



No.:
FCCSZ2025-0015-H

TEST REPORT

FCC ID : 2ASWYSOLARGUARDX110

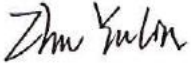
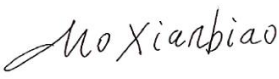
NAME OF SAMPLE : Solar powered E-lock

APPLICANT : SHENZHEN TOPFLYtech CO., LIMITED

CLASSIFICATION OF TEST : N/A

CVC Testing Technology (Shenzhen) Co., Ltd.



Applicant	Name: SHENZHEN TOPFLYtech CO., LIMITED Address: Rm 409, Scientific Research Building, Tsinghua Hi-tech Park Hi-tech Industrial Nanshan District, Shenzhen, Guangdong, China		
Manufacturer	Name: SHENZHEN TOPFLYtech CO., LIMITED Address: Rm 409, Scientific Research Building, Tsinghua Hi-tech Park Hi-tech Industrial Nanshan District, Shenzhen, Guangdong, China		
Equipment Under Test	Product Name: Solar powered E-lock Model Name: SolarGuardX 110 Brand Name: TOPFLYtech Serial NO.: N/A Sample NO.: 4-1		
Date of Receipt.	Feb. 09, 2025	Date of Testing	Feb. 09, 2025 ~ Apr. 25, 2025
Test Specification		Test Result	
FCC Part 2 (Section 2.1091) KDB 447498 D04v01 IEEE C95.1		PASS	
Evaluation of Test Result	The equipment under test was found to comply with the requirements of the standards applied. Seal of CVC Issue Date: Apr. 25, 2025		
Compiled by:  Zhu Yulin Name Signature	Reviewed by:  Mo Xianbiao Name Signature	Approved by:  Dong Sanbi Name Signature	
Other Aspects: NONE.			
Abbreviations: OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested			

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCCSZ2025-0015-H	Original release	Apr. 25, 2025



1. GENERAL INFORMATION

PRODUCT NAME	Solar powered E-lock
BRAND NAME	TOPFLYtech
MODEL NAME	SolarGuardX 110
ADDITIONAL MODEL	N/A
POWER SUPPLY	1. DC 5V from USB host 2. DC 3.6V from Li-Polymer battery
MODULATIONTECHNOLOGY	GFSK, ASK
MODULATION TYPE	GFSK for BT-LE ASK for NFC
OPERATING FREQUENCY	2402MHz ~ 2480MHz for BT-LE (1Mbps/2Mbps) 13.56MHz for NFC
ANTENNA TYPE AND GAIN (Remark 4/5)	See Section 5
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	Single-ended charging cable, 60cm
Remark: 1. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual. 2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report. 3. Please refer to the EUT photo document for detailed product photo. (Report NO.: FCCSZ2025-0015-EUT) 4. Please refer to the antenna report. 5. Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, CVC is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.	

2. DESCRIPTION OF ACCESSORIES

N/A



3. RF EXPOSURE LIMIT

(Option B) According to FCC Part2.1091 and FCC Part1.1307b, the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}}(d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where:

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz;

and

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

(Option C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP 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 (1.64 linear value).

Table 1 to §1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency (MHz)	Threshold ERP (W)
0.3 - 1.34	$1920R^2$
1.34 - 30	$3450R^2 / f^2$
30 - 300	$3.38R^2$
300 - 1500	$0.0128R^2 / f^2$
1500 - 100000	$19.2R^2$



For multiple RF sources: Multiple RF sources are exempt if:

- a) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).
- b) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for Pth, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

Pi = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

Pth,i = the exemption threshold power (Pth) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i.

ERPj = the ERP of fixed, mobile, or portable RF source j.

ERPth,j = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least λ/2π according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

Evaluatedk = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

Exposure Limitk = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from § 1.1310 of this chapter.



4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

Mode	Frequency (MHz)	Peak Gain (dBi)
BT-LE	2402 ~ 2480	1.36
NFC	13.56	/
GSM850*	824 ~ 849	-1.08
GSM1900*	1850 ~ 1910	1.12
LTE B2*	1850 ~ 1910	1.12
LTE B4*	1710 ~ 1755	0.93
LTE B5*	824 ~ 849	-1.08
LTE B7*	2500 ~ 2570	0.74
LTE B12*	699 ~ 716	-1.96
LTE B13*	777 ~ 787	-1.63
LTE B17*	704 ~ 716	-2.05
LTE B25*	1850 ~ 1915	1.12
LTE B26*	814~ 849	-1.08
LTE B38*	2570 ~ 2620	0.66
LTE B40*	2305 ~ 2315	1.03
	2350 ~ 2360	1.25
LTE B41*	2496 ~ 2690	0.68
LTE B66*	1710 ~ 1780	0.93

Remark:

1. This is provided by the manufacturer. The laboratory is not responsible for technical data provided by the customer.
2. *The EUT contains a certified module (FCC ID: XMR2023EG912UGL), according to the MPE reports of FCC ID: XMR2023EG912UGL, Date of Grant: 02/28/2023.



