SPECIFICATION

TOPANT

深圳市大显科技有限公司

Shenzhen Daxian Technology Co., Ltd.

晶讯 MH028 左耳蓝牙天线

Jing Xun MH028 Left Antenna

产 品 规 格 书

Product Specification

客 户 connection	晶讯 Jing Xun	频 段 frequency range	2402 ~ 2480MHz
项目名称 entry name	MH028	版 本 edition	V09
物料编号 Material No	1M-H028X-063-1	颜 色 Color	白色 White
客户料号 Customer Item Number	20.10.0051		
R F 设计 R F Design	靳 群 Jin.Qun	结构设计 Structural Design	周锐斌 RuiBin.Zhou
品质经理 Quality Manager	杨 进 Jin.Yang	技术总监 Technical Director	张 磊 Lei.Zhang
日 期 Date	2023-12-19		

深圳市大显科技有限公司 承认书专用章

客户确认：
Customer confirmation:

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

深圳市大显科技有限公司	Shenzhen DaXian Technology Co., Ltd.
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变更履历
Revision history

版本号 Version number	变更内容 Change content	变更理由 Reason for change	发起变更方 Originating Party	日期 Date	修改人 Modified by
V1.0	创建 found			2023-12-19	

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一 项目说明 Project Description

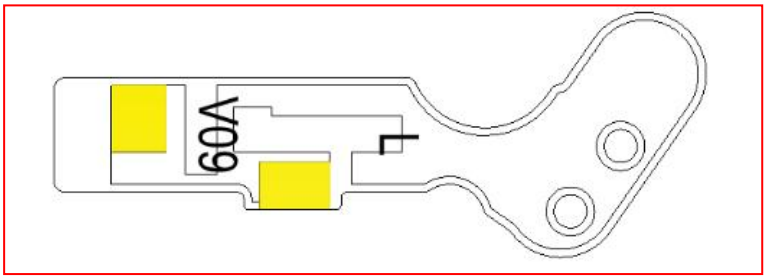
客 户 名： **Customer Name:**	晶讯 Jing Xun
整机类型： **Type of complete machine:**	蓝牙天线 Bluetooth antenna
天线频段： **Antenna band:**	2402 ~ 2480MHz
天线形式： **Antenna form:**	FPC 天线 FPC antenna
天线极性： **Antenna polarity:**	线性极化 Linear polarization
硬件版本： **Hardware version:**	主板：左耳 Motherboard: Right ear
天线制造商： **Antennamanufacturer:**	深圳市大显科技有限公司 Shenzhen daxian technology co., ltd
测试实验室： **Testing laboratory:**	SATIMO 微波实验室 SATIMO microwave laboratory

二 B T 天线组件 Antenna assembly

1 规格 specifications

本报告主要提供 MH028 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 MH028 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

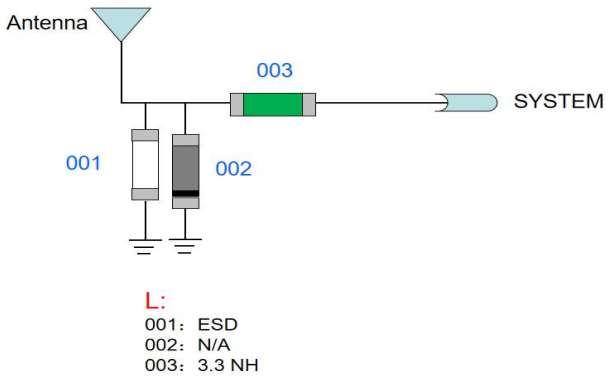
1.1.1 电性能指标 Electrical performance index

天线工作频段在 **2402~ 2480 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 2402 and 2480 MHz. The following table shows the electrical performance indicators of large display design and mass production antennas.

Frequency Range	Frequency (MHz)	VSWR
BT	**2402 ~ 2480**	**≤ 2**

1.1.2 匹配电路图 Match the circuit diagram



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 组成。

The antenna is mainly composed of FPC sponge.

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2、 测试设备 The Equipment of Active Test

Satimo 3D Chamber　6×4×4（ m ）

Agilent 8960 E5515c

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 测试装置依次的连接为：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 周圆，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、Agilent8960 E5515C、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 bel

OTA 有源测试 OTA Active Test：

自由空间						
MAC：	TRP			TIS		
	0	39	78	0	39	78
2C:BE:EB:9F:52:5E	9.27	9.89	10.34	-91.69	-92.29	-91.97

头模状态						
MAC：	TRP			TIS		
	0	39	78	0	39	78
2C:BE:EB:9F:52:5E	2.86	4	4.74	-85.37	-85.4	-85.28

