Antenna Datasheet

Product OC: YEGB000Q1A /YEGN000Q1A
Version: 1.0
Date: 2023-07-27
Status: Preliminary

Product Name: GNSS Antenna
Key Features:
Frequency Band: 1164–1189MHz,1559–1606 MHz
Dimensions: 62mm * 56mm*22.6mm
LNA Gain: 21±3dB
RoHS and REACH Compliant
IP 67

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

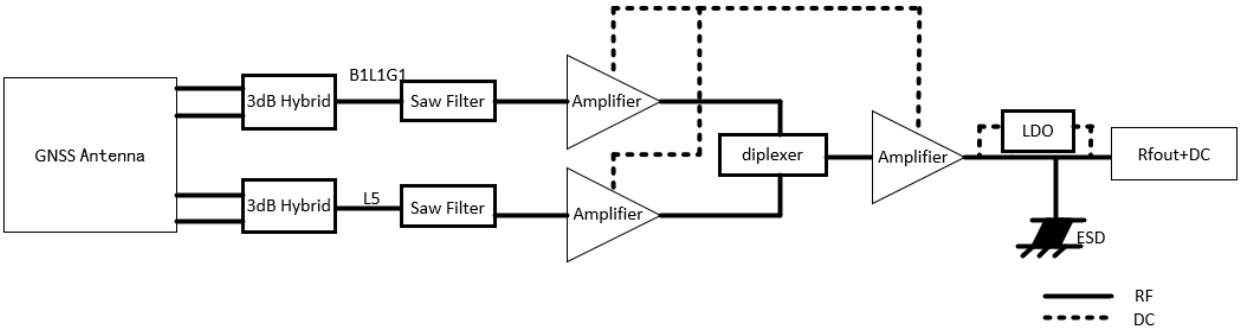
Band / Frequency (MHz)	GPS L5 GALILEO E5a BEIDOU B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BEIDOU B2b	GPS L2 QZSS L2C	GLONASS G2	BEIDOU B3	BEIDOU B1I	GPS L1 GALILEO E1 BEIDOU B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.35	-	-	-	-	1.31	1.28	1.44
Return Loss (dB)	-16.4	-	-	-	-	-17.2	-18	-14.7
Efficiency (%)	59.4	-	-	-	-	58.4	67.8	42.8
Peak Gain (dBi)	1.37	-	-	-	-	2.49	3.39	1.28
Axial Ratio(dB)	1.67	-	-	-	-	0.17	0.34	0.36

LNA Electrical	
LNA Gain	21±3 dB
Noise Figure	≤ 2.5 dB
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	60 dB f0 ±100 MHz f0 (1176 MHz, 1580 MHz)
Working Voltage	3–5 V
Working Current	26.5 ±4mA
Impedance	50 Ω

1.2. Mechanical, Environmental & Storage

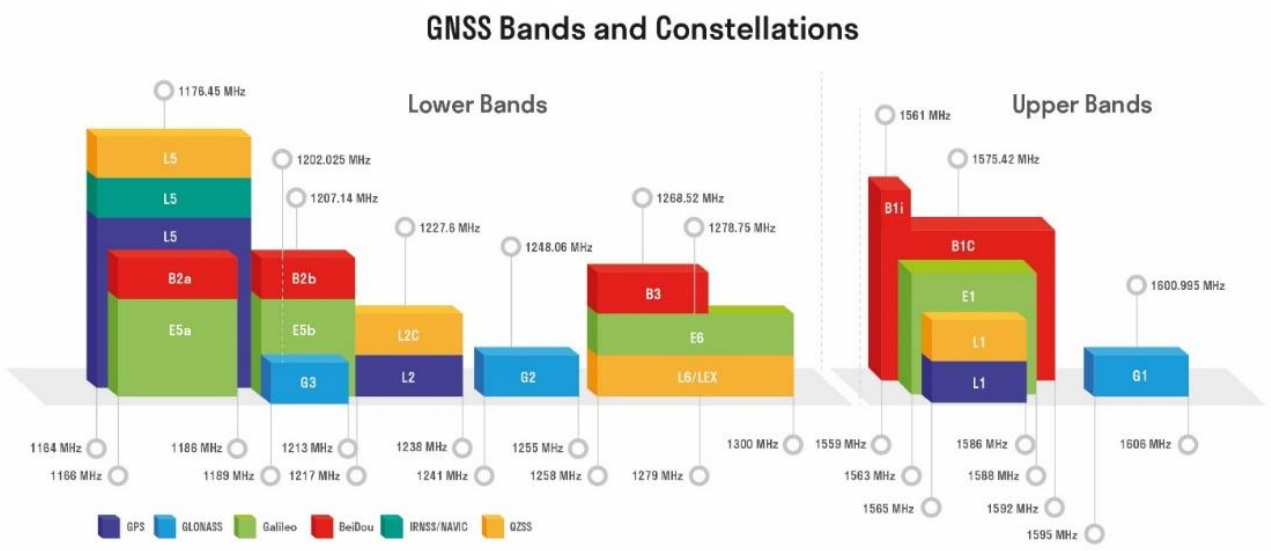
Mechanical	
Antenna Dimensions	62 * 56 * 22.6 mm
Material & Color	PC & Black
Cable Type & Length	RG174 Black & 3000 mm
Connector Type	SMA Male (The current state of the SMA connector is not waterproof. If a waterproof connector is need, it can be customized.)
Mounting Type	Magnet & Bracket & Glue
Weight	Typ. 134 ±5 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Ingress Protection (IP) Rating	IP67
RoHS & REACH Compliant	Yes

