



深圳市海德门电子有限公司
ShenZhen Deman Electronics Technology Co., Ltd

MASP01 Antenna Test Report

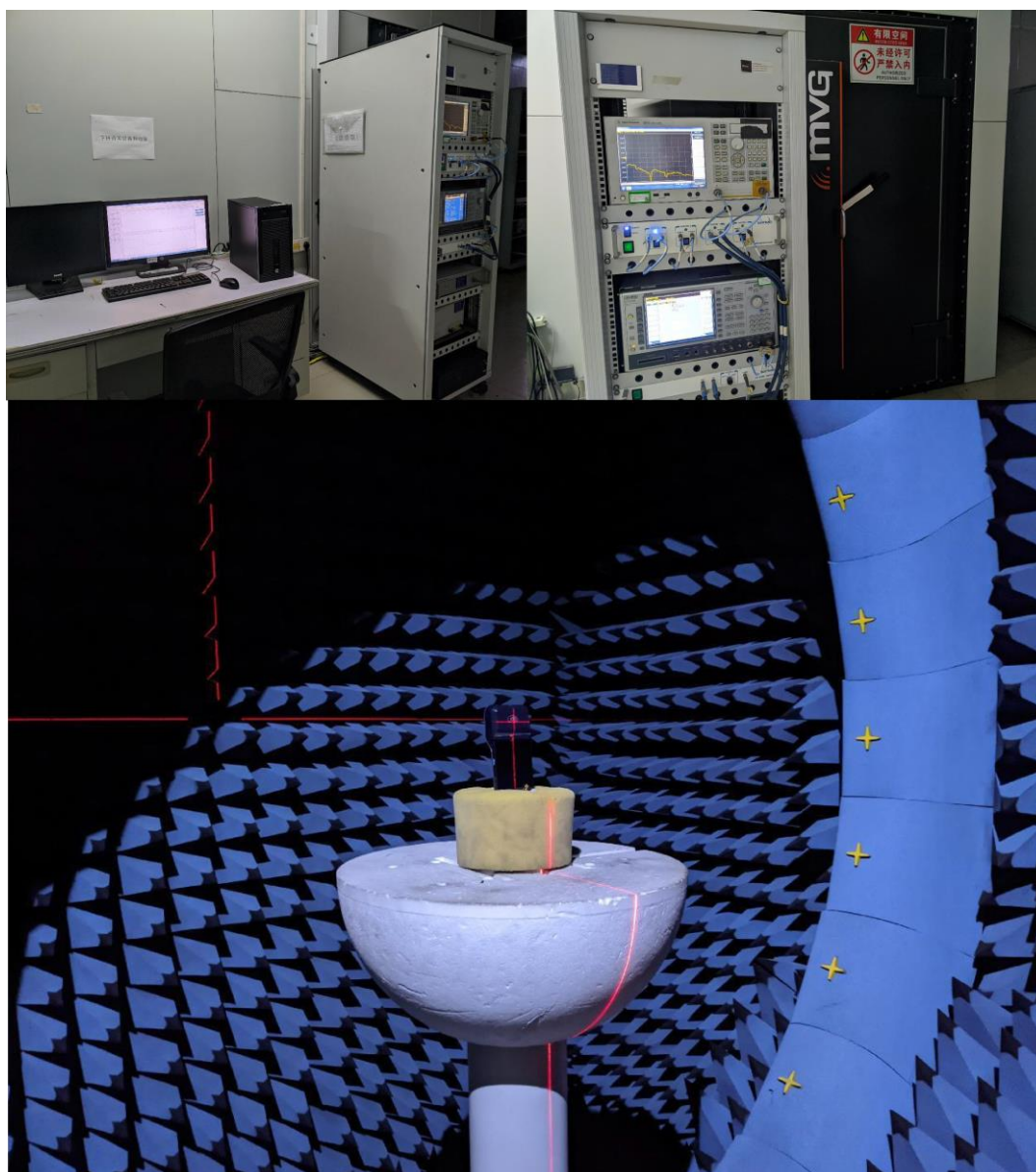


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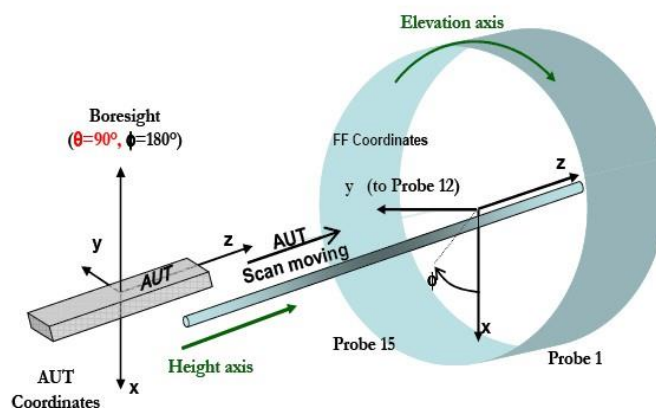
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1. TEST INSTRUMENTATION

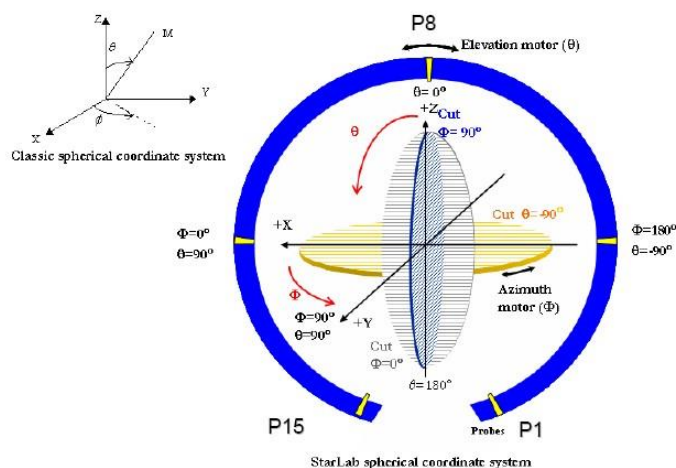
CHAMBER	SATIMO Chamber
Wireless Networking Test Set	Agilent 8960 5515C
NETWORK ANALYZER	Agilent 5072AD
COMPREHENSIVE TESTER	R&S CMW500
TEMPERATURE	20±2℃
HUMIDITY	50±20%rh



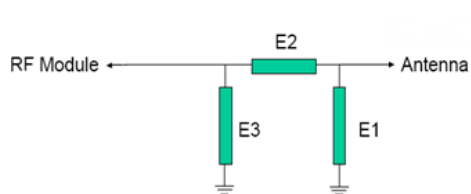
Coordinate system – Cylindrical geometry



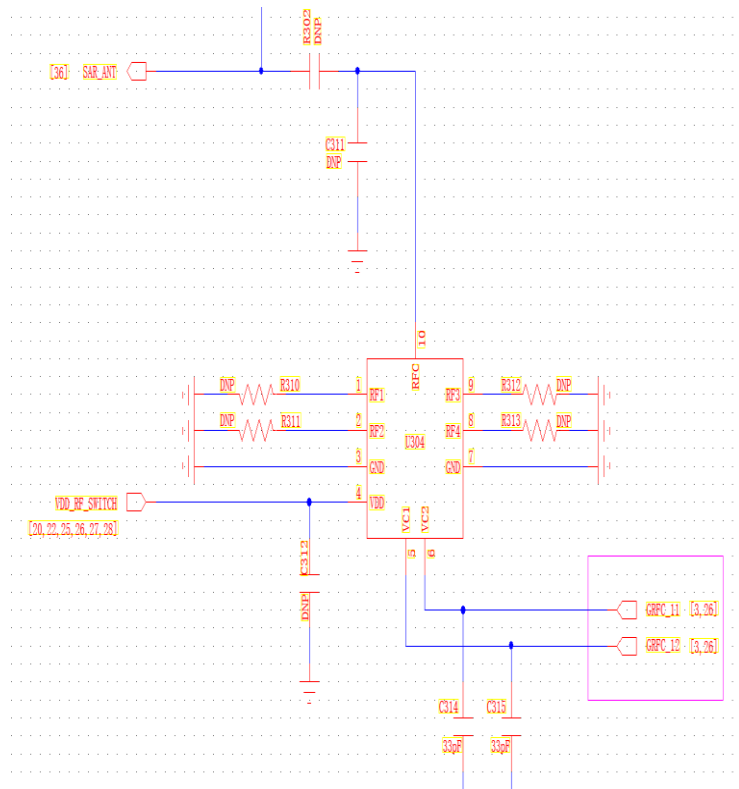
Coordinate system – Spherical geometry



Matching Circuit Description



Element		Value
E1(0402)		7.5nH
E2(0402)		0Ω
E3(0402)		/
RF1	R310	0Ω
RF2	R311	5.6nH
RF3	R312	7.5nH
RF4	R313	12nH
	C672	/



