Antenna

YEMA003AA Datasheet

Antenna Services

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Status: Released

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About the Document

Revision History

Version	Date	Author	Note
-	2021-03-30	Kenny YIN	Creation of the document
1.0	2021-04-08	Kenny YIN	First official release
2.0	2021-08-02	Kenny YIN/ Aria CHU	Updated all test information in the datasheet.
2.1	2021-12-03	Kenny YIN/ Aria CHU	Updated the product description in Chapter 1.

Contents

1 Product Description

To meet customers' requirements for the high performance, high integration, and integrated appearance of their products, Quectel provides a combined antenna box series. The antenna box can integrate a variety of antennas, such as 5G, 4G, GNSS, Wi-Fi antennas, to achieve communication functions of 5G MIMO, 4G, GNSS, and Wi-Fi. These antenna boxes can be mounted on the surface of devices via screw, adhesive or other methods, supports multiple connector types and cable lengths. It is a more flexible and reliable high-performance antenna solution for outdoor applications.

We provide comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs.

2 Product Features

- Cellular LTE/GNSS
- High efficiency
- Excellent performance

3 Product Specifications

Passive Electrical Specifications	
Frequency Range	4G MAIN: 700–960 MHz, 1710–2690 MHz GNSS: 1575.42 ±5 MHz, 1561.098 ±5 MHz
Input Impendence	50 Ω
VSWR	≤ 3.0
Gain	4G MAIN: ≤ 4.0 dBi GNSS: ≤ 5.0 dBi
Polarization Type	4G MAIN: Linear, GNSS: Circular

Detailed Passive Electrical Specifications								
Frequency Range (MHz)	**698–960**	**1176–1280**	**1400–1610**	**1710–2170**	**2170–2690**	**3300–4000**	**4000–5000**	**5000–6000**
VSWR (Max.)	2.4	-	-	1.8	1.8	-	-	-
Average Efficiency (%)	27.06	-	-	21.07	18.39	-	-	-
Max. Peak Gain (dBi)	3.11	-	-	0.42	-2.08	-	-	-

Low Noise Amplifier Electrical Specifications.	
Frequency Range	1575.42 ±5 MHz, 1561.098 ±5 MHz
LNA Gain	26 ±3 dB
Noise Figure	≤ 2.0 dB
Output VSWR	≤ 2.0 dB
Voltage Range	3.0–3.6 V
Current	≤ 10 mA
Impedance	50 Ω
Mechanical Specifications	
Antenna Size	Φ 84 mm × 17.5 mm LMR100, Cable Length = 3000 mm
Casing	ABS + PC

Connector Type	4G: FAKRA D GNSS: FAKRA C
Working Temperature	-40 °C to +85 °C
Radome Color	Black
IP Rating	IP66
Mounting Type	Adhesive

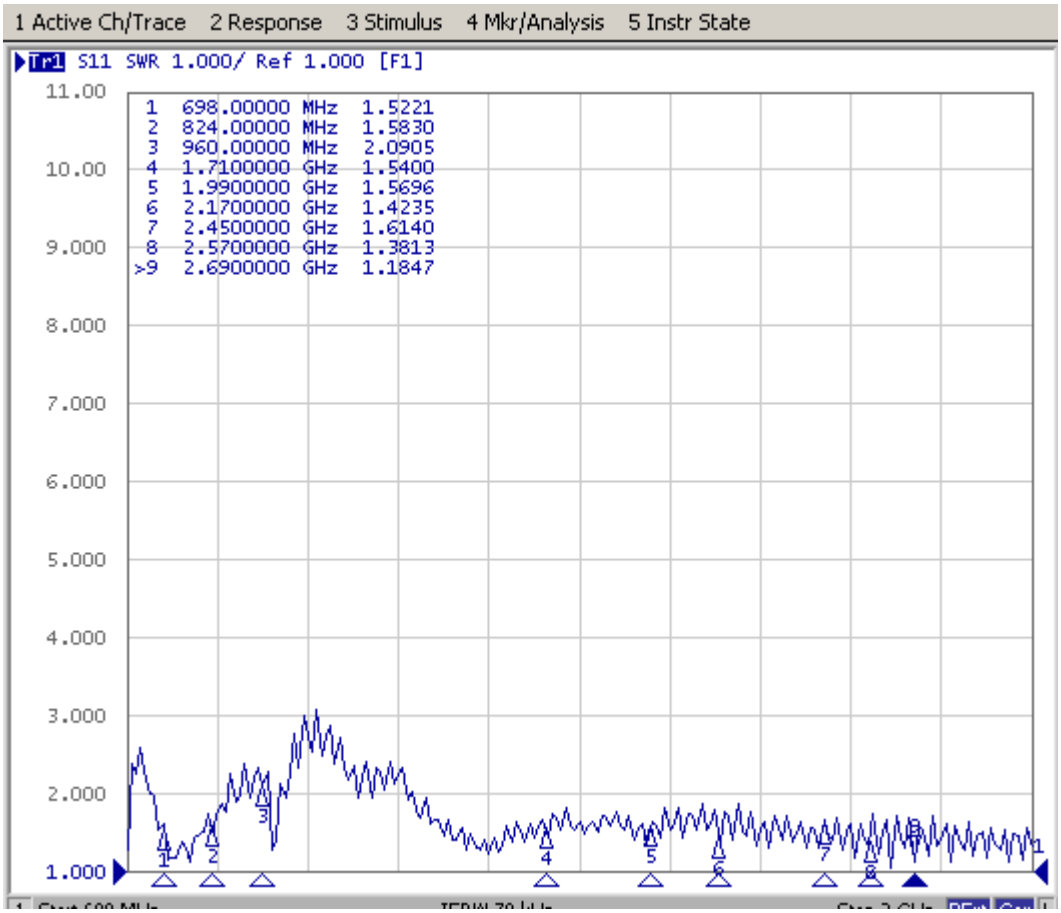
4 Overall Performance

4.1. Test Environment

- KEYSIGHT VNA Network Analyzer E5063A 100 kHz – 8.5 GHz
- RayZone® 2800 Chamber 5G (FR1) SISO/MIMO, 400 MHz – 8.0 GHz

