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Dates of Tests: July 9, 2024  
Test Report S/N: LR500112407E  
Test Site : LTA CO., LTD.

## CERTIFICATION OF COMPLIANCE

FCC ID.	<b>2AQAV-FX400TWR</b>
APPLICANT	<b>SMARTeLock CO., LTD.</b>

<b>Equipment Class</b>	:	<b>Digital Transmission System (DTS)</b>
<b>Manufacturing Description</b>	:	<b>LOCKER LOCK</b>
<b>Manufacturer</b>	:	<b>SMARTeLock CO., LTD.</b>
<b>Model name</b>	:	<b>FX400TWR</b>
<b>Variant Model name</b>	:	<b>SL200TWR, SL200, SL200WR, SL200TW, SL200M, FX400, FX400WR, FX400TW, SL400, SL400A, SL400B, SL400C</b>
<b>Test Device Serial No.:</b>	:	<b>Identical prototype</b>
<b>Rule Part(s)</b>	:	<b>FCC Part 15.247 Subpart C ; ANSI C63.10 - 2013</b>
<b>Frequency Range</b>	:	<b>2402 ~ 2480 MHz - BLE 2405 ~ 2480 MHz - Zigbee</b>
<b>Max. Output Power</b>	:	<b>Max -9.19 dBm - Conducted</b>
<b>Data of issue</b>	:	<b>July 9, 2024</b>

This test report is issued under the authority of:

The test was supervised by:

Ja-Beom Koo, Manager

Jae-hum Yun, Test Engineer

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## 1. General information

### 1-1 Test Performed

Company name : LTA Co., Ltd.  
 Address : 243, Jubug-ri, Yangji-Myeon, Youngin-Si, Kyunggi-Do, Korea. 449-822  
 Web site : <http://www.ltalab.com>  
 E-mail : [chahn@ltalab.com](mailto:chahn@ltalab.com)  
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Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competents of calibration and testing laboratory”.

### 1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
	KOREA		-	
RRA	U.S.A	KR0049	2025-03-29	RRA accredited Lab.
	CANADA		2024-08-15	
		C-14948	2026-09-10	
VCCI	JAPAN	T-12416	2026-09-10	VCCI registration
		R-14483	2026-10-15	
		G-10847	2024-12-13	
KOLAS	KOREA	KT551	2025-10-12	KOLAS accredited Lab.

## 2. Information about test item

### 2-1 Client & Manufacturer

Client Company name : SMARTeLock CO., LTD.  
 Address : B402, Geumgang Penterium IT Tower, 215, Galmachiro, Jungwon gu,  
 Seongnam-si, Gyeonggi-do South Korea 13217  
 Tel / Fax : TEL No : +82-010-3673-7884/ FAX No : +82-031-743-7276  
 Manufacturer : SMARTeLock CO., LTD.  
 Address : B402, Geumgang Penterium IT Tower, 215, Galmachiro, Jungwon gu,  
 Seongnam-si, Gyeonggi-do South Korea 13217  
 Tel / Fax : TEL No : +82-010-3673-7884/ FAX No : +82-031-743-7276

### 2-2 Equipment Under Test (EUT)

Model name : FX400TWR  
 Serial number : Identical prototype  
 Date of receipt : June 13, 2024  
 EUT condition : Pre-production, not damaged  
 Antenna type : Chip antenna (Gain : 3.5i)  
 Frequency Range : 2402 ~ 2480 MHz - BLE  
 : 2405 ~ 2480 MHz - Zigbee  
 RF output power : Max -9.19 dBm – BLE, Conducted  
 : Max -10.16 dBm –Zigbee, Conducted  
 Type of Modulation : GFSK, O-QPSK  
 Power Source : DC 6 V

### 2-3 Tested frequency

	LOW	MID	HIGH
Frequency (MHz) BLE	2402	2440	2480
Frequency (MHz) Zigbee	2405	2440	2480

