

Company: Haitong Communication Ltd.

Customer: TCL Communication Ltd.

Project name: WIFI63-VDF

Product name: WIFI63-VDF

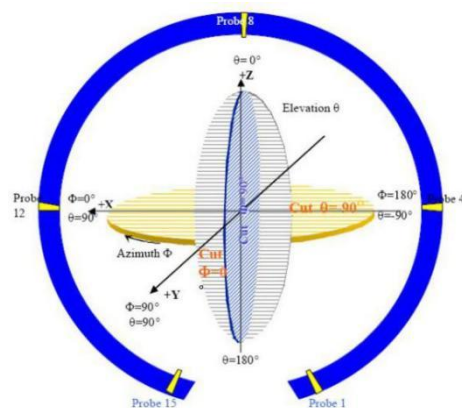
Material: FPC

Date: 2022/9/8

Antenna diagram:



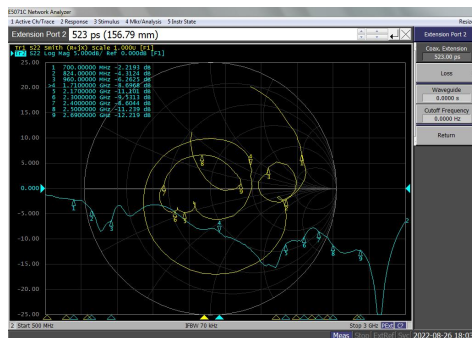
Test system introduction:



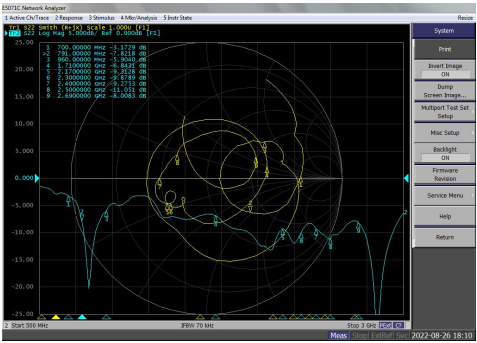
Main Antenna

S11:

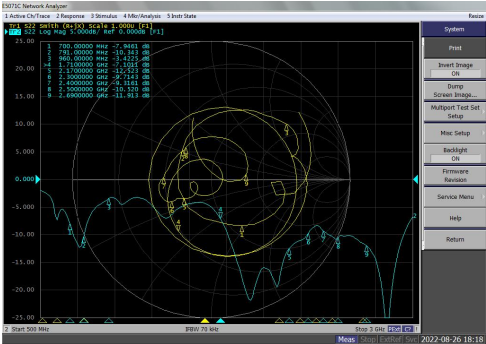
880-960 1710-2690



791-862 1450-1500



703-803

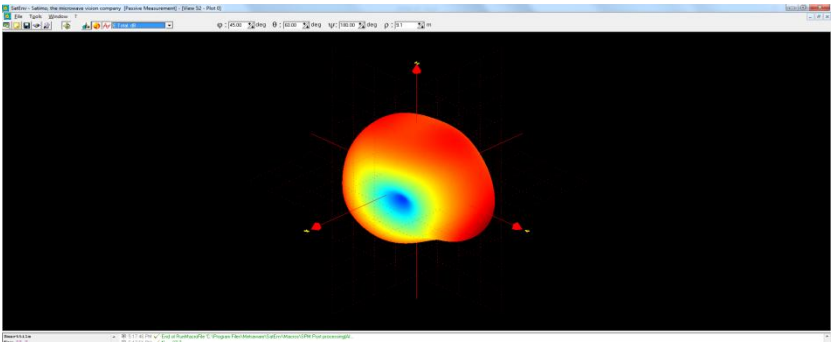


Efficiency&Gain: 效率换算平均增益=10*log（对应的效率）

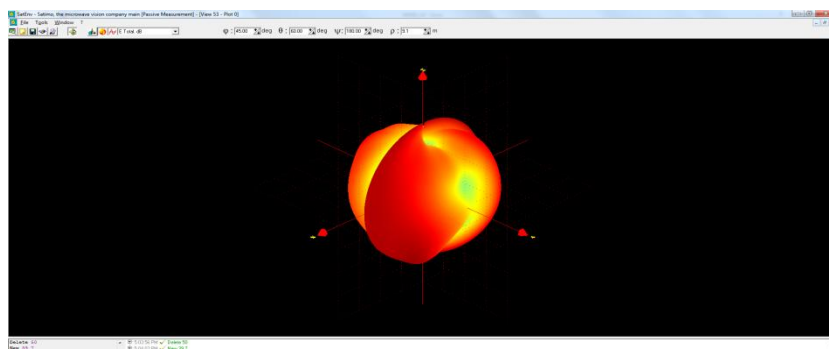
f(MHz)	Efficiency	Average gain	Max gian	f(MHz)	Efficiency	Average gain	Max gian	f(MHz)	Efficiency	Average gain	Max gian
880	44%	-3.5	0.9	1930	52%	-2.9	2.4	2330	47%	-3.3	0.3
890	45%	-3.4	1.2	1950	48%	-3.2	2.1	2350	46%	-3.3	0.4
900	45%	-3.5	1.4	1970	49%	-3.1	2.6	2370	42%	-3.8	0.3
910	43%	-3.6	1.0	1990	48%	-3.2	2.8	2390	39%	-4.1	0.3
920	41%	-3.9	0.4	2010	44%	-3.6	2.7	2410	37%	-4.4	0.0
930	39%	-4.0	0.0	2030	42%	-3.7	2.3	2430	35%	-4.5	0.0
940	38%	-4.2	-0.2	2050	43%	-3.6	2.6	2450	33%	-4.8	0.3
950	38%	-4.2	-0.4	2070	47%	-3.3	2.5	2470	33%	-4.9	0.8
960	40%	-4.0	-0.5	2090	50%	-3.0	2.2	2490	34%	-4.7	1.1
1710	55%	-2.6	3.7	2110	52%	-2.8	2.3	2510	37%	-4.4	1.3
1730	57%	-2.4	3.5	2130	55%	-2.6	2.1	2530	39%	-4.1	1.7
1750	57%	-2.5	3.2	2150	57%	-2.4	1.5	2550	41%	-3.9	1.9
1770	57%	-2.5	3.5	2170	55%	-2.6	1.2	2570	43%	-3.6	2.0
1790	58%	-2.4	3.8	2190	54%	-2.7	0.7	2590	46%	-3.4	2.0
1810	58%	-2.4	3.4	2210	52%	-2.8	0.3	2610	47%	-3.3	2.3
1830	56%	-2.5	3.5	2230	51%	-2.9	0.1	2630	45%	-3.4	1.9
1850	58%	-2.4	3.7	2250	51%	-3.0	0.2	2650	45%	-3.4	1.7
1870	57%	-2.5	2.8	2270	50%	-3.0	0.3	2670	45%	-3.4	1.9
1890	54%	-2.7	2.2	2290	47%	-3.3	0.3	2690	48%	-3.2	1.9
1910	55%	-2.6	2.4	2310	47%	-3.3	0.5				

3D Pattern:

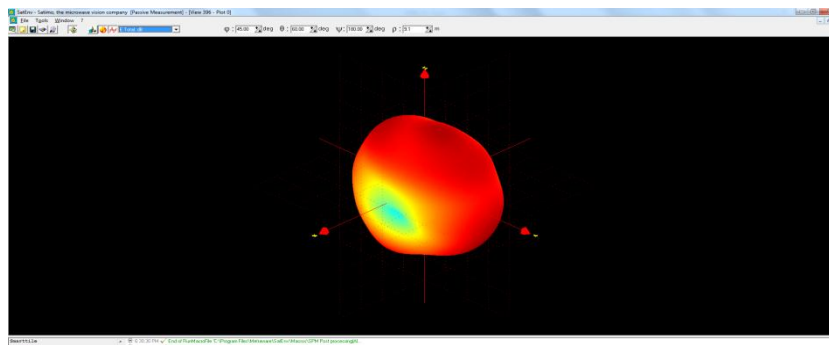
880-960



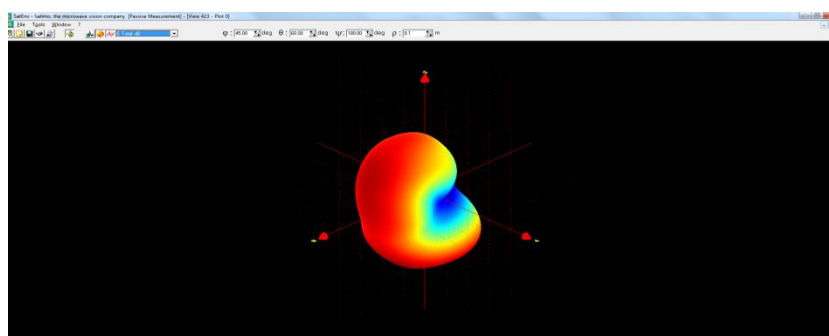
1710-2690



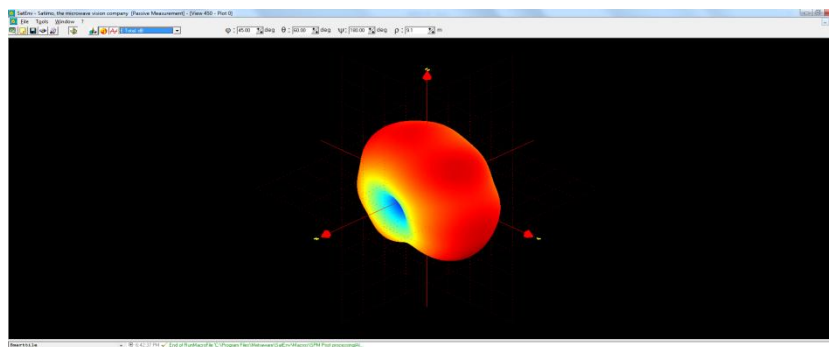
791-862



1450-1500



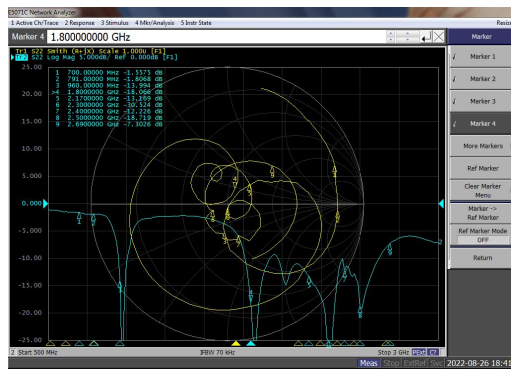
700-800



DIV Antenna

S11:

820-960 1800-2700

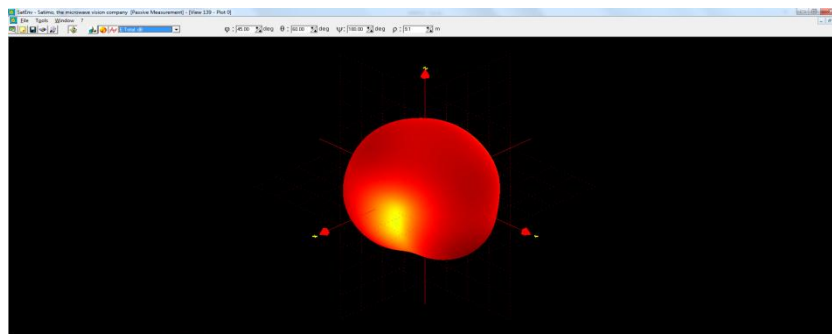


Efficiency&Gain: 效率换算平均增益=10*log（对应的效率）

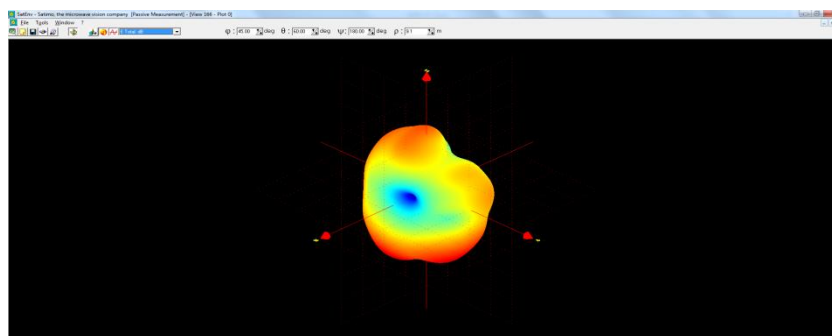
f(MHz)	Efficiency	Average gain	Max gain	f(MHz)	Efficiency	Average gain	Max gain
910	28%	-5.5	-2.1	2200	39%	-4.1	2.1
920	32%	-4.9	-1.3	2220	40%	-3.9	2.2
930	36%	-4.4	-0.6	2240	41%	-3.8	2.7
940	40%	-4.0	0.3	2260	41%	-3.9	2.8
950	43%	-3.7	0.8	2280	41%	-3.9	3.2
960	45%	-3.5	1.3	2300	41%	-3.8	3.5
1800	45%	-3.5	3.5	2320	40%	-4.0	3.6
1820	46%	-3.4	3.8	2340	40%	-4.0	4.0
1840	43%	-3.7	3.4	2360	41%	-3.9	4.1
1860	38%	-4.3	2.5	2380	41%	-3.9	3.9
1880	33%	-4.9	2.1	2400	40%	-4.0	3.7
1900	29%	-5.3	1.6	2420	41%	-3.9	3.5
1920	27%	-5.6	0.5	2440	41%	-3.9	3.2
1940	27%	-5.7	0.2	2460	41%	-3.9	3.1
1960	27%	-5.7	-0.2	2480	38%	-4.2	2.9
1980	27%	-5.7	-0.3	2500	37%	-4.3	2.5
2000	27%	-5.8	-1.0	2520	37%	-4.4	1.9
2020	26%	-5.8	-1.2	2540	36%	-4.5	1.8
2040	25%	-6.0	-1.3	2560	33%	-4.8	1.5
2060	24%	-6.2	-1.2	2580	33%	-4.8	1.3
2080	25%	-6.0	-1.5	2600	33%	-4.8	0.9
2100	26%	-5.9	-1.2	2620	32%	-4.9	0.7
2120	28%	-5.5	-0.6	2640	29%	-5.4	-0.1
2140	30%	-5.2	0.1	2660	27%	-5.7	-0.5
2160	34%	-4.7	0.6	2680	26%	-5.9	-0.6
2180	36%	-4.5	1.3	2700	24%	-6.1	-0.7

3D Pattern:

920-960



1800-2700



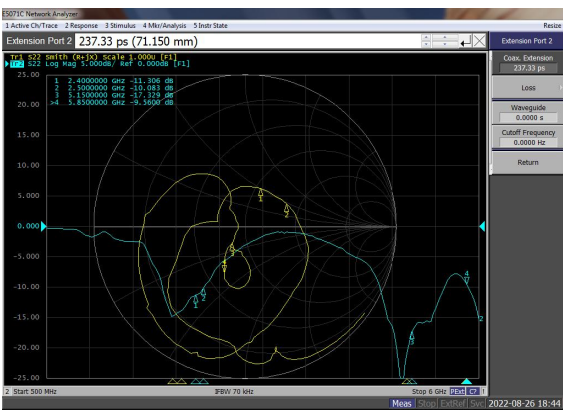
WIFI Antenna

S11:

WIFI1



WIFI2



Efficiency&Gain: 效率换算平均增益=10*log（对应的效率）

WIFI1

f(MHz)	Efficiency	Average gain	Max gain	f(MHz)	Efficiency	Average gain	Max gain
2400	32%	-4.9	4.2	5150	32%	-4.9	0.4
2410	33%	-4.8	4.4	5200	33%	-4.8	0.2
2420	34%	-4.7	4.5	5250	33%	-4.8	0.0
2430	34%	-4.7	4.4	5300	33%	-4.8	0.7
2440	34%	-4.6	4.4	5350	34%	-4.7	0.6
2450	35%	-4.6	4.3	5400	36%	-4.4	0.4
2460	35%	-4.6	4.2	5450	34%	-4.6	0.2
2470	34%	-4.6	4.1	5500	33%	-4.8	0.0
2480	34%	-4.7	4.1	5550	36%	-4.4	0.1
2490	34%	-4.7	3.9	5600	35%	-4.6	0.0
2500	35%	-4.6	3.7	5650	36%	-4.4	0.2
				5700	35%	-4.5	-0.4
				5750	36%	-4.5	0.6
				5800	36%	-4.4	0.7
				5850	39%	-4.1	1.4

