



Antenna Datasheet

Product OC: YEGN103W8A

Version: 1.2

Date: 2024-12-11

Status: Released

Product Name: Active GNSS Antenna (GPS L1/L2/L5, BDS B1/B2/B3, GLONASS G1/G2/G3, Galileo E1/E5a/E5b/E6, L-Band)

Key Features:

Frequency Band: 1164–1300 MHz, 1525–1606 MHz

RG174 (SMA Male to TNC Male) length: 3000 ±30 mm

Magnetic mounting type

Dimensions: Φ 146.4 mm × 71.43 mm

RoHS and REACH Compliant

LNA Gain: 40 ±4 dB

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

Overview.....	1
Contents	2
1 Specification.....	3
1.1. Electrical.....	3
1.2. Mechanical & Environmental	5
1.3. Block Diagram (Active Antenna)	6
1.4. Supported GNSS Frequency Bands.....	7
2 Drawing	9
2.1. Antenna.....	9
2.2. YEGM003WWAM	10
2.3. YEGX000Q1AM	10
3 Detailed Performance	11
3.1. S-Parameter Test	11
3.1.1. VSWR.....	11
3.1.2. Return Loss	12
3.1.3. GNSS LNA Gain.....	13
3.1.4. Noise Figure	14
3.2. Radiation Performance Test.....	15
3.2.1. Efficiency	15
3.2.2. Peak Gain.....	16
3.2.3. Axial Ratio	17
3.2.4. 2D RHCP and LHCP Gain	18
3.2.5. 3D & 2D Radiation Pattern.....	19
4 Packaging	23
Contact Us.....	25
Legal Notices	26
Revision History	28

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

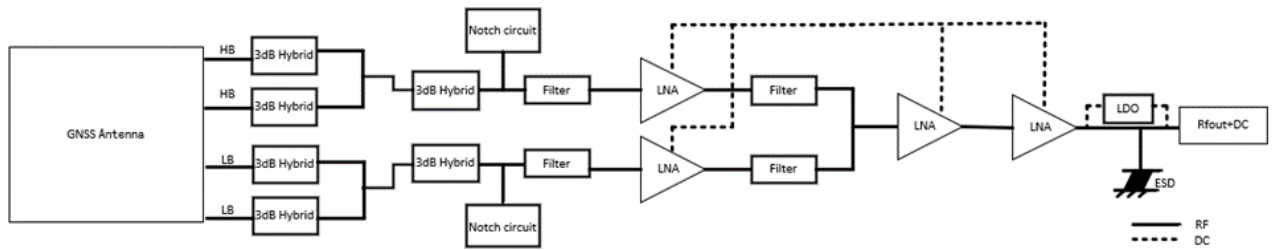
Band Frequency (MHz)	GPS L5 GALILEO E5a BDS B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BDS B2b	GPS L2 QZSS L2C	GLONASS G2	BDS B3	GALILEO E6 QZSS L6	L-Band	BDS B1I	GPS L1 GALILEO E1 BDS B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
VSWR	1.34	1.24	1.08	1.2	1.31	1.33	1.07	1.11	1.1	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
Cable Type & color & Length	RG174 & Black & 3000 mm
Connector Type	Antenna: TNC Female Cable: SMA Male to TNC Male
Mounting Type	Magnetic
Weight	Antenna: 347 g
	Suction cup base: 867.1 g
	Cable: 51.2 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

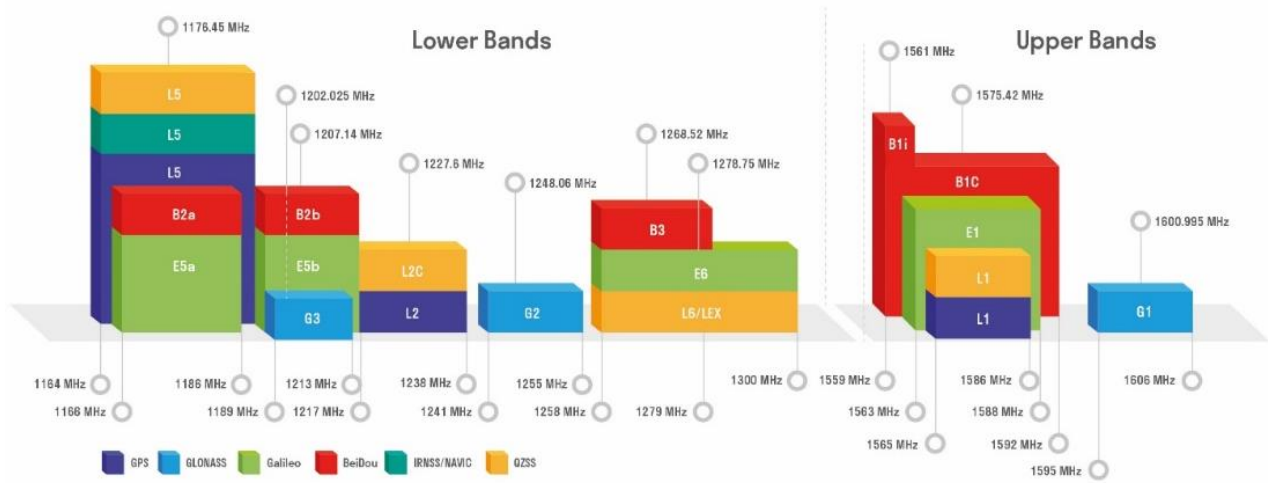
1.3. Block Diagram (Active Antenna)



1.4. Supported GNSS Frequency Bands

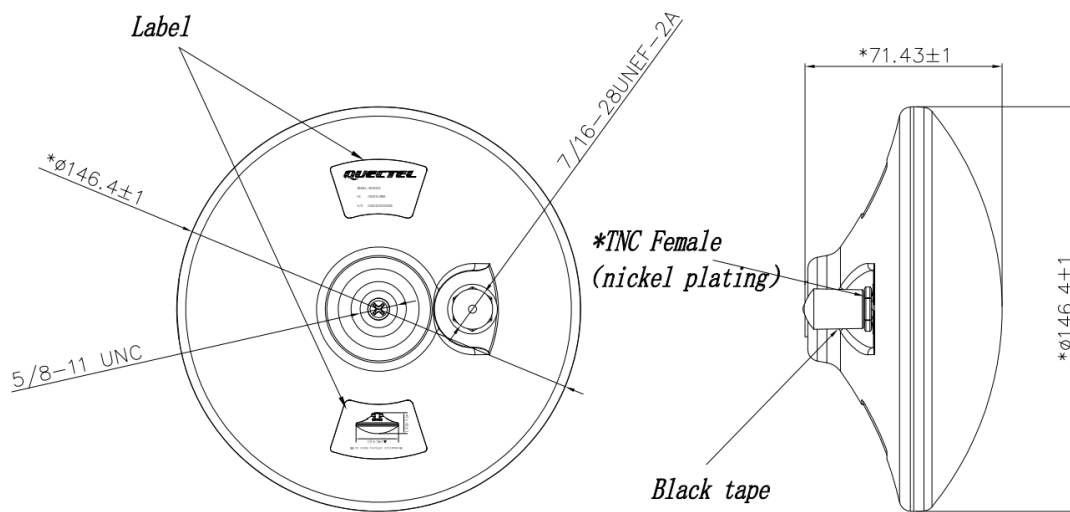
GNSS Frequency Bands (MHz)					
GPS	L1 Centre 1575.42 (1565–1586)	L2 Centre 1227.6 (1217–1238)	L5 Centre 1176.45 (1164–1189)		
	√	√	√		
GLONASS	G1-L10C-L10F Centre 1601 (1595–1606)	G2-L20C-L20F Centre 1248.06 (1241–1255)	G3-L30C Centre 1202.025 (1189–1213)		
	√	√	√		
GALILEO	E1 Centre 1575.42 (1563–1588)	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

