

Antenna specification for approval

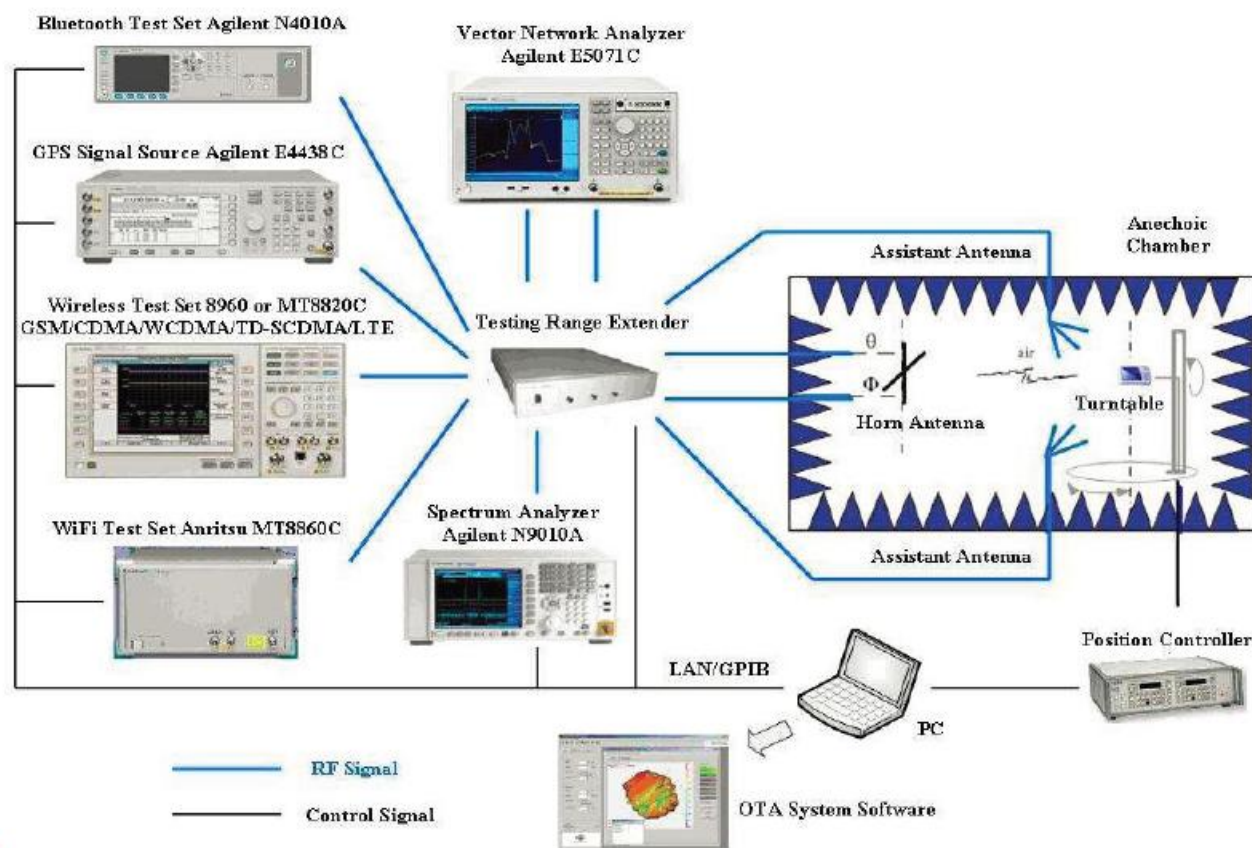
Customer name	Lightcomm Technology Co., Ltd.		
Model	MID1110-MS		
Antenna function	1.575GHz&2.4GHz&5GHz		
Antenna type	GPS&WIFI&BT&5Gwifi ANT		
Antenna material	FPC	FPC 颜色 FPC color	黑色
model	ST1839A-1B2-A		
Material number	ST1839A-1L23B-045-A		
Customer Part Number			
Ward accepted the signature		Client acknowledges signature	
structure		Purchase	
Document control		structure	
radio frequency		engineering	
To examine		QC	
Responsible		To examine	
date 2024.10.14	Seal area	date 2024.10.14	Seal area

