



# Antenna Datasheet

**Product OC:** YCGO011AA

**Version:** 4.0

**Date:** 2023-08-26

**Status:** Released

**Product Name:** Active GPS L1 & GLONASS G1 Antenna

## Key Features:

Frequency Band: 1565–1606 MHz

Dimensions: 25 × 25 × 6.3 mm

Efficiency: Up to 59.5 %

RoHS Compliant

LNA Gain: 17 ±2 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.

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# 1 Specification

Test Condition: By 25 mm square ground plane

## 1.1. Electrical

Electrical								
Frequency Range		1565–1606 MHz						
Impedance		50 Ω						
Polarization		RHCP						
Radiation Pattern		Directional						

Frequency (MHz)	Band	GPS L5	GALILEO E5a	GALILEO E5b	GPS L2	GLONASS G2	BEIDOU B3	BEIDOU B1I	GPS L1	GLONASS G1
		BEIDOU B2a-B2I							E1	
1176		1176		1207	1227	1248	1268	1561	1575	1602
VSWR		-	-	-	-	-	-	-	1.8	1.5
Return Loss (dB)		-	-	-	-	-	-	-	-11.0	-14.7
Efficiency (%)		-	-	-	-	-	-	-	59.5	58.4
Peak Gain (dBi)		-	-	-	-	-	-	-	1.5	1.4

**LNA Electrical**

<b>LNA Gain</b>	17 $\pm$ 2 dB
<b>Noise Figure</b>	$\leq$ 1.5 dB
<b>Output VSWR</b>	< 2.0
<b>Filter Out-of-Band Attenuation</b>	47 dB f0 $\pm$ 100 MHz f0 (1588 MHz)
<b>Working Voltage</b>	2.7–3.3 V
<b>Working Current</b>	8 $\pm$ 2 mA @ 3 V
<b>Impedance</b>	50 $\Omega$

## 1.2. Mechanical & Environmental

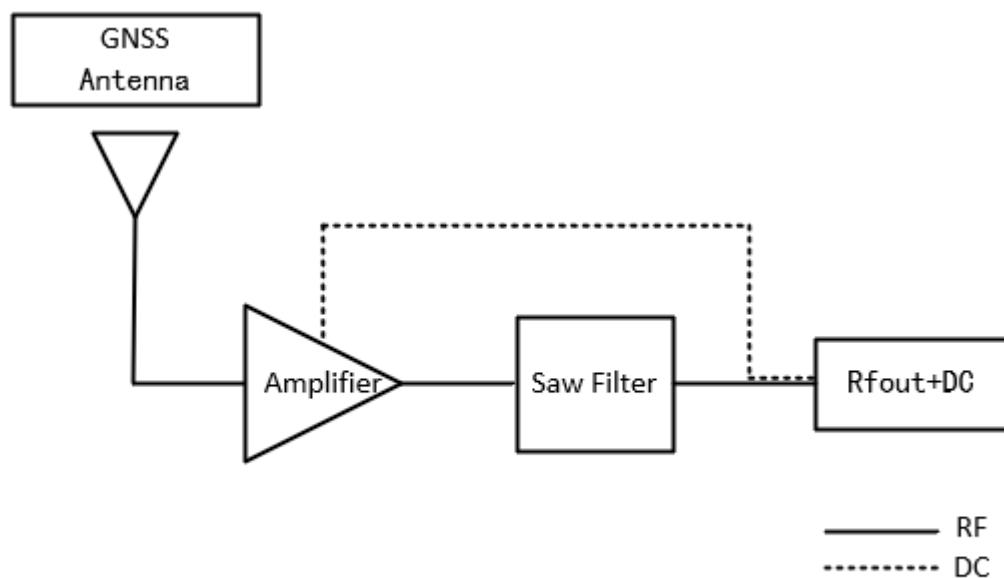
**Mechanical**

<b>Antenna Dimensions</b>	25 $\times$ 25 $\times$ 6.3 mm
<b>Material</b>	PCB + Ceramic
<b>Cable Type &amp; Color &amp; Length</b>	$\Phi$ 1.13 & Black & 50 mm
<b>Connector Type</b>	IPEX MHF 1
<b>Mounting Type</b>	Buckle
<b>Weight</b>	Typ. 11.2 g

