

# Antenna

# YBS00A1AA Datasheet

**Antenna Services**

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# About the Document

## Revision History

Version	Date	Author	Note
-	2021-08-30	Jason LONG/ Xiaodong YANG	Creation of the document
1.0	2021-08-30	Jason LONG/ Xiaodong YANG	First official release
1.1	2021-09-15	Junsen LI	<ol style="list-style-type: none"><li>1. Added the weight information (Chapter 4).</li><li>2. Added the pictures of the VSWR before hybrid coupler (Chapter 5.2).</li><li>3. Updated the efficiency pictures (Chapter 5.3).</li><li>4. Updated the gain pictures (Chapter 5.4).</li><li>5. Updated the first axial ratio picture (Chapter 5.6).</li></ol>
1.2	2021-12-06	Aria CHU	Updated the product description in Chapter 1.
2.0	2022-03-08	Xiaodong YNNG	Updated all test data in this datasheet.

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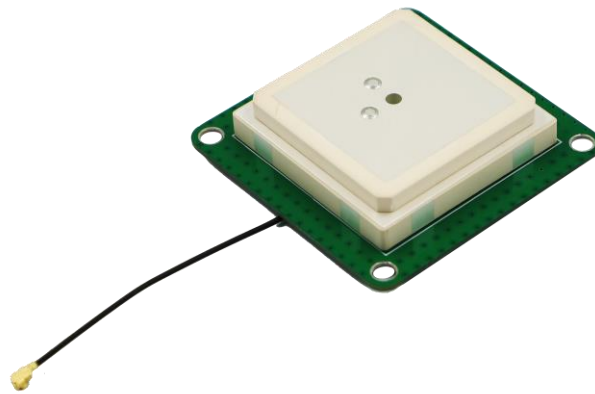
## 1 Product Description

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.

We provide comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs.

## 2 Product Features

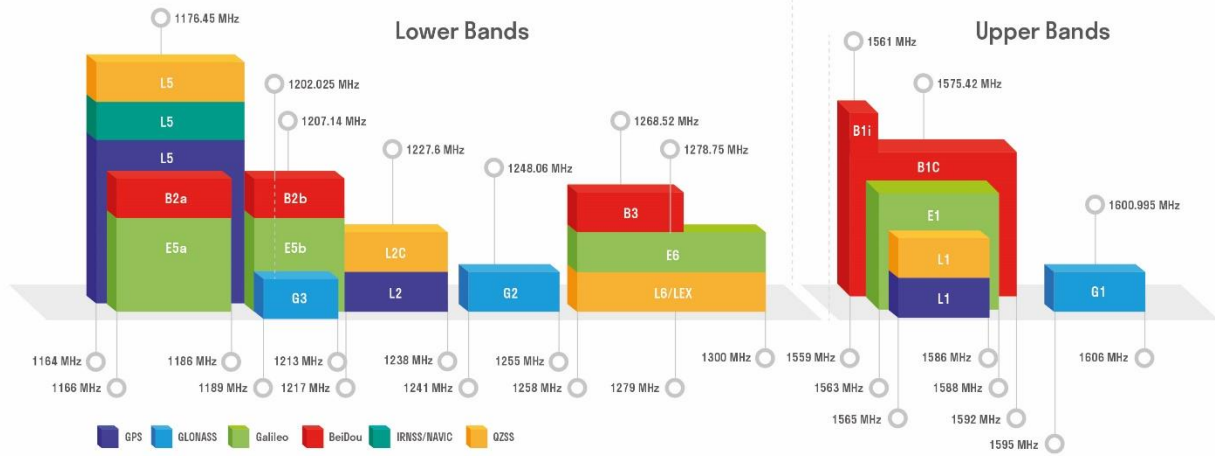
- GNSS L1/L5
- Compact Dual Feed Patch Element
- Excellent Performance



### 3 GNSS Frequency Band Checklist

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/L1OC/L1OF</b> Centre 1601 (1595–1606)	<b>G2/L2OC/L2OF</b> Centre 1248.06 (1241–1255)	<b>G3/L3OC</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/B2I</b> Centre 1176.45 (1166–1187)	<b>B2b</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**





## 4 Product Specifications

- The antenna is tested on a 58.5 mm × 58.5 mm × 1 mm PCB.

### Passive Electrical Specifications

Frequency Range	L5: 1166–1186 MHz, L1: 1559–1606 MHz
Input Impedance	50 Ω
VSWR	< 2
Gain	≤ 3.55 dBi
Polarization Type	RHCP
AR	< 3 dB

### Active Electrical Specifications

Gain (LNA)	18 ±2 dB
Noise Figure	≤ 1.5dB
Filter Out-of-Band Attenuation	20 dB f0 ±50 MHz f0 (1176 MHz, 1580 MHz)
Operation Voltage	2.7–3.3 V
Current	< 40 mA

### Mechanical Specifications

Antenna Size	58.7 mm × 58.7 mm × 14.4 mm
Casing	Ceramics
Connector Type	IPEX 1
Working Temperature	-40 °C to +85 °C
Weight	74 g (Approximation)

