

Yuande Electronics (Shenzhen) Co., Ltd

Sample Approval Sheet

Product Information:

Customer	Shenzhen Gwelltimes Technology Co.,Ltd.
Material Description	0G 2.4G Antenna
Customer's Part number	
Specifications	FPC (32*14.5mm) +Black Coaxial Cable (ϕ 0.81*30mm) +Welding
Supplier's Part number	136-0GXXX-10A
Date	2023-8-2

Supplier:

Prepared By	Checked By	Approved By
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1、Specification

This report mainly provides the testing status of various electrical and structural performance parameters of OG 2.4G Antenna.

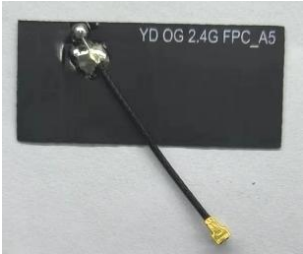


Figure 1 Antenna



Figure 2 Antenna Placement

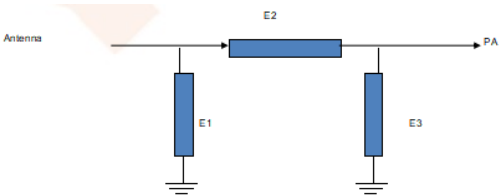
1.1 Electrical specification standard

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	OG 2.4G Antenna
Frequency Range	2400-2480MHz
VSWR	< 2
Efficiency	> 39%
Impedance	50 ohm
Polarization	Linear polarization

