

YUAN DE DAINZI (SHENZHEN)
Sample Confirmation Letter
SAMPLE APPROVAL SHEET

客户 (Customer)	Richsound Electronic Industrial Ltd
部品名称 (Material Description)	AT-SP3X BT ANT
客户料号 (Customer's Part number)	
部品规格 (Specifications)	AT-SP3X BT Antenna:FPC (L25.4*W23.4mm)+black coaxial line(ϕ 0.81 * 70mm)+welding+solder pad UV
远德料号 (Supplier's Part number)	136-ATSP3X-10A
送样日期 (Date)	2024-1-4

拟制 Prepared By	审核 Checked By	批准 Approved By
张登桥	李岳鹏	张相亭 业务专用章

客户签核:

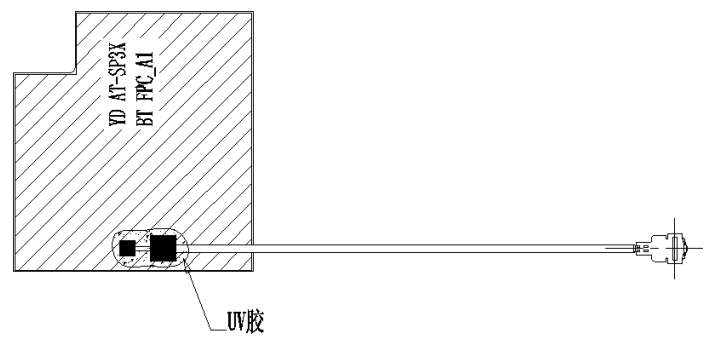
承认 Accepted By	审核 Checked By	批准 Approved By
承认结果: ☐ 完全接受 (Full Approval) ☐ 条件接受 (Conditional Approval) ☐ 不合格 (Unqualified) ☐ 其它 (Others):		

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. If it is confirmed by your R&D department, please send it back to us as soon as possible. If there are other reasons, please inform us in writing.

1 specifications

This report mainly provides the testing status of various electrical and structural performance parameters of the AT-SP3X BT antenna.



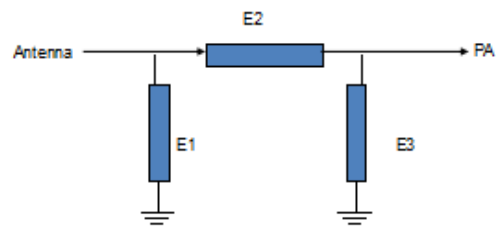
1.1 Electrical specification standards

1.1.1 Electrical performance indicators

The antenna operates in the frequency range of 2400-2480MHz. The following table shows the electrical performance indicators of our designed antennas

ANT	AT-SP3X BT ANT
FRE.	2400-2480MHz
VSWR	< 2
Efficiency	> 45%
Impedance	50 ohm
Polarization	linear polarization

