Antenna Testing Report

Customer：Zhangzhou Wanlida Technology Co.,Ltd

Project Name：N008

Report version：April 17, 2023 A0

Author：Kaiyu Chen

Record

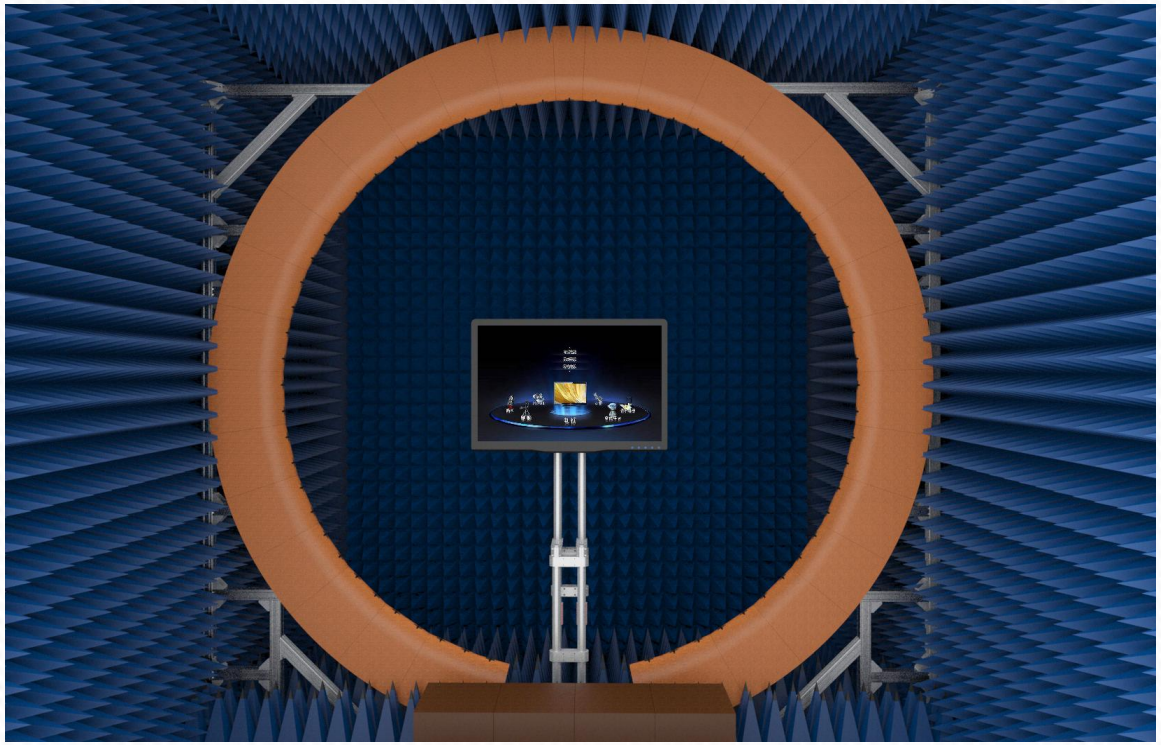
Version	Report date	Remark
A0	2023.04.17	Antenna test report
A1		
A2		
A3		
A4		
A5		
A6		
A7		
A8		
A9		

Contents

Project Overview

Prototype status	Debugging machine
Device type	
Number of antennas	WIFI antenna、BT antenna
Frequency band	2G: N/A
	3G: N/A
	4G-LTE: N/A
	5G-NR: N/A
	WIFI 802.11 a/b/g/n + BT
Structural style	FPC+Cable
Environment adjustment	No change
Matching modification	No change

