WiFi Dual Band PCB Substrate Antenna

TEST REPORT

Customer: 宇翔

Project: Z2

Antenna Size: 50D5005 & 50D8008

Version: C.

Date: June 3, 2014.

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Prepared by: **Ann**

Checked by: **Allen Lin**

Approved by: **Herbert Chou**

Unictron Technologies Corp.

詠業科技股份有限公司 **Unictron Technologies Corporation**

Website: www.unictron.com (TEL)+886-3-5475550

No.41 Shuei-Keng, Guan-si, Hsin-Chu 30648 Taiwan

A. Measurement Setup:

1. Reflection Coefficient Measurement

   (a) Equipment : Network Analyzer(Agilent E5071A) (Fig. 1)

   (b) Item : Impedance、Return loss、VSWR

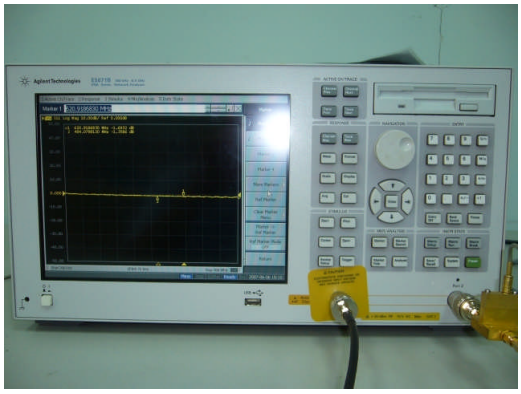

Fig. 1 Network Analyzer

2. Gain Pattern Measurement

   (a) Equipment : Anechoic Chamber, Network Analyzer (Agilent E5071C), Standard Horn. (Fig. 2)

   (b) Item : Gain .

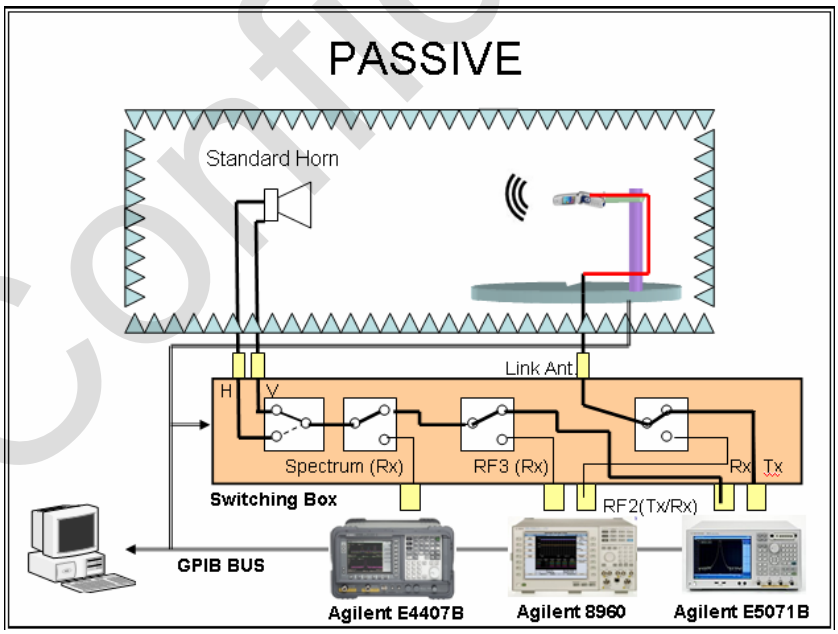

Fig. 2 Anechoic Chamber

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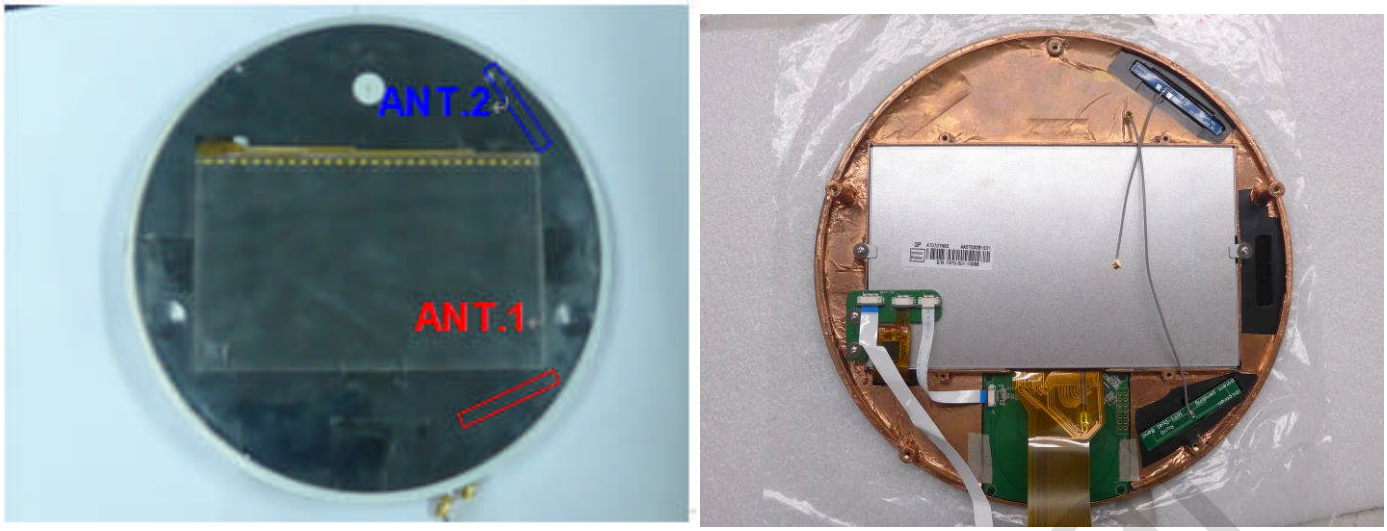

Fig. 3 Antennas Placement

B. Experimental Results:

B-1. Efficiency & Peak Gain v.s. Frequency

WiFi PCB Substrate Antenna-ANT.1 (50D5005)

