

Antenna Report

Product Specification

Guest households	Shenzhen Tinno Mobile Technology Corp	FCC ID	BXZSH4D
project name	DECT	frequency band	DECT 1880Mhz-1930Mhz、 2.4GWiFi、5G&6EWiFi
Supplier Name	KunShan Innowave Communication Technology Co., Ltd	color	Black
version	T06	R F design	YiMeng.Wu
Product specifications	64.12*59.04*10.37mm	Structure design	Xing.Zhang
Product part number	F113G4302K11000	Quality Manager	Fei.Yang
Date	2024/10/22	R&D director	XuDong.Zhang

Change resume

Rev.	Date	Before	After	Reason
A0	2024/10/22	/	/	Create

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I 、 Project description

Whole machine type:	DECT
Antenna band:	DECT、 2.4GWiFi、 5G&6EWiFi
Antenna form:	LDS
Feed form:	welding
Hardware version:	

II 、 DECT+WiFi

1、 specifications

The report provides multiple measurements regarding the electrical performance of the P812DE. Figure 1 shows the antenna designed.

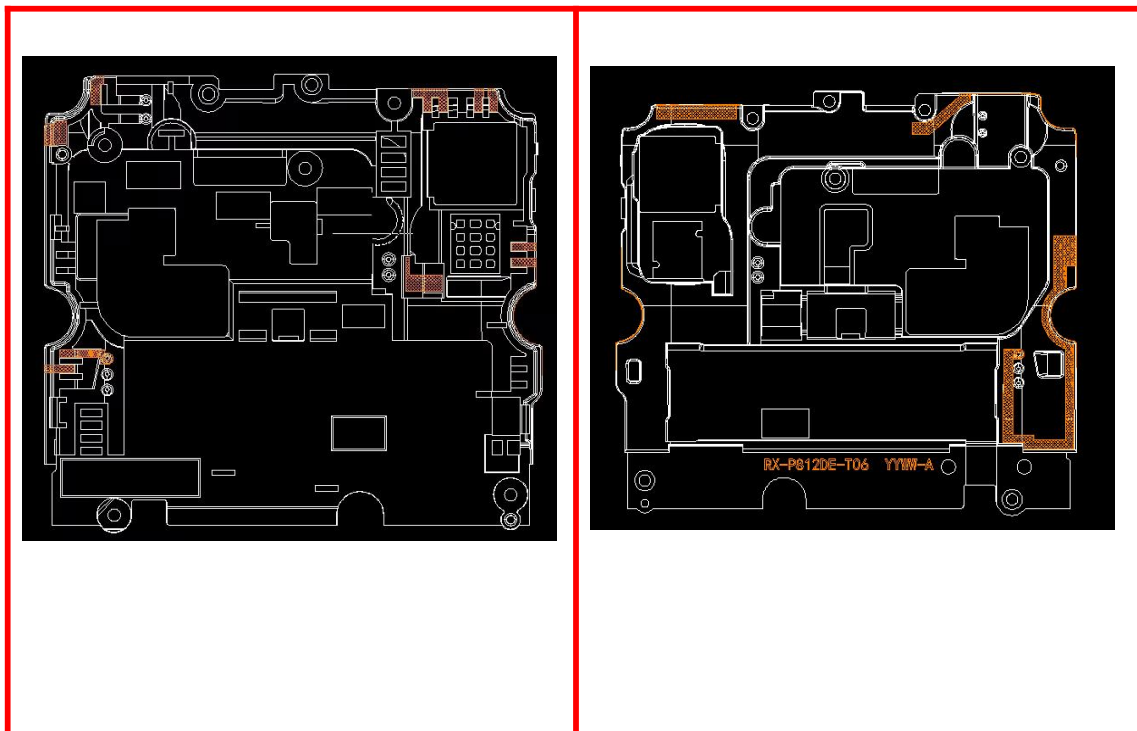


Figure 1

1.1 Electrical specification standard

The frequency range of the antenna:

1880-1930MHz, 2400-2500MHz, 5100-7200MHz

1.2 Antenna matching

1.2.1 ANT0-DECT0 antenna

ANT0 matching						
Position	E2203	E2202	C2204	C2201	C2203	C2202
Value	OK	OK	NC	0 Ω	NC	0 Ω

Table1 DECT matching

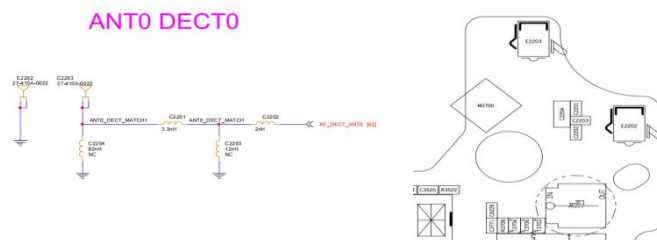


Figure2 DECT0 schematic diagram and layout PCB

1.2.2 ANT1-DECT1 antenna

ANT1matching							
Position	E2205	E2204	E2219	C2208	C2205	C2207	C2206
Value	OK	OK	OK	NC	6.8nH	1.5pF	0 Ω

Table2 DECT matching

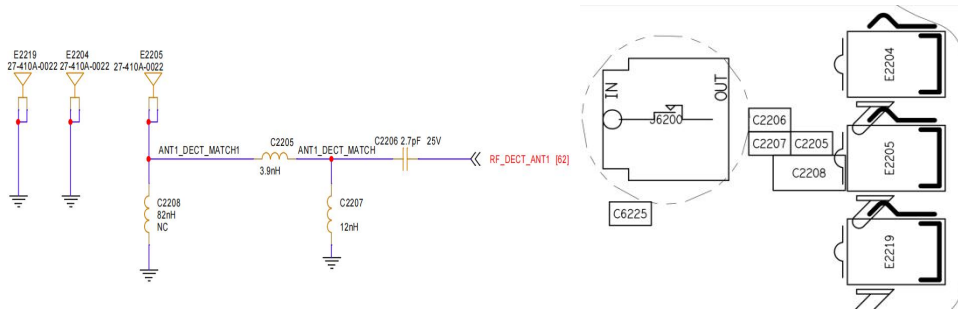


Figure3 DECT1 schematic diagram and layout PCB

1.2.3 ANT2-5G&6E MIMO1

ANT2 matching						
Position	E2201	E2209	C2212	C2209	C2211	C2210
Value	OK	OK	NC	1nH	NC	0Ω

Table3 ANT2 matching

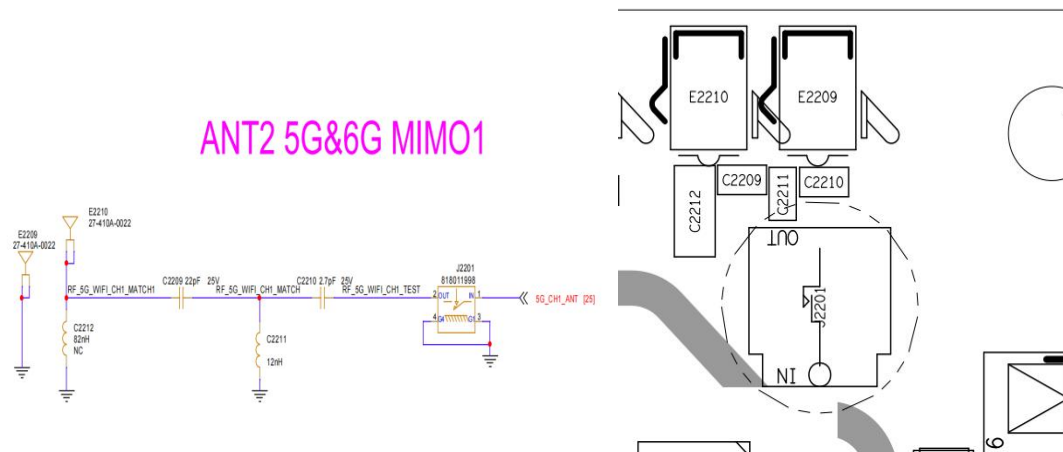


Figure4 ANT2 schematic diagram and layout PCB

1.2.4 ANT3-2G4-MIMO1

ANT3 matching										
Position	E2214	E2201	E2215	C2214	C2222	T2202	C2228	C2231	C2229	C2232
Value	OK	OK	OK	22pF	22pF	NC	22pF	82nH	0Ω	NC

