



SUNNYWAY

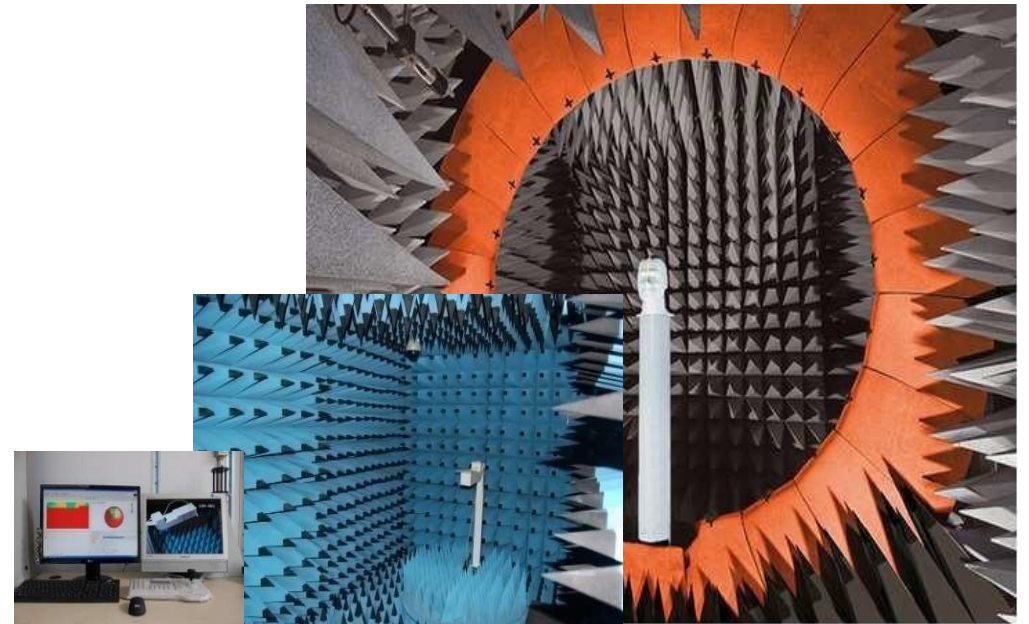
# Antenna Testing Report

**Model Name:T0922**

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# Project Information



Sample status				Product type			
Antenna overview							
	Frequency		Structural style	Type	Location	Matching modification	Antenna version
Main antenna	2G	GSM850/900/1800/1900		FPC		no	sample
	3G	WCDMA1/2/4/5/8					
	4G	B1/2/3/4/5/7/8/12/17/20/28/38/40/41					
Other antennas	WIFI	GPS+2.4G+5G		FPC		no	sample
	DIV	B1/2/3/4/5/7/8/20/28/38/40/41		FPC		no	sample
Environment adjustment				NO			

# Report Version and Remarks



SUNNYWAY

Version	Report date	Remark
A0	October 23, 2023	Active test data
A1		
A2		
A3		
A4		
A5		
A6		
A7		
A8		
A9		
A10		
A11		

# Company Profile and Test Environment



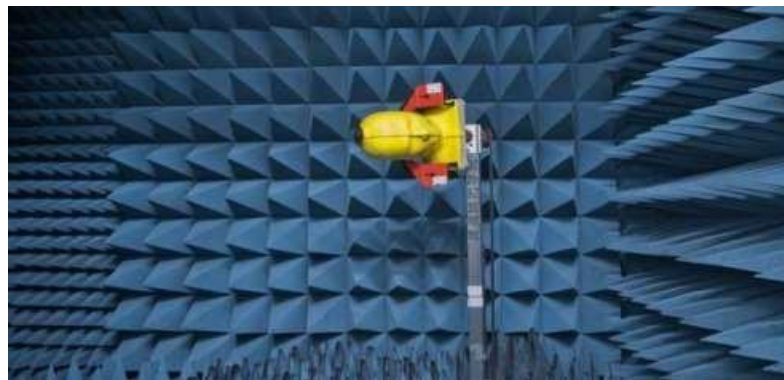
**Sunnyway Technology (China) Co., Ltd.** (hereafter referred to as Sunnyway) was founded in 2009. The brand operation center is located in Shanghai (Shanghai Shouyuan Communication Technology Co., Ltd.), Shanghai, Shenzhen, Taiwan all have R&D bases and **8 OTA Chambers** which are dedicated to provide antenna's R&D, design, production, and sales services for Internet of Things/cell phones to domestic and foreign users. Sunnyway is gradually becoming the first brand of the Internet of Things antenna industry.

Sunnyway Technology R&D and sales products are mainly used in consumer electronics products such as smart phones/tablets/notebooks/smart wear, etc., and are deeply involved in the field of Internet of Things products, and are gradually expanding to smart cities (smart water meters/smart covers, etc.). Smart traffic (smart car lock/smart parking/4G cloud rearview mirror, etc.), smart home (smart door lock/smart lamp), security protection (smart monitor/smart alarm), smart medical, stuff tracking, industrial control (equipment monitoring, production Monitoring, etc.) help the intelligent development of the Internet of Things.

