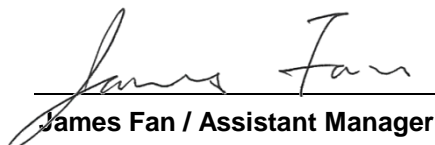


# AS/NZS RF Exposure Report

**Equipment** : 2.4 GHz Bluetooth Low Energy Module  
**Model No.** : SaBLE-x-R2  
**Brand Name** : Laird  
**Applicant** : Laird Technologies, Inc.  
**Address** : W66N220 Commerce Court, Cedarburg,  
Wisconsin 53012, USA  
**Standard** : AS/NZS 2772.2:2011  
Radiation Protection Standard for Maximum  
Exposure Levels to Radiofrequency Fields  
- 3 kHz to 300 GHz  
**Received Date** : Apr. 25, 2017  
**Tested Date** : May 04 ~ Jun. 02, 2017

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

  
James Fan / Assistant Manager

Approved by:

  
Gary Chang / Manager

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## Release Record

Report No.	Version	Description	Issued Date
AA742502	Rev. 01	Initial issue	Jun. 13, 2017

# 1 General Description

## 1.1 Information

### 1.1.1 Specification of the Equipment under Test (EUT)

RF General Information				
Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number	Data Rate
2400-2483.5	V5.0 LE	2402-2480	0-39 [40]	125 kbps
				500 kbps
				1 Mbps
2400-2483.5	V5.0 LE	2402-2480	0-39 [40]	2 Mbps

Note 1: Bluetooth LE (Low energy) uses GFSK modulation.

### 1.1.2 Antenna Details

Ant. No.	Model	Type	Gain (dBi)	Connector
1	LSR 001-0001 center-fed 2.4 GHz dipole antenna	Dipole	SMA	2
2	LSR 001-0014 2.4 GHz FlexPIFA antenna	PIFA	U.FL	2
3	LSR 001-0015 2.4 GHz FlexNotch antenna	Notch	U.FL	2
4	On module PCB trace antenna	On-Board Trace antenna	N/A	0

### 1.1.3 EUT Operational Condition

<b>Power Supply Type</b>	DC 1.8V & DC 3.3V from host
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## 2 RF exposure evaluation

### 2.1 Scope

This Standard specifies requirements for, and provides guidance on, assessing compliance with the exposure limits of radio frequency (RF) safety standards such as ARPANSA Standard RPS3 or New Zealand Standard NZS 2772.1. This includes methodologies for making an assessment (by measurement or computation) of human exposure to ambient RF fields and induced body currents in the frequency range of 3 kHz to 300 GHz.

This Standard also sets out processes for calculating the basic restrictions quantities (such as specific absorption rate and induced current density) in the relevant standards, but does not address their measurement.

This Standard may also be used as a guide for making low-level environmental exposure assessments in areas around RF sources, or for other purposes. This Standard provides appropriate methodologies, including measurement techniques and instrumentation selection, computational techniques and the determination of assessment uncertainty and its use in assessing compliance with applicable exposure limits. The assessment methodologies provided in this Standard may be applied for all types of RF exposure situations including exposure to—

- (a) leakage fields;
- (b) radiated fields; and
- (c) reactive fields.

This Standard is applicable to the compliance assessment of RF exposures from most kinds of RF sources including—

- (i) broadcast installations;
- (ii) cellular base stations;
- (iii) radio-communications facilities;
- (iv) radar installations;
- (v) medical applications such as diathermy machines;
- (vi) industrial applications, including RF welders, heaters and induction heaters; and
- (vii) scientific applications.

### 2.2 Limits

The device shall comply with the relevant limits as below table.

Exposure category	Frequency Range	E-field strength (V/m)	H-field strength (A/m)	Equivalent plane wave power flux density $S_{eq}(W/m^2)$
Occupational	400 MHz~2GHz	$3.07 * f^{0.5}$	$0.00814 * f^{0.5}$	$f / 40$
	2GHz ~ 300 GHz	137	0.364	50
General public	400 MHz~2GHz	$1.37 * f^{0.5}$	$0.00364 * f^{0.5}$	$f / 200$
	2GHz ~ 300 GHz	61.4	0.163	10

Note: f is the frequency in MHz

## 2.3 Evaluation Formula for Far-Field

Follow below formula to evaluate E-field strength.

$$E = \frac{\sqrt{30 * P * G}}{R}$$

Where

P(W) is the input power of antenna

G is the gain of antenna

R(m) Is the distance between the human body and the antenna

## 2.4 Evaluation Results

Frequency Range (MHz)	Maximum Average E.I.R.P (dBm)	Distance (m)	Evaluation E-Field Strength (V/m)	Limit (V/m)	PASS / FAIL
2402-2480	7.68	0.2	2.10	61.4	Pass

### 3 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

#### **Linkou**

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Taiwan, R.O.C.

#### **Kwei Shan**

Tel: 886-3-271-8666

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Kwei Shan District, Tao Yuan City  
333, Taiwan, R.O.C.

#### **Kwei Shan Site II**

Tel: 886-3-271-8640

No. 14-1, Lane 19, Wen San 3rd  
St., Kwei Shan District, Tao Yuan  
City 333, Taiwan, R.O.C..

If you have any suggestion, please feel free to contact us as below information

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