RIDA ANTENNAER 深 圳 市 睿 达 永 利 科 技 有 限 公 司

承認書

APPROVAL SHEET

客戶名稱： CUSTOMER NAME：	

物料編號：
PARTNO:

產品品名：
TYPE NAME： 4G 贴片天線

客戶料號：
CUSTOM P/N：

規格：
SPECIFICATON： SMA-JW1.5 镀镍/RG174 線/1.5M/白色无字泡棉

1. 新品承認（Newly Approved） ■
2. 材料變更再承認（Material Approved） □
3. 規格變更再承認（SPEC Approved） □

製造廠商/供應廠商承認欄			客 戶 承 認 欄		
承認章： （APPROVAL BY）：			承認章： （APPROVAL BY）：		
承認日期： （APPROVAL DATE）：2025 年 月 日			承認日期： （APPROVAL DATE）：2025 年 月 日		
供應商（SUPPLIER）			客戶(CUSTOMER)		
品質 Q. Dept	工程 E. Dept	業務 S. Dept	經辦 TESTED	審核 CHECKED	核准 APPROVED
侯再凤	王世海	张燕平			
日期（DATE）：2025 年 月 日			日期(DATE)：2025 年 月 日		

公司名称：深圳市睿达永利科技有限公司
公司地址：深圳市龙岗区宝龙街道同乐社区南同大道 5 号（锦龙二路 15 号）B 栋厂房三楼
电 话：TEL:0755-89329300 传 真： FAX:0755-28522900 网 址： http://www.szrestart.com

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电性能技术参数

Model 型号	4G 贴片天线
Frequency Range 频率范围-MHz	699MHz~960MHz，1710MHz~2690MHz
Gain 增益 dB	3.0~4.0dB
VSWR 电压驻波比（±0.2）	≤2.0:1
Input impedance 输入阻抗-Ω	50
Polarization 极化方式	Vertical 垂直
Maximum Power 最大功率-W	20
Connector Type 连接器型号	SMA-JW1.5 镀镍
Cable Length 电缆长度-m	RG174 线　1.5 米
Weight 重量-g	45g
Installation 安装方式	粘贴
环境 Environmental	1.工作温度 Working Temp　-40℃~+85℃ 2.湿度 Humidity Humidity　95%~100%R

