SPECIFICATION

H500 Antenna

Product approval sheet

Customer		Band	5G
Project	H500	Colour	Black

Customer check：

Reach requirement of customer：☑OK □NG

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1.2 Antenna Matching circuits

ANT0

NC

ANT2

NC

ANT4

ANT4	
Element	Value
R914	0 ohm
L912	8.2NH
C922	4.7PF
L911	NC
C930	33PF

ANT4 switch

R901(RF3)	0 ohm	WCDMA B5 LTE B5 B20 B26 NR N5 N26
R902(RF2)	0 ohm	WCDMA8
L901(RF4)	22NH	LTE B12/17/ B28 B29 NR N12 N29
L902(RF1)	12NH	LTE B13 B14 NR N13 N14
C913	33PF	
C914	12NH	LTE B71 NR/71

ANT5	
Element	Value
R913	0 ohm
L910	10NH
C921	8.2PF
L909	NC
C934	33PF

ANT5 switch

L903(RF4)	0 ohm	WCDMA B5 LTE B5 B20 B26 NR N5 N26
L904(RF1)	0 ohm	WCDMA8
R903(RF3)	47NH	LTE B12/17/ B28 B29 NR N12 N29
R904(RF2)	12NH	LTE B13 B14 NR N13 N14
C915	33PF	
C916	27NH	LTE B71 NR/71

WIFI-1

NC

WIFI-2

NC

1.3 Antenna PORT

1.4 Antenna location

1.5 RF port

1.6 Tester name: chen hai jin

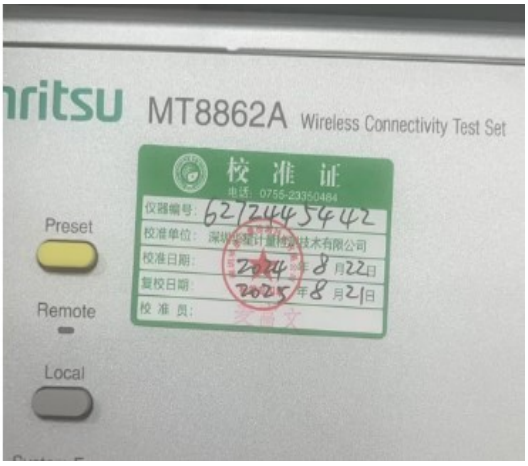
1.7 testing software: ats300

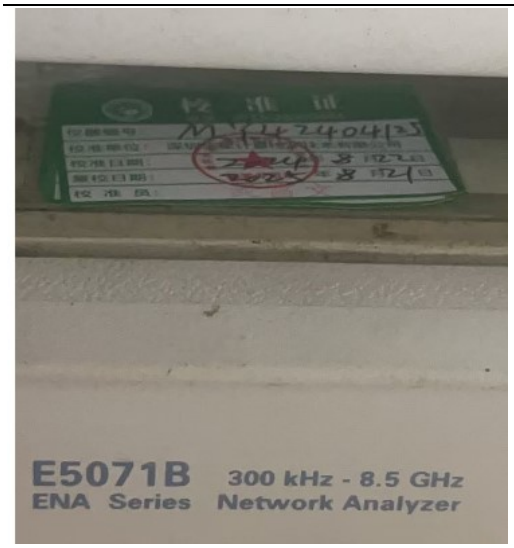
1.8Antrnna type :

ANT0:PIFA ANT1:PIFA ANT2:PIFA ANT3:PIFA ANT4:PIFA

ANT5: PIFA WIFI1: PIFA wifi2:PIFA GPS: PIFA

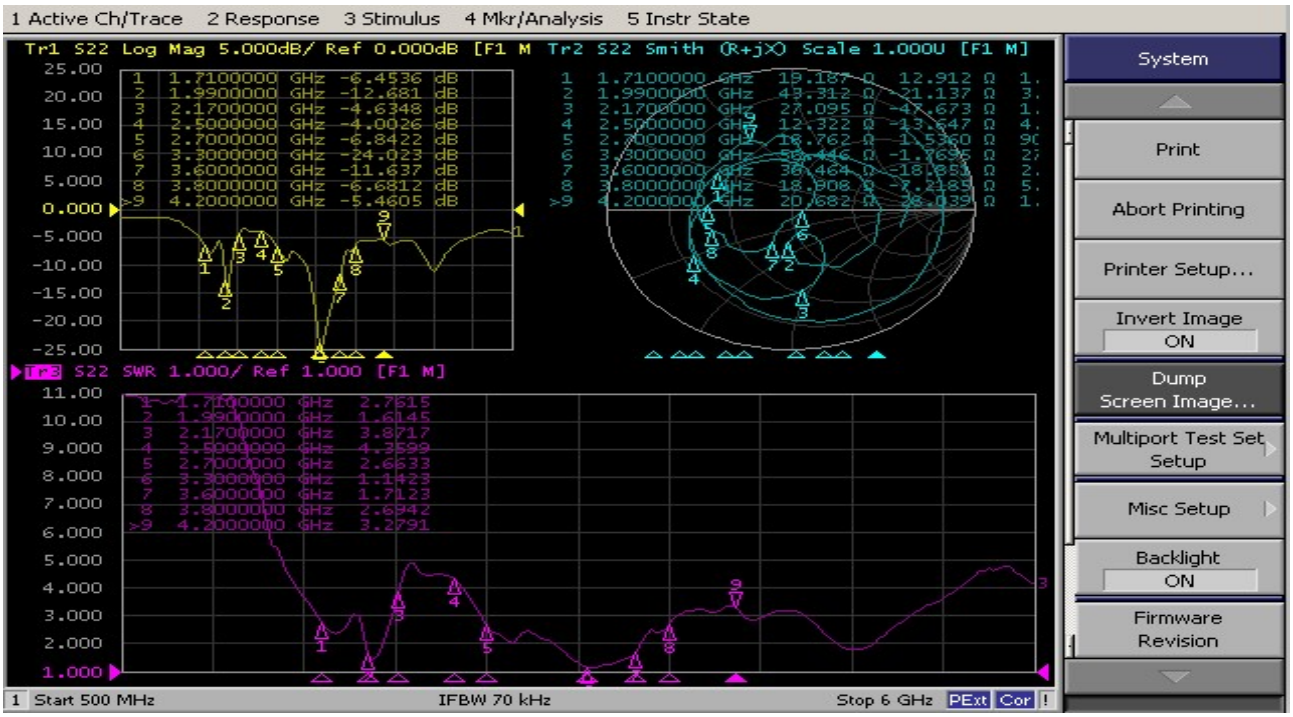
1.9 Instrument calibration date:



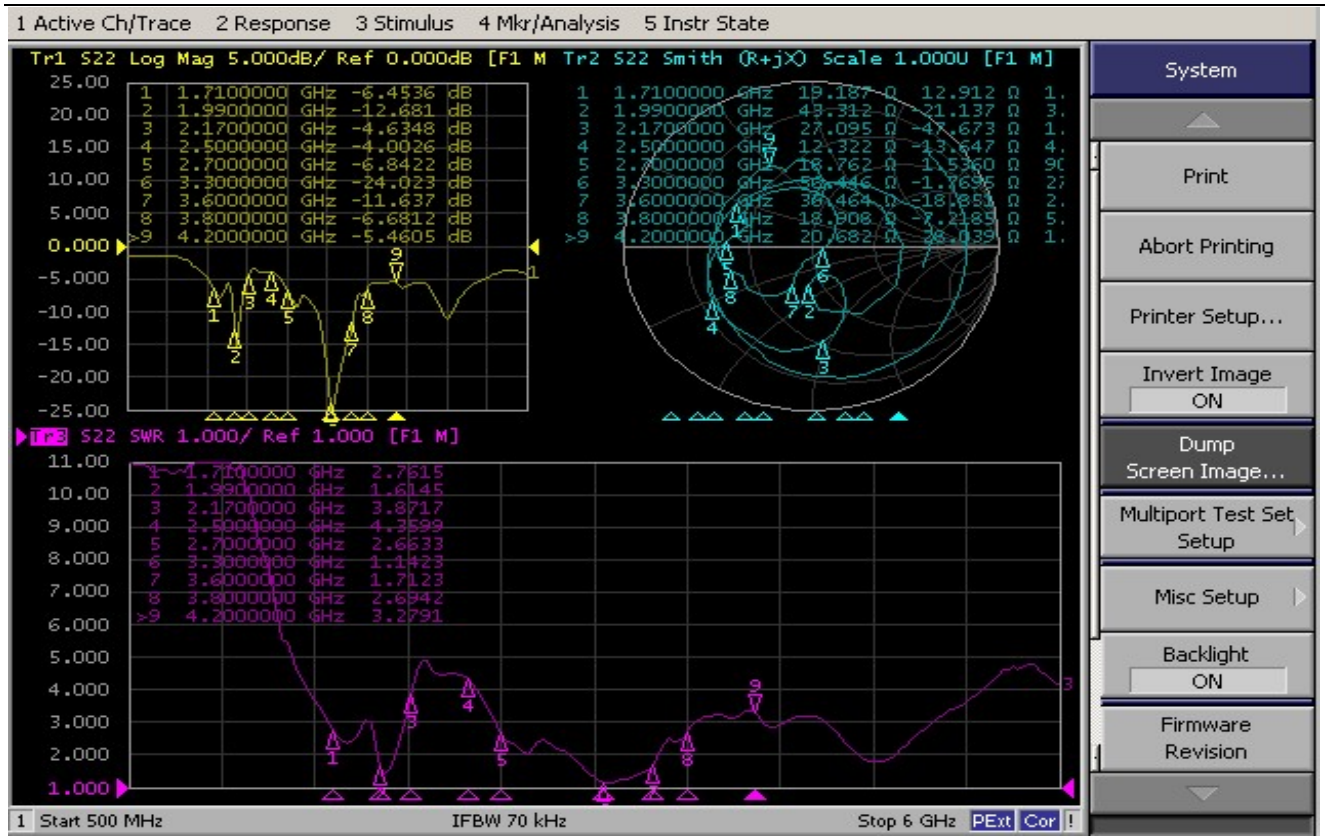


2 Electrical performance

2.1 VSWR



ANT0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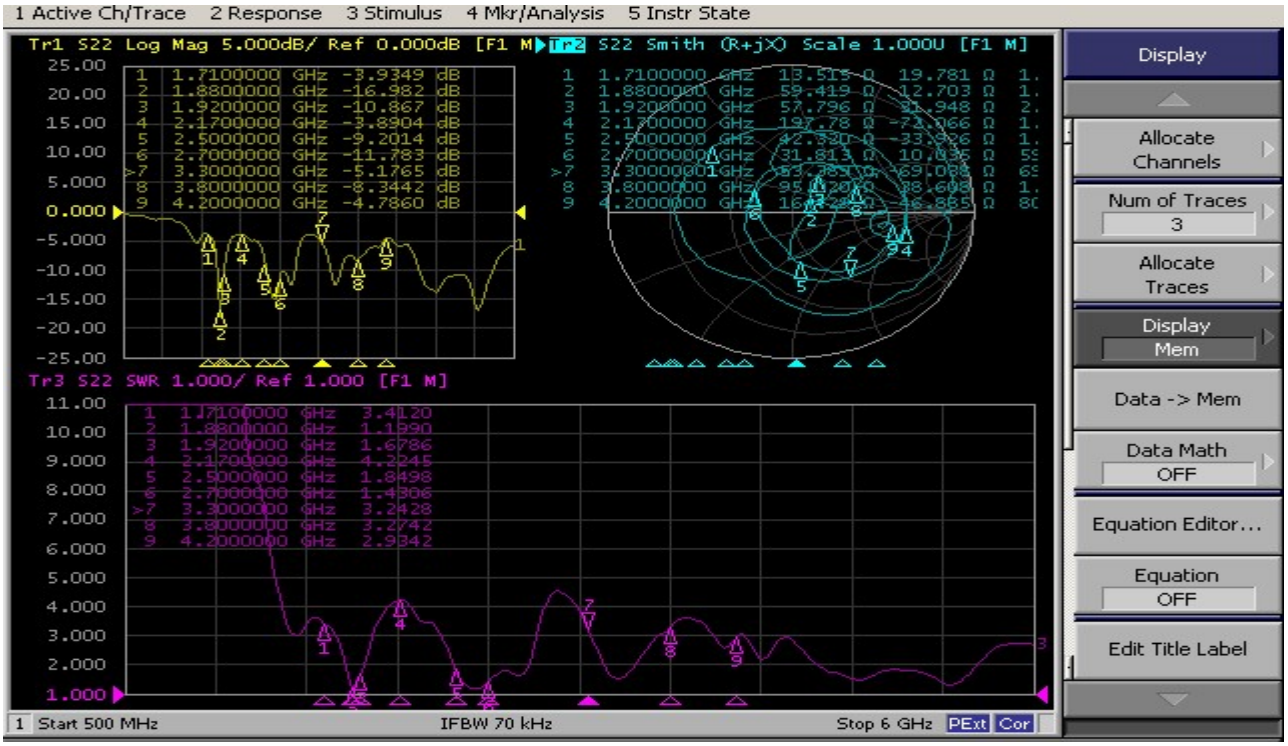
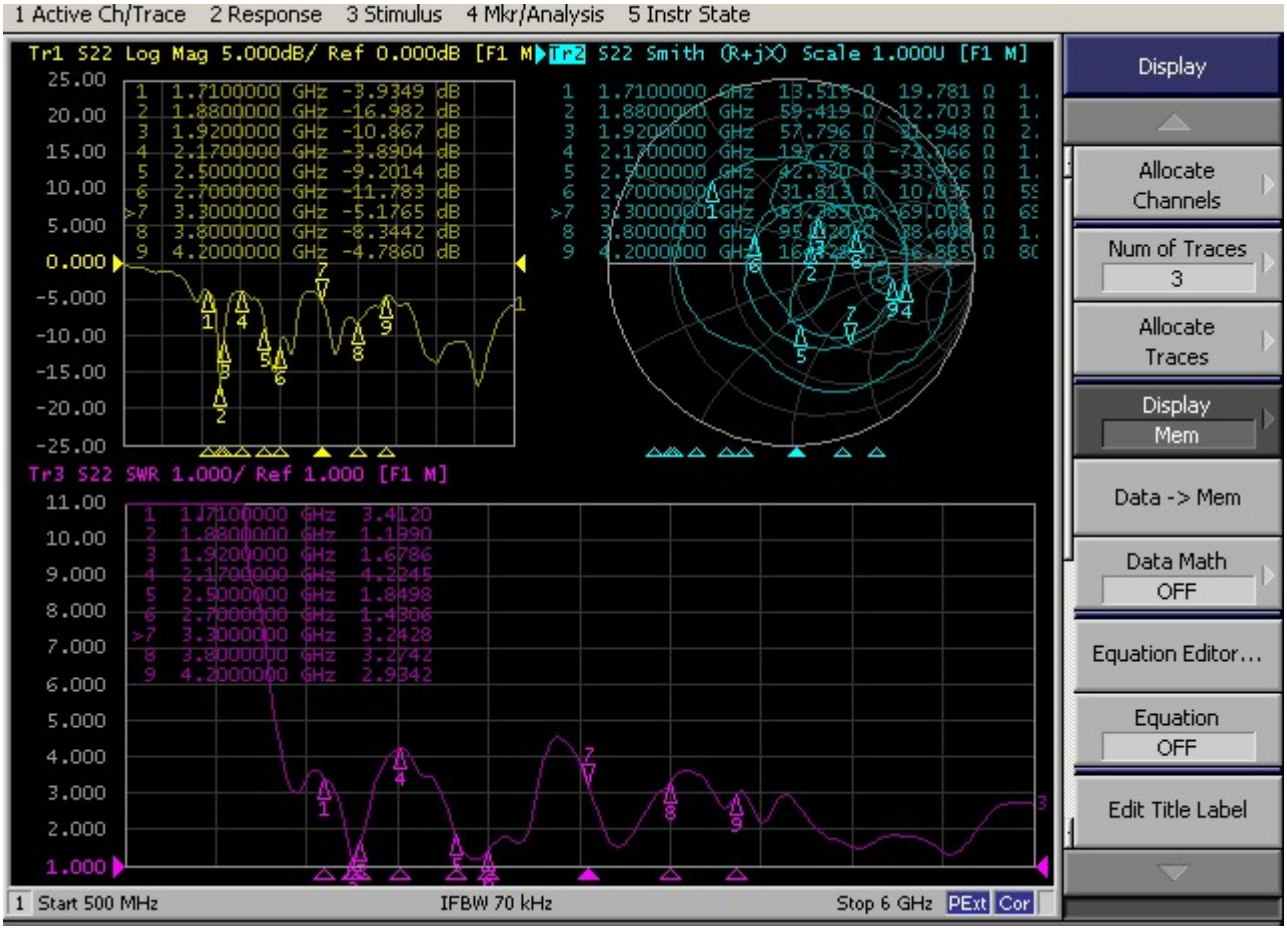
Tr1 S22 Log Mag 5.000dB/ Ref 0.000dB [F1 M
Tr2 S22 Smith (R+jX) Scale 1.000U [F1 M]
Tr3 S22 SWR 1.000/ Ref 1.000 [F1 M]
1 1.7100000 GHz -6.4536 dB
2 1.9900000 GHz -12.681 dB
3 2.1700000 GHz -4.6348 dB
4 2.5000000 GHz -4.0026 dB
5 2.7000000 GHz -6.8422 dB
6 3.3000000 GHz -24.023 dB
7 3.6000000 GHz -11.637 dB
8 3.8000000 GHz -6.6812 dB
>9 4.2000000 GHz -5.4605 dB
1 Start 500 MHz
IFBW 70 kHz
Stop 6 GHz
System
Print
Abort Printing
Printer Setup...
Invert Image
ON
Dump Screen Image...
Multiport Test Set Setup
Misc Setup
Backlight
ON
Firmware Revision

