

WCH931M

Passive Data

2025/09/25

1. Test Condition

* WCH931M Chip Antenna

- Test Chamber: Shine OTA Chamber

(Address: 1F,Building A5,No.18 Jinxing Rd., Huaqiao Economic Development Zone, Kunshan, China)

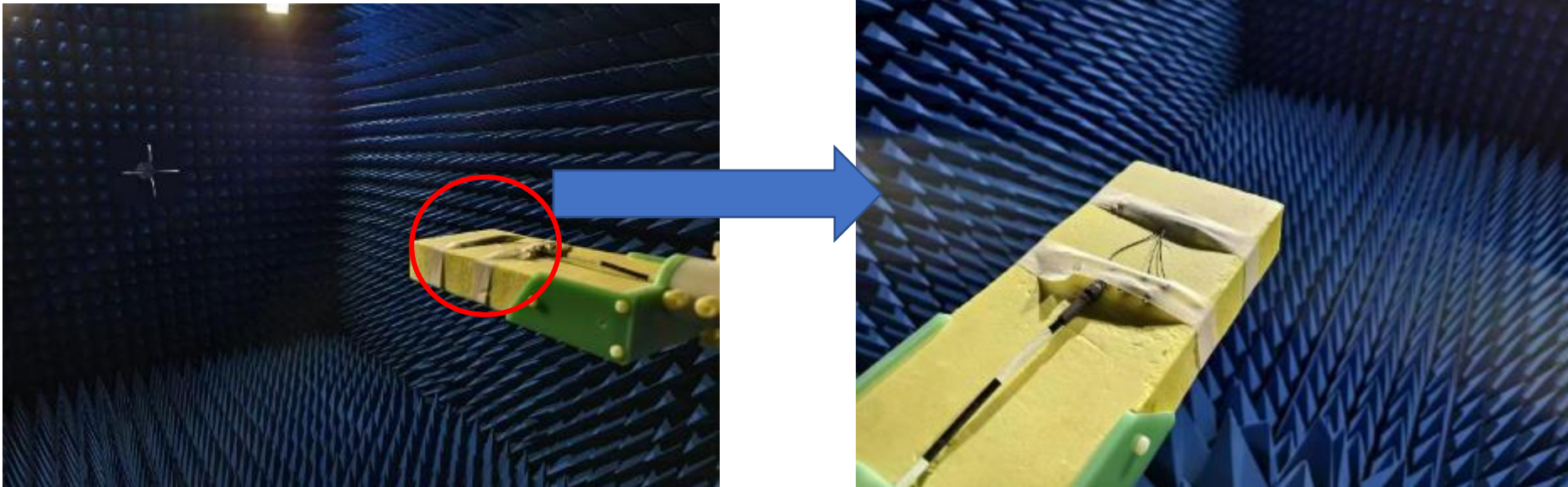
- Network Analyzer : Return Loss

- 3D Passive Chamber : Gain and Efficiency

- Measured by Will Wang 2025/09/25

Will Wang

2. Test Environment



The O5Tester Software is used to test antenna gain in the far field 3D OTA chamber.

The overview of the far field 3D OTA chamber is shown in Fig.1 and the antenna turntable rotation sampling is shown in Fig.2.

The antenna gain can be measured by the following steps

1. Place the AUT (Antenna Under Test) on the biaxial 3D turntable.
2. The test horn antenna maintains horizontal polarization, and the turntable rotation is controlled by the O5Tester test system and the value of each angular horizontal polarization of the AUT is read.
3. The test horn antenna maintains vertical polarization, and the turntable rotation is controlled by the O5Tester test system and the value of each angular vertical polarization of the AUT is read.
4. The O5Tester test system compares the obtained test values with the standard antenna to obtain the final gain values.