Table4 ANT3 matching

ANT3 2G4 MIMO

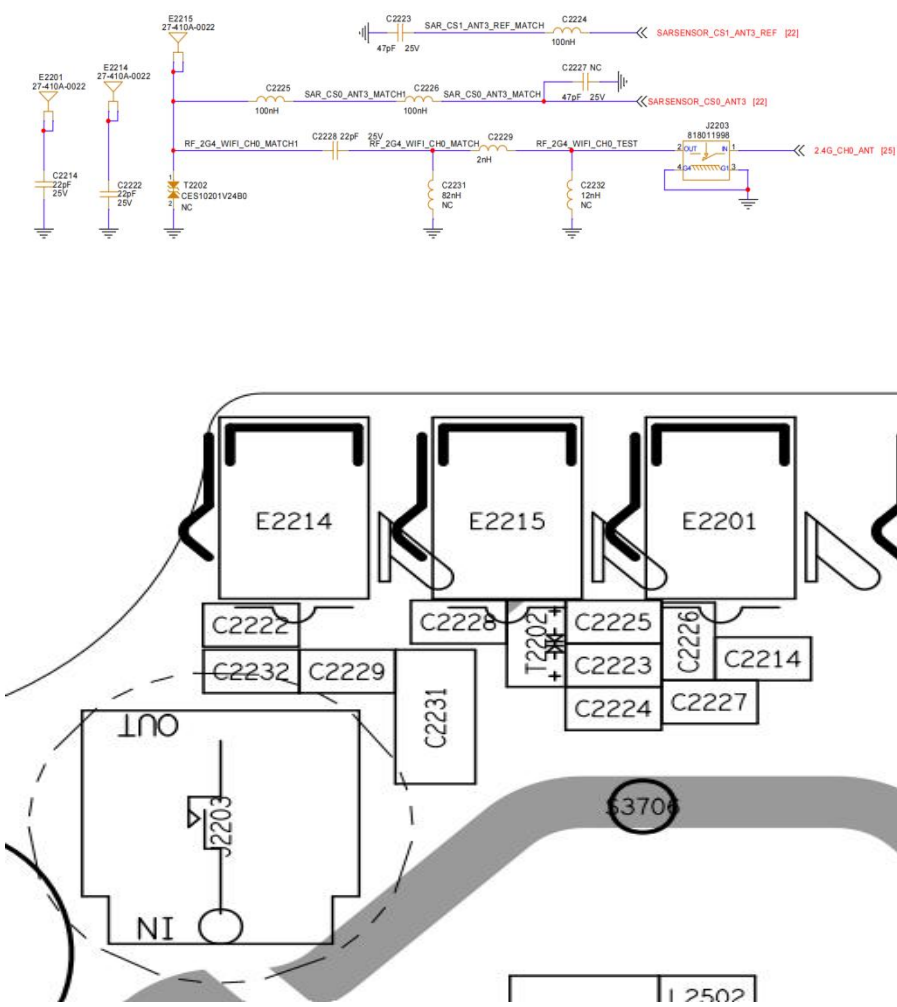


Figure5 ANT3 schematic diagram and layout PCB

1.2.5 ANT4-2G4-MIMO1

ANT4 matching							
Position	E2217	E2218	T2203	C22240	C2243	C2241	C2244
Value	OK	OK	NC	1pF	82nH	0Ω	NC

Table5 ANT4 matching

ANT4 2G4 MIMO1

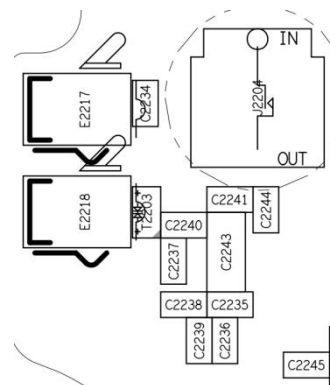
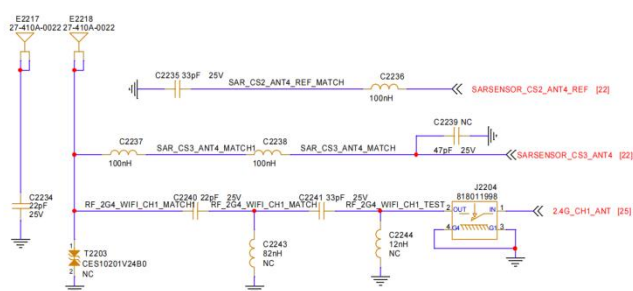


Figure6 ANT4 schematic diagram and layout PCB

1.2.6 ANT5-5G&6E MIMO0

ANT5 matching						
Position	E2211	E2212	C2219	C2217	C2220	C2218
Value	OK	OK	NC	0Ω	NC	0Ω

Table6 ANT5 matching

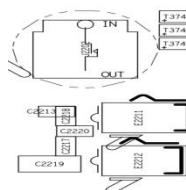


Figure7 ANT5 schematic diagram and layout PCB

1.3 Antenna composition

The antenna is mainly composed of LDS

2、 The Equipment of Active Test

2.1 Rayzone-2800 Test System

2.1.1 Dual-polarized broadband communication antennas

2.1.2 0.4-7.5GHz Frequency Range

2.1.3 Size 3m x 3m x 3m

2.1.4 Supports most wireless testing standards, including 2G/3G/4G/5G/WiFi, SISO/MIMO, GNSS, as well as the NB-IoT/Cat-M testing.



