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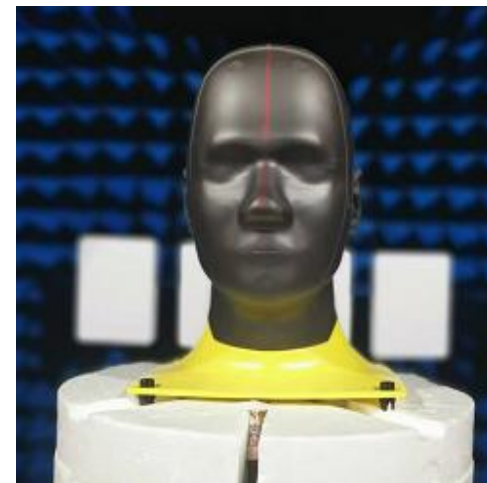
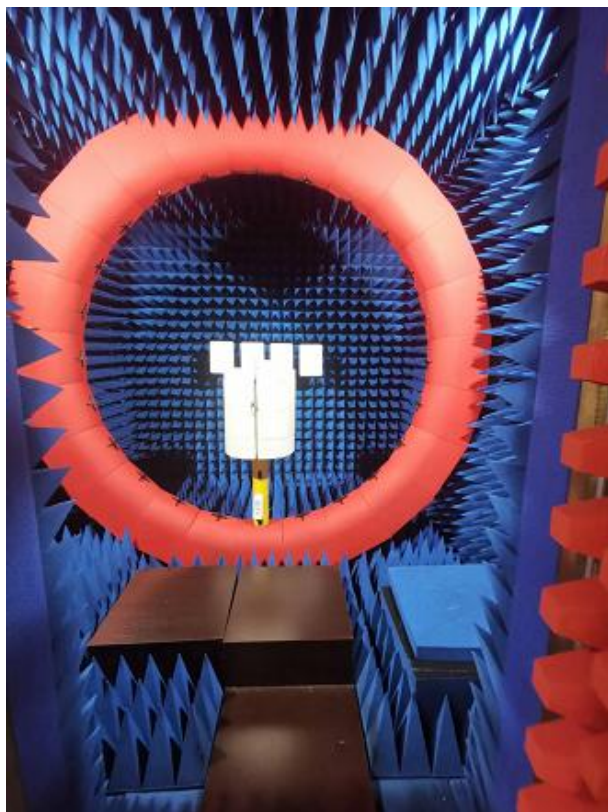
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◆ 项目信息（Project information）

客户名CUSTOMER NAME:	黑马
项目名PRODUCT NAME:	Hi-2606A
研发（R&D）：	李良
日期DATE:	2026/08/10
制造商信息（Manufacturer information）：	深圳顶设科技有限公司（I-TOP DESIGN TECHNOLOGY CO.,LTD）
制造商地址（Manufacturer address）：	Room 711, Building 2GaoxinqiIndustrail Park 2, Longchang Road, Bao'an District, Shenzhen City, China

一. 测试设备 (Test Equipment)

1. 有源测试: 支持2. 3. 4. 5G制式多模式测量 NB-IoT, eMTC, CAT-1, Bluetooth1-5, WIFI802.11 abgn, 可测TRP TIS
2. 无源测试: 可测试增益, 效率
3. TWS耳机测试头模 全套人头手

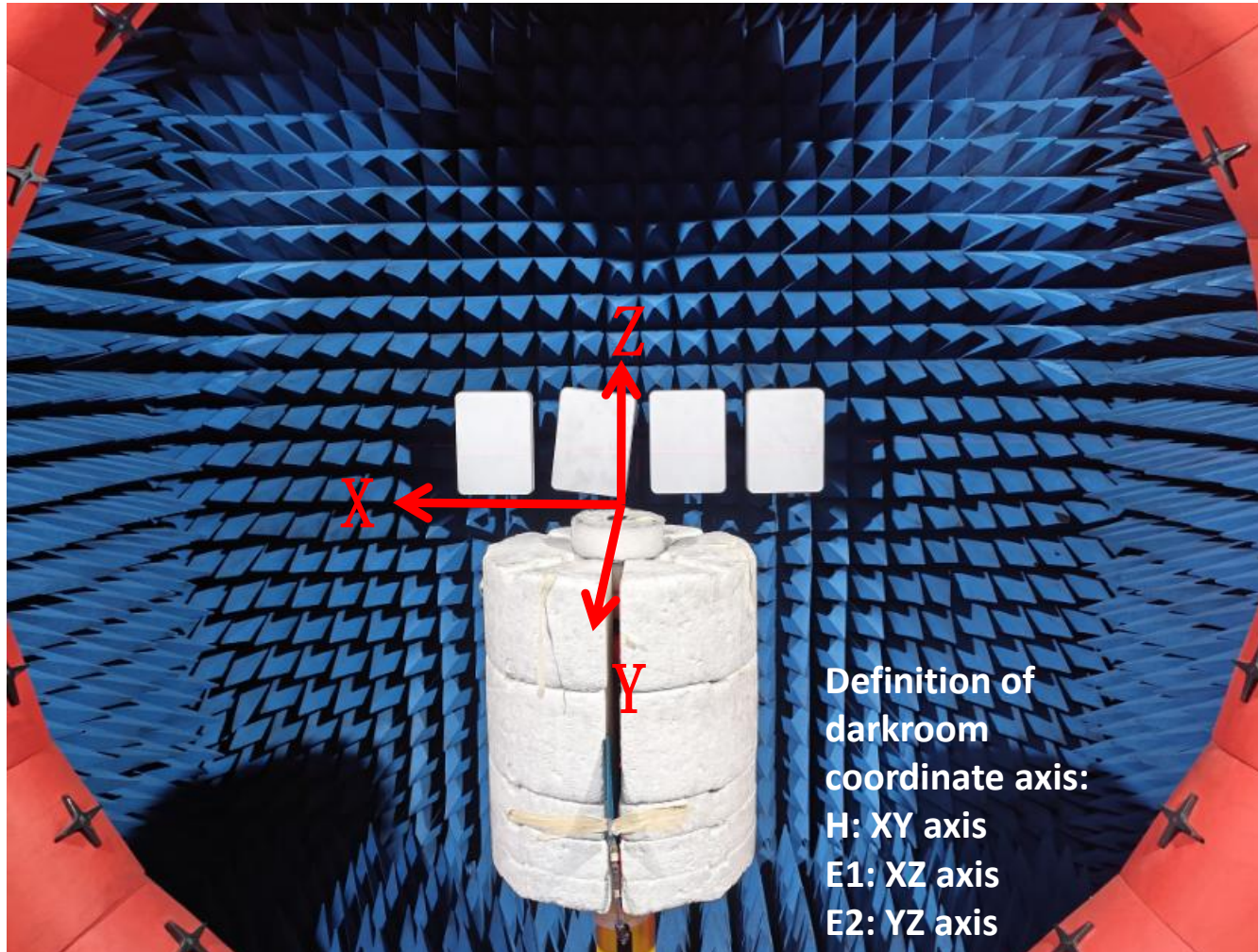


二.机台图片 Machine image



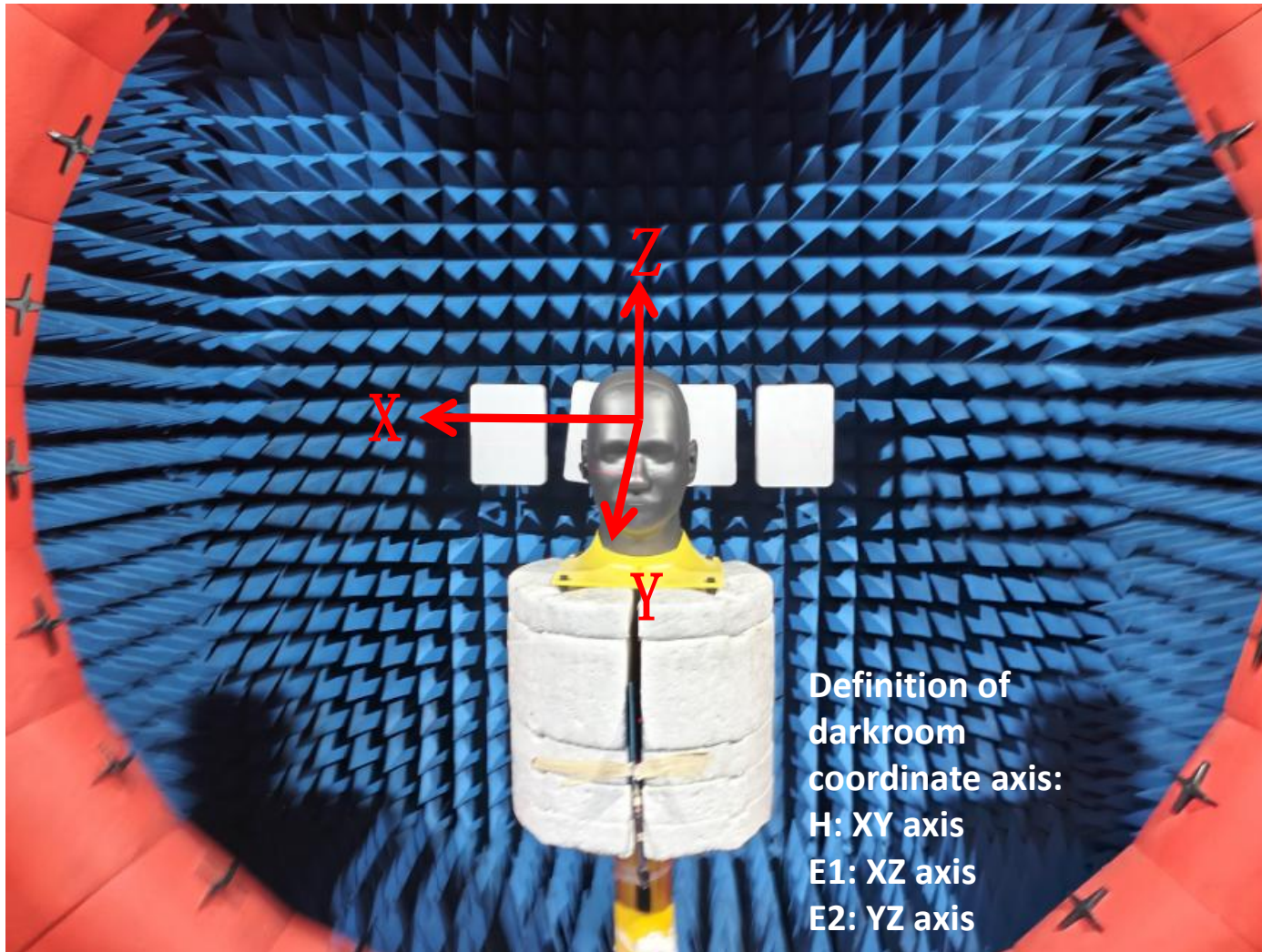
三 实际测试图片 (test photo)

自由空间

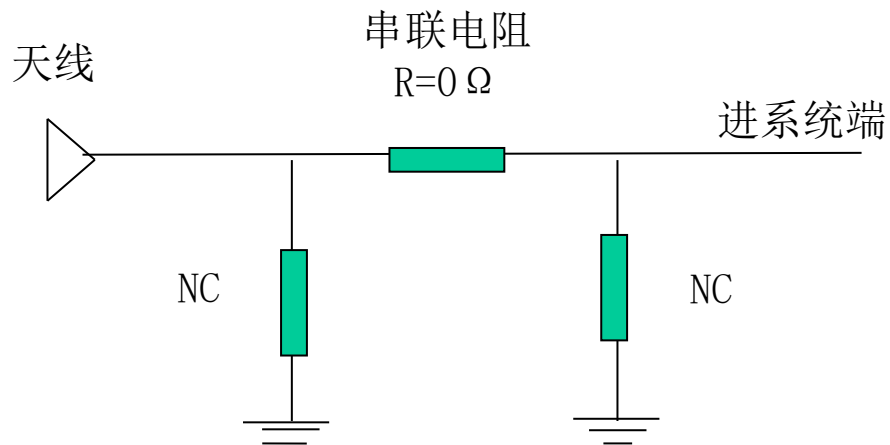


三 实际测试图片 (test photo)

