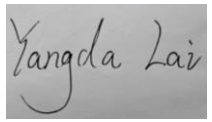
WCF930M
Passive Data

2024/11/11

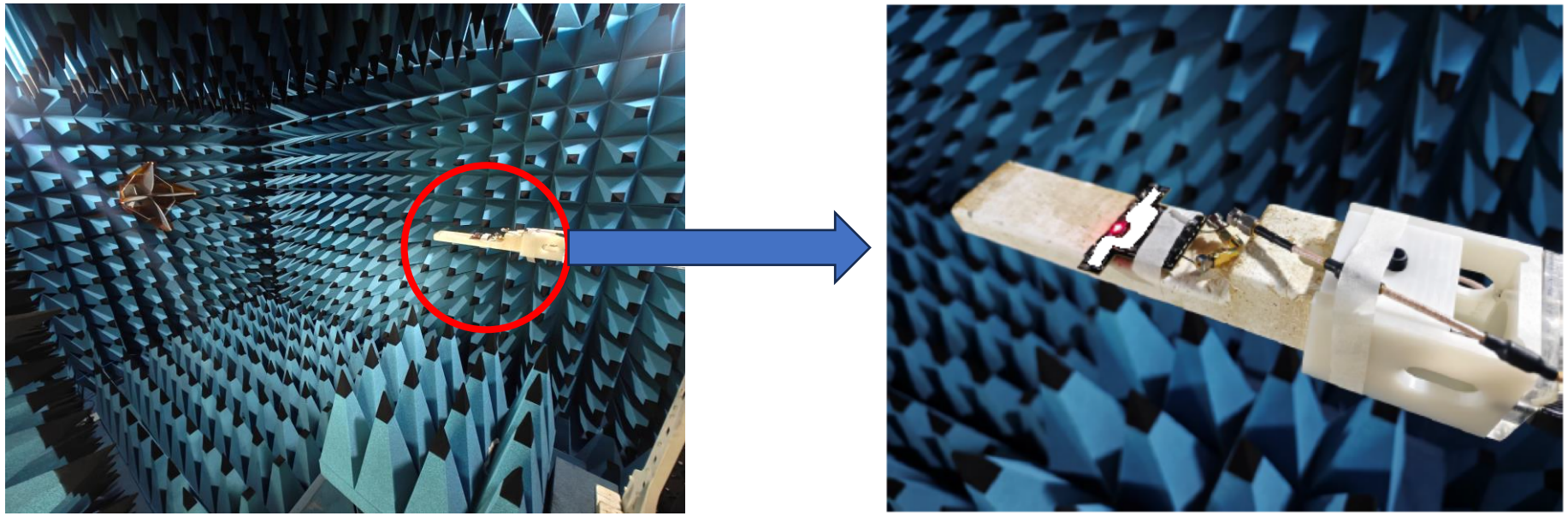
Test Condition

1. Test Condition

* Woc_Frame Metal Antenna and 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 2024/11/11



2. Test Environment



Antenna Gain Measurement Procedure and Software

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OTA measurement system

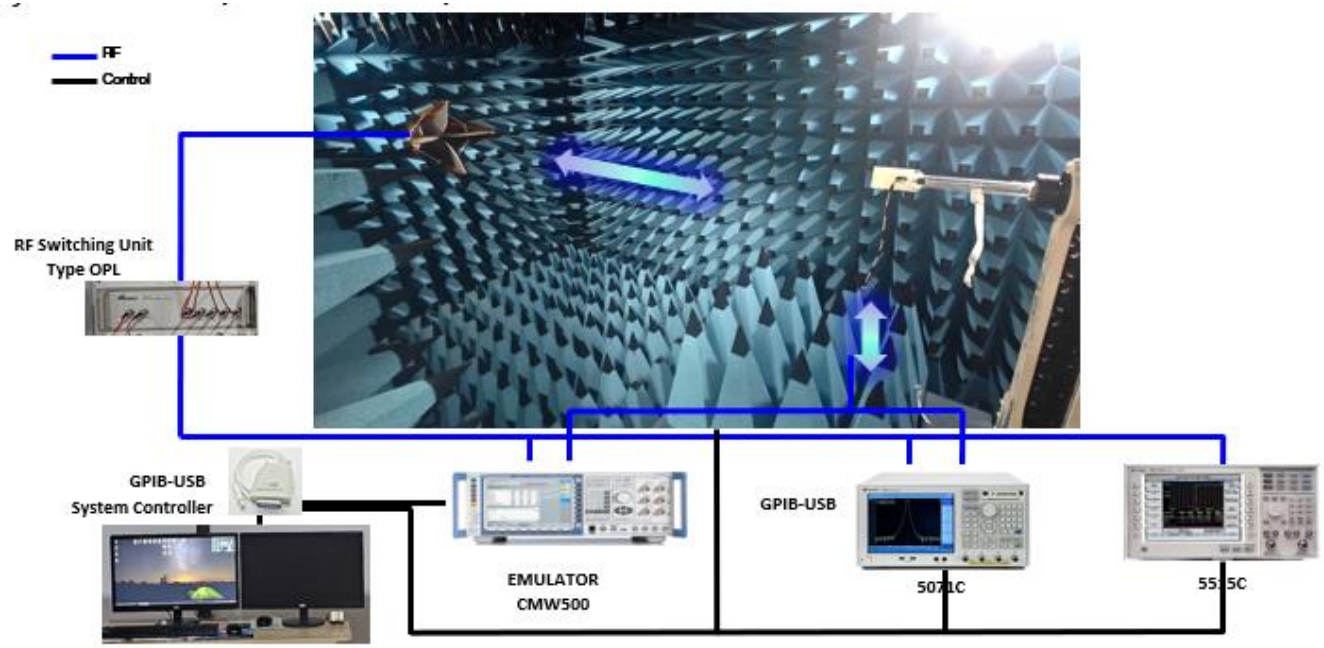
- Test Frequency : Support 400 MHz to 7.5 GHz
- Chamber Size: 4m x 2.5m x 2.5m

