



TEST REPORT



Report No. : KES-EM240342
Page 1 / 70

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1. Client

Applicant : Hanwha Vision Co., Ltd
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

2. Sample Description

Product name : SIP MIC
Model/Type No. : SPA-M2000
Variant Model : -
Manufacturer : Inter-M Corporation
Manufacturer Address : 73, Hwahap-ro 1402beon-gil, Yangju-si, Gyeonggi-do, Republic of Korea

3. Date of Receipt : Jan. 25, 2024

4. Test date : Feb. 03, 2024 ~ Feb. 07, 2024

5. Date of Issue : Mar. 20, 2024

6. Test Results : In Compliance

Tested by

Reviewed by

Seon Ho, Choi
EMC Test Engineer

Dong Hun, Jang
EMC Technical Manager

This test report is not related to KS Q ISO/IEC 17025 and KOLAS.



REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Mar. 20, 2024	KES-EM240342	Issued

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TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency.....	5
1.2	Variant Model Differences.....	5
1.3	Device Modifications.....	5
1.4	Equipment Under Test	5
1.5	Support Equipments	5
1.6	External I/O Cabling.....	6
1.7	EUT Operating Mode(s).....	7
1.8	Configuration	8
1.9	Remarks when standards applied	9
1.10	Calibration Details of Equipment Used for Measurement	9
1.11	Test Facility	9
1.12	Laboratory Accreditations and Listings.....	9
2.0	Test Regulations	10
2.1	Conducted Emissions at Mains Power Ports.....	11
2.2	Conducted Emissions at Telecommunication Ports.....	12
2.3	Radiated Electric Field Emissions(Below 1 GHz).....	13
2.4	Radiated Electric Field Emissions(Above 1 GHz)	14
2.5	Harmonic Current Emissions	15
2.6	Voltage Fluctuations and Flicker.....	16
3.0	Criteria for compliance.....	17
3.1	Electrostatic Discharge	18
3.2	Radiated Electric Field Immunity	22
3.3	Electrical Fast Transients/Bursts	25
3.4	Surge	28
3.5	Conducted Disturbance	31
3.6	Power Frequency Magnetic Field Immunity	35
3.7	Voltage Dips and Short Interruptions.....	37
APPENDIX A – TEST DATA		39
Conducted Emissions at Mains Power Ports		39
Conducted Emissions at Telecommunication Ports		41
Radiated Electric Field Emissions(Below 1 GHz)		43
Radiated Electric Field Emissions(Above 1 GHz)		45
Harmonic Current Emissions and Voltage Fluctuations and Flicker		47
APPENDIX B – Test Setup Photos and Configuration		50
Conducted Emissions at Mains Power Ports		50
Conducted Telecommunication Emissions.....		51
Radiated Electric Field Emissions(Below 1 GHz)		53
Radiated Electric Field Emissions(Above 1 GHz)		54
Harmonic Current Emissions and Voltage Fluctuations and Flicker		56
Electrostatic Discharge		58
Radiated Electric Field Immunity		59
Electrical Fast Transients/Bursts		60
Surge Transients.....		61
Conducted Disturbance		62
Power Frequency Magnetic Field Immunity		63
Voltage Dips and Short Interruptions.....		64
APPENDIX C – EUT Photographs		65
EUT External Photographs.....		65
EUT Internal Photographs		66
Label and Location		67



1.0 General Product Description

Main Specifications of EUT are:

Product	
Type	SIP Microphone
Line Output	
Output Level	None
Frequency Response	None
THD + N Ratio (AES17 LPF)	None
S/N Ratio (20kHz LPF, A-WTD)	None
Line Input	
Maximum Input Level	-7dBV, Aux Input Volume Max
Amplifier	
Description	1W/ 8Ω, Monitor Amp
Network	
Ethernet	10/100 Base-T
Memory	
Internal Memory	None
External Memory (Micro SD)	None
Contact	
Contact Input. Dry contact	None
Contact Output. Dry contact (NO)	None
General	
Operating Temperature	-10 ~ +40°C (+14°F ~ +104°F)
Operating Humidity	10~95% RH (Non-Condensing)
IP code	None
Weight	1.3 Kg
Size	200(W) x 73(H) x 206(D)mm
Color	Black
Certificate	EMC : KS C 9832/9835, EN 55032/55035, FCC Part 15 Subpart B, ICES-003 Safety : UL 62368-1, CAN/CSA 62368-1
Power	
PoE	PoE (IEEE 802.3 af type 1 Class 3)
PoE+	Max.12W, DC24V
Embedded MIC	
Input Sensitivity	-50dBV ± 3dB (Mic Volume Max)
Frequency Response	100Hz ~ 6kHz
Audio	
Supported Audio Format	None
Speaker	
Speaker Component	None
Max. Sound Pressure Level (PoE)	None
Max. Sound Pressure Level (PoE+)	None
Frequency Range (-10dB)	None
Sensitivity (1Watt)	None
Coverage Pattern	None
Network Protocol	
Security	Password protection : admin,setup,user,guest (sha-2, Digest authentication, User access log) Digest authentication, User access log
Supported Protocols	IPv4, HTTP, SIP, mDNS, DNS, NTP, TCP, UDP, DHCP, ARP, ICMP
System Integration	
API (Application Programming Interface)	SUNAPI
Multi-source Dynamic PA control	None
VoIP	Tested with SIP clients such as Grandstream, Yealink, Cisco, MicroSIP softphone and PBX supplier such as Asterisk Tested with SIP client such as Grandstream and PBX supplier such as Grandstream Supported SIP features: DTMF (RFC2833) Supported codecs: PCMU, PCMA, speex/8000, speex/16000
TTS	None
Audio Monitoring	None
Event & Preset	None
Functional Monitoring	Connection verification, Built-in system logging



1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

☒ AC 230 V 50 Hz

☒ PoE

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
SIP MIC	SPA-M2000	-	Inter-M Corporation	EUT
AC / DC Adapter	KPL-060M-VI	-	Channel Well Technology (Guangzhou) Co.,Ltd.	-

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Speaker	-	-	-	-
Notebook	LG15U590	-	LG Electronics Co., Ltd.	-
Notebook Adapter	A13-040N3A	-	CHICONY POWER TECHNOLOGY (Chongqing) CO., LTD.	-
PoE Switch	GS728TPP	3AR3595700005	NETGEAR®	-
Smart Phone	SM-G991N	-	SAMSUNG	-
switching hub	H508	-	IpTIME	-
switching hub Adapter	DWA05200K	-	Dongguan City Rongrun Industry Co.,Ltd	-



1.6 External I/O Cabling

■ AC/DC Adaptor Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
SIP MIC (EUT)	DC Jack	AC / DC Adapter (EUT)	Line out	1.5	U
	AUX IN	Notebook	3.5 mm	1.0	U
	-	Smart Phone	-	-	-
	RJ-45(LAN)	switching hub	RJ-45(LAN)	3.5	U
Poe Switch	RJ-45(LAN)	switching hub	RJ-45(LAN)	1.5	U
	RJ-45(PoE)	Speaker	RJ-45(PoE)	1.6	U
	RJ-45(LAN)	Notebook	RJ-45(LAN)	1.2	U
Notebook	DC Jack	Notebook Adapter	DC Jack	1.4	U
switching hub	DC Jack	switching hub Adapter	DC Jack	1.2	U

* Unshielded=U, Shielded=S

■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
SIP MIC (EUT)	AUX IN	Notebook	3.5 mm	1.0	U
	-	Smart Phone	-	-	-
	RJ-45(PoE)	PoE Switch	RJ-45(PoE)	3.5	U
Poe Switch	RJ-45(PoE)	Speaker	RJ-45(PoE)	1.6	U
	RJ-45(LAN)	Notebook	RJ-45(LAN)	1.2	U
Notebook	DC Jack	Notebook Adapter	DC Jack	1.4	U

* Unshielded=U, Shielded=S



1.7 EUT Operating Mode(s)

■ AC/DC Adaptor Mode, PoE Mode

Test mode	operating
Operating	The test was performed by running Pingtest on a laptop to check whether the test equipment was connected properly and whether 1 kHz tone was output to the speaker through the test equipment.

