



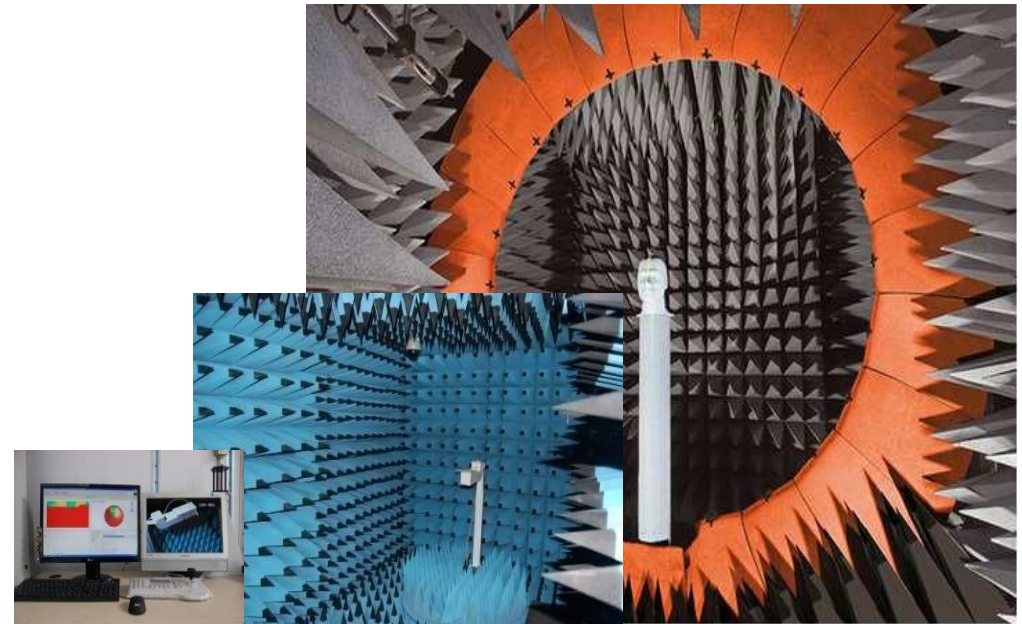
Antenna Testing Report

Model Name: H0721
August 5, 2023

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Project Information

Sample status		Mass production machine		Product type		POS machine	
Antenna overview							
	Frequency		Structural style	Type	Location	Matching modification	Antenna version
Main antenna	2G	GSM850/900/1800/1900	FCB + coaxial line			no	sample
	3G	WCDMA1/2/4/5/8					
	4G	B1/2/3/4/5/7/8/12/17/25/26/28/38/39/40/41					
Other antennas	WIFI	2.4G+5G	FCB + coaxial line			no	sample
	DIV	2G:GSM850/900/1800/1900 3G:WCDMA1/2/4/5/8 4G:B1/2/3/4/5/7/8/12/17/25/26/28/38/39/40/41	FCB + coaxial line			no	sample
Environment adjustment				NO			

Report Version and Remarks

Version	Report date	Remark
A0	August 5, 2023	Active test data
A1		
A2		
A3		
A4		
A5		
A6		
A7		
A8		
A9		
A10		
A11		

Company Profile and Test Environment

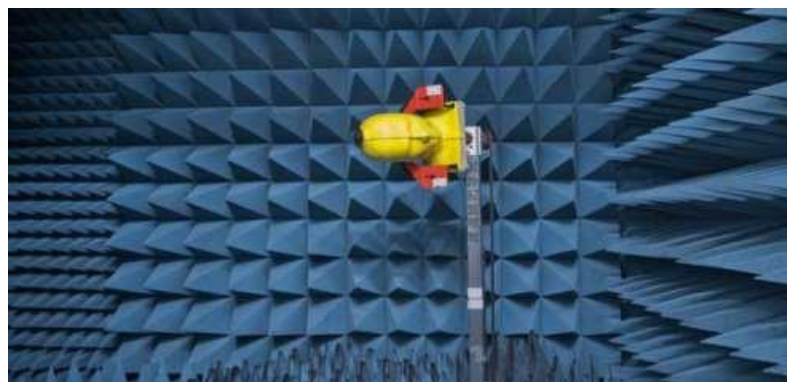
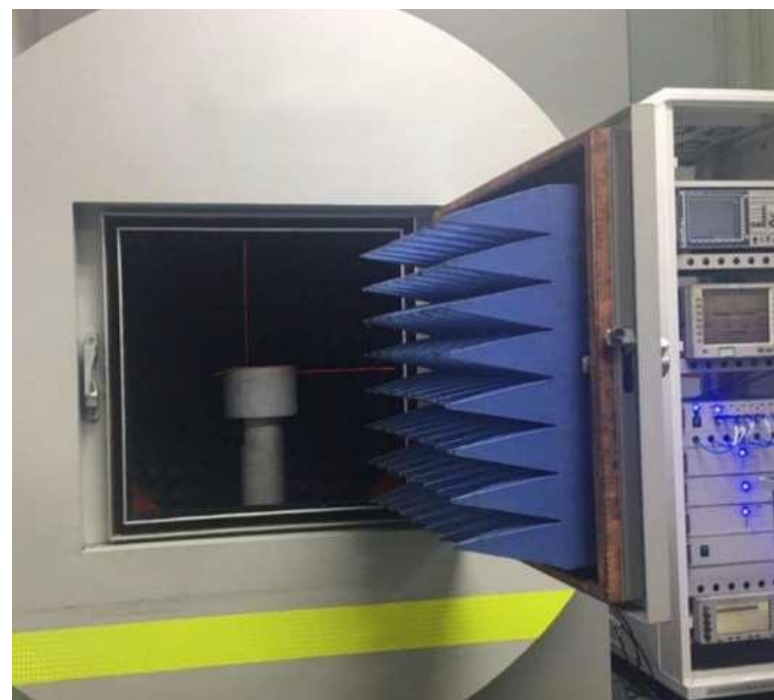
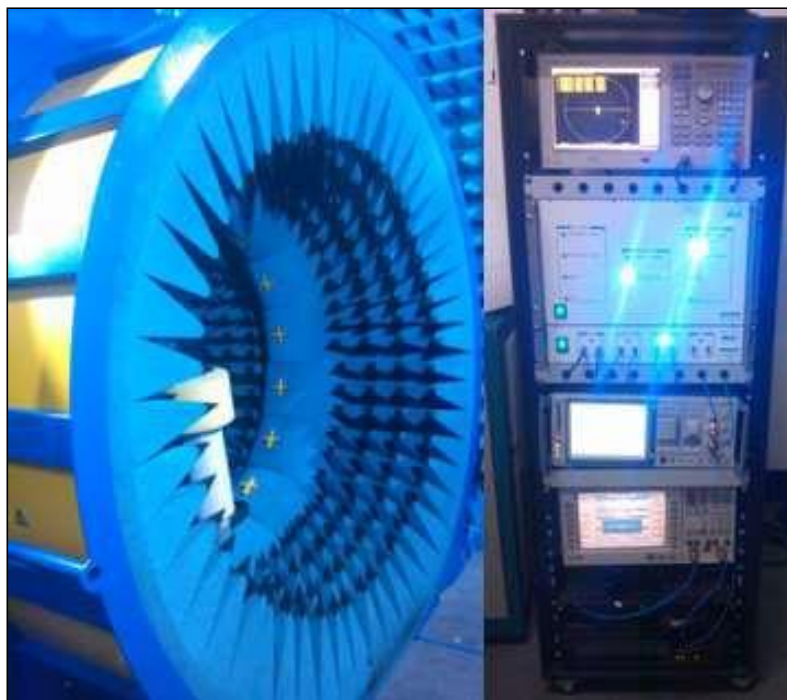


Sunnyway Technology (China) Co., Ltd. (hereafter referred to as Sunnyway) was founded in 2009. The brand operation center is located in Shanghai (Shanghai Shouyuan Communication Technology Co., Ltd.), Shanghai, Shenzhen, Taiwan all have R&D bases and **8 OTA Chambers** which are dedicated to provide 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.

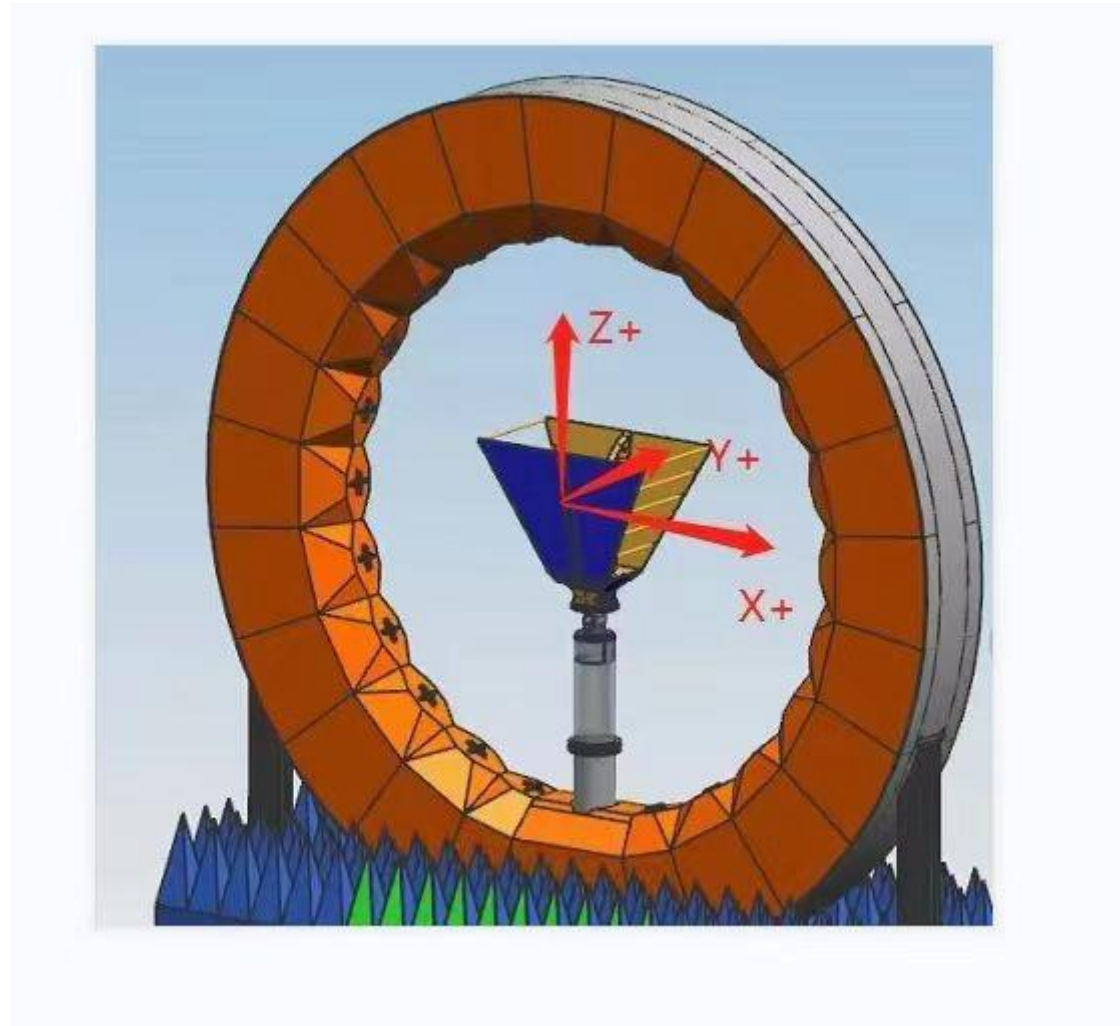
Sunnyway Technology R&D and sales products are mainly used in consumer electronics products such as smart phones/tablets/notebooks/smart wear, etc., and are deeply involved in the field of Internet of Things products, and are gradually expanding to smart cities (smart water meters/smart covers, etc.). 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.



