

Antenna Test Report

产品名称: Wireless Transceiver All-in-One Module

产品型号: WKCT1FR2501

频 率: 2.4GHz+5GHz

检测日期: 20250715

检测目的: Antenna Performance Test

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审 核: 郑伟

批 准: 高照

Revision history

Version	Date	Status
V1.0	2025-05-07	Draft
V1.1	2025-05-13	Added 3D graphics

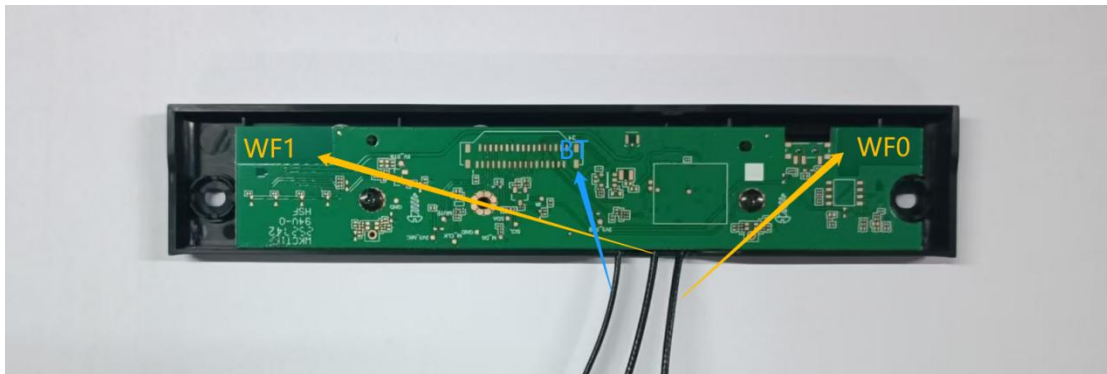
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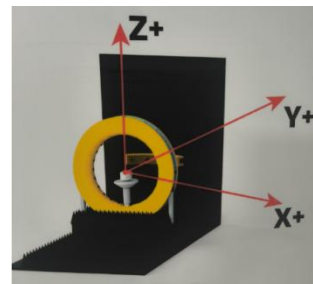
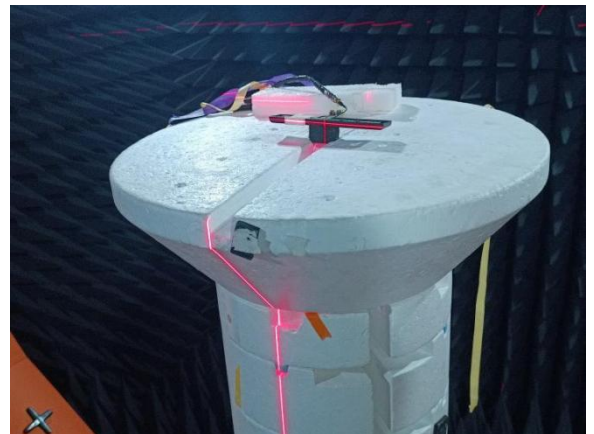
1. Antenna position