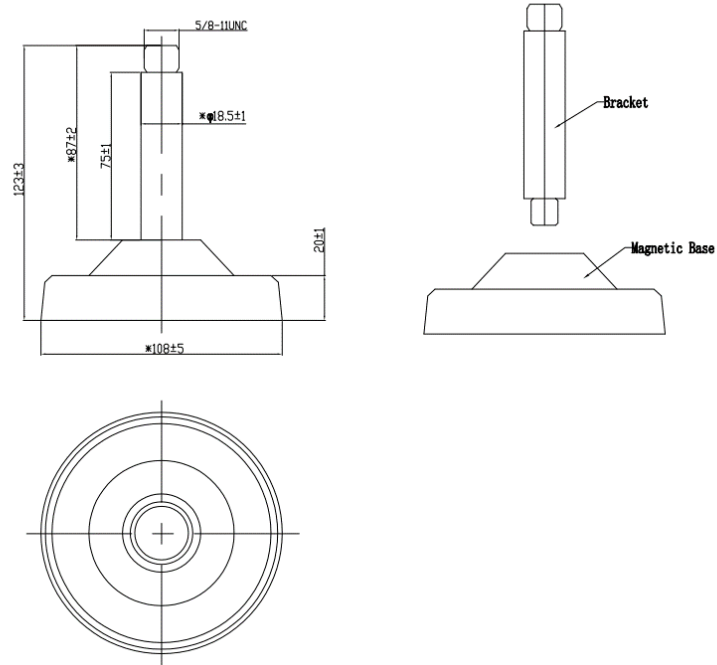


2 Drawing

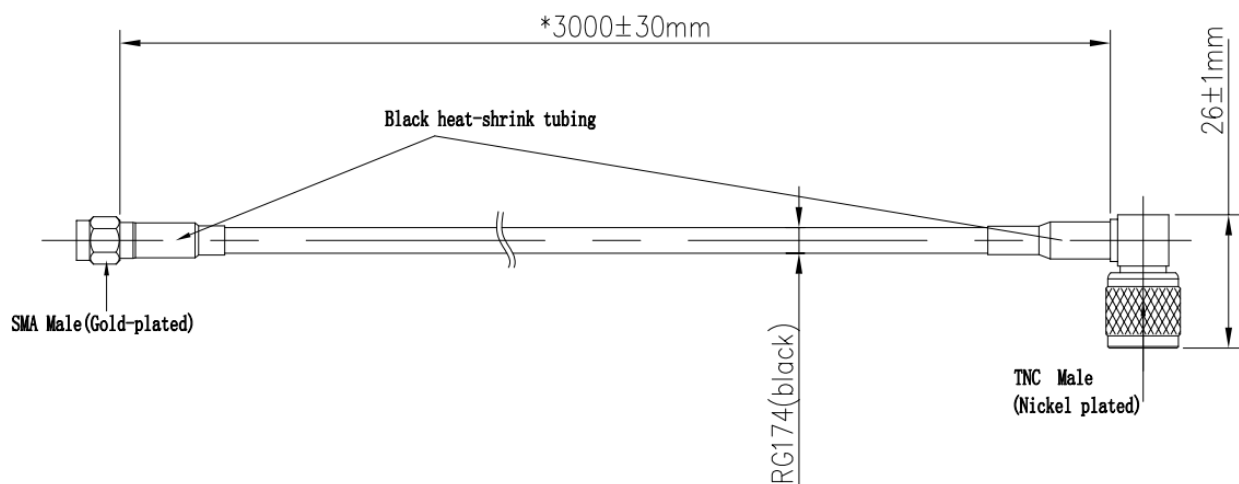
2.1. Antenna



2.2. YEGM003WWAM



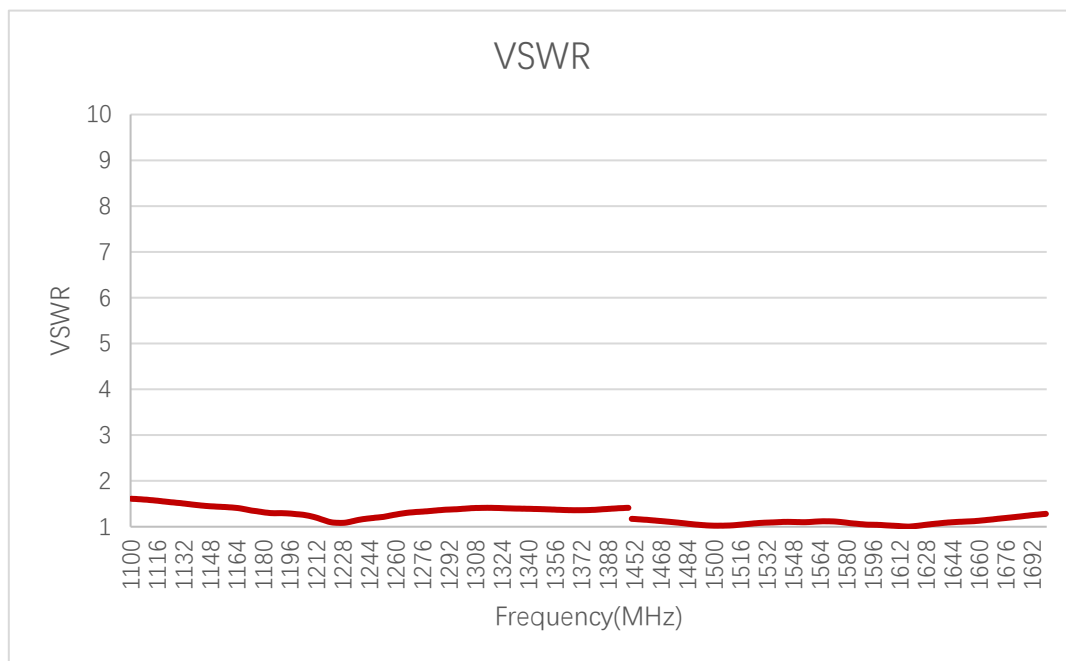
2.3. YEGX000Q1AM



3 Detailed Performance