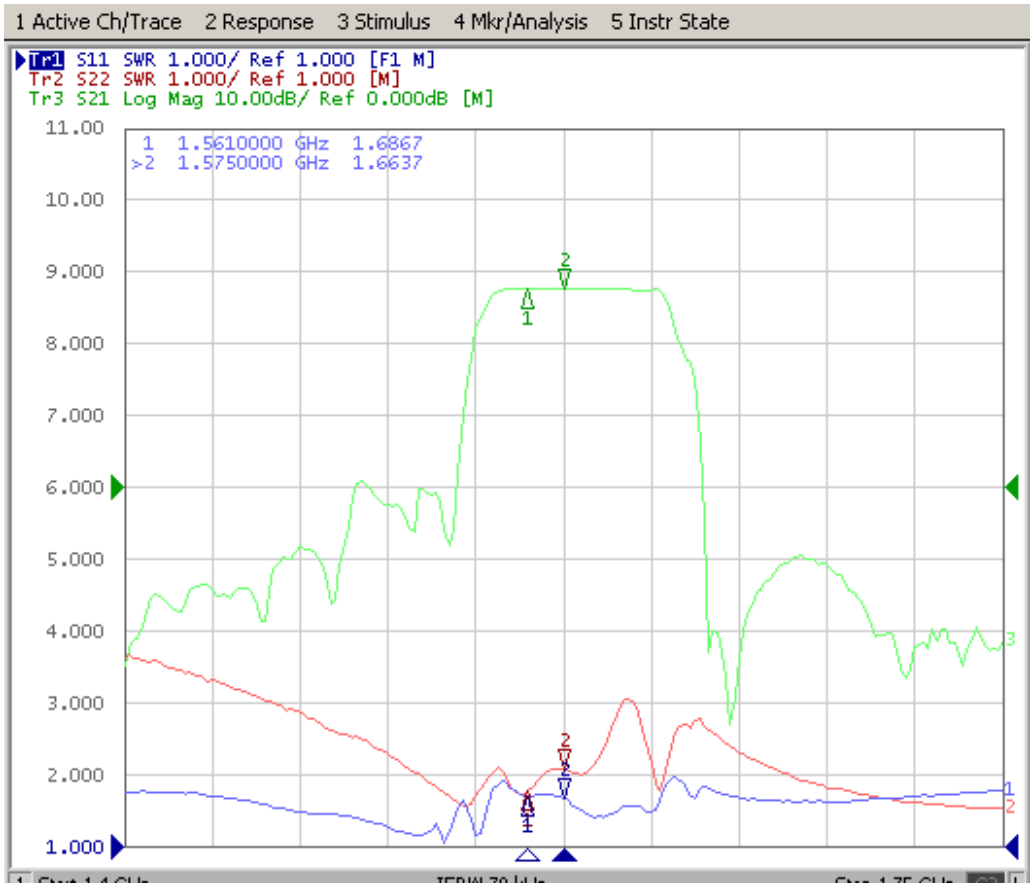
4.2. VSWR

4.2.1. 4G

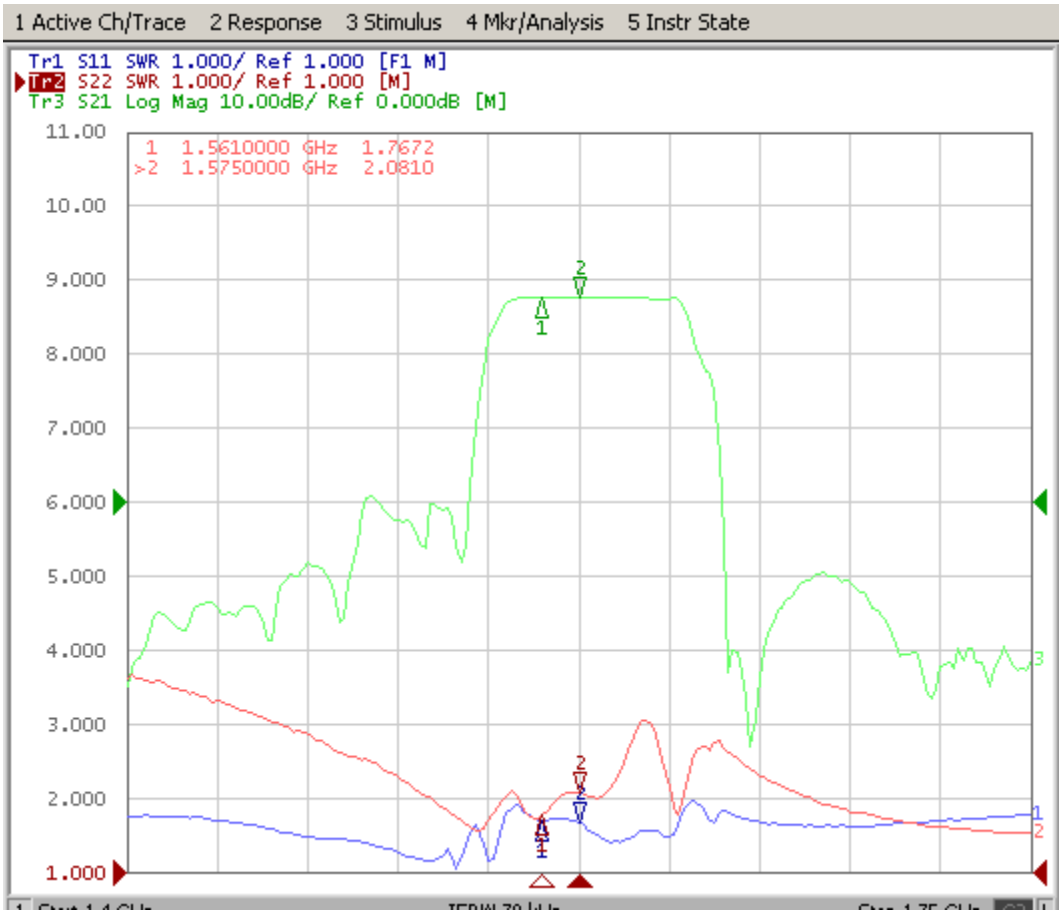


Frequency (MHz)	698	824	960	1710	1990	2170	2450	2570	2690
