



Antenna Datasheet

Product OC: YG0063AA

Version: 2.1

Date: 2023-12-05

Status: Released

Product Name: GPS L1/L2/L5, BDS B1/B2/B3, GLONASS L1/L2, Galileo
E1/E5a/E5b/E6, L-band

Key Features:

Frequency Band: 1164–1300 MHz, 1525–1602 MHz

Dimensions: Φ 165 mm $\times$ 68.8 mm

Efficiency: Up to 63 %

RoHS Compliant

LNA Gain: 39 $\pm$ 4 dB

IP65

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: Free Space

1.1. Electrical

Electrical	
Frequency Range	1164–1300 MHz, 1525–1606 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

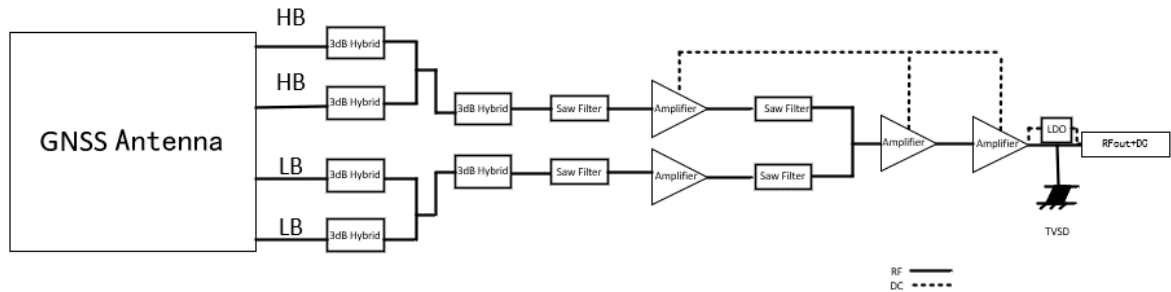
Band	GPS L5 GALILEO E5a BEIDOU B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BEIDOU B2b	GPS L2 QZSS L2C	GLONASS G2	BEIDOU B3	L-Band	BEIDOU B1I	GPS L1 GALILEO E1 BEIDOU B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1540	1561	1575	1602
Frequency (MHz)									
VSWR	1.1	1.1	1.2	1.2	1.2	1.3	1.2	1.2	1.2
Return Loss (dB)	-27.8	-25.5	-22.5	-20.8	-19.9	-18.6	-19.2	-19.6	-20.1
Efficiency (%)	41.6	54.1	63.1	59.9	51.9	44.3	51.2	51.6	55.9
Peak Gain (dBi)	4.0	4.3	4.9	4.6	4.1	3.5	4.3	4.3	4.7
Axial Ratio (dB)	0.85	0.62	0.47	0.45	0.18	0.17	0.22	0.18	0.25

LNA Electrical	
LNA Gain	39 ±4 dB
Noise Figure	≤ 2.5 dB
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	60 dB f0 ± 100 MHz f0 (1164 MHz, 1300 MHz) & (1525 MHz, 1606 MHz)
Working Voltage	DC 3–12 V
Working Current	< 40 mA
Impedance	50 Ω

1.2. Mechanical and Environmental

Mechanical	
Antenna Dimensions	Φ165 mm × 68.8 mm
Material & Color	ASA & White + Black
Connector Type	TNC-K
Mounting Type	Thread
Weight	Typ. 470 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Ingress Protection (IP) Rating	IP65
RoHS Compliant	Yes

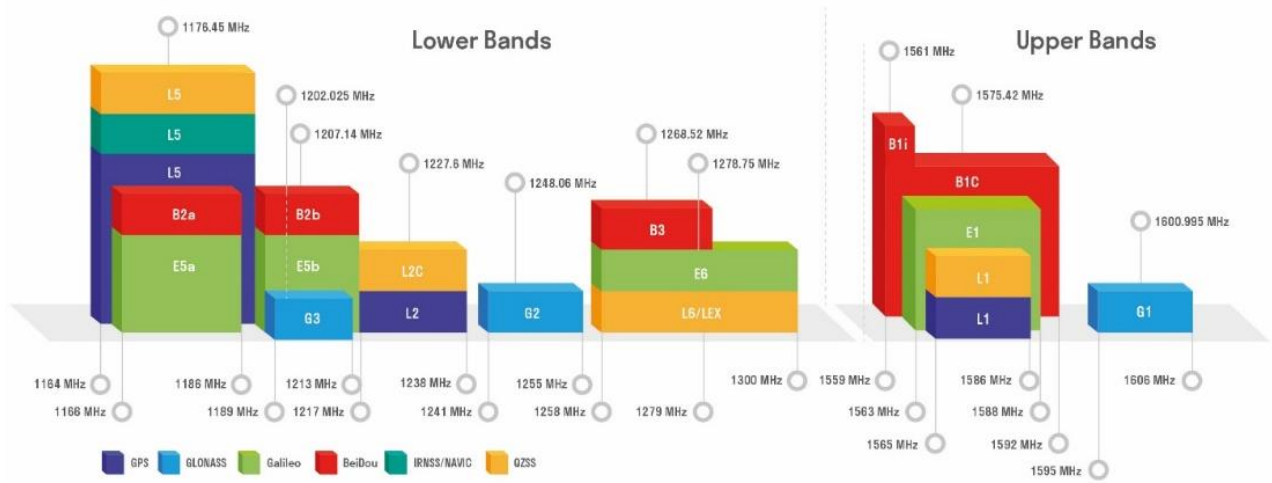
1.3. Block Diagram (Active Antenna)



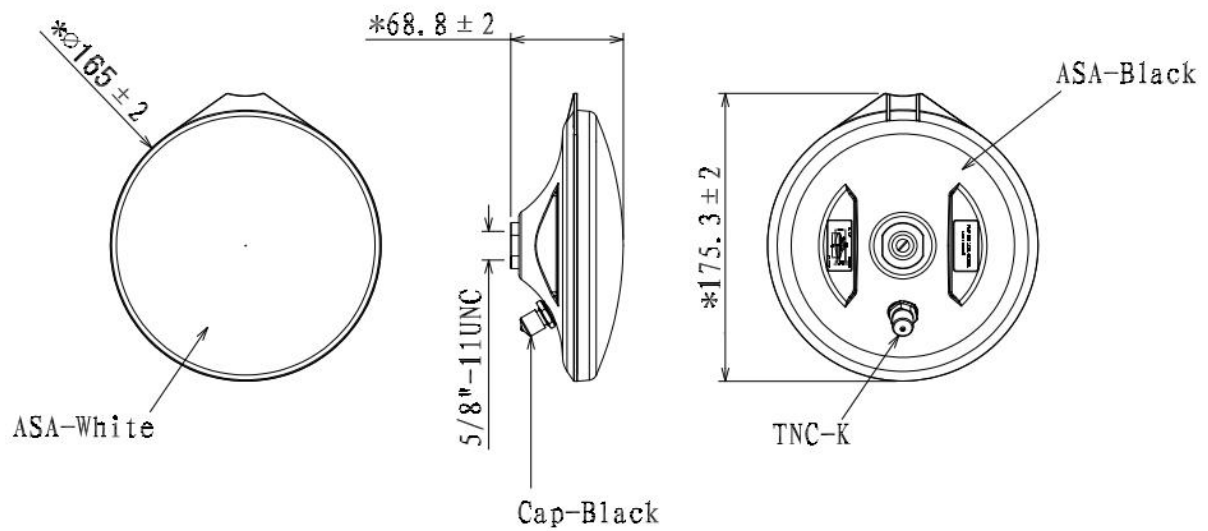
1.4. Supported GNSS Frequency Bands

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-L10C-L10F Centre 1601 (1595–1606)	G2-L20C-L20F Centre 1248.06 (1241–1255)	G3-L30C 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

