# Antenna

# YB0033AA Datasheet

**Antenna Services**

Version: 1.0

Date: 2021-07-05

Status: Released

**Our aim is to provide customers with timely and comprehensive service. For any assistance, please contact our company headquarters:**

**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

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# About the Document

## Revision History

| Version | Date | Author | Note |
|---|---|---|---|
| - | 2021-07-05 | Kenny YIN/ Aria CHU | Creation of the document |
| 1.0 | 2021-07-05 | Kenny YIN/ Aria CHU | First official release |

# Contents

# 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; GPS L1
- High efficiency
- Excellent performance

# 3 Product Specifications

| LTE Electrical Specifications | |
|---|---|
| Frequency Range | 700–2700 MHz |
| Input Impendence | 50 Ω |
| VSWR | ≤ 3 |
| Gain | ≤ 3.0 dBi |
| Polarization Type | Linear |
| **GPS L1 Antenna Electrical Specifications** | |
| Frequency Range | GPS L1: 1575 ±3 MHz |
| Working Voltage | 3–5 V |
| Working Current | 9 ±3 mA @ 3 V |
| Gain | 20 ±3 dB |
| Noise Figure | ≤ 2 dB |
| VSWR | ≤ 2 |
| Input Impendence | 50 Ω |
| Polarization Type | RHCP |
| **Mechanical Specifications** | |
| Antenna Box Size | Φ 120 mm × 43 mm |
| Casing | KIBILAC® ASA |
| Connector Type | SMA Male (Center Pin) |
| Working Temperature | -20 °C to +85 °C |
| Radome Color | Black |
| IP Rating | IP67 |
| Mounting Type | Screw |

