

FCC TEST REPORT

Job No. : GPWE2112000287EC

Applicant Name : O-JIN CORPORATION

Equipment Under Test (EUT) :

Product Name : Charging Dock

Model Name : IMCD100

FCC Authorization Type : Certification

Applied Standards : FCC Part 15 Subpart B, Class B

ANSI C63.4a:2017

FCC ID : 2A3ZZ-IMCD100

Date of Receipt : December 20, 2021

Date of Test : January 7, 2022

Date of Issue : January 12, 2022

Test Results : Complied

Tested by

:



Youngsik Na

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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Revision History

Revision	Report number	Description
0	F690501-RF-EMC000382	Initial

1. General Information

1.1 Client Information

Applicant	O-JIN CORPORATION
Applicant Address	61-1, Seosomun-ro, Seodaemun-gu, Seoul, Republic of Korea
Manufacturer	Bench soft.Co.,Ltd
Manufacturer Address	300-214, Bucheon-Technopark, 345, Seokcheon-ro, Bucheon-si, Gyeonggi-do, Republic of Korea
Factory	Woori Tech Technology
Factory Address	26, Deokjeoljegi-gil Jeongnam-myeon, Hwaseong-si Gyeonggi-do, Republic of Korea

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
FCC Registration No.	KR0150
IC Registration No.	7837B
Phone	+ 82 31 548 0710
Fax	+ 82 31 548 0719
e-mail	julia.choi@sgs.com

1.3 General Information of E.U.T.

Classification	Specification
Product Name	Charging Dock
Model Name	IMCD100
Tested Power	AC 120 V, 60 Hz
Rated Power	DC 5 V, 0.5 A
Internal Clock Frequency	-
Operating Temperature	(-) 0 °C ~ (+) 70 °C
H/W Version	R1.2
Port	USB(C-type), USB(A-type), 2 PIN
Function	Charging dock mouse and operate the USB receiver of the mouse on the USB port

1.4 Operating Modes and Conditions

Operating mode	Operating Condition
1) Operating	Status that the EUT was charge for mouse and operated wireless mouse by USB Dongle at the same time

1.5 Peripheral Equipments

Description	Model	Serial No.	Manufacturer
USB Dongle	-	-	-
Mouse 1	G703	2117LZA045P8	Logitech
Mouse 2	M590	-	Logitech
Laptop	NT740U5L	OMMN91GH900125T	Samsung Electronics Suzhou Computer Co., Ltd.