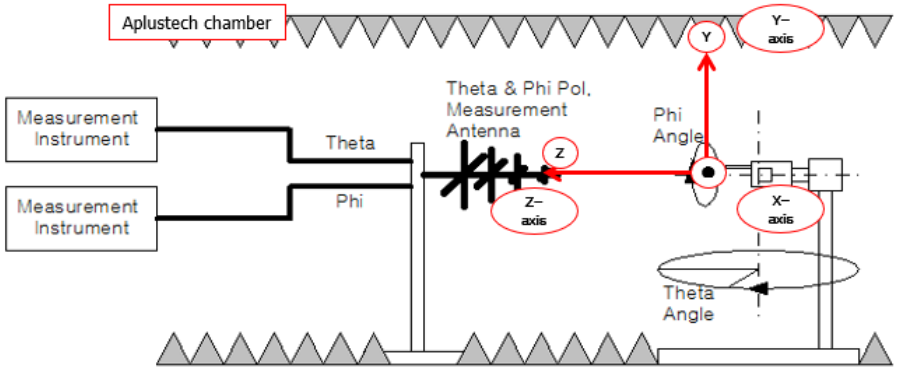
Support

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

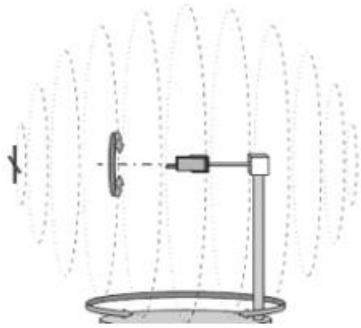
Measurement specifications

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





Great Circle Cut Method



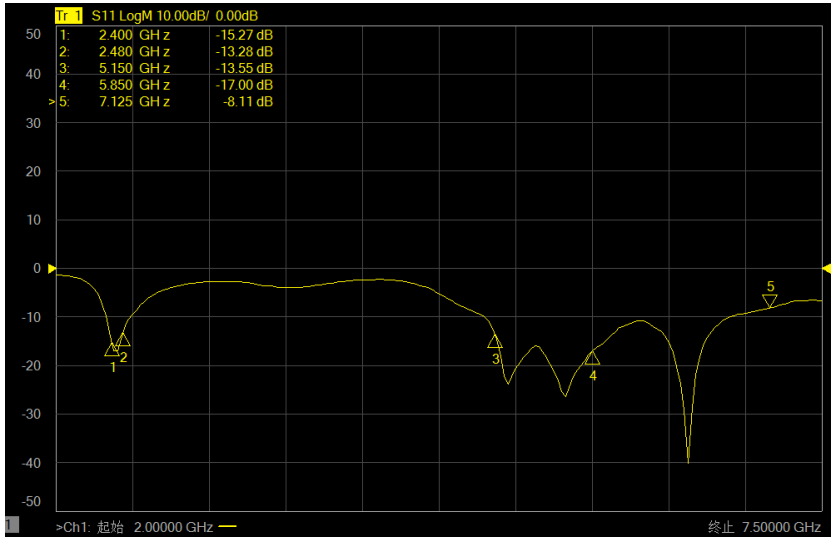
Measuring Instruments

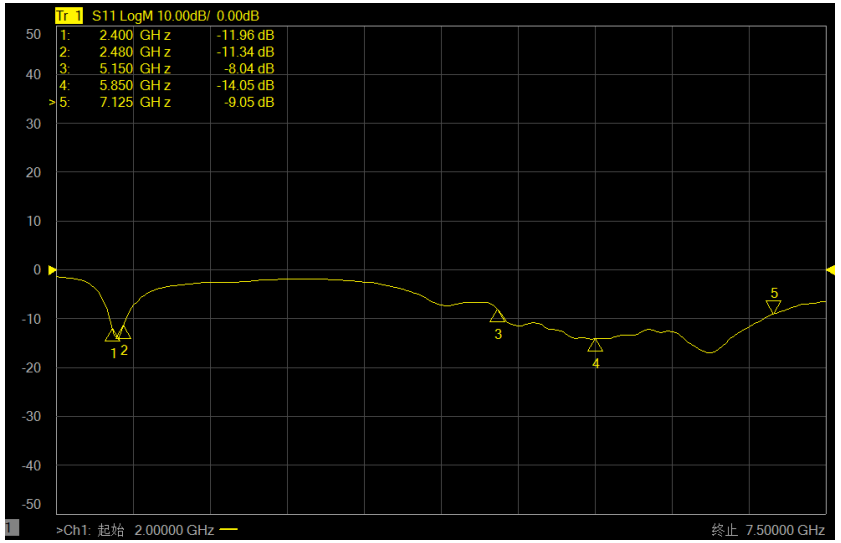
Item	Measuring Instruments	Latest Calibration Schedule
1	OTA Chamber	2024/04/01
2	Network Analyzer Keysight 5071c	2024/07/18

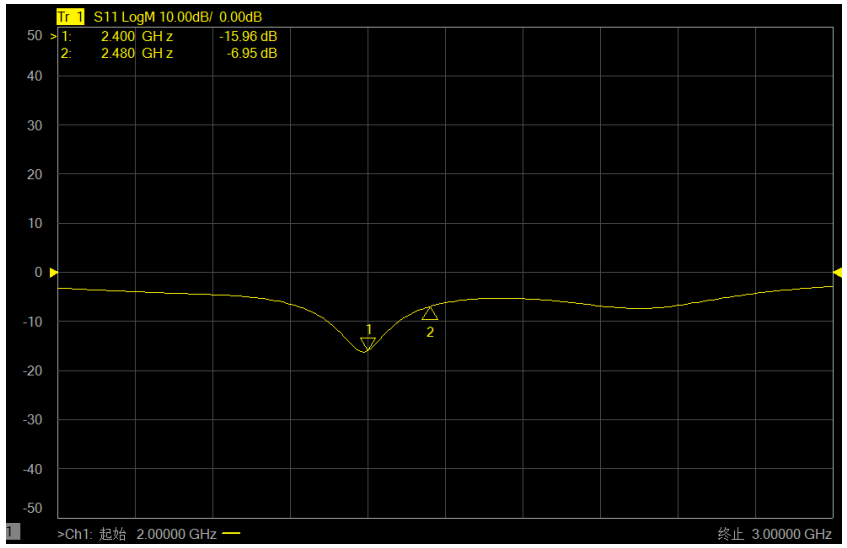
Electrical Characteristics

Item	Specification ANT1			Specification ANT2			Specification BT
Antenna Type	Metal Antenna			Metal Antenna			Chip Antenna
Central Frequency	2440MHz	5550MHz	6525MHz	2440MHz	5550MHz	6525MHz	2440MHz
Band Width	80MHz	700MHz	1200MHz	80MHz	700MHz	1200MHz	80MHz
Peak Gain	0.16dBi	1.07dBi	0.64dBi	-0.15dBi	-0.52dBi	-0.20dBi	-0.44dBi
Return Loss	<-8dB			<-8dB			<-6dB
Polarization	Linear			Linear			Linear
Azimuth Beam width	Omni-directional			Omni-directional			Omni-directional
Impedance	50Ω			50Ω			50Ω
Dimension	11*5*2.4mm			11*5*2.4mm			5.5*4.8*0.55mm

