



APPENDIX J
: ANTENNA SPECIFICATION

ANTENNA SPECIFICATIONS

Product Name	BLE Antenna
Model Name	C302 Antenna

OHSUNG ELECTRONICS CO., LTD. ENGINEERING DEP.		
DATE 2023. 3. 28.		
APPROVED BY	CHECKED BY	DESIGNED BY
		J.W.SON

OHSUNG ELECTRONICS CO., LTD.

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1. Features

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

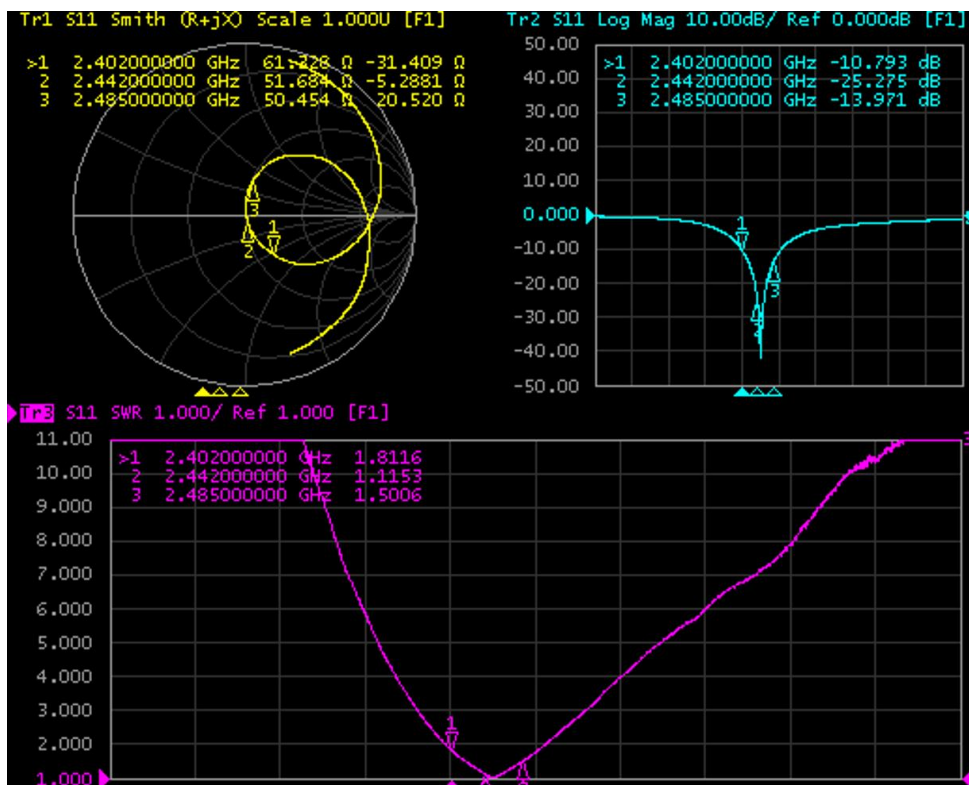
2. Antenna Characteristics

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

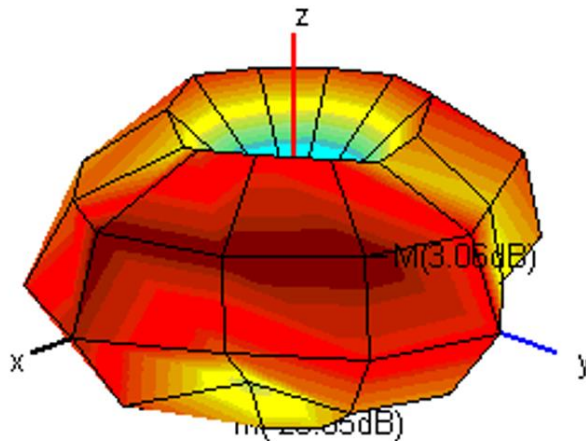
- S11 SWR & Smith chart



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	-3.42	-3.80	-3.60	-3.61	-3.54	-3.41	-3.30	-3.27	-3.17	-2.84	-3.10	-2.97	-3.42	-3.35	-3.33	-2.82	-2.90	-2.86	-3.09
Efficiency [%]	44.75	45.51	41.65	43.70	43.55	44.26	45.67	46.78	47.06	48.22	51.99	48.96	50.46	45.47	46.28	46.42	52.29	51.23	51.72	49.04
TRG [dB]	-3.49	-3.42	-3.80	-3.60	-3.61	-3.54	-3.41	-3.30	-3.27	-3.17	-2.84	-3.10	-2.97	-3.42	-3.35	-3.33	-2.82	-2.90	-2.86	-3.09
TRG₀ [dB]	-6.70	-6.62	-6.66	-6.44	-6.46	-6.27	-6.26	-6.14	-6.10	-5.99	-5.70	-5.88	-5.75	-6.77	-6.70	-6.67	-5.60	-5.72	-5.66	-5.87
Gain_{0, Peak} [dB]	1.84	1.93	1.95	2.16	2.20	2.37	2.44	2.52	2.54	2.65	2.84	2.73	2.81	1.77	1.83	1.82	2.90	2.74	2.84	2.65
Gain_{0, Min} [dB]	-32.18	-35.56	-40.63	-40.69	-36.58	-33.83	-39.15	-53.38	-44.39	-37.53	-31.18	-32.43	-31.17	-31.49	-30.76	-30.13	-30.34	-33.14	-36.75	-43.93
TRG₀ [dB]	-6.31	-6.24	-6.97	-6.77	-6.78	-6.86	-6.60	-6.48	-6.47	-6.37	-6.00	-6.36	-6.22	-6.12	-6.03	-6.04	-6.07	-6.12	-6.10	-6.35
Gain_{0, Peak} [dB]	-0.34	-0.35	-0.42	-0.22	-0.26	-0.44	-0.21	-0.08	-0.08	-0.07	0.66	-0.07	-0.01	-1.00	-0.85	-0.82	0.27	0.22	0.27	0.07
