Antenna Datasheet

Product OC: YEGR001W8AH
Version: 1.2
Date: 2026-01-19
Status: Released

Product Name: GNSS Full Band Multiple Mount Low Profile Active External Antenna

Key Features:

Frequency Band: 1164–1300 MHz, 1525–1606 MHz
Dimensions: Φ 146.4 mm × 71.43 mm
RoHS and REACH Compliant
LNA Gain: 40 ±4 dB

Overview

The Quectel YEGR001W8AH is a high-performance active GNSS antenna designed for applications demanding multi-constellation, multi-frequency positioning with exceptional reliability in harsh environments. Combining a terminal and magnet mount design with an integrated 40 ±4 dB Low Noise Amplifier (LNA), this antenna delivers unparalleled signal reception across L1, L2, L5, and L6 bands (1164–1300 MHz, 1525–1606 MHz), making it ideal for automotive, marine, and industrial deployments where precision and durability are critical.

- **Key Features & Technical Advantages**

✓ Broadband Multi-GNSS Support

✓ Global Compatibility: Supports GPS, GLONASS, Galileo, BDS, QZSS, and IRNSS across L1/L2/L5/L6 bands.

✓ Active Amplification: 40 ±4 dB LNA gain with ultra-low noise figure (≤ 2 5 dB) enhances weak signal reception in urban canyons or remote areas.

✓ Advanced Filtering: ≥60 dB out-of-band attenuation minimizes interference from adjacent frequencies.

- **Robust Mechanical Design**

✓ IP67 Rating: Fully waterproof and dustproof, suitable for marine, automotive, and outdoor use.

✓ Terminal and Magnet Mount: Secure installation on metal surfaces with a Φ 146.4 mm × 71.43 mm low-profile housing.

✓ Extended Temperature Range: Operates in -40°C to +85°C for extreme environments.

- **Optimized RF Performance**

✓ Max Peak Gain: 5.5 dBi.

✓ Low Axial Ratio ensuring minimal polarization mismatch.

- **Flexible Integration**

✓ Wide Voltage Range: Operates at 3–12 V with low power consumption (19.6 ±4 mA).

- **Target Applications**

✓ The EGR001W8AH is engineered for scenarios requiring high-precision, ruggedized GNSS solutions:

✓ Autonomous Vehicles: Lane-level navigation for ADAS and self-driving systems.

✓ Marine Navigation: Offshore vessel tracking and buoy positioning.

✓ Industrial IoT: Heavy machinery guidance and logistics asset monitoring.

✓ Surveying & Geodesy: Centimeter-accurate 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

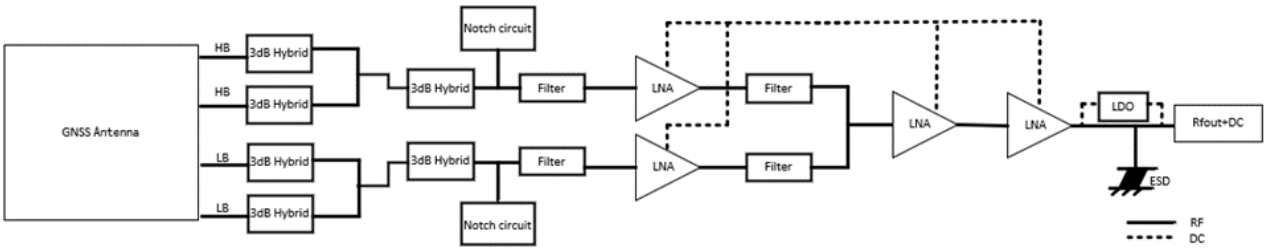
Band / Frequency (MHz)	GPS L5 GALILEO E5a BDS B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BDS B2b	GPS L2 QZSS L2C	GLONASS G2	BDS B3	GALILEO E6 QZSS L6	L-Band	BDS B1I	GPS L1 GALILEO E1 BDS B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
VSWR	1.34	1.24	1.08	1.2	1.31	1.33	1.07	1.11	1.1	1.03
Return Loss (dB)	-16.8	-19.3	-27.8	-20.8	-17.4	-16.8	-28.7	-25.4	-25.9	-35.5
Efficiency (%)	53.3	55.4	67	53.8	37.8	30	48.8	76.7	70.8	58.5
Peak Gain (dBi)	4.3	4.7	5.4	4.6	3.1	2.2	3.3	5.5	5.1	4.5
Axial Ratio (dB)	0.47	0.41	0.74	0.95	1.07	1.06	0.87	0.92	1.01	1.21

LNA Electrical	
LNA Gain	40 ±4 dB
Noise Figure	≤ 2.5 dB
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	≥ 60dB f0 & f1 ±100 MHz f0 (1164 MHz, 1300 MHz) f1 (1525 MHz, 1609 MHz)
Working Voltage	3–12 V
Working Current	19.6 ±4 mA
Impedance	50 Ω

1.2. Mechanical & Environmental

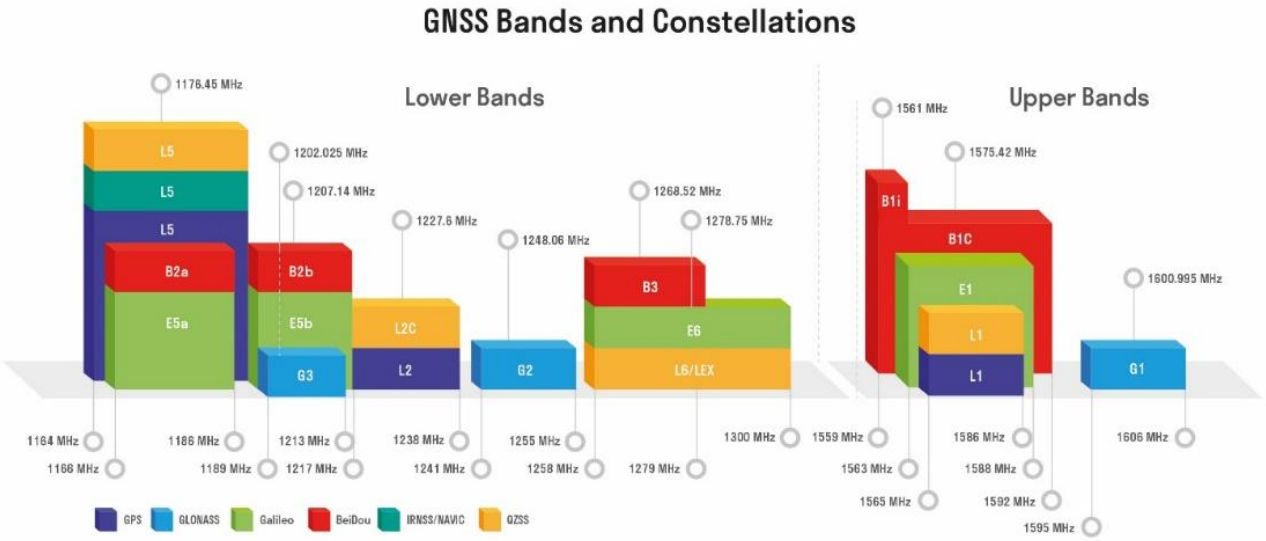
Mechanical	
Antenna Dimensions	Φ 146.4 mm × 71.43 mm
Material	PC & White
Connector Type	TNC Female
Mounting Type	Terminal
Weight	Typ. 347 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Ingress Protection (IP) Rating	IP67
RoHS and REACH Compliant	Yes

