

WCHA41M

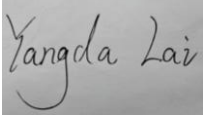
Passive Data

2025/09/09

1. Test Condition

* QS95F 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 2025/09/04



2. Test Environment

【Please refer to WCHA41M_ANT set-up photos】

Antenna Gain Measurement Procedure and Software

OTA measurement system

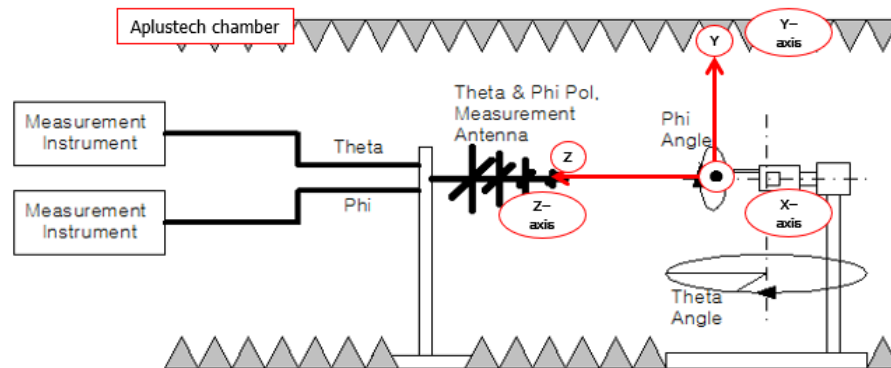
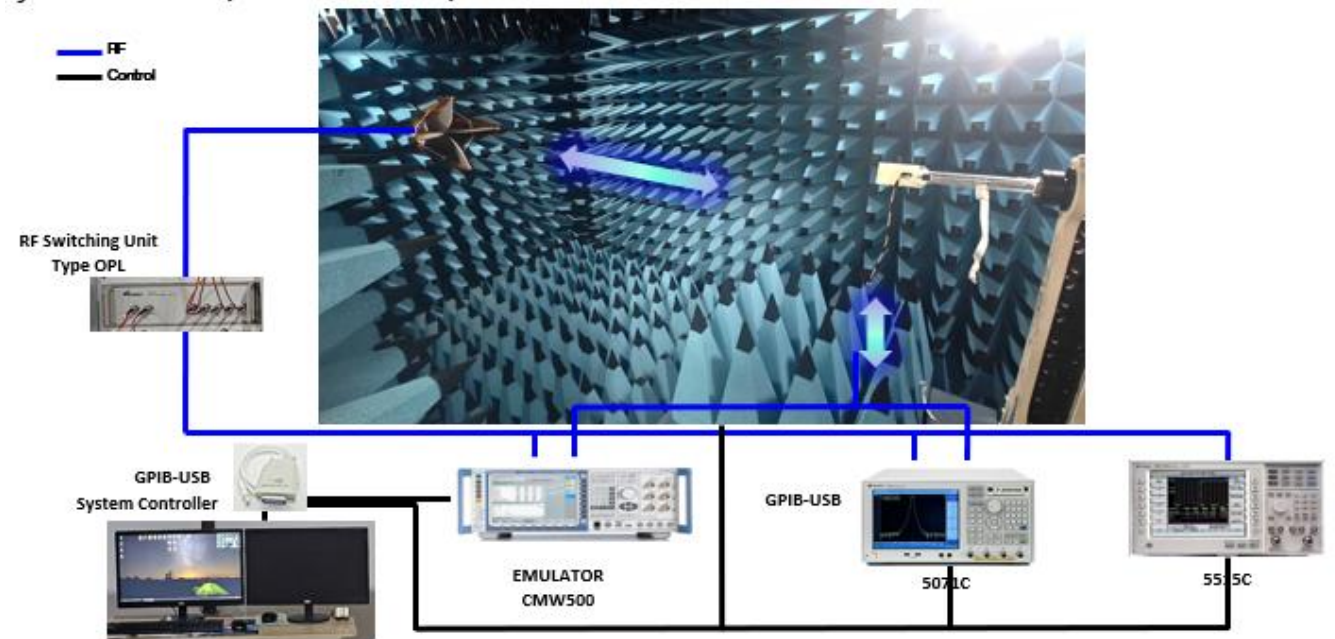
- Test Frequency : Support 400 MHz to 7.5 GHz
- Chamber Size: 4m x 2.5m x 2.5m

Support

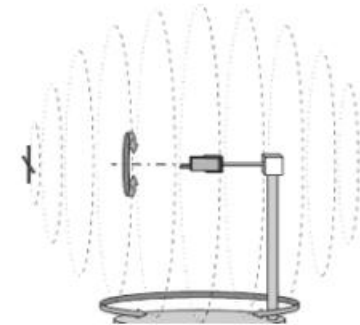
- LTE Support ALL Band (FDD/TDD)
- CDMA,GSM,WCDMA Support ALL Band
- Passive Efficiency Measurement (400 MHz ~ 7.5GHz)

