

Antenna

YB0017AA Datasheet

Antenna Services

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About the Document

Revision History

Version	Date	Author	Note
1.0	2020-09-25	Kenny YIN	Initial
1.1	2021-01-12	Kenny YIN	Updated the antenna image in Chapter 2.
1.2	2021-01-27	Kenny YIN	Added IP rating description.
1.3	2021-08-09	Aria CHU	Updated the data (Chapter 3).
1.4	2021-08-21	Aria CHU	Added the weight information (Chapter 3).
1.5	2021-12-06	Aria CHU	Updated the product description in Chapter 1.
2.0	2021-03-08	Xiaodong YANG	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

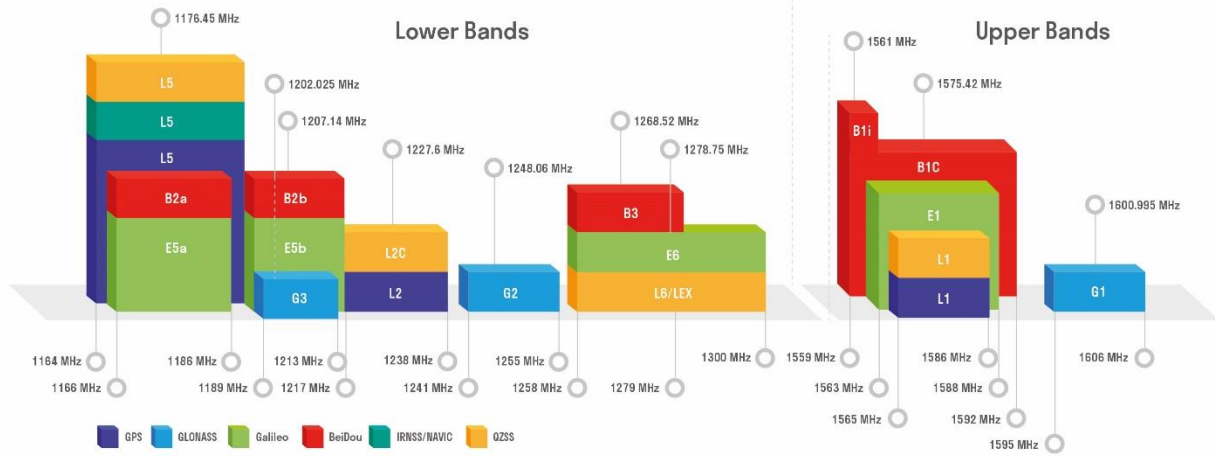
- GNSS L1/L5
- High efficiency
- Excellent performance



3 GNSS Frequency Band Checklist

GNSS Frequency Bands (MHz)					
GPS	L1 Centre 1575.42 (1565–1586)	L2 Centre 1227.6 (1217–1238)	L5 Centre 1176.45 (1164–1189)		
	●	-	●		
GLONASS	G1/L1OC/L1OF Centre 1601 (1595–1606)	G2/L2OC/L2OF Centre 1248.06 (1241–1255)	G3/L3OC Centre 1202.025 (1189–1213)		
	●	-	-		
GALILEO	E1 Centre 1575.42 (1563–1588)	E5a Centre 1176.45 (1166–1187)	E5b Centre 1207.14 (1197–1218)	E6 Centre 1278.75 (1258–1300)	
	●	●	-	-	
BEIDOU	B1I Centre 1561.098 (1559–1564)	B1C (BeiDou-3) Centre 1575.42 (1559–1592)	B2a/B2I Centre 1176.45 (1166–1187)	B2b Centre 1207.14 (1197–1217)	B3 Centre 1268.52 (1258–1279)
	●	●	●	-	-
QZSS	L1 Centre 1575.42 (1573–1578)	L2C Centre 1227.6 (1226–1229)	L5 Centre 1176.45 (1166–1187)	L6 Centre 1278.75 (1257–1300)	
	●	-	●	-	
IRNSS	L5 Centre 1176.45 (1164–1189)				
	●				

GNSS Bands and Constellations



4 Product Specifications

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

Electrical Specifications

Nominal Frequency	L5: 1166–1186 MHz, L1: 1559–1606 MHz
VSWR	≤ 2.0
Gain	≤ 3.5 dBi
Polarization Type	RHCP
Axial Ratio	≤ 3 dB
Impedance	50 Ω

LNA Electrical Properties

Gain	25 ±2 dB
Noise Figure	≤ 3 dB
Filter Out-of-Band Attenuation	30 dB f0 ±50 MHz f0 (1176 MHz, 1580 MHz)
Voltage	2.7–3.3 V
Current	< 40 mA

Mechanical Specifications

Antenna Size	61.5 mm × 56.5 mm × 23 mm RG174 Cable Length = 3000 mm
Casing	ABS
Connector Type	SMA Male (Center Pin)
Working Temperature	-40 °C to +85 °C
Radome Color	Black
Mounting Type	Magnet
IP Rating	IP65
Weight	132 ±3 g