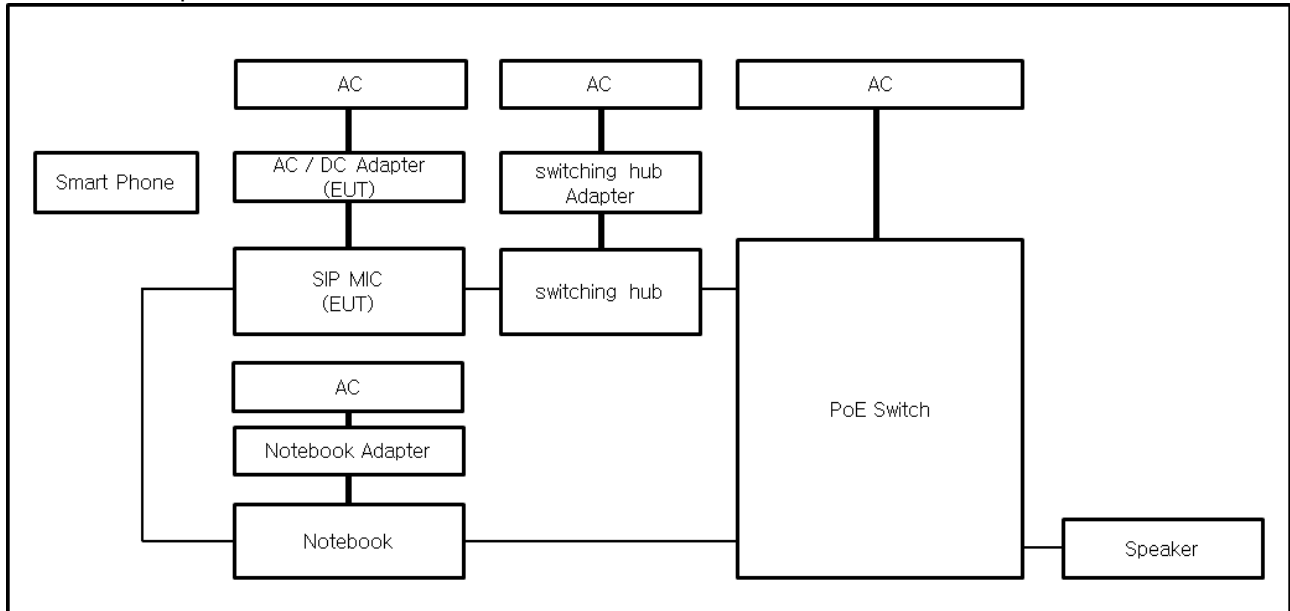
EUT Test operating S/W - Vendor Support Program		
Name	Version	Manufacture Company
-	-	-



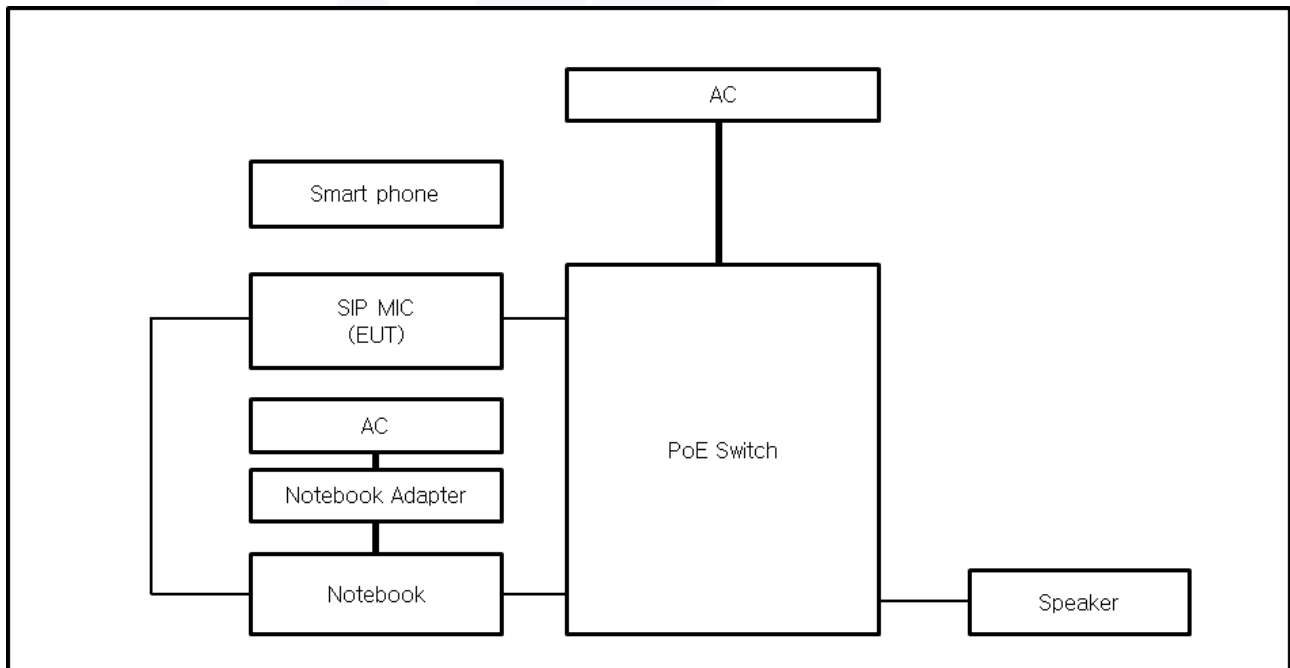


1.8 Configuration

■ AC/DC Adaptor Mode



■ PoE Mode



**1.9 Remarks when standards applied**

In PoE mode, the LAN port is regarded as a wired communication network port and power-related ports are not tested.

1.10 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

1.11 Test Facility

The measurement facility is located at 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	KOLAS	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298
JAPAN	VCCI	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 55035:2017/A11:2020

☒ EN IEC 61000-3-2:2019

☒ EN 61000-3-3:2013/A1:2021

☒ **EMC – Regulations 2016**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 55035:2017/A11:2020

☒ EN IEC 61000-3-2:2019

☒ EN 61000-3-3:2013/A1:2021



2.1 Conducted Emissions at Mains Power Ports

Test Date

Feb. 03, 2024

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	11, 08, 2024
☒	LISN	ENV216	R & S	101787	11, 08, 2024
☒	LISN	ESH2-Z5	R & S	100450	11, 08, 2024
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 08, 2024

Test Conditions

Temperature: (21,8 ± 0,2) °C

Relative Humidity: (45,9 ± 0,2) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



2.2 Conducted Emissions at Telecommunication Ports

Test Date

Feb. 03, 2024

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	11, 08, 2024
☒	LISN	ENV216	R & S	101787	11, 08, 2024
☒	LISN	ESH2-Z5	R & S	100450	11, 08, 2024
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 08, 2024
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	11, 09, 2024
☒	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	11, 09, 2024

Test Conditions

Temperature: (21,8 ± 0,2) °C
Relative Humidity: (45,9 ± 0,3) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Feb. 04, 2024

Test Location☐ OPEN AREA TEST SITE #2☒ SEMI ANECHOIC CHAMBER #4(10 m)**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	03, 21, 2024
☒	AMPLIFIER	SCU 01	R & S	100603	11, 08, 2024
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
☒	ATTENUATOR	8491A	HP	32173	03, 03, 2024

Test Conditions

Temperature: (22,4 ± 0,3) °C

Relative Humidity: (46,2 ± 0,4) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Measurement distance

10 m

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Feb. 05, 2024

Test Location

SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESR7	R & S	101190	07, 31, 2024
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	03, 06, 2024
☒	ATTENUATOR	8491A	HP	35496	03, 03, 2024
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 06, 2024

Test Conditions

Temperature: (22,2 ± 0,2) °C

Relative Humidity: (45,7 ± 0,4) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



2.5 Harmonic Current Emissions

Test Date

Feb. 07, 2024

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	net.control	EM TEST	2.1.4	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	03, 27, 2024
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (22,0 ± 0,2) °C

Relative Humidity: (45,4 ± 0,2) % R.H.

Classification of Equipment for Harmonic Current Emissions

- ☒ Class A
- ☐ Class B
- ☐ Class C(Below 25 W)
- ☐ Class C(Above 25 W)
- ☐ Class D

Test Results

The requirements are:

- ☒ PASS
- ☐ NOT PASS
- ☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



2.6 Voltage Fluctuations and Flicker

Test Date

Feb. 07, 2024

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	net.control	EM TEST	2.1.4	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	03, 27, 2024
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (22,0 ± 0,4) °C

Relative Humidity: (45,4 ± 0,6) % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



3.0 Criteria for compliance

General performance criteria

General performance criteria are defined in 8.2, 8.3 and 8.4. These criteria shall be used during the testing of primary functions where no relevant annex is applicable.

When assessing the impact of a disturbance on a function, the assessment should take into consideration the function's performance prior to the application of the disturbance and only identify as failures those changes in performance that are a result of the disturbance.

Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed

below a performance level specified by the manufacturer when the equipment is used as intended.

The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed,

below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed.

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.



