Antenna Datasheet

Product OC: YEGD006U1A
Version: 1.2
Date: 2025-06-11
Status: Released

Product Name: GNSS Multiple Mount Low Profile Active External Antenna
Key Features:
Frequency Band: 1164–1300 MHz, 1525–1606 MHz
Dimensions: 109.28 mm × 89 mm × 25.8 mm
RoHS & REACH & POPS Compliant
IP68
Total LNA Gain:30 ±4 dB

Overview

The Quectel YEGD006U1A represent the pinnacle of rugged, high-performance GNSS antenna technology, designed to deliver multi-constellation, triple-band（L1/L2/L5/L6） positioning in the most demanding environments. Combining active amplification with industrial-grade durability, these antennas provide unmatched signal clarity and reliability for applications requiring centimeter-level accuracy. With IP68 ingress protection, and extended temperature operation (-40°C to +85°C), they are engineered to thrive in harsh outdoor, automotive, and industrial settings.

Key Features & Technical Specifications

Triple-band Precision & Active Amplification

Frequency Bands: 1164–1300 MHz, 1525–1606 MHz (L1/L2/L5/L6), supporting GPS, Galileo, BDS, QZSS, and GLONASS.

Integrated LNA: Delivers 30 ±4 dB total gain (38 ±4 dB at PCBA) with a ultra-low noise figure (≤2.5 dB), enhancing weak signal reception in urban canyons or remote areas.

Advanced Filtering: SAW filters and hybrid couplers provide 60 dB out-of-band attenuation, minimizing interference from adjacent frequencies.

Superior RF Performance

Peak Gain: 4.82 dBi (max) with RHCP polarization for multipath rejection.

Low axial Ratio ensures near-perfect circular polarization.

Industrial-Grade Durability

IP68 Rating: Fully dustproof and waterproof, suitable for marine or outdoor deployments.

UV-Resistant & Flame-Retardant Housing: Compliant with UL 94 V-0 and UL 746c f1 standards.

Mounting Flexibility: YEGD006U1A: Magnet & Adhesive & Screw base for quick installation.

Power Efficiency & Compliance

Low Power Consumption: Operates at 3–5 V, ideal for battery-powered systems.

RoHS/REACH/POPS Compliant: Environmentally safe for global deployments.

Target Applications

1. These antennas are ideal for mission-critical systems requiring high precision and reliability:
2. Autonomous Vehicles: Lane-level navigation for ADAS and robotics.
3. Marine: Offshore navigation, and other positioning devices.
4. Precision Agriculture: Guidance systems for tractors and harvesters.
5. Industrial IoT: Asset tracking in ports, mining, and logistics.
6. Surveying & Geodesy: High-accuracy mapping and timing synchronization.

Quectel provides comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs. We have regional R & D centers to offer quick response to meet your requirements. Please contact our sales & FAEs if you have any requests.

Contents

1 Specification

Test Condition: Free Space

1.1. Electrical

Electrical	
Frequency Range	1164–1300 MHz, 1525–1606 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

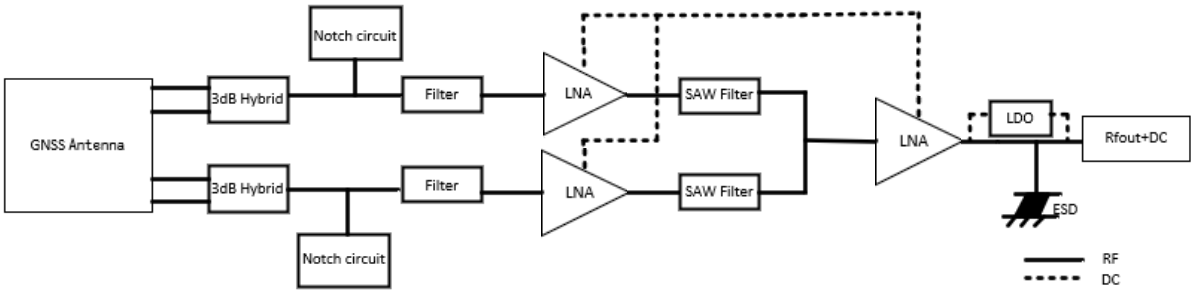
Band / Frequency (MHz)	GPS L5 GALILEO E5a BDS B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BDS B2b	GPS L2 QZSS L2C	GLONASS G2	BDS B3	GALILEO E6 QZSS L6	L-Band	BDS B1I	GPS L1 GALILEO E1 BDS B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
VSWR	1.27	1.44	1.53	1.42	1.27	1.24	1.12	1.12	1.15	1.26
Return Loss (dB)	-18.5	-14.8	-13.3	-15.1	-18.1	-19	-24.5	-24.5	-23	-18.7
Efficiency (%)	31	49.7	63.2	55.8	40	32	51.3	80	70.6	46.4
Peak Gain (dBi)	0.65	2.52	3.27	2.93	1.53	0.6	2.46	4.77	4.31	2.81
Axial Ratio (dB)	1.01	1.92	2.35	2.28	1.91	1.72	1.37	1.13	1.32	2.52

LNA Electrical	
LNA Gain	38 ±4 dB
Total LNA Gain (with cable loss)	30 ±4 dB
Noise Figure	≤ 2.5 dB
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	≥ 60 dB f0 & f1 ±100 MHz f0 (1164 MHz, 1300 MHz) f1 (1525 MHz, 1609 MHz)
Working Voltage	3–5 V
Working Current	19.6 ±4 mA
Impedance	50 Ω

1.2. Mechanical & Environmental

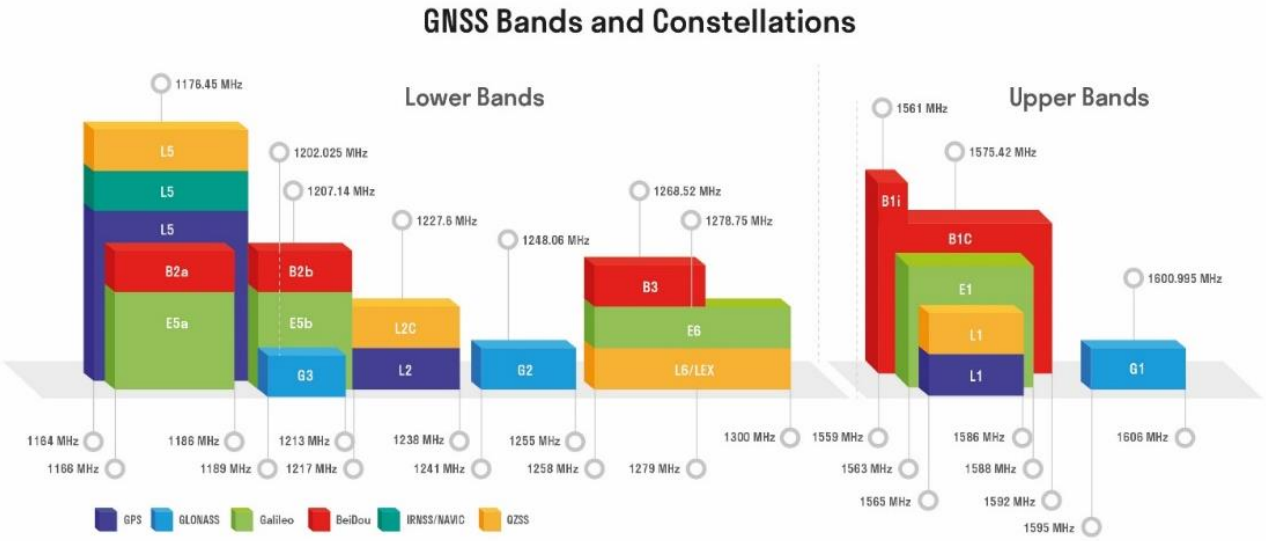
Mechanical	
Antenna Dimensions	109.28 mm × 89 mm × 25.8 mm
Material & Color	PC & Black
Cable Type & Color & Length	RG174 & Black & 5055 ±55 mm
Connector Type	SMA Male (The current state of the SMA connector is not waterproof. If a waterproof connector is required, it can be customized.)
Mounting Type	Magnet & Adhesive & Screw
Weight	Typ. 130 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS & REACH & POPS Compliant	Yes
Ingress Protection (IP) Rating	IP68
Housing Flame Rating	UL 94 V-0
Housing UV Resistant	UL 746c f1