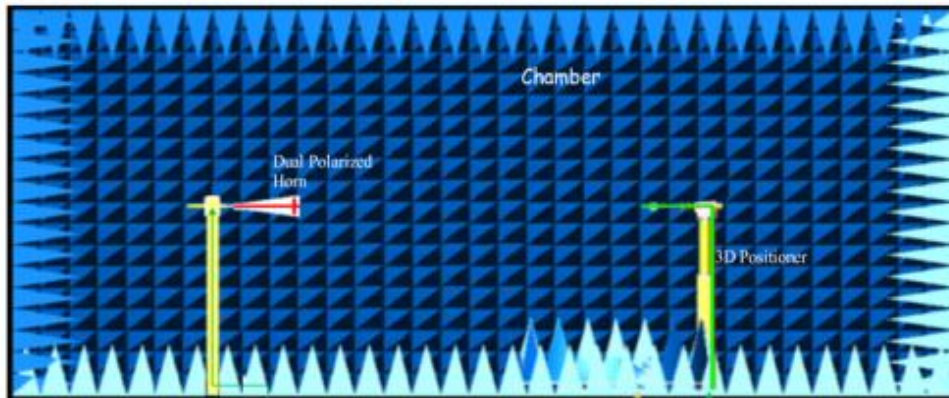


Fig.1 Overview of 3D chamber

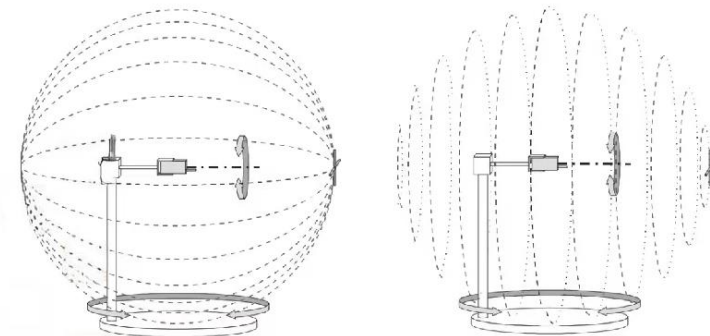


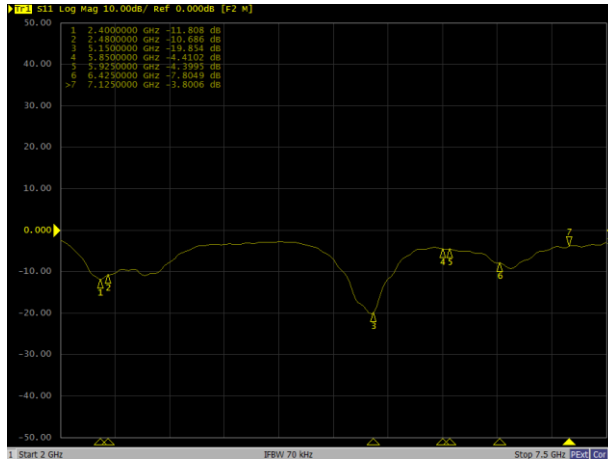
Fig.2 Antenna turntable rotation sampling

Item	Measuring Instruments	Latest Calibration Schedule
1	OTA Chamber	2025/08/20
2	Network Analyzer Keysight 5071c	2025/06/15

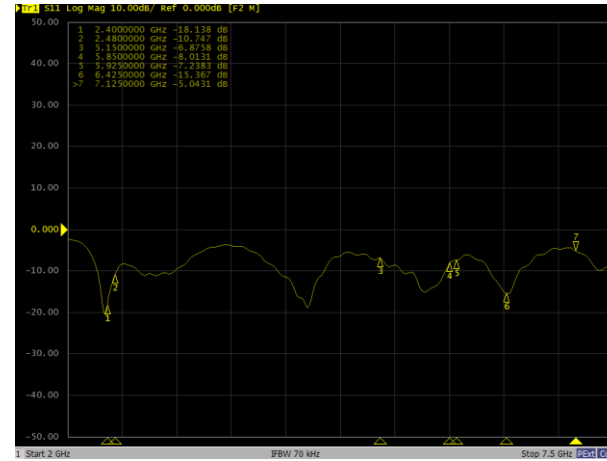
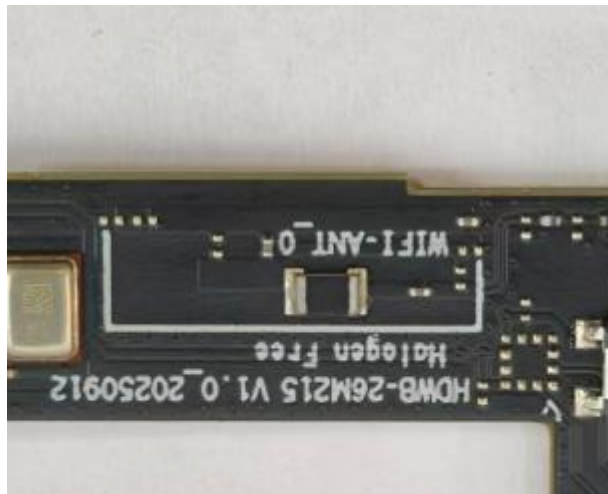
Electrical Characteristics