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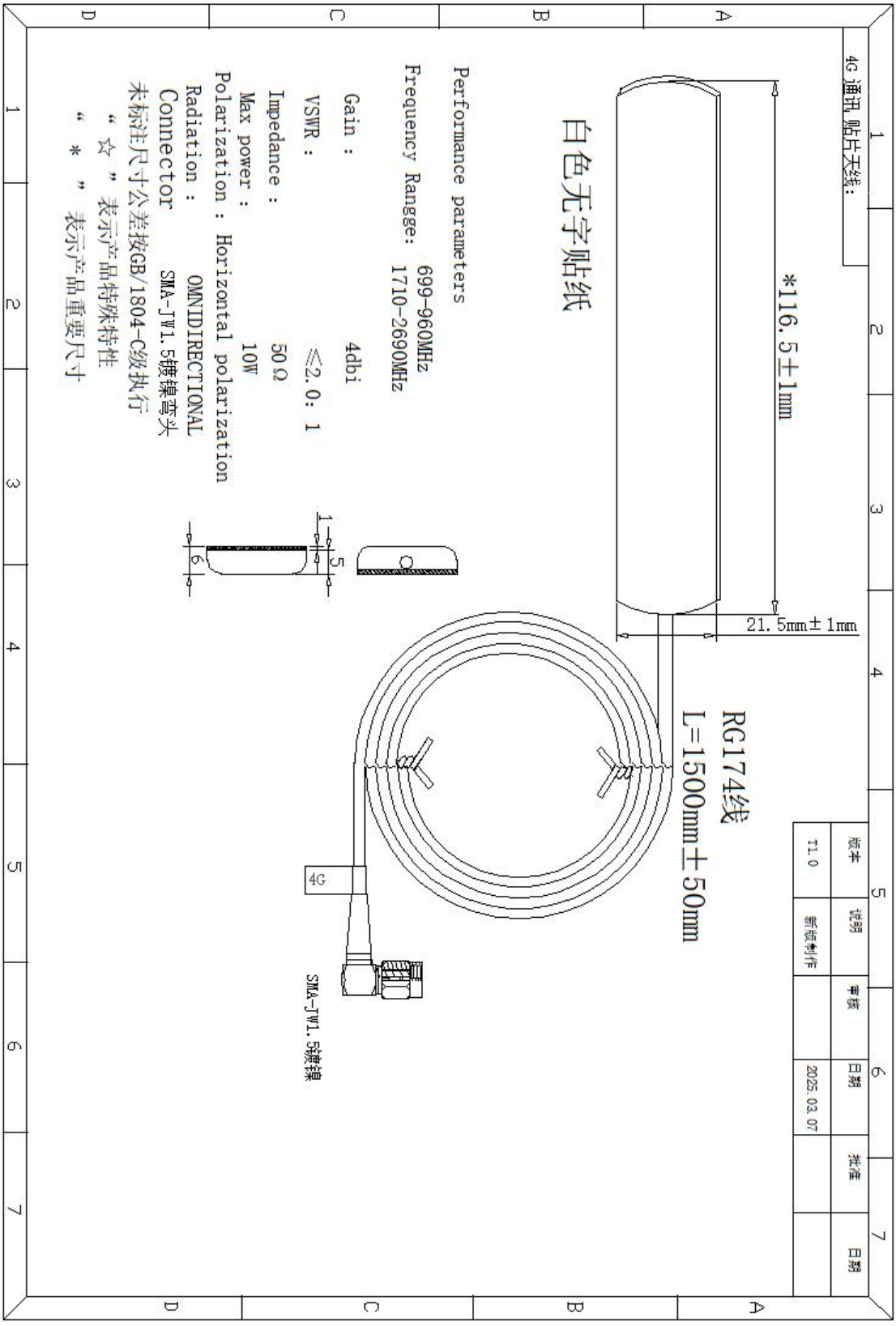
1. Antenna size and shape

