

SPECIFICATION

深圳市大显科技有限公司

Shenzhen Daxian Technology Co., Ltd.

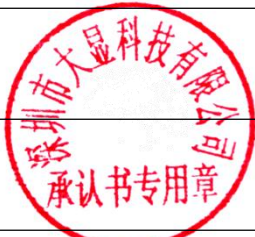


通力 M4 BT 天线组件

Tonly M4 BT Antenna assembly

产 品 规 格 书

Product Specification

客 户 connection	通力 Tonly	频 段 frequency range	2400~2500MHz
项目名称 entry name	M4	版 本 edition	V5.6
物料编号 Material No	1T-LM4XX-152	颜 色 Color	黑色 Black
客户料号 Customer Item Number			
环保要求 environmental requirement			
	☒ RoHS ☒ REACH		
R F 设计 R F Design	胡 鹏 Peng.Hu	结构设计 Structural Design	周锐斌 Rui Bin.Zhou
品质经理 Quality Manager	李高亮 GaoLiang.Li	技术总监 Technical Director	张 磊 Lei.Zhang
日 期 Date	2026-06-25		

客户确认:

Customer confirmation:

装配是否符合贵司要求: ☐OK ☐NGWhether the assembly meets your company's requirements: ☐OK ☐NG

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变更履历

Revision history

[illegible]

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一 项目说明 Project Description

客户名: Customer Name:	通力 Tonly
整机类型: Type of complete machine:	头戴式蓝牙耳机 Headband Bluetooth Headset
天线频段: Antenna band:	2400~2500MHz
天线形式: Antenna form:	FPC+同轴线 FPC+coaxial line
馈电形式: Feed form:	焊接 weld
硬件版本: Hardware version:	/

二 BT 天线组件 Antenna assembly

1 规格 specifications

本报告主要提供 M4 项目天线的各项电气和结构性能参数的测试状况。下图为大显设计的天线图片。

This report mainly provides the testing status of various electrical and structural performance parameters of the antenna for the M4 project. The following image shows an antenna with a large display design.



天线外观图

antenna appearing diagram

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1.1 电气规格标准 Electrical specifications and standards

1.1.1 电性能指标 Electrical performance index

天线工作频段在 2400 ~ 2500 MHz。下表是大显设计和量产天线的电性能的指标。

The operating frequency band of the antenna is between 2400 and 2500 MHz. The following table shows the electrical performance indicators of large display design and mass production antennas.

Frequency Range	Frequency (MHz)	VSWR
BT	2400 ~2500	≤ 2

1.1.2 整机环境处理 Unit Environmental Conditioning

2 结构规格标准 Structural specifications and standards

1.2.1 天线组成 Antenna composition

天线主要是由 FPC+同轴线 组成。

The antenna is mainly composed of FPC + coaxial cable .

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2、测试设备 The Equipment of Active Test

Satimo 3D Chamber $4 \times 4 \times 4$ (m)

CMW500 E5071C

Network analyzer-R&S ZVL

图 2

Figure 2

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3 测试 test

3.1 驻波(VSWR)的测试 Test of standing wave (VSWR)

3.1.1 测试连接: VSWR 测试装置依次连接为: R&S ZVL 网络分析仪 → 测试线 → 测试治

Test connection: The VSWR test device is sequentially connected as follows: R&S ZVL network analyzer → test line → test fixture

实测(附图)Actual measurement (attached drawing)

3.2 增益及效率、功率 (TRP)、灵敏度 (TIS) 的测试

Gain and efficiency, power (TRP), sensitivity (TIS) testing

3.2.1 测试的场地 Test site:

大显微波暗室。测试频率范围为 400MHz—6GHz, 静区范围为 50cm 圆周, 反射率小于 -50 dB。

Large display microwave anechoic chamber. The test frequency range is 400MHz - 6GHz, the static zone range is 50cm circumferential, and the reflectivity is less than - 50dB.

3.2.2 测试的仪表 Tested Instruments:

R&S ZVL 网络分析仪、CMW500 E5071C、标准喇叭天线、法国 SATIMO-SG24SYSTEM 系统、打印机等。

R&S ZVL network analyzer, Agilent 8960 E5515C, standard horn antenna, French SATIMO-SG24SYSTEM system, printer, etc.

