Shenzhen Hetuo Technology Co., Ltd
Building 1202B, Building C 6, Hengfeng industrial city, Hezhou, xixiang, Baoan District, Shenzhen City

Sample Approved Sheet

Antenna Type: FPC Antenna

Hetuo（R1328-R）Acknowledgment

Customer Name Dongguan Shui Wo Electronic Technology Co. , Ltd.

Client Type R1328

Brand HT-R1328-R

Hetuo Judgment Audit Team

Formulate	Check	Ratify	Acknowledge the book completion time
Liyaona	Huxuewen	Daitingting	2024.9.14

（Ruihe）Judgment Audit Team

Acknowledgement Number_____ **Proving time**

acknowledge	check	ratify	Acknowledge the book completion time
Project Review ☐Three acknowledgements☐Specifications/drawings ☐examining report ☐Specimen PCS ☐Safety standard ☐HSF			
Appraisal report☐Accept ☐Conditional acceptance ☐Refuse			

Items	Date	Version	The revised notes	Notes
1	2024.9.14	A0	For the first time	
2				

1. Antenna picture

The report mainly provides the test status of the electrical properties parameters of HT-R1328 -R.
The HT-R1328 -Rantenna is a **BT** Band . The antenna Picture and assembly are shown below.

Antenna picture & assembly picture

2.Antenna Test Equipment Introduction

Test of antenna input characteristics using Agilent E5071C and Agilent 5062A vector network analyzer; The radiation pattern of the antenna are tested using the Satimo starlab 3D near field Anechoic Chamber , and the instrument is used to agilent8960 E5515 and Agilent E4438C. The test coordinates of the darkroom are as follows:

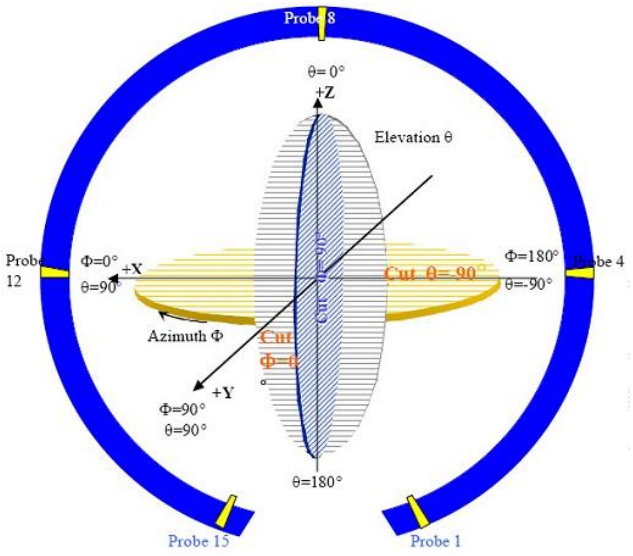


图 4 3D 微波暗室测试坐标系(back view)

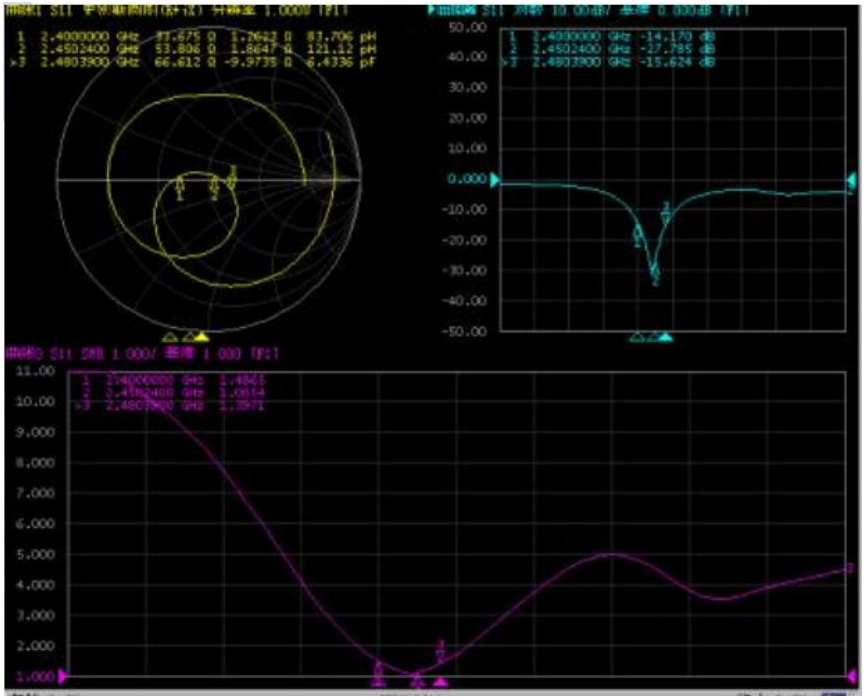
Coordinate system for 3D microwave darkroom testing