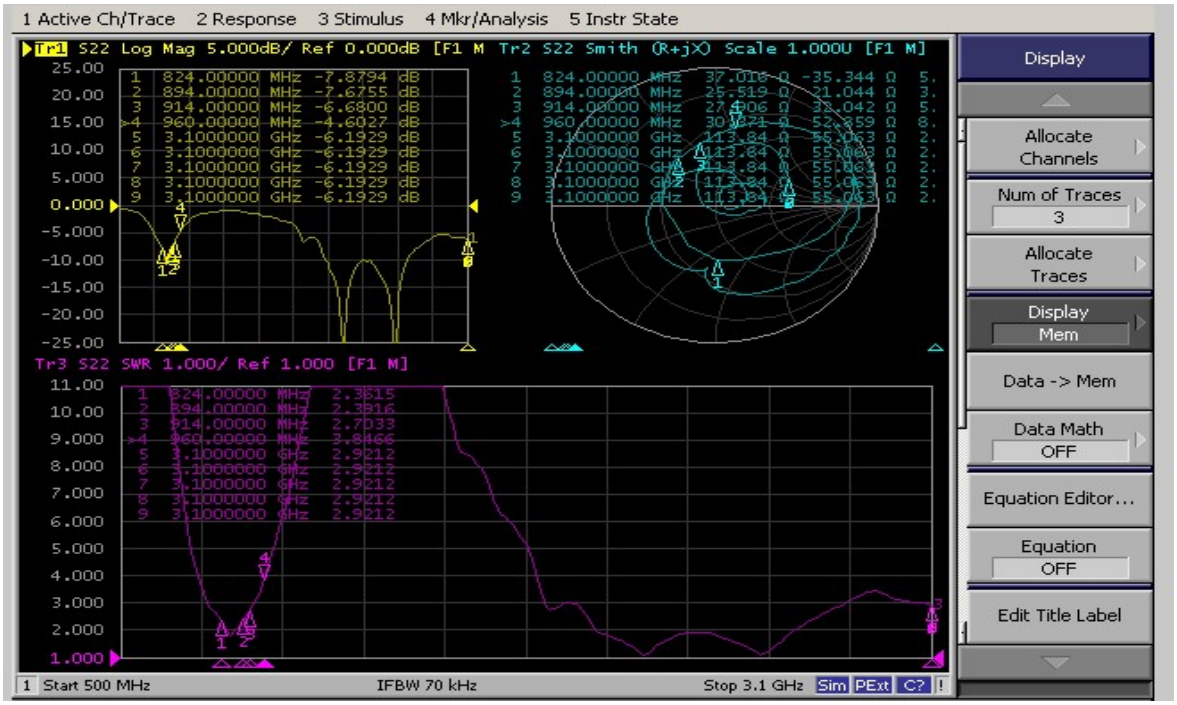
ANT1


1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Tr1 S22 Log Mag 5.000dB/ Ref 0.000dB [F1 M
Tr2 S22 Smith (R+jX) Scale 1.000U [F1 M]
Tr3 S22 SWR 1.000/ Ref 1.000 [F1 M]
1 1.7100000 GHz -3.9349 dB
2 1.8800000 GHz -16.982 dB
3 1.9200000 GHz -10.867 dB
4 2.1700000 GHz -3.8904 dB
5 2.5000000 GHz -9.2014 dB
6 2.7000000 GHz -11.783 dB
>7 3.3000000 GHz -5.1765 dB
8 3.8000000 GHz -8.3442 dB
9 4.2000000 GHz -4.7860 dB
1 Start 500 MHz
IFBW 70 kHz
Stop 6 GHz
Display
Allocate Channels
Num of Traces
3
Allocate Traces
Display Mem
Data -> Mem
Data Math
OFF
Equation Editor...
Equation
OFF
Edit Title Label

ANT2


1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Tr1 S22 Log Mag 5.000dB/ Ref 0.000dB [F1 M]
Tr2 S22 Smith (R+jX) Scale 1.000U [F1 M]
Tr3 S22 SWR 1.000/ Ref 1.000 [F1 M]
1 1.7100000 GHz -3.9349 dB
2 1.8800000 GHz -16.982 dB
3 1.9200000 GHz -10.867 dB
4 2.1700000 GHz -3.8904 dB
5 2.5000000 GHz -9.2014 dB
6 2.7000000 GHz -11.783 dB
>7 3.3000000 GHz -5.1765 dB
8 3.8000000 GHz -8.3442 dB
9 4.2000000 GHz -4.7860 dB
1 Start 500 MHz
IFBW 70 kHz
Stop 6 GHz
PExt
Cor
Display
Allocate Channels
Num of Traces
3
Allocate Traces
Display
Mem
Data -> Mem
Data Math
OFF
Equation Editor...
Equation
OFF
Edit Title Label

ANT3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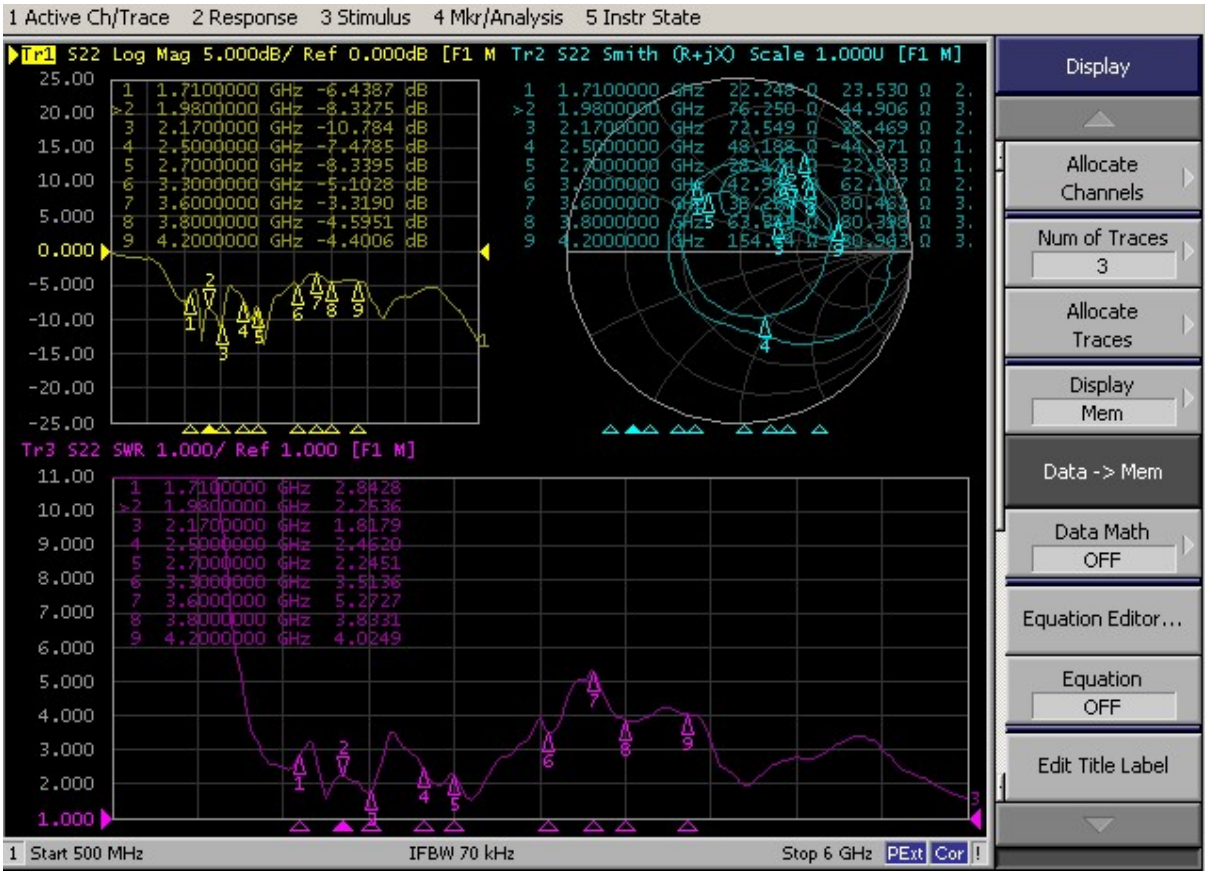
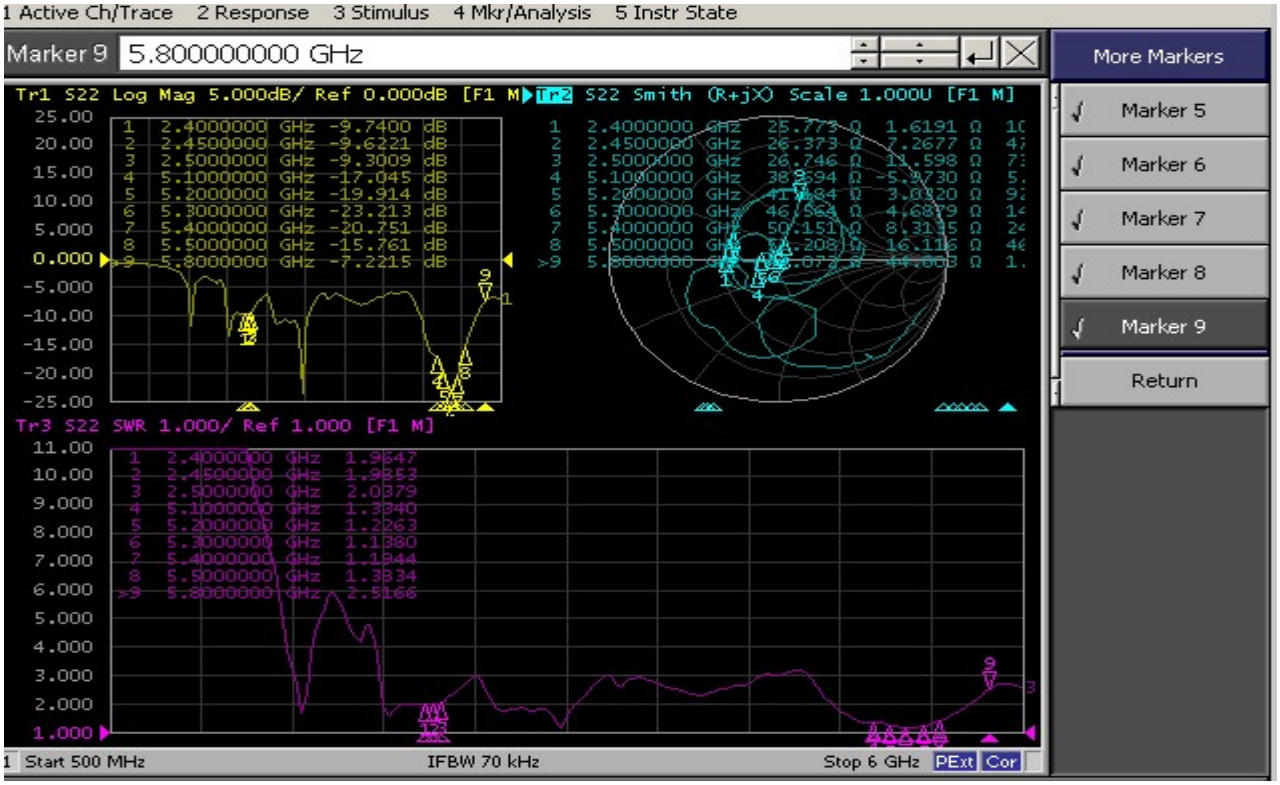
Tr1 S22 Log Mag 5.000dB/ Ref 0.000dB [F1 M Tr2 S22 Smith (R+jX) Scale 1.000U [F1 M]
Tr3 S22 SWR 1.000/ Ref 1.000 [F1 M]
Display
Allocate Channels
Num of Traces
3
Allocate Traces
Display
Mem
Data -> Mem
Data Math
OFF
Equation Editor...
Equation
OFF
Edit Title Label
1 Start 500 MHz
IFBW 70 kHz
Stop 3.1 GHz

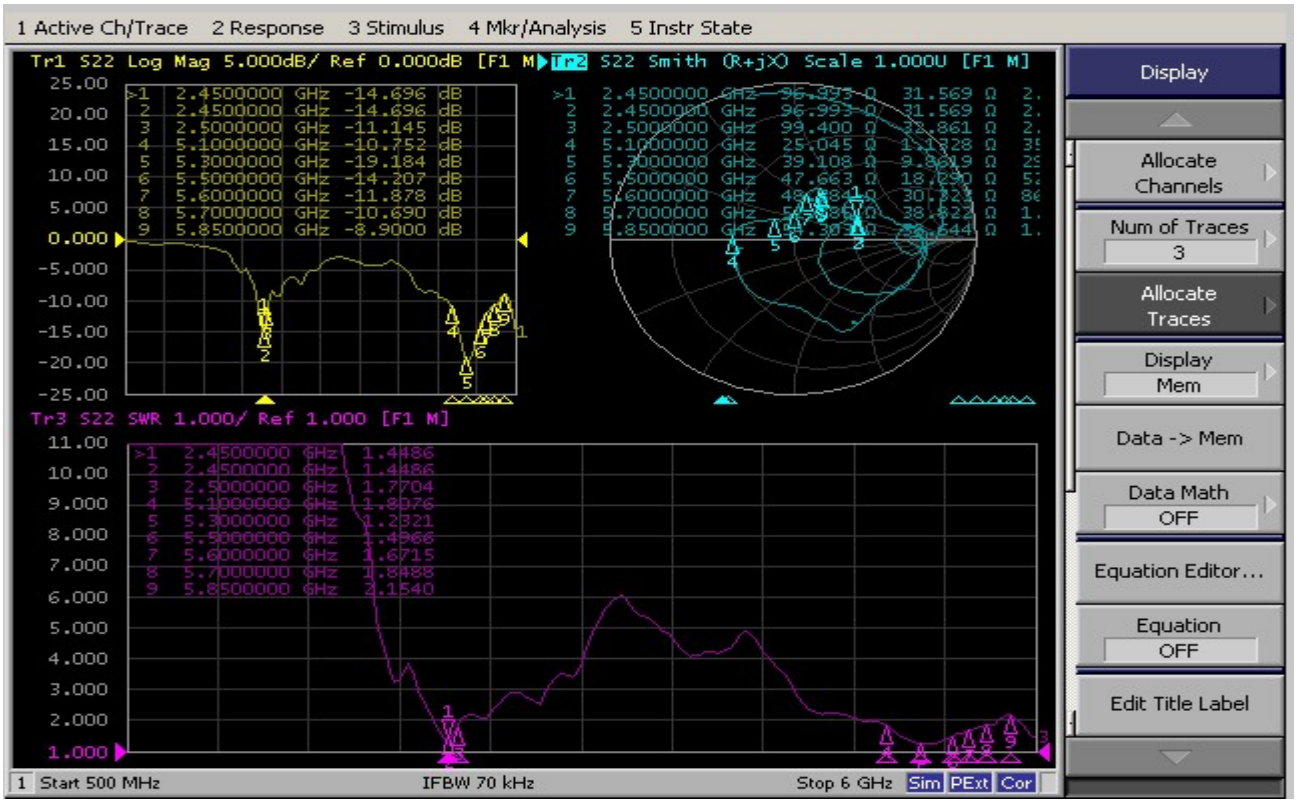
ANT4


1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Tr1 S22 Log Mag 5.000dB/ Ref 0.000dB [F1 M Tr2 S22 Smith (R+jX) Scale 1.000U [F1 M]
Tr3 S22 SWR 1.000/ Ref 1.000 [F1 M]
Display
Allocate Channels
Num of Traces
3
Allocate Traces
Display
Mem
Data -> Mem
Data Math
OFF
Equation Editor...
Equation
OFF
Edit Title Label
1 Start 500 MHz
IFBW 70 kHz
Stop 6 GHz