Item	Specification ANT0				Specification ANT1				Specification BT 0
Antenna Type	Chip Antenna				Chip Antenna				Chip Antenna
Central Frequency	2440MHz	5500MHz	6175MHz	6775MHz	2440MHz	5500MHz	6175MHz	6775MHz	2440MHz
Band Width	80MHz	700MHz	500MHz	700MHz	80MHz	700MHz	500MHz	700MHz	80MHz
Peak Gain	0.51dBi	1.71dBi	0.27dBi	1.07dBi	0.90dBi	-0.15dBi	-0.56dBi	-2.96dBi	-3.30dBi
Return Loss	<-3.5dB				<-4dB				<-6dB
Polarization	Linear				Linear				Linear
Azimuth Beam width	Omni-directional				Omni-directional				Omni-directional
Impedance	50Ω				50Ω				50Ω
Dimension	12.0*4.5mm				11.5*4.5mm				10.0*2.9mm

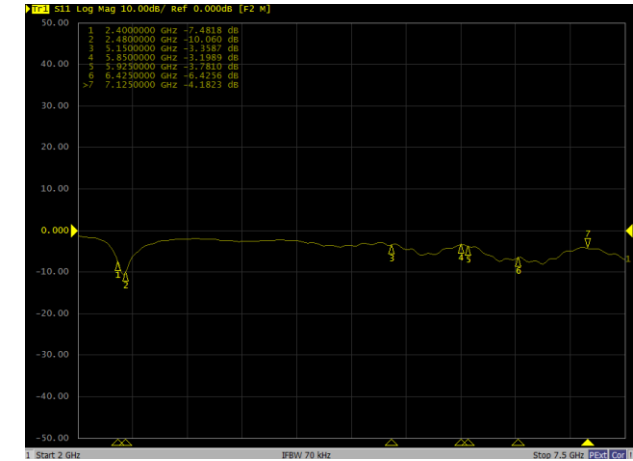
Passive Test – Return Loss



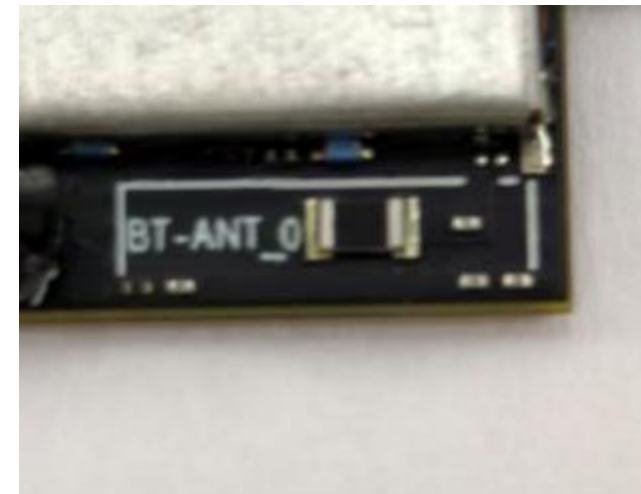
ANT 0



ANT 1



BT 0

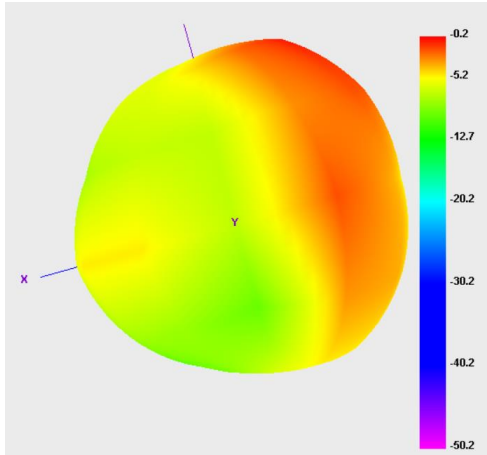


ANT0 Passive Test – Antenna 3D Gain

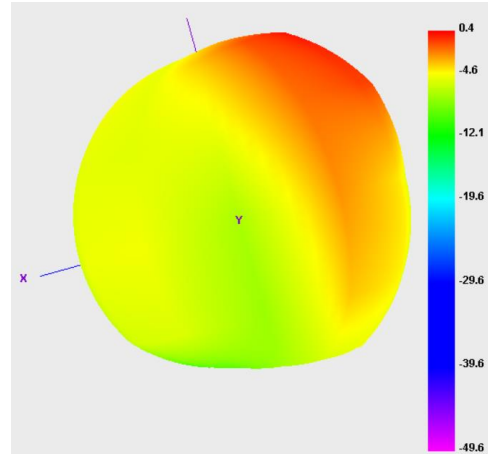
Frequency (MHz)	Efficiency (%)	Average Gain (dBi)			Max Gain (dBi)		
		Ver	Hor	Total	Ver	Hor	Total
2400	33.00	-7.04	-5.28	-4.81	-4.49	-1.71	-0.17
2410	32.91	-7.05	-5.27	-4.83	-4.22	-2.03	-0.14
2420	33.91	-6.85	-5.11	-4.70	-3.93	-2.20	0.04
