Antenna Datasheet

Product OC: YEGT000W8A
Version: 1.0
Date: 2023-05-10
Status: Released

Product Name: Active GNSS L1 & L5 Antenna
Key Features:
Frequency Band: 1164–1189 MHz, 1559–1606 MHz
Dimensions: Φ 65 × 45 mm
LNA Gain: 28 ±2 dB
RoHS Compliant
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 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.

Contents

1 Specification

- Test Condition: Free Space

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 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	1.5	-	-	-	-	1.5	1.3	1.5
Return Loss (dB)	-13.4	-	-	-	-	-13.1	-16.4	-13.0
Efficiency (%)	48	-	-	-	-	27	36	29
AVG Gain (dB)	-3.1	-	-	-	-	-5.6	-4.4	-5.3
Peak Gain (dBi)	-0.5	-	-	-	-	-1.7	-0.5	-1.3
Axial Ratio (dB)	2.6	-	-	-	-	0.4	0.6	2.4

LNA Electrical	
LNA Gain	28 ±2 dB @ 3.0 V
Noise Figure	≤ 1.5 dB @ 3.0 V
Output VSWR	< 2.0
Group Delay Ripple	<10 ns
Filter Out-of-Band Attenuation	≥ 40 dB @ f0 ±40 MHz (f0 = 1176 MHz) ≥ 50 dB @ f0 ±50 MHz (f0 = 1176 MHz) ≥ 50 dB @ f0 ±50 MHz (f0 = 1580 MHz) ≥ 55 dB @ f0 ±100 MHz (f0 = 1580 MHz)
Pout 1dB Gain Compression Point	-3 dBm
Working Voltage	2.0–5.0 V
Working Current	20–26 mA
Impedance	50 Ω

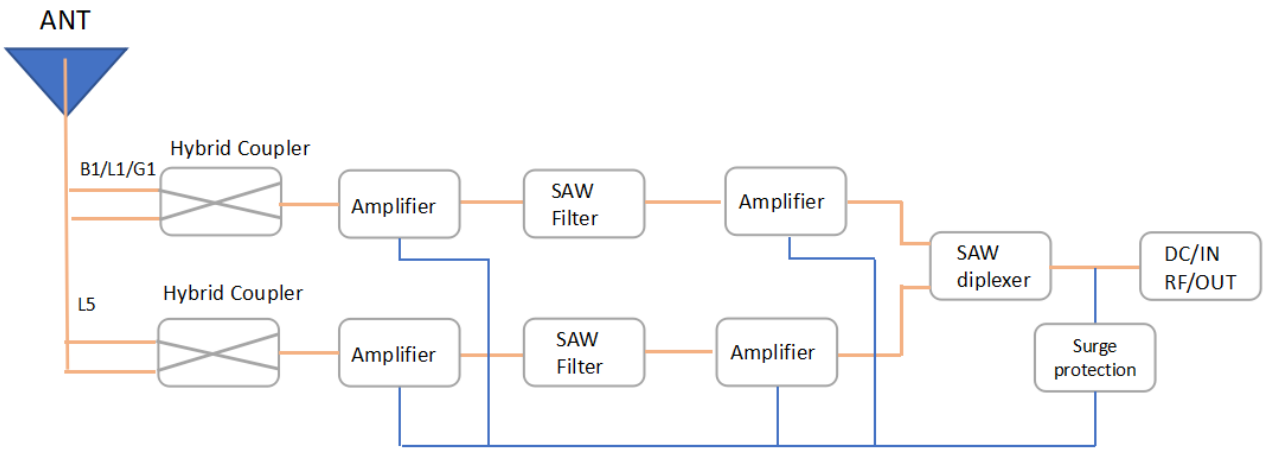
1.2. Mechanical, Environmental & Storage

- **Attention: The antenna shall be powered by PS2 or PS1 circuit**

Mechanical	
Antenna Dimensions	Φ 65 × 45 mm
Casing Material & Color	ASA & White
Connector Type	TNC-K
Mounting Type	Screw (M18 Nut)
Weight	Typ. 130.7 g
Environmental	
Operation Temperature	-45 °C to +85 °C
Ingress Protection (IP) Rating	IP67
RoHS Compliant	Yes

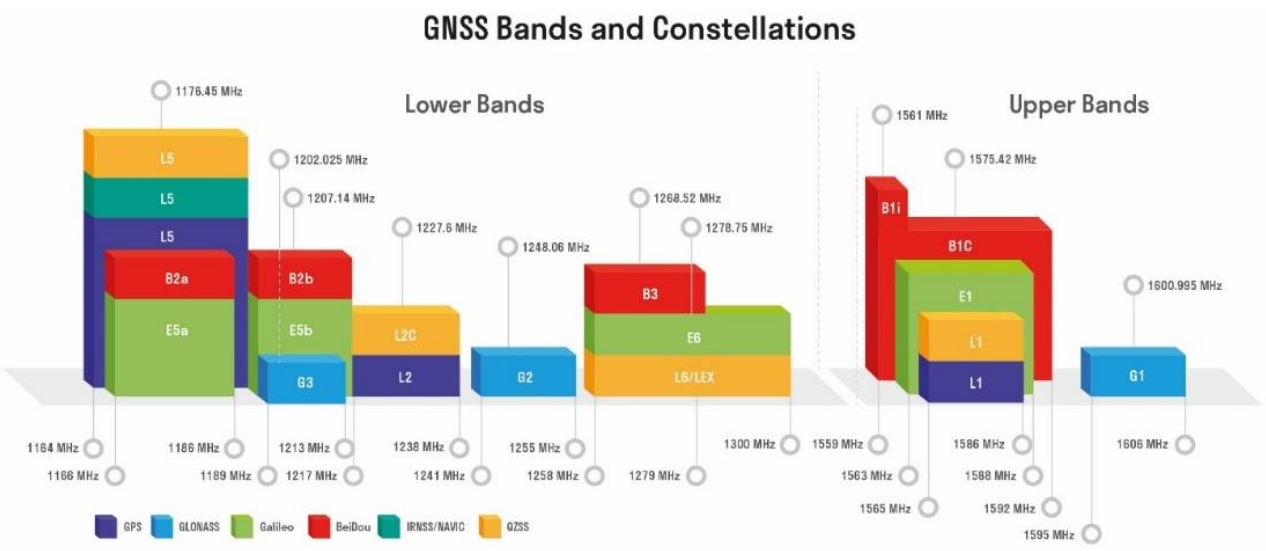
Storage	
Storage Temperature	18 °C–27 °C
Humidity	30 %–80 % RH
Storage Place	Away from corrosive and direct sunlight.
Packaging	Antennas should be stored in unopened sealed manufacturer's plastic packaging.

