

## Specification For Approval

client's name: jing huaAdapted models: A102D (10.1-inch plastic shell - Yidao motherboard -6221C module)Antenna type: WIFI&BT&5Gwifi (aux) antennaWorking frequency: 2.4GHz&5GHzPart No: SF2326A-1R24G-135-A

Certification information (SGS report)

Serial number	Certification number	Material type	Date of issue	Remarks
1	A2230173541101001E	Tinned copper wire	2023-04-24	One year
2	CANEC2227657305	halogen	2023-05-30	One year
3	CANEC2227657306	Adhesive	2023-05-30	One year
4	SHAEC23021984701	FEP sheath	2024-01-04	One year
5	SHAEC23020095573	FEP insulation	2023-12-12	One year
6	SZXEC23001647204	Tin wire	2023-07-28	One year
7	SZXEC23001647208	Tin	2023-07-28	One year
8	ETR23701480	Printing ink	2023-07-13	One year
9	A2230173918101001E	Substrate	2023-04-18	One year
10	CANEC23017402018	EVA foam	2024-01-03	One year
11	A2230383826101003	Conductive cloth	2023-08-04	One year

(Customer)

	purchase	R&D/Engineering	quality

(Supplier)

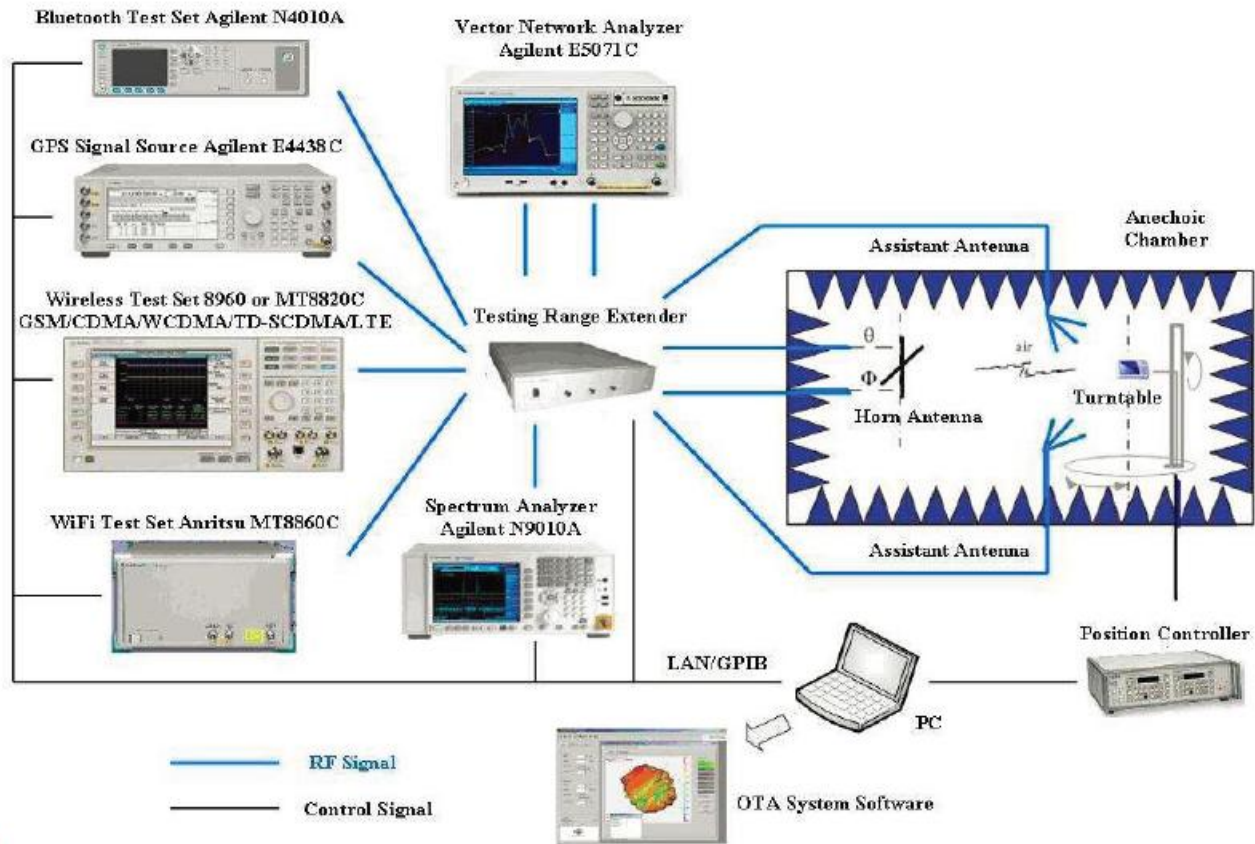
	Engineering production	Engineering audit	business
	LTT		