Frequency(GHz)	2.400	2.412	2.417	2.422	2.427	2.432	2.437	2.442	2.447	2.452	2.457	2.462	2.467	2.472	2.484
Efficiency(dB)	-6.32	-5.81	-5.66	-5.42	-5.26	-5.04	-4.9	-5.01	-5.08	-5.07	-4.96	-5.03	-5.18	-5.33	-5.92
Efficiency (%)	23.33	26.24	27.16	28.71	29.79	31.33	32.36	31.55	31.05	31.12	31.92	31.41	30.34	29.31	25.59
Gain (dBi)	2.11	2.64	2.89	3.19	3.41	3.7	3.91	3.75	3.75	3.72	3.86	3.76	3.61	3.48	2.87

WiFi Dual Band PCB Substrate Antenna-ANT.2 (50D8008)

Frequency(GHz)	2.400	2.412	2.417	2.422	2.427	2.432	2.437	2.442	2.447	2.452	2.457	2.462	2.467	2.472	2.484
Efficiency(dB)	-6.41	-6.18	-6.01	-5.82	-5.68	-5.6	-5.55	-5.57	-5.59	-5.79	-5.95	-5.96	-5.94	-6.12	-6.29
Efficiency (%)	22.86	24.1	25.06	26.18	27.04	27.54	27.86	27.73	27.61	26.36	25.41	25.35	25.47	24.43	23.5
Gain (dBi)	0.58	0.84	1.09	1.38	1.53	1.64	1.65	1.55	1.62	1.51	1.32	1.35	1.36	1.07	0.84

Frequency(GHz)	4.900	4.950	5.000	5.050	5.100	5.150	5.200	5.250	5.300	5.350	5.400	5.450	5.500	5.550	5.600
Efficiency(dB)	-1.73	-1.7	-2.26	-2.88	-2.77	-2.45	-2.1	-1.73	-2.06	-1.31	-2.1	-2.32	-1.87	-1.99	-1.97
Efficiency(%)	67.14	67.61	59.43	51.52	52.84	56.89	61.66	67.14	62.23	73.96	61.66	58.61	65.01	63.24	63.53
Gain(dBi)	7.36	7.43	6.9	6.45	6.43	6.91	7.49	7.82	7.47	8.05	7.34	6.78	7.52	7.59	7.56

Frequency(GHz)	5.650	5.700	5.750	5.800	5.850	5.900
Efficiency(dB)	-2.53	-2.45	-2.03	-2.22	-1.81	-2.86
Efficiency(%)	55.85	56.89	62.66	59.98	65.92	51.76
Gain(dBi)	7.06	7.17	7.74	7.5	7.66	6.67

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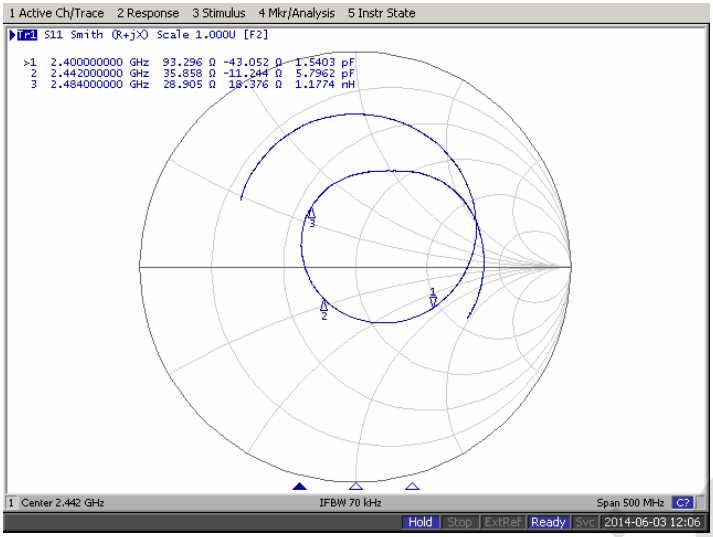
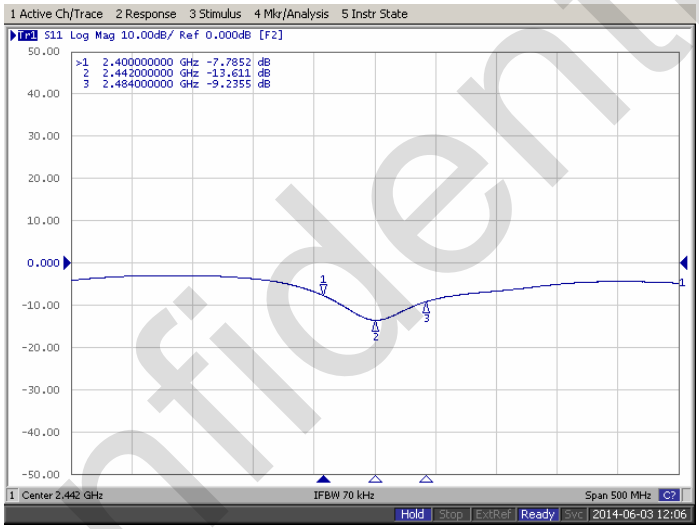
B-2. WiFi PCB Substrate Antenna – Ant.1 (50D5005)