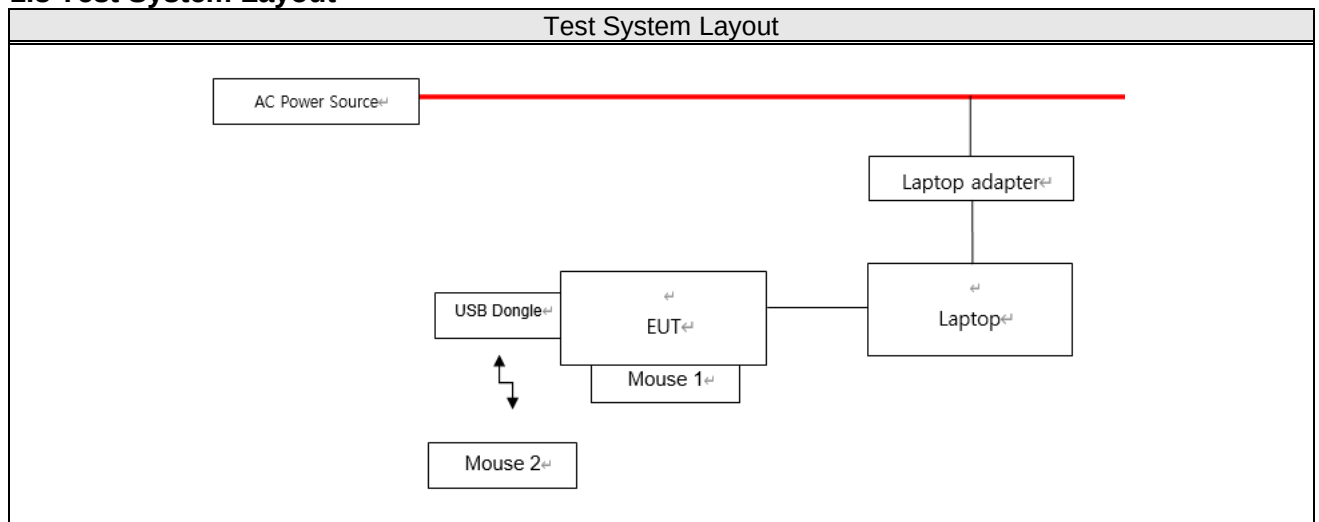
1.6 Cable List

Start		END		Cable Spec.		Used core
Name	I/O Port	Name	I/O Port	Length (m)	Shield	
EUT	USB(C-type)	Laptop	USB(A-type)	2.0	Shield	No
	2 PIN	Mouse	2 PIN	-	-	-
	USB(A-type)	USB Dongle	USB(A-type)	-	-	-
AC Power Source	-	Laptop adapter	AC IN	0.8	Unshield	No
Laptop	DC IN		DC OUT	1.2	Shield	1 EA
USB Dongle	-	Mouse 2	-	-	-	-

1.7 System Configurations

Description	Model	Serial No.	Manufacturer	Note
Main Board	BN_MCH_DOCK_R1.2	-	-	-
USB Cable	IMCD100-C1000	-	HUIZHOU BAIHAO ELECTRONICS.,LTD	-

1.8 Test System Layout



1.9 Modifications/Note

- There was no modified item during the test.

1.10 Applicable Standards for Testing

Standards	Status	Deviation
FCC Part 15 : Subpart B 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 ANSI C63.4a :2017	Complied
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ANSI C63.4a :2017	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 ANSI C63.4a :2017	Complied
Radiated Emission	FCC Part 15 Subpart B Section 15.109 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 μ 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

Frequency Range	Limits(dB μ 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	

-Radiated Emission Limits above 1 GHz (3 m 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 Conducted Disturbance

The initial preliminary exploratory scans were performed over the measuring frequency range(0.15 MHz to 30 MHz) using a max hold mode incorporating a Peak detector and CISPR-Average detector and using the EMI measuring software. The final test data was measured using a Quasi-Peak detector and CISPR-Average detector.

Note. Measuring software

- Giheung 1Lab. : EMC32(V10.40.10) from R&S
- Giheung 2Lab. : EMC32(V10.40.00) from R&S

2.3.1 Test Equipments

Equipment	Model	Manufacturer	Serial No	Cal Due. Date
EMI TEST RECEIVER	ESU8	R&S	100128	2022.05.21
2-LINE V-NETWORK	ENV216	R&S	101180	2022.08.21
PULSE LIMITER	ESH3-Z2	R&S	100283	2022.08.21
RF Cable	EMH-1Lab-CE-01	-	-	-

