

RF Exposure Evaluation Report

Applicant: Hangzhou Roombanker Technology Co., Ltd.

Address of Applicant: A#801 Wantong center, Hangzhou, China

Equipment Under Test (EUT)

Product Name: IoT Gateway

Model No.: CDGW-006

Trade mark: N/A

FCC ID: 2AUXBCDGW-006

Applicable standards: FCC CFR Title 47 Part 2 (§2.1091)

Date of sample receipt: 05 Sep., 2022

Date of Test: 06 Sep., to 21 Sep., 2022

Date of report issue: 22 Sep., 2022

Test Result: PASS

Tested by:	<u>Mike OU</u> Test Engineer	Date:	<u>22 Sep., 2022</u>
Reviewed by:	<u>Wenwen Zhang</u> Project Engineer	Date:	<u>22 Sep., 2022</u>
Approved by:	<u>[Signature]</u> Manager	Date:	<u>22 Sep., 2022</u>

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in above the application standard version. Test results reported herein relate only to the item(s) tested.

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1 Version

Version No.	Date	Description
00	22 Sep., 2022	Original

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3 General Information

3.1 Client Information

Applicant:	Hangzhou Roombanker Technology Co., Ltd.
Address:	A#801 Wantong center, Hangzhou, China
Manufacturer:	Hangzhou Roombanker Technology Co., Ltd.
Address:	A#801 Wantong center, Hangzhou, China

3.2 General Description of E.U.T.

Product Name:	IoT Gateway		
Model No.:	CDGW-006		
Operation Frequency:	2.4G Wi-Fi: 2412MHz~2462MHz		
	WCDMA	WCDMA band II:	1852.4 MHz - 1907.6 MHz
		WCDMA band IV:	1712.4 MHz - 1752.6 MHz
		WCDMA band V:	826.4 MHz - 846.6 MHz
	LTE	LTE band 2:	1850 MHz - 1910 MHz
		LTE band 4:	1710 MHz - 1755 MHz
		LTE band 5:	824 MHz - 849 MHz
		LTE band 7:	2500 MHz - 2570 MHz
		LTE band 12:	699 MHz - 716 MHz
		LTE band 13:	777 MHz - 787 MHz
		LTE band 14:	788 MHz - 798 MHz
LTE band 66:		1710 MHz - 1780 MHz	
LTE band 71:	663 MHz - 698 MHz		
Modulation technology:	802.11b: DSSS, 802.11a/g/n/ac: OFDM Bluetooth BDR /BLE: GFSK, Bluetooth EDR: $\pi/4$ -DQPSK, 8DPSK WCDMA: RMC(QPSK), HSUPA(QPSK), HSDPA(QPSK,16QAM) LTE: QPSK, 16QAM		
Antenna Type:	2.4G Wi-Fi: Internal Antenna; WCDMA/LTE: Cylindrical Antenna		
Antenna gain:	2.4G Wi-Fi: 3.5 dBi; WCDMA band II/ band IV/ band V: 3.5 dBi; LTE band 2/ band 4/ band 5/ band 7/ band 12/ band 13/ band 14/ band 66/ band 71:3.5 dBi		
Test Sample Condition:	The test samples were provided in good working order with no visible defects.		

3.3 Operating Modes

Operating mode	Detail description
2.4G WIFI mode	Keep the EUT in continuously transmitting in 2.4G WIFI mode
WCDMA band II mode	Keep the EUT in continuously transmitting in WCDMA band II mode
WCDMA band IV mode	Keep the EUT in continuously transmitting in WCDMA band IV mode
WCDMA band V mode	Keep the EUT in continuously transmitting in WCDMA band V mode
LTE band 2 mode	Keep the EUT in continuously transmitting in LTE band 2 mode
LTE band 4 mode	Keep the EUT in continuously transmitting in LTE band 4 mode
LTE band 5 mode	Keep the EUT in continuously transmitting in LTE band 5 mode
LTE band 12 mode	Keep the EUT in continuously transmitting in LTE band 12 mode
LTE band 13 mode	Keep the EUT in continuously transmitting in LTE band 13 mode
LTE band 14 mode	Keep the EUT in continuously transmitting in LTE band 14 mode
LTE band 66 mode	Keep the EUT in continuously transmitting in LTE band 66 mode
LTE band 71 mode	Keep the EUT in continuously transmitting in LTE band 71 mode

3.4 Additions to, deviations, or exclusions from the method

No

3.5 Laboratory Facility

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

● **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber and 10m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L15527**

JianYan Testing Group Shenzhen Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L15527.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

3.6 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info-JYTee@lets.com, Website: <http://jyt.lets.com>

4 Technical Requirements Specification

4.1 Limits

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 1.1307(b)

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

4.2 Test Procedure

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

Where:

S = power density

P = power input to the antenna

G = numeric gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna

4.3 Result

Frequency (MHz)	Maximum Output power (dBm)	Maximum Output power (mW)	Antenna Gain (dBi)	Antenna Gain (numeric)	Distance (cm)	Result (mW/cm ²)	Limits for General Population/ Uncontrolled Exposure (mW/cm ²)
2.4G Wi-Fi							
2412	19.26	84.333	3.5	2.24	20.00	0.038	1.0
WCDMA							
Band II	23.17	207.491	3.5	2.24	20.00	0.092	1.0
Band IV	23.39	218.273	3.5	2.24	20.00	0.097	1.0
Band V	23.01	199.986	3.5	2.24	20.00	0.089	0.55
LTE							
Band 2	23.85	242.661	3.5	2.24	20.00	0.108	1.0
Band 4	23.72	235.505	3.5	2.24	20.00	0.105	1.0
Band 5	23.61	229.615	3.5	2.24	20.00	0.102	0.55
Band 12	23.74	236.592	3.5	2.24	20.00	0.105	0.47
Band 13	23.85	242.661	3.5	2.24	20.00	0.108	0.52
Band 14	23.90	245.471	3.5	2.24	20.00	0.109	0.53
Band 66	23.82	240.991	3.5	2.24	20.00	0.107	1.0
Band 71	23.47	222.331	3.5	2.24	20.00	0.099	0.44

Simultaneous transmission(Worse mode):

ANT No.	Mode	Ratio	Total Ratio	Limit
Main ANT	2.4G Wi-Fi	0.038	0.321	1.00
Secondary ANT	WCDMA Band IV	0.097		
	LTE Band 5	0.186		

Note: 1. Just the worst case mode was shown in report.

2. The WCDMA Max Output Power Please refer to R1907A0408-R1V1, R1907A0408-R2V1, R1907A0408-R3V1 report, LTE Max Output Power Please refer to R1907A0408-R2V1, R1907A0408-R1V1, R1907A0408-R3V1, R1907A0408-R4V1 report.

4.4 Conclusion

The device is exempt from the SAR test and satisfies RF exposure evaluation.

-----End of report-----