

SPECIFICATION FOR APPROVAL

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

	MANUFACTURERR SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY:		
DATE:		

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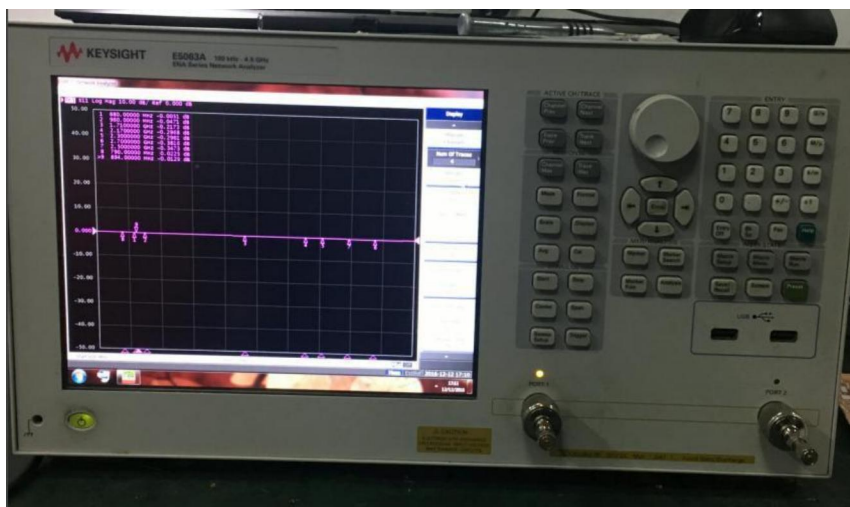
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1.RF Fixture Experiment

1.1 Test Setup

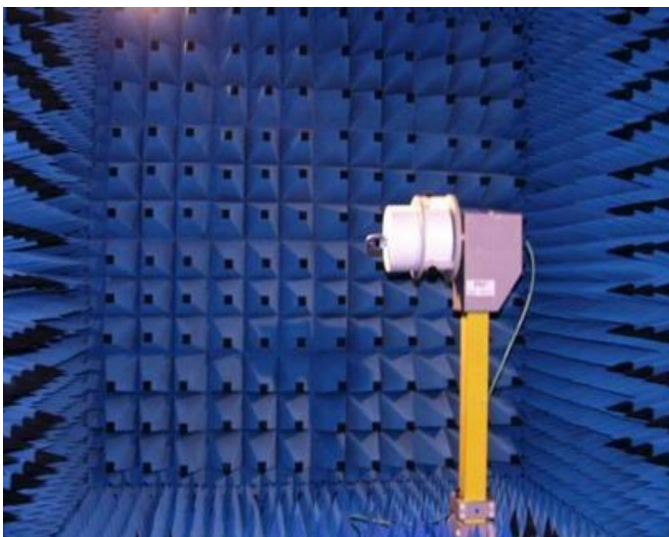
1.1.1 VNA Test Setup

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



1.1.2 Anechoic Chamber Test Setup

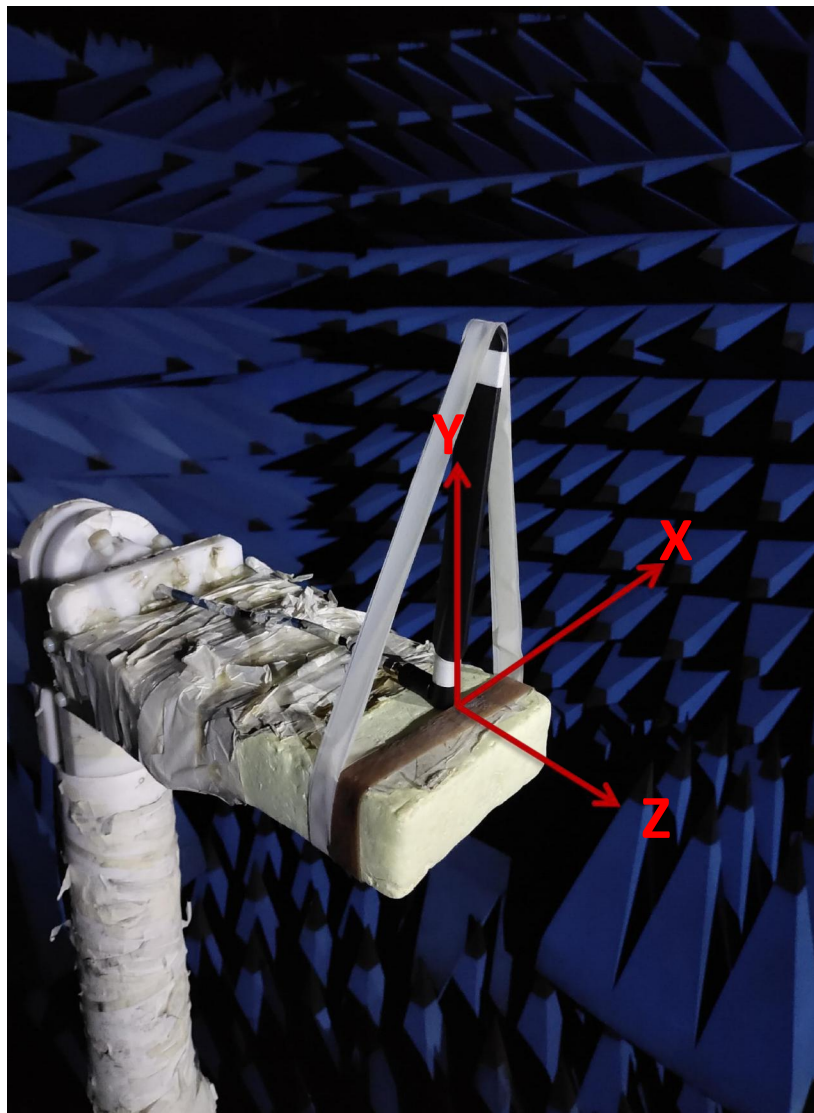
When we test Gain and Efficiency of the antenna, we will use the ETS 3D chamber. The chamber provides test frequency from 400MHz to 6GHz. The real test environment is showing as following picture



