

原图 **Antenna Test Report**

Customer	原图
Project	FL8-BOX-V2.0
Antenna Revision	V1
Product Description	FPC
Product No	V1.0
DATE	2024. 3. 19

Purpose

深圳市合拓科技有限公司

This report is to measure the performance of BT antenna for **FL8-BOX-V2.0**. The antenna operating frequency at **2.4GHz/5.8GHz**, All test data are showed as below.

Content

1. Product Overview & Dimension
2. Test system
3. Antenna Matching Network
4. Test Result
 - 4.1 S11 Parameter
 - 4.2 Test coordinate
 - 4.3 2D Pattern
 - 4.4 OTA Data
 - 4.5 BT Boot measured
5. Antenna Assembly & environmental processing

2. Test System

Sequence Number	Test Item	equipment
S parameter	VSWR	Agilent 5071C & Agilent 5062A
OTA Test	TRP&TIS	CMW500 & CMW270 ETS&SATIMO
Gain & Efficiency	Gain & Efficiency	ETS&SATIMO Agilent 5071C



Product Overview & Dimension

Front

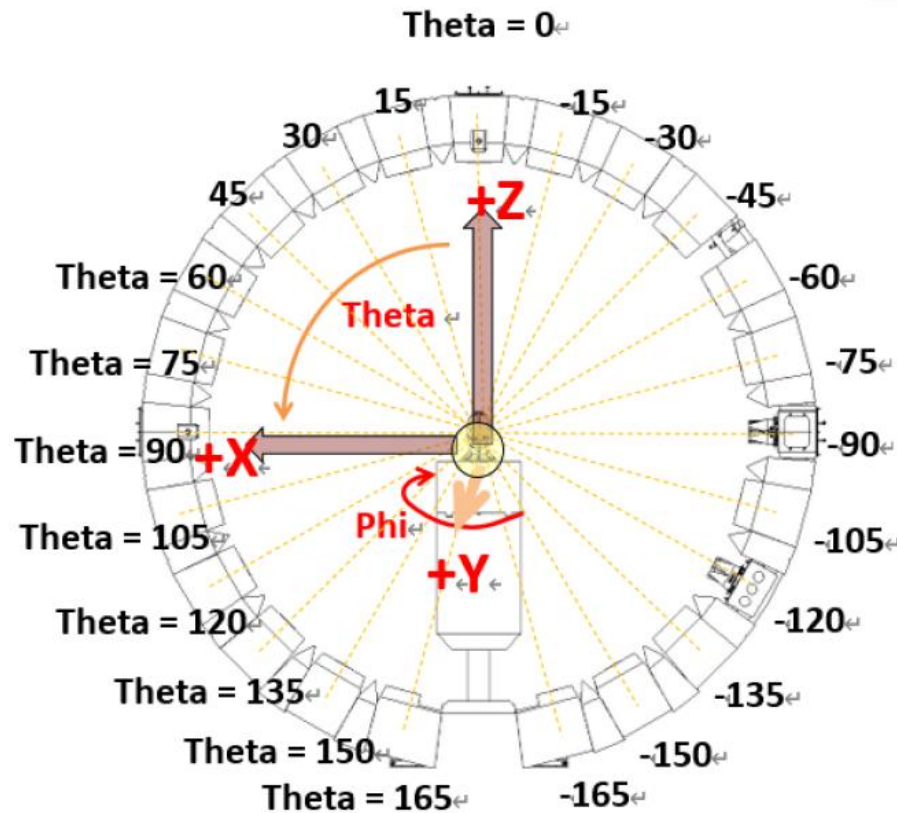


无源S11—(BT ANT)