头模空间



四 主板匹配电路 (Main board matching circuit)



五. 天线位置 (ANT Location)

L

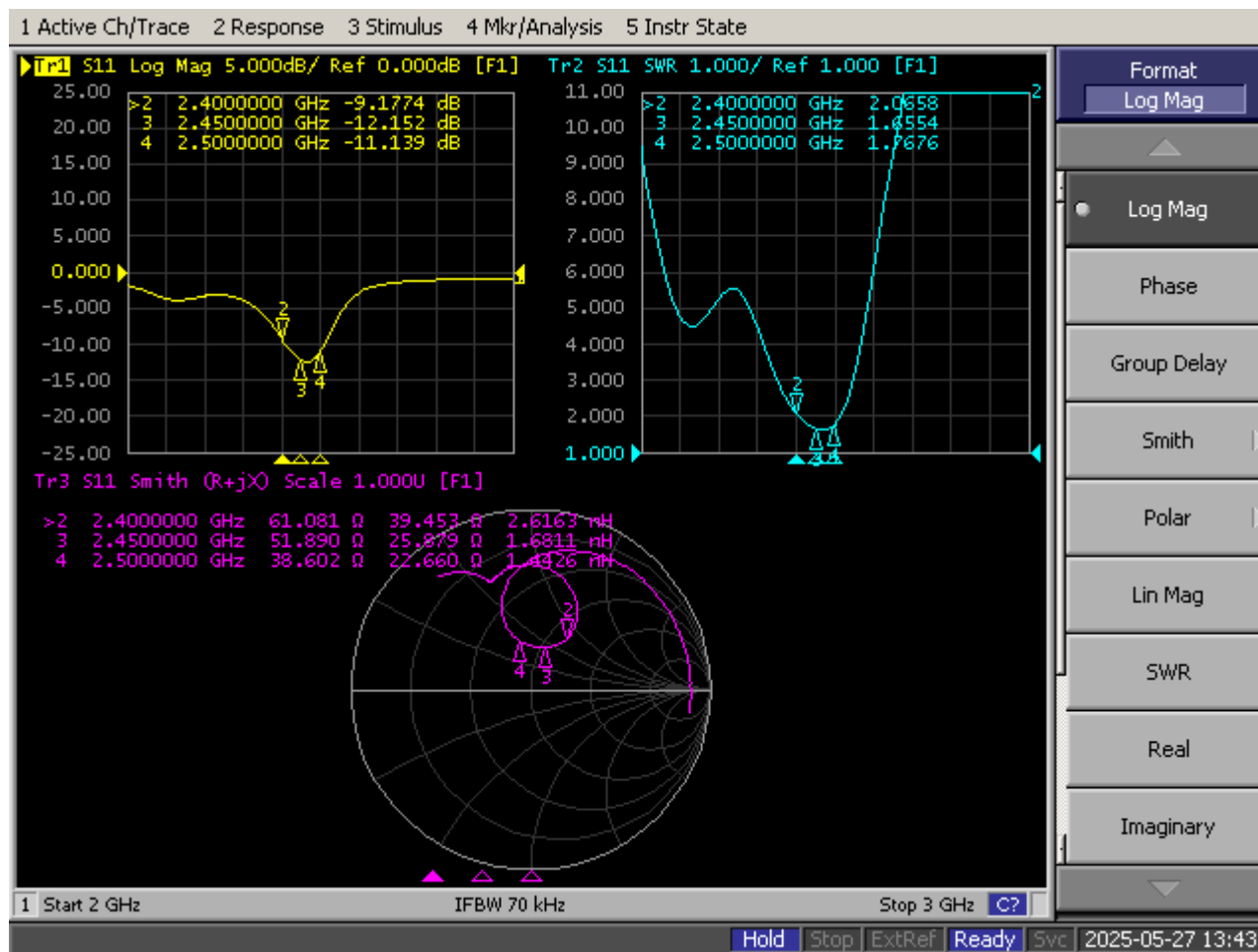


R



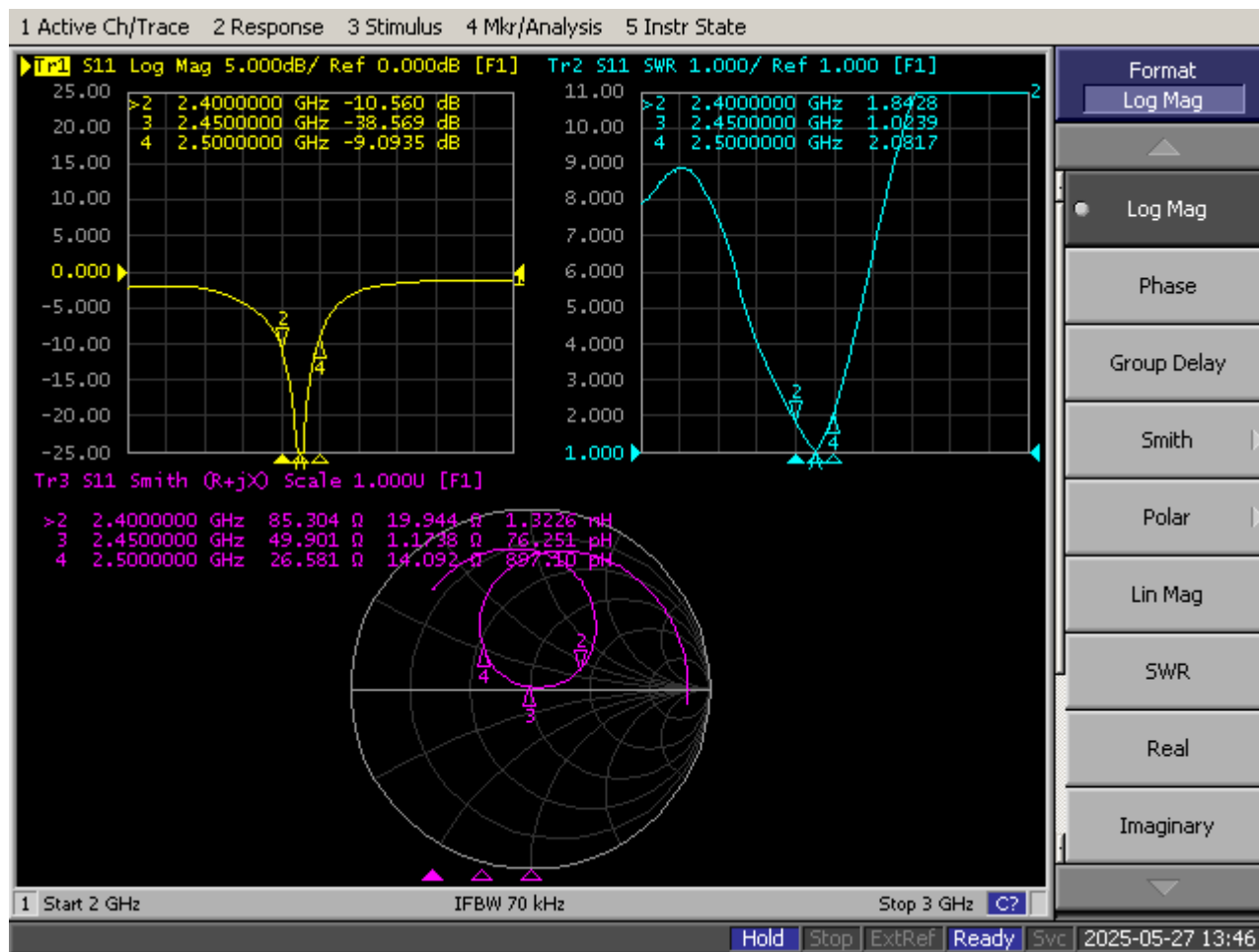
六. Return Loss&VSWR

L



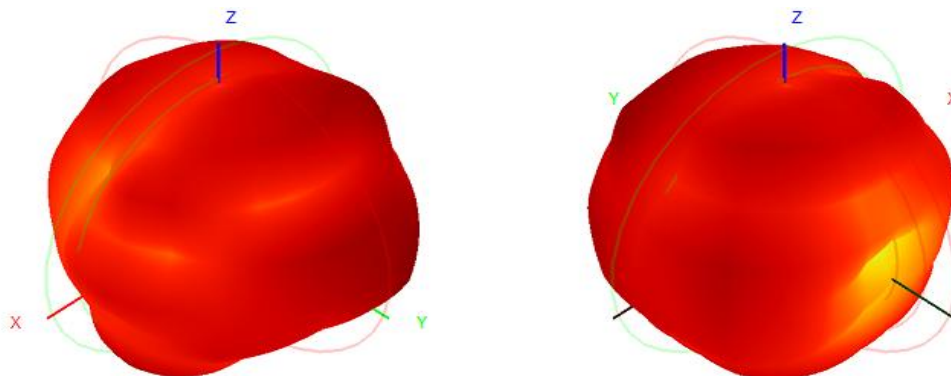
六. Return Loss&VSWR

R

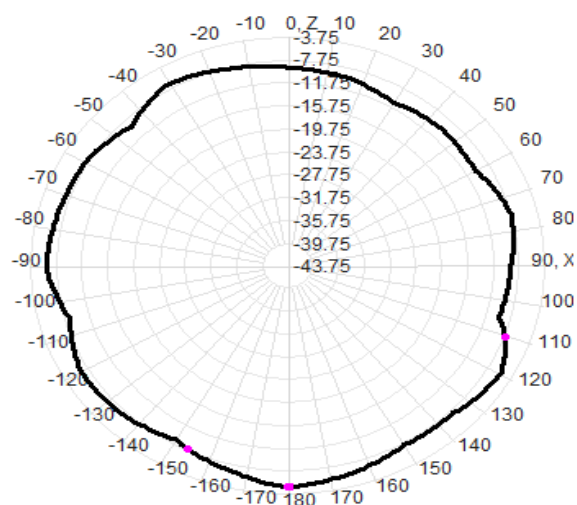


七. 辐射方向图 (Radiation pattern)

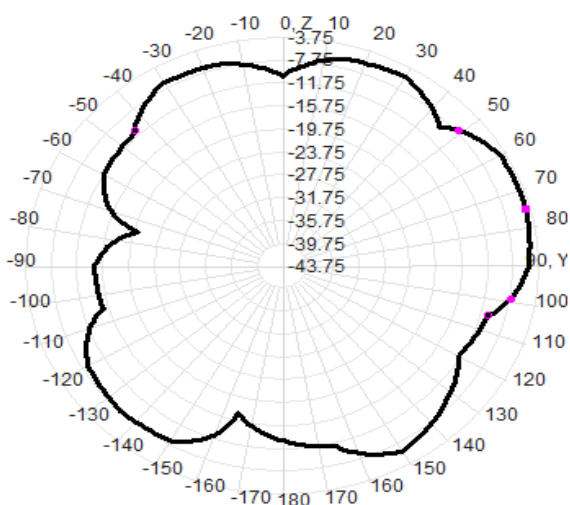
L-2400MHZ



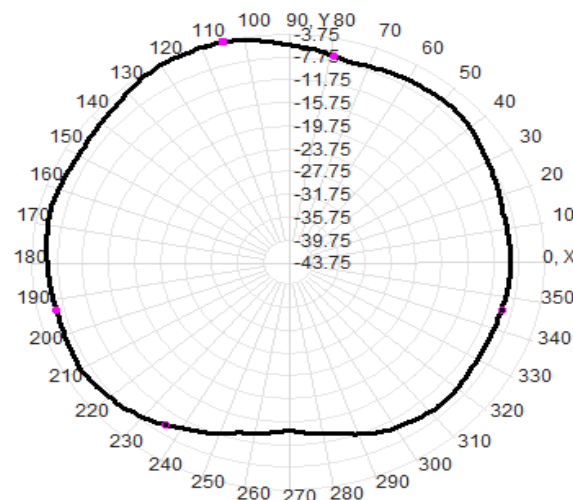
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Total(E2-YZ)

