

WCF934M

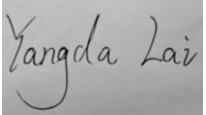
Passive Data

2024/09/12

1. Test Condition

* WCF934M Chip Antenna

- Test Chamber: Aplustech OTA Chamber
(Address: R&D Building No.9, Main Park, Taohuayuan Science & Technology Innovation Park, Shenzhen, China)
- Network Analyzer : Return Loss
- 3D Passive Chamber : Gain and Efficiency
- Measured by Yangda Lai 2024/09/12



2. Test Environment

please refer to Antenna Appendix A

Antenna Gain Measurement Procedure and Software

OTA measurement system

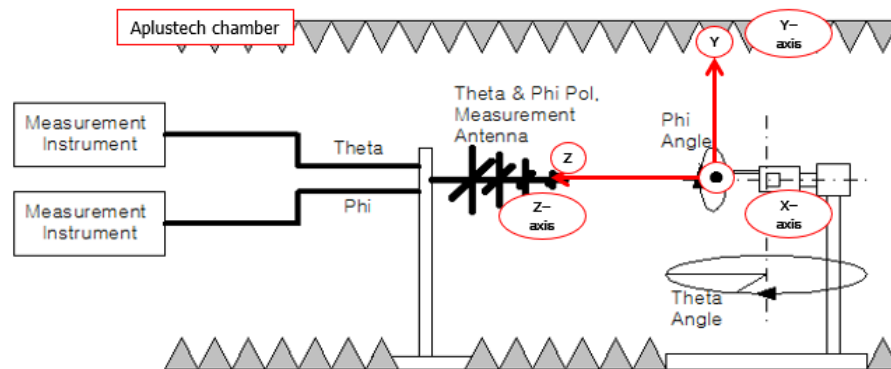
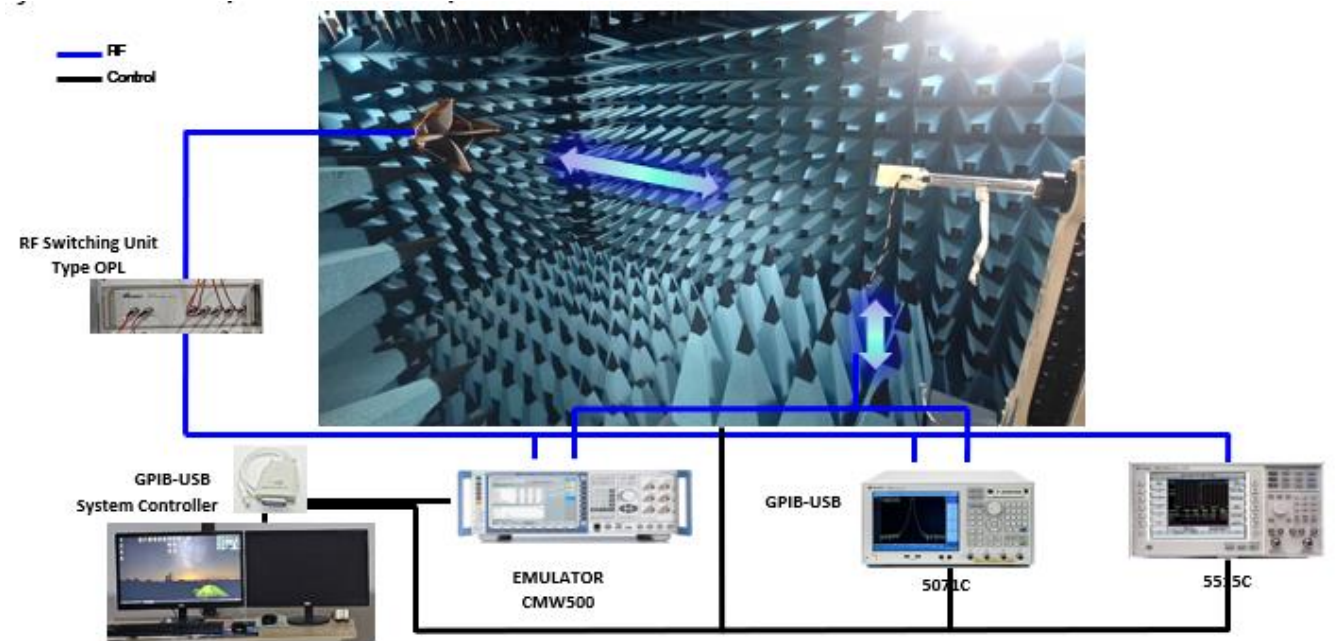
- Test Frequency : Support 400 MHz to 7.5 GHz
- Chamber Size: 4m x 2.5m x 2.5m

