

# **FPC Antenna Specification**

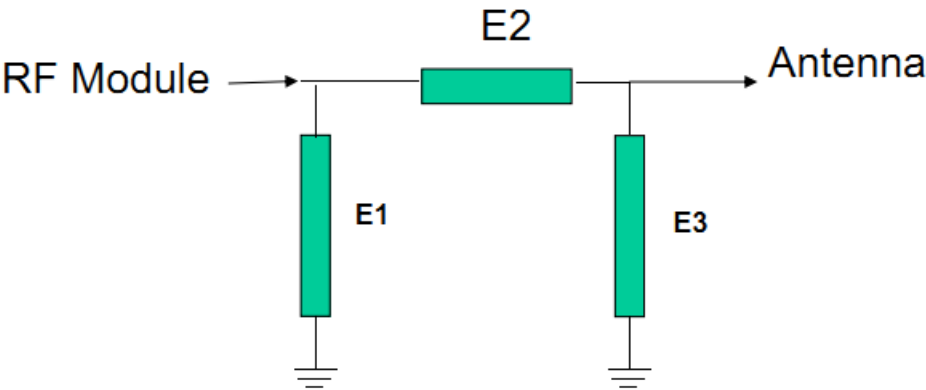
**4G /CAT1 /LTE/2G Flexible FPC Antenna**

Manufacturer: Shenzhen He electric fast technology Co., LTD  
Address: 11th Floor, East Block, Building 6, Hongchuang  
Science and Technology Center, District A, Xikeng Community,  
Fucheng Street, Longhua District, Shenzhen

1. Antenna matching

4G匹配（无改动）

Element	E1	E2	E3
Value	/	/	/



2. Test equipment and principle

## 1. 测试设备:

网络分析仪 Network Analyzers :

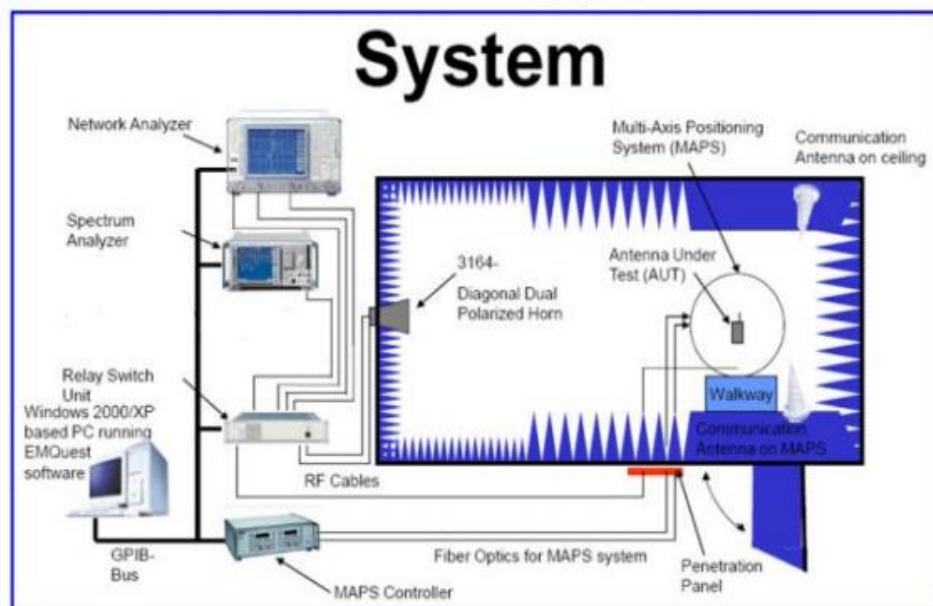
Agilent 8753D 5071B

综合测试仪 Communications Test Set:

Agilent E5515C CMW500

3D 暗室测试系统 3D Chamber Test System:

## 2. 测试原理:



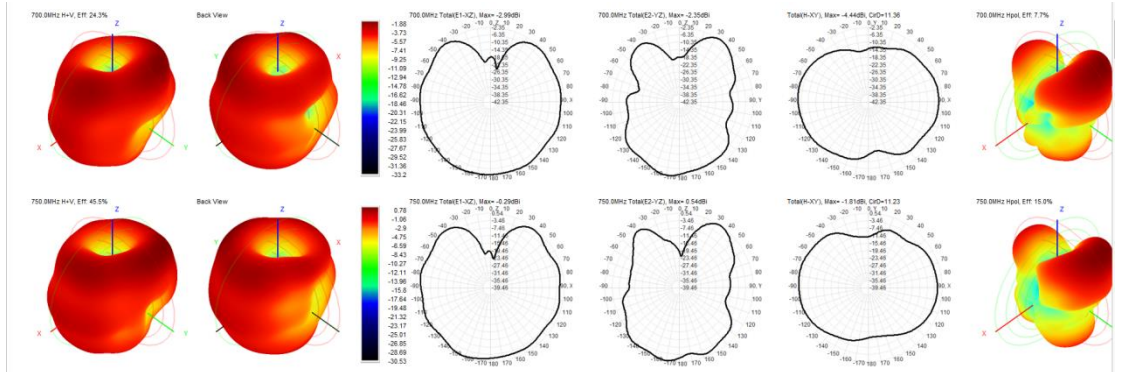
## 3. Antenna performance indicators:

Test Result	LTE1 TRP		Test Result	LTE1 TIS	Test Result	LTE5 TRP		Test Result	LTE5 TIS
	18050	18550		550		20450	20600		2600
Frequency (MHz)	1925	1975	Frequency (MHz)	2165	Frequency (MHz)	829	844	Frequency (MHz)	889
TRP (dBm)	23.81	21.78	TIS (dBm)	-92.17	TRP (dBm)	21.78	22	TIS (dBm)	-90.33
MAX (dBm)	25.45	23.36	MAX (dBm)	-96.31	MAX (dBm)	23.78	24.4	MAX (dBm)	-93.56
Test Result	LTE2 TRP		Test Result	LTE2 TIS	Test Result	LTE7 TRP		Test Result	LTE7 TIS
	18650	19150		1150		20800	21400		3350
Frequency (MHz)	1855	1905	Frequency (MHz)	1985	Frequency (MHz)	2505	2565	Frequency (MHz)	2680
TRP (dBm)	20.2	20.37	TIS (dBm)	-92.87	TRP (dBm)	23.81	21.7	TIS (dBm)	-91.29
MAX (dBm)	22.78	22.1	MAX (dBm)	-94.93	MAX (dBm)	28.73	26.41	MAX (dBm)	-95.69
Test Result	LTE3 TRP		Test Result	LTE3 TIS	Test Result	LTE8 TRP		Test Result	LTE8 TIS
	19250	19900		1850		21500	21750		3750
Frequency (MHz)	1715	1780	Frequency (MHz)	1870	Frequency (MHz)	885	910	Frequency (MHz)	955
TRP (dBm)	19.75	19.84	TIS (dBm)	-92.75	TRP (dBm)	20.49	18.16	TIS (dBm)	-89.43
MAX (dBm)	24.65	22.76	MAX (dBm)	-96.25	MAX (dBm)	23.51	20.76	MAX (dBm)	-92.59
Test Result	LTE4 TRP		Test Result	LTE4 TIS	Test Result	LTE28 TRP		Test Result	LTE28 TIS
	20000	20350		2350		27260	27610		9610
Frequency (MHz)	1715	1750	Frequency (MHz)	2150	Frequency (MHz)	708	743	Frequency (MHz)	798
TRP (dBm)	17.41	19.65	TIS (dBm)	-91.99	TRP (dBm)	15.92	17.36	TIS (dBm)	-89.86
MAX (dBm)	21.31	22.86	MAX (dBm)	-95.27	MAX (dBm)	18.64	20.82	MAX (dBm)	-93.2
Test Result	LTE66 TRP		Test Result	LTE66 TIS					
	132022	132822		67286					
Frequency (MHz)	1715	1795	Frequency (MHz)	2195					
TRP (dBm)	20.32	20.06	TIS (dBm)	-90.79					
MAX (dBm)	22.94	22.53	MAX (dBm)	-93.76					
Test Result	EGSM TRP		EGSM TIS		Test Result	GSM850 TRP		GSM850 TIS	
	1	62	124	124		128	190	251	251
Frequency (MHz)	890.2	902.4	914.8	959.8	Frequency (MHz)	824.2	836.6	848.8	893.8
TRP (dBm)	28.76	28.51	28.29	-103.67	TRP (dBm)	27.38	28.08	28.32	-103.28
MAX (dBm)	31.34	30.19	30.4	-107.23	MAX (dBm)	29.31	30.42	30.7	-107.52
Test Result	DCS TRP		DCS TIS		Test Result	PCS TRP		PCS TIS	
	512	698	885	885		512	661	810	810
Frequency (MHz)	1710.2	1747.4	1784.8	1879.8	Frequency (MHz)	1850.2	1880	1909.8	1989.8
TRP (dBm)	26.36	26.71	26.46	-103.41	TRP (dBm)	25.42	25.8	26.36	-103.02
MAX (dBm)	30.73	31.15	30.84	-108.34	MAX (dBm)	29.72	30.16	30.48	-108.7