F. Efficiency test results

RF Port	GSM	WCDMA	LTE
RF1	900 1800 1900	B2 B3 B4 B8	B2 B3 B4 B7 B8 B25 B38 B40 B41 B66
RF2	850	B5 B6 B19	B5 B18 B19 B20 B26
RF3			B13
RF4		B1	B1 B12 B17 B28

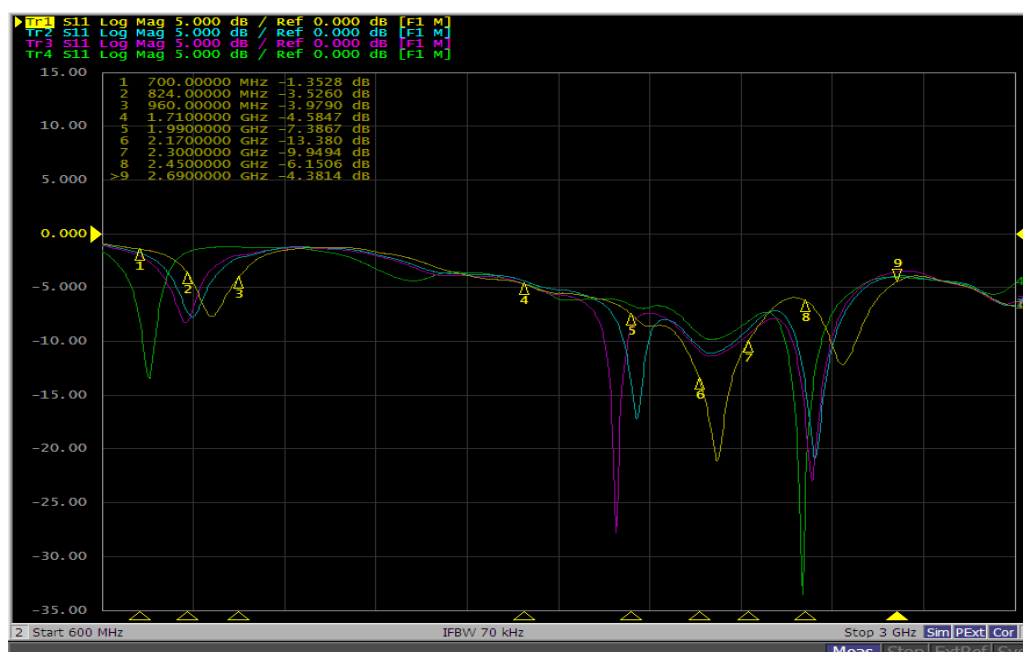
2. ANTENNA Name

2.1 Model: P5_Main_ANTENNA

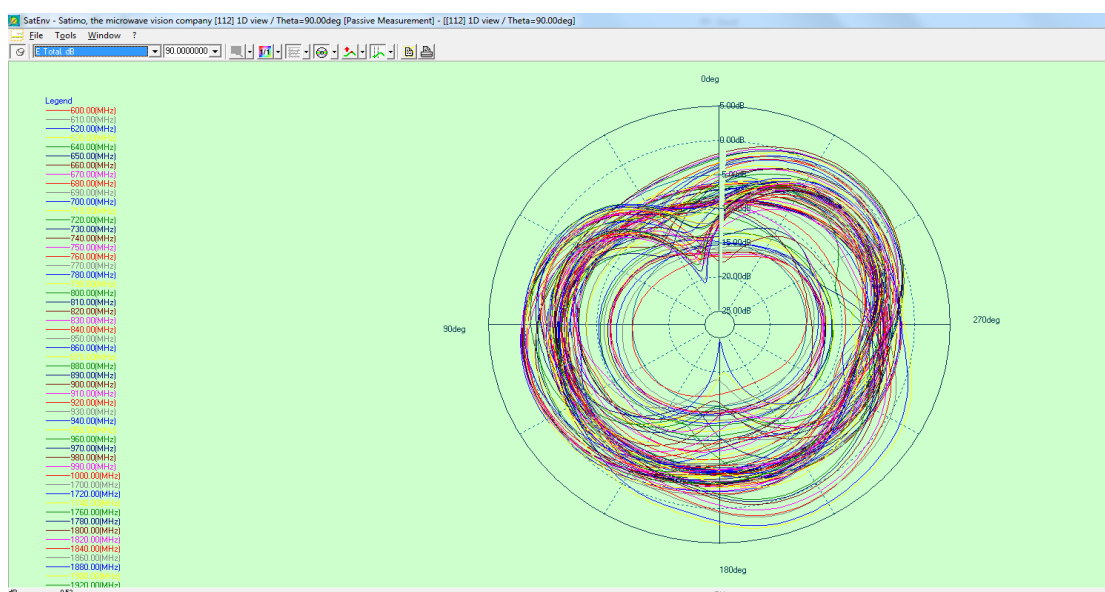
Maximum Gain: 1.65dBi

Measurement: 93*11.8mm

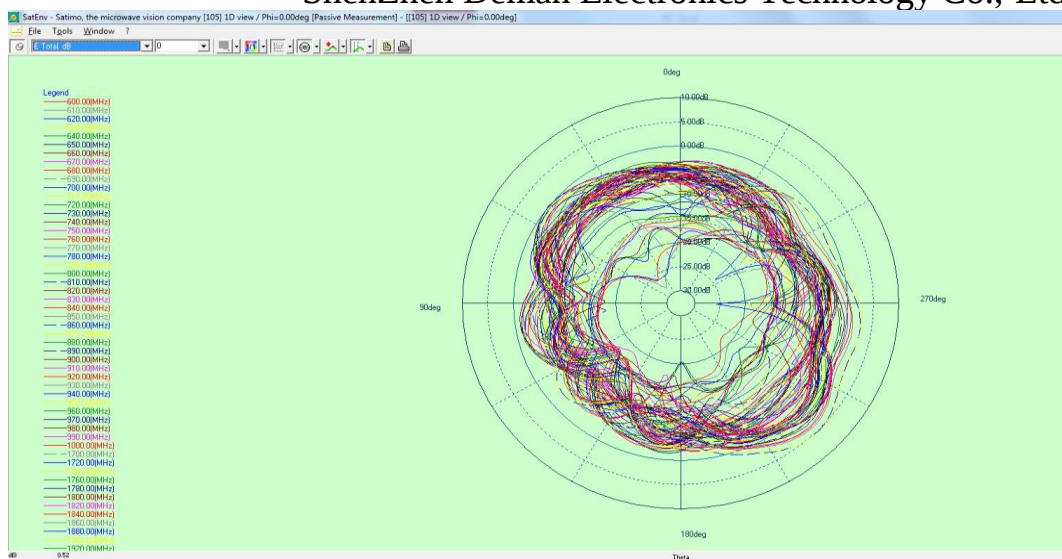
VSWR: Voltage Standing Wave Rate



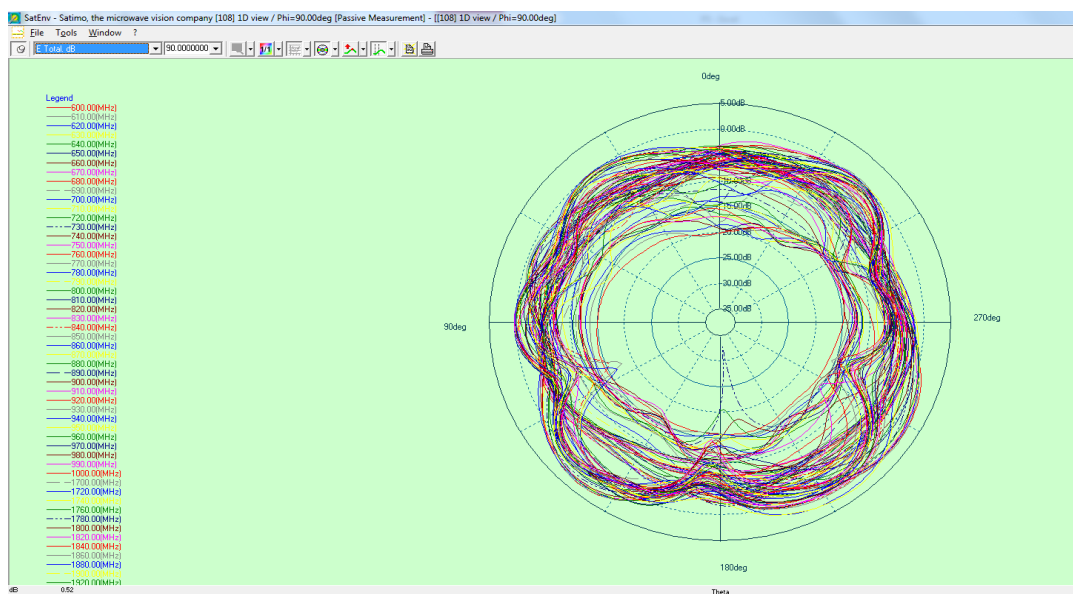
1D view:



Theta = 90



Theta = 0

**Phi = 90**

Efficiency test results

	RF1			RF2			RF3			RF4		
Frequency	Efficiency (%)	Efficiency (dB)	Gain (dBi)	Efficiency (%)	Efficiency (dB)	Gain (dBi)	Efficiency (%)	Efficiency (dB)	Gain (dBi)	Efficiency (%)	Efficiency (dB)	Gain (dBi)

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600	1%	-19.24	-13.92	2%	-17.75	-12.02	2%	-17.10	-11.26	5%	-13.17	-9.12
610	2%	-17.92	-13.05	2%	-16.40	-11.12	3%	-15.77	-10.32	7%	-11.63	-8.09
620	2%	-17.65	-13.08	2%	-16.09	-11.35	3%	-15.50	-10.65	8%	-11.20	-8.16
630	2%	-16.52	-12.68	3%	-14.92	-11.02	4%	-14.36	-10.50	10%	-9.90	-7.73
640	3%	-15.98	-12.43	4%	-14.34	-10.75	4%	-13.76	-10.51	12%	-9.19	-7.58
650	2%	-16.52	-13.57	3%	-14.77	-11.80	4%	-14.12	-11.55	11%	-9.41	-8.49
660	2%	-16.13	-13.63	4%	-14.29	-11.62	4%	-13.55	-11.00	13%	-8.79	-7.84
670	3%	-15.51	-13.10	4%	-13.54	-10.92	5%	-12.74	-10.06	17%	-7.79	-6.97
680	3%	-15.20	-12.22	5%	-13.15	-10.05	6%	-12.30	-9.29	19%	-7.18	-5.76
690	4%	-14.42	-11.38	6%	-12.27	-8.98	7%	-11.38	-8.29	25%	-5.97	-4.59
700	4%	-14.12	-11.16	6%	-11.89	-8.75	8%	-10.94	-7.99	29%	-5.45	-4.20
710	4%	-13.84	-11.10	7%	-11.52	-8.55	9%	-10.52	-7.81	31%	-5.15	-3.82
720	4%	-13.55	-11.38	8%	-11.12	-8.64	10%	-10.07	-7.71	32%	-5.01	-3.68
730	5%	-13.25	-11.55	8%	-10.73	-8.59	11%	-9.65	-7.45	31%	-5.12	-3.50
