

深圳有力科技有限公司

ShenZhen Powerful Technology CO., Limited

規 格 书

SPECIFICATION FOR APPROVAL

客 户

CUSTOMER:

客 户 料 号

CUSTOMER NO:

品 名

PART NAME:

供 方 料 号

SUPPLIER NO:

JACS

4G主天线： FPC黑色/加补强0.1mm/4代端子/1.13黑线 L=220MM/贴导电布/接地面镀金

YL1653-4G-V6-L220

日期 Date: 2024.10.31

客户确认 CUSTOMER APPROVED BY		
APPROVAL	CHIEF	SUPERVISOR

供方确认 SUPPLIER SIGNATURE		
APPROVAL	CHECK	DESIGN
赵旋旋	陈娜	张洋

实验室测试环境及设备



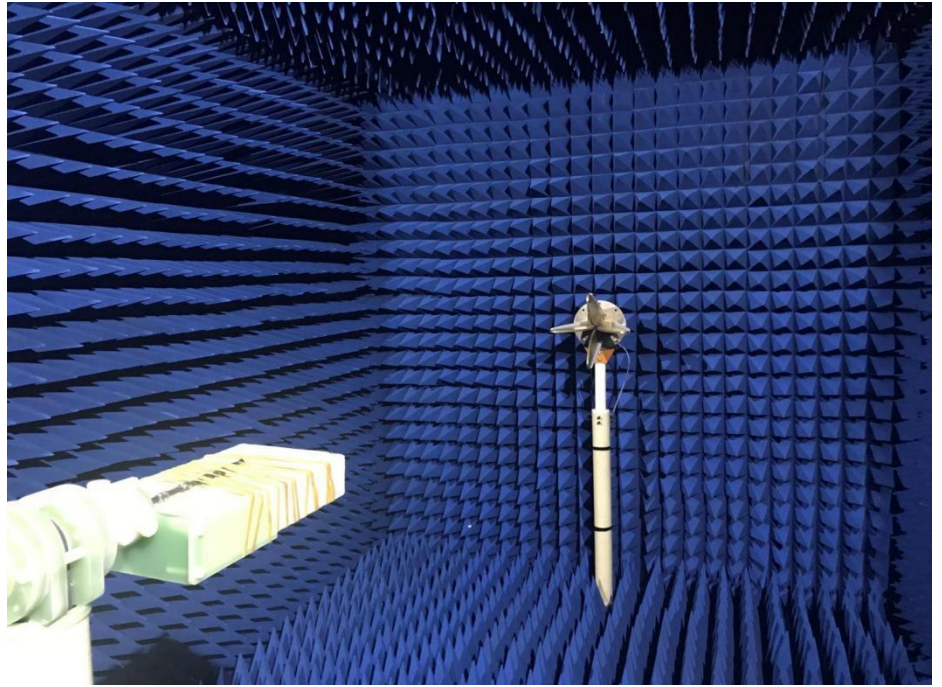
CMW500



E5071B



Aglient 8960



测试项目 (Test Project) : S11、S12 、VSWR 、Efficiency、Gain 3D Radiation Pattern 、TRP、TIS

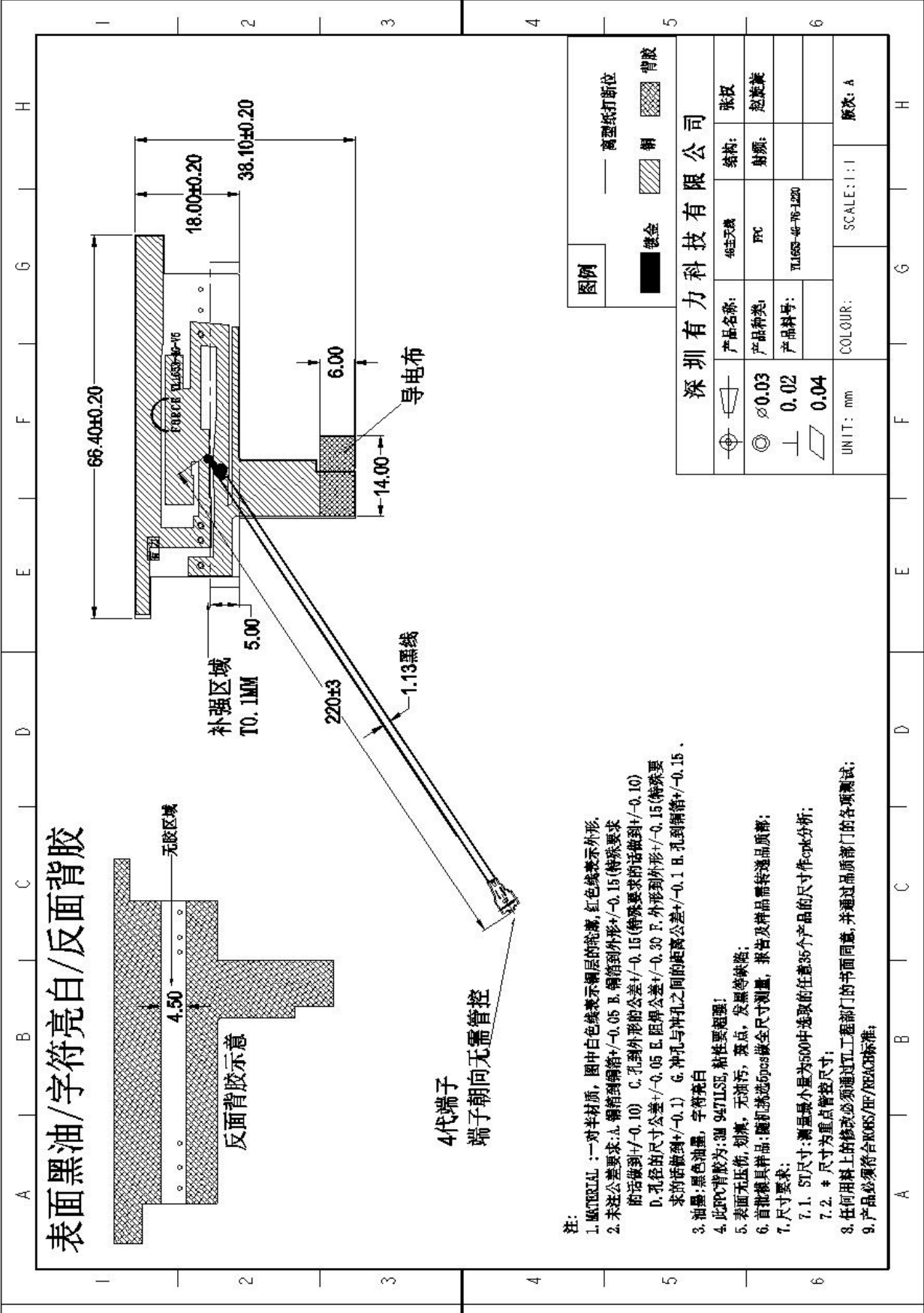
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1. 工程图纸 (Mechanical Drawing)



2.技术指标（Technical Index）

频率范围 Frequency Range （MHz）	620-920MHz/1700-2700MHz/3400-3800MHz/5150-5950MHz		
天线增益 Antenna gain （dBi）	620-920MHz	MAX	1. 61dBi
	1700-2700MHz	MAX	1. 81dBi
	3350-3750MHz	MAX	3. 21dBi
	5150-5950MHz	MAX	4. 43dBi
天线形式	PIFA		
天线方向 Antenna direction	全向		
驻波比 VSWR/50 Ohms	≤2. 0		
输入阻抗 Impedance	50 Ω		
接头 Termination	4代端子 1. 13黑线 L=220mm		
工作温度 （℃）	-30~+75		

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3. 天线测试数据 (Antenna test data)

3-1 OTA测试数据

FDD

Test	LTE2 TRP			Test	LTE2 TIS
Result	18650	18900	19150	Result	1150
Frequency (MHz)	1855	1880	1905	Frequency (MHz)	1985
Txp Ave(dBm)	20.03	20.55	20.67	Sens Ave(dBm)	-93.61
	20				-93.5
Test	LTE4 TRP			Test	LTE4 TIS
Result	20000	20175	20350	Result	2350
Frequency (MHz)	1715	1732.5	1750	Frequency (MHz)	2150
Txp Ave(dBm)	19.83	20.29	20.52	Sens Ave(dBm)	-95.77
	20				-93.5
Test	LTE5 TRP			Test	LTE5 TIS
Result	20450	20525	20600	Result	2600
Frequency (MHz)	829	836.5	844	Frequency (MHz)	889
Txp Ave(dBm)	20.09	19.72	19.63	Sens Ave(dBm)	-92.47
	20				-93.5

Test	LTE7 TRP			Test	LTE7 TIS
Result	20800	21100	21400	Result	3400
Frequency (MHz)	2505	2535	2565	Frequency (MHz)	2685
Txp Ave(dBm)	18. 49	18. 73	19. 16	Sens Ave(dBm)	-93. 74
Test	LTE12 TRP			Test	LTE12 TIS
Result	23060	23095	23130	Result	5130
Frequency (MHz)	703	706. 5	710	Frequency (MHz)	740
Txp Ave(dBm)	18. 25	18. 64	19. 18	Sens Ave(dBm)	-94. 13
			18		
Test	LIE13 TRP	Test		LTE13 TIS	
Result	23230	Result		5230	
Frequency (MHz)	782	Frequency (MHz)		751	
Txp Ave(dBm)	18. 78	Sens Ave(dBm)		-94. 61	
			19		
Test	LTE14 TRP	Test		LTE14 TIS	
Result	23330	Result		5330	
Frequency (MHz)	793	Frequency (MHz)		763	
Txp Ave(dBm)	18. 93	Sens Ave(dBm)		-93. 47	

FDD

Test	LTE17 TRP			Test	LTE17 TIS
Result	23780	23790	23800	Result	5800
Frequency (MHz)	709	710	711	Frequency (MHz)	741
Txp Ave(dBm)	18.83	19.12	19.4	Sens Ave(dBm)	-93.42
Test	LTE71 TRP			Test	LTE71 TIS
Result	133172	133297	133422	Result	68886
Frequency (MHz)	668	680.5	693	Frequency (MHz)	647
Txp Ave(dBm)	16.63	17.26	17.41	Sens Ave(dBm)	-92.6
	17				-92
Test	LTE66 TRP			Test	LTE66 TIS
Result	132022	132322	132622	Result	67086
Frequency (MHz)	1715	1745	1775	Frequency (MHz)	2175
Txp Ave(dBm)	20.9	20.48	21.24	Sens Ave(dBm)	-95.21
	20				-93.5

