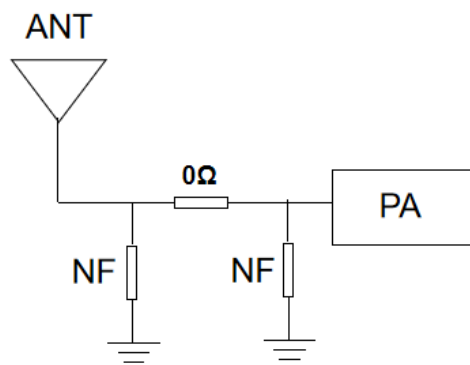


Antenna acknowledgment

Applicable model	D21		
client	Shenzhen Tubu Education Electronic Multimedia Co., Ltd		
Specification description			
	Product content	specifications	Customer material code
Specification description	antenna	FPC / Black / Character QM-D21-V1.0	03.XC.245
Change the resume			
order number	date	edition	Change the content brief
1	2024-09-06	V1.0	New projects
2			
3			

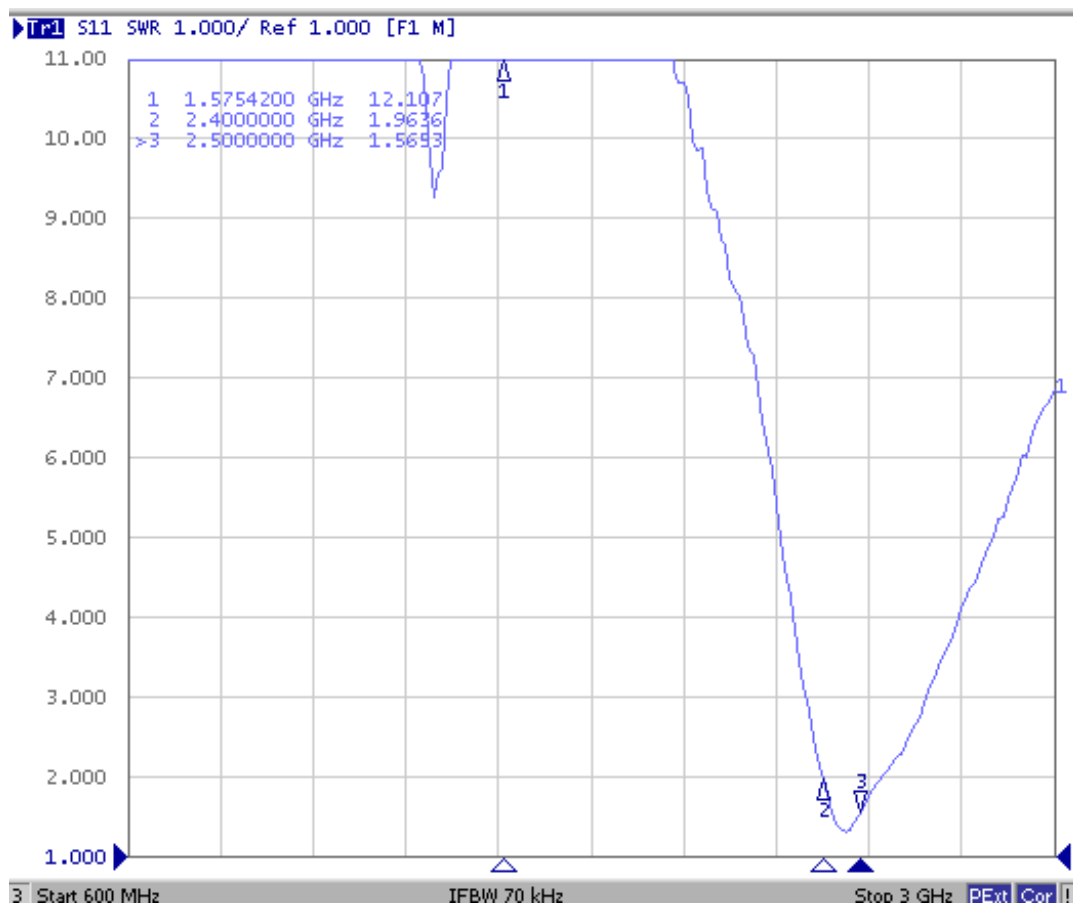
Supplier Sample Confirmation					
research and development	structure	examine and verify	judge		
			PASS <input checked="" type="checkbox"/> FAIL <input type="checkbox"/>		
Customer sample confirmation					
electron	structure	project	purchase	character	examine and verify
Reason for rejection or other precautions:					