740	5%	-12.99	-11.43	9%	-10.34	-8.21	12%	-9.20	-7.37	30%	-5.23	-3.23
750	6%	-12.52	-10.80	10%	-9.82	-7.40	14%	-8.63	-6.73	27%	-5.73	-3.01
760	6%	-12.58	-10.88	11%	-9.77	-7.34	14%	-8.52	-6.75	22%	-6.53	-3.39
770	6%	-12.04	-10.00	12%	-9.16	-6.65	16%	-7.87	-5.73	18%	-7.33	-3.20
780	7%	-11.82	-9.46	13%	-8.86	-5.90	17%	-7.57	-4.94	15%	-8.18	-3.20
790	7%	-11.36	-8.42	15%	-8.36	-4.79	19%	-7.10	-3.98	12%	-9.26	-3.44
800	8%	-10.77	-7.49	16%	-7.89	-3.96	21%	-6.72	-3.25	10%	-9.79	-3.66
810	8%	-10.73	-7.19	16%	-7.86	-3.65	21%	-6.73	-2.93	8%	-10.86	-4.46
820	9%	-10.45	-6.71	17%	-7.78	-3.36	21%	-6.79	-2.85	7%	-11.75	-5.32
830	10%	-10.17	-6.12	18%	-7.56	-3.10	21%	-6.74	-2.77	5%	-12.61	-6.12
840	11%	-9.52	-5.26	18%	-7.35	-2.93	20%	-6.91	-2.94	5%	-13.45	-6.86
850	12%	-9.29	-4.74	18%	-7.50	-2.91	18%	-7.35	-3.04	4%	-14.06	-7.24
860	14%	-8.52	-3.69	18%	-7.36	-2.64	17%	-7.61	-3.00	4%	-14.48	-7.55
870	16%	-7.89	-2.90	19%	-7.26	-2.57	17%	-7.82	-3.08	4%	-14.45	-7.66
880	20%	-6.96	-2.03	20%	-7.05	-2.63	16%	-7.96	-3.34	4%	-14.49	-8.09
890	23%	-6.36	-1.33	20%	-6.98	-2.71	16%	-8.03	-3.49	4%	-14.12	-7.95
900	26%	-5.91	-1.20	21%	-6.84	-2.92	16%	-7.97	-3.57	4%	-14.01	-7.99
910	28%	-5.55	-1.09	20%	-6.93	-3.17	16%	-8.08	-3.90	4%	-14.13	-8.03
920	28%	-5.51	-1.17	19%	-7.22	-3.58	15%	-8.35	-4.43	4%	-14.55	-8.45
930	25%	-5.95	-1.49	15%	-8.10	-4.46	12%	-9.20	-5.44	3%	-15.40	-9.17
940	24%	-6.24	-1.99	15%	-8.34	-4.52	12%	-9.36	-5.47	3%	-15.36	-8.98
950	24%	-6.27	-2.15	14%	-8.43	-4.74	11%	-9.42	-5.69	3%	-15.30	-9.25
960	23%	-6.42	-2.83	14%	-8.46	-5.23	12%	-9.38	-6.17	3%	-15.03	-9.71
970	23%	-6.44	-2.90	14%	-8.49	-5.54	11%	-9.40	-6.45	3%	-14.97	-9.95
980	21%	-6.78	-3.35	13%	-8.74	-5.99	11%	-9.58	-6.85	3%	-14.91	-10.23
990	21%	-6.74	-3.57	14%	-8.56	-6.15	12%	-9.35	-6.88	4%	-14.50	-10.05