1.3. Block Diagram (Active Antenna)

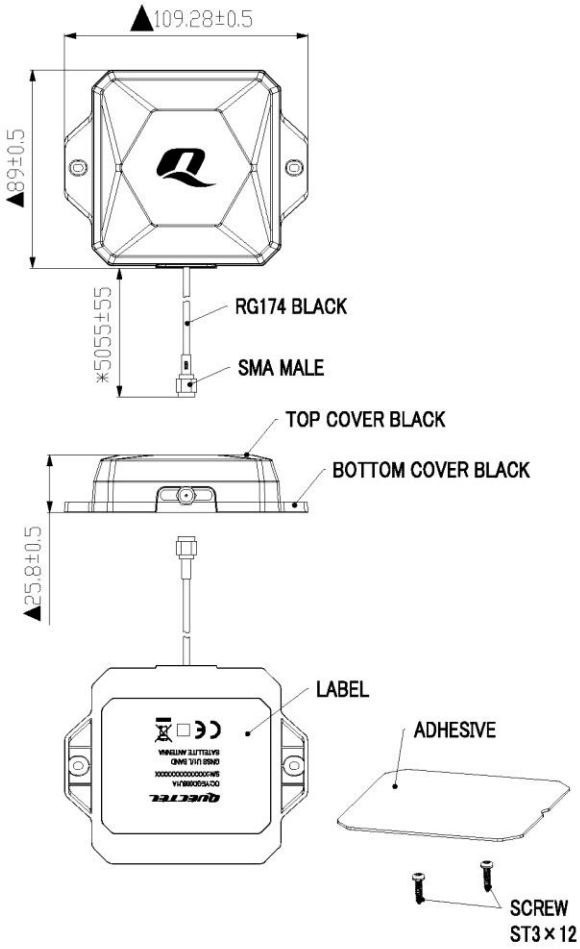


1.4. Supported GNSS Frequency Bands

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-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)	
	√	√	√	√	
BDS	**B1I** Centre 1561.098 (1559–1564)	**B1C (BDS-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
Lower Bands
Upper Bands
1176.45 MHz
L5
L5
L5
B2a
E5a
1202.025 MHz
1207.14 MHz
B2b
E5b
G3
1227.6 MHz
L2C
L2
1248.06 MHz
G2
1268.52 MHz
1278.75 MHz
B3
E6
L6/LEX
1561 MHz
1575.42 MHz
B1i
B1C
E1
L1
L1
1600.995 MHz
G1
1164 MHz
1168 MHz
1186 MHz
1189 MHz
1213 MHz
1217 MHz
1238 MHz
1241 MHz
1255 MHz
1258 MHz
1279 MHz
1300 MHz
1559 MHz
1563 MHz
1565 MHz
1586 MHz
1588 MHz
1592 MHz
1595 MHz
1606 MHz
GPS
GLONASS
Galileo
BeiDou
IRNSS/NAVIC
QZSS

