

# Antenna Datasheet

**Product OC:** YCGA014AA

**Version:** 2.1

**Date:** 2023-11-23

**Status:** Released

**Product Name:** Active GNSS L1 & L5 Antenna

**Key Features:**

Frequency Band: 1164–1189 MHz, 1595–1606 MHz

Dimensions: 25 mm × 25 mm × 11.9 mm

Efficiency: Up to 47.3 %

RoHS and REACH Compliant

LNA Gain: 17 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 also 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.

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# 1 Specification

Test Condition: Free Space

## 1.1. Electrical

Electrical	
Frequency Range	1164–1189, 1595–1606 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

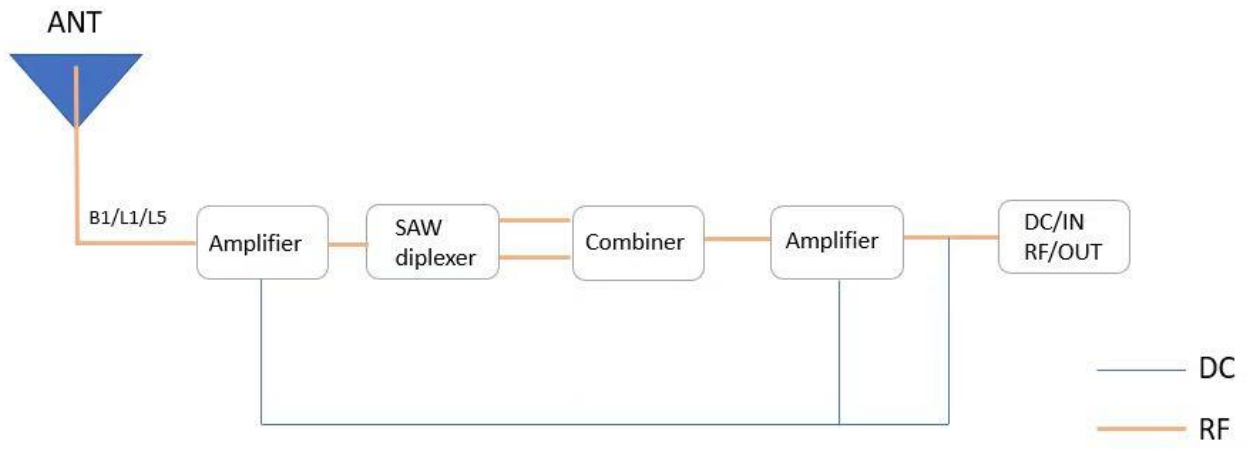
Band	GPS L5	GALILEO	GPS L2	GLONASS	BEIDOU	BEIDOU	GPS L1	
	GALILEO E5a	GALILEO E5b	GPS L2 QZSS L2C	GLONASS G2	BEIDOU B3	BEIDOU B1I	GALILEO E1	GLONASS G1
Frequency (MHz)	BEIDOU B2a-B2I	BEIDOU B2b					BEIDOU B1C	
	QZSS L5						QZSS L1	
	IRNSS L5							
	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.2	-	-	-	-	-	1.7	1.2
Return Loss (dB)	-22.6	-	-	-	-	-	-12.1	-19.7
Efficiency (%)	38.9	-	-	-	-	-	46.6	47.3
Peak Gain (dBi)	-1.5	-	-	-	-	-	-0.6	-0.6

LNA Electrical	
LNA Gain	17 ±3 dB
Noise Figure	≤ 1.23 dB
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	16 dB f0 ±50 MHz f0 (1176 MHz, 1575 MHz)
Working Voltage	2.7–3.3 V
Working Current	≤ 45 mA
Impedance	50 Ω

## 1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	25 mm × 25 mm × 11.9 mm
Material	PCB + Ceramic
Cable Type & Color & Length	Φ 1.13 & Black & 100 mm
Connector Type	IPEX MHF 1
Mounting Type	Buckle
Weight	Typ. 21 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

