

# FCC RF Exposure Report

**FCC ID** : SQGBL653  
**Equipment** : Bluetooth 5.1 Data Module  
**Model No.** : BL653  
**Brand Name** : Laird  
**Applicant** : Laird Connectivity  
**Address** : W66N220 Commerce Court, Cedarburg,  
Wisconsin 53012, USA  
**Standard** : 47 CFR FCC Part 2.1093  
**Received Date** : Jan. 30, 2020  
**Tested Date** : Feb. 11 ~ Feb. 21, 2020

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:

  
\_\_\_\_\_  
Along Chen / Assistant Manager

Approved by:

  
\_\_\_\_\_  
Gary Chang / Manager



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## Release Record

| Report No. | Version | Description   | Issued Date  |
|------------|---------|---------------|--------------|
| FA013002   | Rev. 01 | Initial issue | May 11, 2020 |

# 1 EXPOSURE EVALUATION OF PORTABLE DEVICES

## 1.1 SAR TEST EXCLUSION THRESHOLD FOR 100MHz to 6GHz and $\leq 50$ mm

| Frequency (MHz) | 5  | 10 | 15  | 20  | 25  | Separation distance (mm)          |
|-----------------|----|----|-----|-----|-----|-----------------------------------|
| 150             | 39 | 77 | 116 | 155 | 194 | SAR Test Exclusion Threshold (mW) |
| 300             | 27 | 55 | 82  | 110 | 137 |                                   |
| 450             | 22 | 45 | 67  | 89  | 112 |                                   |
| 835             | 16 | 33 | 49  | 66  | 82  |                                   |
| 900             | 16 | 32 | 47  | 63  | 79  |                                   |
| 1500            | 12 | 24 | 37  | 49  | 61  |                                   |
| 1900            | 11 | 22 | 33  | 44  | 54  |                                   |
| 2450            | 10 | 19 | 29  | 38  | 48  |                                   |
| 3600            | 8  | 16 | 24  | 32  | 40  |                                   |
| 5200            | 7  | 13 | 20  | 26  | 33  |                                   |
| 5400            | 6  | 13 | 19  | 26  | 32  |                                   |
| 5800            | 6  | 12 | 19  | 25  | 31  |                                   |

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR, where

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

## 1.2 DEVIATION FROM TEST STANDARD AND MEASUREMENT PROCEDURE

None

## 1.3 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 | $\pm 0.808$ 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. |

## 1.4 EVALUATION RESULTS

| Maximum Conducted Output Power Result |             |                       |                   |                  |
|---------------------------------------|-------------|-----------------------|-------------------|------------------|
| Condition                             |             | RF Output Power (dBm) |                   |                  |
| Modulation Mode                       | Freq. (MHz) | Average Power (dBm)   | Rated Power (dBm) | Rated Power (mW) |
| LE-0.125Mbps                          | 2402        | 7.65                  | 8                 | 6.31             |
| LE-0.125Mbps                          | 2440        | 7.82                  | 8                 | 6.31             |
| LE-0.125Mbps                          | 2480        | 7.98                  | 8                 | 6.31             |
| LE-0.5Mbps                            | 2402        | 7.65                  | 8                 | 6.31             |
| LE-0.5Mbps                            | 2440        | 7.82                  | 8                 | 6.31             |
| LE-0.5Mbps                            | 2480        | 7.97                  | 8                 | 6.31             |
| LE-1Mbps                              | 2402        | 7.65                  | 8                 | 6.31             |
| LE-1Mbps                              | 2440        | 7.83                  | 8                 | 6.31             |
| LE-1Mbps                              | 2480        | 7.98                  | 8                 | 6.31             |
| LE-2Mbps                              | 2402        | 7.65                  | 8                 | 6.31             |
| LE-2Mbps                              | 2440        | 7.82                  | 8                 | 6.31             |
| LE-2Mbps                              | 2480        | 7.97                  | 8                 | 6.31             |

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f}(\text{GHz})]$   
 $= 6.31 / 5 * \sqrt{2.480} = 1.987 < 3.0$

SAR Test Exclusion Thresholds is < 10mW and 3.0 for separation distance 5mm. Therefore, SAR test is not required.

## 2 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>.

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

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