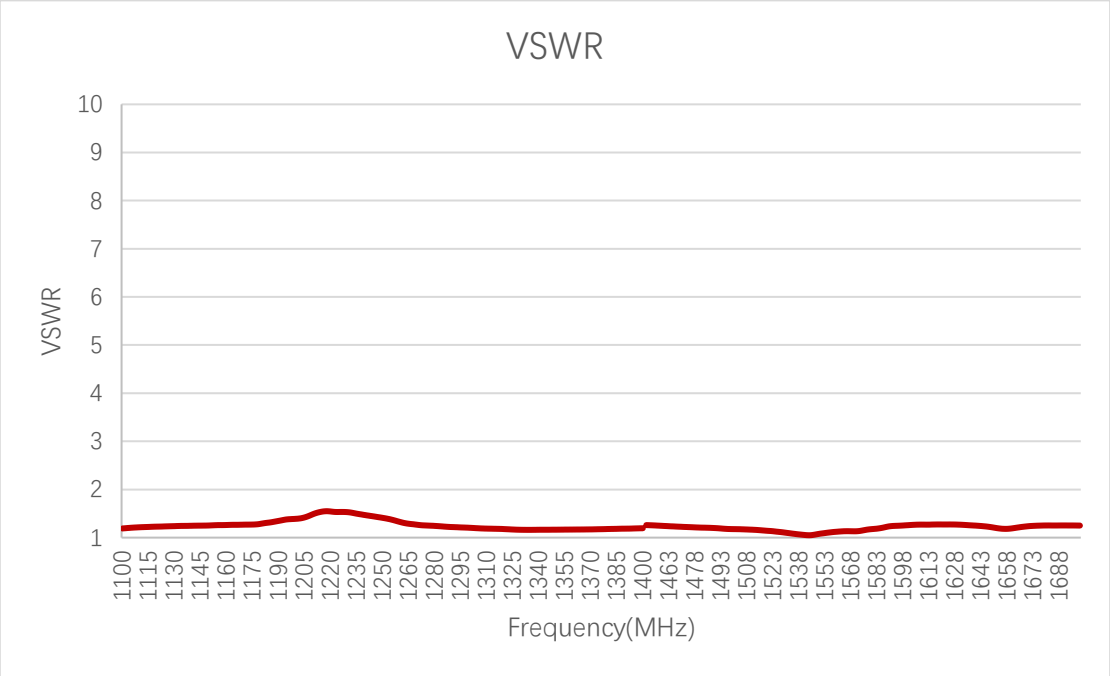
2 Drawing


109.28±0.5
89±0.5
*5055±55
RG174 BLACK
SMA MALE
TOP COVER BLACK
BOTTOM COVER BLACK
25.8±0.5
LABEL
ADHESIVE
SCREW
ST3×12

3 Detailed Performance

3.1. S-Parameter Test

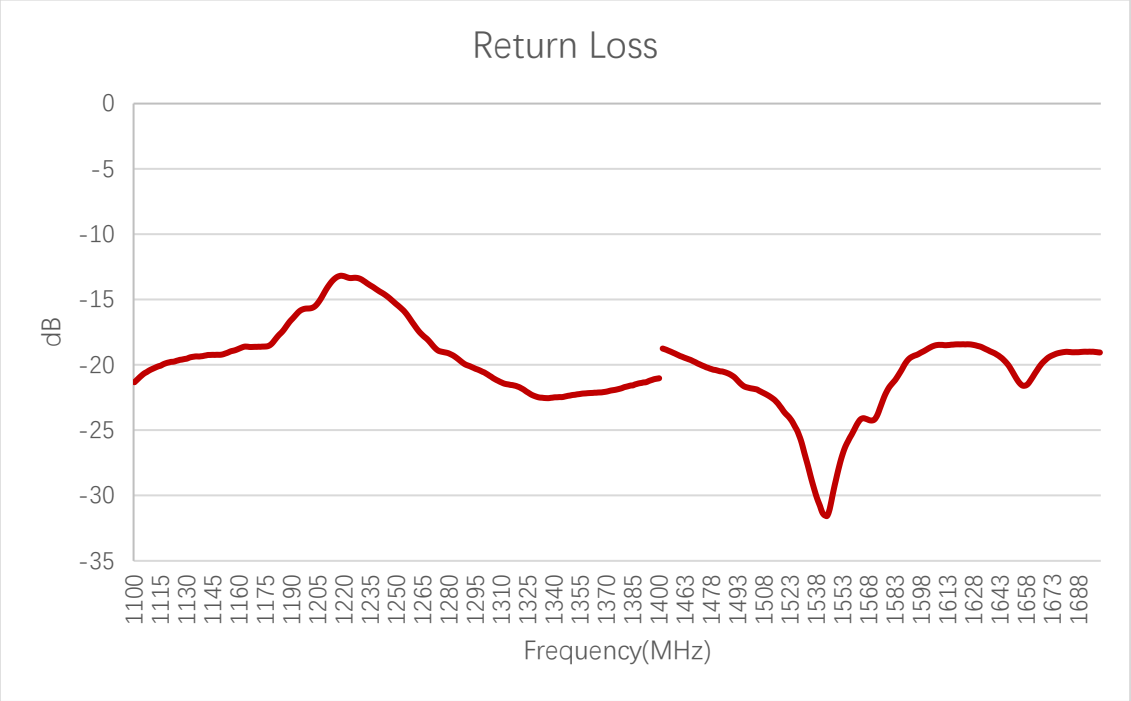
3.1.1. VSWR



VSWR

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
VSWR	1.27	1.44	1.53	1.42	1.27	1.24	1.12	1.12	1.15	1.26

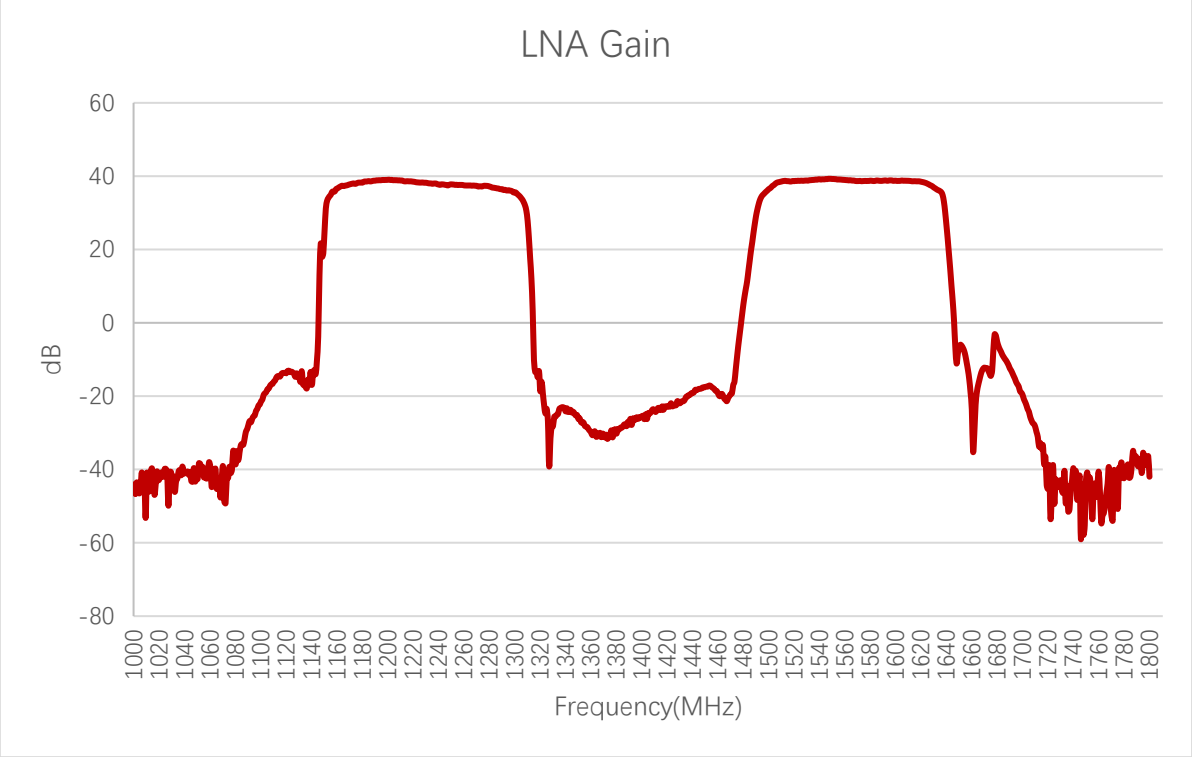
3.1.2. Return Loss



Return Loss (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Return Loss (dB)	-18.5	-14.8	-13.3	-15.1	-18.1	-19	-24.5	-24.5	-23	-18.7

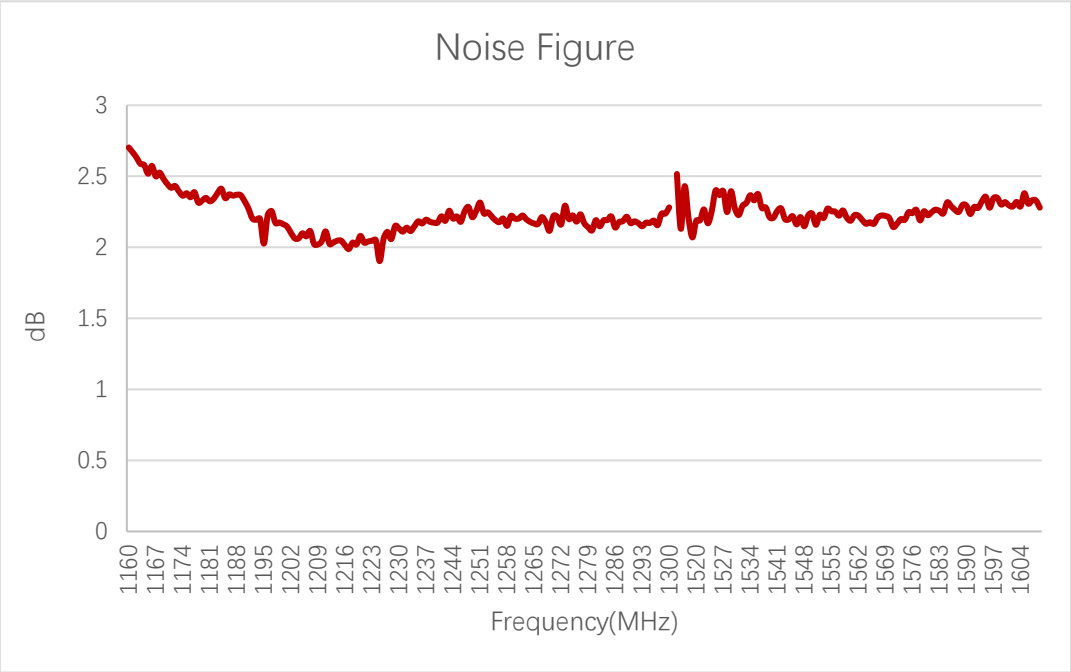
3.1.3. GNSS LNA Gain



LNA Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
LNA Gain (dB)	38.1	38.8	38.2	37.5	37.4	37.3	38.7	38.9	38.6	38.7

