

# Antenna Datasheet

**Product OC:** YFGA025E3AM

**Version:** 2.3

**Date:** 2025-10-27

**Status:** Released

**Product Name:** GNSS L1 Buckle Mount Ceramic Patch + Cable Active  
Embedded Antenna

**Key Features:**

Frequency Band: 1559–1606 MHz

Dimensions: 25 mm × 25 mm × 5.5 mm

LNA Gain: 16 ±3 dB

RoHS and REACH Compliant

# Overview

The Quectel YFGA025E3AM is a high-performance GNSS L1 buckle mount ceramic patch + cable active embedded antenna, designed for precise positioning. Operating in the 1559–1606 MHz range with 50  $\Omega$  impedance and RHCP polarization, it supports key bands like GPS L1, GLONASS G1, GALILEO E1, BDS B1I/B1C, and QZSS L1.

With dimensions 25 mm × 25 mm × 5.5 mm and a 7.2 g weight, it features a  $\Phi$  1.13 mm black RF cable (100 mm) with an IPEX MHF1 connector and buckle mounting. Its LNA gain of 16  $\pm$ 3 dB and noise figure  $\leq$  2.5 dB enhance signal reception, complemented by 47.4 % efficiency at 1561 MHz and a peak gain of -0.41 dBi at 1575 MHz.

RoHS and REACH compliant, it operates in -40 °C to +85 °C. Packaged in pearl cotton trays (36 pcs) and cartons (180 pcs), it suits seamless integration in GNSS-enabled devices requiring reliable performance in diverse environments.

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.

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# 1 Specification

Test Condition: Free Space

## 1.1. Electrical

Electrical	
Frequency Range	1559–1606 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

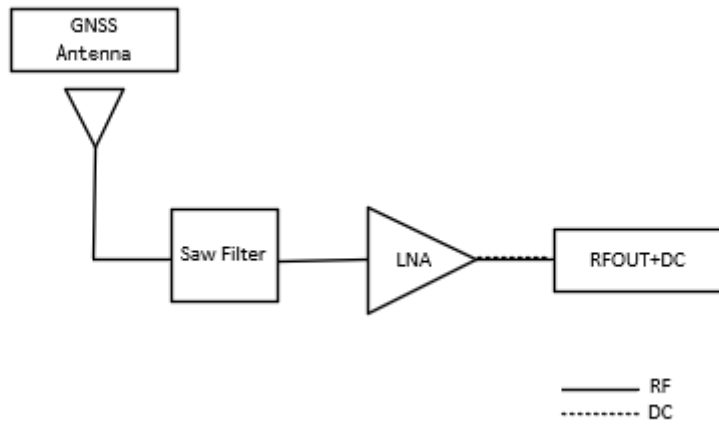
Frequency (MHz)	Band	GPS L5	GALILEO	GPS L2	GLONASS	BDS B3	BDS B1I	GPS L1	GLONASS
		E5a	E5b	QZSS L2C	G2			E1	G1
		BDS B2a- B2I	BDS B2b					BDS B1C	
		QZSS L5						QZSS L1	
		IRNSS L5							
		1176	1207	1227	1248	1268	1561	1575	1602
VSWR		-	-	-	-	-	1.35	1.15	21.6
Return Loss (dB)		-	-	-	-	-	-16.4	-22.7	-0.8
Efficiency (%)		-	-	-	-	-	47.4	47	5.0
Peak Gain (dBi)		-	-	-	-	-	-0.45	-0.41	-10.5

LNA Electrical	
LNA Gain	16 ±3 dB
Noise Figure	≤ 2.5 dB
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	≥ 45 dB f0 ±100 MHz f0 (1568 MHz)
Working Voltage	1.8–3.3 V
Working Current	4.3 ±1.5 mA
Impedance	50 Ω

## 1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	25 mm × 25 mm × 5.5 mm
Material & Color	PCBA + Ceramic + RF Cable
Cable Type & Length	Φ 1.13 mm & Black & 100 mm
Connector Type	IPEX MHF1
Mounting Type	Buckle
Weight	Typ. 7.2 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS & REACH Compliant	Yes

