



Report No.: SZEM210100084503

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## RF Exposure Evaluation Report

**Application No.:** SZEM2101000845CR  
**Applicant:** Hon Lin Technology Co., Ltd.  
**Address of Applicant:** 11F, No.32, Jihu Rd., Neihu Dist., Taipei City 114, Taiwan  
**Manufacturer:** NANNING FUGUI PRECISION INDUSTRIAL CO., LTD.  
**Address of Manufacturer:** No.51, Tongle Avenue, Nanning, Guangxi. China  
**Factory:** NANNING FUGUI PRECISION INDUSTRIAL CO., LTD.  
**Address of Factory:** No.51, Tongle Avenue, Nanning, Guangxi. China  
**Equipment Under Test (EUT):**  
**EUT Name:** Sirius Fly Pro  
**Model No.:** DTU-B048-101  
**FCC ID:** 2AQ68T99B123-03  
47 CFR Part 1.1307  
**Standards:** 47 CFR Part 1.1310  
47 CFR Part 2.1091  
**Date of Receipt:** 2021-01-20  
**Date of Test:** 2021-01-20 to 2021-02-01  
**Date of Issue:** 2021-02-03

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

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

Keny Xu

Keny Xu  
EMC Laboratory Manager



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## 2 Version

| Revision Record |         |            |          |          |
|-----------------|---------|------------|----------|----------|
| Version         | Chapter | Date       | Modifier | Remark   |
| 01              |         | 2021-02-03 |          | Original |
|                 |         |            |          |          |
|                 |         |            |          |          |

|                          |  |                                                                                     |  |  |
|--------------------------|--|-------------------------------------------------------------------------------------|--|--|
| Authorized for issue by: |  |                                                                                     |  |  |
|                          |  |   |  |  |
|                          |  | Calvin Weng /Project Engineer                                                       |  |  |
|                          |  |  |  |  |
|                          |  | Eric Fu /Reviewer                                                                   |  |  |





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## 4 General Information

### 4.1 General Description of EUT

|                               |                                                                                                                                             |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply:                 | Switching Adapter<br>Model: DSA-12PFT-12 FUS 120100<br>Input: AC 100-240V, 50/60Hz, 0.5A<br>Output: DC 12V, 1.0A, 12.0W                     |
| Cable(s):                     | DC cable: 146cm unshielded                                                                                                                  |
| Sample Type:                  | Mobile Product                                                                                                                              |
| For LTE:                      |                                                                                                                                             |
| LTE Operation Frequency Band: | 48                                                                                                                                          |
| Frequency range:              | 3550-3700 MHz                                                                                                                               |
| Modulation Type:              | UL: QPSK, 16QAM, 64QAM<br>DL: QPSK, 16QAM, 64QAM, 256QAM                                                                                    |
| LTE Release Version:          | R11                                                                                                                                         |
| LTE Power Class:              | Level 3                                                                                                                                     |
| CA Capability MIMO:           | DL 2CC 2X2 MIMO<br>DL 1CC 2X2 MIMO<br>UL 1CC 2X2 MIMO<br>UL 2CC SISO<br>Support Intra-band contiguous/non-contiguous CA and support UL MIMO |
| Antenna Type:                 | Dipole Antenna<br>Ant 1: TX & RX<br>Ant 2: TX & RX                                                                                          |
| Antenna Gain:                 | 2.5dBi                                                                                                                                      |
| SIM Card:                     | This device has only one SIM Card sockets.                                                                                                  |
| Contained FCC ID:             | 2AQ68T99B123T03                                                                                                                             |
| For 2.4G WIFI:                |                                                                                                                                             |
| Operation Frequency:          | 802.11b/g/n(HT20): 2412MHz to 2462MHz;<br>802.11n(HT40): 2422MHz to 2452MHz                                                                 |
| Modulation Type:              | 802.11b: DSSS (CCK, DQPSK, DBPSK);<br>802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)                                                            |
| Number of Channels:           | 802.11b/g/n(HT20):11;<br>802.11n(HT40):7                                                                                                    |
| Channel Spacing:              | 5MHz                                                                                                                                        |
| MIMO Capability:              | 802.11 n mode: 2*2UL<br>802.11 n mode: 2*2DL                                                                                                |
| Antenna Type:                 | Ant 1:PCB Antenna; Ant 2: PCB antenna                                                                                                       |





|               |                            |
|---------------|----------------------------|
| Antenna Gain: | Ant 1: 3dBi; Ant 2: 2.3dBi |
|---------------|----------------------------|

## 4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China  
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

## 4.3 Test Facility

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

### • A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

### • VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

### • FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

### • Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

## 4.4 Deviation from Standards

None.

