

# RF EXPOSURE REPORT

**Product:** LTE module

**Model Name:** L830-EB

**FCC ID:** ZMOL830EB

**Applicant:** Fibocom Wireless Inc.

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Nanshan, Shenzhen, China

**Manufacturer:** Fibocom Wireless Inc.

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**Report No.:** SA170712W003

**Received Date:** Jul. 12, 2017

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

**Issued Date:** Aug. 11, 2017

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## RELEASE CONTROL RECORD

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



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## 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

<b>PRODUCT</b>	LTE module	
<b>MODEL NAME</b>	L830-EB	
<b>NOMINAL VOLTAGE</b>	DC 3.3V	
<b>OPERATING TEMPERATURE RANGE</b>	-10 ~ 55°C	
<b>MODULATION TYPE</b>	<b>WCDMA</b>	BPSK/QPSK
	<b>LTE</b>	QPSK/16QAM
<b>OPERATING FREQUENCY</b>	<b>WCDMA</b>	826.4MHz ~ 846.6MHz(FOR WCDMA 850)
	<b>LTE</b>	824.7MHz ~ 848.3MHz (FOR LTE Band5) 2502.5MHz ~ 2567.5MHz (FOR LTE Band7)
<b>ANTENNA TYPE</b>	External Antenna	
<b>ANTENNA GAIN</b>	3dBi for WCDMA Band 5/LTE Band 5 5dBi for LTE Band 7	
<b>HW VERSION</b>	V1.0.1	
<b>SW VERSION</b>	18300.1002.00.01.01.04_R04	
<b>I/O PORTS</b>	Refer to user's manual	
<b>CABLE SUPPLIED</b>	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 <sup>2</sup> )	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

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 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**.



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### 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	<b>23.28</b>
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



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**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	<b>22.48</b>	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



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**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 <sup>2</sup> )	limit (mW/cm <sup>2</sup> )	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 <sup>2</sup> )	limit (mW/cm <sup>2</sup> )	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