



深圳汉阳天线设计有限公司

Hanyang Antenna Design Co., Ltd.

地址(ADD): 深圳市宝安区西乡街道桃花源科技创新园主园区 9 号研发楼

ADD: No.9 R&D Center, Taohuayuan Science and Technology Innovation Park, Tiegang Community,
Xixiang Street, Bao'an District, Shenzhen, China.

电话(TEL): 0755-23069700 传真(FAX): 0755-23069700

产品规格承认书

Product Specifications Acknowledgment

客户名称:

Customer Name

Titanium Union Shenzhen Technology Co., Ltd.

制造厂商:

Manufacturer:

Hanyang Antenna Design Co., Ltd.

产品名称:

Product Name:

N8402A-LDS Antenna

客户料号:

Customer Part Number:

301-01-0011

汉阳料号:

Hanyang Part Number:

F00100001171

Supplier Acknowledgment Signature Section

制表者/Tabulator

审核者/Reviewer

核准者/Approver

Customer Acknowledgment Signature Section

审核者/Reviewer

核准者/Approver

目录/Table of Contents

1 天线成品图片/Product Photography	5
2 产品参数//Product Specifications	6
3 测试数据/Test Data	7
3.1 VSWR & Return Loss	7
3.2 无源增益&效率/Gain & Efficiency	8
3.3 天线方向图/Radiation Pattern	8
4 天线结构图纸/Antenna Structure Drawing	9
5 环境可靠性测试/Environmental Reliability Test	10
6 包装示意图/Packaging Diagram	12

修订记录/Revision History

版本/Version	日期/Date	变更/Changes	作者/Author
1.0	2026-06	初始版本/Initial version	Peak

1 天线成品图片/Product Photography



2 产品参数//Product Specifications

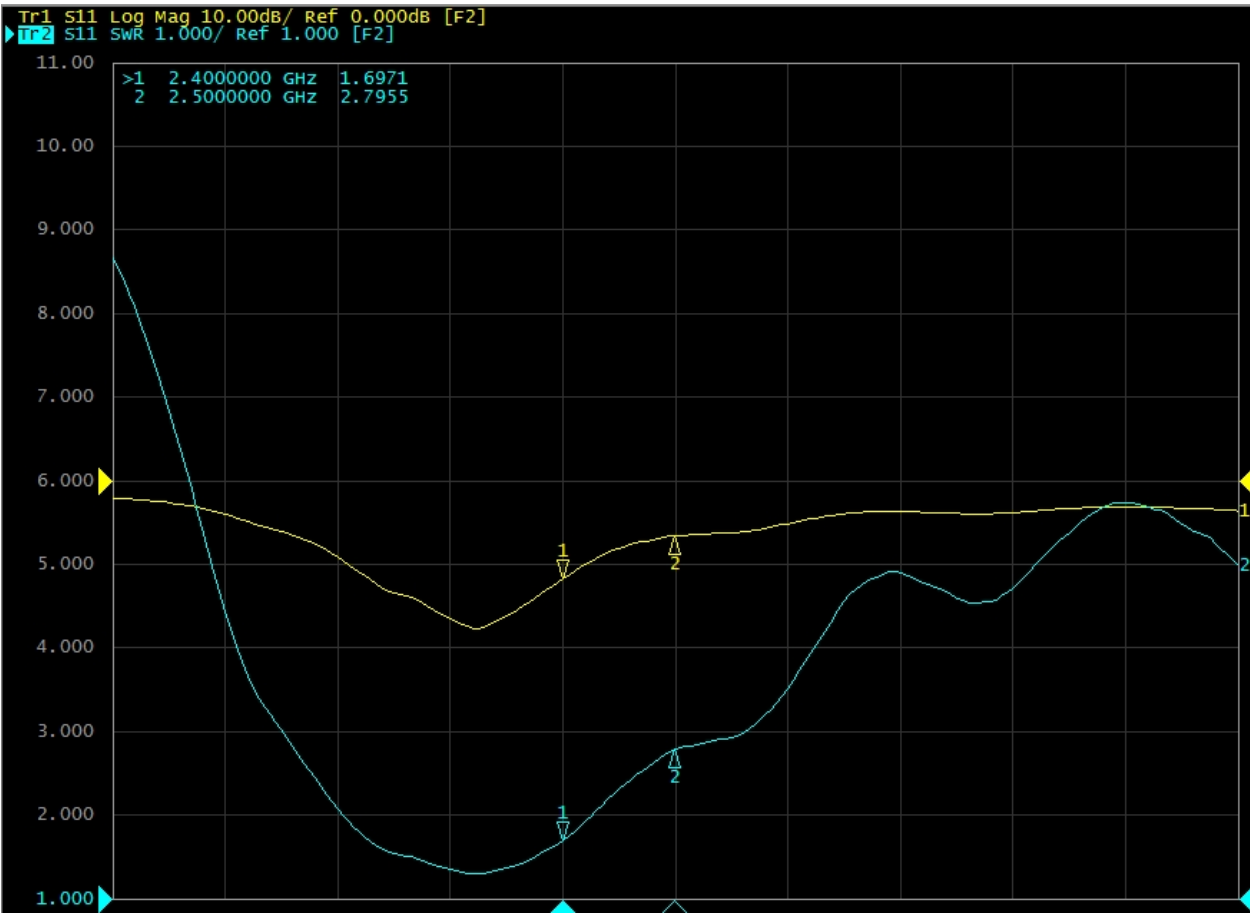
产品名称 Name	LDS Antenna	型号 Model	N8402A
频率范围 Frequency Range	2400-2500MHz	尺寸 Dimensions	30.6*15.98mm
驻波比 VSWR	≤ 3.0	输入阻抗 Impedance	50 Ω
极化方式 Polarization	线极化 Linear Polarization	电缆型号/长度 Cable Model/Length	\
辐射方向 Radiation	全向 Omnidirectional	工作温度 Working Temperature	-30℃ - +70℃

