



Antenna Datasheet

Product OC: YEGM011AA

Version: 2.1

Date: 2023-12-05

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 $\pm$ 50 mm

Magnetic and suction cup support (bracket length: 75 $\pm$ 1 mm)

Dimensions: Φ 146.41 mm $\times$ 65.03 mm

Efficiency: Up to 65 %

RoHS Compliant

LNA Gain: 19 $\pm$ 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

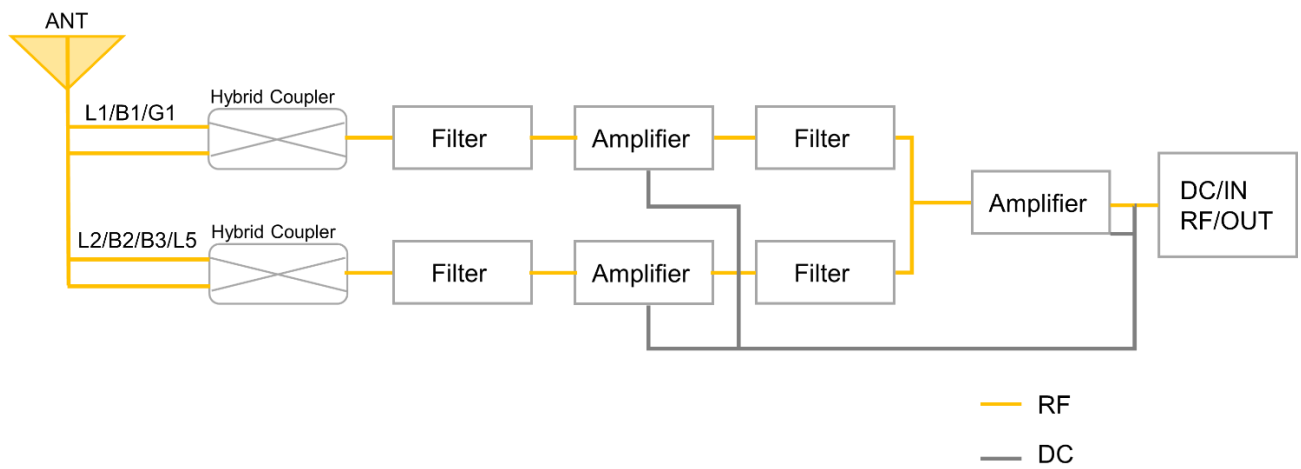
Band Frequency (MHz)	GPS L5 GALILEO E5a BEIDOU B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BEIDOU B2b	GPS L2 QZSS L2C	GLONASS G2	BEIDOU B3	BEIDOU B1I	GPS L1 GALILEO E1 BEIDOU B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.15	1.1	1.12	-	-	1.16	1.17	1.18
Return Loss (dB)	-23	-26.1	-25.0	-	-	-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	19 ±3 dB
Noise Figure	≤ 1.5 dB
Output VSWR	< 2.0
Filter Out-of-band Attenuation	≥ 30 dB f0 ± 100 MHz f0 (1164MHz, 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

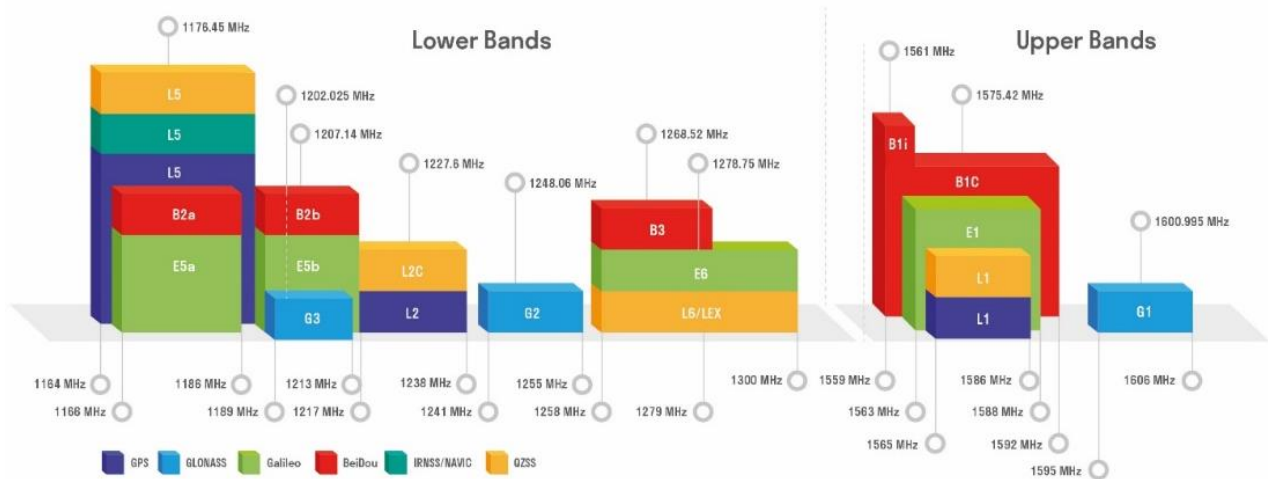
1.3. Block Diagram (Active Antenna)



1.4. Supported GNSS Frequency Bands

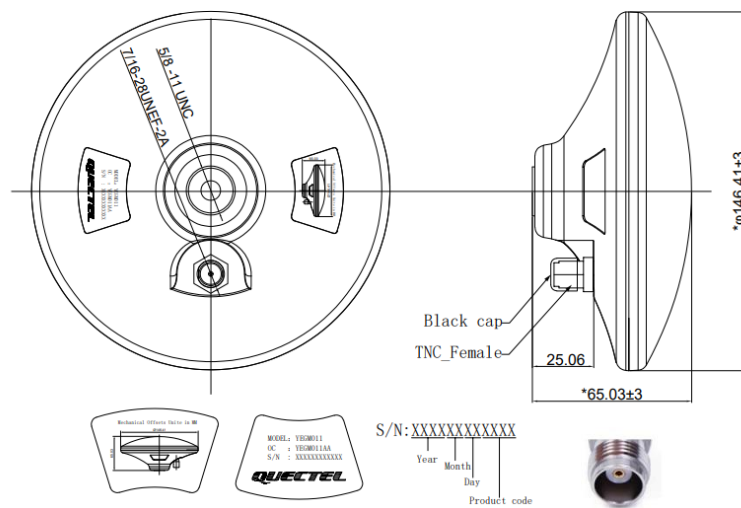
GNSS Frequency Bands (MHz)					
GPS	L1 Centre 1575.42 (1565–1586)	L2 Centre 1227.6 (1217–1238)	L5 Centre 1176.45 (1164–1189)		
	√	√	√		
GLONASS	G1-L10C-L10F Centre 1601 (1595–1606)	G2-L20C-L20F Centre 1248.06 (1241–1255)	G3-L30C Centre 1202.025 (1189–1213)		
	√	-	√		
GALILEO	E1 Centre 1575.42 (1563–1588)	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 Centre 1176.45 (1166–1187)	B2b-B2I 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