3.1. S-Parameter Test

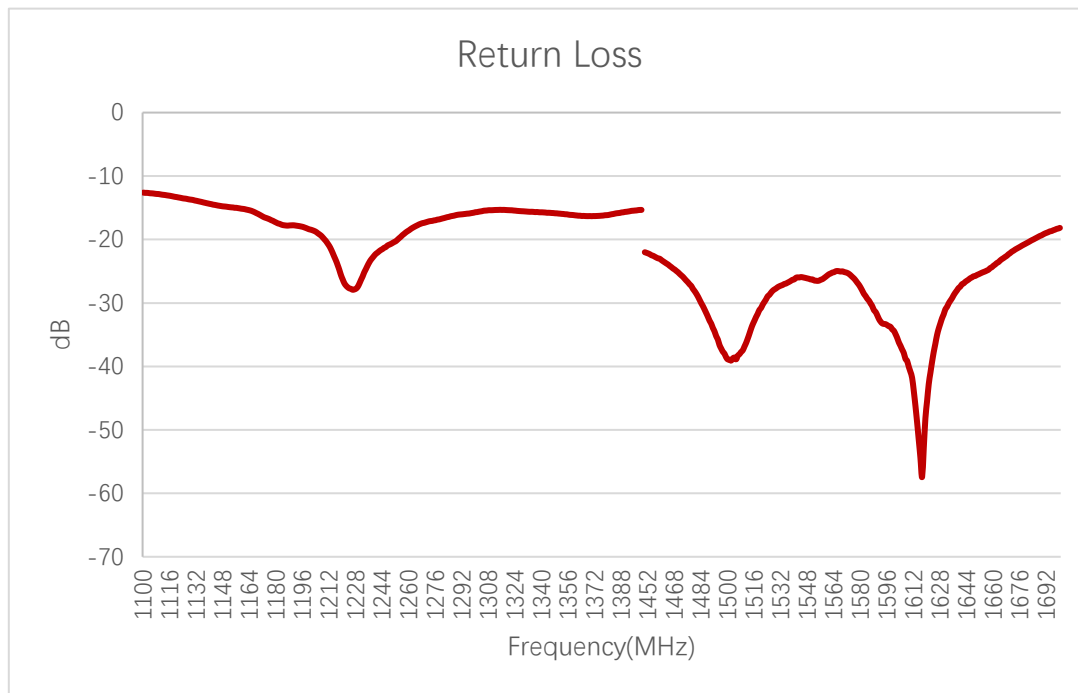
3.1.1. VSWR



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

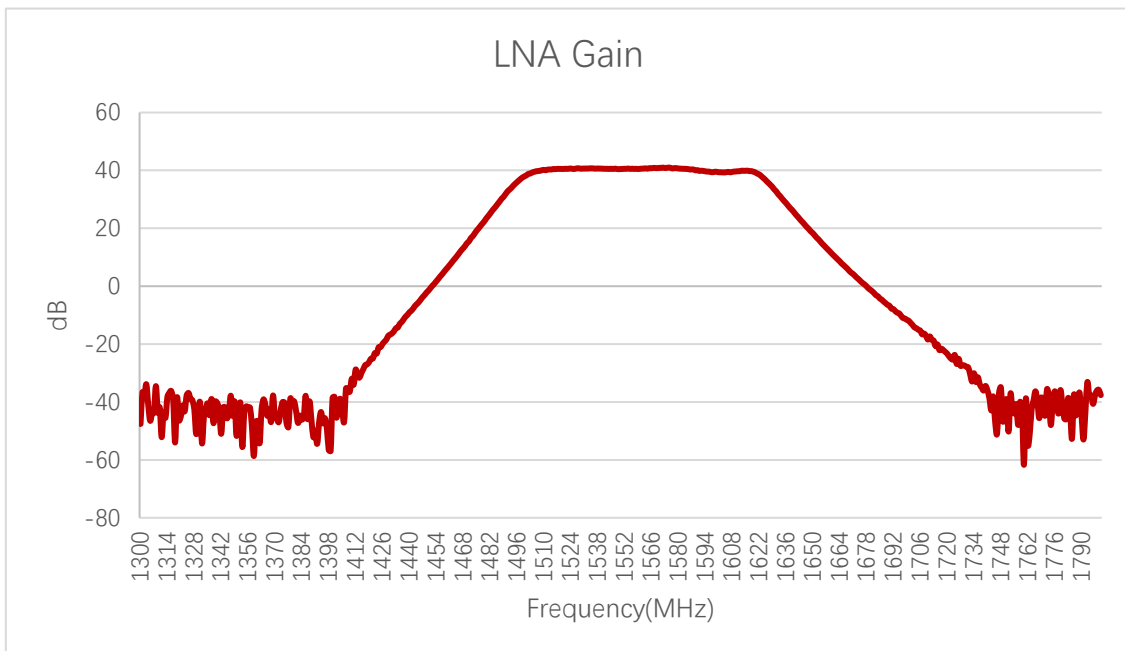
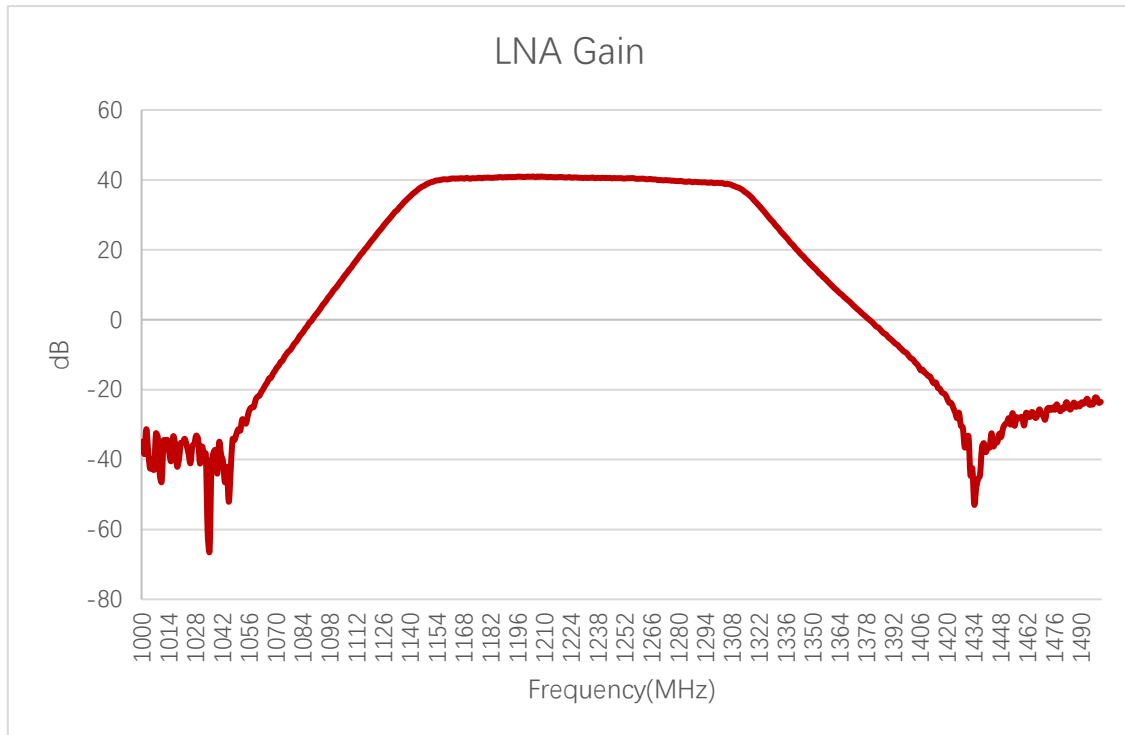
3.1.2. Return Loss