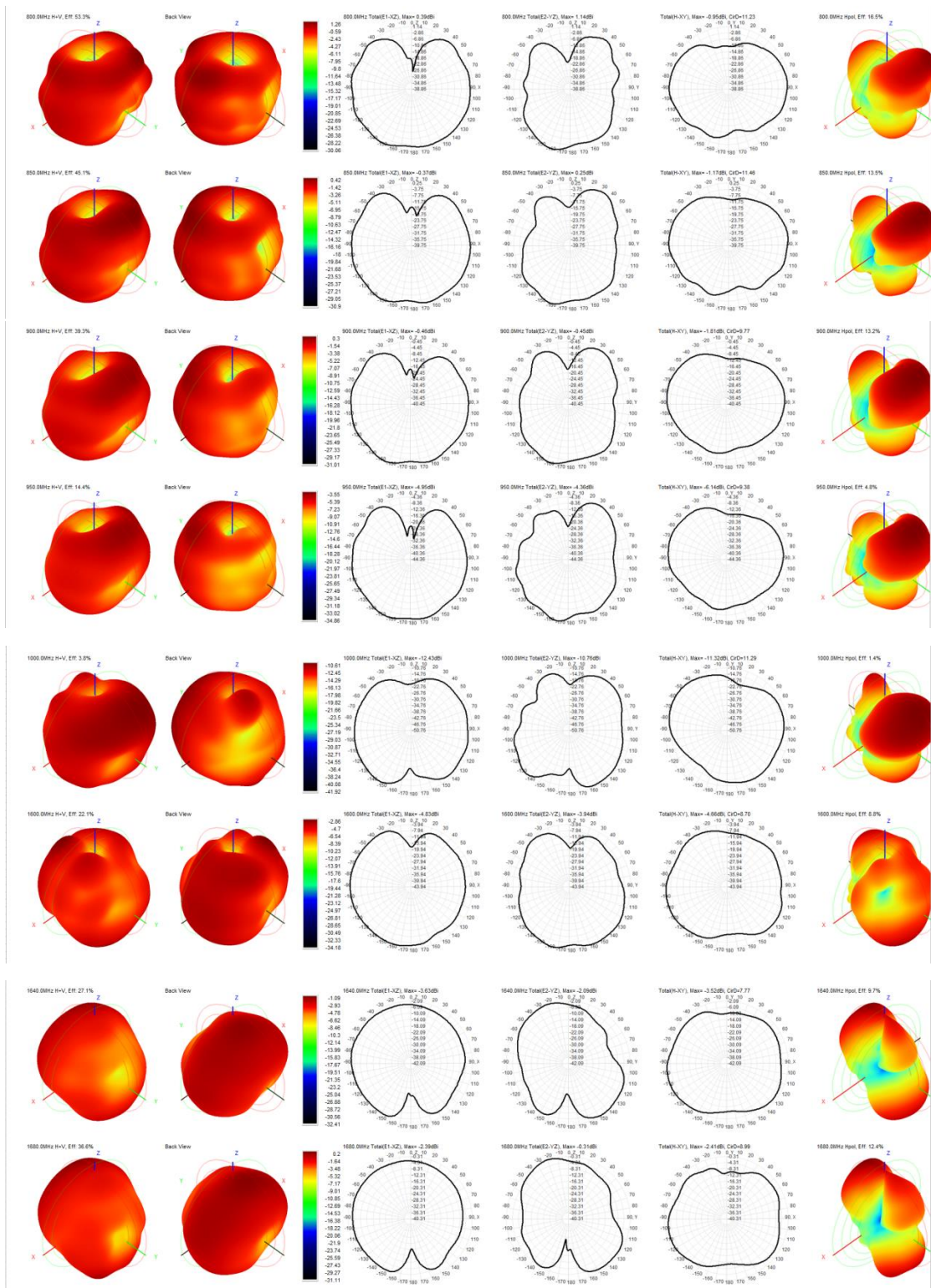
## 4. Antenna efficiency

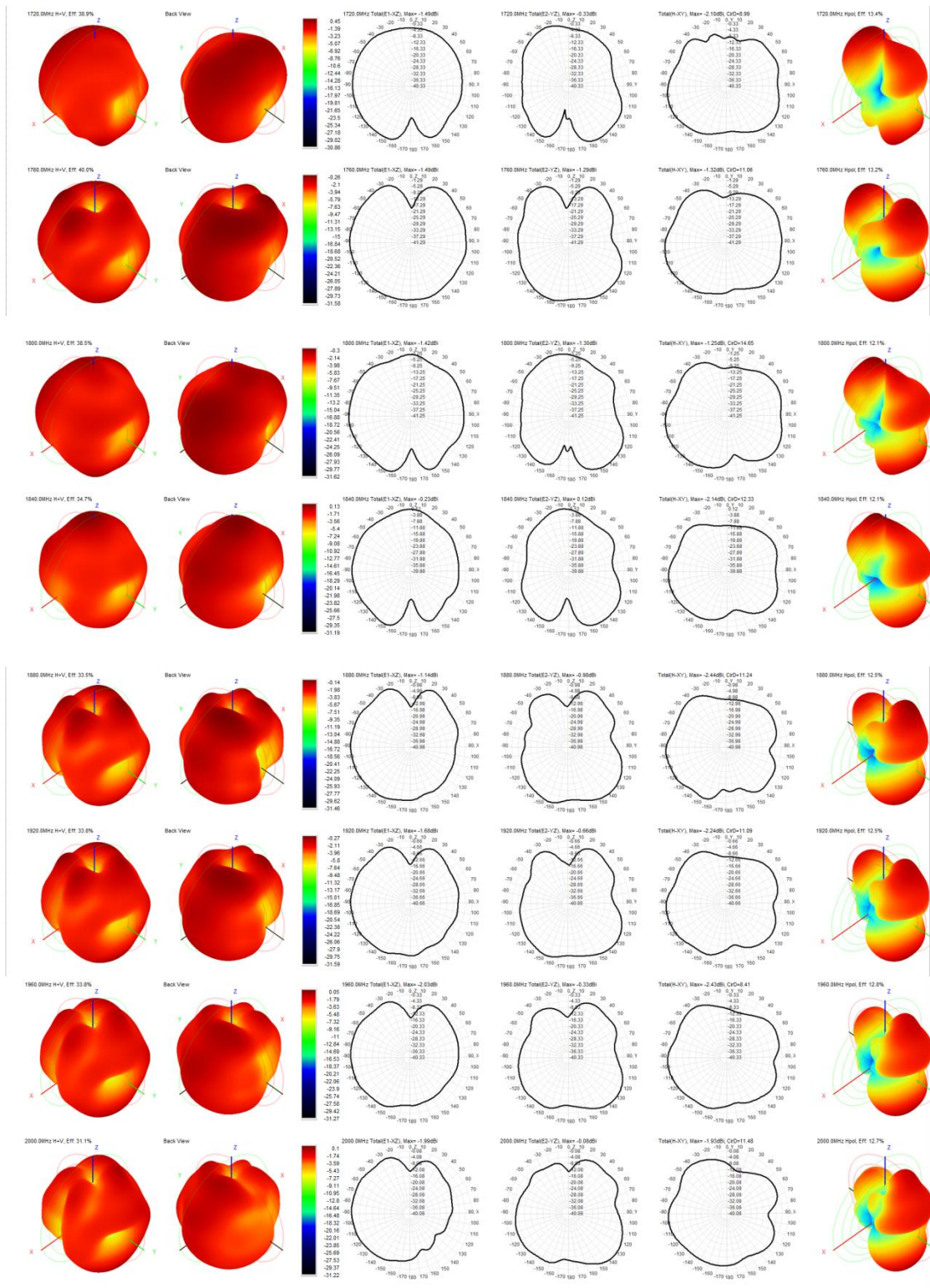
Frequency ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Frequency (MHz)	700	750	800	850	900	950	1000	1600	1640	1680	1720	1760	1800	1840	1880	1920	1960	2000	2400	2450	2500	2550	2600	2650	2700
Efficiency (dBi)	6.15	-3.42	-2.72	-3.46	-4.06	-8.40	-14.16	-6.36	-5.67	-4.36	-4.10	-3.98	-4.14	-4.60	-4.75	-4.70	-4.71	-5.07	-2.99	-2.75	-2.78	-2.72	-2.63	-2.81	-3.01
Gain (dBi)	-1.88	0.78	1.26	0.42	0.30	-3.55	-10.61	-2.86	-1.09	0.20	0.45	-0.26	-0.30	0.13	-0.14	-0.27	0.05	0.10	1.83	1.94	1.57	2.47	2.36	1.84	1.65
Efficiency (%)	24.28	45.53	53.33	45.13	39.28	14.44	3.84	22.07	27.12	36.64	38.88	40.02	38.52	34.70	33.50	33.85	33.83	31.10	50.21	53.04	52.77	53.46	54.60	52.34	50.01
Directivity (dBi)	4.26	4.20	3.99	3.88	4.36	4.86	3.55	3.70	4.58	4.56	4.55	3.72	3.84	4.73	4.61	4.43	4.76	3.17	4.82	4.70	4.35	5.19	4.99	4.66	4.66