1.3. Block Diagram (Active Antenna)

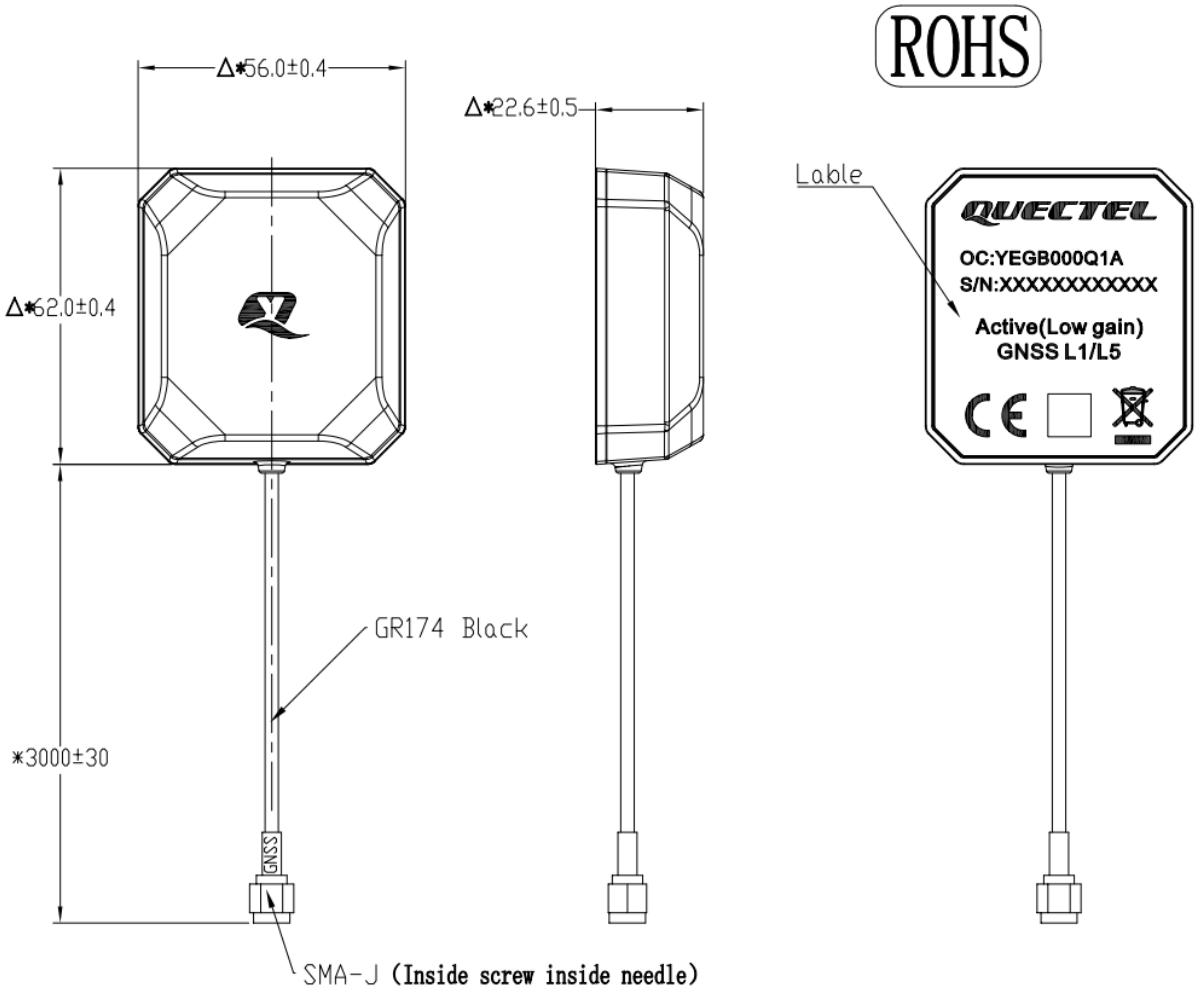


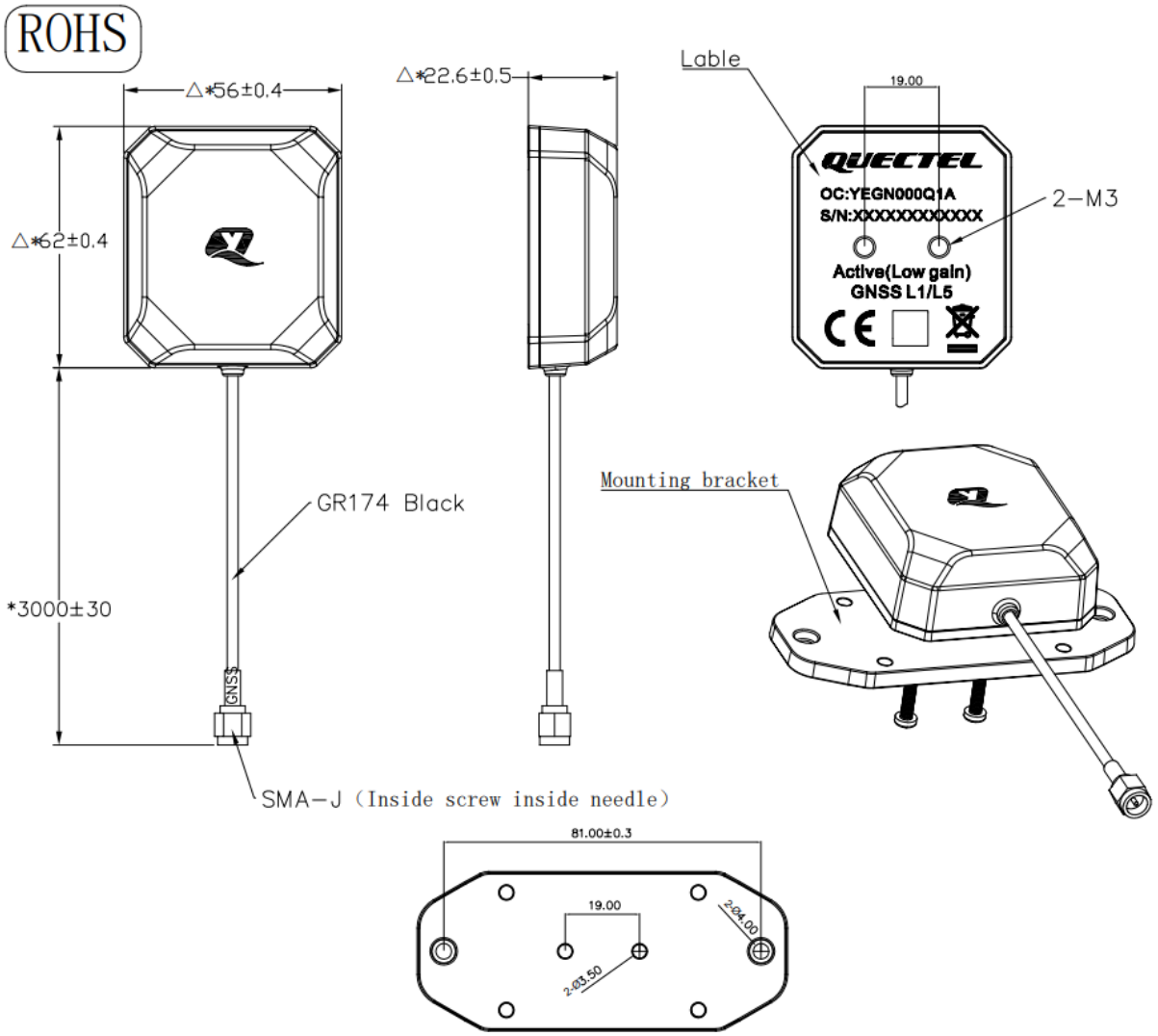
1.4. Supported GNSS Frequency Bands

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)	
	√	√	-	-	
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
1166 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

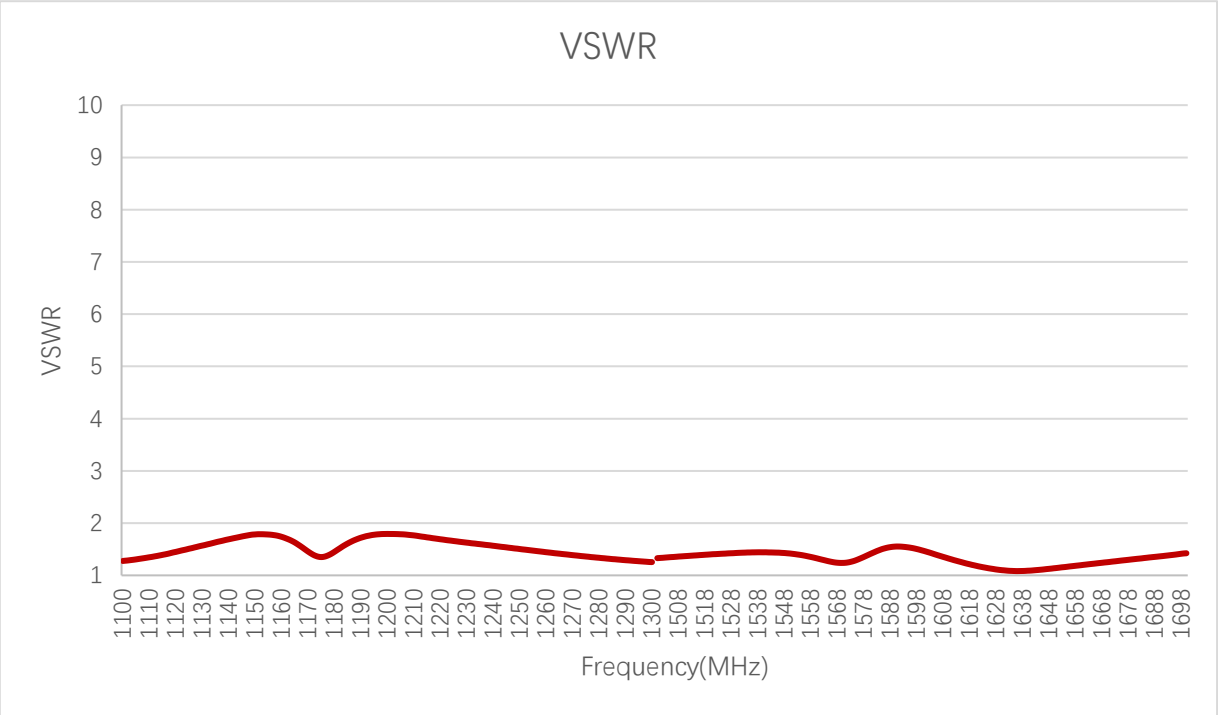

ROHS
Δ*56.0±0.4
Δ*22.6±0.5
Δ*62.0±0.4
Lable
QUECTEL
OC:YEGB000Q1A
S/N:XXXXXXXXXXXX
Active(Low gain)
GNSS L1/L5
GR174 Black
*3000±30
GNSS
SMA-J (Inside screw inside needle)


ROHS
△*56±0.4
△*62±0.4
△*22.6±0.5
Lable
19.00
QUECTEL
OC:YEGN000Q1A
S/N:XXXXXXXXXXX
2-M3
Active(Low gain)
GNSS L1/L5
Mounting bracket
GR174 Black
*3000±30
GNSS
SMA-J (Inside screw inside needle)
81.00±0.3
19.00
2-Φ4.00
2-Φ3.50

