

深圳市大显科技有限公司

承认书

客户名称	深圳市科奈信科技有限公司
产品名称	A1682, 左耳机, FPC天线
客户料号	300012000420
项目名称	A1682
产品品牌	DX
产品型号	1A-1682X-047

附件	☒ 封面	☒ 图纸	☒ FAI 报告	☒ CPK 报告
	☒ 可靠性测试报告	☒ 3D模型	☒ RoHS	☐ UN38.3

供应商 签核	制作	审核	批准
	王翠	周锐斌	张磊

客户 签核	制作	审核	批准

承认条件	☐ 承认	☐ 拒绝承认
	☐ 条件承认 需满足条件: _____	
	☐ 临时承认 限量_____PCS	

供应商信息：深圳市大显科技有限公司	
名称： 深圳市大显科技有限公司	联系人：吴锡欢
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Revision history

[illegible]

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一 项目说明 Project Description

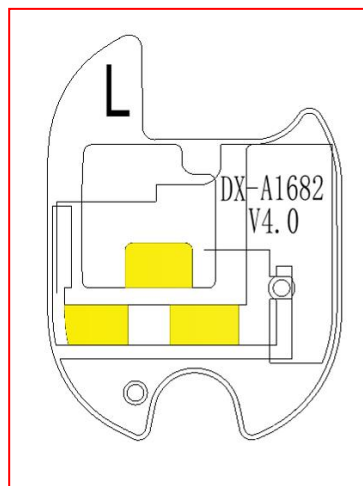
客 户 名: Customer Name:	科奈信 CANNICE
整机类型: Type of complete machine:	蓝牙天线 Bluetooth antenna
天线频段: Antenna band:	2400 ~ 2500MHz
天线形式: Antenna form:	PIFA 天线 PIFA antenna
天线极性: Antenna polarity:	线性极化 Linear polarization

二 BT 天线组件 Antenna assembly

1 规格 specifications

本报告主要提供 A1682 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 A1682 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

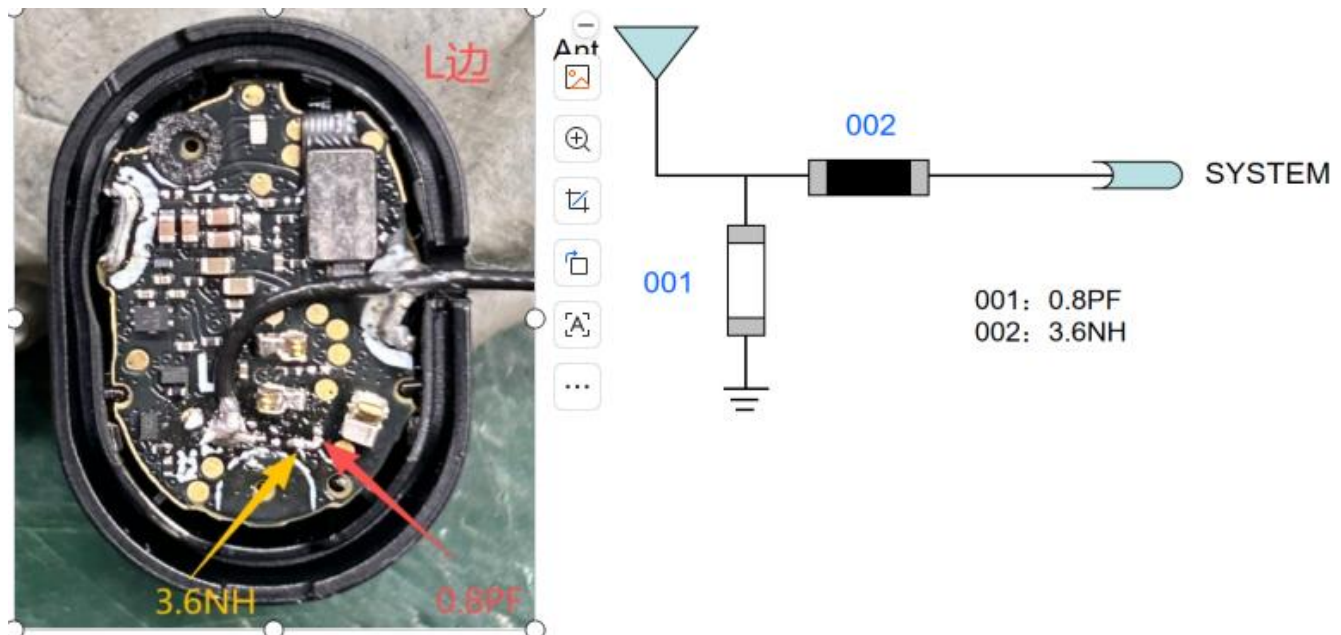
1.1.1 电性能指标 Electrical performance index

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	≤ 3

1.1.2 天线匹配 Antenna matching



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 .

