2024.05.13

RA-N2405-91

APPROVAL SHEET

MODEL : BIKOM
Antenna layout

Review	Consent	Approval

Messrs. SENA Technology Co.,Ltd

RadiNa Co. ,Ltd

TEL:+82-2-463-0373

FAX:+82-2-463-0374

Table of contents

1. Revision History

NO.	Before	After	Reason	Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

2. Product Information

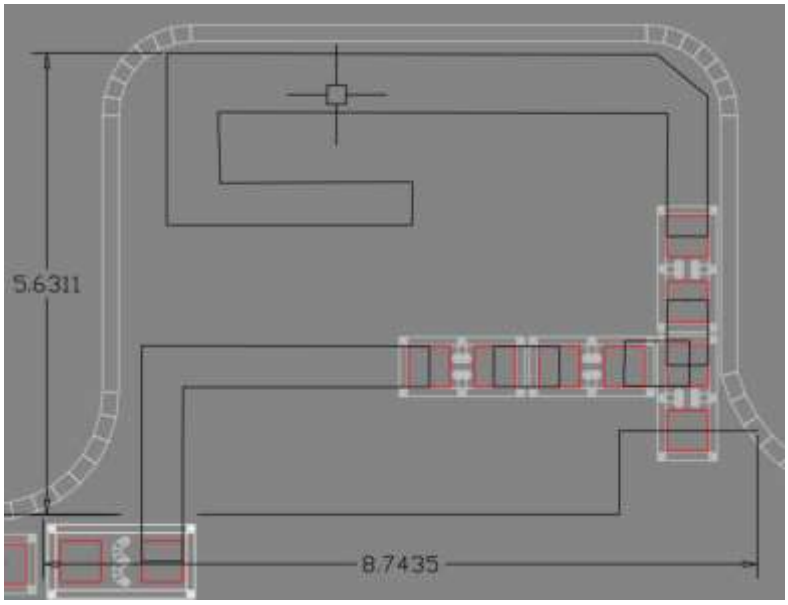
2.1 General Features

PART NUMBER	GRSN24050BT91
ANTENNA TYPE	PCB Pattern Antenna
APPLICATIONS	Bluetooth

2.2 Electrical Specifications

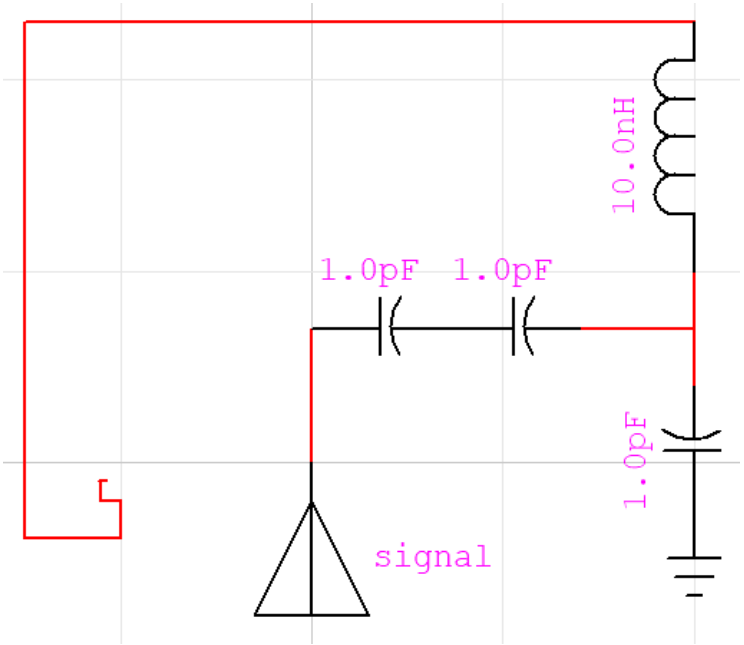
Frequency Range1 (TX)		2400MHz~2485MHz	
Frequency Range1 (RX)		2400MHz~2485MHz	
IMPEDANCE		50 Ω	
V.S.W.R	TX	2400MHz	2485MHz
		10 ↓	10 ↓
	RX	2400MHz	2485MHz
		10 ↓	10 ↓
RADIATION PATTERN		Omni-directional	
POLARIZATION		Linear	