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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

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## 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:

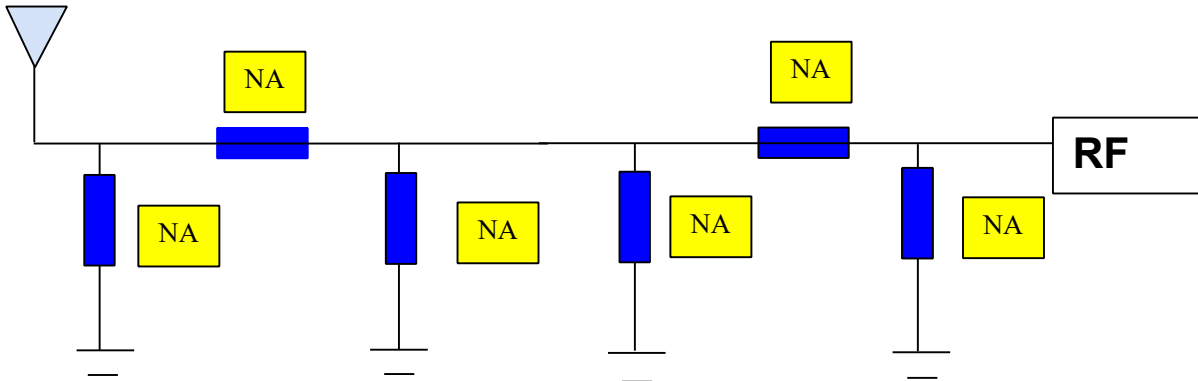
Description	2.4GHz~5GHz	Units
VSWR	$\leq 2.0$	
Average Antenna Gain	$\geq -4.5$	dB
Feed Impedance	50 ohms	
Operating Temperature	-40 to +85 deg C	
Polarization / Azimuth	Linear / Omni-directional	

### (2) Mechanical Information

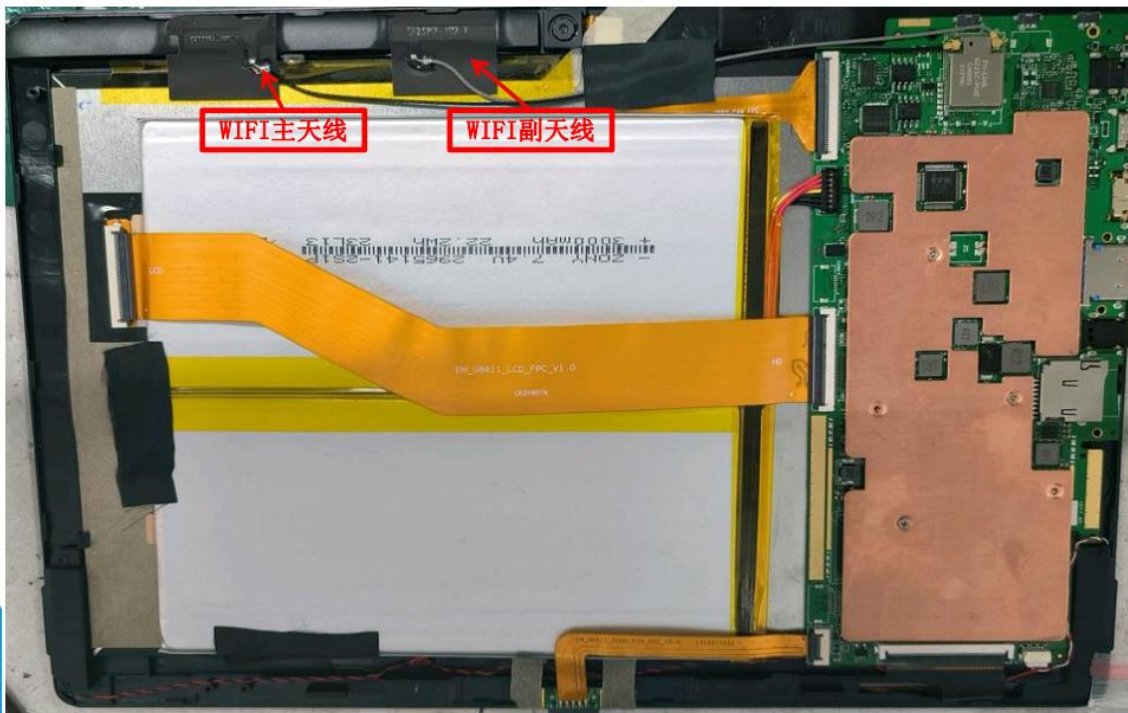
Mechanical Dimension	
Cable Length	135mm/GRAY
Description	WIFI&BT antenna
Material	FPC
Coaxial Cable	50Ω/O. D. 0.81mm
Environmental	
Operation Temperature	-40 to +85 deg C
Storage Temperature	-40 to +85 deg C

