SHENZHEN Xingyuanchuang TECHNOLOGY CO.,LTD
Tangwei Group Business Building, Tangwei Community, Fuhai Street, Bao'an District, Shenzhen, China

Antenna Test Report

TC: Lian Teng\
MN: T0837L
RF: Dai JP
MD: Huang Qingqing
MP: 19918388579

Model:
MAIN ant 1:TH008M1
MAIN ant 1:TH008M2
DIV ant: TH008D
wifi BT ant: TH008WB

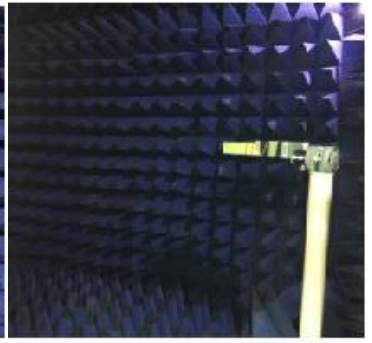
Date: 2023.7.03
REV :V1.0

Test information

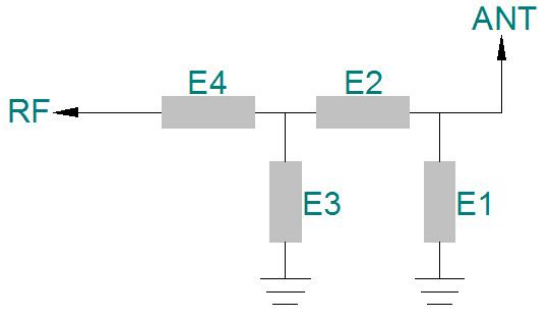
	Antenna band		Antenna state	Antenna form	Matchc hanges	Note
Main ANT	2G	850/900/1800/1900	FPC	PIFA	NO	
	3G	W1/8				
	4G	1/3/5/8/40/41				
AUX ANT	BT/WIFI	2.4/5G	FPC	PIFA	NO	
	GPS	1.575G	FPC	PIFA	NO	
	DIV		FPC	PIFA	NO	

Test environment

	Test Item	Test Equipment
1. S-parameter	1. Voltage standing wave atio 2. Rrtun Loss	Network analyzer：Agilent8753ES
2. Active Tes	1. Transmitted power (TRP) 2. Receiving sensitivity (TIS) 3. screen is off or on	1. Dark room：5*3*3m (3D) Chamber 2. synthesizer：Agilent8960 CMW500
3. Passive Test	1. Antenna gain 2. Antenna efficiency	1. Dark room：5*3*3m (3D) Chamber 2. Network analyzer：Agilent 8753ES



Matching circuit



Matching circuit schematic & bit number diagram

	Capacitance (PF)	Inductance (NH)
E1(0402)		
E2(0402)		
E3(0402)		
E4(0402)		

Antenna position

DIV ANT

OTA test data

2G												
Band	GSM850			GSM900			GSM-1800(DCS)			GSM-1900(PCS)		
Channel	128	192	251	1	62	124	512	698	885	512	660	810
TRP(dBm)	28.80	27.97	27.16	29.14	29.16	28.77	25.13	25.27	26.77	27.46	26.85	25.72
TIS(LCD OFF)			-104.81			-104.27			-106.60			
TIS(LCD ON)												
3G												
Band	WCDMA-1			WCDMA-8			WCDMA-2			WCDMA-5		
Channel	10562	10700	10838	2937	3013	3088	9662	9800	9938	4357	4400	4458
TRP(dBm)	18.87	18.45	18.35	18.76	18.07	18.46						
TIS(LCD OFF)						-104.53						
TIS(LCD ON)			-107.61			-100.14						
4G(FDD 10M)												
Band	FDD-Band 1			FDD-Band 2			FDD-Band 3			FDD-Band 4		
Channel	18050	18300	18550	18650	18900	19150	19250	19575	19900	20000	20175	23050
TRP(dBm)	18.22	17.84	17.36				17.39	17.52	18.24			
TIS(LCD OFF)												
TIS(LCD ON)			-96.26						-95.08			
Band	FDD-Band 5			FDD-Band 7			FDD-Band 8			FDD-Band 20		
Channel	20450	20525	20600	20800	21100	21400	21500	21620	21750	24200	24300	24400
TRP(dBm)	16.49	17.12	17.89				19.02	19.06	18.45			
TIS(LCD OFF)			-91.46									
TIS(LCD ON)			-86.58						-87.86			
4G(TDD 20M)												
Band	FDD-Band 38			FDD-Band 39			FDD-Band 40			FDD-Band 41		
Channel	37850	38000	38150	38350	38450	38550	38750	39150	39550	39750	40620	41490
TRP(dBm)							19.46	19.58	19.54		18.83	
TIS(LCD OFF)												
TIS(LCD ON)									-88.93		-88.86	