1、 Match circuit—the antenna



Original matching circuit is not changed

2、 S11 for the passive parameters



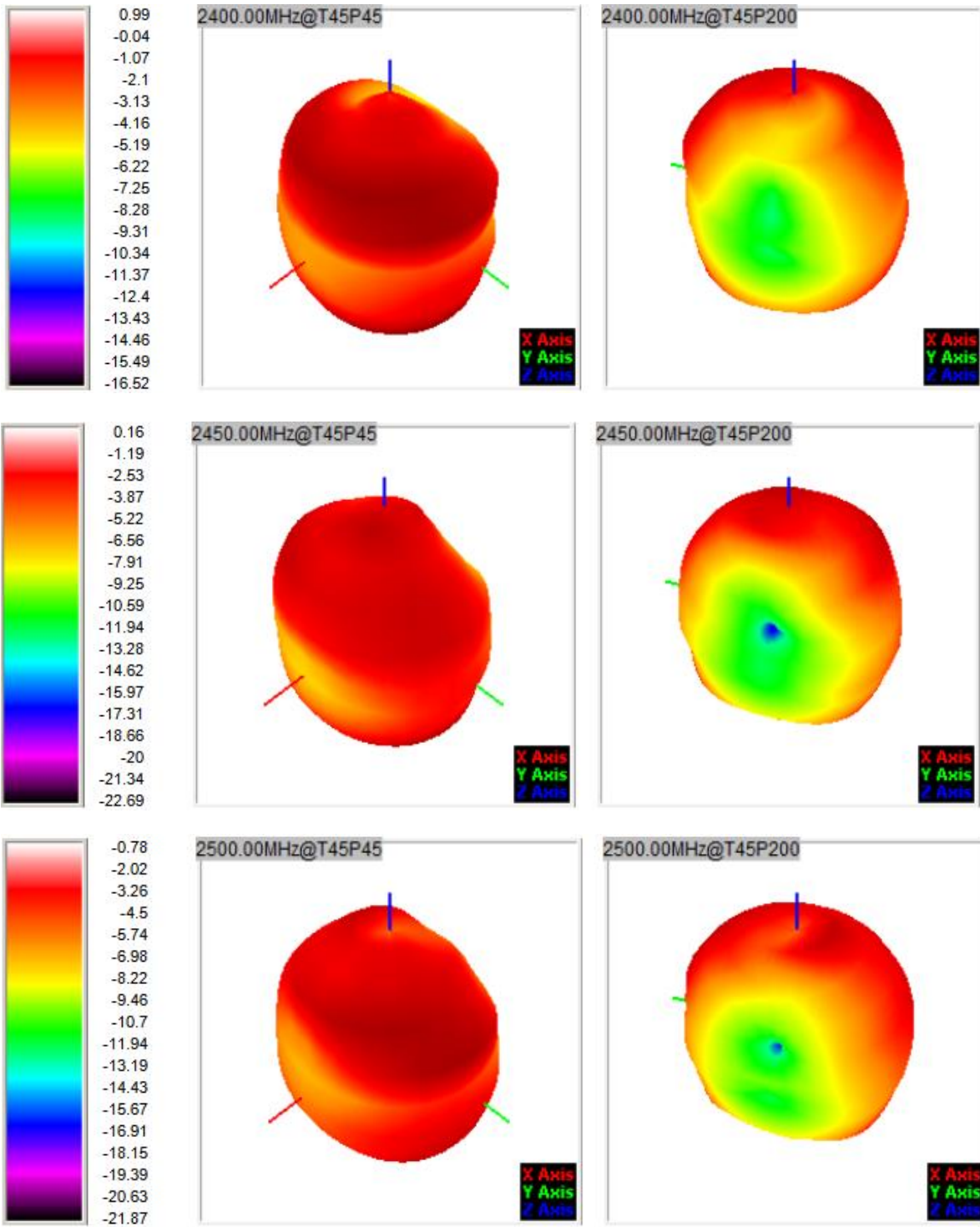
3、The antenna has active data

	2400~2500MHz		
Channel	1	6	11
TRP	13.79	14.01	14.38
TIS	-79.65	-78.63	-78.21

4、antenna effeciency

Frequency ID	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Ant. Port Input Pwr. (dBm)	0	0	0	0	0	0	0	0	0	0	0
Tot. Rad. Pwr. (dBm)	-3.03	-3.09	-3.1	-3.27	-3.36	-3.48	-3.55	-3.82	-4.01	-4.19	-4.31
Peak EIRP (dBm)	0.99	0.95	0.87	0.58	0.36	0.16	0.05	-0.29	-0.61	-0.88	-0.78
Directivity (dBi)	4.02	4.04	3.98	3.86	3.71	3.64	3.6	3.53	3.39	3.31	3.52
Efficiency (dB)	-3.03	-3.09	-3.1	-3.27	-3.36	-3.48	-3.55	-3.82	-4.01	-4.19	-4.31
Efficiency (%)	49.7	49.1	48.9	47.1	46.2	44.9	44.1	41.5	39.8	38.1	37.1
Gain (dBi)	0.99	0.95	0.87	0.58	0.36	0.16	0.05	-0.29	-0.61	-0.88	-0.78
NHPRP $\pm\pi/4$ (dBm)	-4.5	-4.61	-4.69	-4.92	-5.05	-5.18	-5.23	-5.46	-5.62	-5.79	-5.9
NHPRP $\pm\pi/6$ (dBm)	-6.46	-6.6	-6.69	-6.9	-7.01	-7.11	-7.11	-7.3	-7.43	-7.57	-7.66
NHPRP $\pm\pi/8$ (dBm)	-8.22	-8.39	-8.49	-8.67	-8.74	-8.78	-8.74	-8.87	-8.95	-9.06	-9.11
Upper Hem. PRP (dBm)	-6.17	-6.15	-6.12	-6.26	-6.3	-6.39	-6.43	-6.65	-6.81	-6.97	-7.06
Lower Hem. PRP (dBm)	-5.92	-6.05	-6.11	-6.31	-6.44	-6.6	-6.71	-7.01	-7.24	-7.44	-7.59
Upper Hem. PRP (%)	24.14	24.27	24.43	23.68	23.46	22.99	22.77	21.61	20.86	20.07	19.67
Lower Hem. PRP (%)	25.6	24.83	24.51	23.4	22.69	21.89	21.35	19.92	18.9	18.02	17.43

