

2024.03.14

RA-N2403-91

APPROVAL SHEET

MODEL : H2-BP
Antenna layout

Review	Consent	Approval

Messrs. CharmCare Co.,Ltd



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	PRODUCT APPROVAL SHEET		GRcc24031BE31			
	MODEL NAME	H2-BP	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		GRcc24031BE31			
	MODEL NAME	H2-BP	REV.	1.0	Page	3 / 10

1. Revision History

NO.	Before	After	Reason	Date
1				
2				
3				
4				
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6				
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11				
12				
13				

	PRODUCT APPROVAL SHEET		GRcc24031BE31			
	MODEL NAME	H2-BP	REV.	1.0	Page	4 / 10

2.Product Information

2.1 General Features

PART NUMBER	GRcc24031BE31
ANTENNA TYPE	PCB Pattern Antenna
APPLICATIONS	BLE

2.2 Electrical Specifications

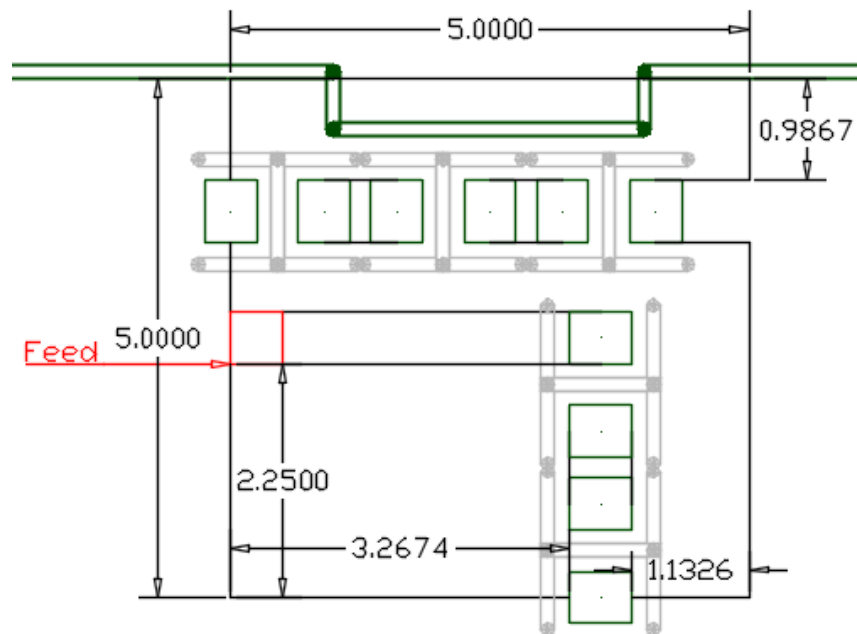
Frequency Range1 (TX)		2400MHz~2485MHz	
Frequency Range1 (RX)		2400MHz~2485MHz	
IMPEDANCE		50 Ω	
V.S.W.R	TX	2400MHz	2485MHz
		3 ↓	3 ↓
	RX	2400MHz	2485MHz
		3 ↓	3 ↓
RADIATION PATTERN		Omni-directional	
POLARIZATION		Linear	