3.1.4. Noise Figure

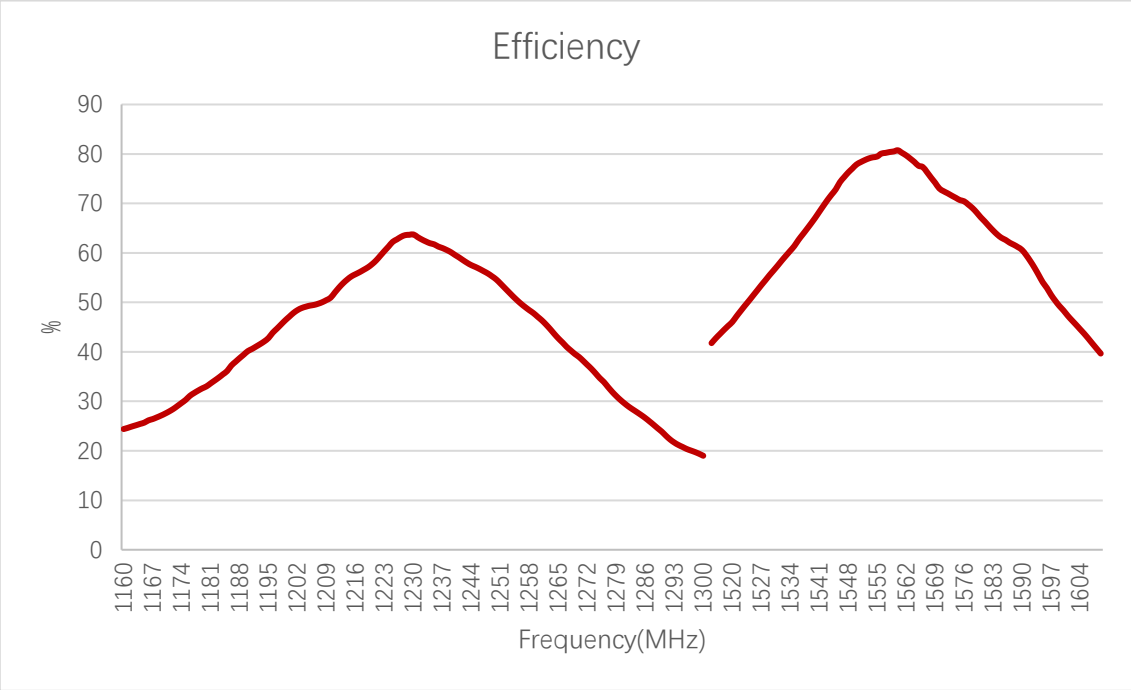


Noise Figure (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Noise Figure (dB)	2.35	2.11	2.1	2.28	2.17	2.16	2.39	2.22	2.24	2.28

3.2. Radiation Performance Test

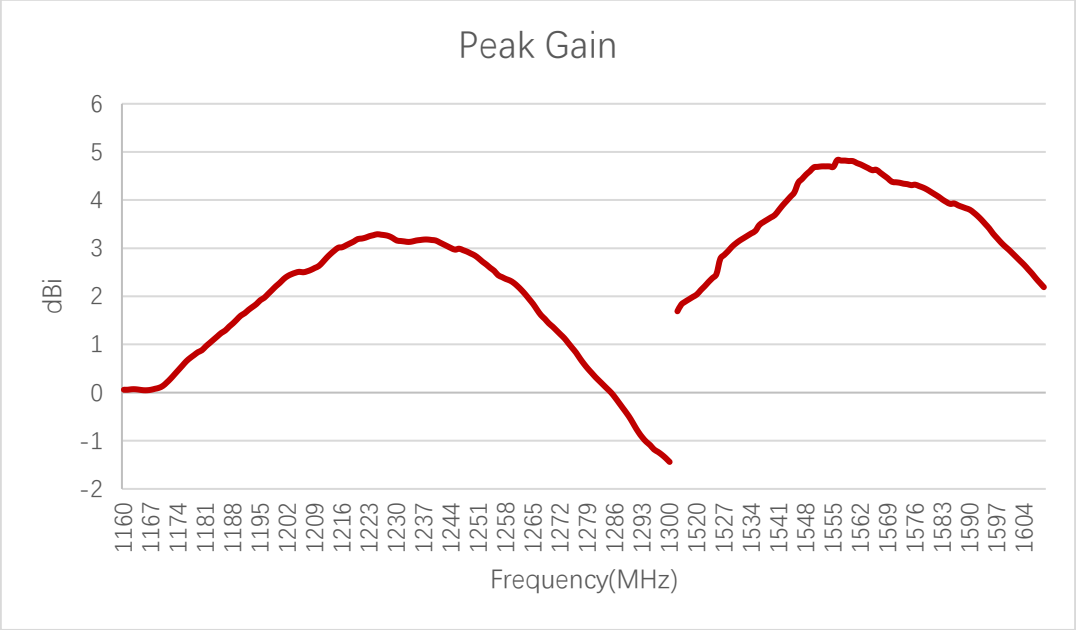
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Efficiency (%)	31	49.7	63.2	55.8	40	32	51.3	80	70.6	46.4