1.3. Block Diagram (Active Antenna)

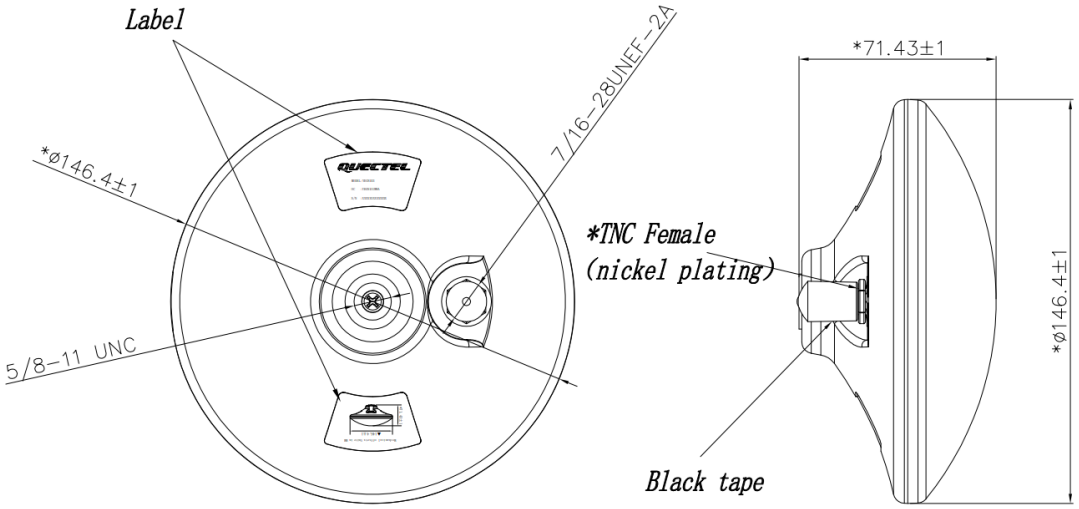


1.4. Supported GNSS Frequency Bands

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

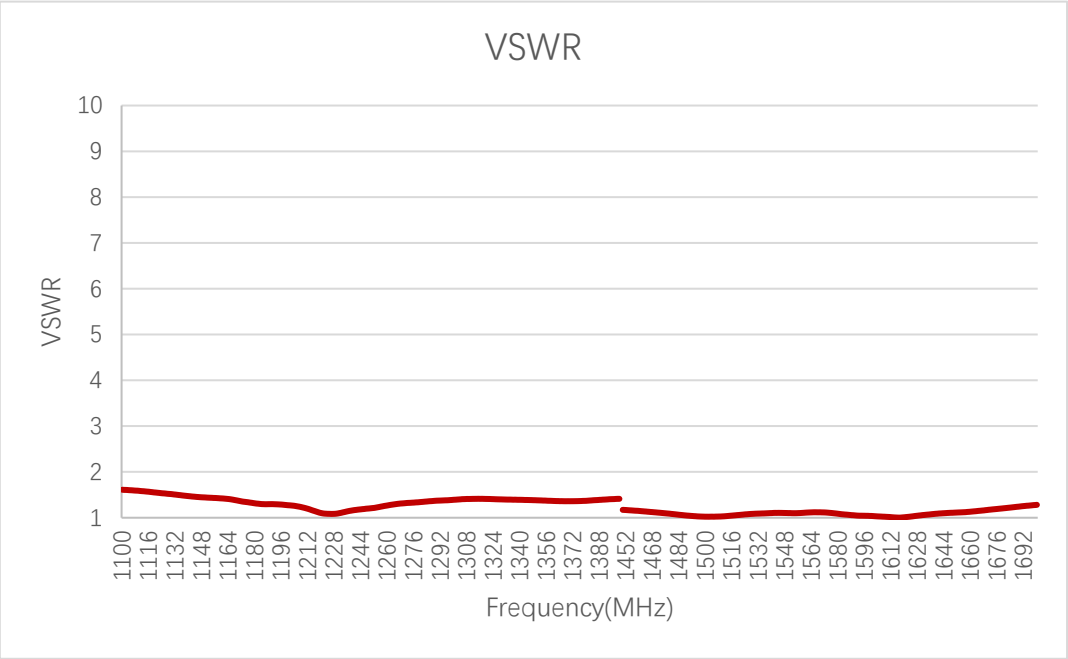
2 Drawing


Label
*ø146.4±1
5/8-11 UNC
7/16-28UNEF-2A
*TNC Female
(nickel plating)
Black tape
*71.43±1
*ø146.4±1

3 Detailed Performance

3.1. S-Parameter Test

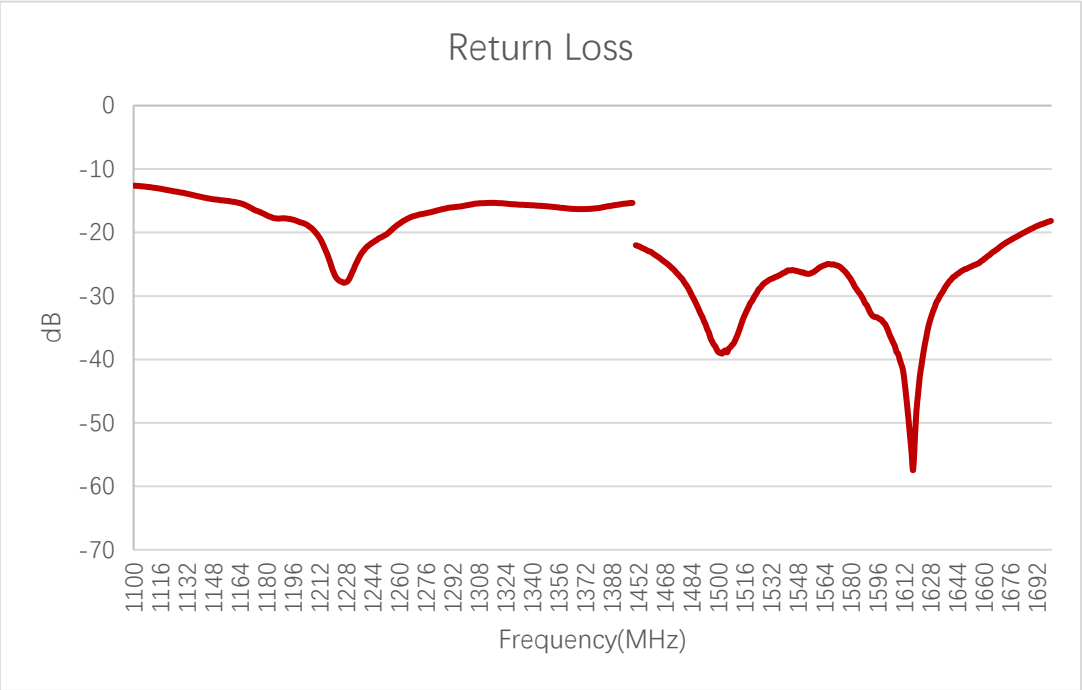
3.1.1. VSWR



VSWR

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
VSWR	1.34	1.24	1.08	1.2	1.31	1.33	1.07	1.11	1.1	1.03

