

# 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

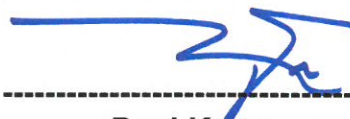
Test Results : Complied

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.

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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

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### 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,<br>ICES-003 Issue 7: 2020,<br>ANSI C 63.4:2014 | <b>Complied</b> |

## 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( $\mu$ V/m) ) | Class                           |
|-------------------|--------------------------|---------------------------------|
|                   | Quasi-peak               |                                 |
| 30 MHz ~ 88 MHz   | 39.1                     | <b>Class A<br/>(10m method)</b> |
| 88 MHz ~ 216 MHz  | 43.5                     |                                 |
| 216 MHz ~ 960 MHz | 46.4                     |                                 |
| 960 MHz ~ 1 GHz   | 49.5                     |                                 |
| 30 MHz ~ 88 MHz   | 40.0                     | <b>Class B<br/>(3m method)</b>  |
| 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( $\mu$ V/m) ) |      | Class          |
|-----------------|--------------------------|------|----------------|
|                 | Average                  | Peak |                |
| Above 1 GHz     | 59.5                     | 79.5 | <b>Class A</b> |
| Above 1 GHz     | 54.0                     | 74.0 | <b>Class B</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.<br>( MHz ) | Reading<br>( dB $\mu$ V ) | Pol.<br>( H/V ) | A<br>( ° ) | H<br>( cm ) | AF<br>( dB/m ) | CL<br>( dB ) | Amp.<br>( dB ) | F/S<br>( dB $\mu$ V/m ) | Limit<br>( dB $\mu$ V/m ) | Margin<br>( 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.<br>( MHz ) | Level (dB $\mu$ V) |       | Pol.<br>( H/V ) | A<br>( ° ) | H<br>( cm ) | AF<br>( dB ) | CL<br>( dB ) | Amp.<br>( dB ) | CF<br>( dB ) | F/S<br>( dB $\mu$ V/m ) | Limit<br>( dB $\mu$ V/m ) | Margin<br>( 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%,  $k=2$ )

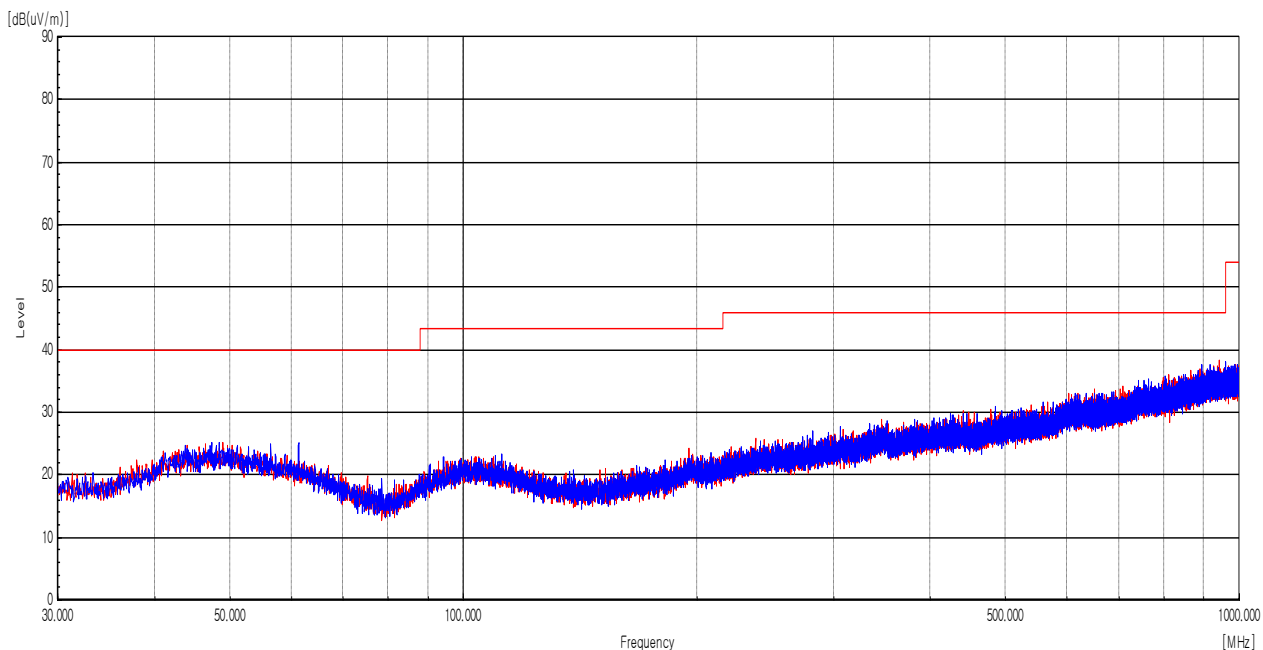
Measurement Uncertainty (Vertical) : 3.64 dB (The confidential level is about 95%,  $k=2$ )

