Antenna Reports

Company: Lenovo

Model name: TB311XU

Issue date: 2024/08/15

Documented by:_ 徐永康

Antenna Summary Table

Check items	Information
Provided by lab	Haitong lab (GTS 2800)
Manufacturer/ Brand name	Zhejiang Haitong Communication Electronics Co., Ltd. Add: 1/F, Building C5, Kangqiao Business Park, No.2555 Xiu Pu Road, Pudong New Area, Shanghai.
Model name	TB311XU
List of calibrated test equipment	(GTS 2800)with calibrated date: 11/3/2024
Antenna detail info.	MAIN ANT:700-960MHz/1710-2690MHz DIV ANT:700-960MHz/1710-2690MHz WIFI ANT:2.4-2.5GHz/5150-5850GHz PIFA type antenna.
Antenna gain test data	Included antenna frequency, gain pattern

Note: Antenna gain was measured in the anechoic chamber, 3D scan was exercised, and the highest numbers are reported in this document.

Antenna Test data:

Antenna model name: P272 Antenna

Antenna type: PIFA

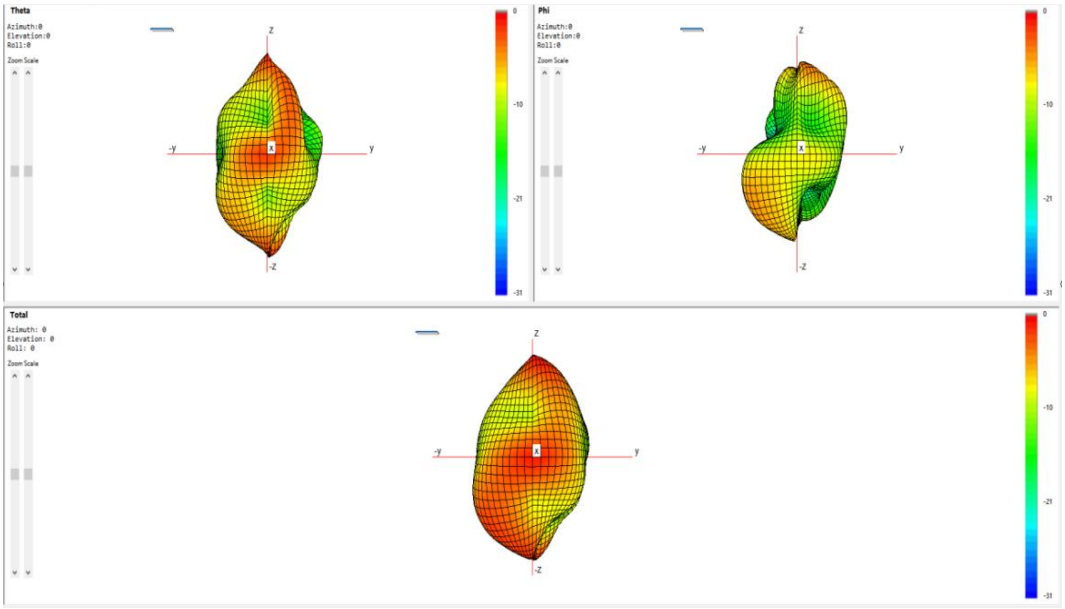
Antenna Gain and Antenna Type specification:

Antenna Gain (dBi)		WIFI	Antenna Type
2.4G WiFi	2400~2483.5MHz	-0.24	PIFA(Inverted F Antenna)
5G Wifi	5150~5250 MHz	1.25	PIFA(Inverted F Antenna)
	5250~5350 MHz	1.25	PIFA(Inverted F Antenna)
	5470~5725 MHz	1.25	PIFA(Inverted F Antenna)
	5725~5850 MHz	1.25	PIFA(Inverted F Antenna)
BT	2400~2483.5MHz	-0.24	PIFA(Inverted F Antenna)

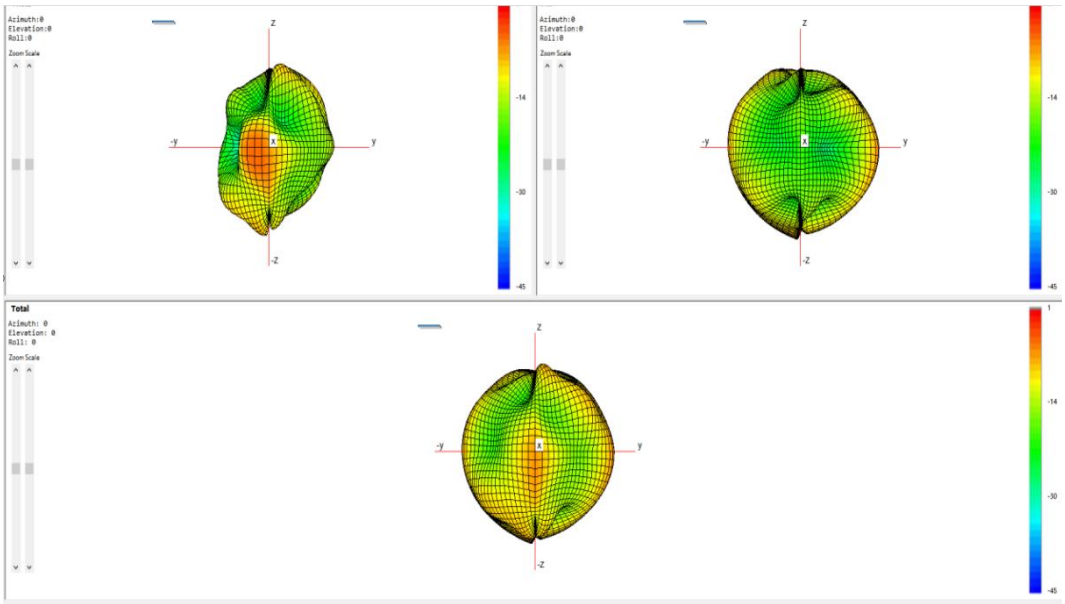
Antenna Gain (dBi)		MAIN Ant	DIV Ant	Antenna Type
GSM-850	824~849	-2.86	-3.42	PIFA(Inverted F Antenna)
GSM-900	880~915	-3.37	-3.03	PIFA(Inverted F Antenna)
GSM-1800	1710~1785	-1.5	-1	PIFA(Inverted F Antenna)
GSM-1900	1850~1910	0.3	-0.57	PIFA(Inverted F Antenna)
WCDMA I (B1)	1920~1980	1.04	-0.08	PIFA(Inverted F Antenna)
WCDMA II (B2)	1850~1910	0.3	-0.57	PIFA(Inverted F Antenna)
WCDMA IV (B4)	1710~1755	-1.56	-1.02	PIFA(Inverted F Antenna)
WCDMA V (B5)	824~849	-2.86	-3.42	PIFA(Inverted F Antenna)
WCDMA VI (B6)	830~840	-2.55	-3.4	PIFA(Inverted F Antenna)
WCDMA VIII (B8)	880~915	-3.37	-3.03	PIFA(Inverted F Antenna)
WCDMA IX (B9)	1749.9~1784.9	-1.5	-1.01	PIFA(Inverted F Antenna)
WCDMA XIX (B19)	830~845	-2.67	-3	PIFA(Inverted F Antenna)
LTE Band (1)	1920~1980	1.04	-0.08	PIFA(Inverted F Antenna)

