

25.06.25

RA-N2506-10

APPROVAL SHEET

**MODEL : SRL3+
Bluetooth
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		GRSN250625BT71			
	MODEL NAME	SRL3+	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		GRSN250625BT71			
	MODEL NAME	SRL3+	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		GRSN250625BT71			
	MODEL NAME	SRL3+	REV.	1.0	Page	4 / 10

2.Product Information

2.1 General Features

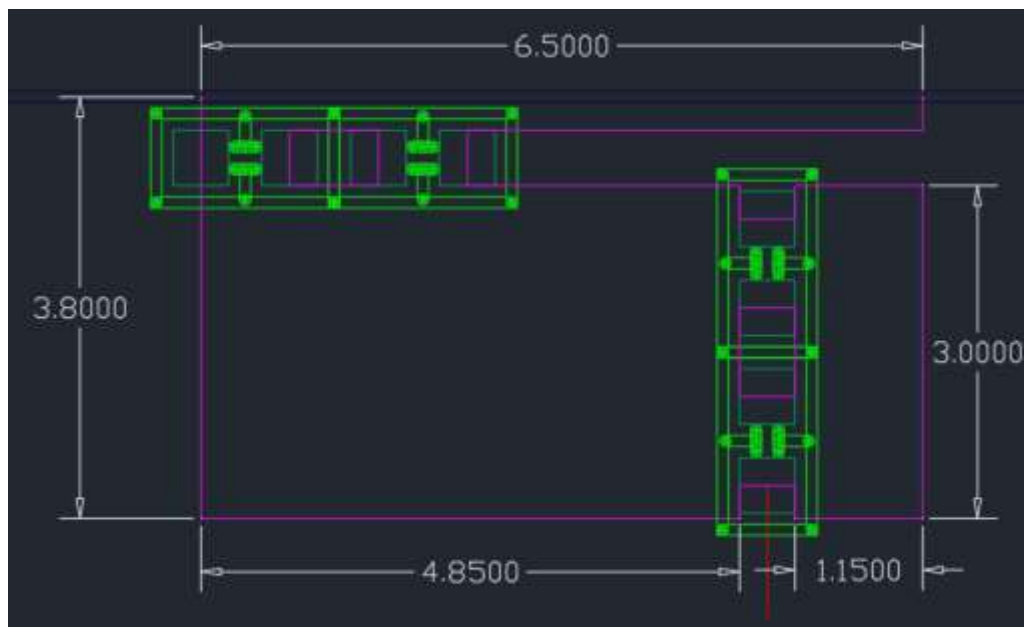
PART NUMBER	GradiANT
ANTENNA TYPE	PCB pattern Antenna
APPLICATIONS	Bluetooth

2.2 Electrical Specifications

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

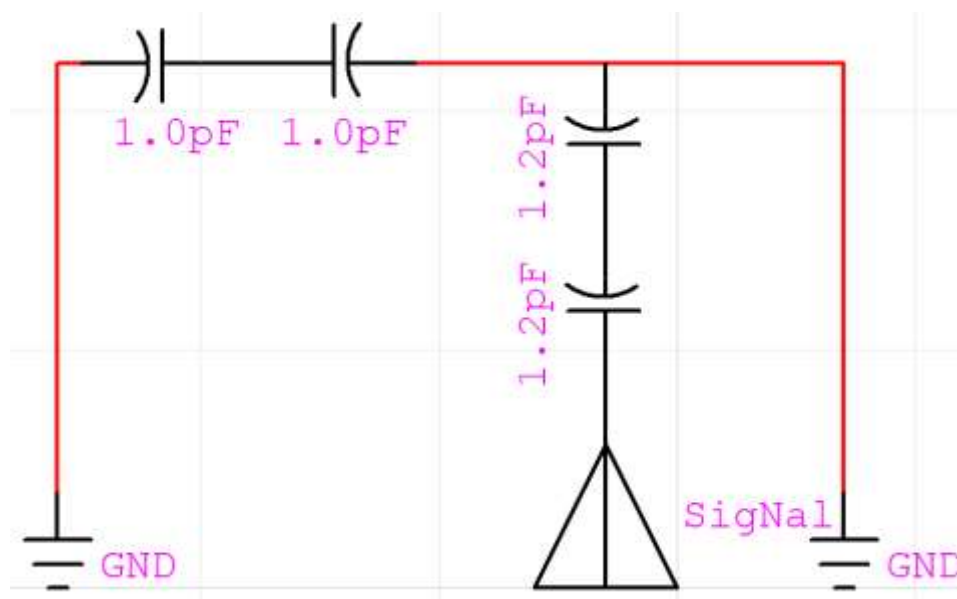
	PRODUCT APPROVAL SHEET		GRSN250625BT71			
	MODEL NAME	SRL3+	REV.	1.0	Page	5 / 10