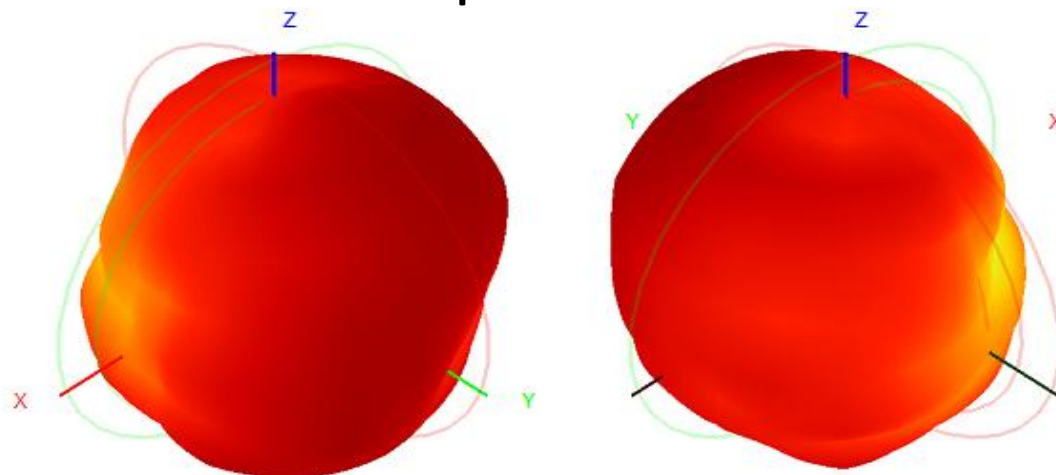


Total(H-XY)



七. 辐射方向图 (Radiation pattern)

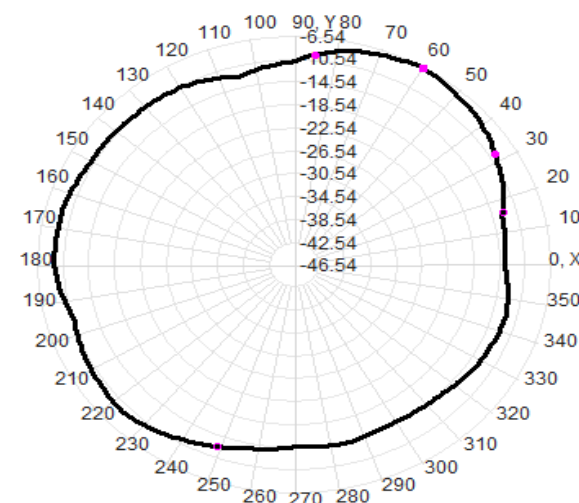
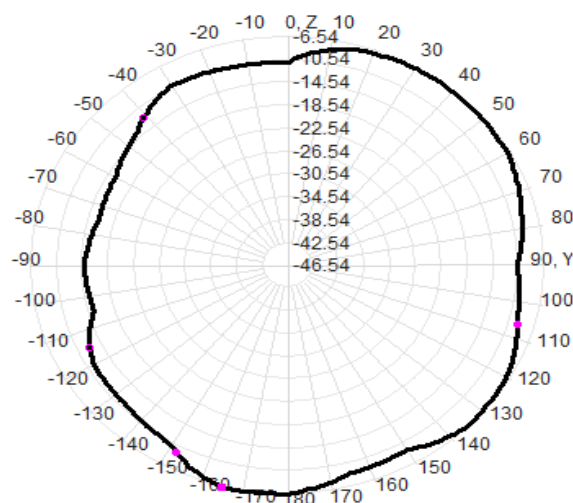
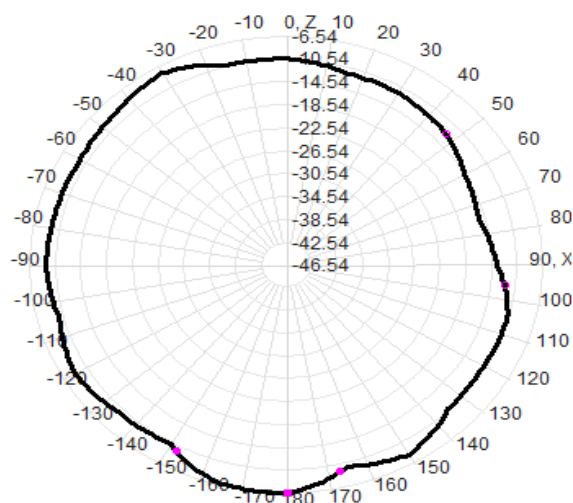
R -2400MHZ



Total(E1-XZ)

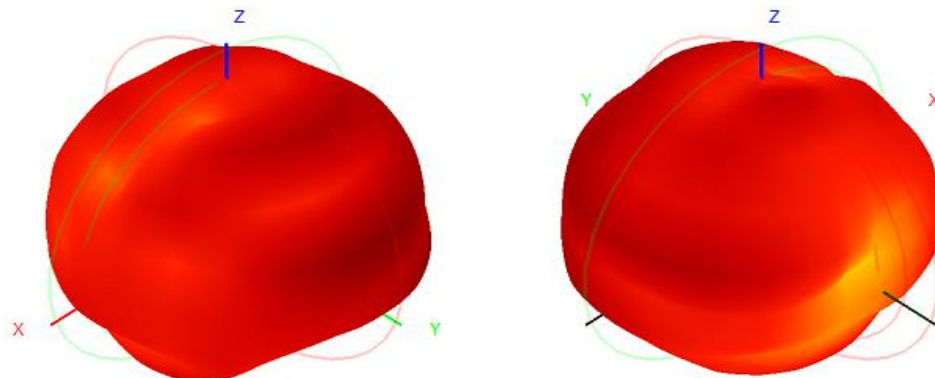
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Total(H-XY)

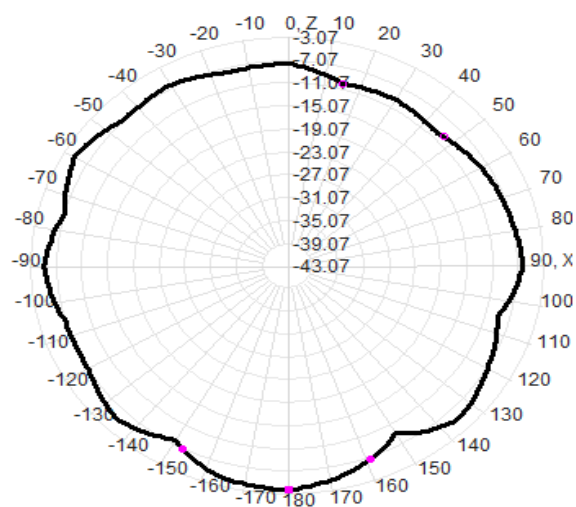


七. 辐射方向图 (Radiation pattern)

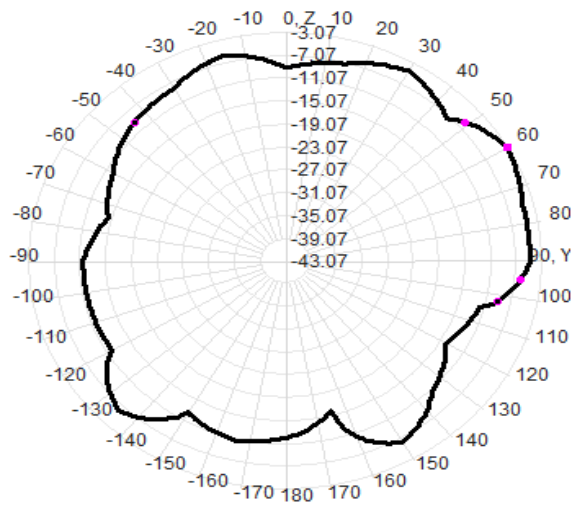
L -2450MHZ



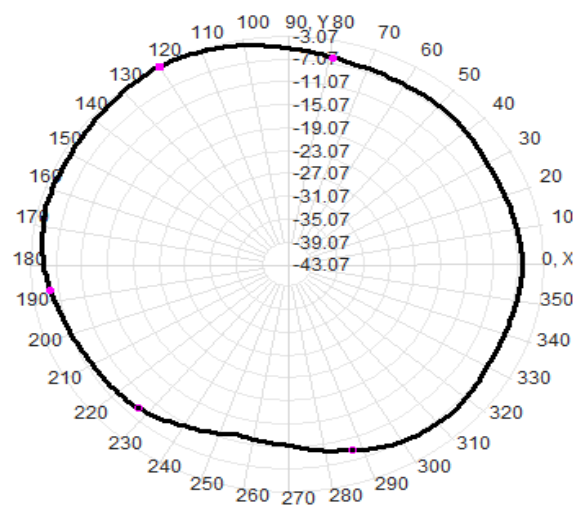
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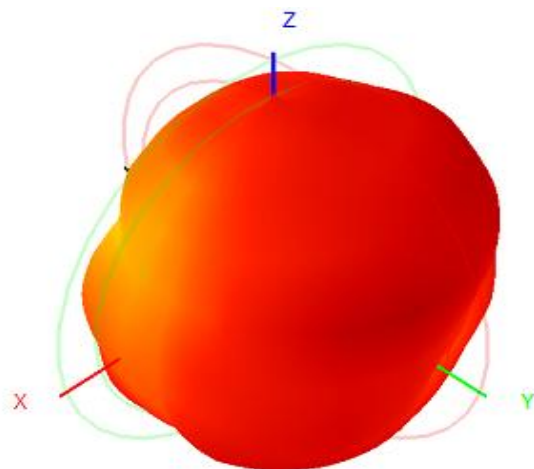


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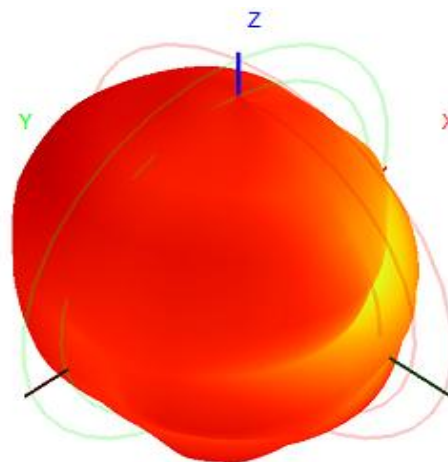


七. 辐射方向图 (Radiation pattern)

