

FCC/IC TEST REPORT

Reference No. : GPSR2103000027EG

Applicant : iRevo-ASSA ABLOY Korea

Equipment Under Test (EUT) :

Product Name : Yale Smart Safe

Model Name : YRSF-MD-BLE-BLK

FCC Authorization Type : Certificate of Conformity

Applied Standards : FCC Part 15 Subpart B,
ICES-003 Issue 7: 2020,
ANSI C 63.4:2014

FCC ID : 2ABFG-IESD100PG0

IC Certification : 11626A-IESD100PG0

Date of Receipt : 2021-02-25

Date of Test : 2021-04-06

Date of Issue : 2021-06-07

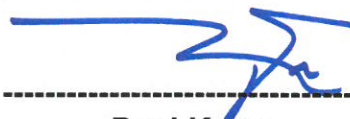
Test Results : Complied

Tested by :



Calix Kim

Reviewed by :



Paul Kang

This test report does not assure KOLAS accreditation.

1) The results of this test report are effective only to the items tested.

2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

Remarks :

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The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full

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Revision History

Revision	Report Number	Description
0	F690501-RF-EMG000522	Initial
1		
2		



1. General Information

1.1 Client Information

Applicant : iRevo-ASSA ABLOY Korea
- Address of Applicant : 10f of JEI PLATZ Bldg., 186, Gasandigital 1-ro, Geumcheon-gu, Seoul, 08502, Korea.

Manufacturer 1 : iRevo-ASSA ABLOY Korea
- Address of Manufacturer 1 : 10f of JEI PLATZ Bldg., 186, Gasandigital 1-ro, Geumcheon-gu, Seoul, 08502, Korea.

Manufacturer 2 : PREGEX PRODUCTS(SUZHOU) CO., LTD.
- Address of Manufacturer 2 : No.18 East Chungshenhu Road, Xiangcheng District, Suzhou, China.

Factory : PREGEX PRODUCTS(SUZHOU) CO., LTD.
- Address of Factory : No.18 East Chunshenhu Road, Xiangcheng District, Suzhou, China.

1.2 Test Laboratory

Name and Address : SGS Korea Co., Ltd.
- Giheung 1 Laboratory : 35, Giheungdanji-ro 121beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea
- Giheung 2 Laboratory : 23, Giheungdanji-ro 24beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea
- Gunpo Laboratory : 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, 15807, Republic of Korea.

FCC Registration No. : KR0150
IC Registration No. : 7837B

Phone : + 82 31 428 5719
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e-mail : paul.kang@sgs.com

1.3 General Information of E.U.T.

Classification	Description
Product Name	Yale Smart Safe
Model Name	YRSF-MD-BLE-BLK
Serial No.	None
EMI Classification	Class B
Test Voltage	6 Vd.c.
Rated Voltage	6 Vd.c.
Internal Clock Frequency	2 402 ~ 2 480 MHz
Function	This product is an electronic door lock.



1.4 Operating Modes and Conditions

Operating Mode	Operating Condition
1) Dial	Unlock to press a number.

1.5 Auxiliary Equipments

Description	Model	Serial No.	Manufacturer	FCC ID
Battery	-	-	-	-

1.6 Cable List

Start		END		Cable Spec.		Used core
Name	I/O Port	Name	I/O Port	Length	Shield	
EUT	-	-	-	-	-	-

1.7 System Configurations

Description	Model	Serial No.	Manufacturer	Note.
Main Board	SMART SAFE MAIN ALPHA2 200826	PC2M-XXXXX-E0	-	-
Motor	-	6V191128	-	-

1.8 Test System Layout



1.9 Modifications

There was no modified item during the test.

1.10 Applicable Standards for Testing

Standards	Status	Deviation
FCC Part 15 Subpart B, ICES-003 Issue 7: 2020	Applicable	No Deviation

1.11 Summary of Test Results

Test Item	Standards	Results
Radiated Emission	FCC Part 15 Subpart B Section 15.109, ICES-003 Issue 7: 2020, ANSI C 63.4:2014	Complied

Note : Test methods of all test items are performed according to the basic standards in this table.

