

SPECIFICATION FOR APPROVAL

CUSTOMER :	德明
PART NAME :	600-6G全频段天线（黑色）
PART NO. :	
DZZ NO. :	N12-7088-ROA
REV. :	

	MANUFACTURERR SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY:		
DATE:		

Shenzhen be-comfortable technology.co.,LTD

深圳市得自在科技有限公司

Address: No.1606,Build C6,HengFeng industrial city,xixiang
street,baoan district,Shenzhen

shanghai mengju technology co., LTD

上海市盟钜科技有限公司

103B, Build10, No.198 Zhang Heng Road , Pudong New
Area,Shanghai

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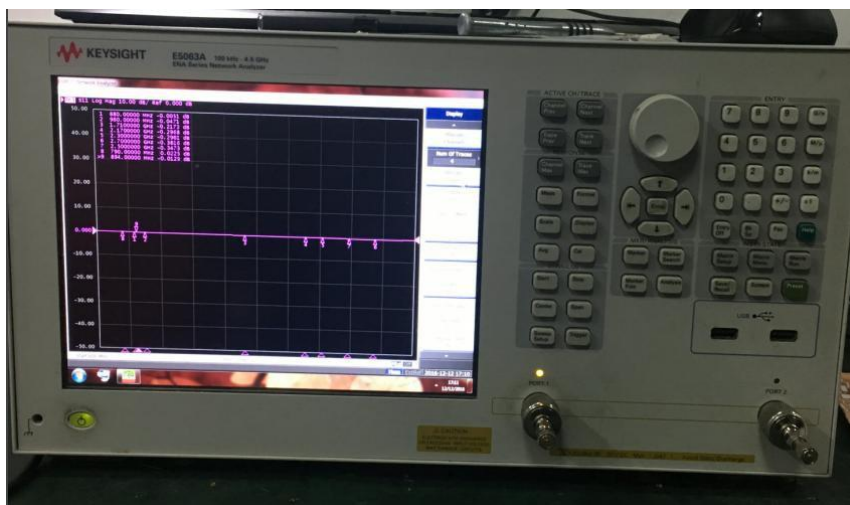
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1.RF Fixture Experiment

1.1 Test Setup

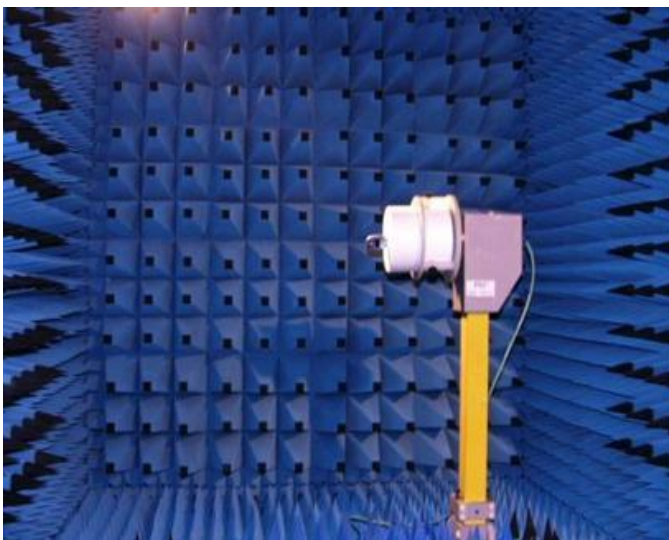
1.1.1 VNA Test Setup

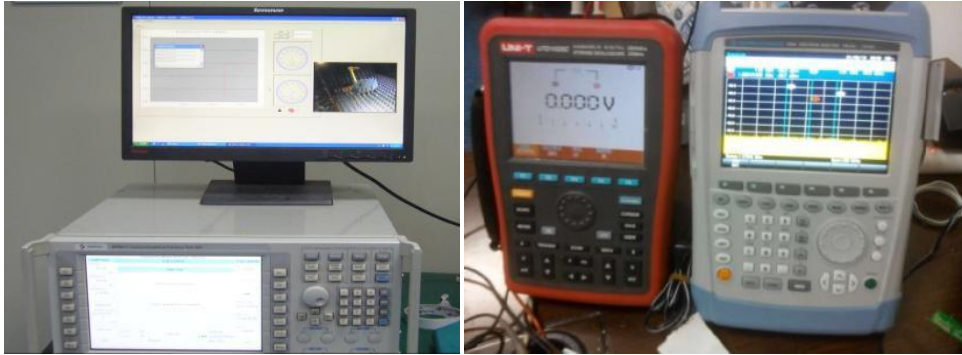
VSWR and Return Loss measurements (S11) were performed using an KeySight E5071C Network Analyzer. The isolation between antennas is also teste. The testing was performed with apparatus in free space.