Test	LTE25 TRP			Test	LTE25 TIS
Result	26090	26365	26640	Result	8640
Frequency (MHz)	1855	1882.5	1910	Frequency (MHz)	1990
Txp Ave(dBm)	19.79	19.64	19.22	Sens Ave(dBm)	-91.92
Test	LTE26 TRP			Test	LTE26 TIS
Result	26740	26865	26990	Result	8990
Frequency (MHz)	819	831	844	Frequency (MHz)	889
Txp Ave(dBm)	19.76	18.91	18.45	Sens Ave(dBm)	-92.19
Test	LTE30 TRP	Test	LTE30 TIS		
Result	27710	Result	9820		
Frequency (MHz)	2310	Frequency (MHz)	2355		
Txp Ave(dBm)	19.42	Sens Ave(dBm)	-94.14		

TDD

Test	LTE41 TRP			Test	LTE41 TRP
Result	39750	40620	41490	Result	41490
Frequency (MHz)	2506	2593	2680	Frequency (MHz)	2680
Txp Ave (dBm)	19. 71	20. 06	20. 19	Txp Ave (dBm)	-94. 7
		19. 5			-94
Test	LTE42 TRP			Test	LTE42 TIS
Result	41640	42590	43540	Result	43540
Frequency (MHz)	3405	3500	3595	Frequency (MHz)	3595
Txp Ave (dBm)	21. 03	20. 94	19. 91	Sens Ave (dBm)	-94. 75
Test	LTE43 TRP			Test	LTE43 TIS
Result	43640	44590	45540	Result	45540
Frequency (MHz)	3605	3700	3795	Frequency (MHz)	3795
Txp Ave (dBm)	20. 05	20. 38	20. 59	Sens Ave (dBm)	-94. 82
Test	LTE48 TRP			Test	LTE48 TIS
Result	55290	55990	56690	Result	56690
Frequency (MHz)	3555	3625	3695	Frequency (MHz)	3695
Txp Ave (dBm)	20. 17	20. 46	19. 92	Sens Ave (dBm)	-96. 49
		19			-95

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3-2 无源效率/增益

Passive Test For 600-4500		
Freq (MHz)	Effi (%)	Gain (dBi)
620	30.99	-2.89
630	31.45	-2.18
640	32.13	-1.54
650	31.36	-1.75
660	32.62	-1.82
670	31.79	-1.48
680	31.55	-0.85
690	36.47	-0.56
700	38.31	0.09
710	42.95	0.77
720	46.71	1.48
730	46.03	1.61
740	45.36	1.55
750	47.59	1.31
760	44.29	0.47
770	40.15	-0.09
780	34.71	-0.66
790	32.54	-0.82
800	33.25	-1.46
810	32.09	-1.29
820	32.34	-1
830	31.75	-0.9
840	29.26	-0.46
850	30.59	-0.22
860	29.42	0.01
870	28.73	-0.08
880	27.16	-0.61
890	28.01	-0.7
900	29.94	-0.74
910	28.83	-0.72
920	28.27	-0.97
1690	71.12	1.54
1700	77.37	1.88
1710	74.96	1.83
1720	70.67	1.64
1730	68.83	1.59
1740	70.85	1.84
1750	67.12	1.76
1760	66.78	1.59
1770	63.83	1.67

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1780	60.02	1.63
1790	57.42	1.43
1800	55.52	1.18
1810	53.31	1.11
1820	51.47	1.02
1830	51.1	1
1840	50.82	0.94
1850	52.49	1.18
1860	53.36	1.25
1870	53.6	1.57
1880	54.56	1.81
1890	52.45	1.73
1900	47.83	1.33
1910	43.93	0.88
1920	45.29	0.97
1930	42.24	0.62
1940	37.9	0.13
1950	37.97	0.03
1960	37.7	-0.11
1970	38.99	-0.14
1980	40.75	-0.37
1990	39.84	-0.44
2000	40.25	0.07
2010	42.87	0.97
2020	42.3	1.17
2030	46.16	1.63
2040	48.46	1.72
2050	47.33	1.34
2060	47.63	1.08
2070	49.92	1.07
2080	48.18	0.82
2090	49.25	0.89
2100	47.38	0.6
2110	42.4	0.01
2120	42.88	-0.06
2130	47.97	0.32
2140	42.18	-0.08
2150	41.86	-0.39
2160	40.47	-0.48
2170	42.82	-0.29
2180	43.44	-0.32
2190	39.89	-0.91
2200	37.04	-1.35
2210	35.19	-1.71
2220	40.07	-1.19
2230	42.64	-0.8

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2240	41.72	-0.86
2250	37.97	-1.3
2260	38.26	-1.28
2270	33.43	-1.97
2280	35.86	-1.42
2290	35.97	-1.32
2300	35.11	-1.52
2310	33.08	-1.94
2320	36.83	-1.56
2330	36.66	-1.69
2340	42.55	-0.97
2350	38.41	-1.44
2360	35.69	-1.9
2370	35.21	-2.03
2380	39.5	-1.34
2390	39.03	-1.41
2400	39.95	-1.04
2410	38.1	-1.13
2420	38.51	-1.01
2430	40.13	-0.84
2440	40.32	-0.82
2450	40.7	-0.66
2460	38.11	-0.92
2470	37.73	-0.9
2480	38.23	-0.8
2490	40.43	-0.41
2500	37.56	-0.68
2510	38.24	-0.54
2520	35.4	-0.93
2530	36.01	-0.79
2540	36.36	-0.69
2550	35.92	-0.79
2560	34.69	-1.03
2570	36.9	-0.66
2580	35.71	-0.78
2590	36.98	-0.59
2600	38.83	-0.32
2610	37.29	-0.53
2620	37.64	-0.64
2630	39.85	-0.19
2640	41.13	0.07
2650	40.88	0.02
2660	39.99	0.05
2670	38.4	-0.48
2680	37.76	-0.66
2690	39.92	-0.78

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2700	36.72	-0.62
3350	34.44	-0.36
3360	32.92	-0.38
3370	36.16	0.12
3380	36.63	0.17
3390	39.91	0.52
3400	37.54	0.05
3410	40.11	0.27
3420	43.09	0.45
3430	42	0.29
3440	41.8	0.12
3450	43.23	0.1
3460	40.35	-0.39
3470	43.86	-0.22
3480	44.06	-0.4
3490	38.74	-1.06
3500	41.77	-0.68
3510	43.07	-0.41
3520	41.62	-0.48
3530	45.1	-0.02
3540	45.01	0.08
3550	43.2	0.08
3560	46.71	0.63
3570	47.07	0.78
3580	49.37	1.02
3590	52.14	1.21
3600	52.77	1.49
3610	53.04	1.72
3620	55.02	1.98
3630	55.58	2.04
3640	55.78	2.08
3650	56.2	2.2
3660	58.34	2.5
3670	60.01	2.79
3680	60.35	2.95
3690	60.06	3.06
3700	58.83	3.09
3710	58.75	3.13
3720	59.94	3.21
3730	59.36	3.19
3740	58.97	3.14
3750	59.38	3.2

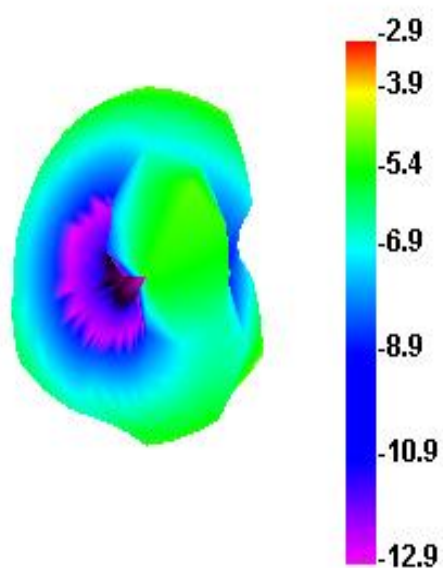
5150-5950		
Freq (MHz)	Effi (%)	Gain (dBi)
5150	57.88	4.11
5160	58.57	4.13
5170	56.58	3.95
5180	57.23	4.03
5190	54.28	3.81
5200	58.43	4.16
5210	61.73	4.38
5220	62.92	4.43
5230	59.95	4.24
5240	58.78	4.1
5250	57.48	3.98
5260	57.01	3.84
5270	56.97	3.75
5280	58.97	3.86
5290	55.97	3.55
5300	57.11	3.64
5310	56.58	3.55
5320	57.78	3.63
5330	57.31	3.55
5340	56.45	3.46
5350	55.1	3.33
5360	55.98	3.25
5370	53.7	2.96
5380	56.42	3.08
5390	56.82	3.09
5400	54	2.88
5410	55.29	2.96
5420	54.16	2.81
5430	53.37	2.73
5440	55.51	2.84
5450	56.07	2.77
5460	55.72	2.69
5470	57.18	2.7
5480	58.91	2.82
5490	61.9	3.01
5500	60.36	2.92
5510	58.32	2.76
5520	56.21	2.56
5530	55.96	2.52
5540	56.15	2.44
5550	59.75	2.57

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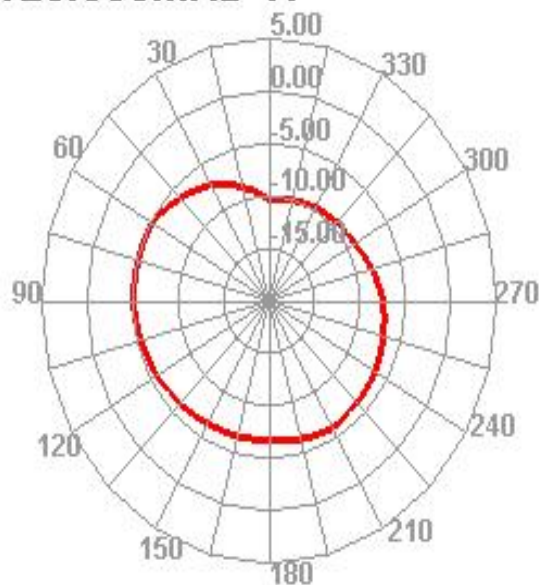
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5560	58.32	2.59
5570	56.16	2.57
5580	52.08	2.33
5590	52.36	2.38
5600	52.24	2.44
5610	50.44	2.35
5620	47.48	2.12
5630	46.93	2.22
5640	44.87	2.12
5650	48.39	2.43
5660	49.75	2.62
5670	48.79	2.55
5680	47.48	2.4
5690	49	2.54
5700	48.03	2.42
5710	52.15	2.85
5720	50.66	2.79
5730	49.28	2.73
5740	48.71	2.65
5750	50.74	2.87
5760	52.14	2.88
5770	54.21	3.11
5780	50.29	2.73
5790	46.96	2.4
5800	45.22	2.34
5810	46.36	2.49
5820	44.85	2.47
5830	44.27	2.31
5840	43.22	2.14
5850	42.7	2.04
5860	43.29	1.93
5870	46.23	2.25
5880	43.71	2.06
5890	40.44	1.88
5900	38.85	1.72
5910	48.55	2.92
5920	50.01	2.94
5930	51.18	2.92
5940	50.57	2.76
5950	50.75	2.65

