

# Antenna

# YB0031AA Datasheet

**Antenna Services**

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**Quectel Wireless Solutions Co., Ltd.**

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China

Tel: +86 21 5108 6236

Email: [info@quectel.com](mailto:info@quectel.com)

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# About the Document

## Revision History

Version	Date	Author	Note
-	2021-01-28	Kenny YIN	Creation of the document
1.0	2021-01-28	Kenny YIN	First official release
1.1	2021-07-25	Kenny YIN	Updated working temperature. (Chapter 3)
1.2	2021-10-08	Aria CHU	<ol style="list-style-type: none"><li>1. Updated the gain for GNSS and added the low noise amplifier electrical specifications (Chapter 3).</li><li>2. Updated the data (Chapters 4.2.2, 4.3.2 and 4.4.2).</li></ol>
1.3	2021-12-06	Aria CHU	Updated the product description in Chapter 1.

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## 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

- GPS + BD/Cellular LTE
- High efficiency
- Excellent performance



### 3 Product Specifications

#### Passive Electrical Specifications

Frequency Range	LTE: 698–960 MHz; 1710–2690 MHz GNSS: 1575.42 ±5 MHz; 1561.098 ±5 MHz
Input Impedance	50 Ω
VSWR	≤ 3.0
Gain	LTE: 2.94 dBi GNSS: ≤ 2 dBi
Polarization Type	LTE: Linear GNSS: RHCP

#### Mechanical Specifications

Antenna Size	Φ 84 mm × 17.5 mm RG174, Cable Length = 300 mm
Casing	PC + ABS
Connector Type	SMA Male (Center Pin)
Working Temperature	-40 °C to +85 °C
Radome Color	Black
IP Rating	IP66
Mounting Type	Adhesive

#### 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
Voltage Range	3.0–3.6 V
Current	≤ 10 mA
Impedance	50 Ω

## 4 Overall Performance

### 4.1. Test Environment

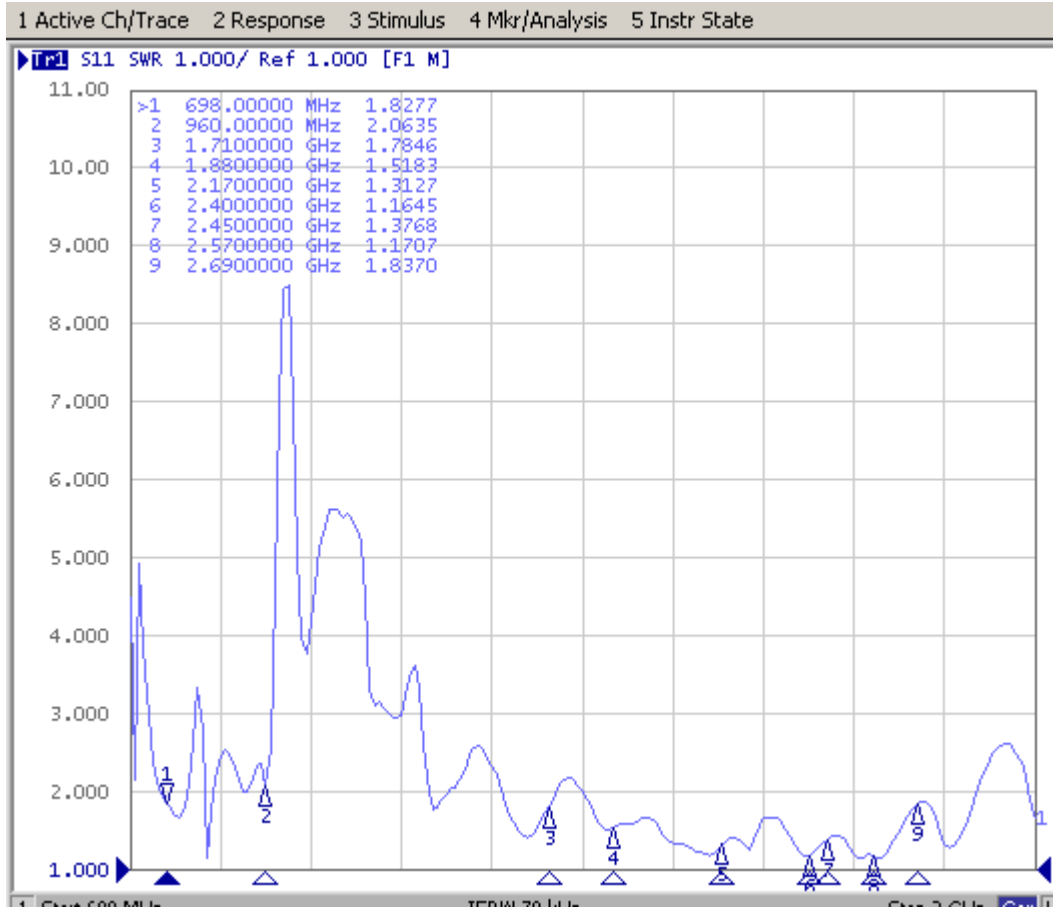
- KEYSIGHT VNA Network Analyzer E5063A 100 kHz – 8.5 GHz
- RayZone®2800 Chamber 5G (FR1) SISO/MIMO, 400 MHz – 8.0 GHz