3 Detailed Performance

3.1. S-Parameter Test

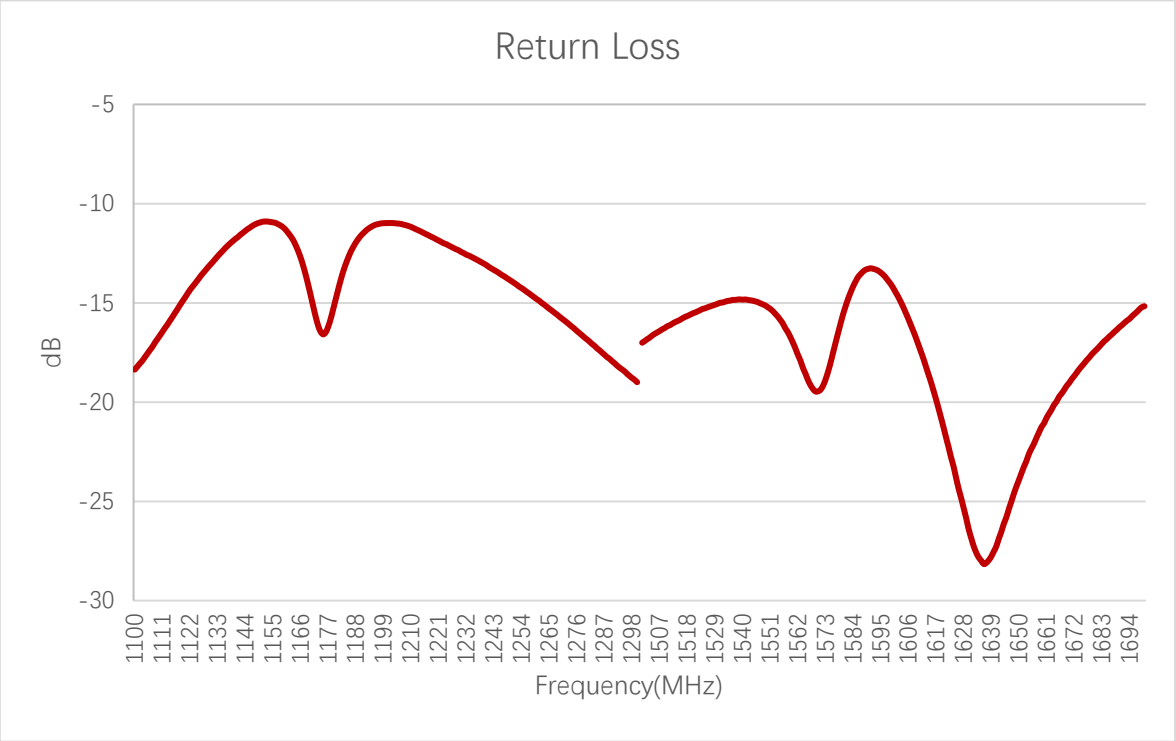
3.1.1. VSWR



VSWR

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.35	-	-	-	-	1.31	1.28	1.44

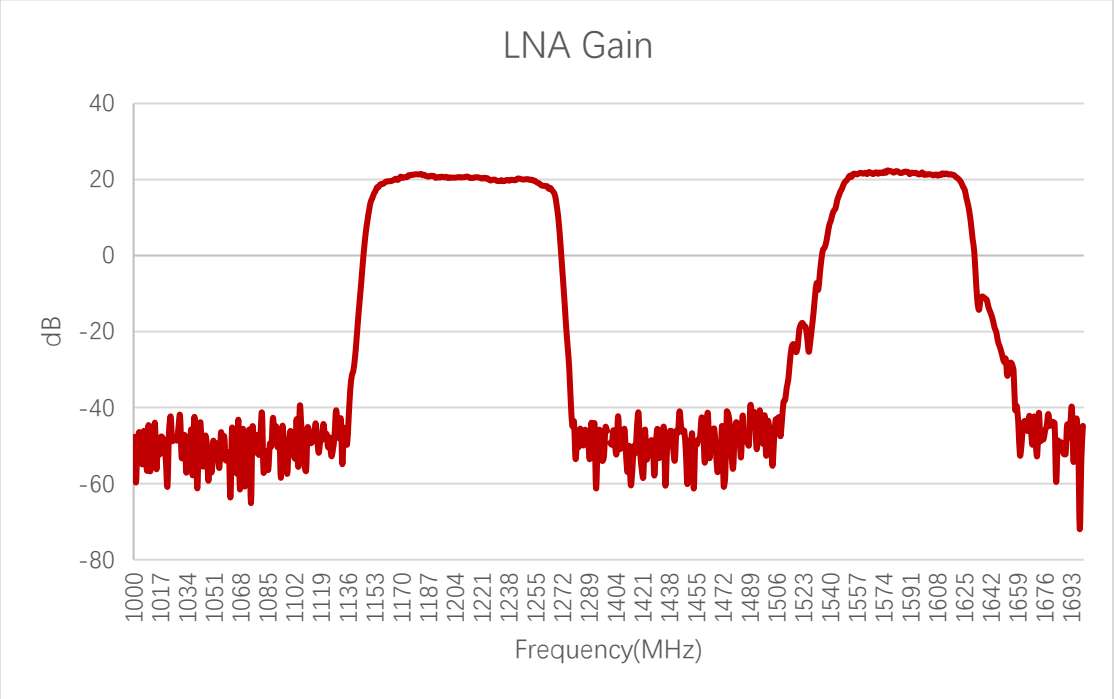
3.1.2. Return Loss



Return Loss(dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss(dB)	-16.4	-	-	-	-	-17.2	-18	-14.7

