



Antenna Sample Confirmation From

深圳健海通天线技术有限公司

广东健博通
证券代码: 831958

Antenna Acknowledgement Letter

Antenna Sample Confirmation From

Vendor Name: Supplier Name	Shenzhen Kenhaitong Antenna Technology Co., Ltd.				
Customer Name: Cust omer's Name	Dadi'er				
Product Model Part Number	KIT-X5-6132-WF-V01				
Sample Specification	Built-in antenna / RG1.13 gray silver tin wire / FPC antenna with adhesive tape welded at P1 / P2 IPEX (1st generation terminal) / Wire length = 140mm				
Customer ID					
Inspection Item: 检验 项目	Performance testin g	Total Appearance Inspectio n	structure	Audit	Inspection Resul t: The test results show that the product meets the quality standa rds.
	OK	OK	OK	OK	OK
Remark					
Quality Assu rance Audit		Engineering Audit		Business Con firmation / Sales Confir mation	
The following are to be filled in by the Customer.					
Customer Feedb ack					
Customer's Signature/ Seal	Date:				

Address: 3rd Floor, West Side, Building 1, Zhongkeno Industrial Park,
Hezhou, Hangcheng Sub-district, Bao'an District, Shenzhen City

TEL: 0755-85274764 FAX: 0755-85274764



Antenna Test Report

Tested by: Shenzhen Kenhaitong Antenna Technology Co., Ltd.			
Material	FPC + coaxial cable + IPEX		
Antenna Type: Antenna type	PIFA	Polarization mode 极化方式	Linear
Application scenarios			
Working frequency band	2.4G Wi-Fi	VSWR	≤1.6
	5.2G WIFI		≤1.9
Power	Max: 50W	Impedance	50 ohms
Gain (dBi)	2.4G: 2.89 dBi		
	5.2G: 1.62 dBi		
Testing Equipment	HPE5071C, Shielding Room, 3D Automatic Turntable		



1 Project images

2 Test fixtures

3 Antenna matching circuit

4 S11 Testing

4.0 S11 Test Method Description

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5 Darkroom testing equipment and data

5.0 Testing Equipment

5.1 Test Data

6 Antenna assembly diagram and environmental treatment

7. Structural Drawings

8. Packaging Method



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1 Project images

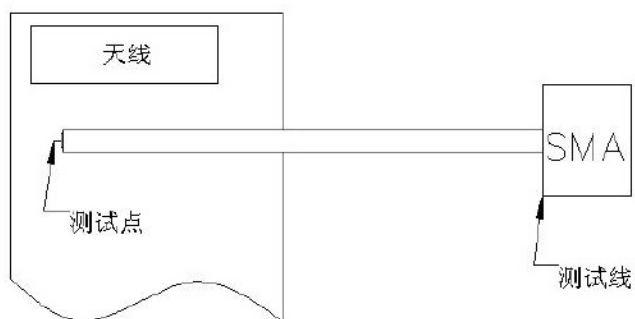


Note: The customer will keep the antenna performance prototype in our company for at least one year for the purpose of analyzing and resolving any abnormal situations during mass production of the antenna and ensuring the quality of the antenna shipments.

2 Test fixtures

Objective: To test the passive parameters of the antenna as accurately as possible.

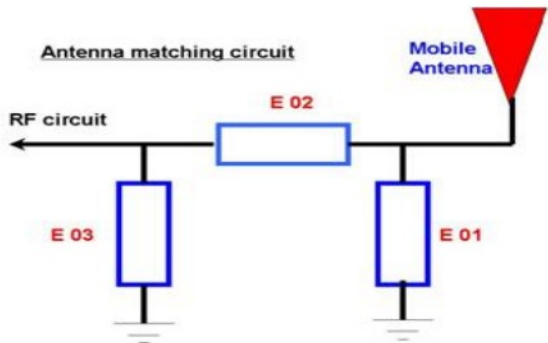
The manufacturing method: The mobile phone fixture is made of a 50-ohm coaxial cable, with one end connected to the test point at the rear end of the matching circuit on the mobile phone mainboard (the front end of the RF test hole), and the other end connected to the SMA connector. The schematic diagram is as follows:





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3 Antenna matching circuit



Modification points / **Modify**

E01	E02	E03
No	No	No

Note: No modifications were made during the matching process.

