

SPECIFICATION



深圳市大显科技有限公司

Shenzhen Daxian Technology Co., Ltd.

通力 Z100 BT 天线组件

Tonly Z100 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	Z100	版 本 edition	V1.3
天线型号 Antenna Model	Z100-BT	颜 色 Color	黑色 Black
客户料号 Customer Item Number			
环保要求 environmental requirement			
	☒ RoHS ☒ REACH ☒ HF		
R F 设计 R F Design	沈 川 Chuan.Shen	结构设计 Structural Design	周锐斌 Rui Bin.Zhou
品质经理 Quality Manager	胡子寅 ZiYi.Hu	技术总监 Technical Director	张 磊 Lei.Zhang
日 期 Date	2025-01-15		

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

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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			2024-11-21	
V1.2	更新 modify	海绵长度由 210mm 改为 200mm Sponge length changed from 210mm to 200mm	客户 our customers	2024-12-12	
V1.3	更新 modify	同轴线长改为 218mm 长 Coax length changed to 218mm long	客户 our customers	2025-1-15	

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一 项目说明 Project Description

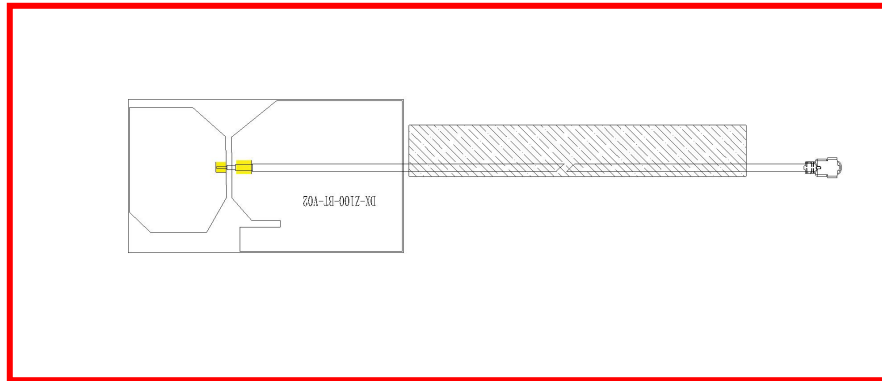
客户名: Customer Name:	通力 Tonly
整机类型: Type of complete machine:	音箱 loudspeaker box
天线频段: Antenna band:	2400 ~ 2500MHz
天线形式: Antenna form:	FPC+同轴线+线材海绵 FPC+coaxial line+wire sponge
馈电形式: Feed form:	焊接 weld
硬件版本: Hardware version:	/

二 BT 天线组件 Antenna assembly

1 规格 specifications

本报告主要提供 Z100 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 Z100 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

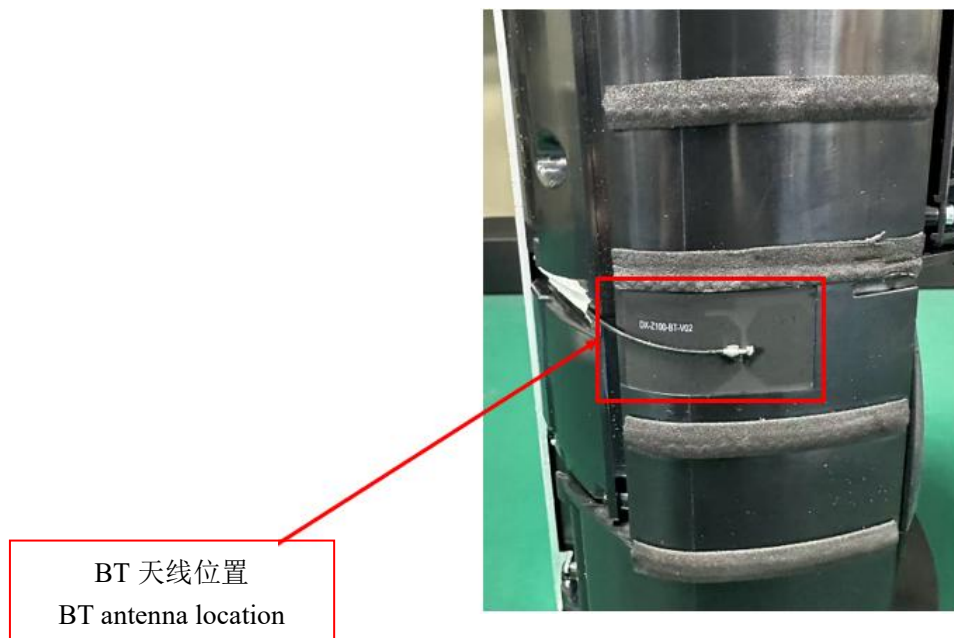
1.1.1 电性能指标 Electrical performance index

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 天线位置图片 Antenna position picture



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+线材海绵 组成。

The antenna is mainly composed of FPC+coaxial line+wire sponge.