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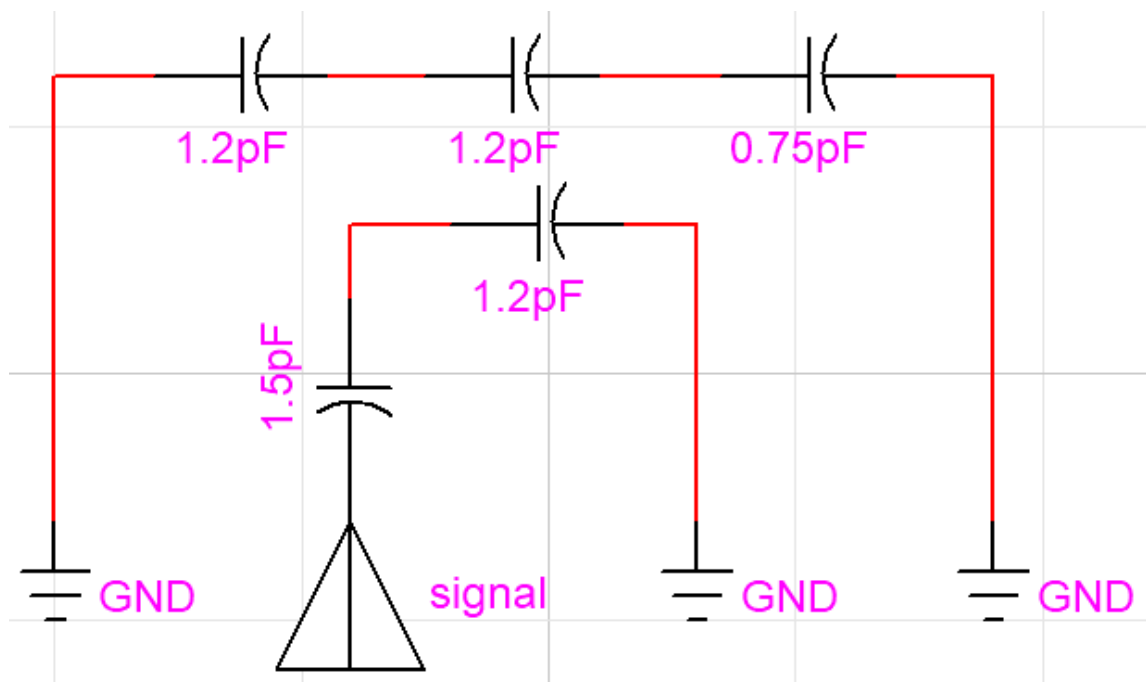
	PRODUCT APPROVAL SHEET		GRcc24031BE31			
	MODEL NAME	H2-BP	REV.	1.0	Page	5 / 10

3. Pattern Specifications



4. Matching Network

Capacitor value can be changed depending on different situation



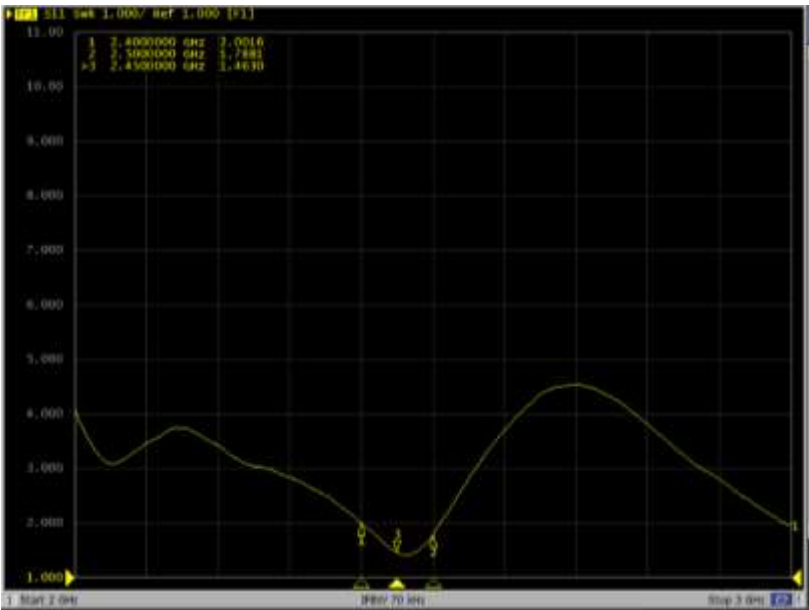
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	PRODUCT APPROVAL SHEET		GRcc24031BE31			
	MODEL NAME	H2-BP	REV.	1.0	Page	6 / 10

