

Shenzhen World Elite Electronic Co. LTD.

Sample Approval Sheet

Product Information:

Customer	Zhong Shan City Richsound Electronic Industrial Ltd
Material Description	U412F BT Antenna
Customer's Part number	101000854
Specifications	FPC (46*10.5mm) +Black Coaxial Cable (ϕ 1.13*110mm) +Welding+UV adhesive+Sponge
Supplier's Part number	01-05-001-000066
Date	2026-9-7

Supplier:

Prepared By	Checked By	Approved By
Zhang Dengqiao	Li Yuepeng	Zhang Hongying

Customer Approval:

Accepted By	Checked By	Approved By

Results:

- ☐ Full Approval
- ☐ Conditional Approval
- ☐ Unqualified
- ☐ Others:

Shenzhen World Elite Electronic Co. LTD.

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1、Specification

This report mainly provides the testing status of various electrical and structural performance parameters of U412F BT Antenna.



Figure 1 Antenna

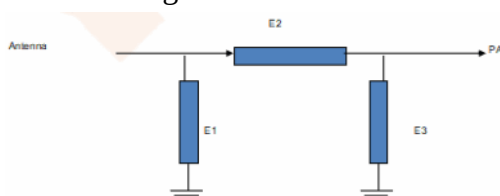
1.1 Electrical specification standard

1.1.1 Electrical Specifications

The antenna operates in the 2400-2480 MHz. The following table is the electrical performance index of the antenna designed by our company.

Antenna	U412F BT Antenna
Frequency Range	2400-2480MHz
VSWR	< 2.0
Efficiency	>50%
Impedance	50 ohm
Polarization	Linear polarization