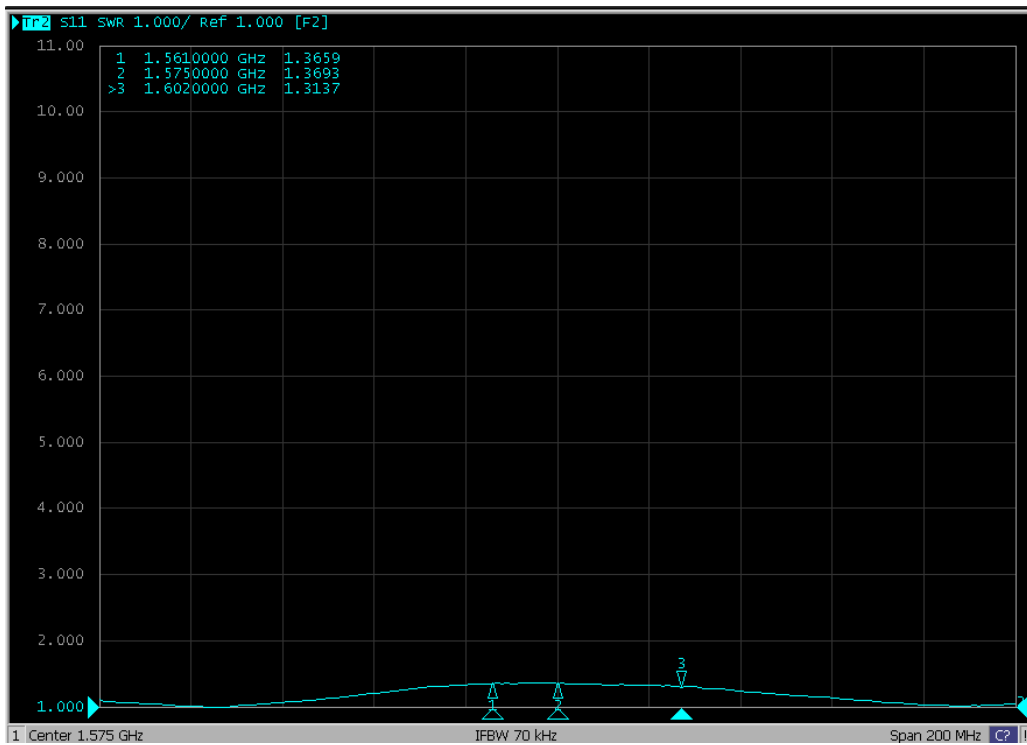
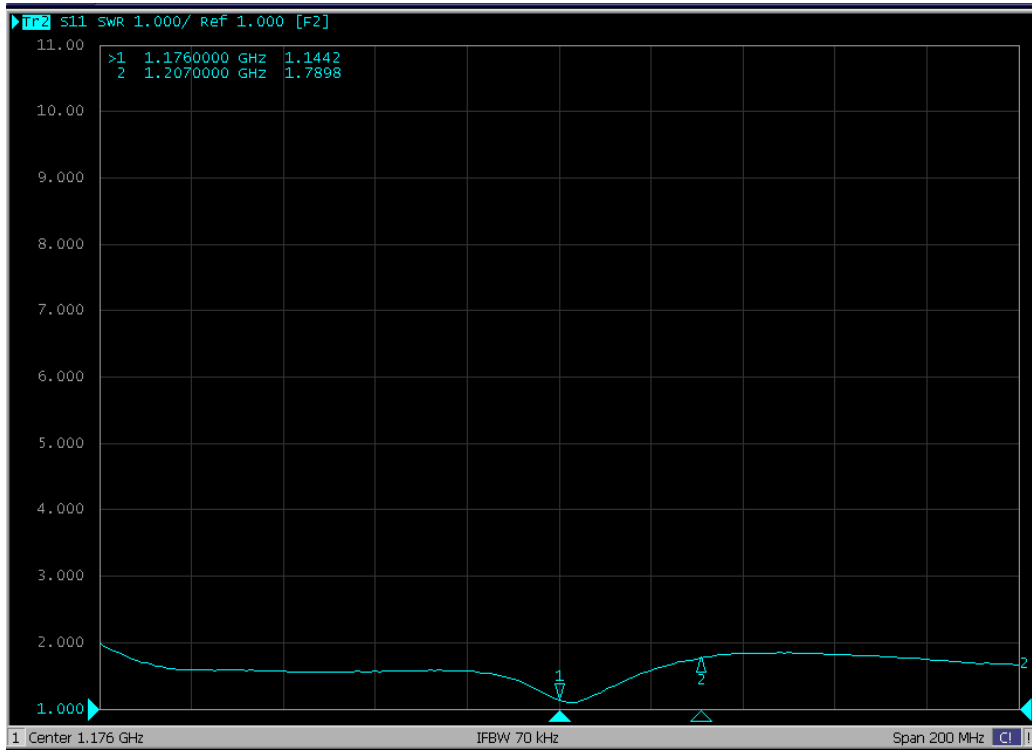
## 5 Overall Performance

### 5.1. Test Environment

- KEYSIGHT VNA Network Analyzer E5063A 100 kHz – 8.5 GHz
- RayZone® 2800 Chamber 5G (FR1) SISO/MIMO, 400 MHz – 8.0 GHz

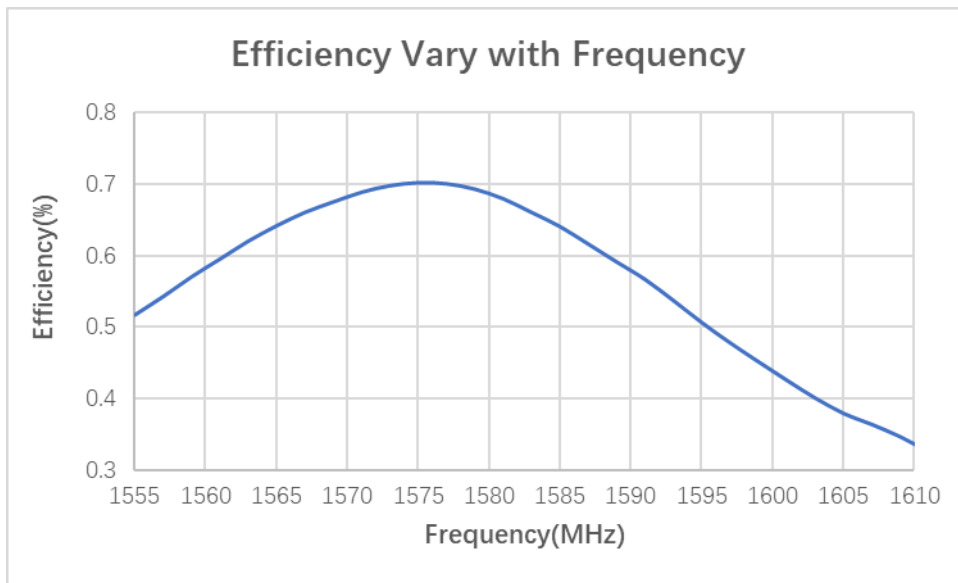
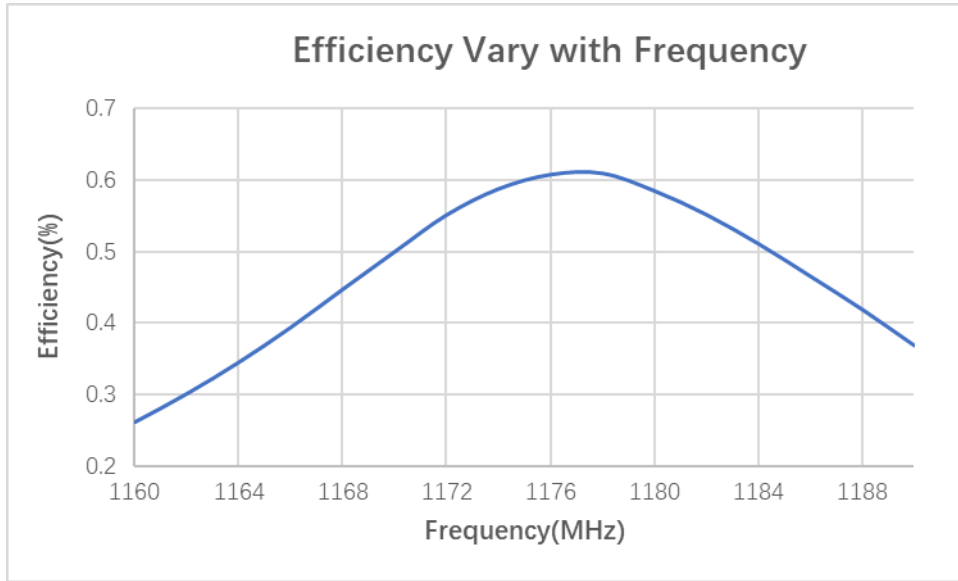