Figure8

2.2 Anritsu MT8000A + MT8821C

2.2.1 All-in-One Support for RF Measurements and Protocol Tests in FR1 (to 7.125 GHz)

Supports Existing LTE Test Environment

2.2.2 Supports mm-wave band RF measurements and beam forming tests combined use with the RF chamber.

2.2.3 Supports various functional tests by GUI operation only without requiring difficult scenario development

2.2.4 Measures maximum IP data throughput for wide variety of band, CA, and MIMO combinations



Figure9 MT8000A & MT8821C

2.3 Keysight E5071C

2.3.1 Frequency Range: 0-8.5GHz

2.3.2 Measurement Channels: 2 or 4 ports

2.3.3 Measurement Speed: 41 ms at 1601 points with full 2-port calibration.

2.3.4 Output Power: +10 dBm (typical)

2.3.5 Connectivity: GPIB, LAN, and USB

2.3.6 Display: 10.4-inch color LCD with touch screen



Figure10 Keysight E5071C & Test Setup

3、Test

3.1 The Test of standing Wave (VSWR)

3.1.1 S11

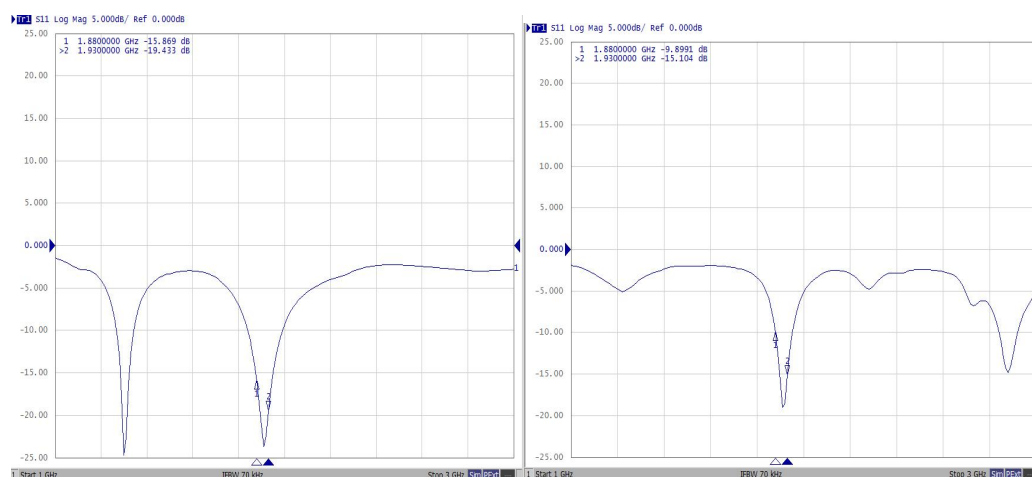


Figure11 ANT0&ANT1 S11

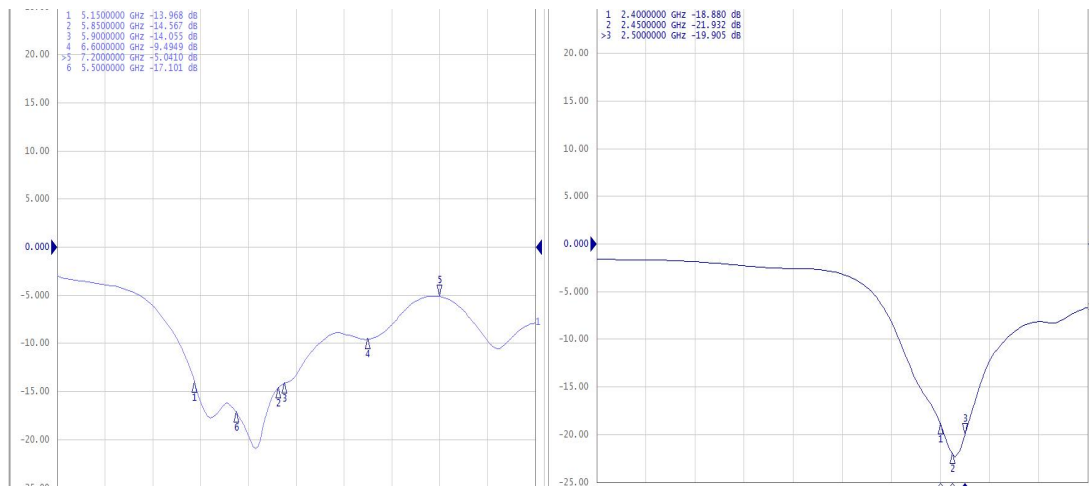


Figure12 ANT2&ANT3 S11

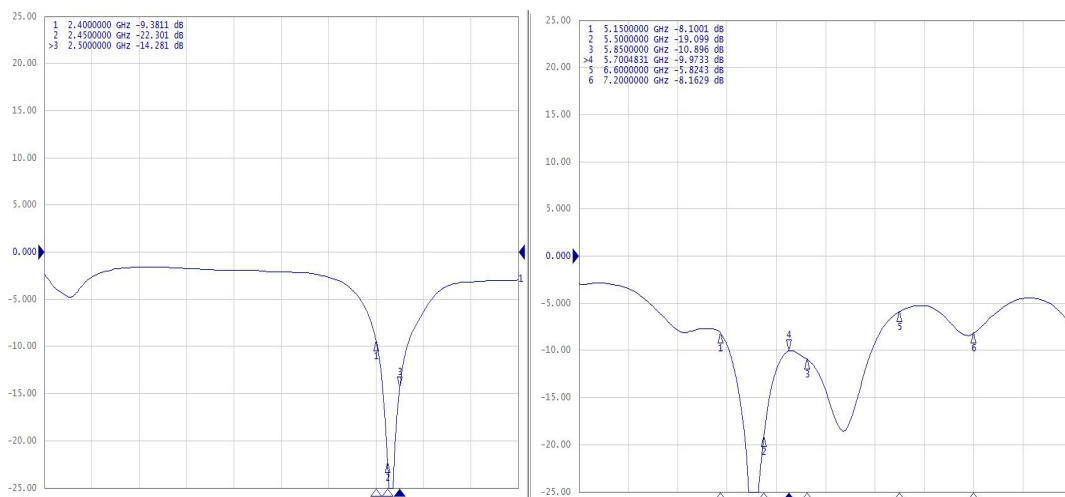


Figure13 ANT4&ANT5 S11

3.2 Measurement of Antenna efficiency and gain

3.2.1 ANT0-DECT

ANT 0-DECT		
Frequency (MHz)	Efficiency (dB)	Gain
1860	-4.9	-0.3
1870	-4.8	-0.2
1880	-4.6	0.1
1890	-4.2	0.33
1900	-4.1	0.2
1910	-3.7	0.3
1920	-3.6	0.1
1930	-3.7	-0.2
1940	-3.7	-0.4
1950	-3.7	-0.5

Table7 ANT0 Efficiency&gain

3.2.2 ANT1-DECT

ANT 1-DECT		
Frequency (MHz)	Efficiency (dB)	Gain
1860	-5.61	-0.77
1870	-5.6	-0.06
1880	-5.11	0.39
1890	-4.98	0.24
1900	-4.72	0.47
1910	-4.73	0.48
1920	-4.82	0.25
1930	-4.92	0.09
1940	-5.03	-0.03
1950	-5.33	-0.7

Table8 ANT1 Efficiency&gain

3.2.3 ANT2-5G&6E WiFi

ANT 2- 5G&6E WIFI					
Frequency (MHz)	Efficiency (dB)	Gain	Frequency (MHz)	Efficiency (dB)	Gain
5150	-5	-1.1	6200	-6.7	-1.3
5200	-4.8	-1.2	6250	-7.2	-1.3
5250	-5	-0.9	6300	-6.8	-1.8
5300	-4.9	-0.3	6350	-7.4	-1.6
5350	-4.8	0.1	6400	-7.6	-0.9
5400	-4.8	0.1	6450	-7.2	-1.7
5450	-5.1	0.2	6500	-7.2	-2.8
5500	-5	0.6	6550	-7	-3.2
5550	-4.8	0.9	6600	-6.6	-3.2
5600	-4.9	0.3	6650	-5.8	-3.5
5650	-5	0.2	6700	-5.9	-2.1
5700	-4.5	0.2	6750	-5.2	-1.1
5750	-4.5	-0.1	6800	-5.7	-0.1
5800	-5	0.6	6850	-5.9	-0.1
5850	-4.7	0.8	6900	-6.8	-2
5900	-3.9	0.8	6950	-7.6	-4
5950	-4.2	0.6	7000	-8.4	-5.3
6000	-4	-0.1	7050	-9.3	-5.4
6050	-5.6	0.3	7100	-9.4	-5.3
6100	-5.7	0.6	7150	-9.3	-5.1
6150	-5.8	-0.9	7200	-9.7	-4.8

