

2024.07.10

RA-N2407-81

APPROVAL SHEET

MODEL :
SHARK_MIDRANGE
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				
9				
10				
11				
12				
13				

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2.Product Information

2.1 General Features

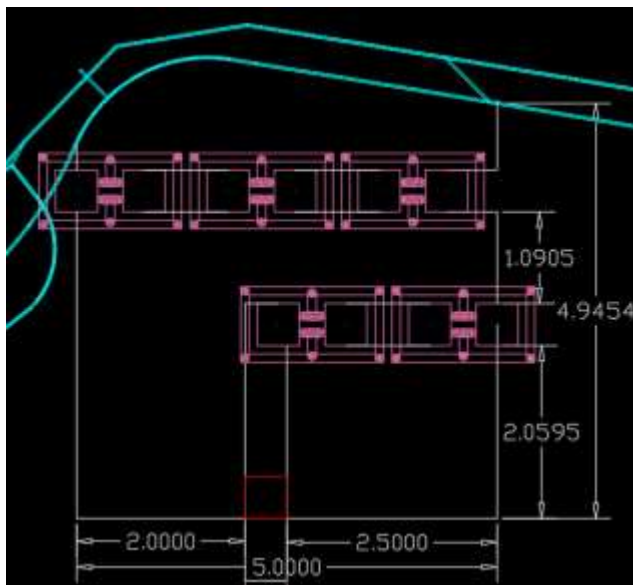
PART NUMBER	GRSN24039MS11
ANTENNA TYPE	PCB Pattern Antenna
APPLICATIONS	BT

2.2 Electrical Specifications

Frequency Range1 (TX)		2400MHz~2485MHz	
Frequency Range1 (RX)		2400MHz~2485MHz	
IMPEDANCE		50 Ω	
V.S.W.R	TX	2400MHz	2485MHz
		3 ↓	3 ↓
	RX	2400MHz	2485MHz
		3 ↓	3 ↓
RADIATION PATTERN		Omni-directional	
POLARIZATION		Linear	

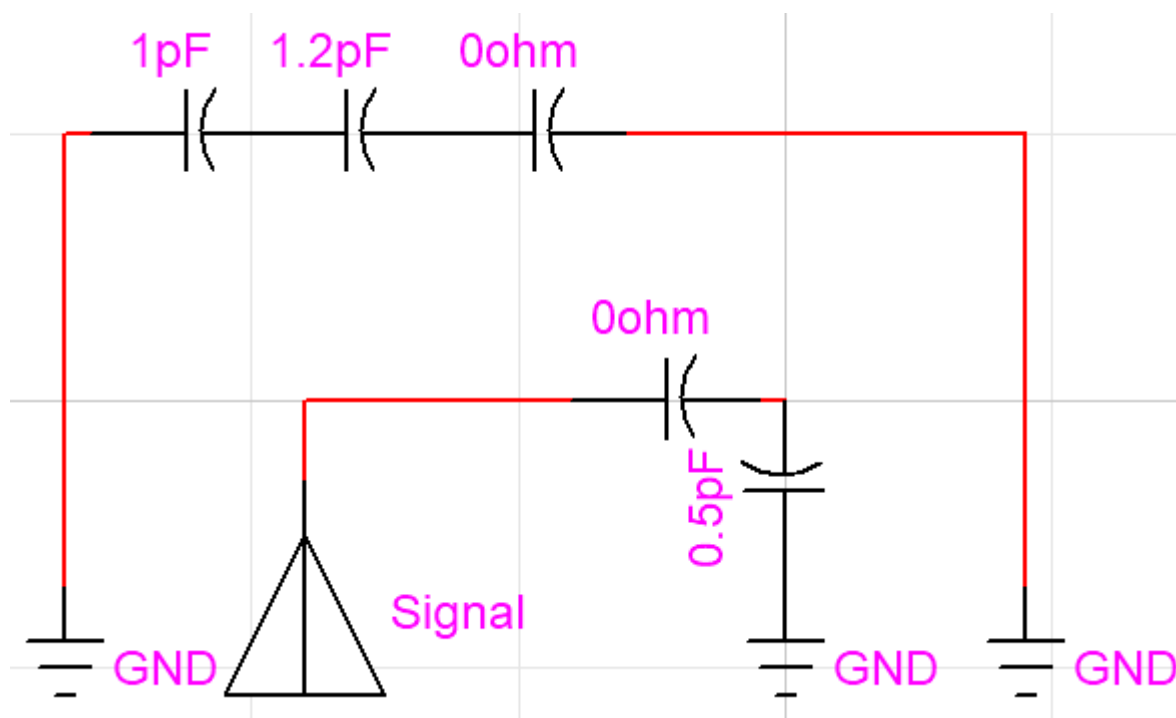
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3. Pattern Specifications



