



Antenna Datasheet

Product OC: YG0035AA

Version: 2.0

Date: 2024-07-03

Status: Released

Product Name: GNSS Magnetic Mount External Active Antenna

Key Features:

Frequency Band: 1559–1586 MHz

Dimensions: 50.3 × 38.4 × 17.1 mm

Efficiency: Up to 63.3 % (MP)

RoHS Compliant

LNA Gain: 28 ±3 dB

IP 64

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 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 / On 300 × 300 mm Metal Plane

1.1. Electrical

Electrical	
Frequency Range	1559–1586 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

Band Frequency (MHz)	Band	GPS L5 GALILEO E5a BDS B2a- B2I QZSS L5 IRNSS L5	GALILEO E5b BDS B2b	GPS L2 QZSS L2C	GLONASS G2	BDS B3	BDS B1I	GPS L1 GALILEO E1 BDS B1C QZSS L1	GLONASS G1
	Freq. (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	FS	-	-	-	-	-	2.2	1.4	-
	MP	-	-	-	-	-	1.9	1.9	-
Return Loss (dB)	FS	-	-	-	-	-	-8.1	-14.8	-
	MP	-	-	-	-	-	-9.7	-9.7	-
Efficiency (%)	FS	-	-	-	-	-	59.6	56.8	-
	MP	-	-	-	-	-	62.9	60.1	-
Gain (dBi)	FS	-	-	-	-	-	1.4	0.6	-

	MP	-	-	-	-	-	4.6	3.4	-
Axial Ratio (dB)	FS	-	-	-	-	-	33.5	4.8	-
	MP	-	-	-	-	-	12.3	3.5	-

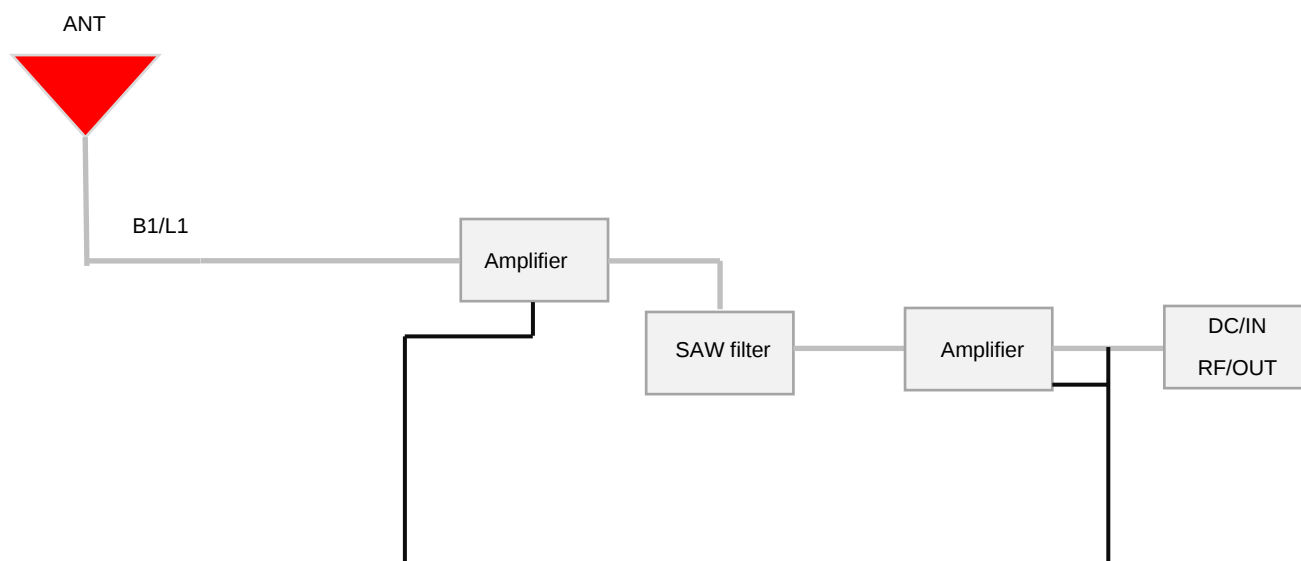
- FS: In Free Space
- MP: On 300 × 300 mm Metal Plane

LNA Electrical	
LNA Gain	28 ±3 dB
Noise Figure	≤ 2 dB
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	15 dB f0 ±100 MHz f0 (1575 MHz)
Pout 1dB Gain compression point	-25 dbm
Working Voltage	1.8–3.6 V
Working Current	9 ±3 mA @ 3.3 V
Impedance	50 Ω

1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	50.3 × 38.4 × 17.1 mm
Material & Color	ABS & Black
Cable Type & Length	RG174 Black & 3000 mm
Connector Type	SMA Male
Mounting Type	Magnet
Weight	Typ. 63.1 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Ingress Protection (IP) Rating	IP64
RoHS Compliant	Yes