1-1 Structure Picture



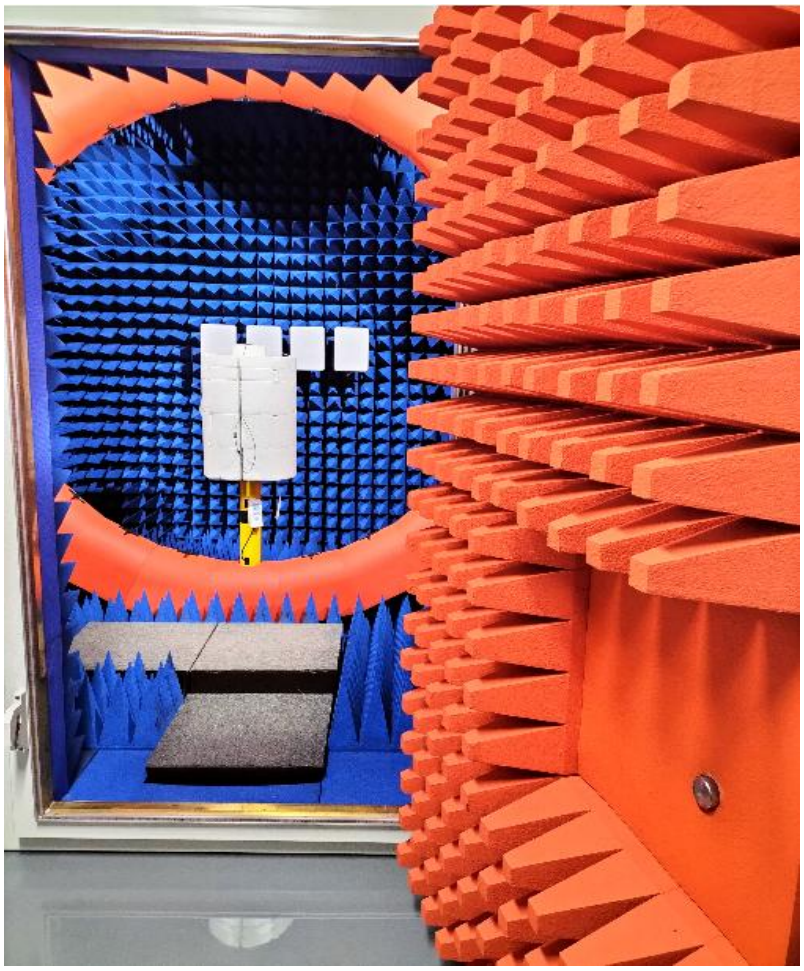
2. Test equipment and darkroom

2-1 Test equipment

The 5071c vector network analyzer was used to test passive data and standing waves and other indicators, while the CMW500 was used to measure active OTA data.

2-2 Test the darkroom

The measurement method of multi-probe single-probe switching can achieve rapid antenna measurement. Compared with the traditional mechanical rotation method, the test speed can be increased by one order of magnitude. The use of a vertically installed multi-probe switching architecture enables the antenna under test to be placed directly horizontally on the test platform. It has the advantages of large load-bearing capacity, no influence from the direction of gravity when the object under test rotates, and simple and convenient placement. Due to the limitation of the test distance, the near-field measurement method can directly obtain the amplitude-phase distribution under near-field conditions. After strict data conversion, the precise far-field radiation direction can be obtained.



3. Electrical performance requirements for antennas

3-1 Frequency Requirements

The operating frequency of 4G antennas is between 699-960 MHZ and 1710-2690 MHZ. Resonance occurs within this frequency range.

3-2 Passive S11 Parameter measurement

The passive S11 parameter measurement method involves connecting one end of a 50Ω coaxial cable to the antenna and the other end to a network analyzer to measure the S11 parameters. During the test, the fixture should be kept at least 20 centimeters away from the metal.

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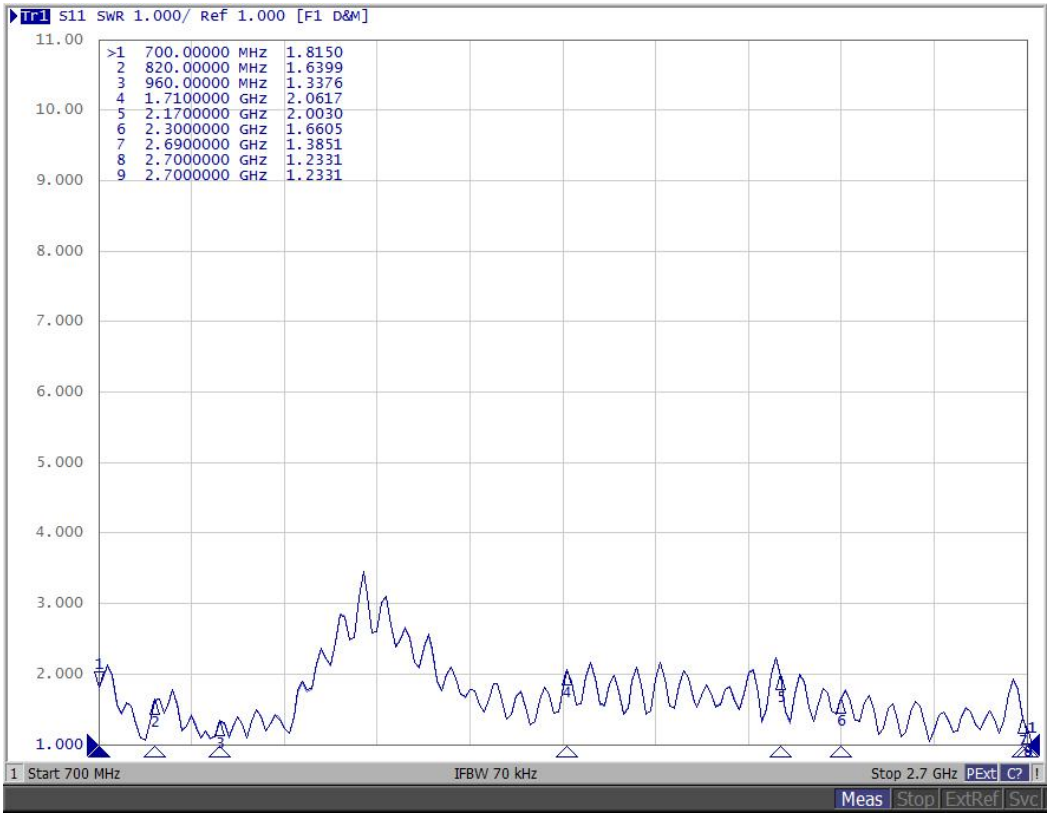

