Antenna Datasheet

Product OC: YFGA025E3AM
Version: 2.1
Date: 2024-12-26
Status: Released

Product Name: Active BDS B1I & GPS L1 & GLONASS G1 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

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 IPEX. Customized connector type and cable length are provided according to requirements.

Contents

1 Specification

Test Condition: Free Space

1.1. Electrical

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

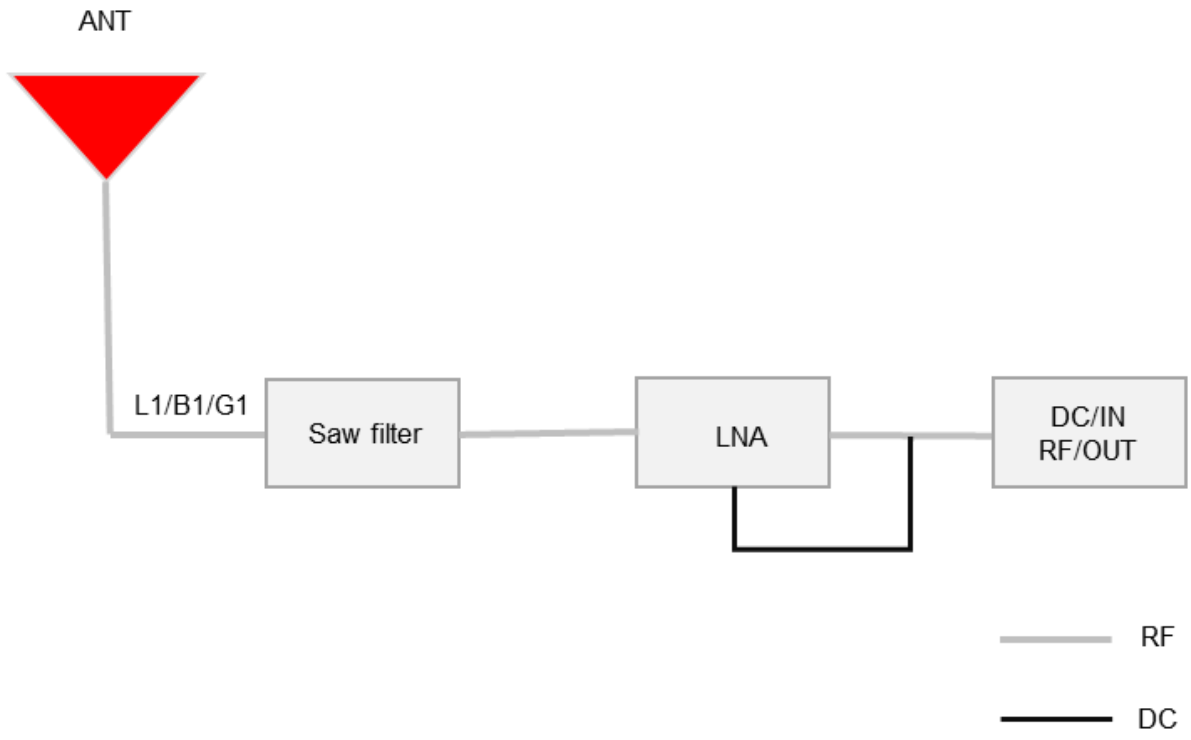
Band / Frequency (MHz)	GPS L5 GALILEO E5a BDS B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BDS B2b	GPS L2 QZSS L2C	GLONASS G2	BDS B3	BDS B1I	GPS L1 GALILEO E1 BDS B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	-	-	-	-	-	1.35	1.15	21.6
Return Loss (dB)	-	-	-	-	-	-16.4	-22.7	-0.8
Efficiency (%)	-	-	-	-	-	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	2.7–3.3 V
Working Current	4.3 ±1.5 mA @ 3 V
Impedance	50 Ω