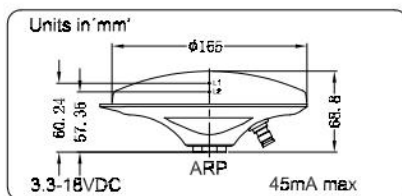


2 Drawing



PHASE LABEL

MODEL LABEL

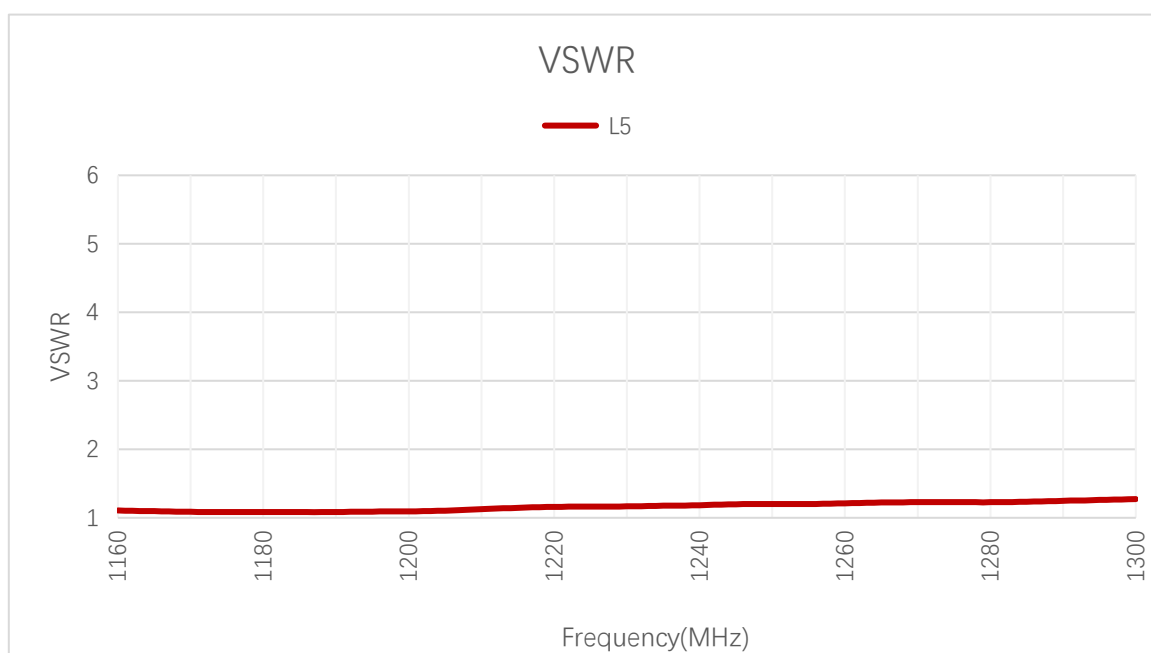


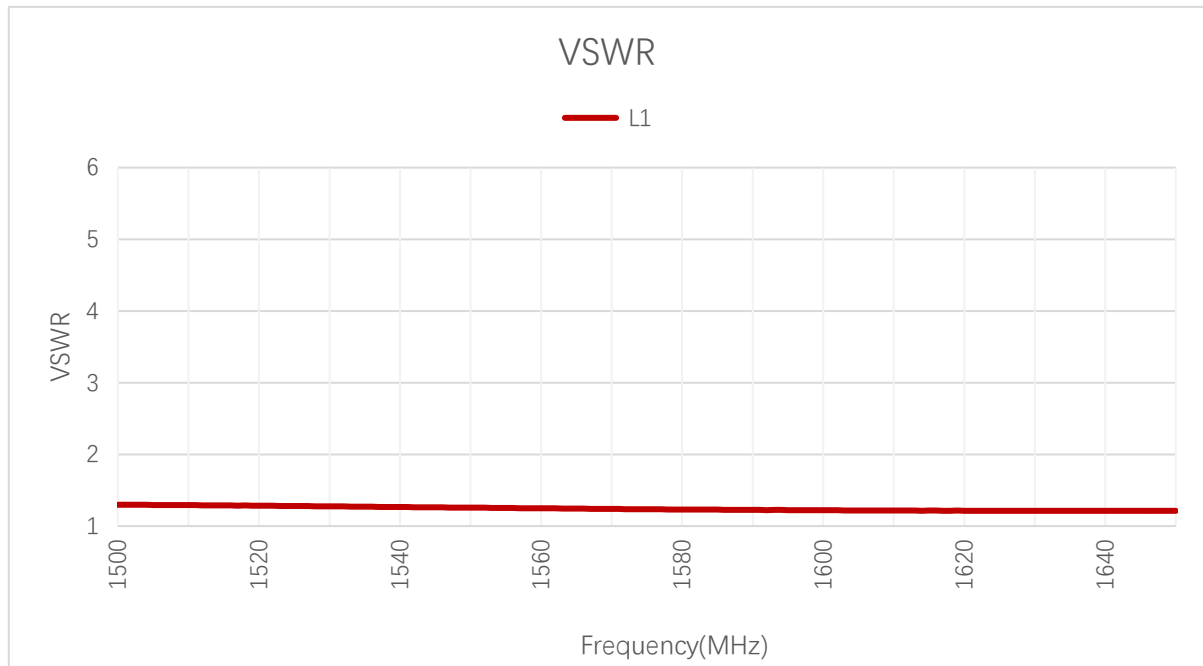
Four SYS MEAS. Antenna
Model: YG0063AA

3 Detailed Performance

3.1. S-Parameter Test

3.1.1. VSWR

