

FCC/IC TEST REPORT

Job No. : GPEM2308000493EC

Applicant : KIDO SPORTS CO., LTD.

Equipment Under Test (EUT) :

Product Name : BLUETOOTH INTERCOM

Model Name : LINK-1

FCC Authorization Type : Certification

Applied Standards : FCC Part 15 Subpart B, Class B

ICES-003 Issue 7:2020

FCC ID : 2BEYM-LINK-1

IC Certification : 32025-LINK-1

Date of Receipt : July 28, 2023

Date of Test : December 5, 2023 ~ December 28, 2023

Date of Issue : February 15, 2024

Test Results : Complied

Tested by

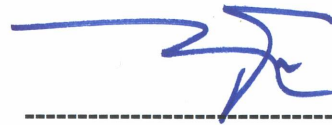
:



DoHyeon Lee

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-EMC002051	Initial
1		

1. General Information

1.1 Client Information

Applicant	KIDO SPORTS CO., LTD.
Applicant Address	395, Gonghang-daero, Gangseo-gu, Seoul, Republic of Korea
Manufacturer	KIDO SPORTS CO., LTD.
Manufacturer Address	395, Gonghang-daero, Gangseo-gu, Seoul, Republic of 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
- Dongtan Laboratory	12, Dongtansandan 10-gil, Hwaseong-si, Gyeonggi-do, 18487, 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	BLUETOOTH INTERCOM
Model Name	LINK-1
Serial No.	-
EMI Classification	Class B
Internal Clock Frequency	2 480 MHz
Rated Power	(100-240) V~, 50-60 Hz
Tested Power	120 V~, 60 Hz
H/W Version	v1.3
S/W Version	V1.0
Port	USB C-Type
Components	Main body, USB Cable, Microphones, Speaker
Function	BLUETOOTH headset in used helmet.

1.4 Operating Modes and Conditions

Operating mode	Operating Condition
1) Charging	A state that the EUT was charging through AC Adapter.

1.5 Peripheral Equipments

Description	Model	Serial No.	Manufacturer	Note.
Travel Adapter	EP-TA20KWK	R37FBLB3JT1SE3	SAMSUNG	China

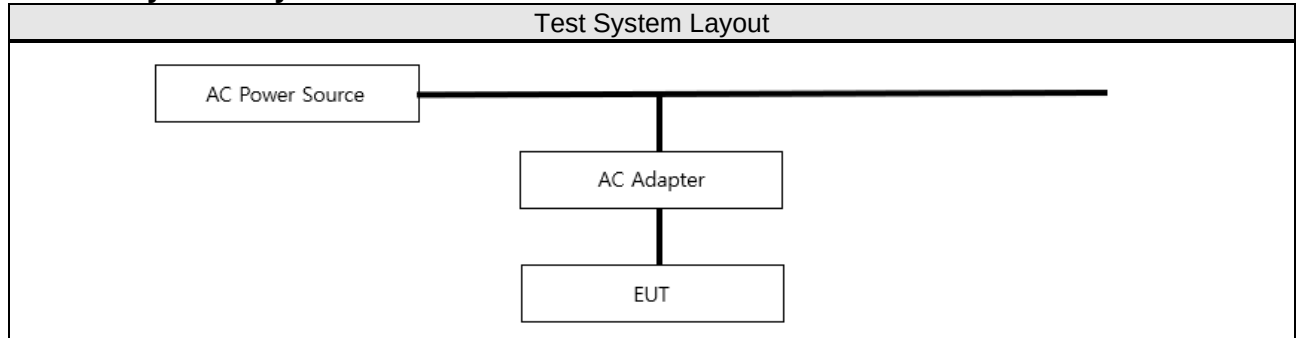
1.6 Cable List

Start		END		Cable Spec.		Used core
Name	I/O Port	Name	I/O Port	Length (m)	Shield	
EUT	USB C-Type	Travel Adapter	USB A-Type	1.0	Unshield	-

1.7 System Configurations

Description	Model	Serial No.	Manufacturer	Note
Main Board	CR-1 V1.3	-	KIDO SPORTS	-
Battery	-	-	-	-

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

[FCC Part 15 Subpart B]

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	

[ICES-003 Issue 7 : 2020]

Frequency Range	Limits(dB μ 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 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.