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

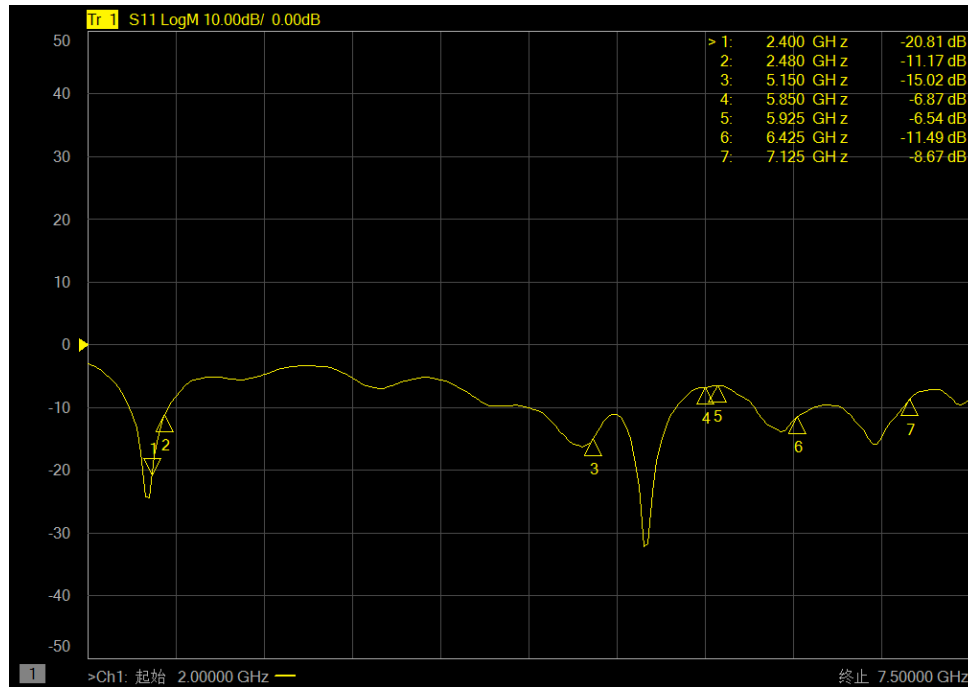


Item	Measuring Instruments	Latest Calibration Schedule
1	OTA Chamber	2024/12/01
2	Network Analyzer Keysight 5071c	2025/06/20

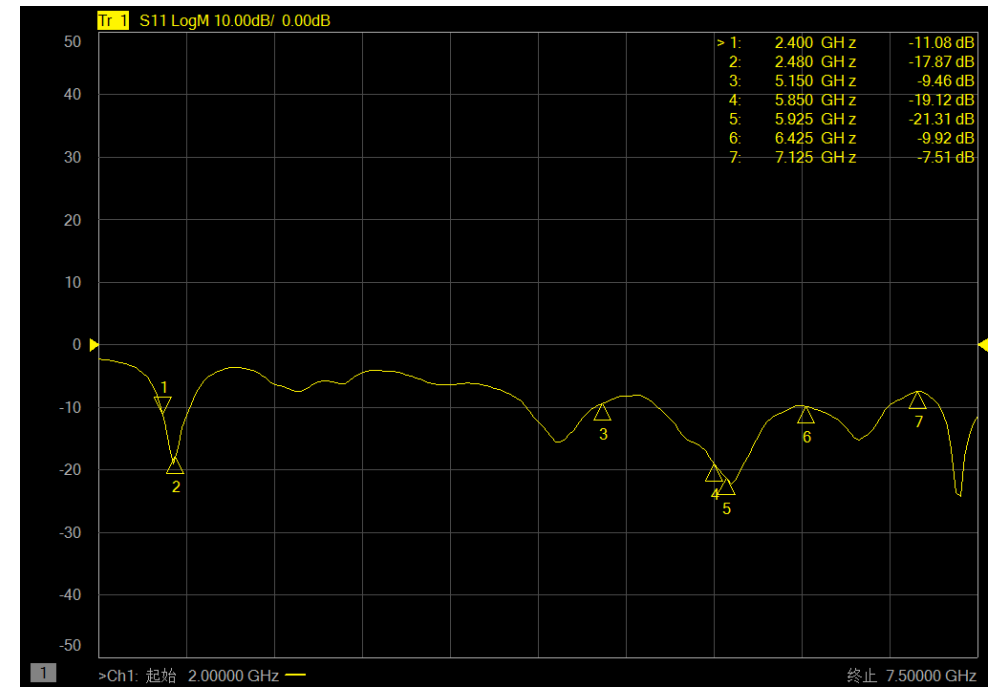
Electrical Characteristics

Item	Specification ANT0				Specification ANT1				Specification BT0	Specification BT1/zigbee
Antenna Type	Chip Antenna				Chip Antenna				Chip Antenna	Chip Antenna
Central Frequency	2440MHz	5500MHz	6175MHz	6775MHz	2440MHz	5500MHz	6175MHz	6775MHz	2440MHz	2440MHz
Band Width	80MHz	700MHz	500MHz	700MHz	80MHz	700MHz	500MHz	700MHz	80MHz	80MHz
Peak Gain	-0.38dBi	-0.44dBi	-0.50dBi	-0.04dBi	-1.88dBi	0.19dBi	0.37dBi	0.34dBi	-1.19dBi	0.51dBi
Return Loss	<-6dB				<-7dB				<-10dB	<-10dB
Polarization	Linear				Linear				Linear	Linear
Azimuth Beam width	Omni-directional				Omni-directional				Omni-directional	Omni-directional
Impedance	50Ω				50Ω				50Ω	50Ω
Dimension	10.5*5*0.55mm				12*5*0.55mm				7*4*0.55mm	9.5*4*0.55mm