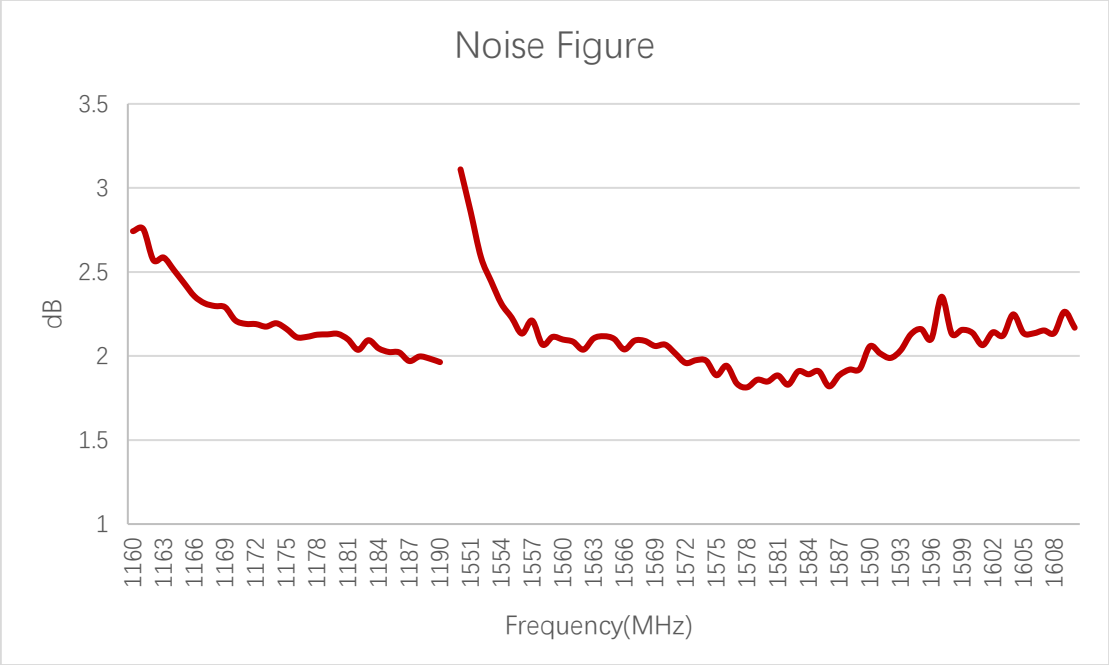
3.1.3. LNA Gain



LNA Gain(dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain(dB)	21.2	-	-	-	-	21.6	21.7	21.4

3.1.4. Noise Figure



Noise Figure(dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Noise Figure （dB）	2.1	-	-	-	-	2.08	1.8	2.14

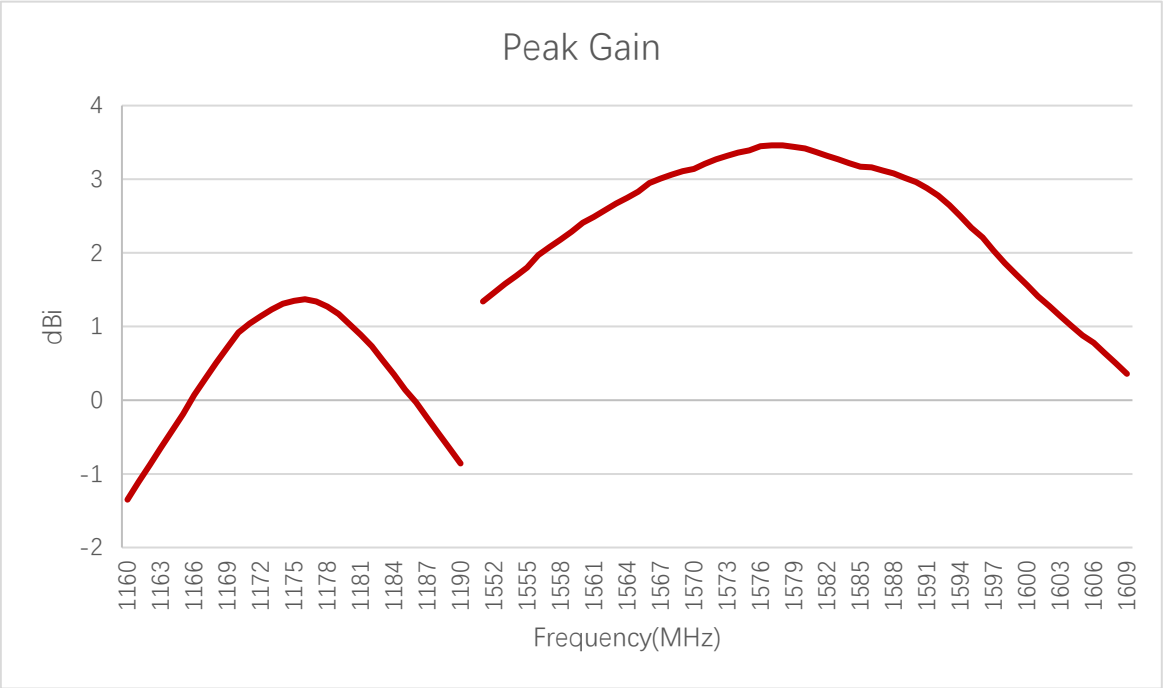
3.2. Radiation Performance Test

3.2.5. Efficiency

Efficiency (%)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	59.4	-	-	-	-	58.4	67.8	42.8

