ComNav Technology Ltd.
Building 2, No.618 Chengliu Middle Rd. Malu town, Shanghai, China

PRODUCT TEST REPORT

of Four-star and Full-range Measurement Antenna

LCY4N75A

Version: LCY4N75A.C01-V0.1

Compose/Date:

Audit / Date:

Approve/Date:

1. Passive Antennas Performance

1.1 GNSS Antenna Performance

1.1.1 Antenna Pattern Performance

Test environment：

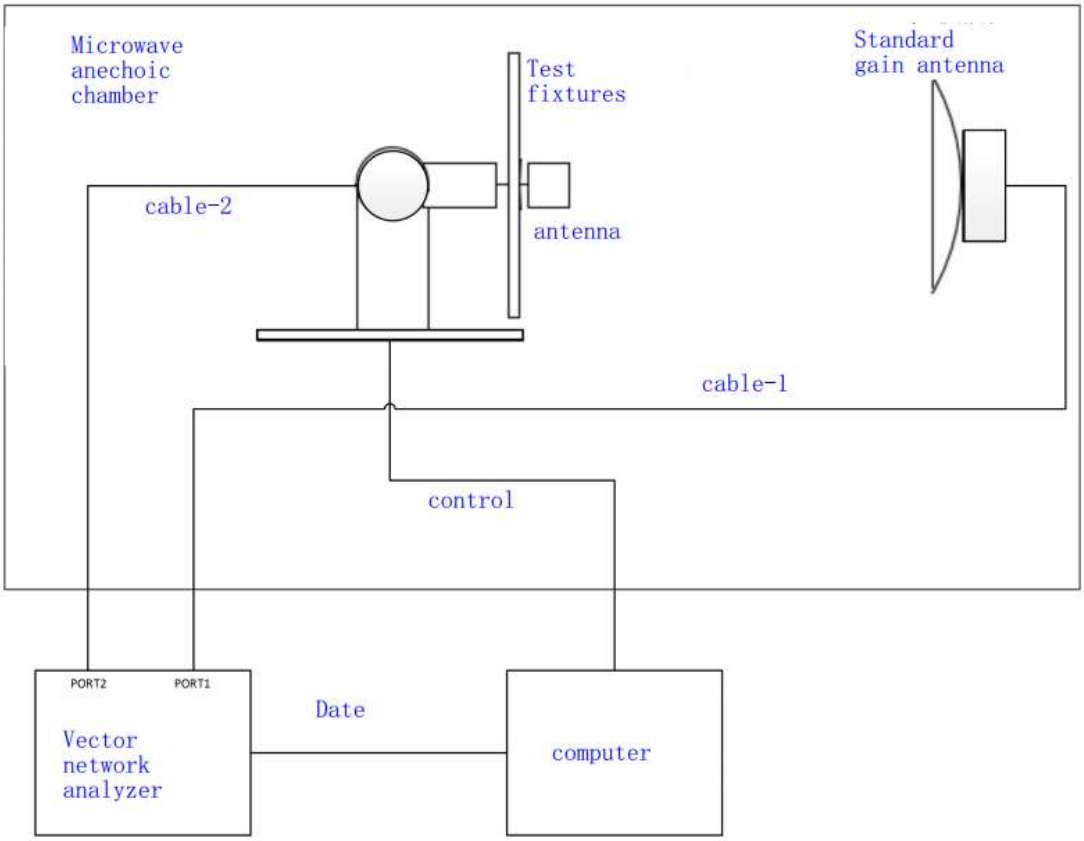


Figure 1： Antenna pattern Test schematic

Test equipment：Far-field microwave anechoic chamber

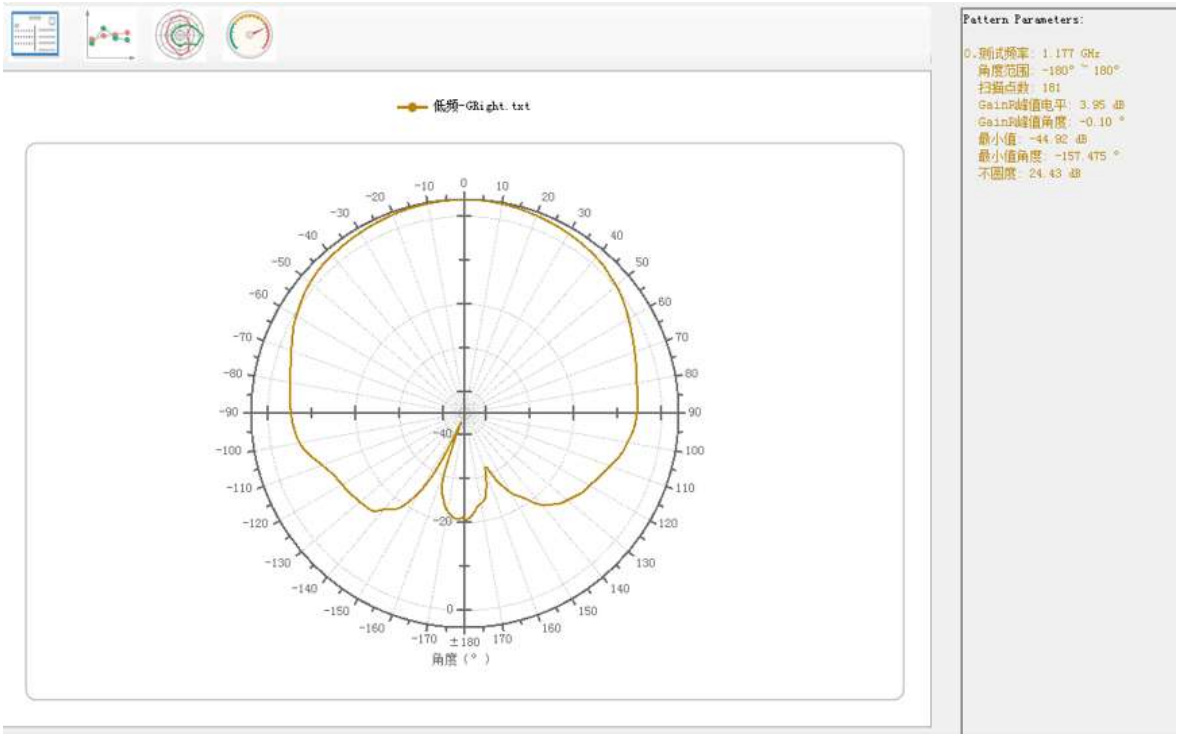
Test Method：

1) Calibrate the gain standard data of 1.15GHz-1.3GHz and 1.5GHz-1.65GHz in advance in the microwave anechoic chamber environment, and store them in the test system;
2) Set up the test environment as shown in Figure 1, connect Cable-2 to the passive antenna port to be tested, and connect the other ports to 50 ohm load;
3) Set the swept frequency range through the antenna test software;
4) During the test, the test software automatically completes the collection and storage of the test data of the passive antenna under test， Savings and calculations。

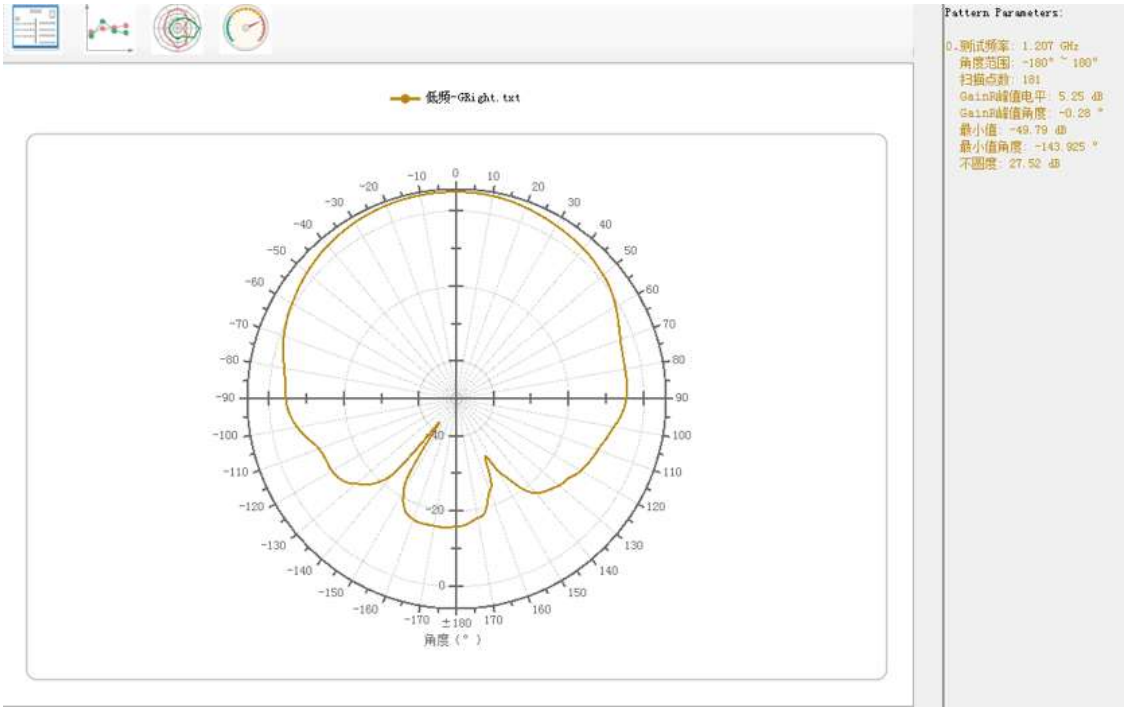
Test results:

Frequency (MHz)	Gain dBi	Axial ratio dB
1176	3.95	0.97
1207	5.25	0.86
1227	5.66	0.32
1246	5.57	0.08
1268	4.65	0.67
1561	5.5	1.09
1575	6.02	0.74
1602	5.59	0.36