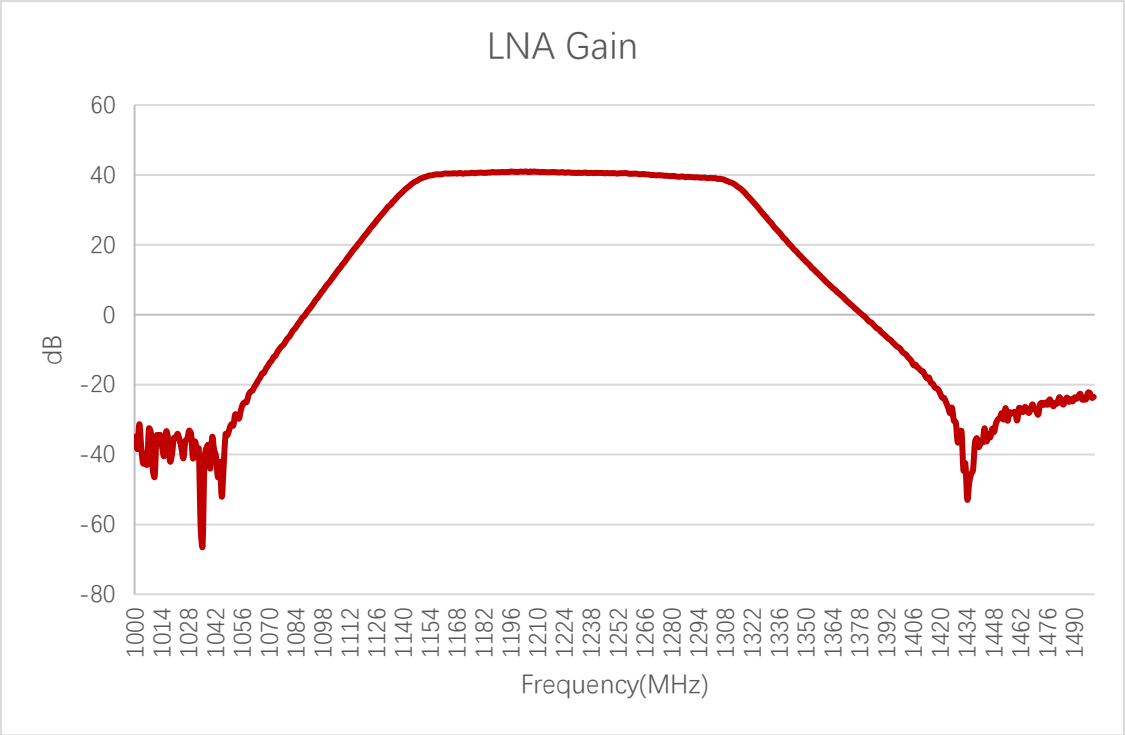
3.1.2. Return Loss

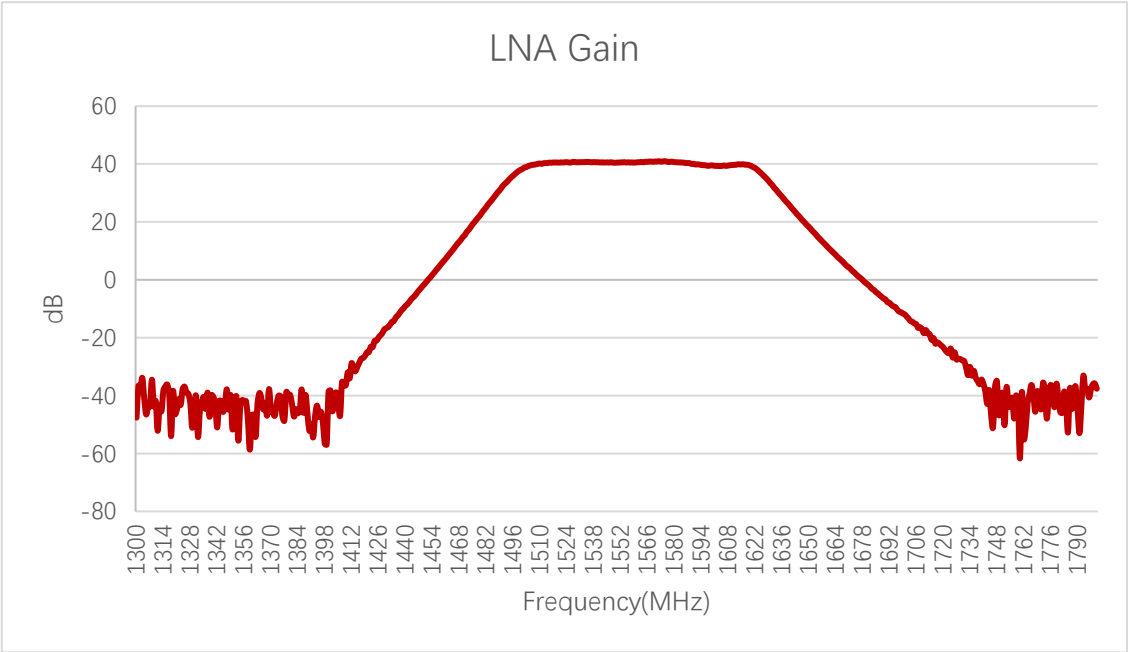


Return Loss (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Return Loss (dB)	-16.8	-19.3	-27.8	-20.8	-17.4	-16.8	-28.7	-25.4	-25.9	-35.5

3.1.3. GNSS LNA Gain

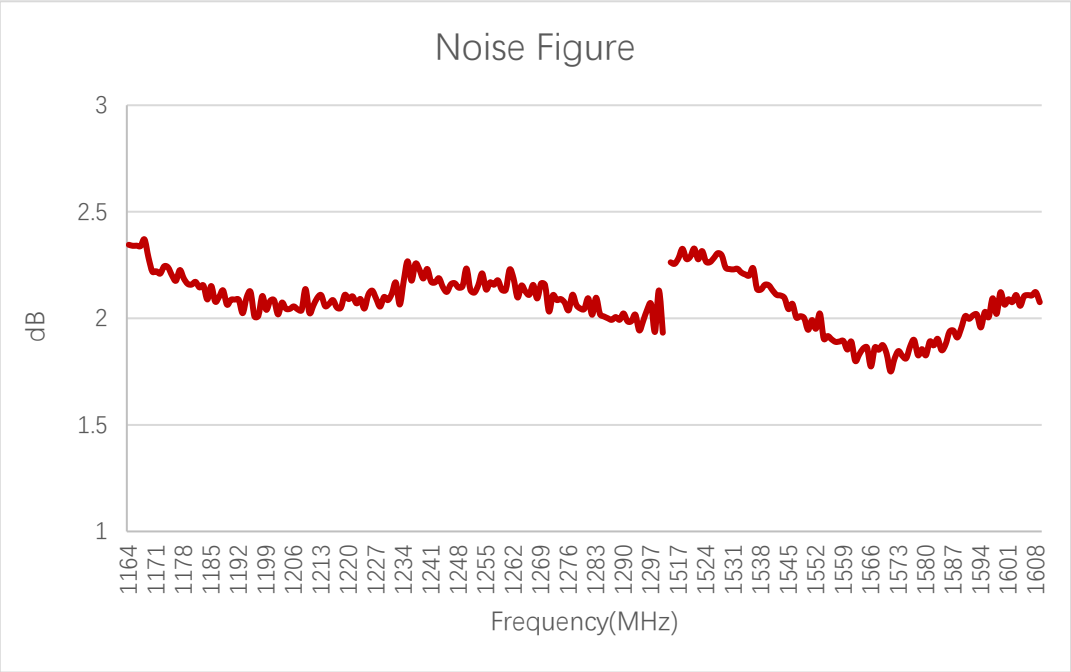




LNA Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
LNA Gain (dB)	40.6	40.8	40.6	40.5	40.1	39.6	40.5	40.6	40.9	39.3

