SPECIFICATION

深圳市大显科技有限公司

Shenzhen Daxian Technology Co., Ltd.

HORN MH056(23282)充电盒 BT 天线

HORN MH056(23282) Battery Pack BT Antenna

产 品 规 格 书

Product Specification

客　户 connection	豪 恩 HORN	频　段 frequency range	2400 ~ 2500MHz
项目名称 entry name	MH056	版　本 edition	V1.0
物料编号 Material No	1M-H056X-035	颜　色 Color	白色 White
客户料号 Customer Item Number			
R F 设计 R F Design	胡 鹏 Peng.Hu	结构设计 Structural Design	周锐斌 RuiBin.Zhou
品质经理 Quality Manager	潘永杰 YongJie.Pan	技术总监 Technical Director	张 磊 Lei.Zhang
日　期 Date	2025-06-19		

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

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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			2025-06-19	

索　引
Indexes

一 项目说明 Project Description

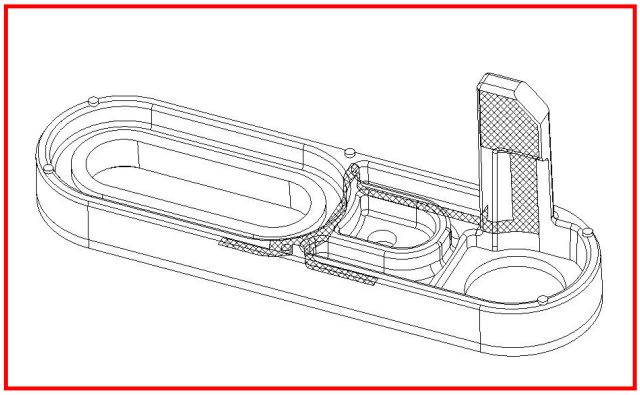
客 户 名： Customer Name：	豪恩 HORN
整机类型： Type of complete machine：	充电盒 Battery Pack
天线频段： Antenna band：	2400 ~ 2500MHz
天线形式： Antenna form：	单极天线 monopole antenna
天线极性： Antenna polarity：	单极天线 monopole antenna
硬件版本： Hardware version：	天线 Antenna
天线制造商： Antennamanufacturer：	深圳市大显科技有限公司 Shenzhen daxian technology co., ltd
测试实验室： Testing laboratory：	SATIMO 微波实验室 SATIMO microwave laboratory

二 B T LDS 天线 B T LDS Antenna

1 规格 specifications

本报告主要提供 **MH056(23282)**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 **MH056(23282)** project. The following image shows an antenna with a large display design.



天线外观图

antenna appearing diagram

1.1 电气规格标准 Electrical specifications and standards

1.1.1 电性能指标 Electrical performance index

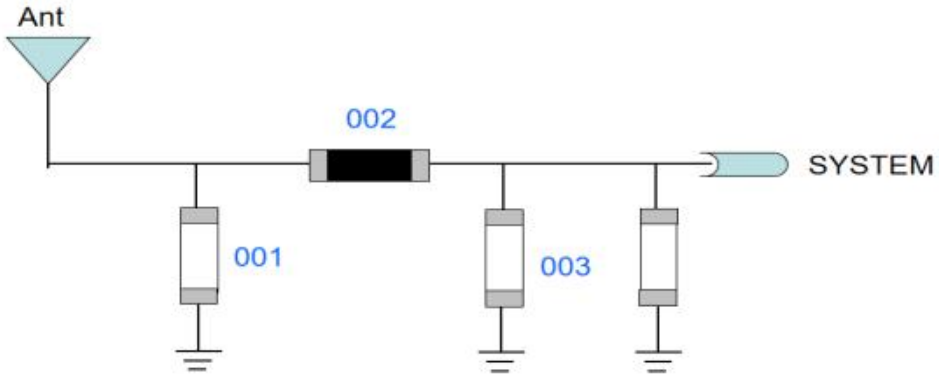
天线工作频段在 **2402~ 2480 MHz。** 下表是大显设计和量产天线的电性能的指标.

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	2400 ~ 2500	≤ 2

1.1.2 匹配电路图 Match the circuit diagram

主板天线端匹配: Motherboard Antenna End Matching



主板天线端匹配更改如下: Matching changes to the antenna side of the motherboard are as follows

001: NC
002: 串5.0PF电容 String 5.0PF Capacitor
003: NC
004: ESD

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 LDS 组成。
The antenna is mainly composed of LDS sponge.