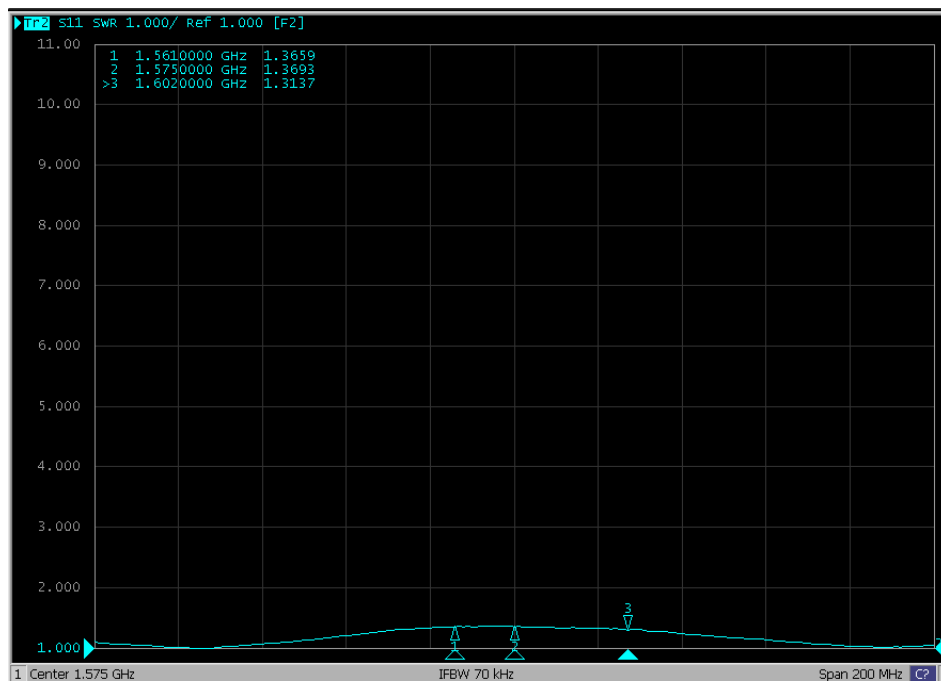
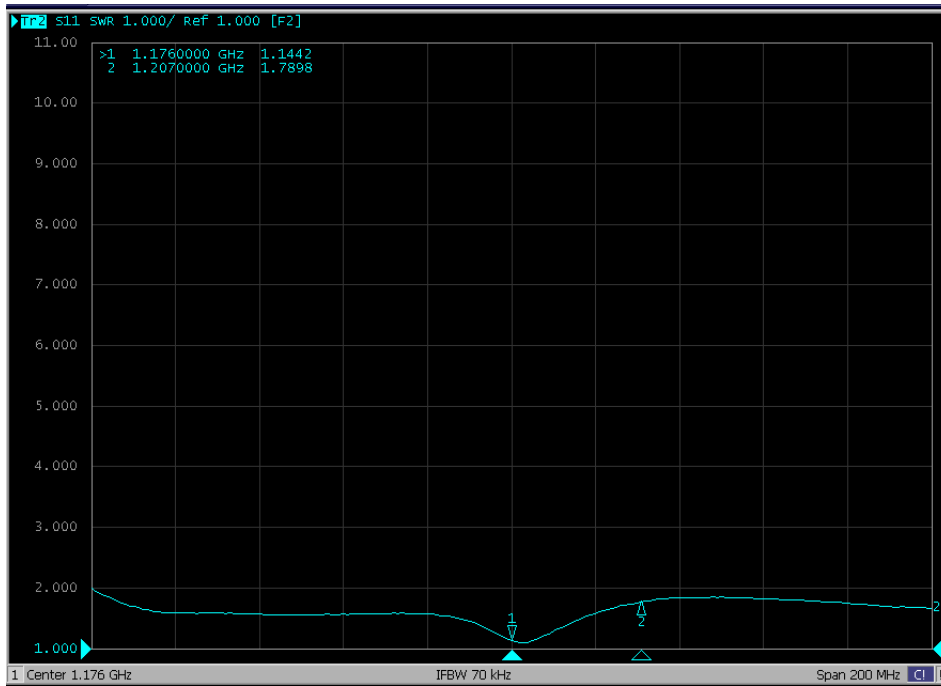
5 Overall Performance

5.1. Test Environment

- KEYSIGHT ENA Network Analyzer E5063A 100 kHz – 8.5 GHz.
- RayZone®2800 Chamber 5G (FR1) SISO/MIMO, 600 MHz – 8.5 GHz.

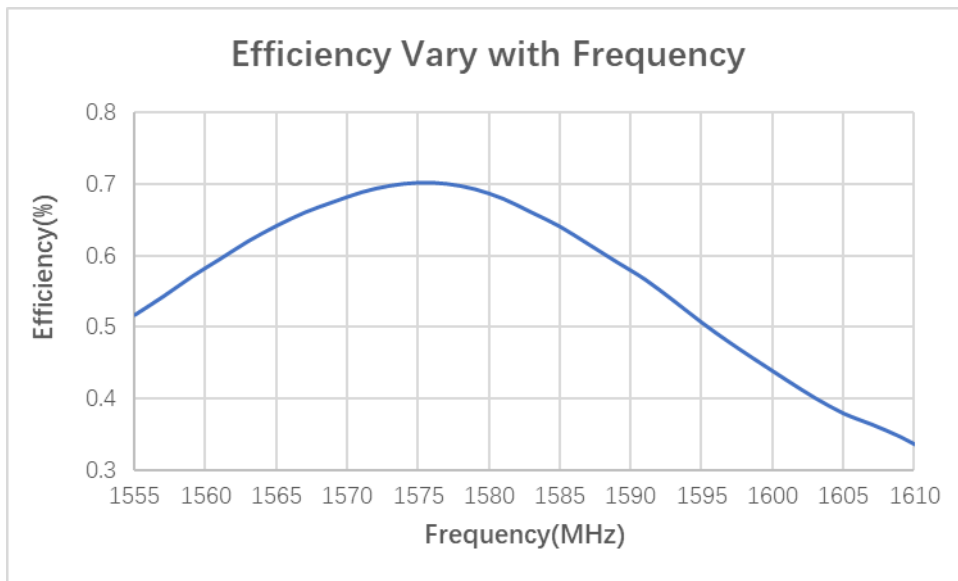
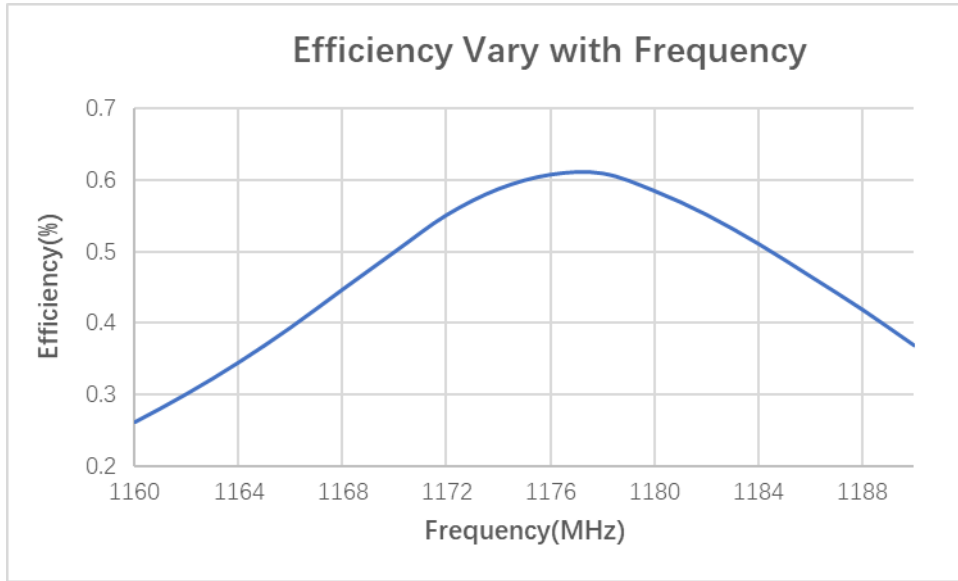


