

# 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/<br>Aria CHU | Updated all test information in the datasheet. |

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## 1 Product Description

The antenna is designed for superior performance, and can be widely used for wireless 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<br>GNSS: 1575.42 ±5 MHz, 1561.098 ±5 MHz |
| Input Impedence   | 50 Ω                                                                         |
| VSWR              | ≤ 3.0                                                                        |
| Gain              | 4G MAIN: ≤ 4.0 dBi<br>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<br>LMR100, Cable Length = 3000 mm |
| Casing       | ABS + PC                                            |

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

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## 4 Overall Performance

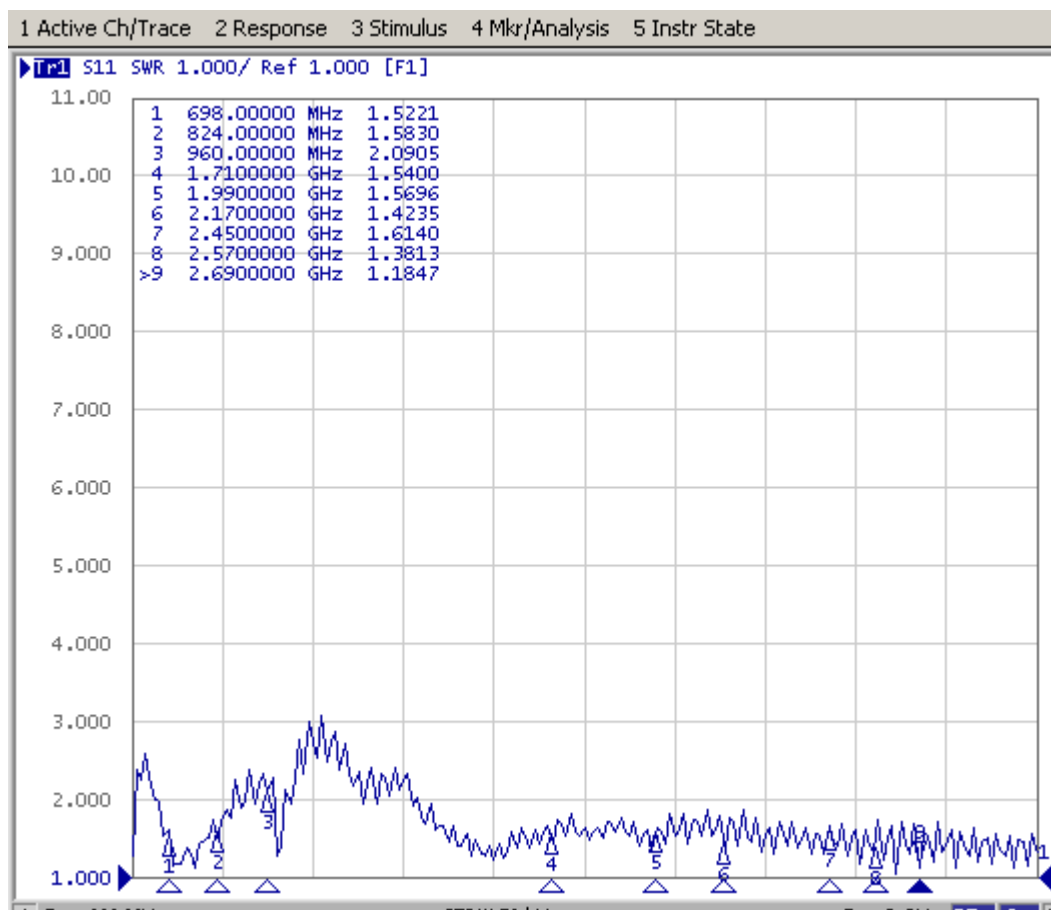
### 4.1. Test Environment

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



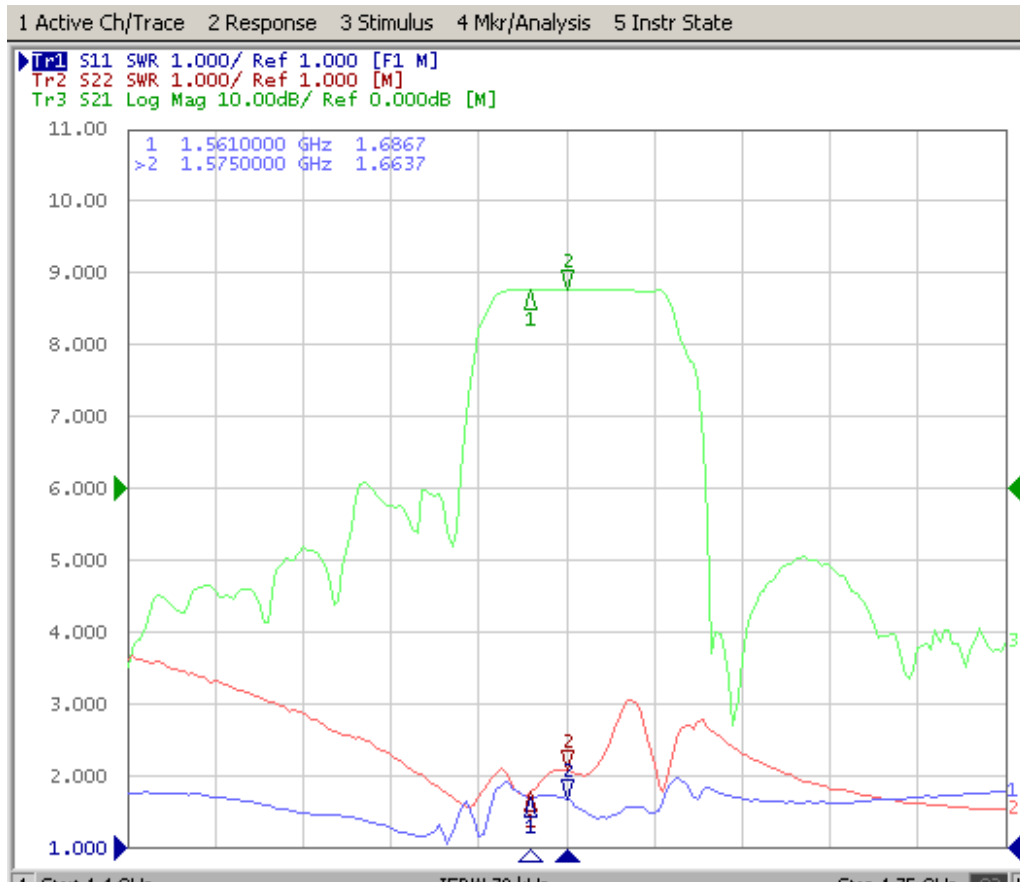
## 4.2. VSWR

### 4.2.1. 4G

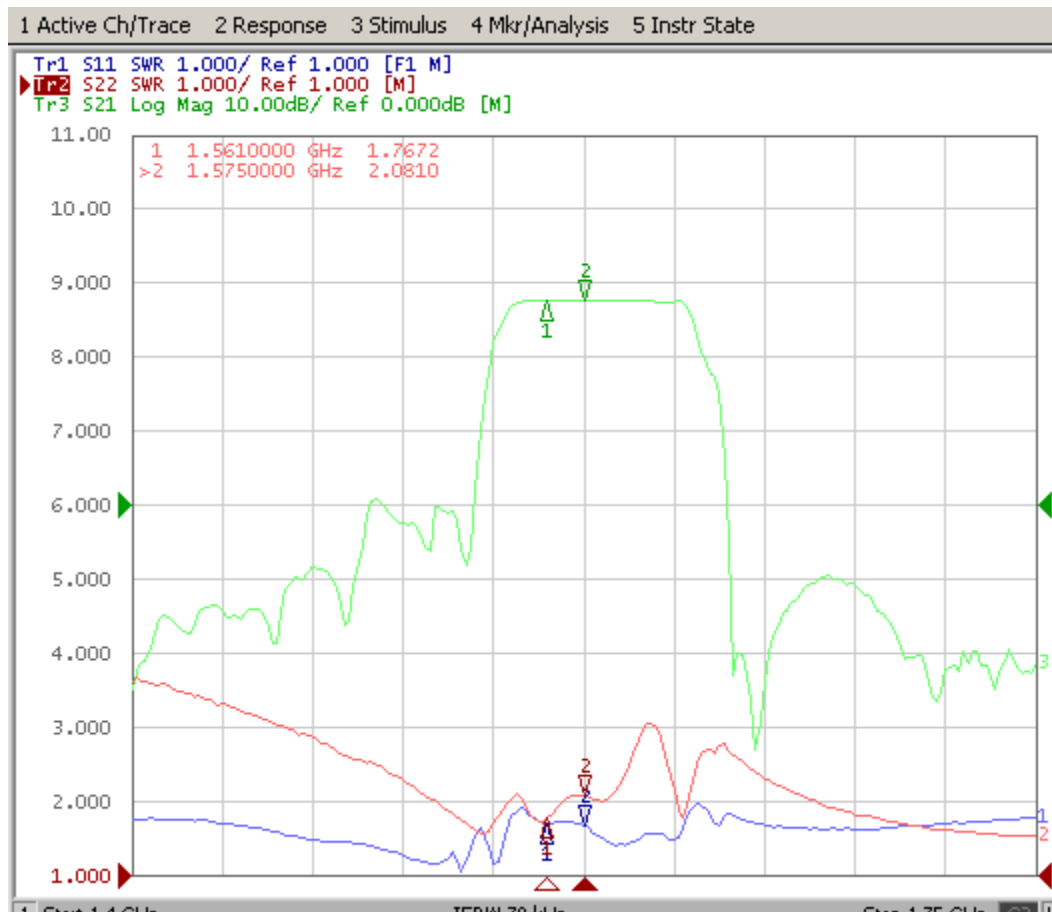


| Frequency (MHz) | 698  | 824  | 960  | 1710 | 1990 | 2170 | 2450 | 2570 | 2690 |
|-----------------|------|------|------|------|------|------|------|------|------|
| VSWR            | 1.52 | 1.58 | 2.09 | 1.54 | 1.57 | 1.42 | 1.61 | 1.38 | 1.18 |

#### 4.2.2. GNSS Antenna



|                 |      |      |
|-----------------|------|------|
| Frequency (MHz) | 1561 | 1575 |
| VSWR            | 1.68 | 1.66 |