1.2. Mechanical & Environmental

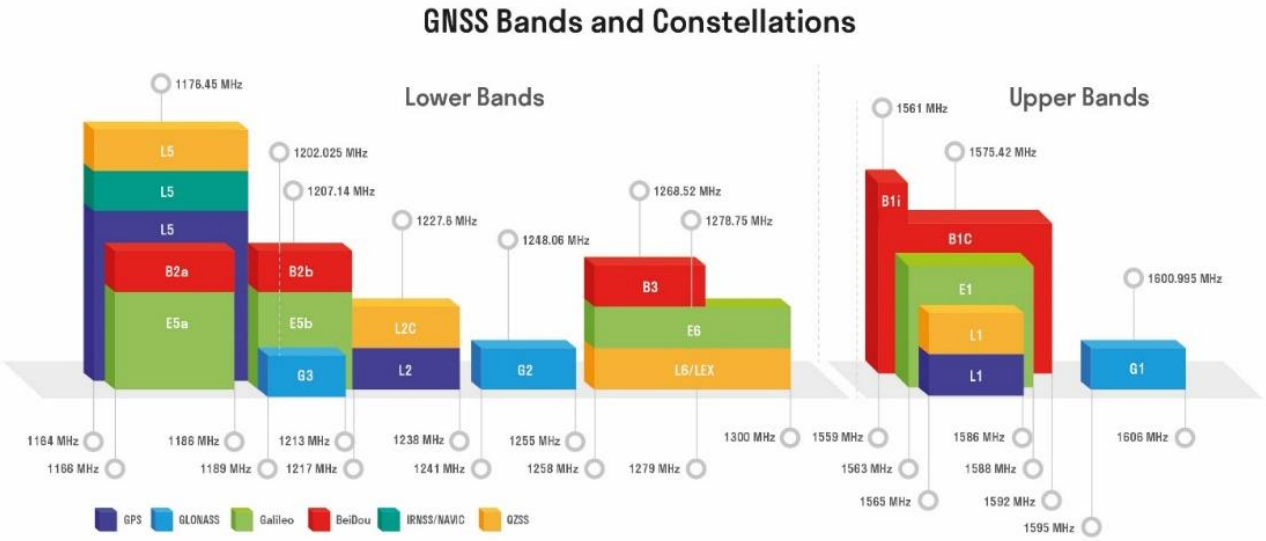
Mechanical	
Antenna Dimensions	25 mm × 25 mm × 5.5 mm
Material & Color	PCBA + Ceramic + RF Cable
Cable Type & Length	Φ 1.13 mm & Black & 100 mm
Connector Type	IPEX MHF1
Mounting Type	Buckle
Weight	Typ. 7.2 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS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

