

# Antenna

# YB0026AA Datasheet

## Antenna Services

Version: 1.3

Date: 2021-12-03

Status: Released



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# About the Document

## Revision History

Version	Date	Author	Note
-	2020-12-07	Kenny YIN	Creation of the document
1.0	2020-12-07	Kenny YIN	First official release
1.1	2020-12-21	Kenny YIN	Added the laboratory test axes
1.2	2021-07-25	Kenny YIN	Updated working temperature. (Chapter 3)
1.3	2021-12-03	Kenny YIN	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

- Cellular LTE/Wi-Fi/GNSS
- High efficiency
- Excellent performance



### 3 Product Specifications

#### LTE/Wi-Fi Electrical Specifications

Frequency Range	LTE: 700–2700 MHz Wi-Fi: 2400–5850 MHz
Input Impedence	50 Ω
VSWR	4G: ≤ 3.0 Wi-Fi-1: ≤ 2.0 Wi-Fi-2: ≤ 2.0
Gain	4G: ≤ 2.5 Wi-Fi-1: ≤ 2.5 Wi-Fi-2: ≤ 2.5
Polarization Type	Linear

#### GNSS Antenna Electrical Specifications

Frequency Range	1561 MHz/1575.42 MHz/1602 MHz
Working Voltage	3 V
Working Current	9 ±3 mA
Gain	20 ±3 dB
Noise Figure	≤ 2 dB
VSWR	≤ 2
Input Impedence	50 Ω
Polarization Type	Circular

#### Mechanical Specifications

Antenna Box Size	Φ 120 mm × 43 mm 1.5DS-QEHB, Cable Length = 1000 mm
Casing	KIBILAC® ASA
Connector Type	GNSS: FAKRA_C LTE: FAKRA_D Wi-Fi: FAKRA_I
Working Temperature	-40 °C to +85 °C
Radome Color	Black
Ingress Protection Rating	IP67 (IP rating of the antenna box after installation)
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

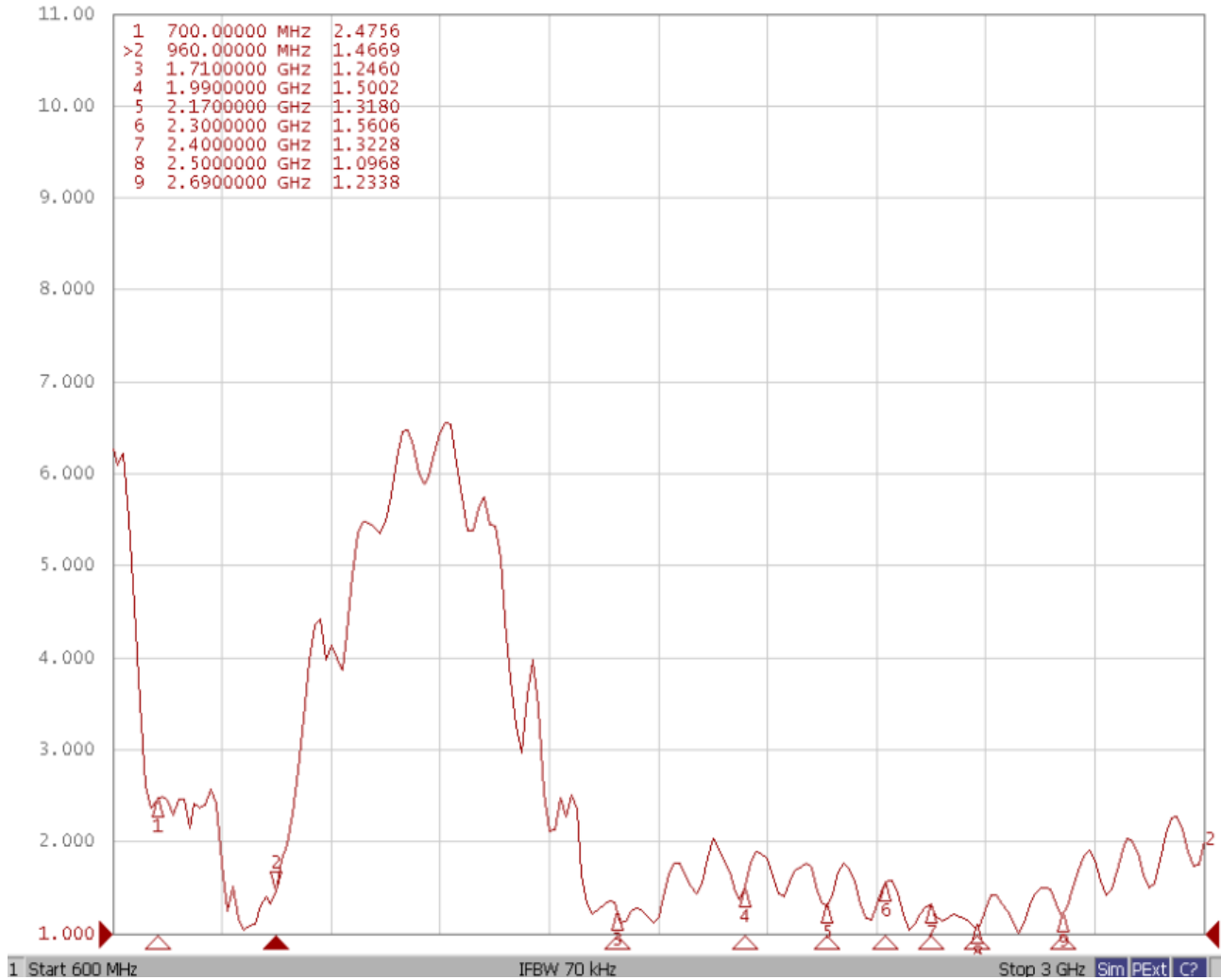




### 4.2. VSWR

#### 4G Main Antenna

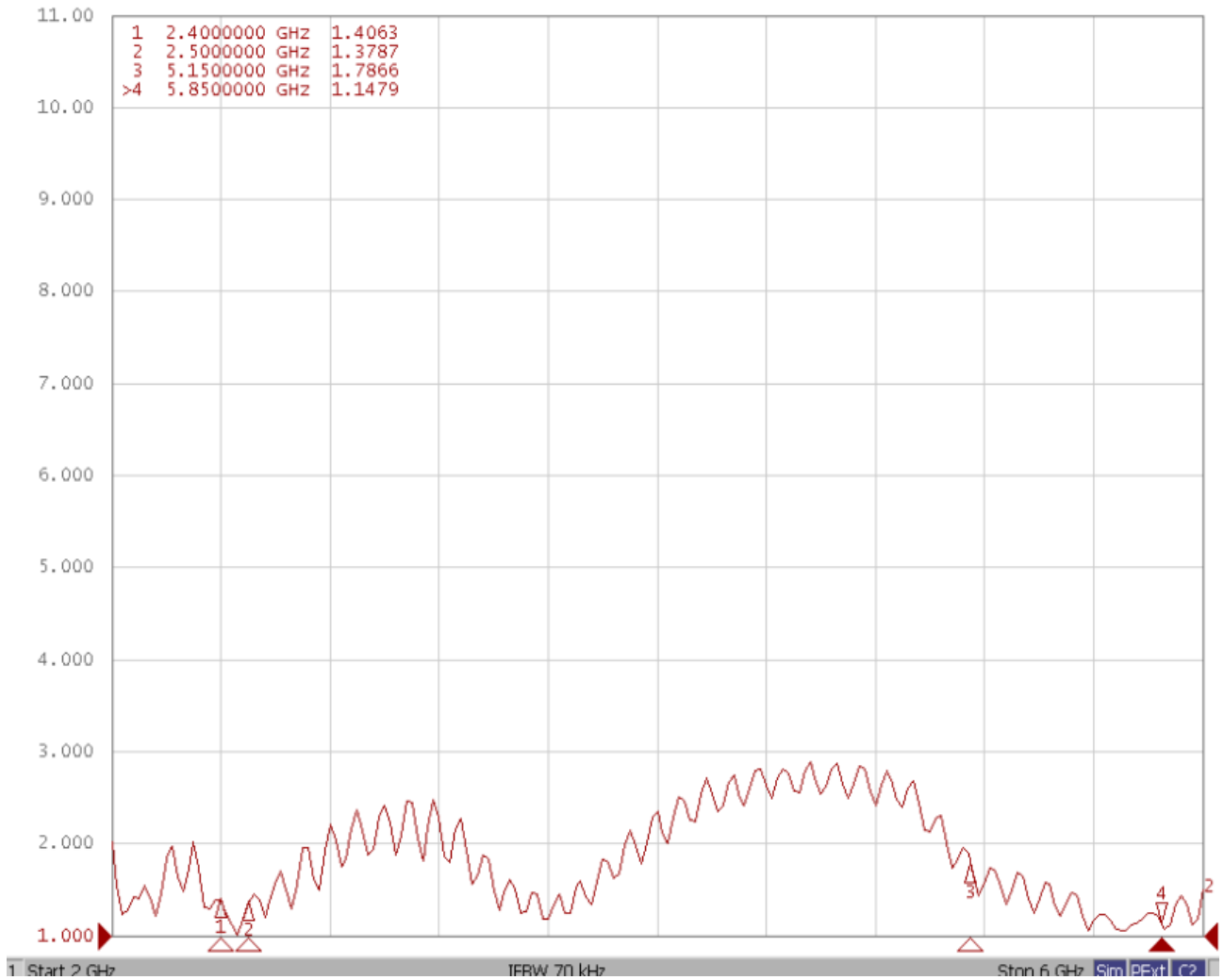
▶ **F2** S22 SWR 1.000/ Ref 1.000 [F2]