1.3. Block Diagram (Active Antenna)

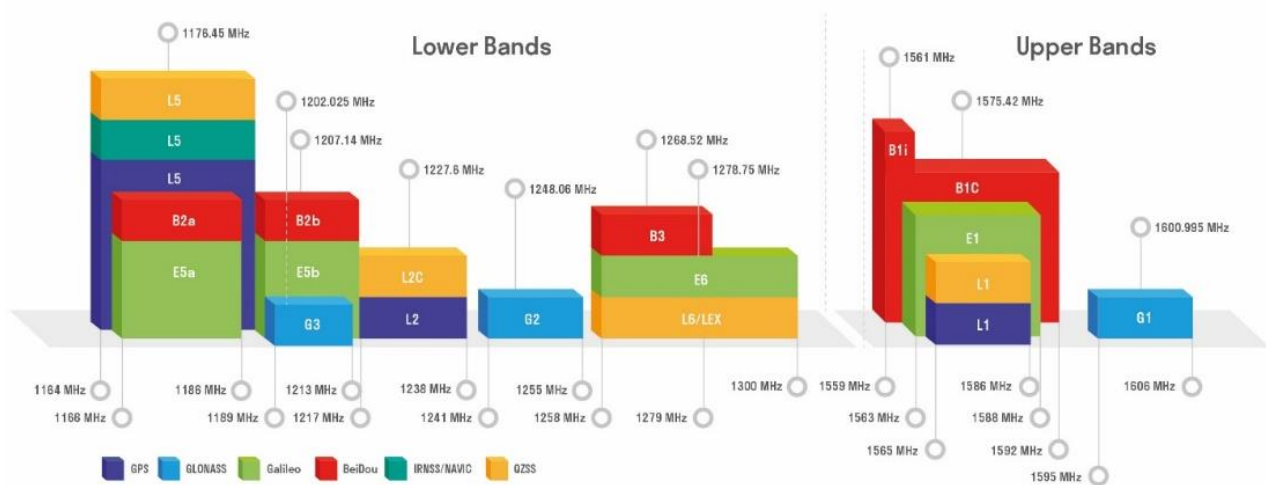


1.4. Supported GNSS Frequency Bands

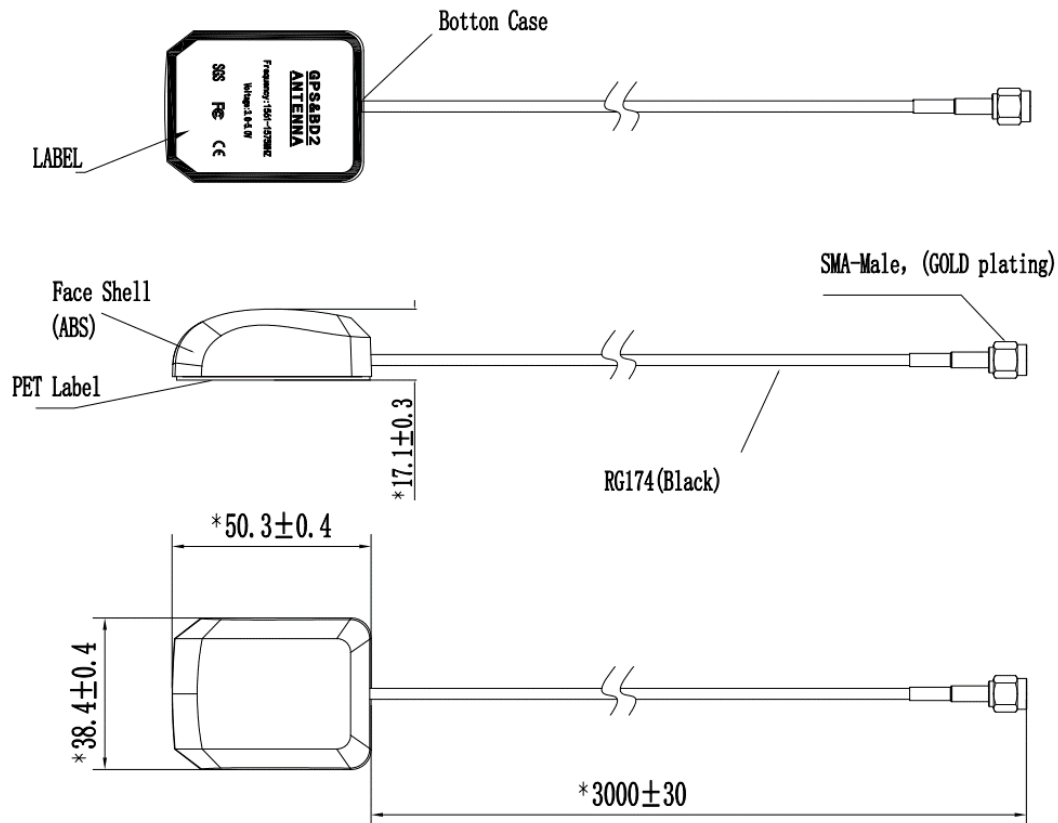
GNSS Frequency Bands (MHz)					
GPS	L1 Centre 1575.42 (1565–1586)	L2 Centre 1227.6 (1217–1238)	L5 Centre 1176.45 (1164–1189)		
	√	-	-		
GLONASS	G1-L10C-L10F Centre 1601 (1595–1606)	G2-L20C-L20F Centre 1248.06 (1241–1255)	G3-L30C Centre 1202.025 (1189–1213)		
	-	-	-		
GALILEO	E1 Centre 1575.42 (1563–1588)	E5a Centre 1176.45 (1166–1187)	E5b Centre 1207.14 (1197–1218)	E6 Centre 1278.75 (1258–1300)	
	-	-	-	-	
BDS	B1I Centre 1561.098 (1559–1564)	B1C (BDS-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



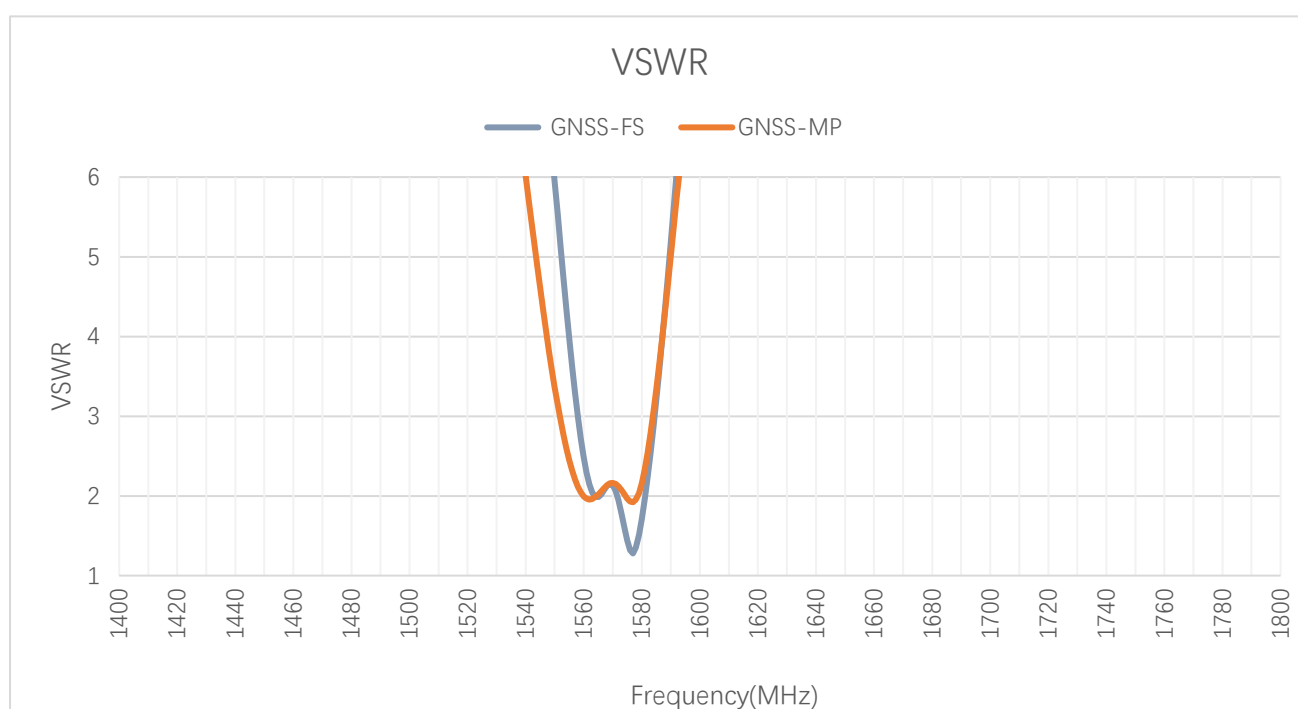
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