1.1.2 Anechoic Chamber Test Setup

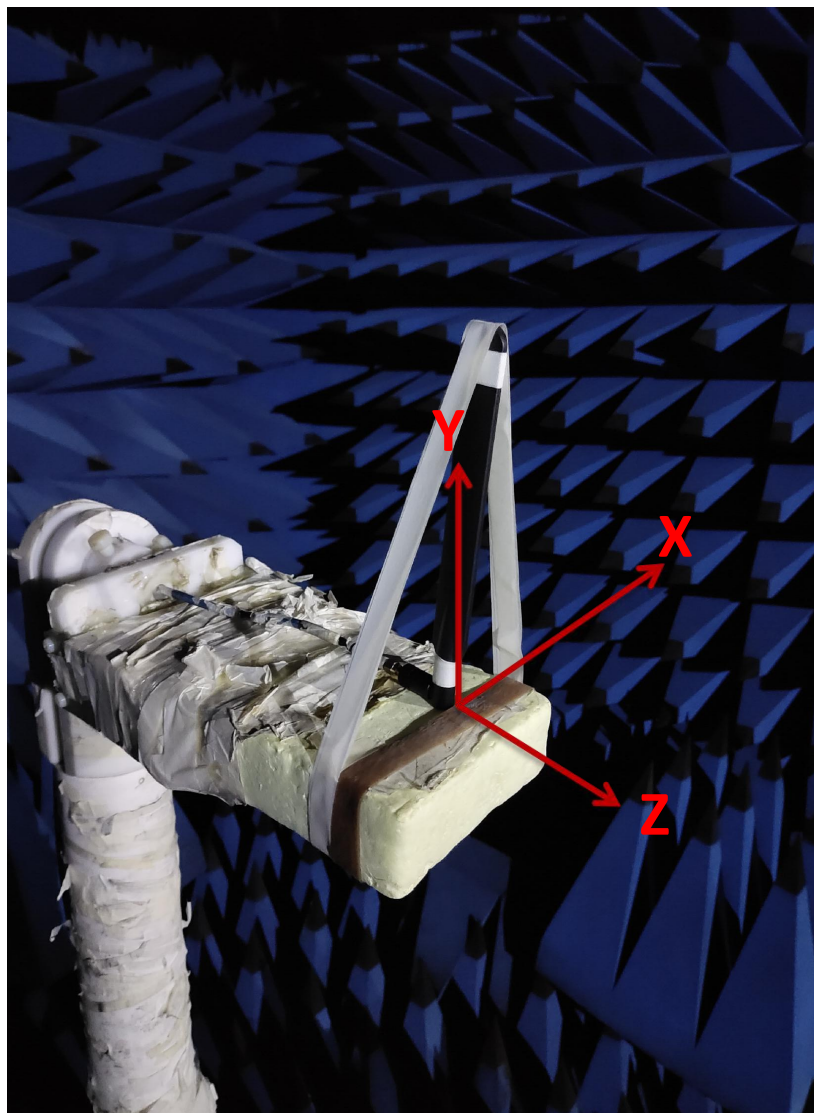
When we test Gain and Efficiency of the antenna, we will use the ETS 3D chamber. The chamber provides test frequency from 400MHz to 6GHz. The real test environment is showing as following picture