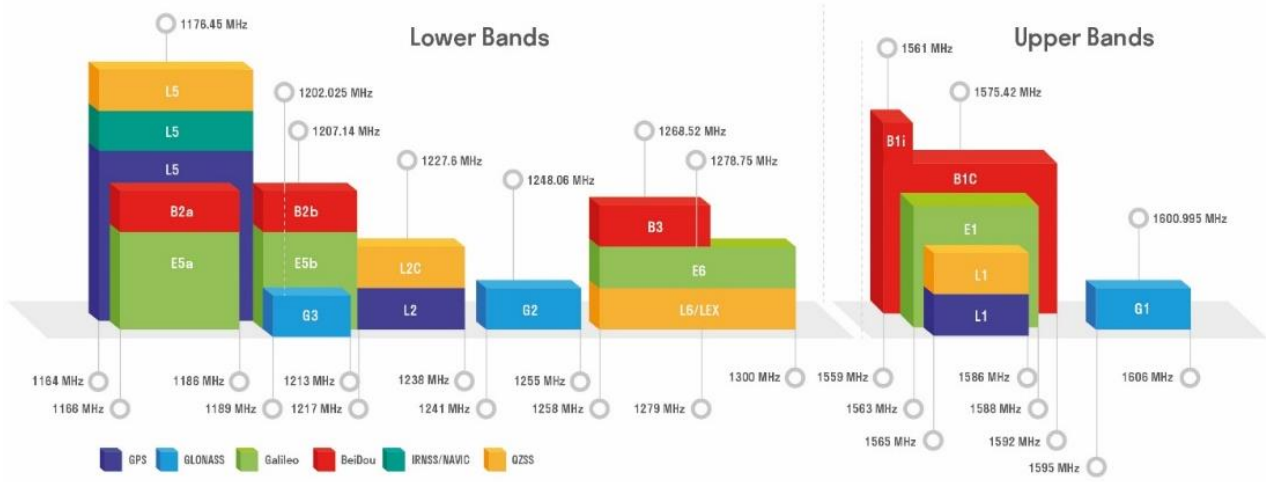
### 1.3. Block Diagram (Active Antenna)



## 1.4. Supported GNSS Frequency Bands

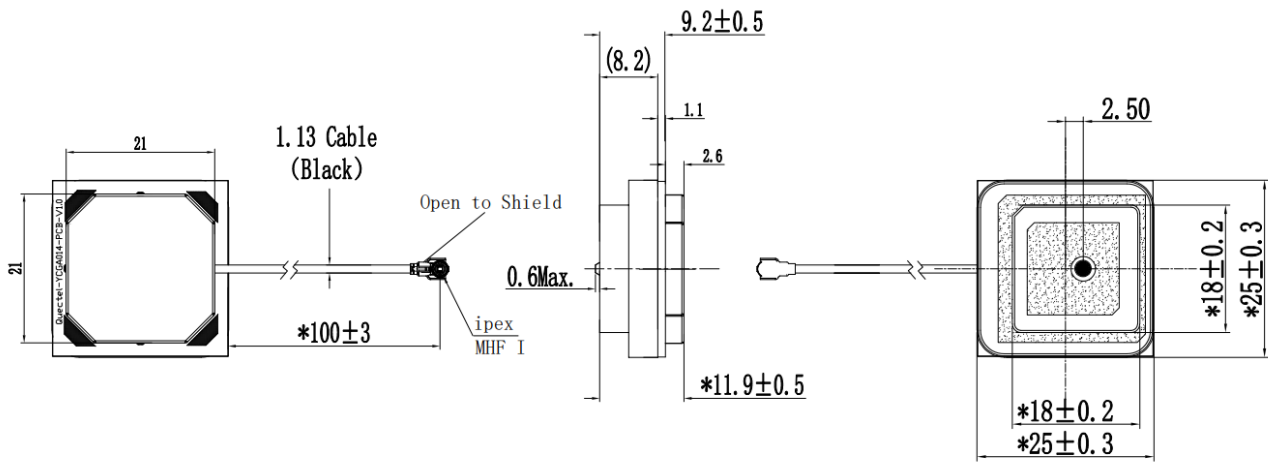
GNSS Frequency Bands (MHz)					
<b>GPS</b>	<b>L1</b> Centre 1575.42 (1565–1586)	<b>L2</b> Centre 1227.6 (1217–1238)	<b>L5</b> Centre 1176.45 (1164–1189)		
	√	-	√		
<b>GLONASS</b>	<b>G1-L10C-L10F</b> Centre 1601 (1595–1606)	<b>G2-L20C-L20F</b> Centre 1248.06 (1241–1255)	<b>G3-L30C</b> Centre 1202.025 (1189–1213)		
	√	-	-		
<b>GALILEO</b>	<b>E1</b> Centre 1575.42 (1563–1588)	<b>E5a</b> Centre 1176.45 (1166–1187)	<b>E5b</b> Centre 1207.14 (1197–1218)	<b>E6</b> Centre 1278.75 (1258–1300)	
	√	√	-	-	
<b>BEIDOU</b>	<b>B1I</b> Centre 1561.098 (1559–1564)	<b>B1C (BeiDou-3)</b> Centre 1575.42 (1559–1592)	<b>B2a-B2I</b> Centre 1176.45 (1166–1187)	<b>B2b</b> Centre 1207.14 (1197–1217)	<b>B3</b> Centre 1268.52 (1258–1279)
	-	√	√	-	-
<b>QZSS</b>	<b>L1</b> Centre 1575.42 (1573–1578)	<b>L2C</b> Centre 1227.6 (1226–1229)	<b>L5</b> Centre 1176.45 (1166–1187)	<b>L6</b> Centre 1278.75 (1257–1300)	
	√	-	√	-	
<b>IRNSS</b>	<b>L5</b> Centre 1176.45 (1164–1189)				
	√				