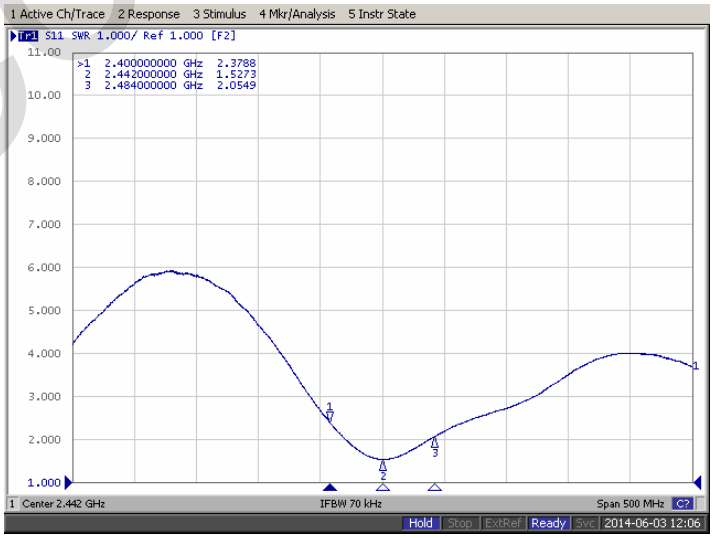
1. Smith Chart



2. Return Loss



3. VSWR



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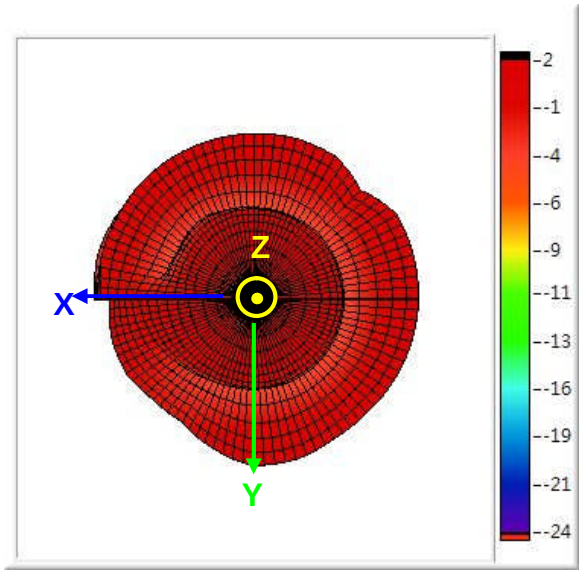
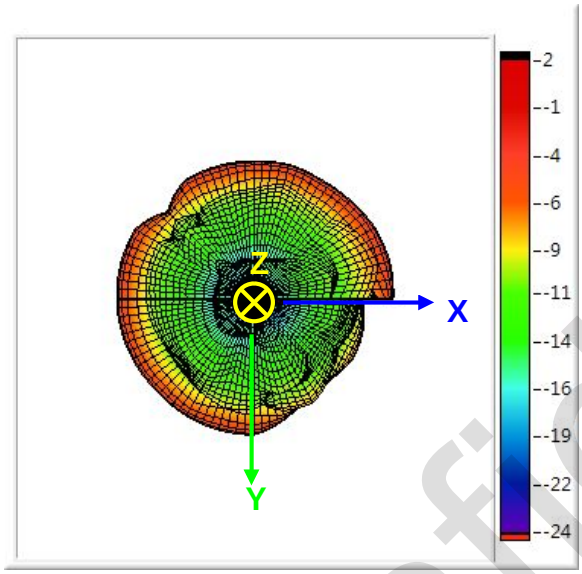
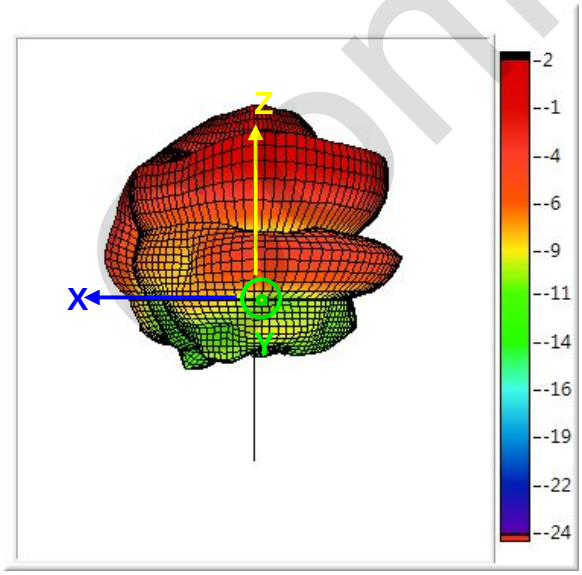
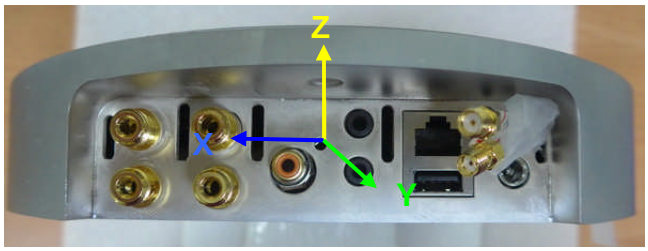
4. 3D Gain Pattern (Radiation Pattern @2442 MHz)









