



Antenna Datasheet

Product OC: YCGO010AA

Version: 2.1

Date: 2023-12-05

Status: Released

Product Name: Active GPS L1 & BEIDOU B1 Antenna

Key Features:

Frequency Band: 1559–1586 MHz

Dimensions: 18 mm × 18 mm × 6.3 mm

Efficiency: Up to 42.5 %

RoHS and REACH Compliant

LNA Gain: 18 ±3 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: By 40 mm square ground plane

1.1. Electrical

Electrical								
Frequency Range		1559–1586 MHz						
Impedance		50 Ω						
Polarization		RHCP						
Radiation Pattern		Directional						

Frequency (MHz)	Band	GPS L5	GALILEO	GPS L2	GLONASS	BEIDOU	BEIDOU	GPS L1	GLONASS
		GALILEO E5a BEIDOU B2a-B2I B2b						E1 BEIDOU B1C QZSS L1	
1176	1176	1207	1227	1248	1268	1561	1575	1602	
VSWR	-	-	-	-	-	1.5	1.4	-	
Return Loss (dB)	-	-	-	-	-	-13.8	-15.6	-	
Efficiency (%)	-	-	-	-	-	42.5	40.5	-	
Peak Gain (dBi)	-	-	-	-	-	1.9	0.6	-	

LNA Electrical

LNA Gain	18 \pm 3 dB
Noise Figure	\leq 1.5 dB
Output VSWR	< 2.0
Filter Out-of-band Attenuation	32 dB f ₀ \pm 100 MHz f ₀ (1568 MHz)
Working Voltage	2.7–3.3 V
Working Current	8 \pm 2 mA @ 3 V
Impedance	50 Ω

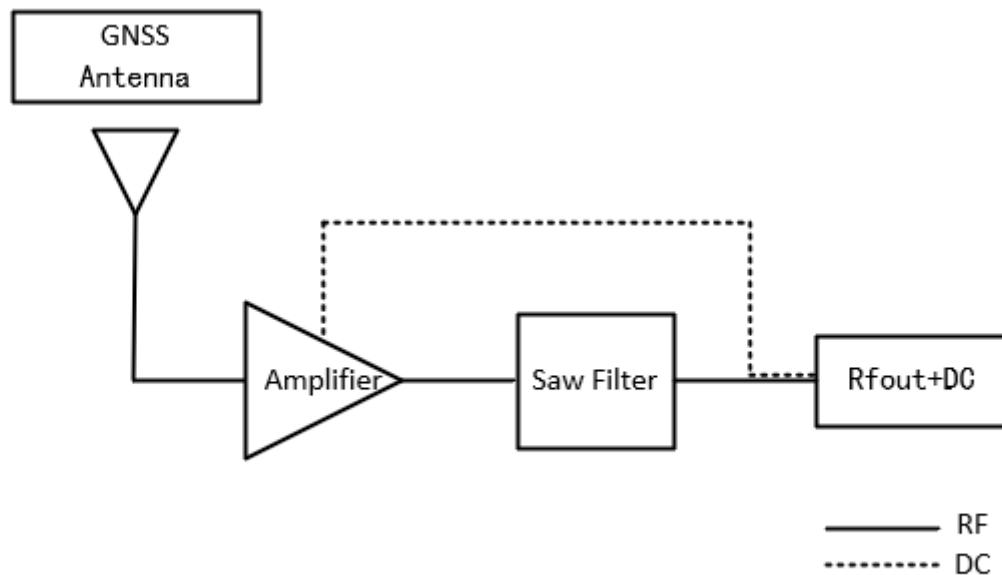
1.2. Mechanical & Environmental**Mechanical**

Antenna Dimensions	18 mm \times 18 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. 7.5 g