Passive test-Return Loss-WiFi



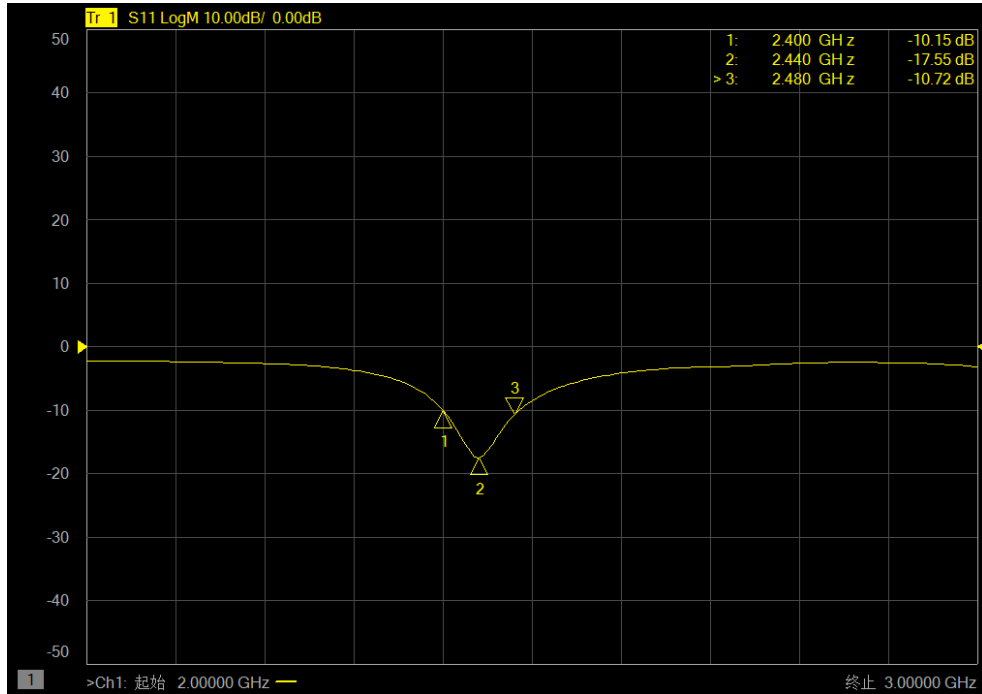
ANT0



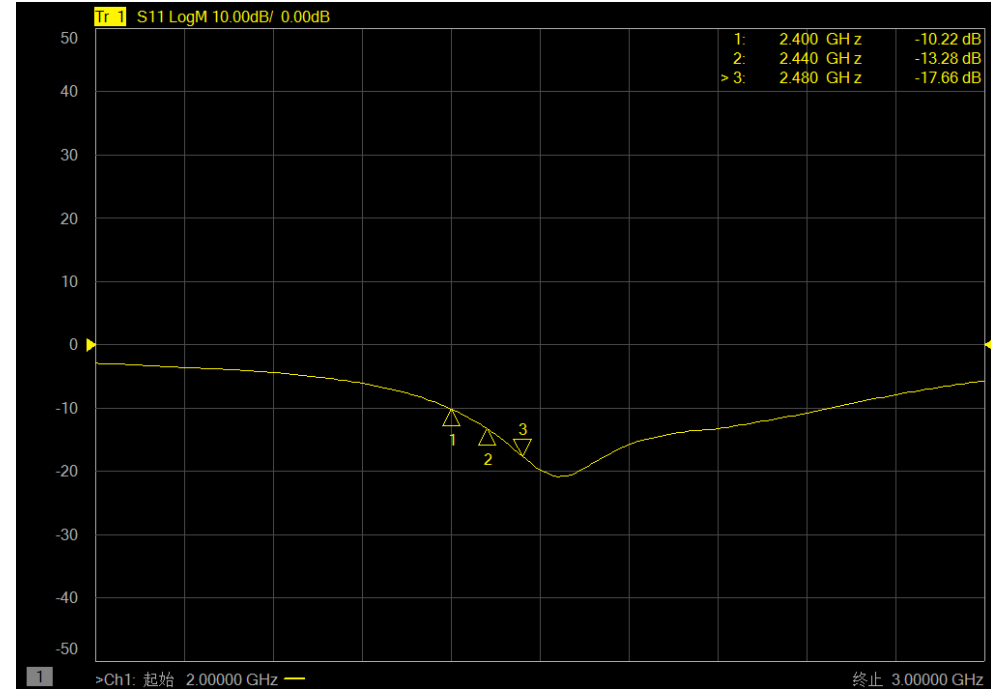
ANT1



Passive test-Return Loss-BT



BT0



BT1/zigbee

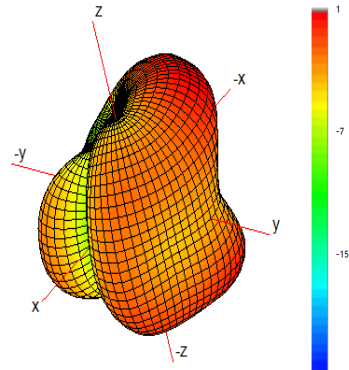


ANT0 Passive Test-Antenna 3D Gain

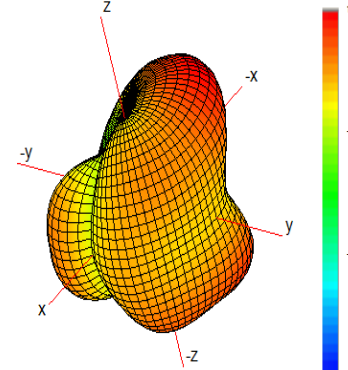
Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400MHz	37.05 %	-8.12 dBi	-6.65 dBi	-4.31 dBi	-0.75 dBi	-2.81 dBi	-0.44 dBi
2410MHz	35.91 %	-8.28 dBi	-6.77 dBi	-4.45 dBi	-0.73 dBi	-3.09 dBi	-0.38 dBi
2420MHz	34.71 %	-8.47 dBi	-6.88 dBi	-4.59 dBi	-0.94 dBi	-2.98 dBi	-0.55 dBi
2430MHz	33.46 %	-8.71 dBi	-6.99 dBi	-4.75 dBi	-1.05 dBi	-3.00 dBi	-0.66 dBi
2440MHz	32.11 %	-9.00 dBi	-7.10 dBi	-4.93 dBi	-1.34 dBi	-2.98 dBi	-0.92 dBi
2450MHz	30.83 %	-9.24 dBi	-7.23 dBi	-5.11 dBi	-1.58 dBi	-3.04 dBi	-1.14 dBi
2460MHz	30.27 %	-9.38 dBi	-7.27 dBi	-5.19 dBi	-1.67 dBi	-3.12 dBi	-1.23 dBi
2470MHz	29.78 %	-9.51 dBi	-7.31 dBi	-5.26 dBi	-1.72 dBi	-3.13 dBi	-1.25 dBi
2480MHz	29.38 %	-9.63 dBi	-7.33 dBi	-5.32 dBi	-1.84 dBi	-3.17 dBi	-1.37 dBi
5150MHz	34.13 %	-10.22 dBi	-6.09 dBi	-4.67 dBi	-2.91 dBi	-1.13 dBi	-1.01 dBi
5250MHz	31.61 %	-10.88 dBi	-6.30 dBi	-5.00 dBi	-3.26 dBi	-0.50 dBi	-0.44 dBi