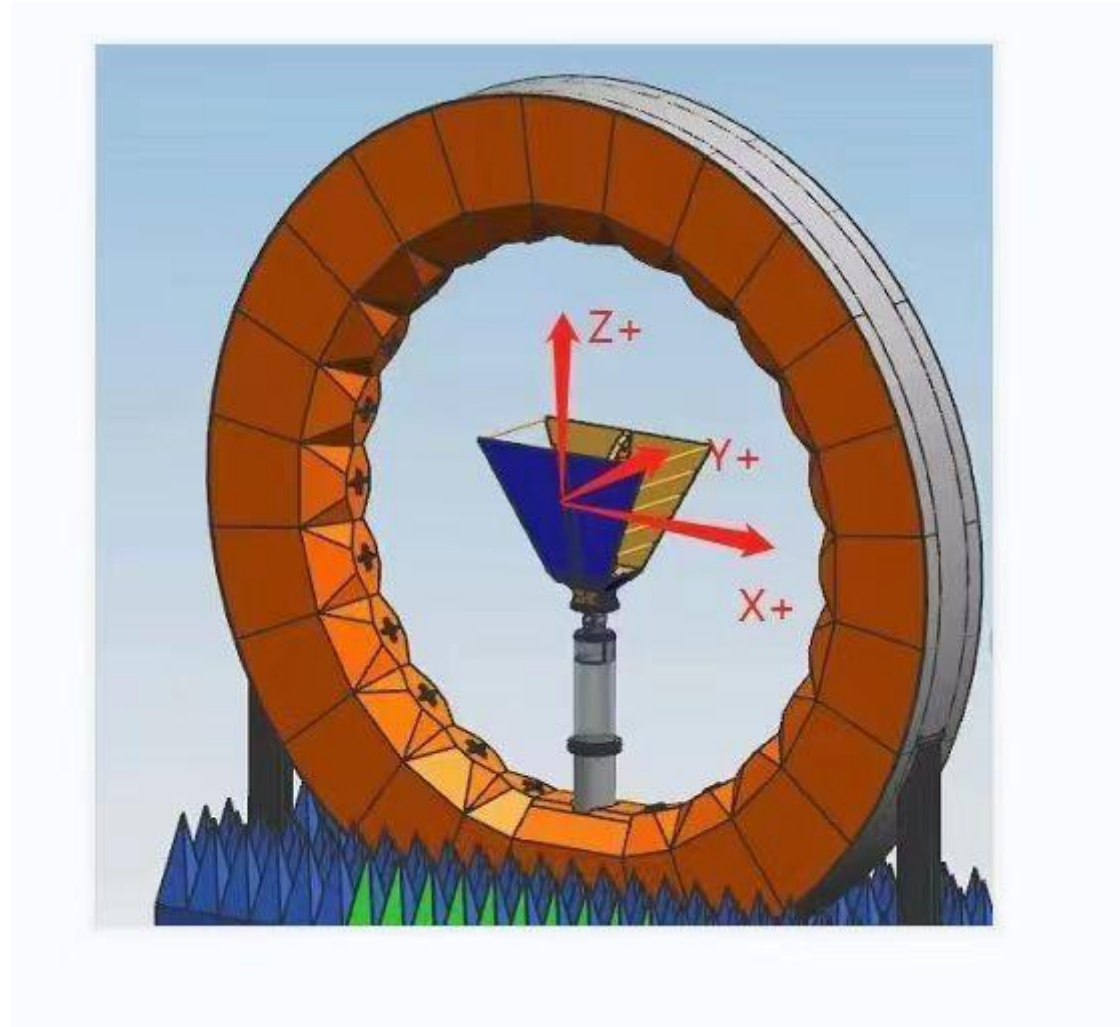
Sunnyway Technology, a senior IoT antenna expert nearby you.



Sunnyway has a number of OTA chambers, the frequency range covers 400MHz~8.5GHz, can provide complete machine OTA test (TRP/TIS), WIFI active test (supports 11b/11g/11n mode test items), Bluetooth/GPS active test items, can provide antenna gain and efficiency, 2D pattern / Apple map analysis and upper and lower hemisphere efficiency values, mutual interference correlation coefficient test items.