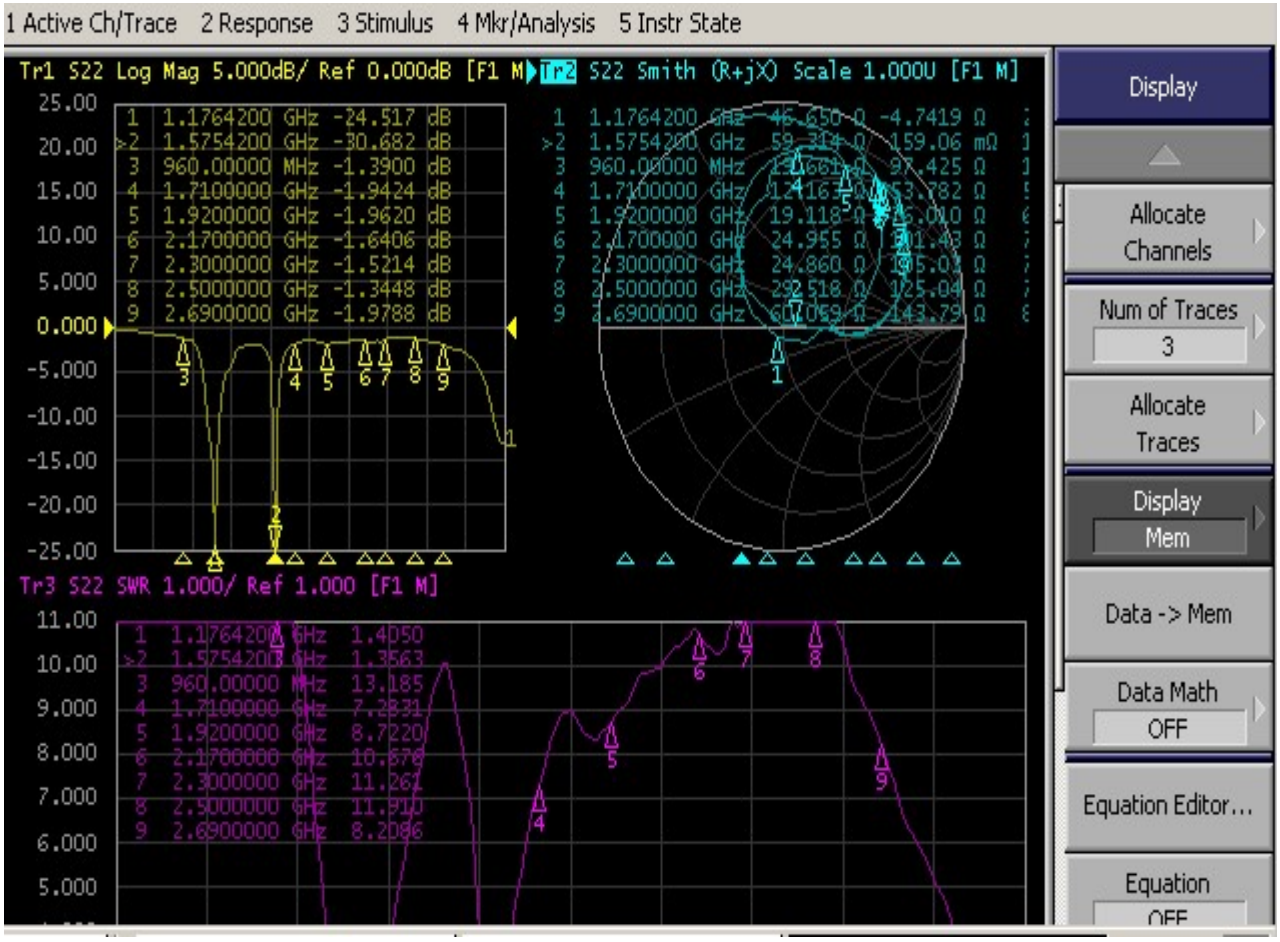
ANT5


1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Marker 9 5.800000000 GHz
More Markers
Marker 5
Marker 6
Marker 7
Marker 8
Marker 9
Return
Tr1 S22 Log Mag 5.000dB/ Ref 0.000dB [F1 M]
Tr2 S22 Smith (R+jX) Scale 1.000U [F1 M]
Tr3 S22 SWR 1.000/ Ref 1.000 [F1 M]
1 Start 500 MHz
IFBW 70 kHz
Stop 6 GHz PExt Cor

WIFI-1


1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Display
Allocate Channels
Num of Traces 3
Allocate Traces
Display Mem
Data -> Mem
Data Math OFF
Equation Editor...
Equation OFF
Edit Title Label
Tr1 S22 Log Mag 5.000dB/ Ref 0.000dB [F1 M]
Tr2 S22 Smith (R+jX) Scale 1.000U [F1 M]
Tr3 S22 SWR 1.000/ Ref 1.000 [F1 M]
1 Start 500 MHz
IFBW 70 kHz
Stop 6 GHz Sim PExt Cor

WIFI-2



GPS

2.2 Efficiency &Gain

ANT0

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1700	39.92	-3.99	1.47
1710	39.28	-4.06	1.29
1720	37.89	-4.22	0.96
1730	37.76	-4.23	0.8
1740	36.77	-4.35	0.37
1750	35.9	-4.45	0.21
1760	36.81	-4.34	0.23
1770	35.17	-4.54	-0.11
1780	36.64	-4.36	-0.08
1790	35.73	-4.47	0.29

1800	34.54	-4.62	0.59
1810	34.04	-4.68	1.05
1820	35.46	-4.5	1.42
1830	37.94	-4.21	1.85
1840	42.93	-3.67	2.16
1850	48.86	-3.11	2.4
1860	51.75	-2.86	1.85
1870	52.06	-2.84	1.59
1880	50.87	-2.94	1.62
1890	49.75	-3.03	1.73
1900	49.71	-3.04	1.8
1910	45.82	-3.39	1.46
1920	41.96	-3.77	1.03
1930	40.98	-3.87	1.05
1940	38.05	-4.2	0.81
1950	39.57	-4.03	1.06
1960	38.79	-4.11	1.11
1970	38.25	-4.17	1.05
1980	39.95	-3.98	1.33
1990	42.08	-3.76	1.48
2000	43.61	-3.6	1.62
2010	43.99	-3.57	1.61
2020	40.17	-3.96	1.18
2030	37.9	-4.21	0.85
2040	35.22	-4.53	0.46
2050	34.15	-4.67	0.17
2060	37.04	-4.31	0.53
2070	39.96	-3.98	0.74
2080	39.95	-3.98	0.75
2090	41.38	-3.83	0.65
2100	43.04	-3.66	1.08
2110	36.89	-4.33	0.94
2120	35.47	-4.5	1.16
2130	34.9	-4.57	1.5
2140	35.03	-4.56	1.63
2150	34.49	-4.62	1.51
2160	34	-4.69	1.2
2170	33.65	-4.73	0.68

2180	34.18	-4.66	0.1
2190	33.51	-4.75	-0.51
2200	33.26	-4.78	-1.03
2300	20.97	-6.79	-2.11
2310	22.51	-6.48	-2.08
2320	25.26	-5.98	-1.6
2330	27.78	-5.56	-1.39
2340	31.18	-5.06	-0.96
2350	31.46	-5.02	-0.79
2360	32.83	-4.84	-0.39
2370	32.41	-4.89	-0.32
2380	33.45	-4.76	-0.12
2390	33.3	-4.78	-0.17
2400	34.32	-4.64	-0.18
2500	30.98	-5.09	-1.2
2510	31.5	-5.02	-1.15
2520	30.57	-5.15	-1.1
2530	32.15	-4.93	-0.66
2540	31.7	-4.99	-0.34
2550	32.25	-4.92	-0.1
2560	31.52	-5.01	0.02
2570	32.16	-4.93	0.35
2580	29.46	-5.31	0.09
2590	28.14	-5.51	0.16
2600	29.17	-5.35	0.42
2610	27.96	-5.54	0.36
2620	26.01	-5.85	0.03
2630	25.58	-5.92	-0.03
2640	27.02	-5.68	0.25
2650	27.25	-5.65	0.26
2660	28.62	-5.43	0.53
2670	29.26	-5.34	0.57
2680	29.87	-5.25	0.74
2690	29.69	-5.27	0.71
2700	29.87	-5.25	0.63

ANT1

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1700	25.59	-5.92	1.18
1710	27.2	-5.65	1.56
1720	30.47	-5.16	1.93

1730	30.45	-5.16	1.8
1740	30.18	-5.2	1.38
1750	31.71	-4.99	1.28
1760	33.3	-4.78	1.44
1770	35.74	-4.47	1.56
1780	36.88	-4.33	1.52
1790	35.64	-4.48	1.28
1800	35.54	-4.49	1.28
1810	35.47	-4.5	1.16
1820	34.07	-4.68	0.89
1830	32.65	-4.86	1.08
1840	31.4	-5.03	1.58
1850	30.81	-5.11	1.92
1860	32.12	-4.93	2.17
1870	31.15	-5.07	1.99
1880	30.06	-5.22	1.72
1890	30.55	-5.15	1.62
1900	34.26	-4.65	0.86
1910	39.62	-4.02	1.29
1920	45.13	-3.46	2.4
1930	46.27	-3.35	2.95
1940	42.92	-3.67	2.93
1950	40.53	-3.92	3.04
1960	36.29	-4.4	2.79
1970	32.63	-4.86	2.45
1980	30.89	-5.1	2.23
1990	28.54	-5.45	1.83
2000	28	-5.53	1.54
2010	27.62	-5.59	1.17
2020	26.51	-5.77	0.58
2030	27.55	-5.6	0.41
2040	29.03	-5.37	0.13
2050	31.35	-5.04	-0.13
2060	34.14	-4.67	0.48
2070	35.49	-4.5	1.11
2080	34.84	-4.58	1.35
2090	35.61	-4.48	1.89
2100	36.2	-4.41	1.85
2110	33.06	-4.81	1.3
2120	32.67	-4.86	1
2130	33.48	-4.75	1.17
2140	34.12	-4.67	1.18
2150	33.21	-4.79	1.01
2160	32.33	-4.9	0.77

2170	32.58	-4.87	0.94
2180	32.08	-4.94	1.08
2190	32.51	-4.88	1.31
2200	32.63	-4.86	1.56
2300	30.76	-5.12	0.1
2310	30.19	-5.2	0.13
2320	30.5	-5.16	0.44
2330	32.06	-4.94	1.03
2340	33.55	-4.74	1.48
2350	32.8	-4.84	1.63
2360	33.82	-4.71	1.67
2370	32.97	-4.82	1.6
2380	35.13	-4.54	1.65
2390	36.87	-4.33	1.88
2400	37.7	-4.24	1.87
2410	37.27	-4.29	1.88
2420	38.28	-4.17	2.01
2430	37.73	-4.23	2.01
2440	39.61	-4.02	2.24
2450	40.36	-3.94	2.36
2460	38.68	-4.13	2.21
2470	36.99	-4.32	1.97
2480	36.22	-4.41	1.86
2490	35.97	-4.44	1.78
2500	36.49	-4.38	1.76
2510	34.86	-4.58	1.41
2520	33.79	-4.71	0.95
2530	33.92	-4.7	0.76
2540	32.1	-4.94	0.29
2550	32.67	-4.86	0.56
2560	32.99	-4.82	0.76
2570	33.48	-4.75	0.92
2580	33.37	-4.77	0.94
2590	33.15	-4.79	0.73
2600	32.9	-4.83	0.62
2610	32.62	-4.87	0.43
2620	30.24	-5.19	0.09
2630	29.89	-5.24	-0.04
2640	31.24	-5.05	0.21
2650	31.66	-4.99	0.32
2660	32.34	-4.9	0.37
2670	32.67	-4.86	0.46
2680	31.48	-5.02	0.26
2690	30.96	-5.09	0.14

2700	30.51	-5.16	0.24
3300	47.44	-3.24	2.86
3310	51.42	-2.89	3.08
3320	53.37	-2.73	3.16
3330	52.35	-2.81	3.03
3340	50.41	-2.97	2.71
3350	53	-2.76	2.79
3360	54.06	-2.67	2.68
3370	50.5	-2.97	2.32
3380	50.39	-2.98	2.29
3390	54.04	-2.67	2.62
3400	55.92	-2.52	2.89
3410	47.7	-3.21	2.48
3420	48.58	-3.13	2.61
3430	52.5	-2.8	2.93
3440	51.97	-2.84	2.7
3450	47.58	-3.23	2.19
3460	44.62	-3.5	1.83
3470	45.77	-3.39	2.06
3480	48.82	-3.11	2.42
3490	46.66	-3.31	2.19
3500	45.58	-3.41	2.09
3510	48.73	-3.12	2.42
3520	50.2	-2.99	2.69
3530	48.77	-3.12	2.58
3540	48.86	-3.11	2.67
3550	54.43	-2.64	3.16
3560	53.96	-2.68	3.1
3570	52.14	-2.83	2.91
3580	47.66	-3.22	2.5
3590	50.12	-3	2.67
3600	50.38	-2.98	2.65
3610	48.18	-3.17	2.33
3620	43.44	-3.62	1.99
3630	44.47	-3.52	2.15
3640	45.54	-3.42	2.36
3650	45.04	-3.46	2.37
3660	42.02	-3.77	2.23
3670	38.72	-4.12	1.75
3680	37.61	-4.25	1.64
3690	35.57	-4.49	1.17
3700	36.37	-4.39	1.19
3710	39.33	-4.05	1.32
3720	40.92	-3.88	1.47

3730	38.33	-4.16	1.19
3740	34.16	-4.66	0.61
3750	35.57	-4.49	0.81
3760	39.6	-4.02	1.31
3770	39.34	-4.05	1.27
3780	35.3	-4.52	0.97
3790	34.75	-4.59	1.01
3800	36.67	-4.36	1.4
3810	42.04	-3.76	1.95
3820	40.53	-3.92	1.76
3830	37.63	-4.24	1.33
3840	37.32	-4.28	1.36
3850	38.96	-4.09	1.6
3860	39.05	-4.08	1.53
3870	41.62	-3.81	1.73
3880	45.7	-3.4	2.2
3890	47.22	-3.26	2.64
3900	49.91	-3.02	3.21
3910	50.72	-2.95	3.46
3920	55.8	-2.53	4.06
3930	60.38	-2.19	4.6
3940	62.88	-2.02	4.85
3950	58.07	-2.36	4.51
3960	60.4	-2.19	4.72
3970	67.23	-1.72	5.29
3980	68.92	-1.62	5.43
3990	65.54	-1.83	5.15
4000	58.95	-2.3	4.73
4010	57.38	-2.41	4.66
4020	58.9	-2.3	4.85
4030	60.64	-2.17	5.07
4040	59.68	-2.24	5.05
4050	61.5	-2.11	5.2
4060	56.79	-2.46	4.95
4070	53.74	-2.7	4.7
4080	56.46	-2.48	4.95
4090	61.11	-2.14	5.29
4100	59.03	-2.29	5.1
4110	53.06	-2.75	4.55
4120	49	-3.1	4.25
4130	52.45	-2.8	4.4
4140	53.38	-2.73	4.36
4150	55.3	-2.57	4.44
4160	48.94	-3.1	3.79

4170	46.67	-3.31	3.4
4180	44.38	-3.53	3.08
4190	45.98	-3.37	2.96
4200	45.79	-3.39	2.7