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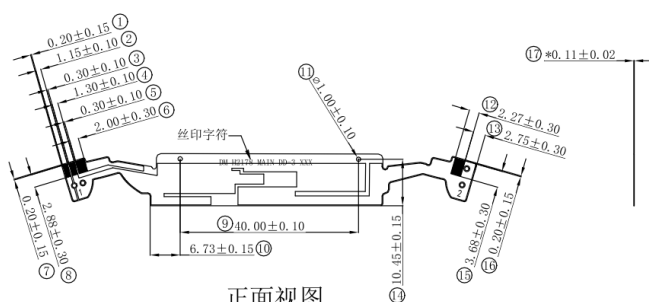
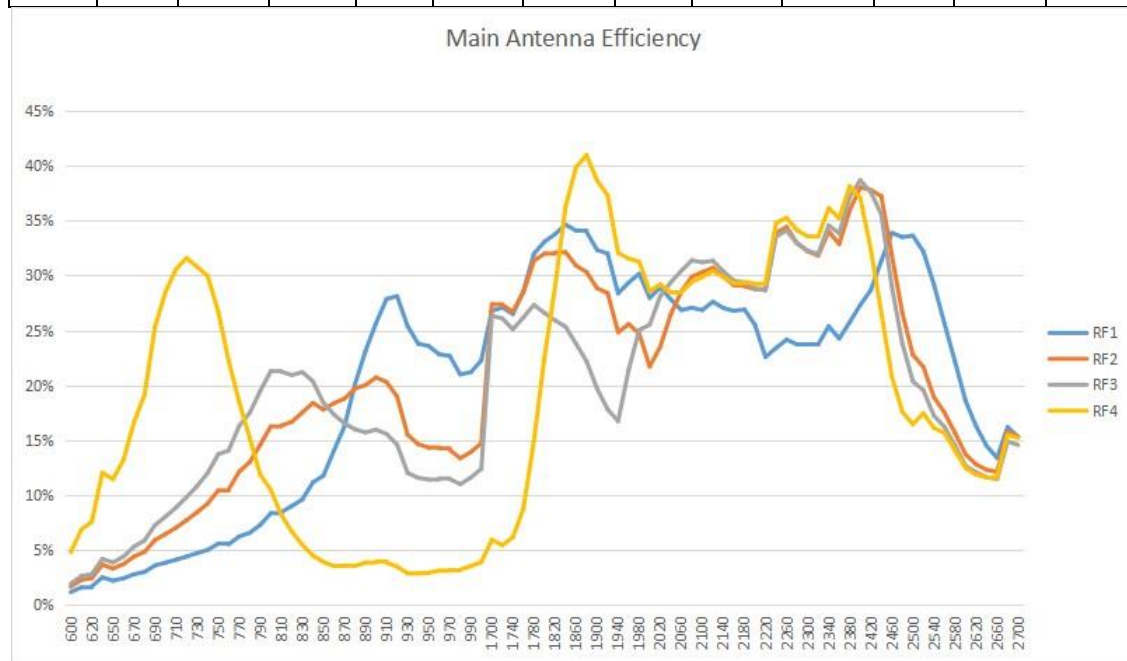
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1000	22%	-6.52	-3.68	15%	-8.32	-6.05	12%	-9.07	-6.82	4%	-14.08	-9.74
1700	27%	-5.72	-1.72	27%	-5.63	-0.74	26%	-5.80	-0.72	6%	-12.26	-6.14
1720	27%	-5.67	-1.76	27%	-5.63	-0.52	26%	-5.84	-0.86	5%	-12.64	-6.99
1740	26%	-5.77	-1.87	27%	-5.73	-0.82	25%	-6.00	-1.24	6%	-12.09	-7.56
1760	29%	-5.44	-1.55	28%	-5.45	-0.33	26%	-5.82	-0.94	9%	-10.55	-7.34
1780	32%	-4.95	-1.01	31%	-5.04	-0.06	27%	-5.64	-0.65	15%	-8.25	-5.64
1800	33%	-4.80	-0.72	32%	-4.95	0.12	27%	-5.75	-0.45	23%	-6.47	-3.97
1820	34%	-4.72	-0.82	32%	-4.93	0.02	26%	-5.86	-1.04	29%	-5.39	-2.68
1840	35%	-4.61	-1.10	32%	-4.93	-0.30	25%	-5.96	-1.26	36%	-4.41	-1.99
1860	34%	-4.67	-1.32	31%	-5.10	-0.37	24%	-6.24	-2.02	40%	-4.00	-1.64
1880	34%	-4.69	-1.56	30%	-5.18	-0.35	22%	-6.54	-2.82	41%	-3.88	-1.23
1900	32%	-4.91	-1.41	29%	-5.40	-0.06	20%	-7.06	-3.25	39%	-4.13	-1.47
1920	32%	-4.95	-1.25	28%	-5.47	-0.67	18%	-7.49	-2.37	37%	-4.28	-1.61
1940	28%	-5.47	-1.82	25%	-6.05	-3.16	17%	-7.76	-2.56	32%	-4.94	-1.87
1960	29%	-5.32	-1.56	26%	-5.92	-3.76	21%	-6.69	-2.69	32%	-5.01	-2.39
1980	30%	-5.21	-0.88	25%	-6.07	-3.13	25%	-6.01	-2.50	31%	-5.05	-2.33
2000	28%	-5.53	-0.43	22%	-6.63	-3.31	26%	-5.93	-2.66	29%	-5.44	-2.58
2020	29%	-5.39	-0.15	24%	-6.29	-2.59	28%	-5.51	-2.07	29%	-5.35	-1.88
2040	28%	-5.56	-0.40	26%	-5.77	-2.26	29%	-5.32	-1.63	28%	-5.46	-1.51
2060	27%	-5.71	-0.38	29%	-5.45	-1.82	30%	-5.17	-1.23	28%	-5.46	-1.01
2080	27%	-5.68	0.09	30%	-5.24	-1.34	31%	-5.03	-0.83	29%	-5.31	-0.72
2100	27%	-5.71	-0.01	30%	-5.19	-1.28	31%	-5.06	-0.55	30%	-5.25	-0.61
2120	28%	-5.59	0.02	31%	-5.13	-0.52	31%	-5.04	0.27	30%	-5.17	0.03
2140	27%	-5.68	-1.00	30%	-5.24	-0.07	30%	-5.18	0.43	30%	-5.25	0.51
2160	27%	-5.72	-2.61	29%	-5.36	0.15	30%	-5.30	0.69	29%	-5.33	0.92
2180	27%	-5.70	-3.25	29%	-5.37	0.44	29%	-5.32	0.99	29%	-5.31	1.20
2200	26%	-5.93	-3.87	29%	-5.41	0.49	29%	-5.40	0.95	29%	-5.34	1.05
2220	23%	-6.46	-3.44	29%	-5.42	0.70	29%	-5.43	1.31	29%	-5.33	1.27
2240	23%	-6.31	-2.69	34%	-4.70	1.97	34%	-4.74	2.39	35%	-4.59	2.25
2260	24%	-6.17	-1.89	34%	-4.63	2.62	34%	-4.67	2.77	35%	-4.53	2.28
2280	24%	-6.25	-1.43	33%	-4.82	2.20	33%	-4.83	2.47	34%	-4.67	1.63
2300	24%	-6.25	-0.94	32%	-4.92	2.62	32%	-4.91	2.28	34%	-4.74	1.54
2320	24%	-6.25	-0.72	32%	-4.97	2.76	32%	-4.95	2.23	34%	-4.75	0.92
2340	25%	-5.96	-0.31	34%	-4.68	2.71	35%	-4.62	2.13	36%	-4.42	0.56
2360	24%	-6.15	-0.20	33%	-4.83	2.69	34%	-4.71	1.56	35%	-4.53	0.30
2380	26%	-5.89	0.15	36%	-4.45	2.26	37%	-4.30	0.92	38%	-4.19	-0.17
2400	27%	-5.64	0.67	38%	-4.20	1.06	39%	-4.13	-0.26	37%	-4.31	-1.52
2420	29%	-5.43	1.00	38%	-4.23	-0.33	38%	-4.25	-1.49	32%	-4.89	-2.76
2440	31%	-5.04	1.19	37%	-4.29	-2.23	36%	-4.49	-2.99	27%	-5.75	-4.15
2460	34%	-4.70	1.30	32%	-4.97	-3.25	29%	-5.38	-3.43	21%	-6.82	-4.83