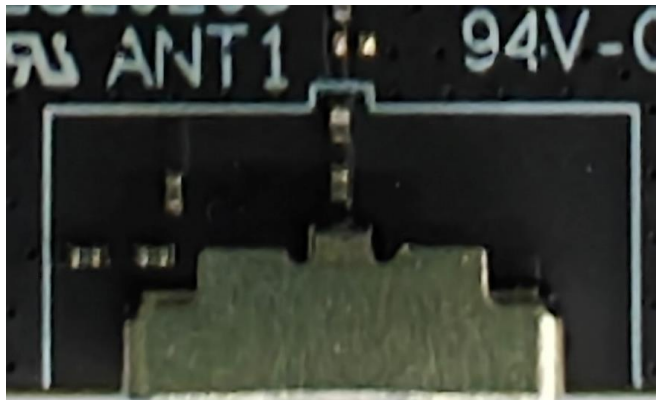
Passive test-Return Loss



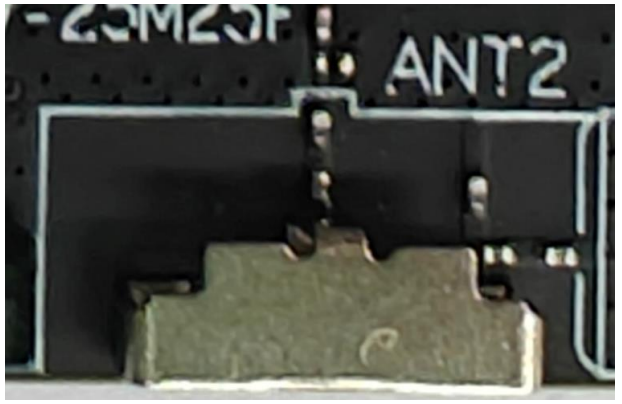




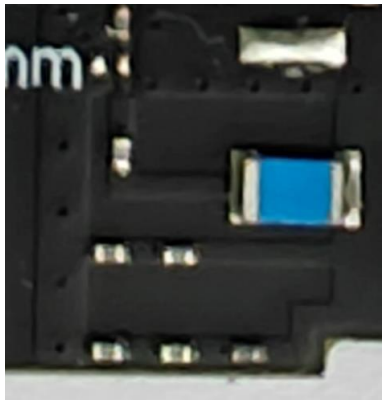
ANT1



ANT2



BT



ANT1 Passive Test-Antenna 3D Gain

Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400MHz	29.62 %	-9.50 dBi	-7.35 dBi	-5.28 dBi	-3.05 dBi	-1.64 dBi	-0.83 dBi
2410MHz	31.59 %	-9.30 dBi	-7.02 dBi	-5.00 dBi	-2.66 dBi	-1.23 dBi	-0.48 dBi
2420MHz	33.17 %	-9.20 dBi	-6.75 dBi	-4.79 dBi	-2.54 dBi	-0.91 dBi	-0.23 dBi
2430MHz	34.17 %	-9.14 dBi	-6.58 dBi	-4.66 dBi	-2.38 dBi	-0.71 dBi	-0.06 dBi
2440MHz	34.89 %	-9.13 dBi	-6.44 dBi	-4.57 dBi	-2.33 dBi	-0.60 dBi	0.02 dBi
2450MHz	35.59 %	-9.08 dBi	-6.34 dBi	-4.49 dBi	-2.24 dBi	-0.55 dBi	0.06 dBi
2460MHz	36.42 %	-9.04 dBi	-6.21 dBi	-4.39 dBi	-2.18 dBi	-0.46 dBi	0.14 dBi
2470MHz	37.02 %	-9.08 dBi	-6.08 dBi	-4.32 dBi	-2.22 dBi	-0.41 dBi	0.16 dBi
2480MHz	37.01 %	-9.18 dBi	-6.03 dBi	-4.32 dBi	-2.43 dBi	-0.48 dBi	0.07 dBi
5150MHz	31.18 %	-9.28 dBi	-7.13 dBi	-5.06 dBi	-0.89 dBi	-1.38 dBi	-0.09 dBi
5250MHz	44.44 %	-8.03 dBi	-5.42 dBi	-3.52 dBi	0.40 dBi	0.65 dBi	0.82 dBi
5350MHz	42.39 %	-8.08 dBi	-5.71 dBi	-3.73 dBi	0.39 dBi	0.65 dBi	0.76 dBi
5450MHz	40.77 %	-8.30 dBi	-5.86 dBi	-3.90 dBi	-0.12 dBi	-0.05 dBi	0.47 dBi
5550MHz	35.46 %	-8.85 dBi	-6.49 dBi	-4.50 dBi	-0.74 dBi	-0.14 dBi	0.32 dBi
5650MHz	41.72 %	-8.15 dBi	-5.78 dBi	-3.80 dBi	0.00 dBi	0.89 dBi	1.07 dBi
5750MHz	41.19 %	-8.33 dBi	-5.77 dBi	-3.85 dBi	-0.31 dBi	0.46 dBi	0.72 dBi
5850MHz	36.46 %	-9.09 dBi	-6.17 dBi	-4.38 dBi	-0.91 dBi	-0.41 dBi	-0.33 dBi
5925MHz	42.23 %	-8.75 dBi	-5.39 dBi	-3.74 dBi	-0.96 dBi	-0.03 dBi	0.04 dBi
6075MHz	37.38 %	-9.32 dBi	-5.90 dBi	-4.27 dBi	-1.85 dBi	-1.56 dBi	-1.45 dBi
6225MHz	35.15 %	-9.81 dBi	-6.07 dBi	-4.54 dBi	-1.97 dBi	-0.89 dBi	-0.62 dBi
6375MHz	34.11 %	-10.01 dBi	-6.17 dBi	-4.67 dBi	-2.00 dBi	-0.16 dBi	-0.11 dBi
6525MHz	38.44 %	-9.70 dBi	-5.57 dBi	-4.15 dBi	-1.12 dBi	0.56 dBi	0.64 dBi
6675MHz	36.42 %	-10.13 dBi	-5.73 dBi	-4.39 dBi	-2.20 dBi	-0.09 dBi	0.00 dBi
6825MHz	39.67 %	-9.81 dBi	-5.34 dBi	-4.02 dBi	-2.46 dBi	-0.39 dBi	-0.03 dBi
6975MHz	36.01 %	-10.27 dBi	-5.75 dBi	-4.44 dBi	-3.64 dBi	-1.27 dBi	-0.92 dBi
7125MHz	32.68 %	-10.53 dBi	-6.23 dBi	-4.86 dBi	-3.43 dBi	-1.45 dBi	-1.16 dBi

