

## Antenna specification for approval

Customer name	SHENZHEN JIEXIANG ELECTRONIC CO LTD		
Model	B00JP3-A (miniPC box plastic case-61821CE module)		
Antenna frequency	2.4GHZ&5GHz		
Antenna function	WIFI&BT&5Gwifi (main) antenna		
Antenna material	FPC	FPC color	Black
model	SF2349A-1B2-A		
Material number	SF2349A-1L24B-145-A		
Customer Part Number			
<b>Ward accepted the signature</b>		<b>Client acknowledges signature</b>	
structure		Purchase	
QC		structure	
radio frequency		engineering	
To examine		QC	
Responsible	LTT	To examine	
date		date	
2024.03.12	Seal area	2024.03.12	Seal area

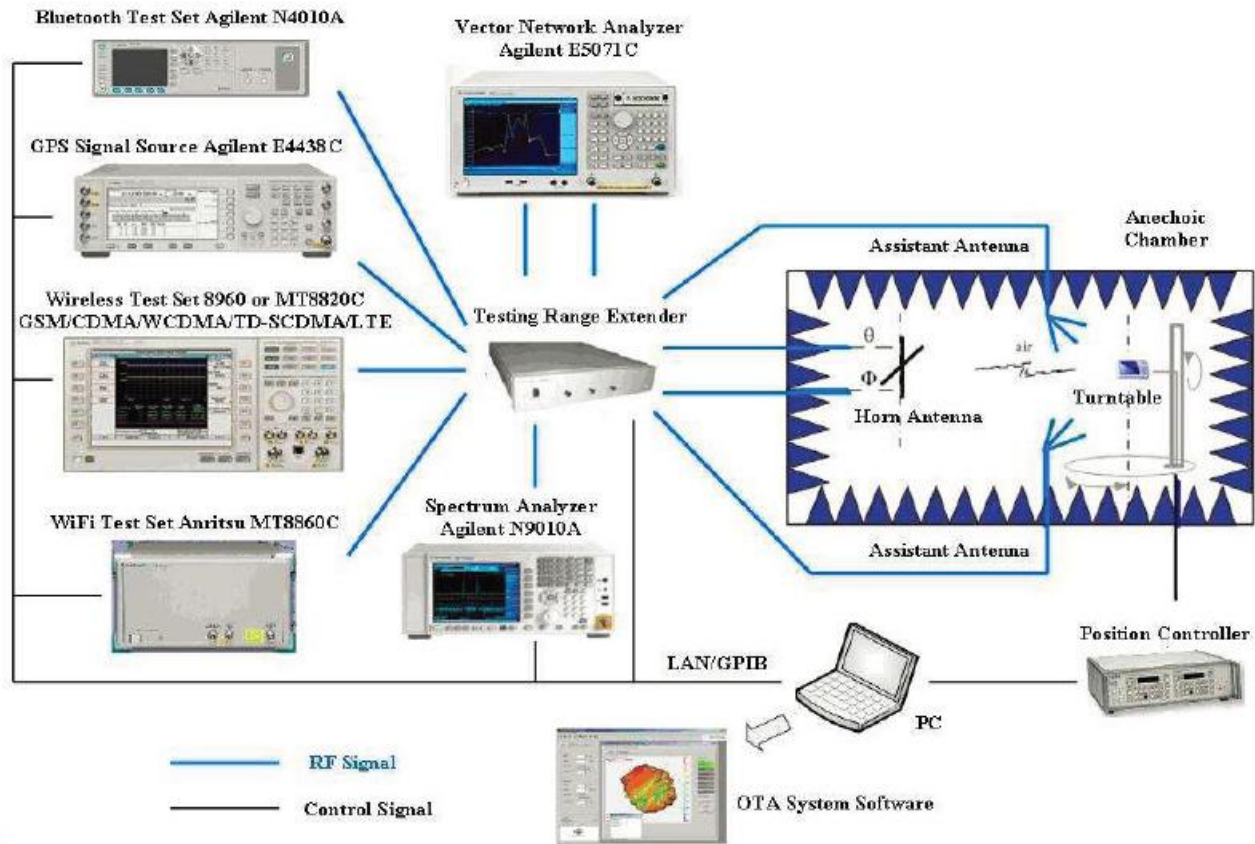
Serial number	Certification number	Material type	Date of issue	Remarks
1	A2230173541101001E	Tinned copper wire	2023-04-24	One year
2	CANEC2227657305	halogen	2023-05-30	One year
3	CANEC2227657306	Adhesive	2023-05-30	One year
4	SHAEC23021984701	FEP sheath	2024-01-04	One year
5	SHAEC23020095573	FEP insulation	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
12	CANEC23002609908	Gold plating	2023-05-11	One year