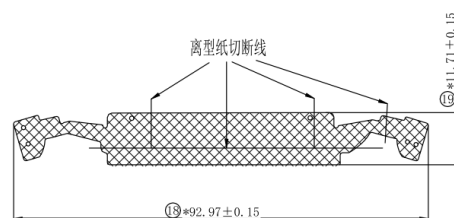
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2480	33%	-4.75	1.14	27%	-5.75	-3.49	24%	-6.23	-3.51	18%	-7.55	-4.88
2500	34%	-4.73	1.50	23%	-6.42	-3.49	20%	-6.91	-3.58	16%	-7.83	-4.47
2520	32%	-4.93	1.65	22%	-6.64	-3.04	20%	-7.09	-2.76	17%	-7.58	-3.18
2540	29%	-5.35	0.97	19%	-7.23	-3.13	17%	-7.64	-2.97	16%	-7.92	-2.91
2560	26%	-5.91	0.54	18%	-7.56	-3.34	16%	-7.90	-2.95	16%	-8.05	-2.74
2580	22%	-6.54	-0.03	16%	-8.05	-3.08	15%	-8.38	-2.97	14%	-8.51	-2.65
2600	19%	-7.30	-1.09	14%	-8.62	-2.84	13%	-8.97	-2.84	12%	-9.04	-2.48
2620	16%	-7.88	-1.68	13%	-8.92	-2.62	12%	-9.18	-2.64	12%	-9.26	-2.60
2640	14%	-8.39	-1.74	12%	-9.09	-2.54	12%	-9.34	-2.66	12%	-9.34	-2.57
2660	13%	-8.73	-1.51	12%	-9.17	-2.25	11%	-9.40	-2.41	12%	-9.32	-2.38
2680	16%	-7.90	-0.68	16%	-8.03	-1.25	15%	-8.27	-1.27	15%	-8.10	-1.36
2700	15%	-8.15	-1.06	15%	-8.14	-1.40	15%	-8.37	-1.41	15%	-8.18	-1.54

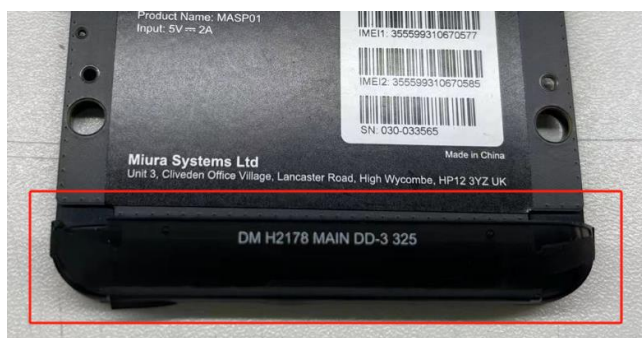
Main Antenna Efficiency



正面视图



背胶视图

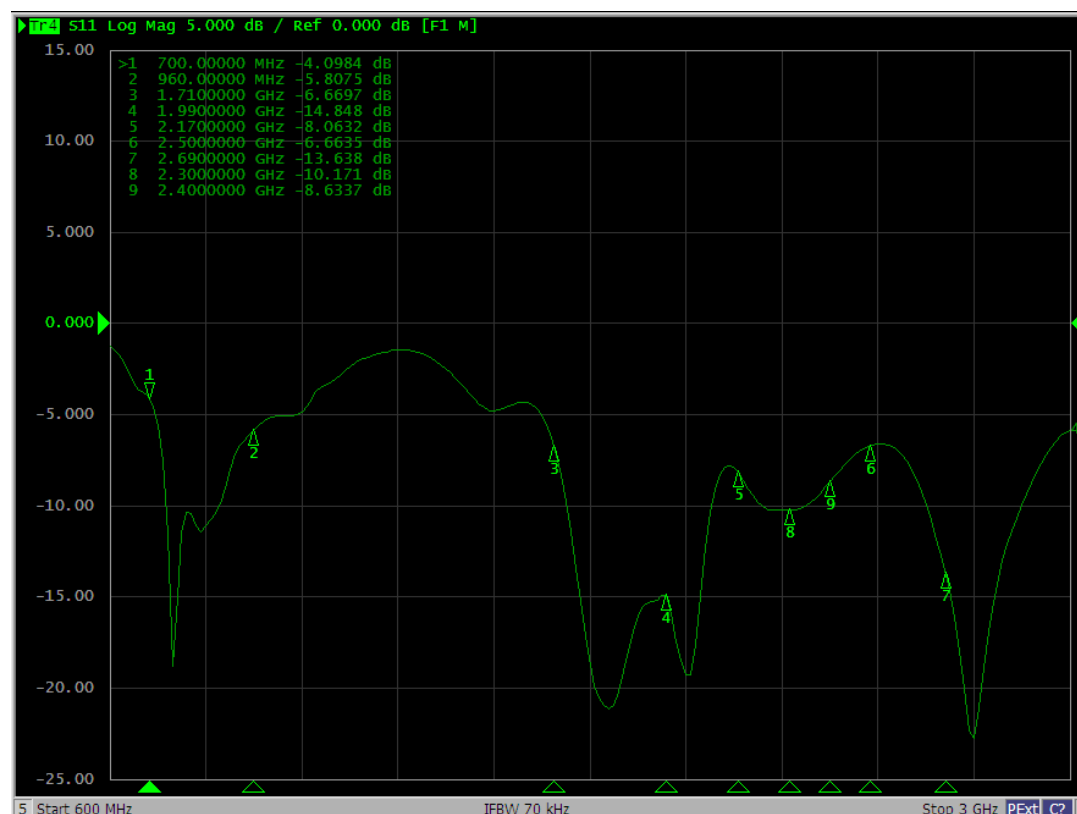


2.2 Model: P5_DIVERSITY_ANTENNA

Maximum Gain: 1.65dBi

Measurement: 93*11.8mm

VSWR: Voltage Standing Wave Rate



E.Efficiency test results

Frequency	Efficiency (%)	Efficiency (dB)	Gain (dBi)	Frequency	Efficiency (%)	Efficiency (dB)	Gain (dBi)
600	2%	-16.40	-14.08	1800	53%	-2.77	2.95
610	3%	-15.47	-13.19	1820	53%	-2.74	2.99
620	3%	-14.98	-12.37	1840	58%	-2.37	3.53
630	4%	-13.92	-11.21	1860	60%	-2.23	3.49
640	5%	-13.01	-9.39	1880	61%	-2.15	3.27
650	4%	-14.05	-8.68	1900	60%	-2.21	3.01
660	4%	-14.45	-8.95	1920	60%	-2.25	3.02
670	4%	-14.20	-10.10	1940	51%	-2.93	1.65
680	4%	-14.16	-11.43	1960	49%	-3.10	1.64