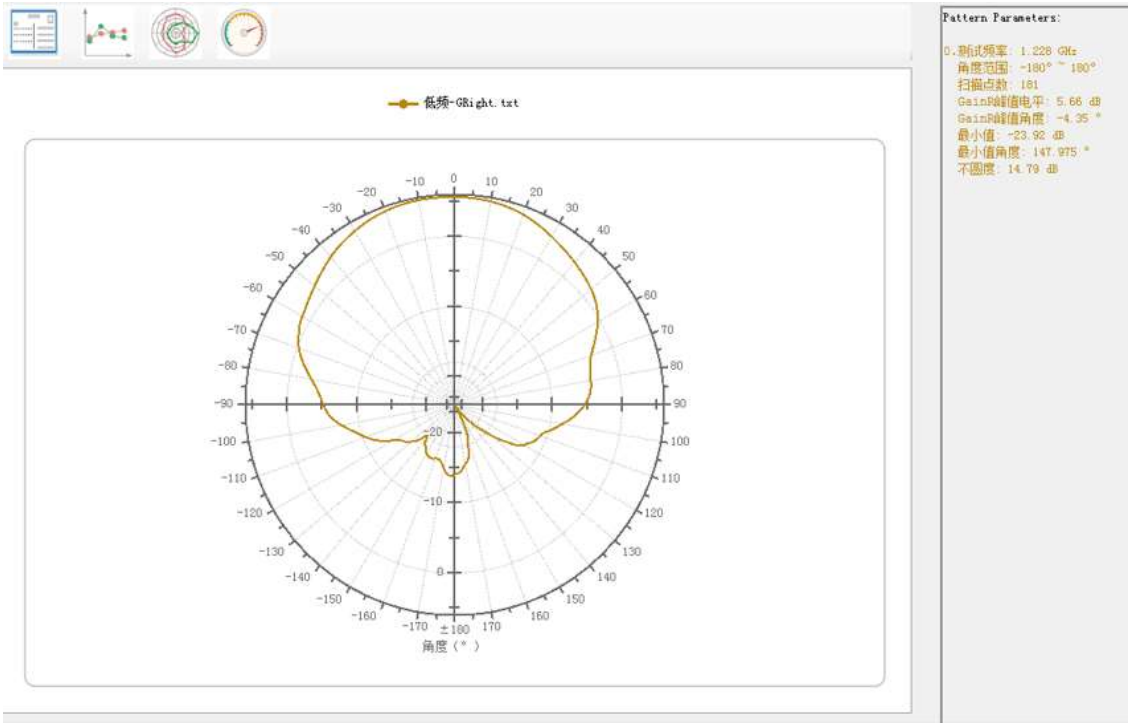
Antenna Gain patterns :



