

RF EXPOSURE REPORT

Product: LTE module

Model Name: L830-EB

FCC ID: ZMOL830EB

Applicant: Fibocom Wireless Inc.

Address: 5/F, Tower A, Technology Building II, 1057 Nanhai Blvd,
Nanshan, Shenzhen, China

Manufacturer: Fibocom Wireless Inc.

Address: 5/F, Tower A, Technology Building II, 1057 Nanhai Blvd,
Nanshan, Shenzhen, China

Prepared by: BV 7Layers Communications Technology (Shenzhen) Co. Ltd

Lab Location: No.B102, Dazu Chuangxin Mansion, North of Beihuan
Avenue, North Area, Hi-Tech Industrial Park, Nanshan District,
Shenzhen, Guangdong, China

TEL: +86 755 8869 6566

FAX: +86 755 8869 6577

E-MAIL: customerservice.dg@cn.bureauveritas.com

Report No.: SA170712W003

Received Date: Jul. 12, 2017

Test Date: Jul. 13, 2017 ~ Aug. 10, 2017

Issued Date: Aug. 11, 2017

This report should not be used by the client to claim product certification, approval, or endorsement by A2LA or any government agencies.

Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.



Test Report No.: SA170712W003

TABLE OF CONTENTS

RF EXPOSURE REPORT	1
RELEASE CONTROL RECORD	3
1 CERTIFICATION	4
2 GENERAL INFORMATION	5
2.1 GENERAL DESCRIPTION OF EUT	5
3 RF EXPOSURE	6
3.1 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)	6
3.2 MPE CALCULATION FORMULA	6
3.3 CLASSIFICATION	6
3.4 CONDUCTED POWER	7
3.5 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER	12



Test Report No.: SA170712W003

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA170712W003	Original release	Aug. 11, 2017



Test Report No.: SA170712W003

1 CERTIFICATION

PRODUCT: LTE module
BRAND NAME: Fibocom
MODEL NAME: L830-EB
APPLICANT: Fibocom Wireless Inc.
TESTED: Jul. 13, 2017 ~ Aug. 10, 2017
TEST SAMPLE: Identical Prototype
STANDARDS: FCC Part 2 (Section 2.1091)
FCC OET Bulletin 65, Supplement C (01-01)
KDB 447498 D01 General RF Exposure Guidance v06
IEEE C95.1

The above equipment has been tested by **BV 7Layers Communications Technology (Shenzhen) Co. Ltd** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Yuqiang, **DATE:** Aug. 11, 2017
(Yuqiang Yin/ Engineer)

APPROVED BY : Bill, **DATE:** Aug. 11, 2017
(Bill Yao / Manager)

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	LTE module	
MODEL NAME	L830-EB	
NOMINAL VOLTAGE	DC 3.3V	
OPERATING TEMPERATURE RANGE	-10 ~ 55°C	
MODULATION TYPE	WCDMA	BPSK/QPSK
	LTE	QPSK/16QAM
OPERATING FREQUENCY	WCDMA	826.4MHz ~ 846.6MHz(FOR WCDMA 850)
	LTE	824.7MHz ~ 848.3MHz (FOR LTE Band5) 2502.5MHz ~ 2567.5MHz (FOR LTE Band7)
ANTENNA TYPE	External Antenna	
ANTENNA GAIN	3dBi for WCDMA Band 5/LTE Band 5 5dBi for LTE Band 7	
HW VERSION	V1.0.1	
SW VERSION	18300.1002.00.01.01.04_R04	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	N/A	

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3 RF EXPOSURE

3.1 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm ²)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

3.2 MPE CALCULATION 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

3.3 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Approval**.