## 4.2. VSWR

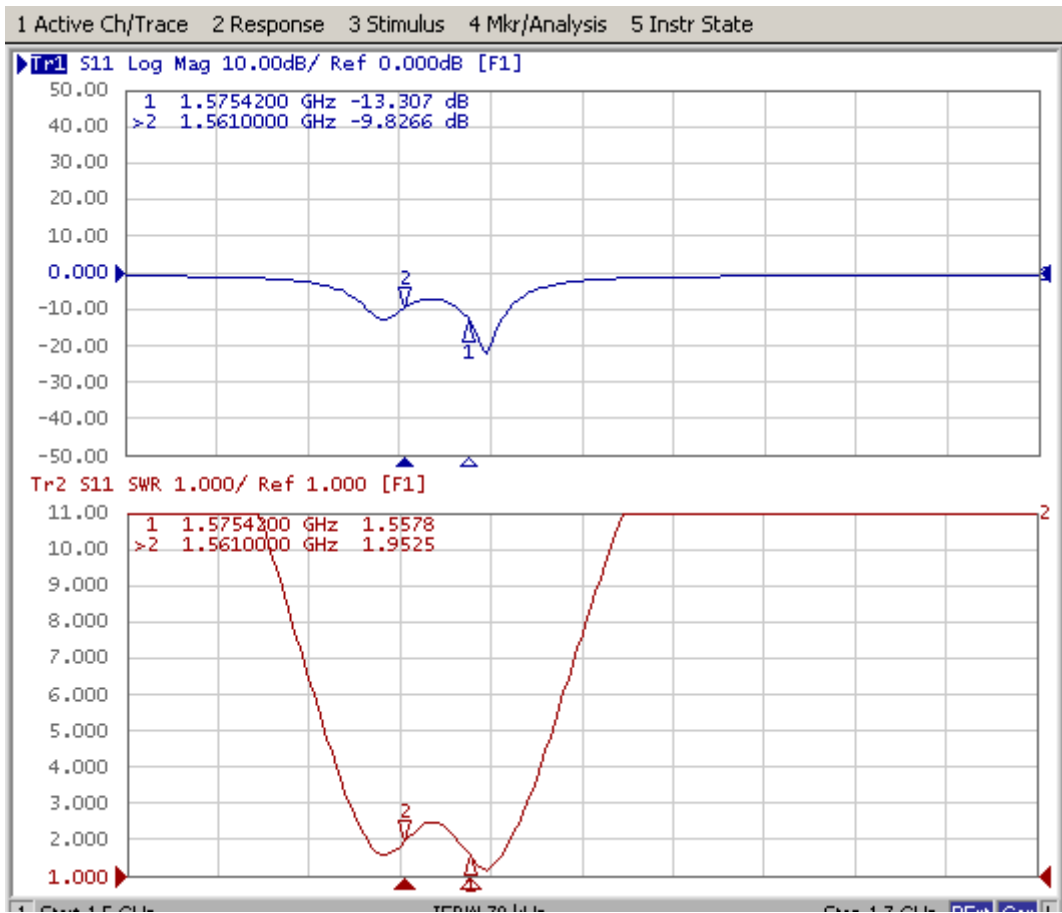
### 4.2.1. LTE Antenna



Frequency (MHz)	698	960	1710	1880	2170	2400	2450	2570	2690
VSWR	1.82	2.06	1.78	1.51	1.31	1.16	1.37	1.17	1.84