3. Pattern Specifications



4. Matching Network

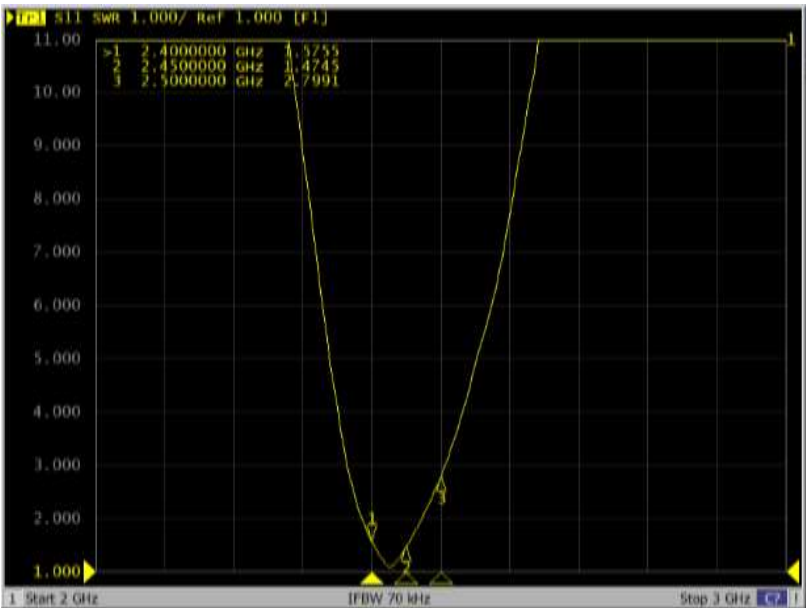
Capacitor value can be changed depending on different situation



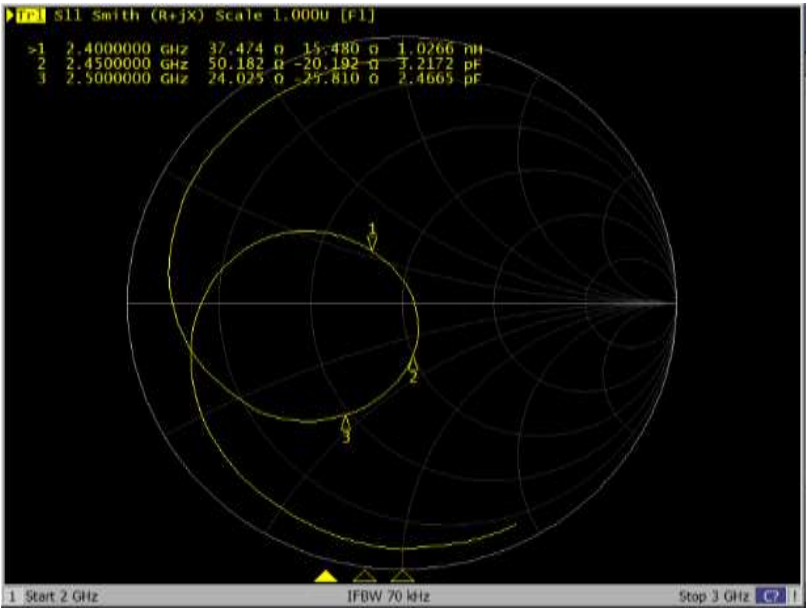
	PRODUCT APPROVAL SHEET		GRSN250625BT71			
	MODEL NAME	SRL3+	REV.	1.0	Page	6 / 10