Environmental

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

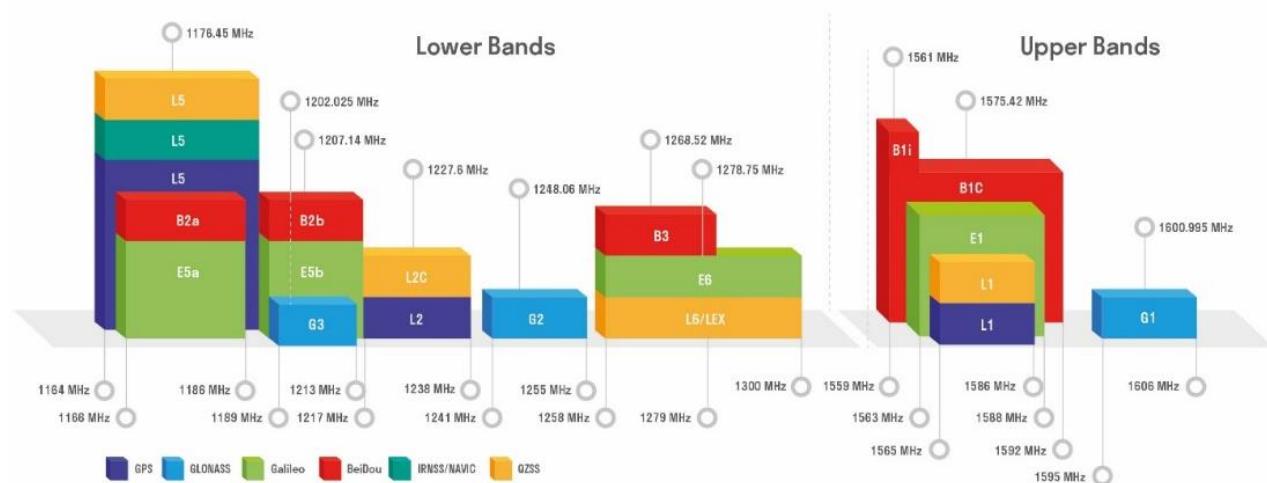
1.3. Block Diagram (Active Antenna)



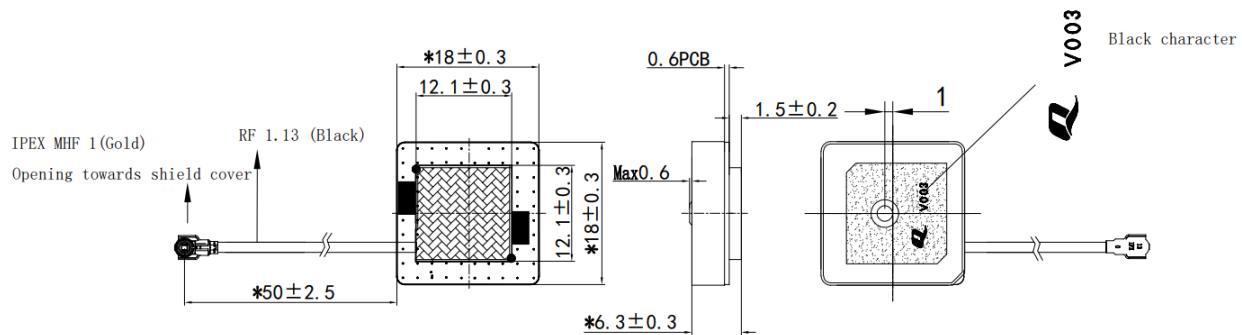
1.4. Supported GNSS Frequency Bands

GNSS Frequency Bands (MHz)					
	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)	B2b Centre 1176.45 (1166–1187)	B2a-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



