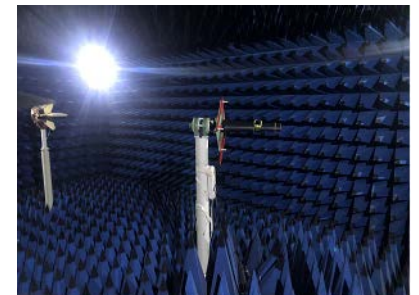


Buttons Antenna Optimization Report

Radio frequency: Chen
Kehong

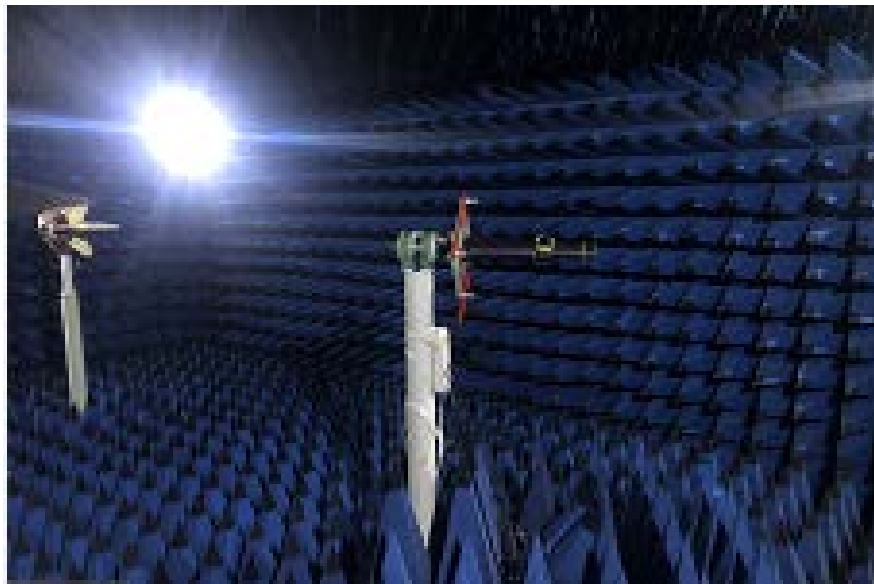
Date: 2022-11-22

Q: 13325125122



Project development environment

We are moving from the Internet age to the intelligent age, and the country is building a digital society and a smart city. In the next 5-10 years, both the consumer electronics market and the Internet of Things market have great development potential. The field of wireless communication is very diversified. In the future, Yusheng will strive to provide customers with professional-grade product solutions with market competitiveness by relying on the advantages of the customer platform of the main antenna business and its comprehensive strength.



Yusheng Communication's products cover almost all antenna applications of wireless terminal equipment, Including automobile antenna, high-precision surveying and mapping antenna, unmanned aerial vehicle ground and satellite data navigation, high-precision positioning antenna, wireless transmission of medical equipment, consumer antenna (mobile phone antenna, PAD, notebook computer antenna), Base station/indoor distributed antenna, smart wearable antenna (smart watch, TWS headset), security home antenna and various smart device antennas for wireless data transmission and wireless control, etc.

1

Brief introduction of project debugging

2

Report version outline

3

Passive parameters of antenna

3

Active parameters of antenna

4

Matching description

Brief introduction of project debugging

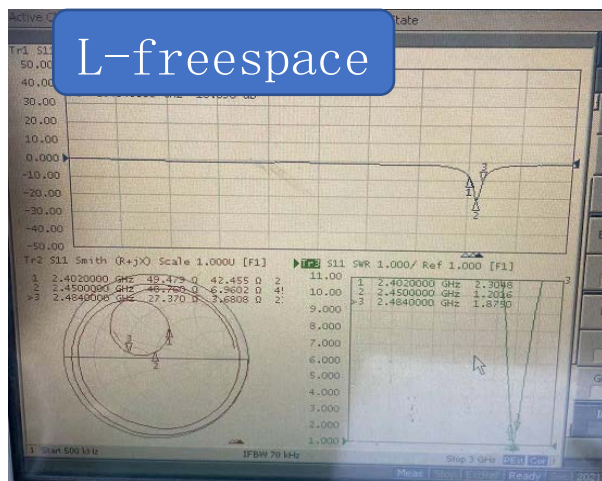
Model	Earphone			
Antenna type	PIFA			
Frequency band and antenna material	Main antenna	Frequency band		Material
		2G	—	
		3G	—	
		4G	—	
	Other antennas	BT	2402-2484MHZ	fpc
		DRX	—	
Performance requirements	Execute according to customer requirements			

