

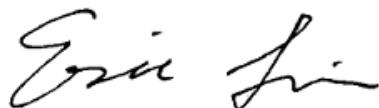
## 1 Cover Page

### RF Exposure Evaluation Report

**Application No.:** KSEM2108001323CR  
**FCC ID:** 2A2EX-LS001  
**Applicant:** Luxshare Electronic Technology (KunShan) Ltd.  
**Address of Applicant:** No.158,Jinchang Road,Jinxi Town,Kunshan City,Jiangsu Province,China  
**Manufacturer:** Luxshare Electronic Technology (KunShan) Ltd.  
**Address of Manufacturer:** No.158,Jinchang Road,Jinxi Town,Kunshan City,Jiangsu Province,China  
**Equipment Under Test (EUT):**  
**EUT Name:** 5G WIFI + BT5.1 Module  
**Model No.:** LS001ONWAS  
**Trade mark:** LUXSHAREICT  
**Standard(s) :** FCC Rules 47 CFR §2.1091  
**Standard(s) :** KDB447498 D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2021-08-05  
**Date of Test:** 2021-09-07 to 2021-09-13  
**Date of Issue:** 2021-09-13

|                     |              |
|---------------------|--------------|
| <b>Test Result:</b> | <b>Pass*</b> |
|---------------------|--------------|

\* In the configuration tested, the EUT complied with the standards specified above.



Eric Lin  
Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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| Revision Record |             |            |        |
|-----------------|-------------|------------|--------|
| Version         | Description | Date       | Remark |
| 00              | Original    | 2021-09-13 | /      |
|                 |             |            |        |
|                 |             |            |        |

|                          |  |                                      |  |
|--------------------------|--|--------------------------------------|--|
| Authorized for issue by: |  |                                      |  |
|                          |  | Damon Zhou                           |  |
|                          |  | <u>Damon Zhou / Project Engineer</u> |  |
|                          |  | Eric Lin                             |  |
|                          |  | <u>Eric Lin / Reviewer</u>           |  |



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### 3 General Information

#### 3.1 General Description of E.U.T.

|               |         |
|---------------|---------|
| Power supply: | DC 3.3V |
|---------------|---------|

#### 3.2 Technical Specifications

2.4G

|                      |   |
|----------------------|---|
| Antenna Gain:        | 2.9dBi (Provided by manufacturer)   |
| Antenna Type:        | FPC Antenna   |
| Channel Spacing:     | 5MHz  |
| Modulation Type:     | 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)   |
| Data Rate:           | 802.11b: 1/2/5.5/11Mbps,<br>802.11g: 6/9/12/18/24/36/48/54Mbps<br>802.11n: MCS0-7 |
| Number of Channels:  | 802.11b/g/n(HT20):11<br>802.11n(HT40):7   |
| Operation Frequency: | 802.11b/g/n(HT20): 2412MHz to 2462MHz<br>802.11n(HT40): 2422MHz to 2452MHz        |

BT

|                             |   |
|-----------------------------|---|
| Antenna Gain:               | 2.9dBi (Provided by manufacturer)       |
| Antenna Type:               | FPC Antenna                             |
| Bluetooth Version:          | V5.1 Dual mode                          |
| Channel Spacing:            | 1MHz                                    |
| Modulation Type:            | GFSK, π/4DQPSK, 8DPSK                   |
| Data Rate:                  | 1/2/3Mbps                               |
| Number of Channels:         | 79                                      |
| Operation Frequency:        | 2402MHz to 2480MHz                      |
| Spectrum Spread Technology: | Frequency Hopping Spread Spectrum(FHSS) |



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## BLE

|                      |                                   |
|----------------------|-----------------------------------|
| Antenna Gain:        | 2.9dBi (Provided by manufacturer) |
| Antenna Type:        | FPC Antenna                       |
| Bluetooth Version:   | V5.1 Dual mode                    |
| Channel Spacing:     | 2MHz                              |
| Modulation Type:     | GFSK                              |
| Data Rate:           | 1Mbps                             |
| Number of Channels:  | 40                                |
| Operation Frequency: | 2402MHz to 2480MHz                |

