

Zhejiang Haitong communications electronic Limited by Share Ltd.

Customer: TCL Communication Ltd.

Project name: T513W

Product name: T513W - Cellular & wifi antenna

Date: 2024.12.11

1. Antenna specification and test location

Antenna 0/1/2

Material: FPC

Manufacturer: Zhejiang Haitong

Manufacturer Address: 1St floor, Phoenix Tower, 15 Science and Technology North
First Road, Shenzhen, Guangdong Province

Antenna gain and radiation pattern measured in GTS2800 anechoic chamber.

Project date: 2024.11.05 - 2024.12.10

Test engineer: daiyong Jiang weicheng Liu 蒋代勇 刘伟成

Test Equipment list

2. Test system introduction

2.1 Anechoic chamber

Our company has a number of anechoic chamber for OTA test. It is ranging from 400 MHz to 8.5 GHz, which can provide passive test and active test, including OTA overall 2G, 3G, 4G, 5G FR test, WiFi multi-mode test, GPS active test, Bluetooth active test. The test system can

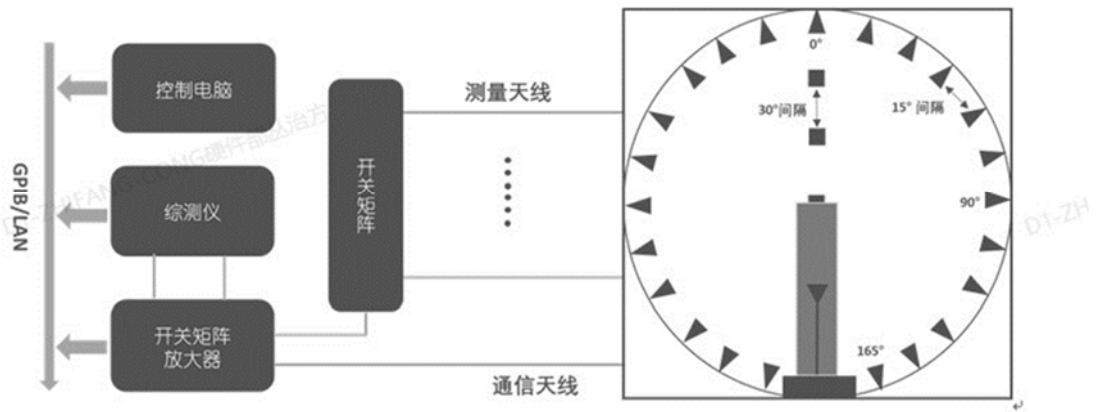
Description	Manufacturer	Model	Cal Date
Vector Network Analyzer	Agilent Technologies	E5071C	2024.04.11
Anechoic Chamber	GTS2800	SG16	2024.04.11

provide antenna gain, efficiency, radiation pattern, upper and lower hemisphere efficiency values and mutual disturbance correlation coefficient analysis.