# Schematic diagram of darkroom coordinate system

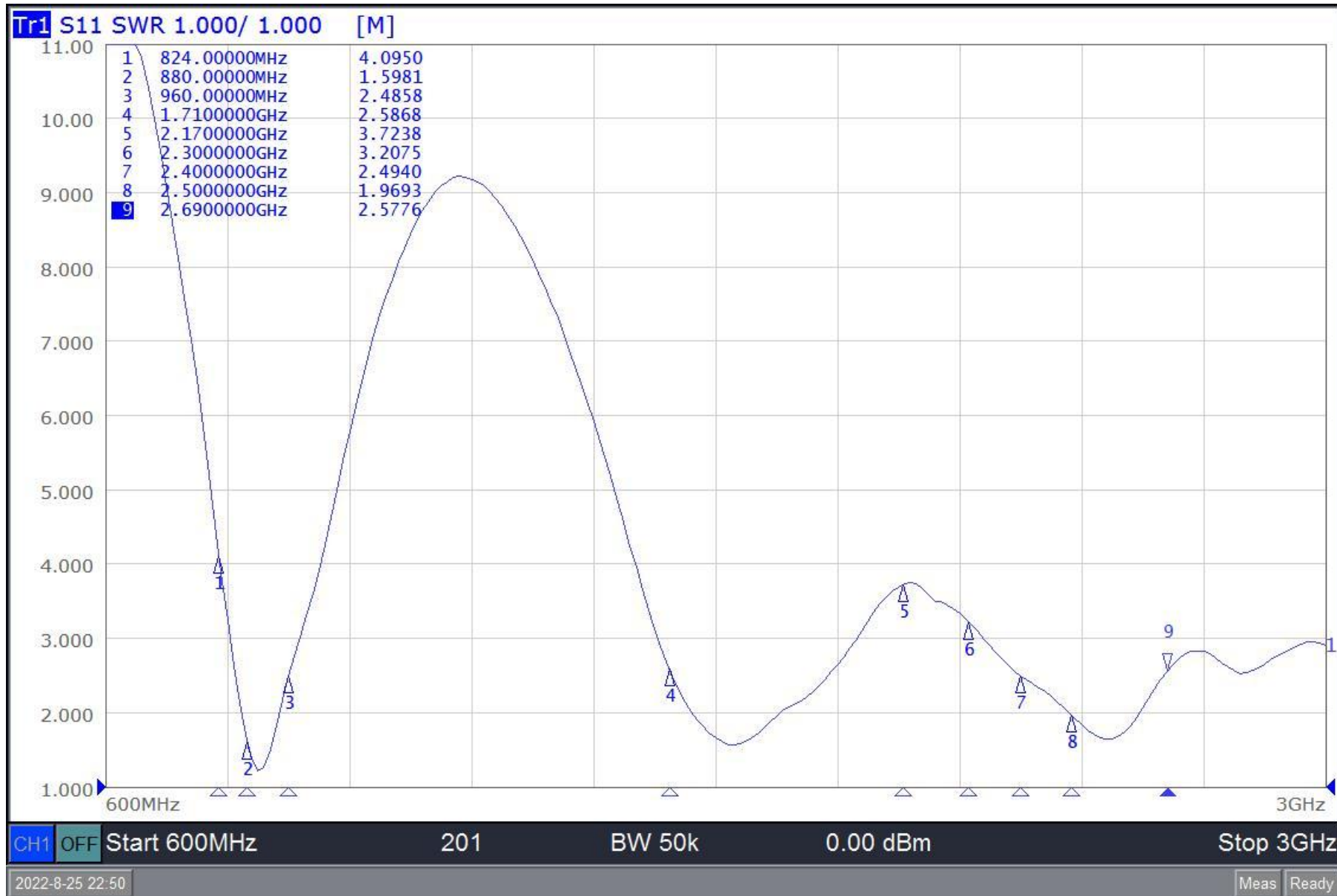


# Efficiency test



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## Main antenna S11





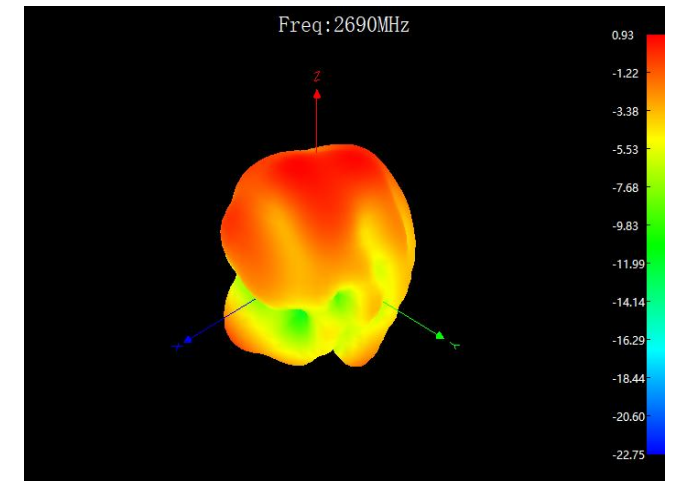
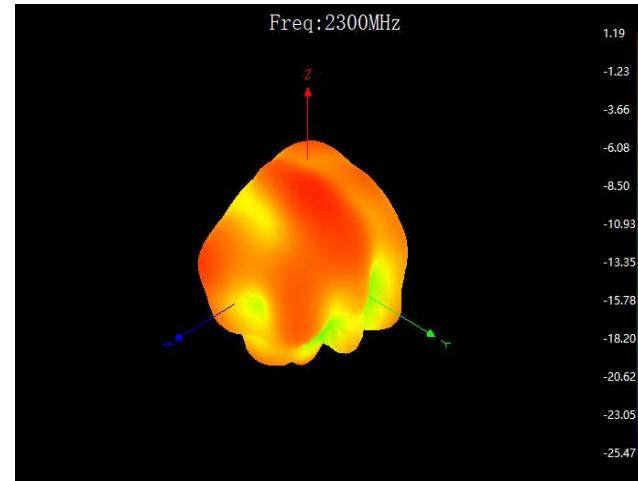
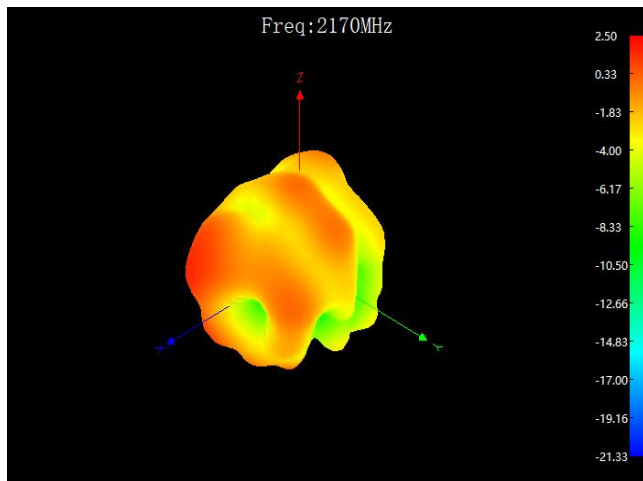
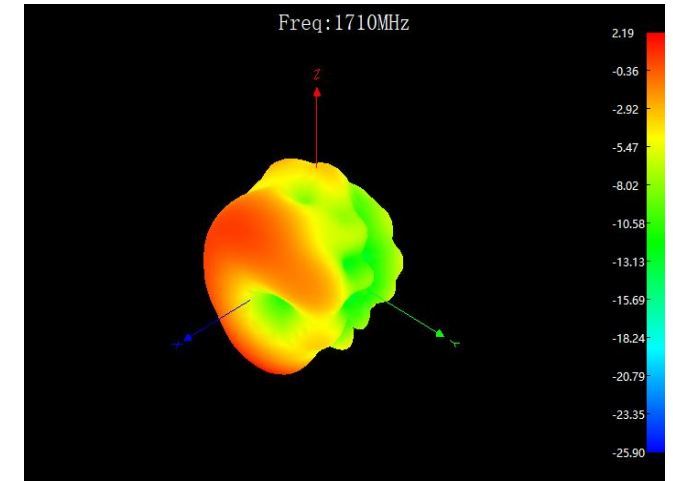
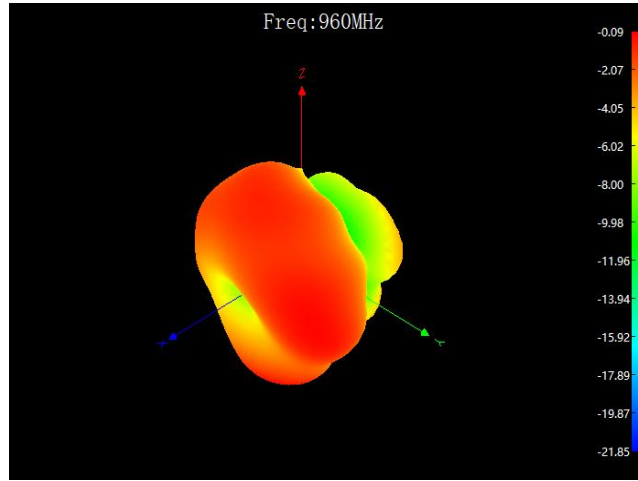
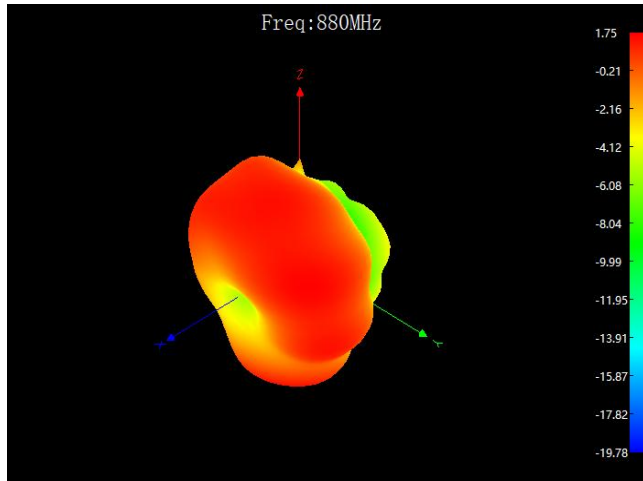
# Main antenna efficiency