Report version outline

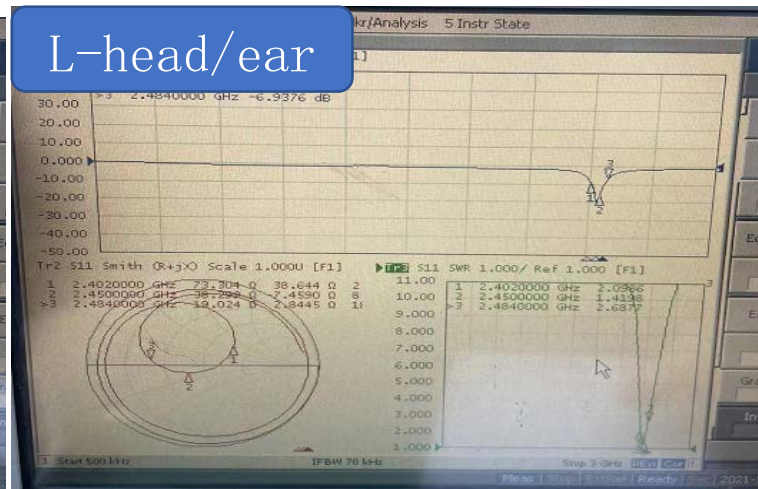
Report version	Reporting time	Problems solved in this antenna research and development
V0.1	2022/10/17	Preliminary debugging
v0.2	222/11/02	Optimization report
v0.3	2022/11/22	Update antenna size