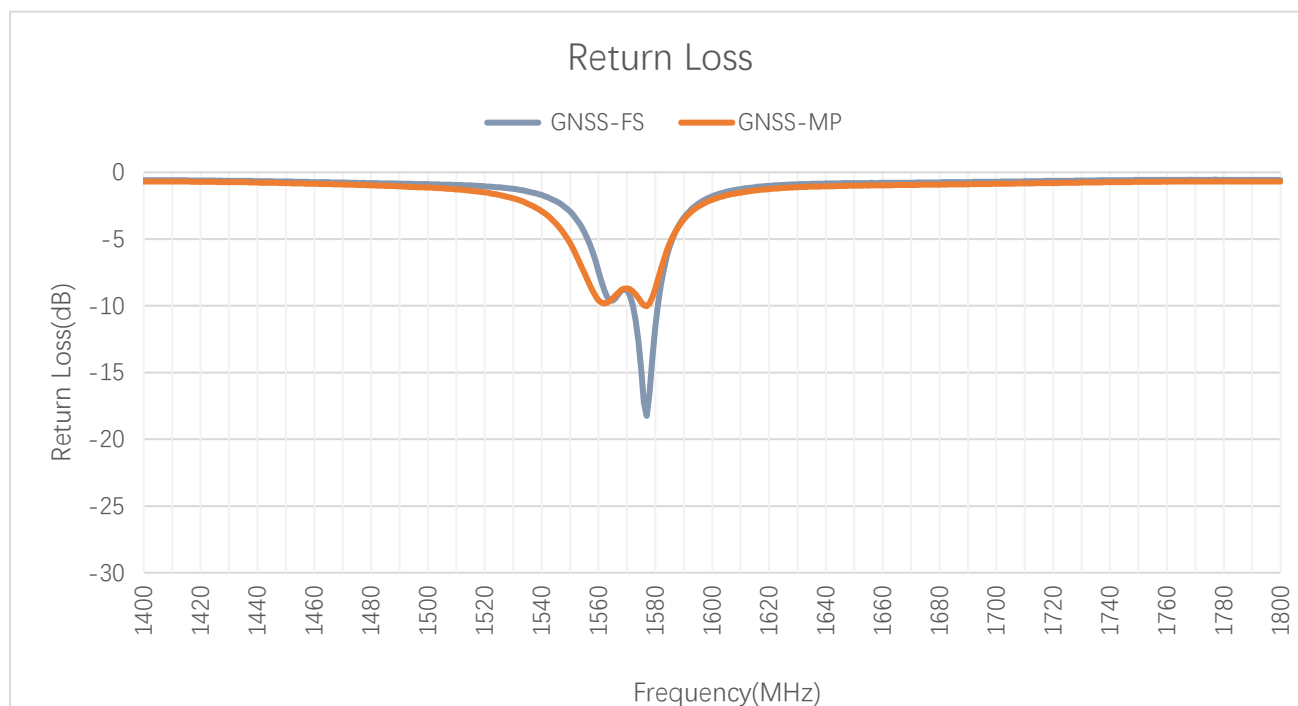
3.1.1. VSWR



VSWR

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
FS	-	-	-	-	-	2.2	1.4	-
MP	-	-	-	-	-	1.9	1.9	-

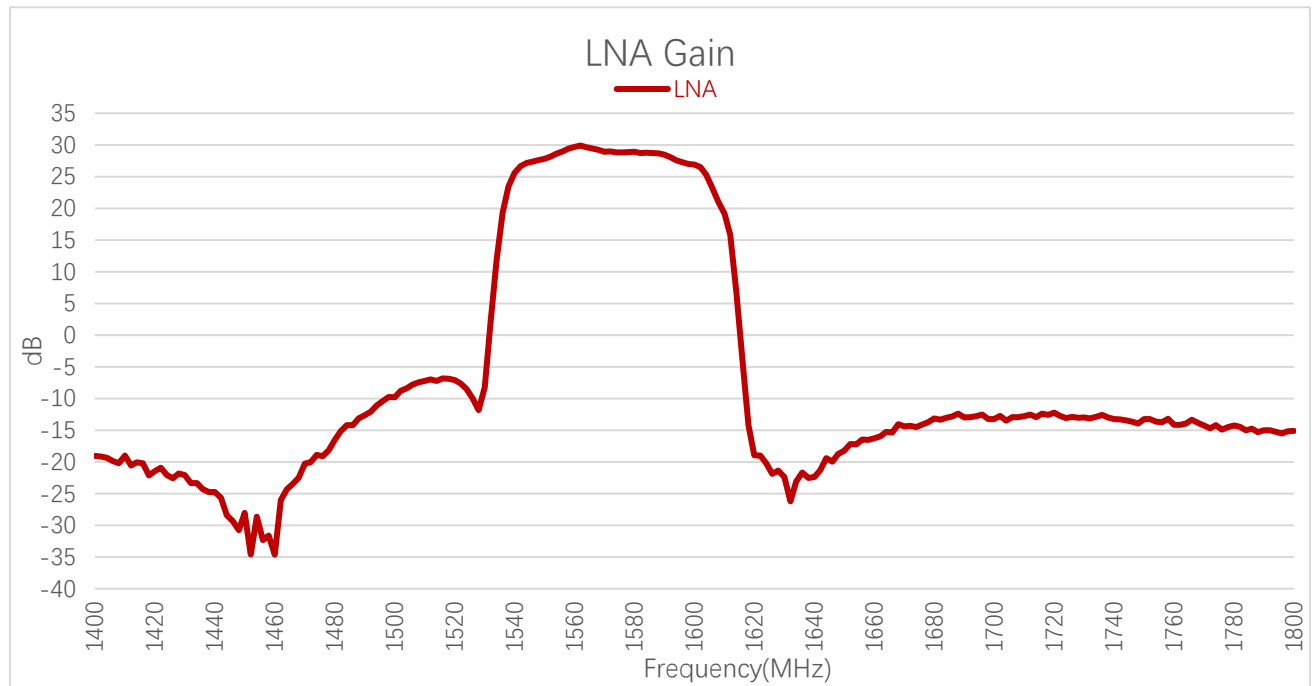
3.1.2. Return Loss



Return Loss (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
FS	-	-	-	-	-	-8.1	-14.8	-
MP	-	-	-	-	-	-9.7	-9.7	-

3.1.3. GNSS LNA Gain

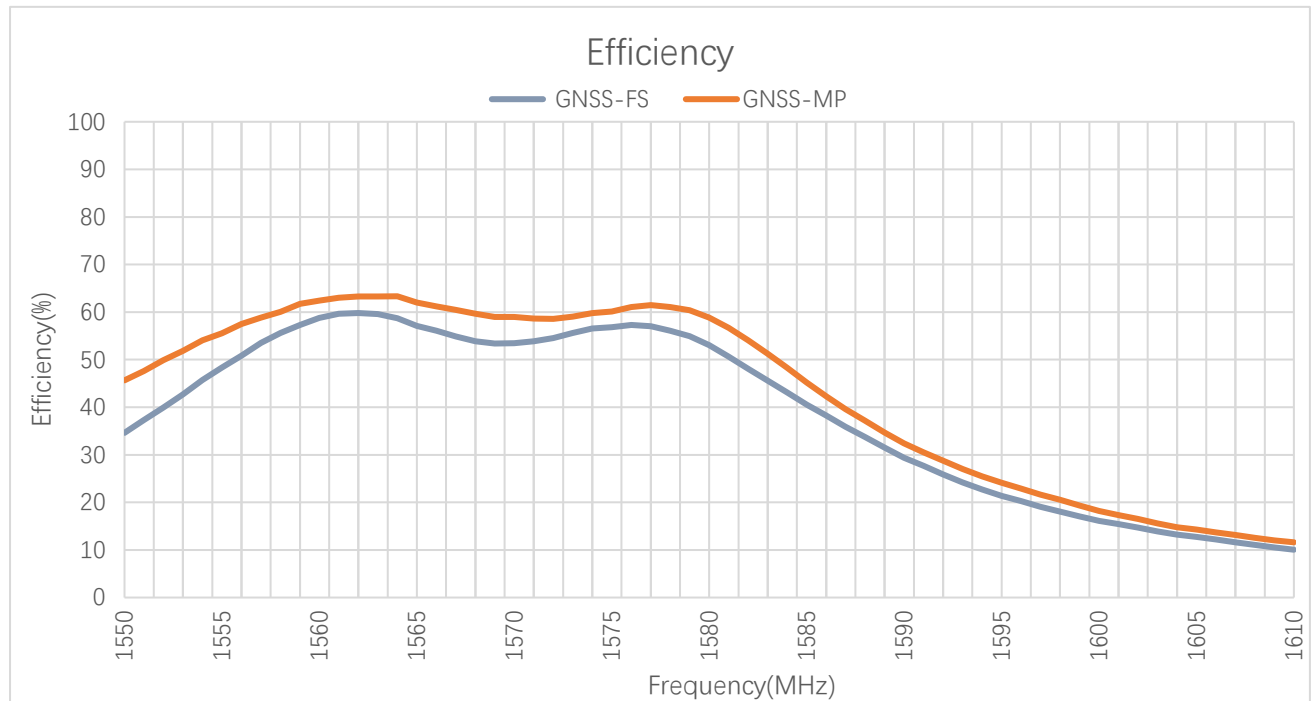


LNA Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain (dB)	-	-	-	-	-	29.8	28.6	-