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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

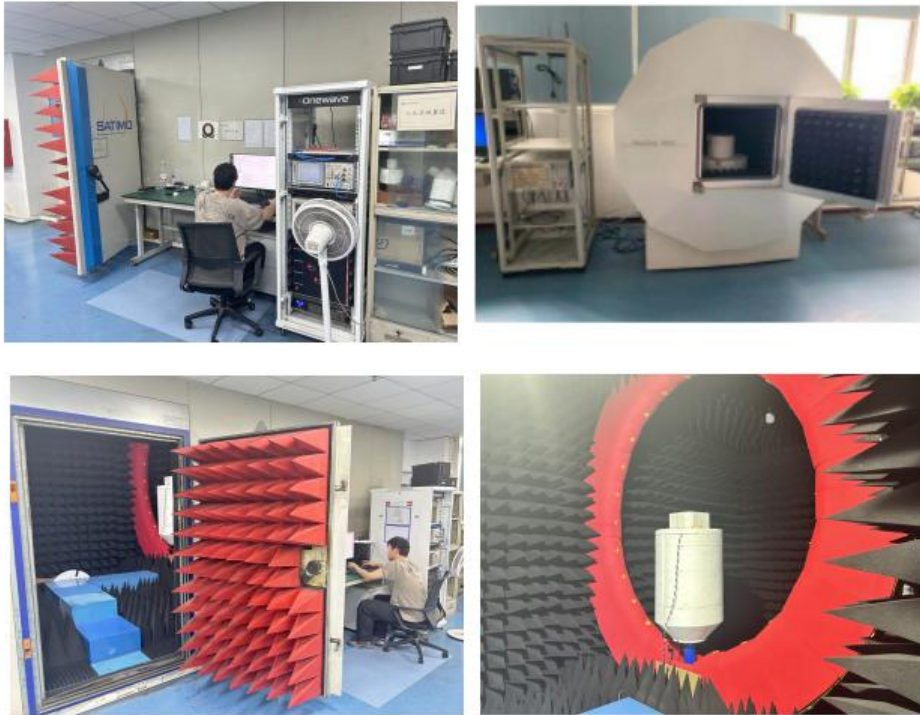


图 2

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 有源测试数据 OTA Active Test Data:

L (左耳) 自由空间 L-side - free space			
BAND	CH	TRP (dBm)	TIS (dBm)
BT	0	1.53	-86.85
	39	3.49	-88.23
	78	3.06	-87.53

L (左耳) 头模状态 L-side-head mold			
BAND	CH	TRP (dBm)	TIS (dBm)
BT	0	-0.7	-83.97
	39	-0.66	-84.02
	78	-0.84	-83.64

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无源效率&增益 Passive efficiency&gain:

自由空间 Free space

Frequency (MHz)	Gain (dBi)	Efficiency (dB)	Efficiency (%)
2400	-3.73	-8.08	15.6
2410	-3.46	-7.74	16.8
2420	-2.71	-6.93	20.3
2430	-2.42	-6.72	21.3
2440	-1.75	-6.01	25.1
2450	-1.35	-5.91	25.6
2460	-1.37	-5.77	26.5
2470	-0.93	-5.34	29.2
2480	-1.67	-5.68	27.0
2490	-1.9	-5.75	26.6
2500	-1.86	-6.2	24.0

