ShenZhen Yangyue Electronic Communication Technology Co., Ltd.

SPECIFICATION FOR APPROVAL

Customer Name	APICAL
Product name	2.4GHz copper tube internal antenna/copper tube diameter 5.2.0mm/ l = 110.0 mm + terminal/BM03 TX Project/Supplier: Yang Yue
Product number	YY-20240312-01
Prepared By	Tony-Men
Checked By	
Approved By	
Apply Date	2024 年 3 月 12 日

CUSTOMER SIGNATURE		
Prepared By	**Checked By**	**Approved By**

PLEASE RETURN TO US ONE COPY OF"SPECIFICATION FOR APPROVAL"WITH YOUR APPROVED SIGNATURES.

频率范围 Frequency range	2400~2500（MHz）
增益 Gain	2.62dBi/MAX
驻波比系数 VSWR	<2.0
输入阻抗 Input Impedance	50±5（Ω）
极化方式 Polarization	Vertical& Honrizontal

Revision History

Date	Revision	Description of Changes
2024-3-12	RA	Measured 2.4GHz Antenna with sample.

1 Technical Summary

This report summarizes the electrical results of the proposed antenna to support the 2.4GHz Antenna program. We test the antenna with the latest version handset. And it seems to be acceptable.

2 General Description

2.1 Components/Part revisions

VSWR: Voltage Standing Wave Rate.

3 Mechanical Description

4 Electrical Performance

4.1 Set-up

4.1.1 VSWR

VSWR measurements (S11) were performed using an Agilent 8753D Network Analyzer and the previously described test fixture. Coaxial chokes were used to mitigate surface currents on the outside of the cabling. The testing was performed in free space.

4.1.2 Gain & Radiation Patterns

The gain of the antenna was measured in the Lxc's anechoic chamber. Coaxial chokes on the feed cable were used to mitigate surface currents. The chamber provides less than –30 dB reflectivity from 300 MHz through 3 GHz and an 18" diameter spherical quite zone. The measurement results are calibrated using both dipole and leaky wave horn standards.

4.1.3 Matching Circuit Description

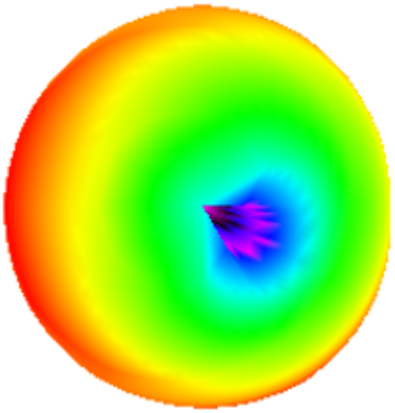
No changed..

4.2 Antenna - Radiation Pattern Test Data

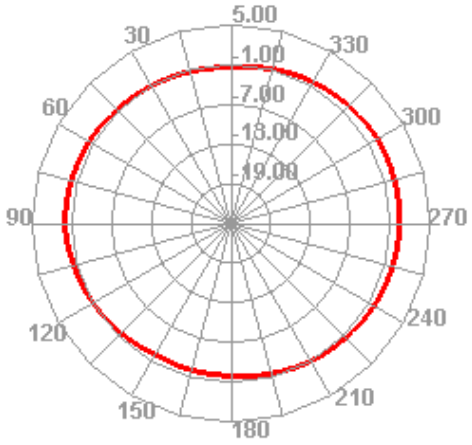
Passive test data

Passive Test For WIFI		
Freq	Effi	Gain
(MHz)	(%)	(dBi)
2400	47.01	1.33
2410	48.67	1.52
2420	51.13	2.43
2430	50.23	2.38
2440	56.11	2.62
2450	50.95	2.19
2460	48.02	1.94
2470	49.61	2.01
2480	49.2	1.88
2490	50.09	2.02
2500	49.03	1.95