ANT1 Passive Test-Antenna 3D Radiation Pattern

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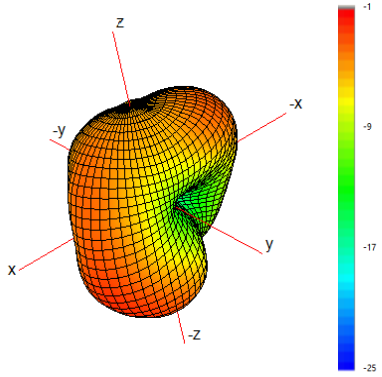
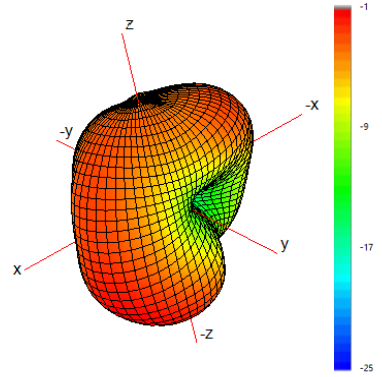
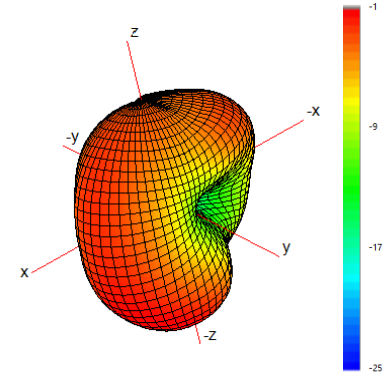
2400MHz



