

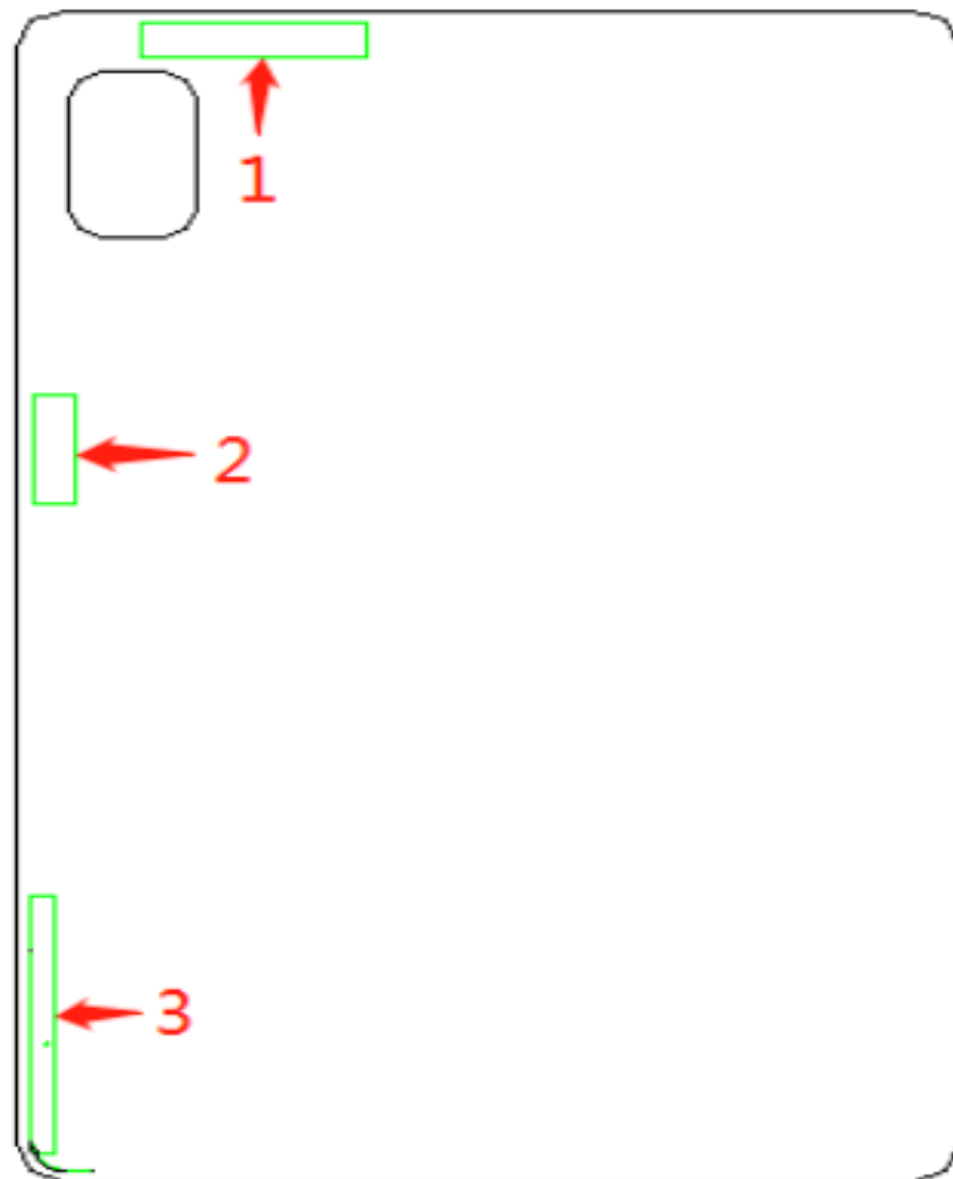


Antenna Performance Test Report			
Customer Name	Tianruixiang Company	RF Engineer	Xiao Long
Project Name	P1005-310A	Structural engineer	Liang Kunrong
Antenna frequency band	GSM+WCDMA+LTE+GPS/WIFI/BT		
Report version	Date	Content Summary	
V1.0	2023-4-13	Antenna Performance Test Report	

Test report directory

- 🔗 I. Passive Standing Wave Graph, Smith Circle Graph, and Apple Graph
- 🔗 II. Passive gain efficiency of antenna
- 🔗 III. Antenna test data
- 🔗 VI. remarks