Num	Certification Number	Material type	Date	Rmark
1	A2240182175102001E		2024-04-12	1 Year
2	A2240123200101001E		2024-03-15	1 Year
3	CANEC24000523102		2024-01-11	1 Year
4	SHAEC23021984701		2024-01-04	1 Year
5	SHAEC23020095573		2023-12-12	1 Year
6	SZXEC24002306404		2024-07-24	1 Year
7	SZXEC24002306408		2024-07-24	1 Year
8	ETR24600712		2024-06-14	1 Year
9	A2240123200102001E		2024-03-20	1 Year
10	CANEC23017402018		2024-01-03	1 Year
11	A2240439752101001		2024-07-29	1 Year
12	SZXEC24002471802		2024-08-08	1 Year

目录 Catalogue

一: 设备支持&可测试天线类型.....	1
二: 概述.....	2
三: 匹配电路图&机器图片&天线图片.....	3
四: 天线驻波&效率&有源数据.....	4
五: 吞吐量.....	5
六: 环境处理.....	6
七: 天线实测图.....	7
八: 3D pattern.....	8
九: 结构图纸.....	9
1: Device support&testable antenna types	1
2: Overview.....	2
3: Matching circuit diagrams, machine images, and antenna images	3
4: Antenna standing wave, efficiency, and active data	4
5: Throughput	5
6: Environmental treatment	6
7: Antenna actual measurement diagram	7
8: 3D pattern	8
9: Structural drawings	9

一:设备支持&可测试天线类型 Device support&testable antenna types



天线功能	频率范围	测试仪器	测试方式	测试标准
2G天线 (GSM)	824MHz-960MHz, 1710MHz-1990MHz	5071B、8960、 OTA暗室	有源测试、无源测试	索沃德标准、客户要求
3G天线 (WCDMA/TDSCDMA/CDMA-EVDO/2000)	824MHz-960MHz, 1710MHz-2170MHz	5071B、8960、 OTA暗室	有源测试、无源测试	索沃德标准、客户要求
4G天线 (LTE-FDD/LTE-TDD)		5071B、CMW500、 SP8011、OTA暗室	有源测试、无源测试	索沃德标准、客户要求
WIFI天线	2.4GHz-2.48GHz, 5.15GHz-5.35GHz, 5.725GHz-5.825GHz	5071B、CMW500、 OTA暗室、路由器 、PC	有源测试、无源测试 、APK实测、吞吐量 测试	索沃德标准、客户要求
BT天线	2.4GHz-2.48GHz	5071B、OTA暗室 、蓝牙音箱	无源测试、实测	索沃德标准、客户要求
定位天线 (GPS、GLONASS、北斗、伽利略)	1575.42MHz±10MHz 1602MHz+0.5625MHz 1561MHz+2.046MHz	5071B、OTA暗室 、APK	无源测试、实测	索沃德标准、客户要求
NFC天线	13.56MHz	5071B、专用测试 治具、OTA暗室、 APK	无源测试、实测	索沃德标准、客户要求
遥控天线	433MHz	5071B、OTA暗室	无源测试、实测	索沃德标准、客户要求

二:概述 Overview

(1)Antenna performance

- 1.This approval sheet supports for MID project. FPC antennas include in this project. This report is for the performance of GPS&WIFI&BT antenna.
- 2.Antenna shape size: Meet the requirement of MID
- 3.Antenna band: 1570MHz~1580MHz, 2400MHz~2500MHz&5400MHz
- 4.Antenna material: Antenna material meet the requirement of MID
- 5.Adhesive performance: Adhesive performance meet the requirement of MID
- 6.Antenna performance meet the spec below:

Description	1.57GHz~1.58GHz 2.4GHz~2.5GHz&5GHz	Units
VSWR	≤ 2.0	
Average Antenna Gain	≥ -4.5	dB
Feed Impedance	50 ohms	
Operating Temperature	-40 to +85 deg C	
Polarization / Azimuth	Linear / Omni-directional	