3.2. Radiation Performance Test

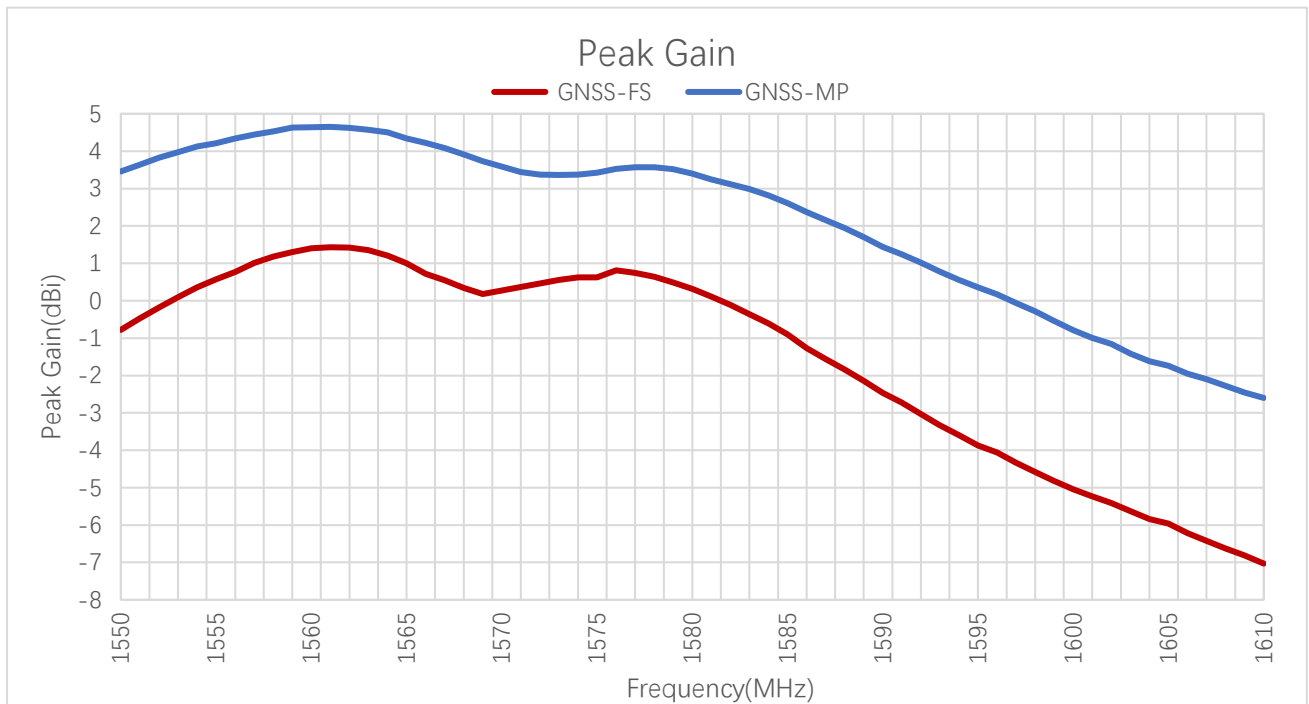
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
FS	-	-	-	-	-	59.6	56.8	-
MP	-	-	-	-	-	62.9	60.1	-

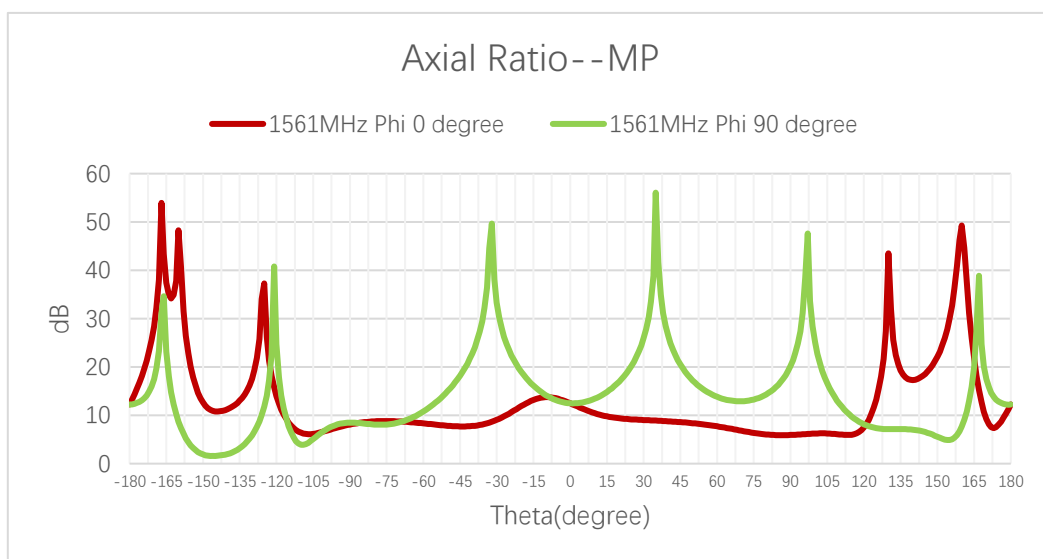
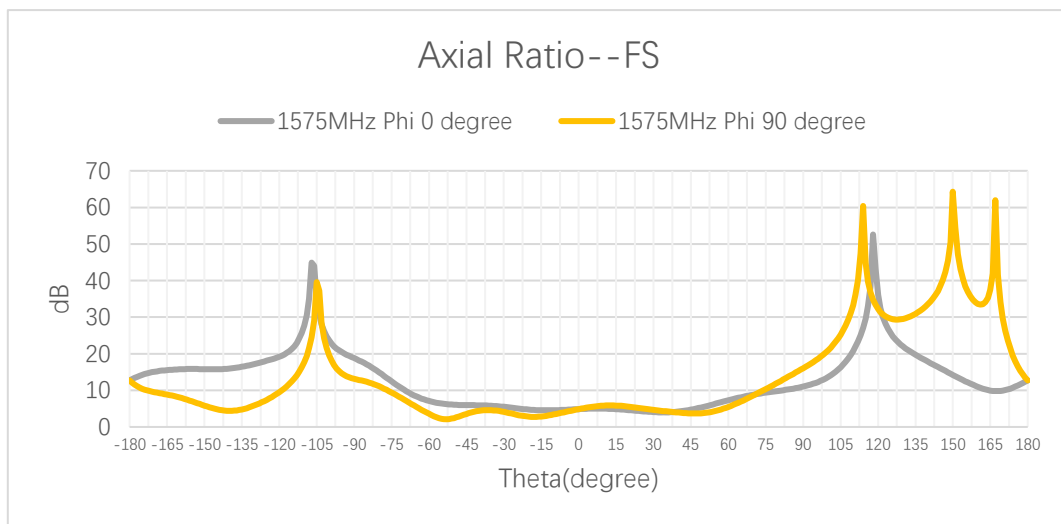
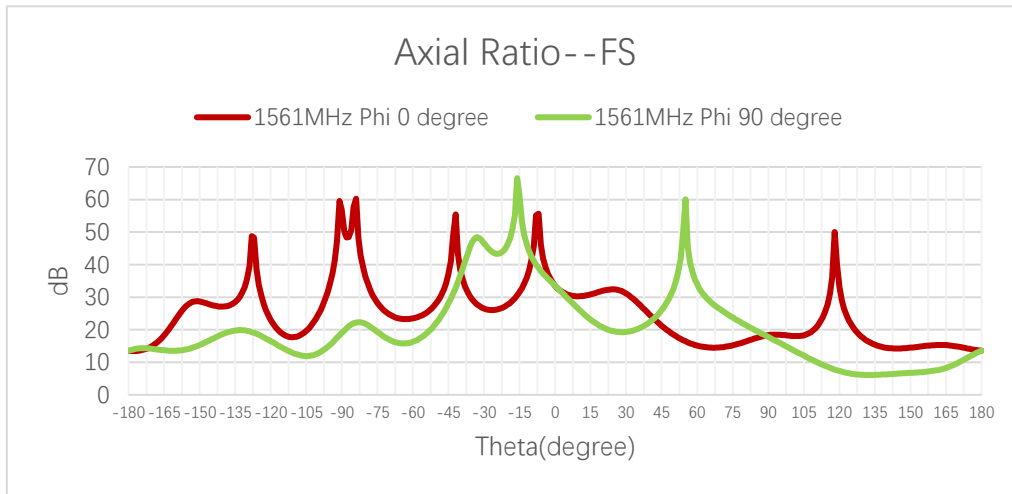
3.2.2. Peak Gain

