Certificate #5505.02

MPE REPORT

Report No.: SRTC2024-9004(F)-24013001(I)

Product Name: 5G Module

Product ID: SC151-GL

Applicant: Fibocom Wireless Inc.

Manufacturer: Fibocom Wireless Inc.

FCC ID：ZMOSC151GL

Reference Specification
FCC Part §1.1310

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30, Shixing Street, Shijingshan District,

Beijing, P.R.China

Tel: 86-10-57996183 Fax: 86-10-57996388

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1 GENERAL INFORMATION

1.1 Notes of the test report

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1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Test Site 1:	15th Building, No.30 Shixing Street, Shijingshan District
Test Site 2:	No.80, Zhaojiachang, Beizang, Daxing District
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Liu Jia
Tel:	+86 10 57996183
Fax:	+86 10 57996388
Email:	liujiaf@srtc.org.cn
Designation Number:	CN1267
Registration number:	239125

1.3 Applicant’s details

Company:	Fibocom Wireless Inc.
Address:	1101,Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen , China
City:	Shenzhen
Country or Region:	China
Contacted person:	Sam Guo
Tel:	15013511563
Email:	sam.guo@fibocom.com

1.4 Manufacturer's details

Company:	Fibocom Wireless Inc.
Address:	1101,Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen , China
City:	Shenzhen
Country or Region:	China
Contacted person:	Sam Guo
Tel:	15013511563
Email:	sam.guo@fibocom.com

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2024/2/4
Testing Start Date:	2024/2/5
Testing End Date:	2024/6/25

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	40
Maximum Extreme	75	---
Minimum Extreme	-30	---

Normal Supply Voltage (V d.c.):	3.8
Maximum Extreme Supply Voltage (V d.c.):	4.4
Minimum Extreme Supply Voltage (V d.c.):	3.5

2 DESCRIPTION OF THE DEVICE UNDER TEST

2.1 Final Equipment Build Status

WCDMA

Frequency Range:	WCDMA Band II: Tx:1850~1910MHz Rx:1930~1990MHz WCDMA Band IV: Tx: 1710~1755MHz Rx: 2110~2155MHz WCDMA Band V: Tx: 824~849MHz Rx: 869~894MHz
Mode:	HSDPA/HSUPA/HSPA+/DC-HSDPA
Duplex Mode:	FDD
Duplex Spacing:	WCDMA Band II: 80MHz WCDMA Band IV: 400MHz WCDMA Band V: 45MHz
Antenna Type:	External antenna
Antenna Gain:	WCDMA Band II: 4.5dBi WCDMA Band IV: 4.5dBi WCDMA Band V: 4.5dBi ERP = EIRP(Power +Gain) – 2.15 (dB)
Power Supply:	DC supply
Software Revision:	SC151-GL-T16.00.057
Hardware Revision:	V1.1
IMEI	NA

LTE

Frequency Range:	LTE Band 2: Tx:1850~1910MHz Rx:1930~1990MHz LTE Band 4: Tx: 1710~1755MHz Rx: 2110~2155MHz LTE Band 5: Tx: 824~849MHz Rx: 869~894MHz LTE Band 7: Tx: 2500~2570MHz Rx: 2620~2690MHz LTE Band 12: Tx: 699 ~716 MHz Rx: 729 ~746 MHz LTE Band 13: Tx: 777~787MHz Rx: 746~756MHz LTE Band 14: Tx: 788 ~798 MHz Rx: 758 ~768 MHz LTE Band 17: Tx: 704 ~ 716 MHz Rx: 734 ~ 746 MHz LTE Band 18: Tx: 815 ~ 830 MHz Rx: 860 ~ 875 MHz LTE Band 19: Tx: 830 ~ 845 MHz Rx: 875 ~ 890 MHz LTE Band 25: Tx: 1850 ~ 1915 MHz Rx: 1930 ~ 1995 MHz LTE Band 26: Tx: 814~849MHz Rx: 859~894MHz LTE Band 30: Tx: 2305 ~ 2315 MHz Rx: 2350 ~ 2360 MHz LTE Band 38: Tx:2570~2620MHz Rx:2570~2620MHz LTE Band 41: Tx: 2496~2690MHz Rx: 2496~2690MHz LTE Band 42: Tx: 3400 ~3600 MHz Rx: 3400 ~ 3600 MHz LTE Band 43: Tx: 3600 ~ 3800 MHz Rx: 3600 ~ 3800 MHz LTE Band 48: Tx: 3550 ~3700 MHz Rx: 3550 ~ 3700 MHz LTE Band 66: Tx: 1710~1780MHz Rx: 2110~2200MHz LTE Band 71: Tx: 663 ~698 MHz Rx: 617 ~652 MHz