3. Electrical Specification

3-2 Passive S11 parameter

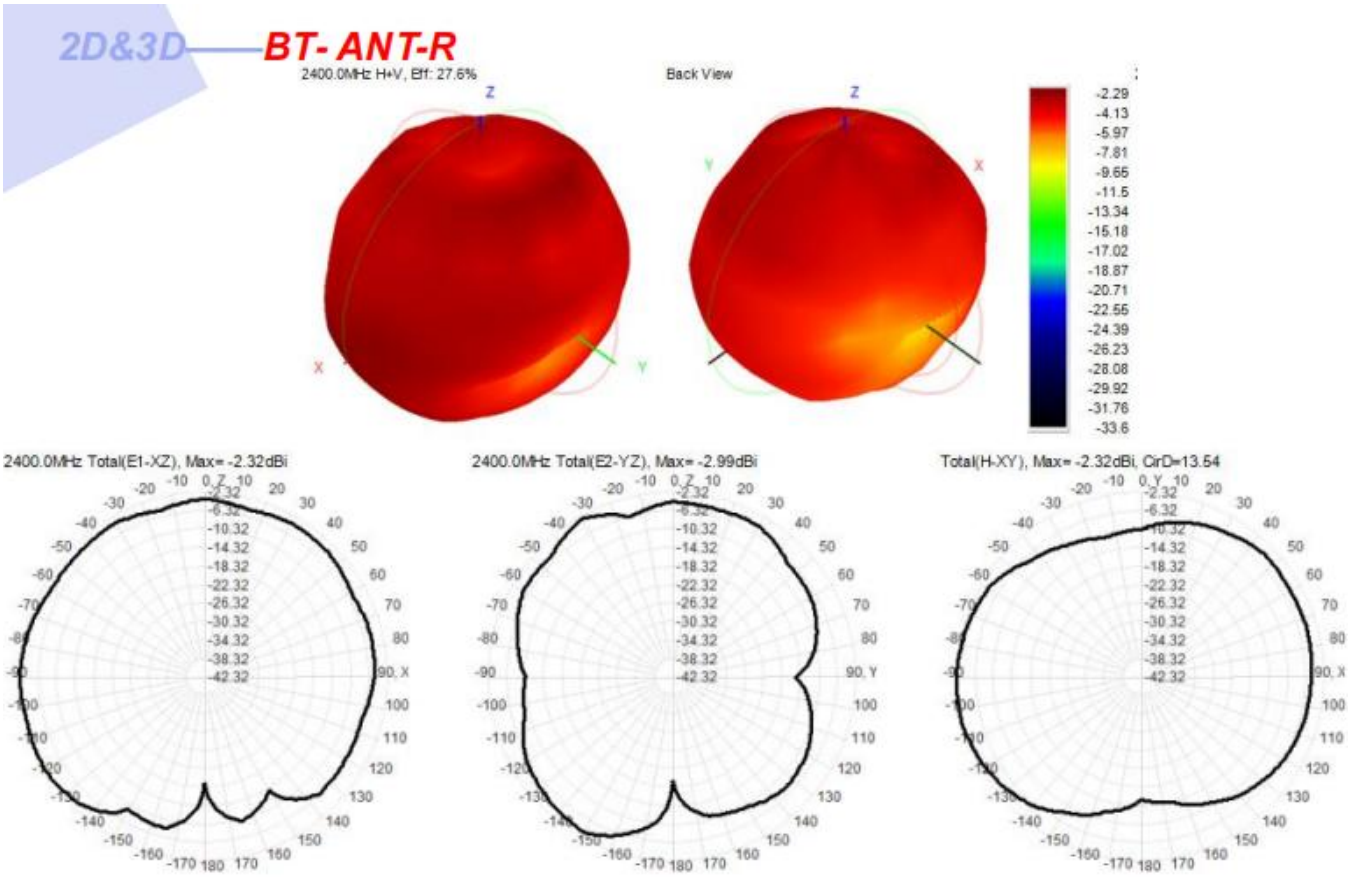
Measuring Method is a 50Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the S11 parameter, Keeping this fixture away from metal at least 20cm.

