



# 长峰科技

团队 / 专业 / 创新 / 诚信 / 服务

长峰电子科技（深圳）有限公司

Chang Feng Electronic Science (Shen zhen) Co.,LTD.

# Antenna test report

Customer name: Handhol

Project name: C6000 mass production retest

Report version: V2.0

RF engineer: Wei Xing

Tel: 13530159694

Test time: 2024-11-04

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## Testing facility (testing equipment)

Test system: 3D dark room

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

Test equipment: Use network analyzer Agilent E5062C for testing passive data

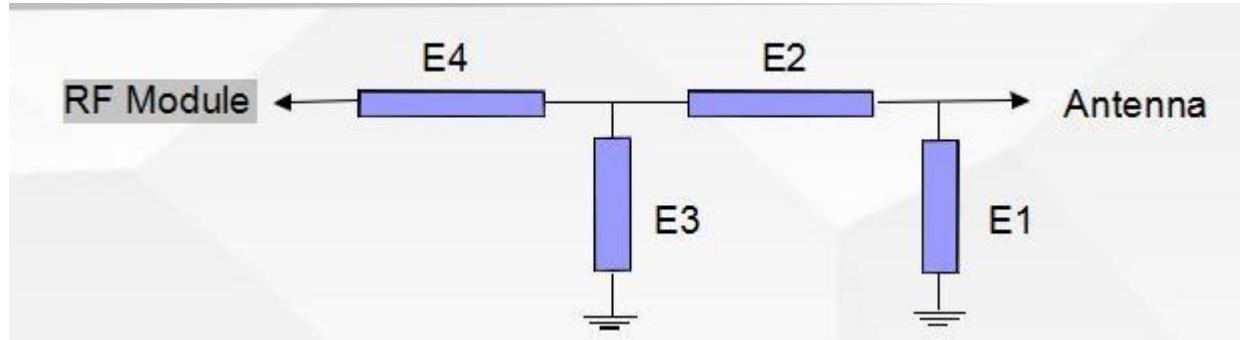
When testing active data, use the comprehensive tester Agilent 8960/4G instrument MT8820C



## Antenna frequency band (antenna band)

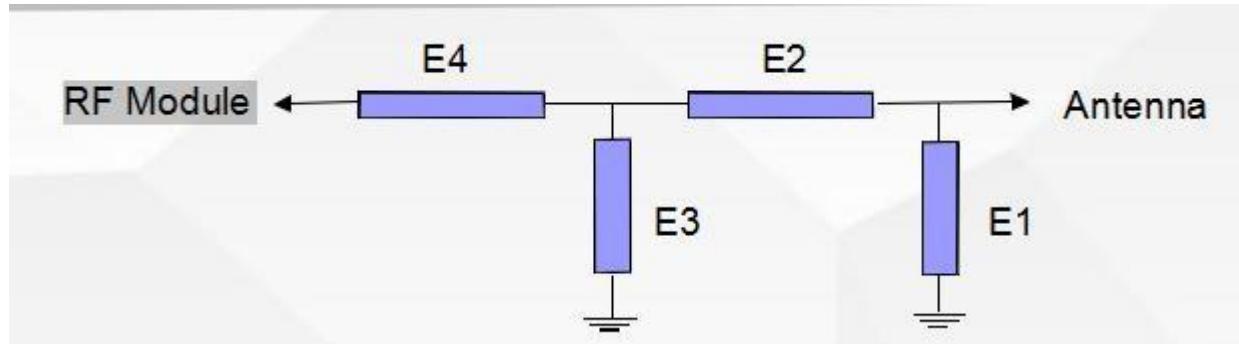
Machine type	Smart straight board				
		Band information	Trapezoidal form	Matching changes	
Information about antenna types and frequency bands	main antenna	<b>GSM. 2. 3.5.8</b> <b>WCDMAB1. B2. B5.B8</b> <b>LTE . B38 B39 B40 B41 B1 B2 .B3 B4 B5 B7. B8</b> <b>B12 B17 B20</b>	PIFA	deny	
	slave antenna	WiFi BT gps NFC	PIFA	deny	
	diversity antenna				
Antenna material		Main antenna FPC; secondary antenna FPC.			