### 5.2. VSWR



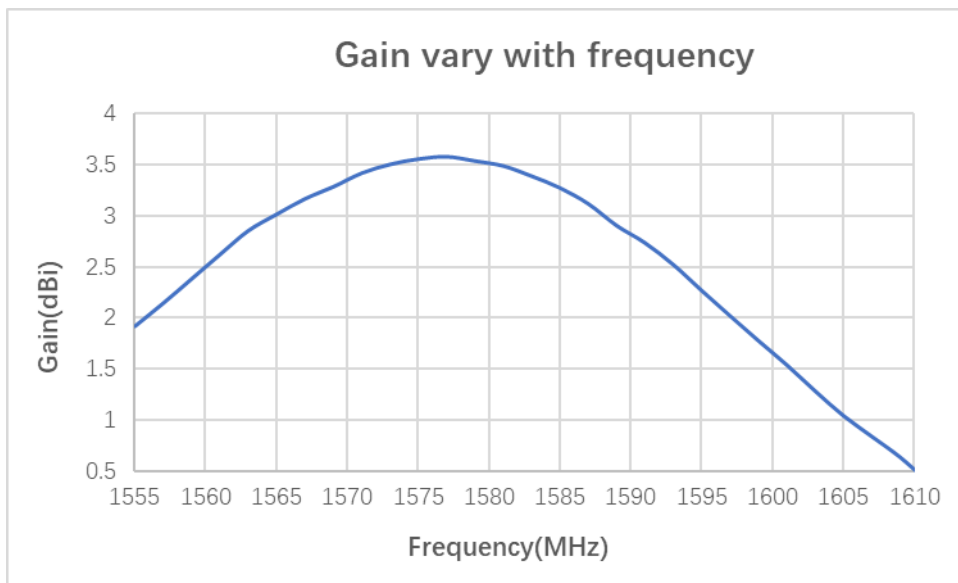
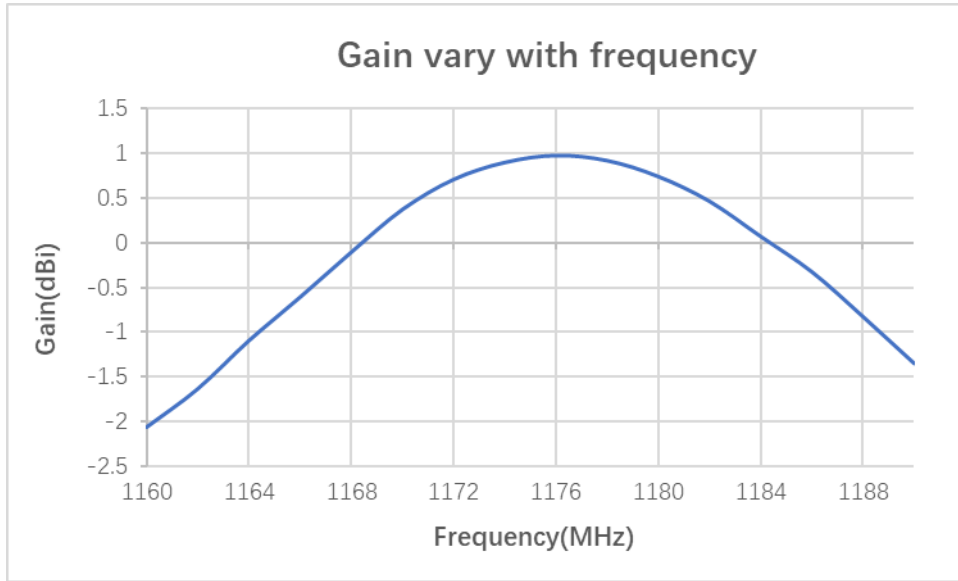
Frequency (MHz)	1176	1561	1575	1602
VSWR	1.14	1.36	1.36	1.31

### 5.3. Efficiency



Frequency (MHz)	1176	1561	1575	1602
Efficiency (%)	61	60	70	43

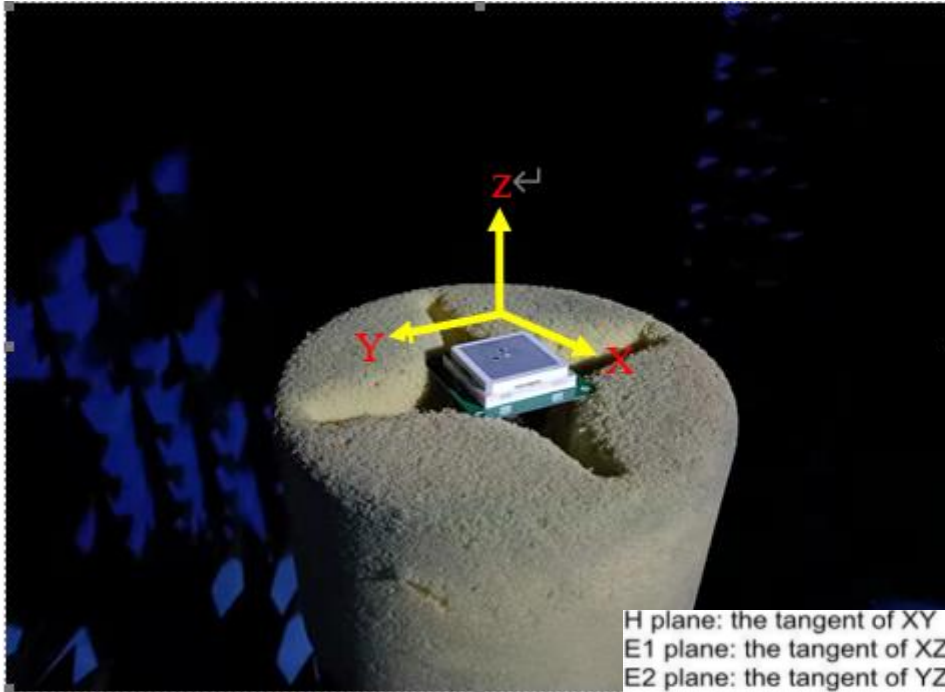
### 5.4. Gain



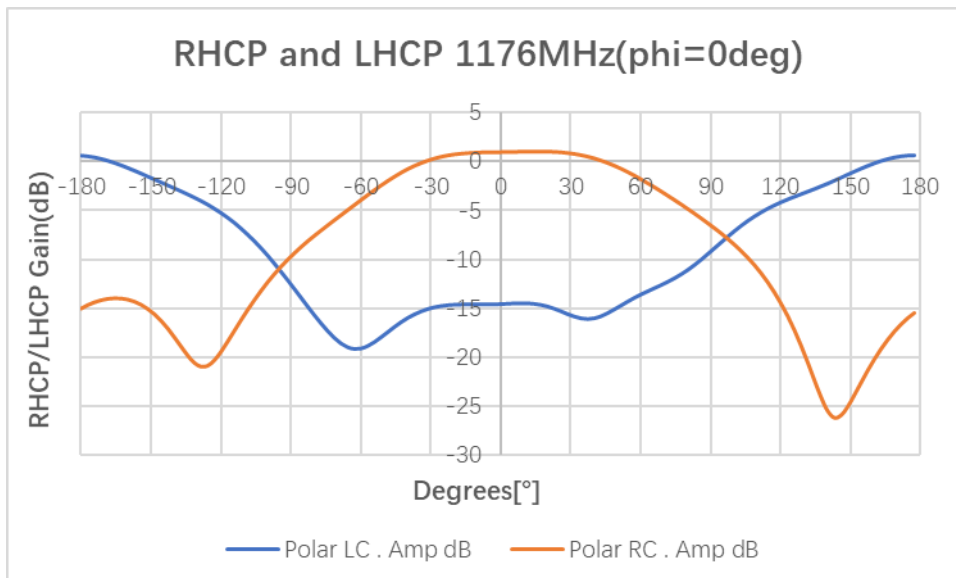
Frequency (MHz)	1176	1561	1575	1602
Gain (dBi)	0.97	2.62	3.56	1.54