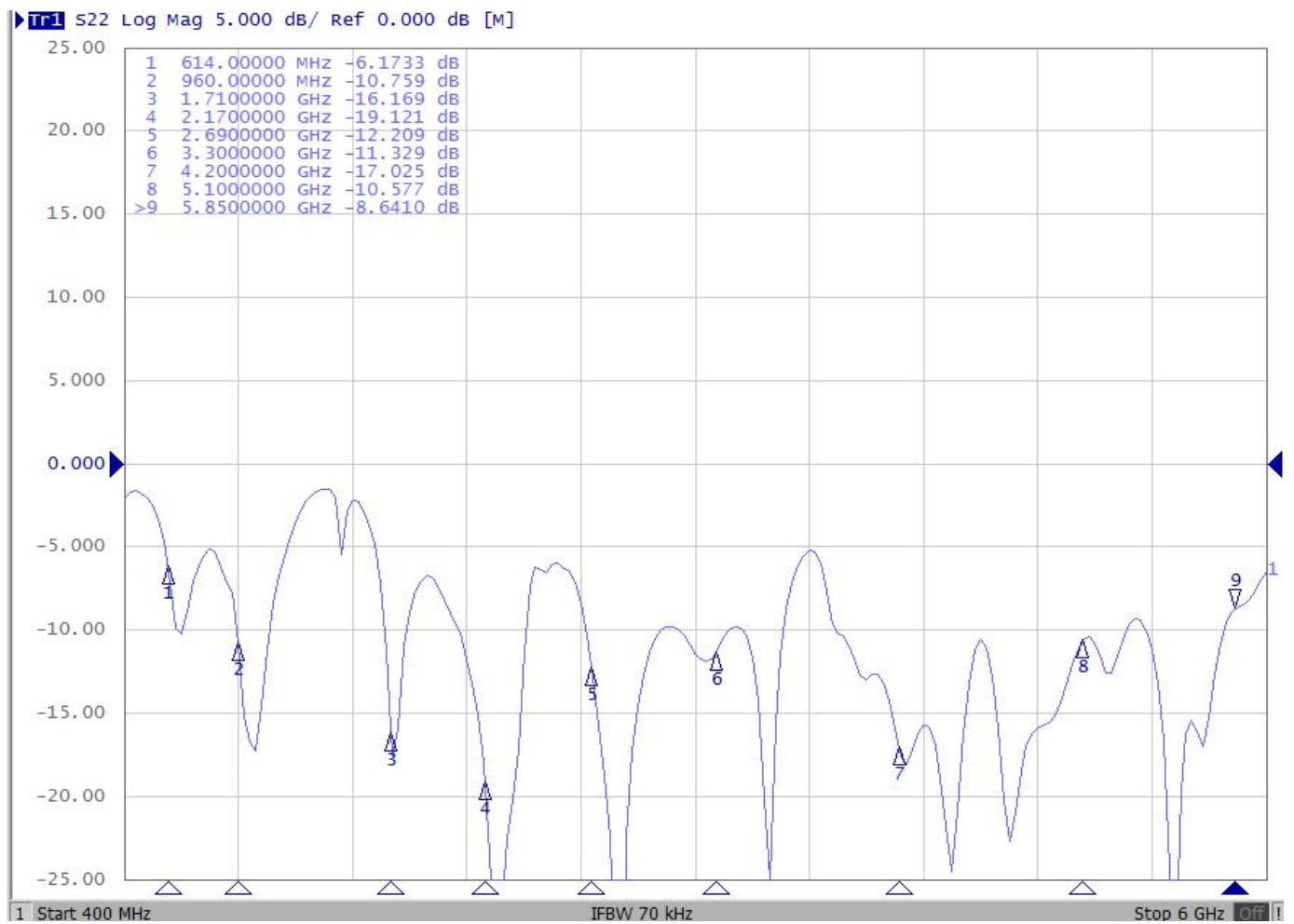


1.2 UE configuration

1.2.1 Antenna location pictures



2. S11



3. Peak Gain & Efficiency

Frequency (MHz)	Gain(dBi)	Efficiency(%)
600	1.27	39.45
610	0.05	39.16
620	-0.05	37.31
630	0.67	40.43
640	2.27	48.28
650	2.79	49.42
660	2.91	47.33
670	2.77	45.59
680	2.95	48.18
690	3.09	53.15
700	3.19	53.35
710	3.13	56.27
720	2.76	50.13
730	2.52	50.94
740	2.61	54.54
750	2.67	59.66
760	2.41	58.59
770	2.44	56.57
780	1.92	52.24
790	2.16	54.11
800	2.5	60.59
810	2.92	57.39
820	3.07	56.61
830	3.53	54.84
840	3.36	54.26
850	3.36	55.76
860	3.01	51.28

Frequency (MHz)	Gain(dBi)	Efficiency(%)
870	3.01	53.92
880	3.57	57.31
890	3.5	57.91
900	3.6	55.92
910	2.74	48.83
920	2.56	46.92
930	2.38	47.7
940	2.61	54.72
950	2.96	59.69
960	3.05	62

Frequency (MHz)	Gain(dBi)	Efficiency(%)
1710	3.42	71.08
1720	3.49	70.9
1730	3.54	70.69
1740	3.69	74.62
1750	3.83	75.41
1760	3.34	69.43
1770	3.18	65.68
1780	2.95	62.54
1790	2.67	62.09
1800	2.64	59.14
1810	2.72	55.11
1820	2.74	53.52
1830	2.6	50.04
1840	3.08	54.29
1850	3.53	60.6
1860	3.58	62.11
1870	3.45	61.29
1880	3.38	61.82
1890	3.53	62.86
1900	3.59	65.29
1910	3.65	68.17
1920	3.71	67.69
1930	3.52	65.42
1940	3.45	63.12
1950	3.53	63.61