1.1.2 Antenna Matching Network



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

2、Test

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

2.1 Test of passive S11

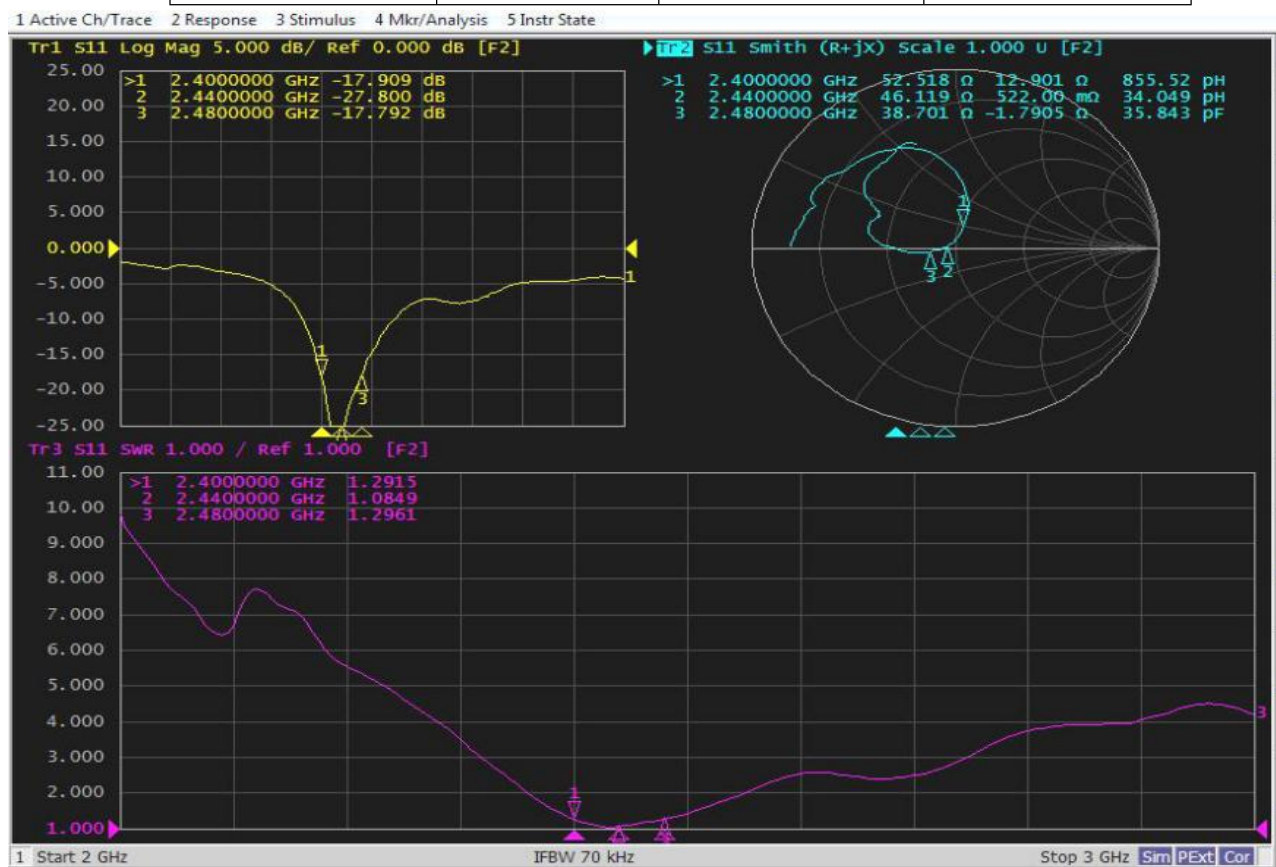
2.1.1 Test connection

The passive S11 test device is connected as follows: Network Analyzer → Test Line → Test Fixture.

2.1.2 Passive S11

The following table shows the standing wave ratio values of the edge frequency points of the antenna operating frequency band. The waveform of Return Loss and VSWR obtained by the test is shown as follows.

Frequency(MHz)	2400	2440	2480
VSWR	1.29	1.08	1.30
Return Loss	-17.91	-27.80	-17.79



2.2 Gain and efficiency test

2.2.1 Test Position

Microwave anechoic chamber, the test frequency range is 400MHz-6GHz.

2.2.2 Test equipment

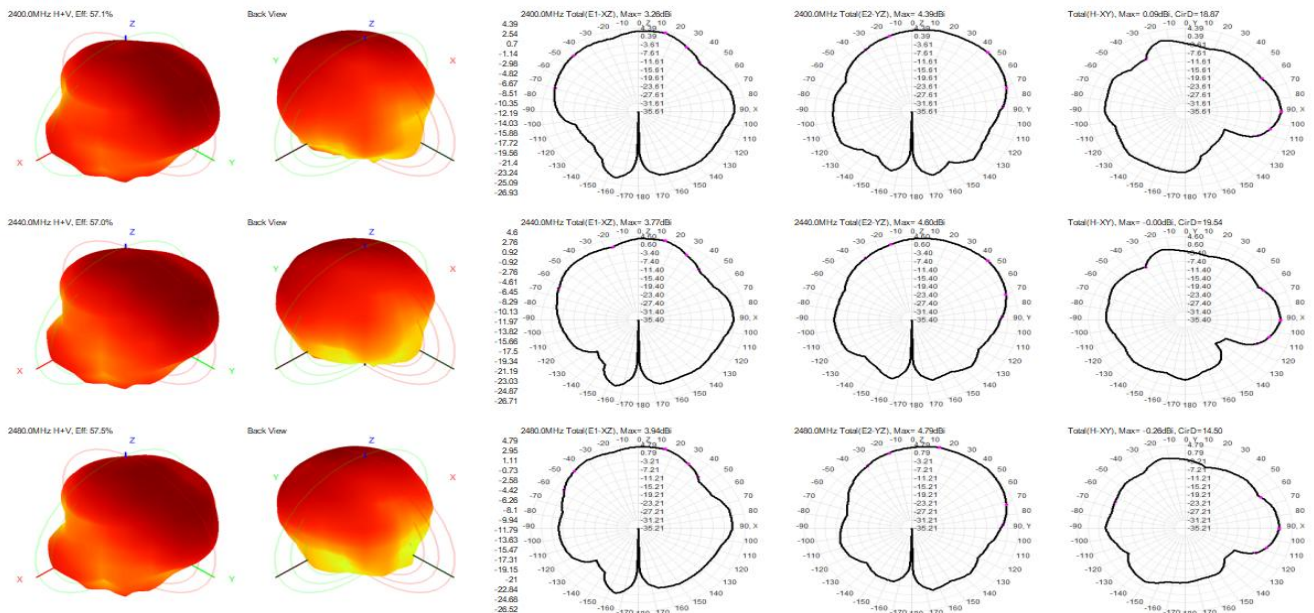
Network analyzer, standard horn antenna, multi-probe near field antenna test system, test computer, etc

2.2.3 Results Summary

In the microwave anechoic chamber, the measured values related to efficiency and gain are shown in the table below.