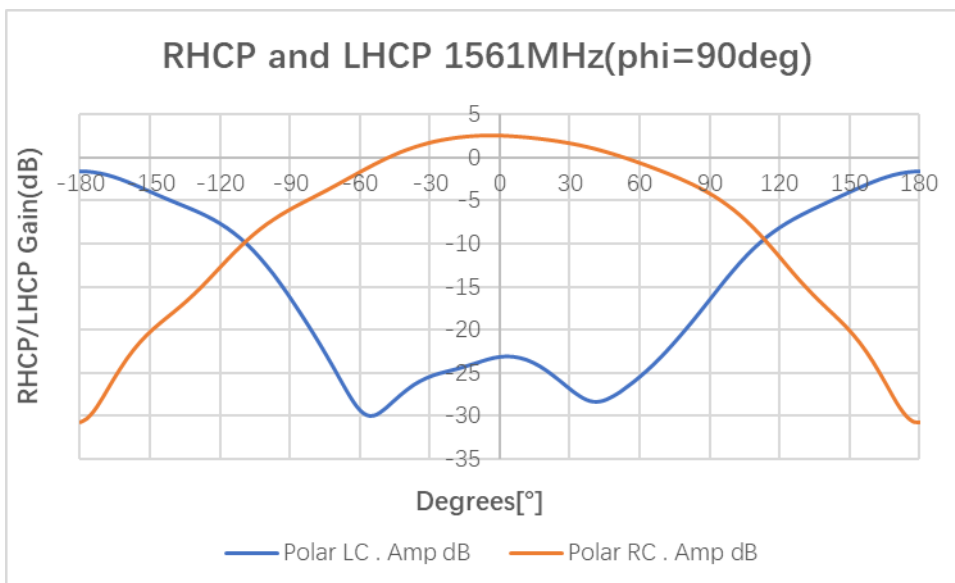
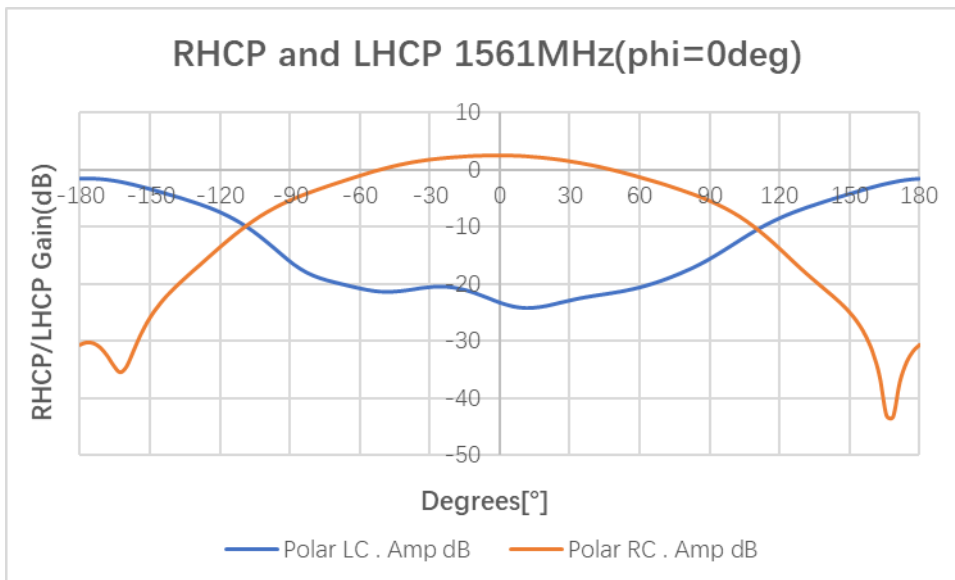
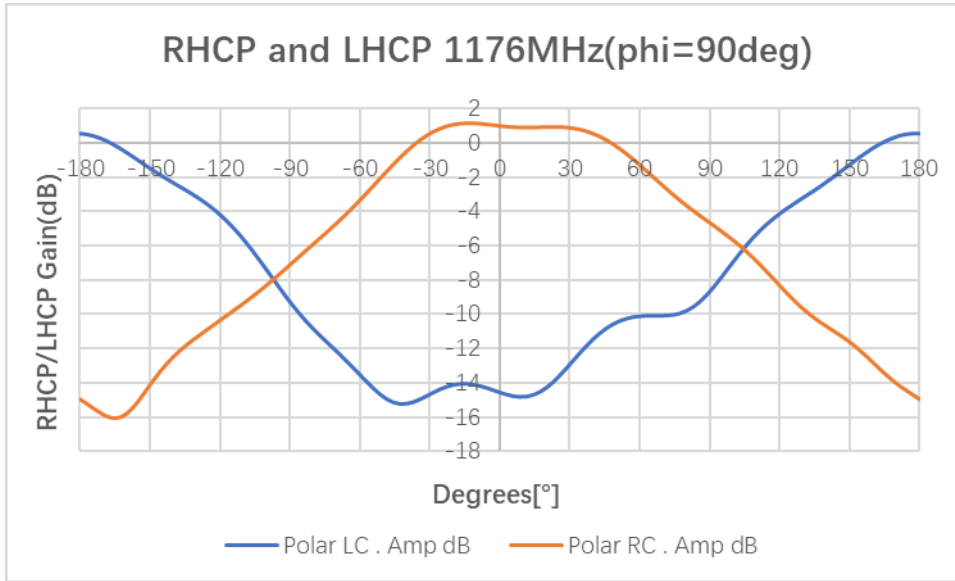
### 5.5. Radiation Pattern