4. Matching Network

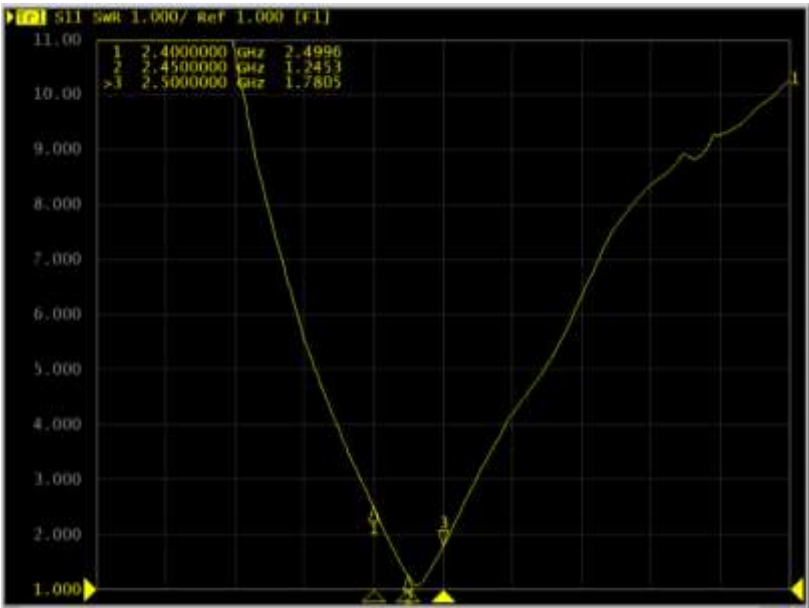
Capacitor value can be changed depending on different situation



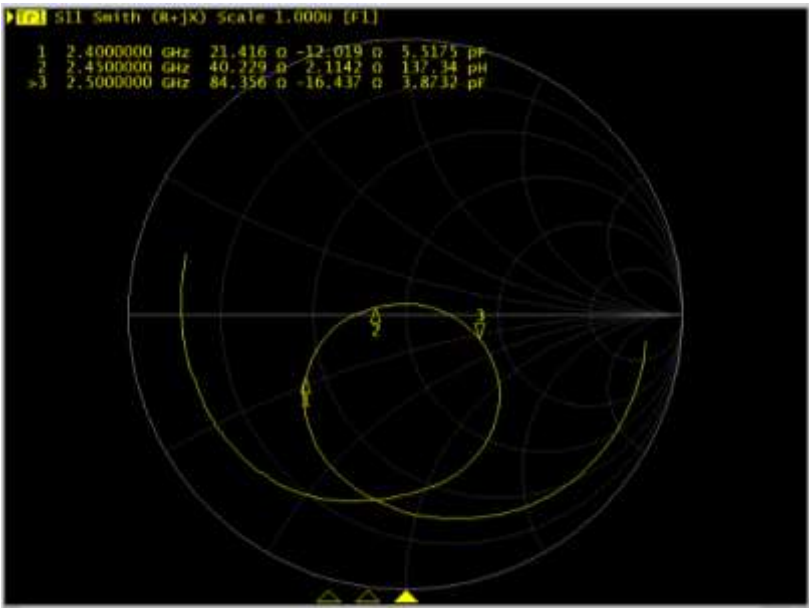
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5. Electrical Characterristics