3. Pattern Specifications



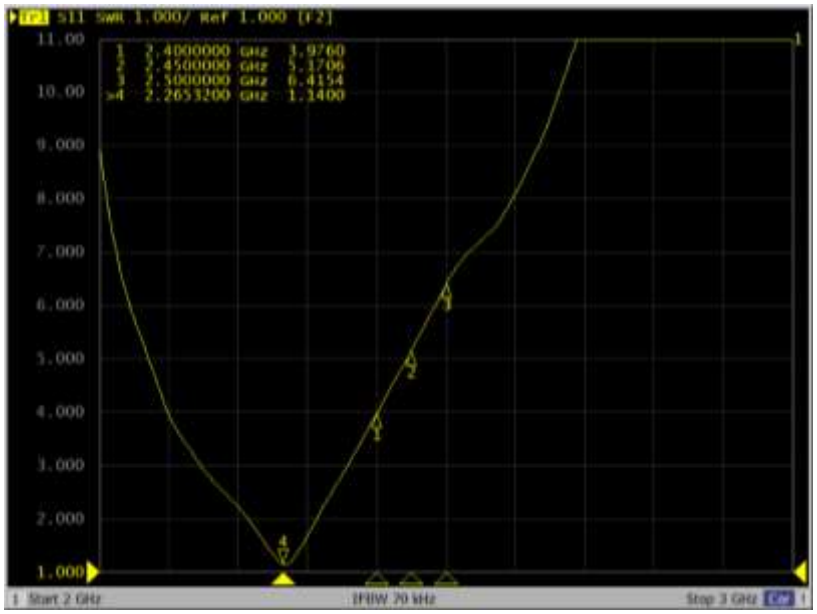
4. Matching Network

Capacitor value can be changed depending on different situation

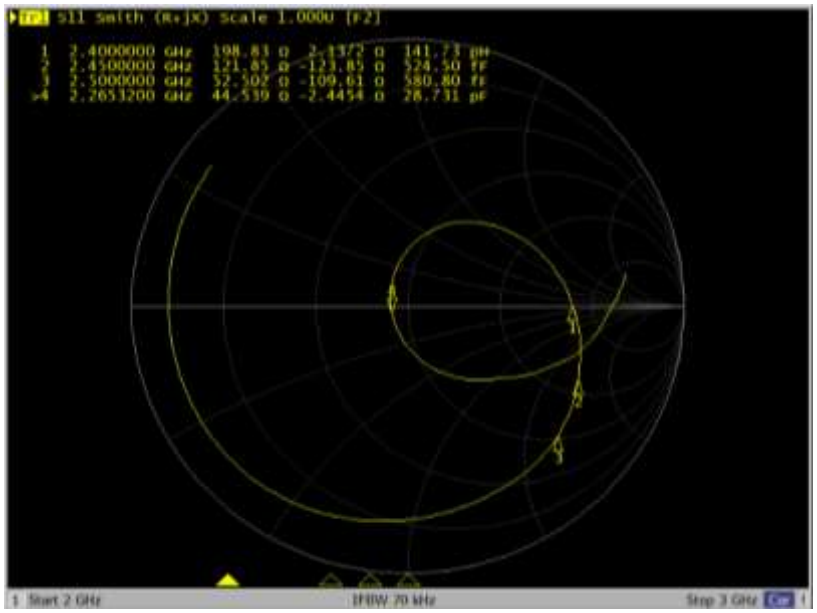


5. Electrical Characterristics

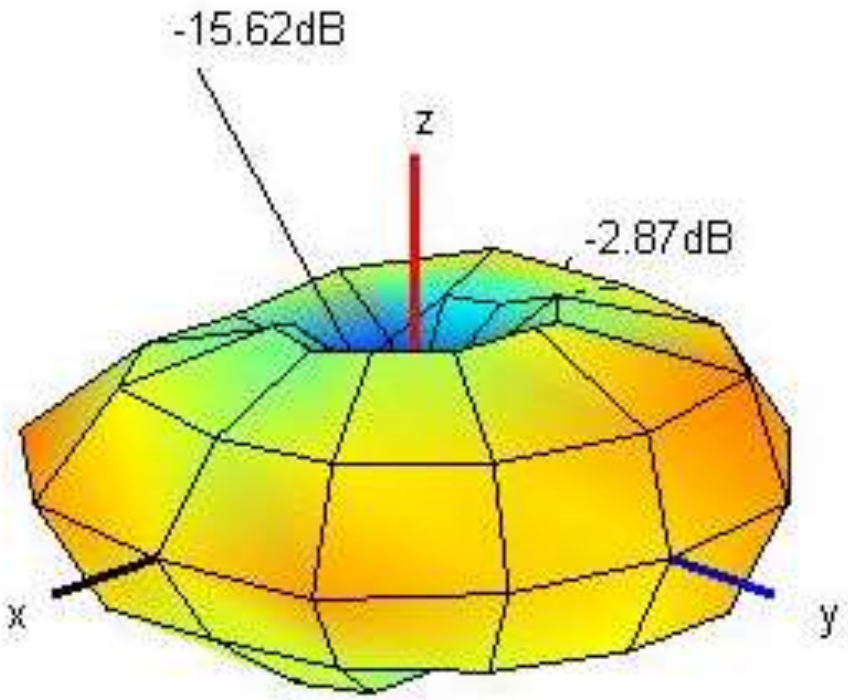
5.1 VSWR



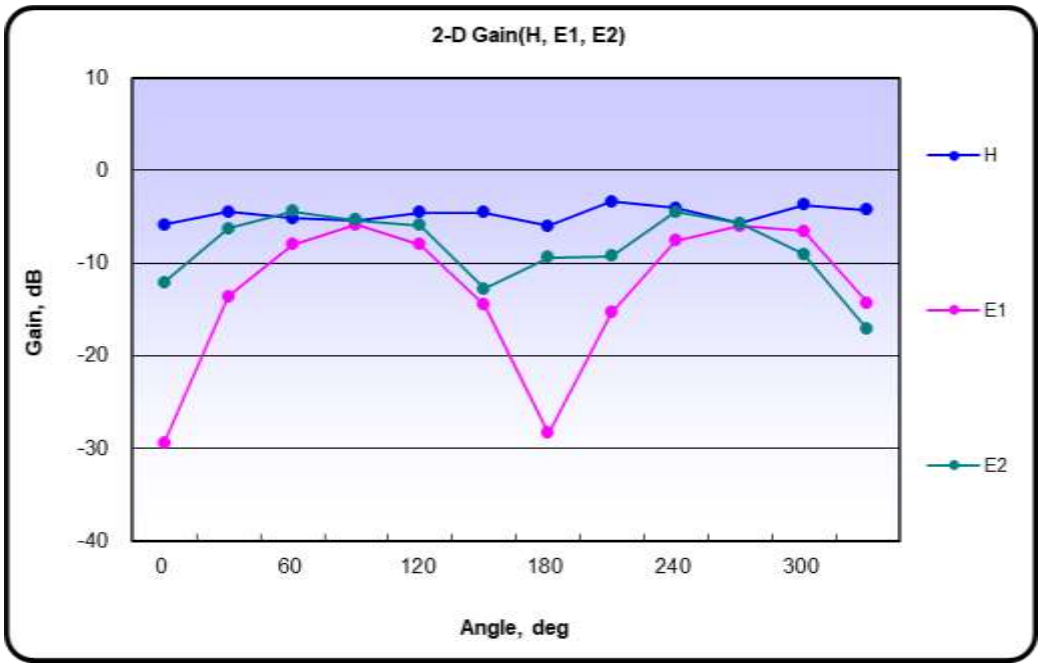
5.2 SMITH CHART



5.3 3D-PLOTs



5.4 2D-GAIN



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]	**-5.52**	**-5.34**	**-5.59**	**-5.90**	**-6.20**	**-6.21**	**-5.75**	**-5.48**	**-5.37**	**-5.89**
Efficiency [%]	**28.0**	**29.2**	**27.6**	**25.7**	**24.0**	**23.9**	**26.6**	**28.3**	**29.0**	**25.8**
TRG_{θ} [dB]	-6.19	-6.02	-6.28	-6.55	-6.88	-6.88	-6.40	-6.14	-6.04	-6.54
$Gain_{\theta\ Peak}$ [dB]	-3.11	-3.09	-3.62	-3.81	-4.27	-3.85	-3.46	-3.18	-3.35	-3.41
$Gain_{\theta\ Min}$ [dB]	-17.96	-19.77	-21.87	-22.69	-25.53	-20.54	-20.00	-22.55	-21.70	-24.71
TRG_{φ} [dB]	-14.00	-13.77	-13.97	-14.46	-14.59	-14.63	-14.32	-13.95	-13.82	-14.45
$Gain_{\varphi\ Peak}$ [dB]	-6.94	-6.94	-8.19	-7.57	-7.08	-7.34	-7.22	-7.50	-6.99	-7.89