Support

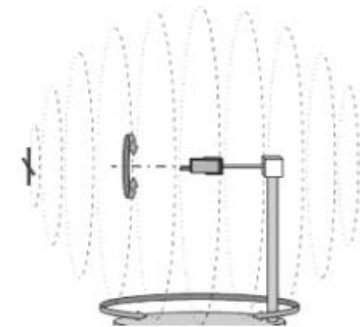
- LTE Support ALL Band (FDD/TDD)
- CDMA,GSM,WCDMA Support ALL Band
- Passive Efficiency Measurement (400 MHz ~ 7.5GHz)

Measurement specifications

- Test Plan for RF Performance Evaluation for LTE Mobile Converged Devices
- Test Plan for Wireless Device Over-the-Air Performance



Great Circle Cut Method

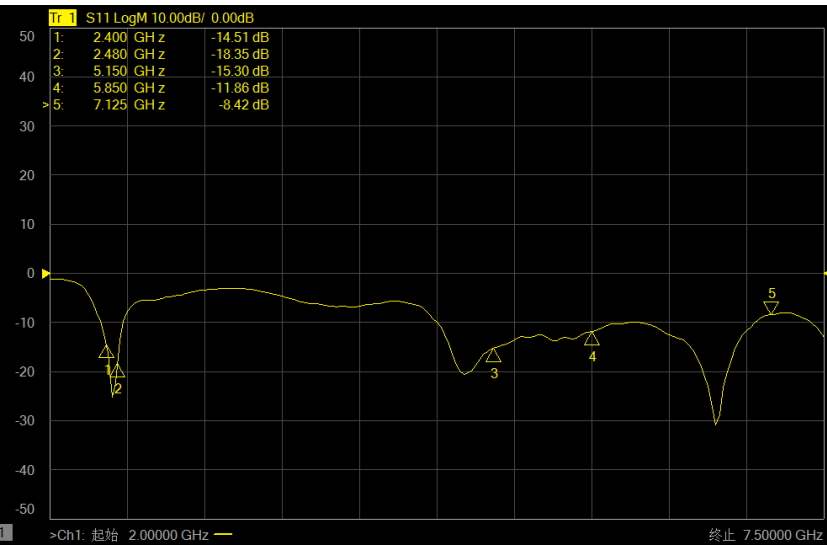


Item	Measuring Instruments	Latest Calibration Schedule
1	OTA Chamber	2024/04/01
2	Network Analyzer Keysight 5071c	2024/07/18

Electrical Characteristics

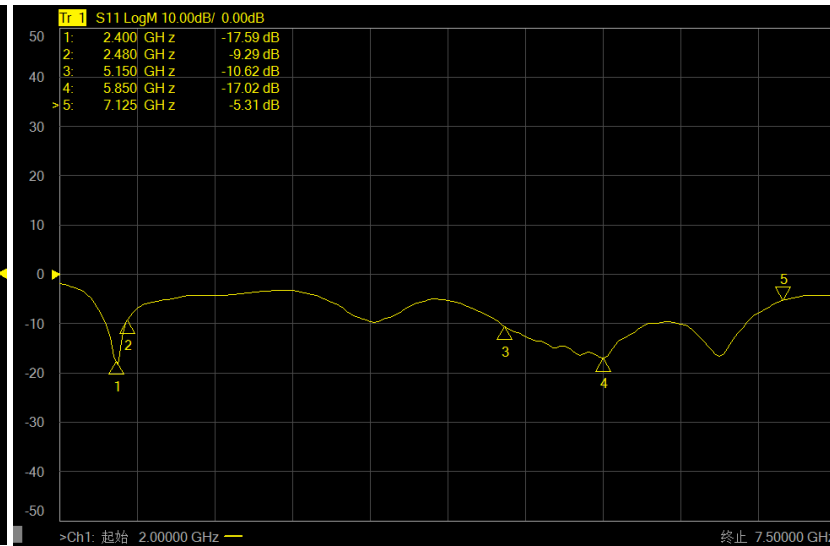
Item	Specification ANT1			Specification ANT2			Specification BT
Antenna Type	Chip Antenna			Chip Antenna			Chip Antenna
Central Frequency	2440MHz	5500MHz	6525MHz	2440MHz	5500MHz	6525MHz	2440MHz
Band Width	80MHz	700MHz	1200MHz	80MHz	700MHz	1200MHz	80MHz
Peak Gain	0.13dBi	1.59dBi	0.68dBi	-0.2dBi	1.75dBi	1.78dBi	-2.07dBi
Return Loss	<-8dB			<-5dB			<-6dB
Polarization	Linear			Linear			Linear
Azimuth Beam width	Omni-directional			Omni-directional			Omni-directional
Impedance	50Ω			50Ω			50Ω
Dimension	12*4.4*0.55mm			12*4.4*0.55mm			8*2.8*0.55mm