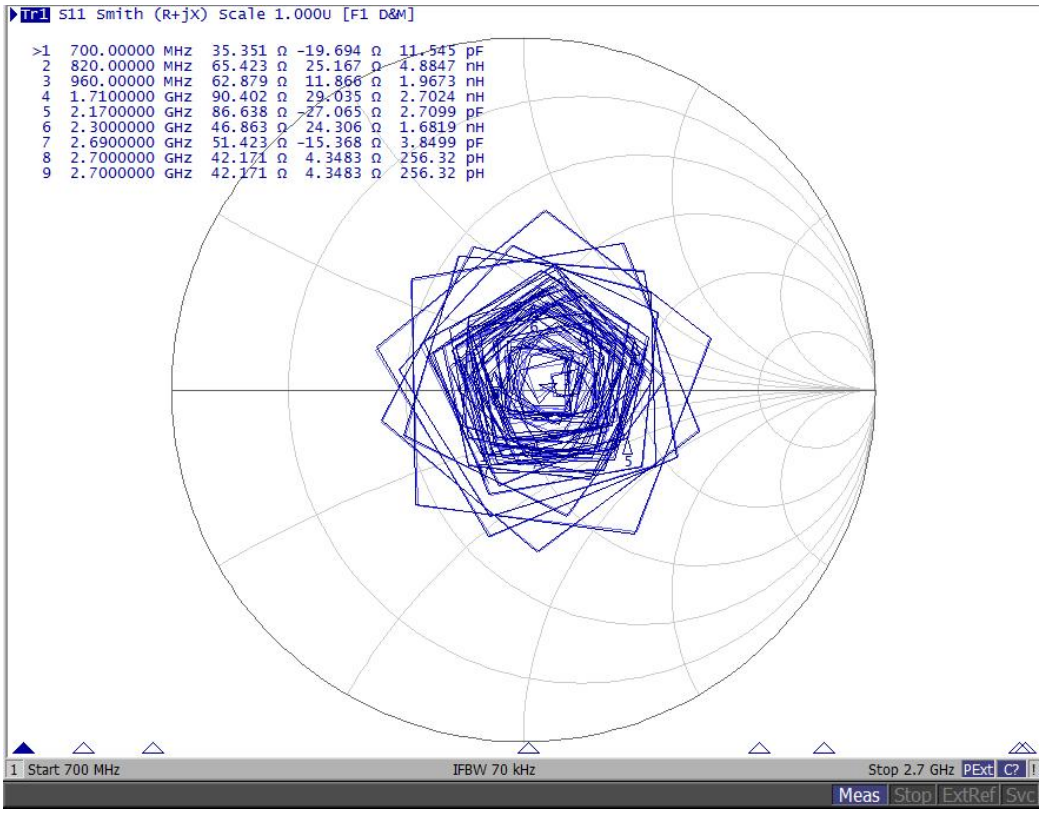

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4. Darkroom test data

4-1 Passive test data

The anechoic chamber supports passive mode measurement of both passive and active antennas, and can measure data such as gain, efficiency, beam width, front-to-back ratio, zero depth, and beam offset Angle.