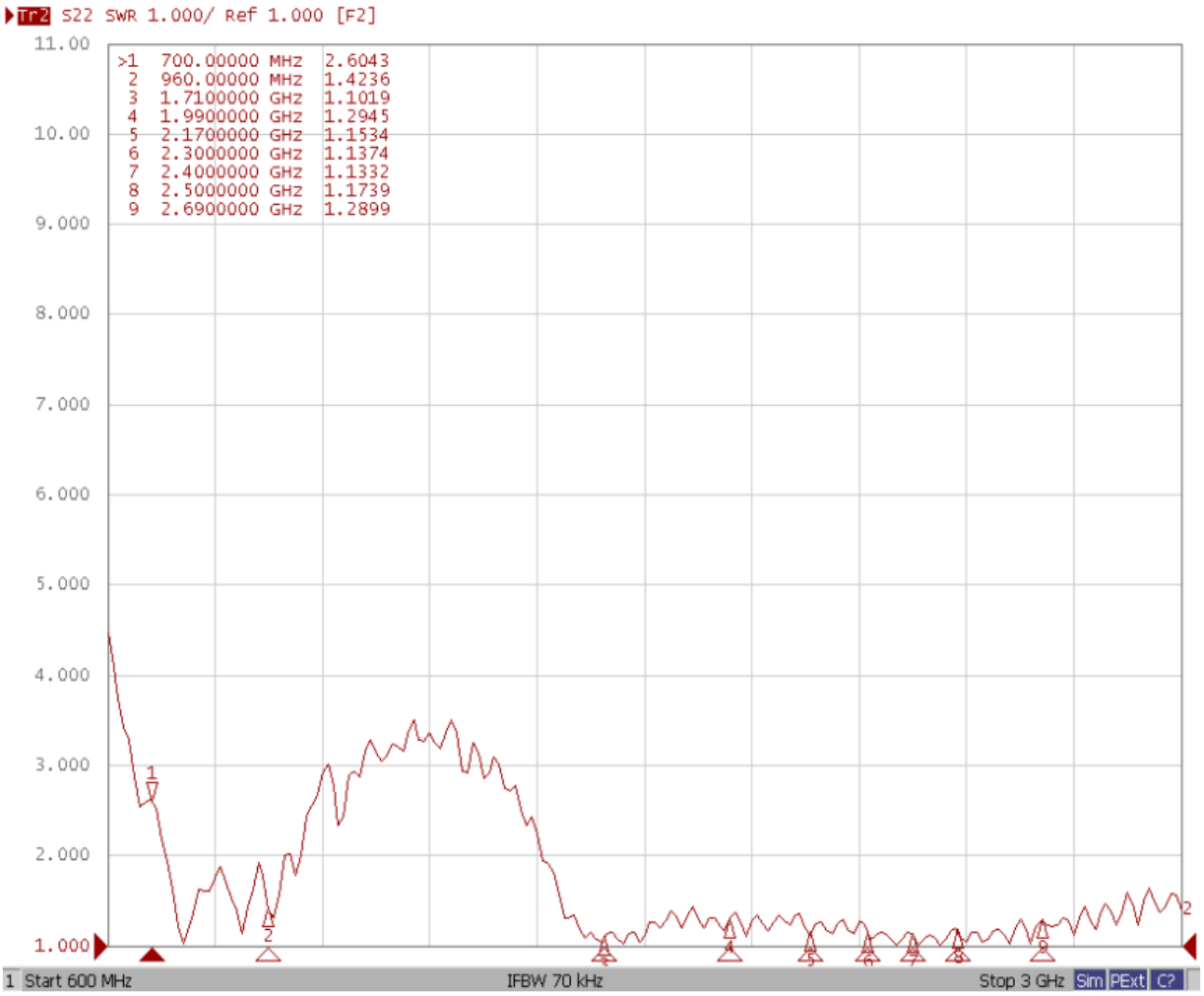
# 4 Overall Performance

## 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

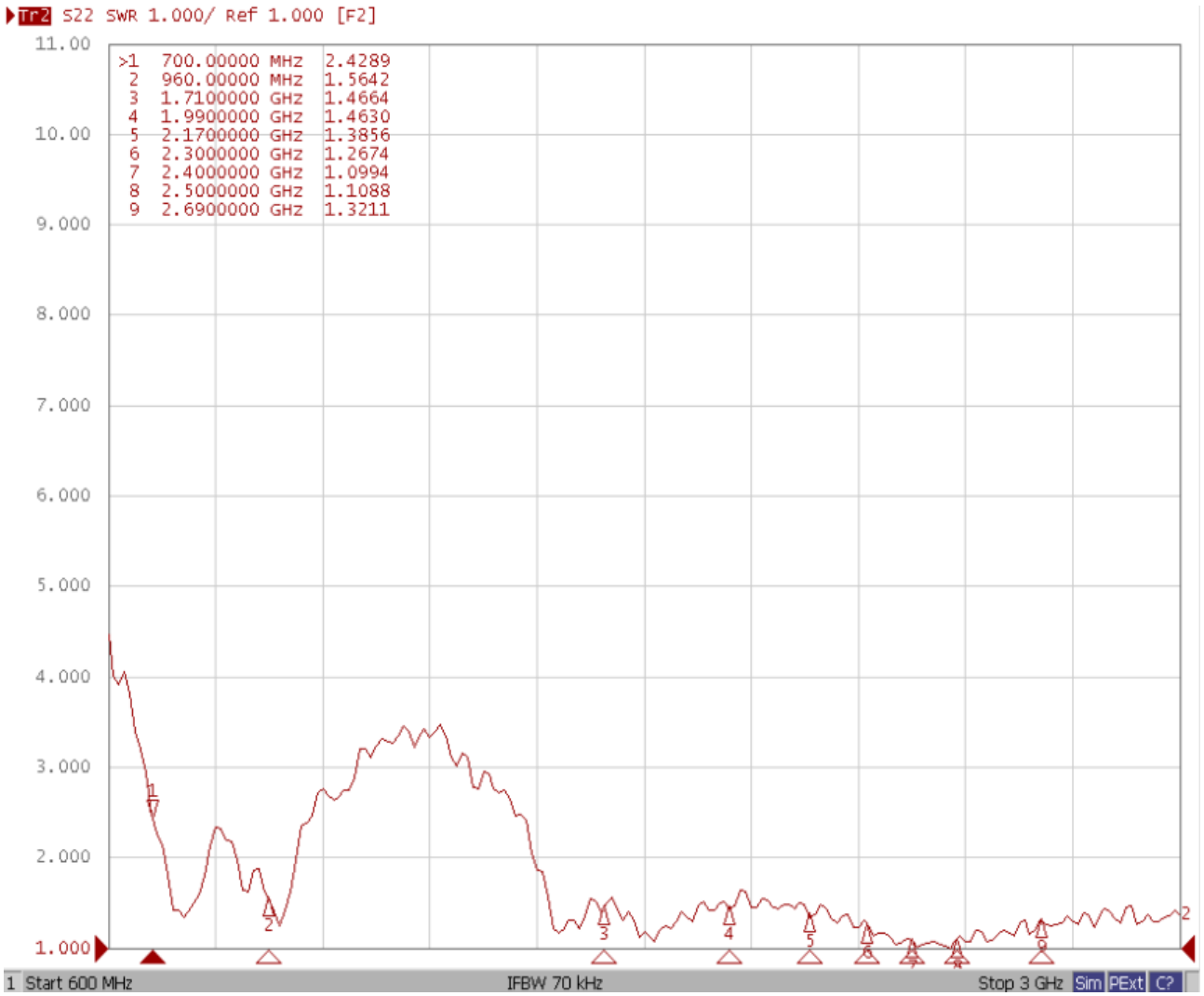
## 4.2. VSWR

### 4.2.1. LTE MIMO 1




| Frequency (MHz) | 700 | 960 | 1710 | 2170 | 2300 | 2400 | 2500 | 2690 |
|---|---|---|---|---|---|---|---|---|
| VSWR | 2.60 | 1.42 | 1.10 | 1.15 | 1.13 | 1.13 | 1.17 | 1.28 |

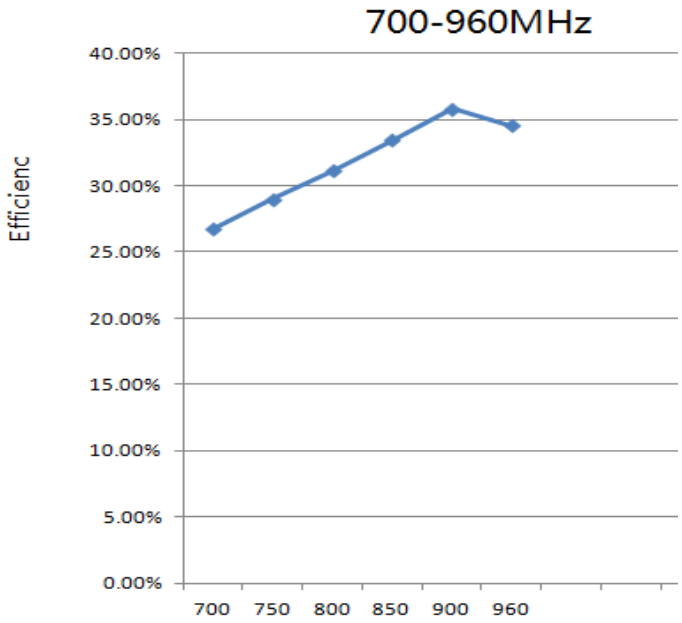
### 4.2.2. LTE MIMO 2

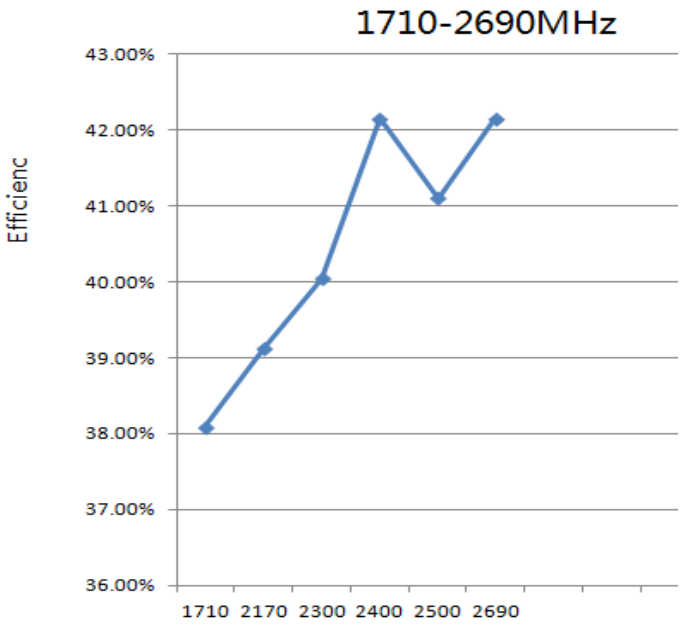



| Frequency (MHz) | 700 | 960 | 1710 | 2170 | 2300 | 2400 | 2500 | 2690 |
|---|---|---|---|---|---|---|---|---|
| VSWR | 2.42 | 1.56 | 1.46 | 1.38 | 1.26 | 1.09 | 1.10 | 1.32 |