Antenna Placement



Antenna :1 :WIFI/BT/GPS

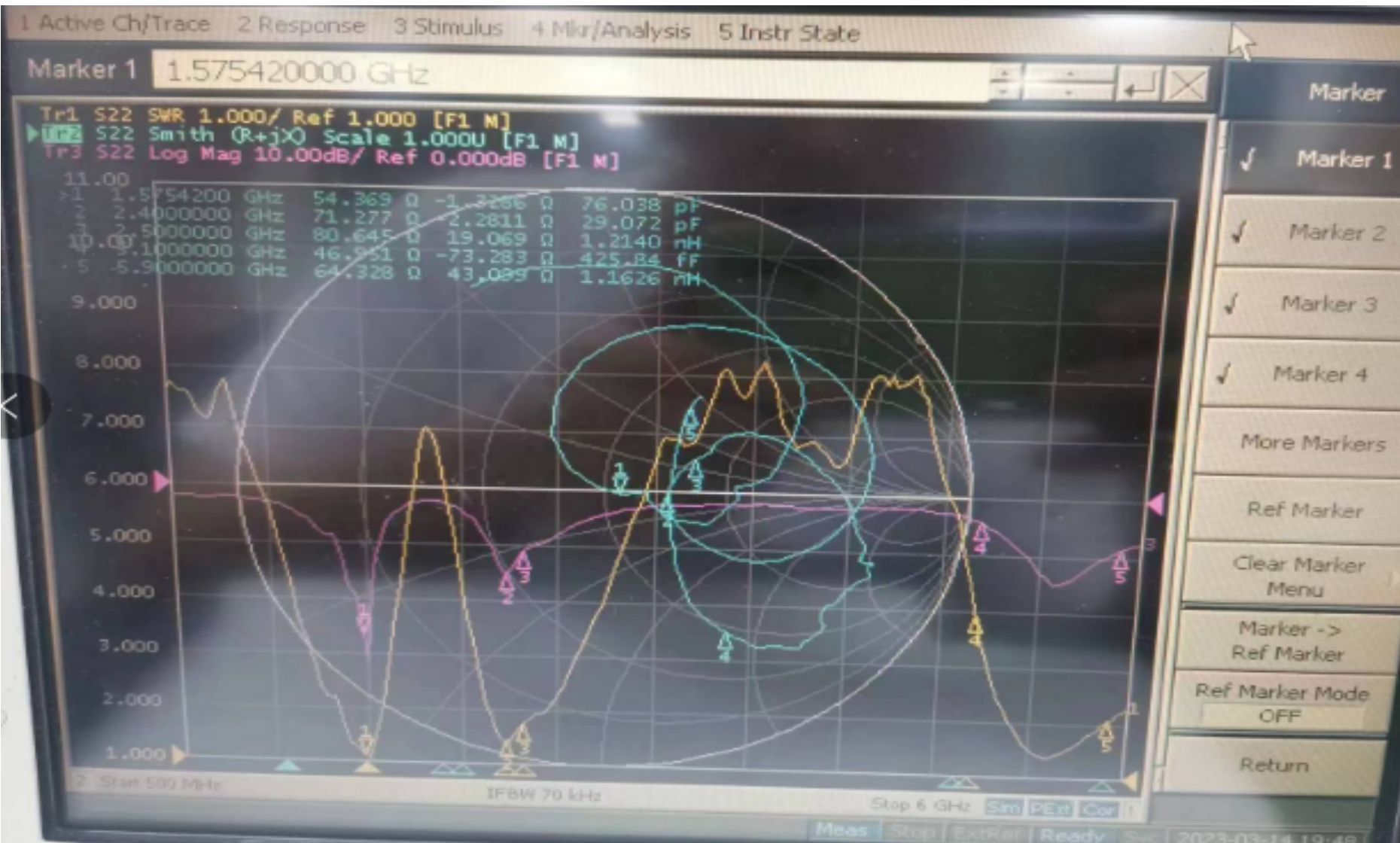
Antenna :2 :2G/3G/4G DIV ANT

Antenna :3:2G/3G/4G Main ANT

I Passive standing waves, Smith circle diagram

GPS/WIFI/BT

The PS / WIFI / BT antenna

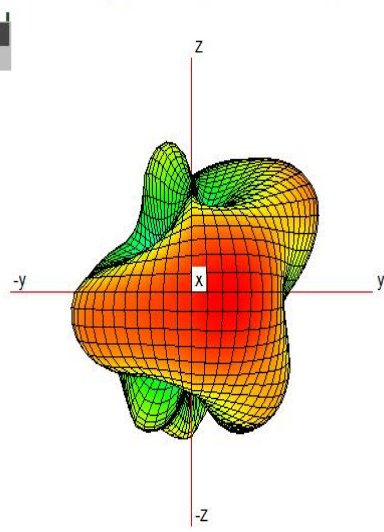


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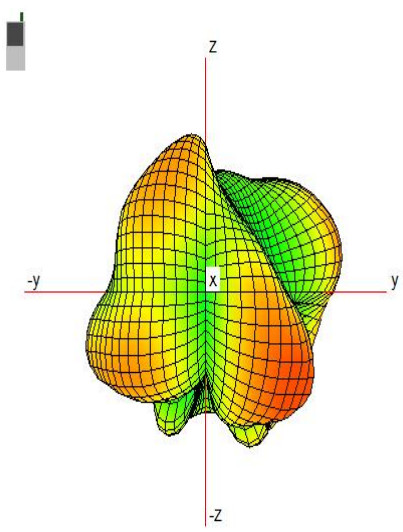
Zoom Scale



Phi

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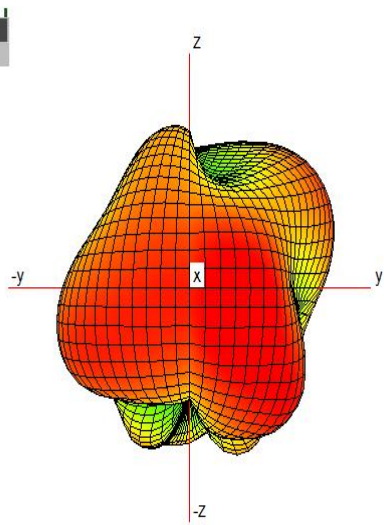
Zoom Scale



Total

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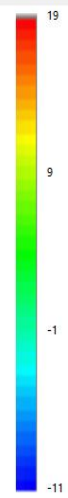
