



RF Exposure Evaluation Report

Application No.: SZEM2101000446CR
Applicant: Shantou Helicute Model Aircraft Industrial Co., Ltd
Address of Applicant: Jiangbei Road, Longtian, Guangyi Street, Chenghai District, Chenghai, Shantou City, Guangdong, Shantou, China
Manufacturer: Shantou Helicute Model Aircraft Industrial Co., Ltd
Address of Manufacturer: Jiangbei Road, Longtian, Guangyi Street, Chenghai District, Chenghai, Shantou City, Guangdong, Shantou, China
Factory: Shantou Helicute Model Aircraft Industrial Co., Ltd
Address of Factory: Jiangbei Road, Longtian, Guangyi Street, Chenghai District, Chenghai, Shantou City, Guangdong, Shantou, China
Equipment Under Test (EUT):
Product Name: R/C Drone
Model No.: Please refer to section 4 ♣
♣ Please refer to section 4 of this report which indicates which model was actually tested and which were electrically identical.
FCC ID: 2AKPP2021HELI1
Standards: 47 CFR Part 1.1310
47 CFR Part 2.1091
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2021-01-12
Date of Test: 2021-01-19 to 2021-02-01
Date of Issue: 2021-02-03

Test Result :	PASS*
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* 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:				
		Gebin Sun		
		Gebin Sun/Project Engineer		
		Eric Fu		
		Eric Fu/Reviewer		





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4 General Information

4.1 General Description of EUT

Power supply:	Rechargeable battery DC7.4V 1500mAh for Drone, Charged by DC5V			
Cable(s):	USB cable:50cm unshielded			
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band 1	IEEE 802.11a	5180-5240	4
		IEEE 802.11n 20MHz	5180-5240	4
Type of Modulation:	IEEE 802.11a: OFDM(BPSK/QPSK/16QAM/64QAM) IEEE 802.11n: OFDM(BPSK/QPSK/16QAM/64QAM)			
DFS Function:	Not Support			
TPC Function:	Not Support			
Antenna Type:	Integral Antenna			
Antenna Gain:	2dBi			

Declaration of EUT Family Grouping:

Model No.: DRC-447, DRC-445, H05NL, H05NCL, H07NL, H07NCL, H09NL, H09NCL, M801R, M803R, H805, H805W, H806, H806W, H809HW, H809SW, H811C, H811W, H812R, S812, H815HW, H815SC, H815SW, H816H, H816HC, H816HW, H817, H817C, H817W, H817H, H817HC, H817HW, H818H, H818HW, H818HC, H818S, H818SC, H818SW, H818HP, H818HPC, H818HPW, H819, H819HW, H820H, H820HC, H820HW, H821H, H821HC, H821HW, H822HW, H823, H823W, H823H, H823HW, H802G, H802W, H02G, H01C, H825, H825G, H825W, H826H, H826HW, H826HP, H826HPW, H827S, H827SC, H827SW, H828P, H828PC, H828PW, H829, H830, H831, H832, H833, H835, H836, H837, H838, H839, H850, H851, H851SW, H851SWP, H852, H853, H855, H856, H857, H858, H859, H860, H860HW, H860SW, H860SPW

Only the model DRC-447 was tested, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, with only difference on packaging.



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 ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	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/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, 1 mW/cm². 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.



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5.1.3 EUT RF Exposure Evaluation

Antenna Gain: 2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.58 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
middle	5200	12.22	16.67	0.005	1.0	PASS

Note: Refer to report No. SZEM210100044603 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 -