2430	34.59	-6.68	-5.00	-4.61	-3.79	-2.51	0.09
2440	37.32	-6.26	-4.67	-4.28	-3.55	-2.49	0.38
2450	37.51	-6.19	-4.69	-4.26	-3.64	-2.83	0.31
2460	39.10	-5.99	-4.52	-4.08	-3.62	-3.03	0.51
2470	37.03	-6.32	-4.78	-4.31	-3.97	-3.65	0.27
2480	37.63	-6.35	-4.73	-4.24	-4.04	-3.91	0.35
5150	41.34	-4.33	-5.23	-3.84	-0.16	0.00	1.67
5250	40.92	-5.05	-5.06	-3.88	-0.90	-0.15	1.71
5350	40.99	-5.47	-4.90	-3.87	-1.43	0.22	1.42
5450	31.03	-6.80	-6.16	-5.08	-2.92	-0.56	-0.56
5550	25.50	-7.31	-7.26	-5.94	-3.52	-1.41	-1.23
5650	26.06	-7.51	-7.11	-5.84	-3.62	-1.70	-1.28
5750	23.93	-7.63	-7.44	-6.21	-4.44	-1.83	-1.36
5850	21.18	-8.92	-7.79	-6.74	-5.44	-1.74	-1.69
5925	22.55	-9.42	-7.41	-6.47	-5.55	-1.76	-1.44
6075	18.81	-11.90	-8.11	-7.26	-7.94	-2.90	-2.10
6225	22.95	-10.40	-6.86	-6.39	-6.89	-1.53	-1.02
6375	28.10	-9.17	-6.27	-5.51	-6.11	-0.21	0.27
6525	33.11	-7.49	-5.86	-4.80	-4.62	-0.07	1.07
6675	27.42	-6.83	-6.87	-5.62	-4.05	-0.56	-0.29
6825	26.00	-6.51	-7.21	-5.85	-3.98	-2.28	-1.62
6975	16.38	-8.13	-9.22	-7.86	-5.77	-4.87	-3.71
7125	16.76	-7.98	-9.08	-7.76	-5.48	-4.56	-4.08