Equipment List



The industry's top 64 sensors OTA chamber

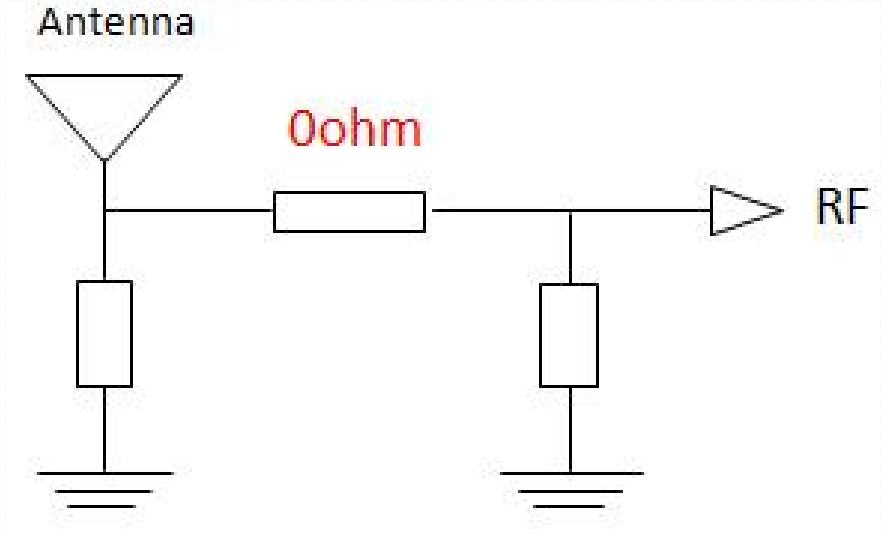
Frequency range: 400MHz-11GHz

Device Llimitation: 2M

Load-bearing limitation:100KG

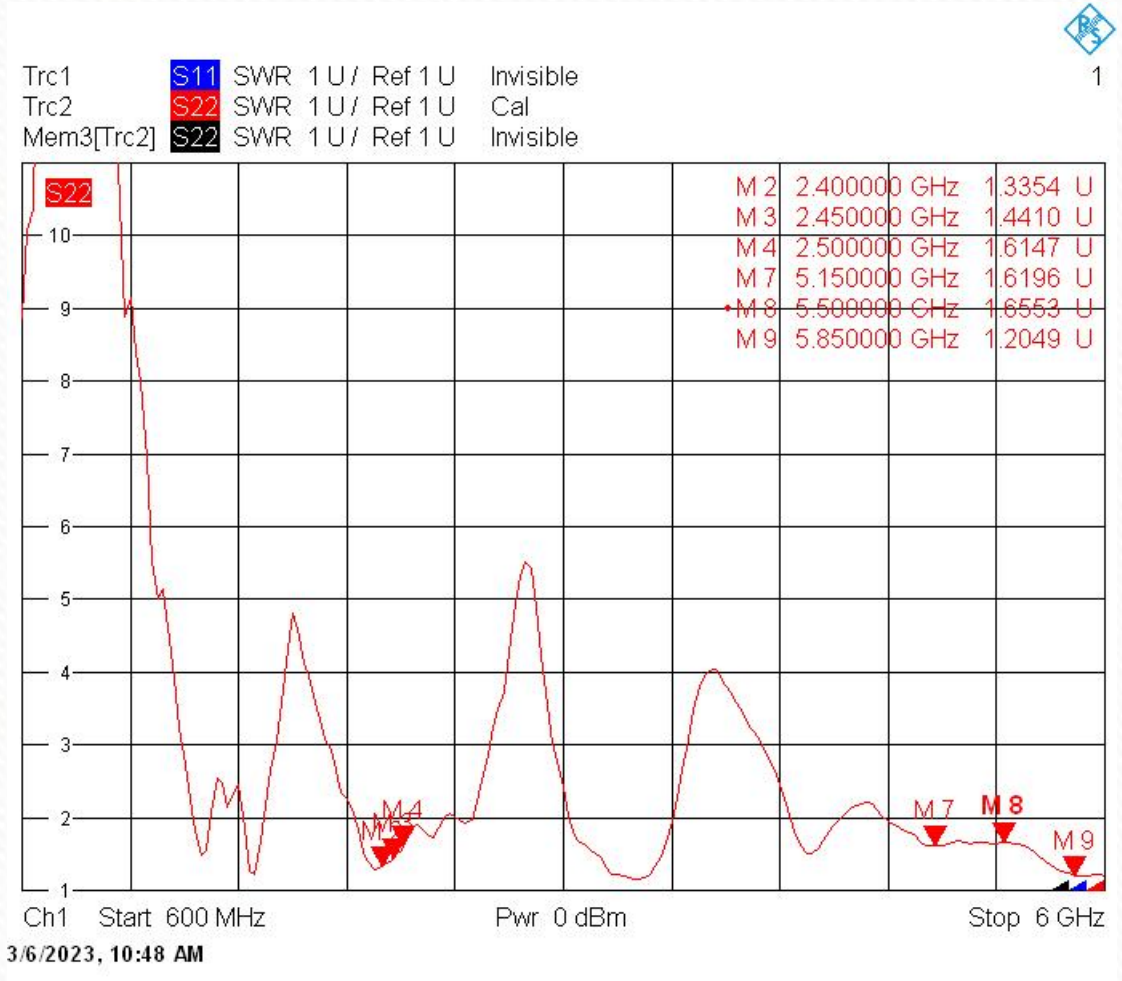
Equipments Items	Total Quantity	Quantity for Shanghai R&D	Quantity for Shenzhen R&D	Quantity for ChongQing R&D
OTA chamber	10	4	5	1
5G Tester（SP9500-CTS）	3	1	1	1
R&S Tester（high configuration CMW500）	6	3	2	1
Japan Anritsu Tester（Dual Channel 8820）	4	2	2	--
NB-IoT Tester (SP8315)	3	1	1	1
Agilent Tester（8960）	9	4	4	--
Agilent Network Analyzer（E5062A）	7	3	3	1
Agilent Network Analyzer（E5071C 8.5GHZ ）	11	5	5	1
Agilent Network Analyzer（E5071B 8.5GHZ ）	7	3	3	1
R&S Network Analyzer（ZND）	9	4	4	1
R&S Network Analyzer（ZVB）	3	1	1	1
OTA head hand / ear hand / arm hand	5	2	2	1
GPS/WIFI active test equipment	5	2	2	1