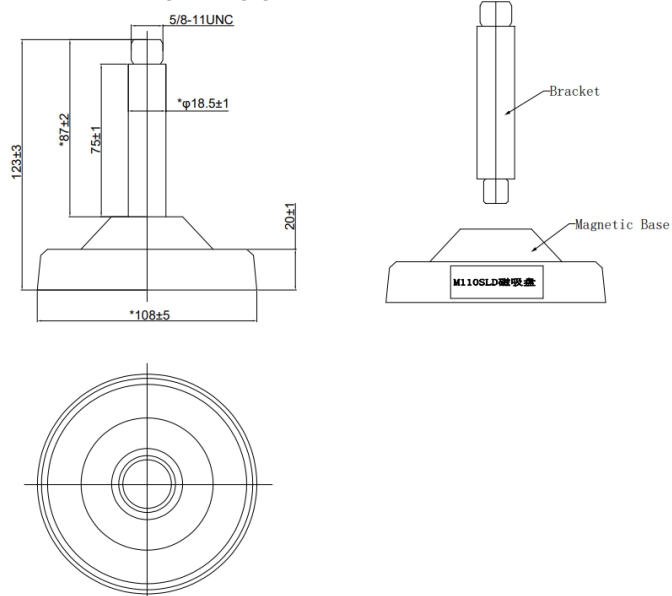


2 Drawing

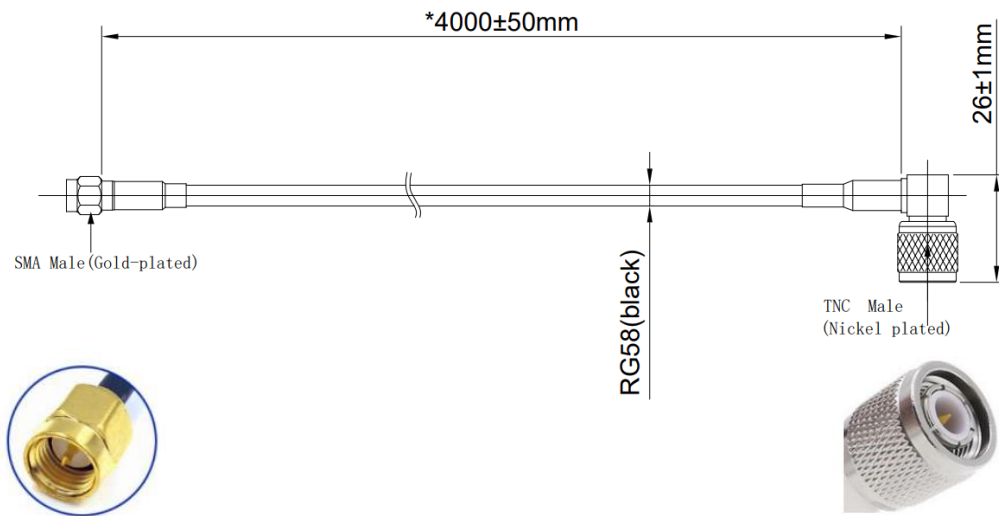
Antenna



Magnetic and suction cup support



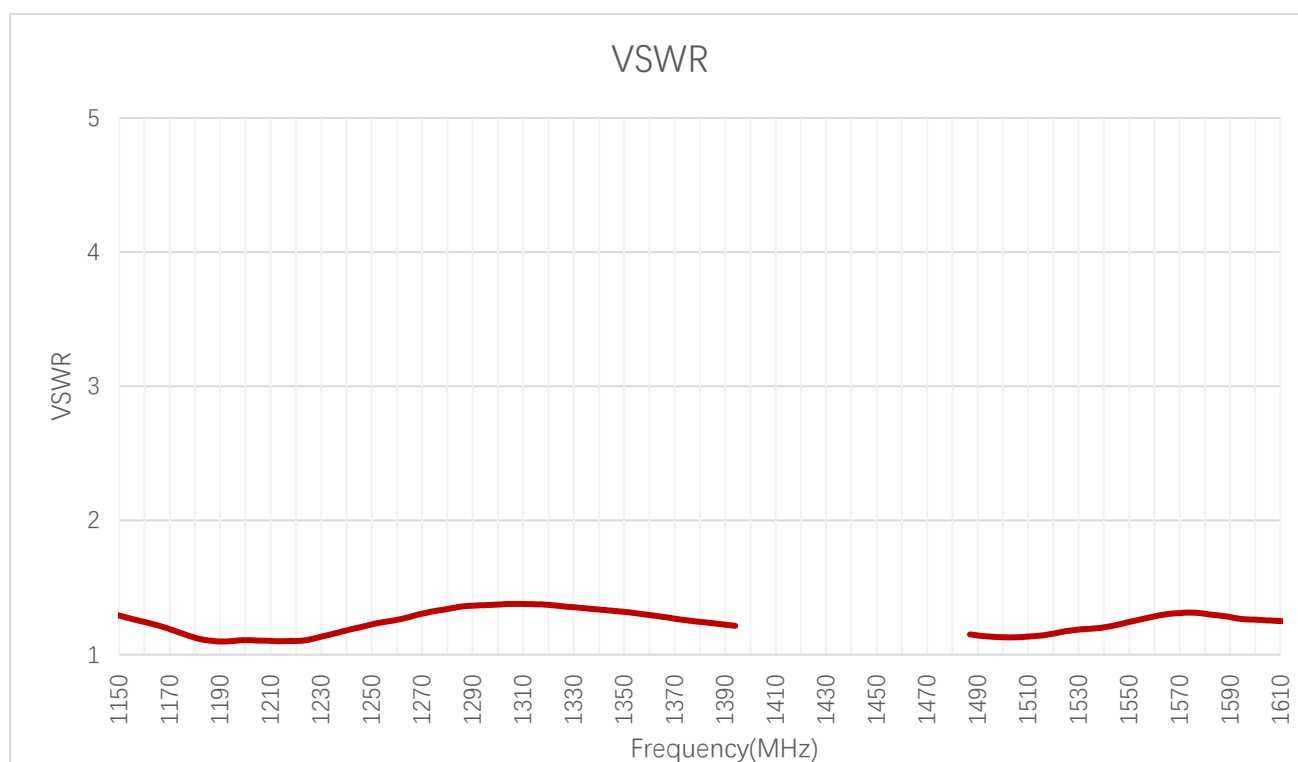
Cable



3 Detailed Performance

3.1. S-Parameter Test

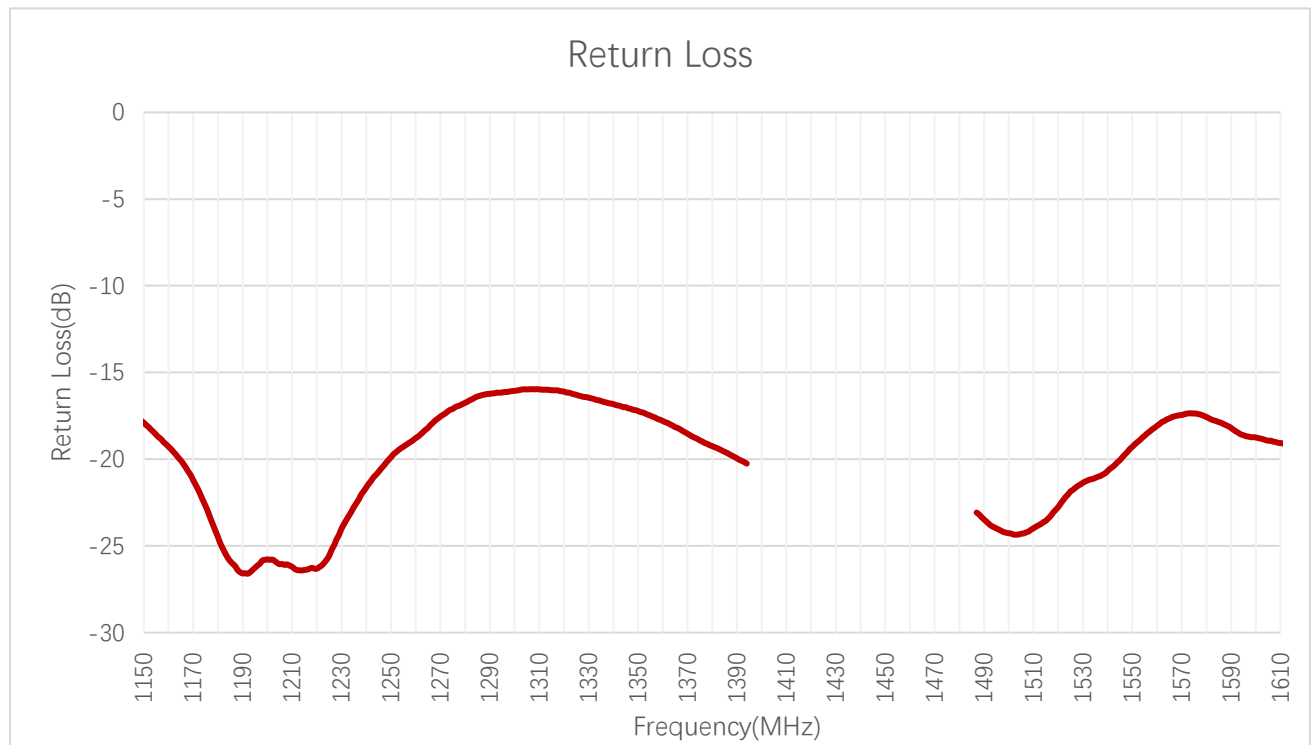
3.1.1. VSWR



VSWR

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.1	1.1	1.1	-	-	1.1	1.1	1.1