1.3. Block Diagram (Active Antenna)

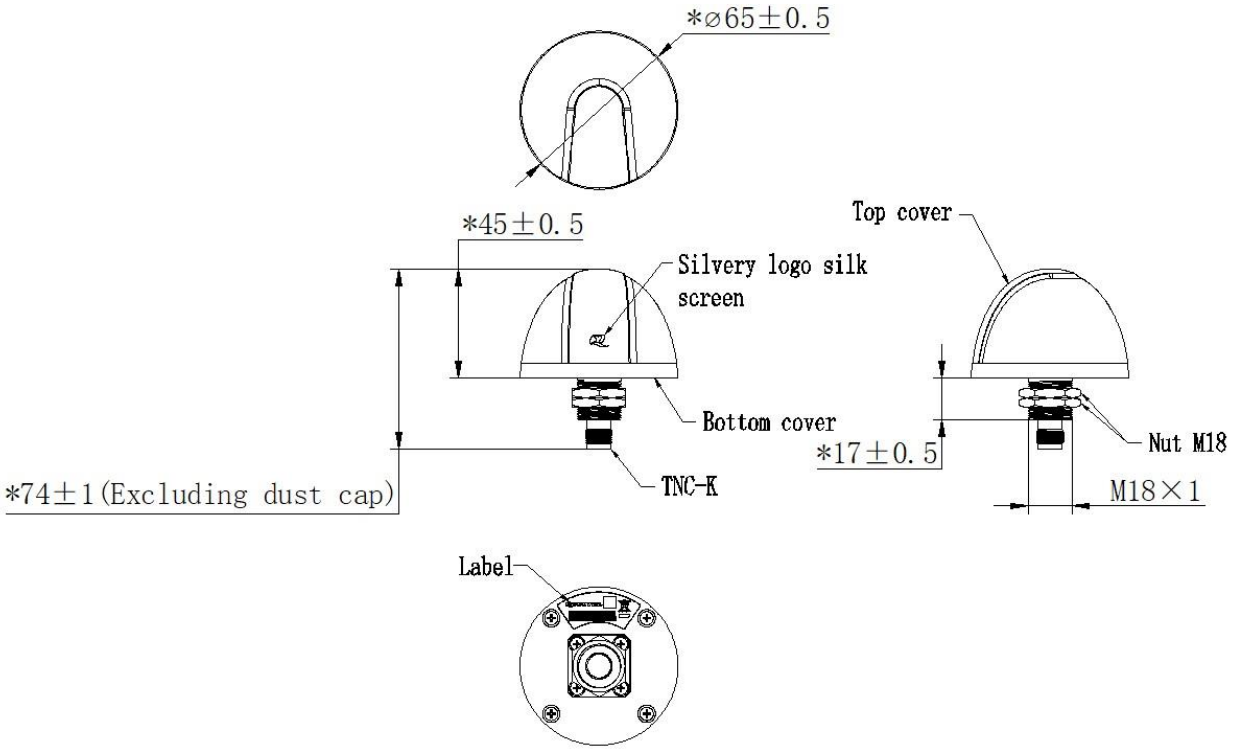


1.4. Supported GNSS Frequency Bands

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)	
	√	√	-	-	
BEIDOU	**B1I** Centre 1561.098 (1559–1564)	**B1C (BeiDou-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
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

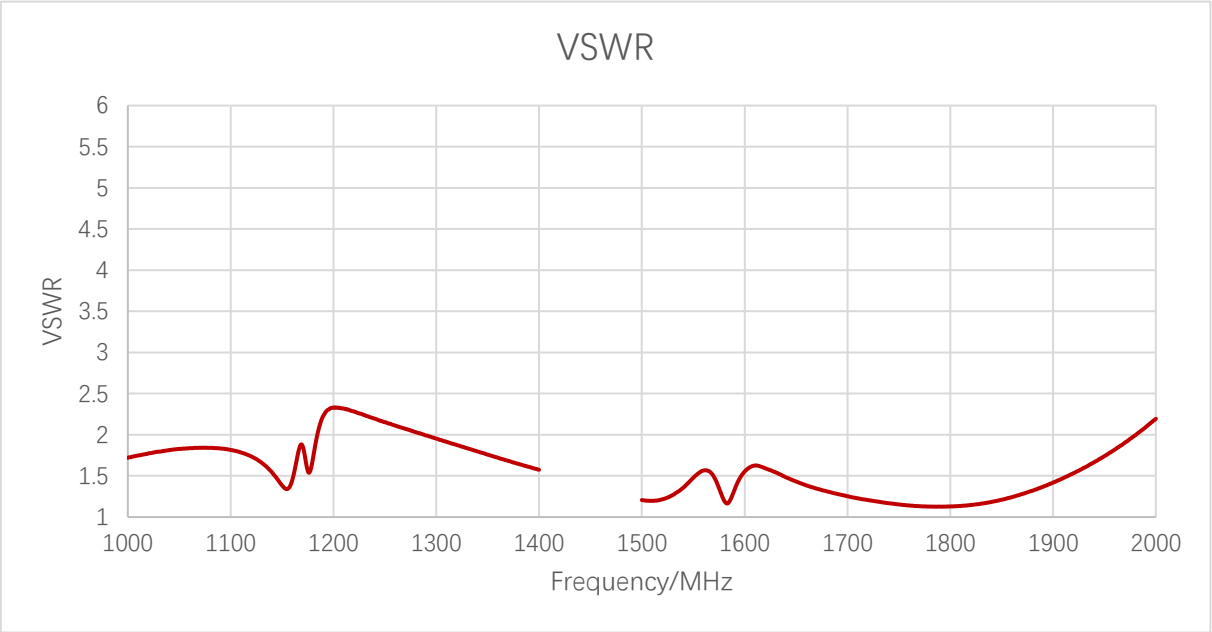
2 Drawing


*⌀65±0.5
*45±0.5
Silvery logo silk screen
Bottom cover
TNC-K
*74±1(Excluding dust cap)
Top cover
Nut M18
*17±0.5
M18×1
Label

3 Detailed Performance

3.1. S-Parameter Test

3.1.1. VSWR



VSWR

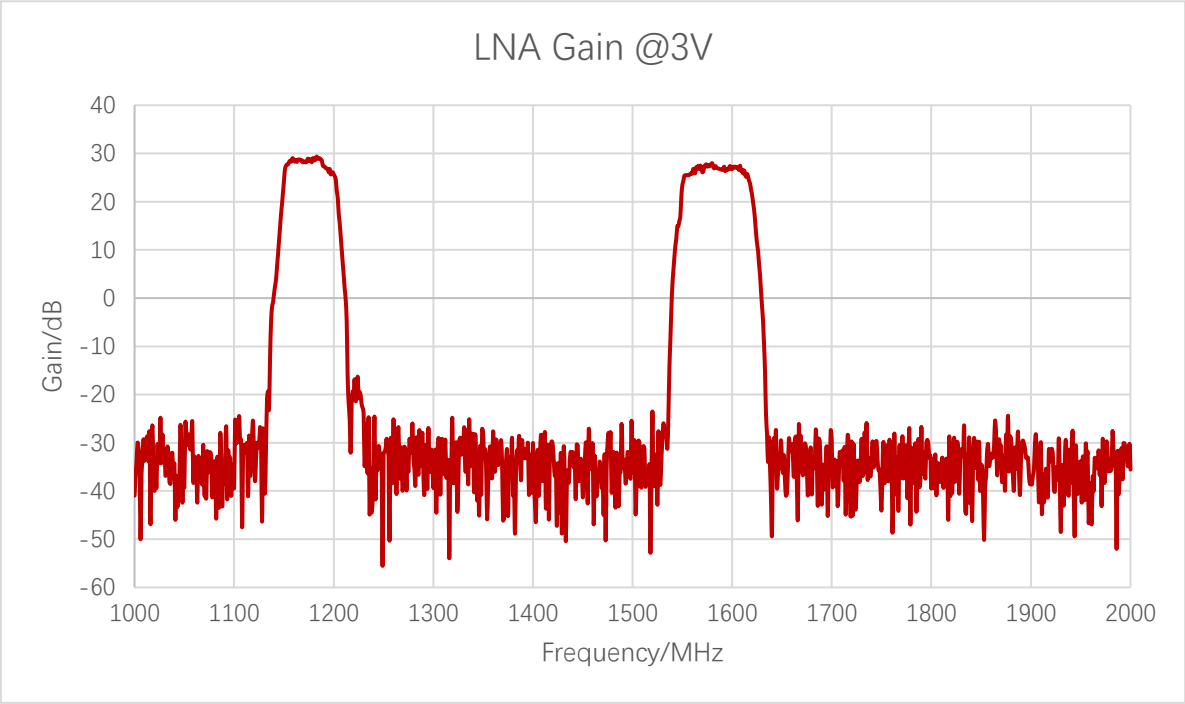
Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.5	-	-	-	-	1.5	1.3	1.5

