AS/NZS RF Exposure Report

Equipment	:	**Bluetooth 4.2 module (BLE only)**
Model No.	:	**BL652-SA, BL652-SC** **(Refer to item 1.1.1 for more details)**
Brand Name	:	**Laird**
Applicant	:	**Laird Technologies**
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	:	**May 14, 2018**
Tested Date	:	**May 28 ~ Aug. 22, 2018**

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: **Approved by:**

James Fan / Assistant Manager **Gary Chang / Manager**

Testing Laboratory 2732

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Release Record

Report No.	Version	Description	Issued Date
AA662202-08	Rev. 01	Initial issue	Sep. 14, 2018

1 General Description

1.1 Information

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
Laird	BL652-SA	Bluetooth 4.2 module (BLE only)	with chip antenna
	BL652-SC		with MHF4 & IPEX connector type antenna

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information				
Frequency Range (MHz)	**Mode**	**Ch. Frequency (MHz)**	**Channel Number**	**Data Rate**
2400-2483.5	V4.2 LE	2402-2480	0-39 [40]	1 Mbps
2400-2483.5	V4.2 LE	2402-2480	0-39 [40]	2 Mbps
Note 1: Bluetooth LE (Low energy) uses GFSK modulation.				

1.1.3 Antenna Details

Ant. No.	Brand	Model	Type	Connector	Gain (dBi)	Remarks
1	ACX	AT3216-B2R7HAA	Chip	N/A	0.5	For BL652-SA
2	LSR	FlexPIFA 001-0022	FlexPIFA	MHF4	2	For BL652-SC
3	LSR	FlexNotch 001-0023	Flexible Notch	MHF4	2	
4	MAG. LAYERS	EDA-8709-2G4C1-B27	Dipole	MHF4	2	
5	Walsin	RFDPA870910EMAB302	Dipole	MHF4	2	
6	Walsin	RFDPA870900SBAB8G1	Dipole	MHF4	2	
7	YAMAMOTO METAL	YAN-02-C-MHF4P-050	Chip	MHF4	-1.76	
8	Laird	PCA-4606-2G4C1-A33-CY Laird # 0600-00056	PCB Dipole	IPEX	2.21	
9	Laird	EFA2400A3S-10MH4L	mFlexPIFA	MHF4	2	

1.1.4 EUT Operational Condition

Power Supply Type	3.3Vdc from host

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

ARPANSA Standard RPS3
The evaluation of mobile or portable transmitting equipment for compliance with this Standard is not required where the nominal mean power output delivered to the antenna does not exceed 20 mW(13dBm)

AS/NZS 2772.2:2011
In some circumstances an RF exposure evaluation may not be required. This is the case with low-power devices whose nominal average RF radiated power output does not exceed 20 mW(13dBm) and which do not produce exceptionally high instantaneous fields.

2.3 Evaluation Results

Mode	Frequency Band (MHz)	E.I.R.P. (dBm)	Antenna Gain (dBi)	Conducted Power (dBm)	Low-power exclusion level (dBm)	PASS / FAIL
BT LE	2402-2480	7.71	2.21	5.50	13	Pass

Conclusion

RF exposure evaluation will not be required if conducted power and EIRP is < 20mW (13dBm) according to ARPANSA Standard RPS3 and AS/NZS 2772.2:2011. RF exposure evaluation is not required for this device since the exemption condition is satisfied as above table.

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	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.	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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