Passive test-Return Loss



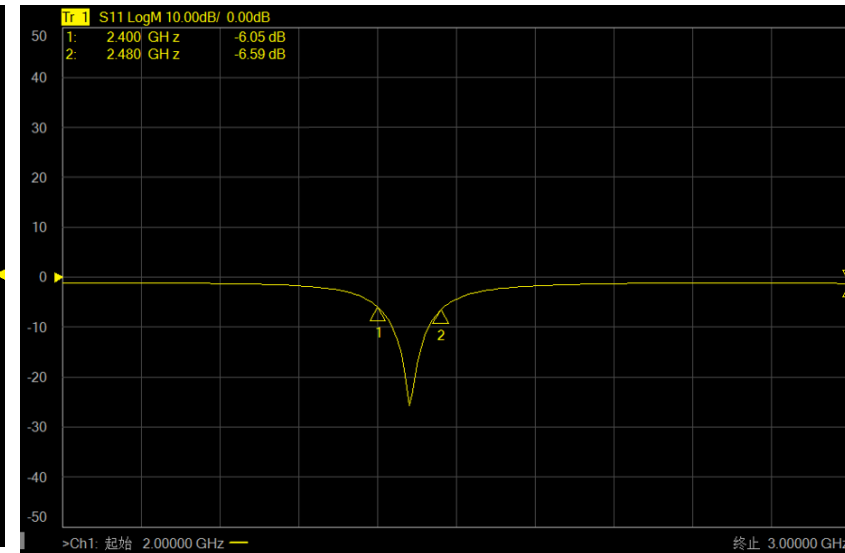
ANT1

Refer to Antenna Appendix A



ANT2

Refer to Antenna Appendix A



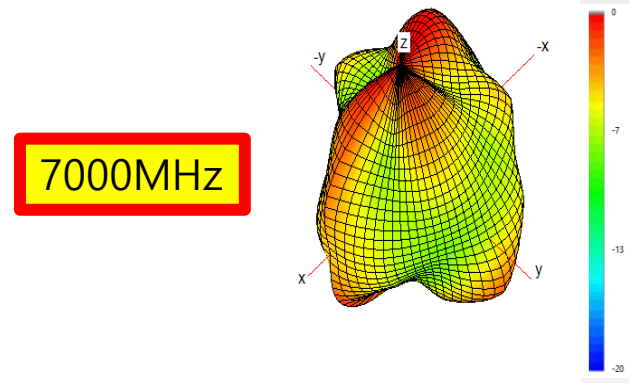
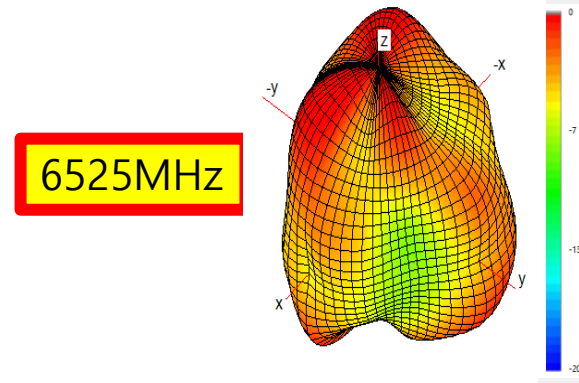
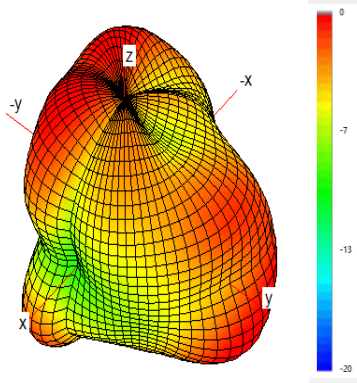