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## table of Contents

一:Device Support & Testable Antenna Type.....	1
二:Overview.....	2
三:Matching circuit diagram & machine picture & antenna picture	3
四:Antenna Standing Wave Ratio & Antenna Efficiency (VSWR) .....	4
五:Throughput testing&WIFI active data.....	5
六:Antenna measurement diagram.....	6
七:3D pattern.....	7
八:Structural drawing.....	8

## 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:

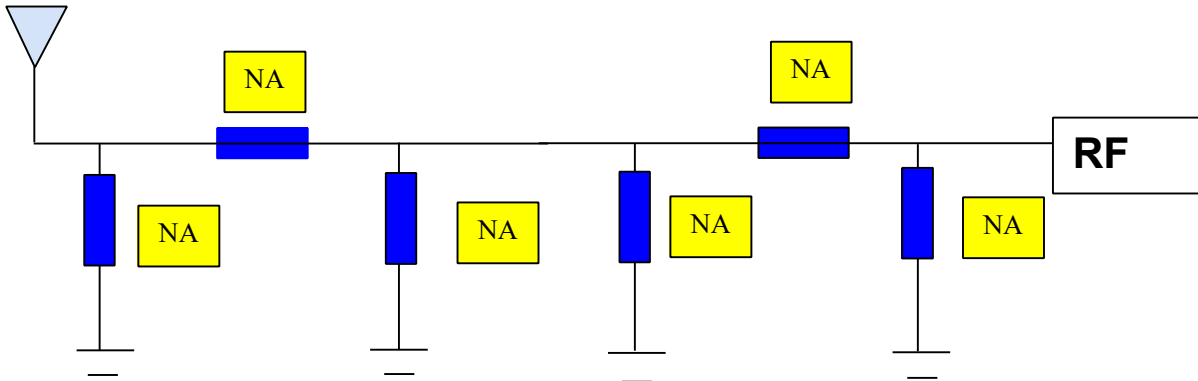
Description	2.4GHz~5GHz	Units
VSWR	$\leq 2.0$	
Average Antenna Gain	$\geq -4.5$	dB
Feed Impedance	50 ohms	
Operating Temperature	-40 to +85 deg C	
Polarization / Azimuth	Linear / Omni-directional	

