

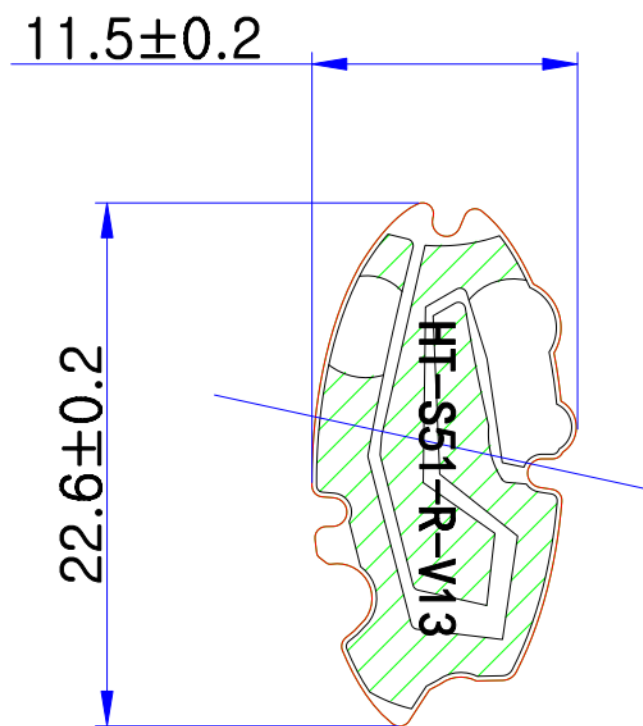
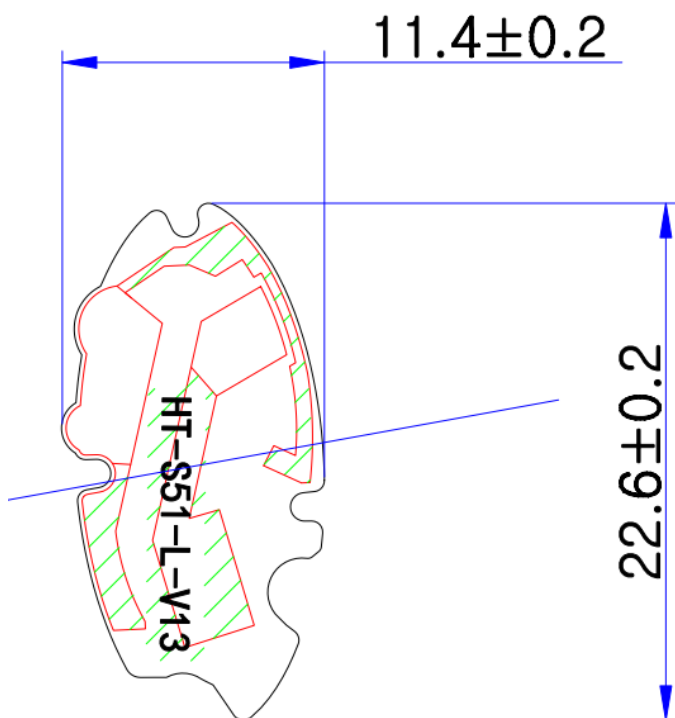
S51 Antenna specification

Customer	XingZhongXing
Antenna Model	S51
Antenna Type	FPC Antenna
Frequency band & Gain	2400-2500MHz L: -3.55dBi; R: -1.71dBi
DATE	2024. 4. 24

manufacturer: Shenzhen Hetuo Technology Co., Ltd
address: 1202B, Building C6, Hengfeng Industrial City, Xixiang, Bao'an
District, Shenzhen

Product Overview & Dimension

Front



Purpose

This report is to measure the performance of BT antenna for S51. The antenna operating frequency at 2.4~2.5GHz, 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