3.2.3 测试数据: 在微波暗室中, 测试的功率和灵敏度相关的数值如下表

Test data: In a microwave anechoic chamber, the values related to the power and sensitivity tested are shown in the table below

OTA 有源测试 OTA active testing

自由状态			
BAND	CH	TRP	TIS
BT	0	3.17	-89.26
	39	4.49	-89.95
	78	3.41	-90.08
头模状态			
BAND	CH	TRP	TIS
BT	0	1.76	-87.41
	39	2.59	-88.06
	78	1.63	-87.38

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无源效率&增益 Passive efficiency&gain:

自由状态 free space

外圈接地-自由状态			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
2400	25.38	-5.95	-1.83
2410	27.09	-5.67	-1.09
2420	29.51	-5.3	-0.22
2430	31.1	-5.07	-0.05
2440	34.16	-4.66	-0.51
2450	36.77	-4.34	-0.8
2460	33.2	-4.78	-0.45
2470	32.89	-4.82	0.25
2480	32.17	-4.92	0
2490	31.85	-4.96	-0.9
2500	31.08	-5.07	-1.16

头模状态 Mannequin head status

外圈接地-头模状态			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
2400	17.17	-7.65	-2.01
2410	17.89	-7.47	-1.36
2420	18.92	-7.23	0.22
2430	20.23	-6.94	0.65
2440	21.3	-6.71	0.35
2450	22.37	-6.5	0.14
2460	21.85	-6.61	0.44
2470	20.02	-6.98	0.96
2480	19.86	-7.02	0.47
2490	18.75	-7.26	-0.75
2500	17.96	-7.45	-1.62

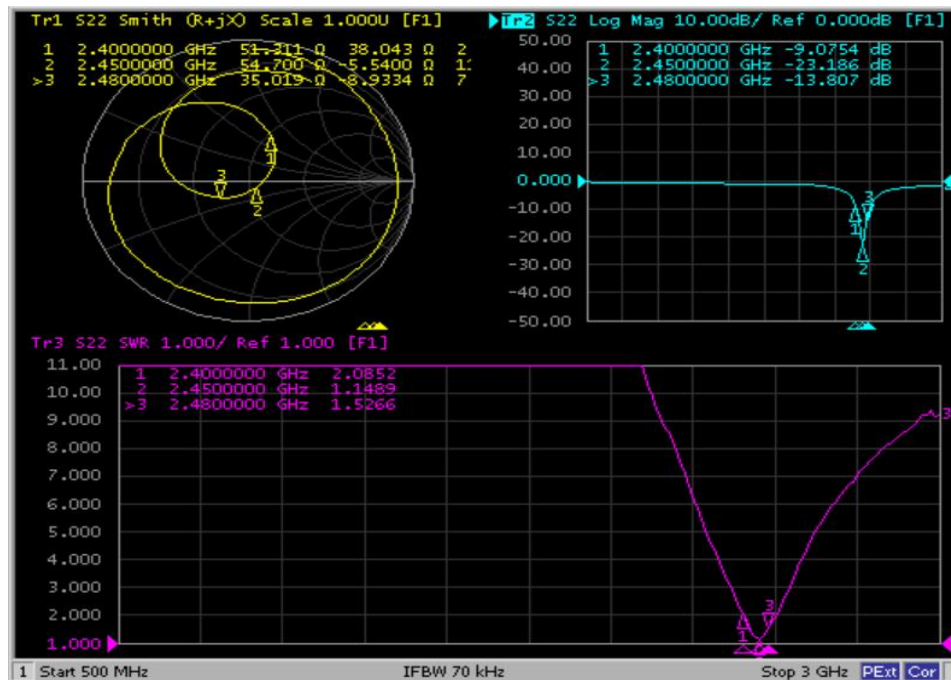
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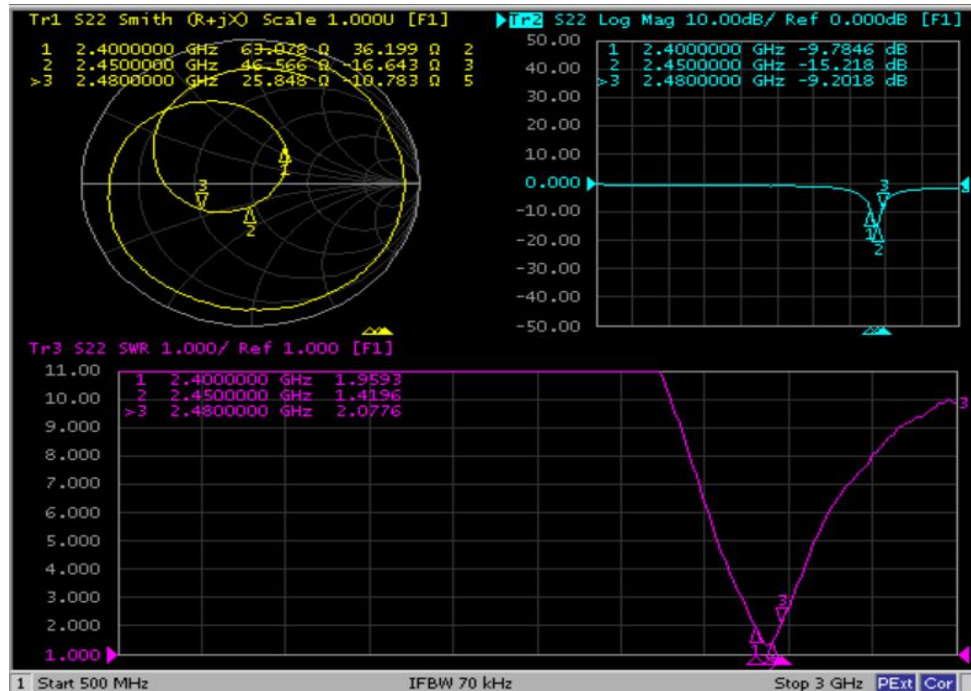
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4、VSWR 参数图 VSWR parameter diagram