5.2. VSWR



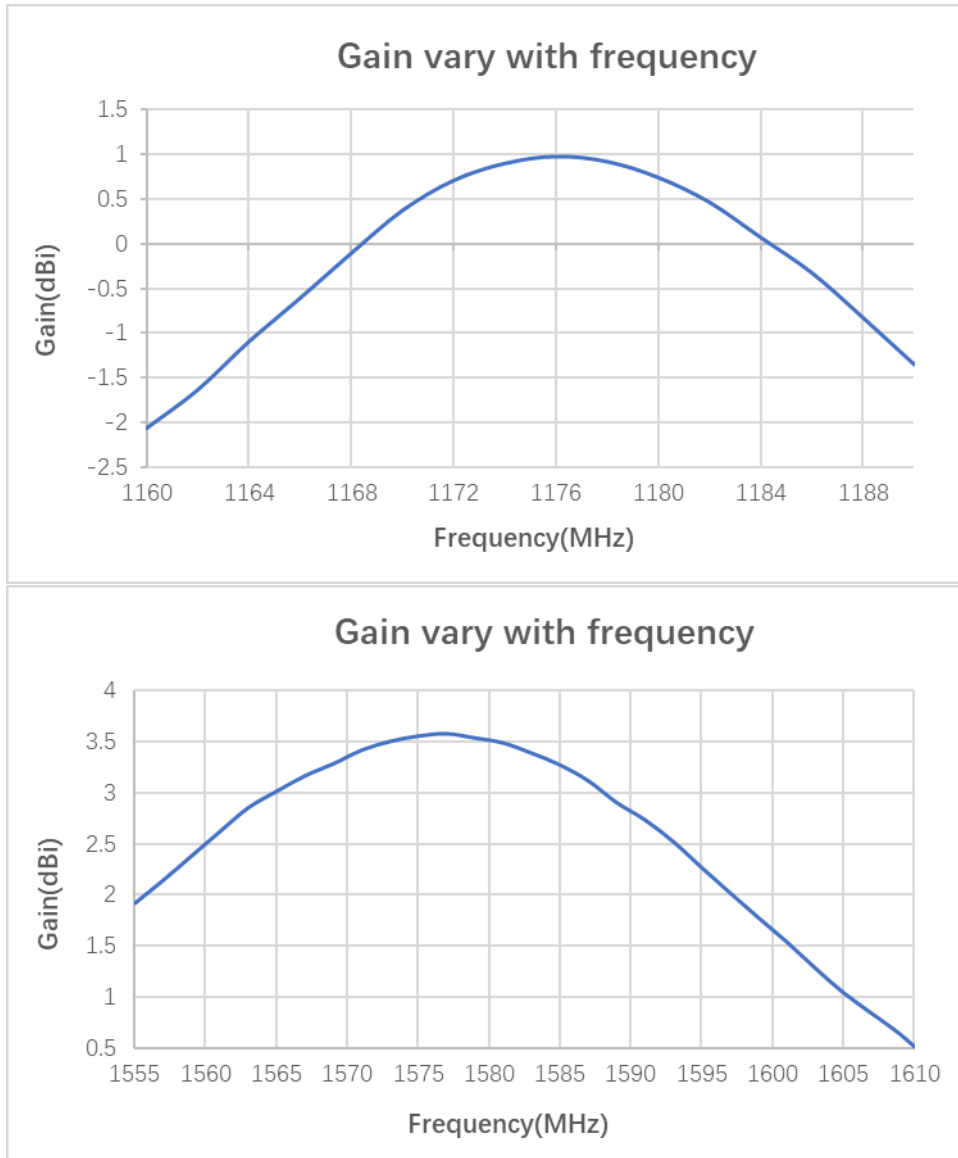
Frequency (MHz)	1176	1561	1575	1602
VSWR	1.14	1.36	1.36	1.31