Frequency/Mhz	Efficiency/dB	Efficiency/%	Frequency/Mhz	Efficiency/dB	Efficiency/%	Frequency/Mhz	Efficiency/dB	Efficiency/%
880	-4.7	33.88	1940	-5.04	31.33	2380	-4.61	34.59
890	-4.06	39.26	1950	-5.06	31.19	2390	-4.44	35.97
900	-3.76	42.07	1960	-5.06	31.19	2400	-4.41	36.22
910	-3.82	41.5	1970	-5.09	30.97	2410	-4.22	37.84
920	-4.13	38.64	1980	-5.1	30.9	2420	-3.99	39.9
930	-4.6	34.67	1990	-5.08	31.05	2430	-3.94	40.36
940	-5.17	30.41	2000	-5.06	31.19	2440	-3.87	41.02
950	-5.81	26.24	2010	-5.28	29.65	2450	-3.77	41.98
960	-6.38	23.01	2020	-5.14	30.62	2460	-4.01	39.72
1710	-6.15	24.27	2030	-5.28	29.65	2470	-3.79	41.78
1720	-5.82	26.18	2040	-5.27	29.72	2480	-3.67	42.95
1730	-5.53	27.99	2050	-5.16	30.48	2490	-3.75	42.17
1740	-5.35	29.17	2060	-5.14	30.62	2500	-3.55	44.16
1750	-5.21	30.13	2070	-5.22	30.06	2510	-3.57	43.95
1760	-5.06	31.19	2080	-5.18	30.34	2520	-3.64	43.25
1770	-4.85	32.73	2090	-5.31	29.44	2530	-3.63	43.35
1780	-4.67	34.12	2100	-5.23	29.99	2540	-3.66	43.05
1790	-4.55	35.08	2110	-5.36	29.11	2550	-3.74	42.27
1800	-4.45	35.89	2120	-5.33	29.31	2560	-3.65	43.15
1810	-4.42	36.14	2130	-5.5	28.18	2570	-3.77	41.98
1820	-4.41	36.22	2140	-5.47	28.38	2580	-3.67	42.95
1830	-4.39	36.39	2150	-5.47	28.38	2590	-3.77	41.98
1840	-4.3	37.15	2160	-5.52	28.05	2600	-3.94	40.36
1850	-4.18	38.19	2170	-5.5	28.18	2610	-4.07	39.17
1860	-4.1	38.9	2300	-5.18	30.34	2620	-4.25	37.58
1870	-4.15	38.46	2310	-5.27	29.72	2630	-4.27	37.41
1880	-4.29	37.24	2320	-5.17	30.41	2640	-4.37	36.56
1890	-4.46	35.81	2330	-5.13	30.69	2650	-4.43	36.06
1900	-4.63	34.43	2340	-5.02	31.48	2660	-4.47	35.73
1910	-4.78	33.27	2350	-4.84	32.81	2670	-4.54	35.16
1920	-4.9	32.36	2360	-4.72	33.73	2680	-4.74	33.57
1930	-4.98	31.77	2370	-4.7	33.88	2690	-4.66	34.2

