



Report No.: SUZR/2021/A002303

Rev.: 01

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RF Exposure Evaluation Report

Application No.: ZR/2021/A0023
Applicant: Fibocom Wireless Inc.
Address of Applicant: 1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China
Manufacturer: Fibocom Wireless Inc.
Address of Manufacturer: 1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China
EUT Description: LTE CatM1&NB-IoT&EGPRS Module
Model No.: MA510-GL
Trade Mark: Fibocom
FCC ID: ZMOMA510GL
Standards: 47 CFR Part 2.1091
 FCC KDB 447498 D01 v06
Date of Receipt: 2021/10/29
Date of Test: 2021/11/10 to 2021/11/16
Date of Issue: 2021/11/22

Test Result:	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Panta Sun

Panta Sun
Wireless Laboratory Manager



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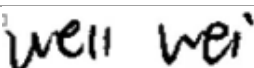
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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021/11/22		Original

Authorized for issue by:		
Prepared By		 (King-p Li) / Engineer
Checked By		 (Well Wei) /Reviewer



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2 General Information

2.1 Client Information

Applicant:	Fibocom Wireless Inc.
Address of Applicant:	1101,Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan,Shenzhen,China
Manufacturer:	Fibocom Wireless Inc.
Address of Manufacturer:	1101,Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan,Shenzhen,China

2.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test engineer:	Weller Liu, King-p Li, Nature Shen, Tizzy Song



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2.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number:0031225543



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2.4 General Description of EUT

EUT Description:	LTE CatM1&NB-IoT&EGPRS Module		
Model No.:	MA510-GL		
Trade Mark:	Fibocom		
Hardware Version:	V1.0.3		
Software Version:	69400.1000.00.00.00.01		
Sample Type:	☐ Portable Device, ☒ Module		
Antenna Type:	☒ External, ☐ Integrated		
Antenna Gain*:	☒ Provided by applicant		
	GSM850:	-1.0dBi	GSM1900: 0.9dBi
	LTE CatM1 Band 2:	0.9dBi	LTE CatM1 Band 4: 1.6dBi
	LTE CatM1 Band 5:	-1.0dBi	LTE CatM1 Band 12: -1.4dBi
	LTE CatM1 Band 13:	-0.7dBi	LTE CatM1 Band 14: -0.7dBi
	LTE CatM1 Band 25:	0.9dBi	LTE CatM1 Band 26: -1.0dBi
	LTE CatM1 Band 66:	1.6dBi	LTE CatM1 Band 85: -0.7dBi
	LTE NB1 Band 2:	0.9dBi	LTE NB1 Band 4: 1.6dBi
	LTE NB1 Band 5:	-1.0dBi	LTE NB1 Band 12: -1.4dBi
	LTE NB1 Band 13:	-0.7dBi	LTE NB1 Band 25: 0.9dBi
	LTE NB1 Band 26:	-1.0dBi	LTE NB1 Band 66: 1.6dBi
	LTE NB1 Band 71:	-1.5dBi	LTE NB1 Band 85: -0.7dBi
Remark: *Since the above data and/or information is provided by the applicant relevant results or conclusions of this report are only made for these data and/or information , SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.			



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3 RF Exposure Evaluation

3.1 RF Exposure Compliance Requirement

3.1.1 Limits

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

F=frequency in MHz
 *=Plane-wave equivalent power density
 RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.



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3.1.2 Test Procedure

Software provided by client enabled the EUT to transmit data at lowest, middle and highest channel individually

3.1.3 EUT RF Exposure Evaluation

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.0 / 2.0 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

This confirmed that the device comply with MPE limit.