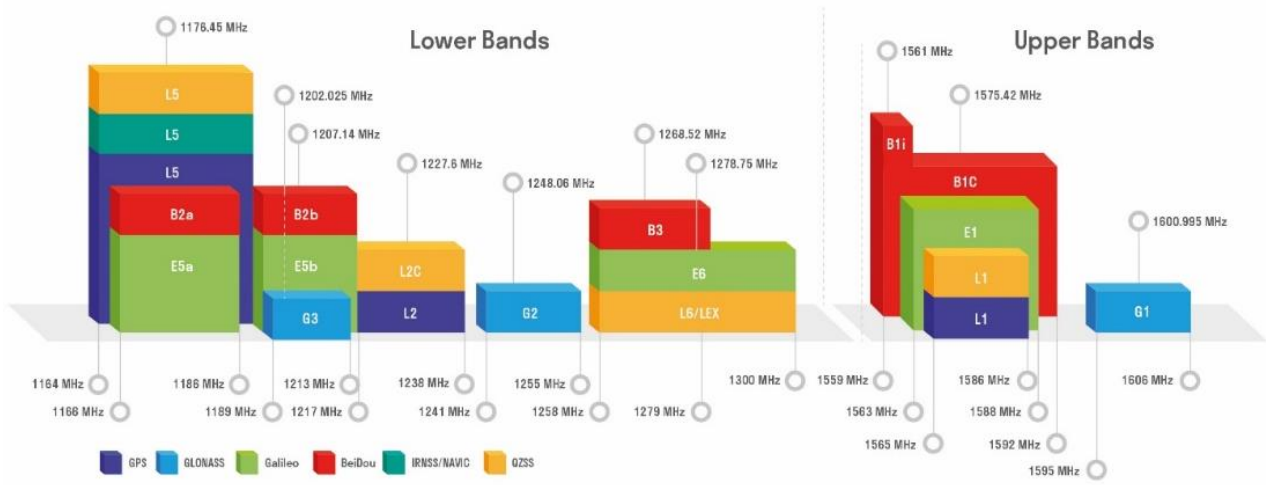
### 1.3. Block Diagram (Active Antenna)



