

2021.03.24

RA-N2103-02

APPROVAL SHEET

**MODEL : 2.4Ghz Dipole
ANTENNA
Antenna layout**

Review	Consent	Approval

Messrs. SENA Technology Co.,Ltd



RadiNa Co. ,Ltd

TEL : +82-2-463-0373

FAX : +82-2-463-0374

	PRODUCT APPROVAL SHEET		GRSN21034BT24			
	MODEL NAME	2.4Ghz Dipole ANT	REV.	1.0	Page	2 / 10

Table of contents

1. Revision History

2. Product Information

2.1 General Features

2.2 Electrical Specifications

3. Pattern Specifications

4. Matching Network

5. Electrical Characteristics

5.1 VSWR

5.2 Smith Chart

5.3 3D-PLOT

5.4 2D-GAIN

6. Passive Measurement

7. Measurement Process

	PRODUCT APPROVAL SHEET		GRSN21034BT24			
	MODEL NAME	2.4Ghz Dipole ANT	REV.	1.0	Page	3 / 10

1. Revision History

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

	PRODUCT APPROVAL SHEET		GRSN21034BT24			
	MODEL NAME	2.4Ghz Dipole ANT	REV.	1.0	Page	4 / 10

2.Product Information

2.1 General Features

PART NUMBER	GRSN21034BT24
ANTENNA TYPE	Dipole Antenna
APPLICATIONS	Mesh, Bluetooth

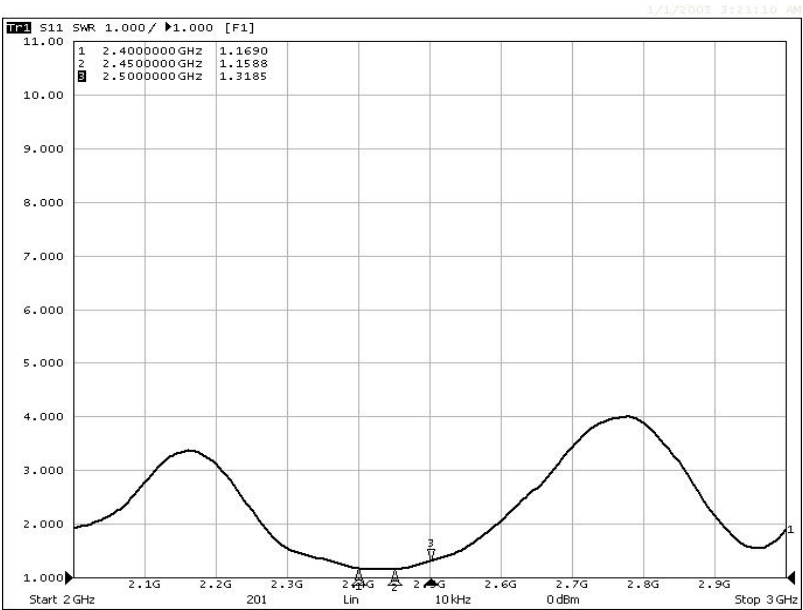
2.2 Electrical Specifications

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

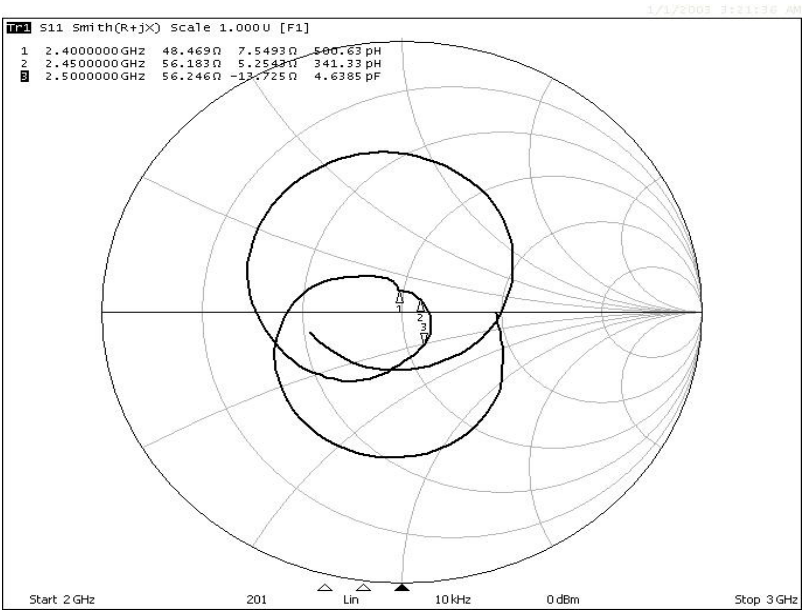
	PRODUCT APPROVAL SHEET		GRSN21034BT24			
	MODEL NAME	2.4Ghz Dipole ANT	REV.	1.0	Page	6 / 10

