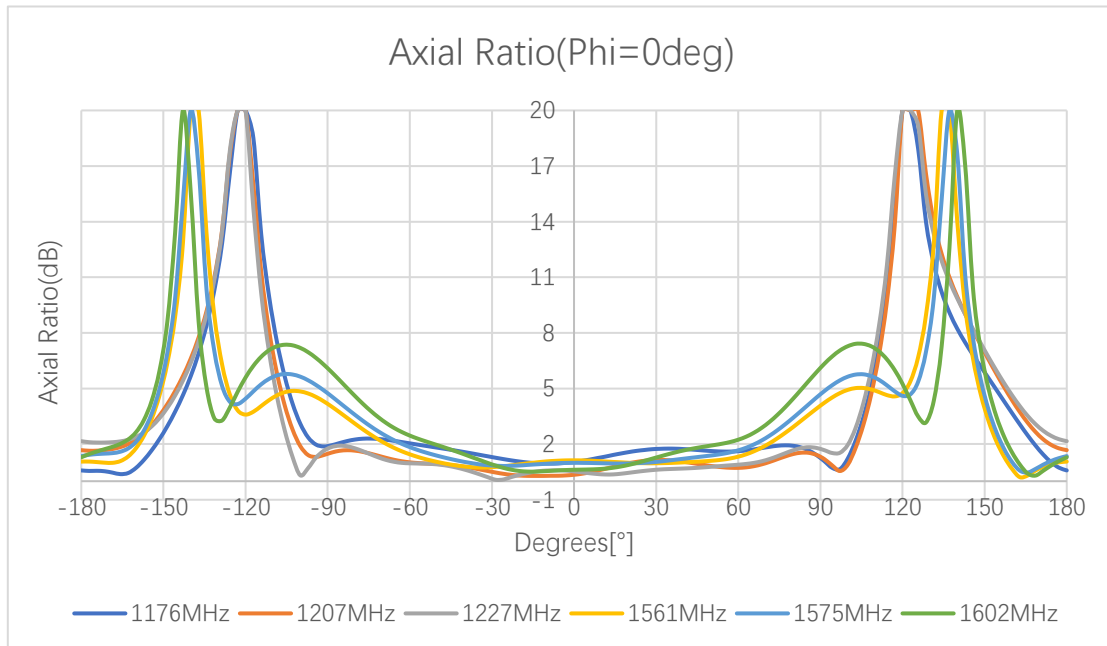
**3.2.2. Peak Gain**



**Peak Gain (dBi)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	4.47	5.7	5.25	-	-	5.64	