## Building-out circuit (matching circuit)



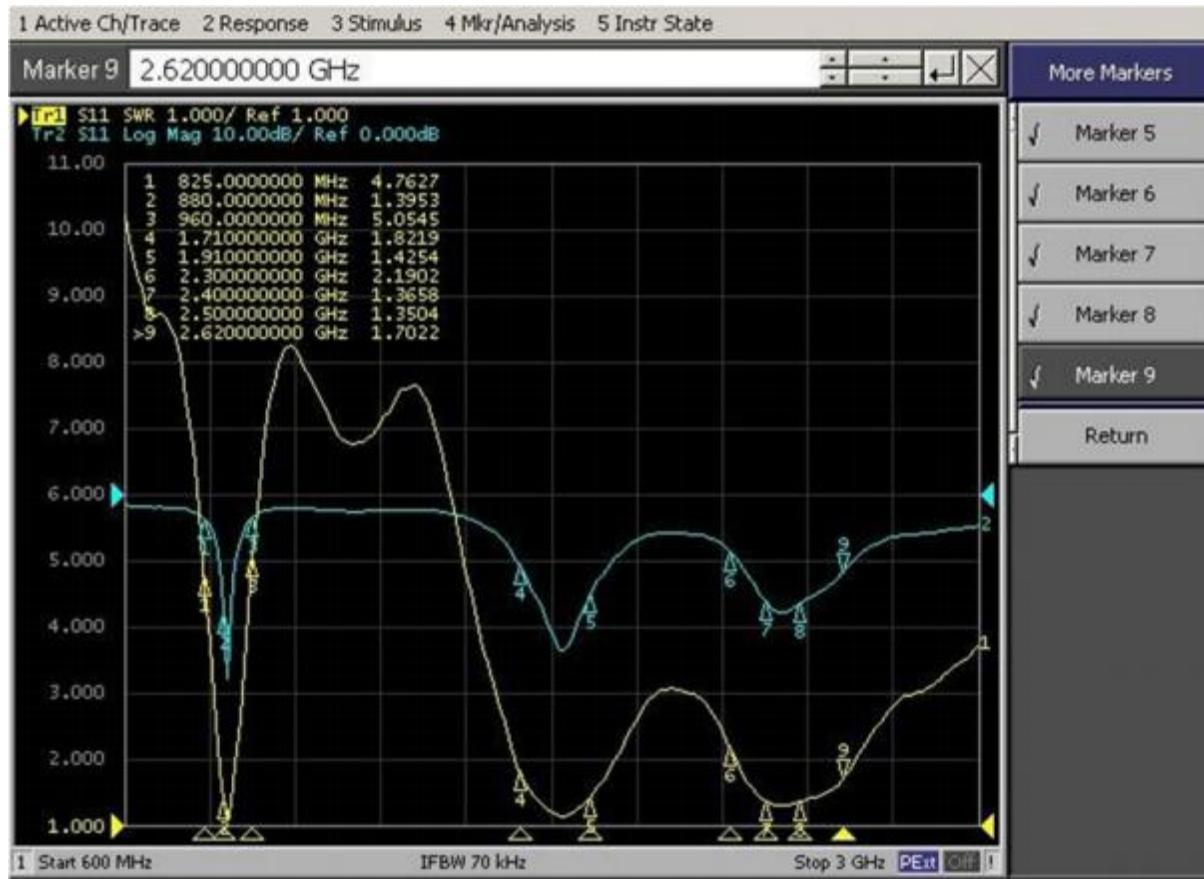
main antenna	Element	Value	Illustration of the drawings
	E 1 ( 0201 )		The original matching circuit of the motherboard is unmodified
	E2( 0201 )		
	E3( 0201 )		
	E4( 0201 )		

## Building-out circuit (matching circuit)



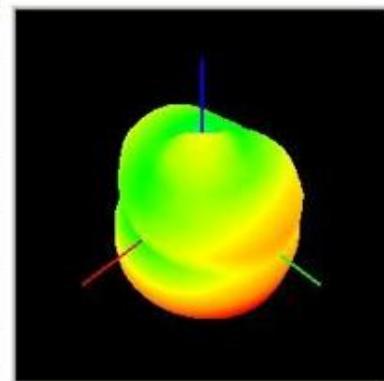
Three-in-one antenna	Element	Value	Illustration of the drawings
	E1( 0201 )		
	E2( 0201 )		The original matching circuit of the motherboard has not been modified.
	E3( 0201 )		
	E4( 0201 )		

## 2G/3G/4G antenna

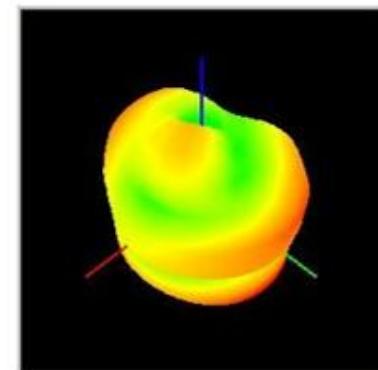
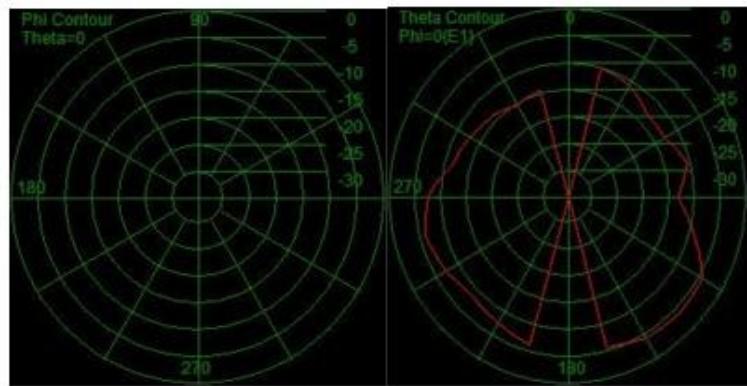


## 2G/3G/4G antenna

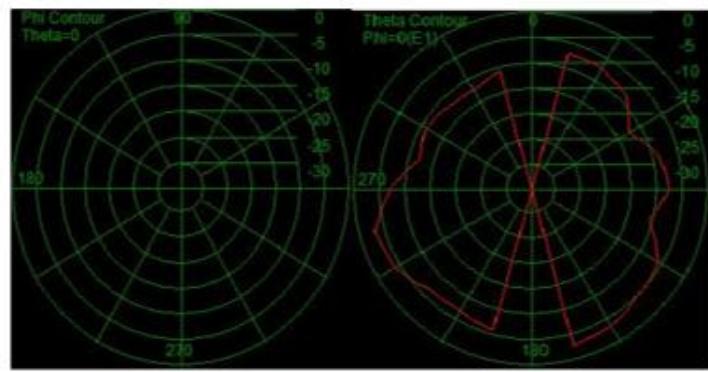
Channel	Gain(dBi)	Efficiency (%)
699	<b>-3.2</b>	<b>9.2</b>
704	<b>-3.0</b>	<b>9.6</b>
716	<b>-2.8</b>	<b>10.1</b>
824	<b>-1.8</b>	<b>26.5</b>
850	<b>-2.0</b>	<b>25.4</b>
880	<b>-2.2</b>	<b>22.0</b>
1700	<b>1.2</b>	<b>38.5</b>
1750	<b>1.6</b>	<b>39.2</b>
1800	<b>1.8</b>	<b>40.2</b>
1850	<b>1.92</b>	<b>37.6</b>
1900	<b>1.34</b>	<b>35.2</b>
1950	<b>0.92</b>	<b>33.8</b>
2000	<b>0.76</b>	<b>32.6</b>
2050	<b>0.46</b>	<b>30.6</b>
2100	<b>0.37</b>	<b>30.0</b>
2150	<b>0.21</b>	<b>29.6</b>