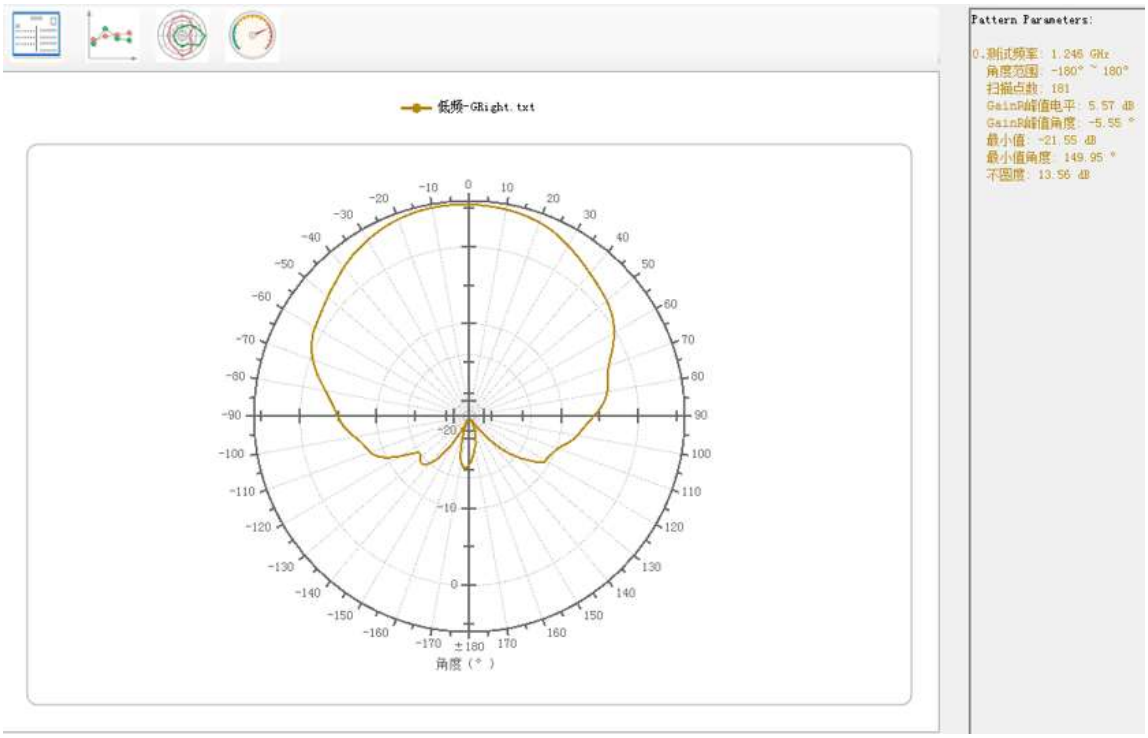
1176MHz： Gain



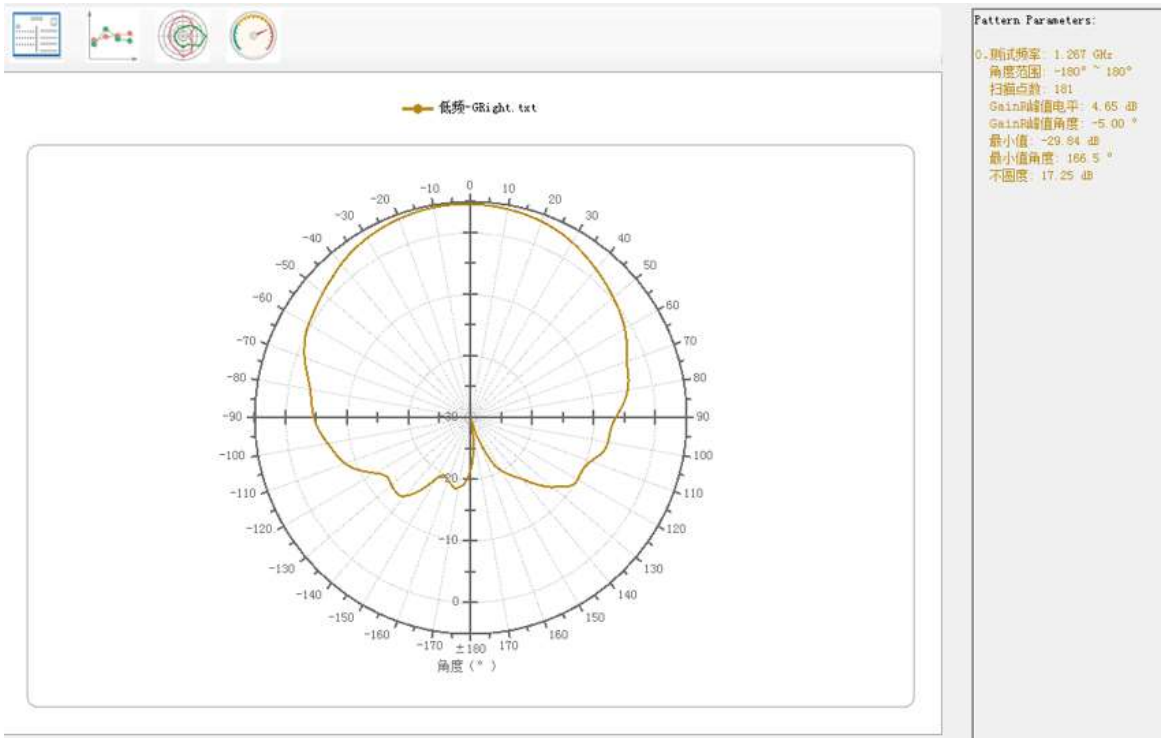
1207 MHz： Gain



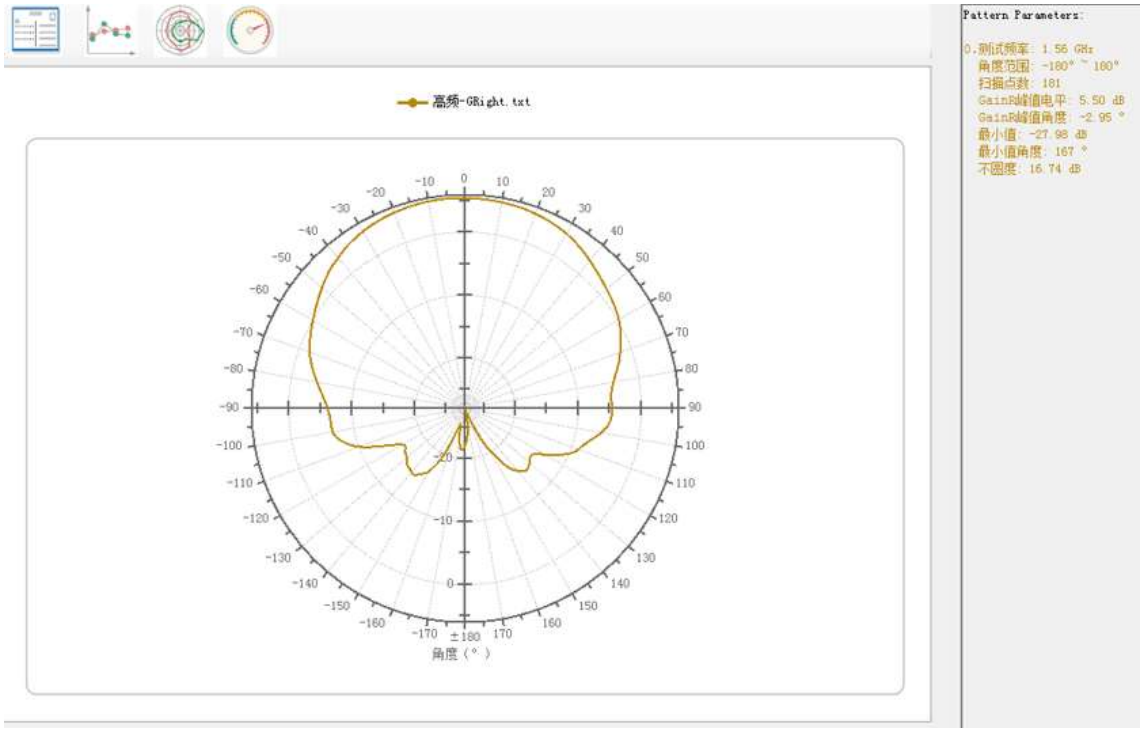
1227 MHz： Gain



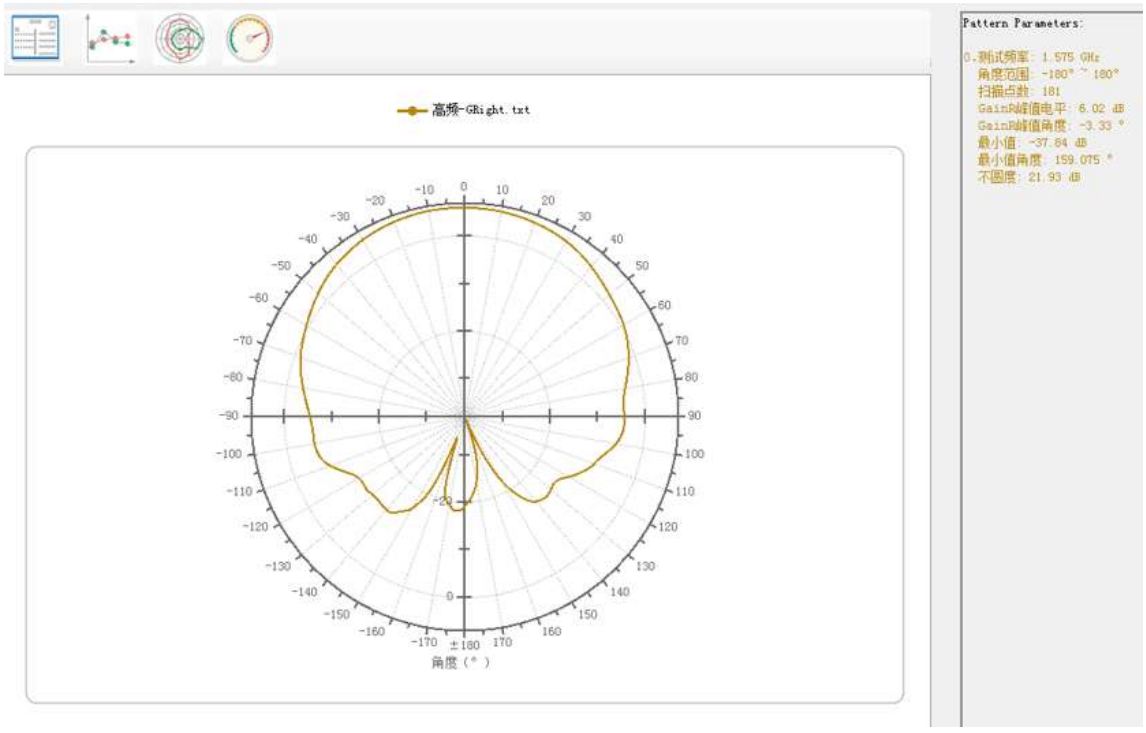
1246 MHz： Gain



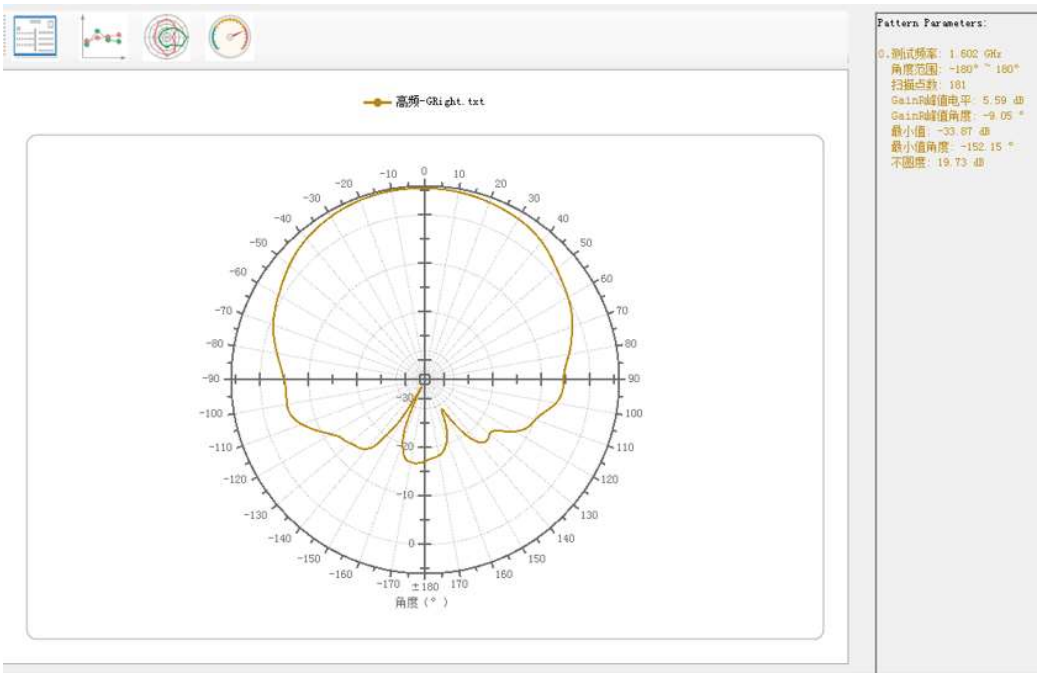
1268 MHz： Gain



1559 MHz： Gain

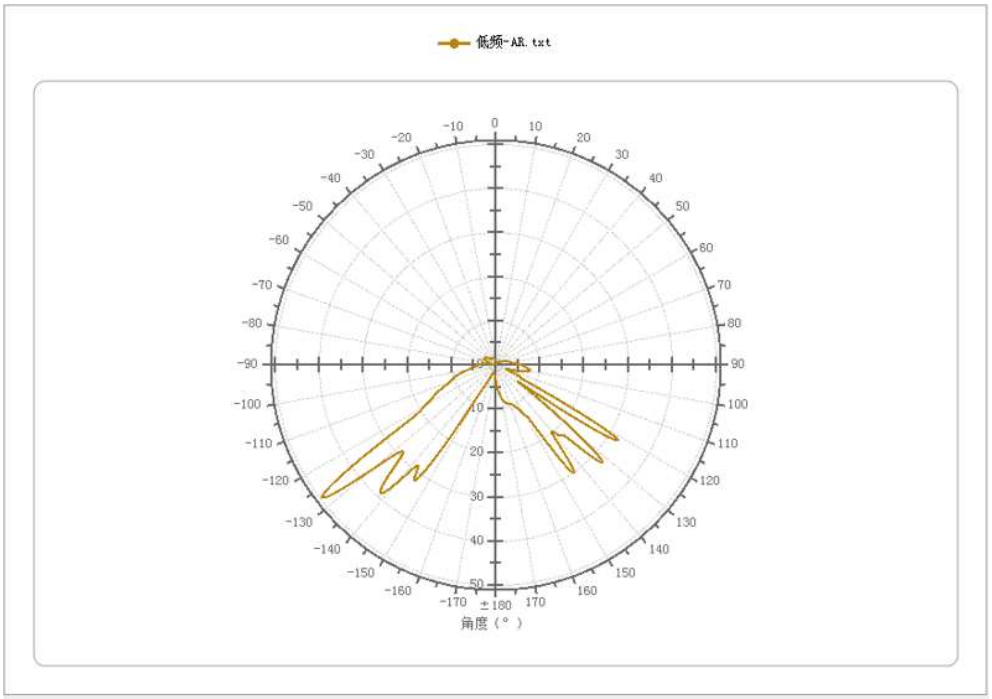


1575 MHz： Gain



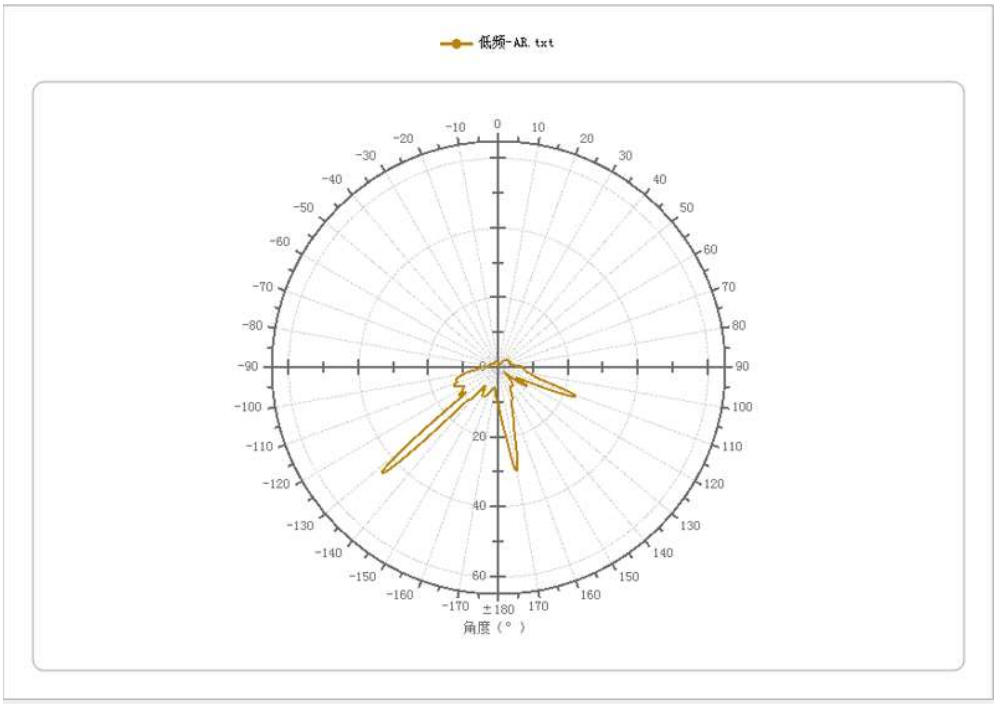
1602 MHz： Gain

Antenna Axial ratio patterns:



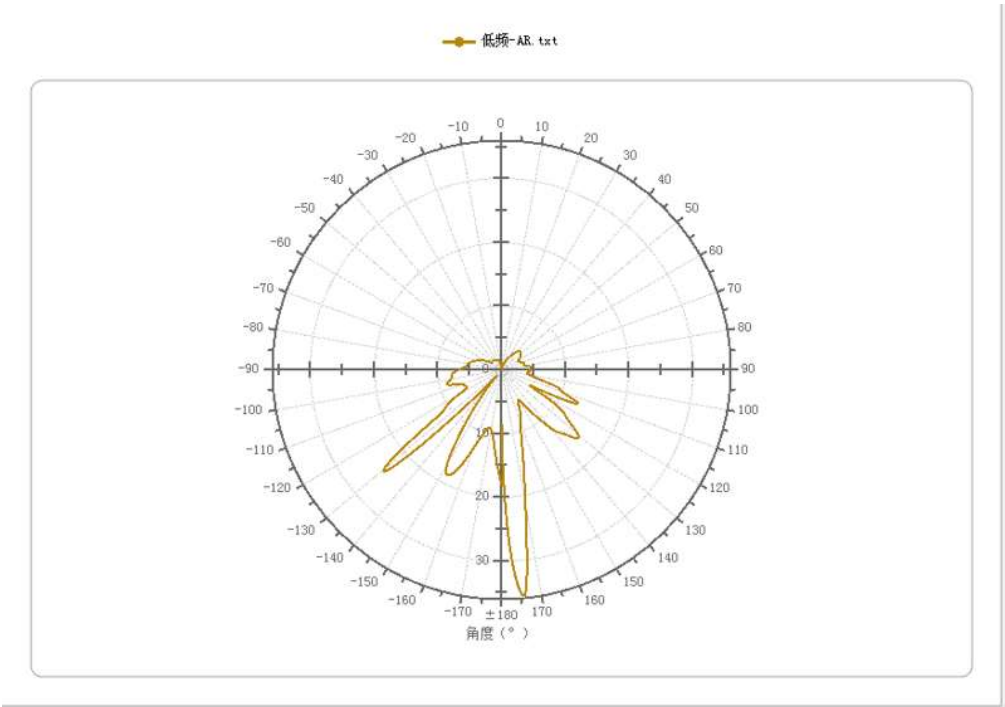
序号	0
频率（GHz）	1.177
X_value	0
Y_value	0.97

1176 MHz：Axial ratio



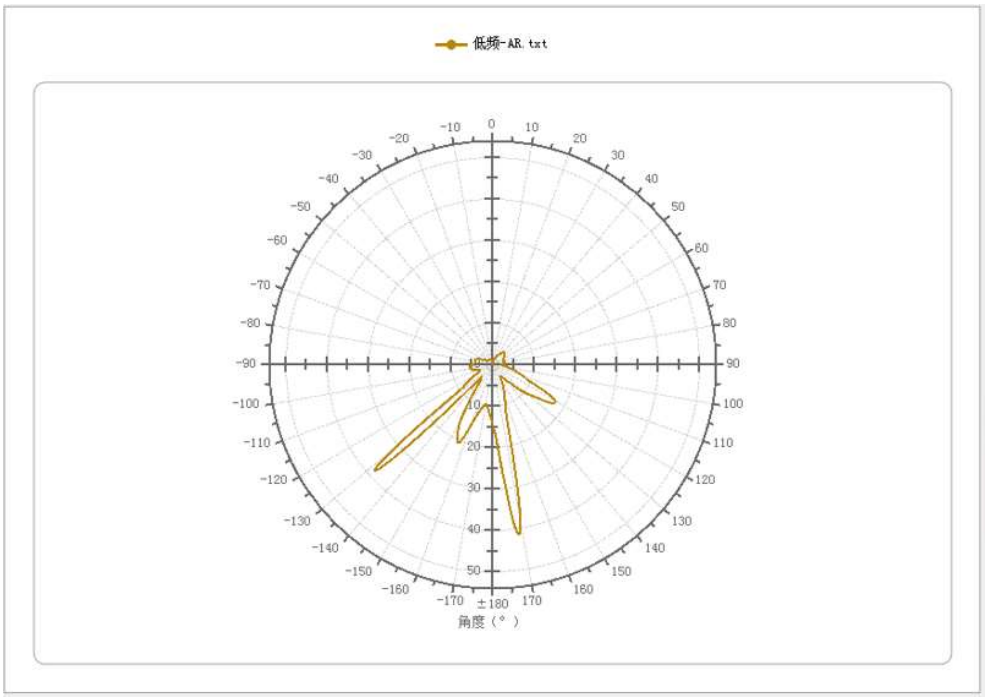
序号	0
频率（GHz）	1.207
X_value	0
Y_value	0.86

1207 MHz：Axial ratio



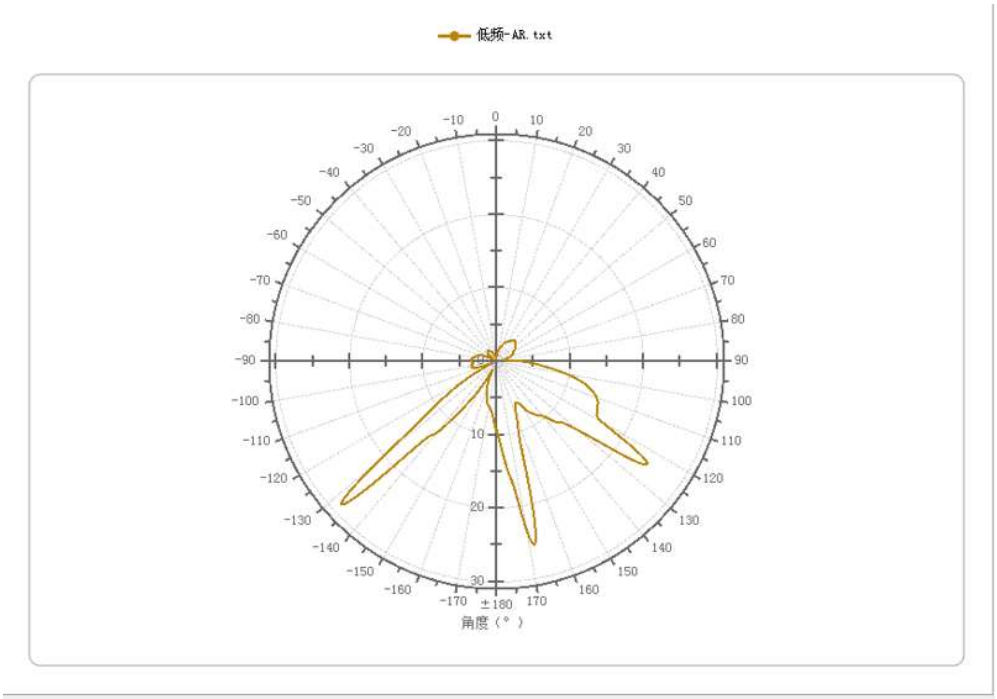
序号	0
频率（GHz）	1.228
X_value	0
Y_value	0.32

1227 MHz：Axial ratio



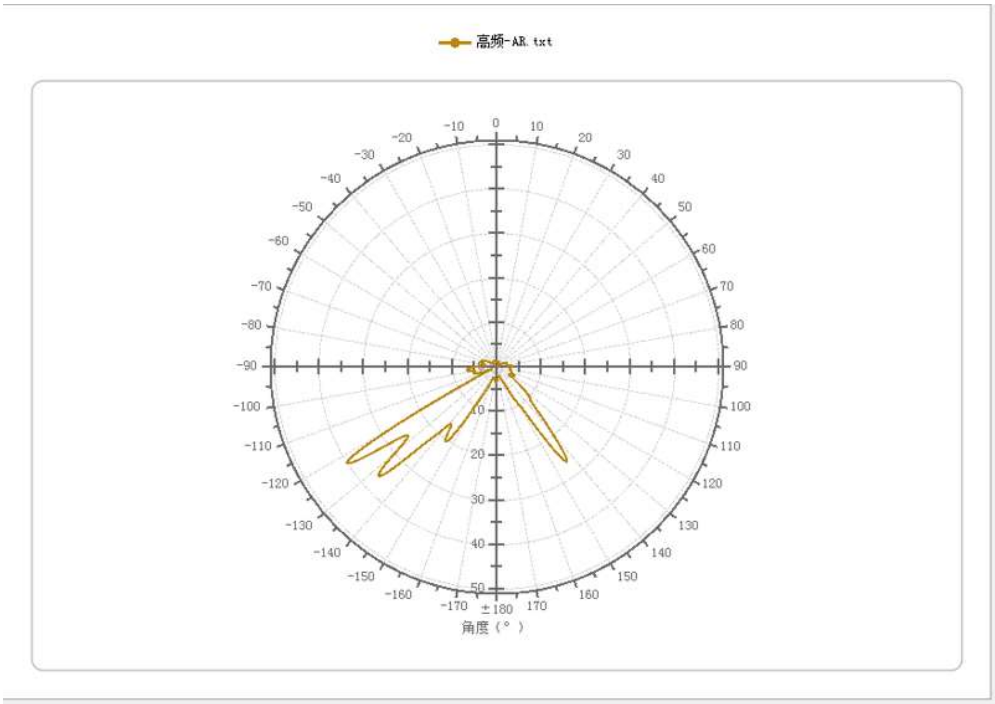
序号	0
频率（GHz）	1.246
X_value	0
Y_value	0.08

1246 MHz：Axial ratio



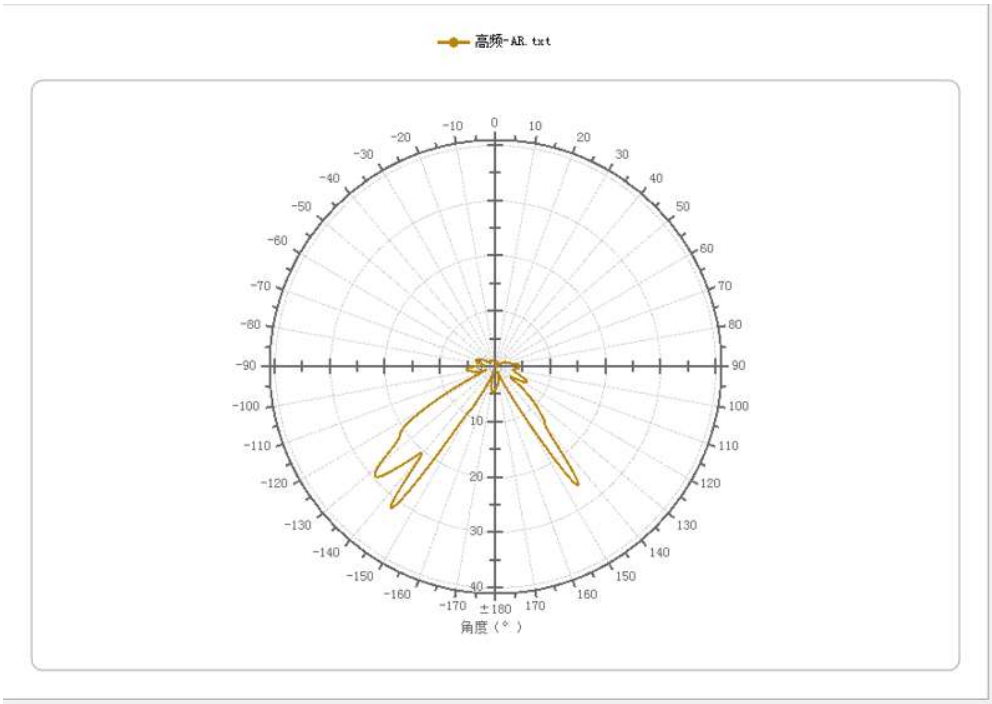
序号	0
频率（GHz）	1.267
X_value	0
Y_value	0.67