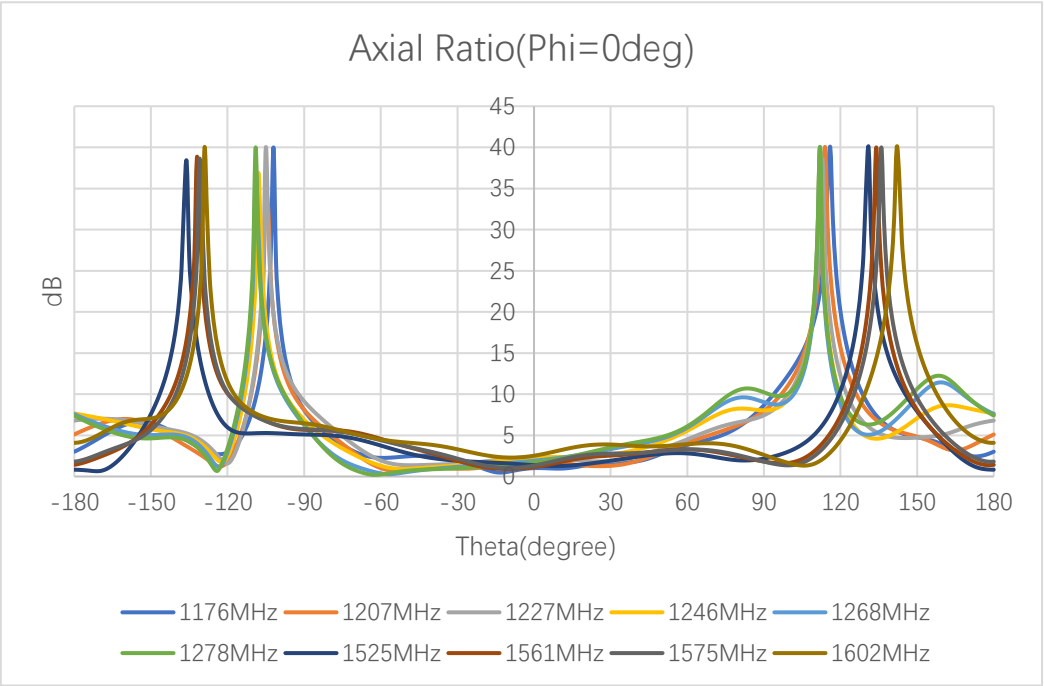
3.2.2. Peak Gain

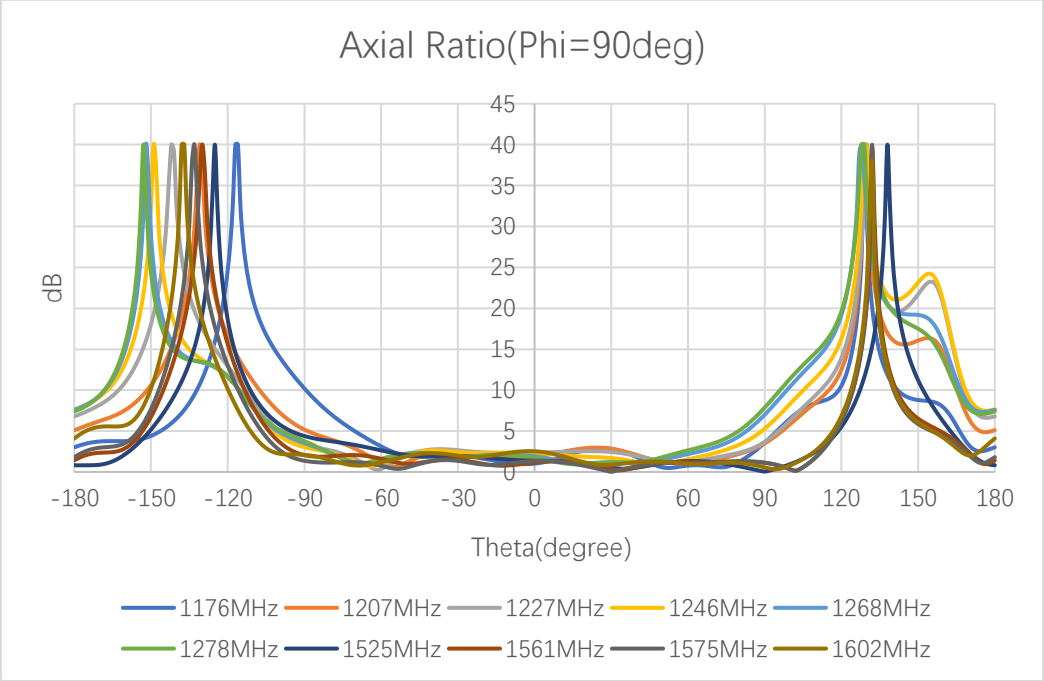


Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Peak Gain (dBi)	0.65	2.52	3.27	2.93	1.53	0.6	2.46	4.77	4.31	2.81