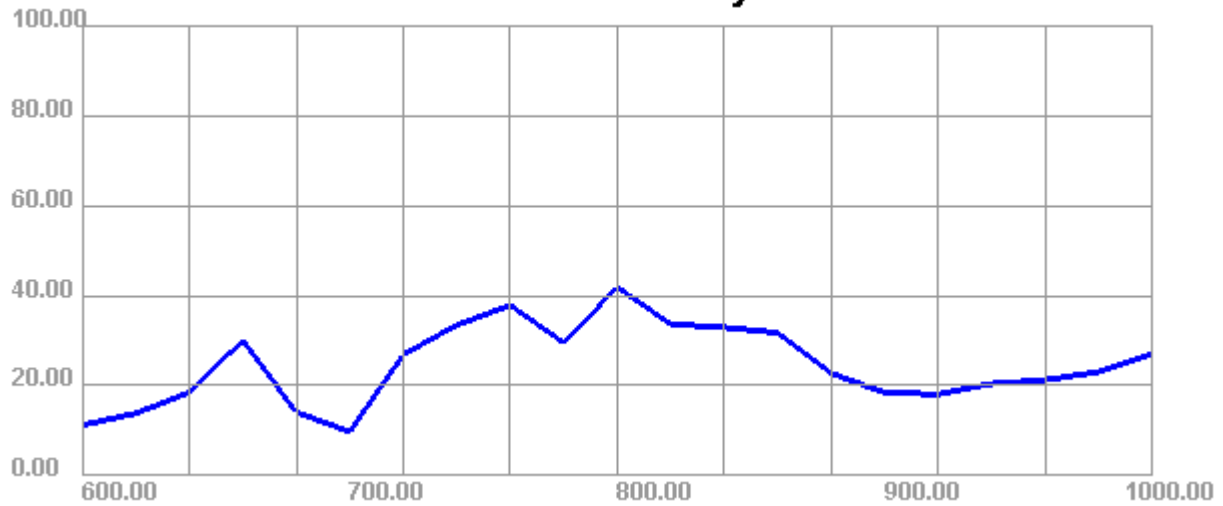


|                 |      |      |
|-----------------|------|------|
| Frequency (MHz) | 1561 | 1575 |
| VSWR            | 1.76 | 2.08 |