5.1 VSWR



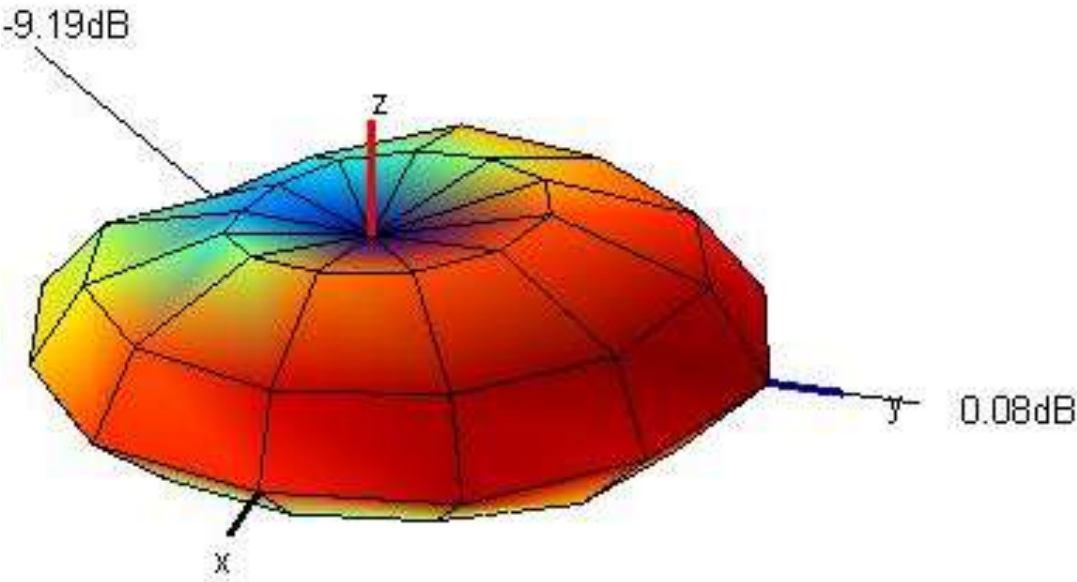
5.2 SMITH CHART



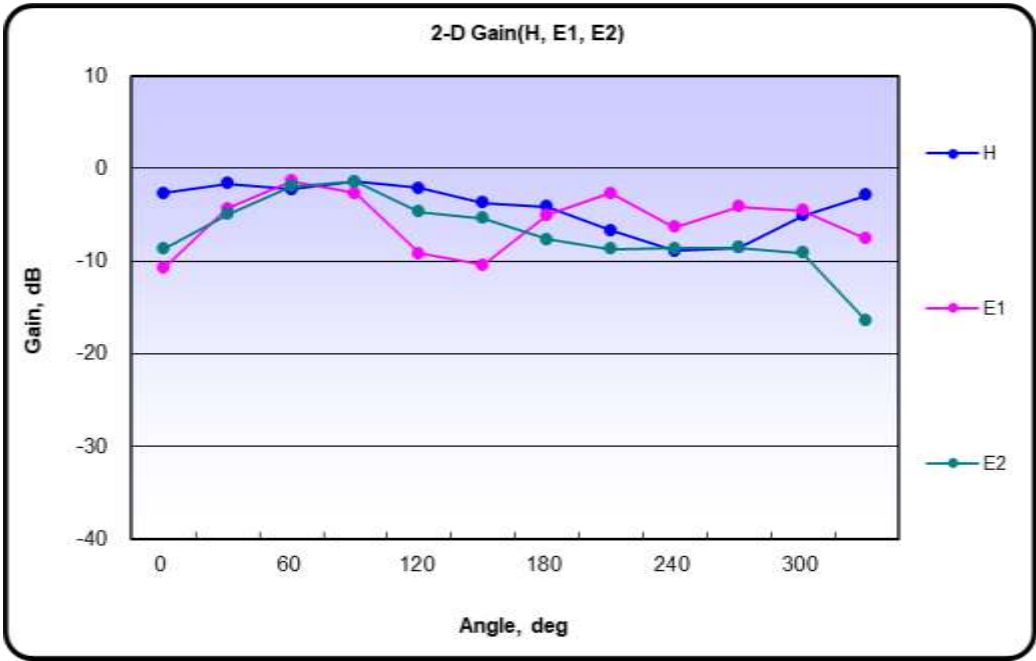
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5.3 3D-PLOTs