Matching Circuit

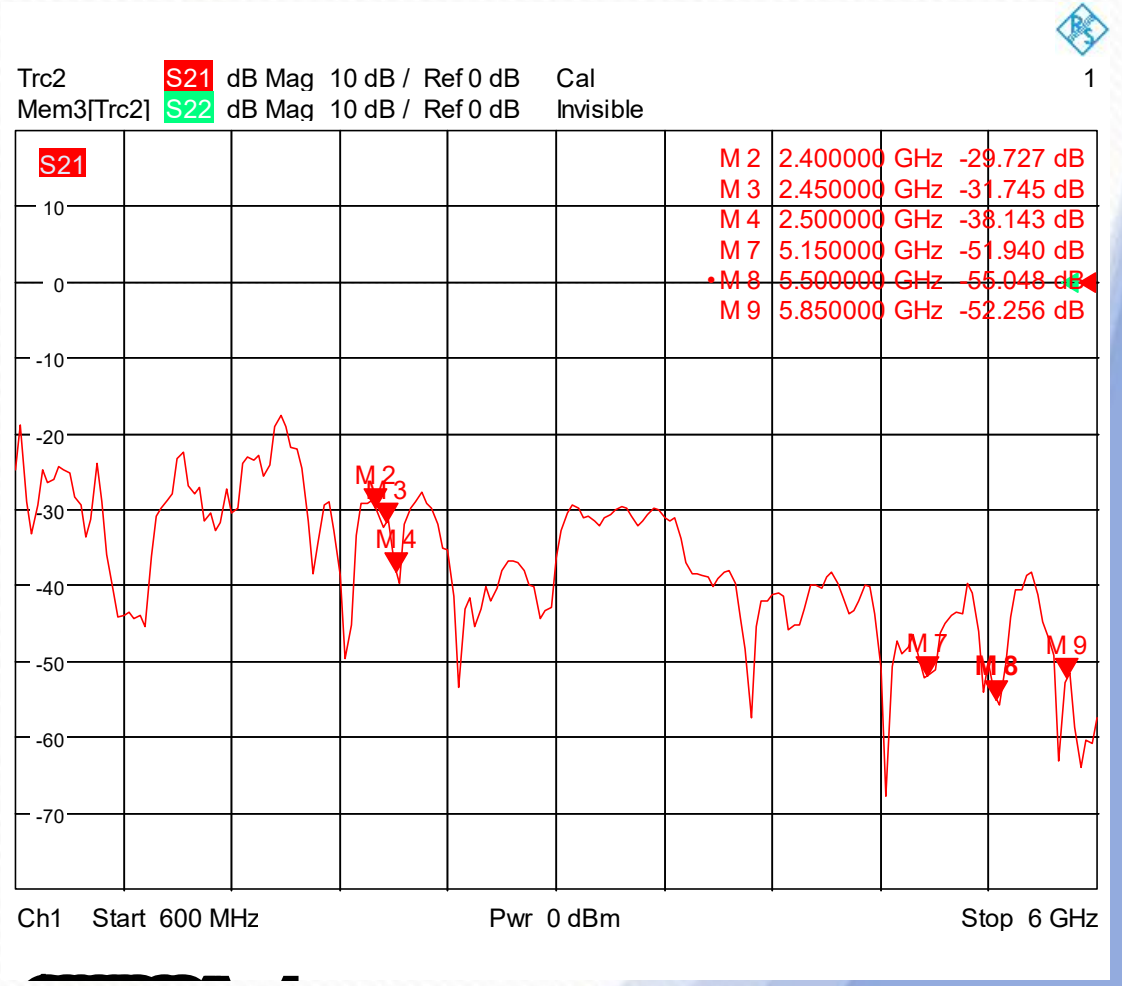


WiFi1 Antenna S11 data

VSWR

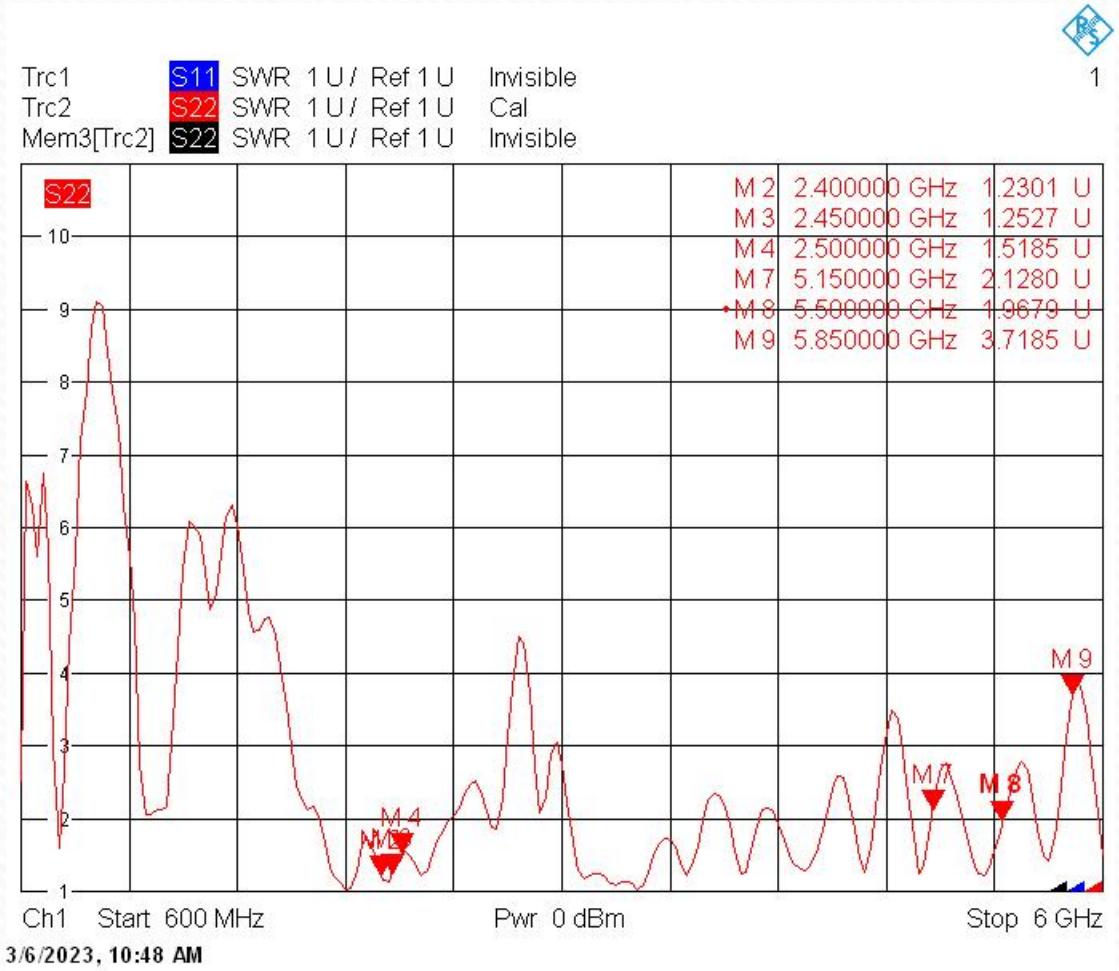


WiFi0 and WiFi1 Antenna isolation

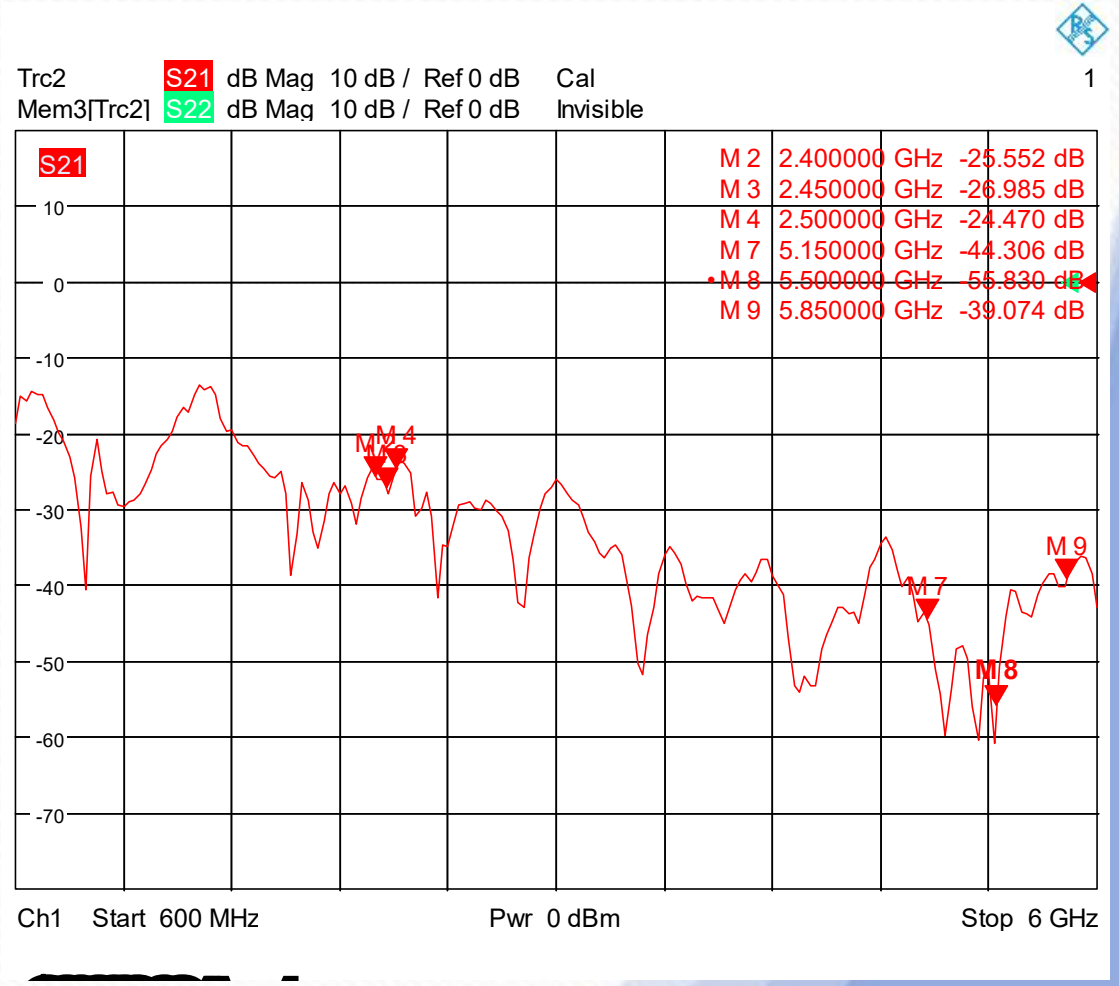


WiFi0 Antenna S11 data

VSWR

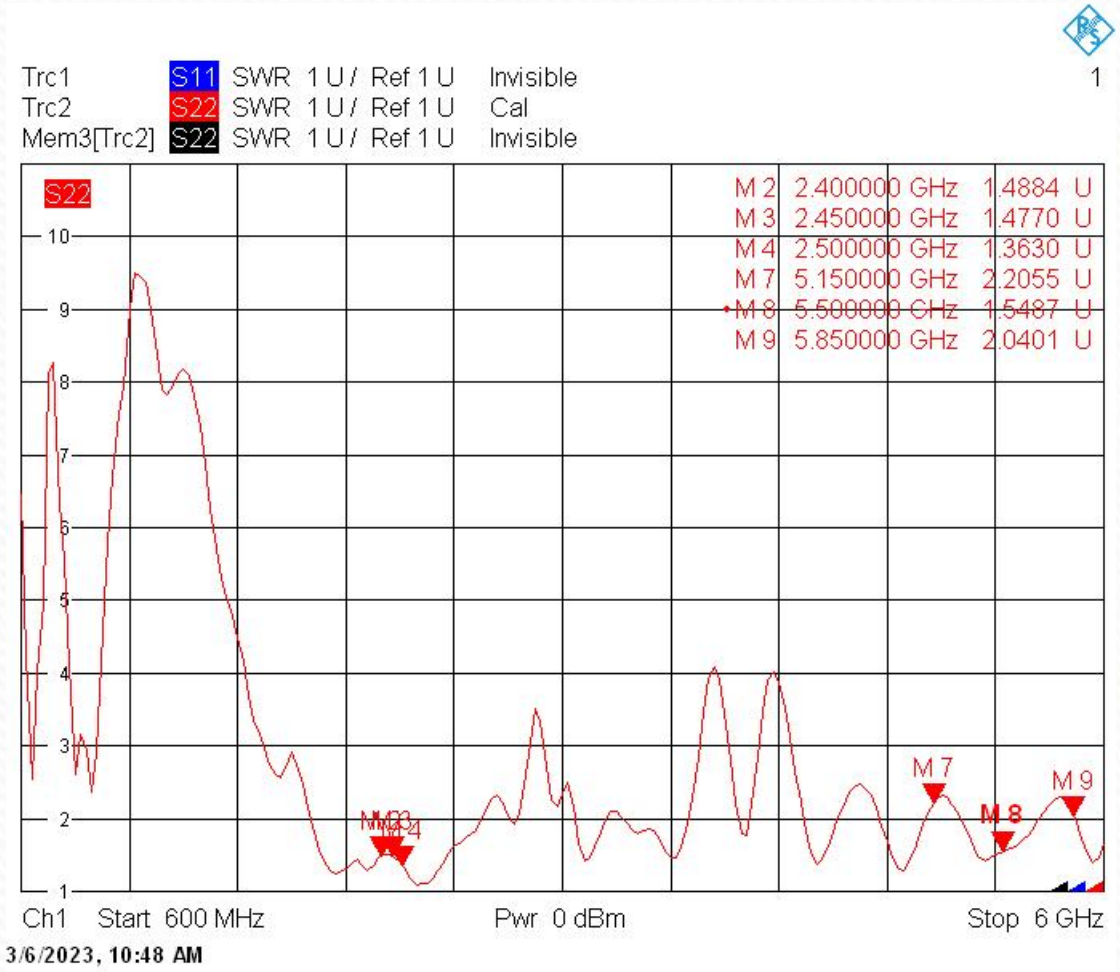


WiFi0 and BT Antenna isolation

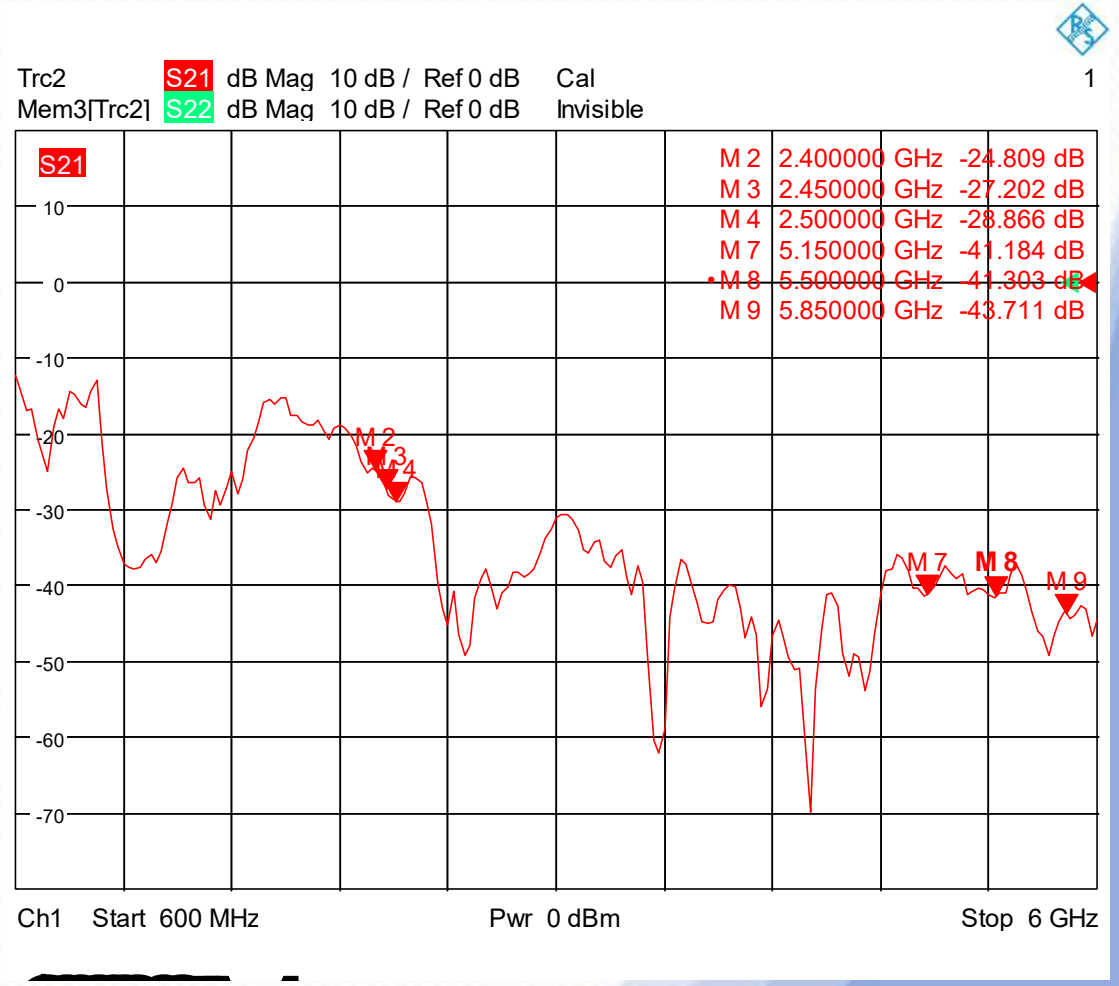


BT Antenna S11 data

VSWR



WiFi1 and BT Antenna isolation



WiFi1 Antenna Passive data

Frequency/Mhz	Efficiency / %	MaxGain/dBi	Pattern Ripple/dB
2400	50.35	3.45	19.19
2410	48.75	3.44	18.76
2420	50.47	3.58	20.19
2430	49.66	3.65	20.44
2440	49.2	3.59	21.22
2450	48.75	3.21	20.52
2460	45.39	3.38	20.31
2470	48.53	3.81	19.2
2480	46.34	3.38	17.76
2490	45.98	3.18	16.64
2500	45.66	2.59	16.36

Frequency/Mhz	Efficiency / %	MaxGain/dBi	Pattern Ripple/dB
5150	35.51	3.74	19.23
5170	35.81	3.85	19.29
5190	35.67	4.41	19.52
5210	36.58	4.33	18.44
5230	36.65	4.59	18.17
5250	37.96	4.78	19.66
5270	37.04	4.16	19.98
5290	36.81	4.28	19.36
5310	36.66	4.19	20.17
5330	35.28	4.47	19.6
5350	35.73	4.11	20.33
5370	35.81	4.88	25.24
5390	35.96	3.59	30.55
