



深圳市维力谷无线技术股份有限公司

ShenZhen VLG Wireless Technology Co.,Ltd

承认书

| | | | | | | | |
|---|-----------------------------|----|-------------------------------|--------------|------------------------------|----|--|
| 项目名称 | 0337 (A12项目) WIFI天线 | | 频段 | 2400-2500MHz | | | |
| VLG机种编码 | V1350-053-A-1 | | 版本 | A | | | |
| 射频 | 刘军 | 确认 | 刘军 | 品质 | 徐胜勇 | 确认 | |
| 结构 | 柴晓瑞 | | 柴晓瑞 | PM | 王春新 | | |
| 日期 | 2019.03.20 | | | | | | |
| 客户项目名称料号 | 客户项目名称: 0337 (A12项目) WIFI天线 | | | | | | |
| | 客户项目编号: | | | | | | |
| 客户确认 | | | | | | | |
| VLG Wireless Technology | | | | | | | |
| 研发项目客户满意度调查 (客户请针对我们的研发或PM管理人员工作进行一个评述, 督促我们更好服务于你) | | | | | | | |
| RF技术人员 | <input type="checkbox"/> 满意 | | <input type="checkbox"/> 基本满意 | | <input type="checkbox"/> 不满意 | | |
| 结构技术人员 | <input type="checkbox"/> 满意 | | <input type="checkbox"/> 基本满意 | | <input type="checkbox"/> 不满意 | | |
| 项目管理 (PM管理人员) | <input type="checkbox"/> 满意 | | <input type="checkbox"/> 基本满意 | | <input type="checkbox"/> 不满意 | | |
| 建议项说明: | | | | | | | |
| 天线图片 :  | | | | | | | |

| | | |
|---|---------------|-----|
| 特征阻抗 (R) Characteristic Impedance | / | |
| 工作温度 Working Temperature | -20 ~ +70 | °C |
| 存储温度 Storage temperature | -20 ~ +80 | °C |
| 频率范围 Frequency Range | 2400-2500 | MHz |
| 介质耐压 Medium Pressure | / | |
| 接触阻抗 Contact impedance | 50 | ohm |
| 绝缘阻抗 Insulation impedance | / | |
| 电压驻波比 Voltage VSWR | <2 | |
| 天线效率 Antenna Efficiency | 52.72 ~ 58.58 | % |
| 增益 Antenna Gain | 2.0 ~ 2.84 | dB |
| 辐射方向 Radiation direction | 全向 | |
| 功率容量 Power capacity | 33 | dBm |
| 极化方式 Polarization mode | 线极化 | |
| 接头类型 Connector type | / | |

Confidential Information

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0337 (A12 项目) WIFI 天线规格书

1、规格：报告主要提供 0337 (A12 项目) WIFI 天线的各项电性能参数的测试状况。（如下图 1 所示）

1、Specification: Report mainly provide 0337 (A12 project) all electrical parameters of the WIFI antenna test condition. (as shown in figure 1)



图一 0337 (A12 项目) WIFI 天线 WIFI Antenna

2、电器性能 Electrical Performance

2.1 规格标准 Specifications And Standards

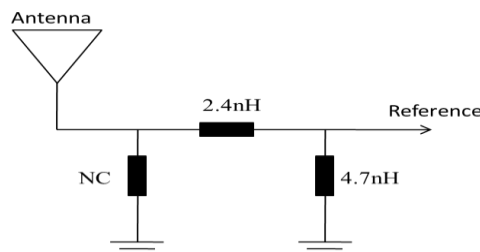
0337 (A12 项目) WIFI 天线工作频段在 **2400-2500MHz**。

0337 (A12 project) WIFI Antenna Working Frequency Range is 2400-2500z.