3.2.3. Axial Ratio

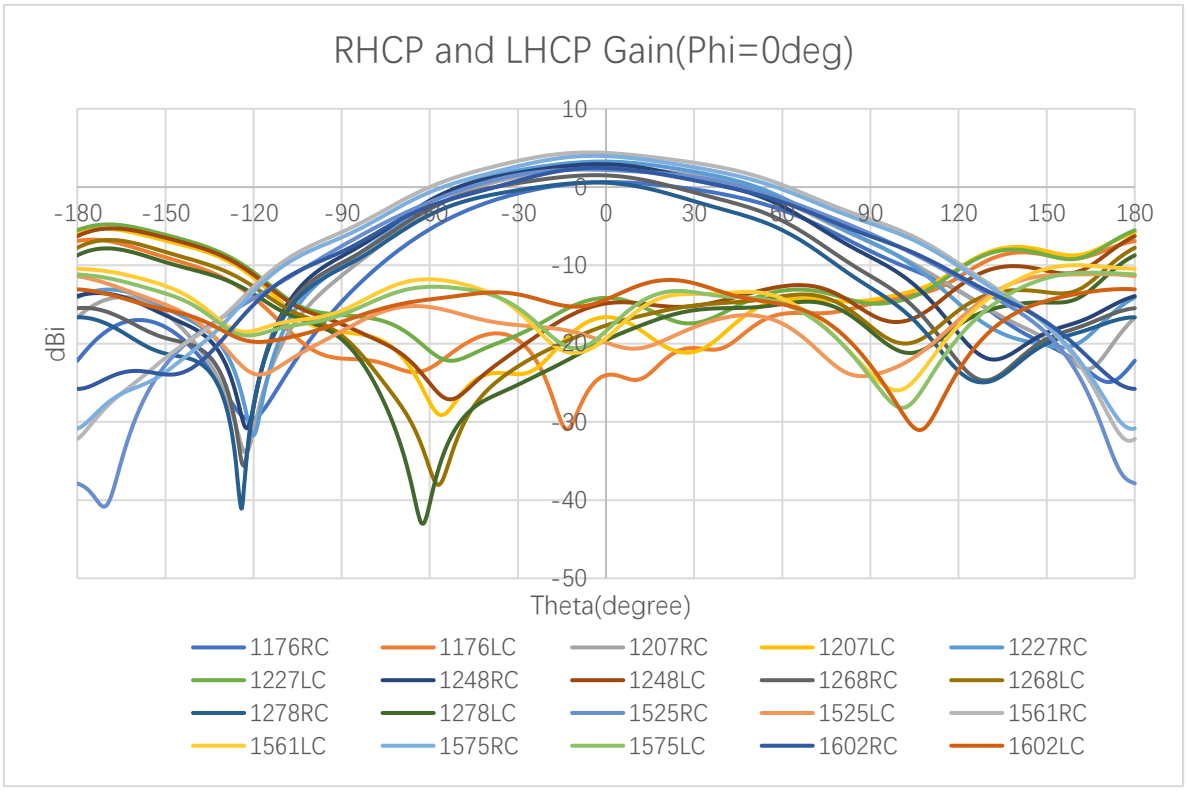


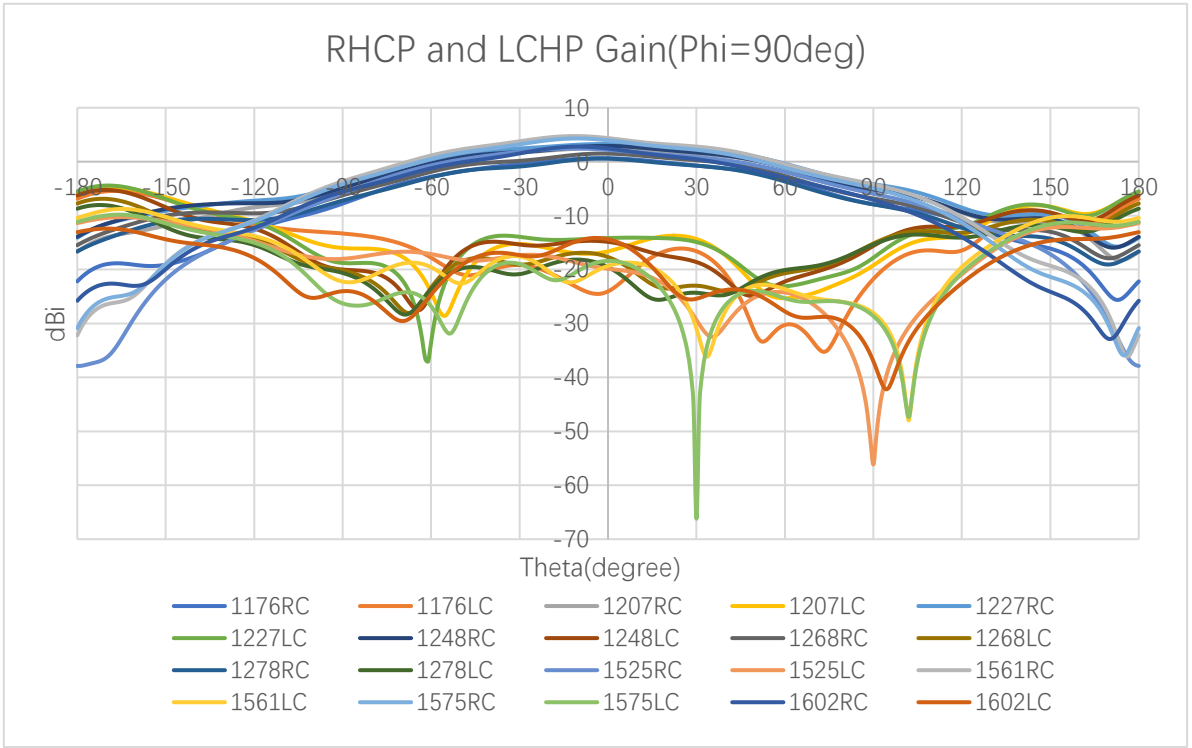


Axial Ratio (dB)

Frequency (MHz)		1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	1.01	1.92	2.35	2.28	1.91	1.72	1.37	1.13	1.32	2.52
	Phi = 90 (deg) Theta = 0 (deg)	1.01	1.92	2.35	2.28	1.91	1.72	1.37	1.13	1.32	2.52

3.2.4. 2D RHCP and LHCP Gain



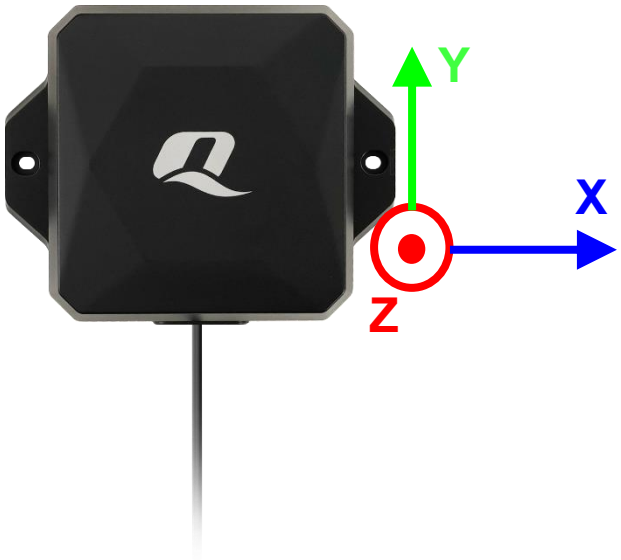


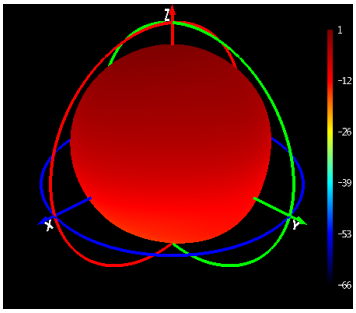
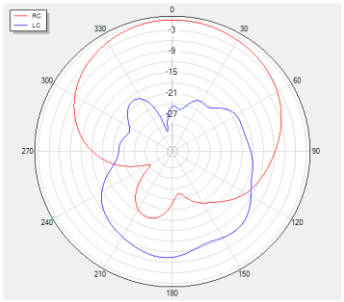
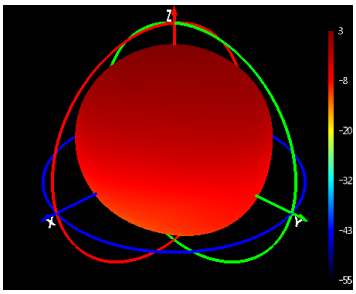
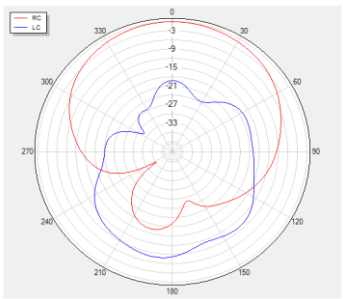
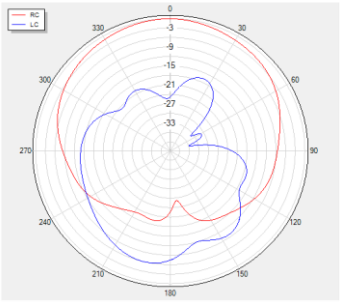
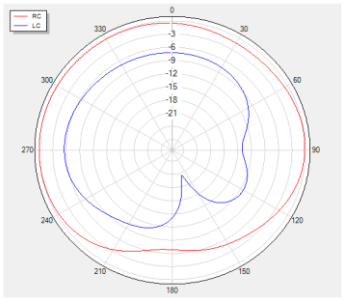
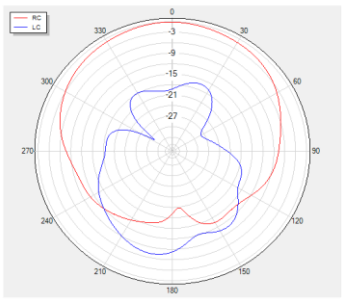
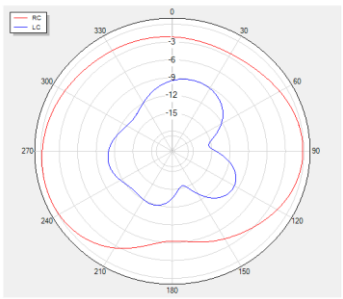
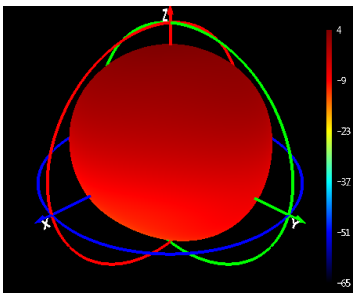
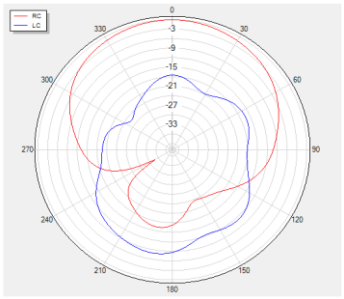
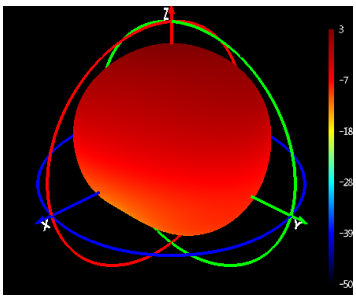
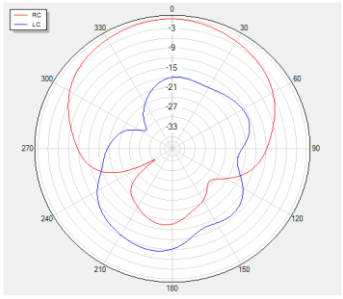
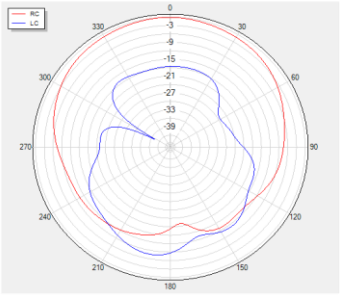
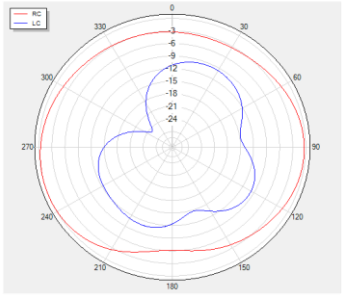
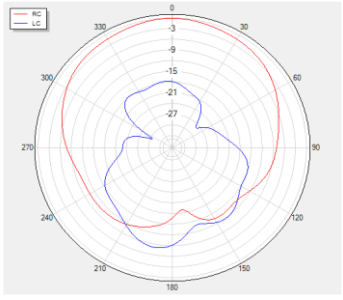
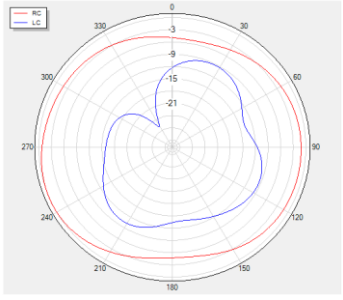
2D RHCP and LHCP Gain (dBi)