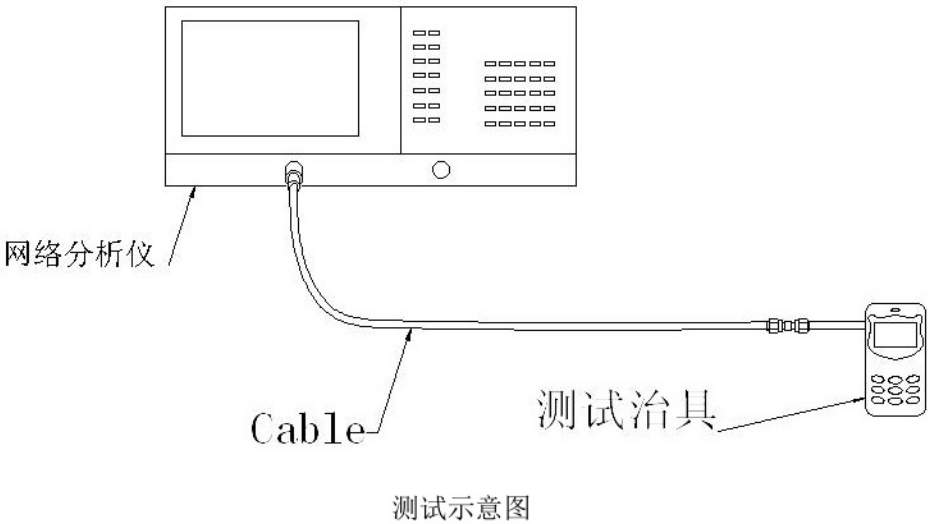
4. S11 Test

4.0 S11 Test Method Description

Test equipment: Network Analyzer (E5071C)

Test method: Connect a 50-ohm CABLE from the instrument's test port to the SMA connector of the mobile phone fixture after calibration with the calibration piece, and record the corresponding return loss and standing wave ratio at relevant frequency points.

The test schematic diagram is as follows:

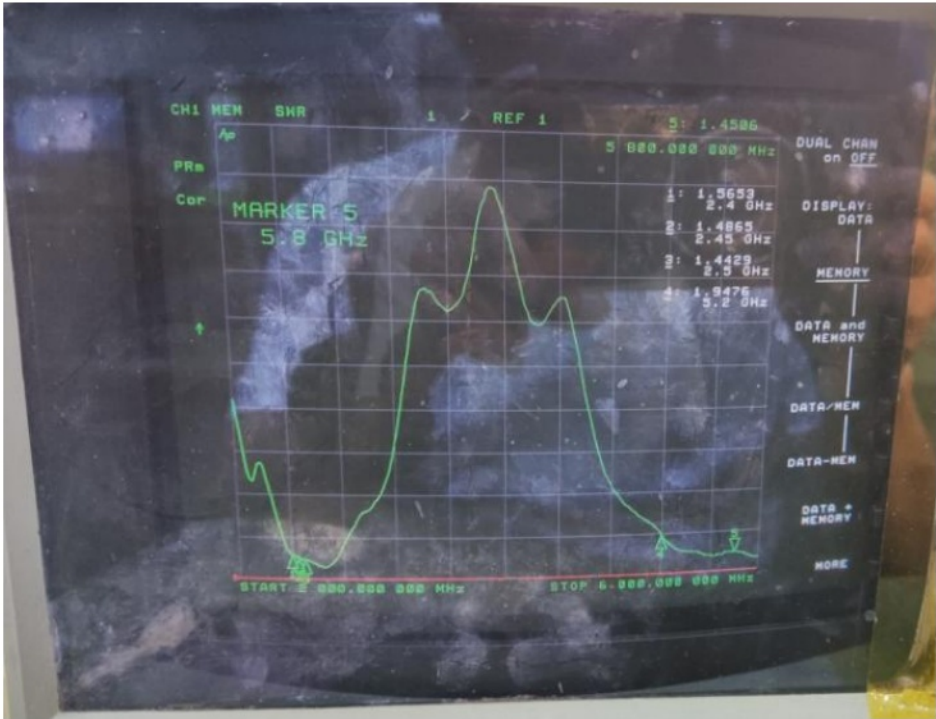




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4.1 S11 Parameter Images

WIFI main antenna standing wave ratio



Frequency (MHz)	2400	2450	2500	5200		5800
Standing wave ratio	1.5	1.4	1.4	1.9		1.4