EMISSION

2.1 Test Results

Test Items	Basic Standards	Test Results
Radiated Emission	FCC Part 15 Subpart B Section 15.109, ICES-003 Issue 7: 2020, ANSI C 63.4:2014	Complied

2.2 Test Method and Limits

2.2.1 Test Method

Test Items	Measuring Frequency Range	RBW	Measuring Distance
Radiated Emission	30 MHz ~ 1 GHz	120 kHz	10 m & 3 m
	Above 1 GHz	1 MHz	3 m

Note : 10 m method of radiated emission measurement is only applied to Class A equipment over the frequency range of 30 MHz ~ 1 GHz. Except this, 3 m method is applied to Class B equipment over the frequency range of 30 MHz ~ 1 GHz and Class A and Class B equipment above 1 GHz.

2.2.2 Test Limits

-Radiated Emission Limits below 1 GHz

Frequency Range	Limits(dB(μ V/m))	Class
	Quasi-peak	
30 MHz ~ 88 MHz	39.1	Class A (10m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.4	
960 MHz ~ 1 GHz	49.5	
30 MHz ~ 88 MHz	40.0	Class B (3m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.0	
960 MHz ~ 1 GHz	54.0	

-Radiated Emission Limits above 1 GHz (3m method)

Frequency Range	Limits(dB(μ V/m))		Class
	Average	Peak	
Above 1 GHz	59.5	79.5	Class A
Above 1 GHz	54.0	74.0	Class B

Note : The limits of class A equipment is extrapolated using an extrapolation factor of 20 dB/decade because it was measured at 3 m distance not 10 m distance.

2.3 Radiated Emission

The initial preliminary exploratory scans were performed at 3 m distance over the measuring frequency range(30 MHz to 13 GHz) using a max hold mode incorporating a Peak detector and using the software of EP5RE(Version Ver5.3.70 from TOYO). The final test data was measured using a Quasi-Peak detector below 1 GHz at 3 m distance and a Peak and CISPR-Average detector above 1 GHz at 3 m distance. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency.

2.3.1 Test Equipments

Description	Model No.	Manufacturer	S/N	Cal Due. Date
Horn Antenna	HF906	R & S	100326	2022-02-04
Signal Conditioning Unit	SCU 18	R & S	10117	2021-06-10
Test Receiver	ESU26	R & S	100109	2022-02-19
Bilog Antenna	VULB9163	SCHWARZBECK	01126	2022-12-22
Amplifier	8447F	HP	2944A03909	2021-08-06
3m SEMI-ANECHOIC CHAMBER	-	SY CORPORATION	-	-

Note : The Bilog Antenna calibration period is 2 years, but the other equipment calibration period are 1 year.

2.3.2 Test Site

3m SEMI-ANECHOIC CHAMBER Gunpo Laboratory (Below 1 GHz, Above 1 GHz)

2.3.3 Environment Conditions and data

Radiated Emission Test

- Below 1 GHz

Temperature (Minimum 18.9, Maximum 19.9) °C,
Humidity (Minimum 19.0, Maximum 20.0) % R.H.,
Atmospheric Pressure (Minimum 101.5, Maximum 101.5) kPa

Test Date : 2021-04-06

- Above 1 GHz

Temperature (Minimum 18.9, Maximum 19.9) °C,
Humidity (Minimum 19.0, Maximum 20.0) % R.H.,
Atmospheric Pressure (Minimum 101.5, Maximum 101.5) kPa

Test Date : 2021-04-06

Radiated Emission Test Data

- Below 1 GHz (3 m method)

Freq. (MHz)	Reading (dB μ V)	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	F/S (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
49.00	32.30	H	284	102	20.00	0.86	28.10	25.06	40.00	14.94
61.32	34.60	V	140	113	17.84	0.96	28.08	25.32	40.00	14.68
112.05	33.10	V	155	100	16.90	1.36	27.95	23.41	43.50	20.09
152.46	33.40	H	226	105	13.75	1.62	27.79	20.98	43.50	22.52
345.82	33.20	H	357	124	20.72	2.41	27.57	28.76	46.00	17.24
351.11	33.10	V	124	109	20.64	2.44	27.61	28.57	46.00	17.43