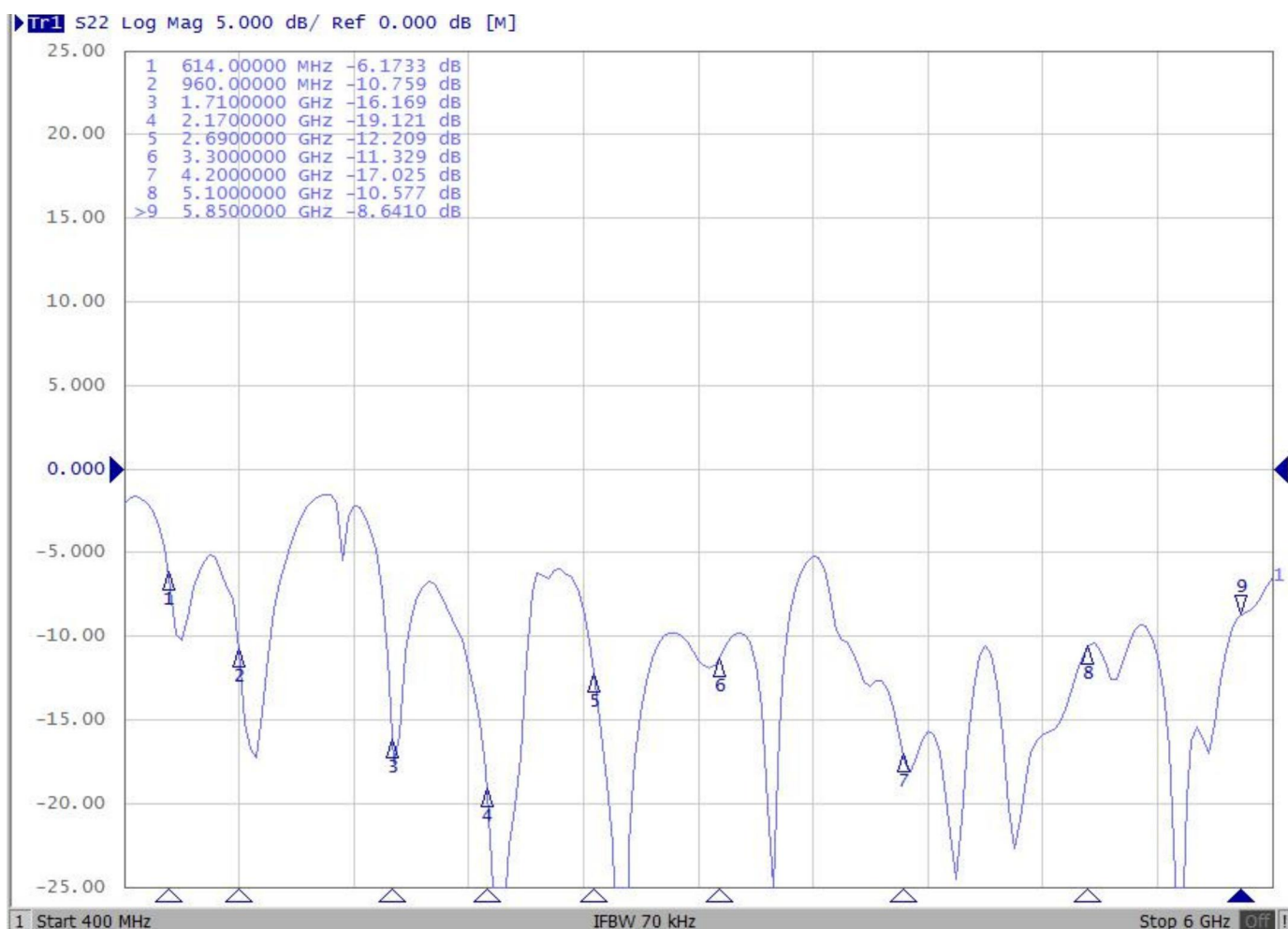


1.2 UE configuration

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	1.67	58.46
2300	-0.54	56.61
2310	-0.54	63.93
2320	-0.56	62.98
2330	1.51	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	0.06	59.53
3310	-0.04	65.48
3320	0.25	64.4
3330	0.18	62.46
3340	0.04	65.22
3350	0.05	65.7
3360	0.24	65.48
3370	0.19	58.22
3380	0.12	57.89
3390	0.29	63.36
3400	0.03	65.66
3410	0.32	68.8
3420	-0.15	61.84
3430	-0.06	58.04
3440	-0.1	60.27
3450	-0.11	68.06
3460	0.02	71.99
3470	-0.12	72.07
3480	-0.09	64.01
3490	-0.07	64.38
3500	-0.02	69.49
3510	-0.09	72.14
3520	-0.01	72.73
3530	-0.01	72.67
3540	0.02	73
3550	-0.94	68.08

Frequency (MHz)	Gain(dBi)	Efficiency (%)
3560	-0.94	66.37
3570	-0.94	65.19
3580	-1.06	68.27
3590	-0.94	69.63
3600	-0.98	64.8
3610	-0.94	64.32
3620	-1.02	66.68
3630	-0.94	62.88
3640	-1.01	56.33
3650	-1	52.54
3660	-0.99	52.42
3670	-0.94	53.42
3680	-1.06	64.92
3690	-1.05	55.26
3700	-1.01	54.44
3710	-0.02	52.85
3720	-0.22	58.25
3730	-0.1	65.94
3740	-0.13	56.79
3750	-0.11	56.18
3760	-0.15	53.66
3770	-0.17	58.31
3780	-0.01	56.03
3790	0.01	55.24
3800	0.02	55.09
3810	-0.04	56.39

Frequency (MHz)	Gain(dBi)	Efficiency (%)