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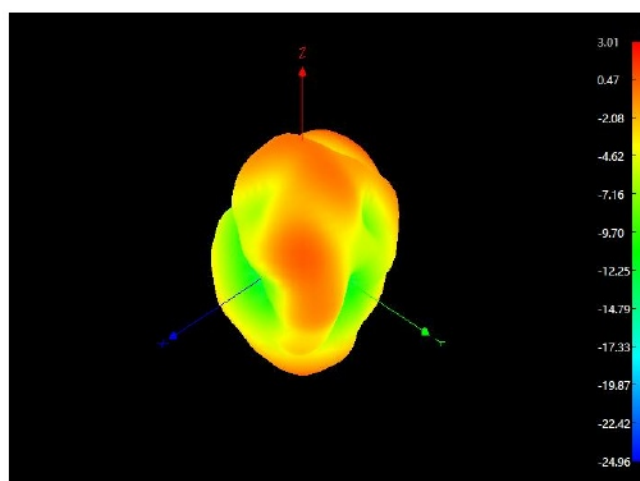
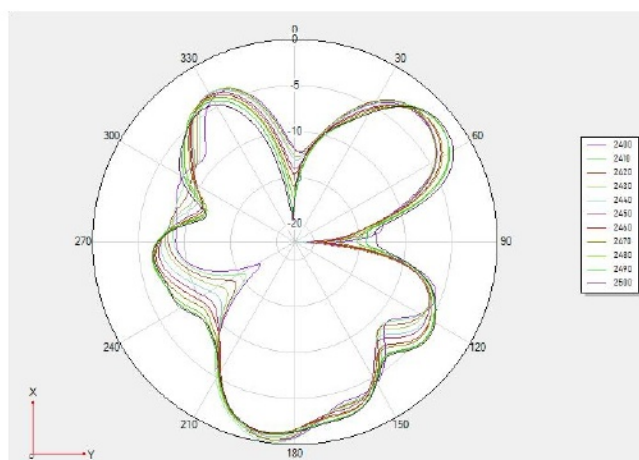
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Passive parameters of 2.4G antenna

Frequency / MHz	Efficiency / %	Gain/ dB
2400	46.11	2.37
2410	45.36	2.28
2420	47.85	2.53
2430	46.3	2.5
2440	48.75	2.78
2450	47.27	2.53
2460	47.85	2.55
2470	47.27	2.6
2480	49.26	2.89
2490	48.05	3.01
2500	47.36	2.91