VSWR	1.52	1.58	2.09	1.54	1.57	1.42	1.61	1.38	1.18

4.2.2. GNSS Antenna



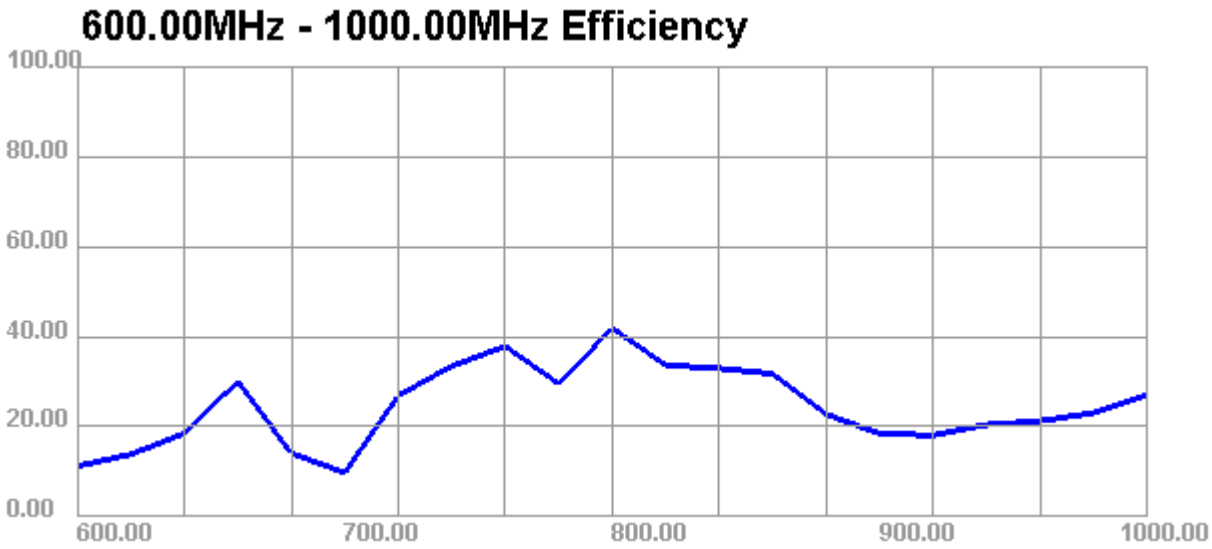
Frequency (MHz)	1561	1575
VSWR	1.68	1.66

