



APPENDIX J

: ANTENNA SPECIFICATION

ANTENNA SPECIFICATIONS

Product Name	BLE Antenna
Model Name	G91 Antenna

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1. Features

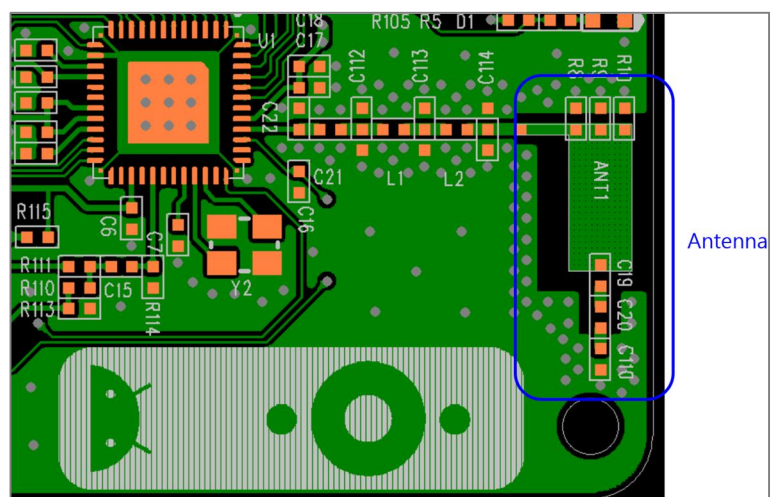
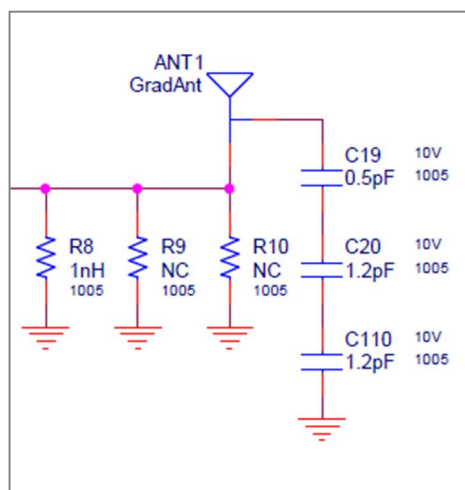
- BLE Antenna
- Frequency range : 2.4GHz ~ 2.5GHz
- PCB Pattern Antenna

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
Peak gain	1.91		2.38	dB

2.2 Antenna circuit, layout



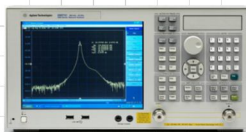
2.3 Network analyzer data

ANTENNA Measurement

Gongdan 1-dong, Gumi-si, Gyeongbuk, Korea TEL : 054)468-7130 , FAX : 054)461-8368

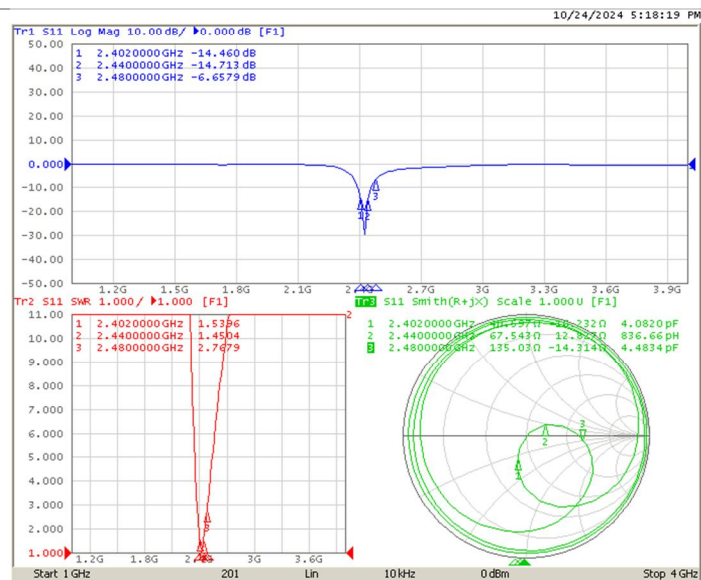
Report No	-	Testing person	KOO YEON KYEONG
Product name	G91	PCB P/No , REV.	PLCFA1658A
Measurement date	2024-10-10	Case on/off	off
Measurement sites	Shield room	Connect the product	-