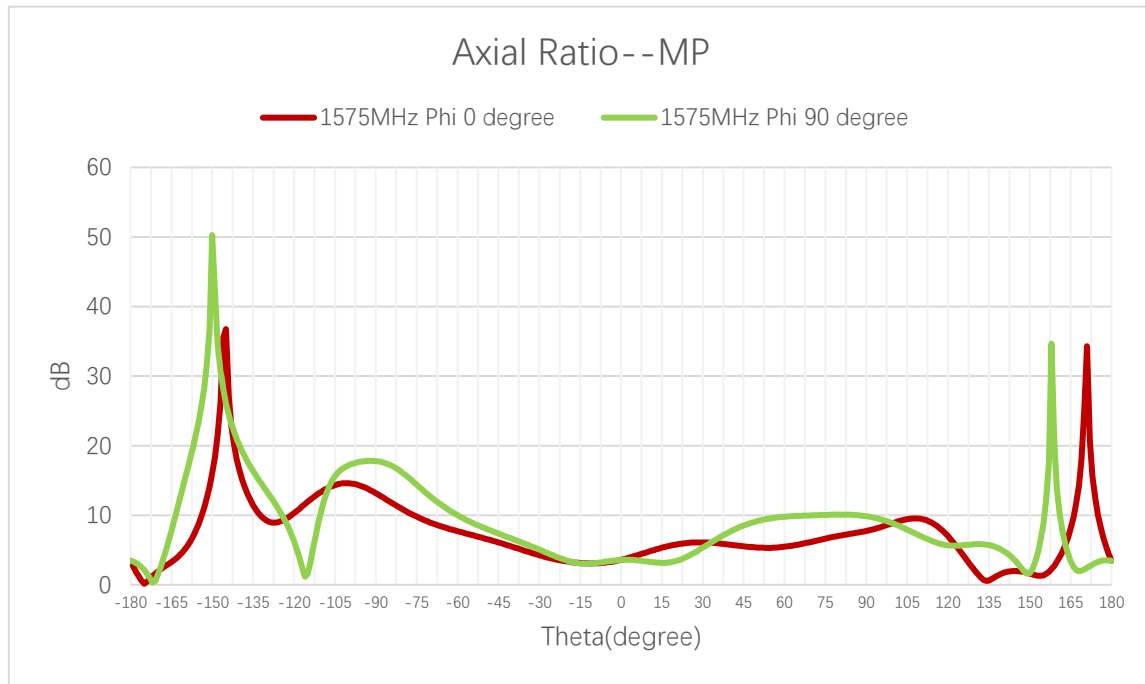


Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
FS	-	-	-	-	-	1.4	0.6	-
MP	-	-	-	-	-	4.6	3.4	-