### (2) Mechanical Information

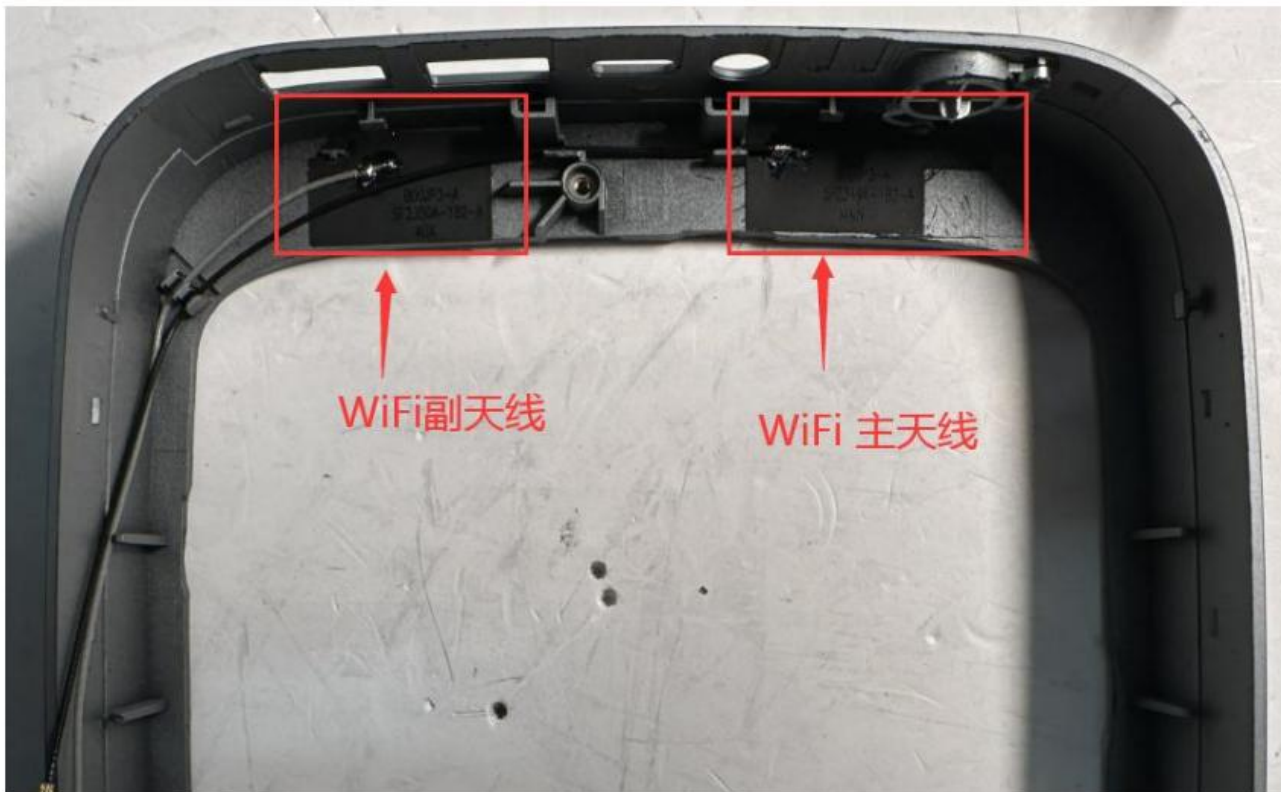
Mechanical Dimension	
Cable Length	145mm/BLACK
Description	WIFI&BT antenna
Material	FPC
Coaxial Cable	50Ω/O. D. 0.81mm
Environmental	
Operation Temperature	-40 to +85 deg C
Storage Temperature	-40 to +85 deg C