**GNSS Bands and Constellations**





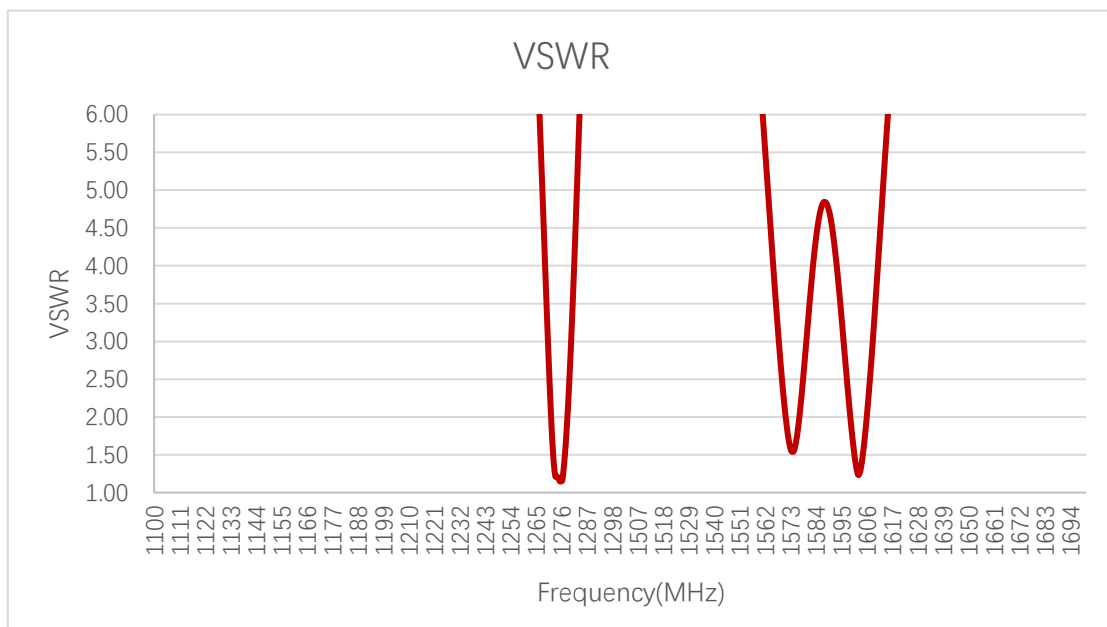
# 2 Drawing



# 3 Detailed Performance

## 3.1. S-Parameter Test

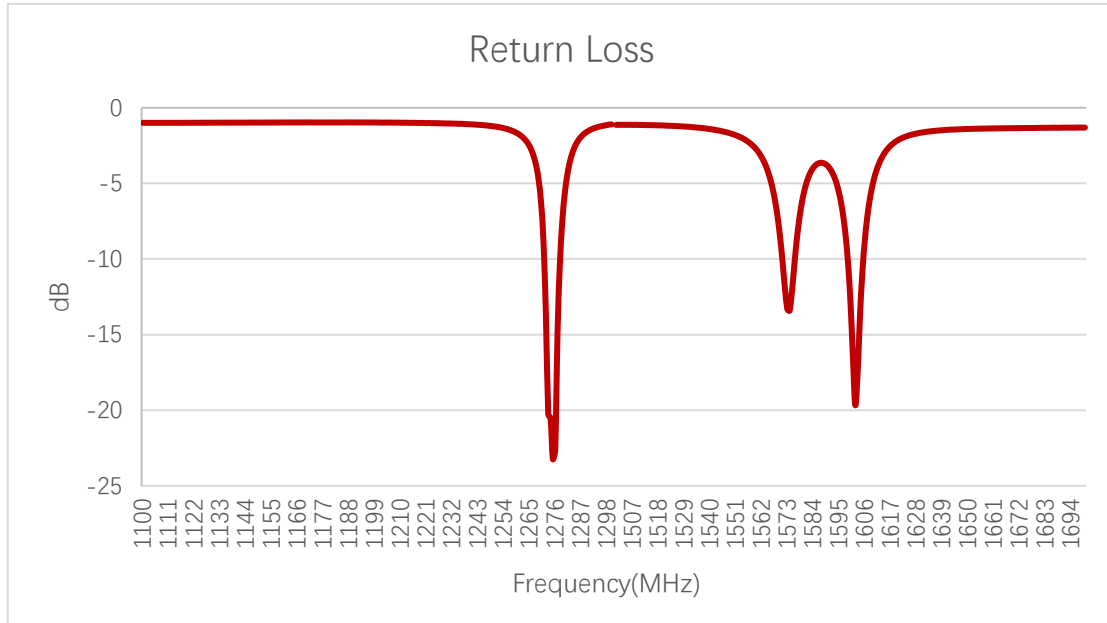
### 3.1.1. VSWR



**VSWR**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.2	