Measurement Uncertainty (Horizontal) : 4.90 dB (The confidential level is about 95%, $k=2$)

Measurement Uncertainty (Vertical) : 4.82 dB (The confidential level is about 95%, $k=2$)

Note: • AF = Antenna Factor • CL = Cable Loss • F/S = Field Strength
• Pol.(H) = Horizontal • Pol.(V) = Vertical • Amp. = Amplifier Gain
• Margin = Limit – F/S • F/S = Level + AF + CL – Amp.
• A : Angle • H : Height

- Above 1 GHz (3 m method)

(Measurement Distance : 3.7 m)

Freq. (MHz)	Level (dB μ V)		Pol. (H/V)	A (°)	H (cm)	AF (dB)	CL (dB)	Amp. (dB)	CF (dB)	F/S (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Peak	C-AV										
1176.00	33.20	-	V	331	194	25.31	4.52	45.50	1.82	19.35	74.00	54.65
1176.00	-	27.40	V	331	194	25.31	4.52	45.50	1.82	13.55	54.00	40.45
1217.50	33.00	-	H	357	105	25.21	4.58	45.49	1.82	19.12	74.00	54.88
1217.50	-	28.00	H	357	105	25.21	4.58	45.49	1.82	14.12	54.00	39.88
2600.50	34.40	-	H	74	187	28.60	7.05	45.20	1.82	26.67	74.00	47.33
2600.50	-	28.20	H	74	187	28.60	7.05	45.20	1.82	20.47	54.00	33.53
3170.50	34.60	-	V	311	100	30.38	7.87	45.46	1.82	29.22	74.00	44.78
3170.50	-	29.40	V	311	100	30.38	7.87	45.46	1.82	24.02	54.00	29.98
4188.50	36.50	-	V	335	111	32.20	9.19	45.31	1.82	34.40	74.00	39.60
4188.50	-	29.60	V	335	111	32.20	9.19	45.31	1.82	27.50	54.00	26.50
12298.15	41.90	-	V	339	100	38.60	15.70	44.79	1.82	53.23	74.00	20.77
12298.15	-	29.10	V	339	100	38.60	15.70	44.79	1.82	40.43	54.00	13.57

Measurement Uncertainty (Horizontal) : 3.62 dB (The confidential level is about 95%, $k=2$)

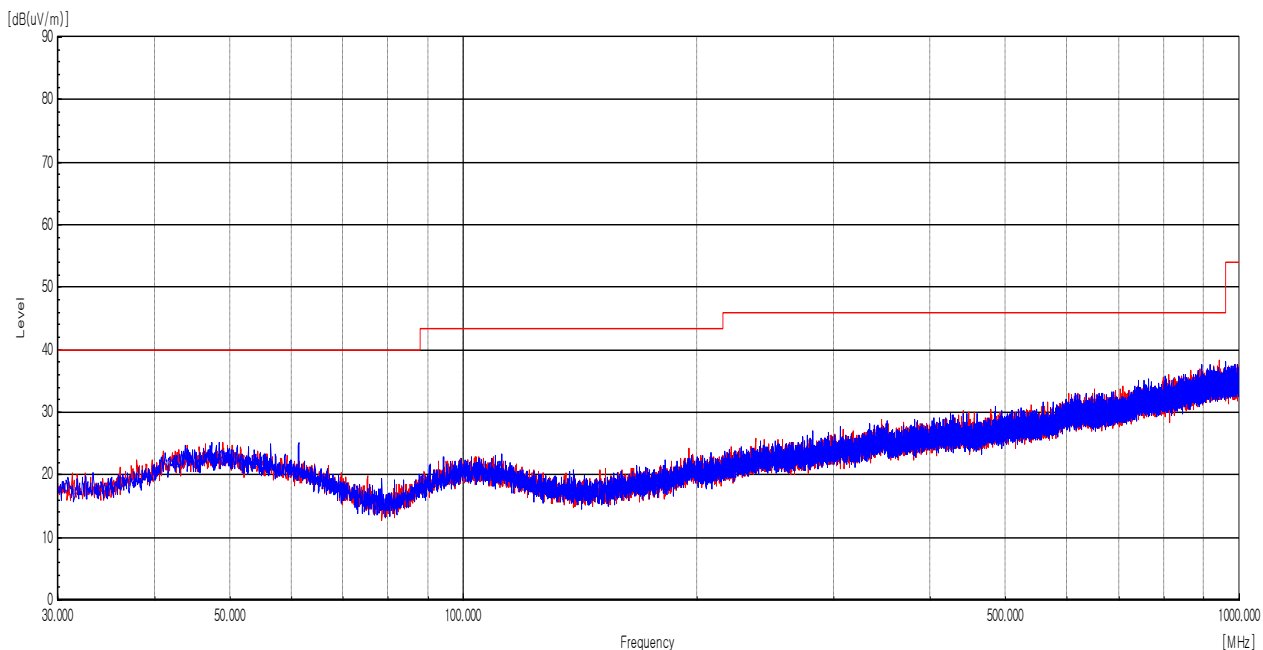
Measurement Uncertainty (Vertical) : 3.64 dB (The confidential level is about 95%, $k=2$)