Peak Gain Position (Theta)	34.00	37.00	38.00	35.00	158.00	164.00	147.00	27.00	145.00	145.00	146.00	28.00	141.00	6.00	24.00	131.00	132.00	133.00	126.00	125.00	123.00	18.00	65.00	67.00	101.00
Peak Gain Position (Phi)	110.00	123.00	119.00	114.00	208.00	224.00	215.00	316.00	61.00	61.00	69.00	306.00	63.00	261.00	211.00	125.55	126.81	76.80	81.00	80.00	80.00	18.00	156.00	155.00	155.00
Efficiency ThetaPol (%)	7.73	14.99	16.47	13.52	13.15	4.82	1.36	8.81	9.75	12.36	13.38	13.21	12.12	12.11	12.55	12.53	12.81	12.69	17.46	18.42	16.80	16.42	17.13	17.48	16.29
Efficiency PhiPol (%)	16.55	30.53	36.86	31.61	26.13	9.62	2.47	13.26	17.37	24.28	25.50	26.82	26.40	22.59	20.95	21.32	21.02	18.41	32.75	34.62	35.98	37.04	37.47	34.86	33.72
Upper Hem. Efficiency (%)	11.49	22.08	24.61	21.33	18.05	6.56	1.85	9.71	14.02	19.03	20.35	19.46	19.45	17.50	16.02	15.76	15.97	14.82	25.34	27.24	26.66	27.86	28.17	26.20	23.38