Frequency (MHz)	700	960	1710	2170	2300	2400	2500	2690
VSWR	2.47	1.46	1.24	1.31	1.56	1.32	1.09	1.23

#### Wi-Fi-1

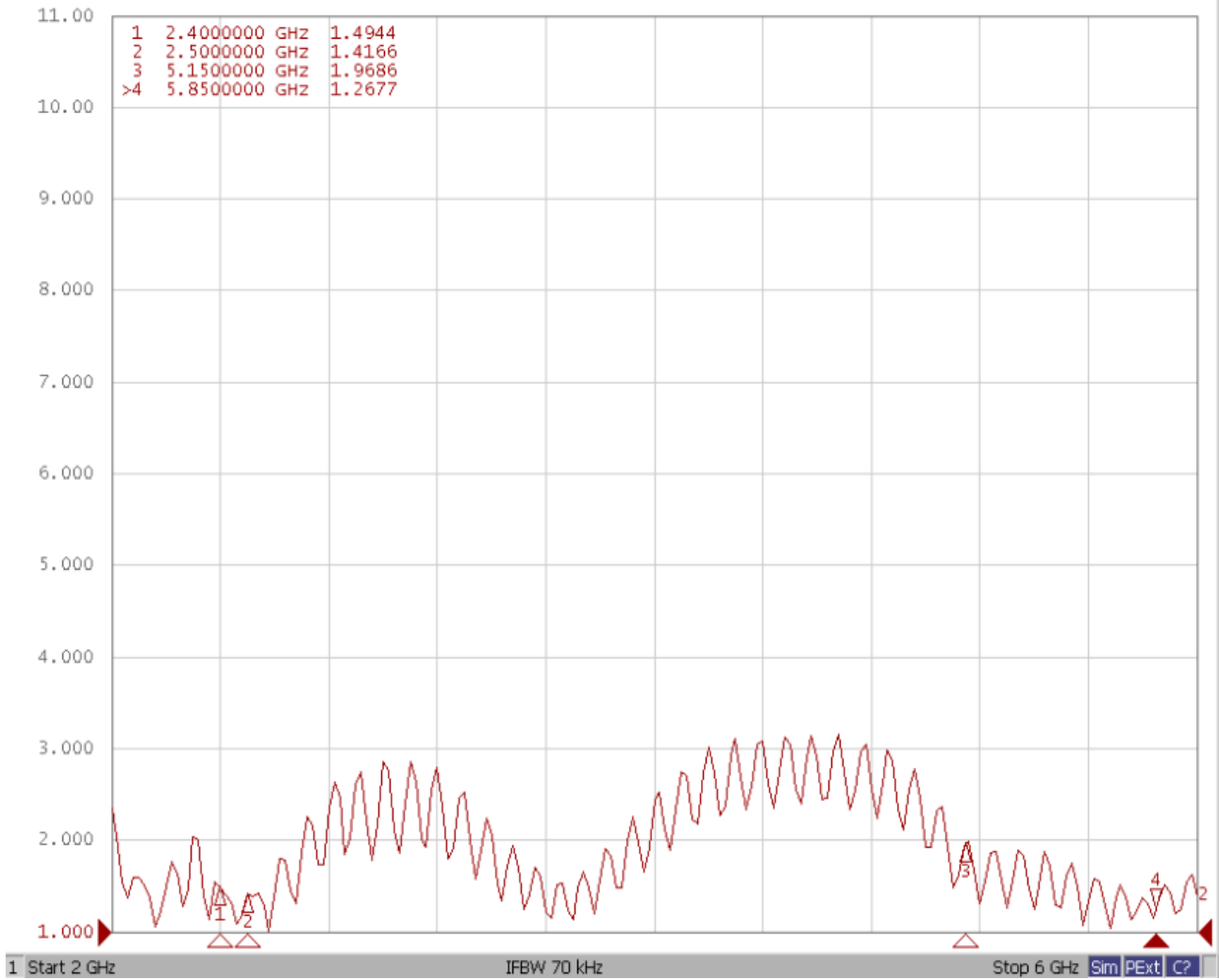
▶ Tr2 S22 SWR 1.000/ Ref 1.000 [F2]



<b>Frequency (MHz)</b>	2400	2500	5150	5850
<b>VSWR</b>	1.40	1.37	1.78	1.14

**Wi-Fi-2**

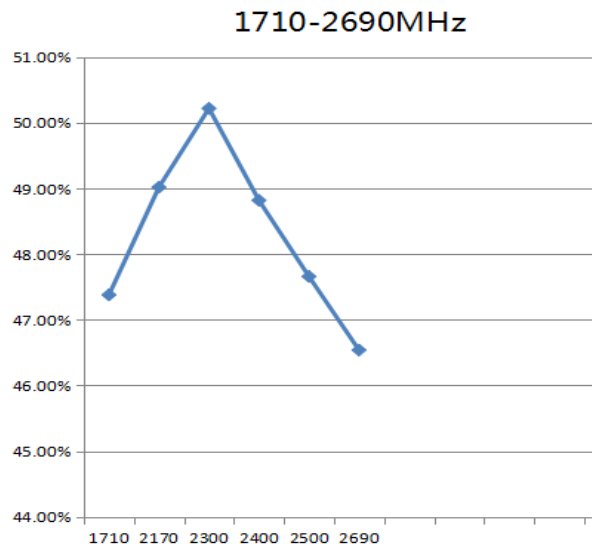
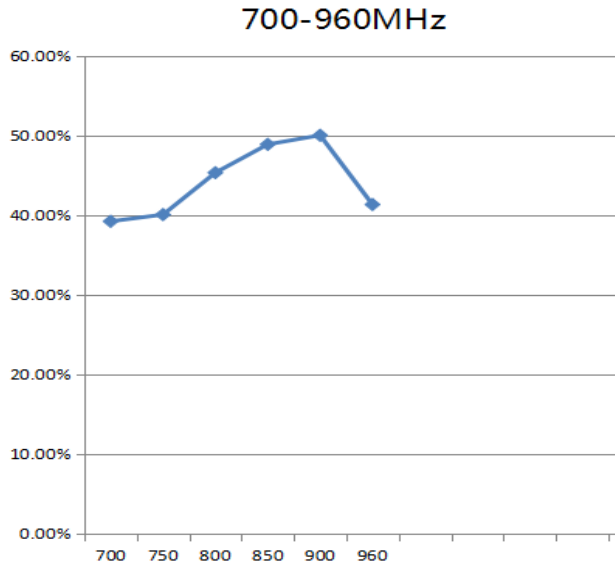
▶ **Tr2** S22 SWR 1.000/ Ref 1.000 [F2]



<b>Frequency (MHz)</b>	2400	2500	5150	5850
<b>VSWR</b>	1.49	1.41	1.96	1.26

### 4.3. Efficiency

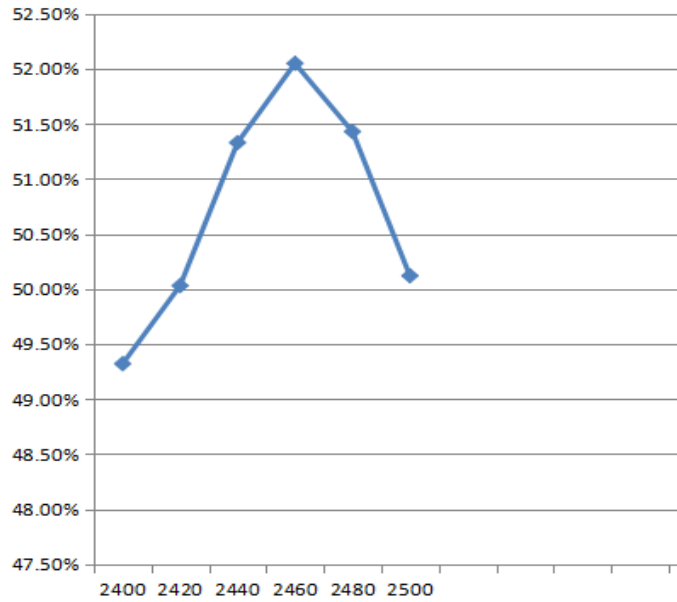
## 4G Main Antenna



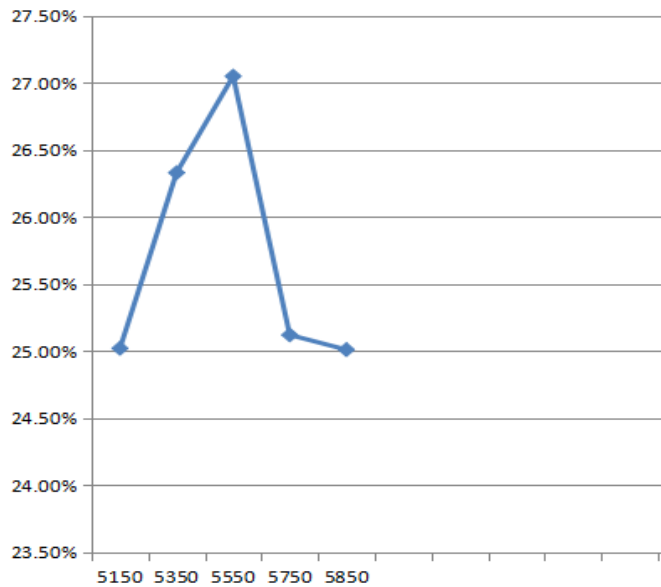
Frequency (MHz)	700	960	1710	2170	2300	2400	2500	2690
Efficiency (%)	39.21	41.32	47.38	49.02	50.22	48.82	47.66	46.54