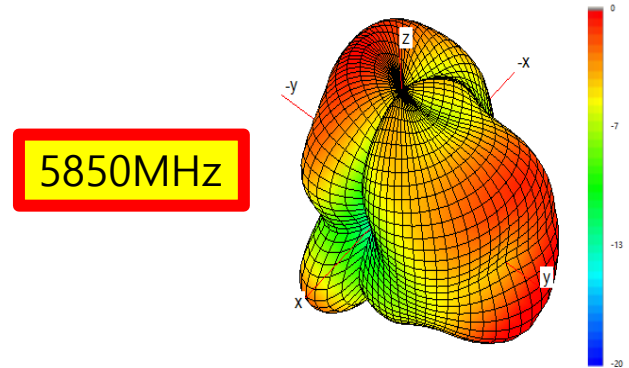
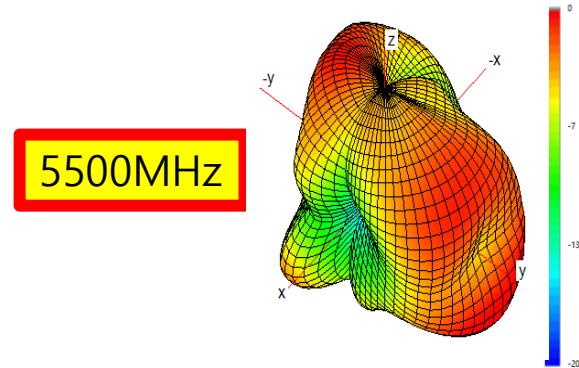
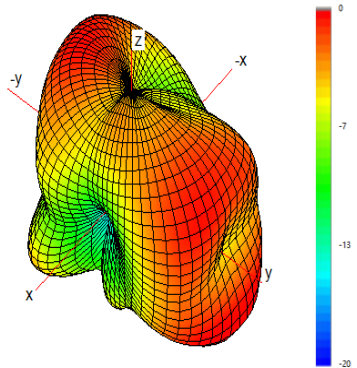
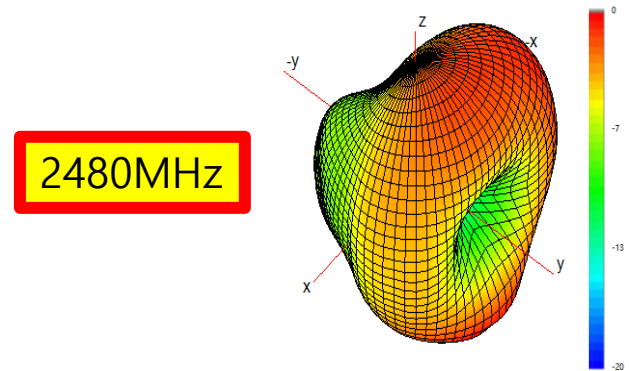
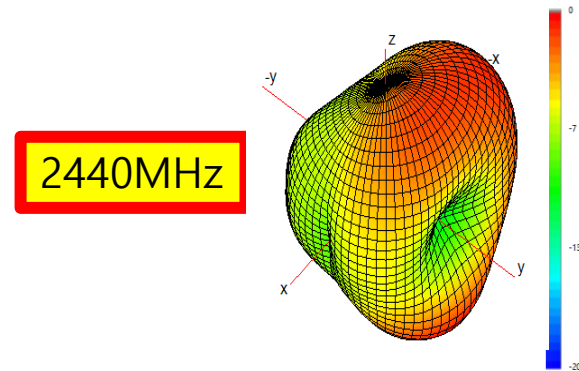
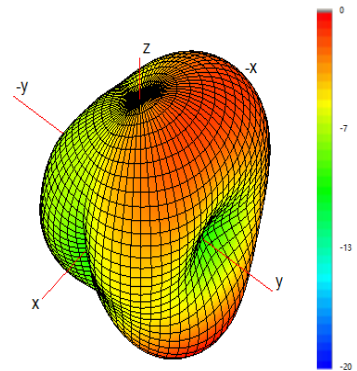
BT