R -2450MHZ

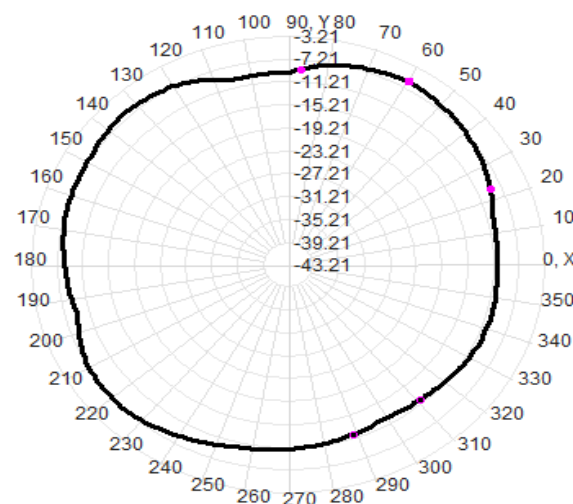
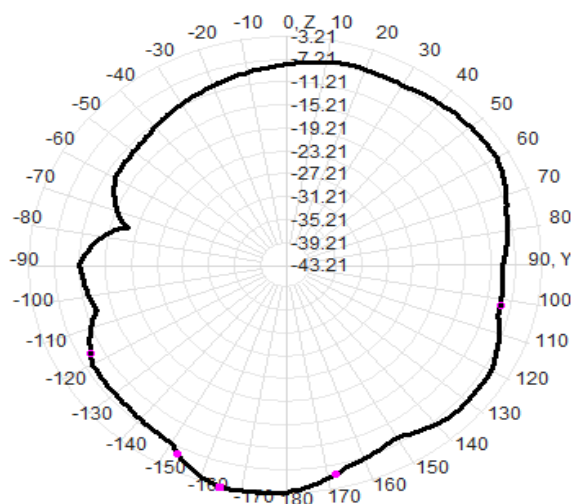
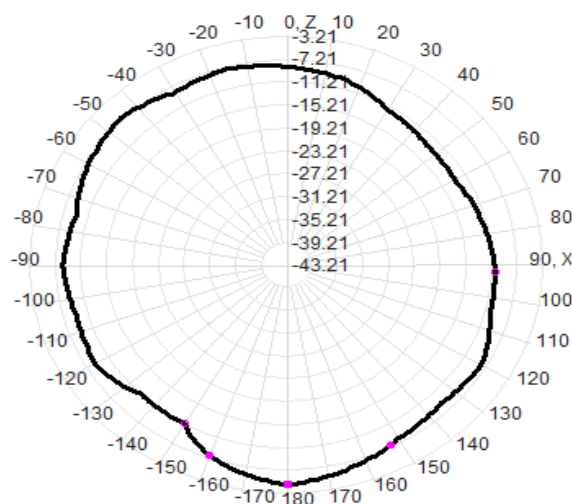


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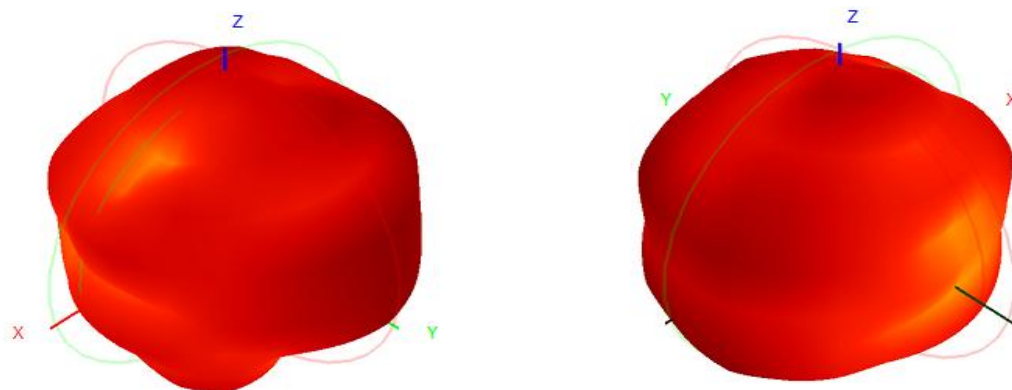
Total(E2-YZ)

Total(H-XY)

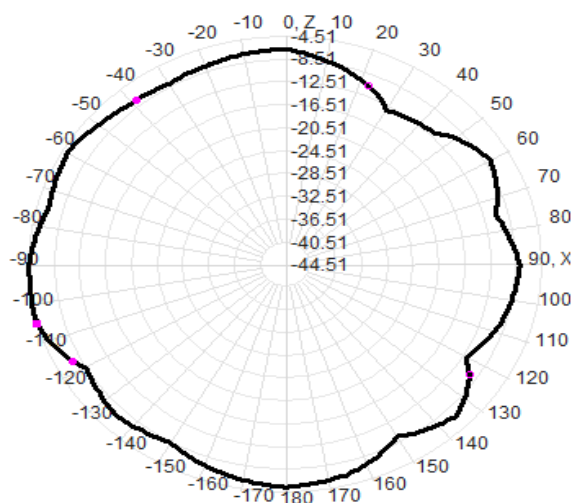


七. 辐射方向图 (Radiation pattern)

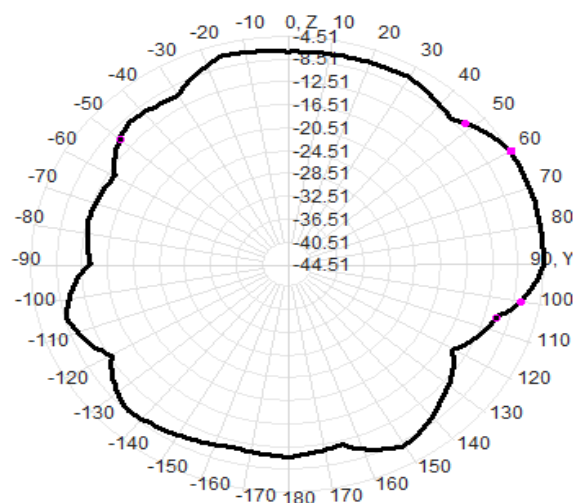
L -2500MHZ



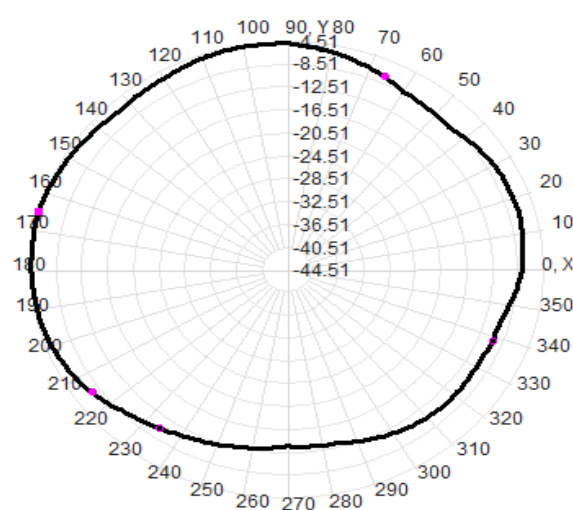
Total(E1-XZ)



Total(E2-YZ)

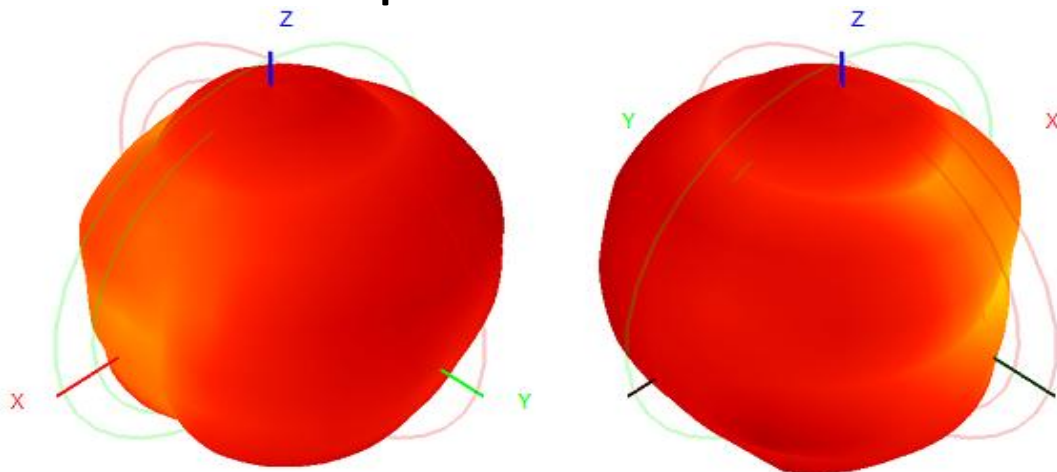


Total(H-XY)



七. 辐射方向图 (Radiation pattern)

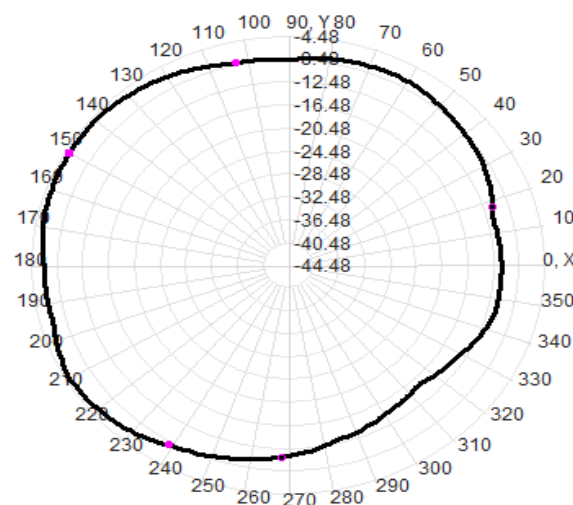
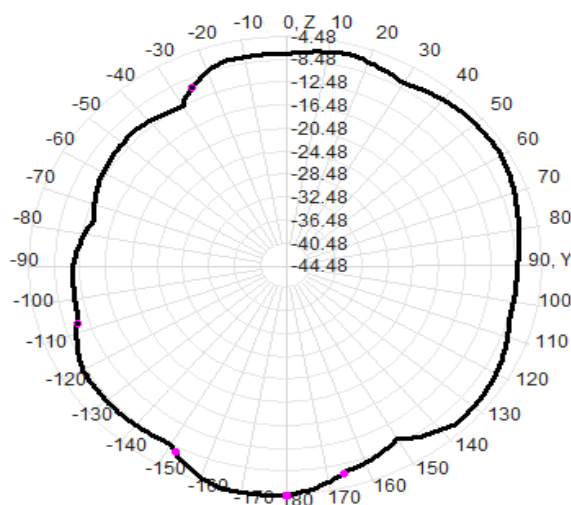
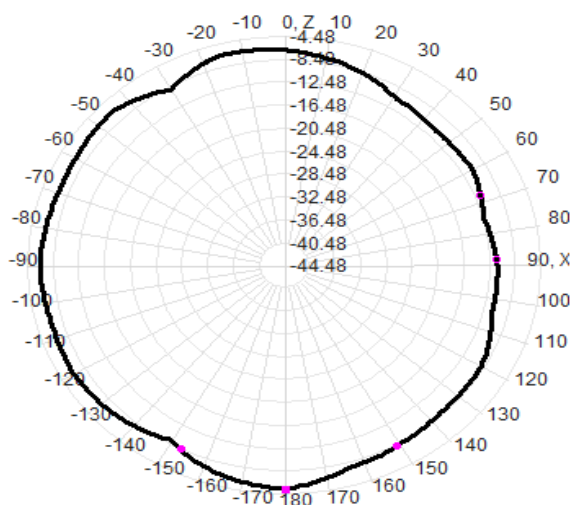
R -2500MHZ



Total(E1-XZ)

Total(E2-YZ)

Total(H-XY)