**Wi-Fi-1**

**2400-2500MHz**



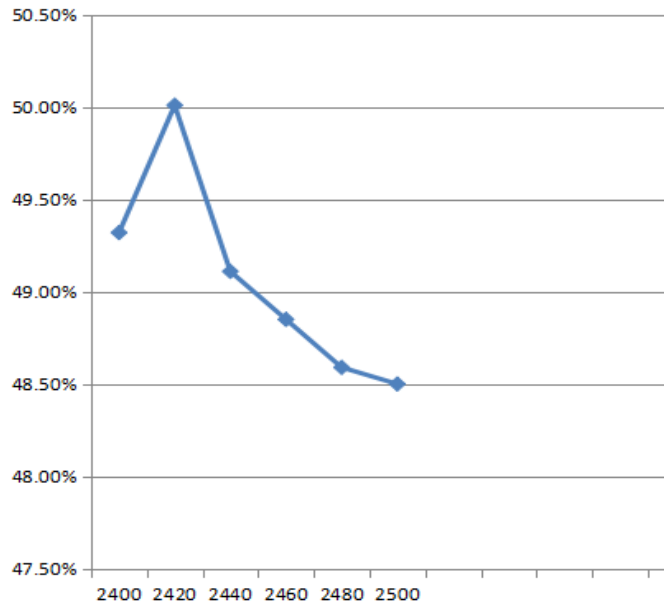
**5150-5850MHz**



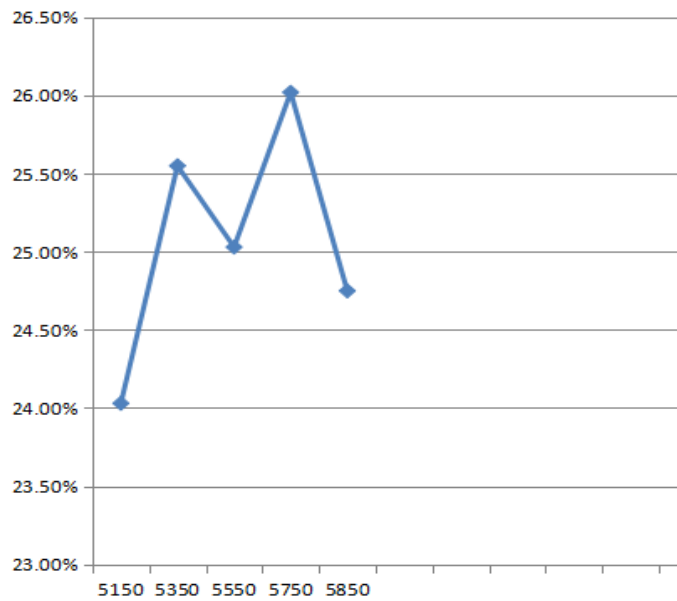
<b>Frequency (MHz)</b>	2400	2460	2500	5150	5350	5550	5750	5850
<b>Efficiency (%)</b>	50.46	52.16	50.09	25.02	26.33	27.05	25.12	25.01

**Wi-Fi-2**

**2400-2500MHz**



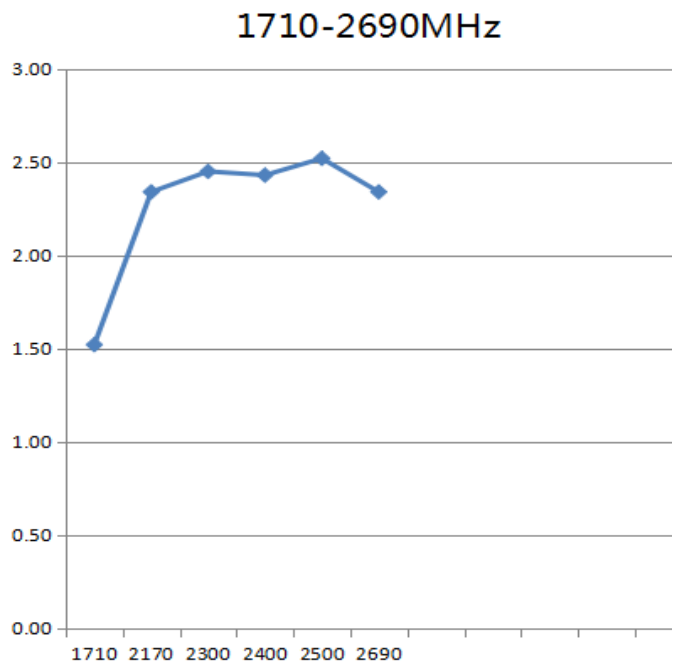
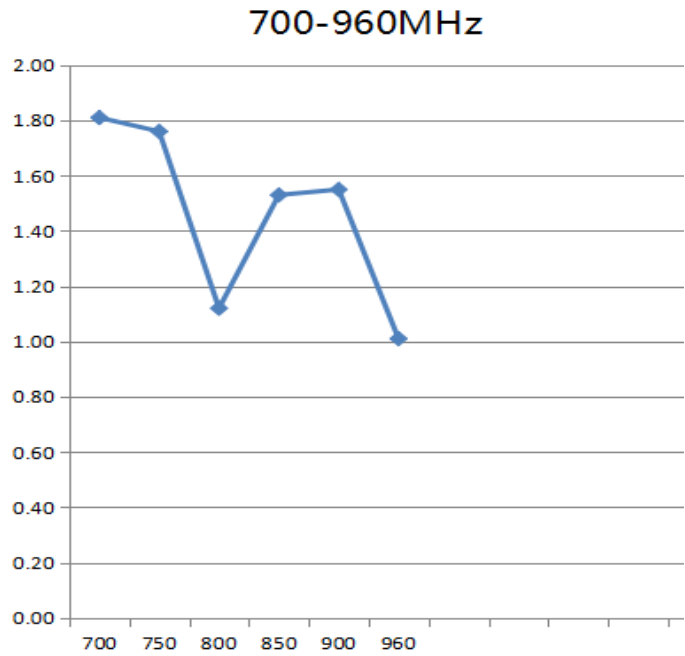
**5150-5850MHz**



<b>Frequency (MHz)</b>	2400	2460	2500	5150	5350	5550	5750	5850
<b>Efficiency (%)</b>	49.32	48.85	48.50	24.03	25.55	25.03	26.02	24.75