3.1 Electrostatic Discharge

Reference Standard

EN 61000-4-2:2009

Test Date

Feb. 03, 2024

Test Location

EMS-ESD: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	01, 30, 2025
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (22,1 ± 0,1) °C
Relative Humidity: (46,0 ± 0,1) % R.H.
Atmospheric Pressure: (100,7 ± 0,0) kPa

Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

Kind of Discharge: Air, Contact (direct and indirect)

Polarity: Positive and Negative

Number of Discharge: 10 at all locations for Air discharge
10 at all locations for Contact discharge

Discharge Voltage:	Contact	Air	HCP	VCP
	☐ 2 kV	☒ 2 kV	☐ 2 kV	☐ 2 kV
	☒ 4 kV	☒ 4 kV	☒ 4 kV	☒ 4 kV
	☐ 6 kV	☐ 6 kV	☐ 6 kV	☐ 6 kV
	☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
	☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

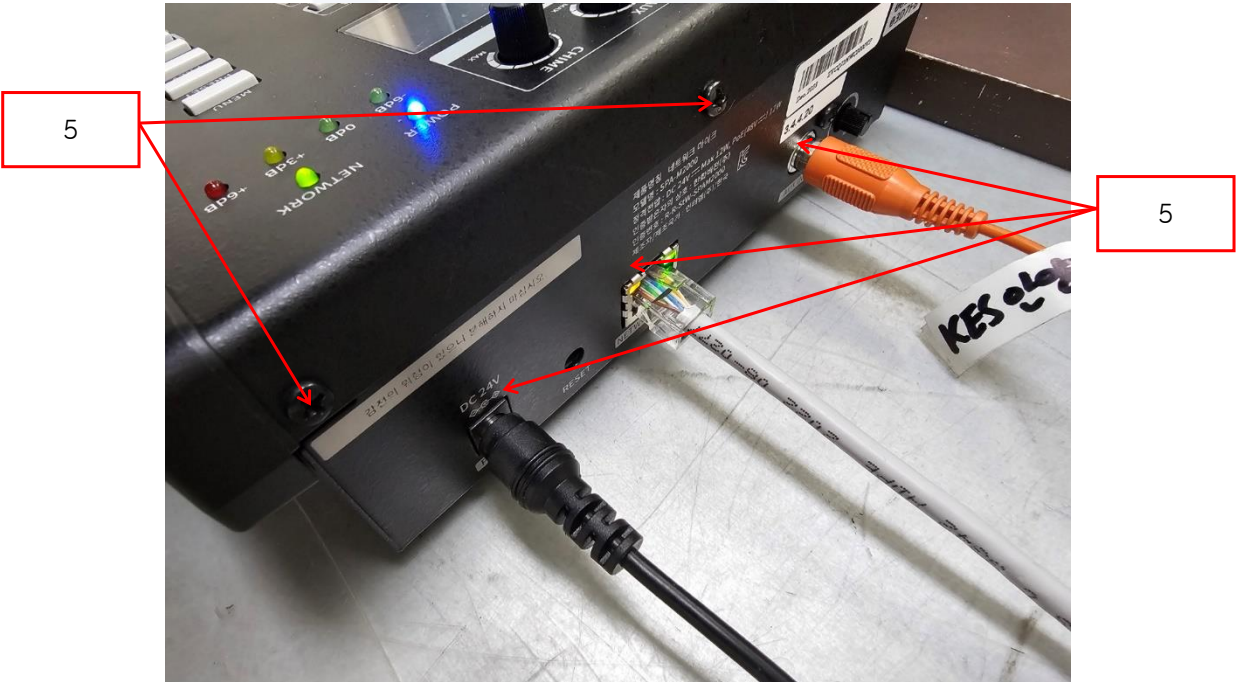
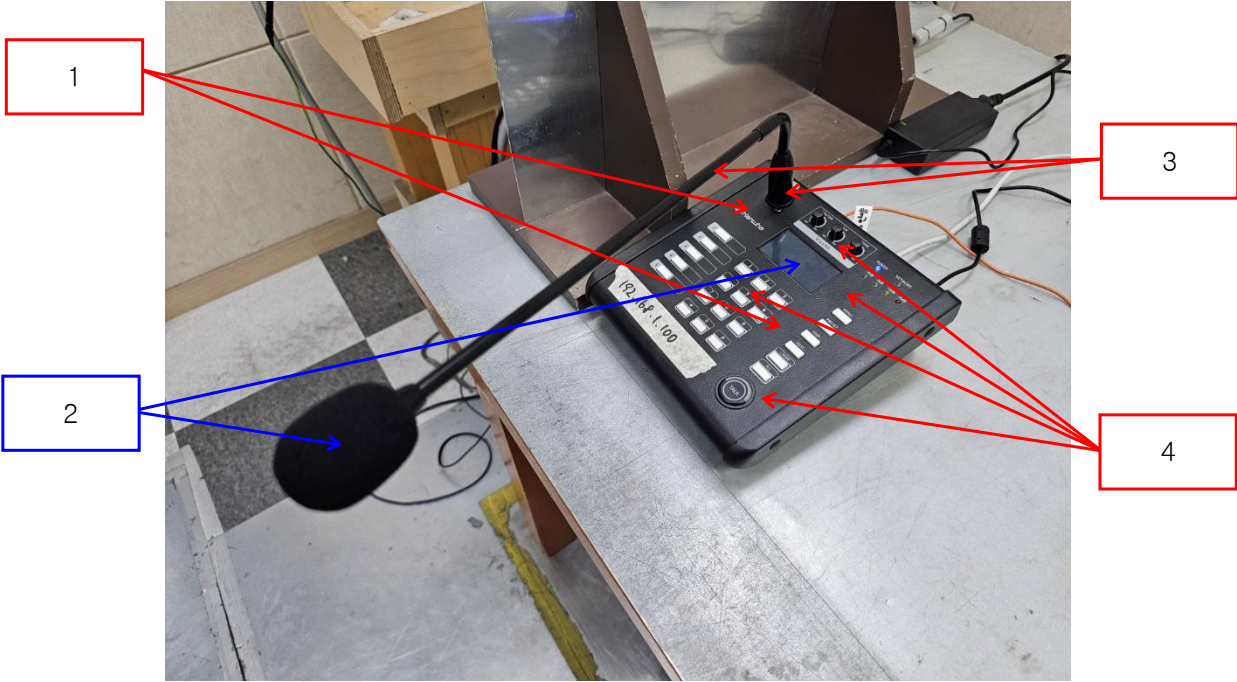
Required Performance Criteria: ☒ B



Location of Discharge:

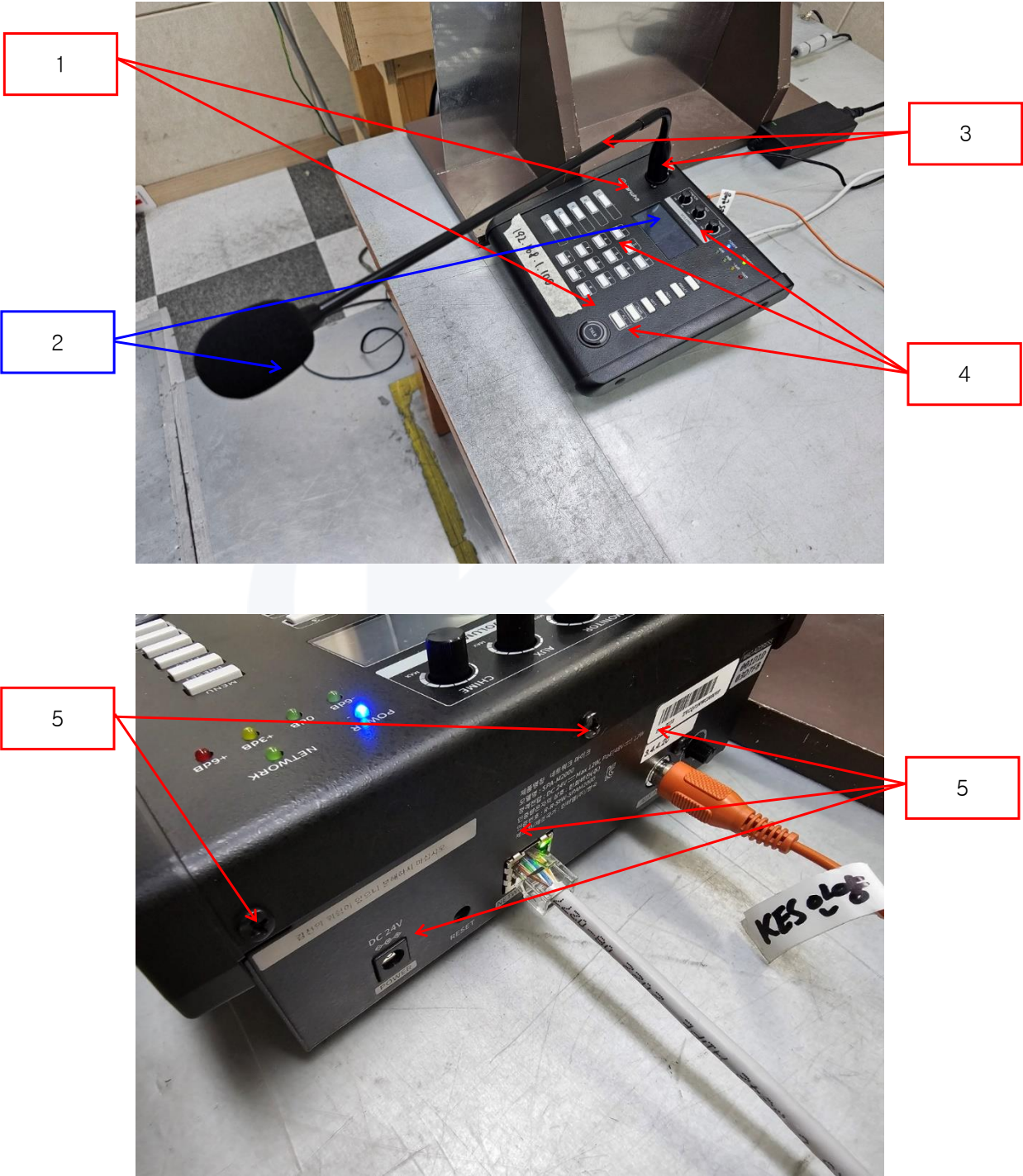


■ AC/DC Adaptor Mode





■ PoE Mode



**Test Data****■ AC/DC Adaptor Mode**

No.	Test Point	Discharge Method	Performance		Remarks
			Criteria	Results	
1	HCP Contact	Contact Discharge	B	A	-
2	VCP Contact	Contact Discharge	B	A	-