头模状态 Head mold

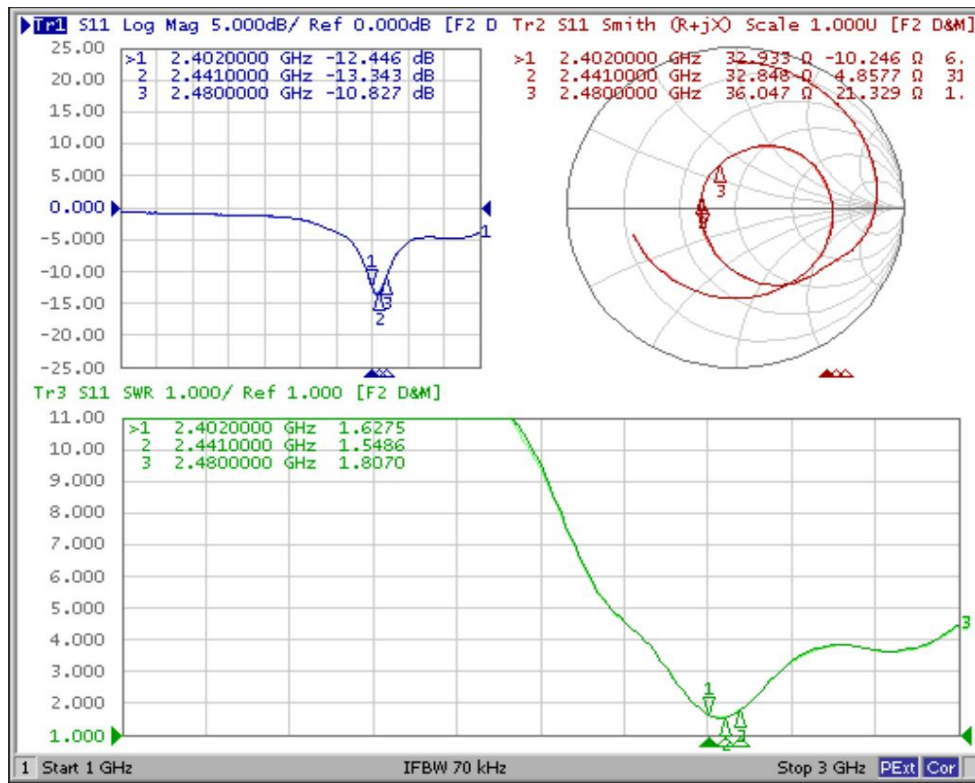
Frequency (MHz)	Gain (dBi)	Efficiency (dB)	Efficiency (%)
2400	-6.82	-12.99	5.02
2410	-6.62	-12.74	5.32
2420	-6.57	-12.57	5.53
2430	-6.47	-12.32	5.86
2440	-6.43	-12.15	6.09
2450	-6.47	-11.9	6.46
2460	-6.47	-11.76	6.67
2470	-6.5	-11.73	6.72
2480	-6.57	-11.83	6.57
2490	-6.62	-12	6.3
2500	-6.96	-12.43	5.72

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4、VSWR 参数图 VSWR parameter diagram