1.1.2 Matching circuit diagram



Element	Value
E1(0402)	N/A
E2(0402)	0R
E3(0402)	N/A

2 Test

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

2.1 Testing of Passive S11

2.1.1 Test Connection

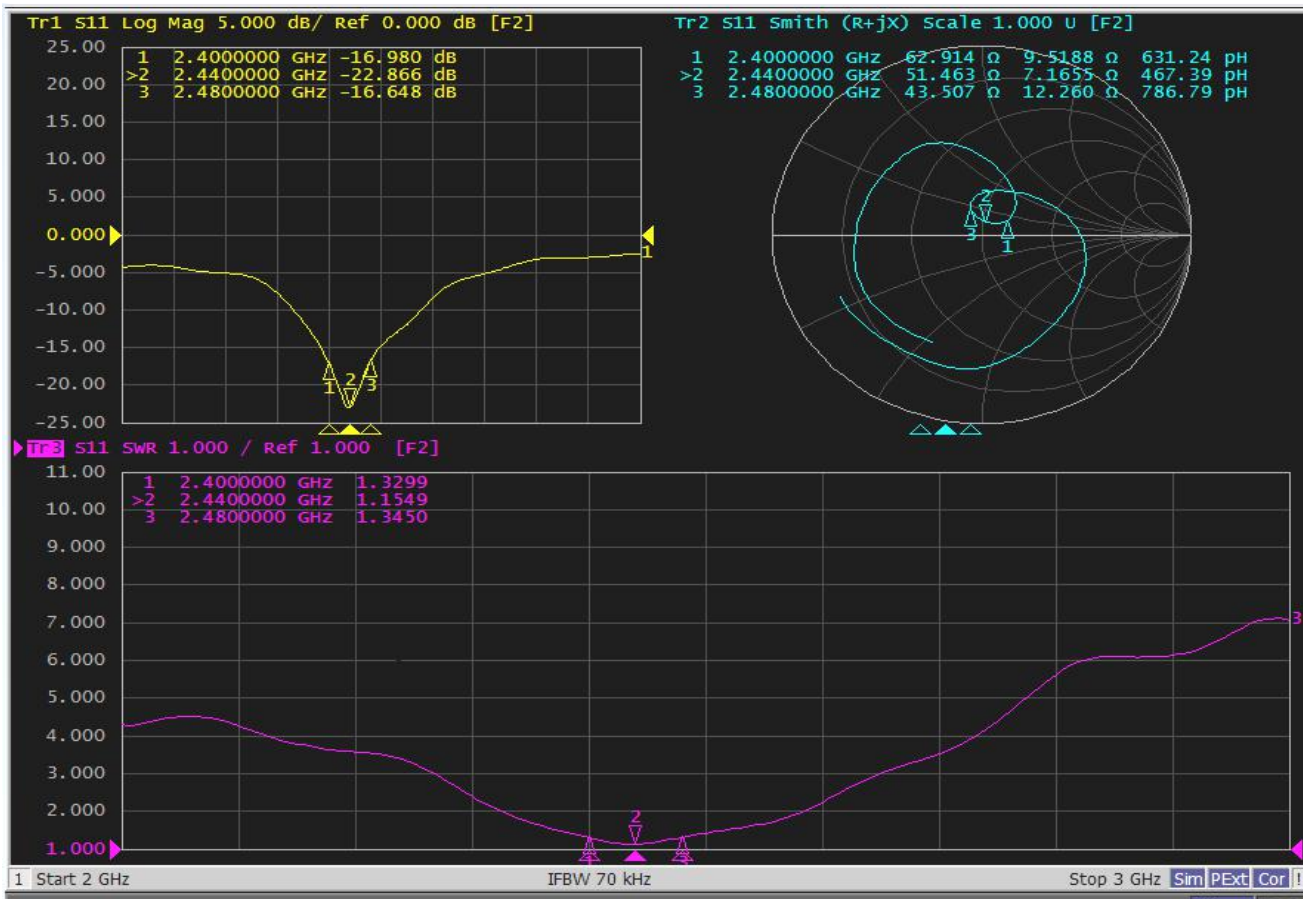
The passive S11 testing device is sequentially connected as follows:

network analyzer → Test line → Test fixture

2.1.2 Passive S11

The following table shows the standing wave ratio values at the edge frequency points of the antenna operating frequency band. The waveform of Return Loss and VSWR obtained from the test is shown in the following figure.