ANT2

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
3300	23.18	-6.35	-0.64
3310	23.13	-6.36	-0.54
3320	22.37	-6.5	-0.74
3330	23.22	-6.34	-0.39
3340	22.21	-6.53	-0.63
3350	22.89	-6.4	-0.59
3360	22.66	-6.45	-0.65
3370	22.2	-6.54	-0.77
3380	21.1	-6.76	-0.79
3390	20.73	-6.83	-1.11
3400	22.17	-6.54	-0.72
3410	21.97	-6.58	-0.7
3420	22.27	-6.52	-0.57
3430	20.54	-6.87	-1.06
3440	24.61	-6.09	-0.65
3450	23.89	-6.22	-0.85
3460	23.99	-6.2	-0.87
3470	23.89	-6.22	-0.85
3480	23.99	-6.2	-0.87
3490	24.55	-6.1	-0.57
3500	25.15	-6	-0.37
3510	24.85	-6.05	-0.47
3520	24.78	-6.06	-0.27
3530	24.44	-6.12	-0.25
3540	24.45	-6.12	-0.36
3550	24.61	-6.09	-0.65
3560	29.11	-5.36	-0.65
3570	30.24	-5.19	-0.62
3580	31.06	-5.08	-0.25
3590	33.74	-4.72	-0.14
3600	33.63	-5.59	-1.36
3610	33.64	-5.58	-0.88

3620	33.87	-5.55	-0.73
3630	32.29	-5.8	-0.51
3640	31	-6.02	-0.66
3650	30.55	-6.1	-0.38
3660	29.86	-6.22	-0.54
3670	30.22	-6.16	-0.26
3680	33.06	-4.81	-0.29
3690	32.65	-4.86	-0.38
3700	31.39	-5.03	-0.77
3710	31.22	-5.06	-0.71
3720	33.06	-4.81	-0.29
3730	32.65	-4.86	-0.38
3740	31.39	-5.03	-0.77
3750	31.22	-5.06	-0.71
3760	34.99	-4.56	-0.67
3770	34.88	-4.57	-0.75
3780	34.77	-4.59	-0.29
3790	33.44	-4.76	-0.07
3800	31.73	-4.99	-0.36
3810	39.72	-4.01	1.53
3820	40.57	-3.92	1.57
3830	40.63	-3.91	1.68
3840	41.08	-3.86	1.69
3850	43.55	-3.61	2.11
3860	42.9	-3.68	2.06
3870	43.71	-3.59	2.01
3880	46.65	-3.31	2.13
3890	47.48	-3.23	2.18
3900	47.82	-3.2	2.26
3910	46.3	-3.34	2.05
3920	49.3	-3.07	2.4
3930	51.7	-2.87	2.53
3940	52.99	-2.76	2.65
3950	46.78	-3.3	2.13
3960	46.84	-3.29	2.05
3970	51.2	-2.91	2.34
3980	53.42	-2.72	2.52
3990	51.43	-2.89	2.4
4000	46.07	-3.37	1.7
4010	44.97	-3.47	1.6
4020	46.12	-3.36	1.68
4030	46.8	-3.3	1.77

4040	46.99	-3.28	2.01
4050	49.2	-3.08	2.08
4060	45.04	-3.46	1.63
4070	43.83	-3.58	1.47
4080	45.36	-3.43	1.63
4090	49.22	-3.08	1.77
4100	47.91	-3.2	1.63
4110	44.12	-3.55	1.03
4120	41.4	-3.83	1.54
4130	45.68	-3.4	1.91
4140	46.86	-3.29	1.85
4150	49.51	-3.05	1.93
4160	46.79	-3.3	1.51
4170	47.73	-3.21	1.4
4180	47.37	-3.24	1.22
4190	47.87	-3.2	0.97
4200	48.6	-3.13	1.13

ANT3

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1700	25.77	-5.89	-1.31
1710	25.12	-6	-1.56
1720	23.96	-6.21	-1.84
1730	23.57	-6.28	-2.11
1740	23.25	-6.33	-1.95
1750	23.74	-6.25	-1.44
1760	25.12	-6	-0.92
1770	24.89	-6.04	-0.69
1780	27.05	-5.68	-0.1
1790	27.6	-5.59	0.04
1800	27.08	-5.67	0.01
1810	25.7	-5.9	-0.52
1820	27.51	-5.6	-0.69
1830	31.01	-5.09	-0.82
1840	36.99	-4.32	-0.7
1850	42.95	-3.67	-0.59
1860	46.58	-3.32	-0.15
1870	49.95	-3.01	0.17
1880	53.82	-2.69	0.54

1890	56.31	-2.49	0.98
1900	58.77	-2.31	1.45
1910	57.56	-2.4	1.62
1920	55.07	-2.59	1.68
1930	51.1	-2.92	1.4
1940	44.83	-3.48	0.95
1950	42.94	-3.67	0.65
1960	38.4	-4.16	0.06
1970	34.07	-4.68	-0.38
1980	32.25	-4.91	-0.84
1990	30.38	-5.17	-1.29
2000	29.07	-5.37	-1.77
2010	28.27	-5.49	-1.71
2020	24.83	-6.05	-1.97
2030	24.37	-6.13	-1.8
2040	25.58	-5.92	-1.42
2050	27.84	-5.55	-1.06
2060	32.09	-4.94	-0.65
2070	34.26	-4.65	-0.58
2080	32.53	-4.88	-1.14
2090	33.6	-4.74	-1.21
2100	35.81	-4.46	-0.58
2110	30.66	-5.13	-1
2120	30.43	-5.17	-0.89
2130	30.26	-5.19	-0.81
2140	30.79	-5.12	-0.71
2150	30.56	-5.15	-0.85
2160	30.19	-5.2	-1.09
2170	29.56	-5.29	-1.31
2180	30.28	-5.19	-1.46
2190	28.92	-5.39	-1.77
2200	29.56	-5.29	-2.13
2300	33.92	-4.7	-1.38
2310	35.22	-4.53	-1.19
2320	38	-4.2	-0.85
2330	39.73	-4.01	-0.41
2340	42.78	-3.69	-0.03
2350	43.21	-3.64	0.09
2360	43.42	-3.62	0.04
2370	41.97	-3.77	-0.11
2380	41.52	-3.82	-0.18
2390	39.89	-3.99	-0.36
2400	40.25	-3.95	-0.23
2410	39	-4.09	-0.2

2420	39.73	-4.01	0.05
2430	39.7	-4.01	0.13
2440	38.42	-4.15	-0.06
2450	39.13	-4.07	-0.01
2460	38.88	-4.1	-0.12
2470	38.38	-4.16	-0.12
2480	39.84	-4	-0.03
2490	43.43	-3.62	0.47
2500	43.87	-3.58	0.33
2510	45.25	-3.44	0.37
2520	45.37	-3.43	0.1
2530	47.93	-3.19	0.34
2540	48.42	-3.15	0.43
2550	50.45	-2.97	0.68
2560	51.34	-2.9	0.86
2570	52.98	-2.76	1.06
2580	50.35	-2.98	0.91
2590	48.86	-3.11	0.81
2600	50.73	-2.95	1.02
2610	49.45	-3.06	0.87
2620	46.26	-3.35	0.66
2630	45.75	-3.4	0.73
2640	48.27	-3.16	1.03
2650	49.11	-3.09	1.24
2660	50.24	-2.99	1.39
2670	50.84	-2.94	1.47
2680	51.51	-2.88	1.49
2690	50.19	-2.99	1.35
2700	49.65	-3.04	1.31
3300	28.73	-5.42	-0.95
3310	31.2	-5.06	-0.65
3320	33.57	-4.74	-0.23
3330	33.48	-4.75	-0.23
3340	31.31	-5.04	-0.75
3350	34.96	-4.56	-0.52
3360	38.14	-4.19	-0.25
3370	39.06	-4.08	-0.23
3380	40.39	-3.94	-0.09
3390	44.18	-3.55	0.22
3400	46.47	-3.33	0.43
3410	44.45	-3.52	0.29
3420	47.9	-3.2	0.49
3430	51.5	-2.88	0.87
3440	50.54	-2.96	0.74

3450	47.5	-3.23	0.26
3460	46.21	-3.35	-0.05
3470	46.44	-3.33	0.1
3480	45.94	-3.38	0.09
3490	41.88	-3.78	-0.3
3500	40.69	-3.9	-0.15
3510	43.13	-3.65	0.31
3520	45.03	-3.46	0.74
3530	43.1	-3.66	0.41
3540	41.6	-3.81	0.18
3550	46.17	-3.36	0.45
3560	47.91	-3.2	0.3
3570	46.85	-3.29	-0.12
3580	42.76	-3.69	-0.17
3590	43.59	-3.61	0.09
3600	44.09	-3.56	0.3
3610	42.93	-3.67	0.31
3620	39.59	-4.02	0.03
3630	40.47	-3.93	0.33
3640	41.76	-3.79	0.59
3650	41.7	-3.8	0.8
3660	39.27	-4.06	0.72
3670	36.34	-4.4	0.48
3680	35.55	-4.49	0.58
3690	33.46	-4.75	0.3
3700	34.65	-4.6	0.48
3710	37.5	-4.26	0.72
3720	39.03	-4.09	0.85
3730	36.23	-4.41	0.54
3740	31.94	-4.96	-0.14
3750	33.39	-4.76	-0.05
3760	37.74	-4.23	0.27
3770	37.94	-4.21	0.3
3780	34.13	-4.67	-0.15
3790	33.77	-4.72	-0.28
3800	35.1	-4.55	-0.32
3810	40.03	-3.98	0.31
3820	39.09	-4.08	0.25
3830	36.36	-4.39	0
3840	34.77	-4.59	-0.14
3850	34.65	-4.6	0.13
3860	33.58	-4.74	0.11
3870	34.64	-4.6	0.18
3880	36.32	-4.4	0.52

3890	35.56	-4.49	0.42
3900	34.03	-4.68	0.23
3910	33.08	-4.8	0.13
3920	36	-4.44	0.58
3930	37.83	-4.22	0.6
3940	36.18	-4.42	0.42
3950	32.04	-4.94	-0.02
3960	32.55	-4.88	-0.06
3970	38.15	-4.19	0.62
3980	40.81	-3.89	0.85
3990	38.45	-4.15	0.67
4000	35.09	-4.55	0.16
4010	35.69	-4.47	0.34
4020	38.96	-4.09	0.83
4030	43.24	-3.64	1.3
4040	44.85	-3.48	1.27
4050	45.49	-3.42	1.38
4060	42.88	-3.68	1.35
4070	43.47	-3.62	1.4
4080	48.53	-3.14	1.8
4090	53.11	-2.75	2.31
4100	49.23	-3.08	2.02
4110	43.01	-3.66	1.56
4120	40.79	-3.89	1.52
4130	45.2	-3.45	1.91
4140	46.06	-3.37	2.04
4150	44.31	-3.54	1.95
4160	38.7	-4.12	1.35
4170	37.84	-4.22	1.45
4180	37.54	-4.25	1.45
4190	38.11	-4.19	1.5
4200	36.64	-4.36	1.35

ANT4

(MHz)	(%)	(dB)	(dBi)
620	2.02	-16.94	-11.89
630	2.23	-16.52	-11.64
640	6.35	-11.97	-7.38
650	6.03	-12.2	-7.81
660	5.43	-12.65	-8.67
670	10.78	-9.67	-5.36

680	11.75	-9.3	-4.93
690	13.95	-8.56	-3.73
700	16.45	-7.84	-2.76
710	17.09	-7.67	-2.61
720	20.35	-6.91	-1.4
730	21.94	-6.59	-1.37
740	22.67	-6.45	-1.27
750	23.71	-6.25	-2.88
760	28.71	-5.42	-2.06
770	27.1	-5.67	-2.47
780	27.82	-5.56	-2.58
790	34.14	-4.67	-1.8
800	45.42	-3.43	-0.73
810	45.66	-3.4	-0.7
820	38.31	-4.17	-1.14
830	24.88	-6.04	-2.91
840	29.65	-5.28	-2.39
850	25.82	-5.88	-2.55
860	31.42	-5.03	-1.34
870	35.37	-4.51	-1.09
880	41.23	-3.85	-0.55
890	43.5	-3.61	-0.65
900	47.28	-3.25	0.84
910	47.76	-3.21	1.14
920	45.02	-3.47	0.92
930	38.89	-4.1	0.69
940	32.62	-4.87	0.28
950	29.52	-5.3	0.22
960	23.95	-6.21	-0.61
970	21.36	-6.7	-1.12
980	16.96	-7.7	-2.16
990	12.51	-9.03	-3.71
1000	11.66	-9.33	-4.14

ANT5

(MHz)	(%)	(dB)	(dBi)
620	0.68	-21.65	-17.13
630	0.78	-21.06	-16.61
640	0.94	-20.25	-15.79
650	1.06	-19.76	-15.4

660	1.38	-18.59	-14.65
670	1.98	-17.04	-13.96
680	2.58	-15.88	-12.13
690	3.63	-14.41	-10.54
700	4.94	-13.06	-8.94
710	7.36	-11.33	-7.2
720	8.07	-10.93	-6.98
730	9.7	-10.13	-6.21
740	10.85	-9.64	-5.88
750	13.68	-8.64	-4.95
760	15.71	-8.04	-4.85
770	16.11	-7.93	-4.74
780	18.27	-7.38	-4.44
790	24.85	-6.05	-2.96
800	36.96	-4.32	-1.54
810	43.44	-3.62	-0.99
820	46.76	-3.3	-0.7
830	46.19	-3.35	-0.6
840	46.02	-3.37	-0.23
850	45.89	-3.38	0.38
860	46.84	-3.29	0.29
870	47.7	-3.21	0.51
880	48.7	-3.13	0.61
890	49.39	-3.06	0.58
900	44.2	-3.55	0.04
910	41.66	-3.8	0.43
920	36.38	-4.39	-0.04
930	33.09	-4.8	-0.09
940	28.01	-5.53	-0.92
950	24.46	-6.12	-1.58
960	18.66	-7.29	-2.89
970	16.18	-7.91	-3.59
980	12.41	-9.06	-4.73
990	10.94	-9.61	-5.36
1000	13.02	-8.86	-4.63

WIFI-1

(MHz)	(%)	(dB)	(dBi)
2400	38.25	-4.17	0.7
2410	38.42	-4.15	0.85

2420	38.68	-4.13	0.71
2430	39.5	-4.03	0.72
2440	38.56	-4.14	0.47
2450	39.23	-4.06	0.58
2460	39.03	-4.09	0.62
2470	37.87	-4.22	0.41
2480	38.76	-4.12	0.5
2490	41.15	-3.86	0.63
2500	40.29	-3.95	0.64
5150	34.27	-4.65	1.27
5160	33.74	-4.72	1.16
5170	32.74	-4.85	1.11
5180	31.76	-4.98	0.97
5190	31.48	-5.02	0.82
5200	31.26	-5.05	0.87
5210	31.76	-4.98	0.92
5220	30.71	-5.13	0.83
5230	31.16	-5.06	0.82
5240	29.75	-5.27	0.64
5250	29.02	-5.37	0.62
5260	29.13	-5.36	0.6
5270	28.01	-5.53	0.53
5280	28.38	-5.47	0.51
5290	29.28	-5.33	0.68
5300	28.07	-5.52	0.48
5310	28.68	-5.42	0.68
5320	29.55	-5.3	0.75
5330	29.02	-5.37	0.68
5340	29.86	-5.25	0.78
5350	31.66	-4.99	1.01
5360	32.13	-4.93	1.02
5370	33.42	-4.76	1.14
5380	33.68	-4.73	1.03
5390	31.75	-4.98	0.69
5400	38.19	-4.18	1.39
5410	40.47	-3.93	1.59
5420	40.82	-3.89	1.67
5430	41.03	-3.87	1.52
5440	40.89	-3.88	1.44
5450	40.59	-3.92	1.37
5460	42.54	-3.71	1.58
5470	42.02	-3.77	1.35