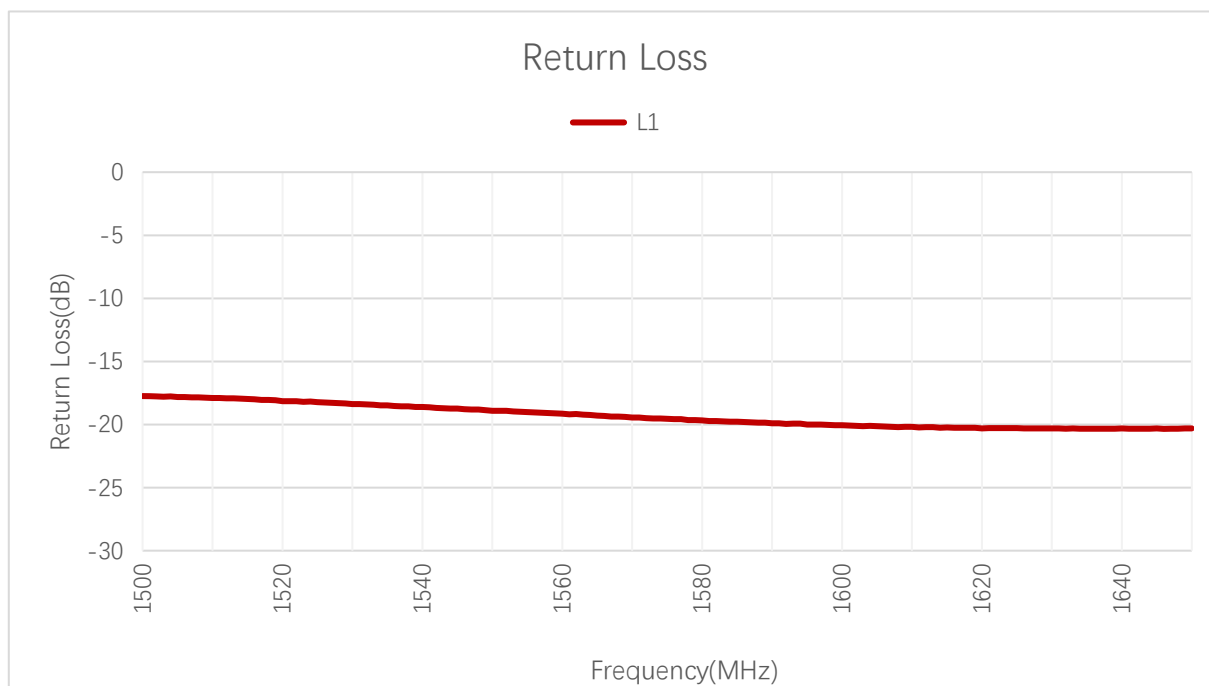
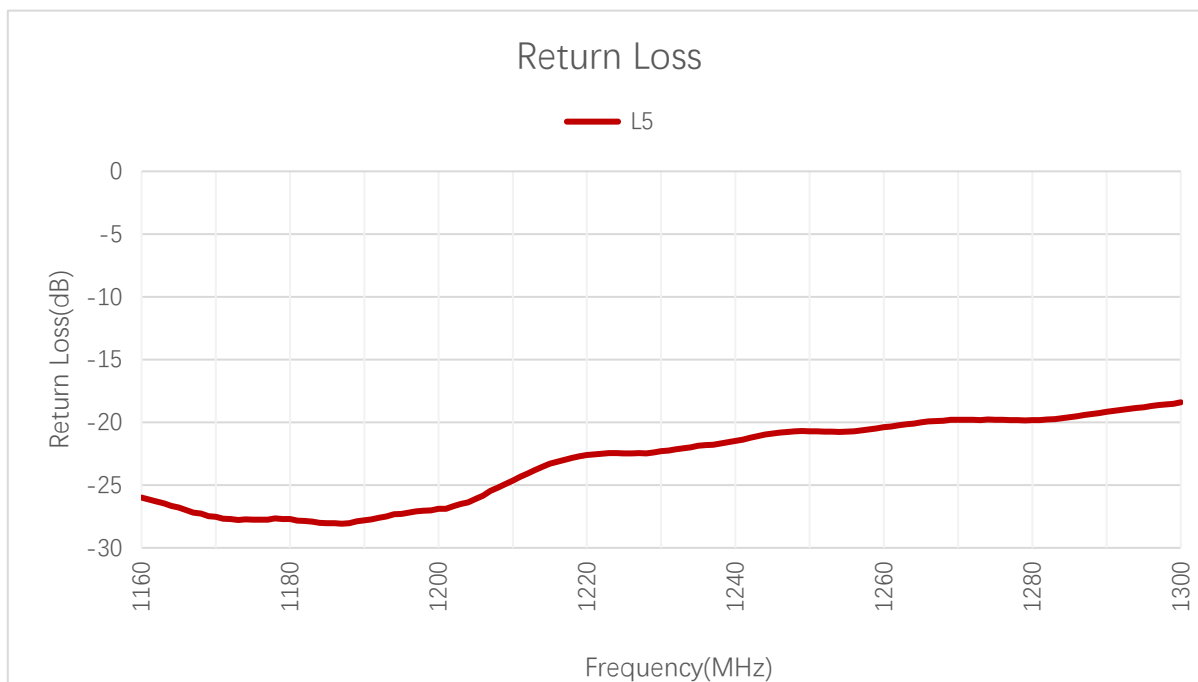




VSWR

Frequency (MHz)	1176	1207	1227	1246	1268	1540	1561	1575	1602
VSWR	1.1	1.1	1.2	1.2	1.2	1.3	1.2	1.2	1.2

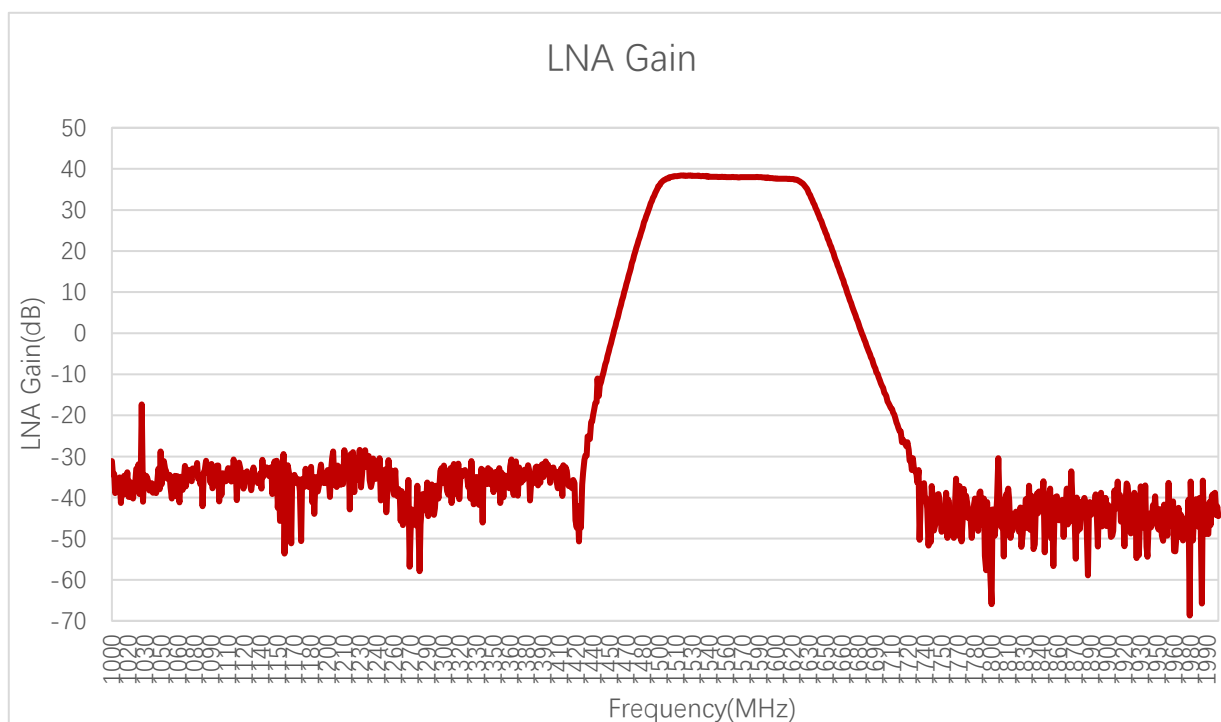
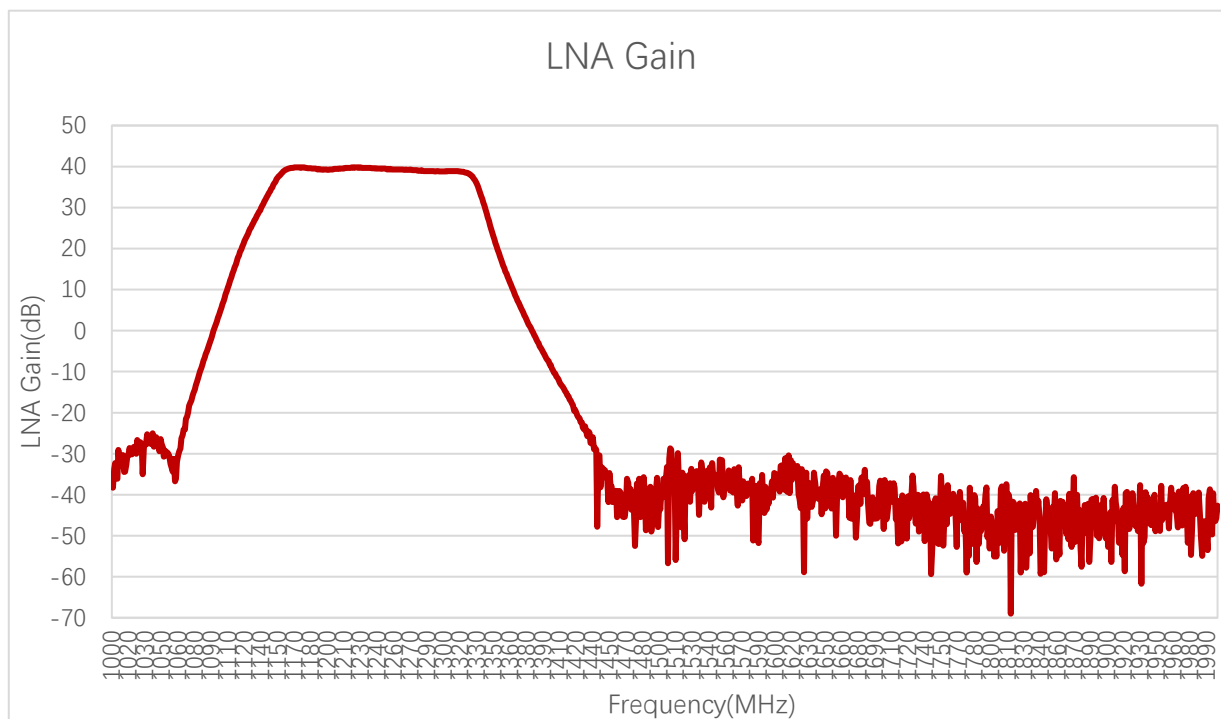
3.1.2. Return Loss