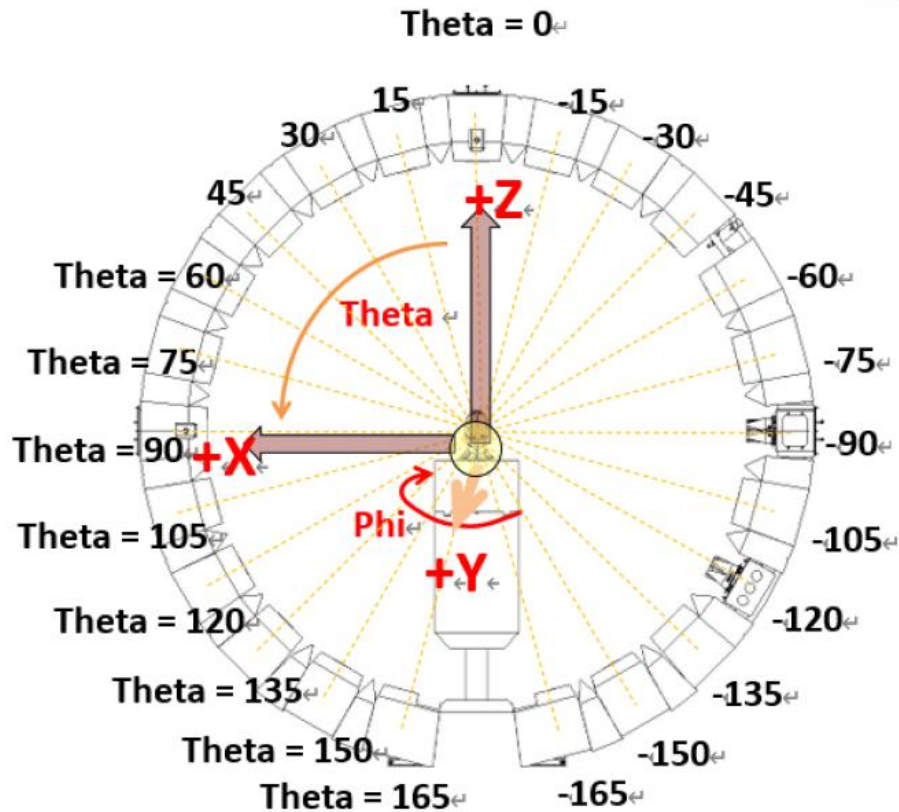
2. Test System

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



Test Result

Sample status & coordinates

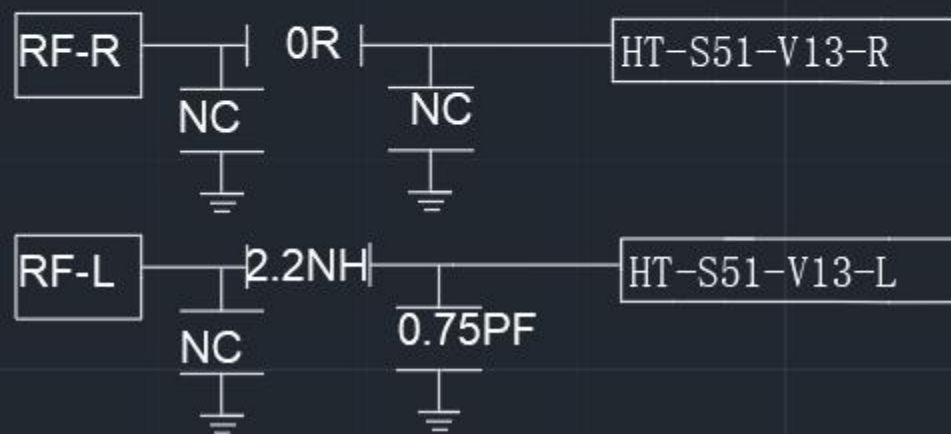


(L-R)