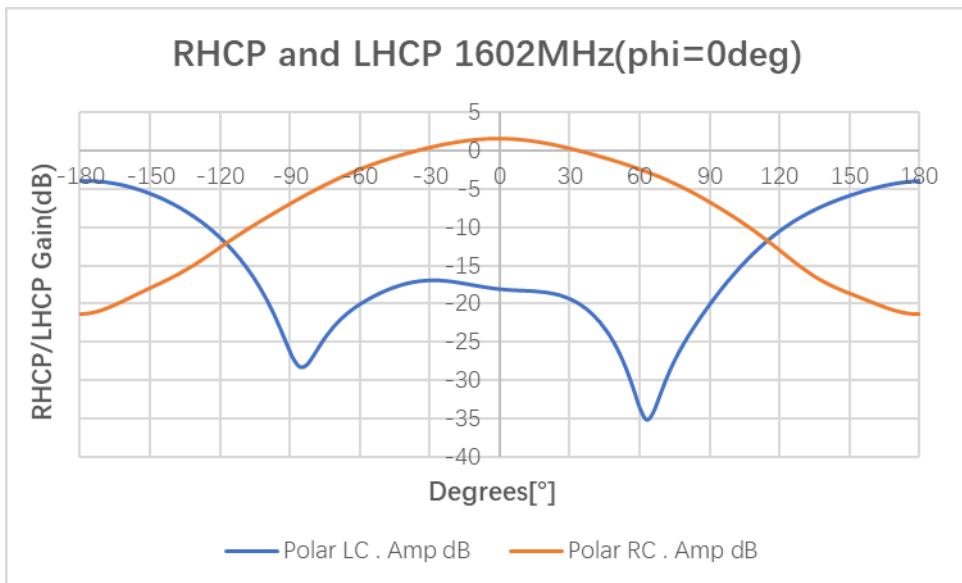
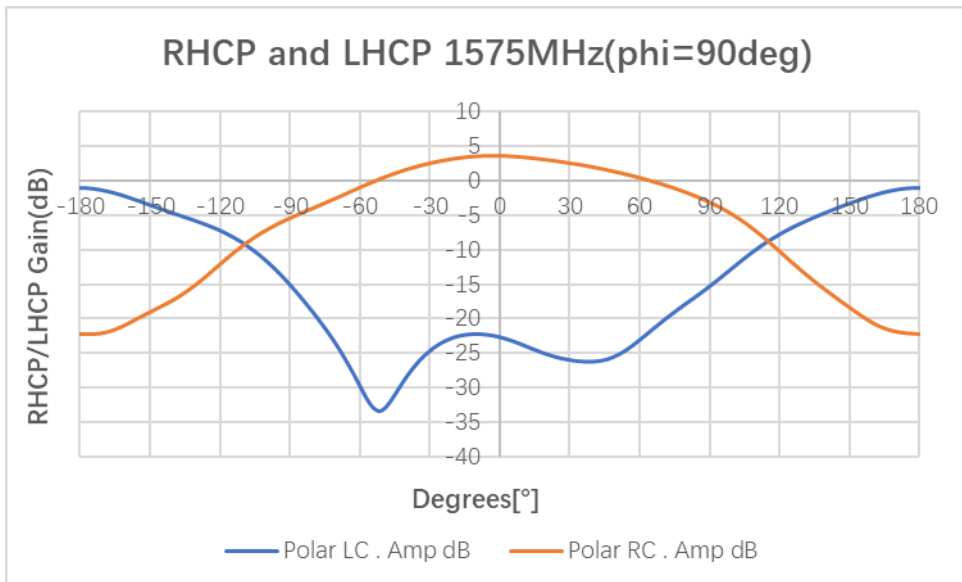
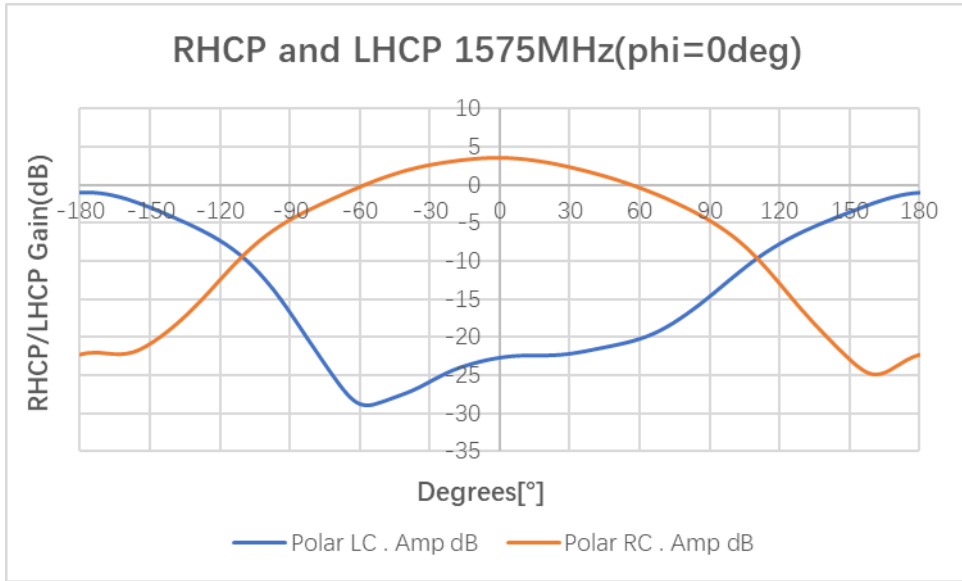
- Test condition: free space.