## 4.3. Efficiency

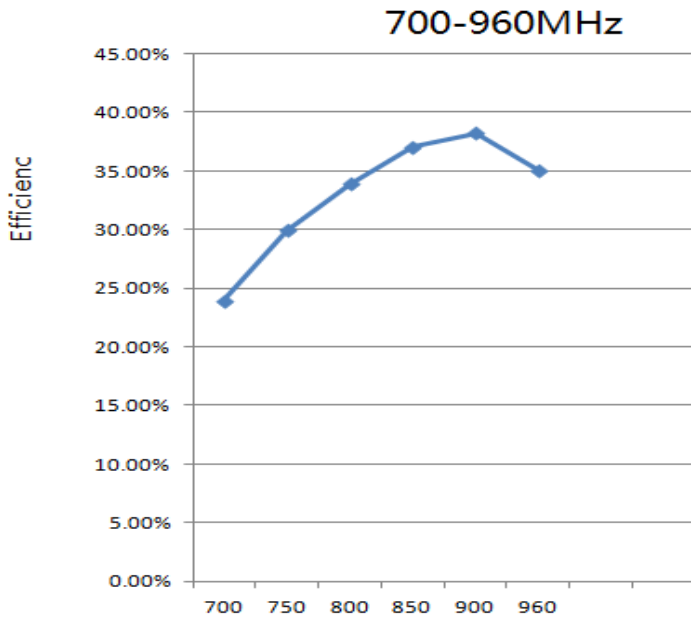
### 4.3.1. LTE MIMO 1

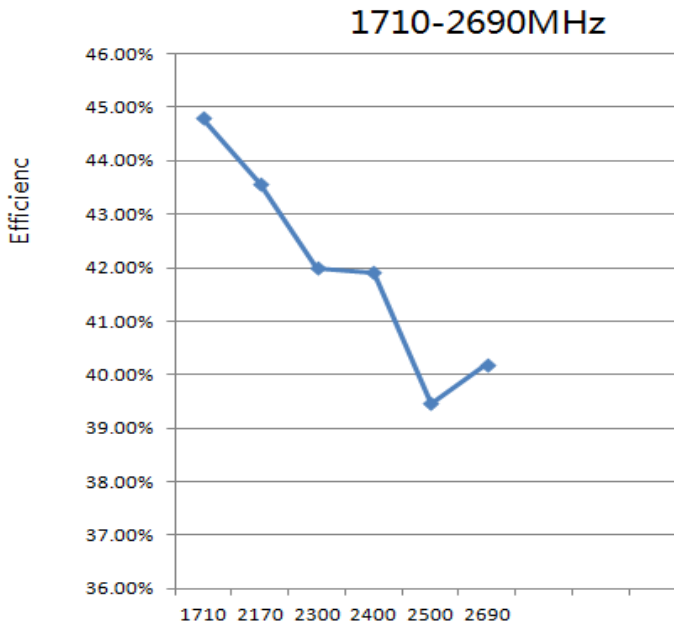



| Frequency (MHz) | 700 | 960 | 1710 | 2170 | 2300 | 2400 | 2500 | 2690 |
|---|---|---|---|---|---|---|---|---|
| Efficiency (%) | 26.73 | 34.54 | 38.09 | 39.12 | 40.04 | 42.15 | 41.10 | 42.15 |

### 4.3.2. LTE MIMO 2

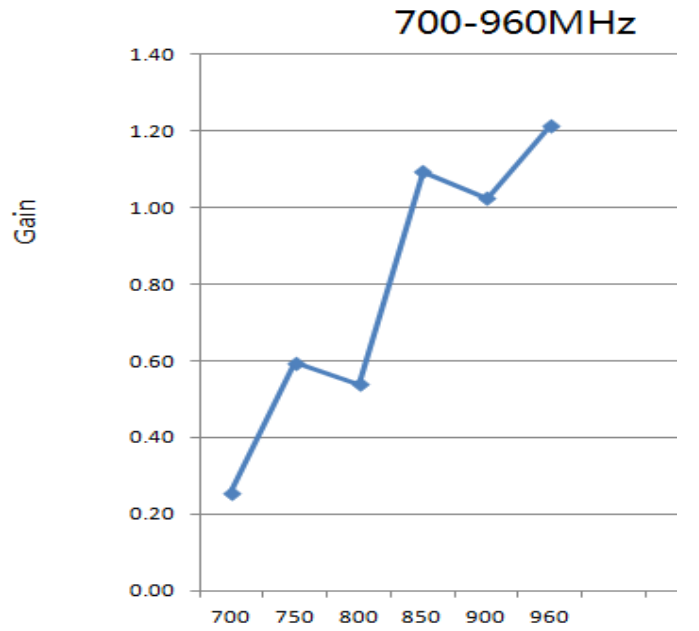


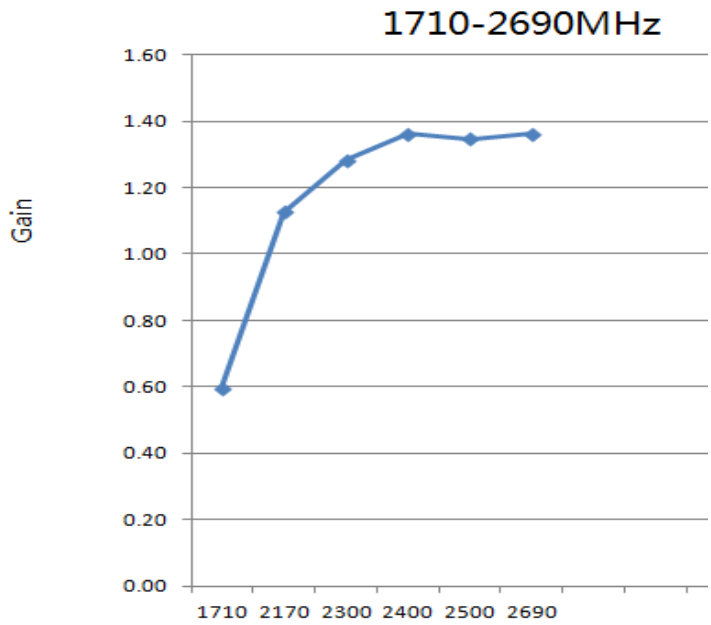




| Frequency (MHz) | 700 | 960 | 1710 | 2170 | 2300 | 2400 | 2500 | 2690 |
|---|---|---|---|---|---|---|---|---|
| Efficiency (%) | 24.32 | 35.12 | 44.79 | 43.57 | 41.99 | 41.91 | 39.46 | 40.19 |