Operating Band	Frequency (MHz)	Antenna Gain (dBi)	Max Conducted Average Output Power (dBm)	Output Power to Antenna (dBm)	EIRP(ERP) Limit (dBm)	Output Power to Antenna (mw)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Gain according to EIRP (dBi)	Gain according to Pd (dBi)	Max Gain Allowed (dBi)	conclusion
GSM 850	824.20	-1.00	23.31	20.16	38.45	103.7528	0.0339	0.5495	8.10	14.25	8.10	Pass
GSM 1900	1850.20	0.90	20.81	21.71	33.00	148.2518	0.0295	1.0000	3.00	15.30	3.00	Pass
LTE NB1 Band 2	1850.10	0.90	21.00	21.90	33.00	154.8817	0.0308	1.0000	12.00	15.11	12.00	Pass
LTE NB1 Band 4	1710.10	1.60	21.00	22.60	30.00	125.8925	0.0362	1.0000	9.00	16.01	9.00	Pass
LTE NB1 Band 5	824.10	-1.00	21.00	17.85	38.45	125.8925	0.0199	0.5494	19.60	13.41	13.41	Pass
LTE NB1 Band 12	699.10	-1.40	21.00	17.45	34.77	125.8925	0.0181	0.4661	15.92	12.69	12.69	Pass
LTE NB1 Band 13	777.10	-0.70	21.00	18.15	34.77	125.8925	0.0213	0.5181	15.92	13.15	13.15	Pass
LTE NB1 Band 25	1850.10	1.60	21.00	22.60	33.00	125.8925	0.0362	1.0000	12.00	16.01	12.00	Pass
LTE NB1 Band 26 (814-824)	814.20	-1.00	21.00	17.85	50.00	125.8925	0.0199	0.5428	31.15	13.35	13.35	Pass
LTE NB1 Band 26 (824-849)	824.10	-1.00	21.00	17.85	38.45	125.8925	0.0199	0.5494	19.60	13.41	13.41	Pass
LTE NB1 Band 66	1710.10	1.60	21.00	19.50	30.00	125.8925	0.0362	1.0000	9.00	16.01	9.00	Pass
LTE NB1 Band 71	663.10	-1.50	21.00	18.15	34.77	125.8925	0.0177	0.4421	15.92	12.46	12.46	Pass
LTE NB1 Band 85	698.10	-0.70	21.00	19.75	34.77	125.8925	0.0213	0.4654	15.92	12.69	12.69	Pass
LTE CatM1 Band 2	1850.70	0.90	22.00	22.90	33.00	158.4893	0.0388	1.0000	11.00	15.01	11.00	Pass
LTE CatM1 Band 4	1710.70	1.60	22.00	23.60	30.00	158.4893	0.0456	1.0000	8.00	15.01	8.00	Pass
LTE CatM1 Band 5	824.70	-1.00	22.00	18.85	38.45	158.4893	0.0250	0.5498	18.60	12.41	12.41	Pass
LTE CatM1 Band 12	699.70	-1.40	22.00	18.45	34.77	158.4893	0.0228	0.4665	14.92	11.70	11.70	Pass
LTE CatM1 Band 13	779.50	-0.70	22.00	19.15	34.77	158.4893	0.0268	0.5197	14.92	12.16	12.16	Pass
LTE CatM1 Band 14	790.50	-0.70	22.00	19.15	34.77	158.4893	0.0268	0.5270	14.92	12.23	12.23	Pass
LTE CatM1 Band 25	1850.70	0.90	22.00	22.90	33.00	158.4893	0.0388	1.0000	11.00	15.01	11.00	Pass
LTE CatM1 Band 26 (814-824)	814.70	-1.00	22.00	18.85	50.00	158.4893	0.0250	0.5431	30.15	12.36	12.36	Pass
LTE CatM1 Band 26 (824-849)	824.70	-1.00	22.00	18.85	38.45	158.4893	0.0250	0.5498	18.60	12.41	12.41	Pass
LTE CatM1 Band 66	1710.70	1.60	22.00	23.60	30.00	158.4893	0.0456	1.0000	8.00	15.01	8.00	Pass
LTE CatM1 Band 85	700.50	-0.70	22.00	19.15	34.77	158.4893	0.0268	0.4670	14.92	11.70	11.70	Pass

The End



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