

Antenna Testing Report

Customer: apical Technology

Project Name: BM04-TX

Report Number: SZ24407IA57/SZ23107IA70

Manufacturer: Sunnyway Technology(CHINA)

Address: Floor 6, Building 5, Nam Tai Inno Park, Guangming District, Shenzhen

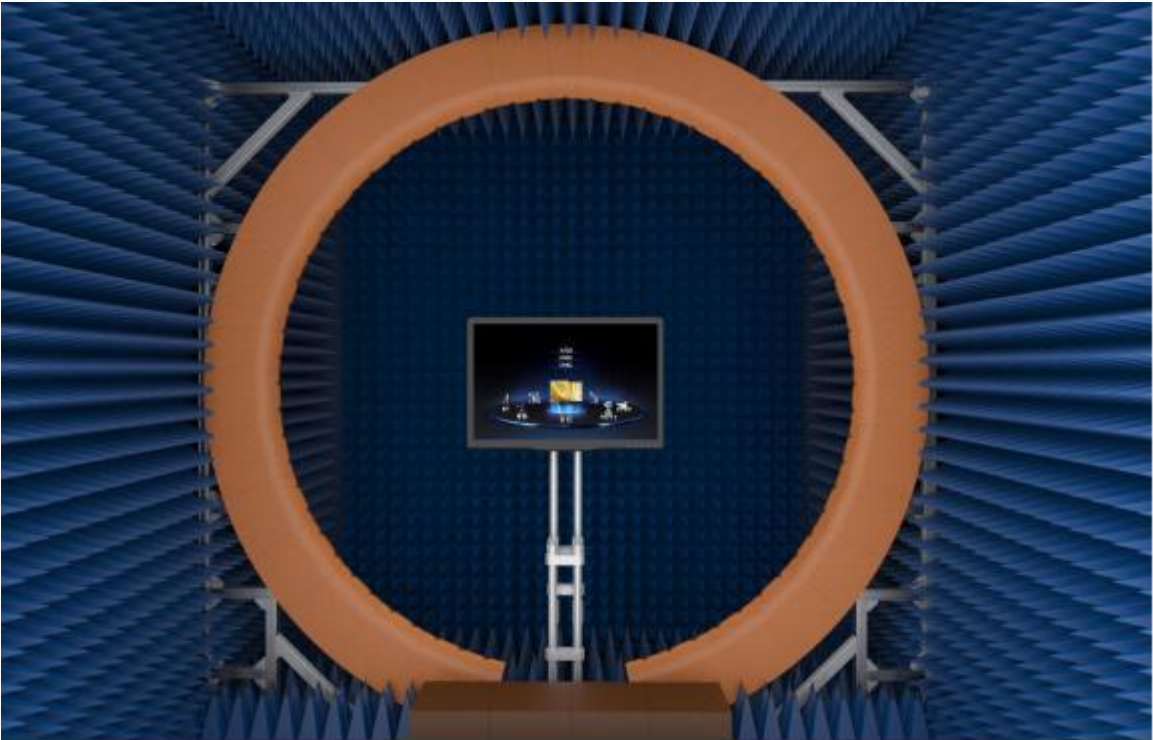
Report version: Nov.26, 2024

Author: Li Jia Bin

Version	Report date	Remark
A0	2024.11.26	Latest test data
A1		
A2		
A3		
A4		
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Prototype status	Debugging machine
Device type	IPC The camera is equipped with a tablet
Number of antennas	WIFI antenna
Frequency band	2.4 B/G/N
Structural style	Copper Tube Antenna+Steel Plate Antenna
Environment adjustment	No change
Matching modification	No change