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2、测试设备 The Equipment of Active Test

Satimo 3D Chamber $6 \times 4 \times 4$ (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、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 below

Antenna Performance Overview-天线性能概述:

	Peak gain	Radiated efficiency	Return Loss
	2.4G	2.4G	2.4G
ANT_1 (BT)	2.4GHz: 1.94	2.4GHz: -2.87	2.4GHz: -15.055
	2.441GHz: 2.27	2.441GHz: -2.80	2.441GHz: -16.197
	2.480GHz: 2.16	2.480GHz: -2.88	2.480GHz: -16.933

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有源测试（传导/OTA）数据 Active test (conducted/OTA) data:

Conduction-传导			ANT_1 (BT)	
Frequency band	Mode	CH	Power	Sensitivity
BT (2.4G)	BR (DH5)	0	10.30	-97
		39	10.13	-97
		78	10.43	-97

OTA			ANT_1 (BT)	
Frequency band	Mode	CH	TRP	TIS
BT (2.4G)	BR (DH5)	0	7.02	-93.02
		39	7.34	-93.64
		78	7.33	-93.41

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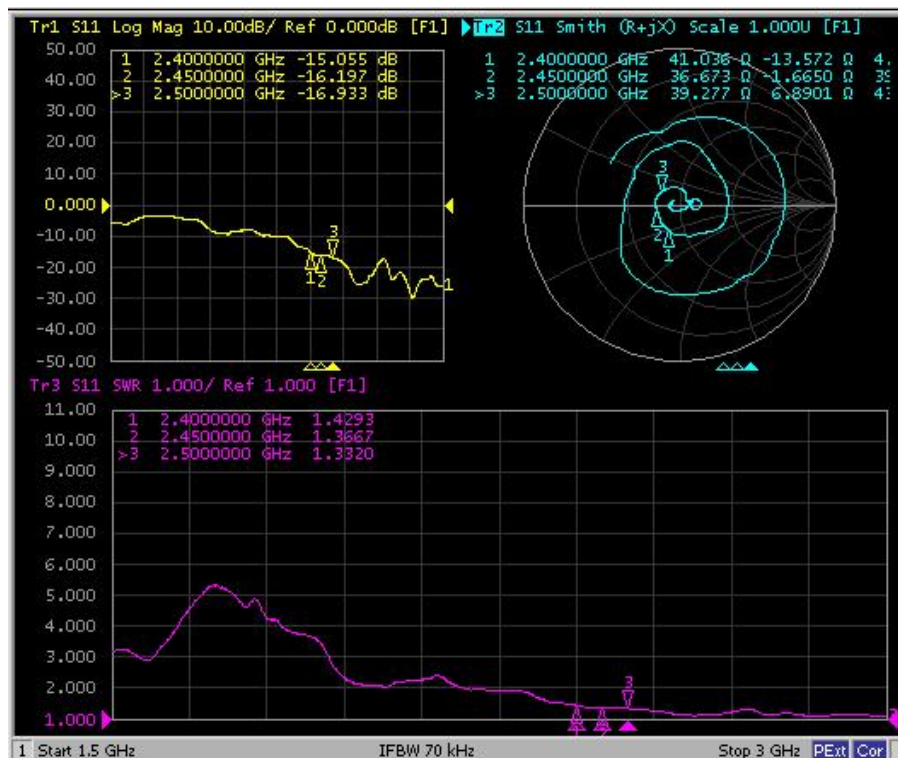
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无源效率&增益 Passive efficiency&gain:

Frequency (MHz)	Efficiency (%)	Efficiency (dB)	Gain(dBi)
2400	51.64	-2.87	1.94
2410	51.86	-2.85	2.03
2420	51.87	-2.85	2.1
2430	52.1	-2.83	2.1
2440	52.42	-2.81	2.25
2450	52.86	-2.8	2.26
2460	52.47	-2.77	2.24
2470	52.04	-2.84	2.22
2480	51.75	-2.86	2.21
2490	51.72	-2.86	2.18
2500	51.51	-2.88	2.16