1.1.2 Antenna Matching Network



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

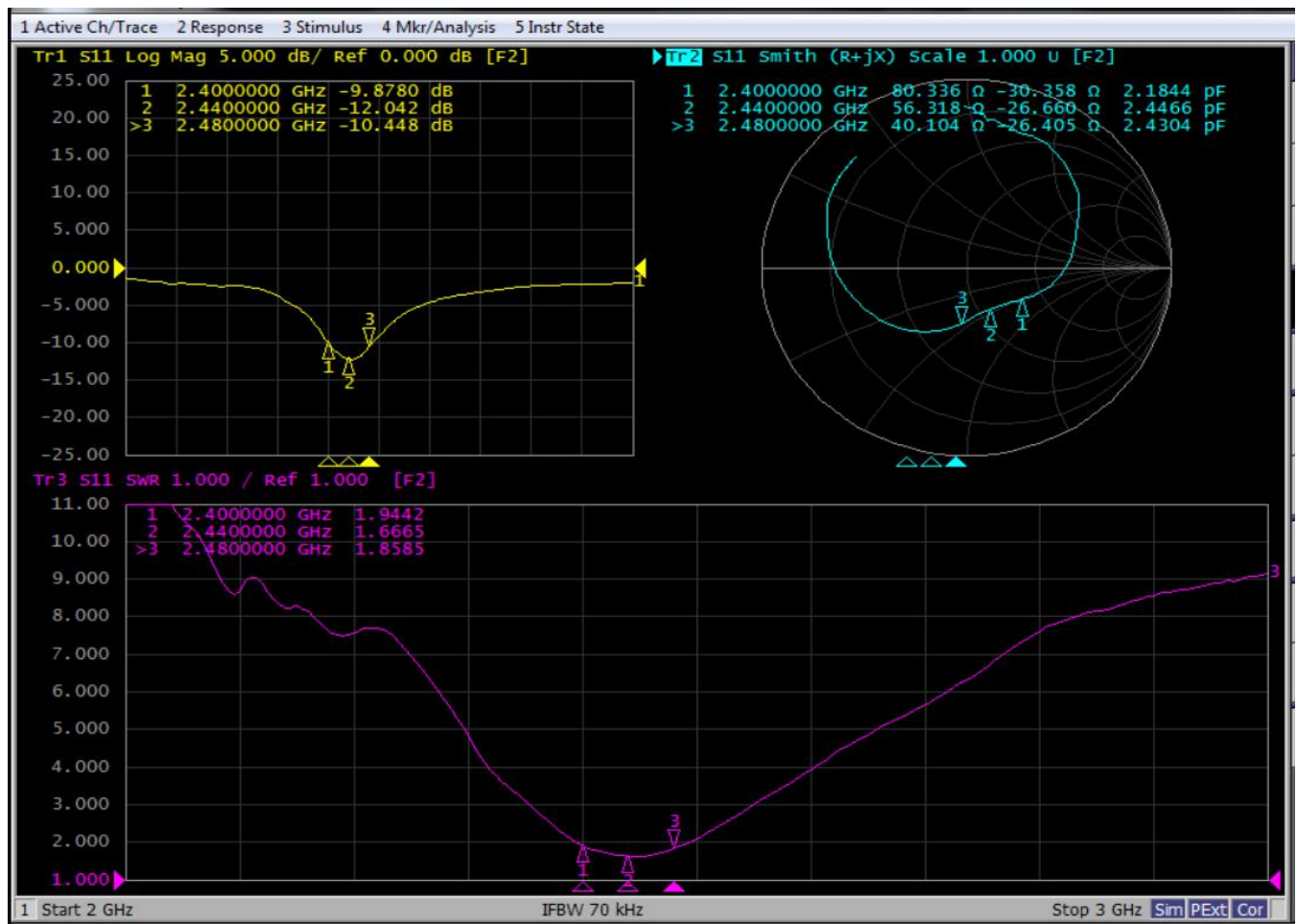
2.1.1 Test connection

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	1.94	1.67	1.86
Return Loss	-9.88	-12.04	-10.45



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

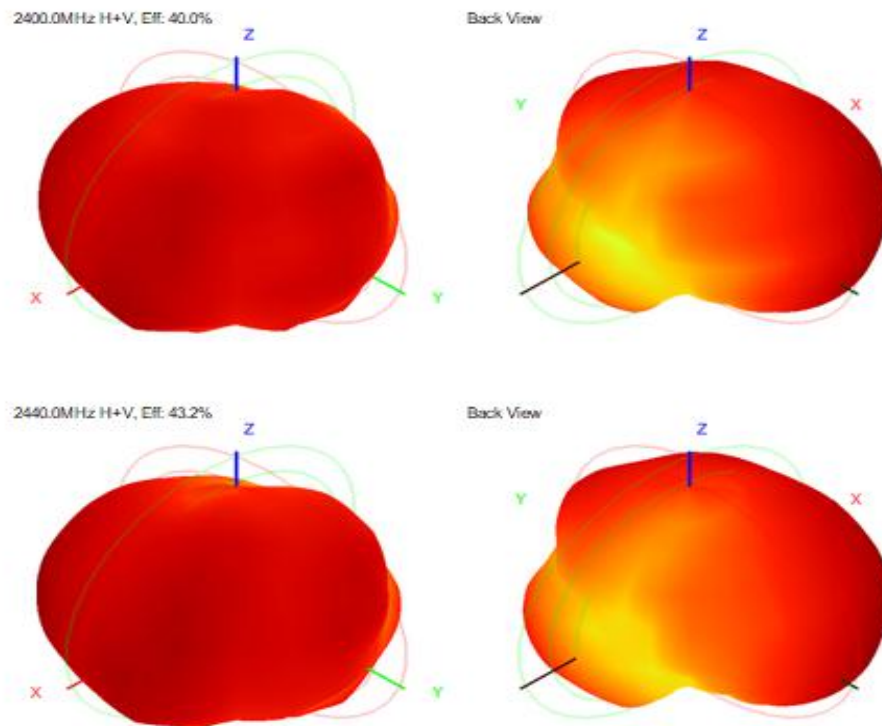
Network analyzer, standard horn antenna, multi-probe near field antenna test system, test computer, etc

2.2.3 Results Summary

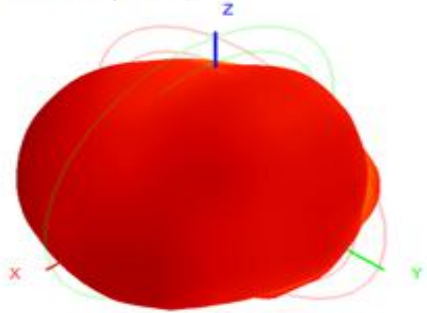
In the microwave anechoic chamber, the measured values related to efficiency and gain are shown in the table below.

