

# FCC/IC TEST REPORT

Job No. : GPEM2206000291EC  
Applicant : iRevo-ASSA ABLOY Korea  
Equipment Under Test (EUT) :  
Product Name : Digital Door Lock  
Model Name : YRD137-ZW-619  
Alt. Model Name : YRD137-ZW-605, YRD137-ZW-0BP, YRD137-ZW-BSP  
FCC Authorization Type : Certification  
Applied Standards : FCC Part 15 Subpart B, Class B  
ICES-003 Issue 7:2020  
FCC ID : 2ABFG-YRIZW2USPB2  
IC Certification : 11626A-YRIZW2USPB2  
Date of Receipt : June 21, 2022  
Date of Test : June 22, 2022  
Date of Issue : August 2, 2022  
Test Results : Complied

Tested by :



DoHyeon Lee

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.

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## Revision History

Revision	Report number	Description
0	F690501-RF-EMC000707	Initial

## 1. General Information

### 1.1 Client Information

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

### 1.2 Test Laboratory

Name and Address	SGS Korea Co., Ltd.
- Giheung Laboratory	35, Giheungdanji-ro 121beon-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 31 548 0710
Fax	+ 82 31 548 0719
e-mail	<a href="mailto:julia.choi@sgs.com">julia.choi@sgs.com</a>

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

Classification	Specification
Product Name	Digital Door Lock
Model Name	YRD137-ZW-619
Alt. Model Name	YRD137-ZW-605, YRD137-ZW-0BP, YRD137-ZW-BSP
Model Differences	Refer Note1.
Serial No.	None
EMI Classification	Class B
Test Voltage	DC 6 V (AA Battery 4 EA)
Rated Voltage	DC 6 V
Highest Internal Frequency	916 MHz
H/W Version	PV01
S/W Version	V2.2.6
Function	This product is an electronic door locking equipment

#### Note1. Model Differences

Model Name	Differences (Color of appearance)	
Basic Model	YRD157-ZW-619	SILVER
Alt. Model	YRD157-ZW-605	GOLD
	YRD157-ZW-0BP	Oil Rubbed Bronze
	YRD157-ZW-BSP	Matt BLACK

### 1.4 Operating Modes and Conditions

Operating mode	Operating Condition
1) unlocking operation	Status that pressing a button on the EUT for unlocking.

### 1.5 Peripheral Equipments

Description	Model	Serial No.	Manufacturer
-	-	-	-

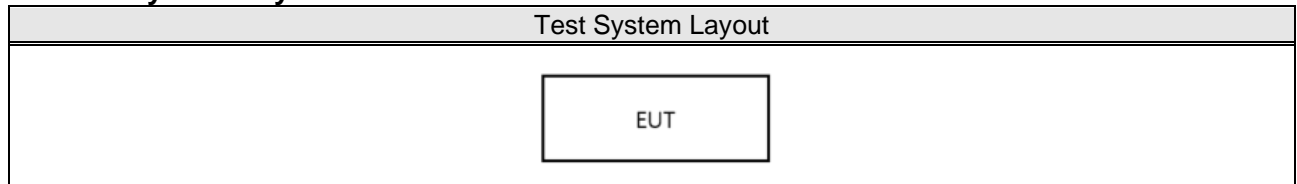
### 1.6 Cable List

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

### 1.7 System Configurations

Description	Model	Serial No.	Manufacturer	Note
Main Board	WGA5.8V MAIN PV01 220428	PC4M-D448S-E1	-	-
Front Board	WGA5.8V PB FRONT PV01 220502	PC2F-D449S-E1	-	-
Motor	-	-	-	-

### 1.8 Test System Layout



### 1.9 Modifications/Notes

- 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 ANSI C63.4a:2017	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 7:2020	N/A
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ICES-003 Issue 7:2020	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 7:2020 ANSI C63.4a:2017	N/A
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ICES-003 Issue 7:2020 ANSI C63.4a:2017	Complied

## 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	Class A
0.5 MHz ~ 30 MHz	73	60	
0.15 MHz ~ 0.5 MHz	66 to 56	56 to 46	Class 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

[ FCC Part 15 Subpart B ]

Frequency Range	Limits(dB $\mu$ V/m)	Class
	Quasi-peak	
30 MHz ~ 88 MHz	39.0	Class A (10 m 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 (3 m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.0	
960 MHz ~ 1 GHz	54.0	

[ ICES-003 Issue 7 : 2020 ]

