

Yuande Electronics (Shenzhen) Co., Ltd.

Sample Approval Sheet

Product Information:

Customer	Shenzhen Skylark Audio Industry Co., Ltd.
Material Description	EM111 TX Antenna
Customer's Part number	
Specifications	Matel Antenna / SUS304 1/2H Nickel Preplating T=0.2mm / 26*1.7*5.2mm
Supplier's Part number	178-EM111-30A
Date	2024-2-29

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:

Yuande Electronics (Shenzhen) Co., Ltd.

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1、 Specification

This report mainly provides the testing status of various electrical and structural performance parameters of EM111 TX Antenna.



Figure 1 Antenna

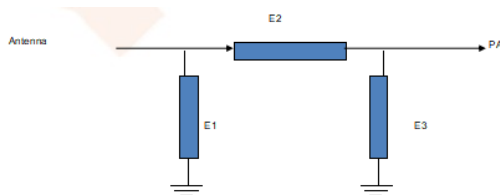
1.1 Electrical specification standard

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	EM111 TX Antenna
Frequency Range	2400-2480MHz
VSWR	< 2.5
Efficiency	> 35%
Impedance	50 ohm
Polarization	Linear polarization

1.1.2 Antenna Matching Network



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

2、 Test

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

2.1 Test of passive S11

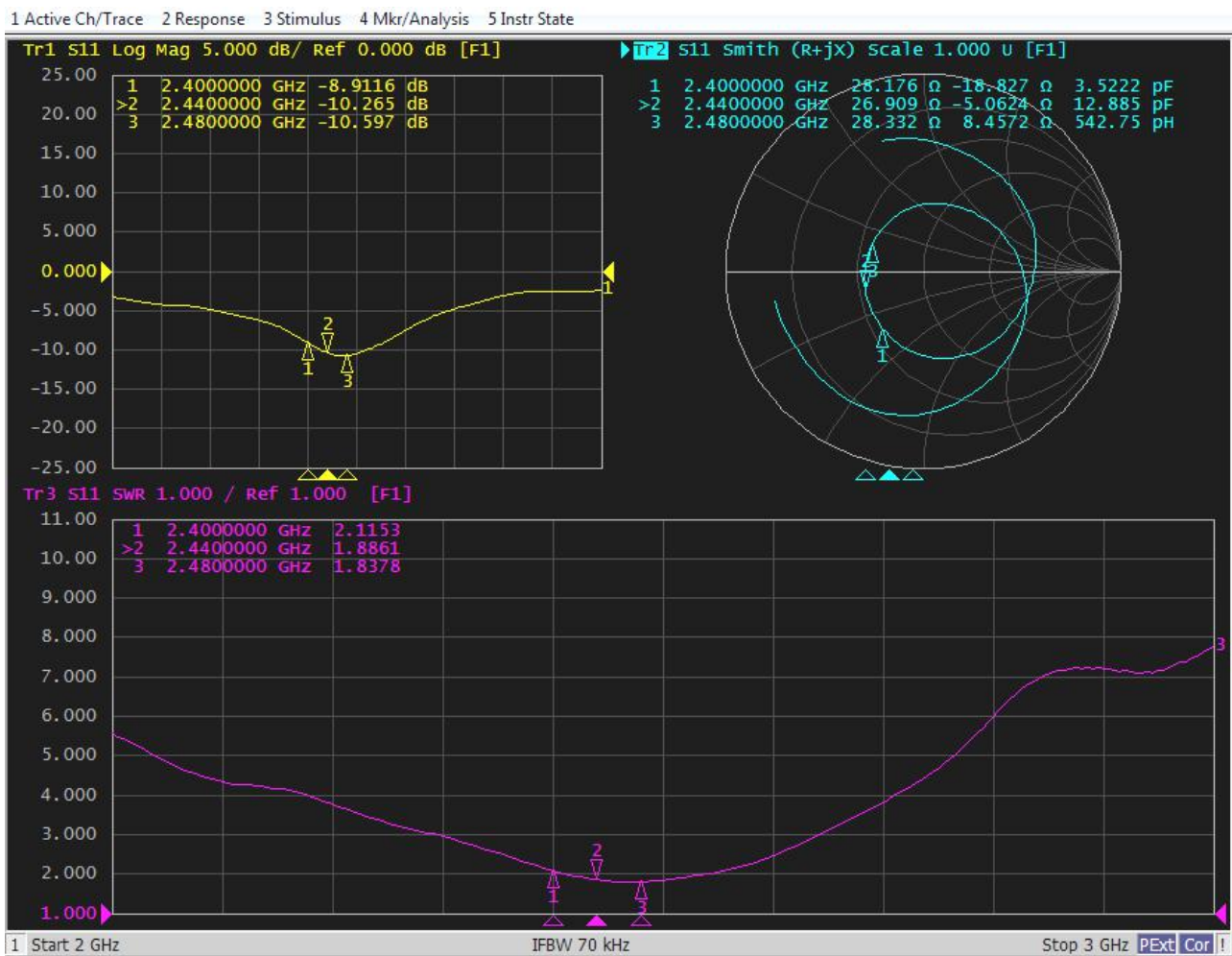
2.1.1 Test connection

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	2.11	1.88	1.83
Return Loss	-8.91	-10.26	-10.59



2.2 Gain and efficiency test

2.2.1 Test Position

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

2.2.2 Test equipment

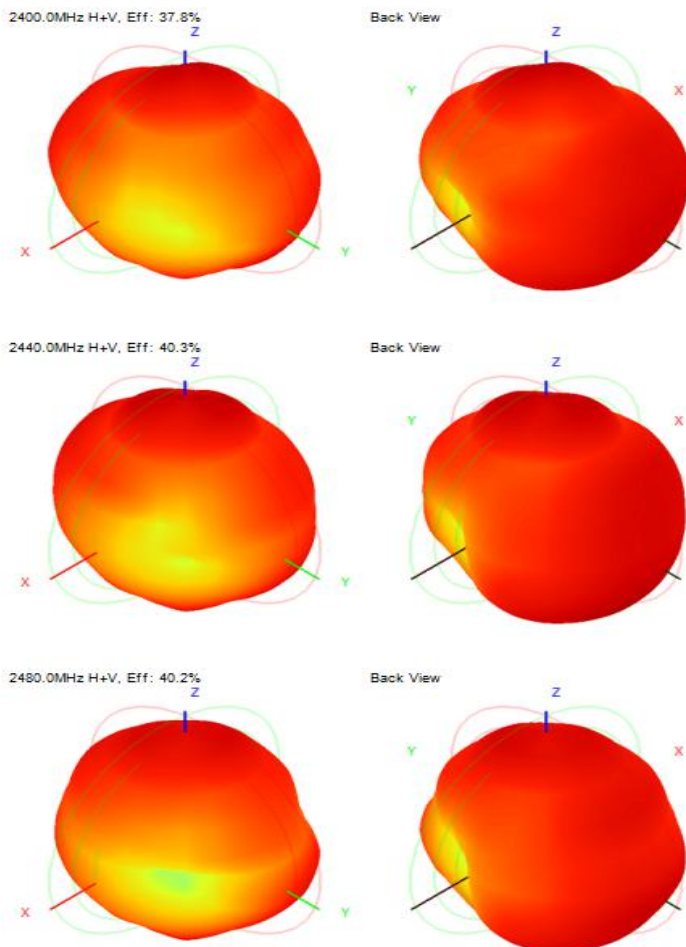
Network analyzer, standard horn antenna, multi-probe near field antenna test system, test computer, etc