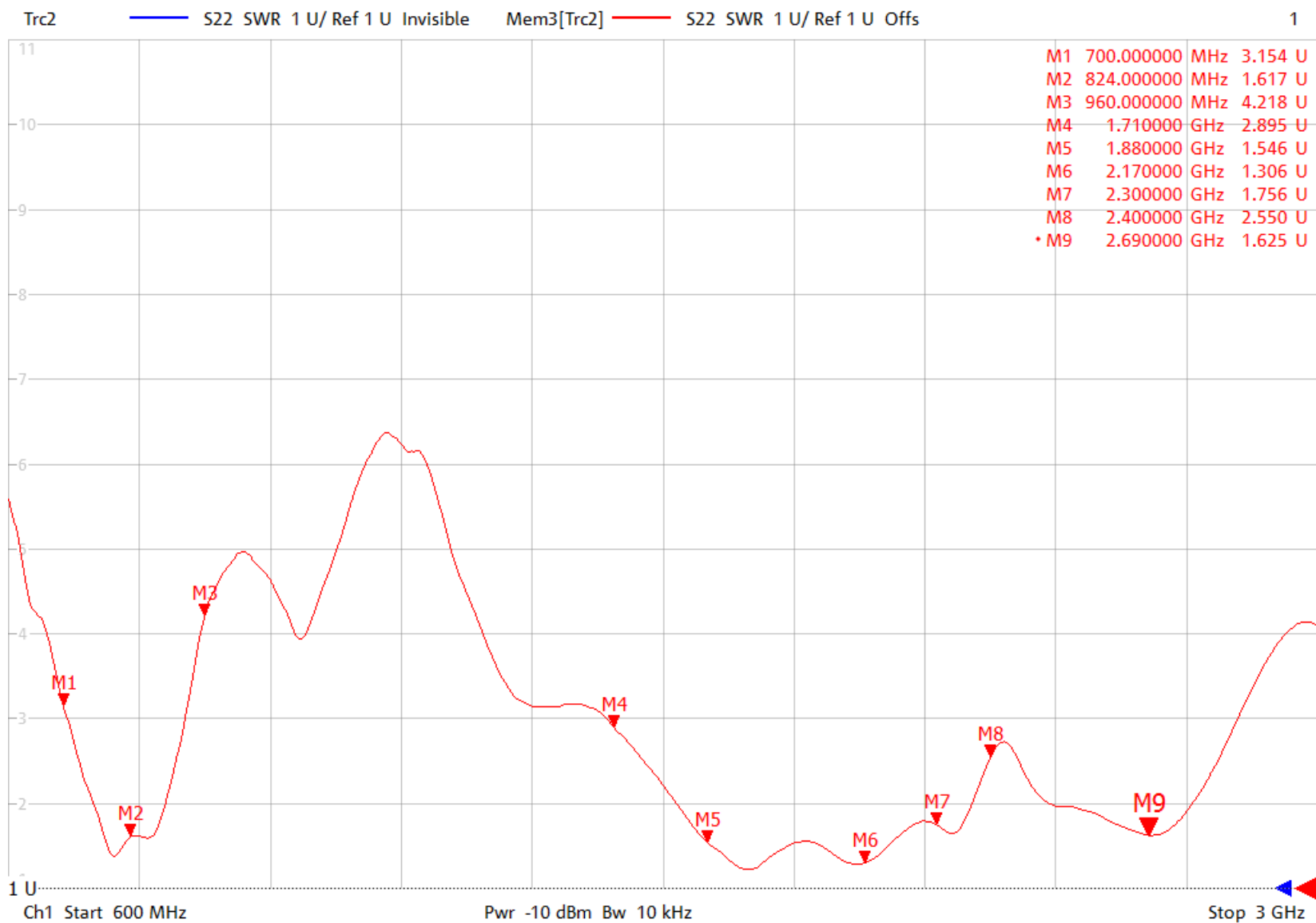
Schematic diagram of darkroom coordinate system



Efficiency test

Main antenna S11

3/6/2023 2:36:08 AM
1328.5170K92-100227-Mv



Main antenna efficiency

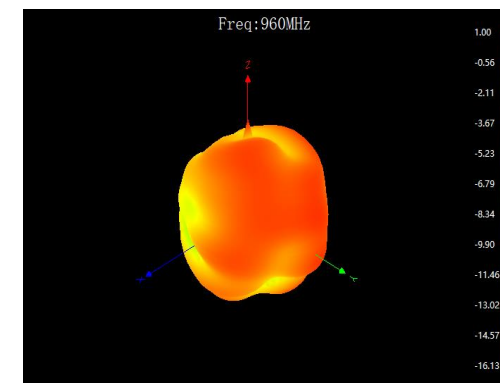
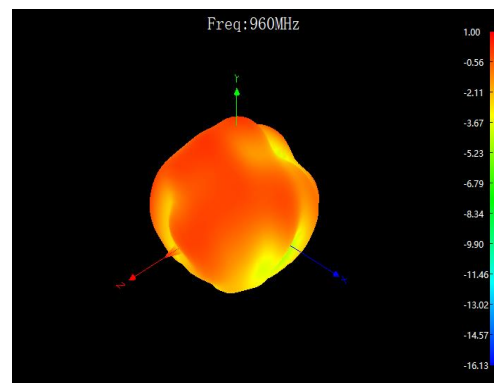
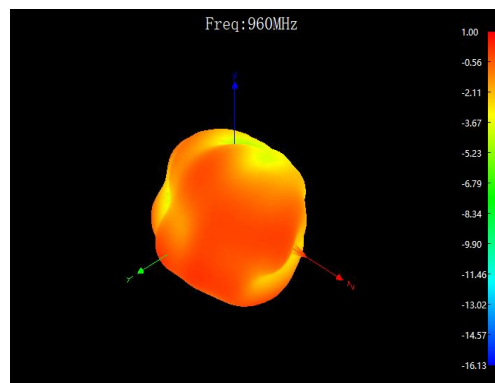
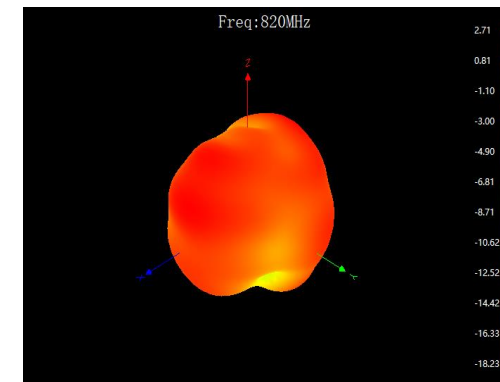
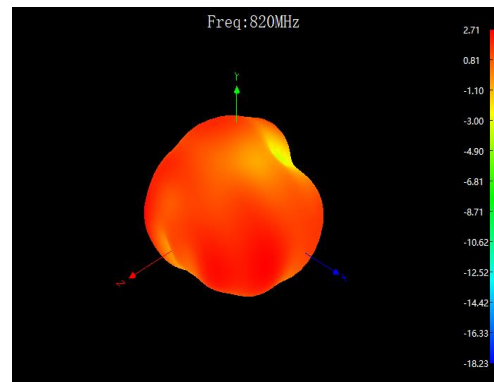
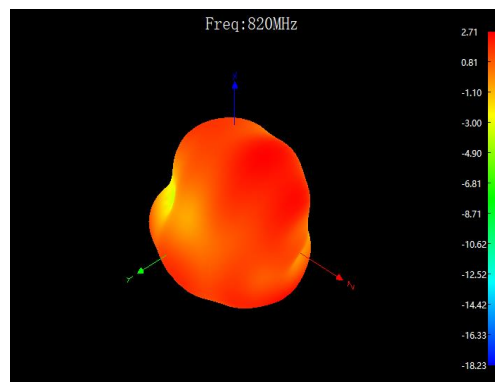
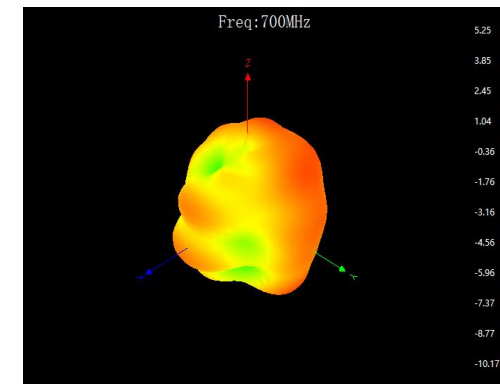
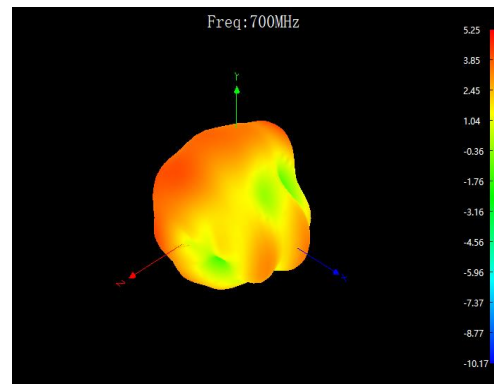
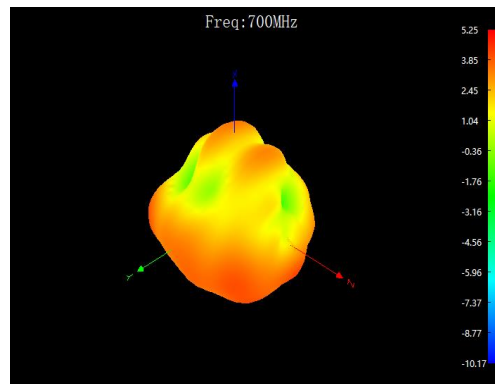