5.3. Efficiency



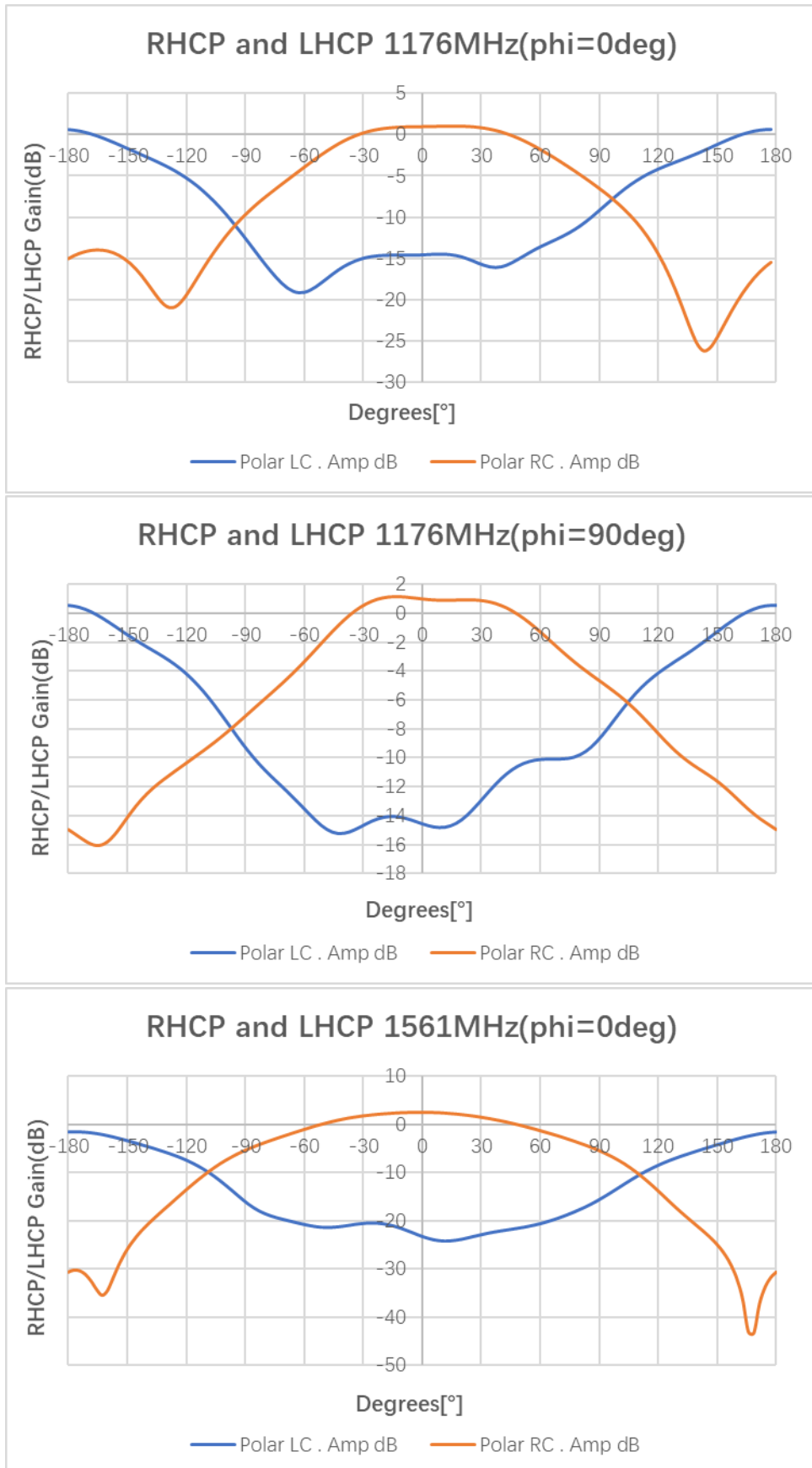
Frequency (MHz)	1176	1561	1575	1602
Efficiency (%)	61	60	70	43