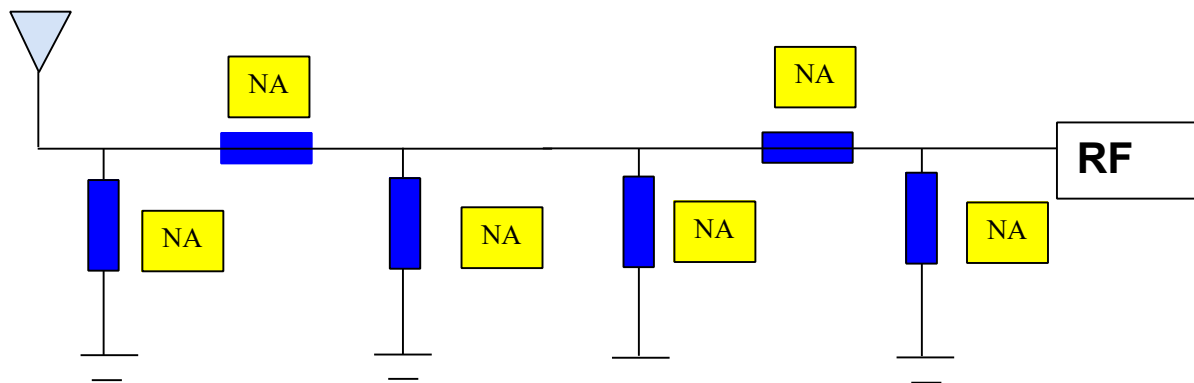
(2)Mechanical Information

Mechanical Dimension	
Cable Length	045mm/black
Description	GPS&WIFI&BT antenna
Material	FPC
Coaxial Cable	50Ω /0. D. 0.81mm
Environmental	
Operation Temperature	-40 to +85 deg C
Storage Temperature	-40 to +85 deg C

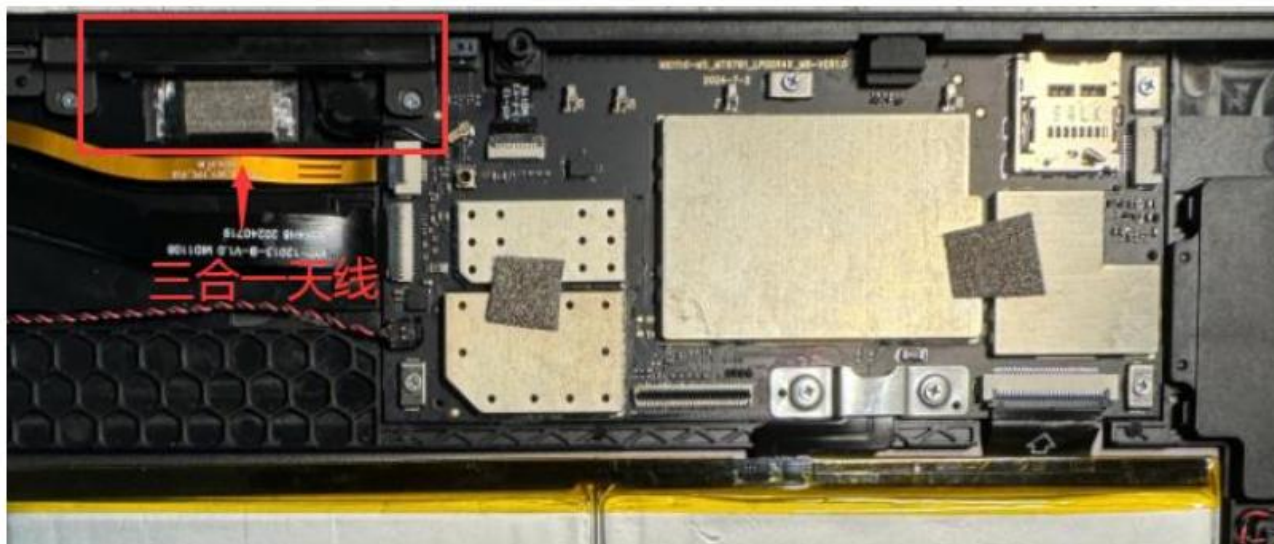
三: 匹配电路图&机器图片&天线图片

Matching circuit diagrams, machine images, and antenna images

(1) 匹配电路



(2) 机器图片&天线图片



四: 天线驻波比&效率&WIFI 有源数据

Antenna standing wave, efficiency, and active data



Passive Test For 2.4G				Passive Test For 5G-WIFI			
Freq	Effi	Effi	Gain	Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)	(MHz)	(%)	(dB)	(dBi)
2400	20.44	-6.9	-2.26	5000	24.73	-6.07	-0.32
2410	19.23	-7.16	-2.64	5100	25.11	-6	0.26
2420	21.96	-6.58	-1.92	5200	25.31	-5.97	1.3
2430	22.28	-6.52	-1.89	5300	34.35	-4.64	1.72
2440	21.94	-6.59	-1.94	5400	38.14	-4.19	0.82
2450	15.39	-8.13	-3.42	5500	35.17	-4.54	1.1
2460	14.64	-8.34	-3.54	5600	38.09	-4.19	1.13
2470	12.31	-9.1	-4.14	5700	43.93	-3.57	2.54
2480	13.88	-8.58	-3.59	5800	39.36	-4.05	2.18
2490	14.53	-8.38	-3.43	5900	25.02	-6.02	0.94
2500	16.8	-7.75	-2.81	6000	16.99	-7.7	-2.38