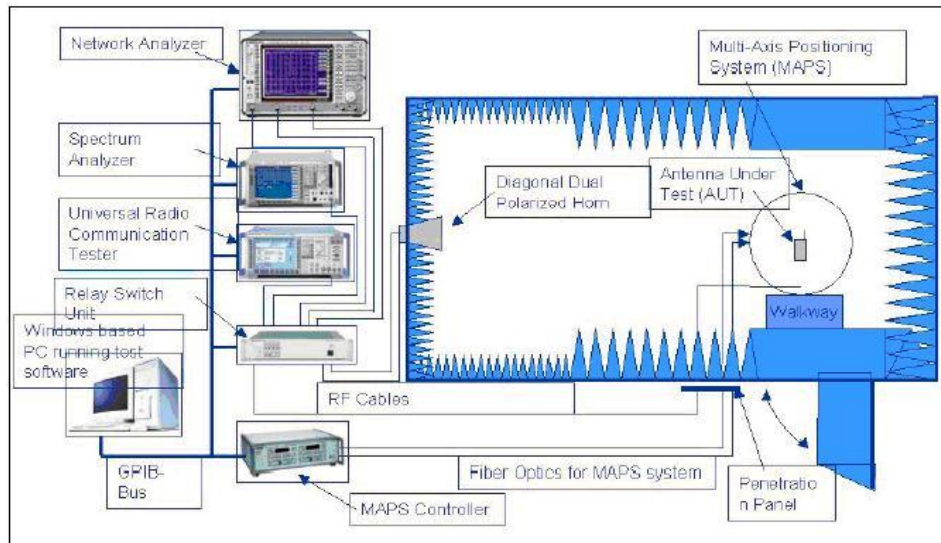
1.1 Module Placement Requirements

1.1.1 WIFI: Metal antenna BT: Metal antenna Install the casing and perform the free space test.



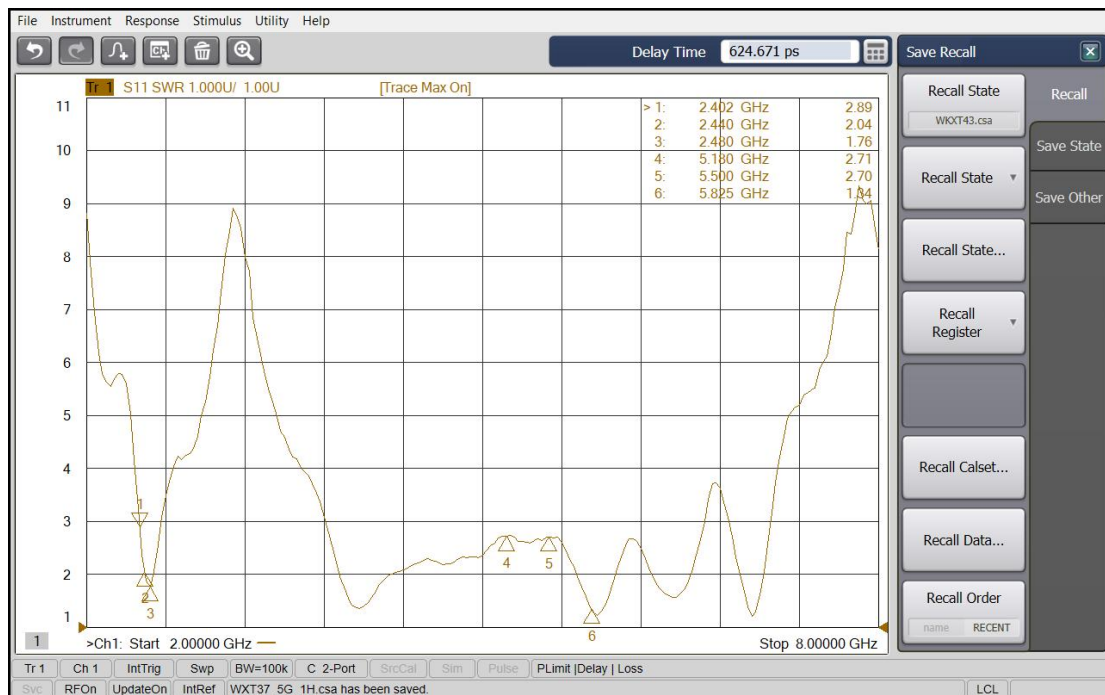
2. Test Environment



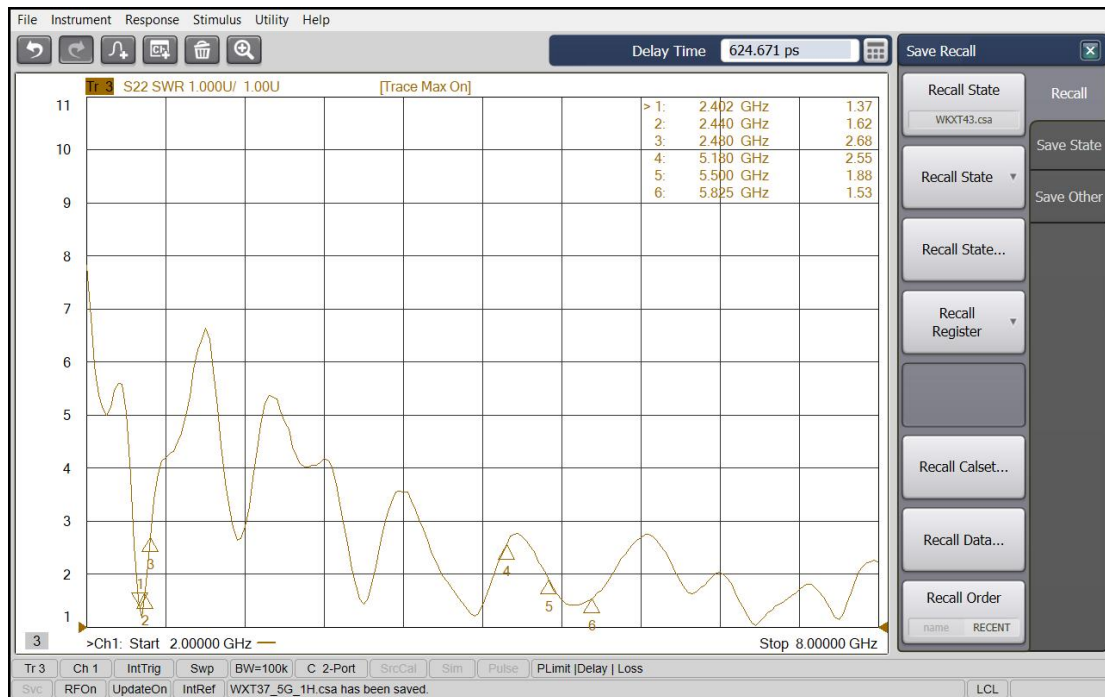


3. Antenna Standing Wave Ratio