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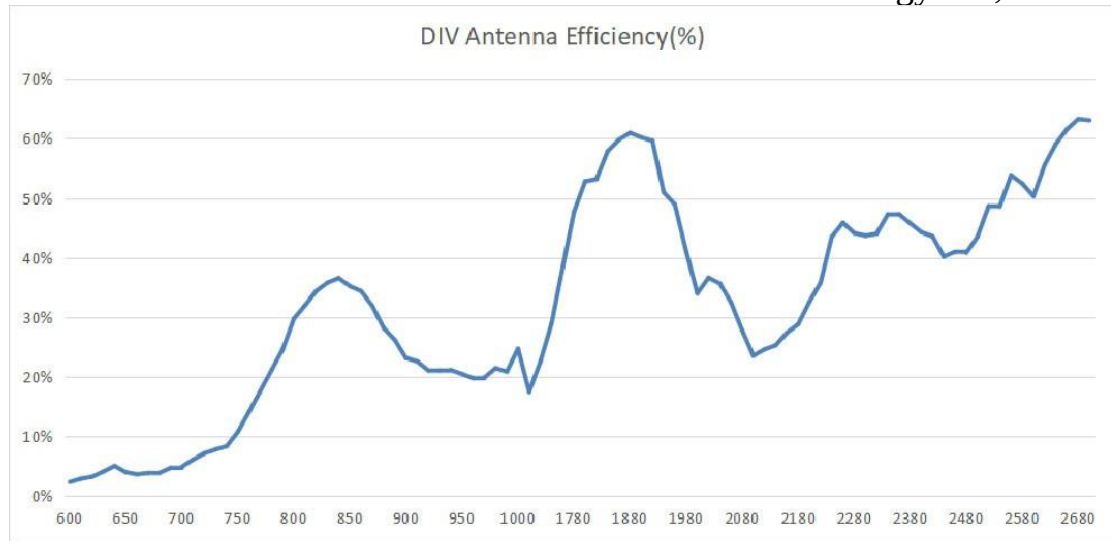
690	5%	-13.31	-10.64	1980	41%	-3.86	1.12
700	5%	-13.14	-10.04	2000	34%	-4.69	0.00
710	6%	-12.16	-8.31	2020	37%	-4.36	0.60
720	7%	-11.48	-7.28	2040	36%	-4.48	1.24
730	8%	-11.11	-6.80	2060	33%	-4.88	0.99
740	8%	-10.81	-6.49	2080	28%	-5.56	-0.37
750	11%	-9.69	-5.71	2100	23%	-6.29	-1.45
760	14%	-8.51	-5.07	2120	25%	-6.10	-1.33
770	18%	-7.55	-4.65	2140	25%	-5.97	-1.21
780	21%	-6.76	-4.20	2160	27%	-5.62	-0.08
790	25%	-6.10	-3.47	2180	29%	-5.41	0.02
800	30%	-5.27	-2.38	2200	33%	-4.87	0.05
810	32%	-4.95	-1.93	2220	36%	-4.46	0.60
820	34%	-4.64	-1.53	2240	43%	-3.62	1.19
830	36%	-4.46	-1.35	2260	46%	-3.39	1.04
840	37%	-4.37	-1.36	2280	44%	-3.55	0.83
850	35%	-4.54	-1.39	2300	44%	-3.60	0.95
860	34%	-4.64	-1.58	2320	44%	-3.57	0.89
870	32%	-4.96	-2.24	2340	47%	-3.26	1.14
880	28%	-5.50	-2.59	2360	47%	-3.25	1.17
890	26%	-5.82	-2.74	2380	46%	-3.40	1.31
900	23%	-6.36	-3.29	2400	44%	-3.54	0.81
910	23%	-6.46	-3.40	2420	44%	-3.61	0.59
920	21%	-6.77	-3.78	2440	40%	-3.96	0.66
930	21%	-6.77	-3.56	2460	41%	-3.88	0.70
940	21%	-6.75	-3.42	2480	41%	-3.90	0.23
950	20%	-6.89	-3.50	2500	43%	-3.62	0.63
960	20%	-7.05	-3.70	2520	49%	-3.13	1.63
970	20%	-7.02	-3.63	2540	49%	-3.13	2.16
980	21%	-6.69	-3.23	2560	54%	-2.69	3.40
990	21%	-6.81	-3.21	2580	52%	-2.80	3.56
1000	25%	-6.07	-2.39	2600	50%	-2.98	3.86
1700	17%	-7.58	-1.91	2620	56%	-2.55	4.50
1720	23%	-6.47	-0.43	2640	59%	-2.28	4.84
1740	29%	-5.38	1.08	2660	62%	-2.11	5.04
1760	38%	-4.15	2.24	2680	63%	-1.99	5.43
1780	48%	-3.21	2.60	2700	63%	-2.00	5.51

This test report belongs to ShenZhen Deman Electronics Technology Co., Ltd and related clients to file, please keeping it properly, without our company and related clients allowed, anybody has no rights to reveal it to public.

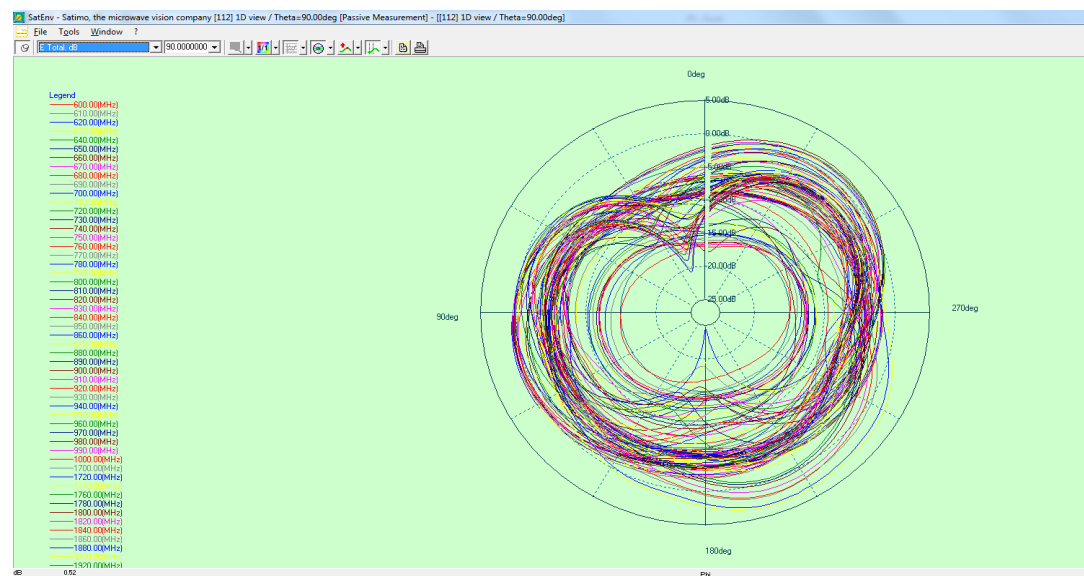


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1D view:



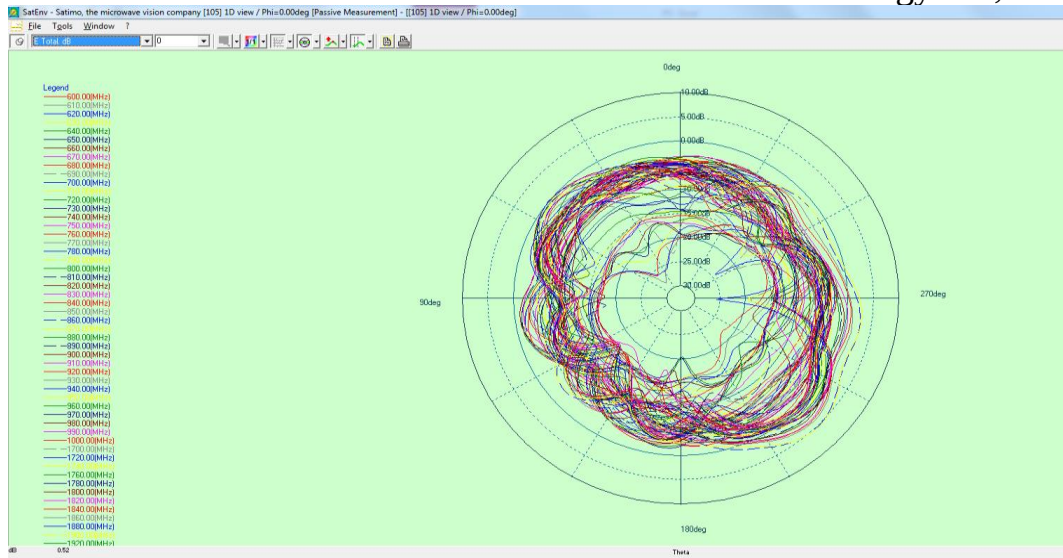
Theta = 90

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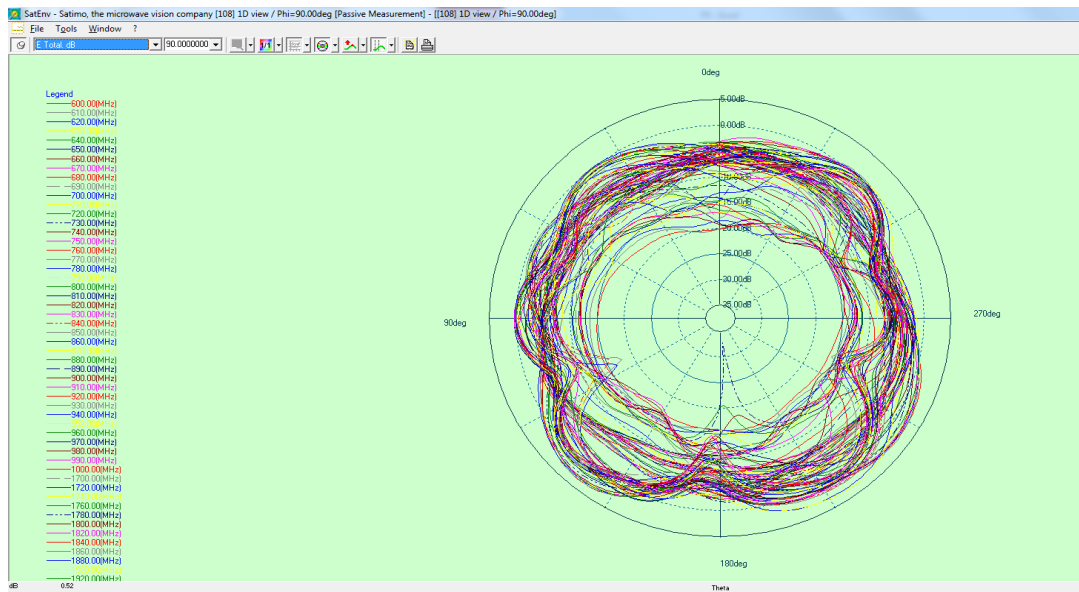