5. Electrical Characterristics

5.1 VSWR

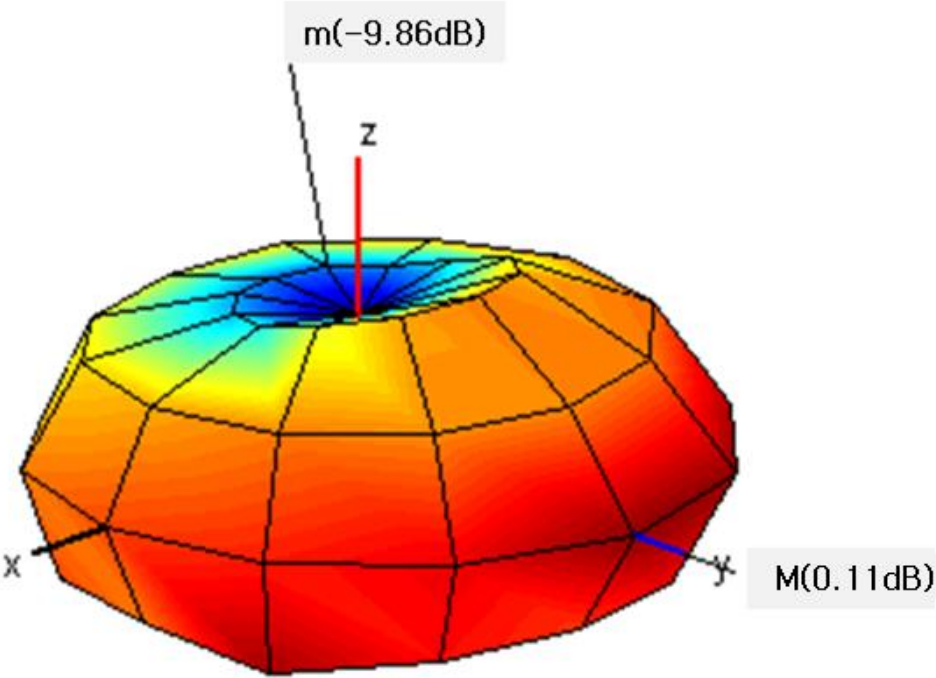


5.2 SMITH CHART

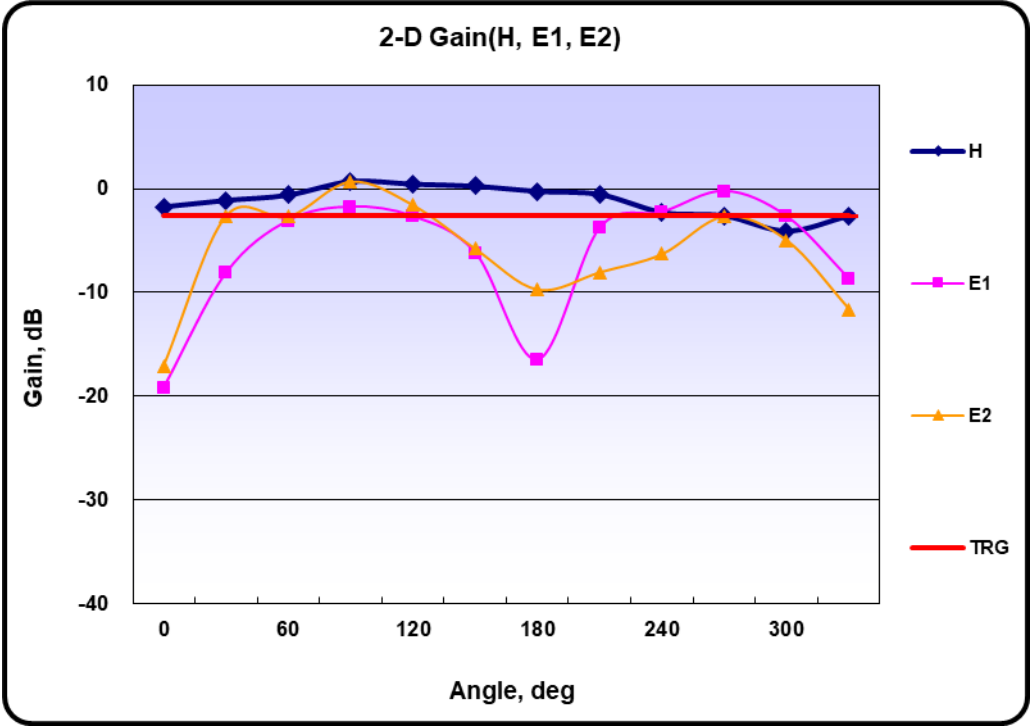


	PRODUCT APPROVAL SHEET		GRSN21034BT24			
	MODEL NAME	2.4Ghz Dipole ANT	REV.	1.0	Page	7 / 10

5.3 3D-PLOTs



5.4 2D-GAIN



	PRODUCT APPROVAL SHEET		GRSN21034BT24			
	MODEL NAME	2.4Ghz Dipole ANT	REV.	1.0	Page	8 / 10

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)	-3.10	-3.05	-2.79	-2.56	-2.64	-2.59	-2.35	-2.28	-2.19	-2.12
Efficiency(%)	48.94	49.57	52.56	55.44	54.45	55.04	58.20	59.17	60.36	61.41
TRG(dB)	-3.10	-3.05	-2.79	-2.56	-2.64	-2.59	-2.35	-2.28	-2.19	-2.12
TRG _{Theta} (dB)	-3.28	-3.22	-2.96	-2.73	-2.81	-2.76	-2.51	-2.44	-2.36	-2.28
TRG _{Phi} (dB)	-17.05	-17.08	-16.99	-16.79	-16.89	-16.77	-16.84	-16.71	-16.55	-16.47
UHRG(dB)	-6.29	-6.24	-5.99	-5.78	-5.88	-5.84	-5.62	-5.55	-5.48	-5.41
UHRG/TRG(%)	48.04	48.00	47.85	47.64	47.47	47.30	47.12	47.06	46.96	46.81
H-Plane	-1.33	-1.24	-0.96	-0.72	-0.79	-0.75	-0.50	-0.43	-0.35	-0.28
E1-Plane, AVG(dB)	-4.54	-4.46	-4.19	-3.94	-4.00	-3.95	-3.67	-3.59	-3.50	-3.43
E2-Plane, AVG(dB)	-4.61	-4.54	-4.27	-4.03	-4.10	-4.06	-3.81	-3.74	-3.66	-3.59
Peak Gain(dB)	-0.93	-0.85	-0.56	-0.30	-0.38	-0.35	-0.12	-0.05	0.02	0.11