5.4



5.5 2D-GAIN



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6. Passive Measurement

	1	2	3	4	5	6	7	8	9	10
Frequency [MHz]	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445
Efficiency [dB]	-4.07	-3.96	-3.92	-3.60	-3.58	-3.51	-3.44	-3.33	-3.47	-3.31
Efficiency [%]	39.2	40.2	40.5	43.7	43.8	44.6	45.3	46.4	45.0	46.6
TRG _θ [dB]	-5.59	-5.54	-5.46	-5.10	-5.08	-5.08	-4.92	-4.86	-5.03	-4.82
Gain _{θ Peak} [dB]	-0.56	-1.13	-0.78	-0.20	-0.07	-0.54	0.03	-0.03	-0.65	-0.51
Gain _{θ Min} [dB]	-15.84	-17.14	-17.08	-16.48	-17.26	-20.98	-17.65	-15.47	-18.91	-16.46
TRG _φ [dB]	-9.37	-9.11	-9.20	-8.93	-8.94	-8.67	-8.83	-8.62	-8.66	-8.64
Gain _{φ Peak} [dB]	-3.62	-3.56	-4.56	-3.59	-3.78	-3.28	-3.51	-3.32	-3.46	-3.39
Gain _{φ Min} [dB]	-25.96	-24.60	-24.96	-29.16	-34.94	-28.63	-31.31	-30.00	-29.15	-31.42
UHRG [dB]	-6.86	-6.72	-6.67	-6.29	-6.30	-6.27	-6.13	-6.11	-6.21	-6.11
UHRG/TRG [%]	52.6	52.9	53.2	53.8	53.4	52.9	53.7	52.8	53.2	52.5
H-Plane	-4.36	-4.23	-4.30	-3.83	-3.72	-3.83	-3.72	-3.50	-3.78	-3.58
E1-Plane, AVG [dB]	-5.61	-5.42	-5.51	-5.06	-5.16	-5.10	-4.83	-4.65	-5.07	-4.85
E2-Plane, AVG [dB]	-7.08	-7.09	-6.68	-6.42	-6.51	-6.18	-6.12	-6.01	-6.38	-5.79
Peak Gain [dB]	-0.40	-0.54	-0.33	0.03	0.11	0.29	0.18	0.28	0.13	0.08
Directivity [dB]	3.67	3.42	3.59	3.63	3.69	3.80	3.62	3.61	3.60	3.40
Minimum Gain [dB]	-9.89	-10.35	-10.02	-9.62	-10.12	-9.24	-8.80	-9.17	-8.98	-9.19

	11	12	13	14	15	16	17	18	19	20
Frequency [MHz]	2450	2455	2460	2465	2470	2475	2480	2485	2490	2497
Efficiency [dB]	-3.28	-3.33	-3.43	-3.42	-3.32	-3.39	-3.34	-4.02	-4.20	-4.35
Efficiency [%]	47.0	46.5	45.4	45.5	46.6	45.8	46.3	39.6	38.0	36.8
TRG _θ [dB]	-4.76	-4.84	-4.96	-4.94	-4.84	-4.86	-4.79	-5.58	-5.69	-5.78
Gain _{θ Peak} [dB]	-0.22	-0.11	-0.12	-0.41	-0.51	-0.44	-0.51	-1.05	-0.95	-1.42
Gain _{θ Min} [dB]	-15.87	-17.71	-16.52	-16.60	-17.81	-18.10	-21.08	-16.97	-21.11	-19.33
TRG _φ [dB]	-8.65	-8.64	-8.68	-8.72	-8.60	-8.81	-8.82	-9.25	-9.57	-9.86
Gain _{φ Peak} [dB]	-3.10	-3.00	-3.88	-3.24	-4.14	-4.09	-4.30	-4.15	-4.84	-4.92
Gain _{φ Min} [dB]	-24.66	-27.35	-35.42	-43.22	-29.27	-45.84	-30.94	-29.71	-28.72	-27.29
UHRG [dB]	-5.96	-6.05	-6.19	-6.06	-6.07	-6.08	-6.03	-6.71	-6.85	-6.97
UHRG/TRG [%]	53.9	53.5	53.0	54.5	53.1	53.8	53.9	53.8	54.3	54.7
H-Plane	-3.54	-3.64	-3.69	-3.77	-3.63	-3.66	-3.64	-4.45	-4.49	-4.69
E1-Plane, AVG [dB]	-4.93	-5.17	-5.22	-4.82	-5.05	-4.92	-4.66	-5.53	-5.78	-5.68
E2-Plane, AVG [dB]	-5.85	-6.05	-5.99	-5.96	-5.60	-6.09	-5.62	-6.49	-6.64	-6.70
Peak Gain [dB]	-0.02	0.37	0.07	0.38	0.09	0.31	0.19	-0.59	-0.33	-0.61
Directivity [dB]	3.25	3.69	3.50	3.80	3.41	3.70	3.54	3.44	3.87	3.74
Minimum Gain [dB]	-9.19	-8.83	-9.39	-9.44	-9.04	-8.91	-9.20	-9.89	-9.94	-10.85

Average Efficiency	-3.60dBi	43.64%
Peak Gain	0.38dBi	