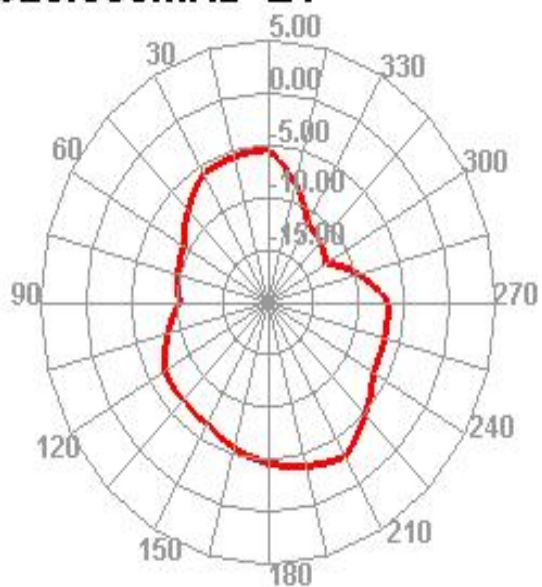
620.000MHz



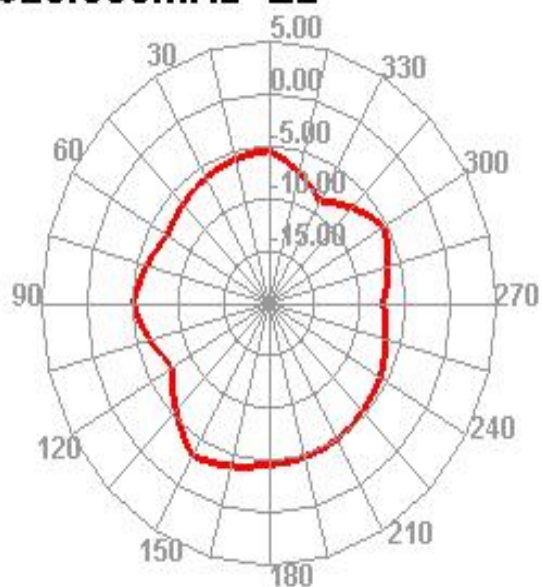
620.000MHz H



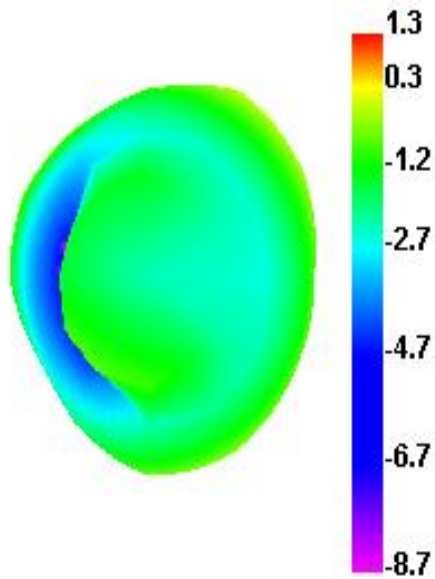
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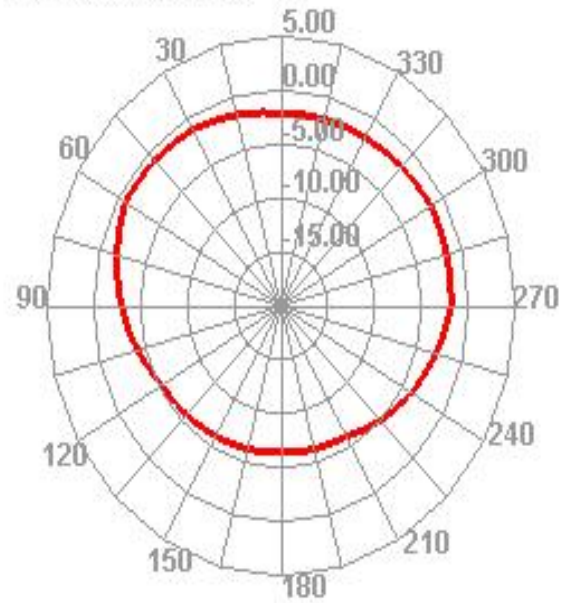
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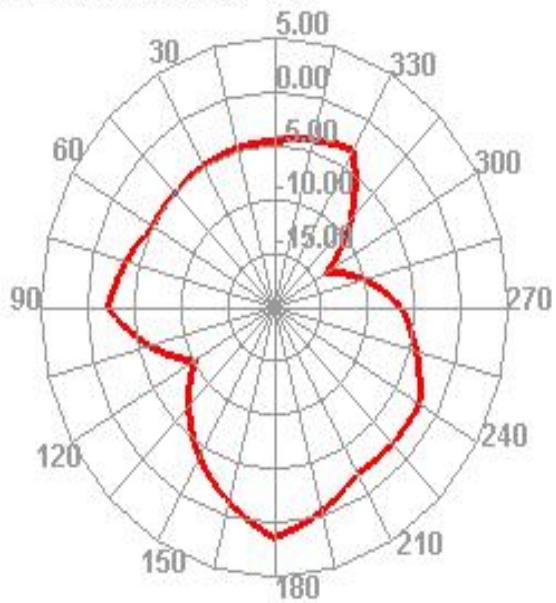
750.000MHz



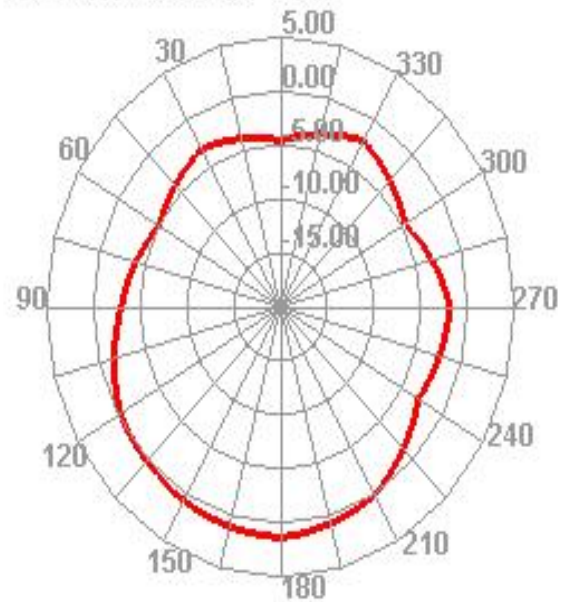
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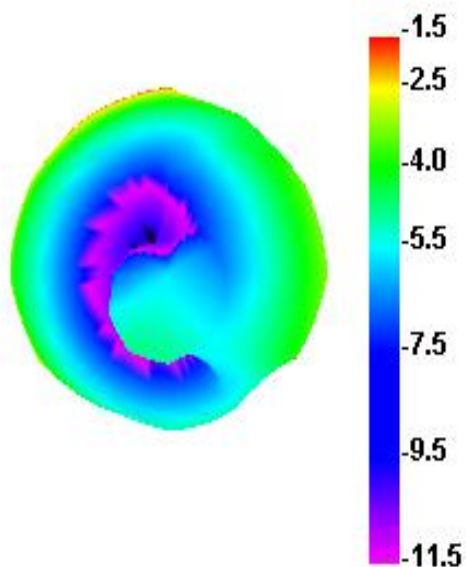
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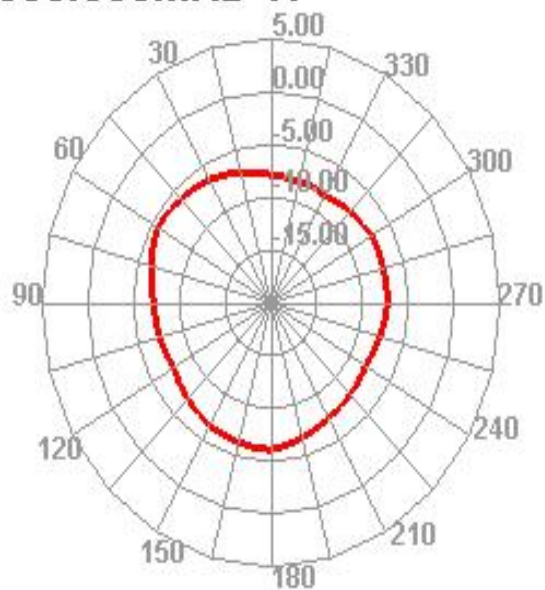
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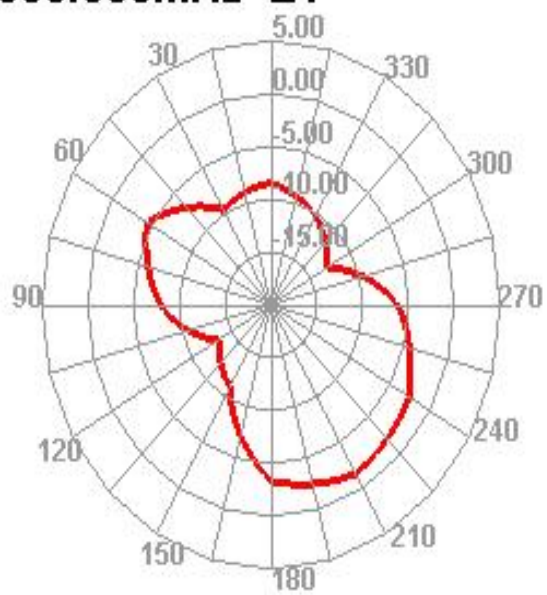
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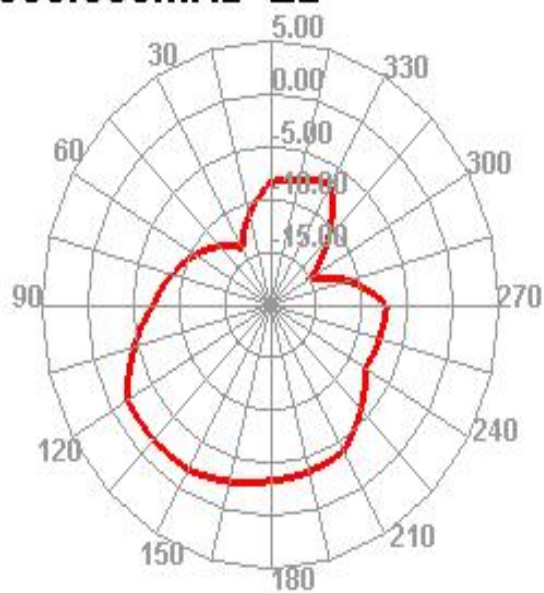
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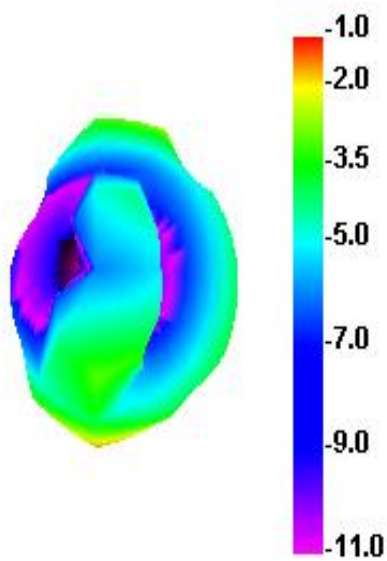
800.000MHz E1