5.74	5.14

**3.2.3. Axial Ratio**

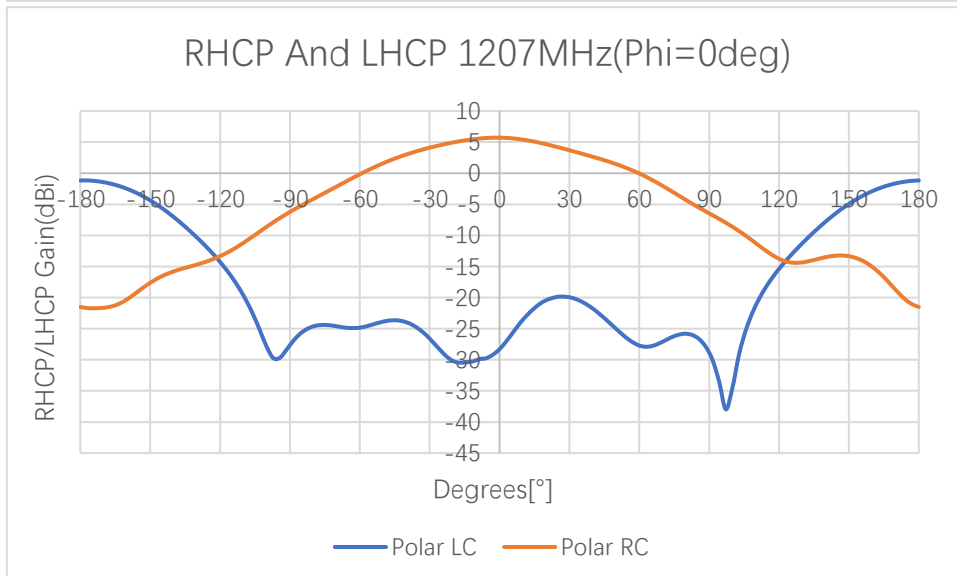
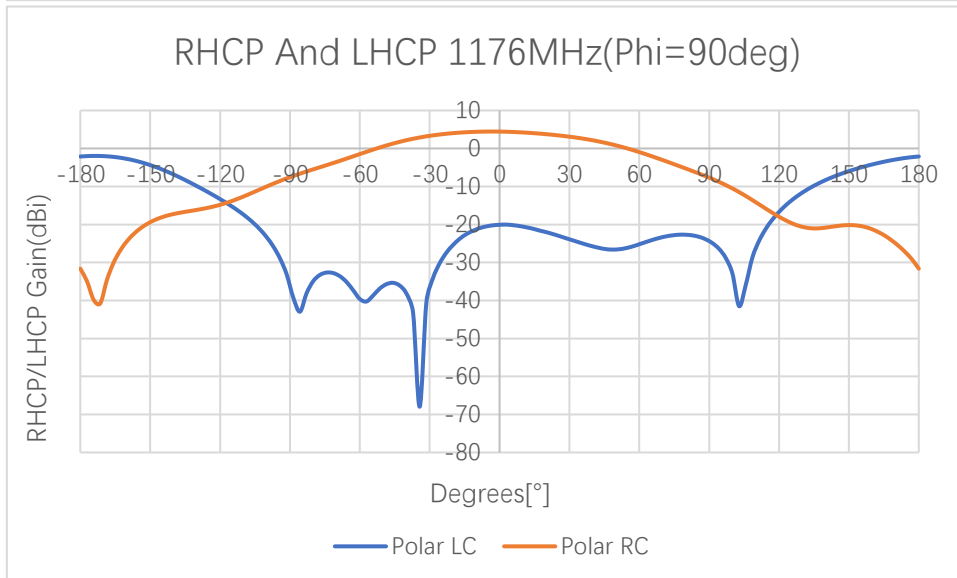
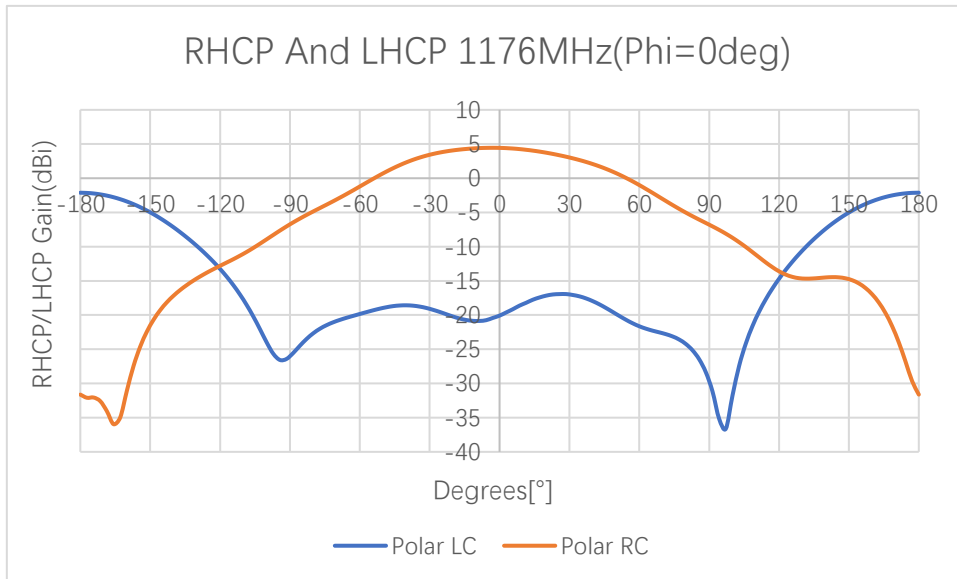