Refer to Antenna Appendix A

ANT1 Passive Test-Antenna 3D Gain

Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400MHz	33.03 %	-9.20 dBi	-6.77 dBi	-4.81 dBi	-0.70 dBi	-1.68 dBi	0.10 dBi
2410MHz	33.69 %	-9.21 dBi	-6.64 dBi	-4.72 dBi	-0.63 dBi	-1.48 dBi	0.13 dBi
2420MHz	34.30 %	-9.24 dBi	-6.50 dBi	-4.65 dBi	-0.57 dBi	-1.20 dBi	0.12 dBi
2430MHz	34.58 %	-9.31 dBi	-6.41 dBi	-4.61 dBi	-0.62 dBi	-1.03 dBi	0.06 dBi
2440MHz	34.78 %	-9.43 dBi	-6.31 dBi	-4.59 dBi	-0.63 dBi	-0.92 dBi	-0.03 dBi
2450MHz	34.57 %	-9.54 dBi	-6.30 dBi	-4.61 dBi	-0.69 dBi	-0.92 dBi	-0.14 dBi
2460MHz	34.63 %	-9.59 dBi	-6.26 dBi	-4.61 dBi	-0.65 dBi	-0.89 dBi	-0.16 dBi
2470MHz	34.56 %	-9.62 dBi	-6.26 dBi	-4.61 dBi	-0.58 dBi	-0.82 dBi	-0.16 dBi
2480MHz	33.81 %	-9.69 dBi	-6.37 dBi	-4.71 dBi	-0.59 dBi	-0.98 dBi	-0.17 dBi
5150MHz	43.13 %	-9.70 dBi	-4.89 dBi	-3.65 dBi	-0.31 dBi	-0.93 dBi	1.31 dBi
5250MHz	44.43 %	-9.34 dBi	-4.84 dBi	-3.52 dBi	-0.53 dBi	-0.67 dBi	1.56 dBi
5350MHz	42.68 %	-9.43 dBi	-5.05 dBi	-3.70 dBi	-0.77 dBi	-0.68 dBi	1.42 dBi
5450MHz	41.37 %	-9.35 dBi	-5.26 dBi	-3.83 dBi	-0.87 dBi	-0.38 dBi	1.59 dBi
5550MHz	39.41 %	-9.44 dBi	-5.52 dBi	-4.04 dBi	-1.60 dBi	-0.59 dBi	1.23 dBi
5650MHz	40.62 %	-9.30 dBi	-5.40 dBi	-3.91 dBi	-1.51 dBi	-0.08 dBi	1.47 dBi
5750MHz	38.05 %	-9.55 dBi	-5.69 dBi	-4.20 dBi	-1.50 dBi	-0.41 dBi	1.06 dBi
5850MHz	35.92 %	-9.74 dBi	-5.97 dBi	-4.45 dBi	-1.86 dBi	-0.70 dBi	0.65 dBi
5925MHz	38.09 %	-9.45 dBi	-5.73 dBi	-4.19 dBi	-1.65 dBi	-0.54 dBi	0.68 dBi
6075MHz	39.71 %	-8.91 dBi	-5.71 dBi	-4.01 dBi	-1.31 dBi	-0.95 dBi	0.60 dBi
6225MHz	40.31 %	-8.60 dBi	-5.77 dBi	-3.95 dBi	-1.51 dBi	-0.92 dBi	0.31 dBi
6375MHz	41.19 %	-8.38 dBi	-5.74 dBi	-3.85 dBi	-1.65 dBi	-0.58 dBi	0.37 dBi
6525MHz	41.61 %	-8.68 dBi	-5.52 dBi	-3.81 dBi	-1.75 dBi	-0.84 dBi	0.28 dBi
6675MHz	41.70 %	-8.84 dBi	-5.43 dBi	-3.80 dBi	-1.65 dBi	-0.89 dBi	0.21 dBi
6825MHz	40.91 %	-9.23 dBi	-5.38 dBi	-3.88 dBi	-2.51 dBi	-0.81 dBi	-0.18 dBi
6975MHz	34.73 %	-10.07 dBi	-6.04 dBi	-4.59 dBi	-3.19 dBi	-2.08 dBi	-1.23 dBi
7125MHz	30.59 %	-10.60 dBi	-6.60 dBi	-5.14 dBi	-3.65 dBi	-2.36 dBi	-1.80 dBi