Table9 ANT2 Efficiency&gain

3.2.4 ANT3-2.4G WiFi

ANT 3-2.4G WIFI		
Frequency (MHz)	Efficiency (dB)	Gain
2400	-4.6	0.07
2410	-4.4	0.04
2420	-4.5	-0.34
2430	-4.7	-0.83
2440	-4.6	-0.99
2450	-4.7	-1.24
2460	-4.7	-1.17
2470	-4.8	-1.22
2480	-4.8	-1.48
2490	-4.9	-1.39
2500	-4.9	-1.24

Table10 ANT3 Efficiency&gain

3.2.5 ANT4-2.4G WiFi

ANT 4-2.4G WIFI		
Frequency (MHz)	Efficiency (dB)	Gain
2400	-4.37	-0.32
2410	-4.05	-0.08
2420	-4.1	-0.29
2430	-4.23	-0.44
2440	-4.04	-0.30
2450	-4.16	-0.37
2460	-4.25	-0.37
2470	-4.38	-0.74
2480	-4.7	-0.74
2490	-4.77	-0.46
2500	-4.93	-0.25

Table11 ANT4 Efficiency&gain

3.2.6 ANT5-5G&6E WiFi

ANT 5- 5G&6E WIFI					
Frequency (MHz)	Efficiency (dB)	Gain	Frequency (MHz)	Efficiency (dB)	Gain
5150	-4.9	-1	6200	-6.1	-1
5200	-4.5	-0.7	6250	-5.9	-1.9
5250	-4.4	-0.1	6300	-5.3	-1.5
5300	-4.5	1	6350	-5.5	-1.1
5350	-4.3	0.9	6400	-6.5	-0.8
5400	-4	0.5	6450	-6.9	-0.9
5450	-4.5	0.5	6500	-7.5	-0.7
5500	-4.3	0.4	6550	-8.1	-3.6
5550	-4.2	0.4	6600	-8.3	-3.8
5600	-4	0.5	6650	-7.5	-3.6
5650	-4.5	-0.7	6700	-8.1	-3.2
5700	-4.9	0.5	6750	-8.1	-3.7
5750	-4.9	-0.7	6800	-7.7	-3.9
5800	-4.93	-1.5	6850	-7.4	-4.2
5850	-5	-0.8	6900	-7.1	-2.7
5900	-5.1	-0.8	6950	-7.6	-1.3
5950	-5.5	-0.7	7000	-8.1	-1.4
6000	-5.5	-0.8	7050	-8.2	-1.4
6050	-6.1	-1	7100	-7.4	-1.9
6100	-5.9	-0.8	7150	-7.4	-2.2
6150	-5.5	-0.7	7200	-8	-2.7