5. Electrical Characterristics

5.1 VSWR

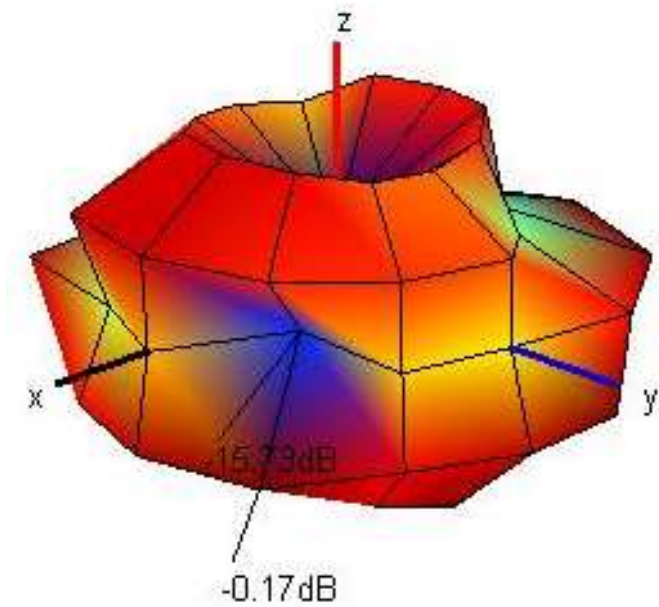


5.2 SMITH CHART

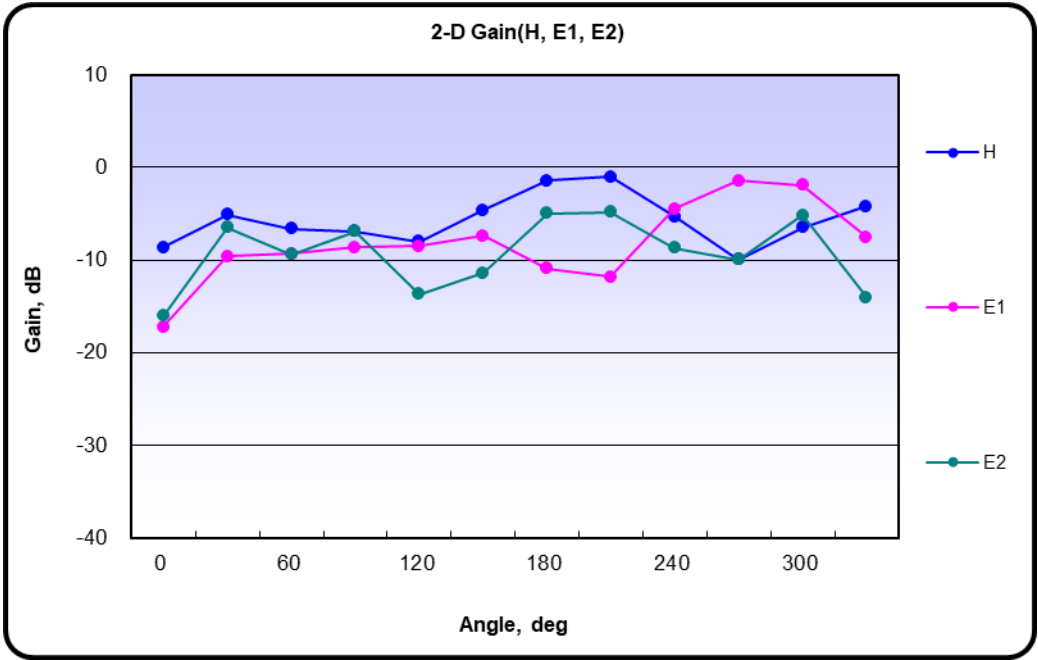


	PRODUCT APPROVAL SHEET		GRSN250625BT71			
	MODEL NAME	SRL3+	REV.	1.0	Page	7 / 10

5.3 3D-PLOTs (2445MHz)