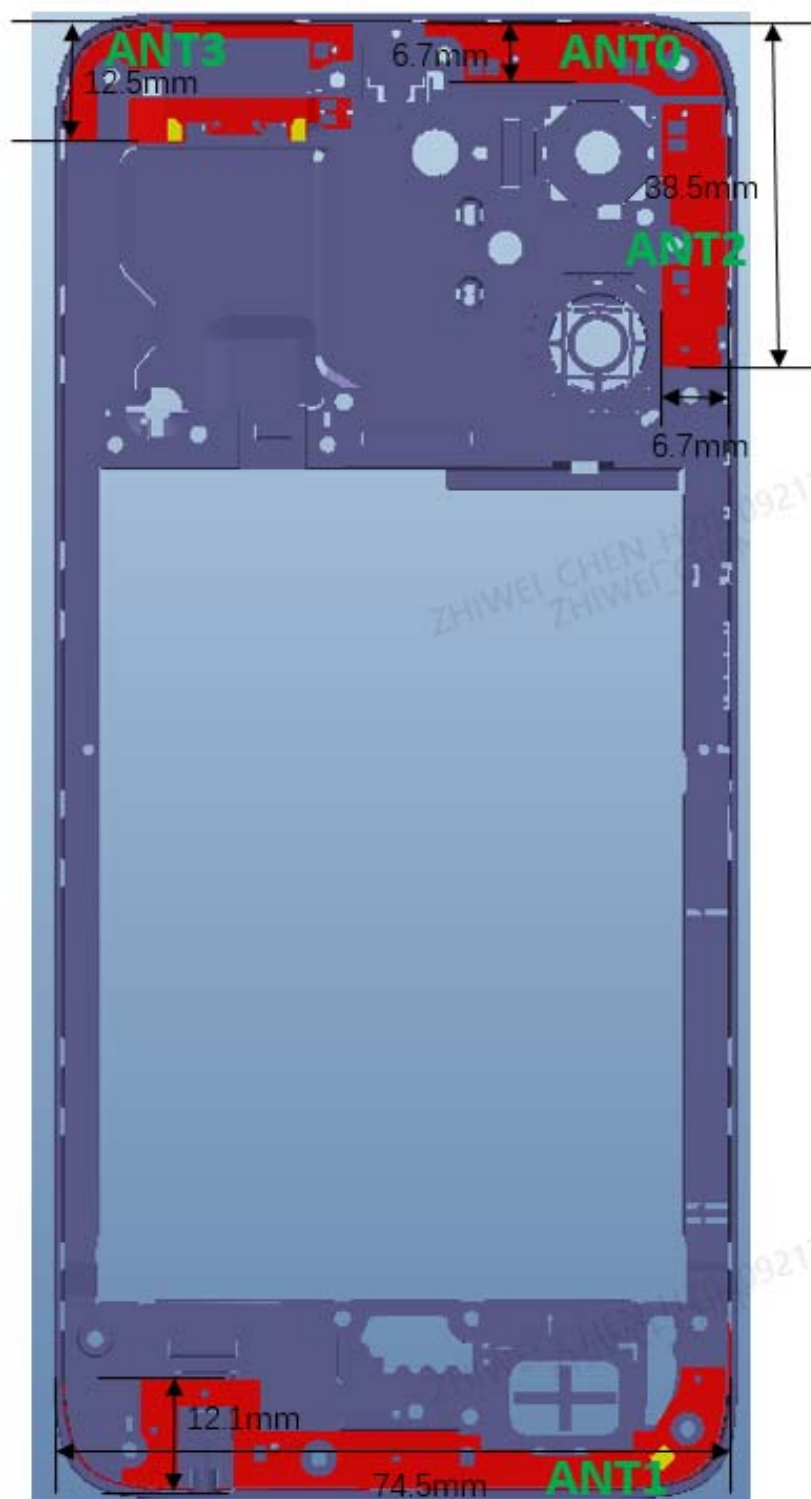
2.2 Test system architecture

The figure above shows the connection and control process between the anechoic chamber of our company and the testing system and computer. The testing system has the characteristics of accurate, fast and simple testing. The operation interface is simple and humanized.



3. Test result

3.1 Antenna plane:



Antenna	Type	Description
0	FPC	LB TRX antenna
1	FPC	LB DRX+MB/HB TRX antenna
2	FPC	MB/HB DRX antenna
3	FPC	GPS/WIFI(2.4G 5G)/BT antenna

3.2 Antenna Gain

Gain of Antenna 0

Band	Gain average(dBi)	Gain Peak (dBi)
GSM850	-6.42	-4.39
WCDMA B5	-6.42	-4.39
LTE B5	-6.42	-4.39
LTE B12	-6.11	-3.68
LTE B26	-6.43	-4.41
LTE B71	-6.96	-4.95
N71	-6.96	-4.95

Gain of Antenna 1

Band	Gain average(dBi)	Gain Peak (dBi)
PCS1900	-4.09	-2.17
WCDMA B2	-4.09	-2.17
WCDMA B4	-4.38	-2.09
LTE B2	-4.09	-2.17
LTE B4	-4.38	-2.09
LTE B25	-4.09	-2.17
LTE B41	-4.81	-1.53
LTE B66	-4.38	-2.09
N25	-4.09	-2.17
N41	-4.81	-1.53
N66	-4.38	-2.09

Gain of Antenna 2

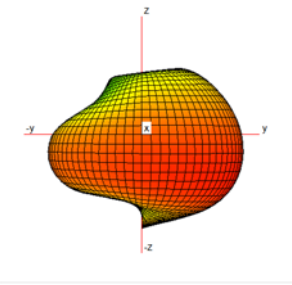
Band	Gain average(dBi)	Gain Peak (dBi)
GPS	-4.3	-2.65
Wi-Fi 2.4G/BT	-3.9	-2.33
Wi-Fi 5G	-4.9	-2.9

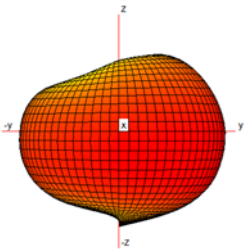
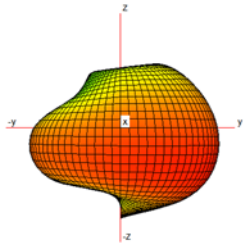
NFC antenna gain description:

The device does not support the test of NFC gain. In addition, all measurements were performed radiated and therefore additional antenna gain documentation is not required.