Frequency Range	Limits(dB $\mu$ V/m)		Class
	Quasi-peak		
30 MHz ~ 88 MHz	40.0		Class A (10 m method)
88 MHz ~ 216 MHz	43.5		
216 MHz ~ 230 MHz	46.4		
230 MHz ~ 960 MHz	47.0		
960 MHz ~ 1 GHz	49.5		
30 MHz ~ 88 MHz	50.0		Class A (3 m method)
88 MHz ~ 216 MHz	54.0		
216 MHz ~ 230 MHz	56.9		
230 MHz ~ 960 MHz	57.0		
960 MHz ~ 1 GHz	60.0		
30 MHz ~ 88 MHz	30.0		Class B (10 m method)
88 MHz ~ 216 MHz	33.1		
216 MHz ~ 230 MHz	35.6		
230 MHz ~ 960 MHz	37.0		
960 MHz ~ 1 GHz	43.5		
30 MHz ~ 88 MHz	40.0		Class B (3 m method)
88 MHz ~ 216 MHz	43.5		
216 MHz ~ 230 MHz	46.0		
230 MHz ~ 960 MHz	47.0		
960 MHz ~ 1 GHz	54.0		

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

[ FCC Part 15 Subpart B ]

Frequency Range	Limits(dB $\mu$ 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.

[ ICES-003 Issue 7 : 2020 ]

Frequency Range	Limits(dB $\mu$ V/m)		Class
	Average	Peak	
Above 1 GHz	60.0	80.0	Class A
Above 1 GHz	54.0	74.0	Class B

### 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 by using the EMI measuring software. The final test data was measured using a Quasi-Peak detector below 1 GHz, 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.

Note. Measuring software  
 - Giheung Lab.: EMC32(V9.26.01) from R&S  
 - Gunpo Lab.: EP5RE(V5.3.70) from TOYO

#### 2.3.1 Test Equipments

Equipment	Model	Manufacturer	Serial No	Cal Due. Date
Horn Antenna	HF906	R & S	100326	2023.02.18
Signal Conditioning Unit	SCU 18	R & S	10117	2023.06.13
Test Receiver	ESU26	R & S	100109	2023.01.18
Hybrid Antenna	VULB9163	SCHWARZBECK	01126	2023.02.07
Amplifier	8447F	HP	2944A03909	2022.08.06

Note: The calibration period of every equipment is 1 year.

#### 2.3.2 Test Site

3 m SEMI-ANECHOIC CHAMBER in Gunpo Laboratory

#### 2.3.3 Environment Conditions

##### Below 1 GHz

Temperature	(Minimum 23.3, Maximum 23.4) °C
Humidity	(Minimum 53.0, Maximum 54.0) % R.H.
Atmospheric Pressure	(Minimum 100.0, Maximum 100.0) kPa
Test Date	June 22, 2022

##### Above 1 GHz

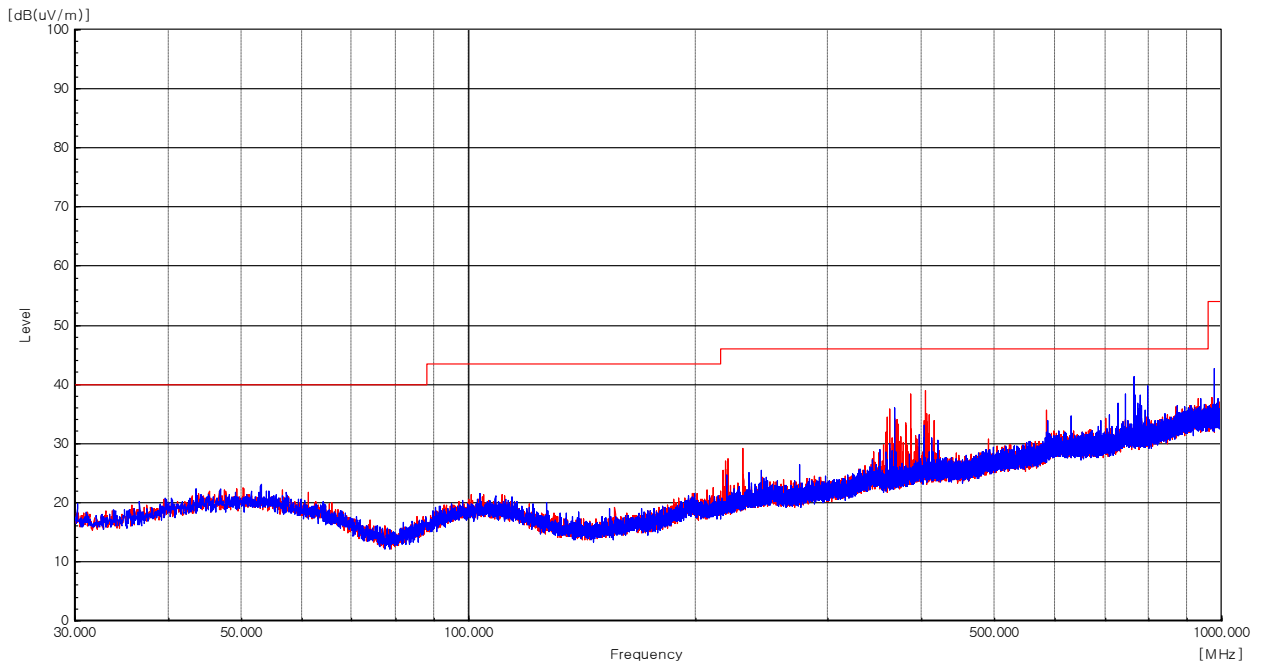
Temperature	(Minimum 23.3, Maximum 23.4) °C
Humidity	(Minimum 53.0, Maximum 54.0) % R.H.
Atmospheric Pressure	(Minimum 100.0, Maximum 100.0) kPa
Test Date	June 22, 2022