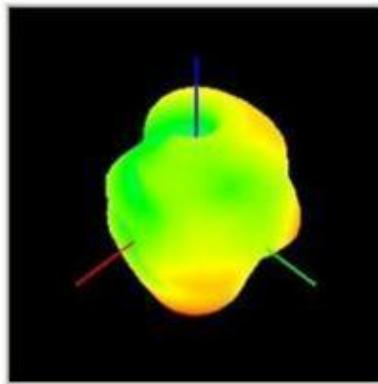
700-716



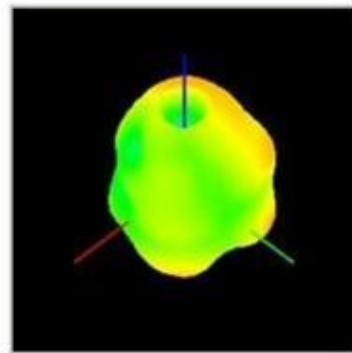
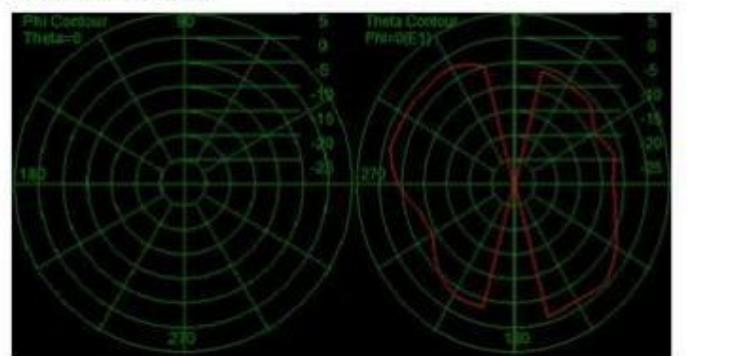
824-880



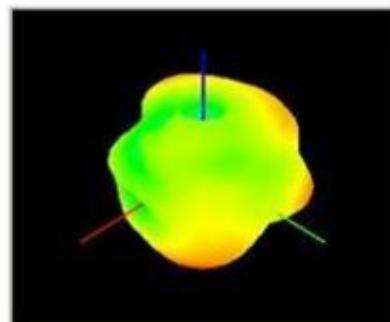
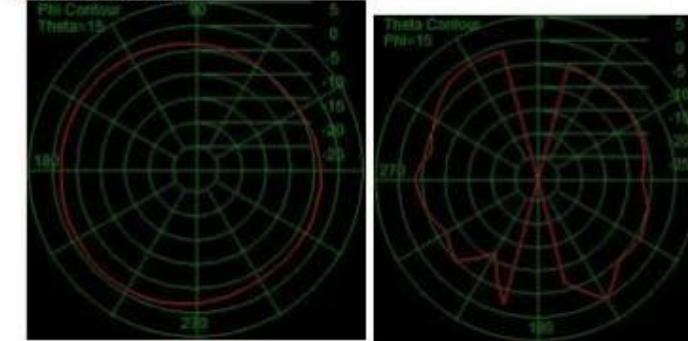
## 2G/3G/4G antenna



