



Antenna Datasheet

Product OC: YCGO008AA

Version: 2.0

Date: 2023-07-19

Status: Released

Product Name: Active GPS L1 Antenna

Key Features:

Frequency Band: 1565–1586 MHz

Dimensions: 10 mm × 10 mm × 6.3 mm

Efficiency: Up to 26.2 %

GNSS LNA Gain: 17 ±2 dB

RoHS and REACH Compliant

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: By 30 mm square ground plane.

1.1. Electrical

Electrical								
Frequency Range	1565–1586 MHz							
Impedance	50 Ω							
Polarization	RHCP							
Radiation Pattern	Directional							

Frequency (MHz)	Band	GPS L5	GALILEO E5a	GALILEO E5b	GPS L2	GLONASS	BEIDOU	BEIDOU	GPS L1	GLONASS
		BEIDOU	B2a-B2I	B2b	QZSS L2C	G2	B3	B1I	E1	BEIDOU
1176		1176		1207		1227		1248		1268
VSWR		-		-		-		-	1.4	
Return Loss (dB)		-		-		-		-	-14.9	
Efficiency (%)		-		-		-		-	22.6	
Peak Gain (dBi)		-		-		-		-	-2.2	
Axial Ratio (dB)		-		-		-		-	4.9	

LNA Electrical

LNA Gain	17 \pm 2 dB
Noise Figure	Typ. 1.5 dB (25 \pm 5 °C)
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	30 dB f ₀ \pm 100 MHz f ₀ (1575 MHz)
Working Voltage	DC 3–3.3 V
Working Current	\leq 10mA
Impedance	50 Ω

1.2. Mechanical & Environmental

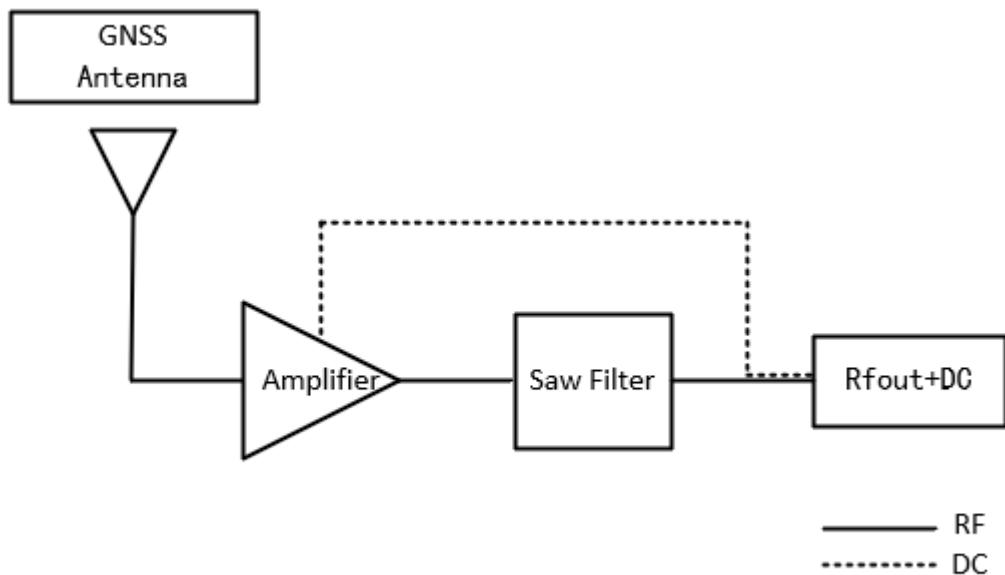
Mechanical

Antenna Dimensions	10 mm \times 10 mm \times 6.3 mm
Material	PCB + Ceramic
Cable Type & Color & Length	Φ 1.13 & Black & 50 mm
Connector Type	IPEX MHF 1
Mounting Type	Buckle
Weight	Typ. 2.5 g

Environmental

Operation Temperature	-40 °C to +85 °C
Storage	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