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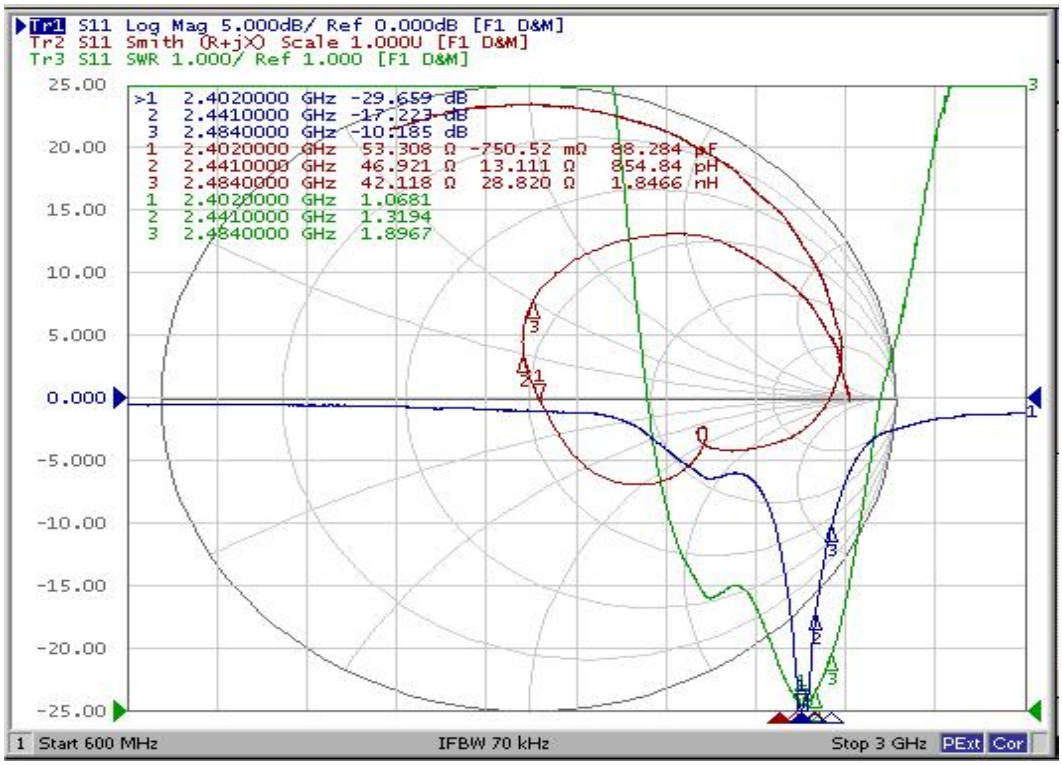
无源效率&增益 Passive efficiency&gain：

频率（MHZ）	效率（%）	平均增益（dB）	增益（dBi）
Frequency (MHz)	Efficiency (%)	AVG Gain (dB)	Gain (dBi)
2400	30.48%	-5.16	-0.29
2410	30.42%	-5.17	-0.37
2420	30.09%	-5.22	-0.55
2430	28.81%	-5.40	-0.62
2440	26.83%	-5.71	-0.8
2450	24.98%	-6.02	-0.94
2460	24.79%	-6.06	-0.53
2470	24.81%	-6.05	-0.61
2480	26.44%	-5.78	-0.12
AVG	27.52%	-5.62	-0.54

4、VSWR 参数图 VSWR parameter diagram



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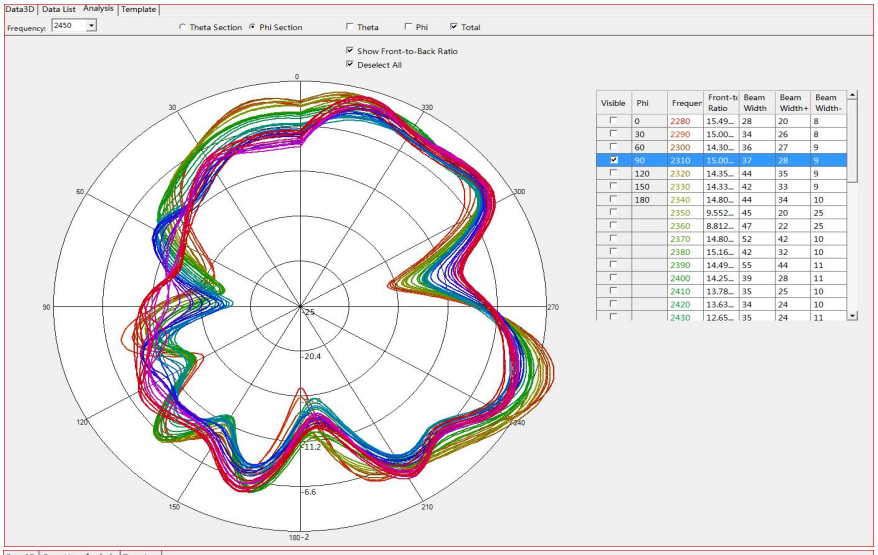
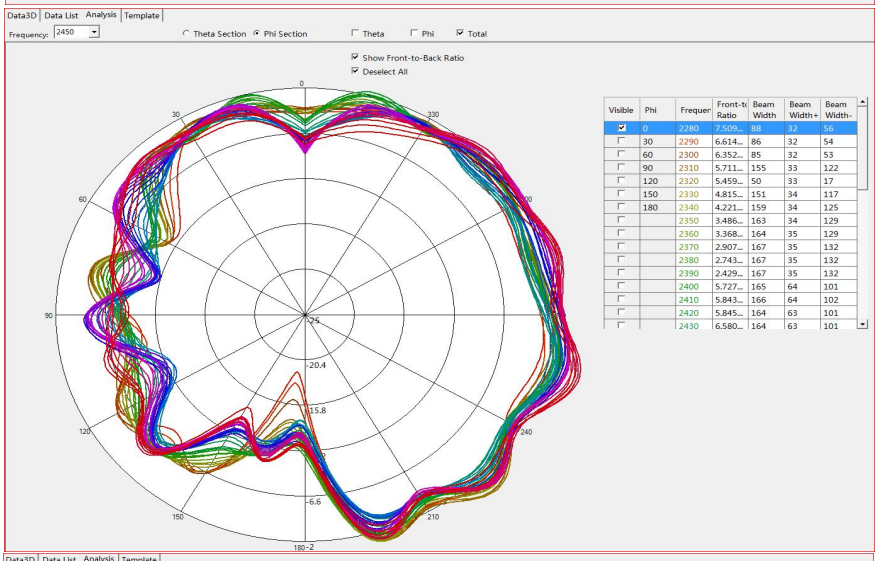
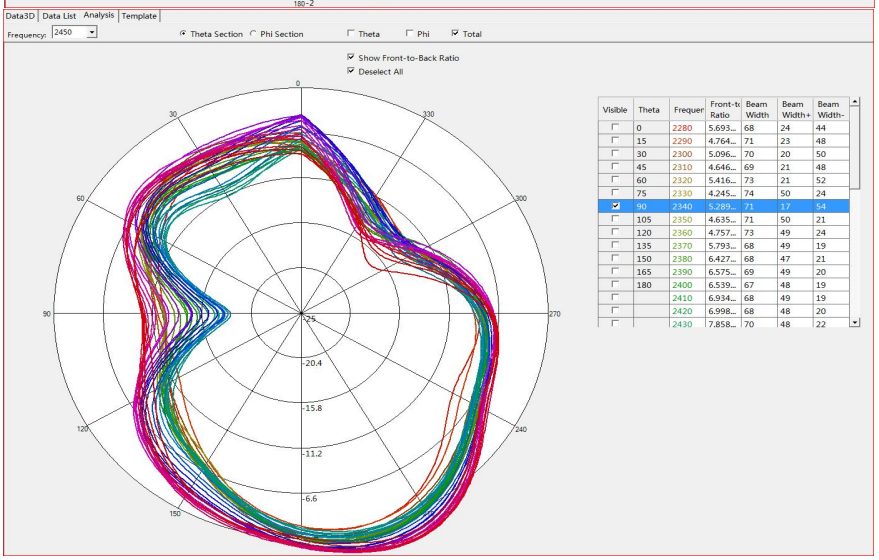
5、无源场型图 Passive Field Pattern Diagram