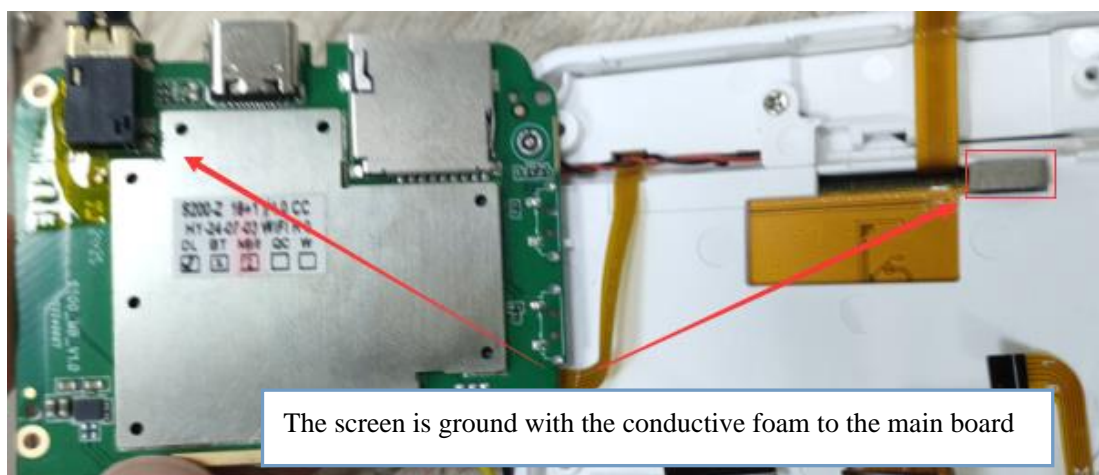
5、 antenna pattern



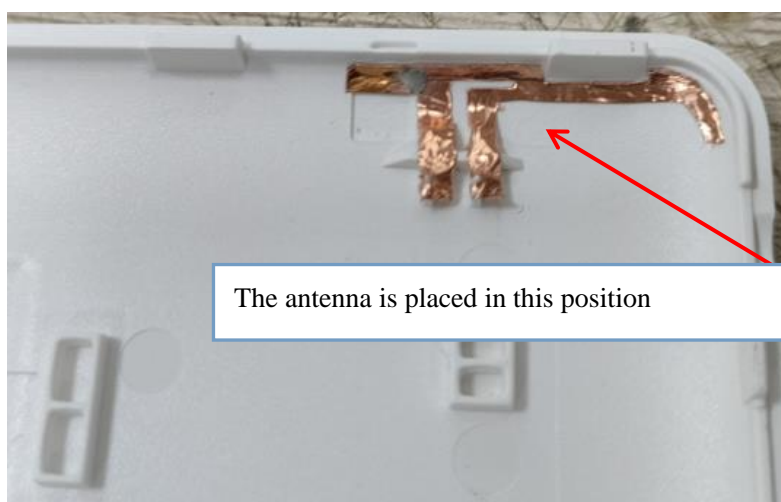
6. antenna measurement



6、 Environmental treatment instructions



7、 Antenna placement



8、schedule drawing

12345678

Note: the FPC to use a half, and the toughness is better, not easy to tear.

ABCD

Peripheral and through holes

Copper platinum

Base material

Gold-plated nickel

plating

Zigzag paper break line

Backless zone

Back glue area

technical requirement:

- 1.Side A represents the copper wire of FPC, and side B represents the 3M 9471 tape paper;
- 2.The total thickness of FPC is 0.24mm, and the thickness of brush gold is 10um~30um and nickel plating;
- 3.Material using a single layer of PI substrate, electrolytic copper;
- 4.Oil film matte black, character bright white;
- 5.The mark with the * number is the key size.

第三角法	第三角法	FPC	Design	DATE
0~10 ±0.10	○ 0.02	D21 QM-D21 PI substrate, electrolytic	RF ME Check	2024-09-06
10~20 ±0.12	◎ φ0.03			DATE
20~40 ±0.15	⊥ 0.02			DATE
40~50 ±0.20	∠ 0.04			DATE
		Proportion:FIT Unit:mm	深圳市千目通讯科技有限公司	
		Position	ShenZhen QianMu Communication Technology Co.,Ltd	

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ABCD

DATE	UPDATE	Remarks