



Shenzhen Qianmu Communication Technology Co., Ltd.

Shenzhen Qianmu Communication Technology Co., Ltd.

Specializing in antenna solutions, design, and manufacturing

Customer: Hugsun
project :

Date: 2026.02.05

Frequency: XU JUN JIE



catalogue

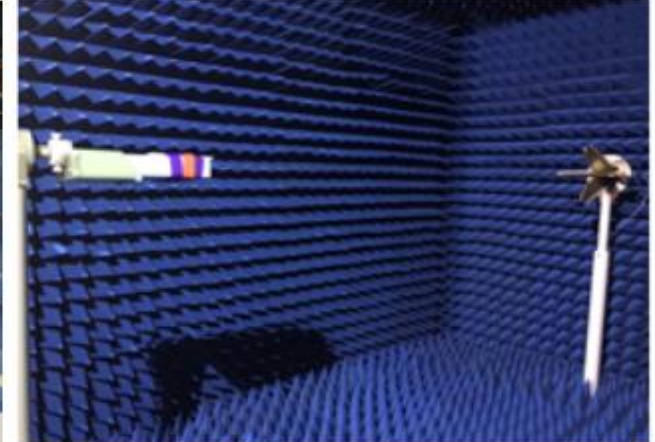
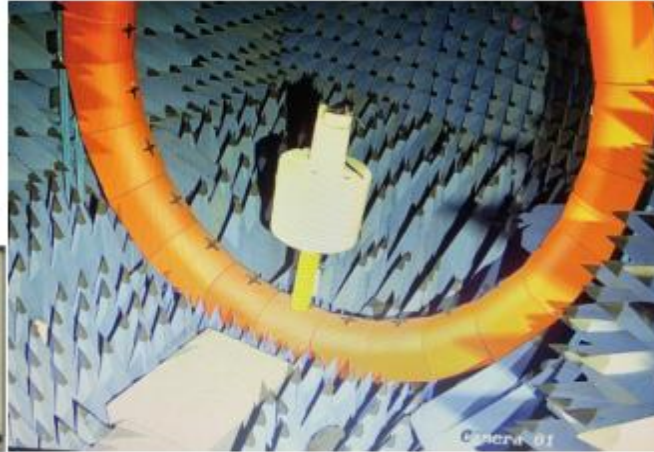
1. Test Environment
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testing environment

ironm- Seeking truth, value creation, and mutual benefit for all parties involved.

	Test item	Equipment
1. S-parameter	1. Echo Loss (Log Mag) 2. Voltage Standing Wave Ratio (SWR)	Network Analyzer: Agilent T E5071B ×2, HP 8753D PROTEK A338
2. Active Testing	1. Transmission Power (TRP) 2. Reception Sensitivity (TIS) 3. frequency error 4. Screen Off, Screen On	1. Dark Room: Feitu 7×4×3 m (24 probes, 3D); Chamber ETS 5×3×3 m (3D). 2. Comprehensive tester: Agilent 8960 × 2 units of CMW500 × 3 units of CMU200
3. Passive Testing	1. Antenna Gain 2. Antenna Efficiency (Efficiency)	1. Dark Room: Feitu 7×4×3 m (24 probes, 3D); Chamber ETS 5×3×3 m (3D). 2. Network Analyzer: Agilent T E5071B





Seeking truth, value cr-

Description of previous debugging records:

ation, and mutual benefit for all parties involved.