头模状态



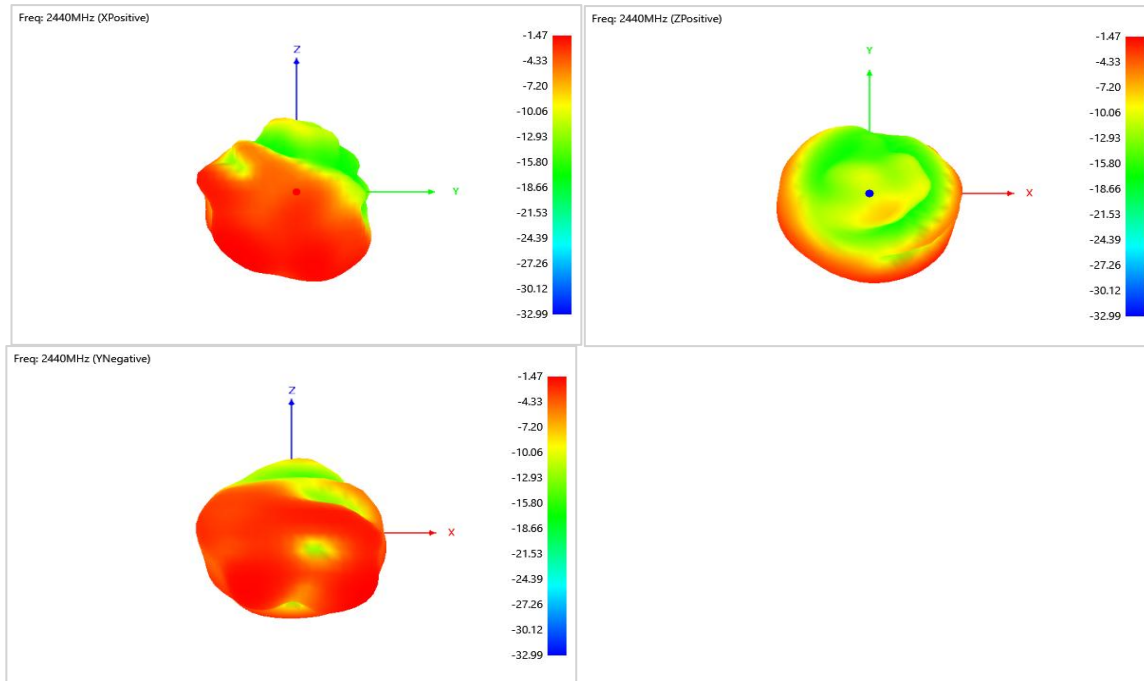
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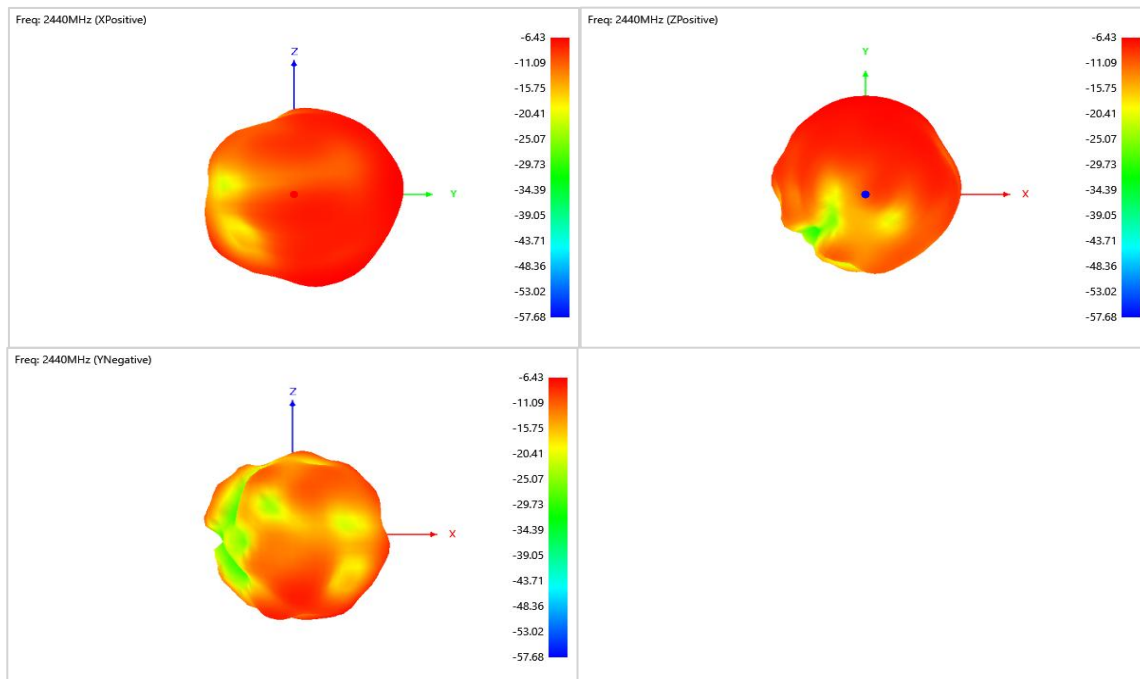
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5、天线无源辐射场型图 Passive radiation pattern diagram of the antenna