# 3D Etotal

Main antenna 880MHz -2690MHz

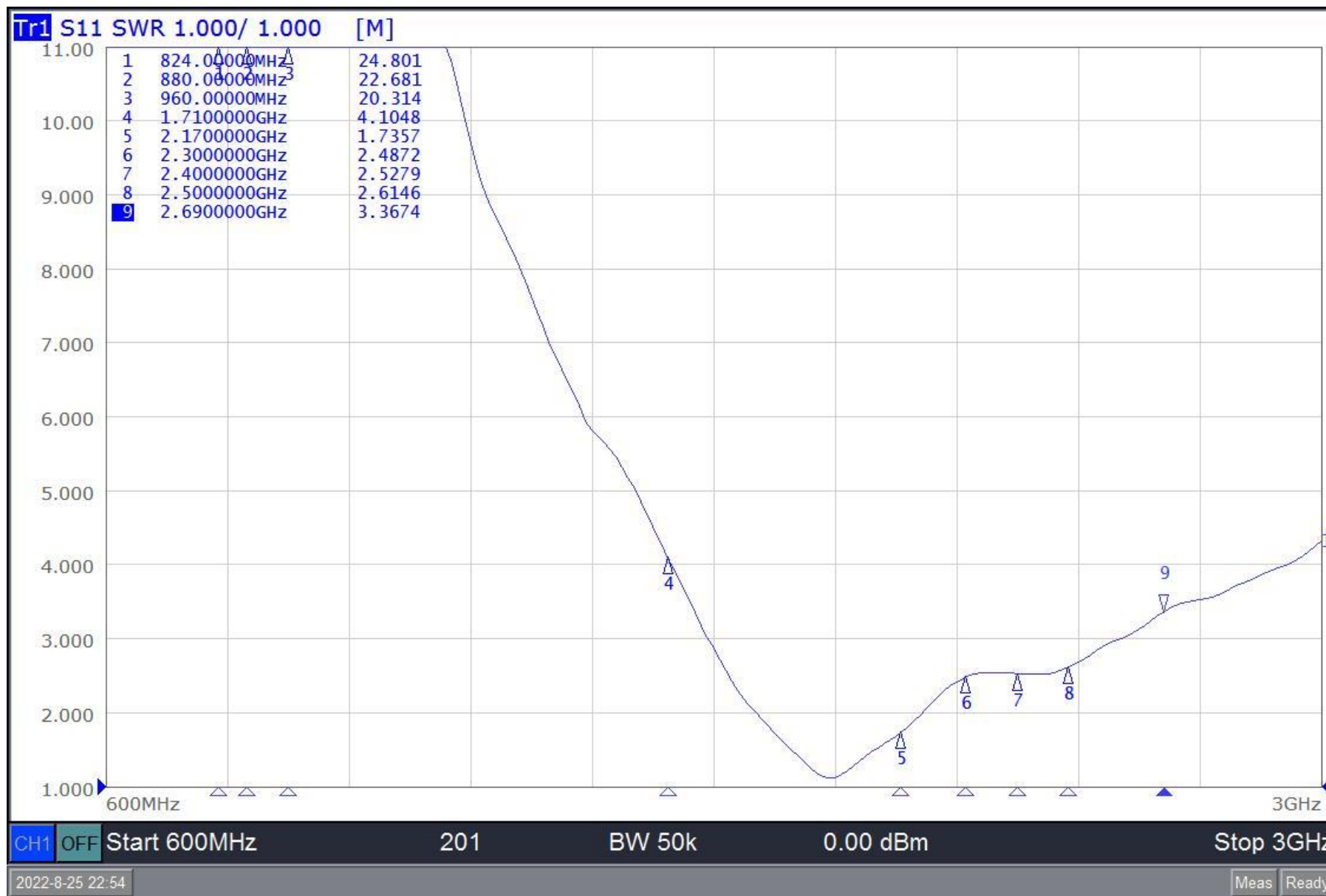


# Efficiency test

## DIV antenna S11



SUNNYWAY



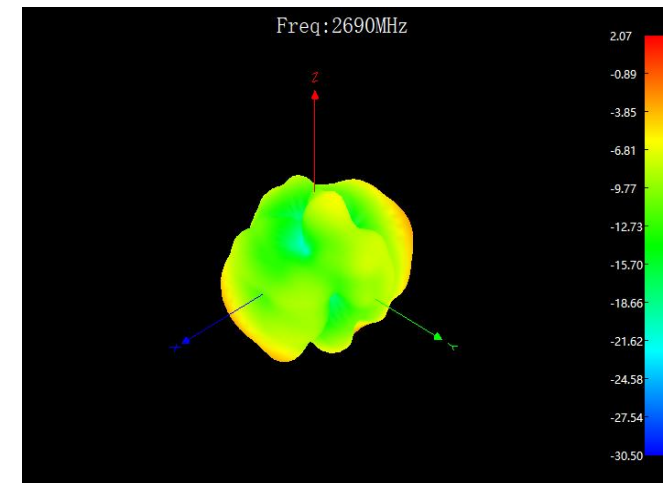
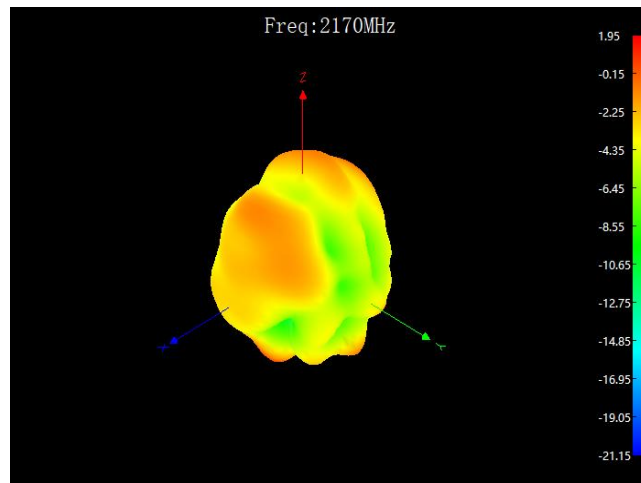
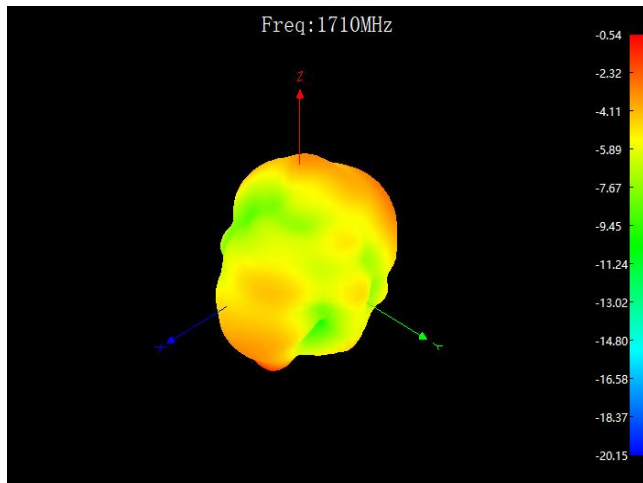
# DIV antenna efficiency