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

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

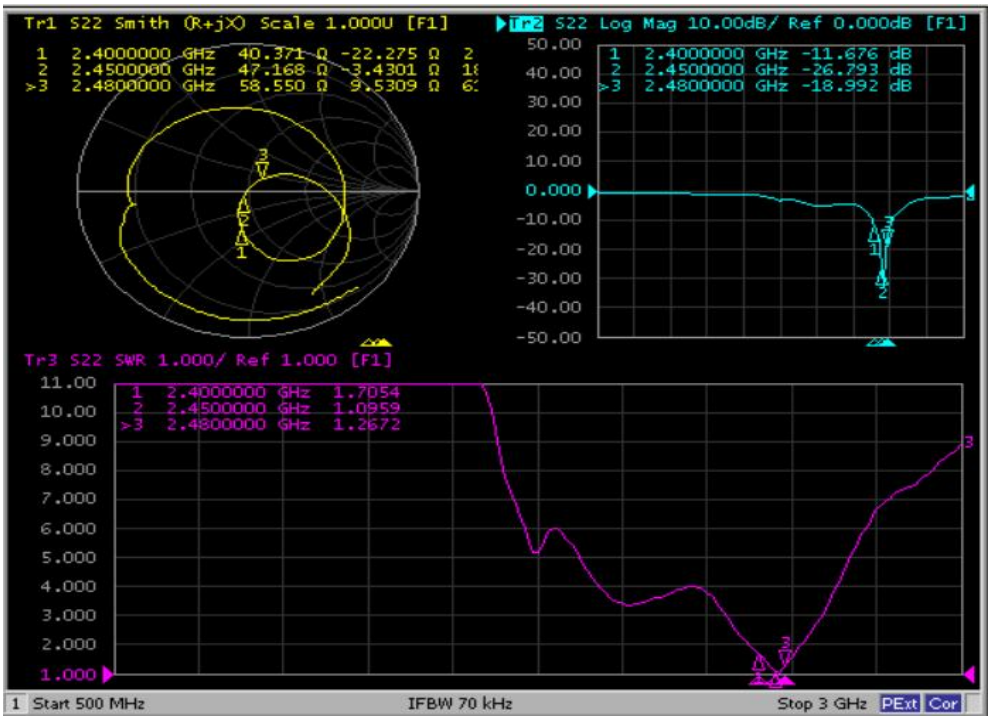
OTA 有源测试 OTA Active Test：

CH	TRPdBm)	TISdBm)
0	5.82	-87.28
39	6.36	-87.51
78	6.23	-87.33

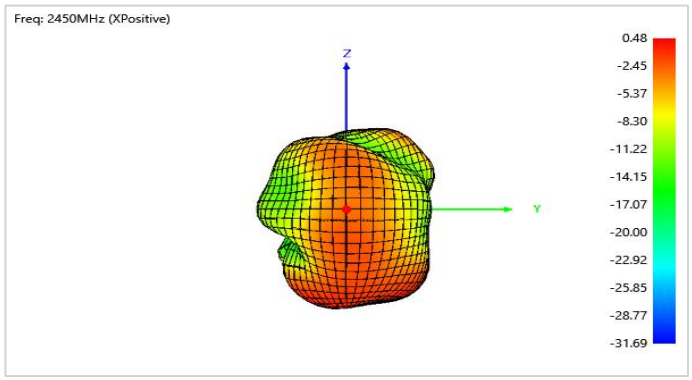
无源效率&增益 Passive efficiency&gain：

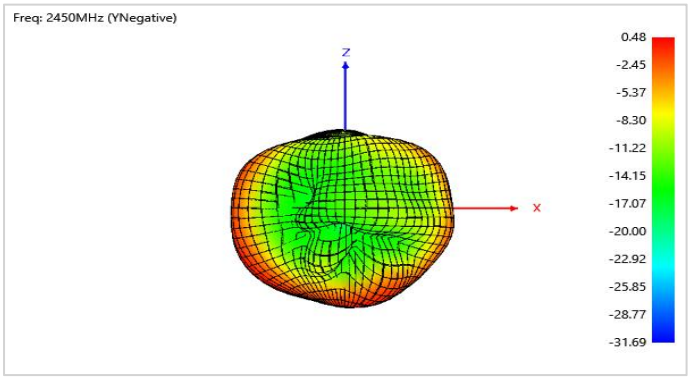
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2400	25.01	-6.02	-0.26
2410	25.49	-5.94	-0.17
2420	25.97	-5.86	-0.1
2430	26.48	-5.77	0.16
2440	26.53	-5.76	0.36
2450	26.67	-5.74	0.48
2460	26.33	-5.79	0.52
2470	25.74	-5.89	0.59
2480	25.17	-5.99	0.64
2490	24.54	-6.1	0.65
2500	23.59	-6.27	0.58