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

### (1) matching circuit

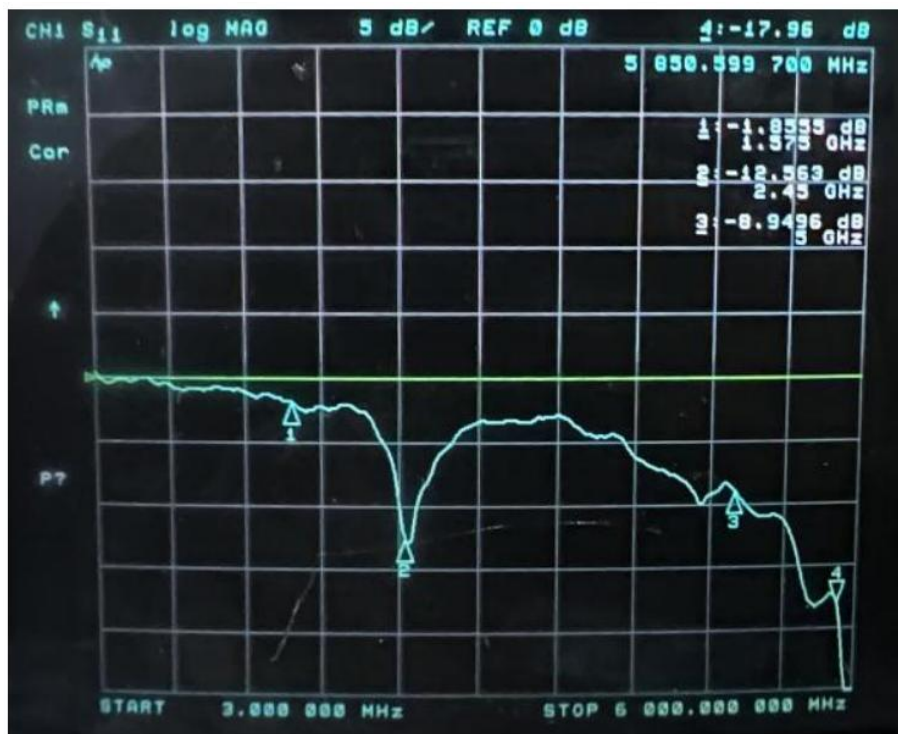


### (2) Machine images&antenna images





**四:Antenna Standing Wave Ratio & Antenna Efficiency (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	39.74	-4.01	-0.19	5000	40.73	-3.9	3.91
2410	40.74	-3.9	0.07	5100	33.3	-4.77	2.53
2420	41.39	-3.83	0.36	5200	33.24	-4.78	1.23
2430	43.49	-3.62	0.8	5300	39.6	-4.02	1.11
2440	43.88	-3.58	0.93	5400	38.09	-4.19	1.64
2450	43.86	-3.58	0.97	5500	37.48	-4.26	2.34
2460	42.43	-3.72	0.86	5600	27.95	-5.54	0.98
2470	34.67	-4.6	0.05	5700	39.19	-4.07	1.84
2480	32.39	-4.9	-0.25	5800	41.14	-3.86	2.01
2490	33.35	-4.77	-0.21	5900	38.7	-4.12	1.37
2500	38.24	-4.17	0.08	6000	35.21	-4.53	2.36

**五:Throughput testing&WIFI active data**

IperfThroughput testing						
model		module		Software version		
Model number	channel	distance	Testing angle	Test data (TX ) 1-minute mean	Test data (RX) 1min average value	Remarks (switching times ) Number)
2.4GWIFI		15米	0°	56.2M/S	67.6M/S	0
			90°	46.3M/S	74.2M/S	
			180°	54.2M/S	65.2M/S	
			270°	61.1M/S	68.5M/S	
5GWIFI		15米	0°	213M/S	236M/S	0
			90°	202M/S	217M/S	
			180°	227M/S	223M/S	
			270°	213M/S	232M/S	