4、VSWR 参数图 VSWR parameter diagram

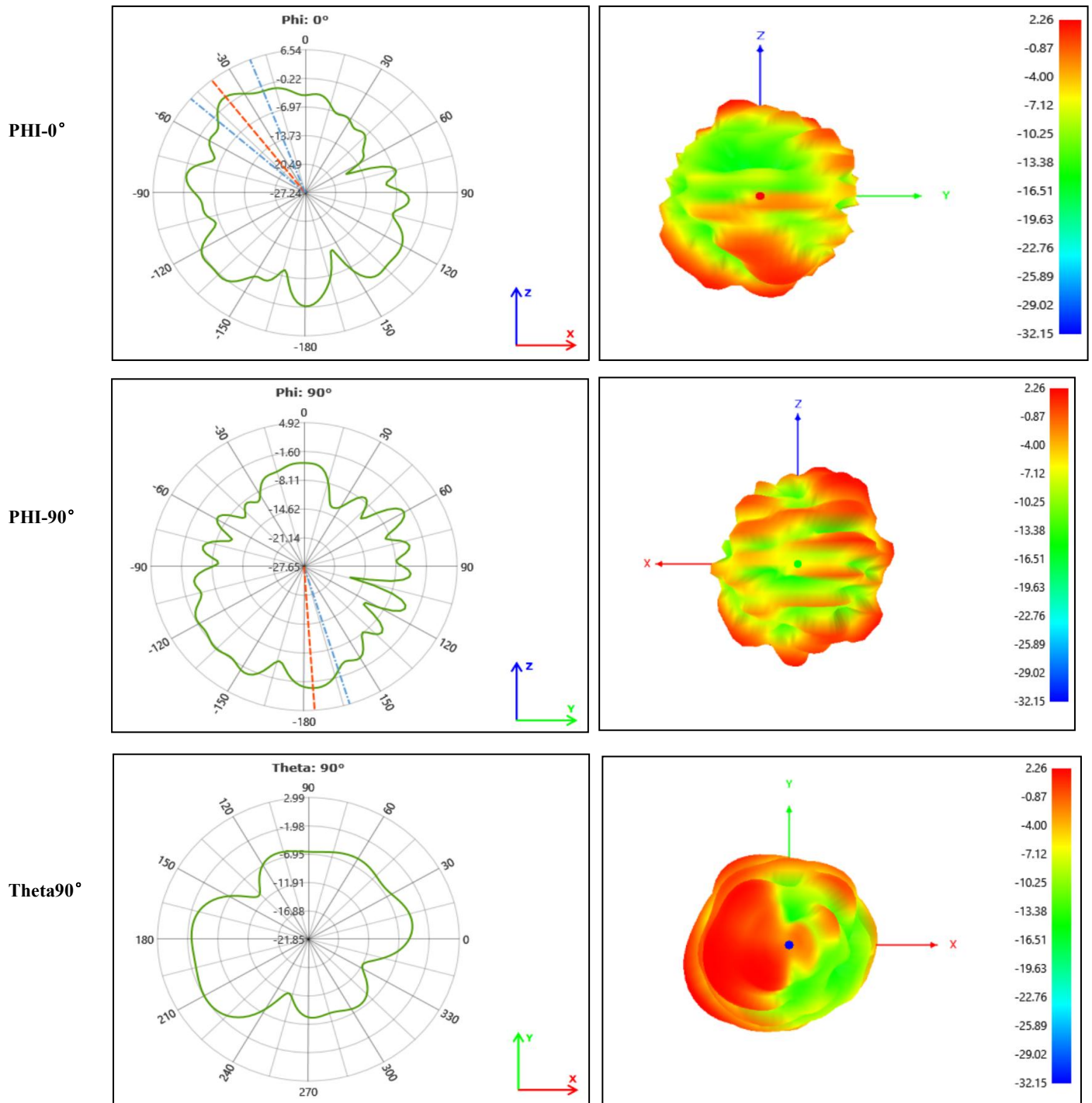


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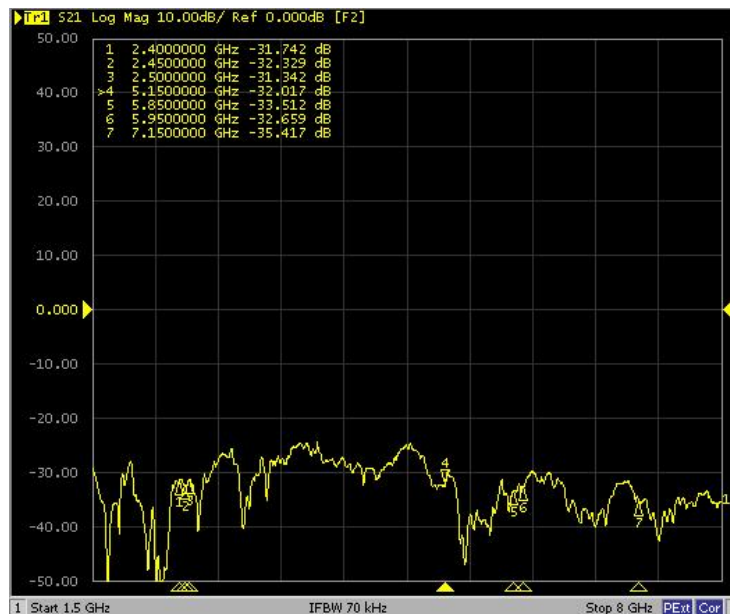
5、无源场型图 Passive Field Pattern Diagram