3.4 CONDUCTED POWER

WCDMA

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	23.17	23.18	23.28
HSPA			
HSDPA Subtest-1	22.24	22.25	22.35
HSDPA Subtest-2	22.21	22.22	22.32
HSDPA Subtest-3	21.81	21.82	21.92
HSDPA Subtest-4	21.76	21.77	21.87
HSUPA Subtest-1	22.18	22.19	22.29
HSUPA Subtest-2	20.26	20.27	20.37
HSUPA Subtest-3	21.22	21.23	21.33
HSUPA Subtest-4	20.22	20.23	20.33
HSUPA Subtest-5	22.32	22.33	22.43



**BUREAU
VERITAS**

Test Report No.: SA170712W003

LTE BAND 5

Band/BW	Modulation	RB Size	RB Offset	Low CH 20407	Mid CH 20525	High CH 20643	3GPP MPR (dB)
				Frequency 824.7 MHz	Frequency 836.5 MHz	Frequency 848.3 MHz	
1.4MHz	QPSK	1	0	22.28	22.18	22.21	0
		1	2	22.35	22.25	22.28	0
		1	5	22.25	22.15	22.18	0
		3	0	22.26	22.16	22.19	0
		3	1	22.33	22.23	22.26	0
		3	3	22.23	22.13	22.16	0
		6	0	21.41	21.31	21.34	1
	16QAM	1	0	21.80	21.70	21.73	1
		1	2	21.75	21.65	21.68	1
		1	5	21.70	21.60	21.63	1
		3	0	21.79	21.69	21.72	1
		3	1	21.74	21.64	21.67	1
		3	3	21.69	21.59	21.62	1
		6	0	20.43	20.33	20.36	2
Band/BW	Modulation	RB Size	RB Offset	Low CH 20415	Mid CH 20525	High CH 20635	3GPP MPR (dB)
				Frequency 825.5 MHz	Frequency 836.5 MHz	Frequency 847.5 MHz	
3MHz	QPSK	1	0	22.32	22.22	22.25	0
		1	7	22.39	22.29	22.32	0
		1	14	22.29	22.19	22.22	0
		8	0	21.48	21.38	21.41	1
		8	3	21.35	21.25	21.28	1
		8	7	21.37	21.27	21.30	1
		15	0	21.45	21.35	21.38	1
	16QAM	1	0	21.84	21.74	21.77	1
		1	7	21.79	21.69	21.72	1
		1	14	21.74	21.64	21.67	1
		8	0	20.55	20.45	20.48	2
		8	3	20.52	20.42	20.45	2
		8	7	20.48	20.38	20.41	2
		15	0	20.47	20.37	20.40	2

Band/BW	Modulation	RB Size	RB Offset	Low CH 20425	Mid CH 20525	High CH 20625	3GPP MPR (dB)
				Frequency 826.5 MHz	Frequency 836.5 MHz	Frequency 846.5 MHz	
5MHz	QPSK	1	0	22.38	22.28	22.31	0
		1	12	22.45	22.35	22.38	0
		1	24	22.35	22.25	22.28	0
		12	0	21.54	21.44	21.47	1
		12	6	21.41	21.31	21.34	1
		12	13	21.43	21.33	21.36	1
		25	0	21.51	21.41	21.44	1
	16QAM	1	0	21.90	21.80	21.83	1
		1	12	21.85	21.75	21.78	1
		1	24	21.80	21.70	21.73	1
		12	0	20.61	20.51	20.54	2
		12	6	20.58	20.48	20.51	2
		12	13	20.54	20.44	20.47	2
		25	0	20.53	20.43	20.46	2
Band/BW	Modulation	RB Size	RB Offset	Low CH 20450	Mid CH 20525	High CH 20600	3GPP MPR (dB)
				Frequency 829 MHz	Frequency 836.5 MHz	Frequency 844 MHz	
10MHz	QPSK	1	0	22.41	22.31	22.34	0
		1	24	22.48	22.38	22.41	0
		1	49	22.38	22.28	22.31	0
		25	0	21.57	21.47	21.50	1
		25	12	21.44	21.34	21.37	1
		25	25	21.46	21.36	21.39	1
		50	0	21.54	21.44	21.47	1
	16QAM	1	0	21.93	21.83	21.86	1
		1	24	21.88	21.78	21.81	1
		1	49	21.83	21.73	21.76	1
		25	0	20.64	20.54	20.57	2
		25	12	20.61	20.51	20.54	2
		25	25	20.57	20.47	20.50	2
		50	0	20.56	20.46	20.49	2