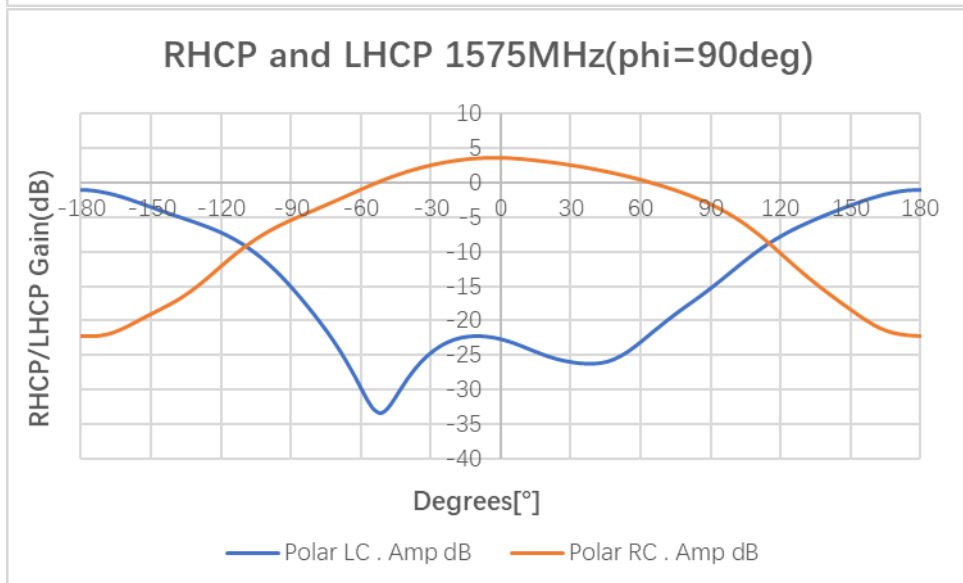
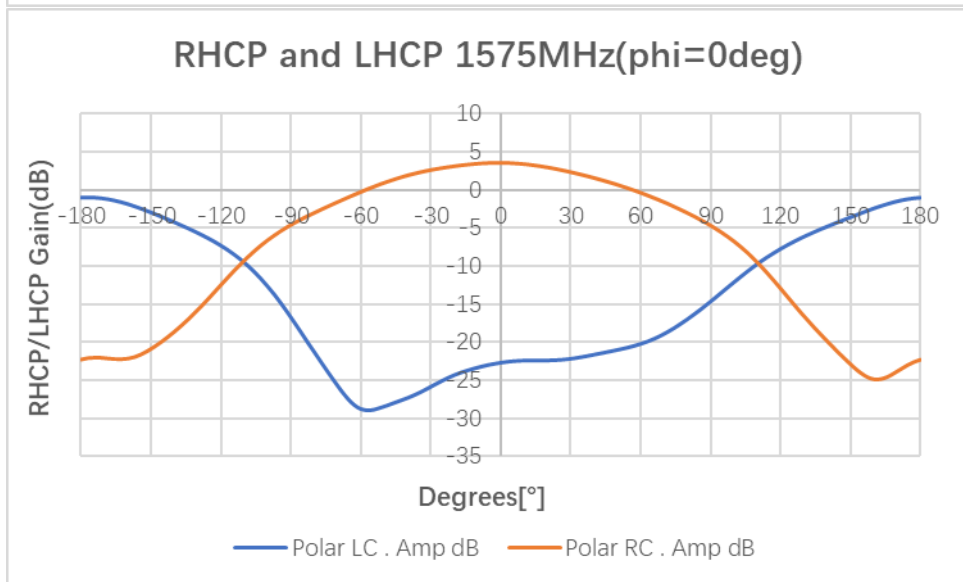
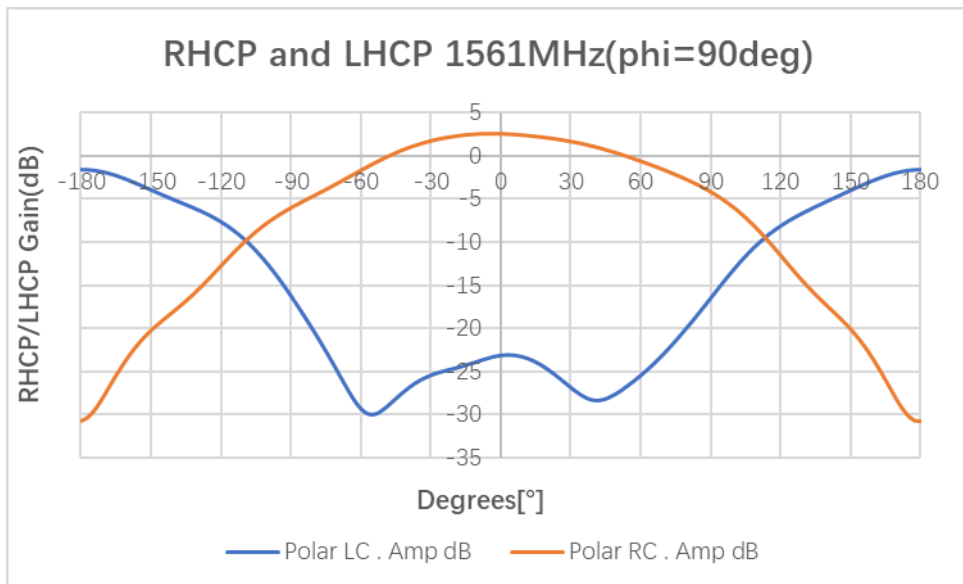
5.4. Gain

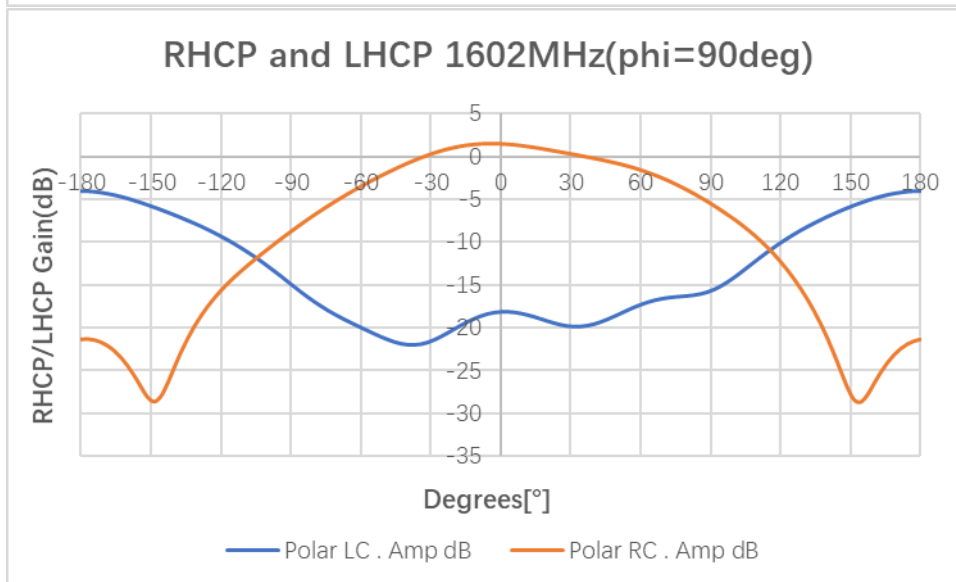
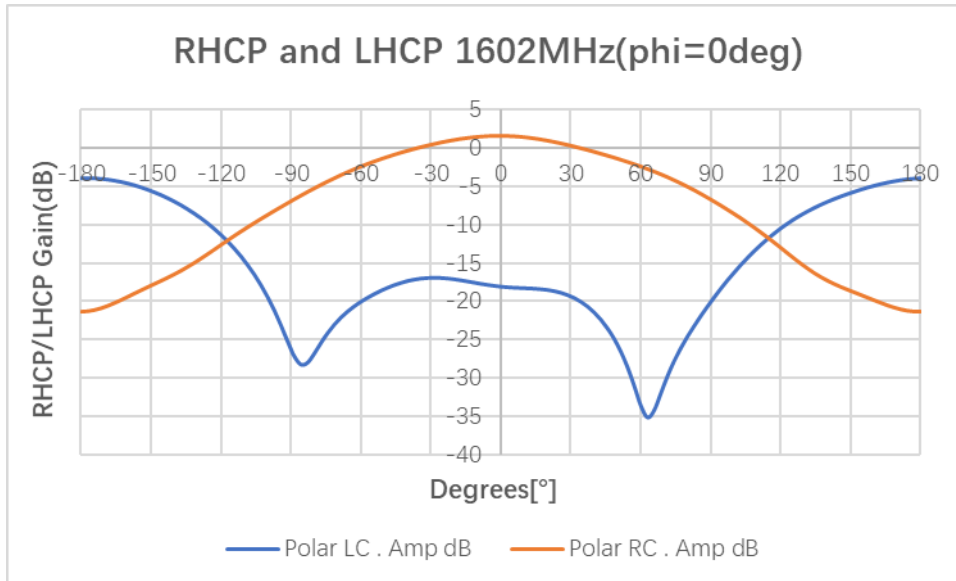