1.3. Block Diagram (Active Antenna)

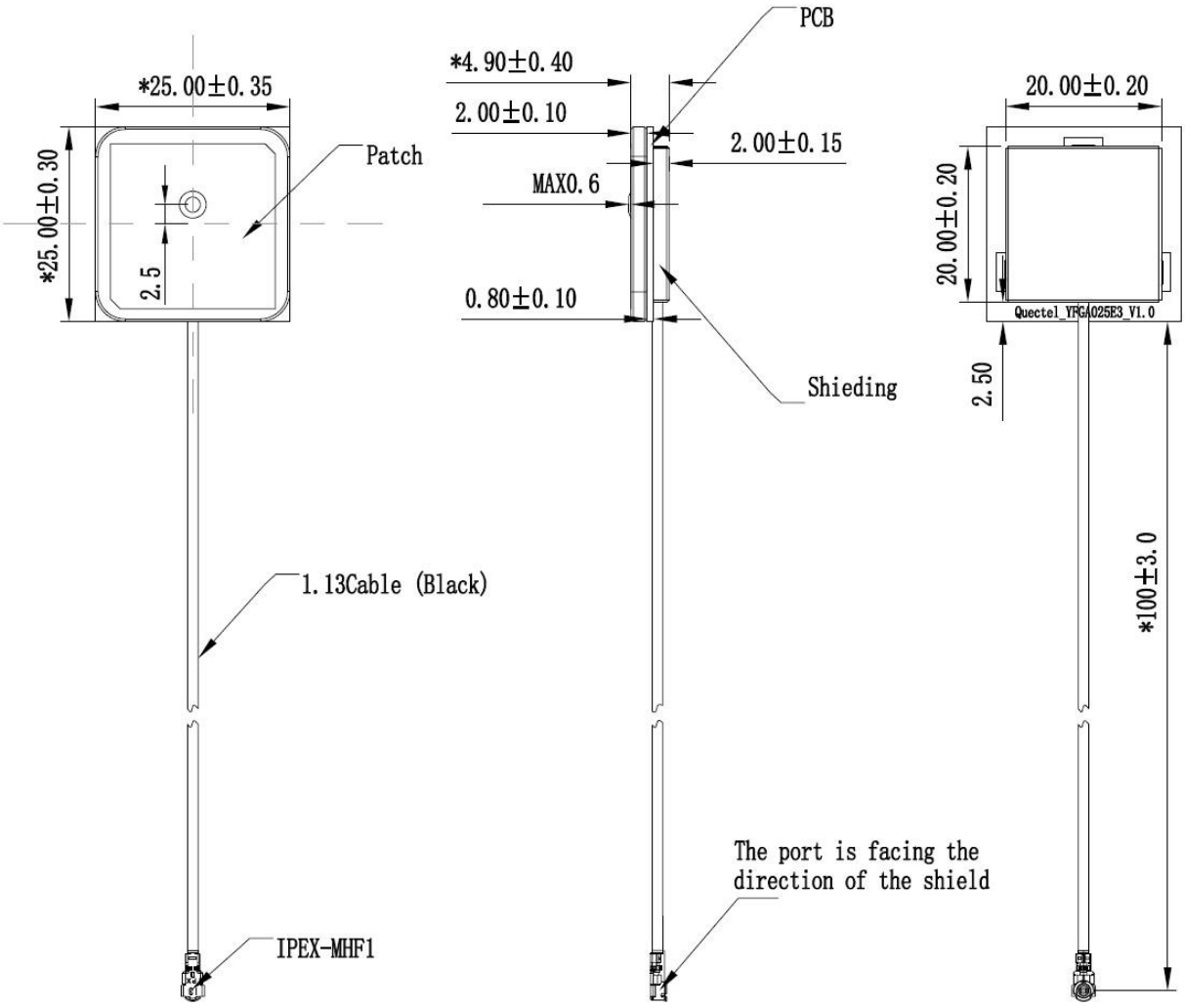


1.4. Supported GNSS Frequency Bands

GNSS Frequency Bands (MHz)					
GPS	**L1** Centre 1575.42 (1565–1586)	**L2** Centre 1227.6 (1217–1238)	**L5** 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)	
	√	-	-	-	
BDS	**B1I** Centre 1561.098 (1559–1564)	**B1C (BDS-3)** Centre 1575.42 (1559–1592)	**B2a-B2I** Centre 1176.45 (1166–1187)	**B2b** 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
Lower Bands
Upper Bands
1176.45 MHz
L5
L5
L5
B2a
E5a
1202.025 MHz
1207.14 MHz
B2b
E5b
G3
1227.6 MHz
L2C
L2
1248.06 MHz
G2
1268.52 MHz
1278.75 MHz
B3
E6
L6/LEX
1561 MHz
1575.42 MHz
B1i
B1C
E1
L1
L1
1600.995 MHz
G1
1164 MHz
1168 MHz
1186 MHz
1189 MHz
1213 MHz
1217 MHz
1238 MHz
1241 MHz
1255 MHz
1258 MHz
1279 MHz
1300 MHz
1559 MHz
1563 MHz
1565 MHz
1586 MHz
1588 MHz
1592 MHz
1595 MHz
1606 MHz
GPS
GLONASS
Galileo
BeiDou
IRNSS/NAVIC
QZSS