## 三: Matching circuit diagram & machine picture & antenna picture

### (1) matching circuit



### (2) Machine images&antenna images





## 四:Antenna standing wave ratio & Antenna Efficiency



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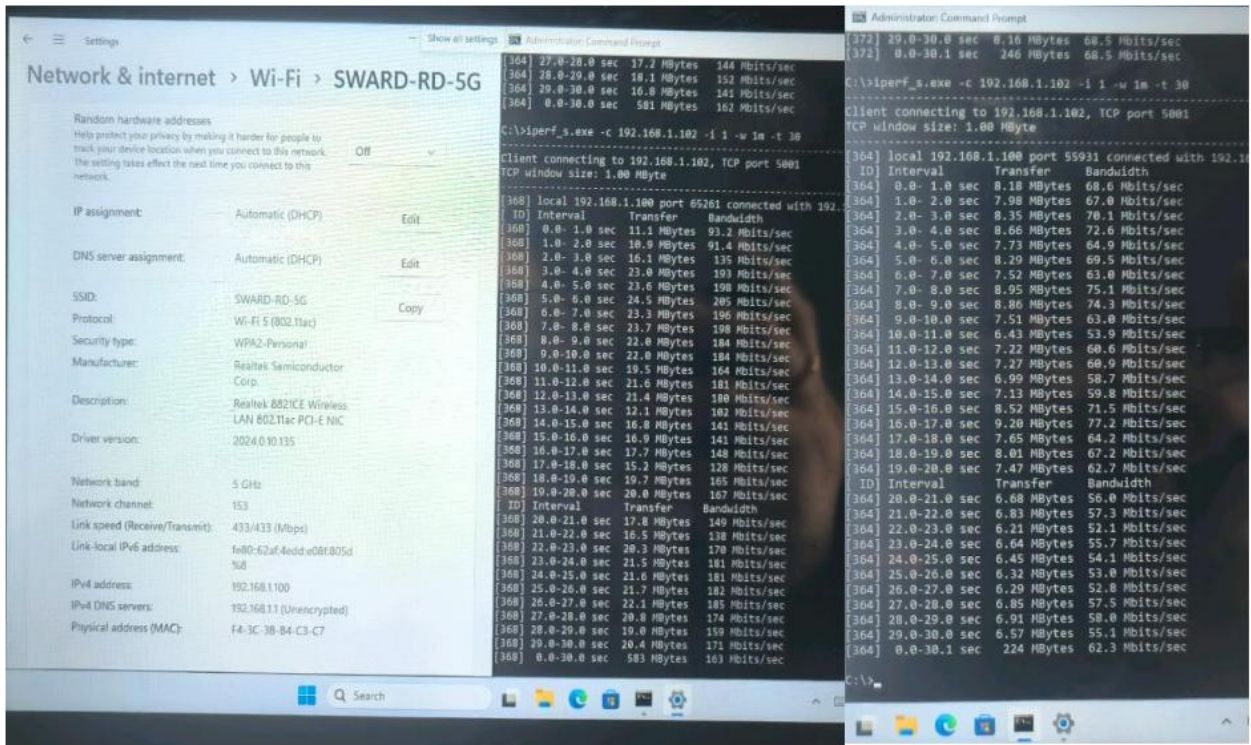
Passive Test For 2.4Gwifi								
Freq	Effi	Effi	Gain	Gain	UHS	DHIS	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(%)	(%)	(dB)	(dB)
2400	33.15	-4.8	-1.37	-3.52	17.619	15.53	-1.37	-19.26
2410	32.96	-4.82	-0.98	-3.13	17.766	15.192	-0.98	-20.07
2420	36.37	-4.39	-0.24	-2.39	19.921	16.451	-0.24	-20.13
2430	35.4	-4.51	-0.3	-2.45	19.796	15.605	-0.3	-21.32
2440	37.05	-4.31	-0.03	-2.18	21.112	15.934	-0.03	-21.24
2450	33.37	-4.77	-0.5	-2.65	19.335	14.035	-0.5	-21.07
2460	33.8	-4.71	-0.37	-2.52	19.793	14.01	-0.37	-20.82
2470	33.85	-4.7	-0.37	-2.52	20.091	13.761	-0.37	-21.08
2480	37.25	-4.29	0.05	-2.1	22.403	14.848	0.05	-20.35
2490	39.83	-4	0.33	-1.82	24.27	15.559	0.33	-19.65
2500	41.87	-3.78	0.56	-1.59	25.913	15.954	0.56	-18.83