3.1.4. Noise Figure

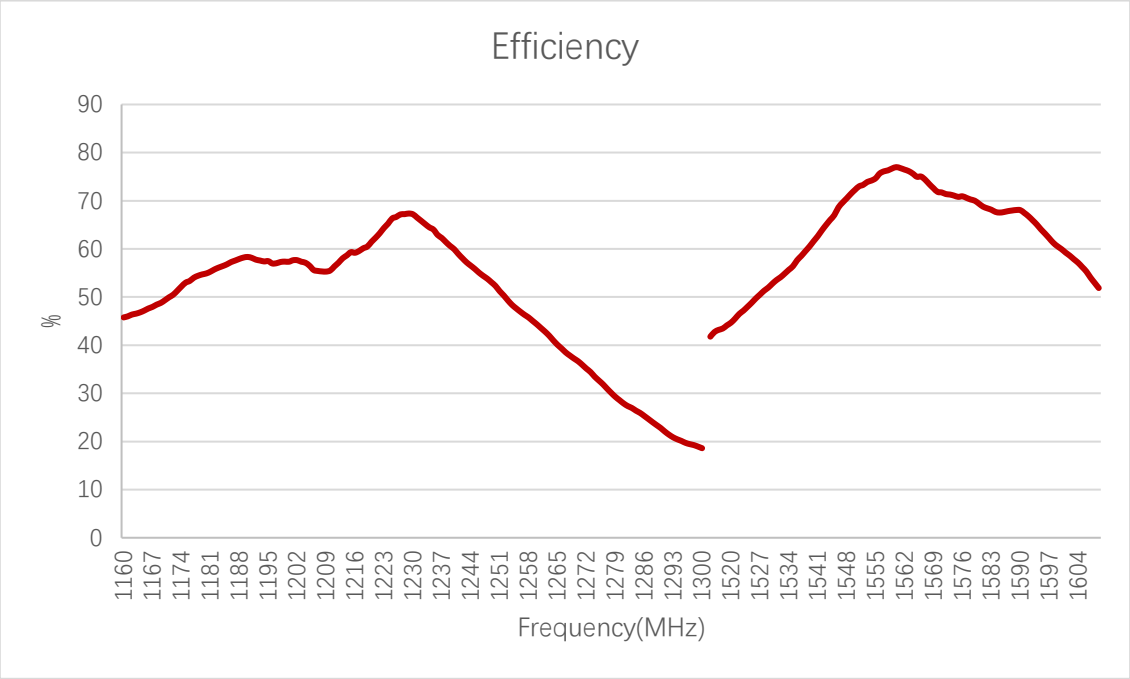


Noise Figure (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Noise Figure (dB)	2.17	2.04	2.09	2.14	2.09	2.06	2.26	1.89	1.81	2.07

3.2. Radiation Performance Test

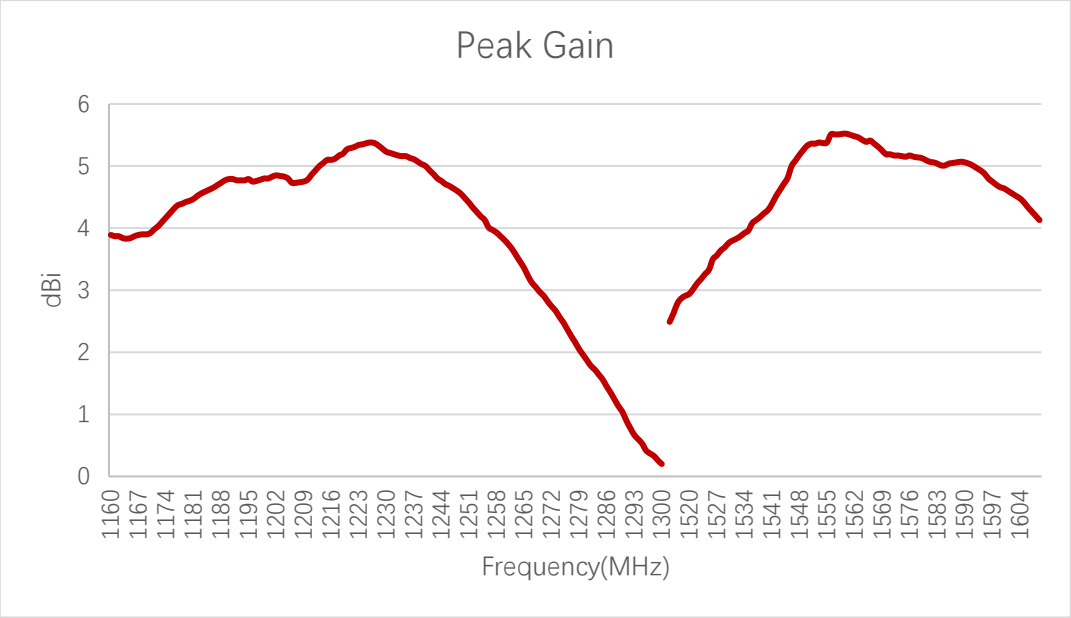
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Efficiency (%)	53.3	55.4	67	53.8	37.8	30	48.8	76.7	70.8	58.5