Test Result

Sample status & coordinates



Test Result

Gain & Efficiency——**ANT--2.4G**



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Frequency ID	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	2400.0	2410.0	2420.0	2430.0	2440.0	2450.0	2460.0	2470.0	2480.0	2490.0	2500.0
Efficiency (dBi)	-7.03	-6.66	-6.65	-6.22	-6.07	-6.03	-5.91	-6.00	-6.09	-6.15	-6.11
Gain (dBi)	-3.19	-2.47	-1.63	-1.26	-1.87	-1.80	-1.61	-1.74	-1.63	-1.56	-0.93
Efficiency (%)	19.81	21.56	21.61	23.89	24.73	24.97	25.67	25.10	24.58	24.27	24.49
Directivity (dB)	3.84	4.19	5.02	4.96	4.20	4.22	4.30	4.26	4.47	4.59	5.18
Peak Gain Position (Theta)	105.00	90.00	90.00	90.00	90.00	75.00	75.00	120.00	105.00	90.00	120.00
Peak Gain Position (Phi)	120.00	120.00	120.00	135.00	135.00	315.00	315.00	120.00	120.00	120.00	120.00
Efficiency ThetaPol (%)	7.84	8.82	8.78	9.79	10.29	10.50	11.39	11.58	11.77	11.71	11.58
Efficiency PhiPol (%)	11.97	12.74	12.83	14.11	14.45	14.47	14.27	13.51	12.81	12.56	12.91
Upper Hem. Efficiency (%)	10.12	11.05	11.29	12.27	12.93	13.26	13.51	13.01	13.05	12.78	13.22
Lower Hem. Efficiency (%)	9.69	10.51	10.33	11.62	11.80	11.71	12.16	12.09	11.53	11.49	11.27

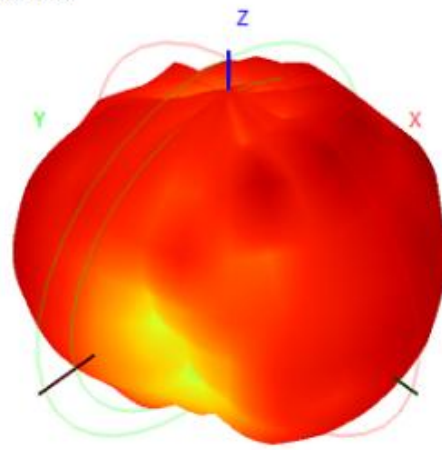
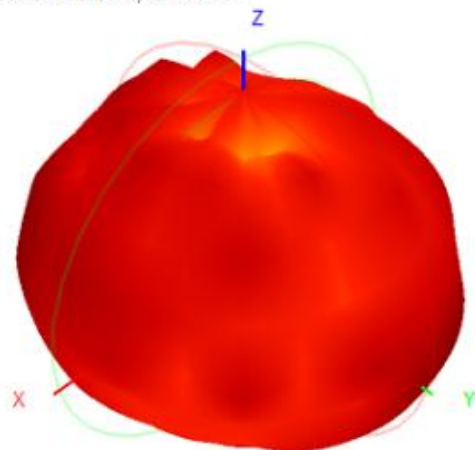
Frequency (MHz)	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Efficiency (dBi)	19.81	21.56	21.61	23.89	24.73	24.97	25.67	25.10	24.58	24.27	24.49
Gain (dBi)	-3.19	-2.47	-1.63	-1.26	-1.87	-1.80	-1.61	-1.74	-1.63	-1.56	-0.93