Table12 ANT5 Efficiency&gain

4、 Attachment chart

4.1 ANT0 Antenna gain diagram and directional diagram

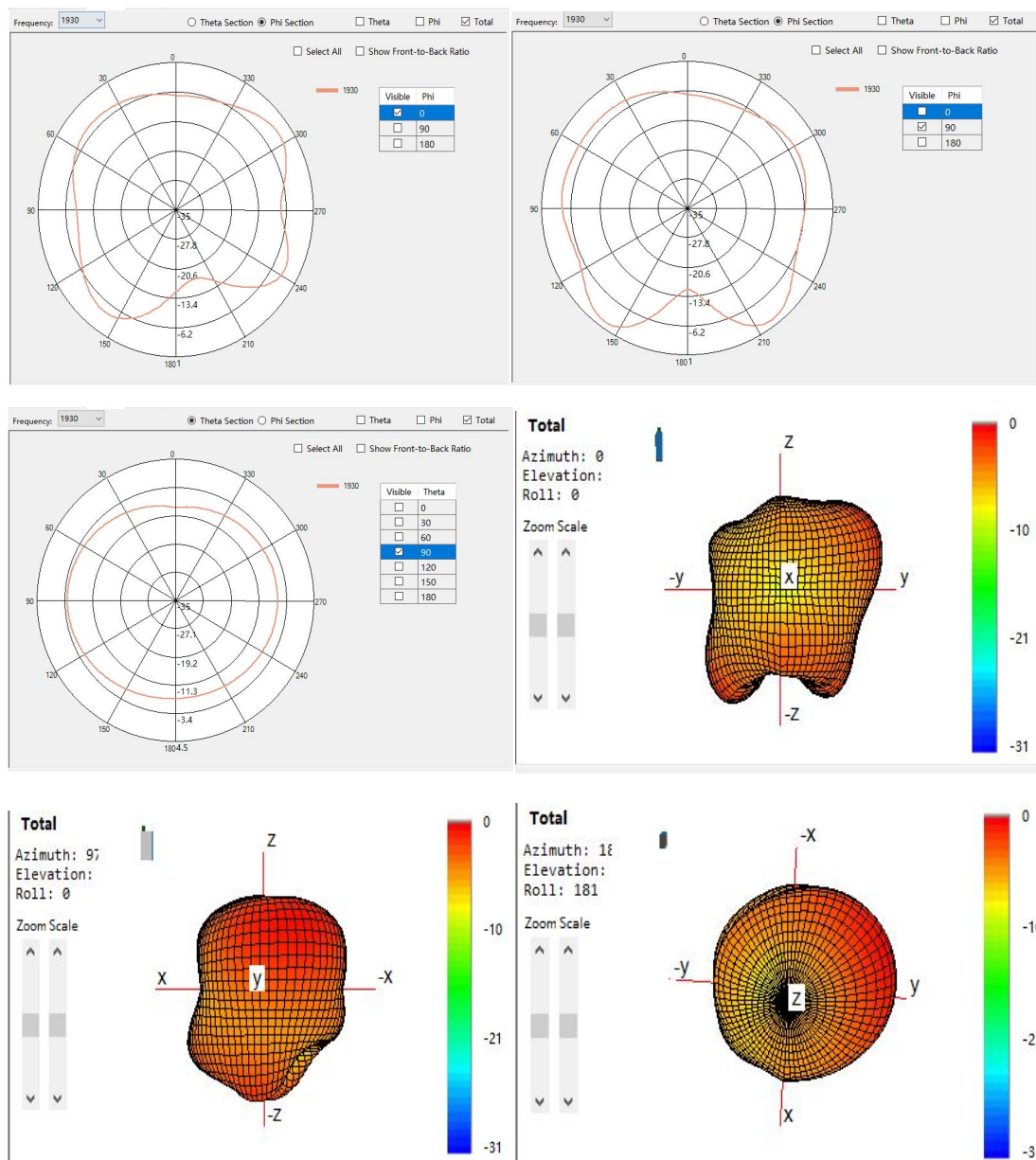


Figure1 ANT0

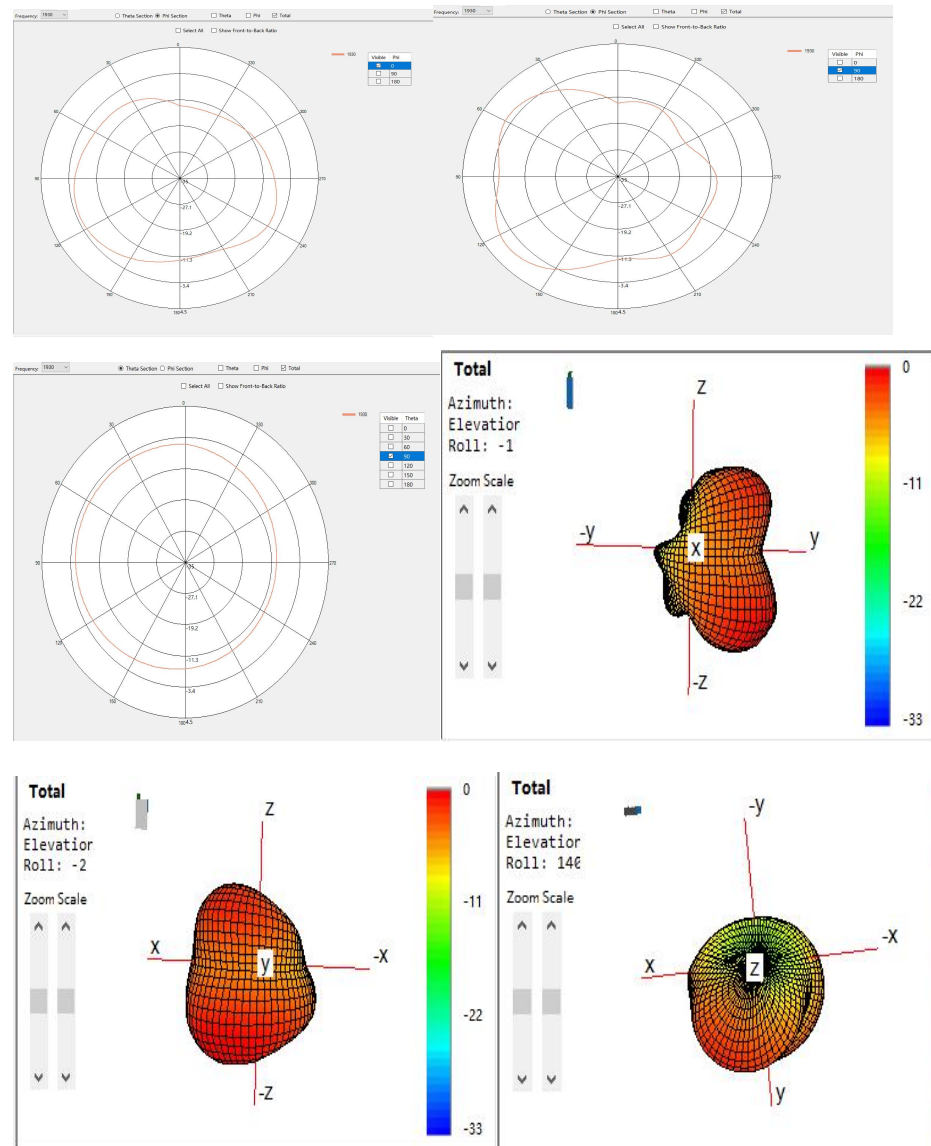


Figure2 ANT1