Frequency (MHz)	Gain (dBi)	Efficiency (%)
2400	0.69	39.97
2410	0.69	41.26
2420	0.76	42.27
2430	0.96	43.37
2440	0.95	43.15
2450	0.95	42.52
2460	0.84	42.24
2470	0.82	42.05
2480	0.87	41.88
2490	0.93	42.08
2500	0.99	41.65

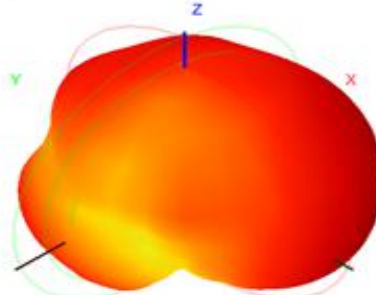
2.2.4 Radiation Pattern Results



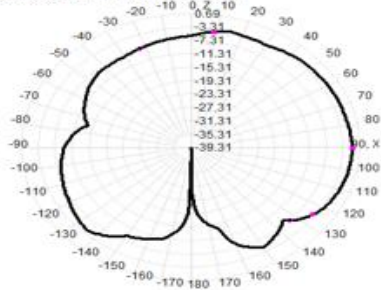
2490.0MHz H+V, Eff: 41.9%



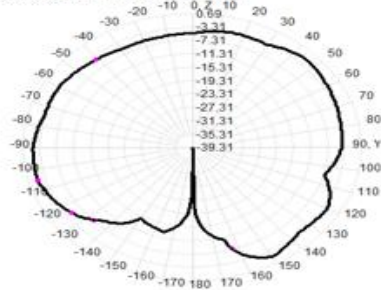
Back View



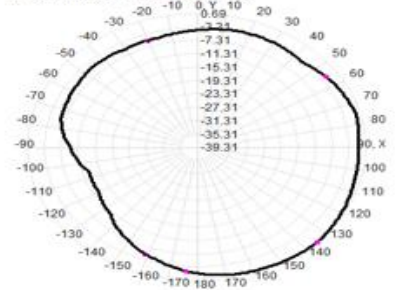
2400.0MHz Total(E1-XZ), Max=-1.38dB



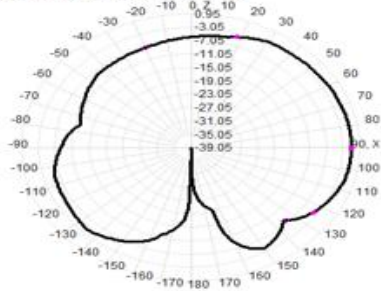
2400.0MHz Total(E2-YZ), Max=-1.64dB



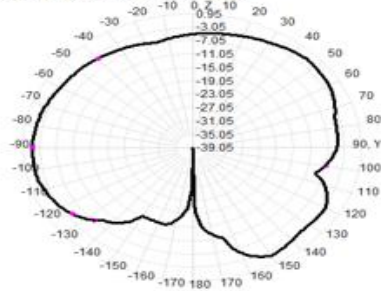
Total(H-XY), Max= 0.69dB, CirD=13.50



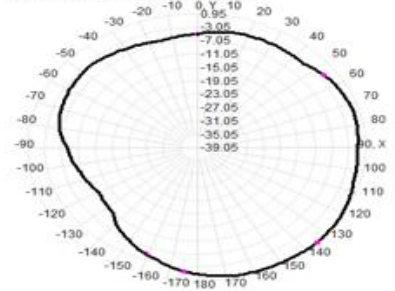
2440.0MHz Total(E1-XZ), Max=-1.29dB



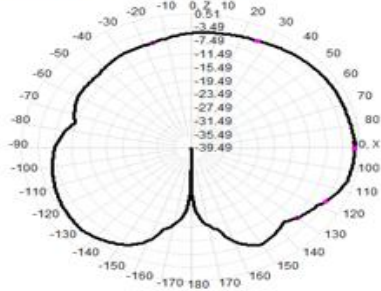
2440.0MHz Total(E2-YZ), Max=-1.33dB



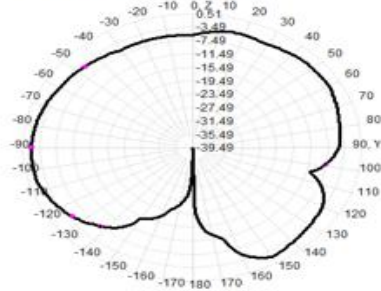
Total(H-XY), Max= 0.95dB, CirD=13.38



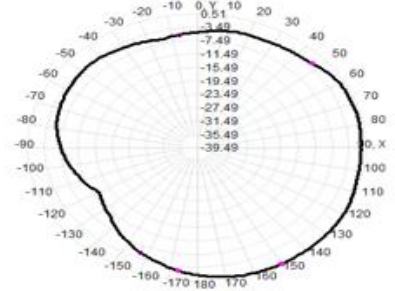
2480.0MHz Total(E1-XZ), Max=-0.95dB



2480.0MHz Total(E2-YZ), Max=-1.53dB



Total(H-XY), Max= 0.51dB, CirD=13.55



2.3 Test of OTA

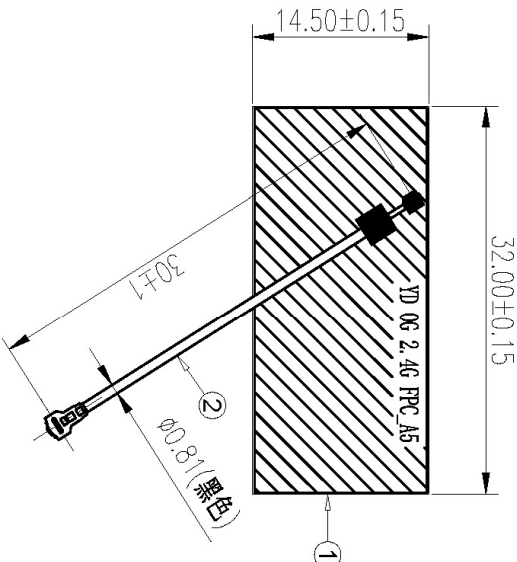
2.3.1 Results Summary

WIFI 802.11b 11Mbps	Channel	TRP (dBm)	TIS (dBm) -80
	1	16.21	-83
	6	15.01	-82.38
	9	14.98	-81.72
	10	15.12	-83.46
	11	15.67	-84.76
WIFI 802.11b 1Mbps	Channel	TRP (dBm) 18	TIS (dBm)
	1	18.7	-91.27
	6	17.43	-90.35
	11	17.91	-92.98
WIFI 802.11g 54Mbps	Channel	TRP (dBm)	TIS (dBm) -70
	1	16.78	-70.34
	6	16.49	-69.81
	11	17.03	-72.27
WIFI 802.11g 6Mbps	Channel	TRP (dBm) 17	TIS (dBm)
	1	17.86	-88.52
	6	16.67	-86.82
	11	17.16	-89.22
WIFI 802.11n MCS7	Channel	TRP (dBm)	TIS (dBm) -65
	1	16.81	-69.05
	6	16.5	-67.64
	11	17.06	-70.35
WIFI 802.11n MCS0	Channel	TRP (dBm) 16	TIS (dBm)
	1	17.8	-88.04