**4.4. Gain**

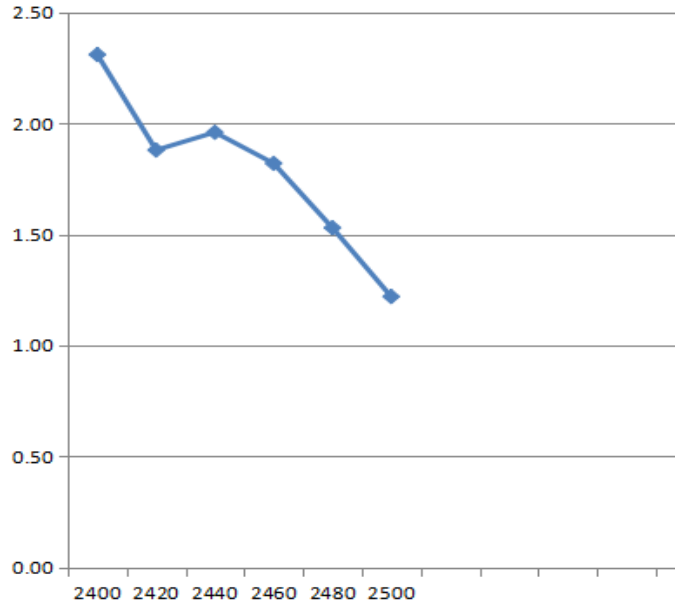
**4G Main Antenna**



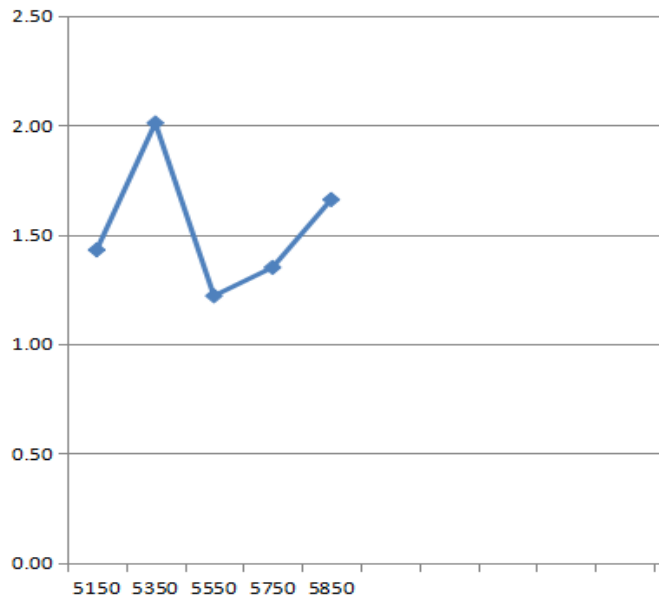
<b>Frequency (MHz)</b>	700	960	1710	2170	2300	2400	2500	2690
<b>Gain (dBi)</b>	1.81	1.01	1.52	2.34	2.45	2.43	2.52	2.34

**Wi-Fi-1**

**2400-2500MHz**



**5150-5850MHz**

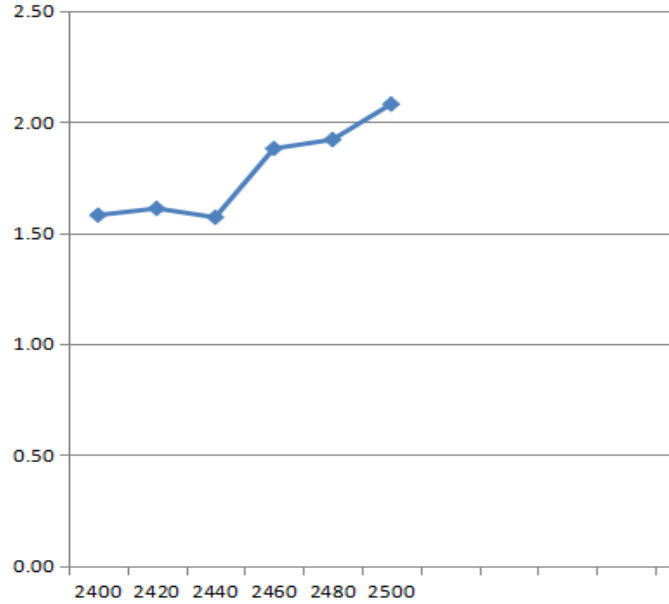


Frequency (MHz)	2400	2460	2500	5150	5350	5550	5750	5850
Gain (dBi)	2.31	1.82	1.22	1.43	2.01	1.22	1.35	1.66