The industry's top 64 sensors OTA chamber

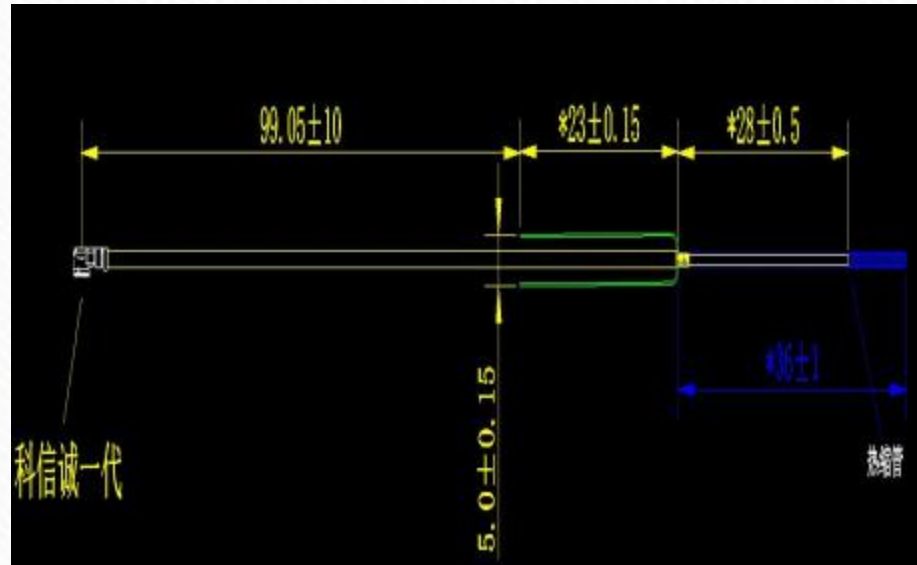
Frequency range: 400MHz-11GHz

Device Llimitation: 2M

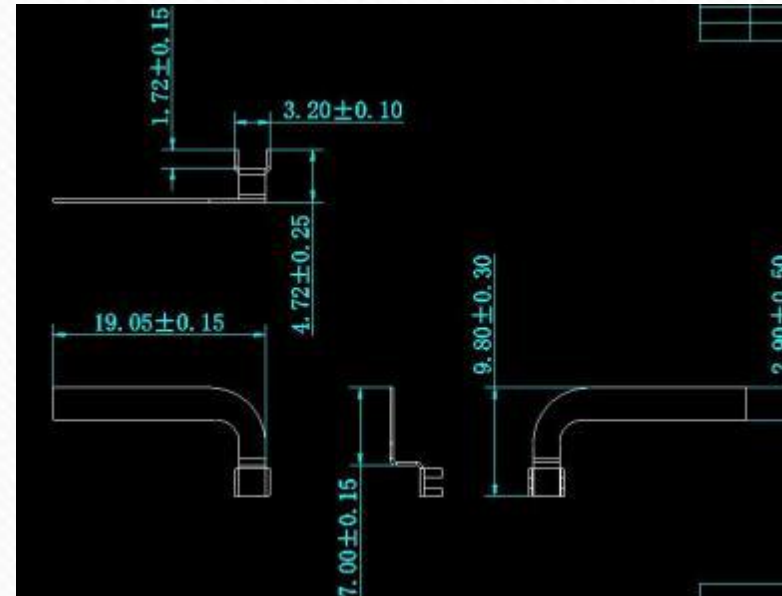