Modulation Type(Uplink):	QPSK/16QAM/64QAM
Antenna Type:	External antenna
Antenna Gain:	LTE B2: 4.5dBi LTE B4: 4.5dBi LTE B5: 4.5dBi LTE B7: 4.5dBi LTE B12: 4.5dBi LTE B13: 4.5dBi LTE B14: 4.5dBi LTE B17: 4.5dBi LTE B18: 4.5dBi LTE B19: 4.5dBi LTE B25: 4.5dBi LTE B26: 4.5dBi LTE B30: 4.5dBi LTE B38: 4.5dBi LTE B41: 4.5dBi LTE B42: 2.56dBi LTE B43: -0.13dBi LTE B48: -0.13dBi LTE B66: 4.5dBi LTE B71: 4.5dBi ERP = EIRP(Power+Gain) – 2.15 (dB)
Power Supply:	DC supply
Software Revision:	SC151-GL-T16.00.057
Hardware Revision:	V1.1
IMEI	NA

NR

Frequency Range:	N2: Tx:1850~1910 MHz Rx:1930~1990 MHz N5: Tx: 824~849 MHz Rx:869~894 MHz N7: Tx:2500~2570 MHz Rx:2620~2690 MHz N12: Tx: 699~716 MHz Rx:729~746 MHz N14: Tx: 788~798 MHz Rx:758~768 MHz N25: Tx: 1850~1915 MHz Rx:1930~1995 MHz N30: Tx: 2305~2315 MHz Rx:2350~2360 MHz N41: Tx:2496~2690 MHz Rx: 2496~2690 MHz N48: Tx: 3550~3700 MHz Rx:3550~3700 MHz N66: Tx:1710~1780 MHz Rx:2110~2200 MHz N71: Tx: 663~698 MHz Rx:617~652 MHz N77: Tx: 3300~4200 MHz Rx:3300~4200 MHz N78: Tx: 3300~3800 MHz Rx:3300~3800 MHz
Single band single	N2/N5/N7/N12/N14/ N25/N30/N41/N48/N66/N71/N77/N78

SCS single carrier	
Single band single SCS HPUE	N41/N77/N78
SA Bandwidth	N2: 5MHz/ 10MHz/ 15MHz/ 20MHz N5: 5MHz/ 10MHz/ 15MHz/ 20MHz N7: 5MHz/ 10MHz/ 15MHz/ 20MHz N12: 5MHz/ 10MHz/ 15MHz N14: 5MHz/ 10MHz N25: 5MHz/ 10MHz/ 15MHz/ 20MHz N30: 10MHz N41: 20MHz/ 30MHz/ 40MHz/ 50MHz/ 60MHz/ 70MHz/ 80MHz/ 90MHz/ 100MHz N48: 20MHz/ 40MHz/ N66: 5MHz/ 10MHz/ 15MHz/ 20MHz N71: 5MHz/ 10MHz/ 15MHz/ 20MHz N77: 20MHz/ 30MHz/ 40MHz/ 60MHz/ 80MHz/ 100MHz N78: 20MHz/ 30MHz/ 40MHz/ 50MHz/ 60MHz/ 70MHz/ 80MHz/ 90MHz/ 100MHz
NSA Band	N41: DC_66A_n41A N66: DC_5A_n66A/ DC_12A_n66A
Modulation Type:	PI/2 BPSK, QPSK,16QAM,64QAM,256QAM
Antenna Type:	External antenna
Antenna Gain:	N2: 4.5dBi N5: 4.5dBi N7: 4.5dBi N12: 4.5dBi N14: 4.5dBi N25: 4.5dBi N30: 4.5dBi N41: 4.5dBi N48: -0.13dBi N66: 4.5dBi N71: 4.5dBi N77: 2.95dBi N78: 2.56dBi ERP = EIRP(Power +Gain) – 2.15 (dB)
Power Supply:	DC supply
Software Revision:	SC151-GL-T16.00.057
Hardware Revision:	V1.1
IMEI:	NA

BT

Frequency Range:	2.402GHz~2.480GHz
Number of Channel:	79
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Duplex Mode:	TDD
Channel Spacing:	1MHz
Data Rate:	1Mbps, 2 Mbps, 3 Mbps
Power Supply:	DC supply
Antenna gain:	4.5dBi
Software Revision:	SC151-GL-T16.00.057
Hardware Revision:	V1.1
IMEI:	NA
Antenna type:	External antenna