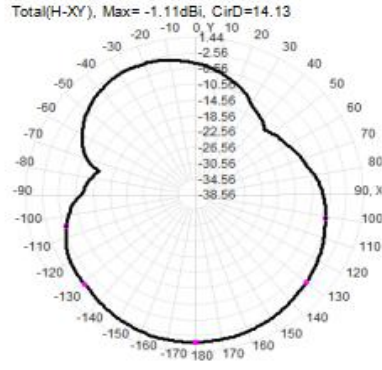
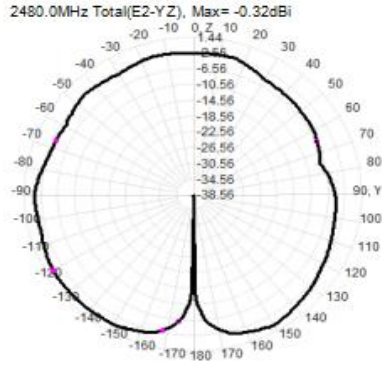
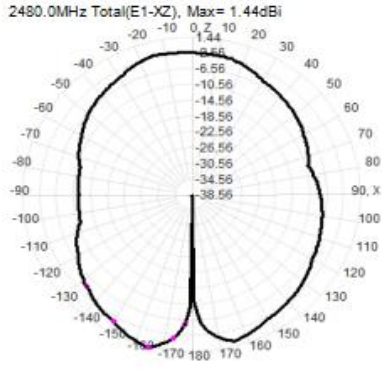
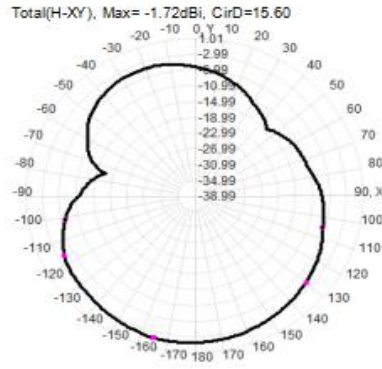
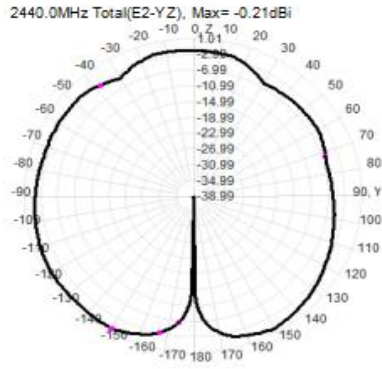
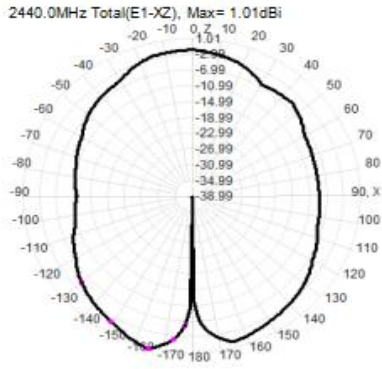
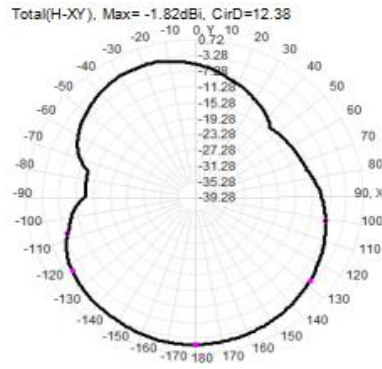
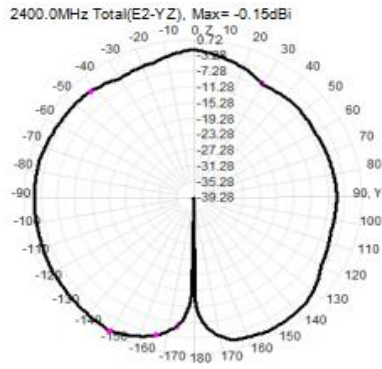
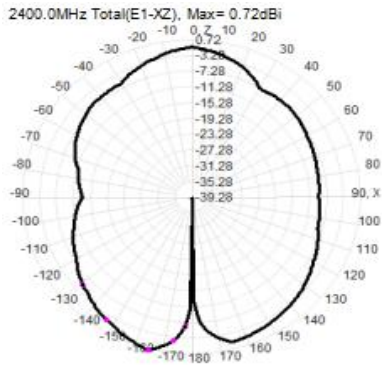
2.2.3 Results Summary

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	1.02	37.83
2410	0.98	38.75
2420	0.87	38.92
2430	0.93	39.55
2440	1.01	40.25
2450	1.11	40.09
2460	1.21	39.90
2470	1.32	40.07
2480	1.44	40.22
2490	1.46	40.41
2500	1.27	39.85

2.2.4 Radiation Pattern Results





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

1	2	3	4	5	6	7	8
A					A	B	C
D					A	B	C
<p>Technical requirement:</p> <ol style="list-style-type: none"> 1. Material: SUS304 1/2H Nickel Preplating, T=0.2mm; 2. Unmarked dimensions shall be in accordance with 3D; 3. All components must comply with RoHS requirements. 							
<p>远德电子（深圳）有限公司 Yuan de Electronics (Shenzhen) Co., LTD</p>							
Third Angle		Project		EM111		Date	
0~10 ±0.05		Part Name		TX Metal Antenna		2023-10-06	
10~18 ±0.10		Part No.		178-EM11-30A		Designed by	
18~30 ±0.12		Material		SUS304 1/2 Nickel Preplating		Checked by	
30~40 ±0.15		Technology		T=0.2		RF	
40~ ±0.20		Angle		±0.5°		MD	
Location		Unit		mm		Scale	
5		7		1:1		Rev	
						A2.1	