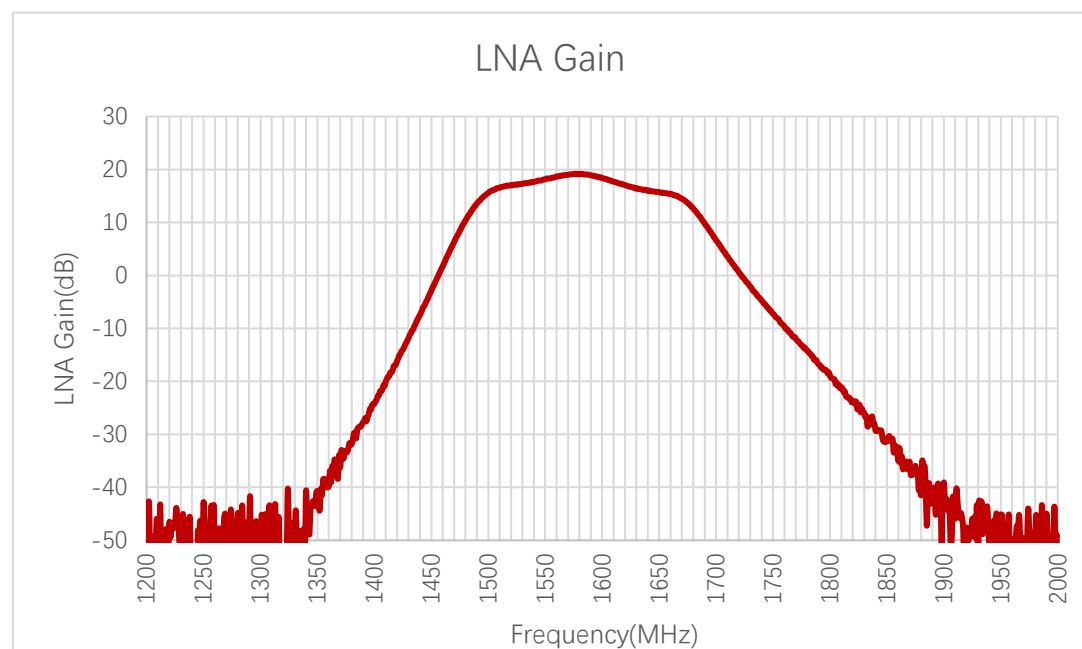
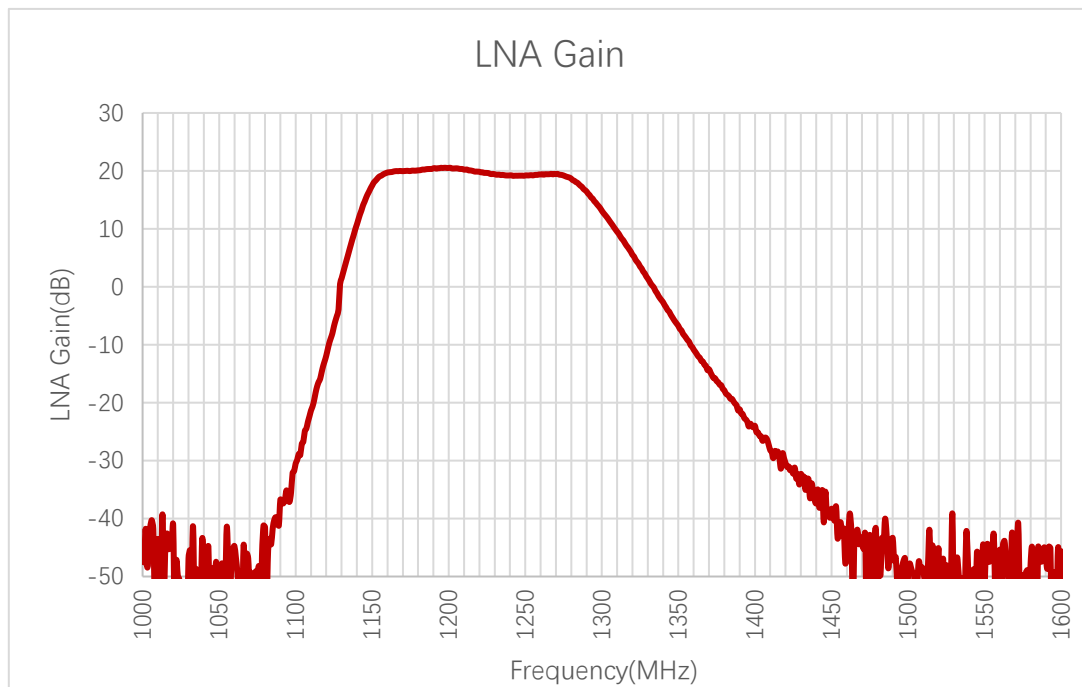
3.1.2. Return Loss



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

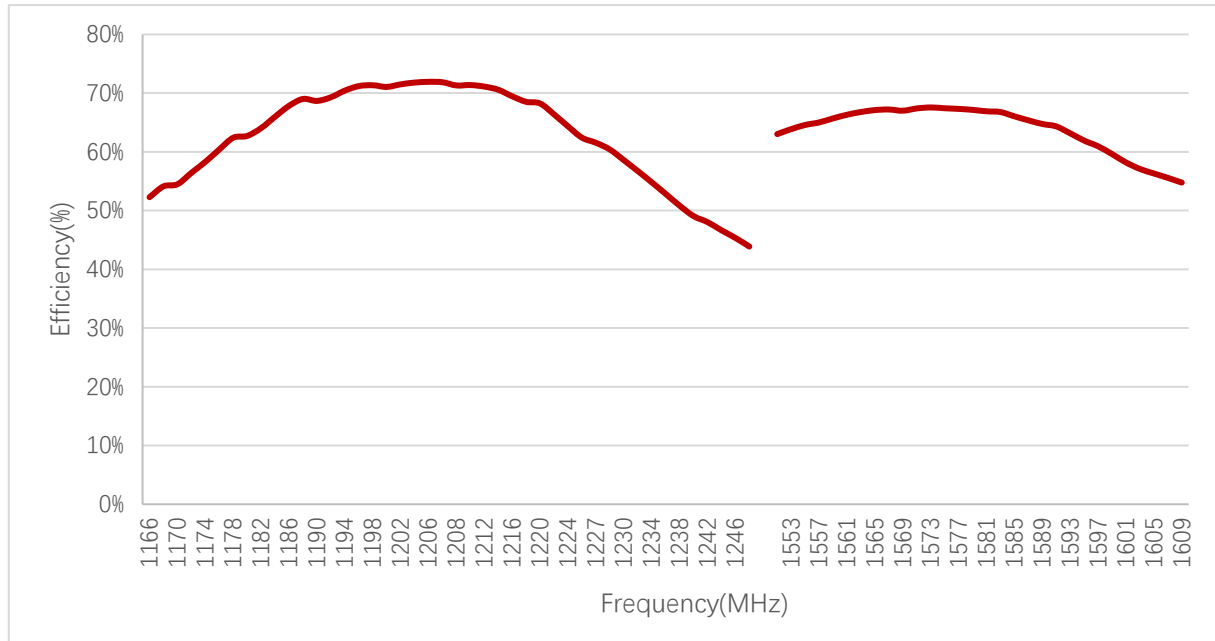


LNA Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain (dB)	20.0	20.3	19.5	-	-	18.8	19.2	18.3

