

## Antenna specification for approval

Customer name	Lightcomm Technology Co., Ltd		
Model	MID7021-MQ (7-inch metal shell-MT8768V)		
Antenna frequency	2.4GHZ&5GHz		
Antenna function	WIFI&BT&5Gwifi Antenna		
Antenna material	FPC	FPC color	black
model	SF2299A-1B2-A		
Material number	SF2299A-1B2-A		
Customer Part Number			
<b>Ward accepted the signature</b>		<b>Client acknowledges signature</b>	
structure		Purchase	
Document control		structure	
radio frequency		engineering	
To examine		QC	
Responsible	Tingting Li	To examine	
date 2023.12.07	Seal area	date 2023.12.07	Seal area

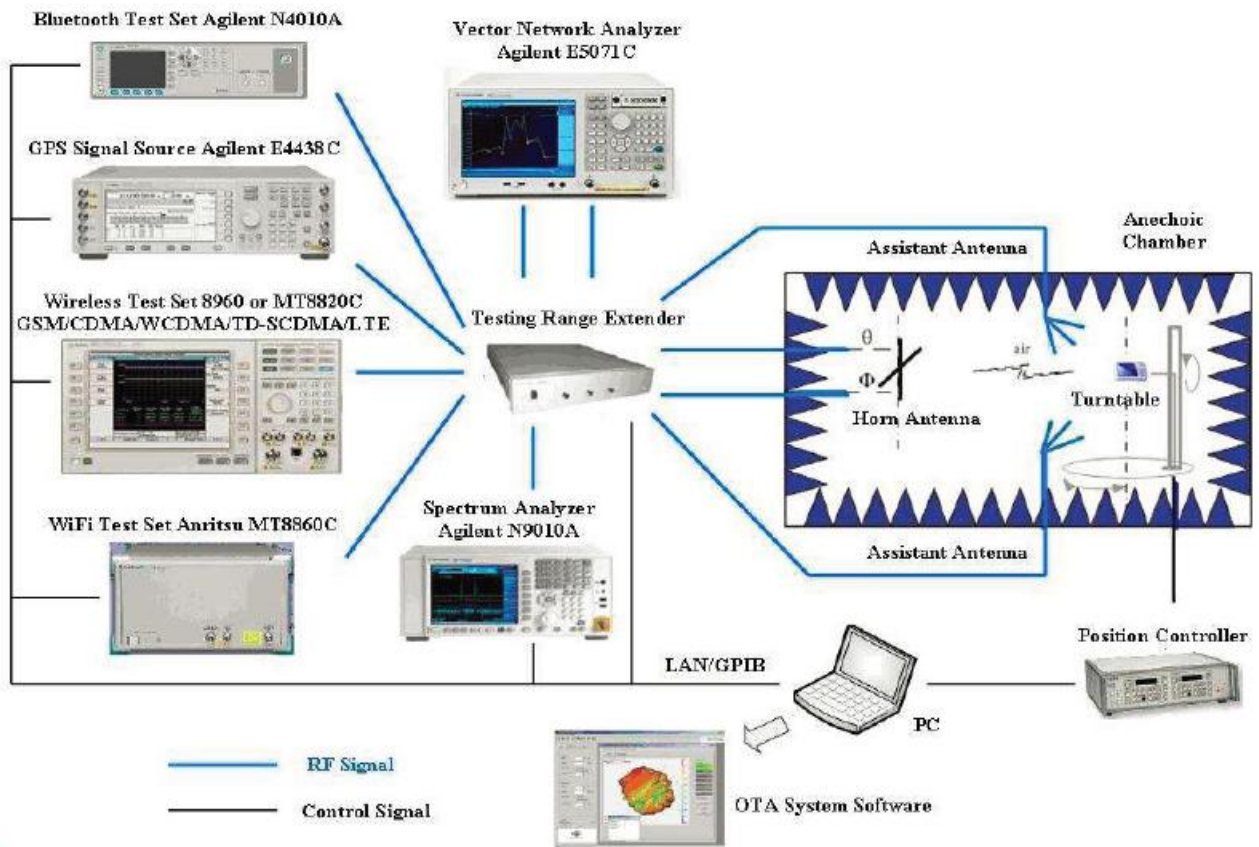
No.	Authentication No.	Material type	issue Date	Remarks
1	A2230173541101001E	tinned copper wire	2023-04-24	one year
2	CANEC2227657302	halogen	2022-12-28	one year
3	CANEC2227657303	back adhesive	2022-12-28	one year
4	SHAEC23000346911	FEP sheath	2023-01-13	one year
5	SHAEC22004639301	FEPinsulation	2022-12-15	one year
6	SZXEC23001647204	tin wire	2023-07-28	one year
7	SZXEC23001647208	tin bar	2023-07-28	one year
8	ETR23701480	printing ink	2023-07-13	one year
9	A2230173918101001E	base material	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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—: Device support & testable antenna type