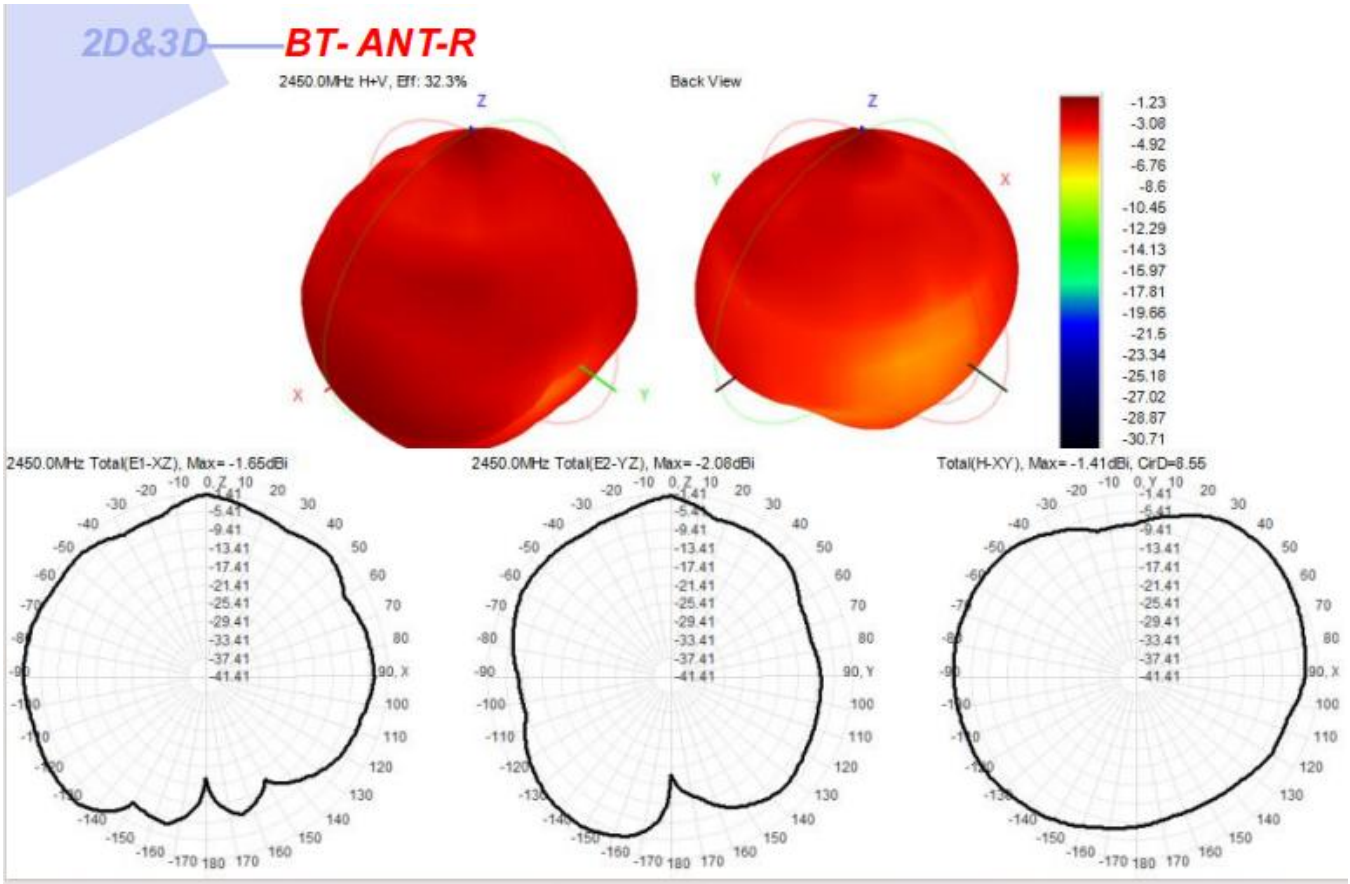
VSWR

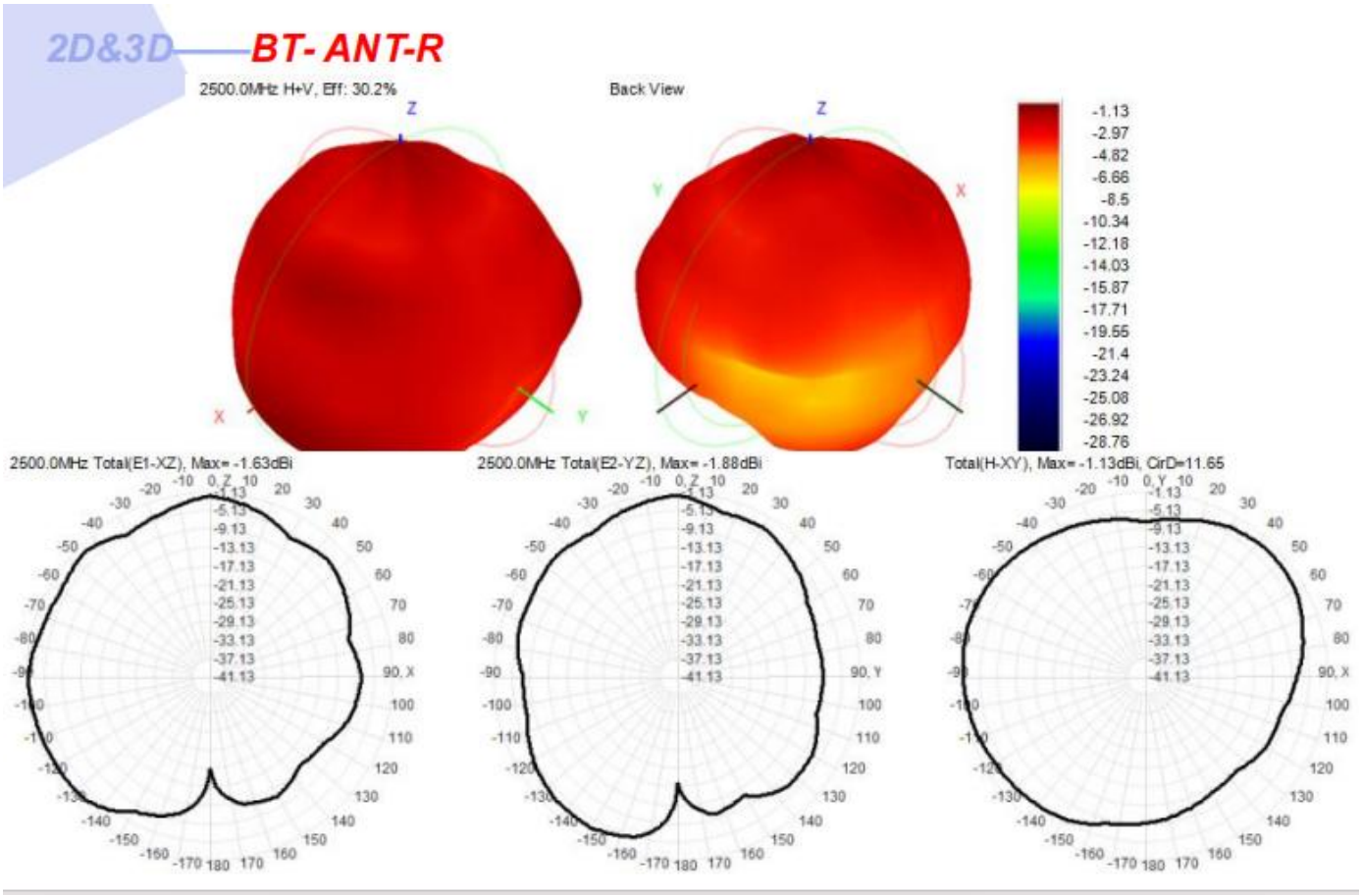


3-3 Antenna Matching Network

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)	-5.60	-5.38	-5.28	-5.09	-5.07	-4.91	-5.00	-4.83	-4.94	-5.10	-5.20
Gain (dBi)	-2.29	-1.94	-1.76	-1.92	-1.58	-1.23	-1.15	-0.53	-0.68	-1.22	-1.13
Efficiency (%)	27.57	28.94	29.63	30.95	31.11	32.31	31.62	32.91	32.03	30.91	30.23
Directivity (dB)	3.31	3.44	3.53	3.17	3.49	3.67	3.85	4.30	4.26	3.88	4.06
Peak Gain Position (Theta)	135.00	90.00	135.00	120.00	90.00	0.00	90.00	90.00	90.00	90.00	90.00