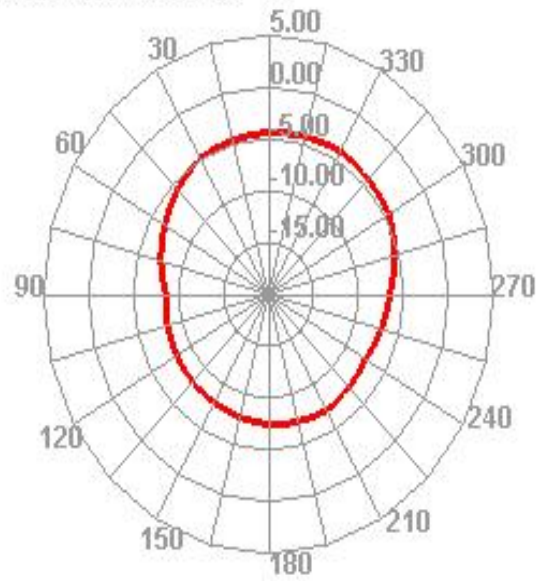
800.000MHz E2



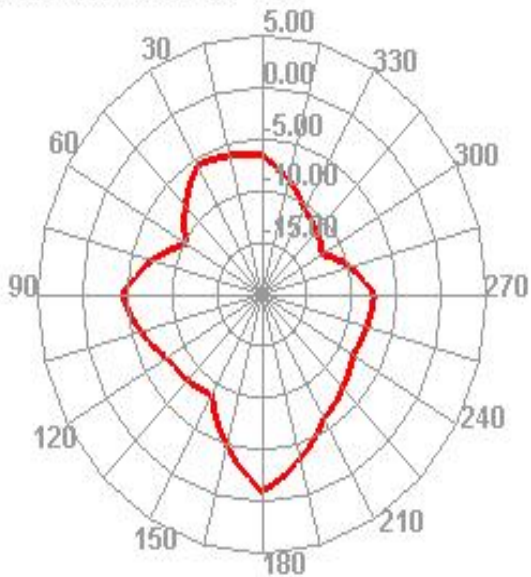
920.000MHz



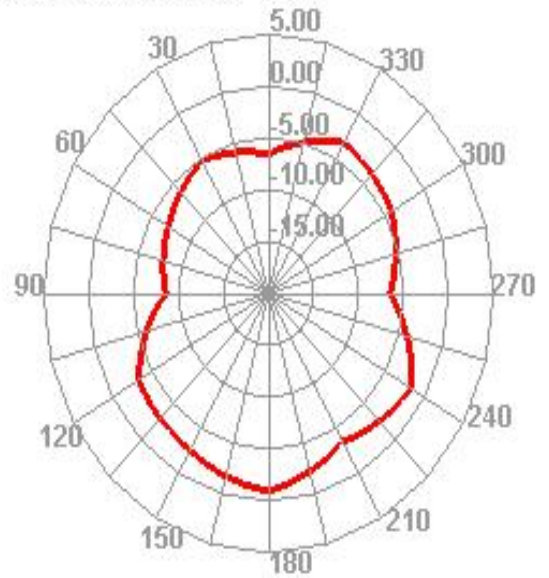
920.000MHz H



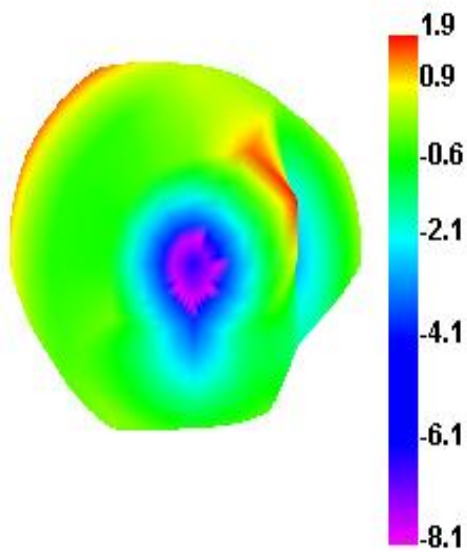
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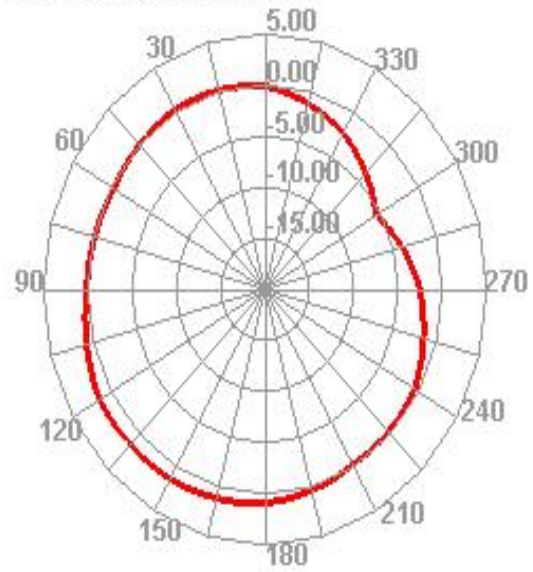
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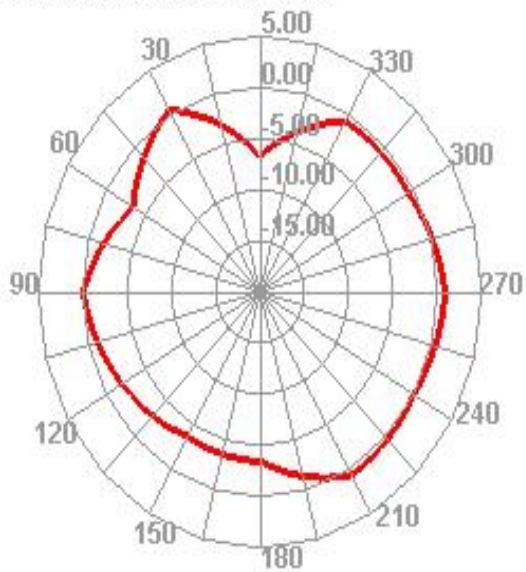
1700.000MHz