**Environmental**

<b>Operation Temperature</b>	-40 °C to +85 °C
<b>Storage Temperature</b>	-40 °C to +85 °C
<b>RoHS Compliant</b>	Yes

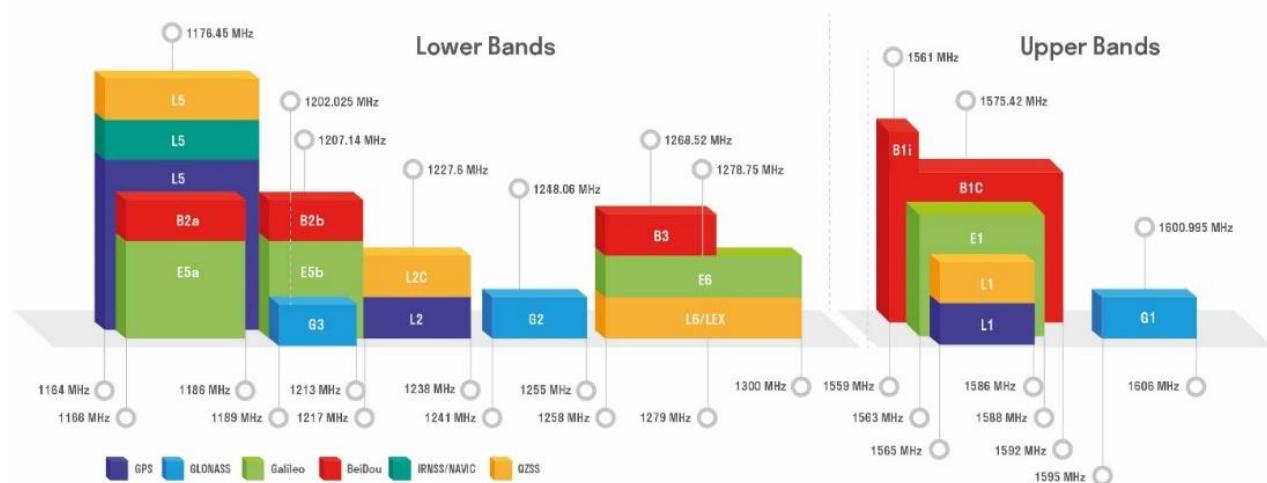
### 1.3. Block Diagram (Active Antenna)