Peak Gain Position (Phi)	120.00	0.00	135.00	15.00	135.00	30.00	15.00	15.00	15.00	15.00	15.00
Efficiency ThetaPol (%)	10.01	10.47	10.77	11.35	11.49	12.20	12.51	13.83	14.35	14.40	14.58
Efficiency PhiPol (%)	17.56	18.47	18.86	19.59	19.62	20.10	19.10	19.07	17.67	16.51	15.66
Upper Hem. Efficiency (%)	14.91	15.46	15.90	16.48	16.80	17.46	17.58	18.39	18.06	17.22	16.67
Lower Hem. Efficiency (%)	12.66	13.48	13.73	14.47	14.32	14.84	14.03	14.52	13.97	13.69	13.57


2D&3D
BT- ANT-R
2400.0MHz H+V, Eff: 27.6%
Back View
-2.29
-4.13
-5.97
-7.81
-9.65
-11.5
-13.34
-15.18
-17.02
-18.87
-20.71
-22.55
-24.39
-26.23
-28.08
-29.92
-31.76
-33.6
2400.0MHz Total(E1-XZ), Max= -2.32dBi
2400.0MHz Total(E2-YZ), Max= -2.99dBi
Total(H-XY), Max= -2.32dBi, CirD=13.54


2D&3D
BT- ANT-R
2450.0MHz H+V, Eff: 32.3%
Back View
-1.23
-3.08
-4.92
-6.76
-8.6
-10.45
-12.29
-14.13
-15.97
-17.81
-19.66
-21.5
-23.34
-25.18
-27.02
-28.87
-30.71
2450.0MHz Total(E1-XZ), Max= -1.65dBi
2450.0MHz Total(E2-YZ), Max= -2.06dBi
Total(H-XY), Max= -1.41dBi, CirD=8.55