## 4.4. Gain

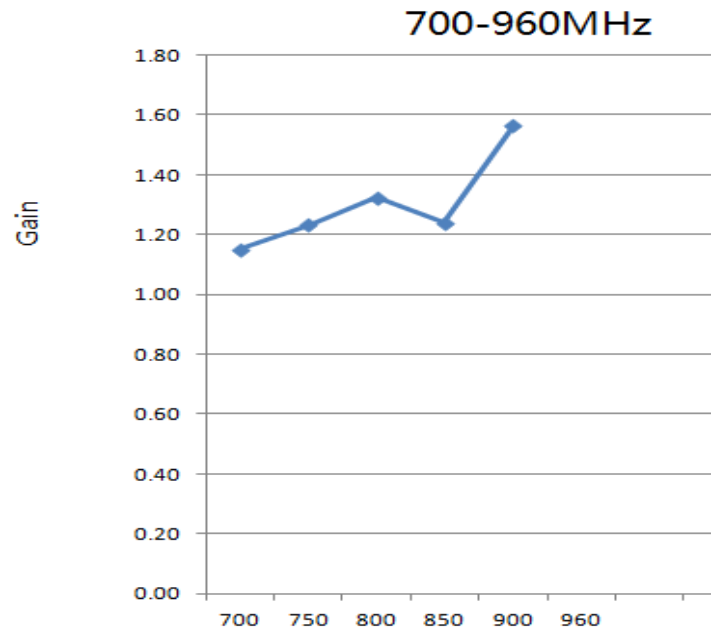
### 4.4.1. LTE MIMO 1

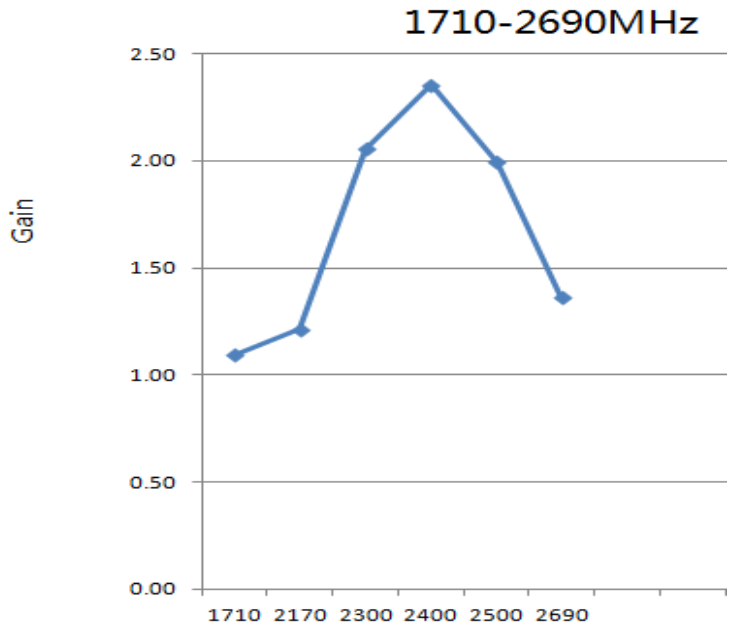



| Frequency (MHz) | 700 | 960 | 1710 | 2170 | 2300 | 2400 | 2500 | 2690 |
|---|---|---|---|---|---|---|---|---|
| Gain (dBi) | 0.26 | 1.21 | 0.60 | 1.13 | 1.28 | 1.36 | 1.35 | 1.36 |

