



APPENDIX J

: ANTENNA SPECIFICATION

ANTENNA SPECIFICATIONS

Product Name	BLE Antenna
Model Name	C314 Antenna

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1. Features

- BLE Antenna
- Frequency range : 2.4GHz ~ 2.5GHz
- PCB Pattern Antenna

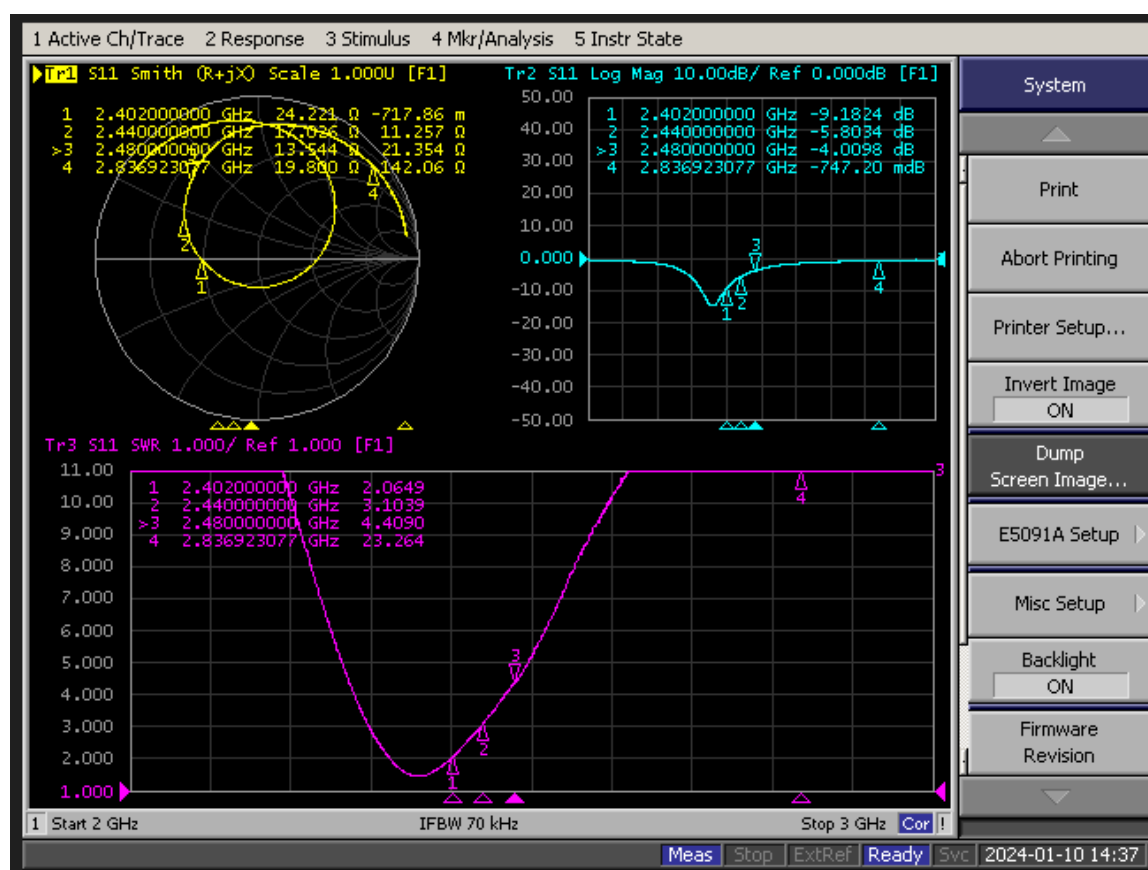
2. Antenna Characteristics

2.1 Antenna Performance

Parameter	Min.	Typ	Max.	Unit
Frequency Range	2400	2450	2500	MHz
Directivity		Omni		-
Polarization		Linear		-
VSWR	3:1			Under
Impedance		50		Ohm

