Antenna Datasheet

Product OC: YFGC000WWAM
Version: 2.1
Date: 2025-07-01
Status: Released

Product Name: GNSS Adhesive & Soldering Mount Ceramic Patch Passive Embedded Antenna

Key Features:

Frequency Band: 1164–1189 MHz, 1559–1606 MHz
Dimensions: 25 × 25 × 4 mm + 18 × 18 × 4 mm
RoHS and REACH Compliant
Peak Gain: 0.58 dBi

Overview

The Quectel YFGC000WWAM is an innovative dual-band passive GNSS antenna designed to support both L1 (1559–1606 MHz) and L5 (1164–1189 MHz) frequency bands, delivering enhanced positioning accuracy for next-generation navigation applications. With its unique dual-element ceramic design (25 mm × 25 mm × 4 mm + 18 mm × 18 mm × 4 mm), this antenna provides robust performance across multiple satellite systems while maintaining a compact footprint for space-constrained devices.

Key Features & Technical Advantages

Dual-Band GNSS Support

Simultaneously receives GPS L1/L5, Galileo E1/E5a, BDS B1/B2a, and QZSS L1/L5 signals

Enables higher positioning accuracy through multi-frequency signal processing

Frequency ranges: 1164–1189 MHz (L5) and 1559–1606 MHz (L1)

Optimized RF Performance

RHCP polarization for reduced multipath effects

Low VSWR for efficient power transfer

Low axial ratio, ensuring signal purity

Robust Mechanical Design

Dual ceramic elements with adhesive mounting for vibration resistance

Wide temperature range: -40 °C to +85 °C operation (industrial-grade reliability)

RoHS/REACH compliant

Simplified Integration

Adhesive & Soldering mount

39 mm × 39 mm reference PCB design included in datasheet

Target Applications

Ideal for devices requiring multi-band GNSS precision:

Autonomous Vehicles: Enhanced lane-level positioning for ADAS systems

Surveying Equipment: Centimeter-level precision for geodetic applications

IoT Asset Trackers: Reliable location data in urban canyons

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: On 39 mm × 39 mm PCB

1.1. Electrical

Electrical	
Frequency Range	1164–1189 MHz, 1559–1606 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

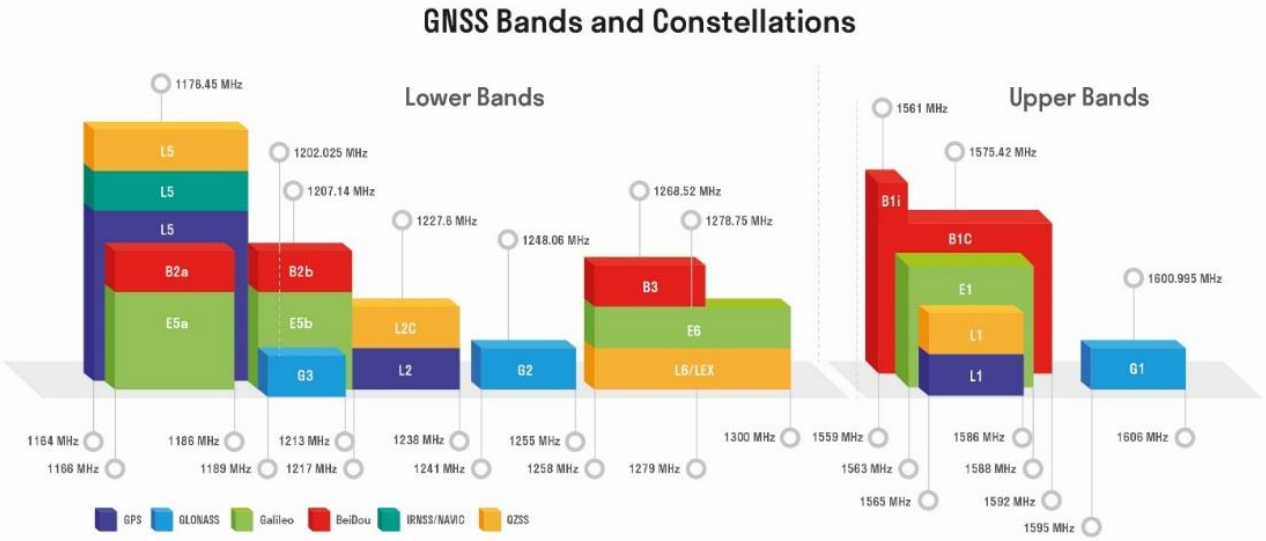
Band / Frequency (MHz)	GPS L5 GALILEO E5a BDS B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BDS B2b	GPS L2 QZSS L2C	GLONASS G2	BDS B3	BDS B1I	GPS L1 GALILEO E1 BDS B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.12	-	-	-	-	3.5	1.42	5.6
Return Loss (dB)	-24.3	-	-	-	-	-5.1	-14.9	-3.1
Efficiency (%)	43.8	-	-	-	-	31.9	64.8	21.3
Peak Gain (dBi)	-0.31	-	-	-	-	-4.45	0.58	-5.95
Axial Ratio (dB)	2	-	-	-	-	11.0	2.8	5.9

1.2. Mechanical & Environmental

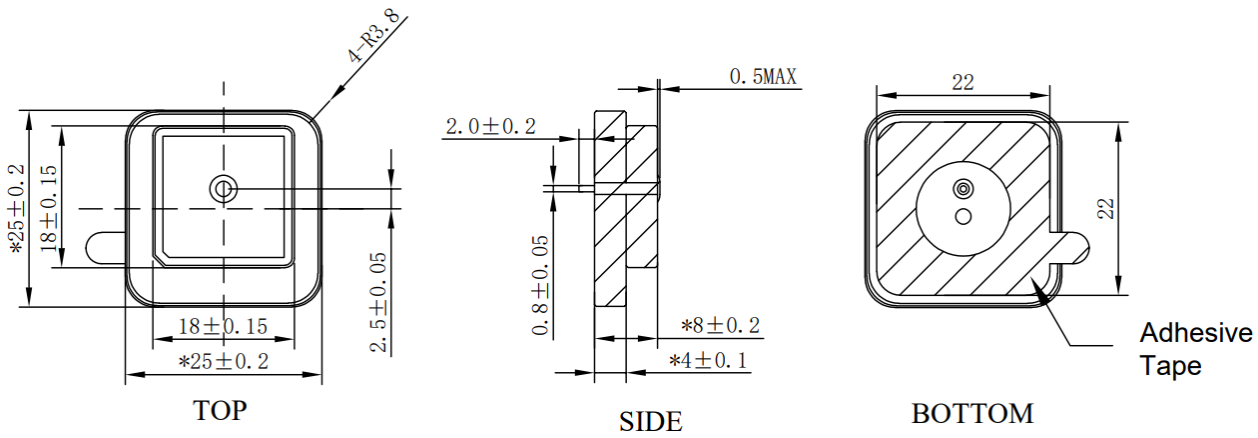
Mechanical	
Antenna Dimensions	25 × 25 × 4 mm + 18 × 18 × 4 mm
Material	Ceramic
Mounting Type	Adhesive
Weight	Typ. 17.9 g
Environmental	
Operation Temperature	-40 °C to +90 °C
Storage Temperature	-40 °C to +85 °C
RoHS & REACH Compliant	Yes