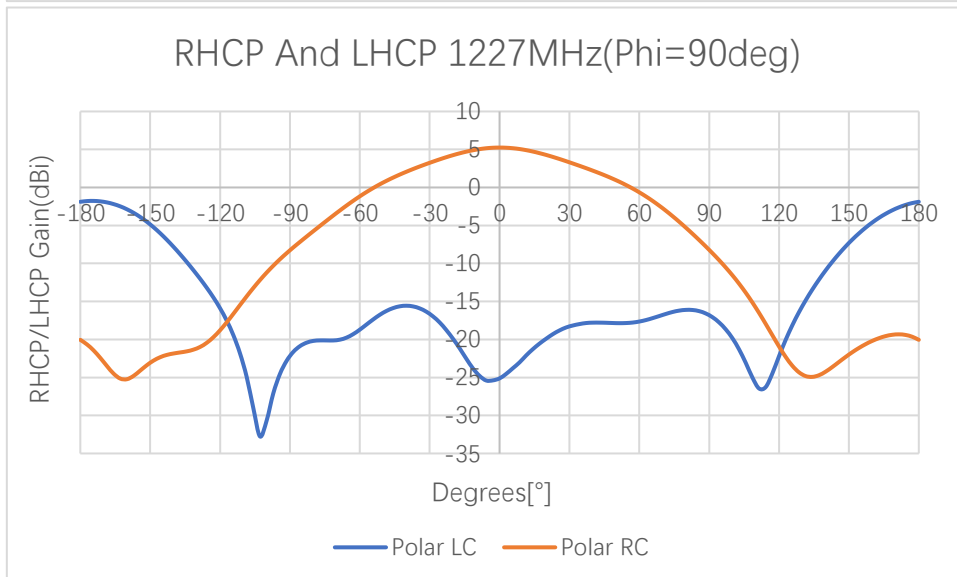
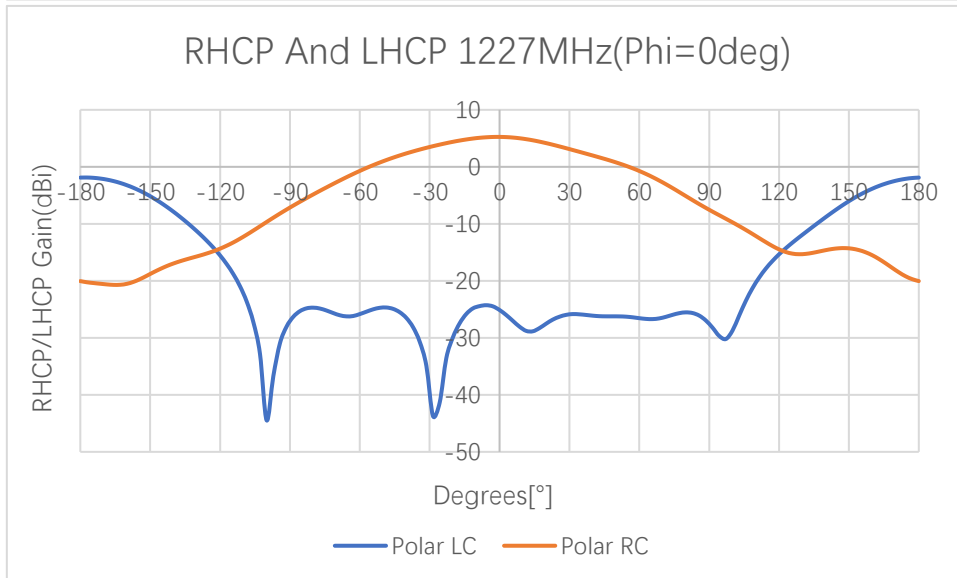
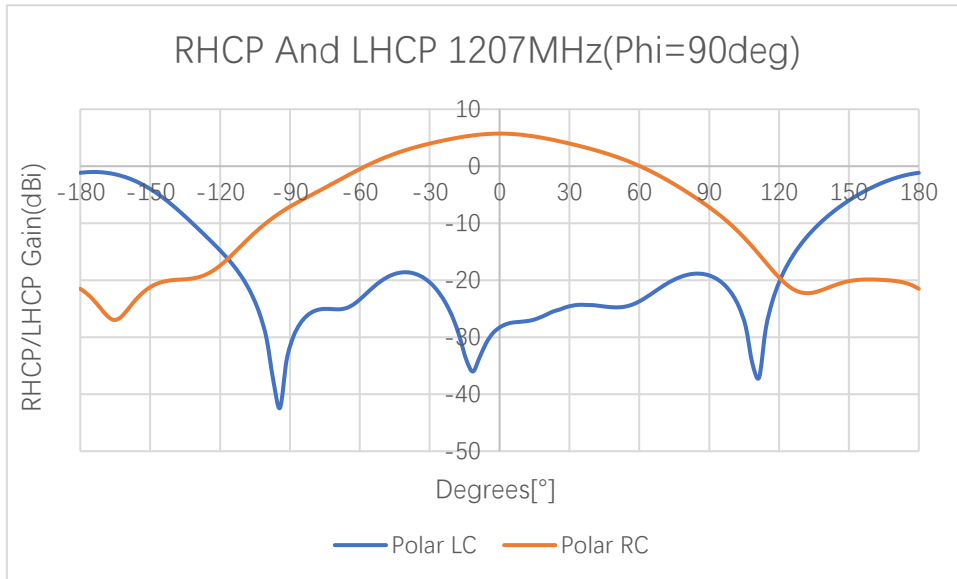
**Axial Ratio (dB)**