3.2.3. Axial Ratio

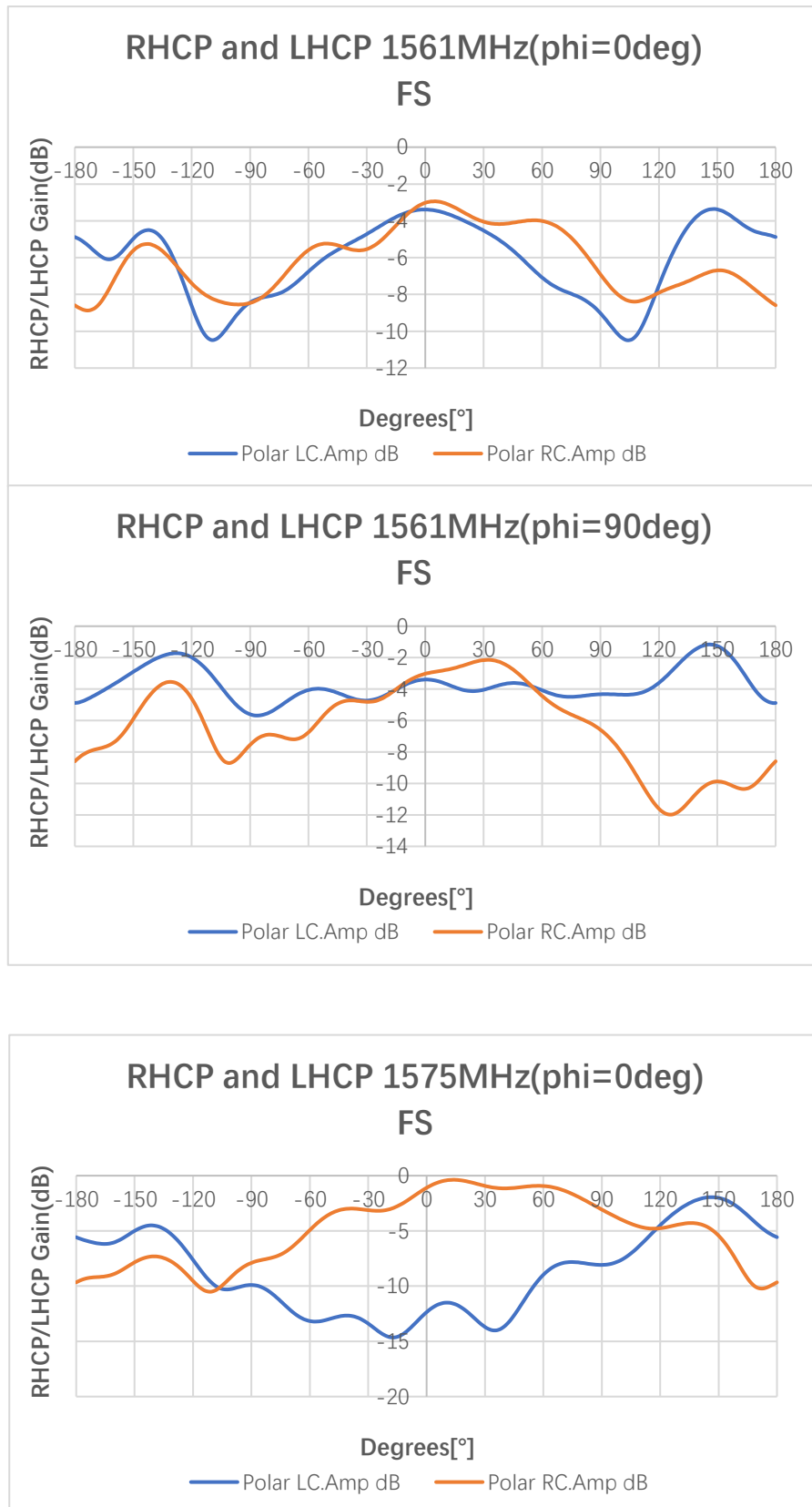


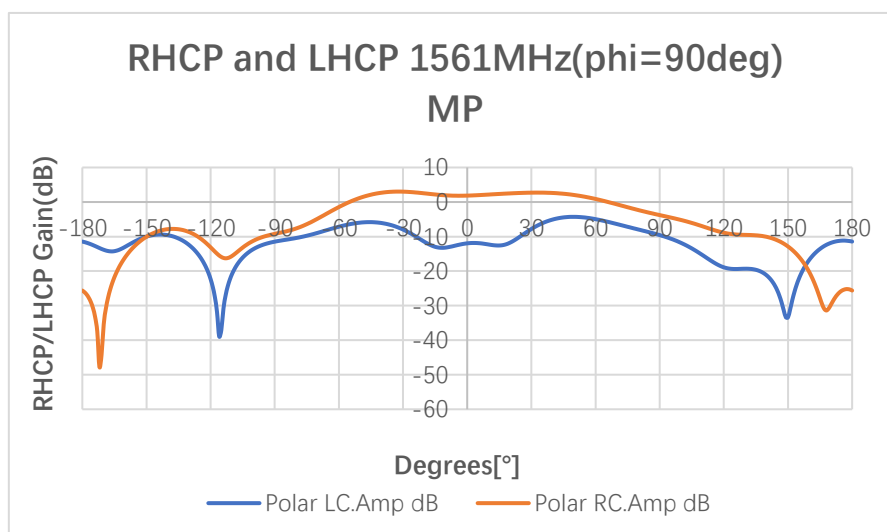
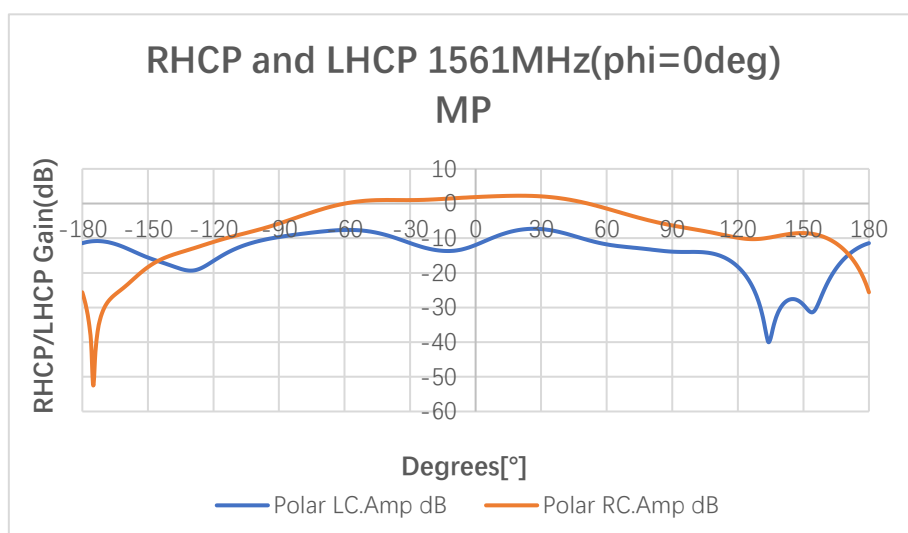
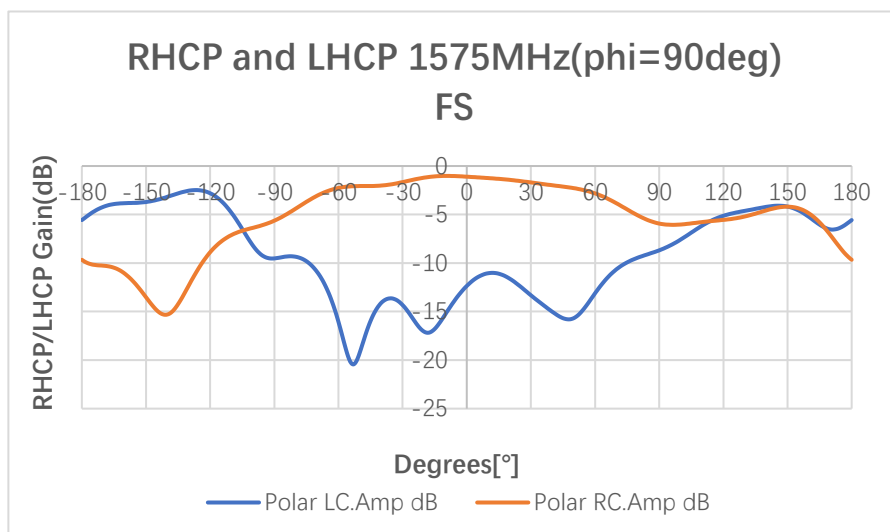