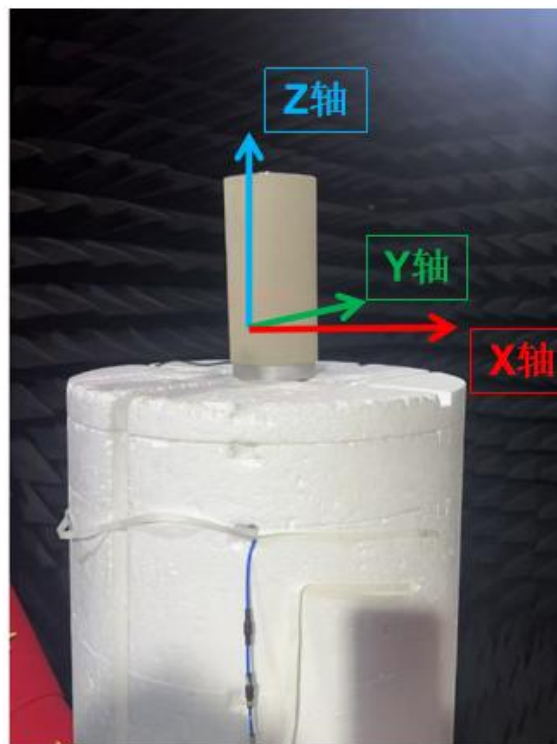
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6、天线测试结果：整机数据--隔离度 Antenna Test Results: Whole Unit Data - Isolation WIFI--BT



7、测试环境示意图 Schematic diagram of testing environment



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8、场测数据（拉距测试）Field test data (Pull distance test):

测试时间 Testing time: 2025/01/03

测试场地 test site: 深圳铁岗水库附近 Near Tiegang Reservoir, Shenzhen

测试手机 Test Cell Phones: Iphone 14 Pro



测试方向 Test direction	前 ahead	后 empress	左 Left	右 Right
	测试距离Test Distance			
BT	80M	90M	90M	90M

9、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!

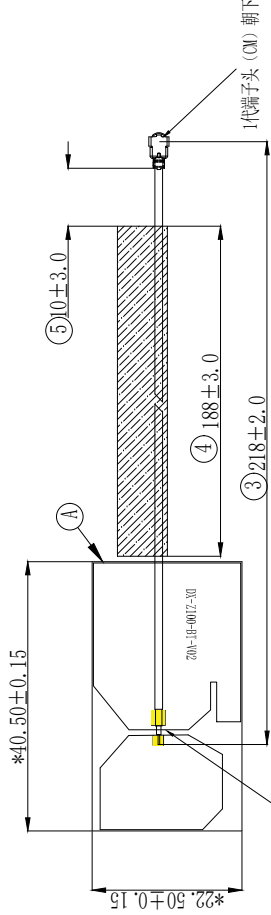
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1		2		3		4		5		6	
第三视角	☉	☉						角度		⊥	
	mm	比例		1:1		0~10		30~50		0.02	
						0.05		0.10		0.03	
								1°		0.05	

A



B

C

注:

1. "*"为重点尺寸;
2. 未标注尺寸请依图纸;
3. 不可有虚焊、漏焊、短线、断线等操作不良;
4. 符合 RoHS 要求.

D

C	线材海绵	PU海绵	黑色	
B	端子线	Cable线	黑色	
A	FPC	电解铜 PI	黑色	
序号	零件名称	材质	颜色	备注

深圳大显科技有限公司

Shenzhen Daxian Technology Co., Ltd.



机型	Z100	产品颜色	黑色	日期	2025/01/06
项目编码	CA-100XX-112	模面处理		结构设计	周锐斌
零件名称	BT天线			射频设计	沈川
零件编码	2A-100XX-112			审核	吴锡欢
材质	FPC+线材海绵+同轴线			批准	张磊
保存路径				当前版本	A

版本	描述	日期	备注
A	首次绘制		