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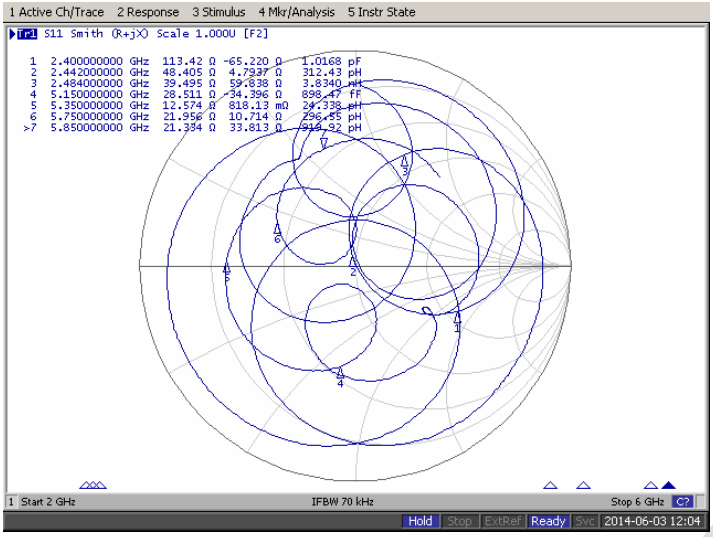
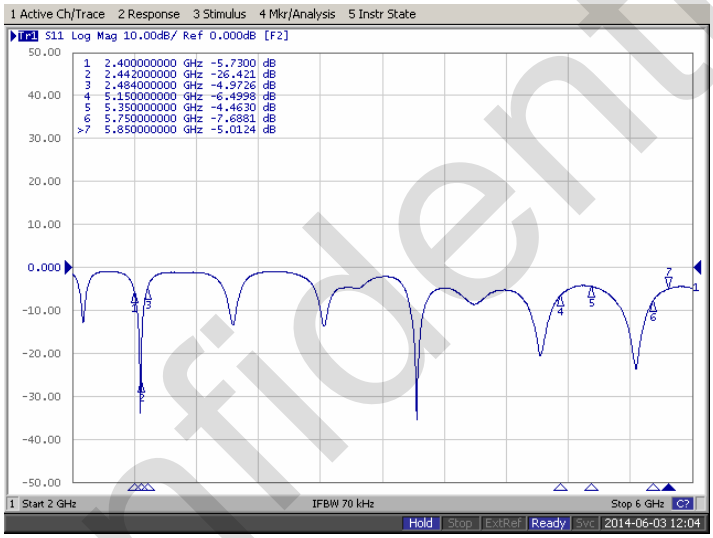
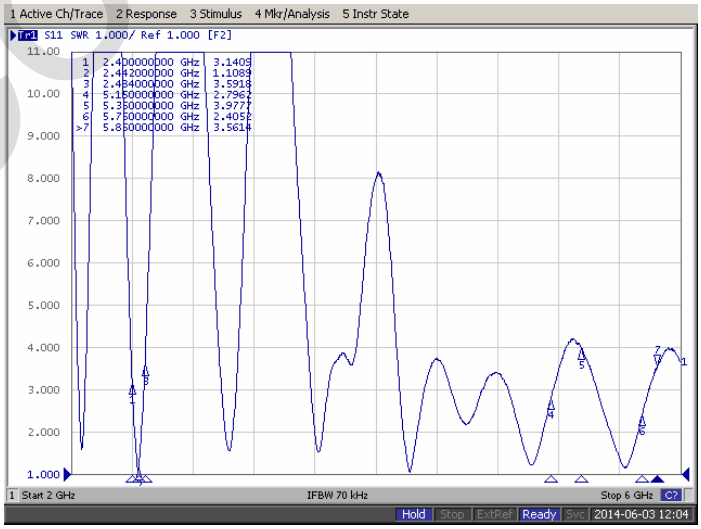
1. Smith Chart



2. Return Loss



3. VSWR



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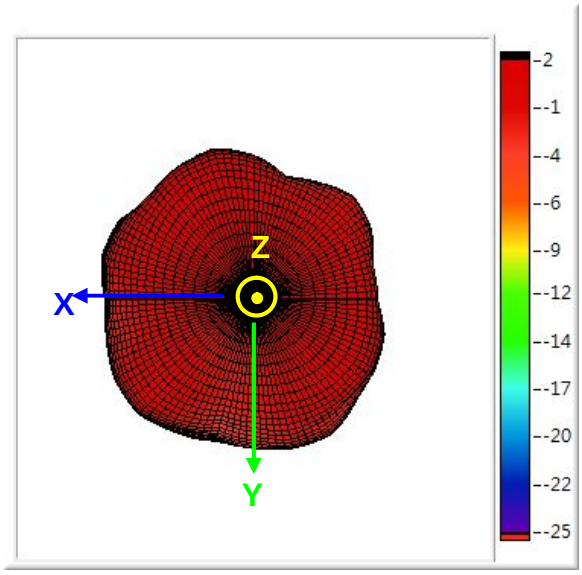
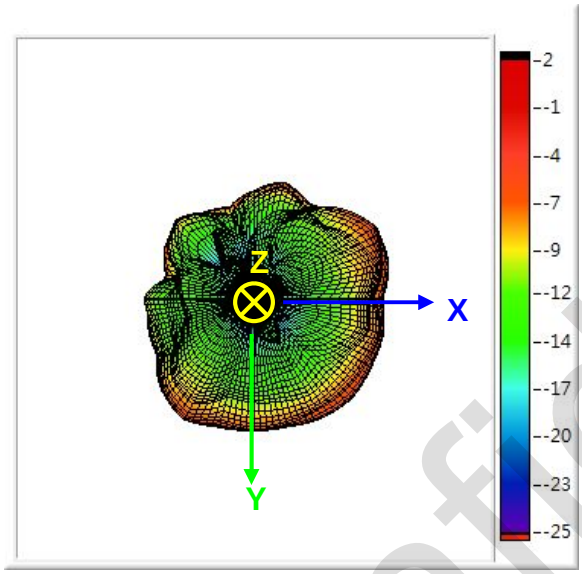
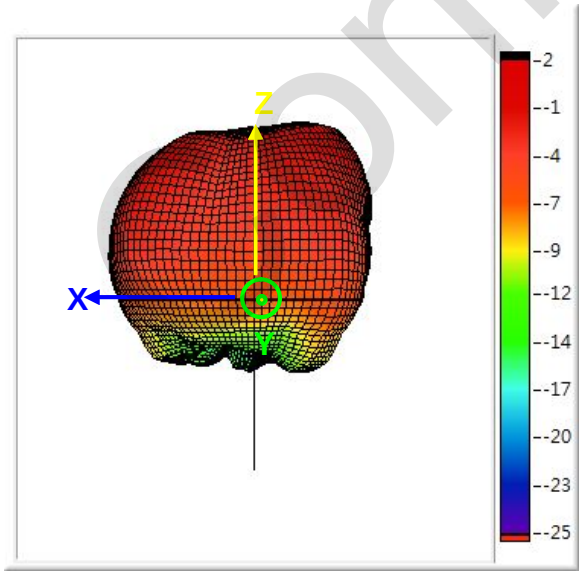
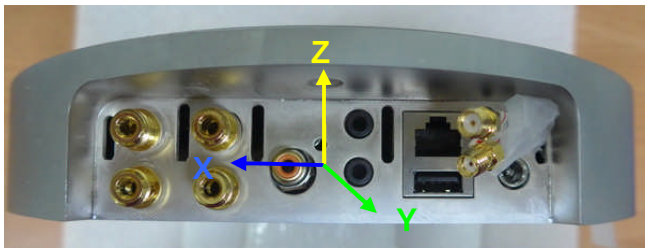
4. 3D Gain Pattern (Radiation Pattern @2442 MHz)