4.3 ANT2 Antenna gain diagram and directional diagram

4.3.1 5G WiFi

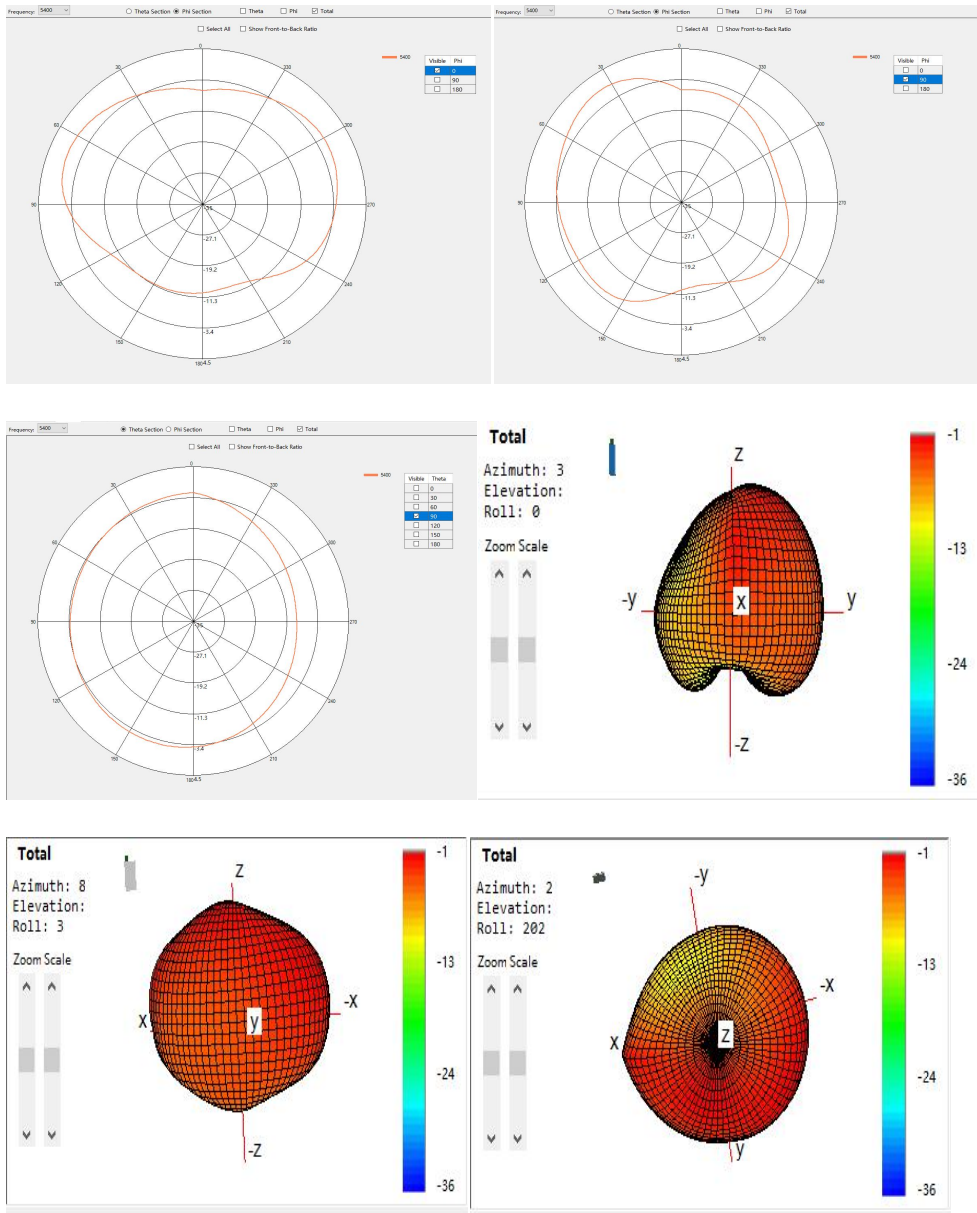


Figure3 5G WiFi

4.3.2 6E WiFi

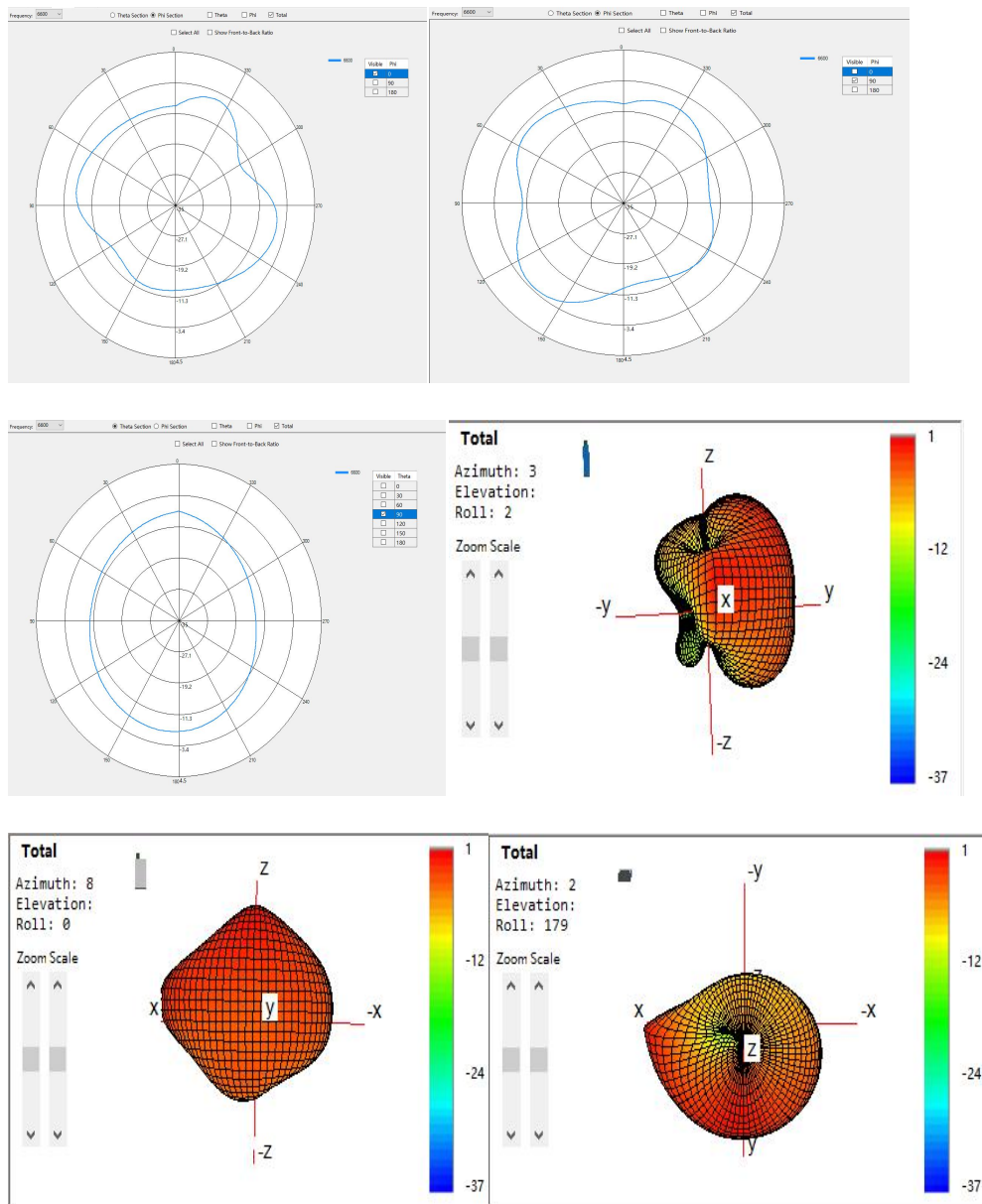


Figure4 6E WiFi

4.4 ANT3 Antenna gain diagram and directional diagram