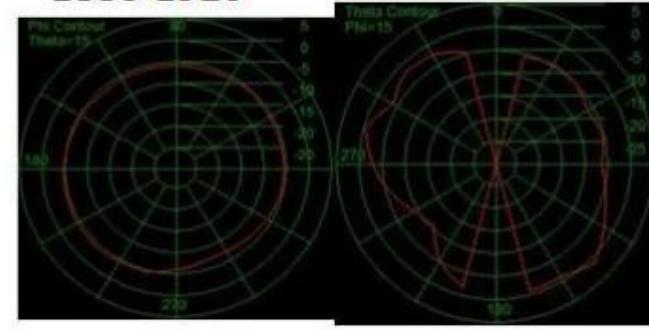
1880-1998



1920-2170

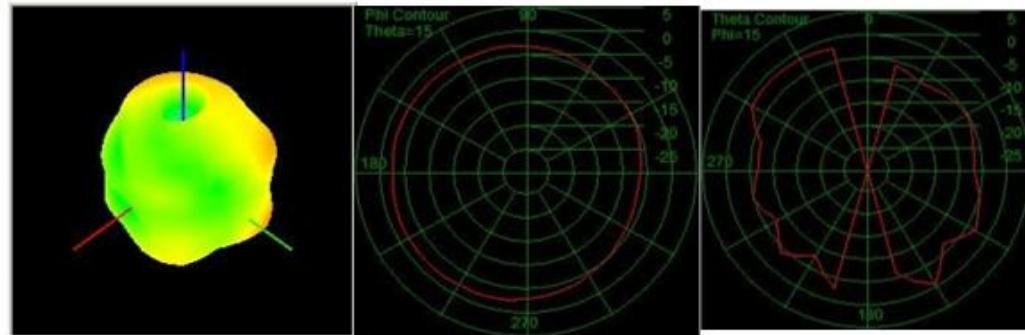


1880-1920

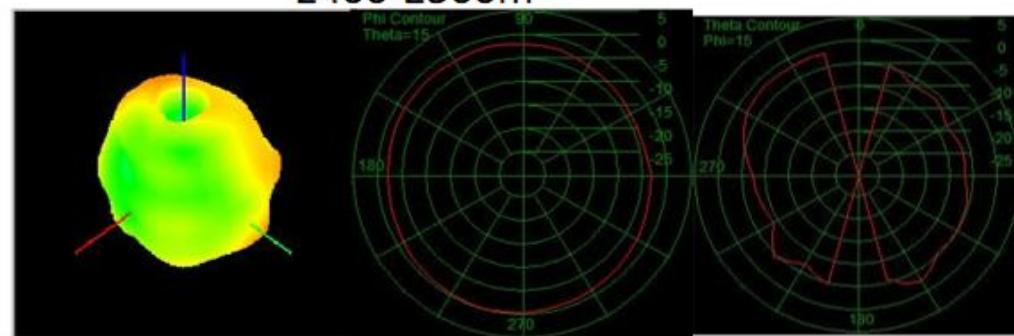


## 2G/3G/4G antenna

2305-2400M



2400-2500m



2500-2700m



# 2G/3G/4G antenna

Frequency band	Channel	TRP(dBm)	TIS(dBm)		Frequency band	Channel	TRP(dBm)	TIS(dBm)	
EGSM 900	Low	27.08	-104.2		DCS 1800	Low	24.6	-104.01	
	Mid	27.1	-103.2			Mid	25.4	-104.2	
	Hig	27.18	-102.5			Hig	26.3	-103.4	
EGSM 850	Low	25.68	-103.6		PCS 1900	Low	26.3	-104.3	
	Mid	25.58	-103.5			Mid	26.5	-104.6	
	Hig	26.59	-102.7			Hig	26.3	-105.2	
WCDMA Band 1	Low	19.2	-105.6		WCDMA Band 5	Low	15.6	-105.8	
	Mid	19.5	-105.4			Mid	15.8	-105.32	
	Hig	19.0	-104.46			Hig	16.3	-104.7	
WCDMA Band 2	Low	20.3	-104.2		WCDMA Band 8	Low	17.2	-104.3	
	Mid	20.4	-105.3			Mid	17.50	-104.2	
	Hig	19.7	-105.4			Hig	18.07	-104.11	
	Low					Low			
	Mid					Mid			
	Hig					Hig			

# 2G/3G/4G antenna



Frequency band	Channel	TRP(dBm)	TIS(dBm)	Frequency band	Channel	TRP(dBm)	TIS(dBm)
LTE B38	Low	19.01	-90.5	LTE B39	Low	20.5	-91.7
	Mid	18.2	-90.7		Mid	20.4	-91.8
	Hig	17.6	-91.5		Hig	20.3	-92.5
LTE B40	Low	19.2	-91.2	LTE B41	Low	19.2	-90.2
	Mid	19.2	-91.3		Mid	18.0	-90.3
	Hig	18.9	-90.2		Hig	18.5	-90.1
LTE B1	Low	20.3	-92.9	LTE B2	Low	20.3	-91.5
	Mid	19.5	-92.8		Mid	20.4	-91.3
	Hig	20.3	-93.5		Hig	19.0	-91.23
LTE B3	Low	19.0	-94.2	LTE B4	Low	18.7	-91.5
	Mid	19.3	-94.5		Mid	19.2	-91.2
	Hig	19.5	-94.3		Hig	19.5	-91.05
LTE B5	Low	15.6	-93.2	LTE B7	Low	18.1	-92.1
	Mid	16.0	-93.5		Mid	17.8	-92.5
	Hig	16.1	-93.4		Hig	17.6	-91.2