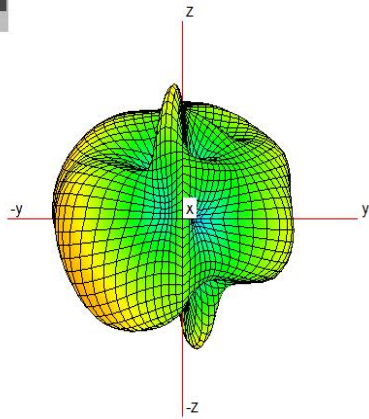
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Theta

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Elevation: 0
Roll: 0

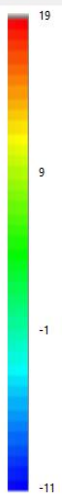
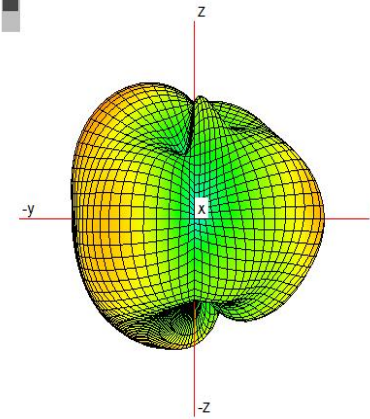
Zoom Scale



Phi

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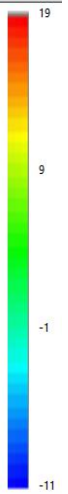
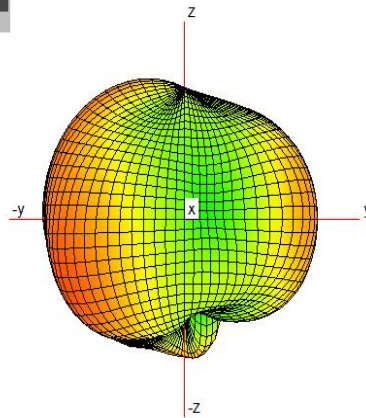
Zoom Scale



Total

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Zoom Scale

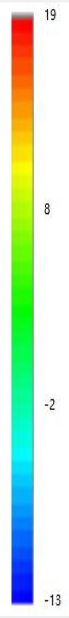
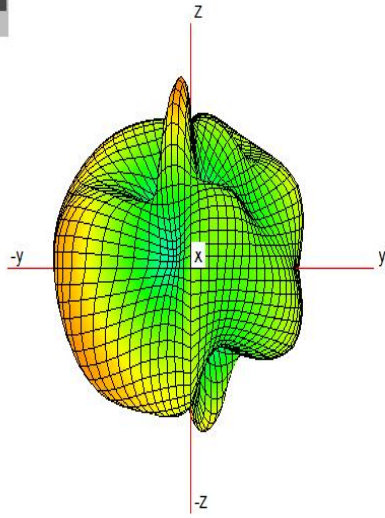