Return Loss (dB)

Frequency (MHz)	1176	1207	1227	1246	1268	1540	1561	1575	1602
Return Loss (dB)	-27.8	-25.5	-22.5	-20.8	-19.9	-18.6	-19.2	-19.6	-20.1

3.1.3. GNSS LNA Gain

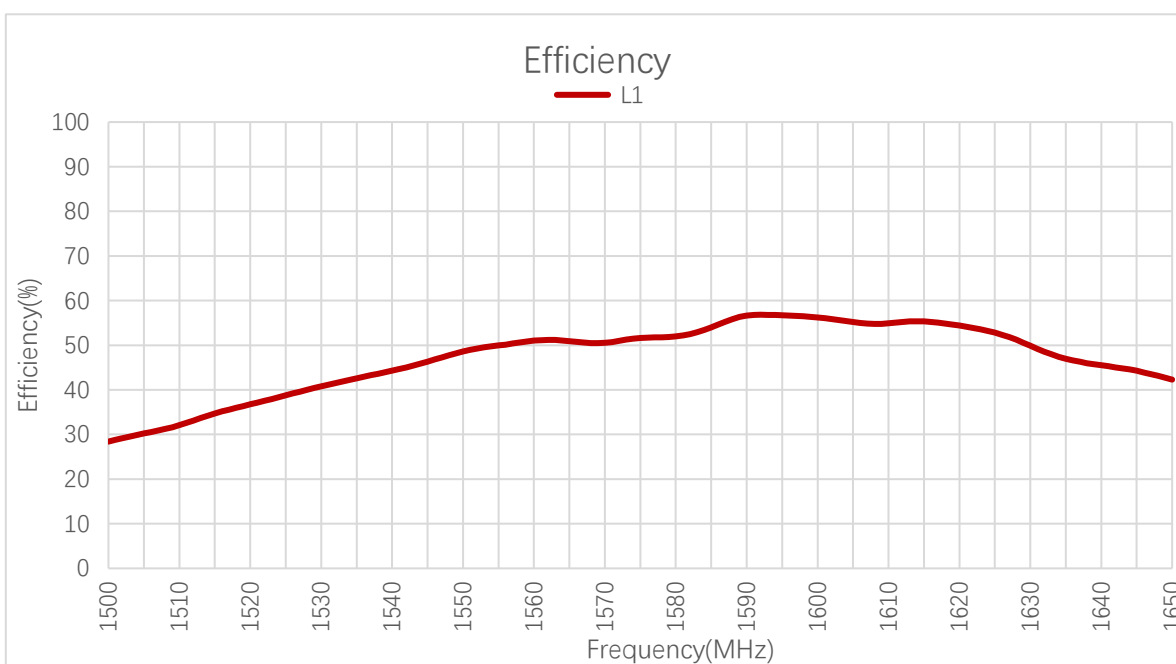
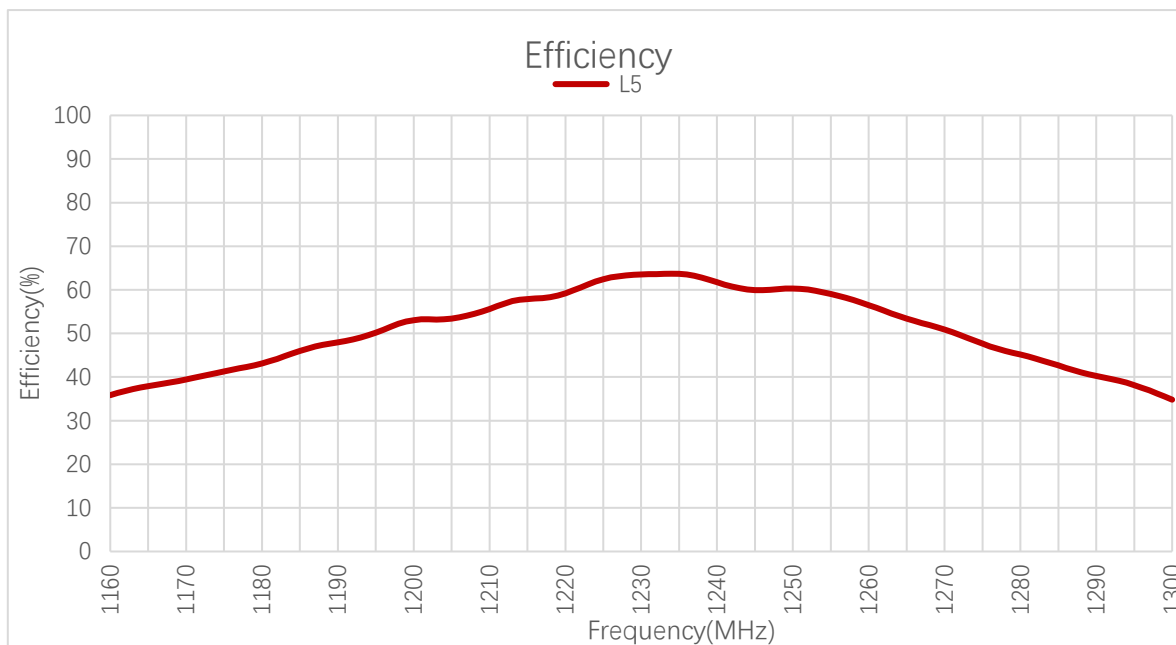


LNA Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1540	1561	1575	1602
LNA Gain (dB)	39.7	39.5	39.7	39.4	39.2	38.1	38.1	38.0	37.6

