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RF Exposure Evaluation Report

Report No.:	CQASZ20220701263E-03
Applicant:	Shenzhen Inkbird Technology Co., Ltd.
Address of Applicant:	Room 1803, Guowei Building, NO.68 Guowei Road, Xianhu Community, Liantang, Luohu District,Shenzhen,China
Equipment Under Test (EUT):	
EUT Name:	Smart Fan Controller
Model No.:	IVC-001W T4, IVC-001W T6, IVC-001W T8, IVC-001W T10, IVC-002W T4, IVC-002W T6, IVC-002W T8, IVC-002W T10, IVC-001W
Test Model No.:	IVC-001W
Brand Name:	INKBIRD
FCC ID:	2AYZDIVC-001W
Standards:	47 CFR Part 1.1307 47 CFR Part 1.1310 447498 D04 Interim General RF Exposure Guidance v01
Date of Receipt:	2022-07-25
Date of Test:	2022-07-25 to 2022-08-04
Date of Issue:	2022-10-27
Test Result:	**PASS***

***In the configuration tested, the EUT complied with the standards specified above**

Tested By: lewis zhou
(Lewis Zhou)

Reviewed By: Timo Lei
(Timo Lei)

Approved By: Jack Ai
(Jack Ai)

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20220701263E-03	Rev.01	Initial report	2022-10-27

2 Contents

3 General Information

3.1 Client Information

Applicant:	Shenzhen Inkbird Technology Co., Ltd.
Address of Applicant:	Room 1803, Guowei Building, NO.68 Guowei Road, Xianhu Community, Liantang, Luohu District, Shenzhen, China
Manufacturer:	Shenzhen Inkbird Technology Co., Ltd.
Address of Manufacturer:	Room 1803, Guowei Building, NO.68 Guowei Road, Xianhu Community, Liantang, Luohu District, Shenzhen, China
Factory:	Shenzhen Inkbird Technology Co., Ltd.
Address of Factory:	Room 1803, Guowei Building, NO.68 Guowei Road, Xianhu Community, Liantang, Luohu District, Shenzhen, China

3.2 General Description of EUT

Product Name:	Smart Fan Controller
Model No.:	IVC-001W T4, IVC-001W T6, IVC-001W T8, IVC-001W T10, IVC-002W T4, IVC-002W T6, IVC-002W T8, IVC-002W T10, IVC-001W
Test Model No.:	IVC-001W
Trade Mark:	INKBIRD
Software Version:	V1.0
Hardware Version:	REV.A
EUT Power Supply:	DC 24V

3.3 General Description of BT Classic

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 4.2
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channel:	79
Transfer Rate:	1Mbps/2Mbps/3Mbps
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type:	PCB Antenna
Antenna Gain:	2.54 dBi

3.4 General Description of 2.4G WIFI Classic

Operation Frequency:	2412MHz~2462MHz
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)
Number of Channel:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels
Channel Separation:	5MHz
Transfer Rate:	IEEE for 802.11b: 1Mbps/2Mbps/5.5Mbps/11Mbps IEEE for 802.11g : 6Mbps/9Mbps/12Mbps/18Mbps/24Mbps/36Mbps/48Mbps/54Mbps IEEE for 802.11n(HT20) : 6.5Mbps/13Mbps/19.5Mbps/26Mbps/39Mbps/52Mbps/58.5Mbps/65Mbps
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type:	PCB Antenna
Antenna Gain:	2.54 dBi

Note：

The above parameters will directly affect the test results. The information is provided by the applicant.

4 MPE Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

The table applies to any RF source (i.e., single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits. These criteria apply at separation distances from any part of the radiating structure of at least $\lambda/2\pi$. The thresholds are based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in the main beam of the radiator.For mobile devices that are not exempt per Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP20cm inFormula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{\text{th}}\,(\text{mW}) = ERP_{20\,\text{cm}}\,(\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave Dipole.
SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.1.3 EUT RF Exposure

1) For BT Classic

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-1.08	-1±1	0	1.000
Middle(2441MHz)	-0.5	0±1	1	1.259
Highest(2480MHz)	0.16	0.5±1	1.5	1.413
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-0.63	0±1	1	1.259
Middle(2441MHz)	0.13	0.5±1	1.5	1.413
Highest(2480MHz)	0.64	1±1	2	1.585
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	0.1	0.5±1	1.5	1.413
Middle(2441MHz)	0.53	1±1	2	1.585
Highest(2480MHz)	1.03	1.5±1	2.5	1.778

Note: 1) Refer to report No. CQASZ20220701263E-01 for EUT test Max Conducted Peak Output Power value.
2) EUT's Wireless module is more than 20cm away from the human body.
3) wifi and Bluetooth cannot be transmitted at the same time. wifi is turned off during Bluetooth transmission

2) **For 2.4G WIFI Classic**

Measurement Data

11B mode				
Test channel	AV Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	9.47	10±1	11	12.589
Middle(2437MHz)	10.56	11±1	12	15.849
Highest(2462MHz)	11.08	11.5±1	12.5	17.783
11G mode				
Test channel	AV Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	8.66	9±1	10	10.000
Middle(2437MHz)	9.98	10±1	11	12.589
Highest(2462MHz)	10.50	11±1	12	15.849
11N20 mode				
Test channel	AV Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	8.93	9±1	10	10.000
Middle(2437MHz)	10.02	10.5±1	11.5	15.849
Highest(2462MHz)	10.56	11±1	12	15.849

Note: 1) Refer to report No. CQASZ20220701263E-02 for EUT test Max AV Output Power value.
2) EUT's Wireless module is more than 20cm away from the human body.
3) wifi and Bluetooth cannot be transmitted at the same time, wifi transmission is Bluetooth Shut down

*** END OF REPORT ***