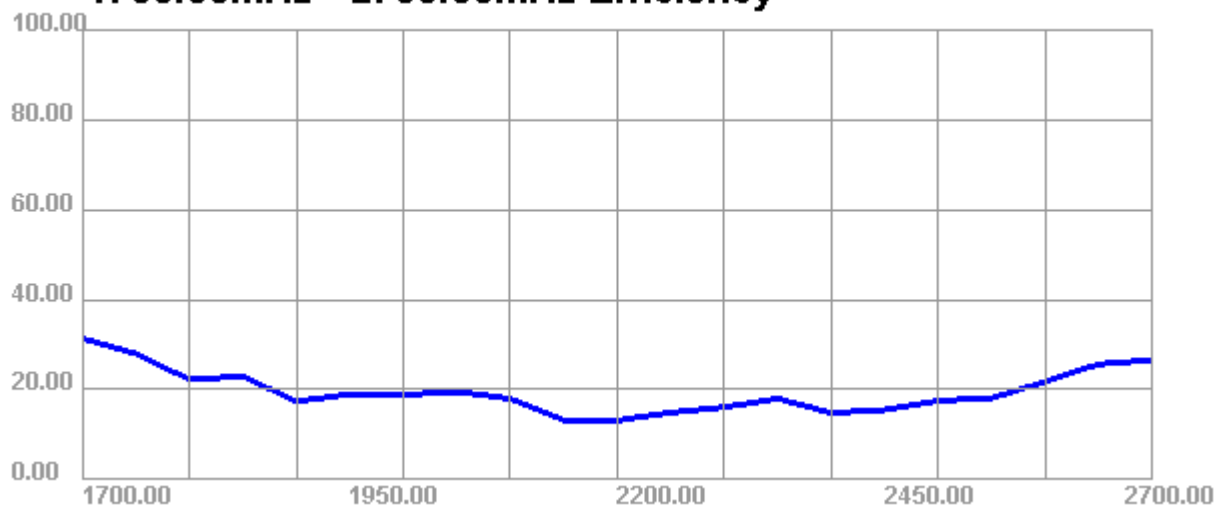
### 4.3. Efficiency

#### 4.3.1. 4G

**600.00MHz - 1000.00MHz Efficiency**



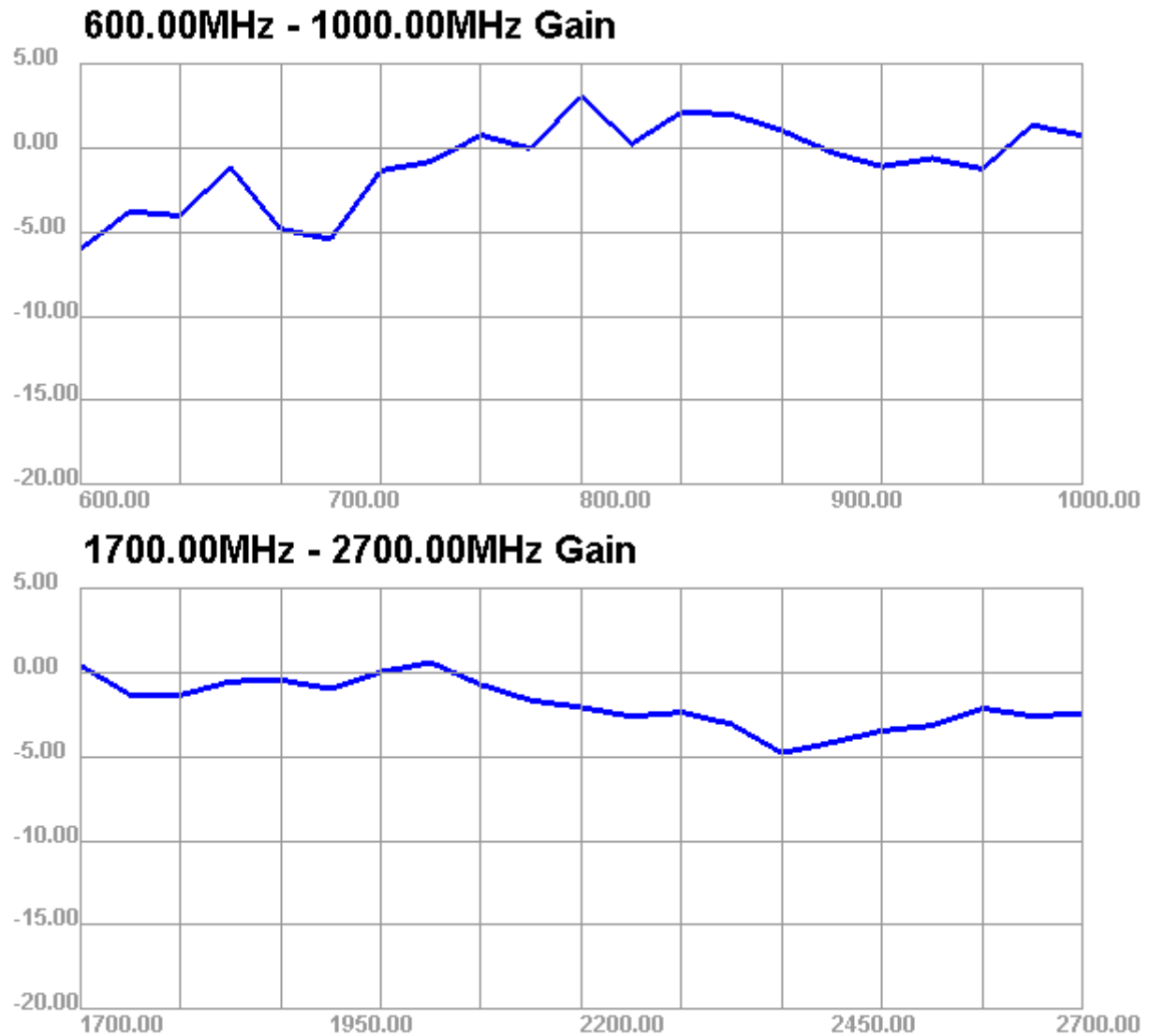
**1700.00MHz - 2700.00MHz Efficiency**



| 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 |

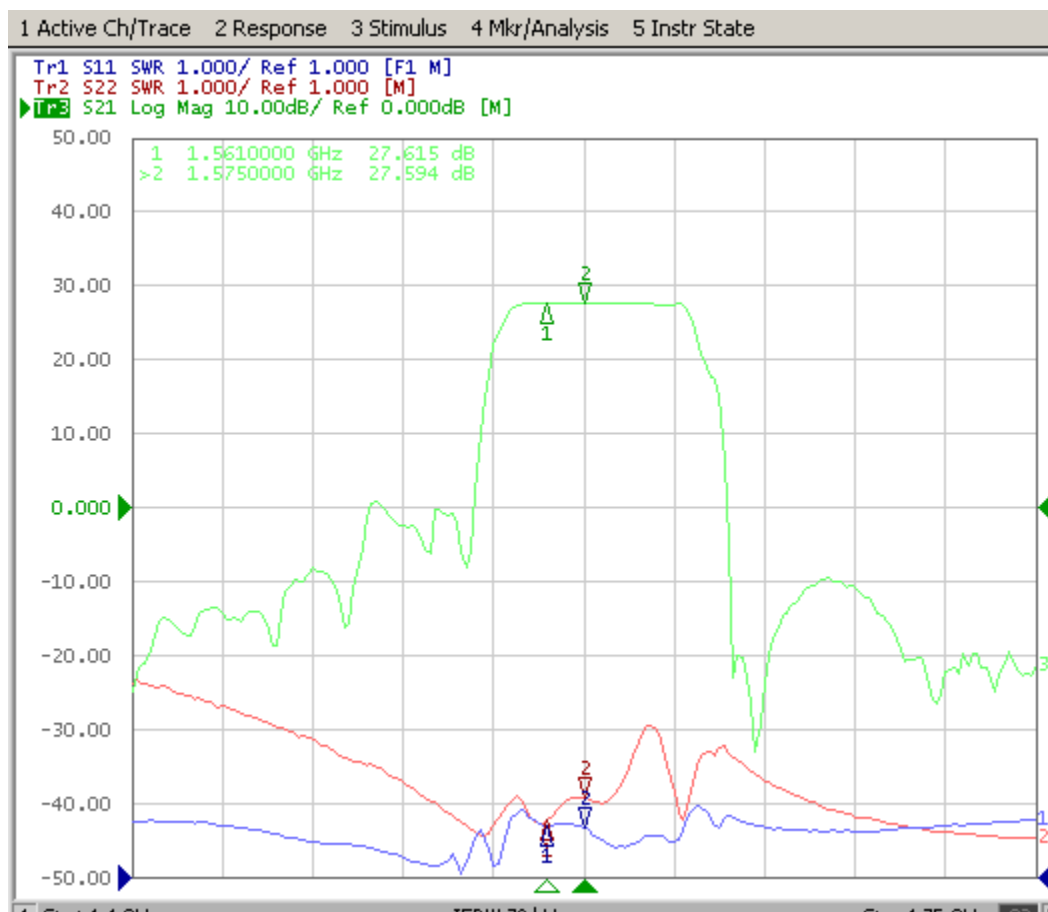