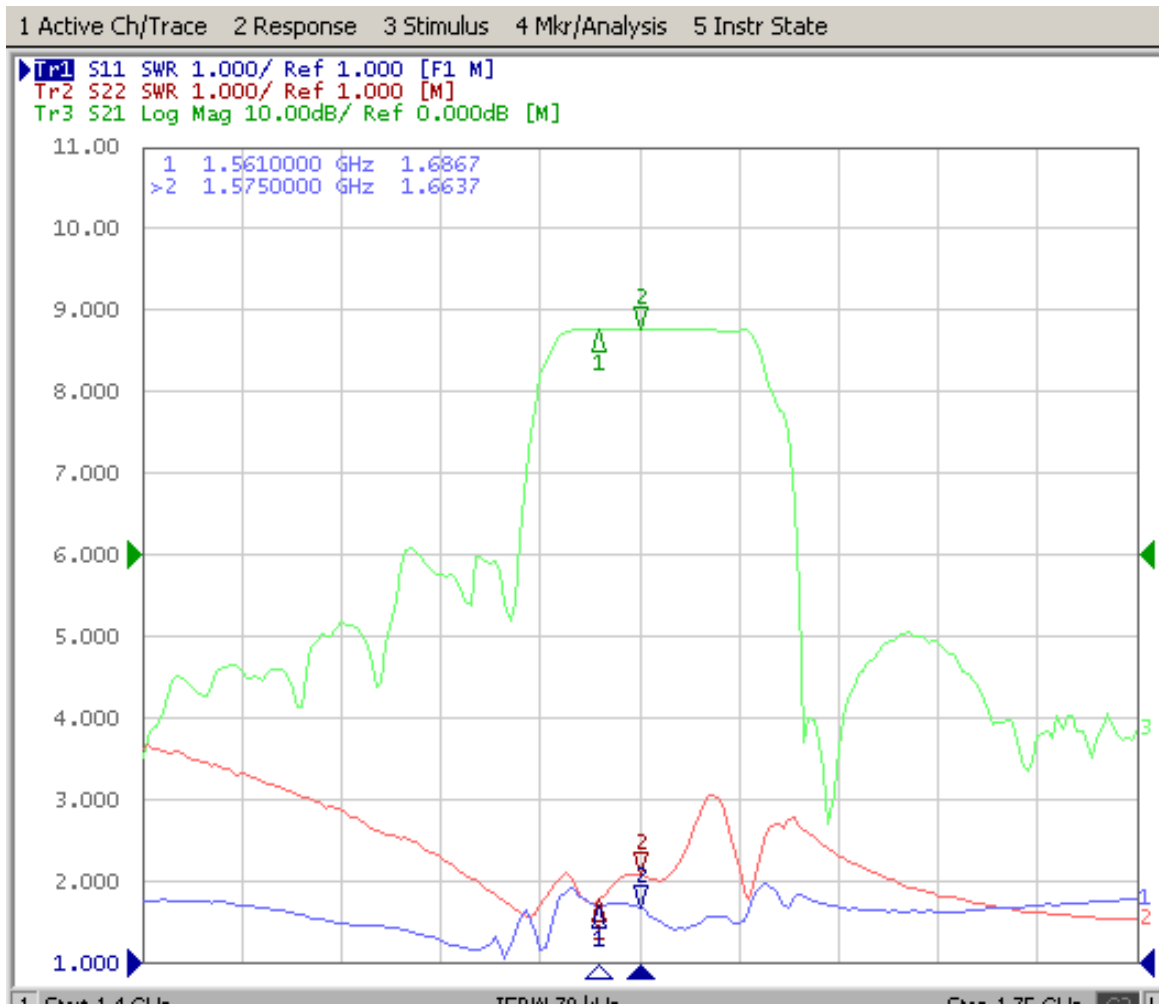
4.2.2. GNSS Antenna

- GNSS



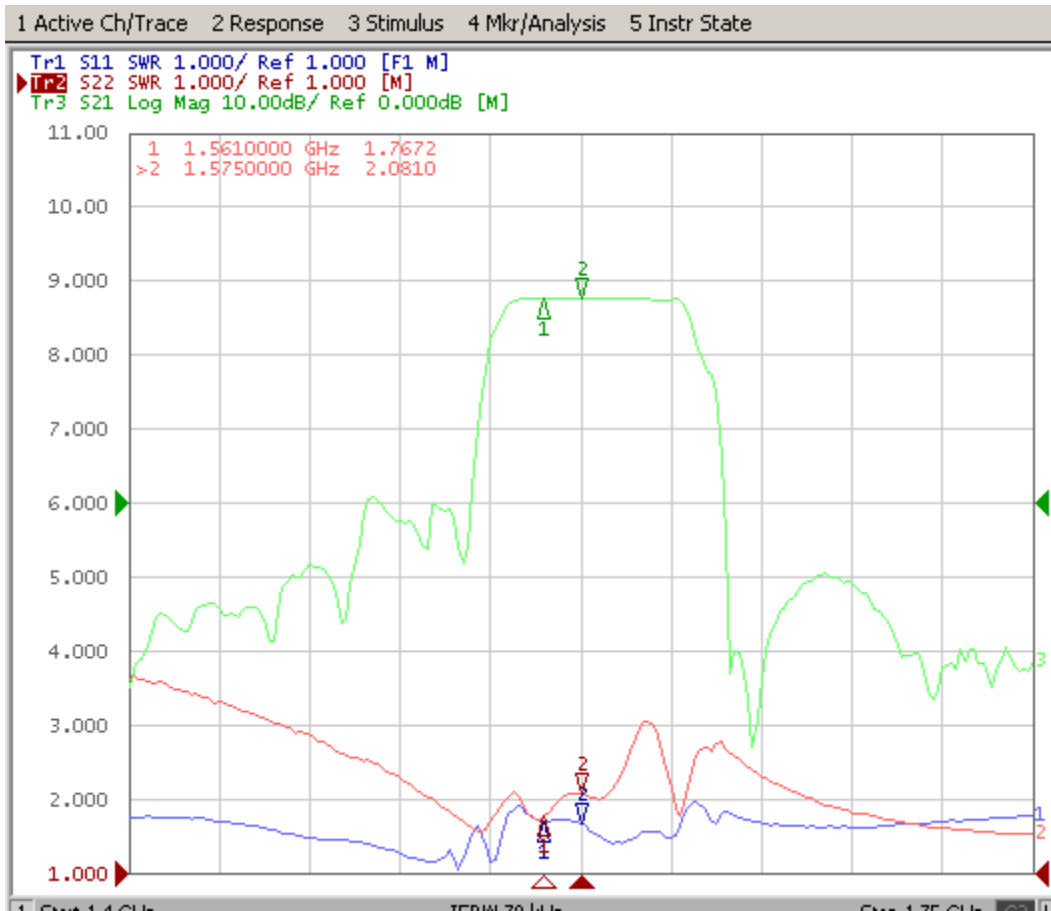
Frequency (MHz)	1561	1575
VSWR	1.95	1.55

- GNSS LNA (Input VSWR)



Frequency (MHz)	1561	1575
VSWR	1.68	1.66

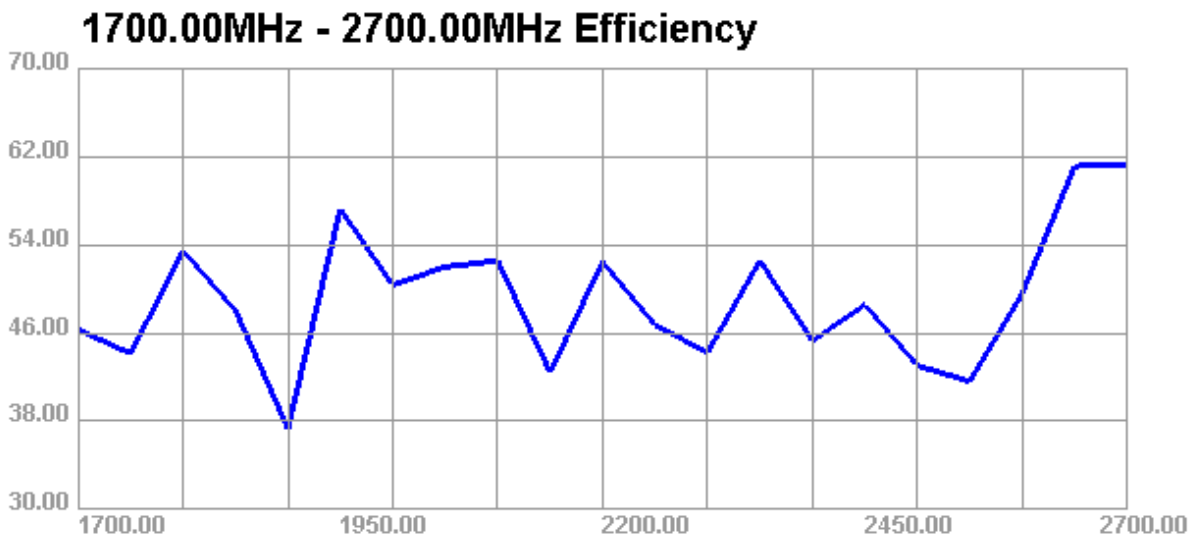
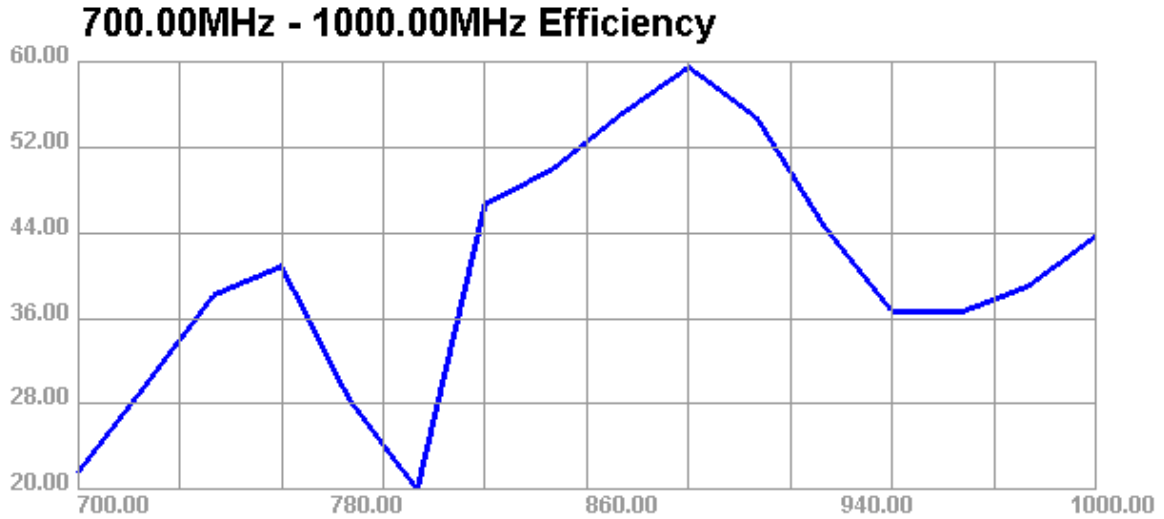
- GNSS LNA (Output VSWR)