2.2 天线的匹配电路 Antenna Matching Circuit

0337 (A12 项目) WIFI 天线匹配为主板为串联 2.4nH 电感，并联 4.7nH 电感。

0337 (A12 project) WIFI Antenna Matching Circuit: Main board has 2.4nH inductance in series and 4.7nH inductance in parallel



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2.4nH: 叠层普通电感 0402-±0.3nH-400mA-85°C-0.15R, 制造商: 奇力新电子 (CHILISIN)

2.4nH: Laminated common inductor 0402-±0.3nH-400mA-85°C-0.15R, manufacturer: CHILISIN

4.7nH: 叠层普通电感 0402-±0.3nH-300mA-125°C-0.2R, 制造商: 深圳顺络电子股份有限公司

4.7nH: Laminated common inductor 0402-±0.3nH-300mA-125°C-0.2R, manufacturer: Shenzhen Shunluo Electronics Co., Ltd

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2.3 驻波比(VSWR)的测试 VSWR Testing

A. 测试的设置 Test setting

Test standard & procedure:

| | | | |
|---------------------|----------------------|--|-------------------------|
| Antenna performance | Radiation efficiency | IEEE Standard Test Procedures for Antennas | ANSI/IEEE Std 149- 2021 |
|---------------------|----------------------|--|-------------------------|

Equipment List

| Equipment | Manufacturer | Model Number | Last Cal | Due Date |
|------------------|--------------|--------------|-----------|-----------|
| Network Analyzer | Agilent | 8714ET | 2018.8.28 | 2021.8.27 |

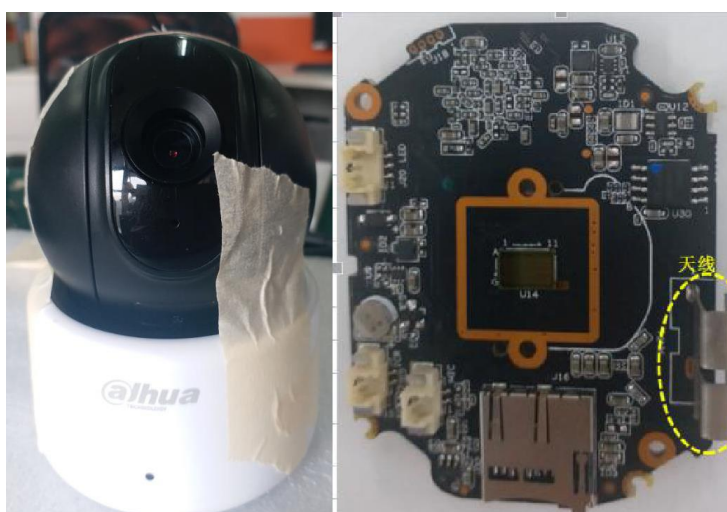
VSWR 测试装置依次的连接为：8714ET网络分析仪→50 欧姆的同轴 Cable→120mm 长的铜管→测试治具。

VSWR test equipment connected in turn order: 8714ET network analyzer→

50 ohm coaxial cable →120mm long copper pipe →test fixture

测试治具的处理：从 0337 (A12 项目) WIFI 天线 PCB 上天线 50 欧姆测试点处用一根电缆引出 SMA 接头，与套有扼流圈的铜管连接，再依次连接其他装置。

Treatment of test fixture: lead out with a cable from the 50 ohm test point of the antenna on the 0337 (A12 project) WIFI antenna PCB, The SMA connector is connected to the copper pipe with a choke, and then connected to other devices in turn.