$Gain_{\varphi\ Min}$ [dB]	-40.07	-38.37	-45.47	-33.13	-29.91	-30.82	-32.22	-30.10	-44.00	-37.22
UHRG [dB]	-8.59	-8.50	-8.68	-8.98	-9.20	-9.32	-8.80	-8.61	-8.44	-9.05
UHRG/TRG [%]	49.3	48.3	49.2	49.2	50.1	48.9	49.6	48.6	49.3	48.3
H-Plane	-4.49	-4.26	-4.49	-4.85	-5.15	-5.18	-4.73	-4.36	-4.30	-4.69
E1-Plane, AVG [dB]	-8.91	-8.75	-9.03	-9.17	-9.45	-9.85	-8.98	-9.11	-8.72	-9.45
E2-Plane, AVG [dB]	-6.72	-6.43	-6.74	-7.10	-7.42	-7.31	-7.23	-6.67	-6.52	-7.26
Peak Gain [dB]	-2.64	-2.29	-2.90	-3.00	-3.66	-3.65	-2.74	-2.85	-2.77	-2.87
Directivity [dB]	2.88	3.05	2.70	2.90	2.54	2.56	3.01	2.63	2.60	3.02
Minimum Gain [dB]	-13.88	-13.70	-14.21	-16.58	-14.52	-13.66	-13.32	-13.91	-12.71	-15.62

	11	12	13	14	15	16	17	18	19	20
Frequency [MHz]	**2450**	**2455**	**2460**	**2465**	**2470**	**2475**	**2480**	**2485**	**2490**	**2497**
Efficiency [dB]	**-6.32**	**-6.45**	**-6.34**	**-6.41**	**-6.21**	**-6.41**	**-6.93**	**-7.64**	**-7.92**	**-8.00**
Efficiency [%]	**23.4**	**22.6**	**23.2**	**22.8**	**23.9**	**22.8**	**20.3**	**17.2**	**16.2**	**15.9**
TRG_{θ} [dB]	-6.99	-7.12	-7.04	-7.10	-6.95	-7.11	-7.68	-8.42	-8.72	-8.80