Date	Edition	Pattern	Debugging Record Description
2026. 02. 05	A		Debugging Prototype

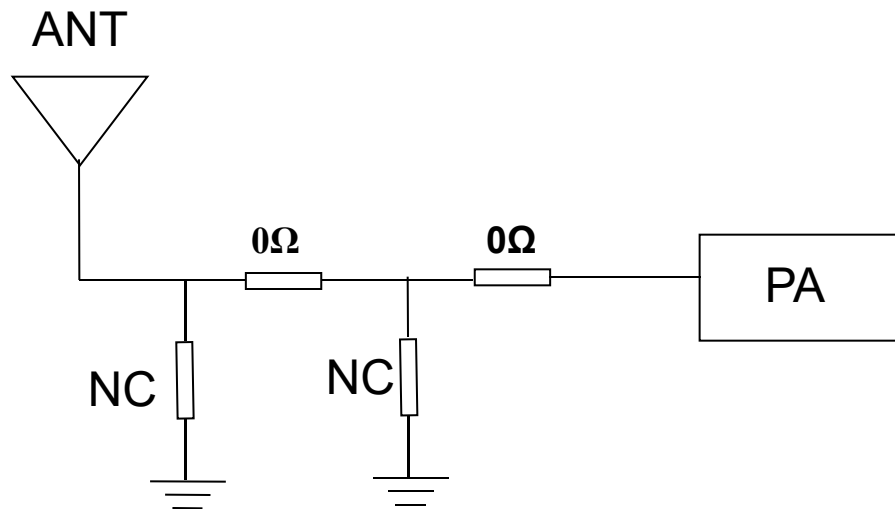


Complete System Debugging
Instructions

Type	Projector						
Pattern	Motherboard						
Antenna Overview	Main antenna	Frequency range		Antenna Status	Antenna Type	Design Area	Match Changes
		2G	N/A	N/A	N/A	N/A	N/A
		3G	N/A				
		4G	N/A				
	Other Antennas	WIFI/BT	2. 4/5G	/	Internal	Motherboard	Not have
		GPS	N/A				
		Episode	N/A	N/A	N/A	N/A	N/A
Prototype Status	Debugging Prototype			Environmental Treat- ment	Not have		



Internal Antenna



The matching circuit remains unchanged



Passive Efficiency/Gain

FEITUKEJI											
Frequency ID	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	2400.0	2410.0	2420.0	2430.0	2440.0	2450.0	2460.0	2470.0	2480.0	2490.0	2500.0
Point Values											
Ant. Port Input Pwr. (dBm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot. Rad. Pwr. (dBm)	-3.99	-4.08	-4.14	-4.29	-4.37	-4.42	-4.45	-4.62	-4.81	-4.87	-4.95
Peak EIRP (dBm)	1.47	1.36	1.24	1.02	0.89	0.80	0.87	0.79	0.65	0.51	0.28
Directivity (dBi)	5.46	5.44	5.39	5.32	5.26	5.22	5.31	5.41	5.45	5.38	5.23
Efficiency (dB)	-3.99	-4.08	-4.14	-4.29	-4.37	-4.42	-4.45	-4.62	-4.81	-4.87	-4.95
Efficiency (%)	39.90	39.10	38.50	37.20	36.60	36.10	35.90	34.50	33.10	32.60	32.00
Gain (dBi)	1.47	1.36	1.24	1.02	0.89	0.80	0.87	0.79	0.65	0.51	0.28
NHPRP $\pm \pi/4$ (dBm)	-5.48	-5.58	-5.65	-5.81	-5.89	-5.93	-5.95	-6.13	-6.32	-6.38	-6.48
NHPRP $\pm \pi/6$ (dBm)	-7.01	-7.10	-7.17	-7.31	-7.38	-7.42	-7.44	-7.62	-7.81	-7.88	-7.99
NHPRP $\pm \pi/8$ (dBm)	-8.20	-8.29	-8.34	-8.47	-8.53	-8.56	-8.57	-8.74	-8.92	-8.99	-9.12
Upper Hem. PRP (dBm)	-5.88	-5.94	-6.01	-6.18	-6.28	-6.35	-6.38	-6.57	-6.75	-6.79	-6.84
Lower Hem. PRP (dBm)	-8.50	-8.64	-8.71	-8.82	-8.86	-8.88	-8.89	-9.05	-9.24	-9.32	-9.47
Upper Hem. PRP (%)	25.81	25.44	25.04	24.07	23.57	23.19	23.00	22.05	21.16	20.92	20.71
Lower Hem. PRP (%)	14.13	13.67	13.47	13.13	13.01	12.94	12.92	12.43	11.91	11.70	11.30