Visible	Phi	Frequer	Front-to Ratio	Beam Width	Beam Width+	Beam Width-
☐	0	2280	15.49...	28	20	8
☐	30	2290	15.00...	34	26	8
☐	60	2300	14.30...	36	27	9
☑	90	2310	15.00...	37	28	9
☐	120	2320	14.35...	44	35	9
☐	150	2330	14.33...	42	33	9
☐	180	2340	14.80...	44	34	10
☐		2350	9.552...	45	20	25
☐		2360	8.812...	47	22	25
☐		2370	14.80...	52	42	10
☐		2380	15.16...	42	32	10
☐		2390	14.49...	55	44	11
☐		2400	14.25...	39	28	11
☐		2410	13.78...	35	25	10
☐		2420	13.63...	34	24	10
☐		2430	12.65...	35	24	11



Visible	Phi	Frequer	Front-to Ratio	Beam Width	Beam Width+	Beam Width-
☑	0	2280	7.509...	88	32	56
☐	30	2290	6.614...	86	32	54
☐	60	2300	6.352...	85	32	53
☐	90	2310	5.711...	155	33	122
☐	120	2320	5.459...	50	33	17
☐	150	2330	4.815...	151	34	117
☐	180	2340	4.221...	159	34	125
☐		2350	3.486...	163	34	129
☐		2360	3.368...	164	35	129
☐		2370	2.907...	167	35	132
☐		2380	2.743...	167	35	132
☐		2390	2.429...	167	35	132
☐		2400	5.727...	165	64	101
☐		2410	5.843...	166	64	102
☐		2420	5.845...	164	63	101
☐		2430	6.580...	164	63	101



Visible	Theta	Frequer	Front-to Ratio	Beam Width	Beam Width+	Beam Width-
☐	0	2280	5.693...	68	24	44
☐	15	2290	4.764...	71	23	48
☐	30	2300	5.096...	70	20	50
☐	45	2310	4.646...	69	21	48
☐	60	2320	5.416...	73	21	52
☐	75	2330	4.245...	74	50	24
☑	90	2340	5.289...	71	17	54
☐	105	2350	4.635...	71	50	21
☐	120	2360	4.757...	73	49	24
☐	135	2370	5.793...	68	49	19
☐	150	2380	6.427...	68	47	21
☐	165	2390	6.575...	69	49	20
☐	180	2400	6.539...	67	48	19
☐		2410	6.934...	68	49	19
☐		2420	6.998...	68	48	20
☐		2430	7.858...	70	48	22