3.2. Radiation Performance Test

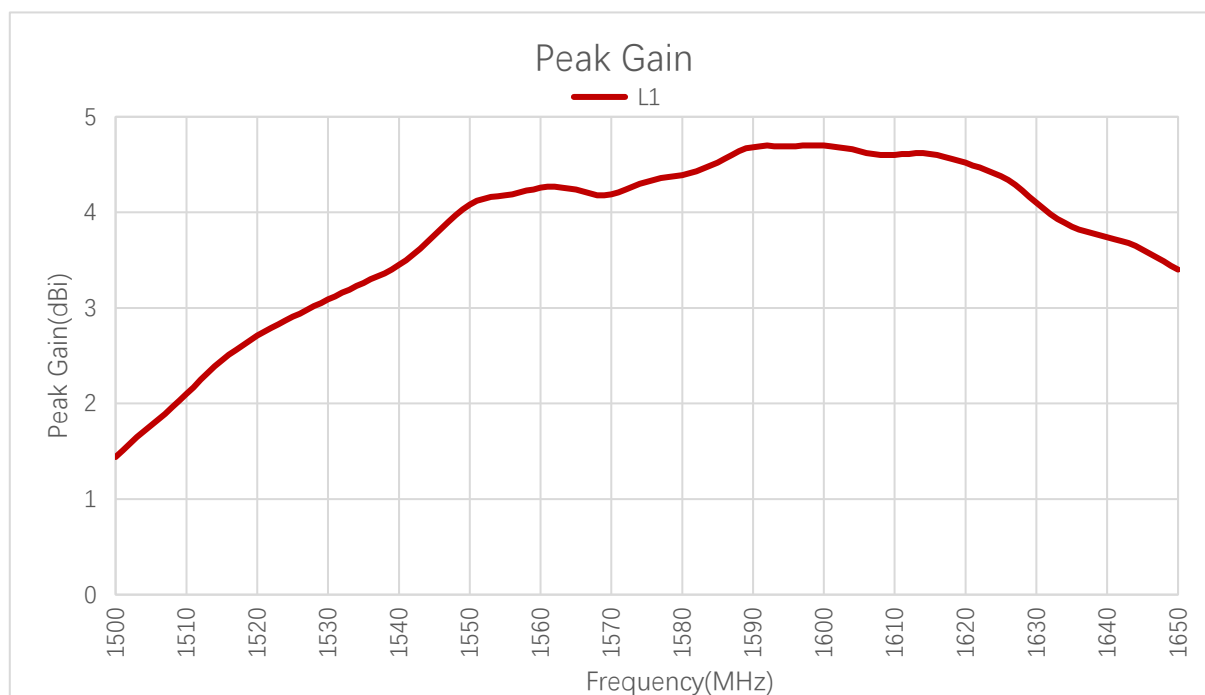
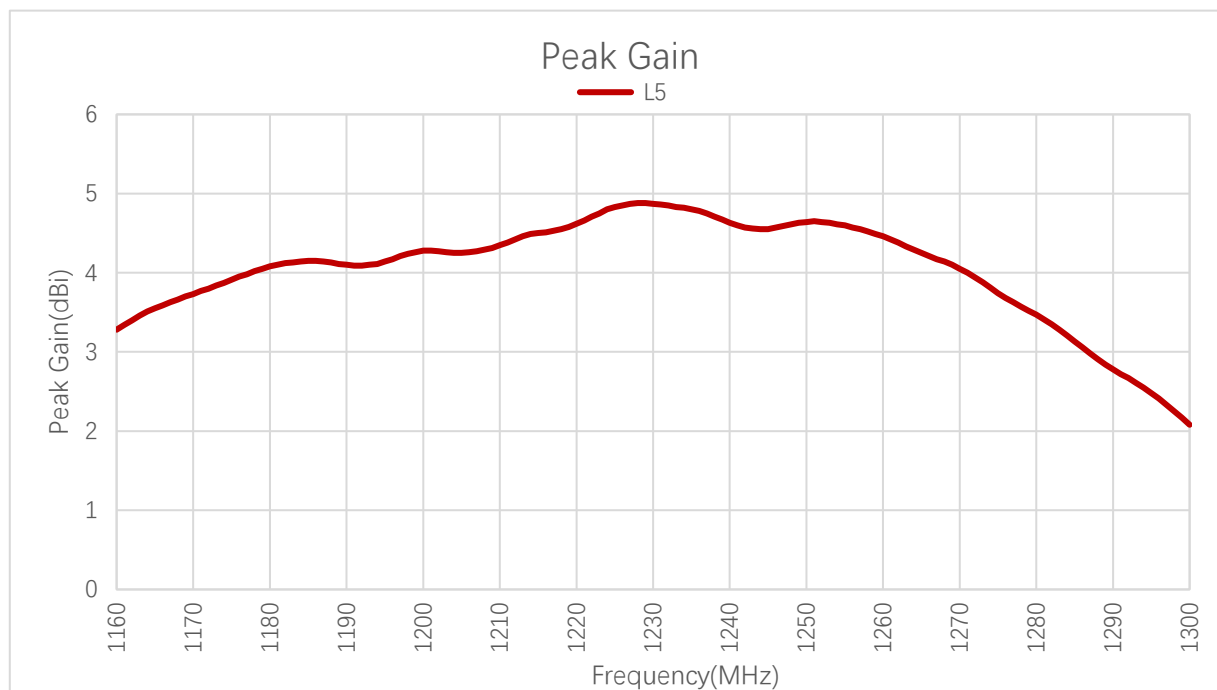
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	1176	1207	1227	1246	1268	1540	1561	1575	1602
Efficiency (%)	41.6	54.1	63.1	59.9	51.9	44.3	51.2	51.6	55.9