5.4 2D-Gain



	PRODUCT APPROVAL SHEET		GRSN250625BT71			
	MODEL NAME	SRL3+	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]	-4.57	-4.44	-4.29	-4.35	-4.20	-4.13	-3.90	-3.79	-3.95	-3.98
Efficiency [%]	34.9	36.0	37.2	36.7	38.0	38.6	40.7	41.8	40.3	40.0
TRG _θ [dB]	-7.54	-7.40	-7.32	-7.29	-7.23	-7.17	-6.82	-6.68	-7.01	-6.77
Gain _{θ Peak} [dB]	-0.75	-0.21	-0.78	-0.42	-0.59	-0.47	-0.46	-0.35	-0.71	-0.84
Gain _{θ Min} [dB]	-25.17	-20.03	-19.40	-20.30	-18.83	-19.87	-18.33	-23.06	-21.17	-20.36
TRG _φ [dB]	-7.63	-7.51	-7.28	-7.43	-7.19	-7.12	-7.01	-6.92	-6.90	-7.21
Gain _{φ Peak} [dB]	-2.09	-2.03	-1.83	-1.38	-1.60	-1.01	-1.07	-1.17	-1.06	-1.13
Gain _{φ Min} [dB]	-25.04	-28.92	-24.70	-28.40	-44.89	-41.98	-23.52	-21.79	-22.66	-26.86
UHRG [dB]	-8.04	-7.97	-7.74	-7.94	-7.73	-7.57	-7.36	-7.26	-7.43	-7.43
UHRG/TRG [%]	44.9	44.3	45.2	43.7	44.3	45.4	45.1	45.0	44.9	45.1
H-Plane	-8.51	-8.39	-7.91	-7.92	-7.66	-7.34	-6.84	-6.72	-6.98	-6.37
E1-Plane, AVG [dB]	-5.79	-6.11	-5.80	-5.89	-5.92	-6.25	-5.71	-5.68	-6.05	-5.75
E2-Plane, AVG [dB]	-8.12	-8.08	-7.97	-8.06	-8.08	-8.25	-7.72	-7.59	-7.58	-7.26
Peak Gain [dB]	-0.16	0.21	-0.27	0.11	-0.03	-0.09	0.05	0.02	-0.13	-0.17
Directivity [dB]	4.41	4.65	4.02	4.46	4.17	4.04	3.95	3.80	3.82	3.81
Minimum Gain [dB]	-14.44	-14.72	-12.77	-15.10	-16.76	-16.11	-14.36	-13.43	-14.43	-15.73

	11	12	13	14	15	16	17	18	19	20
Frequency [MHz]	2450	2455	2460	2465	2470	2475	2480	2485	2490	2497
Efficiency [dB]	-4.20	-4.31	-4.34	-4.30	-4.41	-4.78	-5.03	-5.76	-5.53	-5.71
Efficiency [%]	38.0	37.0	36.8	37.2	36.2	33.3	31.4	26.5	28.0	26.8
TRG _θ [dB]	-7.04	-7.16	-7.24	-7.12	-7.22	-7.60	-7.80	-8.59	-8.28	-8.37
Gain _{θ Peak} [dB]	-1.01	-1.08	-1.31	-1.38	-1.24	-1.36	-1.59	-2.65	-1.66	-1.80
Gain _{θ Min} [dB]	-24.78	-19.42	-23.69	-22.71	-26.35	-22.53	-22.71	-22.82	-26.78	-26.82
TRG _φ [dB]	-7.39	-7.49	-7.47	-7.50	-7.63	-7.99	-8.30	-8.96	-8.83	-9.11
Gain _{φ Peak} [dB]	-1.81	-1.33	-0.83	-1.67	-1.59	-1.88	-1.77	-2.12	-2.59	-2.55
Gain _{φ Min} [dB]	-29.20	-32.12	-34.26	-32.16	-30.23	-22.74	-20.51	-20.81	-24.77	-21.08
UHRG [dB]	-7.73	-7.87	-7.90	-7.96	-8.05	-8.40	-8.86	-9.69	-9.37	-9.77
UHRG/TRG [%]	44.4	44.1	44.1	43.0	43.3	43.5	41.4	40.5	41.4	39.3
H-Plane	-6.58	-6.57	-6.58	-6.51	-6.47	-6.73	-6.76	-7.81	-7.09	-7.51
E1-Plane, AVG [dB]	-6.28	-5.96	-6.42	-6.18	-6.22	-6.40	-6.90	-7.93	-7.20	-7.17
E2-Plane, AVG [dB]	-7.82	-7.74	-7.83	-7.42	-7.53	-7.67	-7.99	-8.91	-8.14	-8.55
Peak Gain [dB]	-0.49	-0.09	-0.20	0.09	-0.27	-0.53	-0.21	-0.61	-0.84	-0.59
Directivity [dB]	3.72	4.22	4.14	4.39	4.14	4.24	4.82	5.16	4.69	5.12
Minimum Gain [dB]	-17.64	-14.40	-13.51	-16.20	-16.02	-17.01	-18.46	-15.95	-17.07	-16.18

Average Efficiency	-4.46dBi	35.78%
Peak Gain	0.21dBi	