



# Liteon\_LTE Antenna FCC Report

**Date of Report: 2023/ 02 / 09**

**Department: WCB , Auden Techno Corp.**

**Tested by: Sean Li**

**auden** 

Persisting in Technology  
antenna solutions for wireless technologies

# Document/Report Information

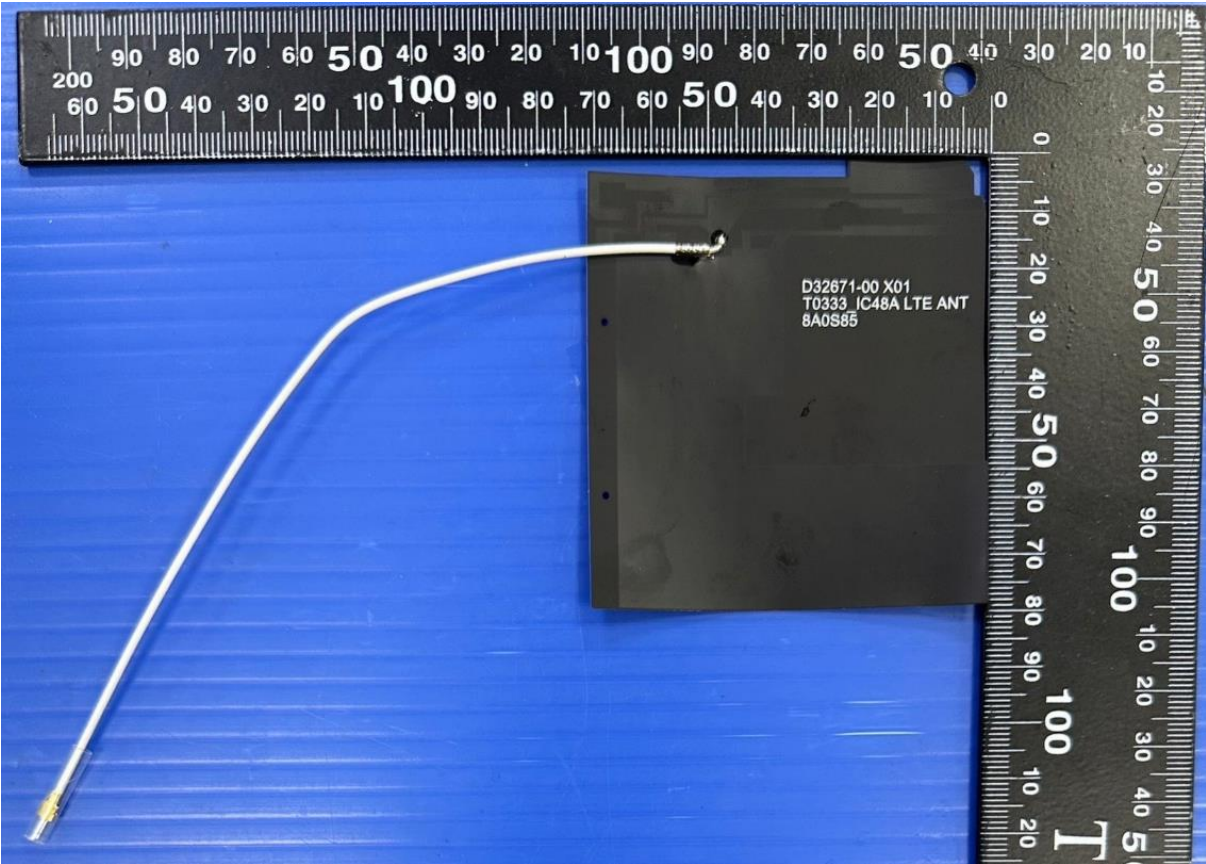
<b>Antenna model Name</b>	<b>D32671-00</b>
<b>Topics</b>	<b>LTE Antenna FCC Report</b>
<b>Date of Report</b>	<b>2023/ 02 / 09</b>
<b>Report Revision</b>	<b>Rev03</b>
<b>Dept.</b>	<b>WCB, Auden Techno Corp.</b>
<b>Tested by</b>	<b>Sean Li</b>
<b>Revised by</b>	<b>Jessie Chien</b>

