Antenna Datasheet

Product OC: YEGB001Q1A
Version: 1.2
Date: 2025-12-01
Status: Released

Product Name: GNSS Magnet Mount Low Profile Active External Antenna
Key Features:
Frequency Band: 1164–1189 MHz, 1559–1606 MHz
Dimensions: 55.2 mm × 48 mm × 20.5 mm
Total LNA Gain: 17 ±3 dB
RoHS and REACH Compliant
IP67
Compatible with ECE-R118 cables under demand

Overview

The Quectel YEGB001Q1A represent the pinnacle of rugged, high-performance GNSS antenna technology, designed to deliver multi-constellation, dual-band (L1/L5) positioning in the most demanding environments. Combining active amplification with industrial-grade durability, these antennas provide unmatched signal clarity and reliability for applications requiring centimeter-level accuracy. With IP67 ingress protection, and extended temperature operation (-40 °C to +85 °C), they are engineered to thrive in harsh outdoor, automotive, and industrial settings.

Key Features & Technical Specifications

Dual-Band Precision & Active Amplification

Frequency Bands: 1164–1189 MHz (L5) and 1559–1606 MHz (L1), supporting GPS, Galileo, BDS, QZSS, and GLONASS.

Integrated LNA: Delivers 17 ±3 dB total gain (21 ±3 dB at PCBA) with an ultra-low noise figure (≤2.5 dB), enhancing weak signal reception in urban canyons or remote areas.

Advanced Filtering: SAW filters and hybrid couplers provide 60 dB out-of-band attenuation, minimizing interference from adjacent frequencies.

Superior RF Performance

Peak Gain: 1.39 dBi (max) with RHCP polarization for multipath rejection.

Industrial-Grade Durability

IP67 Rating: Fully dustproof and waterproof, suitable for marine or outdoor deployments.

UV-Resistant & Flame-Retardant Housing: Compliant with UL 94 V-0 and UL 746c f1 standards.

Power Efficiency & Compliance

Low Power Consumption: Operates at 1.8–5 V, ideal for battery-powered systems.

RoHS/REACH Compliant: Environmentally safe for global deployments.

Target Applications

These antennas are ideal for mission-critical systems requiring high precision and reliability:

1. Autonomous Vehicles: Lane-level navigation for ADAS and robotics.
2. Marine: Offshore navigation, and other positioning devices.
3. Precision Agriculture: Guidance systems for tractors and harvesters.
4. Industrial IoT: Asset tracking in ports, mining, and logistics.
5. Surveying & Geodesy: High-accuracy 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	1164–1189 MHz, 1559–1606 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

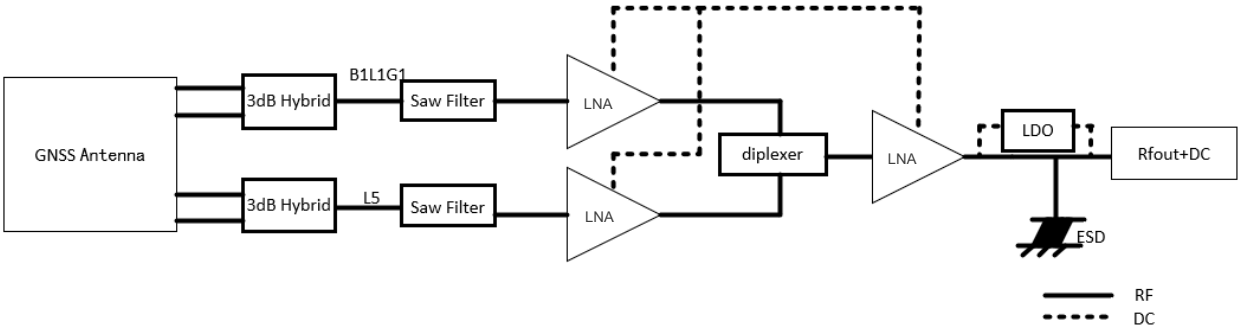
Band / Frequency (MHz)	GPS L5 GALILEO E5a BDS B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BDS B2b	GPS L2 QZSS L2C	GLONASS G2	BDS B3	BDS B1I	GPS L1 GALILEO E1 BDS B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.16	-	-	-	-	1.21	1.35	1.46
Return Loss (dB)	-22.3	-	-	-	-	-20.1	-16.2	-14.4
Efficiency (%)	52	-	-	-	-	37	52	32
Peak Gain (dBi)	0.99	-	-	-	-	-0.62	1.19	-0.97
Axial Ratio (dB)	1.72	-	-	-	-	1.88	1.42	1.17

LNA Electrical	
LNA Gain	21 ±3 dB (PCBA) @ 3-5 V 19 ±3 dB (PCBA) @ 1.8 V
Total LNA Gain	17 ±3 dB (With cable loss) @ 3-5 V 15 ±3 dB (With cable loss) @ 1.8 V
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	1.8–5 V
Working Current	16 ±3 mA @ 3-5 V 11.5 ±3 mA @ 1.8 V
Impedance	50 Ω