Frequency ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Frequency (MHz)	700	710	720	730	740	750	760	770	780	790	800	810	820	830	840	850	860	870
Efficiency (dBi)	-3.23	-3.17	-3.10	-2.93	-2.82	-2.73	-2.78	-2.94	-2.90	-2.93	-2.82	-2.68	-2.49	-2.40	-2.36	-2.55	-2.98	-3.16
Gain (dBi)	4.91	5.09	5.25	5.35	5.37	5.40	5.16	4.77	4.59	4.35	4.27	4.25	4.31	4.37	4.46	4.43	4.14	4.38
Efficiency (%)	47.51	48.17	48.99	50.92	52.22	53.31	52.74	50.86	51.28	50.98	52.26	53.98	56.30	57.55	58.10	55.54	50.33	48.29
Directivity (dB)	8.14	8.26	8.34	8.28	8.19	8.13	7.94	7.70	7.49	7.28	7.09	6.92	6.80	6.77	6.82	6.99	7.12	7.55
Peak Gain Position (Theta)	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	150.00	150.00
Peak Gain Position (Phi)	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	45.00	45.00	45.00	60.00	60.00
Efficiency ThetaPol (%)	32.36	33.47	34.65	36.37	37.36	38.00	37.51	36.40	37.24	37.47	38.82	40.38	42.31	43.27	43.53	41.13	36.45	33.86
Efficiency PhiPol (%)	15.14	14.71	14.34	14.54	14.85	15.32	15.23	14.46	14.04	13.51	13.44	13.60	13.99	14.28	14.57	14.41	13.88	14.43
Upper Hem. Efficiency (%)	15.75	15.43	15.19	15.53	15.88	16.01	15.48	14.46	14.12	13.84	14.15	14.60	15.23	15.68	15.89	15.38	14.05	13.42
Lower Hem. Efficiency (%)	31.75	32.75	33.81	35.39	36.33	37.31	37.25	36.40	37.16	37.14	38.11	39.38	41.07	41.87	42.20	40.16	36.28	34.87

Frequency ID	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Frequency (MHz)	880	890	900	910	920	930	940	950	960	1710	1720	1730	1740	1750	1760	1770	1780	1790
Efficiency (dBi)	-3.35	-3.42	-3.44	-3.39	-3.56	-3.90	-4.08	-3.96	-3.75	-4.00	-3.73	-3.74	-3.98	-4.08	-4.07	-4.13	-4.10	-4.22
Gain (dBi)	4.65	4.94	5.06	5.11	5.04	4.71	4.54	4.64	4.80	3.89	4.12	4.08	3.81	3.71	3.71	3.63	3.66	3.54
Efficiency (%)	46.19	45.54	45.31	45.78	44.03	40.72	39.06	40.17	42.13	39.84	42.34	42.28	39.98	39.05	39.22	38.64	38.90	37.84
Directivity (dB)	8.00	8.35	8.50	8.50	8.60	8.61	8.62	8.60	8.56	7.89	7.85	7.82	7.79	7.79	7.78	7.76	7.76	7.77
Peak Gain Position (Theta)	150.00	150.00	150.00	135.00	135.00	135.00	135.00	135.00	135.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00
Peak Gain Position (Phi)	60.00	60.00	60.00	45.00	45.00	45.00	45.00	45.00	45.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
Efficiency ThetaPol (%)	31.18	29.84	29.45	29.82	28.87	27.11	26.60	28.03	29.96	30.92	33.11	33.14	31.24	30.31	30.27	29.72	29.90	29.16
Efficiency PhiPol (%)	15.01	15.70	15.86	15.95	15.16	13.61	12.46	12.14	12.17	8.92	9.22	9.14	8.74	8.74	8.95	8.92	9.00	8.68
Upper Hem. Efficiency (%)	12.52	12.13	11.86	11.90	11.32	10.39	9.85	10.06	10.45	12.80	13.90	13.73	12.52	11.57	11.07	10.40	10.26	9.86
Lower Hem. Efficiency (%)	33.67	33.41	33.46	33.87	32.71	30.32	29.21	30.11	31.68	27.04	28.44	28.54	27.46	27.48	28.15	28.24	28.64	27.97