Load-bearing limitation:100KG

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

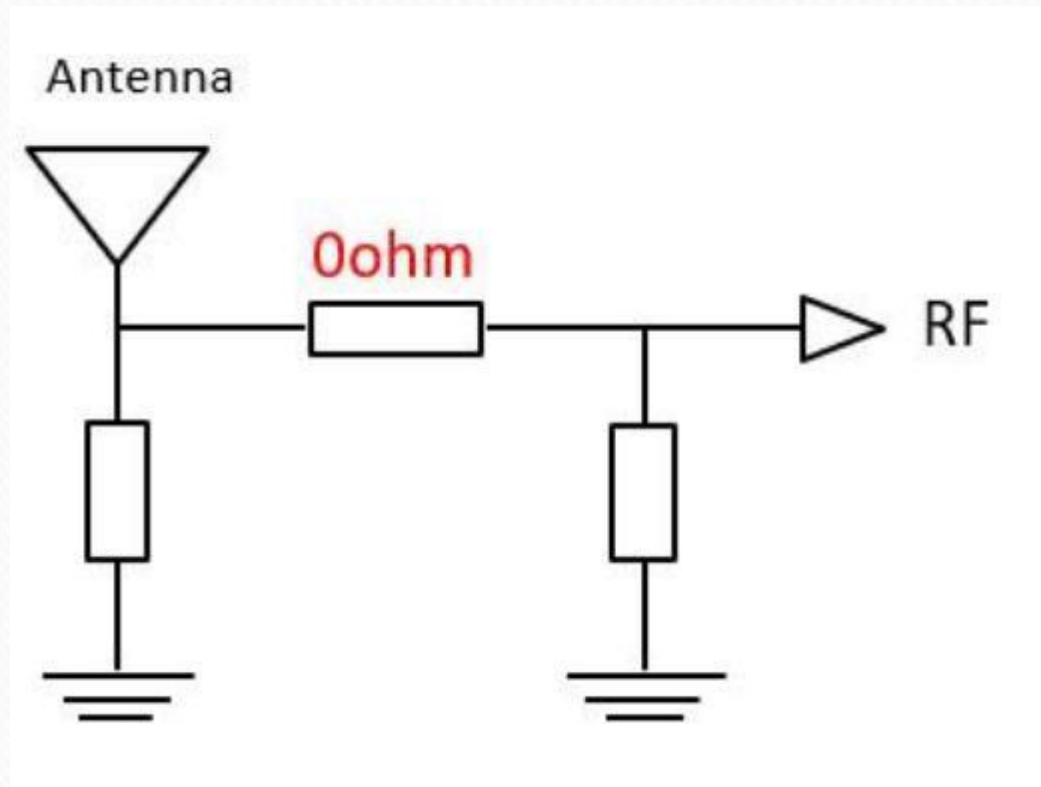
Copper Tube Antenna



Steel Plate Antenna

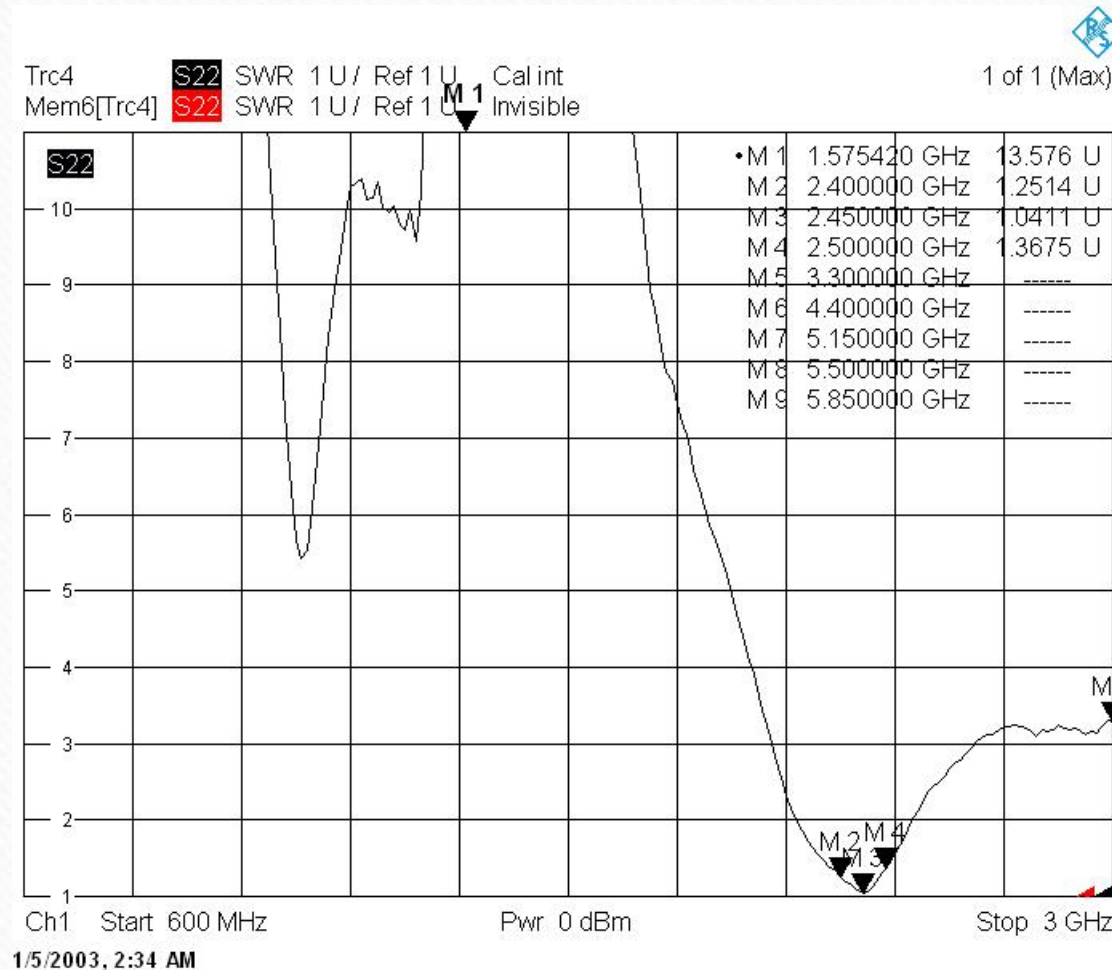