### 2.3.4 Test Results

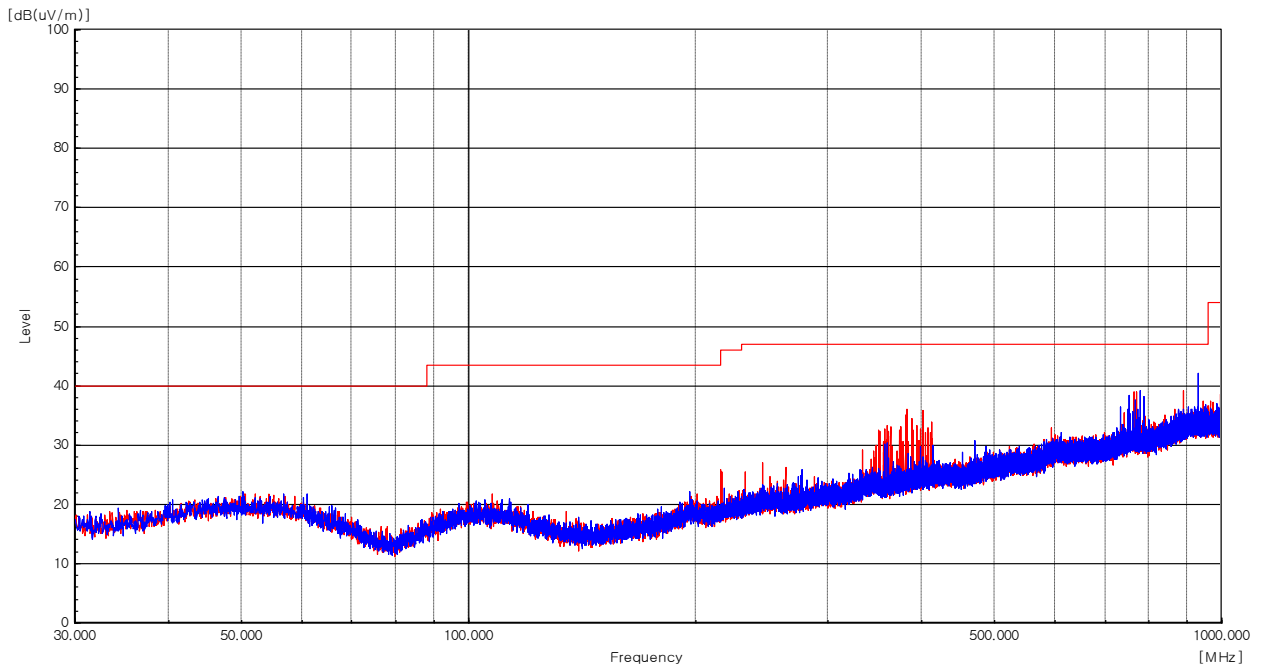
#### Below 1 GHz (3 m method)

[FCC Part 15 Subpart B]



Freq. ( MHz )	Reading ( dB $\mu$ V )	Pol. ( H/V )	A ( $^{\circ}$ )	H ( cm )	AF ( dB/m )	CL ( dB )	Amp. ( dB )	F/S ( dB $\mu$ V/m )	Limit ( dB $\mu$ V/m )	Margin ( dB )
221.92	26.90	H	65	107	17.25	3.19	27.73	19.61	46.00	26.39
367.74	27.00	V	360	109	20.61	3.92	27.74	23.79	46.00	22.21
395.00	28.00	H	110	195	21.50	4.07	27.96	25.61	46.00	20.39
601.86	23.90	H	310	100	25.34	4.87	28.71	25.40	46.00	20.60
763.57	28.50	V	145	115	26.63	5.54	28.87	31.80	46.00	14.20
977.17	25.00	V	140	100	28.20	6.22	28.35	31.07	54.00	22.93