[ICES-003 Issue 7 : 2020]

Frequency Range	Limits(dB μ 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 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 Lab.: EMC32(V10.40.10) from R&S
- Gunpo Lab.: EMC32(V10.60.20) from R&S
- Dongtan Lab.: EMC32(V10.40.00) from R&S

2.3.1 Test Equipments

Equipment	Model	Manufacturer	Serial No	Cal Due. Date
Two-Line V-Network	ENV216	R & S	100190	2024.05.17
Test Receiver	ESCI 7	R & S	100911	2024.02.24

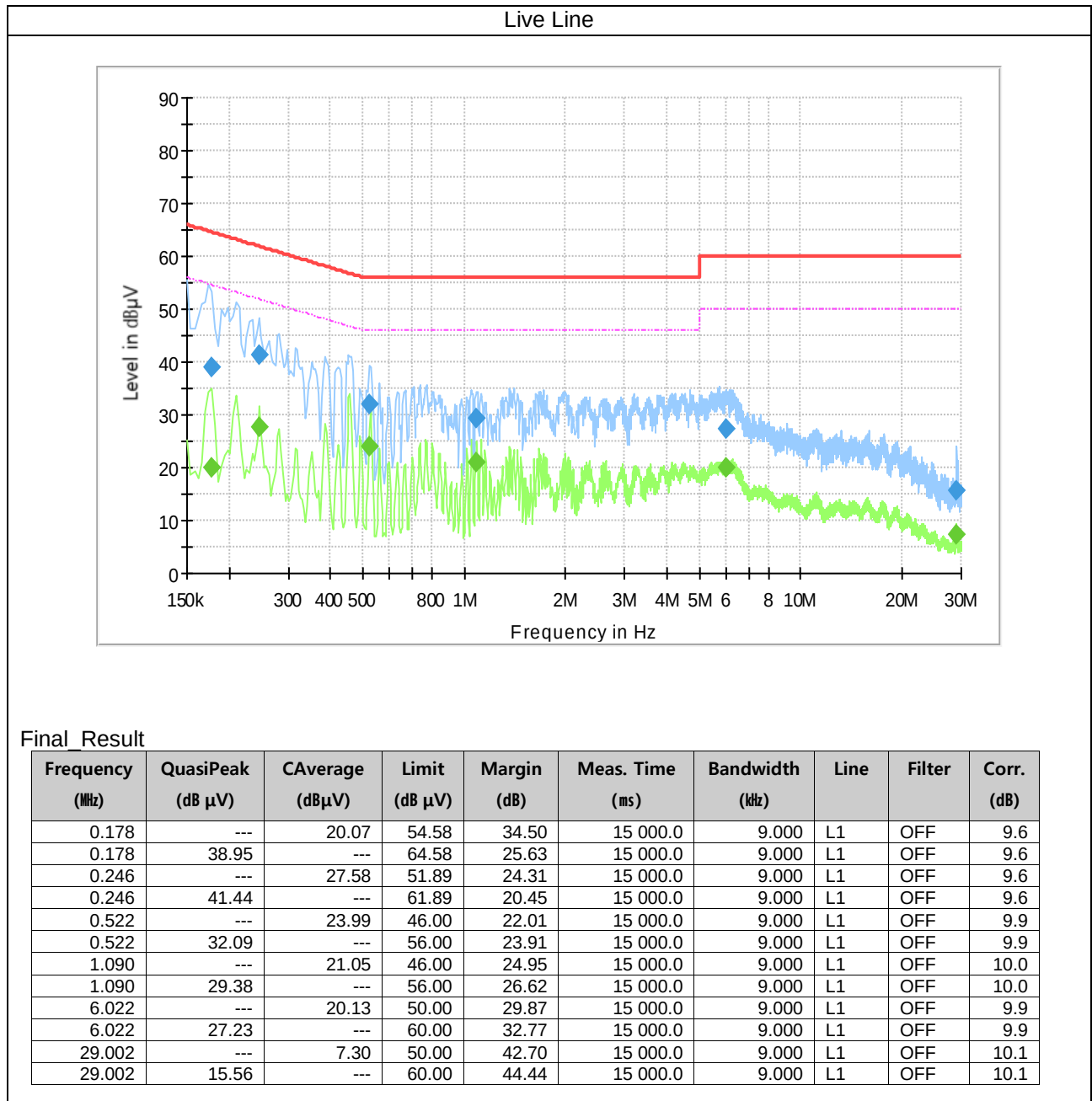
2.3.2 Test Site

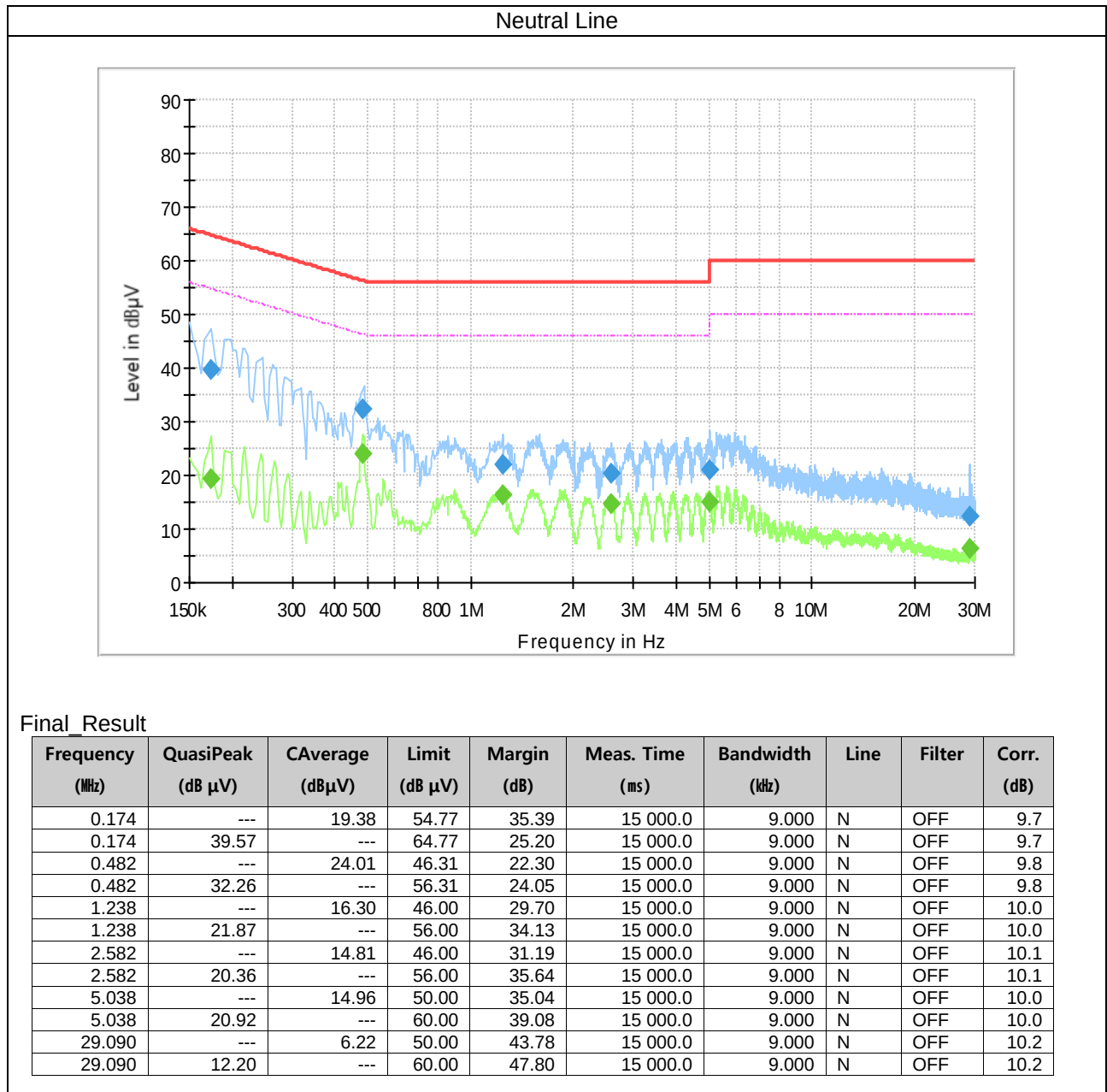
Shield Room in Gunpo Laboratory

2.3.3 Environment Conditions

Temperature	(Minimum 23.0, Maximum 24.0) °C
Humidity	(Minimum 24.5, Maximum 25.5) % R.H.
Atmospheric Pressure	(Minimum 101.0, Maximum 101.1) kPa
Test Date	December 5, 2023

