

2023.12.08

RA-N2312-04

APPROVAL SHEET

**MODEL : PhanTom
Wi-Fi Antenna layout**

Review	Consent	Approval

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1. Revision History

NO.	Before	After	Reason	Date
1				
2				
3				
4				
5				
6				
7				
8				
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10				
11				
12				
13				

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2.Product Information

2.1 General Features

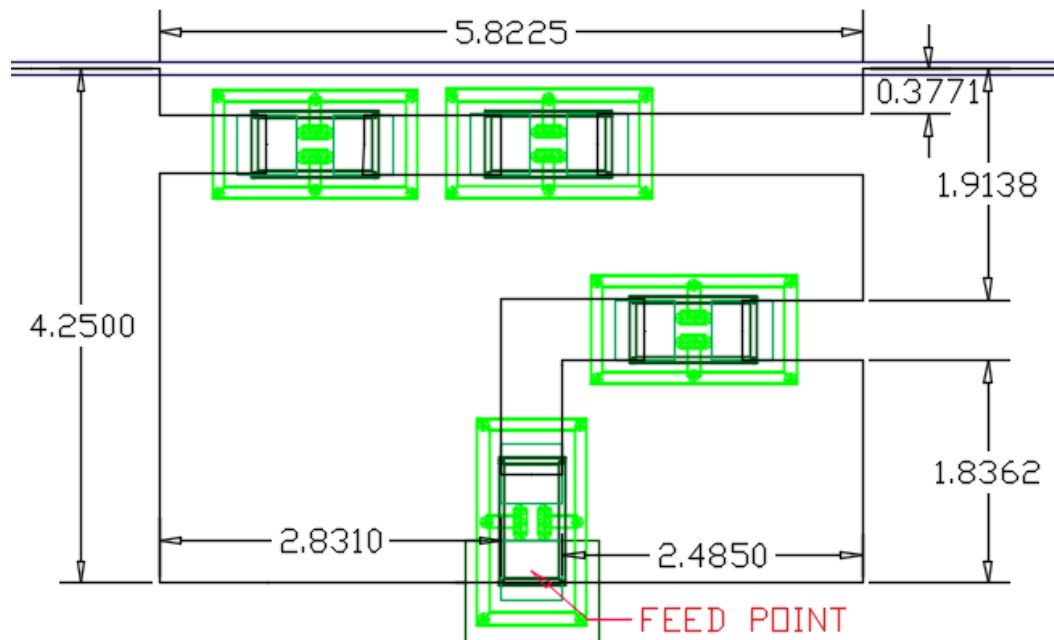
PART NUMBER	GradiANT
ANTENNA TYPE	PCB Pattern Antenna
APPLICATIONS	Wi-Fi

2.2 Electrical Specifications

Frequency Range1 (TX)		2400MHz~2485MHz	
Frequency Range1 (RX)		2400MHz~2485MHz	
IMPEDANCE		50 Ω	
V.S.W.R	TX	2400MHz	2485MHz
		5 ↓	5 ↓
	RX	2400MHz	2485MHz
		5 ↓	5 ↓
RADIATION PATTERN		Omni-directional	
POLARIZATION		Linear	

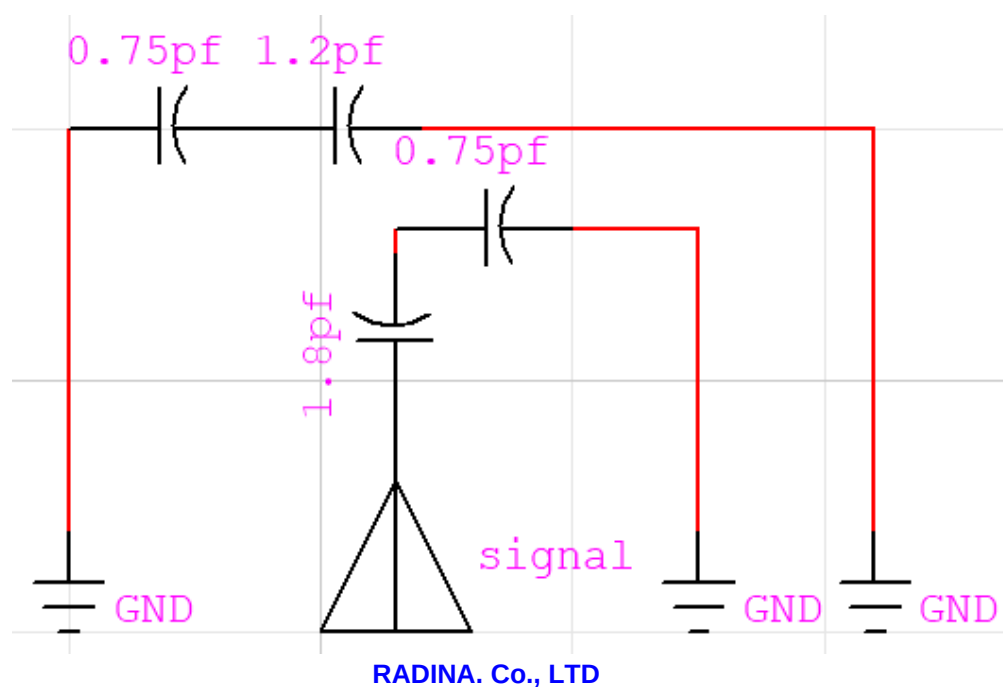
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3. Pattern Specifications