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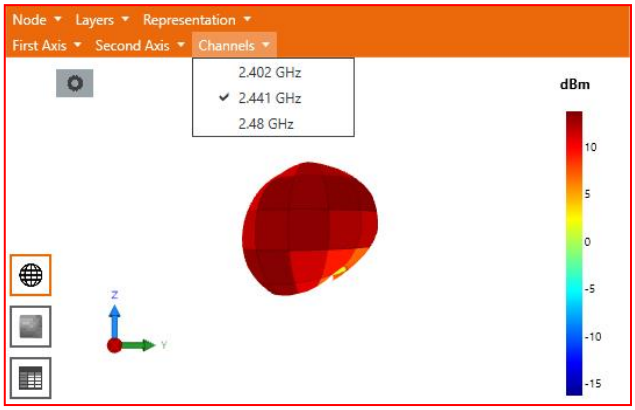
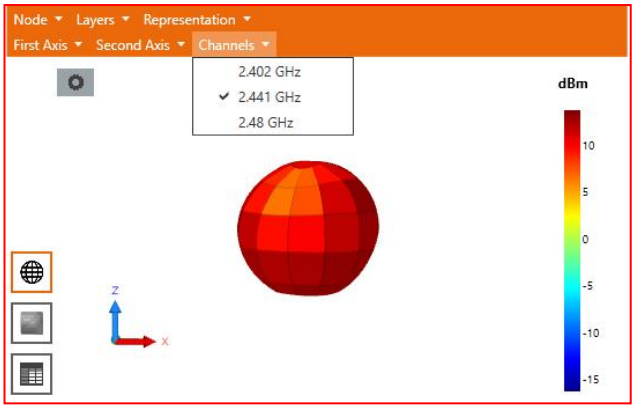
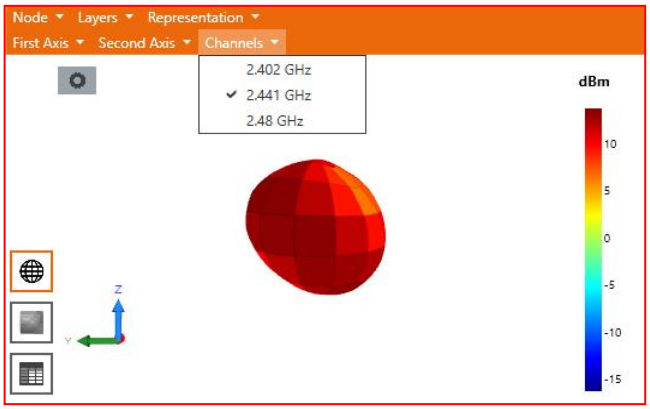
6、有源场型图 Active field pattern diagram

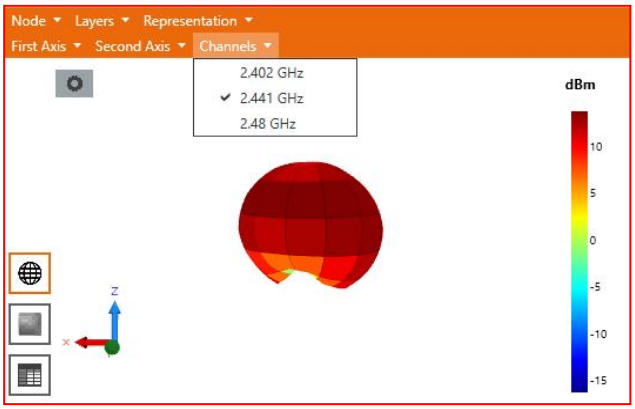
R 边--自由空间状态 R-edge-free space state：

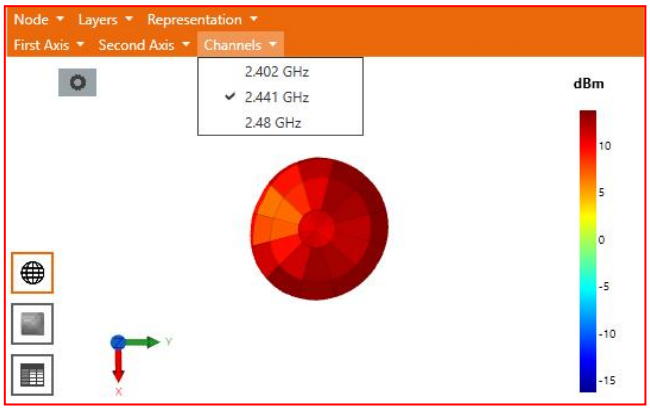
TRP:











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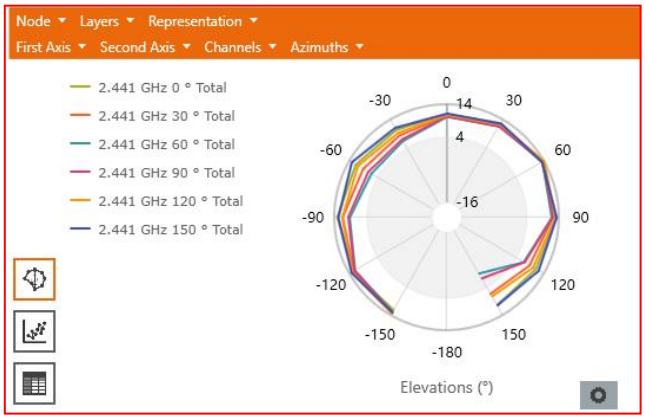

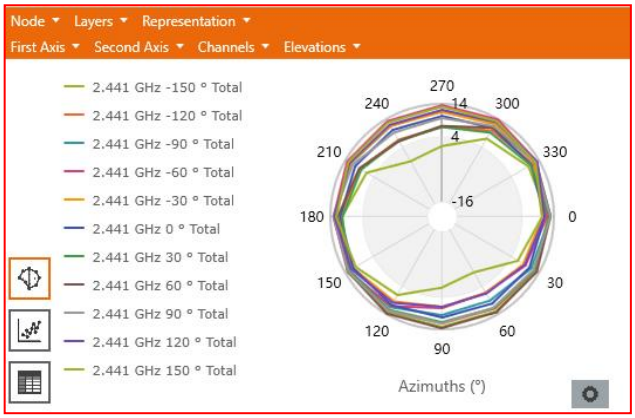

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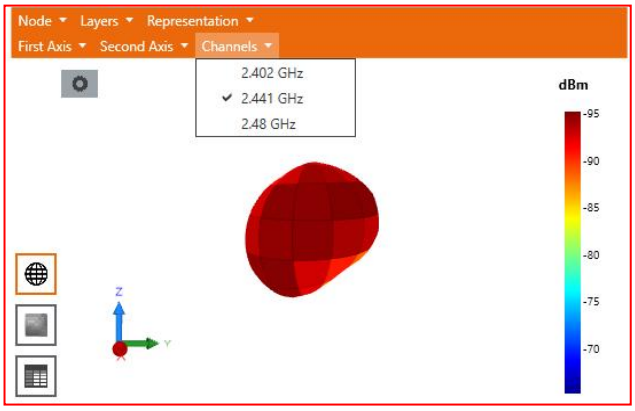