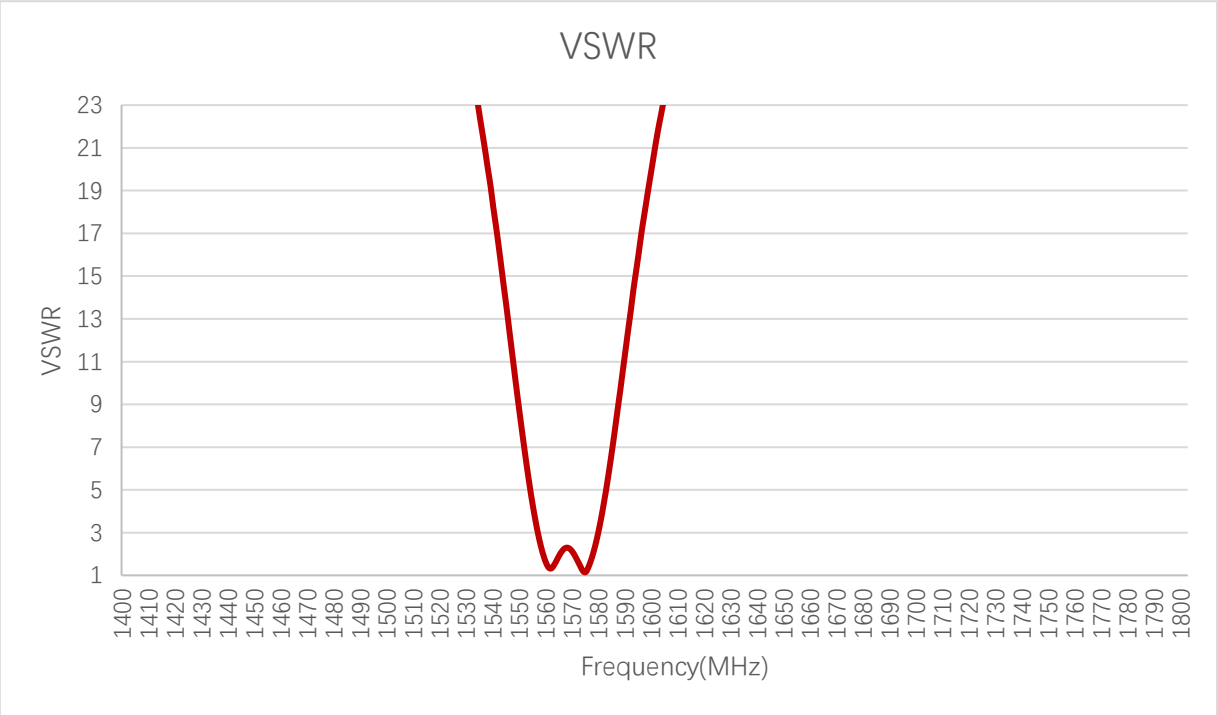
2 Drawing


*25.00±0.35
*25.00±0.30
2.5
Patch
1.13Cable (Black)
IPEX-MHF1
*4.90±0.40
2.00±0.10
MAX0.6
0.80±0.10
PCB
2.00±0.15
Shieding
The port is facing the direction of the shield
20.00±0.20
20.00±0.20
Quectel_YFGA025E3_V1.0
2.50
*100±3.0

