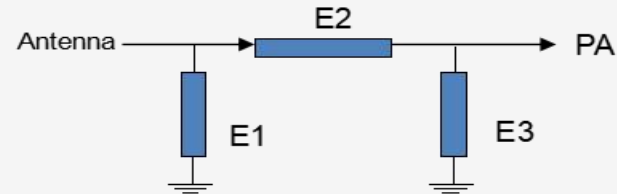


Antenna Test Report

Customer	Timekettle	Project	TMK019
Report Version	V3.0	Report Date	2026-01-28
Prepared by	LIU	Checked by	lei zhang



Customer provided machine pictures and antenna matching



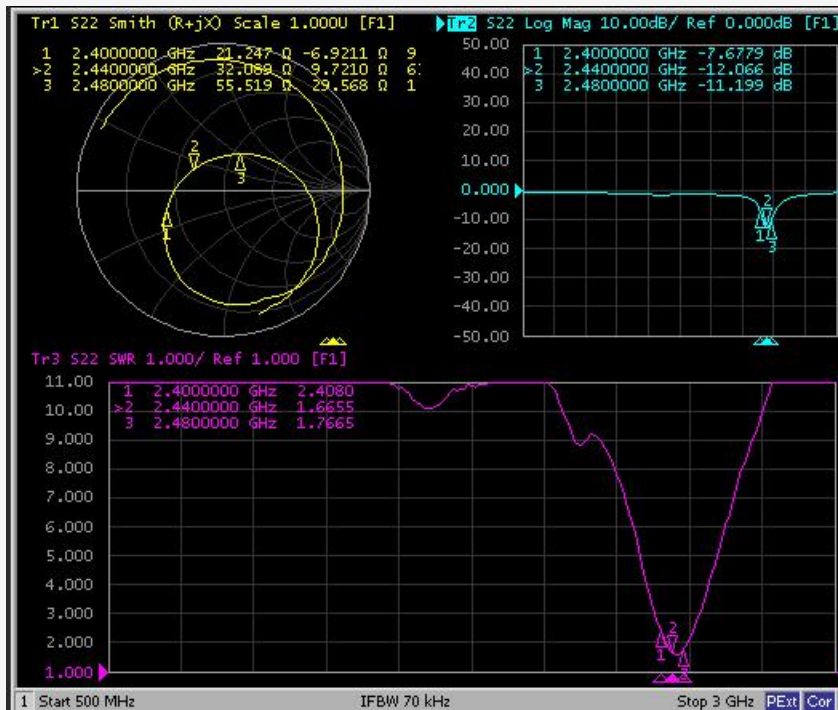
earphones	
E1(0402)	1.5PF
E2(0402)	0Ω
E3(0402)	NC

Antenna test results:

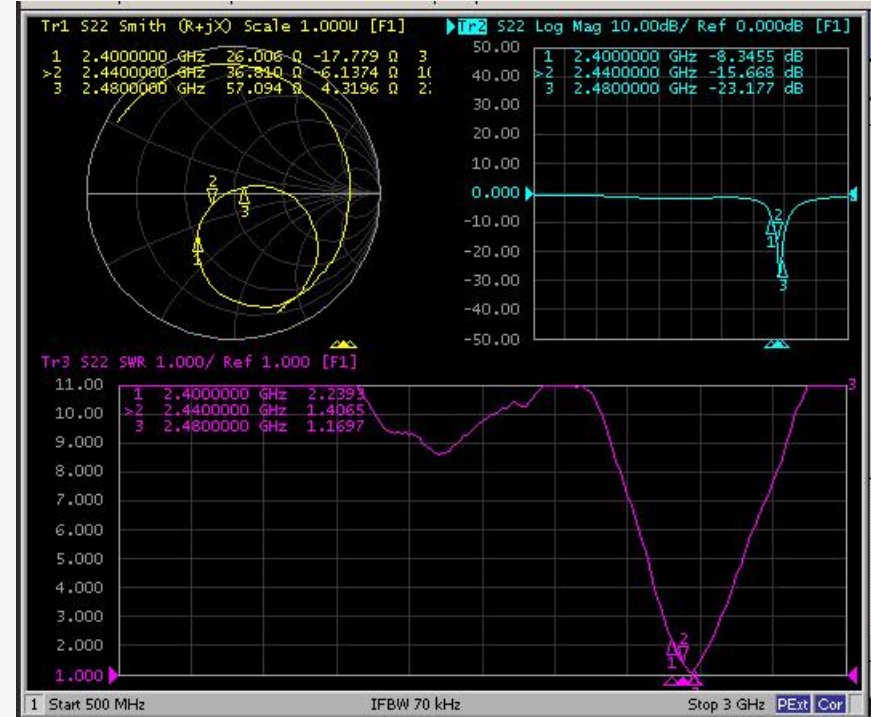
Bluetooth antenna

Whole machine data - antenna waveform diagram

Free state of antenna left ear



Antenna right ear free state



Passive antenna efficiency:

Bluetooth antenna

Free state of antenna left ear

Freq (MHz)	Gain (dBi)	Effi (dB)	Effi (%)
2400	-6.82	-7.56	17.52
2410	-6.64	-7.57	17.48
2420	-7.19	-8.06	15.64
2430	-7.16	-8.07	15.6
2440	-6.72	-7.63	17.25
2450	-6.17	-6.97	20.11
2460	-5.8	-6.72	21.26
2470	-5.91	-7.16	19.25
2480	-6.73	-7.76	16.76

Antenna right ear free state

Freq (MHz)	Gain (dBi)	Effi (dB)	Effi (%)
2400	-6.1	-8.26	14.94
2410	-5.57	-7.58	17.46
2420	-5.74	-7.88	16.31
2430	-5.73	-7.99	15.89
2440	-5.11	-7.53	17.64
2450	-4.26	-6.67	21.51
2460	-3.59	-5.99	25.17
2470	-3.63	-5.97	25.27
2480	-4.37	-6.58	21.99

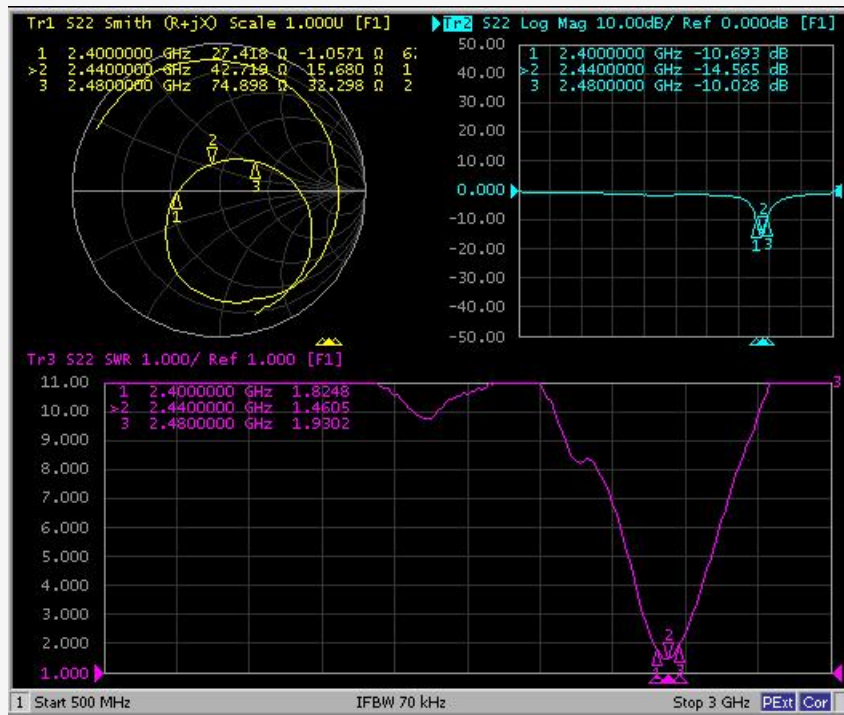


Antenna test results:

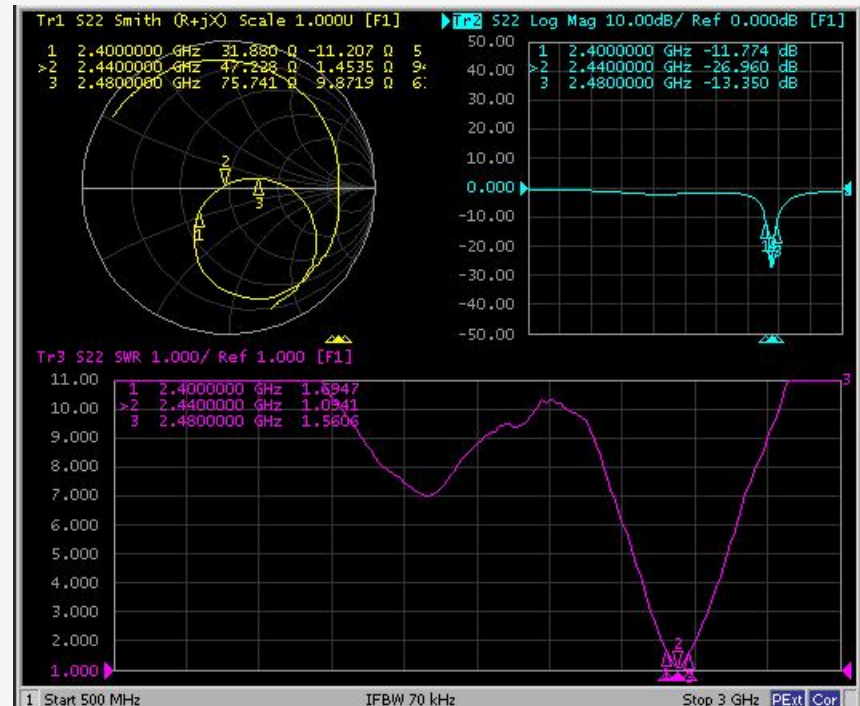
Bluetooth antenna

Whole machine data - antenna waveform diagram

Antenna left ear head module status



Antenna right ear head module status



Passive antenna efficiency:

Bluetooth antenna

Antenna left ear head module status

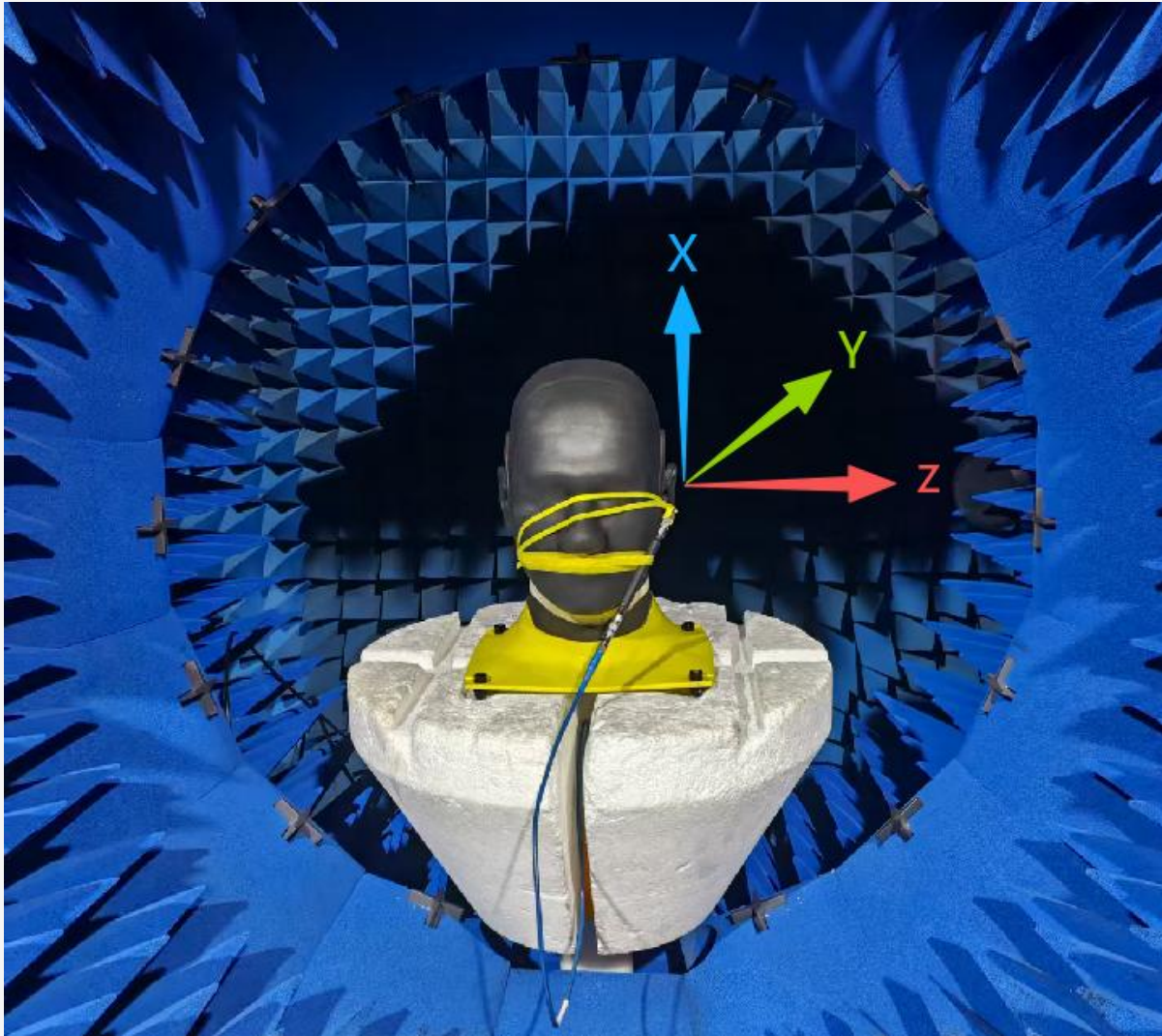
Freq (MHz)	Gain (dBi)	Effi (dB)	Effi (%)
2400	-5.47	-11.44	7.17
2410	-5.55	-11.62	6.88
2420	-5.92	-12.10	6.17
2430	-5.71	-11.84	6.55
2440	-5	-11.14	7.7
2450	-4.46	-10.51	8.9
2460	-4.42	-10.61	8.69
2470	-5.04	-11.37	7.3
2480	-5.74	-12.04	6.25

Antenna right ear head module status

Freq (MHz)	Gain (dBi)	Effi (dB)	Effi (%)
2400	-6.52	-11.38	7.28
2410	-6.2	-10.97	8
2420	-6.48	-11.28	7.45
2430	-6.59	-11.32	7.38
2440	-6.43	-11.07	7.82
2450	-6.34	-10.67	8.57
2460	-6.33	-10.64	8.62
2470	-6.53	-10.94	8.05
2480	-6.86	-11.37	7.29