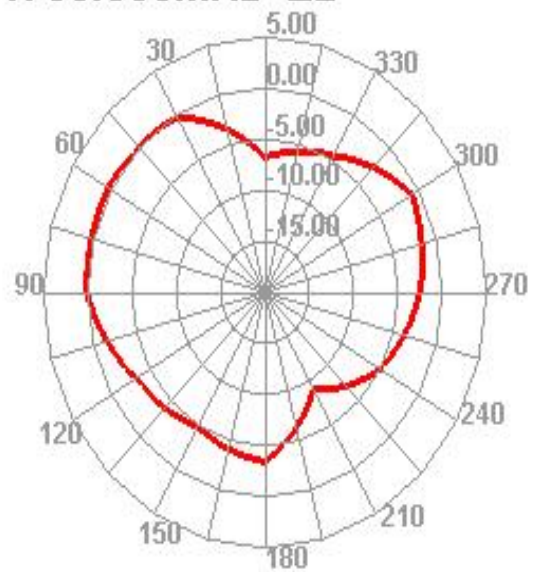
1700.000MHz H



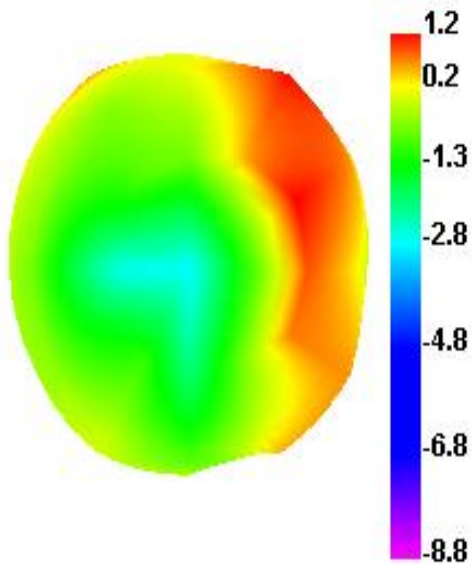
1700.000MHz E1



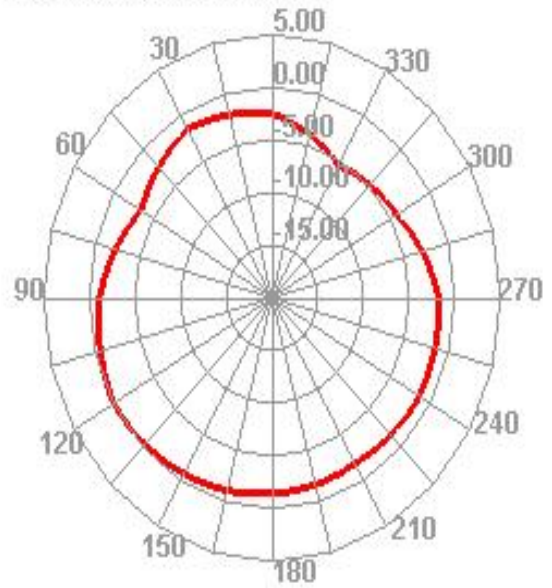
1700.000MHz E2



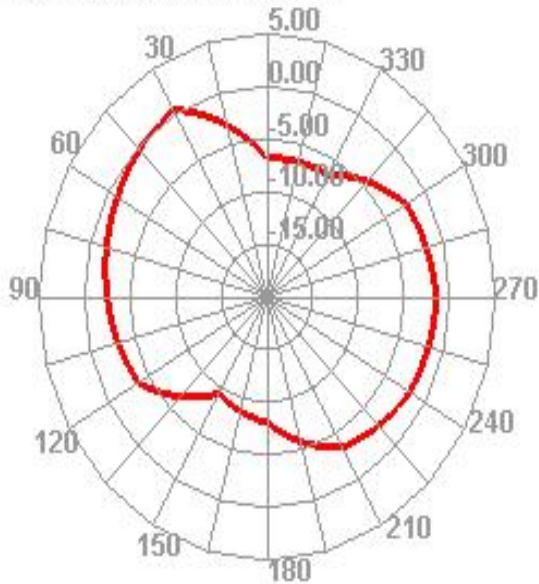
1800.000MHz



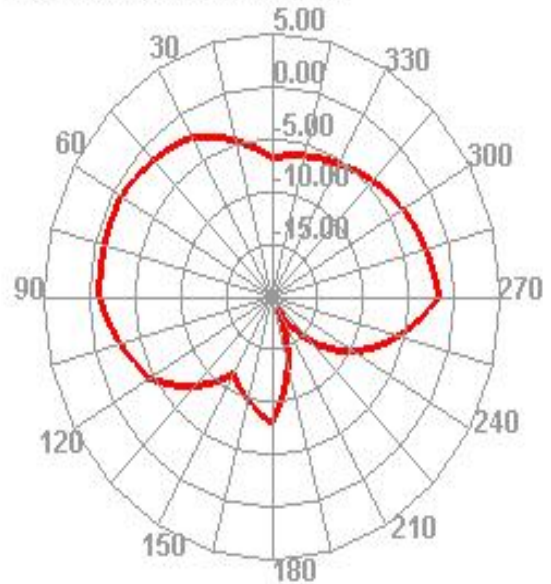
1800.000MHz H



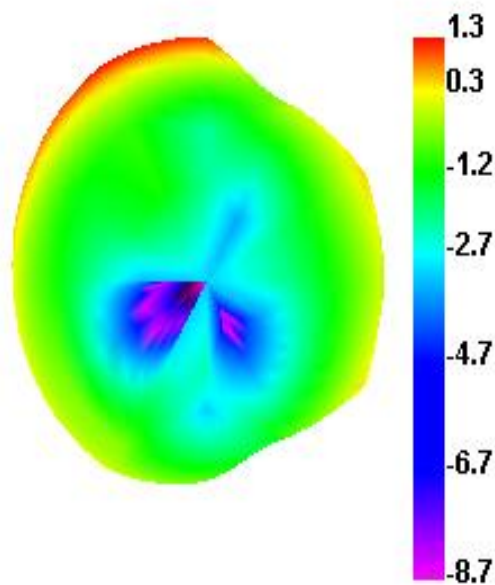
1800.000MHz E1



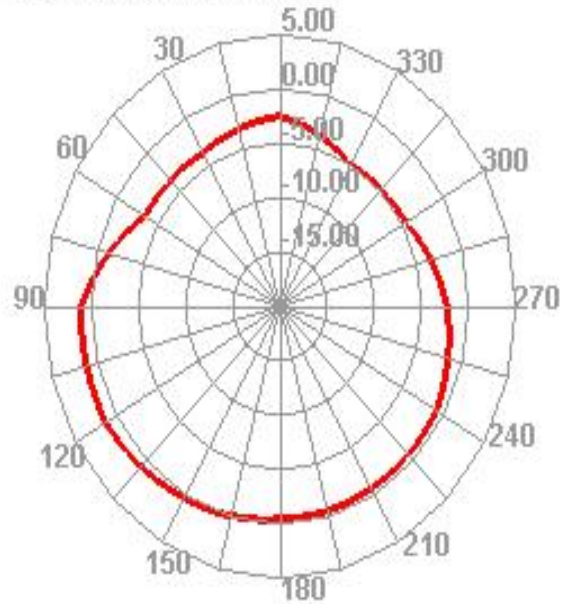
1800.000MHz E2



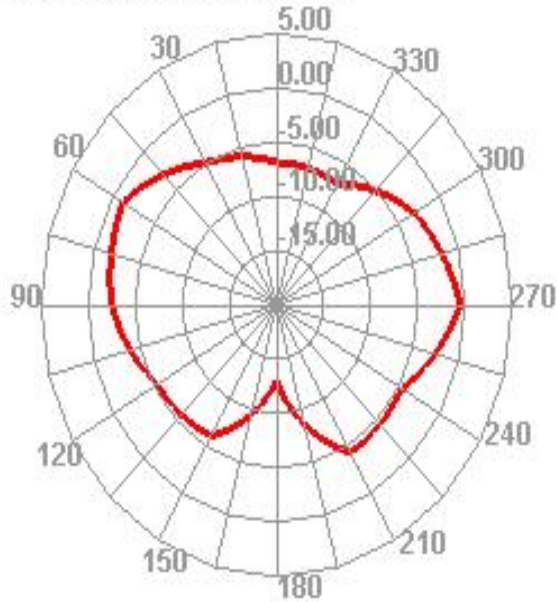
1900.000MHz



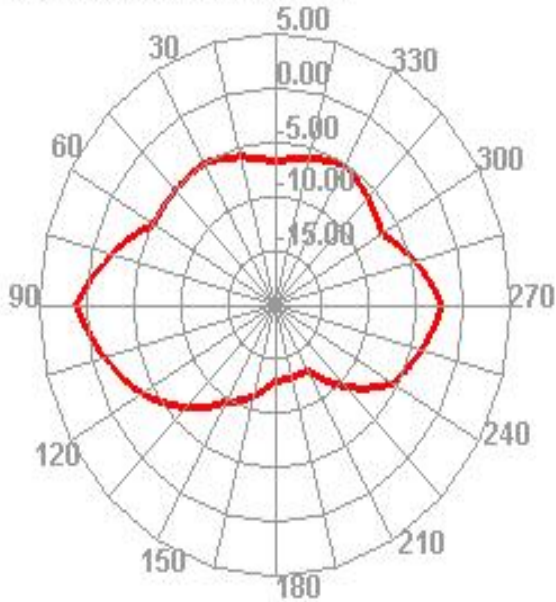
1900.000MHz H



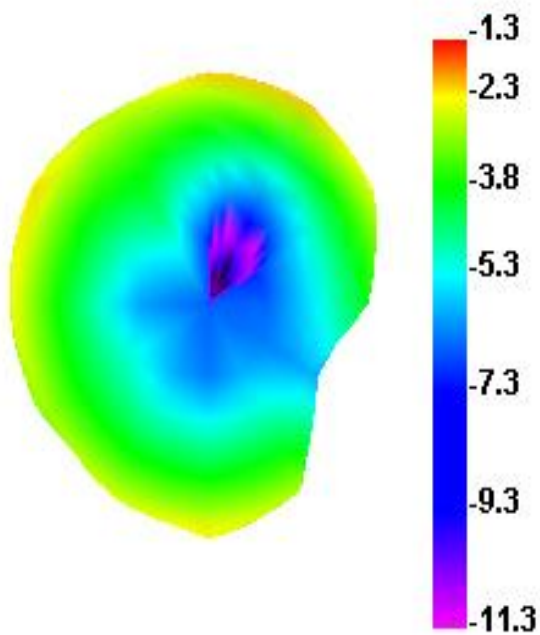
1900.000MHz E1



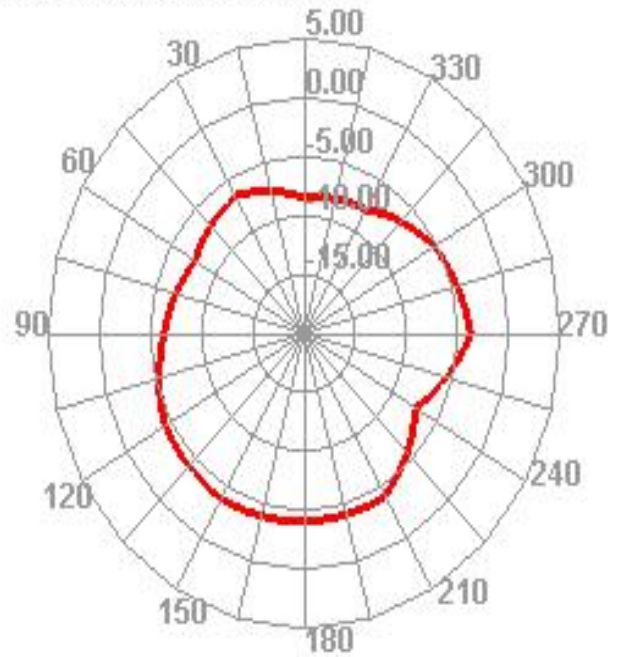
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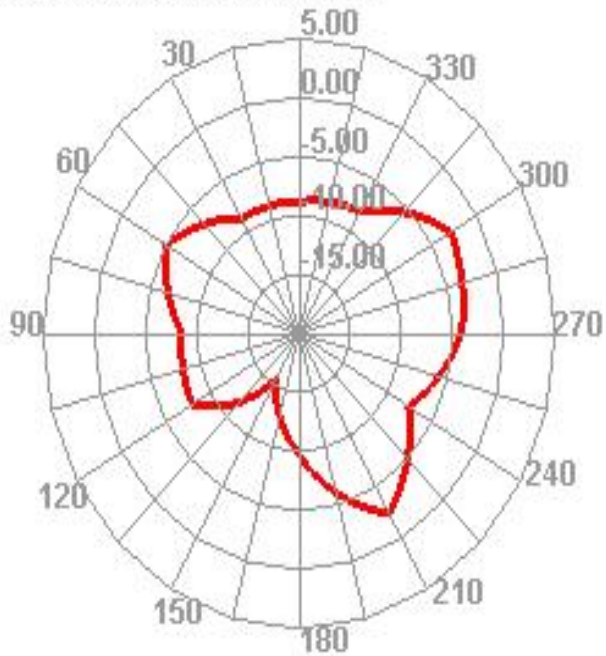
2200.000MHz