1.2. Mechanical & Environmental

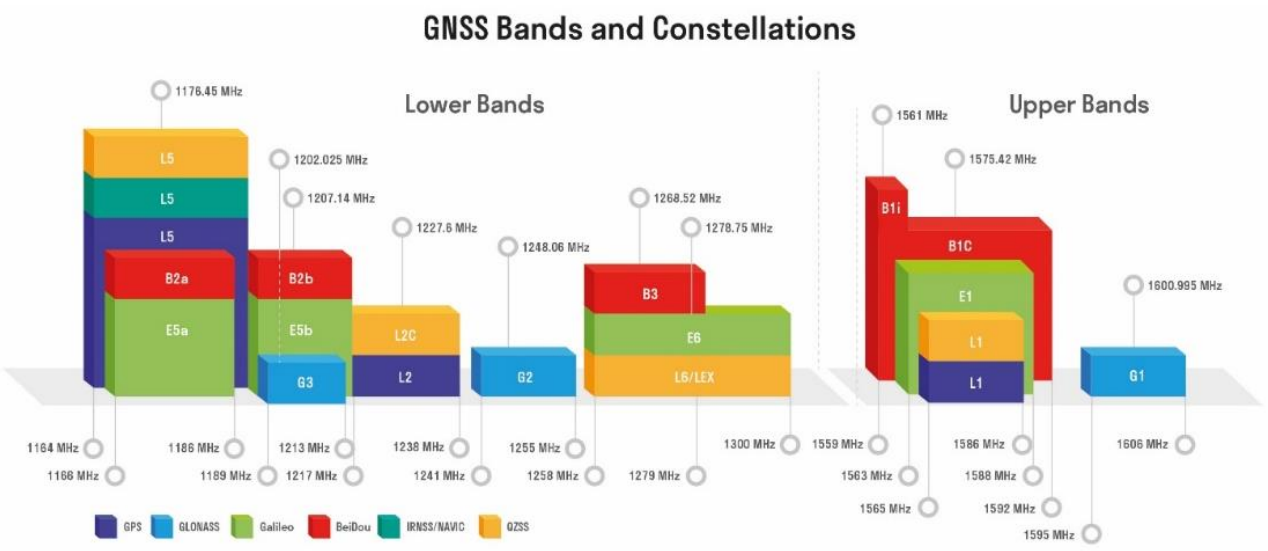
Mechanical	
Antenna Dimensions	55.2 mm × 48 mm × 20.5 mm
Material & Color	PC & Black
Cable Type & Length	RG174 Black & 3000 mm
Connector Type	SMA Male (The current state of the SMA connector is not waterproof. If a waterproof connector is required, it can be customized.)
Mounting Type	Magnet
Weight	Typ. 95.6 ±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
Housing Flame Rating	UL 94 V-0
Housing UV Resistant	UL 746c f1

1.3. Block Diagram (Active Antenna)

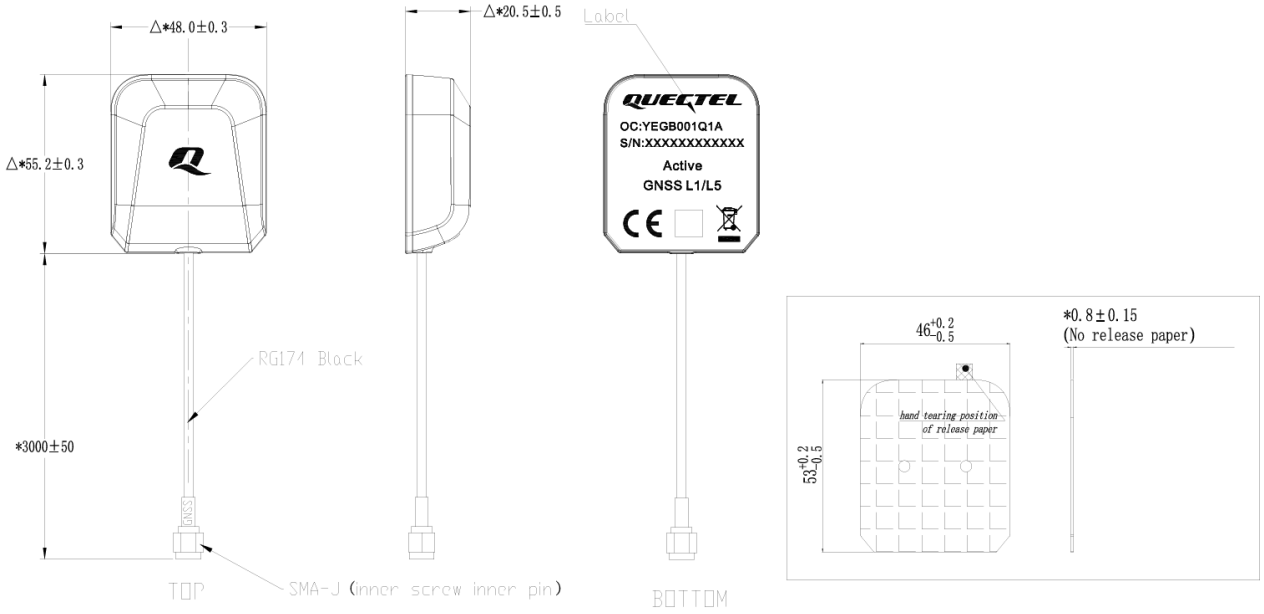


1.4. Supported GNSS Frequency Bands

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-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