1.3. 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

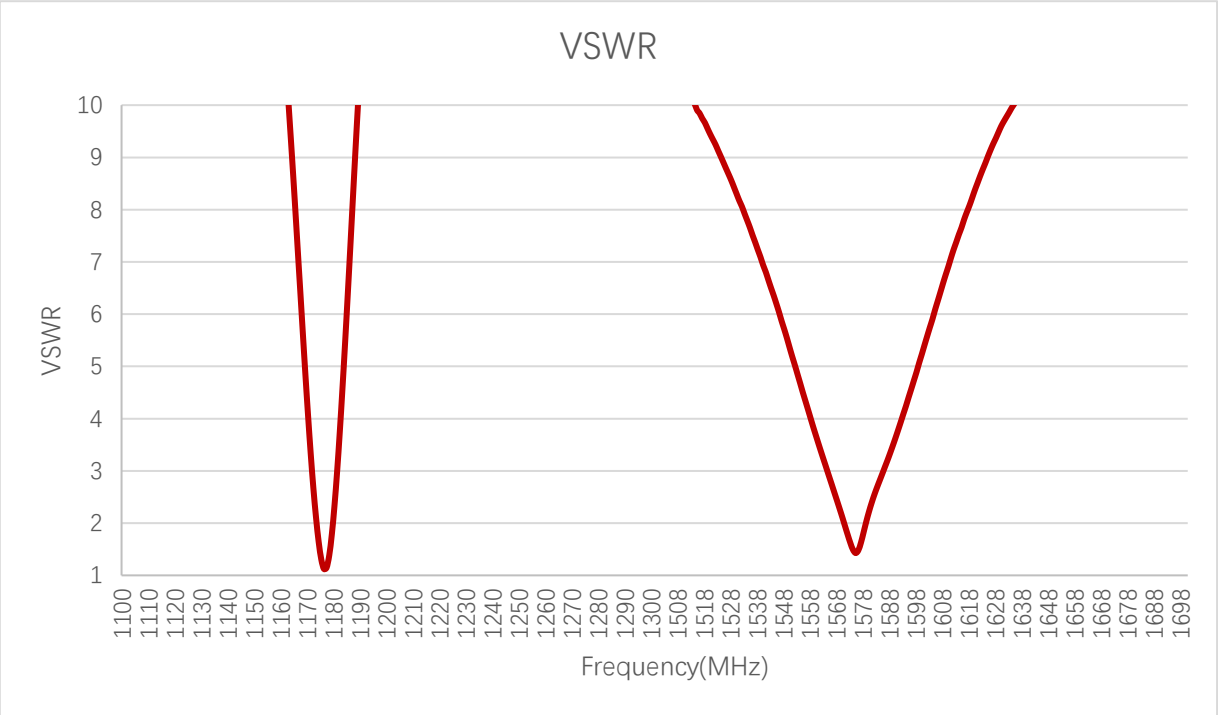
2 Drawing


4-R3.8
*25±0.2
18±0.15
18±0.15
*25±0.2
2.5±0.05
TOP
0.5MAX
2.0±0.2
0.8±0.05
*8±0.2
*4±0.1
SIDE
22
22
Adhesive
Tape
BOTTOM

3 Detailed Performance

3.1. S-Parameter Test

3.1.1. VSWR



VSWR

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.12	-	-	-	-	3.5	1.42	5.6

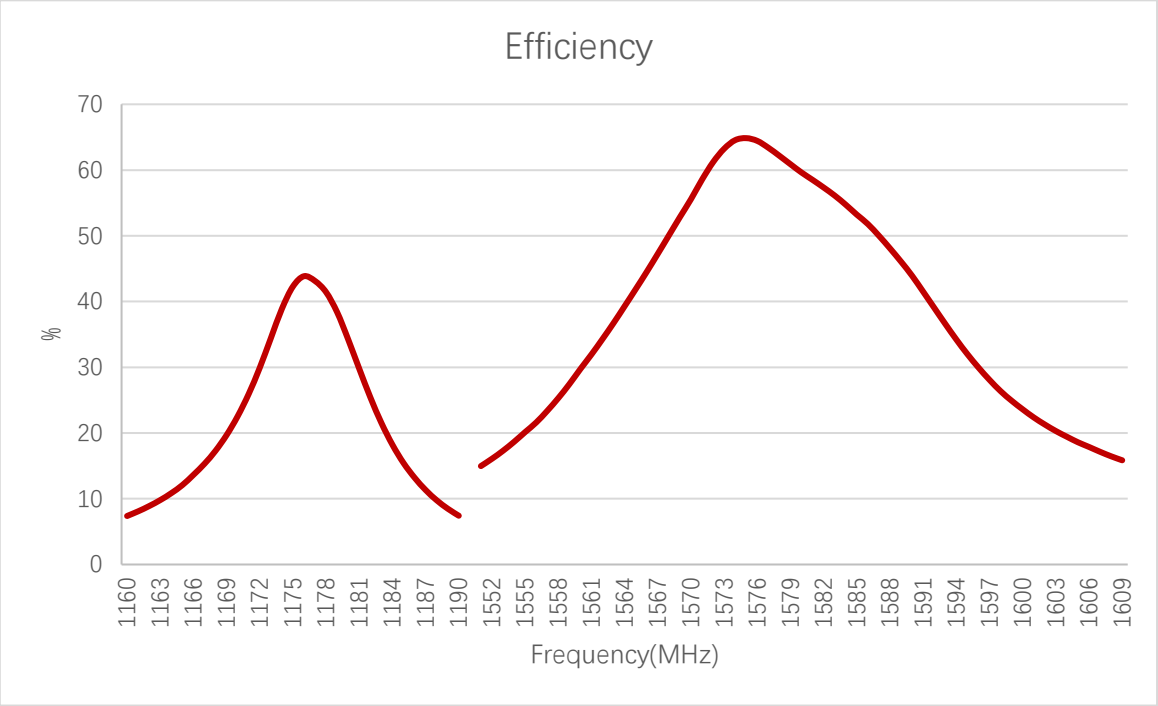
3.1.2. Return Loss

Return Loss (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-24.3	-	-	-	-	-5.1	-14.9	-3.1