LTE Band (2)	1850~1910	0.3	-0.57	PIFA(Inverted F Antenna)
LTE Band (3)	1710~1785	-1.5	-1	PIFA(Inverted F Antenna)
LTE Band (4)	1710~1755	-1.56	-1.02	PIFA(Inverted F Antenna)
LTE Band (5)	824~849	-2.86	-3.42	PIFA(Inverted F Antenna)
LTE Band (7)	2500~2570	0.49	-1.01	PIFA(Inverted F Antenna)
LTE Band (8)	880~915	-3.37	-3.03	PIFA(Inverted F Antenna)
LTE Band (12)	698~716	-4.13	-7.67	PIFA(Inverted F Antenna)
LTE Band (13)	777~787	-2.68	-3.18	PIFA(Inverted F Antenna)
LTE Band (17)	704~716	-4.13	-7.67	PIFA(Inverted F Antenna)
LTE Band (18)	815~830	-3.44	-2.85	PIFA(Inverted F Antenna)
LTE Band (19)	830~845	-2.55	-3.4	PIFA(Inverted F Antenna)
LTE Band (20)	832~862	-2.55	-1.76	PIFA(Inverted F Antenna)
LTE Band (25)	1850 ~1915	-0.3	-0.57	PIFA(Inverted F Antenna)
LTE Band (28)	703 ~748	-3.4	-6.27	PIFA(Inverted F Antenna)
LTE Band (66)	1710 ~1780	-1.55	-1	PIFA(Inverted F Antenna)
T-LTE Band (34)	2010~2025	0.86	-0.58	PIFA(Inverted F Antenna)
T-LTE Band (38)	2570~2620	1.2	-0.44	PIFA(Inverted F Antenna)
T-LTE Band (39)	1880~1920	0.62	-0.52	PIFA(Inverted F Antenna)
T-LTE Band (40)	2300~2400	1.4	-1.41	PIFA(Inverted F Antenna)
T-LTE Band (41)	2496~2690	1.2	-0.44	PIFA(Inverted F Antenna)

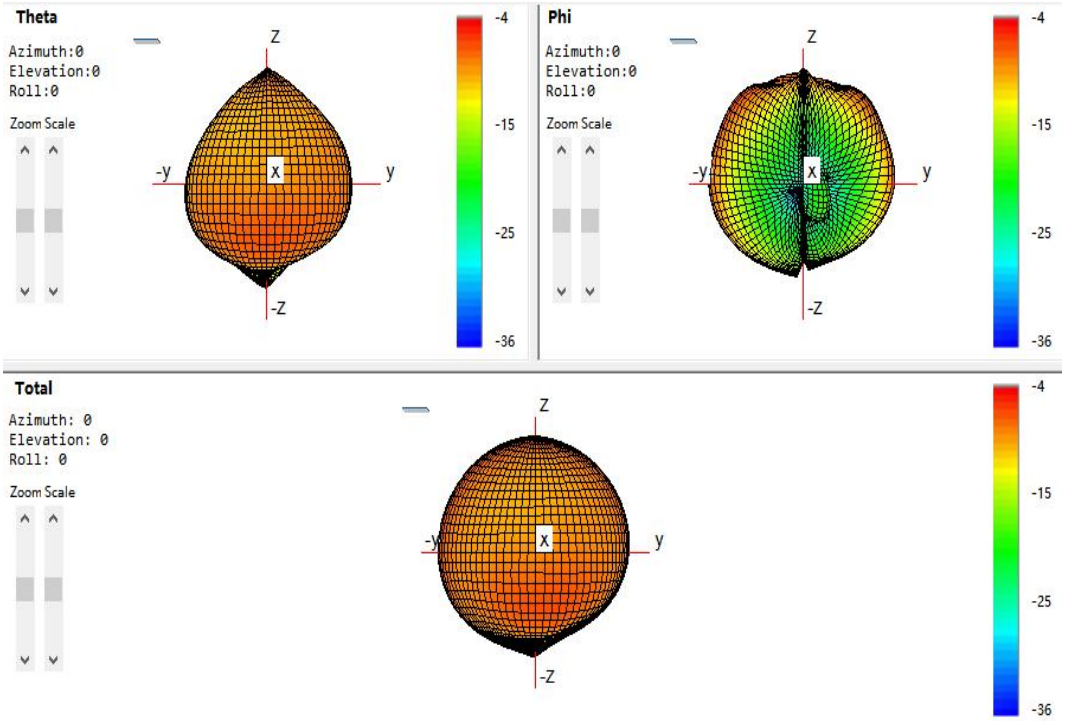
WIFI 2.4G (2450 MHz)