3.1.2. Return Loss

Return Loss (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-13.4	-	-	-	-	-13.1	-16.4	-12.9

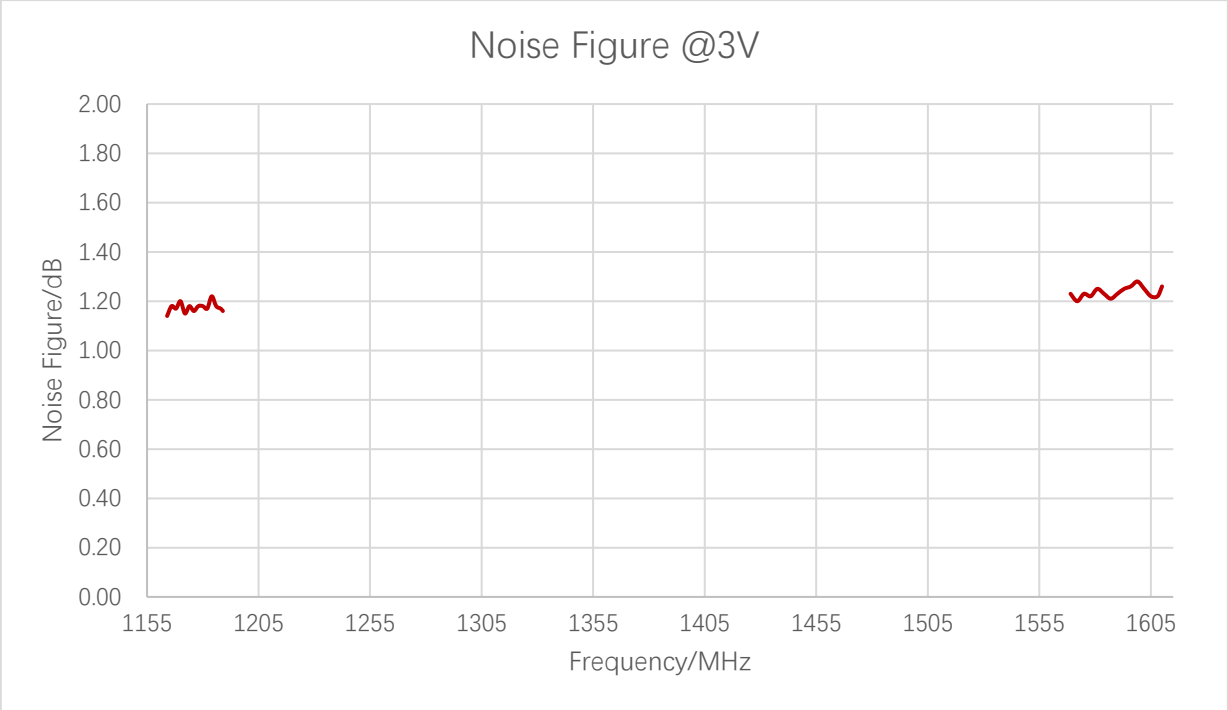
3.1.3. GNSS LNA Gain



LNA Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain (dB)	28.5	-	-	-	-	26.8	27.2	27.0

3.1.4. Noise Figure

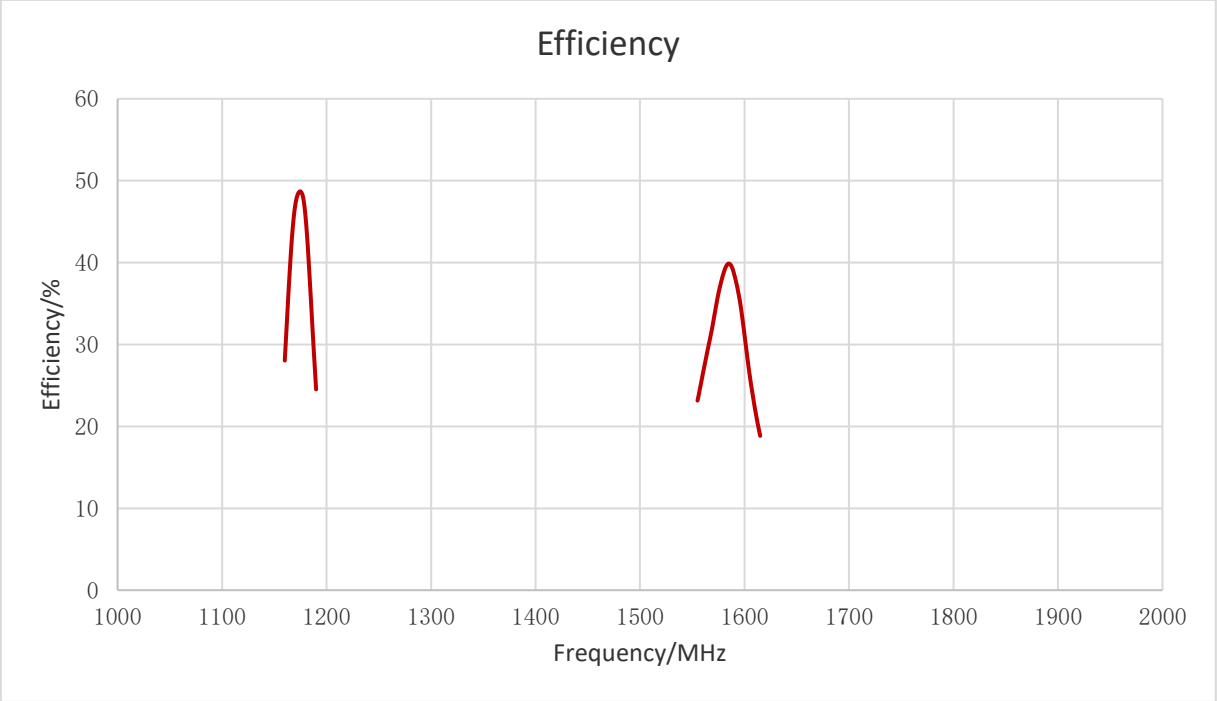


Noise Figure (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Noise Figure (dB)	1.1	-	-	-	-	1.3	1.2	1.2