3.2. Radiation Performance Test

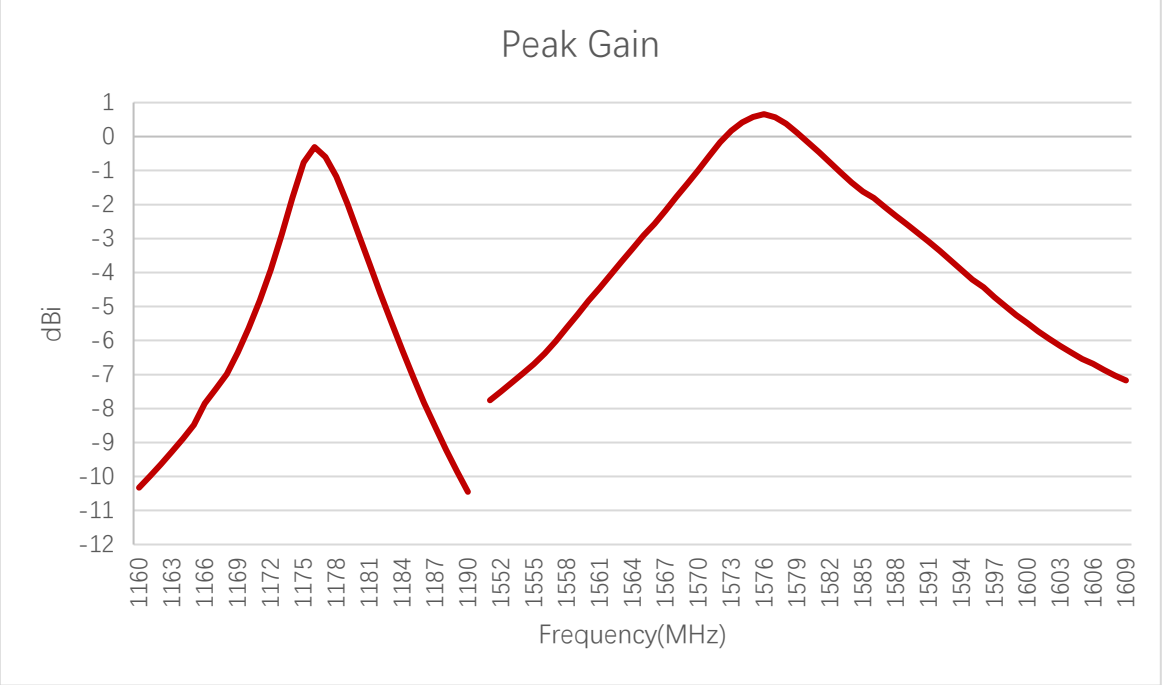
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	43.8	-	-	-	-	31.9	64.8	21.3

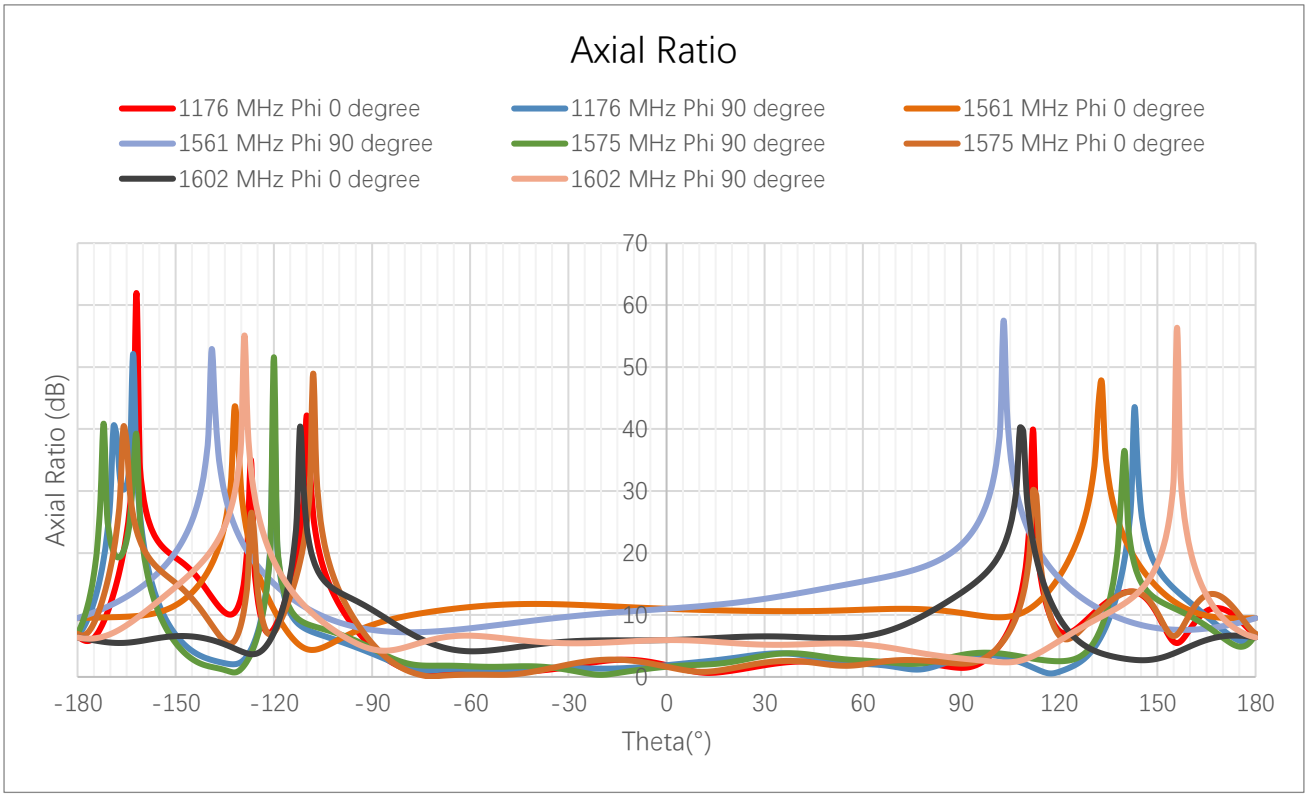
3.2.2. Peak Gain



Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	-0.31	-	-	-	-	-4.45	0.58	-5.95