Frequency (MHz)	1176	1561	1575	1602
Gain (dBi)	0.97	2.62	3.56	1.54

5.5. 2D RHCP and LHCP Gain

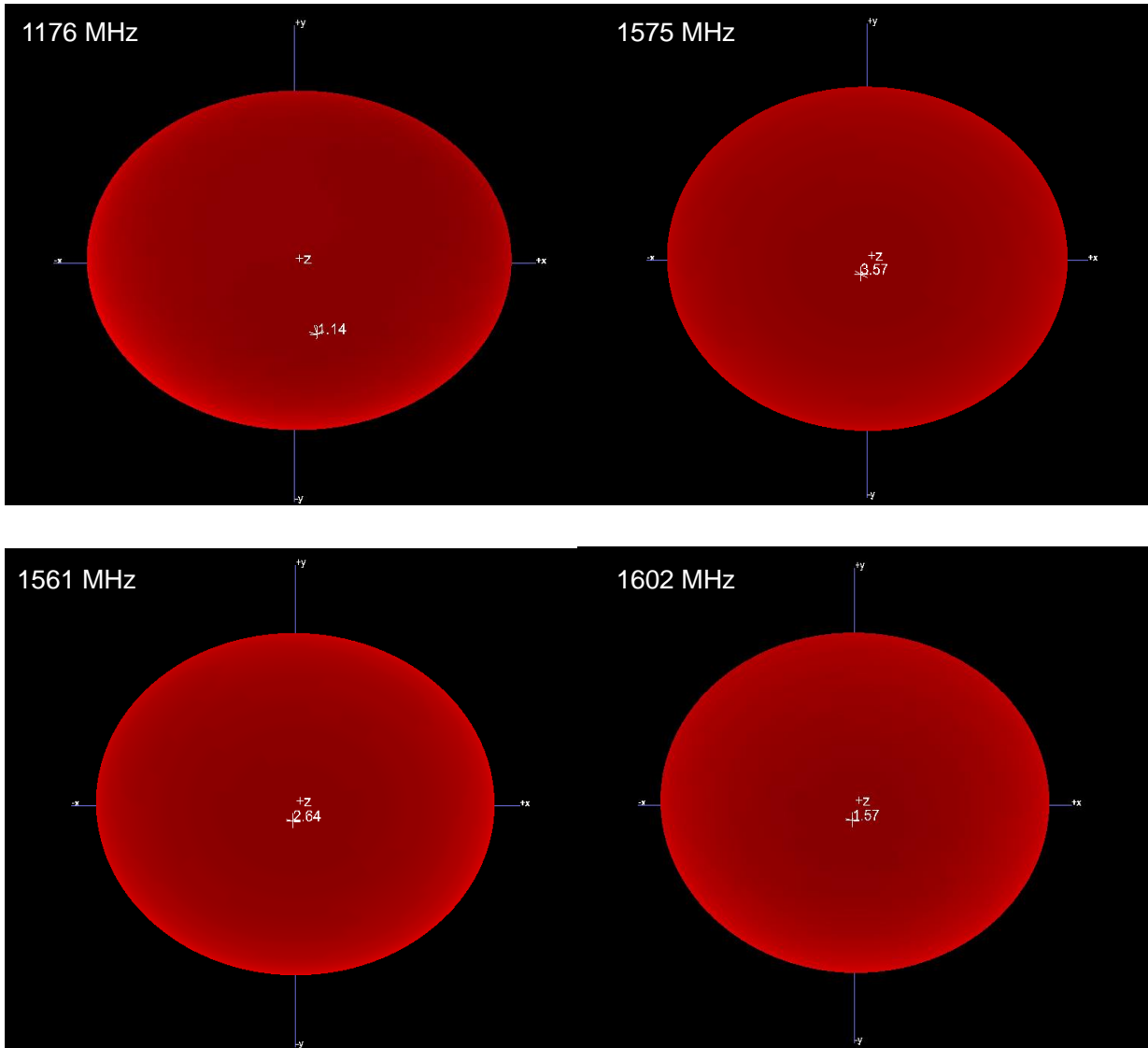




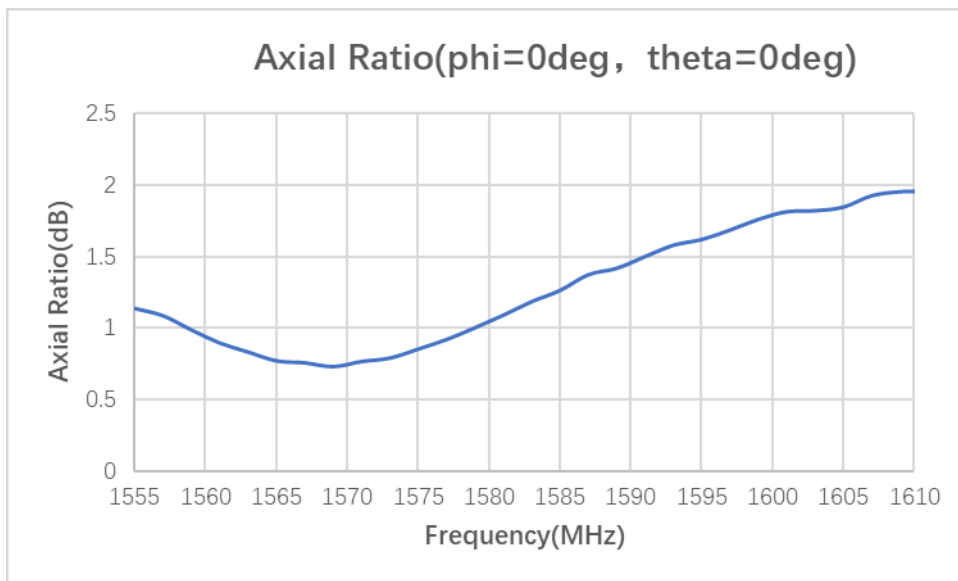
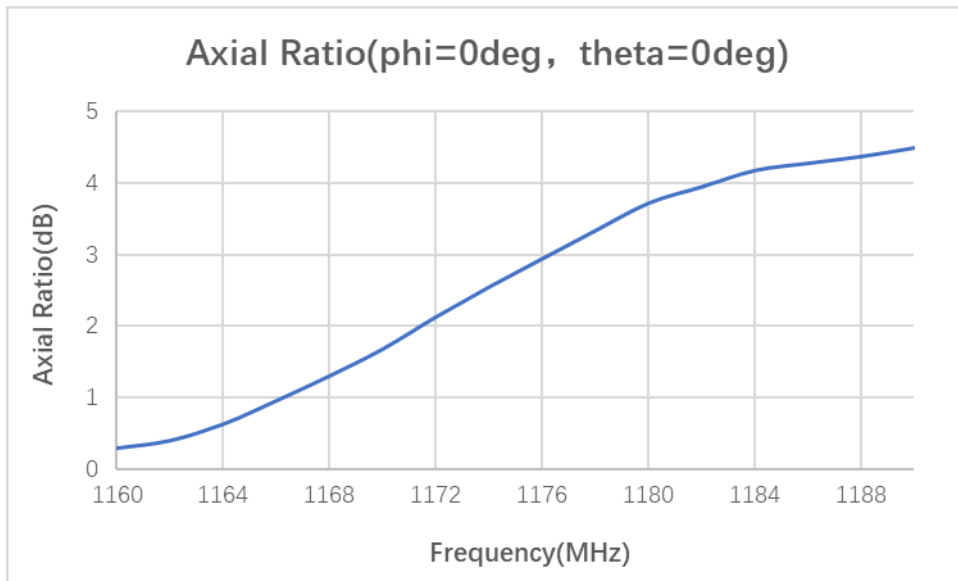


Frequency (MHz)	1176	1561	1575	1602
RC Gain (dB) Phi = 0 (deg) Theta = 0 (deg)	0.97	2.63	3.56	1.54