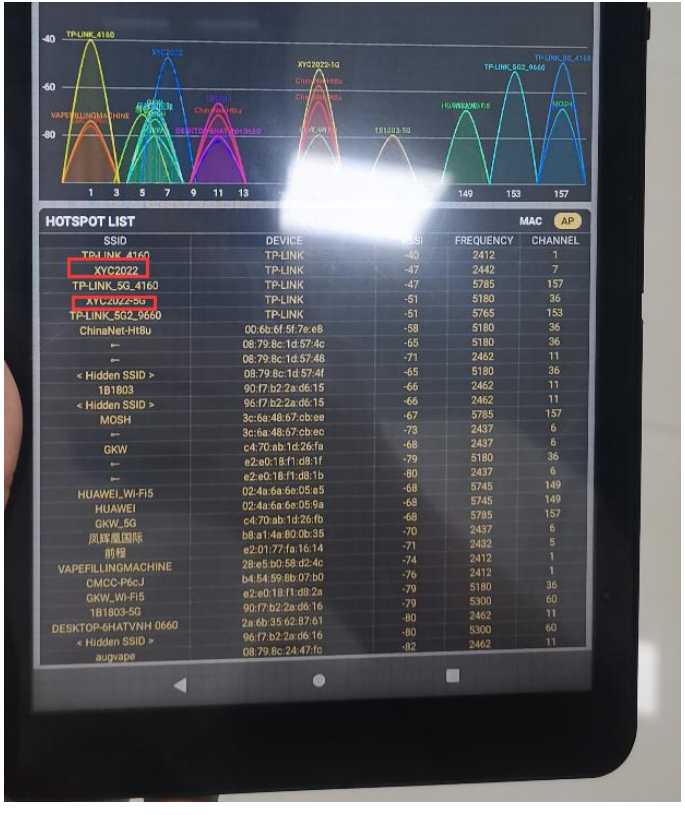
GPS star search test

The measured effect of GPS cold start is as follows:
CN value over 40 3 pieces
CN value more than 35 5 pieces
Actual location of 14+

Note;
GPS star search test. It varies by time period and region. The above data are the best data in our test (open area)

Wifi Antenna test

WIFI
Test environment: Open space
Test distance: 10m
The test results are shown on the right



BT
Test environment: Open space (channel)
Test tool: Bluetooth speaker
Test distance: 10m
Results: Play music smoothly, no noise.