1268 MHz：Axial ratio



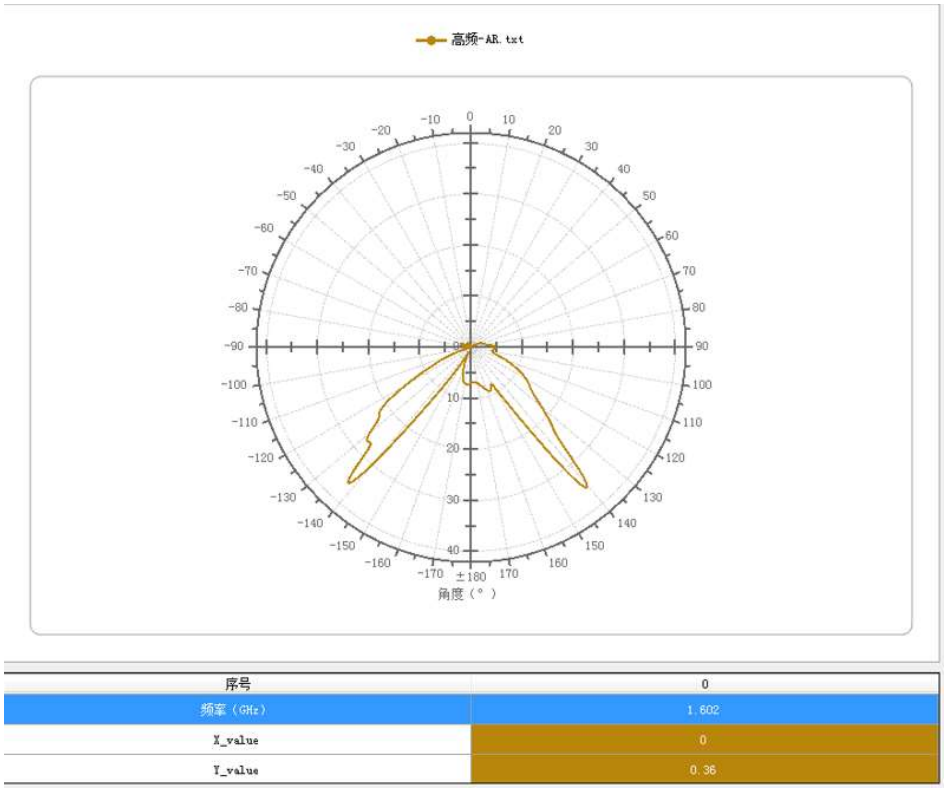
序号	0
频率（GHz）	1.56
X_value	0
Y_value	1.09

1561 MHz：Axial ratio



序号	0
频率（GHz）	1.575
X_value	0
Y_value	0.74

1575 MHz：Axial ratio



序号	0
频率（GHz）	1.602
X_value	0
Y_value	0.36

1602 MHz：Axial ratio

1.1.2 Antenna VSWR Performance

Test environment：

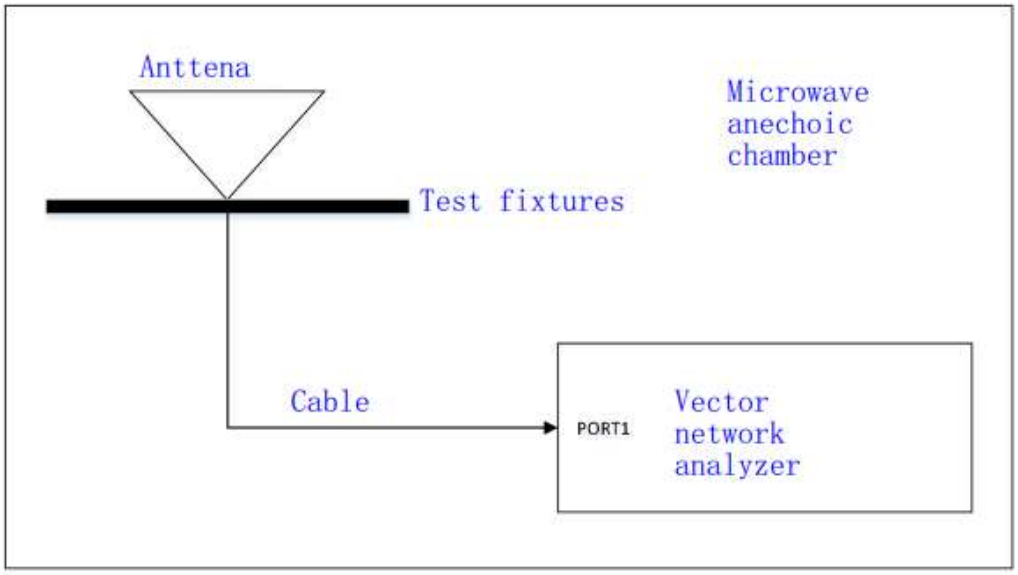


Figure 2： Antenna VSWR Test schematic

Test equipment：E5071C

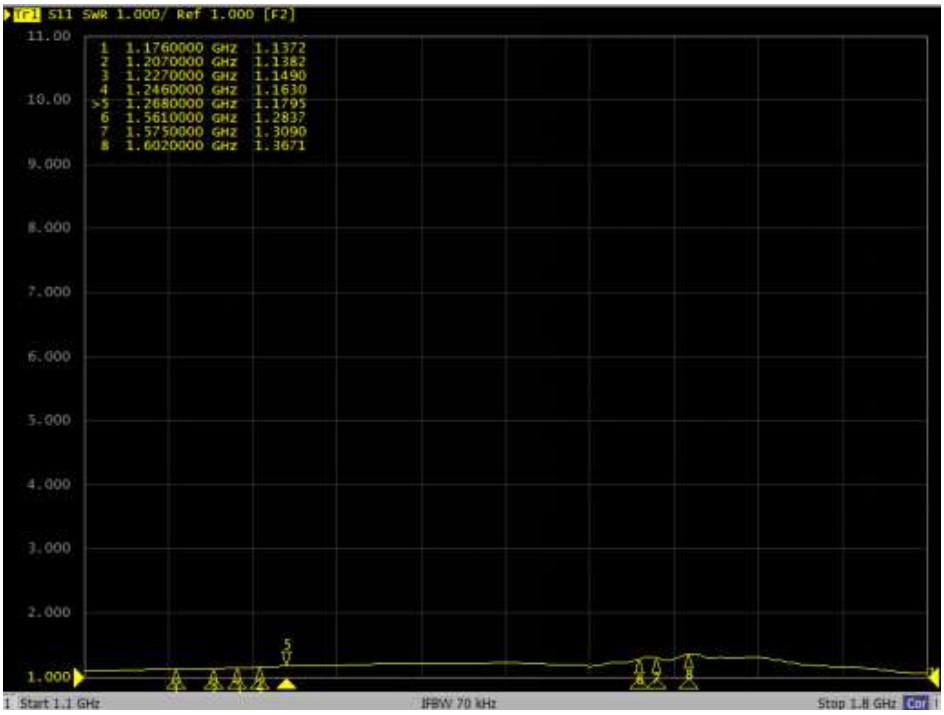
Test Method：

1) Set the vector network analyzer to S11 test mode, and the display mode is SWR;
2) Set the frequency range of the vector network analyzer to 1100MHz~1800MHz, together with the RF cable Calibrate VSWR;
3) As shown in Figure 2, in a microwave anechoic chamber environment, connect the L1 or L2 ports of the antenna under test and other test equipment, and connect the other ports of the passive antenna to a 50Ω load;
4) Read the VSWR of the vector network analyzer at the corresponding frequency, and fill in the test results in Table B.2 of Appendix B to confirm whether the index requirements are met.

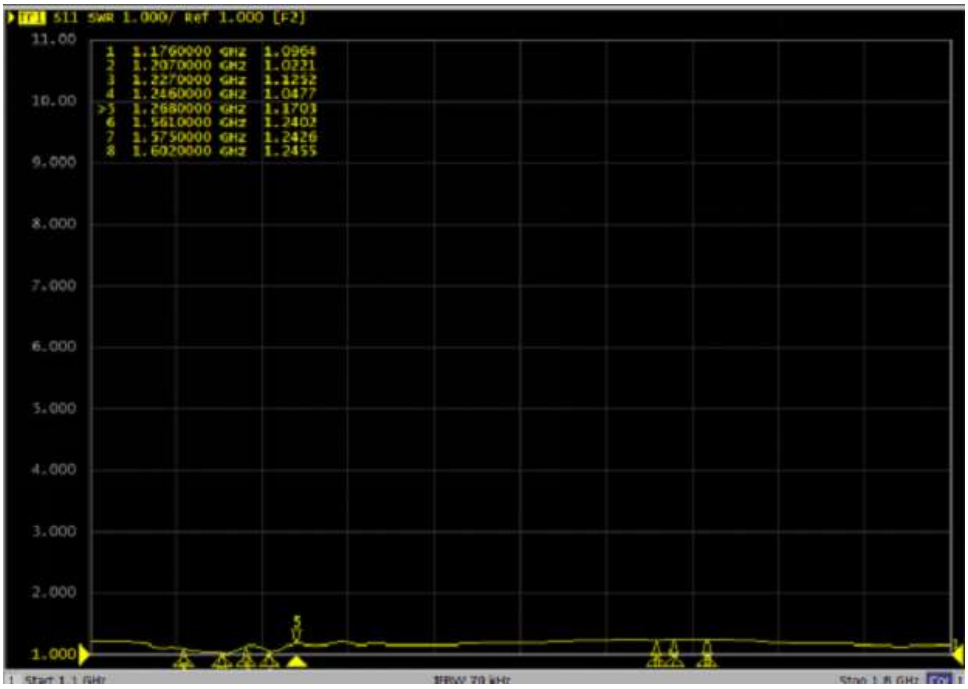
VSWR Test Result：

Frequency (MHz)	VSWR
1176	1.09
1207	1.02
1227	1.12
1246	1.04
1268	1.17
1561	1.28
1575	1.3
1602	1.36