4. Matching Network

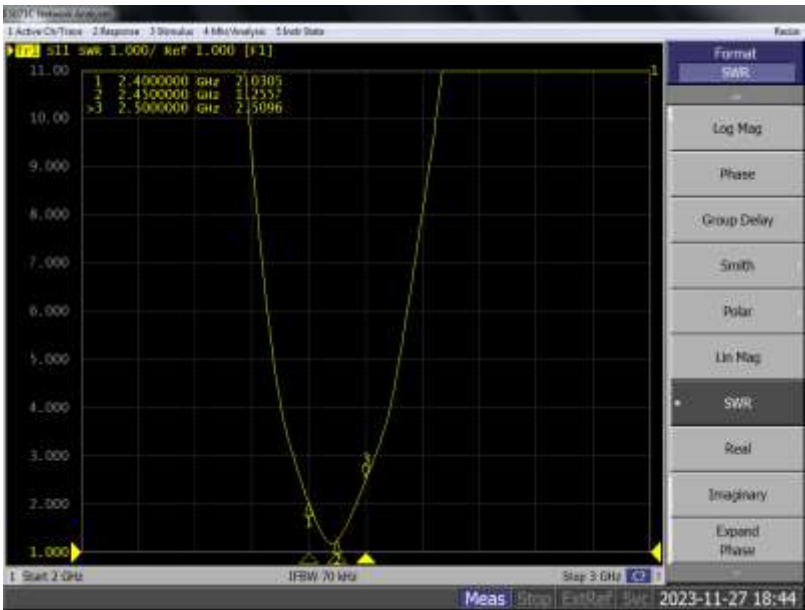
Capacitor value can be changed depending on different situation



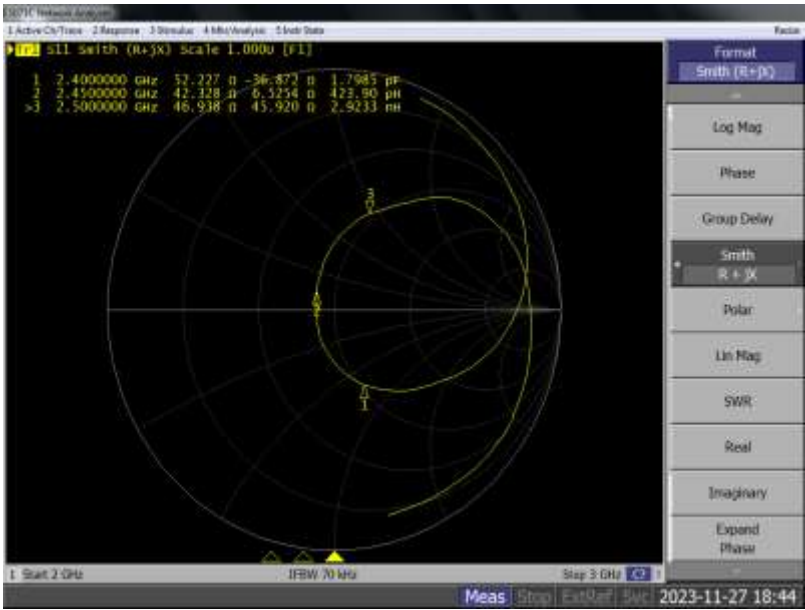
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5. Electrical Characterristics