Passive Test For GPS			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
1570	21.04	-6.77	-2.84
1571	21.01	-6.78	-2.83
1572	20.98	-6.78	-2.92
1573	20.84	-6.81	-2.99
1574	20.78	-6.82	-3
1575	20.85	-6.81	-3.06
1576	20.78	-6.82	-3.05
1577	20.81	-6.82	-2.94
1578	20.74	-6.83	-3
1579	20.75	-6.83	-2.95
1580	20.85	-6.81	-2.94

WIFI 有源数据

Test Result	802.11b : 11Mbps 20M		
	1	7	13
Frequency (MHz)	2412	2442	2472
TRP (dBm)	11.29	12.24	12.01
TIS (dBm)	-80.39	-81.47	-81.09
Test Result	802.11g : 54Mbps 20M		
	1	7	13
Frequency (MHz)	2412	2442	2472
TRP (dBm)	10.05	10.58	10.37
TIS (dBm)	-69.43	-69.33	-69.25
Test Result	802.11n : MCS7 20M		
	1	7	13
Frequency (MHz)	2412	2442	2472
TRP (dBm)	11.02	10.59	10.37
TIS (dBm)	-65.29	-64.98	-64.78
Test Result	802.11n : MCS7 20M		
	36	64	165
Frequency (MHz)	5180	5320	5825
TRP (dBm)	10.35	11.08	11.47
TIS (dBm)	-68.62	-68.61	-68.5
Test Result	802.11a : 54Mbps 20M		
	36	64	165
Frequency (MHz)	5180	5320	5825
TRP (dBm)	10.68	11.43	11.53
TIS (dBm)	-70.19	-70.57	-70.29