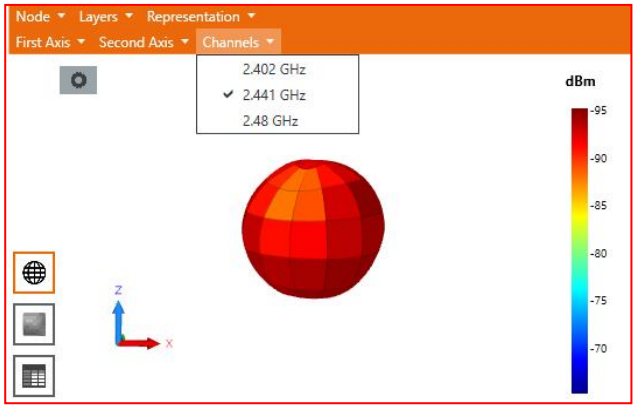

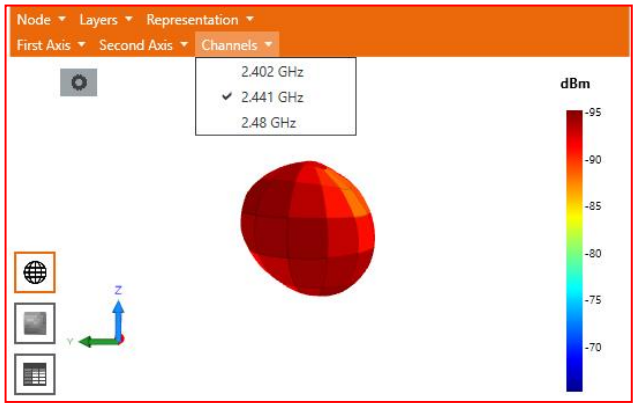

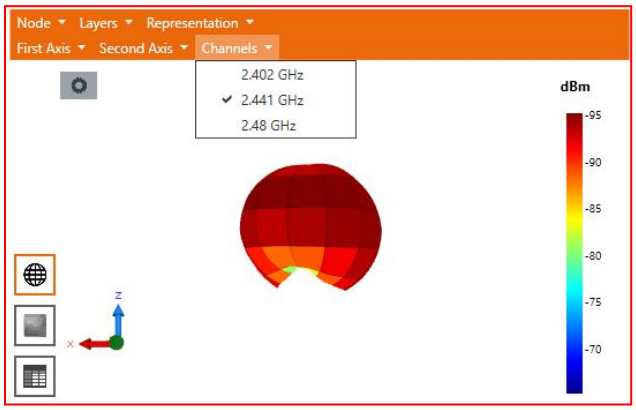

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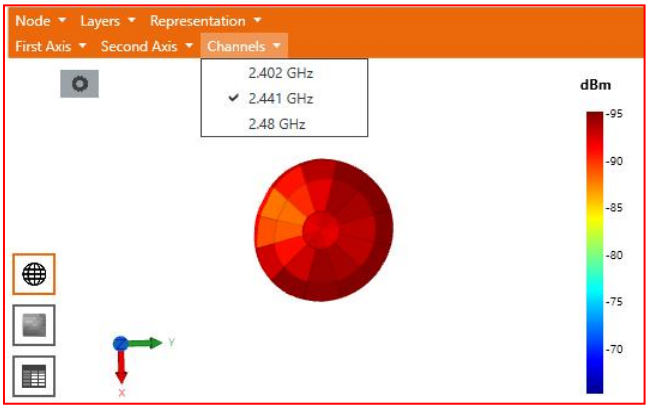
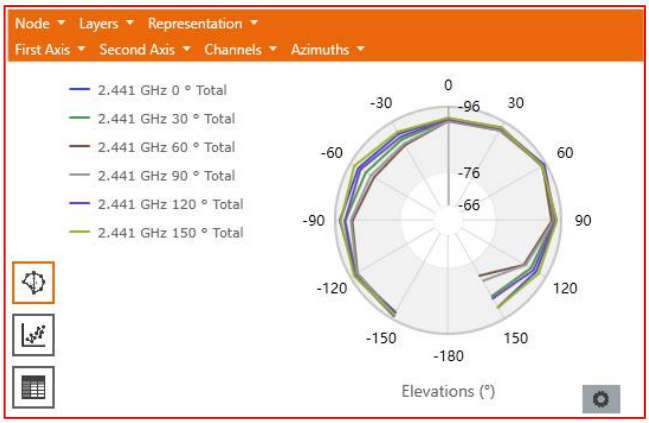
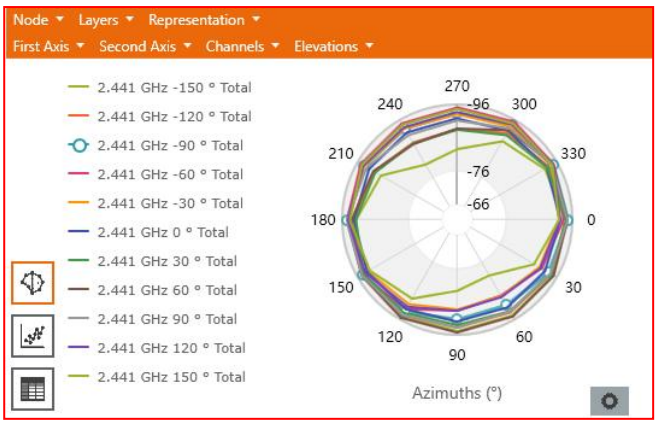
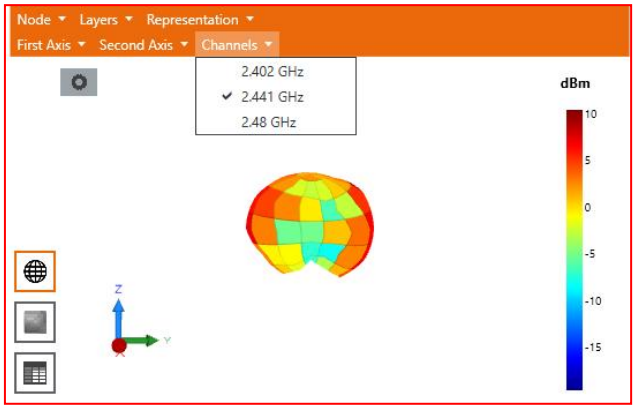