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Theta

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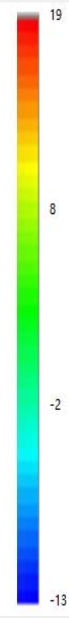
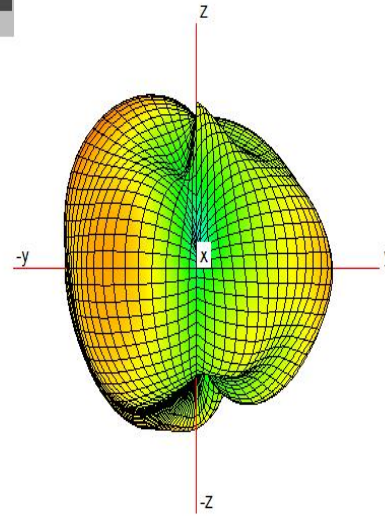
Zoom Scale



Phi

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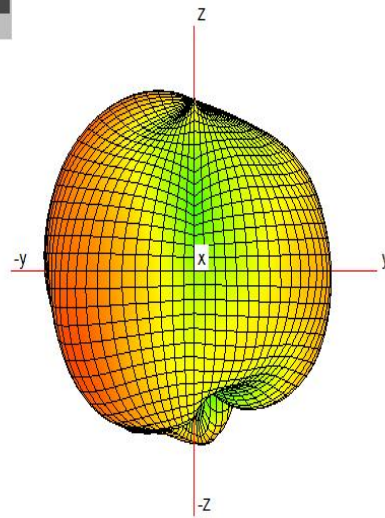
Zoom Scale



Total

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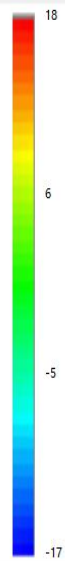
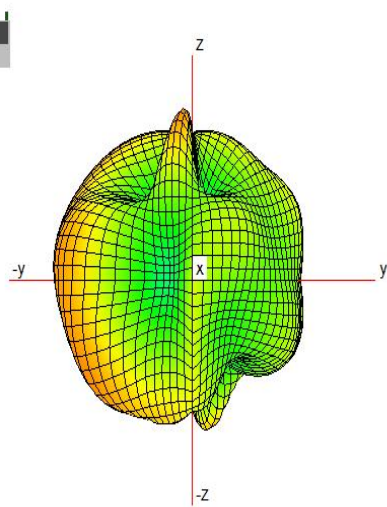
Zoom Scale



Theta

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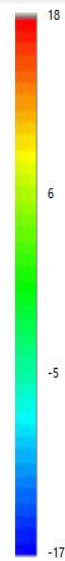
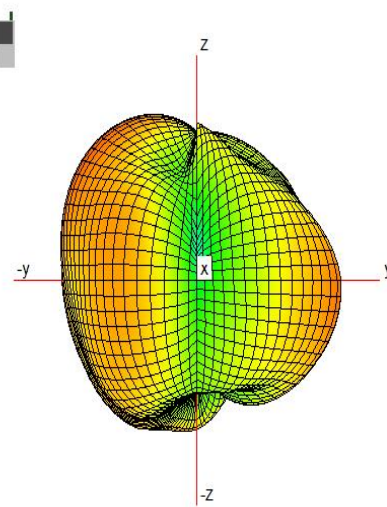
Zoom Scale



Phi

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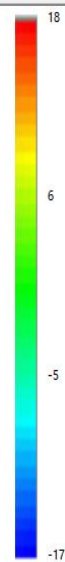
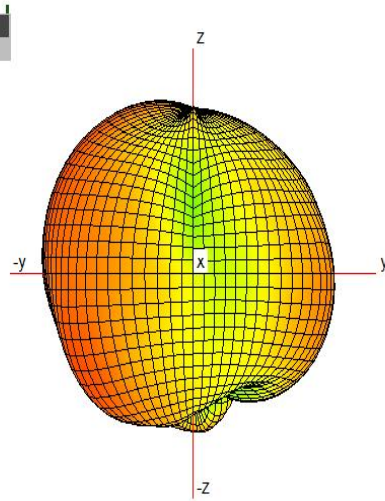
Zoom Scale



Total

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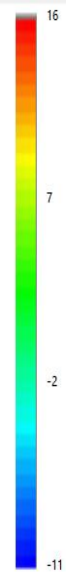
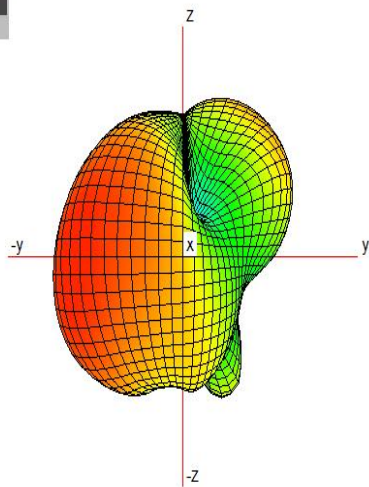
Zoom Scale