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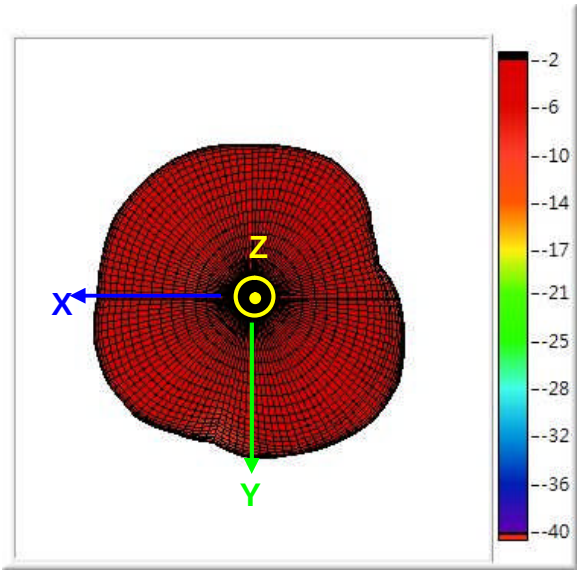
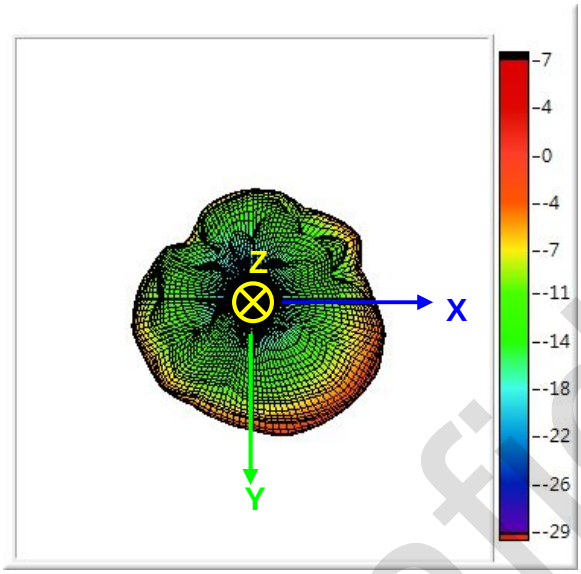
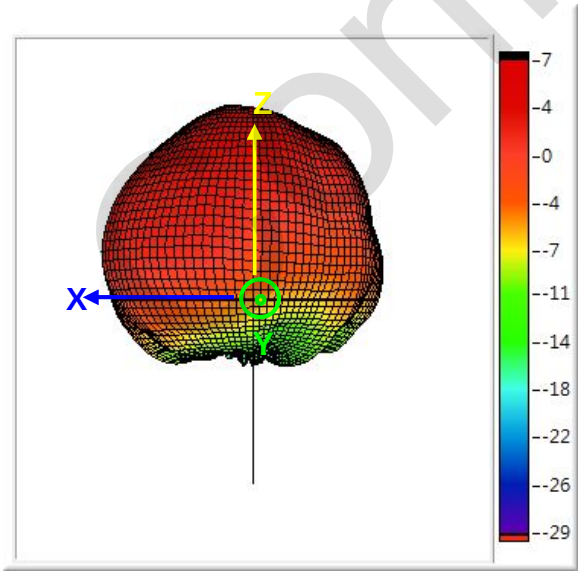
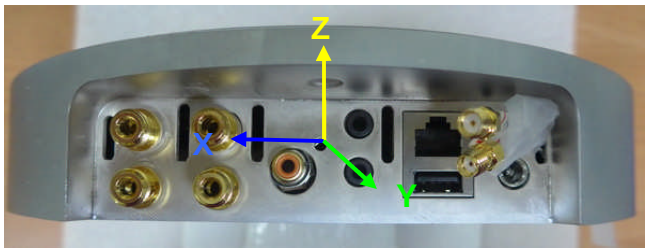
5. 3D Gain Pattern (Radiation Pattern @4900 MHz)









