



APPENDIX J

: ANTENNA SPECIFICATION

ANTENNA SPECIFICATIONS

Product Name	BLE Antenna
Model Name	C304 Antenna

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1. Features

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

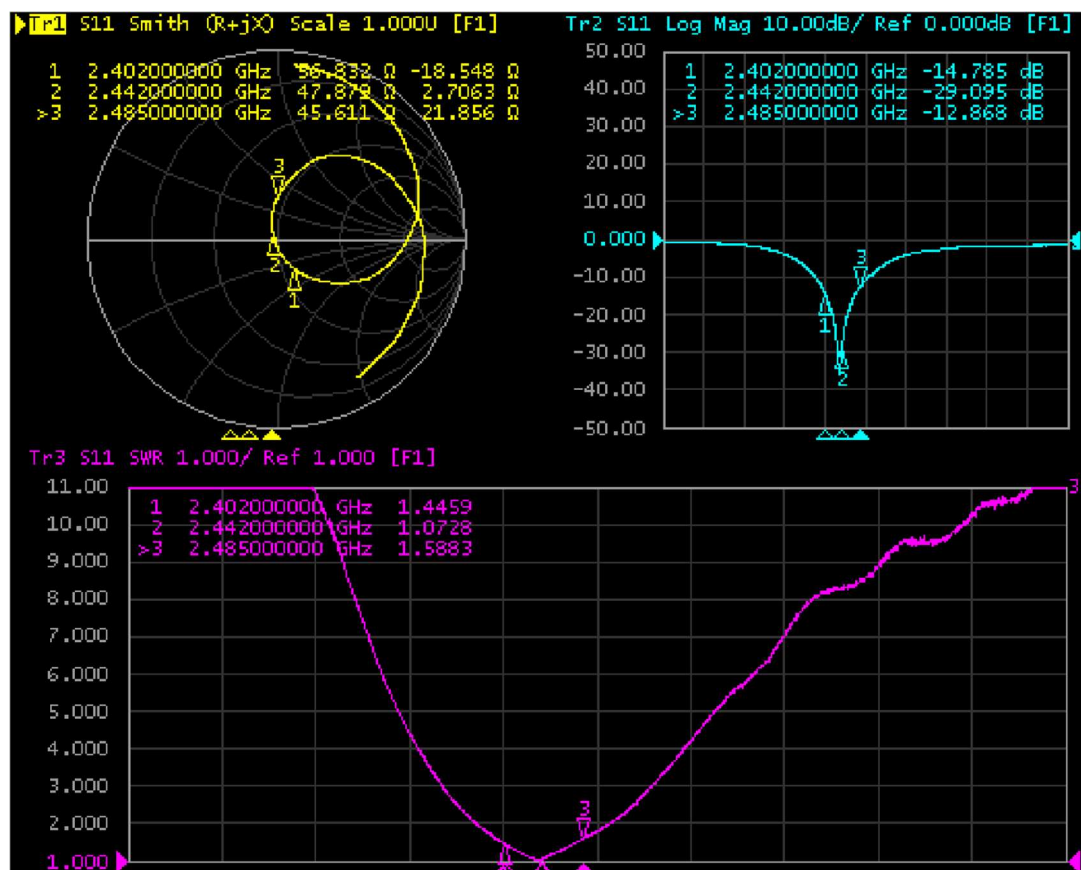
2. Antenna Characteristics

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

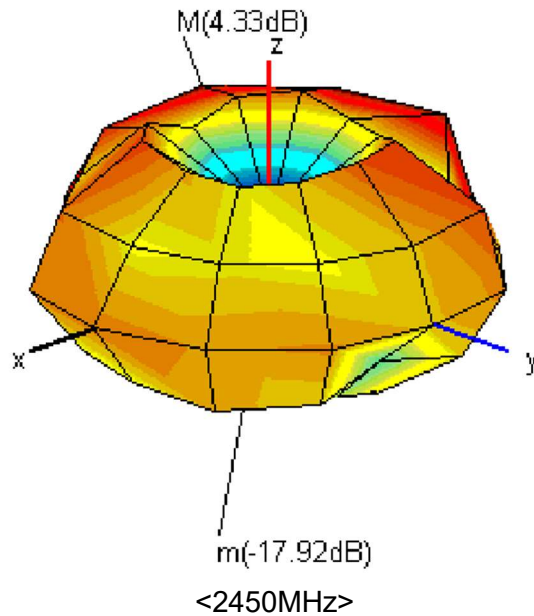
- S11 SWR & SMITH CHART



2.3 Efficiency

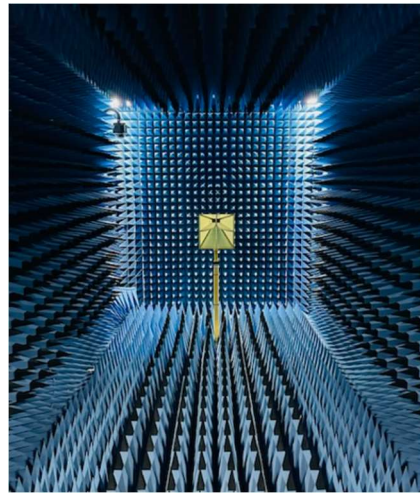
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Frequency [MHz]	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445	2450	2455	2460	2465	2470	2475	2480	2485	2490	2500
Efficiency [dB]	-2.06	-2.03	-2.06	-1.92	-1.93	-1.91	-1.79	-1.73	-1.72	-1.73	-1.68	-1.86	-1.82	-1.93	-1.85	-1.92	-1.87	-2.06	-2.04	-2.34
Efficiency [%]	62.28	62.73	62.21	64.28	64.11	64.36	66.23	67.12	67.35	67.11	67.94	65.09	65.73	64.19	65.29	64.30	65.08	62.24	62.52	58.36
TRG [dB]	-2.06	-2.03	-2.06	-1.92	-1.93	-1.91	-1.79	-1.73	-1.72	-1.73	-1.68	-1.86	-1.82	-1.93	-1.85	-1.92	-1.87	-2.06	-2.04	-2.34
TRG ₀ [dB]	-4.66	-4.63	-4.66	-4.52	-4.55	-4.43	-4.44	-4.39	-4.40	-4.44	-4.38	-4.57	-4.56	-4.67	-4.62	-4.68	-4.66	-4.90	-4.87	-5.13
Gain _{0 Peak} [dB]	3.75	3.79	3.75	3.86	3.87	3.99	4.02	4.06	4.07	4.05	4.10	3.86	3.95	3.84	3.88	3.80	3.82	3.62	3.65	3.48
Gain _{0 Min} [dB]	-29.51	-27.64	-26.08	-24.61	-24.87	-25.46	-25.91	-26.25	-26.30	-26.34	-27.10	-29.60	-32.46	-35.22	-35.96	-34.23	-32.01	-30.83	-32.02	-32.60
TRG ₀ [dB]	-5.52	-5.49	-5.53	-5.39	-5.37	-5.48	-5.20	-5.12	-5.08	-5.07	-5.02	-5.21	-5.12	-5.22	-5.12	-5.20	-5.10	-5.24	-5.24	-5.58
Gain _{0 Peak} [dB]	1.36	1.42	1.37	1.51	1.53	1.45	1.73	1.82	1.84	1.89	1.90	1.62	1.67	1.53	1.52	1.38	1.47	1.24	1.21	0.84