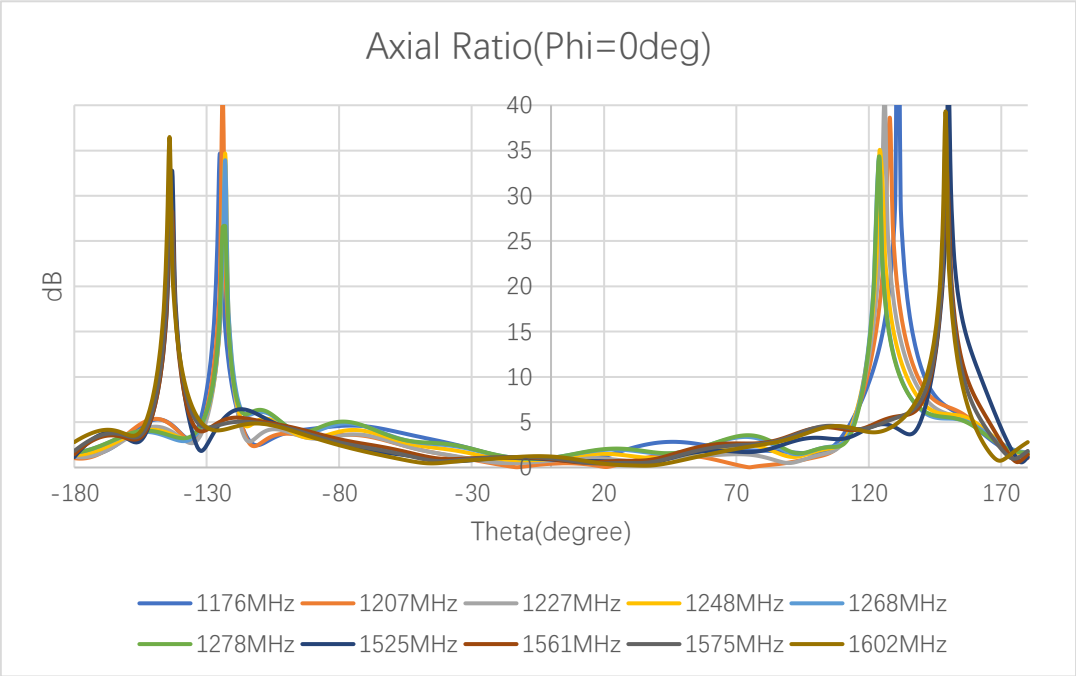
3.2.2. Peak Gain

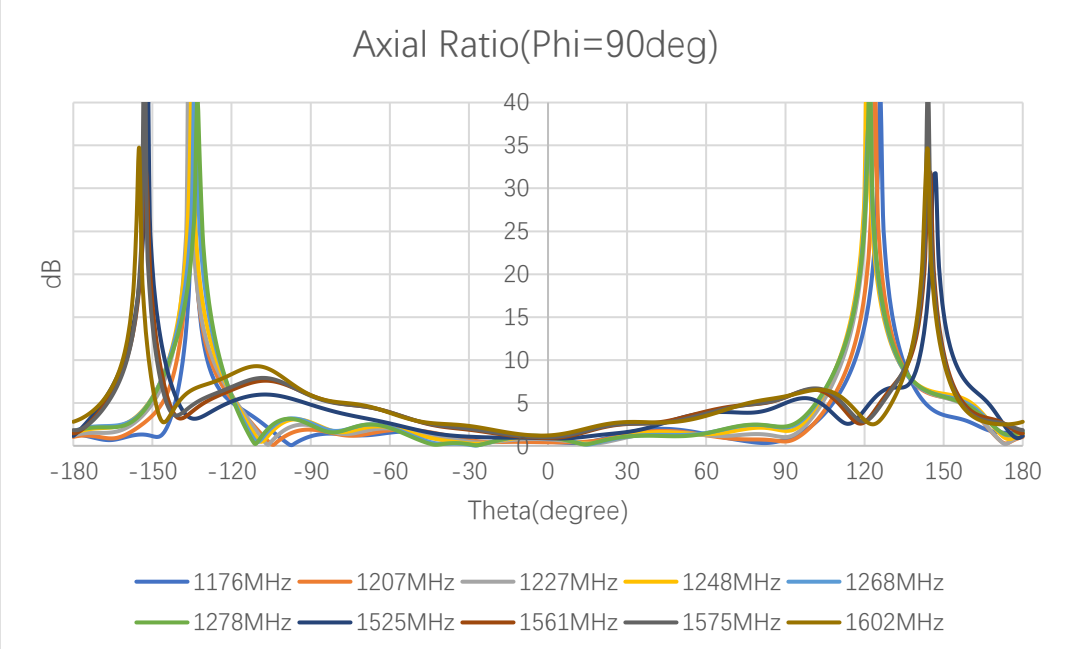


Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Peak Gain (dBi)	4.3	4.7	5.4	4.6	3.1	2.2	3.3	5.5	5.1	4.5