LTE BAND 7

LTE Band 7							
BW	Modulation	RB Size	RB Offset	Low CH 20775	Mid CH 21100	High CH 21425	MPR
				Frequency 2502.5 MHz	Frequency 2535 MHz	Frequency 2567.5 MHz	
5 MHz	QPSK	1	0	21.82	22.10	22.32	0
		1	12	21.56	21.84	22.06	0
		1	24	21.55	21.83	22.05	0
		12	0	20.98	21.26	21.48	1
		12	6	20.93	21.21	21.43	1
		12	13	20.87	21.15	21.37	1
		25	0	20.95	21.23	21.45	1
	16QAM	1	0	20.77	21.05	21.27	1
		1	12	20.73	21.01	21.23	1
		1	24	20.66	20.94	21.16	1
		12	0	20.10	20.38	20.60	2
		12	6	20.06	20.34	20.56	2
		12	13	20.00	20.28	20.50	2
		25	0	20.05	20.33	20.55	2
BW	Modulation	RB Size	RB Offset	Low CH 20800	Mid CH 21100	High CH 21400	MPR
				Frequency 2505 MHz	Frequency 2535 MHz	Frequency 2565 MHz	
10 MHz	QPSK	1	0	21.86	22.14	22.36	0
		1	24	21.60	21.88	22.10	0
		1	49	21.59	21.87	22.09	0
		25	0	21.02	21.30	21.52	1
		25	12	20.97	21.25	21.47	1
		25	25	20.91	21.19	21.41	1
		50	0	20.99	21.27	21.49	1
	16QAM	1	0	20.81	21.09	21.31	1
		1	24	20.77	21.05	21.27	1
		1	49	20.70	20.98	21.20	1
		25	0	20.14	20.42	20.64	2
		25	12	20.10	20.38	20.60	2
		25	25	20.04	20.32	20.54	2
		50	0	20.09	20.37	20.59	2

BW	Modulation	RB Size	RB Offset	Low CH 20825	Mid CH 21100	High CH 21375	MPR
				Frequency 2507.5 MHz	Frequency 2535 MHz	Frequency 2562.5 MHz	
15 MHz	QPSK	1	0	21.92	22.20	22.42	0
		1	37	21.66	21.94	22.16	0
		1	74	21.65	21.93	22.15	0
		36	0	21.08	21.36	21.58	1
		36	19	21.03	21.31	21.53	1
		36	39	20.97	21.25	21.47	1
		75	0	21.05	21.33	21.55	1
	16QAM	1	0	20.87	21.15	21.37	1
		1	37	20.83	21.11	21.33	1
		1	74	20.76	21.04	21.26	1
		36	0	20.20	20.48	20.70	2
		36	19	20.16	20.44	20.66	2
		36	39	20.10	20.38	20.60	2
		75	0	20.15	20.43	20.65	2
BW	Modulation	RB Size	RB Offset	Low CH 20850	Mid CH 21100	High CH 21350	MPR
				Frequency 2510 MHz	Frequency 2535 MHz	Frequency 2560 MHz	
20 MHz	QPSK	1	0	21.95	22.23	22.45	0
		1	50	21.69	21.97	22.19	0
		1	99	21.68	21.96	22.18	0
		50	0	21.11	21.39	21.61	1
		50	25	21.06	21.34	21.56	1
		50	50	21.00	21.28	21.50	1
		100	0	21.08	21.36	21.58	1
	16QAM	1	0	20.90	21.18	21.40	1
		1	50	20.86	21.14	21.36	1
		1	99	20.79	21.07	21.29	1
		50	0	20.23	20.51	20.73	2
		50	25	20.19	20.47	20.69	2
		50	50	20.13	20.41	20.63	2
		100	0	20.18	20.46	20.68	2

3.5 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

WCDMA

Band	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Tune-up Power (dBm)	E.I.R.P Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
WCDMA V	846.4	RMC12.2K	3	24.5	562.341	0.112	0.56	PASS

LTE

Band	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Tune-up Power (dBm)	E.I.R.P Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
Band5	829	QPSK	3	24.0	501.187	0.100	0.55	PASS
Band7	2560	QPSK	5	24.0	794.328	0.158	1.00	PASS