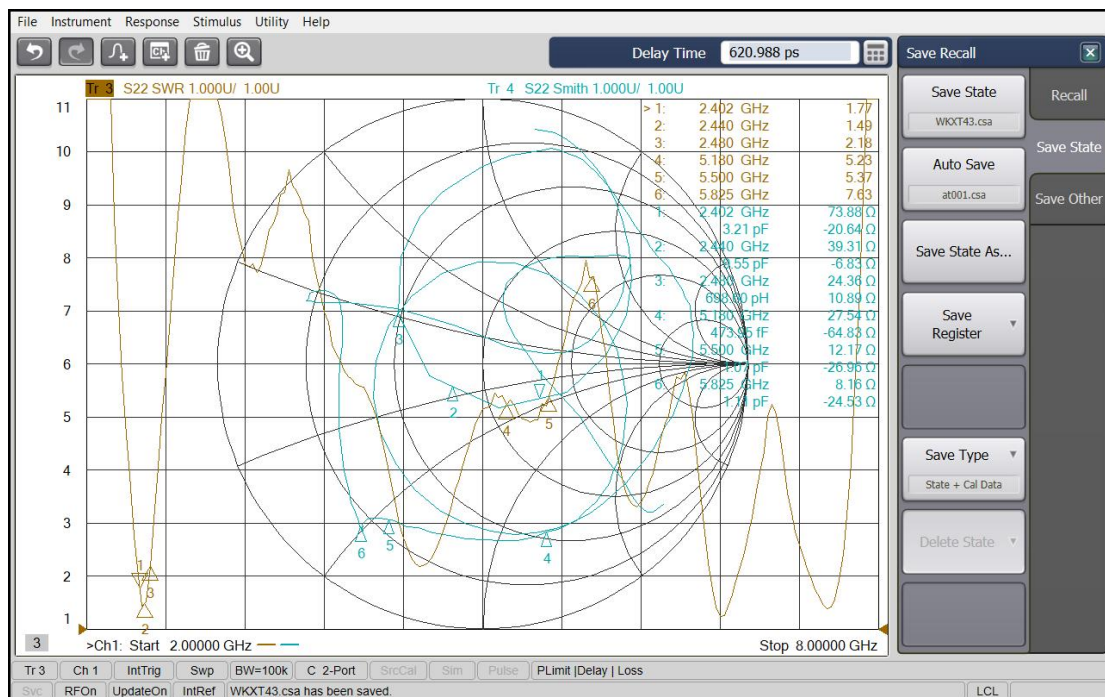
3.1 WF0



3.2 WF1



3.3 BT



4. Antenna isolation

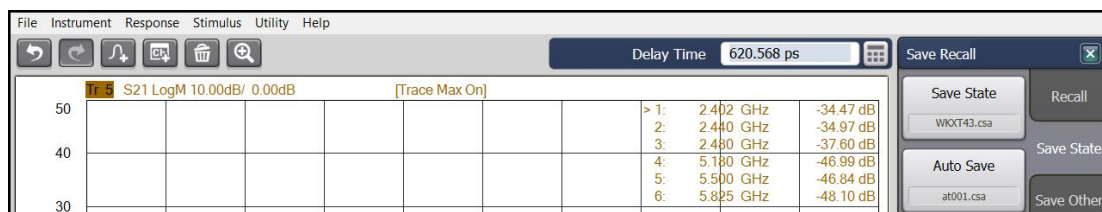
4.1 WF0 & WF1



4.2 WF0 & BT



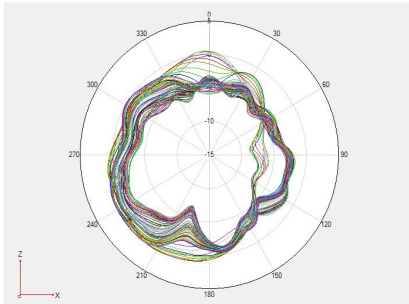
4.3 WF1 & BT



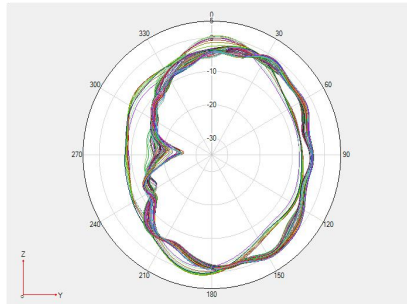
5. Directional map

5.1 WF0 Directional map

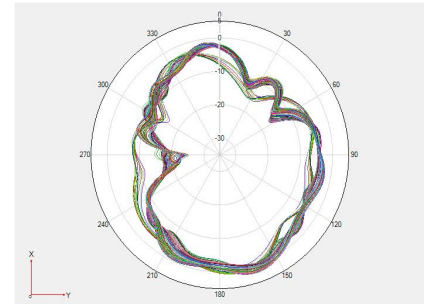