ANT Direction of figure 790-2690MHz

Passive test data

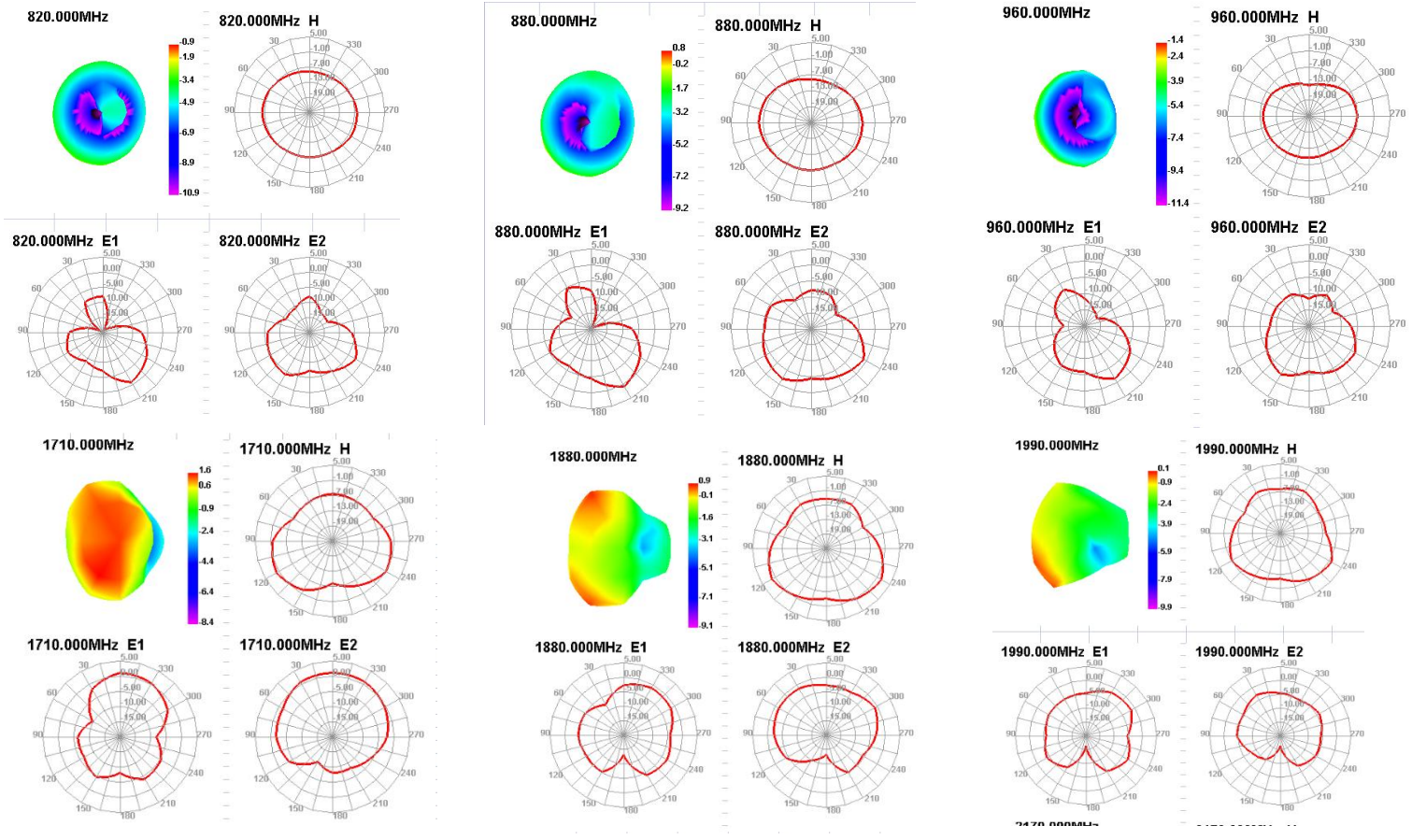
Passive Test For 低频						
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHIS (%)	DHIS (%)
790	15.01	-8.24	-3.13	-5.28	3.471	11.538
800	19.5	-7.1	-1.51	-3.66	4.09	15.412
810	20.33	-6.92	-1.19	-3.34	4.195	16.131
820	21.6	-6.66	-0.93	-3.08	4.384	17.213
830	24.6	-6.09	-0.5	-2.65	4.957	19.641
840	26.74	-5.73	-0.31	-2.46	5.41	21.332
850	30.57	-5.15	0.22	-1.93	6.336	24.236
860	32.41	-4.89	0.58	-1.57	6.885	25.522
870	30.61	-5.14	0.61	-1.54	6.615	24
880	29.66	-5.28	0.76	-1.39	6.583	23.078
890	30.95	-5.09	1.25	-0.9	7.162	23.792
900	31.26	-5.05	1.37	-0.78	7.592	23.669
910	30.61	-5.14	1.21	-0.94	7.452	23.159
920	30.03	-5.22	0.93	-1.22	7.177	22.858
930	27.04	-5.68	0.23	-1.92	6.508	20.536
940	23.37	-6.31	-0.53	-2.68	5.704	17.667
950	20.87	-6.8	-1.08	-3.23	5.12	15.751
960	19.62	-7.07	-1.36	-3.51	4.865	14.755