-	-	-	-	-	1.7	1.2

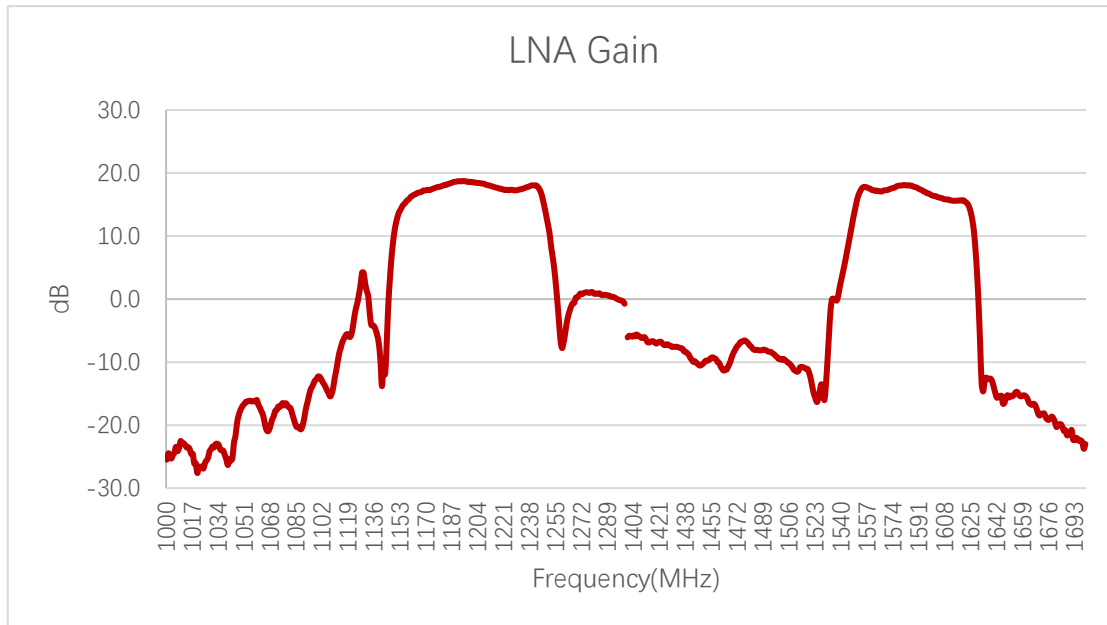
**3.1.2. Return Loss**



**Return Loss (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-22.6	-	-	-	-	-	-12.1	-19.7

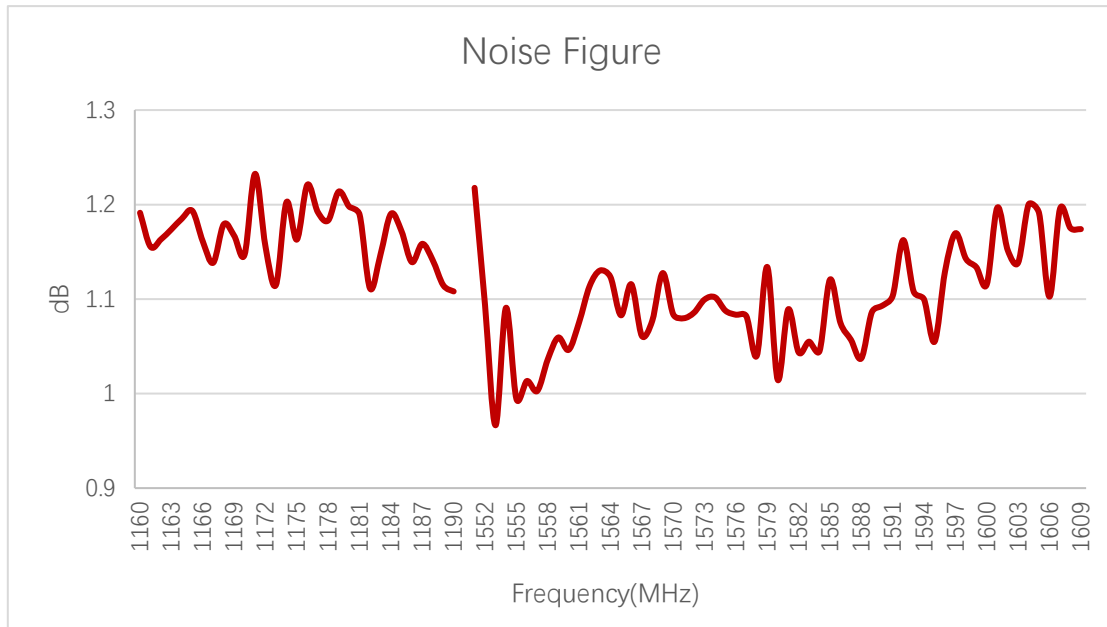