Test Result

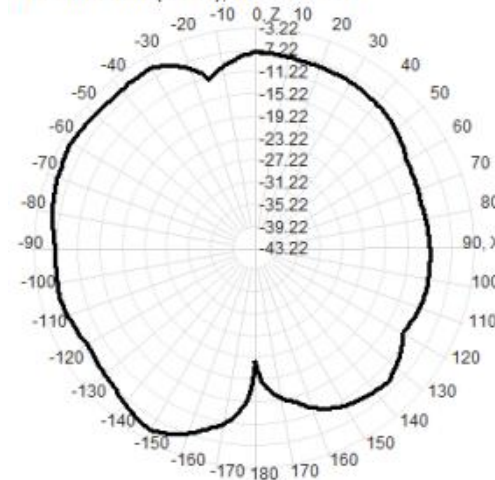
2D&3D — **ANT-2.4G**

2400.0MHz H+V, Eff: 19.8%

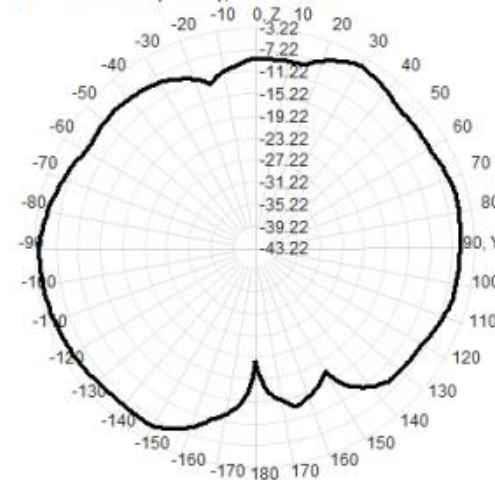
Back View



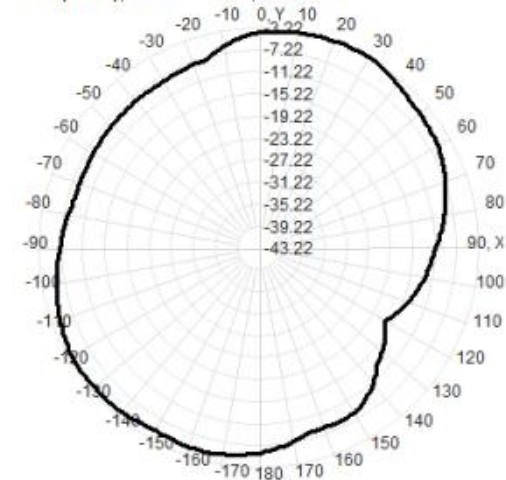
2400.0MHz Total(E1-XZ), Max=-4.88dBi



2400.0MHz Total(E2-YZ), Max=-4.06dBi



Total(H-XY), Max=-3.22dBi, CirD=13.86

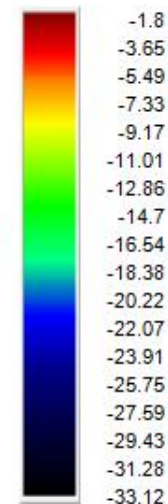
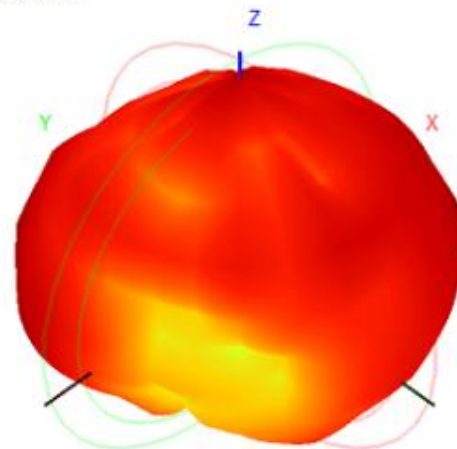
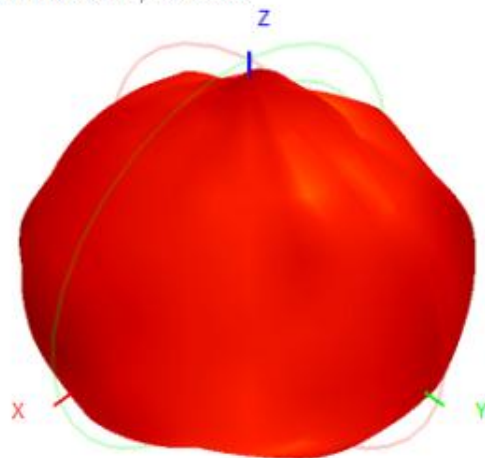