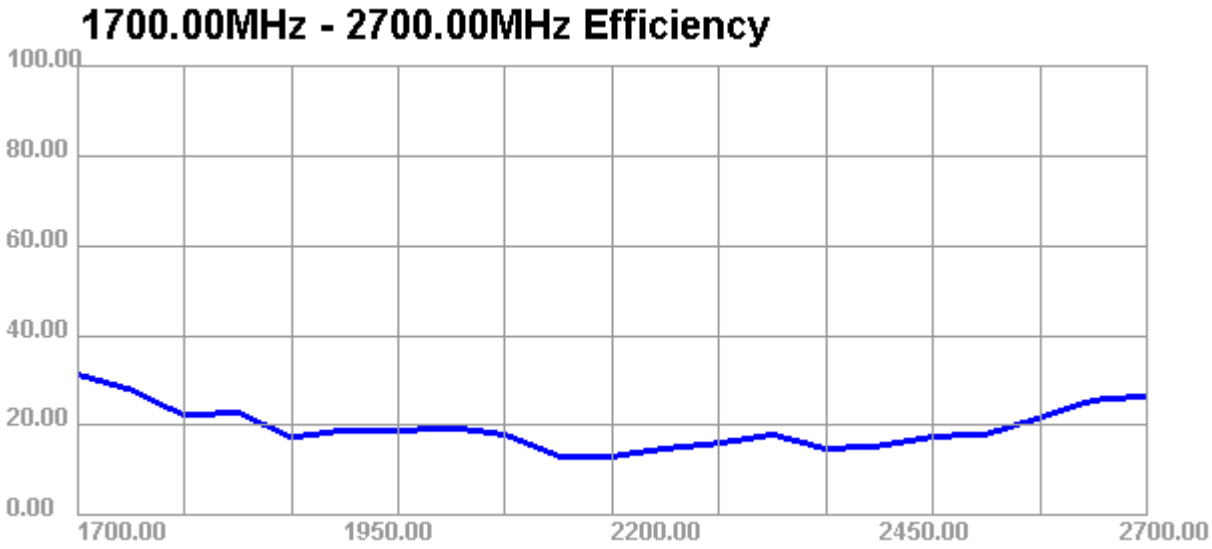


Frequency (MHz)	1561	1575
VSWR	1.76	2.08

4.3. Efficiency

4.3.1. 4G

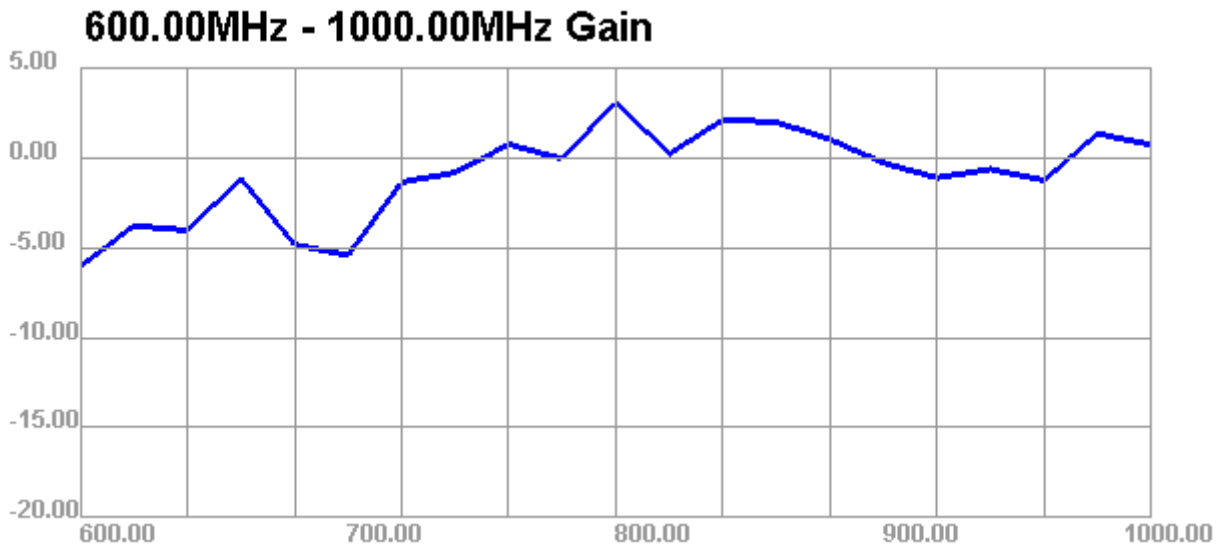


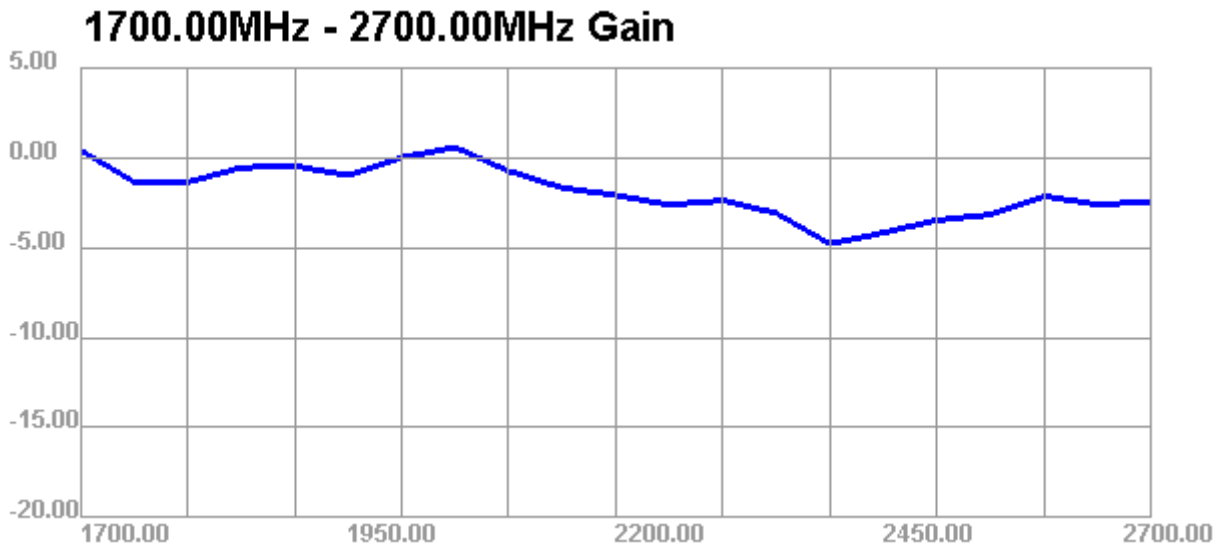


Frequency (MHz)	700	840	960	1700	1950	2150	2450	2700
Efficiency (%)	9.79	32.96	21.26	31.44	18.96	13.22	15.51	26.56