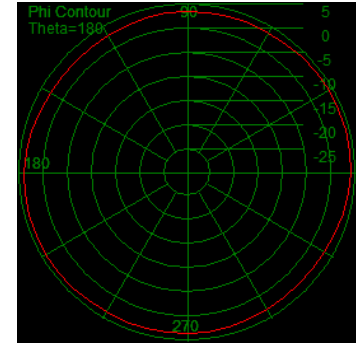
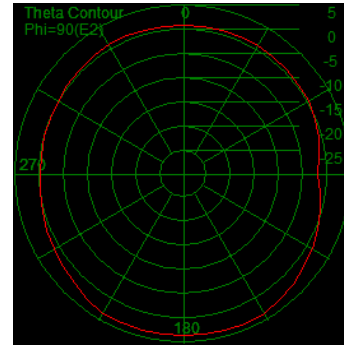
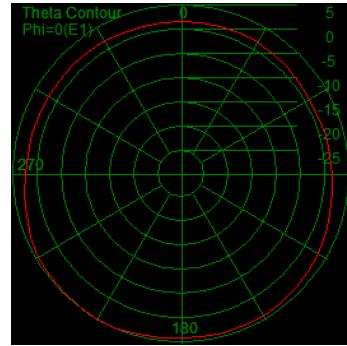
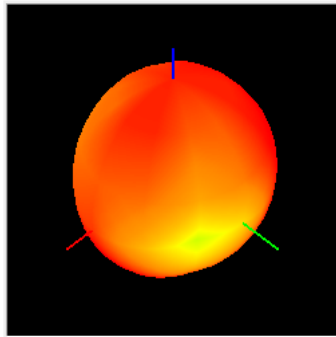
八. 无源效率、增益（Passive efficiency and gain）

2400MHZ-2500MHZ					
L			R		
Frequency (MHz)	Gain (dBi)	Efficiency (%)	Frequency (MHz)	Gain (dBi)	Efficiency (%)
2400	-3.75	16.15	2400	-5.65	10.84
2410	-3.32	17.40	2410	-4.63	11.87
2420	-3.06	17.64	2420	-3.86	12.85
2430	-2.80	18.37	2430	-3.27	13.97
2440	-2.86	18.22	2440	-3.03	14.94
2450	-3.07	18.05	2450	-3.09	15.32
2460	-3.54	17.54	2460	-3.25	15.44
2470	-3.81	17.18	2470	-3.38	15.67
2480	-4.00	16.56	2480	-3.33	15.63
2490	-4.08	15.85	2490	-3.20	16.32
2500	-4.15	15.27	2500	-3.36	16.22

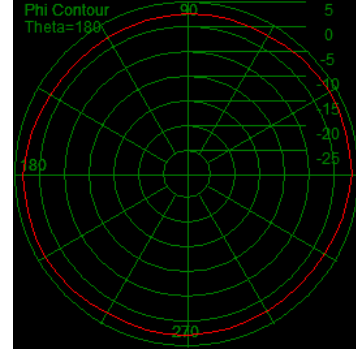
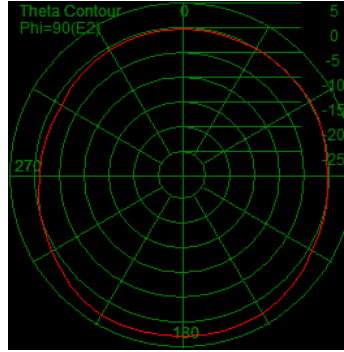
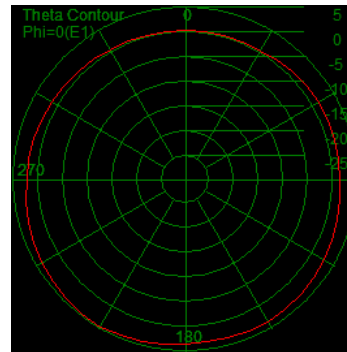
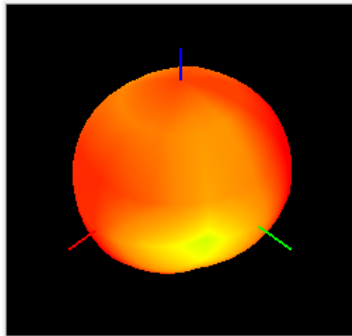
九.有源3D&2D场型图-L-自由空间-TRP

(Active 3D&2D field pattern -L- Free space -TRP)

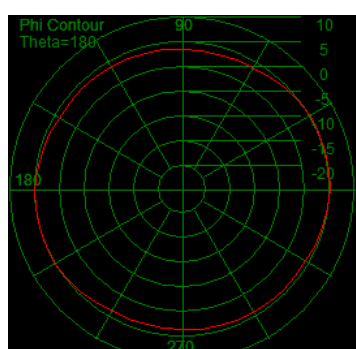
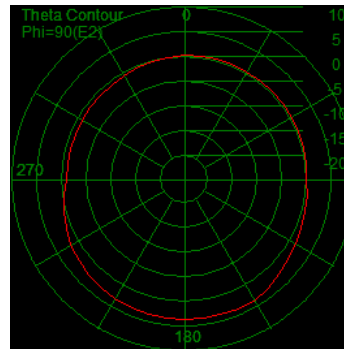
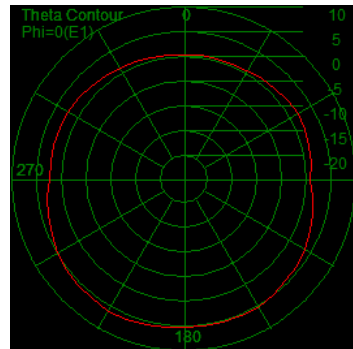
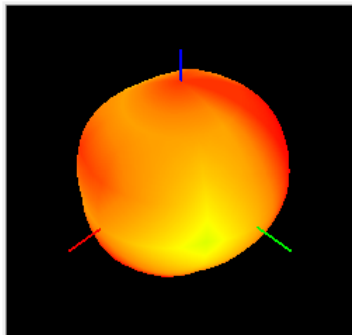
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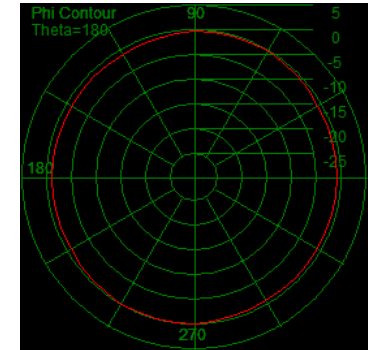
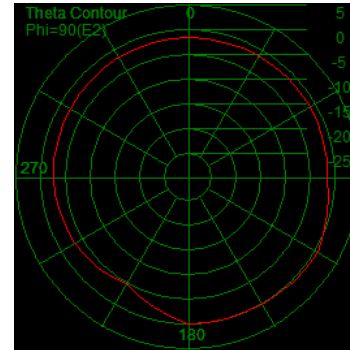
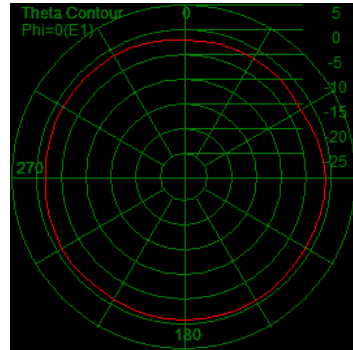
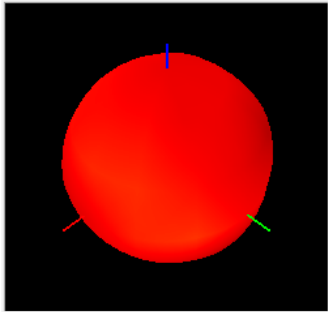
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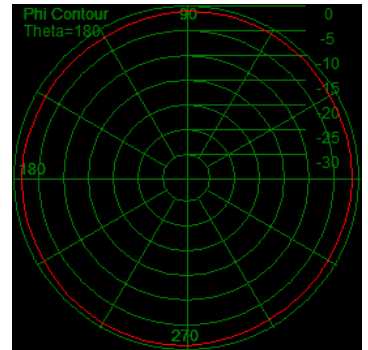
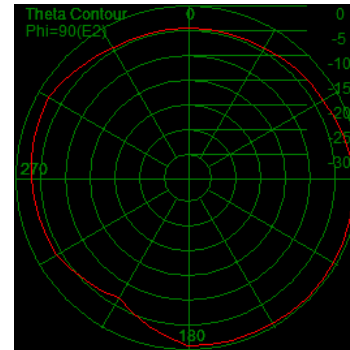
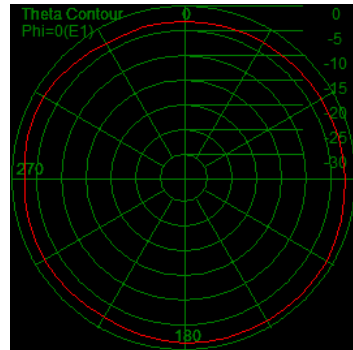
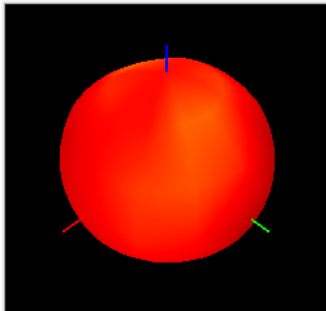
九.有源3D&2D场型图-R-自由空间-TRP

(Active 3D&2D field pattern -L- Free space -TRP)