2.2 Network Analyzer Data

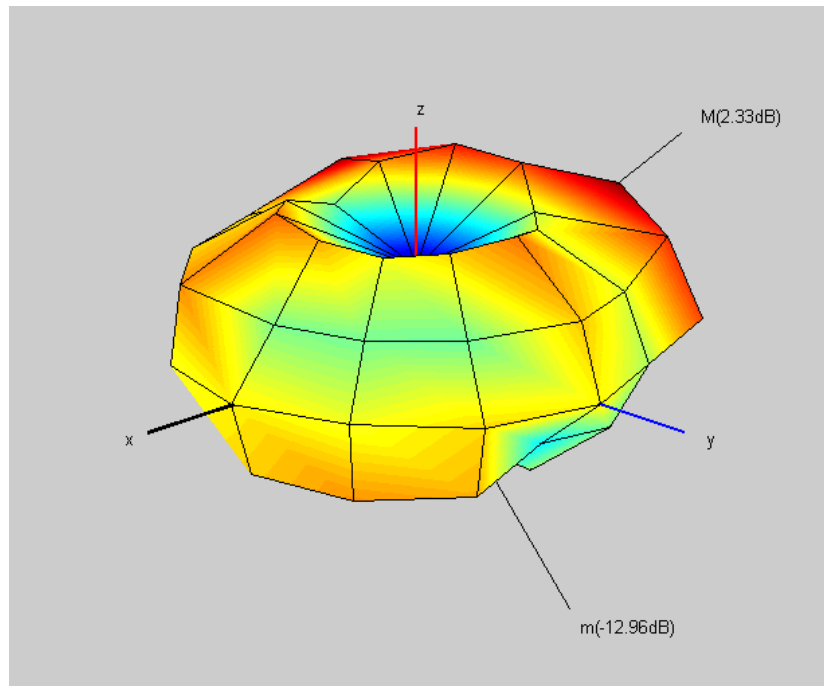
- S11 SWR & SMITH CHART



2.3 Efficiency

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Frequency [MHz]	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445	2450	2455	2460	2465	2470	2475	2480	2485	2490	2500
Efficiency [dB]	-3.49	-3.60	-3.81	-3.72	-4.00	-4.17	-4.32	-4.54	-4.85	-4.90	-5.17	-5.13	-5.21	-5.32	-5.50	-5.64	-5.89	-6.04	-6.10	-6.38
Efficiency [%]	44.79	43.63	41.63	42.47	39.85	38.31	36.98	35.14	32.70	32.39	30.42	30.66	30.15	29.35	28.17	27.26	25.77	24.90	24.53	23.02
TRG [dB]	-3.49	-3.60	-3.81	-3.72	-4.00	-4.17	-4.32	-4.54	-4.85	-4.90	-5.17	-5.13	-5.21	-5.32	-5.50	-5.64	-5.89	-6.04	-6.10	-6.38
TRG ₀ [dB]	-5.97	-6.06	-6.30	-6.15	-6.50	-6.55	-6.84	-7.09	-7.41	-7.51	-7.77	-7.75	-7.87	-7.98	-8.19	-8.34	-8.62	-8.82	-8.87	-9.15
Gain _{Peak} [dB]	1.99	1.87	1.73	1.73	1.43	1.42	1.17	0.99	0.71	0.60	0.48	0.50	0.48	0.38	0.16	0.05	-0.35	-0.46	-0.57	-0.88
Gain _{Min} [dB]	-22.05	-21.93	-21.96	-21.72	-21.93	-22.11	-22.60	-23.46	-24.54	-25.61	-27.27	-28.59	-30.75	-33.40	-36.72	-40.21	-41.17	-40.64	-39.76	-39.51
TRG ₀ [dB]	-7.10	-7.24	-7.41	-7.39	-7.57	-7.90	-7.89	-8.07	-8.37	-8.34	-8.63	-8.58	-8.59	-8.71	-8.86	-8.99	-9.20	-9.28	-9.38	-9.65
Gain _{Peak} [dB]	-0.54	-0.66	-0.74	-0.79	-0.81	-1.16	-1.13	-1.31	-1.60	-1.55	-1.90	-1.83	-1.90	-2.07	-2.24	-2.37	-2.57	-2.66	-2.82	-3.06
Gain _{Min} [dB]	-33.43	-34.44	-35.55	-36.78	-37.82	-38.83	-39.39	-40.56	-42.24	-44.44	-46.64	-49.92	-45.30	-41.60	-38.82	-37.37	-35.97	-35.45	-35.37	-36.56
UHRG [dB]	-5.25	-5.38	-5.58	-5.52	-5.82	-5.98	-6.15	-6.36	-6.68	-6.72	-6.96	-6.94	-6.99	-7.10	-7.28	-7.42	-7.70	-7.83	-7.90	-8.21
UHRG/TRG [%]	66.71	66.45	66.43	66.01	65.70	65.88	65.68	65.74	65.71	65.66	66.14	65.98	66.34	66.39	66.38	66.45	65.89	66.16	66.06	65.61
H-Plane	-6.04	-6.09	-6.37	-6.15	-6.59	-6.59	-6.89	-7.15	-7.48	-7.58	-7.83	-7.79	-7.95	-8.02	-8.22	-8.34	-8.55	-8.77	-8.75	-8.94
E1-Plane, AVG [dB]	-4.65	-4.74	-4.94	-4.85	-5.14	-5.20	-5.50	-5.74	-6.07	-6.14	-6.42	-6.40	-6.53	-6.65	-6.86	-7.01	-7.29	-7.48	-7.53	-7.79
E2-Plane, AVG [dB]	-8.67	-8.72	-9.04	-8.81	-9.22	-9.27	-9.49	-9.77	-10.04	-10.16	-10.42	-10.34	-10.52	-10.58	-10.78	-10.90	-11.13	-11.40	-11.38	-11.71
Peak Gain [dB]	2.34	2.22	2.04	2.09	1.72	1.65	1.46	1.24	0.93	0.92	0.73	0.69	0.72	0.62	0.43	0.30	-0.09	-0.17	-0.25	-0.59
Directivity [dB]	5.83	5.83	5.84	5.81	5.72	5.82	5.78	5.78	5.79	5.81	5.90	5.82	5.92	5.94	5.93	5.94	5.79	5.87	5.85	5.79
Minimum Gain [dB]	-12.96	-13.08	-13.26	-13.26	-13.47	-13.73	-13.83	-14.05	-14.34	-14.31	-14.61	-14.50	-14.62	-14.85	-15.14	-15.35	-15.52	-15.62	-15.75	-16.23
Test Condition	FS																			
Antenna Type	FS=Free Space, BHR=Beside Head Right Side, BHL=Beside Head Left Side, HR=Hand Right, HL=Hand Left, BHHR=Beside Head and Hand Right Side, BHHL=Beside Head and Hand Left Side, NB=Notebook																			
Average Efficiency	-4.80 dB, 33.11 %																			

