

Manufacturer: Shenzhen World Elite Electronic CO.LTD

样品承认书 / SAMPLE APPROVAL SHEET

部品信息 / Part Information

客户 / Customer	中山市悦辰电子实业有限公司 (Zhong Shan City Richsound Electronic Industrial Ltd.)
部品名称 / Material Description	VPS-2100 BT 天线 (VPS-2100 BT Antenna)
部品规格 / Specifications	FPC (47*9.5mm) + 黑色同轴线 (φ 1.13*65mm) FPC (47*9.5mm) + <i>Black Coaxial Cable</i> (φ1.13*65mm) +
供应商料号 / Supplier's Part Number	01-05-001-*****
送样日期 / Date	2025-12-18

签核 / Signatures

供应商签核 / Supplier Signatures:

拟制 / Prepared By	审核 / Checked By	批准 / Approved By
张登桥 (Zhang Dengqiao)	李岳鹏 (Li Yuepeng)	张红英 (Zhang Hongying)

客户签核 / Customer Signatures:

承认 / Accepted By	审核 / Checked By	批准 / Approved By

承认结果 / Approval Result:

- ☐ 完全接受 / Full Approval
- ☐ 条件接受 / Conditional Approval
- ☐ 不合格 / Unqualified
- ☐ 其它 / Others: _____

声明 / Statement:

本样品承认书我司确保属实，如经贵司研发部门确认签核后，请以最快速度回传给
我司。如有其它原因，请以书面形式通知我。

This sample approval sheet is guaranteed to be true by our company. If confirmed and
signed by your R&D department, please return it to us as soon as possible. If there are any
other reasons, please inform us in writing.

目录

1. 规格 / Specifications	3
1.1 电气规格标准 / Electrical Specification Standards	3
1.1.1 电性能指标 / Electrical Performance Indicators.....	3
1.1.2 匹配电路图 / Matching Circuit Diagram	3
2. 测试 / Testing.....	4
2.1 无源 S11 的测试 / Passive S11 Testing	5
2.1.1 测试连接 / Test Connection	5
2.1.2 无源 S11 / Passive S11	5
2.2 增益及效率的测试 / Gain and Efficiency Testing.....	5
2.2.1 测试的场地 / Test Site	6
2.2.2 测试的仪表 / Test Instruments.....	6
2.2.3 测试结果 / Test Results.....	6
2.2.4 无源辐射方向图 / Passive Radiation Pattern.....	7
2.3 有源测试 / Active Testing	7
2.3.1 OTA 测试结果 / OTA Test Results	7
3. 结论 / Conclusion	8
4. 产品结构图 / Product Structure Drawings.....	9

1. 规格 / Specifications

本报告主要提供天线 VPS-2100 BT 天线各项电气和结构性能参数的测试状况。
This report mainly provides the test status of various electrical and structural performance parameters of the VPS-2100 BT Antenna.(Antenna Type:FPC)



(图 1 天线 / Figure 1 Antenna)

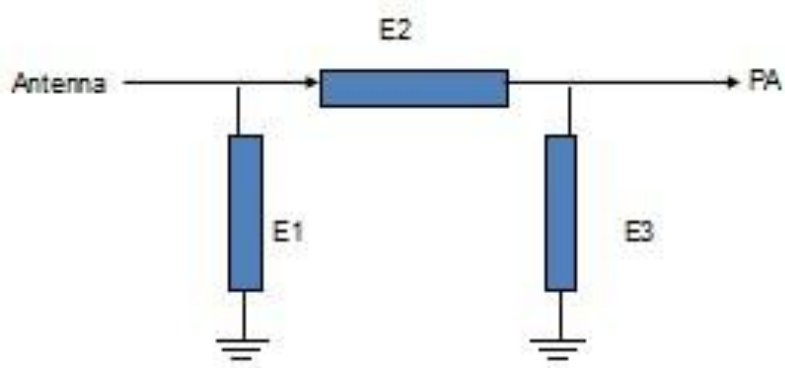
1.1 电气规格标准 / Electrical Specification Standards

1.1.1 电性能指标 / Electrical Performance Indicators

天线工作频段在 2400-2480MHz。下表是我司设计天线的电性能的指标。
The antenna operating frequency band is 2400-2480MHz. The table below shows the electrical performance indicators of the antenna designed by our company.

天线 / Antenna	VPS2100 BT 天线
频段 / Frequency Band	2400-2480 MHz
驻波比 / VSWR	< 2
效率 / Efficiency	> 50%
阻抗 / Impedance	50 ohm
极化方式 / Polarization	线极化 / Linear Polarization

1.1.2 匹配电路图 / Matching Circuit Diagram



Element	Value
E1 (0402)	NC
E2 (0402)	NC
E3 (0402)	NC

2. 测试 / Testing

天线用客户提供的样机进行调试及测试。

The antenna was debugged and tested using the prototype provided by the customer.