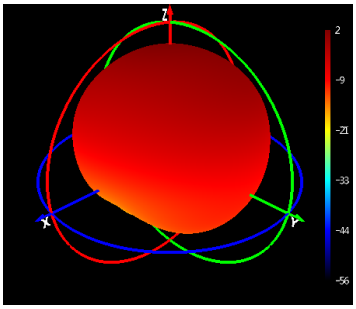
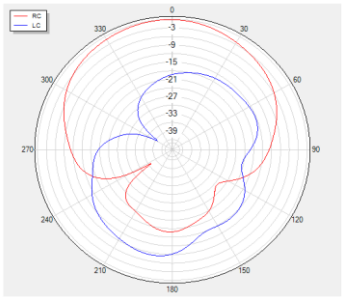
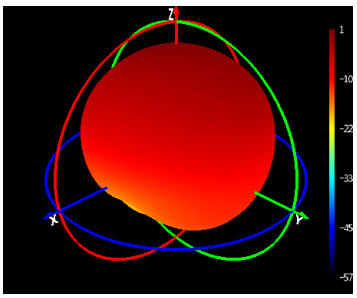
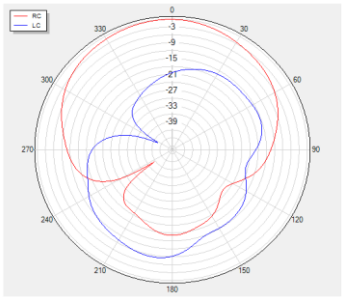
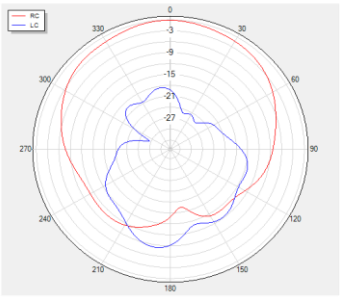
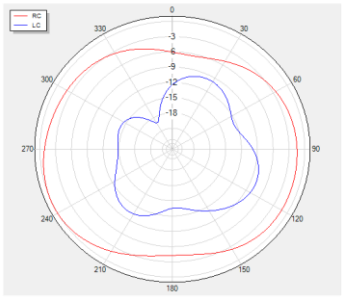
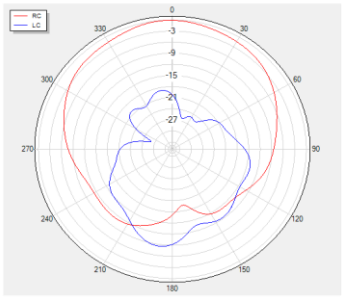
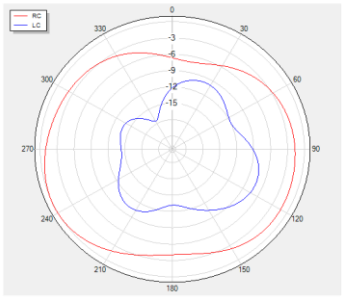
Frequency (MHz)		1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
RC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	0.64	2.51	3.26	2.92	1.49	0.56	2.19	4.37	3.96	2.44
	Phi = 90 (deg) Theta = 0 (deg)	0.64	2.51	3.26	2.92	1.49	0.56	2.19	4.37	3.96	2.44
LC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-24.1	-16.6	-14.1	-14.8	-17.6	-19.5	-19.8	-19.3	-18.4	-14.3
	Phi = 90 (deg) Theta = 0 (deg)	-24.1	-16.6	-14.1	-14.8	-17.6	-19.5	-19.8	-19.3	-18.4	-14.3

3.2.5. 3D & 2D Radiation Pattern

- Test Condition: Free Space
- Test Chamber: SH-SY-16M



1176 MHz		1207 MHz	
	Phi=0 freq=1176MHz 		Phi=0 freq=1207MHz 
Phi=90 freq=1176MHz 	Theta=90 freq=1176MHz 	Phi=90 freq=1207MHz 	Theta=90 freq=1207MHz 
1227 MHz		1248 MHz	
	Phi=0 freq=1227MHz 		Phi=0 freq=1248MHz 
Phi=90 freq=1227MHz 	Theta=90 freq=1227MHz 	Phi=90 freq=1248MHz 	Theta=90 freq=1248MHz 

