

AS/NZS RF Exposure Report

Equipment : Intelligent LoRa/BLE Module [915MHz LoRa)
featuring smartBASIC

Model No. : RM191-SM

Brand Name : Laird Connectivity

Applicant : Laird Connectivity

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 08, 2019

Tested Date : May 08 ~ Jul. 22, 2019

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
AA821301-03	Rev. 01	Initial issue	Jul. 30, 2019

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

LoRa			
Country	AUSTRALIA		
Region	AS923 / AU915		
Operating Frequency	Region	Frequency Range (MHz)	UL/DL
	AS923	915.3 ~ 927.7	UL/DL
		915.4 ~ 927.6	UL/DL
		915.2 ~ 927.8	UL/DL
	AU915	923.3 ~ 927.5	DL
		915.3 ~ 927.7	UL
		915.9 ~ 927.1	UL
Modulation Type	LoRa 125kHz / LoRa 250kHz / LoRa 500kHz / FSK 50kbps		
BT			
Operating Frequency	2402 MHz ~ 2480 MHz		
Modulation Type	Bluetooth 4.1 LE: GFSK		

1.1.2 Antenna Details

For Bluetooth

Ant. No.	Model	Type	Gain (dBi)	Connector
1	ACX AT5020-E3R0HBANT/LF	Chip	0	N/A

For LoRa

Ant. No.	External Antenna Part Number	Laird Part Number	Mfg.	Type	Gain (dBi)	Connector Type
1	RFDPA131015IMB B301	0600-00060	Walsin	Dipole	0.9	U.FL
2	WPANTDP036-R5A	---	World Products	Dipole	2	U.FL
3	S152CL-L-PX-915S	---	Nearson	Dipole	2	U.FL
4	001-0002	---	Laird	Dipole	2	SMA
5	WPANT10009	---	World Products	PCB Dipole	2	MHF

1.1.3 EUT Operational Condition

Power Supply Type	3.5Vdc from host
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2 RF exposure evaluation

2.1 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

2.2 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

2.3 Deviation from Test Standard and Measurement Procedure

None

2.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Parameters	Uncertainty
Conducted power	±0.808 dB

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

2.5 Evaluation Results

Country	Frequency Range (MHz)	Maximum Average E.I.R.P (dBm)	Distance (m)	Evaluation E-Field Strength (V/m)	Limit (V/m)	PASS / FAIL
AUSTRALIA	2402-2480	3.74	0.2	1.33	61.4	Pass

Country	Region	Frequency Range (MHz)	Maximum Average E.I.R.P (dBm)	Distance (m)	Evaluation E-Field Strength (V/m)	Limit (V/m)	PASS / FAIL
AUSTRALIA	AS923	915.3 ~ 927.7	18.25	0.2	7.08	41.45	Pass
		915.4 ~ 927.6	17.76	0.2	6.69	41.45	Pass
		915.2 ~ 927.8	15.98	0.2	5.45	41.45	Pass
	AU915	915.3 ~ 927.7	18.25	0.2	7.08	41.45	Pass
		915.9 ~ 927.1	17.65	0.2	6.61	41.46	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

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin
Kou District, New Taipei City,
Taiwan, R.O.C.

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St.,
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

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

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