5480	41.8	-3.79	1.35
5490	40.96	-3.88	1.12
5500	40.21	-3.96	1.04
5510	39.59	-4.02	0.92
5520	40.63	-3.91	1.02
5530	41.3	-3.84	1.11
5540	40.76	-3.9	0.9
5550	39.49	-4.03	0.82
5560	38.65	-4.13	0.68
5570	39.69	-4.01	0.82
5580	40.31	-3.95	0.81
5590	39.7	-4.01	0.72
5600	39.81	-4	0.74
5610	40.27	-3.95	0.78
5620	40.53	-3.92	0.61
5630	41.61	-3.81	0.68
5640	41.13	-3.86	0.44
5650	42.6	-3.71	0.68
5660	43.82	-3.58	0.74
5670	42.44	-3.72	0.42
5680	43.6	-3.61	0.43
5690	44.57	-3.51	0.58
5700	45.35	-3.43	0.42
5710	44.66	-3.5	0.55
5720	43.81	-3.58	0.18
5730	43.89	-3.58	0.25
5740	45.64	-3.41	0.39
5750	46.24	-3.35	0.33
5760	44.93	-3.47	0.28
5770	44.13	-3.55	0.25
5780	42.48	-3.72	0.25
5790	42.4	-3.73	0.18
5800	41.74	-3.79	0.39
5810	41.67	-3.8	0.44
5820	42.08	-3.76	0.47
5830	41.88	-3.78	0.42
5840	42.64	-3.7	0.68
5850	44.95	-3.47	1
6000	29.58	-5.29	2.74
6050	28.77	-5.41	2.74
6100	27.8	-5.56	2.47
6150	28.71	-5.42	2.73

6200	30.83	-5.11	2.98
6250	30.55	-5.15	2.78
6300	31.62	-5	3
6350	32.51	-4.88	3.06
6400	30.9	-5.1	2.83
6450	28.77	-5.41	1.69
6500	25.7	-5.9	1.32
6550	26.18	-5.82	1.32
6600	28.58	-5.44	1.92
6650	32.14	-4.93	2.49
6700	35.32	-4.52	2.66
6750	37.58	-4.25	2.64
6800	36.9	-4.33	2.45
6850	37.84	-4.22	2.02
6900	38.73	-4.12	2.27
6950	42.07	-3.76	2.55
7000	41.98	-3.77	2.16
7050	36	-4.44	2.74

WIFI-2

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2400	39.78	-4	0.56
2405	39.33	-4.05	0.58
2410	39.05	-4.08	0.58
2415	39.79	-4	0.71
2420	40.22	-3.96	0.78
2425	40.2	-3.96	0.83
2430	40.62	-3.91	0.94
2435	41.56	-3.81	1.17
2440	41.94	-3.77	1.22
2445	41.36	-3.83	1.12
2450	39.07	-4.08	0.93
2455	39.08	-4.08	1.15
2460	39.43	-4.04	1.37
2465	39.72	-4.01	1.39
2470	38.93	-4.1	1.34
2475	39.15	-4.07	1.47
2480	39.67	-4.02	1.62
2485	40.46	-3.93	1.62

2490	40.17	-3.96	1.54
2495	39.8	-4	1.45
2500	39.49	-4.04	1.36
5150	31.25	-5.05	0.92
5178	28.96	-5.38	0.43
5206	30.73	-5.12	0.32
5234	32.04	-4.94	-0.13
5262	32.56	-4.87	-0.2
5290	35.21	-4.53	0.28
5318	36.92	-4.33	0.67
5346	40.6	-3.92	1.02
5374	42.09	-3.76	1.27
5402	45.68	-3.4	1.6
5430	43.19	-3.65	1.14
5458	45.07	-3.46	1.47
5486	42.53	-3.71	1.18
5514	43.28	-3.64	1.14
5542	42.76	-3.69	1.16
5570	46.28	-3.35	1.58
5598	48.85	-3.11	1.69
5626	51.89	-2.85	1.91
5654	48.78	-3.12	1.72
5682	48.53	-3.14	1.61
5710	48.42	-3.15	1.72
5738	48.82	-3.11	1.69
5766	47.85	-3.2	1.55
5794	46.78	-3.3	1.7
5822	47.64	-3.22	1.98
5850	47.19	-3.26	1.9
6000	34.43	-4.63	3.62
6050	32.39	-4.9	2.93
6100	34.21	-4.66	3.54
6150	35.12	-4.54	3.51
6200	36.12	-4.42	3.65
6250	36.24	-4.41	3.75
6300	29.47	-5.31	3.65
6350	30.35	-5.18	4.02
6400	29.44	-5.31	3.66
6450	29.49	-5.3	3.19
6500	28.17	-5.5	4.54
6550	28.56	-5.44	3.64
6600	27.28	-5.64	4.61

6650	26.86	-5.71	4.29
6700	25.72	-5.9	4.14
6750	25.7	-5.9	3.88
6800	24.45	-6.12	-0.18
6850	23.79	-6.24	0.21
6900	23.02	-6.38	-0.63
6950	22.89	-6.4	0.04
7000	22.5	-6.48	0.33
7050	21.72	-6.63	0.25

GPS

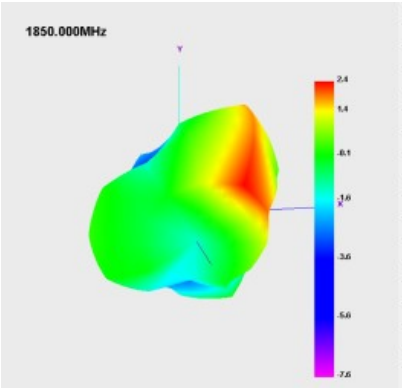
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1151	46.71	-3.31	-0.56
1156	50.04	-3.01	-0.36
1161	52.35	-2.81	0
1166	51.85	-2.85	0.06
1171	52.77	-2.78	0.12
1176	51.14	-2.91	-0.05
1181	49.39	-3.06	-0.1
1186	48.88	-3.11	0.04
1191	48.3	-3.16	0.1
1196	49.39	-3.06	0.28
1201	48.28	-3.16	0.22
1206	49.07	-3.09	0.43
1550	37.17	-4.3	0.34
1555	37.38	-4.27	0.23
1560	37.78	-4.23	0.13
1565	37.46	-4.26	-0.05
1570	40.99	-3.87	0.2
1575	42.13	-3.75	0.2
1580	38.39	-4.16	-0.44
1585	36.79	-4.34	-0.57
1590	33.88	-4.7	-0.17
1595	33.76	-4.72	-0.03
1600	32.75	-4.85	-0.15