## 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:

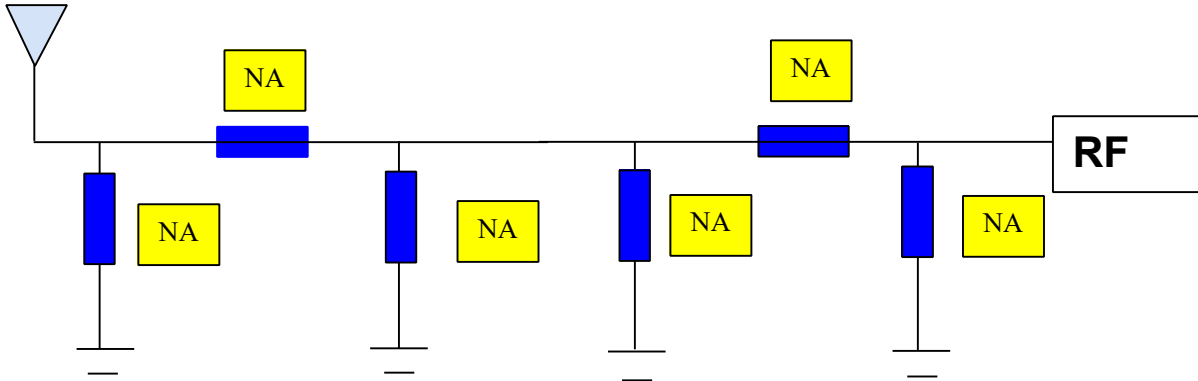
Description	2.4GHz~5GHz	Units
VSWR	$\leq 2.0$	
Average Antenna Gain	$\geq -4.5$	dB
Feed Impedance	50 ohms	
Operating Temperature	-40 to +85 deg C	
Polarization / Azimuth	Linear / Omni-directional	