Used equipment - RF Network Analyzer(Agilent E5071B)



- 300KHz ~ 8.5GHz
- More than 125dB dynamic range

S-PARAMETER



ANTENNA TUNING DATA

Date	담당사	RF Matching Location No.							Return loss			Result	
		R8	R9	R10	C19	C20	C110	기타	2402MHz	2440MHz	2480MHz	Limit	
10/10	Koo.	1nH	NC	NC	0.5pF	1.2pF	1.2pF		-14.46	-14.71	-6.66		

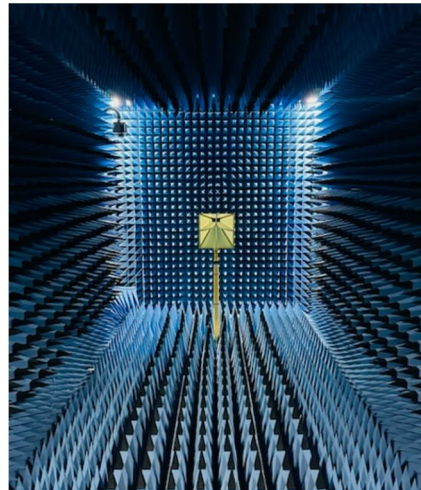
A4(210x297mm)

2.4 Efficiency

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Frequency [MHz]	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445	2450	2455	2460	2465	2470	2475	2480	2485
Efficiency [dB]	-3.22	-3.19	-3.20	-3.31	-3.31	-3.48	-3.15	-2.90	-2.89	-2.83	-2.98	-3.06	-3.12	-3.08	-3.08	-3.19	-3.33	-3.95
Efficiency [%]	47.6	48.0	47.9	46.7	46.7	44.9	48.4	51.3	51.5	52.1	50.3	49.4	48.8	49.2	49.2	48.0	46.5	40.2
TRG θ [dB]	-4.04	-4.02	-4.06	-4.18	-4.20	-4.39	-4.07	-3.83	-3.87	-3.86	-4.01	-4.09	-4.24	-4.21	-4.20	-4.34	-4.48	-5.20
TRG ϕ [dB]	-10.86	-10.74	-10.68	-10.70	-10.65	-10.73	-10.35	-10.03	-9.79	-9.58	-9.76	-9.83	-9.56	-9.46	-9.52	-9.51	-9.66	-9.98
UHRG [dB]	-7.91	-7.78	-7.75	-7.88	-7.84	-7.92	-7.54	-7.29	-7.23	-7.02	-7.21	-7.30	-7.35	-7.23	-7.23	-7.30	-7.54	-8.12
UHRG/TRG [%]	34.0	34.7	35.1	34.9	35.2	36.0	36.4	36.4	36.8	38.1	37.8	37.7	37.8	38.4	38.5	38.8	37.9	38.3
H-Plane	-6.55	-6.56	-6.53	-6.51	-6.35	-6.43	-6.23	-5.70	-5.73	-5.79	-5.74	-6.06	-6.18	-6.10	-6.02	-6.10	-6.42	-7.05
E1-Plane, AVG [dB]	-4.53	-4.60	-4.64	-4.70	-4.62	-5.00	-4.57	-4.38	-4.36	-4.44	-4.72	-4.58	-4.78	-4.86	-4.76	-4.91	-4.88	-5.39
E2-Plane, AVG [dB]	-3.29	-3.24	-3.26	-3.50	-3.57	-3.59	-3.24	-3.03	-2.81	-2.92	-3.02	-3.13	-3.34	-3.18	-2.99	-3.25	-3.33	-4.12
Peak Gain [dB]	2.35	2.37	2.10	2.16	2.21	2.22	2.38	2.27	2.19	2.37	2.31	2.24	2.36	2.25	2.37	2.23	2.27	1.91
Directivity [dB]	5.57	5.56	5.30	5.47	5.52	5.70	5.53	5.17	5.08	5.20	5.29	5.30	5.48	5.33	5.45	5.42	5.59	5.86
Minimum Gain [dB]	-12.49	-13.43	-14.21	-14.68	-14.16	-14.20	-15.80	-14.99	-14.93	-14.95	-14.71	-15.59	-17.85	-16.74	-16.20	-17.36	-16.80	-22.17
Average Efficiency	-3.25 dB		47.34 %						Peak Gain : 2.38dBi									

3. Antenna Test Condition

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



- Passive Test System