[ICES-003 Issue 7:2020]

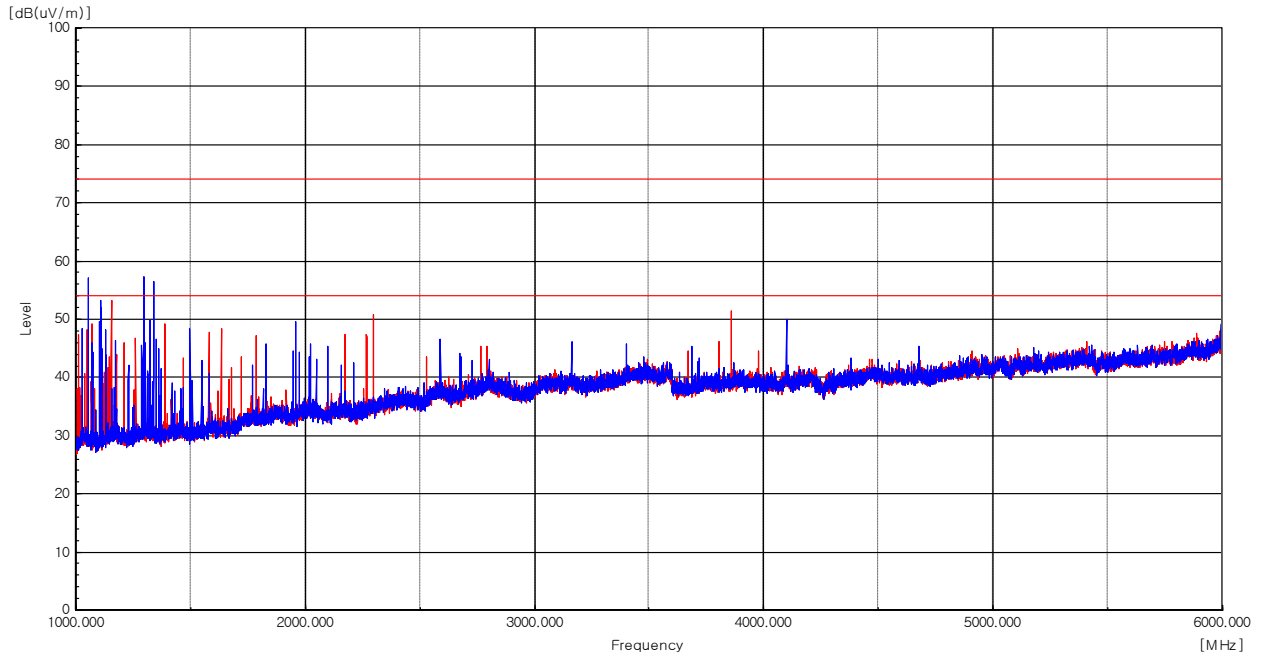


Freq. ( MHz )	Reading (dBµV)	Pol. (H/V)	A ( ° )	H ( cm )	AF ( dB/m )	CL ( dB )	Amp. ( dB )	F/S (dBµV/m)	Limit (dBµV/m)	Margin ( dB )
360.27	25.90	V	358	100	20.22	3.88	27.68	22.32	46.00	23.68
378.89	28.00	H	281	100	20.88	3.99	27.83	25.04	46.00	20.96
401.63	24.90	V	129	100	21.63	4.11	28.01	22.63	46.00	23.37
770.24	26.00	V	269	100	26.60	5.55	28.86	29.29	46.00	16.71
893.00	23.40	H	310	200	27.86	6.05	28.53	28.78	46.00	17.22
989.32	24.50	V	16	100	28.30	6.21	28.32	30.69	54.00	23.31

Measurement Uncertainty :See the Appendix A

- Note:
- AF = Antenna Factor
  - CL = Cable Loss
  - Amp. = Amplifier Gain
  - Pol. H = Horizontal
  - Pol. V = Vertical
  - A = Angle
  - H = Height
  - Margin = Limit – Result
  - F/S = Level + AF + CL – AMP