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B. VSWR

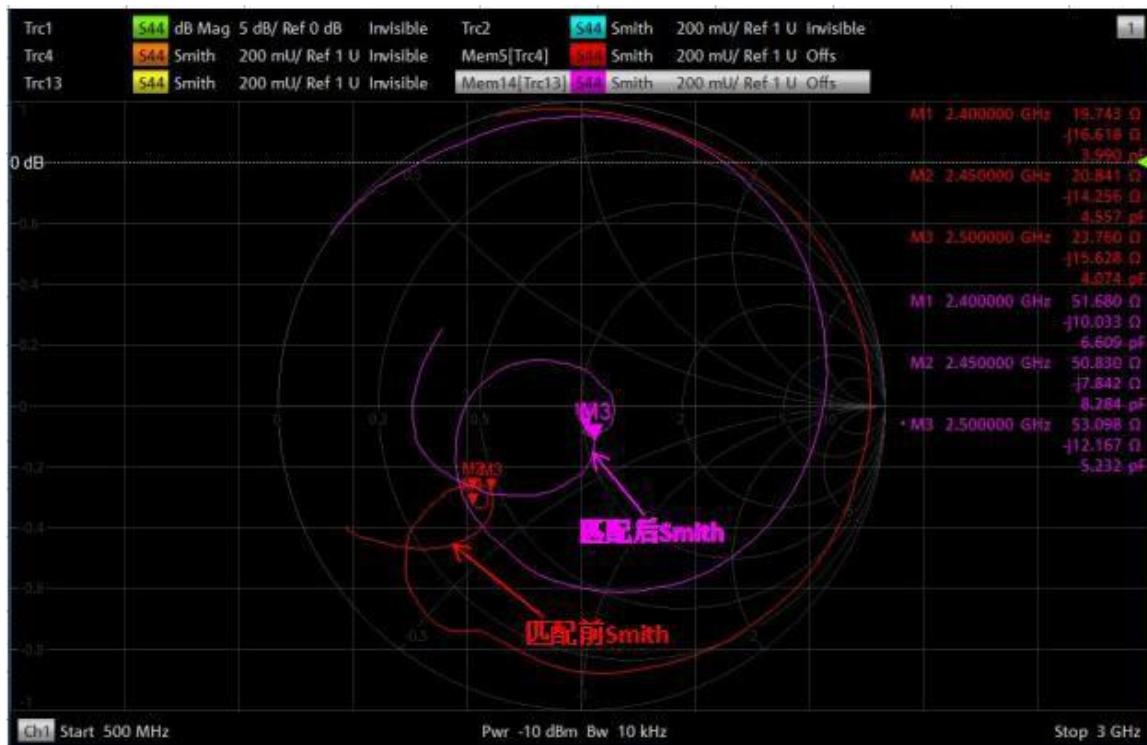
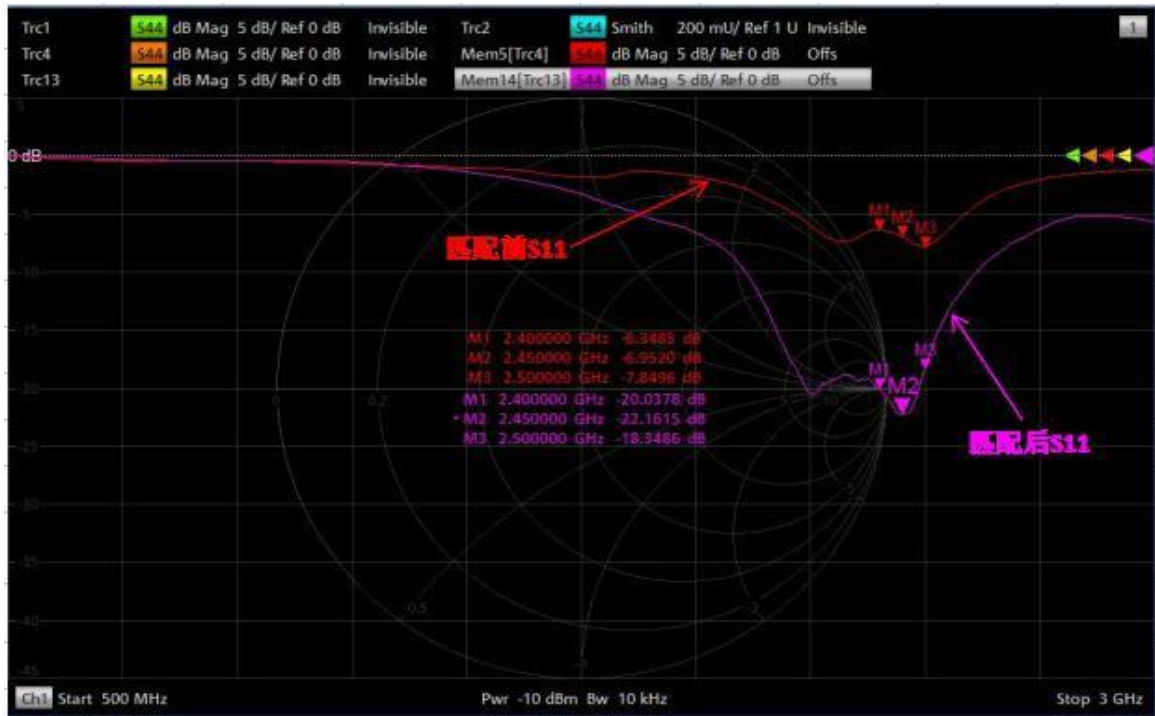
下表所示为 0337（A12 项目）WIFI 天线工作频段边缘频点的驻波比数值。测试所得的 log, 相关波形图如附件所示。

| 频段 | 频率 (MHz) | Log |
|------------------|----------|--------|
| 2.4G WiFi | 2400 | -20.03 |
| | 2500 | -18.34 |