5.1 VSWR



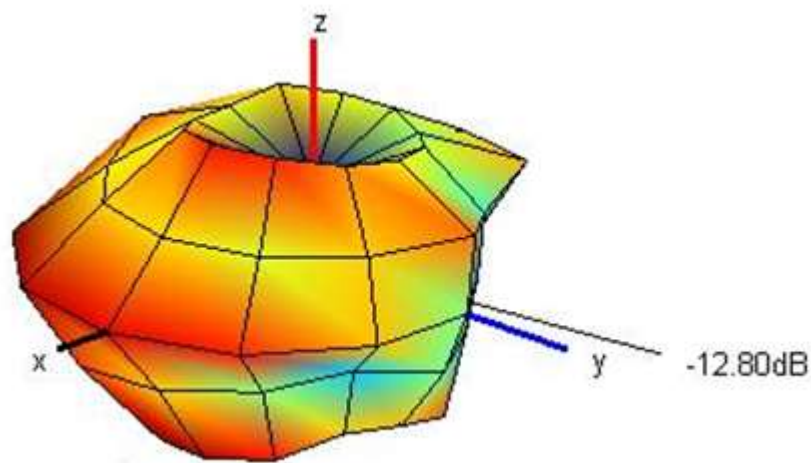
5.2 SMITH CHART



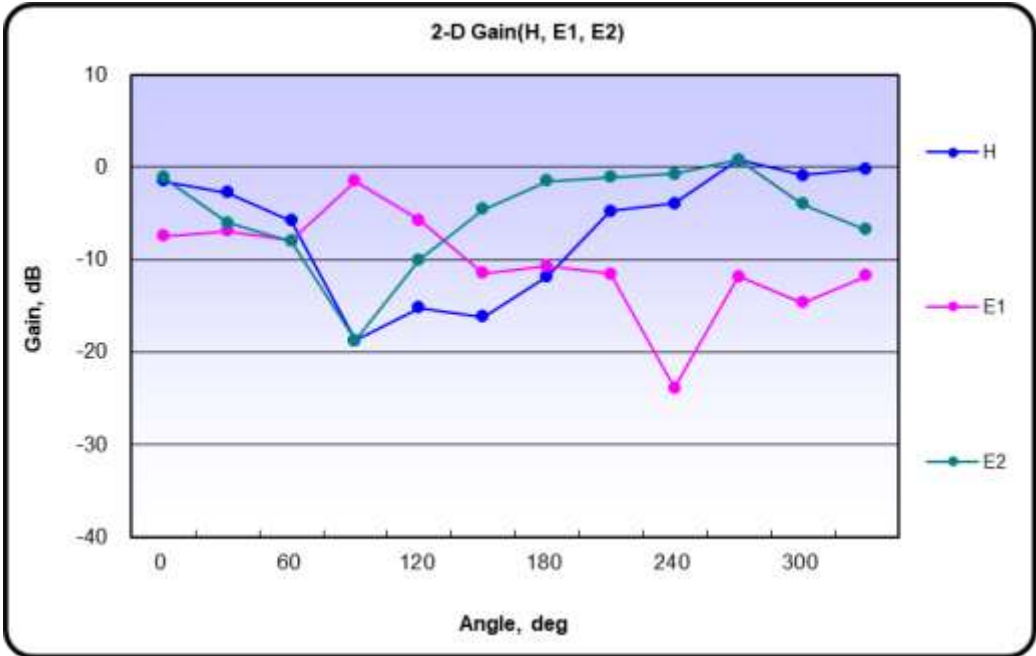
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5.3 3D-PLOTs