3.2. Radiation Performance Test

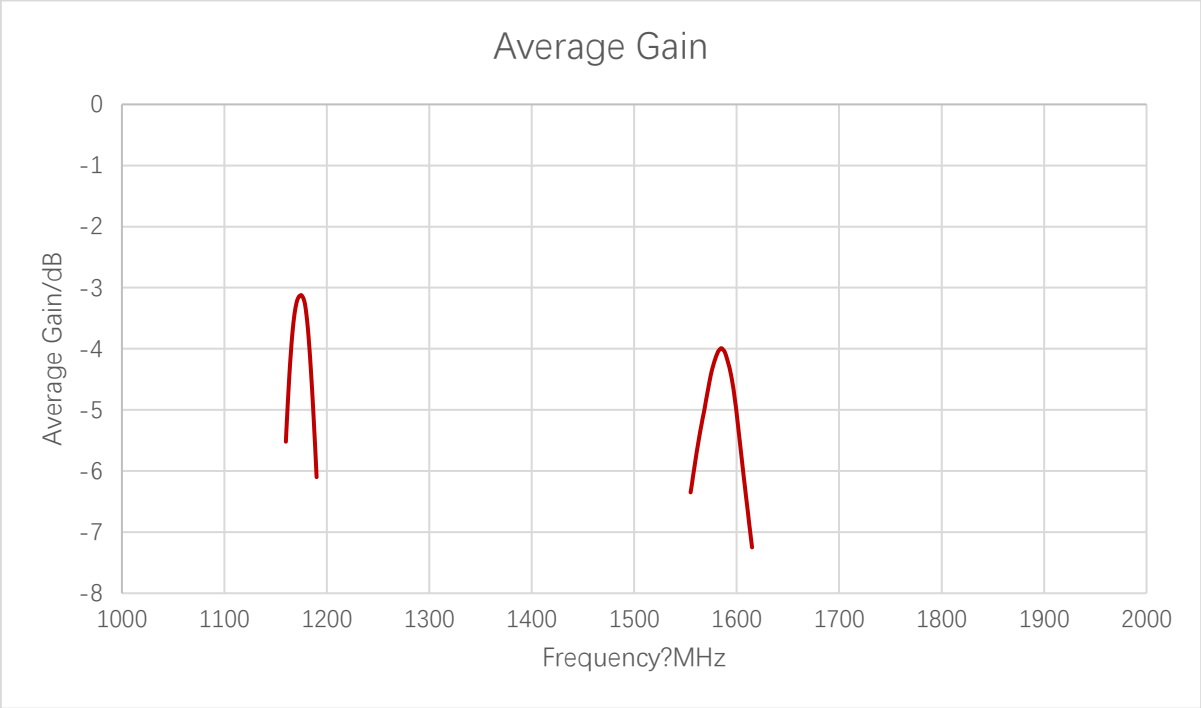
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	48	-	-	-	-	27	36	29

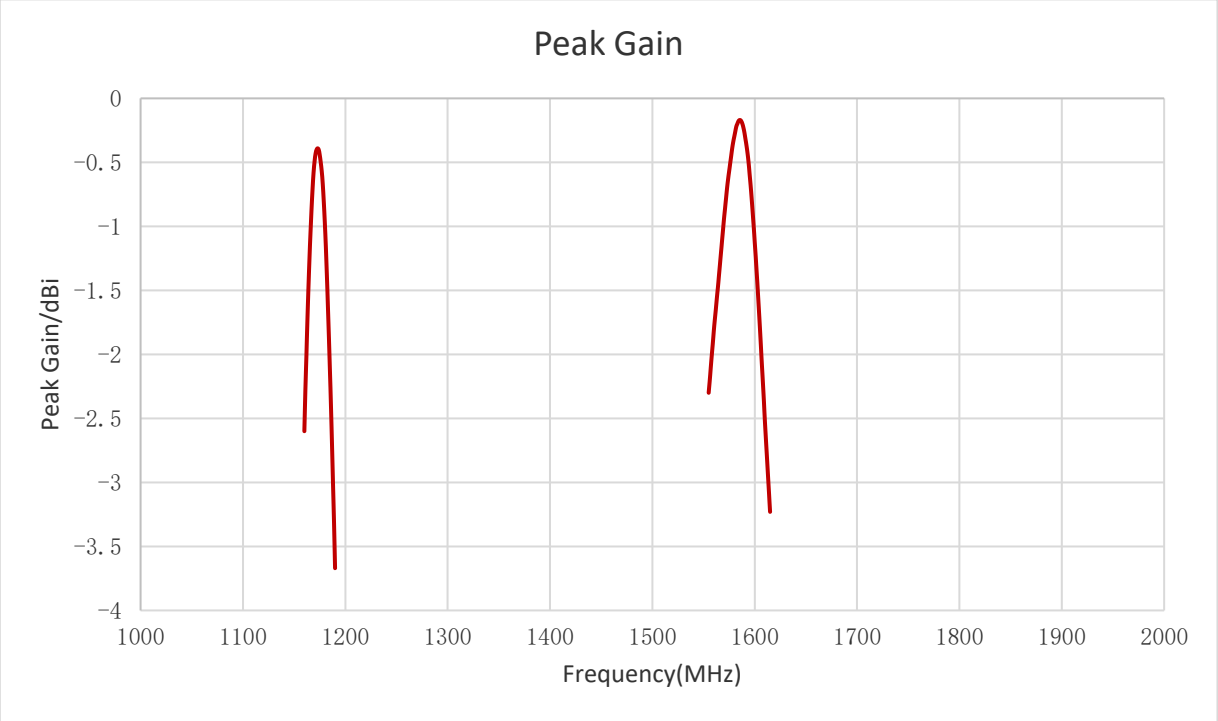
3.2.2. Average Gain



Average Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Average Gain (dB)	-3.1	-	-	-	-	-5.6	-4.4	-5.3