Passive Test For 5Gwifi								
Freq	Effi	Effi	Gain	Gain	UHS	DHIS	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(%)	(%)	(dB)	(dB)
5000	37.56	-4.25	0.73	-1.42	23.948	13.609	0.73	-12.88
5100	36.83	-4.34	0.68	-1.47	22.611	14.222	0.68	-14.33
5200	35.15	-4.54	1.49	-0.66	22.556	12.595	1.49	-14.96
5300	30.16	-5.21	0.74	-1.41	20.603	9.557	0.74	-18.61
5400	32.85	-4.83	0.18	-1.97	22.297	10.552	0.18	-18.17
5500	32.56	-4.87	-1.04	-3.19	20.562	11.994	-1.04	-20.16
5600	29	-5.38	-1.65	-3.8	17.513	11.486	-1.65	-19.15
5700	30.28	-5.19	-0.8	-2.95	18.844	11.434	-0.8	-21.12
5800	28.48	-5.46	-0.02	-2.17	19.022	9.454	-0.02	-17.39
5900	22.46	-6.49	-0.17	-2.32	15.647	6.815	-0.17	-21.36
6000	24.9	-6.04	-0.67	-2.82	17.357	7.542	-0.67	-19.83

## 五: Throughput testing

IperfThroughput testing						
model	A102D -Yidao motherboard	module	6221C module module block	Software version	Windows_Iperf	
Model number	Frequency band	distance	Testing angle	test data (TX) 1minmean value	Test Data (RX) 1-minute mean	Remarks (Number of Swaps)
1	2.4G	2.4G WIFI (R&D testing15m)	0°	60.2 Mbps	67.8 Mbps	0
			90°	68.3 Mbps	67.0 Mbps	0
			180°	54.1 Mbps	68.5 Mbps	0
			270°	59.6 Mbps	62.3 Mbps	0
	5G	5F WIFI (R&D testing15m)	0°	163 Mbps	209 Mbps	0
			90°	155 Mbps	209 Mbps	0
			180°	163 Mbps	225 Mbps	0
			270°	145 Mbps	231 Mbps	0
			0°			
			90°			
			180°			
			270°			

Test data 2.4Gwifi/5.8Gwifi (corresponding to connection speed of 72/433Mbps)