Passive parameters of antenna

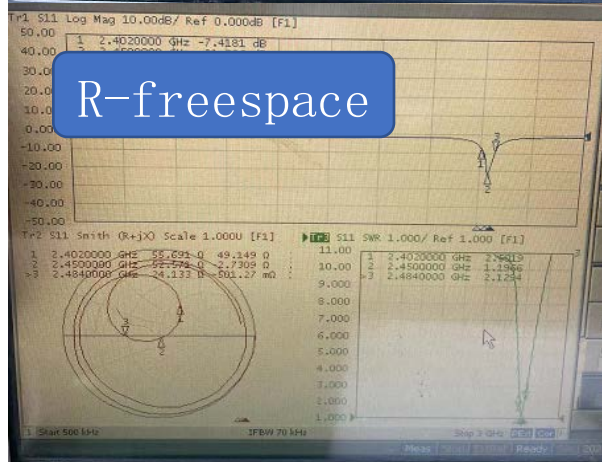
L-freespace



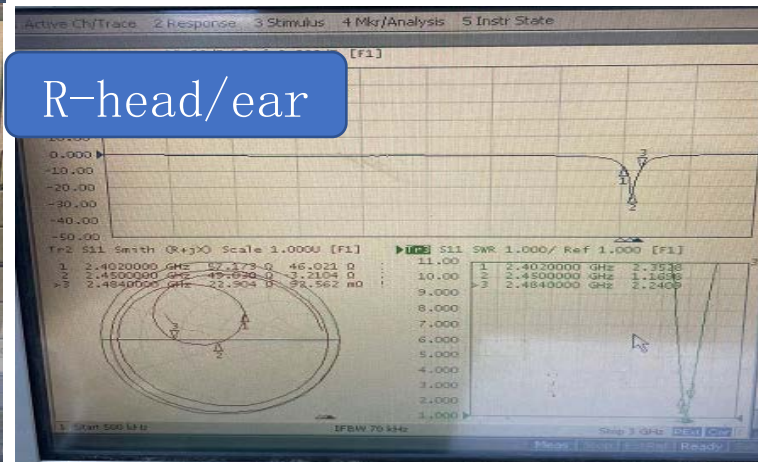
L-head/ear



R-freespace

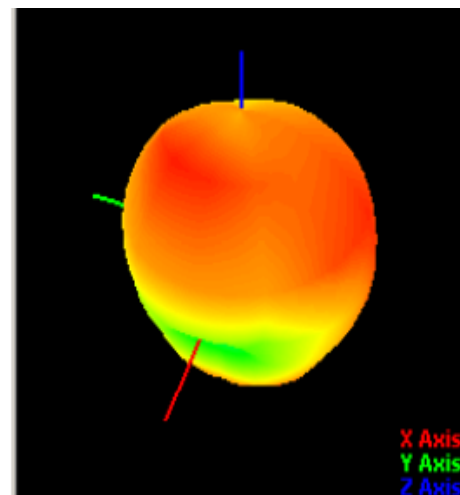
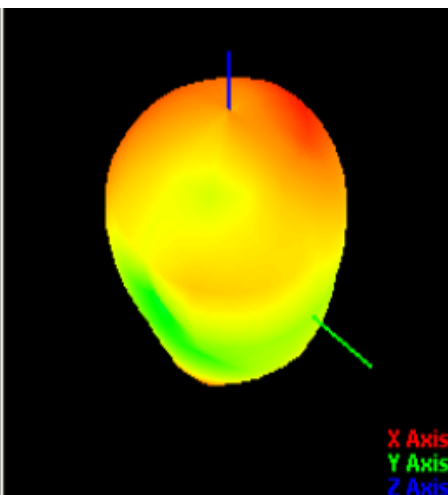
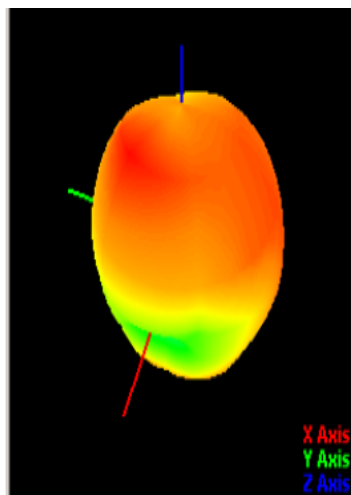
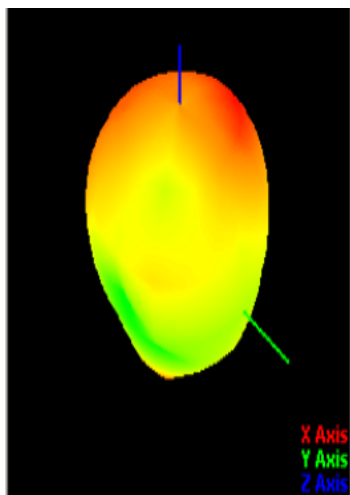


R-head/ear

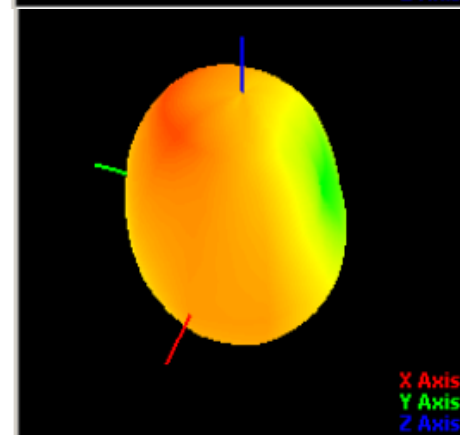
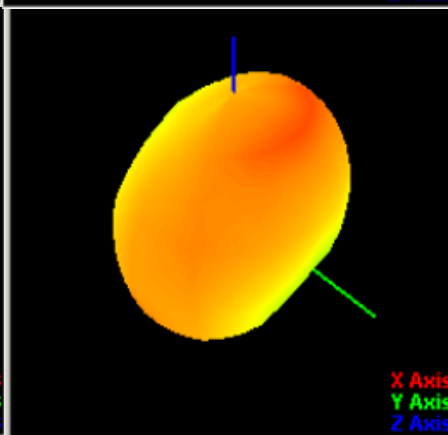
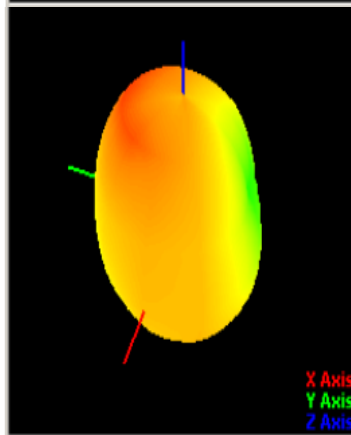
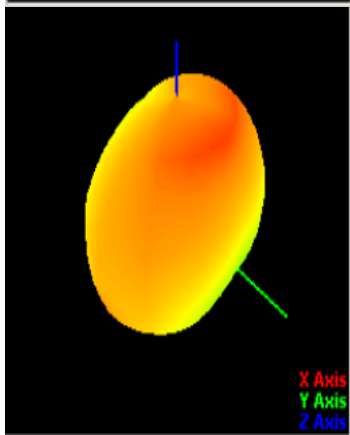