5. Electrical Characterristics

5.1 VSWR

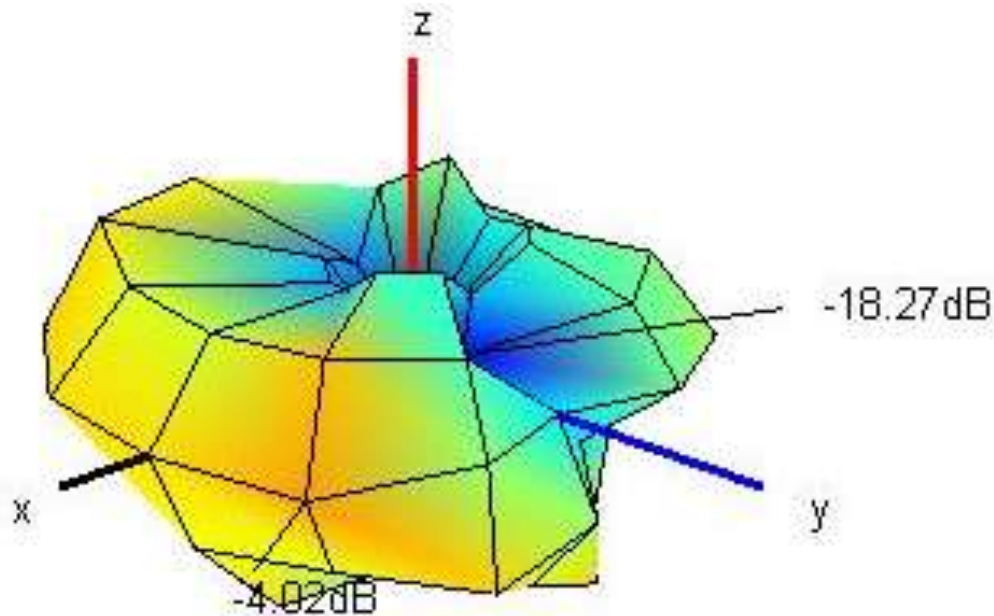


5.2 SMITH CHART

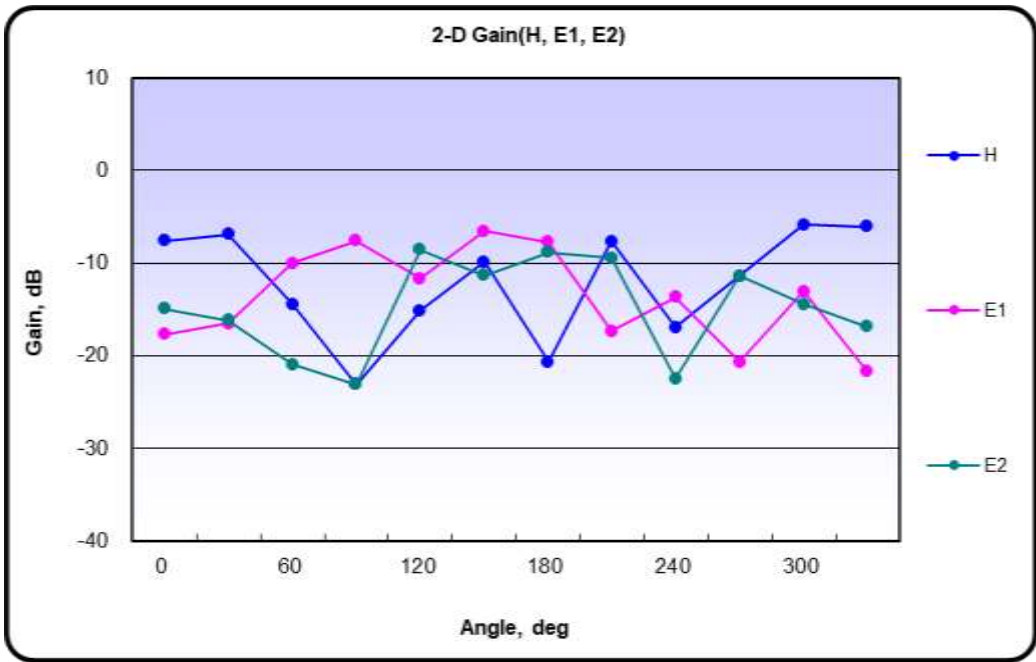


	PRODUCT APPROVAL SHEET		GRcc24031BE31			
	MODEL NAME	H2-BP	REV.	1.0	Page	7 / 10

5.3 3D-PLOTs



5.4 2D-GAIN



	PRODUCT APPROVAL SHEET		GRcc24031BE31			
	MODEL NAME	H2-BP	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]	-8.51	-8.73	-8.86	-8.75	-8.45	-8.35	-7.94	-8.01	-7.88	-7.80
Efficiency [%]	14.1	13.4	13.0	13.3	14.3	14.6	16.1	15.8	16.3	16.6
TRG _θ [dB]	-11.83	-11.94	-12.09	-11.94	-11.71	-11.66	-11.02	-11.18	-11.20	-11.08
Gain _{θ Peak} [dB]	-6.71	-6.87	-6.69	-5.91	-6.48	-6.45	-5.71	-6.19	-5.89	-5.73
Gain _{θ Min} [dB]	-32.99	-46.29	-35.16	-32.02	-32.26	-36.43	-32.43	-29.34	-26.35	-27.53
TRG _φ [dB]	-11.24	-11.55	-11.66	-11.60	-11.23	-11.09	-10.88	-10.87	-10.60	-10.56
Gain _{φ Peak} [dB]	-5.98	-6.44	-6.82	-6.55	-6.30	-5.60	-5.41	-6.25	-5.36	-4.53
Gain _{φ Min} [dB]	-27.04	-35.56	-27.74	-23.27	-26.67	-28.44	-33.15	-23.38	-22.57	-24.79
UHRG [dB]	-12.00	-12.20	-12.50	-12.28	-11.99	-11.96	-11.52	-11.57	-11.55	-11.51
UHRG/TRG [%]	44.9	45.0	43.2	44.4	44.3	43.6	43.9	44.1	43.0	42.5
H-Plane	-10.57	-10.49	-10.71	-10.19	-10.09	-10.07	-9.29	-9.64	-9.66	-9.57
E1-Plane, AVG [dB]	-11.26	-11.85	-11.71	-12.03	-11.07	-11.40	-11.10	-11.18	-11.23	-11.28
E2-Plane, AVG [dB]	-14.00	-13.63	-14.79	-13.58	-13.85	-13.38	-12.78	-12.59	-12.89	-12.60
Peak Gain [dB]	-4.52	-5.17	-5.34	-5.03	-4.64	-3.89	-3.90	-4.16	-3.96	-4.02
Directivity [dB]	4.00	3.57	3.52	3.72	3.82	4.47	4.04	3.85	3.92	3.78
Minimum Gain [dB]	-19.63	-18.42	-17.48	-17.27	-22.36	-18.39	-18.47	-18.97	-18.22	-18.27

	11	12	13	14	15	16	17	18	19	20
Frequency [MHz]	2400	2450	2455	2460	2465	2470	2475	2480	2485	2490