Direct Discharge

No.	Test Point	Discharge Method	Performance		Remarks
			Criteria	Results	
1	Enclosure	Contact Discharge	B	A	-
2	MIC 1, Display	Air Discharge	B	A	-
3	MIC 2	Contact Discharge	B	A	-
4	Button	Contact Discharge	B	A	-
5	Port, Screw	Contact Discharge	B	A	-

■ PoE Mode

No.	Test Point	Discharge Method	Performance		Remarks
			Criteria	Results	
1	HCP Contact	Contact Discharge	B	A	-
2	VCP Contact	Contact Discharge	B	A	-

Direct Discharge

No.	Test Point	Discharge Method	Performance		Remarks
			Criteria	Results	
1	Enclosure	Contact Discharge	B	A	-
2	MIC 1, Display	Air Discharge	B	A	-
3	MIC 2	Contact Discharge	B	A	-
4	Button	Contact Discharge	B	A	-
5	Port, Screw	Contact Discharge	B	A	-

Note: "Blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

Any degradations of performance was not observed during in the test.



3.2 Radiated Electric Field Immunity

Reference Standard

EN IEC 61000-4-3:2020

Test Date

Feb. 07, 2024

Test LocationEMS-RS: ☐ SEMI ANECHOIC CHAMBER #1☒ SEMI ANECHOIC CHAMBER #3**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	10.10.02	-
☒	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	07, 31, 2024
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	03, 21, 2024
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	03, 21, 2024
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	03, 21, 2024
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 06, 2024



Test Conditions

Temperature: (22,3 ± 0,4) °C
Relative Humidity: (46,3 ± 0,6) % R.H.
Atmospheric Pressure: (100,5 ± 0,0) kPa

Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☐ 1 V/m ☒ 3 V/m
☐ 10 V/m

Frequency Range: ☒ 80 MHz to 1 GHz (swept test) ☐ 1,4 GHz to 2,7 GHz
☒ 1.8 GHz , 2.6 GHz , 3.5 GHz , 5 GHz (± 1 %)(spot test)

Modulation: ☒ AM, 80 %, 1 kHz sine wave
☐ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☒ 3 s (spot test)

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ A

**Test Data****■ AC/DC Adaptor Mode**

Side Exposed	Performance Criteria	Results	
		Horizontal	Vertical
Front	A	A	A
Right	A	A	A
Back	A	A	A
Left	A	A	A

[Audio output function]

☐ Electrical Measurements / ☐ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Observations	
		Criteria	Measured		Horizontal	Vertical
-	-	-	-	A	-	-

* The SOUND ACOUSTIC TESTER mark characteristics indicate low if less than 50 dB.

■ PoE Mode

Side Exposed	Performance Criteria	Results	
		Horizontal	Vertical
Front	A	A	A
Right	A	A	A
Back	A	A	A
Left	A	A	A

[Audio output function]

☐ Electrical Measurements / ☐ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Observations	
		Criteria	Measured		Horizontal	Vertical
-	-	-	-	A	-	-

* The SOUND ACOUSTIC TESTER mark characteristics indicate low if less than 50 dB.

Note: "Blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**Any degradations of performance was not observed during in the test.



3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Feb. 03, 2024

Test Location

EMS-EFT: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 09, 2024
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 09, 2024
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 10, 2024

Test Conditions

Temperature: (22,1 ± 0,2) °C
Relative Humidity: (46,0 ± 0,4) % R.H.
Atmospheric Pressure: (100,7 ± 0,0) kPa

Test Specifications

Pulse Amplitude & Polarity: ☒ ± 1.0 kV ☐ ± 2.0 kV
(Power Lines) ☐ ± 4.0 kV

Pulse Amplitude & Polarity: ☒ ± 0.5 kV ☐ ± 1.0 kV
(Signal Lines) ☐ ± 2.0 kV

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☒ 5 klz ☐ 100 klz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ B

**Test Data**

■ AC/DC Adaptor Mode

☒ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
L	B	A	A
N	B	A	A
PE	B	A	A
L – N	B	A	A
L – PE	B	A	A
N – PE	B	A	A
L – N – PE	B	A	A

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	B	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
RJ-45 (LAN)	B	A	A

■ PoE Mode

☐ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	B	-	-

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	B	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
RJ-45 (PoE)	B	A	A



Note: "Blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

Any degradations of performance was not observed during in the test.





3.4 Surge

Reference Standard

EN 61000-4-5:2014+A1:2017

Test Date

Feb. 03, 2024

Test Location

EMS-Surge: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 09, 2024
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 09, 2024
☐	CDN	CNV 508N1	EM TEST	P1610176296	11, 10, 2024

Test Conditions

Temperature: (22,1 ± 0,3) °C
Relative Humidity: (46,0 ± 0,6) % R.H.
Atmospheric Pressure: (100,7 ± 0,0) kPa



Test Specifications

AC Power Lines

Source Impedance: 12 ohm for common mode and 2 ohm for differential mode

Surge Amplitude :

Common Mode

☒ (0,5 / 1,0 / 2,0) kV

Differential Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 surges per angle

Angle:

☒ 90°, 270° (input a.c. power port)

Polarity:

☒ Positive & Negative

Repetition Rate:

☐ 1 surge per min

☒ 1 surge per 30 sec.

Required Performance Criteria:

☒ B

Signal Lines

Source Impedance:

42 ohm for common mode

Surge Amplitude:

Common Mode

☐ (1,0) kV

Number of Surges:

☐ 5 Surges

Polarity:

☐ Positive & Negative

Repetition Rate:

☐ 1 surge per min

☐ 1 surge per 30 sec.

Required Performance Criteria:

☐ B

**Test Data**☒ AC/DC Adaptor Mode☒ Line to Line – Differential Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
L - N	B	A	A

☒ Line to Earth – Common Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
L – PE	B	A	A
N – PE	B	A	A

Signal Lines☐ Line to Earth – Common Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
-	B	-	-

Note: "Blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**Any degradations of performance was not observed during in the test.



3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Feb. 06, 2024

Test Location

EMS-CS: Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.12	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	11, 08, 2024
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 08, 2024
☒	CDN	CDN M016	TESEQ	43694	11, 08, 2024
☒	CDN	CDN M016	TESEQ	43697	11, 08, 2024
☒	CDN	CDN T8RJ45	EM TEST	0909-09	07, 31, 2024
☐	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 09, 2024

Test Conditions

Temperature: (22,4 ± 0,4) °C
Relative Humidity: (46,1 ± 0,4) % R.H.
Atmospheric Pressure: (100,7 ± 0,0) kPa



Test Specifications

Frequency range:

☐ 150 kHz to 100 MHz

☒ 150 kHz to 80 MHz

Voltage Level:

☒ 3 Vrms (150 kHz to 10 MHz)

☒ 3 Vrms to 1Vrms (10 MHz to 30 MHz)

☒ 1 Vrms (30 MHz to 80 MHz)

Modulation:

☒ AM, 80 %, 1 kHz sine wave

☐ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step:

☒ 1 % step

Dwell Time:

☒ 1 s

☐ 3 s

Required Performance Criteria:

☒ A

**Test Data**☒ AC/DC Adaptor Mode☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
L – N – PE	CDN	A	A

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	-	A	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
RJ-45 (LAN)	CDN	A	A

[Audio output function]

☐ Electrical Measurements / ☐ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Results
		Criteria	Measured		
-	-	-	-	A	-

* The SOUND ACOUSTIC TESTER mark characteristics indicate low if less than 50 dB.