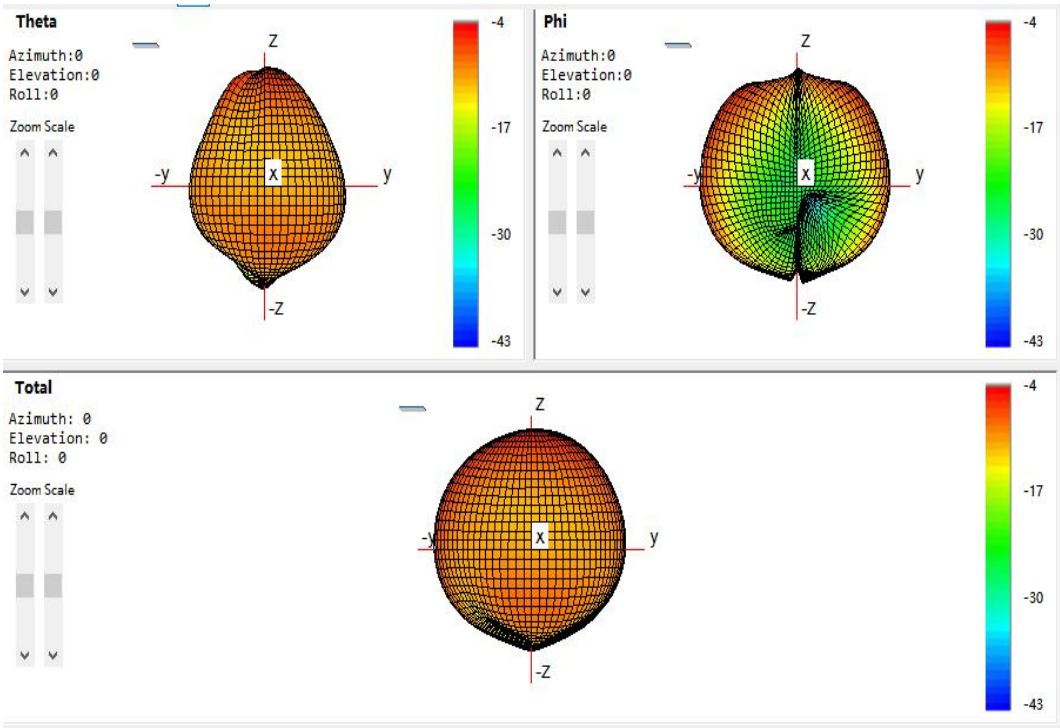
WIFI 5G (5150~5850MHz)



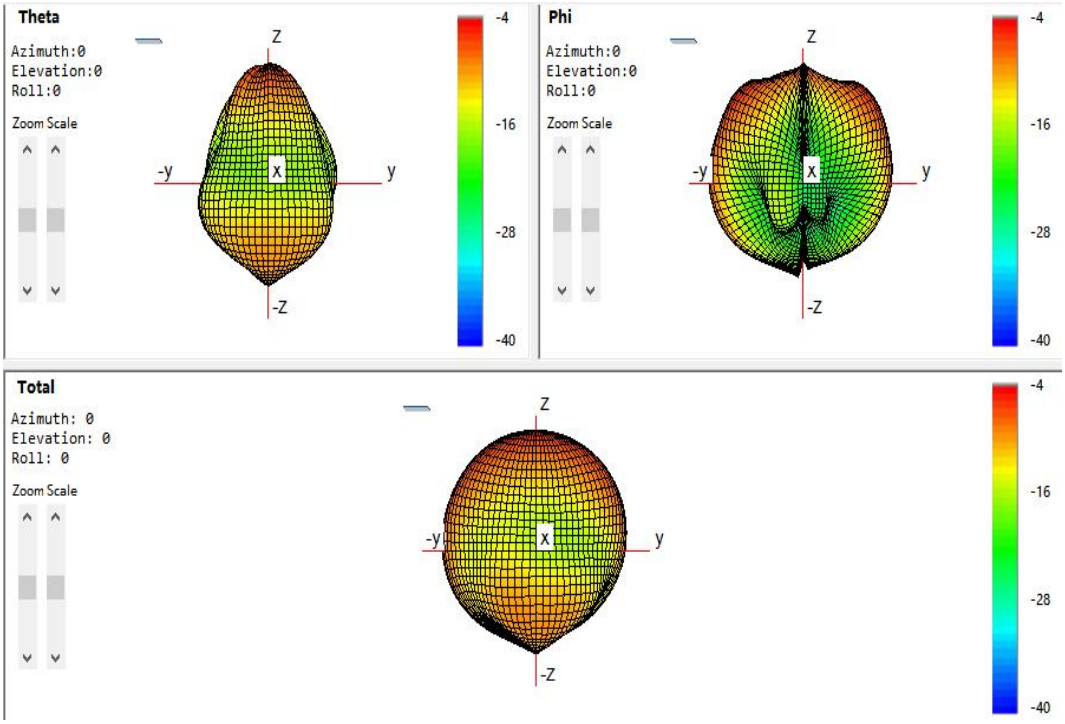
WCDMA、LTE　MAIN ANT (700~800)