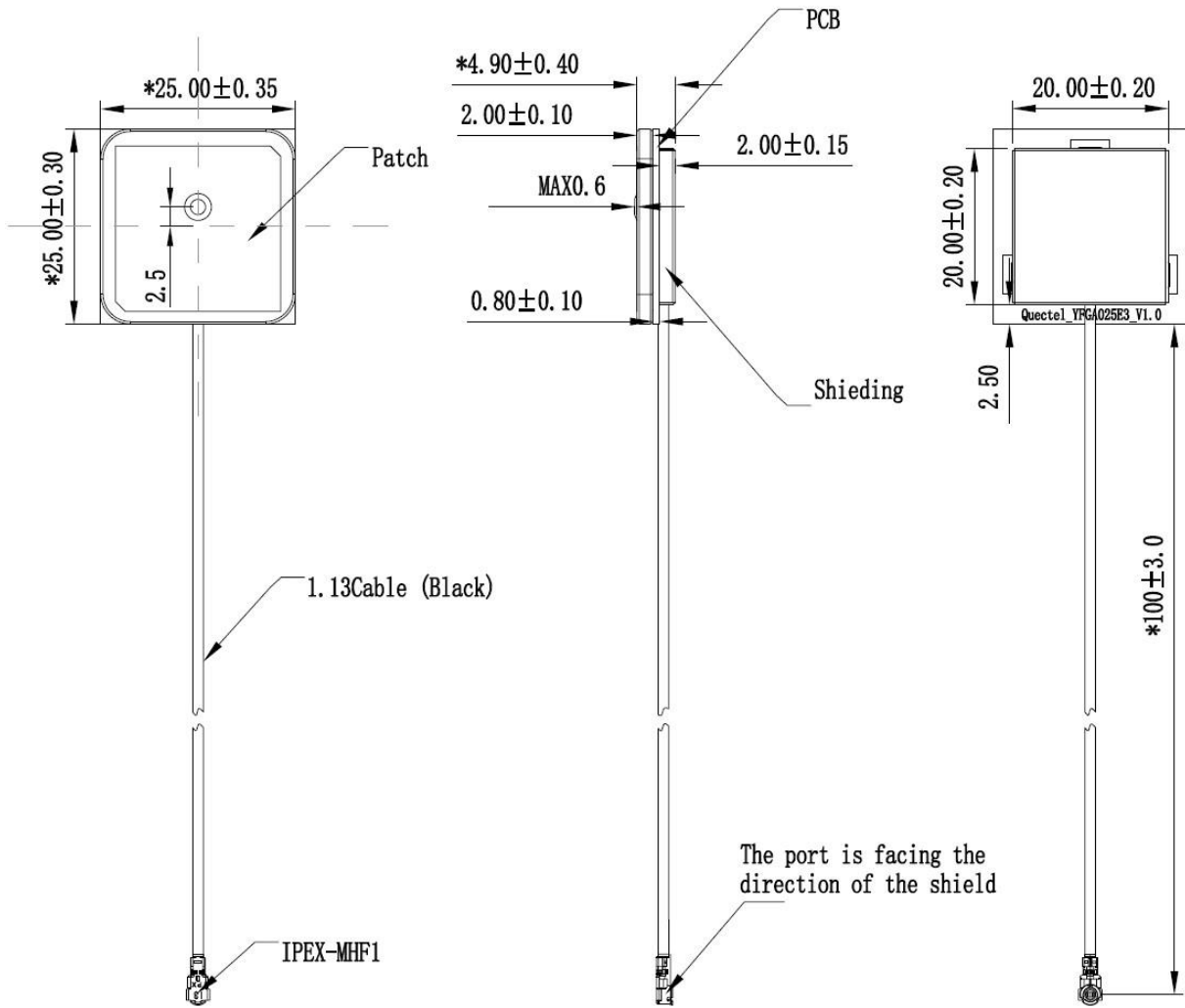
## 1.4. Supported GNSS Frequency Bands

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>BDS</b>	<b>B1I</b> Centre 1561.098 (1559–1564)	<b>B1C (BDS-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