### (2)Mechanical Information

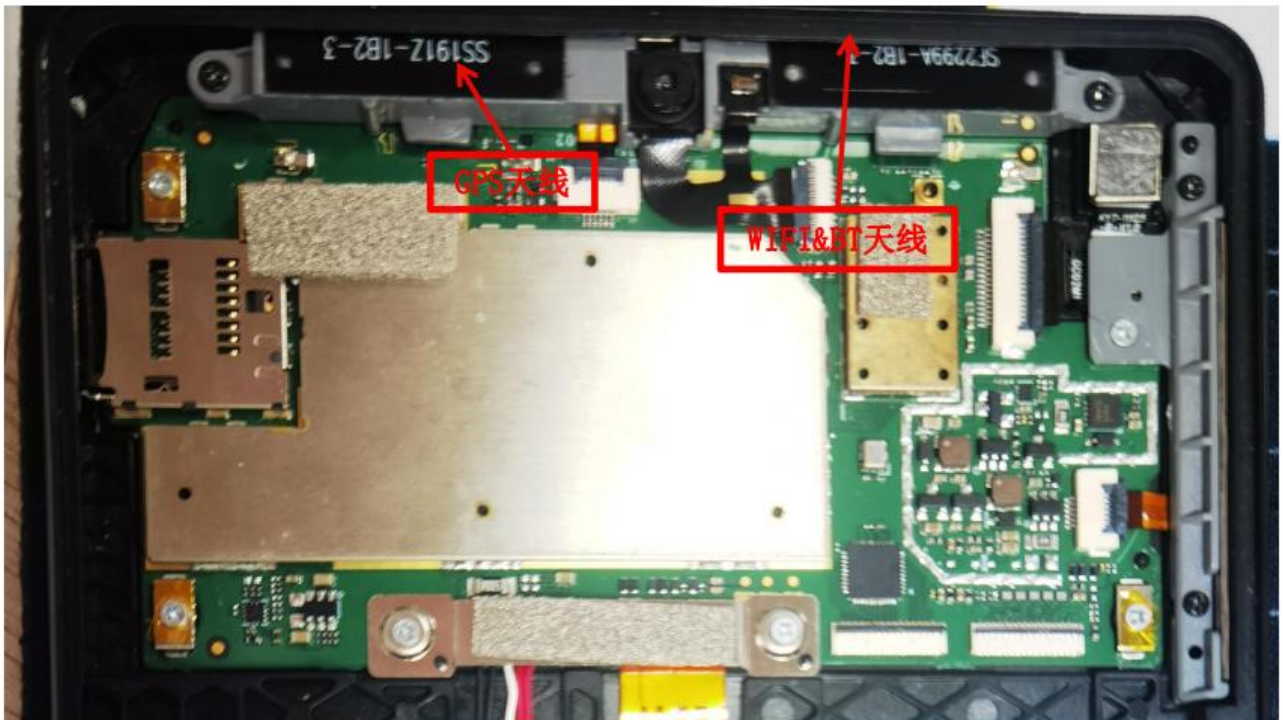
Mechanical Dimension	
Cable Length	NA
Description	WIFI&BT antenna
Material	FPC
Coaxial Cable	NA
Environmental	
Operation Temperature	-40 to +85 deg C
Storage Temperature	-40 to +85 deg C