ANT0 Passive Test – Antenna 3D Radiation Pattern

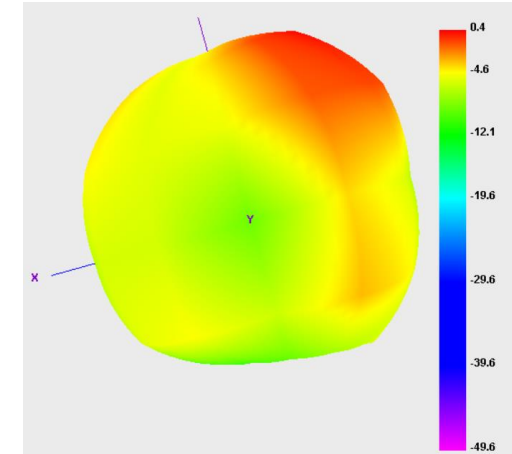
2400MHz



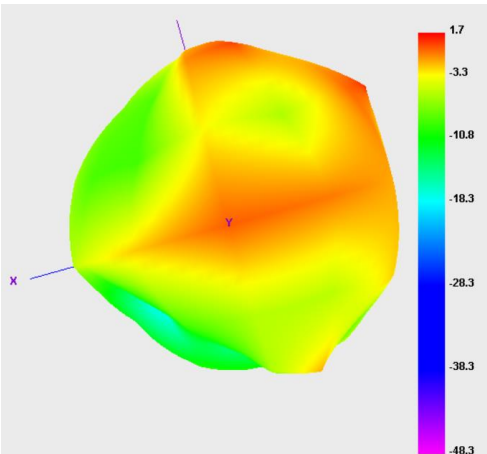
2440MHz



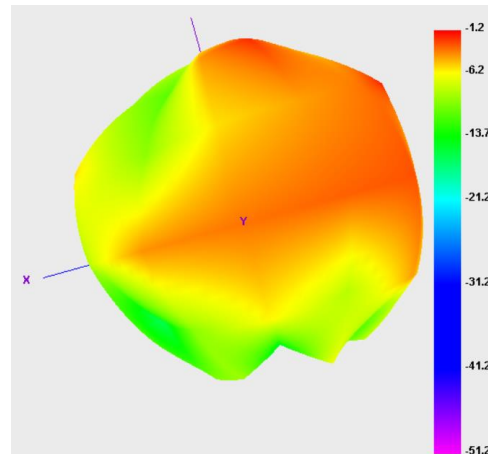
2480MHz



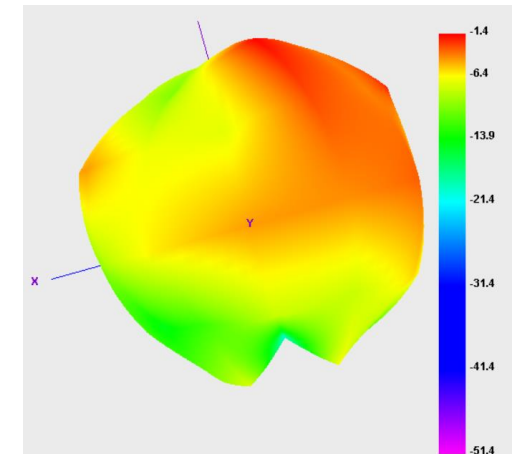
5150MHz



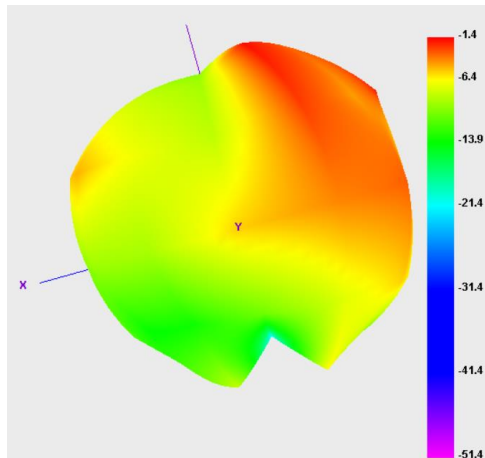
5550MHz



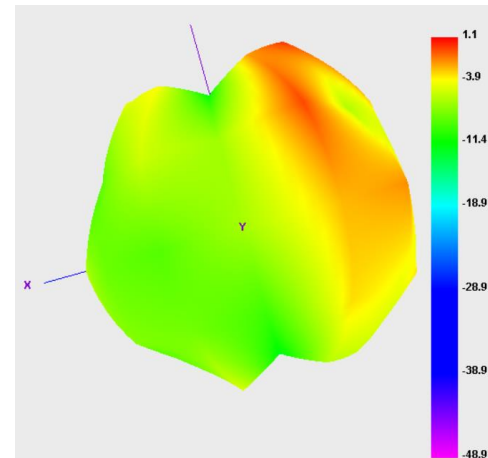
5750MHz



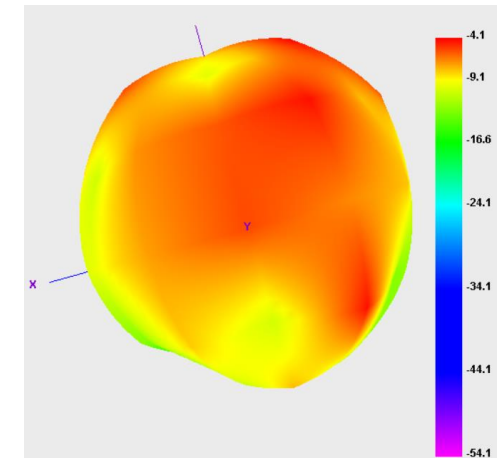
5925MHz



6525MHz



7125MHz

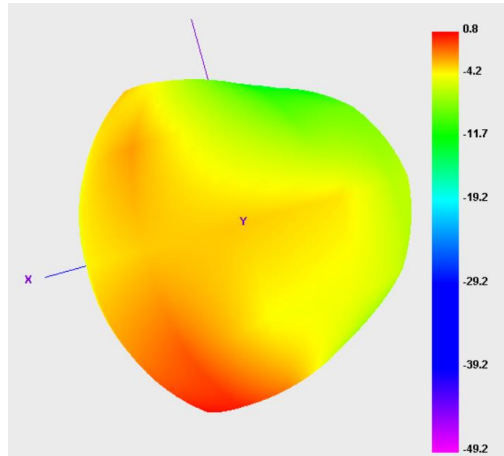


ANT1 Passive Test – Antenna 3D Gain

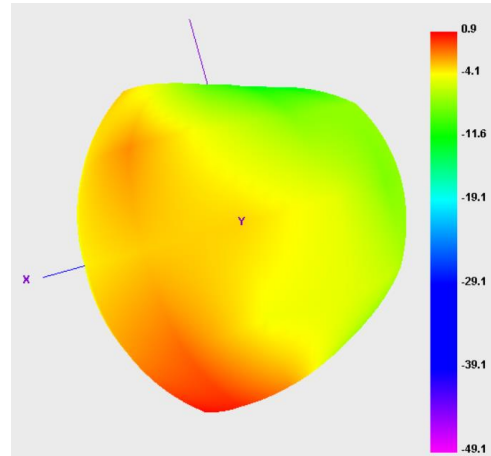
Frequency (MHz)	Efficiency (%)	Average Gain (dBi)			Max Gain (dBi)		
		Ver	Hor	Total	Ver	Hor	Total
2400	40.40	-6.09	-4.27	-3.94	-1.86	-2.00	0.76
2410	39.28	-6.20	-4.52	-4.06	-2.02	-2.16	0.64
2420	39.80	-6.15	-4.51	-4.00	-1.99	-2.03	0.70
2430	40.35	-6.11	-4.49	-3.94	-2.00	-1.88	0.76
2440	41.49	-5.98	-4.46	-3.82	-1.84	-1.69	0.90
2450	39.67	-6.22	-4.81	-4.02	-2.05	-1.82	0.67