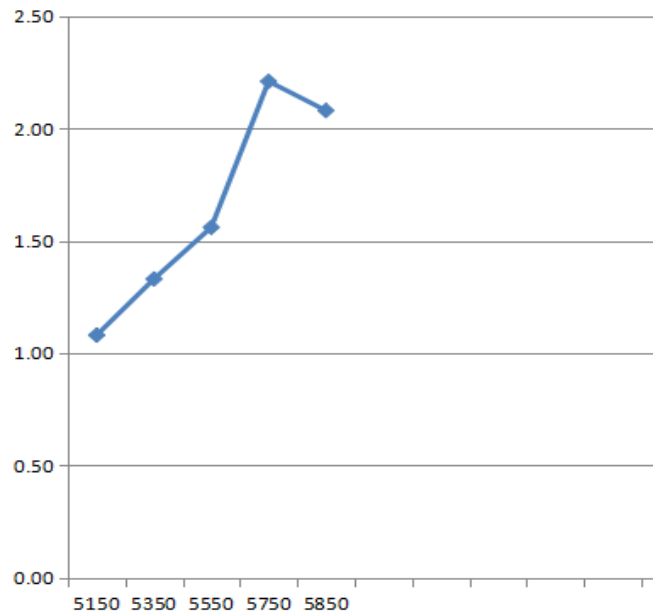


**Wi-Fi-2**

**2400-2500MHz**

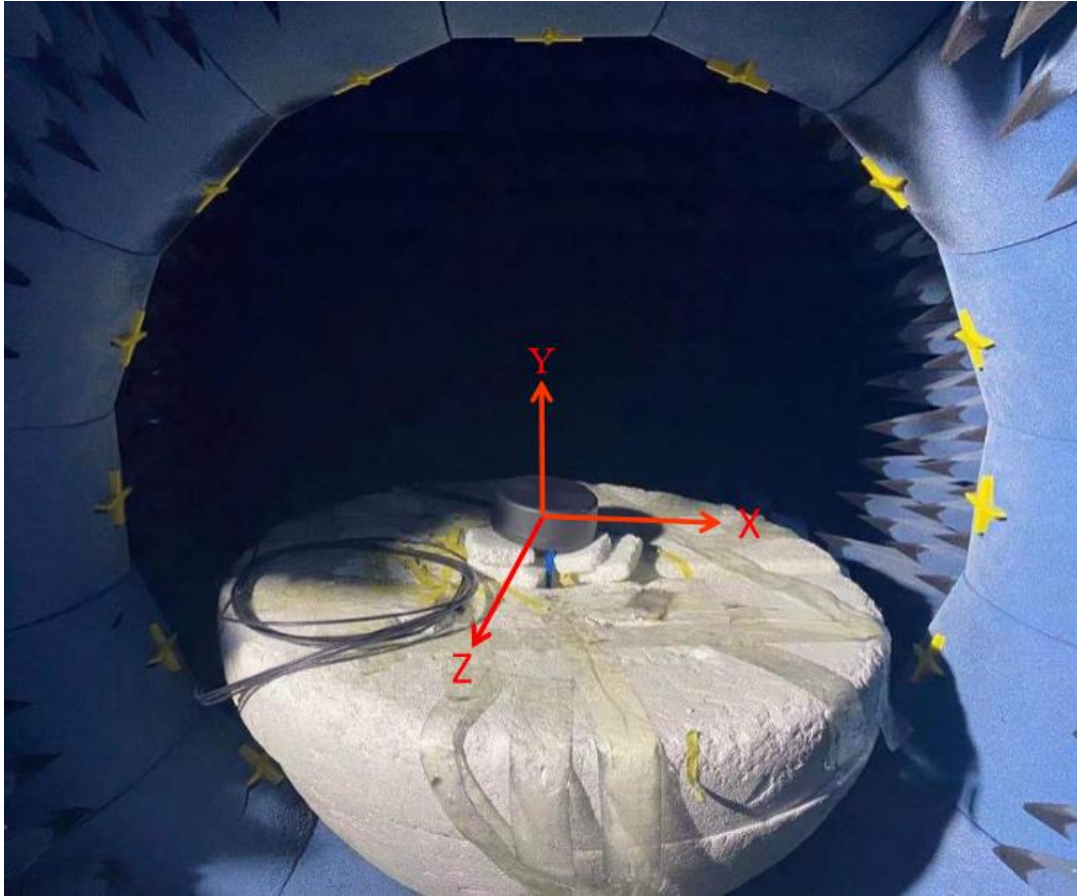


**5150-5850MHz**



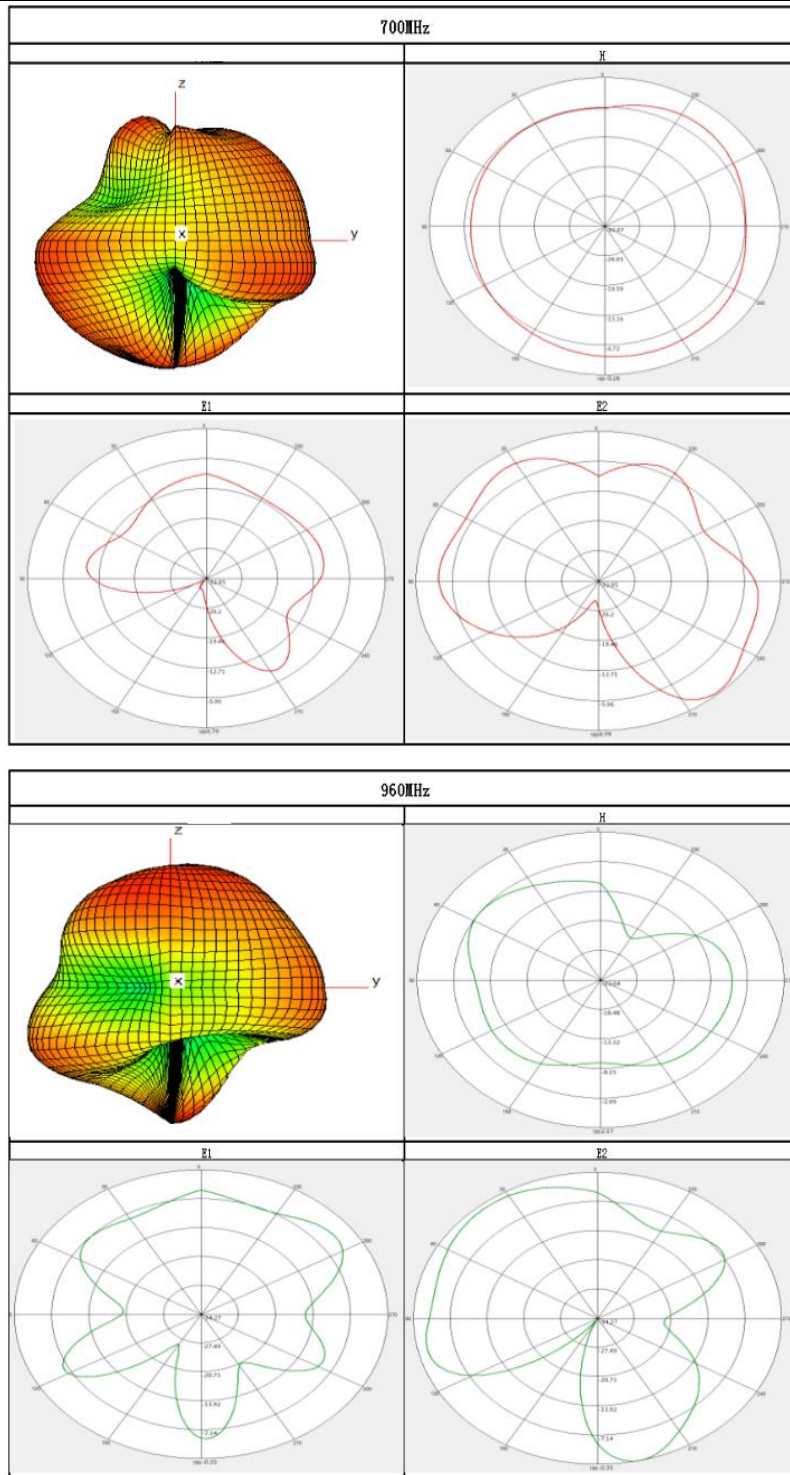
<b>Frequency (MHz)</b>	2400	2460	2500	5150	5350	5550	5750	5850
<b>Gain (dBi)</b>	1.58	1.88	2.08	1.08	1.33	1.56	2.21	2.08

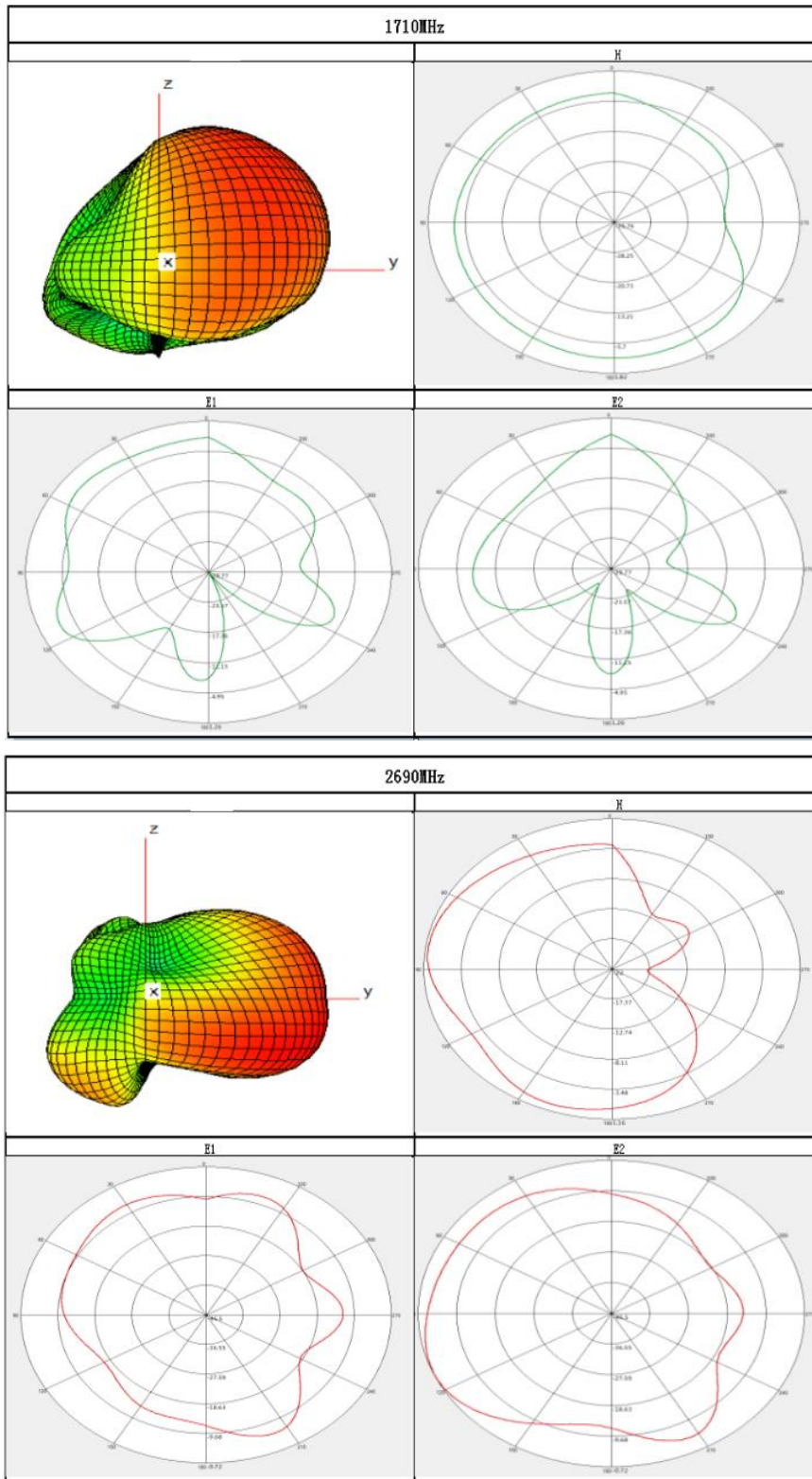
## 4.5. Radiation Pattern



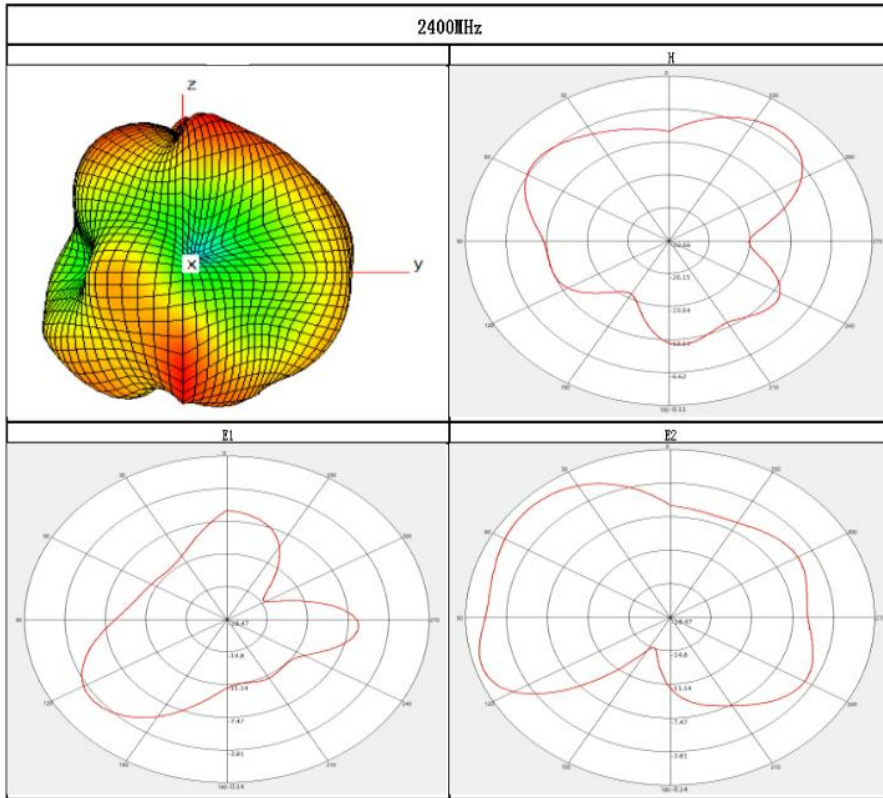
H plane: the tangent of XY  
E1 plane: the tangent of XZ  
E2 plane: the tangent of YZ