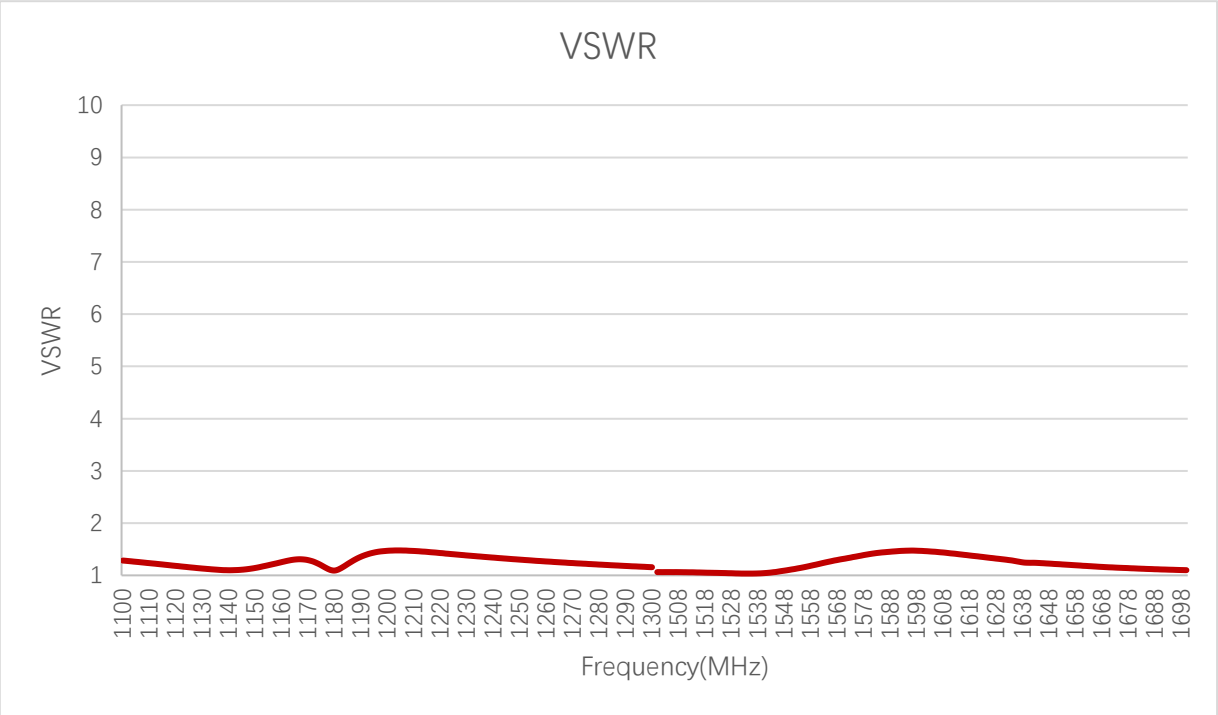
2 Drawing


△*48.0±0.3
△*55.2±0.3
△*20.5±0.5
Label
QUECTEL
OC:YEGB001Q1A
S/N:XXXXXXXXXXXX
Active
GNSS L1/L5
RG174 Black
*3000±50
GNSS
TOP
SMA-J (inner screw inner pin)
BOTTOM
46+0.2 -0.5
hand tearing position of release paper
53+0.2 -0.5
*0.8±0.15
(No release paper)