5410	38.02	3.76	27.75
5430	37.33	3.44	24.01
5450	36.56	3.82	21.68
5470	39.17	3.35	20.88
5490	40.36	3.44	21.28

Frequency/Mhz	Efficiency / %	MaxGain/dBi	Pattern Ripple/dB
5510	38.99	4.37	21.58
5530	39.9	4.52	21.9
5550	41.88	4.76	21.53
5570	38.02	4.38	22.67
5590	39.08	4.56	23.09
5610	40.09	4.65	23.09
5630	38.55	3.41	22.96
5650	38.55	3.47	23.95
5670	40.83	4.6	25.39
5690	42.36	4.87	26.61
5710	40.36	4.53	24.91
5730	38.19	4.31	21.53
5750	39.81	4.49	21.1
5770	44.46	4.94	22.67
5790	42.07	4.84	23.3
5810	41.5	4.83	22.88
5830	43.05	4.06	22.15
5850	43.15	4.1	23.5

WiFi0 Antenna Passive data

Frequency/Mhz	Efficiency / %	MaxGain/dBi	Pattern Ripple/dB
2400	46.34	3.24	15.18
2410	47.34	3.66	14.94
2420	47.62	3.6	13.97
2430	48.59	3.92	13.14
2440	49.33	3.94	12.44
2450	49.95	4.11	12.24
2460	47.64	3.96	11.83
2470	47.2	4.34	11.87
2480	46.7	4.17	12.26
2490	45.33	4.37	13.25
2500	45.33	4.08	13.79

Frequency/Mhz	Efficiency / %	MaxGain/dBi	Pattern Ripple/dB
5150	37.75	2.78	15.18
5170	38.98	2.87	14.94
5190	39.84	3.02	13.97
5210	40.35	3.67	13.14
5230	41.09	3.41	12.44
5250	42.6	3.42	12.24