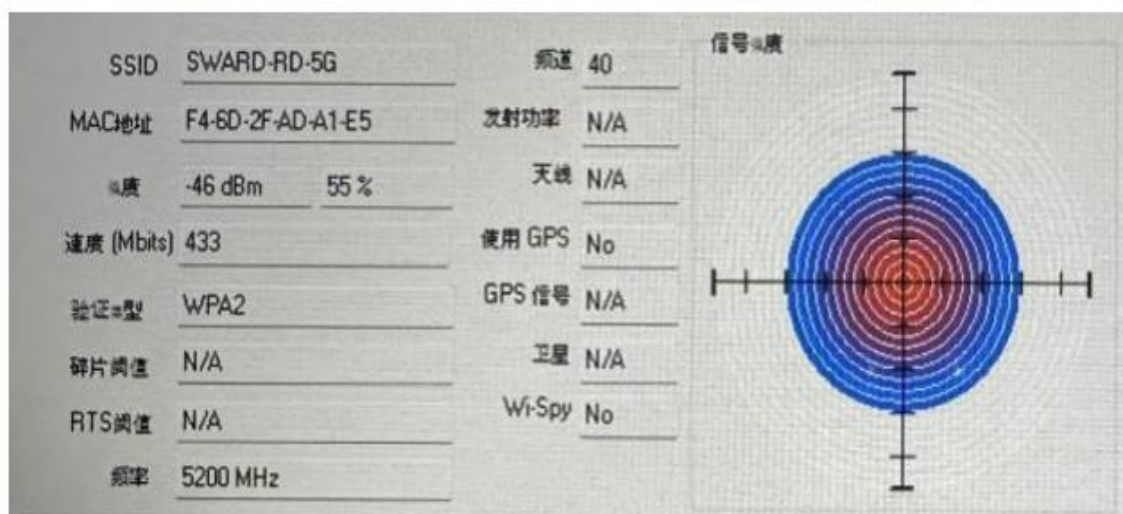
**Active data**



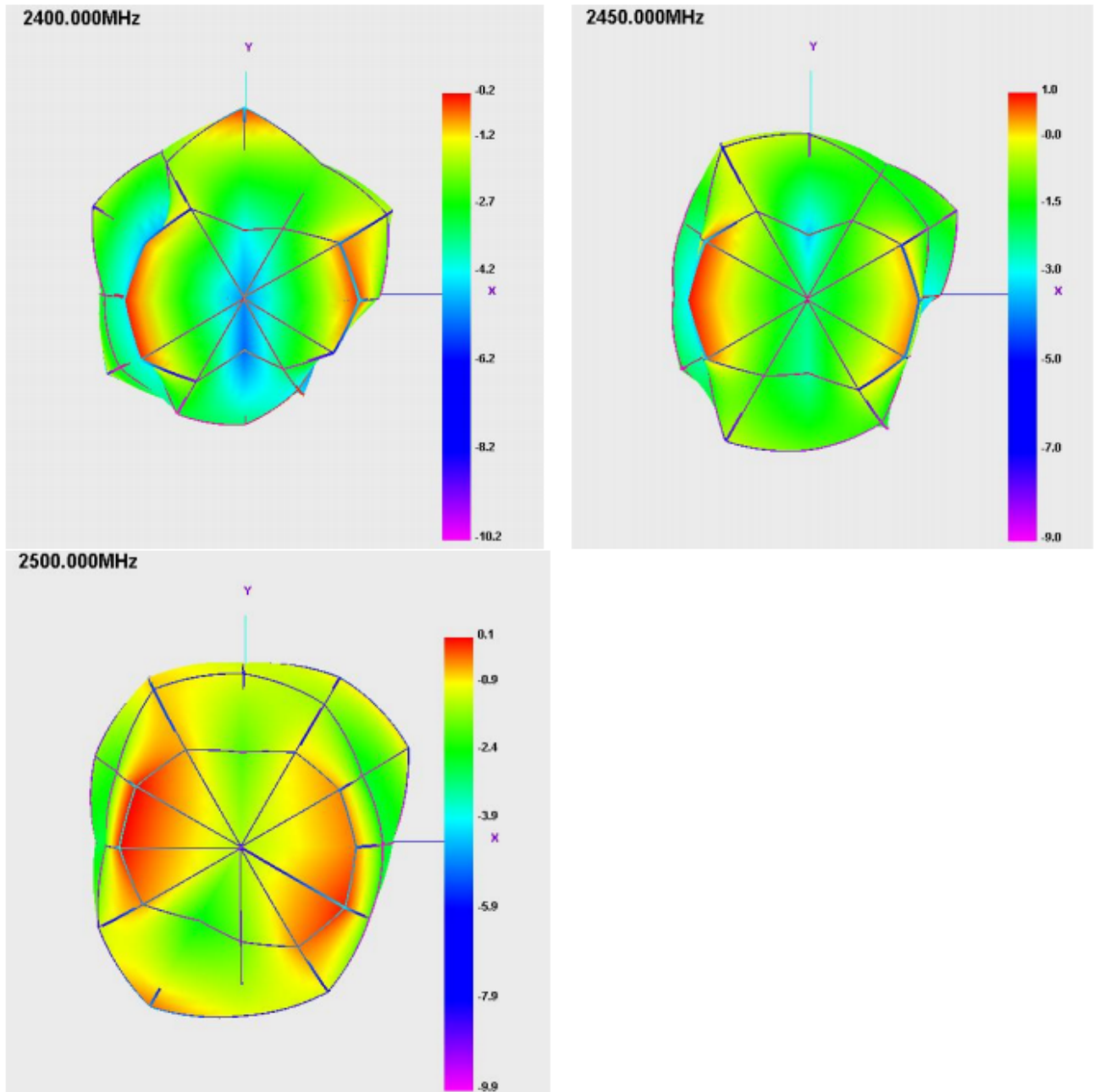
Model number	channel	n模式 (MCS7)	
		TRP	TIS
1	1	11.77	-58.67
	6	11.67	-58.72
	11	11.81	-60.37
	36	14.63	-64.1
	56	14.49	-64.2
	100	14.87	-64.06
	149	15.72	-64.8
	165	15.8	-64.2