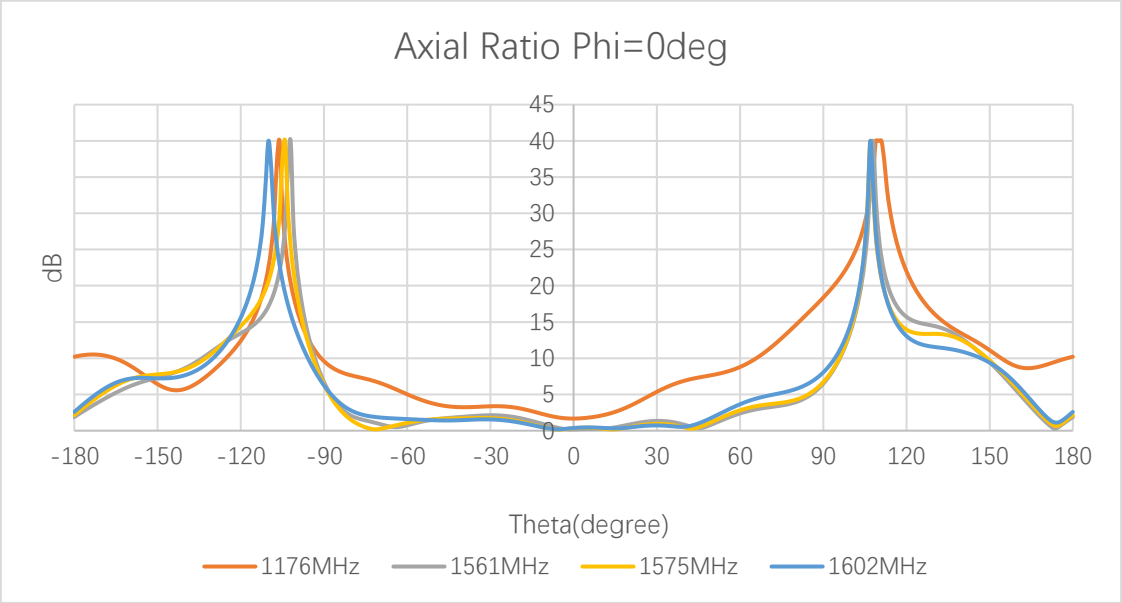
3.2.6. Peak Gain

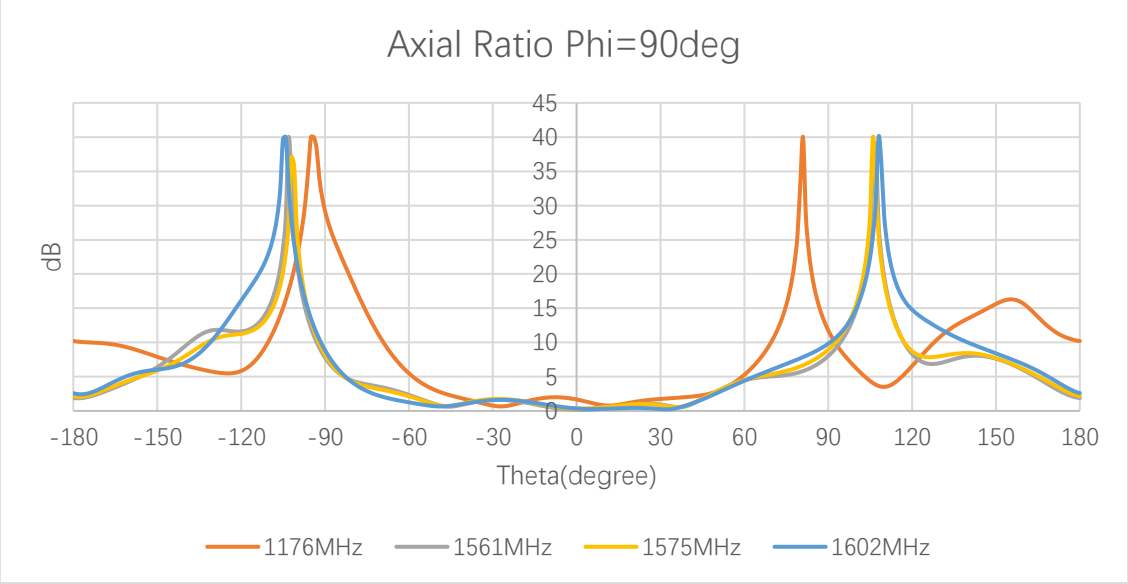


Peak Gain(dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain(dBi)	1.37	-	-	-	-	2.49	3.39	1.28