5350MHz	25.31 %	-11.94 dBi	-7.82 dBi	-5.97 dBi	-3.57 dBi	-1.98 dBi	-1.60 dBi
5450MHz	25.67 %	-11.10 dBi	-7.47 dBi	-5.91 dBi	-2.48 dBi	-2.21 dBi	-1.92 dBi
5550MHz	25.91 %	-11.17 dBi	-7.38 dBi	-5.87 dBi	-3.03 dBi	-2.09 dBi	-1.84 dBi
5650MHz	25.37 %	-11.37 dBi	-7.43 dBi	-5.96 dBi	-3.90 dBi	-2.18 dBi	-1.95 dBi
5750MHz	26.07 %	-12.01 dBi	-8.31 dBi	-5.84 dBi	-4.67 dBi	-3.15 dBi	-2.46 dBi
5850MHz	25.12 %	-12.23 dBi	-8.85 dBi	-5.99 dBi	-4.83 dBi	-3.57 dBi	-2.94 dBi
5925MHz	25.29 %	-11.88 dBi	-8.60 dBi	-5.97 dBi	-4.29 dBi	-3.28 dBi	-2.89 dBi
6075MHz	26.04 %	-11.12 dBi	-8.44 dBi	-5.84 dBi	-3.36 dBi	-3.21 dBi	-2.27 dBi
6225MHz	26.45 %	-10.05 dBi	-8.08 dBi	-5.78 dBi	-1.84 dBi	-3.23 dBi	-1.31 dBi
6375MHz	26.89 %	-9.82 dBi	-8.11 dBi	-5.70 dBi	-1.11 dBi	-2.67 dBi	-0.50 dBi
6425MHz	25.79 %	-10.70 dBi	-9.11 dBi	-5.89 dBi	-1.33 dBi	-3.40 dBi	-0.70 dBi
6675MHz	25.99 %	-10.65 dBi	-9.07 dBi	-5.85 dBi	-1.53 dBi	-3.62 dBi	-0.89 dBi
6825MHz	27.50 %	-9.58 dBi	-7.83 dBi	-5.61 dBi	-0.59 dBi	-2.54 dBi	-0.08 dBi
6975MHz	27.00 %	-9.67 dBi	-7.90 dBi	-5.69 dBi	-0.52 dBi	-3.29 dBi	-0.04 dBi
7125MHz	24.33 %	-9.97 dBi	-8.46 dBi	-6.14 dBi	-1.23 dBi	-3.80 dBi	-0.73 dBi