	6	16.63	-86.56
	11	16.88	-89.11

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																																																						
					Rev	Description	Date	Remark																																																					
					A	New drawing																																																							
技术要求: 1. 未标注尺寸依照图纸; 2. 无虚焊、假焊、连锡、短路、断路等焊接不良现象; 3. 所有部件需符合RoHS/REACH要求。					远德电子（深圳）有限公司 Yuan de Electronics (Shenzhen) Co. LTD																																																								
<table><tr><td colspan="2">Third Angle</td><td colspan="2">Project</td><td colspan="2">Date</td></tr><tr><td>0~10</td><td>±0.05</td><td>0.02</td><td>06</td><td colspan="2">2023-08-02</td></tr><tr><td>10~18</td><td>±0.10</td><td>0.03</td><td>Part Name</td><td colspan="2">2.4G天线</td></tr><tr><td>18~30</td><td>±0.12</td><td>0.02</td><td>Part No.</td><td colspan="2">136-06XXX-10A</td></tr><tr><td>30~40</td><td>±0.15</td><td>0.04</td><td>Material</td><td colspan="2">/</td></tr><tr><td>40~</td><td>±0.20</td><td>±0.5°</td><td>Technology</td><td colspan="2">/</td></tr></table>					Third Angle		Project		Date		0~10	±0.05	0.02	06	2023-08-02		10~18	±0.10	0.03	Part Name	2.4G天线		18~30	±0.12	0.02	Part No.	136-06XXX-10A		30~40	±0.15	0.04	Material	/		40~	±0.20	±0.5°	Technology	/		<table><tr><td>Project</td><td>Designed by</td><td>张登桥</td></tr><tr><td>Part No.</td><td>Checked by</td><td>RF</td></tr><tr><td>Material</td><td>MD</td><td></td></tr><tr><td>Technology</td><td>Approved by</td><td></td></tr><tr><td>Unit</td><td>mm</td><td>Scale</td></tr><tr><td>1:1</td><td>Rev</td><td>A1</td></tr></table>			Project	Designed by	张登桥	Part No.	Checked by	RF	Material	MD		Technology	Approved by		Unit	mm	Scale	1:1	Rev	A1
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