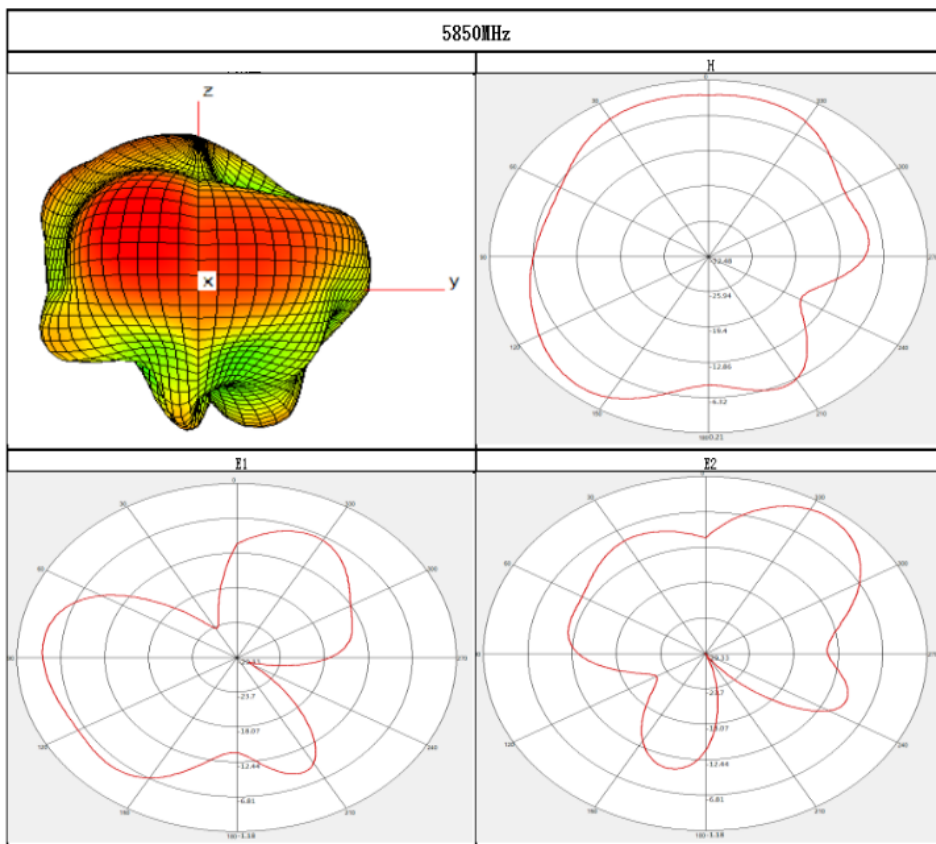
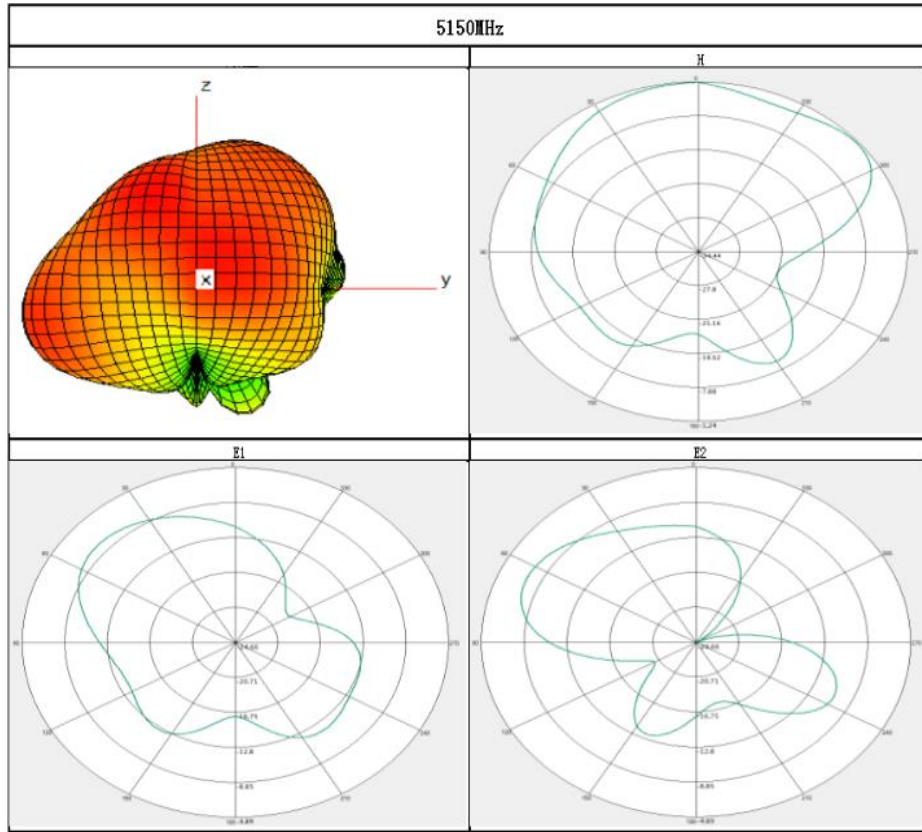
**4G Main Antenna**