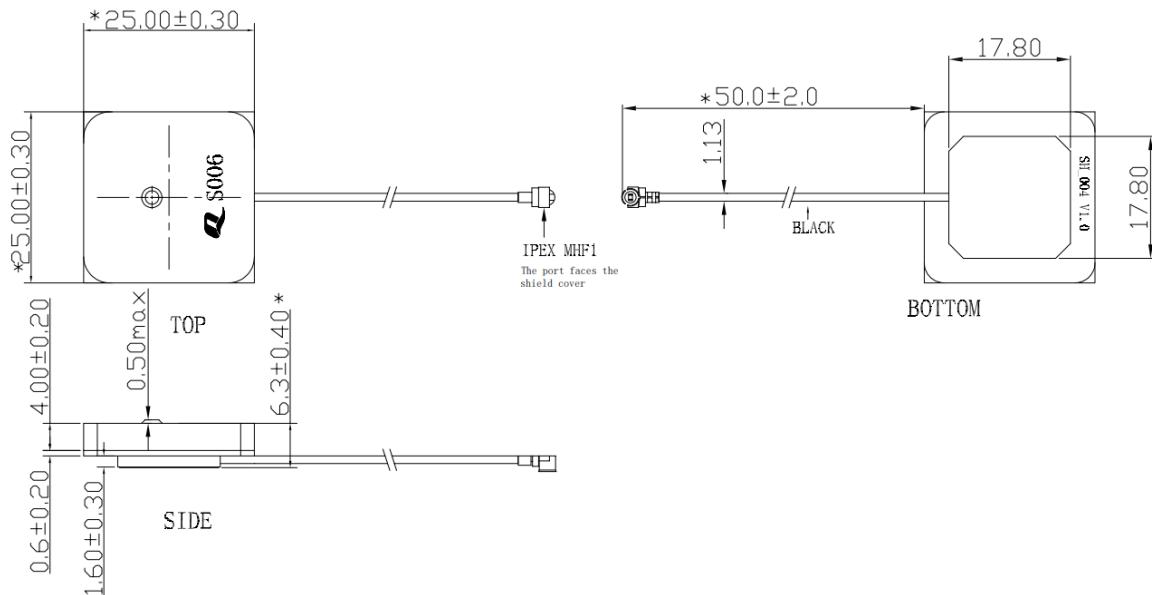
## 1.4. Supported GNSS Frequency Bands

GNSS Frequency Bands (MHz)					
	<b>L1</b>	<b>L2</b>	<b>L5</b>		
<b>GPS</b>	Centre 1575.42 (1565–1586)	Centre 1227.6 (1217–1238)	Centre 1176.45 (1164–1189)		
	√	-	-		
<b>GLONASS</b>	<b>G1-L1OC-L1OF</b> Centre 1601 (1595–1606)	<b>G2-L2OC-L2OF</b> Centre 1248.06 (1241–1255)	<b>G3-L3OC</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>B2b</b> Centre 1176.45 (1166–1187)	<b>B2a-B2I</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