自由状态 free space



头模状态 Mannequin head status

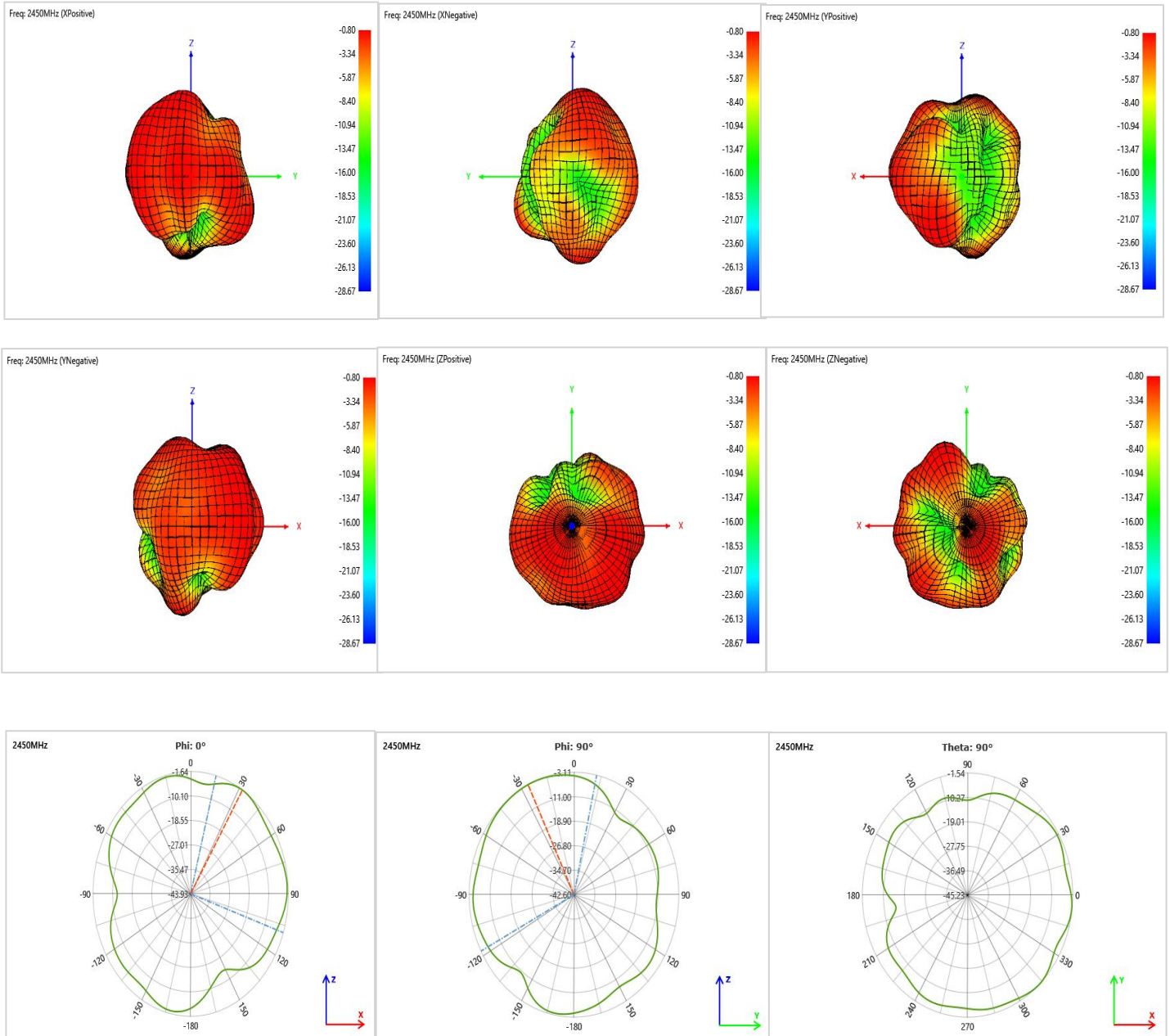


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5、无源场型图 Passive Field Pattern Diagram