2460	40.57	-6.11	-4.78	-3.92	-1.93	-1.61	0.80
2470	40.30	-6.14	-4.83	-3.95	-1.97	-1.48	0.79
2480	40.80	-6.06	-4.78	-3.89	-1.95	-1.35	0.88
5150	22.72	-8.56	-7.20	-6.44	-4.58	-2.67	-2.12
5250	25.50	-8.18	-6.86	-5.93	-4.47	-1.88	-1.43
5350	29.07	-7.82	-6.30	-5.37	-3.97	-1.87	-0.90
5450	29.74	-7.85	-6.15	-5.27	-4.69	-1.38	-1.08
5550	29.85	-8.12	-6.19	-5.25	-4.94	-0.96	-0.72
5650	28.67	-8.43	-6.49	-5.43	-5.32	-1.02	-0.57
5750	29.81	-8.07	-6.65	-5.26	-4.73	-0.60	-0.15
5850	27.30	-8.29	-7.13	-5.64	-4.66	-1.24	-0.79
5925	20.01	-9.38	-8.15	-6.99	-5.92	-2.48	-2.03
6075	23.25	-8.60	-7.29	-6.34	-4.68	-1.47	-1.02
6225	22.92	-8.00	-6.88	-6.40	-3.79	-1.01	-0.56
6375	25.48	-7.74	-6.24	-5.94	-3.74	-1.53	-1.08
6525	17.28	-9.39	-7.98	-7.62	-5.69	-3.41	-2.96
6675	12.80	-10.28	-9.26	-8.93	-7.74	-4.80	-4.52
6825	10.04	-11.57	-10.78	-9.98	-9.19	-5.61	-4.40
6975	8.34	-12.34	-11.56	-10.79	-9.34	-6.92	-4.51
7125	11.35	-11.26	-10.85	-9.45	-8.93	-6.44	-3.58