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2.3.1 SWR 参数



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2.3.2 无源天线效率、增益的测试 Test of passive antenna efficiency and gain

测试方法：通过多探头采集 DUT 球面近场数据，再通过严格的数学近远场转换计算出 DUT 的方向图，依据方向图上的方向性系数计算出无源的增益效率。

Test method: collect the near-field data of DUT spherical surface through multiple probes, calculate the DUT pattern through strict mathematical near-field to far-field conversion, and calculate the passive gain efficiency according to the directivity coefficient on the pattern.

测试设备：安捷伦 5071C Test equipment: Agilent 5071C

测试环境：通用-GTS Test environment: Universal GTS



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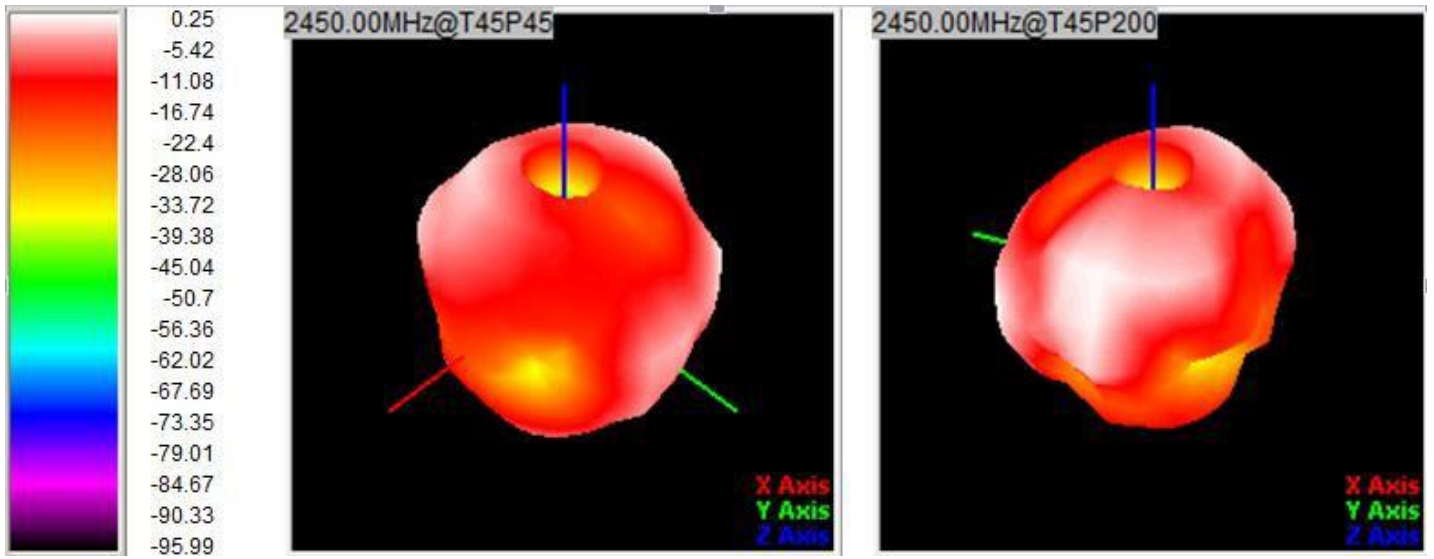
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| Gain&Efficiency 增益和效率 | | | |
|--------------------------|----------------|----------------------|---------------------|
| frequency 频率(MHz) | gain 增益(dB) | efficiency 效率(dB) | efficiency 效率(%) |
| 2400 | 2.41 | -2.32 | 58.58% |
| 2410 | 2.59 | -2.33 | 58.54% |
| 2420 | 2.25 | -2.55 | 55.64% |
| 2430 | 2.57 | -2.51 | 56.15% |
| 2440 | 2.84 | -2.47 | 56.65% |
| 2450 | 2.46 | -2.55 | 55.59% |
| 2460 | 2.35 | -2.66 | 54.15% |
| 2470 | 2.72 | -2.51 | 56.07% |
| 2480 | 2.55 | -2.48 | 56.49% |
| 2490 | 2 | -2.78 | 52.72% |
| 2500 | 2.19 | -2.67 | 54.04% |
| Average | 2.45 | -2.53 | 55.87% |