Frequency(MHz)	Gain(dBi)	Efficiency(%)
2400	4.39	57.05
2410	4.43	57.66
2420	4.50	57.76
2430	4.68	58.10
2440	4.60	57.01
2450	4.67	57.12
2460	4.65	56.20
2470	4.73	56.45
2480	4.79	57.46
2490	4.71	57.05
2500	4.75	57.70

2.2.4 Radiation Pattern Results



2.3 OTA test

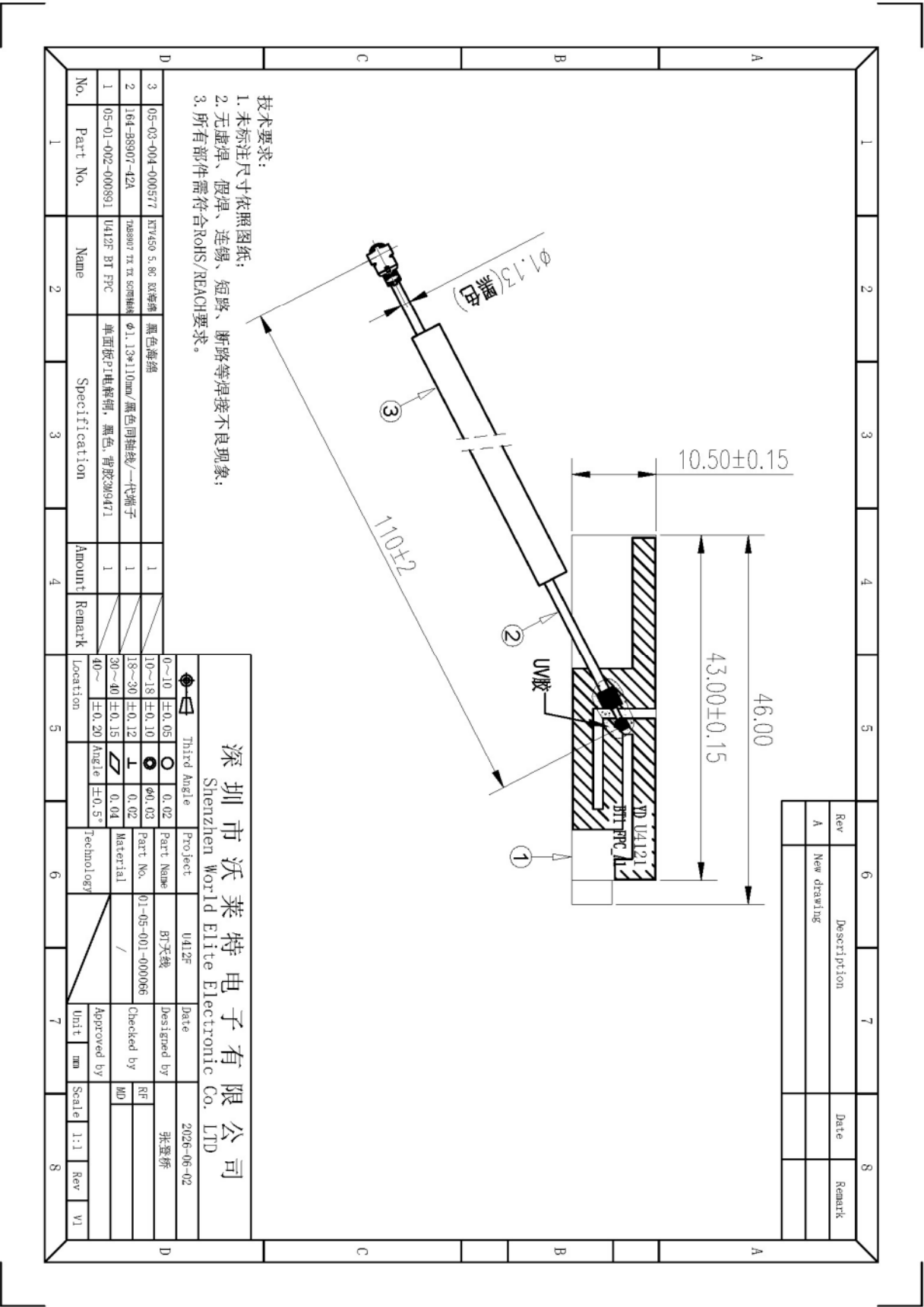
2.3.1 Results Summary

Channels	TRP	TIS
0	5.75	-92.8
39	5.42	-92.22
78	5.71	-91.95

3、 Conclusion

This antenna is designed on the basis of the prototype provided by the customer. The above electrical performance parameters are tested under the environmental treatment conditions of the test prototype. The electrical parameters and structural performance have met the technical requirements. Please confirm!

4、Part Drawing



Shenzhen Wallet Electronics Co., Ltd.