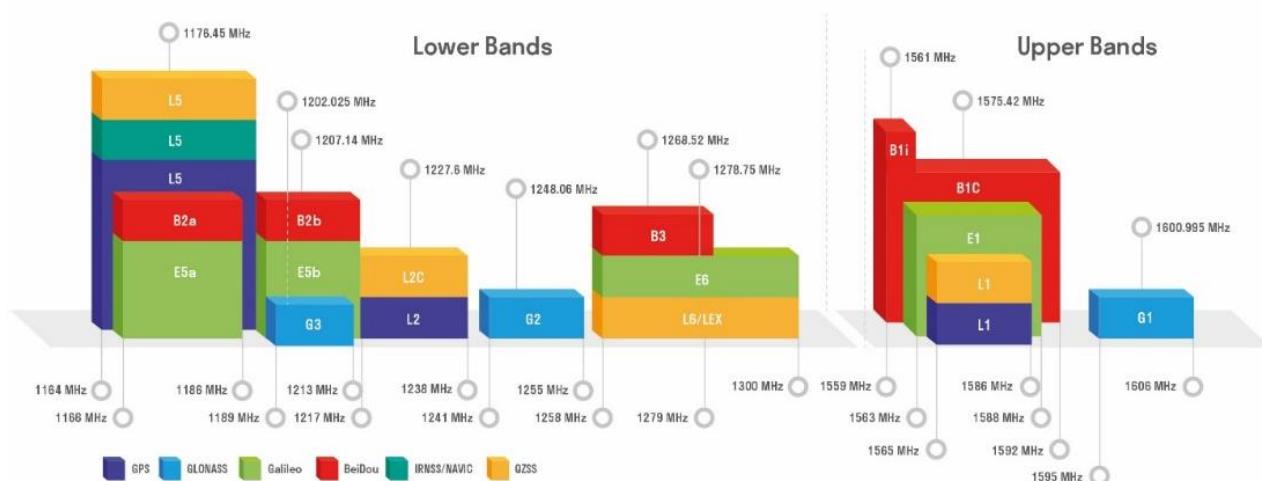
1.3. Block Diagram (Active Antenna)



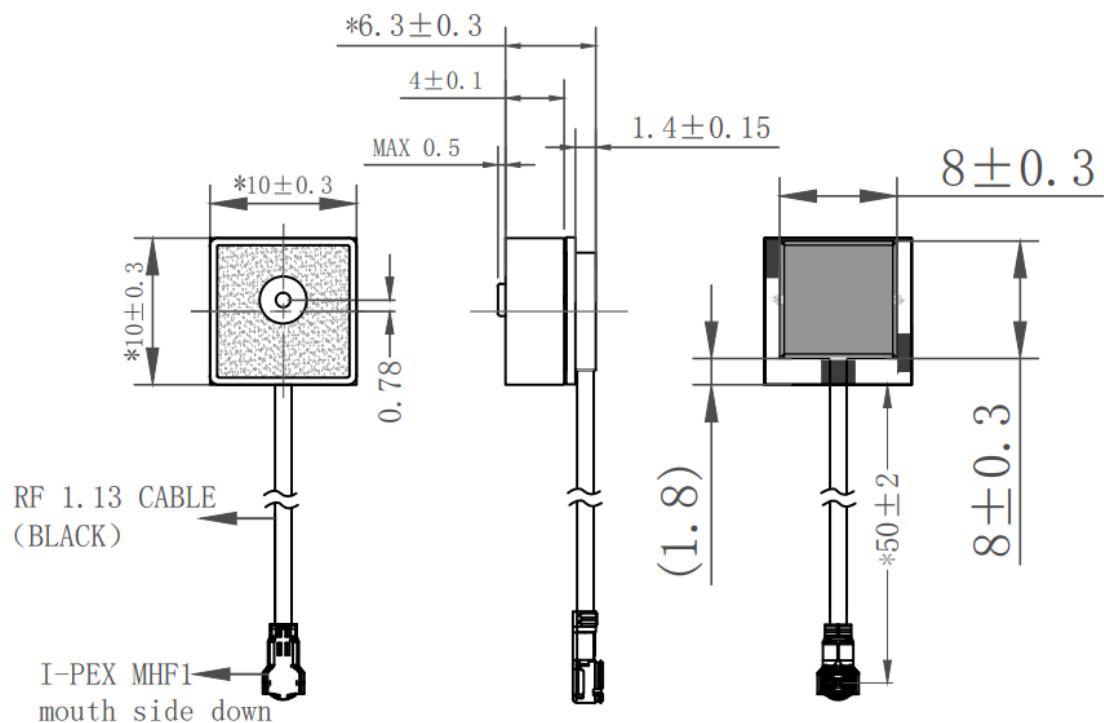
1.4. Supported GNSS Frequency Bands

GNSS Frequency Bands (MHz)					
	L1	L2	L5		
GPS	Centre 1575.42 (1565–1586)	Centre 1227.6 (1217–1238)	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)	
	√	-	-	-	
BEIDOU	B1I Centre 1561.098 (1559–1564)	B1C (BeiDou-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