Frequency ID	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Frequency (MHz)	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Efficiency (dBi)	-4.25	-4.28	-4.26	-4.17	-4.06	-4.02	-4.00	-4.22	-4.42	-4.49	-4.43	-4.35	-4.16	-3.94	-3.70	-3.51	-3.43	-3.46
Gain (dBi)	3.43	3.48	3.66	4.02	4.46	4.80	5.04	4.92	4.76	4.75	4.82	4.89	5.03	5.04	5.00	4.95	4.87	4.85
Efficiency (%)	37.62	37.31	37.49	38.25	39.26	39.64	39.83	37.86	36.13	35.56	36.07	36.70	38.37	40.35	42.69	44.58	45.42	45.04
Directivity (dB)	7.68	7.76	7.92	8.19	8.52	8.81	9.03	9.13	9.18	9.24	9.25	9.25	9.19	8.99	8.70	8.46	8.30	8.31
Peak Gain Position (Theta)	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00
Peak Gain Position (Phi)	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Efficiency ThetaPol (%)	29.11	28.96	29.11	29.64	30.35	30.62	30.77	29.24	27.87	27.47	27.97	28.61	30.08	31.95	34.24	36.23	37.28	37.14
Efficiency PhiPol (%)	8.51	8.35	8.38	8.62	8.91	9.02	9.06	8.62	8.26	8.09	8.10	8.09	8.29	8.40	8.45	8.36	8.14	7.90
Upper Hem. Efficiency (%)	9.93	9.85	10.15	10.46	10.69	10.59	10.35	9.49	8.72	8.31	8.32	8.64	9.58	10.71	11.73	12.31	12.26	11.91
Lower Hem. Efficiency (%)	27.69	27.46	27.34	27.80	28.57	29.04	29.49	28.37	27.40	27.25	27.75	28.06	28.80	29.64	30.95	32.28	33.16	33.13

Frequency ID	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
Frequency (MHz)	1980	1990	2000	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150
Efficiency (dBi)	-3.78	-3.94	-4.04	-4.12	-4.18	-4.34	-4.27	-4.26	-4.23	-4.12	-4.15	-4.01	-3.97	-3.97	-4.02	-3.98	-4.01	-4.04
Gain (dBi)	4.60	4.47	4.32	4.14	3.95	3.63	3.41	3.04	2.87	3.01	3.02	3.12	3.02	2.77	2.60	2.53	2.40	2.37
Efficiency (%)	41.87	40.39	39.41	38.73	38.16	36.78	37.39	37.47	37.71	38.74	38.49	39.74	40.08	40.05	39.61	39.97	39.69	39.42
Directivity (dB)	8.38	8.41	8.36	8.26	8.14	7.97	7.68	7.31	7.10	7.13	7.17	7.13	6.99	6.75	6.62	6.51	6.42	6.41
Peak Gain Position (Theta)	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00
Peak Gain Position (Phi)	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Efficiency ThetaPol (%)	34.57	33.41	32.68	32.21	31.80	30.64	31.19	31.37	31.80	32.95	33.01	34.34	34.90	35.17	35.09	35.74	35.80	35.80
Efficiency PhiPol (%)	7.29	6.98	6.73	6.51	6.36	6.13	6.20	6.10	5.91	5.79	5.48	5.40	5.19	4.88	4.53	4.23	3.89	3.62
Upper Hem. Efficiency (%)	11.04	10.77	10.68	10.60	10.43	10.10	10.38	10.61	10.66	10.83	10.48	10.66	10.72	10.76	10.58	10.53	10.21	9.75
Lower Hem. Efficiency (%)	30.82	29.62	28.73	28.13	27.73	26.68	27.01	26.86	27.06	27.91	28.01	29.08	29.36	29.29	29.04	29.44	29.47	29.67