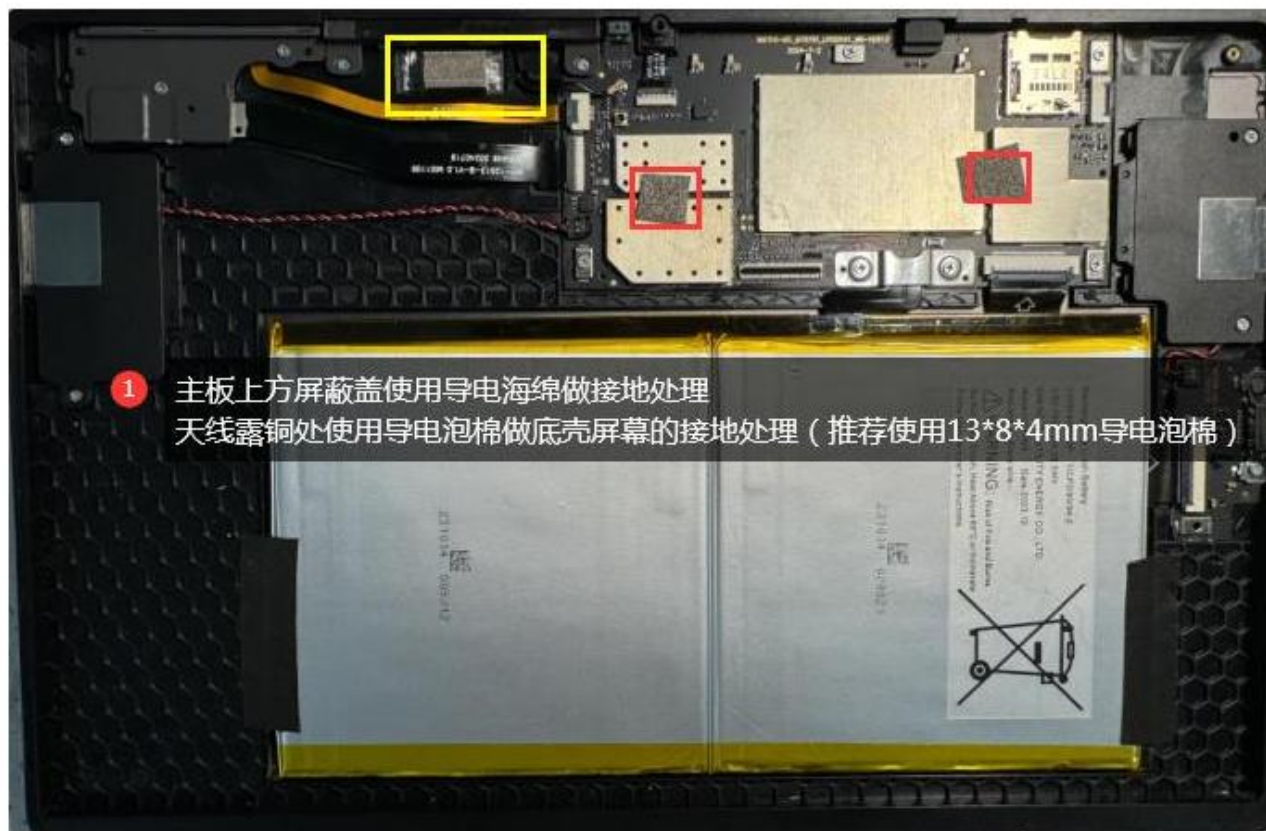
五:吞吐量

Throughput

Iperf吞吐量测试						
机型		模块		软件版本		
机型编号	信道	距离	测试角度	测试数据 (TX) 1min均值	测试数据 (RX) 1min均值	备注 (掉包次数)
2.4GWIFI		15米	0°	34.6M/S	52.6M/S	0
			90°	36.7M/S	50.4M/S	
			180°	35.9M/S	53.9M/S	
			270°	36.9M/S	55.6M/S	
5GWIFI		15米	0°	68.8M/S	75.8M/S	0
			90°	69.6M/S	74.9M/S	
			180°	66.4M/S	72.1M/S	
			270°	67.6M/S	73.7M/S	