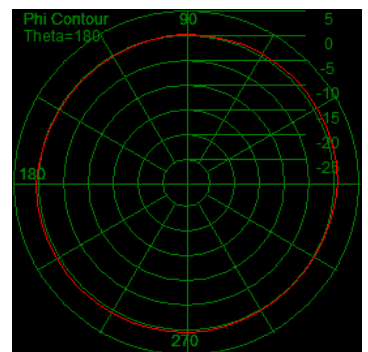
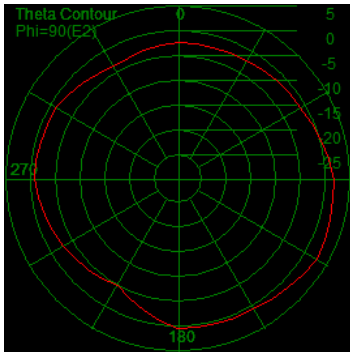
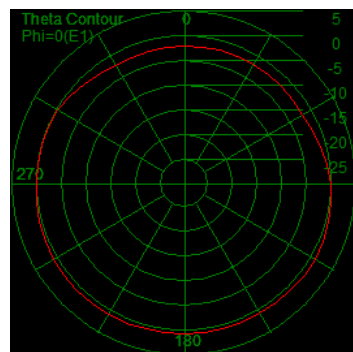
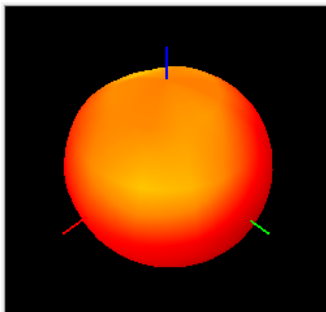
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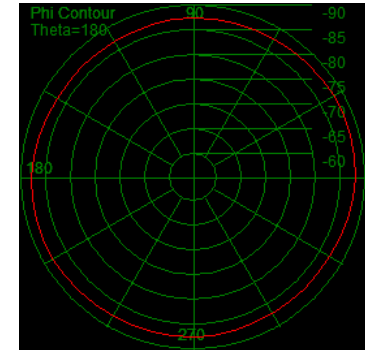
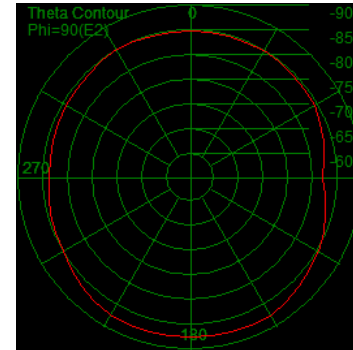
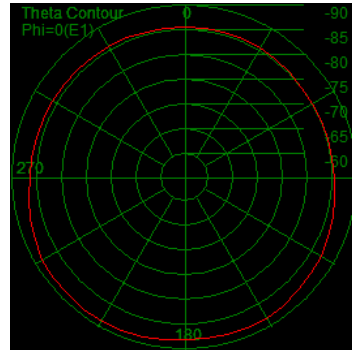
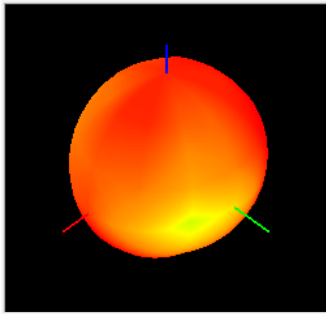
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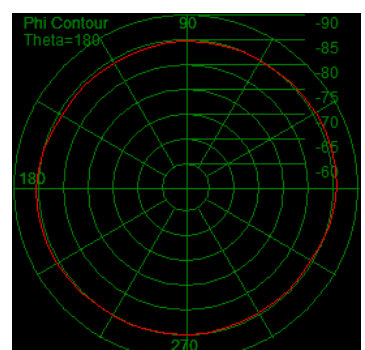
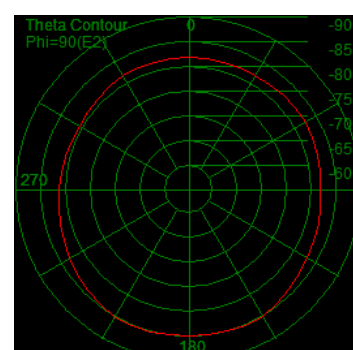
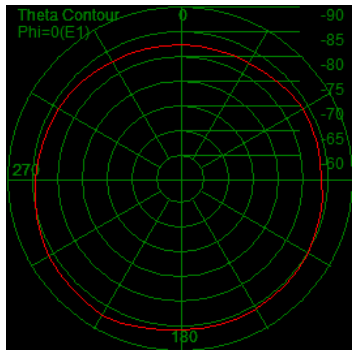
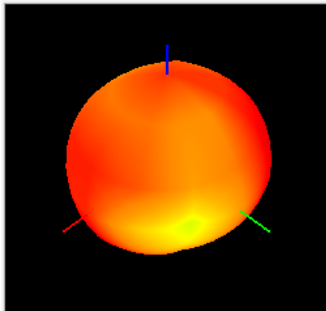
九.有源3D&2D场型图-L-自由空间-TIS

(Active 3D&2D field pattern -L- Free space -TIS)

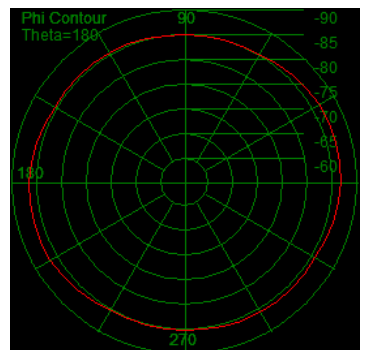
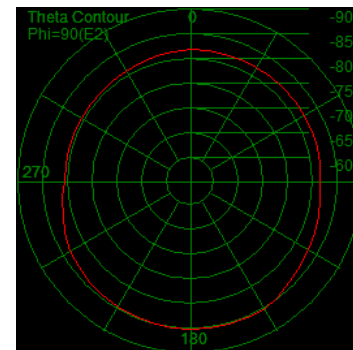
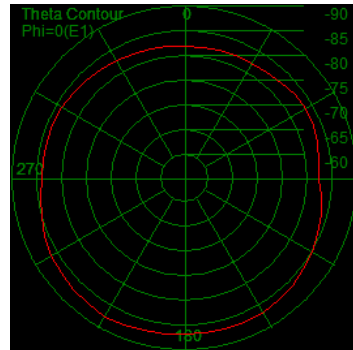
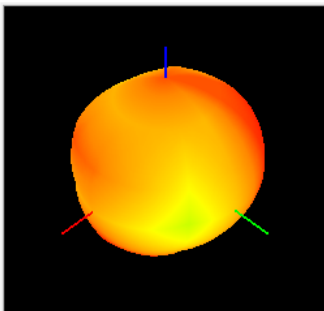
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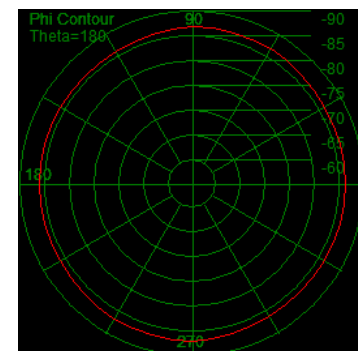
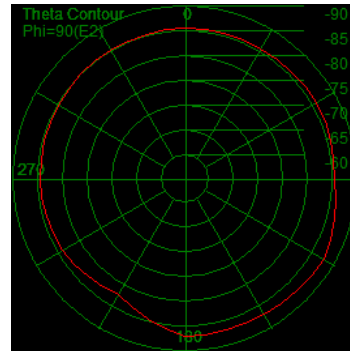
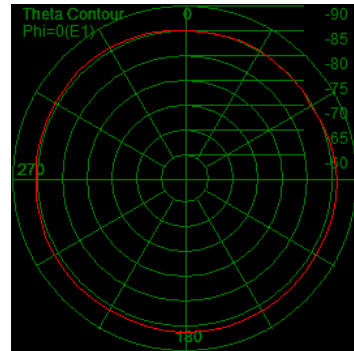
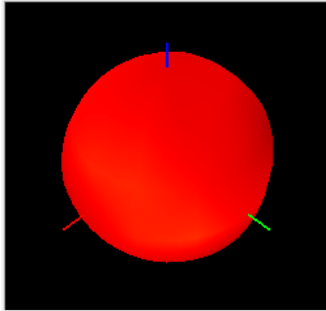
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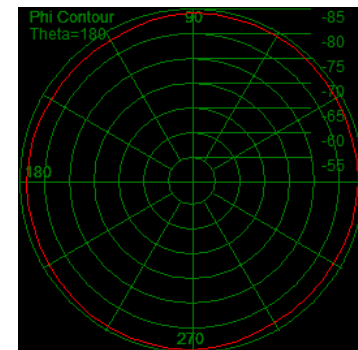
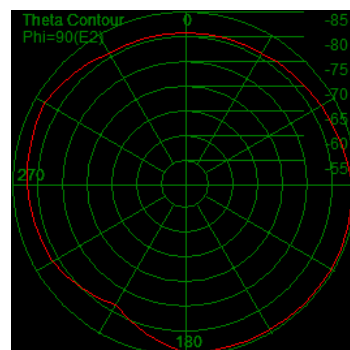
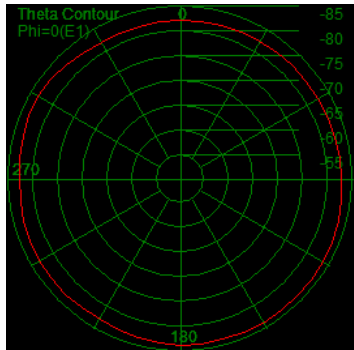
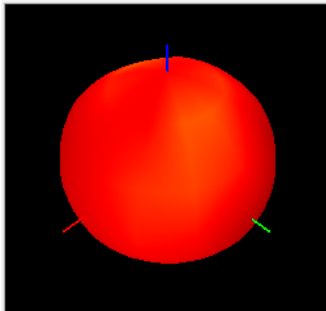
九.有源3D&2D场型图-R-自由空间-TIS

(Active 3D&2D field pattern -R- Free space -TIS)

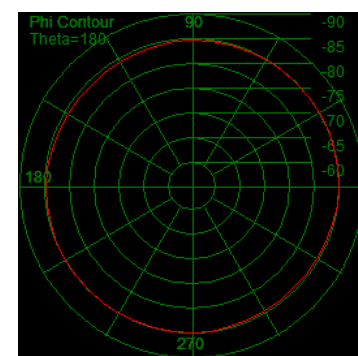
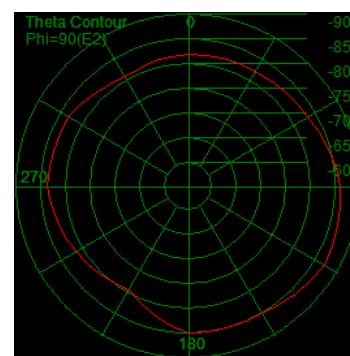
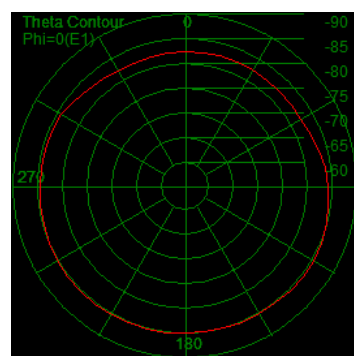
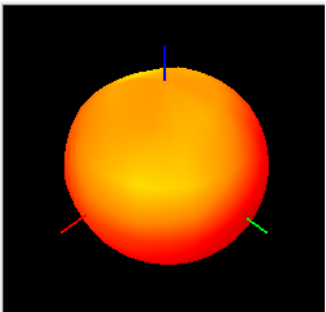
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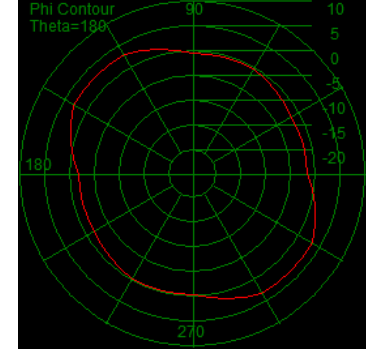
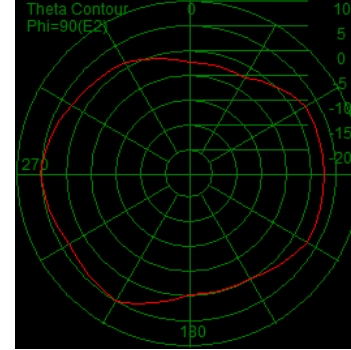
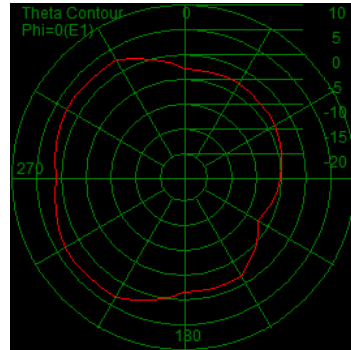
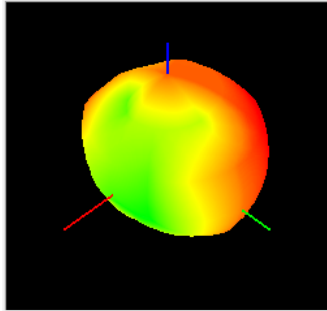
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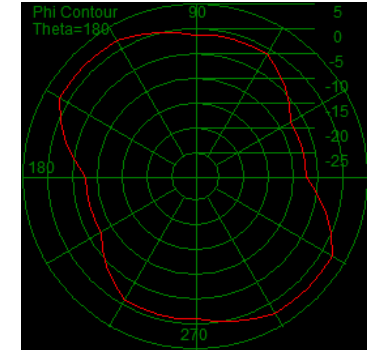
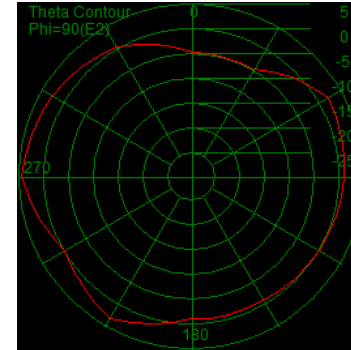
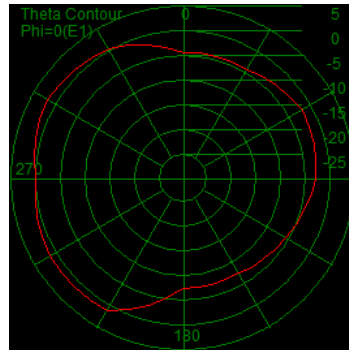
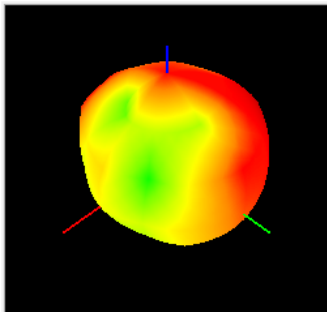
九.有源3D&2D场型图-L-头模-TRP