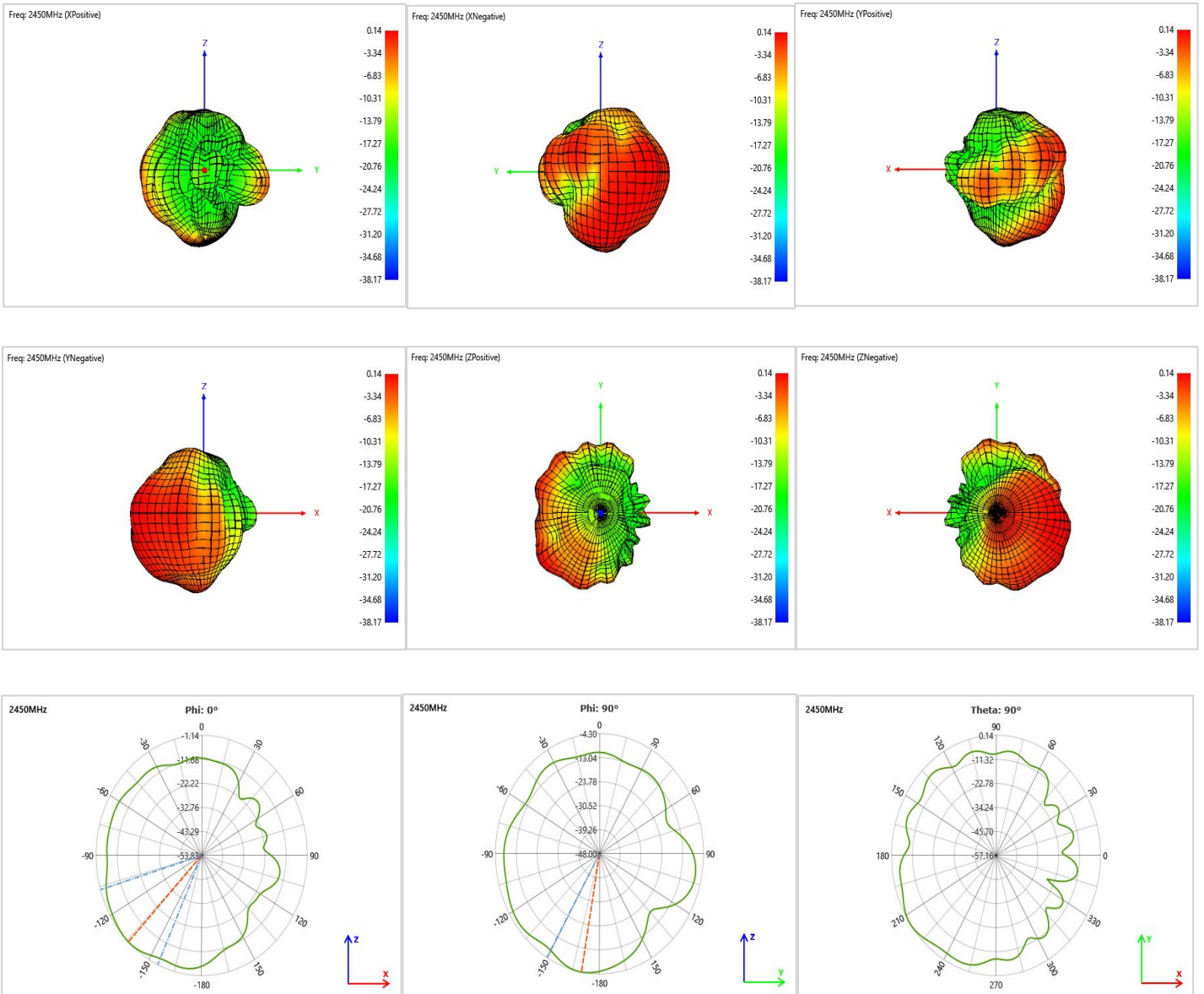
自由状态 free space



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头模状态 Mannequin head status