Test environment



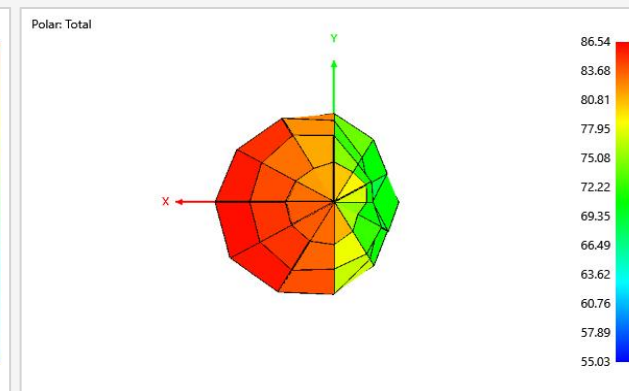
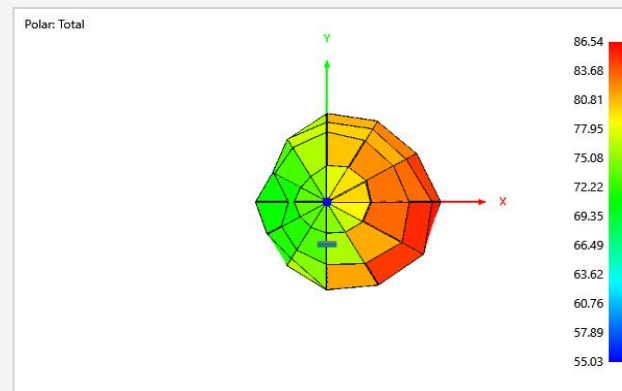
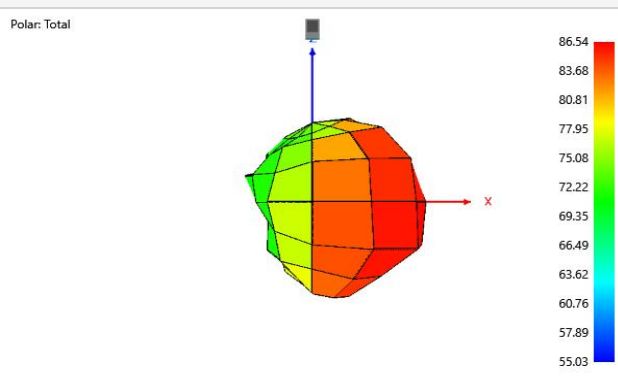
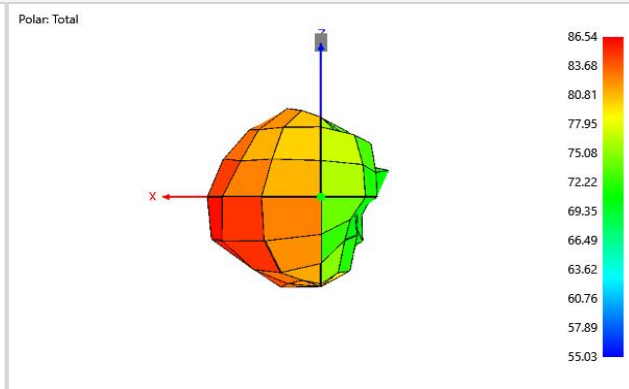
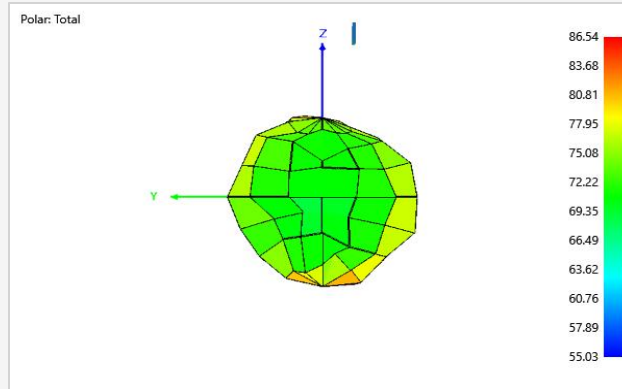
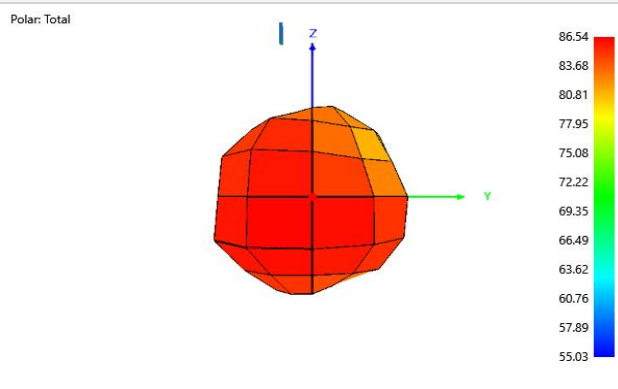
Dark room OTA test data:

OTA	free state					
Test	L			R		
Result	0	39	78	0	39	78
TRP (dBm)	1.5	2.25	1.10	2.11	3.52	3.23
TIS (dBm)	-80.78	-81.14	-82.6	-81.14	-84.01	-84.33

OTA	Head model status					
Test	L			R		
Result	0	39	78	0	39	78
TRP (dBm)	0.46	0.81	-0.51	0.11	1.22	0.23
TIS (dBm)	-80.11	-80.12	-82.12	-80.29	-82.31	-83.11

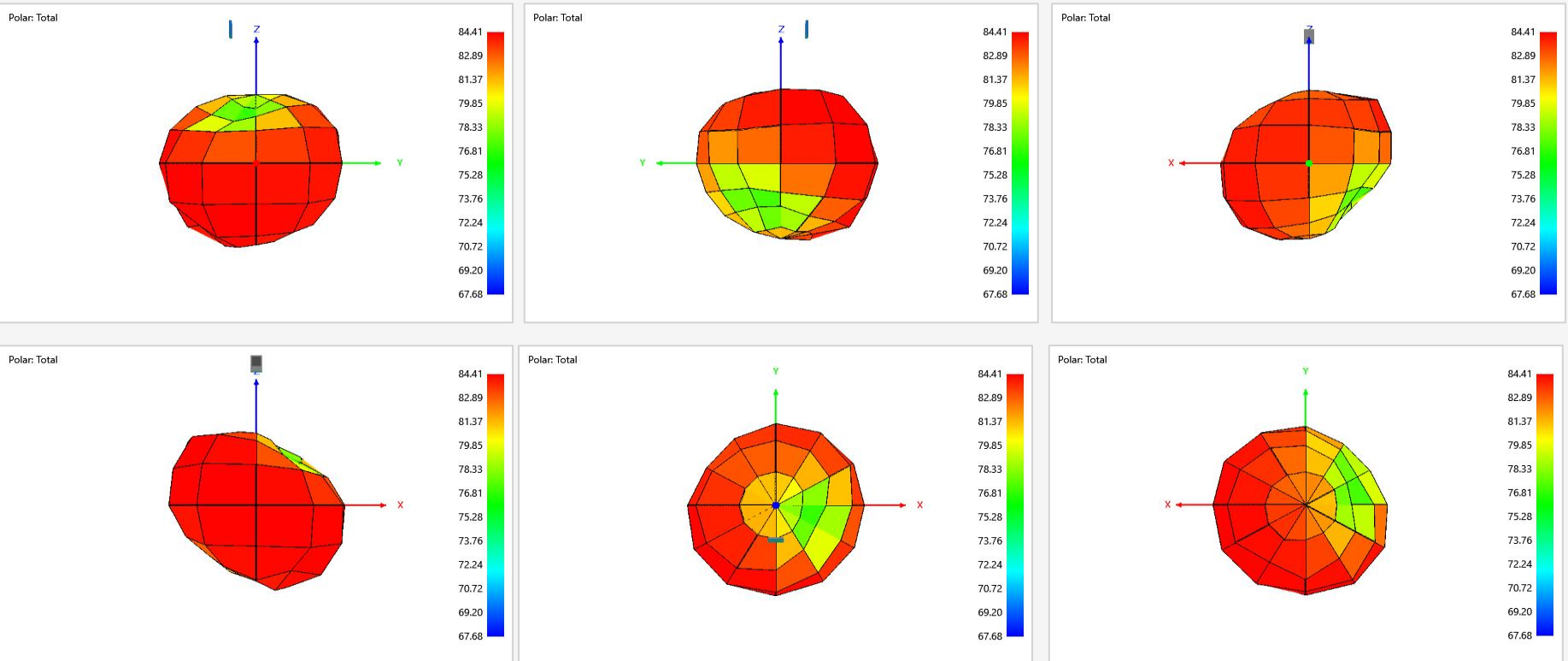
3D radiation pattern:

Left Ear Head Model



3D radiation pattern:

Right ear head mold



Thanks for watching