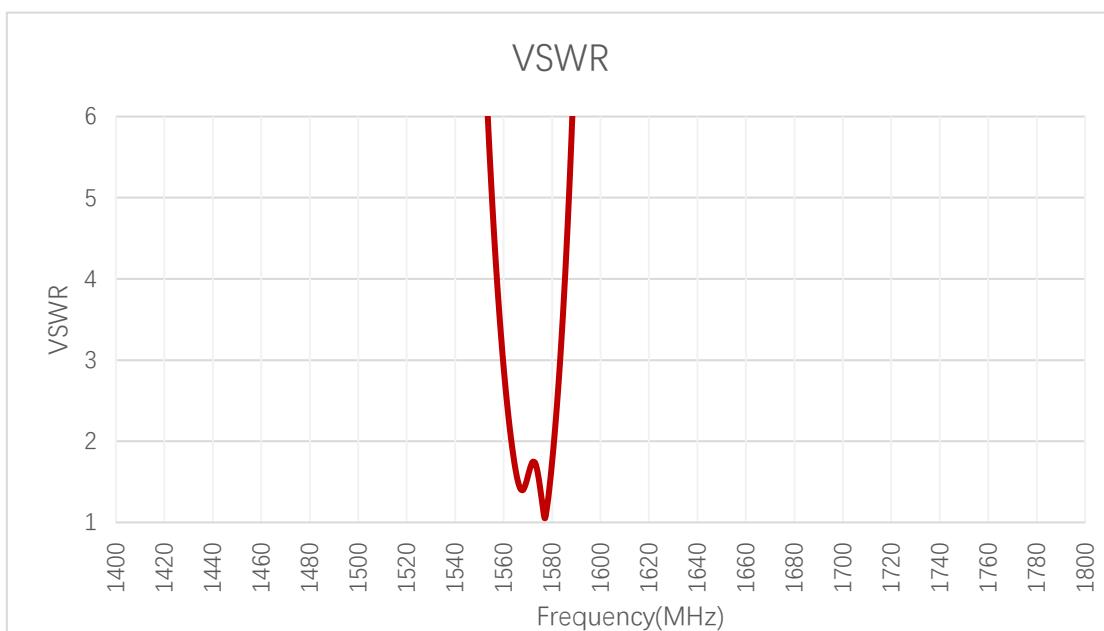
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