Test Result

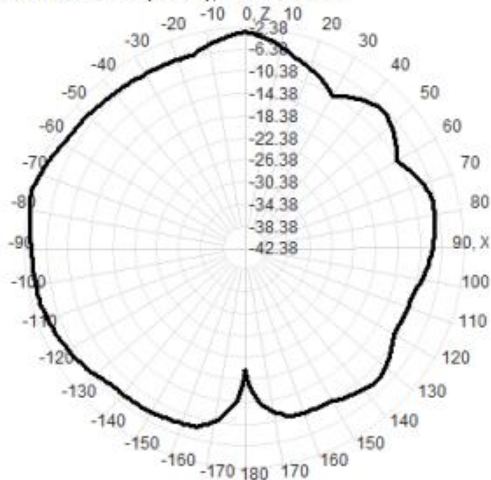
2D&3D — **ANT-2.4G**

2450.0MHz H+V, Eff: 25.0%

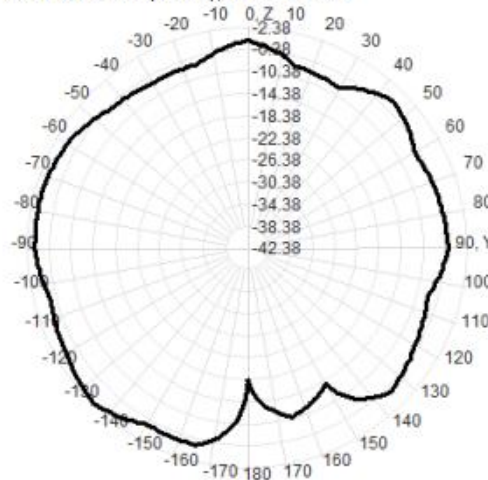
Back View



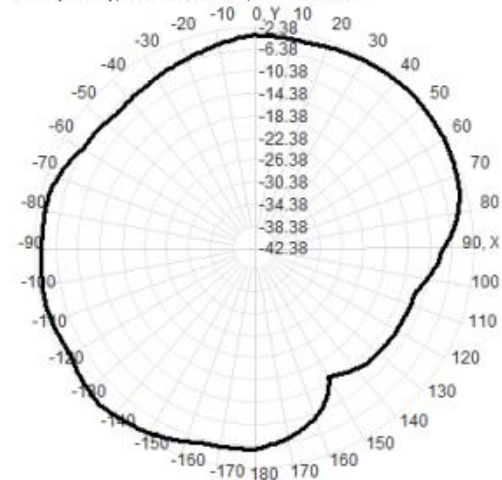
2450.0MHz Total(E1-XZ), Max=-2.38dBi



2450.0MHz Total(E2-YZ), Max=-2.90dBi



Total(H-XY), Max=-2.45dBi, CirD=13.20

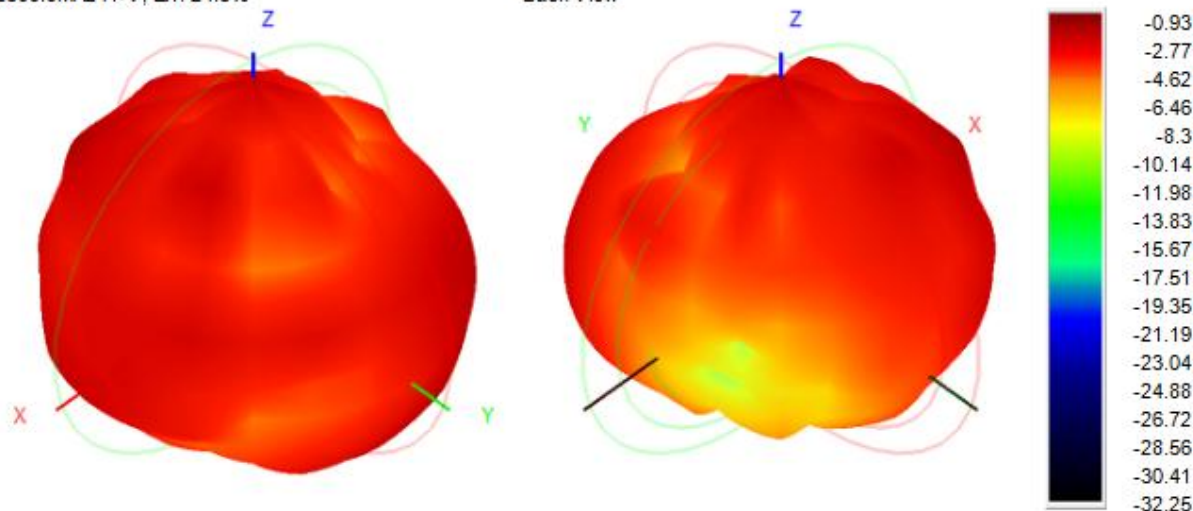


Test Result

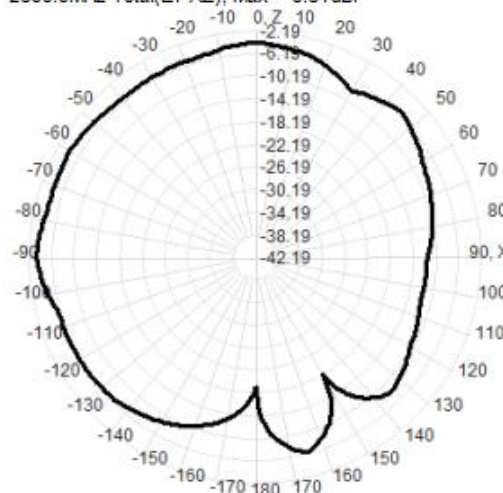
2D&3D — **ANT-2.4G**

2500.0MHz H+V, Eff: 24.5%

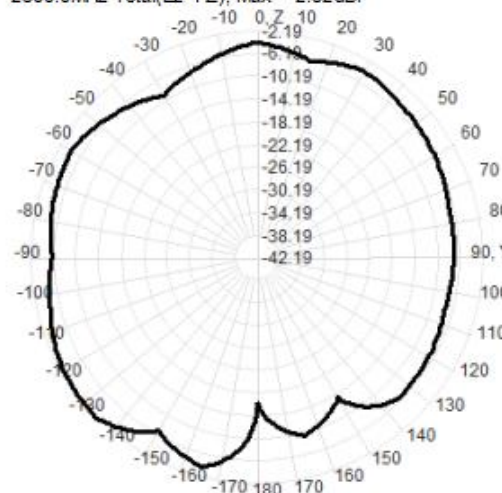
Back View



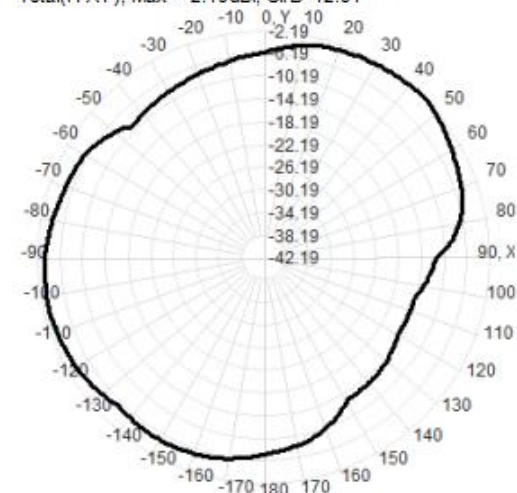
2500.0MHz Total(E1-XZ), Max=-3.51dBi



2500.0MHz Total(E2-YZ), Max=-2.32dBi



Total(H-XY), Max=-2.19dBi, CirD=12.81



Test Result

Gain & Efficiency—**ANT--5G**



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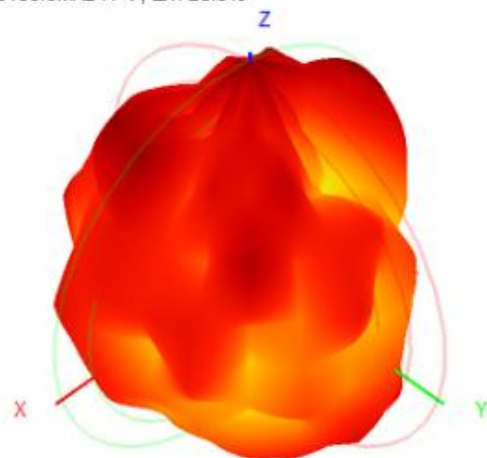
Frequency ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Frequency (MHz)	5150.0	5200.0	5250.0	5300.0	5350.0	5400.0	5450.0	5500.0	5550.0	5600.0	5650.0	5700.0	5750.0	5800.0	5850.0