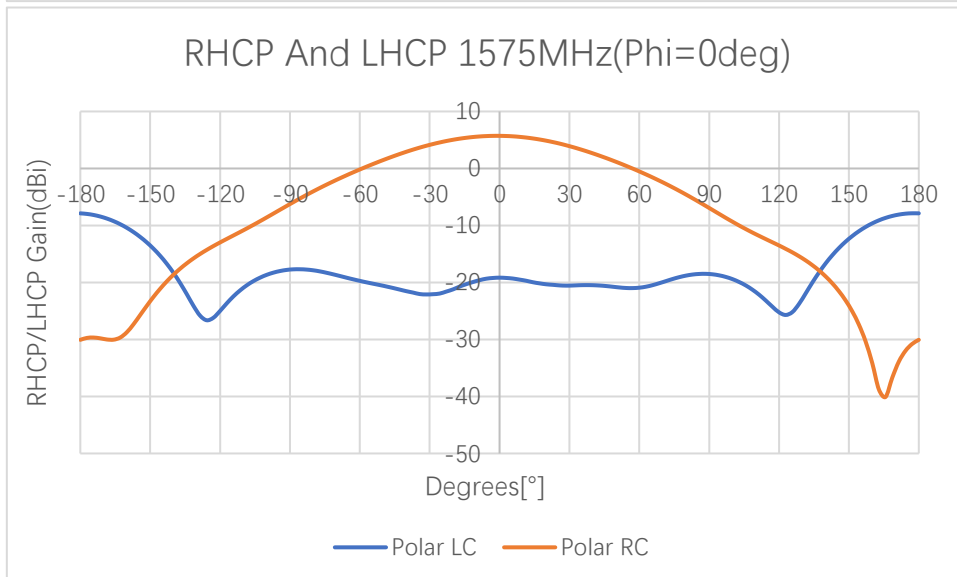
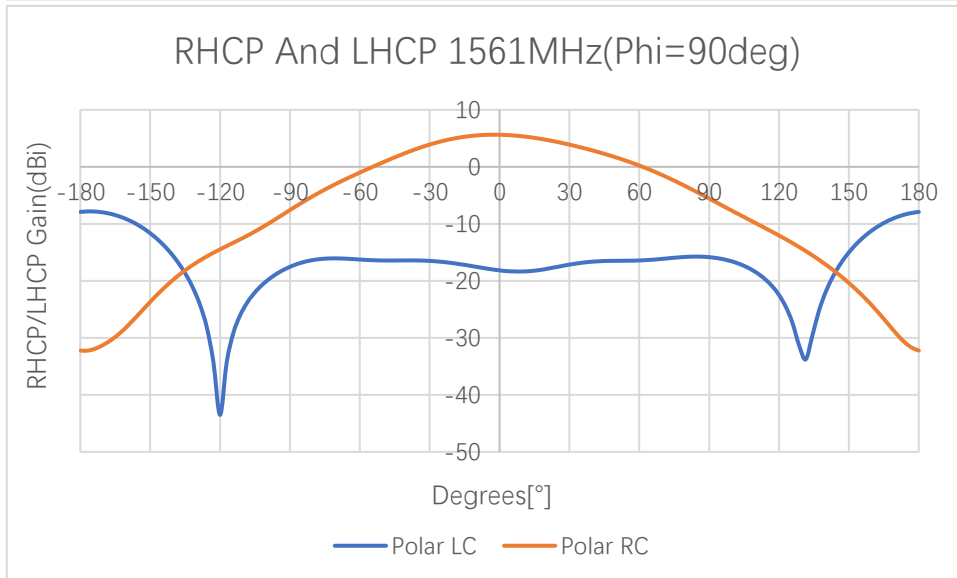
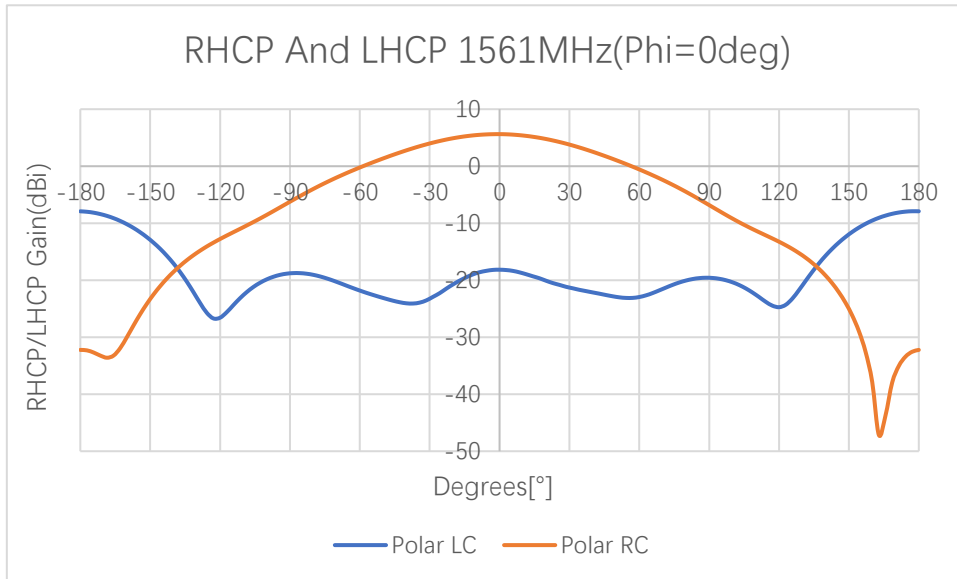
Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	1.03	0.35	0.53	-	-	1.12	0.99	0.61
	Phi = 90 (deg) Theta = 0 (deg)	1.03	0.35	0.53	-	-	1.12	0.99	0.61