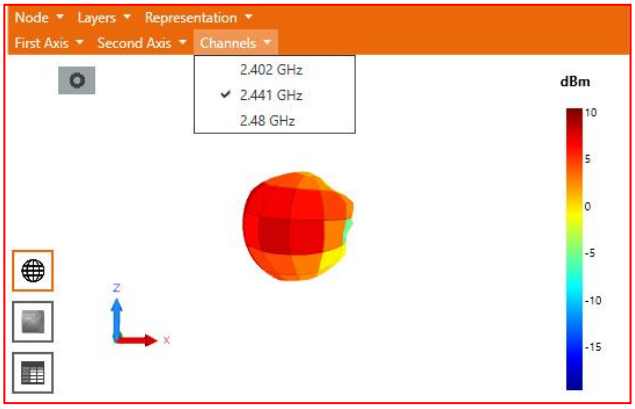




R 边--头模状态 R-edge-die state

TRP:





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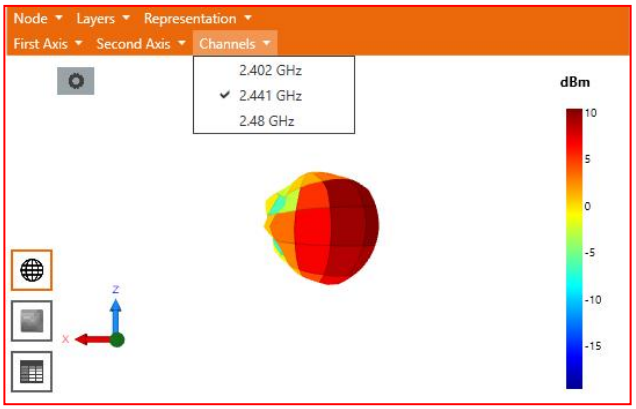
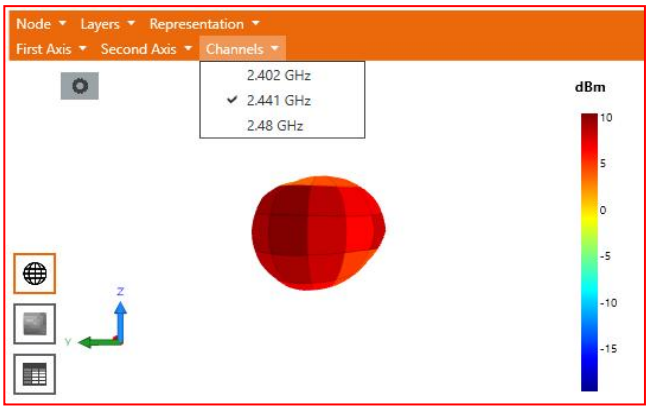
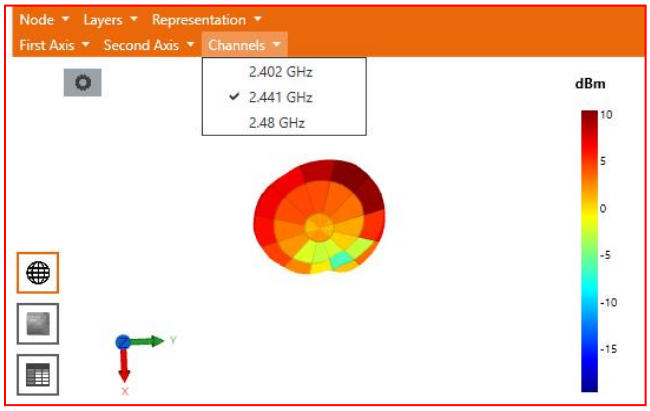
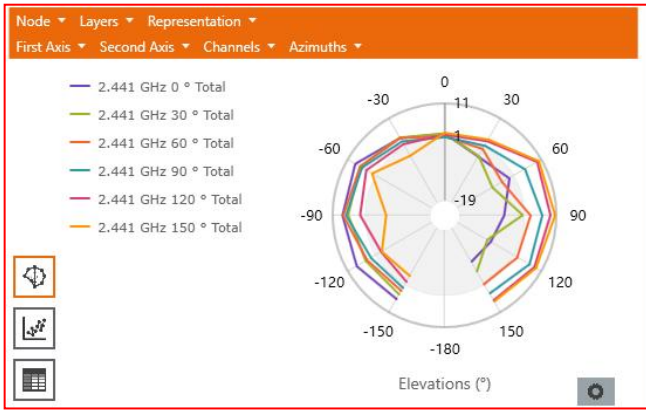
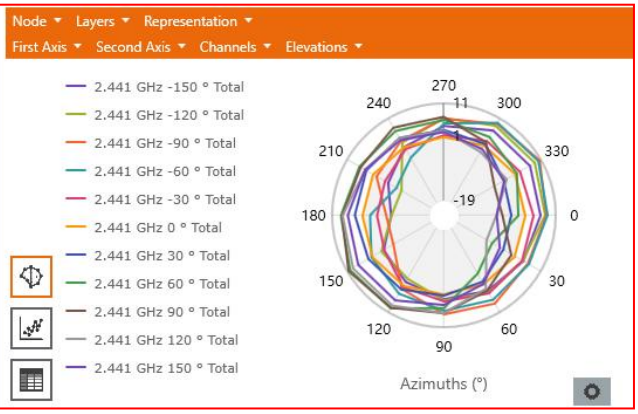