3.2. Radiation Performance Test

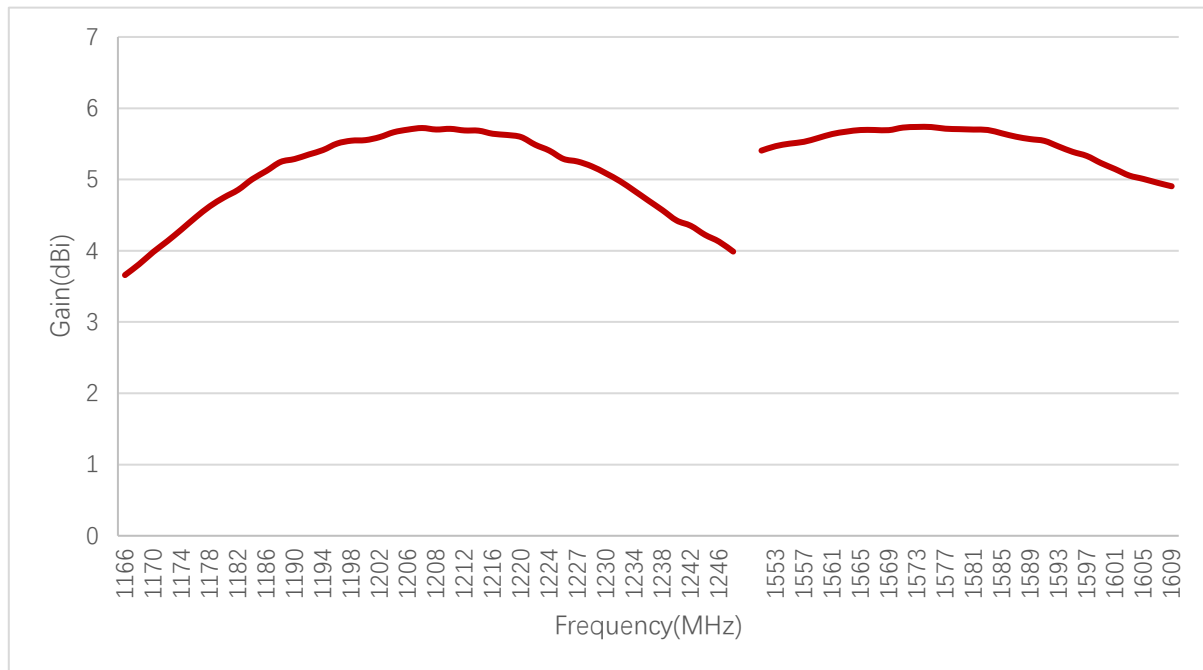
3.2.1. Efficiency



Efficiency (%)

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

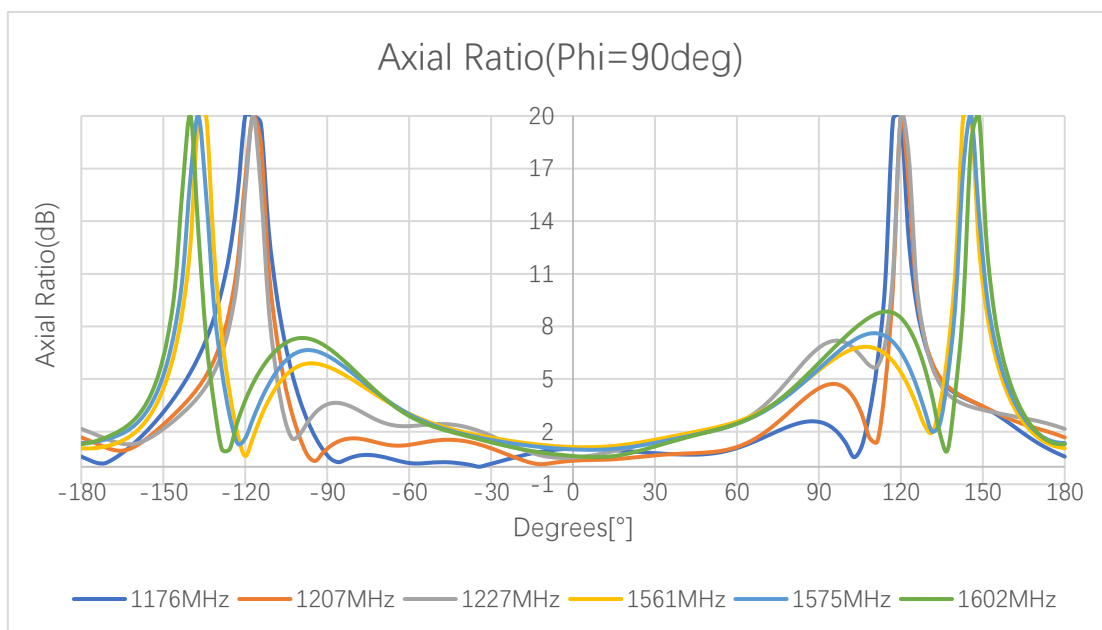
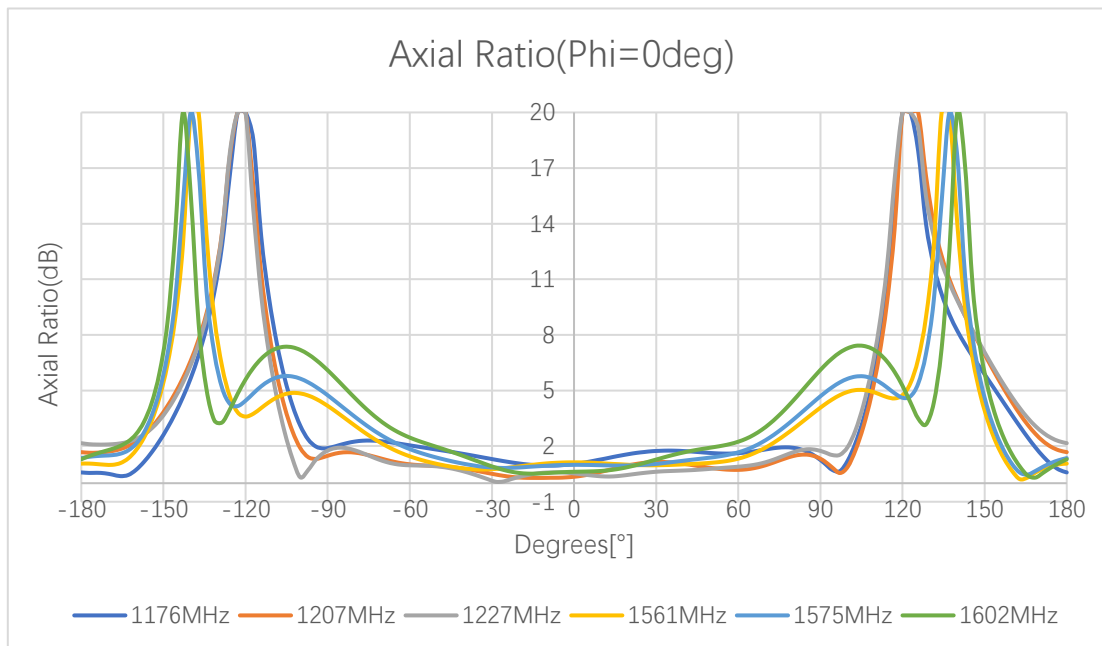
3.2.2. Peak Gain