Frequency (MHz)	Gain(dBi)	Efficiency(%)
1960	3.8	63.74
1970	3.64	60.73
1980	3.6	57.83
1990	3.6	58.72
2000	3.31	57.05
2010	3.45	62.43
2020	3.43	65.93
2030	4.02	70.15
2040	3.99	67.66
2050	4.11	66.13
2060	4.21	72.44
2070	4.23	74.67
2080	4	72.17
2090	4.36	77.02
2100	4.45	79.88
2110	3.98	73.58
2120	3.97	70.94
2130	3.59	64.62
2140	3.96	67.22
2150	4.08	68.66
2160	4.37	72.99
2170	4.64	73.18
2180	4.02	62.02
2190	3.7	59.8
2200	3.61	61.71
2210	3.72	64.3

Frequency (MHz)	Gain(dBi)	Efficiency(%)
2220	3.86	68.23
2230	3.78	65.26
2240	3.59	62.07
2250	3.42	59.03
2260	3.42	58.89
2270	3.49	59.06
2280	3.34	55.62
2290	3.67	58.46
2300	3.64	56.61
2310	3.39	63.93
2320	3.45	62.98
2330	3.51	62.77
2340	3.31	60.03
2350	3.4	58.49
2360	2.92	54.56
2370	2.69	54.94
2380	2.39	53.38
2390	1.5	54.27
2400	2.06	54.41
2410	1.47	55.61
2420	1.69	55.36
2430	1.68	57.45
2440	1.13	53.38
2450	1.33	55.28
2460	1.51	56.22
2470	1.26	57.16

Frequency (MHz)	Gain(dBi)	Efficiency(%)
2480	1.42	62.12
2490	1.28	61.85
2500	1.35	61.12
2510	2.07	59.11
2520	2.37	55.83
2530	2.17	56.19
2540	2.1	58.05
2550	2.3	57.97
2560	1.86	59.17
2570	2.19	58.47
2580	1.93	57.51
2590	2.41	59.91
2600	2.37	58.2
2610	2.21	58.83
2620	2.03	62.23
2630	2.66	61.76
2640	2.63	60.6
2650	2.53	58.41
2660	2.15	62.79
2670	2.9	54.56
2680	3.27	56.9
2690	3.07	57.49

Frequency (MHz)	Gain(dBi)	Efficiency(%)
3300	1.56	59.53
3310	1.96	65.48
3320	2.25	64.4
3330	2.18	62.46
3340	2.04	65.22
3350	2.45	65.7
3360	2.24	65.48
3370	1.79	58.22
3380	1.52	57.89
3390	2.29	63.36
3400	2.03	65.66
3410	2.32	68.8
3420	1.85	61.84
3430	1.74	58.04
3440	2.05	60.27
3450	2.63	68.06
3460	3.27	71.99
3470	3.44	72.07
3480	3.07	64.01
3490	3.12	64.38
3500	3.43	69.49
3510	3.71	72.14
3520	3.59	72.73
3530	3.69	72.67
3540	4.02	73
3550	3.57	68.08

Frequency (MHz)	Gain(dBi)	Efficiency(%)
3560	3.46	66.37
3570	3.59	65.19
3580	3.84	68.27
3590	4.16	69.63
3600	3.62	64.8
3610	3.76	64.32
3620	3.88	66.68
3630	3.6	62.88
3640	2.89	56.33
3650	2.7	52.54
3660	2.91	52.42
3670	3.15	53.42
3680	2.84	64.92
3690	1.85	55.26
3700	1.89	54.44
3710	1.98	52.85
3720	2.22	58.25
3730	2.7	65.94
3740	1.87	56.79
3750	1.59	56.18
3760	1.45	53.66
3770	1.63	58.31
3780	1.69	56.03
3790	0.41	55.24
3800	0.19	55.09
3810	0.56	56.39

Frequency (MHz)	Gain(dBi)	Efficiency(%)
3820	1.22	53.25
3830	1.32	54.69
3840	1.38	55.04
3850	1.66	58.07
3860	2.83	57.39
3870	3.41	59.88
3880	3.8	61.98
3890	3.71	62.97
3900	3.59	61.06
3910	3.76	59.75
3920	3.73	64.08
3930	4.32	55.81
3940	4.45	60.95
3950	4.88	60.49
3960	4.61	60.62
3970	5.05	65.02
3980	5.16	66.19
3990	4.58	61.6
4000	4.68	64.24
4010	4.84	61.81
4020	5.52	69.42
4030	4.93	66.1
4040	4.54	64.76
4050	4.22	58
4060	3.85	58.63
4070	4.74	65.26

Frequency (MHz)	Gain(dBi)	Efficiency(%)
4080	4.48	67.75
4090	4.83	66.67
4100	4.37	58.19
4110	4.05	57.89
4120	3.41	58.09
4130	4.6	68.88
4140	5.06	73.81
4150	4.17	67.07
4160	4.59	69.18
4170	4.34	66.05
4180	4.56	66.4
4190	4.22	63.8
4200	3.97	62.3
4210	4.42	63.87
4220	4.53	64.3
4230	4.87	68.82
4240	4.75	61.28
4250	4.44	59.03
4260	4.24	62.2
4270	4.76	63.68
4280	4.95	66.88
4290	5.1	70.59
4300	4.66	69.86
4310	5.26	69.75
4320	4.95	68.15
4330	5.05	72.05