Frequency (MHz)	1561	1575
VSWR	1.76	2.08

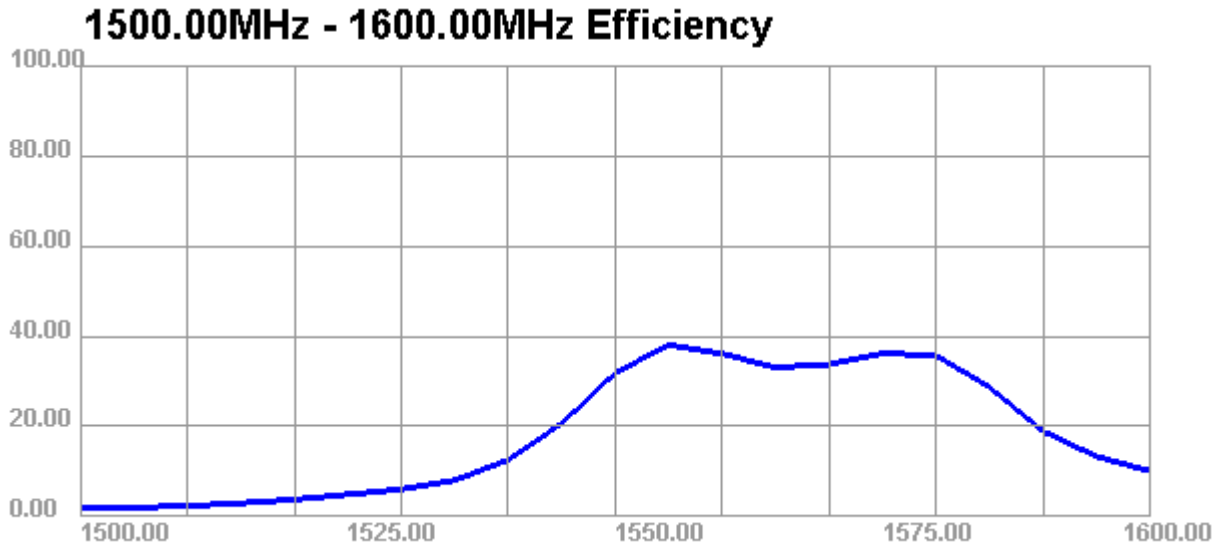
### 4.3. Efficiency

#### 4.3.1. 4G Antenna



<b>Frequency (MHz)</b>	698	880	960	1710	1880	2170	2400	2450	2570	2690
<b>Efficiency (%)</b>	21.6	59.47	36.53	46.33	48.06	42.44	45.3	48.58	41.62	61.14

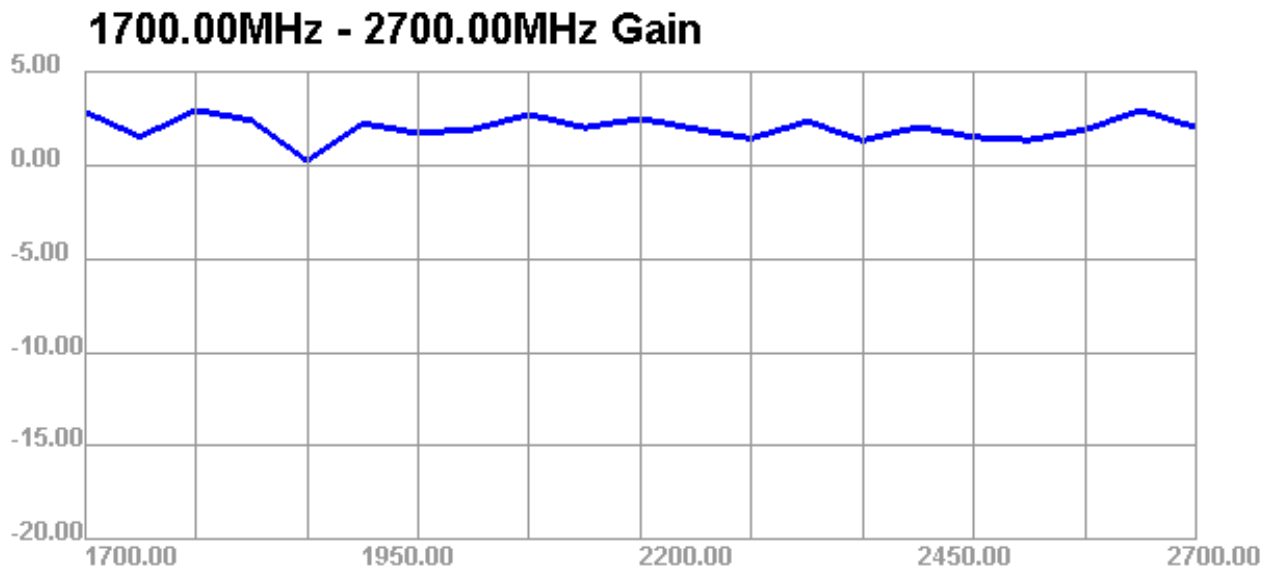
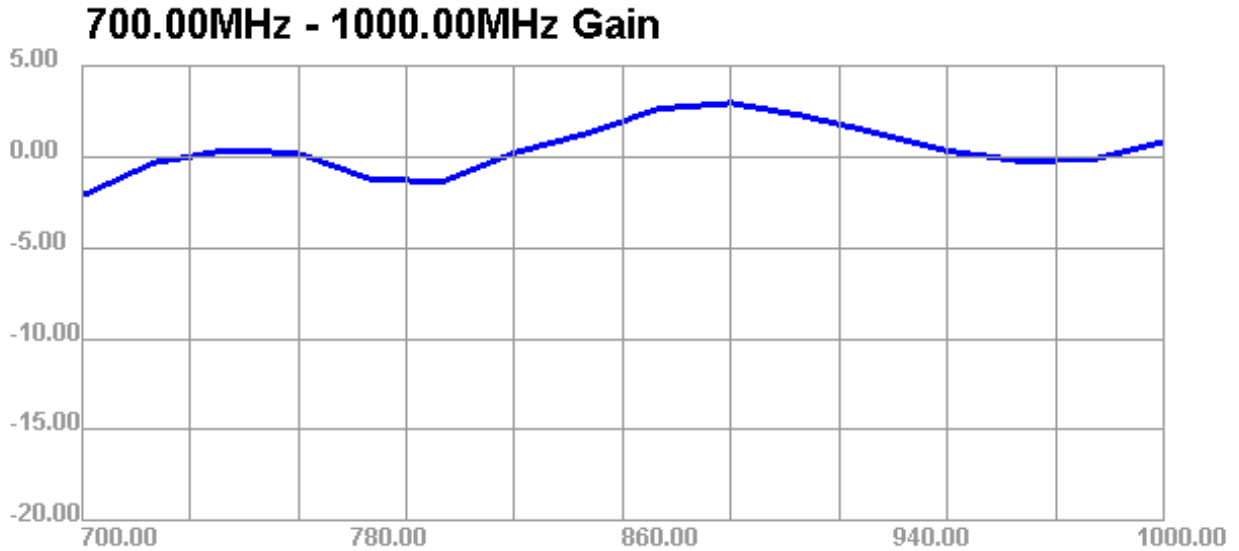
4.3.2. GNSS Antenna