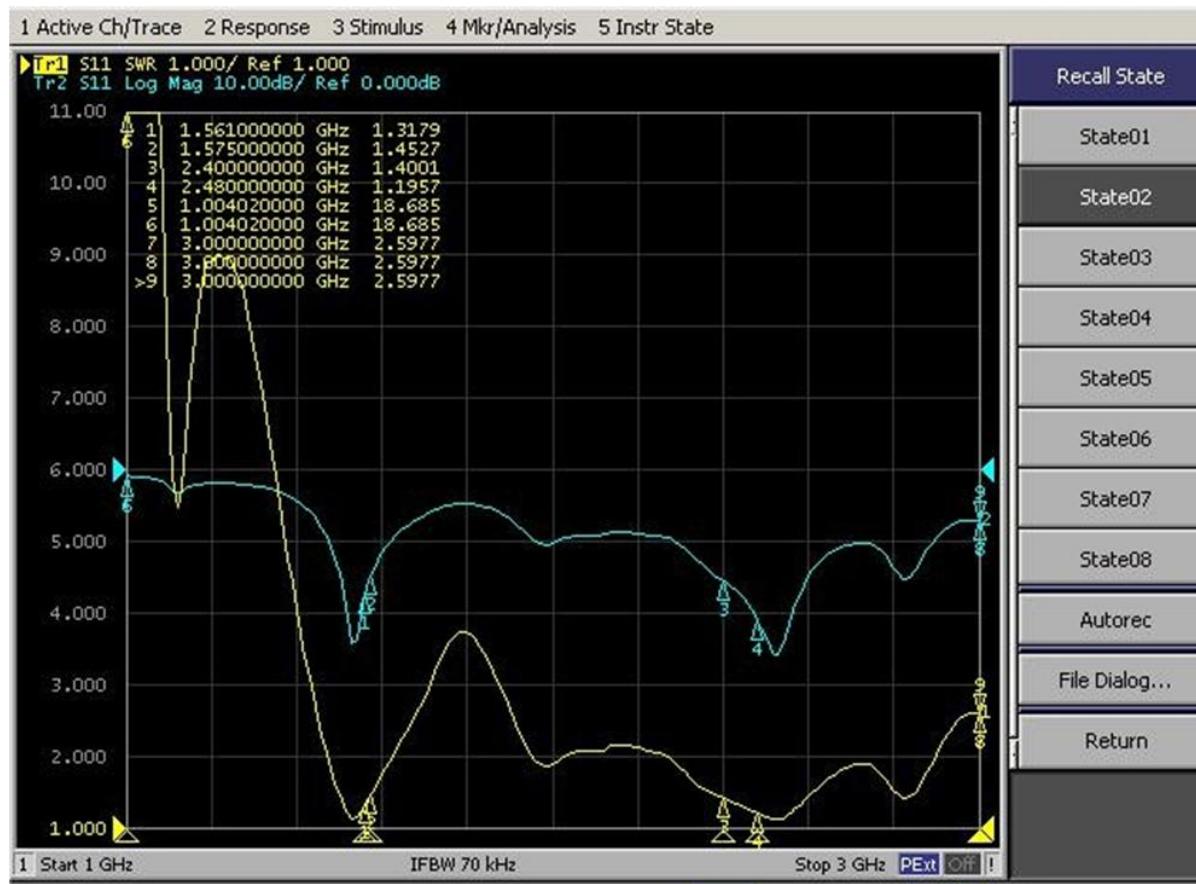
## 2G/3G/4G antenna

Frequency band	Channel	TRP(dBm)	TIS(dBm)	Frequency band	Channel	TRP(dBm)	TIS(dBm)
LTE B8	Low	17.6	-93.8	LTE B12	Low	10.3	-88.3
	Mid	18.3	-93.4		Mid	10.8	-88.1
	Hig	18.3	-93.2		Hig	10.0	-88.2
LTE B17	Low	10.4	-87.6	LTE B20	Low	15.3	-92.3
	Mid	10.3	-88.0		Mid	15.8	-92.1
	Hig	10.2	-88.0		Hig	16.0	-92.2
	Low				Low		
	Mid				Mid		
	Hig				Hig		
	Low				Low		
	Mid				Mid		
	Hig				Hig		
	Low				Low		
	Mid				Mid		
	Hig				Hig		
	Low				Low		
	Mid				Mid		
	Hig				Hig		

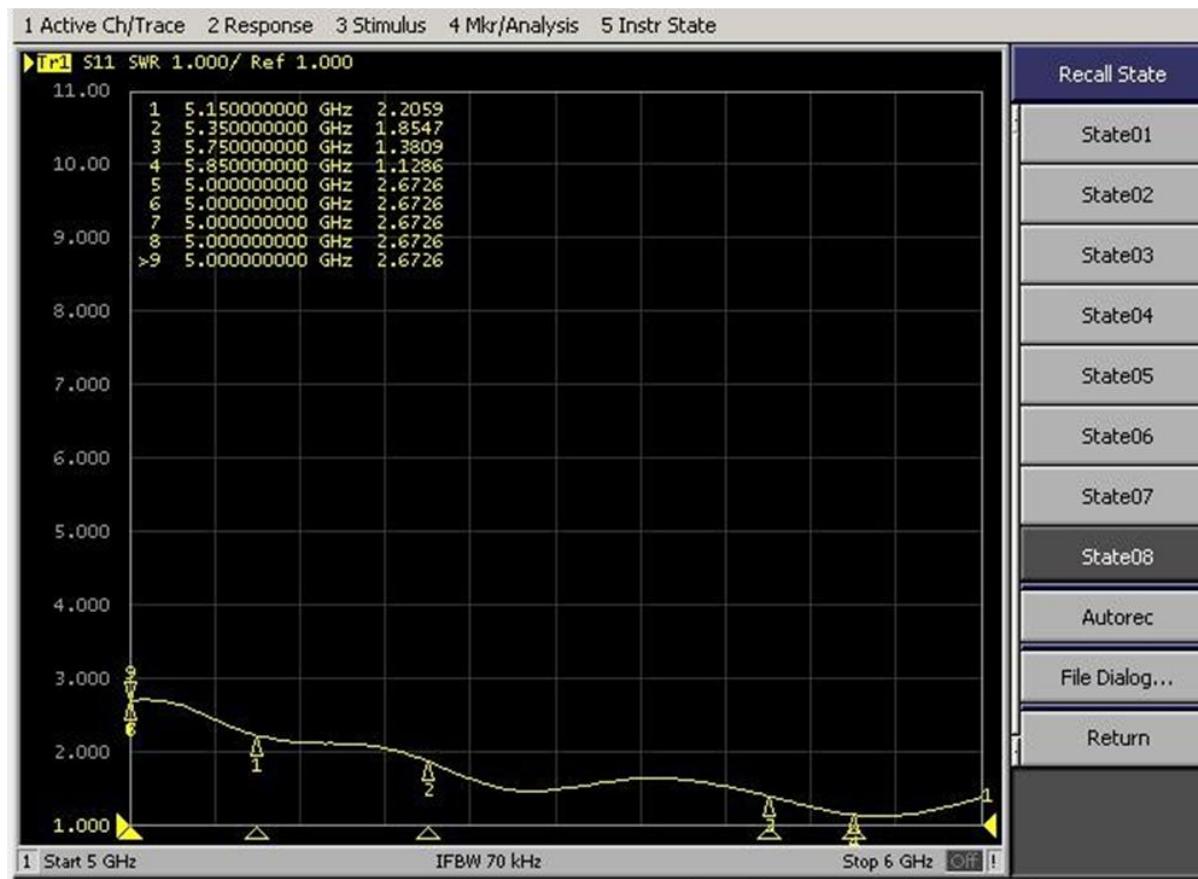
## GPS/WIFI/BT antenna

GPS	Maximum signal strength	Number of stars searched	average positioning time	weather regime	GPS		
	42	7	58	clear day			
WIFI	Receive signal strength at 10m from WIFI router			Normal distance for barrier-free Internet access			
	49			20			
BT	Clear communication distance for the disabled						
	10m						