☒ PoE Mode☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	-	A	-

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	-	A	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
RJ-45 (PoE)	CDN	A	A

[Audio output function]

☐ Electrical Measurements / ☐ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Results
		Criteria	Measured		
-	-	-	-	A	-

* The SOUND ACOUSTIC TESTER mark characteristics indicate low if less than 50 dB.



Notes: CDN = Coupling Decoupling Network
"blank" = Not performed

Results:

A – No degradation of function
B – Distortion/Error of function (self-recoverable)
C – Loss of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

- Any degradations of performance was not observed during in the test.





3.6 Power Frequency Magnetic Field Immunity

Reference Standard

EN 61000-4-8:2010

Test Date

N/A

Test Location

EMS-Magnetic: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☐	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 09, 2024
☐	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 09, 2024
☐	MAGNETIC FIELD COIL	MS 100N	EM TEST	P1536163691	11, 10, 2024
☐	CURRENT TRANSFORMER	MC 2630	EM TEST	P1629182219	11, 10, 2024

Test Conditions

Temperature:

°C

Relative Humidity:

% R.H.

Atmospheric Pressure:

kPa

Test Specifications

Field Strength:

☐ 1 A/m☐ 3 A/m☐ 30 A/m

Frequency:

☐ 50 Hz☐ 60 Hz

Required Performance Criteria:

☐ A

**Test Data**☐ Immersion method

Coil orientation	Performance Criteria	Results
X - axis	A	-
Y - axis	A	-
Z - axis	A	-

Note: "blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results

- ☐ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria
☒ NOT APPLICABLE

RemarksNot affected by magnetic fields.



3.7 Voltage Dips and Short Interruptions

Reference Standard

EN IEC 61000-4-11:2020

Test Date

Feb. 03, 2024

Test Location

EMS-Voltage dip: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 09, 2024
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 09, 2024

Test Conditions

Temperature: (22,1 ± 0,2) °C
Relative Humidity: (46,0 ± 0,3) % R.H.
Atmospheric Pressure: (100,7 ± 0,0) kPa

**Test Data**

■ AC/DC Adaptor Mode

NO	Depth	Duration	Performance		Remarks
			Criteria	Results	
1	95 %	0.5	B	A	-
2	30 %	25	C	A	-
3	95 %	250	C	C	-

Results:

- A – No response observed from EUT
B – Unit shuts down then automatically restarts when full voltage is restored.
C – Unit shuts down then manually restarts when full voltage is restored or Loss of function.

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

Any degradations of performance was not observed during in the test.

C : During the interruption (95 %, 250 cycle), EUT was turned off but after the test, it was recovered by operator's intervention.



APPENDIX A – TEST DATA

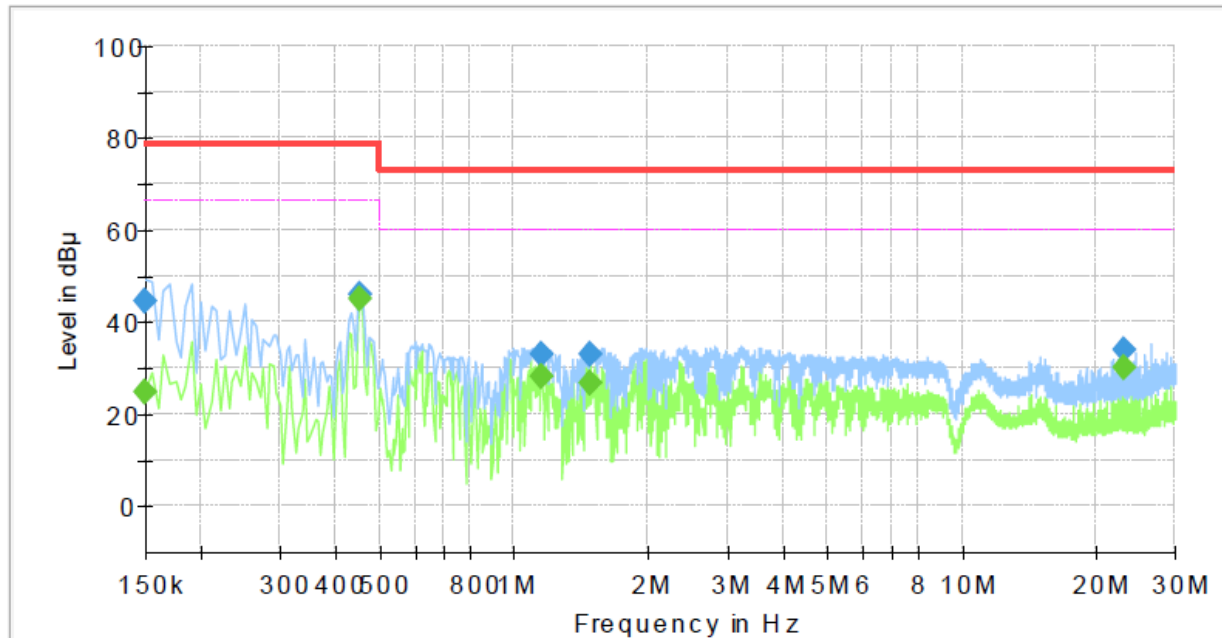
Conducted Emissions at Mains Power Ports

■ AC/DC Adaptor Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SPA-M2000
Phase:	DC 24 V
Mode:	H
Operator Name:	KES



Final Result

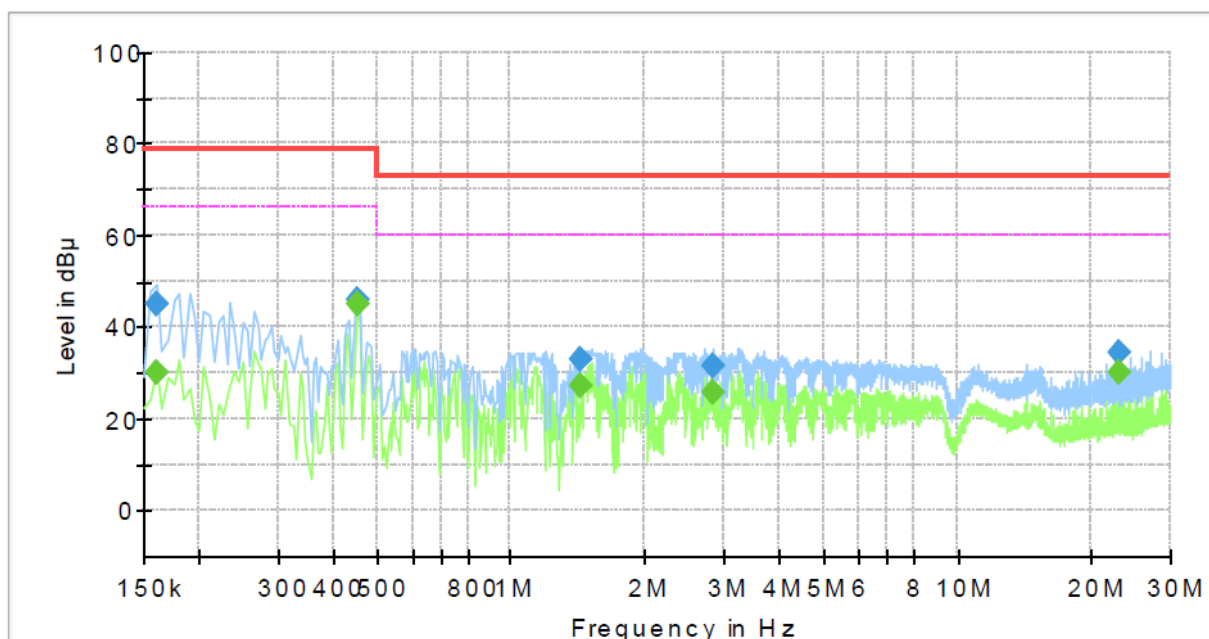
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	24.58	66.00	41.42	1000.0	9.000	L1	19.4
0.150000	44.60	---	79.00	34.40	1000.0	9.000	L1	19.4
0.455000	---	44.94	66.00	21.06	1000.0	9.000	L1	19.5
0.455000	45.94	---	79.00	33.06	1000.0	9.000	L1	19.5
1.150000	---	28.10	60.00	31.90	1000.0	9.000	L1	19.5
1.150000	32.80	---	73.00	40.20	1000.0	9.000	L1	19.5
1.480000	---	26.58	60.00	33.42	1000.0	9.000	L1	19.5
1.480000	33.02	---	73.00	39.98	1000.0	9.000	L1	19.5
23.130000	---	29.84	60.00	30.16	1000.0	9.000	L1	20.3
23.130000	34.01	---	73.00	38.99	1000.0	9.000	L1	20.3