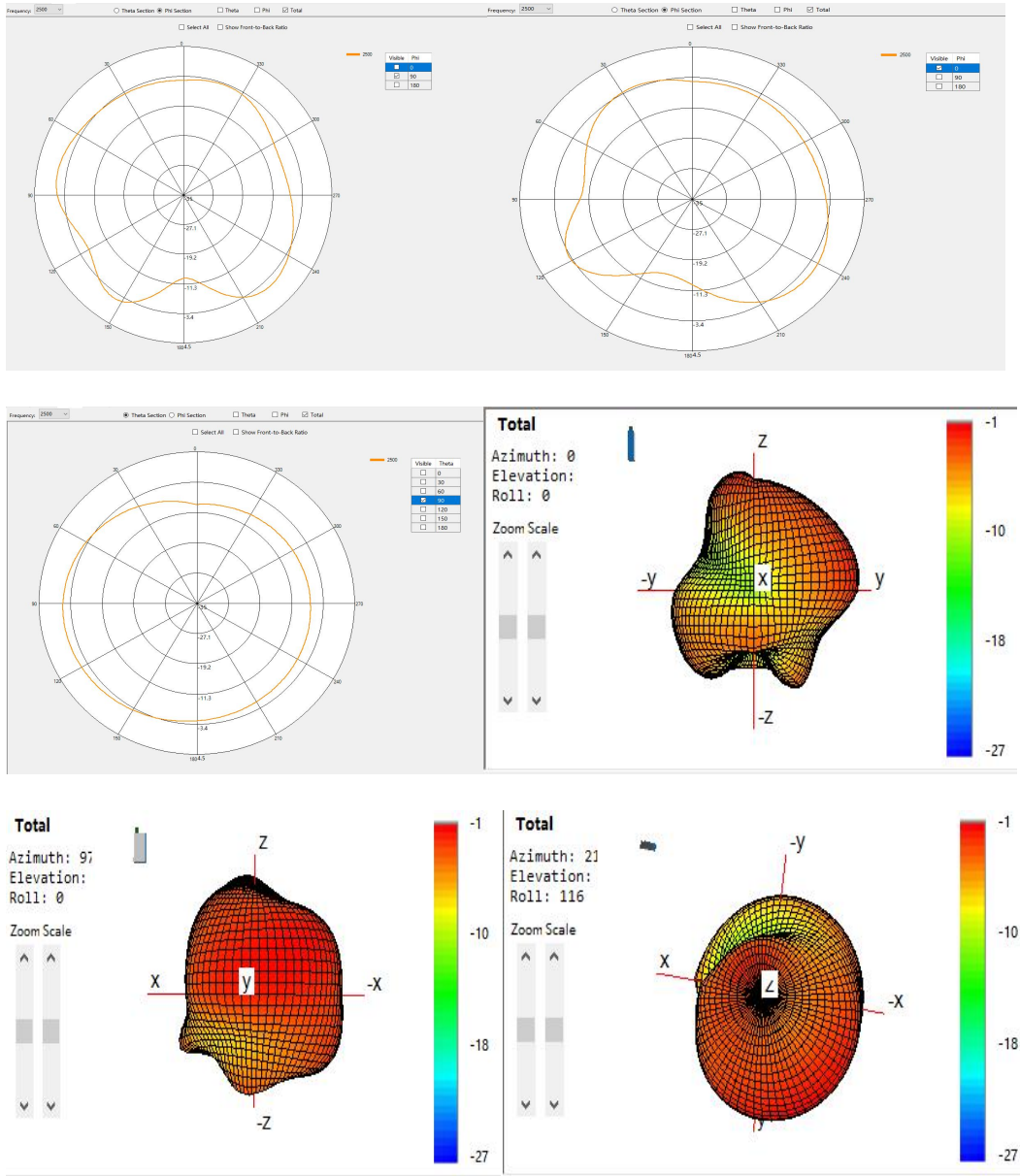


Figure5 ANT3

4.5 ANT4 Antenna gain diagram and directional diagram

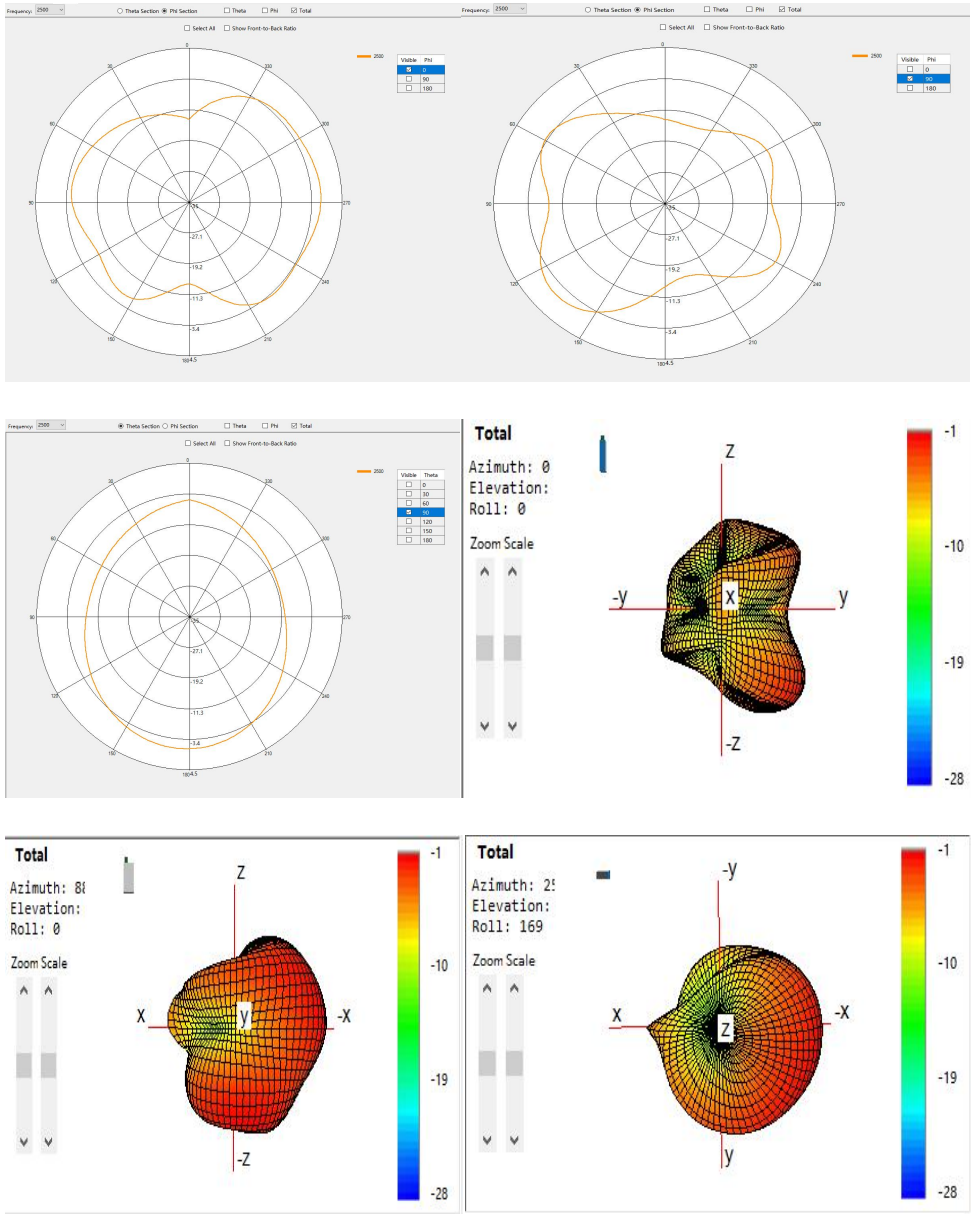


Figure6 ANT4

4.6 ANT5 Antenna gain diagram and directional diagram

4.6.1 5G WiFi