BLE

Frequency Range:	2.402GHz~2.480GHz
Number of Channel:	40
Modulation Type:	GFSK
Equipment Class:	DTS
Channel Spacing:	2MHz
Data Rate:	LE 1Mbps/2Mbps
Power Supply:	DC supply
Antenna gain:	4.5dBi
Software Revision:	SC151-GL-T16.00.057
Hardware Revision:	V1.1
IMEI:	NA
Antenna type:	External antenna

Wi-Fi 2.4G

Frequency Band:	2.412GHz~2.462GHz
Number of Channel For 20MHz:	11
Number of Channel For 40MHz:	7

Modulation Type:	802.11b 802.11g 802.11n (HT20/HT40) 802.11ax (HE20/HE40)
Power Supply:	DC supply
Antenna gain:	For Power/PSD: ANT0：4.5dBi ANT1：4.5dBi
Directional Gain:	For Power/PSD: ANT0：4.5dBi(Uncorrelated) ANT1：4.5dBi(Uncorrelated)
Software Revision:	SC151-GL-T16.00.057
Hardware Revision:	V1.1
IMEI:	N/A
Antenna type:	External Antenna

Wi-Fi 5G

Frequency Band(s)**:**	U-NII-1:5150MHz-5250MHz U-NII-2A:5250MHz-5350MHz U-NII-2C:5470MHz-5725MHz U-NII-3:5725MHz-5850MHz U-NII-4: 5850MHz-5895MHz	
The DFS related operating mode(s) of the equipment:	□	Master
	□	Slave with radar detection
	☑	Slave without radar detection
Modulation Type:	802.11a 802.11n (HT20/HT40) 802.11ac (VHT20/VHT40/VHT80/VHT160) 802.11ax (HE20/HE40/HE80/HE160)	
RU Type	Full RU Partial RU	
Antenna Type**:**	External antenna	
Antenna gain	For Power/PSD: ANT0: U-NII-1/ U-NII-2A: 4.49dBi U-NII-2C/ U-NII-3/ U-NII-4: 3.32dBi ANT1: U-NII-1/ U-NII-2A: 4.49dBi U-NII-2C/ U-NII-3/ U-NII-4: 3.32dBi	
Directional Gain:	For Power/PSD: ANT0:U-NII-1/ U-NII-2A:	

	4.49dBi(Uncorrelated) U-NII-2C/ U-NII-3/ U-NII-4: 3.32dBi(Uncorrelated) ANT1:U-NII-1/ U-NII-2A: 4.49dBi(Uncorrelated) U-NII-2C/ U-NII-3/ U-NII-4: 3.32dBi(Uncorrelated)
Beamforming Directional Gain:	N/A
Power Supply**:**	DC supply
Software Revision:	SC151-GL-T16.00.057
Hardware Revision:	V1.1
IMEI:	NA

Wi-Fi 6G

Frequency Band(s)**:**	U-NII-5:5945MHz-6425MHz U-NII-6:6425 MHz-6525MHz U-NII-7:6525 MHz-6875MHz U-NII-8:6875 MHz-7125MHz
Modulation Type:	802.11a 802.11ax (HE20/HE40/HE80/HE160)
RU Type	Full RU Partial RU
Antenna Type**:**	External antenna
Antenna Gain**:**	For Power/PSD:ANT0: 6.12dBi(max) ANT1:6.12dBi(max)
Directional Gain:	For Power/PSD: ANT0:6.12dBi(max) (Uncorrelated) ANT1:6.12dBi(max) (Uncorrelated)
Beamforming Directional Gain:	N/A
Power Supply**:**	DC supply
Software Revision:	SC151-GL-T16.00.057
Hardware Revision:	V1.1
IMEI:	NA

3 REFERENCE SPECIFICATION

Specification	Version	Title
Part 1.1310	Latest	Radio frequency radiation exposure limits.