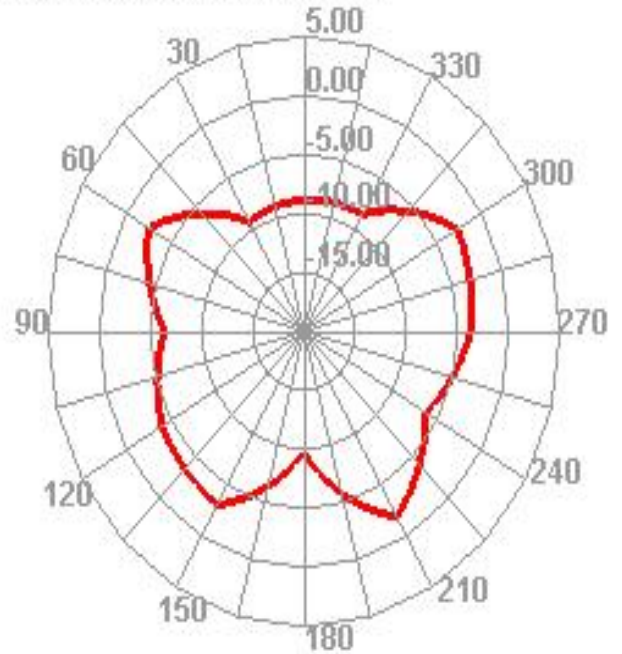
2200.000MHz H



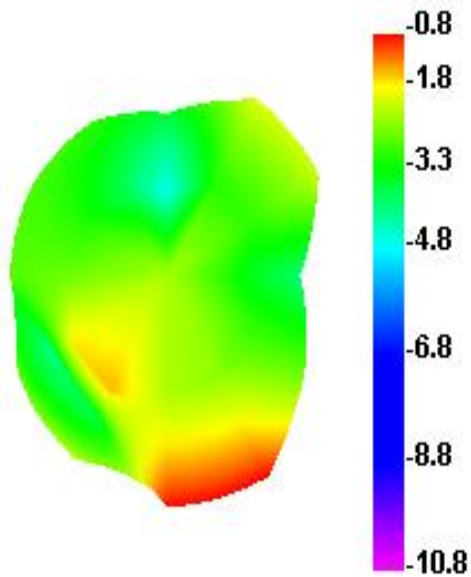
2200.000MHz E1



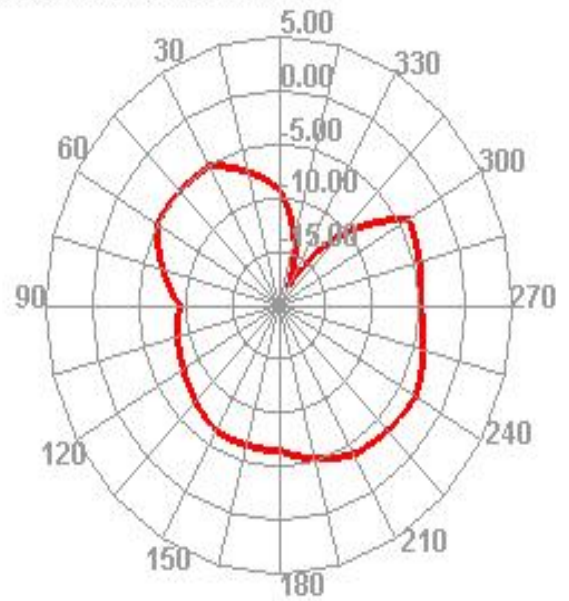
2200.000MHz E2



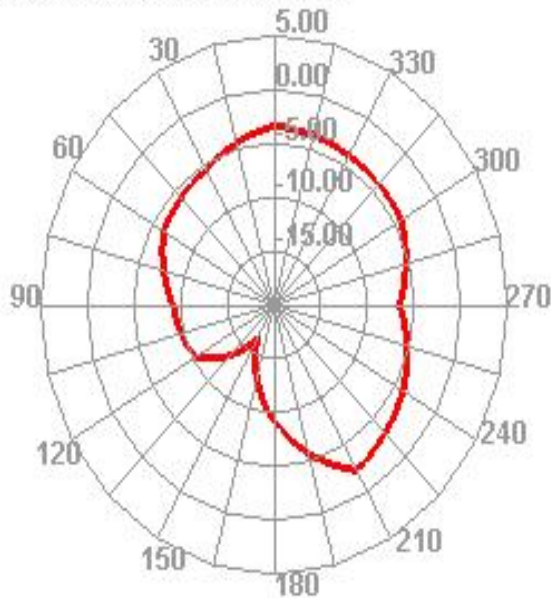
2550.000MHz



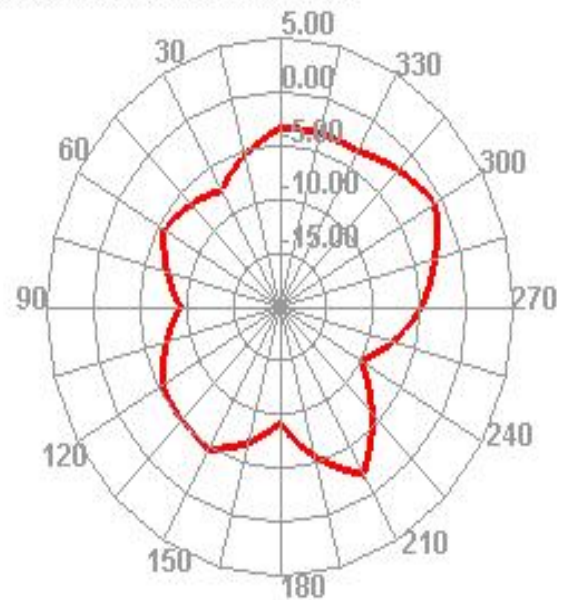
2550.000MHz H



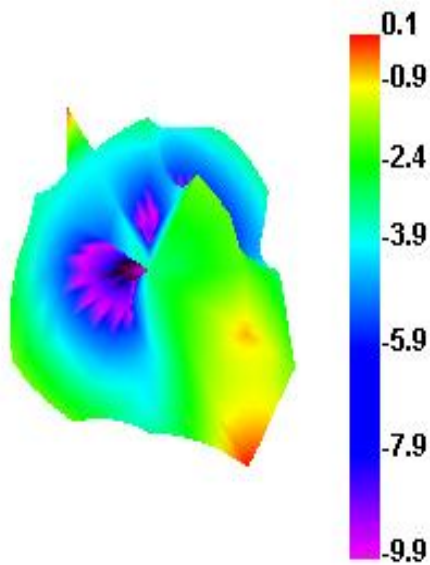
2550.000MHz E1



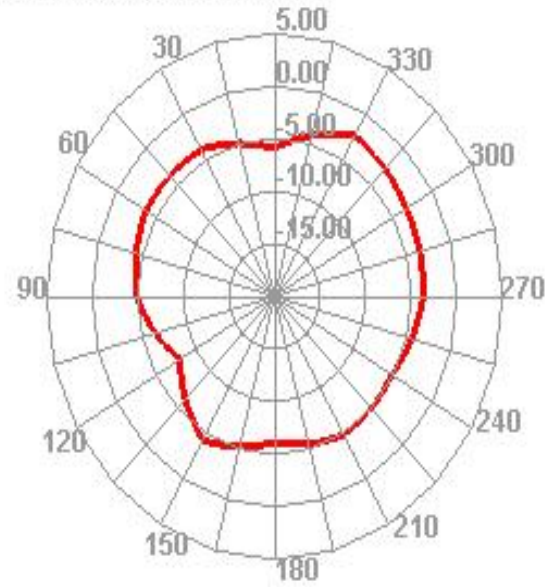
2550.000MHz E2



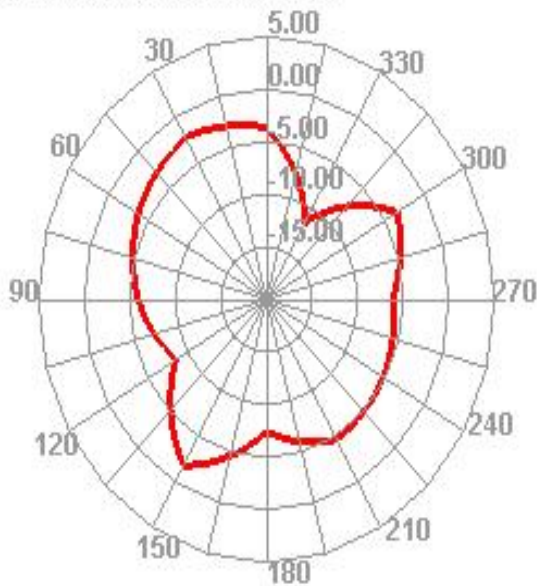
3400.000MHz



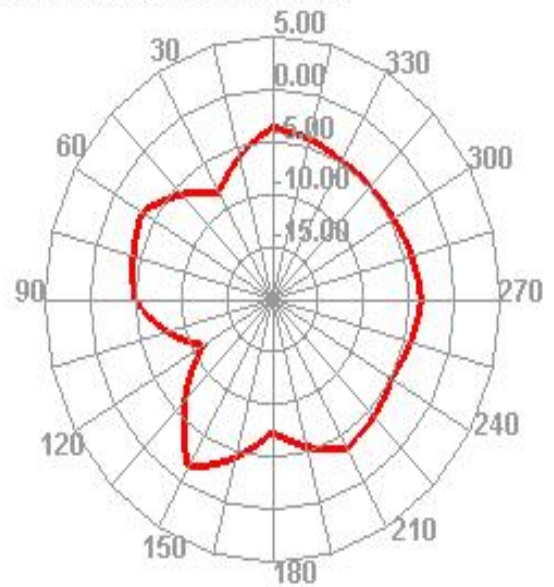
3400.000MHz H



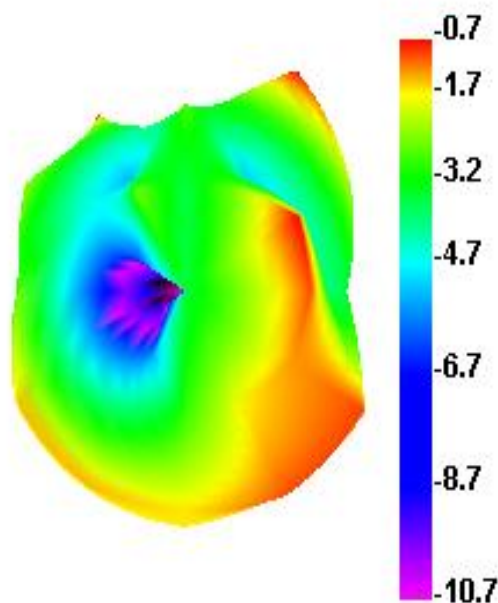
3400.000MHz E1



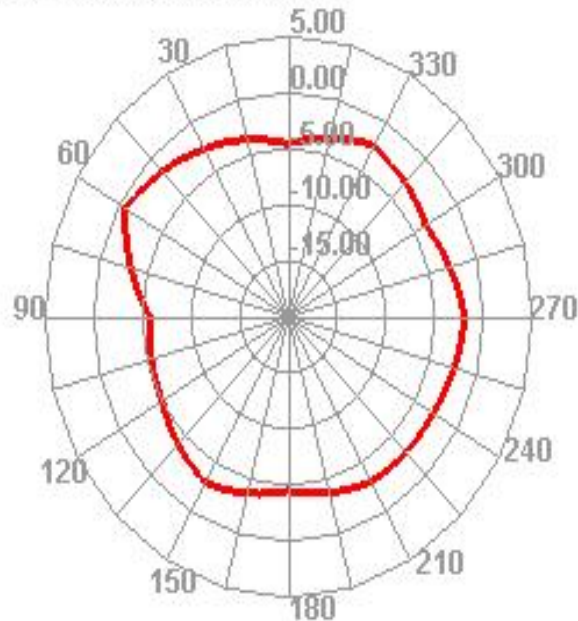
3400.000MHz E2