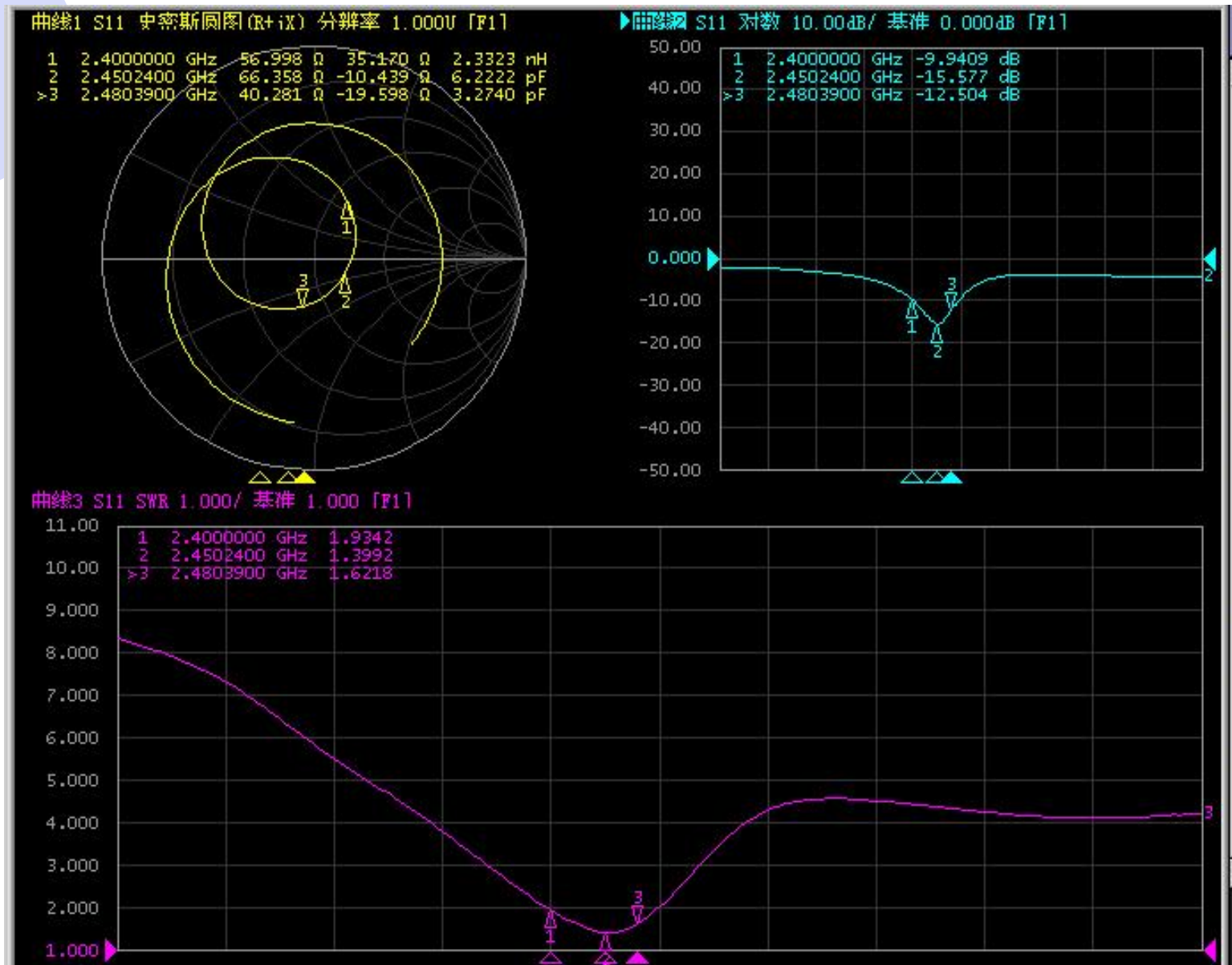
芯中芯

S51

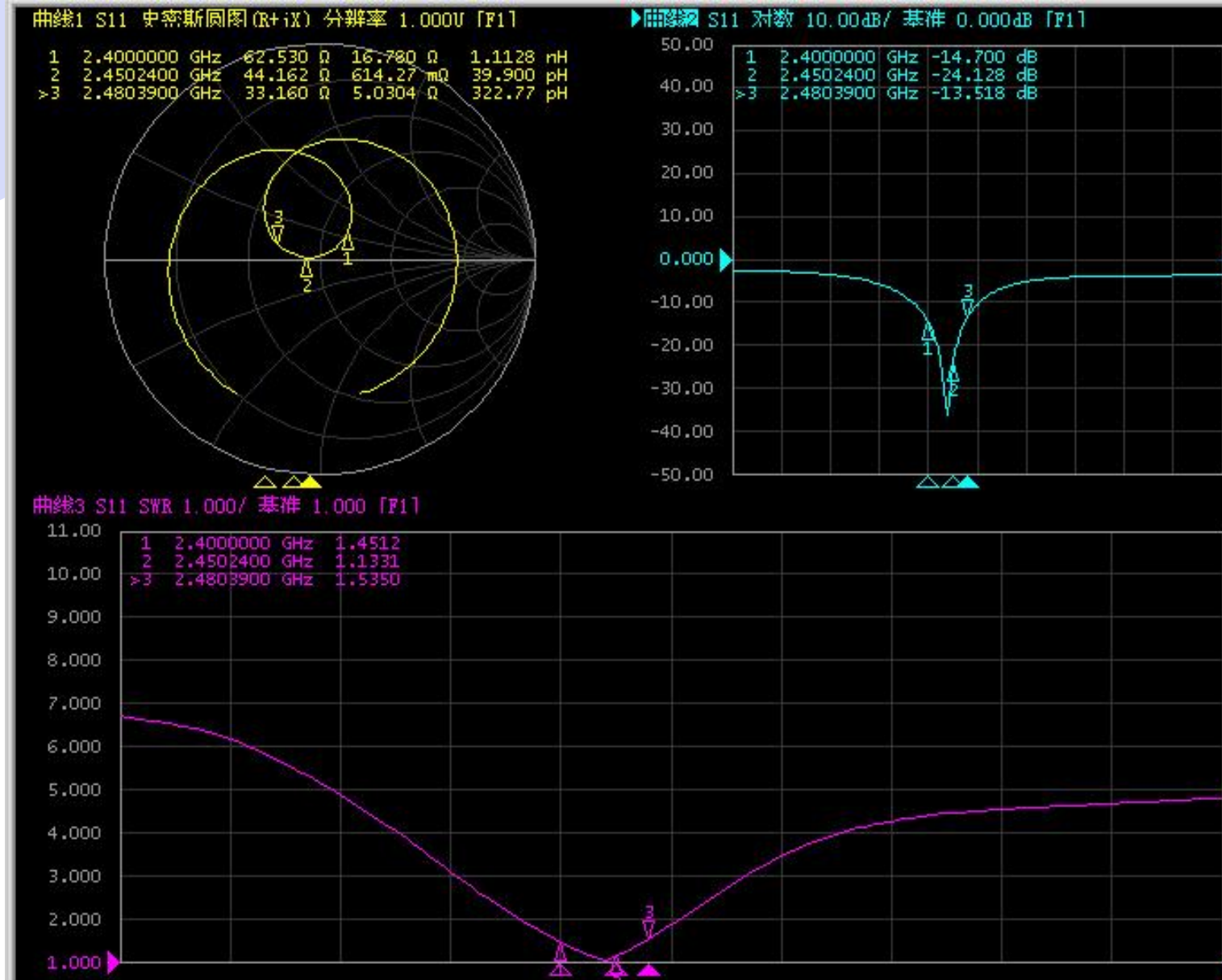
2024. 4. 24



passive S11—L(BT ANT)



passive S11—R(BT ANT)