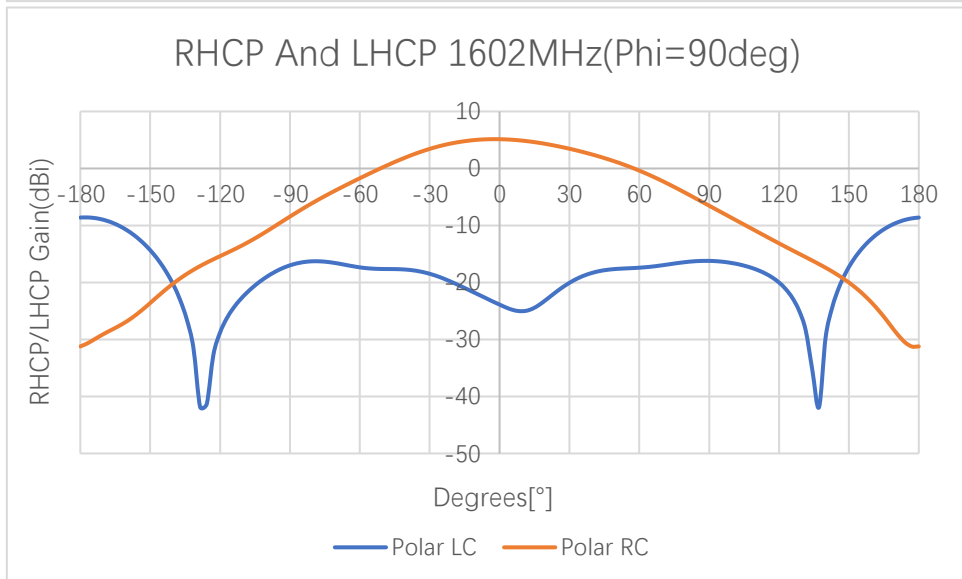
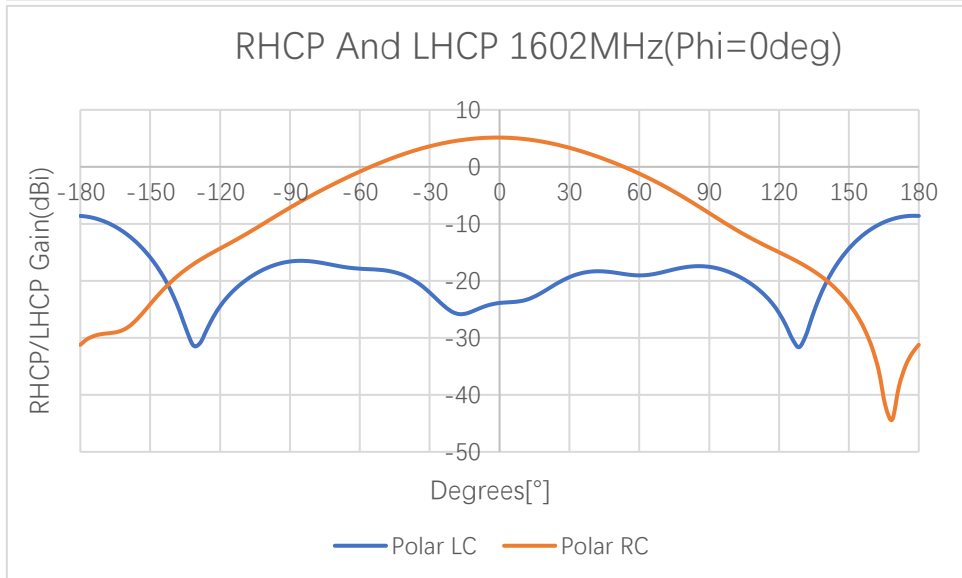
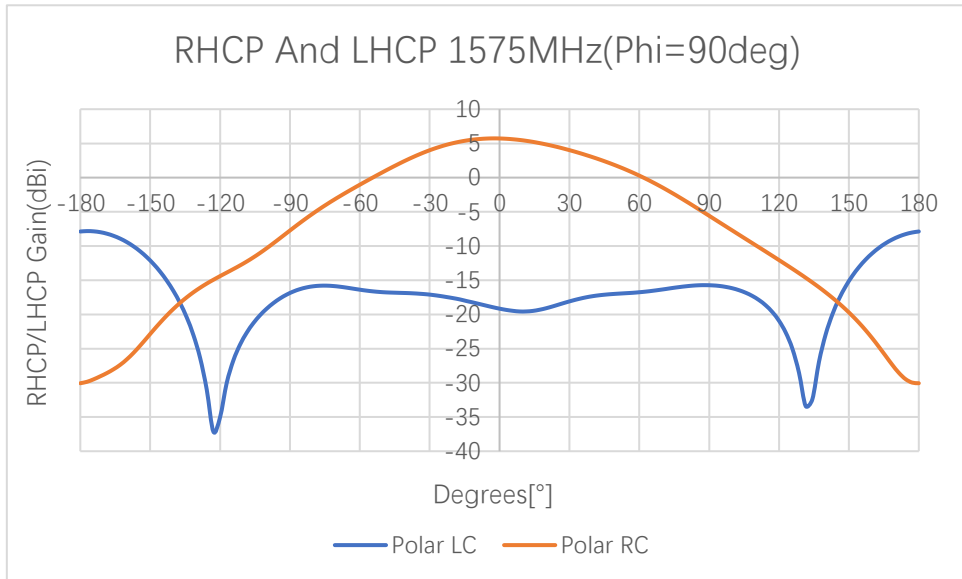