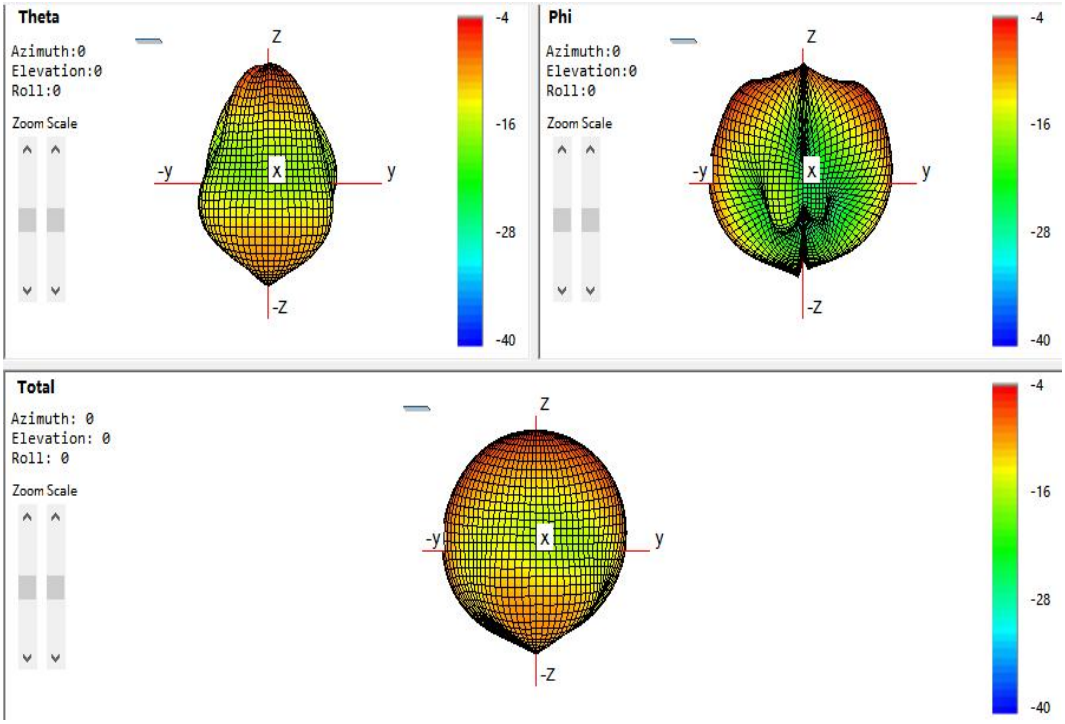
WCDMA、LTE MAIN ANT (800~894)



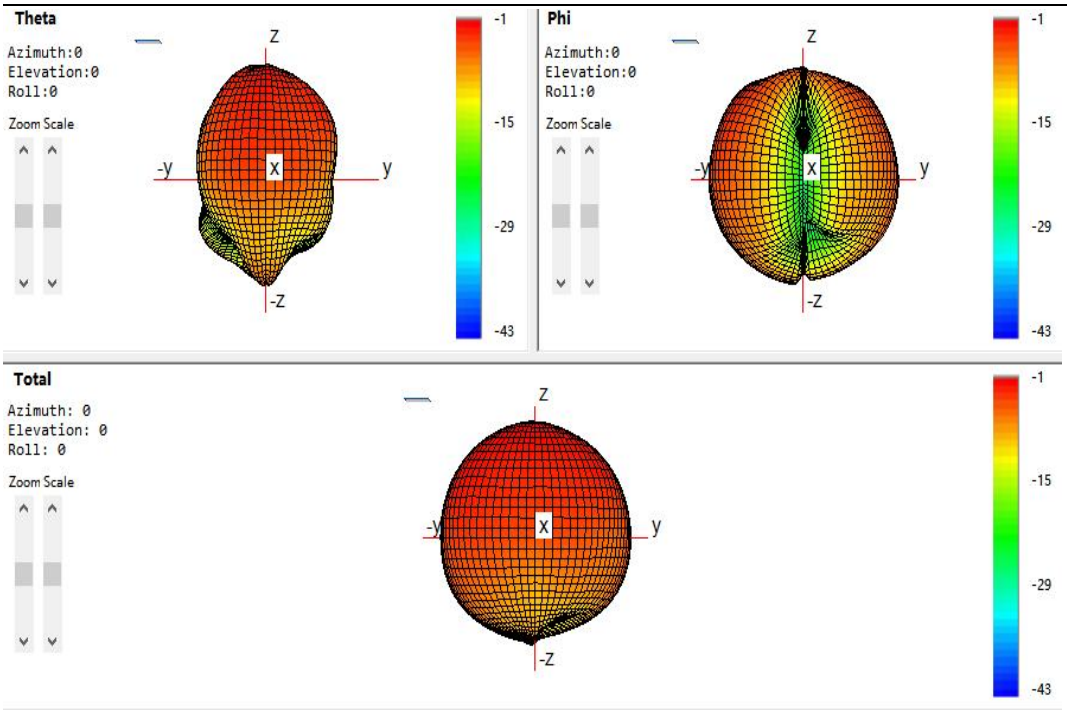
WCDMA、LTE MAIN ANT (880~960)



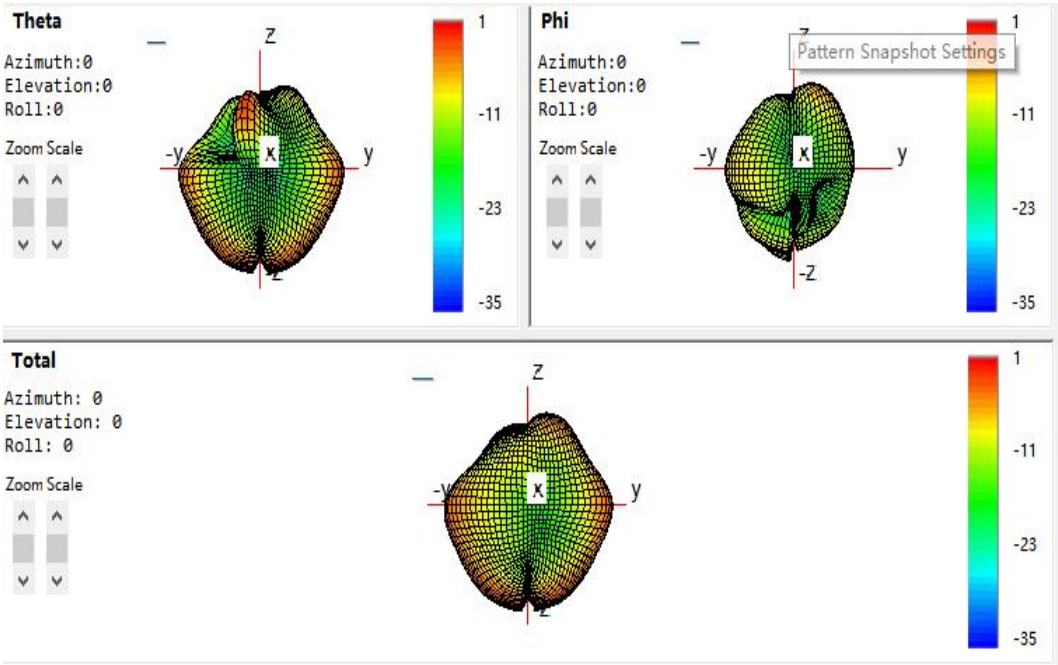
WCDMA、LTE MAIN ANT (1710~1880)