六: 环境处理

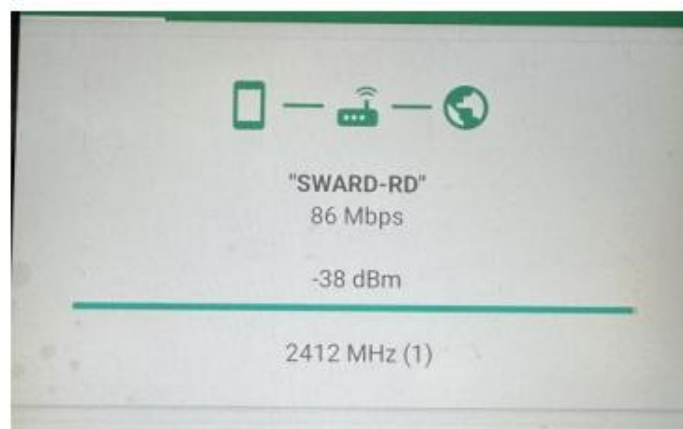
Environmental treatment



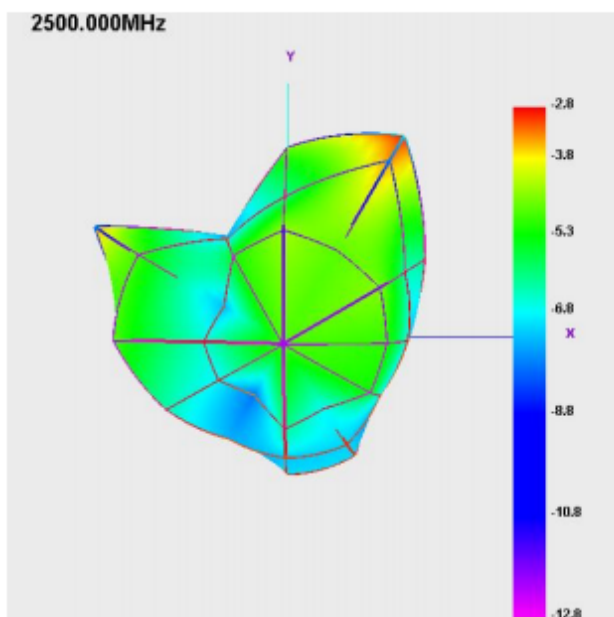
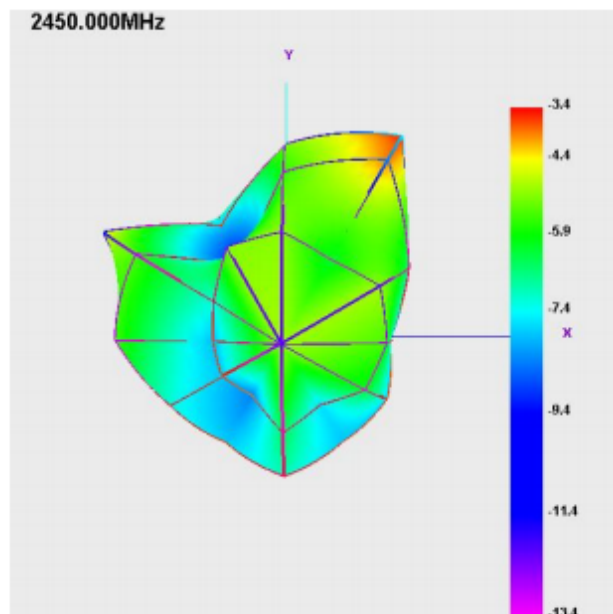
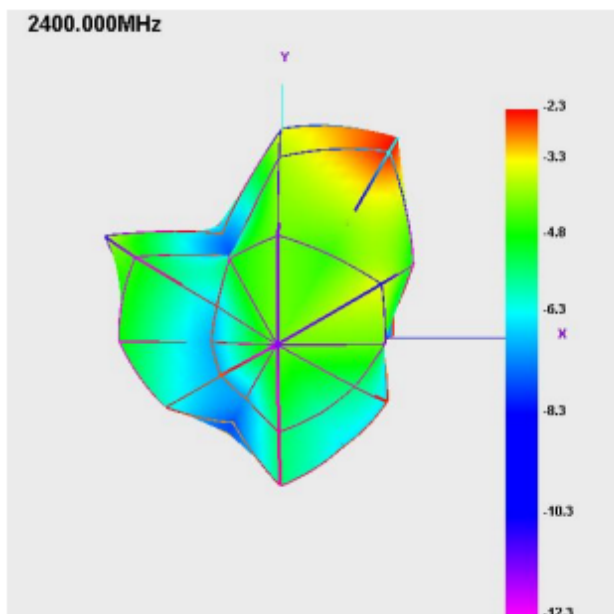


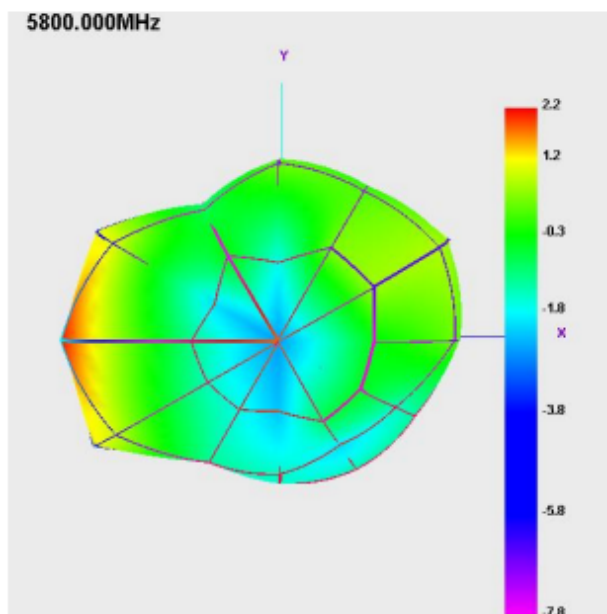
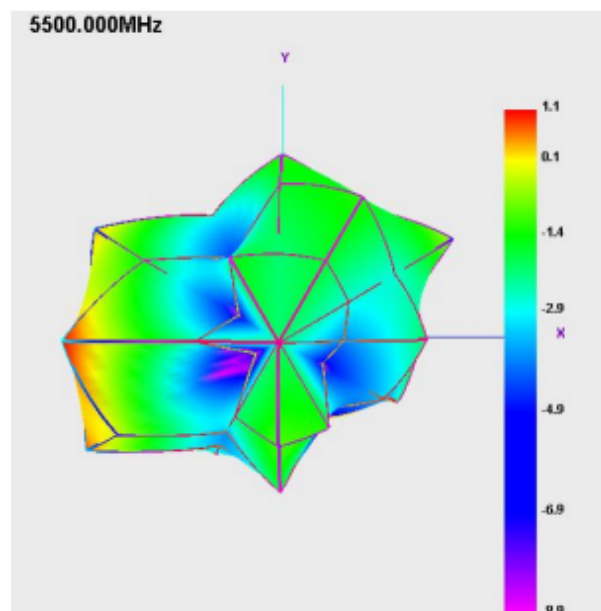
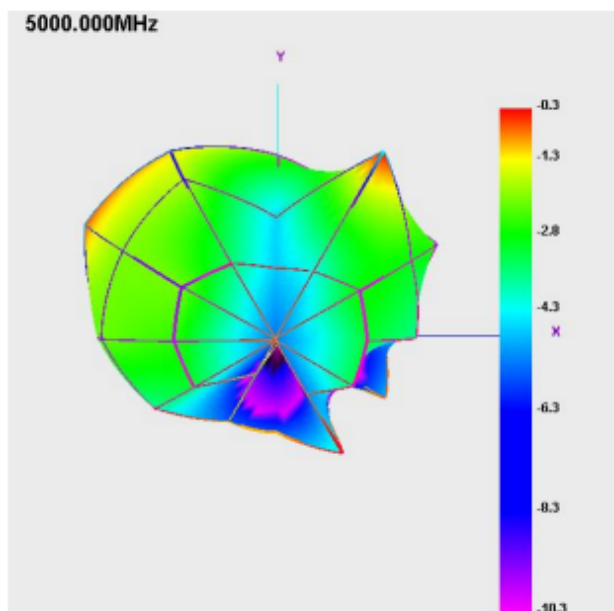
七:天线实测图
Antenna actual measurement diagram