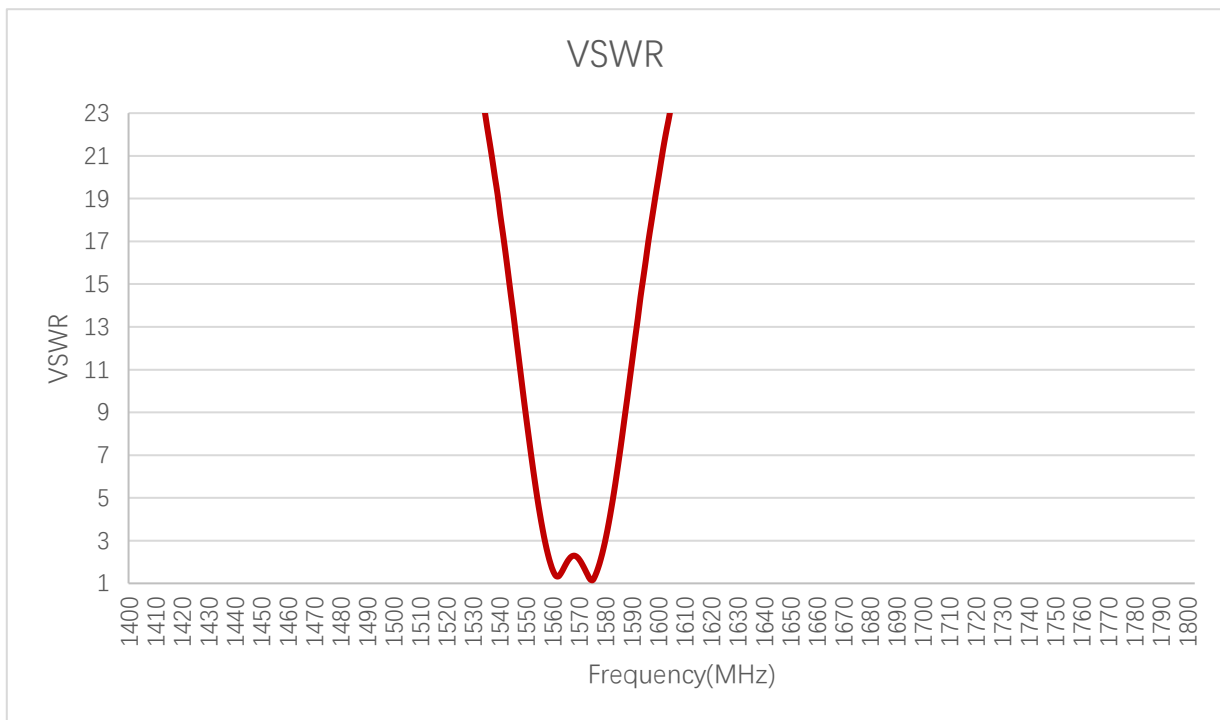
# 2 Drawing



# 3 Detailed Performance

## 3.1. S-Parameter Test

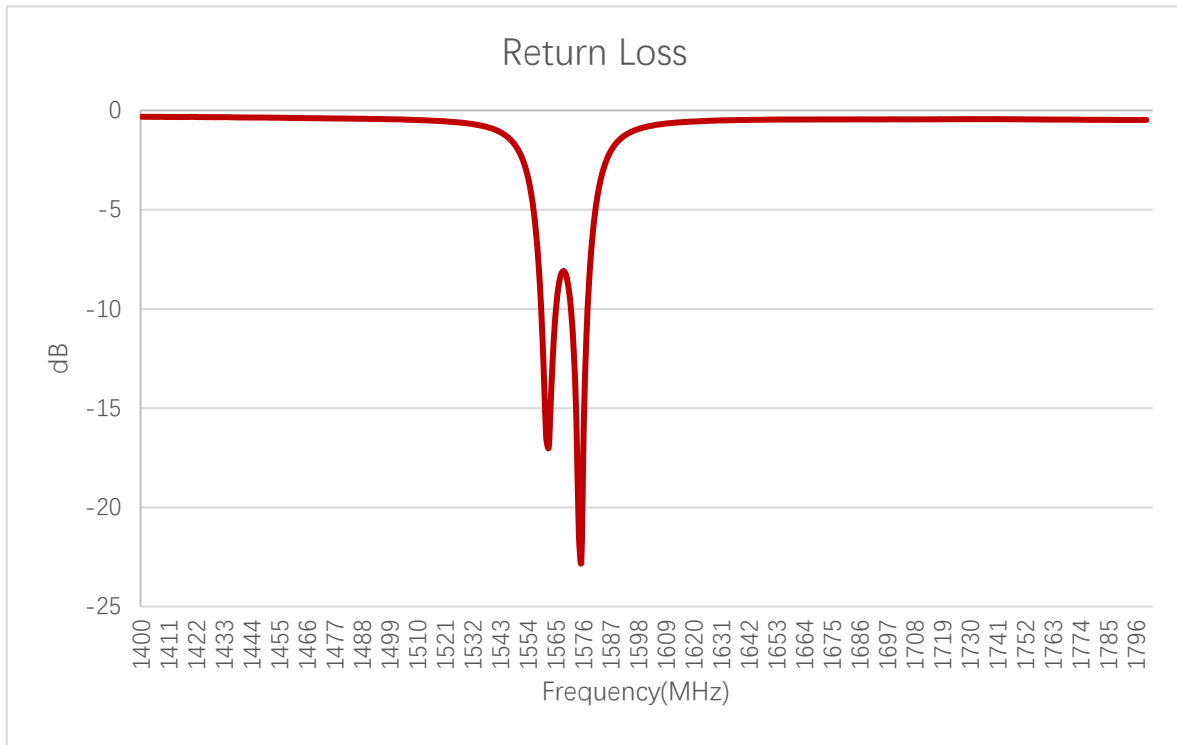
### 3.1.1. VSWR



**VSWR**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	-	-	-	-	-	1.35	1.15	21.6

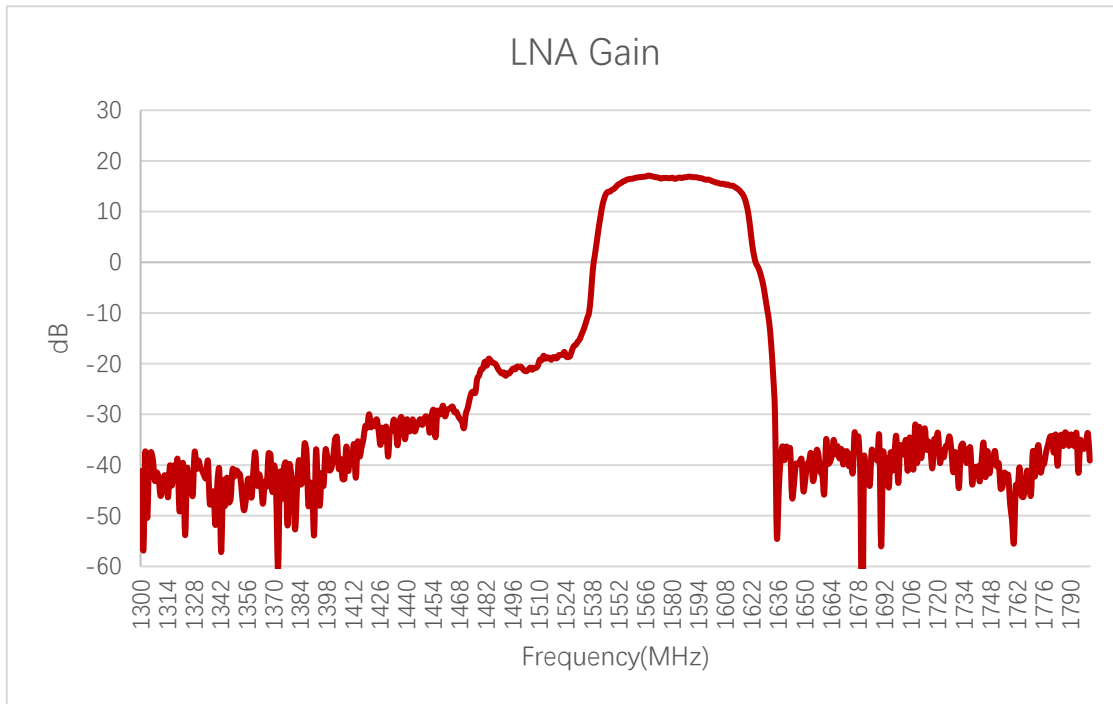