RC Gain (dB) Phi = 90 (deg) Theta = 0 (deg)	0.97	2.63	3.56	1.54
LC Gain (dB) Phi = 0 (deg) Theta = 0 (deg)	-14.54	-23.17	-22.65	-18.1
LC Gain (dB) Phi = 90 (deg) Theta = 0 (deg)	-14.54	-23.17	22.65	-18.1

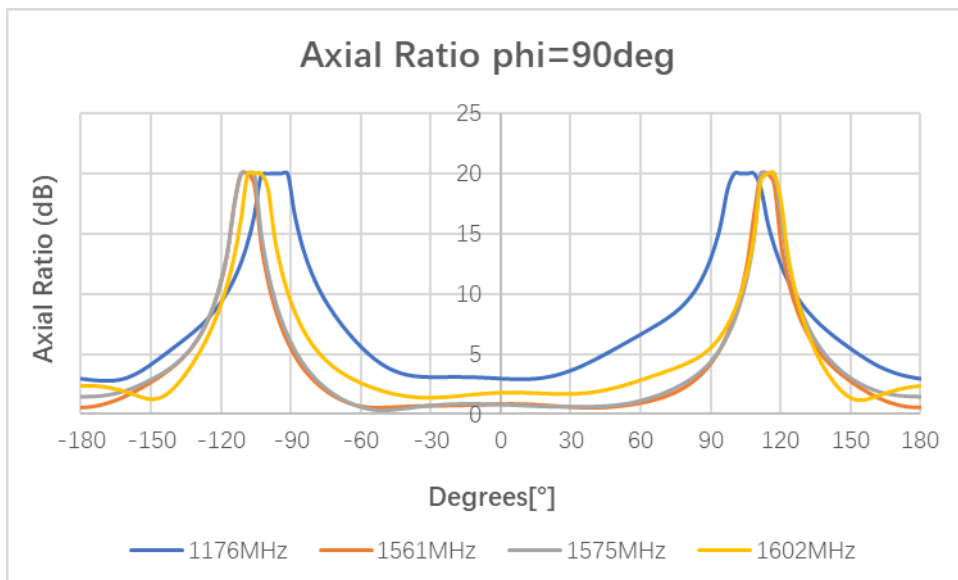
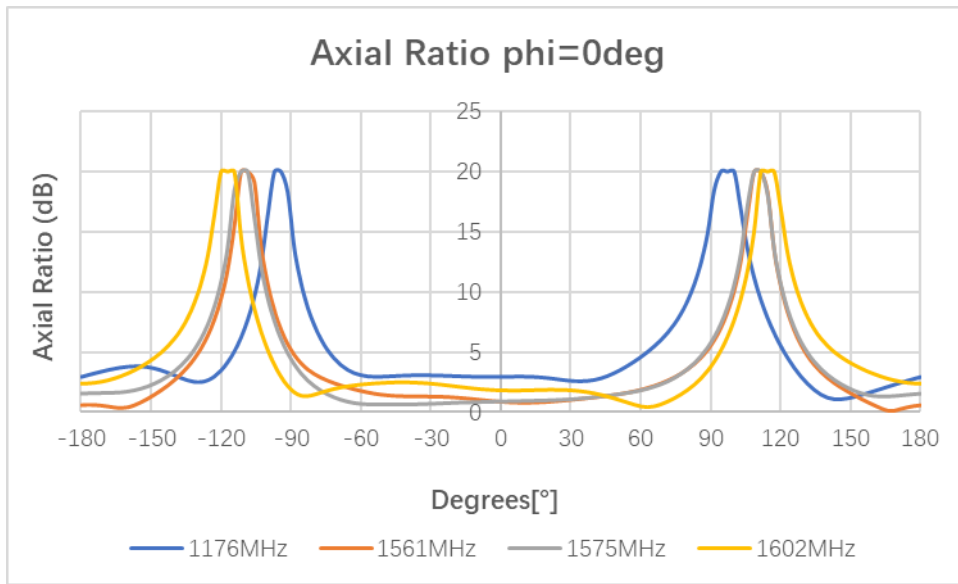
5.6. 3D Radiation Pattern