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

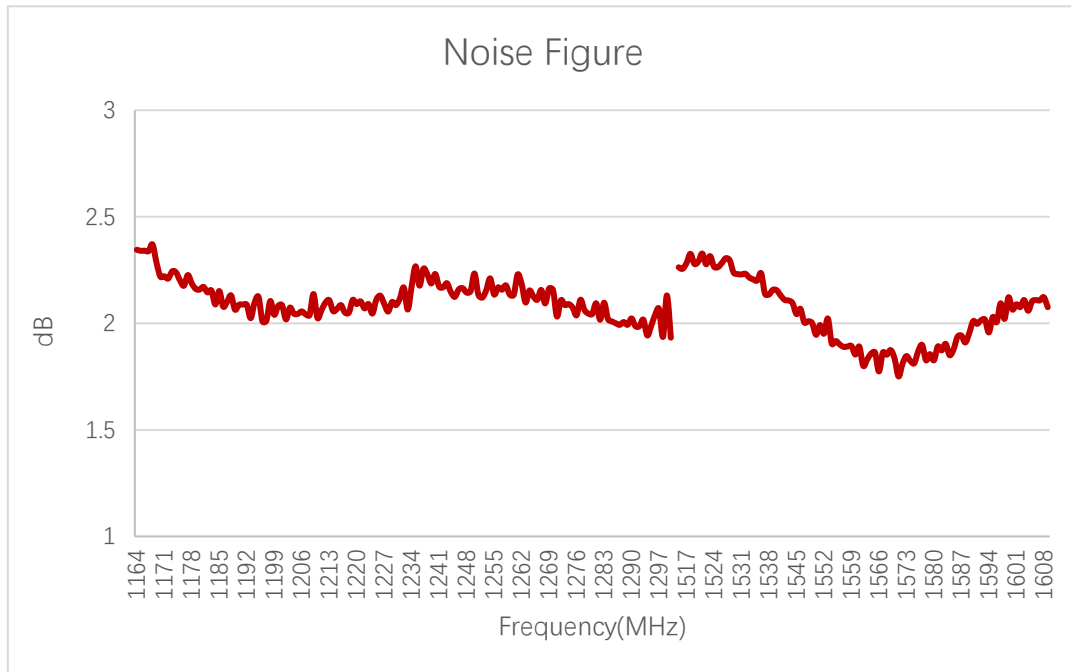
3.1.3. GNSS LNA Gain



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

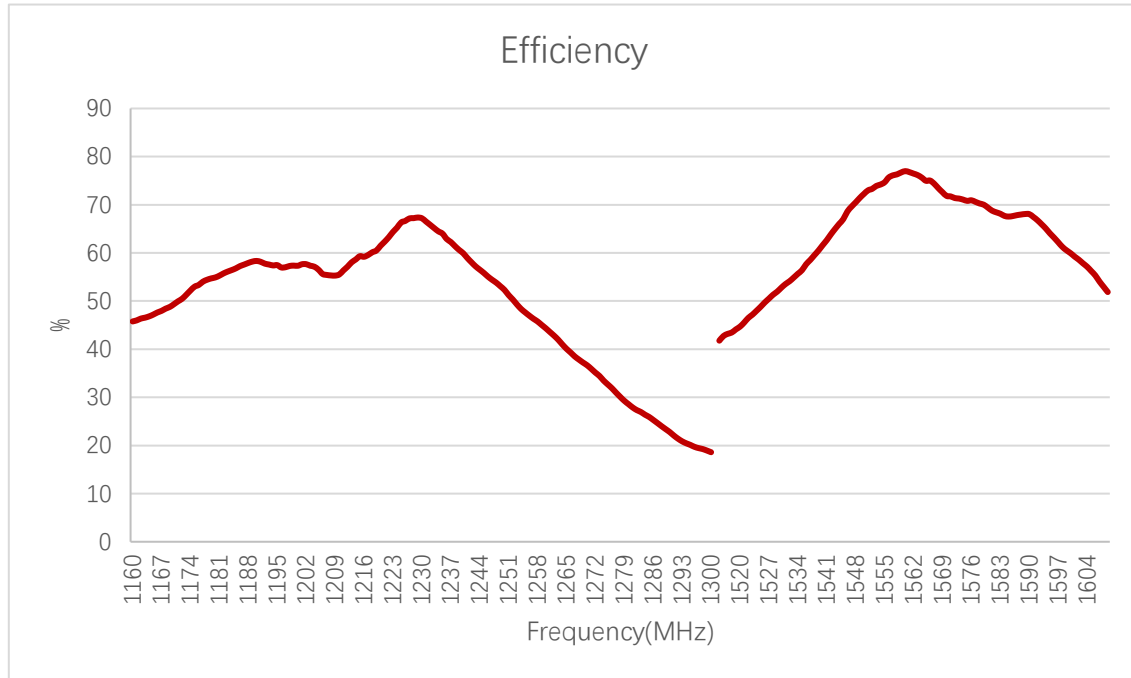


Noise Figure (dB)