**3.1.2. Return Loss**



**Return Loss (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-	-	-	-	-	-16.4	-22.7	-0.8

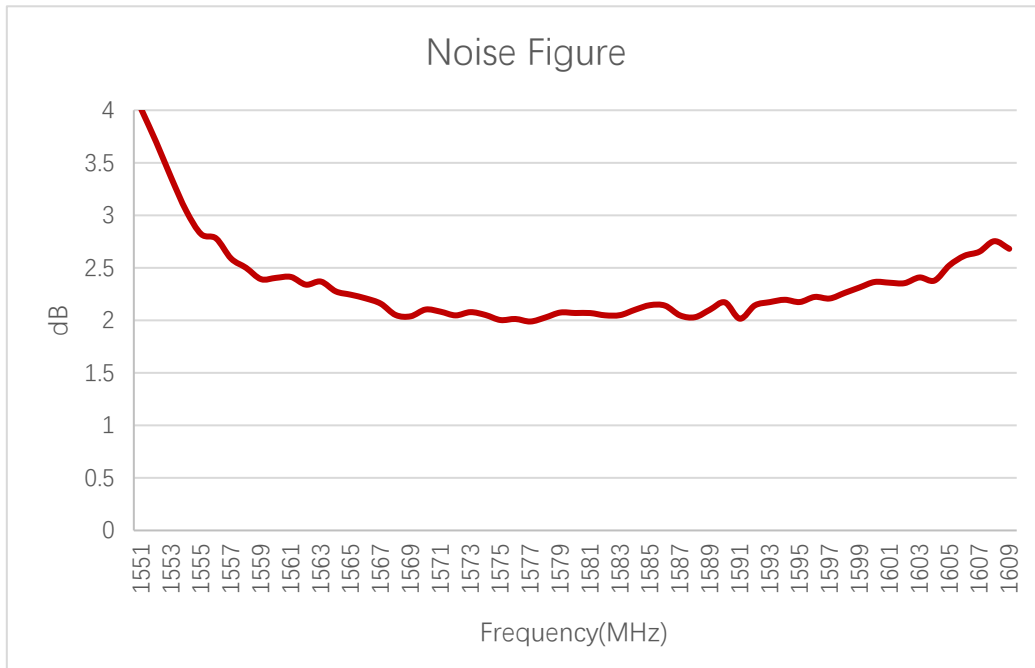
**3.1.3. LNA Gain**



**LNA Gain (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain (dB)	-	-	-	-	-	16.7	16.6	15.8