SUNNYWAY

Freq	Effi	Effi	Gain	Freq	Effi	Effi	Gain	Freq	Effi	Effi	Gain	Freq	Effi	Effi	Gain	Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)	(MHz)	(%)	(dB)	(dBi)	(MHz)	(%)	(dB)	(dBi)	(MHz)	(%)	(dB)	(dBi)	(MHz)	(%)	(dB)	(dBi)
700	38.75	-4.12	5.25	1710	37.93	-4.21	2.21	1930	44.05	-3.56	3.14	2300	41.02	-3.87	1	2510	43.65	-3.6	2.37
710	39.52	-4.03	4.81	1720	40.64	-3.91	2.4	1940	43.98	-3.57	3.03	2310	39.17	-4.07	0.61	2520	42.27	-3.74	2.26
720	40.54	-3.92	3.68	1730	43.08	-3.66	2.96	1950	42.86	-3.68	2.9	2320	39.36	-4.05	0.68	2530	40.83	-3.89	1.71
730	40.86	-3.89	3.02	1740	43.6	-3.61	3.17	1960	43.64	-3.6	2.79	2330	39.9	-3.99	1.22	2540	39.45	-4.04	2.02
740	42.64	-3.7	3.58	1750	43.6	-3.61	3.25	1970	43.19	-3.65	2.68	2340	41.21	-3.85	1.49	2550	36.73	-4.35	1.64
750	43.62	-3.6	3.64	1760	44.99	-3.47	3.49	1980	42.53	-3.71	2.75	2350	42.46	-3.72	1.63	2560	37.76	-4.23	2.14
760	44.29	-3.54	3.97	1770	45.09	-3.46	3.54	1990	43.12	-3.65	2.98	2360	42.85	-3.68	2.36	2570	35.48	-4.5	2.16
770	44.68	-3.5	3.73	1780	45.77	-3.39	3.4	2000	42.36	-3.73	3.01	2370	42.95	-3.67	2.1	2580	34.36	-4.64	1.52
780	45.26	-3.44	4.32	1790	46.2	-3.35	3.33	2010	41.52	-3.82	2.92	2380	43.85	-3.58	2.28	2590	32.89	-4.83	1.71
790	46.33	-3.34	5.22	1800	46.66	-3.31	3.26	2020	45.08	-3.46	3	2390	44.67	-3.5	3.06	2600	31.84	-4.97	1.69
800	47.28	-3.25	3.54	1810	45.77	-3.39	3.05	2030	46.89	-3.29	3.92	2400	43.15	-3.65	2.4	2610	29.85	-5.25	1.52
810	47.05	-3.27	3.23	1820	45.75	-3.4	2.64	2040	45.61	-3.41	4.23	2410	44.1	-3.56	2.62	2620	27.1	-5.67	1.6
820	46.63	-3.31	2.71	1830	43.08	-3.66	2.69	2050	45.95	-3.38	4.67	2420	45.77	-3.39	3.28	2630	26.67	-5.74	1.17
830	45.86	-3.39	2.53	1840	42.87	-3.68	2.76	2060	47.23	-3.26	4.99	2430	45.1	-3.46	3.21	2640	26.49	-5.77	1.62
840	45.95	-3.38	2.65	1850	44.03	-3.56	2.7	2070	47.52	-3.23	4.99	2440	44.75	-3.49	2.89	2650	25.82	-5.88	1.44
850	45.31	-3.44	3.02	1860	44.56	-3.51	2.76	2080	47.86	-3.2	5.28	2450	44.58	-3.51	3.08	2660	25.64	-5.91	0.62
860	45.08	-3.46	2.8	1870	44.99	-3.47	2.82	2090	47.81	-3.2	5.31	2460	45.12	-3.46	3.27	2670	26	-5.85	1.31
870	45.29	-3.44	2.72	1880	45.08	-3.46	2.82	2100	46.52	-3.32	5.34	2470	44.92	-3.48	2.43	2680	25.29	-5.97	0.78
880	44.69	-3.5	2.87	1890	44.87	-3.48	2.81	2110	46.84	-3.29	5.43	2480	45.86	-3.39	2.79	2690	26	-5.85	0.21
890	44.18	-3.55	3.07	1900	43.98	-3.57	2.65	2120	46.34	-3.34	5.3	2490	45.19	-3.45	2.85				
900	43.29	-3.64	2.75	1910	44.55	-3.51	2.68	2130	45.24	-3.44	4.95	2500	45.5	-3.42	2.24				
910	42.58	-3.71	2.3	1920	45.12	-3.46	2.97	2140	45.76	-3.4	4.48								
920	41.99	-3.77	1.95					2150	44.52	-3.51	3.94								
930	40.81	-3.89	2.38					2160	43.75	-3.59	3.93								
940	37.66	-4.24	2.36					2170	41.45	-3.82	3.31								
950	37.5	-4.26	1.81																
960	35.08	-4.55	1																

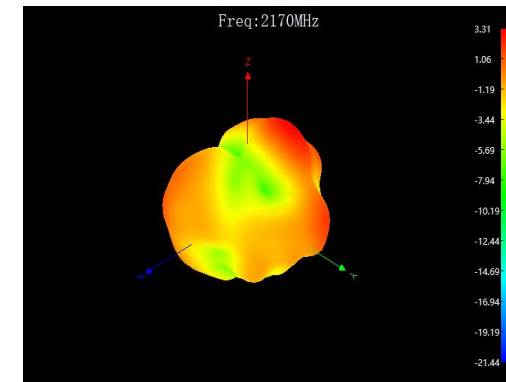
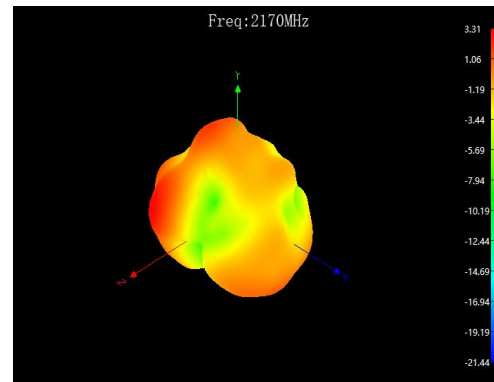
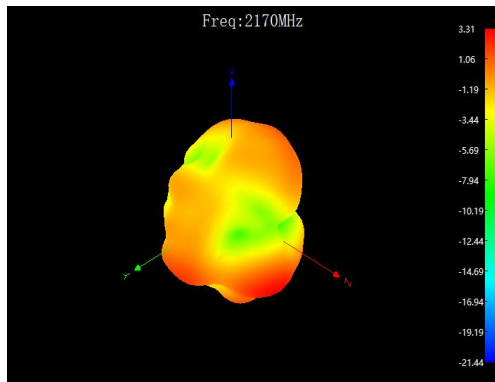
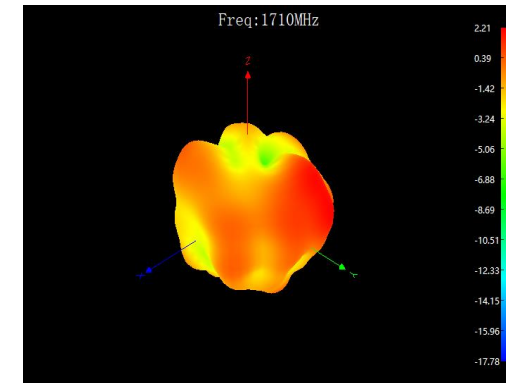
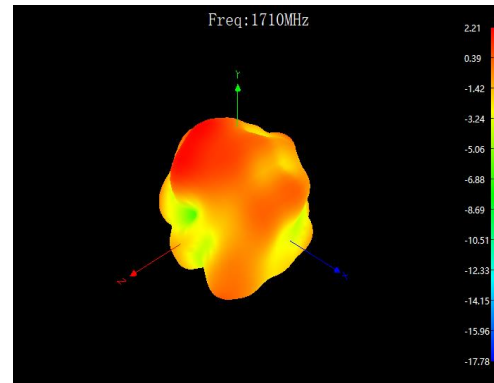
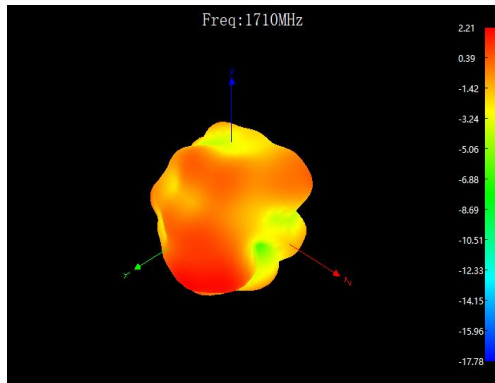
3D Etotal