Frequency (MHz)	Gain(dBi)	Efficiency(%)
4340	4.87	73.02
4350	5.78	85.75
4360	5.96	86.05
4370	5.59	85.93
4380	4.77	79.72
4390	4.89	77.85
4400	4.83	76.58
4410	6.01	81.05
4420	4.82	82.51
4430	4.37	78.27
4440	3.86	77.63
4450	4.38	71.89
4460	4.35	73.41
4470	3.85	68.86
4480	4.26	67.88
4490	3.56	71.02
4500	4.68	87.33
4510	4.36	80.47
4520	4.12	66.36
4530	3.42	64.35
4540	3.41	65.3
4550	3.88	67.54
4560	2.35	65.6
4570	2.49	63.78
4580	2.37	62.43
4590	1.4	59.3

Frequency (MHz)	Gain(dBi)	Efficiency(%)
4600	1.76	51.22
4610	2.22	50.19
4620	1.71	51.23
4630	2.23	52.28
4640	2.33	51.46
4650	2.26	51.15
4660	1.72	53.58
4670	2.75	59.16
4680	3.23	57.95
4690	3.19	61.75
4700	3.14	66.77
4710	2.44	64.28
4720	2.81	64.33
4730	2.8	58.75
4740	2.84	56.64
4750	2.87	56.98
4760	2.8	61.23
4770	3.53	63.46
4780	2.71	59.56
4790	3.27	64.55
4800	3.77	63.72
4810	4.07	67.15
4820	3.8	64.76
4830	2.61	64.03
4840	2.45	60.47
4850	2.79	64.28

Frequency (MHz)	Gain(dBi)	Efficiency(%)
4860	3.66	72.57
4870	2.93	68.1
4880	3.64	71.24
4890	2.77	63.63
4900	2.98	64.85
4910	3.18	67.01
4920	3.3	68.17
4930	3.09	66.15
4940	3.76	64.28
4950	3.66	60.41
4960	3.61	60.65
4970	3.18	69
4980	3.18	66.66
4990	3.85	65.07
5000	1.56	57.89
5010	1.33	58.52
5020	2.48	60.41
5030	2.36	60.49
5040	3.32	59.64
5050	1.89	62.03
5060	2.71	61.62
5070	2.83	63.29
5080	2.8	58.88
5090	2.47	60.07
5100	4.12	65.23
5110	2.05	58.78

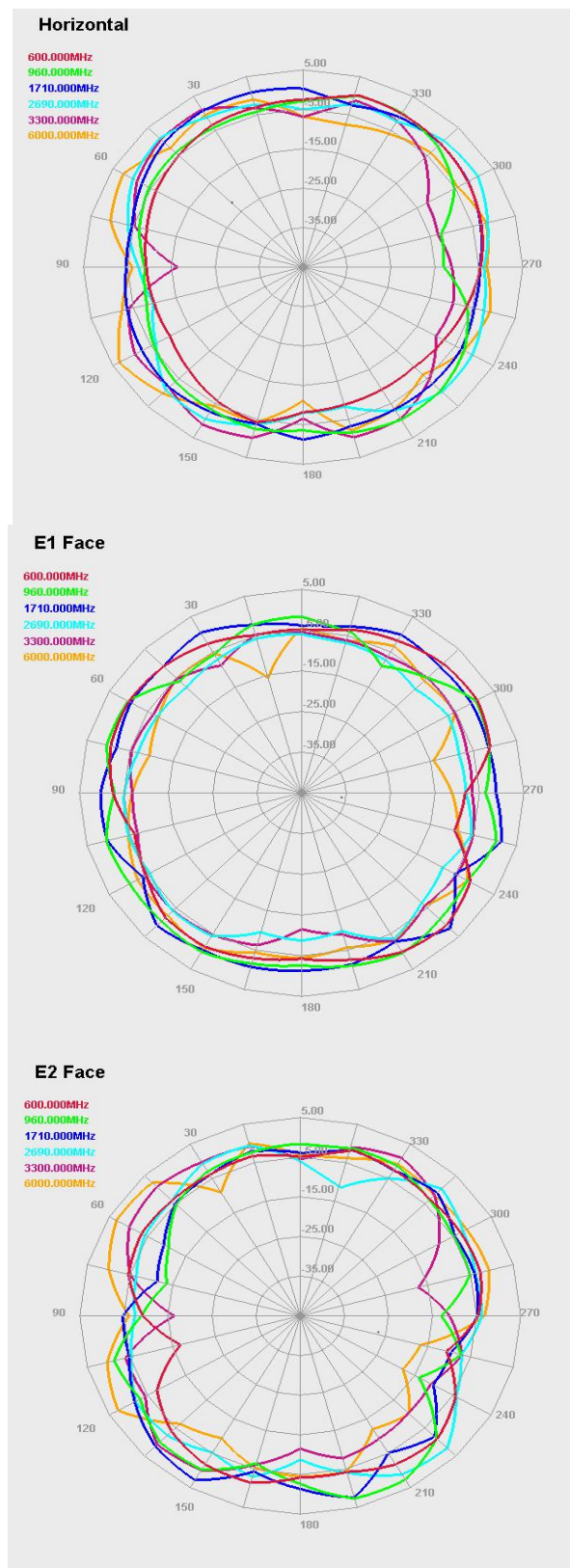
Frequency (MHz)	Gain(dBi)	Efficiency(%)
5120	2.93	58.85
5130	2.63	56.73
5140	2.66	54.96
5150	1.23	54.15
5160	3.33	56.13
5170	2.88	67.84
5180	1.76	62.99
5190	2.51	59.63
5200	2.95	62.59
5210	1.51	59.81
5220	2.31	56.47
5230	1.56	53.84
5240	1.37	55.33
5250	1.79	54.44
5260	2.7	54.33
5270	0.82	57.19
5280	0.89	54.59
5290	1.32	53.58
5300	1.55	55.94
5310	1.14	55.03
5320	1.69	56.32
5330	3.6	57.17
5340	2.89	60.92
5350	3.76	65.15
5360	3.38	69.56
5370	2.95	66.36