**3.1.4. Noise Figure**

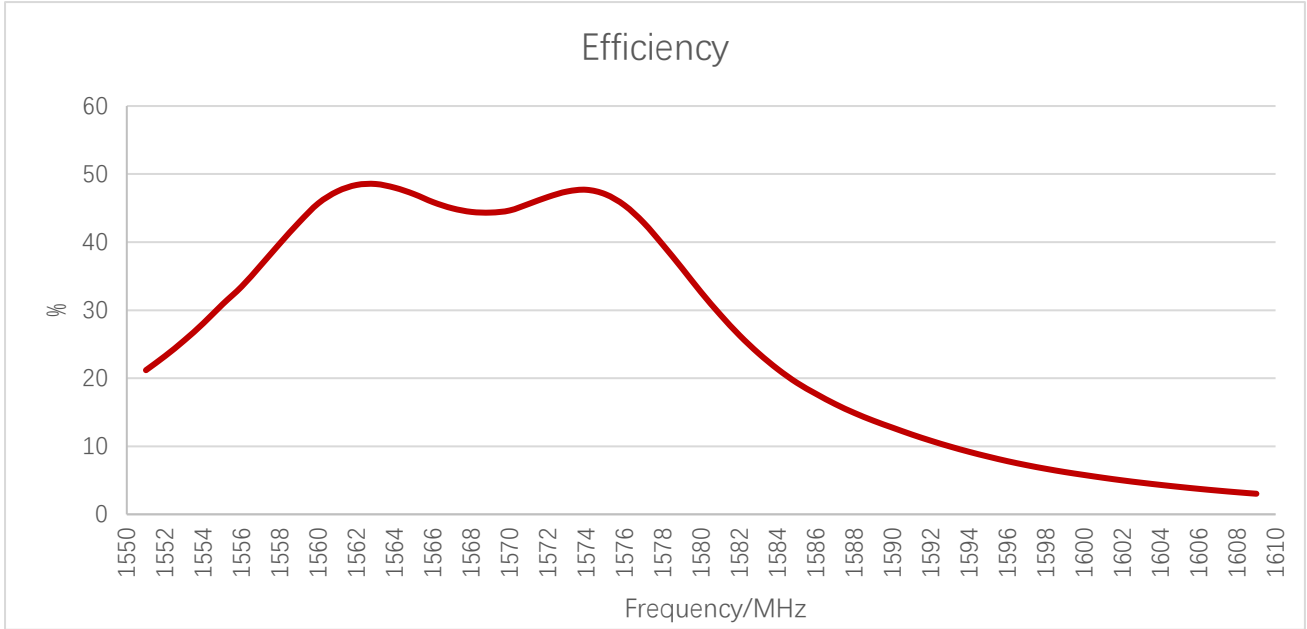


**Noise Figure (dB)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Noise Figure (dB)	-	-	-	-	-	2.4	2	2.35

### 3.2. Radiation Performance Test

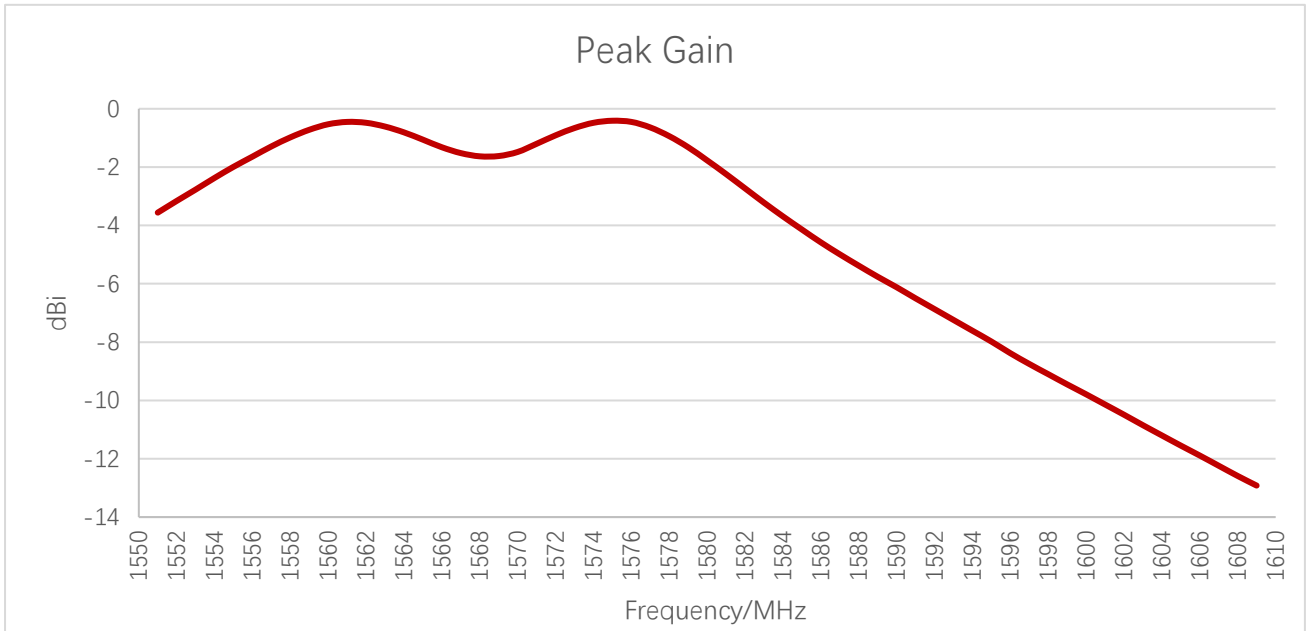