3 Detailed Performance

3.1. S-Parameter Test

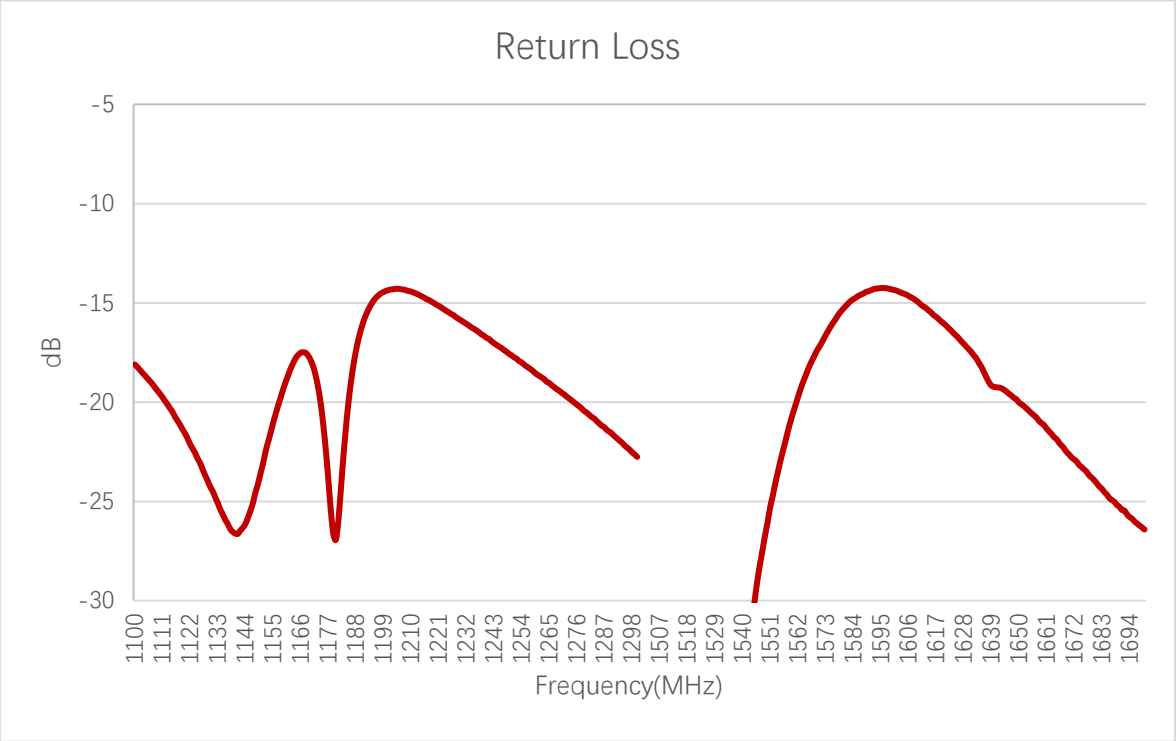
3.1.1. VSWR



VSWR

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.16	-	-	-	-	1.21	1.35	1.46

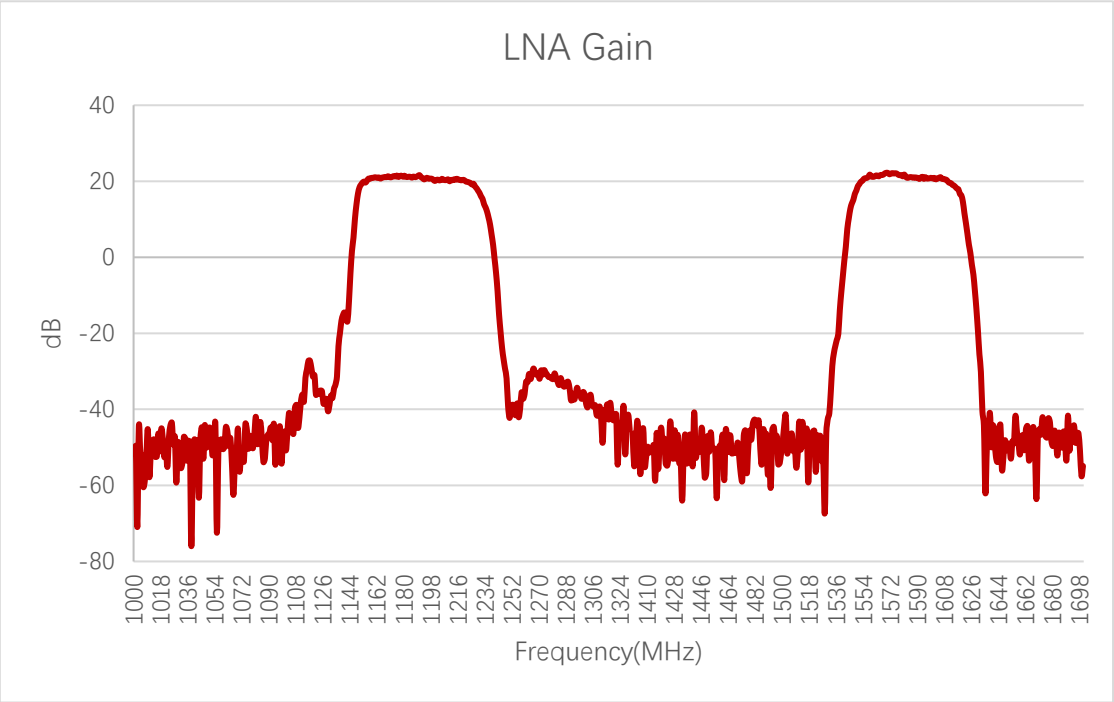
3.1.2. Return Loss



Return Loss (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-22.3	-	-	-	-	-20.1	-16.2	-14.4

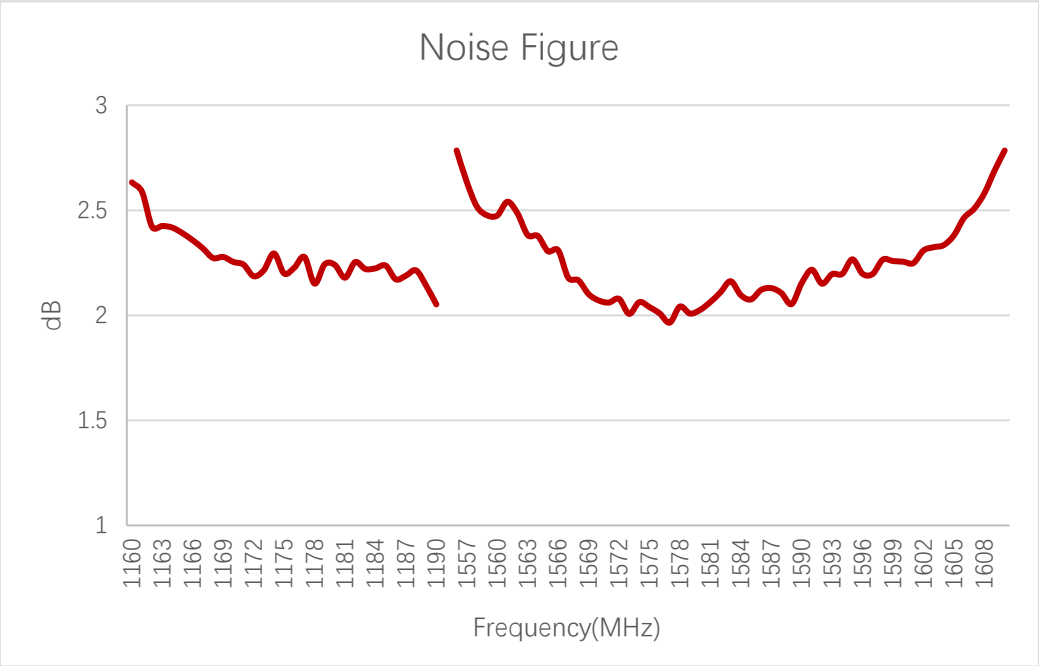
3.1.3. LNA Gain



LNA Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain (dB)	21.1	-	-	-	-	21.2	22	20.5

