

Antenna specification for approval

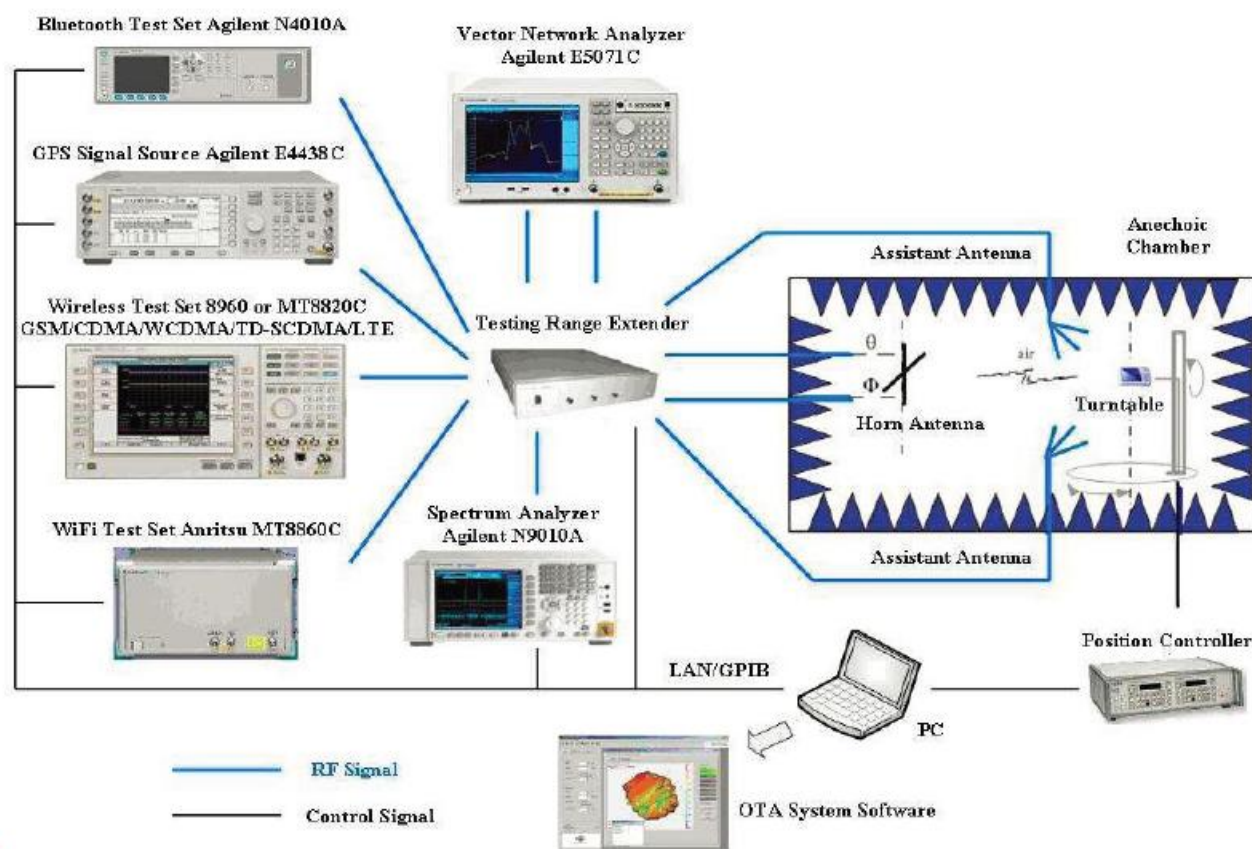
Customer name	Wisdom is intelligence.		
Model	1327-13 inch ultrabook -AX201S2W module		
Antenna frequency	2.4GHZ&5GHz		
Antenna function	WIFI&BT&5Gwifi (AUX) antenna		
Antenna material	FPC	FPC color	black
model	SF2227A-1B2-A		
Material number	SF2227A-1L24G-160-A		
Customer Part Number			
Ward accepted the signature		Client acknowledges signature	
structure		Purchase	
Document control		structure	
radio frequency		engineering	
To examine		QC	
Responsible LTT		To examine	
date 2023.10.19	Seal area	date 2023.10.19	Seal area