[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	SPA-M2000
Phase:	DC 24 V
Mode:	N
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	29.93	66.00	36.07	1000.0	9.000	N	19.3
0.160000	45.22	---	79.00	33.78	1000.0	9.000	N	19.3
0.455000	---	45.11	66.00	20.89	1000.0	9.000	N	19.4
0.455000	46.13	---	79.00	32.87	1000.0	9.000	N	19.4
1.430000	---	27.34	60.00	32.66	1000.0	9.000	N	19.5
1.430000	32.77	---	73.00	40.23	1000.0	9.000	N	19.5
2.835000	---	25.76	60.00	34.24	1000.0	9.000	N	19.6
2.835000	31.65	---	73.00	41.35	1000.0	9.000	N	19.6
23.130000	---	30.18	60.00	29.82	1000.0	9.000	N	20.3
23.130000	34.30	---	73.00	38.70	1000.0	9.000	N	20.3

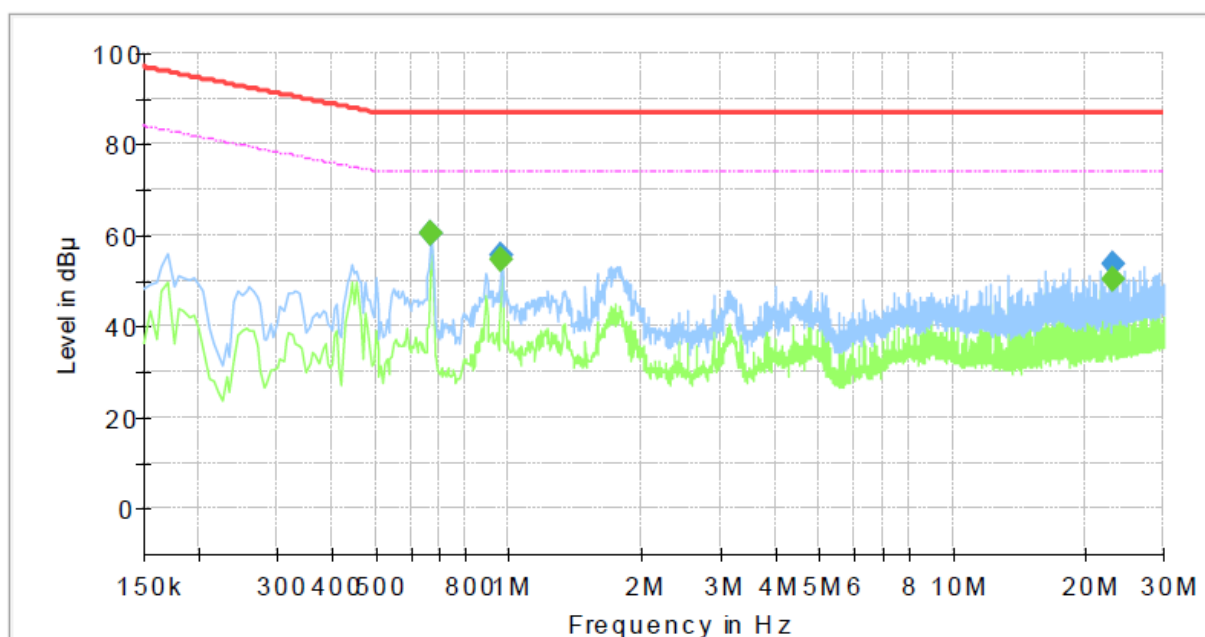
**Conducted Emissions at Telecommunication Ports**

■ AC/DC Adaptor Mode

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SPA-M2000
Mode :	DC 24 V
Speed :	1 000 Mbps
Operator Name:	KES

**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.670000	---	60.23	74.00	13.77	1000.0	9.000	Single Line	19.3
0.670000	60.67	---	87.00	26.33	1000.0	9.000	Single Line	19.3
0.965000	---	54.59	74.00	19.41	1000.0	9.000	Single Line	19.3
0.965000	55.48	---	87.00	31.52	1000.0	9.000	Single Line	19.3
23.130000	---	50.39	74.00	23.61	1000.0	9.000	Single Line	19.9
23.130000	53.74	---	87.00	33.26	1000.0	9.000	Single Line	19.9

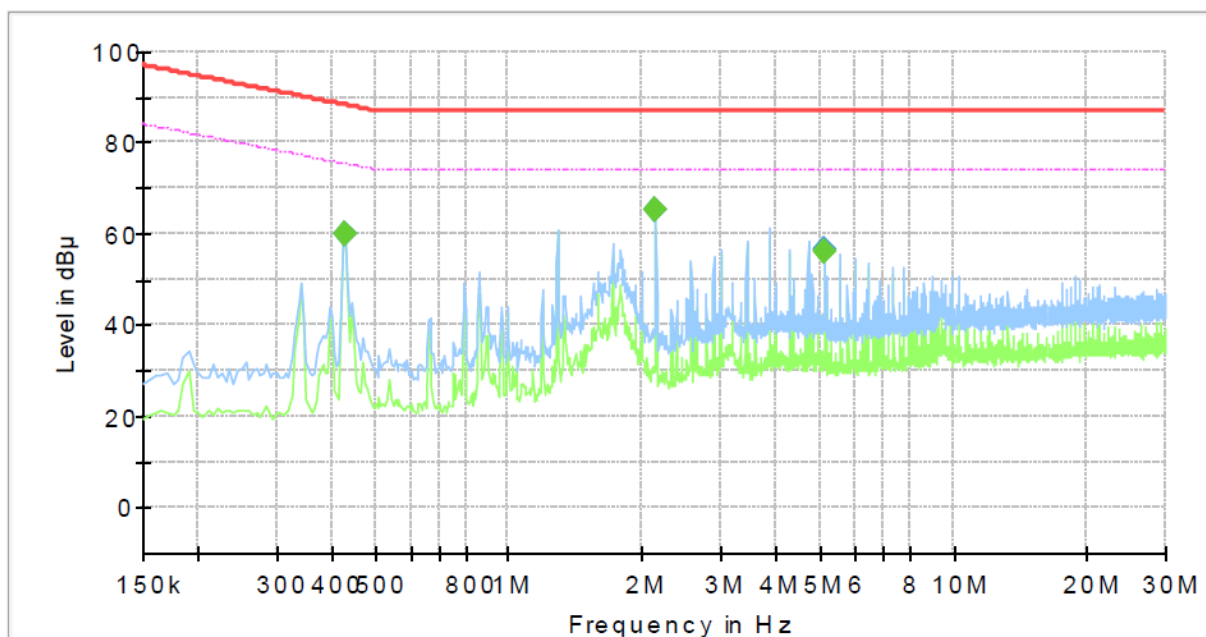


■ PoE Mode

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SPA-M2000
Mode : PoE
Speed : 1 000 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.430000	---	59.97	75.25	15.28	1000.0	9.000	Single Line	19.4
0.430000	59.98	---	88.25	28.27	1000.0	9.000	Single Line	19.4
2.140000	---	65.29	74.00	8.71	1000.0	9.000	Single Line	19.3
2.140000	65.32	---	87.00	21.68	1000.0	9.000	Single Line	19.3
5.140000	---	56.15	74.00	17.85	1000.0	9.000	Single Line	19.4
5.140000	56.47	---	87.00	30.53	1000.0	9.000	Single Line	19.4