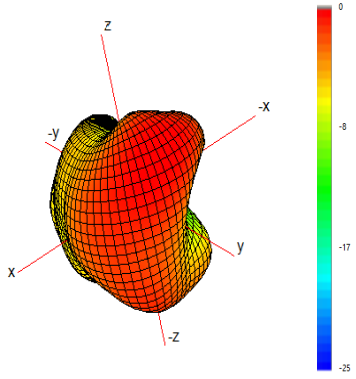
2440MHz



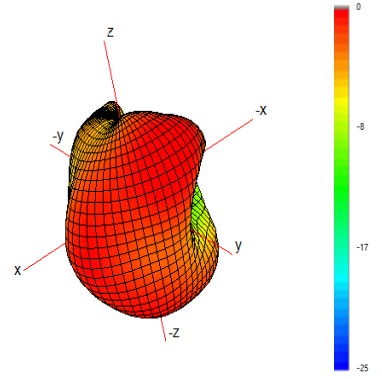
2480MHz



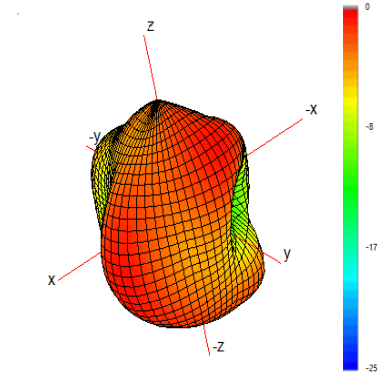
5150MHz



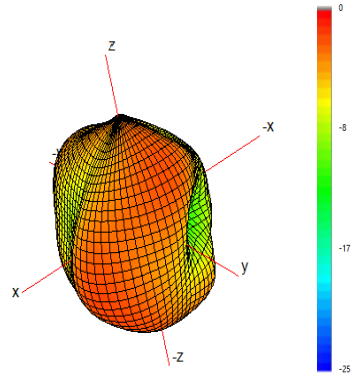
5550MHz



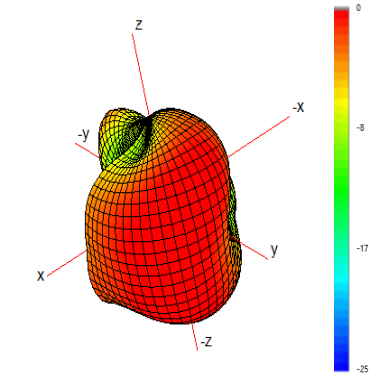
5850MHz



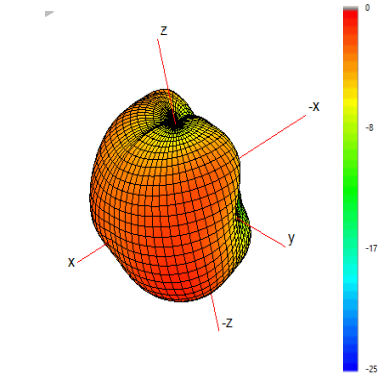
5925MHz



6525MHz



7125MHz



ANT2 Passive Test-Antenna 3D Gain

Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400MHz	30.06 %	-9.97 dBi	-6.99 dBi	-5.22 dBi	-2.80 dBi	-1.83 dBi	-0.91 dBi
2410MHz	30.97 %	-9.85 dBi	-6.86 dBi	-5.09 dBi	-2.56 dBi	-1.56 dBi	-0.68 dBi
2420MHz	31.62 %	-9.81 dBi	-6.74 dBi	-5.00 dBi	-2.58 dBi	-1.38 dBi	-0.51 dBi
2430MHz	32.33 %	-9.77 dBi	-6.62 dBi	-4.90 dBi	-2.42 dBi	-1.22 dBi	-0.41 dBi
2440MHz	32.92 %	-9.75 dBi	-6.51 dBi	-4.83 dBi	-2.42 dBi	-1.10 dBi	-0.30 dBi
2450MHz	32.99 %	-9.80 dBi	-6.48 dBi	-4.82 dBi	-2.45 dBi	-1.11 dBi	-0.32 dBi
2460MHz	33.59 %	-9.81 dBi	-6.36 dBi	-4.74 dBi	-2.44 dBi	-0.99 dBi	-0.22 dBi
2470MHz	33.98 %	-9.85 dBi	-6.26 dBi	-4.69 dBi	-2.46 dBi	-0.92 dBi	-0.15 dBi
2480MHz	33.97 %	-9.94 dBi	-6.23 dBi	-4.69 dBi	-2.56 dBi	-0.90 dBi	-0.19 dBi
5150MHz	35.13 %	-10.69 dBi	-8.11 dBi	-4.54 dBi	-3.41 dBi	-3.83 dBi	-2.55 dBi