2300	35.5	-4.5	-0.66	-2.81	19.724	15.777
2310	37.86	-4.22	-0.42	-2.57	21.06	16.8
2320	44.92	-3.48	0.39	-1.78	24.88	20.044
2330	46.37	-3.34	0.46	-1.69	25.828	20.539
2340	41.45	-3.82	-0.11	-2.26	23.396	18.058
2350	42.94	-3.67	0.06	-2.09	24.395	18.542
2360	44.41	-3.53	0.31	-1.84	25.381	19.03
2370	41.98	-3.77	0.21	-1.94	23.957	18.022
2380	43.48	-3.62	0.27	-1.88	24.99	18.485
2390	44.1	-3.56	0.01	-2.14	25.608	18.495
2400	44.14	-3.55	-0.36	-2.51	25.969	18.171
2410	40.81	-3.89	-0.43	-2.58	24.133	16.676
2420	42.44	-3.72	-0.12	-2.27	25.28	17.164
2430	41.57	-3.81	-0.08	-2.23	25.221	16.347
2440	38.76	-4.12	-0.27	-2.42	23.973	14.784
2450	37.89	-4.22	-0.25	-2.4	23.756	14.132
2460	39.75	-4.01	0.11	-2.04	25.032	14.715
2470	39.75	-4.01	0.29	-1.86	25.135	14.611
2480	40.13	-3.96	0.47	-1.68	25.572	14.562
2490	40.37	-3.94	0.54	-1.61	25.733	14.633
2500	42.25	-3.74	0.75	-1.4	27.102	15.145
2510	40.6	-3.91	0.57	-1.58	26.135	14.463
2520	38.43	-4.15	0.35	-1.8	25.076	13.353
2530	39.89	-3.99	0.59	-1.56	26.378	13.516
2540	38.62	-4.13	0.5	-1.65	25.752	12.867
2550	37.89	-4.21	0.42	-1.73	25.465	12.427
2560	40.45	-3.93	0.7	-1.45	27.331	13.12
2570	39.6	-4.02	0.51	-1.64	26.889	12.711
2580	37.54	-4.26	0.2	-1.95	25.523	12.014
2590	37.63	-4.25	0.23	-1.92	25.566	12.059
2600	40.07	-3.97	0.6	-1.55	27.297	12.771
2610	38.55	-4.14	0.49	-1.66	26.449	12.097
2620	36.37	-4.39	0.42	-1.73	25.171	11.2
2630	35.83	-4.46	0.45	-1.7	24.908	10.924
2640	37.29	-4.28	0.78	-1.37	26.068	11.223
2650	37.82	-4.22	1.01	-1.14	26.627	11.194
2660	37.35	-4.28	1.14	-1.01	26.51	10.844
2670	32.94	-4.82	0.7	-1.45	23.414	9.529
2680	33.55	-4.74	0.8	-1.35	23.817	9.737
2690	34.22	-4.66	0.85	-1.3	24.178	10.038
2700	30.8	-5.11	0.4	-1.75	21.801	8.998
2710	27.87	-5.55	-0.07	-2.22	19.825	8.048
2720	27.43	-5.62	-0.05	-2.2	19.575	7.851
2730	28.65	-5.43	0.21	-1.94	20.445	8.209
2740	26.14	-5.83	-0.04	-2.19	18.639	7.501
2750	23.64	-6.26	-0.43	-2.58	16.845	6.793

Passive Test For 高频						
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHIS (%)	DHIS (%)
1710	47.79	-3.21	1.56	-0.59	31.797	15.989
1720	46.85	-3.29	1.48	-0.67	30.596	16.257
1730	49.66	-3.04	1.63	-0.52	31.985	17.673
1740	51.89	-2.85	1.73	-0.42	33.006	18.888
1750	54.22	-2.66	1.9	-0.25	34.327	19.891
1760	54.97	-2.6	1.85	-0.3	34.608	20.364
1770	59.45	-2.26	2.08	-0.07	37.096	22.359
1780	61.11	-2.14	1.99	-0.16	37.774	23.341
1790	58.36	-2.34	1.51	-0.64	35.69	22.674
1800	57.43	-2.41	1.34	-0.81	34.772	22.654
1810	57.48	-2.4	1.3	-0.85	34.276	23.205
1820	56.24	-2.5	1.27	-0.88	33.09	23.147
1830	56.26	-2.5	1.35	-0.8	32.867	23.389
1840	56.51	-2.48	1.34	-0.81	32.876	23.63
1850	55.25	-2.58	1.17	-0.98	32.145	23.105
1860	56.37	-2.49	1.07	-1.08	32.602	23.768
1870	55.9	-2.53	1.15	-1	32.203	23.702
1880	49.43	-3.06	0.9	-1.25	28.503	20.923
1890	44.47	-3.52	0.55	-1.6	25.579	18.891
1900	41.54	-3.81	0.38	-1.77	23.844	17.7
1910	46.82	-3.3	0.65	-1.5	26.613	20.207
1920	42.27	-3.74	0.12	-2.03	23.845	18.426
1930	40.5	-3.93	-0.24	-2.39	22.801	17.695
1940	40.88	-3.89	-0.33	-2.48	23.187	17.692
1950	37.17	-4.3	-0.39	-2.54	21.125	16.048
1960	39.67	-4.02	-0.11	-2.26	22.472	17.201
1970	39.59	-4.02	-0.1	-2.25	22.104	17.485
1980	41.1	-3.86	0.13	-2.02	22.767	18.334
1990	40.46	-3.93	0.07	-2.08	22.228	18.229
2000	42.62	-3.7	0.26	-1.89	23.495	19.129
2010	46.31	-3.34	0.38	-1.77	25.495	20.818
2020	39.08	-4.08	-0.51	-2.66	21.619	17.46
2030	37.06	-4.31	-0.87	-3.02	20.534	16.528
2040	42.23	-3.74	-0.32	-2.47	23.487	18.745
2050	40.85	-3.89	-0.48	-2.63	22.567	18.285
2060	40	-3.98	-0.69	-2.84	21.772	18.229
2070	38.32	-4.17	-0.87	-3.02	20.43	17.885
2080	45.37	-3.43	0.26	-1.89	24.058	21.313
2090	47.36	-3.25	0.65	-1.5	25.03	22.329
2100	43.23	-3.64	0.25	-1.9	23.03	20.2
2110	45.17	-3.45	0.43	-1.72	24.128	21.04
2120	44.37	-3.53	0.5	-1.65	24.019	20.351
2130	38.03	-4.2	-0.15	-2.3	20.702	17.329
2140	39.76	-4	-0.09	-2.24	21.737	18.028
2150	38.37	-4.16	-0.26	-2.41	20.773	17.601
2160	42.9	-3.68	0.4	-1.75	23.059	19.836
2170	43.83	-3.58	0.74	-1.41	23.306	20.519