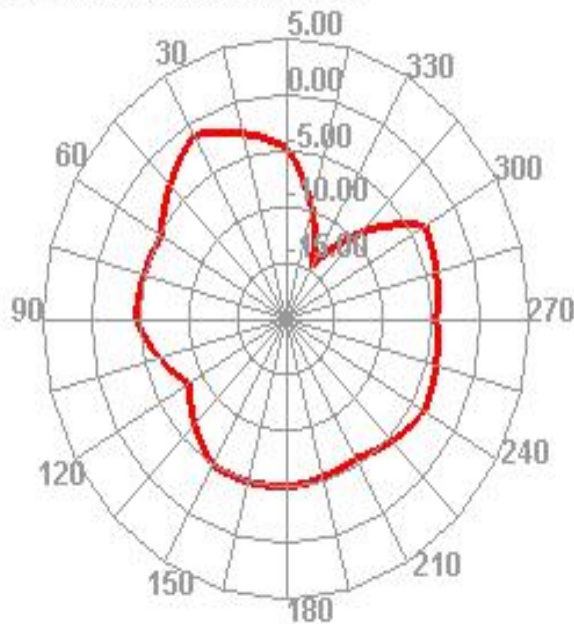
3500.000MHz



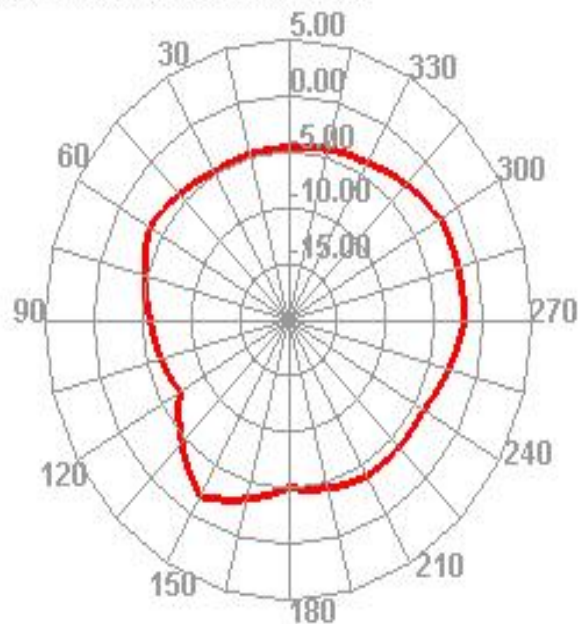
3500.000MHz H



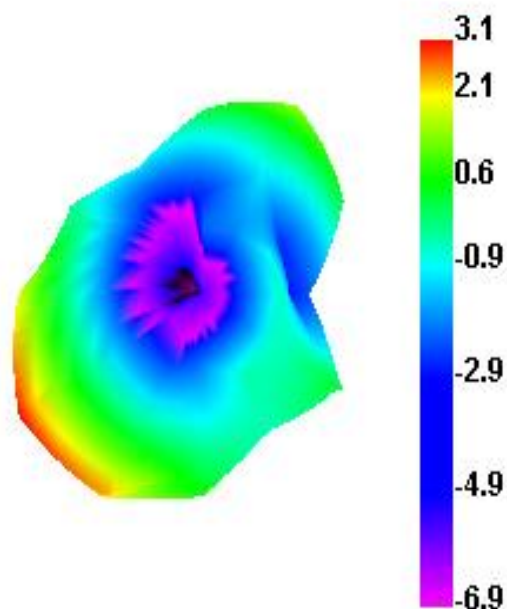
3500.000MHz E1



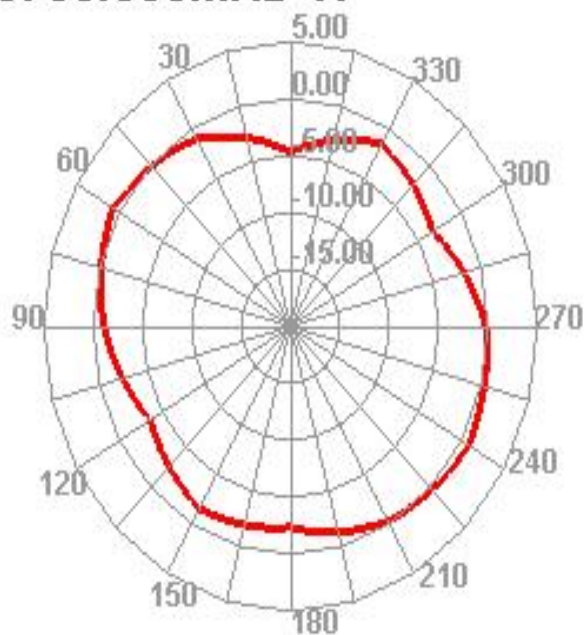
3500.000MHz E2



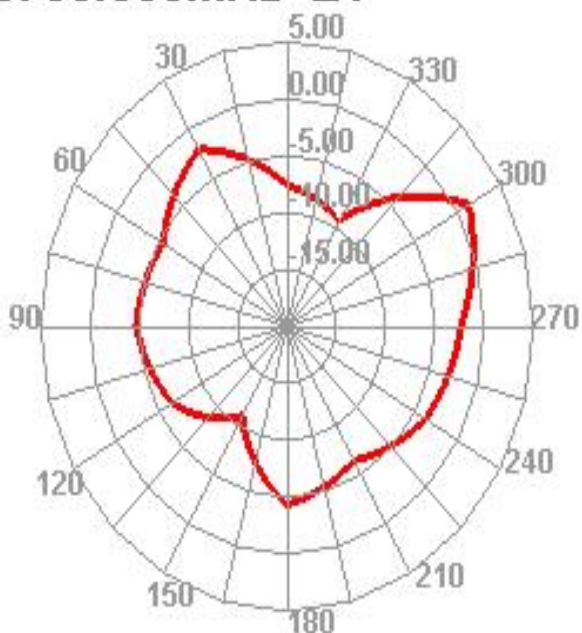
3700.000MHz



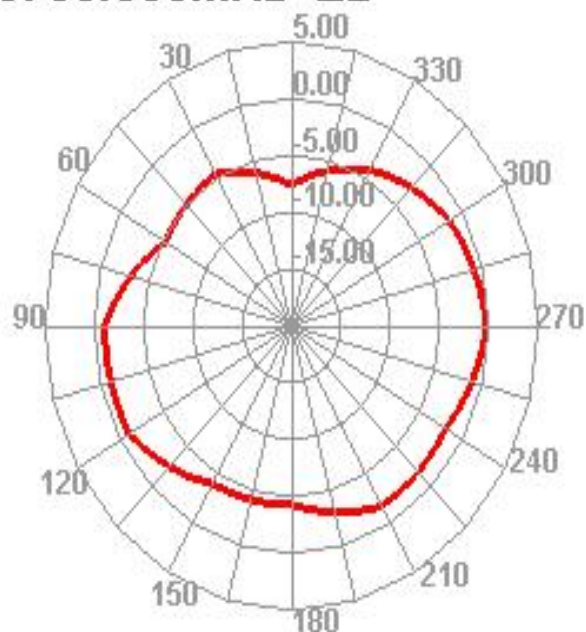
3700.000MHz H



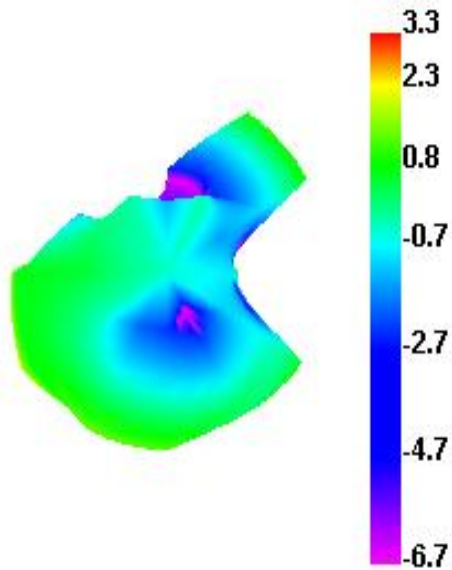
3700.000MHz E1



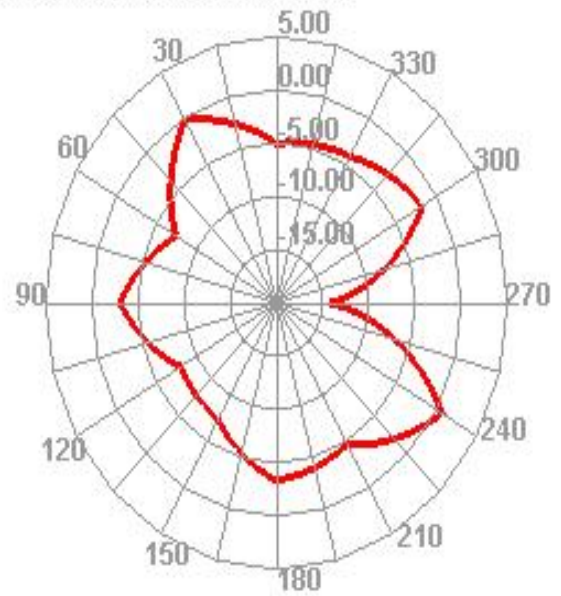
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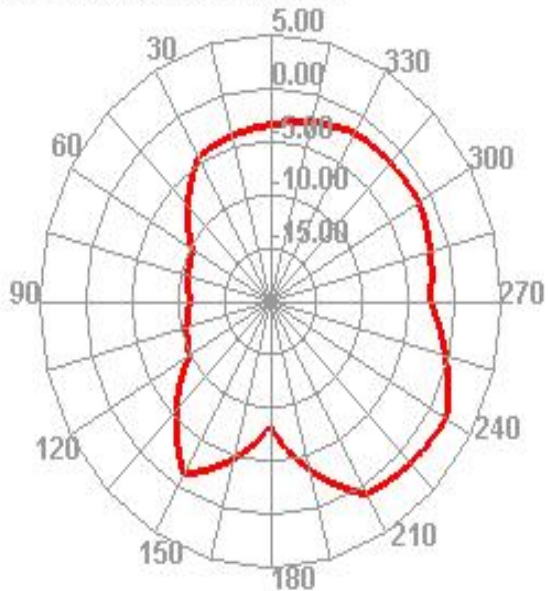
5350.000MHz



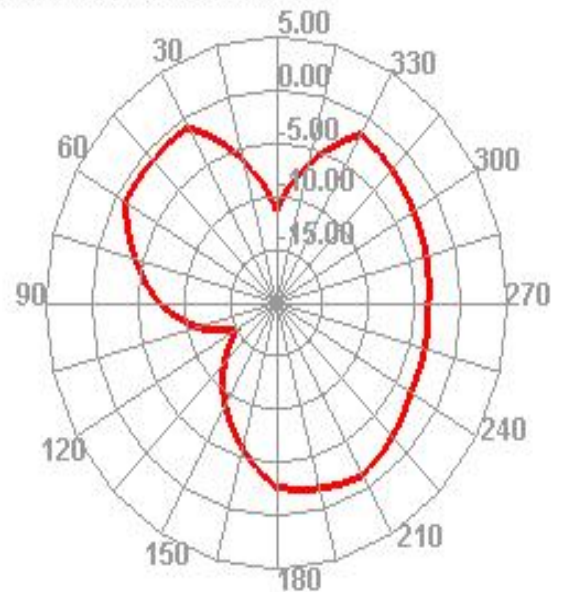
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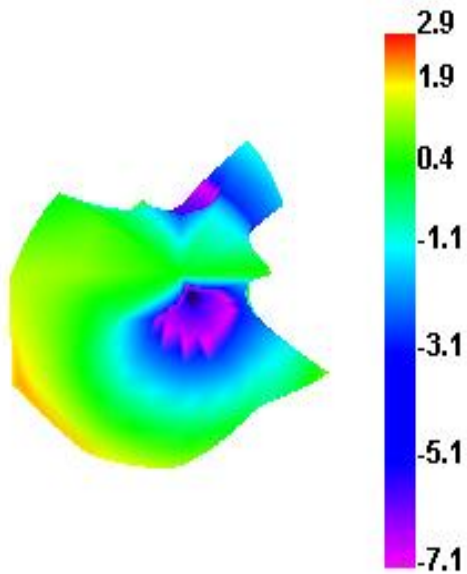