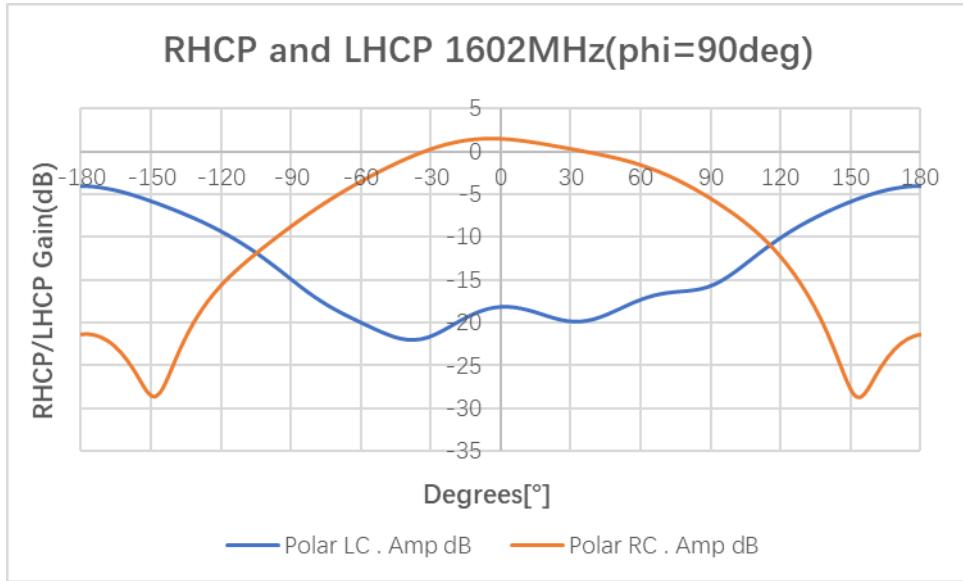
#### 5.5.1. 2D RHCP and LHCP Gain





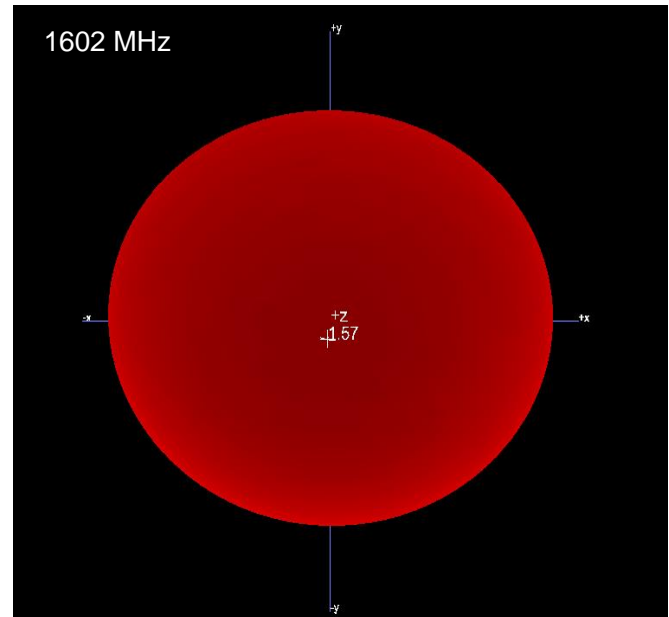
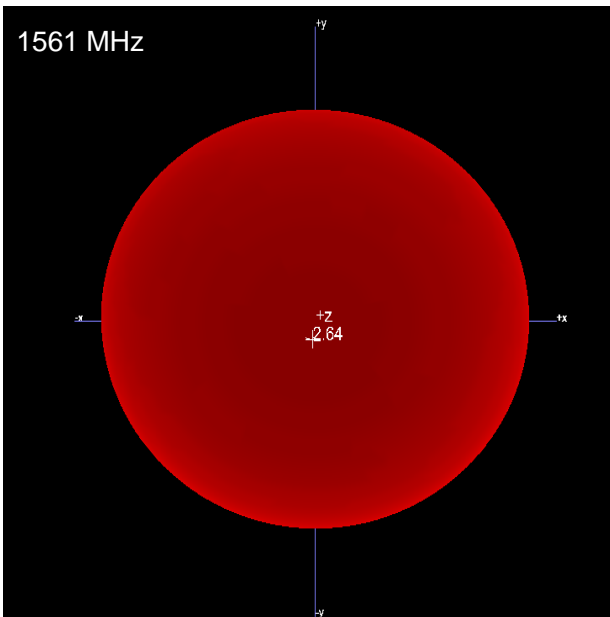
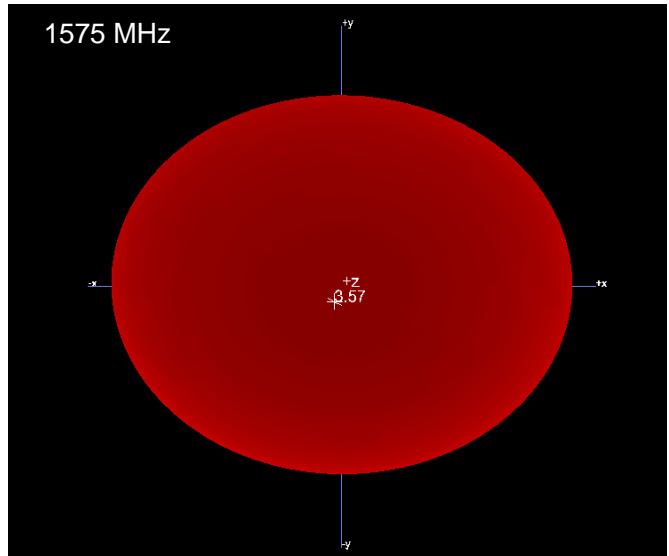
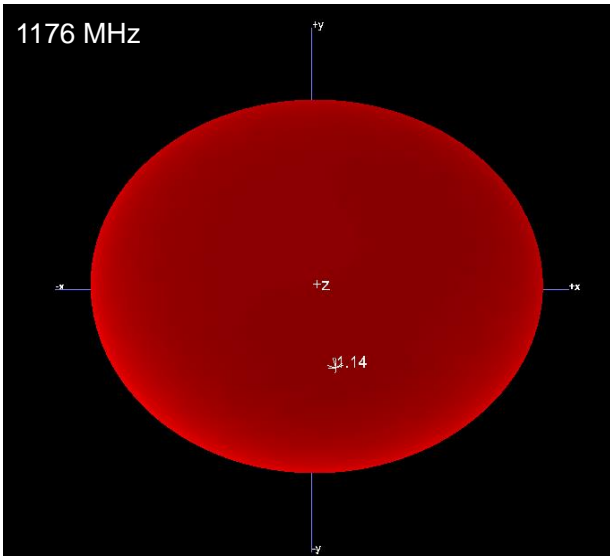




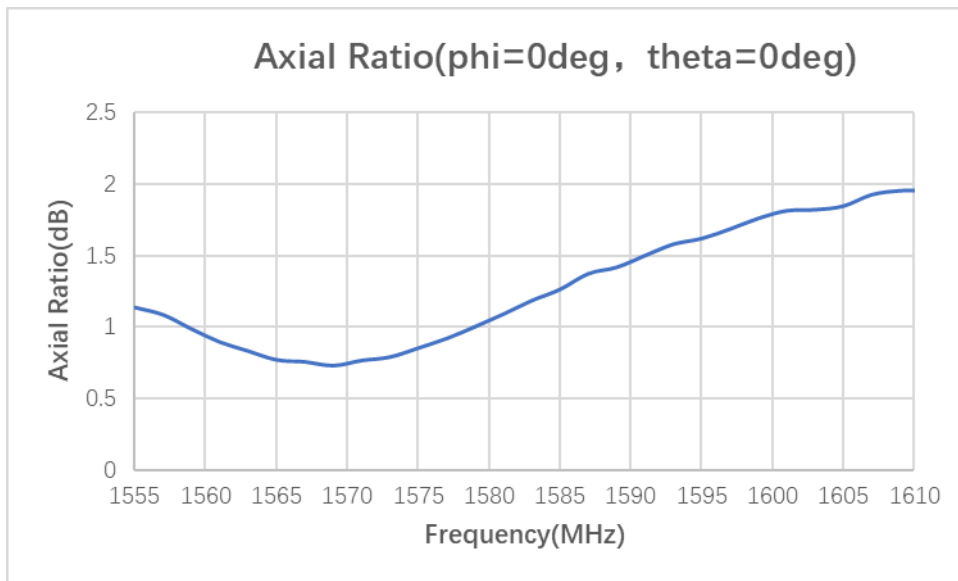
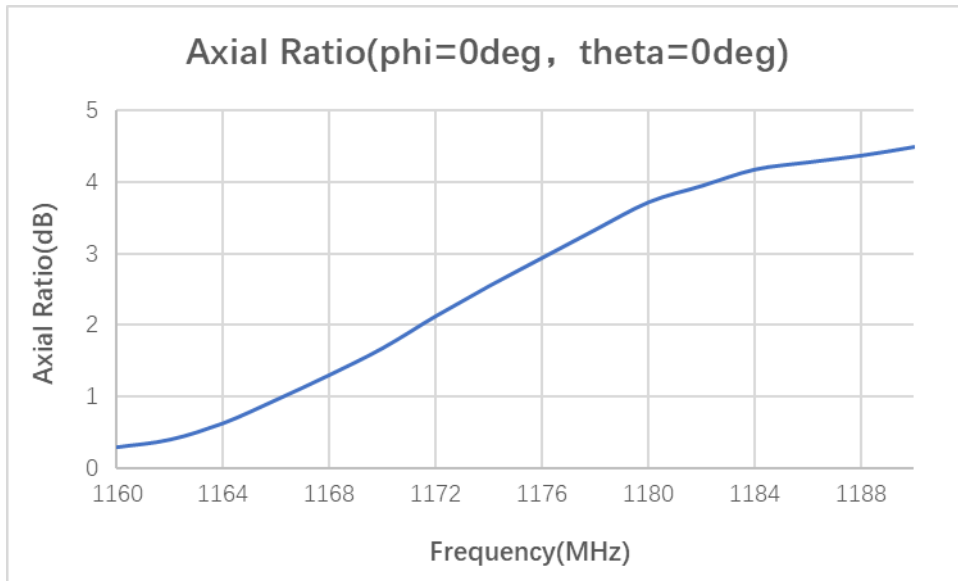