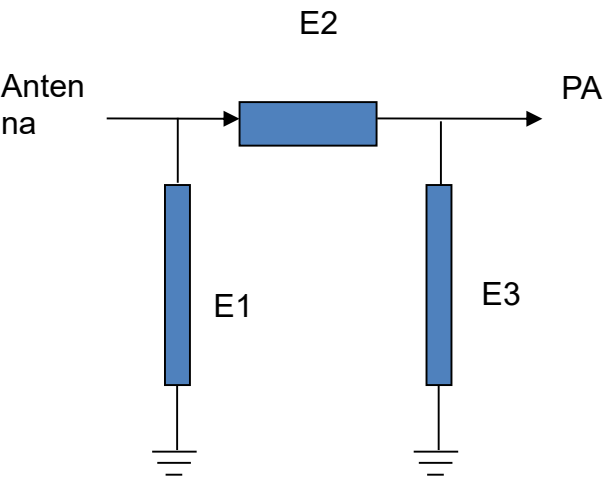
U412F Antenna specifications V1

Test date:2026-9-7

Purpose of this report:			
Conclusions of this report:			
Type	Frequency band	Material	Performance requirement
TX	2400-2480MHz	ON-board Ant	

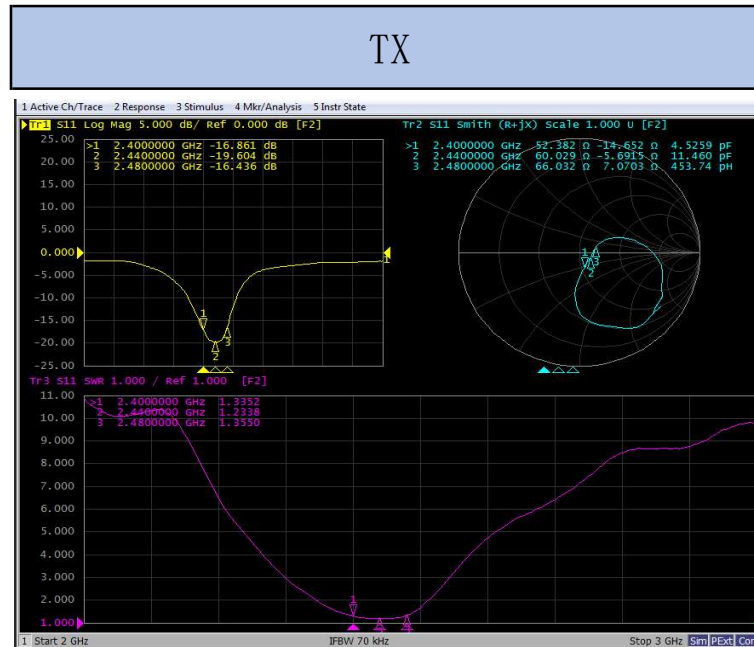
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Antenna Matching Circuit:



TX	
Element	
E1(0402)	0.5pF
E2(0402)	1.0pF
E3(0402)	NC

Antenna Passive S11 Parameter Testing:

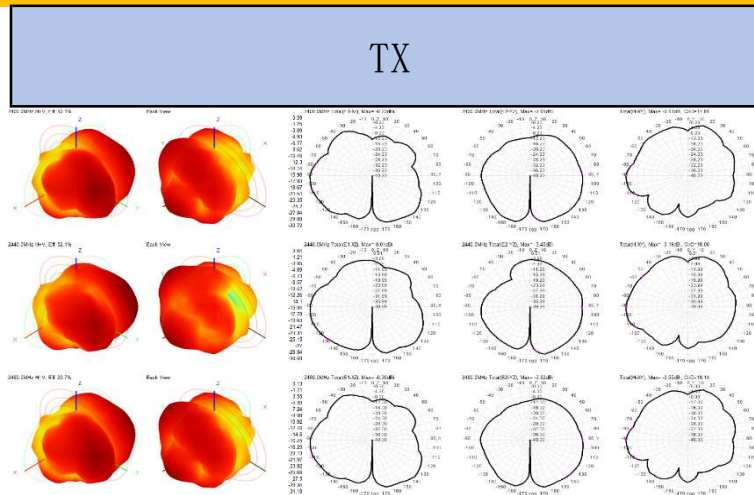


Freq (MHz)	2400	2440	2480
SWR	1.34	1.23	1.36
Log Mag	-16.86	-19.60	-16.44

Antenna Passive Efficiency and Gain Measurement:

TX		
Frequency (MHz)	Gain (dBi)	Efficiency (%)
2400	0.24	50.10
2410	0.11	50.64
2420	0.59	52.35
2430	0.56	52.87
2440	0.64	52.13
2450	0.58	51.49
2460	0.35	50.38
2470	0.33	52.41
2480	0.13	50.73
2490	0.43	50.00
2500	0.40	53.20

Antenna Passive Radiation Pattern:



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Antenna OTA Data

TX		
Channels	TRP	TIS
0	5.59	-90.72
39	5.25	-89.13
78	5.73	-88.54

Antenna pictures