Frequency (MHz)	1561	1575
Efficiency (%)	36.11	36.21

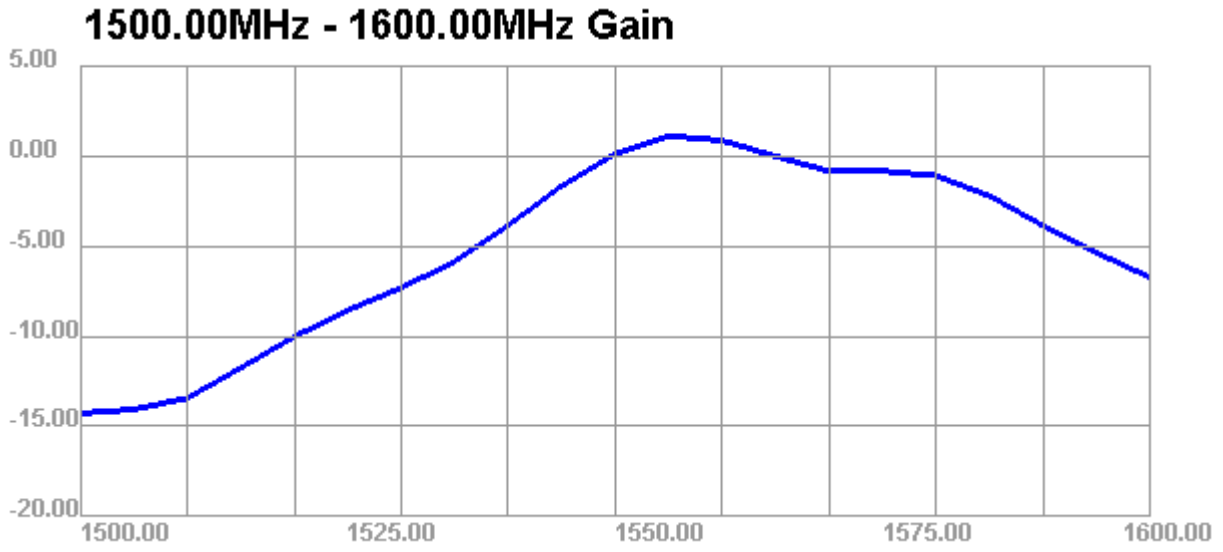
## 4.4. Gain

### 4.4.1. 4G Antenna



<b>Frequency (MHz)</b>	698	960	1710	1880	2170	2400	2450	2570	2690
<b>Gain (dBi)</b>	-2.16	-0.23	2.85	2.4	2.48	1.31	2.04	1.34	2.93