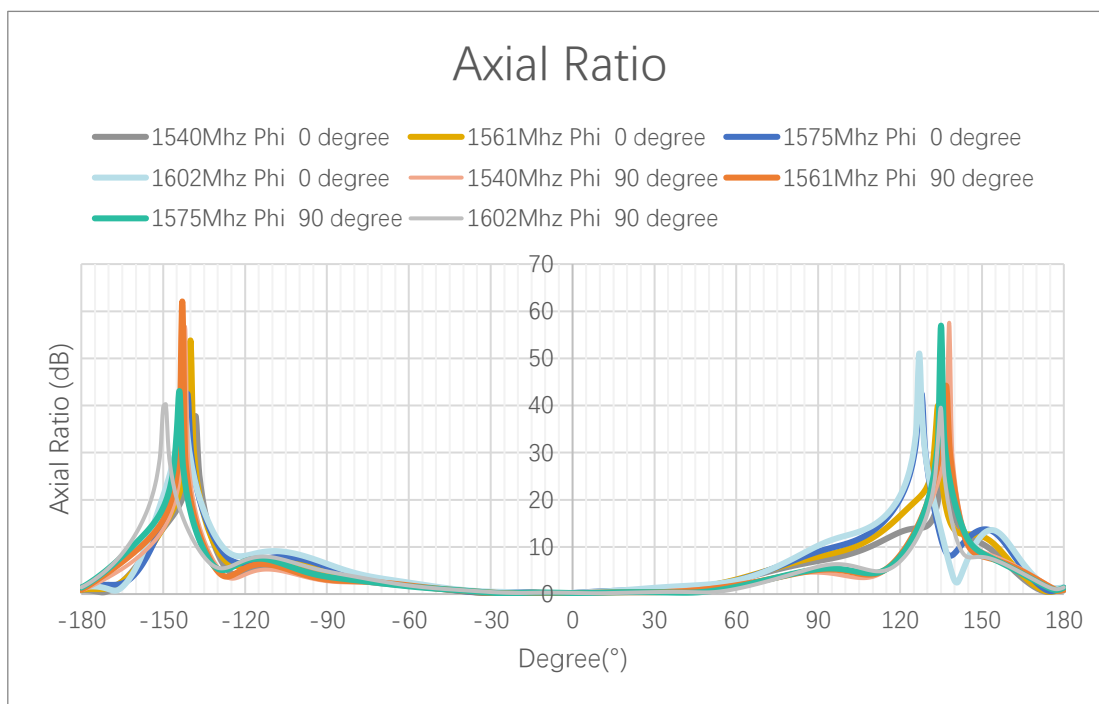
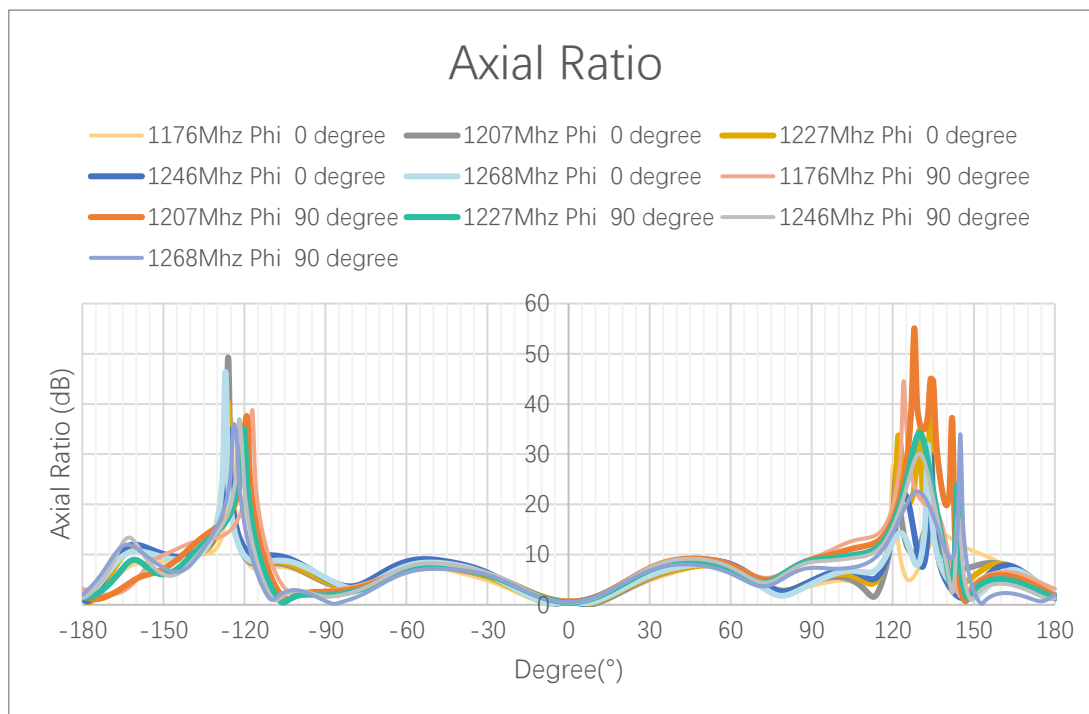
3.2.2. Peak Gain



Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1246	1268	1540	1561	1575	1602
Peak Gain (dBi)	4.0	4.3	4.9	4.6	4.1	3.5	4.3	4.3	4.7

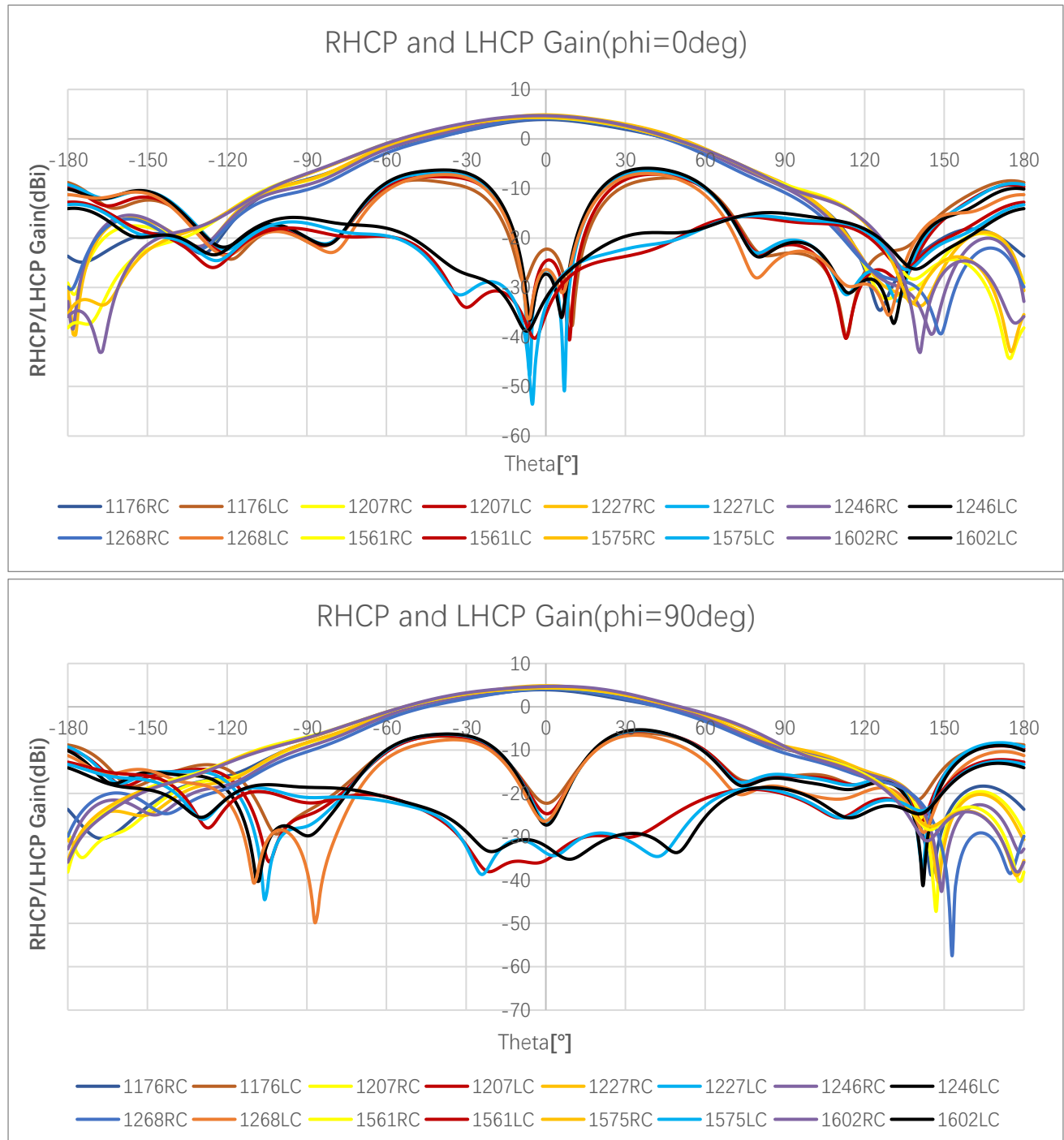
3.2.3. Axial Ratio



Axial Ratio (dB)

Frequency (MHz)		1176	1207	1227	1246	1268	1540	1561	1575	1575
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	0.85	0.62	0.47	0.45	0.18	0.17	0.22	0.18	0.25
	Phi = 90 (deg) Theta = 0 (deg)	0.85	0.62	0.47	0.45	0.18	0.17	0.22	0.18	0.25

3.2.4. 2D RHCP and LHCP Gain

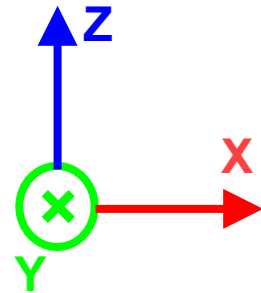


2D RHCP and LHCP Gain (dBi)