4.4. Gain

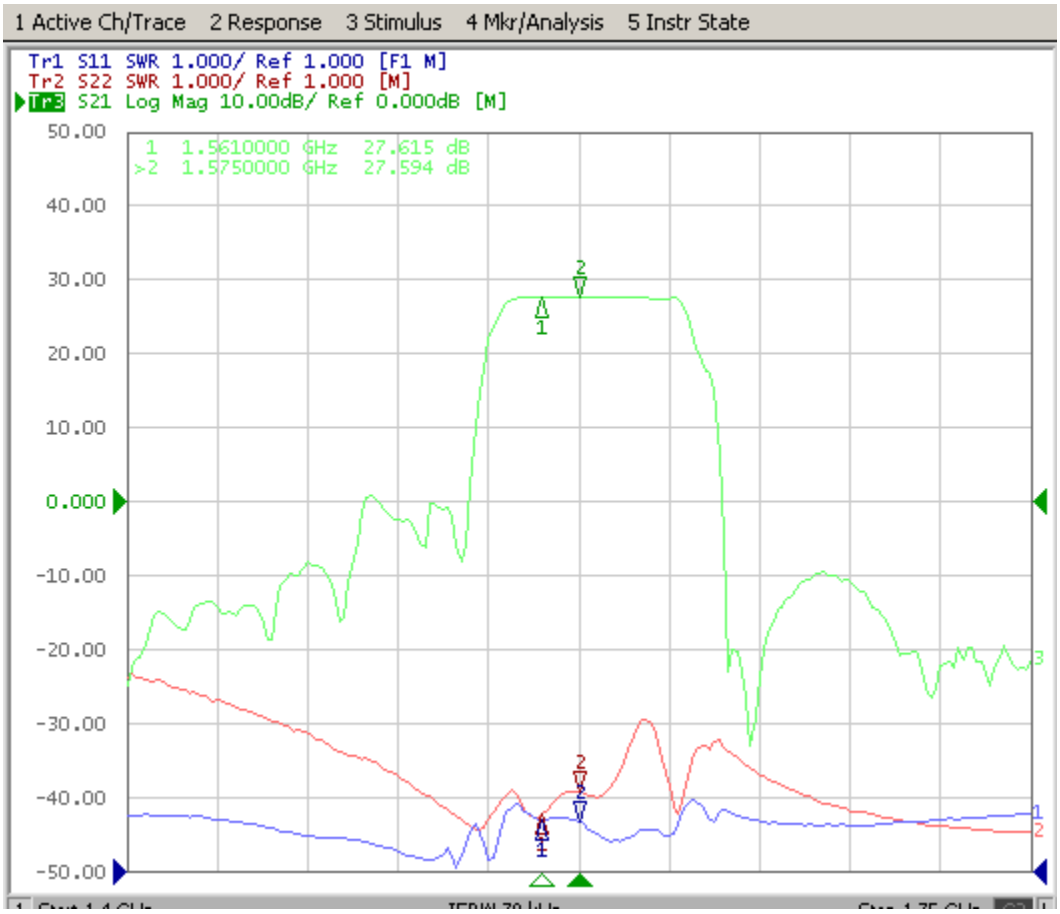
4.4.1. 4G





Frequency (MHz)	700	840	960	1700	1950	2150	2450	2700
Gain (dBi)	-5.42	2.11	-1.25	0.42	-0.98	-1.67	-4.17	-2.44