Matching Circuit



S11 Antenna Standing Wave Ratio (Copper Tube Antenna)

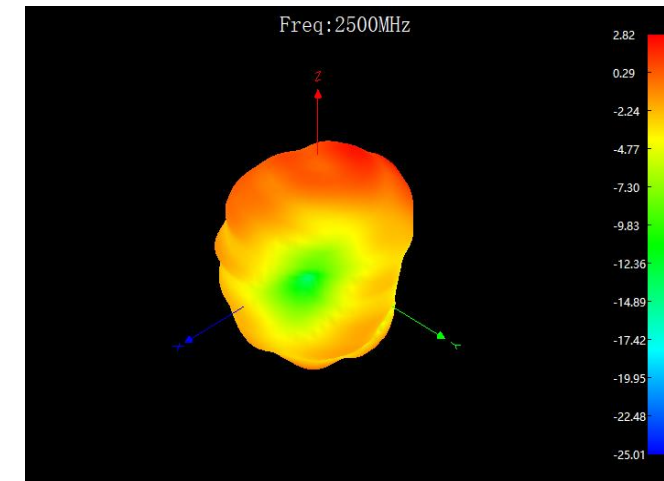
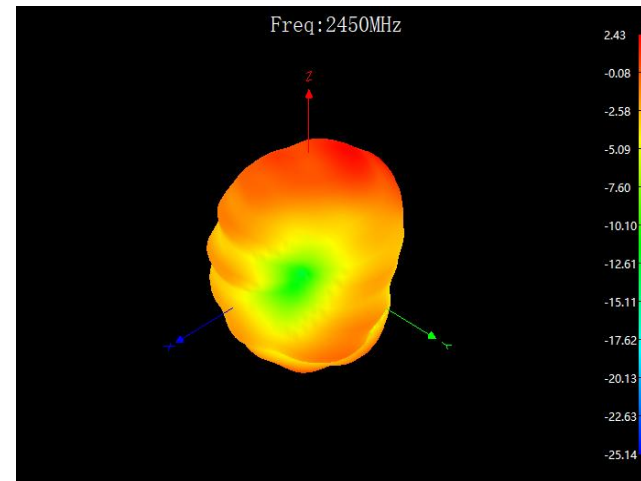