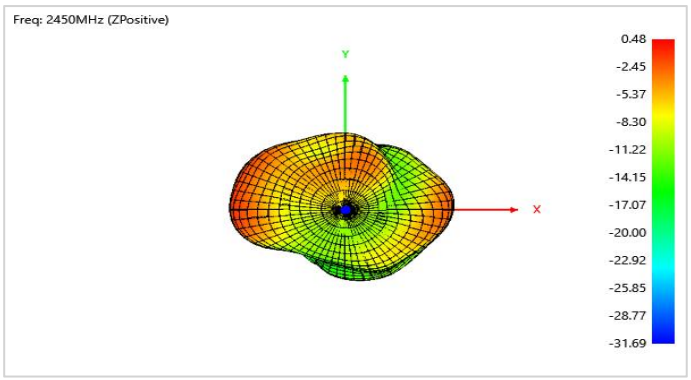
4、VSWR 参数图 VSWR parameter diagram

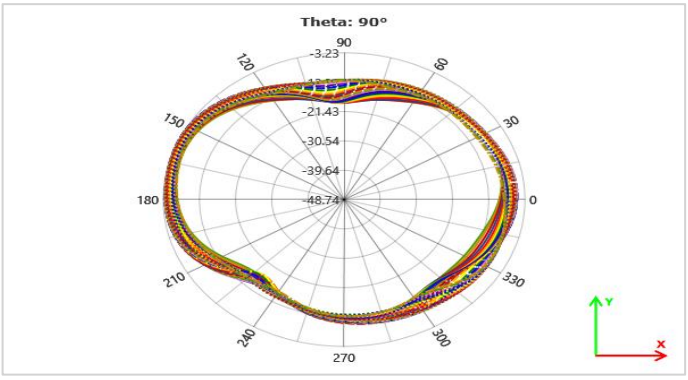


5、无源场型图 Passive Field Pattern Diagram

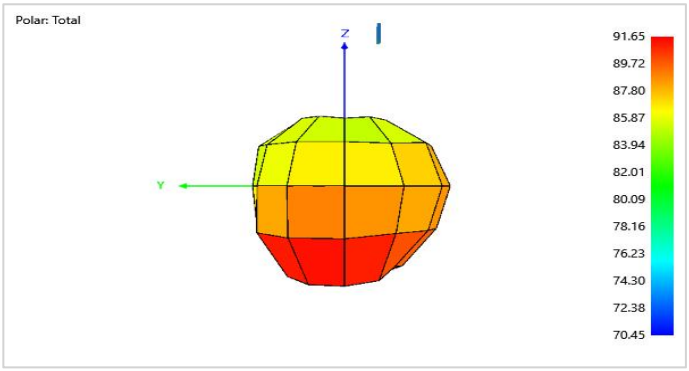


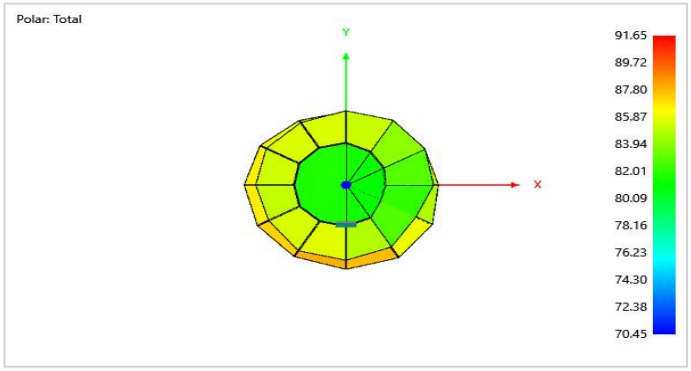


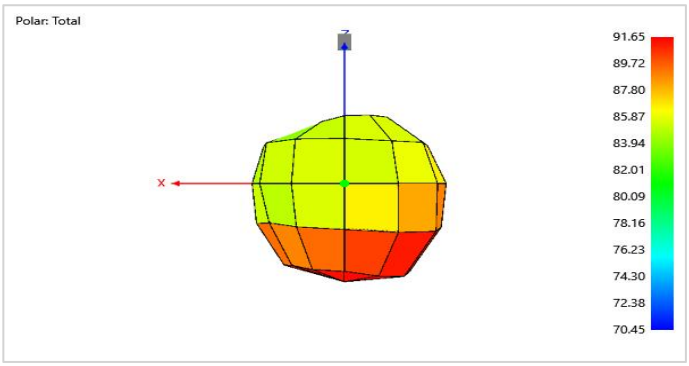


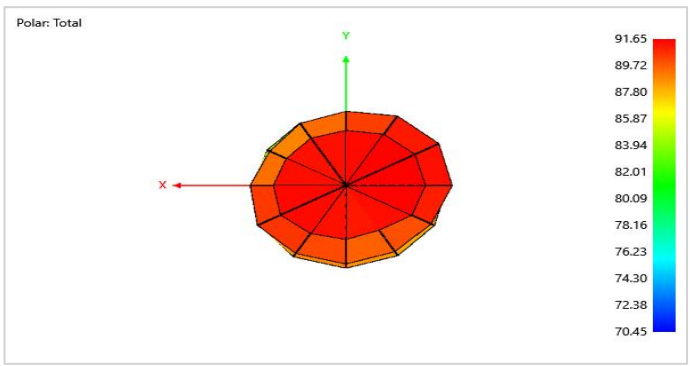


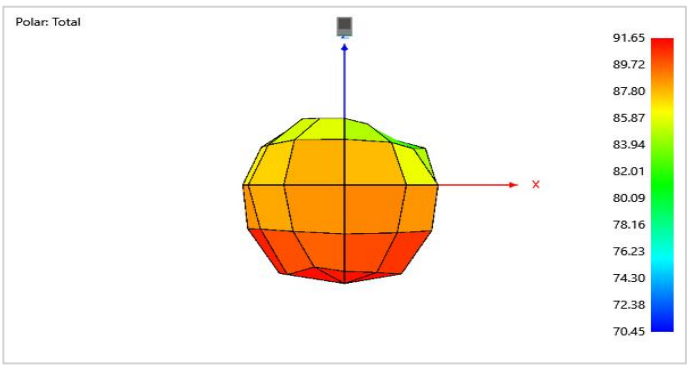
6、有源场型图 Active field pattern diagram

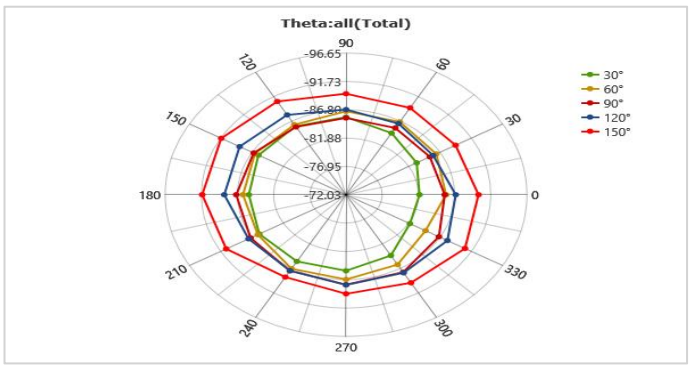




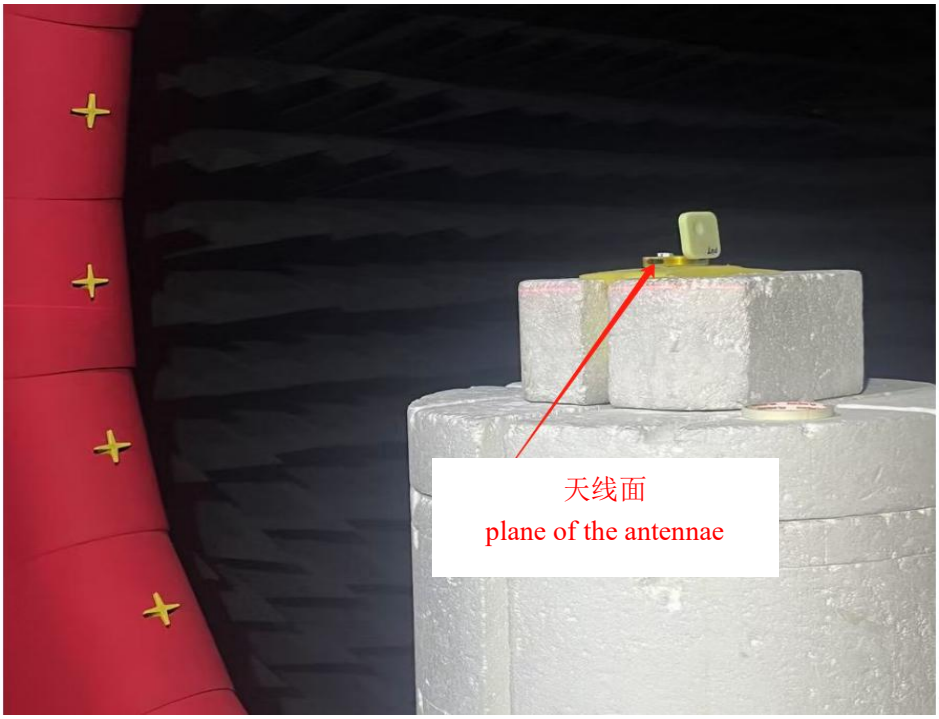








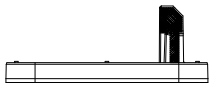
7、整机 OTA 测试场景 Whole machine OTA test scenario

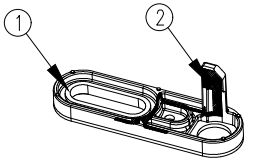


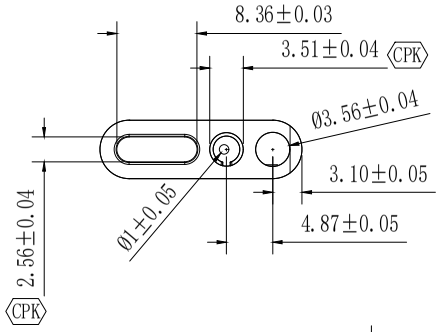
8、结论 conclusion

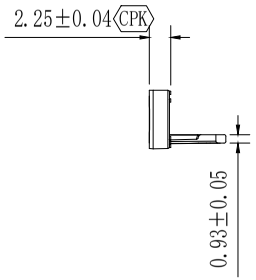