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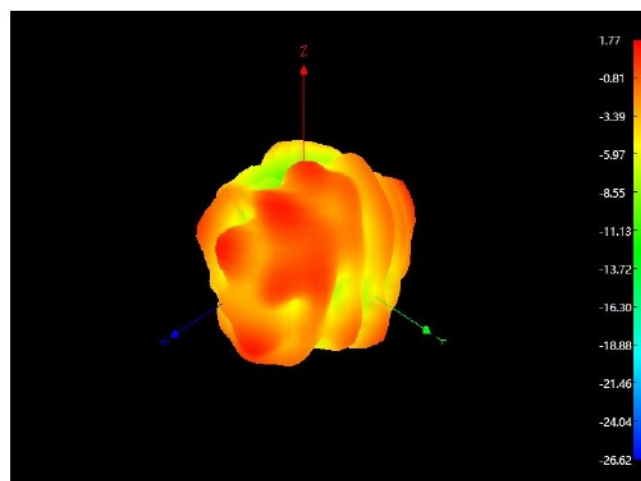
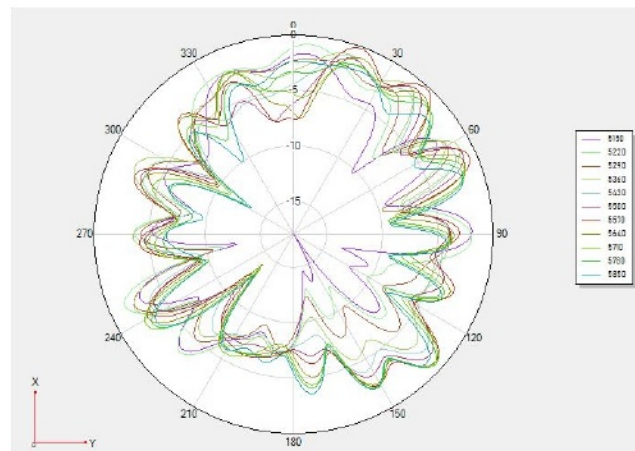
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Passive parameters of 5.8G antenna

Frequency / MHz	Efficiency / %	Gain/ dB
5150	40.83	1.62
5220	40.74	1.38
5290	40.19	0.95
5360	42.17	1.25
5430	40.08	0.15
5500	41.11	0.17
5570	45.39	0.96
5640	46.03	1.26
5710	45.5	1.66
5780	45.5	1.72
5850	46.56	1.77



5 Darkroom testing equipment and data

5.0 Test equipment

Test system: Shielded anechoic chamber

Test environment: Temperature $22^{\circ}\text{C} \pm 3^{\circ}\text{C}$, humidity $50\% \pm 15\%$

Test equipment: When testing passive data, a network analyzer Agilent E5071C is used.

When testing active data, the CMW500 comprehensive tester is used.





5.1 Active Test OTA

Band	Channel	TRP	TIS
802.11b (11 Mbps)	L	15.94	-81.63
	M	15.11	-82.84
	H	15.48	-82.79
802.11g (54 Mbps)	L	14.53	-68.55
	M	14.73	-69.87
	H	13.67	-70.2
802. 11n (MCS7 - 65 Mbps)	L	13.61	-65.28
	M	13.71	-66.04
	H	13.77	-67.5
802.11a (54 Mbps)	L	11.62	-71.21
	M	10.08	-69.44
	H	10.63	-69.44



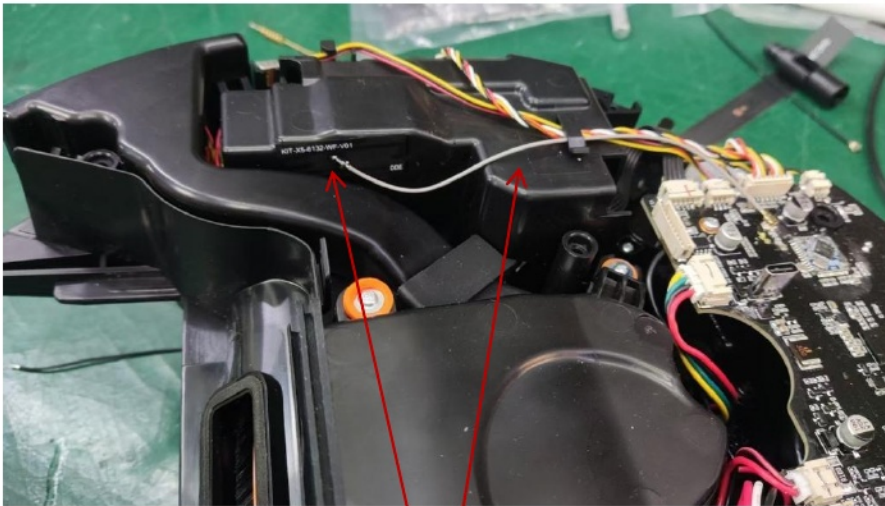
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6 Antenna assembly position and environmental treatment



Assemble the sky as shown in the figure
Lines and Routing



7Structural drawings