**3.1.3. GNSS LNA Gain**



**LNA Gain (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain (dB)	17.7	-	-	-	-	-	17.7	16.3

**3.1.4. Noise Figure**

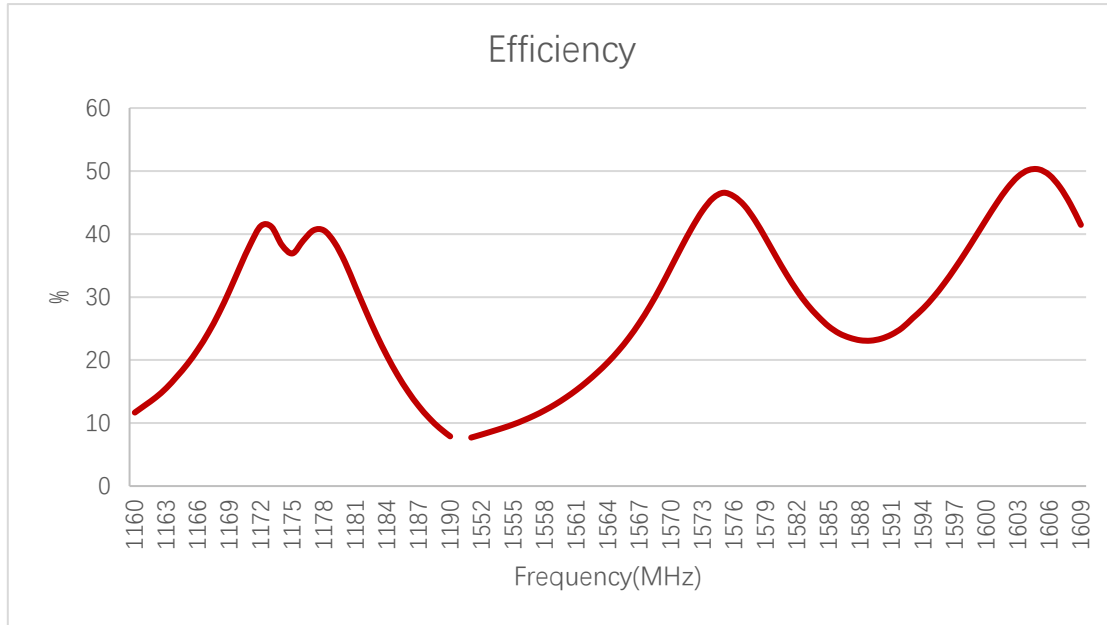


**Noise Figure (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Noise Figure (dB)	1.22	-	-	-	-	-	1.09	1.15

### 3.2. Radiation Performance Test

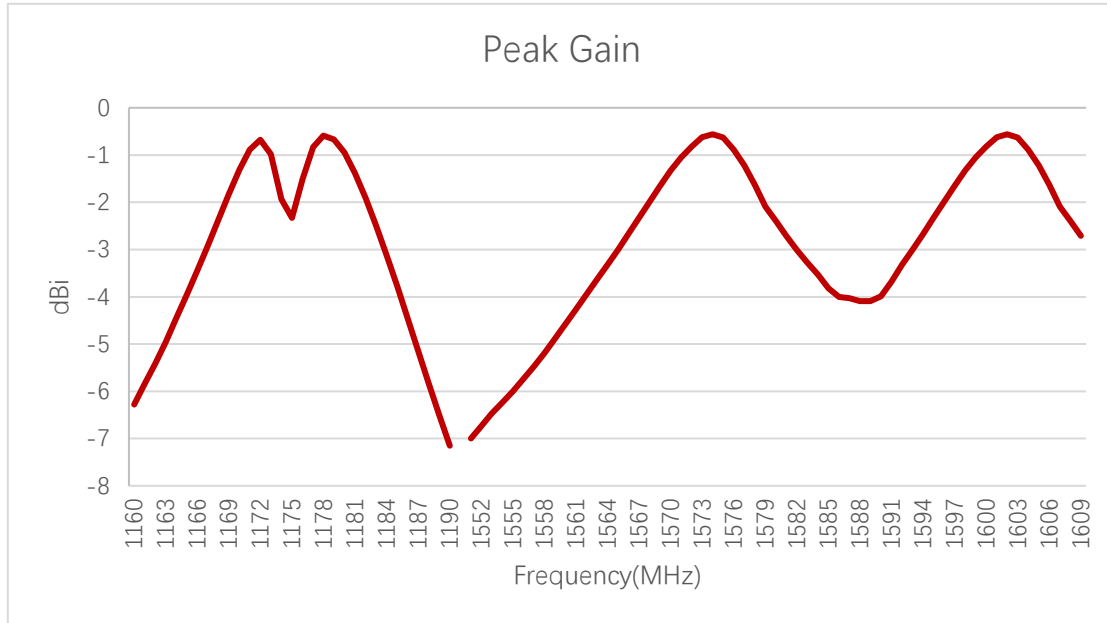
#### 3.2.1. Efficiency



**Efficiency (%)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	