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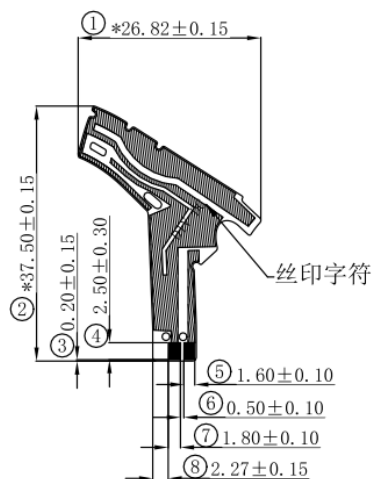
ShenZhen Deman Electronics Technology Co., Ltd



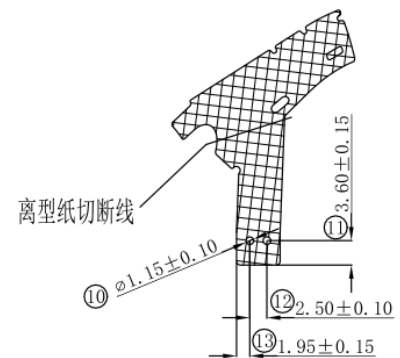
Theta = 0



Phi = 90



正面视图



背胶视图



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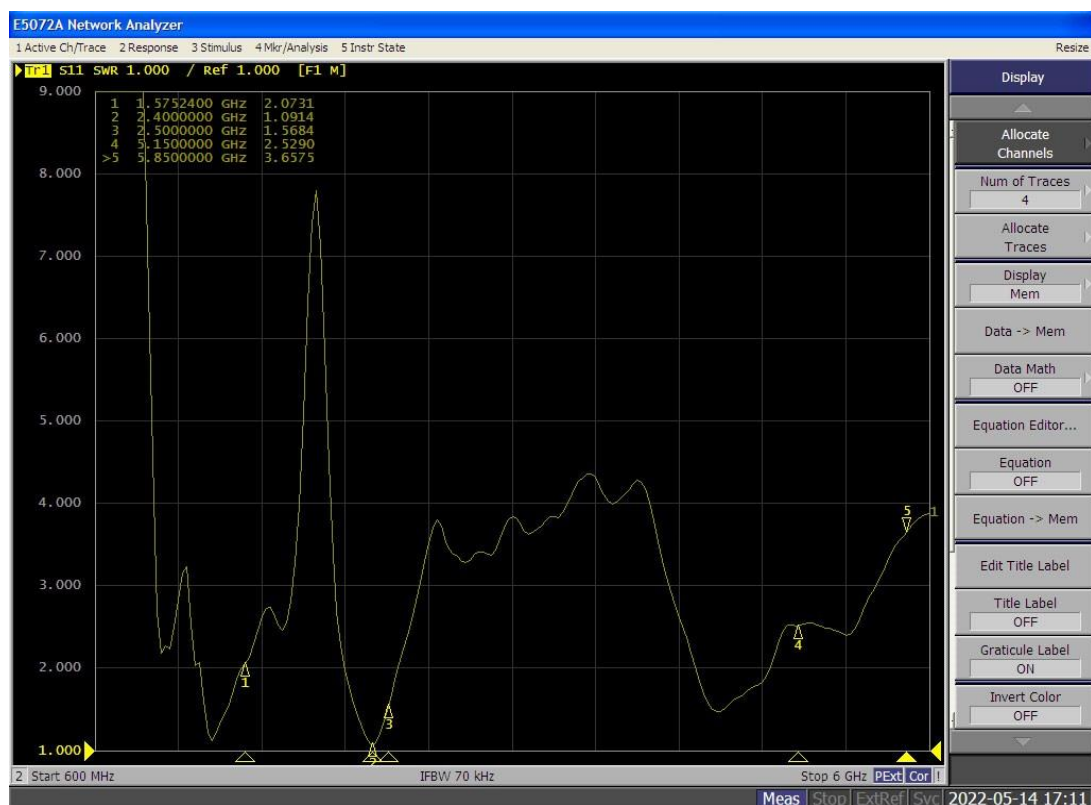
ShenZhen Deman Electronics Technology Co., Ltd

