

WCH941M

Passive Data

2025/08/28

1. Test Condition

* WCH941M Chip Antenna

- Test Chamber: Shine OTA Chamber

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

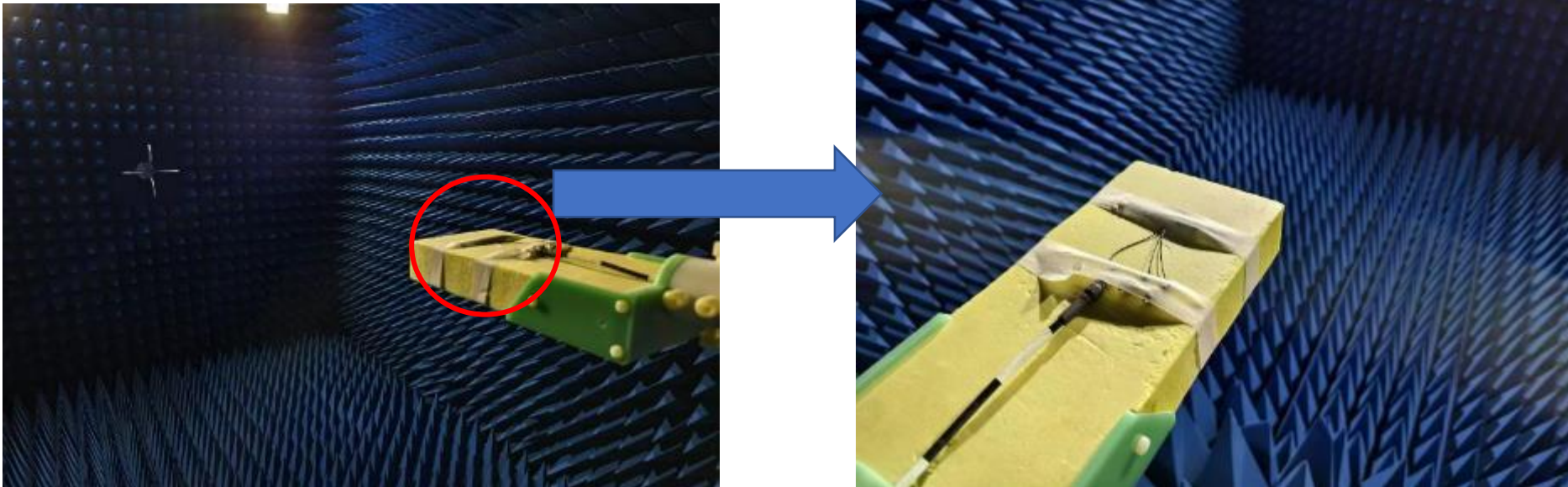
- Network Analyzer : Return Loss

- 3D Passive Chamber : Gain and Efficiency

- Measured by Will Wang 2025/08/28

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.

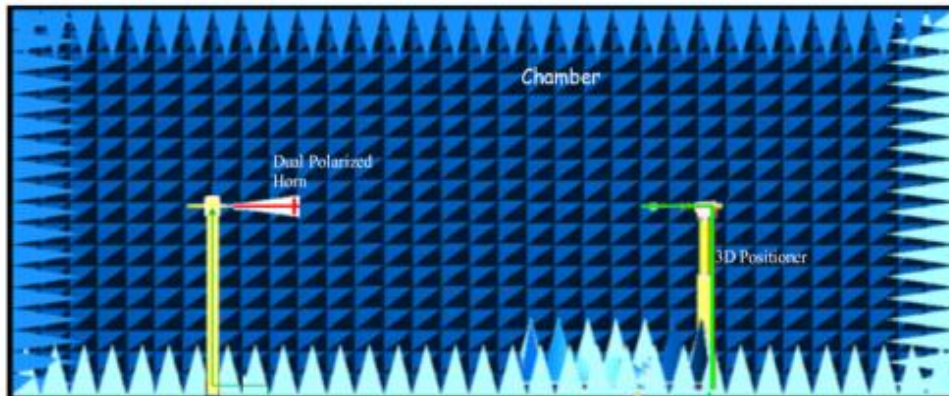


Fig.1 Overview of 3D chamber

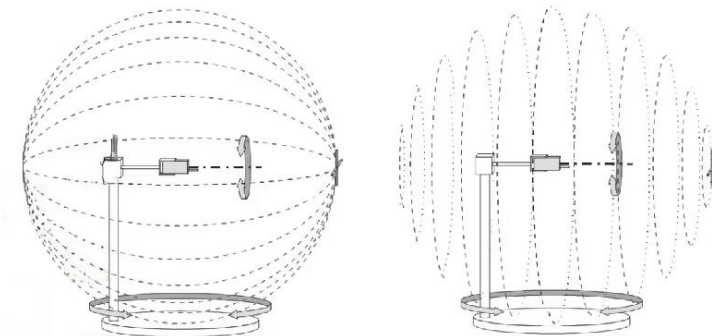


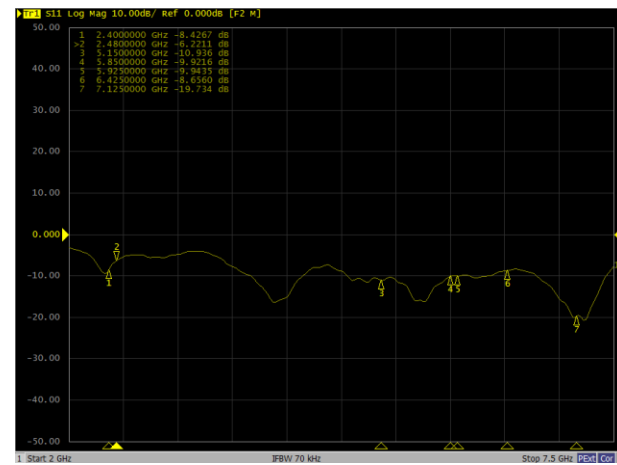
Fig.2 Antenna turntable rotation sampling

Item	Measuring Instruments	Latest Calibration Schedule
1	OTA Chamber	2025/07/06
2	Network Analyzer Keysight 5071c	2025/06/15