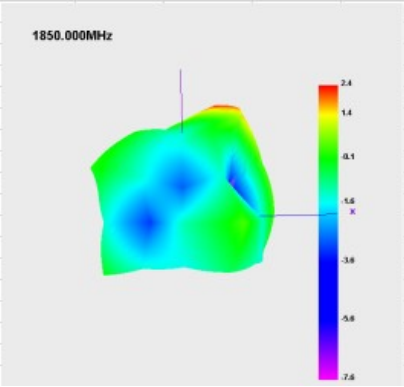
2.3 3D Pattern

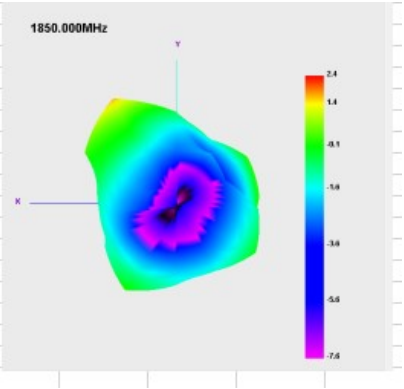
ANT0

WCDMA B2

H plane **E1 plane** **E2 plane**

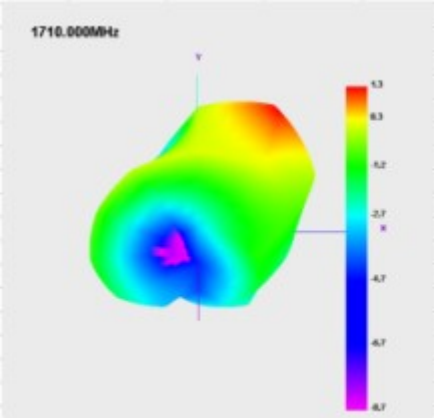


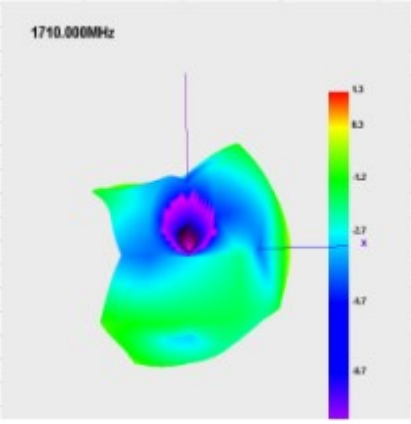


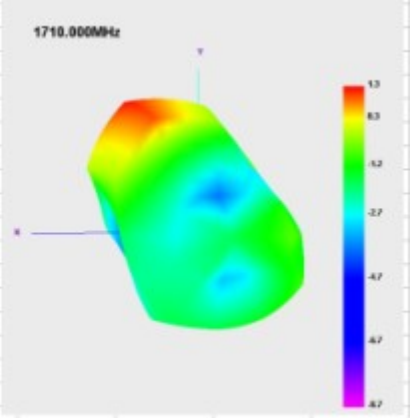


WCDMA B4

H plane **E1 plane** **E2 plane**

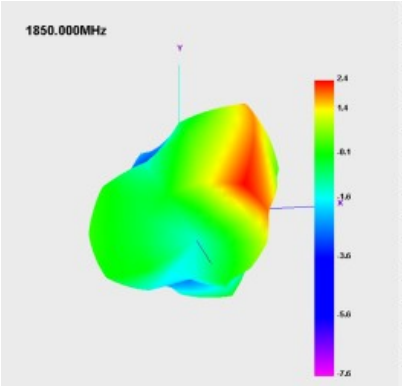


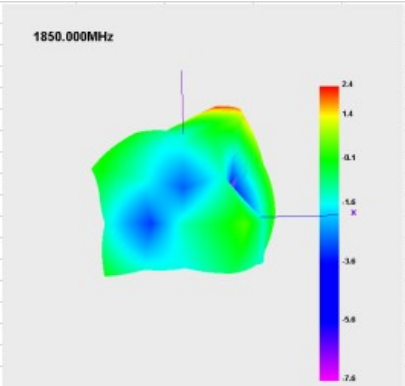


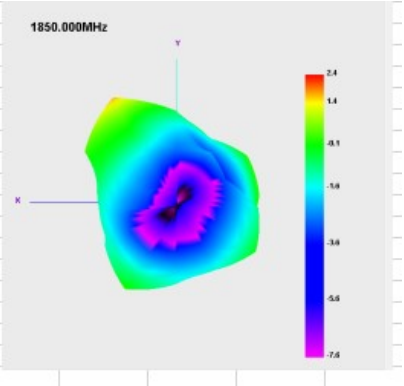


LTE B2

H plane **E1 plane** **E2 plane**

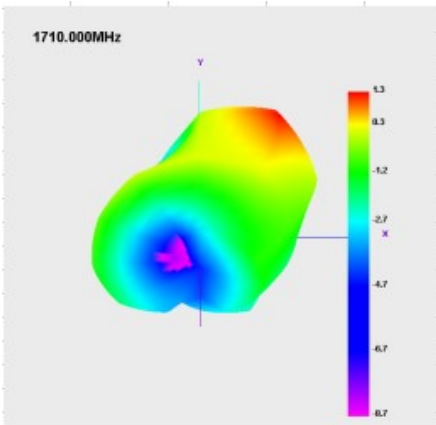


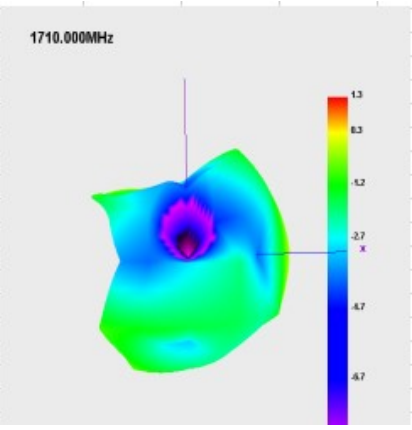


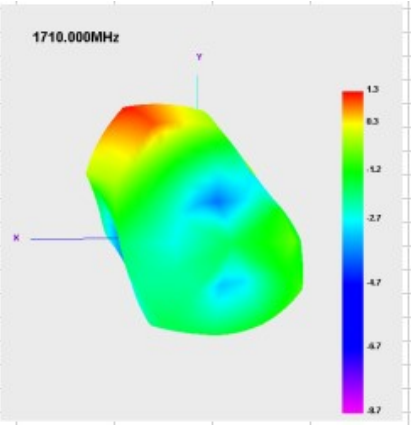


LTE B4

H plane **E1 plane** **E2 plane**

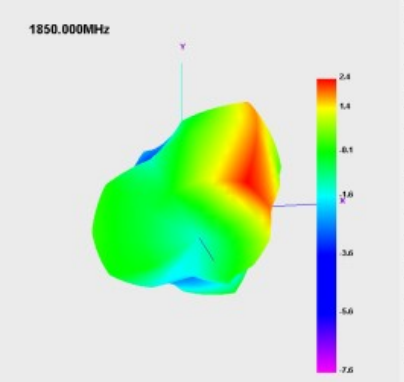


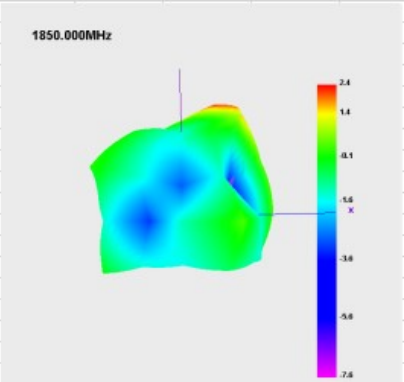


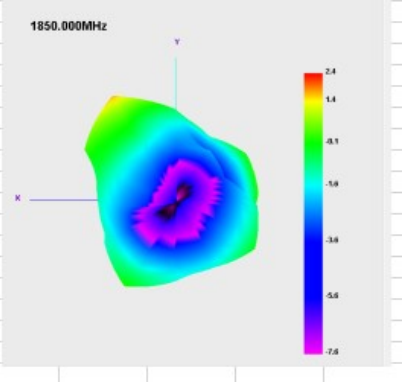


LTE B25

H plane **E1 plane** **E2 plane**

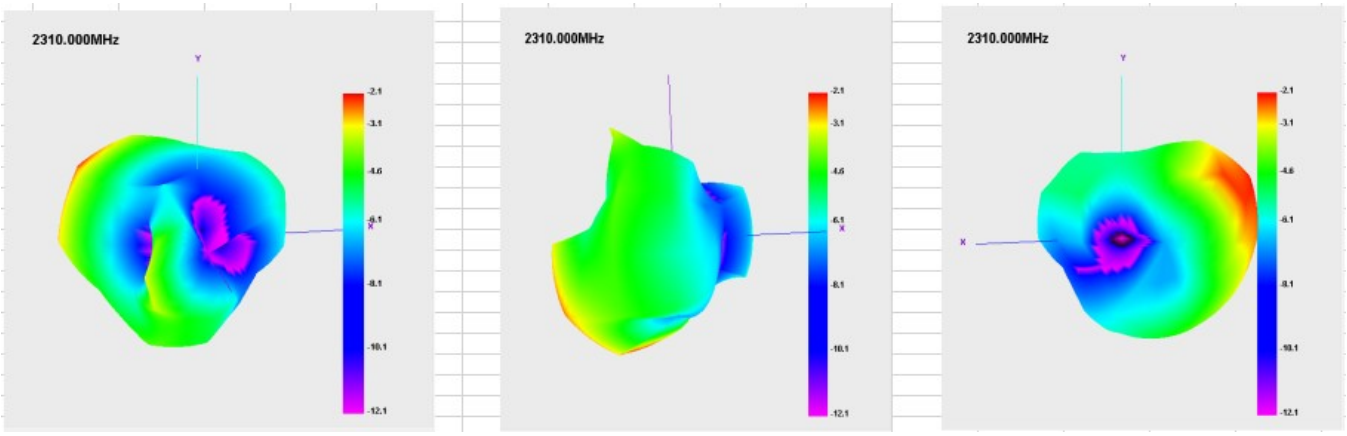






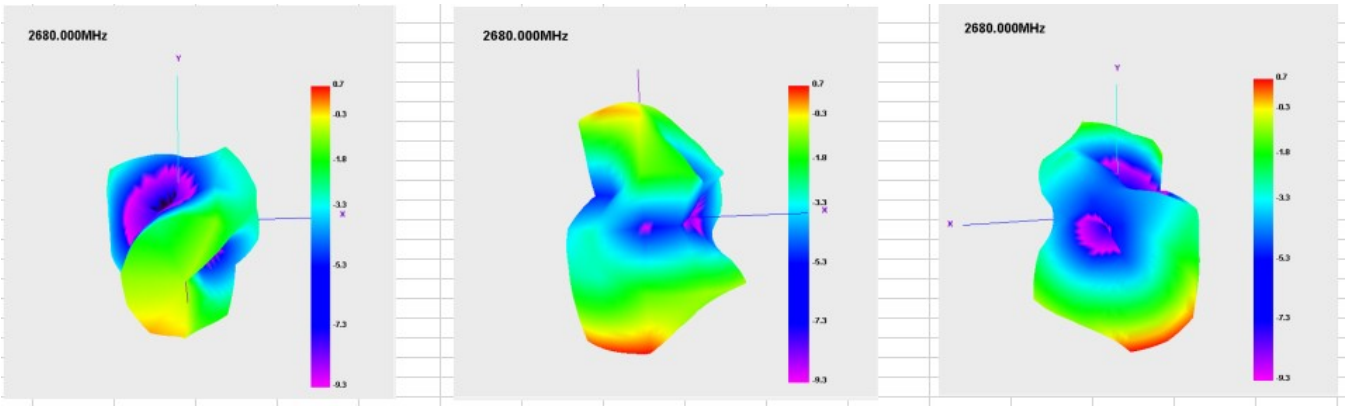
LTE B30

H plane **E1 plane** **E2 plane**



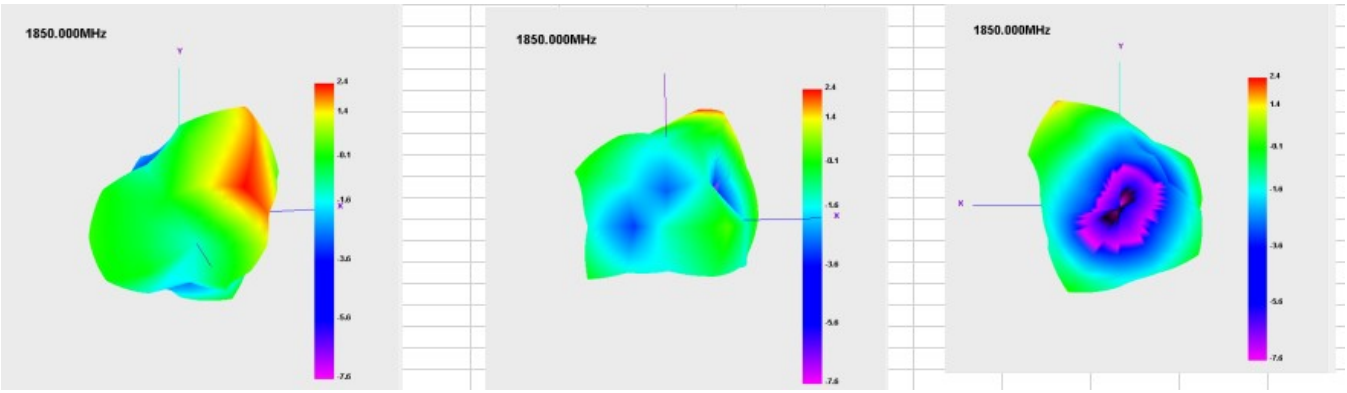
TE B41

H plane **E1 plane** **E2 plane**



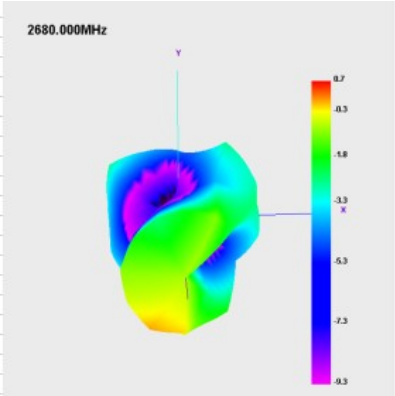
NR N2

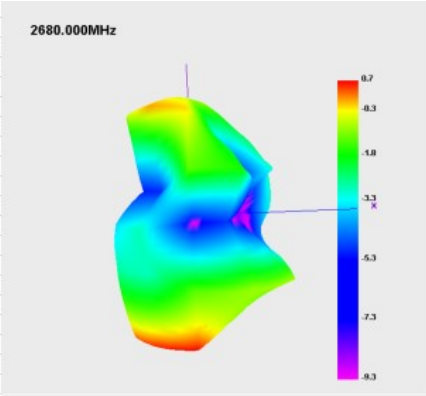
H plane **E1 plane** **E2 plane**

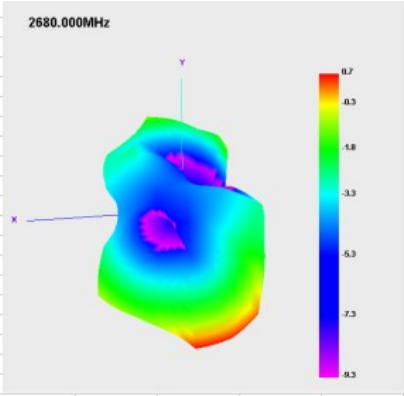


NR N41

H plane **E1 plane** **E2 plane**

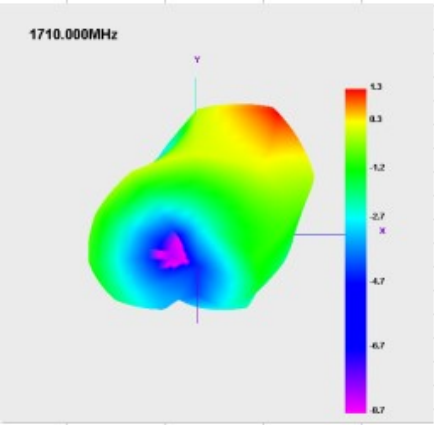


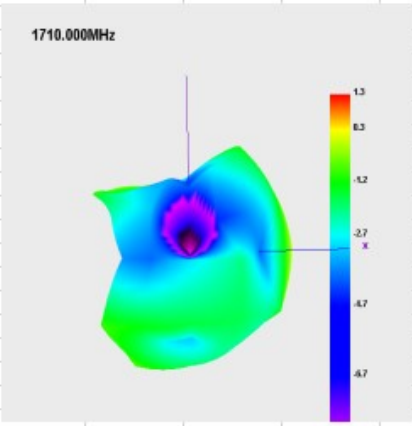


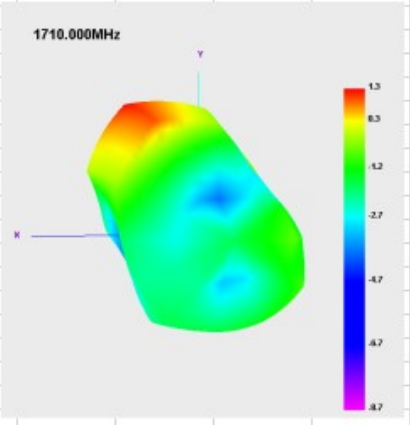


NR N66

H plane **E1 plane** **E2 plane**