#### 3.2.1. Efficiency



**Efficiency (%)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	-	-	-	-	-	47.4	47	5.0

**3.2.2. Peak Gain**

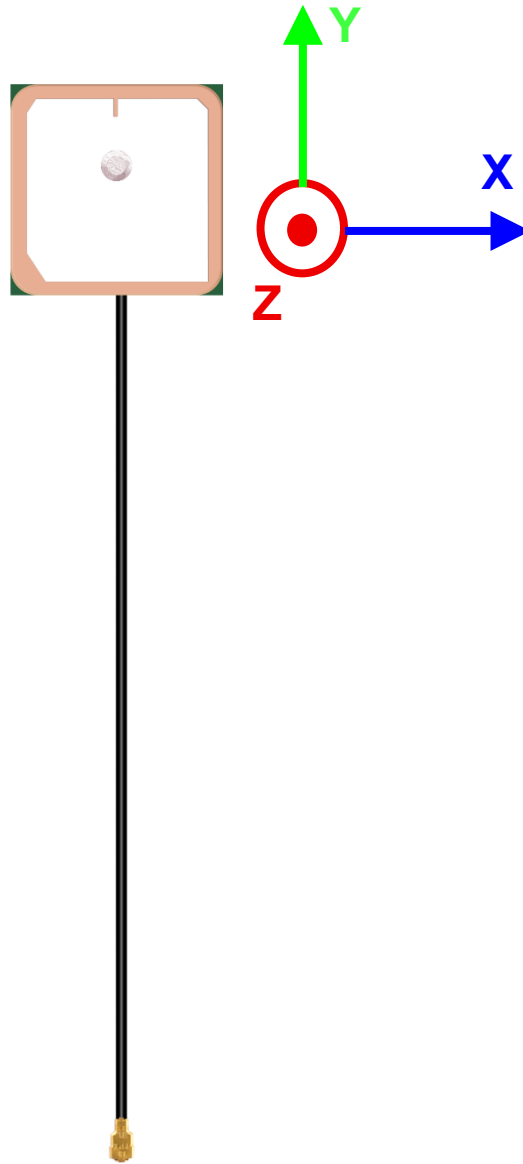


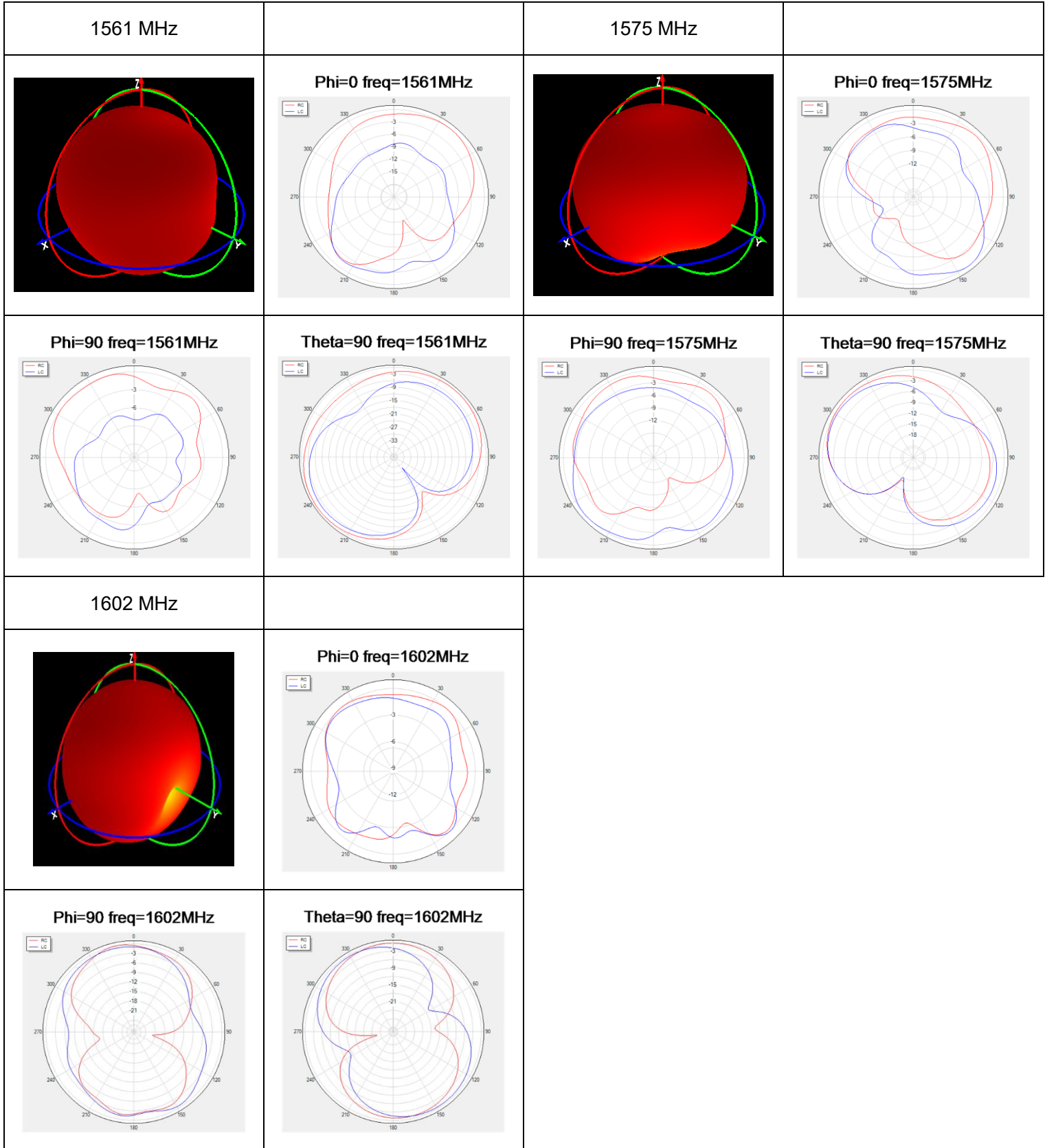
**Peak Gain (dBi)**

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	-	-	-	-	-	-0.45	-0.41	-10.5