Efficiency [dB]	-8.51	-7.82	-7.70	-8.24	-8.39	-8.28	-8.31	-8.02	-7.93	-7.76
Efficiency [%]	14.1	16.5	17.0	15.0	14.5	14.9	14.8	15.8	16.1	16.7
TRG _θ [dB]	-11.22	-11.01	-11.60	-11.86	-11.78	-12.01	-11.56	-11.61	-11.64	-11.36
Gain _{θ Peak} [dB]	-5.93	-5.35	-5.98	-6.21	-6.00	-6.12	-6.31	-6.34	-5.85	-5.64
Gain _{θ Min} [dB]	-31.71	-33.05	-28.97	-29.26	-26.47	-34.55	-33.27	-27.07	-29.25	-33.48
TRG _φ [dB]	-10.47	-10.43	-10.93	-10.98	-10.85	-10.72	-10.56	-10.35	-10.05	-10.00
Gain _{φ Peak} [dB]	-4.82	-5.02	-6.11	-6.25	-5.56	-5.68	-5.30	-4.50	-4.62	-4.59
Gain _{φ Min} [dB]	-22.59	-23.89	-26.08	-32.39	-27.51	-28.63	-26.83	-25.47	-22.00	-26.74
UHRG [dB]	-11.55	-11.41	-11.93	-12.16	-11.99	-12.10	-11.77	-11.65	-11.62	-11.42
UHRG/TRG [%]	42.3	42.5	42.8	42.0	42.6	41.8	42.2	42.4	41.1	41.7
H-Plane	-9.56	-9.30	-10.06	-10.14	-10.06	-10.35	-9.91	-9.96	-10.17	-9.75
E1-Plane, AVG [dB]	-11.74	-11.37	-11.77	-12.27	-12.36	-12.50	-11.93	-12.19	-12.01	-12.07
E2-Plane, AVG [dB]	-12.69	-12.75	-13.35	-13.31	-13.49	-13.81	-13.26	-13.66	-13.28	-13.05
Peak Gain [dB]	-4.00	-3.16	-4.22	-4.09	-4.07	-3.99	-3.31	-2.87	-3.10	-2.34
Directivity [dB]	3.81	4.54	4.03	4.30	4.20	4.32	4.71	5.06	4.66	5.28
Minimum Gain [dB]	-16.69	-18.85	-16.41	-20.40	-19.03	-19.87	-17.55	-16.30	-17.45	-18.18

Average Efficiency	-8.15dBi	15.30%
Peak Gain	-2.87dBi	

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	PRODUCT APPROVAL SHEET		GRcc24031BE31			
	MODEL NAME	H2-BP	REV.	1.0	Page	9 / 10

7.Measurement Process

7.1 SWR / Return loss

	Set Condition
Network Analyzer	Agilent 8753ES
Cable	Semi-ridid (40mm, 60mm)
Test condition	

7.2 Gain

Antenna gain is measured in the anechoic chamber of this company.