2.1 无源 S11 的测试 / Passive S11 Testing

2.1.1 测试连接 / Test Connection

无源 S11 测试装置依次的连接为：网络分析仪 → 测试线 → 测试治具。

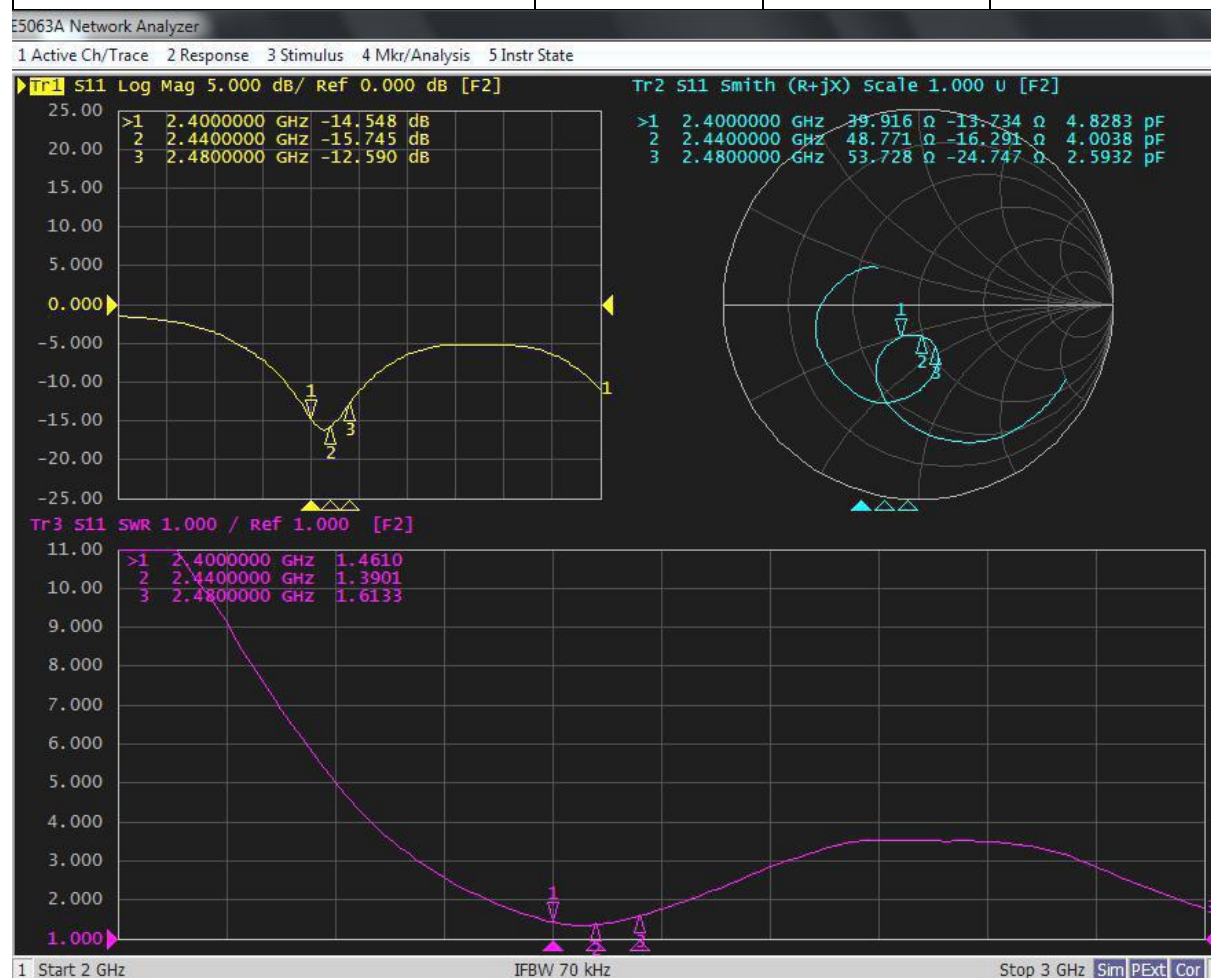
The connection sequence for the passive S11 test setup is: Network Analyzer → Test Cable → Test Fixture.

2.1.2 无源 S11 / Passive S11

下表所示为天线工作频段边缘频点的驻波比数值。测试所得的 Return Loss, VSWR 相关波形图如下图所示。

The table below shows the VSWR values at the edge frequencies of the antenna operating band. The measured Return Loss and VSWR waveforms are shown in the figure below (figure omitted).