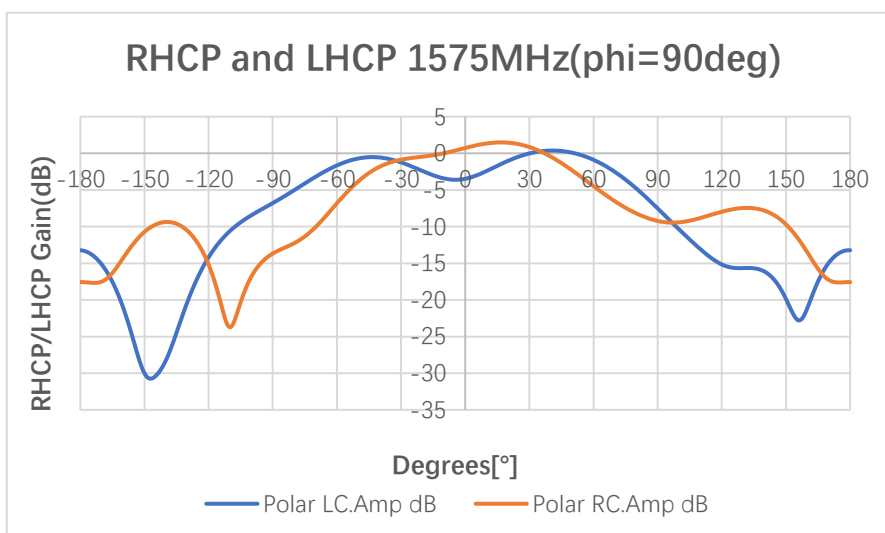
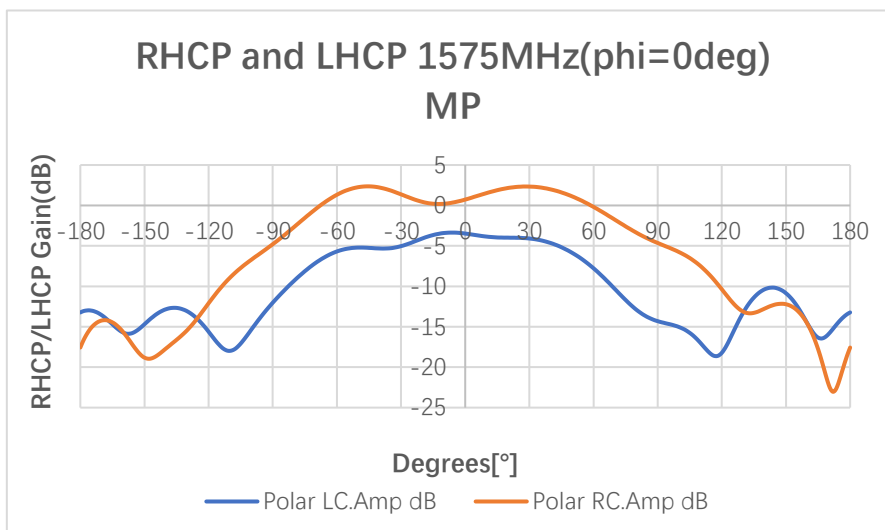
Axial Ratio (dB)

Frequency (MHz)			1176	1207	1227	1248	1268	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	FS	-	-	-	-	-	33.5	4.8	-
		MP	-	-	-	-	-	12.4	3.5	-
	Phi = 90 (deg) Theta = 0 (deg)	FS	-	-	-	-	-	33.5	4.8	-
		MP	-	-	-	-	-	12.4	3.5	-

3.2.4. 2D RHCP and LHCP Gain





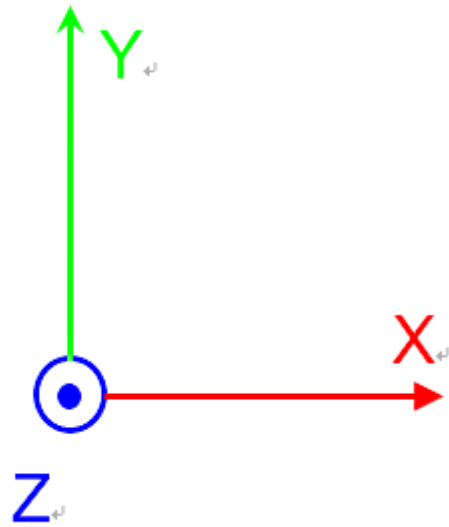


2D RHCP and LHCP Gain (dB)

Frequency (MHz)			1176	1207	1227	1248	1268	1561	1575	1602
RC Gain (dB)	Phi = 0 (deg) Theta = 0 (deg)	FS	-	-	-	-	-	-3.02	-1.1	-
		MP	-	-	-	-	-	1.8	0.7	-
	Phi = 90 (deg) Theta = 0 (deg)	FS	-	-	-	-	-	-3.02	-1.1	-
		MP	-	-	-	-	-	1.8	0.7	-
LC Gain (dB)	Phi = 0 (deg) Theta = 0 (deg)	FS	-	-	-	-	-	-3.39	-12.36	-
		MP	-	-	-	-	-	-11.9	-3.4	-
	Phi = 90 (deg) Theta = 0 (deg)	FS	-	-	-	-	-	-3.39	-12.36	-
		MP	-	-	-	-	-	-11.9	-3.4	-

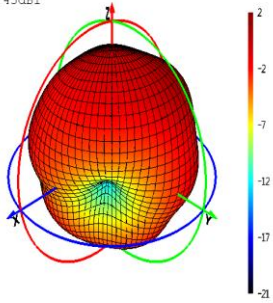
3.2.5. 3D & 2D Radiation Pattern

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

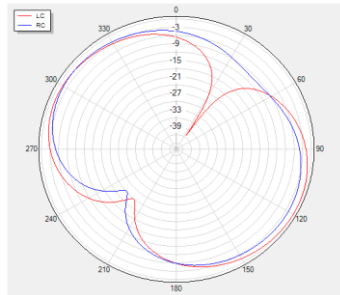


1561 MHz

MAX:1.43dBi
MIN:-22.43dBi

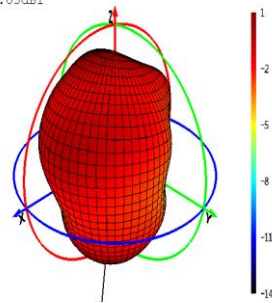


Theta=90 freq=1561MHz

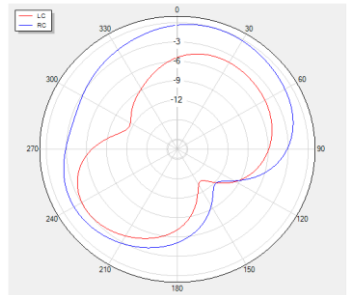


1575 MHz

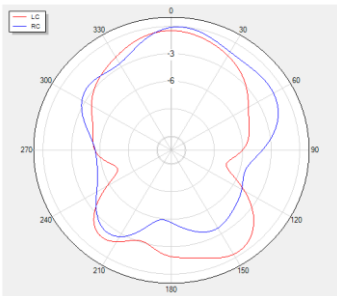
MAX:0.62dBi
MIN:-15.03dBi



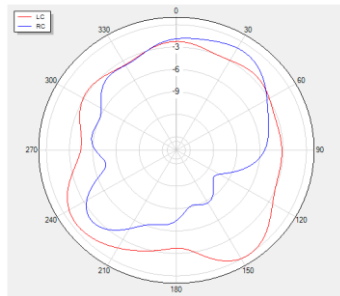
Theta=90 freq=1575MHz



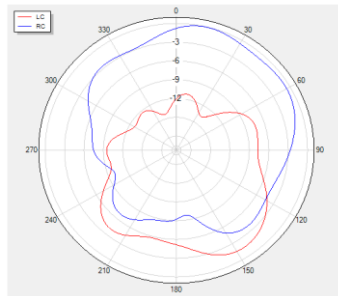
Phi=0 freq=1561MHz



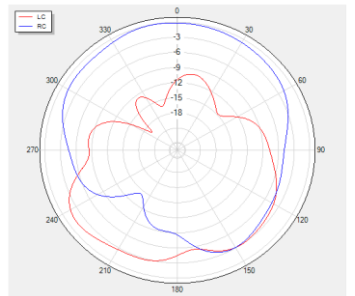
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Phi=0 freq=1575MHz