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2.3.3 3D 方向图

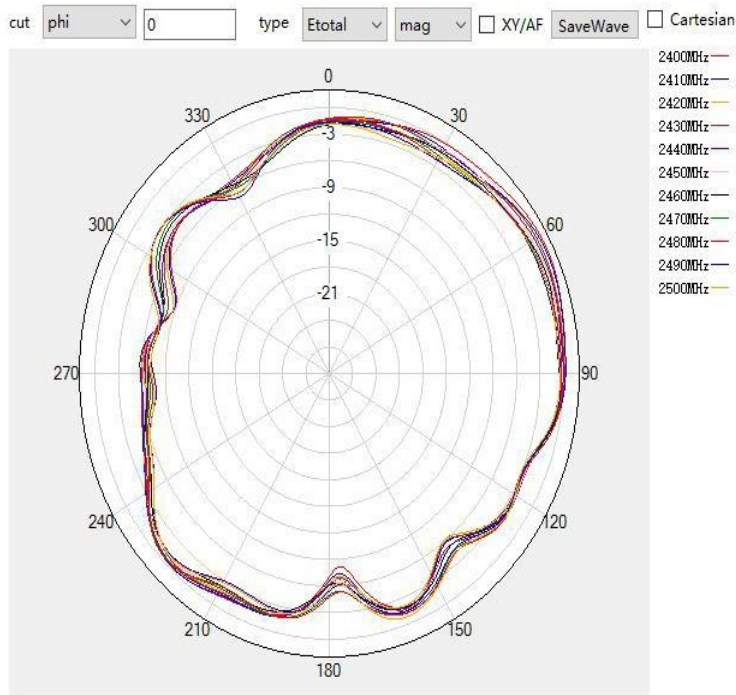


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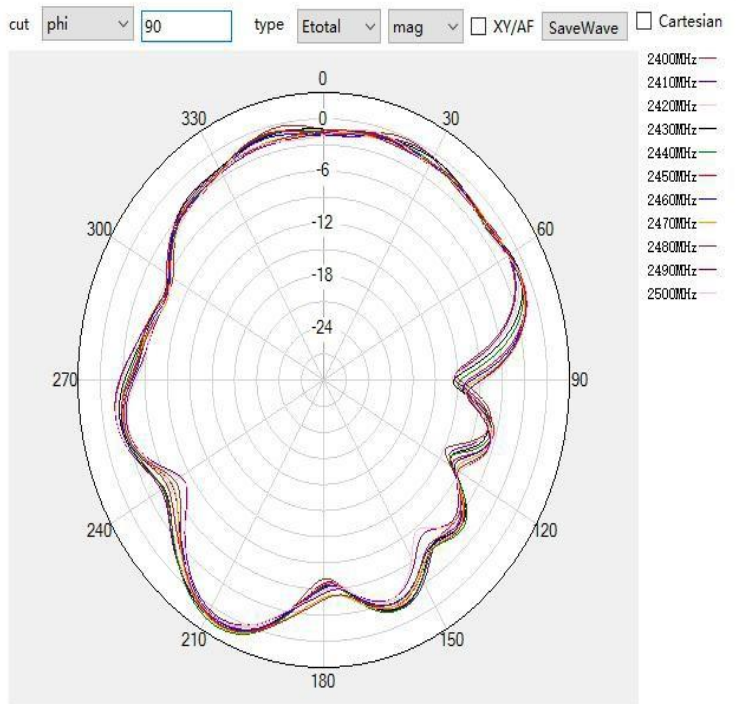
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2.3.4 2D 方向图

E1-Plane (Phi=0°)