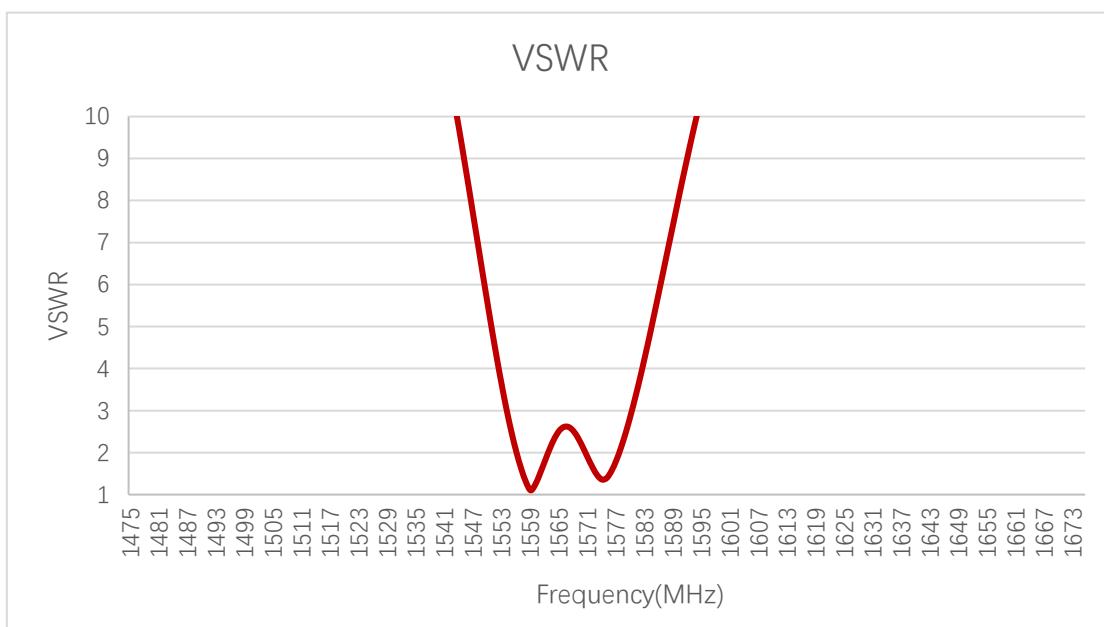
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