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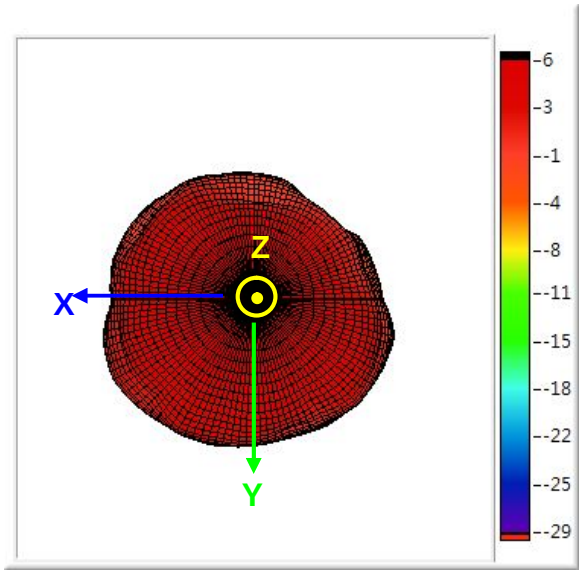
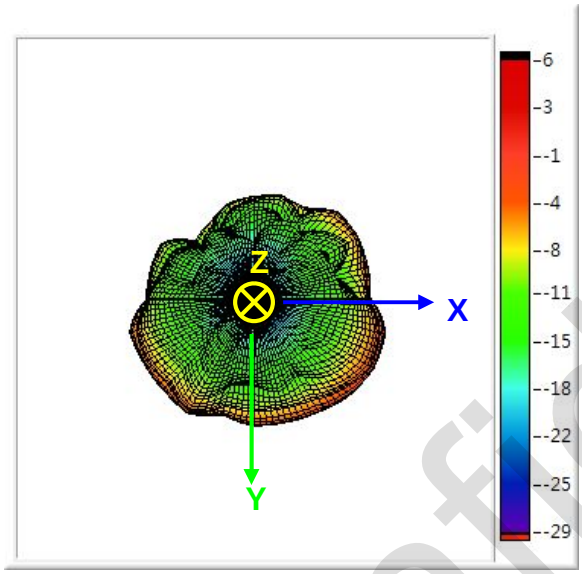
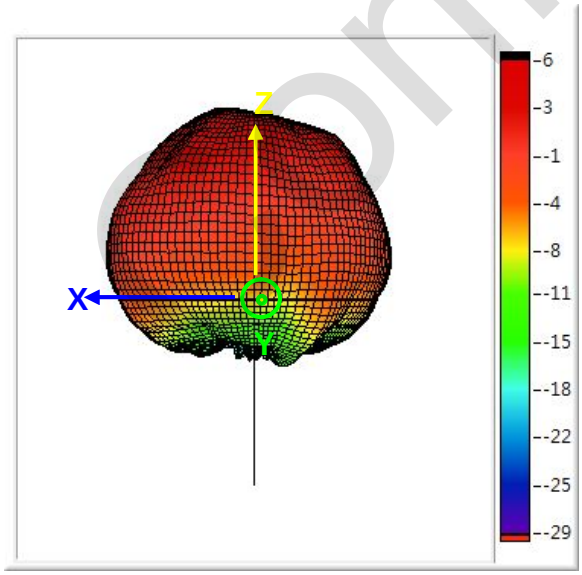
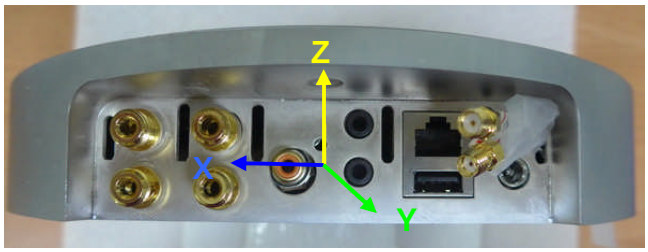
6. 3D Gain Pattern (Radiation Pattern @5150 MHz)









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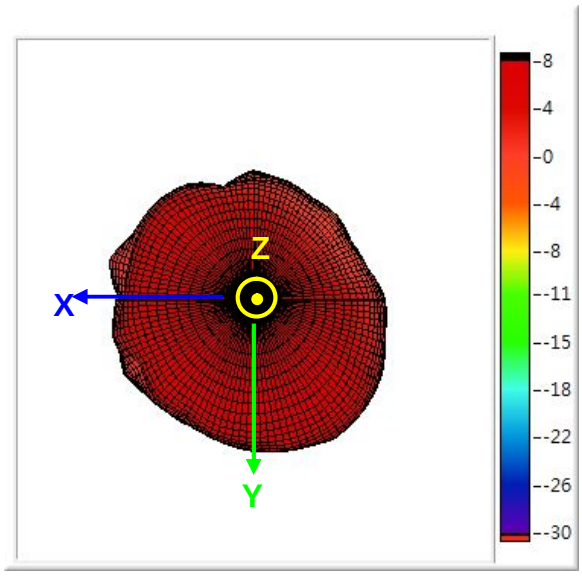
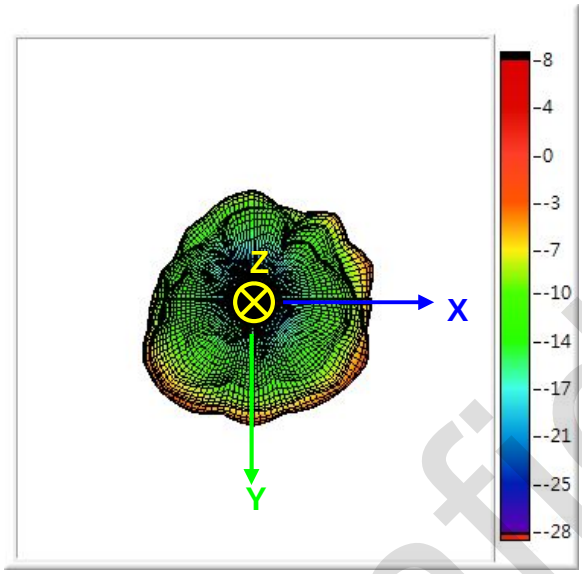
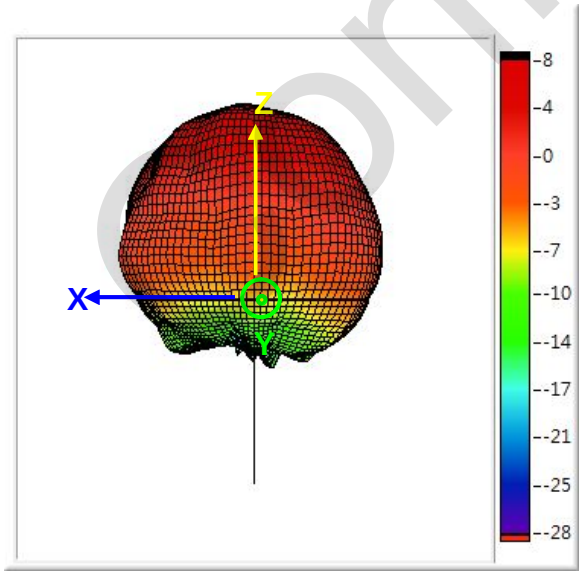
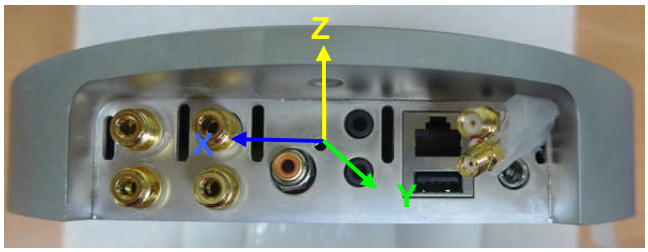
7. 3D Gain Pattern (Radiation Pattern @5550 MHz)