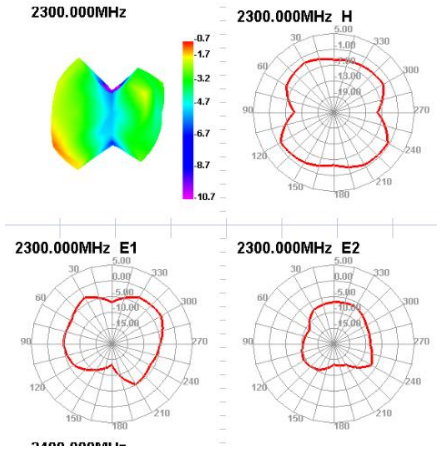
Passive test data

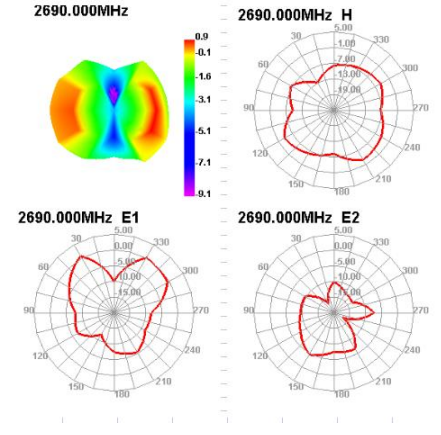
ANT Direction of figure 690-2690MHz

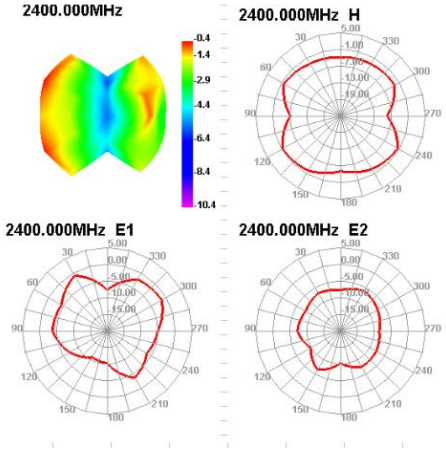


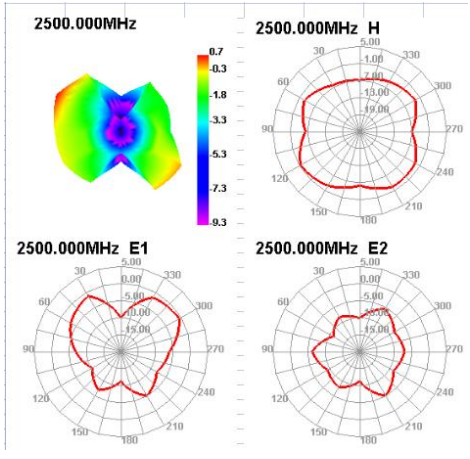
Passive test data

ANT Direction of figure 690-2690MHz









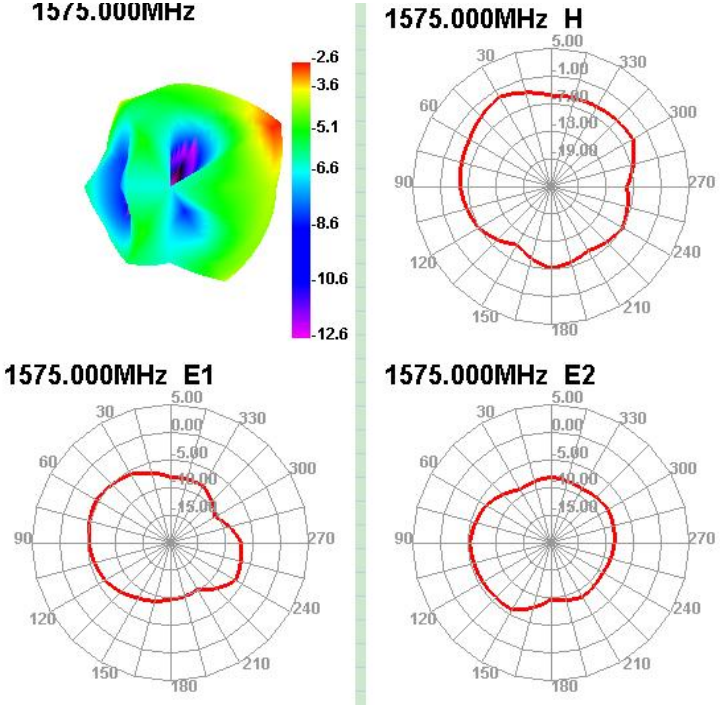
ANT1 GAIN&Efficiency-GPS

Passive test data

1570	24.58	-6.09	-2.59	-4.74	10.92	13.663	-2.59	-16.86	3.51	90	41.5	41.03
1575	24.18	-6.17	-2.61	-4.76	10.74	13.44	-2.61	-17.19	3.55	90	41.68	41.23
1580	24.91	-6.04	-2.44	-4.59	11.084	13.829	-2.44	-18.49	3.59	90	41.78	41.35

Passive test data

ANT1 Direction of figure(GPS)