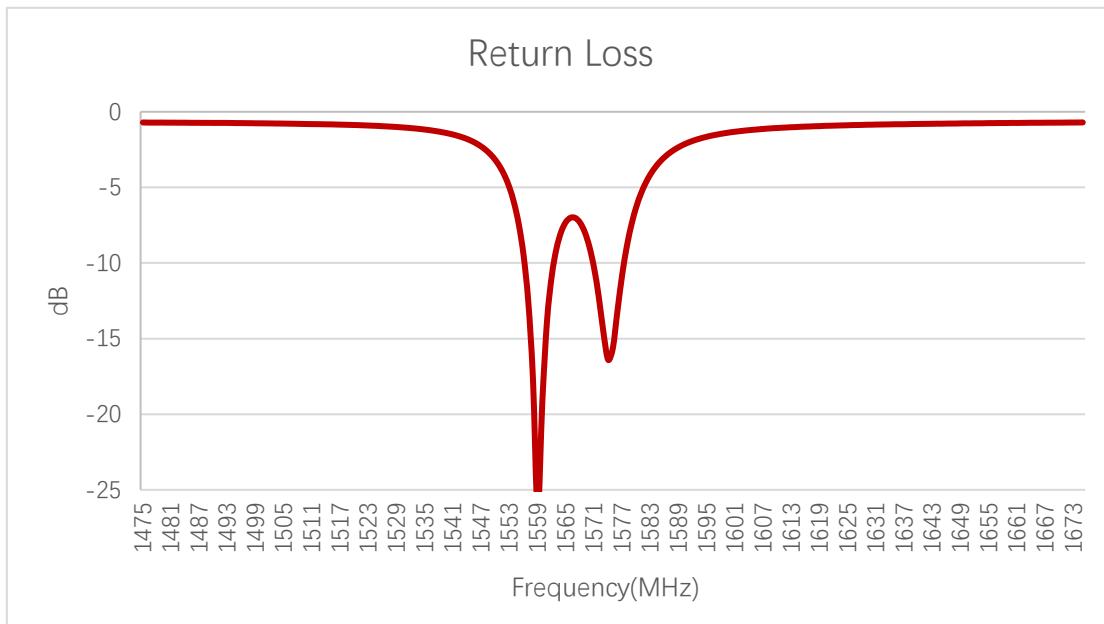
3.1.1. VSWR



VSWR

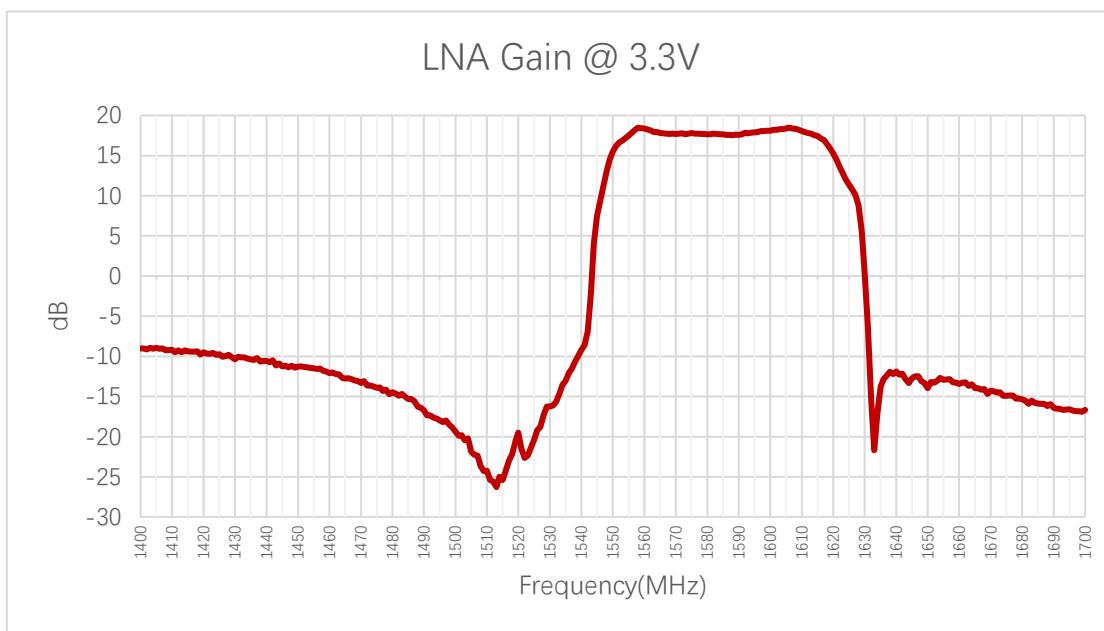
Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	-	-	-	-	-	1.5	1.4	-

3.1.2. Return Loss



Return Loss (dB)								
Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-	-	-	-	-	-13.8	-15.6	-

