



# 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>
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\* 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. 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.



## 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:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

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 (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit (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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