Serial number	Certification number	Material type	Date of issue	Remarks
1	A2230173541101001E	Tinned copper wire	2023-04-24	One year
2	CANEC2227657302	halogen	2022-12-28	One year
3	CANEC2227657303	Adhesive	2022-12-28	One year
4	SHAEC23000346911	FEP sheath	2023-01-13	One year
5	SHAEC22004639301	FEP insulation	2022-12-15	One year
6	SZXEC2203054804	Tin wire	2022-09-19	One year
7	SZXEC2203054808	Tin	2022-09-19	One year
8	ETR23701480	Printing ink	2023-07-13	One year
9	A2230173918101001E	Substrate	2023-04-18	One year
10	CANEC2227574118	EVA foam	2023-01-03	One year
11	A2230383826101003	Conductive cloth	2023-08-04	One year
12	CANEC23002609908	Gold plating	2023-05-11	One year

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一: Device Support & Testable Antenna Type



Antenna function	Frequency Range	test instrument	test method	standard test
2G antenna (GSM)	824MHz-960MHz, 1710MHz-1990MHz	5071B、8960 OTA darkroom	Active test, passive test	Soward standards, customer requirements
3G antenna (WCDMA/TDSCDMA/CDMA-EVDO/2000)	824MHz-960MHz, 1710MHz-2170MHz	5071B、8960 OTA darkroom	Active test, passive test	Soward standards, customer requirements
4G antenna (LTE-FDD/LTE-TDD)		5071B、CMW500、 SP8011、OTA darkroom	Active test, passive test	Soward standards, customer requirements
WIFI antenna	2.4GHz-2.48GHz, 5.15GHz-5.35GHz, 5.725GHz-5.825GHz	5071B、CMW500、OTA darkroom、router、 PC	Active test, passive test, APK actual test, throughput test	Soward standards, customer requirements
BT antenna	2.4GHz-2.48GHz,	5071B、OTA darkroom 、Bluetooth Speaker	Passive test, actual test	Soward standards, customer requirements
Positioning antenna (GPS, GLONASS, Beidou, Galileo)	1.575.42MHz±10MHz 1602MHz±0.5625MHz 1561MHz±2.046MHz	5071B、OTA darkroom 、APK	Passive test, actual test	Soward standards, customer requirements
NFC antenna	13.56MHz	5071B、Dedicated test fixture、OTA darkroom、APK	Passive test, actual test	Soward standards, customer requirements
Remote control antenna	433MHz	5071B、OTA darkroom	Passive test, actual test	Soward standards, customer requirements

二: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 WIFI&BT antenna.
- 2.Antenna shape size: Meet the requirement of MID
- 3.Antenna band: 2.4GHz~5GHz
- 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:

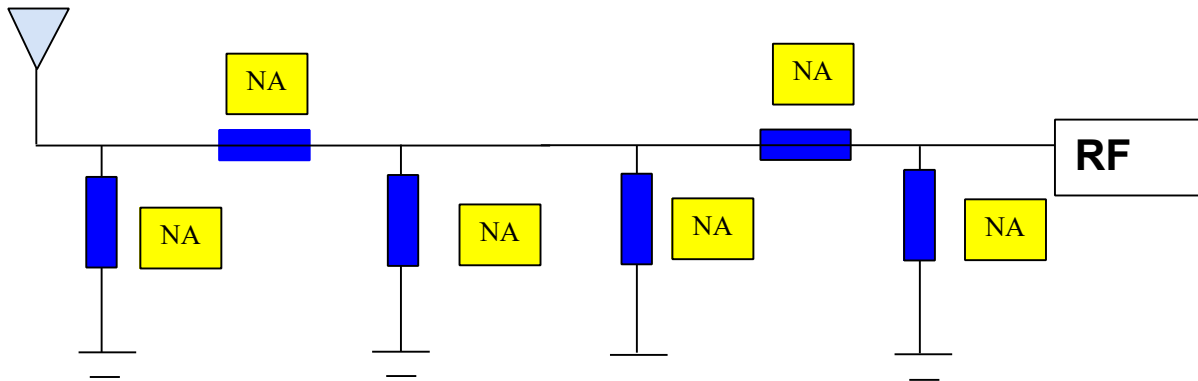
Description	2.4GHz~5GHz	Units
VSWR	≤ 2.0	
Average Antenna Gain	≥ -4.5	dB
Feed Impedance	50 ohms	
Operating Temperature	-40 to +85 deg C	
Polarization / Azimuth	Linear / Omni-directional	