**Above 1 GHz (1 GHz - 18 GHz)(3 m method)**



Freq. ( MHz )	Level (dB $\mu$ V)		Pol. (H/V)	A ( ° )	H ( cm )	AF ( dB )	CL ( dB )	Amp. ( dB )	F/S (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin ( dB )
	Peak	C-AV									
1 055.81	78.20	-	V	10	110	24.42	7.00	45.57	64.05	74.00	9.95
1 055.81	-	33.40	V	10	110	24.42	7.00	45.57	19.25	54.00	34.75
1 153.00	72.90	-	H	325	105	25.02	7.32	45.52	59.72	74.00	14.28
1 153.00	-	33.40	H	325	105	25.02	7.32	45.52	20.22	54.00	33.78
1 295.78	73.30	-	V	300	190	25.00	7.79	45.45	60.64	74.00	13.36
1 295.78	-	33.00	V	300	190	25.00	7.79	45.45	20.34	54.00	33.66
2 295.00	57.90	-	H	290	100	27.88	10.60	45.30	51.08	74.00	22.92
2 295.00	-	30.80	H	290	100	27.88	10.60	45.30	23.98	54.00	30.02
3 859.91	52.00	-	H	195	200	32.14	14.06	45.40	52.80	74.00	21.20
3 859.91	-	38.00	H	195	200	32.14	14.06	45.40	38.80	54.00	15.20
4 097.54	48.80	-	V	0	100	31.90	15.23	45.35	50.58	74.00	23.42
4 097.54	-	29.20	V	0	100	31.90	15.23	45.35	30.98	54.00	23.02

Measurement Uncertainty: See the Appendix A

Note: • AF = Antenna Factor

- Pol.(H) = Horizontal
- Margin = Limit – F/S
- A: Angle

• CL = Cable Loss

- Pol.(V) = Vertical
- F/S = Level + AF + CL – Amp.
- H: Height

• F/S = Field Strength

• Amp. = Amplifier Gain

### Appendix A : Measurement Uncertainty

#### - Giheung Laboratory

Test Method		Measurement Uncertainty	
Conducted Emission	ENV216	3.5 dB	(The confidential level is 95 %, k=2)
	ESH2-Z5	3.2 dB	(The confidential level is 95 %, k=2)
	ESH3-Z6	3.2 dB	(The confidential level is 95 %, k=2)
	NNLK8129	3.2 dB	(The confidential level is 95 %, k=2)
Conducted Emission - Signal	ISN T800	5.6 dB	(The confidential level is 95 %, k=2)
	ISNT8-Cat6	5.4 dB	(The confidential level is 95 %, k=2)
	ISN S751	5.6 dB	(The confidential level is 95 %, k=2)
Discontinuous		3.4 dB (The confidential level is 95 %, k=2)	
Disturbance Voltage at Antenna Terminal		2.0 dB (The confidential level is 95 %, k=2)	
Radiated Emission	9 kHz ~30 MHz	Horizontal	3.4 dB (The confidential level is 95 %, k=2)
		Vertical	3.4 dB (The confidential level is 95 %, k=2)
	30 MHz ~ 1 000 MHz	Horizontal	4.4 dB (The confidential level is 95 %, k=2)
		Vertical	4.6 dB (The confidential level is 95 %, k=2)
	1 GHz ~ 18 GHz	Horizontal	4.0 dB (The confidential level is 95 %, k=2)
		Vertical	4.0 dB (The confidential level is 95 %, k=2)

#### - Gunpo Laboratory

Test Method		Measurement Uncertainty	
Conducted Emission	ENV216	3.4 dB	(The confidential level is 95 %, k=2)
	ESH2-Z5	3.2 dB	(The confidential level is 95 %, k=2)
	ESH3-Z6	3.4 dB	(The confidential level is 95 %, k=2)
Conducted Emission - Signal	ISN T800	5.6 dB	(The confidential level is 95 %, k=2)
	ISNT8-Cat6	5.6 dB	(The confidential level is 95 %, k=2)
	ISN S751	7.3 dB	(The confidential level is 95 %, k=2)
Disturbance Voltage at Antenna Terminal		2.4 dB (The confidential level is 95 %, k=2)	
Radiated Emission	9 kHz ~30 MHz	Horizontal	3.3 dB (The confidential level is 95 %, k=2)
		Vertical	3.3 dB (The confidential level is 95 %, k=2)
	30 MHz ~ 1 000 MHz	Horizontal	4.8 dB (The confidential level is 95 %, k=2)
		Vertical	5.2 dB (The confidential level is 95 %, k=2)
	1 GHz ~ 18 GHz	Horizontal	3.9 dB (The confidential level is 95 %, k=2)
		Vertical	4.0 dB (The confidential level is 95 %, k=2)

- End of Test Report -