Efficiency (dBi)	-6.38	-7.04	-6.26	-6.24	-6.44	-6.12	-6.74	-6.41	-6.50	-5.87	-6.30	-6.19	-5.97	-6.37	-6.19
Gain (dBi)	0.60	0.74	1.14	1.76	0.53	1.48	1.68	1.39	1.05	0.98	1.72	0.62	2.47	2.21	0.46
Efficiency (%)	23.00	19.77	23.64	23.79	22.72	24.43	21.17	22.84	22.37	25.89	23.43	24.02	25.27	23.07	24.03
Directivity (dB)	6.98	7.78	7.40	7.99	6.96	7.60	8.42	7.80	7.55	6.85	8.02	6.82	8.45	8.58	6.65
Peak Gain Position (Theta)	45.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00	15.00	30.00	0.00	30.00	45.00	45.00
Peak Gain Position (Phi)	180.00	165.00	15.00	45.00	15.00	105.00	165.00	135.00	285.00	15.00	330.00	150.00	30.00	0.00	75.00
Efficiency ThetaPol (%)	12.30	10.99	13.81	13.78	12.22	13.81	12.44	13.61	12.56	15.92	14.51	14.82	15.41	14.06	14.72
Efficiency PhiPol (%)	10.70	8.78	9.83	10.01	10.50	10.62	8.73	9.24	9.82	9.97	8.91	9.20	9.86	9.00	9.31
Upper Hem. Efficiency (%)	14.87	12.49	15.46	16.18	15.89	16.62	14.79	16.21	15.92	17.40	16.66	17.59	18.36	17.63	19.23
Lower Hem. Efficiency (%)	8.13	7.28	8.18	7.61	6.84	7.82	6.38	6.64	6.45	8.49	6.77	6.44	6.91	5.43	4.81