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

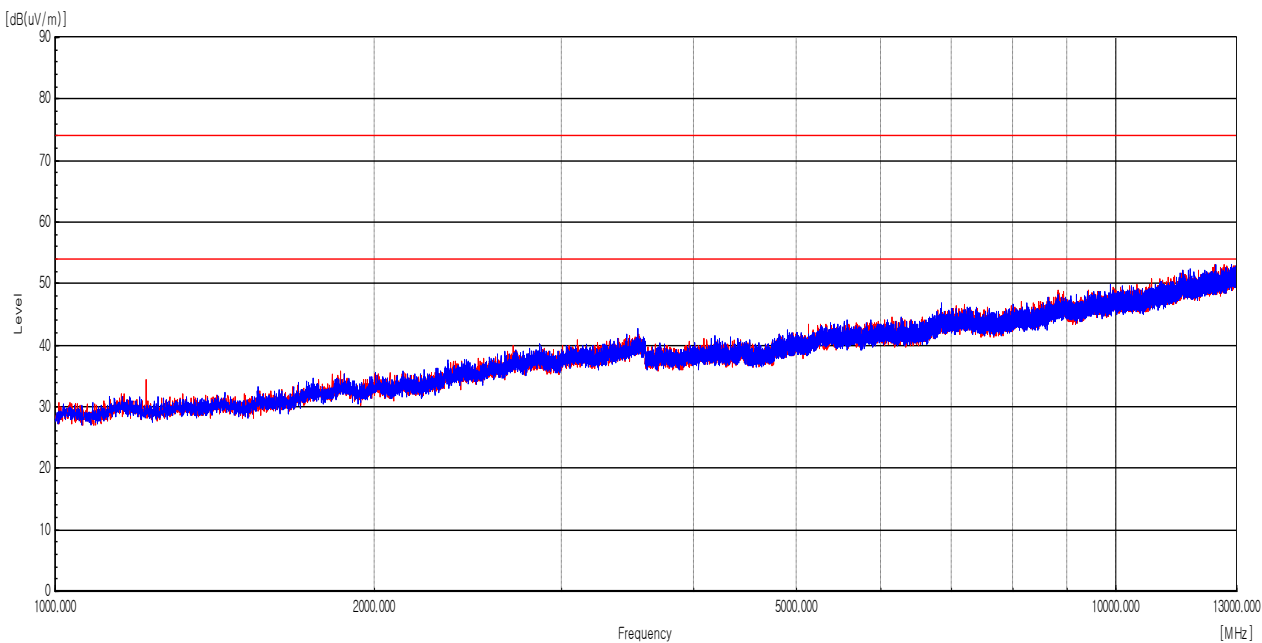
See Appendix A (Radiated Emission)

## Appendix A : Radiated Emission

### Below 1 GHz



### Above 1 GHz



- End of the Report -