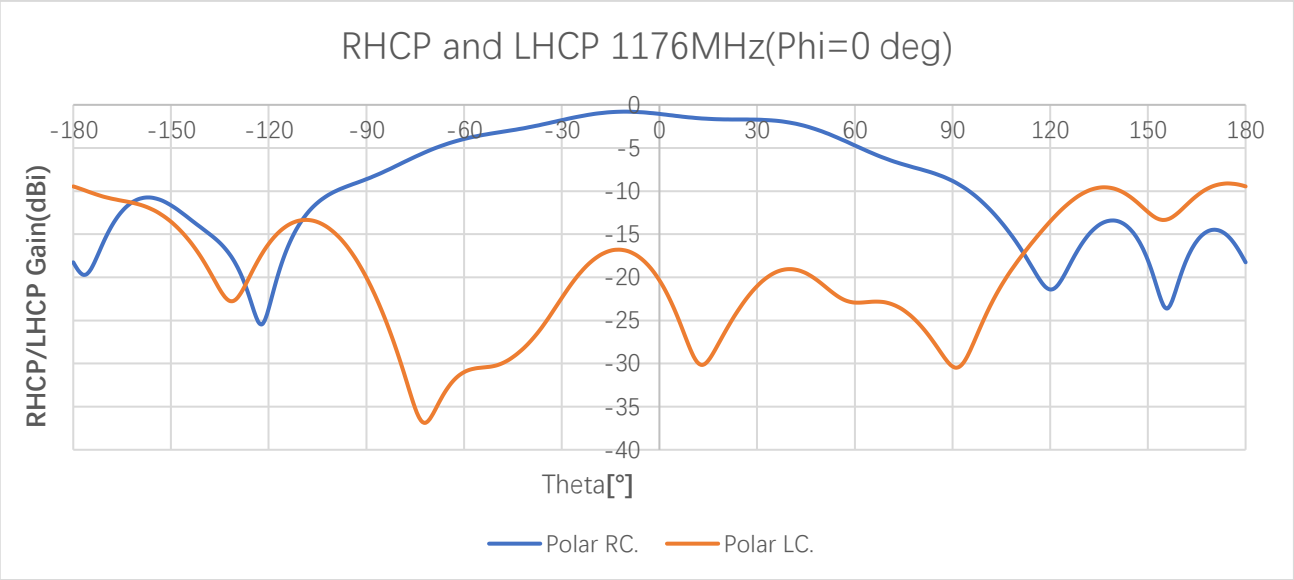
3.2.3. Axial Ratio

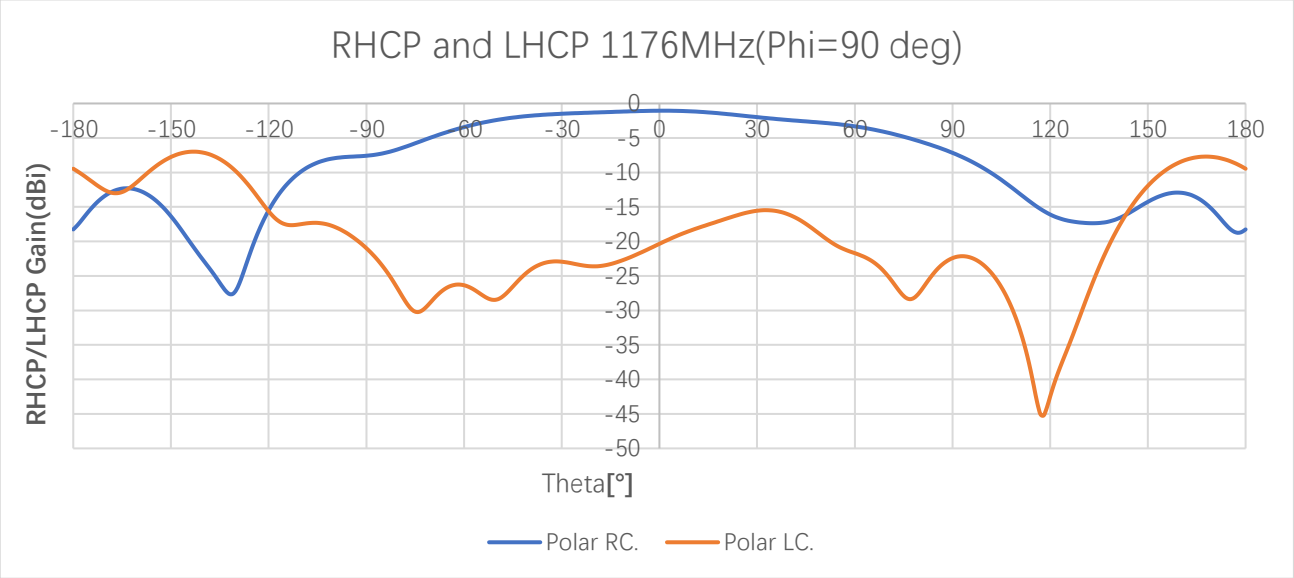


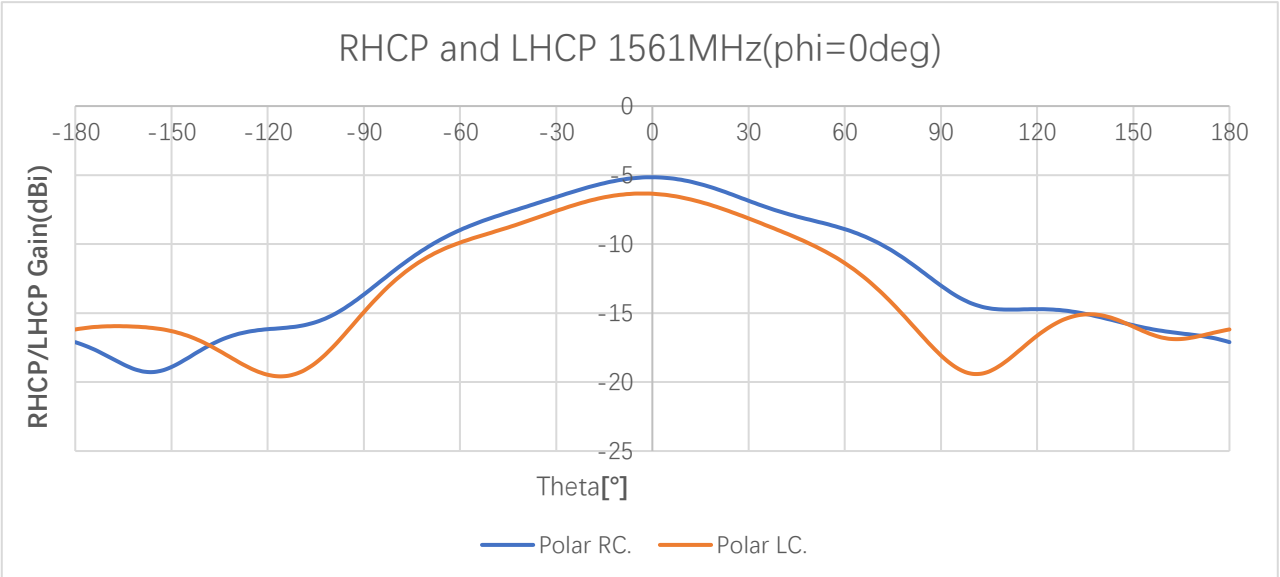
Axial Ratio (dB)