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

(1) Matching circuit diagram

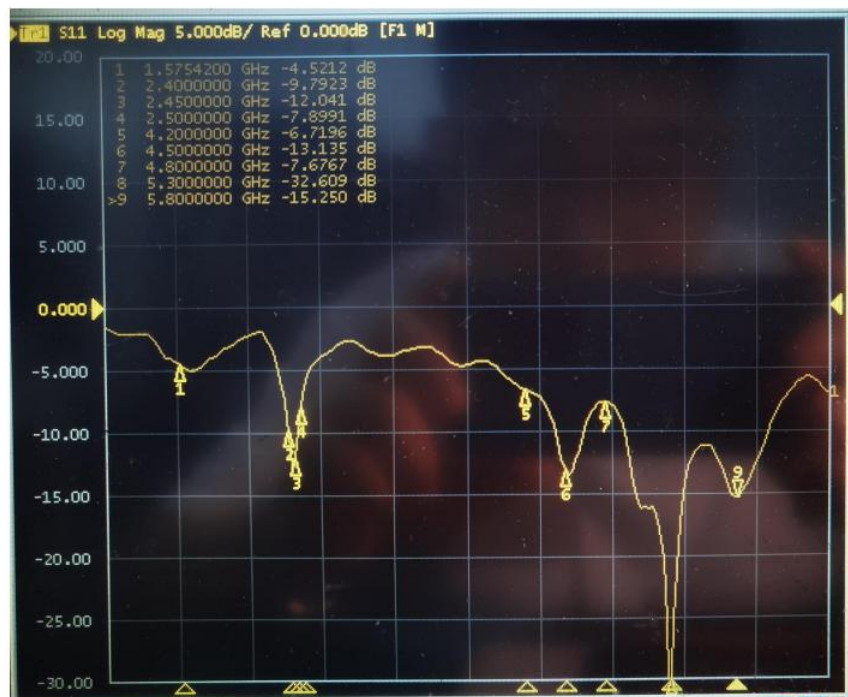


(2) machine picture&antenna picture





**四:Antenna standing wave ratio&antenna efficiency**





Passive Test For 2.4G												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Directivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
2400	11.26	-9.49	-5.21	-7.36	4.694	6.562	-5.21	-16.2	4.28	60	46.77	47.04
2410	11.46	-9.41	-5.12	-7.27	4.824	6.637	-5.12	-16.24	4.29	60	46.94	47.16
2420	13.82	-8.59	-4.48	-6.63	5.903	7.917	-4.48	-15.69	4.11	60	47.02	47.39
2430	16.03	-7.95	-3.77	-5.92	6.903	9.126	-3.77	-14.54	4.18	60	47.31	47.67
2440	14.68	-8.33	-4.22	-6.37	6.345	8.338	-4.22	-14.74	4.11	60	47.68	47.91
2450	13.92	-8.56	-4.43	-6.58	5.973	7.951	-4.43	-14.84	4.14	60	47.98	48.27
2460	13.94	-8.56	-4.45	-6.6	6	7.94	-4.45	-14.12	4.11	60	47.79	48.02
2470	14.34	-8.44	-4.44	-6.59	6.144	8.193	-4.44	-13.84	4	60	47.6	47.7
2480	16.13	-7.92	-4.1	-6.25	6.909	9.225	-4.1	-13.49	3.82	60	47.93	48.05