Test Result

Gain & Efficiency—**BT- ANT(L)**



Shenzhen Hetuo Technology Co., Ltd

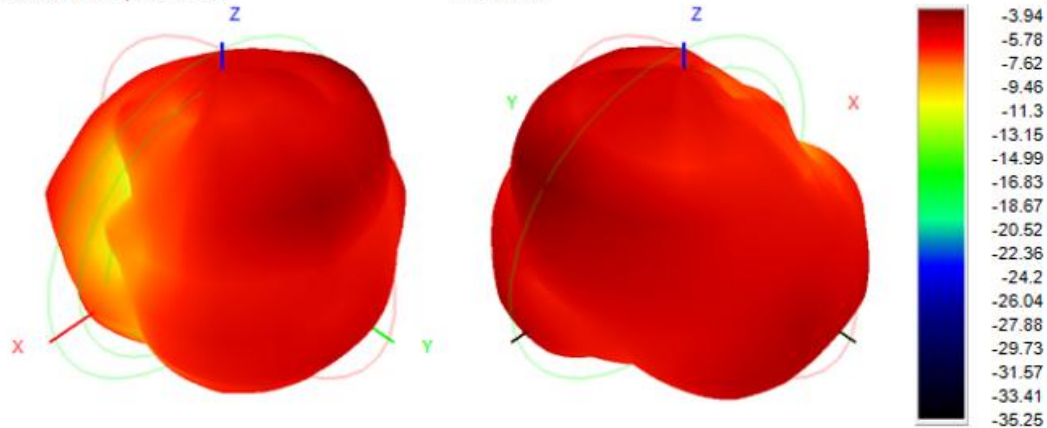
深圳市合拓科技有限公司

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)	-8.21	-7.75	-7.71	-7.32	-7.19	-7.39	-7.68	-7.97	-8.66	-9.17	-9.65
Gain (dBi)	-3.94	-4.01	-4.21	-3.99	-3.83	-3.55	-3.67	-3.89	-4.48	-4.85	-5.32
Efficiency (%)	15.09	16.80	16.94	18.53	19.11	18.23	17.07	15.97	13.60	12.09	10.85
Directivity (dB)	4.28	3.74	3.50	3.33	3.36	3.85	4.00	4.08	4.18	4.32	4.33
Peak Gain Position (Theta)	45.00	45.00	90.00	90.00	0.00	0.00	0.00	0.00	45.00	45.00	60.00
Peak Gain Position (Phi)	180.00	180.00	255.00	255.00	165.00	90.00	90.00	90.00	180.00	180.00	165.00
Efficiency ThetaPol (%)	7.80	8.74	8.94	9.94	10.35	10.03	9.33	8.45	7.14	6.25	5.52
Efficiency PhiPol (%)	7.29	8.05	8.00	8.59	8.76	8.21	7.74	7.52	6.46	5.84	5.32
Upper Hem. Efficiency (%)	8.15	8.98	8.95	9.81	10.03	9.44	8.94	8.36	7.36	6.56	6.01
Lower Hem. Efficiency (%)	6.94	7.81	7.99	8.72	9.09	8.79	8.13	7.60	6.24	5.54	4.84

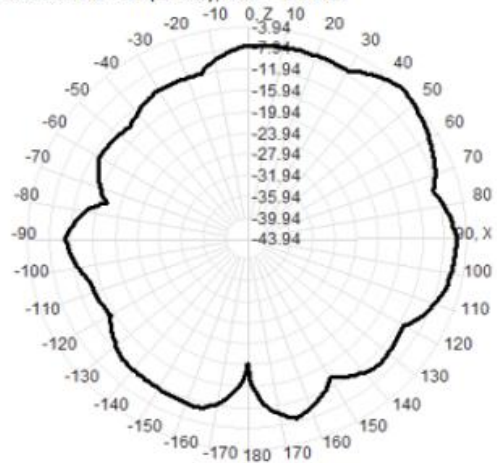
(L)

2400.0MHz H+V, Eff: 15.1%

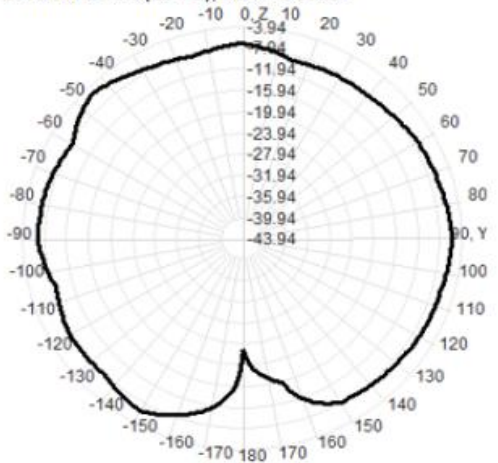
Back View



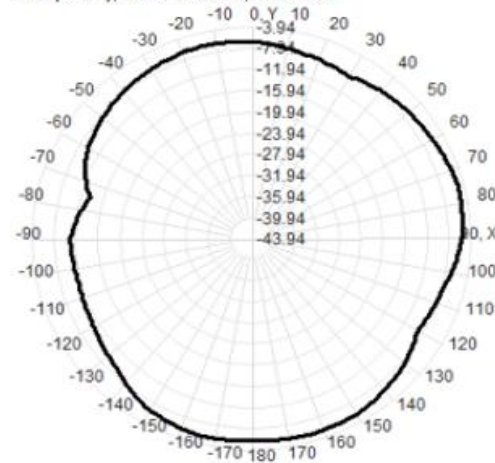
2400.0MHz Total(E1-XZ), Max= -3.94dBi



2400.0MHz Total(E2-YZ), Max= -5.30dBi



Total(H-XY), Max= -5.24dBi, CirD=8.38

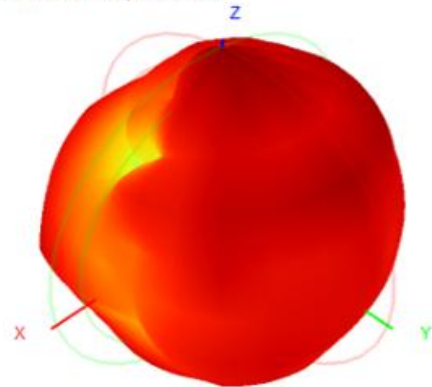


(L) Test Result

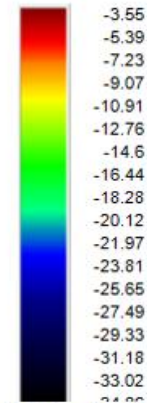
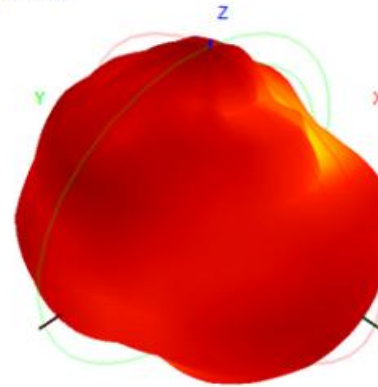
2D&3D — BT- ANT