Frequency (MHz)	Gain(dBi)	Efficiency(%)
5380	2.8	66.08
5390	3.05	66.44
5400	4.41	69.35
5410	4.34	70.78
5420	3.29	67.25
5430	3.74	67.23
5440	4.99	67.46
5450	3.23	69.75
5460	3.92	78.26
5470	3.12	71.53
5480	3.77	68.3
5490	3.05	65.79
5500	4.04	66.8
5510	3.87	70.51
5520	4.03	64.25
5530	4.59	65.3
5540	2.41	61.95
5550	2.1	59.15
5560	2.91	59.17
5570	2.89	56.67
5580	2.68	63.37
5590	2.84	63.27
5600	3.57	66.11
5610	2.85	62.78
5620	2.32	61.83
5630	2.62	63.97

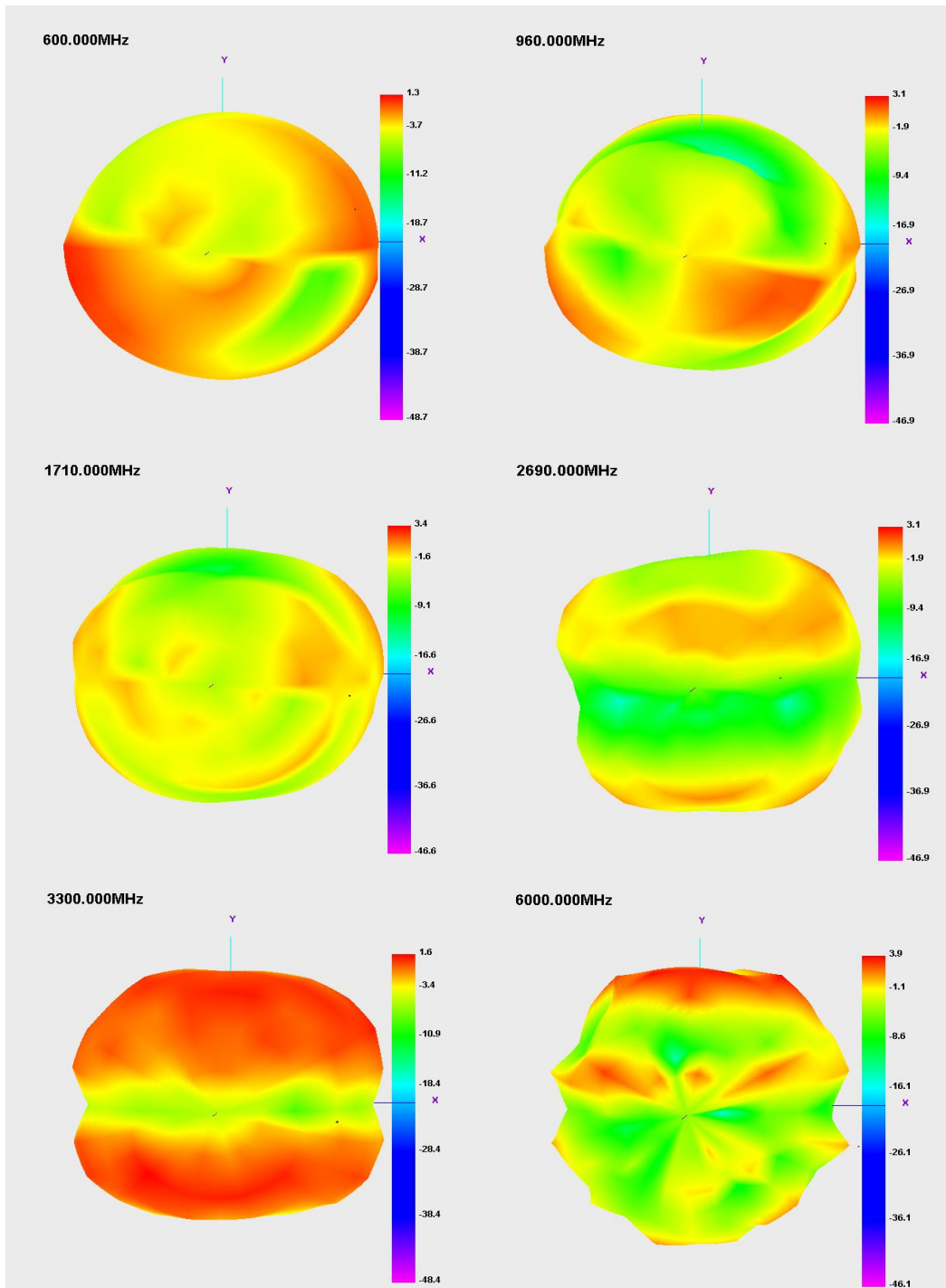
Frequency (MHz)	Gain(dBi)	Efficiency(%)
5640	2.11	64.39
5650	3.94	67.71
5660	3.27	66.77
5670	3.39	70.9
5680	3.81	70.4