(2)Mechanical Information

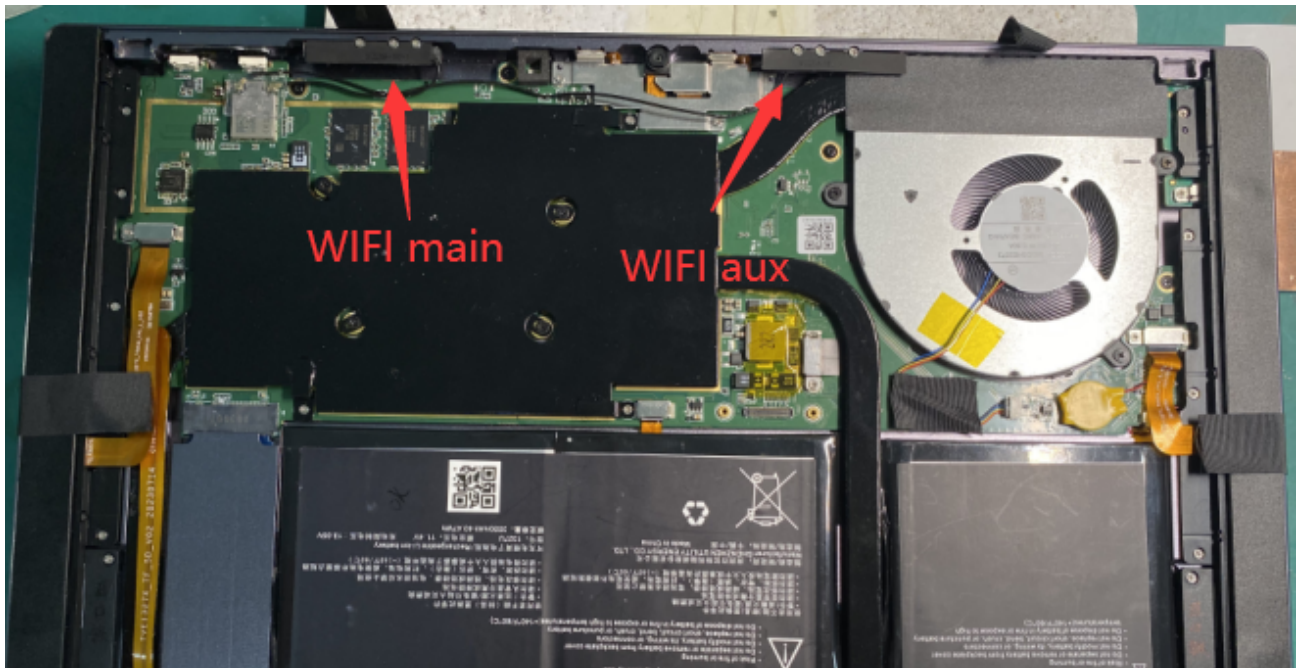
Mechanical Dimension	
Cable Length	160mm/GRAY
Description	WIFI&BT antenna
Material	FPC
Coaxial Cable	50Ω/O. D. 0.81mm
Environmental	
Operation Temperature	-40 to +85 deg C
Storage Temperature	-40 to +85 deg C

三: Matching circuit diagram & machine picture & antenna picture

(1) Matching circuit



(2) Machine picture & antenna picture





四:Antenna Standing Wave Ratio & Antenna Efficiency (VSWR)