自由空间 Free space



头模状态 Head mold

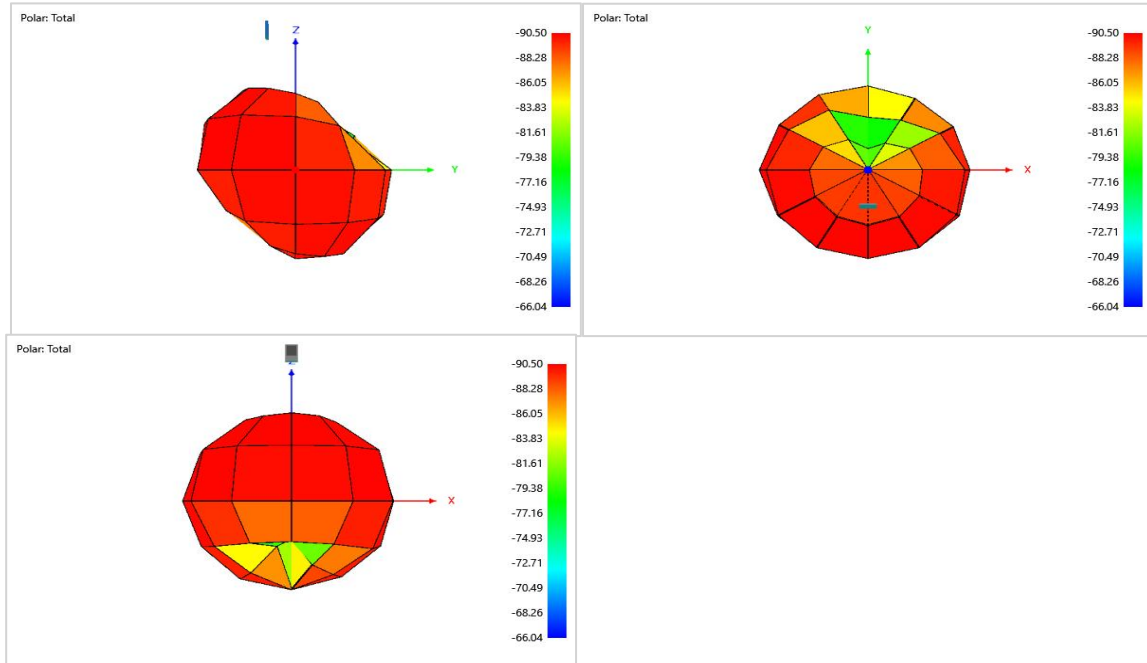


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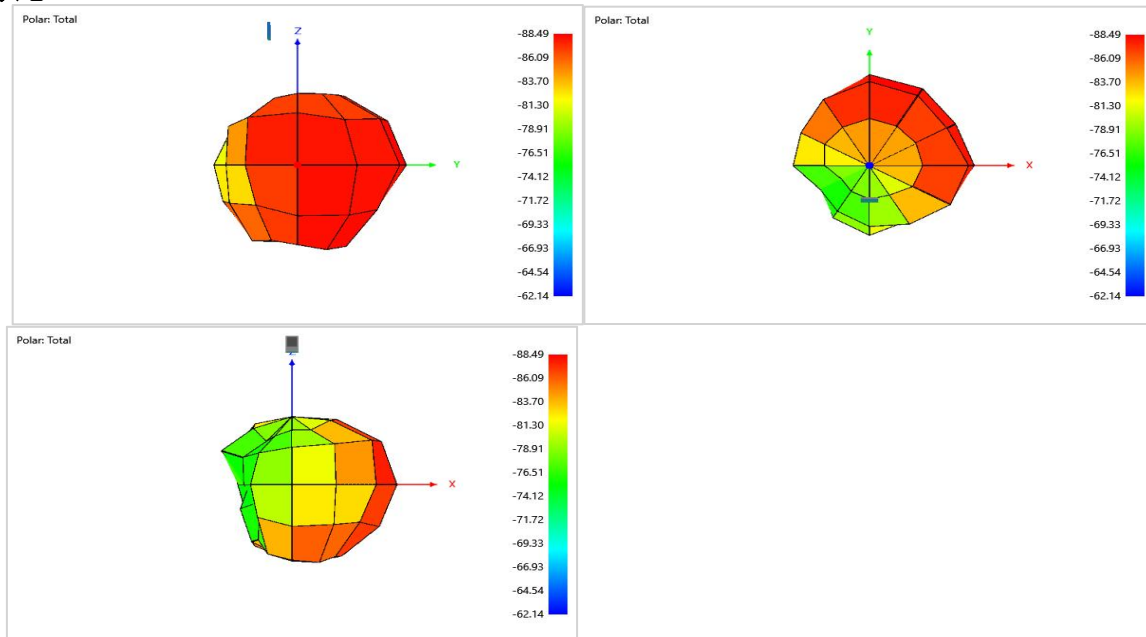
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6、OTA 场型图 OTA pattern diagram