ANT1 Passive Test-Antenna 3D Radiation Pattern

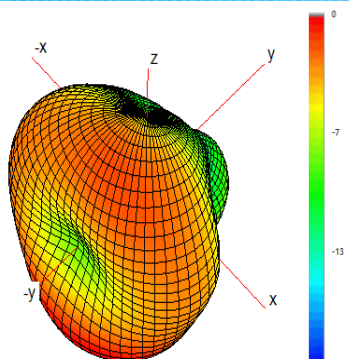


ANT2 Passive Test-Antenna 3D Gain

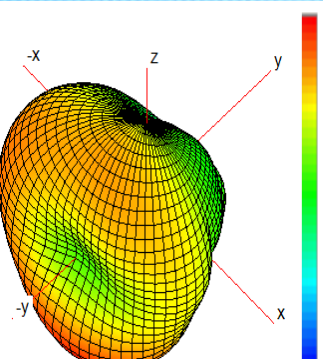
Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400MHz	34.14 %	-9.57 dBi	-7.25 dBi	-4.67 dBi	-1.66 dBi	-1.90 dBi	-0.20 dBi
2410MHz	32.99 %	-9.80 dBi	-7.39 dBi	-4.82 dBi	-1.88 dBi	-1.83 dBi	-0.42 dBi
2420MHz	32.04 %	-10.03 dBi	-7.57 dBi	-4.94 dBi	-2.14 dBi	-1.74 dBi	-0.71 dBi
2430MHz	30.54 %	-10.25 dBi	-7.82 dBi	-5.15 dBi	-2.44 dBi	-1.69 dBi	-1.00 dBi
2440MHz	28.67 %	-10.49 dBi	-8.11 dBi	-5.43 dBi	-2.73 dBi	-1.82 dBi	-1.13 dBi
2450MHz	26.64 %	-10.70 dBi	-8.50 dBi	-5.74 dBi	-2.97 dBi	-1.90 dBi	-1.37 dBi
2460MHz	24.77 %	-10.69 dBi	-8.49 dBi	-6.06 dBi	-2.95 dBi	-1.90 dBi	-1.46 dBi
2470MHz	23.27 %	-10.65 dBi	-8.43 dBi	-6.33 dBi	-2.87 dBi	-1.91 dBi	-1.57 dBi
2480MHz	22.81 %	-10.71 dBi	-8.51 dBi	-6.42 dBi	-2.99 dBi	-1.98 dBi	-1.61 dBi
5150MHz	40.33 %	-8.63 dBi	-5.75 dBi	-3.94 dBi	0.36 dBi	-1.02 dBi	1.63 dBi
5250MHz	45.66 %	-8.40 dBi	-5.06 dBi	-3.40 dBi	0.65 dBi	-0.46 dBi	1.67 dBi
5350MHz	46.77 %	-8.58 dBi	-4.83 dBi	-3.30 dBi	0.52 dBi	-0.40 dBi	1.62 dBi
5450MHz	49.60 %	-8.41 dBi	-4.54 dBi	-3.05 dBi	0.43 dBi	0.04 dBi	1.61 dBi
5550MHz	48.22 %	-8.78 dBi	-4.56 dBi	-3.17 dBi	-0.59 dBi	0.30 dBi	1.61 dBi
5650MHz	49.56 %	-8.74 dBi	-4.41 dBi	-3.05 dBi	-0.54 dBi	0.48 dBi	1.75 dBi
5750MHz	47.03 %	-9.10 dBi	-4.59 dBi	-3.28 dBi	-1.04 dBi	0.14 dBi	1.67 dBi
5850MHz	41.92 %	-9.51 dBi	-5.12 dBi	-3.78 dBi	-1.76 dBi	-0.23 dBi	1.71 dBi
5925MHz	49.55 %	-8.87 dBi	-4.37 dBi	-3.05 dBi	-0.93 dBi	0.53 dBi	1.78 dBi
6075MHz	45.28 %	-9.08 dBi	-4.83 dBi	-3.44 dBi	-0.95 dBi	-0.27 dBi	1.56 dBi
6225MHz	42.02 %	-9.39 dBi	-5.15 dBi	-3.77 dBi	-1.65 dBi	-0.75 dBi	1.61 dBi
6375MHz	37.95 %	-9.75 dBi	-5.63 dBi	-4.21 dBi	-2.19 dBi	-1.03 dBi	1.01 dBi
6525MHz	34.78 %	-10.16 dBi	-5.99 dBi	-4.59 dBi	-2.92 dBi	-1.43 dBi	0.32 dBi
6675MHz	32.31 %	-10.42 dBi	-6.34 dBi	-4.91 dBi	-3.02 dBi	-2.12 dBi	-0.11 dBi
6825MHz	26.13 %	-11.30 dBi	-7.28 dBi	-5.83 dBi	-4.09 dBi	-2.79 dBi	-1.33 dBi
6975MHz	22.98 %	-11.74 dBi	-7.89 dBi	-6.39 dBi	-4.58 dBi	-2.86 dBi	-0.81 dBi
7125MHz	20.48 %	-12.29 dBi	-8.36 dBi	-6.89 dBi	-5.45 dBi	-3.35 dBi	-1.64 dBi