VSWR Test Screenshot：



L1: VSWR



L2: VSWR

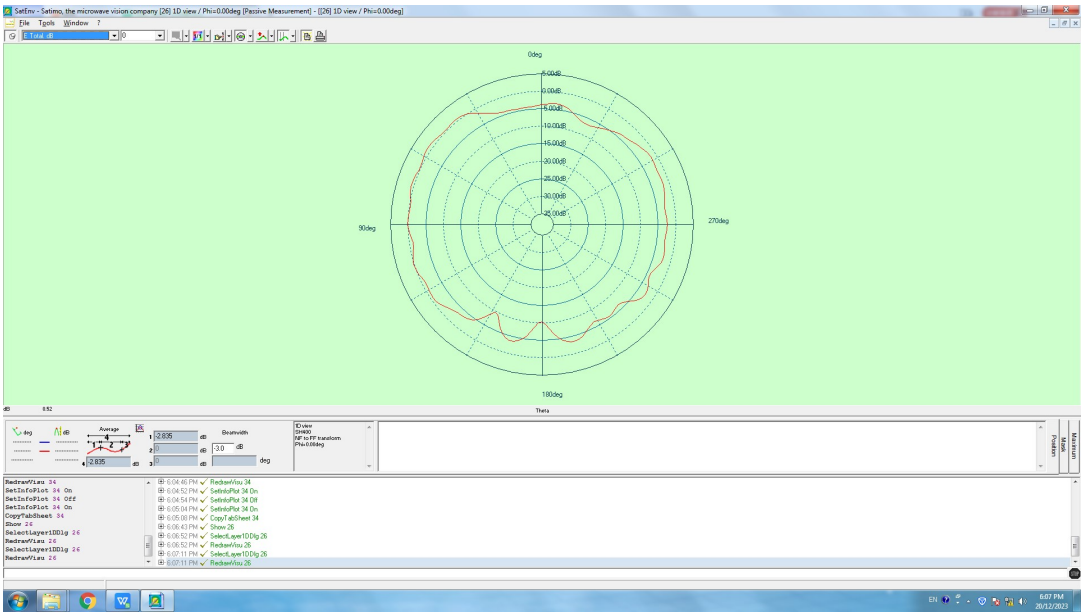
1.2 BT/4G Antenna Performance

1.2.1 Antenna Pattern Performance

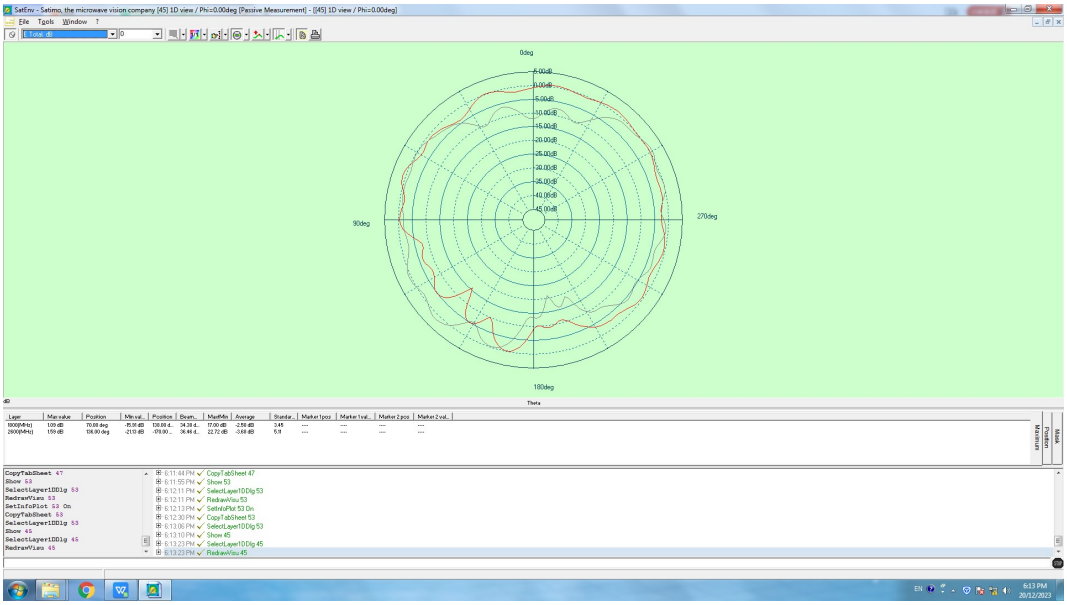
The test environment and test method are the same as GNSS antenna.

Test results：

	Maximum Gain dBi
BT	1.09
4G	1.59



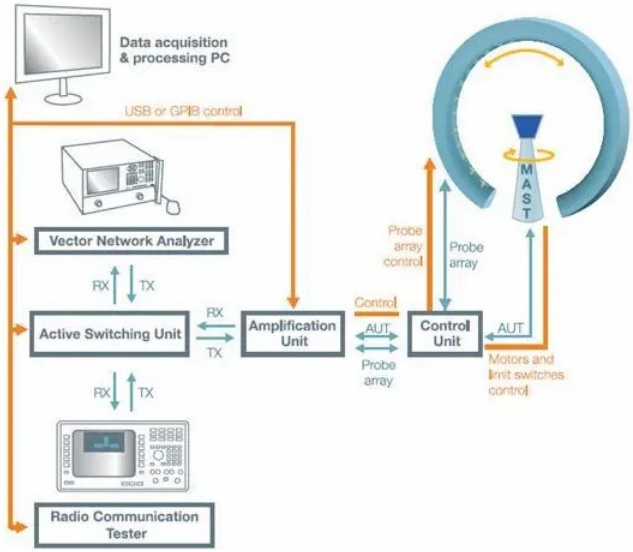
BT antenna gain pattern



4G antenna gain pattern

1.2.2 Antenna Efficiency Performance

Test environment：



Test equipment：SATIMO SG-24

Test results：

BT antenna efficiency

Frequency/Hz	Efficiency
2.350000000	56%

2400000000	58%
2450000000	50%
2500000000	37%
2550000000	30%
2600000000	30%
2650000000	40%
2700000000	44%
2750000000	55%
2800000000	40%

4G antenna efficiency

Frequency/Hz	Efficiency
820000000	16%
840000000	22%
860000000	29%
880000000	31%
900000000	24%
920000000	7%
940000000	19%
960000000	24%
1700000000	31%
1720000000	32%
1740000000	37%

1760000000	47%
1780000000	60%
1800000000	64%
1820000000	63%
1840000000	57%
1860000000	57%
1880000000	59%
1900000000	63%
1920000000	63%
1940000000	60%
1960000000	60%
1980000000	59%
2000000000	57%
2020000000	56%
2040000000	55%
2060000000	53%
2080000000	47%
2100000000	40%
2120000000	31%
2140000000	24%
2160000000	19%
2180000000	16%

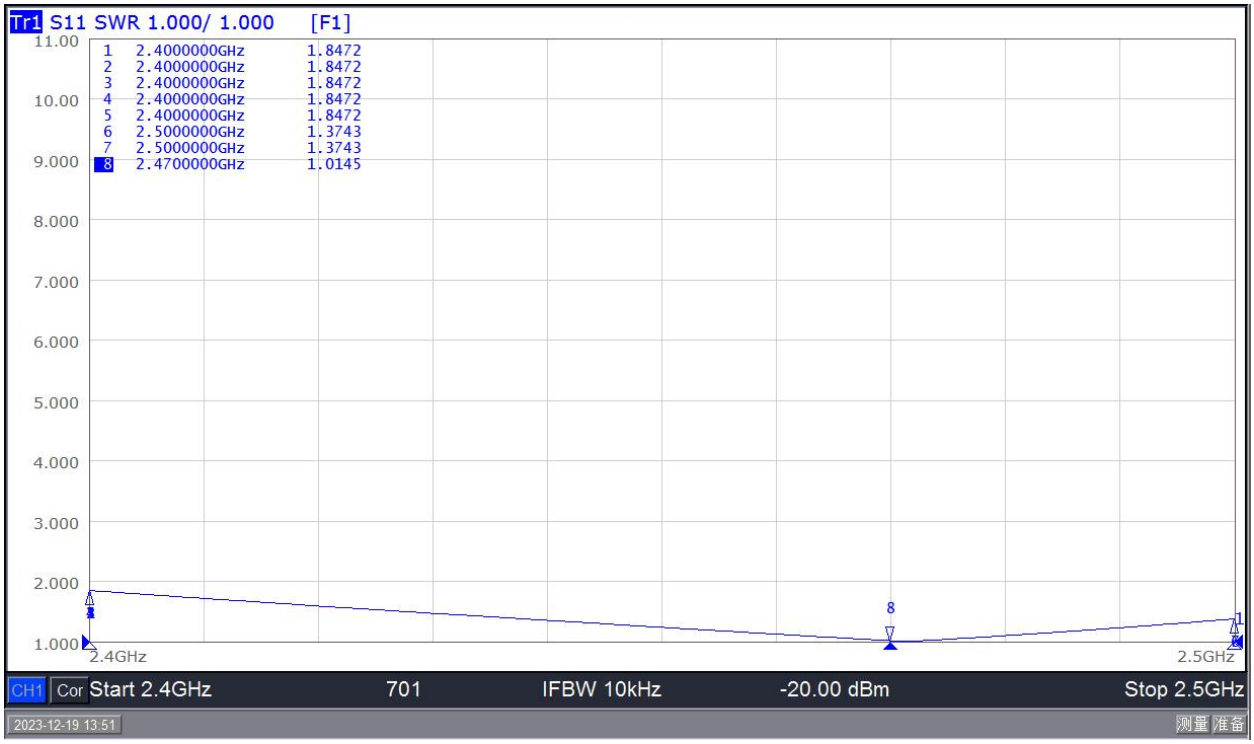
2200000000	13%
2220000000	11%
2240000000	9%
2260000000	7%
2280000000	6%
2300000000	6%
2320000000	7%
2340000000	7%
2360000000	8%
2380000000	9%
2400000000	11%
2420000000	12%
2440000000	15%
2460000000	17%
2480000000	20%
2500000000	23%
2520000000	30%
2540000000	36%
2560000000	46%
2580000000	55%
2600000000	62%
2620000000	62%