## 4.5 Abnormalities from Standard Conditions

None.

## 4.6 Other Information Requested by the Customer

None.



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## 5 RF Exposure Evaluation

### 5.1 RF Exposure Compliance Requirement

#### 5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

**TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

| Frequency range (MHz)                                          | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposures</b>        |                               |                               |                                     |                          |
| 0.3–3.0 .....                                                  | 614                           | 1.63                          | *(100)                              | 6                        |
| 3.0–30 .....                                                   | 1842/f                        | 4.89/f                        | *(900/f <sup>2</sup> )              | 6                        |
| 30–300 .....                                                   | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300–1500 .....                                                 | .....                         | .....                         | f/300                               | 6                        |
| 1500–100,000 .....                                             | .....                         | .....                         | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3–1.34 .....                                                 | 614                           | 1.63                          | *(100)                              | 30                       |
| 1.34–30 .....                                                  | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | 30                       |
| 30–300 .....                                                   | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300–1500 .....                                                 | .....                         | .....                         | f/1500                              | 30                       |
| 1500–100,000 .....                                             | .....                         | .....                         | 1.0                                 | 30                       |

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

For Uncontrolled Environment, the MPE limit of 1500MHz to 100000MHz is 1.0 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

#### 5.1.2 Test Procedure

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





### 5.1.3 EUT RF Exposure Evaluation

#### 1) Test Results

##### For WIFI:

Antenna Gain: Ant 1: 3dBi; Ant 2: 2.3dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is Ant 1: 2.00; Ant 2: 1.70 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

| Frequency (MHz) | Max Conducted Output Power (dBm) (include tune-up power) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm <sup>2</sup> ) | Limit | MPE Ratios | Result |
|-----------------|----------------------------------------------------------|------------------------------|--------------------------------------------------|-------|------------|--------|
| 2437            | 18                                                       | 63.10                        | 0.025                                            | 1.0   | 0.025      | PASS   |

Note: Refer to report No. SZEM210100084502 for EUT test Max Conducted Output Power value.  
The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.  
Only recorded maximum power with the maximum gain.

##### For LTE Band 48:

As the antenna type and antenna gain is still the same with previous LTE module report, RF exposure in this section is same with LTE module RF report SZEM210100084403.

##### SISO

| Antenna | Max Antenna Gain (dBi) | Max Antenna Gain (Numeric) | Max tune-up tolerance power (dBm) | Max tune-up Tolerance power to Antenna (mW) | Power Density at R = 20 cm (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | MPE Ratios | Result |
|---------|------------------------|----------------------------|-----------------------------------|---------------------------------------------|--------------------------------------------------|-----------------------------|------------|--------|
| Ant1    | 2.5                    | 1.78                       | 20.5                              | 112.20                                      | 0.0397                                           | 1.0                         | 0.0397     | PASS   |





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MIMO

| Antenna | Max<br>Antenna<br>Gain<br>(dBi) | Max<br>Antenna<br>Gain<br>(Numeric) | Max<br>tune-up<br>tolerance<br>power<br>(dBm) | Max<br>tune-up<br>Tolerance<br>power<br>to Antenna<br>(mW) | Power<br>Density<br>at R=20 cm<br>(mW/cm <sup>2</sup> ) | Limit<br>(mW/cm <sup>2</sup> ) | MPE<br>Ratios | Result |
|---------|---------------------------------|-------------------------------------|-----------------------------------------------|------------------------------------------------------------|---------------------------------------------------------|--------------------------------|---------------|--------|
| Ant1+2  | 2.5                             | 1.78                                | 20.5                                          | 112.20                                                     | 0.0397                                                  | 1.0                            | 0.0397        | PASS   |

Since the SAR Exclusion Threshold Level is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

**Simultaneously transmitting:**

This device supports LTE and WIFI transmitting simultaneously.

| Operating<br>Mode     | Power Density at R = 20 cm<br>(mW/cm <sup>2</sup> ) |             |          | Limit<br>(mW/cm <sup>2</sup> ) | Result |
|-----------------------|-----------------------------------------------------|-------------|----------|--------------------------------|--------|
|                       | 2.4G WIFI                                           | LTE band 48 | Combined |                                |        |
| 2.4G WIFI+LTE band 48 | 0.025                                               | 0.0397      | 0.0647   | 1.0                            | PASS   |

- End of the Report -



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