## 4.4. Gain

### 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 |

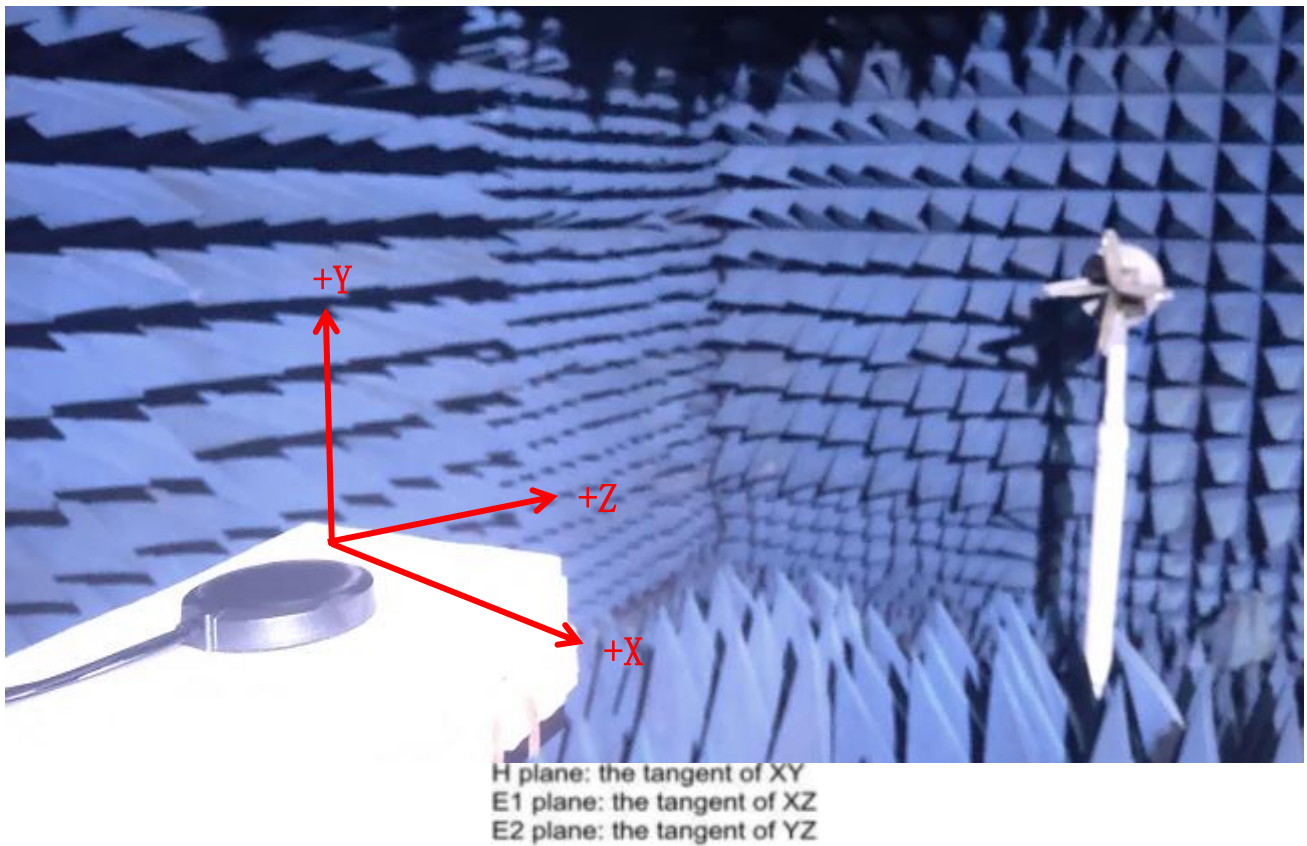
#### 4.4.2. GNSS Antenna LNA Data



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

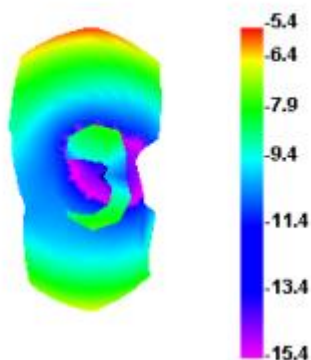
## 4.5. Radiation Pattern

- Test condition: free space.