2.3.4 Test Results





Measurement Uncertainty : See Appendix A

Note : • (L1) : Live

• Margin = Limit – Quasi Peak or CAverage

• (N) : Neutral

• Corr. = LISN Factor + Cable loss

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 13 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(V10.40.10) from R&S
- Gunpo Lab.: EP5RE(V5.3.70) from TOYO
- Dongtan Lab.: EMC32(V10.40.10) from R&S

2.4.1 Test Equipments

Equipment	Model	Manufacturer	Serial No	Cal Due. Date
Horn Antenna	HF906	R & S	100326	2024.02.28
Signal Conditioning Unit	SCU18F	R & S	101058	2024.12.07
Test Receiver	ESU26	R & S	100109	2024.01.18
Hybrid Antenna	VULB9163	SCHWARZBECK	01126	2024.02.09
Amplifier	8447F	HP	2944A03909	2024.08.04

2.4.2 Test Site

3 m SEMI-ANECHOIC CHAMBER in Gunpo Laboratory

2.4.3 Environment Conditions

Below 1 GHz

Temperature	(Minimum 18.2, Maximum 18.9) °C
Humidity	(Minimum 23.0, Maximum 24.0) % R.H.
Atmospheric Pressure	(Minimum 101.1, Maximum 101.1) kPa
Test Date	December 5, 2023

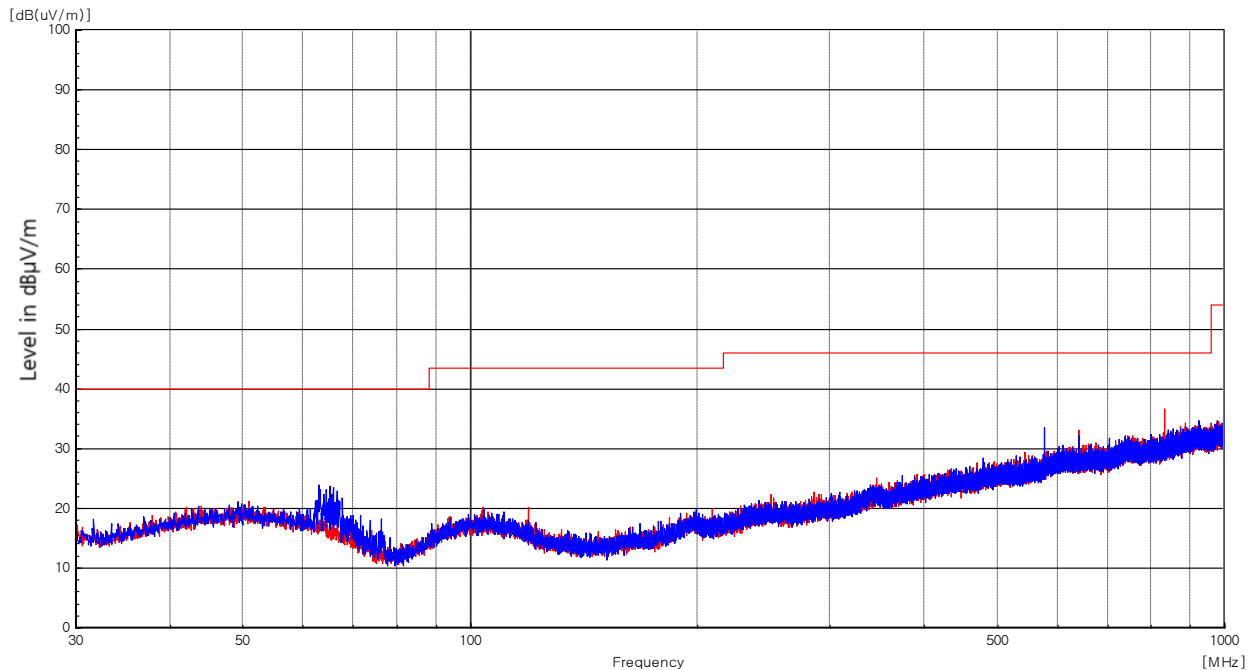
Above 1 GHz

Temperature	(Minimum 17.5, Maximum 18.5) °C
Humidity	(Minimum 24.0, Maximum 25.0) % R.H.
Atmospheric Pressure	(Minimum 102.4, Maximum 102.4) kPa
Test Date	December 28, 2023