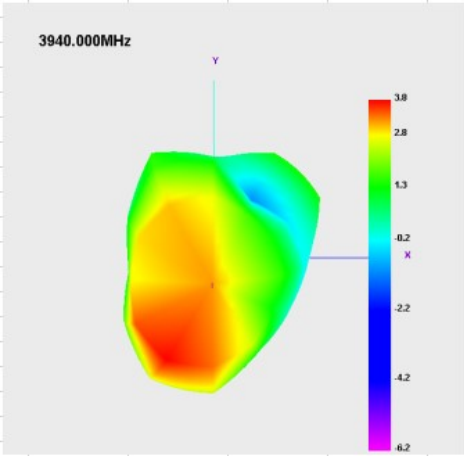


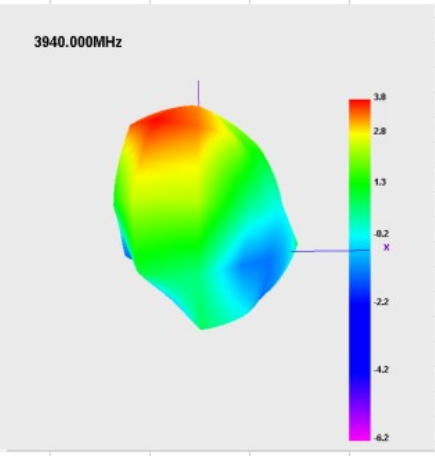


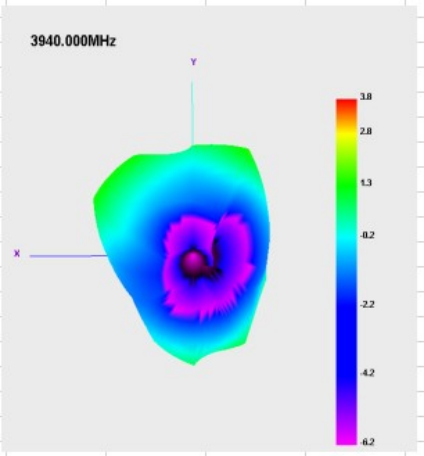
ANT2

NR N77

H plane **E1 plane** **E2 plane**

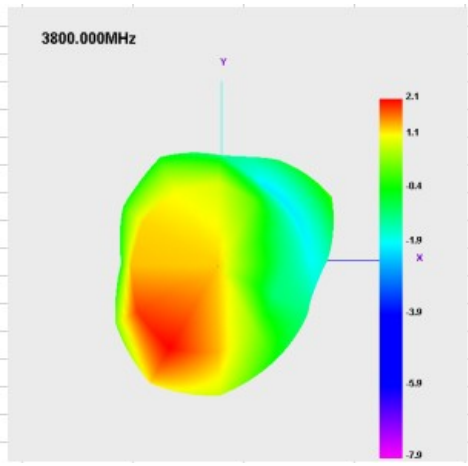


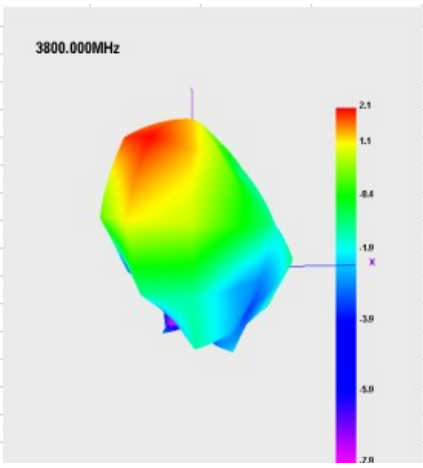


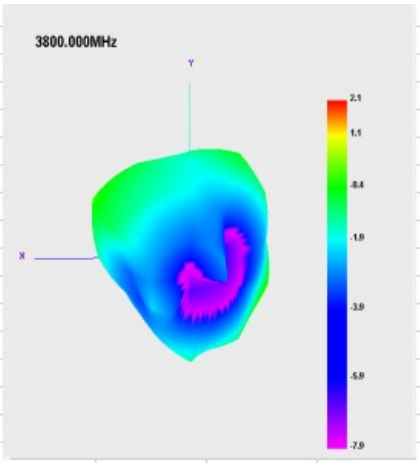


NR N78

H plane **E1 plane** **E2 plane**



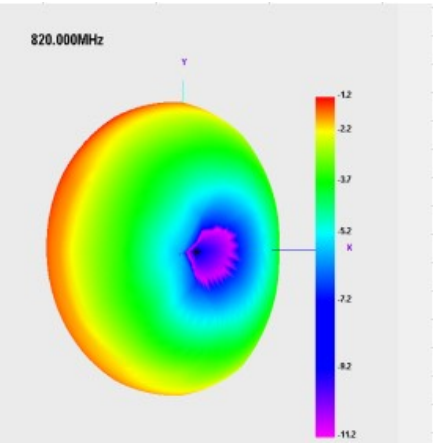


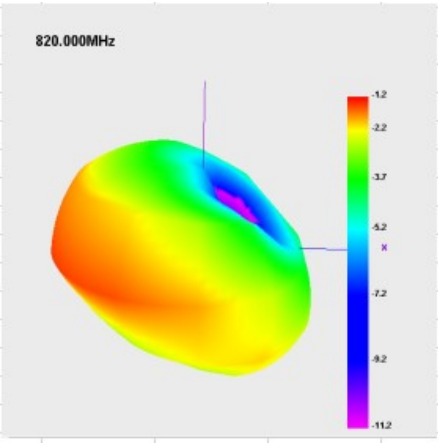


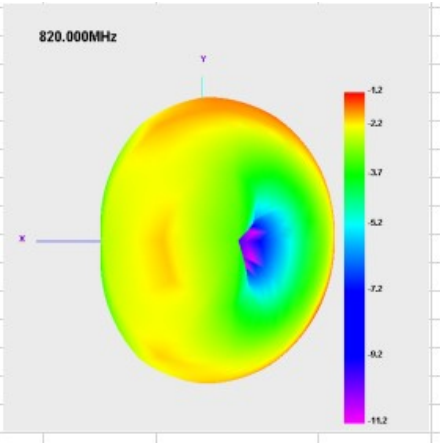
ANT4

LTE B5

H plane **E1 plane** **E2 plane**

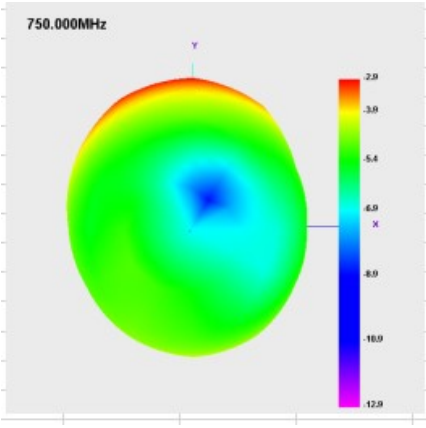


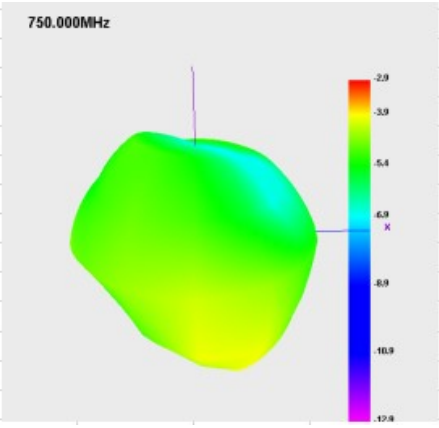


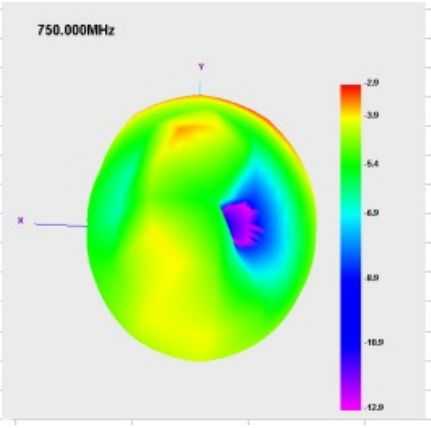


LTE B12

H plane **E1 plane** **E2 plane**

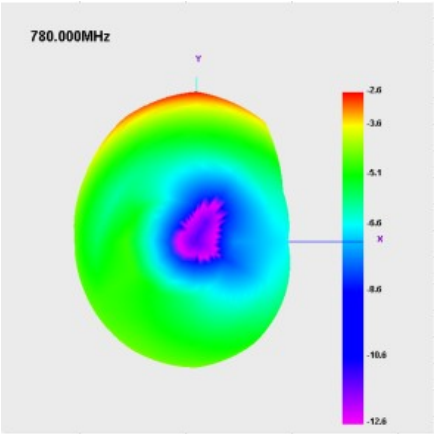


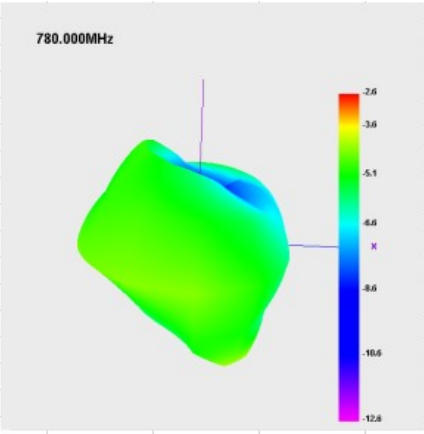


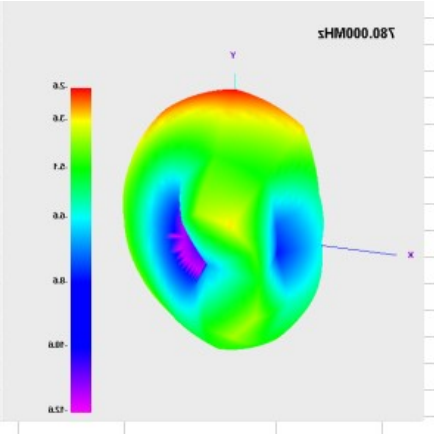


LTE B13

H plane **E1 plane** **E2 plane**

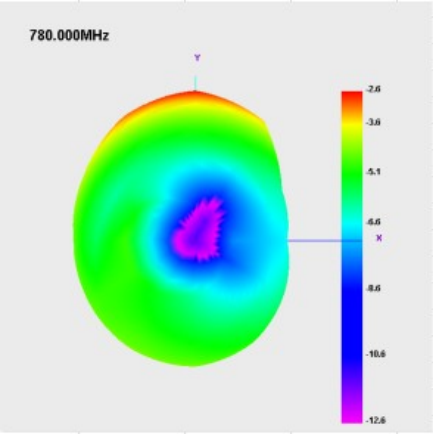


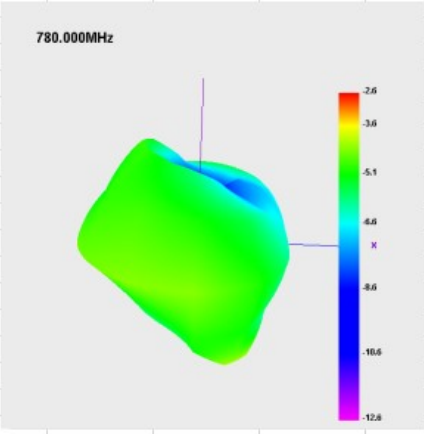


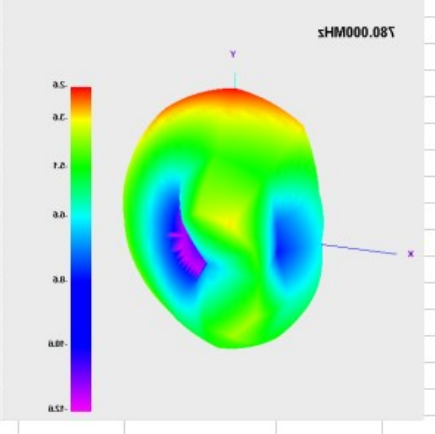


LTE B14

H plane **E1 plane** **E2 plane**

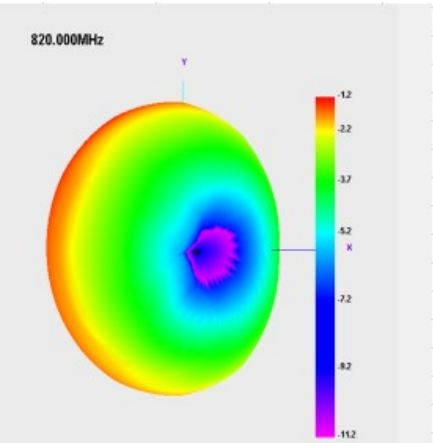


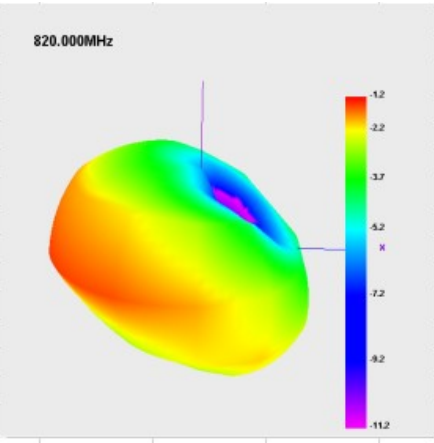


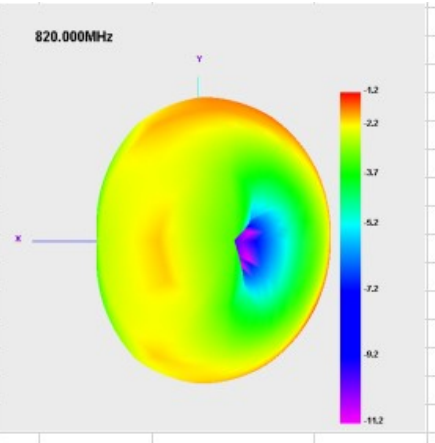


LTE B26

H plane **E1 plane** **E2 plane**

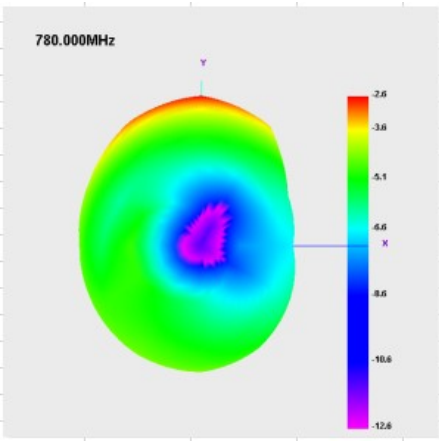


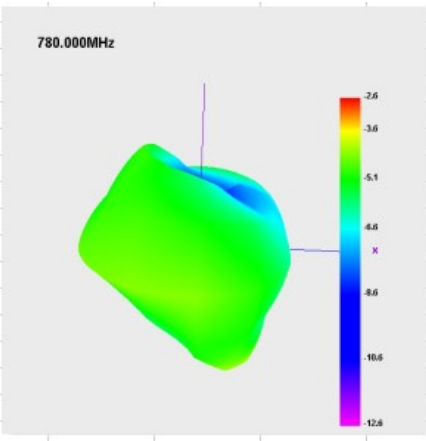


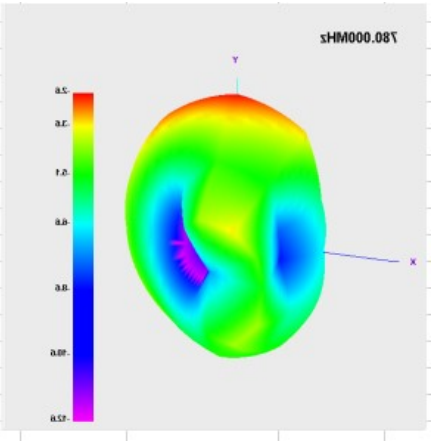


LTE B28

H plane **E1 plane** **E2 plane**

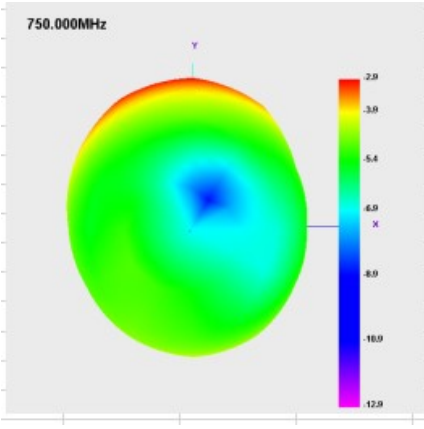