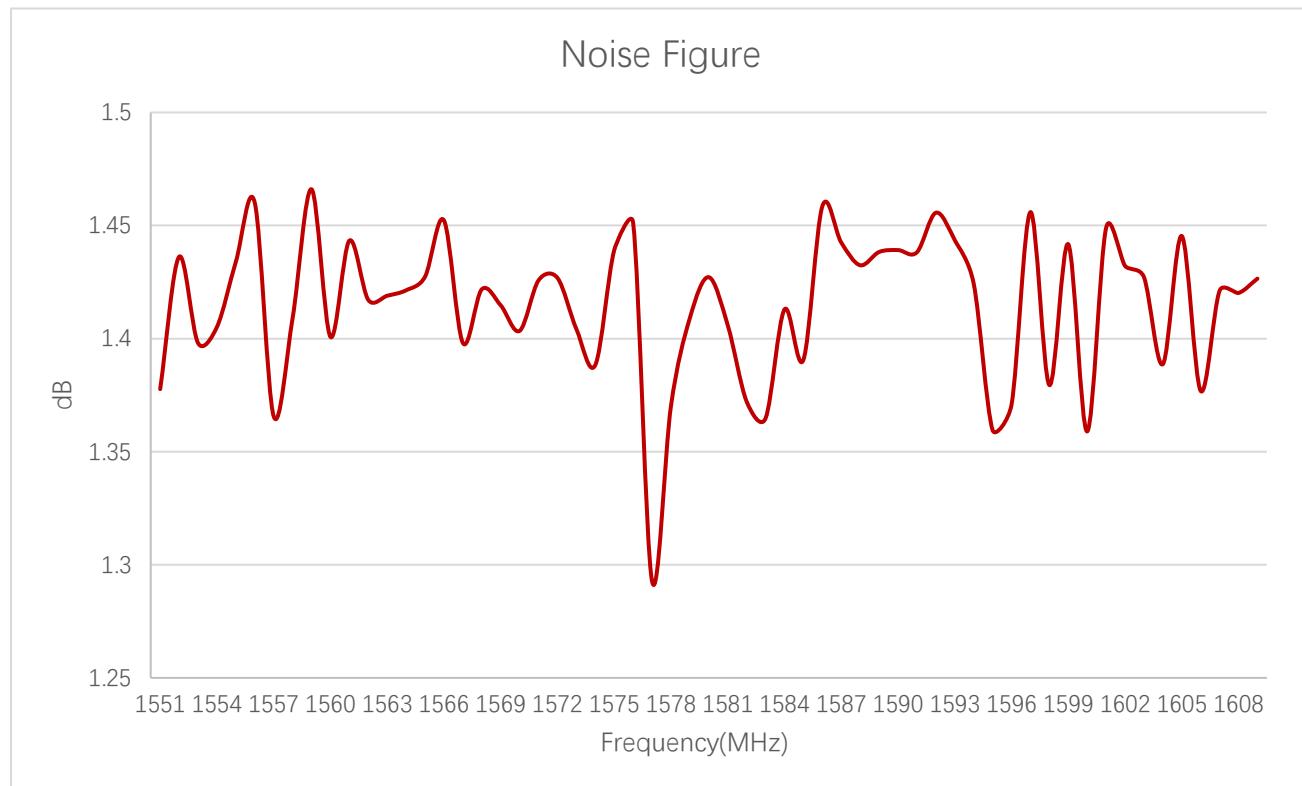
3.1.3. GNSS LNA Gain



LNA Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain (dB)	-	-	-	-	-	18.2	17.8	-

3.1.4. Noise Figure

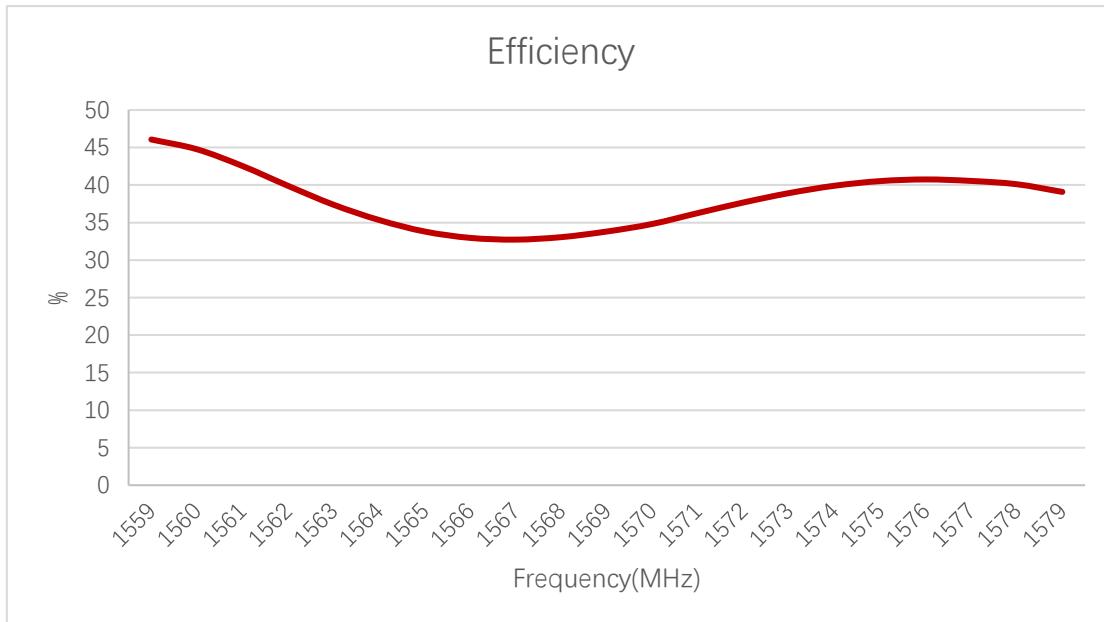


Noise Figure (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Noise Figure (dB)	-	-	-	-	-	1.4	1.4	-