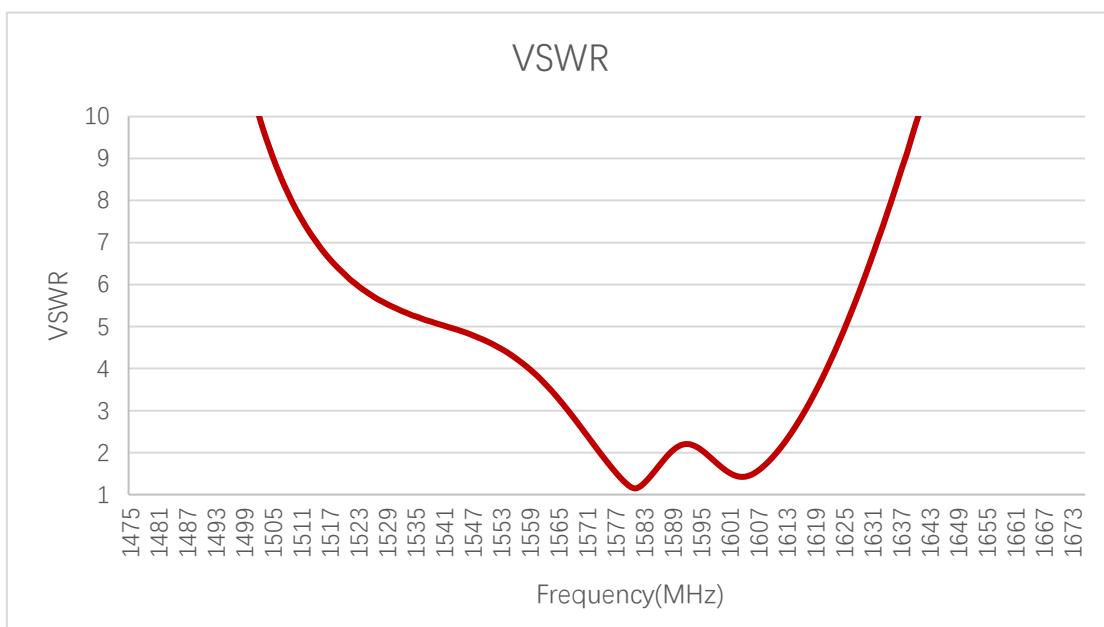
## 2 Drawing



# 3 Detailed Performance

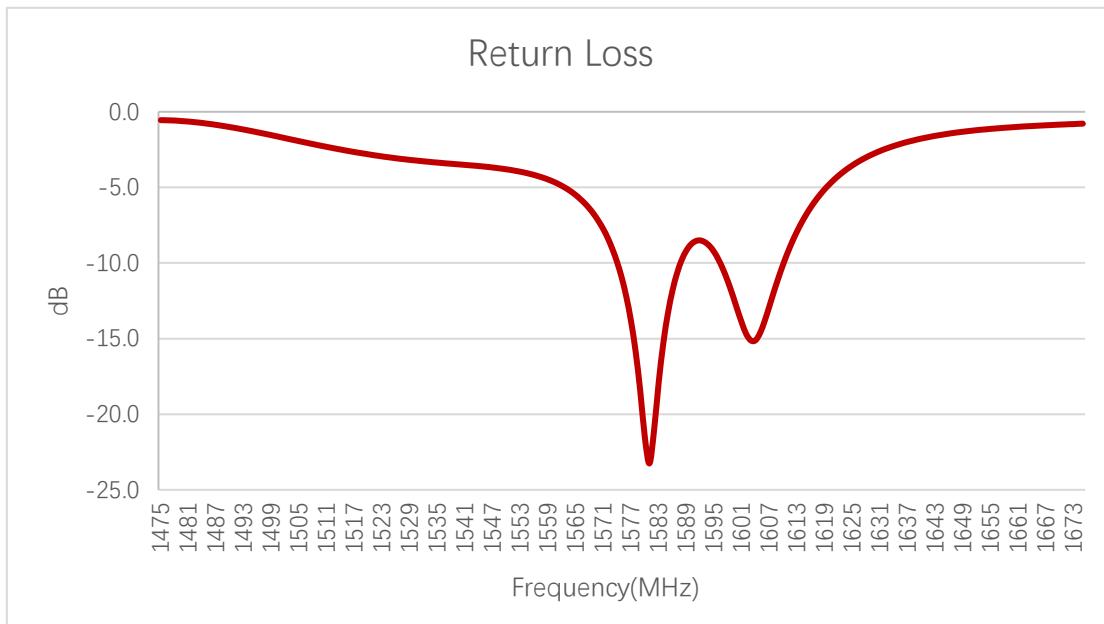
## 3.1. S-Parameter Test

### 3.1.1. VSWR



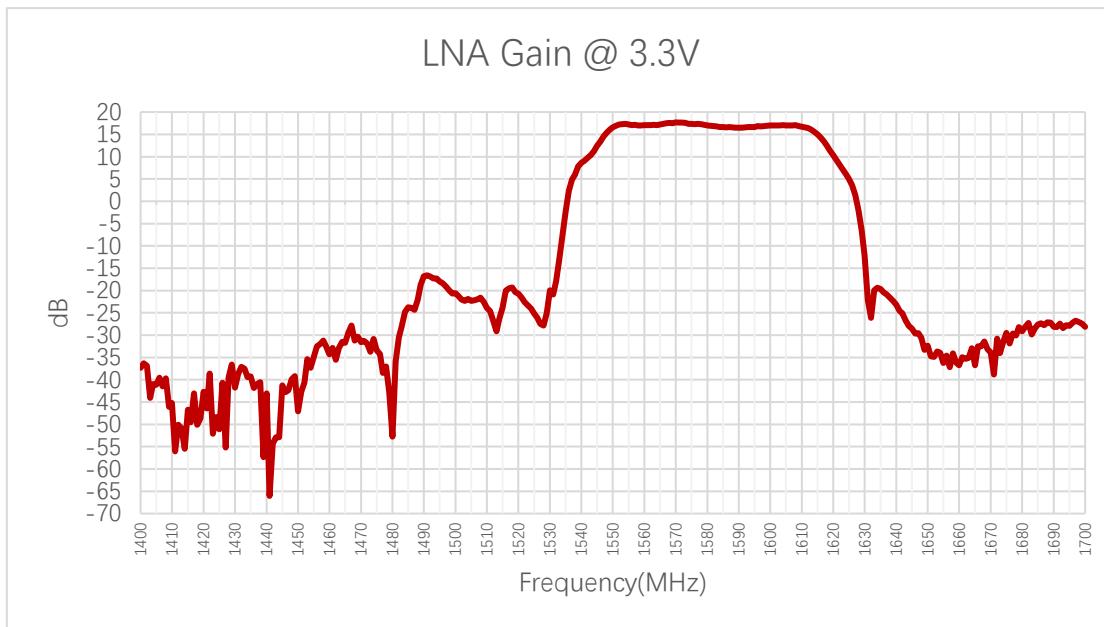
VSWR									
Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602	
VSWR	-	-	-	-	-	-	1.8	1.5	

### 3.1.2. Return Loss



Return Loss (dB)								
Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-	-	-	-	-	-	-11.0	-14.7