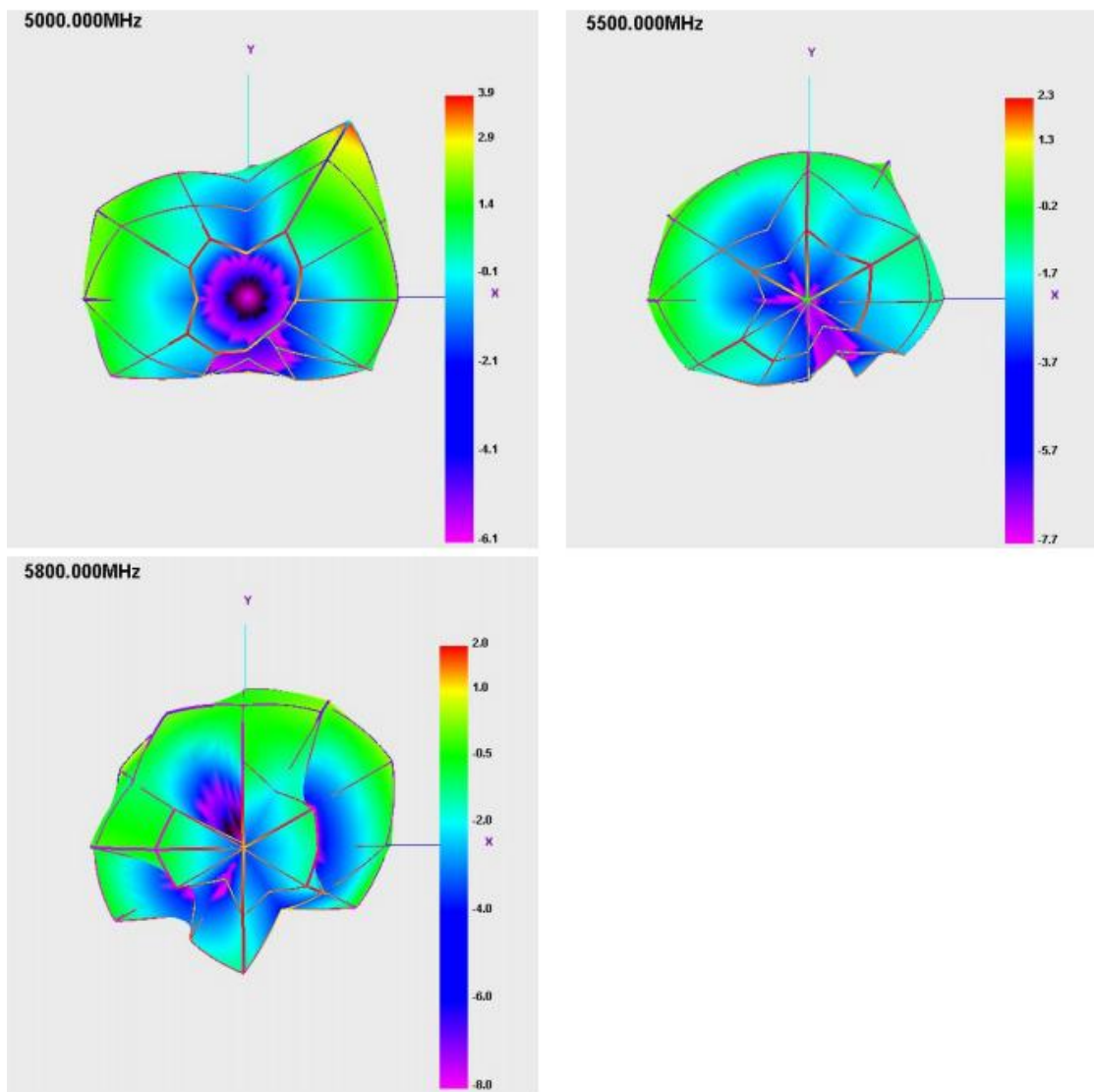
**六:Antenna measurement diagram**

Actual measurement effect	
Model number	1
testing environment	Soward R&D Center
Test equipment	HuaweiAM08
test distance	10m $\geq$

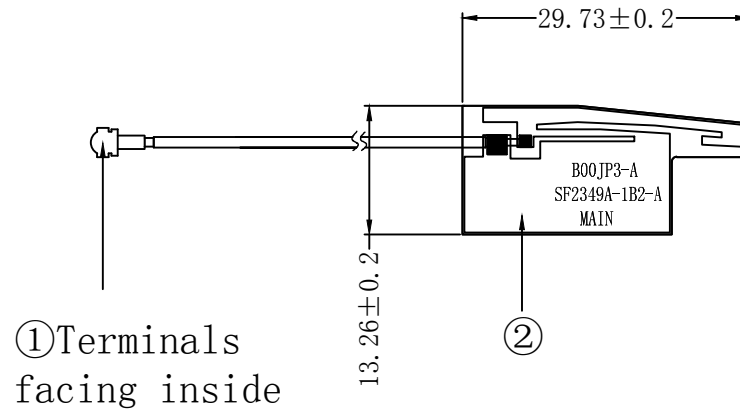
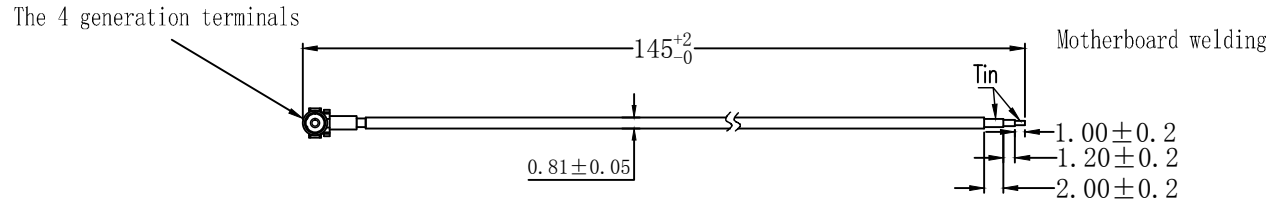


## 七:3D pattern





## 八: Structural drawing



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>SWARD</b>	ShenZhen SWARD Communication Technology Co.Ltd	
4											SF2349A-1L24B-145-A	
3					signatures	date	mass	signatures	date	time markup		percentage
2	FPC	black	1	SF2349A-1B2-A	RD	Joseph	2024.3.12	Q C		1	A	1 : 1
1	coaxial line	black	1	φ=0.81mm	RF							ROHS
	name	color	quantity	specifications	audits			approval				