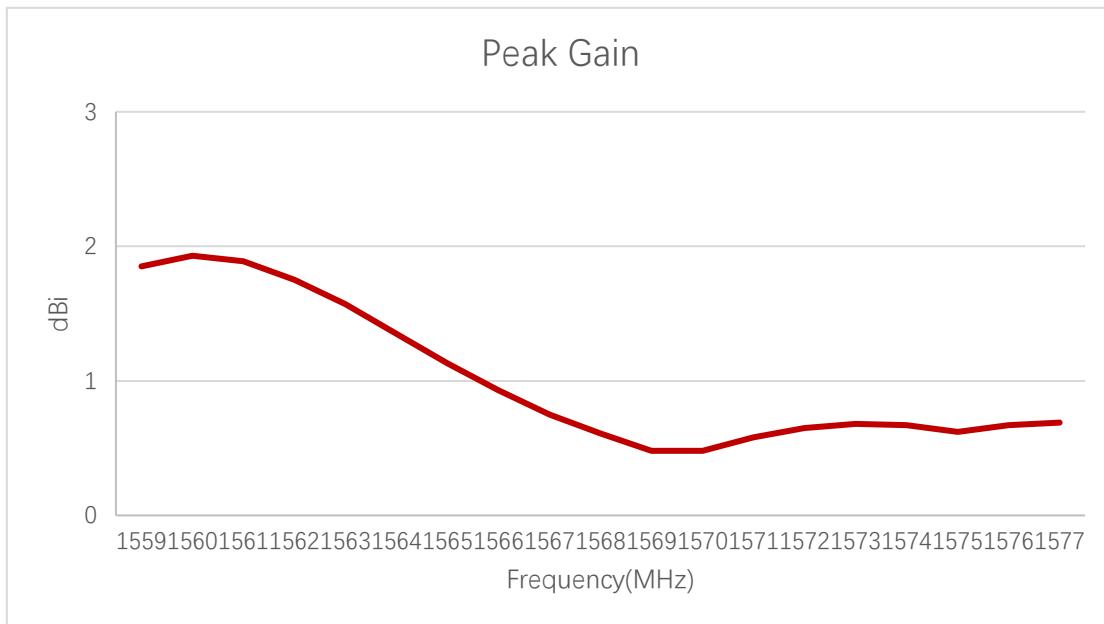
3.2. Radiation Performance Test

3.2.1. Efficiency



Efficiency (%)								
Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	-	-	-	-	-	42.5	40.5	-