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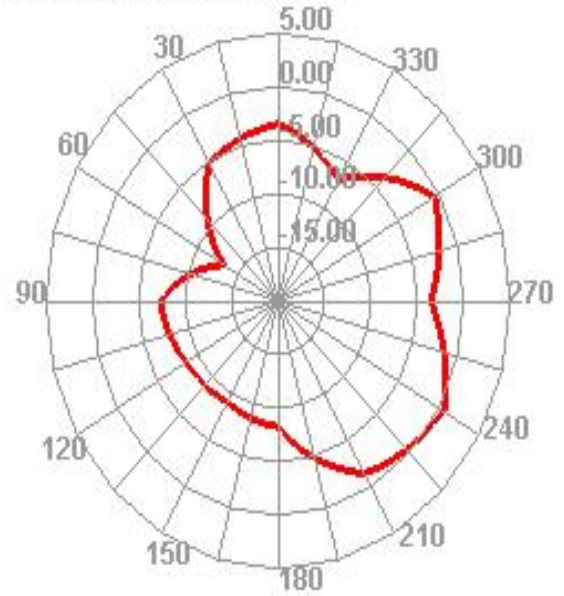
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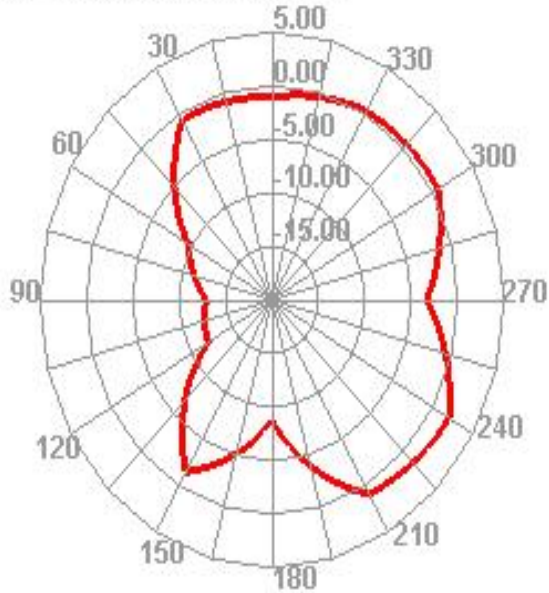
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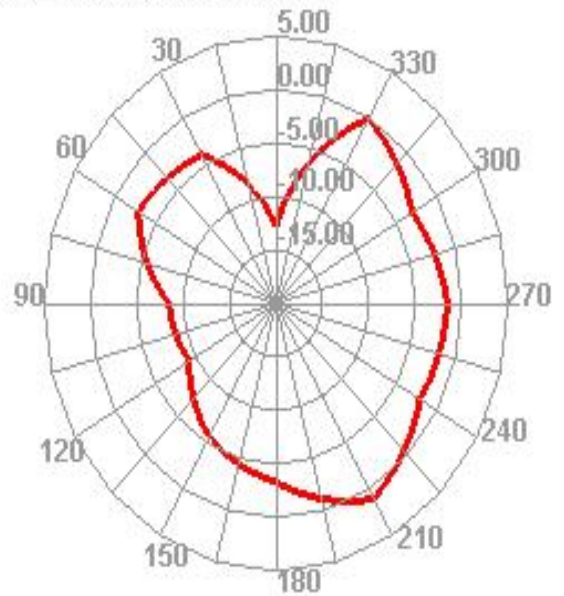
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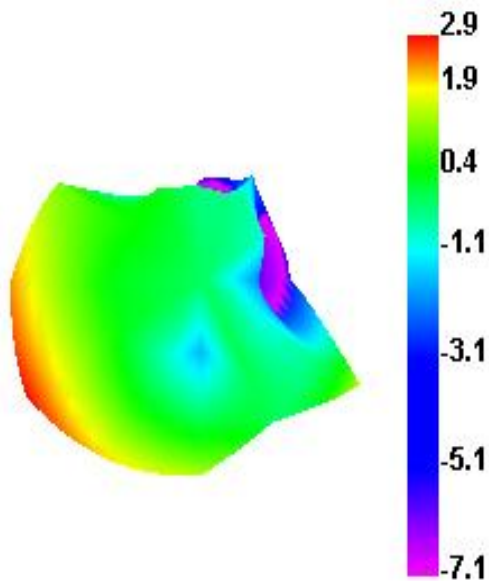
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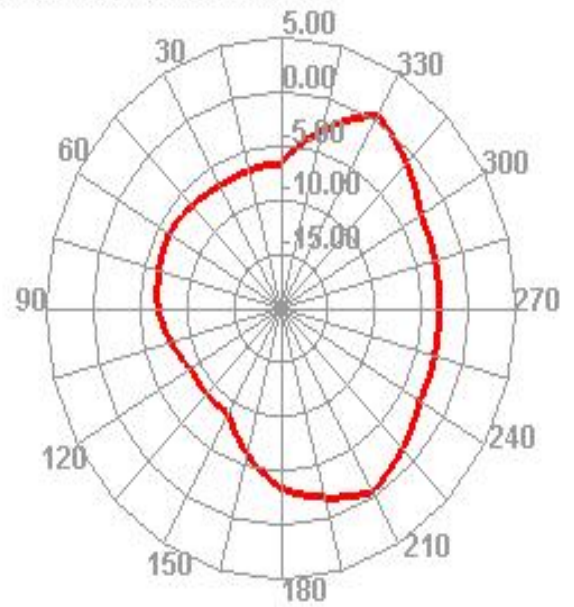
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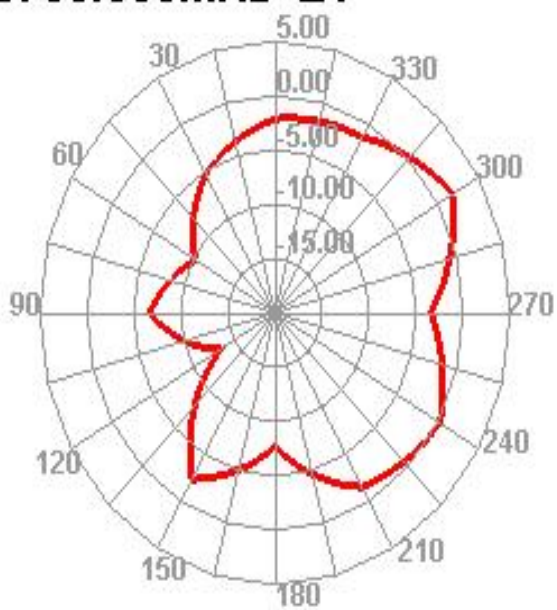
5750.000MHz



5750.000MHz H



5750.000MHz E1



5750.000MHz E2