2640000000	54%
2660000000	35%
2680000000	23%
2700000000	19%

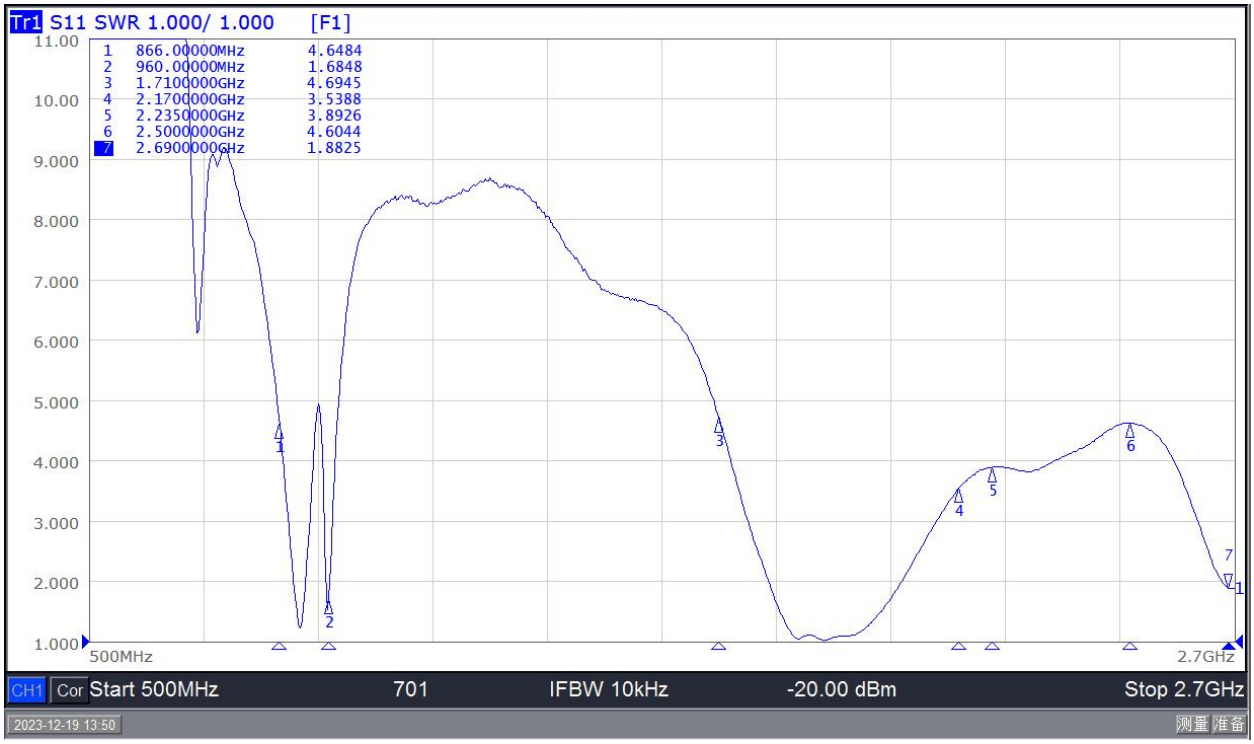
1.2.3 Antenna VSWR Performance

The test environment and test method are the same as GNSS antenna.

VSWR Test Result:



BT VSWR



4G VSWR

2. LNA Performance

2.1 Noise figure

Test environment：

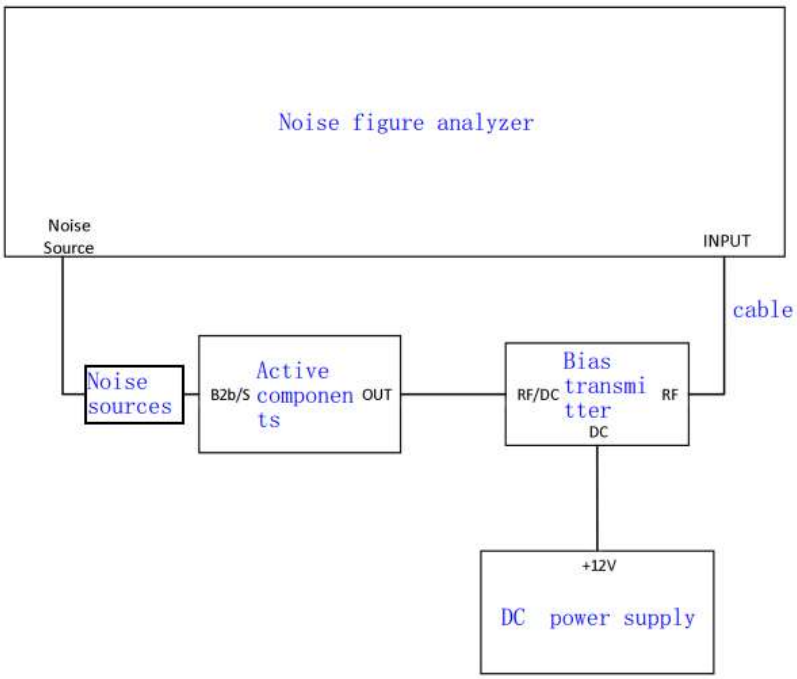


Figure 3： Noise figure Test schematic

Test equipment：Noise Figure Analyzer N8973A

Test Method:

1）Set the center frequency of the noise figure analyzer to 1220MHz and the bandwidth to 120MHz and calibrate it;

2）The output voltage of the whole DC regulated power supply is +12V;

3）As shown in Figure 3, set up a test environment;

4）Turn on the DC regulated power supply and check whether the noise figure of the frequency point on the display interface of the noise figure analyzer meets the requirements of the index;

5）Set the center frequency of the noise figure analyzer to 1570MHz and the bandwidth to 100MHz and calibrate it;

6）Turn on the DC regulated power supply and check whether the noise figure of the frequency point on the display interface of the noise figure analyzer meets the requirements of the index.

Test results：

Frequency/MHz	Noise figure/dB
1176	1.46
1207	1.58
1227	1.68
1246	1.67
1268	1.65
1561	1.86
1575	1.75
1602	1.88

frequency（GHz）	noise figure（dB）
1.166-1.278	≤1.8
1.559-1.605	≤1.9

L2: noise figure

L1: noise figure

2.2 LNA Gain test

Test method：

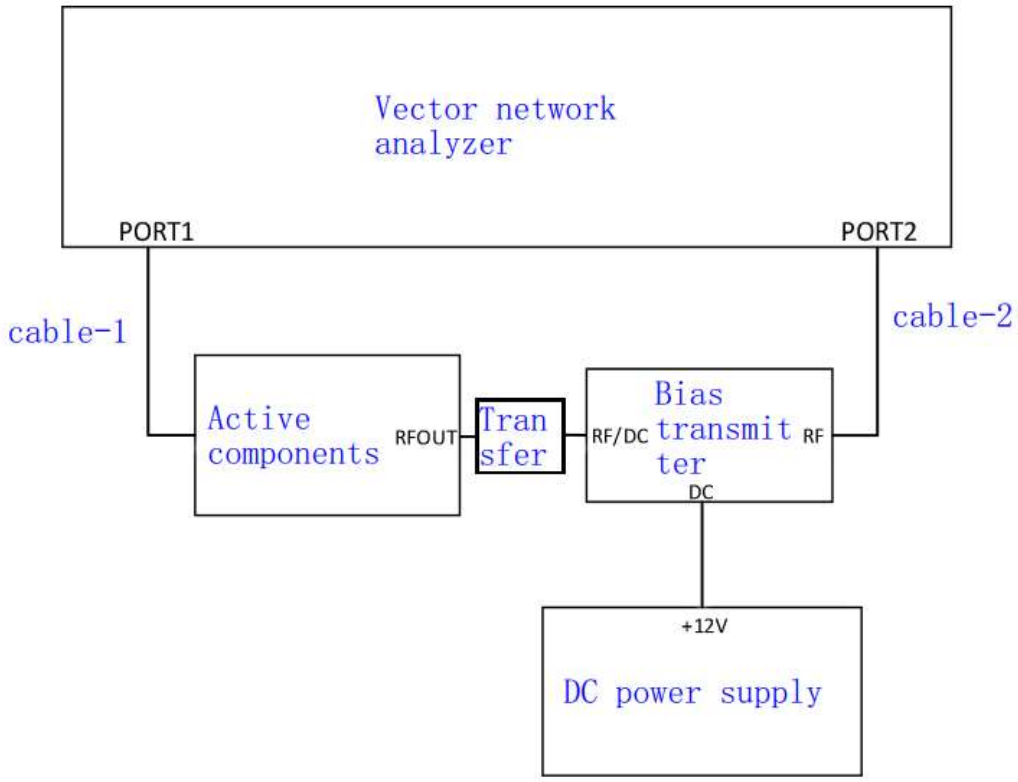


Figure 3： LNA Gain Test schematic

1) Set the testing bandwidth to 1.1GHz -1.7GHz, calibrate the network analyzer, and set the output power of the network analyzer to -50dBm to ensure that the low noise amplifier gain is not compressed;

2) As shown in Figure 3, connect the DC stabilized power supply and the low noise amplifier to be tested through a feeder, power on and work, and supply 5V;

3) Connect the network analyzer and the low noise amplifier to be tested, measure and record the maximum gain Gmax, minimum gain Gmin, and gain value at the center frequency point within the bandwidth range;

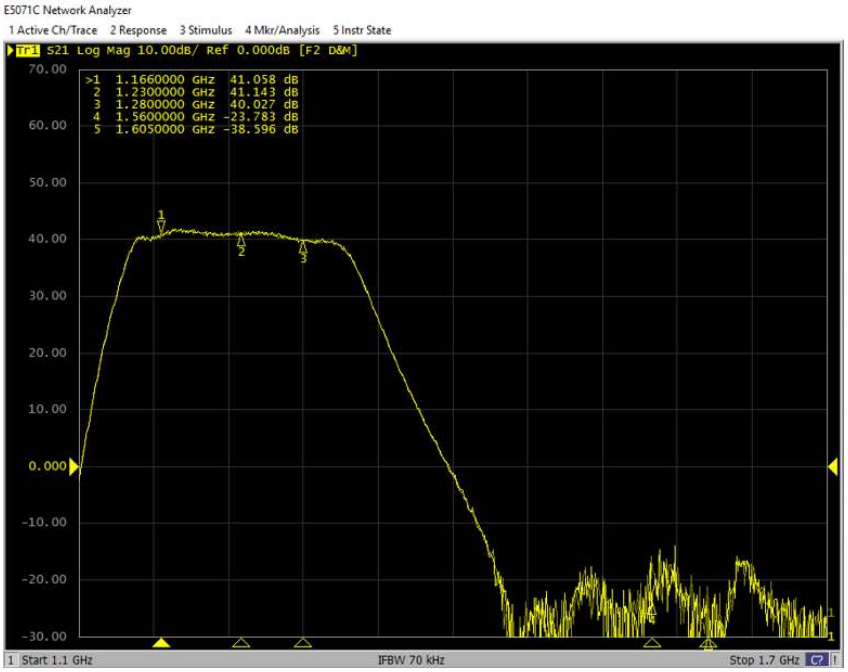
4) Test the gain of the low noise amplifier, and at the same time, the network analyzer will display the standing wave ratio of the circuit's output voltage and record it.