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

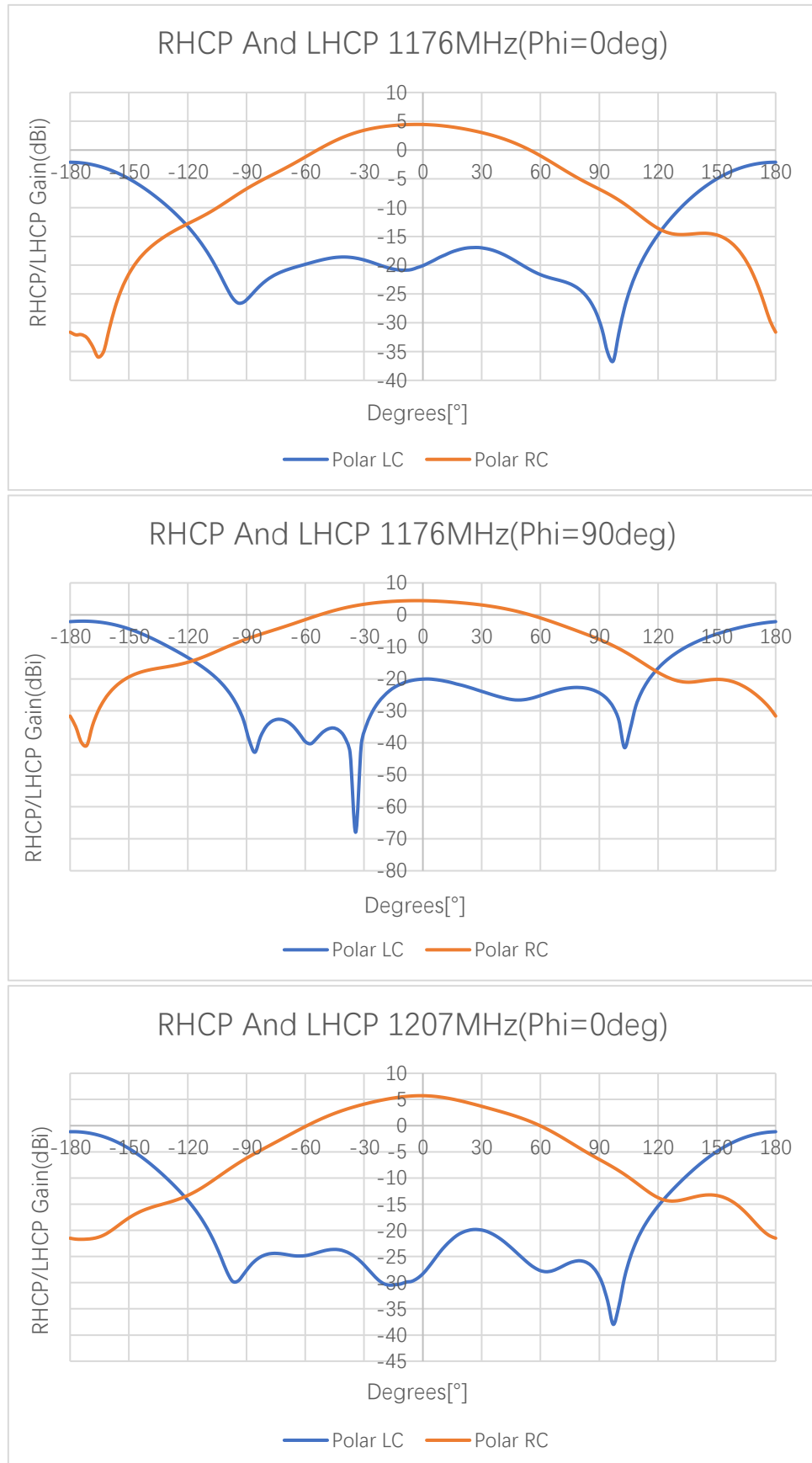
3.2.3. Axial Ratio

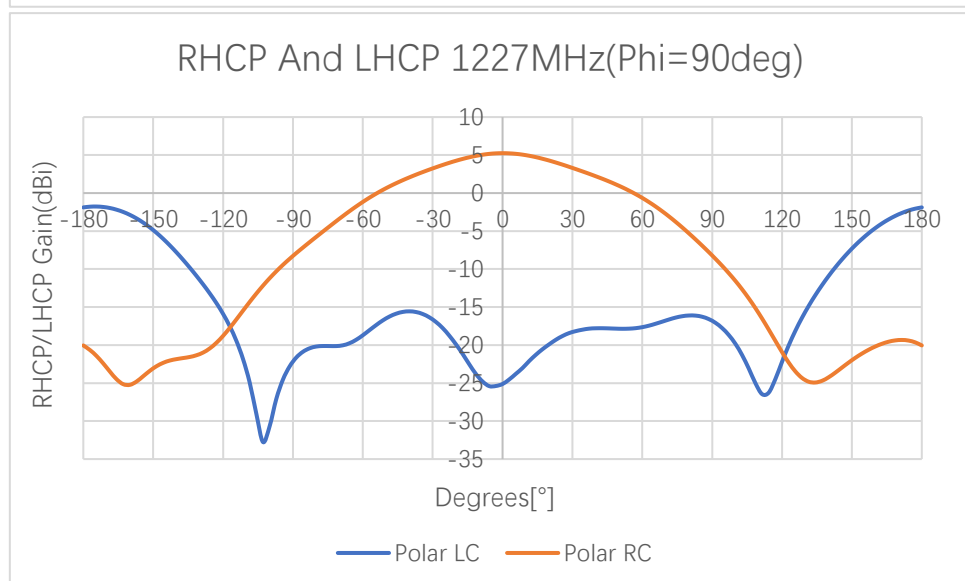
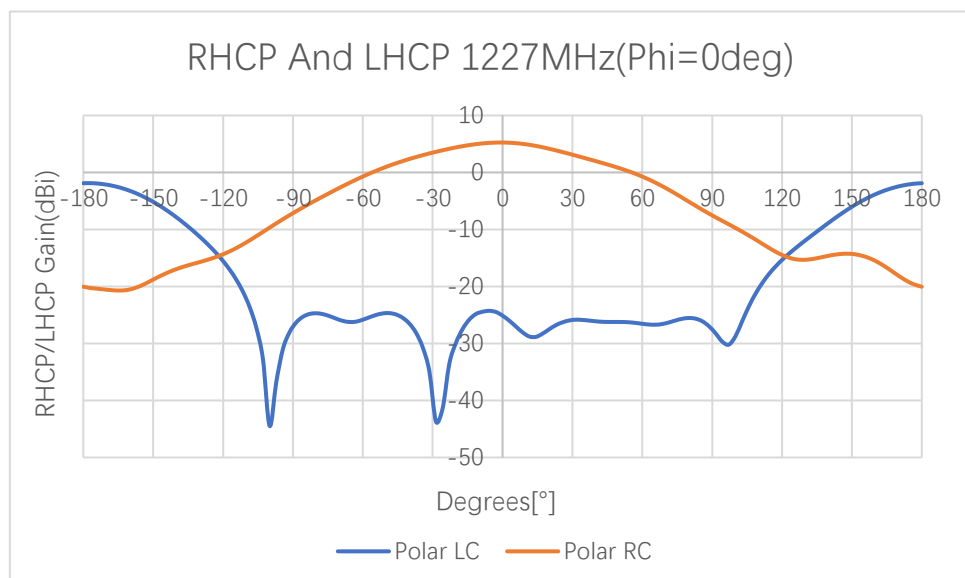
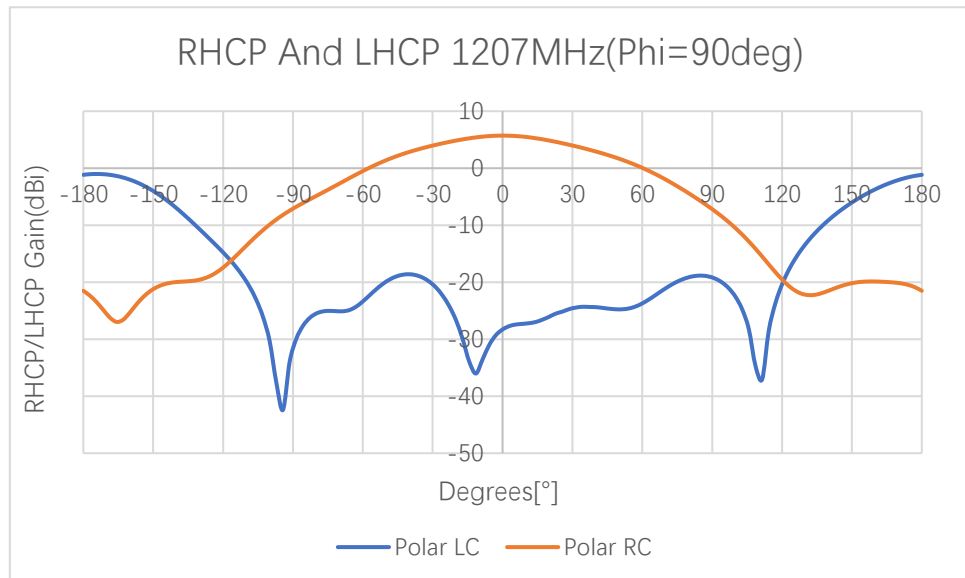