### 4.4.2. LTE MIMO 2

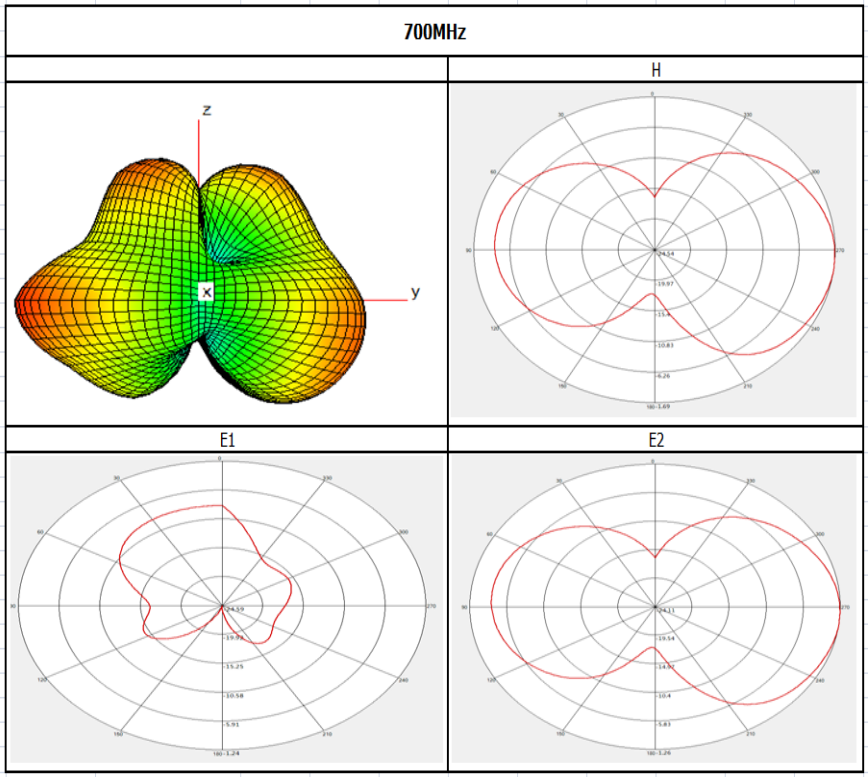


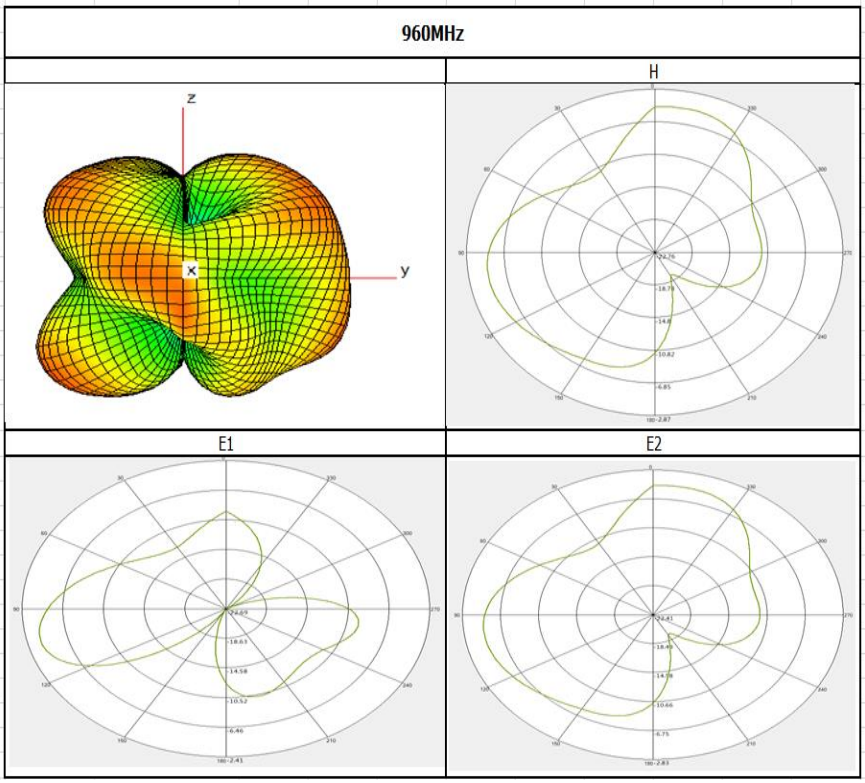



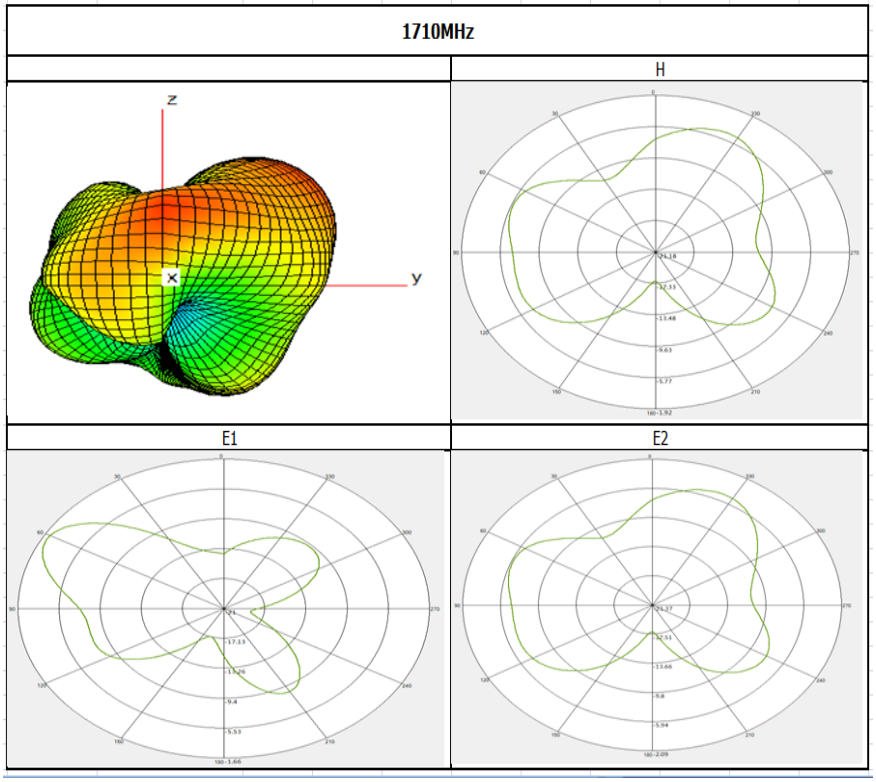

| Frequency (MHz) | 700 | 960 | 1710 | 2170 | 2300 | 2400 | 2500 | 2690 |
|---|---|---|---|---|---|---|---|---|
| Gain (dBi) | 0.82 | 1.56 | 1.09 | 1.21 | 2.05 | 2.36 | 1.99 | 1.36 |