Test equipment：E5071C

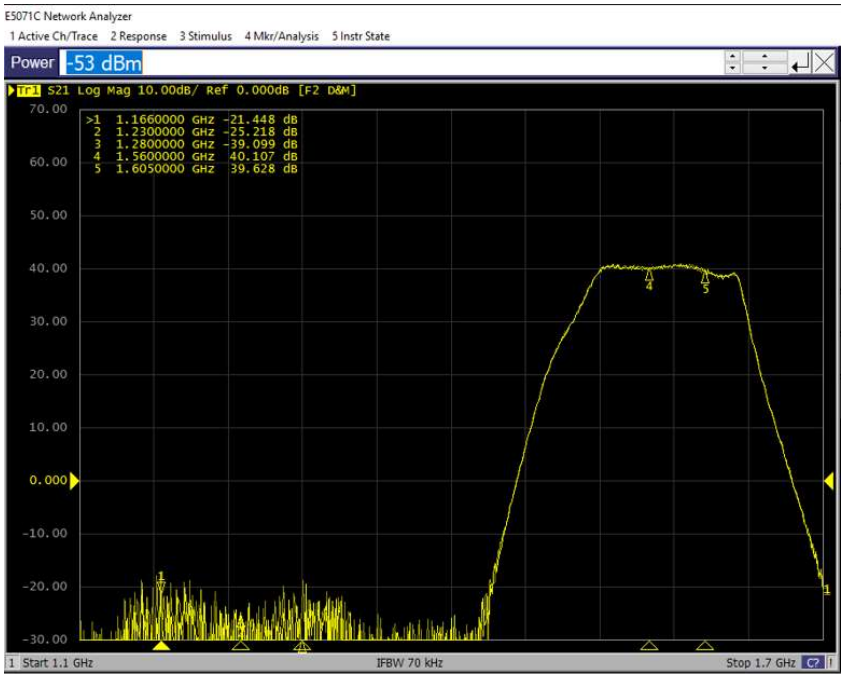
Test results：

Frequency/MHz	LNA Gain/dB
1176	41.5
1207	40.9
1227	41.1
1246	41.8

1268	41.6
1561	40.2
1575	40.9
1602	39.8



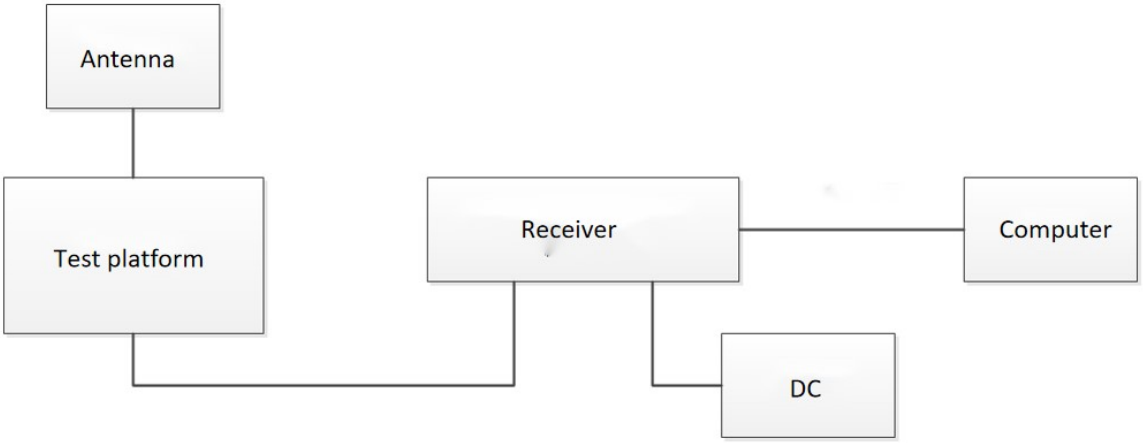
L2 LNA Gain



L1 LNA Gain

3. Complete machine Performance

Test environment：



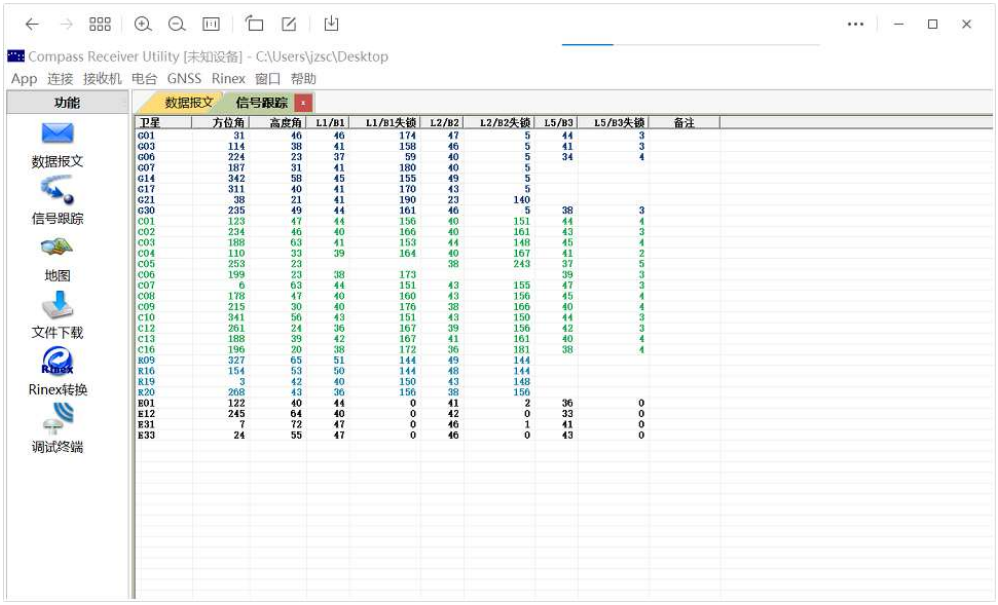
Test equipment：GNSS Receiver

Test method：

1）Connect the receiver to the LCY4N75A antenna, voltage regulator, and computer；

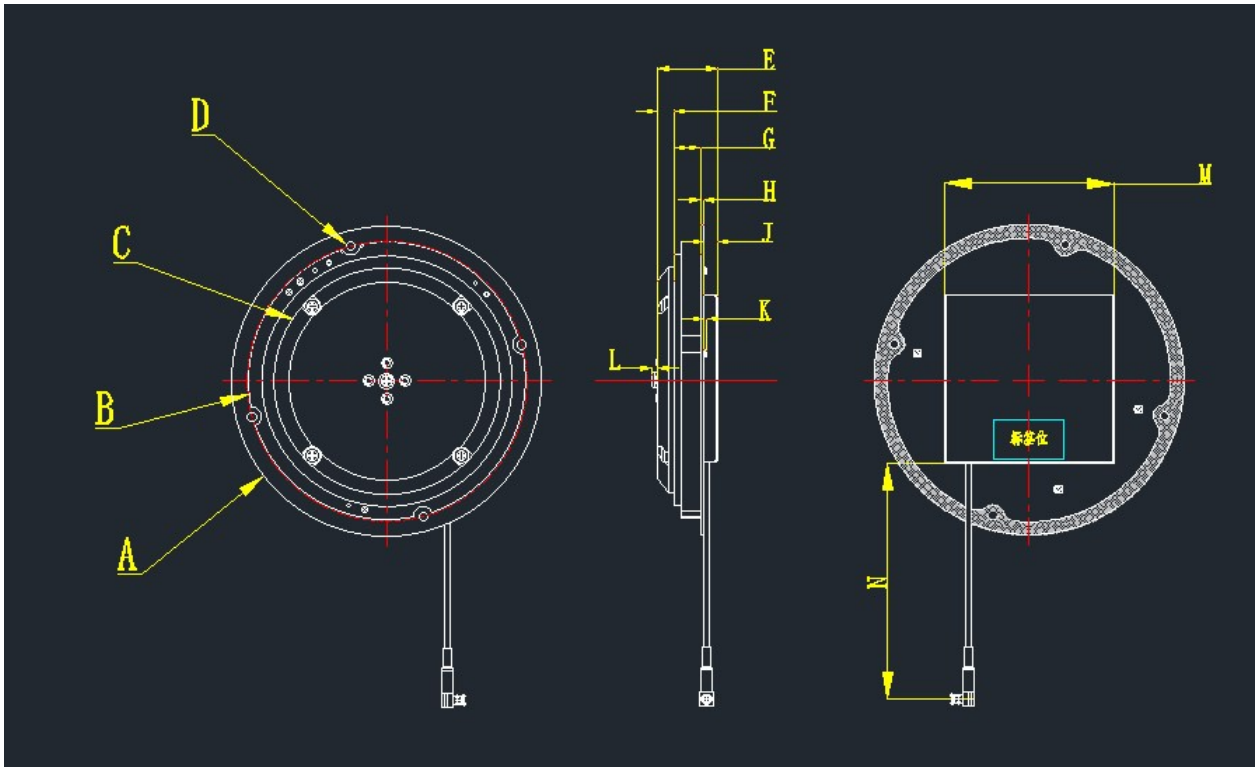
2）Open the computer testing software for star search testing:

Test result：



4.Complete machine Size

Product Structure Dimensional Inspection Report											
Inspection items		Inspection standards			Actual inspection records			Measuring tool	determine		notes
	S/N	Standard value	UCL	LCL	1	2	3		AC	RE	
size	A	116.5	0.1	0.1	116.5	116.5	116.48	C	√		
	B	104	0.3	0.3	104.1	104.1	104.12	C	√		
	C	85	0.3	0.3	84.8	84.79	84.85	C	√		
	D	3.2	0.15	0.15	3.18	3.22	3.25	C	√		
	E	22.6	1	1	22.55	22.62	22.58	C	√		
	F	6	0.2	0.2	6.05	6.04	6.05	C	√		
	G	10	0.2	0.2	10.12	10.09	10.1	C	√		
	H	1.2	0.1	0.1	1.18	1.15	1.17	C	√		
	J	5.1	0.2	0.2	5.1	5.2	5.13	C	√		
	K	2	1	0.5	1.8	2	2.05	C	√		
	L	2.2	1	1	1.7	2	2.1	C	√		
	M	63.6	0.6	0.6	63.95	64.16	64.04	C	√		
	N	150	3	3	152	152.5	152.8	C	√		
inspector: ZhangJie 2023.10.13									auditor:		
Final judgment: ■Qualified □Unqualified research and development: QiuShigui									quality: YanJingxiang		
Measuring instrument	CMM	CoordinateMusuringMa chine			C	Caliper	HG	Height Gauge			
	PG	Pin Gauge			PP	Profile Projectors					


D
C
B
A
E
F
G
H
J
K
L
M
N
标签位