5250MHz	41.58 %	-8.91 dBi	-5.98 dBi	-3.81 dBi	-1.09 dBi	-1.01 dBi	-0.52 dBi
5350MHz	39.25 %	-8.94 dBi	-6.39 dBi	-4.06 dBi	-1.08 dBi	-1.33 dBi	-0.96 dBi
5450MHz	37.12 %	-9.24 dBi	-6.63 dBi	-4.30 dBi	-1.64 dBi	-1.82 dBi	-0.81 dBi
5550MHz	35.79 %	-10.05 dBi	-7.39 dBi	-4.46 dBi	-2.61 dBi	-2.50 dBi	-1.75 dBi
5650MHz	38.64 %	-9.12 dBi	-6.40 dBi	-4.13 dBi	-2.00 dBi	-1.26 dBi	-1.05 dBi
5750MHz	36.21 %	-10.27 dBi	-7.29 dBi	-4.41 dBi	-2.94 dBi	-2.47 dBi	-2.19 dBi
5850MHz	35.66 %	-9.92 dBi	-6.84 dBi	-4.48 dBi	-2.92 dBi	-2.51 dBi	-1.71 dBi
5925MHz	36.04 %	-9.27 dBi	-6.16 dBi	-4.43 dBi	-2.34 dBi	-1.78 dBi	-0.80 dBi
6075MHz	36.71 %	-9.16 dBi	-6.10 dBi	-4.35 dBi	-2.25 dBi	-1.86 dBi	-1.34 dBi
6225MHz	37.16 %	-9.20 dBi	-6.00 dBi	-4.30 dBi	-2.33 dBi	-1.97 dBi	-1.63 dBi
6375MHz	38.36 %	-9.20 dBi	-5.79 dBi	-4.16 dBi	-2.32 dBi	-1.84 dBi	-0.96 dBi
6525MHz	34.29 %	-9.92 dBi	-6.18 dBi	-4.65 dBi	-3.27 dBi	-2.27 dBi	-1.96 dBi
6675MHz	37.55 %	-9.58 dBi	-5.76 dBi	-4.25 dBi	-3.40 dBi	-0.93 dBi	-0.68 dBi
6825MHz	41.38 %	-9.04 dBi	-5.39 dBi	-3.83 dBi	-2.20 dBi	-0.35 dBi	-0.20 dBi
6975MHz	38.21 %	-9.64 dBi	-5.63 dBi	-4.18 dBi	-2.57 dBi	-0.64 dBi	-0.48 dBi
7125MHz	33.15 %	-9.97 dBi	-6.37 dBi	-4.80 dBi	-2.53 dBi	-1.24 dBi	-1.04 dBi