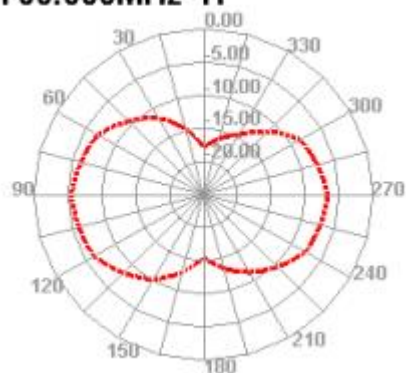




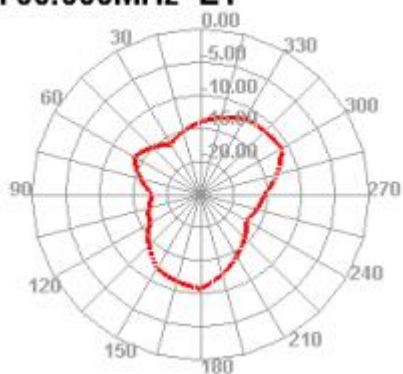
**700.000MHz**



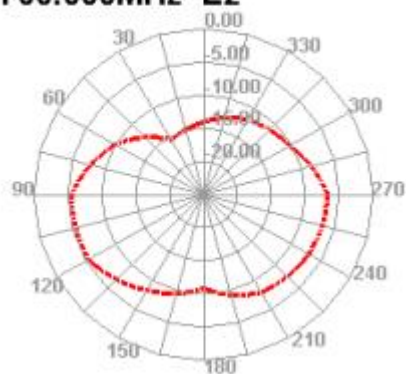
**700.000MHz H**



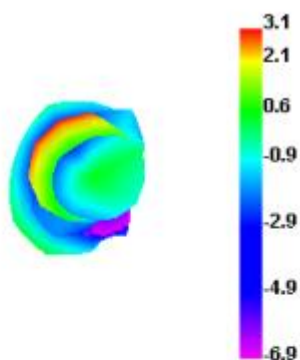
**700.000MHz E1**



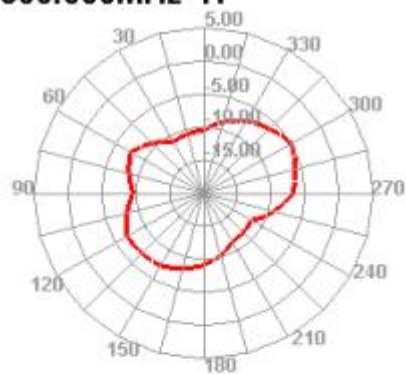
**700.000MHz E2**



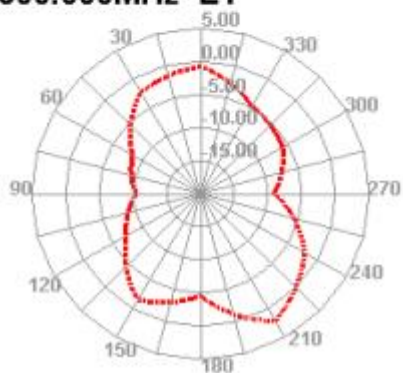
**800.000MHz**



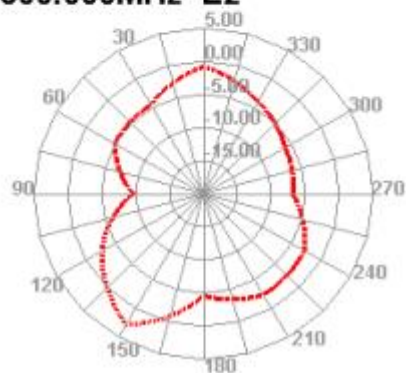
**800.000MHz H**



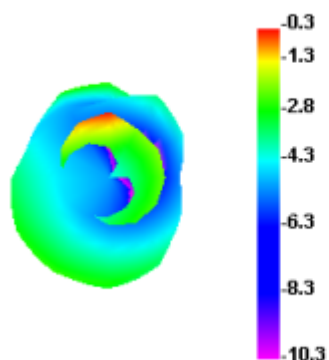
**800.000MHz E1**



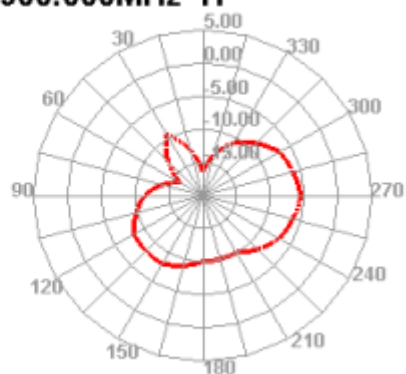
**800.000MHz E2**



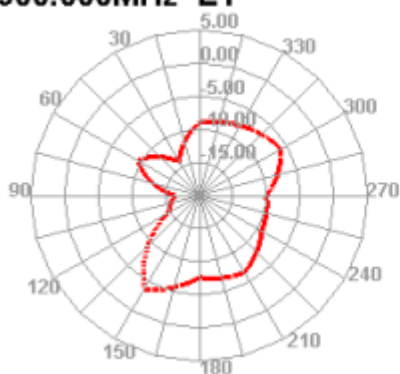
**900.000MHz**



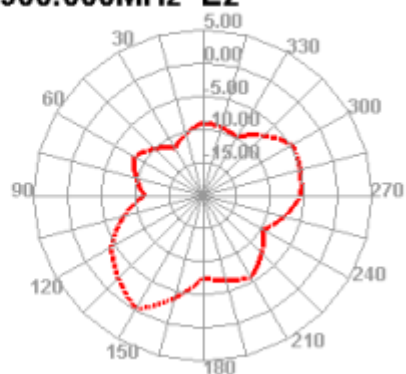