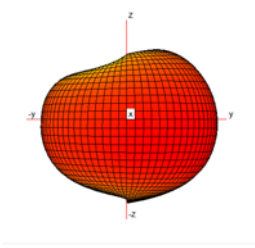
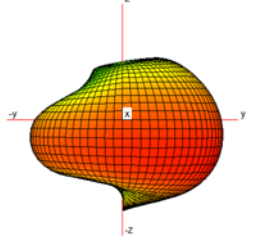
3.3 Radiation Pattern

Antenna 0

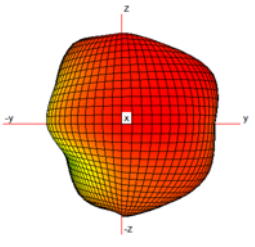
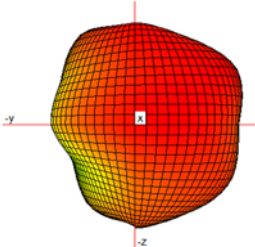
(Frequency Band)	GSM850	
3D Radiation Pattern		
Efficiency[%]	23	
Avg Gain [dBi]	-6.42	
Peak Gain [dBi]	-4.39	

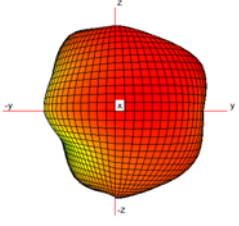
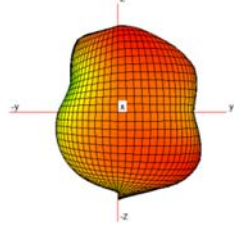
(Frequency Band)	B12	W5
3D Radiation Pattern		
Efficiency[%]	24	23
Avg Gain [dBi]	-6.11	-6.42
Peak Gain [dBi]	-3.68	-4.39

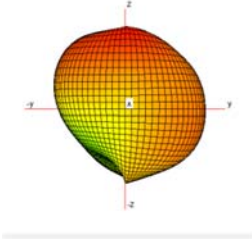
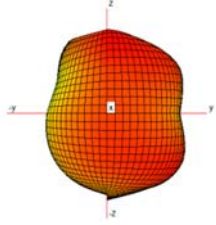
(Frequency Band)	B71/N71	B26
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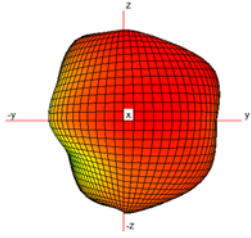
3D Radiation Pattern		
Efficiency[%]	20	23
Avg Gain [dBi]	-6.96	-6.43
Peak Gain [dBi]	-4.95	-4.41

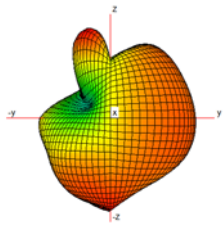
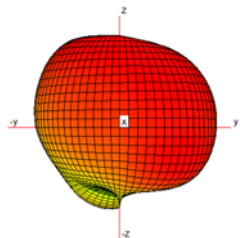
Antenna 1

(Frequency Band)	B2	PCS1900
3D Radiation Pattern		
Efficiency[%]	39	39
Avg Gain [dBi]	-4.09	-4.09
Peak Gain [dBi]	-2.17	-2.17

(Frequency Band)	W2	W4
3D Radiation Pattern		
Efficiency[%]	39	36
Avg Gain [dBi]	-4.09	-4.38
Peak Gain [dBi]	-2.17	-2.09

(Frequency Band)	B41/N41	B66/N66
3D Radiation Pattern		
Efficiency[%]	32	36
Avg Gain [dBi]	-4.81	-4.38
Peak Gain [dBi]	-1.53	-2.09

(Frequency Band)		B25
3D Radiation Pattern		
Efficiency[%]		39
Avg Gain [dBi]		-4.09
Peak Gain [dBi]		-2.17

(Frequency Band)	WiFi 2.4G/BT	WiFi 5G
3D Radiation Pattern		
Efficiency[%]	41	32
Avg Gain [dBi]	-3.9	-4.9
Peak Gain [dBi]	-2.33	-2.9