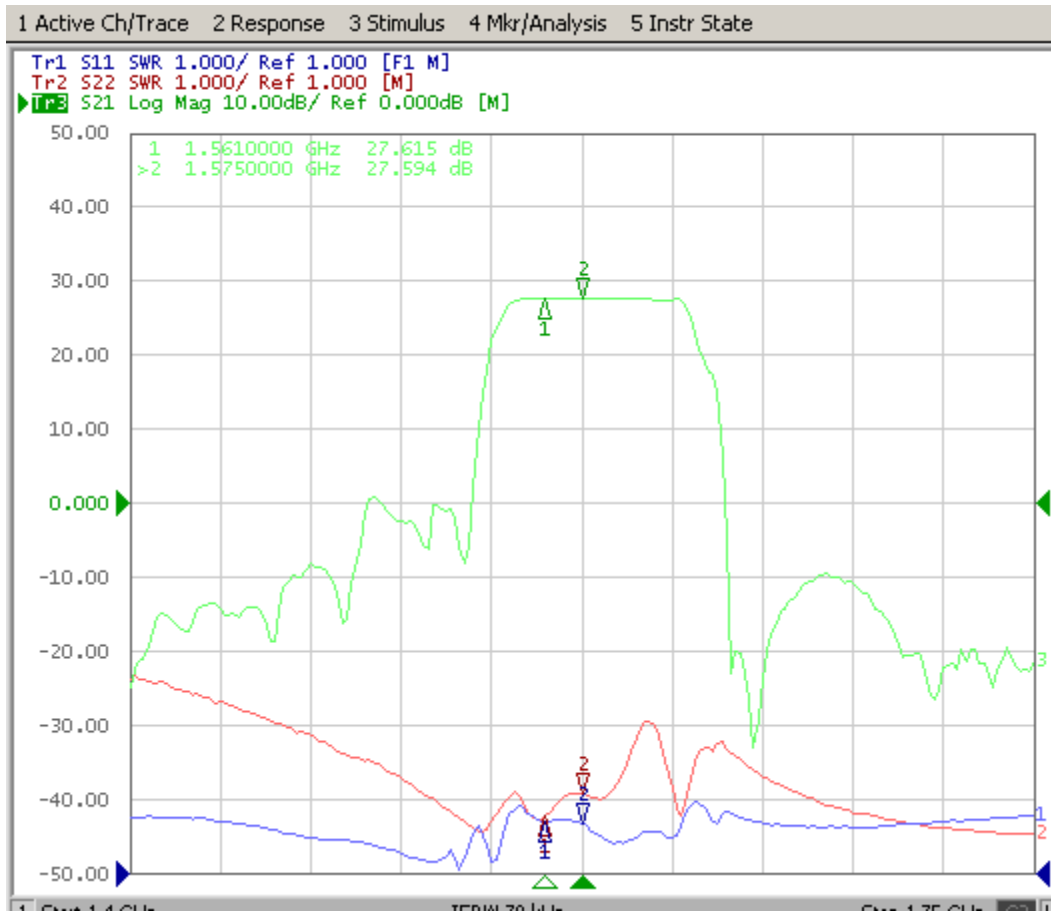
4.4.2. GNSS Antenna



Frequency (MHz)	1561	1575
Gain (dBi)	0.86	-0.84

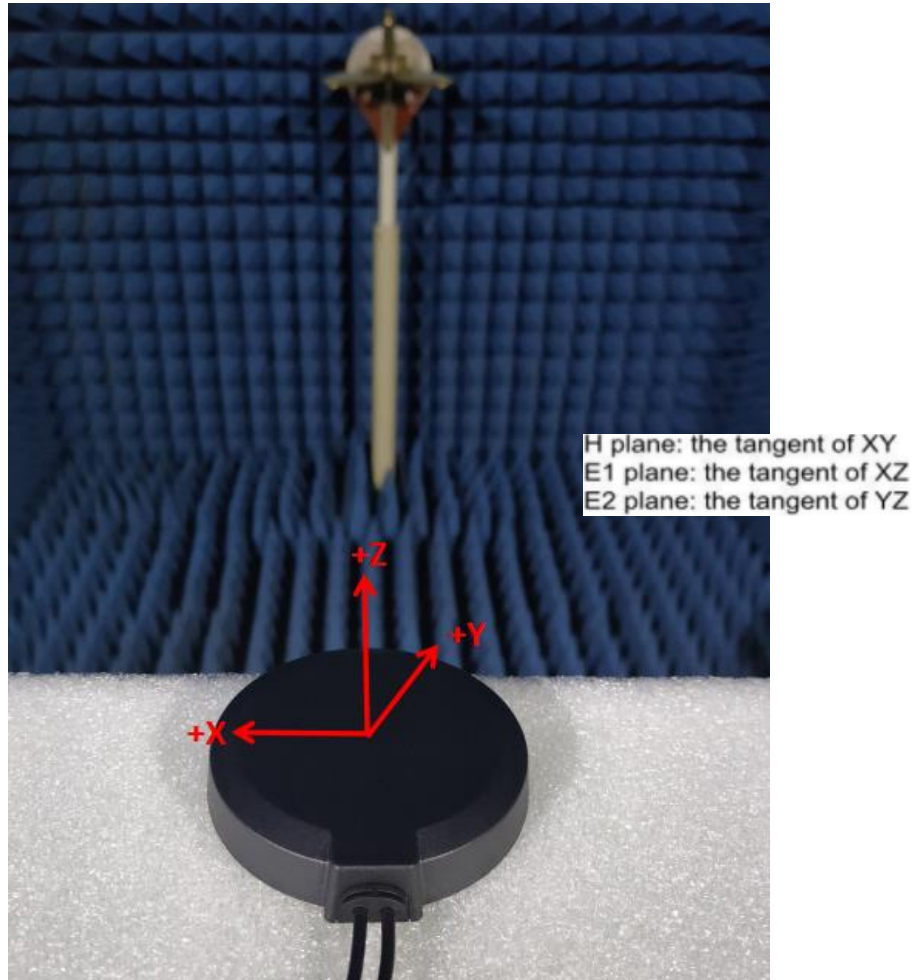


● GNSS LNA



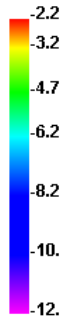
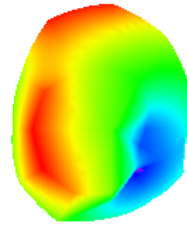
Frequency (MHz)	1561	1575
Gain (dB)	27.61	27.59

### 4.5. Radiation Pattern

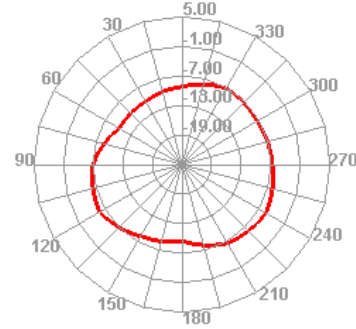


4.5.1. LTE Antenna

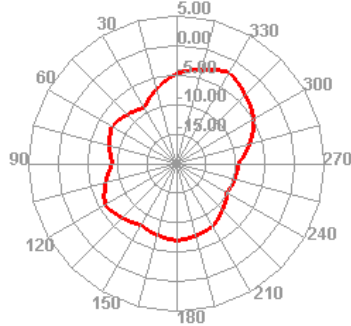
**700.000MHz**



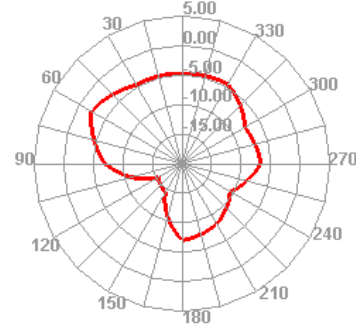
**700.000MHz H**



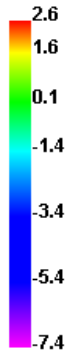
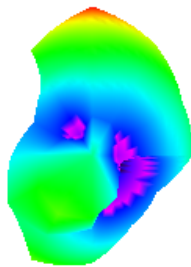
**700.000MHz E1**