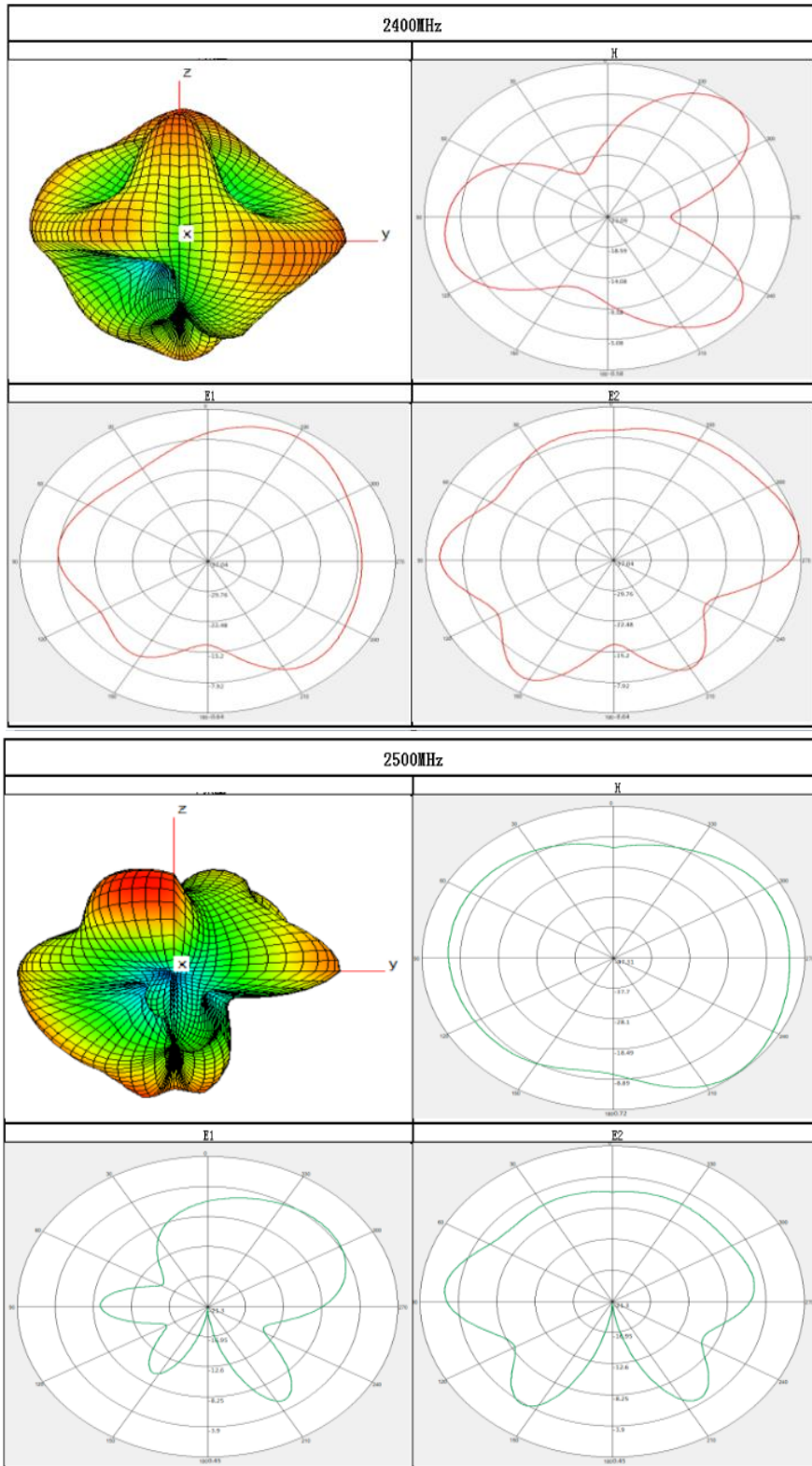


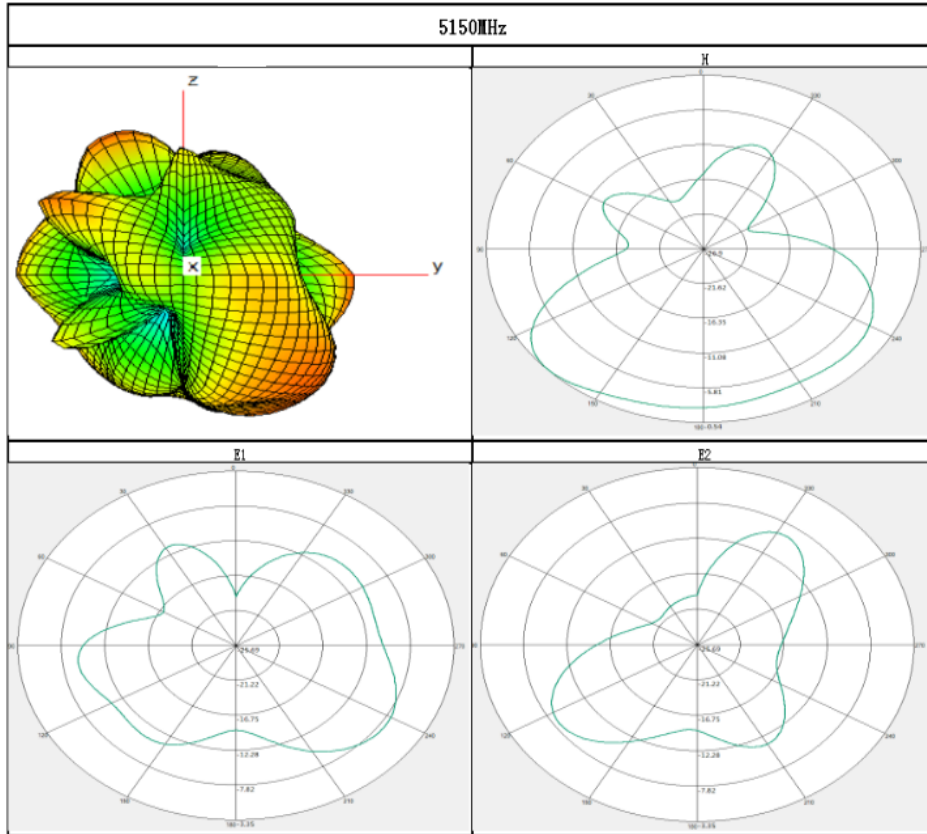
**Wi-Fi-1**





**Wi-Fi-2**

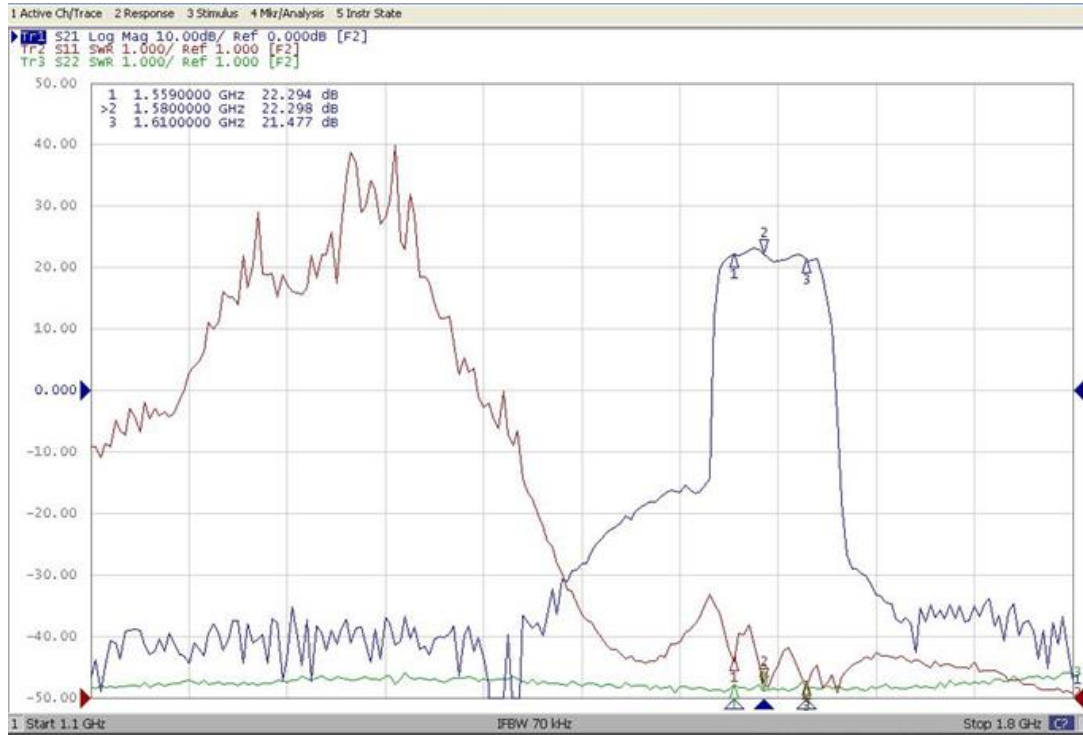






## 4.6. GNSS Antenna

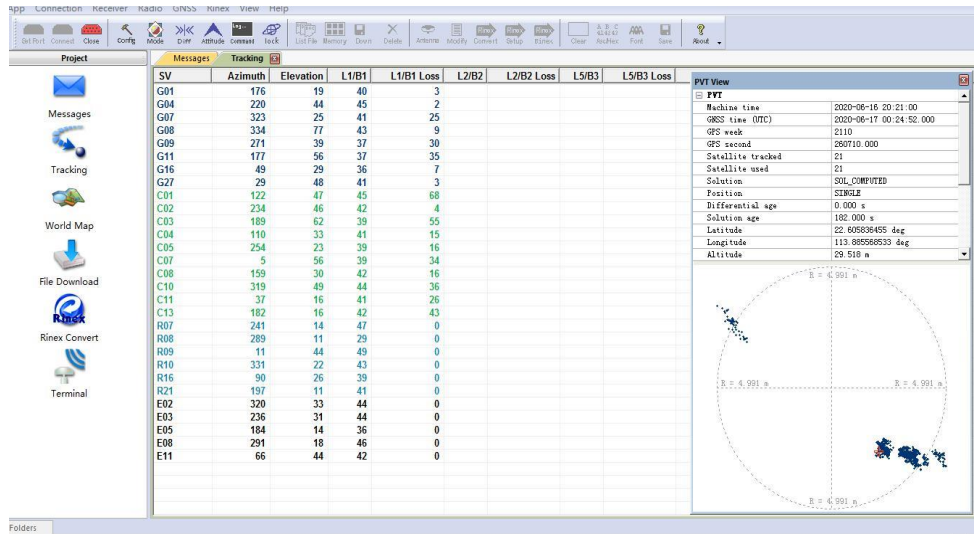
### 4.6.1. GNSS Antenna Gain (LNA)



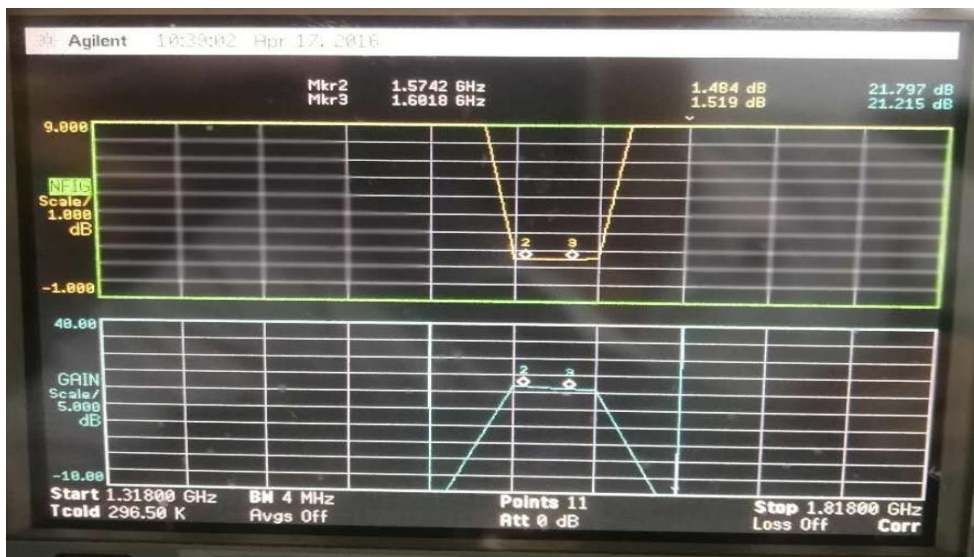
**GNSS Relative Gain Test Data**

MARKER	Frequency (MHz)	Peak Gain (dBi)	VSWR
1	1559	22.2	1.86
2	1580	22.2	1.67
3	1610	21.4	1.59

### 4.6.2. GNSS Antenna Measurement (Static State)



### 4.6.3. GNSS Antenna Noise Figure (LNA)



GNSS Noise Test Date		
MARKER	Frequency (MHz)	Noise figure(dB)
1	1575	1.48
2	1601	1.51