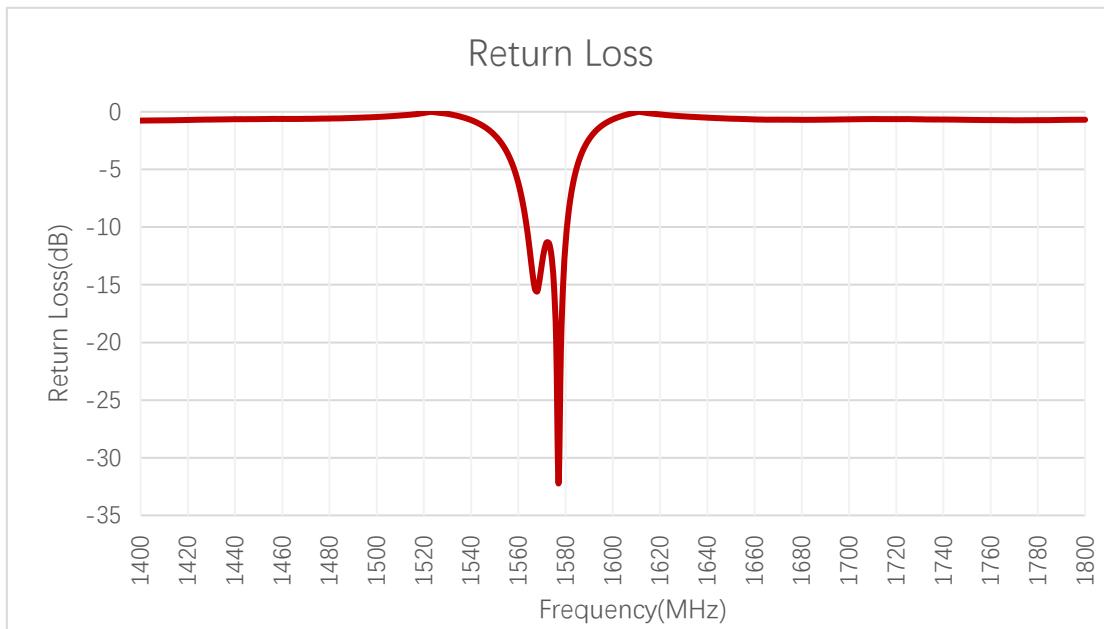
3.1.1. VSWR



VSWR

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	-	-	-	-	-	-	1.4	-

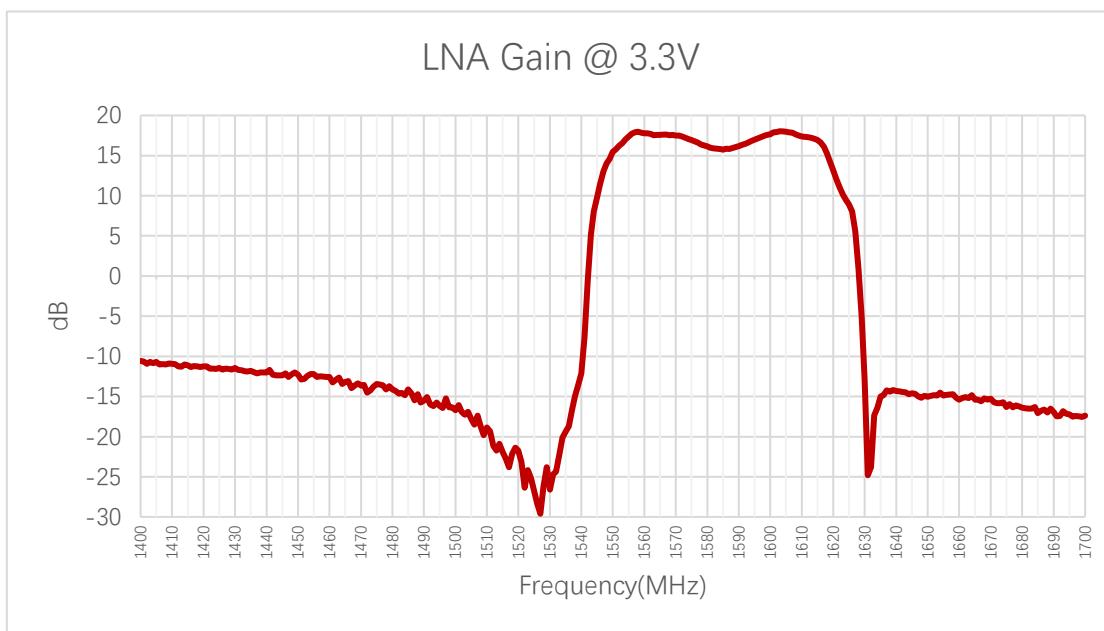
3.1.2. Return Loss



Return Loss (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-	-	-	-	-	-	-14.9	-

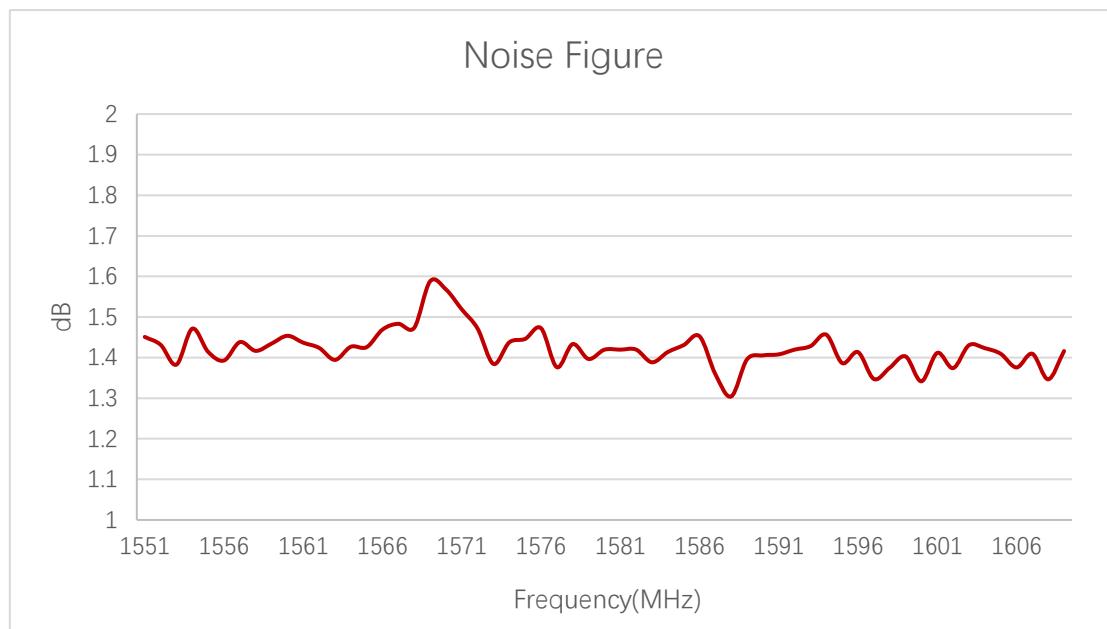
3.1.3. GNSS LNA Gain



LNA Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain (dB)	-	-	-	-	-	-	16.9	-