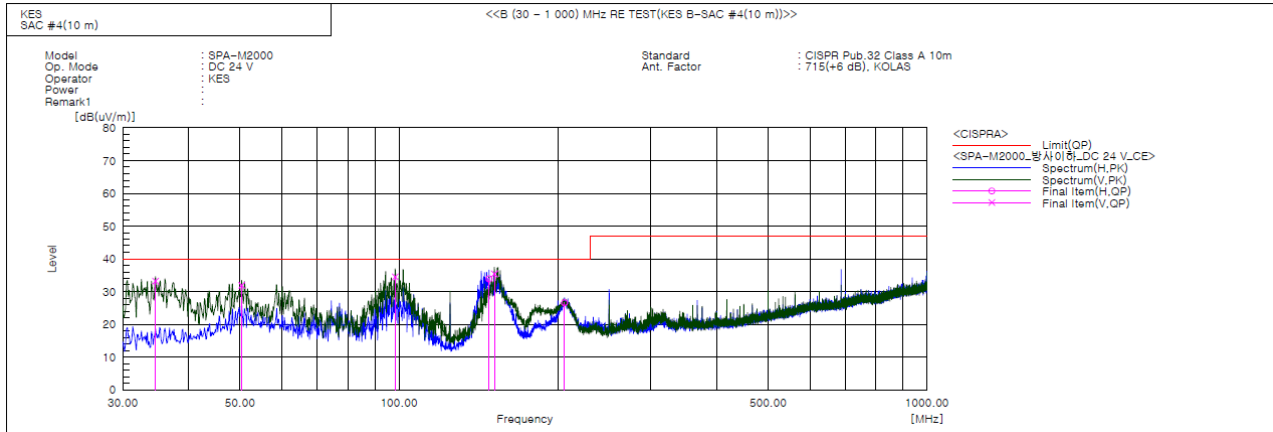
◆ Calculation

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

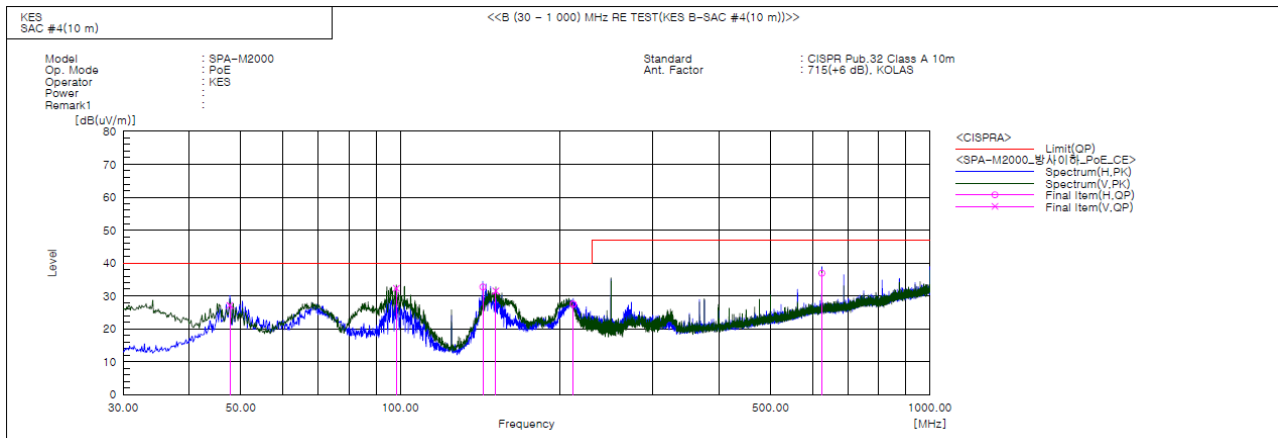
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

**Radiated Electric Field Emissions(Below 1 GHz)****■ AC/DC Adaptor Mode****Final Result**

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	34.608	V	58.1	-24.9	33.2	40.0	6.8	100.0	7.0	
2	50.370	V	53.0	-21.1	31.9	40.0	8.1	108.0	209.0	
3	98.385	V	56.9	-22.4	34.5	40.0	5.5	110.0	183.0	
4	148.098	H	59.1	-25.2	33.9	40.0	6.1	400.0	177.0	
5	151.614	V	60.5	-25.1	35.4	40.0	4.6	100.0	202.0	
6	205.813	H	46.9	-20.3	26.6	40.0	13.4	400.0	143.0	



■ PoE Mode



Final Result

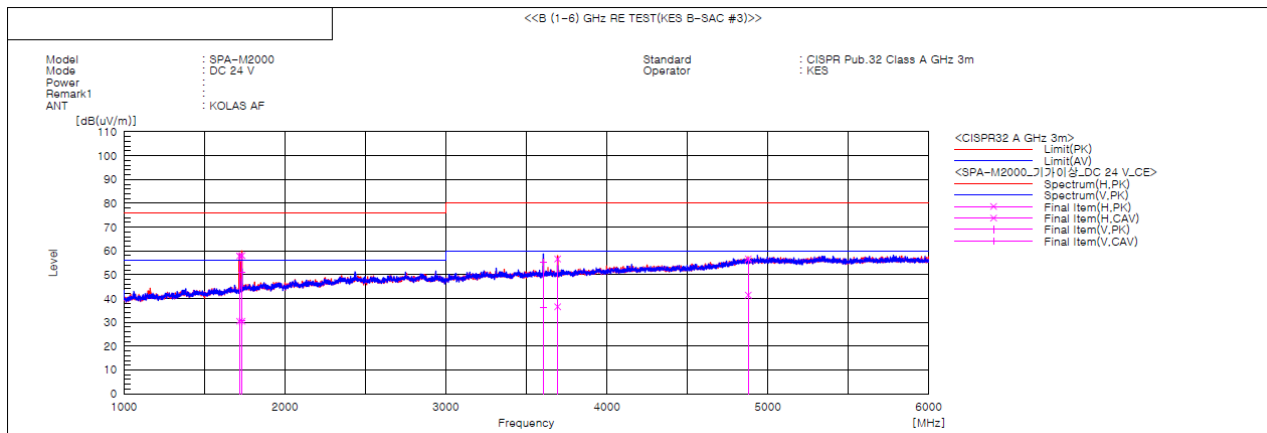
No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	47.703	V	48.3	-21.2	27.1	40.0	12.9	100.0	262.0	
2	98.385	V	54.7	-22.4	32.3	40.0	7.7	107.0	135.0	
3	143.248	H	57.9	-25.2	32.7	40.0	7.3	306.0	158.0	
4	151.493	V	56.6	-25.1	31.5	40.0	8.5	102.0	224.0	
5	212.239	H	47.4	-19.9	27.5	40.0	12.5	397.0	312.0	
6	625.095	H	44.5	-7.6	36.9	47.0	10.1	400.0	184.0	

◆ Calculation

$$\text{Result(QP)} [\text{dB}(\mu\text{V/m})] = (\text{Reading(QP)}[\text{dB}(\mu\text{V})] + \text{c.f}[\text{dB}(1/\text{m})])$$
$$\text{Margin(QP)}[\text{dB}] = \text{Limit}[\text{dB}(\mu\text{V/m})] - \text{Result(QP)} [\text{dB}(\mu\text{V/m})]$$

Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

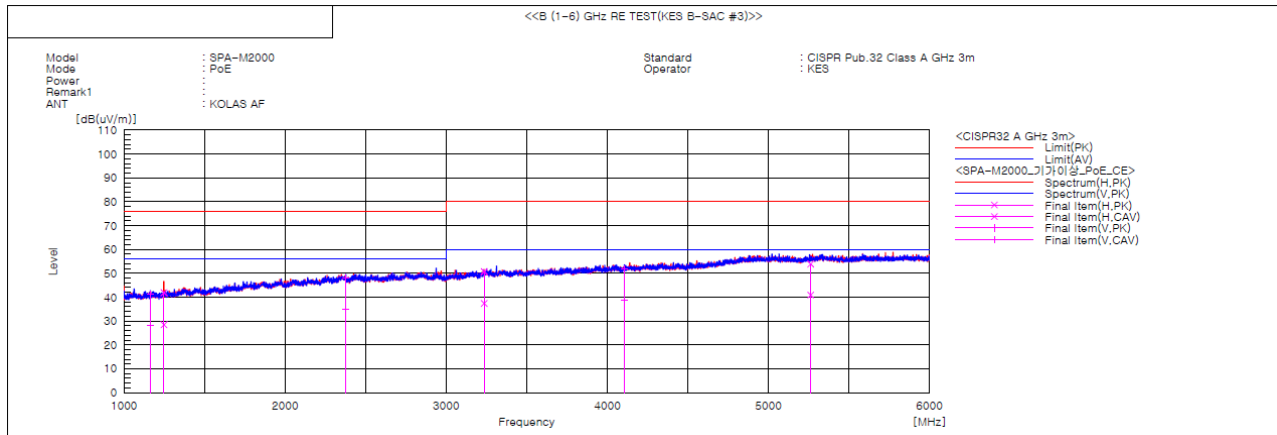
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

**Radiated Electric Field Emissions(Above 1 GHz)****■ AC/DC Adaptor Mode**

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1718.740	H	55.9	28.5	2.0	57.9	30.5	76.0	56.0	18.1	25.5	100.0	4.2	
2	1733.336	H	55.9	28.4	2.1	58.0	30.5	76.0	56.0	18.0	25.5	100.0	29.3	
3	1734.101	V	48.9	28.8	2.1	51.0	30.9	76.0	56.0	25.0	25.1	100.0	286.4	
4	3606.095	V	45.2	26.0	10.0	55.2	36.0	80.0	60.0	24.8	24.0	100.0	257.4	
5	3694.615	H	46.3	26.3	10.3	56.6	36.6	80.0	60.0	23.4	23.4	100.0	323.1	
6	4877.690	H	41.8	26.6	14.9	56.7	41.5	80.0	60.0	23.3	18.5	100.0	6.1	



■ PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1164.110	V	44.0	30.8	-2.5	41.5	28.3	76.0	56.0	34.5	27.7	100.0	132.4	
2	1247.850	H	43.7	30.3	-1.8	41.9	28.5	76.0	56.0	34.1	27.5	100.0	294.0	
3	2377.358	V	41.6	28.8	6.3	47.9	35.1	76.0	56.0	28.1	20.9	100.0	11.1	
4	3235.765	H	41.9	28.6	8.8	50.7	37.4	80.0	60.0	29.3	22.6	100.0	17.2	
5	4106.103	V	40.5	27.5	11.2	51.7	38.7	80.0	60.0	28.3	21.3	100.0	23.5	
6	5261.645	H	38.5	25.5	15.4	53.9	40.9	80.0	60.0	26.1	19.1	100.0	249.7	

