



RF Exposure Evaluation Report

Application No.: SZCR2105021258AT
Applicant: Guangdong WiiRobot Co., Ltd
Address of Applicant: Room 401, Building 1, No.11 Yinghe 1st Street, Yaoshan, Xiegang Town, Dongguan City, Guangdong Province, China
Manufacturer: Guangdong WiiRobot Co., Ltd.
Address of Manufacturer: Room 401, Building 1, No. 11, Yaoshan Yinghe Street, Xiegang Town, Dongguan City, Guangdong Province

Equipment Under Test (EUT):
Product Name: Speedbird
Model No.: I63E, I63E Bundle A, I63E Bundle B, I63EA ♣
♣ Please refer to section 4.1 of this report which indicates which model was actually tested and which were electrically identical.

Trade Mark: ING
FCC ID: 2AZ7PI63E
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
47 CFR Part 2.1091
KDB447498D01 General RF Exposure Guidance v06

Date of Receipt: 2021-05-28
Date of Test: 2021-06-09 to 2021-06-17
Date of Issue: 2021-06-22

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



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

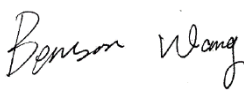
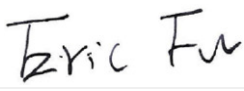
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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-06-22		Original

Authorized for issue by:				
				
		Benson Wang/Project Engineer		
				
		Eric Fu/Reviewer		





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4 General Information

4.1 General Description of EUT

Power supply:	Lithium Ion Battery: DC11.4V 3200mAh (Charged by adapter)
Cable(s):	Type-C to Type-C cable: 43cm unshielded support 5V/2A USB-A to Type-C cable: 43cm unshielded support 45W.
For 5G Wi-Fi	
Operation Frequency (20MHz):	U-NII-1: 5180-5240MHz; U-NII-3: 5745-5825MHz
Modulation Type:	802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing:	802.11a/n(HT20): 20MHz
Antenna Type:	Integral Antenna
Antenna Gain:	Antenna 1/ Antenna 2: 2dBi Two antennas can simultaneous transmission.
For 2.4G property	
Operation Frequency:	2452MHz-2474MHz
Modulation Type:	GFSK
Number of Channels:	23
Channel Spacing:	1MHz
Antenna Type:	Integral Antenna
Antenna Gain:	Antenna 1/2: 2dBi Two antennas can not simultaneous transmission.

Declaration of EUT Family Grouping:

Model No.: I63E, I63E Bundle A, I63E Bundle B, I63EA

Only the model I63E was tested. 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 models, appearance and package method.



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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4.1.3 EUT RF Exposure Evaluation

For 5G Wi-Fi:

Antenna 1/ Antenna 2: 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:

Antenna	Max Conducted Output Power (including tune-up tolerance) (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Sum of Power Density (mW/cm ²)	Limit	MPE Ratios	Result
1	16.90	48.98	0.015	0.038	1.0	0.038	PASS
2	18.71	74.30	0.023				

Note: Refer to report No. SZCR210502125802 for EUT test Max Conducted Peak Output Power value.

The distance r (5th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For 2.4G property:

Antenna 1/ Antenna 2: 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:

According to the Annex G of C63.10:

The Maximum peak radiated emission for the EUT is 89.06dBμV/m at 3m in the frequency 2452MHz of Antenna 1.

The EIRP = [(FS*D) ^2 / 30] mW = -6.17dBm

which is within the production variation.

Antenna	Max Conducted Output Power (including tune-up tolerance) (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	MPE Ratios	Result
1	-6.17	0.24	0.00008	1.0	0.00008	PASS

Note: Refer to report No. SZCR210502125803 for EUT test Max Conducted Output Power value.

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



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exposure conditions for simultaneous transmission operations

The EUT has two modules: 5G WiFi module and 2.4G property module, they can simultaneous transmission at the same time.

So, Simultaneous transmission SAR test is not required, because the Max. sum of the MPE ratios is $0.038+0.00008=0.03808<1$.

- End of the Report -