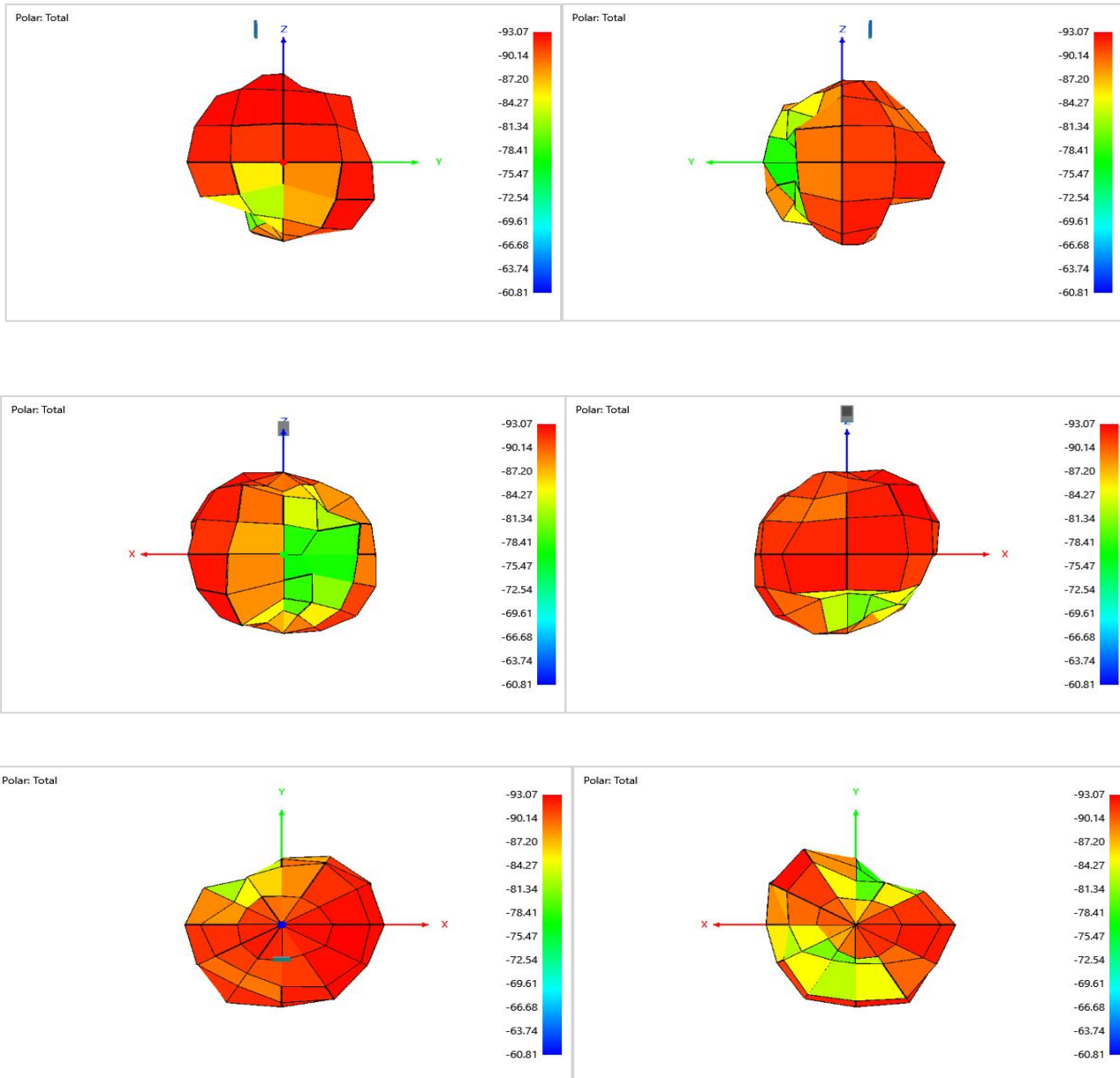


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6、有源场型图 Active Field Pattern Diagram