<b>Frequency (MHz)</b>	1176	1561	1575	1602
<b>RC Gain (dB)</b> <b>Phi = 0 (deg) Theta = 0 (deg)</b>	0.97	2.63	3.56	1.54
<b>RC Gain (dB)</b> <b>Phi = 90 (deg) Theta = 0 (deg)</b>	0.97	2.63	3.56	1.54
<b>LC Gain (dB)</b> <b>Phi = 0(deg) Theta = 0 (deg)</b>	-14.54	-23.17	-22.65	-18.1
<b>LC Gain (dB)</b> <b>Phi = 90 (deg) Theta = 0 (deg)</b>	-14.54	-23.17	22.65	-18.1

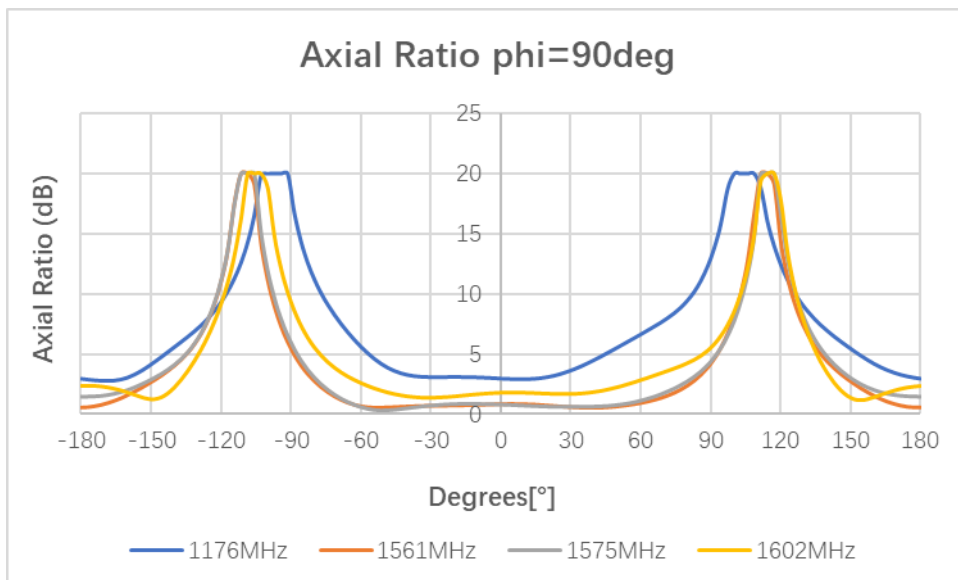
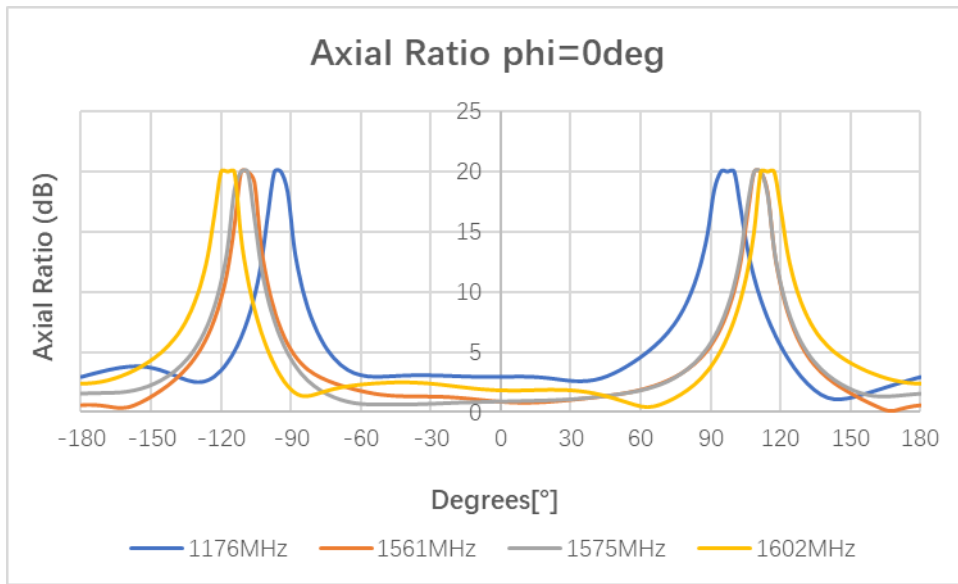
5.5.2. 3D Radiation