3 Detailed Performance

3.1. S-Parameter Test

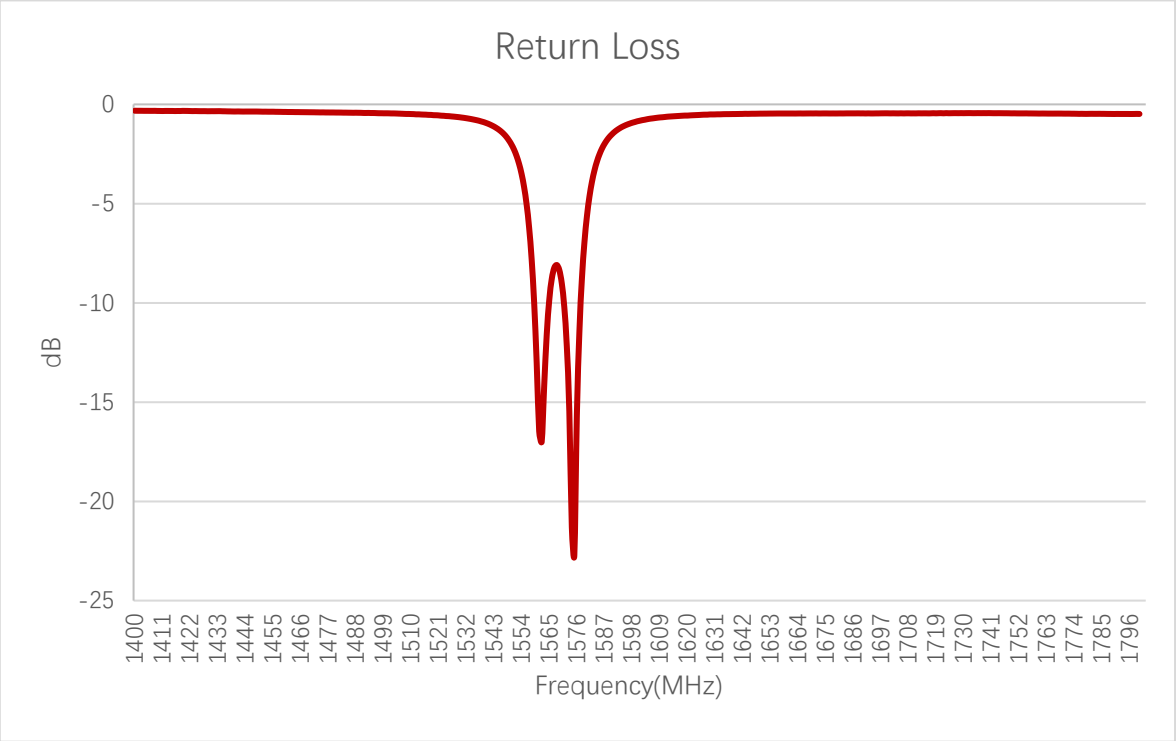
3.1.1. VSWR



VSWR

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

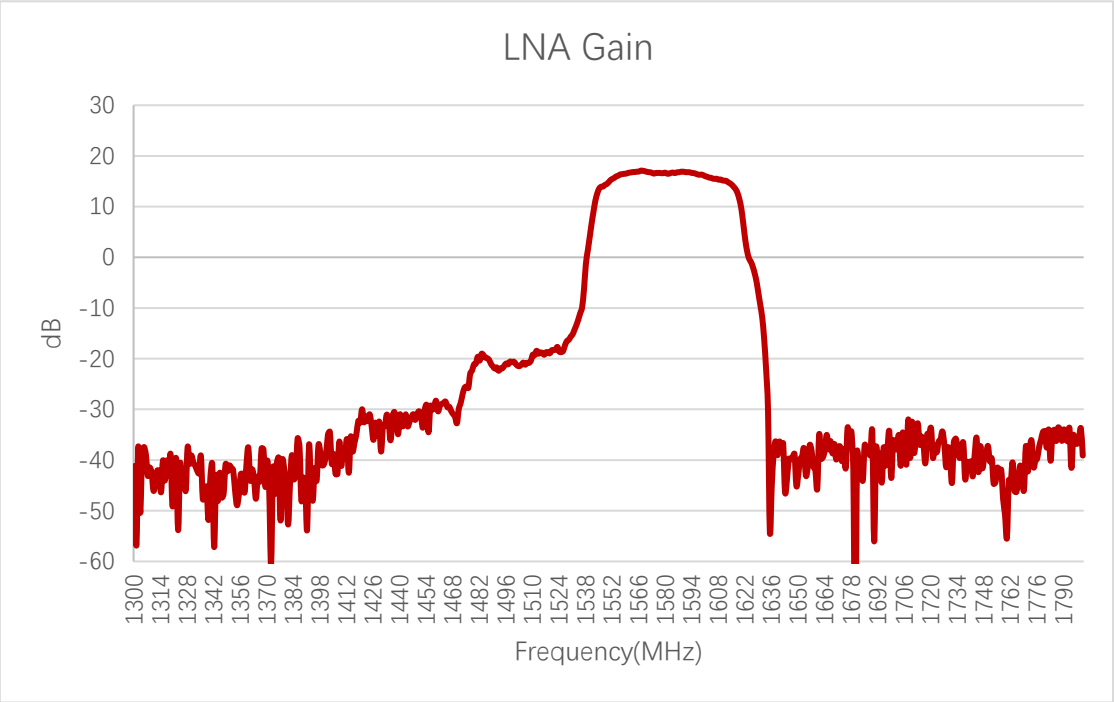
3.1.2. Return Loss



Return Loss (dB)