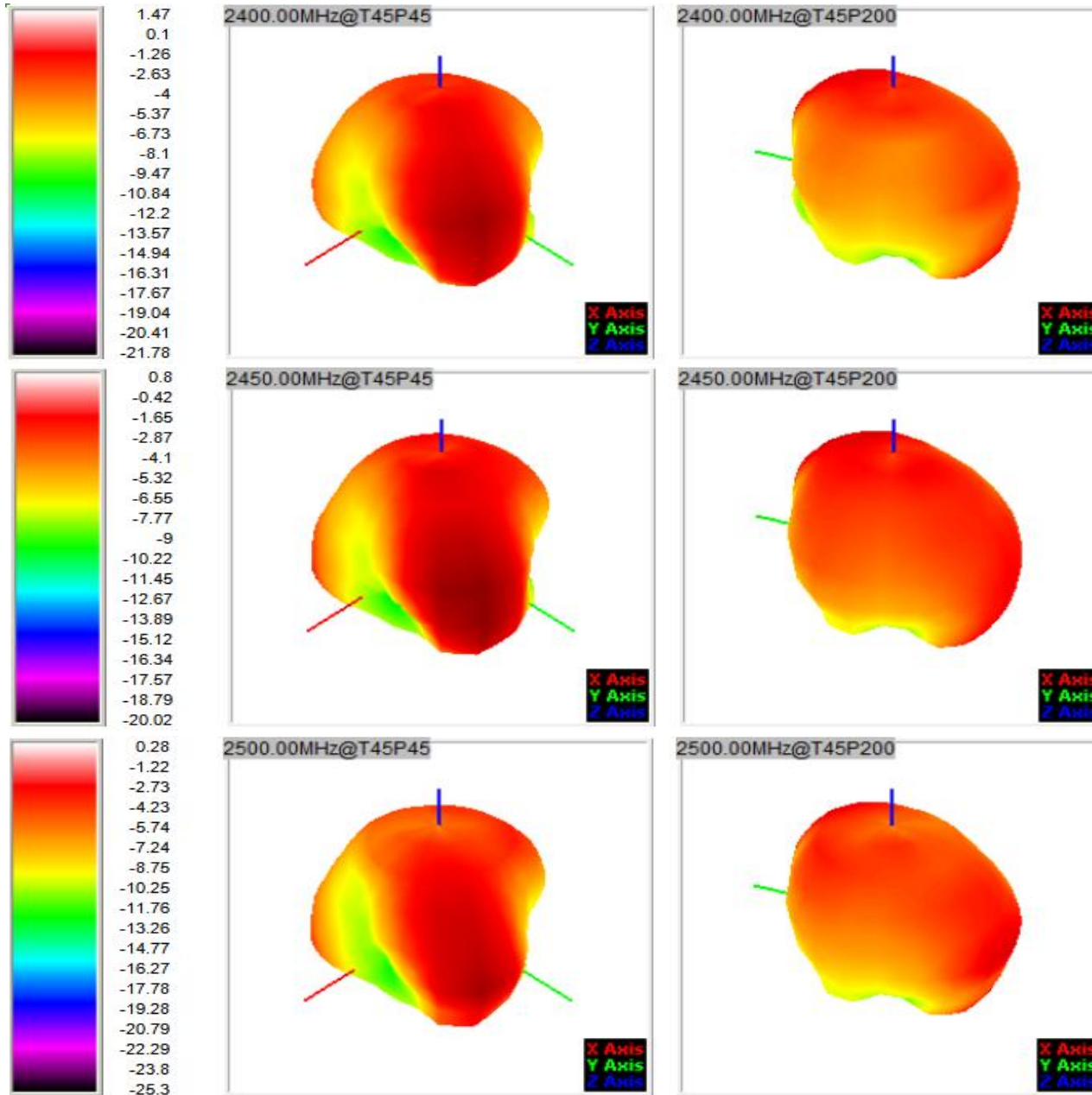


Passive Efficiency/Gain

FEITUKEJI															
Frequency ID	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Frequency (MHz)	5150.0	5200.0	5250.0	5300.0	5350.0	5400.0	5450.0	5500.0	5550.0	5600.0	5650.0	5700.0	5750.0	5800.0	5850.0
Point Values															
Ant. Port Input Pwr. (dBm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot. Rad. Pwr. (dBm)	-3.66	-3.38	-3.34	-3.00	-3.32	-3.72	-3.25	-3.66	-4.02	-4.03	-4.46	-4.66	-4.75	-5.28	-5.03
Peak EIRP (dBm)	0.56	1.15	1.31	1.82	1.77	1.48	1.93	1.19	0.48	0.34	0.46	0.30	-0.33	-0.72	-0.60
Directivity (dBi)	4.22	4.52	4.65	4.81	5.09	5.20	5.18	4.85	4.49	4.37	4.93	4.96	4.43	4.55	4.43
Efficiency (dB)	-3.66	-3.38	-3.34	-3.00	-3.32	-3.72	-3.25	-3.66	-4.02	-4.03	-4.46	-4.66	-4.75	-5.28	-5.03
Efficiency (%)	43.00	46.00	46.30	50.20	46.50	42.40	47.30	43.10	39.60	39.60	35.80	34.20	33.50	29.70	31.40