### 4.7. Insulation

## 4G Main & Wi-Fi-1

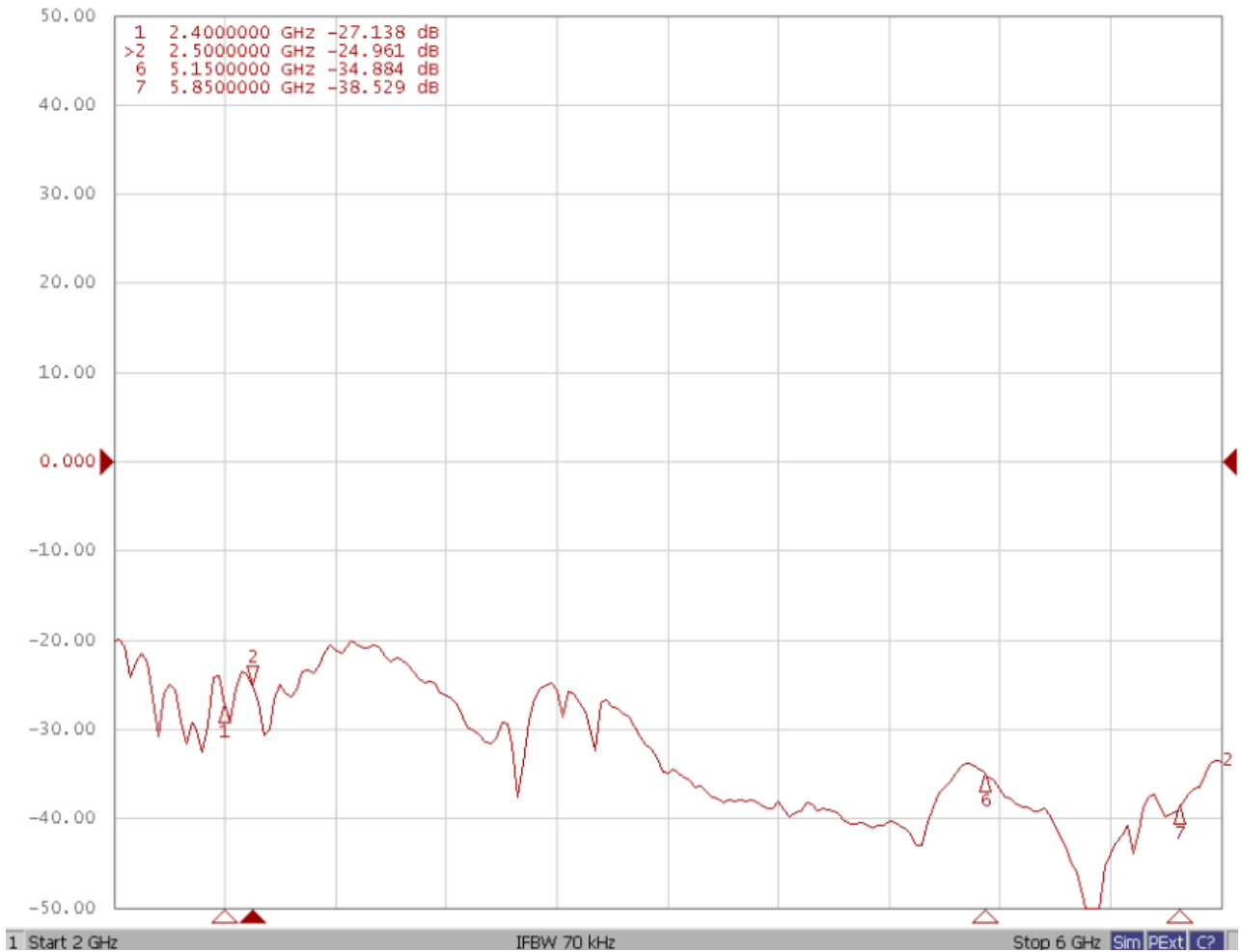


**4G Main & Wi-Fi-2**

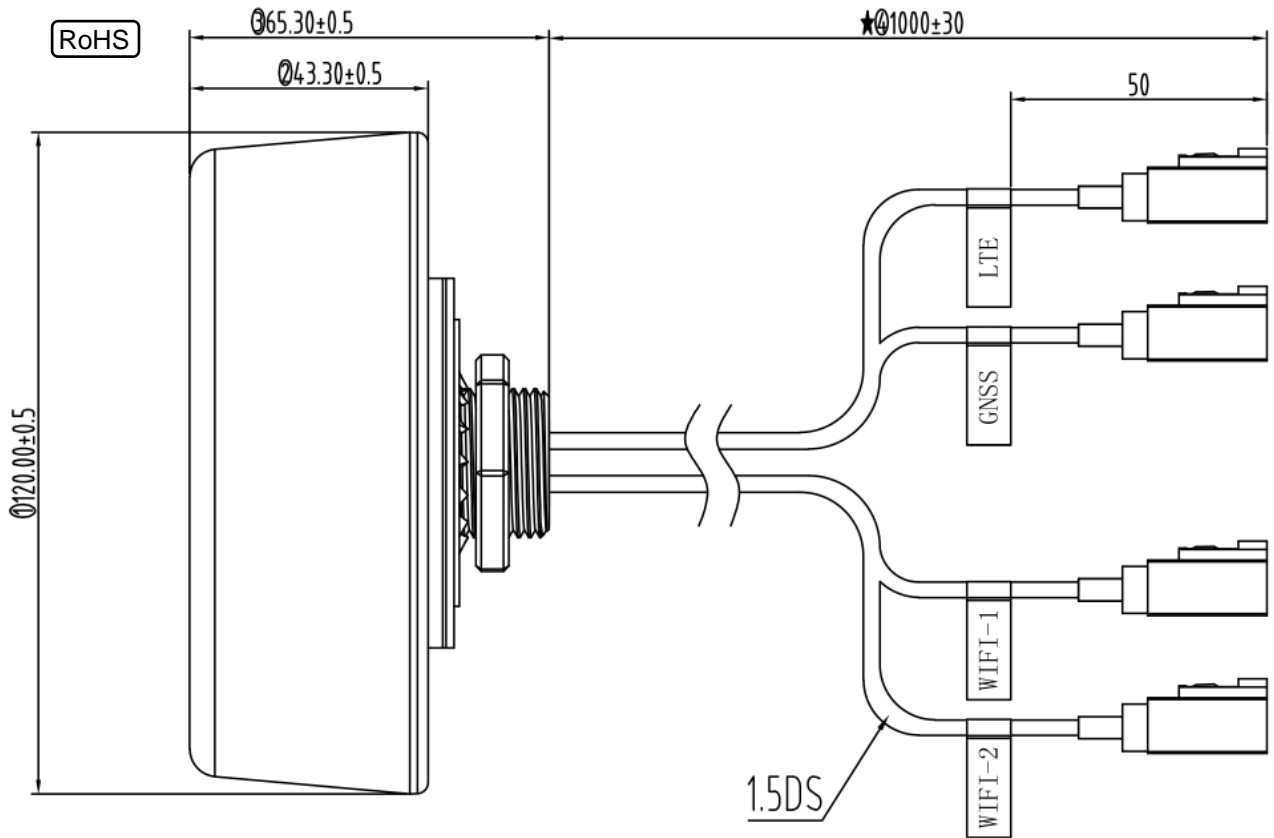


**Wi-Fi-2 & Wi-Fi-1**

S12 Log Mag 10.00dB/ Ref 0.000dB [F2]

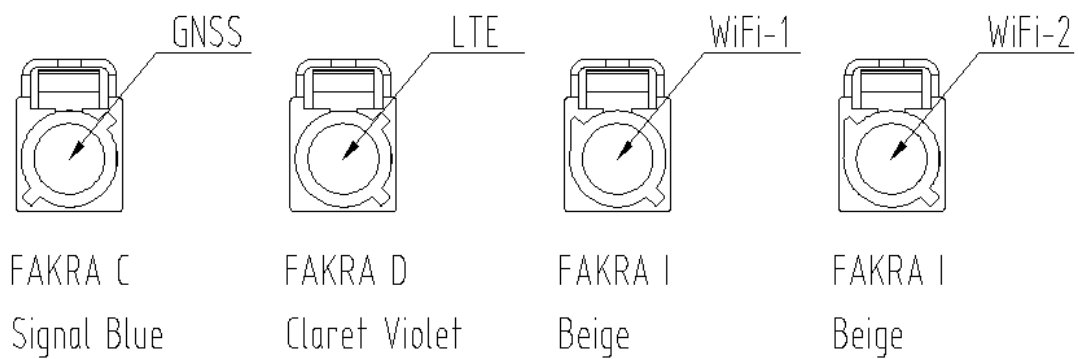


## 5 Product Size



## 6 Connection Description

As follows, the connectors on the product are Fakra\_C, Fakra\_D and Fakra\_I.



## 7 Installation

- Recommended hole size:  $\Phi 28.0 \pm 0.5$  mm.
- Recommended wall thickness size:  $3.0 \pm 1.0$  mm.