2.4.4 Test Results

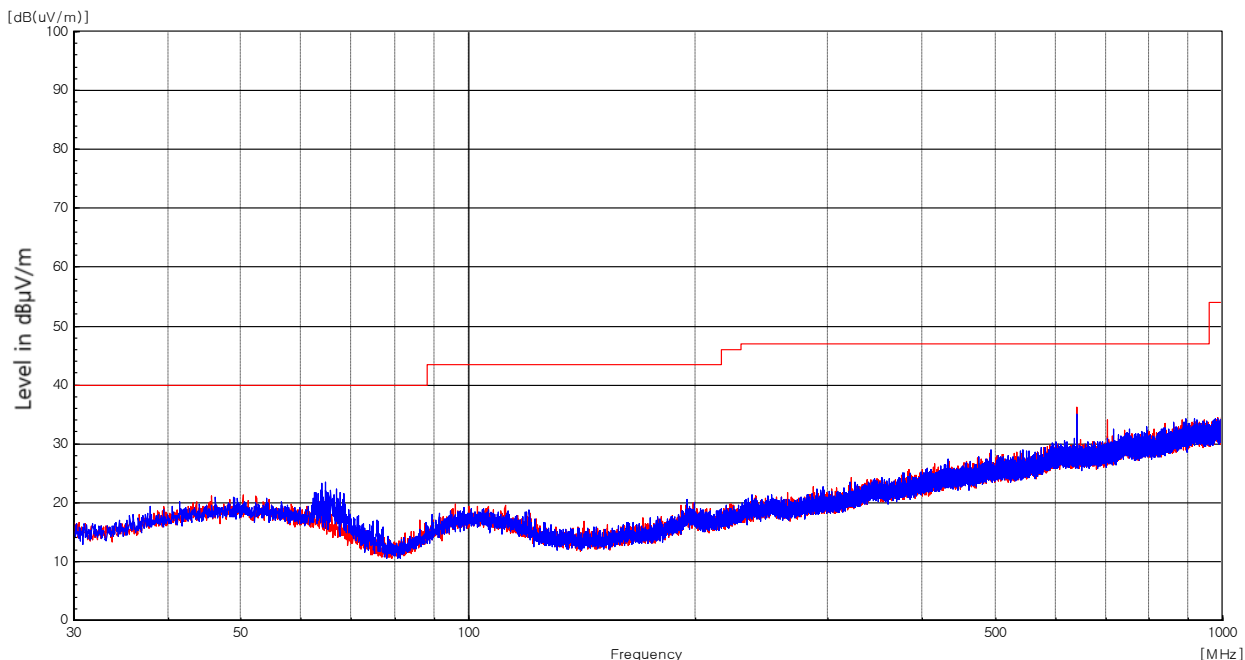
Below 1 GHz (3 m method)

[FCC Part 15 Subpart B]