Frequency (MHz)	5150.0	5200.0	5250.0	5300.0	5350.0	5400.0	5450.0	5500.0	5550.0	5600.0	5650.0	5700.0	5750.0	5800.0	5850.0	5900.0	5950.0	6000.0
Gain (dBi)	0.60	0.74	1.14	1.76	0.53	1.48	1.68	1.39	1.05	0.98	1.72	0.62	2.47	2.21	0.46	0.60	0.74	1.14
Efficiency (%)	23.00	19.77	23.64	23.79	22.72	24.43	21.17	22.84	22.37	25.89	23.43	24.02	25.27	23.07	24.03	23.00	19.77	23.64

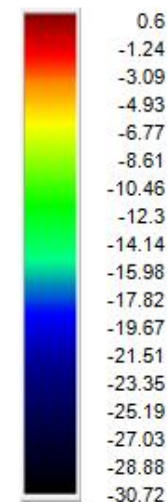
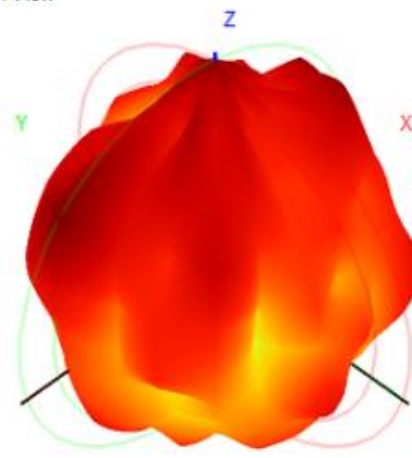
Test Result