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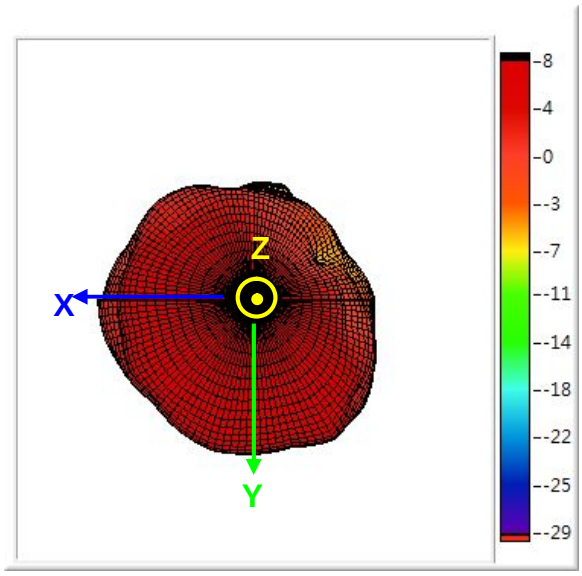
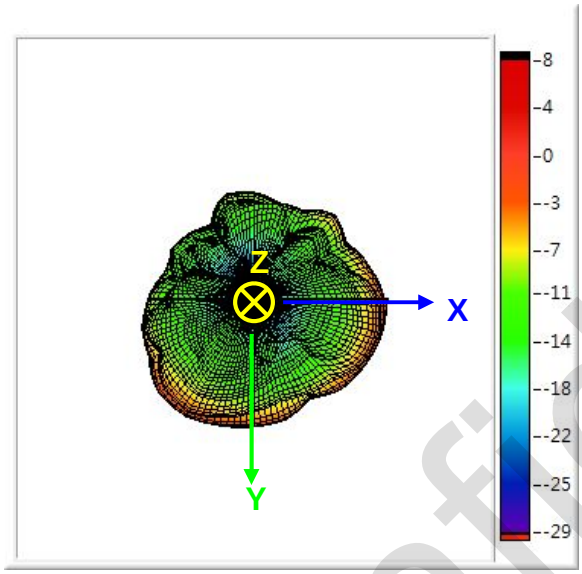
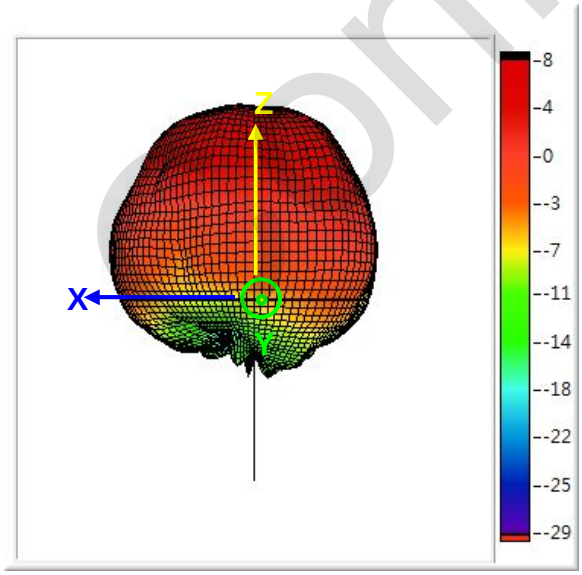
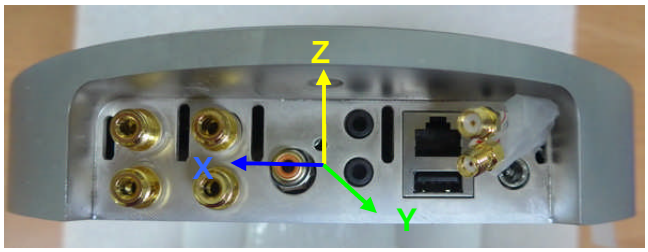
8. 3D Gain Pattern (Radiation Pattern @5850 MHz)









