

Shenzhen Etheta Communication  
Technology Co., Ltd.  
(Shenzhen Etheta)

Customer: TCL Communication Ltd.

Project name: T440W

Product name: T440W - Cellular & wifi antenna

Date: 2024.10.15

1. Antenna specification and test location

Antenna 0/1/2  
Material: FPC  
Manufacturer: Shenzhen Etheta  
Manufacturer Address: NO.138 ShangXia Section,Hi-tech District of  
East river, Huizhou,Guangdong P.R. China  
Antenna gain and radiation pattern measured in SATIMO anechoic chamber.  
Project date: 2023.12.15 - 2024.01.05  
Test engineer: qi.ma  
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Test Equipment list

Description	Manufacturer	Model	Cal Date
Vector Network Analyzer	Agilent Technologies	E5071B	2023.12.14
Anechoic Chamber	SATIMO	SG16	2023.12.14

## 2. Test system introduction

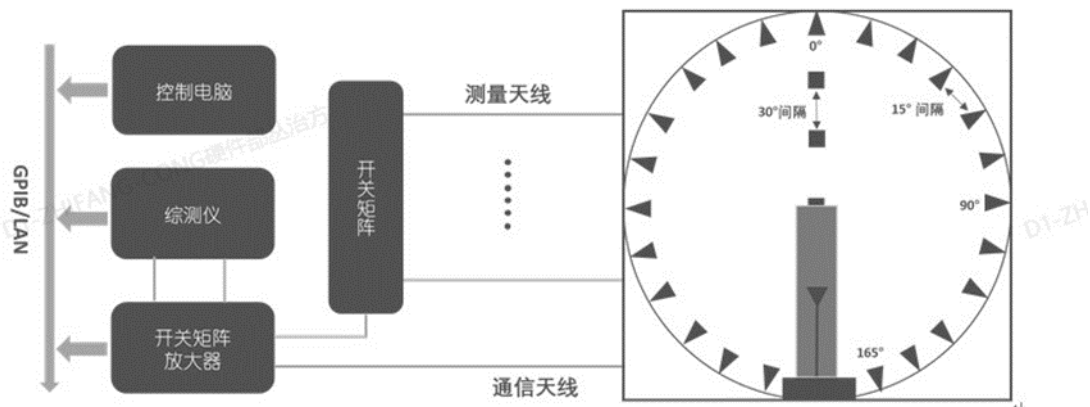
### 2.1 Anechoic chamber

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 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

#### 3.2 Antenna Gain

##### Gain of Antenna 0

Band	Gain average(dBi)	Gain Peak (dBi)
GSM850	-4.21	-2.32
PCS1900	-2.32	-1.12
WCDMA B2	-2.32	-1.32
WCDMA B4	-2.32	-1.12
WCDMA B5	-4.21	-2.32
LTE B2	-2.32	-1.32
LTE B4	-2.32	-1.12
LTE B5	-4.21	-2.32
LTE B12	-3.21	-2.44
LTE B25	-2.32	-1.32
LTE B26	-4.21	-2.32
LTE B41	-1.2	-0.12
LTE B66	-2.32	-1.12
LTE B71	-4.5	-2.57
N25	-2.32	-1.32
N41	-1.2	-0.12
N66	-2.32	-1.12
N71	-4.5	-2.57
N77	-2.32	-2.4

##### Gain of Antenna 2

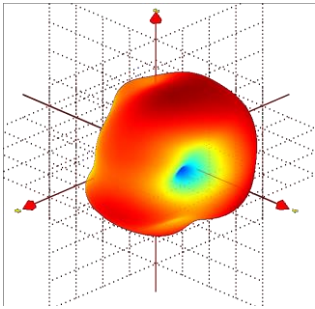
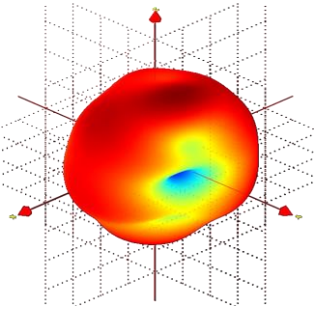
Band	Gain average(dBi)	Gain Peak (dBi)
GPS	-4.7	-4.7
Wi-Fi 2.4G/BT	-3.8	-2.5
Wi-Fi 5G	-3.5	-2.2

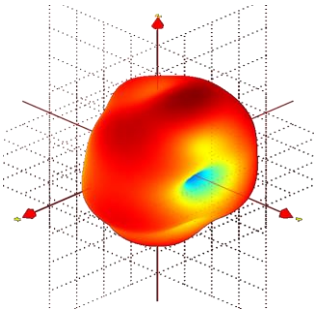
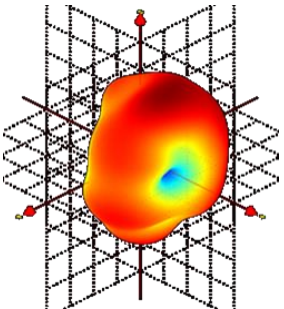
NFC antenna gain description:

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.