Phi 0 2D



Phi 90 2D

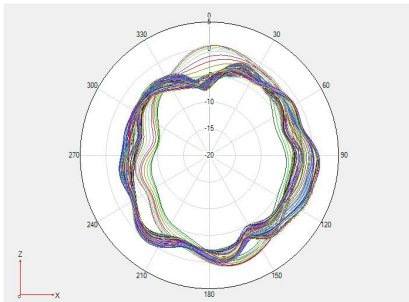


Theta 90

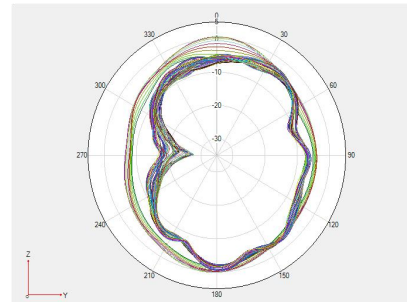


5.2 WF1 Directional map

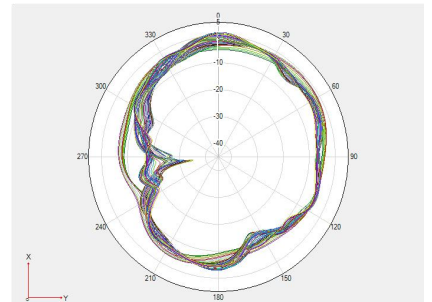
Phi 0 2D



Phi 90 2D

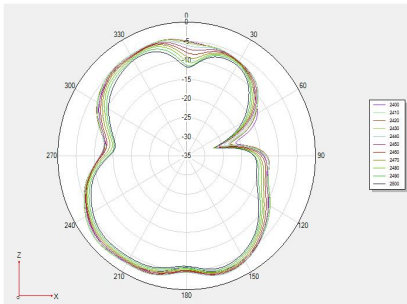


Theta 90

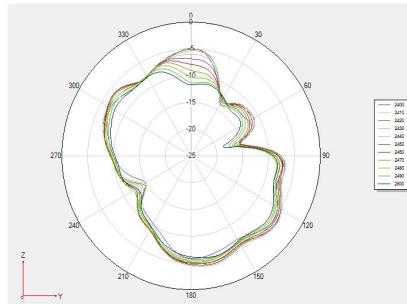