6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

Option	Mode	Maximum Conducted Avg Power (dBm)	Target Power (dBm)	Tolerance (dBm)	Lower Tolerance (dBm)	Upper Tolerance (dBm)
B	BT-LE	5.26	5	+ -1	4	6
	GSM850* (1 Tx slot)	26.00	26	+ -1	25	27
	GSM1900* (1 Tx slot)	22.00	22	+ -1	21	23
	LTE B2*	25.00	25	+ -1	24	26
	LTE B4*	25.00	25	+ -1	24	26
	LTE B5*	25.00	25	+ -1	24	26
	LTE B7*	25.00	25	+ -1	24	26
	LTE B12*	25.00	25	+ -1	24	26
	LTE B13*	25.00	25	+ -1	24	26
	LTE B17*	25.00	25	+ -1	24	26
	LTE B25*	25.00	25	+ -1	24	26
	LTE B26*	25.00	25	+ -1	24	26
	LTE B38*	25.00	25	+ -1	24	26
	LTE B40*	25.00	25	+ -1	24	26
	LTE B41*	25.00	25	+ -1	24	26
	LTE B66*	25.00	25	+ -1	24	26

Rematk: *The EUT contains a certified module (FCC ID: XMR2023EG912UGL), according to the MPE reports of FCC ID: XMR2023EG912UGL, Date of Grant: 02/28/2023.

Option	Mode	Frequency (MHz)	EIRP(dBm)	ERP(dBm)	Target Power (dBm)	Tolerance (dBm)	Lower Tolerance (dBm)	Upper Tolerance (dBm)
C	NFC	13.56	-46.45	-48.60	-49	+ -1	-50	-48

Note: EIRP= 8.75dBuV/m + 40(Distance 30m to 3m factor) - 95.2, for d=3m.



Option	Mode	Maximum tune up power (dBm)	Maximum Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Part1.1307b Threshold (mW)	Ratio	Verify
B	BT-LE	6	1.36	7.36	5.21	3.32	3060	0.001	PASS
	GSM850*	27	-1.08	25.92	23.77	238.23	1680.96	0.142	PASS
	GSM1900*	23	1.12	24.12	21.97	157.40	3060	0.051	PASS
	LTE B2*	26	1.12	27.12	24.97	314.05	3060	0.103	PASS
	LTE B4*	26	0.93	26.93	24.78	300.61	3060	0.098	PASS
	LTE B5*	26	-1.08	24.92	22.77	189.23	1680.96	0.113	PASS
	LTE B7*	26	0.74	26.74	24.59	287.74	3060	0.094	PASS
	LTE B12*	26	-1.96	24.04	21.89	154.53	1425.96	0.108	PASS
	LTE B13*	26	-1.63	24.37	22.22	166.72	1585.08	0.105	PASS
	LTE B17*	26	-2.05	23.95	21.8	151.36	1436.16	0.105	PASS
	LTE B25*	26	1.12	27.12	24.97	314.05	3060	0.103	PASS
	LTE B26*	26	-1.08	24.92	22.77	189.23	1660.56	0.114	PASS
	LTE B38*	26	0.66	26.66	24.51	282.49	3060	0.092	PASS
	LTE B40*	26	1.25	27.25	25.1	323.59	3060	0.106	PASS
	LTE B41*	26	0.68	26.68	24.53	283.79	3060	0.093	PASS
	LTE B66*	26	0.93	26.93	24.78	300.61	3060	0.098	PASS

Rematk: *The EUT contains a certified module (FCC ID: XMR2023EG912UGL), according to the MPE reports of FCC ID: XMR2023EG912UGL, Date of Grant: 02/28/2023.

Option	Technology	Maximum tune up power (dBm)	ERP(W)	Threshold ERP (W)	Ratio	Verify
C	NFC	-48	0.00002	0.75	0.00003	PASS

CALCULATION FOR SIMULTANEOUS TRANSMISSION:

BT-LE and GSM, LTE can transmit simultaneously, the formula of calculated the MPE is

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

Max: 0.001 + 0.142 + 0.000003= 0.143< 1,which is less than the “1” limit.

----- End of the Report -----



Important

- (1) The test report is invalid without the official stamp of CVC;
- (2) Any part photocopies of the test report are forbidden without the written permission from CVC;
- (3) The test report is invalid without the signatures of Approval and Reviewer;
- (4) The test report is invalid if altered;
- (5) Objections to the test report must be submitted to CVC within 15 days.
- (6) Generally, commission test is responsible for the tested samples only.
- (7) As for the test result “-” or “N” means “not applicable”, “/” means “not test”, “P” means “pass” and “F” means “fail”

Address: No. 1301-14&16, Guanguang Road, Xinlan Community, Guanlan Street, Longhua District, Shenzhen City, Guangdong Province 518110 P.R.China

Post Code: 518110 Tel: 0755-23763060-8805

Fax: 0755-23763060 E-mail: sz-kf@cvc.org.cn

<http://www.cvc.org.cn>