## WIFI GPS BT antenna



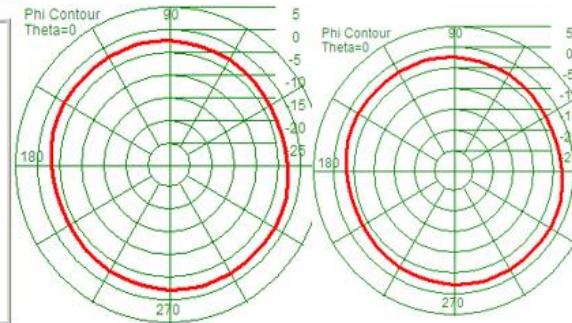
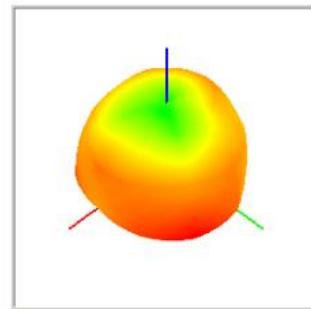
## WIFI antenna



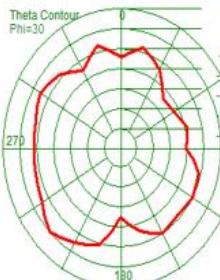
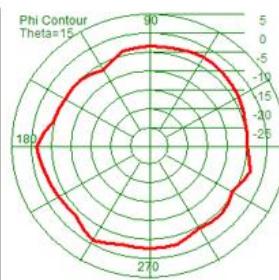
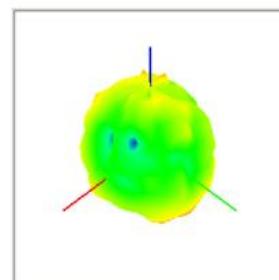
## WIFI BT antenna

Channel	增益(dBi)	效率(%)
2400	<b>1.65</b>	<b>45.2</b>
2450	<b>1.74</b>	<b>46.3</b>
2480	<b>2.15</b>	<b>47.7</b>
5150	<b>0.85</b>	<b>40.6</b>
5200	<b>0.89</b>	<b>43.8</b>
5250	<b>0.92</b>	<b>42.6</b>
5300	<b>1.02</b>	<b>42.5</b>
5350	<b>0.86</b>	<b>40.4</b>
5400	<b>0.79</b>	<b>40.6</b>
5450	<b>0.87</b>	<b>41.0</b>
5600	<b>0.72</b>	<b>40.2</b>
5650	<b>0.83</b>	<b>41.3</b>
5700	<b>1.05</b>	<b>42.5</b>
5750	<b>1.35</b>	<b>42.8</b>
5800	<b>1.46</b>	<b>43.4</b>
5850	<b>1.58</b>	<b>43.5</b>