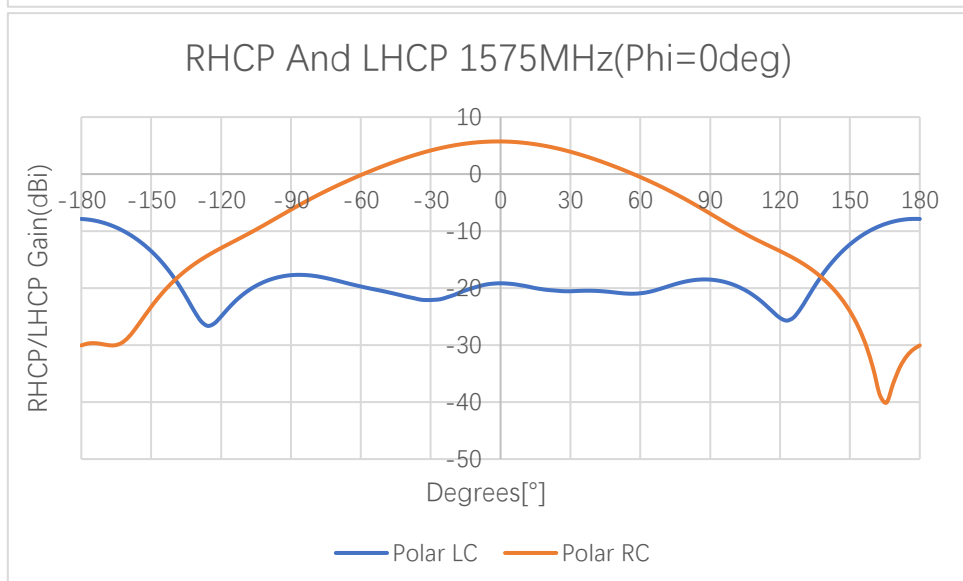
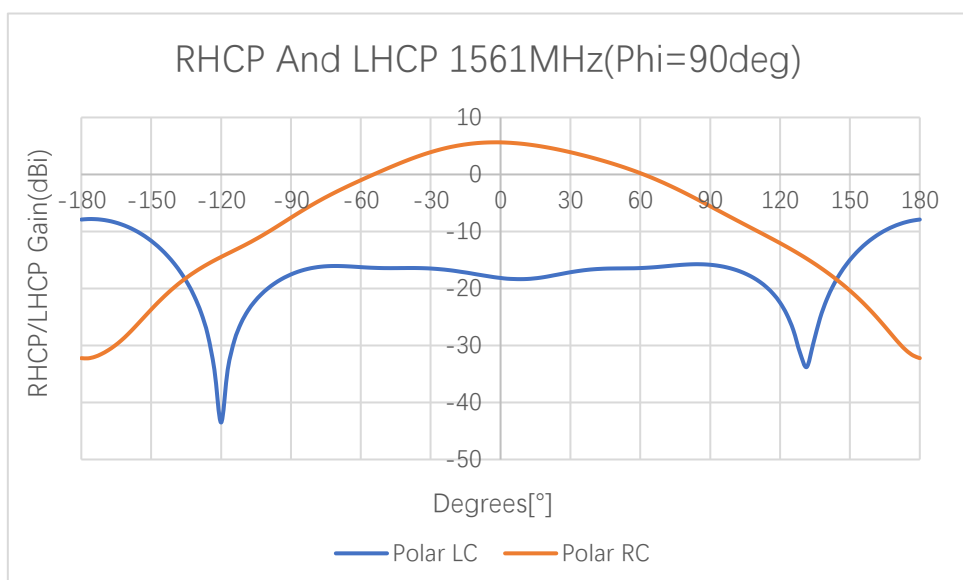
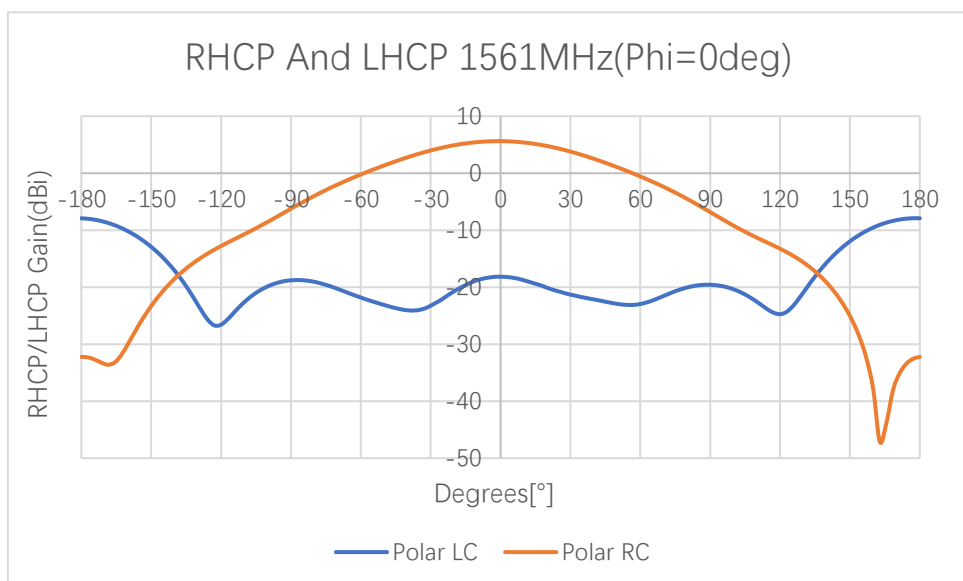
Axial Ratio (dB)

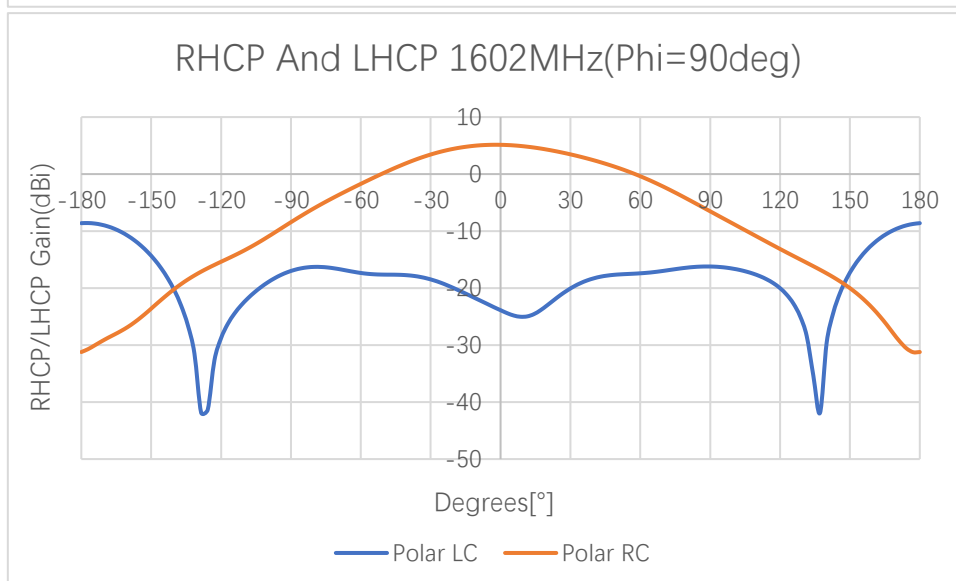
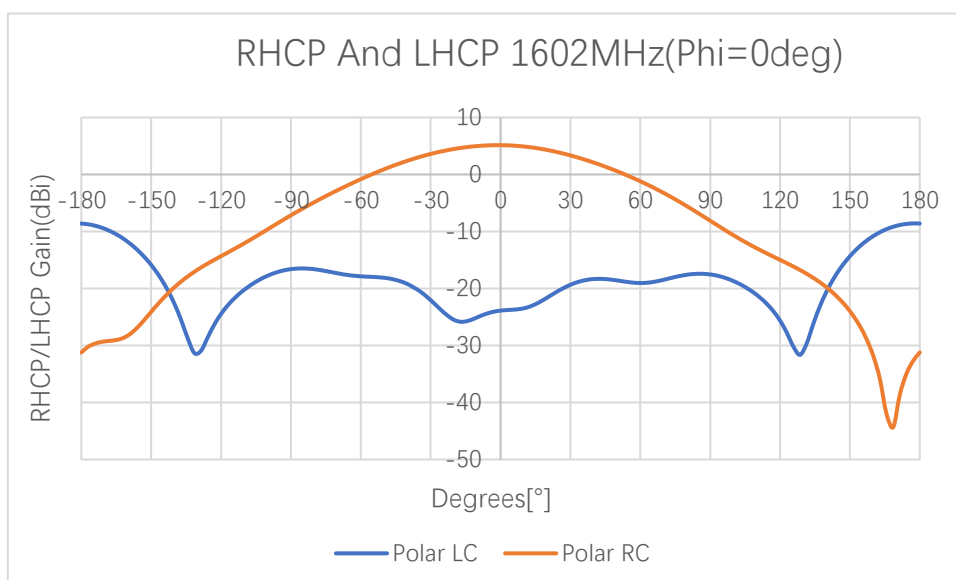
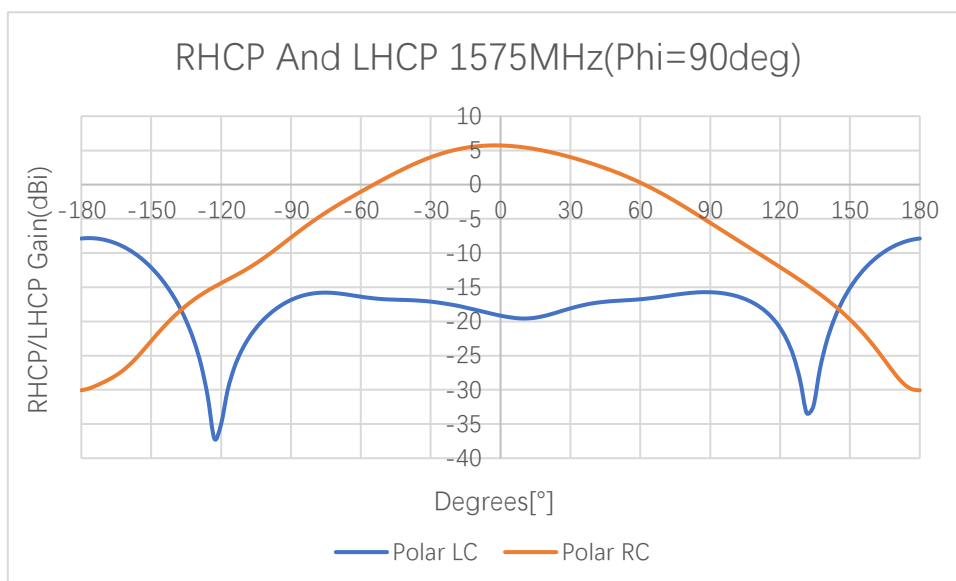
Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	1.03	0.35	0.53	-	-	1.12	0.99	0.61
	Phi = 90 (deg) Theta = 0 (deg)	1.03	0.35	0.53	-	-	1.12	0.99	0.61