# Report History

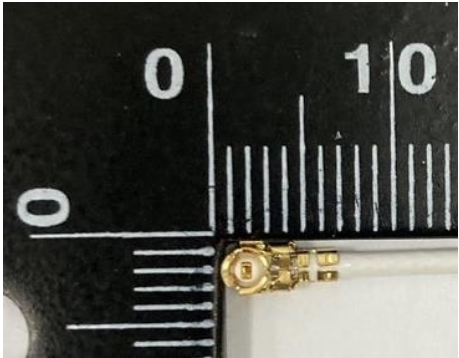
Date	Report Rev.	Project Stage	Description
2022-03-25	Rev00	RFQ	Check antennas performance
2022-07-28	Rev01	RFQ	Check factory sample antennas performance and fine tuned.
2022-10-07	Rev02	RFQ	New LTE pattern check performance and fine tuned.
2023-02-09	Rev03	RFQ	LTE Antenna FCC Report

- Platform and Antenna Introduction
- Antenna Performance
- 3D Radiation Pattern
- Conclusions

# Information of LTE Antenna

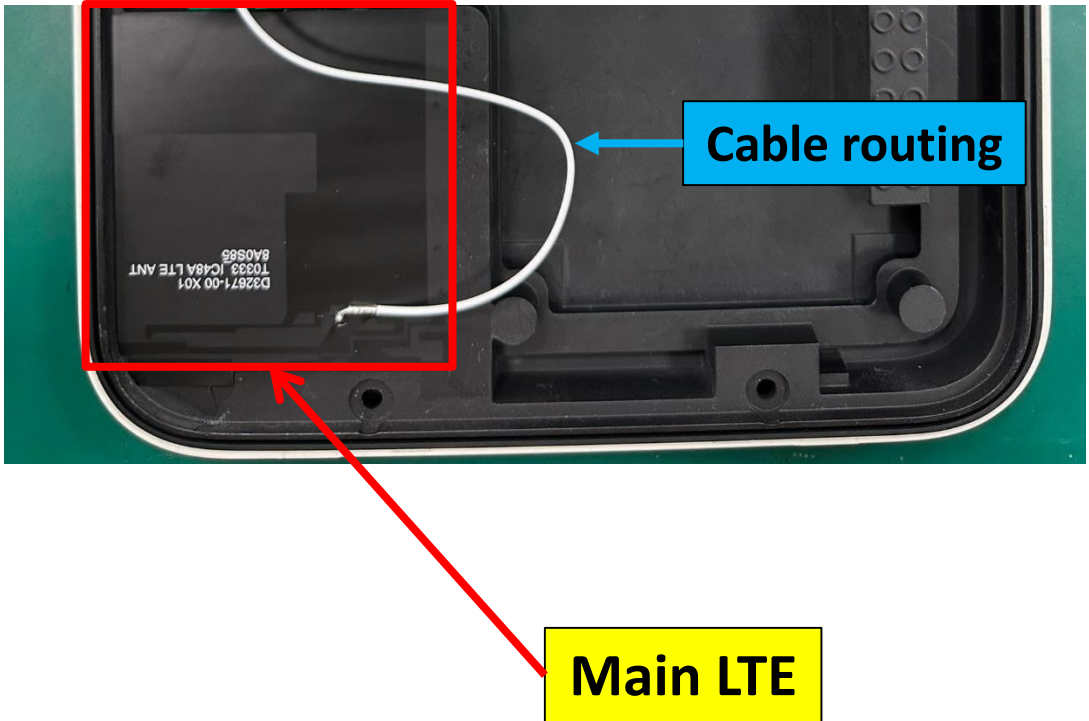


**Date of Report:** 2023-02-09  
**Antenna Model**  
**Name** : D32671-00  
**Department** : WCB, Auden Techno Corp.  
**Tested by** : Sean Li  
**Antenna Type** : Monopole Coupling  
**Assembly** : FPCB + Coaxial Cable (1.37 $\phi$  low loss )173.2mm  
**PCB Size** : 78.6mm x 71.36mm x t=0.25mm



Frequency range	698~960MHz/ 1710~2170MHz
Gain	2.8 dBi
Connector	IPEX I
Impedance	50 Ohm

# Antenna Position and Cable Routing



- Platform and Antenna Introduction
- **Antenna Performance**
- 3D Radiation Pattern
- Conclusions

# Measurement software



GTS MaxSign  
File Window Tools Help

**Test Setup**

**Settings**

Operator: GTS    Temperature: 20 °C    Humidity: 50 %  
Test Polar: Both    Pole Test Manner: Single    Test Position: FS  
Instrument Preset: Once    Ring Off End: True    Manual Page Max: 10