1268 MHz		1278 MHz	
	Phi=0 freq=1268MHz 		Phi=0 freq=1278MHz 
Phi=90 freq=1268MHz 	Theta=90 freq=1268MHz 	Phi=90 freq=1278MHz 	Theta=90 freq=1278MHz 
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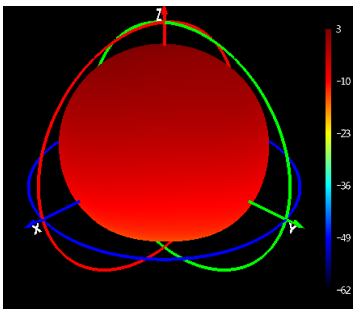
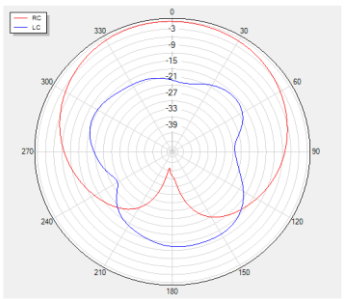
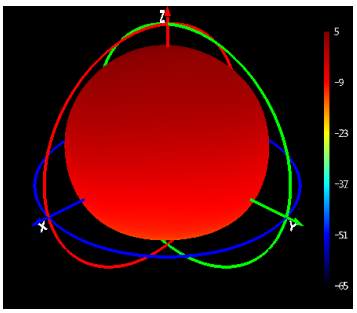
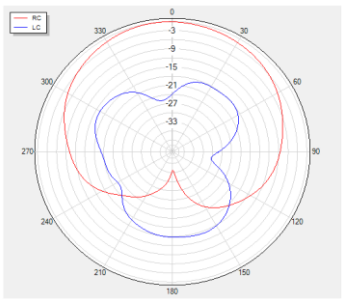
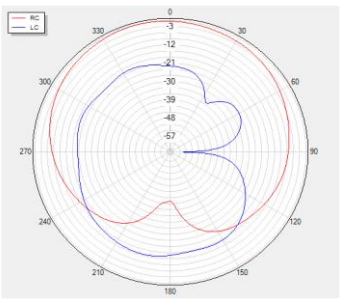
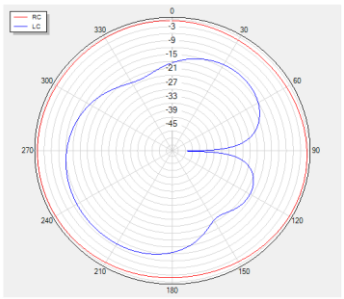
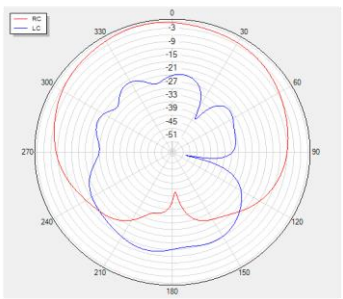
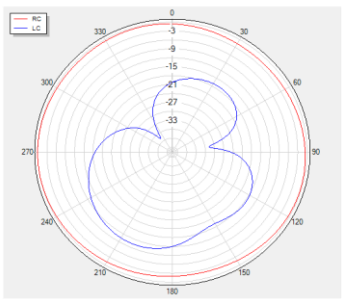
	Phi=0 freq=1525MHz 		Phi=0 freq=1561MHz 
Phi=90 freq=1525MHz 	Theta=90 freq=1525MHz 	Phi=90 freq=1561MHz 	Theta=90 freq=1561MHz 

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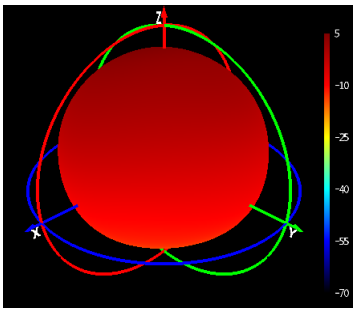
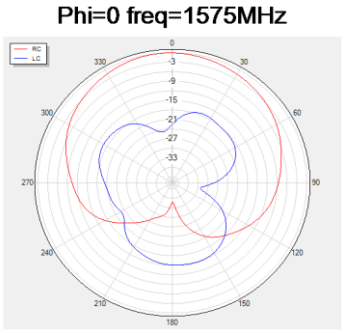
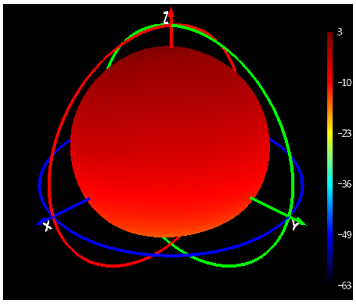
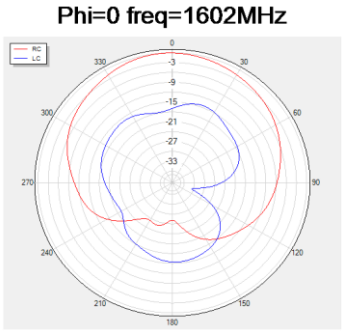
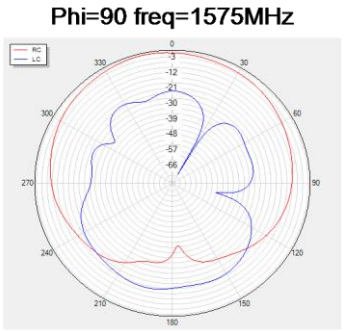
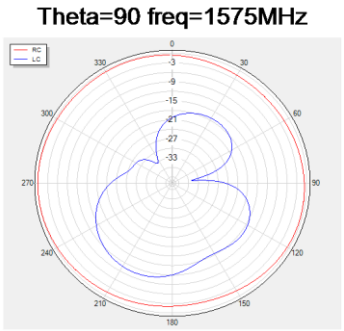
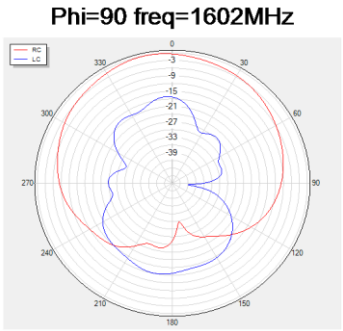
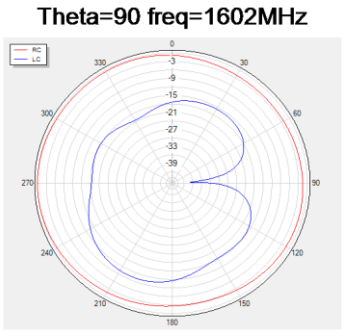
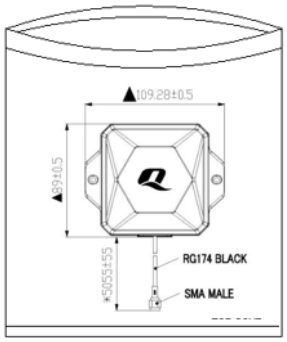
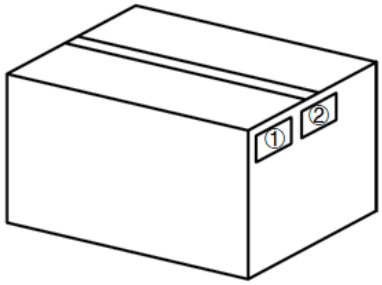
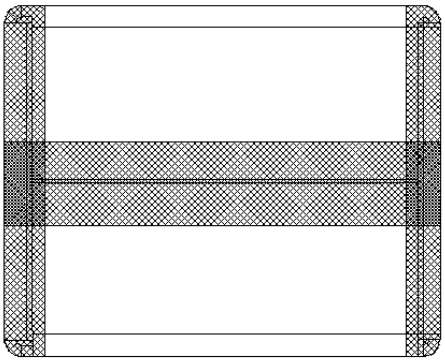
			
			

4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		1 pc antenna product in a PE bag. (1 PC Antenna / PE Bag)
2		5 pcs antenna products in an inner box. (5 PCS Antennas / Inner Box)
3		(30 Inner Boxes / Carton Box) (30 PCS Antennas / Carton Box) Estimated quantity Products that cannot fill the entire carton box are packed in a suitable size carton box. Carton Size: L × W × H = 606 × 404 × 164 mm

4		**Position for Attaching Labels** ① Carton Label ② Quality Label
5		**Sealing Cartons** H-shaped sealing cartons
Note	The initial packaging method described above is for reference only, and the final actual packaging method shall be subject to the actual shipping packaging.	

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

Or our local offices. For more information, please visit:
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Revision History

Version	Date	Author	Note
-	2024-05-29	Junsen LI/ Rojin LUO/ David LIU/ Rainey LIAO	Creation of the document
1.0	2024-05-29	Junsen LI/ Rojin LUO/ David LIU/ Rainey LIAO	First official release
1.1	2025-03-06	Rojin LUO / Riva REN	1. Update the Ingress Protection Rating (Chapter 1.2). 2. Updated the packaging (Chapter 4).
1.2	2025-06-11	Rainey LIAO	1. Updated the antenna image (Cover Page). 2. Updated the overview.

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