3.1.4. Noise Figure

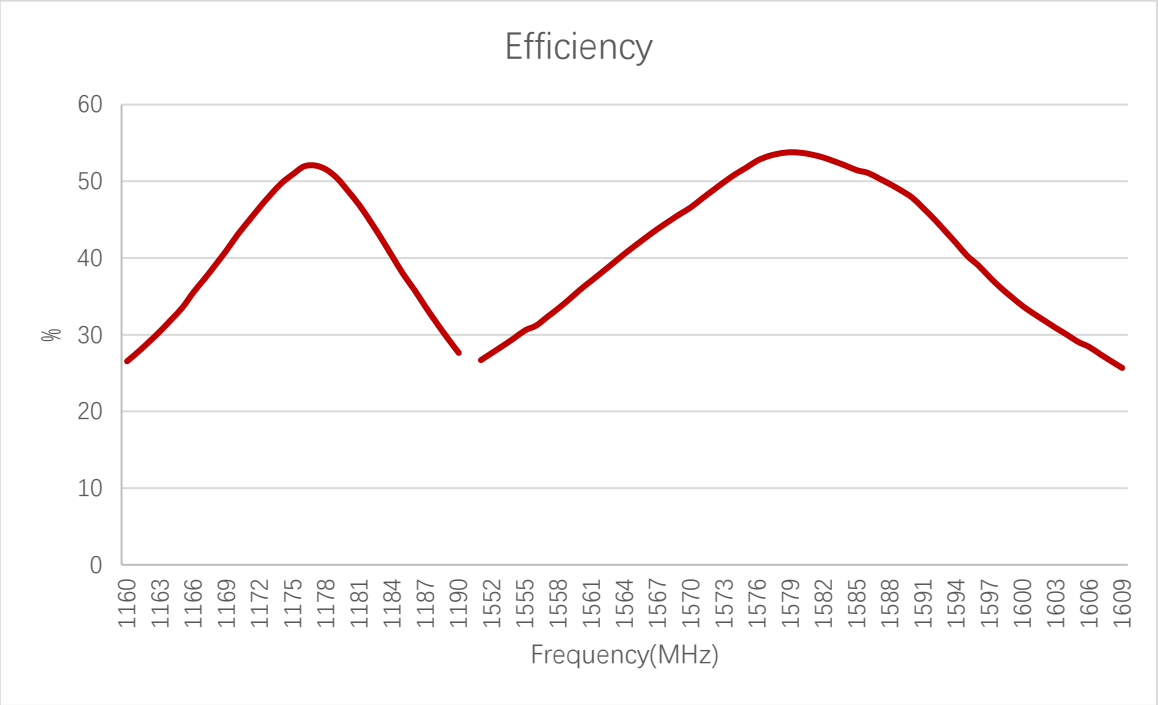


Noise Figure (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Noise Figure (dB)	2.22	-	-	-	-	2.5	2.01	2.3

3.2. Radiation Performance Test

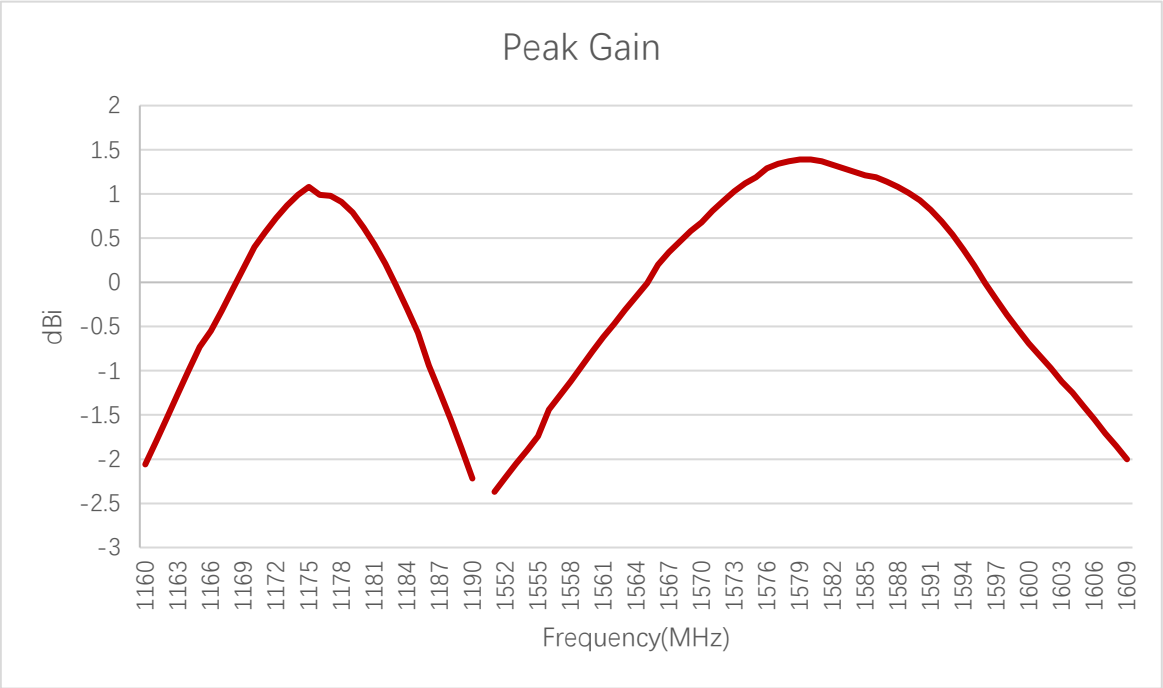
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	52	-	-	-	-	37	52	32