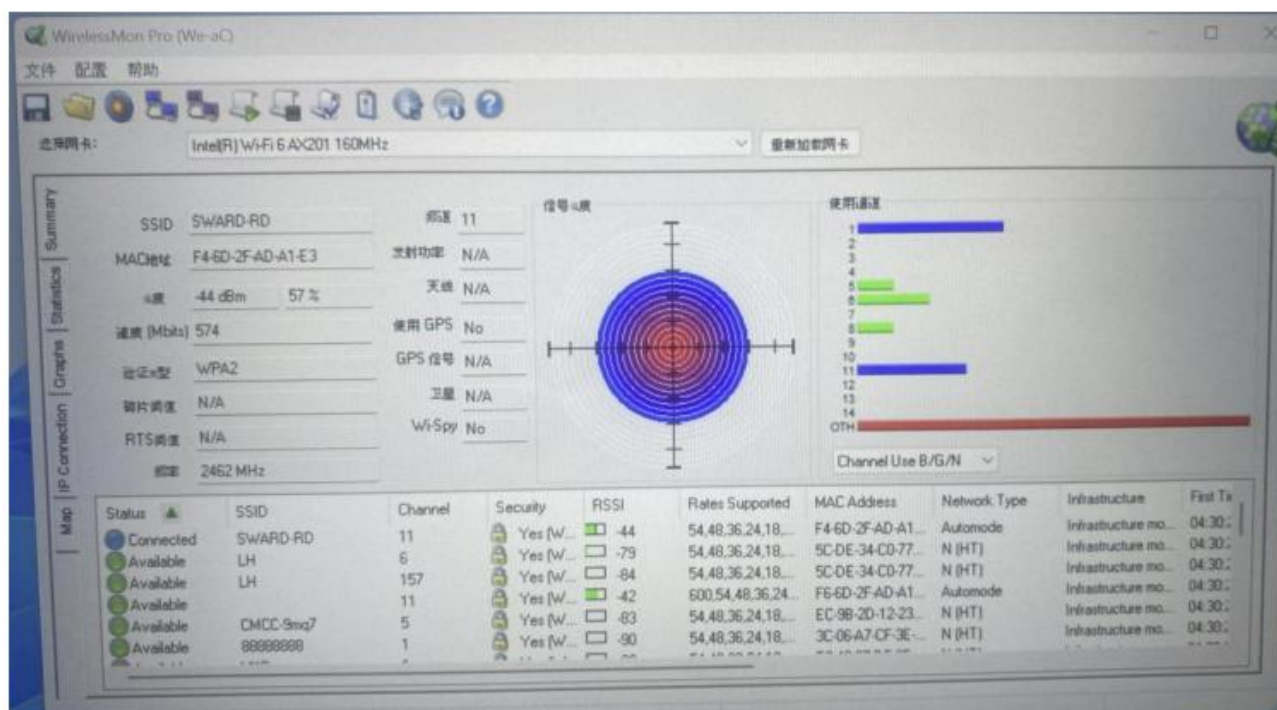
Passive Test For 2.4G				Passive Test For 5G-WIFI			
Freq	Effi	Effi	Gain	Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)	(MHz)	(%)	(dB)	(dBi)
2400	4.91	-13.09	-3.81	5000	15.03	-8.23	0.03
2410	4.19	-13.78	-4.39	5100	17.22	-7.64	-1.03
2420	5.08	-12.94	-3.45	5200	17.74	-7.51	-1.3
2430	5.43	-12.65	-3.28	5300	12.33	-9.09	-3.33
2440	6.22	-12.06	-2.72	5400	14.07	-8.52	-2.41
2450	7.01	-11.54	-2.3	5500	16.1	-7.93	-0.69
2460	6.55	-11.84	-2.75	5600	11.64	-9.34	-1.95
2470	6.06	-12.18	-3.21	5700	18.24	-7.39	-0.42
2480	6.36	-11.97	-3.12	5800	20.04	-6.98	1.06
2490	8	-10.97	-2.37	5900	24.71	-6.07	1.32
2500	8.77	-10.57	-2.09	6000	28.3	-5.48	1.7

五:Throughput test

Iperf throughput test						
Machine type	1327	module	AX201S2W			
Model number	channel	distance	Test Angle	Test data (TX) 1min mean value	Test data (RX) 1min mean value	Remarks (Number of switching)
2.4GWIFI		15m	0°	53.9M/S	114M/S	0
			90°	57.3M/S	128M/S	
			180°	56.1M/S	119M/S	
			270°	55.3M/S	116M/S	
5GWIFI		15m	0°	486M/S	366M/S	0
			90°	486M/S	363M/S	
			180°	496M/S	360M/S	
			270°	495M/S	361M/S	

六:Signal strength

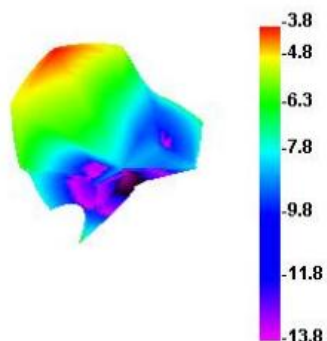
Measured effect	
Model number	1
Test environment	Soward Research and Development Center
Test equipment	Huawei AM08
Test distance	10 m $\geq$