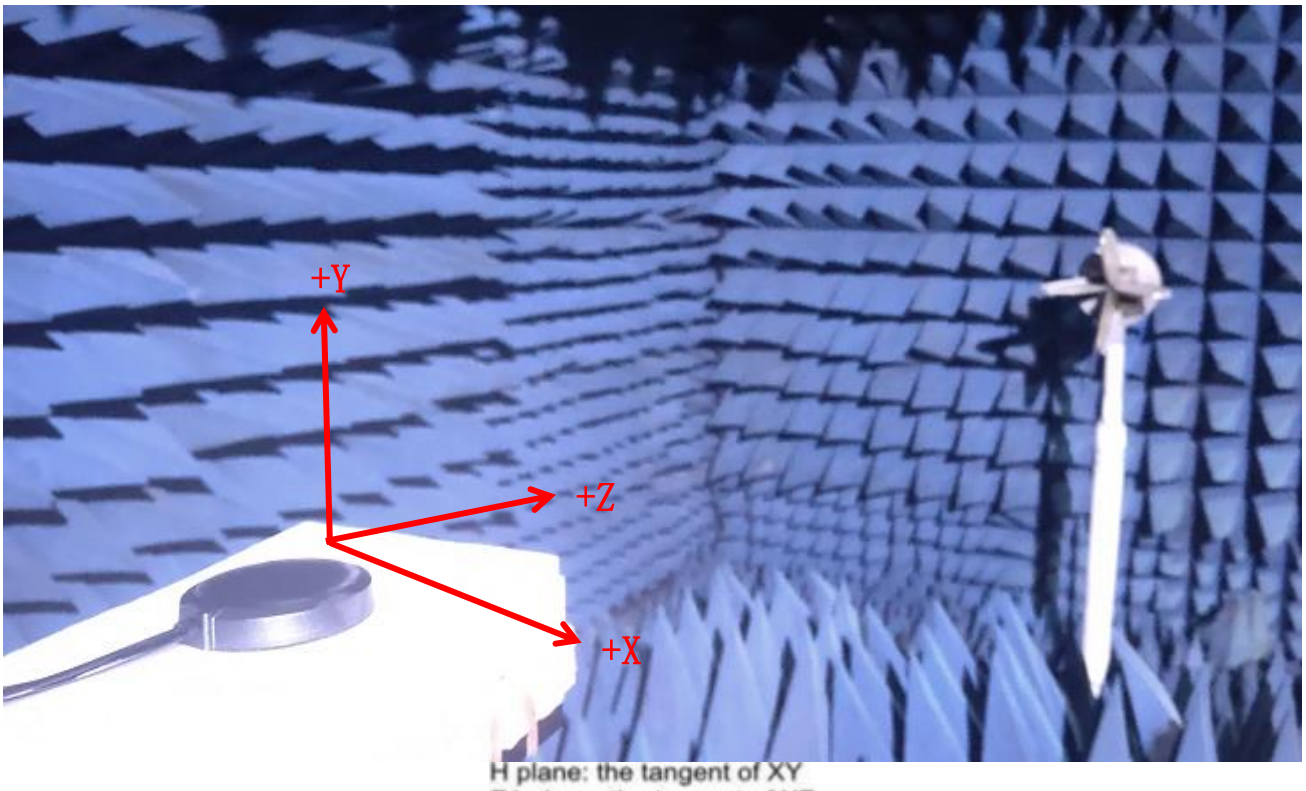
4.4.2. GNSS Antenna LNA Data



Frequency (MHz)	1561	1575
Gain (dBi)	27.61	27.59

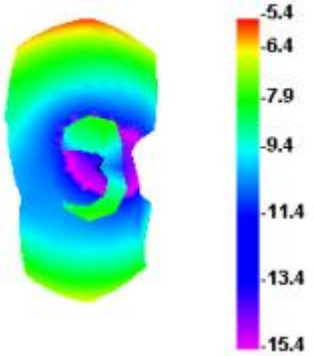
4.5. Radiation Pattern

- Test condition: free space.

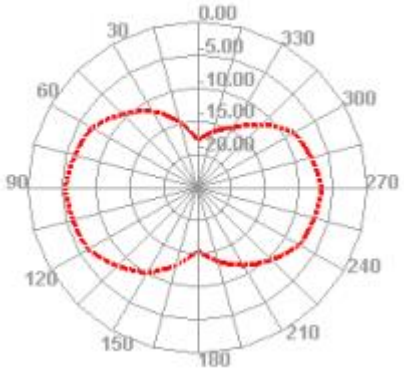


H plane: the tangent of XY
E1 plane: the tangent of XZ
E2 plane: the tangent of YZ

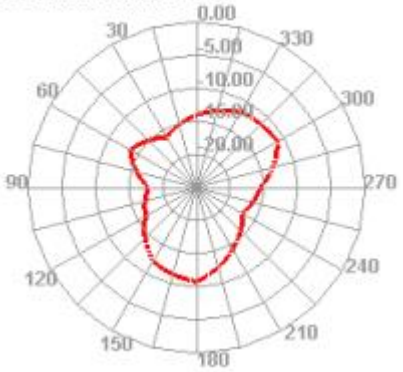
700.000MHz



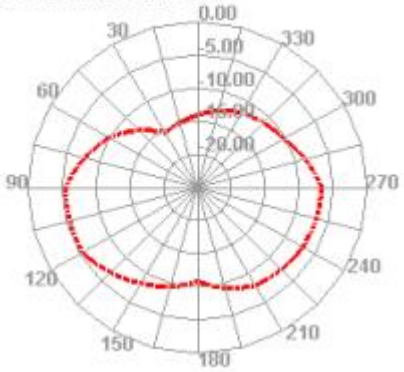
700.000MHz H



700.000MHz E1



700.000MHz E2



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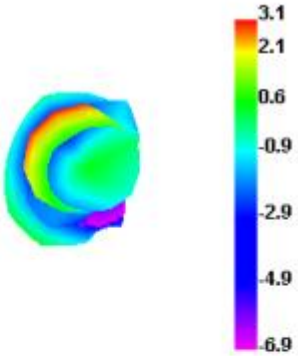

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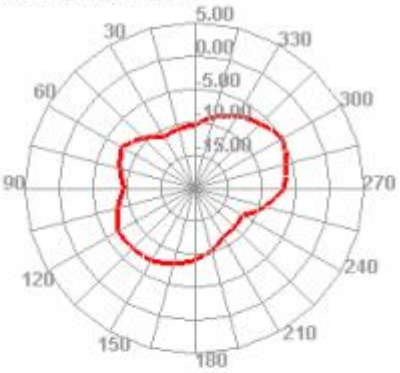

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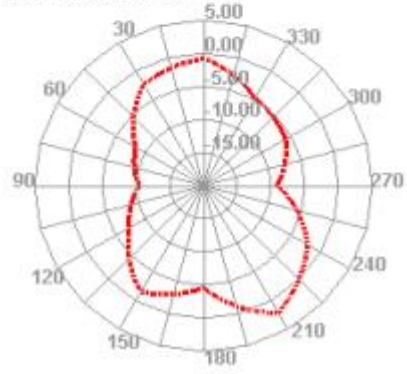

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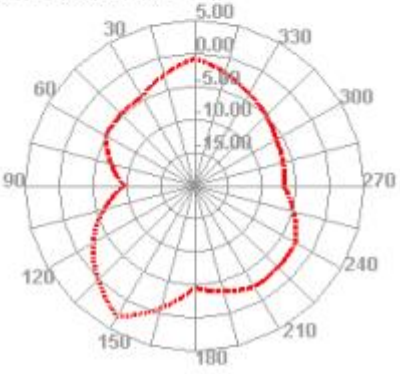

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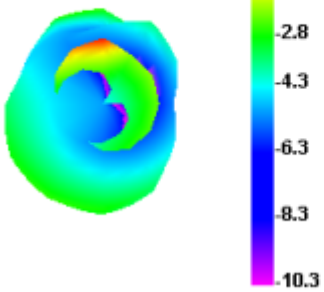

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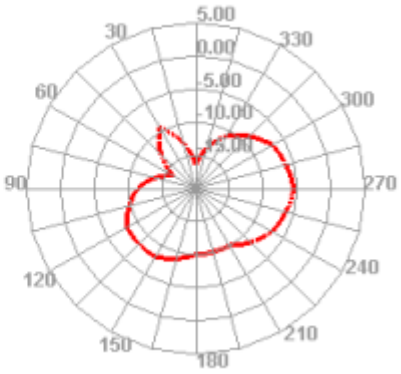