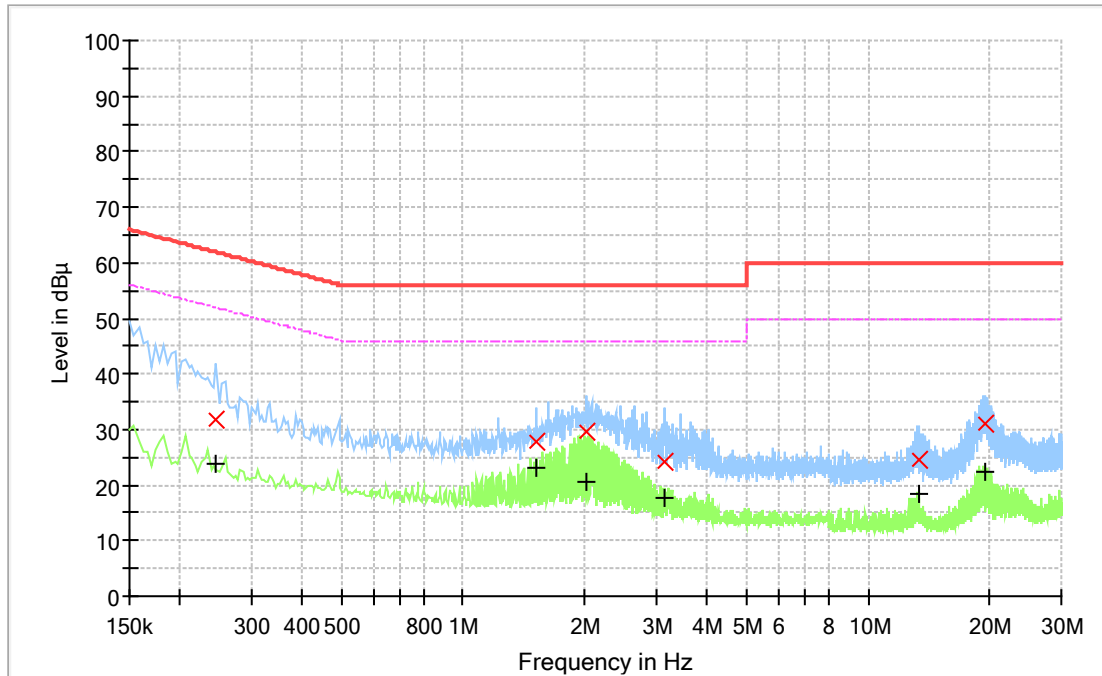
2.3.2 Test Site

Shield Room in Giheung 1 Laboratory

2.3.3 Environment Conditions

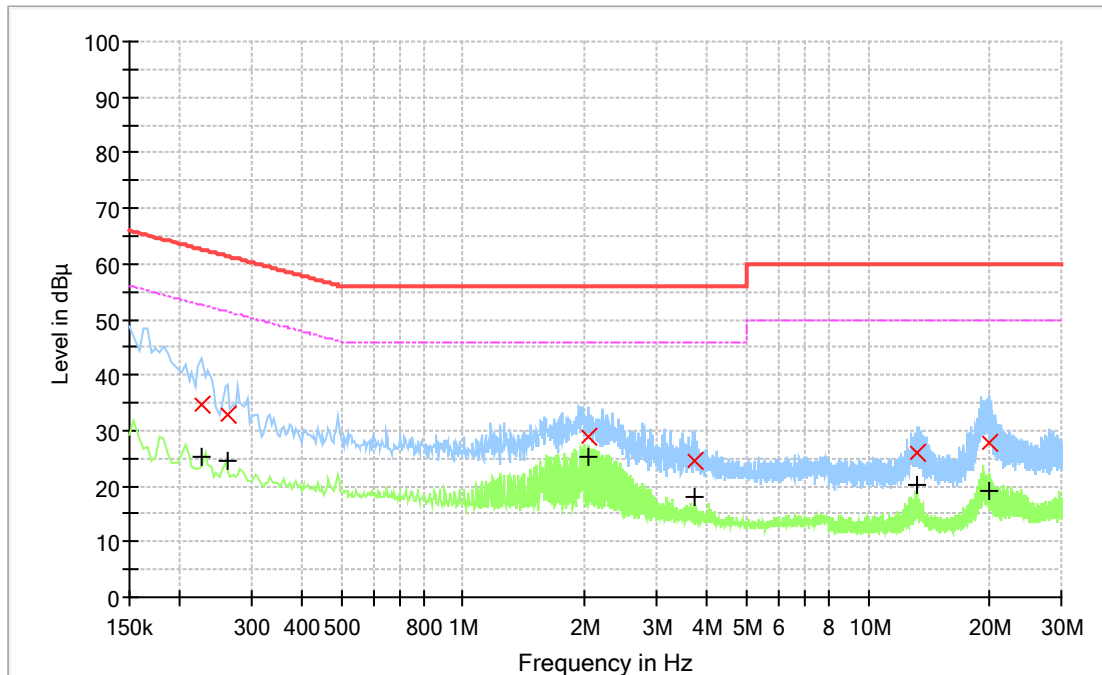
Temperature	(Minimum 21.0, Maximum 22.0)℃
Humidity	(Minimum 31.0, Maximum 32.0)%R.H.
Atmospheric Pressure	(Minimum 102.1, Maximum 102.1)kPa
Test Date	January 7, 2022