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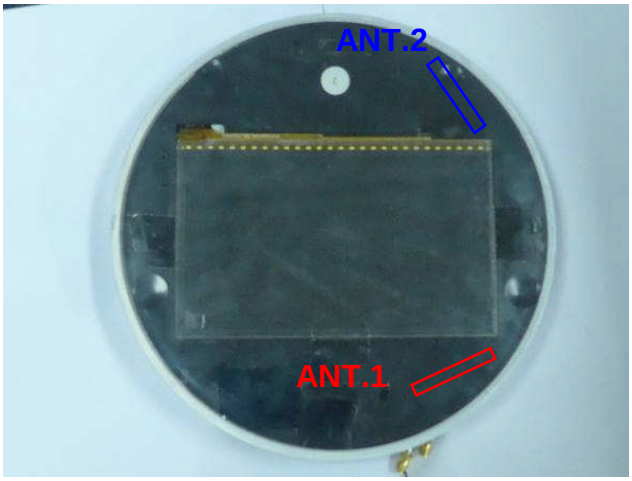
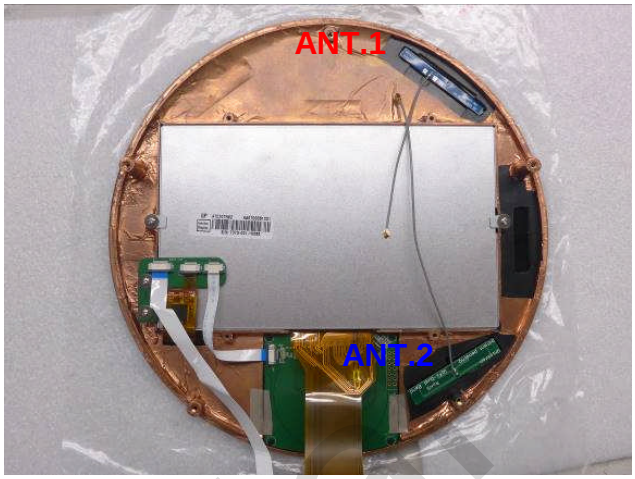
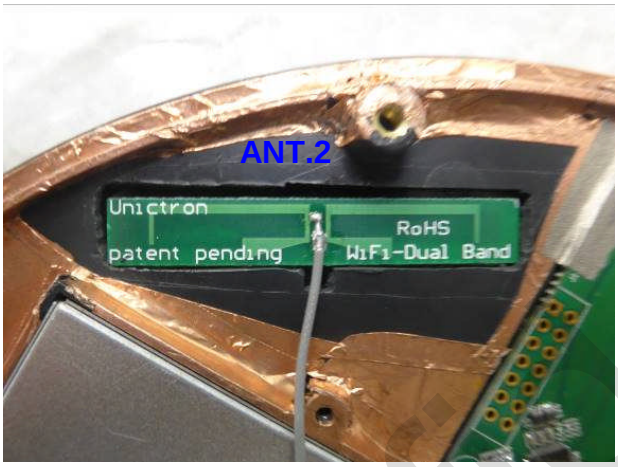
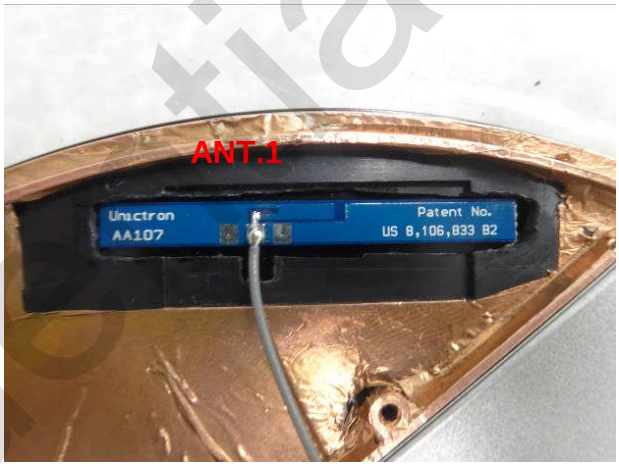
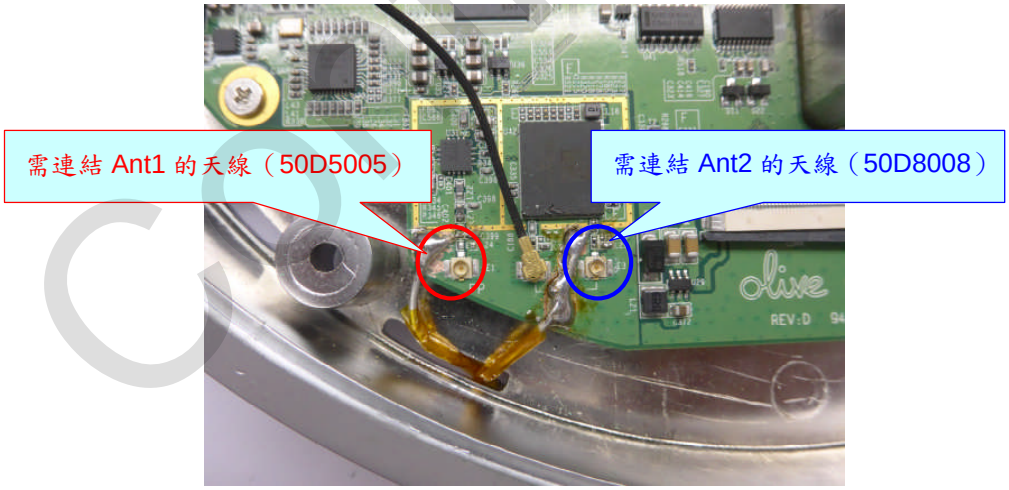
C. PCB Substrate Antenna Location Diagram:











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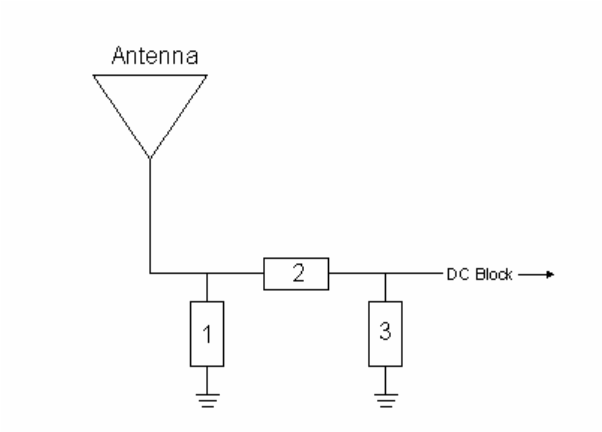
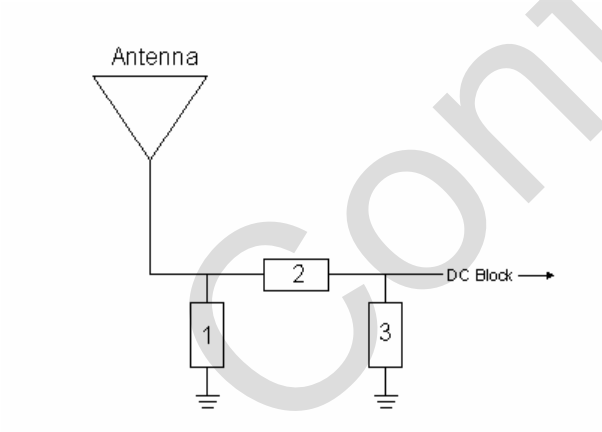
D. Matching Circuit:

WiFi PCB Substrate Antenna-Ant.1 (50D5005)



System Matching Circuit Component		
Location	Description	Vendor
1	5.6 nH	DARFON(0402)
2	0Ω	(0402)
3	N/A	-

WiFi Dual Band PCB Substrate Antenna-Ant.2 (50D8008)



System Matching Circuit Component		
Location	Description	Vendor
1	1.2 nH	DARFON(0402)
2	0Ω	(0402)
3	N/A	-

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