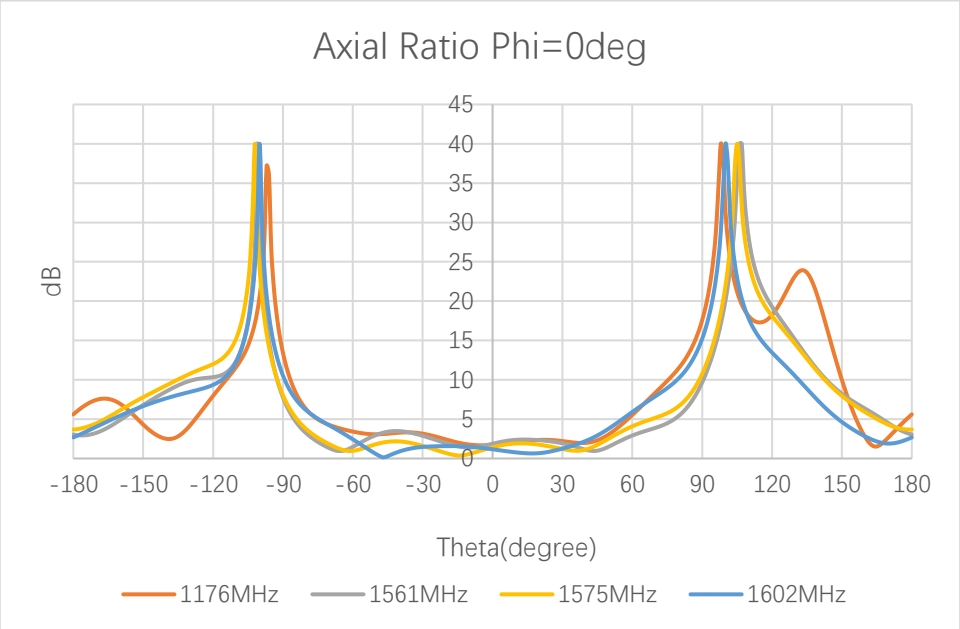
3.2.2. Peak Gain

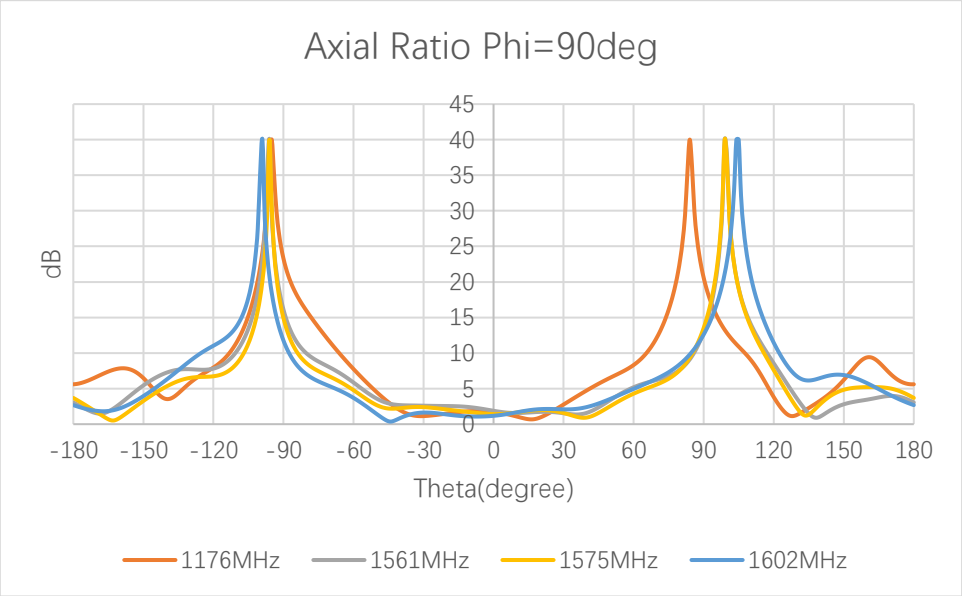


Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	0.99	-	-	-	-	-0.62	1.19	-0.97