2.3.4 Test Results



Final Result

Frequency (MHz)	QuasiPeak (dB μV)	CAverage (dB μV)	Limit (dB μV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.246	---	23.95	51.89	27.94	15 000.0	9.000	L1	ON	19.5
0.246	31.66	---	61.89	30.23	15 000.0	9.000	L1	ON	19.5
1.518	---	23.23	46.00	22.77	15 000.0	9.000	L1	ON	19.6
1.518	27.80	---	56.00	28.20	15 000.0	9.000	L1	ON	19.6
2.022	---	20.63	46.00	25.37	15 000.0	9.000	L1	ON	19.6
2.022	29.59	---	56.00	26.41	15 000.0	9.000	L1	ON	19.6
3.154	---	17.66	46.00	28.34	15 000.0	9.000	L1	ON	19.7
3.154	24.23	---	56.00	31.77	15 000.0	9.000	L1	ON	19.7
13.310	---	18.27	50.00	31.73	15 000.0	9.000	L1	ON	19.9
13.310	24.62	---	60.00	35.38	15 000.0	9.000	L1	ON	19.9
19.490	---	22.33	50.00	27.67	15 000.0	9.000	L1	ON	19.9
19.490	31.02	---	60.00	28.98	15 000.0	9.000	L1	ON	19.9



Final Result

Frequency (MHz)	QuasiPeak (dB μV)	CAverage (dB μV)	Limit (dB μV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.226	---	25.17	52.60	27.43	15 000.0	9.000	N	ON	19.6
0.226	34.61	---	62.60	27.98	15 000.0	9.000	N	ON	19.6
0.262	---	24.61	51.37	26.76	15 000.0	9.000	N	ON	19.5
0.262	32.77	---	61.37	28.59	15 000.0	9.000	N	ON	19.5
2.034	---	25.21	46.00	20.79	15 000.0	9.000	N	ON	19.6
2.034	28.91	---	56.00	27.09	15 000.0	9.000	N	ON	19.6
3.714	---	18.13	46.00	27.87	15 000.0	9.000	N	ON	19.6
3.714	24.62	---	56.00	31.38	15 000.0	9.000	N	ON	19.6
13.150	---	20.06	50.00	29.94	15 000.0	9.000	N	ON	19.9
13.150	25.89	---	60.00	34.11	15 000.0	9.000	N	ON	19.9
19.874	---	19.23	50.00	30.77	15 000.0	9.000	N	ON	20.0
19.874	27.81	---	60.00	32.19	15 000.0	9.000	N	ON	20.0

Measurement Uncertainty : See Appendix A

Note1 : • Line (L1) : Hot • Line (N) : Neutral

- Margin = Limit – Quasi Peak or CAverage
- Corr. = LISN Factor + Cable loss + Pulse Limiter Factor

Ex) In case

Freq ; 0.5 MHz, level ; 30 dB(μV), CL ; 0.2 dB, LISN ; 9.5 dB, P/L: 9.8 dB

Result = Level + CL + LISN + P/L

$$= 30 + 0.2 + 9.5 + 9.8$$

$$= 49.5$$

Margin = Limit – Result

$$= 79 - 49.5$$

$$= 29.5$$

2.4 Radiated Emission

The initial preliminary exploratory scans were performed over the measuring frequency range (30 MHz to 12 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 1Lab. : EMC32(V9.26.01) from R&S