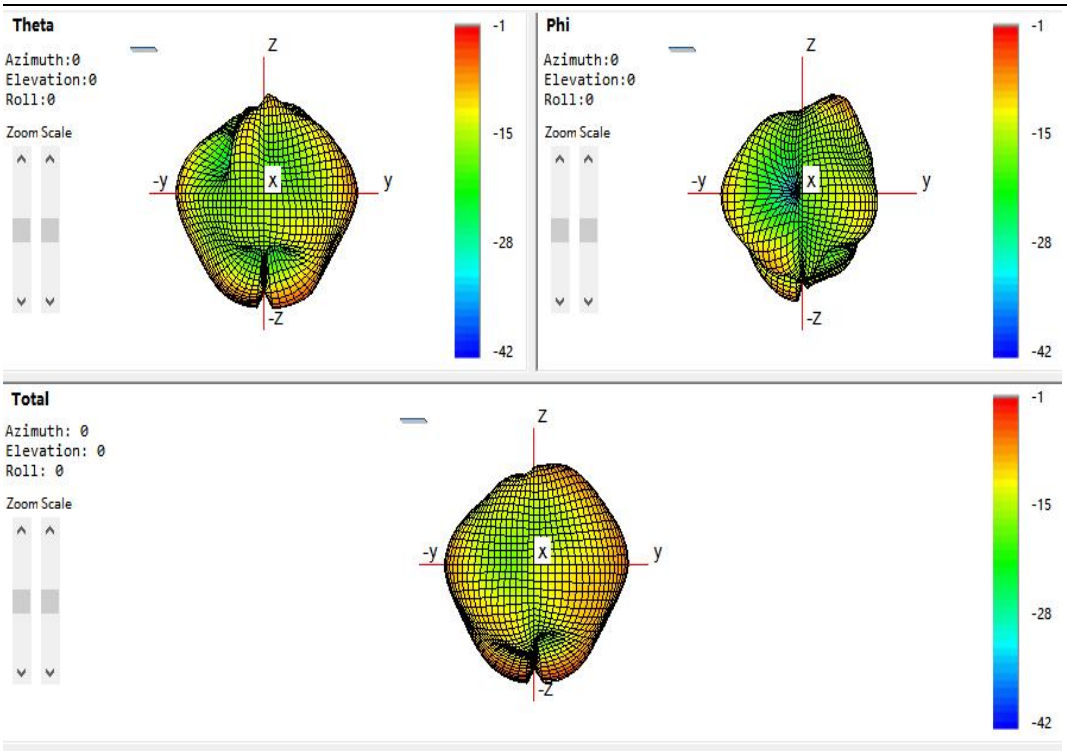
WCDMA、LTE MAIN ANT (1880~2170)



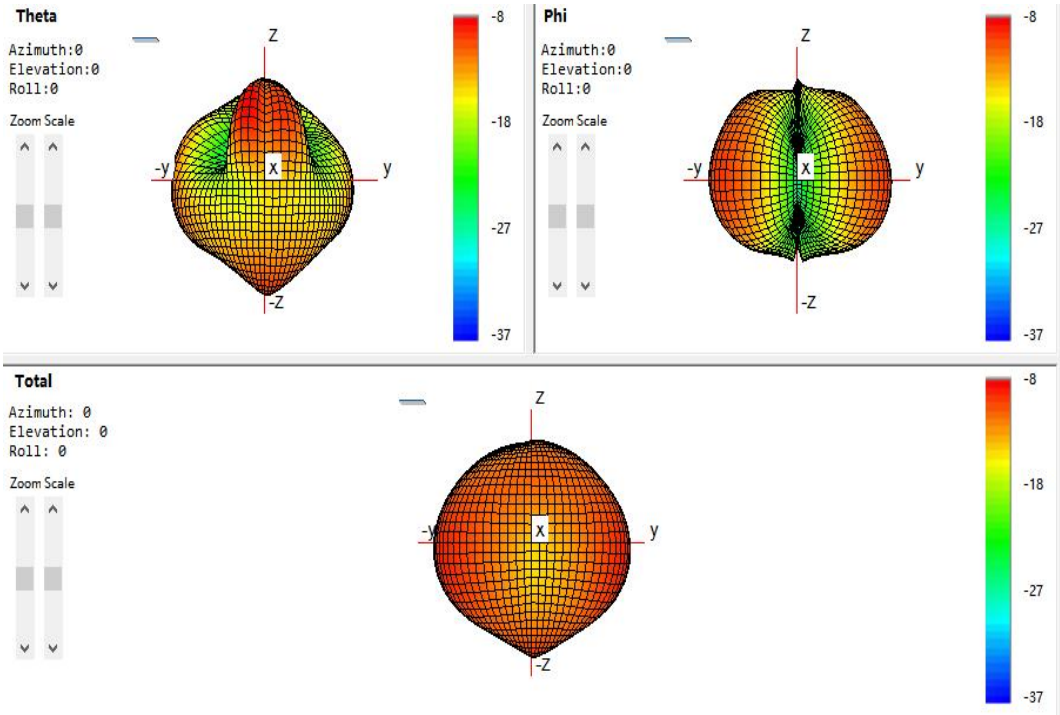
LTE MAIN ANT (2300~2400)