此天线是在客户提供样机基础上设计，电参数和结构性能已达到技术要求，请确认！

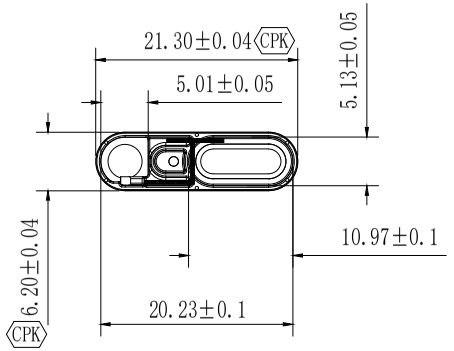
This antenna is designed based on the prototype provided by the customer. The electrical parameters and structural performance have met the technical requirements, please confirm!

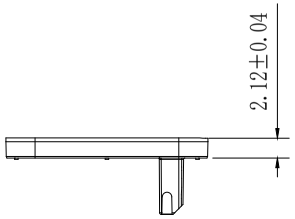












技术要求:
(technical requirement:)

1.″*″为重点尺寸 ;
(1.″*″is the key dimension;)

2.未标注尺寸请依图纸;
(2.Please refer to the drawing for unspecified dimensions;)

3.镀镍2-4um 铜层8-12um;
(3.Nickel plating 2-4um Copper layer 8-12um;)

4.不能有溢镀，镀层脱落，电镀液残留，断线，短路 阻值≤1Ω
(4.No over-plating, plating off, plating residue, broken wire, short circuit Resistance ≤1Ω;)

5.Pb、Hg、Cr+6、PBBs、PBDEs各项小于500PPM，Cd小于50PPM。
(5.Pb, Hg, Cr+6, PBBs, PBDEs each less than 500 PPM, Cd less than 50 PPM;)

序号(serial number)	零件名称(Part Name)	材质(material)	颜色(colour)
2	LDS天线 (LDS-ANTENNA)	镭雕化镀 NI:2-4UM, CU:8-12UM Laser engraving NI:2-4UM, CU:8-12UM	银色 (silvery)
1	LDS支架 (LDS-BRACKET)	SABIC DX11354 PC	白色(表面喷白色) White (white surface)

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

机型(Machine model)	MH056	产品颜色(Product Color)	白色(white)	日期(date)	2025/06/19
项目编码(Project Code)	CM-H056X-035	模面处理(Mold surface treatment)	NA	结构(MD)	Zhou Ruibin
零件名称(Part Name)	LDS天线(LDS antenna)	单位 (unit) mm	比例 (scale) 1:1	射频(RF)	Hu Peng
零件编码(Part Number)	1M-H056X-035	第三视角 (Third perspective)		审核(check)	Wu Xihuan
材质(material)	PC+LDS			批准(ratify)	Zhang Lei
保存路径(Save Path)				当前版本(current version)	A