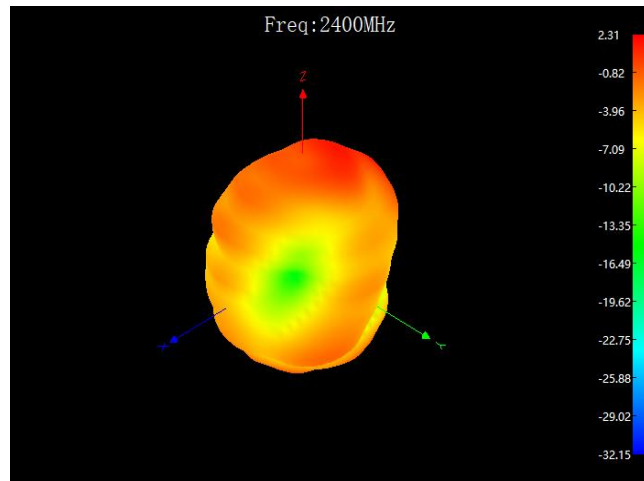
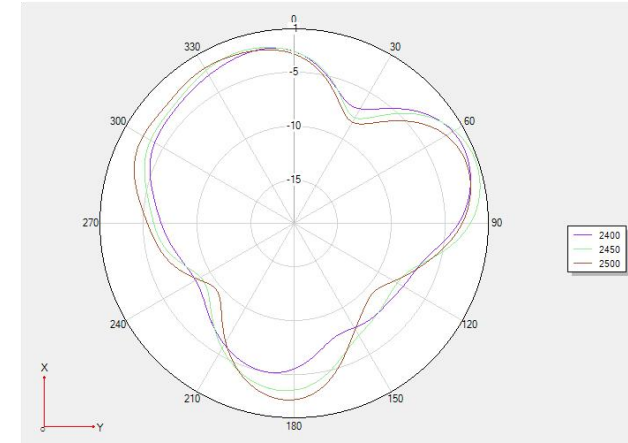
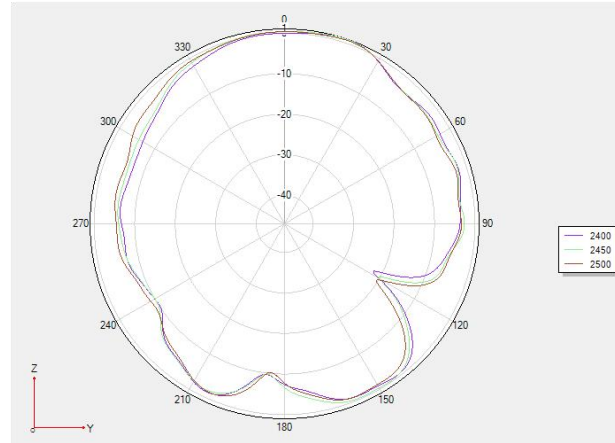
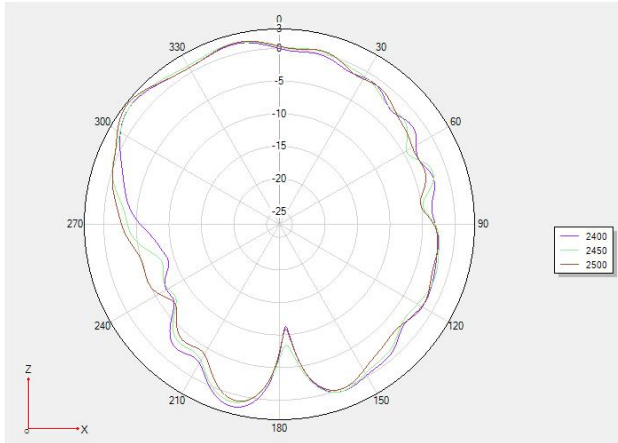
frequency	2400	2450	2500
SWR	1.25	1.04	1.36