ANT0 Passive Test-Antenna 3D Radiation Pattern

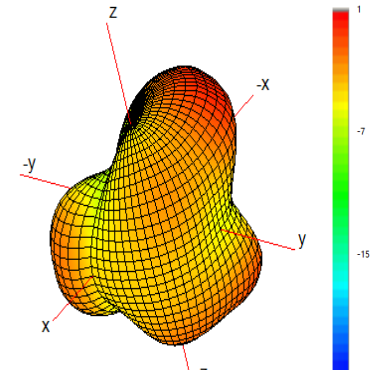
2400MHz



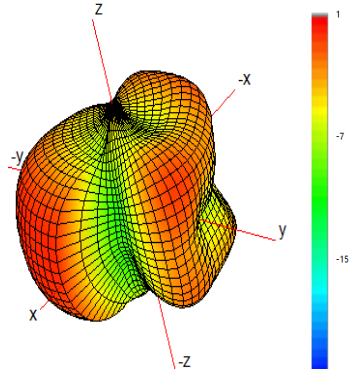
2440MHz



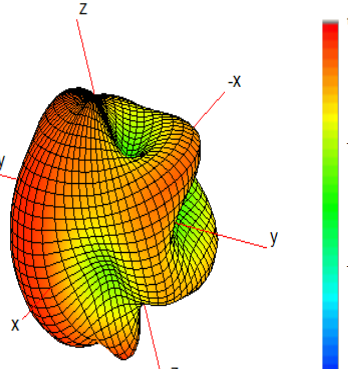
2480MHz



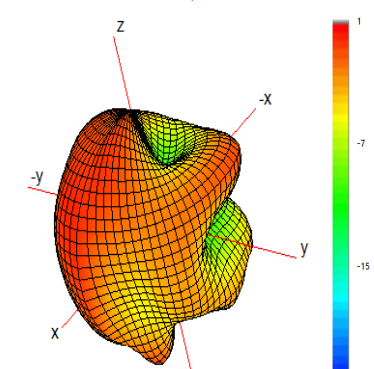
5150MHz



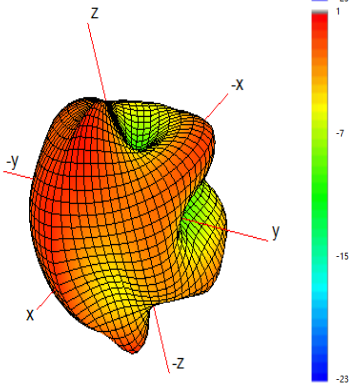
5550MHz



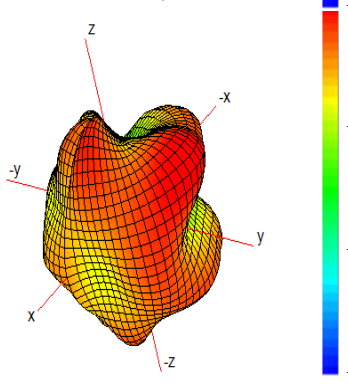
5850MHz



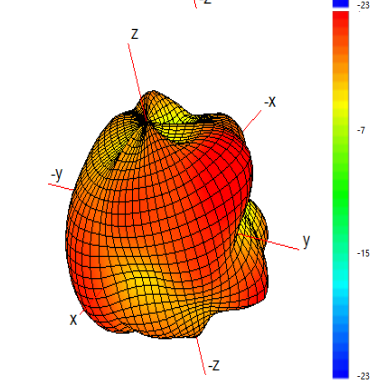
5925MHz



6525MHz



7125MHz

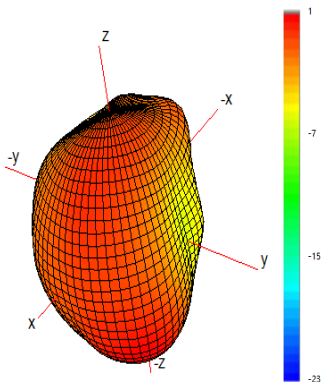


ANT1 Passive Test-Antenna 3D Gain

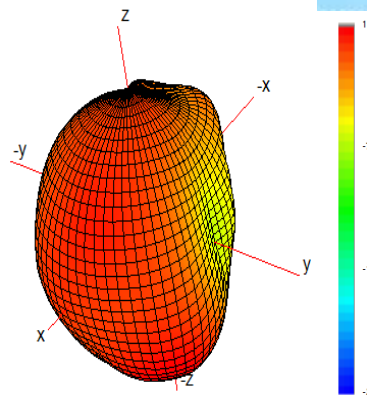
Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400MHz	24.12 %	-11.69 dBi	-8.12 dBi	-6.18 dBi	-5.15 dBi	-2.52 dBi	-2.24 dBi
2410MHz	24.43 %	-11.59 dBi	-7.96 dBi	-6.12 dBi	-5.20 dBi	-2.58 dBi	-2.28 dBi
2420MHz	24.66 %	-11.52 dBi	-7.86 dBi	-6.08 dBi	-5.31 dBi	-2.62 dBi	-2.33 dBi
2430MHz	24.76 %	-11.48 dBi	-7.72 dBi	-6.06 dBi	-5.27 dBi	-2.68 dBi	-2.38 dBi
2440MHz	25.08 %	-11.46 dBi	-7.57 dBi	-6.01 dBi	-5.06 dBi	-2.66 dBi	-2.36 dBi
2450MHz	25.17 %	-11.41 dBi	-7.46 dBi	-5.99 dBi	-4.86 dBi	-2.61 dBi	-2.20 dBi
2460MHz	25.45 %	-11.47 dBi	-7.37 dBi	-5.94 dBi	-4.71 dBi	-2.53 dBi	-2.11 dBi
2470MHz	25.45 %	-11.49 dBi	-7.36 dBi	-5.94 dBi	-4.59 dBi	-2.48 dBi	-2.04 dBi
2480MHz	25.58 %	-11.58 dBi	-7.30 dBi	-5.92 dBi	-4.48 dBi	-2.34 dBi	-1.88 dBi