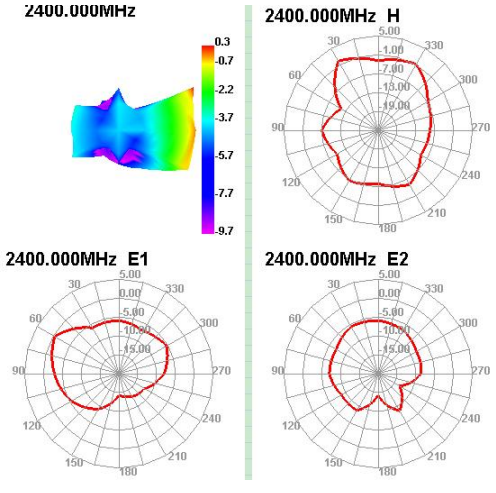
Passive test data

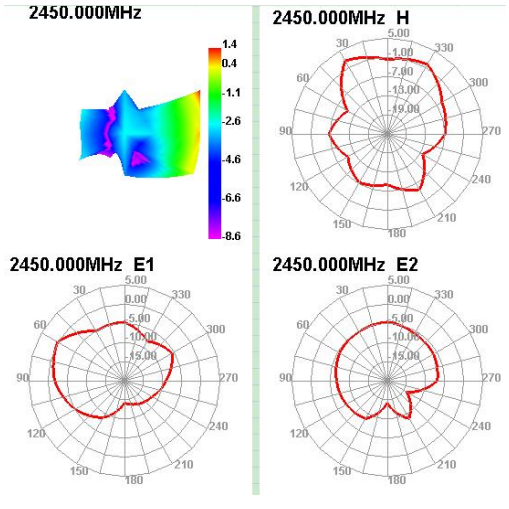
ANT1 GAIN&Efficiency-WIFI2.4G/BT

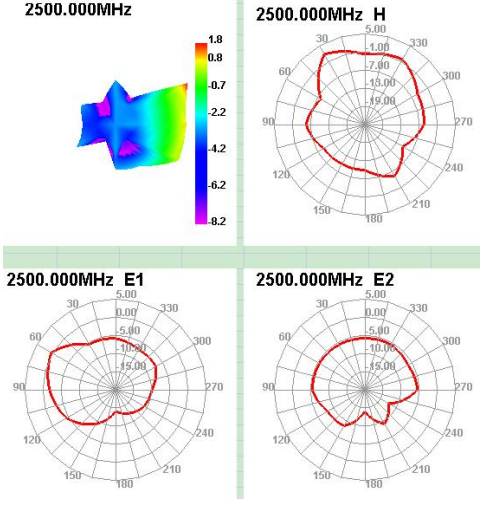
Passive Test For WIFI2.4												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHIS (%)	DHIS (%)	Max (dB)	Min (dB)	irectivit (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
2400	24.44	-6.12	0.3	-1.85	14.262	10.176	0.3	-14.34	6.42	30	45.78	46.01
2410	24.89	-6.04	0.44	-1.71	14.686	10.202	0.44	-14.75	6.48	30	46.01	46.29
2420	25.66	-5.91	0.65	-1.5	15.278	10.384	0.65	-14.76	6.56	30	45.73	46
2430	25.08	-6.01	0.64	-1.51	14.926	10.149	0.64	-15.32	6.65	30	46.01	46.36
2440	26.1	-5.83	0.9	-1.25	15.237	10.86	0.9	-14.97	6.73	30	46.12	46.48
2450	28.43	-5.46	1.42	-0.73	16.36	12.071	1.42	-14.3	6.88	30	46.12	46.54
2460	28.76	-5.41	1.55	-0.6	16.397	12.359	1.55	-14.23	6.96	30	46.14	46.52
2470	27.54	-5.6	1.49	-0.66	15.652	11.889	1.49	-14.23	7.09	30	46.4	46.8
2480	29.45	-5.31	1.8	-0.35	16.601	12.85	1.8	-13.68	7.11	30	46.26	46.64
2490	32.01	-4.95	2.16	0.01	17.887	14.121	2.16	-13.54	7.1	30	46.51	46.91
2500	29.12	-5.36	1.8	-0.35	16.327	12.793	1.8	-14.12	7.16	30	46.47	46.86

Passive test data

ANT1 Direction of figure(2.4/BT)