Directivity(dB)	2.17	2.20	2.23	2.26	2.25	2.24	2.23	2.23	2.21	2.23
Minimum Gain(dB)	-9.52	-9.60	-9.61	-9.61	-9.85	-9.80	-9.72	-9.83	-9.91	-9.86

	11	12	13	14	15	16	17	18	19	20
Frequency(MHz)	2450	2455	2460	2465	2470	2475	2480	2485	2490	2497
Efficiency(dB)	-2.12	-2.09	-2.06	-2.21	-2.25	-2.17	-2.37	-2.63	-2.54	-2.56
Efficiency(%)	61.32	61.74	62.28	60.19	59.63	60.71	57.91	54.63	55.70	55.42
TRG(dB)	-2.12	-2.09	-2.06	-2.21	-2.25	-2.17	-2.37	-2.63	-2.54	-2.56
TRG _{Theta} (dB)	-2.28	-2.26	-2.22	-2.38	-2.42	-2.34	-2.56	-2.81	-2.73	-2.75
TRG _{Phi} (dB)	-16.54	-16.48	-16.26	-16.28	-16.32	-16.16	-16.18	-16.36	-16.37	-16.25
UHRG(dB)	-5.44	-5.41	-5.39	-5.56	-5.61	-5.55	-5.77	-6.04	-5.96	-5.99
UHRG/TRG(%)	46.63	46.58	46.38	46.19	46.04	45.90	45.74	45.55	45.49	45.39
H-Plane	-0.30	-0.29	-0.29	-0.47	-0.54	-0.48	-0.72	-0.99	-0.94	-0.99
E1-Plane, AVG(dB)	-3.43	-3.41	-3.39	-3.55	-3.60	-3.53	-3.75	-4.02	-3.94	-3.98
E2-Plane, AVG(dB)	-3.60	-3.58	-3.54	-3.69	-3.70	-3.63	-3.83	-4.09	-4.00	-4.02
Peak Gain(dB)	0.11	0.16	0.21	0.08	0.06	0.16	-0.02	-0.26	-0.16	-0.18
Directivity(dB)	2.23	2.26	2.26	2.28	2.31	2.33	2.36	2.36	2.38	2.38
Minimum Gain(dB)	-9.91	-9.71	-9.61	-9.62	-9.63	-9.44	-9.56	-9.72	-9.82	-10.03

Average Efficiency	-2.42dBi,	57.23%
Peak Gain	0.21dBi,	