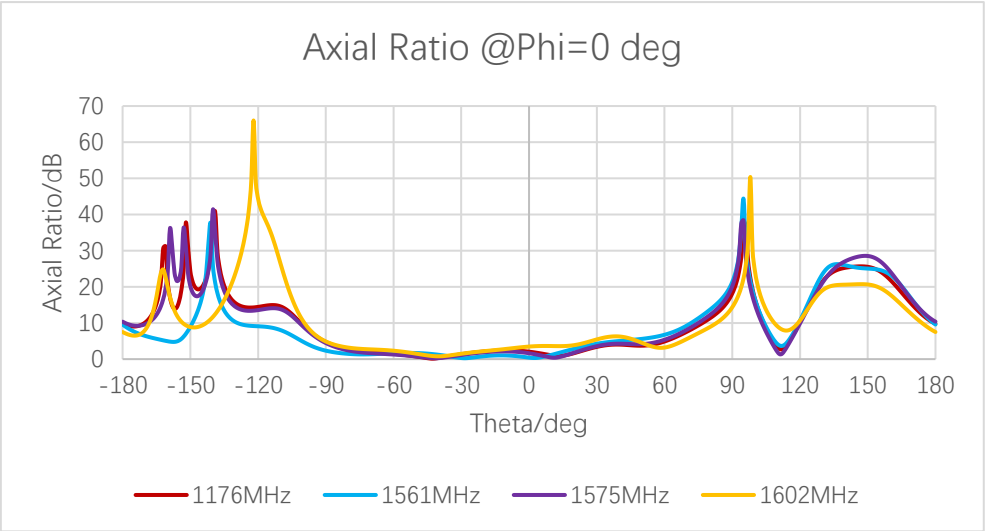
3.2.3. Peak Gain

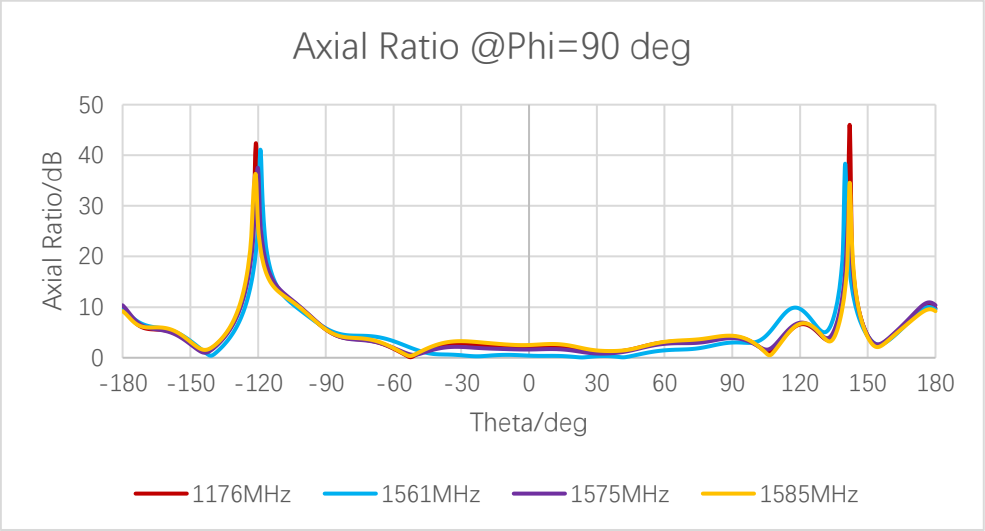


Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	-0.5	-	-	-	-	-1.7	-0.5	-1.3

3.2.4. Axial Ratio

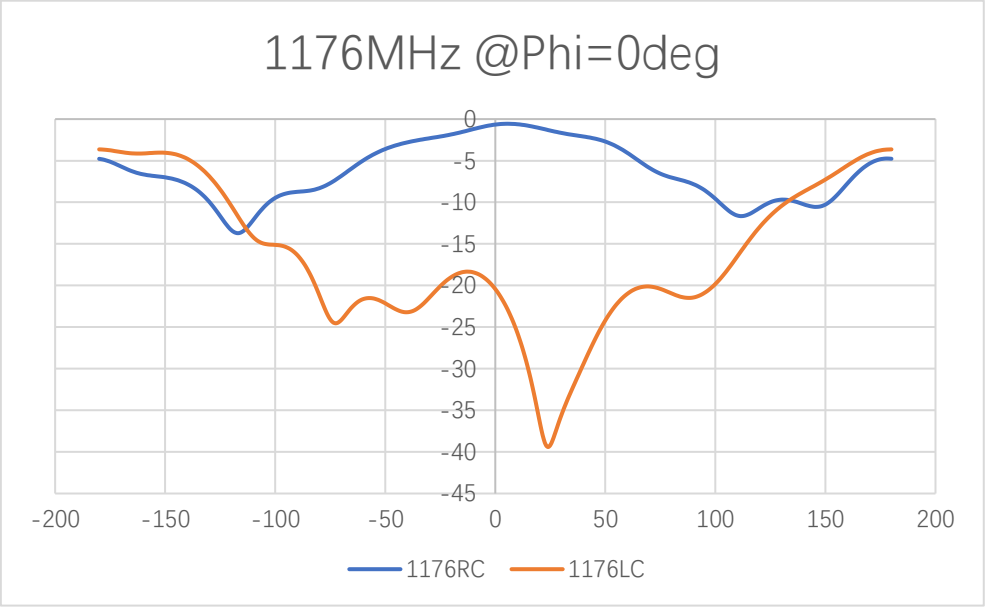


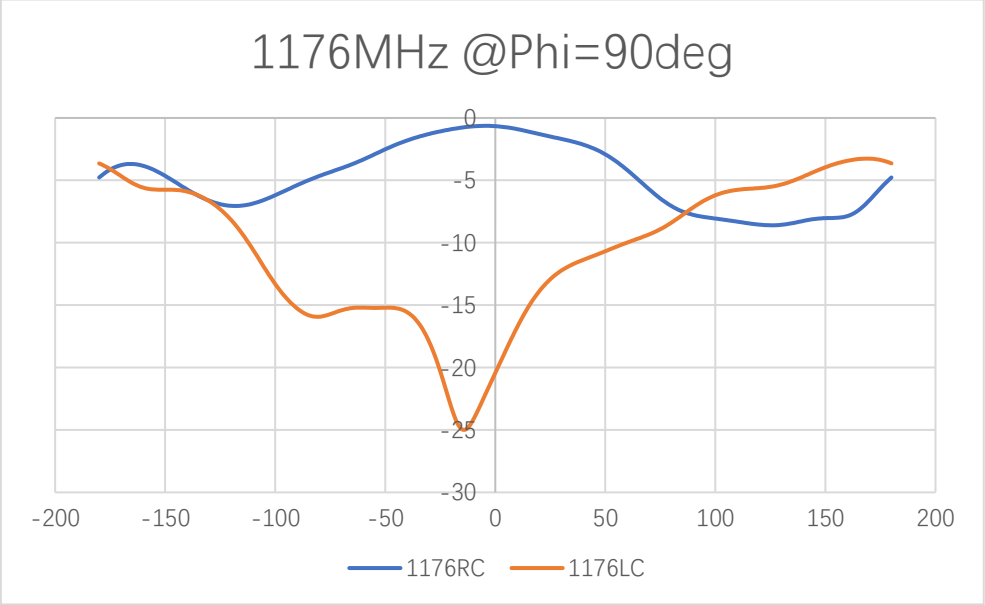


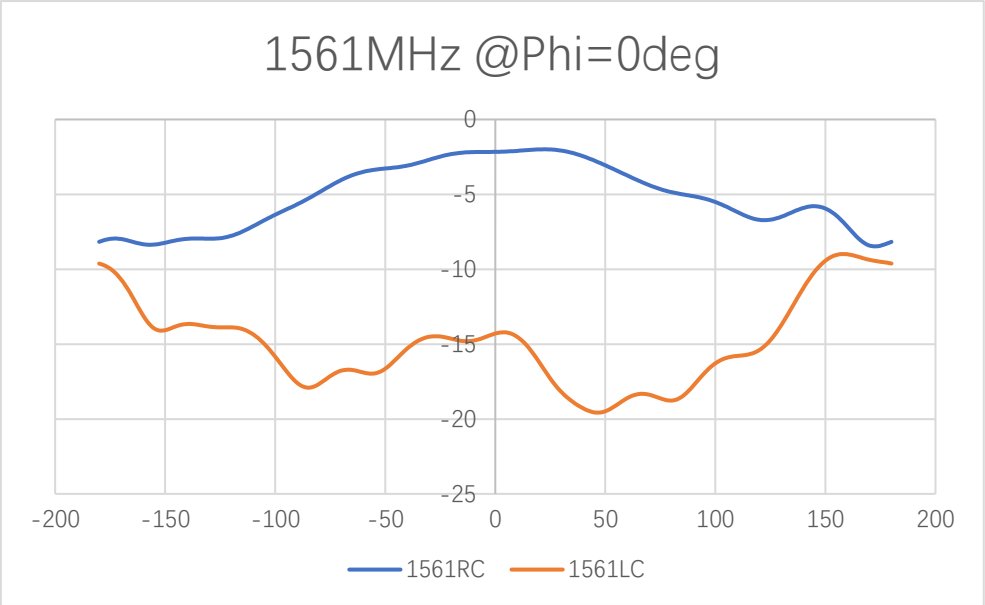
Axial Ratio (dB)