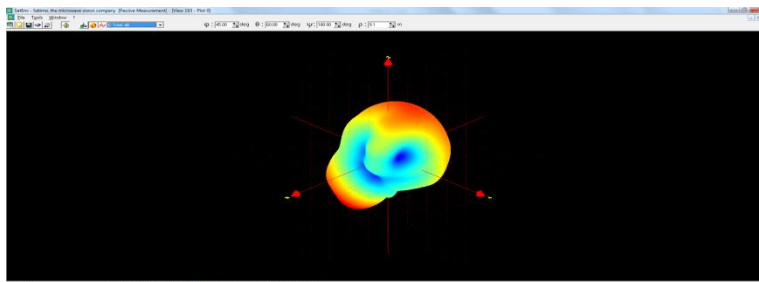
WIFI2

f(MHz)	Efficiency	Average gain	Max gain	f(MHz)	Efficiency	Average gain	Max gain
2400	65%	-1.9	3.1	5150	56%	-2.5	3.2
2410	65%	-1.9	3.1	5200	53%	-2.7	2.8
2420	65%	-1.9	2.9	5250	55%	-2.6	2.9
2430	64%	-1.9	2.9	5300	52%	-2.8	2.9
2440	65%	-1.9	2.9	5350	45%	-3.4	2.9
2450	66%	-1.8	2.9	5400	39%	-4.0	2.8
2460	66%	-1.8	2.9	5450	44%	-3.6	3.0
2470	66%	-1.8	2.8	5500	43%	-3.6	3.1
2480	65%	-1.9	2.5	5550	45%	-3.4	3.2
2490	64%	-1.9	2.3	5600	45%	-3.4	2.8
2500	64%	-1.9	2.5	5650	46%	-3.4	2.8
				5700	45%	-3.4	2.5
				5750	51%	-3.0	2.7
				5800	60%	-2.2	3.6
				5850	54%	-2.7	2.8

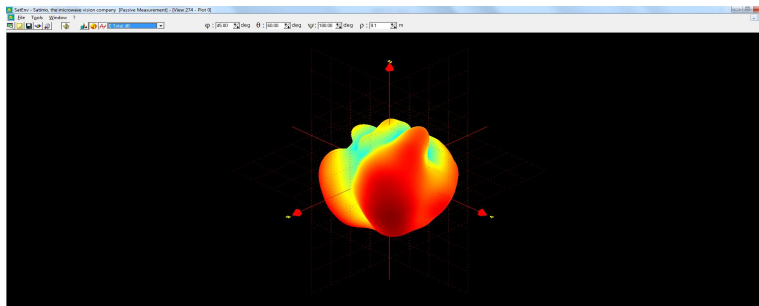
3D Pattern:

WIFI1

2400-2500

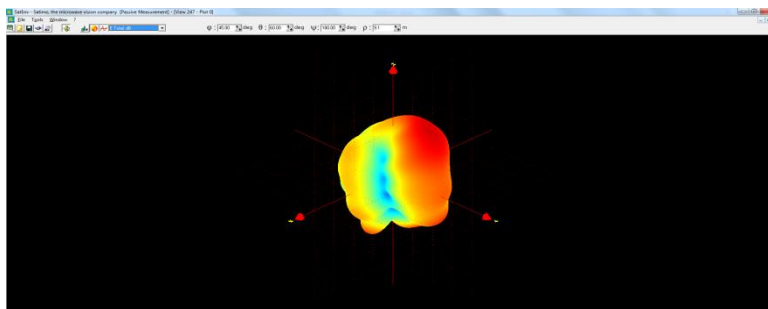


5150-5850

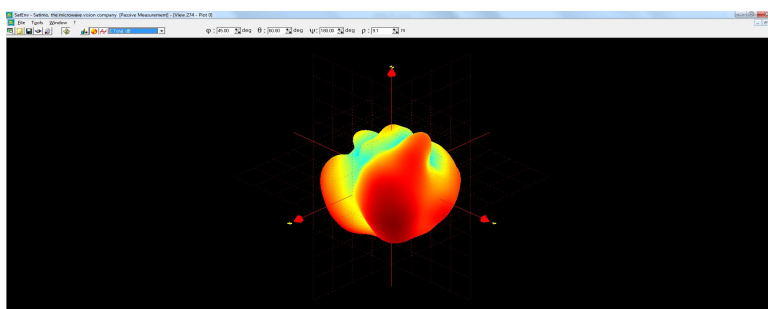


WIFI2

2400-2500



5150-5850



According to KDB 662911

beamforming directional gain= $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}] \text{ dBi}$