Antenna pattern

L



R



Passive parameters of antenna

Test	L								
Test Point ID	1	2	3	4	5	6	7	8	9
Freq. (MHz)	2400	2410	2420	2430	2440	2450	2460	2470	2480
Efficiency (%)	21.6%	24.2%	28.0%	32.3%	34.1%	33.9%	32.0%	28.0%	26.5%
Efficiency (dB)	-6.6	-6.16	-5.53	-4.91	-4.62	-4.71	-4.85	-5.60	-5.74
Gain (dBi)	-0.63	-0.26	0.36	1.08	1.14	1.30	1.36	1.27	0.59

Test	R								
Test Point ID	1	2	3	4	5	6	7	8	9
Freq. (MHz)	2400	2410	2420	2430	2440	2450	2460	2470	2480
Efficiency (%)	23.4%	25.1%	27.5%	31.3%	35.0%	31.3%	28.9%	27.8%	27.1%
Efficiency (dB)	-6.30	-6.15	-5.89	-5.04	-4.55	-5.10	-5.51	-5.60	-5.60
Gain (dBi)	-0.53	0.12	0.49	1.12	1.10	1.40	0.65	0.20	-0.21

**Motherboard
conduction data**

	L			R		
CHANNEL	0	39	78	0	39	78
max power (dBm)	9.24	9.45	9.58	9.68	9.47	9.50
sensitivity (dBm)	-93	-93	-93	-93	-93	-93

Antenna OTA

freespace	L			R		
CHANNEL	0	39	78	0	39	78
TRP (dBm)	3.62	4.35	4.57	3.62	4.57	4.29
TIS (dBm)	-88.26	-88.79	-89.54	-88.69	-88.74	-89.07