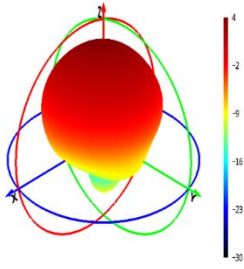
Frequency (MHz)		1176	1207	1227	1246	1268	1561	1575	1602
RC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	3.93	4.27	4.87	4.55	4.13	4.33	4.37	4.7
	Phi = 90 (deg) Theta = 0 (deg)	3.93	4.27	4.87	4.55	4.13	4.33	4.37	4.7
LC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-22.26	-24.65	-26.49	-27.28	-26.38	-35.42	-33.74	-32.16
	Phi = 90 (deg) Theta = 0 (deg)	-22.26	-24.65	-26.49	-27.28	-26.38	-35.42	-33.74	-32.16

3.2.5. 3D & 2D Radiation Pattern

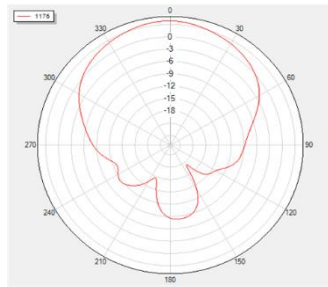
- Test Condition: Free Space
- Test Chamber: GL-S-1



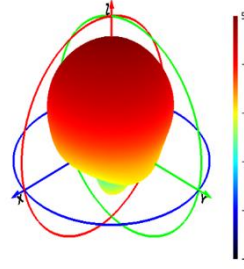
1176 MHz



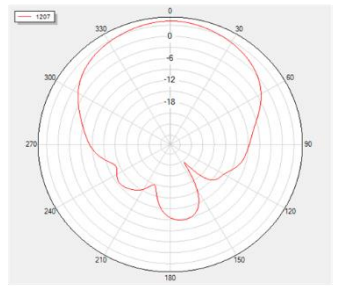
Phi=90



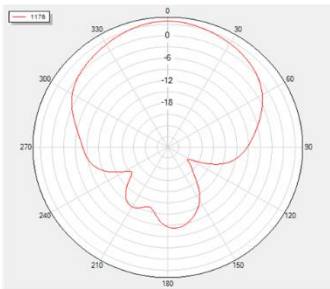
1207 MHz



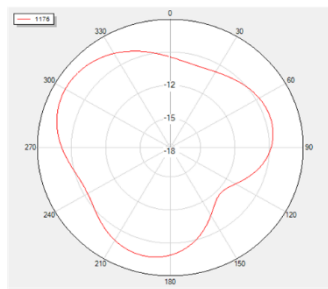
Phi=90



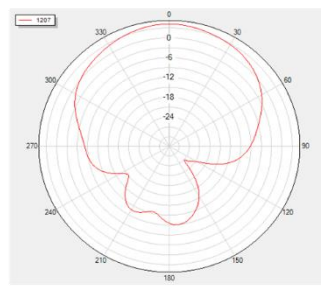
Phi=0



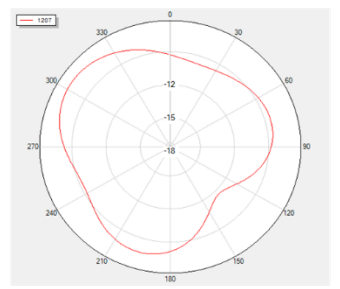
Theta=90



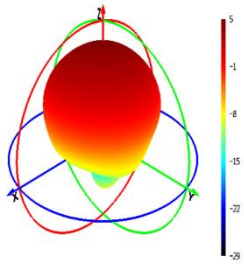
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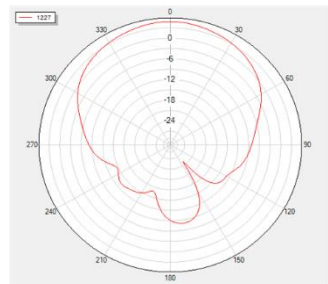
Theta=90



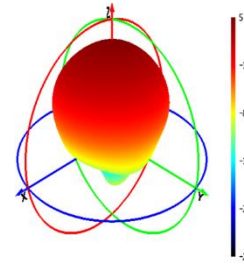
1227 MHz



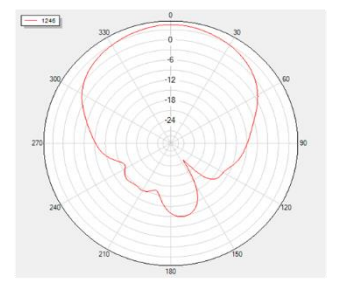
Phi=90



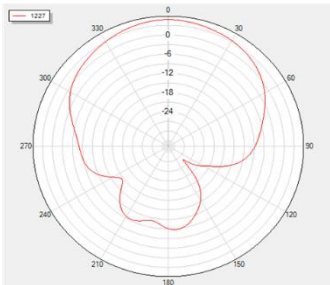
1246 MHz



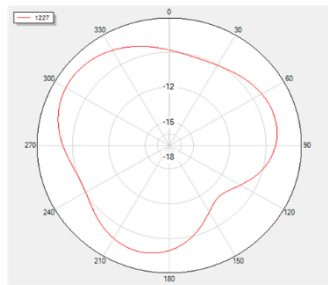
Phi=90



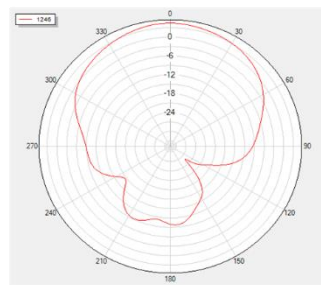
Phi=0



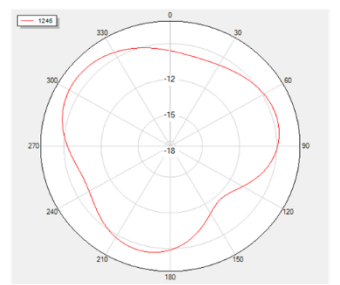
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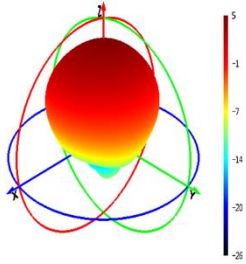
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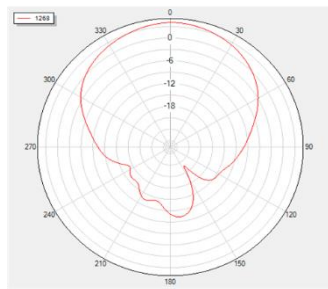
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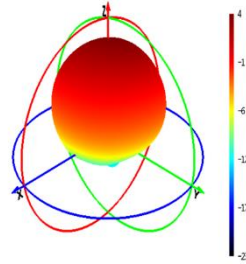
1268 MHz



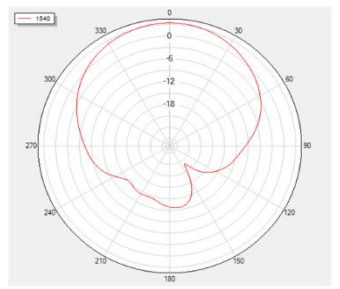
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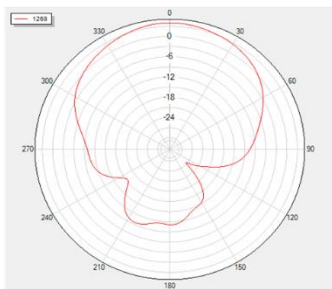
1540 MHz