3.2.2. Peak Gain



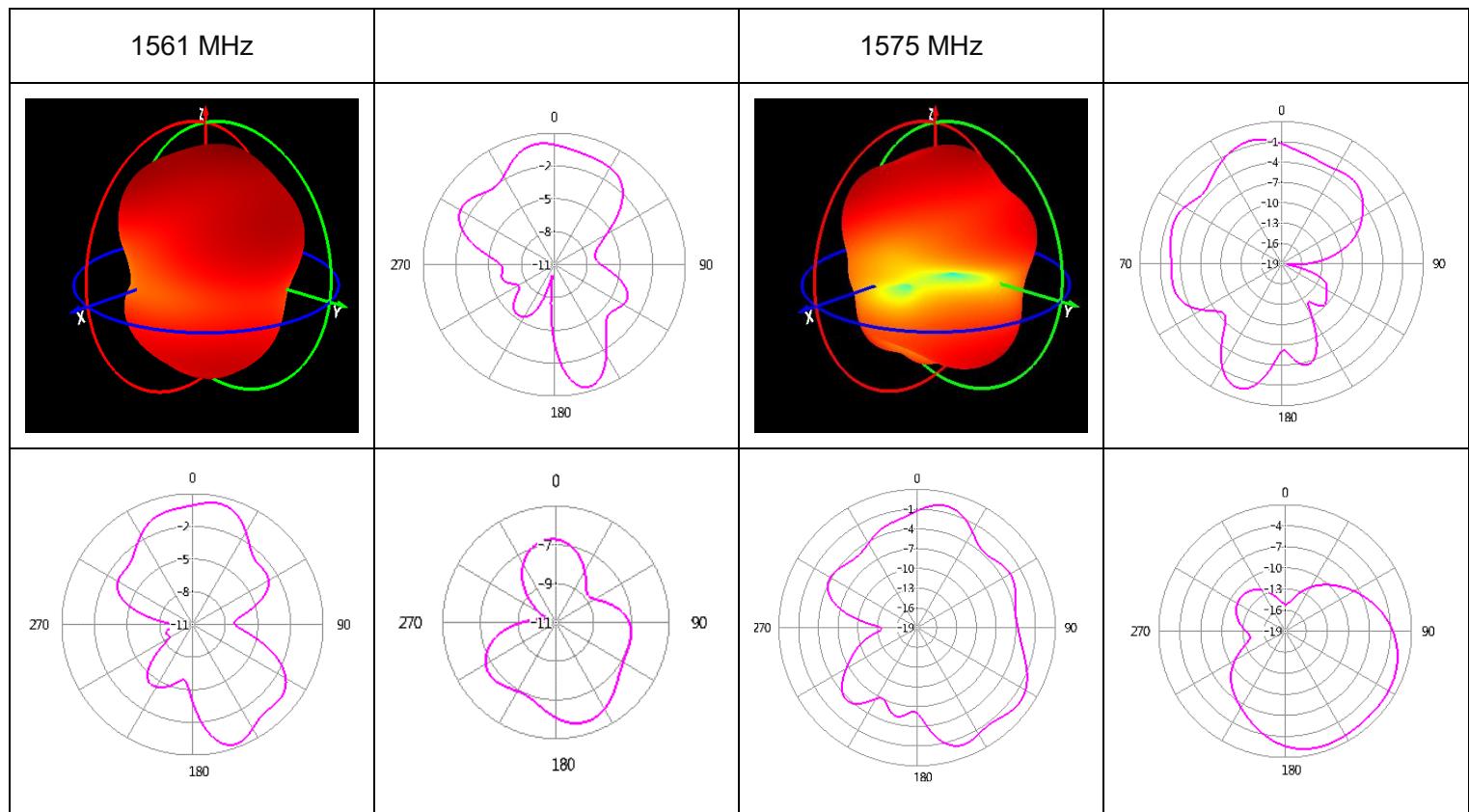
Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	-	-	-	-	-	1.9	0.6	-

3.2.3. 3D & 2D Radiation Pattern

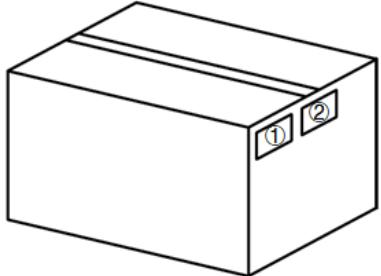
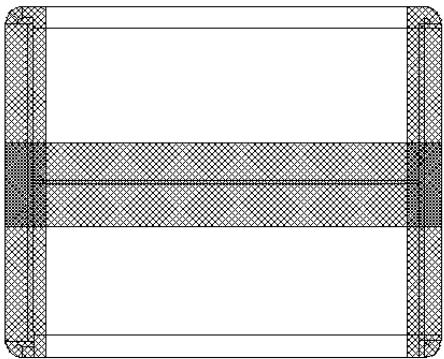
- Test Condition: By 40 mm square ground plane
- Test Chamber: GL-S-1





4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		<p>Put the product into the pearl cotton tray. (80 PCS / Cotton Tray)</p> <p>Put the tray in a vacuum bag to vacuum.</p>
2		<p>Put 5 vacuum bags into the carton box. (400 PCS Antennas / Carton Box)</p> <p><u>Carton Box Size:</u> <u>$L \times W \times H = 405 \times 293 \times 185 \text{ mm}$</u></p>
3		<p>Put a bubble bag on the top of the product.</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>

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
-	2021-05-19	Kenny YIN/ Aria CHU	Creation of the document
1.0	2021-05-19	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 (Chapter 1).
1.3	2023-06-25	Toby WANG/ Vinnie LIU	Updated the drawing (Chapter 5).
2.0	2023-08-26	Nico PAN/ Lucky FENG/ David LIU/ Aria CHU	Updated all test data in this datasheet.
2.1	2023-12-05	Lucky FENG/ Aria CHU	Added REACH compliant (Chapter 1.2).



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