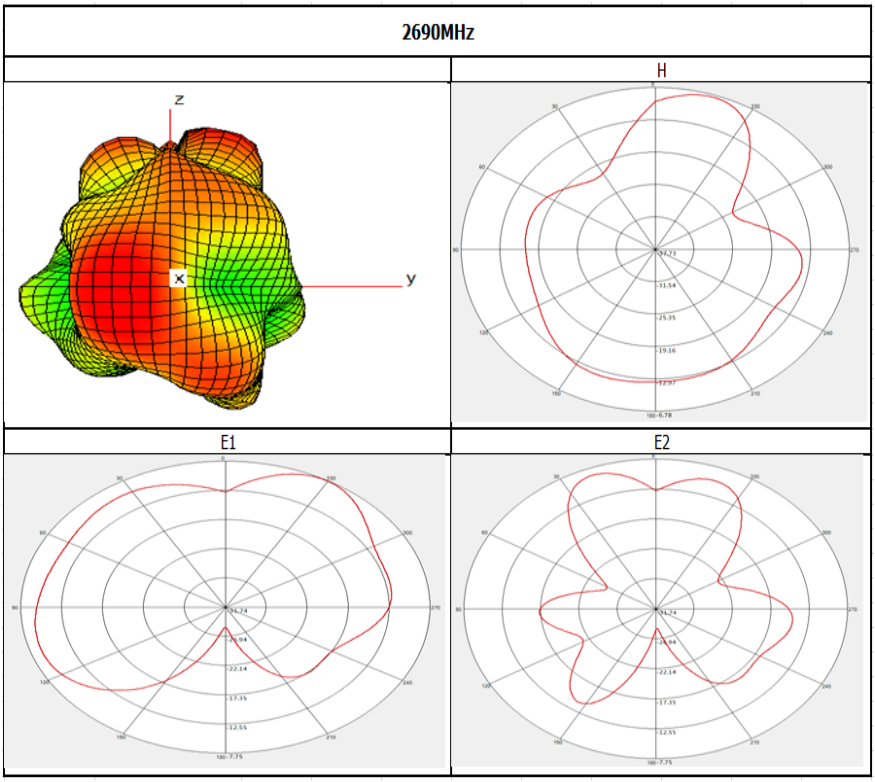
## 4.5. Radiation Pattern

### 4.5.1. LTE MIMO 1

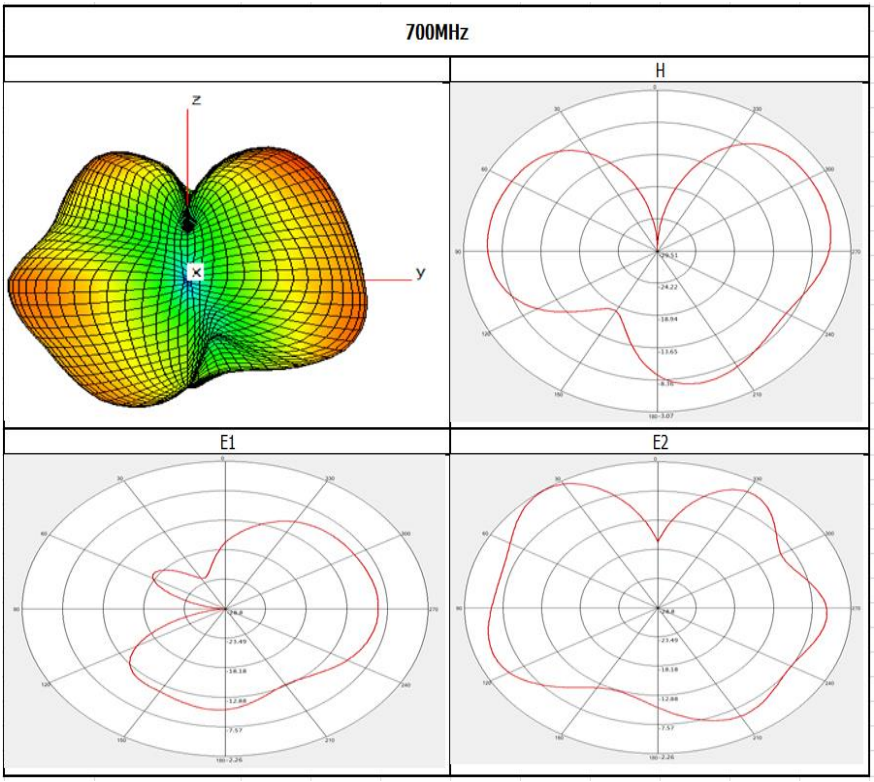


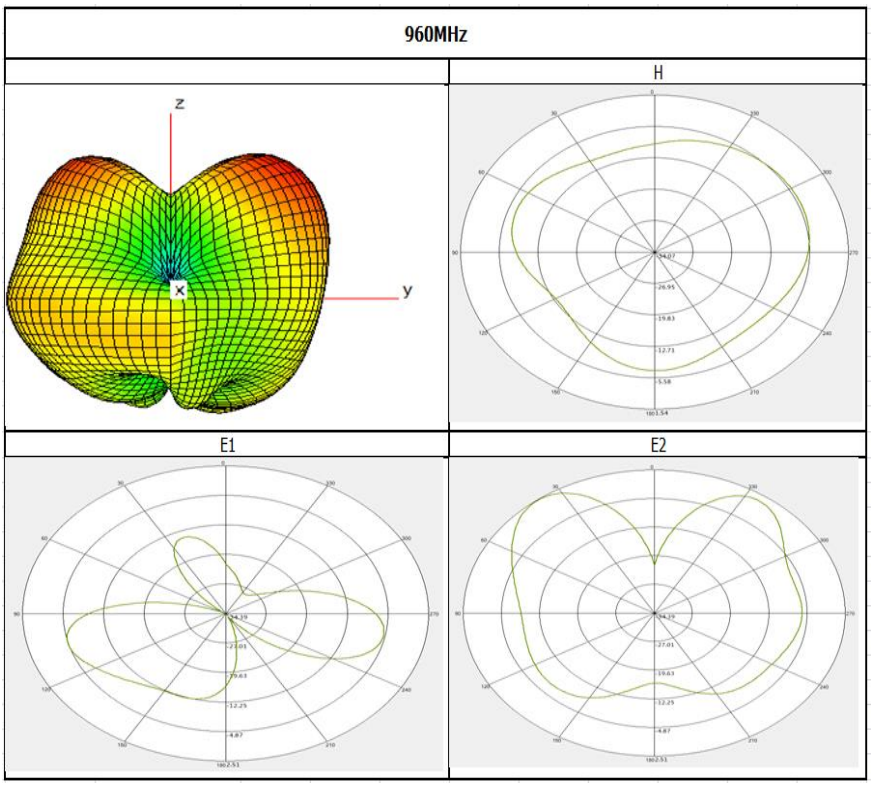



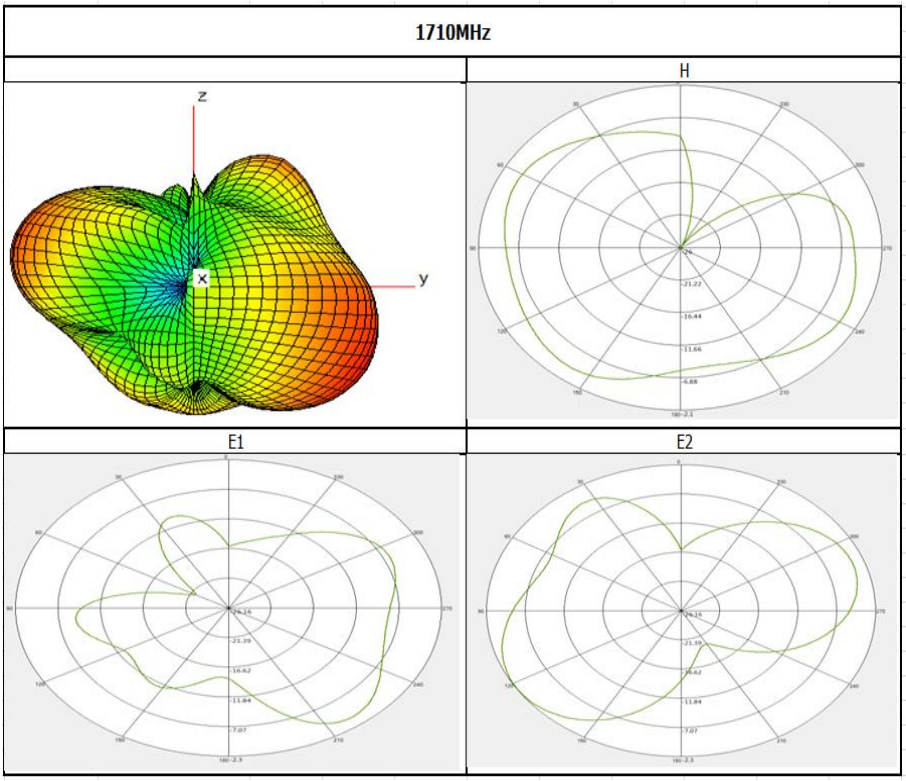

1710MHz
H
z
y
x
E1
E2

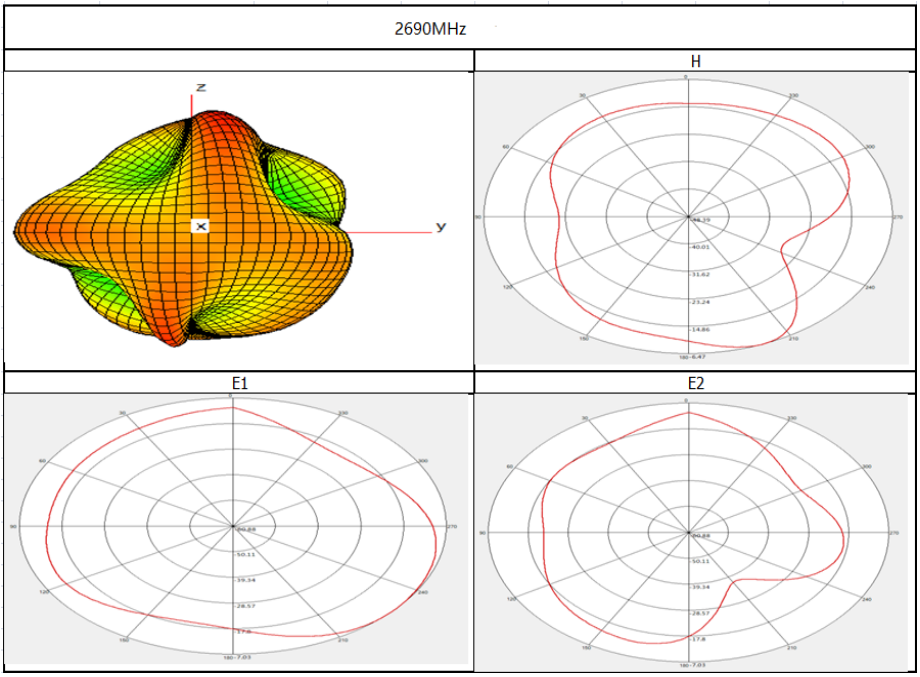

2690MHz
H
z
y
x
E1
E2

### 4.5.2. LTE MIMO 2



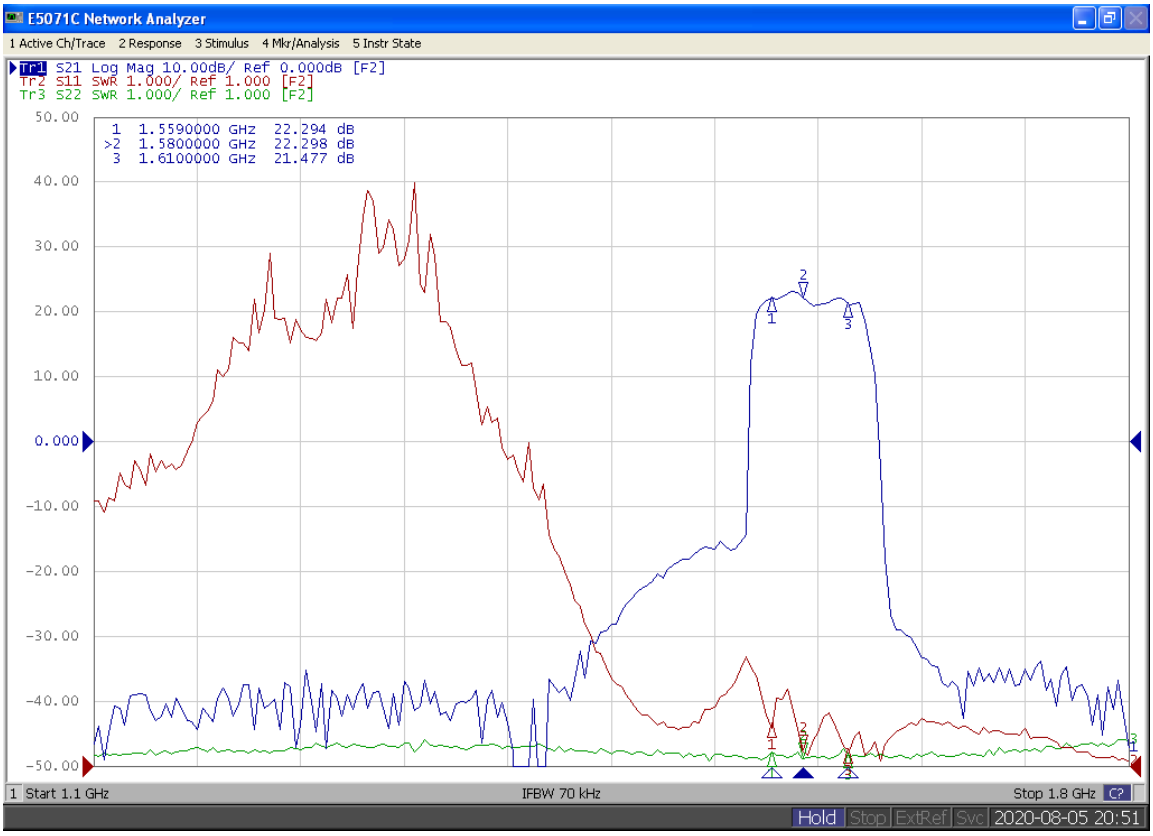




1710MHz
H
z
y
x
E1
E2


2690MHz
H
z
y
x
E1
E2