**900.000MHz H**



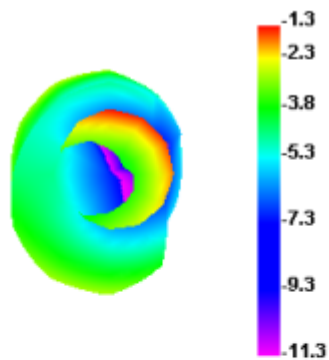
**900.000MHz E1**



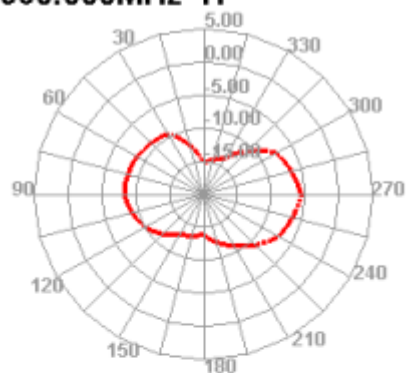
**900.000MHz E2**



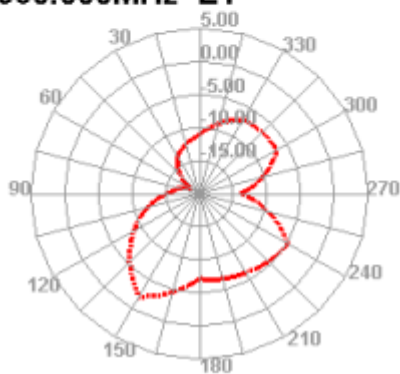
**960.000MHz**



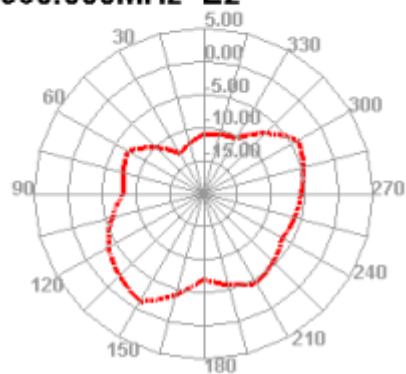
**960.000MHz H**



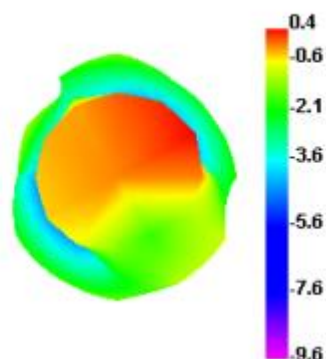
**960.000MHz E1**



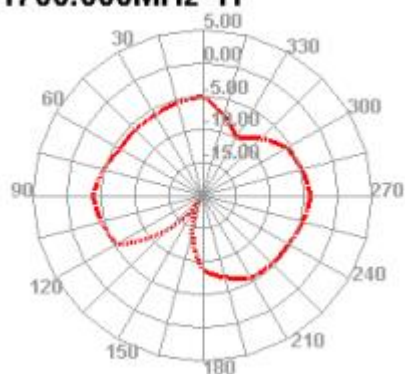
**960.000MHz E2**



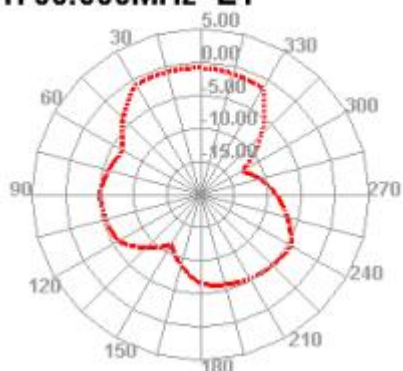
**1700.000MHz**



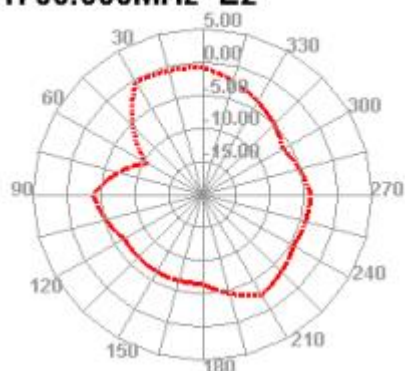
**1700.000MHz H**



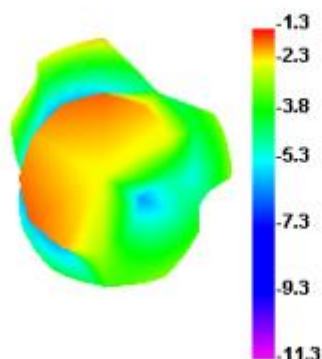
**1700.000MHz E1**



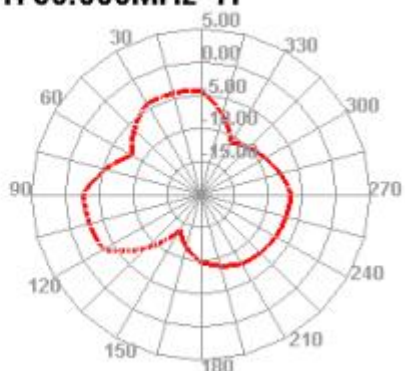
**1700.000MHz E2**



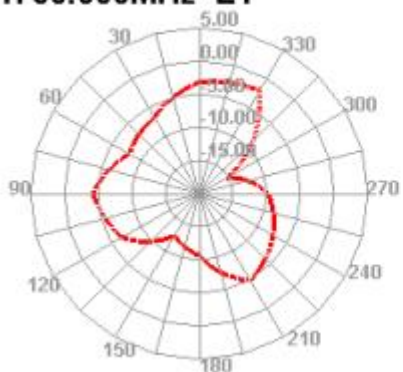