**Equipment**

Product Series: RayZone  
Instrument: R8S ZNB8  
Instrument Add: TCPIP0:ZNB8-42-102677:inst0:INSTR    Refresh    Identify    GPIB    LAN  
Controller: COM4    Refresh    ON  
Amplifier: COM5    Refresh    Bypass    Reading amplifier serial port successfully.  
Working Port: Port1  
Link Port: NULL

**Manual Operation**

Command:    Execute

**Testing Information**

Template: Zebra\_SRV\_Ant6.xml  
DUT Code: Luke  
Instrument Type: R8S\_ZNB8  
Test System: Passive  
Test Mode:  
DUT Memo:

**Controller**

Theta: 0    Phi: 0    Polar: -

**Logging**

```
13:14:57 >> Start
13:14:57 >> Target chamber type is RayZone2800G.
13:14:57 >> Authorization will be expired in 748 days.
13:14:57 >> DUT[Luke] load success
13:14:57 >> Pathloss load success
13:14:59 >> Instrument Address scanning done.
13:15:00 >> Reading serial port[COM4] successfully.
13:15:02 >> PC - Extra Controller START...
13:15:02 >> Power Limit, downLink: -25dBm; upLink -10dBm
13:15:02 >> GTSAMP, -25, -10, 288
13:15:02 >> Extra controller connected.
13:15:02 >> Reading amplifier serial port[COM5] successfully.
```

Display Logging    Line Count Limit: 5000    Collect Debug Info

Ready    Test Status: Idle    Estimated Left Time:    Beep



## Test Lab Environment Conditions

Temperature	20° C to 28° C
Humidity	30% to 70%

## Test Equipment List

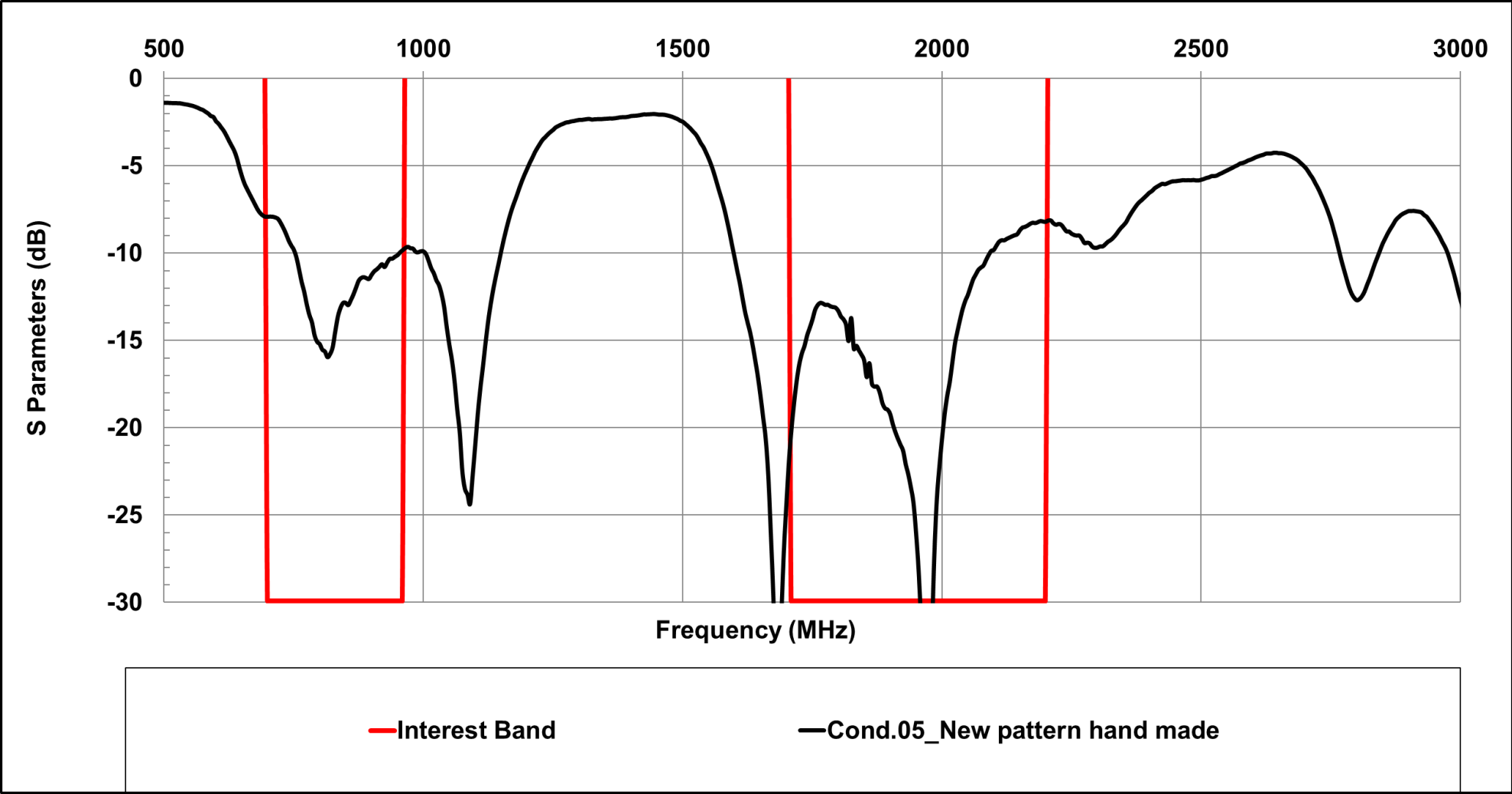
Type of Equipment	Model Number	Calibration Due Date
Antenna Chamber	GTS2800	14 May 2023
Vector Network Analyzer	Agilent Technologies E5071B	14 May 2023