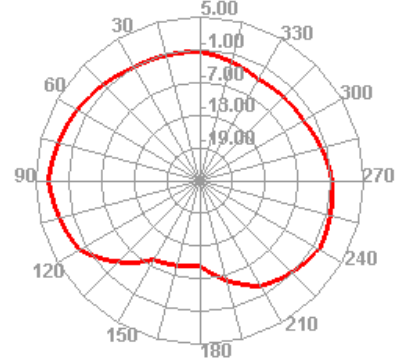
**700.000MHz E2**



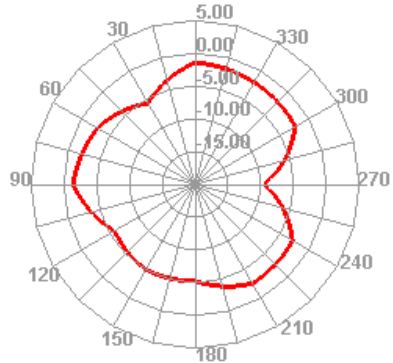
**860.000MHz**



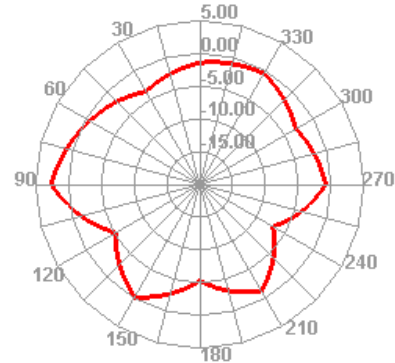
**860.000MHz H**



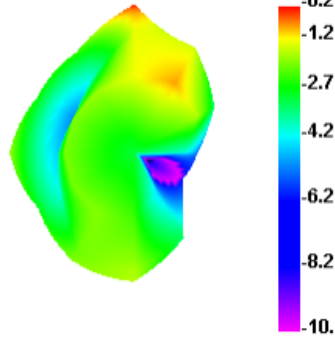
**860.000MHz E1**



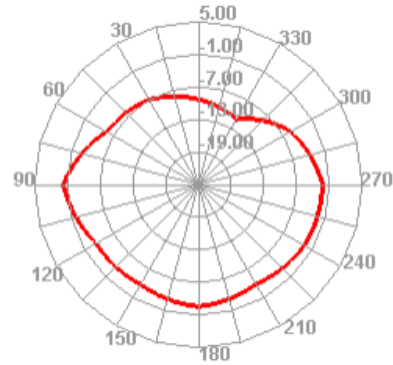
**860.000MHz E2**



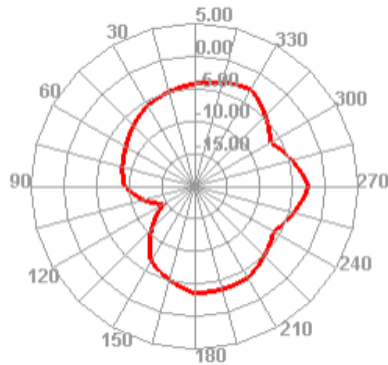
**960.000MHz**



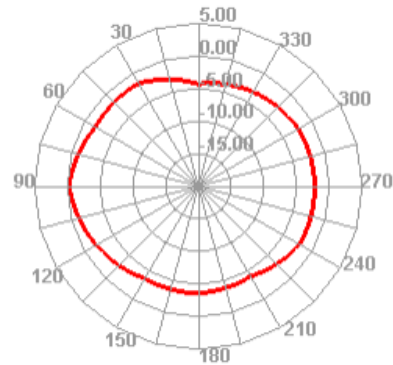
**960.000MHz H**



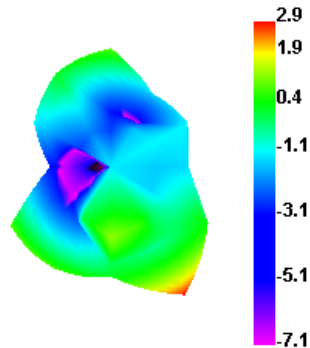
**960.000MHz E1**



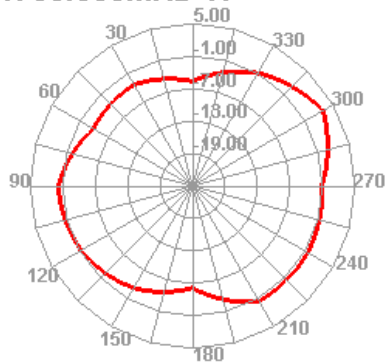
**960.000MHz E2**



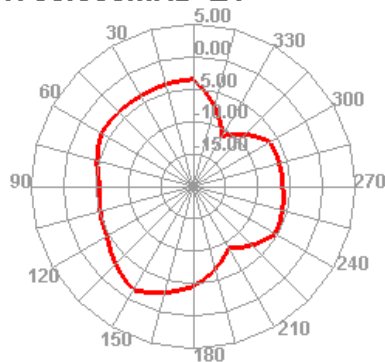
**1700.000MHz**



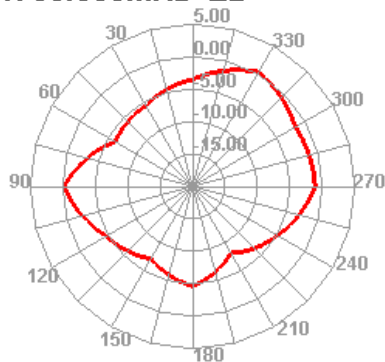
**1700.000MHz H**



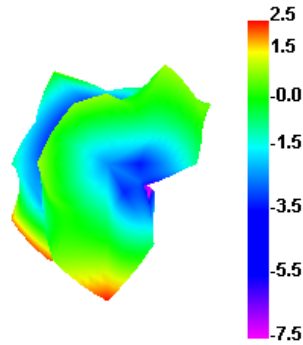
**1700.000MHz E1**



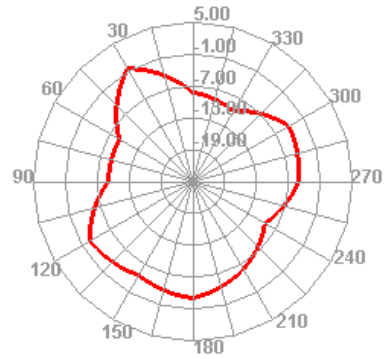
**1700.000MHz E2**



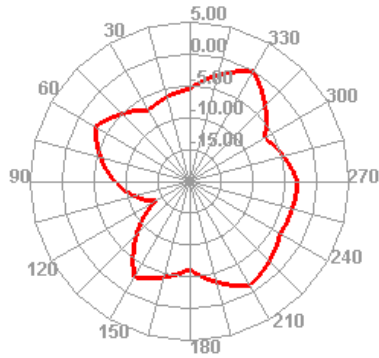
**2200.000MHz**



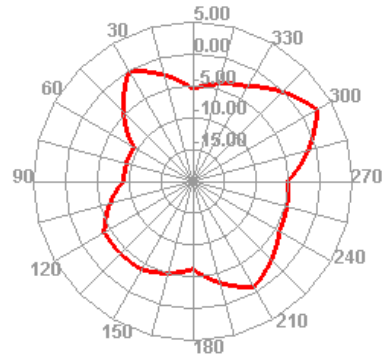
