



APPENDIX J

: ANTENNA SPECIFICATION

ANTENNA SPECIFICATIONS

Product Name	BLE Antenna
Model Name	C401 Antenna

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1. Features

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

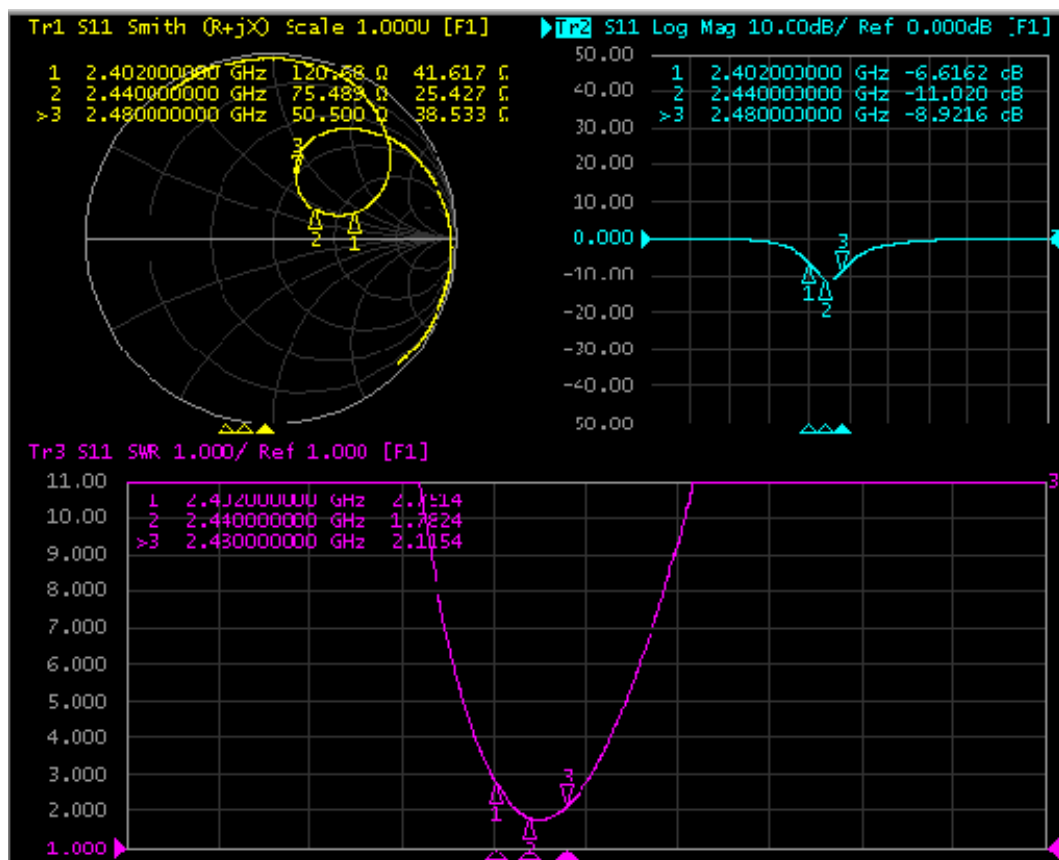
2. Antenna Characteristics

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

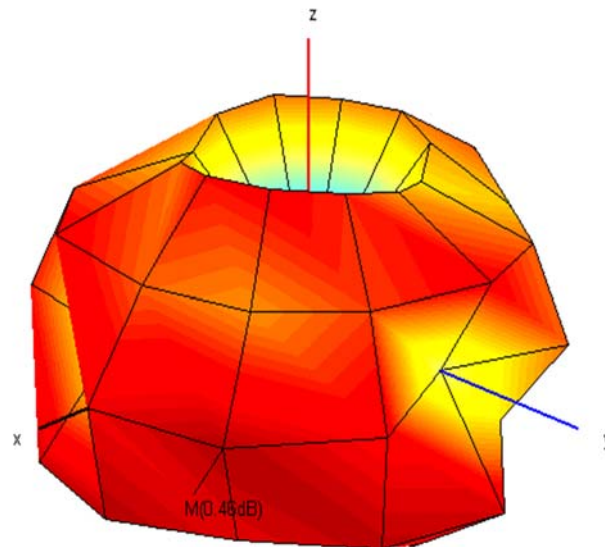
- S11 SWR & SMITH CHART



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]	-3.34	-3.35	-3.44	-3.33	-3.47	-3.46	-3.59	-3.67	-3.89	-3.90	-4.08	-4.08	-4.08	-4.15	-4.25	-4.39	-4.52	-4.56	-4.61	-4.71
Efficiency [%]	46.30	46.25	45.28	46.50	45.03	45.07	43.77	42.90	40.86	40.70	39.12	39.11	39.07	38.48	37.61	36.43	35.35	35.01	34.60	33.83
TRG [dB]	-3.34	-3.35	-3.44	-3.33	-3.47	-3.46	-3.59	-3.67	-3.89	-3.90	-4.08	-4.08	-4.08	-4.15	-4.25	-4.39	-4.52	-4.56	-4.61	-4.71
TRG _g [dB]	-4.89	-4.90	-4.98	-4.88	-5.03	-4.94	-5.15	-5.26	-5.48	-5.52	-5.69	-5.72	-5.73	-5.82	-5.95	-6.11	-6.29	-6.38	-6.47	-6.59
Gain _{g Peak} [dB]	1.39	1.38	1.32	1.36	1.26	1.33	1.09	1.00	0.72	0.62	0.45	0.31	0.28	0.04	-0.11	-0.36	-0.64	-0.70	-0.81	-0.80
Gain _{g Min} [dB]	-27.30	-27.17	-27.36	-27.48	-27.85	-28.06	-28.24	-28.09	-27.61	-26.42	-25.33	-26.38	-28.09	-30.40	-33.18	-36.43	-43.17	-51.29	-40.24	-32.66
TRG _g [dB]	-8.57	-8.58	-8.69	-8.55	-8.66	-8.85	-8.78	-8.83	-9.02	-8.98	-9.16	-9.10	-9.08	-9.09	-9.13	-9.23	-9.25	-9.22	-9.19	-9.25
Gain _{g Peak} [dB]	-2.13	-2.14	-2.10	-1.90	-2.22	-2.21	-2.28	-2.33	-2.57	-2.62	-2.72	-2.90	-2.97	-3.13	-3.26	-3.44	-3.70	-3.51	-3.60	-4.02
Gain _{g Min} [dB]	-38.40	-37.57	-33.59	-30.54	-30.91	-31.54	-31.26	-30.51	-30.47	-33.54	-37.91	-42.83	-45.40	-40.71	-38.22	-36.98	-36.01	-35.27	-34.73	-33.72
