

# FCC/IC TEST REPORT

Order No. : G-44-2019-02614

Applicant Name : iRevo-ASSA ABLOY Korea

Equipment Under Test (EUT) :

Product Name : Digital Door Lock

Model Name : YRD136-ZW2-619

Alt. Model Name : See 1.3 General Information of E.U.T on page 6.

FCC Authorization Type : Certification

Applied Standards : FCC Part 15 Subpart B, Class B

ANSI C63.4 : 2014

ICES-003 Issue 6:2016

Date of Receipt : August 7, 2019

Date of Test : August 23, 2019

Date of Issue : September 5, 2019

Test Results : Complied

Tested by

:



Noah Jeon

Reviewed by

:



Julia Choi

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-EMC005063(H)	Initial

## 1. General Information

### 1.1 Client Information

Applicant : iRevo-ASSA ABLOY Korea  
 Address : 205-29, Gasan Digital 1-ro, Geumcheon-gu, Seoul, 08503, Republic of Korea

Manufacturer : iRevo-ASSA ABLOY Korea  
 Address : 205-29, Gasan Digital 1-ro, Geumcheon-gu, Seoul, 08503, Republic of Korea

### 1.2 Test Laboratory

Name and Address : SGS Korea Co., Ltd.  
 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Republic of Korea, 15807

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IC Registration No. : 7837B

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### 1.3 General Information of E.U.T.

Classification	Specification										
Product Name	Digital Door Lock										
Model Name	YRD136-ZW2-619										
Alt. Model Name	YRD136-ZW2-605, YRD136-ZW2-0BP, YRD136-ZW2-BSP										
Model Description	Each model has different exterior colors.										
	<table border="1"> <thead> <tr> <th>Model Name</th> <th>Color</th> </tr> </thead> <tbody> <tr> <td>YRD136-ZW2-619</td> <td>Silver</td> </tr> <tr> <td>YRD136-ZW2-605</td> <td>Gold</td> </tr> <tr> <td>YRD136-ZW2-0BP</td> <td>Dark Brown</td> </tr> <tr> <td>YRD136-ZW2-BSP</td> <td>Black</td> </tr> </tbody> </table>	Model Name	Color	YRD136-ZW2-619	Silver	YRD136-ZW2-605	Gold	YRD136-ZW2-0BP	Dark Brown	YRD136-ZW2-BSP	Black
	Model Name	Color									
	YRD136-ZW2-619	Silver									
	YRD136-ZW2-605	Gold									
YRD136-ZW2-0BP	Dark Brown										
YRD136-ZW2-BSP	Black										
Rated Power	6 Vd.c.										
Test Power	6 Vd.c.( AA battery x 4EA)										
Internal Clock Frequency	916 MHz										
Function	Digital door lock										

### 1.4 Operating Modes and Conditions

Operating mode	Operating Condition
1) Operating	status that EUT is continuously opening and closing the lock.

### 1.5 Peripheral Equipments

Description	Model	Serial No.	Manufacturer
-	-	-	-

### 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
Main Board	WGA5.8 LatchKey MAIN PV01	PC4M-D438S-E1	-
Motor	-	0.99524	-
Lock key Board	WGA5.8_PB_FRONT ALPHA 190701	PC2M-XXXXX-EO	-

### 1.8 Test System Layout

**AC Source**

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**EUT**

### 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 6 :2016	Applicable	No Deviation

### 1.11 Summary of Test Results

Test Item	Standards	Results
Conducted Emission	FCC Part 15 Subpart B Section 15.107 ICES-003 ISSUE 6 :2016	N/A
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ICES-003 ISSUE 6 :2016	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	Standards	Test Results
Conducted Emission	FCC Part 15 Subpart B Section 15.107 ICES-003 ISSUE 6 :2016	<b>N/A</b>
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ICES-003 ISSUE 6 :2016	<b>Complied</b>

## 2.2 Test Method and Limits

### 2.2.1 Test Method

Test Items	Measuring Frequency Range	RBW	Measuring Distance
Conducted Emission	0.15 MHz ~ 30 MHz	9 kHz	-
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