Passive efficiency (Copper Tube Antenna)

Frequency/Mhz	Efficiency / %	MaxGain/dBi	AvgGain/dBi
2400	55.34	2.31	-2.57
2410	54.58	2.11	-2.63
2420	55.46	2.39	-2.56
2430	55.21	2.24	-2.58
2440	56.23	2.51	-2.5
2450	57.28	2.43	-2.42
2460	57.68	2.75	-2.39
2470	58.08	2.63	-2.36
2480	58.88	2.81	-2.3
2490	58.88	2.75	-2.3
2500	57.54	2.82	-2.4

directiondiagram (Copper Tube Antenna)



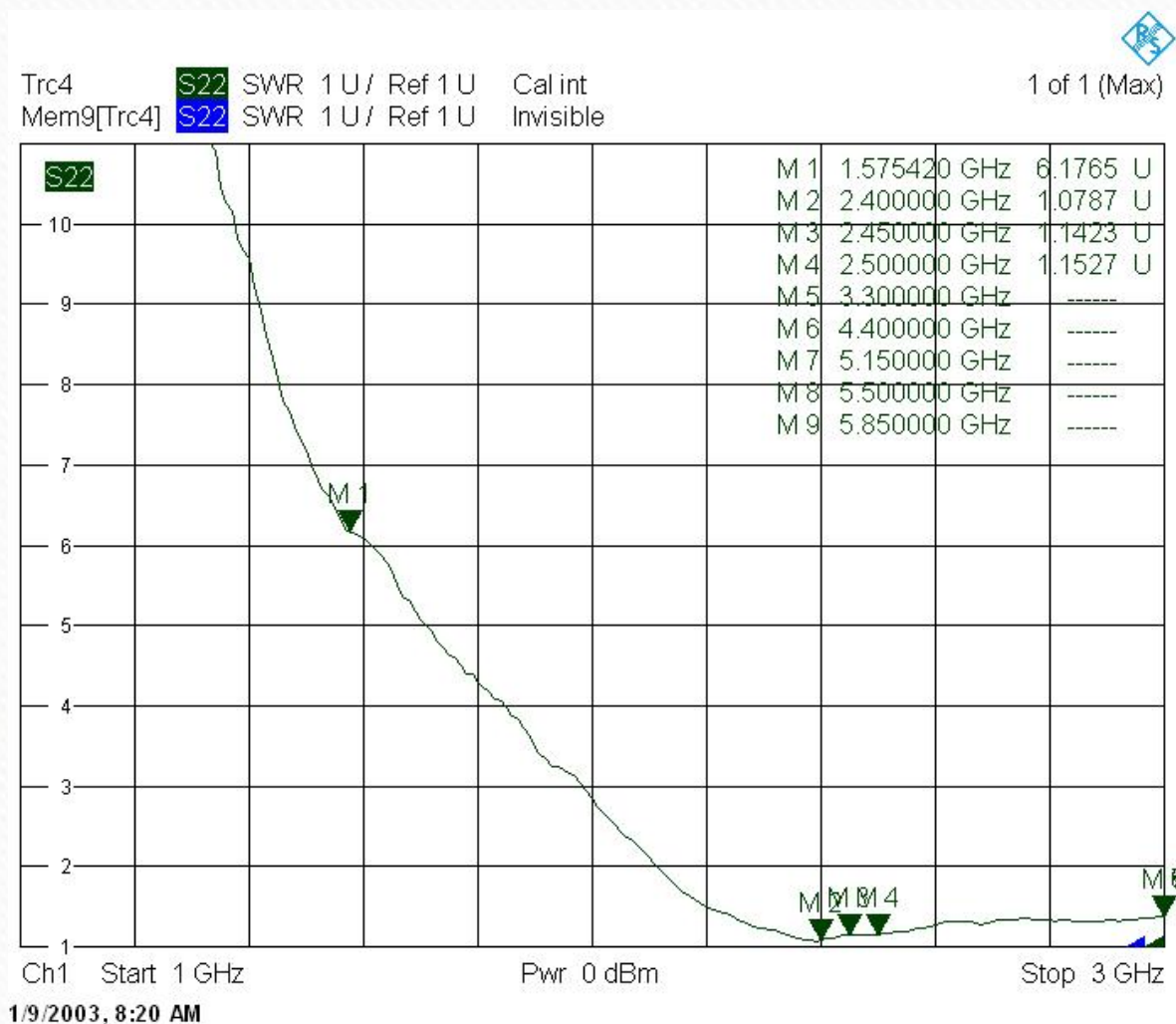
Wi Fi Active Data (Copper Tube Antenna)

Measurement	Standard	Band	Channel	Frequency	Total
TRP	WIFI (AP)	WIFI_B (11M)	1	2412	18.92
TRP	WIFI (AP)	WIFI_B (11M)	6	2437	18.96
TRP	WIFI (AP)	WIFI_B (11M)	11	2462	19.79
TIS(EIRP)	WIFI (AP)	WIFI_B (11M)	11	2462	-83.06
TRP	WIFI (AP)	WIFI_G (54M)	1	2412	12.29
TRP	WIFI (AP)	WIFI_G (54M)	6	2437	13.18
TRP	WIFI (AP)	WIFI_G (54M)	11	2462	14.32
TIS(EIRP)	WIFI (AP)	WIFI_G (54M)	11	2462	-70.94
TRP	WIFI (AP)	WIFI_N_ISM (65M)	1	2412	19.99
TRP	WIFI (AP)	WIFI_N_ISM (65M)	6	2437	21.9
TRP	WIFI (AP)	WIFI_N_ISM (65M)	11	2462	21.86
TIS(EIRP)	WIFI (AP)	WIFI_N_ISM (65M)	11	2462	-70.84