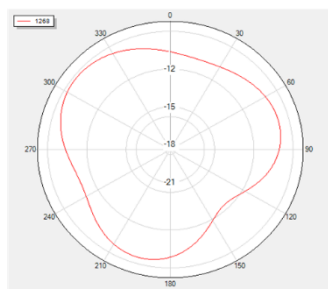
Phi=90



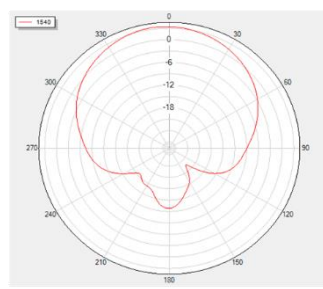
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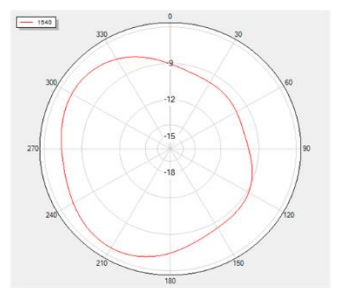
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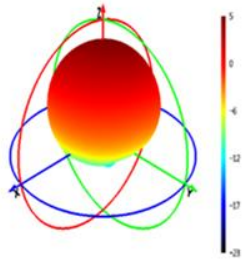
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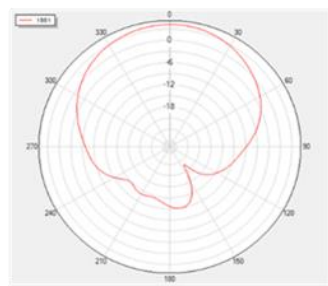
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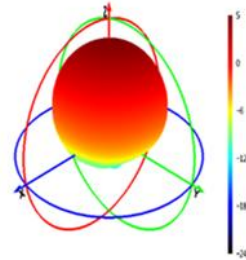
1561 MHz



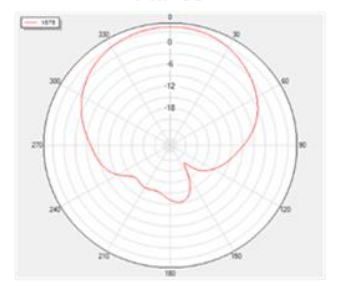
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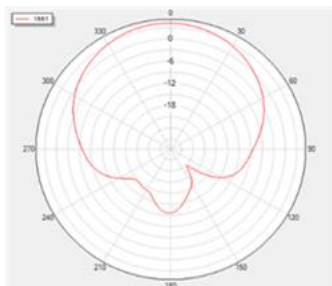
1575 MHz



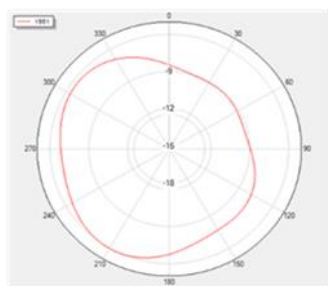
Phi=90



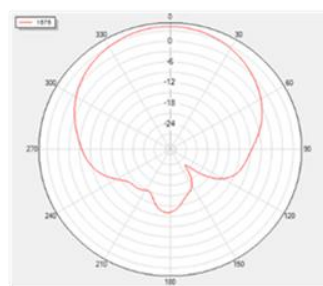
Phi=0



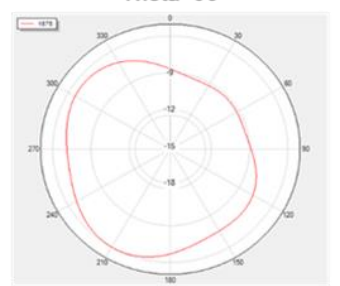
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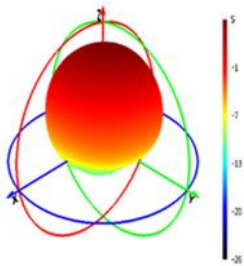
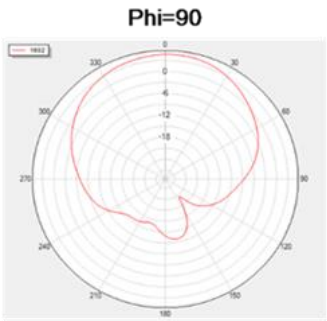
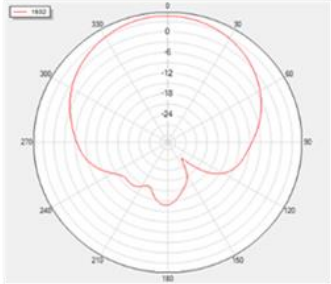
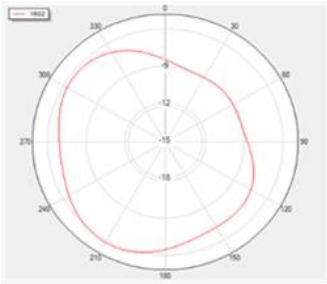


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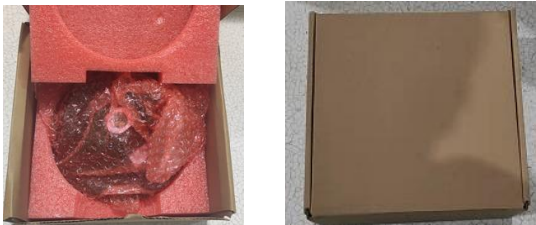
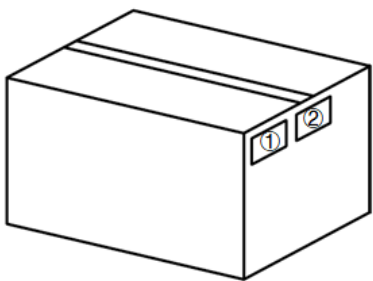


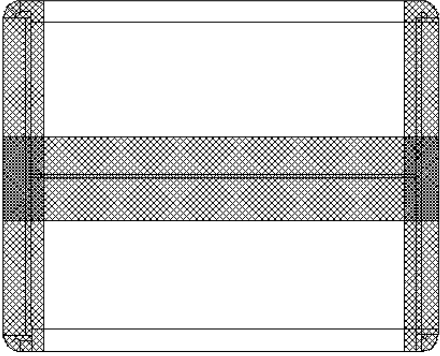
Theta=90



1602 MHz			
			
			

4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		Wrap the product in a bubble bag and put it into the inner box (1 Antenna / Inner Box).
2		Put 4 inner boxes in one layer and stack 3 layers. 12 Inner Boxes / Carton Box (12 Antennas / Carton Box) <u>Carton Size:</u> <u>L × W × H = 470 × 430 × 310 mm</u>
3		Position for Attaching Labels ① Carton Label ② Quality Label

4		Sealing Cartons “I” type sealing cartons
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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:

Quectel Wireless Solutions Co., Ltd.

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Tel: +86 21 5108 6236

Email: info@quectel.com

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

<http://www.quectel.com/support/sales.htm>.

For technical support, or to report documentation errors, please visit:

<http://www.quectel.com/support/technical.htm>.

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Revision History

Version	Date	Author	Note
-	2021-05-25	Kenny YIN/ Aria CHU	Creation of the document
1.0	2021-05-25	Kenny YIN/ Aria CHU	First official release
1.1	2021-07-01	Aria CHU	Added the RoHS marking (Chapter 5)
1.2	2021-08-18	Aria CHU	Added the weight information (Chapter 3)
1.3	2021-12-06	Aria CHU	Updated the product description (Chapter 1).
1.4	2022-12-29	Xiaodong YANG	Updated template and data (Chapter 3).
1.5	2023-06-27	Kenny YIN	1. Updated the drawing (Chapter 5). 2. Added mounting type (Chapter 3).
2.0	2023-09-06	Damon ZHANG/ Lucky FENG/ David LIU/ Aria CHU	Numerous changes were made to this document. It should be read in its entirety.
2.1	2023-12-05	Junsen LI	Updated test data (Chapters 1.1, 3.1.3 and 3.2.4).



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