频率 / Frequency (MHz)	2400	2440	2480
驻波比 / VSWR	1.46	1.39	1.61
回波损耗 / Return Loss (dB)	-14.55	-15.75	-12.59



2.2 增益及效率的测试 / Gain and Efficiency Testing

2.2.1 测试的场地 / Test Site

微波暗室：测试频率范围为 400MHz—6GHz。

Anechoic Chamber: Test frequency range is 400MHz—6GHz.

2.2.2 测试的仪表 / Test Instruments

网络分析仪、标准喇叭天线、多探头近场天线测试系统、测试电脑等。

Network Analyzer, Standard Horn Antenna, Multi-probe Near-field Antenna Test System, Test Computer, etc.

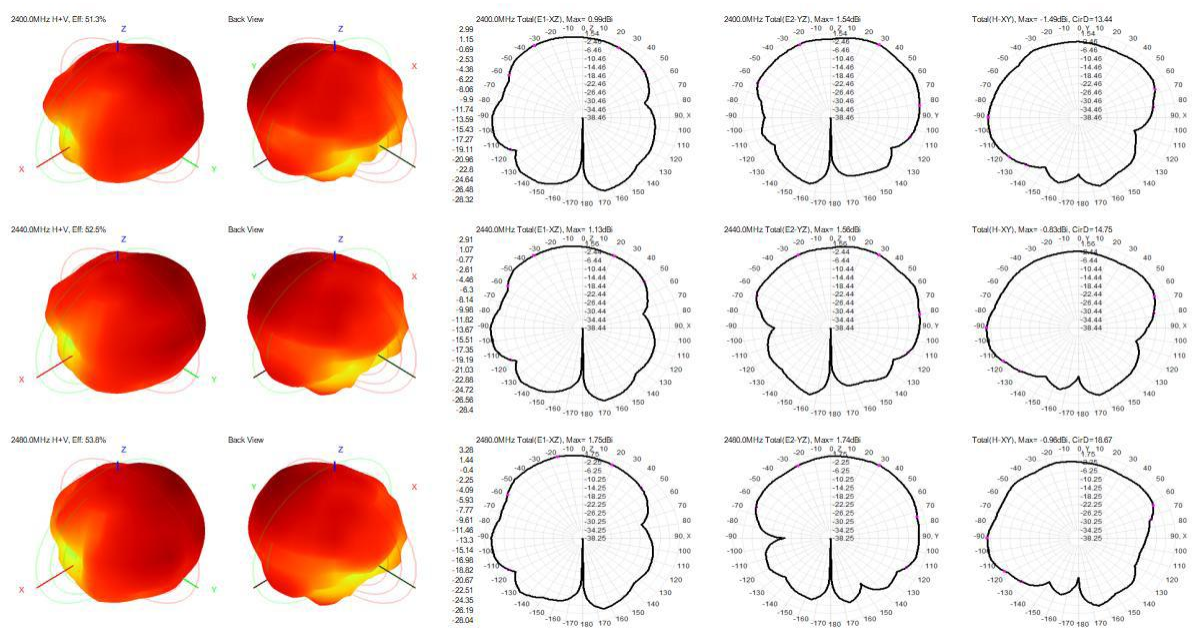
2.2.3 测试结果 / Test Results

在微波暗室中，测试的与效率及增益相关的数值如下表所示：

The values related to efficiency and gain tested in the anechoic chamber are shown in the table below:

频率 / Frequency (MHz)	增益 / Gain (dBi)	效率 / Efficiency (%)
2400	2.99	51.32
2410	2.92	51.26
2420	2.97	52.27
2430	2.89	53.37
2440	2.91	52.45
2450	3.01	52.41
2460	3.16	52.31
2470	3.26	52.80
2480	3.28	53.85
2490	3.16	53.89
2500	3.04	54.53

2.2.4 无源辐射方向图 / Passive Radiation Pattern



2.3 有源测试 / Active Testing

2.3.1 OTA 测试结果 / OTA Test Results

信道 / Channels	TRP (dBm)	TIS (dBm)
0	14.5	-87.26
39	15.19	-90.56
78	13.62	-88.67

3. 结论 / Conclusion

此天线是在客户提供样机基础上设计，上述电性能参数基于测试样机环境处理条件下测试，电参数和结构性能已达到技术要求，请确认！

This antenna was designed based on the prototype provided by the customer. The above electrical performance parameters were tested under the conditions of the test prototype environment. The electrical parameters and structural performance have met the technical requirements. Please confirm!

4. 产品结构图 / Product Structure Drawings

