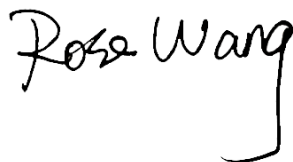


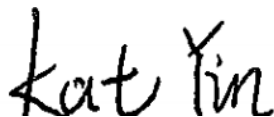
RF Exposure Evaluation Report

APPLICANT : Fibocom Wireless Inc.
EQUIPMENT : LTE Wireless Module
BRAND NAME : Fibocom
MODEL NAME : MC116-NA
FCC ID : ZMOMC116NA
STANDARD : 47 CFR Part 2.1091
FCC KDB 447498 D01 v06

We, Sporton International (Kunshan) Inc., 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 (Kunshan) Inc., the test report shall not be reproduced except in full.



Reviewed by: Rose Wang / Supervisor



Approved by: Kat Yin / Manager



Sporton International (Kunshan) Inc.

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China



Table of Contents

1. ADMINISTRATION DATA	4
1.1. Testing Laboratory	4
2. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)	5
3. MAXIMUM RF AVERAGE OUTPUT TUNE UP POWER AMONG PRODUCTION UNITS	6
4. RF EXPOSURE LIMIT INTRODUCTION	7
5. RADIO FREQUENCY RADIATION EXPOSURE EVALUATION	8
5.1. Standalone Power Density Calculation	8
5.2. Collocated Power Density Calculation.....	8

**Revision History**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA003026	Rev. 01	Initial issue of report.	Dec. 16, 2020



1. Administration Data

1.1. Testing Laboratory

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory		
Test Firm	Sporton International (Kunshan) Inc.	
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958	
Test Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CN1257	314309

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 Wireless Module
Brand Name	Fibocom
Model Name	MC116-NA
FCC ID	ZMOMC116NA
Wireless Technology and Frequency Range	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz
Mode	LTE: QPSK, 16QAM, 64QAM (downlink only)
HW Version	V1.0.0
SW Version	19001.1000.00.02.20.03
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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.

**3. Maximum RF average output tune up power among production units****<LTE>**

Mode		Maximum Average power(dBm)
LTE	Band 2	25.00
	Band 4	25.00
	Band 5	25.00
	Band 12	25.00
	Band 13	25.00
	Band 17	25.00
	Band 66	25.00



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/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				
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

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)
LTE Band 2	1850.7	8.0	25.00	33.000	1995.262	0.397	1.000
LTE Band 4	1710.7	5.0	25.00	30.000	1000.000	0.199	1.000
LTE Band 5	824.7	6.0	25.00	31.000	1258.925	0.251	0.550
LTE Band 12	699.7	5.5	25.00	30.500	1122.018	0.223	0.466
LTE Band 13	779.5	5.5	25.00	30.500	1122.018	0.223	0.520
LTE Band 17	706.5	5.5	25.00	30.500	1122.018	0.223	0.471
LTE Band 66	1710.7	5.0	25.00	30.000	1000.000	0.199	1.000

Note:

- For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.

5.2. Collocated Power Density Calculation

General Note:

- This MPE analysis is applicable to any collocated transmitters with EIRP for WLAN is less than or equal to 28.0dBm and EIRP for Bluetooth is less than or equal to 22.0dBm.
- A maximum antenna gain of 8dBi for WLAN and 5dBi for Bluetooth has been assumed for all collocated antennas.

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)	Power Density / Limit
LTE Band 2	1850.7	7.5	25.00	32.500	1778.279	0.354	1.000	0.354
LTE Band 4	1710.7	5.0	25.00	30.000	1000.000	0.199	1.000	0.199
LTE Band 5	824.7	5.0	25.00	30.000	1000.000	0.199	0.550	0.362
LTE Band 12	699.7	4.5	25.00	29.500	891.251	0.177	0.466	0.380
LTE Band 13	779.5	4.5	25.00	29.500	891.251	0.177	0.520	0.341
LTE Band 17	706.5	4.5	25.00	29.500	891.251	0.177	0.471	0.377
LTE Band 66	1710.7	5.0	25.00	30.000	1000.000	0.199	1.000	0.199
WLAN2.4GHz Band	2412	5.0	20.00	25.000	316.228	0.063	1.000	0.063
WLAN5GHz Band	5180	8.0	20.00	28.000	630.957	0.126	1.000	0.126
Bluetooth	2402	5.0	17.00	22.000	158.489	0.032	1.000	0.032



WWAN Power Density / Limit	WLAN Power Density / Limit	Bluetooth Power Density / Limit	Σ (Power Density / Limit) of WWAN + WLAN + Bluetooth
0.380	0.126	0.032	0.538

Note:

1. For colocation analysis, LTE band 12 are chosen for summation due to the highest (power density/limit) among all WWAN wireless modes.
2. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN + Bluetooth.
3. Considering the WWAN module collocation with the WLAN and Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 3 collocated transmitters is compliant.

Conclusion:

Based on 47 CFR §2.1091 and FCC KDB 447498 D01 v06, the analysis concludes that this product when transmitting in standalone within a host device, is compliant with the FCC RF exposure requirements in mobile exposure condition, provided the conducted power and antenna gain do not exceed the limits for each given frequency band per wireless technology as follow table:

Device	Band	Frequency (MHz)	Maximum Conducted Power (dBm)	Standalone Maximum Antenna Gain (dBi)	Collocated Maximum Antenna Gain (dBi)
MC116-NA	LTE Band 2	1850.7	25.00	8.0	7.5
	LTE Band 4	1710.7	25.00	5.0	5.0
	LTE Band 5	824.7	25.00	6.0	5.0
	LTE Band 12	699.7	25.00	5.5	4.5
	LTE Band 13	779.5	25.00	5.5	4.5
	LTE Band 17	706.5	25.00	5.5	4.5
	LTE Band 66	1710.7	25.00	5.0	5.0
Collocated Transmitters	WLAN2.4GHz	2412	20.00		5.0
	WLAN5GHz	5180	20.00		8.0
	Bluetooth	2402	17.00		5.0

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