2490	18.72	-7.28	-3.46	-5.61	7.969	10.753	-3.46	-13.02	3.81	60	48.1	47.95
2500	20.86	-6.81	-3.04	-5.19	8.822	12.036	-3.04	-12.74	3.77	60	48.13	48.09

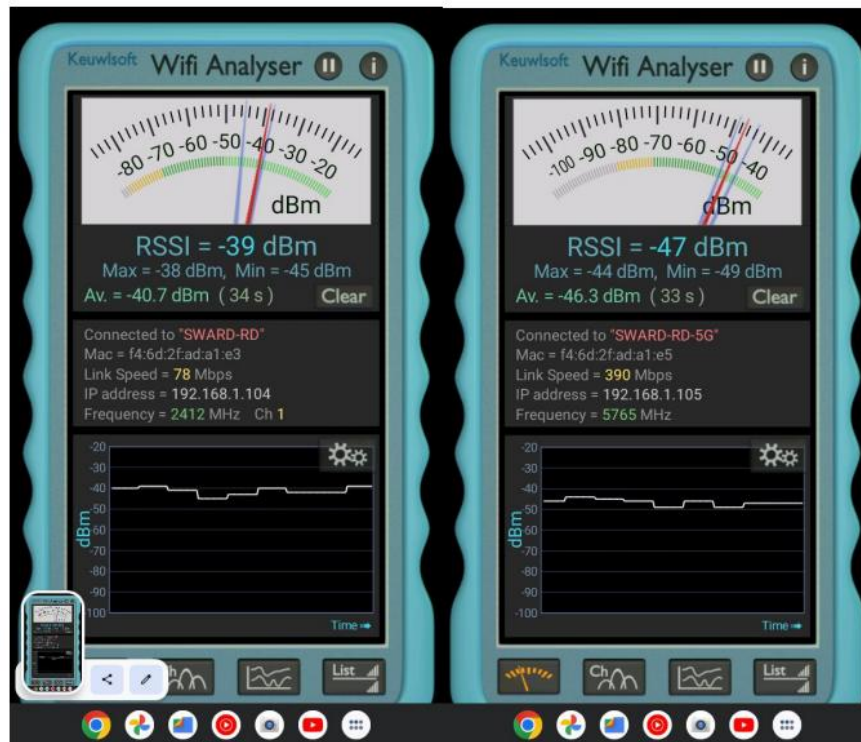
Passive Test For 5Gwifi												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Directivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
5050	25.7	-5.9	0.45	-1.7	16.321	9.377	0.45	-13.79	6.35	30	57.87	57.75
5150	30.19	-5.2	1.58	-0.57	19.324	10.861	1.58	-16.9	6.78	30	57.03	57.26
5250	27.36	-5.63	0.83	-1.32	17.24	10.119	0.83	-19.54	6.46	60	56.42	56.34
5350	27.35	-5.63	1.86	-0.29	14.374	12.975	1.86	-19.65	7.49	90	56.72	56.77
5450	32.72	-4.85	3.31	1.16	13.748	18.97	3.31	-19.22	8.16	90	56.86	57.62
5550	39.5	-4.03	3.63	1.48	15.724	23.772	3.63	-21.31	7.66	90	58.37	59.35
5650	33.96	-4.69	2.06	-0.09	15.499	18.46	2.06	-18.96	6.75	90	59	59.74
5750	30.2	-5.2	0.49	-1.66	16.923	13.279	0.49	-15.02	5.69	90	59.01	59.89
5850	30.88	-5.1	0.37	-1.78	18.951	11.926	0.37	-14.95	5.47	60	60.11	60.72
5950	37.73	-4.23	2.61	0.46	23.888	13.837	2.61	-21.79	6.85	90	61.2	62.61