Lower Hem. Efficiency (%)	12.79	23.44	28.73	23.80	21.23	7.88	1.89	12.36	13.09	17.61	18.53	20.56	19.07	17.20	17.48	18.08	17.86	16.28	24.86	25.80	26.11	25.60	26.43	26.14	26.63
1900(M)回電	11.36	11.23	11.23	11.46	9.77	9.38	11.29	8.70	7.77	8.99	8.89	11.06	14.65	12.33	11.24	11.09	8.41	11.48	13.45	12.48	15.51	18.67	17.36	16.39	17.95
Gain 15deg (dBi)	305.00	308.00	303.00	146.00	265.00	215.00	138.00	184.00	224.00	229.00	211.00	163.00	154.00	128.00	119.00	120.00	121.00	116.00	60.00	70.00	66.00	53.00	54.00	139.00	139.00
E1(XZ)前傾度比	0.01	0.00	0.15	0.10	0.00	0.00	0.21	0.73	1.61	1.55	2.24	2.30	1.81	2.29	3.31	3.37	3.30	4.53	1.25	0.00	0.71	0.00	0.00	0.00	0.36
E1(XZ)波高比	28.00	26.00	39.00	31.00	34.00	34.00	48.00	125.00	65.00	50.00	49.00	31.00	49.00	41.00	48.00	45.00	43.00	42.00	39.00	37.00	36.00	25.00	23.00	24.00	71.00
E2(YZ)前傾比	0.25	0.44	0.00	1.05	0.63	0.04	1.24	0.00	0.92	2.36	1.02	0.59	1.01	1.60	1.41	2.13	2.52	2.93	3.16	4.59	3.36	6.33	4.61	1.42	0.94