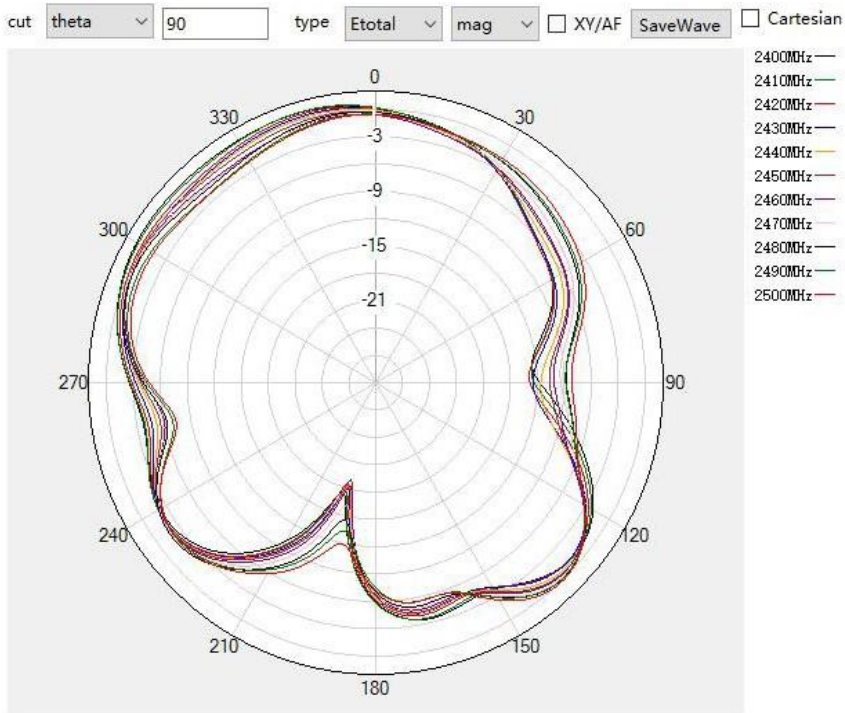


E2-Plane (Phi=90°)



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H-Plane (Theta=90°)

3、建议与结论

此报告是根据客户提供 0337 (A12 项目) WIFI 天线的最终版测得的天线电气性能。从如上测试数据可以看到，此天线提供了较好的电气性能。维力谷研发期盼您的确认，谢谢合作！