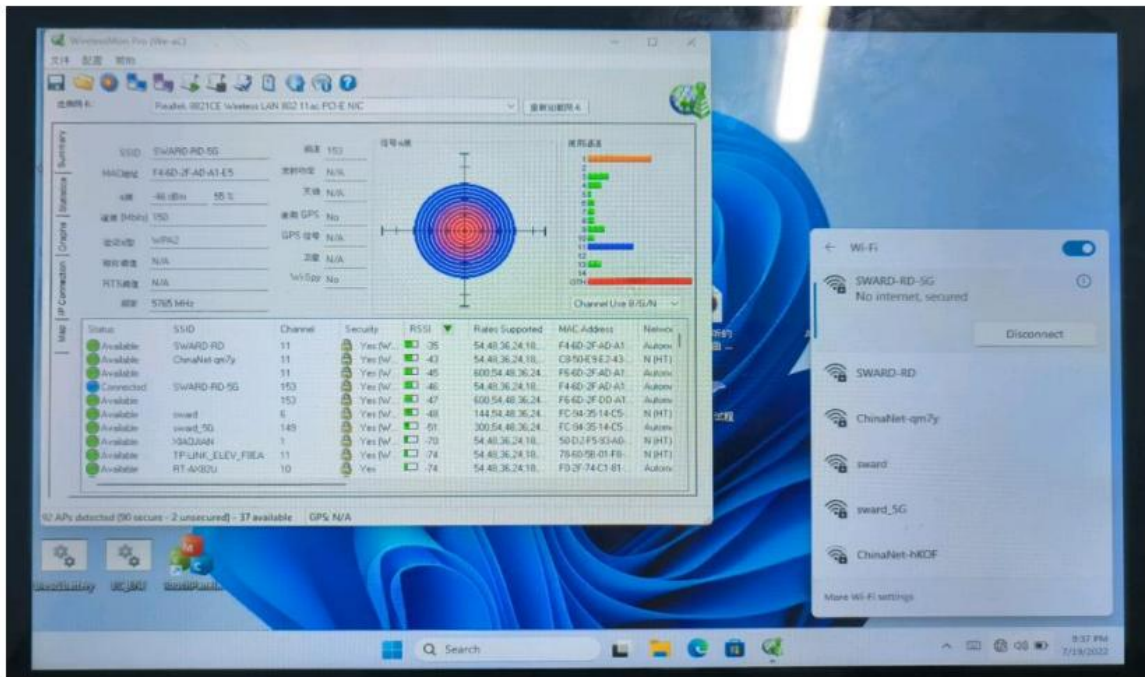
六:Signal measurement

Actual measurement effect	
Model number	1
testing environment	SWARD R&D Center
Test equipment	Huawei AM08
test distance	》 10m



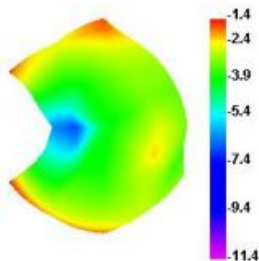
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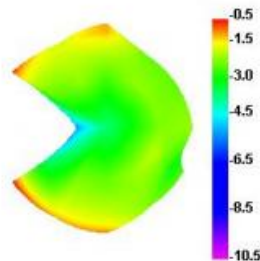


## 七:3D pattern

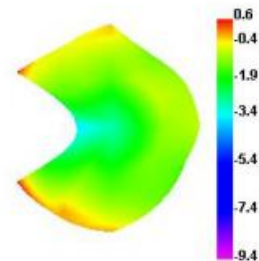
2400.000MHz



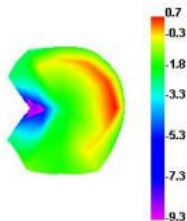
2450.000MHz



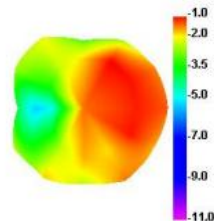
2500.000MHz



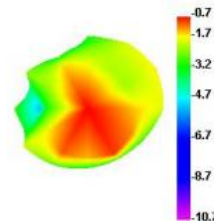
5000.000MHz



5500.000MHz



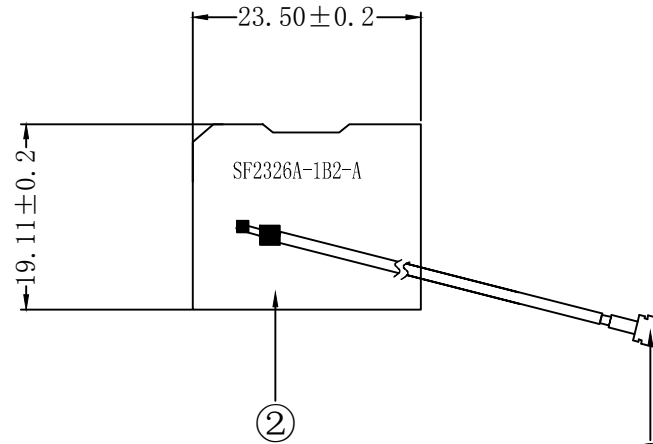
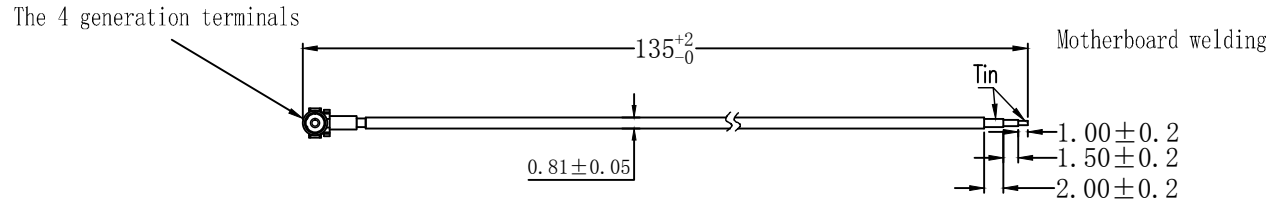
6000.000MHz



## 八:structural drawings

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① Terminals facing inside

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										<b><u>SWARD</u></b>	ShenZhen SWARD Communication Technology Co.Ltd	
4											SF2326A-1R24G-135-A	
3					signatures	date	mass	signatures	date	time markup		percentage
2	FPC	black	1	SF2326A-1B2-A	RD	LXH	2024.1.26	Q C		1	A	1 : 1
1	coaxial line	grey	1	φ=0.81mm	RF							ROHS
	name	color	quantity	specifications	audits			approval				