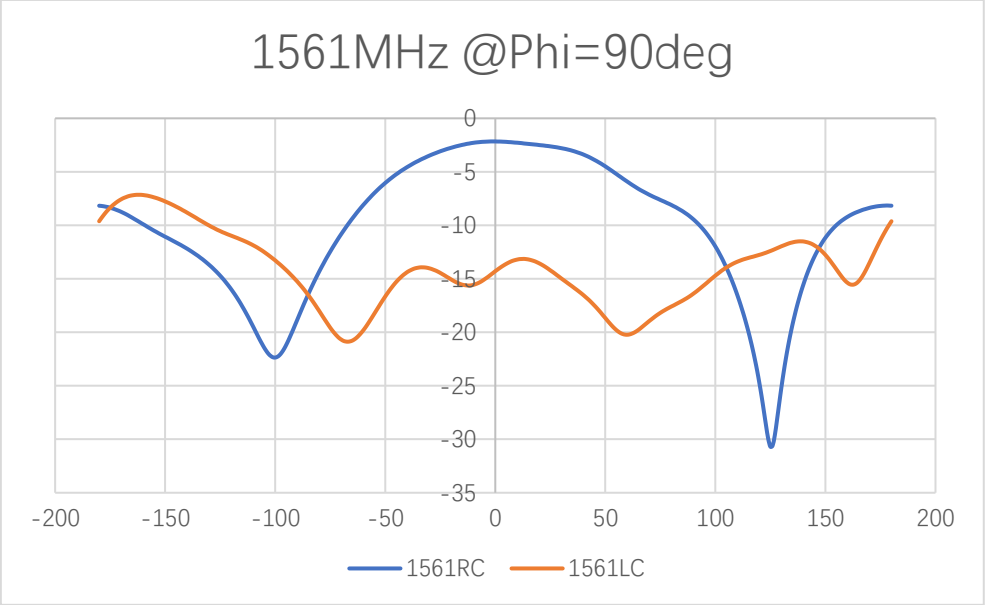
Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	2.6	-	-	-	-	0.4	0.6	2.4
	Phi = 90 (deg) Theta = 0 (deg)	2.6	-	-	-	-	0.4	0.6	2.4