Main antenna 700MHz 824MHz 960MHz



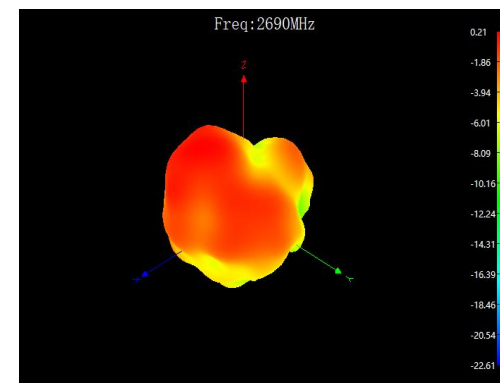
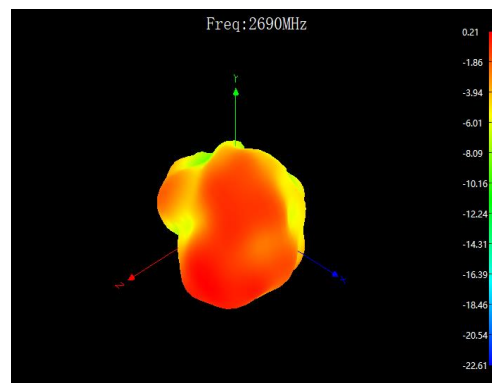
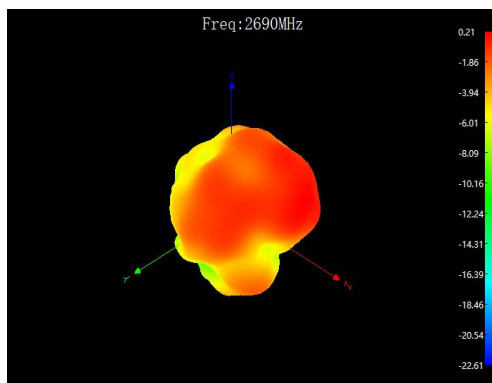
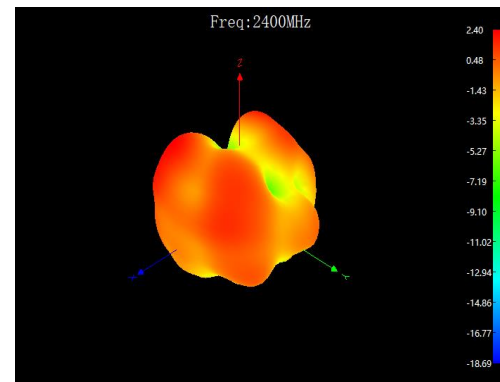
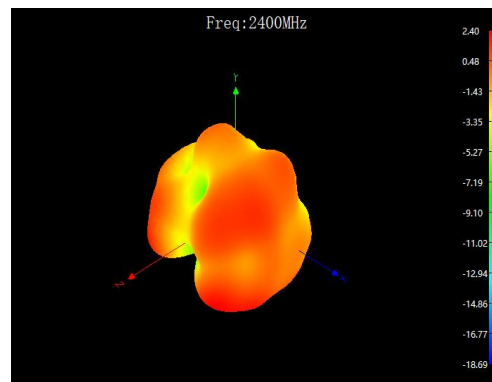
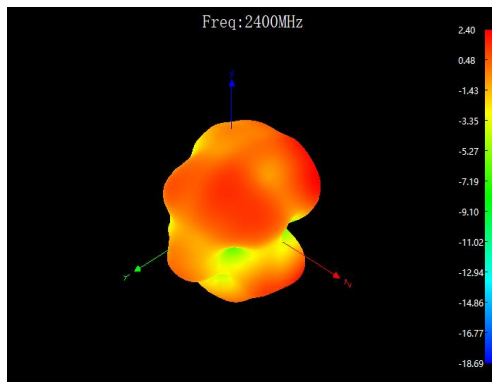
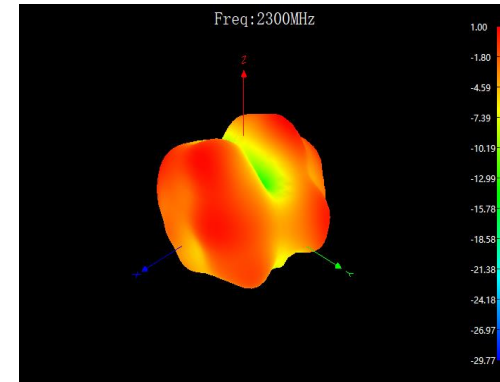
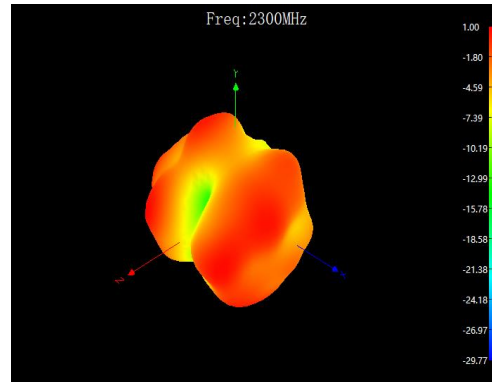
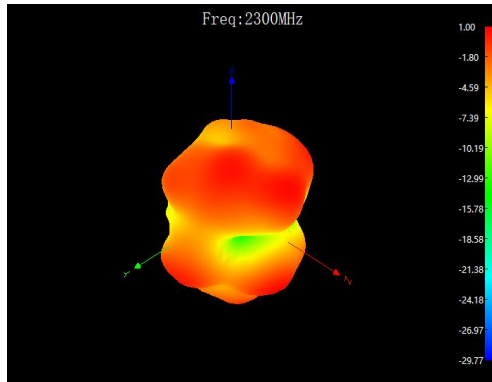
3D Etotal

