

RF Exposure Evaluation Report

Product : Smart lock
Trade mark : ofo
Model/Type reference : TWX5G02
Serial Number : N/A
Report Number : EED32J00098304
FCC ID : 2AMBSTWX5G02-1
Date of Issue : Jun. 13, 2017
Test Standards : 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB 447498 D01v06
Test result : PASS

Prepared for:

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Date:

Jun. 13, 2017

Check No.: 2447639457



2 Version

Version No.	Date	Description
00	Jun. 13, 2017	Original

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4 General Information

4.1 Client Information

Applicant:	Dongxia Datong(Beijing) Management and Consulting Co.,Ltd
Address of Applicant:	11th Floor, Ideal Plaza, No.58, North 4th Ring Road West, Haidian District, Beijing, P.R. China
Manufacturer:	Dongxia Datong(Beijing) Management and Consulting Co.,Ltd.
Address of Manufacturer:	11th Floor, Ideal Plaza, No.58, North 4th Ring Road West, Haidian District, Beijing, P.R. China
Factory 1:	Hi-P(Shanghai)Housing APPLIANCE Co.,Ltd.
Address of Factory 1:	Factory buildings 4#, No.79 Jinwen road, Zhuqiao Airport Industrial ZONE, Pudong New Area Shanghai China 201323
Factory 2:	Flextronics Computing (SuZhou) Co.,Ltd
Address of Factory 2:	No. 1 Guanpu Road, Guoxiang Street, Wuzhong District Suzhou, Jiangsu, China, 215124

4.2 General Description of EUT

Product Name:	Smart lock
Model No.:	TWX5G02
Trade Mark:	ofo
EUT Supports Radios application:	GSM 850/1900 GPRS,EGPRS, WCDMA Band II(1900MHz), Band V(850MHz), BT 4.0 BLE, GPS L1:1575.42MHz
Power Supply:	3.6V,19Ah

4.3 Product Specification subjective to this standard

Modulation Type:	DSSS, OFDM,
Sample Type:	Fixed production
Antenna Type:	PIFA
Antenna Gain:	BT: 2.2dBi , GSM850MHz:-2.9dBi, GSM1900MHz:0.48dBi WCDMA850MHz:-2.9dBi, WCDMA1900MHz:0.48dBi
Test Voltage:	DC 3.6V
Sample Received Date:	May 23, 2017
Sample tested Date:	May 23, 2017 to Jun. 12, 2017
The tested sample and the sample information are provided by the client.	

4.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 3368 3668 Fax:+86 (0) 755 3368 3385

No tests were sub-contracted.

4.5 Test Facility

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

CNAS-Lab Code: L1910

Centre Testing International Group Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories..

A2LA-Lab Cert. No. 3061.01

Centre Testing International Group Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 886427

Centre Testing International Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 886427.

IC-Registration No.: 7408A-2

The 3m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408A-2 .

IC-Registration No.: 7408B-1

The 10m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408B-1.

NEMKO-Aut. No.: ELA503

Centre Testing International Group Co., Ltd. has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10.

VCCI

The Radiation 3 & 10 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-4096.

Main Ports Conducted Interference Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-4563.

Telecommunication Ports Conducted Disturbance Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-2146.

The Radiation 3 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-758

4.6 Deviation from Standards

None.

4.7 Abnormalities from Standard Conditions

None.

4.8 Other Information Requested by the Customer

None.

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

A rough estimation of the expected exposure in power flux density on a given point can be made with the following equation:

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

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

EIRP = P*G

The antenna of the product, under normal use condition is at least 20 cm away from the body of the user.

Warning statement to the user for keeping at least 20cm separation distance and the prohibition of operating to a person has been printed on the user's manual. Therefore, the S of the device is calculated with R=20cm, and if it is below the limit S, then we can conclude the device complies with the rules.

5.1.2 Test Procedure

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

5.1.3 EUT RF Exposure Evaluation

Antenna Gain: BT: 2.2dBi , GSM850MHz: -2.9dBi, GSM1900MHz: 0.48dBi

WCDMA850MHz: -2.9dBi, WCDMA1900MHz: 0.48dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

BT 4.0

Channel	Frequency (MHz)	Max Conducted Peak Output Power(dBm)	Gain (dBi)	EIRP* (dBm)	EIRP (mW)	R (cm)	S (mW/cm ²)	Limit (mW/cm ²)	Result
Lowest	2402	0.02	2.2	2.22	1.67	20	0.00033	1.0	Pass

GSM850MHz

Channel	Mode	Freq. (MHz)	Max Conducted Peak Output Power (dBm)	Division Factors	Max Conducted Peak Output Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	R (cm)	S (mW/c m ²)	Limit (mW/cm ²)	Result
Middle	1TS* (1/8)	836.6	35.18	-9.19	25.99	-2.9	23.09	203.70	20	0.041	0.558	Pass

GSM1900MHz

Channel	Mode	Freq. (MHz)	Max Conducted Peak Output Power (dBm)	Division Factors	Max Conducted Peak Output Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	R (cm)	S (mW/c m ²)	Limit (mW/cm ²)	Result
Lowest	1TS* (1/8)	836.6	32.25	-9.19	23.06	0.48	23.54	225.94	20	0.045	0.558	Pass

WCDMA850MHz

Channel	Frequency (MHz)	Max Conducted Peak Output Power(dBm)	Gain (dBi)	EIRP* (dBm)	EIRP (mW)	R (cm)	S (mW/cm ²)	Limit (mW/cm ²)	Result
Middle	836.4	23.51	-2.9	20.61	115.08	20	0.023	0.558	Pass

WCDMA1900MHz

Channel	Frequency (MHz)	Max Conducted Peak Output Power(dBm)	Gain (dBi)	EIRP* (dBm)	EIRP (mW)	R (cm)	S (mW/cm ²)	Limit (mW/cm ²)	Result
Lowest	1852.4	24.23	0.48	24.71	295.80	20	0.059	1.0	Pass

Note: Refer to report No. EED32J00098301, EED32J00098302, EED32J00098303 for EUT test Max Conducted Peak Output Power value.

PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32J00098302 for EUT external and internal photos.

*** End of Report ***

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