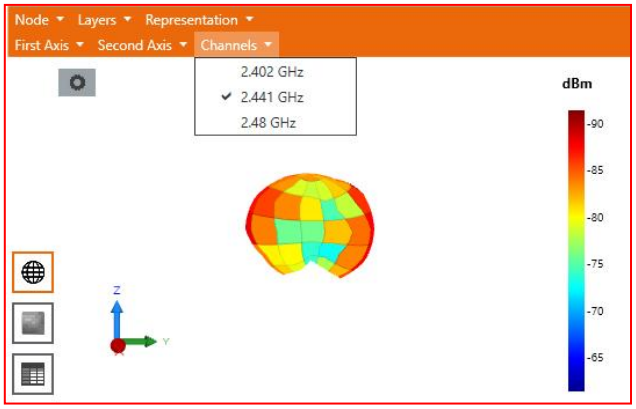


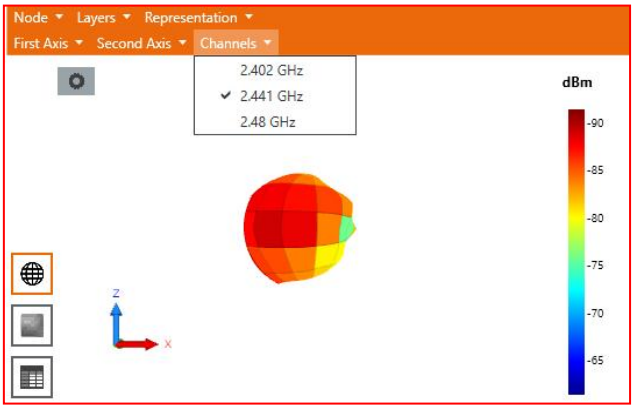


Confidentiality requirements

Shenzhen Daxian Technology Co., Ltd. already possesses the information provided by the proprietary technology, which should be strictly confidential and not allowed to be disclosed to any person or company without the prior written consent of Shenzhen Daxian Technology Co., Ltd

T I S:


Node
Layers
Representation
First Axis
Second Axis
Channels
2.402 GHz
2.441 GHz
2.48 GHz
dBm
-90
-85
-80
-75
-70
-65