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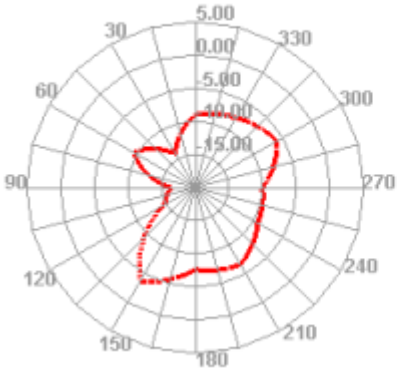

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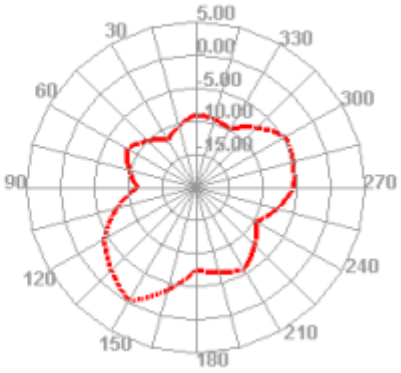

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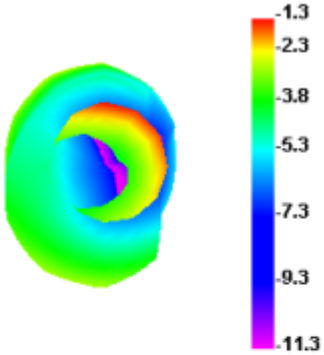

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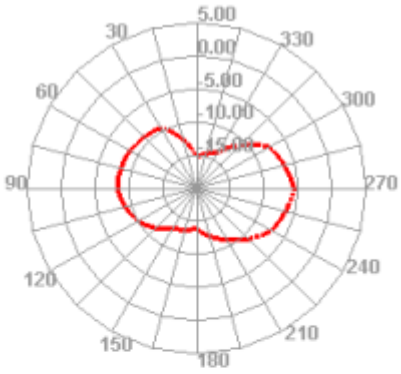

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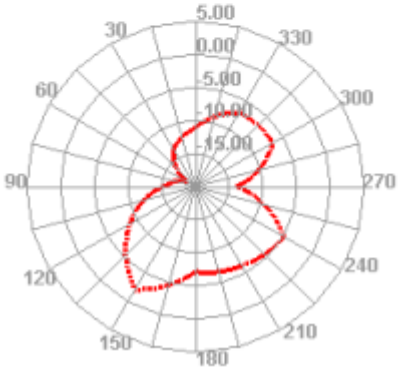

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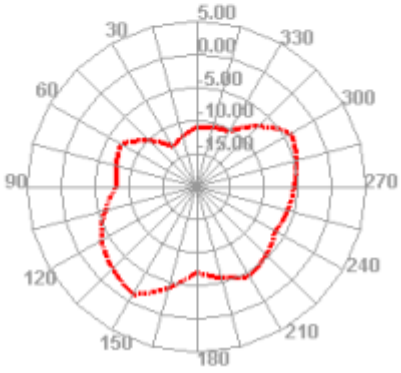

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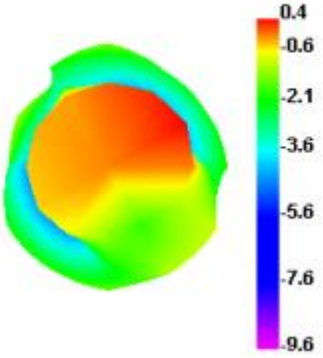

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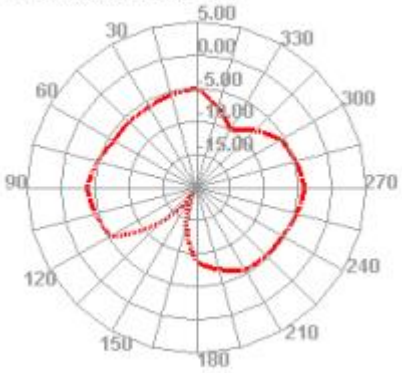

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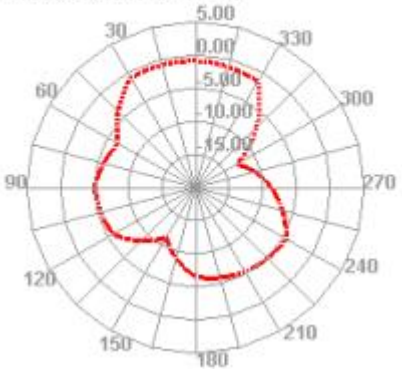

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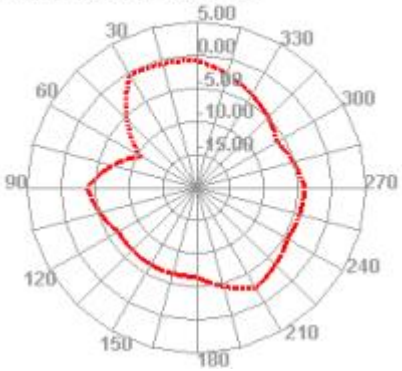

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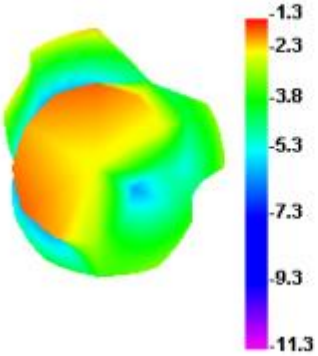