Frequency/Mhz	Efficiency/dB	Efficiency/%	Frequency/Mhz	Efficiency/dB	Efficiency/%	Frequency/Mhz	Efficiency/dB	Efficiency/%
1710	-7.4	18.2	2000	-4.41	36.22	2410	-5.91	25.64
1720	-7.28	18.71	2010	-4.6	34.67	2420	-5.82	26.18
1730	-7.15	19.28	2020	-4.56	34.99	2430	-5.74	26.67
1740	-7.01	19.91	2030	-4.68	34.04	2440	-5.69	26.98
1750	-6.92	20.32	2040	-4.61	34.59	2450	-5.62	27.42
1760	-6.83	20.75	2050	-4.51	35.4	2460	-5.82	26.18
1770	-6.72	21.28	2060	-4.39	36.39	2470	-5.71	26.85
1780	-6.64	21.68	2070	-4.33	36.9	2480	-5.75	26.61
1790	-6.51	22.34	2080	-4.19	38.11	2490	-5.8	26.3
1800	-6.4	22.91	2090	-4.28	37.33	2500	-5.63	27.35
1810	-6.34	23.23	2100	-4.18	38.19	2510	-5.62	27.42
1820	-6.25	23.71	2110	-4.33	36.9	2520	-5.53	27.99
1830	-6.14	24.32	2120	-4.29	37.24	2530	-5.67	27.1
1840	-6	25.12	2130	-4.47	35.73	2540	-5.64	27.29
1850	-5.88	25.82	2140	-4.55	35.08	2550	-5.68	27.04
1860	-5.71	26.85	2150	-4.59	34.75	2560	-5.66	27.16
1870	-5.54	27.93	2160	-4.74	33.57	2570	-5.75	26.61
1880	-5.39	28.91	2170	-4.87	32.58	2580	-5.51	28.12
1890	-5.33	29.31	2300	-6.32	23.33	2590	-5.46	28.44
1900	-5.25	29.85	2310	-6.48	22.49	2600	-5.49	28.25
1910	-5.13	30.69	2320	-6.4	22.91	2610	-5.48	28.31
1920	-4.95	31.99	2330	-6.49	22.44	2620	-5.46	28.44
1930	-4.89	32.43	2340	-6.48	22.49	2630	-5.37	29.04
1940	-4.81	33.04	2350	-6.36	23.12	2640	-5.41	28.77
1950	-4.69	33.96	2360	-6.25	23.71	2650	-5.44	28.58
1960	-4.65	34.28	2370	-6.27	23.6	2660	-5.58	27.67
1970	-4.61	34.59	2380	-6.18	24.1	2670	-5.38	28.97
1980	-4.52	35.32	2390	-6.01	25.06	2680	-5.56	27.8
1990	-4.44	35.97	2400	-6.07	24.72	2690	-5.47	28.38