5.3 BT Directional map

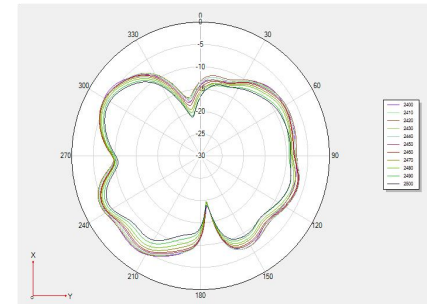
Phi 0 2D



Phi 90 2D

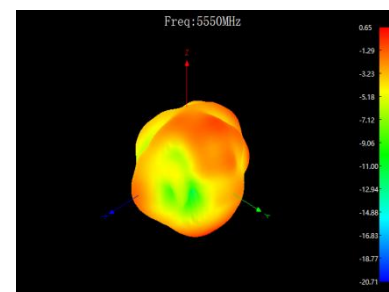
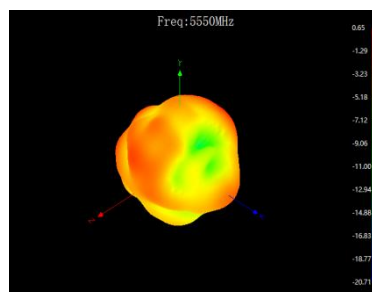
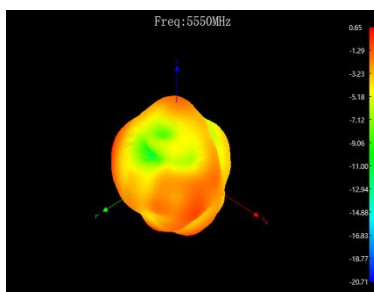
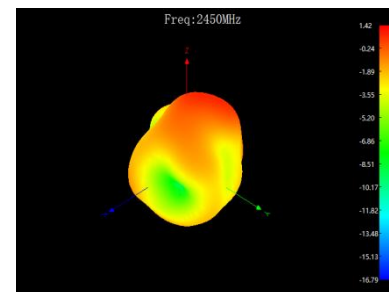
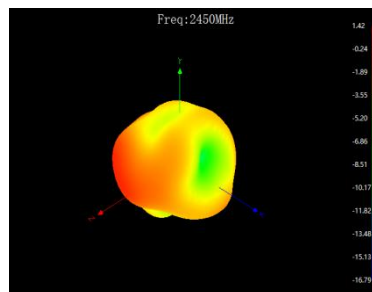
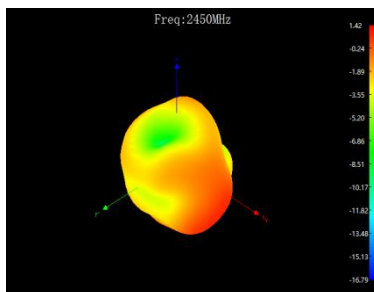