38.9	-	-	-	-	-	46.6	47.3

**3.2.2. Peak Gain**

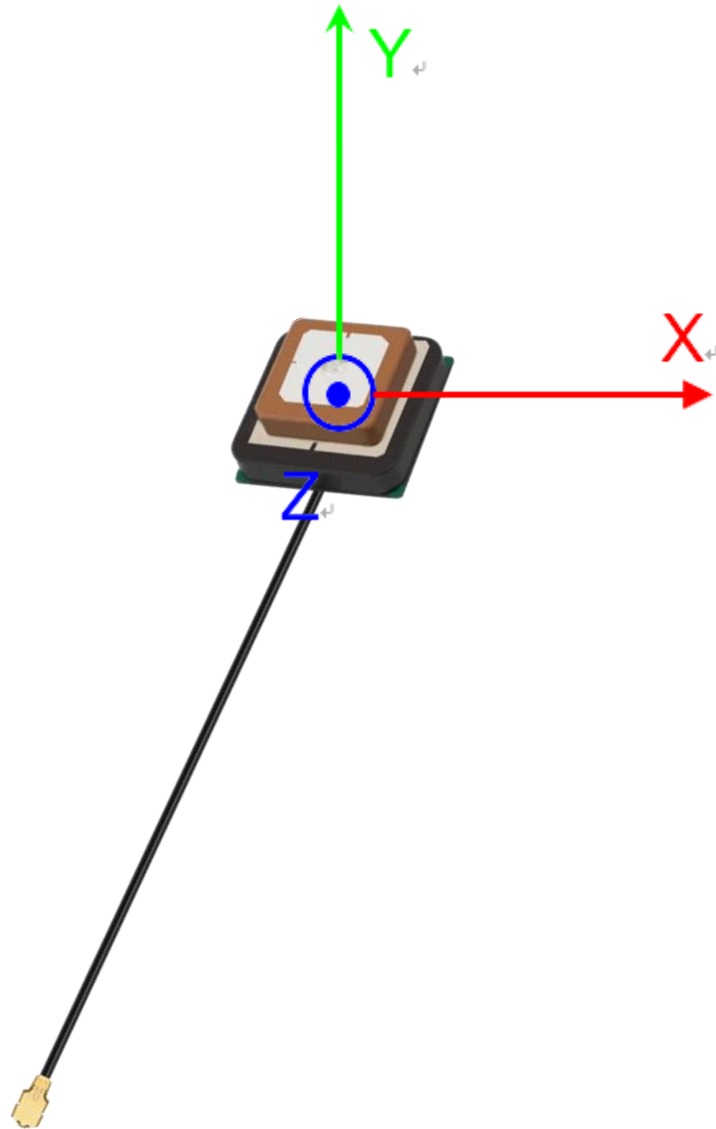


**Peak Gain (dBi)**

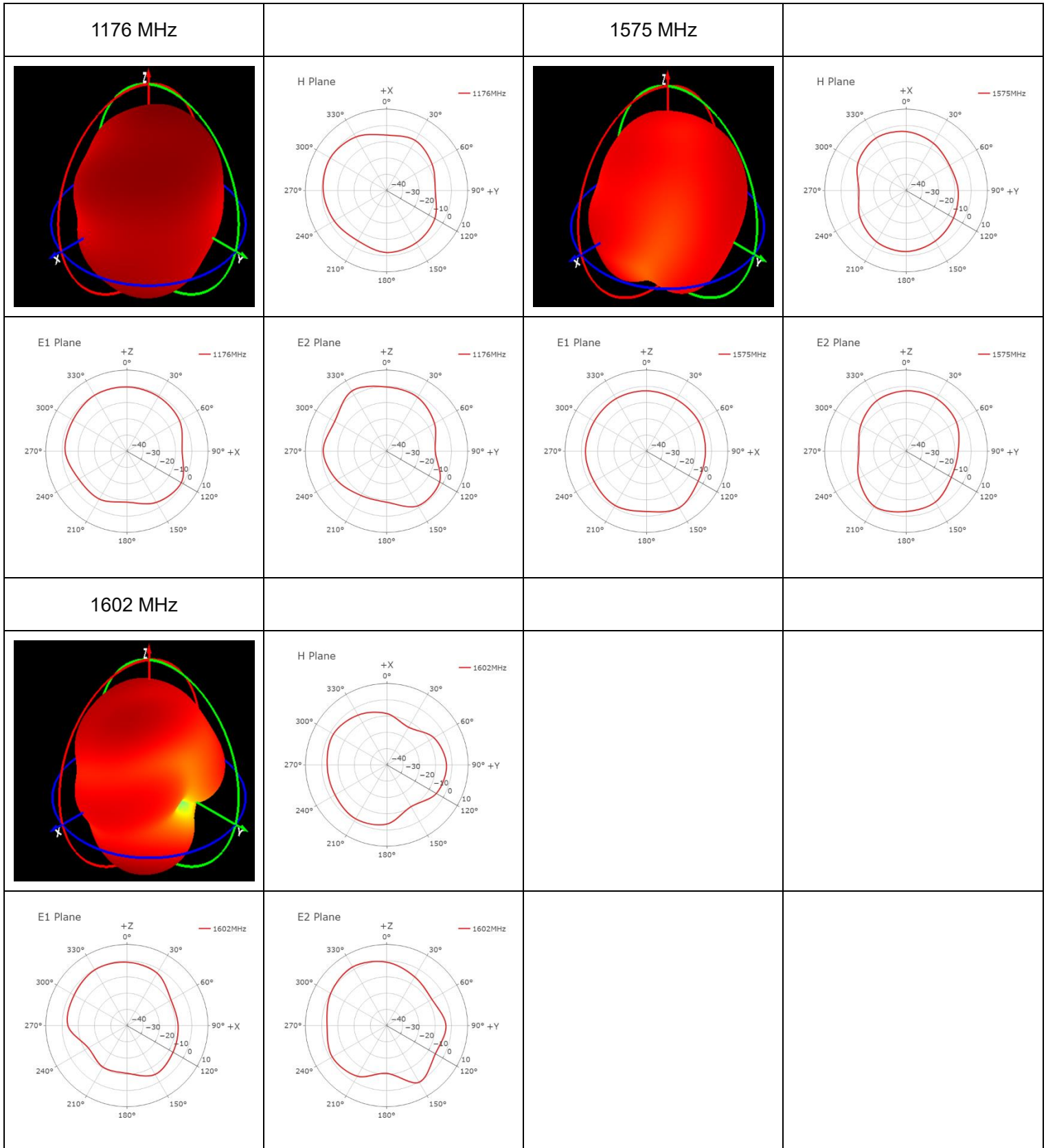
requency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	-1.5	-	-	-	-	-	-0.6	-0.6