ANT1 Passive Test – Antenna 3D Radiation Pattern

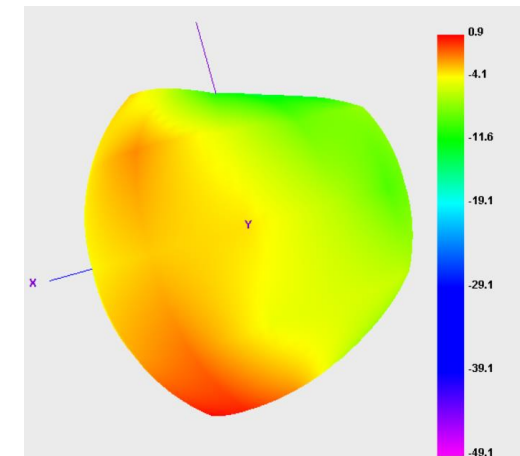
2400MHz



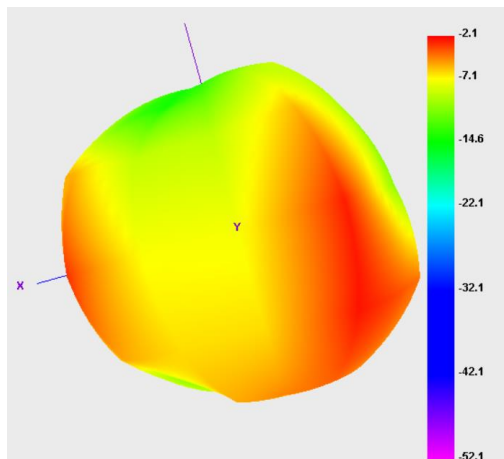
2440MHz



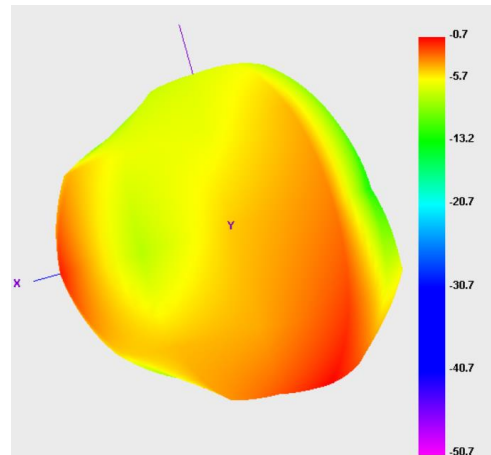
2480MHz



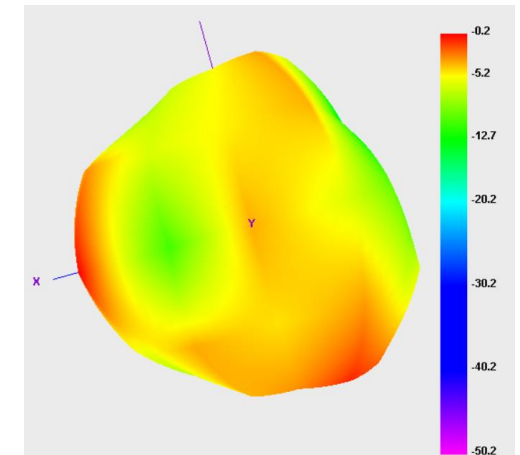
5150MHz



5550MHz

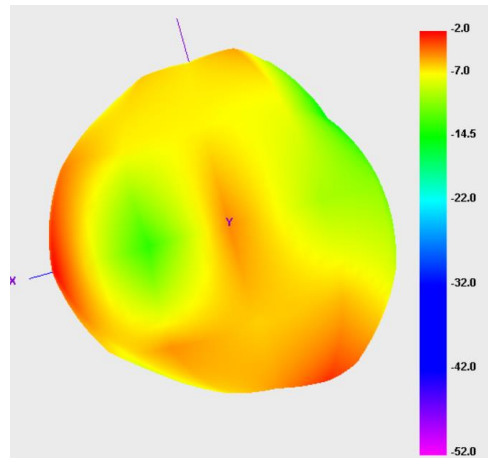


5750MHz

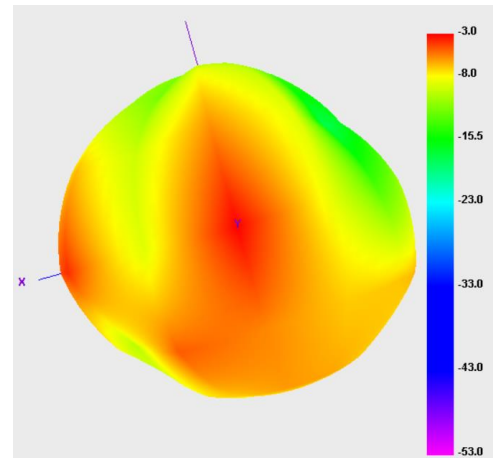


ANT1 Passive Test – Antenna 3D Radiation Pattern

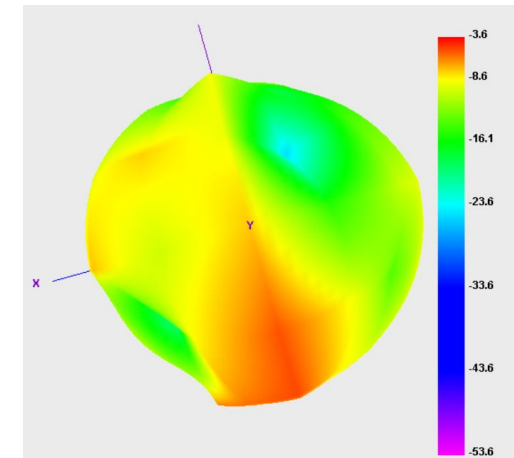
5925MHz



6525MHz



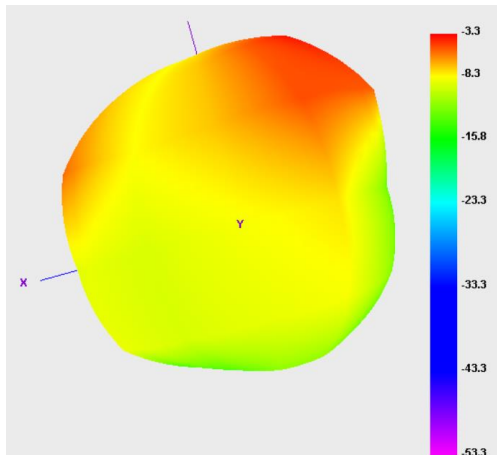
7125MHz



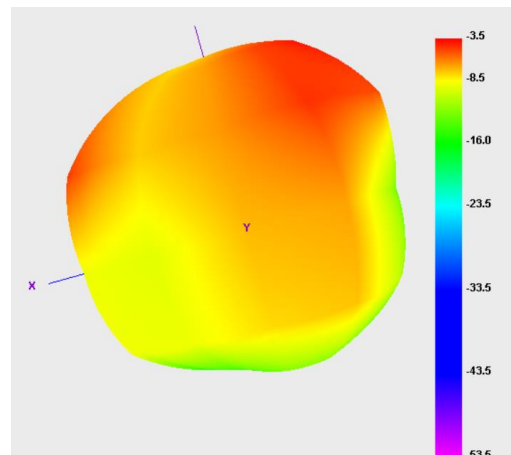
BT 0 Passive Test – Antenna 3D Gain

Frequency (MHz)	Efficiency (%)	Average Gain (dBi)			Max Gain (dBi)		
		Ver	Hor	Total	Ver	Hor	Total
2400	16.17	-8.15	-9.37	-7.91	-6.62	-7.02	-3.30
2410	15.82	-8.26	-9.53	-8.01	-6.61	-7.04	-3.41
2420	16.27	-8.21	-9.36	-7.89	-6.41	-6.77	-3.49
2430	17.54	-7.98	-8.89	-7.56	-6.00	-6.23	-3.44
2440	18.32	-7.85	-8.61	-7.37	-5.75	-5.77	-3.50
2450	18.09	-7.95	-8.67	-7.43	-5.81	-5.69	-3.73
2460	17.56	-8.06	-8.78	-7.55	-6.08	-5.68	-3.99
2470	17.91	-7.97	-8.63	-7.47	-6.19	-5.42	-3.97
2480	18.24	-7.86	-8.46	-7.39	-6.37	-5.20	-3.86

2400MHz



2440MHz



2480MHz

