

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, 右耳机, FPC天线
客户料号	300012000419
项目名称	A1682
产品品牌	DX
产品型号	2A-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	
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Revision history

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一 项目说明 Project Description

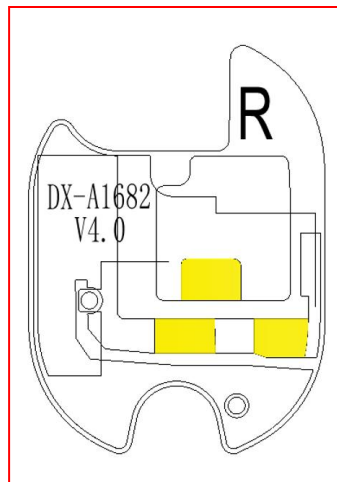
客 户 名: Customer Name:	科奈信 CANNICE
整机类型: Type of complete machine:	蓝牙天线 Bluetooth antenna
天线频段: Antenna band:	2400 ~ 2500MHz
天线形式: Antenna form:	PIFA 天线 PIFA antenna
天线极性: Antenna polarity:	线性极化 Linear polarization

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

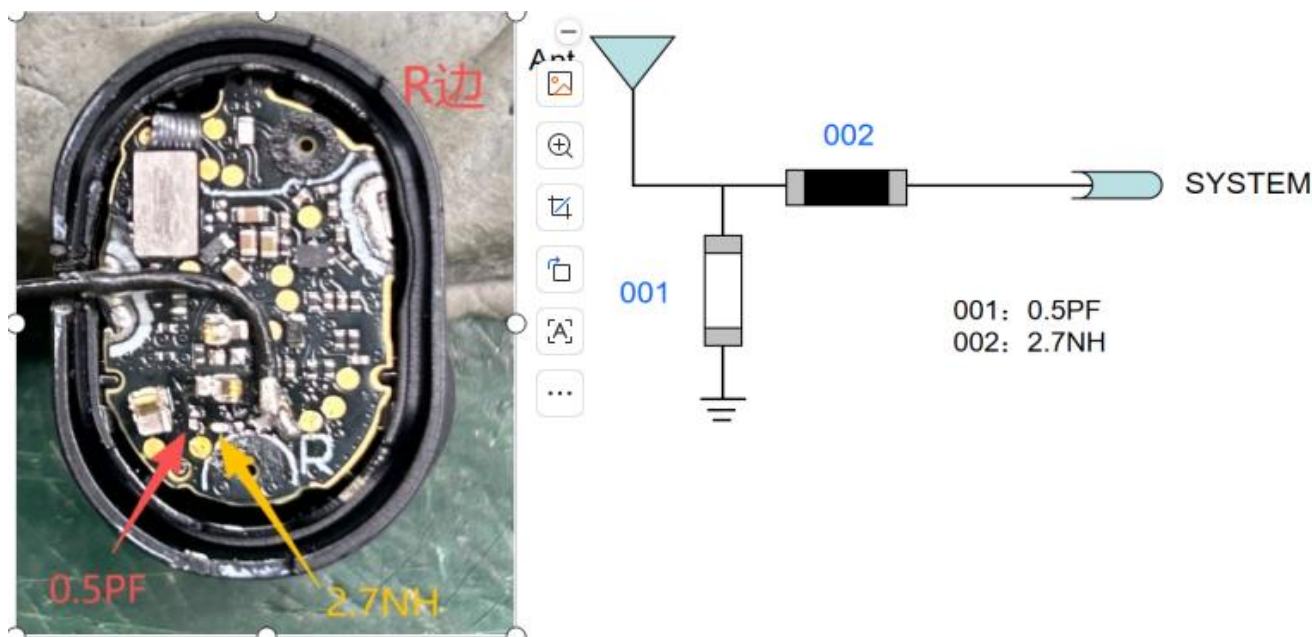
1.1.1 电性能指标 Electrical performance index

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	≤ 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