3.2.3. Axial Ratio

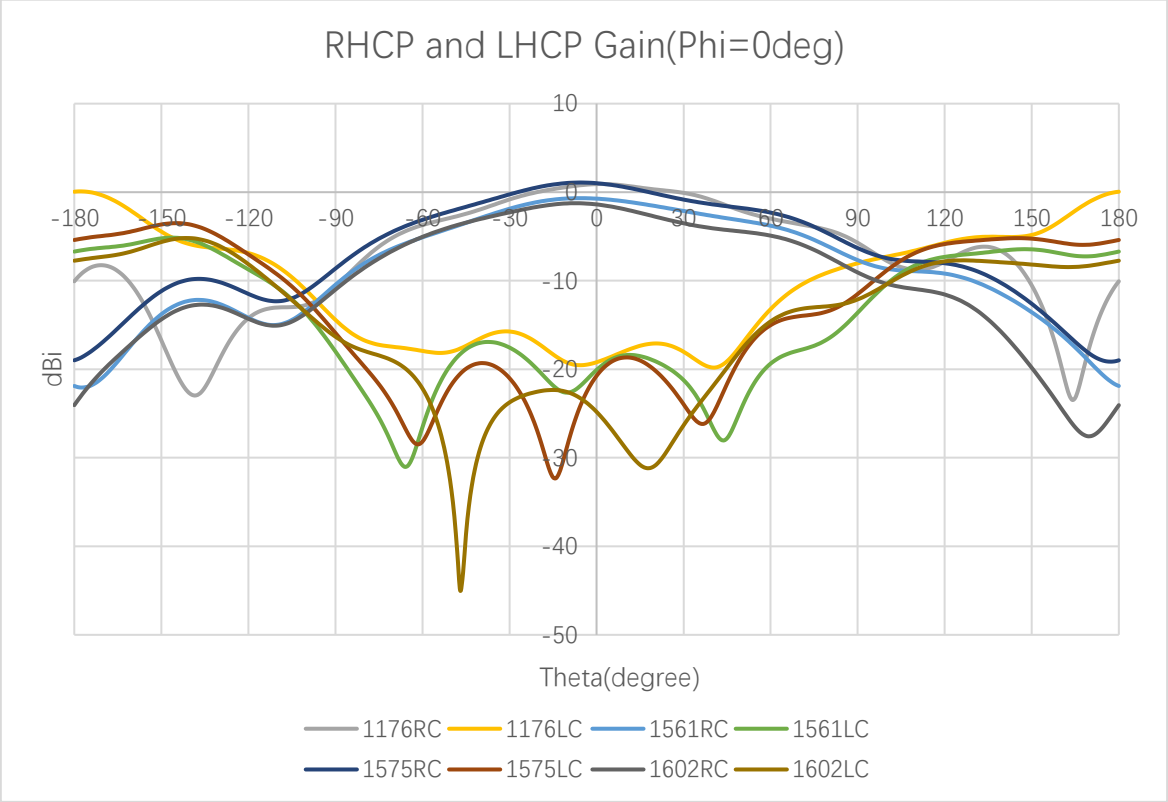


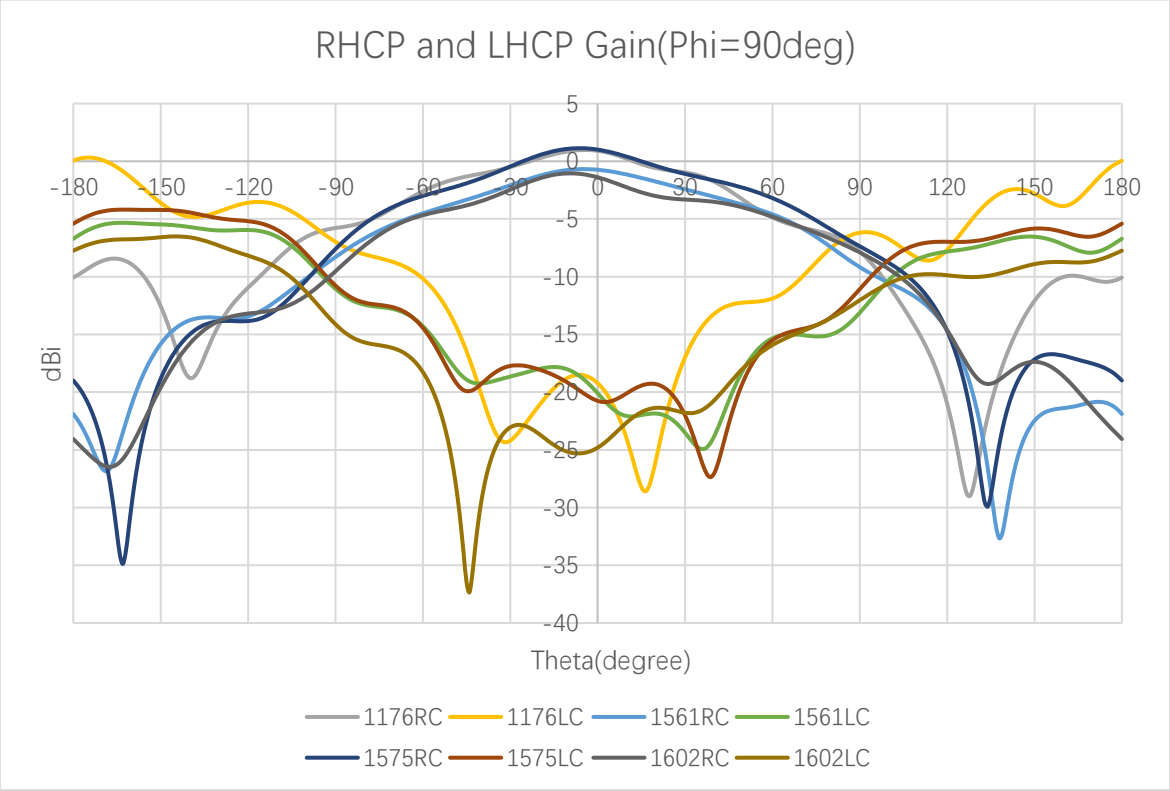


Axial Ratio (dB)

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	1.72	-	-	-	-	1.88	1.42	1.17
	Phi = 90 (deg) Theta = 0 (deg)	1.72	-	-	-	-	1.88	1.42	1.17