ANT2 Passive Test-Antenna 3D Radiation Pattern

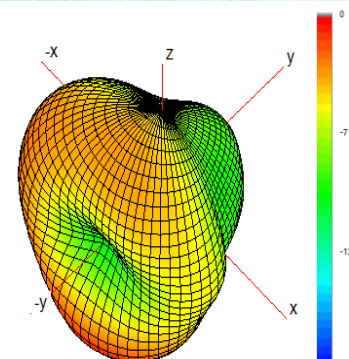
2400MHz



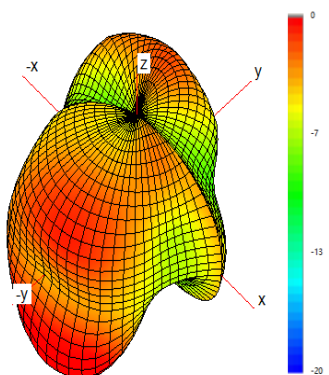
2440MHz



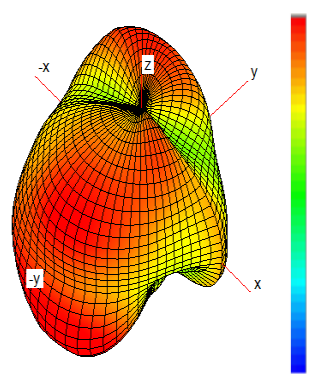
2480MHz



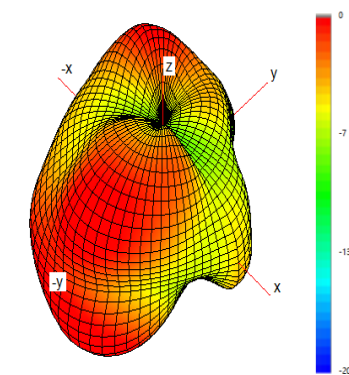
5150MHz



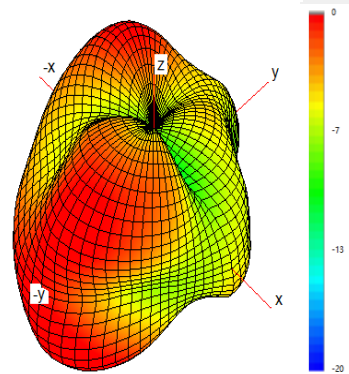
5500MHz



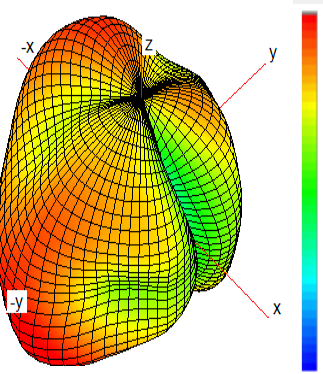
5850MHz



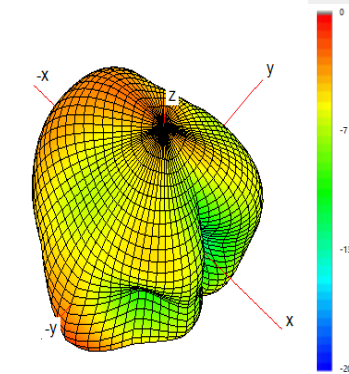
6000MHz



6525MHz



7000MHz

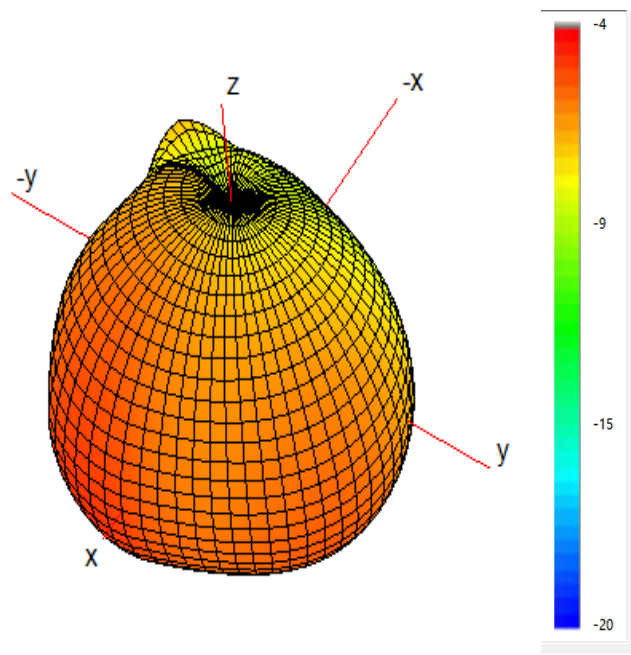


BT Passive Test-Antenna 3D Gain

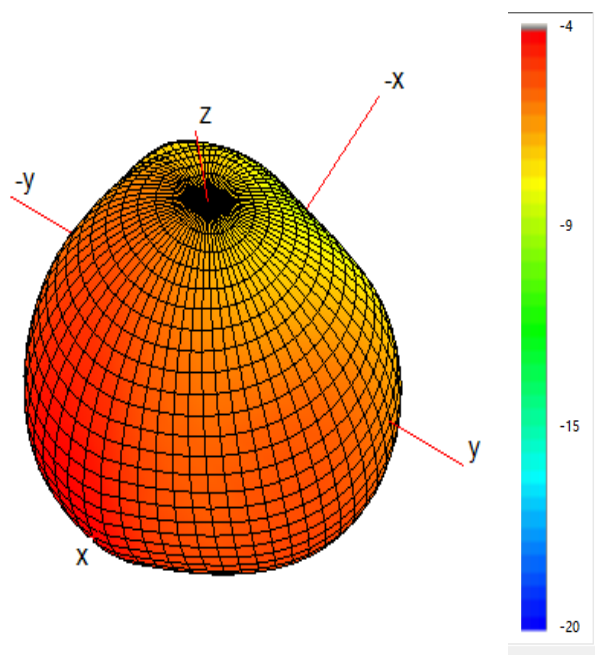
Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400MHz	14.67 %	-16.18 dBi	-9.12 dBi	-8.34 dBi	-8.45 dBi	-4.47 dBi	-4.44 dBi