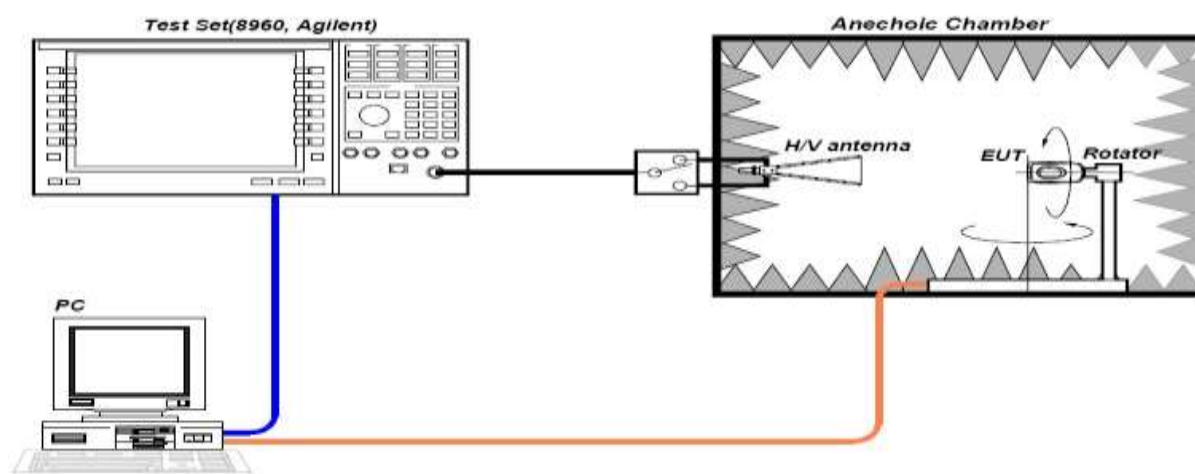
Anechoic Chamber for Antenna Gain Measurement	
	
	

	PRODUCT APPROVAL SHEET		GRcc24031BE31			
	MODEL NAME	H2-BP	REV.	1.0	Page	10 / 10

7.3 Gain test block diagram

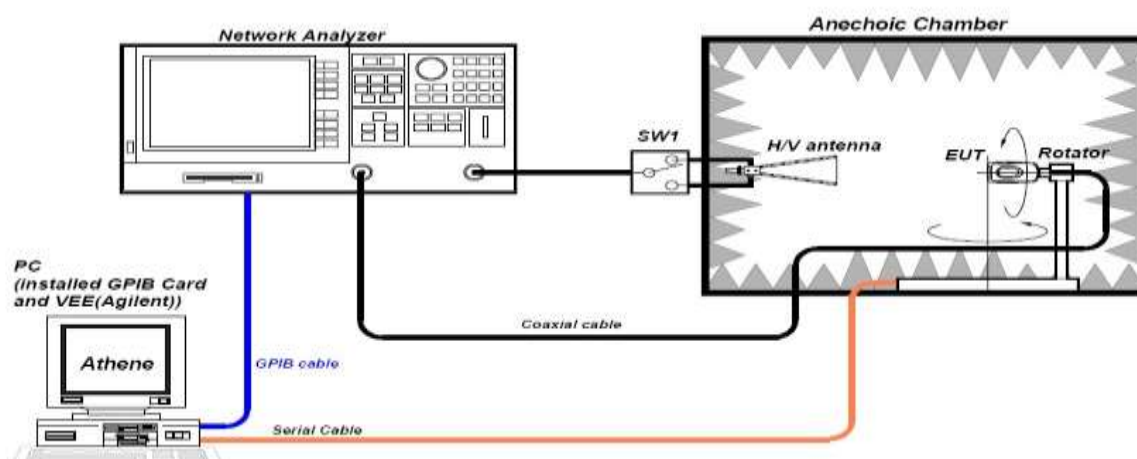
Active test Sysetm

- TRP, NHPRP, UHRP
- TIS, NHPIS, UHIS
- Relative Sensitivity



Passiver test Sysetm

- Efficiency
- Peak Gain, Avg, Gain
- Min, Max PWR



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