$Gain_{\theta\ Peak}$ [dB]	-3.95	-3.95	-3.37	-3.68	-3.65	-3.11	-4.44	-5.13	-5.24	-5.19
$Gain_{\theta\ Min}$ [dB]	-20.49	-20.11	-20.98	-23.08	-20.69	-20.12	-22.24	-23.30	-26.57	-24.92
TRG_{φ} [dB]	-14.71	-14.92	-14.63	-14.73	-14.31	-14.70	-14.94	-15.48	-15.62	-15.71
$Gain_{\varphi\ Peak}$ [dB]	-7.89	-7.63	-8.36	-7.52	-7.00	-8.64	-7.87	-9.42	-8.92	-9.68
$Gain_{\varphi\ Min}$ [dB]	-35.00	-37.86	-31.53	-35.68	-37.47	-37.40	-31.79	-36.85	-30.74	-33.42
UHRG [dB]	-9.48	-9.60	-9.46	-9.64	-9.50	-9.66	-10.22	-10.85	-11.19	-11.32
UHRG/TRG [%]	48.2	48.4	48.8	47.5	46.9	47.4	47.0	47.7	47.1	46.5
H-Plane	-5.34	-5.41	-5.34	-5.49	-5.25	-5.41	-5.95	-6.86	-7.24	-7.36
E1-Plane, AVG [dB]	-9.62	-9.83	-9.78	-9.72	-9.21	-9.76	-10.33	-10.87	-11.09	-11.42
E2-Plane, AVG [dB]	-7.58	-7.80	-7.66	-7.94	-7.32	-7.59	-8.07	-8.93	-9.49	-9.43
Peak Gain [dB]	-3.61	-3.57	-2.95	-3.25	-3.32	-2.83	-4.05	-4.62	-4.87	-4.80
Directivity [dB]	2.70	2.88	3.39	3.16	2.90	3.59	2.88	3.02	3.05	3.19
Minimum Gain [dB]	-14.98	-14.68	-14.84	-16.76	-15.59	-15.62	-15.62	-17.77	-18.08	-18.46

Average Efficiency	**-6.23dBi**	**23.82%**
Peak Gain	**-2.29dBi**	