3.1.4. Noise Figure

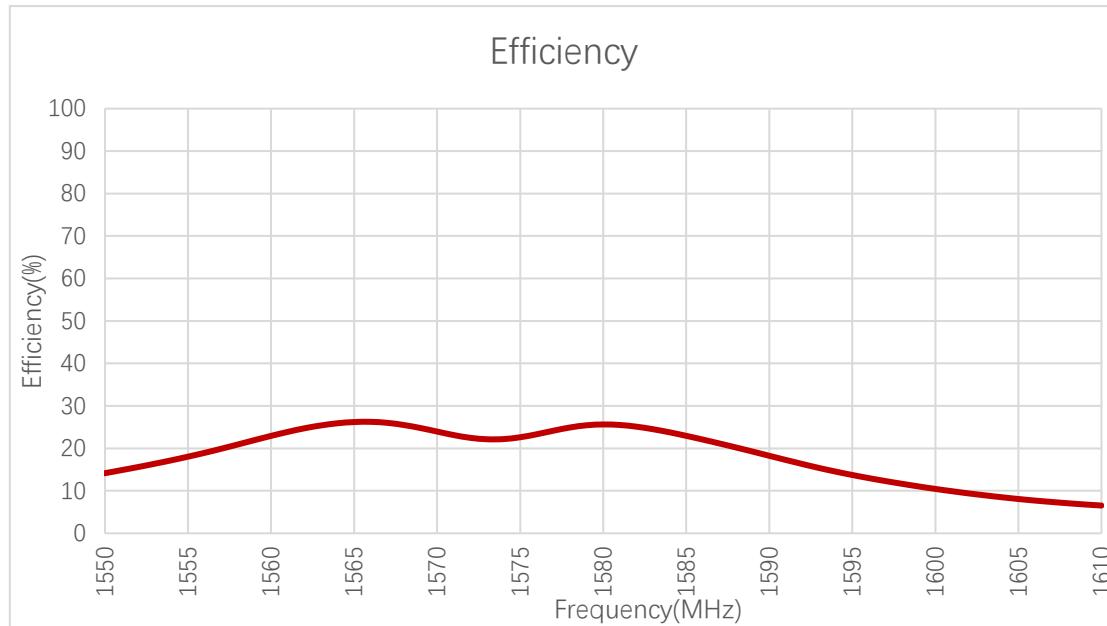


Noise Figure (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Noise Figure (dB)	-	-	-	-	-	-	1.45	-