-Giheung 2Lab. : EMC32(V10.40.10) from R&S

2.4.1 Test Equipments

Equipment	Model	Manufacturer	Serial No	Cal Due. Date
EMI TEST RECEIVER	ESU26	R&S	100570	2022.02.24
Hybrid ANTENNA	VULB 9163	SCHWARZBECK	9163-437	2022.05.14
PREAMPLIFIER	AM-1431	MITEQ	1336160	2022.05.24
RF Cable	EMH-1Lab-RE-02	HUBER+SHUNER	-	-
RF Cable	EMH-1Lab-RE-03	-	-	-
RF Cable	EMH-1Lab-RE-04	-	-	-

2.4.2 Test Site

10m SEMI-ANECHOIC CHAMBER in Giheung 1 Laboratory

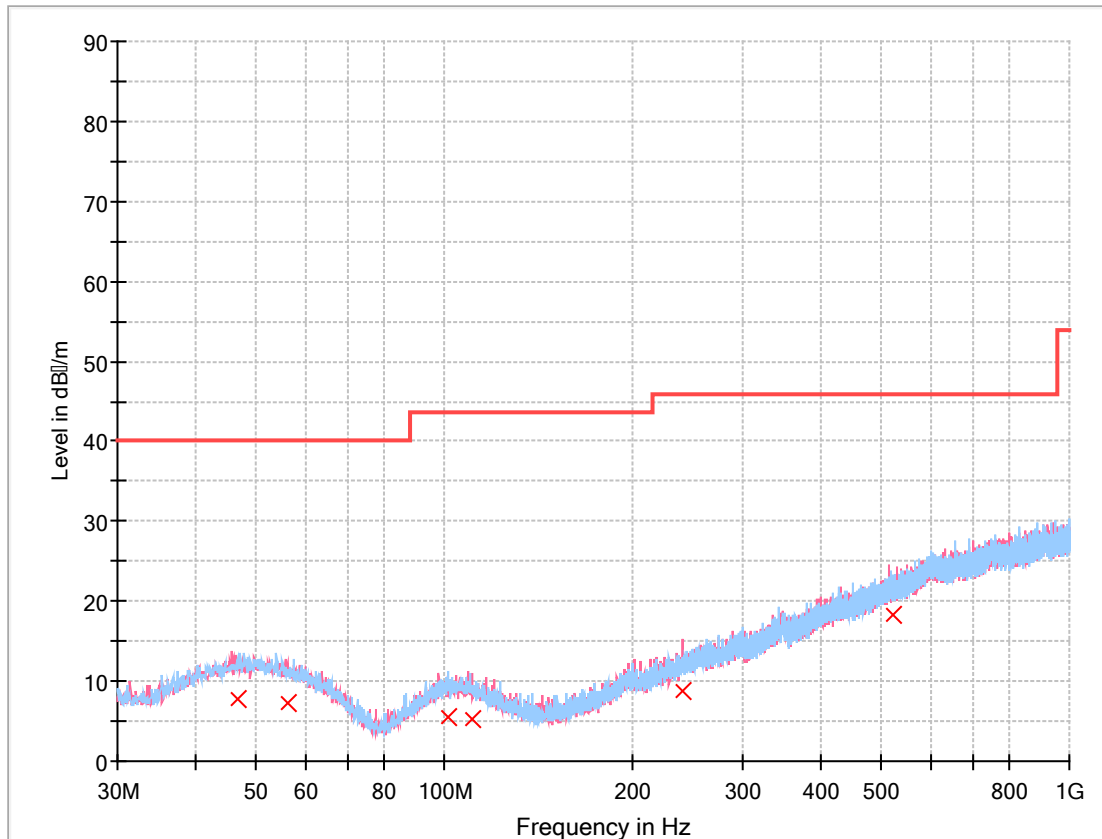
2.4.3 Environment Conditions

① Below 1 GHz

Temperature	(Minimum 22.0, Maximum 23.0) °C
Humidity	(Minimum 32.0, Maximum 33.0) % R.H.
Atmospheric Pressure	(Minimum 102.1, Maximum 102.1) kPa
Test Date	January 7, 2022