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

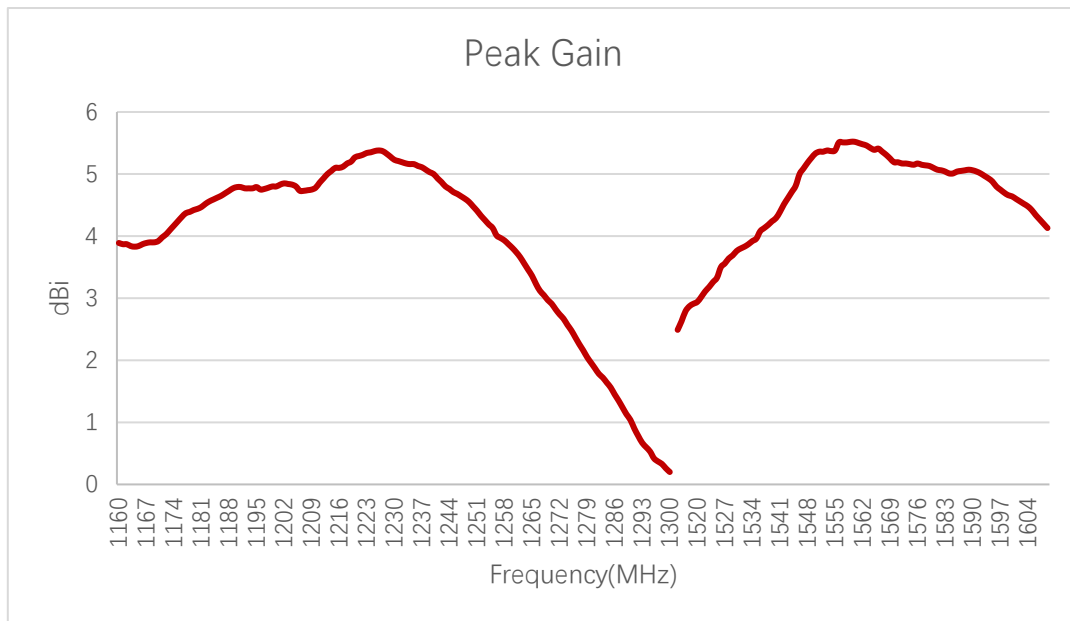
3.2.1. Efficiency



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

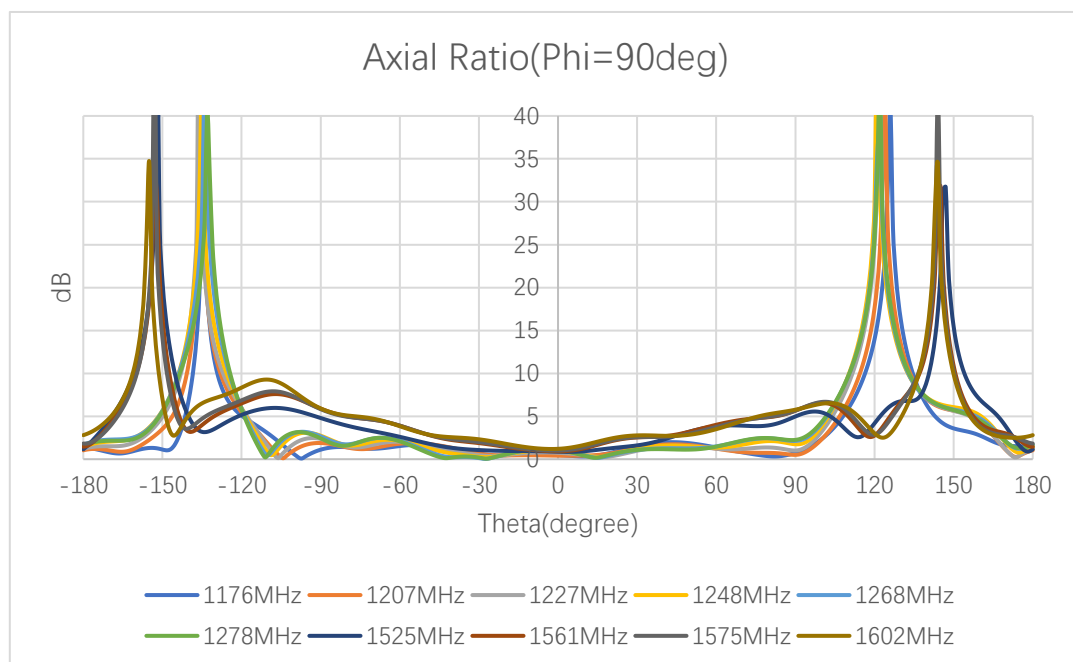
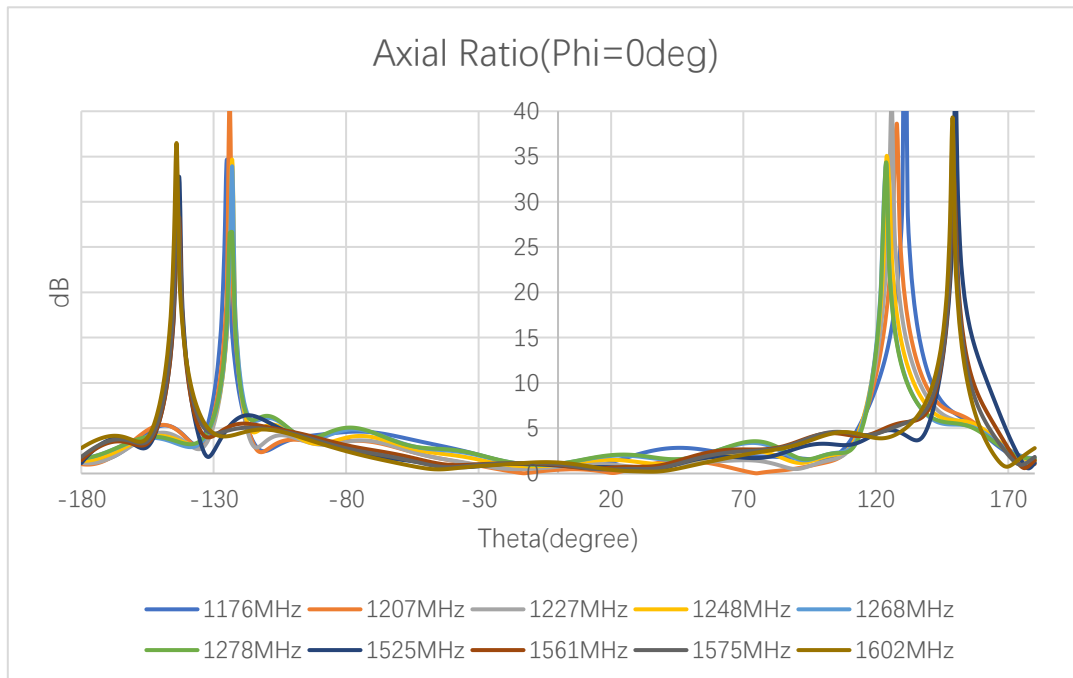
3.2.2. Peak Gain



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

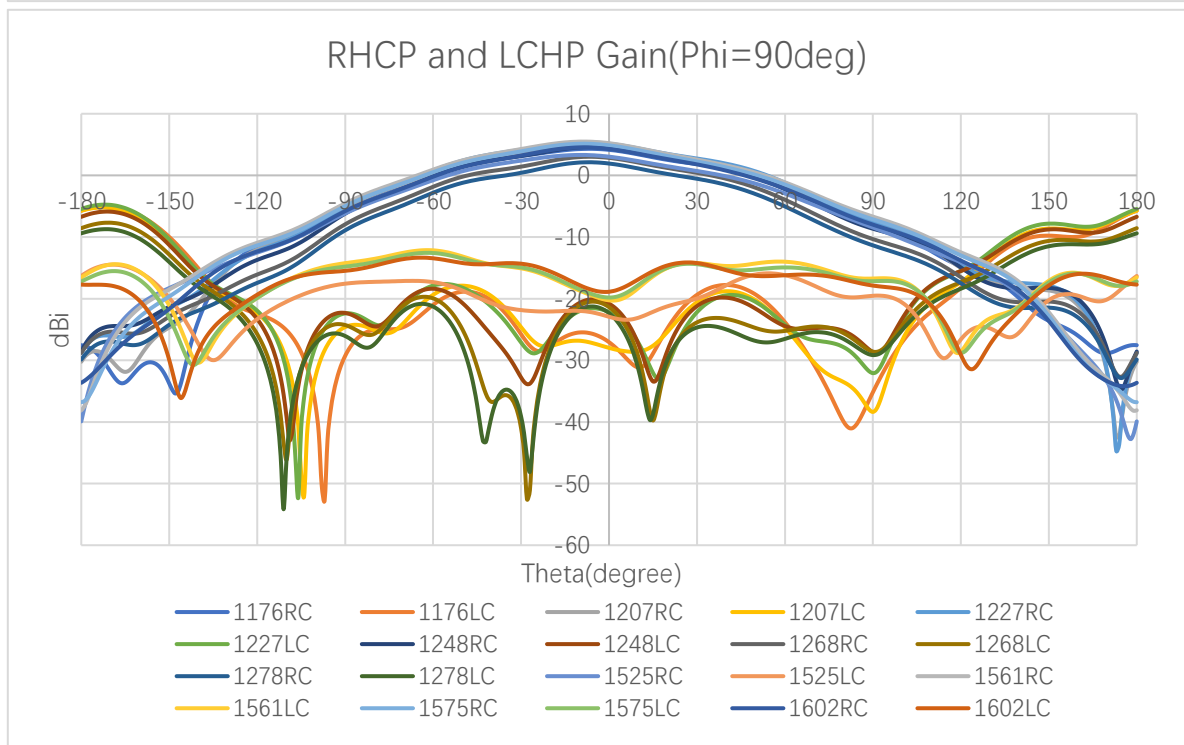
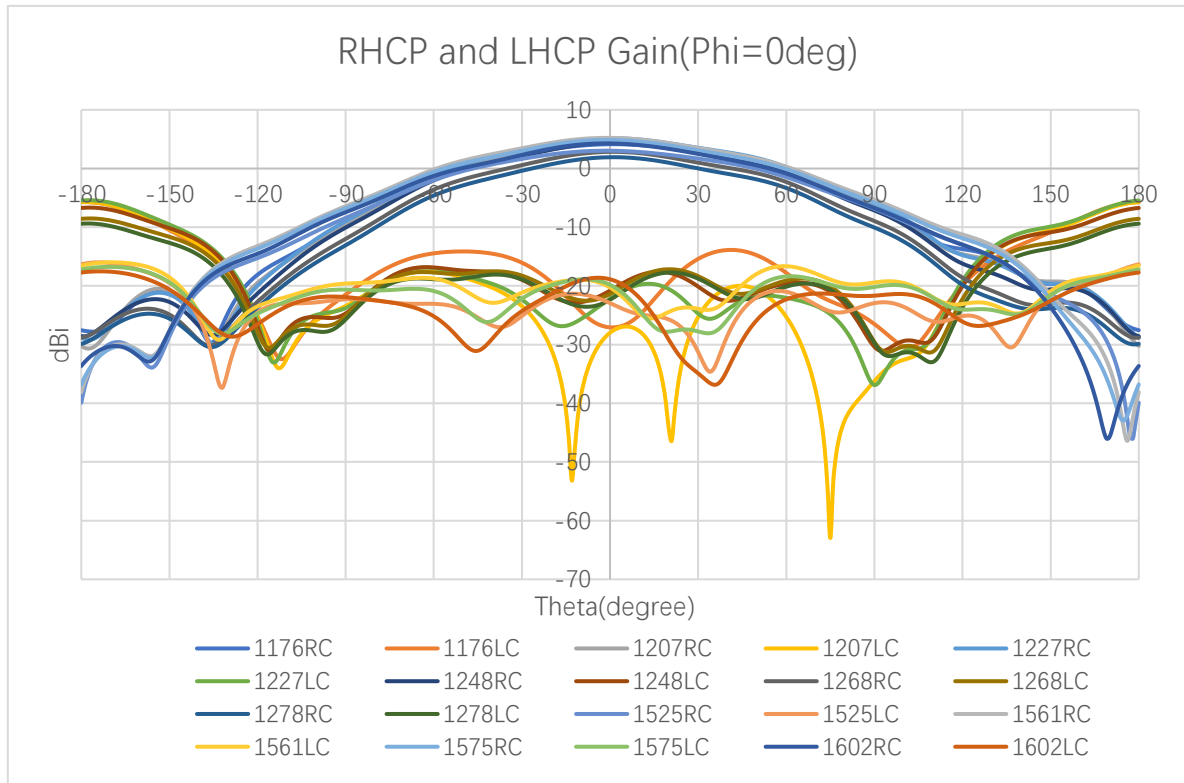
3.2.3. Axial Ratio