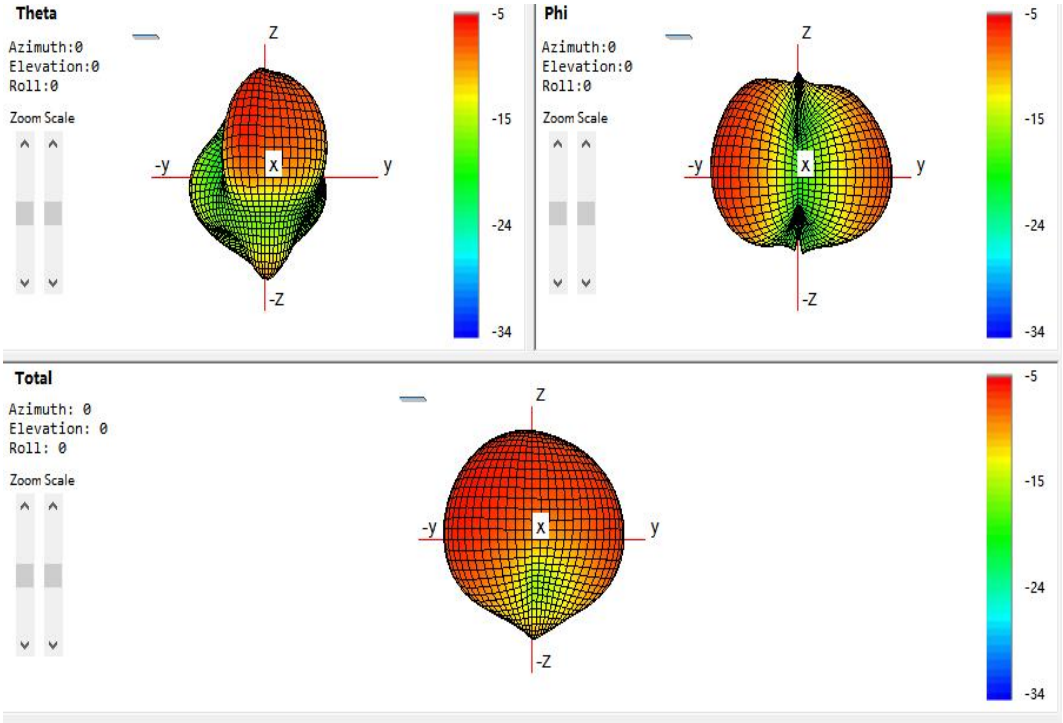
LTE、 MAIN ANT (2490~2690)



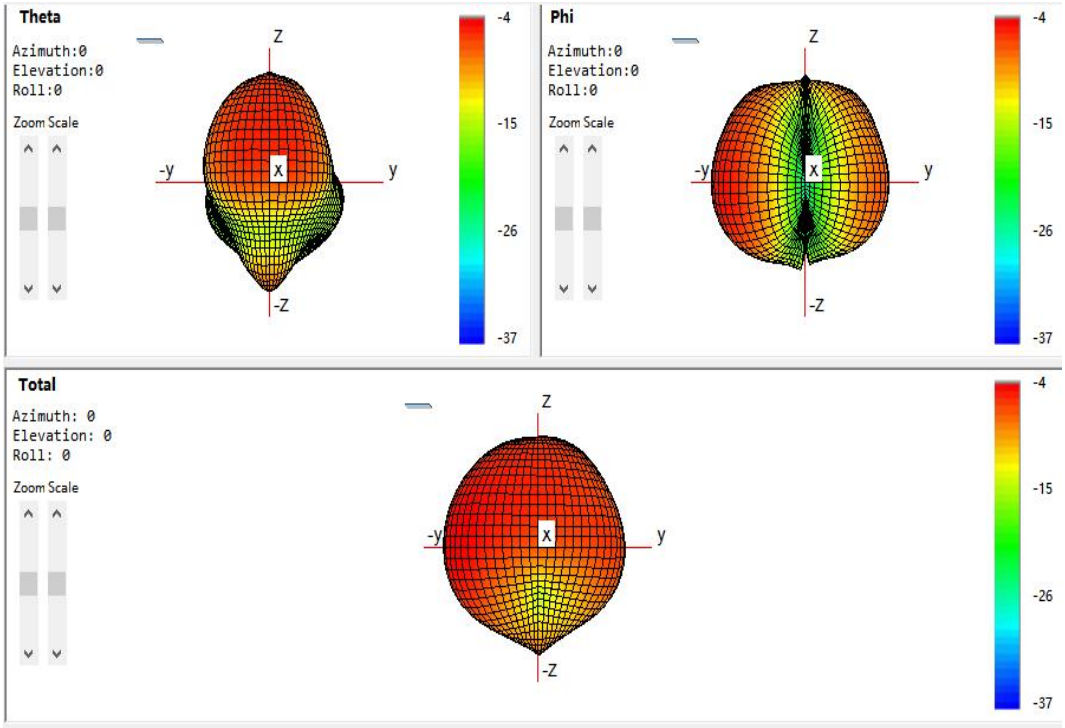
WCDMA、LTE DIV ANT (700~800)



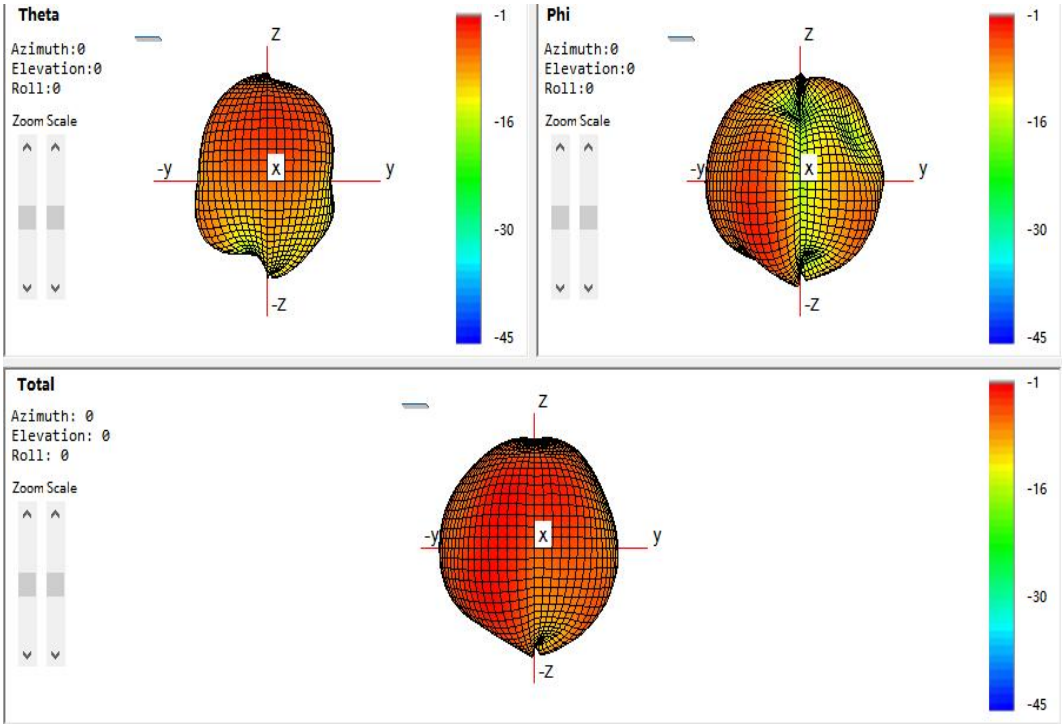
WCDMA、LTE DIV ANT (800~894)