Gain (dBi)	0.56	1.15	1.31	1.82	1.77	1.48	1.93	1.19	0.48	0.34	0.46	0.30	-0.33	-0.72	-0.60
NHPRP $\pm\pi/4$ (dBm)	-5.29	-5.10	-5.09	-4.62	-5.01	-5.53	-4.99	-5.42	-5.73	-5.63	-6.08	-6.29	-6.36	-6.82	-6.54
NHPRP $\pm\pi/6$ (dBm)	-6.89	-6.77	-6.78	-6.24	-6.75	-7.36	-6.64	-7.12	-7.41	-7.23	-7.70	-7.89	-7.94	-8.39	-8.13
NHPRP $\pm\pi/8$ (dBm)	-8.16	-8.11	-8.11	-7.50	-8.17	-8.82	-7.95	-8.50	-8.78	-8.51	-9.01	-9.15	-9.20	-9.69	-9.43
Upper Hem. PRP (dBm)	-5.97	-5.52	-5.51	-5.35	-5.47	-5.86	-5.57	-5.92	-6.47	-6.62	-7.04	-7.35	-7.58	-8.10	-8.00
Lower Hem. PRP (dBm)	-7.51	-7.47	-7.39	-6.78	-7.41	-7.83	-7.08	-7.57	-7.68	-7.50	-7.96	-8.02	-7.96	-8.48	-8.08
Upper Hem. PRP (%)	25.32	28.07	28.11	29.15	28.39	25.94	27.71	25.57	22.57	21.77	19.77	18.43	17.46	15.48	15.84
Lower Hem. PRP (%)	17.73	17.91	18.24	21.00	18.14	16.49	19.60	17.49	17.07	17.79	16.01	15.78	16.01	14.19	15.56