ANT1 Passive Test-Antenna 3D Radiation Pattern

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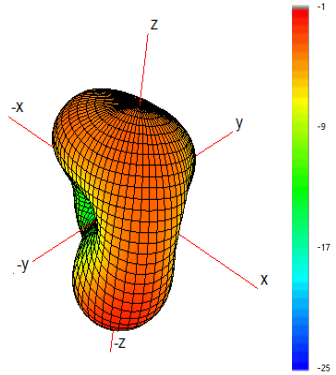
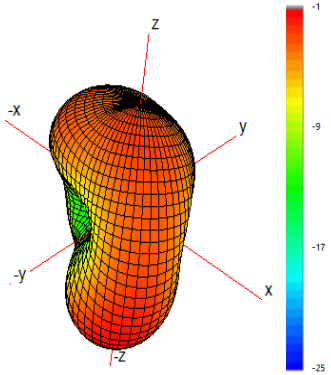
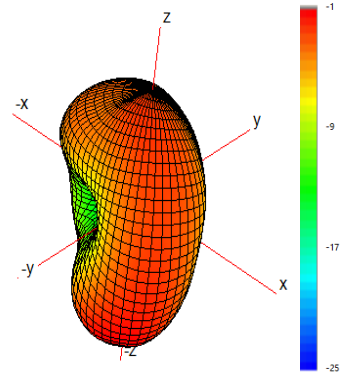
2400MHz



