

TEST REPORT

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1. Client

- Name : ASSA ABLOY KOREA Co., Ltd Unilock
- Address : 10-Floor, 186, Gasan digital 1-ro, Geumcheon-gu, Seoul, Republic of Korea
- Date of Receipt : 2020-02-06

2. Use of Report : Certification

3. Name of Product and Model : Smart Cabinet Lock / SCL01-1

4. Manufacturer and Country of Origin : ASSA ABLOY KOREA Co., Ltd Unilock / Korea

5. FCC ID : 2AJUHCBA

6. Date of Test : 2020-02-17 to 2020-02-25

7. Test Standards : 47 CRF Part 1.1310

8. Test Results : Refer to the test result in the test report

Affirmation	Tested by Name : Hosung Lee 	Technical Manager Name : Heesu Ahn 
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2020-04-20

KCTL Inc.

As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by KCTL Inc.

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Page (2) of (8)

**Report revision history**

Date	Revision	Page No
2020-04-17	Initial report	-
2020-04-20	Updated Maximum tune-up tolerance table	7

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Note. The report No. KR20-SRF0104 is superseded by the report No. KR20-SRF0104-A.



CONTENTS

1. General information	4
2. Device information	4
2.1. Information about derivative model.....	4
2.2. Frequency/channel operations.....	5
3. Measurement uncertainty	5
4. RF Exposure.....	6
4.1. Test results.....	7
5. Measurement Equipment.....	8



1. General information

Client : ASSA ABLOY KOREA Co., Ltd Unilock.
Address : 10-Floor, 186, Gasan digital 1-ro, Geumcheon-gu, Seoul, Republic of Korea
Manufacturer : ASSA ABLOY KOREA Co., Ltd Unilock
Address : 10-Floor, 186, Gasan digital 1-ro, Geumcheon-gu, Seoul, Republic of Korea
Laboratory : KCTL Inc.
Address : 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Accreditations : FCC Site Designation No: KR0040, FCC Site Registration No: 687132
VCCI Registration No. : R-20080, G-20078, C-20059, T-20056
Industry Canada Registration No. : 8035A
KOLAS No.: KT231

2. Device information

Equipment under test : Smart Cabinet Lock
Model : SCL01-1
Derivative models : SCL02-1, SCL03-1, SCL04-1, SCL06-1
Frequency range : 2 402 MHz ~ 2 480 MHz
Modulation technique : GFSK
Number of channels : 40 ch
Power source : DC 3 V
Antenna specification : PCB Pattern Antenna
Antenna gain : -1.55 dBi
Software version : V 2.0.4
Hardware version : V 2.0
Test device serial No. : N/A
Operation temperature : -20 °C ~ 50 °C

2.1. Information about derivative model

The difference between basic model and derivative models is:

The basic and derivative model are electrically identical.

The derivative models is only for the simplified derivation based on buyer's model name.

2.2. Frequency/channel operations

This device contains the following capabilities:

Bluetooth Low Energy

Ch.	Frequency (MHz)
00	2 402
.	.
19	2 440
.	.
39	2 480

Table 2.2.1. Bluetooth Low Energy

3. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicated a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded uncertainty (\pm)
Conducted RF power	1.23 dB

4. RF Exposure

FCC

Regulation

This document is prepared to show compliance with the RF Exposure requirements as required in §1.1310 of the FCC rules and Regulations.

The limit for Maximum Permissible Exposure (MPE), specified in FCC §1.1310, is listed in Table 1-1. According to FCC §1.1310: the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(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 [minute]
(A) Limits for Occupational / Controlled Exposure				
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 ~ 1 500	/	/	f/300	6
1 500 ~ 15 000	/	/	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 ~ 1 500	/	/	f/1 500	30
1 500 ~ 15 000	/	/	1.0	30

f=frequency in MHz, * = plane-wave equivalent power density

Per the guidance of KDB 680106, the E-field and H-field limits shown in the table above are extended down to 100 kHz

4.1. Test results

FCC

MPE (Maximum Permissive Exposure) Prediction

Predication of MPE limit at a given distance: Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2 \quad (\Rightarrow R = \sqrt{PG/4\pi S})$$

S = power density [mW/cm^2]

P = Power input to antenna [mW]

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

R = distance to the center of radiation of the antenna [cm]

Calculation Result of RF exposure (FCC)

Maximum tune-up tolerance

Mode	Frequency [MHz]	Max Tune-up Power [dBm]	Max Tune-up Power [mW]	Ant Gain [dBi]	Ant Gain [mW]	Power density at 20 cm [mW/cm^2]	Limit [mW/cm^2]
BLE/1 Mbps	2 480	1.00	1.26	-1.55	0.70	0.000 18	1.00

Note.

1. The power density P_d (5th column) at a distance of 20 cm calculated from the friis transmission Formula is far below the limit of 1 mW/cm^2 .

5. Measurement Equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Pulse Power Meter	ANRITSU	ML2495A	1608009	2019-07-31	2020-07-31
Pulse Power Sensor	ANRITSU	MA2411B	1726174	2019-07-31	2020-07-31
Attenuator	Weinschel ENGINEERING	56-10	51395	2020-01-22	2021-01-22

End of test report