3.2.3. Axial Ratio

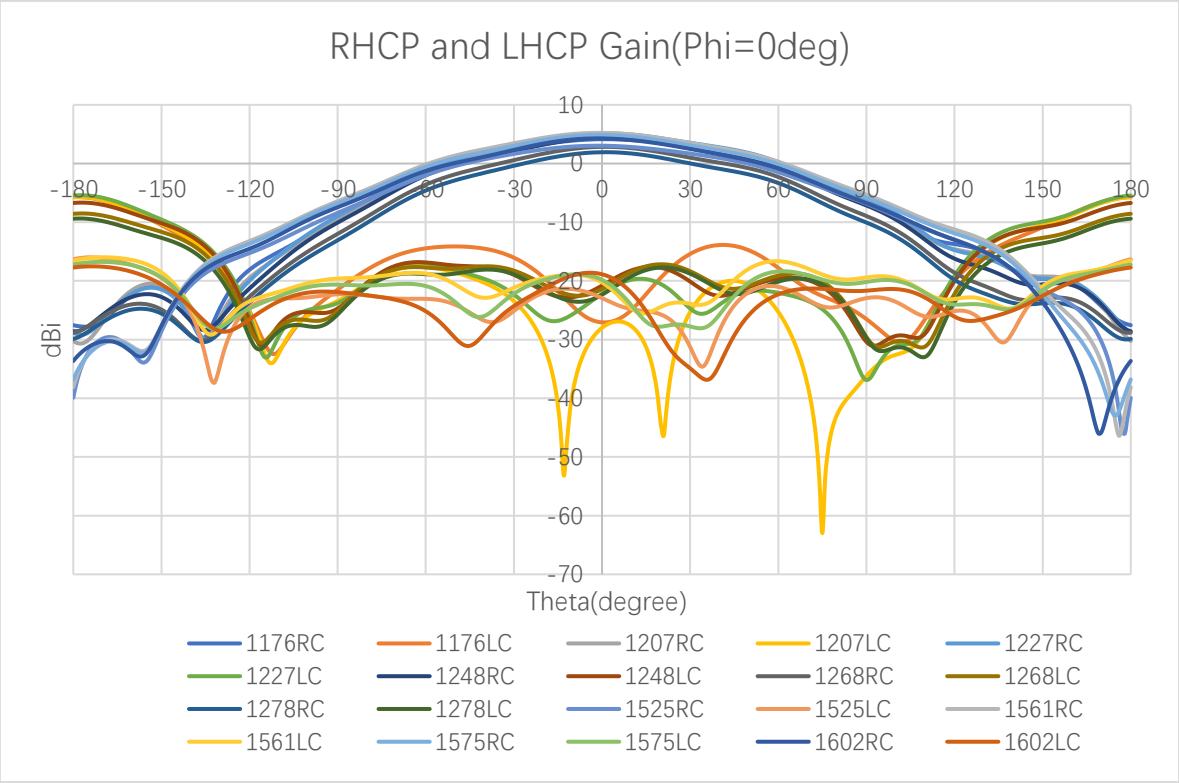


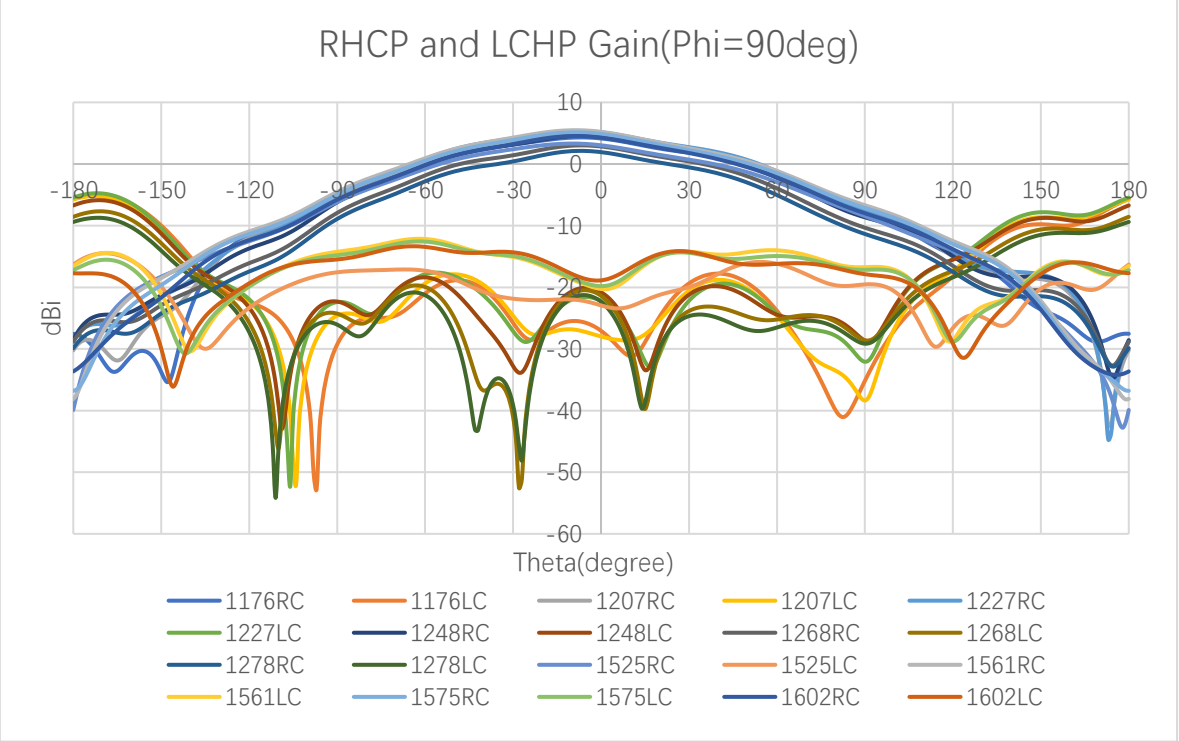


Axial Ratio (dB)

Frequency (MHz)		1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	0.47	0.41	0.74	0.95	1.0	1.06	0.87	0.92	1.01	1.21
	Phi = 90 (deg) Theta = 0 (deg)	0.47	0.41	0.74	0.95	1.0	1.06	0.87	0.92	1.01	1.21

3.2.4. 2D RHCP and LHCP Gain



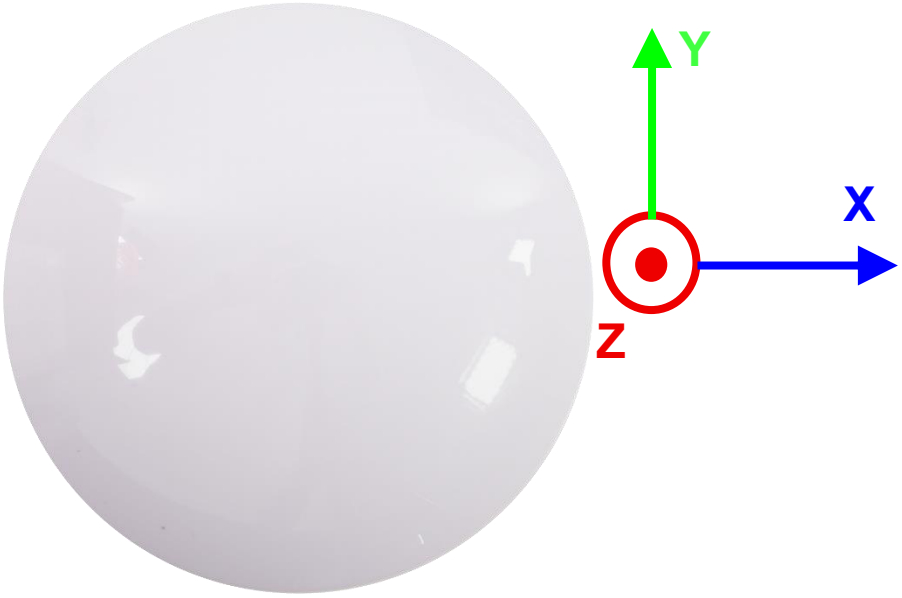


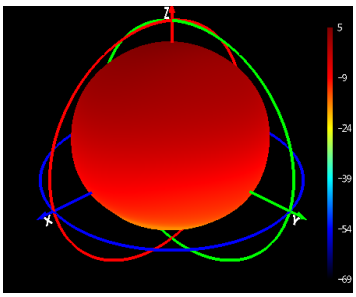
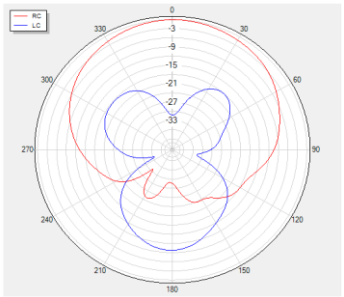
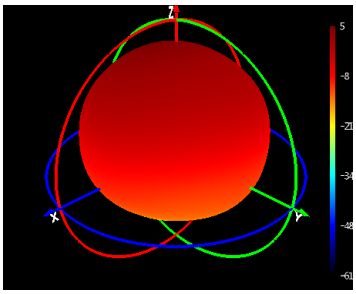
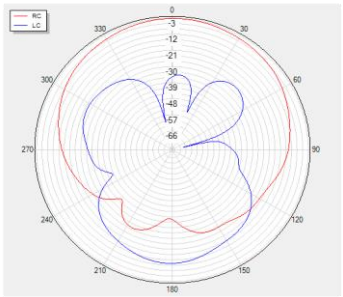
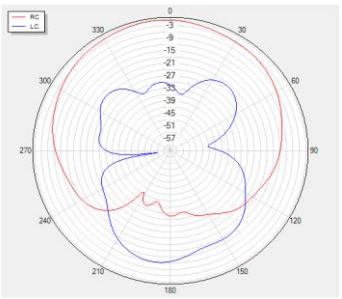
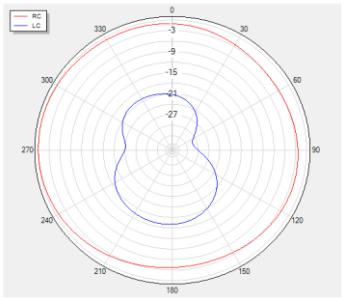
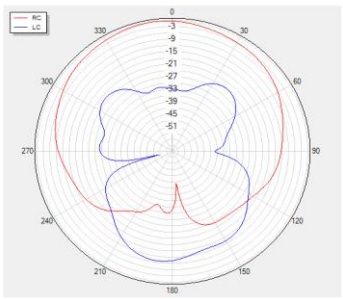
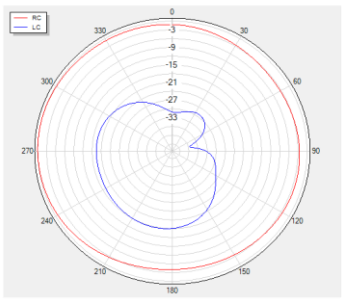
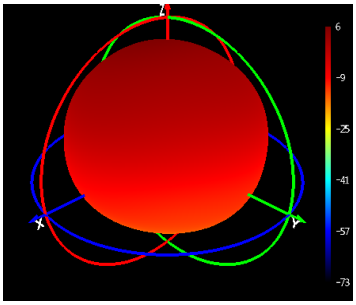
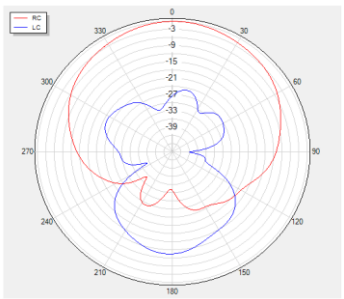
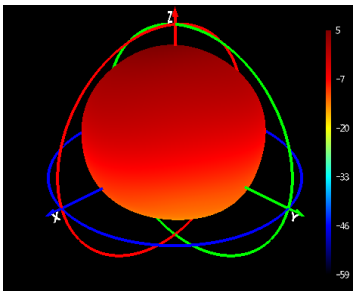
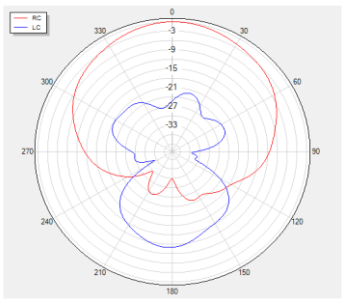
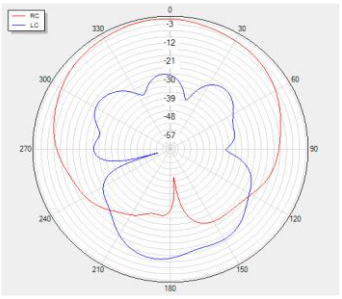
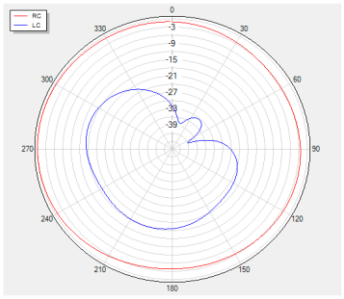
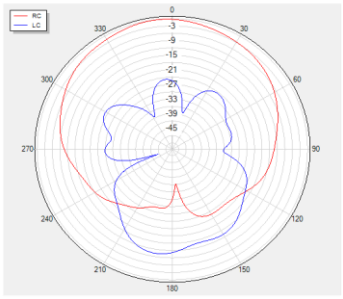
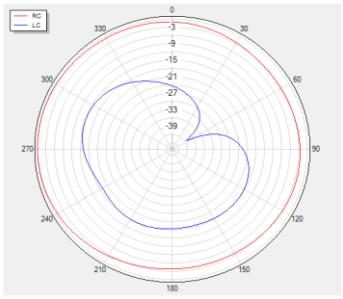
2D RHCP and LHCP Gain (dBi)