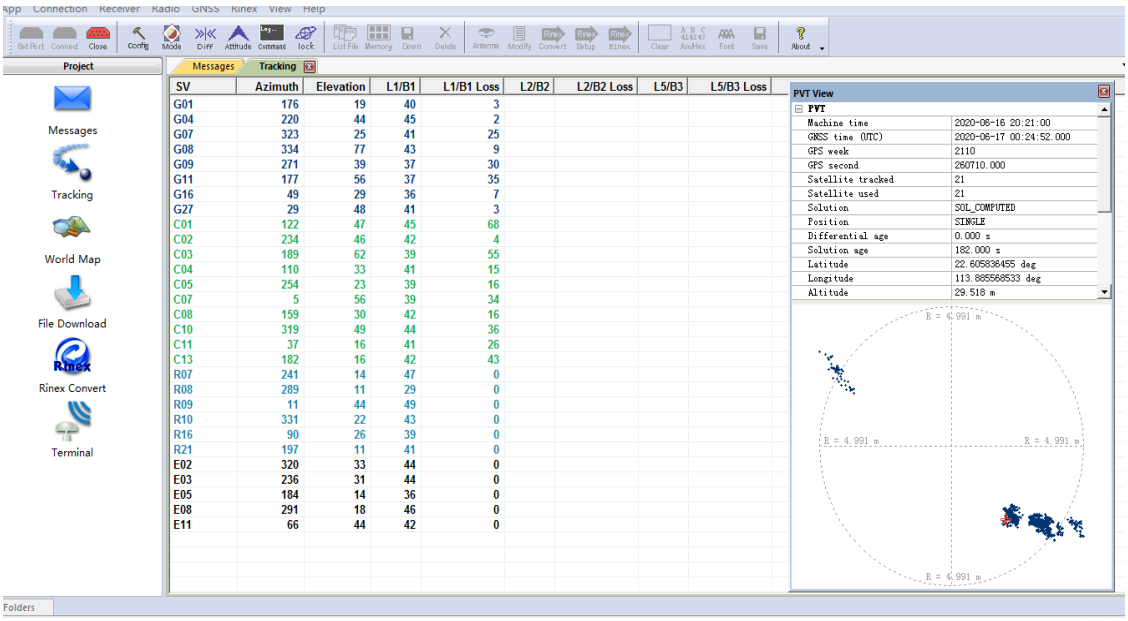
## 4.6. GNSS Antenna

- GPS L1 Antenna Gain (LNA)



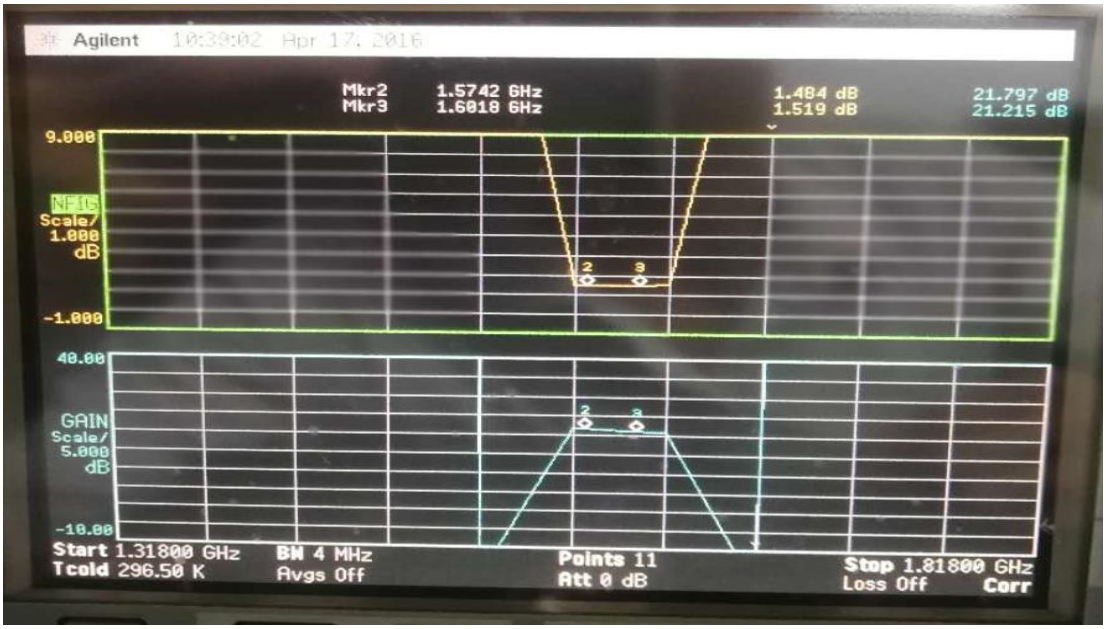

| GNSS Relative Gain Test Data | | | |
|---|---|---|---|
| MARKER | Frequency/MHz | Gain/dB | SWR/S11 |
| 1 | 1559 | 22.2 | 1.86 |
| 2 | 1580 | 22.2 | 1.67 |
| 3 | 1610 | 21.4 | 1.59 |

- GPS L1 Antenna Measurement (Static State)




Test Condition: Outdoor; Roof of Fourth Floor; Sunny Day.