3.2.4. 2D RHCP and LHCP Gain



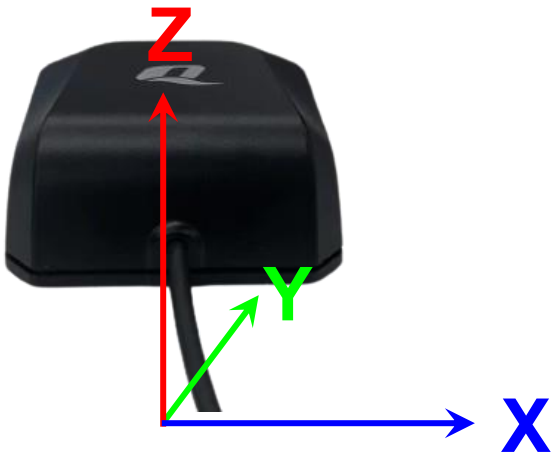


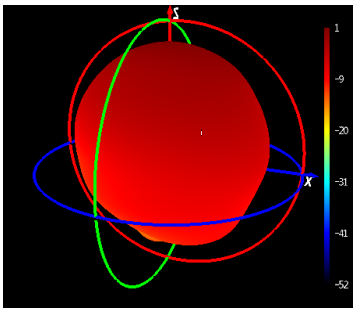
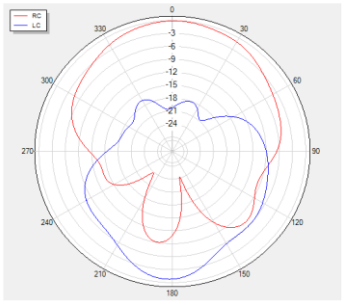
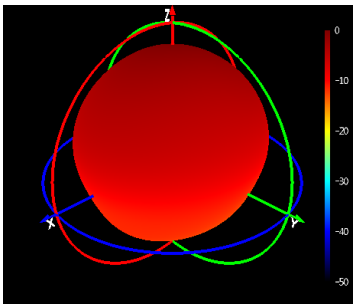
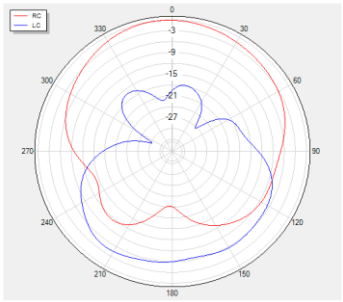
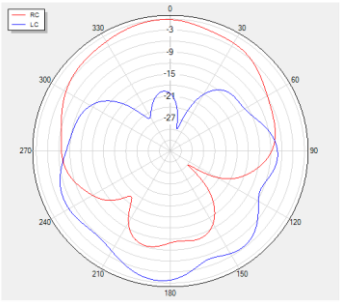
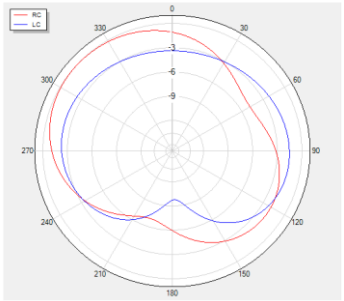
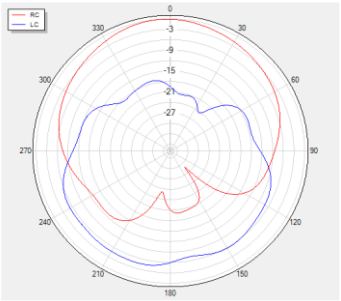
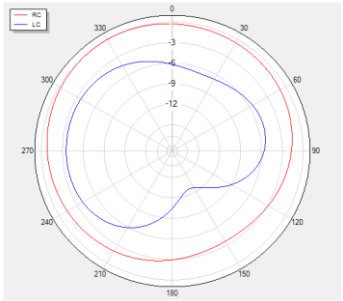
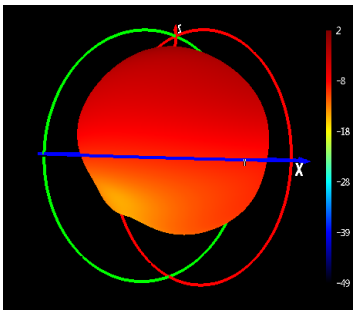
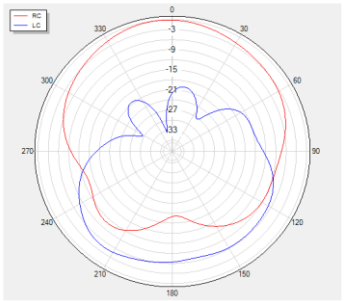
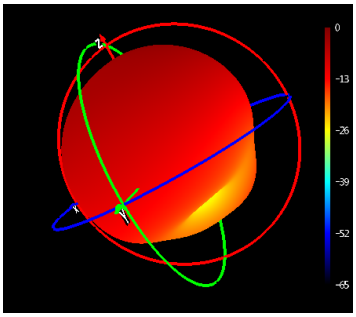
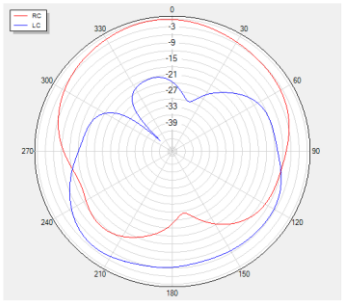
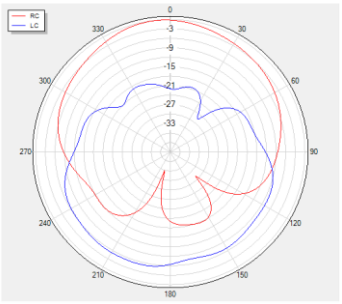
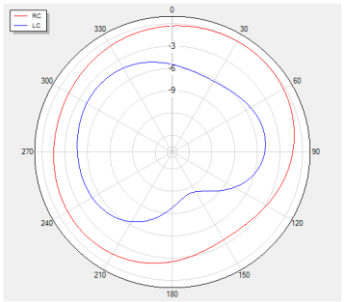
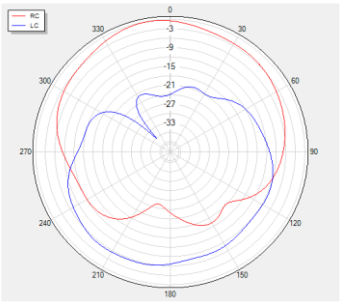
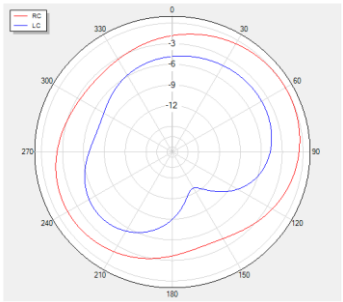
2D RHCP and LHCP Gain (dBi)

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
RC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	0.91	-	-	-	-	-0.73	1.01	-1.38
	Phi = 90 (deg) Theta = 0 (deg)	0.91	-	-	-	-	-0.73	1.01	-1.38
LC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-19.2	-	-	-	-	-20.8	-20.7	-25.8
	Phi = 90 (deg) Theta = 0 (deg)	-19.2	-	-	-	-	-20.8	-20.7	-25.8

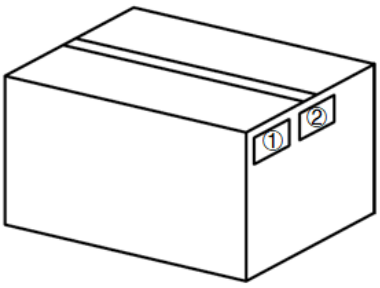
3.2.5. 3D & 2D Radiation Pattern

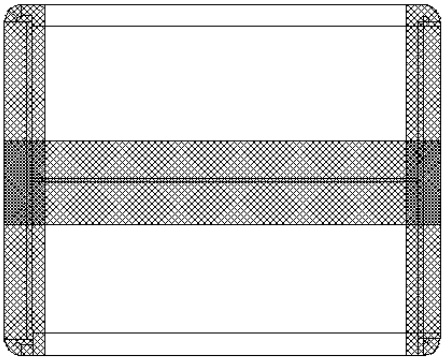
- Test Condition: Free Space
- Test Chamber: SH-SY-16M



1176 MHz		1561 MHz	
	Phi=0 freq=1176MHz 		Phi=0 freq=1561MHz 
Phi=90 freq=1176MHz 	Theta=90 freq=1176MHz 	Phi=90 freq=1561MHz 	Theta=90 freq=1561MHz 
1575 MHz		1602 MHz	
	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 antenna products in a small PE bag. (1 Antenna / Small PE Bag)
2		10 antenna products in a big PE bag. (10 Antennas / Big PE Bag)
3		(6 Big Product PE Bags and Accessory Bag / Carton Box) (60 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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Tel: +86 21 5108 6236
Email: info@quectel.com

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

Version	Date	Author	Note
-	2025-07-01	Junsen Li/ Steven Mo/ Riva Ren/ Rainey Liao	Creation of the document
1.0	2025-07-01	Junsen Li/ Steven Mo/ Riva Ren/ Rainey Liao	First official release
1.1	2025-10-14	Junsen Li	Added the LNA gains and noise figure according to different supply voltages (Chapter 1.1).
1.2	2025-12-01	Steven Mo	Updated the drawing (Chapter 2).

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