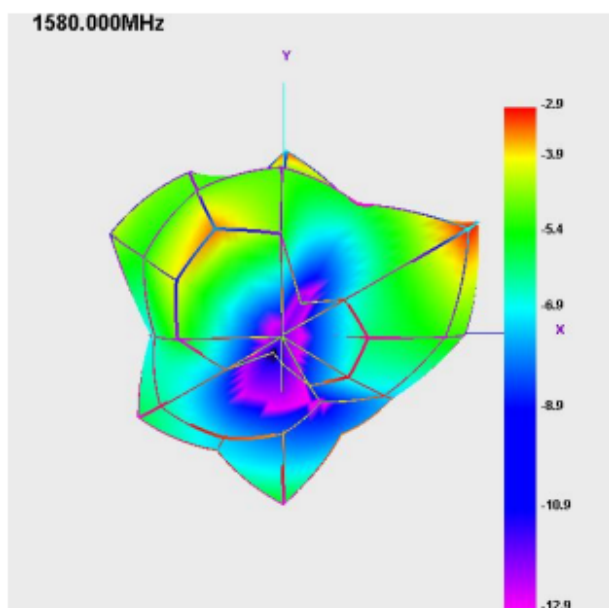
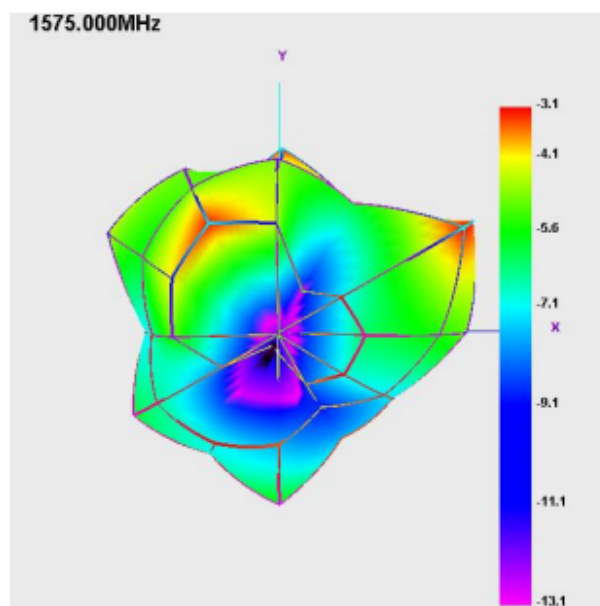
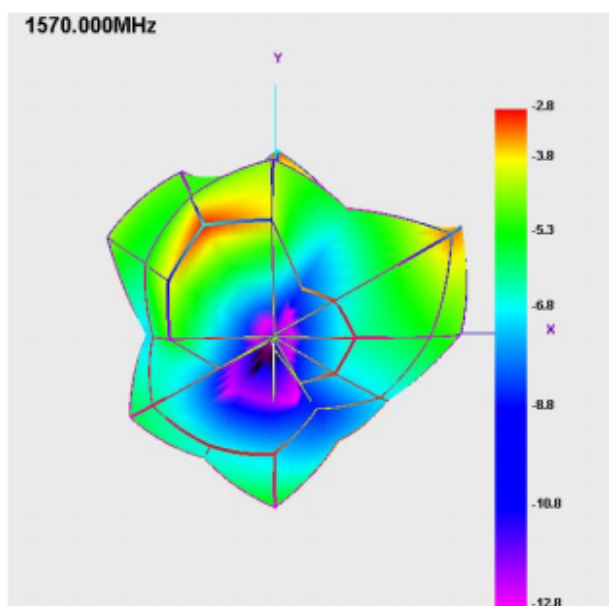
实测效果	
机型编号	1
测试环境	索沃德研发中心
测试设备	华为AM08
测试距离	10米≥