2D&3D — BT- ANT

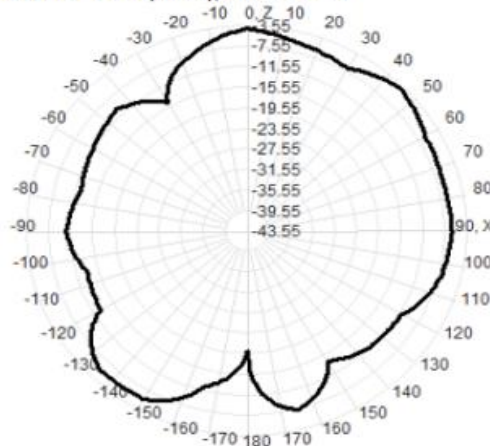
2450.0MHz H+V, Eff: 18.2%



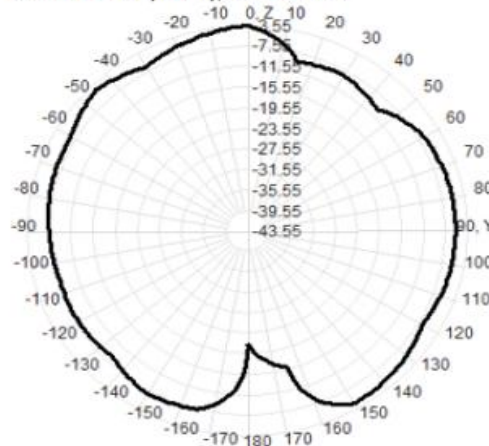
Back View



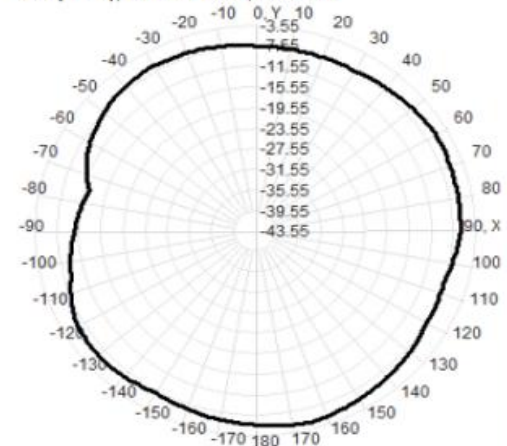
2450.0MHz Total(E1-XZ), Max= -4.23dBi



2450.0MHz Total(E2-YZ), Max= -3.55dBi



Total(H-XY), Max= -5.18dBi, CirD=7.20



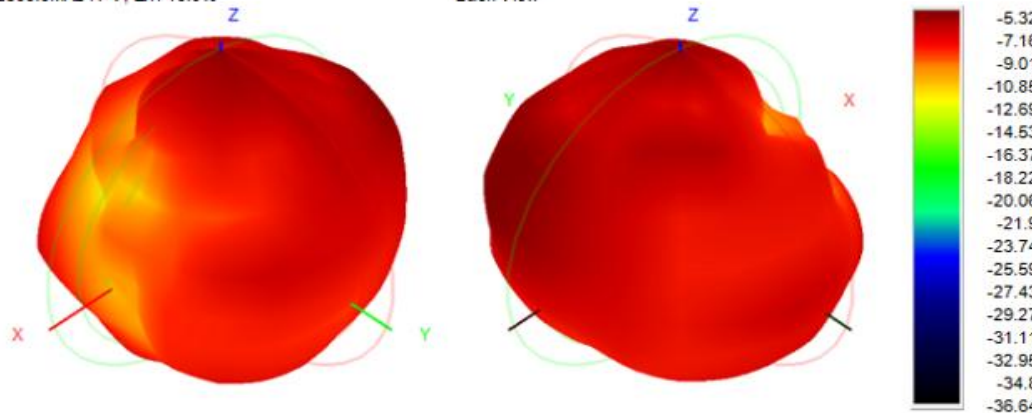
Test^(L) Result

2D&3D — BT- ANT

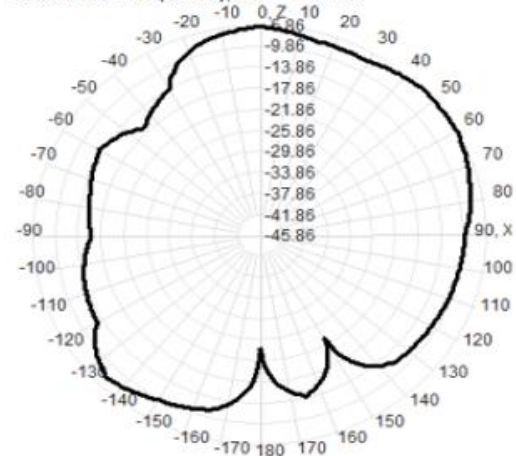
2D&3D — BT- ANT

2500.0MHz H+V, Eff: 10.8%

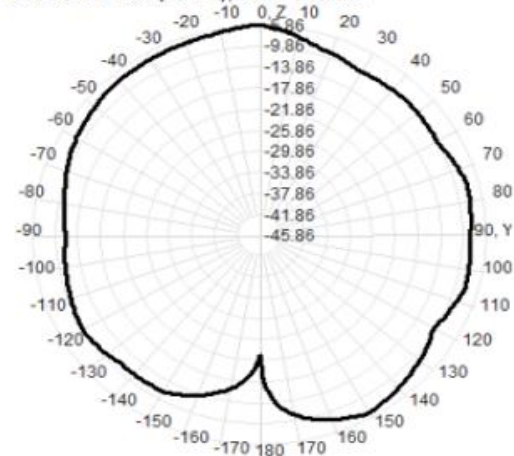
Back View



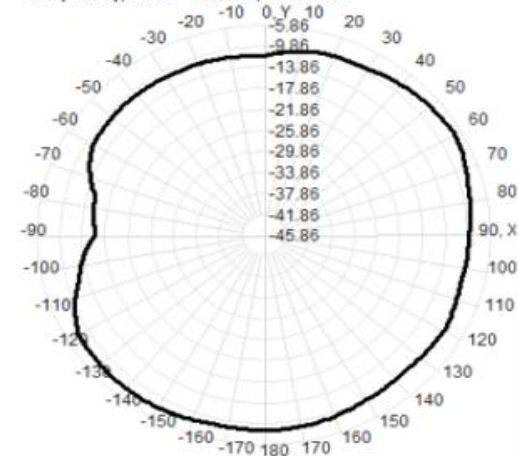
2500.0MHz Total(E1-XZ), Max= -5.97dBi



2500.0MHz Total(E2-YZ), Max= -5.86dBi



Total(H-XY), Max= -7.23dBi, CirD=8.94



Test Result

Gain & Efficiency—**BT- ANT(R)**



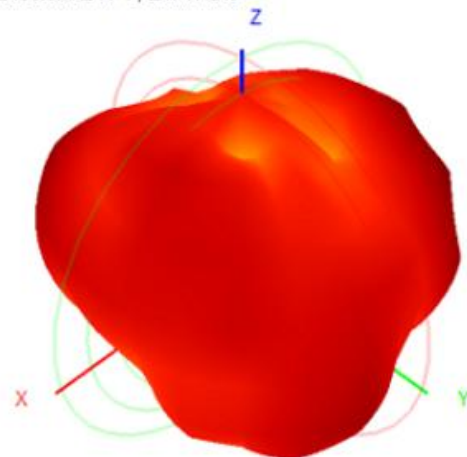
Shenzhen Hetuo Technology Co., Ltd

深圳市合拓科技有限公司

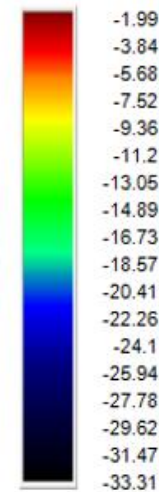
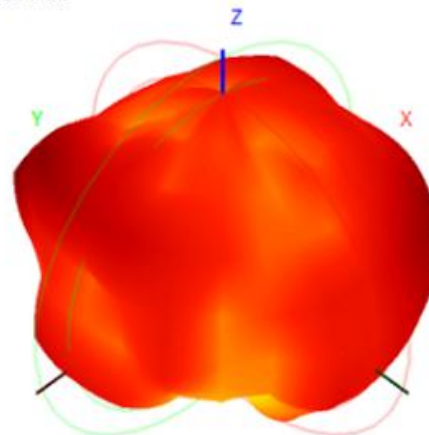