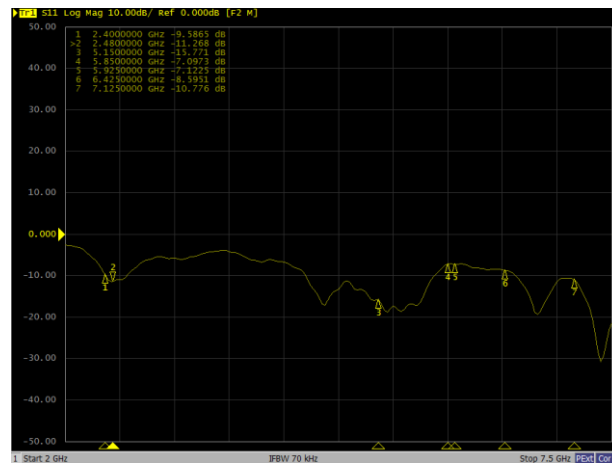
Electrical Characteristics

Item	Specification ANT1				Specification ANT2				Specification BT 1	Specification BT 2
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	-1.42dBi	1.55dBi	0.35dBi	-0.62dBi	0.66dBi	0.54dBi	-2.09dBi	-1.15dBi	-2.18dBi	-4.84dBi
Return Loss	< -6dB				< -6dB				< -6dB	< -6dB
Polarization	Linear				Linear				Linear	Linear
Azimuth Beam width	Omni-directional				Omni-directional				Omni-directional	Omni-directional
Impedance	50Ω				50Ω				50Ω	50Ω
Dimension	12.0*4.5mm				11.5*4.5mm				7.3*2.5mm	6.0*2.8mm

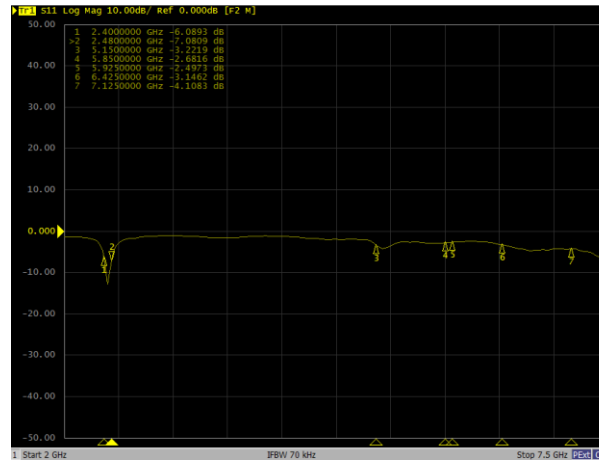
Passive Test – Return Loss



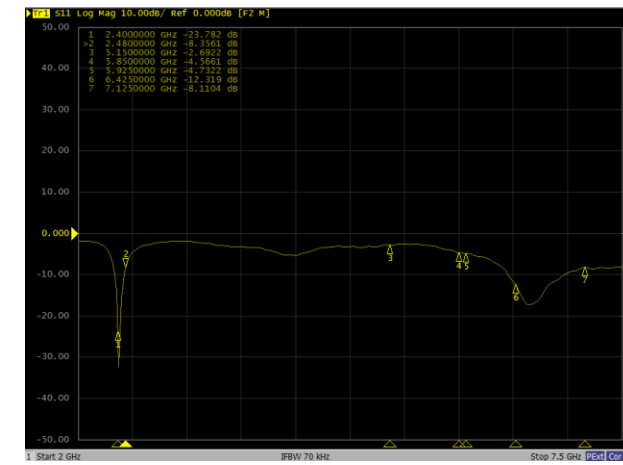
ANT 1



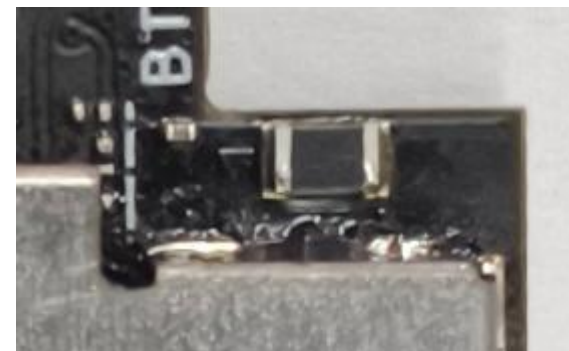
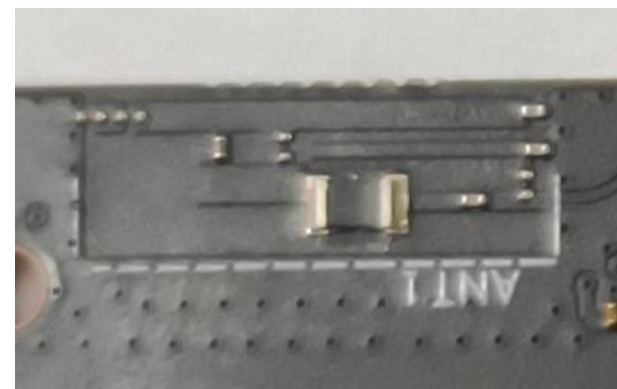
ANT 2