S11 Antenna Standing Wave Ratio

(Steel Plate Antenna)

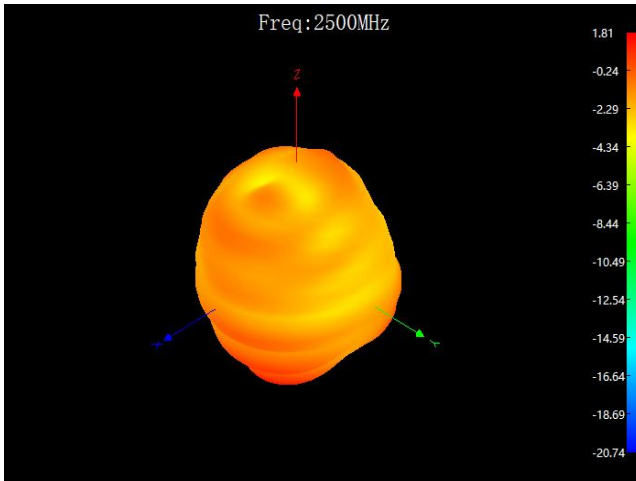
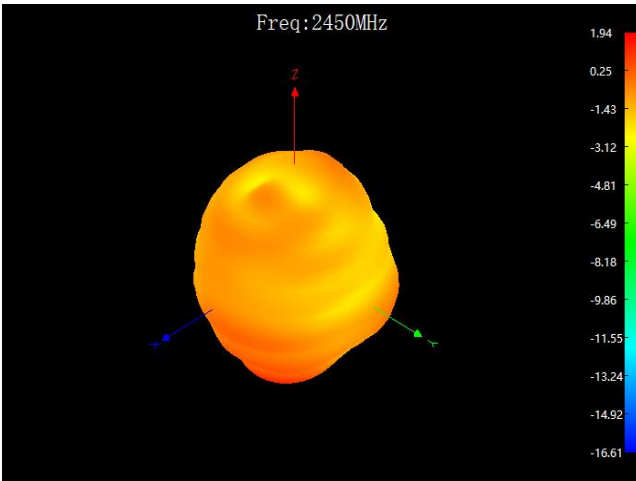
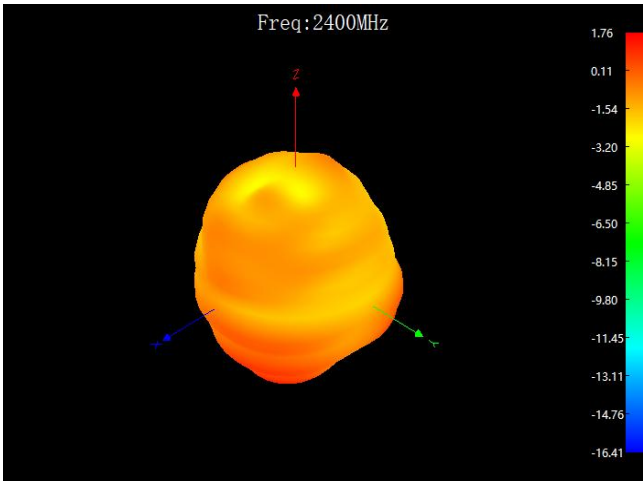
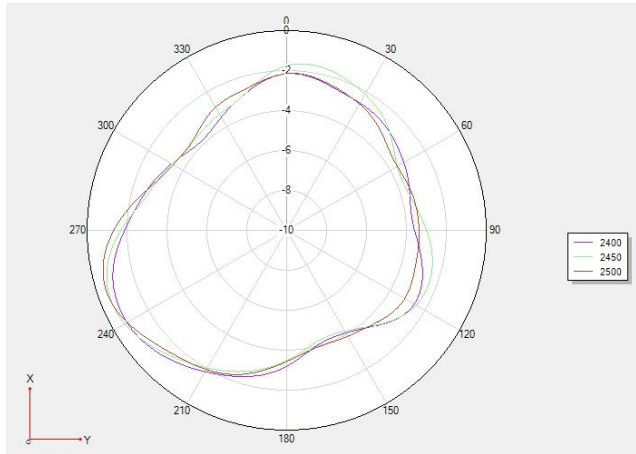
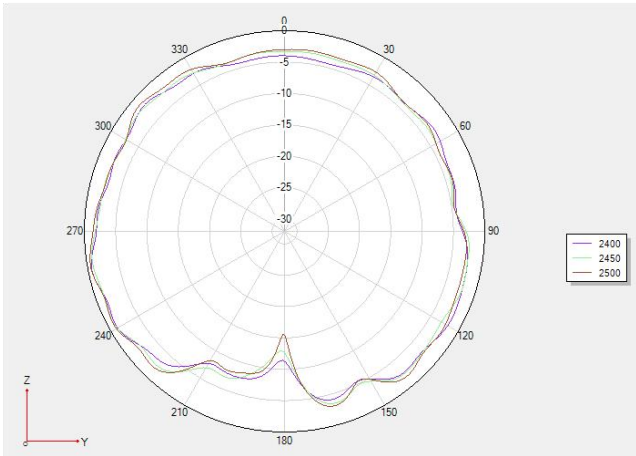
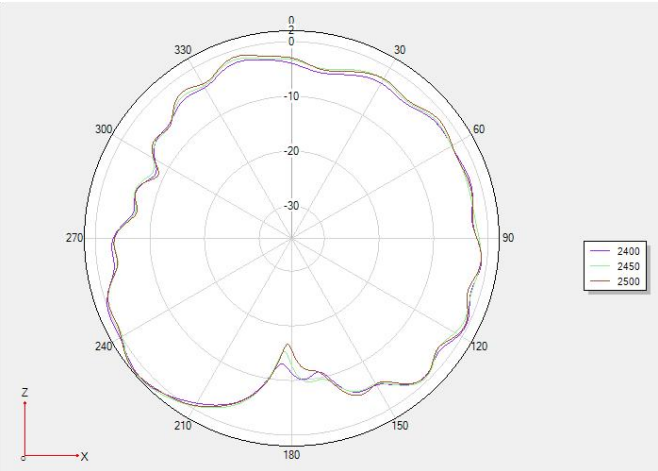
frequency	2400	2450	2500
SWR	1.07	1.14	1.15