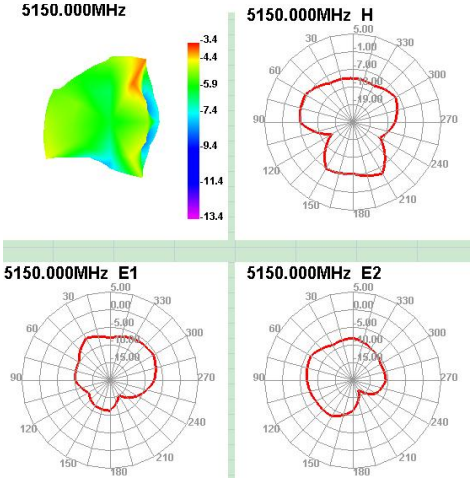
Passive test data

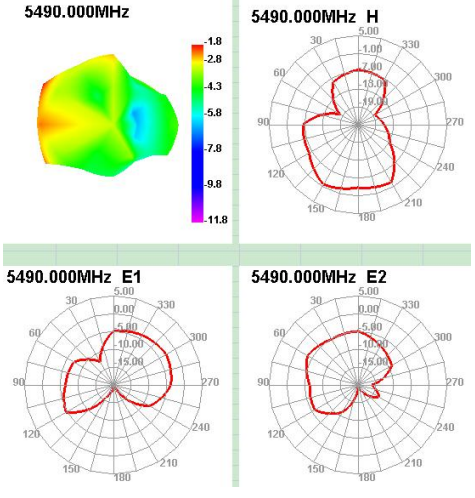
ANT1 GAIN&Efficiency-WIFI 5G

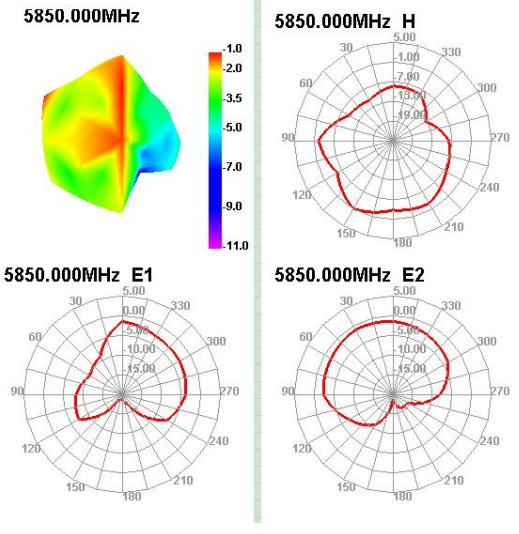
Passive Test For WIFI5G												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHIS (%)	DHIS (%)	Max (dB)	Min (dB)	irectivit (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
5150	15.04	-8.23	-3.38	-5.53	8.949	6.091	-3.38	-20.62	4.84	120	49.82	49.4
5170	13.29	-8.76	-4.03	-6.18	7.793	5.498	-4.03	-22.49	4.73	120	50.13	49.77
5190	15.52	-8.09	-3.65	-5.8	9.014	6.504	-3.65	-22.05	4.44	60	50.42	49.95
5210	15.16	-8.19	-3.7	-5.85	8.55	6.614	-3.7	-21.88	4.49	60	50.88	50.49
5230	15.61	-8.06	-3.24	-5.39	8.538	7.077	-3.24	-20	4.82	60	50.42	50.08
5250	17.45	-7.58	-2.78	-4.93	9.466	7.98	-2.78	-21.1	4.8	60	51.02	50.72
5270	17.86	-7.48	-2.28	-4.43	9.684	8.178	-2.28	-20.69	5.2	60	50.85	50.6
5290	19.38	-7.13	-2.12	-4.27	10.42	8.96	-2.12	-21.16	5	60	51.34	51.12
5310	16.33	-7.87	-2.71	-4.86	8.73	7.603	-2.71	-21.11	5.16	60	50.44	50.36
5330	17.89	-7.47	-1.95	-4.1	9.59	8.301	-1.95	-20.34	5.52	90	51.08	51.01
5350	16.96	-7.71	-2.06	-4.21	9.143	7.814	-2.06	-21.12	5.65	90	51.02	51.01
5370	18.14	-7.41	-2.04	-4.19	9.794	8.35	-2.04	-20.56	5.37	90	50.91	50.95
5390	14.58	-8.36	-3.32	-5.47	7.912	6.663	-3.32	-24.06	5.04	90	50.46	50.43
5410	19.63	-7.07	-1.88	-4.03	10.75	8.876	-1.88	-22.71	5.19	90	51.18	51.09
5430	14.95	-8.25	-2.94	-5.09	8.259	6.688	-2.94	-22.81	5.32	90	50.69	50.7
5450	18.8	-7.26	-2.17	-4.32	10.481	8.314	-2.17	-24.31	5.09	90	50.71	50.85