5690	2.78	68.55
5700	3.57	72.63
5710	3.43	65.79
5720	3.79	66.38
5730	3.1	64.77
5740	3.72	67.17
5750	3	65.45
5760	2.68	54.62
5770	2.24	58.13
5780	1.95	57.66
5790	4.88	58.81
5800	3.57	62.91
5810	3.22	65.54
5820	3.2	67.2
5830	5.28	64.31
5840	4.75	57.54
5850	4.75	63
5860	4.08	65.2
5870	4.96	71.67
5880	4.97	63.41
5890	5.34	63.35

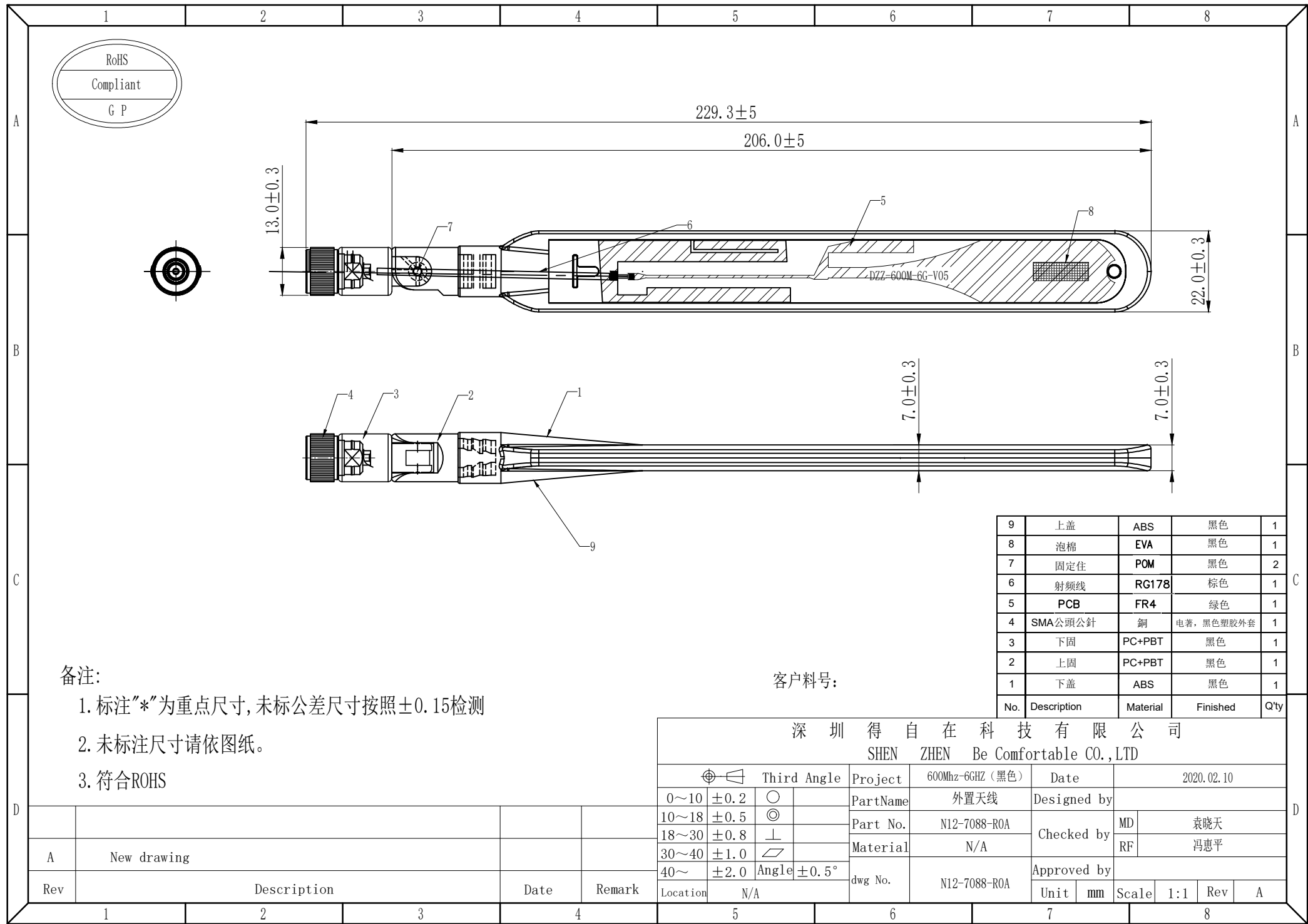
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5900	5.49	67.38
5910	5.08	61.51
5920	4.76	63.12
5930	4.23	58.68
5940	4.99	67.09
5950	4.25	68.14
5960	4.49	57.85
5970	3.63	59.26
5980	3.42	58.29
5990	3.57	59.92
6000	3.86	56.37