2D&3D — **ANT--5G**

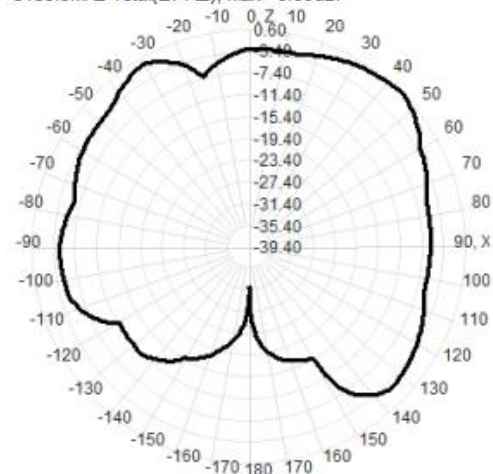
5150.0MHz H+V, Eff: 23.0%



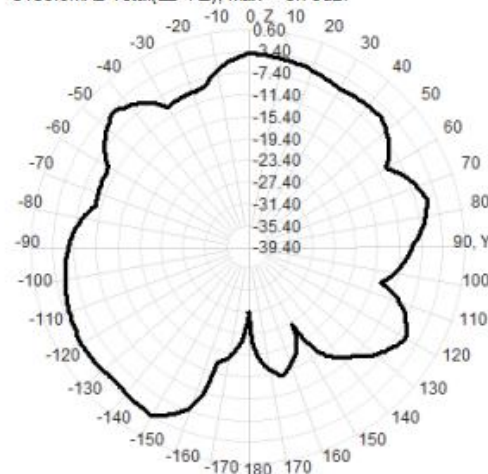
Back View



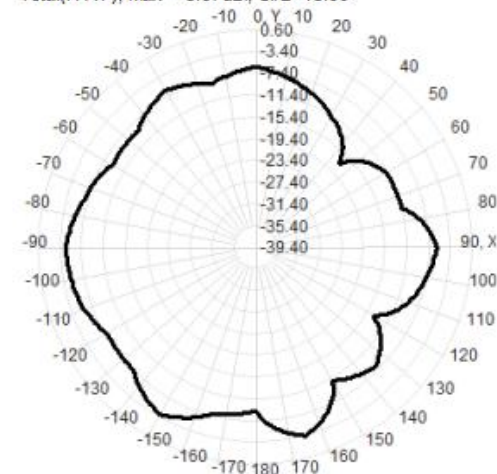
5150.0MHz Total(E1-XZ), Max= 0.60dBi



5150.0MHz Total(E2-YZ), Max= -3.76dBi



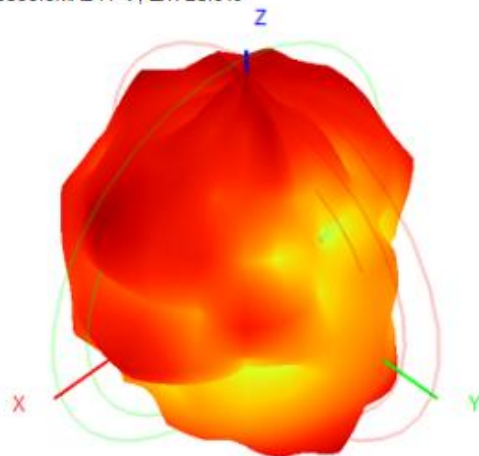
Total(H-XY), Max= -3.67dBi, CirD=13.88



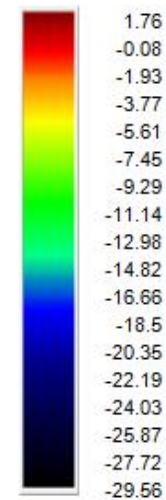
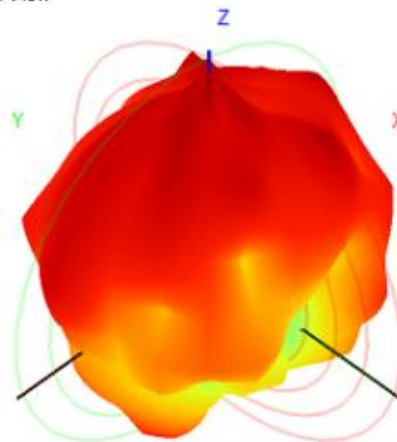
Test Result