5.4



5.5 2D-GAIN



6.Passive Measurement

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	1	2	3	4	5	6	7	8	9	10
Frequency [MHz]	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445
Efficiency [dB]	-3.96	-4.03	-4.12	-4.07	-4.01	-3.77	-3.66	-3.46	-3.66	-3.62
Efficiency [%]	40.1	39.5	38.7	39.2	39.7	41.9	43.1	45.1	43.0	43.5
TRG _θ [dB]	-6.14	-6.28	-6.30	-6.28	-6.23	-6.02	-5.81	-5.52	-5.72	-5.69
Gain _{θ Peak} [dB]	0.76	0.41	0.71	0.54	0.38	1.01	1.25	1.62	1.05	0.75
Gain _{θ Min} [dB]	-20.47	-22.44	-25.38	-25.55	-21.50	-17.95	-19.48	-21.18	-22.28	-23.88
TRG _φ [dB]	-8.01	-7.98	-8.17	-8.07	-7.98	-7.71	-7.73	-7.69	-7.91	-7.82
Gain _{φ Peak} [dB]	-1.08	-1.07	-1.01	-0.55	-0.32	-0.03	-0.04	0.15	-0.17	0.35
Gain _{φ Min} [dB]	-35.13	-29.57	-24.37	-21.69	-23.75	-29.70	-34.87	-40.78	-45.94	-38.73
UHRG [dB]	-7.04	-7.20	-7.24	-7.26	-7.31	-7.13	-7.05	-6.92	-7.19	-7.21
UHRG/TRG [%]	49.3	48.3	48.8	48.0	46.8	46.2	45.8	45.1	44.4	43.7
H-Plane	-4.06	-4.19	-4.15	-4.21	-4.22	-3.83	-3.55	-3.40	-3.46	-3.52
E1-Plane, AVG [dB]	-7.89	-8.31	-8.31	-8.47	-8.12	-8.37	-8.34	-7.89	-8.01	-7.98
E2-Plane, AVG [dB]	-4.22	-4.24	-4.33	-4.20	-4.13	-3.70	-3.33	-2.95	-3.22	-3.17
Peak Gain [dB]	-0.04	-0.45	-0.16	-0.37	-0.52	0.08	0.28	0.65	0.11	-0.11
Directivity [dB]	3.92	3.59	3.96	3.70	3.49	3.86	3.94	4.12	3.77	3.50
Minimum Gain [dB]	-13.71	-12.85	-11.14	-12.99	-10.91	-13.11	-12.80	-12.58	-16.18	-12.80
	11	12	13	14	15	16	17	18	19	20
Frequency [MHz]	2450	2455	2460	2465	2470	2475	2480	2485	2490	2497
Efficiency [dB]	-3.55	-3.74	-4.01	-3.96	-3.86	-3.72	-3.69	-4.15	-4.39	-4.67
Efficiency [%]	44.2	42.3	39.7	40.2	41.1	42.5	42.7	38.4	36.4	34.1
TRG _θ [dB]	-5.61	-5.74	-6.04	-6.00	-5.93	-5.79	-5.74	-6.30	-6.57	-6.82
Gain _{θ Peak} [dB]	0.88	0.91	0.69	0.69	0.69	0.55	1.03	0.31	0.13	-0.13
Gain _{θ Min} [dB]	-20.92	-25.00	-22.62	-23.03	-20.82	-18.47	-21.65	-22.92	-21.94	-33.79
TRG _φ [dB]	-7.77	-8.06	-8.30	-8.23	-8.08	-7.93	-7.95	-8.24	-8.43	-8.74
Gain _{φ Peak} [dB]	-0.12	-0.19	-0.14	-0.56	-0.21	-0.51	-0.49	-1.21	-1.30	-1.73
Gain _{φ Min} [dB]	-37.19	-23.83	-29.31	-31.60	-28.38	-32.39	-26.62	-25.47	-22.38	-22.50
UHRG [dB]	-7.13	-7.42	-7.75	-7.71	-7.64	-7.52	-7.53	-8.08	-8.31	-8.56
UHRG/TRG [%]	43.9	42.9	42.3	42.1	41.9	41.7	41.4	40.5	40.6	40.8
H-Plane	-3.38	-3.51	-3.84	-3.74	-3.79	-3.66	-3.48	-4.39	-4.57	-4.76
E1-Plane, AVG [dB]	-8.11	-8.43	-8.43	-8.51	-8.66	-8.27	-8.45	-9.42	-9.42	-9.70
E2-Plane, AVG [dB]	-3.09	-3.29	-3.39	-3.40	-3.36	-3.28	-3.30	-3.73	-4.15	-4.34
Peak Gain [dB]	-0.04	-0.04	-0.20	-0.16	-0.21	-0.20	0.24	-0.09	-0.71	-0.79
Directivity [dB]	3.51	3.70	3.82	3.81	3.65	3.52	3.94	4.06	3.69	3.88
Minimum Gain [dB]	-12.31	-12.39	-12.04	-19.94	-17.46	-13.03	-16.14	-17.60	-15.53	-21.37

Average Efficiency	-3.90dBi	40.76%
Peak Gain	0.65dBi	