3.2.4. 2D RHCP and LHCP Gain







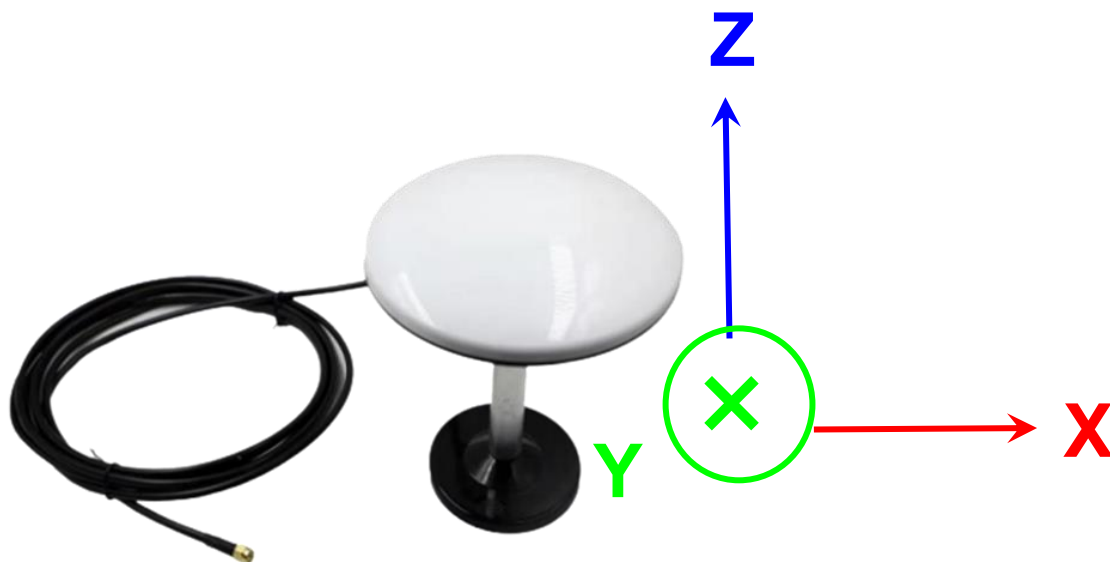


2D RHCP and LHCP Gain (dBi)

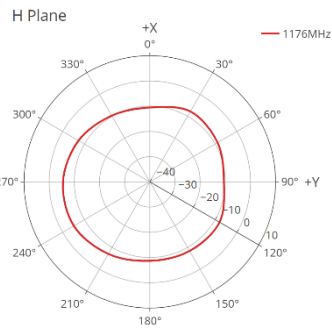
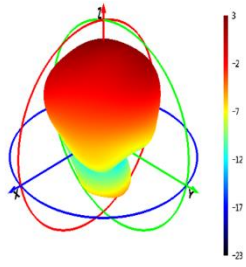
Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
RC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	4.43	5.72	5.24	-	-	5.62	5.72	5.13
	Phi = 90 (deg) Theta = 0 (deg)	4.43	5.72	5.24	-	-	5.62	5.72	5.13
LC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-20.08	-28.29	-25.12	-	-	-18.16	-19.15	-23.88
	Phi = 90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

3.2.5. 3D & 2D Radiation Pattern

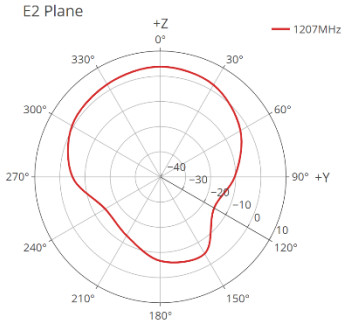
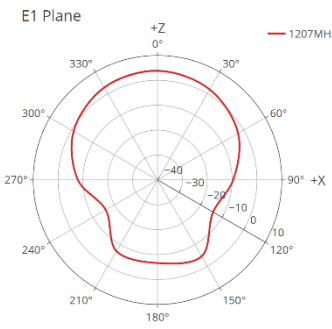
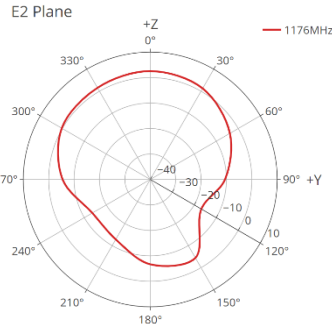
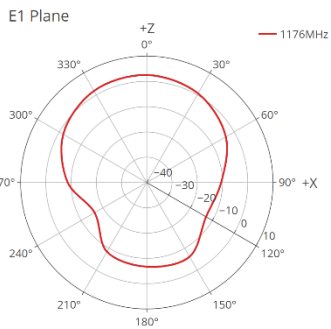
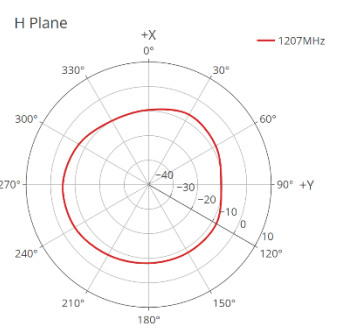
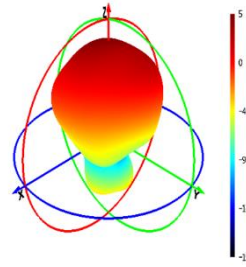
- Test Condition: Free Space
- Test Chamber: FS-G-1



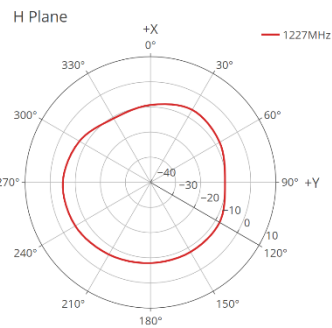
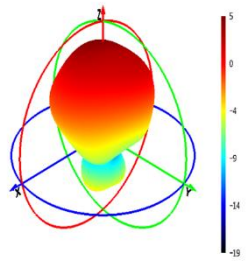
1176 MHz