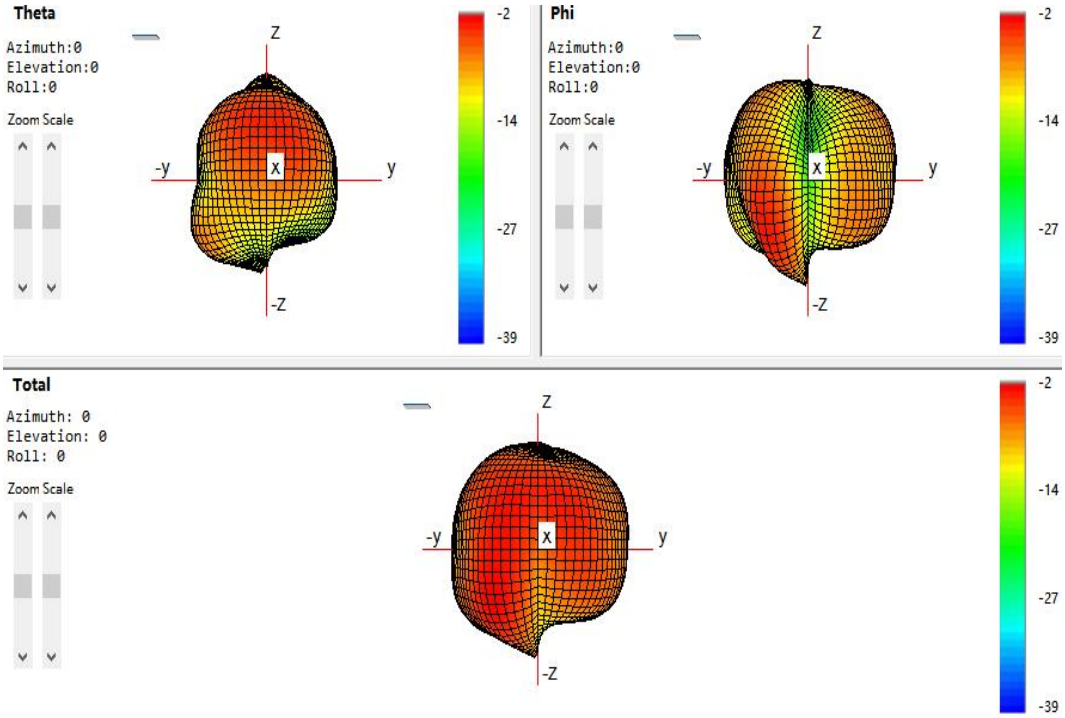
WCDMA、LTE DIV ANT (880~960)



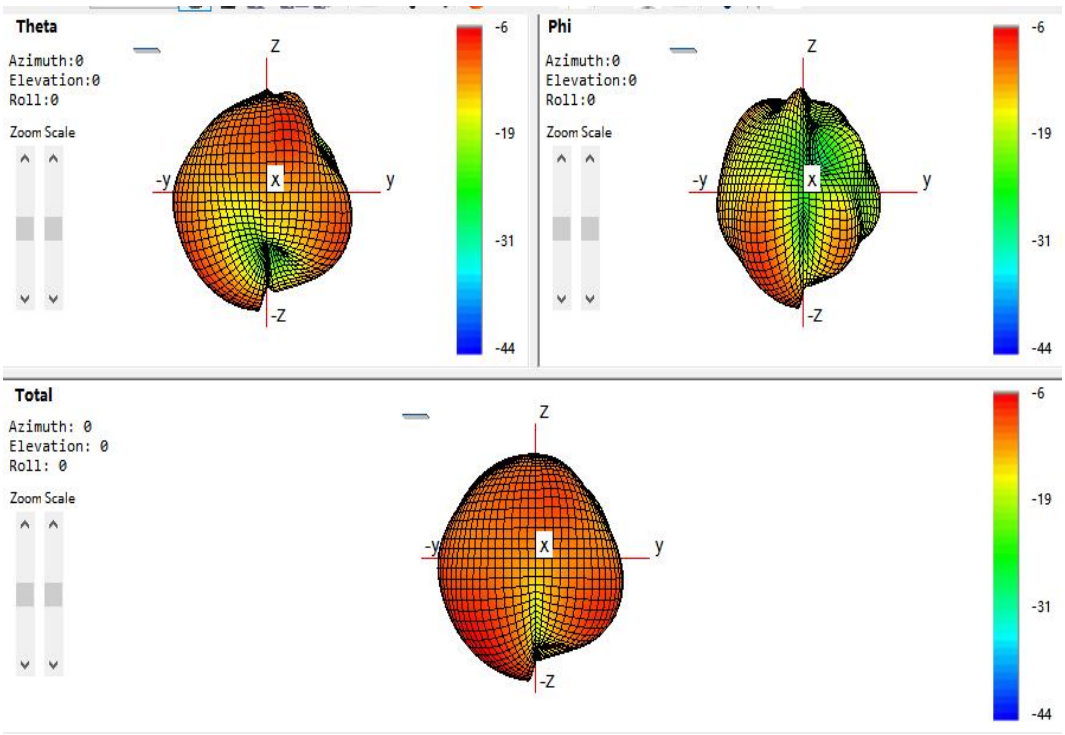
WCDMA、LTE DIV ANT (1710~1880)