4、图面样品、外观见附档：

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A

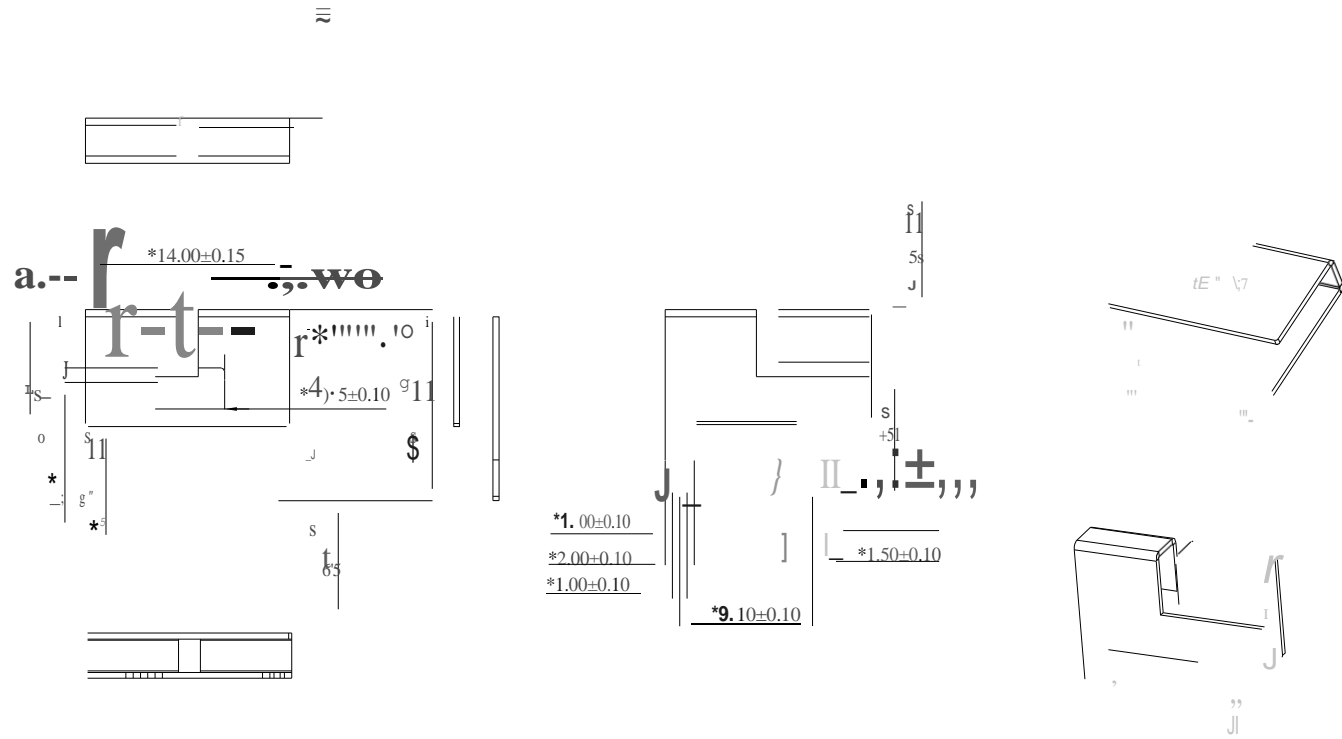
B

C

A

B

C



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Shenzhen VLG Wireless Technology Co.,Ltd

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|-------|-------------|-------|----------------------|---------------|------------|---------|-------|
| 4l--t | L::: Jll !/ | fll f | 0337 (A12J91=1) | EUJl | 2019.03.20 | JHJ:b | 1/1 |
| 0~10 | ±0.10 | 0.02 | WIFI;11: | OO | B]af | t-HISil | -xJff |
| 10~20 | ±0.15 | 0.03 | VI350-053-A-1 | | | | |
| 20~40 | ±0.20 | 0.02 | | | | | |
| > 40 | ±0.25 | 0.04 | HHI304H/11, o. 4mm | | | | |
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深圳市维力谷无线技术有限公司

ShenZhen VLG Wireless Technology Co.,Ltd

样品尺寸检测报告

| 客户名称 | | 大华 | | 产品名称 | | 0337 (A12项目) WIFI天线 | | | 产品类型 | | 弹片天线 | |
|-------|------|------------------|--------|-------|-------|---------------------|-------|------|------|----|------------|--|
| 供应商名称 | | 深圳市维力谷无线技术股份有限公司 | | 产品料号 | | V1350-053-A-1 | | | 检验人员 | | 徐胜勇 | |
| 图纸版本 | | R: A | | 单位 | | mm | | | 检验日期 | | 2019.03.20 | |
| 序号 | 检测项目 | 检测标准 | 实际测量尺寸 | | | | | 判定结果 | 检测仪器 | 穴号 | 备注 | |
| | | | 1 | 2 | 3 | 4 | 5 | | | | | |
| 1 | 外观 | 见外观不良现象简述 | OK | OK | OK | OK | OK | OK | 目测 | | | |
| | | ★ 14.00 ± 0.15 | 14.08 | 14.10 | 14.05 | 14.09 | 14.12 | OK | PM | | | |
| | | ★ 13.10 ± 0.20 | 13.15 | 13.17 | 13.12 | 13.12 | 13.16 | OK | PM | | | |
| | | ★ 8.00 ± 0.15 | 8.05 | 8.02 | 8.02 | 8.04 | 8.03 | OK | PM | | | |
| | | ★ 3.00 ± 0.10 | 3.03 | 3.05 | 3.02 | 3.05 | 3.06 | OK | PM | | | |
| | | ★ 1.00 ± 0.10 | 1.02 | 1.05 | 1.03 | 1.02 | 1.02 | OK | PM | | | |
| | | ★ 4.45 ± 0.10 | 4.48 | 4.50 | 4.47 | 4.52 | 4.49 | OK | PM | | | |
| | | ★ 4.75 ± 0.10 | 4.78 | 4.79 | 4.75 | 4.76 | 4.79 | OK | PM | | | |
| | | ★ 1.50 ± 0.10 | 1.52 | 1.52 | 1.55 | 1.50 | 1.53 | OK | PM | | | |
| | | ★ 3.10 ± 0.20 | 3.16 | 3.18 | 3.12 | 3.15 | 3.15 | OK | PM | | | |
| | | ★ 3.60 ± 0.10 | 3.62 | 3.65 | 3.65 | 3.63 | 3.66 | OK | PM | | | |
| | | ★ 1.00 ± 0.10 | 1.02 | 1.01 | 1.00 | 1.00 | 1.03 | OK | PM | | | |
| | | ★ 1.00 ± 0.10 | 1.02 | 1.00 | 1.00 | 1.03 | 1.01 | OK | PM | | | |
| | | ★ 1.50 ± 0.10 | 1.52 | 1.53 | 1.55 | 1.50 | 1.52 | OK | PM | | | |
| | | ★ 1.00 ± 0.10 | 1.02 | 1.01 | 1.02 | 1.01 | 1.00 | OK | PM | | | |
| | | ★ 9.10 ± 0.10 | 9.12 | 9.10 | 9.12 | 9.11 | 9.13 | OK | PM | | | |
| | | ★ 2.50 ± 0.10 | 2.53 | 2.56 | 2.52 | 2.53 | 2.55 | OK | PM | | | |
| | | ★ 2.80 ± 0.10 | 2.79 | 2.81 | 2.80 | 2.78 | 2.80 | OK | PM | | | |
| | | ★ 2.00 ± 0.10 | 2.02 | 2.01 | 2.02 | 2.00 | 1.99 | OK | PM | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