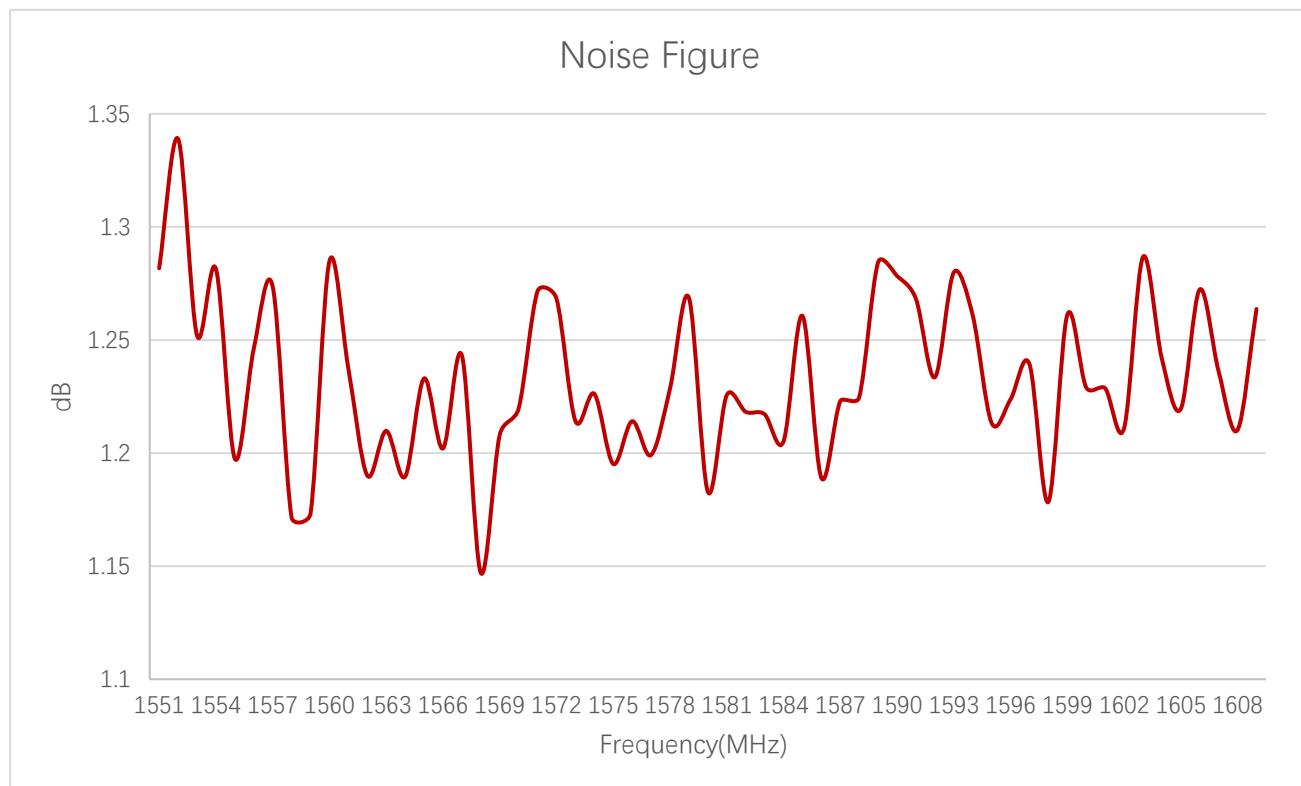
### 3.1.3. GNSS LNA Gain



**LNA Gain (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain (dB)	-	-	-	-	-	-	17.3	17.0

### 3.1.4. Noise Figure

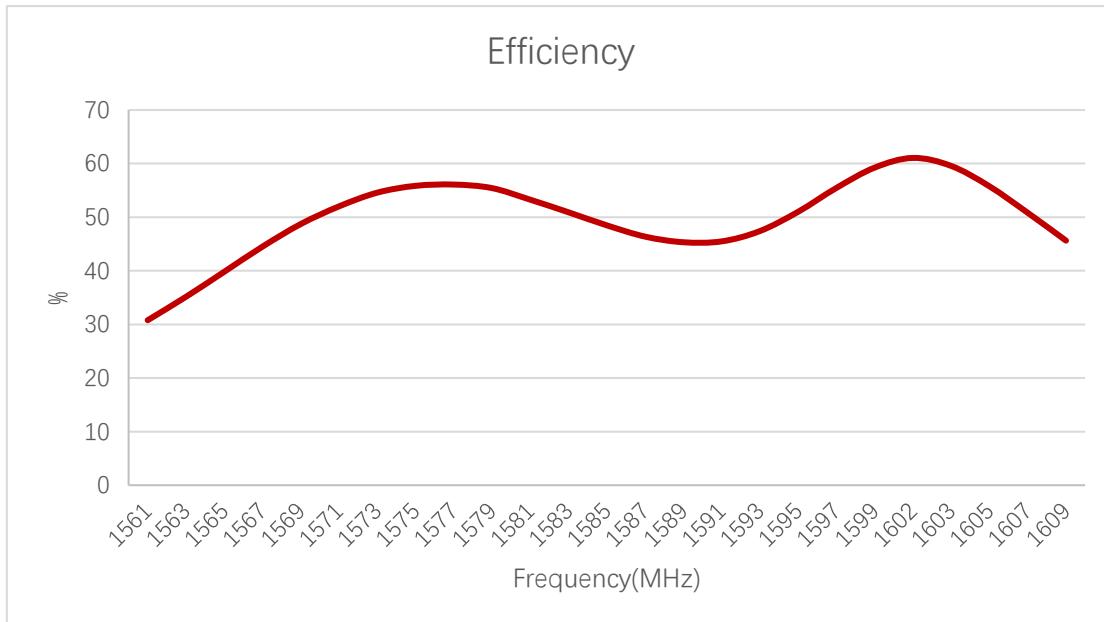


Noise Figure (dB)