Node
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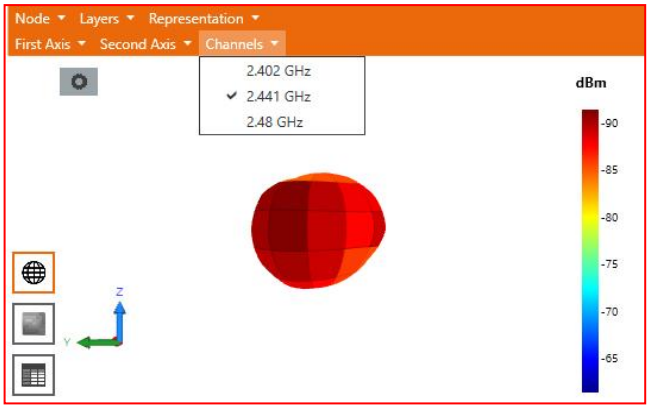
Node
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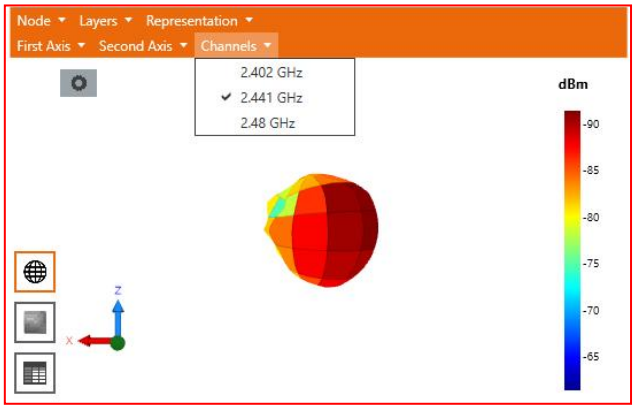
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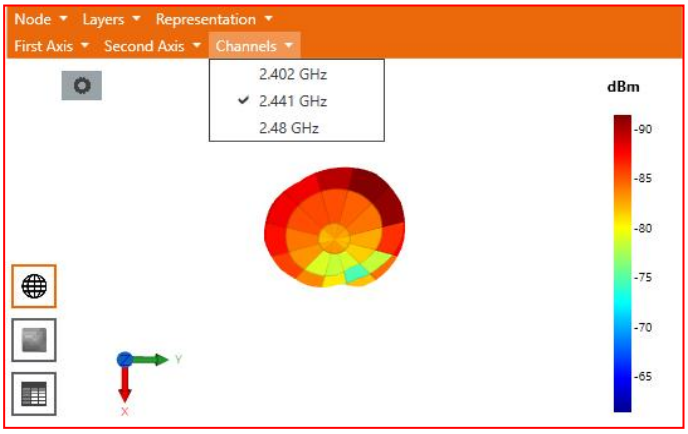
Node
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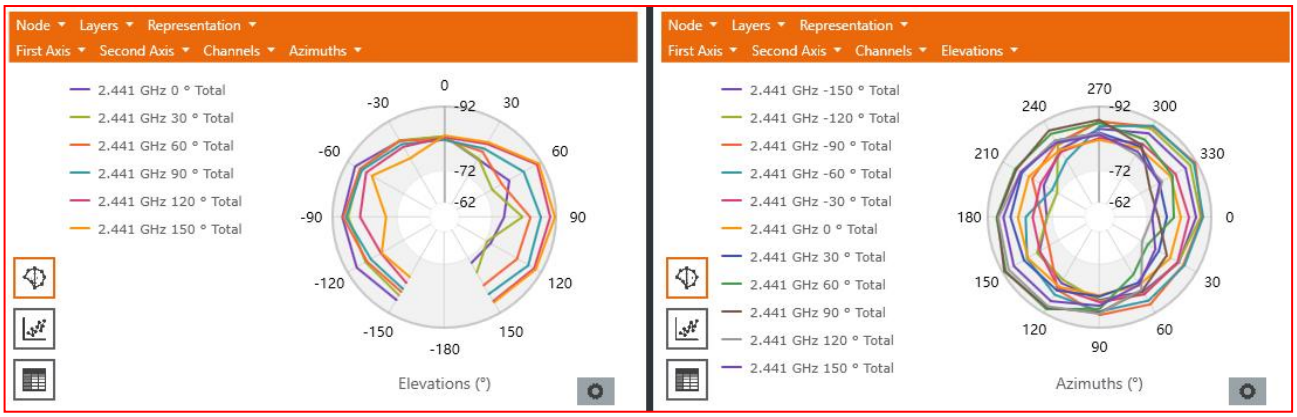

7、结论 conclusion

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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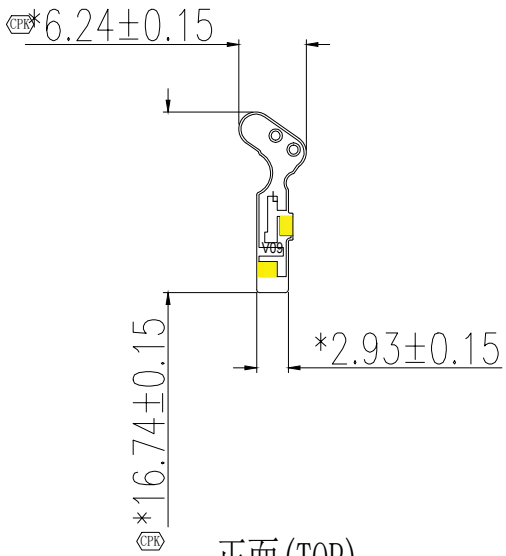
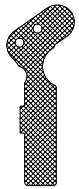
	0~10	10~30	30~50	50~	角度(Angle)	○	◎	⊥	▱
	0.05	0.10	0.15	0.20	1°	0.02	0.02	0.03	0.05



正面(TOP)



反面(BOT)

注:
(Note:)

1.″*″为重点尺寸 ;
(1. ″*″ for the key size;)

2.FPC材料:电解铜,半对半 ;
(2.FPC Material Science:Half and half base copper foil)

3.反面背胶3M9471;
(3. 3m300 series double-sided adhesive tape is pasted on the back of the product)

4.未标公差尺寸,模具冲出尺寸公差为±0.1;
(4.No tolerance dimension is marked, and the tolerance of die stamping dimension is ± 0.1)

5.画 ■ 为镀金区，画 □ 为铜箔区,画 ▨ 的为背胶区.
(5. ■ Gold plated area,□Copper foil area,▨ Gum;)

版 本(edition)	描述(describe)	日期(date)	备注(Note)

深 圳 大 显 科 技 有 限 公 司
Shenzhen Daxian Technology Co., Ltd.

机型(Machine model)	MH028	产品颜色(Product Color)		白色 (white)		日期(date)	2023/12/19
项目编码(Project Code)	CM-H028X-063	模面处理(Mold surface treatment)		NA		结构(MD)	RuibinZhou
零件名称(Part Name)	BT-L天线(BT-L antenna)	单位 (unit)	mm	比例 (scale)	1:1	射频(RF)	PengHU
零件编码(Part Number)	1M-H028X-063-1	第三视角 (Third perspective)				审核(check)	KangZhou
材质(material)	PI Electrolytic copper					批准(ratify)	LeiZhang
保存路径(Save Path)						当前版本(current version)	A