3.2.7. Axial Ratio

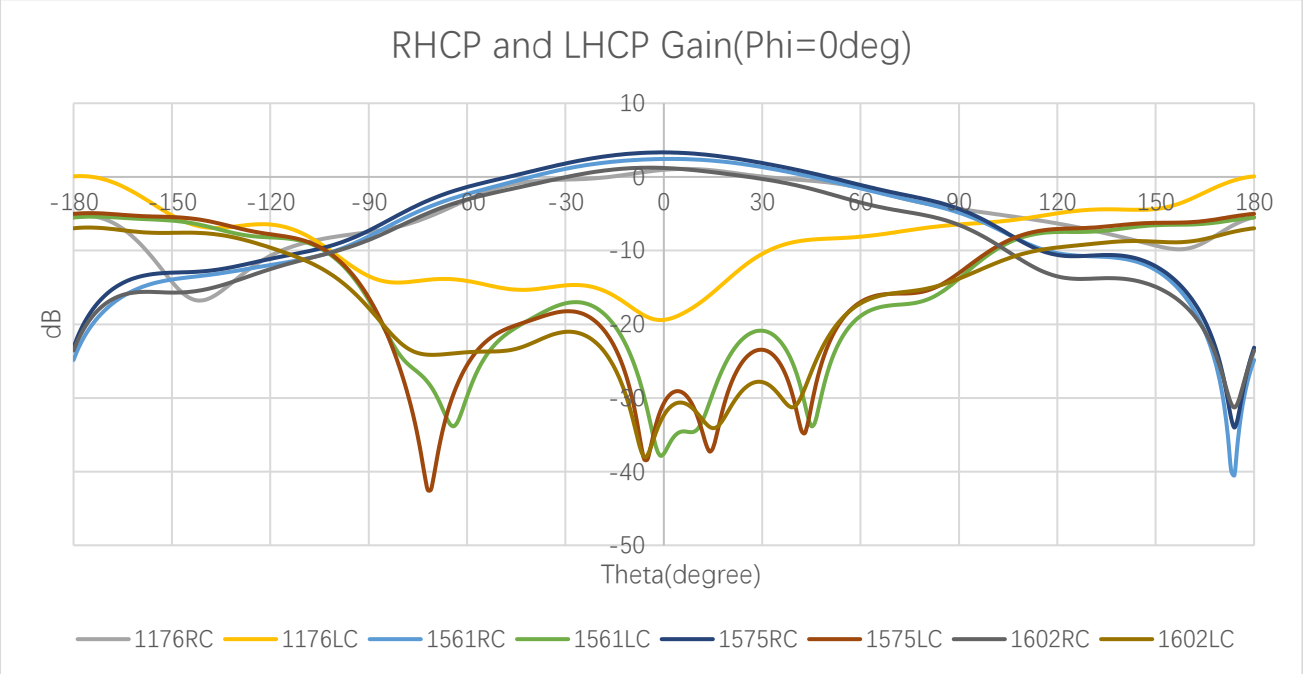


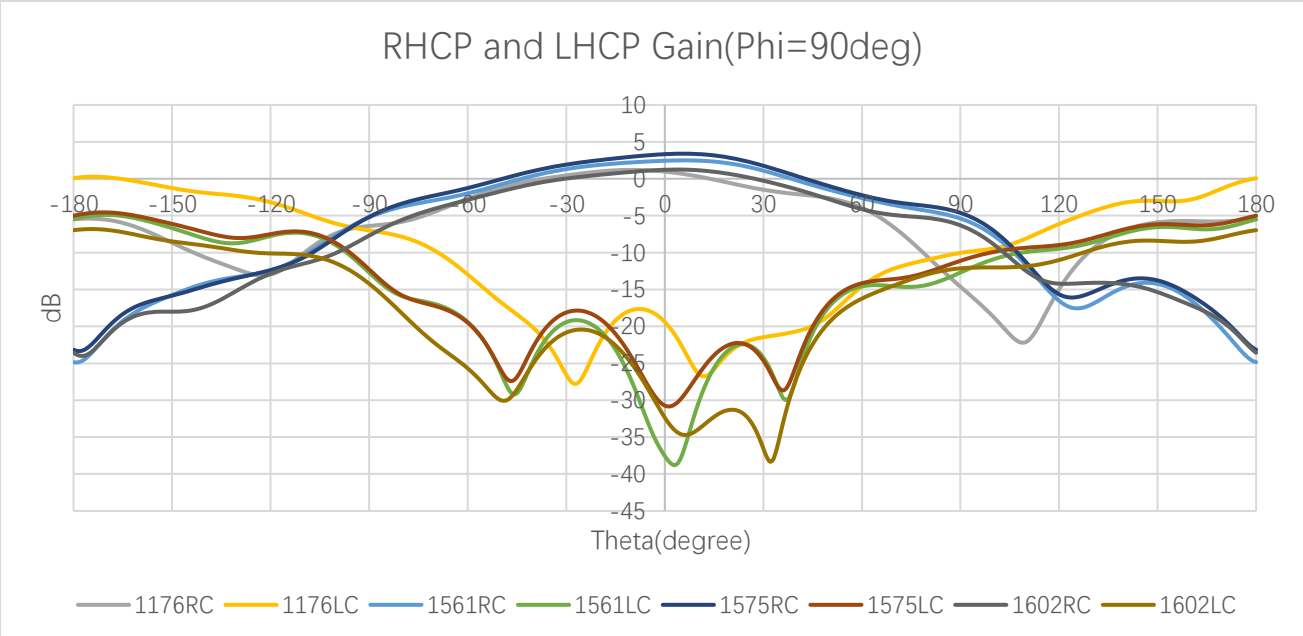


Axial Ratio (dB)

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
Axial Ratio(dB)	Phi = 0 (deg) Theta = 0 (deg)	1.67	-	-	-	-	0.17	0.34	0.36
	Phi = 90 (deg) Theta = 0 (deg)	1.67	-	-	-	-	0.17	0.34	0.36

3.2.8. 2D RHCP and LHCP Gain



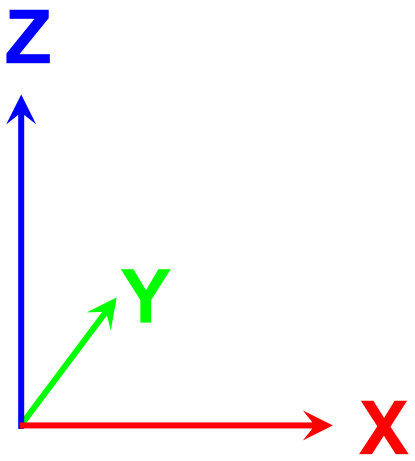


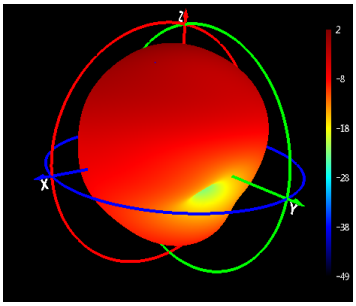
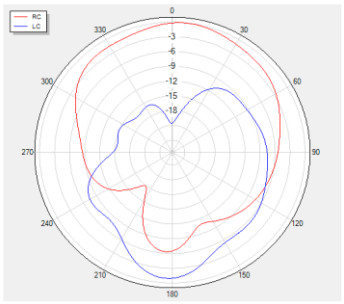
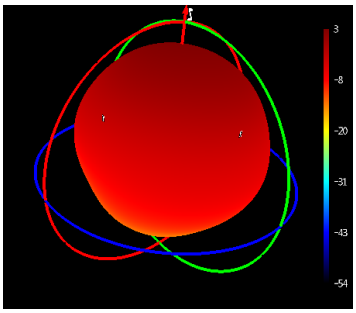
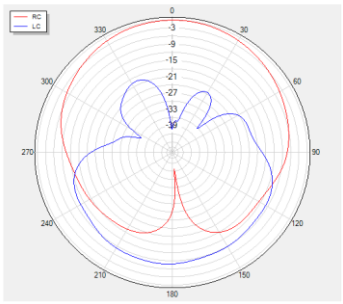