Axial Ratio (dB)

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

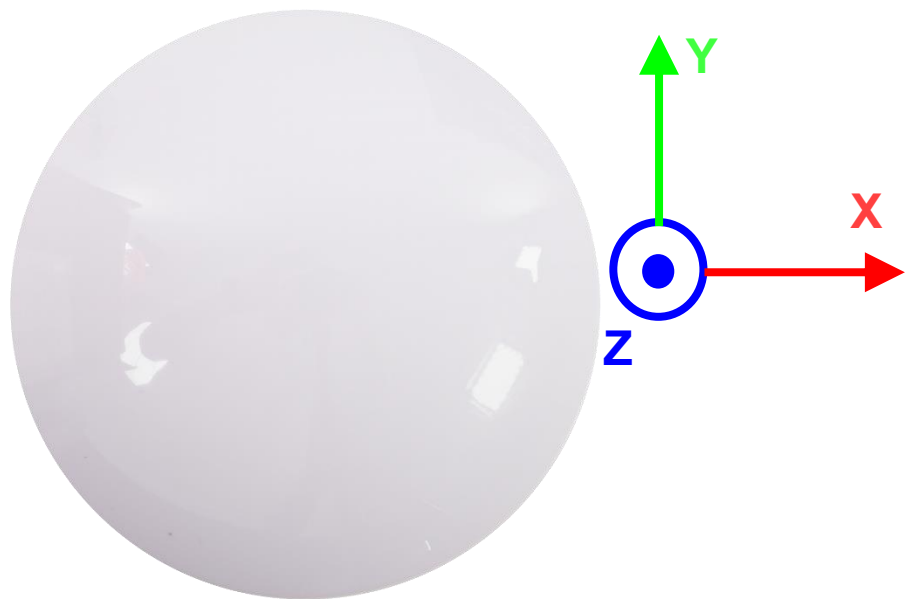


2D RHCP and LHCP Gain (dBi)

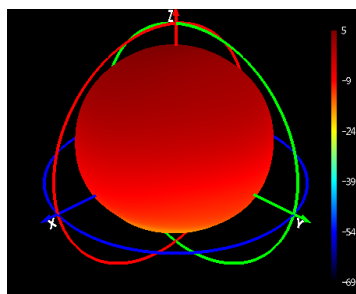
Frequency (MHz)		1176	1207	1227	1248	1268	1278	1525	1561	1575	1602
RC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	4.14	4.49	5.13	4.42	2.84	1.92	3.03	5.22	4.87	4.28
	Phi = 90 (deg) Theta = 0 (deg)	4.14	4.49	5.13	4.42	2.84	1.92	3.03	5.22	4.87	4.28
LC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-27	-27.9	-22.2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

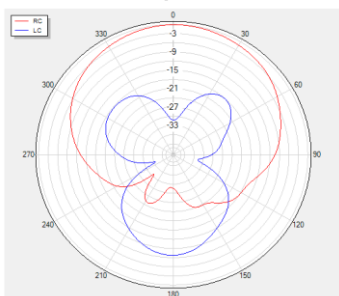
- Test Condition: Free Space
- Test Chamber: SH-SY-16M