### 5.6. Axial Ratio

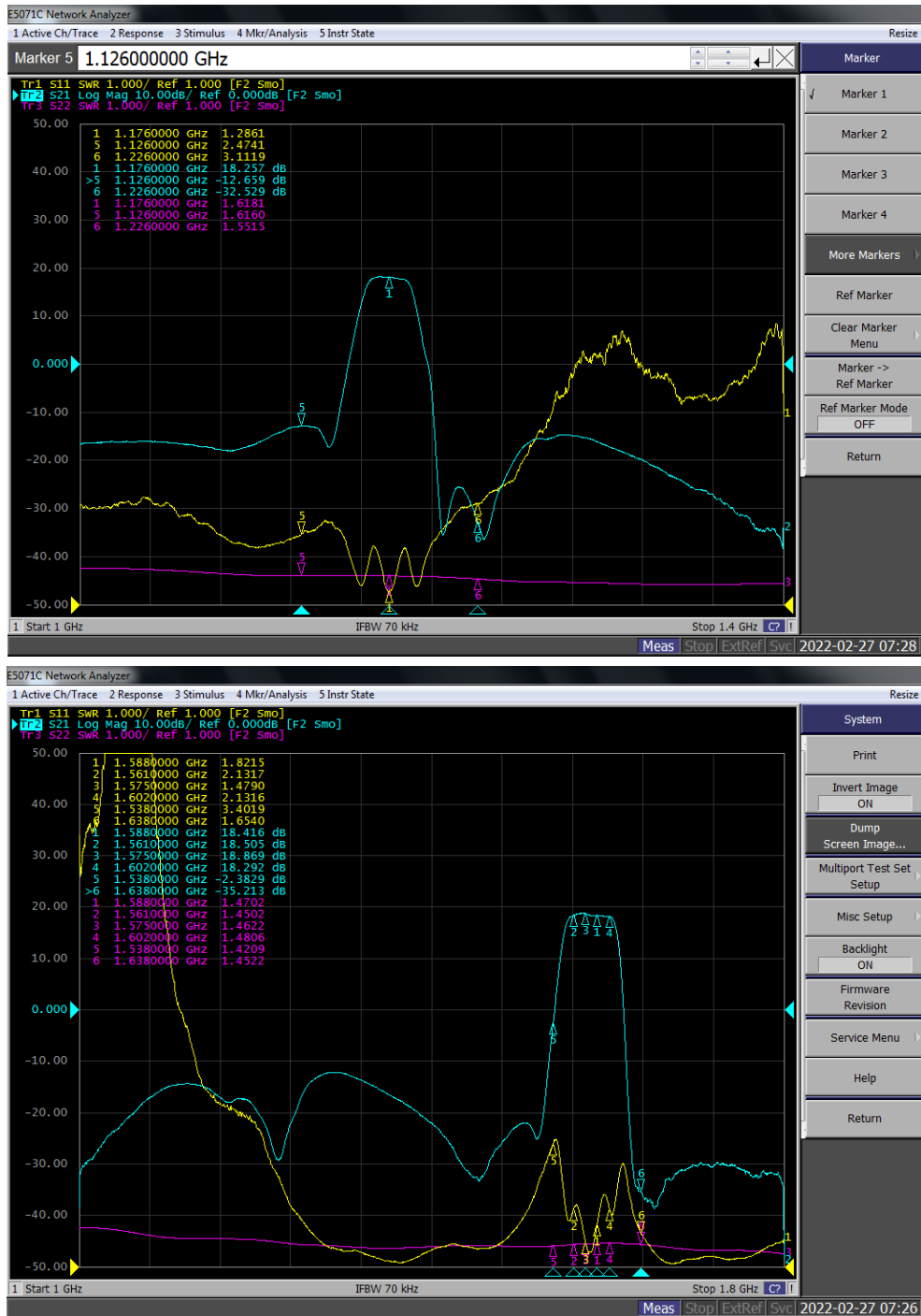


5.6.1. Axial Ratio in XOZ/YOZ



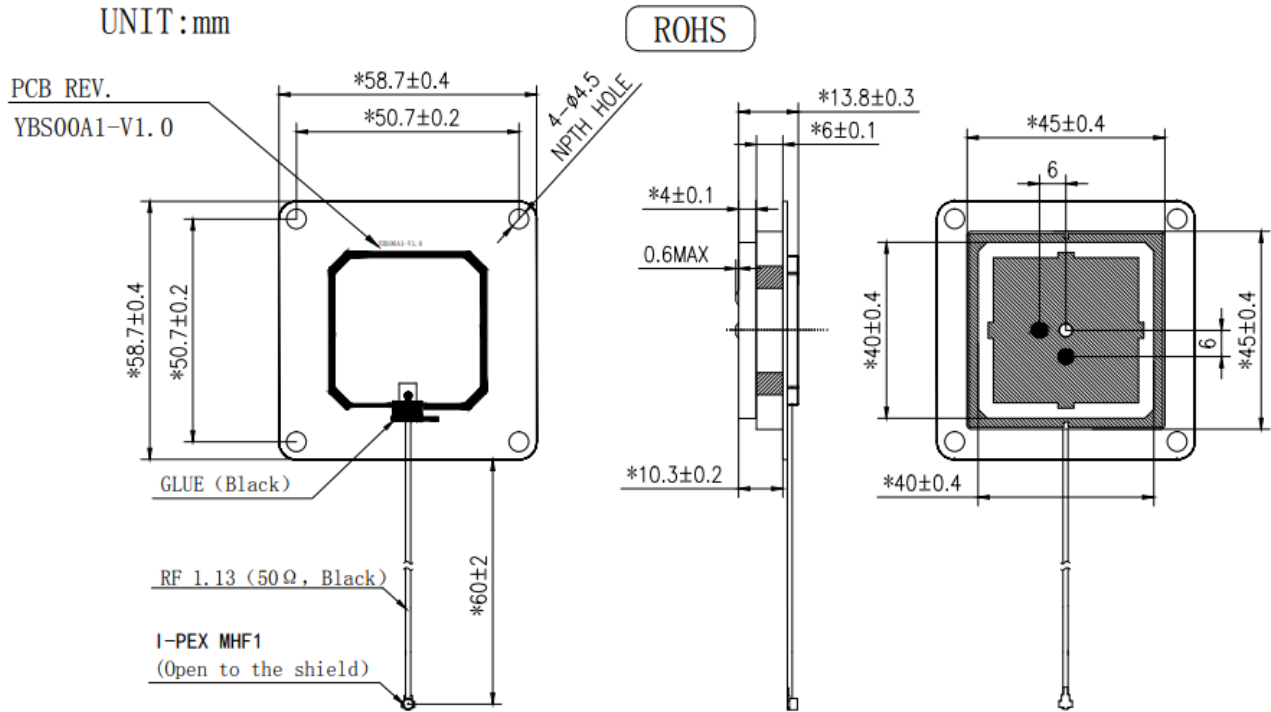
Frequency (MHz)	1176	1561	1575	1602
AR (dB) Phi = 0 (deg) Theta = 0 (deg)	2.94	0.89	0.85	1.82
AR (dB) Phi = 90 (deg) Theta = 0 (deg)	2.94	0.89	0.85	1.82

### 5.7. LNA Data



Frequency (MHz)	1176	1561	1575	1602
LNA Gain (dB)	18.2	18.5	18.8	18.2

## 6. Product Size



## 7. Packaging

S/N	Content	QTY	Remark
1		9	<ul style="list-style-type: none"> <li>● 9 PCS per EPE tray.</li> <li>● Size: 370 mm x 245 mm x 26 mm.</li> </ul>
2		9	<ul style="list-style-type: none"> <li>● One paper card on EPE.</li> <li>● Vacuum packing.</li> </ul>
3	<p>Vacuum packing Bag Size<sup>①</sup> 500*310*0.1mm</p> <p>5 Layer</p> <p>SIZE: L390*270W*H150mm</p>	45	<ul style="list-style-type: none"> <li>● Carton size: 390 mm (L) x 270 mm (W) x 150 mm (H).</li> <li>● 5 layers.</li> <li>● Antenna No.: 45 PCS.</li> </ul>