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

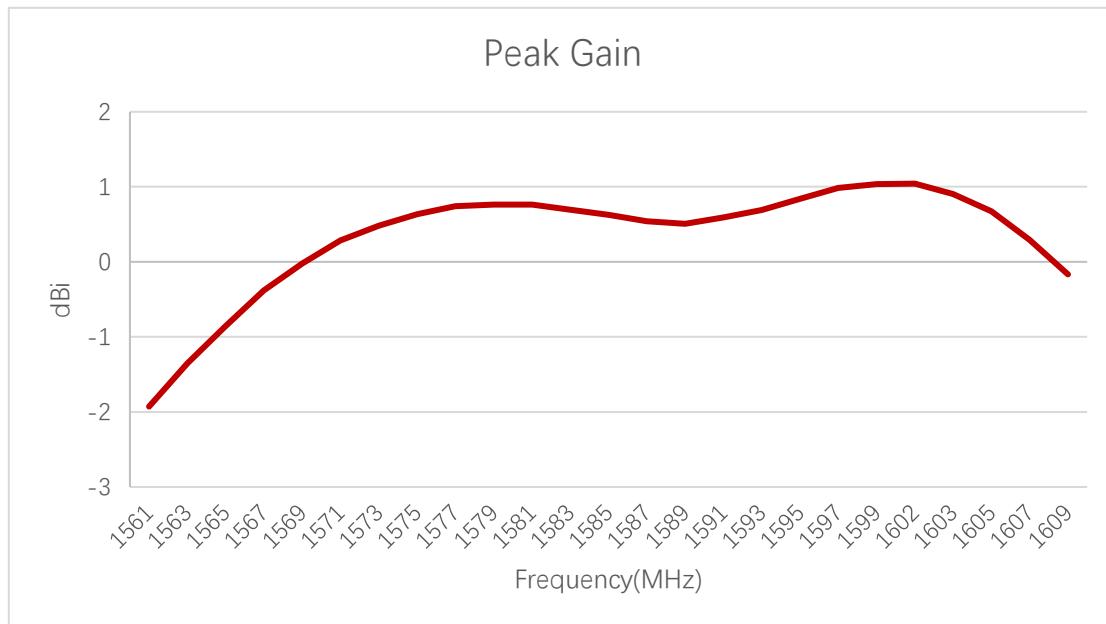
## 3.2. Radiation Performance Test

### 3.2.1. Efficiency



Efficiency (%)								
Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	-	-	-	-	-	-	55.9	61.1