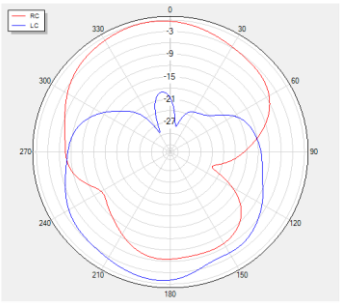
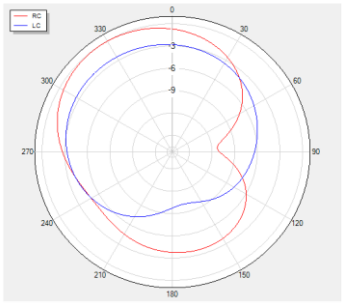
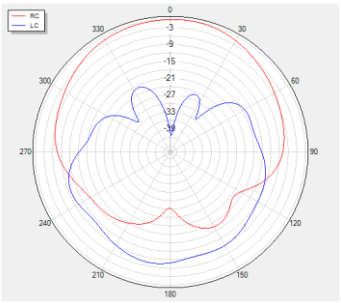
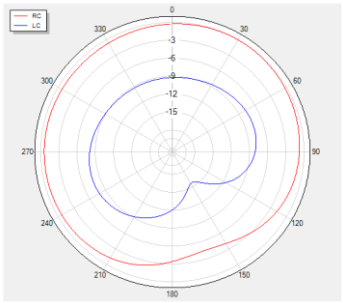
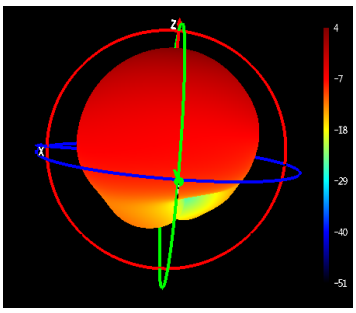
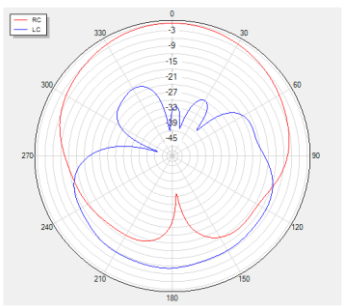
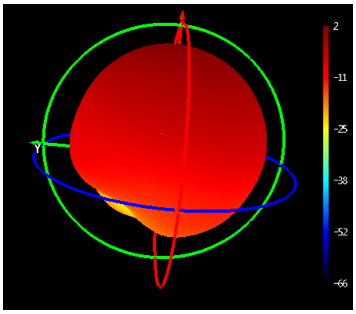
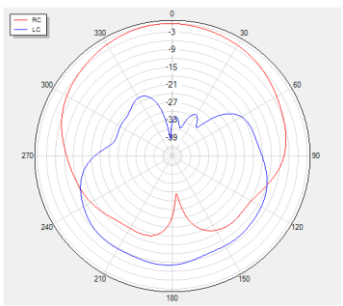
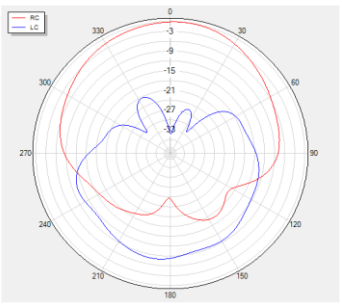
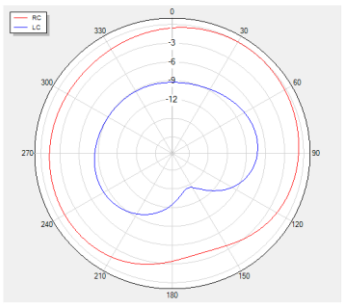
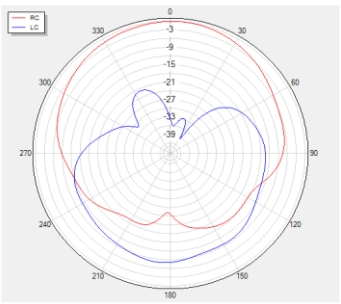
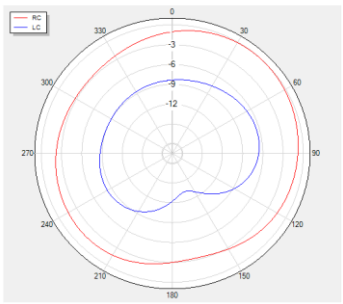
2D RHCP and LHCP Gain (dB)