5150MHz	28.90 %	-11.21 dBi	-6.71 dBi	-5.39 dBi	-4.47 dBi	-1.78 dBi	-1.75 dBi
5250MHz	29.70 %	-11.01 dBi	-6.62 dBi	-5.27 dBi	-4.59 dBi	-1.24 dBi	-1.24 dBi
5350MHz	28.52 %	-10.89 dBi	-6.91 dBi	-5.45 dBi	-4.80 dBi	-1.90 dBi	-1.87 dBi
5450MHz	29.44 %	-10.67 dBi	-6.80 dBi	-5.31 dBi	-3.90 dBi	-1.41 dBi	-1.24 dBi
5550MHz	31.31 %	-10.60 dBi	-6.46 dBi	-5.04 dBi	-2.95 dBi	-1.54 dBi	-1.19 dBi
5650MHz	35.32 %	-10.23 dBi	-5.88 dBi	-4.52 dBi	-2.02 dBi	-0.23 dBi	-0.03 dBi
5750MHz	33.98 %	-10.57 dBi	-5.99 dBi	-4.69 dBi	-1.99 dBi	-0.07 dBi	0.19 dBi
5850MHz	33.21 %	-10.70 dBi	-6.07 dBi	-4.79 dBi	-1.62 dBi	-0.38 dBi	-0.10 dBi
5925MHz	36.23 %	-10.31 dBi	-5.70 dBi	-4.41 dBi	-1.42 dBi	0.16 dBi	0.37 dBi
6075MHz	35.94 %	-10.12 dBi	-5.82 dBi	-4.44 dBi	-1.47 dBi	-0.07 dBi	0.04 dBi
6225MHz	33.93 %	-10.09 dBi	-6.17 dBi	-4.69 dBi	-1.02 dBi	-0.40 dBi	-0.29 dBi
6375MHz	30.78 %	-10.58 dBi	-6.57 dBi	-5.12 dBi	-1.44 dBi	-0.36 dBi	-0.31 dBi
6425MHz	27.40 %	-11.22 dBi	-7.02 dBi	-5.62 dBi	-3.03 dBi	-0.29 dBi	-0.27 dBi
6675MHz	28.06 %	-10.87 dBi	-7.02 dBi	-5.52 dBi	-3.16 dBi	0.11 dBi	0.13 dBi
6825MHz	28.78 %	-10.62 dBi	-6.97 dBi	-5.41 dBi	-3.34 dBi	0.33 dBi	0.34 dBi
6975MHz	23.21 %	-11.95 dBi	-8.35 dBi	-6.34 dBi	-4.23 dBi	-0.72 dBi	-0.70 dBi
7125MHz	21.59 %	-12.15 dBi	-9.26 dBi	-6.66 dBi	-4.84 dBi	-1.17 dBi	-1.07 dBi