最大增益外傾比(P)	28.23	15.81	40.93	32.32	14.37	13.52	8.22	11.48	24.82	19.41	20.30	7.80	28.58	8.92	9.76	19.80	18.79	29.75	13.00	12.32	11.60	24.30	18.63	16.20	6.44
仰角10度增益(大)傾比(P)	58.18	74.08	50.97	65.24	63.70	53.91	55.60	48.97	53.12	67.18	58.79	64.38	78.29	34.24	50.47	51.75	58.51	56.53	38.33	36.71	54.44	73.19	65.99	57.61	52.50
Hc(XY)波高比	87.00	93.00	78.00	79.00	79.00	84.00	76.00	141.00	127.00	69.00	68.00	71.00	71.00	72.00	60.00	62.00	63.00	45.00	37.00	29.00	31.00	27.00	29.00	32.00	49.00
Hc(XY)前傾比	5.21	6.89	5.52	5.27	6.33	5.67	3.90	2.95	3.11	3.71	3.68	3.46	3.37	3.40	2.94	3.46	3.57	4.43	2.88	4.40	3.71	4.49	3.95	3.31	2.58
左旋圓極化效率(%)	12.92	23.43	30.30	21.36	19.90	6.97	2.03	8.39	12.13	15.59	15.13	17.61	17.81	8.60	12.80	12.98	13.15	10.41	18.81	11.23	18.69	19.15	18.27	17.36	11.94
右旋圓極化效率(%)	11.35	22.10	23.03	23.77	19.38	7.47	1.81	13.68	14.98	21.06	23.75	22.42	20.71	26.09	20.70	20.86	20.68	20.69	31.40	41.81	34.08	34.31	36.33	34.98	38.07