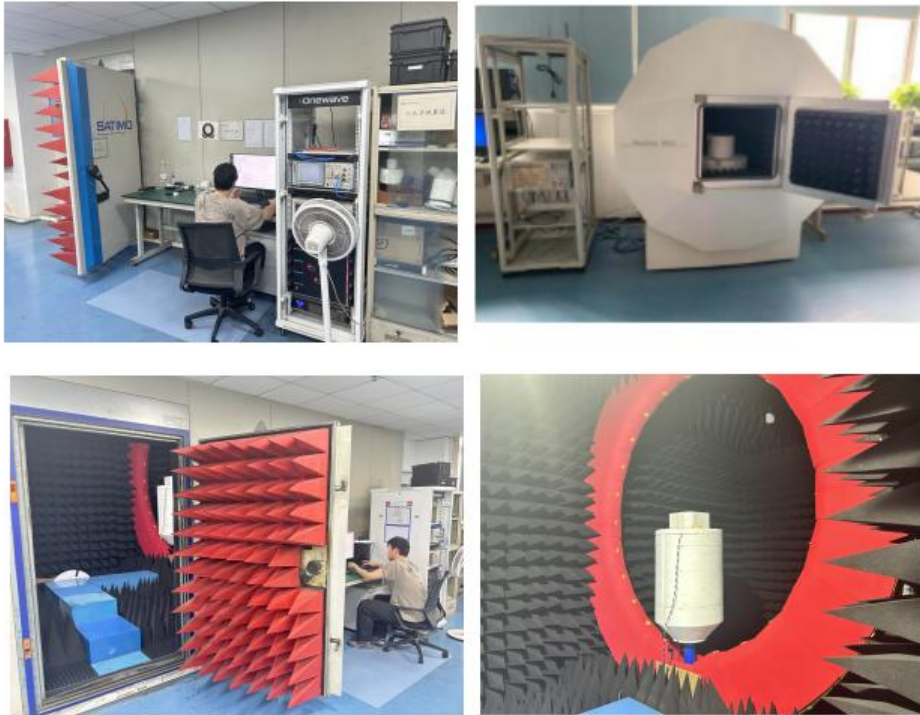


图 2

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:

A1657--可拆状态 Dismantled state

R (右耳) 自由空间 R-side - free space			
BAND	CH	TRP (dBm)	TIS (dBm)
BT	0	0.37	-86.66
	39	3.5	-88.26
	78	3.42	-87.91
R (右耳) 头模状态 R-side-head mold			
BAND	CH	TRP (dBm)	TIS (dBm)
BT	0	-0.04	-84.55
	39	-0.27	-84.87
	78	-1.29	-83.74

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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	-1.68	-7.67	17.1
2410	-1.51	-7.43	18.1
2420	-1.31	-7.25	18.8
2430	-1.02	-6.58	22.0
2440	-0.18	-6.04	24.9
2450	0.42	-5.75	26.6
2460	1.01	-5.49	28.2
2470	1.09	-5.09	31.0
2480	0.77	-5.52	28.1
2490	0.5	-5.65	27.2
2500	-1.86	-5.91	25.6

头模状态 Head mold

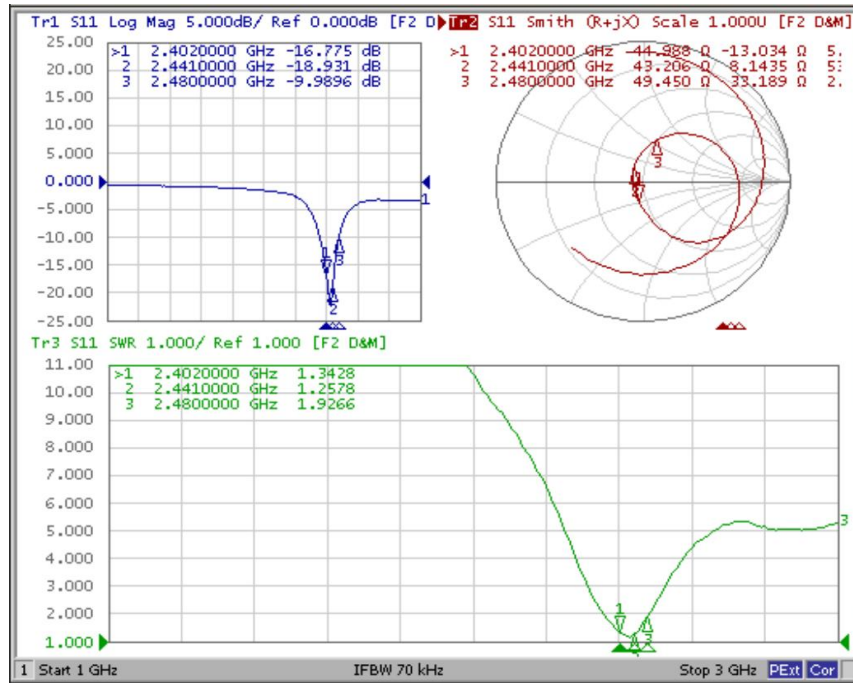
Frequency (MHz)	Gain (dBi)	Efficiency (dB)	Efficiency (%)
2400	-6.28	-12.29	5.91
2410	-6.07	-12.07	6.21
2420	-5.95	-11.92	6.42
2430	-5.77	-11.7	6.77
2440	-5.76	-11.56	6.99
2450	-5.86	-11.34	7.35
2460	-5.99	-11.28	7.44
2470	-6.24	-11.37	7.3
2480	-6.67	-11.61	6.91
2490	-6.98	-11.92	6.43
2500	-7.37	-12.63	5.46