3 测试数据/Test Data

3.1 VSWR & Return Loss

Frequency (MHZ)	2400	2500
VSWR	1.69	2.79

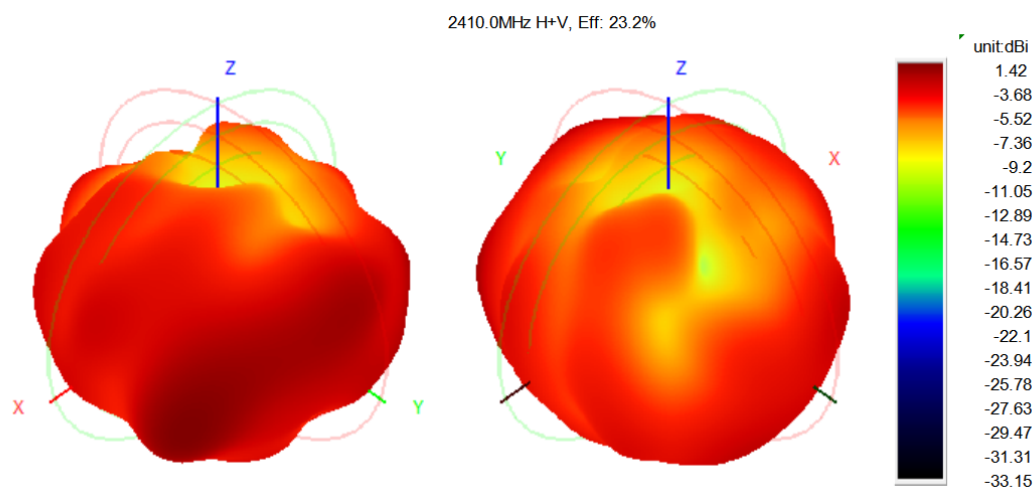
VSWR & Return Loss



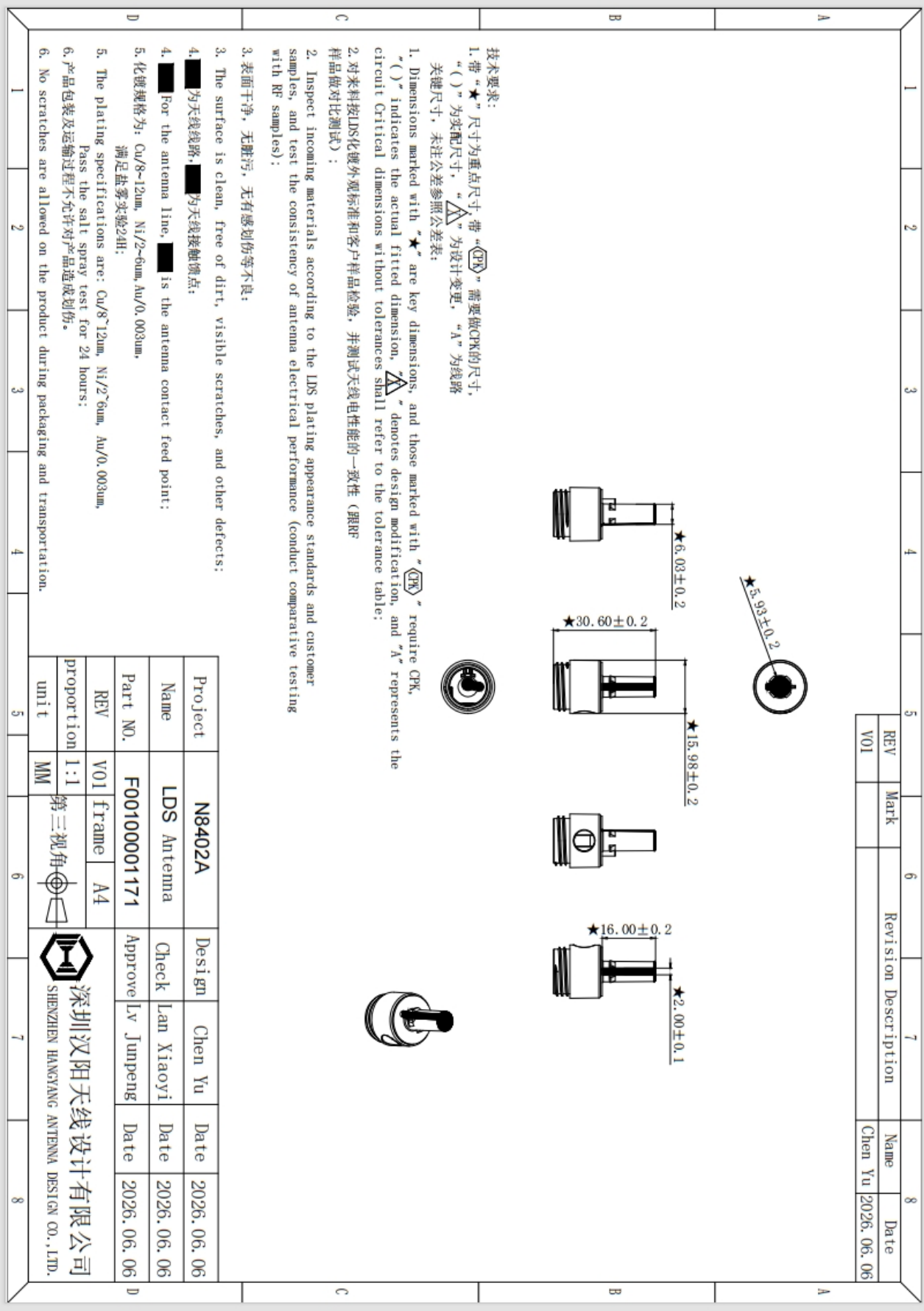
3.2 无源增益&效率/Gain & Efficiency

Freq	Efficiency_dB	Gain_dBi	Efficiency_Pcent_ %
2400	-6.14	1.39	24.3
2410	-6.2	1.42	24.01
2420	-6.3	1.37	23.46
2430	-6.47	1.17	22.53
2440	-6.6	1.02	21.9
2450	-6.75	0.88	21.15
2460	-6.86	0.84	20.61
2470	-6.99	0.71	19.99
2480	-7.16	0.55	19.23
2490	-7.29	0.43	18.66
2500	-7.42	0.27	18.09