Frequency ID	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	2400.0	2410.0	2420.0	2430.0	2440.0	2450.0	2460.0	2470.0	2480.0	2490.0	2500.0
Efficiency (dBi)	-7.65	-7.47	-7.42	-7.20	-7.20	-7.32	-7.27	-7.21	-7.22	-7.23	-7.26
Gain (dBi)	-1.99	-2.46	-1.91	-1.81	-2.03	-1.71	-2.01	-2.52	-2.59	-2.28	-2.41
Efficiency (%)	17.19	17.92	18.11	19.06	19.07	18.54	18.74	19.02	18.97	18.91	18.79
Directivity (dB)	5.65	5.01	5.51	5.39	5.16	5.61	5.26	4.69	4.63	4.95	4.85
Peak Gain Position (Theta)	60.00	60.00	60.00	75.00	75.00	75.00	75.00	75.00	75.00	90.00	60.00
Peak Gain Position (Phi)	135.00	300.00	300.00	300.00	300.00	300.00	300.00	315.00	315.00	60.00	135.00
Efficiency ThetaPol (%)	11.45	12.07	12.43	13.48	13.51	13.12	13.35	13.57	13.61	13.55	13.59
Efficiency PhiPol (%)	5.74	5.85	5.68	5.58	5.56	5.42	5.39	5.46	5.37	5.36	5.20
Upper Hem. Efficiency (%)	11.88	12.38	12.60	12.98	12.78	12.32	12.52	12.57	12.49	12.51	12.31
Lower Hem. Efficiency (%)	5.31	5.54	5.51	6.08	6.29	6.22	6.23	6.45	6.48	6.41	6.48

(R)