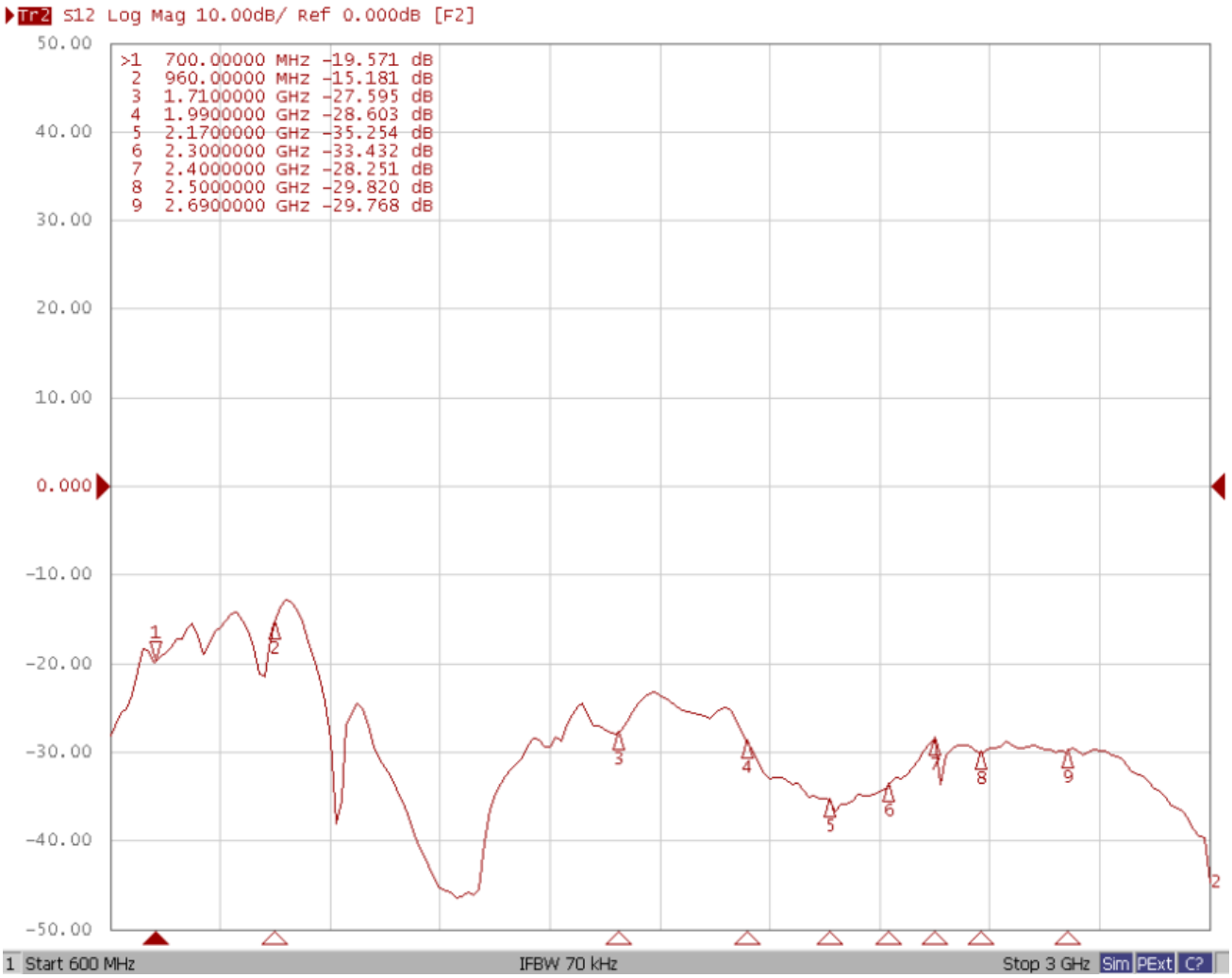
- GPS L1 Antenna Noise Figure (LNA)



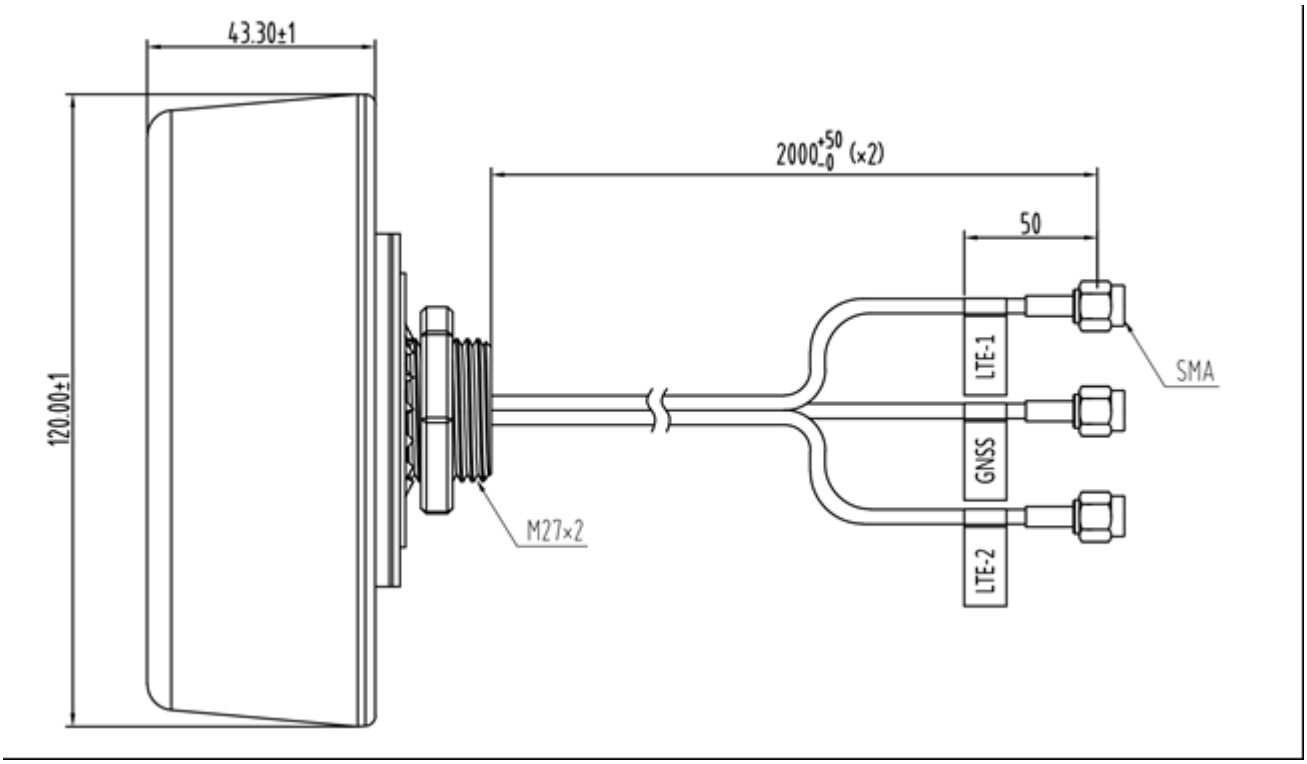

| GPS Noise Test Data | | |
|---|---|---|
| MARKER | Frequency/MHz | Noise Factor/dB |
| 1 | 1575 | 1.48 |
| 2 | 1601 | 1.51 |

## 4.7. Insulation

- LTE MIMO 1 & LTE MIMO 2



# 5 Product Size




# 6 Connect Description

As follows, the default SMA male (center pin) is usually the setting that most users probably choose.

# 7 Installation

- Recommended hole size: Φ 28.0 ±0.5 mm；
- Recommended wall thickness size: 3.0 ±1.0 mm.