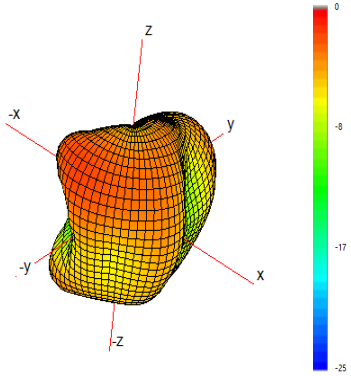
2440MHz



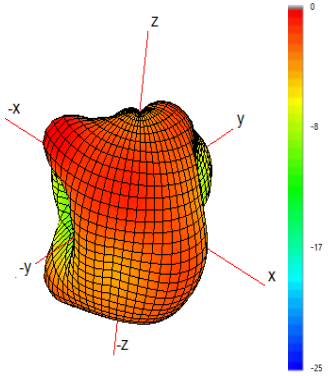
2480MHz



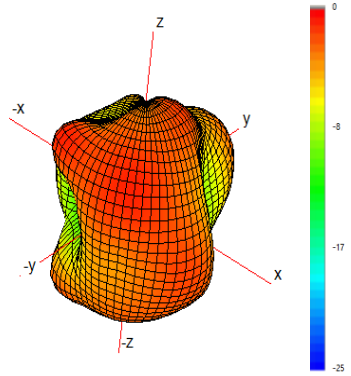
5150MHz



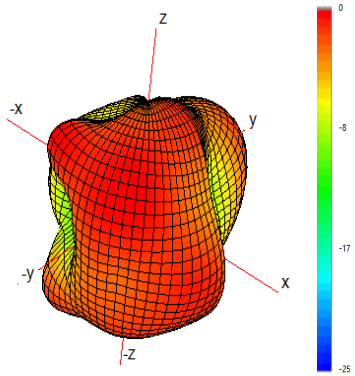
5550MHz



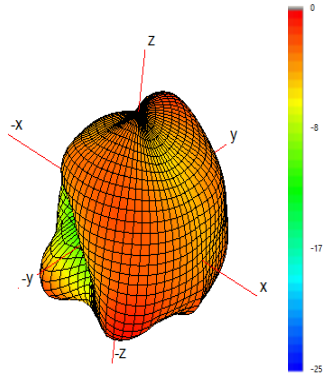
5850MHz



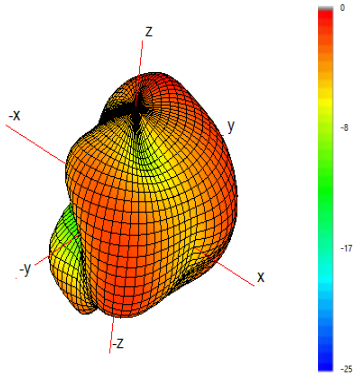
5925MHz



6525MHz



7125MHz

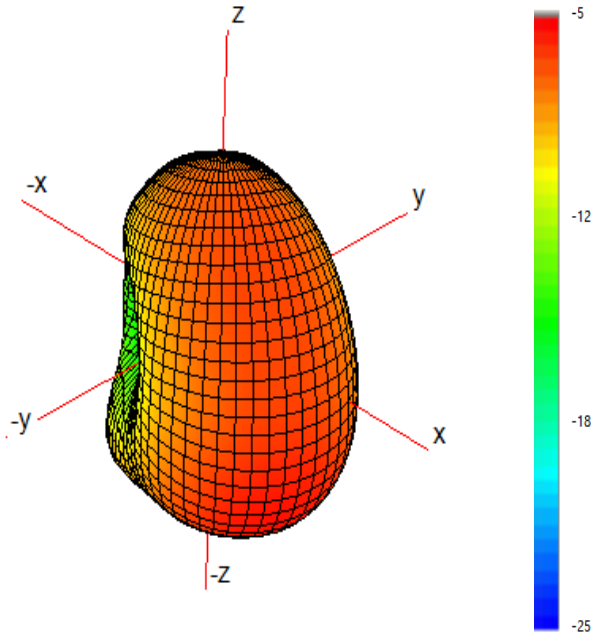


BT Passive Test-Antenna 3D Gain

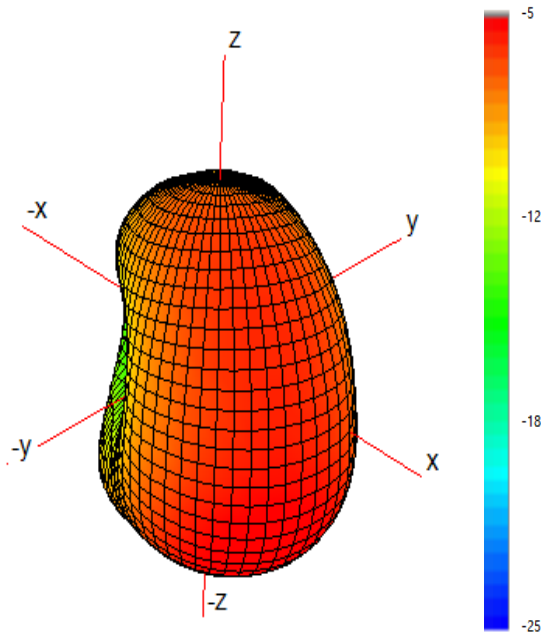
Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400MHz	24.77 %	-12.41 dBi	-7.21 dBi	-6.06 dBi	-4.21 dBi	-0.50 dBi	-0.44 dBi
2410MHz	25.02 %	-12.36 dBi	-7.16 dBi	-6.02 dBi	-4.22 dBi	-0.52 dBi	-0.45 dBi
2420MHz	24.93 %	-12.48 dBi	-7.15 dBi	-6.03 dBi	-4.35 dBi	-0.52 dBi	-0.46 dBi
2430MHz	24.38 %	-12.65 dBi	-7.22 dBi	-6.13 dBi	-4.51 dBi	-0.61 dBi	-0.55 dBi
2440MHz	23.27 %	-12.93 dBi	-7.41 dBi	-6.33 dBi	-4.82 dBi	-0.86 dBi	-0.80 dBi
2450MHz	22.03 %	-13.24 dBi	-7.62 dBi	-6.57 dBi	-5.16 dBi	-1.10 dBi	-1.05 dBi
2460MHz	20.63 %	-13.57 dBi	-7.89 dBi	-6.85 dBi	-5.49 dBi	-1.47 dBi	-1.42 dBi
2470MHz	19.03 %	-13.98 dBi	-8.23 dBi	-7.21 dBi	-5.88 dBi	-1.92 dBi	-1.87 dBi
2480MHz	17.96 %	-14.32 dBi	-8.46 dBi	-7.46 dBi	-6.12 dBi	-2.22 dBi	-2.16 dBi

BT Passive Test-Antenna 3D Radiation Pattern

2400MHz



2440MHz



2480MHz