Theta

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Elevation: 0
Roll: 0

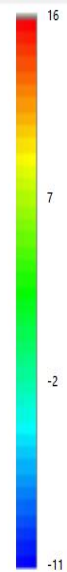
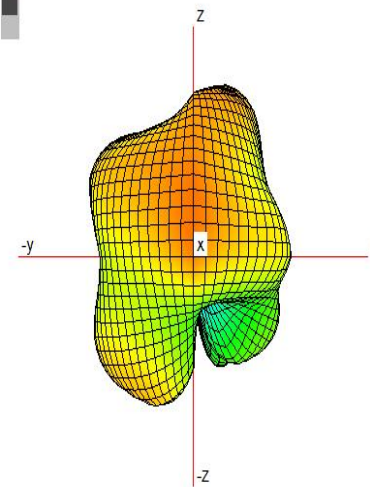
Zoom Scale



Phi

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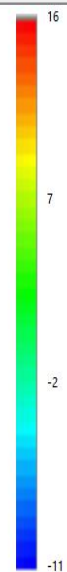
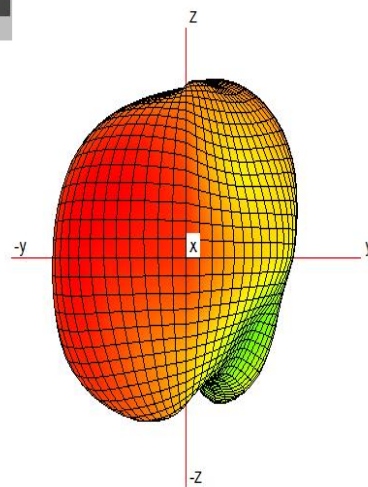
Zoom Scale



Total

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Zoom Scale

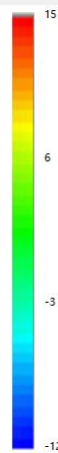
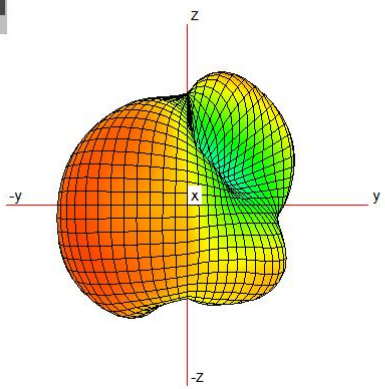


Frequency: 5320

Theta

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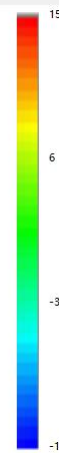
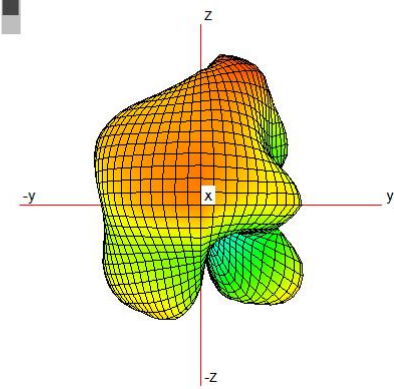
Zoom Scale



Phi

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Elevation: 0
Roll: 0

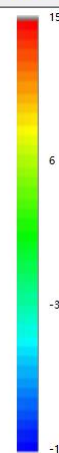
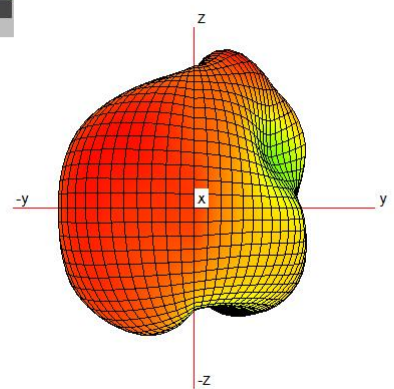
Zoom Scale