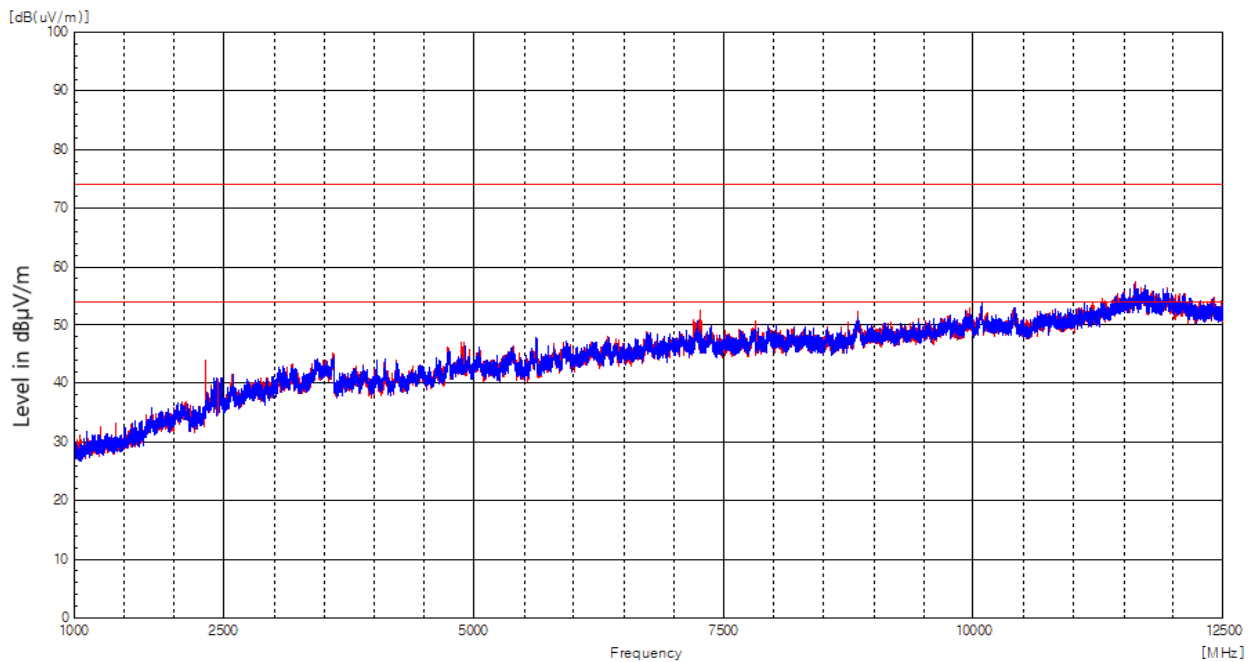
Freq. (MHz)	Reading (dBμV)	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	F/S (dBμV/m)	Limit (dBμV/m)	Margin (dB)
62.90	27.70	V	358	106	17.61	1.06	28.80	17.57	40.00	22.43
65.16	28.80	V	357	100	16.77	1.07	28.80	17.84	40.00	22.16
119.52	23.80	H	170	304	15.60	1.45	28.76	12.09	43.50	31.41
576.03	30.20	V	150	108	23.80	3.51	28.75	28.76	46.00	17.24
640.01	37.30	H	355	195	25.00	3.45	28.88	36.87	46.00	9.13
832.07	30.80	H	130	100	26.80	4.03	29.00	32.63	46.00	13.37

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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)
64.60	28.40	V	25	105	17.00	1.07	28.80	17.67	40.00	22.33
66.78	28.50	V	355	209	16.37	1.09	28.80	17.16	40.00	22.84
96.20	22.00	H	145	100	17.44	1.31	28.80	11.95	43.50	31.55
321.85	22.10	H	85	200	19.49	2.43	28.41	15.61	46.00	30.39
639.97	37.10	H	90	198	25.00	3.45	28.88	36.67	46.00	9.33
704.07	31.90	H	200	305	25.30	3.73	29.00	31.93	46.00	14.07

Above 1 GHz (3 m method)



Freq. (MHz)	Level(dBμV/m)		Pol. (H/V)	A (°)	H (cm)	AF (dB)	CL (dB)	Amp. (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Peak	C-AV									
2 308.29	54.20	-	H	210	198	27.97	7.16	41.85	47.48	74.00	26.52
2 308.29	-	29.40	H	210	198	27.97	7.16	41.85	22.68	54.00	31.32
3 598.17	42.40	-	V	10	106	31.49	10.37	41.30	42.96	74.00	31.04
3 598.17	-	28.10	V	10	106	31.49	10.37	41.30	28.66	54.00	25.34
5 630.38	41.00	-	H	245	200	34.20	14.18	40.13	49.25	74.00	24.75
5 630.38	-	27.60	H	245	200	34.20	14.18	40.13	35.85	54.00	18.15
8 847.62	41.40	-	H	195	195	37.10	16.58	41.31	53.77	74.00	20.23
8 847.62	-	27.70	H	195	195	37.10	16.58	41.31	40.07	54.00	13.93
10 790.58	41.60	-	H	240	200	38.26	16.83	41.64	55.05	74.00	18.95
10 790.58	-	27.90	H	240	200	38.26	16.83	41.64	41.35	54.00	12.65
11 608.71	42.10	-	V	110	100	38.60	19.22	41.64	58.28	74.00	15.72
11 608.71	-	28.10	V	110	100	38.60	19.22	41.64	44.28	54.00	9.72

Measurement Uncertainty: See the Appendix A

Note: • AF = Antenna Factor

• Pol.(H) = Horizontal

• Margin = Limit – F/R

• A: Angle

• CL = Cable Loss

• Pol.(V) = Vertical

• F/R = Level + AF + CL – Amp.