BT 1



BT 2

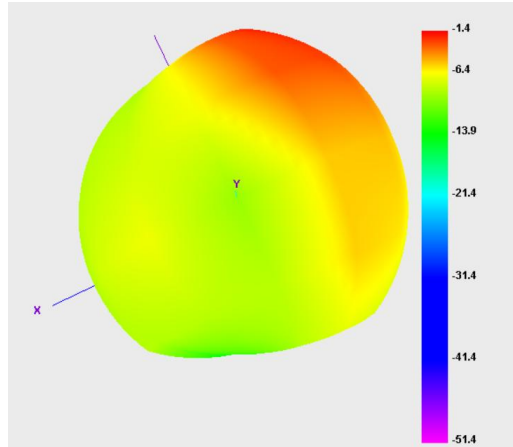


ANT1 Passive Test – Antenna 3D Gain

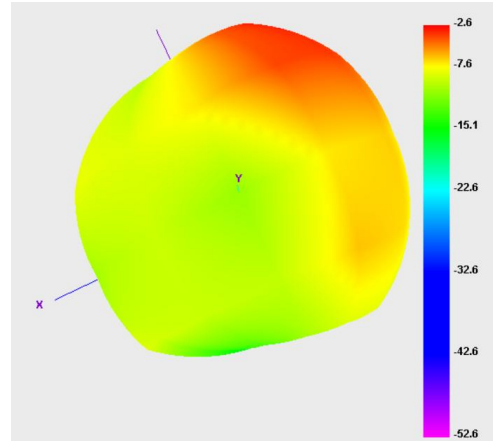
Frequency (MHz)	Efficiency (%)	Average Gain (dBi)			Max Gain (dBi)		
		Ver	Hor	Total	Ver	Hor	Total
2400	24.79	-8.08	-7.19	-6.06	-6.16	-5.17	-1.42
2410	22.06	-8.71	-8.06	-6.56	-6.65	-5.92	-1.92
2420	20.52	-9.12	-8.62	-6.88	-7.04	-6.41	-2.33
2430	20.57	-9.13	-8.73	-6.87	-7.13	-6.47	-2.46
2440	20.88	-9.02	-8.80	-6.80	-7.11	-6.56	-2.56
2450	21.11	-8.92	-8.97	-6.76	-7.03	-6.83	-2.63
2460	20.34	-9.10	-9.35	-6.92	-7.06	-7.21	-2.95
2470	21.02	-8.94	-9.25	-6.77	-6.90	-6.78	-2.89
2480	22.24	-8.64	-8.88	-6.53	-6.71	-6.17	-2.73
5150	33.73	-5.52	-5.47	-4.72	-2.72	-0.64	0.13
5250	33.26	-5.44	-6.17	-4.78	-4.37	-0.29	0.42
5350	38.16	-4.86	-5.44	-4.18	-3.60	0.48	1.40
5450	36.11	-5.17	-5.58	-4.42	-2.93	0.22	1.09
5550	41.25	-4.77	-4.95	-3.85	-2.02	0.37	1.55
5650	37.23	-5.46	-5.37	-4.29	-2.82	-0.40	0.83
5750	40.51	-5.16	-5.22	-3.92	-2.83	0.26	1.21
5850	37.08	-5.70	-5.60	-4.31	-3.26	0.33	1.02
5925	30.89	-6.48	-6.61	-5.10	-3.69	-0.57	0.35
6075	28.97	-7.18	-6.66	-5.38	-4.36	-0.85	0.15
6225	25.49	-7.43	-7.21	-5.94	-5.16	-2.06	-0.97
6375	25.55	-7.18	-7.27	-5.93	-5.19	-1.78	-1.75
6525	28.09	-6.72	-6.40	-5.51	-4.40	-1.53	-1.46
6675	29.56	-6.35	-6.36	-5.29	-4.69	-1.85	-1.50
6825	32.24	-6.16	-5.86	-4.92	-3.74	-2.06	-0.62
6975	26.95	-6.57	-6.22	-5.69	-3.19	-3.03	-1.91
7125	25.77	-6.31	-6.44	-5.89	-3.16	-3.08	-1.96

