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RF Exposure Evaluation Report

Application No.: SZEM1612010706CR
Applicant: Shantou Helicute Model Aircraft Industrial Co., Ltd
Manufacturer: Shantou Helicute Model Aircraft Industrial Co., Ltd
Factory: Shantou Helicute Model Aircraft Industrial Co., Ltd
Product Name: Flying Saucer Series
Model No.(EUT): H816HW
Add Model No.: H05NL, H05NCL, H07L, H07CL, H07NL, H07NCL, H07NHC, H07NHW, H09NL, H09NCL, H107R, M801R, M803R, H805, H805C, H805W, H805S, H805H, H805HC, H805HW, H806, H806C, H806W, H806S, H806H, H806HC, H806HW, H807, H807C, H808, H808C, H809, H809C, H809W, H809H, H809HC, H809HW, H809S, H809SC, H809SW, H811C, H811W, H812, H812R, S812, H815H, H815HW, H815HS, H815HC, H816H, H816HC, H817, H817C, H817W, H818H, H818HC, H818HW, H819, H819C, H819W, H820H, H820HC, H820HW, H821H, H821HC, H821HW, H821S, H821SC, H821SW, H822H, H822HC, H822HW, H823H, H823HC, H823HW, H802G, H802W, H02G, H01C

FCC ID: 2AKPPHELICUTE
Standards: 47 CFR Part 1.1307 (2016)
 47 CFR Part 1.1310 (2016)
Date of Receipt: 2016-12-15
Date of Test: 2017-01-17 to 2017-02-14
Date of Issue: 2017-02-17

Test Result :	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang
 EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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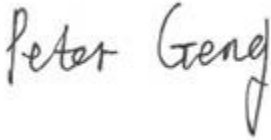



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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2017-02-17		Original

Authorized for issue by:			
Tested By			2017-02-14
	<hr/>		<hr/>
	(Peter Geng) /Project Engineer		Date
Checked By			2017-02-17
	<hr/>		<hr/>
	(Eric Fu) /Reviewer		Date



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4 General Information

4.1 Client Information

Applicant:	Shantou Helicute Model Aircraft Industrial Co., Ltd
Address of Applicant:	Jiangbei Road, Longtian, Guangyi Street, Chenghai District, Chenghai, Shantou City, Guangdong, China.
Manufacturer:	Shantou Helicute Model Aircraft Industrial Co., Ltd
Address of Manufacturer:	Jiangbei Road, Longtian, Guangyi Street, Chenghai District, Chenghai, Shantou City, Guangdong, China.
Factory:	Shantou Helicute Model Aircraft Industrial Co., Ltd
Address of Factory:	Jiangbei Road, Longtian, Guangyi Street, Chenghai District, Chenghai, Shantou City, Guangdong, China.

4.2 General Description of EUT

Product Name:	Flying Saucer Series
Model No.:	H816HW
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20) : OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Type:	Integral antenna
Antenna Gain:	2.5dBi
EUT Power Supply:	DC 3.7V 520mAh rechargeable battery which charged by AC adapter

Remark:

Model No.: H816HW, H05NL, H05NCL, H07L, H07CL, H07NL, H07NCL, H07NHC, H07NHW, H09NL, H09NCL, H107R, M801R, M803R, H805, H805C, H805W, H805S, H805H, H805HC, H805HW, H806, H806C, H806W, H806S, H806H, H806HC, H806HW, H807, H807C, H808, H808C, H809, H809C, H809W, H809H, H809HC, H809HW, H809S, H809SC, H809SW, H811C, H811W, H812, H812R, S812, H815H, H815HW, H815HS, H815HC, H816H, H816HC, H817, H817C, H817W, H818H, H818HC, H818HW, H819, H819C, H819W, H820H, H820HC, H820HW, H821H, H821HC, H821HW, H821S, H821SC, H821SW, H822H, H822HC, H822HW, H823H, H823HC, H823HW, H802G, H802W, H02G, H01C

Only the model H816HW was tested, since the electrical circuit design, layout, components used and internal wiring were identical for all above models, only different on model No., color, appearance and packaging.



4.3 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.

4.4 Test Facility

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

• **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC

Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• **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 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

• **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

• **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.



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: $Pd = (Pout * G) / (4 * Pi * R^2)$

Where

Pd = power density in mW/cm²

Pout = 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

Pd id 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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4.1.3 EUT RF Exposure Evaluation

Antenna Gain: 2.5dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1 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
Lowest	2412	15.81	38.11	0.0071	1.0	PASS

Note: Refer to report No. SZEM161201070602 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.