2410MHz	17.38 %	-15.60 dBi	-8.35 dBi	-7.60 dBi	-7.76 dBi	-3.58 dBi	-3.55 dBi
2420MHz	19.84 %	-15.07 dBi	-7.77 dBi	-7.02 dBi	-7.05 dBi	-2.89 dBi	-2.87 dBi
2430MHz	22.05 %	-14.64 dBi	-7.30 dBi	-6.56 dBi	-6.57 dBi	-2.34 dBi	-2.33 dBi
2440MHz	23.01 %	-14.45 dBi	-7.12 dBi	-6.38 dBi	-6.35 dBi	-2.09 dBi	-2.08 dBi
2450MHz	22.75 %	-14.57 dBi	-7.15 dBi	-6.43 dBi	-6.43 dBi	-2.08 dBi	-2.07 dBi
2460MHz	21.21 %	-14.92 dBi	-7.45 dBi	-6.73 dBi	-6.72 dBi	-2.40 dBi	-2.40 dBi
2470MHz	19.00 %	-15.39 dBi	-7.93 dBi	-7.21 dBi	-7.15 dBi	-2.87 dBi	-2.87 dBi
2480MHz	16.41 %	-15.96 dBi	-8.58 dBi	-7.85 dBi	-7.63 dBi	-3.56 dBi	-3.56 dBi

BT Passive Test-Antenna 3D Radiation Pattern

2400MHz



2440MHz



2480MHz