Theta 90

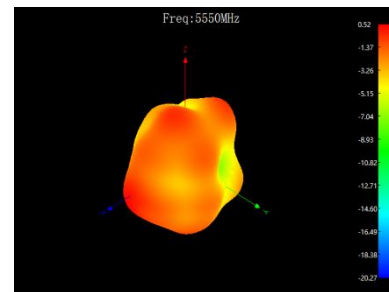
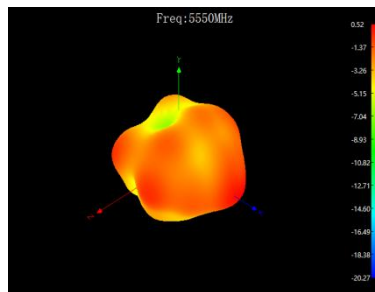
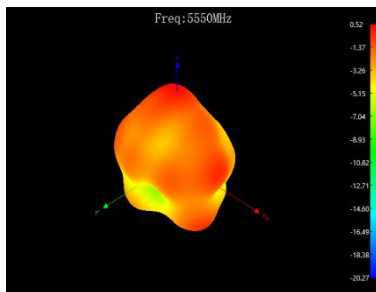
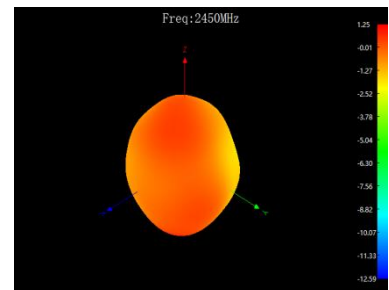
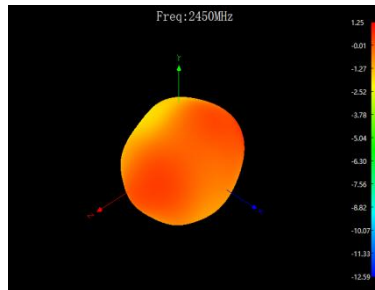
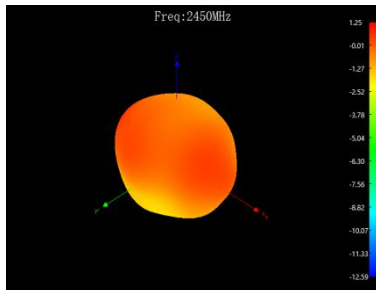


6. 3D Etotal

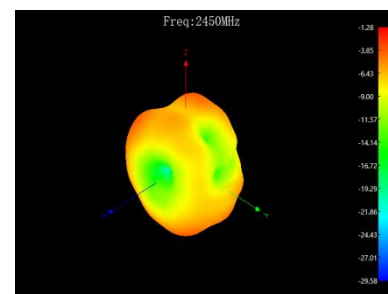
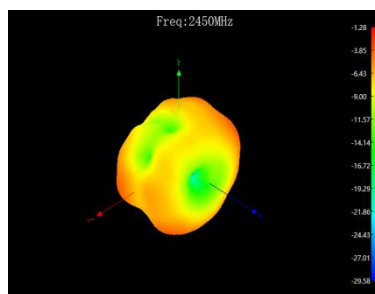
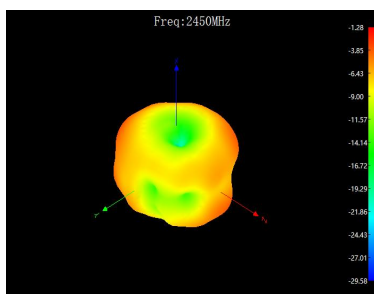
6.1 WF0 3D map



6.2 WF1 3D map



6.3 BT 3D map



7. Antenna Efficiency and Gain

7.1 WF0&WF1 Antenna Efficiency and Gain

WIFI0				WIFI1		
Frequency/Mhz	MaxGain/dBi	Efficiency / %		Frequency/Mhz	MaxGain/dBi	Efficiency / %
2400	-0.04	31.33		2400	0.64	45.39
2410	0.31	33.57		2410	0.7	46.34
2420	0.99	37.41		2420	1.07	47.32
2430	1.34	39.81		2430	1.24	46.24
2440	1.49	40.55		2440	1.31	44.46
2450	1.42	40.46		2450	1.25	42.27
2460	1.48	40.93		2460	1.14	39.81
2470	1.49	41.21		2470	0.84	36.48
2480	1.44	40.46		2480	0.42	32.89
2490	1.34	39.9		2490	0.04	29.99
2500	1.24	39.45		2500	-0.33	27.93
5150	-0.08	40.64		5150	-1.34	36.31
5160	-0.1	39.81		5160	-1.51	35.4
5170	-0.08	38.64		5170	-1.56	34.2
5180	-0.14	37.93		5180	-1.77	33.5
5190	-0.02	38.19		5190	-1.65	33.81
5200	0.2	39.63		5200	-1.42	35.08
5210	0.36	40.18		5210	-1.28	35.4
5220	0.19	38.73		5220	-1.37	34.12
5230	0.05	38.46		5230	-1.39	33.81
5240	0.01	37.76		5240	-1.49	33.19
5250	-0.25	37.33		5250	-1.6	32.81
5260	-0.22	37.07		5260	-1.57	32.81
5270	-0.17	36.98		5270	-1.7	32.89
5280	-0.11	36.64		5280	-1.6	32.81
5290	0.08	37.5		5290	-1.57	33.57
5300	0.16	37.58		5300	-1.43	33.65
5310	0.11	37.24		5310	-1.51	33.42
5320	0.01	36.39		5320	-1.54	32.81
5330	-0.15	35.4		5330	-1.71	32.28
5340	-0.14	35.56		5340	-1.67	32.73
5350	-0.07	35.97		5350	-1.58	33.57