2400M



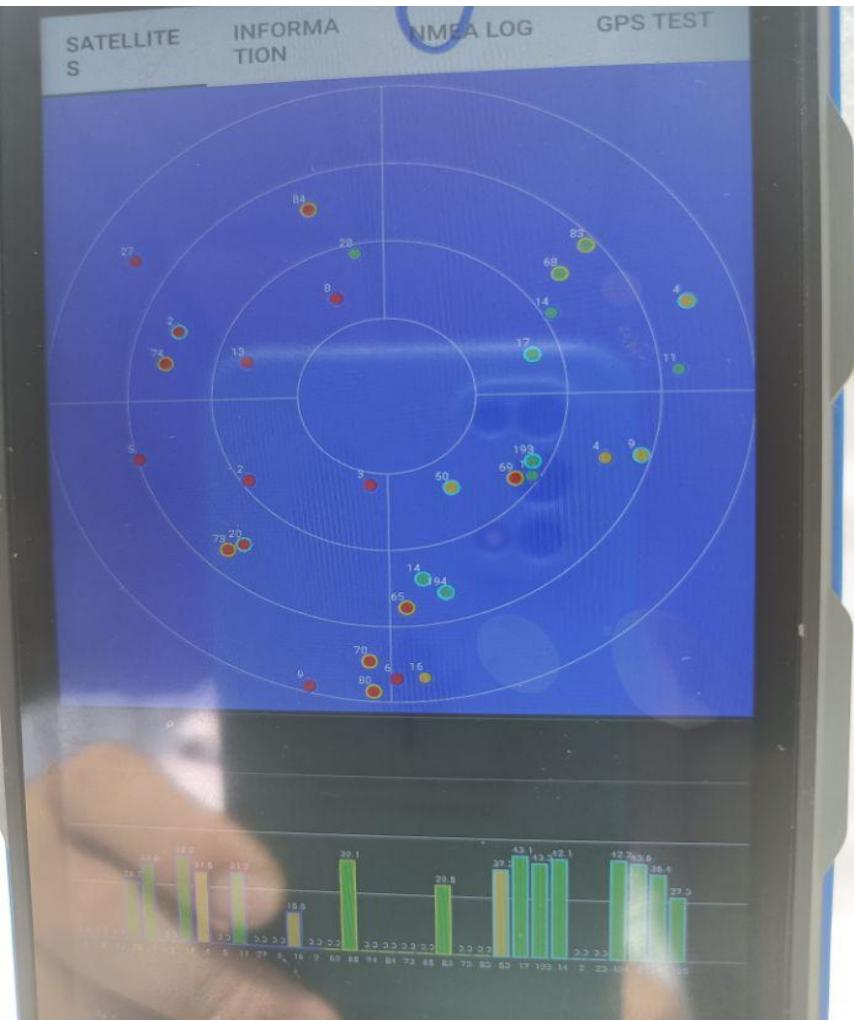
5150-5850M



# WIFI antenna

Frequency band	Channel	TRP(dBm)	TIS(dBm)	Frequency band	Channel	TRP(dBm)	TIS(dBm)
B 11 M	1	10.2	-78.6	G 54 M	1	9.2	-68.5
	6	10.5	<b>-79.2</b>		6	9.3	<b>-68.6</b>
	11	10.6	-79.1		11	9.2	-68.5
n 65 M	1	7.5	-66.7	A 54 M	36	9.12	-69.6
	6	7.6	-66.2		149	10.3	-70.1
	11	7.7	-66.5		165	10.4	-69.8