Gain _{0 Min} [dB]	-34.94	-39.65	-42.29	-37.52	-33.75	-31.25	-28.91	-27.35	-27.86	-28.09	-28.45	-28.35	-28.50	-29.69	-30.59	-31.81	-32.82	-34.23	-34.90	-35.84
UHRG [dB]	-3.94	-3.91	-3.96	-3.83	-3.85	-3.82	-3.72	-3.67	-3.66	-3.69	-3.63	-3.83	-3.78	-3.89	-3.82	-3.89	-3.85	-4.05	-4.03	-4.33
UHRG/TRG [%]	64.86	64.77	64.57	64.40	64.31	64.44	64.15	64.04	63.87	63.78	63.79	63.65	63.72	63.58	63.49	63.50	63.38	63.30	63.24	63.19
H-Plane	-3.58	-3.57	-3.58	-3.41	-3.46	-3.35	-3.34	-3.28	-3.29	-3.33	-3.27	-3.40	-3.46	-3.56	-3.51	-3.55	-3.56	-3.85	-3.83	-4.15
E1-Plane, AVG [dB]	-4.33	-4.31	-4.38	-4.24	-4.28	-4.17	-4.20	-4.16	-4.18	-4.21	-4.18	-4.37	-4.34	-4.45	-4.40	-4.44	-4.44	-4.67	-4.65	-4.95
E2-Plane, AVG [dB]	-6.76	-6.72	-6.76	-6.56	-6.67	-6.49	-6.52	-6.49	-6.53	-6.60	-6.51	-6.71	-6.74	-6.83	-6.77	-6.76	-6.77	-6.97	-6.96	-7.24
Peak Gain [dB]	3.82	3.91	3.87	4.00	4.03	4.12	4.20	4.27	4.28	4.27	4.34	4.11	4.20	4.07	4.11	4.02	4.07	3.84	3.87	3.62
Directivity [dB]	5.88	5.93	5.93	5.92	5.96	6.04	5.99	6.00	5.99	6.01	6.02	5.98	6.02	5.99	5.96	5.93	5.94	5.90	5.91	5.96
Minimum Gain [dB]	-28.42	-27.37	-25.98	-24.39	-23.26	-22.08	-21.19	-20.26	-19.51	-18.70	-17.92	-17.28	-17.08	-17.07	-16.96	-17.12	-17.15	-17.36	-17.39	-17.67
Test Condition	FS																			
Antenna Type																				
oe Space, BHR=Beside Head Right Side, BHL=Beside Head Left Side, HR=Hand Right, HL=Hand Left, BHHR=Beside Head and Hand Right Side, BHLH=Beside Head and Hand Left Side, NB=Notebook																				
Average Efficiency	-1.91 dB, 64.43 %																			

2.4 Radiation Pattern

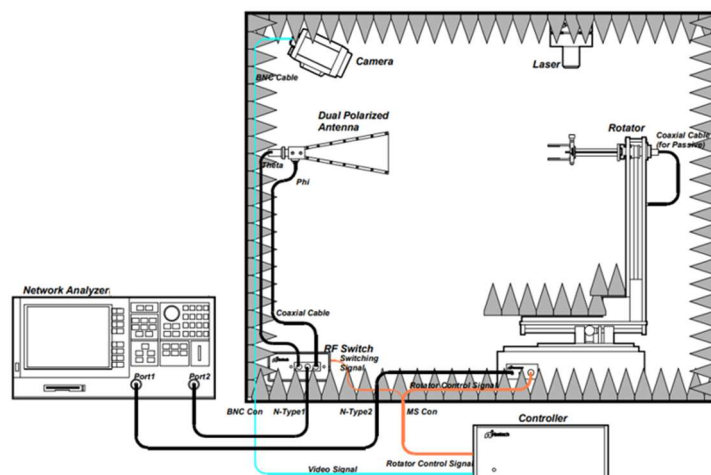


3. Antenna Test Condition

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



- Passive Test System



- Active Test System