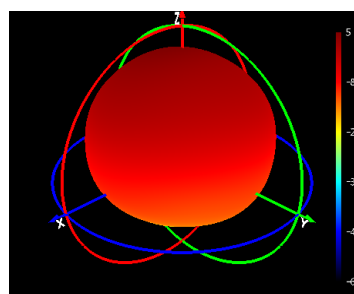
1176 MHz



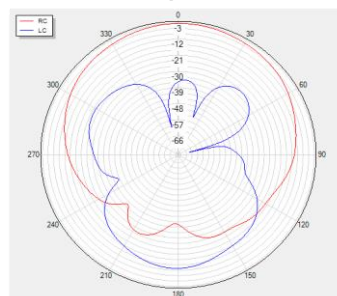
Phi=0 freq=1176MHz



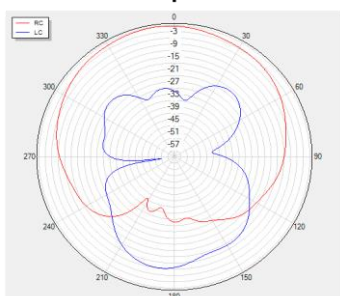
1207 MHz



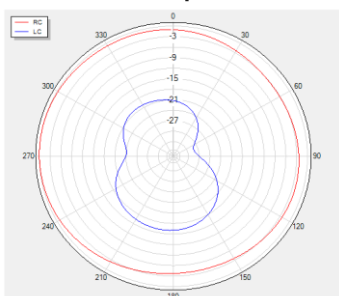
Phi=0 freq=1207MHz



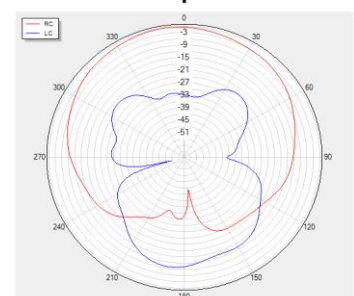
Phi=90 freq=1176MHz



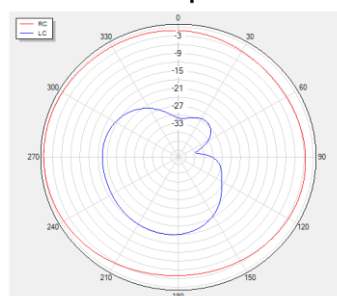
Theta=90 freq=1176MHz



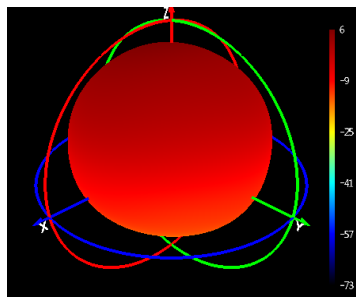
Phi=90 freq=1207MHz



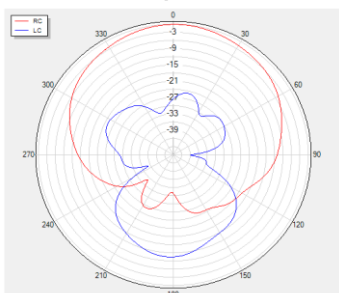
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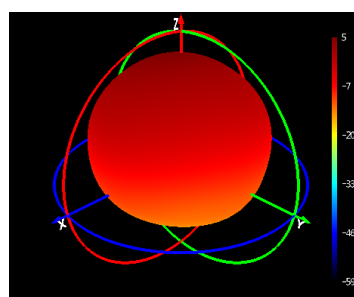
1227 MHz



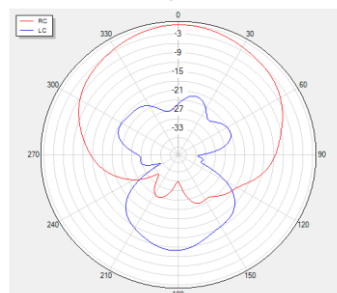
Phi=0 freq=1227MHz



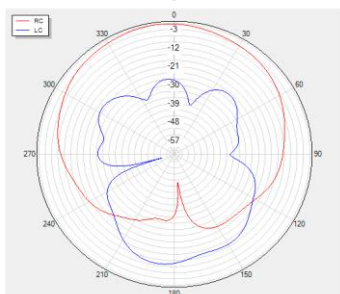
1248 MHz



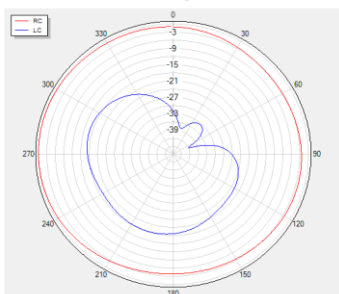
Phi=0 freq=1248MHz



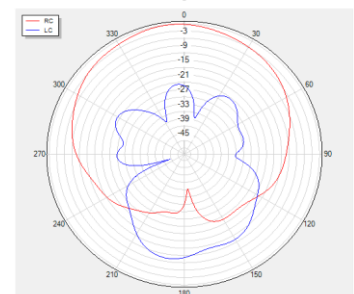
Phi=90 freq=1227MHz



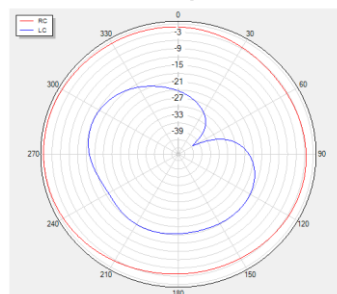
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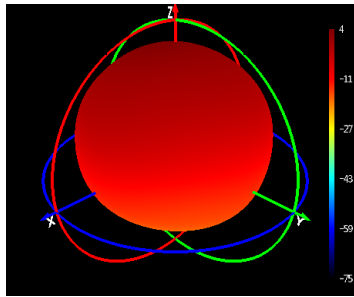
Phi=90 freq=1248MHz



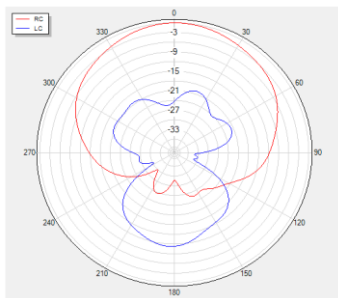
Theta=90 freq=1248MHz



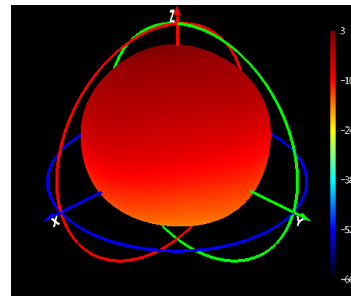
1268 MHz



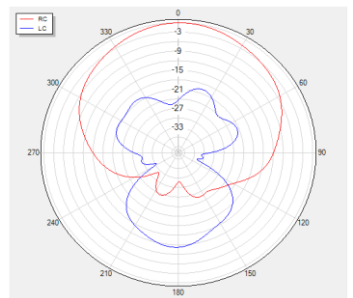
Phi=0 freq=1268MHz



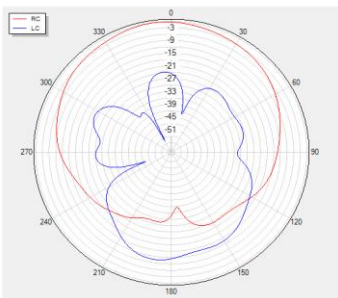
1278 MHz



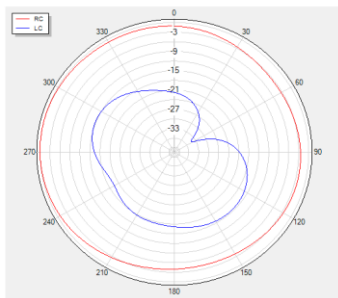
Phi=0 freq=1278MHz



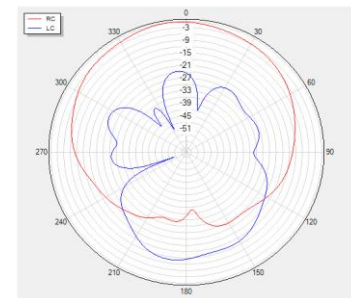
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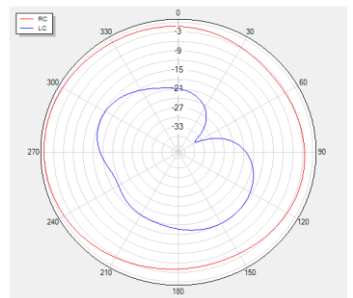
Theta=90 freq=1268MHz