ANT1 Passive Test-Antenna 3D Radiation Pattern

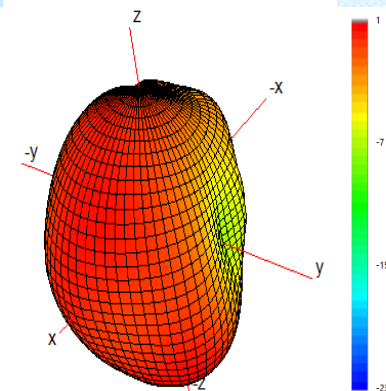
2400MHz



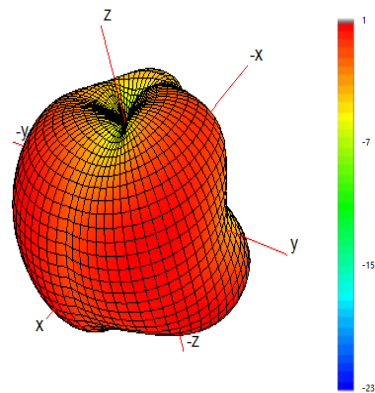
2440MHz



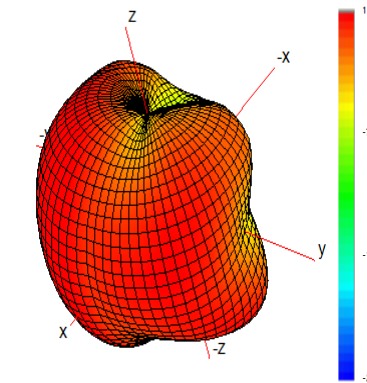
2480MHz



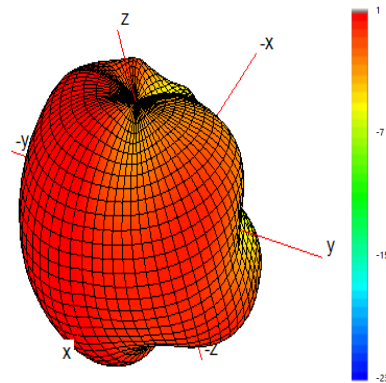
5150MHz



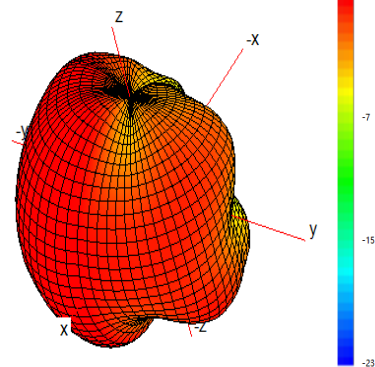
5500MHz



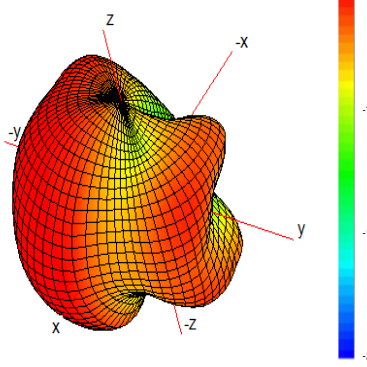
5850MHz



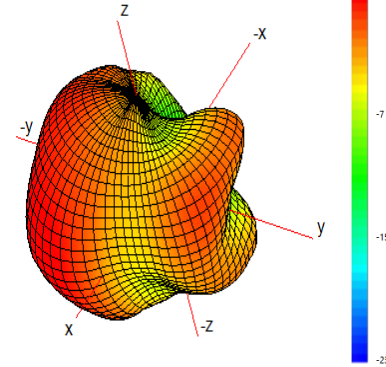
6000MHz



6525MHz



7000MHz

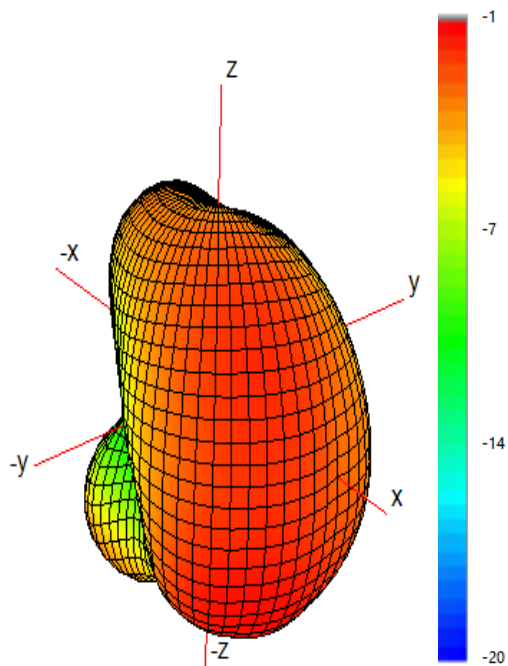


BT0 Passive Test-Antenna 3D Gain

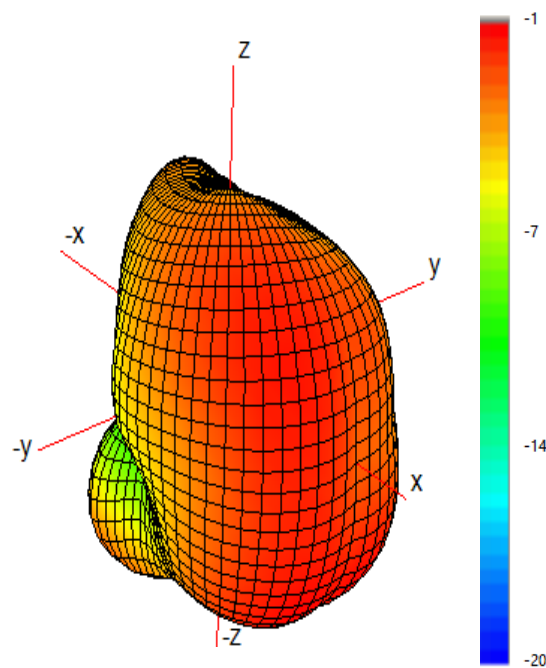
Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400MHz	25.17 %	-11.40 dBi	-7.46 dBi	-5.99 dBi	-3.30 dBi	-1.41 dBi	-1.23 dBi
2410MHz	26.21 %	-11.22 dBi	-7.29 dBi	-5.82 dBi	-3.08 dBi	-1.38 dBi	-1.19 dBi
2420MHz	27.02 %	-11.06 dBi	-7.17 dBi	-5.68 dBi	-2.86 dBi	-1.42 dBi	-1.20 dBi
2430MHz	27.25 %	-10.98 dBi	-7.15 dBi	-5.65 dBi	-2.82 dBi	-1.51 dBi	-1.26 dBi
2440MHz	26.99 %	-10.98 dBi	-7.21 dBi	-5.69 dBi	-2.80 dBi	-1.72 dBi	-1.42 dBi
2450MHz	26.61 %	-10.97 dBi	-7.30 dBi	-5.75 dBi	-2.79 dBi	-1.76 dBi	-1.43 dBi
2460MHz	25.96 %	-11.02 dBi	-7.43 dBi	-5.86 dBi	-2.86 dBi	-1.90 dBi	-1.54 dBi