Note: • AF = Antenna Factor • CL = Cable Loss • F/S = Field Strength
• Pol.(H) = Horizontal • Pol.(V) = Vertical • Amp. = Amplifier Gain
• Margin = Limit – F/S • F/S = Level + AF + CL – Amp.
• A : Angle • H : Height

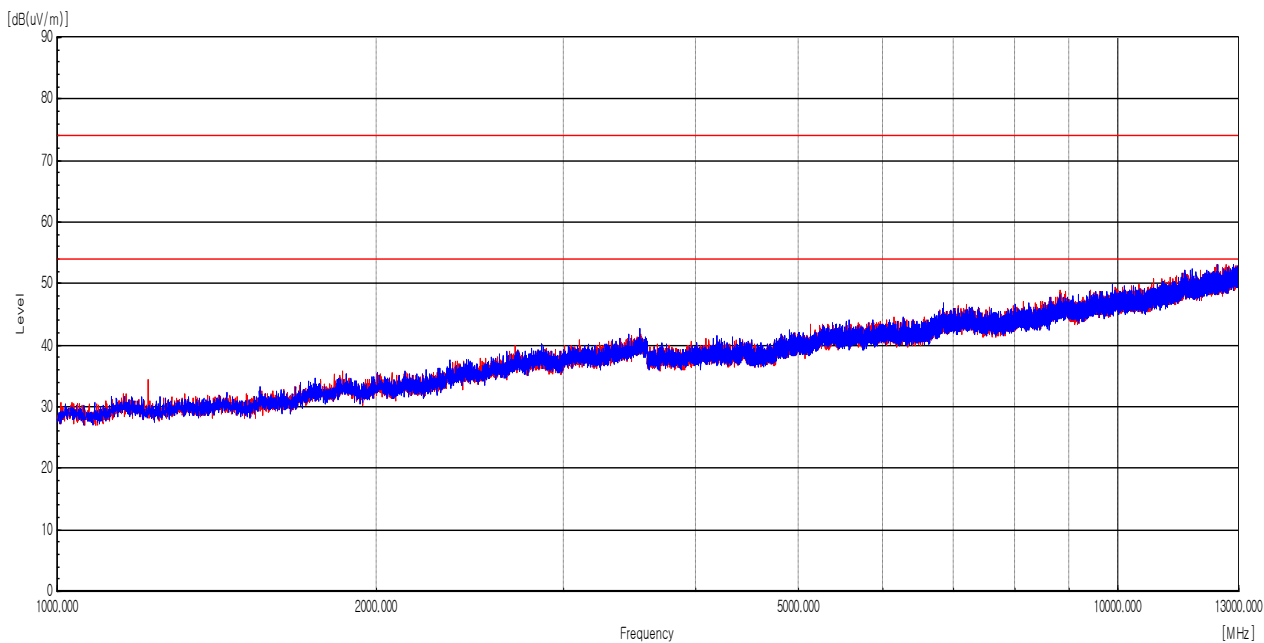
See Appendix A (Radiated Emission)

Appendix A : Radiated Emission

Below 1 GHz



Above 1 GHz



- End of the Report -