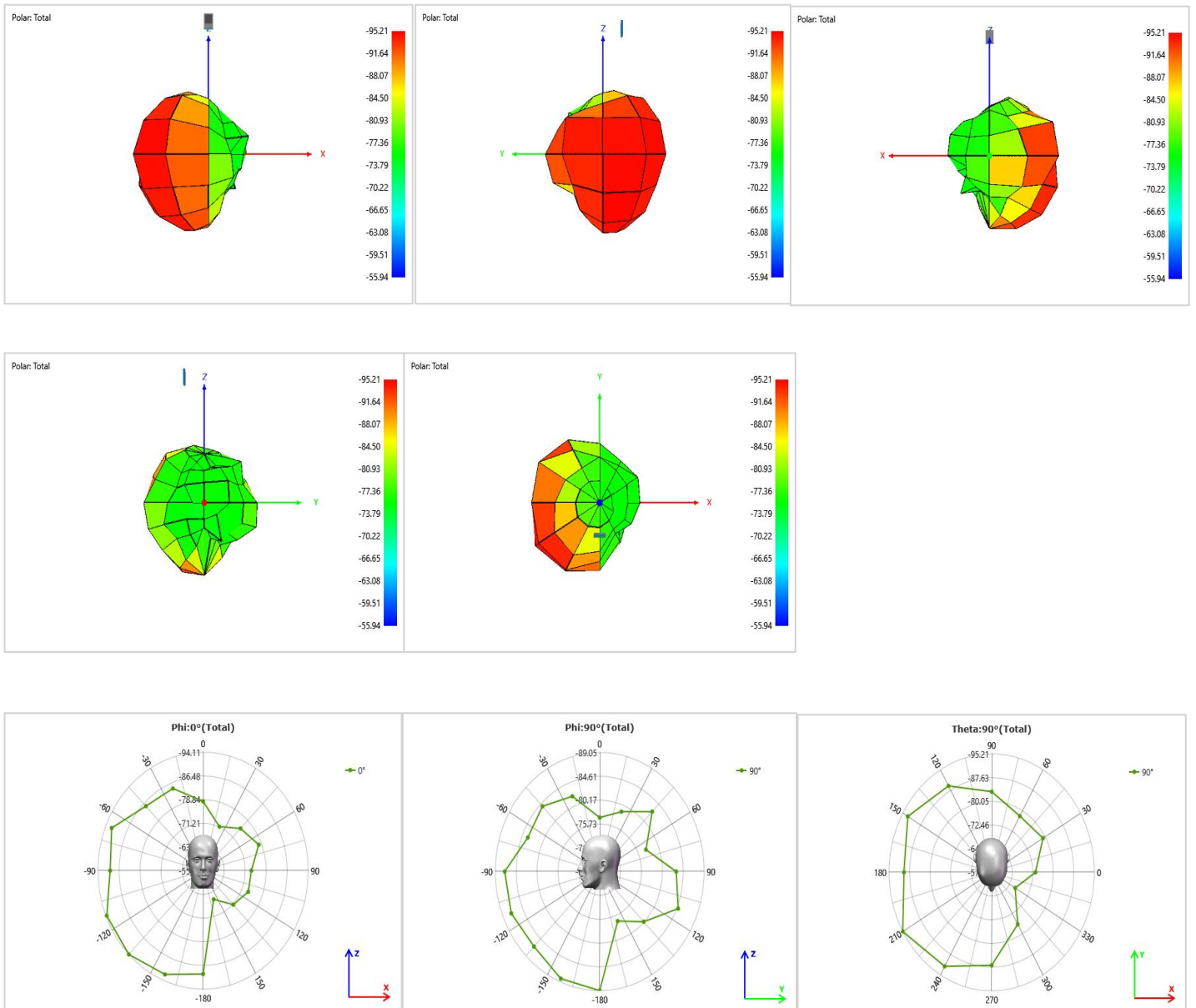
自由状态 free space



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头模状态 Mannequin head status



7、结论 conclusion

此天线是在客户提供样机基础上设计，电参数和结构性能已达到技术要求，请确认！

This antenna is designed based on the prototype provided by the customer. The electrical parameters and structural performance have met the technical requirements, please confirm!

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