• H: Height

• F/R = Field Strength

• Amp. = 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

Appendix A : Measurement Uncertainty

- Giheung Laboratory

Test Method		Measurement Uncertainty	
Conducted Emission		ENV216	3.2 dB (The confidential level is 95 %, $k=2$)
		ESH3-Z6	3.2 dB (The confidential level is 95 %, $k=2$)
		ESH2-Z5	3.0 dB (The confidential level is 95 %, $k=2$)
		NNLK8129	3.0 dB (The confidential level is 95 %, $k=2$)
Conducted Emission - Signal		ISN T800	5.5 dB (The confidential level is 95 %, $k=2$)
		ISN ST08	6.6 dB (The confidential level is 95 %, $k=2$)
Discontinuous		2.7 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	4.3 dB (The confidential level is 95 %, $k=2$)
		Vertical	4.6 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 %, $k=2$)

- Gunpo Laboratory

Test Method		Measurement Uncertainty	
Conducted Emission		ENV216	3.1 dB (The confidential level is 95 %, $k=2$)
		ESH2-Z5	2.8 dB (The confidential level is 95 %, $k=2$)
		ESH3-Z6	3.0 dB (The confidential level is 95 %, $k=2$)
Conducted Emission - Signal		ISN T800	5.3 dB (The confidential level is 95 %, $k=2$)
		ISNT8-Cat6	5.4 dB (The confidential level is 95 %, $k=2$)
		ISN S751	7.1 dB (The confidential level is 95 %, $k=2$)
Disturbance Voltage at Antenna Terminal		2.2 dB (The confidential level is 95 %, $k=2$)	
Radiated Emission	9 kHz ~30 MHz	Horizontal	3.6 dB (The confidential level is 95 %, $k=2$)
		Vertical	3.6 dB (The confidential level is 95 %, $k=2$)
	30 MHz ~ 1 000 MHz	Horizontal	4.6 dB (The confidential level is 95 %, $k=2$)
		Vertical	4.9 dB (The confidential level is 95 %, $k=2$)
	1 GHz ~ 18 GHz	Horizontal	3.9 dB (The confidential level is 95 %, $k=2$)
		Vertical	3.8 dB (The confidential level is 95 %, $k=2$)

- Dongtan Laboratory

Test Method		Measurement Uncertainty	
Conducted Emission	ENV216	3.5 dB (The confidential level is 95 %, $k=2$)	
	ESH2-Z5	3.3 dB (The confidential level is 95 %, $k=2$)	
	ESH3-Z6	3.3 dB (The confidential level is 95 %, $k=2$)	
	NNLK8129	3.4 dB (The confidential level is 95 %, $k=2$)	
Conducted Emission - Signal	ISN T800	5.7 dB (The confidential level is 95 %, $k=2$)	
	ISN ST08	5.5 dB (The confidential level is 95 %, $k=2$)	
Discontinuous		2.9 dB (The confidential level is 95 %, $k=2$)	
disturbance Power		3.9 dB (The confidential level is 95 %, $k=2$)	
Radiated Emission	9 kHz ~30 MHz (Triple Loop Ant.)	3.4 dB (The confidential level is 95 %, $k=2$)	
	9 kHz ~30 MHz (Loop Ant.)	Horizontal	3.8 dB (The confidential level is 95 %, $k=2$)
		Vertical	3.8 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	5.4 dB (The confidential level is 95 %, $k=2$)
	1 GHz ~ 18 GHz	Horizontal	4.1 dB (The confidential level is 95 %, $k=2$)
		Vertical	4.2 dB (The confidential level is 95 %, $k=2$)

- End of Test Report -