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
RC Gain(dB)	Phi = 0 (deg) Theta = 0 (deg)	0.96	-	-	-	-	2.43	3.33	1.21
	Phi = 90 (deg) Theta = 0 (deg)	0.96	-	-	-	-	2.43	3.33	1.21
LC Gain(dB)	Phi = 0 (deg) Theta = 0 (deg)	-19.4	-	-	-	-	-37.5	-30.7	-32.3
	Phi = 90 (deg) Theta = 0 (deg)	-19.4	-	-	-	-	-37.5	-30.7	-32.3

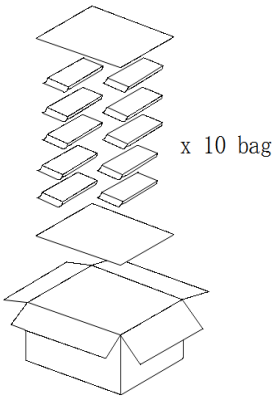
3.2.9. 3D & 2D Radiation Pattern

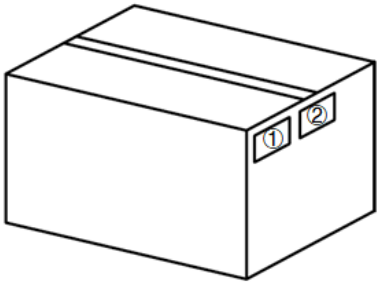
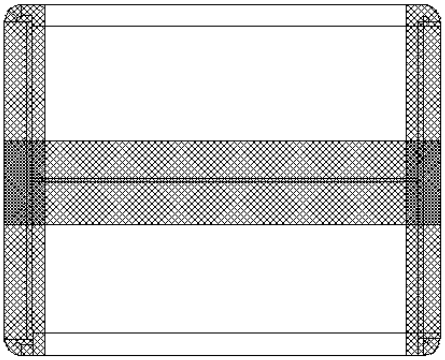
- Test Condition: Free Space
- Test Chamber: SH-SY-16M



1176MHz		1561MHz	
	Phi=0 freq=1176MHz 		Phi=0 freq=1561MHz 
Phi=90 freq=1176MHz 	Theta=90 freq=1176MHz 	Phi=90 freq=1561MHz 	Theta=90 freq=1561MHz 
1575MHz		1602MHz	
	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		1 pcs Antenna products in a small PE bags; (1 pcs Antenna / Per Small PE Bag)
2		10 pcs Antenna products in a big PE bags; (10 pcs Antenna / Per Big PE Bag) –
3		10 PE Bags / Per Carton Box (100 pcs Antenna / Per Carton Box) Estimated quantity Carton Size:L*W*H=405*293*185mm

4		**Position for Attaching Labels---** ① Carton Label ② Quality Label
5		**Sealing Cartons---** "工" type sealing cartons
6	Initial packaging plan, the final packaging method is subject to the physical supply	

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:
http://www.quectel.com/support/sales.htm.

For technical support, or to report documentation errors, please visit:
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Revision History

Version	Date	Author	Note
-	2023-07-27	Junsen Li Steven Mo David Liu Vinnie Liu	Creation of the document
1.0	2023-07-27	Junsen Li Steven Mo David Liu Vinnie Liu	First official release

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