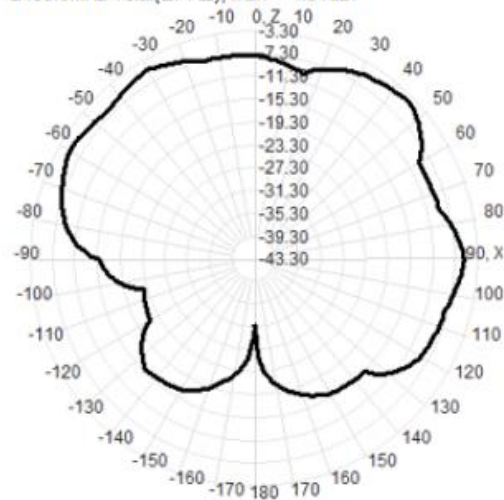
2400.0MHz H+V, Eff: 17.2%



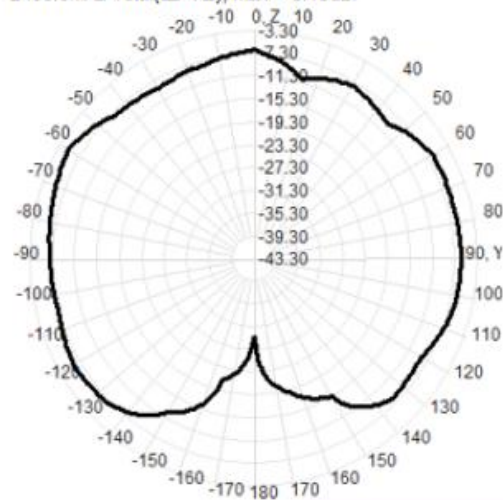
Back View



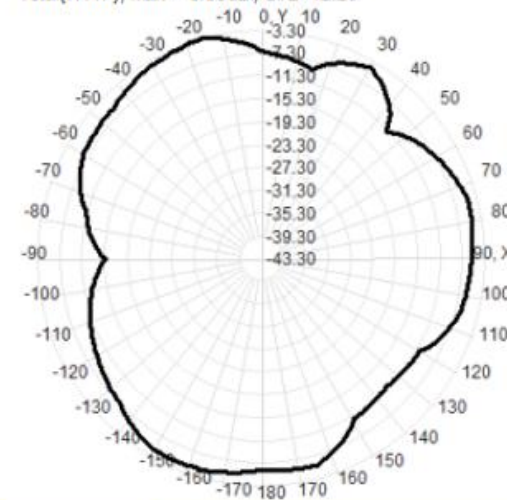
2400.0MHz Total(E1-XZ), Max= -4.31dBi



2400.0MHz Total(E2-YZ), Max= -5.13dBi



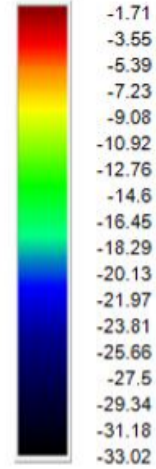
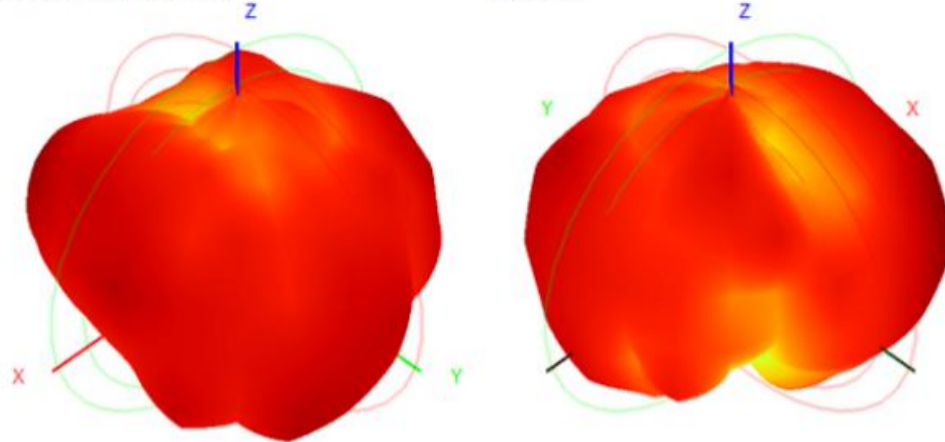
Total(H-XY), Max= -3.30dBi, CirD=12.28



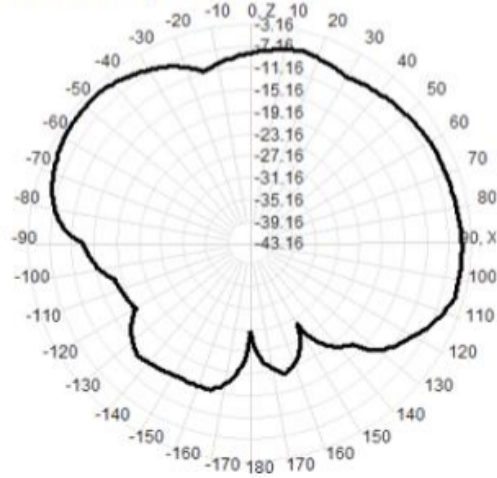
(R)