3.3 天线方向图/Radiation Pattern



4 天线结构图纸/Antenna Structure Drawing



5 环境可靠性测试/Environmental Reliability Test

测试项目 Test Items	测试方法 Test Methods	测试标准 Test Standards
低温贮存 Store at low temperatures	1、 将待测天线放进温度试验箱。 2、 温度为$-30^{\circ}\text{C} \pm 2^{\circ}\text{C}$的低温环境存贮 48h。 3、 实验后在常温下恢复2小时，将产品取出检验，对样品进行外观检查，机械性能检查和电性能指标测试； 1.Put the antenna to be measured into the temperature test chamber. 2.Store in a low-temperature environment with a temperature of $-30^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 48 hours. 3.After the experiment, recover at room temperature for 2 hours, take out the product for inspection, and conduct visual inspection, mechanical property inspection and electrical performance index test on the sample.	● 整体样品不能出现变形、硬化、脆化、起泡等不良现象，电性能符合要求 ● The whole sample should not be deformed, hardened, brittle, foaming and other bad phenomena, and the electrical properties meet the requirements.
高温贮存 Store at high temperatures	1、 将待测天线放进温度试验箱。 2、 温度为 $70^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 的高温环境存贮 48h， 3、 实验后在常温下恢复 2 小时，将产品取出检验，对样品进行外观检查，机械性能检查和电性能指标测试； 1.Put the antenna to be measured into the temperature test chamber. 2. Store in a high-temperature environment with a temperature of $70^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 48 hours. 3. After the experiment, recover at room temperature for 2 hours, take out the product for inspection, and conduct visual inspection, mechanical property inspection and electrical performance index test on the sample;	● 整体样品不能出现变形、硬化、脆化、起泡等不良现象，电性能符合要求 ● The whole sample should not be deformed, hardened, brittle, foaming and other bad phenomena, and the electrical properties meet the requirements.
温度循环 Temperature Cycle	1、将待测天线放入温度测试舱。 2、首先在-30°C环境下保持 1 小时，随后$+70^{\circ}\text{C}$环境维持 1 小时，每组循环包含两个阶段，总时长不超过 40 分钟。共进行 10 次循环测试。 3、测试完成后，将产品置于室温环境中静置 2 小时自然恢复，随后取出进行外观检查、机械性能检测及电气参数测试。 1. Place the antenna to be tested into the temperature test chamber. 2. Maintain at -30°C for 1 hour and $+70^{\circ}\text{C}$ for 1 hour, which constitutes one cycle. The temperature change time should be no more than 40 minutes. A total of 10 cycles are tested. 3. After the experiment, let the product recover at room temperature for 2 hours. Then take it out for inspection. Conduct appearance inspection, mechanical performance inspection and electrical performance index test on the sample.	● 整体样品不能出现变形、硬化、脆化、起泡等不良现象，电性能符合要求。 ● The whole sample should not be deformed, hardened, brittle, foaming and other bad phenomena, and the electrical properties meet the requirements.

盐雾测试 Salt Spray Test	1、 将待测天线放进温度试验箱。 2、 设置喷雾参数：在温度 $35^{\circ}\text{C} \pm 2^{\circ}\text{C}$、湿度 $>85\%$ 的密闭环境中，PH 值在 6.5-7.2 范围内，用 $5\% \pm 1\%$ 的 NaCl 溶液连续 24h 盐水喷雾后。 3、 实验后取出产品，用自来水充分冲洗，常温静置干燥，检查测试表面 1. Put the antenna to be measured into the temperature test chamber. 2. 2Set the spray parameters: in a closed environment with a temperature of $35^{\circ}\text{C} \pm 2^{\circ}\text{C}$, a humidity of $>85\%$, and a pH value in the range of 6.5-7.2, spray with $5\% \pm 1\%$ NaCl solution for 24 hours in continuous saline. 3. After the experiment, take out the product, rinse it fully with tap water, let it dry at room temperature, and check the test surface	● 检查试样，不允许有任何裂纹、锈蚀、起泡、明显变形、变蓝色、起皱或整个脱落不良。 ● Check the sample, any cracks, rust, bubbling, obvious deformation, blue, wrinkling or poor overall detachment are not allowed.
---------------------------------	---	---

6 包装示意图/Packaging Diagram