WIFI Active data

Test	802.11b : 11Mbps					
Result	1	7	13			
Frequency (MHz)	2412	2442	2472			
TRP (dBm)	11.16	12.25	12.38			
TIS (dBm)	-81.37	-82.12	-82.32			
Test	802.11g : 54Mbps			802.11a : 54Mbps		
Result	1	7	13	36	64	165
Frequency (MHz)	2412	2442	2472	5180	5320	5825
TRP (dBm)	10.5	10.27	10.58	12.21	11.05	12.62
TIS (dBm)	-69.56	-70.34	-69.51	-71.87	-72.21	-73.72
Test	802.11n : MCS7			802.11n : MCS7		
Result	1	7	13	36	64	165
Frequency (MHz)	2412	2442	2472	5180	5320	5825
TRP (dBm)	10.35	11.12	10.19	12.34	11.28	12.7
TIS (dBm)	-65.21	-66.59	-65.11	-69.38	-69.66	-69.17

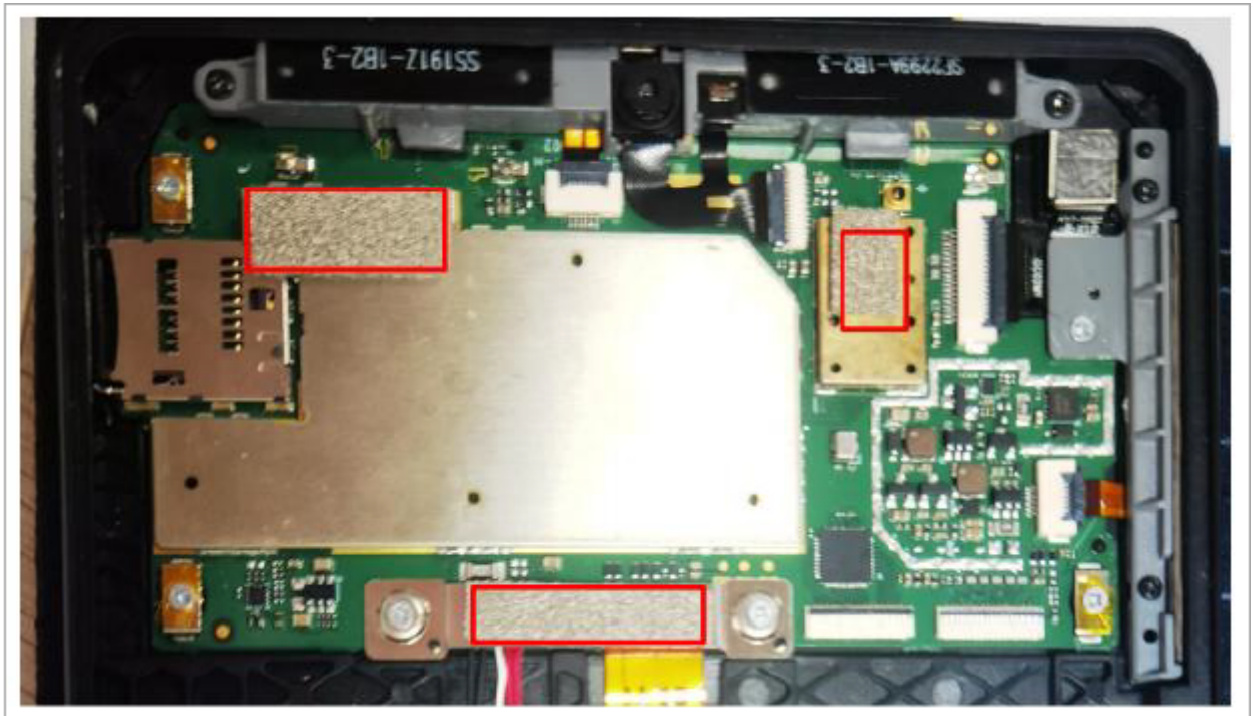
**五: Signal measurement:**



**六:Environmental Treatment:**



Attach conductive sponge and metal bottom shell below the motherboard for grounding treatment.



Stick conductive sponge at the red box position to ground the motherboard and screen;  
Attach conductive cloth to the camera cable for grounding treatment.

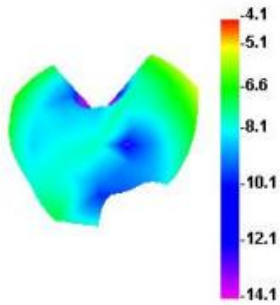


Cover the screen cables with conductive cloth (or copper foil) for shielding treatment.

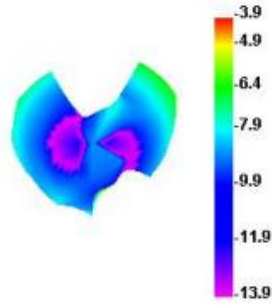
**Note:** Please optimize the specific environmental handling method according to the test report

七:3D pattern

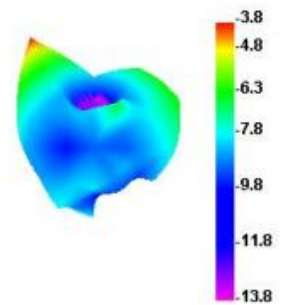
2400.000MHz



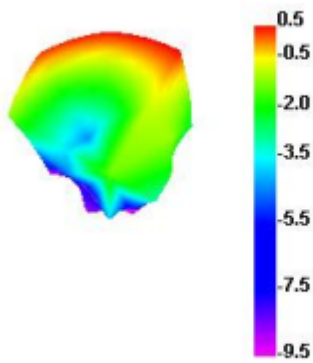
2450.000MHz



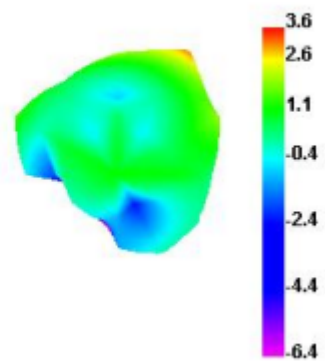
2500.000MHz



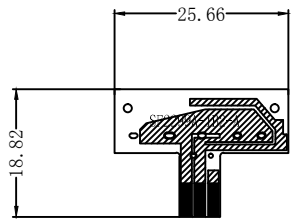
5050.000MHz



5550.000MHz

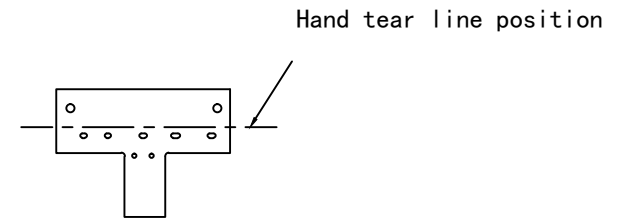


八:Structural Drawing



Front

Adhesive backing -3M300



back