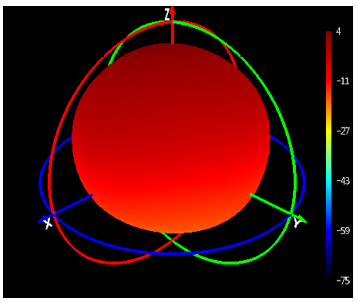
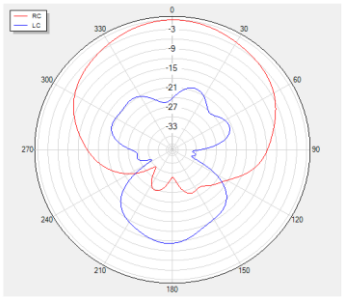
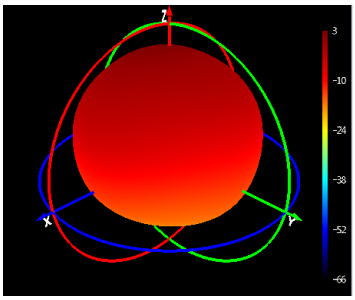
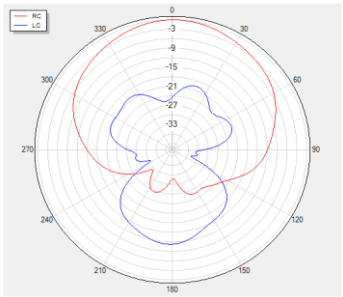
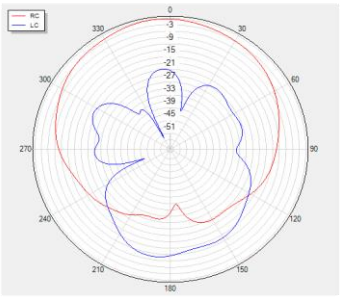
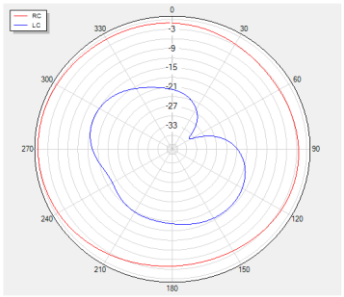
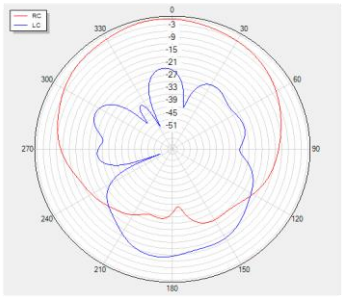
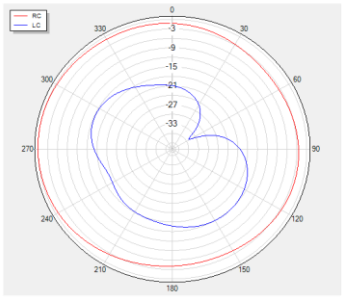
Frequency (MHz)		1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
RC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	4.14	4.49	5.13	4.42	2.84	1.92	3.03	5.22	4.87	4.28
	Phi = 90 (deg) Theta = 0 (deg)	4.14	4.49	5.13	4.42	2.84	1.92	3.03	5.22	4.87	4.28
LC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-27	-27.9	-22.2	-20.8	-21.3	-22.3	-22.9	-20.2	-19.8	-18.8
	Phi = 90 (deg) Theta = 0 (deg)	-27	-27.9	-22.2	-20.8	-21.3	-22.3	-22.9	-20.2	-19.8	-18.8

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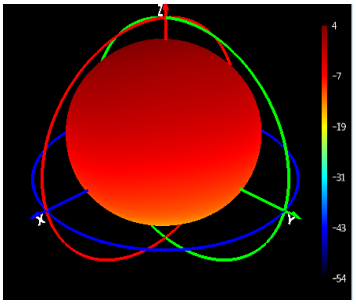
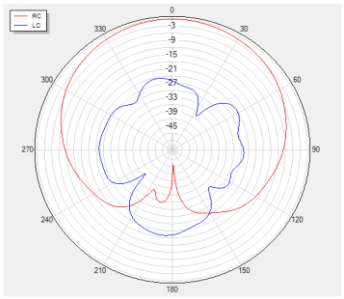
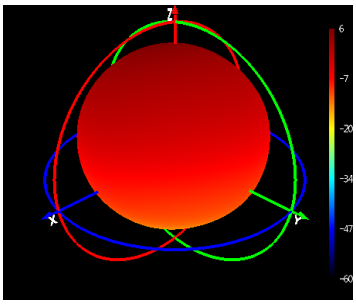
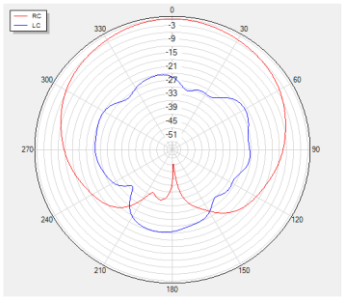
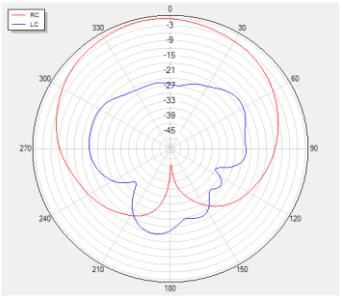
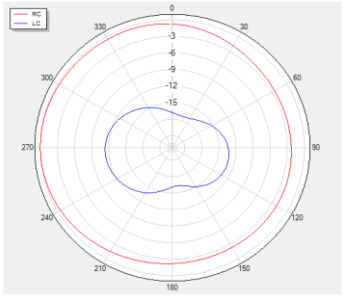
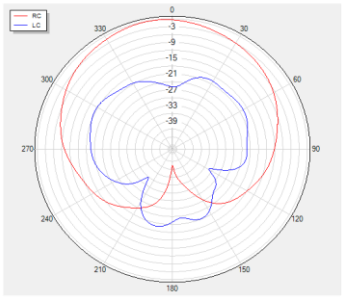
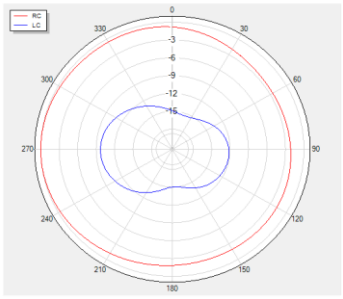
	Phi=0 freq=1525MHz 		Phi=0 freq=1561MHz 
Phi=90 freq=1525MHz 	Theta=90 freq=1525MHz 	Phi=90 freq=1561MHz 	Theta=90 freq=1561MHz 