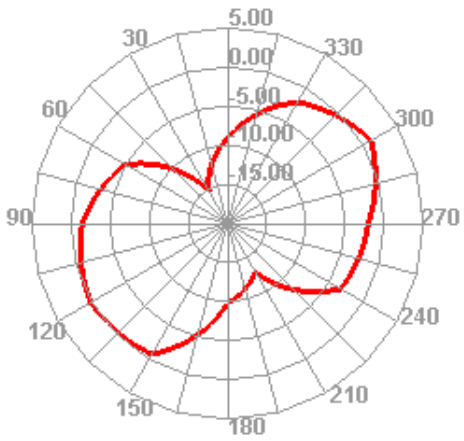
2450.000MHz



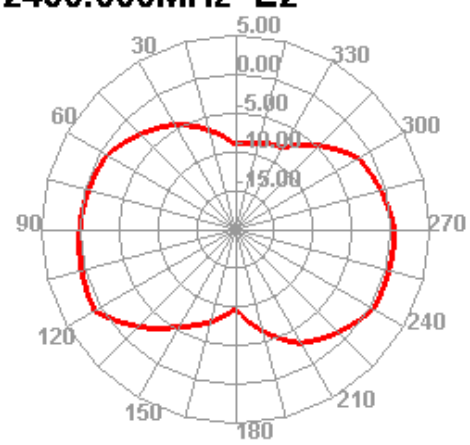
2450.000MHz H



2450.000MHz E1



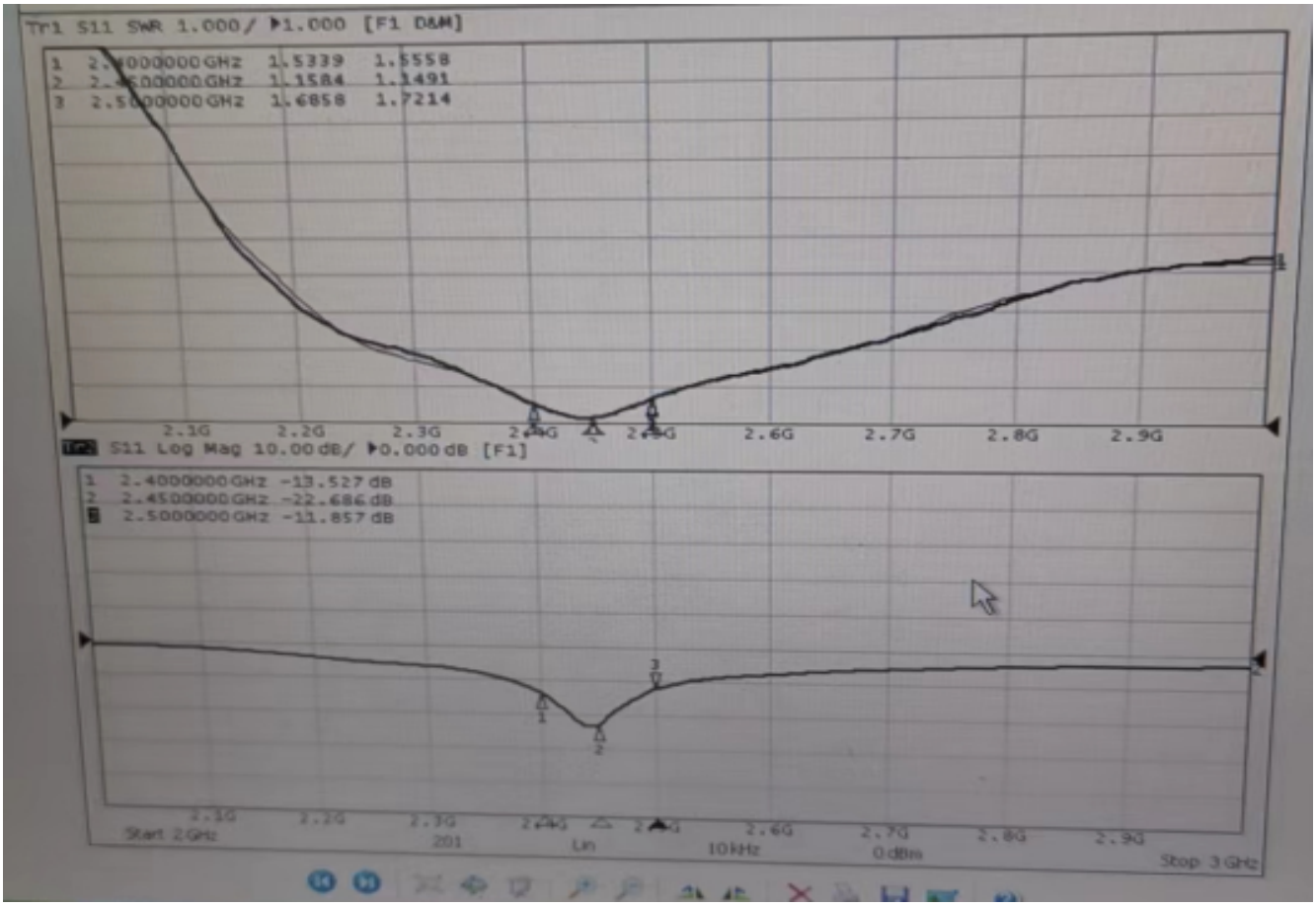
2450.000MHz E2



5.Plots

Remarks：vswr

Remarks：Standard value of return loss

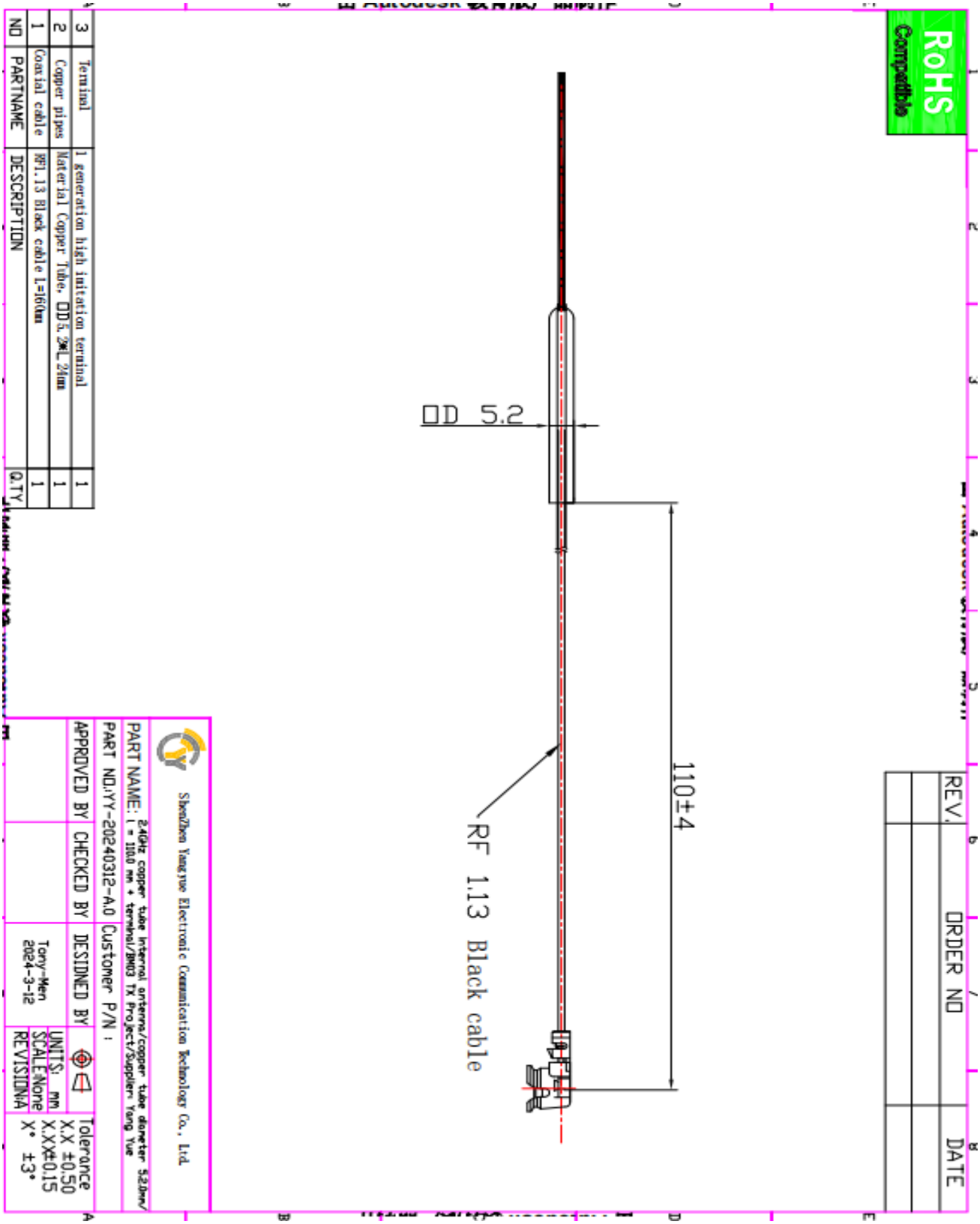


Active testing data

Test Result	Wifi 2G TRP		
	1	6	11
Frequency (MHz)	2412	2437	2462
Txp Ave(dBm)	20.08	19.73	19.91
MAX(dBm)	23.06	22.36	23.05

Test Result	Wifi 2G TIS		
	1	6	11
Frequency (MHz)	2412	2437	2462
Sens Ave(dBm)	-88.69	-91.33	-90.63
MaxPosSens	-91	-93.58	-93.06

6.Mechanical drawing



7 Reliability tests

7.1 Test content

No	Test items	Test method	Defining principle
1	Salt water spray test	Spray the solution with salt concentration of 5% for 24HR	There should be no defects such as discoloration, distortion, or detachment, and the corrosion area should not be too large

7.2 Test results

NO	Number of samples	Test cycle	Experimental result	Remarks
1	10	24 Hours	**OK**	The technical level is level 9 Corrosion<0.4mm

8 Conclusion

The above data indicates that the parameters of this 2.4GHz antenna have all met the standards. The performance is subject to the actual usage effect after installation.

From the above test results, we can know the electrical performance of the antenna is seems good.

Shenzhen Yangyue Electronic Communication Technology Co., Ltd, look forward to your confirmation, thank you for your cooperation!