UHRG [dB]	-6.50	-6.49	-6.61	-6.48	-6.59	-6.63	-6.73	-6.82	-7.03	-7.04	-7.25	-7.21	-7.23	-7.28	-7.37	-7.49	-7.55	-7.62	-7.61	-7.65
UHRG/TRG [%]	48.39	48.47	48.19	48.41	48.66	48.17	48.50	48.49	48.50	48.57	48.14	48.65	48.41	48.66	48.77	48.87	49.76	49.44	50.14	50.77
H-Plane	-4.26	-4.26	-4.35	-4.23	-4.37	-4.28	-4.50	-4.60	-4.85	-4.93	-5.13	-5.20	-5.28	-5.44	-5.63	-5.85	-6.08	-6.23	-6.39	-6.66
E1-Plane, AVG [dB]	-4.16	-4.17	-4.26	-4.14	-4.25	-4.20	-4.38	-4.49	-4.69	-4.68	-4.87	-4.86	-4.87	-4.93	-5.05	-5.22	-5.34	-5.50	-5.55	-5.70
E2-Plane, AVG [dB]	-7.52	-7.52	-7.58	-7.39	-7.65	-7.44	-7.66	-7.71	-7.87	-7.91	-8.02	-8.05	-8.07	-8.16	-8.31	-8.45	-8.73	-8.80	-8.91	-9.11
Peak Gain [dB]	1.39	1.38	1.32	1.37	1.27	1.34	1.10	1.01	0.73	0.63	0.46	0.34	0.47	0.39	0.32	0.20	0.02	0.07	-0.06	-0.09
Directivity [dB]	4.74	4.73	4.77	4.69	4.73	4.80	4.69	4.68	4.62	4.54	4.54	4.42	4.55	4.53	4.57	4.59	4.53	4.63	4.55	4.62
Minimum Gain [dB]	-25.29	-25.30	-25.55	-25.74	-26.11	-26.45	-26.48	-26.12	-25.44	-24.18	-23.15	-21.80	-20.96	-21.02	-21.07	-21.06	-21.05	-20.92	-20.70	-20.46
Test Condition	FS																			
Antenna Type																				
e Space, BHR=Beside Head Right Side, BHL=Beside Head Left Side, HR=Hand Right, HL=Hand Left, BHRH=Beside Head and Hand Right Side, BHHL=Beside Head and Hand Left Side, NB=Notebook																				
Average Efficiency	-3.92 dB, 40.56 %																			

2.4 Radiation Pattern



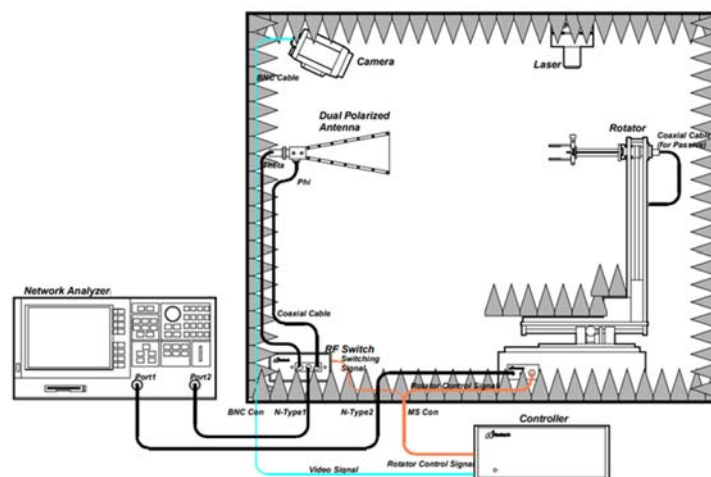
<2450MHz>

3. Antenna Test Condition

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



- Passive Test System



- Active Test System