2D&3D — **ANT--5G**

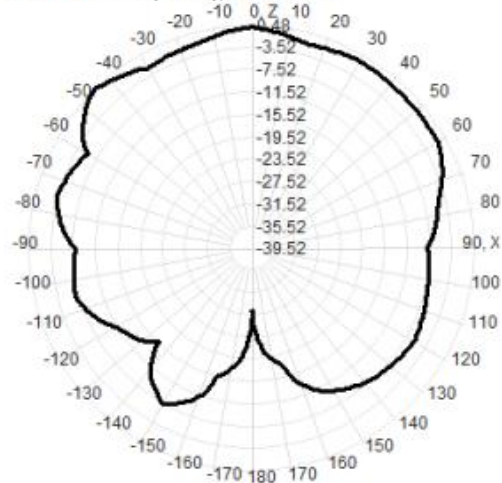
5300.0MHz H+V, Eff: 23.8%



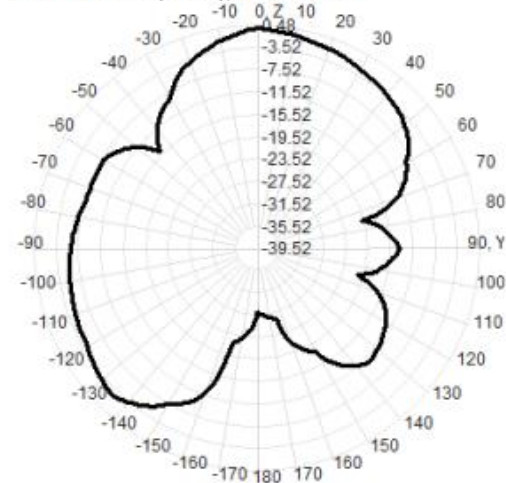
Back View



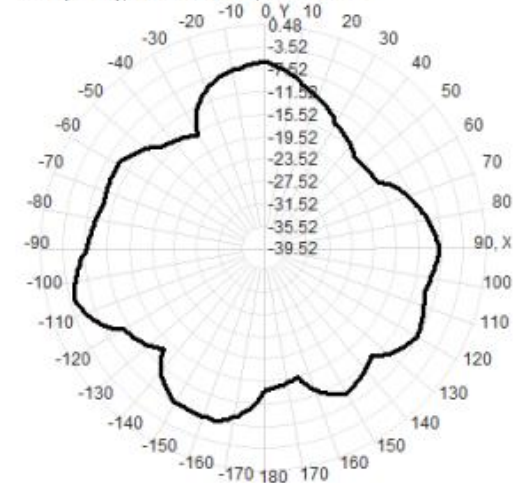
5300.0MHz Total(E1-XZ), Max= 0.48dBi



5300.0MHz Total(E2-YZ), Max= -0.11dBi



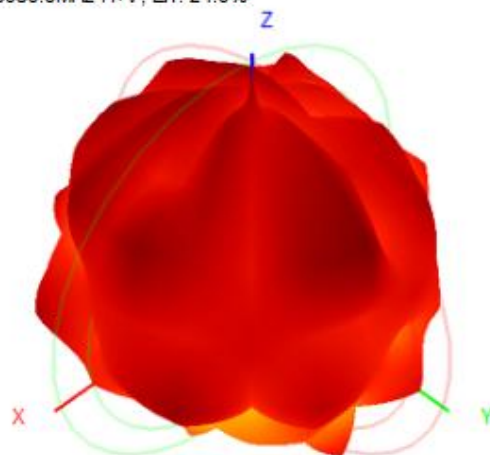
Total(H-XY), Max= -4.45dBi, CirD=12.07



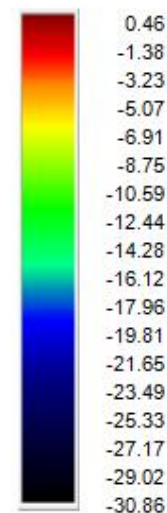
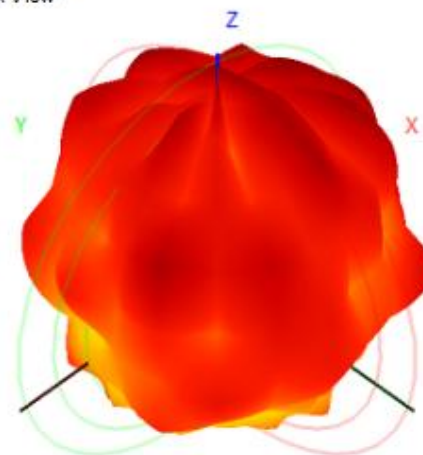
Test Result

2D&3D — **ANT--5G**

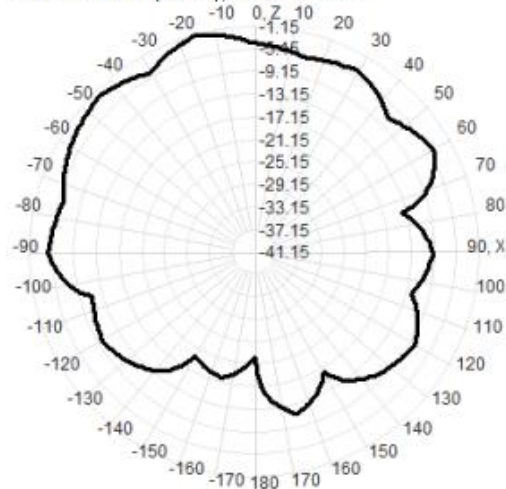
5850.0MHz H+V, Eff: 24.0%



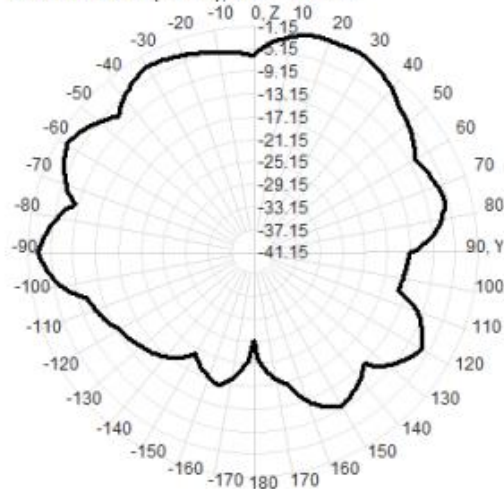
Back View



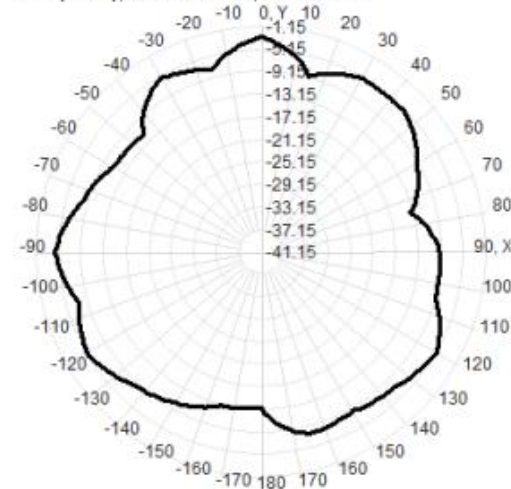
5850.0MHz Total(E1-XZ), Max= -1.39dBi



5850.0MHz Total(E2-YZ), Max= -1.15dBi



Total(H-XY), Max= -3.08dBi, CirD=10.80



Thanks for your comment!

✧ 深圳市合拓科技有限公司

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✧ RF: 胡雪文 13714934800