### 2-4 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
Notebook	-	MS-1736	MSI

### 3. Test Report

#### 3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
§ 1.1310 and §2.1091	RF EXPOSURE EVULATION	-	-	C

*Note 1:* C=Complies    NC=Not Complies    NT=Not Tested    NA=Not Applicable

**3.2 RF EXPOSURE EVULATION**

**1.1 Limit**

According to §1.1310 and §2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength	Magnetic field Strength	Power density (mW/cm <sup>2</sup> )	Averaging time
1.34 - 30.....	824/f	2.19/f	*(180/ f <sup>2</sup> )	30
30 - 300.....	27.5	0.073	0.2	30
300 - 1500.....	.....	.....	<b>f/1500</b>	30
1500 - 100.000.....	.....	.....	1.0	30

F = frequency in MHz  
 \* = Plane-wave equivalent power density

**1.2 MAXIMUM PERMISSIBLE EXPOSURE Prediction**

Prediction of MPE limit at a given distance

**Power density at the specific separation:**

<p><math>S = PG/(4R^2\pi)</math></p> <p><math>S = (0.1 * 2.24) / (4 * 20^2 * \pi)</math></p> <p><math>S = 0.002 \text{ mW/cm}^2</math></p>	<p>Where,</p> <p>S = Maximum power density (mW/cm<sup>2</sup>)</p> <p>P = Power input to the antenna (mW)</p> <p>G = Numeric power gain of the antenna</p> <p>R = Distance to the center of the radiation of the antenna (20 cm = limit for MPE)</p>
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### 1.3 MAXIMUM PERMISSIBLE EXPOSURE Prediction

- Calculated under the worst-case conditions of each mode.

(Measured power 3 dBm ± 0.5dB)

#### 2.4GHz Mode

Max Peak output Power at antenna input terminal	-9.19	dBm
Max Peak output Power at antenna input terminal	0.1	mW
Prediction distance	0.5	cm
Prediction frequency	2440	MHz
Antenna Gain(typical)	3.5	dBi
Antenna Gain(numeric)	2.24	-

SAR Test exclusion thresholds for 100MHz to 6GHz at test separation distance ≤ 50 mm = **Used**

$[(\text{max.power of channel, including tune-up torelance, mW})/(\text{min. test separation distance, mm})] * [\sqrt{f}(\text{GHz})]$

$= [0.1 / 5] * [\sqrt{2.440}] = 0.03 \leq 3.0$ , for 1g SAR

**Thus, SAR for this device is not required.**

Max Peak output Power at antenna input terminal	-10.16	dBm
Max Peak output Power at antenna input terminal	0.1	mW
Prediction distance	0.5	cm
Prediction frequency	2440	MHz
Antenna Gain(typical)	3.5	dBi
Antenna Gain(numeric)	2.24	-

SAR Test exclusion thresholds for 100MHz to 6GHz at test separation distance ≤ 50 mm = **Used**

$[(\text{max.power of channel, including tune-up torelance, mW})/(\text{min. test separation distance, mm})] * [\sqrt{f}(\text{GHz})]$

$= [0.1 / 5] * [\sqrt{2.440}] = 0.03 \leq 3.0$ , for 1g SAR

**Thus, SAR for this device is not required.**

**RFID Mode**

According to the calculation formula of power

$$E.I.R.P [dBm] = E[dBuV/m] + 20\log(d[m]) - 104.77$$

E is electric field strength in dBuV/m;

d is measurement distance in meters (m);

E.I.R.P.[dBm] is the equivalent isotropically radiated power in dBm(above 1GHz);

Modulation	Channel Freq. (MHz)	Maximum Field strenath @3m (dBuv/m)	Calculated E.I.R.P. (dBm)	Maximum Output power (mW)
FSK	13.56	55.67	-39.55	0.0001

ss

Number of concurrent transfers

2.4 GHz + RFID

Conditions for Simultaneous Transmission

$$2.4GHz + RFID = 0.03 + 0.03 + 0.01 = 0.21 \leq 3.0, \text{ for } 1g \text{ SAR}$$