2D&3D
BT- ANT-R
2500.0MHz H+V, Eff: 30.2%
Back View
-1.13
-2.97
-4.82
-6.66
-8.5
-10.34
-12.18
-14.03
-15.87
-17.71
-19.55
-21.4
-23.24
-25.08
-26.92
-28.76
2500.0MHz Total(E1-XZ), Max=-1.63dBi
2500.0MHz Total(E2-YZ), Max=-1.88dBi
Total(H-XY), Max=-1.13dBi, CirD=11.65

OTA DATA(R)--自由空间1#

Test Equipment：	R&S CMW500			
Test Condition：				
Band	Wireless Protocol	Channel	TRP(dBm)	TIS(dBm)
BT		0	3.23	-87.94
		39	3.85	-87.65
		78	3.15	-87.35

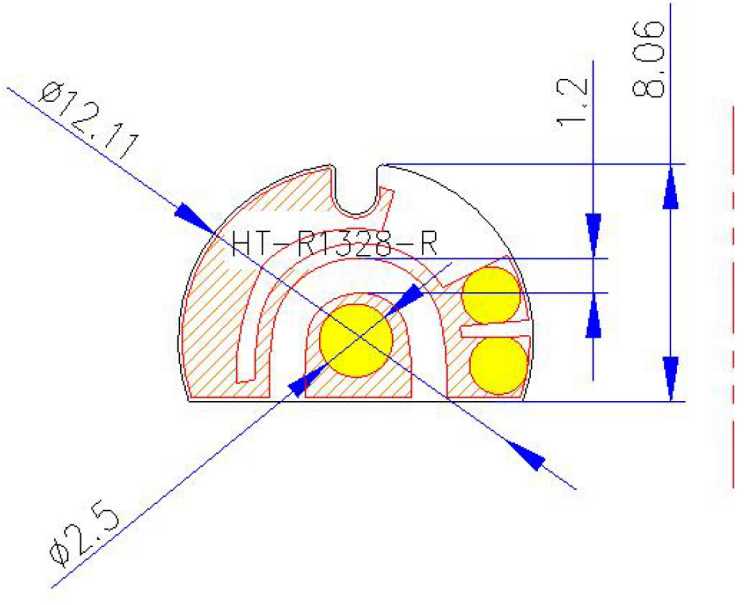
OTA DATA(R)--头模

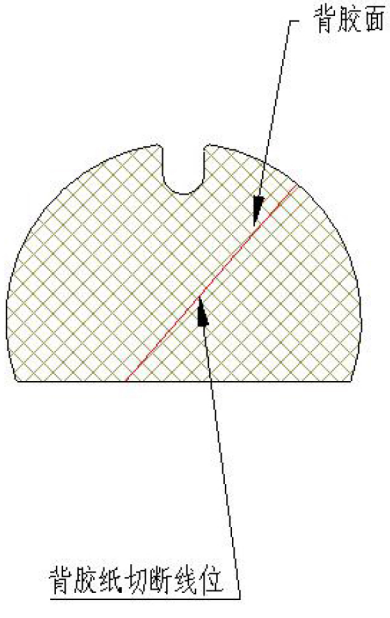
Test Equipment：	R&S CMW500			
Test Condition：				
Band	Wireless Protocol	Channel	TRP(dBm)	TIS(dBm)
BT		0	1.21	-84.45
		39	1.43	-84.64
		78	1.54	-84.28

4. Mechanical Specification:

Mechanical Configuration (Unit: mm)

The appearance of the antenna is according to drawing Figure 8





Cutting line position of adhesive paper

MODIFICATION			
NO.	DESCRIPTION	DATE	ENGINEER
		2022.08.10	

Drawn	
Designed	
Checked	
Approved	
PART NAME:	HT-20230620001-R1328
Customer Rev:	R1328-R
SHEET	1 OF 1
DATE	2022.08.10
SCALE	1:1
UNITS	MM
USED ON	
DWG NO.	8812M-ANT-FPC-INSTANT