2.4.4 Test Results

① Below 1 GHz (3 m method)



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)
46.587	7.87	40.00	32.13	15 000.0	120.000	382.0	H	137.0	-16.2
56.190	7.18	40.00	32.82	15 000.0	120.000	225.0	V	24.0	-16.6
101.392	5.56	43.50	37.94	15 000.0	120.000	210.0	H	0.0	-18.0
110.898	5.25	43.50	38.25	15 000.0	120.000	333.0	V	0.0	-18.2
240.296	8.71	46.00	37.29	15 000.0	120.000	236.0	V	0.0	-16.0
521.596	18.42	46.00	27.58	15 000.0	120.000	116.0	H	214.0	-7.8

Measurement Uncertainty : See Appendix A

Note : • POL H = Horizontal

• Margin = Limit – Quasi Peak

• POL V = Vertical

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

Ex) In case

Freq ; 100 MHz, level ; 30 dB(μ V/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

Appendix A : Measurement Uncertainty

- Giheung 1 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 (3m chamber)	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 (10m chamber)	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 (3m chamber)	Horizontal	4.0 dB (The confidential level is 95 %, $k=2$)
		Vertical	4.0 dB (The confidential level is 95 %, $k=2$)
Radiated Immunity Test		0.9 dB (The confidential level is 95 %, $k=2$)	
Conducted Immunity Test		4.5 dB (The confidential level is 95 %, $k=2$)	
Magnetic Field		5.0 dB (The confidential level is 95 %, $k=2$)	

- Giheung 2 Laboratory

Test Method		Measurement Uncertainty	
Conducted Emission		ENV216	3.4 dB (The confidential level is 95 %, $k=2$)
		ESH2-Z5	3.1 dB (The confidential level is 95 %, $k=2$)
		ESH3-Z6	3.1 dB (The confidential level is 95 %, $k=2$)
		NNLK8129	3.1 dB (The confidential level is 95 %, $k=2$)
Conducted Emission - Signal		ISN T800	5.4 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		3.3 dB (The confidential level is 95 %, $k=2$)	
Disturbance Voltage at Antenna Terminal		2.0 dB (The confidential level is 95 %, $k=2$)	
Disturbance Power		3.0 dB (The confidential level is 95 %, $k=2$)	
Radiated Emission	9 kHz ~30 MHz (Triple Loop Ant)	2.7 dB (The confidential level is 95 %, $k=2$)	
	9 kHz ~30 MHz (3m chamber)	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 (10m chamber)	Horizontal	4.1 dB (The confidential level is 95 %, $k=2$)
		Vertical	4.4 dB (The confidential level is 95 %, $k=2$)
	1 GHz ~ 18 GHz (3m chamber)	Horizontal	4.3 dB (The confidential level is 95 %, $k=2$)
		Vertical	4.3 dB (The confidential level is 95 %, $k=2$)
Radiated Immunity Test		1.3 dB (The confidential level is 95 %, $k=2$)	
Conducted Immunity Test		1.9 dB (The confidential level is 95 %, $k=2$)	
Magnetic Field		5.0 dB (The confidential level is 95 %, $k=2$)	
Proximity magnetic fields Immunity Test	30 kHz, 134.2 kHz	2.3 dB (The confidential level is 95 %, $k=2$)	
	13.56 MHz	1.7 dB (The confidential level is 95 %, $k=2$)	

- End of Test Report -