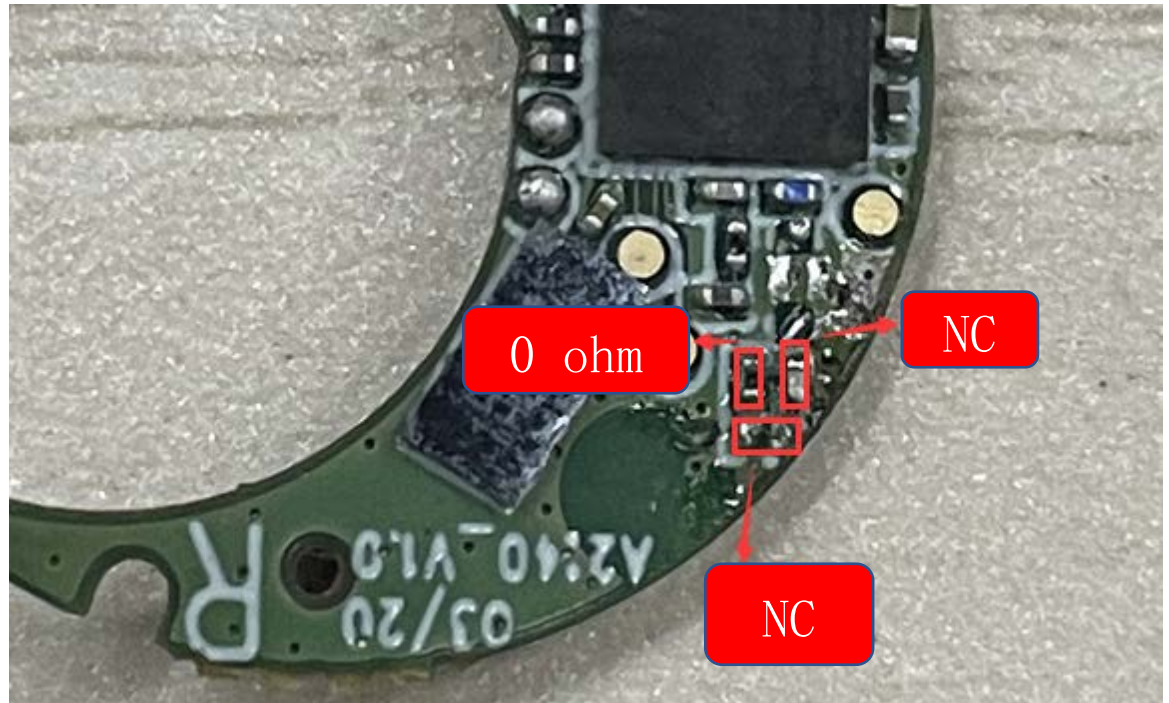
Antenna OTA

Head/ear	L			R		
CHANNEL	0	39	78	0	39	78
TRP (dBm)	0.18	0.35	0.57	0.33	0.41	0.44
TIS (dBm)	-83.35	-83.19	-83.50	-82.15	-83.48	-83.84

Schematic diagram of
head die placement



Antenna matching is as shown in the right picture, and the left and right ears match

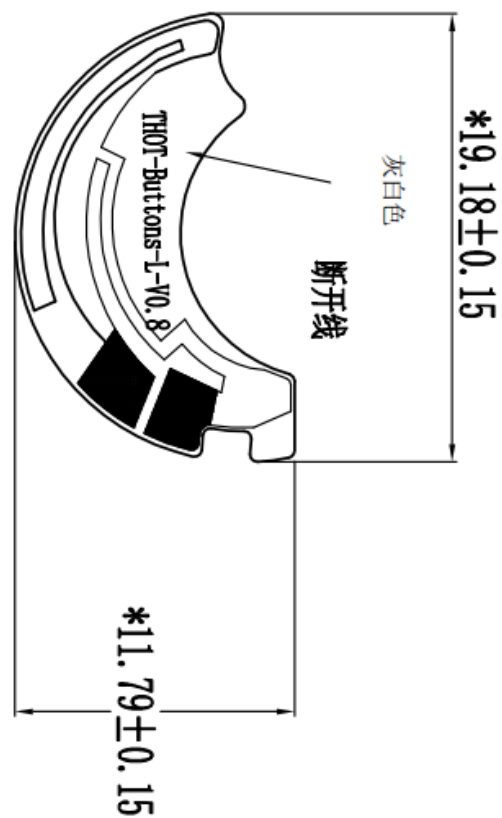
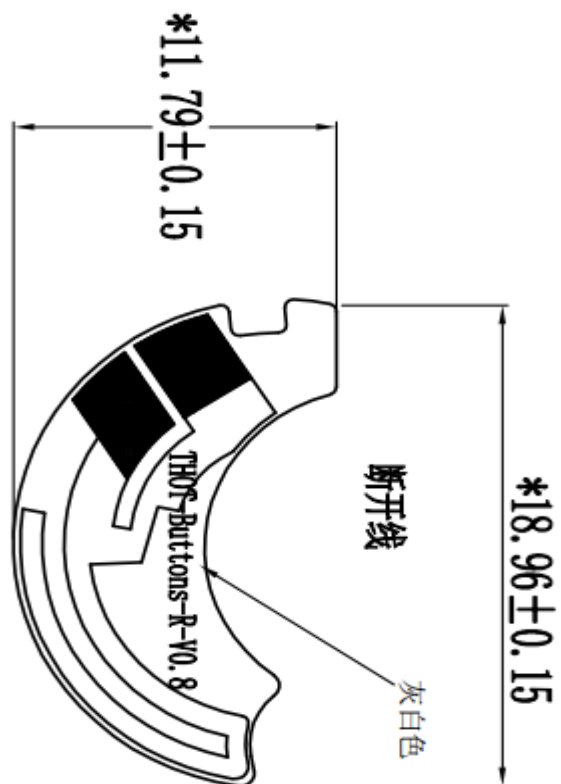


Matters needing attention

The positive and negative electrodes of the battery are placed according to the horizontal line of the arrow as shown in the figure, and the battery lines are placed as shown in the figure.



Antenna size



Thank you!



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