Frequency ID	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Frequency (MHz)	2160	2170	2300	2310	2320	2330	2340	2350	2360	2370	2380	2390	2400	2410	2420	2430	2440	2450
Efficiency (dBi)	-4.26	-4.68	-5.37	-5.26	-5.01	-4.76	-4.77	-4.73	-4.69	-4.71	-4.56	-4.36	-4.21	-4.21	-4.25	-4.36	-4.36	-4.36
Gain (dBi)	2.14	1.69	1.86	2.38	2.81	3.06	2.88	2.66	2.43	2.17	2.26	2.48	2.67	2.67	2.54	2.34	2.20	1.93
Efficiency (%)	37.53	34.02	29.04	29.78	31.54	33.41	33.32	33.67	34.00	33.77	35.00	36.63	37.97	37.93	37.57	36.64	36.64	36.66
Directivity (dB)	6.40	6.38	7.23	7.64	7.82	7.82	7.66	7.39	7.11	6.89	6.82	6.84	6.87	6.88	6.80	6.70	6.56	6.29
Peak Gain Position (Theta)	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00
Peak Gain Position (Phi)	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Efficiency ThetaPol (%)	34.28	31.22	26.92	27.27	28.59	30.06	29.80	30.01	30.23	30.05	31.14	32.59	33.76	33.68	33.34	32.56	32.62	32.81
Efficiency PhiPol (%)	3.25	2.80	2.12	2.51	2.96	3.36	3.52	3.66	3.76	3.72	3.86	4.04	4.21	4.25	4.23	4.08	4.02	3.86
Upper Hem. Efficiency (%)	8.78	7.48	5.42	5.88	6.62	7.61	8.54	9.91	11.40	12.45	13.67	14.53	14.92	14.53	13.95	13.19	12.83	12.73
Lower Hem. Efficiency (%)	28.75	26.54	23.62	23.90	24.93	25.80	24.78	23.77	22.60	21.33	21.33	22.10	23.05	23.41	23.62	23.45	23.81	23.94

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Frequency ID	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
Frequency (MHz)	2460	2470	2480	2490	2500	2510	2520	2530	2540	2550	2560	2570	2580	2590	2600	2610	2620	2630
Efficiency (dBi)	-4.34	-4.18	-4.04	-4.04	-4.09	-4.18	-4.27	-4.44	-4.37	-4.31	-4.12	-4.07	-4.04	-4.05	-4.09	-3.94	-3.82	-3.74
Gain (dBi)	1.61	1.57	1.46	1.20	0.89	0.73	0.54	0.51	0.69	0.59	0.79	0.87	0.74	0.45	0.01	-0.29	-0.37	-0.38
Efficiency (%)	36.78	38.17	39.45	39.42	38.98	38.19	37.41	35.97	36.59	37.07	38.71	39.20	39.49	39.36	38.97	40.35	41.52	42.23
Directivity (dB)	5.95	5.76	5.50	5.24	4.98	4.91	4.81	4.95	5.06	4.90	4.91	4.94	4.78	4.50	4.10	3.65	3.45	3.37
Peak Gain Position (Theta)	135.00	135.00	135.00	135.00	150.00	150.00	150.00	60.00	60.00	60.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00
Peak Gain Position (Phi)	30.00	120.00	120.00	120.00	0.00	0.00	0.00	300.00	300.00	300.00	45.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00
Efficiency ThetaPol (%)	33.18	34.77	36.17	36.25	35.82	35.00	34.20	32.87	33.49	34.04	35.71	36.32	36.74	36.76	36.57	37.85	39.07	39.78
Efficiency PhiPol (%)	3.60	3.41	3.28	3.16	3.16	3.19	3.21	3.10	3.10	3.03	3.00	2.89	2.75	2.60	2.40	2.49	2.45	2.45
Upper Hem. Efficiency (%)	12.93	13.65	14.42	14.80	15.25	15.62	16.04	15.94	16.46	16.72	17.24	17.31	17.37	17.49	17.50	18.36	19.03	19.64
Lower Hem. Efficiency (%)	23.84	24.53	25.03	24.61	23.73	22.56	21.37	20.04	20.12	20.34	21.47	21.89	22.12	21.87	21.47	21.99	22.49	22.59

