ilac-MRA A2LA ACCREDITED Certificate #4312.01

# FCC RF EXPOSURE EVALUATION REPORT

| | |
|---|---|
| **Product Name:** | LED Controller |
| **Trade Mark:** | SPERLL |
| **Model No.:** | SP318E |
| **Add. Model No.:** | SP311E,SP312E,SP313E,SP314E,SP315E,SP316E,SP317E,SP318E,SP319E,SP31AE,SP31BE,SP31CE |
| **Report Number:** | 25030316389RFC-2 |
| **Test Standards:** | FCC 47 CFR Part 1 Subpart I |
| **FCC ID:** | 2ATV8SP31XE |
| **Test Result:** | PASS |
| **Date of Issue:** | March 20, 2025 |

Prepared for:

**Shenzhen Sperll Optoelectronic Technology Co., Ltd.**
**4th Floor, Building 3, NO.1059 Songbai Road, Nanshan District, Shenzhen, China**

Prepared by:

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Reviewed by: Henry Lu — Henry Lu, Team Leader

Approved by: Kevin Liang, Assistant Manager (UnionTrust Laboratories Certified)

Date: March 20, 2025

## Version

| Version No. | Date | Description |
|---|---|---|
| V1.0 | March 20, 2025 | Original |

# CONTENTS

# 1. GENERAL INFORMATION

## 1.1 CLIENT INFORMATION

| | |
|---|---|
| **Applicant:** | Shenzhen Sperll Optoelectronic Technology Co., Ltd. |
| **Address of Applicant:** | 4th Floor, Building 3, NO.1059 Songbai Road, Nanshan District, Shenzhen, China |
| **Manufacturer:** | Shenzhen Sperll Optoelectronic Technology Co., Ltd. |
| **Address of Manufacturer:** | 4th Floor, Building 3, NO.1059 Songbai Road, Nanshan District, Shenzhen, China |

## 1.2 EUT INFORMATION

| | | |
|---|---|---|
| **Product Name:** | LED Controller | |
| **Model No.:** | SP318E | |
| **Add. Model No.:** | SP311E,SP312E,SP313E,SP314E,SP315E,SP316E,SP317E,SP318E,SP319E,SP31AE,SP31BE,SP31CE | |
| **Trade Mark:** | SPERLL | |
| **EUT Supports Function:** (Provided by the customer) | 2.4 GHz ISM Band: | Bluetooth 5.0 |
| **Sample Received Date:** | March 3, 2025 | |
| **Sample Tested Date:** | March 5, 2025 to March 11, 2025 | |
| **Note:** The additional models are identical with the test model SP318E except the model number for marketing purpose. | | |

## 1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

| **For BT_LE** | |
|---|---|
| **Frequency Band:** | 2400 MHz to 2483.5 MHz |
| **Frequency Range:** | 2402 MHz to 2480 MHz |
| **Bluetooth Version:** | Bluetooth LE |
| **Type of Modulation:** | GFSK |
| **Number of Channels:** | 40 |
| **Channel Separation:** | 2 MHz |
| **Antenna Type:** | PCB Antenna |
| **Antenna Gain:** (Provided by the customer) | 1.3 dBi |
| **Maximum Peak Power:** | 1.20 dBm |

## 1.4 OTHER INFORMATION

| **Test channels for BT_LE** | | | | |
|---|---|---|---|---|
| **Type of Modulation** | **Tx/Rx Frequency** | **Test RF Channel Lists** | | |
| | | **Lowest(L)** | **Middle(M)** | **Highest(H)** |
| GFSK | 2402 MHz to 2480 MHz | Channel 0 | Channel 19 | Channel 39 |
| | | 2402 MHz | 2440 MHz | 2480 MHz |

## 1.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

**FCC 47 CFR Part 1 Subpart I**

All test items have been performed and recorded as per the above standards

## 1.6 TEST LOCATION

All tests were performed at:

**Shenzhen UnionTrust Quality and Technology Co., Ltd.**

Address: 16/F, Block A, Building 6th, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, China, China 518109
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

## 1.7 TEST FACILITY

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

**CNAS-Lab Code: L9069**
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

**A2LA-Lab Certificate No.: 4312.01**
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

**ISED Wireless Device Testing Laboratories**
CAB identifier: CN0032

**FCC Accredited Lab.**
Designation Number: CN1194
Test Firm Registration Number: 259480

## 1.8 DEVIATION FROM STANDARDS

None.

## 1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

## 1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

## 2. EQUIPMENT LIST

Please refer to the RF test report.

# 3. MPE EVALUATION

## 3.1 REFERENCE DOCUMENTS FOR EVALUATION

| No. | Identity | Document Title |
|---|---|---|
| 1 | FCC 47 CFR Part 1 Subpart I | PROCEDURES IMPLEMENTING THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 |
| 2 | KDB 447498 D01 General RF Exposure Guidance v06 | RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES |

## 3.2 MPE COMPLIANCE REQUIREMENT

### 3.2.1 Limits

According to §1.1307(b)(1), system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

**Limits for Occupational / Controlled Exposure**

| Frequency range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) ($mW/cm^2$) | Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minutes) |
|---|---|---|---|---|
| 0.3-3.0 | 614 | 1.63 | (100)* | 6 |
| 3.0-30 | 1842/f | 4.89/f | (900/f)* | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | / | / | F/300 | 6 |
| 1500-100000 | / | / | 5 | 6 |

**Limits for General Population / Uncontrolled Exposure**

| Frequency range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) ($mW/cm^2$) | Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minutes) |
|---|---|---|---|---|
| 0.3-1.34 | 614 | 1.63 | (100)* | 30 |
| 1.34-30 | 824/f | 2.19/f | (180/f)* | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | / | / | F/1500 | 30 |
| 1500-100000 | / | / | 1 | 30 |

**Note:** f = frequency in MHz: * = Plane-wave equivalents power density.

### 3.2.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

## 3.3 MPE CALCULATION METHOD

S = PG/4πR^2= EIRP/4πR^2
S = power density (in appropriate units, e.g., mw/cm2)
P = power input to the antenna (in appropriate units, e.g., mw)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.
R = 20cm, distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

## 3.4 MPE CALCULATION RESULTS

***Note:*** *For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.*

### 3.4.1 For BT

For BT_LE function, operating at 2402MHz to 2480 MHz for GFSK

#### 3.4.1.1 Antenna Type:

**Chain 0:** PCB Antenna

#### 3.4.1.2 Antenna Gain:

**Chain 0:** 2402MHz to 2480 MHz: 1.3 dBi

#### 3.4.1.3 Results for BT

| Operating Mode | Freq. | Declared maximum conducted average output power | Max. positive tolerance according manufacturer | Antenna Gain | Calculated maximum EIRP | Declared maximum EIRP | MPE Limit | MPE Value |
|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (mW) | ($mw/cm^2$) | |
| LE | 2402 | 1.0 | 1 | 1.3 | 3.3 | 2.1380 | 1 | 0.0004 |
| | 2440 | 1.0 | 1 | 1.3 | 3.3 | 2.1380 | 1 | 0.0004 |
| | 2480 | 1.0 | 1 | 1.3 | 3.3 | 2.1380 | 1 | 0.0004 |

# APPENDIX 1 PHOTOS OF TEST SETUP

N/A

# APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***