V1.1

5360	-0.02	35.97		5360	-1.5	33.96
5370	-0.07	35.16		5370	-1.37	33.65
5380	-0.06	35.56		5380	-1.16	34.36
5390	-0.03	35.56		5390	-0.99	34.75
5400	0.03	35.73		5400	-0.97	35.24
5410	0	35.24		5410	-0.98	35.08
5420	0.06	35.89		5420	-0.96	35.97
5430	0.18	36.64		5430	-0.78	36.98
5440	0.42	38.11		5440	-0.57	38.82
5450	0.43	37.84		5450	-0.48	38.73
5460	0.34	37.5		5460	-0.44	38.73
5470	0.33	37.58		5470	-0.23	38.9
5480	0.46	38.02		5480	-0.17	39.45
5490	0.65	38.37		5490	-0.03	40.09
5500	0.67	37.93		5500	0.04	39.9
5510	0.64	37.93		5510	0.17	40.18
5520	0.53	37.33		5520	0.15	39.72
5530	0.57	37.84		5530	0.29	40.18
5540	0.6	37.84		5540	0.3	39.99
5550	0.65	39.17		5550	0.52	41.4
5560	0.73	39.45		5560	0.63	41.69
5570	0.91	40.74		5570	0.88	42.95
5580	0.94	41.11		5580	1	43.45
5590	1	41.69		5590	1.01	43.85
5600	1	41.88		5600	0.97	43.45
5610	1.08	42.66		5610	0.91	43.45
5620	1.26	43.45		5620	0.9	43.35
5630	1.26	43.15		5630	0.76	42.46
5640	1.25	42.66		5640	0.71	42.07
5650	1.28	42.46		5650	0.79	41.5
5660	1.51	44.06		5660	1.05	42.07
5670	1.63	44.77		5670	1.17	41.69
5680	1.8	46.24		5680	1.37	42.56
5690	1.71	46.03		5690	1.38	42.07
5700	1.76	46.77		5700	1.46	42.36
5710	1.65	46.67		5710	1.31	41.3
5720	1.66	47.42		5720	1.24	41.21
5730	1.7	47.97		5730	1.19	40.93
5740	1.75	48.75		5740	1.16	41.21
5750	1.75	48.42		5750	1.06	40.64
5760	1.81	49.09		5760	1.02	40.93

5770	2.09	51.05		5770	1.2	42.17
5780	2.15	51.64		5780	1.16	42.27
5790	2.17	51.52		5790	1.08	41.59
5800	2.08	50.82		5800	0.9	40.55
5810	2.23	51.52		5810	1	40.55
5820	2.21	51.05		5820	0.96	39.81
5830	2.31	51.17		5830	1.07	39.54
5840	2.26	49.89		5840	1.01	37.84
5850	2.34	50.12		5850	1.06	37.76

7.2 Antenna Efficiency and Gain

BT		
Frequency/Mhz	MaxGain/dBi	Efficiency / %
2400	-1.2	22.23
2410	-0.88	22.96
2420	-0.76	23.77
2430	-0.85	23.88
2440	-1.01	23.39
2450	-1.28	22.03
2460	-1.48	20.65
2470	-1.71	19.32
2480	-2	18.03
2490	-2.52	16.18
2500	-2.78	15.59