自由空间 Free space



头模状态 Head mold



7、结论 conclusion

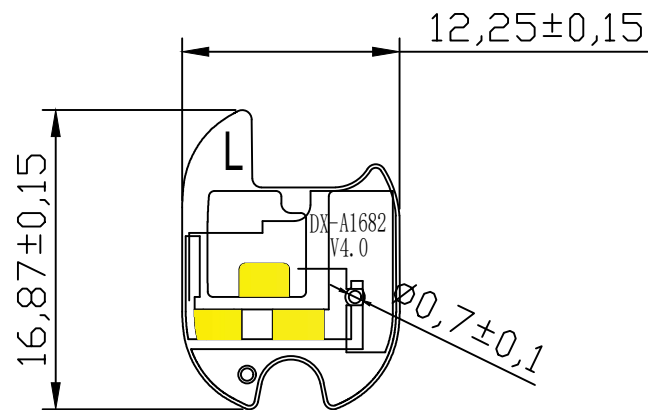
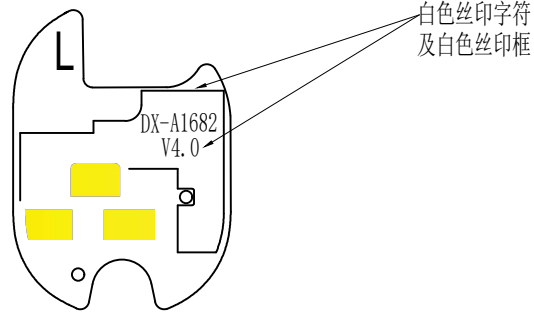
此天线是在客户提供样机基础上设计，电参数和结构性能已达到技术要求，请确认！

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!

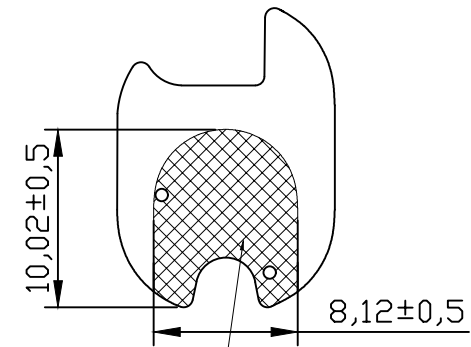
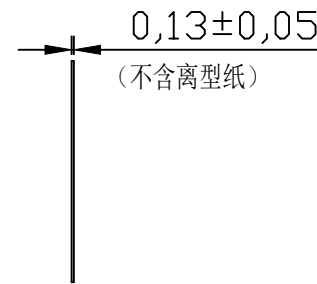
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版 本	标 记	更 改 内 容	签 名	日 期



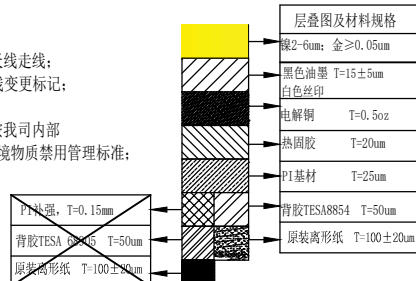
双面黑色油墨



阴影背胶区域，其余位置不背胶
(TESA8854)

技术要求:

1. 正面代表FPC铜箔走线覆盖油墨或覆盖膜部分，背面代表背胶原浆纸层部分；
2. 带“*”尺寸为重点尺寸，带“CPK”需要做CPK的尺寸，“（）”为实配尺寸，“△”为设计变更；
- 未注公差参照公差表；
3. 表面干净，无脏污，无露铜，脱落等不良；
4. 红色线——为FPC的最大外形，绿色线——为天线走线；黄色线——为离型纸切断线，蓝色线——为天线变更标记；
- 黄色为镀金区，□为背胶区，□为离型纸手撕位；
5. 满足盐雾实验/附着力学测试等相关可靠性测试，按我司内部可靠性试验标准执行，所有物料均符合我司产品环境物质禁用管理标准；
6. FPC来料按半切方式制作；
7. 产品包装必须干净、整洁，包装过程不允许对产品造成脏污。
- PC补强，T=0.15mm



公 差 表	
长宽50mm以下规则的外形到外形	±0.15
长宽50mm以上不规则的外形到外形	±0.20
走线到外形	±0.15
走线到走线	±0.05
孔径	±0.10
孔中心到外形	±0.15
孔中心到孔中心	±0.10
油墨到走线	±0.30
补强或背胶到外形	±0.35