ANT1 Passive Test – Antenna 3D Radiation Pattern

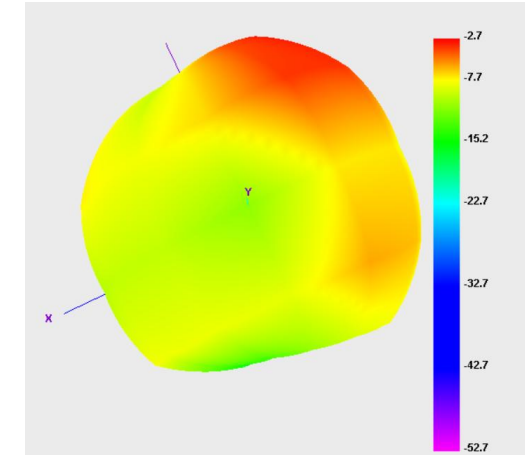
2400MHz



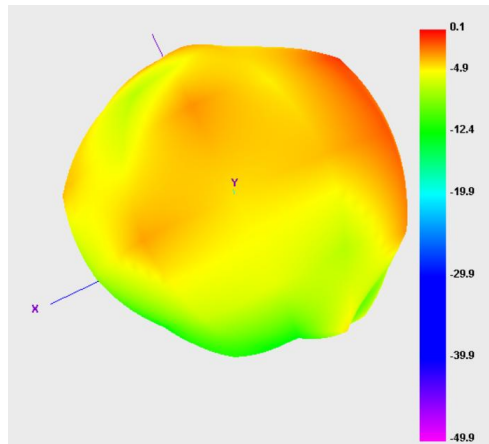
2440MHz



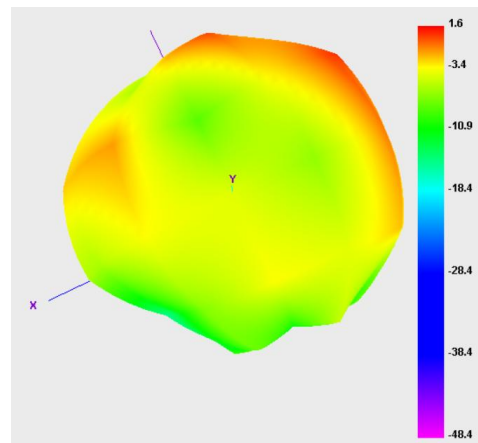
2480MHz



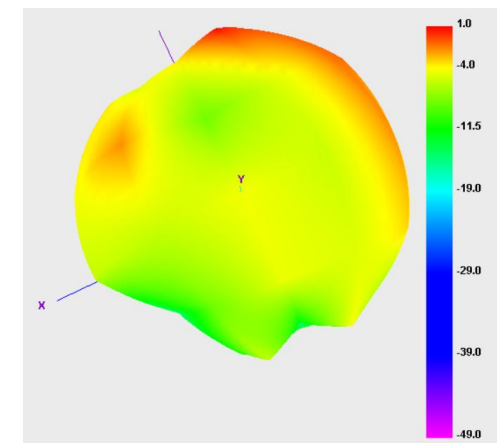
5150MHz



5550MHz

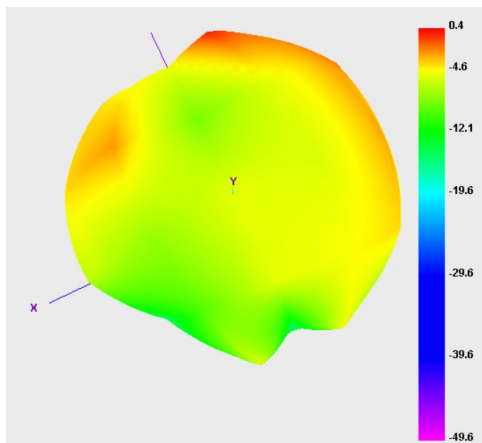


5750MHz

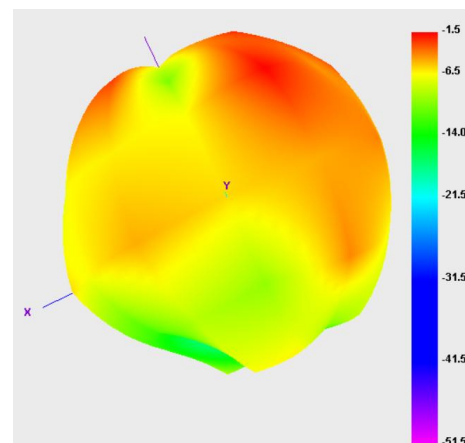


ANT1 Passive Test – Antenna 3D Radiation Pattern

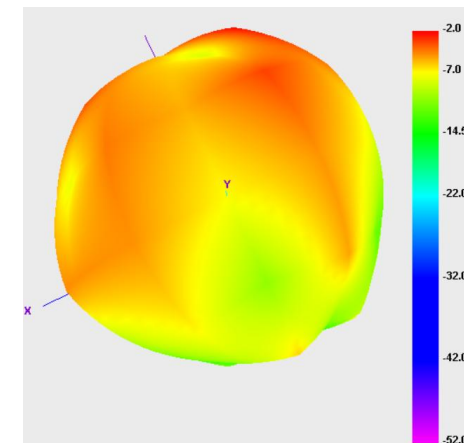
5925MHz



6525MHz



7125MHz

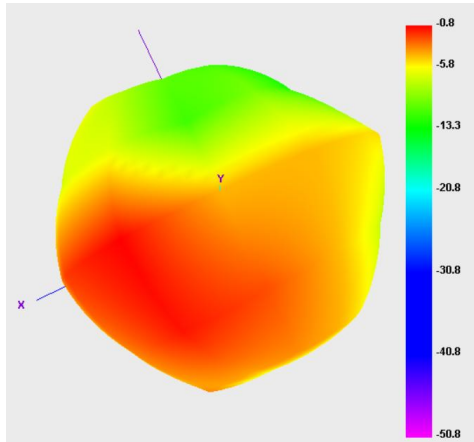


ANT2 Passive Test – Antenna 3D Gain

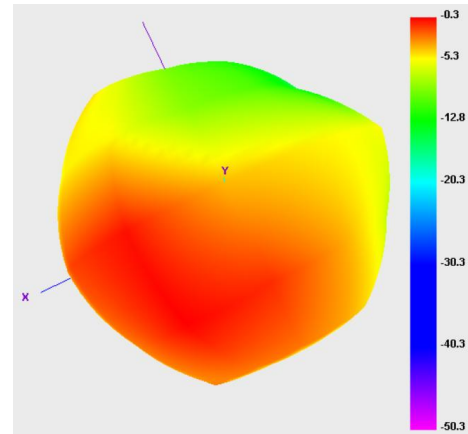
Frequency (MHz)	Efficiency (%)	Average Gain (dBi)			Max Gain (dBi)		
		Ver	Hor	Total	Ver	Hor	Total
2400	29.03	-7.77	-6.46	-5.37	-3.14	-1.02	-0.82
2410	28.61	-7.78	-6.65	-5.44	-3.26	-1.31	-1.01
2420	29.59	-7.63	-6.60	-5.29	-3.16	-1.16	-0.96
2430	31.75	-7.34	-6.42	-4.98	-2.82	-0.73	-0.61
2440	33.67	-7.10	-6.35	-4.73	-2.50	-0.57	-0.27
2450	33.65	-7.10	-6.60	-4.73	-2.39	-0.68	-0.19
2460	34.47	-6.96	-6.70	-4.63	-2.22	-0.69	0.00
2470	36.03	-6.72	-6.69	-4.43	-1.89	-0.56	0.27
2480	38.17	-6.39	-6.60	-4.18	-1.52	-0.36	0.66
5150	35.58	-7.09	-6.26	-4.49	-2.65	-3.10	-0.74
5250	36.07	-6.74	-6.25	-4.43	-2.41	-2.89	-0.15
5350	39.52	-6.54	-5.55	-4.03	-1.81	-2.88	0.54
5450	36.81	-7.15	-5.67	-4.34	-2.46	-3.13	-0.05
5550	36.45	-7.45	-5.82	-4.38	-2.57	-2.76	-0.15
5650	31.96	-7.82	-6.59	-4.95	-3.45	-3.08	-0.38
5750	31.47	-7.44	-6.80	-5.02	-3.12	-3.00	-0.59
5850	25.07	-8.39	-7.71	-6.01	-4.67	-4.14	-1.44
5925	21.98	-9.50	-8.64	-6.58	-5.69	-4.82	-2.09
6075	20.72	-9.84	-9.16	-6.84	-5.76	-5.75	-2.13
6225	18.08	-9.90	-9.59	-7.43	-5.71	-6.30	-2.75
6375	16.59	-10.45	-9.78	-7.80	-5.72	-5.28	-3.78
6525	17.58	-9.69	-9.60	-7.55	-5.67	-5.73	-3.51
6675	20.69	-9.07	-8.61	-6.84	-5.70	-4.35	-1.63
6825	23.92	-8.30	-8.18	-6.21	-5.01	-2.74	-1.15
6975	20.23	-9.08	-8.96	-6.94	-6.67	-3.55	-2.70
7125	21.79	-8.92	-8.25	-6.62	-6.72	-3.00	-2.89