**3.2.4. 2D RHCP and LHCP Gain**







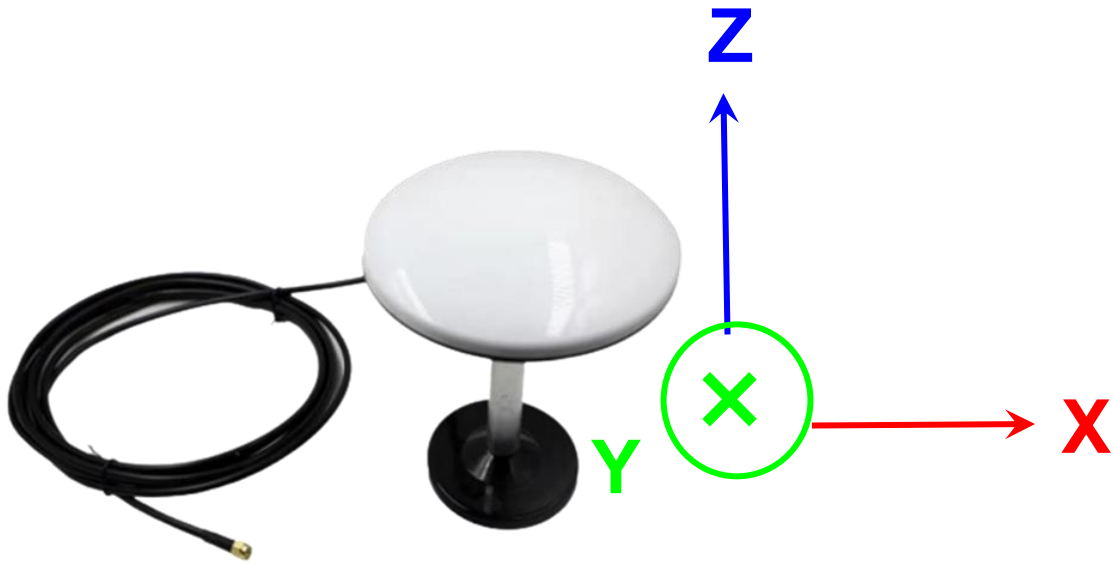


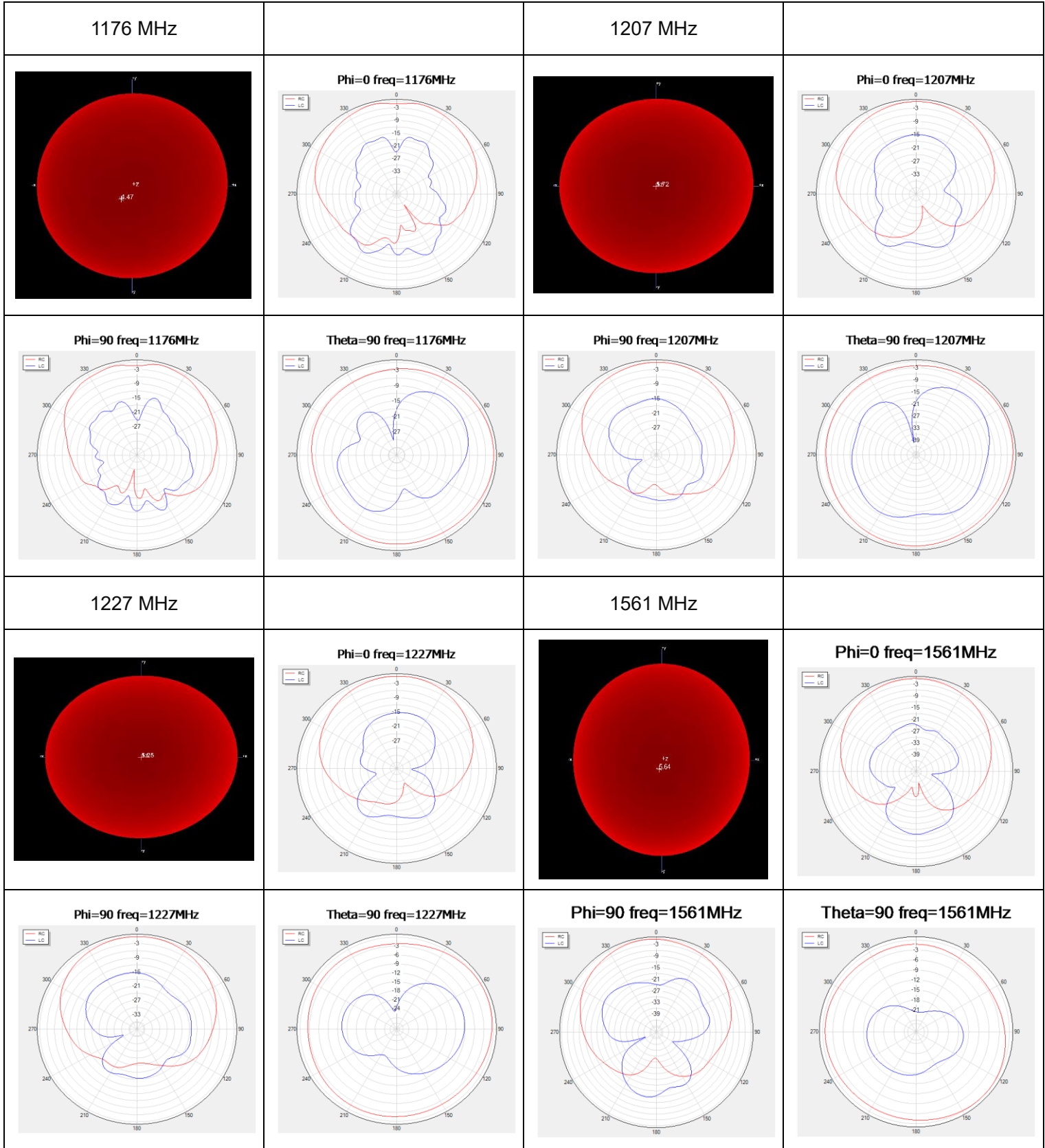
2D RHCP and LHCP Gain (dBi)