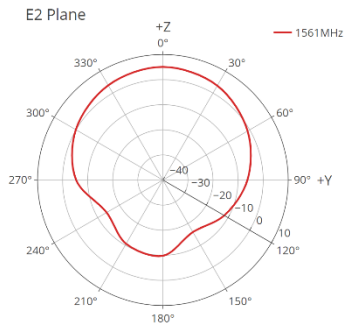
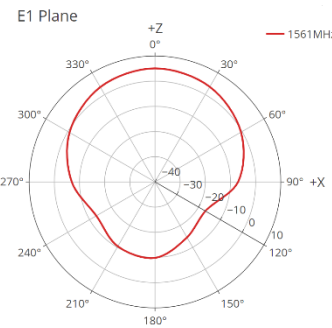
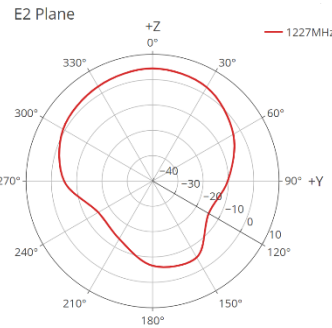
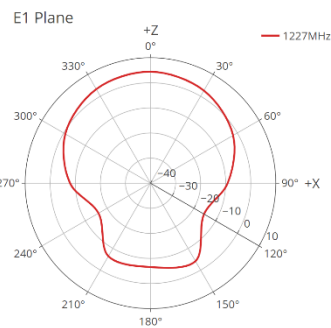
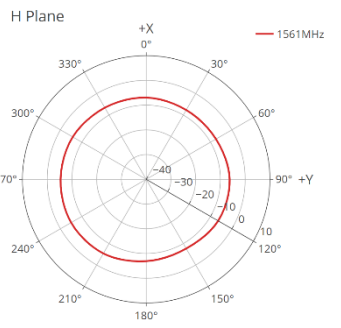
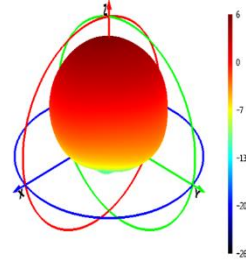
1207 MHz

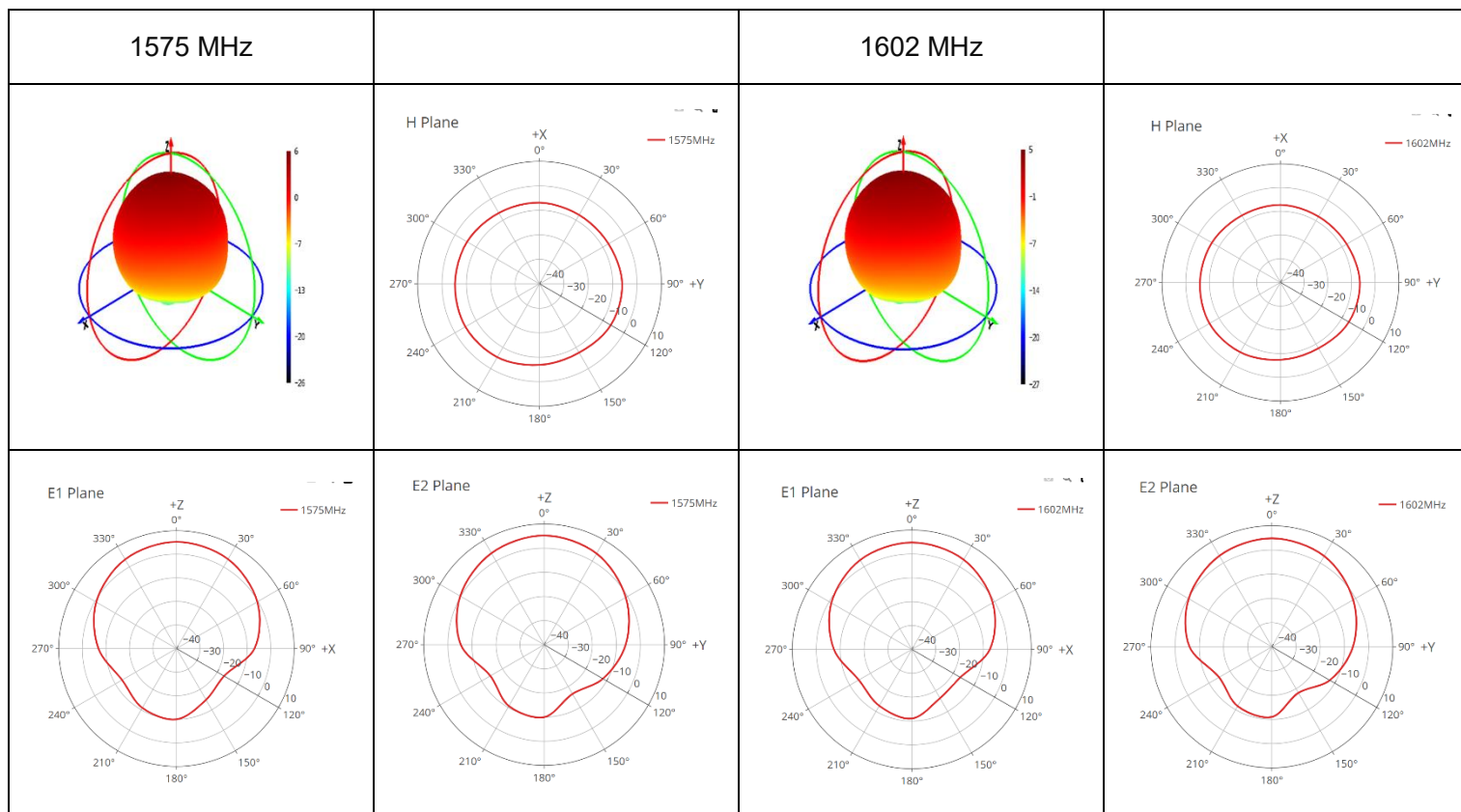


1227 MHz



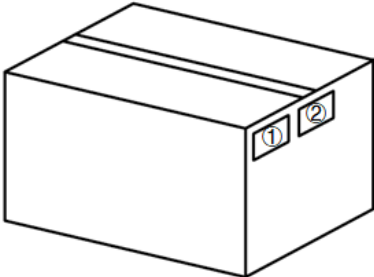
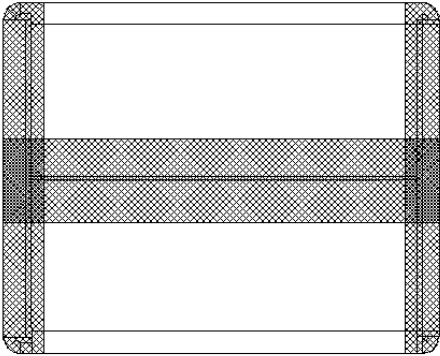
1561 MHz





4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		Put the product in the inner box
2		1 pc antenna per inner box
3		Fill the gaps inside the carton with bubble bags. 5 inner boxes per carton box (5 pcs antennas per carton box) <u>Carton Size:</u> <u>L × W × H = 450 × 240 × 290 mm</u>

4		Position for Attaching Labels ① Carton Label ② Quality Label
5		Sealing Cartons “I” type sealing cartons

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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Tel: +86 21 5108 6236

Email: info@quectel.com

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Revision History

Version	Date	Author	Note
-	2022-01-27	Kenny YIN/ Xiaodong YANG	Creation of the document
1.0	2022-01-27	Kenny YIN/ Xiaodong YANG	First official release
1.1	2022-03-17	Junsen LI	Updated the data (Chapters 2, 4, 6 and 7).
1.2	2022-06-17	Kenny YIN	Updated the coaxial cable drawing (Chapter 4 and 6).
1.3	2023-03-10	Kenny YIN	Updated the base drawing (Chapter 6).
2.0	2023-09-05	Damon ZHANG/ Lucky FENG/ David LIU/ Aria CHU	Updated the template and all test data in this datasheet.
2.1	2023-12-05	Junsen LI	Numerous changes were made to this document. It should be read in its entirety.



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