**Test Date:** 2023/02/09

**ISSUED:** 2023/02/09

**Test Location:** No. 19, Lane 772, Heping Road, Bade District, Taoyuan City, 334

Device Under Test mounted on Antenna Chamber turntable as shown in Appendix A. Measurements, including conducted power, TRP, and Peak EIRP and obtained by the TS8991 test system across low, mid and hi portions of the frequency band and across a 360 degree sphere. Peak antenna gain is determined from the maximum EIRP measured across the sphere with respect to the conducted power.



# LTE Antenna\_Efficiency Low Band(698~960MHz)



Conditions		Cond.05			
Date		2023/2/9			
Report Rev.		Rev 02			
Antenna (Rev.)		LTE Main Antenna			
Detail		*Monopolo+Coupling antenna type(IC-48A) *認證機台手工pattern			
Chamber		Auden GTS 2800			
MHz		MHz	Avg. (dB)	Peak Gain	Eff. (%)
698	-5.0	698	-3.5	1.7	44.7
703	-5.0	703	-3.3	1.9	46.8
704	-5.0	704	-3.3	1.8	46.9
707	-5.0	707	-3.2	1.8	47.8
710	-5.0	710	-3.1	1.7	48.7
716	-5.0	716	-3.3	1.5	46.7
726	-5.0	726	-3.2	1.3	48.2
728	-5.0	728	-3.2	1.3	48.0
734	-5.0	734	-3.1	1.4	49.0
737	-5.0	737	-3.1	1.4	49.0
740	-5.0	740	-3.1	1.4	49.1
746	-5.0	746	-3.1	1.2	49.2
748	-5.0	748	-3.1	1.3	49.1
751	-5.0	751	-3.1	1.5	49.1
756	-5.0	756	-3.2	1.4	48.3
758	-5.0	758	-3.2	1.4	47.5
777	-5.0	777	-3.2	1.7	47.8
781	-5.0	781	-3.2	1.7	48.3
782	-5.0	782	-3.2	1.6	48.0
787	-5.0	787	-3.2	1.5	48.0
791	-5.0	791	-3.0	1.7	49.6