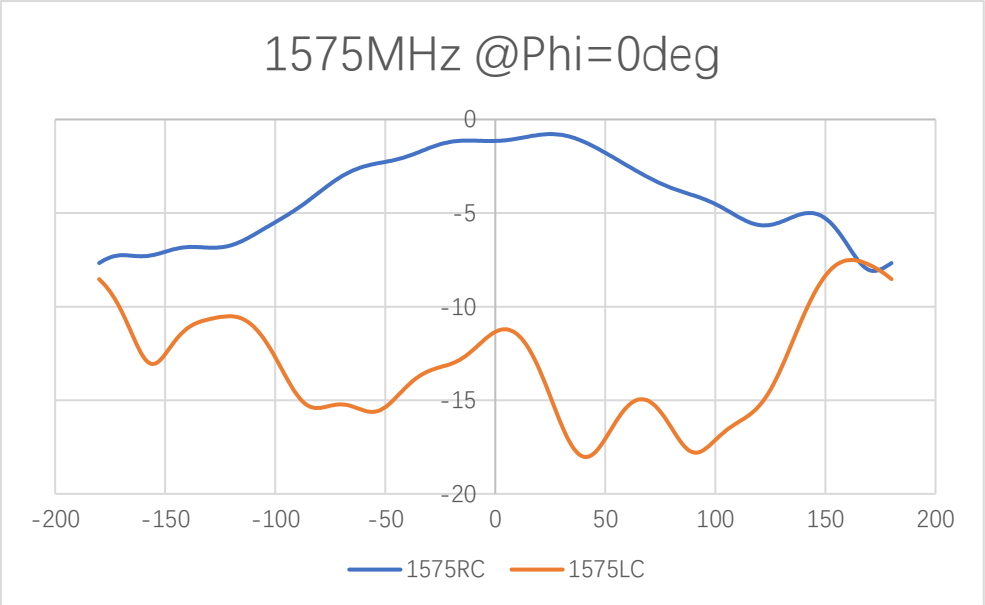
3.2.5. 2D RHCP and LHCP Gain

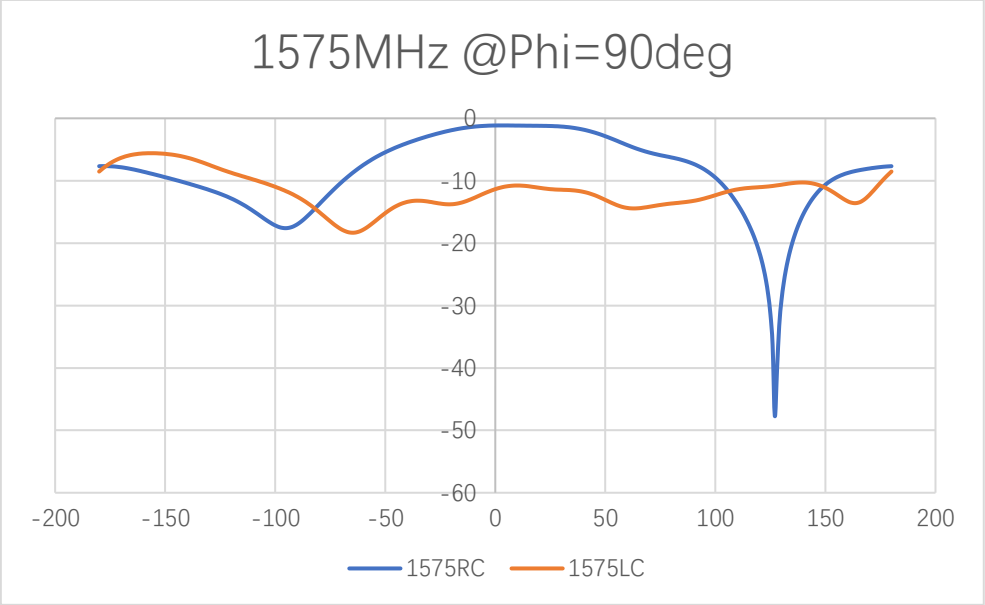


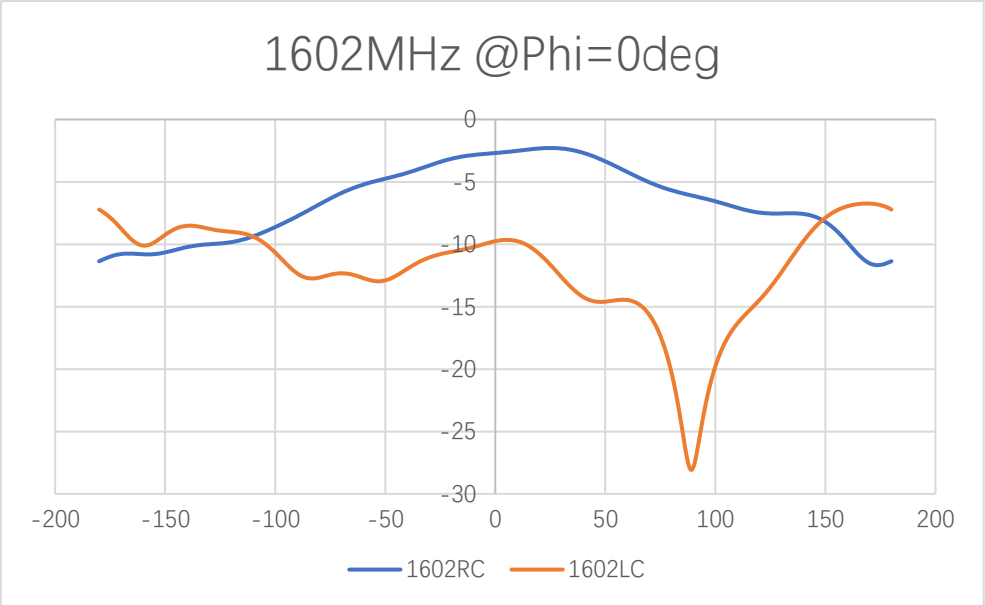


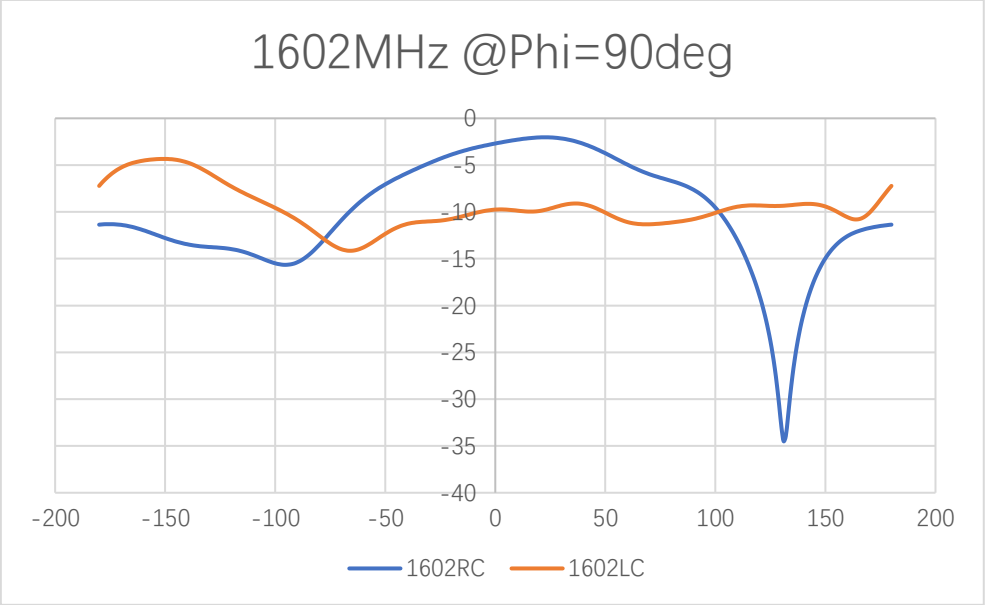

1561MHz @Phi=0deg
0
-5
-10
-15
-20
-25
-200
-150
-100
-50
0
50
100
150
200
1561RC
1561LC


1561MHz @Phi=90deg
0
-5
-10
-15
-20
-25
-30
-35
-200
-150
-100
-50
0
50
100
150
200
1561RC
1561LC


1575MHz @Phi=0deg
0
-5
-10
-15
-20
-200
-150
-100
-50
0
50
100
150
200
1575RC
1575LC


1575MHz @Phi=90deg
0
-10
-20
-30
-40
-50
-60
-200
-150
-100
-50
0
50
100
150
200
1575RC
1575LC