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4、VSWR 参数图 VSWR parameter diagram

头模状态 Head mold



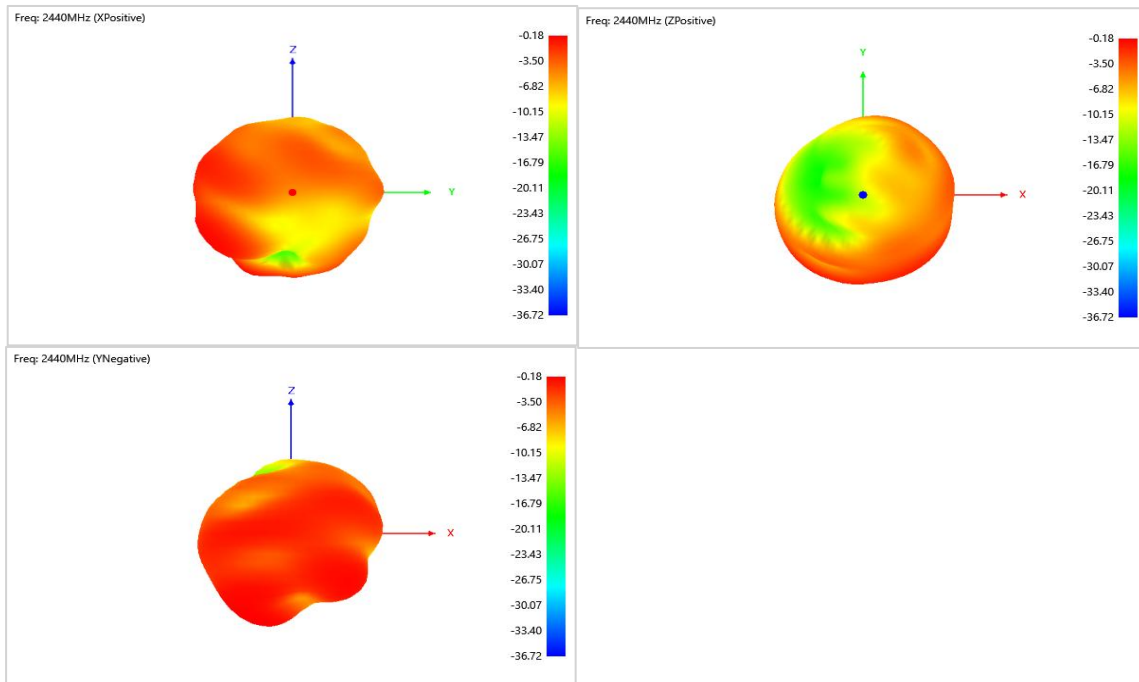
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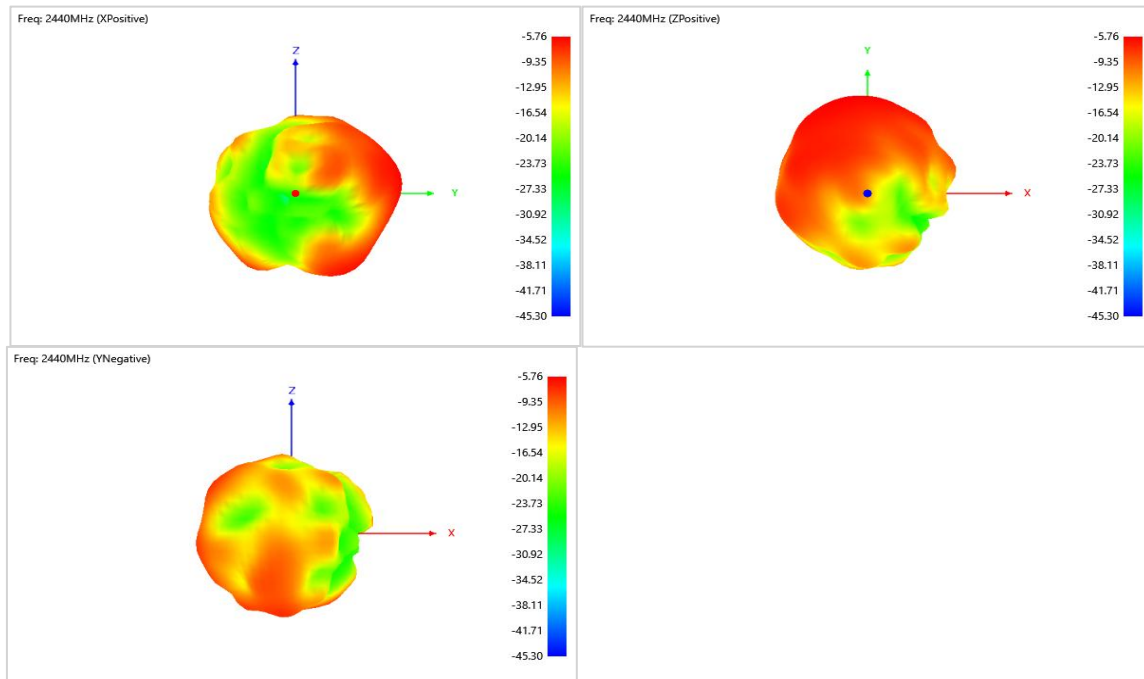
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5、天线无源辐射场型图 Passive radiation pattern diagram of the antenna