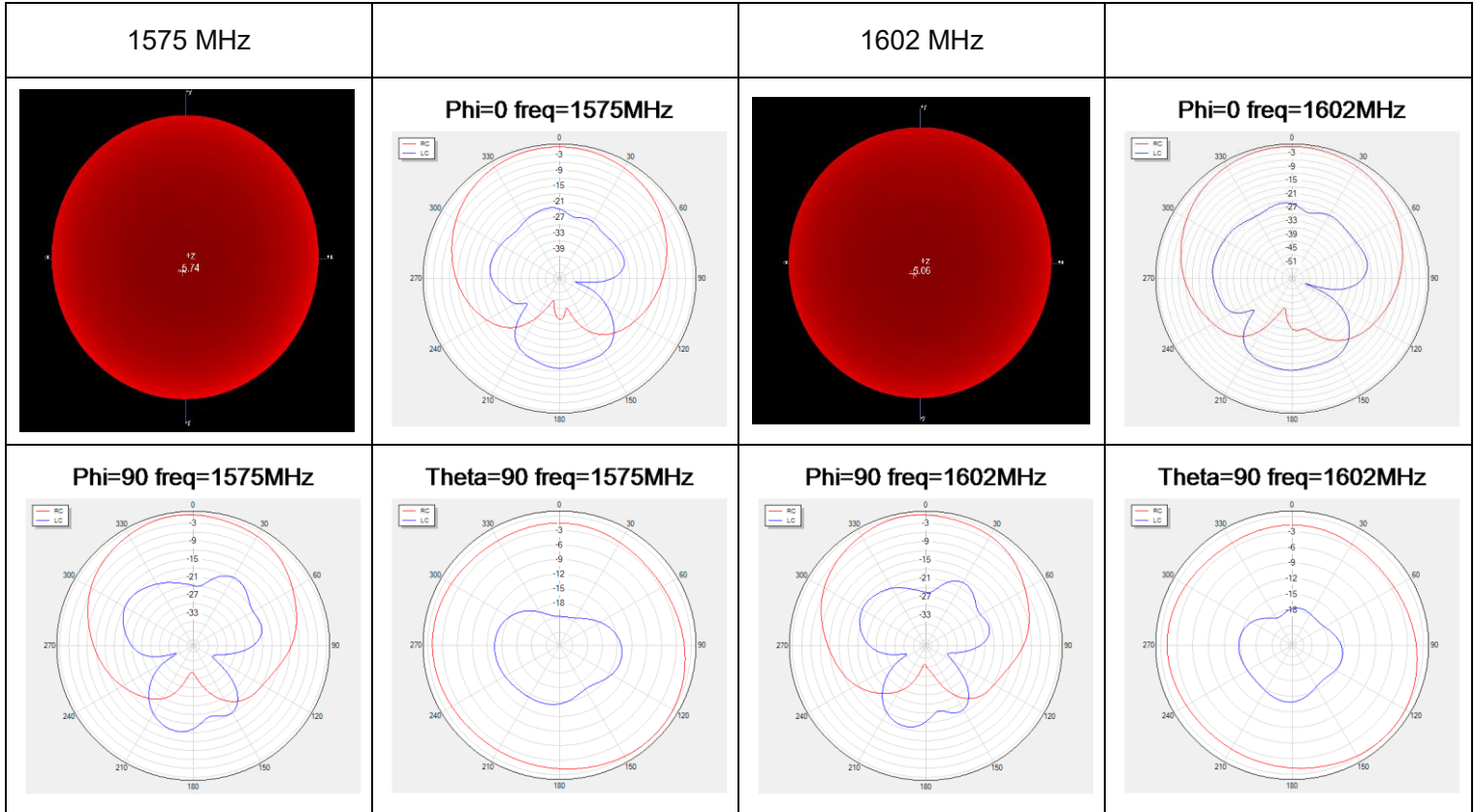
Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
RC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	4.43	5.72	5.24	-	-	5.62	5.72	5.13
	Phi = 90 (deg) Theta = 0 (deg)	4.43	5.72	5.24	-	-	5.62	5.72	5.13
LC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-20.08	-28.29	-25.12	-	-	-18.16	-19.15	-23.88
	Phi = 90 (deg) Theta = 0 (deg)	-20.08	-28.29	-25.12	-	-	-18.16	-19.15	-23.88

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

- Test Condition: Free Space
- Test Chamber: FS-G-1


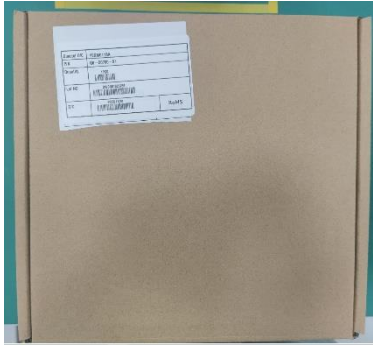



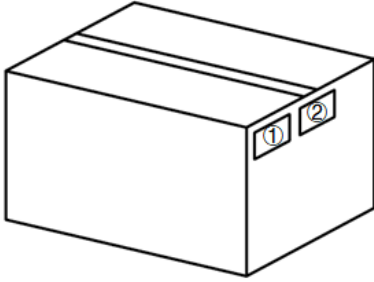
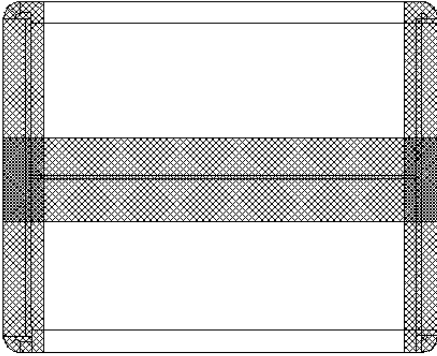






# 4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		<p>1 pc antenna product in an inner box. (1 PC Antenna / Inner Box)</p>
2		<p>Inner box diagram</p>
3		<p>(5 Inner Boxes / Carton Box) (5 PCS Antennas / Carton Box) <u>Carton Size:</u> <u>L × W × H = 450 × 240 × 290 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		<p><b>Sealing Cartons</b></p> <p>“I” type sealing cartons</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
-	2022-03-17	Kenny YIN/ Junsen LI	Creation of the document
1.0	2022-03-17	Kenny YIN/ Junsen LI	First official release
1.1	2022-06-17	Kenny YIN	Updated the coaxial cable drawing (Chapter 4 and 6).
1.2	2023-03-10	Kenny YIN	Updated the base drawing (Chapter 6).
2.0	2023-09-05	Damon ZHANG/ Lucky FENG/ David LIU/ Aria CHU	Numerous changes were made to this document. It should be read in its entirety.

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