3820	-0.18	53.25
3830	-0.18	54.69
3840	-0.02	55.04
3850	-0.14	58.07
3860	-0.17	57.39
3870	-0.19	59.88
3880	-0.2	61.98
3890	-0.29	62.97
3900	-0.21	61.06
3910	-0.24	59.75
3920	-0.27	64.08
3930	-0.18	55.81
3940	-0.15	60.95
3950	-0.12	60.49
3960	-0.39	60.62
3970	0.05	65.02
3980	0.16	66.19
3990	-0.22	61.6
4000	-0.22	64.24
4010	-0.16	61.81
4020	0.52	69.42
4030	-0.07	66.1
4040	-0.16	64.76
4050	-0.18	58
4060	-0.15	58.63
4070	-0.16	65.26

Frequency (MHz)	Gain(dBi)	Efficiency (%)
4080	-0.12	67.75
4090	-0.17	66.67
4100	-0.23	58.19
4110	-0.15	57.89
4120	-0.09	58.09
4130	-0.2	68.88
4140	0.06	73.81
4150	-0.13	67.07
4160	-0.21	69.18
4170	-0.16	66.05
4180	-0.14	66.4
4190	-0.18	63.8
4200	-0.03	62.3
4210	0.72	63.87
4220	1.93	64.3
4230	2.87	68.82
4240	3.75	61.28
4250	4.84	59.03
4260	4.74	62.2
4270	4.76	63.68
4280	4.95	66.88
4290	5.1	70.59
4300	4.86	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	4.86	77.63
4450	4.38	71.89
4460	4.35	73.41
4470	4.85	68.86
4480	4.26	67.88
4490	4.56	71.02
4500	4.68	87.33
4510	4.36	80.47
4520	4.12	66.36
4530	4.42	64.35
4540	4.41	65.3
4550	4.88	67.54
4560	4.35	65.6
4570	4.49	63.78
4580	4.37	62.43
4590	4.4	59.3