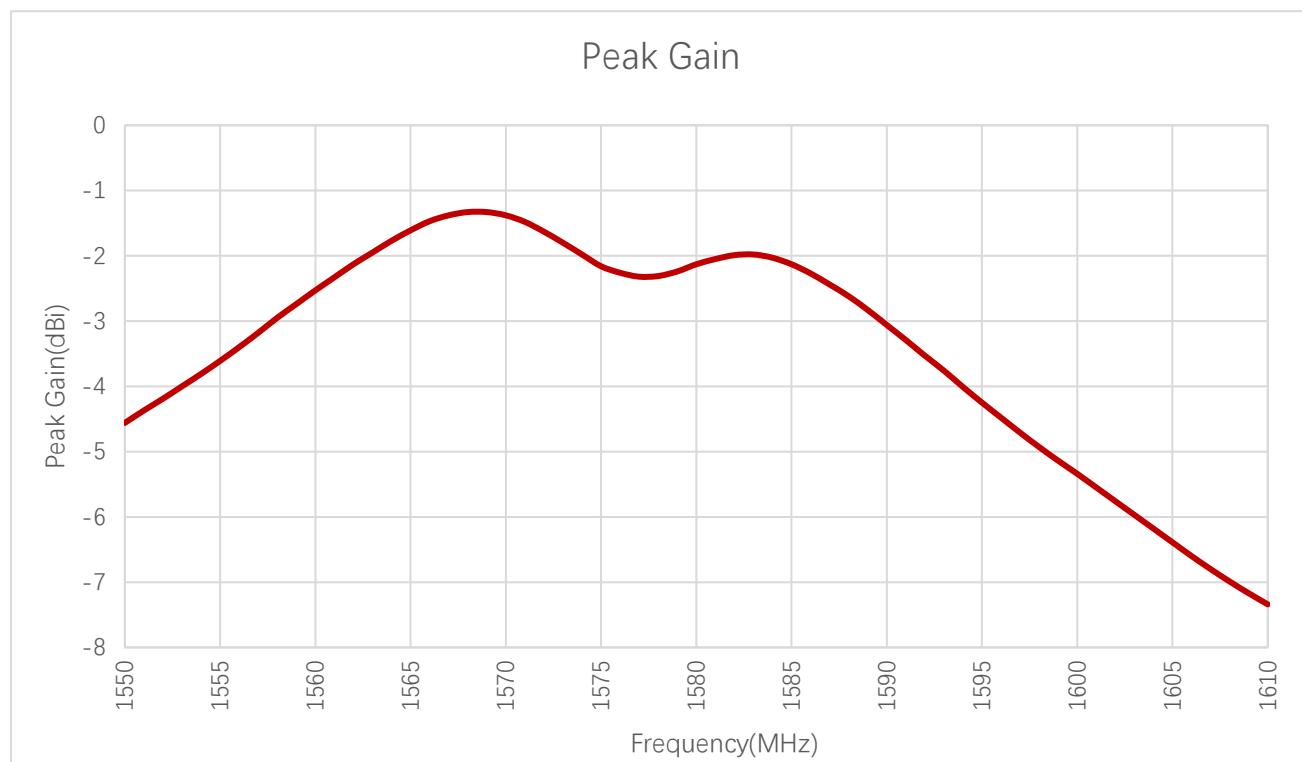
3.2. Radiation Performance Test

3.2.1. Efficiency



Efficiency (%)								
Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	-	-	-	-	-	-	22.6	-