5270	42.45	3.24	11.83
5290	39.7	3.75	11.87
5310	39.36	3.43	12.26
5330	38.34	3.67	13.25
5350	39.08	3.43	13.79
5370	39.36	3.72	24.98
5390	38.52	3.67	24.67
5410	37.54	4.07	23.4
5430	35.83	4.04	21.77
5450	36.84	4.53	20.93
5470	36.62	3.99	19.12
5490	37.54	4.13	17.73

Frequency/Mhz	Efficiency / %	MaxGain/dBi	Pattern Ripple/dB
5510	39.33	4.29	17.12
5530	40.72	4.49	18.13
5550	39.81	4.39	21.11
5570	38.24	4.51	22.42
5590	38.46	4.4	21.48
5610	37.46	4.35	20.39
5630	37.64	4.43	19.04
5650	35.64	4.67	17.49
5670	35.33	4.78	17.3
5690	36.83	4.75	18.03
5710	38.72	4.95	18.76
5730	38.98	4.55	18.26
5750	37.93	4.77	17.69
5770	36.36	4.62	19.16
5790	36.08	4.52	20.83
5810	36.33	4.84	21.66
5830	37.28	4.76	22.75
5850	37.41	4.69	22.62

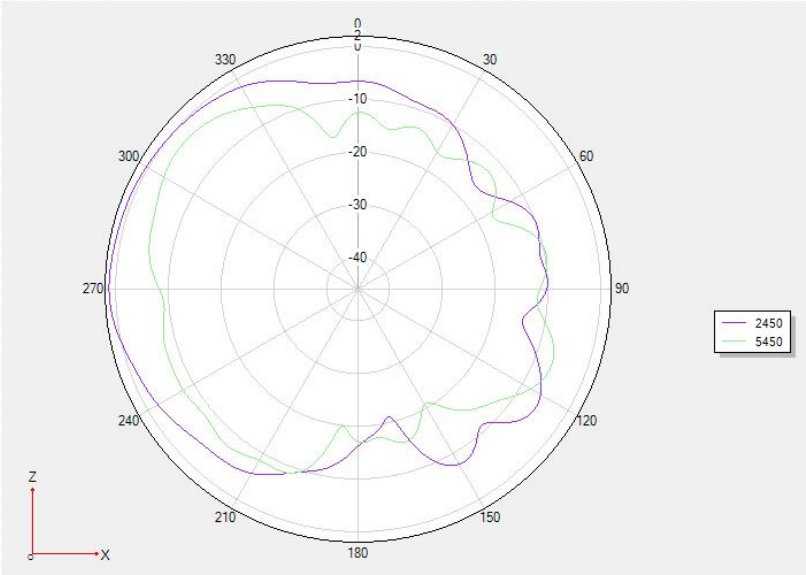
BT Antenna Passive data

Frequency/Mhz	Efficiency / %	MaxGain/dBi	Pattern Ripple/dB
2400	45.98	3.97	19.18
2410	45.66	3.76	19.74
2420	46.55	3.49	20.09
2430	47.57	3.46	20.24
2440	45.81	3.18	19.93
2450	46.67	3.01	19.12
2460	45.71	2.66	18.76
2470	49.32	2.87	19.94
2480	49.32	2.94	22.63
2490	50.23	3.28	25.3
2500	49.66	3.28	25.14