Passive efficiency (Steel Plate Antenna)

Frequency/Mhz	Efficiency / %	MaxGain/dBi	AvgGain/dBi
2400	63.83	1.76	-1.95
2410	63.1	2.12	-2
2420	63.24	1.74	-1.99
2430	62.37	1.96	-2.05
2440	63.68	1.79	-1.96
2450	63.97	1.94	-1.94
2460	64.42	1.71	-1.91
2470	64.71	1.84	-1.89
2480	66.37	1.88	-1.78
2490	65.61	1.83	-1.83
2500	65.77	1.81	-1.82

directiondiagram (Steel Plate Antenna)



(Steel Plate Antenna)

Measurement	Standard	Band	Channel	Frequency	Total
TRP	WIFI (AP)	WIFI_B (11M)	1	2412	18.65
TRP	WIFI (AP)	WIFI_B (11M)	6	2437	18.32
TRP	WIFI (AP)	WIFI_B (11M)	11	2462	19.07
TIS(EIRP)	WIFI (AP)	WIFI_B (11M)	11	2462	-75.62
TRP	WIFI (AP)	WIFI_G (54M)	1	2412	18.44
TRP	WIFI (AP)	WIFI_G (54M)	6	2437	18.43
TRP	WIFI (AP)	WIFI_G (54M)	11	2462	19.66
TIS(EIRP)	WIFI (AP)	WIFI_G (54M)	11	2462	-64.93
TRP	WIFI (AP)	WIFI_N_ISM (65M)	1	2412	18
TRP	WIFI (AP)	WIFI_N_ISM (65M)	6	2437	19.61
TRP	WIFI (AP)	WIFI_N_ISM (65M)	11	2462	19.33
TIS(EIRP)	WIFI (AP)	WIFI_N_ISM (65M)	11	2462	-60.59



The power cord is wrapped in copper foil, grounded with a conductive cloth, and fixed on the shield cover to keep it away from the antenna

The above is the latest validation test data.

Thank You

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