RF Exposure Evaluation Report

APPLICANT	:	Fibocom Wireless Inc
EQUIPMENT	:	LTE module
BRAND NAME	:	Fibocom
MODEL NAME	:	NL668-AM-00
FCC ID	:	ZMONL668AM00
STANDARD	:	47 CFR Part 2.1091 FCC KDB 447498 D01 v06

The product evaluation date was started from Jan. 16, 2025 and completed on Jan. 16, 2025. We, Sporton International Inc. (Shenzhen), would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.

Si Zhang

Approved by: Si Zhang

Sporton International Inc. (Shenzhen)
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People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA4D2309	Rev. 01	Initial issue of report	Jan. 21, 2025

1. Administration Data

1.1. Testing Laboratory

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	SAR01-SZ	CN1256	421272

Applicant	
Company Name	Fibocom Wireless Inc
Address	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China

Manufacturer	
Company Name	Fibocom Wireless Inc
Address	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	LTE module
Brand Name	Fibocom
Model Name	NL668-AM-00
FCC ID	ZMONL668AM00
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 12 : 699 MHz ~ 716 MHz LTE Band 13 : 777 MHz ~ 787 MHz LTE Band 17 : 704 MHz ~ 716 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz
Mode	RMC12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is not supported) LTE: QPSK / 16QAM
Antenna Type	Dipole Antenna
HW Version	V1.0.1
SW Version	19011.1000.00.02.79.08
EUT Stage	Production Unit

Remark:
1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are six optional antenna models provided by different manufacturers, and the manufacturer declares that the antenna gain values please refers to following gain table.

Comments and Explanations:
1. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.
2. The maximum RF output tune up power, antenna gain also the safe distance used for evaluate RF exposure were declared by manufacturer.

Antenna Gain:

Band	ANT 1 Gain (dBi)	ANT 2 Gain (dBi)	ANT 3 Gain (dBi)	ANT 4 Gain (dBi)	ANT 5 Gain (dBi)	Ant0 Gain (dBi)
WCDMA Band 2	**6.2**	5.9	5.1	2.55	1.45	4.00
WCDMA Band 4	4.7	**5.1**	3.7	2.78	1.45	4.50
WCDMA Band 5	1.3	**4.1**	3.5	2.02	0.36	4.00
LTE Band 2	**6.2**	5.9	5.1	2.55	1.45	4.00
LTE Band 4	4.7	**5.1**	3.7	2.78	1.45	4.50
LTE Band 5	1.3	**4.1**	3.5	2.02	0.36	4.00
LTE Band 12	4.4	**5.6**	3.7	2.20	0.42	3.00
LTE Band 13	2.6	5.2	**5.4**	2.20	0.42	3.50
LTE Band 17	4.4	**5.6**	3.7	2.20	0.42	3.00
LTE Band 66	4.7	**5.1**	3.9	2.78	1.45	4.50
LTE Band 71	3.7	**4.3**	2.1	2.66	0.42	2.00

3. Maximum RF average output power among production units

<WCDMA>

Mode		Maximum Average power(dBm)
WCDMA	Band II	24.50
	Band IV	24.50
	Band V	24.50

<LTE>

Mode		Maximum Average power(dBm)
LTE	Band 2	24.00
	Band 4	24.00
	Band 5	24.00
	Band 12	24.00
	Band 13	24.00
	Band 17	24.00
	Band 66	24.00
	Band 71	24.00

4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	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				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

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:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)
WCDMA Band 2	1850	6.20	24.50	30.70	1174.90	0.234	1.000
WCDMA Band 4	1710	5.10	24.50	29.60	912.01	0.182	1.000
WCDMA Band 5	824	4.10	24.50	28.60	724.44	0.144	0.549
LTE Band 2	1850	6.20	24.00	30.20	1047.13	0.208	1.000
LTE Band 4	1710	5.10	24.00	29.10	812.83	0.162	1.000
LTE Band 5	824	4.10	24.00	28.10	645.65	0.129	0.549
LTE Band 12	699	5.60	24.00	29.60	912.01	0.182	0.466
LTE Band 17	704	5.60	24.00	29.60	912.01	0.182	0.469
LTE Band 13	777	5.40	24.00	29.40	870.96	0.173	0.518
LTE Band 66	1710	5.10	24.00	29.10	812.83	0.162	1.000
LTE Band 71	663	4.30	24.00	28.30	676.08	0.135	0.442

Note:
1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
2. Chose the maximum RF output tune up power and the maximum antenna gain of all antennas among same frequency WWAN bands to perform MPE calculation conservatively.

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

------THE END------