## 5G

| Operation Frequency: | Band   | Mode            | Frequency Range(MHz) | Number of channels |
|----------------------|--|-----------------|----------------------|--------------------|
| UNII Band I          |  | 802.11a/n(HT20) | 5180-5240            | 4                  |
|                      |  | 802.11n(HT40)   | 5190-5230            | 2                  |
| UNII Band II-A       |  | 802.11a/n(HT20) | 5260-5320            | 4                  |
|                      |  | 802.11n(HT40)   | 5270-5310            | 2                  |
| UNII Band II-C       |  | 802.11a/n(HT20) | 5500-5700            | 11                 |
|                      |  | 802.11n(HT40)   | 5510-5670            | 5                  |
| UNII Band III        |  | 802.11a/n(HT20) | 5745-5825            | 5                  |
|                      |  | 802.11n(HT40)   | 5755-5795            | 2                  |
| Modulation Type:     | 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) |                 |                      |                    |
| Data Rate:           | 802.11a: 6/9/12/18/24/36/48/54Mbps<br>802.11n: MCS0-7                                |                 |                      |                    |
| Channel Spacing:     | 802.11a/n(HT20): 20MHz<br>802.11n(HT40): 40MHz                                       |                 |                      |                    |
| Antenna Gain:        | Max 2.9dBi (Provided by manufacturer)  |                 |                      |                    |
| Antenna Type:        | FPC Antenna  |                 |                      |                    |



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### 3.3 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiyi Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

### 3.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L4354)**

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 2541.01)**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

- **FCC (Designation Number: CN1172)**

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory.

Designation Number: CN1172.

- **ISED (CAB Identifier: CN0072)**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development (ISED) Canada as an accredited testing laboratory.

CAB Identifier: CN0072.

- **VCCI (Member No.: 1938)**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600,C-11707, T-11499, G-10216 respectively.



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## 4 Test Standards and Limits

### 4.1 FCC Radiofrequency radiation exposure limits:

According to §1.1310, the limit for general population/uncontrolled exposures

| Frequency     | Power density(mW/cm <sup>2</sup> ) | Averaging time(minutes) |
|---------------|------------------------------------|-------------------------|
| 300MHz~1.5GHz | f/1500                             | 30                      |
| 1.5GHz~100GHz | 1.0                                | 30                      |

## 5 Measurement and Calculation

### 5.1 Maximum transmit power

The Power Data is based on the RF Test Report KSEM210800132301, KSEM210800132302, KSEM210800132303, KSEM210800132304.

#### BT

| Test Mode | Test Frequency (MHz) | Output Power (dBm) | Reading Power (mW) |
|-----------|----------------------|--------------------|--------------------|
| GFSK      | 2402                 | 0.81               | 1.21               |
|           | 2441                 | 0.84               | 1.21               |
|           | 2480                 | 0.45               | 1.11               |
| Pi/4DQPSK | 2402                 | -0.37              | 0.92               |
|           | 2441                 | -0.40              | 0.91               |
|           | 2480                 | -0.96              | 0.80               |
| 8DPSK     | 2402                 | -0.10              | 0.98               |
|           | 2441                 | -0.15              | 0.97               |
|           | 2480                 | -0.73              | 0.85               |

#### BLE

| Test Mode | Test Frequency (MHz) | Output Power (dBm) | Reading Power (mW) |
|-----------|----------------------|--------------------|--------------------|
| 1M        | 2402                 | 0.91               | 1.23               |
|           | 2440                 | 0.94               | 1.24               |
|           | 2480                 | 0.56               | 1.14               |



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## 2.4GHz

| Test Mode | Test Frequency (MHz) | Output Power (dBm) | Reading Power (mW) |
|-----------|----------------------|--------------------|--------------------|
| 11B       | 2412                 | 16.96              | 49.66              |
| 11B       | 2437                 | 17.03              | 50.47              |
| 11B       | 2462                 | 17.12              | 51.52              |
| 11G       | 2412                 | 15.72              | 37.33              |
| 11G       | 2437                 | 15.78              | 37.84              |
| 11G       | 2462                 | 15.91              | 38.99              |
| 11N20SISO | 2412                 | 15.18              | 32.96              |
| 11N20SISO | 2437                 | 14.08              | 25.59              |
| 11N20SISO | 2462                 | 14.19              | 26.24              |
| 11N40SISO | 2422                 | 14.04              | 25.35              |
| 11N40SISO | 2437                 | 14.06              | 25.47              |
| 11N40SISO | 2452                 | 14.16              | 26.06              |