(Active 3D&2D field pattern -L- Head mold -TRP)

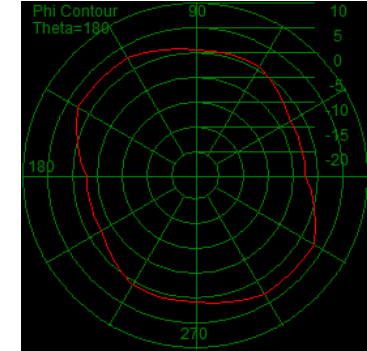
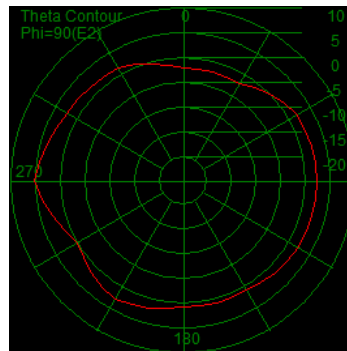
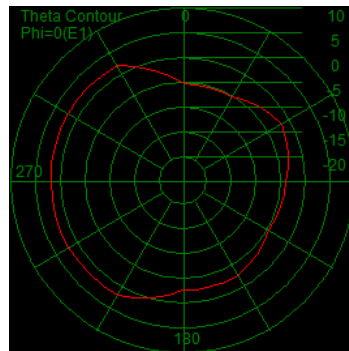
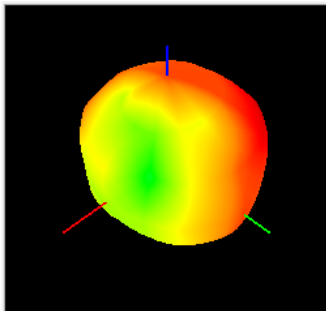
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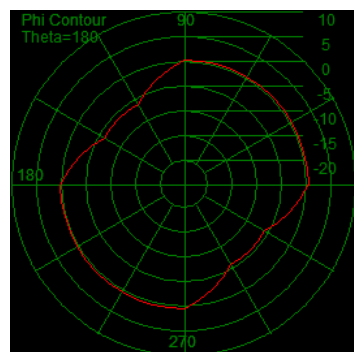
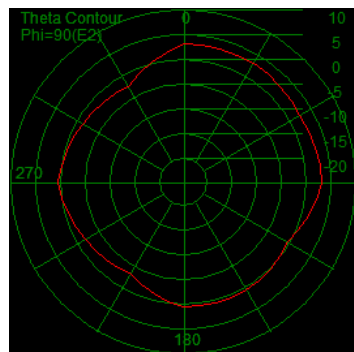
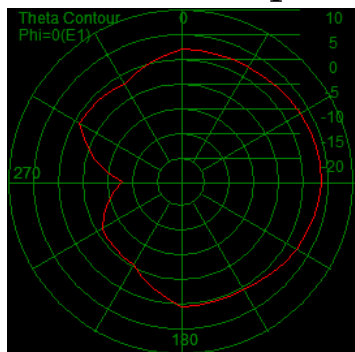
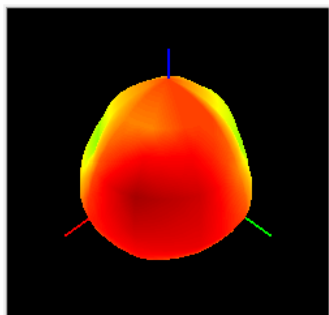
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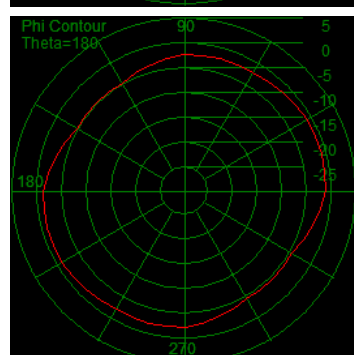
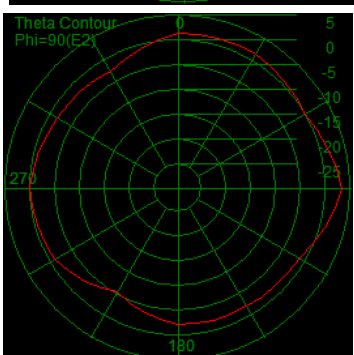
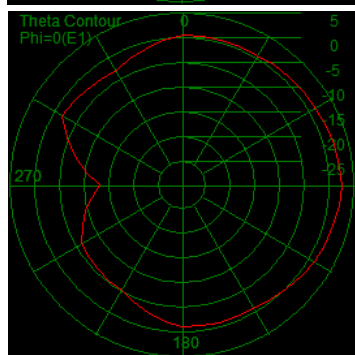
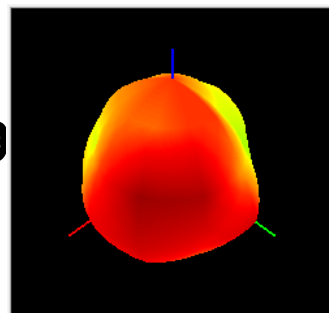
九.有源3D&2D场型图-R-头模-TRP

(Active 3D&2D field pattern -R- Head mold -TRP)

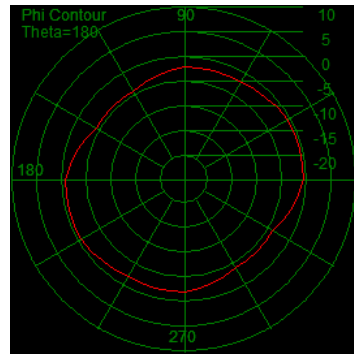
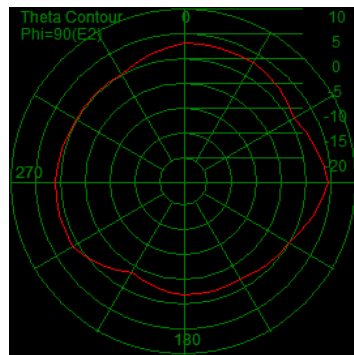
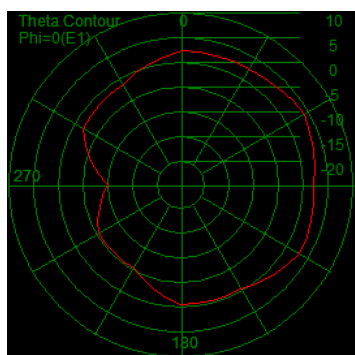
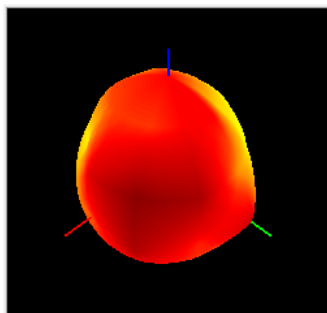
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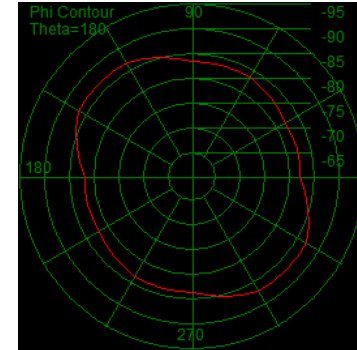
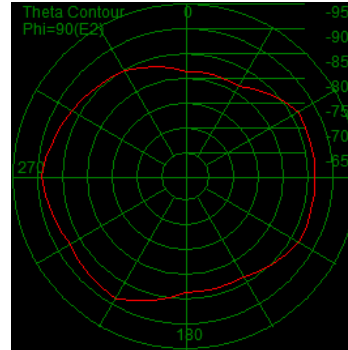
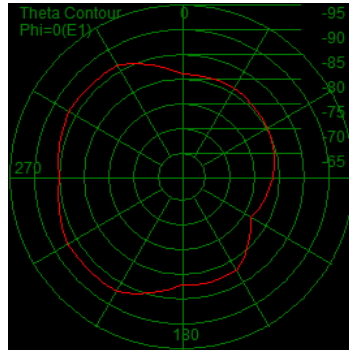
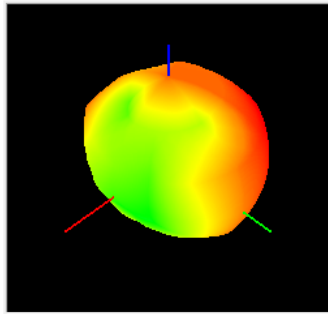
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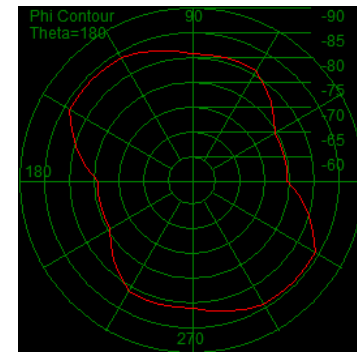
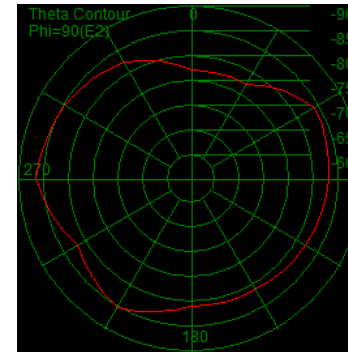
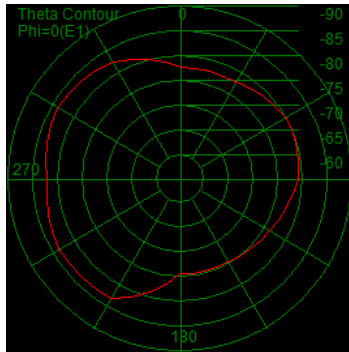
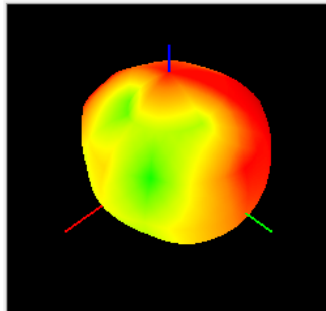
九.有源3D&2D场型图-L-头模-TIS

(Active 3D&2D field pattern -L- Head mold -TIS)

