# RF EXPOSURE REPORT

| | |
|---|---|
| **Product:** | LTE module |
| **Model Name:** | L830-EB-11 |
| **FCC ID:** | ZMOL830EB11 |
| **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.:** | SA170816W008 |
| **Received Date:** | Aug. 16, 2017 |
| **Test Date:** | Aug. 17, 2017 ~ Aug. 29, 2017 |
| **Issued Date:** | Aug. 30, 2017 |

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

# TABLE OF CONTENTS

# RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|---|---|---|
| SA170816W008 | Original release | Aug. 30, 2017 |

BV 7Layers Communications Technology (Shenzhen) Co. Ltd

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
Email: customerservice.dg@cn.bureauveritas.com

# 1 CERTIFICATION

| | |
|---|---|
| **PRODUCT:** | LTE module |
| **BRAND NAME:** | Fibocom |
| **MODEL NAME:** | L830-EB-11 |
| **APPLICANT:** | Fibocom Wireless Inc. |
| **TESTED:** | Aug. 17, 2017 ~ Aug. 29, 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 :** _____ , **DATE:** Aug. 30, 2017
(Yuqiang Yin/ Engineer)

**APPROVED BY :** _____ , **DATE:** Aug. 30, 2017
( Bill Yao / Manager)

# 2 GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF EUT

| | | |
|---|---|---|
| **PRODUCT** | LTE module | |
| **MODEL NAME** | L830-EB-11 | |
| **NOMINAL VOLTAGE** | DC 3.3V | |
| **OPERATING TEMPERATURE RANGE** | -10 ~ 55℃ | |
| **MODULATION TYPE** | **LTE** | QPSK/16QAM |
| **OPERATING FREQUENCY** | **LTE** | 2502.5MHz ~ 2567.5MHz (FOR LTE Band7) |
| **ANTENNA TYPE** | External Antenna | |
| **ANTENNA GAIN** | 5dBi for LTE Band 7 | |
| **HW VERSION** | V1.0.1 | |
| **SW VERSION** | 18300.1008.00.01.01.05_R01 | |
| **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

Pd = (Pout*G) / (4*pi*r2)

where

Pd = power density in mW/cm2

Pout = 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**.

## 3.4 CONDUCTED POWER

**LTE BAND 7**

| LTE Band 7 | | | | | | | |
|---|---|---|---|---|---|---|---|
| BW | Modulation | RB Size | RB Offset | Low CH 20775 Frequency 2502.5 MHz | Mid CH 21100 Frequency 2535 MHz | High CH 21425 Frequency 2567.5 MHz | MPR |
| 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 Frequency 2505 MHz | Mid CH 21100 Frequency 2535 MHz | High CH 21400 Frequency 2565 MHz | MPR |
| 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 Frequency 2507.5 MHz | Mid CH 21100 Frequency 2535 MHz | High CH 21375 Frequency 2562.5 MHz | MPR |
|---|---|---|---|---|---|---|---|
| 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 Frequency 2510 MHz | Mid CH 21100 Frequency 2535 MHz | High CH 21350 Frequency 2560 MHz | MPR |
| 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

**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 |
|---|---|---|---|---|---|---|---|---|
| **Band 7** | 2560 | QPSK | 5 | 24.0 | 794.328 | 0.158 | 1.00 | PASS |