# 3D Etotal

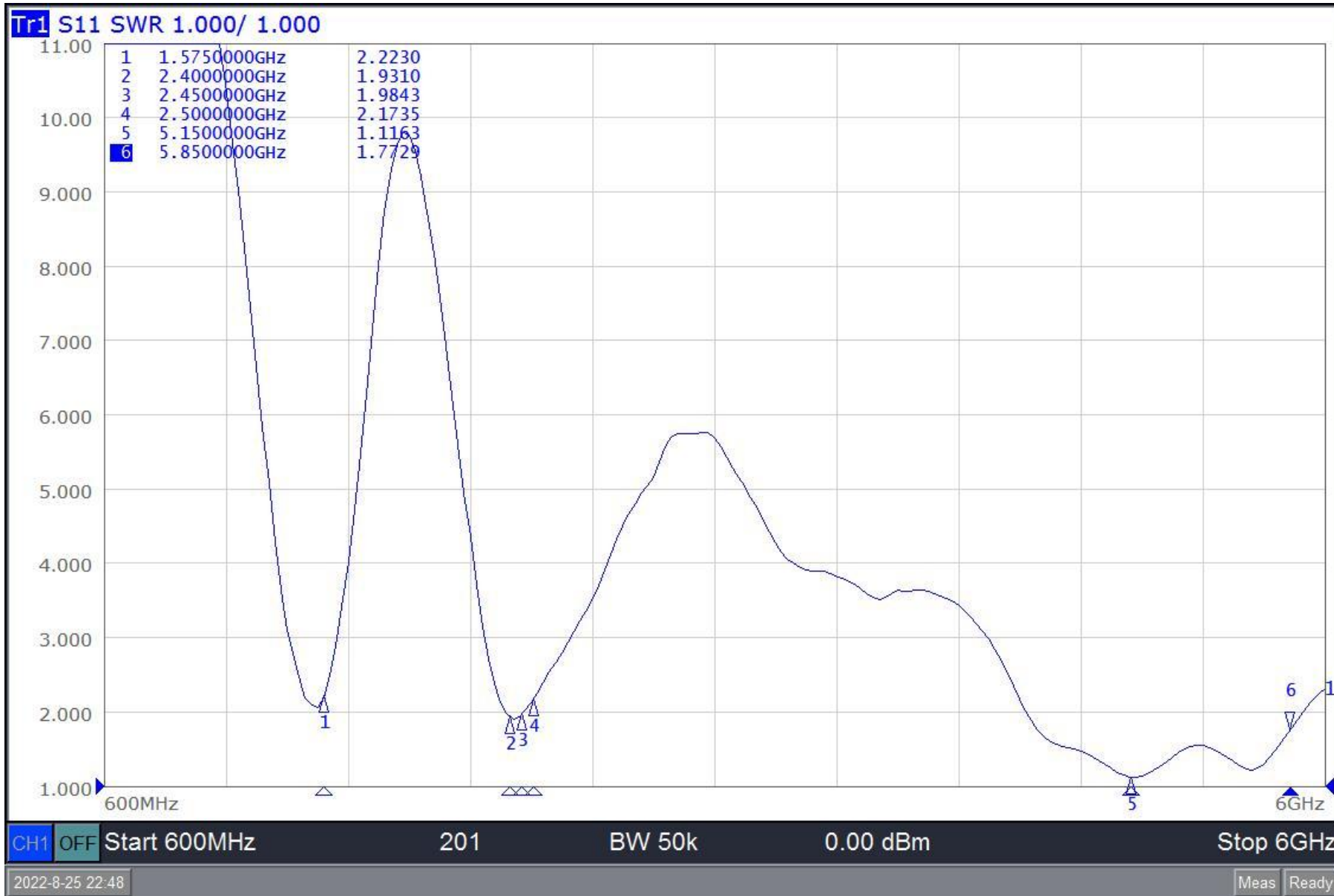
DIV antenna 1710MHz 2170MHz 2690MHz





# Efficiency test

Three in one antenna S11



# Three in one antenna efficiency



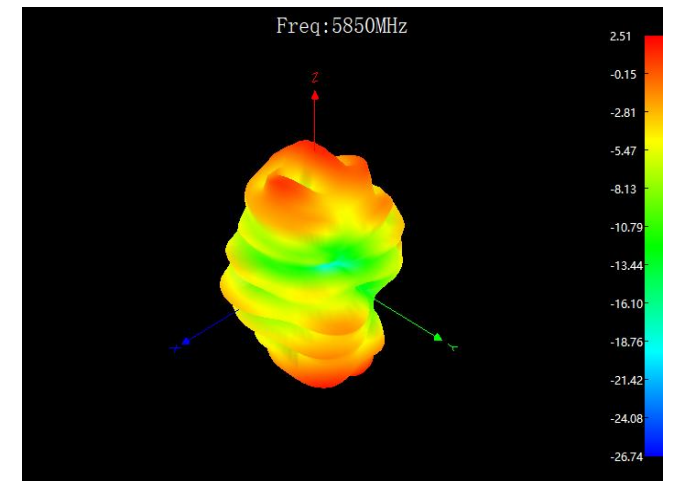
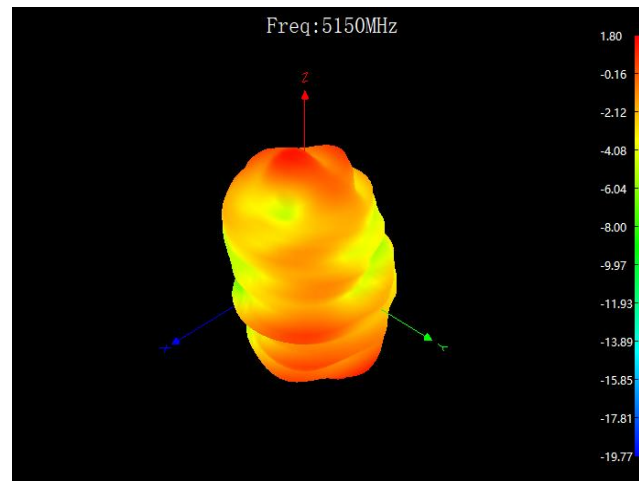
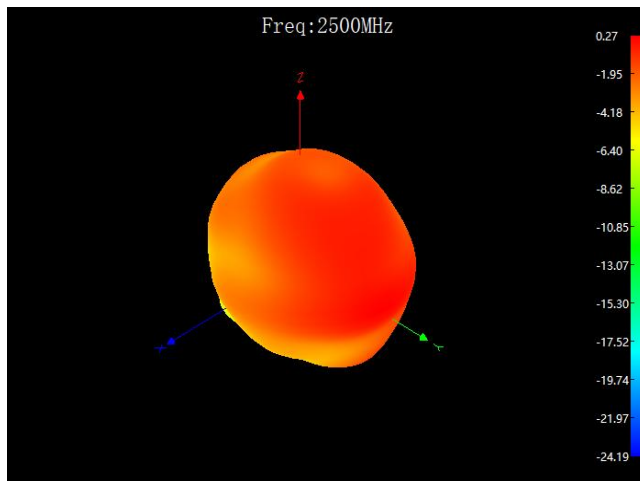
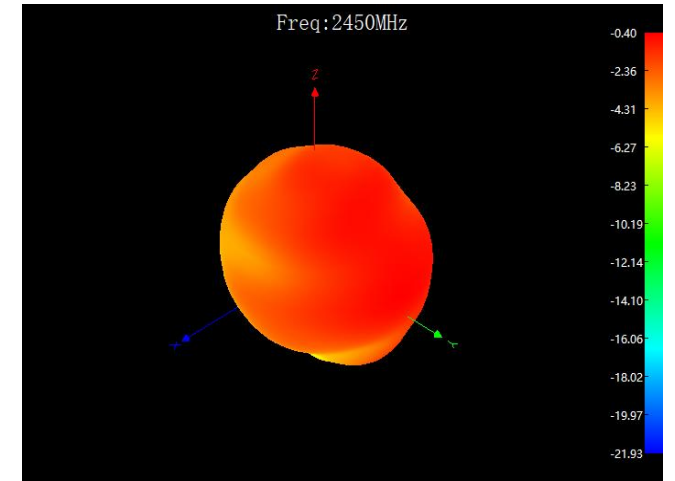
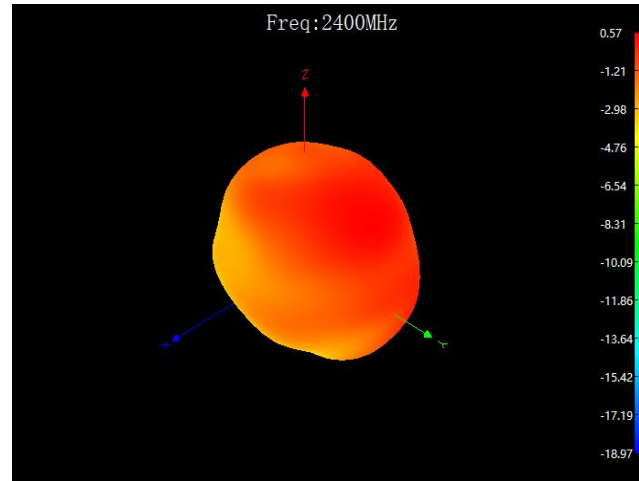
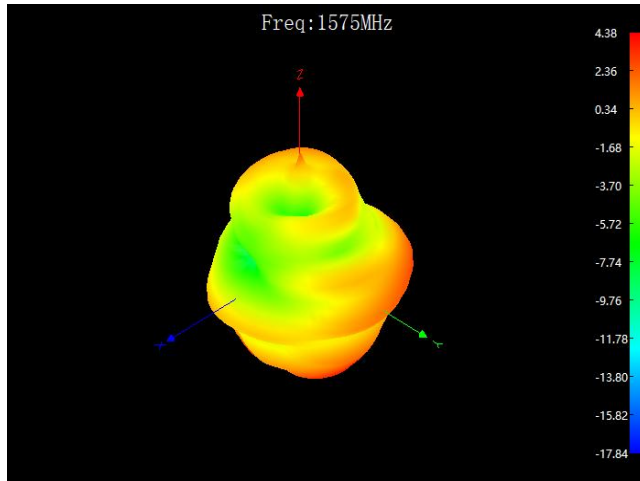
2.4G		
Frequency/Mhz	Efficiency/dB	Efficiency/%
2400	-4.92	32.21
2410	-4.83	32.89
2420	-4.67	34.12
2430	-4.78	33.27
2440	-4.76	33.42
2450	-4.66	34.2
2460	-4.93	32.14
2470	-4.76	33.42
2480	-4.69	33.96
2490	-4.83	32.89
2500	-4.64	34.36