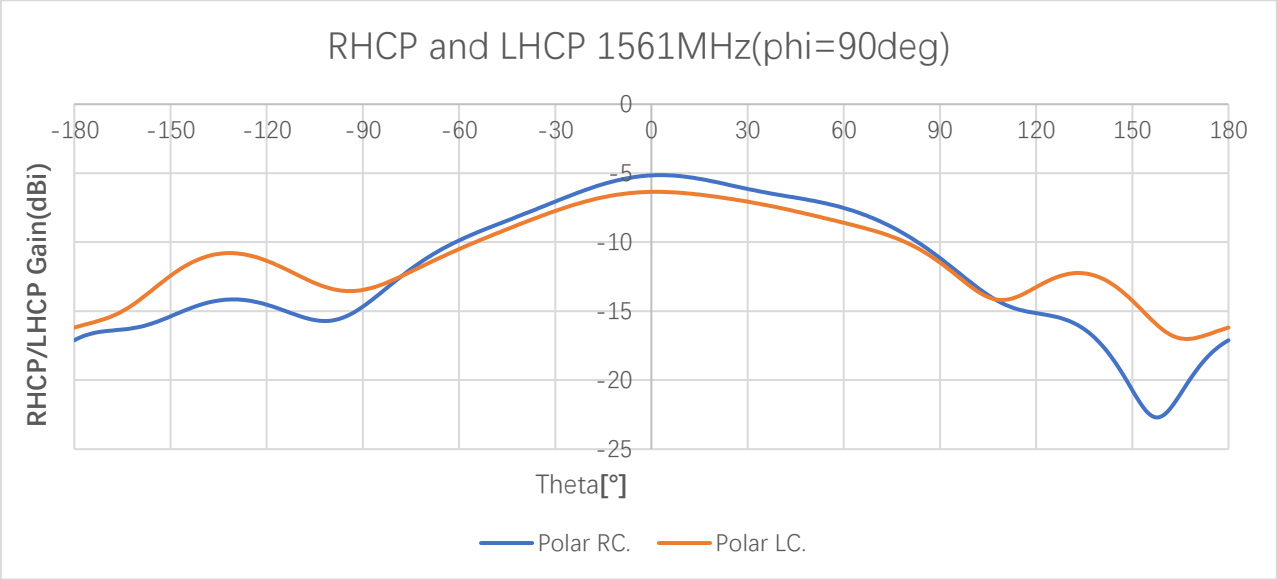
Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	1.9	-	-	-	-	11.0	1.7	5.9
	Phi = 90 (deg) Theta = 0 (deg)	1.9	-	-	-	-	11.0	1.7	5.9