5470	16.19	-7.91	-2.57	-4.72	9.086	7.099	-2.57	-26.5	5.34	90	50.93	50.83
5490	18.86	-7.24	-1.78	-3.93	10.699	8.163	-1.78	-25.89	5.46	90	50.92	50.79
5510	18.26	-7.39	-2.12	-4.27	10.535	7.722	-2.12	-23.53	5.27	90	51.18	51.16
5530	20.22	-6.94	-1.83	-3.98	11.938	8.286	-1.83	-24.28	5.11	90	51.44	51.3
5550	20.64	-6.85	-1.62	-3.77	12.171	8.465	-1.62	-24.93	5.23	90	51.89	51.76
5570	21.24	-6.73	-1.5	-3.65	12.546	8.693	-1.5	-22.96	5.23	90	51.42	51.33
5590	23.43	-6.3	-0.96	-3.11	14.087	9.339	-0.96	-22.77	5.34	90	51.71	51.76
5610	22.68	-6.44	-0.86	-3.01	13.868	8.816	-0.86	-23.02	5.58	90	51.17	51.22
5630	25.26	-5.98	-0.31	-2.46	15.538	9.717	-0.31	-21.81	5.67	90	51.78	51.77
5650	21.83	-6.61	-1.09	-3.24	13.482	8.348	-1.09	-22.58	5.52	90	51.47	51.55
5670	26.58	-5.75	-0.24	-2.39	16.613	9.965	-0.24	-20.75	5.52	90	52.12	52.28
5690	23.3	-6.33	-0.7	-2.85	14.787	8.511	-0.7	-21.15	5.63	90	52.12	52.25
5710	27.02	-5.68	-0.1	-2.25	17.169	9.85	-0.1	-20.38	5.58	90	51.95	52.05
5730	24.81	-6.05	-0.39	-2.54	15.765	9.046	-0.39	-23.87	5.66	90	51.59	51.69
5750	25.31	-5.97	-0.21	-2.36	16.17	9.135	-0.21	-25.2	5.76	90	51.12	51.15
5770	24.3	-6.14	-0.52	-2.67	15.72	8.583	-0.52	-22.29	5.62	90	51.02	51.06
5790	23.77	-6.24	-0.67	-2.82	15.468	8.3	-0.67	-21.99	5.57	90	51.08	51.16
5810	23.03	-6.38	-0.82	-2.97	14.942	8.087	-0.82	-26.4	5.56	90	51.36	51.43
5830	23.66	-6.26	-0.75	-2.9	15.381	8.284	-0.75	-28.13	5.51	90	51.65	51.66
5850	22.69	-6.44	-1.04	-3.19	14.787	7.904	-1.04	-22.01	5.4	90	51.88	52.05

Passive test data

ANT1 Direction of figure(5G)







Win-win cooperation