4. 2D



5. 3D





备注:

1. 标注“*”为重点尺寸, 未标公差尺寸按照 ± 0.15 检测
2. 未标注尺寸请依图纸。
3. 符合ROHS

客户料号:

9	上盖	ABS	黑色	1
8	泡棉	EVA	黑色	1
7	固定住	POM	黑色	2
6	射频线	RG178	棕色	1
5	PCB	FR4	绿色	1
4	SMA公头公针	铜	电著, 黑色塑胶外套	1
3	下固	PC+PBT	黑色	1
2	上固	PC+PBT	黑色	1
1	下盖	ABS	黑色	1
No.	Description	Material	Finished	Q'ty

深圳得自在科技有限公司

SHEN ZHEN Be Comfortable CO.,LTD

Project	600Mhz-6GHZ (黑色)	Date	2020.02.10
PartName	外置天线	Designed by	
Part No.	N12-7088-R0A	Checked by	MD 袁晓天
Material	N/A	RF	冯惠平
dwg No.	N12-7088-R0A	Approved by	
Unit	mm	Scale	1:1
Rev	A	Rev	A

A	New drawing		
Rev	Description	Date	Remark

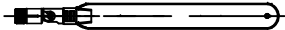
产品包装规范

日期: 2022.02.10

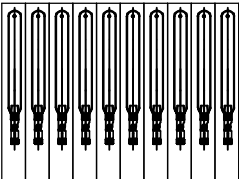
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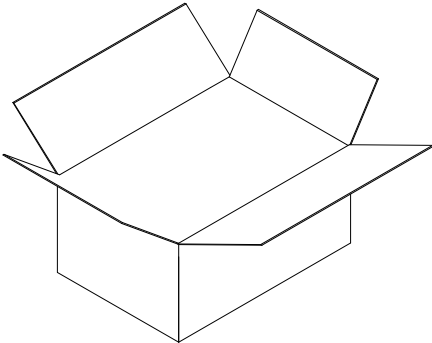
成品料号 : N12-7088-ROA	版本: A
成品名称 : 外置天线	

1)成品外置天线

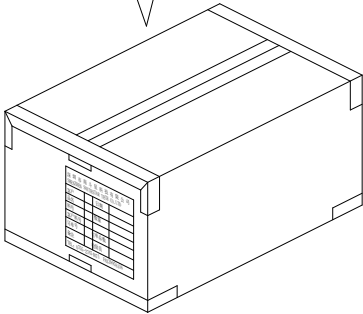


二: 用PE袋装起来, 25pcs为准





四: 装一箱, 以500pcs包装为准



五: 封箱, 外箱贴我司生产标签和ROHS标签.

批准: _____

确认: 冯惠平

拟制: 袁晓天