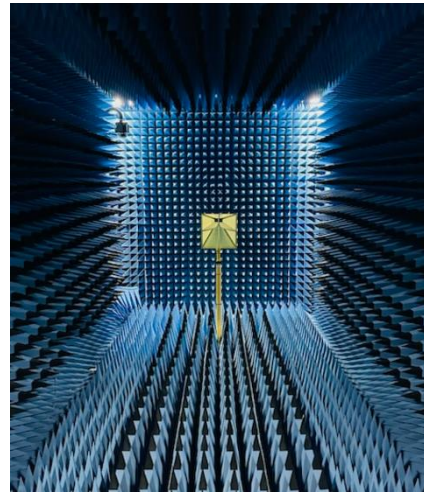
2.4 Radiation Pattern



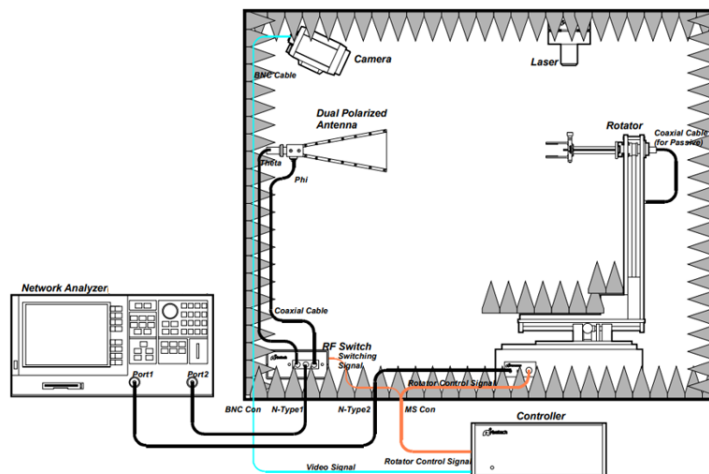
<2450MHz>

3. Antenna Test Condition

- CTIA OTA Test Chamber : 6.0 x 3.0 x 3.0 m



- Passive Test System



- Active Test System