Frequency (MHz)	Gain(dBi)	Efficiency (%)
4600	4.76	51.22
4610	4.22	50.19
4620	4.71	51.23
4630	4.23	52.28
4640	4.33	51.46
4650	4.26	51.15
4660	4.72	53.58
4670	4.75	59.16
4680	4.23	57.95
4690	4.19	61.75
4700	4.14	66.77
4710	4.44	64.28
4720	4.81	64.33
4730	4.8	58.75
4740	4.84	56.64
4750	4.87	56.98
4760	4.8	61.23
4770	4.53	63.46
4780	4.71	59.56
4790	4.27	64.55
4800	4.77	63.72
4810	4.07	67.15
4820	4.8	64.76
4830	4.61	64.03
4840	4.45	60.47
4850	4.79	64.28

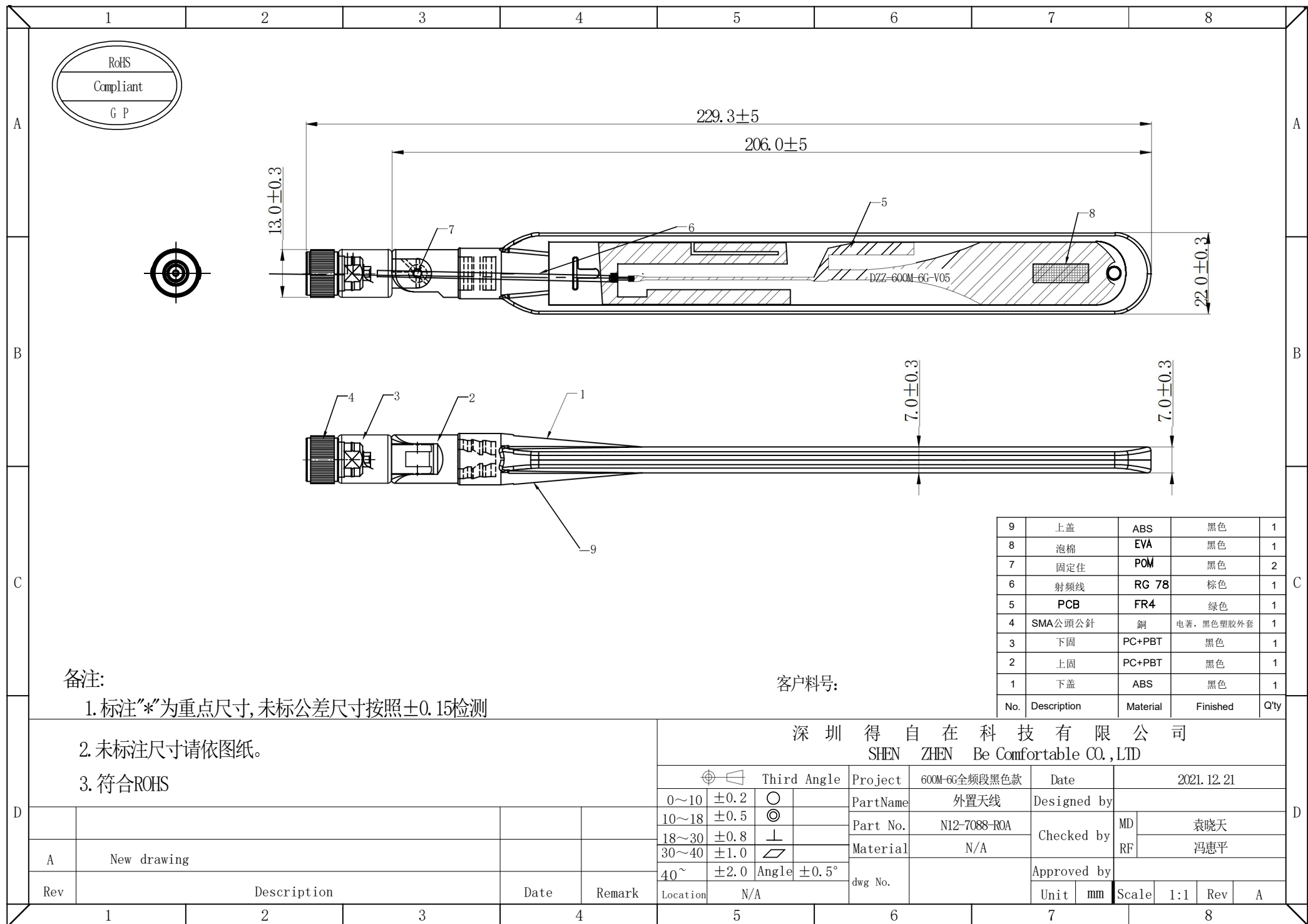
Frequency (MHz)	Gain(dBi)	Efficiency (%)
4860	3.66	72.57
4870	4.93	68.1
4880	4.64	71.24
4890	4.77	63.63
4900	4.98	64.85
4910	4.18	67.01
4920	4.3	68.17
4930	4.09	66.15
4940	4.76	64.28
4950	4.66	60.41
4960	4.61	60.65
4970	4.18	69
4980	4.18	66.66
4990	4.85	65.07
5000	4.56	57.89
5010	4.33	58.52
5020	4.48	60.41
5030	4.36	60.49
5040	4.32	59.64
5050	4.89	62.03
5060	4.71	61.62
5070	4.83	63.29
5080	4.8	58.88
5090	4.47	60.07
5100	4.12	65.23
5110	4.05	58.78