#### -Conducted Emission Limits

Frequency Range	Limits(dB $\mu$ V)		Class
	Quasi-peak	Average	
0.15 MHz ~ 0.5 MHz	79	66	<b>Class A</b>
0.5 MHz ~ 30 MHz	73	60	
0.15 MHz ~ 0.5 MHz	66 to 56	56 to 46	<b>Class B</b>
0.5 MHz ~ 5 MHz	56	46	
5 MHz ~ 30 MHz	60	50	

Note : The lower limit shall apply at the transition frequencies. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

#### -Radiated Emission Limits below 1 GHz

Frequency Range	Limits(dB $\mu$ V/m)		Class
	Quasi-peak		
30 MHz ~ 88 MHz	39.0		<b>Class A (10 m 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 (3 m 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 (3 m 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 over the measuring frequency range (30 MHz to 6 GHz) using a max hold mode incorporating a Peak detector and using the software of EMC32 (Version V10.40.10 from R&S). The final test data was measured using a Quasi-Peak detector below 1 GHz and Peak and CISPR-Average detector above 1 GHz.

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

Equipment	Model	Manufacturer	Serial No	Cal Due. Date
EMI TEST RECEIVER	ESU40	R&S	100075	2020.08.13
BILOG ANTENNA	VULB 9163	SCHWARZBECK	9163-437	2021.07.22
Double Ridged Horn Antenna	HF907	R&S	102578	2021.01.22
AMPLIFIER	8447D	HP	2727A05297	2020.07.08
Microwave Preamplifier	PAM-118A	Com-Power	551074	2019.10.02
3m SEMI-ANECHOIC CHAMBER	-	Will Tech	-	-

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

### 2.3.2 Test Site

3m SEMI-ANECHOIC CHAMBER in Giheung 2 Laboratory

### 2.3.3 Environment Conditions

#### ① Below 1 GHz

Temperature : (Minimum 23.0, Maximum 23.0) °C

Humidity : (Minimum 39.0, Maximum 40.0) %R.H.

Atmospheric Pressure : (Minimum 100.1, Maximum 100.1) kPa

**Test Date** : August 23, 2019

#### ② Above 1 GHz

Temperature : (Minimum 20.0, Maximum 21.0) °C

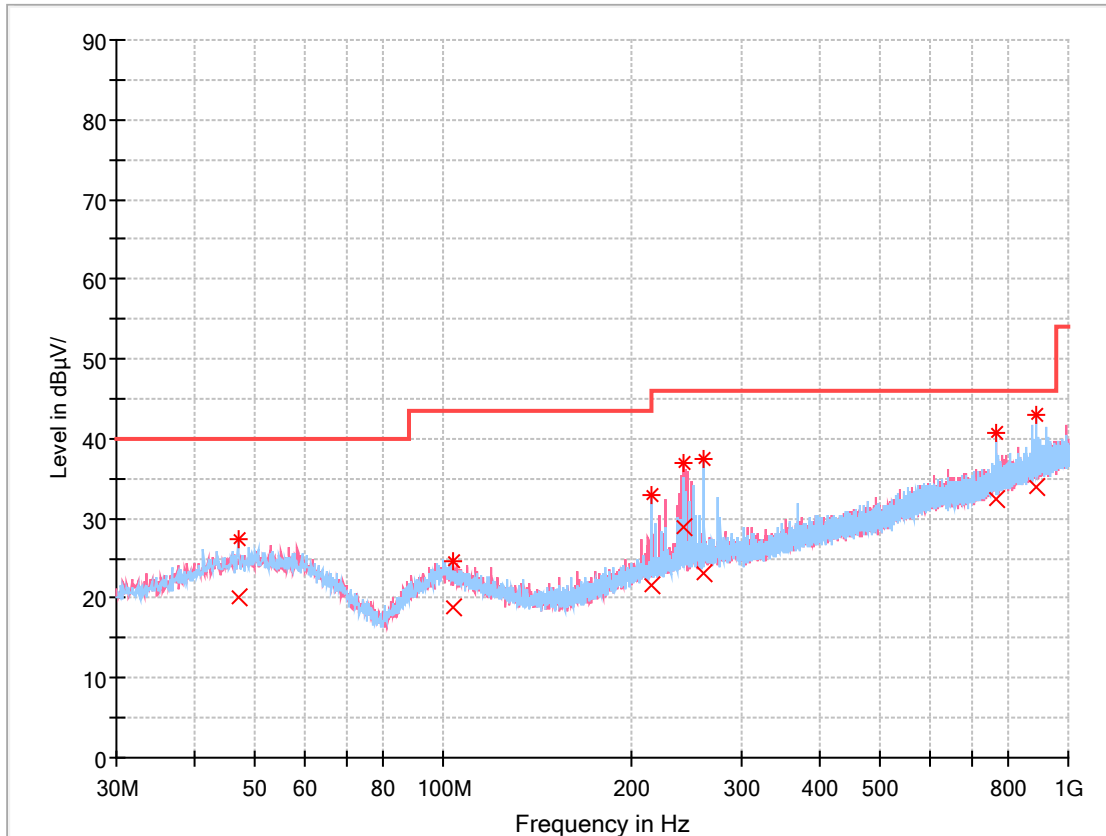
Humidity : (Minimum 48.0, Maximum 49.0) %R.H.