### 3.2.3. 3D & 2D Radiation Pattern

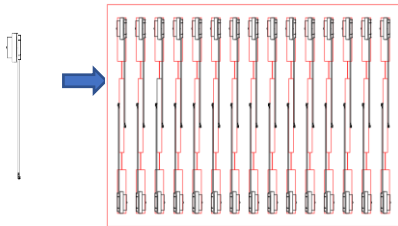
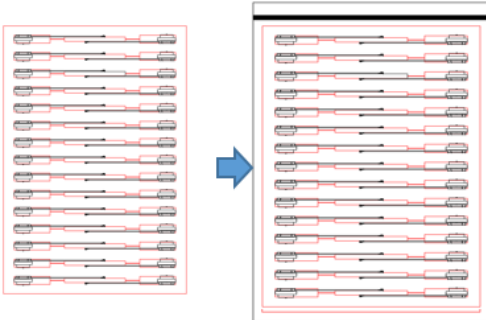
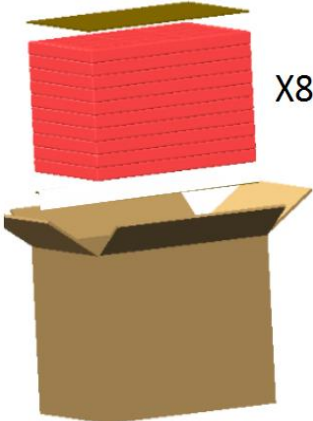
- Test Condition: Free Space
- Test Chamber: GL-S-1

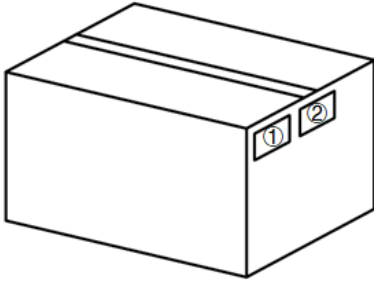
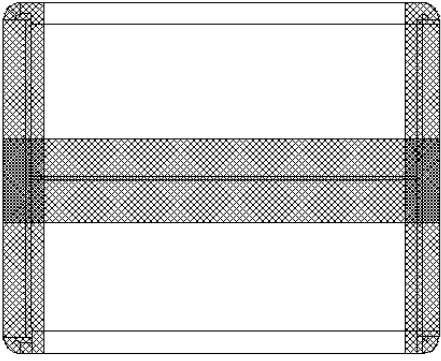






# 4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		<p>Put the product into the pearl cotton tray, (1 Product / Cavity) (30 PCS Antennas / Pearl Cotton Tray)</p>
2		<p>Place the pearl cotton tray into a vacuum bag to vacuum.</p>
3		<p>Put 8 vacuum bags into the carton. (240 PCS Antennas / Carton Box) Estimated quantity Products that cannot fill the entire carton box are packed in a suitable size carton box. <u>Carton Size:</u> <u>L × W × H = 390 × 270 × 295 mm</u></p>

<p>4</p>		<p><b>Position for Attaching Labels</b></p> <p>① Carton Label ② Quality Label</p>
<p>5</p>		<p><b>Sealing Cartons</b></p> <p>“I” type sealing cartons</p>
<p>6</p>	<p>The initial packaging method described above is for reference only, and the final actual packaging method shall be subject to the actual shipping packaging.</p>	

# 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:**

**Quectel Wireless Solutions Co., Ltd.**

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China

Tel: +86 21 5108 6236

Email: [info@quectel.com](mailto:info@quectel.com)

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# Revision History

Version	Date	Author	Note
-	2021-03-25	Kenny YIN/ Xiaodong YANG	Creation of the document
1.0	2021-03-25	Kenny YIN/ Xiaodong YANG	First official release
1.1	2022-05-10	Kenny YIN/ Aria CHU	Updated the data (Chapter 2, 4 and 6).
2.0	2023-08-26	Edwin XIAO/ Lucky FENG/ David LIU/ Aria CHU	Updated all test data in this datasheet.
2.1	2023-11-23	Lucky FENG/ David Liu	1. Updated the drawing (Chapter 2). 2. Updated the packaging (Chapter 4).

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