机 种	A1682			名 称	蓝牙天线-L	审核	吴锡欢
项目编码	CA-1682X-047			R F	胡鹏	批准	张磊
零件编码	1A-1682X-047-1			结构	周锐斌	日期	2026-06-24
版 本	A1	图框	A4	 TOPANT	深 圳 大 显 科 技 有 限 公 司 Shenzhen Daxian Technology Co., Ltd.		
比 例	1:1	第三视角 					
单 位	MM						

深圳市大显科技有限公司

全尺寸报告

送样单位:工程

日期：2026年6月16日

品 名		耳机天线FPC-L		数 量		5pcs		类别	□模具零件 □材料评估		
料 号		1A-1682X-047-1		模穴数					■送样评估 □其他		
序号	图面规格	量具	测试结果					超差值	判定		
			1	2	3	4	5		OK	NG	
①	16.87±0.15	P	16.890	16.940	16.910	16.890	16.870	0	√		
②	12.25±0.15	P	12.310	12.280	12.280	12.270	12.280	0	√		
③	0.7±0.10	P	0.702	0.698	0.702	0.695	0.702	0	√		
④	0.13±0.05	Pg	0.131	0.132	0.132	0.131	0.132	0	√		
⑤											
⑥											
⑦											
量具		目视 E 卡尺 C 千分尺 M 投影仪 P 螺纹规 Pg								最终判定	
代号		网络分析仪 Ne 扭力计 G 万用表 Me 直 尺 F								OK	NG
备注:		外观OK.									

表单编号: QR/RD-P01-08

核准:李高亮

作成：李朝花

深圳大显科技有限公司
Shenzhen Topant Technology Co., Ltd.

CPK Report							
Part Number(料号)	1A-1682X-047-1			Vendor(供应商)		大显	
Description(零件名称)	耳机天线FPC-L			Inspected(确认者)		李高亮	
Tool Number(模号)	/			Inches/MM(英寸/毫米)		mm	
Cavity(穴号)	/			Material Name(材质名称)		FPC	
				Material Code(材质牌号)		/	
Revision(版本)	A1			Date(日期)		2026.6.16	
Dim. Designator(尺寸序号)	1	2	3				
Nominal(公称尺寸)	16.87	12.25	0.7				
+ Tolerance(正公差)	0.15	0.15	0.10				
- Tolerance(负公差)	-0.15	-0.15	-0.10				
Upper Limit(规格上限)	17.02	12.40	0.80				
Lower Limit(规格下限)	16.72	12.10	0.60				
1	16.89	12.28	0.688				
2	16.87	12.29	0.684				
3	16.89	12.28	0.677				
4	16.88	12.24	0.692				
5	16.89	12.26	0.694				
6	16.86	12.23	0.692				
7	16.88	12.24	0.684				
8	16.87	12.29	0.693				
9	16.86	12.26	0.681				
10	16.88	12.25	0.694				
11	16.89	12.28	0.697				
12	16.86	12.29	0.682				
13	16.88	12.28	0.684				
14	16.87	12.24	0.684				
15	16.86	12.26	0.677				
16	16.89	12.23	0.692				
17	16.88	12.24	0.694				
18	16.89	12.29	0.692				
19	16.86	12.26	0.684				
20	16.88	12.25	0.693				
21	16.87	12.28	0.681				
22	16.86	12.24	0.694				
23	16.88	12.29	0.697				
24	16.89	12.26	0.682				
25	16.86	12.25	0.681				
26	16.88	12.28	0.694				
27	16.88	12.24	0.697				
28	16.87	12.29	0.682				
29	16.86	12.26	0.681				
30	16.88	12.25	0.694				
31	16.87	12.28	0.697				
32	16.86	12.21	0.682				
MAX.	16.89	12.29	0.70				
MIN.	16.86	12.21	0.68				
AVERAGE	16.87	12.26	0.69				
STDEV	0.01	0.02	0.01				
CP	4.40	2.26	5.12				
Cpk	4.27	2.08	4.51				
TOOLING(测量工具)	2.5次元	2.5次元	2.5次元				

审核：李高亮

制表：李朝花

日期：2026.06.16

深圳大显科技有限公司

Shenzhen Topant Technology Co., Ltd.

