

AS/NZS RF Exposure Report

Equipment : 802.11 ac/a/b/g/n + Bluetooth 4.2 module
(please refer to section 1.1.1 for more details.)

Model No. : ST60-2230C
(please refer to section 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 : Apr. 07, 2017

Tested Date : Apr. 24, 2017 ~ Jun. 25, 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:


James Fan / Assistant Manager

Approved by:


Gary Chang / Manager

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Release Record

Report No.	Version	Description	Issued Date
AA740701-03	Rev. 01	Initial issue	Jul. 09, 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 Technologies	ST60-SIPT	802.11 ac/a/b/g/n + Bluetooth 4.2 module	SIPT only	For marketing purpose
	SU60-SIPT			
	ST60-2230C	802.11 ac/a/b/g/n M.2 2230 + Bluetooth 4.2 module	with carrier board	
	SU60-2230C			
★ The above models, model ST60-2230C was selected as a representative one for the final test and only its data was recorded in this report.				

1.1.2 Specification of the Equipment under Test (EUT)

WLAN	
Operating Frequency	802.11b/g/n: 2412 MHz ~ 2472 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz 5500 MHz ~ 5700 MHz, 5745 MHz ~ 5825 MHz
Modulation Type	802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n/ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
BT	
Operating Frequency	2402 MHz ~ 2480 MHz
Modulation Type	Bluetooth 4.2 LE: GFSK Bluetooth BR(1Mbps): GFSK Bluetooth EDR (2Mbps): $\pi/4$ -DQPSK Bluetooth EDR (3Mbps): 8-DPSK

1.1.3 EUT Operational Condition

Power Supply Type	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 BR	14.81	0.2	4.76	61.4	Pass
2402-2480 LE	9.85	0.2	2.69	61.4	Pass
2412-2472	19.86	0.2	8.52	61.4	Pass
5180-5240	22.87	0.2	12.05	61.4	Pass
5260-5320	22.76	0.2	11.90	61.4	Pass
5500-5700	22.89	0.2	12.08	61.4	Pass
5745-5825	23.63	0.2	13.15	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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