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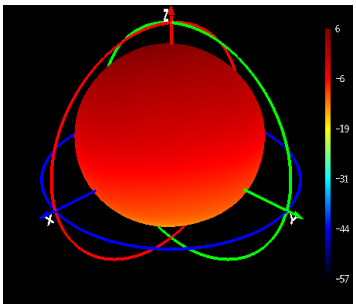
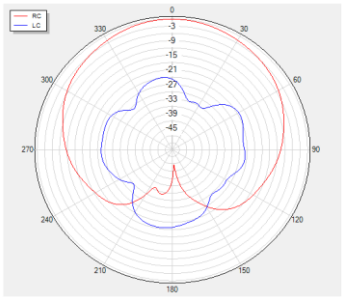
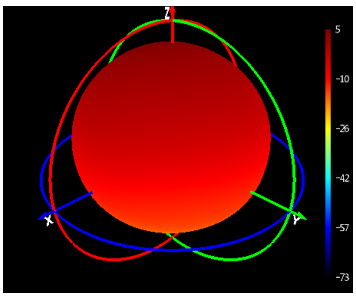
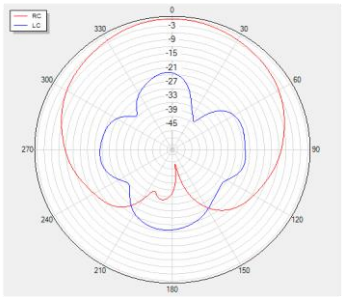
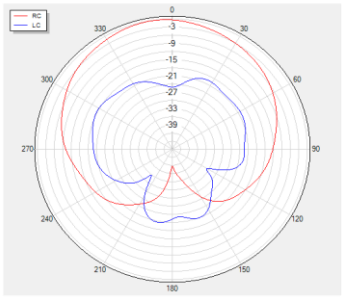
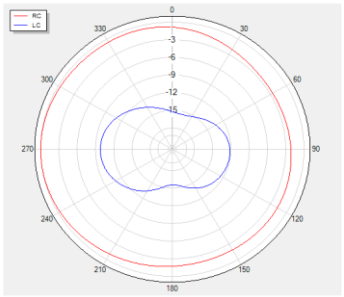
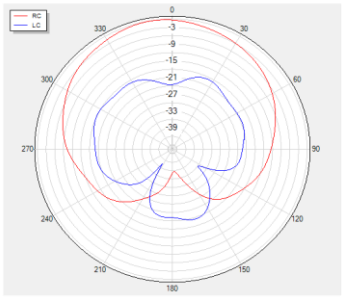
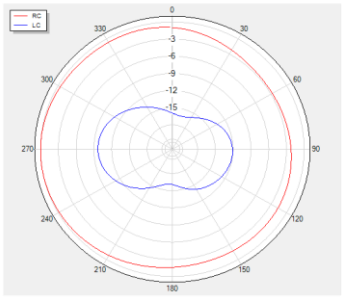
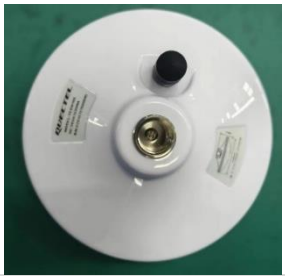
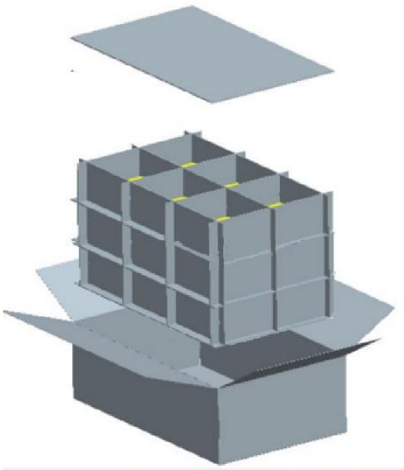
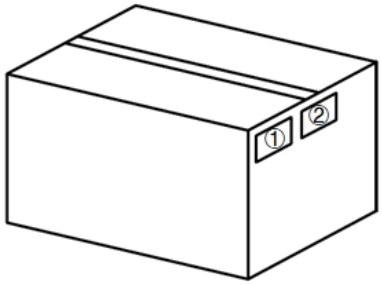
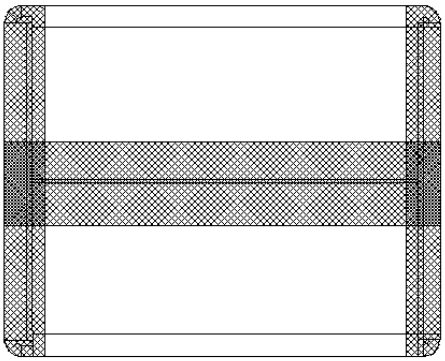
	Phi=0 freq=1575MHz 		Phi=0 freq=1602MHz 
Phi=90 freq=1575MHz 	Theta=90 freq=1575MHz 	Phi=90 freq=1602MHz 	Theta=90 freq=1602MHz 

4 Packaging

Step	Packaging Picture/2D Picture	Description
1		Product drawing
2	  	Wrap the product in bubble wrap and place it on an EPE foam liner. Then, insert the products into the knife cards, with one product per cavity. Each card layer holds six products.
3		Place separator boards at the top and bottom, and then stack three layers of loaded knife cards. (18 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 = 600 × 405 × 300 mm

4		**Position for Attaching Labels** ① Carton Label ② Quality Label
5		**Sealing Cartons** H-shaped 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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Email: info@quectel.com

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

Version	Date	Author	Note
-	2024-10-22	Junsen Li/ Lucky Feng/ David Liu/ Rainey Liao	Creation of the document
1.0	2024-10-22	Junsen Li/ Lucky Feng/ David Liu/ Rainey Liao	First official release
1.1	2025-06-20	Lucky Feng/ Rainey Liao	1. Updated the overview. 2. Updated the connector and mounting type (Chapter 1.2).
1.2	2026-01-19	Strong Qiang	Updated the packaging (Chapter 4).

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