## 5 . 2D/3D Pattern

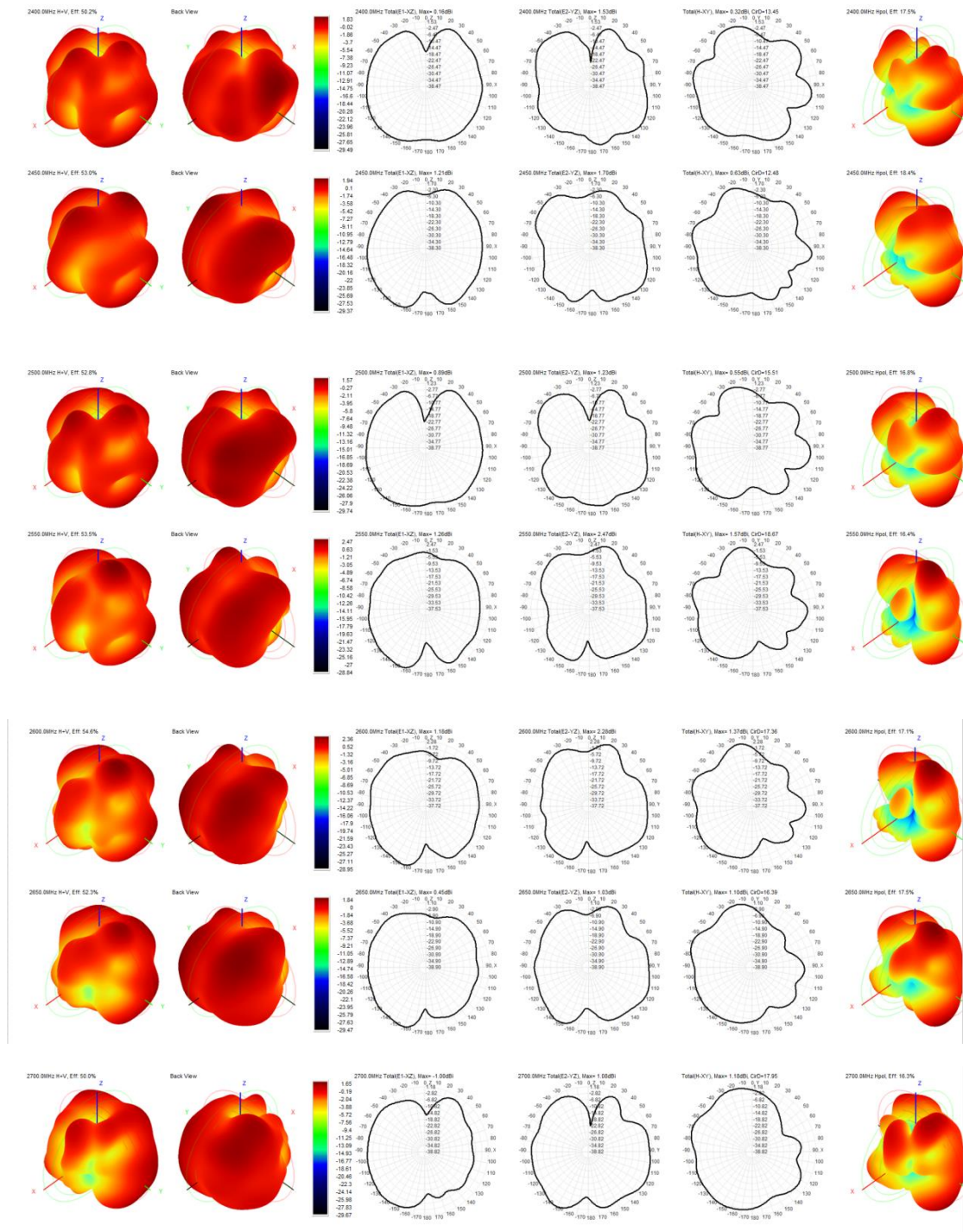












## 6. Antenna structure