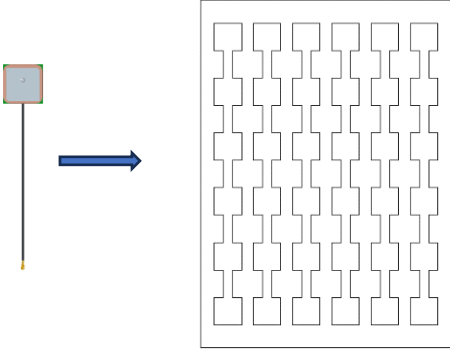
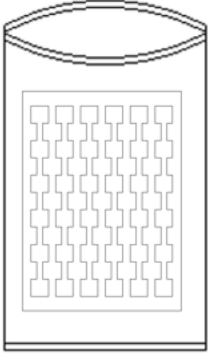
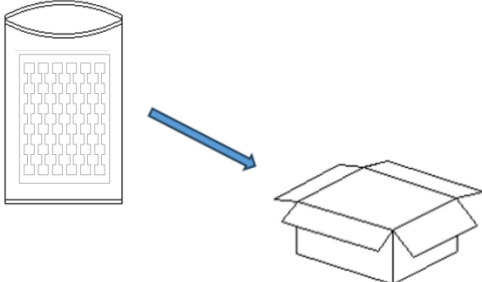
### 3.2.3. 3D & 2D Radiation Pattern

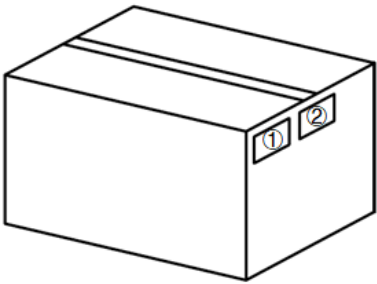
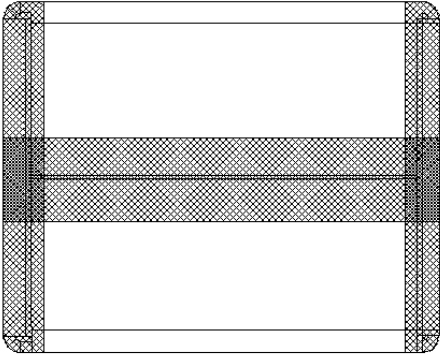
- Test Condition: Free Space
- Test Chamber: SH-SY-16M





# 4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		<p>(36 Antennas / Pearl Cotton Tray)</p>
2		<p>The pearl cotton tray is vacuumed in a vacuum bag.</p>
3		<p>5 Pearl Cotton Trays / Carton Box (180 Antennas / Carton Box)</p> <p><u>Carton Size:</u> <u>L × W × H = 405 × 293 × 185 mm</u></p>

4	 A 3D perspective drawing of a rectangular carton. On the front face, there are two small rectangular labels. The left label is marked with a circled '1' and the right label is marked with a circled '2'.	<p><b>Position for Attaching Labels</b></p> <ul style="list-style-type: none"><li>① Carton Label</li><li>② Quality Label</li></ul>
5	 A 2D perspective drawing of an H-shaped sealing carton. The structure consists of two vertical side rails and two horizontal top and bottom rails, forming an 'H' shape. The entire structure is filled with a cross-hatched pattern, representing the sealing material.	<p><b>Sealing Cartons</b> H-shaped 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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# Revision History

Version	Date	Author	Note
-	2024-04-19	Junsen Li/ Poker Guo/ David Liu/ Rainey Liao	Creation of the document
1.0	2024-04-19	Junsen Li/ Poker Guo/ David Liu/ Rainey Liao	First official release
2.0	2024-12-07	Rhone Wei/ Mike Guo	Numerous changes were made to this document. It should be read in its entirety.
2.1	2024-12-26	Mike Guo	Deleted adhesive mounting type of antenna (Chapter 1.2).
2.2	2025-07-21	Aria Chu	<ol style="list-style-type: none"><li>1. Updated the antenna image (Cover page).</li><li>2. Updated the overview.</li></ol>
2.3	2025-10-27	Junsen Li	<ol style="list-style-type: none"><li>1. Added the LNA gains according to different supply voltages (Chapter 1.1).</li><li>2. Update the figure (Chapter 1.3).</li></ol>

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