**2200.000MHz H**



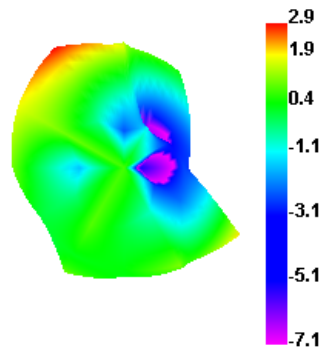
**2200.000MHz E1**



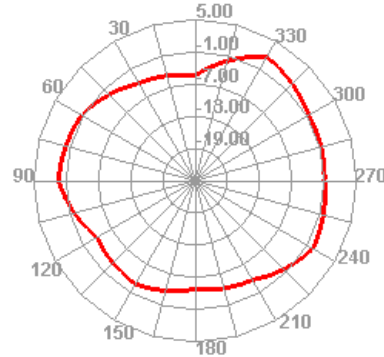
**2200.000MHz E2**



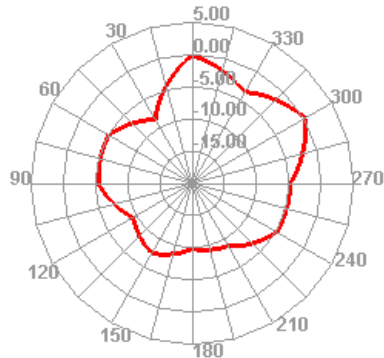
**2650.000MHz**



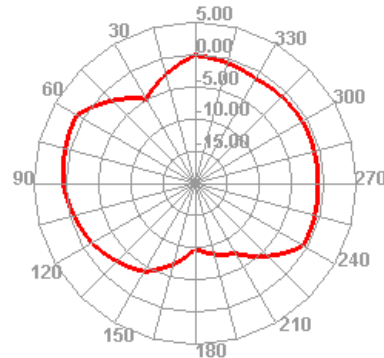
**2650.000MHz H**



**2650.000MHz E1**

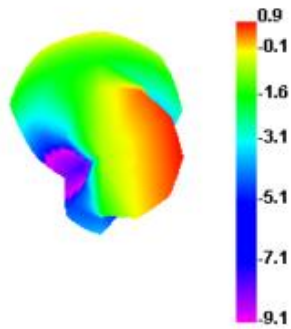


**2650.000MHz E2**

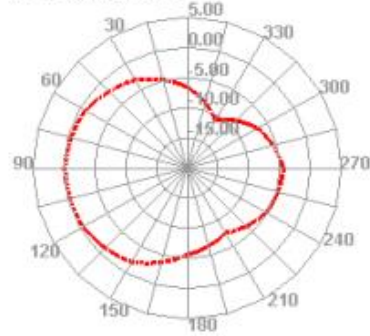


4.5.2. GNSS Antenna

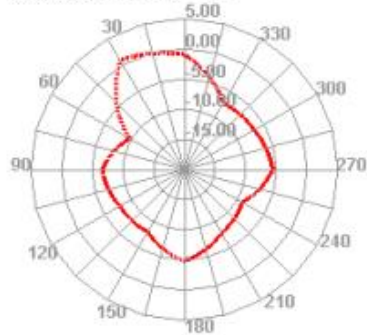
**1560.000MHz**



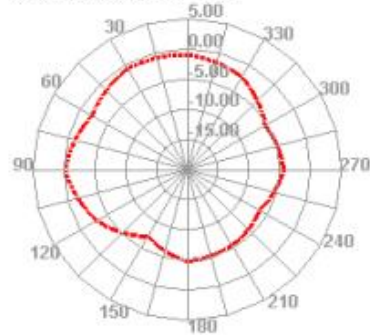
**1560.000MHz H**



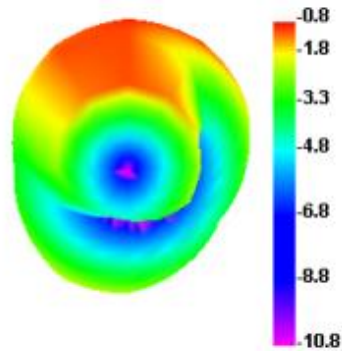
**1560.000MHz E1**



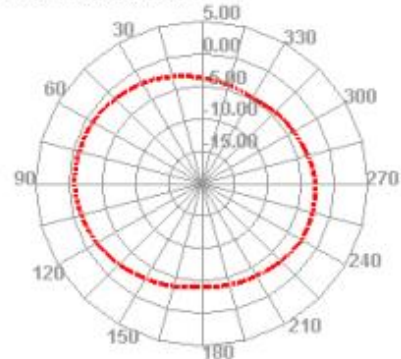
**1560.000MHz E2**



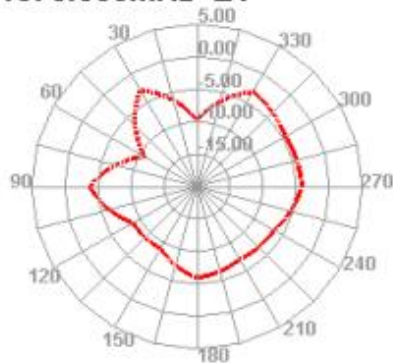
**1575.000MHz**



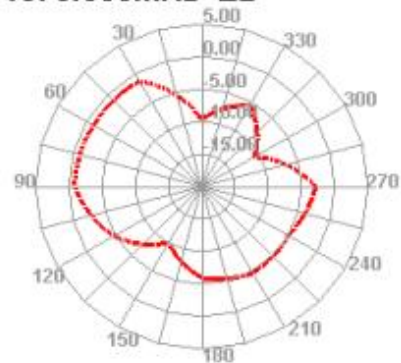
**1575.000MHz H**



**1575.000MHz E1**



**1575.000MHz E2**



## 5 Product Size