Gain_{0, Min} [dB]	-23.61	-23.61	-25.29	-27.25	-29.94	-32.78	-34.12	-33.23	-31.65	-29.47	-22.61	-28.49	-28.10	-25.49	-24.89	-24.55	-24.53	-23.72	-23.40	-24.18
UHRG [dB]	-5.53	-5.45	-5.41	-5.21	-5.23	-5.17	-5.06	-4.98	-4.96	-4.87	-4.46	-4.84	-4.72	-6.55	-6.44	-6.43	-4.62	-4.73	-4.69	-4.94
UHRG/TRG [%]	62.55	62.67	69.05	68.87	68.85	68.78	68.42	67.97	67.81	67.52	68.88	67.09	66.82	48.70	49.04	49.02	65.98	65.73	65.65	65.32
H-Plane	-6.54	-6.50	-6.54	-6.24	-6.29	-6.07	-6.06	-5.87	-5.86	-5.73	-5.54	-5.50	-5.43	-10.63	-10.36	-10.22	-5.27	-5.42	-5.36	-5.61
E1-Plane, AVG [dB]	-6.04	-5.90	-5.92	-5.70	-5.68	-5.45	-5.42	-5.30	-5.25	-5.16	-5.04	-5.07	-4.93	-5.66	-5.61	-5.60	-4.90	-5.04	-5.01	-5.29
E2-Plane, AVG [dB]	-9.28	-9.23	-9.33	-9.14	-9.23	-9.08	-9.12	-9.01	-8.95	-8.83	-8.28	-8.68	-8.55	-8.20	-8.13	-8.08	-8.26	-8.38	-8.28	-8.42
Peak Gain [dB]	1.85	1.94	2.15	2.36	2.36	2.47	2.54	2.65	2.64	2.70	3.07	2.78	2.86	2.01	2.01	2.01	2.95	2.85	2.93	2.74
Directivity [dB]	5.34	5.36	5.95	5.96	5.97	6.01	5.95	5.95	5.92	5.87	5.91	5.88	5.83	5.43	5.36	5.34	5.77	5.76	5.80	5.84
Minimum Gain [dB]	-21.51	-21.91	-21.31	-21.48	-21.85	-21.80	-21.81	-21.66	-21.73	-21.70	-20.36	-21.86	-21.81	-23.04	-23.10	-23.31	-22.47	-22.92	-23.20	-24.13
Test Condition	FS																			
Antenna Type																				
<small>ae 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</small>																				
Average Efficiency	-3.26 dB, 47.25 %																			

2.4 Radiation Pattern

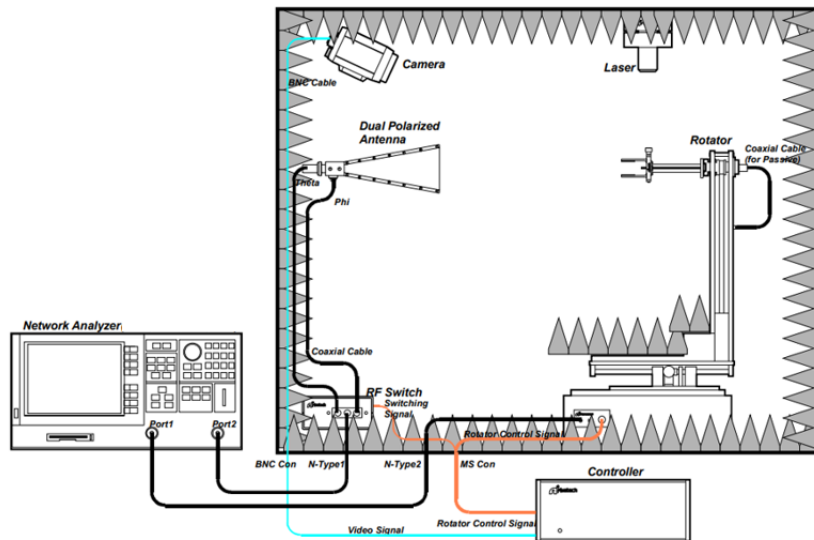


3. Antenna Test Condition

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



- Passive Test System



- Active Test System