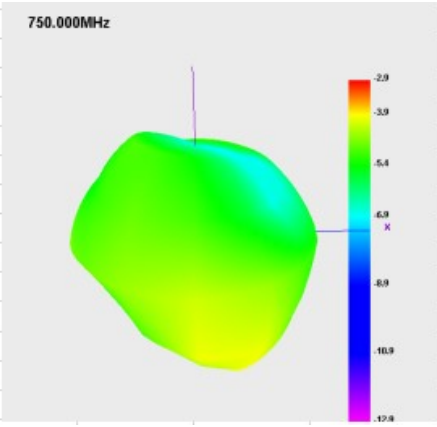


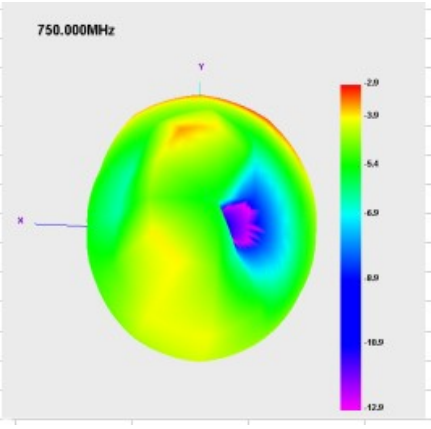


LTE B29

H plane **E1 plane** **E2 plane**

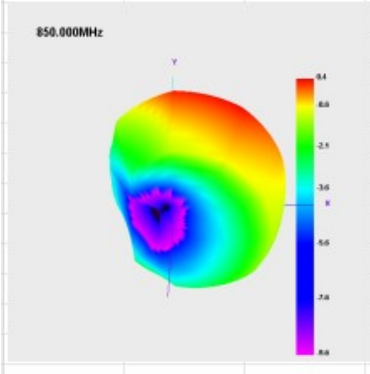


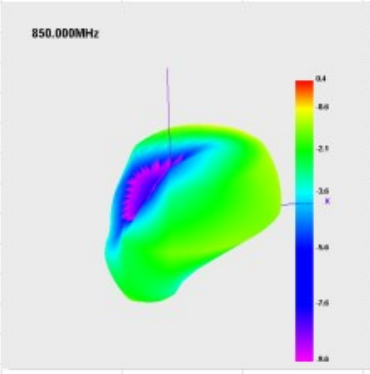


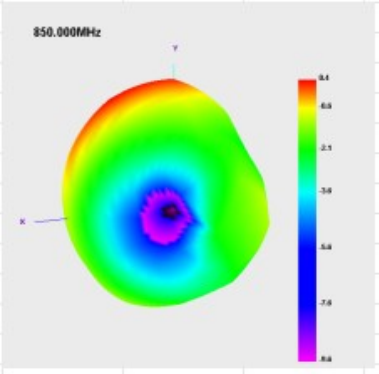


ANT5

H plane **E1 plane** **E2 plane**

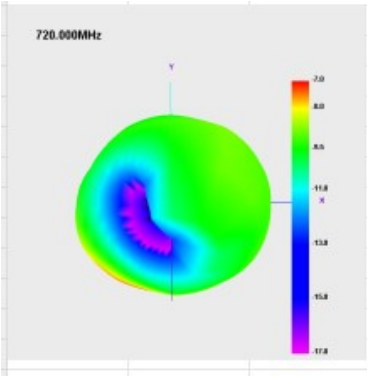


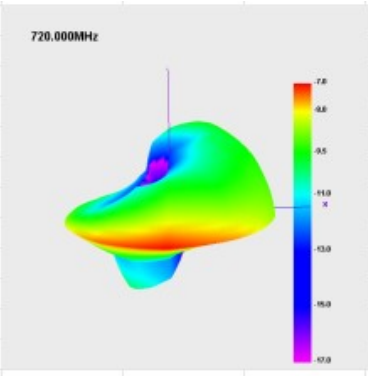


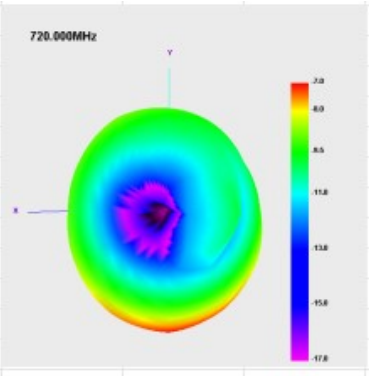


LTE B12

H plane **E1 plane** **E2 plane**

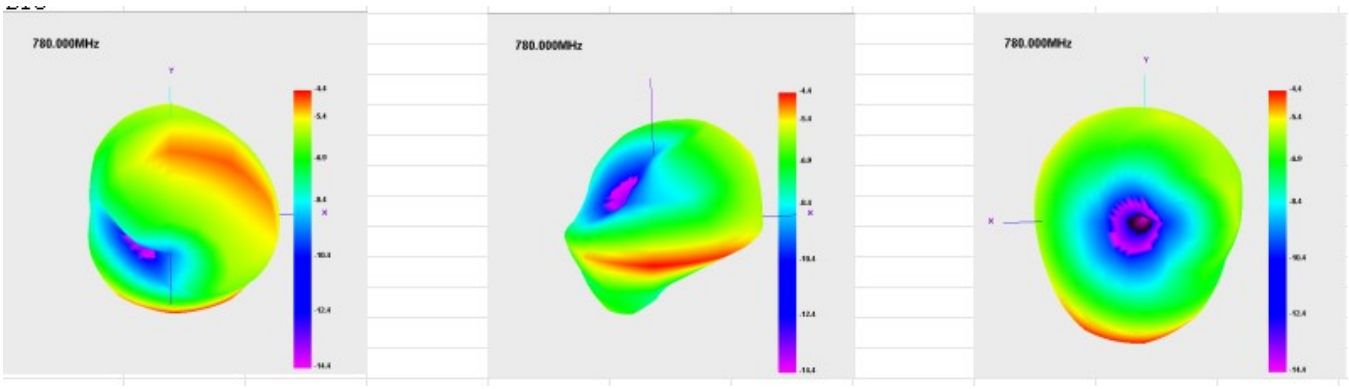






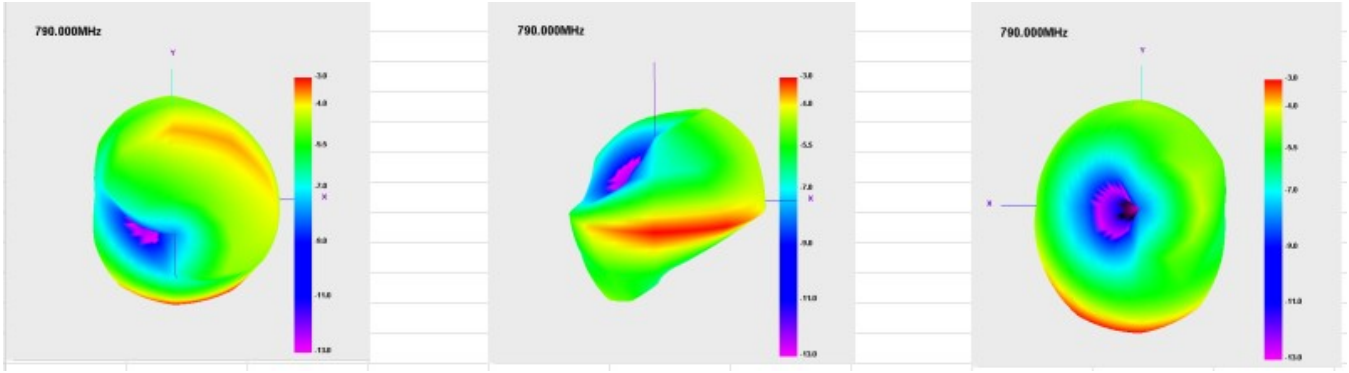
LTE B13

H plane **E1 plane** **E2 plane**



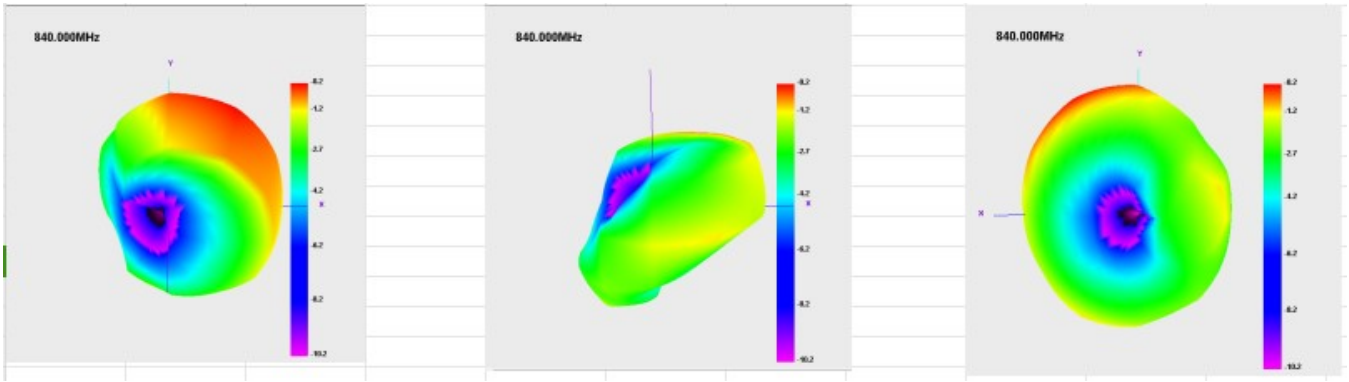
LTE B14

H plane **E1 plane** **E2 plane**



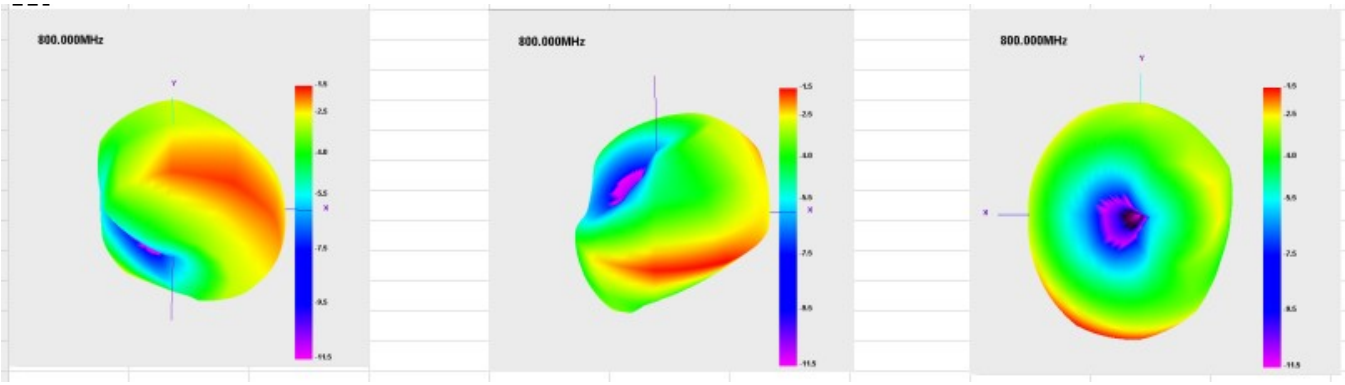
LTE B26

H plane **E1 plane** **E2 plane**



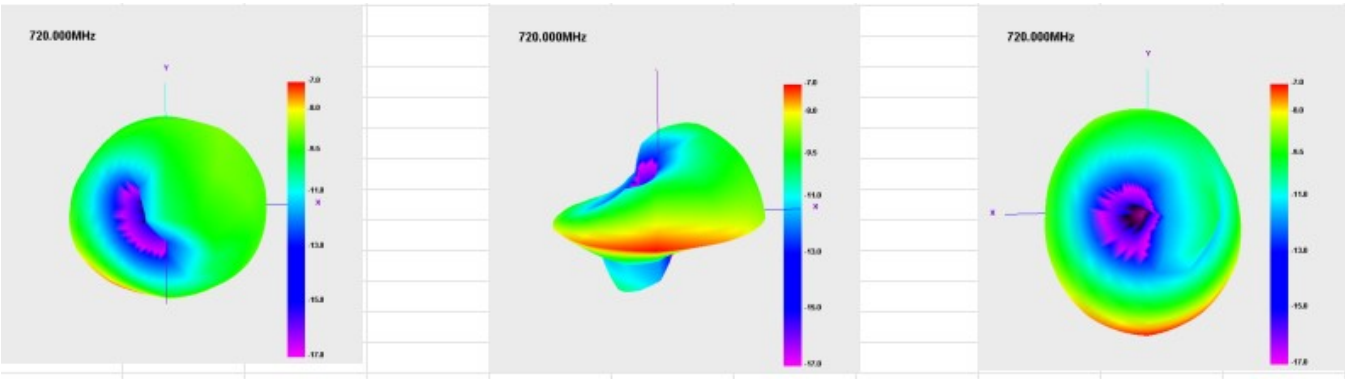
LTE B28

H plane **E1 plane** **E2 plane**



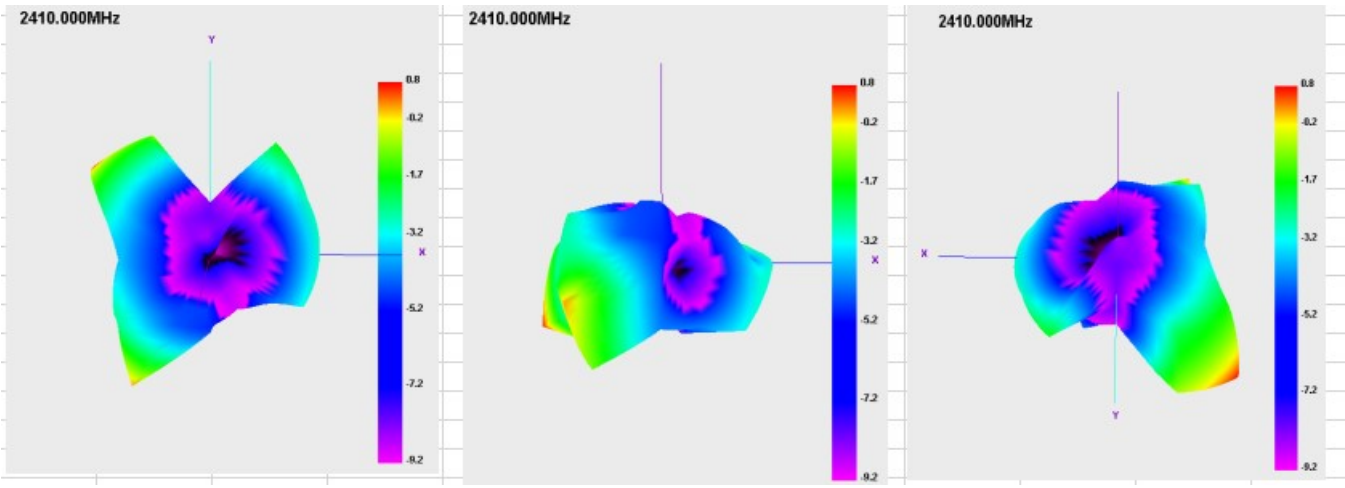
LTE B29

H plane **E1 plane** **E2 plane**

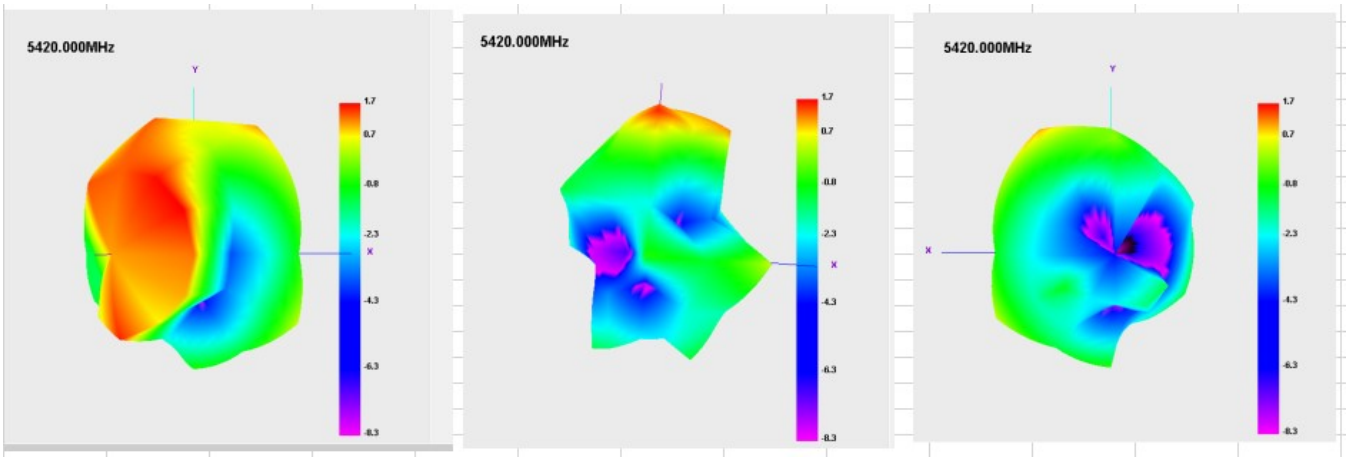


WIFI-1

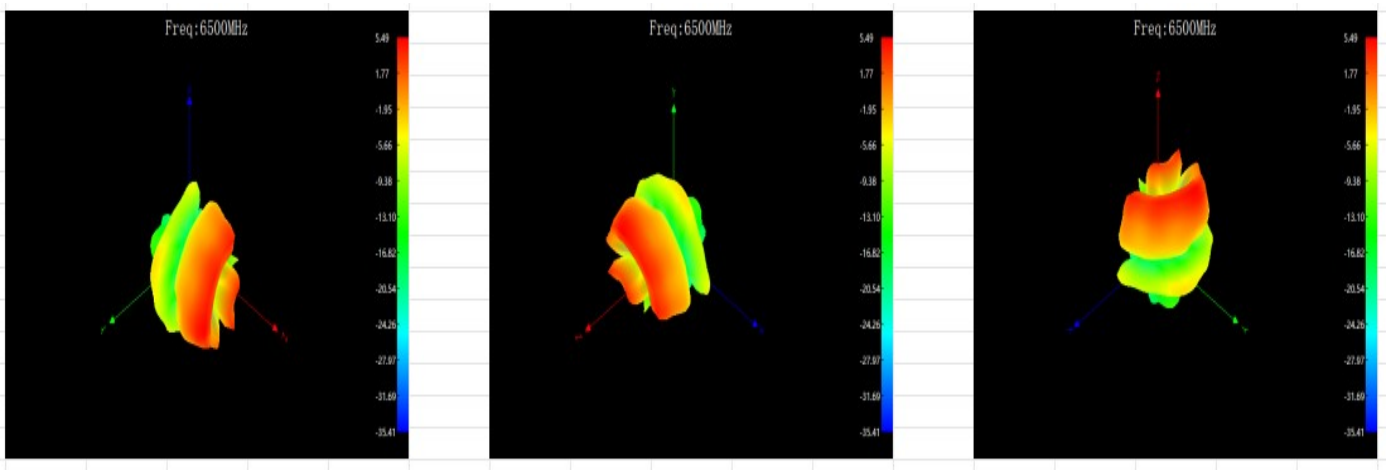
2.4G**Hz** **Hplane** **E1 plane** **E2 plane**



5G**Hz** **Hplane** **E1 plane** **E2 plane**

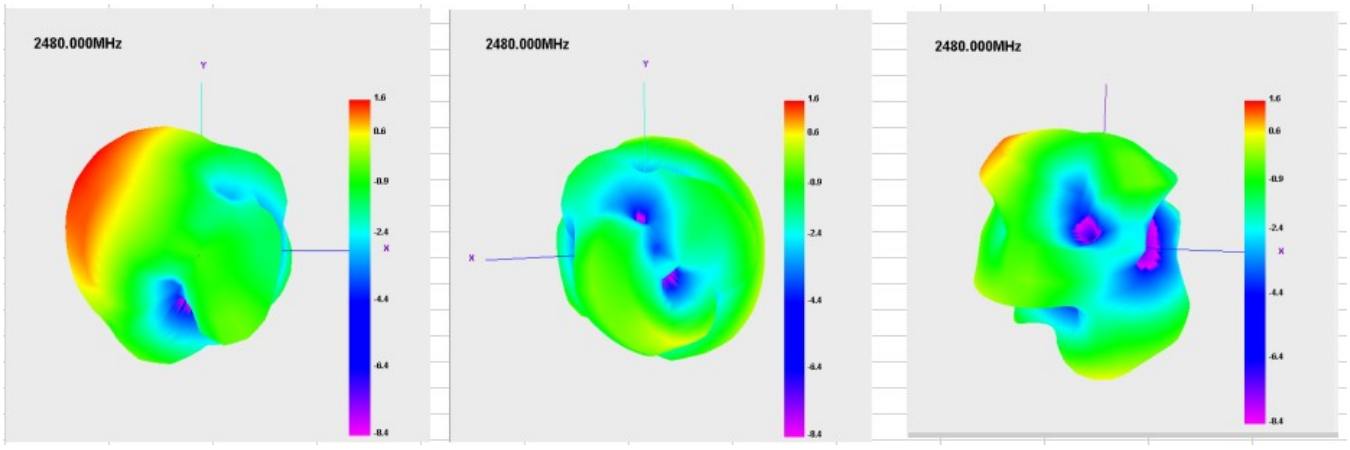


6.5G**Hz** **Hplane** **E1 plane** **E2 plane**

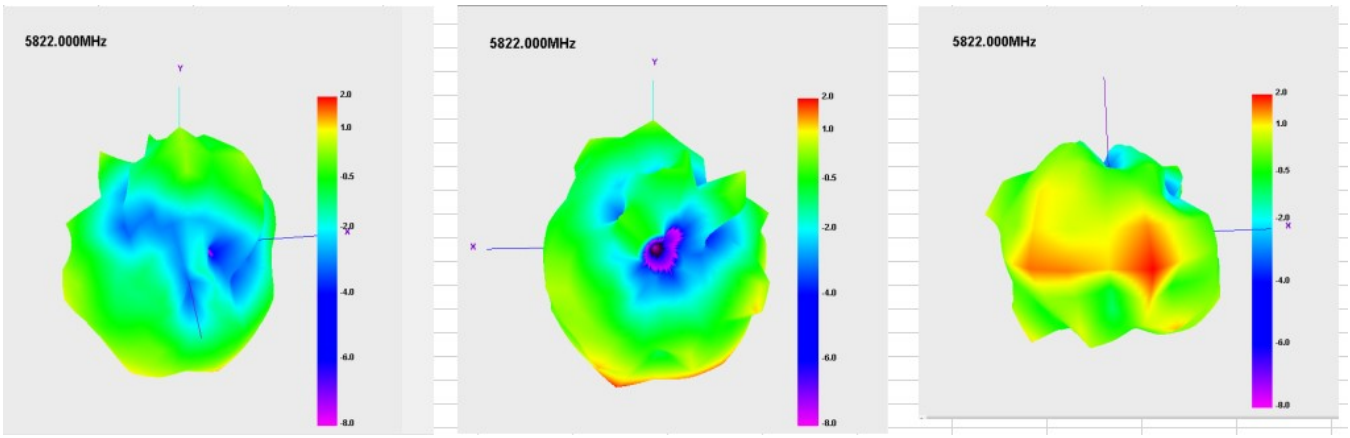
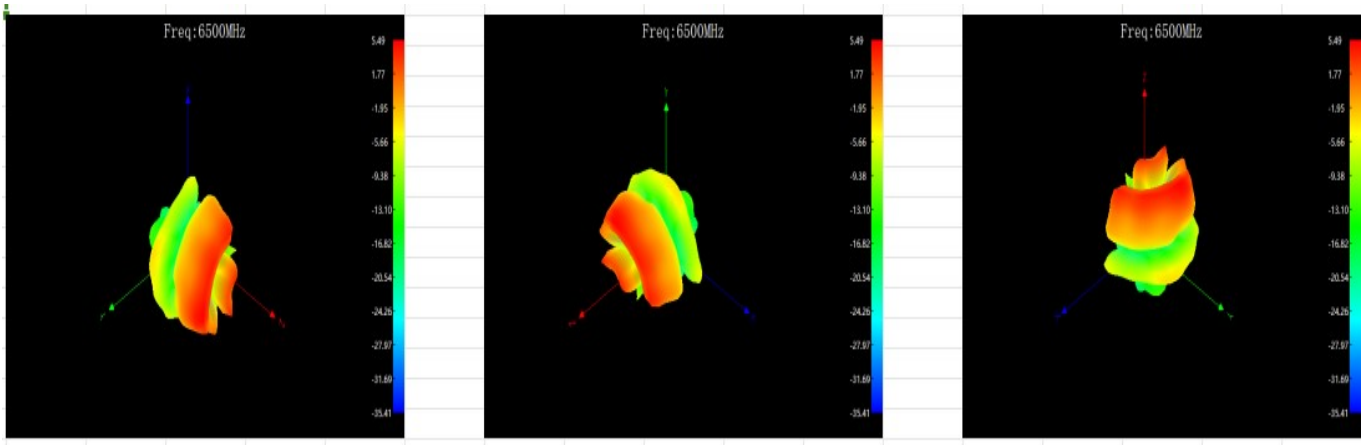


WIFI-2

2.4GHz **H plane** **E1 plane** **E2 plane**



5 GHz **H plane** **E1 plane** **E2 plane**



6.5 GHz **H plane** **E1 plane** **E2 plane**