Main antenna 1710MHz 2170MHz



3D Etotal

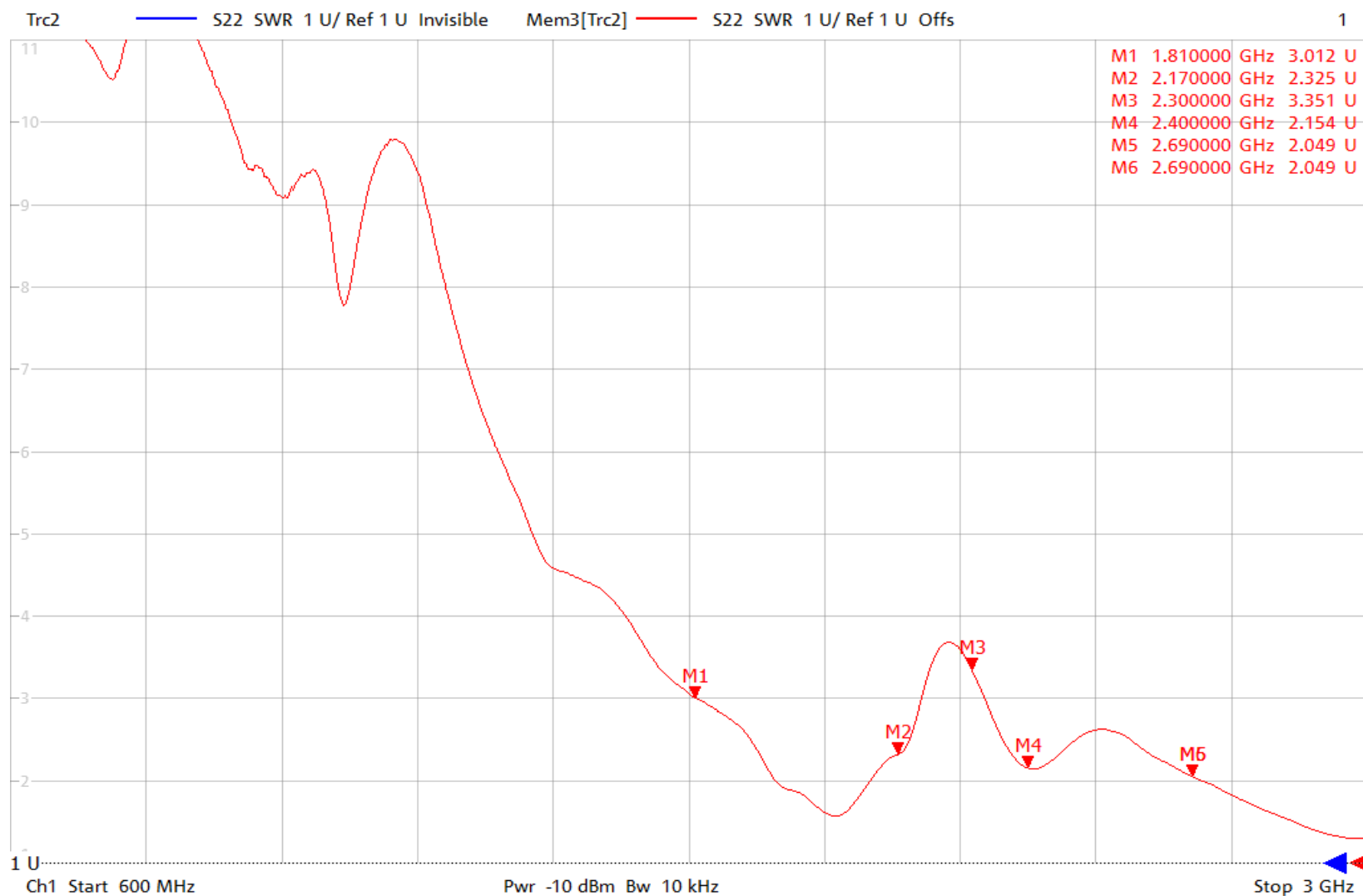
Main antenna 2300 MHz 2400MHz 2690MHz



Efficiency test

DIV antenna S11

3/6/2023 3:22:15 AM
1328.5170K92-100227-Mv

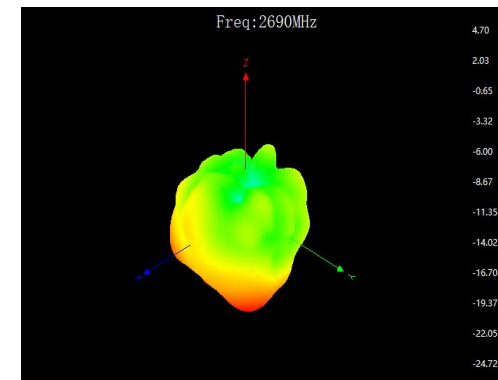
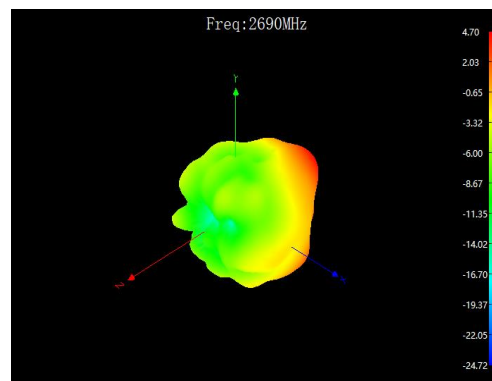
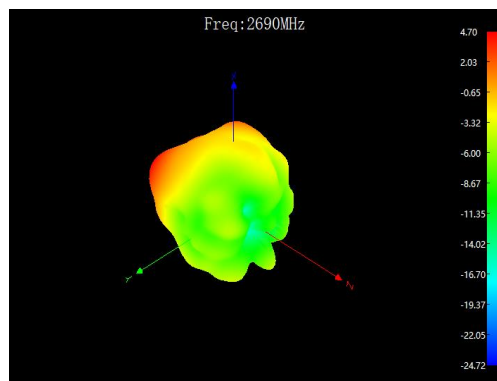
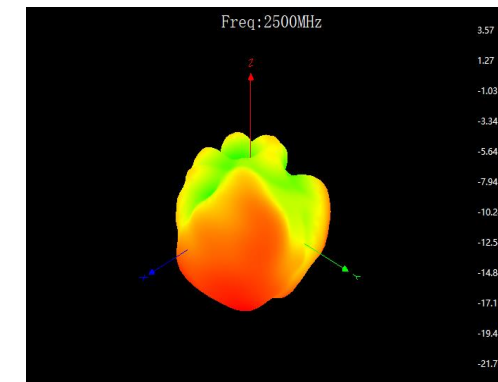
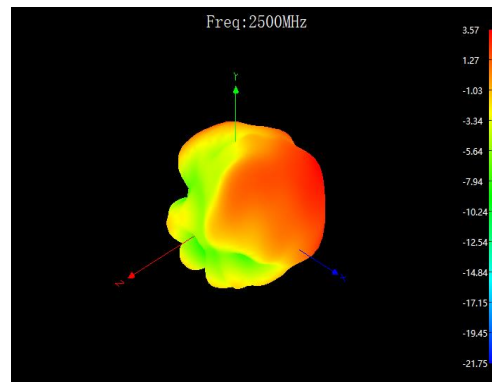
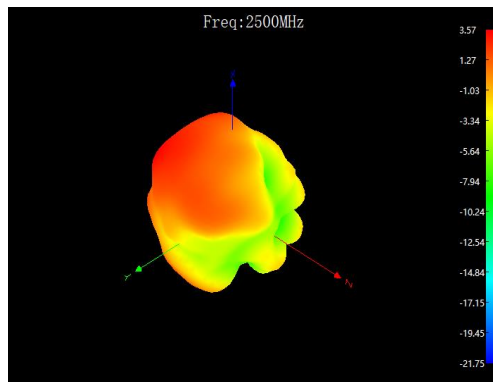
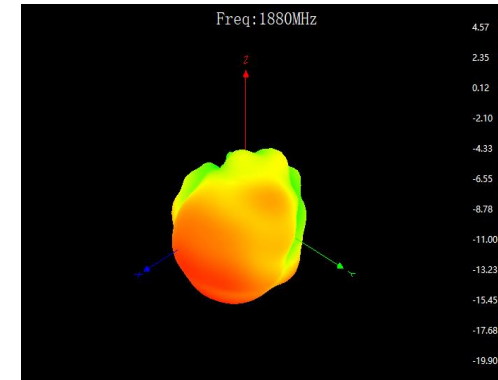
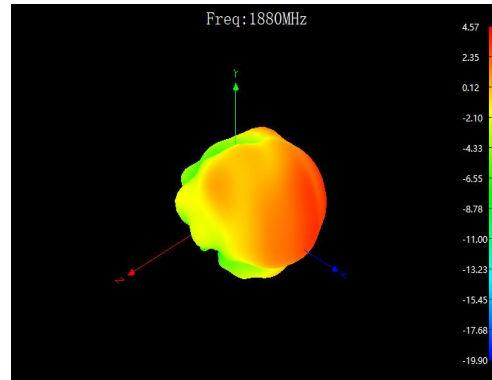
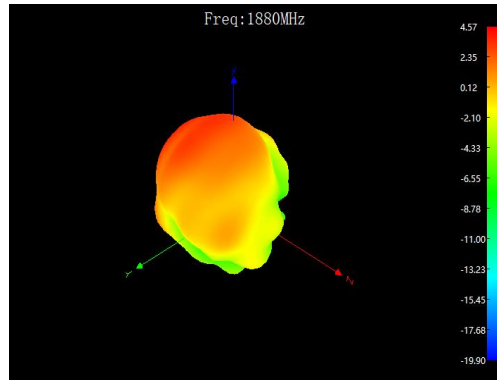


DIV antenna efficiency

Freq	Effi	Effi	Gain	Freq	Effi	Effi	Gain	Freq	Effi	Effi	Gain	Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)	(MHz)	(%)	(dB)	(dBi)	(MHz)	(%)	(dB)	(dBi)	(MHz)	(%)	(dB)	(dBi)
1810	29.85	-5.25	3.34	2030	43.05	-3.66	5.35	2300	23.88	-6.22	0.04	2510	47.86	-3.2	4.23
1820	30.76	-5.12	3.41	2040	43.64	-3.6	5.31	2310	22.86	-6.41	-0.81	2520	47.42	-3.24	4.36
1830	32.14	-4.93	3.55	2050	44.36	-3.53	5.43	2320	23.99	-6.2	-0.56	2530	46.77	-3.3	4.08
1840	33.81	-4.71	3.75	2060	45.36	-3.43	5.81	2330	24.43	-6.12	-0.25	2540	45.81	-3.39	4.41
1850	35.56	-4.49	4	2070	45.33	-3.44	5.43	2340	25.7	-5.9	0.18	2550	43.45	-3.62	4.11
1860	37.84	-4.22	4.27	2080	45.08	-3.46	5.68	2350	28.12	-5.51	0.39	2560	44.36	-3.53	4.63
1870	40.46	-3.93	4.44	2090	44.09	-3.56	5.47	2360	30.9	-5.1	0.87	2570	42.66	-3.7	4.97
1880	43.15	-3.65	4.57	2100	44.7	-3.5	5.79	2370	32.43	-4.89	1.26	2580	44.46	-3.52	5.32
1890	43.03	-3.66	4.61	2110	42.7	-3.7	5.43	2380	34.2	-4.66	1.22	2590	43.95	-3.57	5.38
1900	43.75	-3.59	4.92	2120	43.05	-3.66	5.38	2390	36.31	-4.4	1.16	2600	41.88	-3.78	4.78
1910	43.05	-3.66	5.13	2130	43.97	-3.57	5.32	2400	35.56	-4.49	1.1	2610	39.72	-4.01	4.93
1920	44.6	-3.51	5.3	2140	43.64	-3.6	5.16	2410	36.81	-4.34	0.82	2620	36.56	-4.37	4.76
1930	46.2	-3.35	5.61	2150	43.99	-3.57	4.65	2420	38.19	-4.18	0.54	2630	35.56	-4.49	4.25
1940	46.46	-3.33	5.81	2160	43.6	-3.61	4.86	2430	37.67	-4.24	1.64	2640	34.59	-4.61	4.75
1950	45.1	-3.46	5.85	2170	43.65	-3.6	3.96	2440	38.37	-4.16	0.95	2650	34.83	-4.58	4.64
1960	45.72	-3.4	5.63					2450	40.27	-3.95	1.16	2660	35.08	-4.55	4.15
1970	46.72	-3.3	5.38					2460	38.28	-4.17	1.89	2670	36.06	-4.43	4.74
1980	46.1	-3.36	5.55					2470	41.4	-3.83	1.83	2680	35.16	-4.54	3.96
1990	45.49	-3.42	5.67					2480	43.45	-3.62	2.7	2690	38.37	-4.16	4.7
2000	45.75	-3.4	5.62					2490	42.46	-3.72	3.26				
2010	44.45	-3.52	5.37					2500	46.77	-3.3	3.57				
2020	44.84	-3.48	5.06												