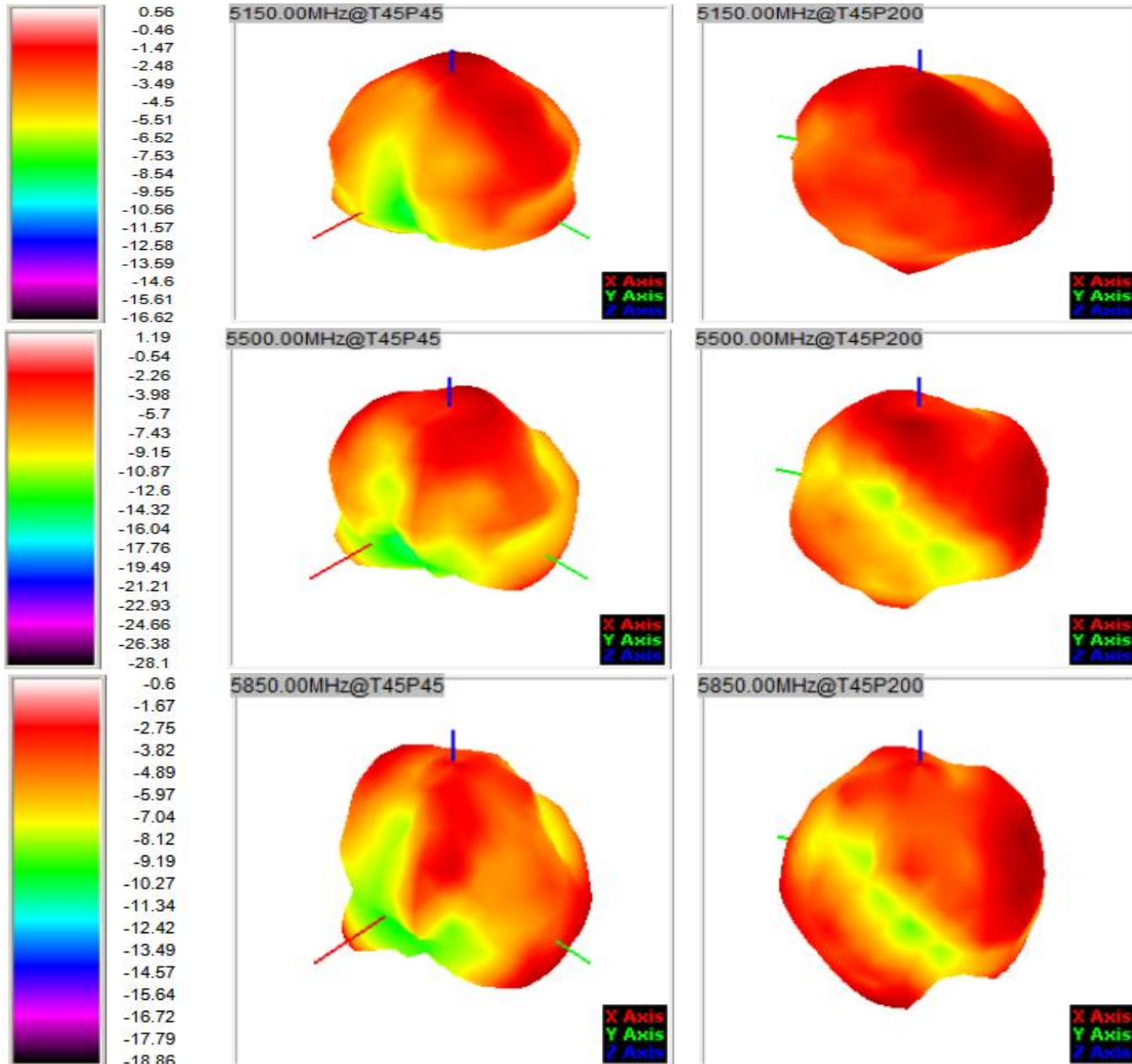


Passive 3D Pattern





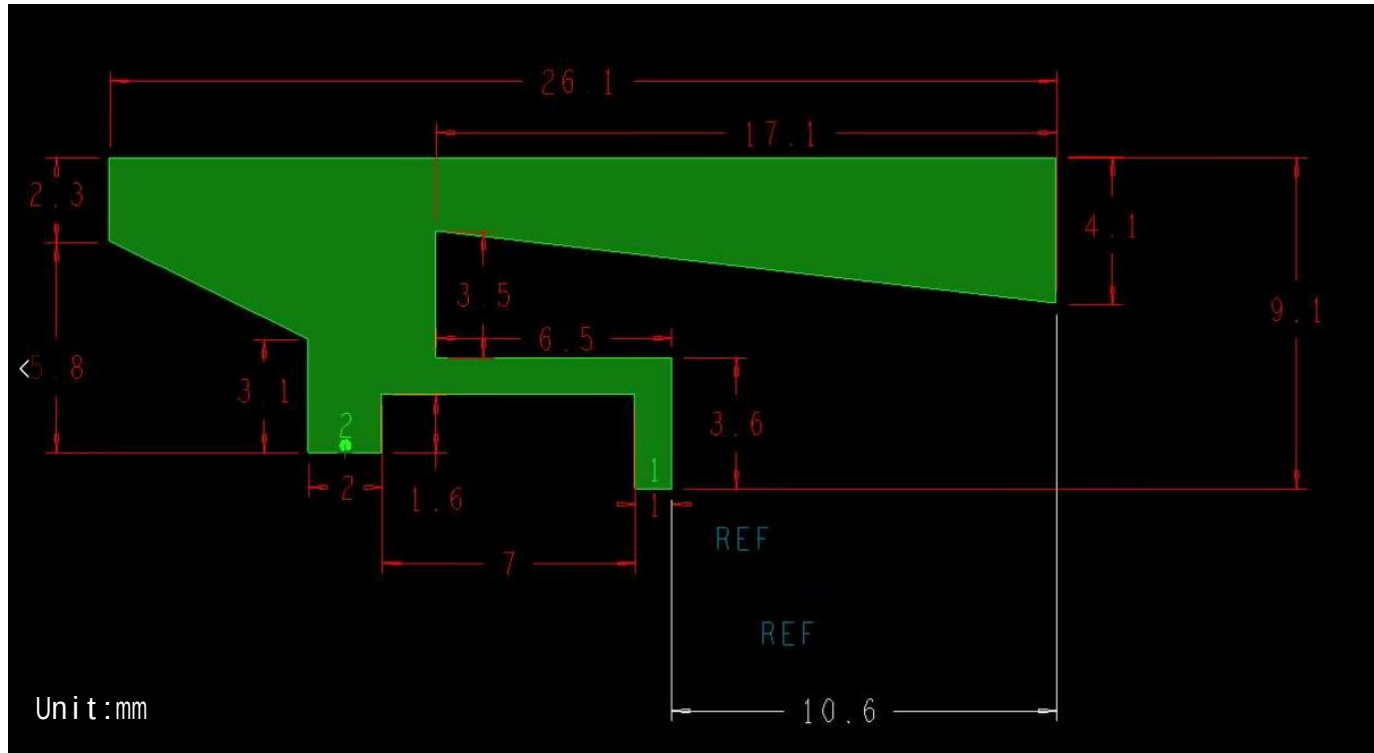
Passive 3D Pattern





mutual benefit for all parties involved.

Shape and Dimensions of the Onboard Antenna



Antenna Supplier: Dongguan CSR Circuit Technology Co., Ltd.
Antenna Model: HS86-MINI 13



Prompt Description

1. This data refers solely to the information generated from customer-provided prototypes and does not represent the final mass production status.
2. Please carefully review the modifications to the matching circuit and environmental treatment instructions in our company's report.
3. Prior to mass production, please provide trial prototypes for our second verification. Please notify us in advance of any changes in materials, software updates, or environmental adjustments.
4. If the customer requires third-party retesting or needs samples sent for testing, please have them verified by our company before submitting the prototype to avoid discrepancies between the production unit and the test unit.
5. Our company does not accept data from machines other than the test machine or from other certified darkroom tests, except for reference purposes (excluding certified darkrooms). In case of discrepancies, the test machine's data shall prevail for determining the cause.



Seeking truth, value creation, and mutual benefit for all parties involved.

Thanks !

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Shenzhen Qianmu Communication Technology Co.,Ltd.