### 3.2.2. Peak Gain

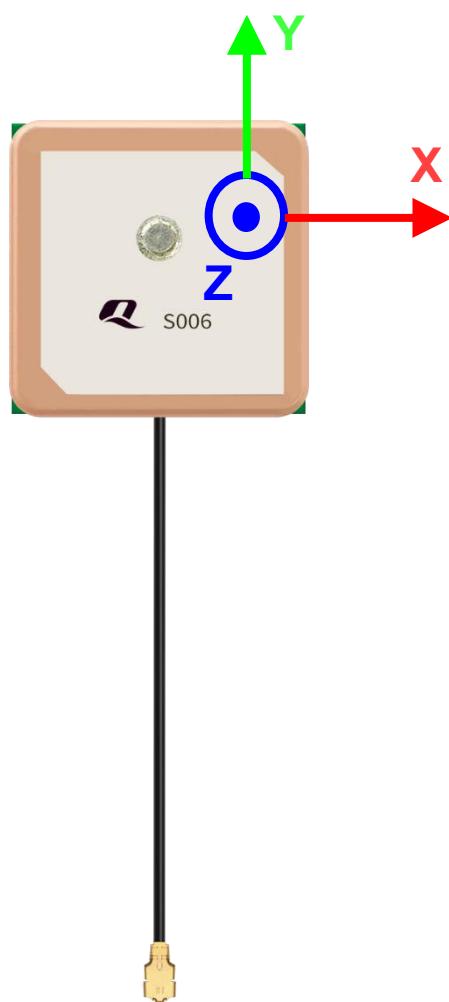


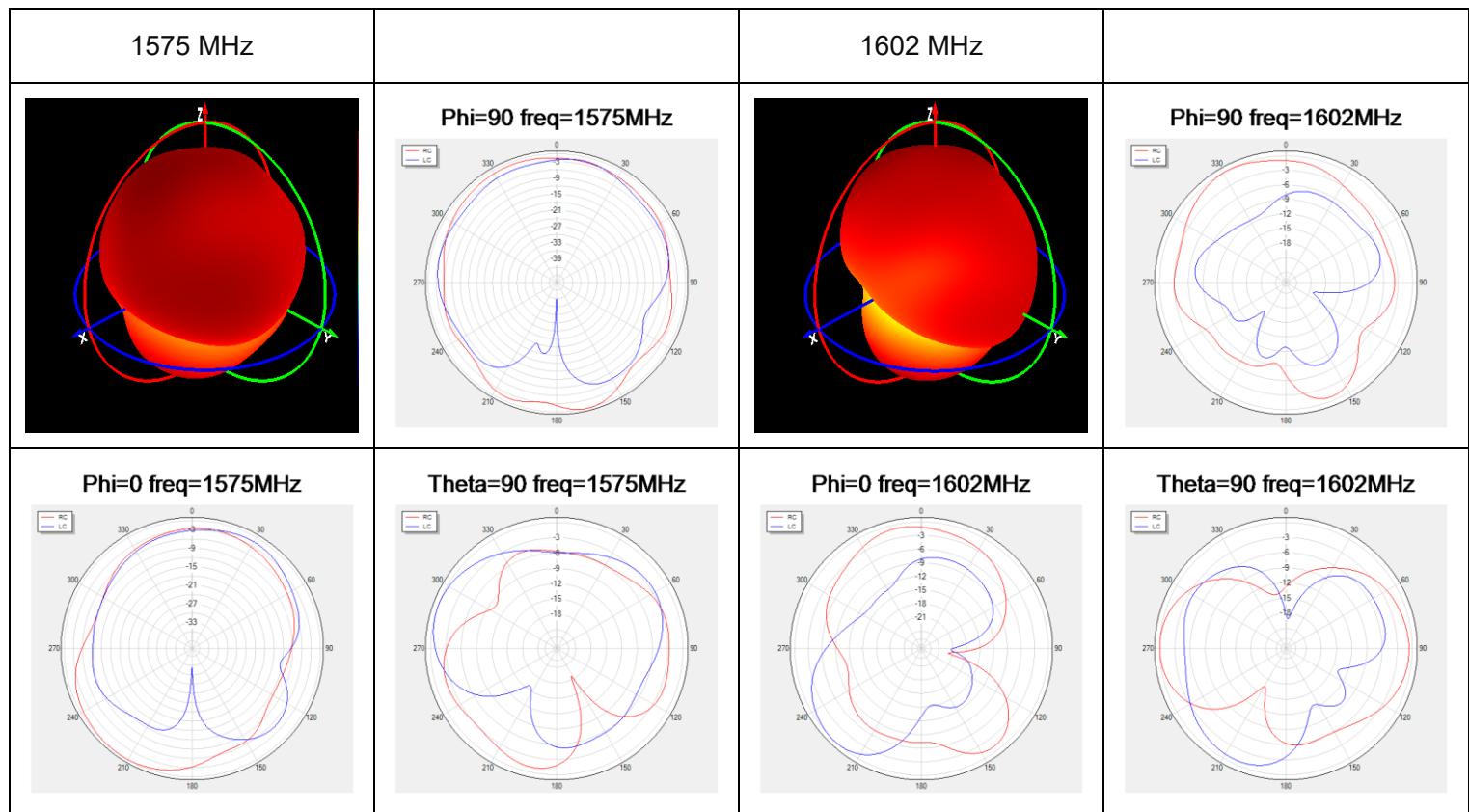
Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	-	-	-	-	-	-	0.6	1.0

