CE RF Exposure Report

Equipment	:	**802.11ac Professional Wi-Fi + BT5.0 Module**
Model No.	:	**SU60-SOMC (453-00003), SU60-SOMC-2G (453-00004) (please refer to section 1.1.1 for more details.)**
Brand Name	:	**Laird Connectivity**
Applicant	:	**Laird Connectivity LLC**
Address	:	**W66N220 Commerce Court Cedarburg WI 53012 United States Of America (Excluding The States Of Alaska)**
Standard	:	**EN IEC 62311:2020 EN 50385:2017 EN 50665:2017 BS EN IEC 62311:2020 BS EN 50385:2017 BS EN 50665:2017**
Received Date	:	**Aug. 11, 2021**
Tested Date	:	**Sep. 15 ~ Sep. 16, 2021**

We, International Certification Corporation, 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 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**

Table of Contents

Release Record

Report No.	Version	Description	Issued Date
EA841101-06	Rev. 01	Initial issue	Oct. 20, 2022

1 General Description

1.1 Information

This report is issued as a duplicate report to original ICC report no. EA841101-05. The difference is concerned with following items:

- ✧ Updating version of standard and adding BS standard.
- ✧ Changing applicant name.

Above changes have no impact on test, thus test results are consistent with previous report.

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
Laird Connectivity	SU60-SOMC (453-00003)	802.11ac Professional Wi-Fi + BT5.0 Module	2G/1G MCP
	SU60-SOMC-2G (453-00004)		4G/2G MCP
✦ The above models, both options were assessed and **SU60-SOMC-2G (453-00004)** was found to be worst case and was selected for the final testing.			

1.1.1 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, 5725-5850
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 LE: GFSK Bluetooth BR(1Mbps): GFSK Bluetooth EDR (2Mbps): π/4-DQPSK Bluetooth EDR (3Mbps): 8-DPSK

1.1.2 EUT Operational Condition

Power Supply Type	3.3Vdc from host

1.1.3 Antenna Details

For WiFi

Brand	Model	Type	Connector	Operating Frequency (MHz) / Gain (dBi)				
				2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
LSR	001-0009	Dipole	IPEX U.FL	2	2			
Laird	NanoBlade -IP04	PCB Dipole	IPEX U.FL	2	3.9		4	4
Laird	MAF95310 Mini NanoBlade Flex	PCB Dipole	IPEX U.FL	2.79	3.38			
LSR	FlexPIFA 001-0016	PIFA	IPEX U.FL	2.5	3			
Ethertronics	WLAN_1000146	Magnetic Dipole	IPEX U.FL	2.5	3.5			
Laird	MIMO FlexPIFA Antenna	PIFA	IPEX U.FL	2	3			
LSR	001-0009 (with filter)	Dipole	IPEX U.FL	2	2			

For Bluetooth

Brand	Model	Type	Connector	Gain (dBi)
LSR	001-0009	Dipole	IPEX U.FL	2
Laird	NanoBlade-IP04	PCB Dipole	IPEX U.FL	2
Laird	MAF95310 Mini NanoBlade Flex	PCB Dipole	IPEX U.FL	2.79
LSR	FlexPIFA 001-0016	PIFA	IPEX U.FL	2.5
Ethertronics	WLAN_1000146	Magnetic Dipole	IPEX U.FL	2.5
Laird	MIMO FlexPIFA Antenna	PIFA	IPEX U.FL	2
LSR	001-0009 (with filter)	Dipole	IPEX U.FL	2

2 RF exposure evaluation

2.1 Limits

The device shall comply with the relevant limits for general public exposure specified as basic restrictions or reference levels in the Council Recommendation 1999/519/EC as below table.

Reference levels for electric, magnetic and electromagnetic fields (0 Hz to 300 GHz, unperturbed rms values)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density S_{eq} (W/m²)
0-1 Hz	—	$3,2 \times 10^4$	4×10^4	—
1-8 Hz	10 000	$3,2 \times 10^4/f^2$	$4 \times 10^4/f^2$	—
8-25 Hz	10 000	4 000/f	5 000/f	—
0,025-0,8 kHz	250/f	4/f	5/f	—
0,8-3 kHz	250/f	5	6,25	—
3-150 kHz	87	5	6,25	—
0,15-1 MHz	87	0,73/f	0,92/f	—
1-10 MHz	$87/f^{1/2}$	0,73/f	0,92/f	—
10-400 MHz	28	0,073	0,092	2
400-2 000 MHz	$1,375\ f^{1/2}$	$0,0037\ f^{1/2}$	$0,0046\ f^{1/2}$	f/200
2-300 GHz	61	0,16	0,20	10

Notes:

1. f as indicated in the frequency range column.
2. For frequencies between 100 kHz and 10 GHz, S_{eq}, E^2, H^2, and B^2 are to be averaged over any six-minute period.
3. For frequencies exceeding 10 GHz, S_{eq}, E^2, H^2, and B^2 are to be averaged over any $68/f^{1.05}$ -minute period (f in GHz).
4. No E-field value is provided for frequencies < 1 Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m. Spark discharges causing stress or annoyance should be avoided.

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

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

Mode	Frequency Range (MHz)	Maximum E.I.R.P. (dBm)	Distance (m)	Evaluation E-Field Strength (V/m)	Limit (V/m)	PASS / FAIL
BT LE	2402-2480	9.21	0.20	2.50	61	Pass
BT EDR	2402-2480	12.70	0.20	3.74	61	Pass
Wi-Fi	2412-2472	18.63	0.20	7.40	61	Pass
	5180-5240	21.34	0.20	10.10	61	Pass
	5260-5320	21.16	0.20	9.90	61	Pass
	5500-5700	21.09	0.20	9.82	61	Pass
	5745-5825	13.40	0.20	4.05	61	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 Corporation (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 Dist., Tao Yuan City 33381, Taiwan (R.O.C.) No.2-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)	No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., 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: 886-3-318-0345
Email: ICC_Service@icertifi.com.tw

══END══