最终判定: OK NG

外观不良现象简述: A—漏铜、B—折皱、C—划伤、D—混色、E—背胶、F—色差、G—虚焊、H—脏污、I—孔位歪斜、J—披锋、K—压痕、L—变形、L—缩水、N—断脚、O—顶白、P—锈蚀、Q—电镀不良、R—无突包

检测仪器简称: PG—塞(圆孔)规、RG—R规、SG—块规、LG—环规 DC—数显卡尺 PM—二次元坐标投影仪

版本:A.0

表单编号:VLG/QRF8.2-28/A.0

检验: 卓伟传

审核: 徐胜勇

RoHS限用物质成份调查表

QR-QA20-08

供应商：**维力谷无线技术股份有限公司**

| 所供产品信息 | | | | | | | | | | | | | | | | |
|--------|---------------------|---------------|-------|---------|----|-----------|--------|--------|-------------------------|------------|--------------|----------------|----------------|----------------|------------------|----|
| 物料代码 | 物料名称/型号 | 供应商物料料号 | | | | | 制造商 | | | | | 绿色物料标识 | | | | |
| | 0337 (A12项目) WIFI天线 | V1350-053-A-1 | | | | | 维力谷 | | | | | | | | | |
| 产品构成信息 | | | | | | | | | | | | | | | | |
| 序号 | 部件名称 | 部件料号 | 部件供应商 | 第三方检测报告 | | 限用物质含量PPM | | | | | | | | | | 备注 |
| | | | | 日期 | 编号 | 铅 (Pb) | 镉 (Cd) | 汞 (Hg) | 六价铬 (Cr ⁶⁺) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) | 邻苯二甲酸二丁酯 (DBP) | 邻苯二甲酸丁苯酯 (BBP) | 邻苯二甲酸二脂 (DEHP) | 邻苯二甲酸二异丁酯 (DIBP) | |
| 1 | 0337 (A12项目) WIFI天线 | 维力谷 | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | | | | | | | | | | | | | | | | |
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Note 1、请以○、×表示六项限用物质含量合规与否；合规者以○表示；不合规以×表示。
 2、PPM限量值：镉<100PPM；铅/汞/六价铬/PBB/PBDE/DBP/BBP/DEHP/DIBP<1000PPM。
 3、其中针对包装材料中铅、六价铬、汞和镉的总量不超过100ppm。
 4、此表请供应商完整填写后盖章；此处供应商指直接交易方。（提供盖章的纸件或扫描PDF文件）
 5、若有限用物质超标但符合豁免条款，请在备注中说明。

填写人：余洪

填写人公司/部门：深圳市维力谷 品质部

审核：余洪

出厂包装要求

一般要求:

- 1.说明客户名, 项目名称, 型号,
- 2.图片说明内外箱, 出货时包装方式, 层数, 单层数量等
- 3.备注栏内填写包装所用材料名称, 数量等
- 4.质量部主管签字, 日期

托盘

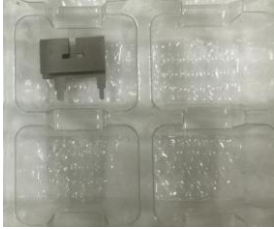


图1: 内箱基本包装方式



图2: 内箱基本包装方式



图3: 包装箱



图4: 外箱标签



图5: 外包装箱外形



图6: 包装箱正面

| | |
|-------|---------------------|
| 产品料号: | V1350-053-A-1 |
| 产品名称: | 0337 (A12项目) WIFI天线 |
| 产品版本: | R:A |
| 包装方式: | 托盘+隔板+外纸箱 |

签名: 余云春 18.10.19