ANT2 Passive Test – Antenna 3D Radiation Pattern

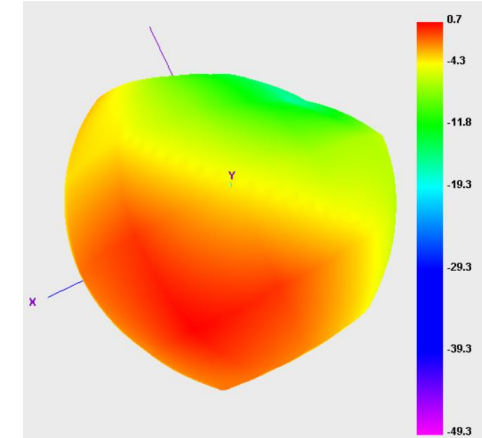
2400MHz



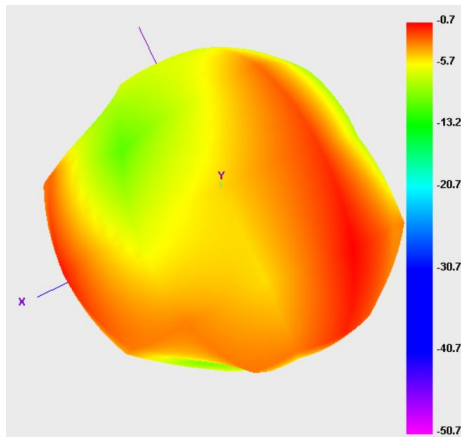
2440MHz



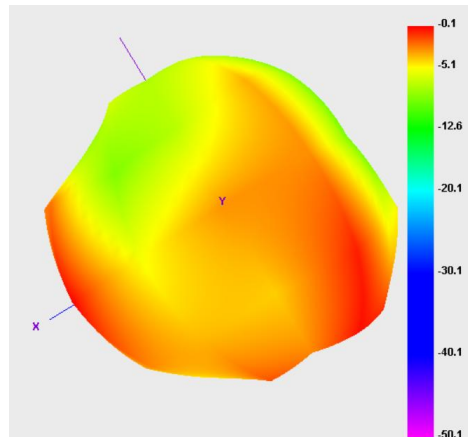
2480MHz



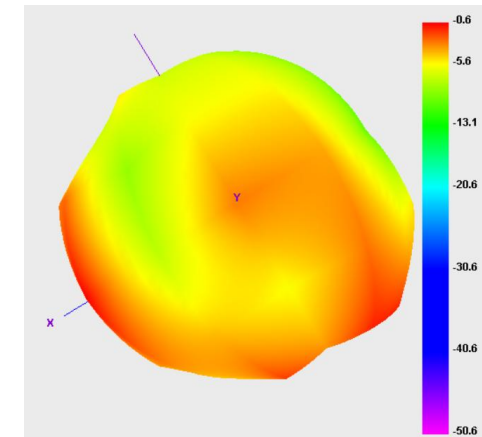
5150MHz



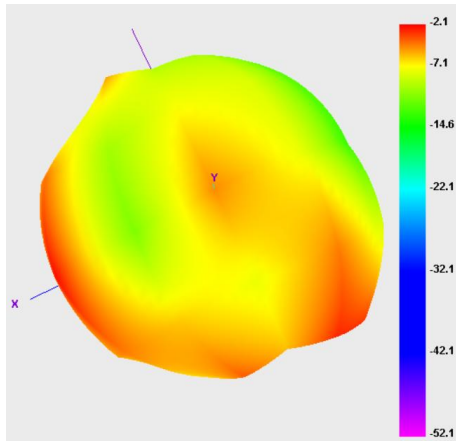
5550MHz



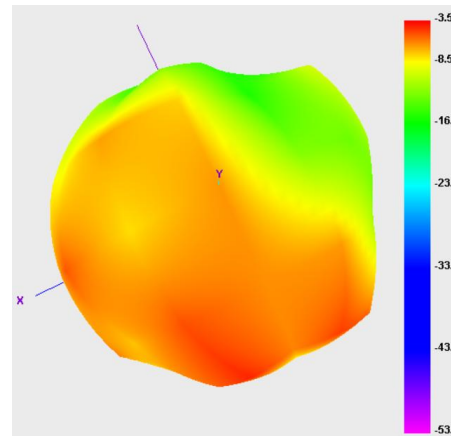
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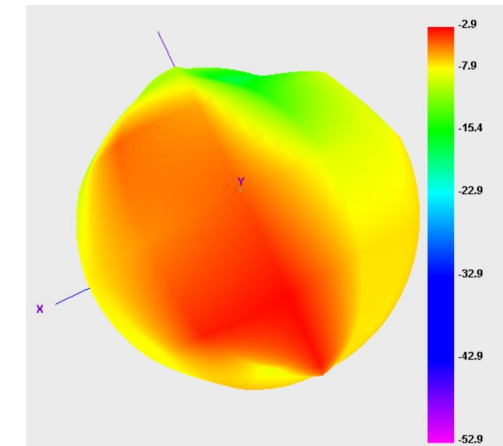
5925MHz