3D Etotal

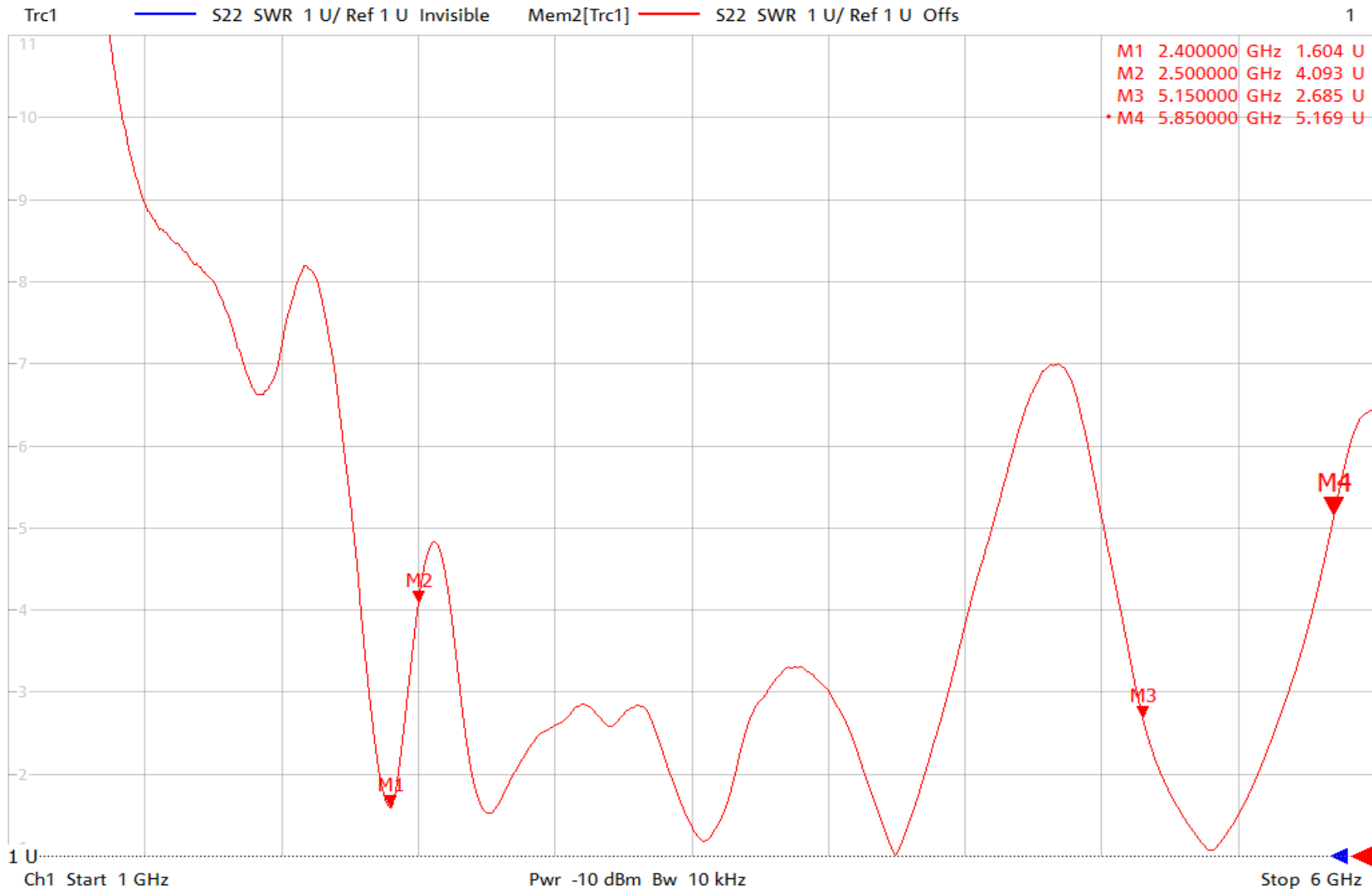
DIV antenna 1880MHz 2500MHz 2690MHz



Efficiency test

Three in one antenna S11

3/15/2023 6:29:06 PM
1328.5170K92-100227-Mv



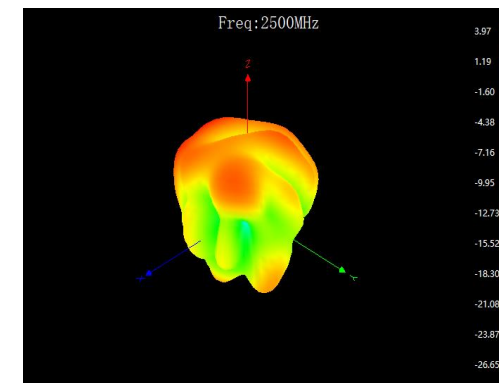
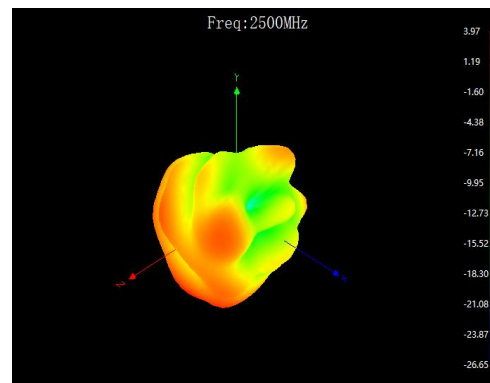
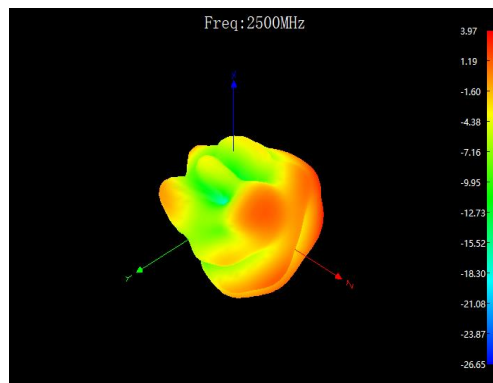
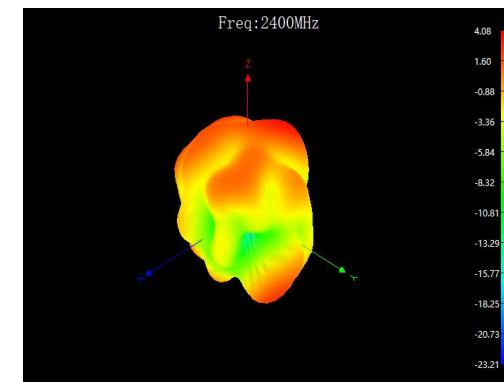
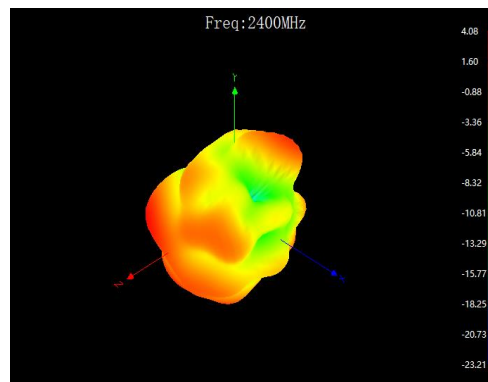
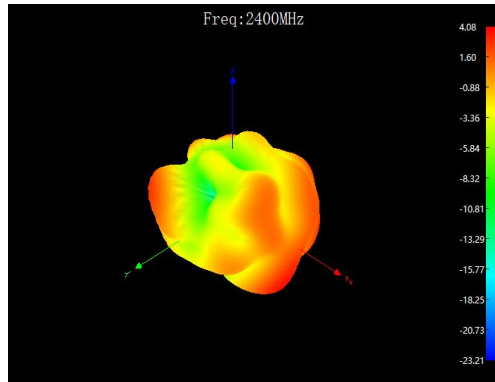
Three in one antenna efficiency



Freq	Effi	Effi	Gain	Freq	Effi	Effi	Gain	Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)	(MHz)	(%)	(dB)	(dBi)	(MHz)	(%)	(dB)	(dBi)
2400	48.61	-3.13	4.08	5150	41.75	-3.79	3.86	5510	40.72	-3.9	4.76
2410	52.37	-2.81	3.25	5160	41.12	-3.86	3.72	5520	40.41	-3.94	4.68
2420	53.53	-2.71	4.36	5170	41.91	-3.78	4.01	5530	42.91	-3.67	5.01
2430	49.29	-3.07	3.72	5180	42.48	-3.72	4.15	5540	41.43	-3.83	5.11
2440	50.67	-2.95	3.03	5190	41.51	-3.82	3.93	5550	41.27	-3.84	5.01
2450	51.94	-2.84	4.25	5200	43.31	-3.63	4.01	5560	42	-3.77	5.16
2460	45.21	-3.45	3.31	5210	40.65	-3.91	3.74	5570	42.66	-3.7	5.33
2470	46.23	-3.35	2.98	5220	40.42	-3.93	3.68	5580	41.68	-3.8	5.16
2480	48.21	-3.17	4	5230	41.2	-3.85	3.95	5590	42.41	-3.73	5.06
2490	45.72	-3.4	3.75	5240	40.81	-3.89	4.24	5600	42.91	-3.67	5.32
2500	47.68	-3.22	3.97	5250	40.04	-3.98	4.31	5610	40.56	-3.92	4.98
				5260	40.19	-3.96	4.44	5620	41.27	-3.84	5.09
				5270	40.81	-3.89	4.54	5630	39.56	-4.03	4.91
				5280	39.21	-4.07	4.34	5640	38.22	-4.18	4.64
				5290	40.88	-3.88	4.68	5650	40.17	-3.96	4.85
				5300	41.59	-3.81	4.84	5660	39.22	-4.06	4.64
				5310	39.73	-4.01	4.7	5670	38.62	-4.13	4.54
				5320	41.67	-3.8	4.93	5680	38.65	-4.13	4.52
				5330	40.52	-3.92	4.77	5690	38.8	-4.11	4.35
				5340	40.34	-3.94	5.12	5700	38.45	-4.15	4.21
				5350	41.28	-3.84	5.13	5710	38.44	-4.15	4.42
				5360	40.27	-3.95	5.13	5720	38.44	-4.15	4.17
				5370	40.04	-3.98	5.13	5730	38.22	-4.18	4.2
				5380	40.5	-3.93	5.42	5740	38.37	-4.16	4.02
				5390	40.42	-3.93	5.59	5750	38.65	-4.13	4.04
				5400	40.04	-3.98	5.51	5760	37.73	-4.23	3.81
				5410	41.51	-3.82	5.68	5770	38.08	-4.19	3.75
				5420	41.75	-3.79	5.4	5780	38.01	-4.2	3.81
				5430	43.06	-3.66	5.71	5790	37.77	-4.23	3.24
				5440	42.24	-3.74	5.53	5800	37.11	-4.31	3.85
				5450	44.24	-3.54	5.81	5810	37.46	-4.26	3.18
				5460	41.28	-3.84	5.42	5820	36.39	-4.39	3.17
				5470	43.06	-3.66	5.53	5830	37.65	-4.24	3.37
				5480	43.31	-3.63	5.53	5840	36.73	-4.35	3.54
				5490	41.36	-3.83	5.09	5850	36.64	-4.36	3.98
				5500	44.07	-3.56	5.39				

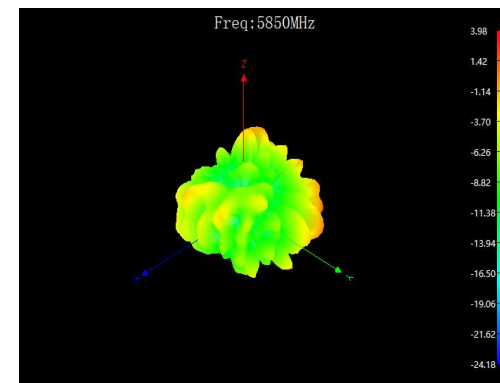
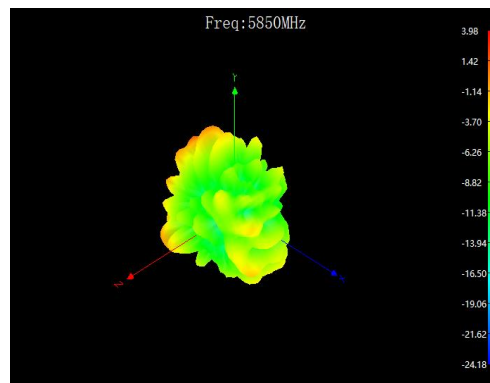
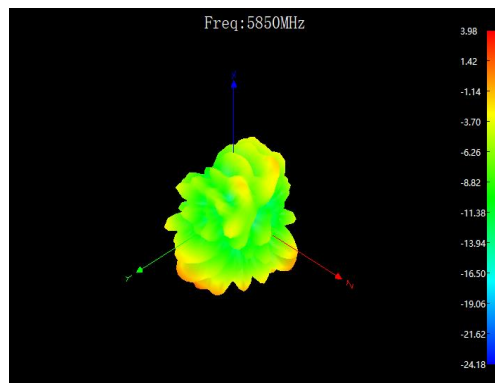
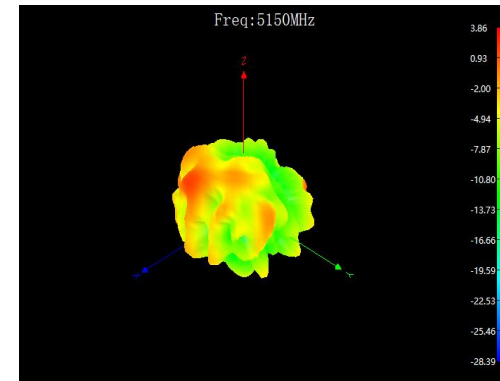
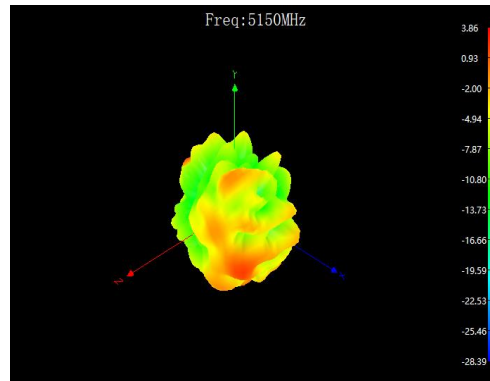
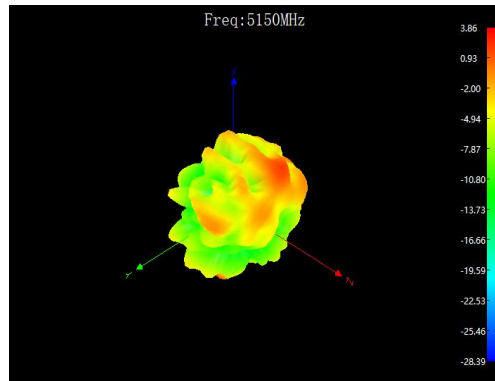
3D Etotal