2450.0MHz H+V, Eff: 18.5%

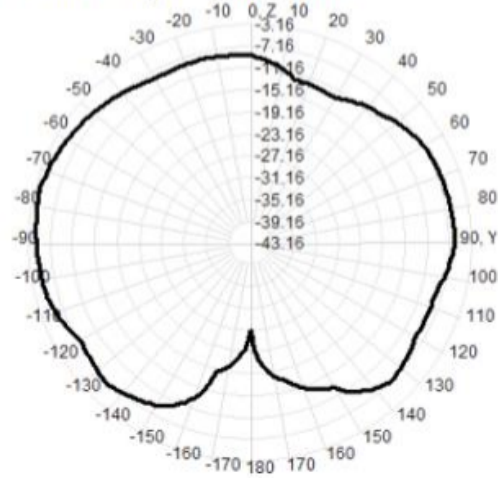
Back View



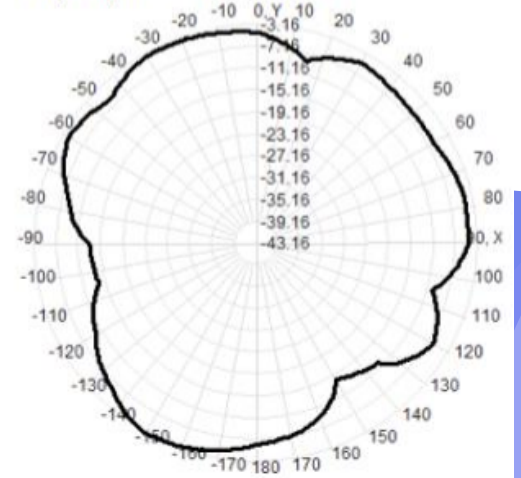
2450.0MHz Total(E1-XZ), Max= -4.50dBi



2450.0MHz Total(E2-YZ), Max= -4.04dBi

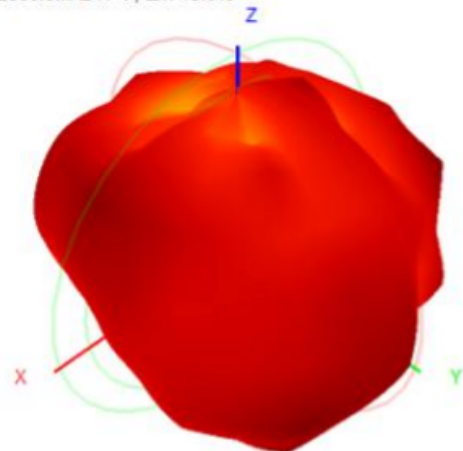


Total(H-XY), Max= -3.16dBi, CirD=11.48

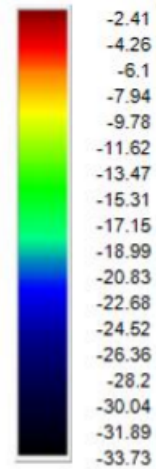
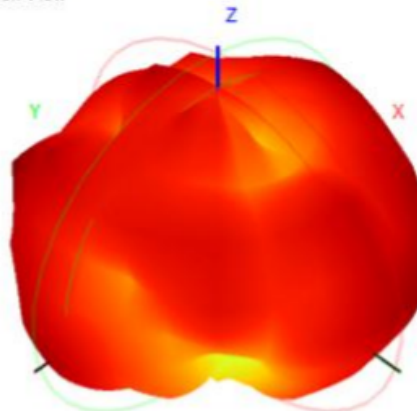


(R)

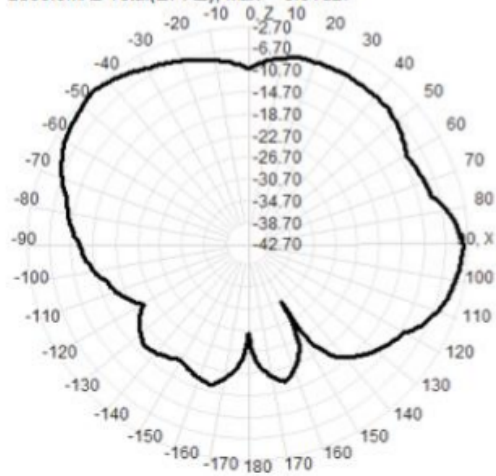
2500.0MHz H+V, Eff: 18.8%



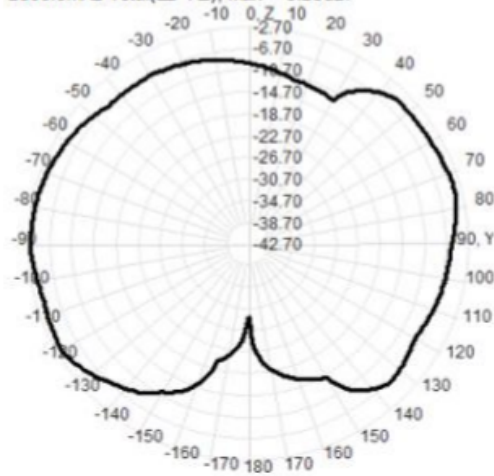
Back View



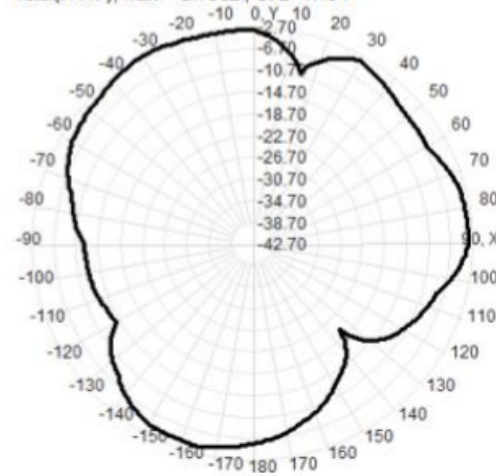
2500.0MHz Total(E1-XZ), Max=-3.01dBi



2500.0MHz Total(E2-YZ), Max=-3.23dBi



Total(H-XY), Max=-2.70dBi, CirD=17.84



OTA DATA(L)--free space

Test Equipment:	R&S CMW500			
Test Condition:				
Band	Wireless Protocol	Channel	TRP(dBm)	TIS(dBm)
BT		0	2.12	-86.5
		39	2.82	-86.82
		78	2.88	-86.83

OTA DATA(L)--Head mold

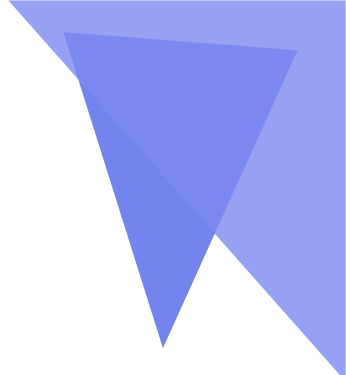
Test Equipment:	R&S CMW500			
Test Condition:				
Band	Wireless Protocol	Channel	TRP(dBm)	TIS(dBm)
BT		0	0.46	-83.45
		39	0.53	-83.41
		78	-0.62	-82.39

OTA DATA(R)--free space

Test Equipment:	R&S CMW500			
Test Condition:				
Band	Wireless Protocol	Channel	TRP(dBm)	TIS(dBm)
BT		0	2.92	-86.34
		39	3.08	-86.65
		78	3.58	-86.85

OTA DATA(R)--Head mold

Test Equipment:	R&S CMW500			
Test Condition:				
Band	Wireless Protocol	Channel	TRP(dBm)	TIS(dBm)
BT		0	0.22	-83.82
		39	0.69	-83.91
		78	0.27	-83.03



Thanks for your comment!

✧ Shenzhen Hetuo Technology Co., Ltd

✧ **Shenzhen: 1202B, Building C6, Hengfeng Industrial City, Xixiang, Bao'an District, Shenzhen**

✧ RF: **Hu Xuewen** 13714934800