5.7. Axial Ratio

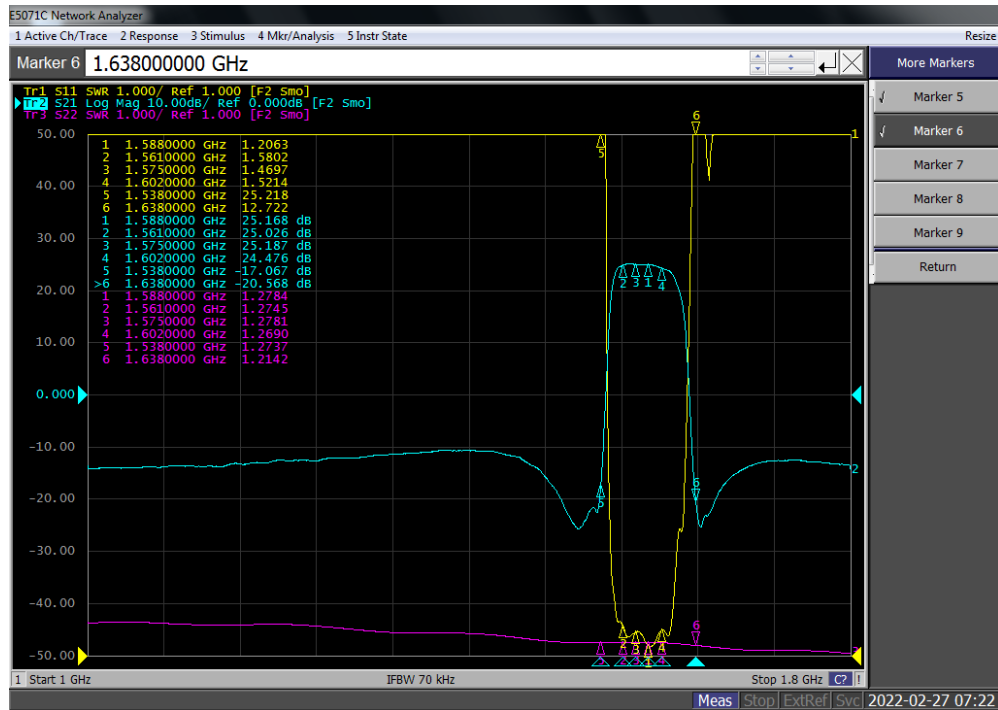
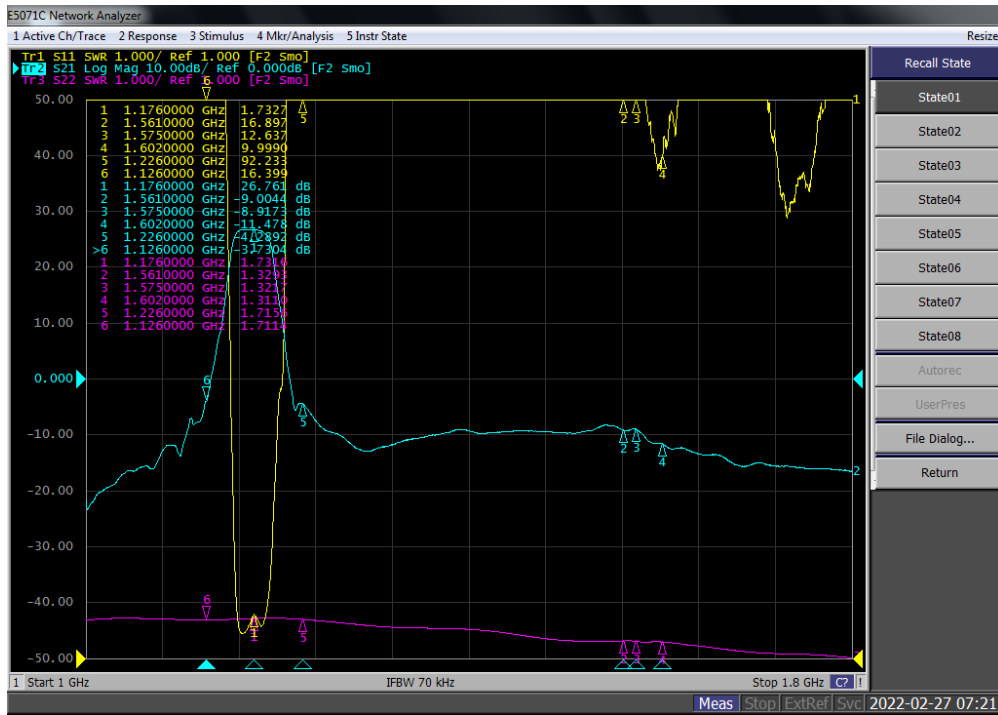


5.7.1. Axial Ratio in XOZ/YOZ



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

5.8. LNA Data



Frequency (MHz)	1176	1561	1575	1602
LNA Gain (dB)	26.7	25	25.1	24.4

6 Product Size