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

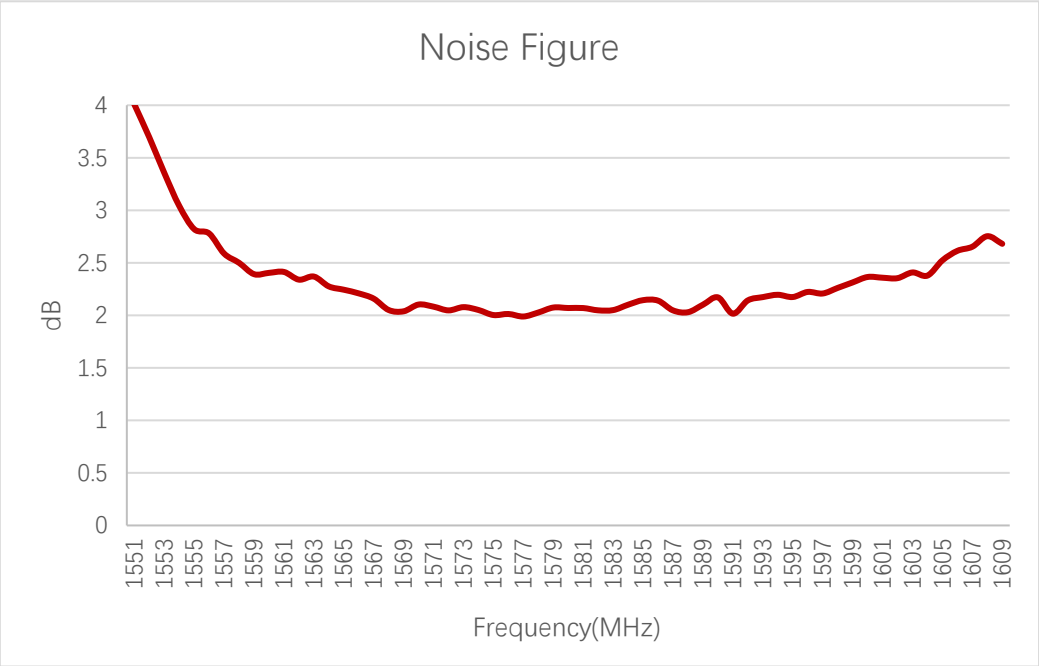
3.1.3. LNA Gain



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

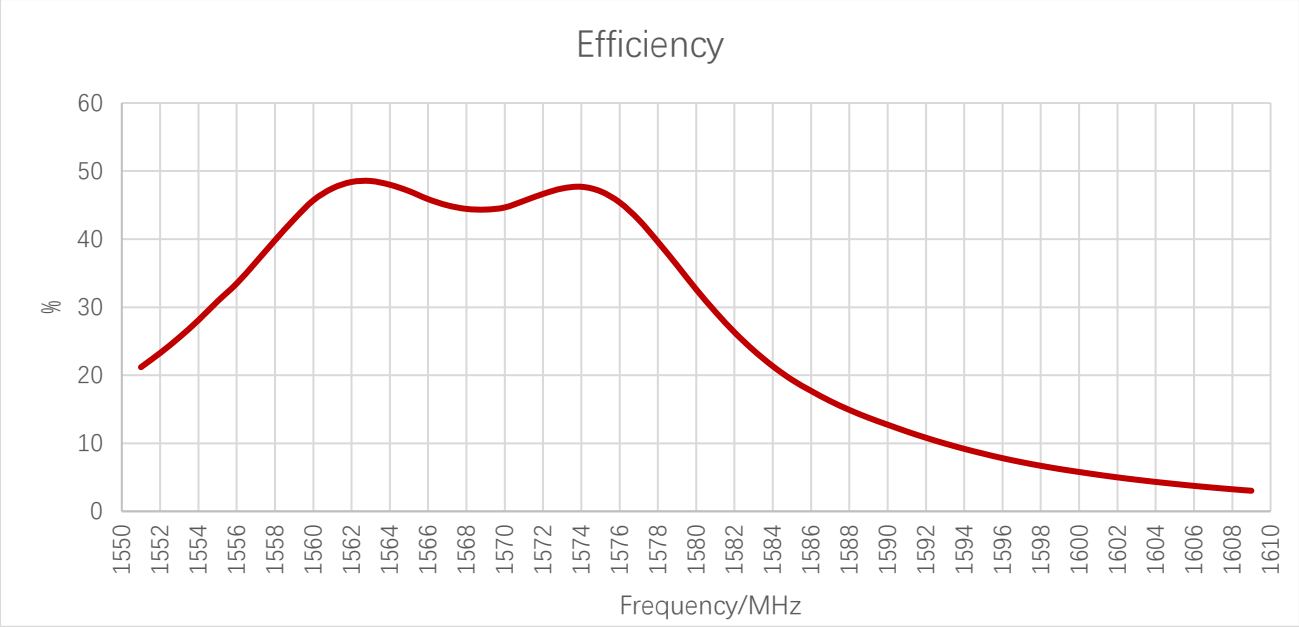


Noise Figure (dB)

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

3.2. Radiation Performance Test

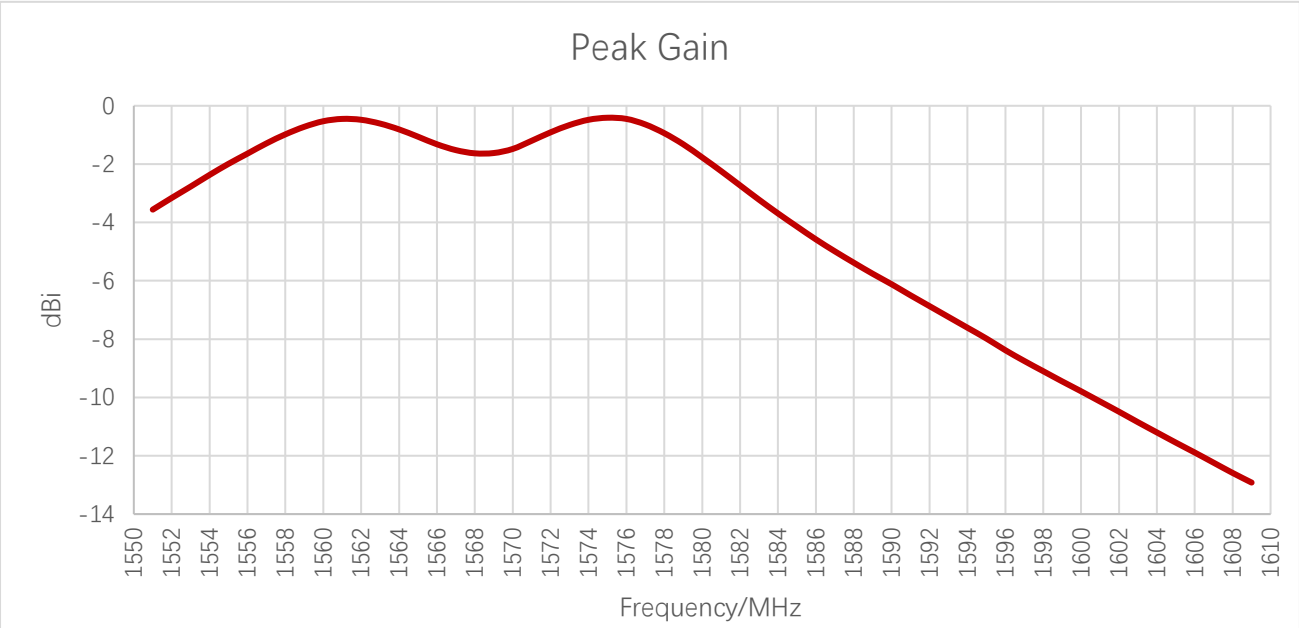
3.2.1. Efficiency



Efficiency (%)