6525MHz



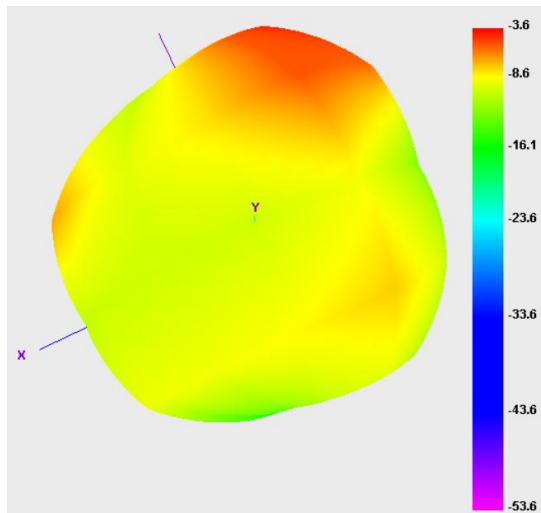
7125MHz



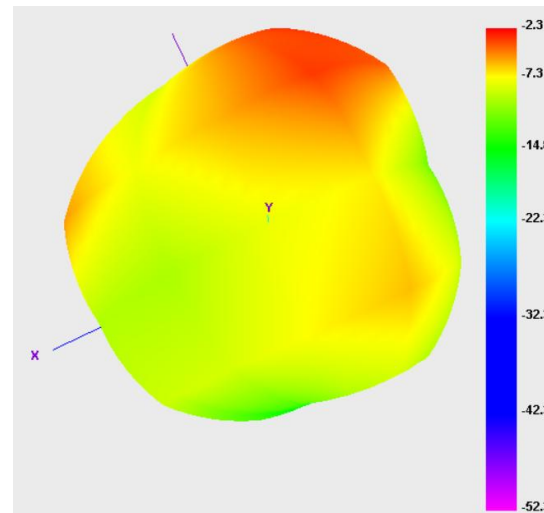
BT 1 Passive Test – Antenna 3D Gain

Frequency (MHz)	Efficiency (%)	Average Gain (dBi)			Max Gain (dBi)		
		Ver	Hor	Total	Ver	Hor	Total
2400	16.83	-8.86	-10.12	-7.74	-6.32	-7.40	-3.62
2410	17.47	-8.66	-10.07	-7.58	-6.00	-7.18	-3.41
2420	18.93	-8.28	-9.71	-7.23	-5.52	-6.67	-3.06
2430	20.58	-7.93	-9.22	-6.87	-4.99	-6.08	-2.84
2440	20.66	-7.53	-8.63	-6.85	-4.46	-5.36	-2.30
2450	20.36	-7.66	-8.61	-6.91	-4.46	-5.21	-2.31
2460	20.8	-7.60	-8.46	-6.82	-4.42	-4.88	-2.18
2470	19.29	-8.17	-9.00	-7.15	-5.08	-5.31	-2.73
2480	17.76	-8.58	-9.34	-7.51	-5.65	-5.56	-3.09

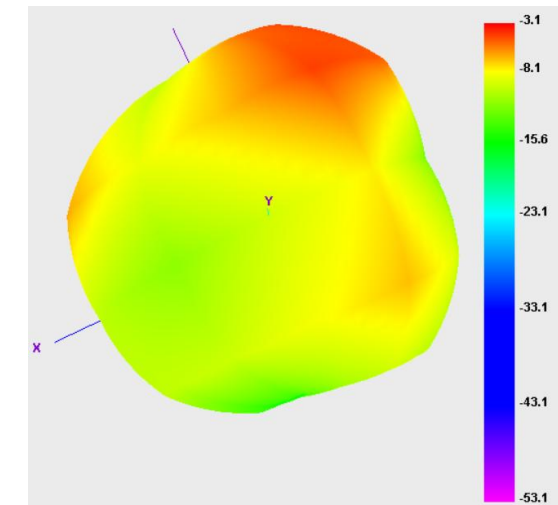
2400MHz



2440MHz



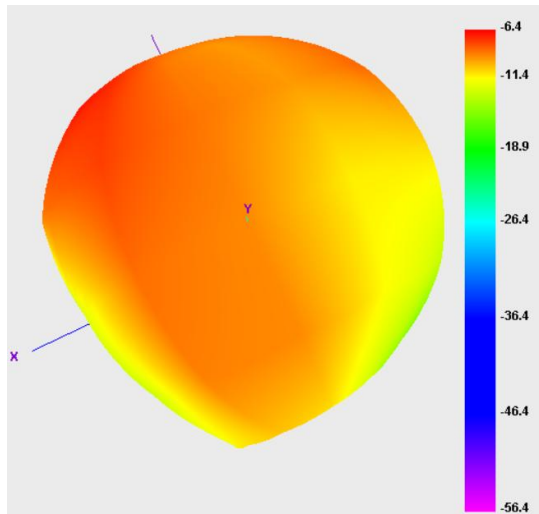
2480MHz



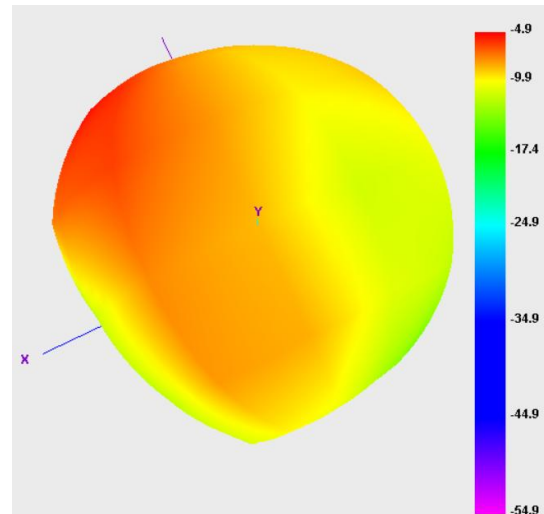
BT 2 Passive Test – Antenna 3D Gain

Frequency (MHz)	Efficiency (%)	Average Gain (dBi)			Max Gain (dBi)		
		Ver	Hor	Total	Ver	Hor	Total
2400	10.12	-10.65	-10.67	-9.95	-7.29	-8.21	-6.35
2410	11.39	-10.11	-10.19	-9.44	-6.68	-7.76	-5.76
2420	12.24	-9.77	-9.96	-9.12	-6.21	-7.50	-5.24
2430	12.09	-9.82	-10.05	-9.17	-6.10	-7.59	-5.07
2440	12.15	-9.83	-10.00	-9.16	-6.05	-7.47	-4.92
2450	12.16	-9.85	-9.97	-9.15	-6.12	-7.35	-4.84
2460	11.85	-9.95	-10.11	-9.26	-6.38	-7.48	-4.90
2470	11.28	-10.15	-10.37	-9.48	-6.79	-7.77	-5.10
2480	10.63	-10.39	-10.58	-9.73	-7.33	-7.88	-5.37