**1750.000MHz**



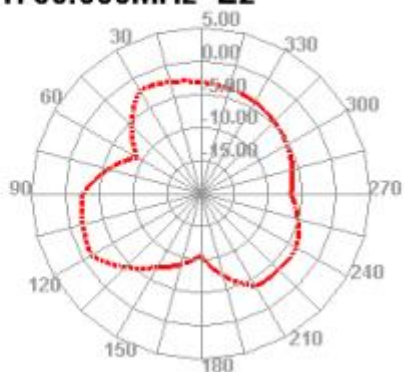
**1750.000MHz H**



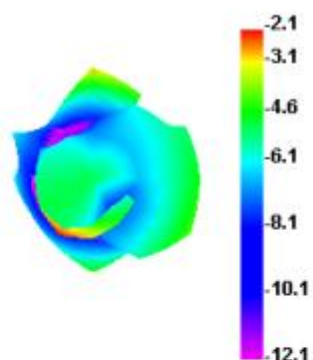
**1750.000MHz E1**



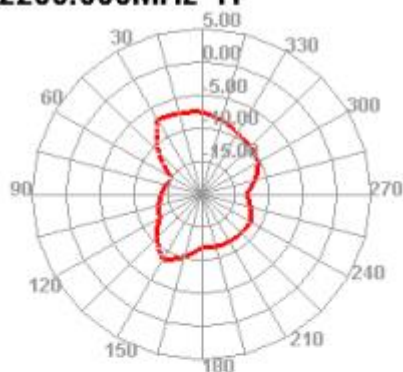
**1750.000MHz E2**



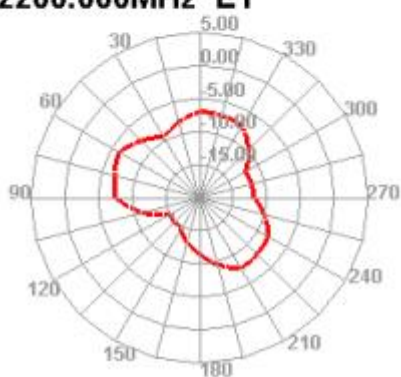
**2200.000MHz**



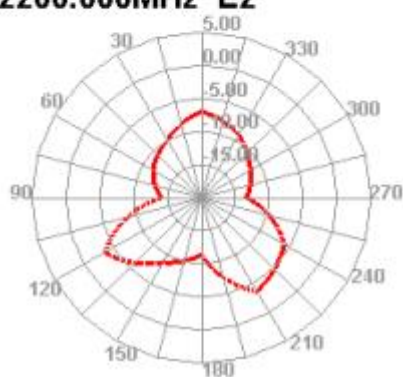
**2200.000MHz H**



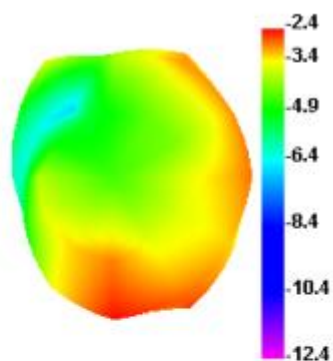
**2200.000MHz E1**



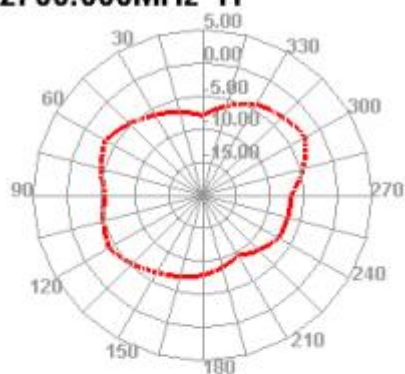
**2200.000MHz E2**



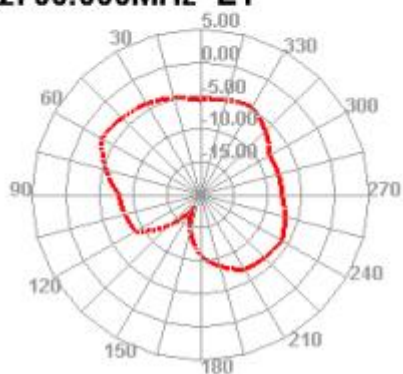
**2700.000MHz**



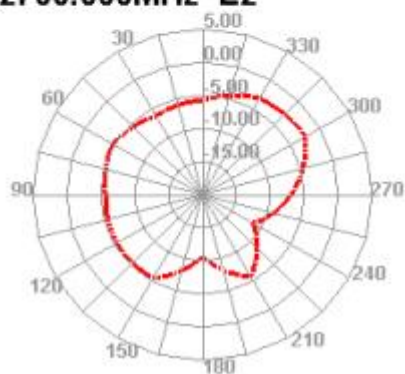
**2700.000MHz H**



**2700.000MHz E1**



**2700.000MHz E2**





## 5 Product Size