Atmospheric Pressure : (Minimum 100.1, Maximum 100.1) kPa

**Test Date** : August 23, 2019

### 2.3.4 Test Results

#### ① Below 1 GHz



#### Final Result

Frequency (MHz)	QuasiPeak (dB µV/m)	Limit (dB µV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
46.975 000	20.15	40.00	19.85	15 000.0	120.000	100.0	H	94.0	-1.4
103.526 000	18.76	43.50	24.74	15 000.0	120.000	200.0	H	114.0	-2.7
214.882 000	21.58	43.50	21.92	15 000.0	120.000	200.0	H	103.0	-1.5
241.654 000	28.85	46.00	17.15	15 000.0	120.000	200.0	V	347.0	-0.3
260.860 000	23.23	46.00	22.77	15 000.0	120.000	100.0	H	308.0	0.3
766.521 000	32.42	46.00	13.58	15 000.0	120.000	100.0	H	74.0	8.5
886.122 000	33.88	46.00	12.12	15 000.0	120.000	200.0	H	6.0	10.6

Measurement Uncertainty (Horizontal) : 5.18 dB (The confidential level is about 95 %,  $k = 2$ )

Measurement Uncertainty (Vertical) : 5.20 dB (The confidential level is about 95 %,  $k = 2$ )

Note : • POL H = Horizontal

• POL V = Vertical

• Margin = Limit – Quasi Peak

• Corr. = Antenna Factor + Cable loss – Amplifier Gain

Ex) In case

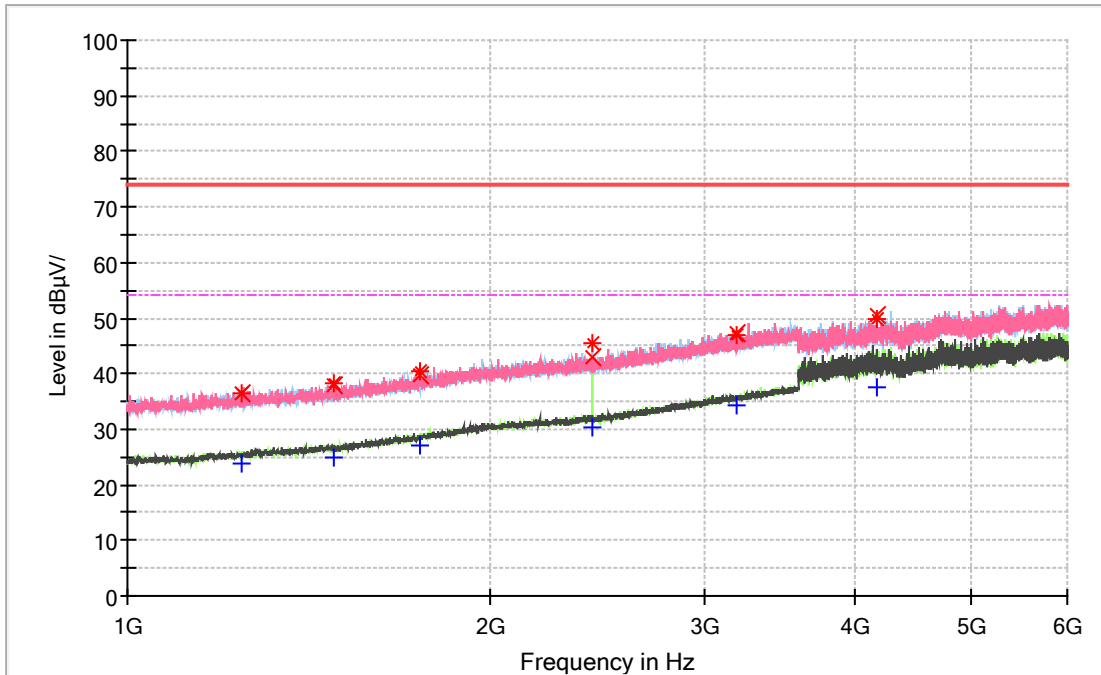
Freq ; 100 MHz, level ; 30 dB(µV/m), AF ; 10 dB/m, CL ; 4 dB, Amp ; 25 dB

Result = Level + AF + CL – Amp = 30 + 10 + 4 - 25 = 19

Margin = Limit – Result = 43.5 – 19 = 24.5



② Above 1 GHz



Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1 243.500 000	36.39	---	74.00	37.61	15 000.0	1 000.000	200.0	V	273.0	-9.5