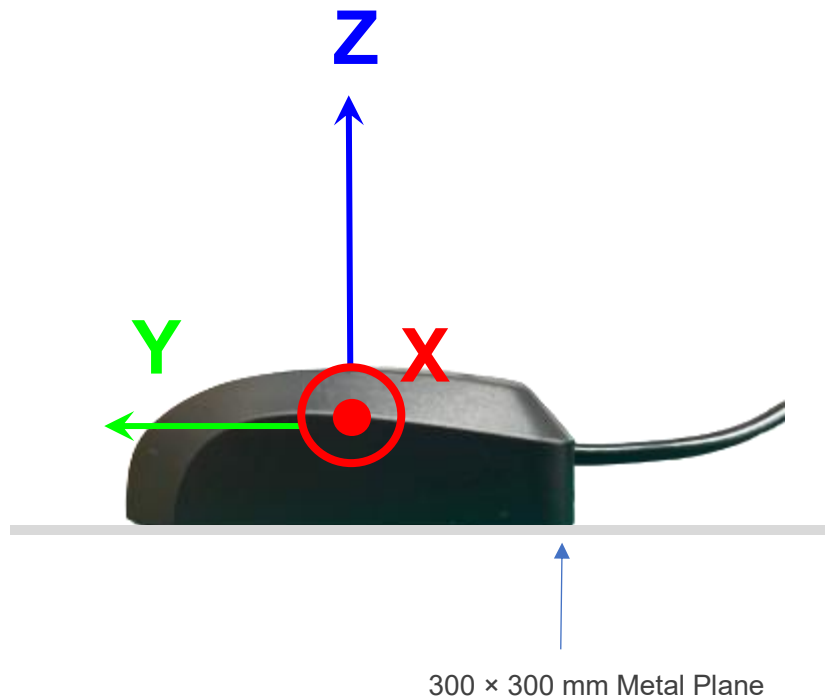


Phi=90 freq=1575MHz



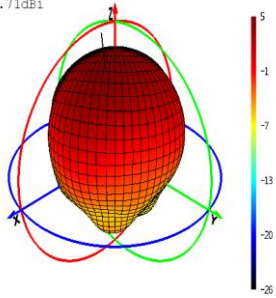
3.2.6. 3D & 2D Radiation Pattern

- Test Condition: 300 × 300 mm Metal Plane
- Test Chamber: FS-S-1

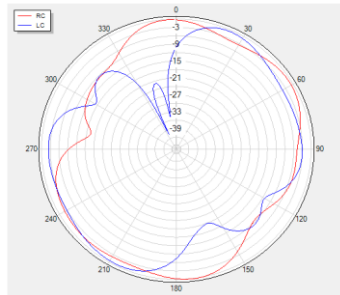


1561 MHz

MAX: 4.65dBi
MIN: -26.71dBi

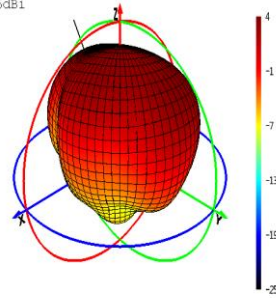


Theta=90 freq=1561MHz

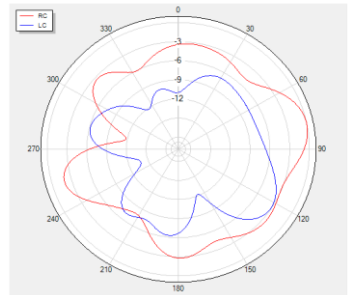


1575 MHz

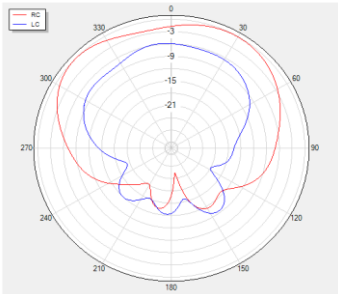
MAX: 3.42dBi
MIN: -26dBi



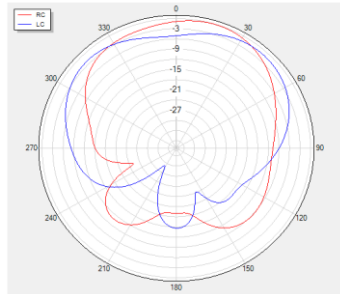
Theta=90 freq=1575MHz



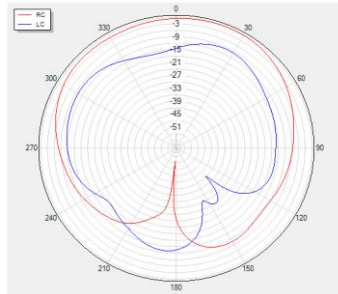
Phi=0 freq=1561MHz



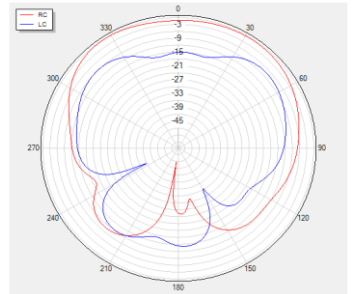
Phi=90 freq=1561MHz



Phi=0 freq=1575MHz

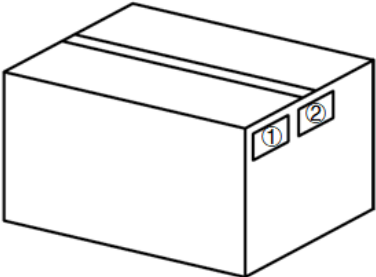
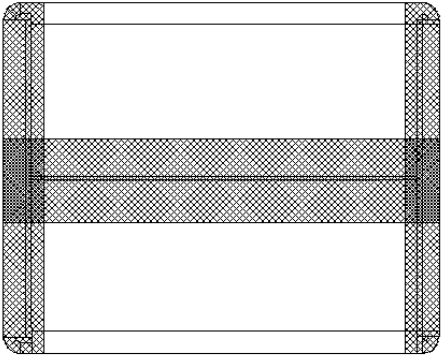


Phi=90 freq=1575MHz



4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		6 products are neatly placed on one floor, and 30 products are packed in one inner box.
2		30 pcs antenna products in an inner box. (30 PCS / Inner Box)
3		(4 Inner Boxes / Carton Box) (120 PCS Antennas / Carton Box) The top of the outer box is filled with bubble bags. <u>Carton Size:</u> <u>L × W × H = 370 × 370 × 295 mm</u>

4		Position for Attaching Labels ① Carton Label ② Quality Label
5		Sealing Cartons “工” 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
-	2020-10-26	Kenny YIN	Creation of the document
1.0	2020-10-26	Kenny YIN	First official release
1.1	2021-01-19	Kenny YIN	Updated the antenna image in Chapter 2.
1.2	2021-01-27	Kenny YIN	Added IP rating description.
1.3	2021-07-20	Aria CHU	1. Updated working temperature (Chapter 3). 2. Added LNA data (Chapter 4.6).
1.4	2021-10-15	Aria CHU	Updated the data (Chapter 3).
1.5	2021-12-06	Aria CHU	Updated the product description in Chapter 1.
1.6	2022-05-06	Xiaodong YANG	Updated the data (Chapter 2, 3, 4 and 5.1).
2.0	2024-07-03	Charming YANG/ Lucky FENG/ David LIU/ Rainey LIAO	1. Updated the template. 2. Numerous changes were made to this document. It should be read in its entirety.



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