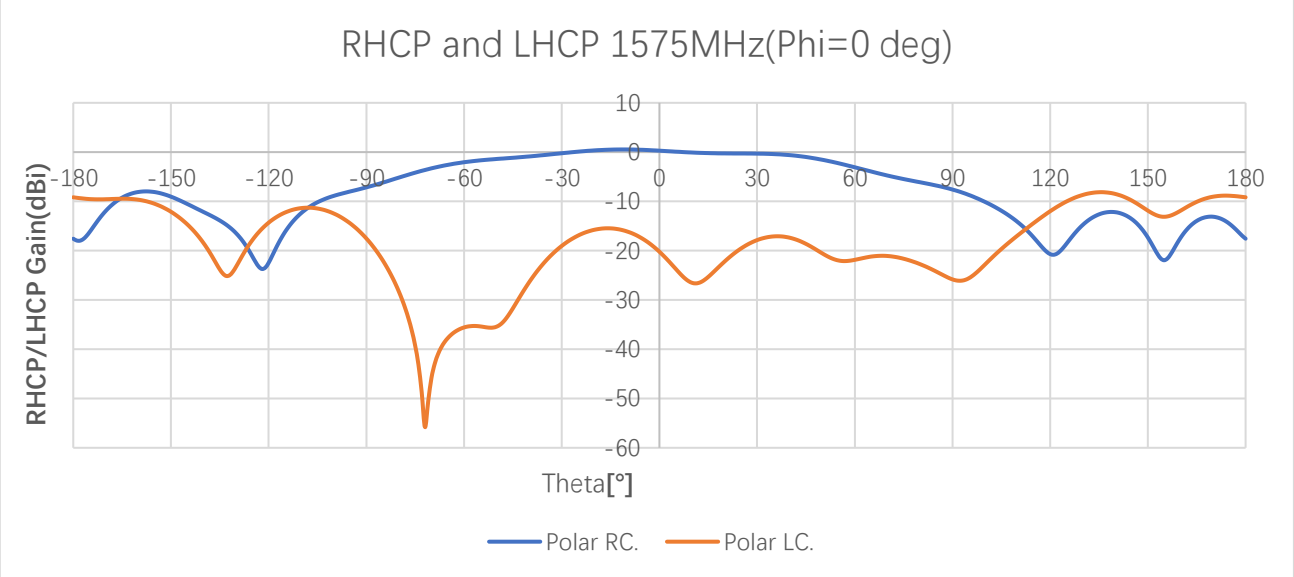
3.2.4. 2D RHCP and LHCP Gain

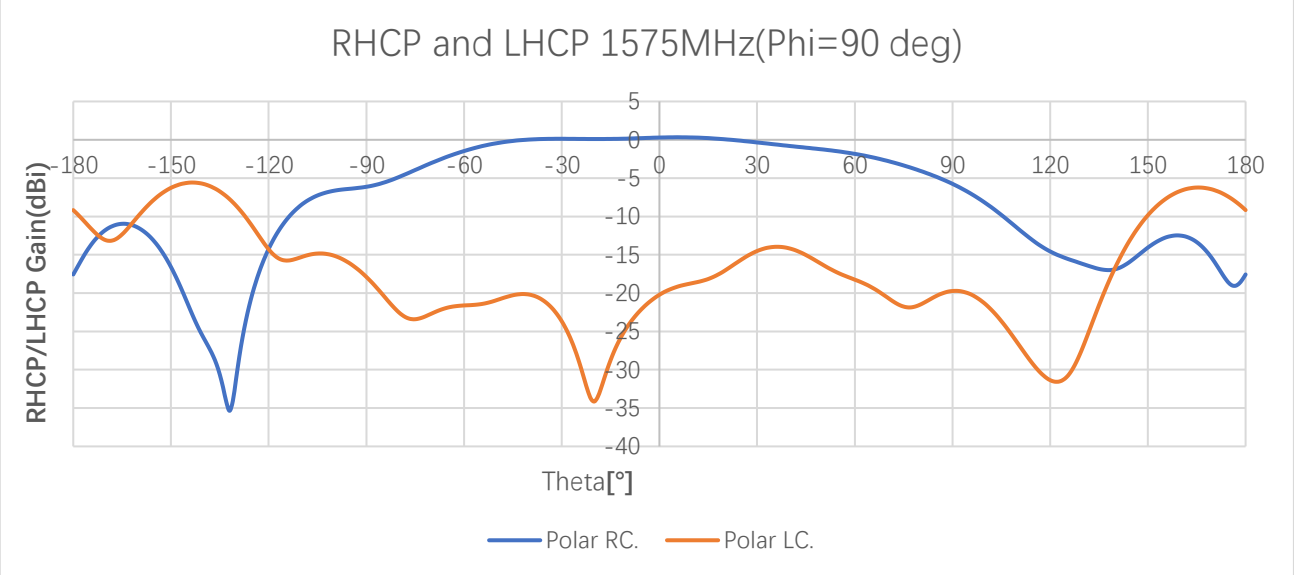


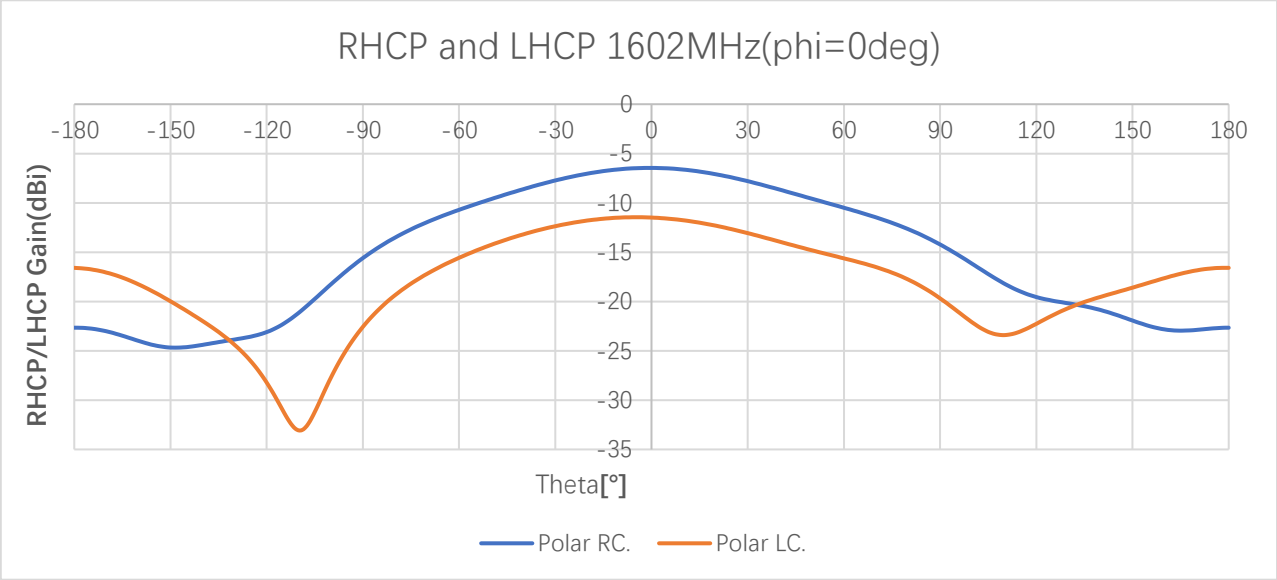


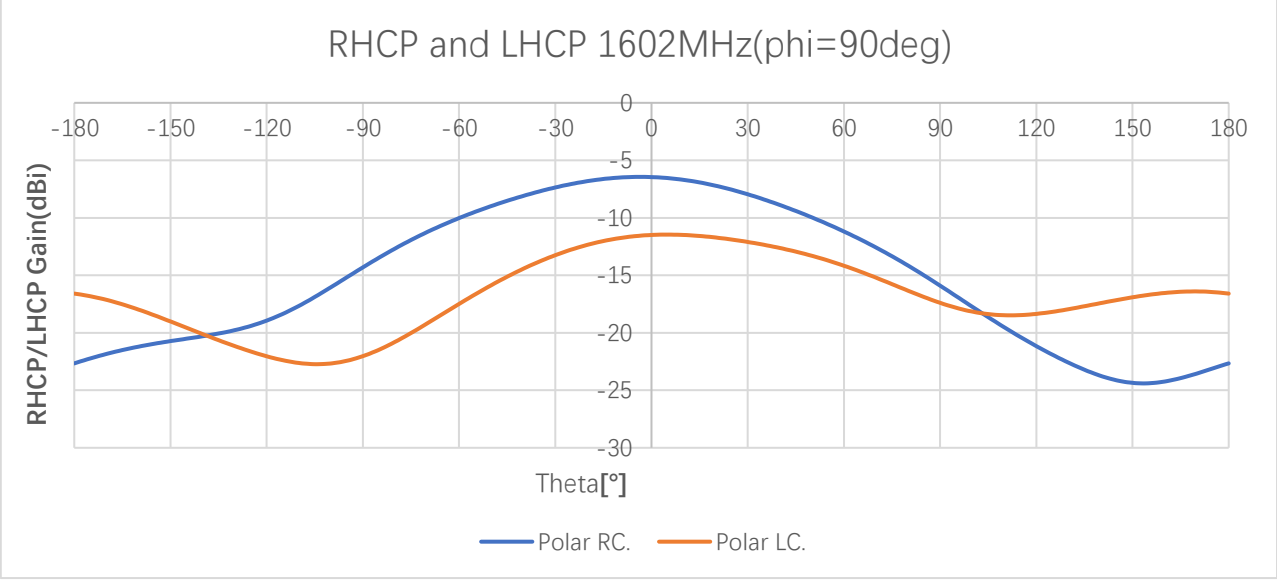



RHCP and LHCP 1561MHz(phi=90deg)
RHCP/LHCP Gain(dBi)
0
-5
-10
-15
-20
-25
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Theta[°]
Polar RC.
Polar LC.