自由空间 Free space



头模状态 Head mold

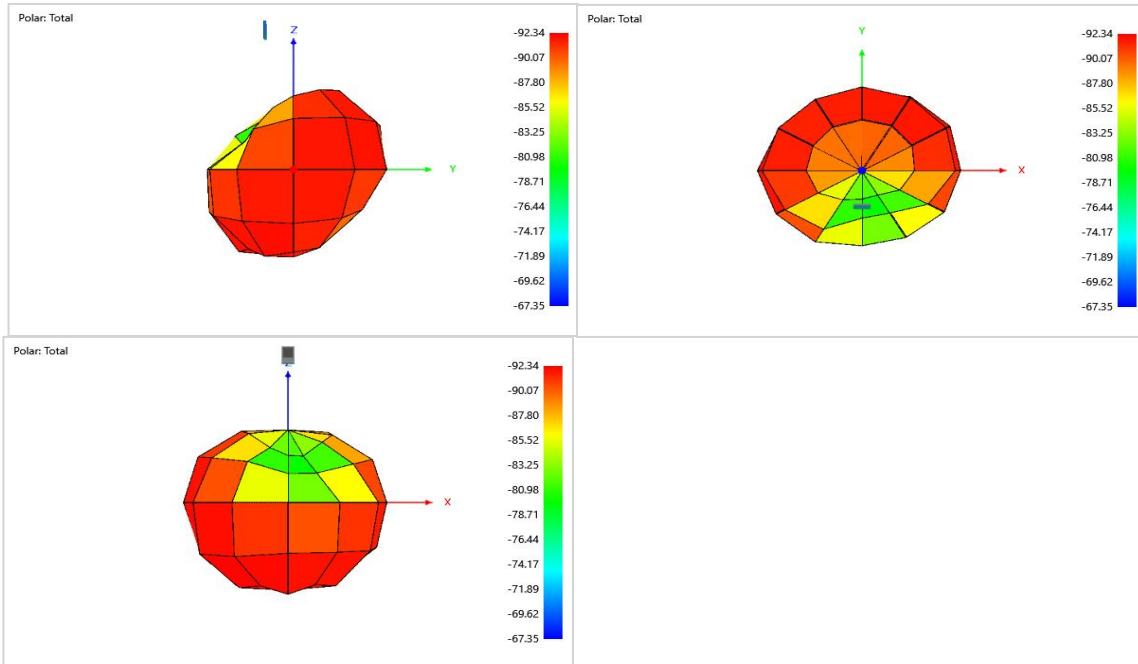


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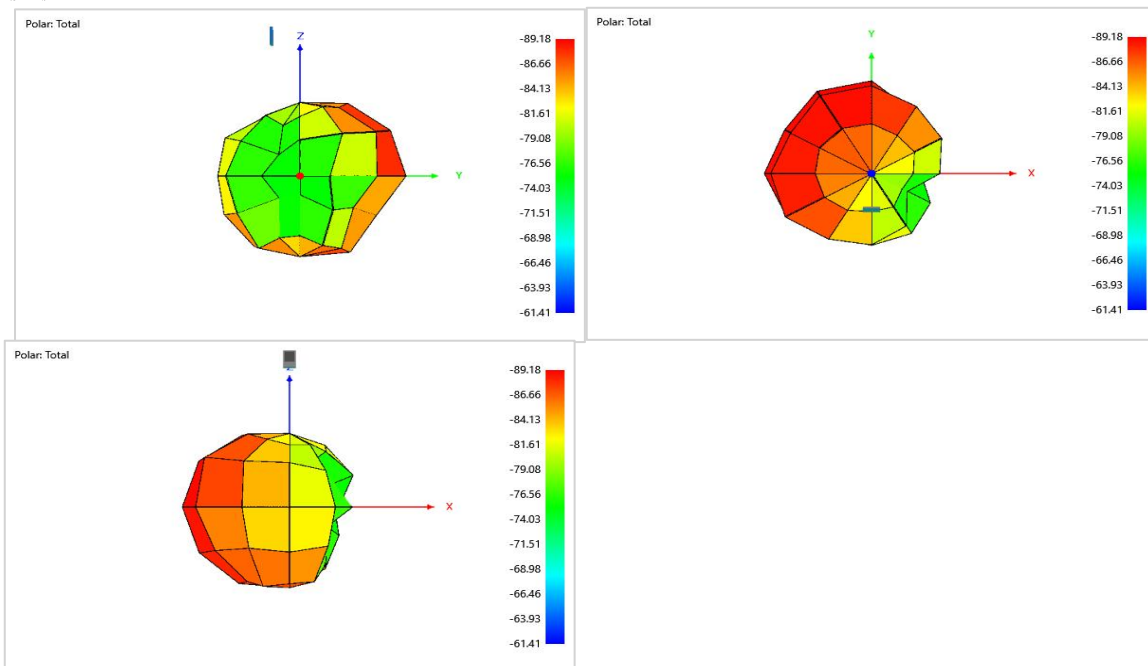
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6、OTA 场型图 OTA pattern diagram

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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技术要求:

1. 正面代表PVC铜网走线覆盖油墨或覆盖银漆部分，背面代表背胶层及底纸部分；
2. 带“*”尺寸为重点尺寸，带“△”需要做CN的尺寸，“（）”为实配尺寸，“△”为设计变更；
3. 未注公差参照公差表；
4. 红色干净，无脏污，无露铜，脱落等不良；
4. 红色线 □ 为PVC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；
- 为敏感区，□ 为背胶区，□ 为离形纸卡断位；
5. 满足试验标准准行，所有物料均符合我司产品环境物质禁用 管理标准；
6. 可靠性试验标准准行，所有物料均符合我司产品环境物质禁用 管理标准；
7. 产品包装必须二清、整洁，包装过程不允许对产品造成脏污。
- | | |
|---------|-------|
| 尺寸公差：mm | 1.5mm |
|---------|-------|

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-R		数 量		5pcs		类别	□模具零件 □材料评估		
料 号		2A-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	16.880	16.950	16.930	16.840	16.870	0	√		
②	12.25±0.15	P	12.300	12.250	12.280	12.290	12.260	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)	2A-1682X-047-1			Vendor(供应商)		大显	
Description(零件名称)	耳机天线FPC-R			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	16.88	12.27	0.688				