盐雾测试报告

编号：QR/QC-WI09-01版本B

试验时间：2026年6月13日8:30 至6月15日8:30 共计 48 H						
(喷雾时间) 试验若有中断，其原因为：						
☒ 盐水试验法：试验室温度35℃，饱和空气桶温度47℃ ☐ 腐蚀试验法：试验室温度35℃，饱和空气桶温度47℃						
1. 氯化钠品质	99.50%		2. 纯净水品质	纯净水		
3. 喷雾采取PH值	雾化前6.5~7.2		4. 试验液PH值	6.0		
5. 压力表	1.0 Kgf/cm		6. 试验室相对湿度	30%		
7. 试验室温度	35 ℃		8. 压力桶温度	47 ℃		
9. 盐水浓度	5±0.1 %		10. 其他			
供应商名称		产品品名	试样数量	试验样品		判定依据
大显		A1682	耳机天线 FPC-R	3PCS		合格 依GB6461-2002标准判定（外观无氧化、无镀层脱落、无腐蚀）
大显		A1682	耳机天线 FPC-L	3PCS		合格 依GB6461-2002标准判定（外观无氧化、无镀层脱落、无腐蚀）
判定： 1. 依标准样品判定 2. 依GB6461-2002标准判定						
3. 依不良限度样品判定 4. 依其他方法判定						
备注：试验结束后, 如果试样状态允许, 可不经清洗进行检查。如果污垢和盐类沉积物等掩盖了缺陷而使检查难以进行时, 宜用蘸有中性肥皂液的海绵对表面进行擦拭, 然后用水漂洗。但在此过程中不应施加压力, 以免洗掉腐蚀产物而造成评级偏高。清洗液不应覆盖层产生任何破坏。中途或定期检查时不允许清洗试样, 否则影响测试结果						

审核：李高亮

测试员：李朝花

产品材料宣告表 Product material declaration

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Part Number (料号)				1A-1682X-047-1			Description (零件名称)				耳机天线PPC-L				Vendor (供应商)				深圳市大显科技有限公司				Written By (制作)		李朝花	
序号	物料编号/名称	均质名称	型号	原材料商	报告编号	检测机构	RoHS/电池指令(Directive 2006/66/EC)/包装指令 (94/62/EC) 测试结果 (Testing Result)				测试结果				卤素测试		结果	备注	报告插入	MSDS	检测日期	有效时间				
							Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP	F	Br	Cl							
1	PPC	基材	PT-CCL	蔡伦格蒂	SHARC25031840901	SGS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			2025/12/8	有效期一年			
2		黑色油墨	PSM-800FSDM-A	优立	ETR26403059M01 ETR26403060	SGS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	317			2026/3/12 2026/04/24	有效期一年			
3		文字油墨	ZSR-150	川裕	ETR25901252M01 ETR25901254M01	SGS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	625			2025/9/11	有效期一年			
4		镀镍金	KBX-108H	金源新辉	A2250732863101001 A2250732863103001	CTI	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	64			2025/10/13 2025/01/14	有效期一年			
5		双面胶		9471	3M	SHARC25032493501 SHARC25032493503	SGS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	124			2025/12/12	有效期一年			

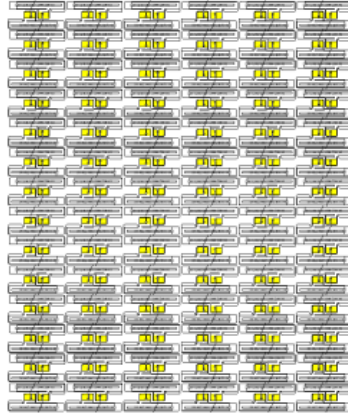
批准:李高亮

制作: 李朝花

日期:2026. 6. 15

一、包装方式 Packing method:

1 . 整版 FPC Full FPC:



2. 入盒包装, 每盒50版 Packed in boxes with 50 editions per box;



二、运输要求 Transport requirements:

产品包装件运输时, 应防潮、防破损、防污染。

When the product package is transported, it should be moisture-proof, damage-proof and pollution-proof.

三、存储要求 Storage requirements:

产品包装件应在仓库内堆放, 库房应干燥、通风、清洁。

Product packages should be stacked in the warehouse, which should be dry, ventilated and clean.

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Confidentiality requirements

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