RHCP and LHCP 1575MHz(Phi=0 deg)
RHCP/LHCP Gain(dBi)
10
0
-10
-20
-30
-40
-50
-60
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Theta[°]
Polar RC.
Polar LC.


RHCP and LHCP 1575MHz(Phi=90 deg)
RHCP/LHCP Gain(dBi)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Theta[°]
Polar RC.
Polar LC.



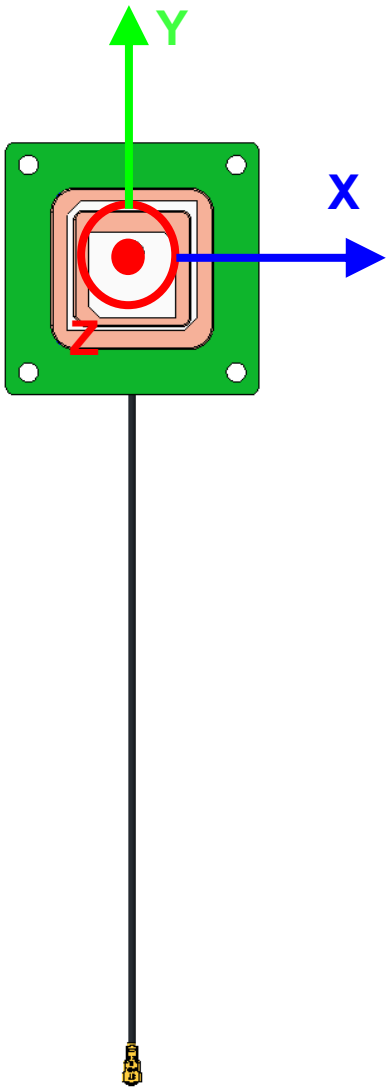


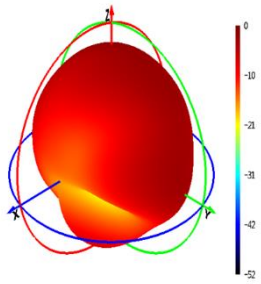
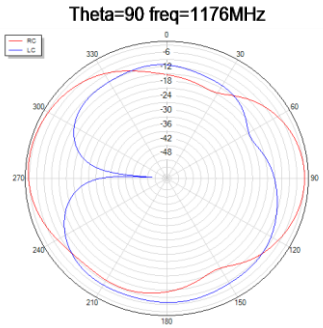
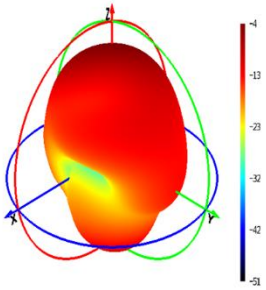
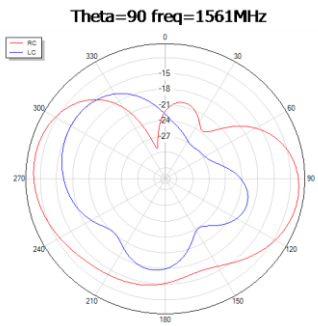
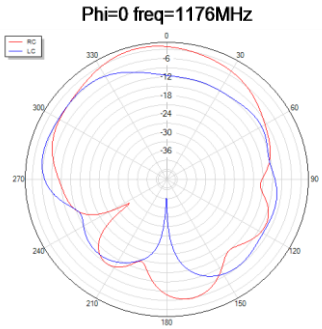
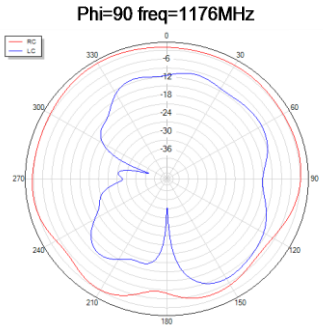
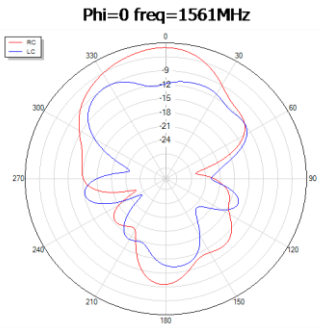
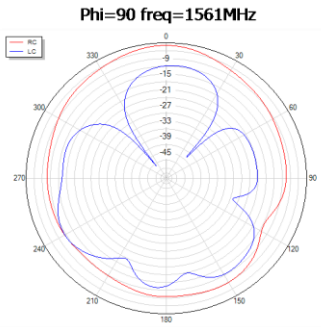
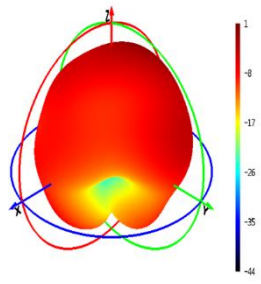
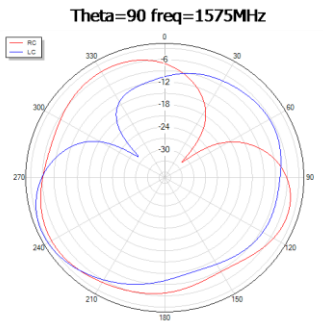
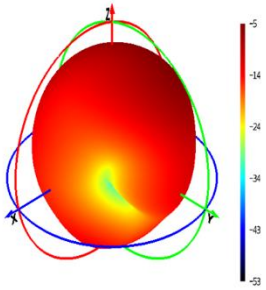
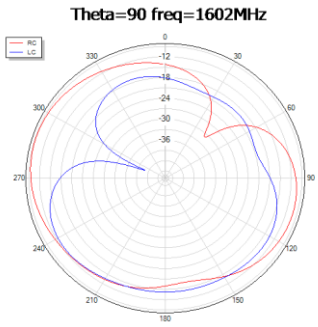
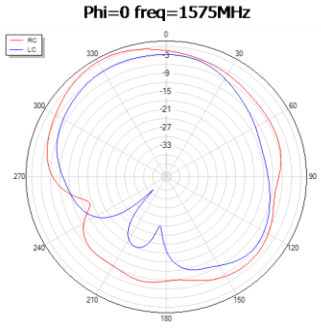
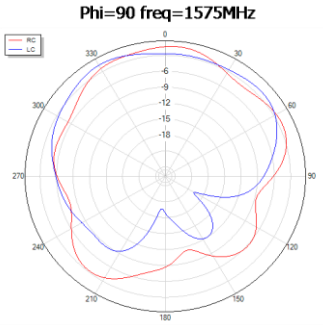
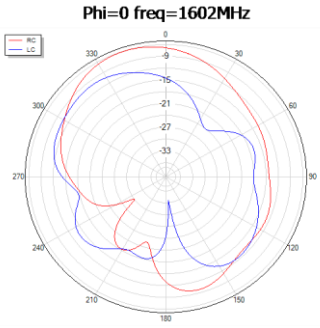
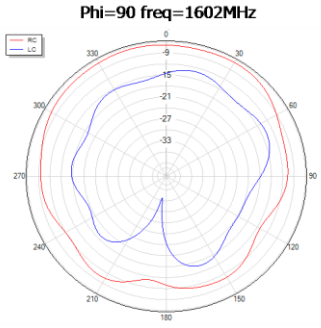
2D RHCP and LHCP Gain (dBi)