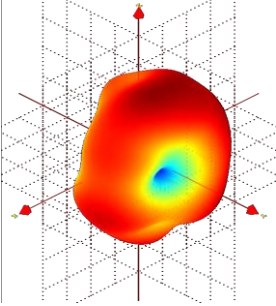
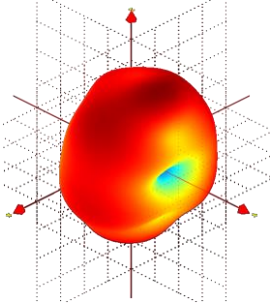
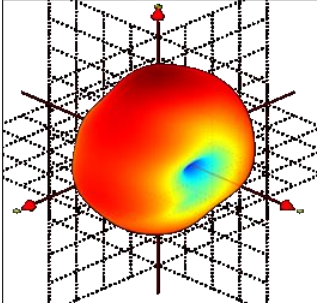
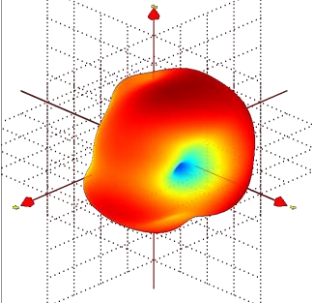
3.3 Radiation Pattern

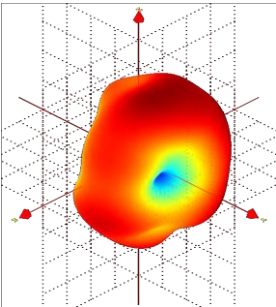
Antenna 0

(Frequency Band)	GSM850	PCS1900
3D Radiation Pattern		
Efficiency[%]	30	35
Avg Gain [dBi]	-4.21	-2.32
Peak Gain [dBi]	-2.32	-1.12

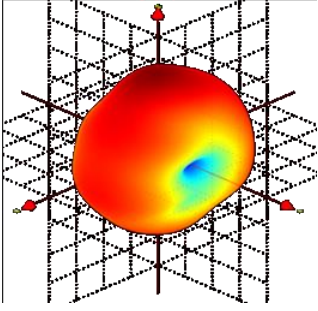
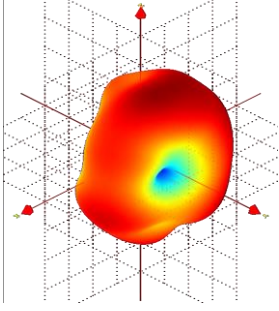
(Frequency Band)	W2	W4
3D Radiation Pattern		
Efficiency[%]	33	35
Avg Gain [dBi]	-2.32	-2.32
Peak Gain [dBi]	-1.32	-1.12

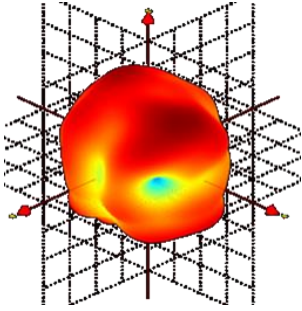
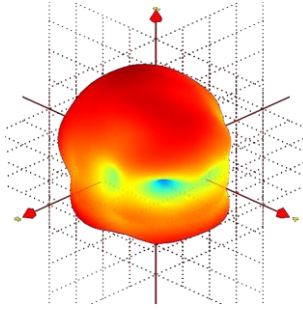
(Frequency Band)	W5	B2
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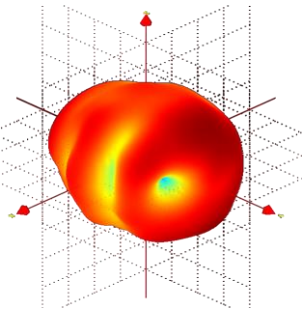
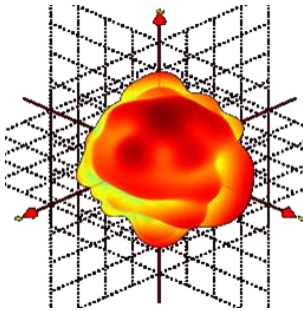
3D Radiation Pattern		
Efficiency[%]	30	33
Avg Gain [dBi]	-4.21	-2.32
Peak Gain [dBi]	-2.44	-1.32
(Frequency Band)	B4	B5
3D Radiation Pattern		
Efficiency[%]	35	30
Avg Gain [dBi]	-2.32	-4.21
Peak Gain [dBi]	-1.12	-2.32

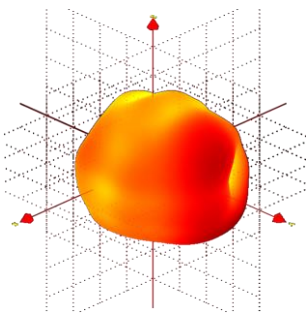
(Frequency Band)	B12	
3D Radiation Pattern		
Efficiency[%]	32	
Avg Gain [dBi]	-3.21	
Peak Gain [dBi]	-2.44	

(Frequency Band)	B25/N25	B26
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3D Radiation Pattern		
Efficiency[%]	30	30
Avg Gain [dBi]	-2.32	-4.21
Peak Gain [dBi]	-1.32	-2.32

(Frequency Band)	B41/N41	B66/N66
3D Radiation Pattern		
Efficiency[%]	38	35
Avg Gain [dBi]	-1.2	-2.32
Peak Gain [dBi]	-0.15	-1.12

(Frequency Band)	B71/N71	N77
3D Radiation Pattern		
Efficiency[%]	35	37
Avg Gain [dBi]	-4.5	-3.5
Peak Gain [dBi]	-2.57	-2.4

(Frequency Band)	WiFi 2.4G/BT	WiFi 5G
3D Radiation Pattern		
Efficiency[%]	31	36
Avg Gain [dBi]	-3.8	-3.5
Peak Gain [dBi]	-2.5	-2.2