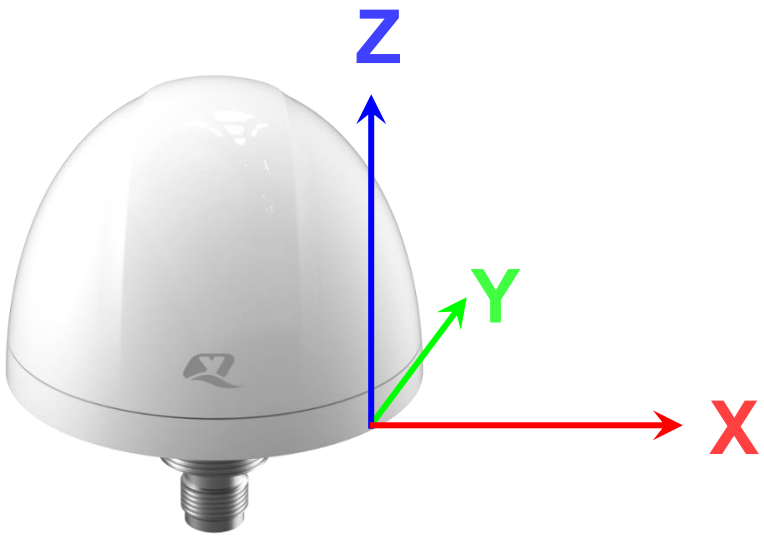


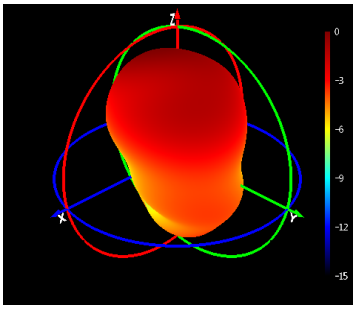
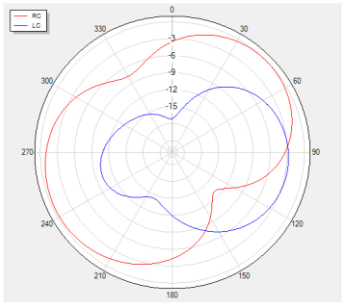
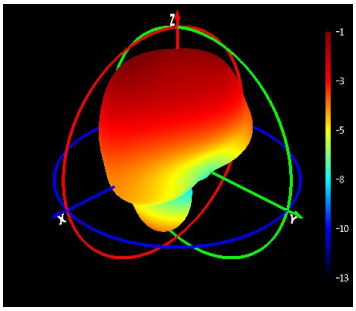
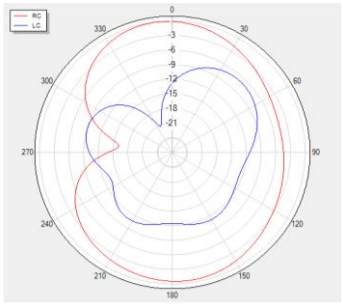
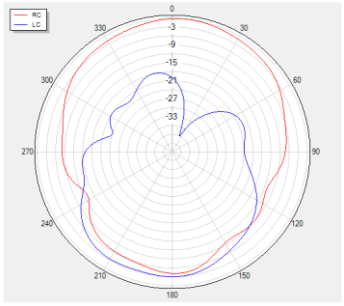
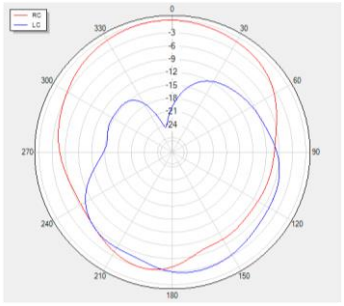
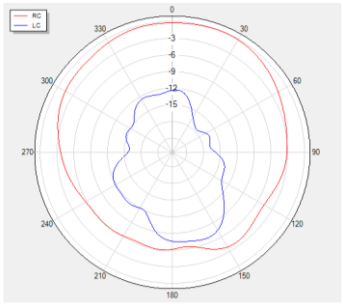
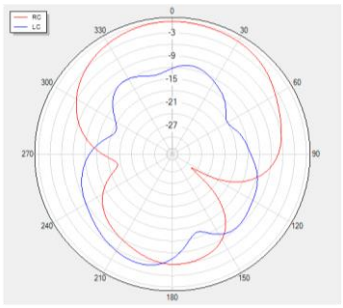
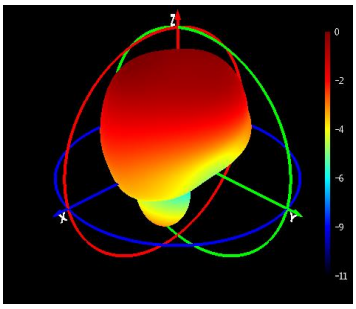
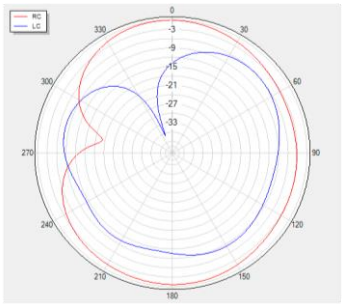
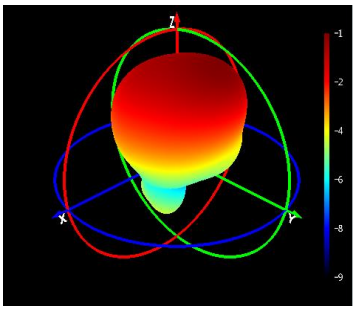
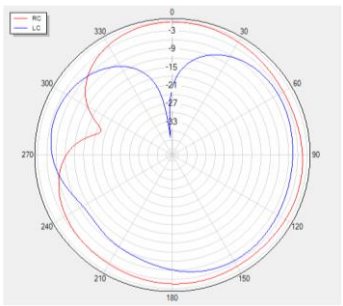
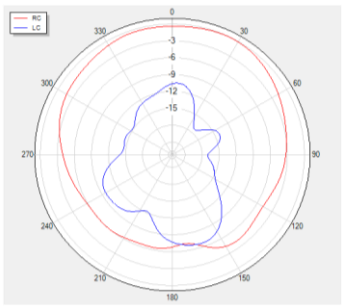
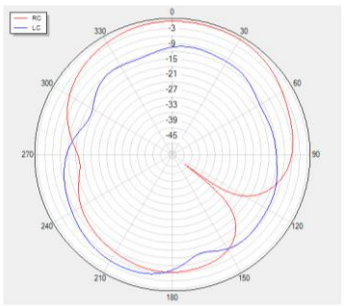
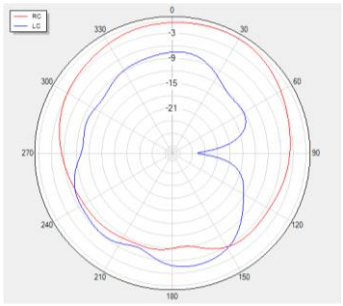
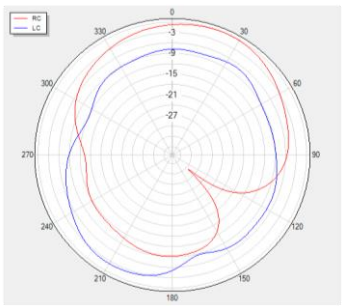
RHCP and LHCP Gain (dBi)

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
RHCP Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-0.6	-	-	-	-	-2.1	-1.1	-2.7
	Phi = 90 (deg) Theta = 0 (deg)	-0.6	-	-	-	-	-2.1	-1.1	-2.7
LHCP Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-20.4	-	-	-	-	-14.3	-11.3	-9.7
	Phi = 90 (deg) Theta = 0 (deg)	-20.4	-	-	-	-	-14.3	-11.3	-9.7

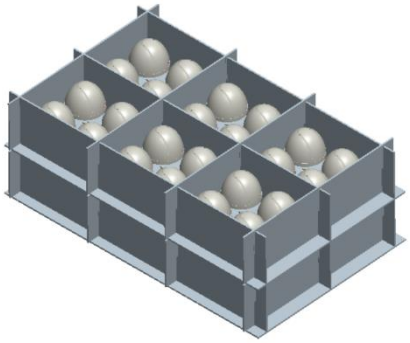
3.2.6. 3D & 2D Radiation Pattern

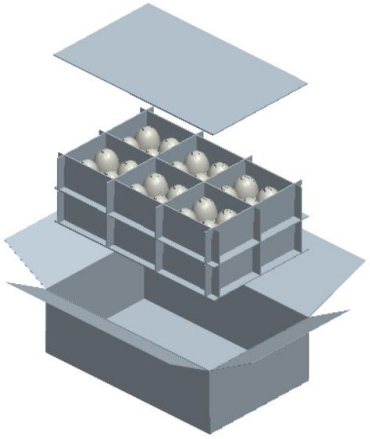
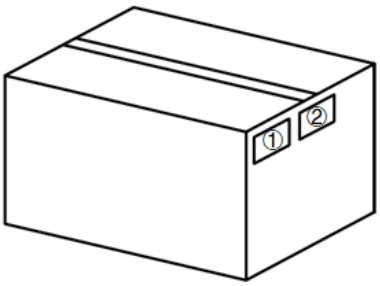
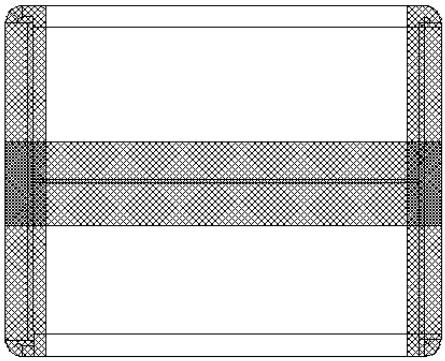
- Test Condition: Free Space
- Test Chamber: FS-G-1



1176 MHz		1561 MHz	
	H plane 		H plane 
E1 plane 	E2 plane 	E1 plane 	E2 plane 
1575 MHz		1602 MHz	
	H plane 		H plane 
E1 plane 	E2 plane 	E1 plane 	E2 plane 

4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		Put the product in a bubble bag
2		Each knife card slot holds 4 products and one layer of knife cards holds 24 products.

3		Stack knife cards in 2 layers; (48 pcs antennas per carton box) Carton Size: L × W × H = 550 × 350 × 210 mm
4		**Position for Attaching Labels** ① Carton Label ② Quality Label
5		**Sealing Cartons** "工" type sealing cartons

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Revision History

Version	Date	Author	Note
-	2023-05-10	Mastin ZENG/ Jason LONG/ David LIU/ Vinnie LIU	Creation of the document
1.0	2023-05-10	Mastin ZENG/ Jason LONG/ David LIU/ Vinnie LIU	First official release

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