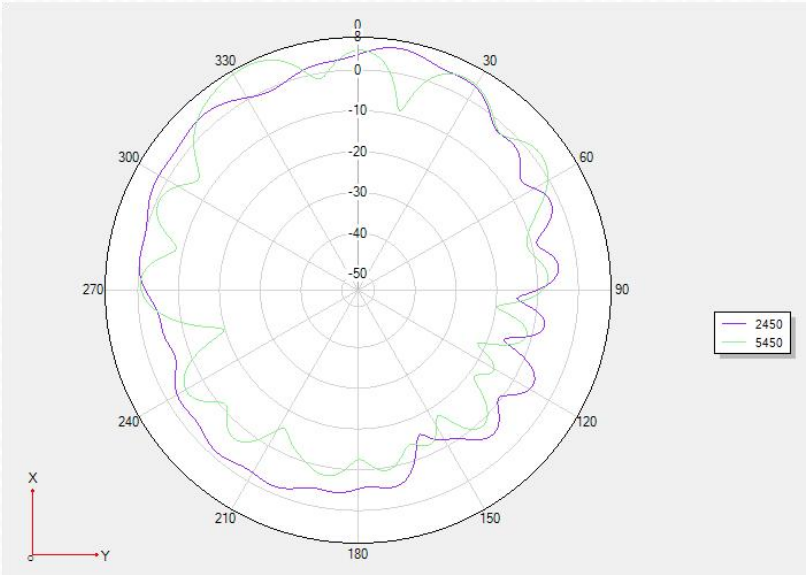
WiFi 2.4G 2D cross-sectional view

theta 90°

WiFi0 Antenna



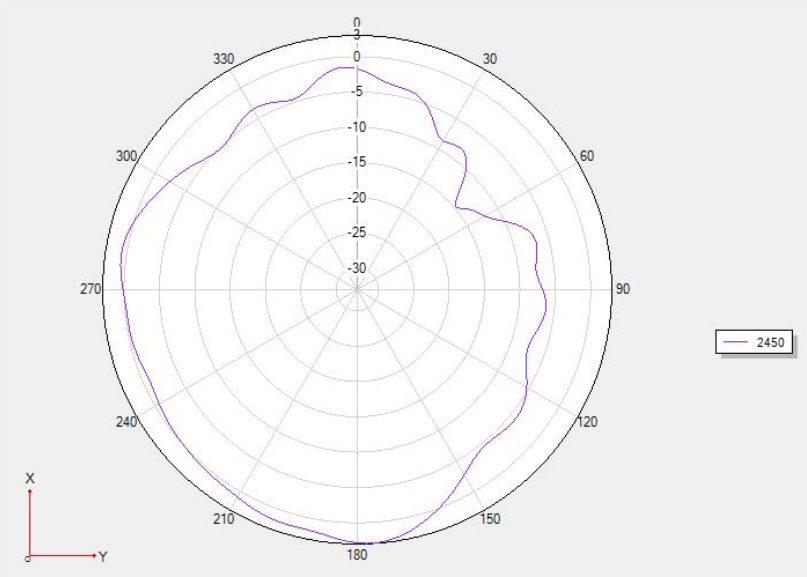
WiFi1 Antenna



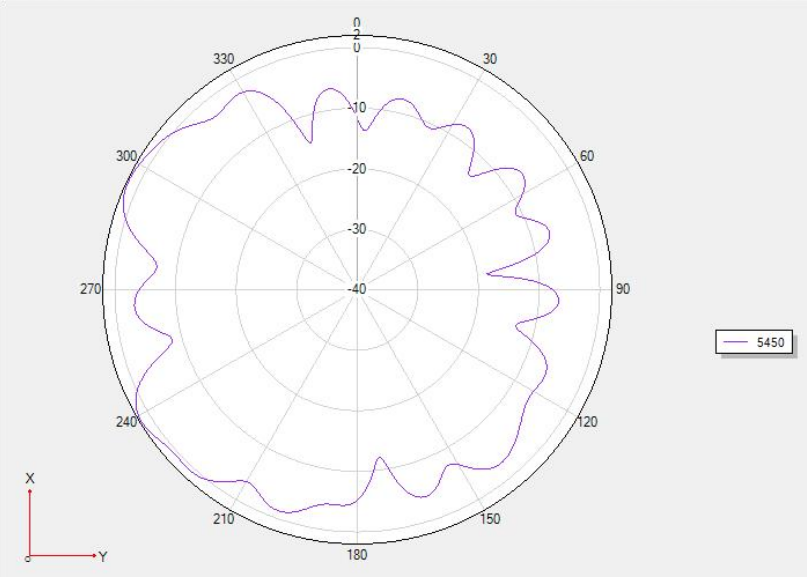
WiFi 5.8G 2D cross-sectional view

theta 90°

WiFi0 Antenna

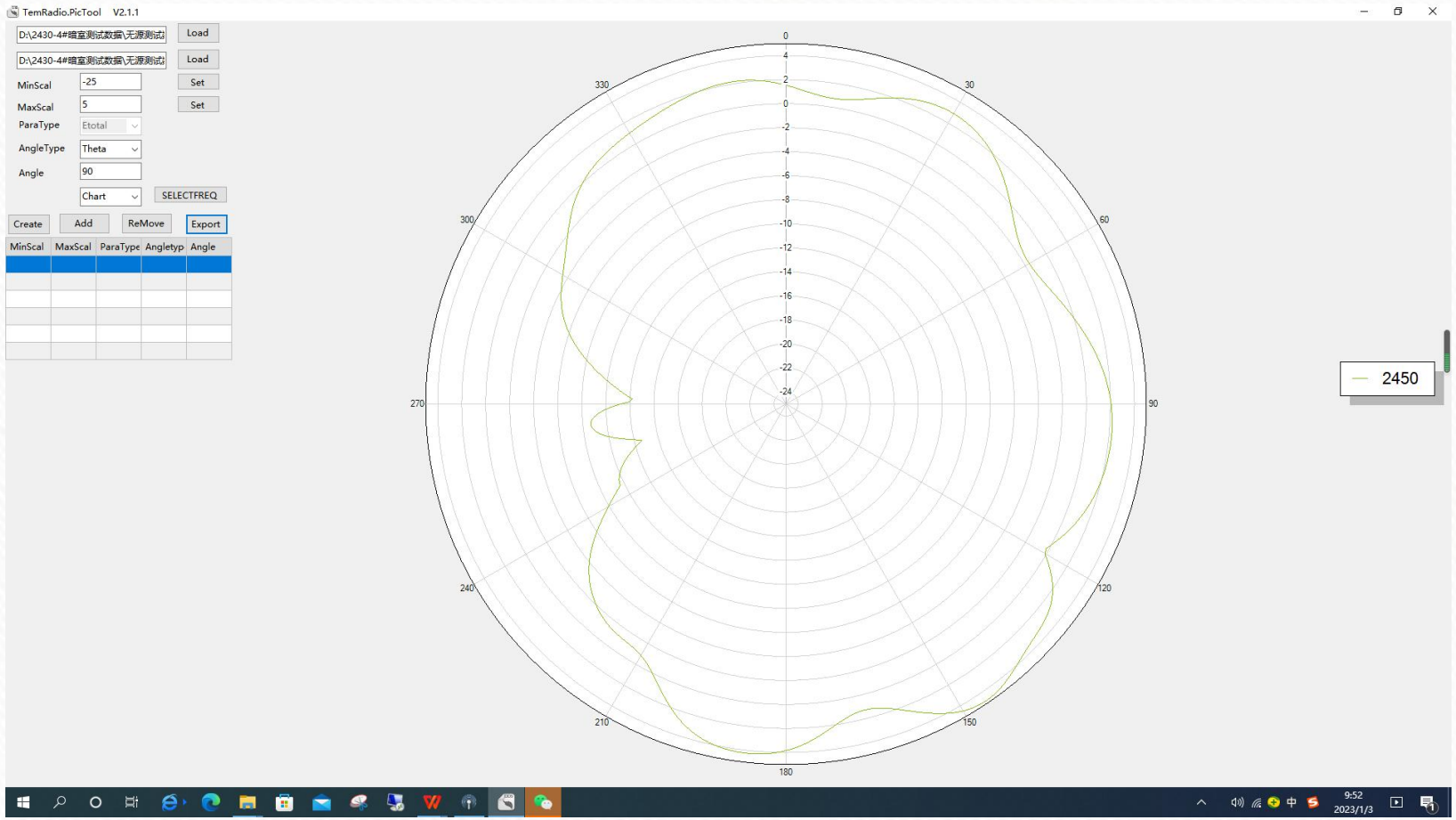


WiFi1 Antenna



2.4g WiFi0 and WiFi 1 Antenna 2D composite diagram

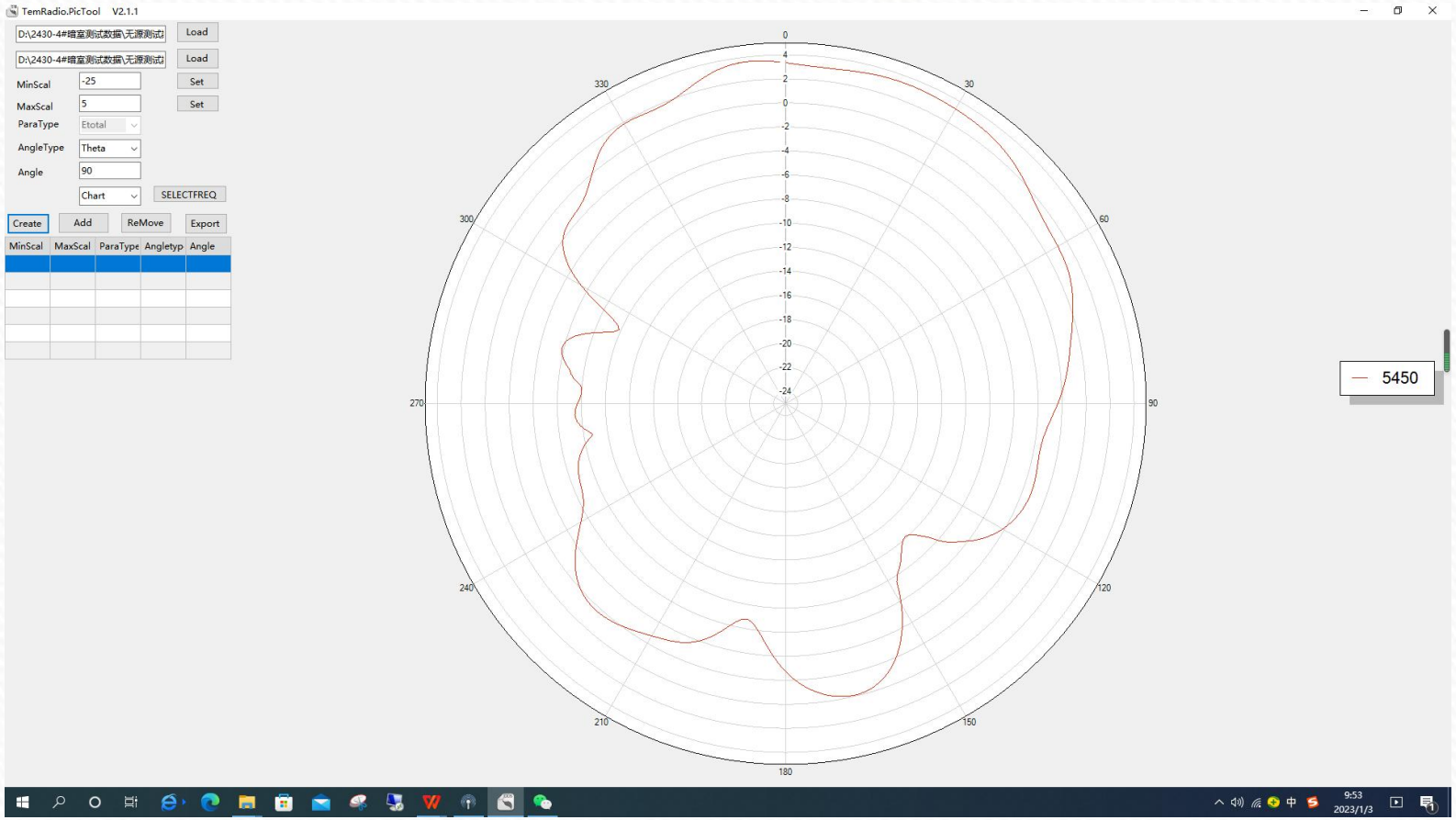
theta 90°



Minimum gain:-13.54

5.8g WiFi0 and WiFi 1 Antenna 2D composite diagram

theta 90°