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

3.2.2. Peak Gain

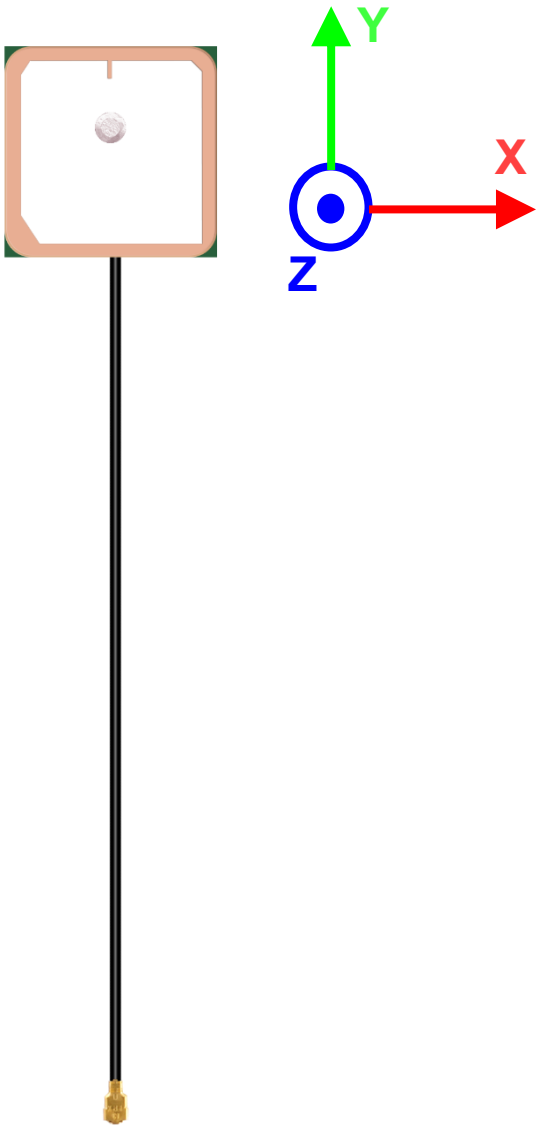


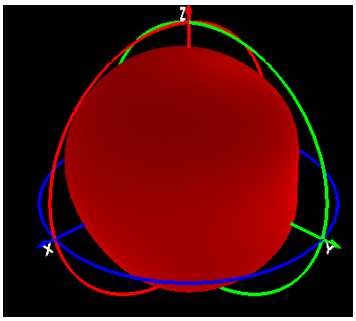
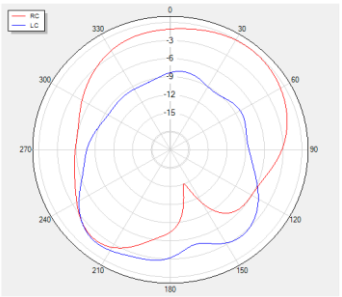
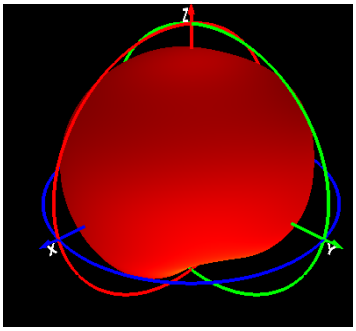
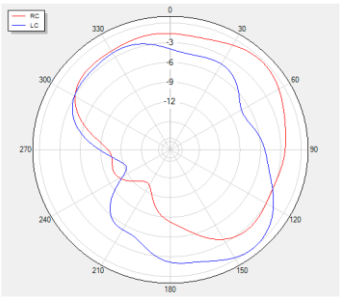
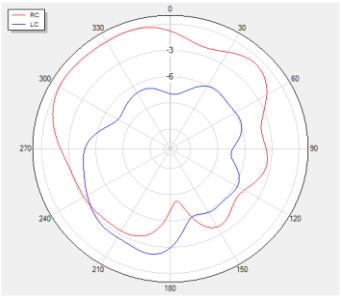
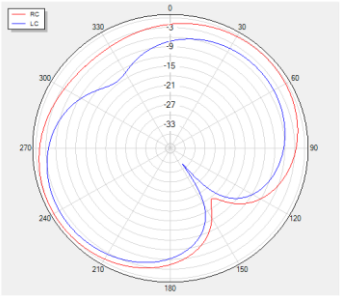
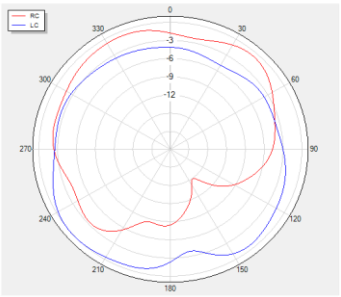
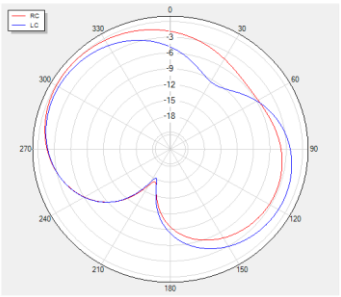
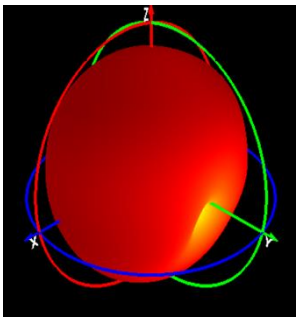
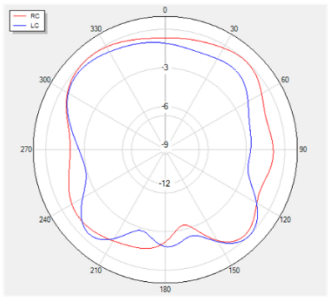
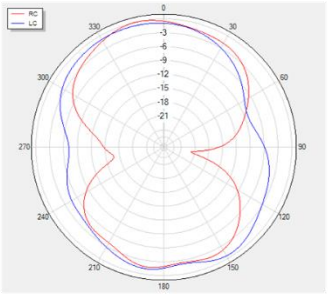
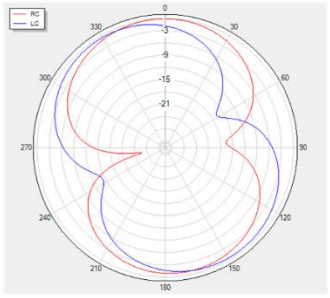
Peak Gain (dBi)