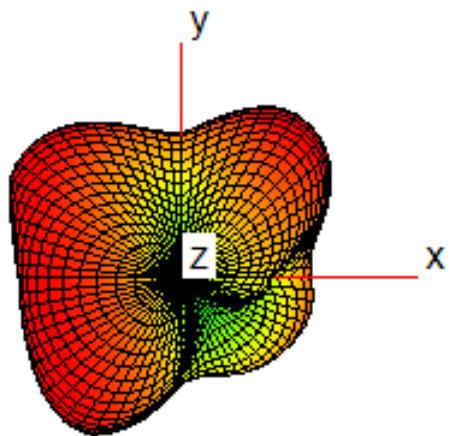
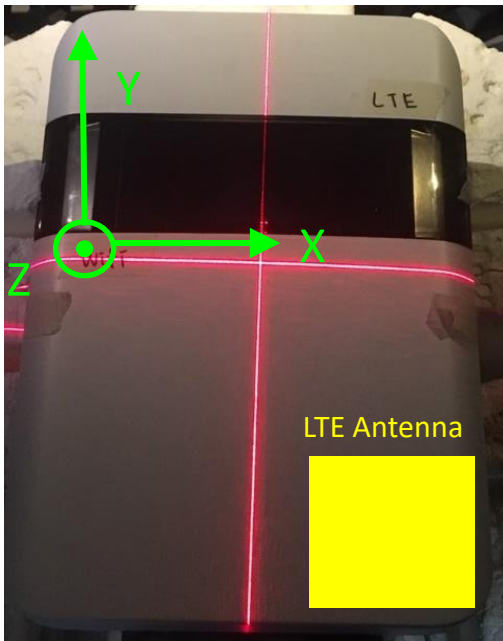
Conditions		Cond.05			
Date		2023/2/9			
Report Rev.		Rev 02			
Antenna (Rev.)		LTE Main Antenna			
Detail		*Monopolo+Coupling antenna type(IC-48A) *認證機台手工pattern			
Chamber		Auden GTS 2800			
MHz		MHz	Avg. (dB)	Peak Gain	Eff. (%)
803	-5.0	803	-3.0	2.1	49.7
806	-5.0	806	-2.9	2.3	51.1
821	-5.0	821	-2.9	1.9	51.3
824	-5.0	824	-2.9	1.8	51.3
832	-5.0	832	-2.9	1.8	51.6
837	-5.0	837	-2.8	1.6	52.8
847	-5.0	847	-2.8	1.9	52.9
849	-5.0	849	-2.7	1.9	53.1
862	-5.0	862	-2.7	1.9	53.5
869	-5.0	869	-2.6	2.0	55.3
880	-5.0	880	-2.5	2.2	55.7
882	-5.0	882	-2.5	2.2	56.0
894	-5.0	894	-2.6	1.8	55.5
898	-5.0	898	-2.7	1.6	53.8
915	-5.0	915	-2.8	1.5	52.8
925	-5.0	925	-2.9	1.4	51.3
943	-5.0	943	-2.7	1.9	53.2
960	-5.0	960	-2.8	2.0	52.4

# LTE Antenna\_Efficiency Mid Band(1710~2200MHz)

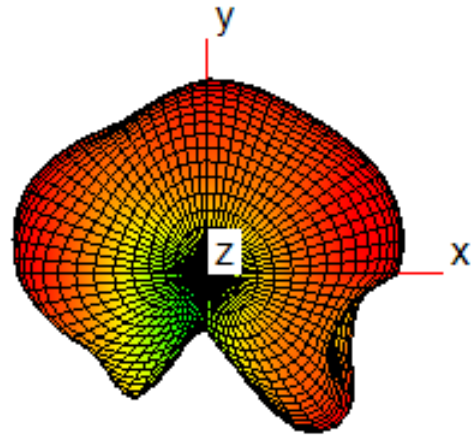
Conditions		Cond.05			
Date		2023/2/9			
Report Rev.		Rev 02			
Antenna (Rev.)		LTE Main Antenna			
Detail		*Monopolo+Coupling antenna type(IC-48A) *認證機台手工pattern			
Chamber		Auden GTS 2800			
MHz		MHz	Avg. (dB)	Peak Gain	Eff. (%)
1710	-5.0	1710	-2.1	2.0	61.1
1733	-5.0	1733	-2.5	1.5	56.6
1745	-5.0	1745	-2.6	1.3	54.7
1748	-5.0	1748	-2.6	1.3	55.0
1755	-5.0	1755	-2.7	1.2	53.9
1780	-5.0	1780	-2.8	1.8	53.0
1785	-5.0	1785	-2.8	1.9	52.8
1805	-5.0	1805	-2.7	2.1	53.5
1843	-5.0	1843	-2.3	2.3	59.1
1850	-5.0	1850	-2.4	2.2	57.4
1880	-5.0	1880	-2.6	2.7	55.1
1910	-5.0	1910	-2.6	2.4	55.3
1920	-5.0	1920	-2.6	2.2	54.4
1930	-5.0	1930	-2.6	1.9	55.3
1950	-5.0	1950	-2.6	1.3	54.7
1960	-5.0	1960	-2.7	0.9	53.5
1980	-5.0	1980	-3.0	0.4	50.3
1990	-5.0	1990	-3.1	0.4	49.1
2110	-5.0	2110	-2.9	2.1	51.2
2133	-5.0	2133	-2.9	2.3	50.8
2140	-5.0	2140	-3.0	2.4	50.4
2155	-5.0	2155	-3.0	2.8	49.9
2170	-5.0	2170	-3.2	2.7	48.3
2200	-5.0	2200	-3.4	2.6	45.9