八:3D pattern

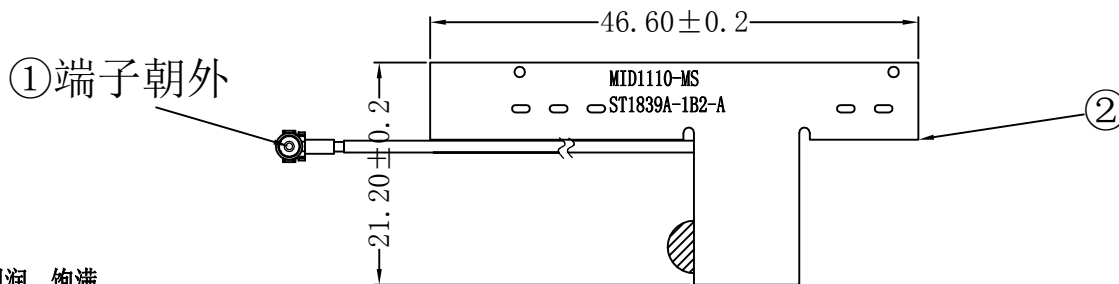
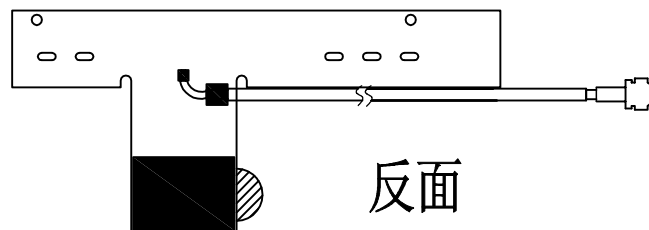
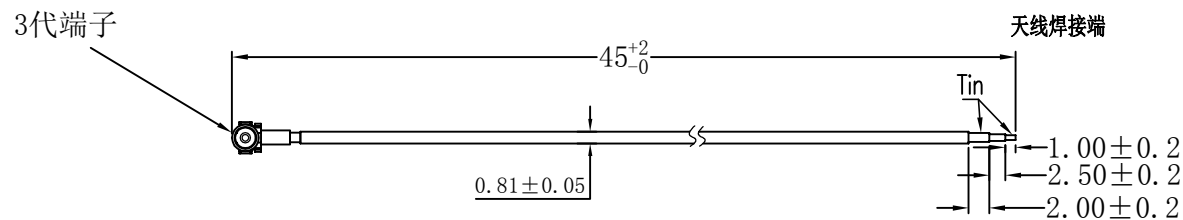






九: 结构图纸

Structural drawings



正面

技术要求:

1. 打*为重点尺寸;
2. 尺寸符合图纸要求;
3. 焊点无虚焊、假焊。要求圆润、饱满。
4. 网分测试通过（出现指定波形）。
5. 线形尺寸未注公差按照SJ/T 10628 1995 6级，公差值由上下偏差均分;

5												
4												
3							签名	年月日	量产	签名	年月日	
2	FPC		黑色	1	ST1839A-1B2-A	RD	ZYA	2024. 10. 14	Q C			
1	同轴线	3代端子	黑色	1	φ=0.81mm	RF						
序号	名称	材料	颜色	数量	描述	审核			批准			

SWORD

索沃德通讯技术有限公司

ST1839A-1L23B-045-A

阶段标记				比例			
1			A			1 : 1	
共 1 张				第 1 张			

ROHS