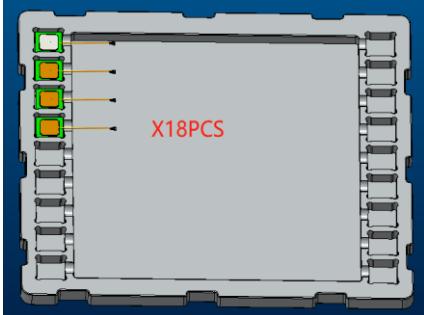
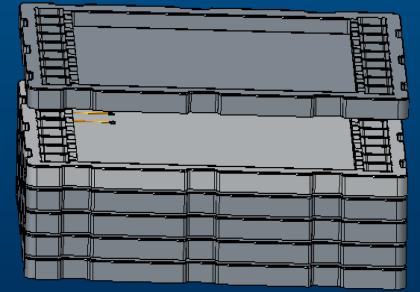
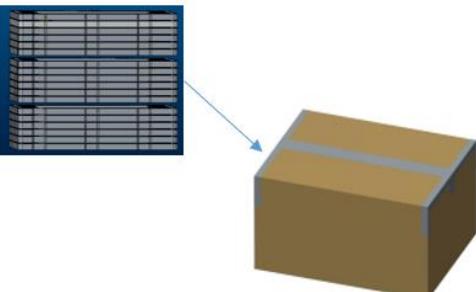
### 3.2.3. 3D & 2D Radiation Pattern

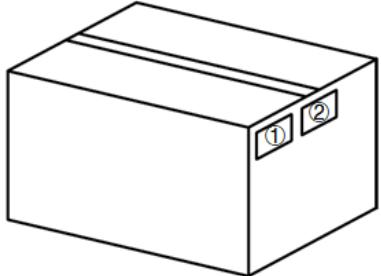
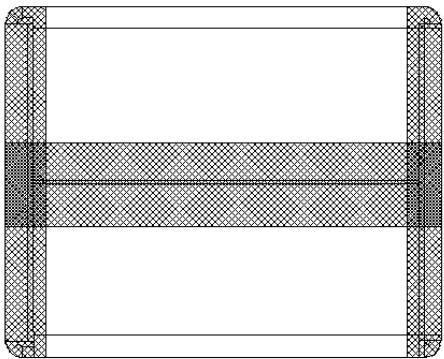
- Test Condition: By 25 mm square ground plane
- Test Chamber: GL-S-1





# 4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		Put the product into the tray (18 pcs per tray)
2		Stack 5 layers of trays into a vacuum bag to vacuum; 90 pcs antenna products in a vacuum bag.
3		Put 3 vacuum bags into the carton box; (270 pcs antennas per carton box)  <u>Carton Box Size:</u> <u><math>L \times W \times H = 390 \times 340 \times 175 \text{ mm}</math></u>

4		<p><b>Position for Attaching Labels</b></p> <p>① Carton Label ② Quality Label</p>
5		<p><b>Sealing Cartons</b> “工” type sealing cartons</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:**

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

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# Revision History

Version	Date	Author	Note
-	2021-06-04	Kenny YIN/ Aria CHU	Creation of the document
1.0	2021-06-04	Kenny YIN/ Aria CHU	First official release
1.1	2021-06-23	Aria CHU	Added the LNA electrical properties (Chapter 3).
1.2	2021-11-30	Aria CHU	Updated the product description (Chapter 1).
2.0	2021-11-22	Xiaodong YANG	Updated the product description (Chapter 1).
3.0	2022-03-01	Junsen LI	Updated all test data in this datasheet.
3.1	2022-03-17	Junsen LI	Updated all test data in this datasheet.
4.0	2023-08-26	Nico PAN/ Lucky FENG/ David LIU/ Aria CHU	Updated all test data in this datasheet.



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