GPS		
Frequency/Mhz	Efficiency/dB	Efficiency/%
1550	-3.69	42.76
1555	-3.56	44.06
1560	-3.48	44.87
1565	-3.34	46.34
1570	-3.26	47.21
1575	-3.14	48.53
1580	-3.22	47.64
1585	-3.39	45.81
1590	-3.54	44.26
1595	-3.71	42.56
1600	-3.86	41.11
1605	-3.99	39.9

5G		
Frequency/Mhz	Efficiency/dB	Efficiency/%
5150	-4.16	38.37
5170	-4.02	39.63
5190	-4.05	39.36
5210	-4.26	37.5
5230	-4.15	38.46
5250	-4.29	37.24
5270	-4.54	35.16
5290	-4.49	35.56
5310	-4.59	34.75
5330	-4.87	32.58
5350	-4.65	34.28
5370	-4.58	34.83
5390	-4.88	32.51
5410	-4.78	33.27
5430	-4.68	34.04
5450	-5.09	30.97
5470	-5.05	31.26
5490	-4.98	31.77
5510	-5.06	31.19
5530	-4.97	31.84
5550	-4.94	32.06
5570	-5.01	31.55
5590	-5.02	31.48
5610	-4.86	32.66
5630	-5.18	30.34
5650	-5.12	30.76
5670	-5.11	30.83
5690	-5.3	29.51
5710	-5.16	30.48
5730	-4.96	31.92
5750	-5.14	30.62
5770	-5.07	31.12
5790	-4.98	31.77
5810	-5.3	29.51
5830	-5.01	31.55
5850	-4.63	34.43

# 3D Etotal

Three in one antenna 1575MHz 2400MHz 2500MHz



## Main Active test data

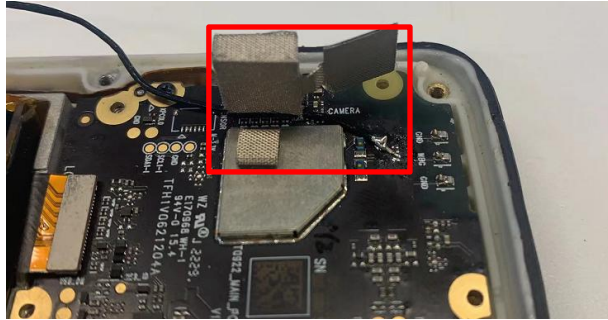
Band	信道	OTA数据		Band	信道	OTA数据		Band	信道	OTA数据	
		TRP	TIS (P+D)			TRP	TIS (P+D)			TRP	TIS (P+D)
GSM850	128	26.27		FDD-LTE1 (10MHz)	18050	19.16		FDD-LTE20 (10MHz)	24200	17.51	
	190	26.84			18300	19.52			24300	17.39	
	251	26.38	-101.14		18550	19.62	-94.83		24400	17.61	-91.58
EGSM900	975	26.47		FDD-LTE2 (10MHz)	18650	18.75		FDD-LTE28 (10MHz)	27260	16	
	38	26.32			18900	18.38			27435	16.04	
	124	25.59	-100.34		19150	18.92	-95.71		27610	16.31	-90.23
DCS1800	512	23.87		FDD-LTE3 (10MHz)	19250	17.45		TDD-LTE38 (10MHz)	37850	18.77	
	698	24.58			19575	18.59			38000	17.73	
	885	24.23	-104.14		19900	18.8	-94.69		38150	17.66	-89.25
GSM1900	512	24.5		FDD-LTE4 (10MHz)	20000	18.11		TDD-LTE40 (10MHz)	38750	18.02	
	661	24.52			20175	18.4			39150	18.34	
	810	24.47	-103.01		20350	18.61	-93.95		39550	16.63	-89.21
WCDMA1	9612	18.32		FDD-LTE5 (10MHz)	20450	17.08		TDD-LTE41 (10MHz)	40340	17.75	
	9750	18.72			20525	17.58			40740	17.17	
	9888	18.83	-106.06		20600	17.76	-90.12		41140	16.22	-88.34
WCDMA2	9262	17.49		FDD-LTE7 (10MHz)	20800	17.21					
	9400	17.55			21100	18.23					
	9538	18.31	-106.31		21400	18.41	-92.3				
WCDMA4	1312	17.94		FDD-LTE8 (10MHz)	21500	18.17					
	1412	18.11			21625	17.85					
	1513	18.21	-105.59		21750	17.1	-89.29				
WCDMA5	4132	17.63		FDD-LTE12 (10MHz)	23060	15.79					
	4183	17.56			23095	16.29					
	4233	17.49	-103.64		23130	16.25	-88.57				
WCDMA8	2712	18.08		FDD-LTE17 (10MHz)	23780	15.51					
	2787	18.11			23790	15.83					
	2863	17.15	-102.93		23800	15.95	-89.93				

## WiFi test data

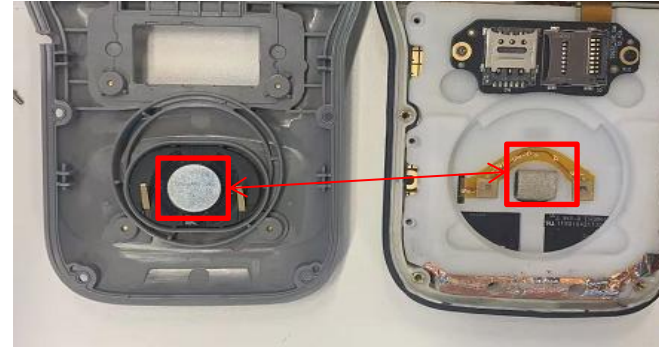
				亮屏	
制式	频段	信道	频率	测试数据	
				TRP	TIS
WiFi	802.11b (11Mbps)	1	2412	13.44	
		6	2442	14.03	
		11	2472	13.48	-83.33
	802.11a (54Mbps)	36	5180	12.38	
		64	5320	12.3	
		165	5825	11.72	-71.02
	频段		频率	测试数据	
GPS捕获灵敏度	GPS		1575.4	-147.31	



## Environmental treatment:



The camera is encased and grounded with the shield



The horn and the lower motherboard do ground handling



The upper motherboard is grounded to the metal frame



Screen and metal frame do grounding treatment

# Thank You