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
RC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-1.0	-	-	-	-	-5.2	0.3	-6.5
	Phi = 90 (deg) Theta = 0 (deg)	-1.0	-	-	-	-	-5.2	0.3	-6.5
LC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-20.3	-	-	-	-	-6.4	-21.5	-11.5
	Phi = 90 (deg) Theta = 0 (deg)	-20.3	-	-	-	-	-6.4	-21.5	-11.5

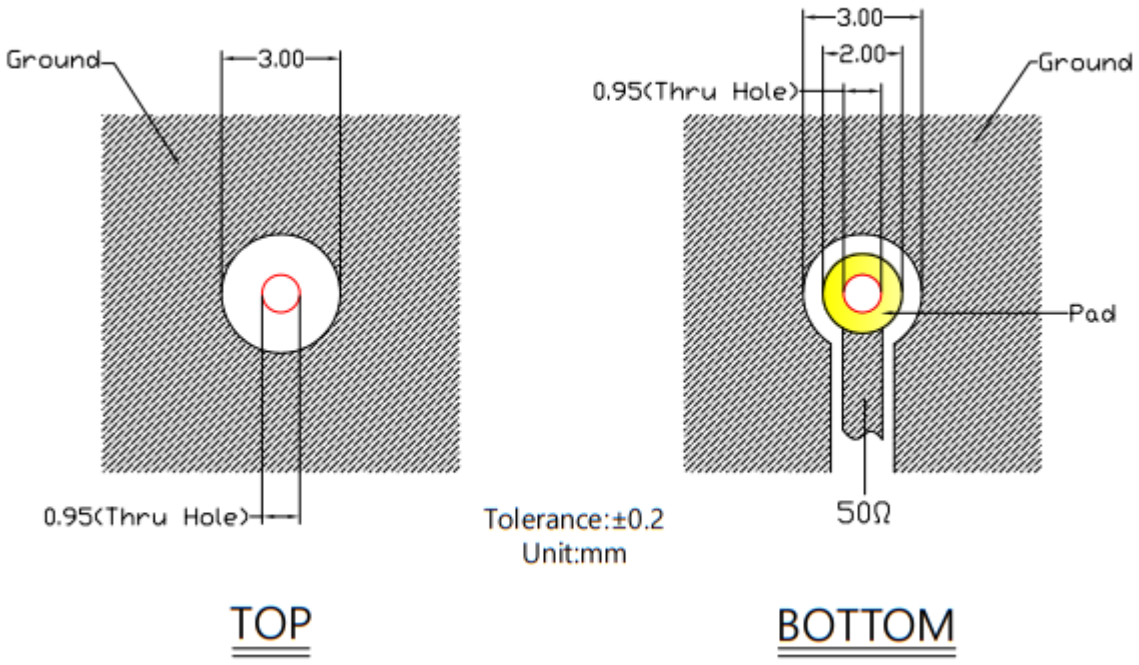
3.2.5. 3D & 2D Radiation Pattern

- Test Condition: On 39 mm × 39 mm PCB
- Test Chamber: SH-SY-16M

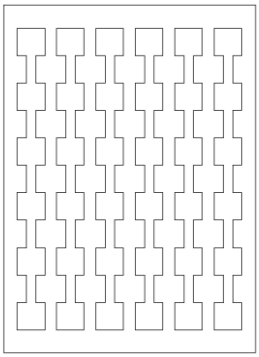
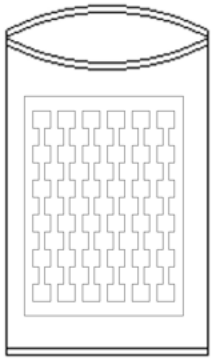
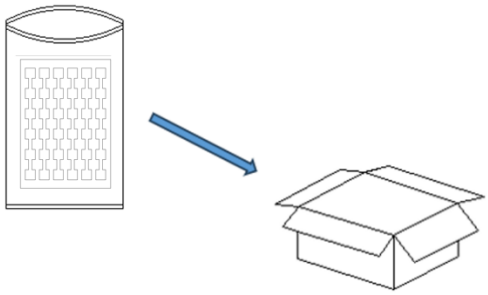


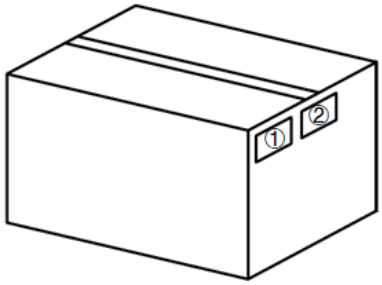
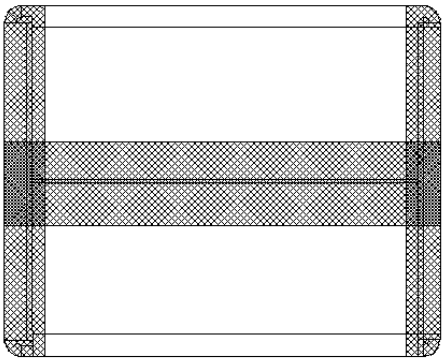
1176 MHz		1561 MHz	
			
			
1575 MHz		1602 MHz	
			
			

4 PCB Footprint Recommendation



5 Packaging

Step	Packaging Picture / 2D Picture	Description
1		(36 PCS Antennas / Pearl Cotton Tray)
2		The pearl cotton tray is vacuumed in a vacuum bag.
3		(5 Pearl Cotton Trays / Carton Box) (180 PCS Antennas / Carton Box) Carton Size: L × W × H = 405 × 293 × 185 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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Revision History

Version	Date	Author	Note
-	2024-08-12	Rhone WEI/ Lucky FENG/ David LIU/ Rainey LIAO	Creation of the document
1.0	2024-08-12	Rhone WEI/ Lucky FENG/ David LIU/ Rainey LIAO	First official release
2.0	2024-12-07	Rhone WEI	Numerous changes were made to this document. It should be read in its entirety.
2.1	2025-07-01	Rhone WEI/ Lucky FENG	1 Updated the operation temperature (Chapter 1.2). 2 Added the PCB footprint recommendation (Chapter 4).

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