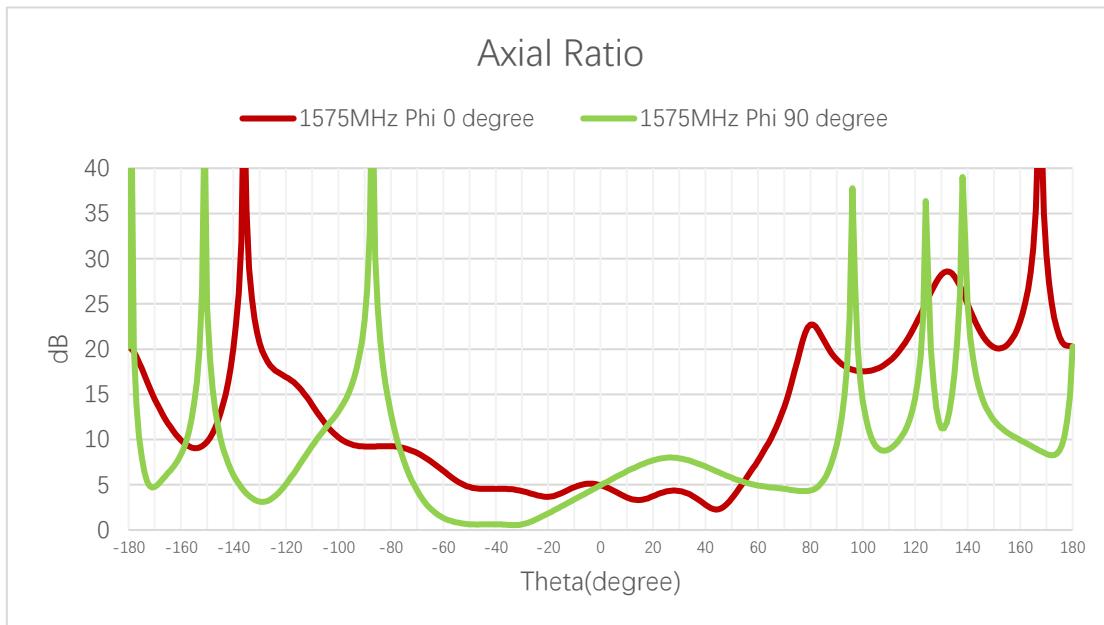
3.2.2. Peak Gain



Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	-	-	-	-	-	-	-2.2	-

3.2.3. Axial Ratio

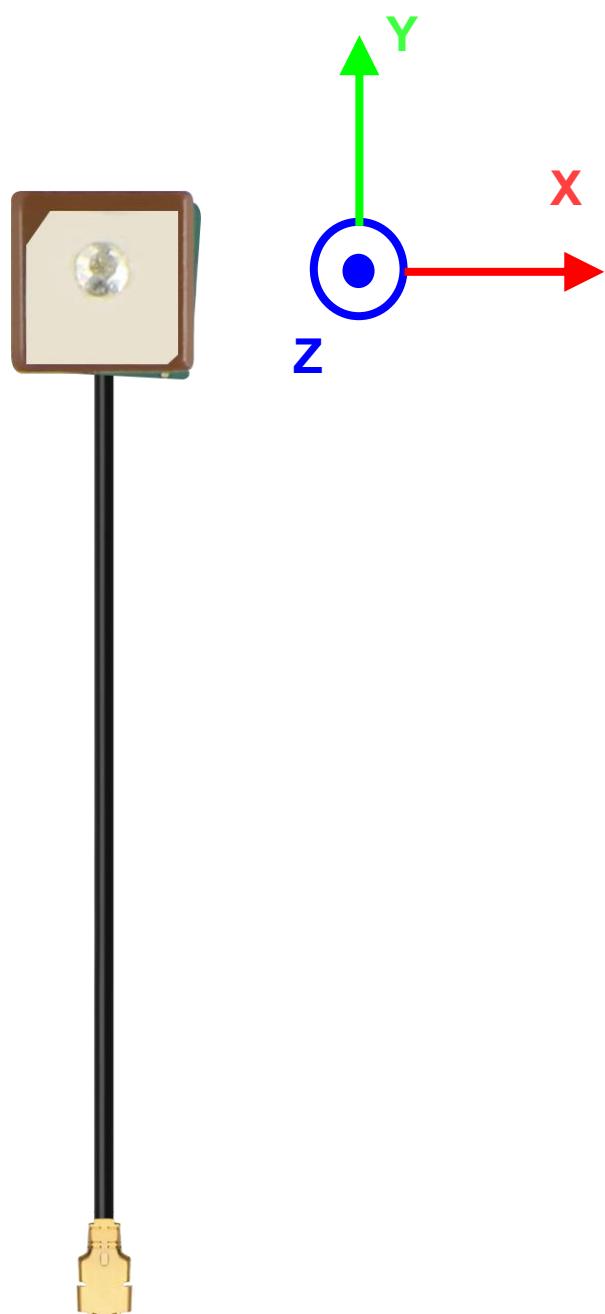


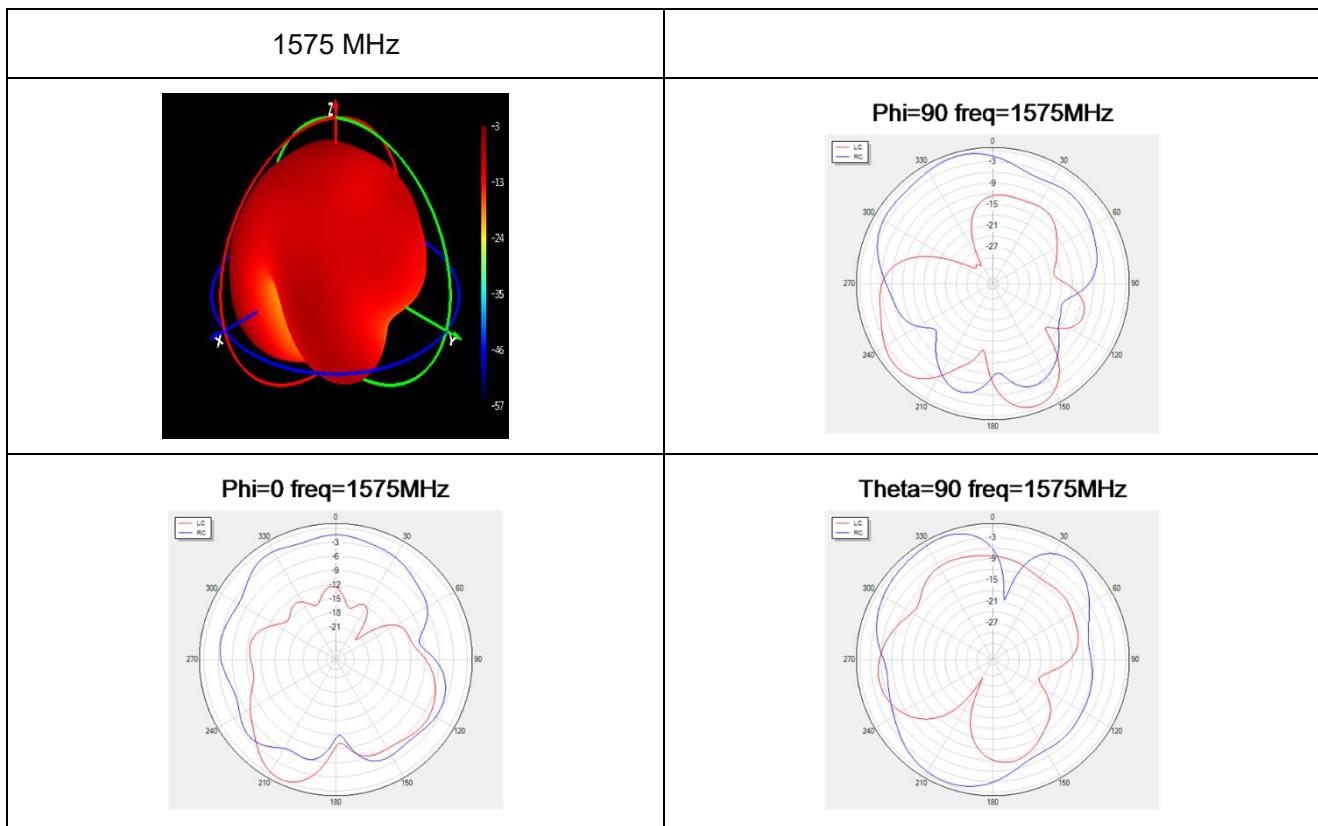
Axial Ratio (dB)