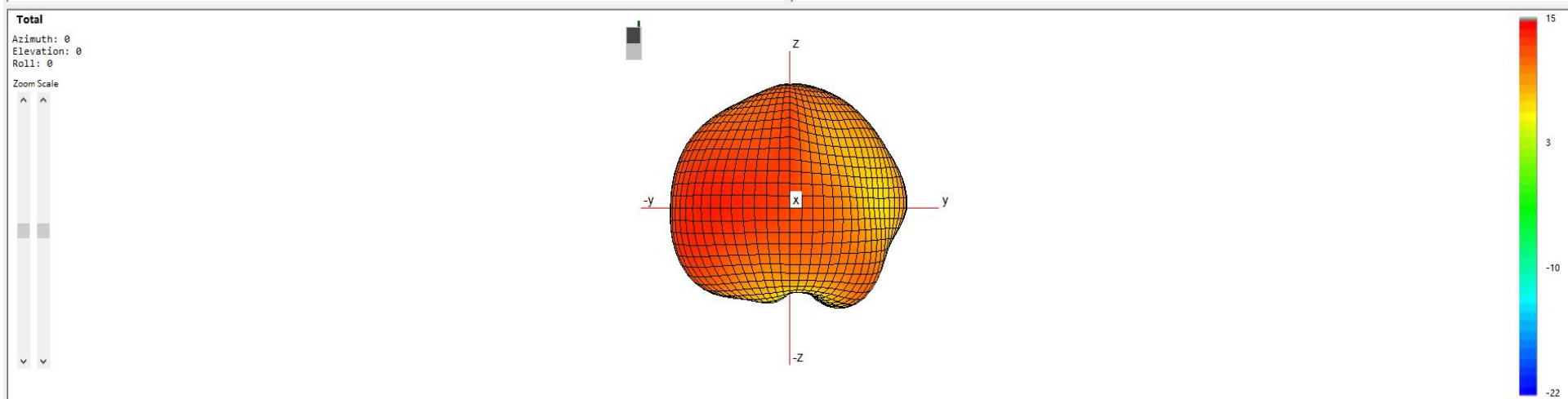
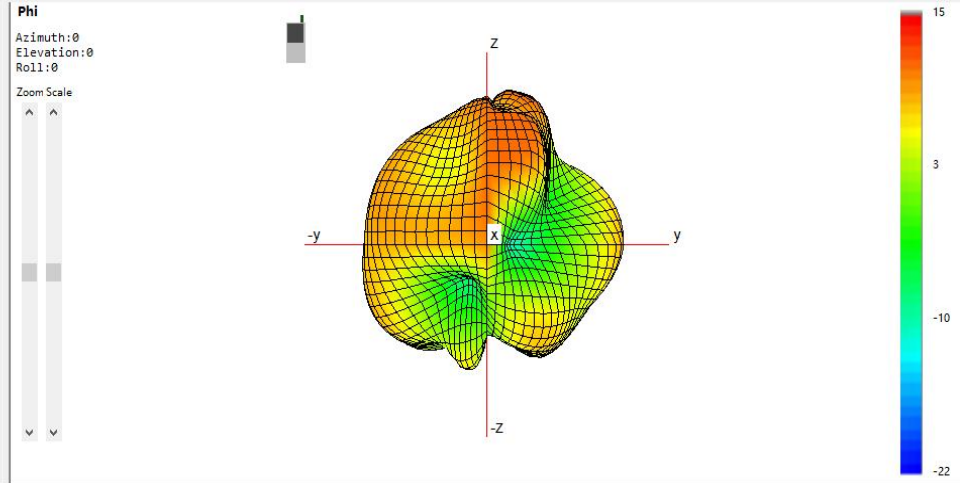
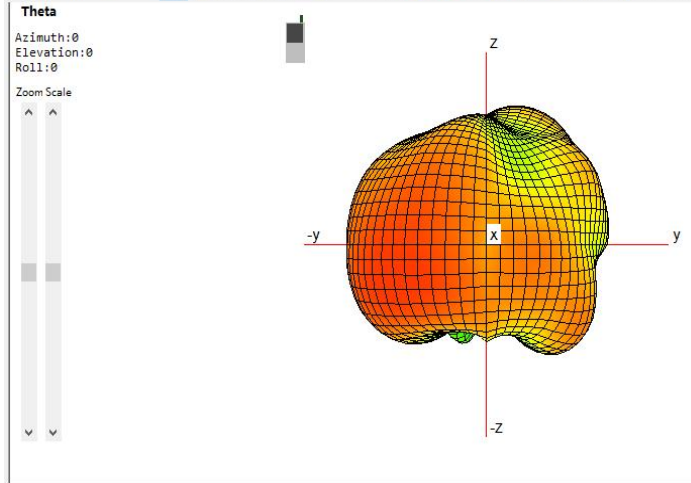


Total

Azimuth: 0
Elevation: 0
Roll: 0

Zoom Scale





II Antenna passive gain efficiency:

The GPS / WIFI / BT antenna

Passive Test For GPS				Freq	Gain	Effi	Effi	Freq	Gain	Effi	Effi
Freq	Gain	Effi	Effi	(MHz)	(dBi)	(dB)	(%)	(MHz)	(dBi)	(dB)	(%)
(MHz)	(dBi)	(dB)	(%)	5160	0.98	-4.07	39.20	5520	-1.17	-5.81	26.24
1550	-0.20	-4.53	35.22	5180	0.94	-4.06	39.26	5540	-1.29	-5.82	26.19
1555	-0.11	-4.44	35.94	5200	0.92	-3.97	40.12	5560	-1.18	-5.76	26.54
1560	-0.07	-4.37	36.59	5220	1.01	-3.90	40.73	5580	-1.09	-5.63	27.34
1565	-0.05	-4.34	36.79	5240	0.98	-4.00	39.80	5600	-1.22	-5.76	26.55
1570	-0.10	-4.36	36.60	5260	0.82	-4.18	38.16	5620	-1.42	-6.06	24.75
1575	-0.20	-4.44	35.98	5280	0.80	-4.29	37.22	5640	-1.42	-6.24	23.76
1580	-0.42	-4.59	34.72	5300	0.93	-4.31	37.07	5660	-1.19	-6.17	24.16
1585	-0.63	-4.76	33.42	5320	0.98	-4.38	36.48	5680	-1.05	-6.16	24.19
1590	-0.96	-4.92	32.23	5340	0.95	-4.45	35.91	5700	-1.18	-6.30	23.47
1595	-1.30	-5.11	30.82	5360	0.74	-4.57	34.92	5720	-1.10	-6.36	23.12
1600	-1.62	-5.26	29.82	5380	0.30	-4.83	32.86	5740	-1.00	-6.41	22.83
1605	-1.96	-5.41	28.77	5400	-0.15	-5.12	30.79	5760	-0.94	-6.51	22.33
1610	-2.16	-5.57	27.76	5420	-0.30	-5.20	30.23	5780	-0.75	-6.54	22.17
1615	-2.05	-5.68	27.06	5440	-0.36	-5.18	30.32	5800	-0.39	-6.43	22.75
Passive Test For 2.4GWIFI/BT				5460	-0.68	-5.39	28.88	5820	0.01	-6.30	23.43
Freq	Gain	Effi	Effi	5480	-0.86	-5.66	27.19	5840	0.19	-6.39	22.94
(MHz)	(dBi)	(dB)	(%)	5500	-0.98	-5.77	26.47	5860	0.32	-6.57	22.03
2400	-0.55	-4.82	32.96								
2410	0.11	-4.69	33.94								
2420	0.66	-4.54	35.19								
2430	0.96	-4.41	36.25								
2440	1.06	-4.27	37.41								
2450	0.85	-4.25	37.61								
2460	0.51	-4.23	37.77								
2470	-0.13	-4.27	37.43								
2480	-0.17	-4.31	37.11								
2490	0.32	-4.37	36.57								
2500	0.73	-4.38	36.45								

III Antenna passive gain efficiency: main antenna

Freq (MHz)	Effi (dB)	Gain (dBi)	Effi (%)	Freq (MHz)	Effi (dB)	Gain (dBi)	Effi (%)
700	-4.95	-1.06	31.97	1940	-2.06	1.32	62.28
710	-4.57	-1.25	34.88	1960	-2.13	1.43	61.3
720	-4.55	-1.01	35.05	1980	-2.1	1.74	61.67
730	-4.53	-1.43	35.23	2000	-2.25	1.61	59.52
740	-4.13	-1.62	38.65	2020	-2.64	1.26	54.45
750	-3.78	-1.10	41.92	2040	-2.49	2.03	56.34
760	-3.55	-0.49	44.15	2060	-2.48	2.22	56.47
770	-3.62	-0.41	43.42	2080	-2.75	1.81	53.09
780	-3.76	-0.50	42.11	2100	-2.92	1.6	51.06
790	-4.08	-1.41	39.13	2120	-3.01	1.53	50.05
800	-3.89	0.27	40.82	2140	-3.16	1.47	48.35
810	-3.41	0.68	45.57	2160	-3.2	1.57	47.86
820	-3.34	0.73	46.32	2180	-3.3	1.6	46.81
830	-3.16	0.89	48.26	2200	-3.48	1.34	44.85
840	-3.27	0.73	47.06	2220	-3.5	1.34	44.65
850	-3.21	0.63	47.79	2240	-3.63	1.11	43.36
860	-3.53	0.32	44.39	2260	-3.66	1.21	43.03
870	-3.47	0.23	44.79	2280	-3.67	1.42	42.94
880	-3.74	-0.1	42.28	2300	-3.7	1.48	42.63
890	-4.09	-0.53	38.98	2320	-3.84	1.43	41.28
900	-3.37	-0.54	45.99	2340	-3.79	1.55	41.75
910	-3	-0.21	50.12	2360	-3.89	1.47	40.83
920	-3.06	-0.41	49.44	2380	-4.28	1.06	37.32
930	-3.13	-0.7	48.68	2400	-4.52	0.56	35.31
940	-3.43	-0.96	45.44	2420	-4.72	-0.01	33.71
950	-4.01	-1.32	39.69	2440	-4.85	-0.64	32.74
960	-4.73	-1.99	33.64	2460	-4.7	-0.95	33.86
970	-5.46	-2.84	28.47	2480	-4.34	-0.91	36.77
980	-6.4	-3.71	22.9	2500	-4.15	-0.79	38.48
1680	-1.67	2.71	68.06	2520	-4.15	-0.6	38.45
1700	-1.89	2.06	64.65	2540	-4.05	-0.22	39.36
1720	-2.13	1.43	61.28	2560	-4.18	0.31	38.16
1740	-1.96	1.49	63.69	2580	-4.1	0.85	38.89
1760	-2	1.47	63.08	2600	-3.92	1.39	40.6
1780	-2.1	1.47	61.7	2620	-3.82	1.72	41.47
1800	-2.08	1.26	61.87	2640	-4.06	1.33	39.29
1820	-2.11	1.21	61.5	2660	-4.08	1.48	39.1
1840	-2.34	1.51	58.31	2680	-4.17	1.69	38.29
1860	-2.64	1.75	54.47	2700	-4.18	1.64	38.19
1880	-3.03	1.31	49.79	2720	-4.17	1.69	38.3
1900	-2.73	1.44	53.37	2740	-4.16	1.51	38.37
1920	-2.4	1.38	57.58	2750	-4.12	1.46	38.69