2.3 Model: P5_3IN1_ANTENNA

Maximum Gain: 1.30dBi

Measurement: 29.1*9.2mm

VSWR: Voltage Standing Wave Rate



Efficiency test results

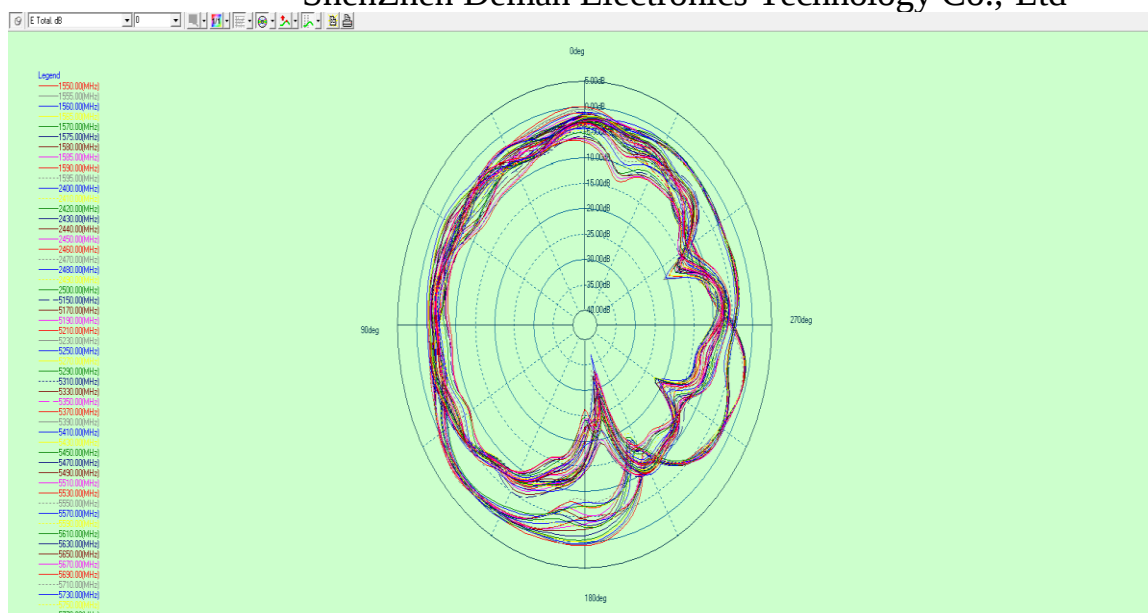


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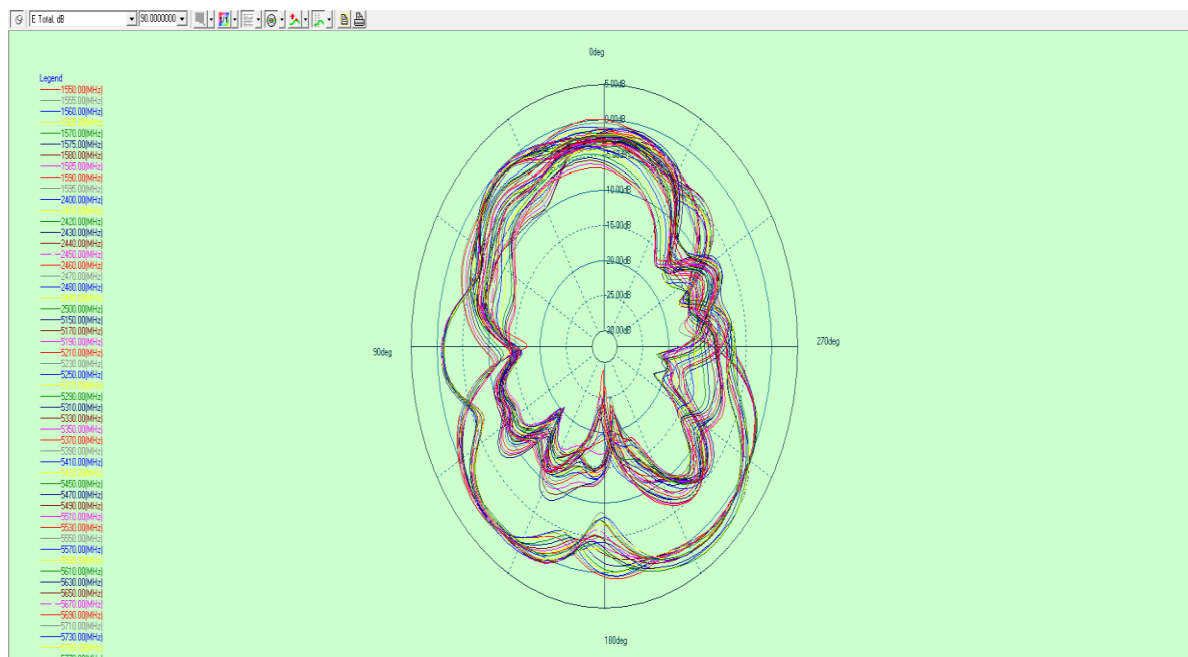
ShenZhen Deman Electronics Technology Co., Ltd

Efficiency&Gain test dataset

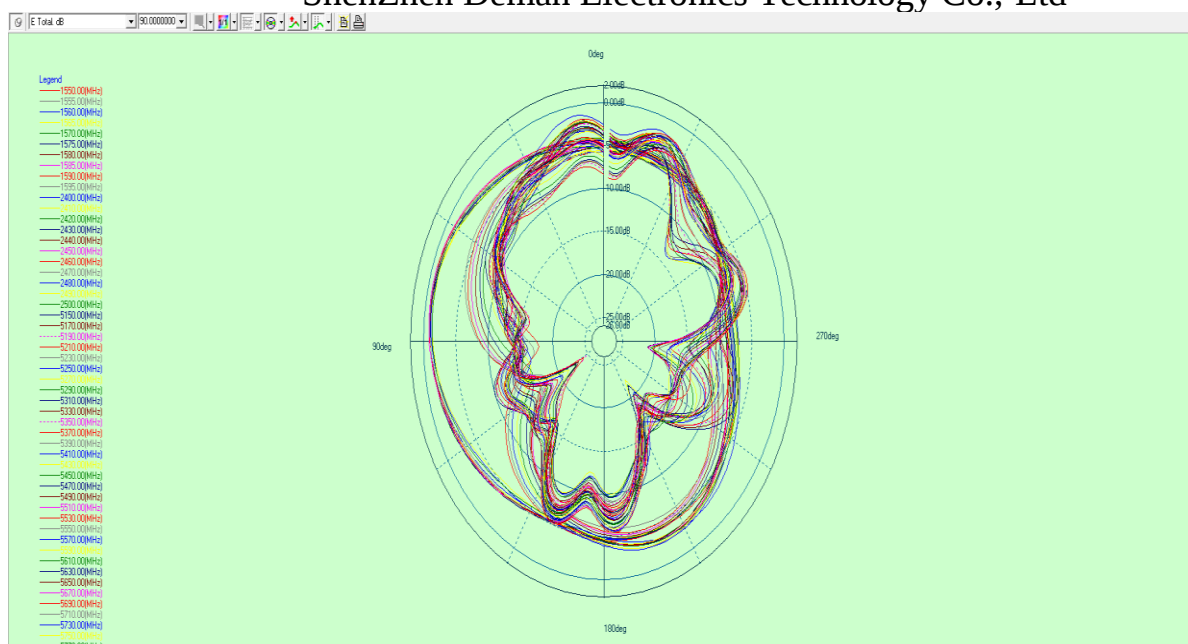
Fre. (Mhz)	Eff. %	Eff. dB	Gain. dBi	Fre. (Mhz)	Eff. %	Eff. dB	Gain. dBi
1550	50%	-3.02	1.27	5150	29%	-5.37	-0.96
1555	49%	-3.09	1.06	5170	37%	-4.31	-1.29
1560	48%	-3.17	1.03	5190	35%	-4.54	-1.44
1565	48%	-3.22	1.18	5210	34%	-4.63	-1.71
1570	50%	-3.04	1.03	5230	34%	-4.74	-2.23
1575	49%	-3.08	1.24	5250	32%	-4.96	-2.41
1580	50%	-3.03	1.31	5270	32%	-4.99	-2.51
1585	50%	-3.02	1.17	5290	31%	-5.09	-2.02
1590	52%	-2.84	1.04	5310	32%	-4.89	-2.19
1595	51%	-2.93	1.03	5330	32%	-4.96	-1.18
2400	55%	-2.58	1.29	5350	36%	-4.50	-1.14
2410	54%	-2.68	1.30	5370	35%	-4.54	-0.53
2420	54%	-2.64	1.27	5390	38%	-4.23	-0.71
2430	53%	-2.72	1.11	5410	37%	-4.32	0.27
2440	51%	-2.94	1.15	5430	43%	-3.71	-0.19
2450	51%	-2.96	1.02	5450	39%	-4.09	-0.24
2460	48%	-3.18	1.03	5470	39%	-4.12	-0.61
2470	48%	-3.19	1.05	5490	37%	-4.27	-0.96
2480	47%	-3.29	1.09	5510	37%	-4.36	-1.54
2490	46%	-3.40	1.11	5530	34%	-4.70	-1.41
2500	46%	-3.35	1.10	5550	35%	-4.61	-1.89
				5570	33%	-4.83	-1.96
				5590	33%	-4.78	-2.09
				5610	33%	-4.77	-1.66
				5630	35%	-4.55	-1.83
				5650	35%	-4.57	-1.67
				5670	36%	-4.50	-1.68
				5690	35%	-4.54	-1.64
				5710	36%	-4.48	-1.86
				5730	34%	-4.66	-1.98
				5750	33%	-4.77	-2.22
				5770	32%	-4.97	-2.61
				5790	30%	-5.19	-2.87
				5810	29%	-5.35	-2.67
				5830	29%	-5.34	-2.73
				5850	21%	-6.85	-2.65



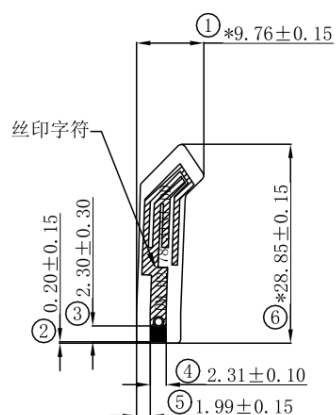
Pi=0



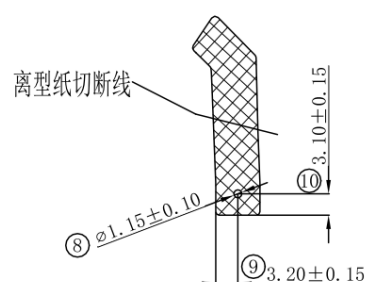
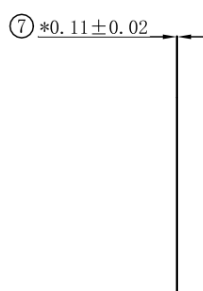
Pi=90



Theta=90



正面视图



背胶视图