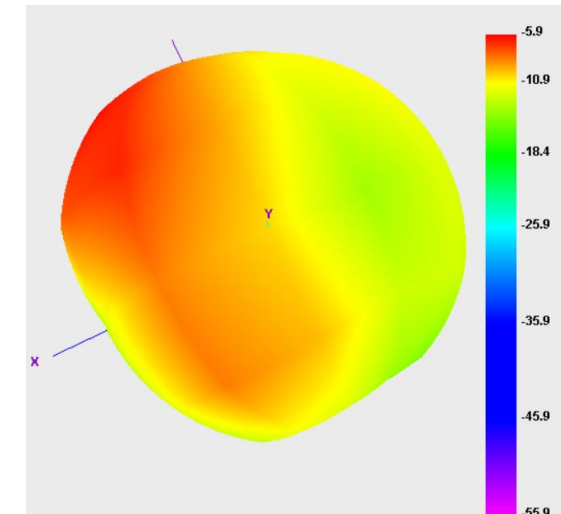
2400MHz



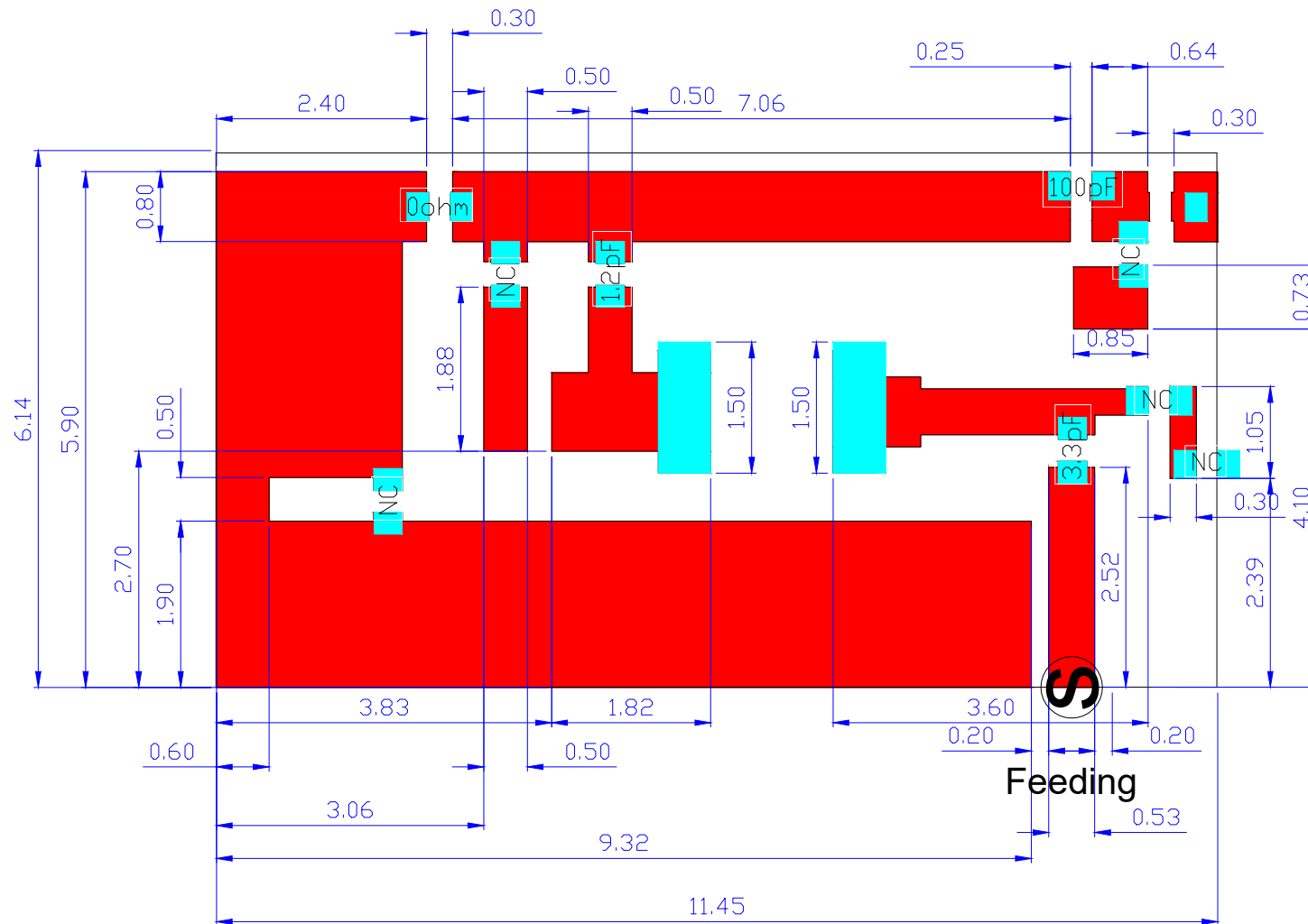
2440MHz



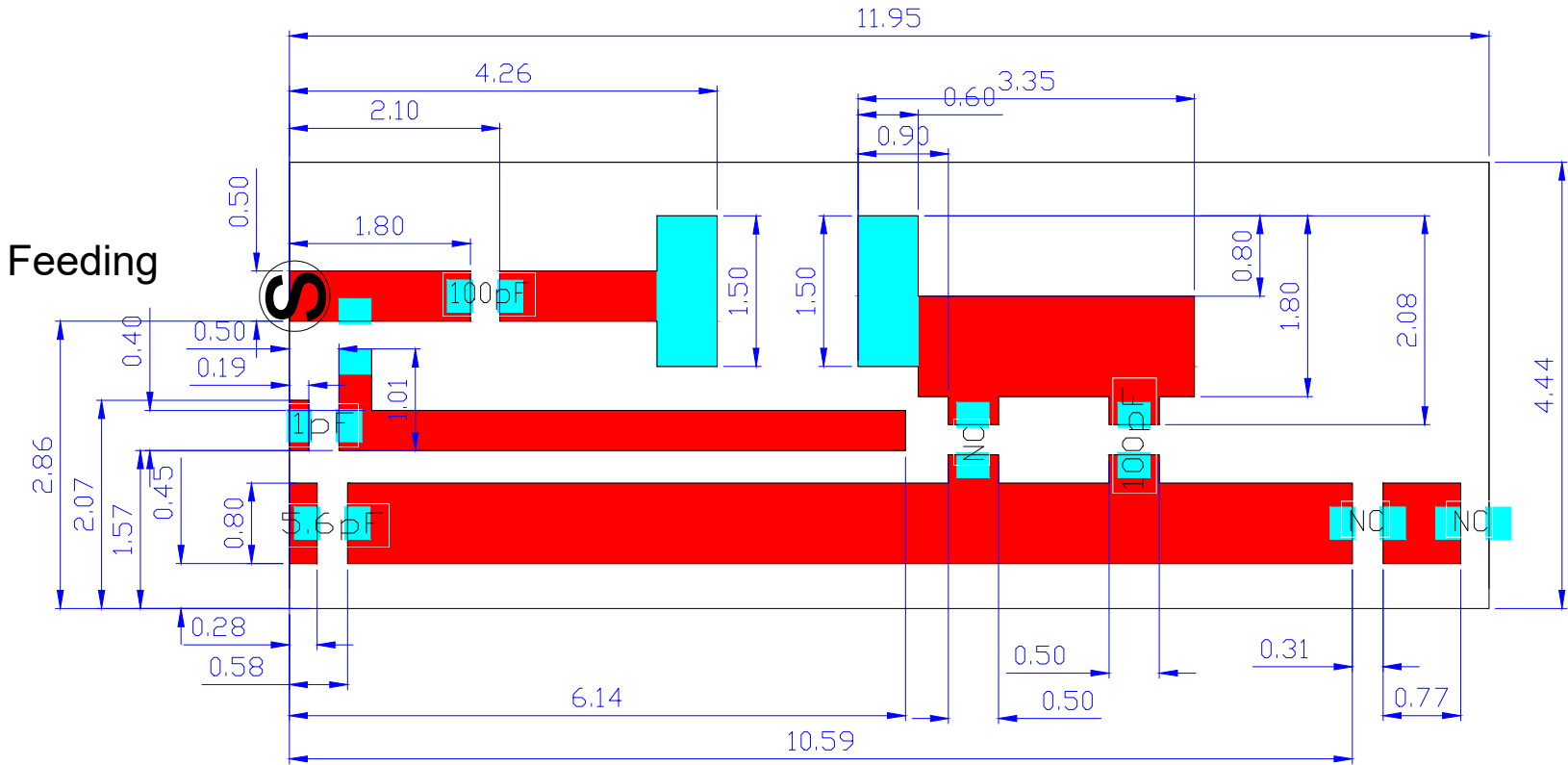
2480MHz



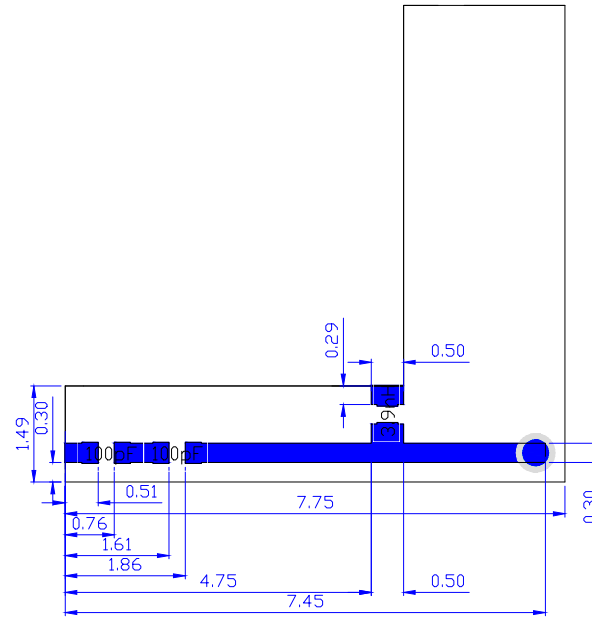
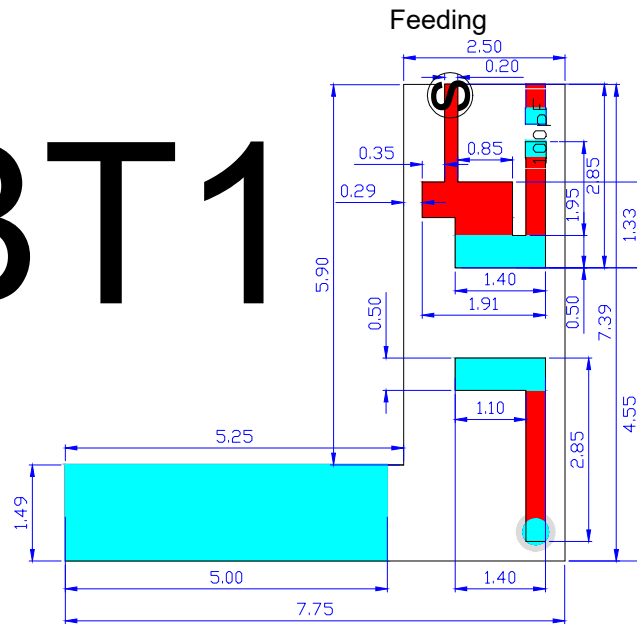
ANT0



ANT1



BT1



BT1

Technical drawing of a PCB layout showing dimensions and component footprints. The drawing includes the following dimensions and labels:

- Overall Dimensions:**
 - Top: 2.78
 - Left: 1.50
 - Bottom: 6.19
 - Right: 4.05
- Component Footprints and Dimensions:**
 - Top Left:** 0.94, 0.30, 0.30, 0.60, 1.50, 0.27
 - Top Right:** 0.60, 1.18, 0.20
 - Bottom Left:** 1.07, 0.65, 0.40, 0.27, 0.57, 0.76, 1.56, 1.89, 2.51
 - Bottom Right:** 0.60, 1.18, 0.20
- Labels:**
 - 3.9mH
 - NC
 - 0.0m
 - NC