Frequency ID	109	110	111	112	113	114	115
Frequency (MHz)	2640	2650	2660	2670	2680	2690	2700
Efficiency (dBi)	-3.84	-4.08	-4.57	-4.88	-5.14	-5.36	-5.30
Gain (dBi)	-0.49	-0.66	-0.99	-1.11	-1.18	-1.47	-1.25
Efficiency (%)	41.28	39.04	34.88	32.54	30.64	29.12	29.48
Directivity (dB)	3.35	3.43	3.58	3.77	3.96	3.89	4.06
Peak Gain Position (Theta)	135.00	135.00	135.00	135.00	135.00	60.00	60.00
Peak Gain Position (Phi)	0.00	45.00	45.00	45.00	45.00	300.00	300.00
Efficiency ThetaPol (%)	38.85	36.73	32.77	30.56	28.77	27.36	27.76
Efficiency PhiPol (%)	2.43	2.31	2.11	1.98	1.87	1.77	1.72
Upper Hem. Efficiency (%)	19.48	18.64	16.73	15.59	14.58	13.92	14.41
Lower Hem. Efficiency (%)	21.80	20.40	18.16	16.95	16.06	15.21	15.07

（以上数据以睿达永利实验室测试为准）

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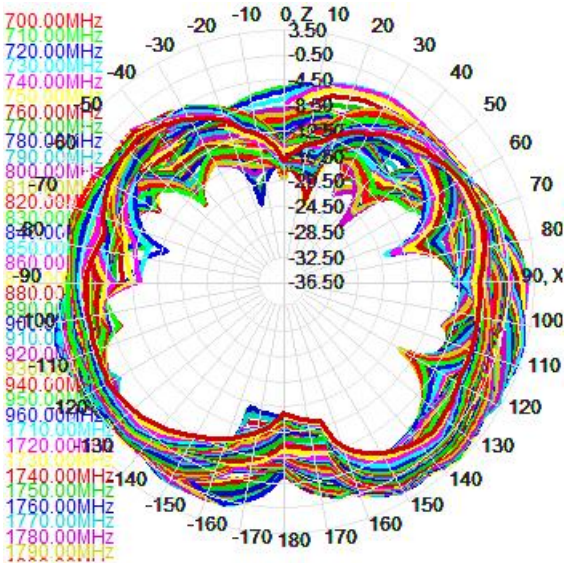
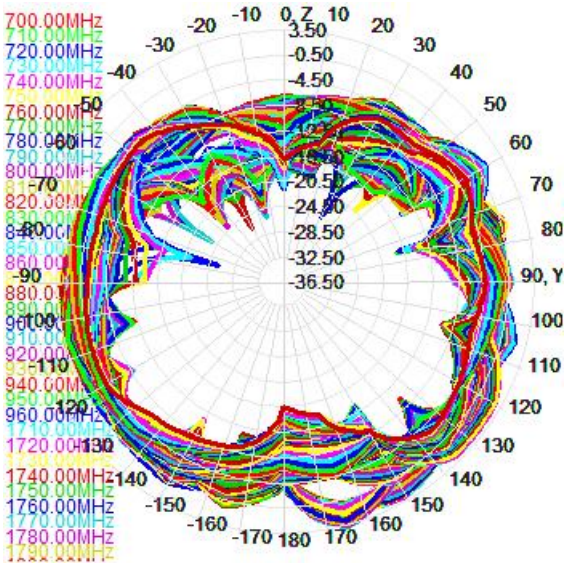
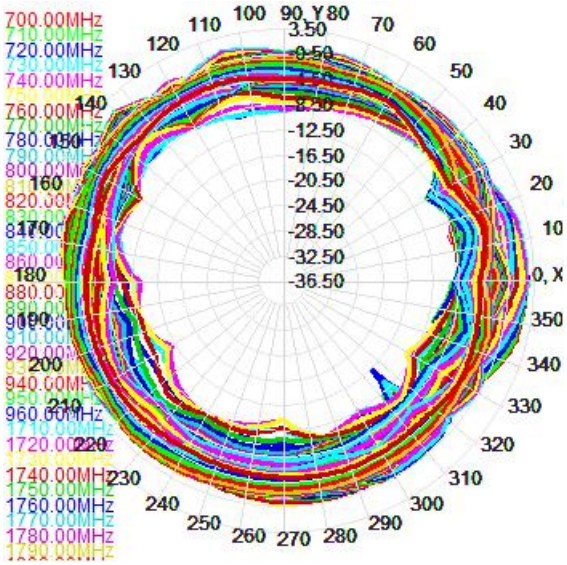
E1



E2



H



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