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检测
CNAS L5785

RF Exposure Evaluation Report

Report No.: CQASZ20250802041E-02
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: Smoker Controller
Model No.: ISC-027BW, ISC-007BW, ISC-028-BW
Test Model No.: ISC-027BW
Brand Name: INKBIRD
FCC ID: 2AYZD-ISC027BW
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt: 2025-08-28
Date of Test: 2025-08-28 to 2025-09-08
Date of Issue: 2025-10-20
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
CQASZ20250802041E-02	Rev.01	Initial report	2025-10-20

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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:	5th and 6th Floor, Building 138, No. 71, Yiqing Road, Xianhu Community, Liantang Street, Luohu District, Shenzhen, Guangdong, China
Factory:	Shenzhen Inkbird Technology Co., Ltd
Address of Factory:	5th and 6th Floor, Building 138, No. 71, Yiqing Road, Xianhu Community, Liantang Street, Luohu District, Shenzhen, Guangdong, China

3.2 General Description of EUT

Product Name:	Smoker Controller
Model No.:	ISC-027BW, ISC-007BW, ISC-028-BW
Test Model No.:	ISC-027BW
Trade Mark:	INKBIRD
Software Version:	1.0.7, 1.0.2, 1.0.0
Hardware Version:	ISC-027-BW, ISC-007-BW, ISC-028-BW
EUT Power Supply:	Model:GAT-0501000U Input:100-240V~0.5A Max 50/60Hz Output:5V 1000mA

3.3 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 5.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK
Number of Channel:	40
Transfer Rate:	1Mbps
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type:	PCB antenna
Antenna Gain:	1dBi

3.4 General Description of 2.4G WIFI Classic

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
Type of Modulation:	802.11b: DSSS(CCK/QPSK/BPSK) 802.11g: OFDM(BPSK/QPSK/16QAM/64QAM) 802.11n : OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels
Channel Separation:	5MHz
Transfer Rate:	802.11b: 1M/2M/5.5M/11M bps 802.11g: 6M/9M/12M/18M/24M/36M/48M/54M bps 802.11n: 7.2M/14.4M/21.7M/28.9M/43.3M/57.8M/65M/72.2M bps
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	PCB antenna
Antenna Gain:	2.5dBi

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

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.

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 BLE

Antenna Gain: 1dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.259 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-3.82	-3.5±1	-2.5	0.56
Middle(2440MHz)	-3.94	-3.5±1	-2.5	0.56
Highest(2480MHz)	-2.51	-2.5±1	-1.5	0.71

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
0.71	1	0.0001773083	1.0	PASS

Note: 1) Refer to report No. CQASZ20250100185E-02 for EUT test Max Conducted Peak Output Power value.

2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (0.71 \cdot 1.259) / (4 \cdot 3.1416 \cdot 20^2) = 0.0001773083$

2) For 2.4G WIFI

Antenna Gain: 2.5dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.778 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11G mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	24.05	24.5±1	25.5	354.81
Middle(2437MHz)	24.33	24.5±1	25.5	354.81
Highest(2462MHz)	24.02	24.5±1	25.5	354.81

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
354.81	2.5	0.1255246818	1.0	PASS

Note: 1) Refer to report No. 708881974877-00(FCC ID:2ANDL-WBR3) for EUT test Max Conducted Peak Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (354.81 * 1.778) / (4 * 3.1416 * 20^2) = 0.1255246818$

Simultaneous transmission:

MPE ratios(BLE)+MPE ratios(2.4G WIFI)

=0.0001773083 /1+0.1255246818 /1

=0.1257019901 ≤ 1

*** END OF REPORT ***