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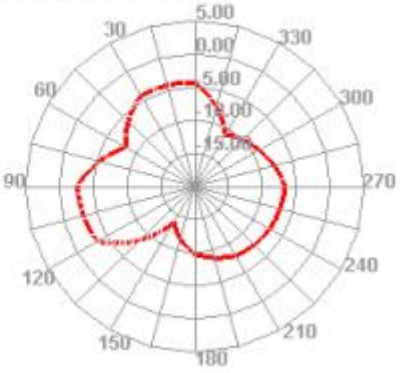

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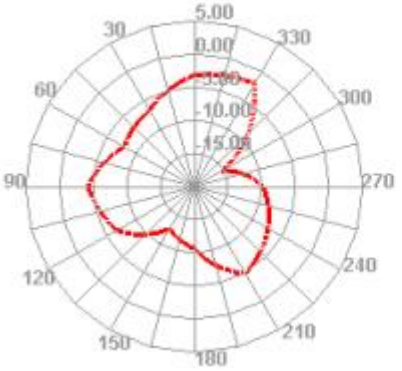

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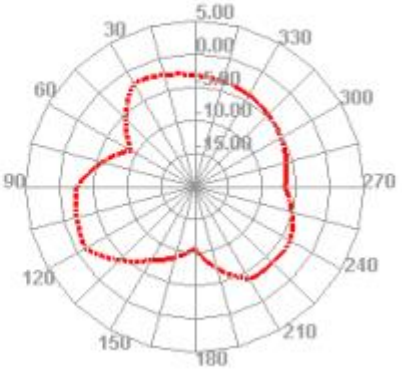

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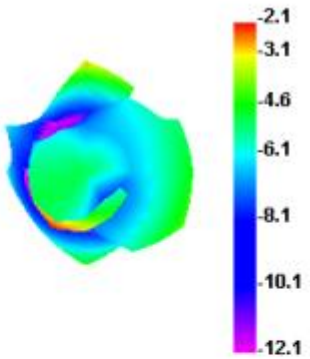

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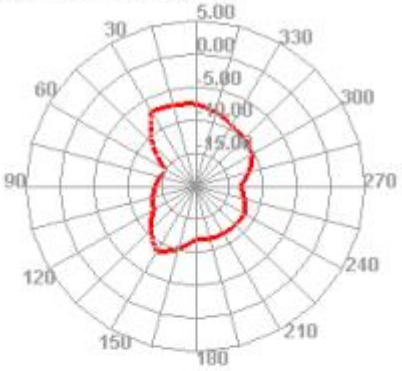

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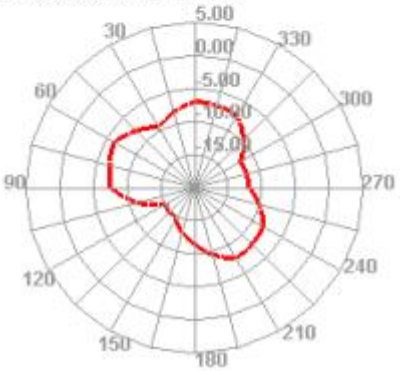

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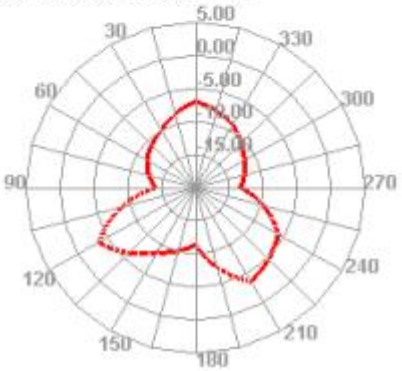

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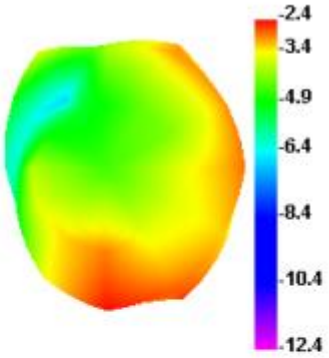

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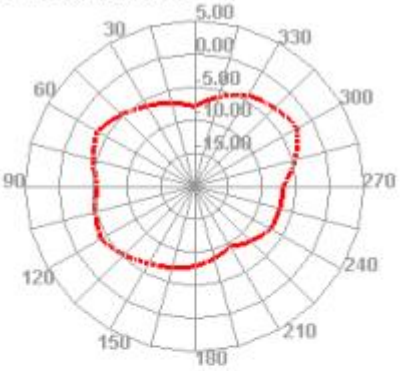

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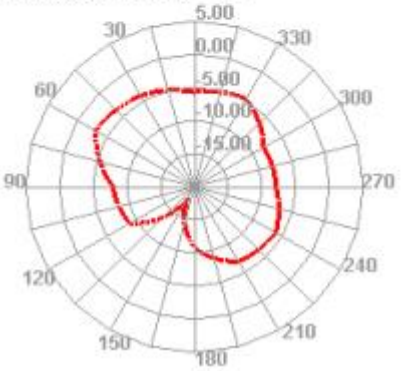

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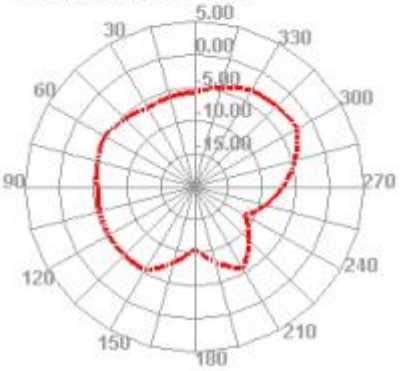

5 Product Size