FRE. (MHz)	2400	2440	2480
VSWR	1.32	1.15	1.34
Return Loss	-16.98	-22.86	-16.64



2.2 Testing of gain and efficiency

2.2.1 Test site

Yuande - Microwave Anechoic Room: Test frequency range from 400MHz to 6GHz

2.2.2 Tested instruments

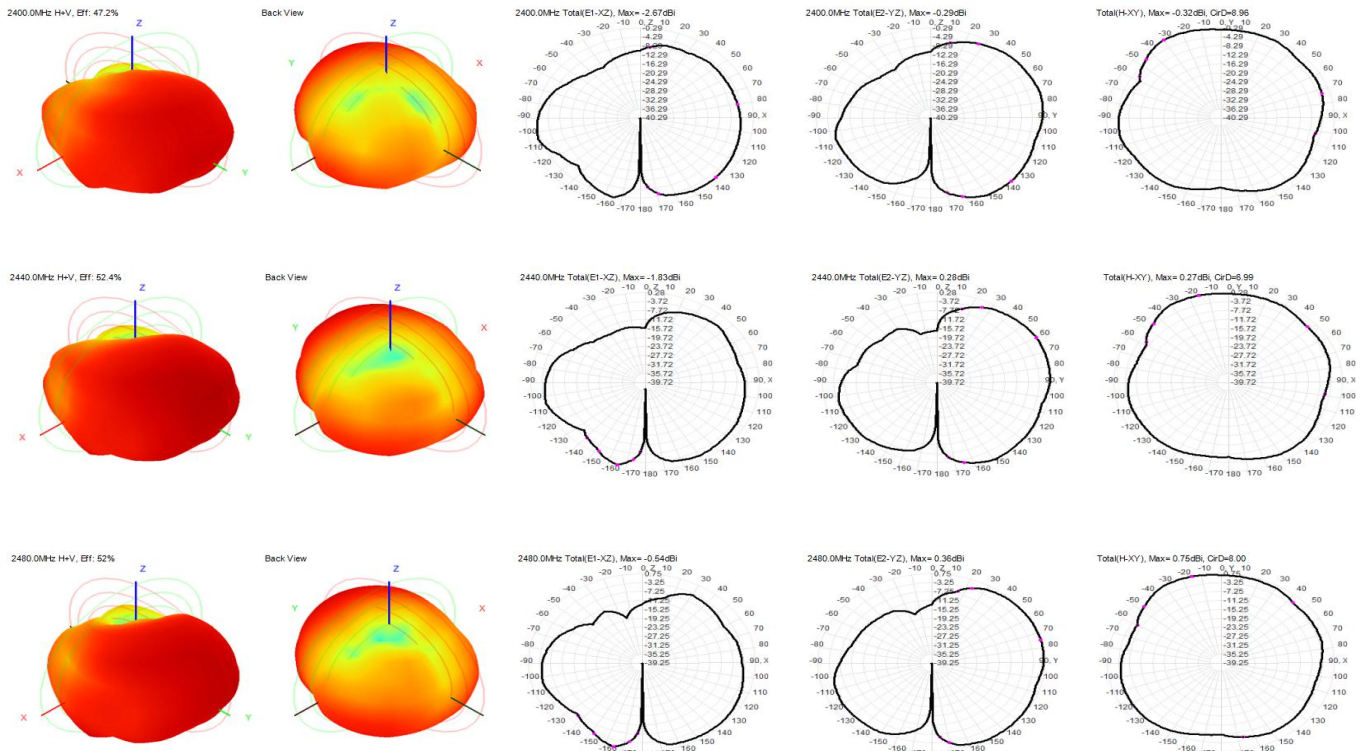
Network analyzer, standard horn antenna, multi probe near-field antenna testing system, testing computer, etc.

2.2.3 Test result

The efficiency and gain related values tested in a microwave anechoic chamber are shown in the table below

Frequency (MHz)	Gain (dBi)	Efficiency (%)
2400	2.31	47.30%
2410	2.16	48.00%
2420	2.12	49.20%
2430	2.10	50.90%
2440	2.11	52.60%
2450	2.22	54.40%
2460	2.08	53.90%
2470	2.14	53.00%
2480	2.20	52.00%
2490	2.26	51.90%
2500	2.34	50.00%

2.2.4 Passive radiation pattern



2.3 OTA

2.3.1 Test result

Channel	TRP (dBm)	TIS (dBm)
0	-2.44	-85.11
39	-1.85	-89.09
78	-2.02	-88.48

[illegible]