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
Axial	Phi = 0 (deg)	-	-	-	-	-	-	4.9	-
Ratio (dB)	Theta = 0 (deg)	-	-	-	-	-	-	-	-
	Phi = 90 (deg)	-	-	-	-	-	-	4.9	-
	Theta = 0 (deg)	-	-	-	-	-	-	-	-

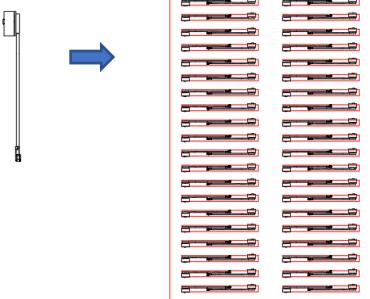
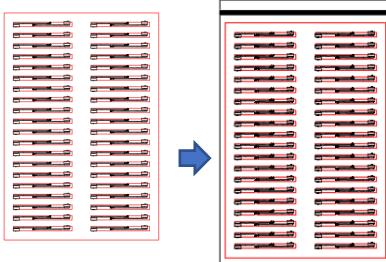
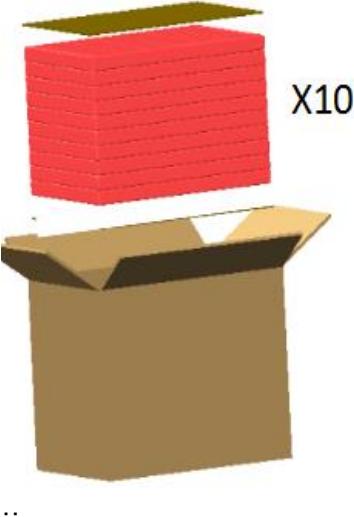
3.2.4. 3D & 2D Radiation Pattern

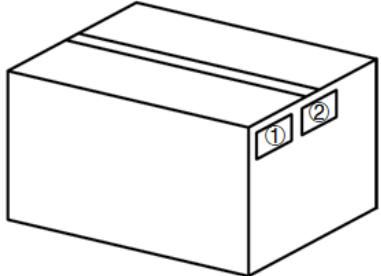
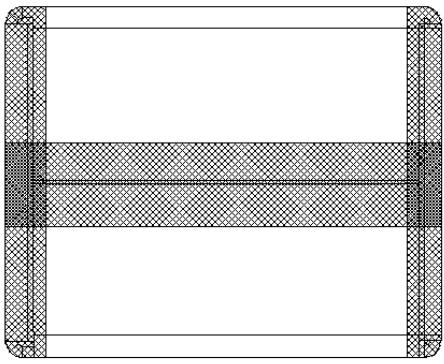
- Test Condition: Free Space
- Test Chamber: GL-S-1





4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		<p>Put the product into the pearl cotton tray. (2 Products / Cavity) (80 PCS Antennas / Per Pearl Cotton Tray)</p>
2		<p>Place the pearl cotton tray into a vacuum bag to vacuum.</p>
3		<p>Put 10 vacuum bags into the carton. (800 PCS Antennas / Carton Box) Estimated quantity Numerous changes were made to this document. It should be read in its entirety. <u>Carton Size:</u> <u>$L \times W \times H = 390 \times 270 \times 295 \text{ mm}$</u></p>

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

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
-	2021-05-14	Kenny YIN/ Aria CHU	Creation of the document
1	2021-05-14	Kenny YIN/ Aria CHU	First official release
1.1	2021-07-25	Kenny YIN/ Aria CHU	Updated working temperature. (Chapter 3)
1.2	2021-11-30	Kenny YIN/ Aria CHU	Updated the product description in Chapter 1.
1.3	2022-05-24	Kenny YIN	1. Updated some details about the antenna (Chapters 3, 4.1 and 4.5). 2. Updated the antenna drawing (Chapter 6).
2.0	2023-07-19	Tina GNA/ Lucky FENG/ David LIU/ Aria CHU	Numerous changes were made to this document. It should be read in its entirety.



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