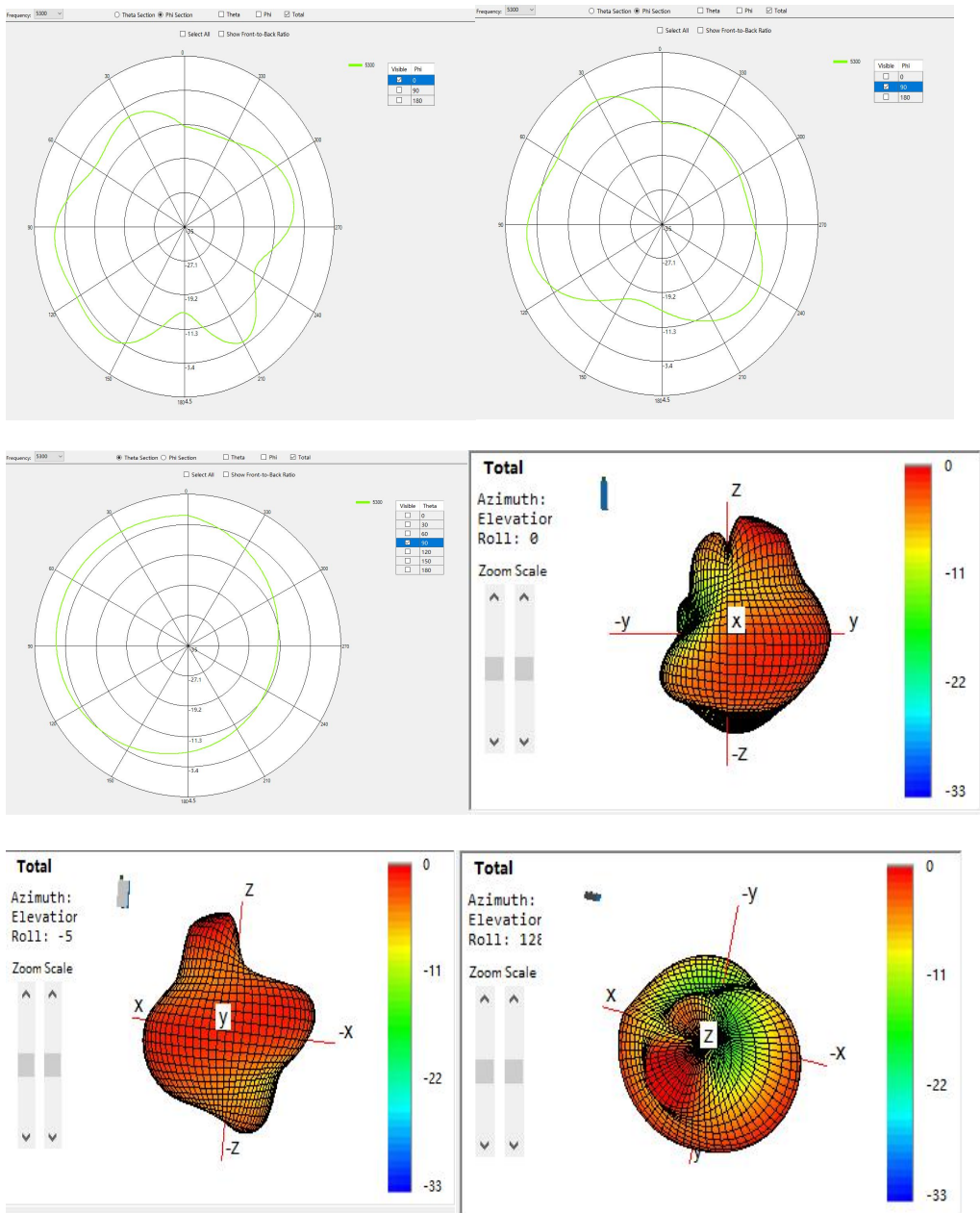


Figure7 5G WiFi

4.6.2 6E WiFi

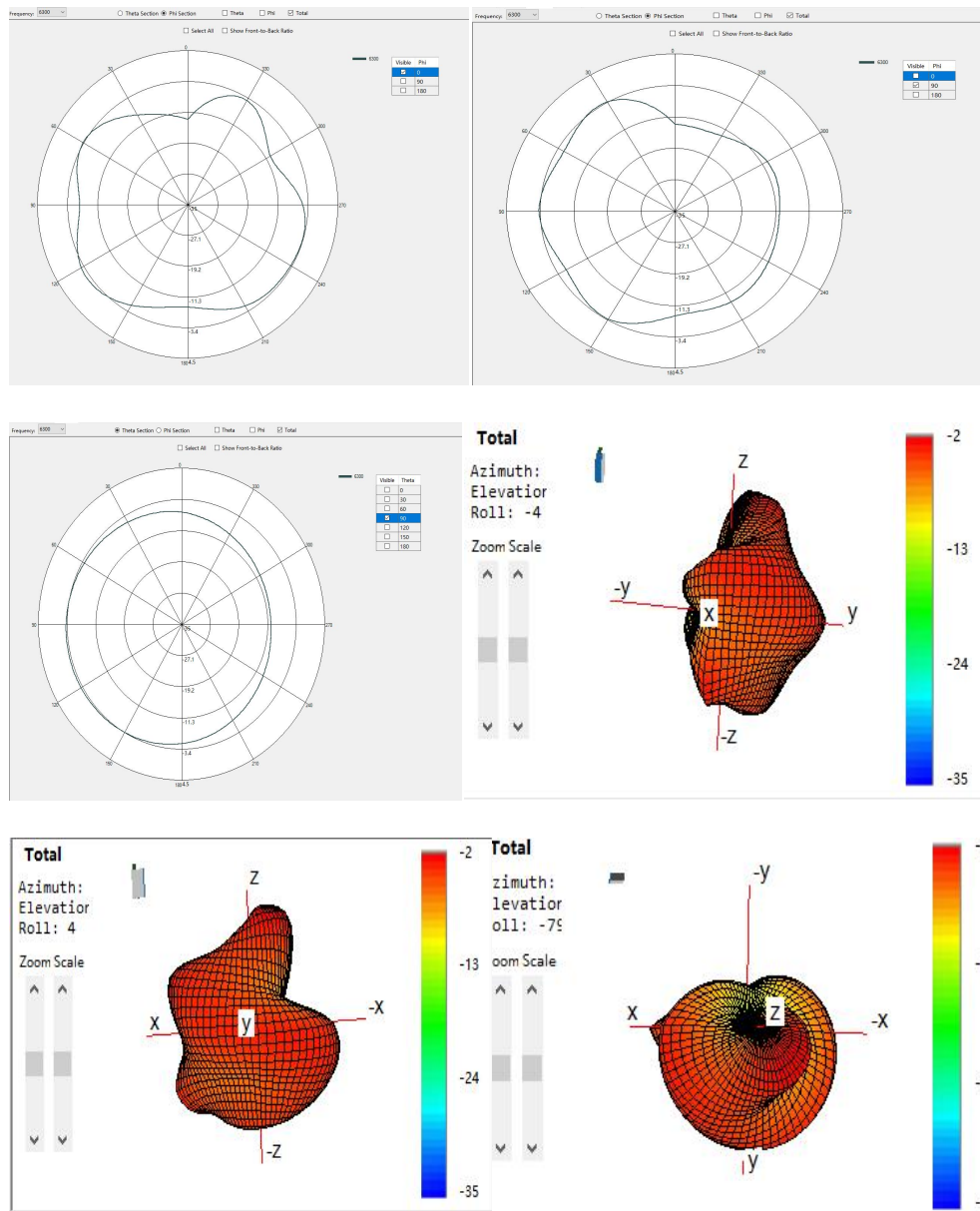


Figure8 6E WiFi

III、Schedule drawing

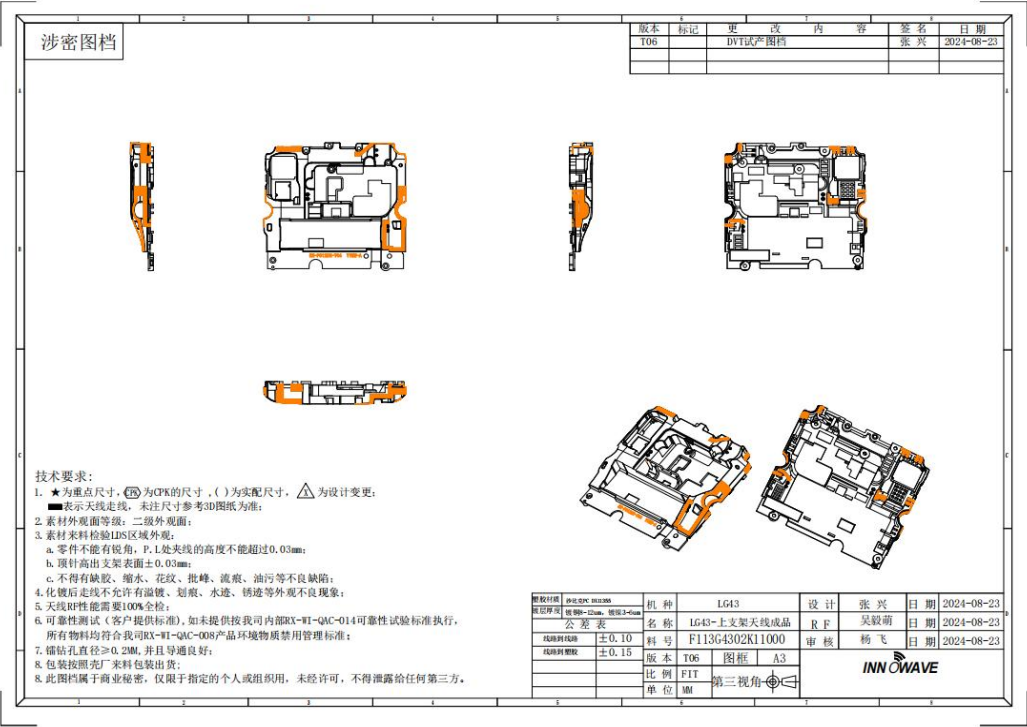
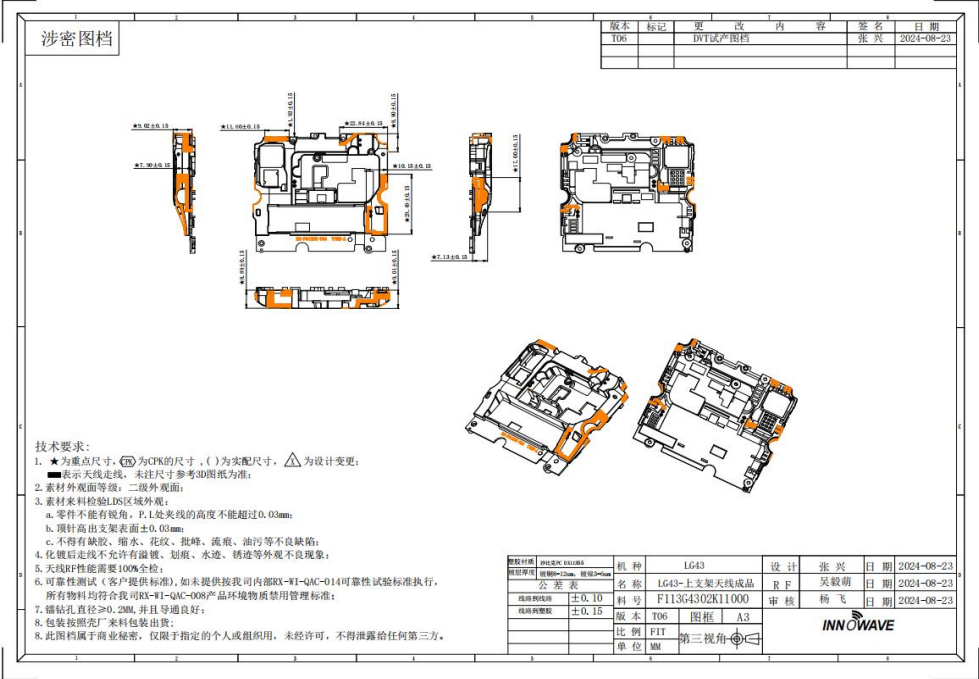


Figure1 Antenna Drawing