Three in one antenna 2400MHz 2500MHz



3D Etotal

Three in one antenna 5150MHz 5850MHz



Main Active test data

Band	TRP(dB)	TIS(dB)	Band	TRP(dB)	TIS(dB)	Band	TRP(dB)	TIS(dB)
GSM_850	27.25		WCDMA_B 4	18.51		FDD_B4(10M)	18.72	
	28.16			18.42			19.41	
	27.92	-102.16		17.67	-106.72		18.82	-93.25
GSM_900	28.53		WCDMA_B 5	18.52		FDD_B5(10M)	18.53	
	28.02			17.76			18.49	
	27.33	-102.39		17.11	-103.72		18.61	-92.76
GSM_1800	25.26		WCDMA_B 8	18.42		FDD_B7(10M)	20.16	
	25.16			17.75			20.32	
	25.08	-102.74		17.19	-104.06		20.29	-92.89
GSM_1900	25.52		FDD_B1(10M)	19.39		FDD_B8(10M)	18.64	
	25.71			19.75			17.86	
	25.41	-104.72		19.55	-94.05		17.25	-91.75
WCDMA_B 1	18.59		FDD_B2(10M)	18.07		FDD_B12(10M)	18.63	
	18.86			18.63			19.29	
	19.13	-107.15		18.51	-93.41		19.37	-91.39
WCDMA_B 2	17.39		FDD_B3(10M)	18.56		FDD_B17(10M)	18.52	
	17.71			18.31			19.11	
	18.26	-104.13		18.16	-93.58		19.05	-91.16

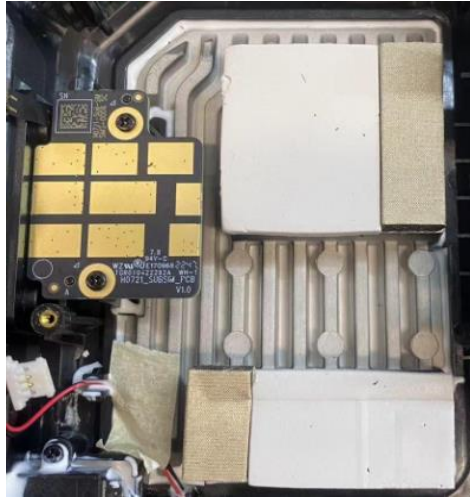
Main Active test data

Band	TRP(dB)	TIS(dB)	Band	TRP(dB)	TIS(dB)
FDD_B25(10M)	18.31		TDD_B41 (20M)	19.52	
	18.72			19.71	
	19.39	-88.71		19.39	-90.16
FDD_B26(10M)	18.53				
	18.82				
	19.62	-91.53			
FDD_B28(10M)	18.59				
	19.36				
	19.72	-93.05			
TDD_B38 (20M)	20.25				
	20.58				
	20.63	-92.16			
TDD_B39 (20M)	19.52				
	19.86				
	20.15	-91.13			
TDD_B40 (20M)	20.61				
	21.11				
	20.91	-92.85			

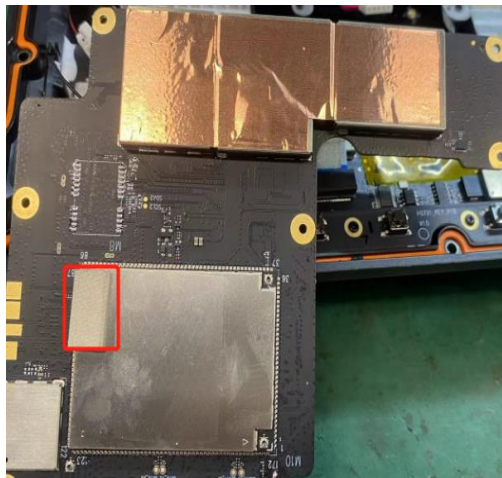
WiFi test data

Band	TRP(dB)	TIS(dB)
WiFi 11b 11M	14.15	
	14.62	
	14.06	-83.28
WiFi 11g 54M	12.76	
	13.08	
	12.65	-71.86
WiFi 11n 65M	13.05	
	13.41	
	13.19	-70.05
WiFi 5G 11a 54M	9.34	
	10.15	
	10.66	-69.82

Environmental treatment:

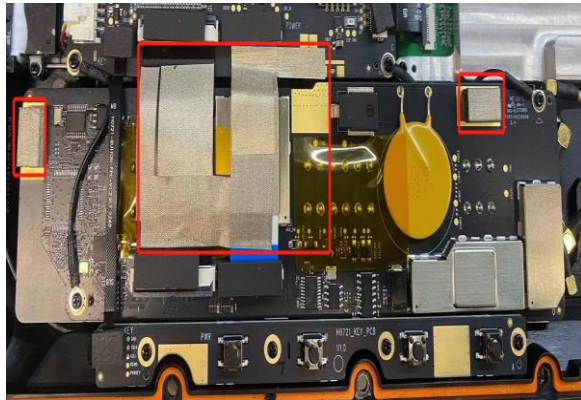


Zinc alloy coated with
conductive foam Ground
the motherboard

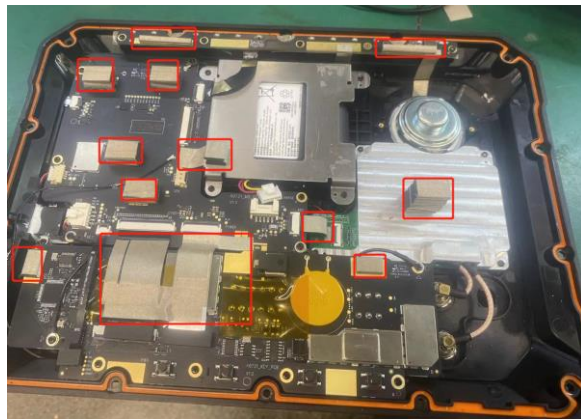


The motherboard is pasted with conductive
foam and SIN card Slot leakage copper plate
grounding

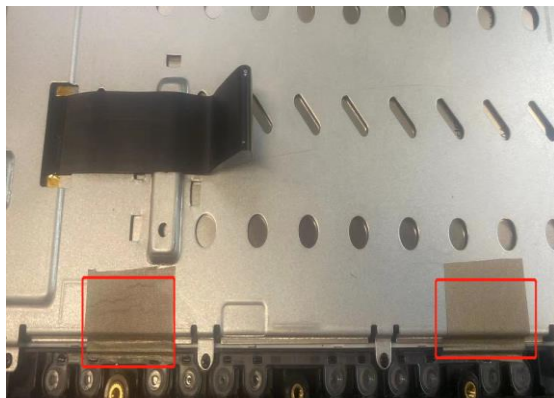
Environmental treatment:



The connector wiring should be covered with conductive cloth to



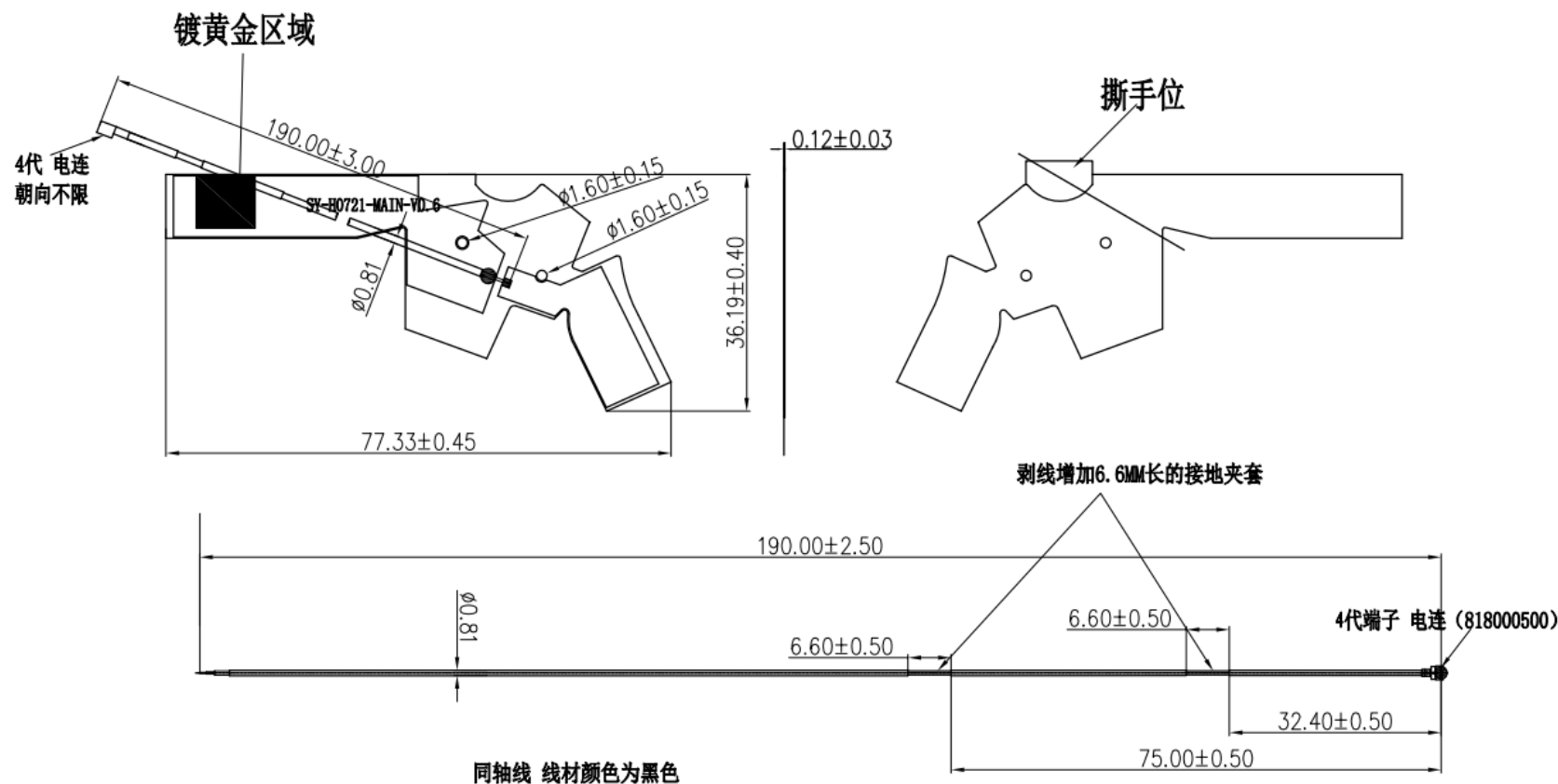
The motherboard is grounded with conductive sponge and screen zinc alloy, and the lamp board is grounded with conductive foam and screen Grounding, The light panel FPC is grounded with conductive cloth to shield interference, and the module is grounded with conductive cloth and battery steel.



Screen zinc alloy conductive cloth and lamp board foam are

Engineering drawing: MAIN

版 本	修 改 内 容	修 改 人	日 期



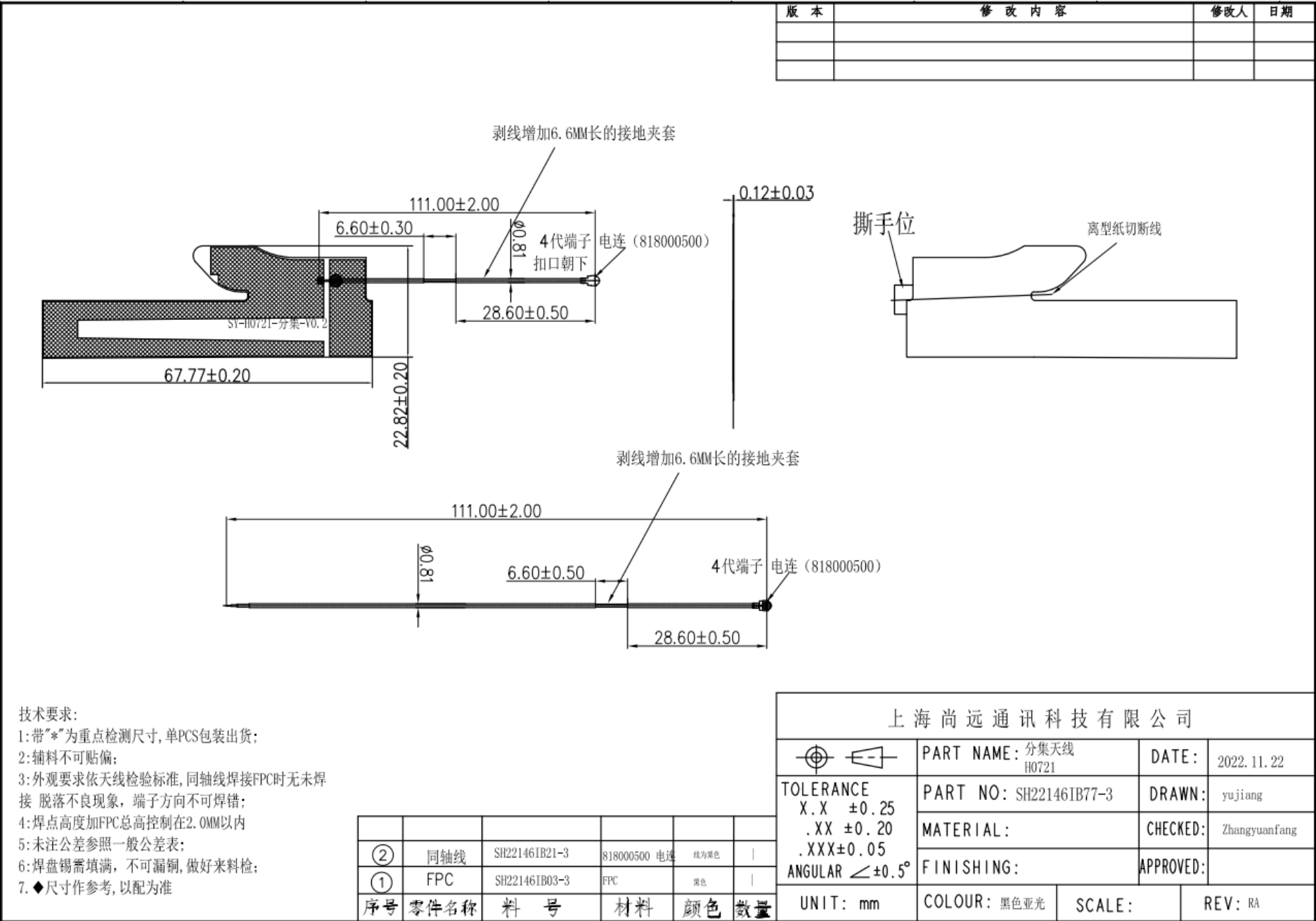
技术要求:

- 1:带“*”为重点检测尺寸,单PCS包装出货;
- 2:辅料不可贴偏;
- 3:外观要求依天线检验标准,同轴线焊接FPC时无未焊接脱落不良现象,端子方向不可焊错;
- 4:焊点高度加FPC总高控制在2.0MM以内
- 5:未注公差参照一般公差表;
- 6:焊盘锡需填满,不可漏铜,做好来料检;
- 7:◆尺寸作参考,以配为准

序号	零件名称	料号	材料	颜色	数量
②	同轴线	SH22146IB21-1	818000500 电连	线为黑色	1
①	FPC	SH22146IB03-1	FPC	黑色	1

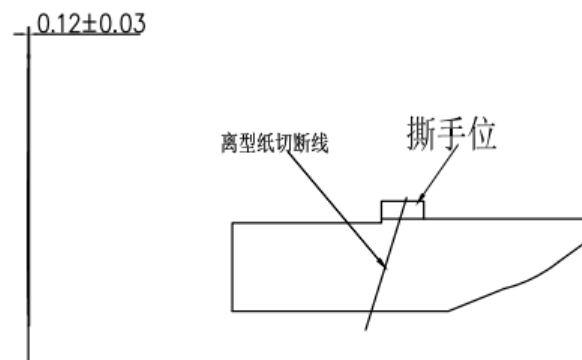
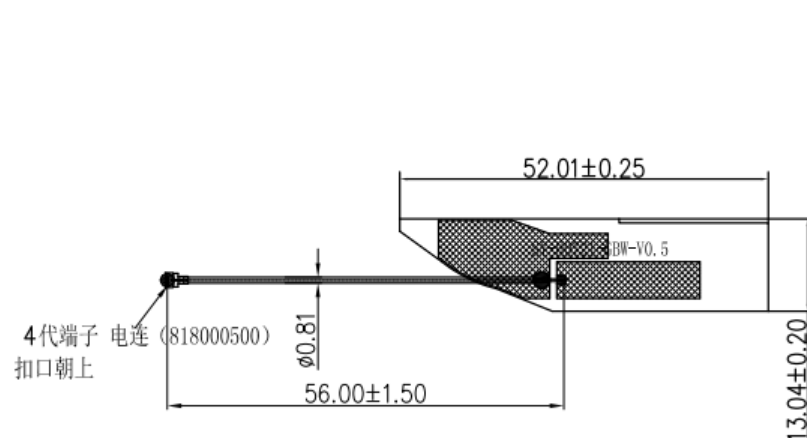
上海尚远通讯科技有限公司

	PART NAME: 主天线 H0721	DATE: 2022.12.12
TOLERANCE X.X ±0.25 .XX ±0.20 .XXX±0.05 ANGULAR <±0.5°	PART NO: SH22146IB77-4	DRAWN: yujiang
	MATERIAL:	CHECKED: Zhangyuanfang
	FINISHING:	APPROVED:
UNIT: mm	COLOUR: 黑色亚光	SCALE: REV: RA



Engineering drawing: 3in1

版 本	修 改 内 容	修改人	日期



技术要求:

- 1:带"*"为重点检测尺寸,单PCS包装出货;
- 2:辅料不可贴偏;
- 3:外观要求依天线检验标准,同轴线焊接FPC时无未焊接 脱落不良现象,端子方向不可焊错;
- 4:焊点高度加FPC总高控制在2.0MM以内
- 5:未注公差参照一般公差表;
- 6:焊盘锡需填满,不可漏铜,做好来料检;
- 7:◆尺寸作参考,以配为准

②	同轴线	SH22146IB21-2	818000500 电连	线为黑色	
①	FPC	SH22146IB03-2	FPC	铜色	
序号	零件名称	料 号	材料	颜色	数量

上海尚远通讯科技有限公司					
 TOLERANCE X.X ±0.25 .XX ±0.20 .XXX±0.05 ANGULAR <±0.5° UNIT: mm	PART NAME: 三合一天线 H0721	DATE:	2022.11.22		
	PART NO: SH22146IB77-2	DRAWN:	yujiang		
	MATERIAL:	CHECKED:	Zhangyuanfang		
	FINISHING:	APPROVED:			
	COLOUR: 黑色亚光	SCALE:		REV: RA	

Thank You