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

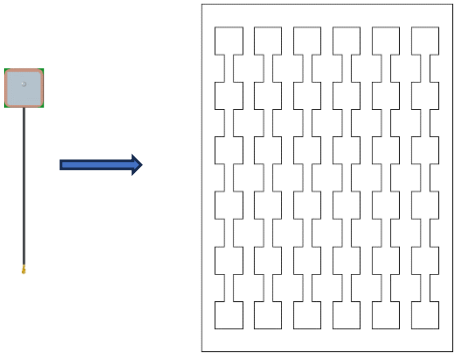
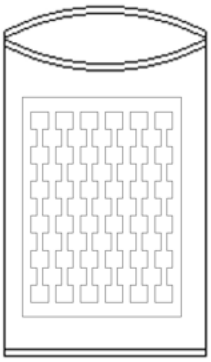
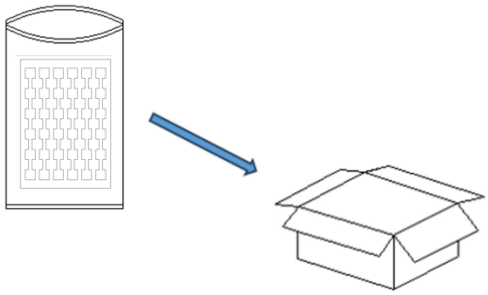
3.2.3. 3D & 2D Radiation Pattern

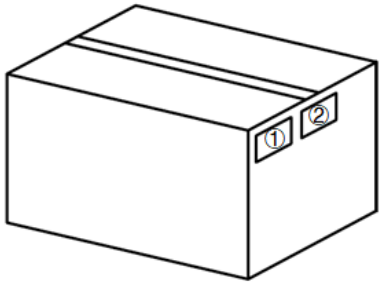
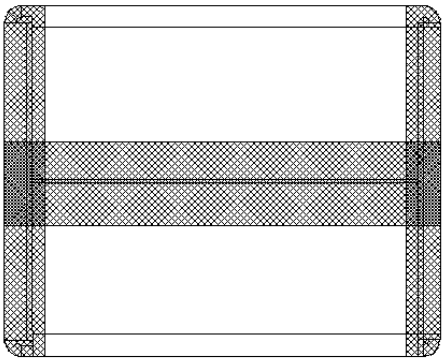
- Test Condition: Free Space
- Test Chamber: SH-SY-16M



1561 MHz		1575 MHz	
	Phi=0 freq=1561MHz 		Phi=0 freq=1575MHz 
Phi=90 freq=1561MHz 	Theta=90 freq=1561MHz 	Phi=90 freq=1575MHz 	Theta=90 freq=1575MHz 
1602 MHz			
	Phi=0 freq=1602MHz 		
Phi=90 freq=1602MHz 	Theta=90 freq=1602MHz 		

4 Packaging

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

4		**Position for Attaching Labels** ① Carton Label ② Quality Label
5		**Sealing Cartons** H-shaped sealing cartons

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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Tel: +86 21 5108 6236
Email: info@quectel.com

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

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