



# RF Exposure Evaluation Report

**Application No.:** SZEM1912020897CR  
**Applicant:** Shenzhen Zero Zero Infinity Technology Co., Ltd  
**Address of Applicant:** Room A211-B, F2, Shanshui Building, No.4093, Liuxian Avenue, Nanshan District, Shenzhen, Guangdong, China  
**Manufacturer:** Shenzhen Zero Zero Infinity Technology Co., Ltd  
**Address of Manufacturer:** Room A211-B, F2, Shanshui Building, No.4093, Liuxian Avenue, Nanshan District, Shenzhen, Guangdong, China  
**Factory:** SHENZHEN CENCOM TECHNOLOGY CO., LTD  
**Address of Factory:** NO.1 Yuanlingzai Park, Henggang Town, Longgang District, Shenzhen, Guangdong, China  
**Equipment Under Test (EUT):**  
**Product Name:** Drone  
**Model No.:** ZV101  
**Trade mark:** Zerozero Robotics  
**FCC ID:** 2AIDW-ZV101  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 1.1310  
47 CFR Part 2.1091  
**Date of Receipt:** 2019-12-05  
**Date of Test:** 2019-12-18 to 2019-12-19  
**Date of Issue:** 2020-02-25

|                      |              |
|----------------------|--------------|
| <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



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

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## 2 Version

| Revision Record |         |            |          |          |
|-----------------|---------|------------|----------|----------|
| Version         | Chapter | Date       | Modifier | Remark   |
| 01              |         | 2020-02-25 |          | Original |
|                 |         |            |          |          |
|                 |         |            |          |          |

|                          |  |                                                                                     |  |
|--------------------------|--|-------------------------------------------------------------------------------------|--|
| Authorized for issue by: |  |                                                                                     |  |
|                          |  |   |  |
|                          |  | Hank Yan /Project Engineer                                                          |  |
|                          |  |  |  |
|                          |  | Eric Fu /Reviewer                                                                   |  |





### 3 Contents

|                                                       | Page |
|-------------------------------------------------------|------|
| 1 COVER PAGE .....                                    | 1    |
| 2 VERSION .....                                       | 2    |
| 3 CONTENTS .....                                      | 3    |
| 4 GENERAL INFORMATION .....                           | 4    |
| 4.1 GENERAL DESCRIPTION OF EUT .....                  | 4    |
| 4.2 TEST LOCATION .....                               | 5    |
| 4.3 TEST FACILITY .....                               | 5    |
| 4.4 DEVIATION FROM STANDARDS .....                    | 5    |
| 4.5 ABNORMALITIES FROM STANDARD CONDITIONS .....      | 5    |
| 4.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER ..... | 5    |
| 5 RF EXPOSURE EVALUATION .....                        | 6    |
| 5.1 RF EXPOSURE COMPLIANCE REQUIREMENT .....          | 6    |
| 5.1.1 Limits .....                                    | 6    |
| 5.1.2 Test Procedure .....                            | 6    |
| 5.1.3 EUT RF Exposure Evaluation .....                | 7    |





## 4 General Information

### 4.1 General Description of EUT

|                      |                                                                                                                                                                                                   |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power Supply:        | DC15.4V Rechargeable Lipo Battery                                                                                                                                                                 |
| Operation Frequency: | 2406MHz to 2466MHz                                                                                                                                                                                |
| Modulation Type:     | BPSK, QPSK, 16QAM, 64QAM                                                                                                                                                                          |
| Number of Channels:  | 7                                                                                                                                                                                                 |
| Channel Spacing:     | 10MHz                                                                                                                                                                                             |
| Antenna Type:        | Antenna 1 & 2: Dipole antenna                                                                                                                                                                     |
| Antenna Gain:        | Antenna 1 & 2: 2.86dBi                                                                                                                                                                            |
| Remark:              | 1.Two Antennas can't transmit synchronously.<br>2.Both Antenna 1 and Antenna 2 of TX were tested, and found the Antenna 2 was the worst case, so the worst data were recorded in the report only. |



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Shenzhen Branch (Testing Center) EEC Laboratory

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## 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<br>(MHz)                                       | Electric field<br>strength<br>(V/m) | Magnetic field<br>strength<br>(A/m) | Power density<br>(mW/cm <sup>2</sup> ) | Averaging time<br>(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:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

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

R = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1 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

Antenna Gain: Antenna 1 & 2: 2.86dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.93 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

| Ant  | Frequency<br>(MHz) | Max Conducted<br>Peak Output<br>Power (dBm) | Output Power<br>to Antenna<br>(mW) | Power Density<br>at R = 20 cm<br>(mW/cm <sup>2</sup> ) | Limit<br>(mW/cm <sup>2</sup> ) | Result |
|------|--------------------|---------------------------------------------|------------------------------------|--------------------------------------------------------|--------------------------------|--------|
| Ant2 | 2406               | 17.83                                       | 60.67                              | 0.023                                                  | 1.0                            | PASS   |

Note: Refer to report No. SZEM191202089701 for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

- End of the Report -



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