1 243.500 000	---	23.85	54.00	30.15	15 000.0	1 000.000	200.0	V	273.0	-9.5
1 481.000 000	37.97	---	74.00	36.03	15 000.0	1 000.000	100.0	V	273.0	-8.5
1 481.000 000	---	25.07	54.00	28.93	15 000.0	1 000.000	100.0	V	273.0	-8.5
1 748.500 000	39.74	---	74.00	34.26	15 000.0	1 000.000	100.0	V	292.0	-6.5
1 748.500 000	---	27.09	54.00	26.91	15 000.0	1 000.000	100.0	V	292.0	-6.5
2 426.000 000	42.95	---	74.00	31.05	15 000.0	1 000.000	200.0	H	324.0	-3.7
2 426.000 000	---	30.36	54.00	23.64	15 000.0	1 000.000	200.0	H	324.0	-3.7
3 189.000 000	47.19	---	74.00	26.81	15 000.0	1 000.000	100.0	H	121.0	-0.2
3 189.000 000	---	34.12	54.00	19.88	15 000.0	1 000.000	100.0	H	121.0	-0.2
4 177.000 000	50.67	---	74.00	23.33	15 000.0	1 000.000	100.0	V	0.0	3.3
4 177.000 000	---	37.71	54.00	16.29	15 000.0	1 000.000	100.0	V	0.0	3.3

Measurement Uncertainty (Horizontal) : 3.87 dB (The confidential level is about 95 %, k = 2)

Measurement Uncertainty (Vertical) : 4.04 dB (The confidential level is about 95 %, k = 2)

Note : • POL H = Horizontal • POL V = Vertical

• Margin = Limit – MaxPeak or CAverage

• Corr. = Antenna Factor + Cable loss – Amplifier Gain

Ex) In case

Freq ; 1 500 MHz, level ; 30 dB(µV/m), AF ; 10 dB/m, CL ; 4 dB, Amp ; 25 dB

Result = Level + AF + CL – Amp = 30 + 10 + 4 - 25 = 19

Margin = Limit – Result = 43.5 – 19 = 24.5

- End of Test Report -