4 RESULT SUMMARY

Case	Verdict
MPE	Pass

This Test Report Is Issued by: Mr. Peng Zhen	Checked by: Mr. Li Bin
Tested by: Mr. Hui Wen	Issued date: 2024/07/24

5.CALCULATION RESULT

5.1 Maximum permissible exposure (MPE)

Limit:

(A) Limits for Occupational/Controlled Exposure ☐

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm2)	Averaging Time |E|2, |H|2 or S (minutes)
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f^2	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

(B) Limits for General Population/Uncontrolled Exposure ☑

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm2)	Averaging Time |E|2, |H|2 or S (minutes)
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f^2	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

Result:

According to §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

The $S = PG / (4\pi R^2)$

Where S = power density in mW/cm^2

P = transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

Standalone Transmission Result

Band	Freq. (MHz)	Maximum Power (dBm)	ANT Gain (dBi)	Maximum EIRP (dBm)	Maximum EIRP(mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)	Power Density/ Limit
WCDMA II	1880	23.65	4.5	28.15	653.131	0.130	1	0.130
WCDMA IV	1712.4	23.75	4.5	28.25	668.344	0.133	1	0.133
WCDMA V	846.6	24.32	4.5	28.82	762.079	0.152	0.5644	0.269
LTE B2	1850.7	22.99	4.5	27.49	561.048	0.112	1	0.112
LTE B4	3625	24.48	4.5	28.98	790.679	0.157	1	0.157
LTE B5	836.5	22.96	4.5	27.46	557.186	0.111	0.5577	0.199
LTE B7	2505	23.01	4.5	27.51	563.638	0.112	1	0.112
LTE B12	699.7	22.94	4.5	27.44	554.626	0.110	0.4664	0.237
LTE B13	782	23.87	4.5	28.37	687.068	0.137	0.5213	0.262
LTE B14	790.5	23.31	4.5	27.81	603.949	0.120	0.5270	0.228
LTE B17	713.5	23.67	4.5	28.17	656.145	0.131	0.4757	0.274
LTE B18	822.5	23.57	4.5	28.07	641.210	0.128	0.5483	0.233
LTE B19	832.5	23.50	4.5	28.00	630.957	0.126	0.5550	0.226
LTE B25	1850.7	22.91	4.5	27.41	550.808	0.110	1	0.110
LTE B26	819	23.30	4.5	27.80	602.560	0.120	0.5460	0.220
LTE B30	2312.5	23.35	4.5	27.85	609.537	0.121	1	0.121
LTE B38	2617.5	22.49	4.5	26.99	500.035	0.099	1	0.099
LTE B41	2685	22.58	4.5	27.08	510.505	0.102	1	0.102
LTE B42	3597.5	23.23	4.5	27.73	592.925	0.118	1	0.118
LTE B43	3795	23.78	-0.13	23.65	231.739	0.046	1	0.046
LTE B48	3625	24.48	-0.13	24.35	272.270	0.054	1	0.054
LTE B66	1779.5	22.12	4.5	26.62	459.198	0.091	1	0.091
LTE B71	680.5	23.93	4.5	28.43	696.627	0.139	0.4537	0.305
NR2	1907.5	24.31	4.5	28.81	760.326	0.151	1	0.151
NR5	826.5	24.13	4.5	28.63	729.458	0.145	0.5510	0.263
NR7	2502.5	22.84	4.5	27.34	542.001	0.108	1	0.108

NR12	701.5	23.83	4.5	28.33	680.769	0.135	0.4677	0.290
NR14	793	24.03	4.5	28.53	712.853	0.142	0.5287	0.268
NR25	1910	27.19	4.5	31.69	1475.707	0.294	1	0.294
NR30	2310	16.20	4.5	20.70	117.490	0.023	1	0.023
NR41	2674.98	26.78	4.5	31.28	1342.765	0.267	1	0.267
NR48	3679.98	25.37	-0.13	25.24	334.195	0.066	1	0.066
NR66	1745	5.96	4.5	10.46	11.117	0.002	1	0.002
NR71	680.5	23.87	4.5	28.37	687.068	0.137	0.4537	0.301
NR 77	3750	29.10	2.95	32.05	1603.245	0.319	1	0.319
NR 78	3789.99	28.66	2.56	31.22	1324.342	0.263	1	0.263
BT	2402	17.25	4.5	21.75	149.624	0.030	1	0.030
BLE	2402	7.33	4.5	11.83	15.241	0.003	1	0.003
WIFI 2.4G	2437	19.48	4.5	23.98	250.035	0.050	1	0.050
WIFI 5G	5180	19.94	4.49	24.43	277.332	0.055	1	0.055
WIFI 6G	6895	5.72	4.5	10.22	10.520	0.002	1	0.002

Note：The maximum power frequency bands for each test mode were selected for standalone transmission result.

Simultaneous Transmission Result

Power Density1 / Limit (NR77)	Powe Density2 / Limit (WIFI 5G)	Σ(Power Density / Limit)
0.319	0.055	0.374

Note: Simultaneous Transmission Limit = Power_1 / Limit_1 + Power_2 / Limit_2 < 1.

---End of Test Report---