- Platform and Antenna Introduction
- Antenna Performance
- **3D Radiation Pattern**
- Conclusions

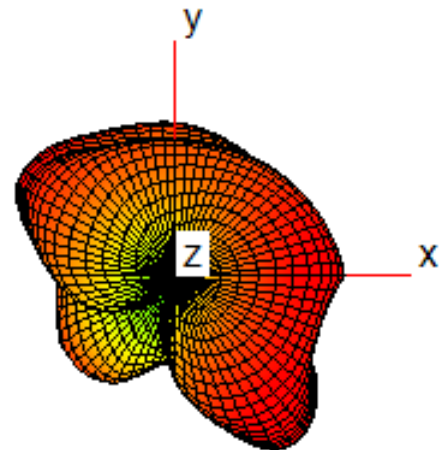
# LTE Antenna 3D Radiation Pattern



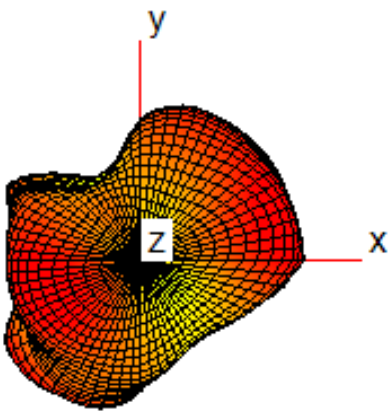
750MHz



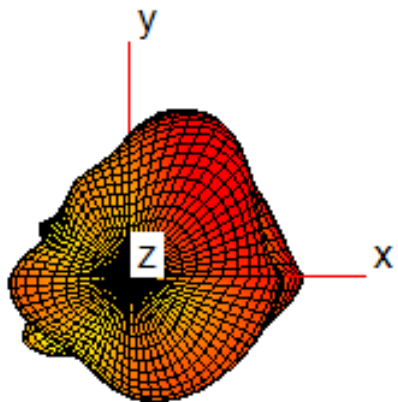
850MHz



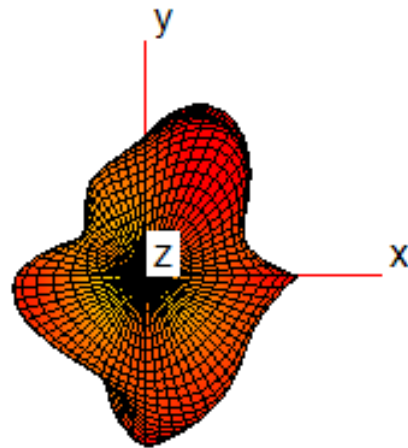
960MHz



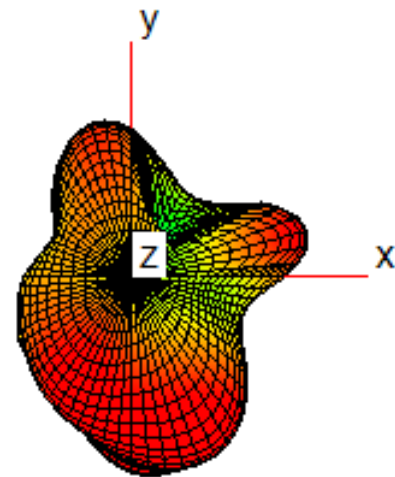
1710MHz



1810MHz



1910MHz



2170MHz

- Platform and Antenna Introduction
- Antenna Performance
- 3D Radiation Pattern
- **Conclusions**



- LTE:
  1. 低頻部分，效率約為-2.5~-3.5dB，最大Peak Gain = 2.2dBi
  2. 中頻部分，效率約為-2.1~-3.4dB，最大Peak Gain = 2.8dBi