

RF EXPOSURE EVALUATION REPORT

Application No.: GZCR2205000697AT
Applicant: Guangzhou Xaircraft Technology Co., LTD
Address of Applicant: Block C, No.115, Gaopu Road, Tianhe District, Guangzhou City, Guangdong, PR.China
Manufacturer: Guangzhou Xaircraft Technology Co., LTD
Address of Manufacturer: Block C, No.115, Gaopu Road, Tianhe District, Guangzhou City, Guangdong, PR.China
Factory: DONGGUAN XAIRCRAFT UAS TECHNOLOGY CO. LTD
Address of Factory: Room 201, Building 2, No.25, Section of Dalingshan, Guanchang Road, Dalingshan Town, Dongguan City, Guangdong, P.R. China
Equipment Under Test (EUT):
EUT Name: WLAN Module
Model No.: WM303
Standard(s) : 47 CFR Part 1.1310
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2022-06-01
Date of Test: 2022-07-04 to 2022-07-04
Date of Issue: 2022-07-12

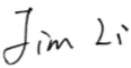
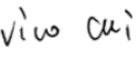
Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian
EMC Laboratory Manager



Revision Record			
Version	Report No.	Date	Remark
01	GZCR220500069703	2022-07-12	Original

Authorized for issue by:			
		 <hr/> Jim Li/Project Engineer	
		 <hr/> Vico Cui/Reviewer	



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2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
RF Exposure	KDB447498D01 General RF Exposure Guidance v06	KDB447498D01 General RF Exposure Guidance v06	47 CFR Part 1.1310	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.



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3 Contents

	Page
1 Cover Page	1
2 Test Summary	3
3 Contents.....	4
4 General Information	5
4.1 Details of E.U.T.	5
4.2 Test Location	5
4.3 Test Facility	6
4.4 Deviation from Standards	6
4.5 Abnormalities from Standard Conditions	6
5 Technical Requirements Specification	7
5.1 General Description of Applied Standards	7
5.2 RF Exposure Evaluation.....	7
5.2.1 Limit & Test Method	7
5.2.2 Conclusion	8
6 EUT Constructional Details (EUT Photos).....	9



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 5V
Cable(s):	N/A
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11 802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	Dedicated Antenna Antenna 1: 2 dBi for 2.4G Wi-Fi band
Antenna Gain:	Antenna 2: 2 dBi for 2.4G Wi-Fi band Two antennas support MIMO synchronous transmission for 801.11n.

4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555

Fax: +86 20 82075059

No tests were sub-contracted.



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4.3 Test Facility

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

● **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

● **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

● **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

● **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

● **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

● **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

● **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 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.: R-12460, C-12584, G-20107 and T-11179 respectively.

● **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.4 Deviation from Standards

None

4.5 Abnormalities from Standard Conditions

None



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5 Technical Requirements Specification

5.1 General Description of Applied Standards

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

5.2 RF Exposure Evaluation

5.2.1 Limit & Test Method

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.



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5.2.2 Conclusion

Normal use condition for Distance between antenna and body:	≥ 20cm declared by applicant
Antenna Gain(max):	2 dBi for 2.4G Wi-Fi both ant1 & ant2.
Directional gain:	5.01 dBi (Refer to report GZCR220500069702 clause 6.1.2 for details.)

For 2.4 GHz Wi-Fi

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
11B(ANT1)						
2412	1.585	13.13	20.559	0.0648	1	Complies
2442	1.585	15.66	36.813	0.1161	1	Complies
2462	1.585	13.59	22.856	0.0721	1	Complies
11G(ANT1)						
2412	1.585	18.41	69.343	0.2186	1	Complies
2442	1.585	19.86	96.828	0.3053	1	Complies
2462	1.585	18.80	75.858	0.2392	1	Complies
11B(ANT2)						
2412	1.585	14.84	30.479	0.0961	1	Complies
2442	1.585	15.29	33.806	0.1066	1	Complies
2462	1.585	12.84	19.231	0.0606	1	Complies
11G(ANT2)						
2412	1.585	19.12	81.658	0.2575	1	Complies
2442	1.585	20.30	107.152	0.3378	1	Complies
2462	1.585	18.53	71.285	0.2248	1	Complies
11N20(MINO)						
2412	3.170	20.89	122.744	0.7740	1	Complies
2442	3.170	21.36	136.773	0.8624	1	Complies
2462	3.170	21.00	125.893	0.7938	1	Complies
11N40(MINO)						
2422	3.170	19.52	89.536	0.5646	1	Complies
2442	3.170	20.96	124.738	0.7865	1	Complies
2452	3.170	20.62	115.345	0.7273	1	Complies

The antenna 1 and antenna 2 for 802.11b and 802.11g can be transmitted together, the result is

$0.1161/1 + 0.1066/1 = 0.2227 < 1.0$ for 802.11b

$0.3053/1 + 0.3378/1 = 0.6431 < 1.0$ for 802.11g

So SAR report is not required.

Note: Refer to report No. GZCR220500069702 for EUT test Max Conducted Peak Output Power value.



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6 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for GZCR2205000697AT

- End of the Report -



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