Frequency (MHz)	Gain(dBi)	Efficiency (%)
5120	4.93	58.85
5130	4.63	56.73
5140	4.66	54.96
5150	4.23	54.15
5160	4.33	56.13
5170	4.88	67.84
5180	4.76	62.99
5190	4.51	59.63
5200	4.95	62.59
5210	4.51	59.81
5220	4.31	56.47
5230	4.56	53.84
5240	4.37	55.33
5250	4.79	54.44
5260	4.7	54.33
5270	4.82	57.19
5280	4.89	54.59
5290	4.32	53.58
5300	4.55	55.94
5310	4.14	55.03
5320	4.69	56.32
5330	4.6	57.17
5340	4.89	60.92
5350	4.76	65.15
5360	4.38	69.56
5370	4.95	66.36

Frequency (MHz)	Gain(dBi)	Efficiency (%)
5380	4.8	66.08
5390	4.05	66.44
5400	4.41	69.35
5410	4.34	70.78
5420	4.29	67.25
5430	4.74	67.23
5440	4.99	67.46
5450	4.23	69.75
5460	4.92	78.26
5470	4.12	71.53
5480	4.77	68.3
5490	4.05	65.79
5500	4.04	66.8
5510	4.87	70.51
5520	4.03	64.25
5530	4.59	65.3
5540	4.41	61.95
5550	4.1	59.15
5560	4.91	59.17
5570	4.89	56.67
5580	4.68	63.37
5590	4.84	63.27
5600	4.57	66.11
5610	4.85	62.78
5620	4.32	61.83
5630	4.62	63.97

Frequency (MHz)	Gain(dBi)	Efficiency (%)
5640	4.11	64.39
5650	4.94	67.71
5660	4.27	66.77
5670	4.39	70.9
5680	4.81	70.4
5690	4.78	68.55
5700	4.57	72.63
5710	4.43	65.79
5720	4.79	66.38
5730	4.1	64.77
5740	4.72	67.17
5750	4	65.45
5760	4.68	54.62
5770	4.24	58.13
5780	4.95	57.66
5790	4.88	58.81
5800	4.57	62.91
5810	4.22	65.54
5820	4.2	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

Frequency (MHz)	Gain(dBi)	Efficiency (%)
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



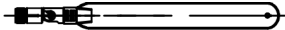
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日期:2021. 12. 16

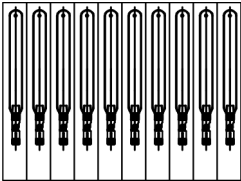
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成品料号 : NI2-ROA	版本: A
成品名称 : 外置天线	客户:

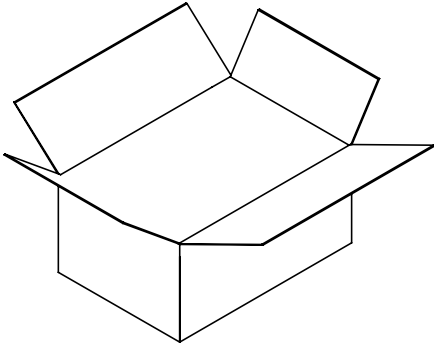
1)成品外置天线



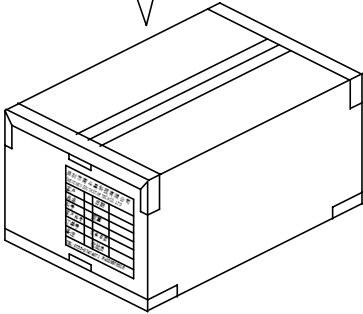
二:用PE袋装起来



四:装一箱, 以实际包装为准



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