2470MHz	25.01 %	-11.12 dBi	-7.63 dBi	-6.02 dBi	-2.97 dBi	-2.17 dBi	-1.77 dBi
2480MHz	23.73 %	-11.27 dBi	-7.89 dBi	-6.25 dBi	-3.13 dBi	-2.48 dBi	-2.02 dBi

BT0 Passive Test-Antenna 3D Radiation Pattern

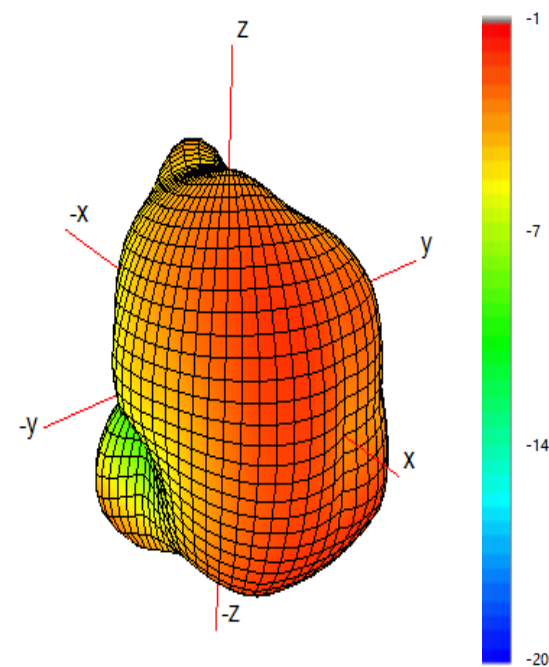
2400MHz



2440MHz



2480MHz



BT1/zigbee Passive Test-Antenna 3D Gain

Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400MHz	28.50 %	-9.29 dBi	-7.77 dBi	-5.45 dBi	-2.35 dBi	-4.25 dBi	-1.64 dBi
2410MHz	30.28 %	-9.13 dBi	-7.43 dBi	-5.19 dBi	-2.22 dBi	-4.07 dBi	-1.45 dBi
2420MHz	31.74 %	-8.99 dBi	-7.19 dBi	-4.98 dBi	-2.05 dBi	-3.65 dBi	-1.27 dBi
2430MHz	33.28 %	-8.87 dBi	-6.92 dBi	-4.78 dBi	-1.94 dBi	-3.35 dBi	-1.07 dBi
2440MHz	34.72 %	-8.78 dBi	-6.68 dBi	-4.59 dBi	-1.84 dBi	-3.10 dBi	-0.91 dBi
2450MHz	35.79 %	-8.73 dBi	-6.50 dBi	-4.46 dBi	-1.86 dBi	-2.89 dBi	-0.81 dBi
2460MHz	36.66 %	-8.68 dBi	-6.37 dBi	-4.36 dBi	-1.84 dBi	-2.82 dBi	-0.72 dBi
2470MHz	37.50 %	-8.61 dBi	-6.25 dBi	-4.26 dBi	-1.73 dBi	-2.74 dBi	-0.65 dBi
2480MHz	38.76 %	-8.52 dBi	-6.07 dBi	-4.12 dBi	-1.65 dBi	-2.45 dBi	-0.51 dBi

BT1 Passive Test-Antenna 3D Radiation Pattern