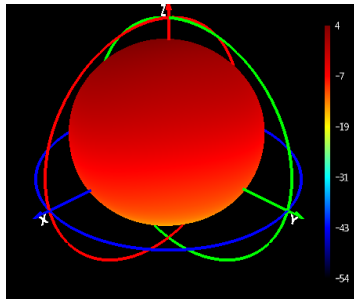
Phi=90 freq=1278MHz



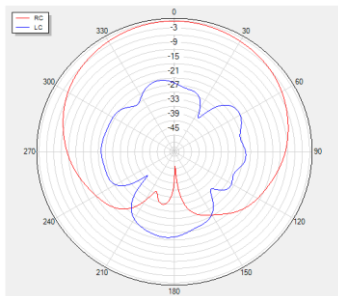
Theta=90 freq=1278MHz



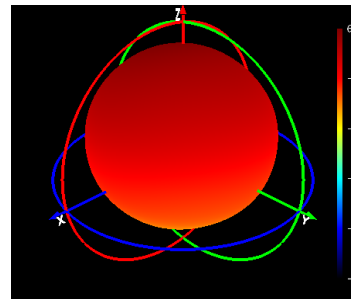
1525 MHz



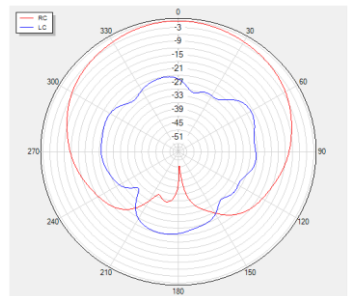
Phi=0 freq=1525MHz



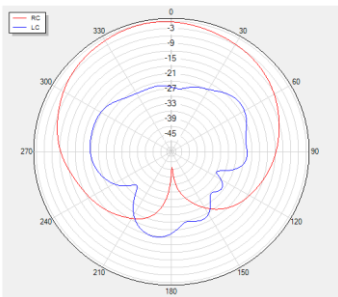
1561 MHz



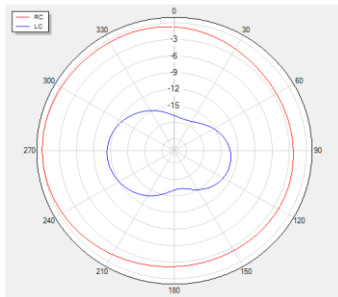
Phi=0 freq=1561MHz



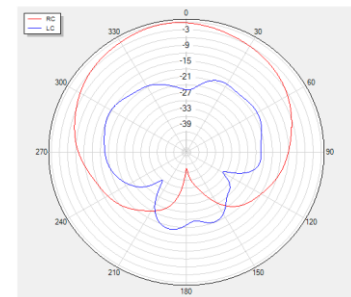
Phi=90 freq=1525MHz



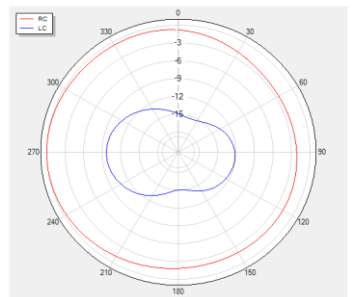
Theta=90 freq=1525MHz



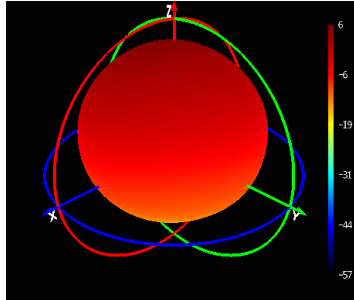
Phi=90 freq=1561MHz



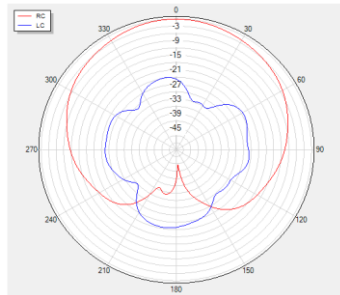
Theta=90 freq=1561MHz



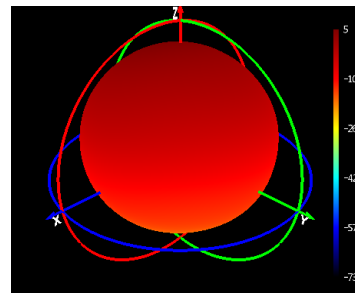
1575 MHz



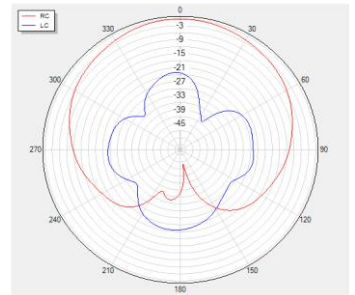
Phi=0 freq=1575MHz



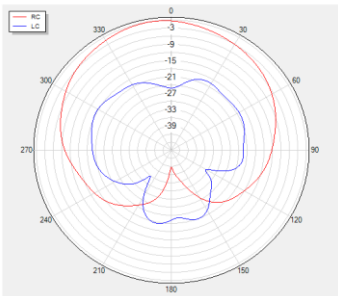
1602 MHz



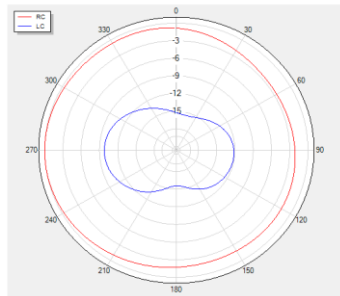
Phi=0 freq=1602MHz



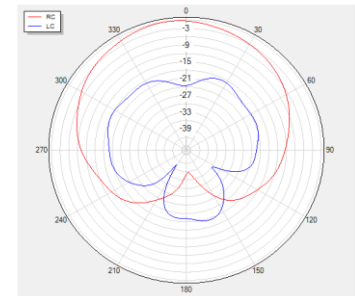
Phi=90 freq=1575MHz



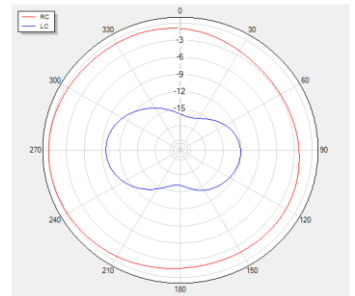
Theta=90 freq=1575MHz



Phi=90 freq=1602MHz

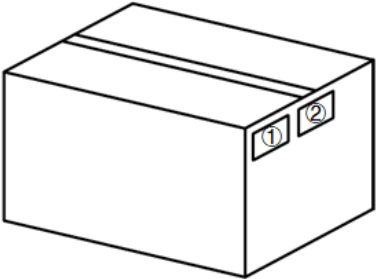
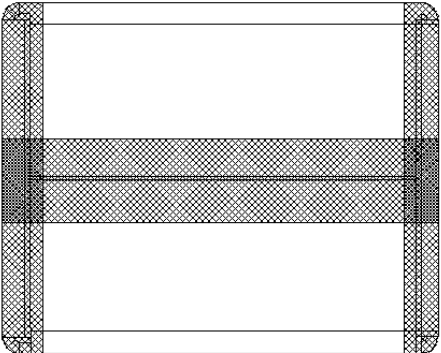


Theta=90 freq=1602MHz



4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		Products
2		Products and accessories are placed separately into the inner lining of the inner box. The above product is lined with pearl cotton and the wiring harness is placed next to the upper lining. (1 PC Antenna / Inner Box)
3		Inner box packaging

4		Put bubble bags on the side of the outer box and on top of the inner box. (4 PCS Inner Boxes / Carton Box) (4 PCS Antennas / Carton Box) <u>Carton Size:</u> <u>L × W × H = 390 × 275 × 300 mm</u>
5		Position for Attaching Labels ① Carton Label ② Quality Label
6		Sealing Cartons H-shaped sealing cartons

Contact Us

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Revision History

Version	Date	Author	Note
-	2024-07-11	Junsen.LI/ Lucky FENG/ David LIU/ Rainey LIAO	Creation of the document
1.0	2024-07-11	Junsen.LI/ Lucky FENG/ David LIU/ Rainey LIAO	First official release
1.1	2024-10-22	Junsen.LI/ Lucky FENG	- Updated block diagram (Chapter 1.3). - Specified the antenna accessory OC (Chapters 2.2 and 2.3).
1.2	2024-12-11	Lucky FENG	Updated the mounting type and added the weight of suction cup base and the cable (Chapter 1.2).



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