## 5GHz

| Test Mode | Test Frequency (MHz) | Output Power (dBm) | Reading Power (mW) |
|-----------|----------------------|--------------------|--------------------|
| 11A       | 5180                 | 15.82              | 38.19              |
| 11A       | 5220                 | 15.66              | 36.81              |
| 11A       | 5240                 | 15.21              | 33.19              |
| 11A       | 5260                 | 15.31              | 33.96              |
| 11A       | 5280                 | 15.30              | 33.88              |
| 11A       | 5320                 | 15.25              | 33.50              |
| 11A       | 5500                 | 13.43              | 22.03              |
| 11A       | 5600                 | 12.81              | 19.10              |
| 11A       | 5700                 | 13.02              | 20.04              |
| 11A       | 5745                 | 13.48              | 22.28              |
| 11A       | 5785                 | 13.64              | 23.12              |
| 11A       | 5825                 | 13.53              | 22.54              |
| 11N20     | 5180                 | 14.78              | 30.06              |
| 11N20     | 5220                 | 14.62              | 28.97              |
| 11N20     | 5240                 | 14.27              | 26.73              |
| 11N20     | 5260                 | 14.53              | 28.38              |



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|       |      |       |       |
|-------|------|-------|-------|
| 11N20 | 5280 | 14.58 | 28.71 |
| 11N20 | 5320 | 14.49 | 28.12 |
| 11N20 | 5500 | 12.97 | 19.82 |
| 11N20 | 5600 | 11.67 | 14.69 |
| 11N20 | 5700 | 12.27 | 16.87 |
| 11N20 | 5745 | 12.69 | 18.58 |
| 11N20 | 5785 | 12.97 | 19.82 |
| 11N20 | 5825 | 12.89 | 19.45 |
| 11N40 | 5190 | 13.71 | 23.50 |
| 11N40 | 5230 | 13.65 | 23.17 |
| 11N40 | 5270 | 13.60 | 22.91 |
| 11N40 | 5310 | 13.44 | 22.08 |
| 11N40 | 5510 | 12.17 | 16.48 |
| 11N40 | 5590 | 12.08 | 16.14 |
| 11N40 | 5670 | 12.03 | 15.96 |
| 11N40 | 5755 | 12.13 | 16.33 |
| 11N40 | 5795 | 12.07 | 16.11 |



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## 5.2 MPE Calculation

For FCC:

According to the formula  $S=P/4\pi R^2$ , we can calculate S which is MPE.

Note:

- 1) P (mW)
- 2) R = distance to the center of radiation of antenna (in meter) = 20cm
- 3) MPE limit = 1mW/cm<sup>2</sup>

Bluetooth

The max. antenna gain is 2.9 dBi

| Max. Conducted Power P(mW) | Gain in Linear Scale G | Operation Distance R(cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Result |
|----------------------------|------------------------|--------------------------|-------------------------------------|-----------------------------|--------|
| 1.24                       | 1.950                  | 20                       | 0.00048                             | 1                           | Pass   |

For 2.4G WiFi:

The max. antenna gain is 2.9 dBi

| Max. Conducted Power P(mW) | Gain in Linear Scale G | Operation Distance R(cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Result |
|----------------------------|------------------------|--------------------------|-------------------------------------|-----------------------------|--------|
| 51.52                      | 1.950                  | 20                       | 0.01999                             | 1                           | Pass   |



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For 5G WiFi:

The max. antenna gain is 2.9 dBi

| Max. Conducted Power P(mW) | Gain in Linear Scale G | Operation Distance R(cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Result |
|----------------------------|------------------------|--------------------------|-------------------------------------|-----------------------------|--------|
| 38.19                      | 1.950                  | 20                       | 0.01481                             | 1                           | Pass   |

The Bluetooth,2.4G and 5G WiFi can simultaneous transmitting at frequency, so the maximum rate of MPE is  $0.00048/1.0+0.01999/1.0+0.01481/1.0=0.03528 \leq 1.0$ . according to the KDB447498 section 7.2 determine the device is exclusion from SAR test.

--End of the Report--



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