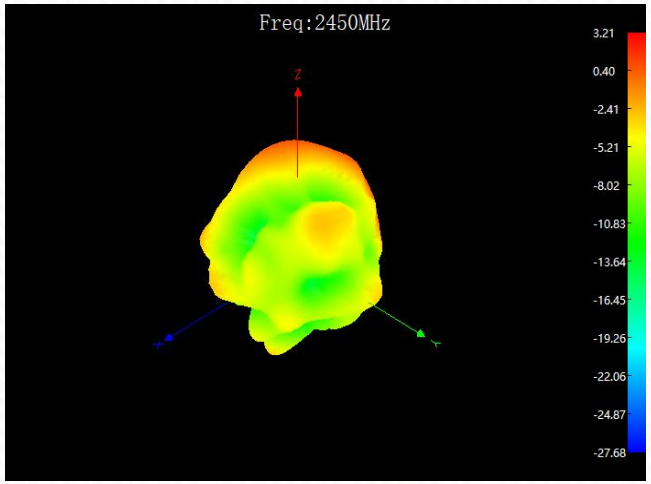


Minimum gain:-10.08

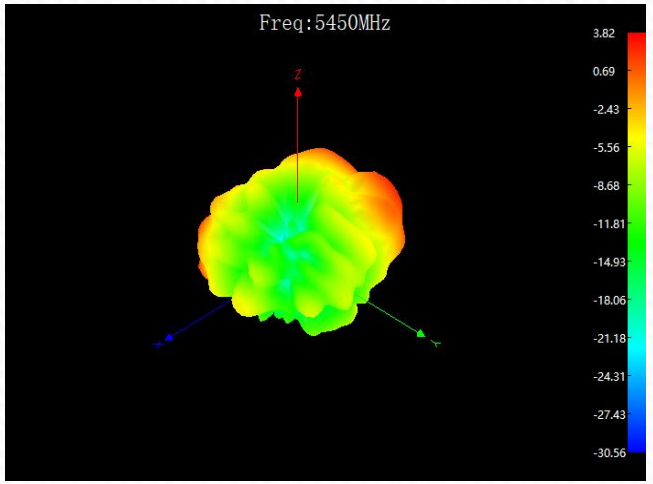
WiFi Radiation Pattern

WiFi1 Antenna

2450

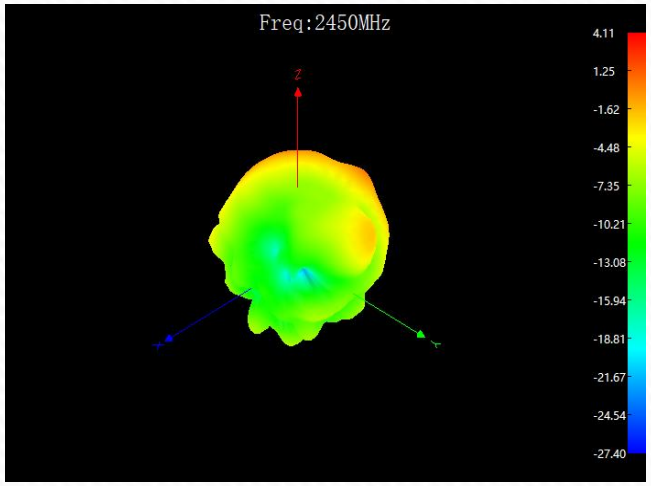


5450

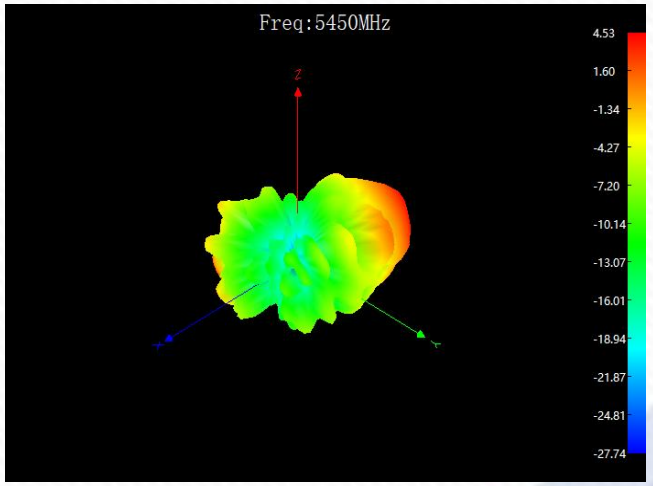


WiFi0 Antenna

2450

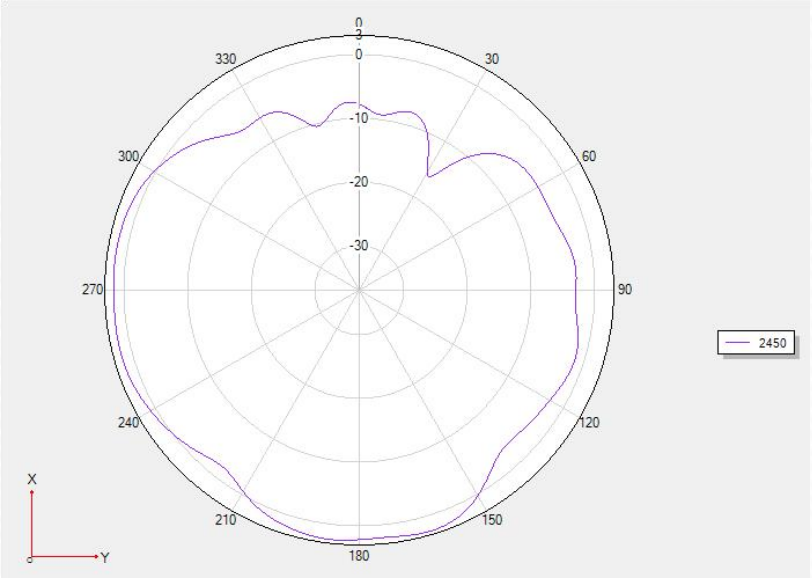


5450

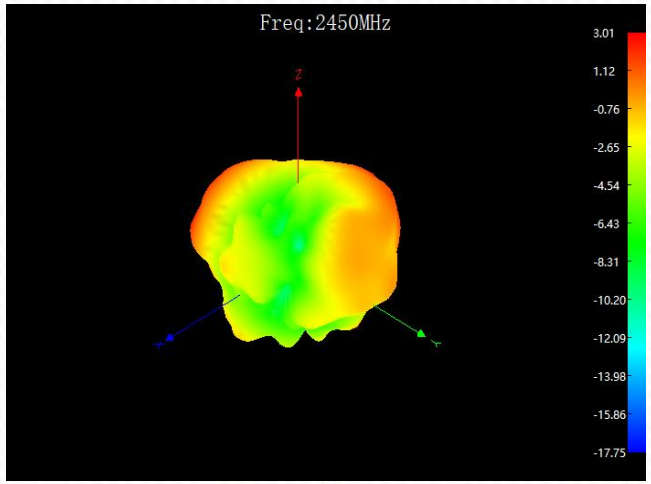


BT Radiation Pattern

theta 90°



2450



Minimum gain： -16.47

summarize

1. Antenna matching has not been changed;

2. The antenna data is up to standard。

Thank You

Shanghai R&D Center: 1F, Building 4, No.99, Lane 215, Gaoguang Road, Qingpu District, Shanghai, 201799, PRC

Shenzhen R&D Center:6th Floor, Building 5, NantaiyunChuanggu Center, Guangming District, Shenzhen, 518107, PRC

ChongQing R&D Center: 1F, ARM Ecological Industrial Park, 19 East Datugu Road, Xiantao, Yubei District, Chongqing, 401120, PRC

Huizhou Factory: 4-5F, No.1, Central Village Road, Longhu Industrial Zone, Shuikou Town, Huicheng District, Huizhou, 516255, PRC

TEL：021-60835368 E-mail：sales@sunnyway-iot.com

www.sunnyway-iot.com