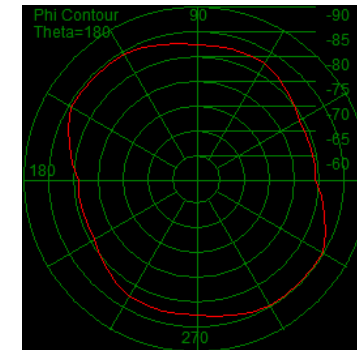
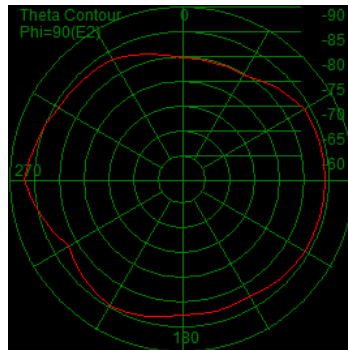
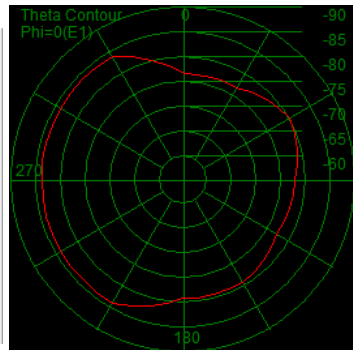
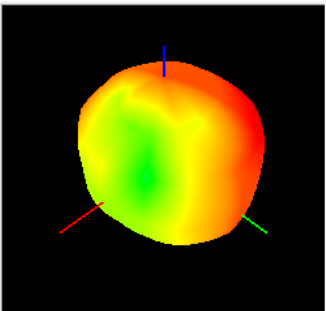
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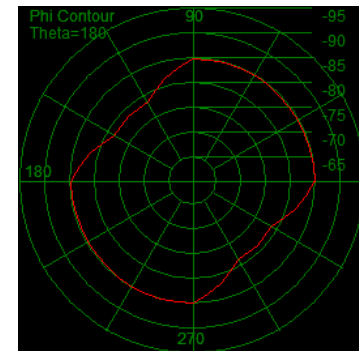
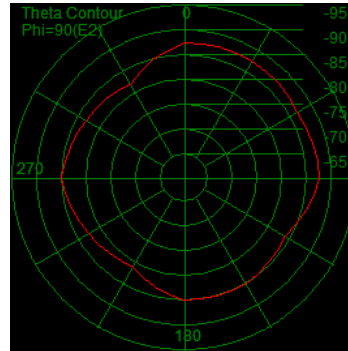
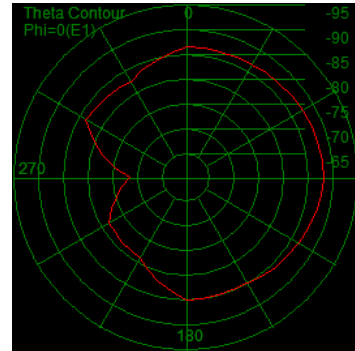
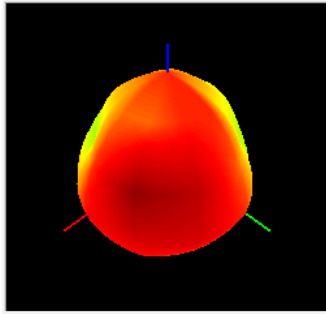
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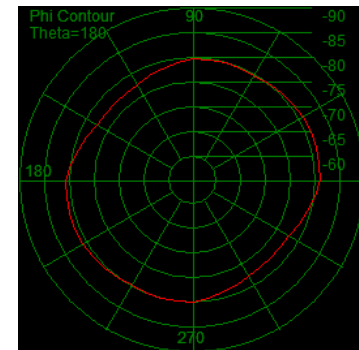
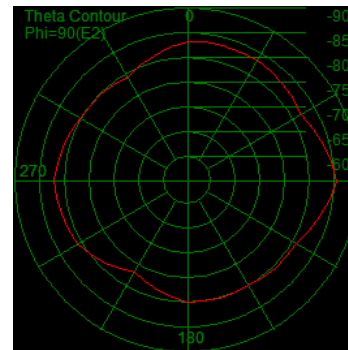
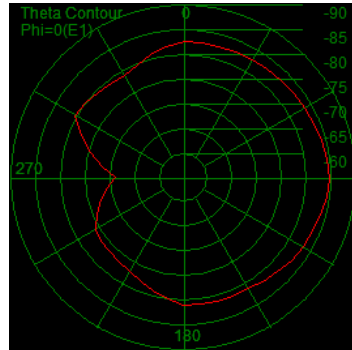
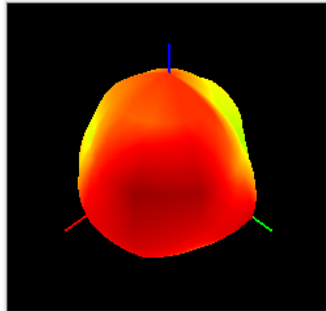
九.有源3D&2D场型图-R-头模-TIS

(Active 3D&2D field pattern -R- Head mold -TIS)

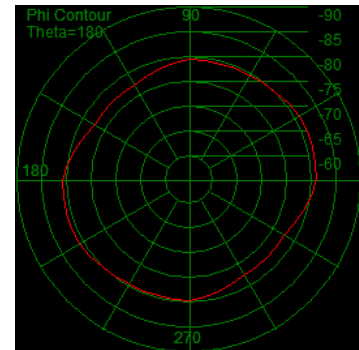
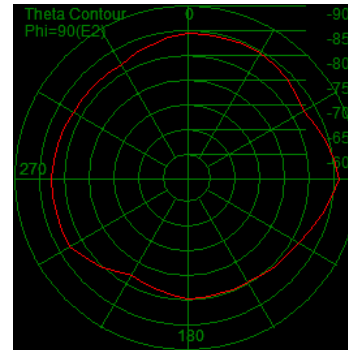
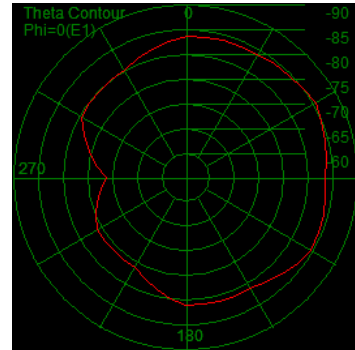
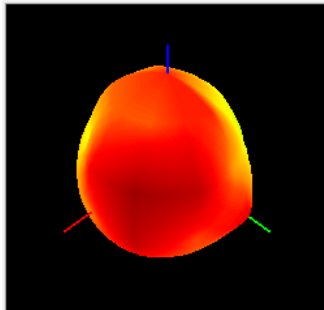
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十. OTA有源 (OTA active)

OTA有源					
Test Condition		自由空间		头模	
band	Channel	TRP (dBm)	TIS (dBm)	TRP (dBm)	TIS (dBm)
L	0	1.58	-85.55	1.49	-85.34
	39	1.21	-83.39	0.17	-82.16
	78	1.88	-83.42	0.91	-82.77
	0	-1.84	-85.25	0.15	-84.58
	39	-2.61	-82.58	-1.03	-81.02
	78	-0.48	-83.91	0.38	-81.88

十一. 抗干扰测试

深圳北候车厅抗干扰测试报告											
测试方式：左耳为主手机放右口袋，围着深圳北候车厅中间走一圈到服务台那计算卡顿次数											
测试人员	BMI值	测试手机	测试日期	样机	解码格式	手机放主耳同侧			手机放主耳对侧		
						走动（3分钟）			走动（3分钟）		
						卡顿次数	无声时长	杂音，断连异常	卡顿次数	无声时长	杂音，断连异常
李良	26.5	苹果17		R1330	默认	0	0	0	17	0	0
				Hi-2606A 1#	默认	0	0	0	7	0	0
				Hi-2606A 2#	默认	0	0	0	3	0	0
				Hi-2606A 3#	默认	0	0	0	6	0	0
李良	26.5	三星S23		R1330	默认	6	0	0	47	0	0
				Hi-2606A 1#	默认	2	0	0	15	0	0
				Hi-2606A 2#	默认	5	0	0	18	0	0
				Hi-2606A 3#	默认	3	0	0	17	0	0

十二. 拉距测试

拉距测试报告	
测试日期	2026.8.7
测试样机	R1330-HI2606A1# 2# 3#
测试人员	李良
测试场景	河边空旷区域，手机放置于支架上，离地面1M，充电口正对拉距方向。走动并360°缓慢转圈，测试到卡顿停止，开始计算有效距离。测试环境入下图： 

测试手机	解码格式	对比样机	2606A 1#	2606A 2#	2606A-3#
iPhone 17	AAC	45.5米	50.4米	50.9米	50.6米
Galaxy Z Flip6	AAC	40.4米	46.8米	48.1米	49.7米
Galaxy Z Flip6	APTX	37.6米	40.4米	41.2米	39.8米

十三. 触摸稳定性测试

case ID	测试项目	前置条件	操作步骤	预期结果	次数	测试结果 #1 样机	测试结果 #2 样机	测试结果 #3 样机	问题描述
001 TOUCH	触摸稳定性	耳机连接手机, 充电1分钟以上	1、取出耳机佩戴, 自动回连手机, 播放 2、交替操作触摸处(单击、双击、三击、长按), 确认每次是否可以有效识别 3、操作10次为一轮, 再入仓关盖充电1分钟后取出测试第二轮, 测5轮共50次	每次操作可以成功识别, 识别率>95%	50	PASS	PASS	PASS	
002 TOUCH	误触-充电后佩戴静音	耳机连接手机, 充电1分钟以上	1、耳机佩戴1分钟不做操作重复压测 10次	静音状态下, 触摸不会自动误触任何功能	10	PASS	PASS	PASS	
003 TOUCH	误触-充电后佩戴调整	耳机连接手机, 耳机入仓关盖, 充电1分钟以上	1、取出耳机佩戴, 自动回连手机, 播放 2、捏住耳机两边前后旋转调整佩戴角度和松紧 3、取下耳机放到桌面, 再拿起佩戴调整重复压测	取戴耳机/调整佩戴时, 不会误触任何功能	10	PASS	PASS	PASS	
004 TOUCH	误触-女生佩戴撩头发	女生佩戴测试, 耳机连接手机, 播放	1、头发盖在耳机面板上 2、头部左右晃动、低头、仰头, 使头发在耳机面板上摩擦 3、撩头发至耳后使头发在耳机面板上摩擦	触摸不会自动误触任何功能	10	PASS	PASS	不适用	
005 TOUCH	误触-耳机放背包/裤兜	开机将耳机放入背包/裤兜	1、耳机播放状态放入背包或者裤兜	不会被误触, 识别率>95%	10	PASS	PASS	PASS	
006 TOUCH	稳定性-低温环境	耳机放入冰箱冷冻室10分钟以上	1、取出耳机佩戴, 自动回连手机, 播放 2、交替操作左右耳的触摸30次(单击、双击、三击、长按), 确认每次是否可以有效识别	每次操作可以成功识别, 识别率>95%	30	PASS	PASS	PASS	
007 TOUCH	稳定性-汗液环境	手指沾人工汗液打湿, 再操作触摸	1、取出耳机佩戴, 自动回连手机, 播放 2、交替操作左右耳的触摸30次(单击、双击、三击、长按), 确认每次是否可以有效识别	每次操作可以成功识别, 识别率>95%	30	PASS	PASS	PASS	过期汗液
008 TOUCH	稳定性-手沾水环境	手指沾水打湿, 再操作触摸	1、取出耳机佩戴, 自动回连手机, 播放 2、交替操作左右耳的触摸30次(单击、双击、三击、长按), 确认每次是否可以有效识别	每次操作可以成功识别, 识别率>95%	30	PASS	PASS	PASS	

Thank you

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- RF: 李良 18770406282