# GPS Test



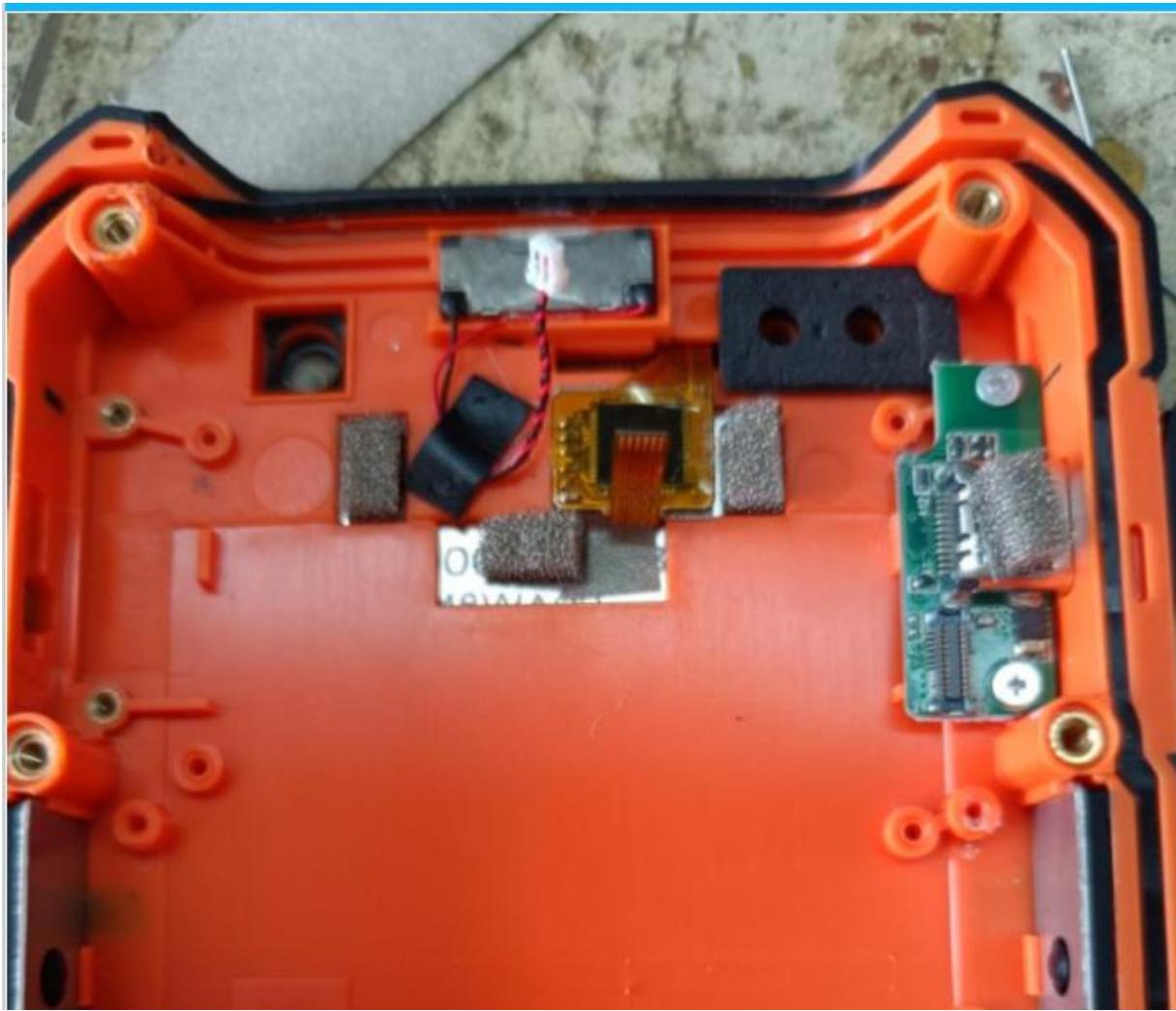
## Environmental treatment



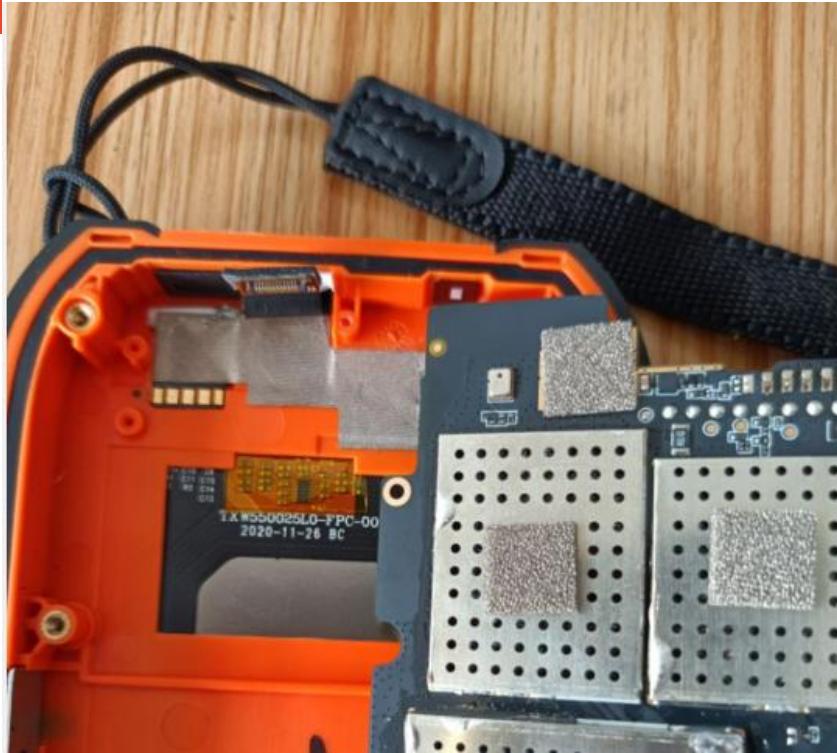
The IC of the screen  
is shielded by  
conductive cloth



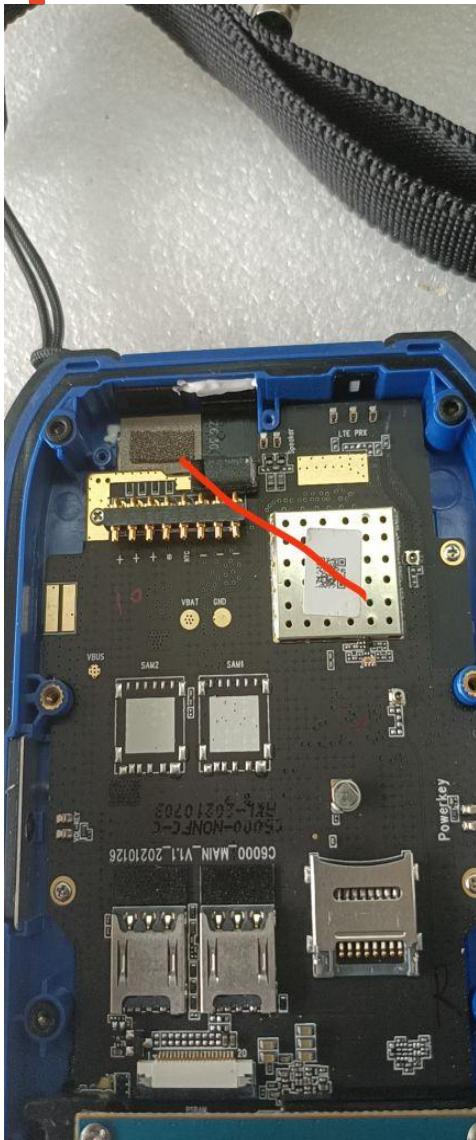
Here, three places are attached to the conductive foam and the iron frame of the display screen is grounded



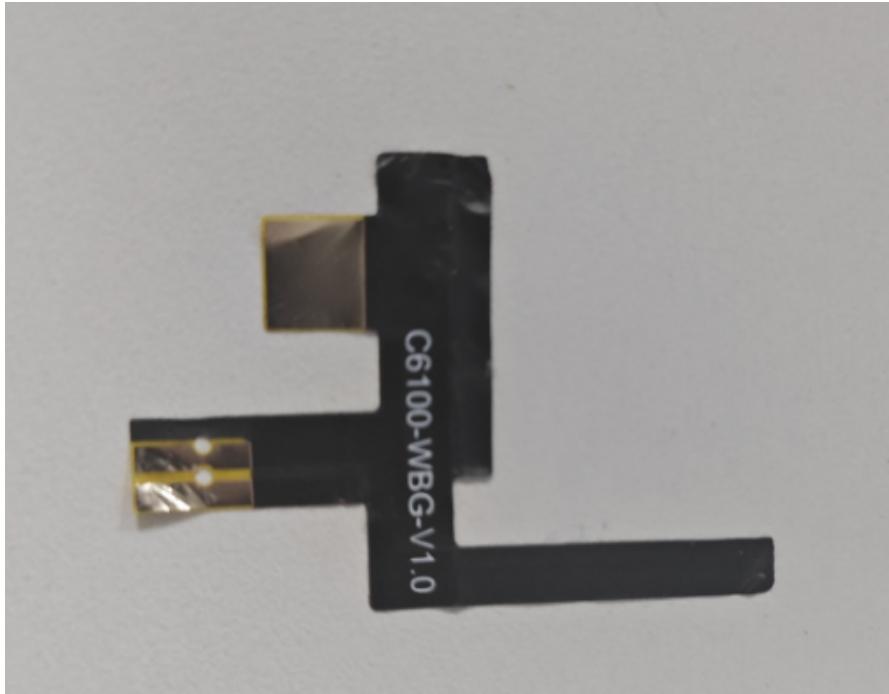
Here, three pieces of conductive sponge are attached to the motherboard for grounding



The speaker is grounded and  
connected to the motherboard



The speaker here adds a conductive  
foam ground



WIFI/ Bluetooth antenna



2/3/4G antenna



Thank You

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Chang Feng Electronic Science (Shen zhen) Co., LTD.