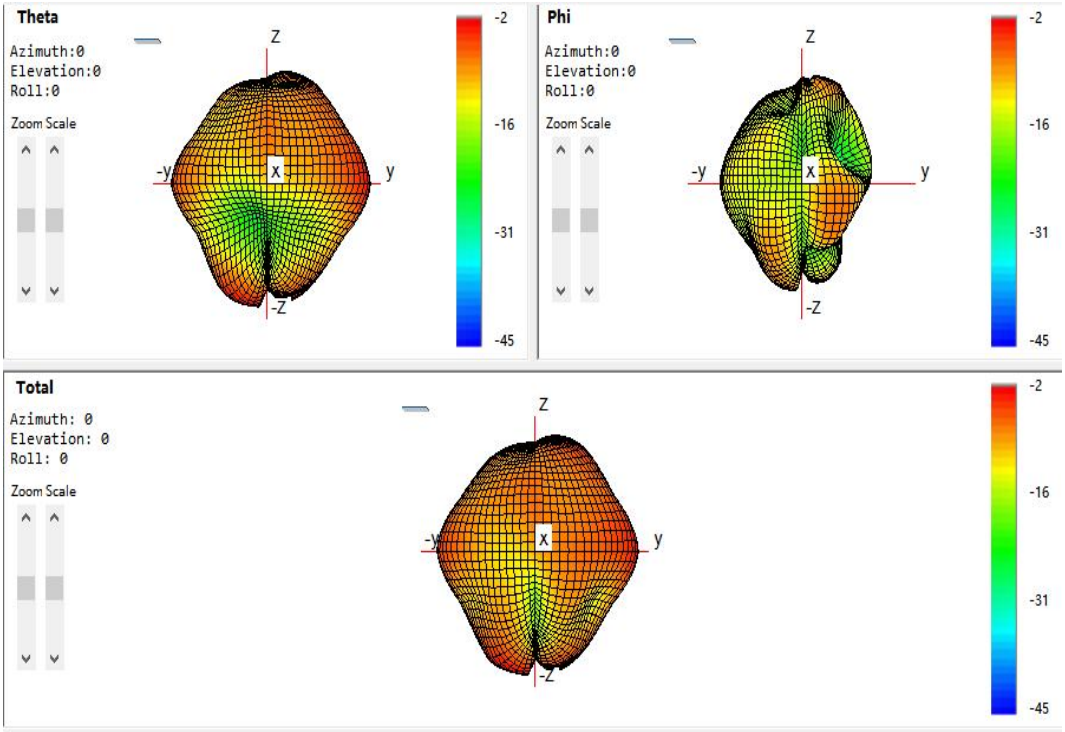
WCDMA、LTE DIV ANT (1880~2170)



LTE DIV ANT (2300~2400)



LTE DIV ANT (2490~2690)



List of Test and Measurement Instruments

NO.	Equipment	Manufacturer	Model No.
1	RayZone2800	GTS	CT10120500B5058
2	Network Analyzer E5071C	Kesight	MY46651258

Fig 2 dipole model 3126-2500 frequency 2500 MHz

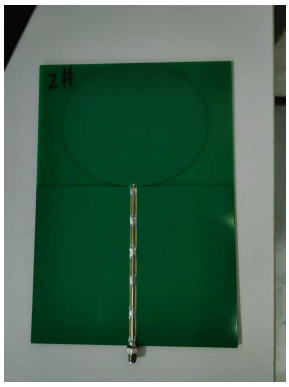


Fig 3 model 3126-5500 frequency 5500 MHz

I. Measurement Setup:

A. Reflection Coefficient Measurement:

Instrument: Network Analyzer (Kesight E5071C).

Setup:

1. Calibrate the Network Analyzer by one port calibration using Kesight 85093C Electronic calibration module .
2. Connect the antenna under test to the Network Analyzer.
3. Measure the S11(reflection coefficient),Return Loss….

B. Pattern Measurement:

A Fully Anechoic Chamber is used to simulate free-space conditions.

A Fully Anechoic Chamber is a shielded room lined with RF/microwave absorber on all walls, ceiling, and floor.

RF/microwave absorber reduces reflections from the inner walls of the shield. Absorber performance depends on the depth and design of the absorber and the angle of incidence of the field.

Normal incidence is best, shallower angles are worse**.**

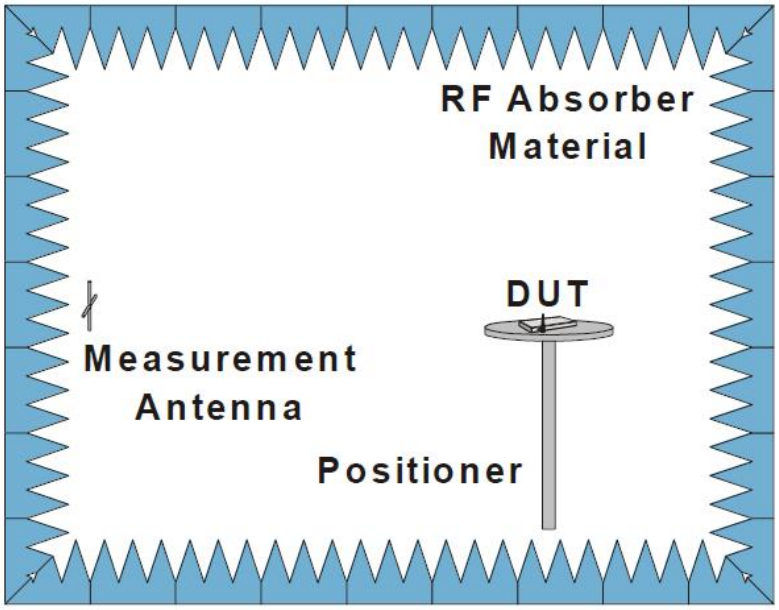


Fig. 4. The fully anechoic chamber