VIAntenna test data

Band	自由空间测试								
2G									
	Channel	1	38	124	LTE	Channel	18650	18900	19150
GSM900	TRP	30.82	30.33	28.51	B2	TRP	20.01	19.65	19.12
	EIRP	35.59	35	33.13		EIRP	24.56	24.28	23.83
	TIS	-101.09	-101.32	-100.53		TIS	-96.24	-96.23	-96.11
	Channel	512	698	885		Channel	20000	20525	20350
DC S1800	TRP	26.62	27.1	27.4	B4	TRP	19.2	19.49	19.37
	EIRP	30.34	30.09	30.96		EIRP	22.66	22.92	22.26
	TIS	-104.45	-105.62	-105.09		TIS	-96.53	-97.54	-95.74
	Channel	128	190	251		Channel	20450	20525	20600
GSM850	TRP	30.73	30.62	30.53	B5	TRP	21.11	20.58	20.36
	EIRP	35.62	35.56	35.53		EIRP	26.27	25.65	25.48
	TIS	-105.23	-105.65	-104.38		TIS	-97.66	-94.33	-93.79
	Channel	512	660	810		Channel	20800	21100	21400
PC S1900	TRP	26.96	27.31	26.93	B7	TRP	22.33	20.99	20.02
	EIRP	31.88	32.07	31.69		EIRP	26.07	24.62	23.5
	TIS	-105.26	-106.02	-107.57		TIS	-93.86	-96.05	-94.87
3G	Channel	9262	9400	9538		Channel	23060	23095	23130
B2	TRP	17.5	17.8	18.13	B12	TRP	16.82	16.95	17.03
	EIRP	22.39	22.57	22.82		EIRP	20.69	20.89	21.5
	TIS	-105.82	-106.11	-105.74		TIS	-95.51	-95.45	-95.39
	Channel	1312	1412	1513		Channel	23780	23790	23800
B4	TRP	17.84	17.26	17.2	B17	TRP	17.17	17.04	17.56
	EIRP	21.38	21.36	21.21		EIRP	21.82	21.47	21.96
	TIS	-105.51	-106.15	-105.13		TIS	-99.11	-98.6	-98.37
3G	Channel	4132	4185	4233		Channel	132022	132322	132622
B5	TRP	20.32	20.13	20.12	B66	TRP	20.27	20.99	20.62
	EIRP	25.38	25.27	25.27		EIRP	23.78	23.96	23.75
	TIS	-108.3	-107.51	-107.29		TIS	-96.39	-96.82	-96.46
WIFIB	Channel	1	7	13	B71	Channel	133172	133297	133422
	TRP	12.4	12.56	12.63		TRP	16.79	17.53	16.99
	TIS	-83.24	-82.98	-83.01		EIRP	20.84	21.59	21.02
WIFIA	Channel	36	65	165		TIS	-91.69	-92.34	-91.42
	TRP	9.33	9.42	9.71					
	TIS	70.35	-70.89	-70.9					
GPS	CN	TIS							
		39.85	-147						

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VII.remarks