2	16.87	12.26	0.686				
3	16.86	12.27	0.677				
4	16.84	12.24	0.695				
5	16.89	12.25	0.696				
6	16.87	12.23	0.692				
7	16.88	12.26	0.684				
8	16.87	12.29	0.693				
9	16.86	12.26	0.69				
10	16.85	12.28	0.698				
11	16.89	12.24	0.697				
12	16.86	12.28	0.682				
13	16.86	12.28	0.684				
14	16.87	12.26	0.684				
15	16.86	12.26	0.677				
16	16.89	12.28	0.694				
17	16.88	12.24	0.684				
18	16.85	12.29	0.692				
19	16.84	12.26	0.684				
20	16.83	12.25	0.693				
21	16.87	12.28	0.685				
22	16.86	12.27	0.694				
23	16.82	12.29	0.697				
24	16.83	12.26	0.686				
25	16.86	12.25	0.681				
26	16.88	12.28	0.694				
27	16.88	12.27	0.697				
28	16.87	12.29	0.682				
29	16.86	12.26	0.687				
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.	16.82	12.21	0.68				
AVERAGE	16.86	12.26	0.69				
STDEV	0.02	0.02	0.01				
CP	2.82	2.61	5.28				
Cpk	2.70	2.37	4.70				
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

测试员： 李朝花

产品材料宣告表

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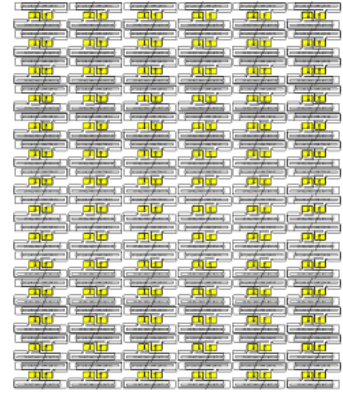
批准:李高亮

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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