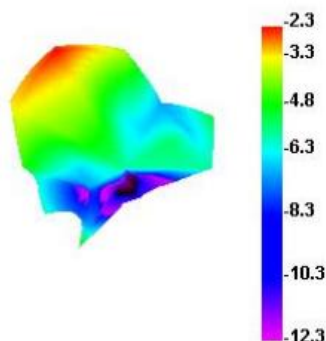


七:3D pattern

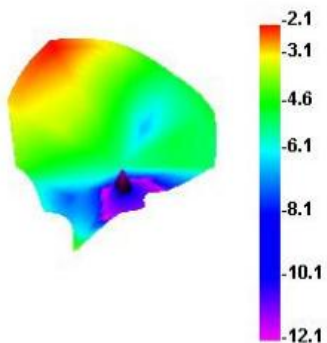
2400.000MHz



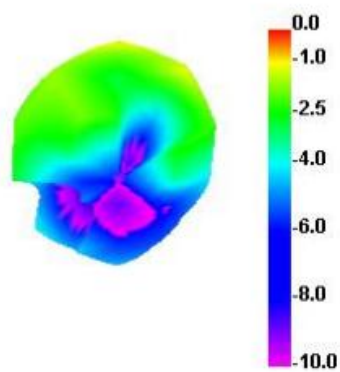
2450.000MHz



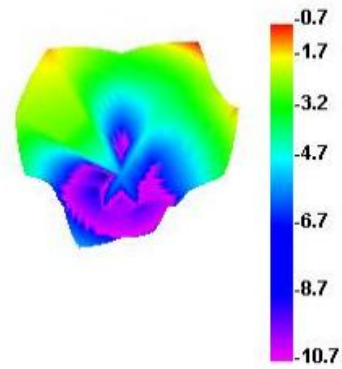
2500.000MHz



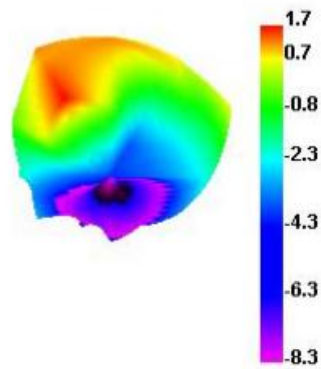
5000.000MHz



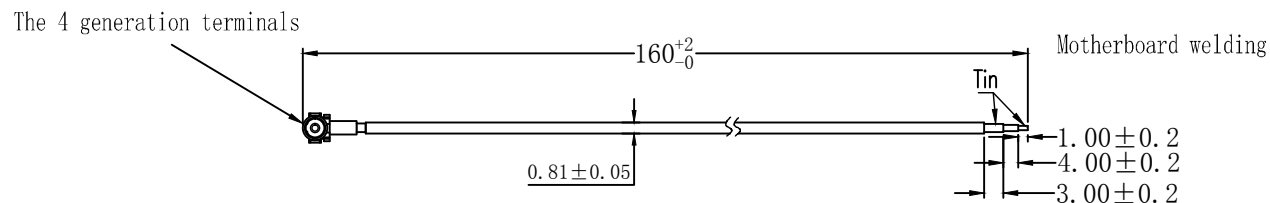
5500.000MHz



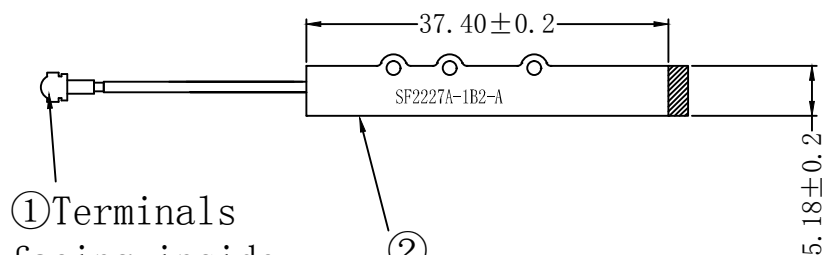
6000.000MHz



八: 结构图纸



Reverse side



Frontage

technical requirements:

- 1.* for critical dimensions;
- 2.Size conform to the requirements of the drawings;
- 3.No virtual welding welding point, false welding. Require full welding points.
- 4.Network test pass.
- 5.No marked tolerance according toSJ/T 10628 1995 6classes;

5											SWARD			ShenZhen SWARD Communication Technology Co.Ltd	
4														SF2227A-1L24G-160-A	
3					① ②	signatures	date	mass	signatures	date	time markup			percentage	ROHS
2	FPC	black	1	SF2227A-1B2-A		RD	YWD	2023. 10. 19	Q C		1		A	1 : 1	
1	coaxial line	grey	1	φ=0.81mm	RF										
	name	color	quantity	specifications	audits			approval							