◆ Calculation

Result(PK/CAV) [dB(μV/m)] = (Reading(PK/CAV)[dB(μV)] + c.f[dB(1/m)]

Margin(PK/CAV)[dB] = Limit[dB(μV/m)] - Result(PK/CAV) [dB(μV/m)]

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

**Harmonic Current Emissions and Voltage Fluctuations and Flicker**

■ AC/DC Adaptor Mode

Average harmonic current results				
Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.044			
2	0.004	0.363	1.080	n/a
3	0.027	1.177	2.300	PASS
4	0.006	1.360	0.430	PASS
5	0.027	2.349	1.140	PASS
6	0.004	1.407	0.300	n/a
7	0.026	3.435	0.770	PASS
8	0.004	1.945	0.230	n/a
9	0.026	6.377	0.400	PASS
10	0.006	3.041	0.184	PASS
11	0.025	7.624	0.330	PASS
12	0.004	2.863	0.153	n/a
13	0.025	11.682	0.210	PASS
14	0.004	2.750	0.131	n/a
15	0.024	15.754	0.150	PASS
16	0.004	3.152	0.115	n/a
17	0.023	17.310	0.132	PASS
18	0.004	3.827	0.102	n/a
19	0.022	18.198	0.118	PASS
20	0.004	4.052	0.092	n/a
21	0.020	12.548	0.161	PASS
22	0.003	4.002	0.084	n/a
23	0.019	13.251	0.147	PASS
24	0.003	4.362	0.077	n/a
25	0.018	13.533	0.135	PASS
26	0.003	4.297	0.071	n/a
27	0.017	13.518	0.125	PASS
28	0.003	4.092	0.066	n/a
29	0.016	13.497	0.116	PASS
30	0.003	4.516	0.061	n/a
31	0.014	13.253	0.109	PASS
32	0.002	4.301	0.058	n/a
33	0.013	13.012	0.102	PASS
34	0.002	3.926	0.054	n/a
35	0.012	12.580	0.096	PASS
36	0.002	4.096	0.051	n/a
37	0.011	11.933	0.091	PASS
38	0.002	3.765	0.048	n/a
39	0.010	11.377	0.087	PASS
40	0.002	3.587	0.046	n/a

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.



Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.044			n/a
2	0.004	0.272	1.620	n/a
3	0.027	0.790	3.450	PASS
4	0.006	0.998	0.645	PASS
5	0.027	1.575	1.710	PASS
6	0.005	1.042	0.450	n/a
7	0.027	2.306	1.155	PASS
8	0.005	1.437	0.345	n/a
9	0.026	4.312	0.600	PASS
10	0.006	2.234	0.276	PASS
11	0.026	5.158	0.495	PASS
12	0.005	2.115	0.230	n/a
13	0.025	7.836	0.315	PASS
14	0.004	2.079	0.197	n/a
15	0.024	10.602	0.225	PASS
16	0.004	2.380	0.173	n/a
17	0.023	11.613	0.199	PASS
18	0.004	2.842	0.153	n/a
19	0.022	12.282	0.178	PASS
20	0.004	3.020	0.138	n/a
21	0.020	12.670	0.161	PASS
22	0.004	2.989	0.125	n/a
23	0.020	13.441	0.147	PASS
24	0.004	3.274	0.115	n/a
25	0.018	13.638	0.135	PASS
26	0.003	3.202	0.106	n/a
27	0.017	13.623	0.125	PASS
28	0.003	3.042	0.099	n/a
29	0.016	13.703	0.116	PASS
30	0.003	3.382	0.092	n/a
31	0.015	13.467	0.109	PASS
32	0.003	3.212	0.086	n/a
33	0.014	13.203	0.102	PASS
34	0.002	2.984	0.081	n/a
35	0.012	12.725	0.096	PASS
36	0.002	3.106	0.077	n/a
37	0.011	12.085	0.091	PASS
38	0.002	2.835	0.073	n/a
39	0.010	11.513	0.087	PASS
40	0.002	2.736	0.069	n/a

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.



Test Data - Voltage Fluctuations

■ AC/DC Adaptor Mode

Flicker Measurements					
	Plt	Max Pst	Max Dc	Max Dmax	Max Tmax
Line 1:	0.028	0.028	0	< 0.2	0
Limits:	0.65	1	3.3	4	0.5
Results:	PASS	PASS	PASS	PASS	PASS

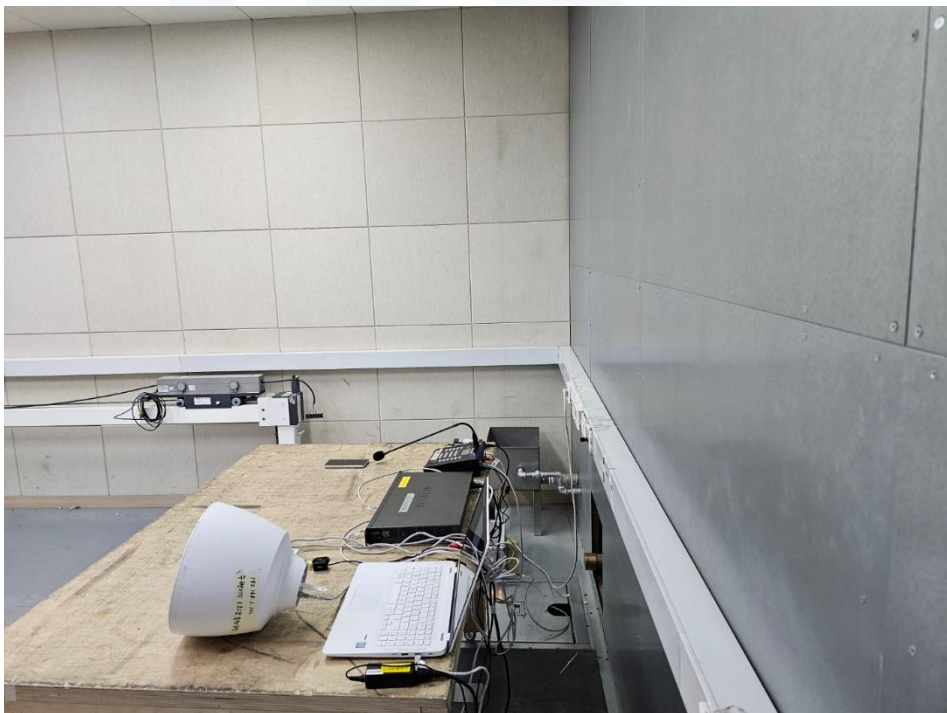




APPENDIX B – Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

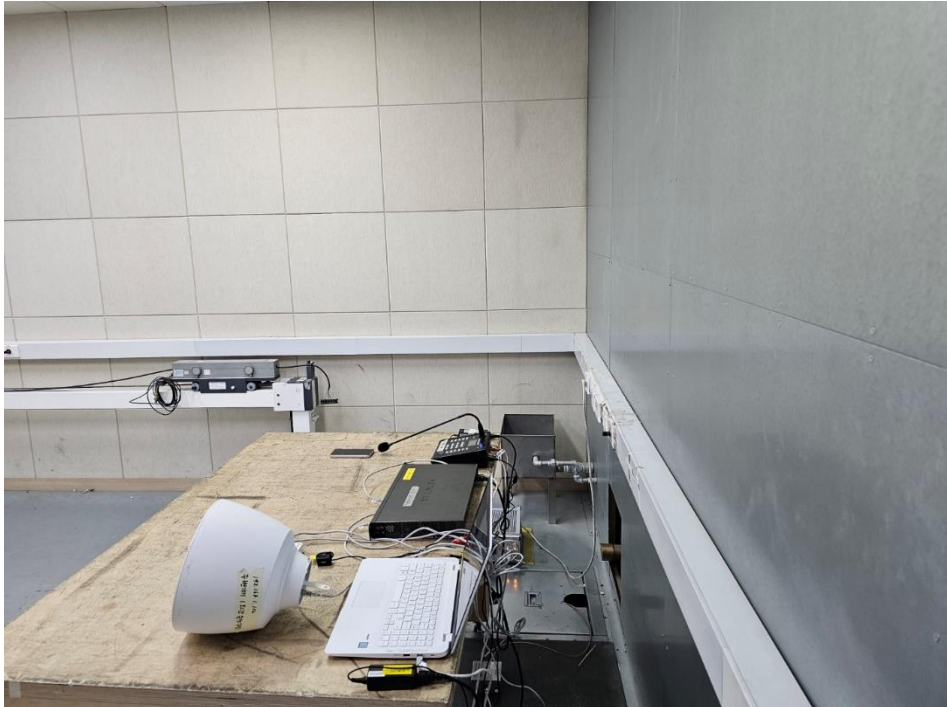
■ AC/DC Adaptor Mode





Conducted Telecommunication Emissions

■ AC/DC Adaptor Mode





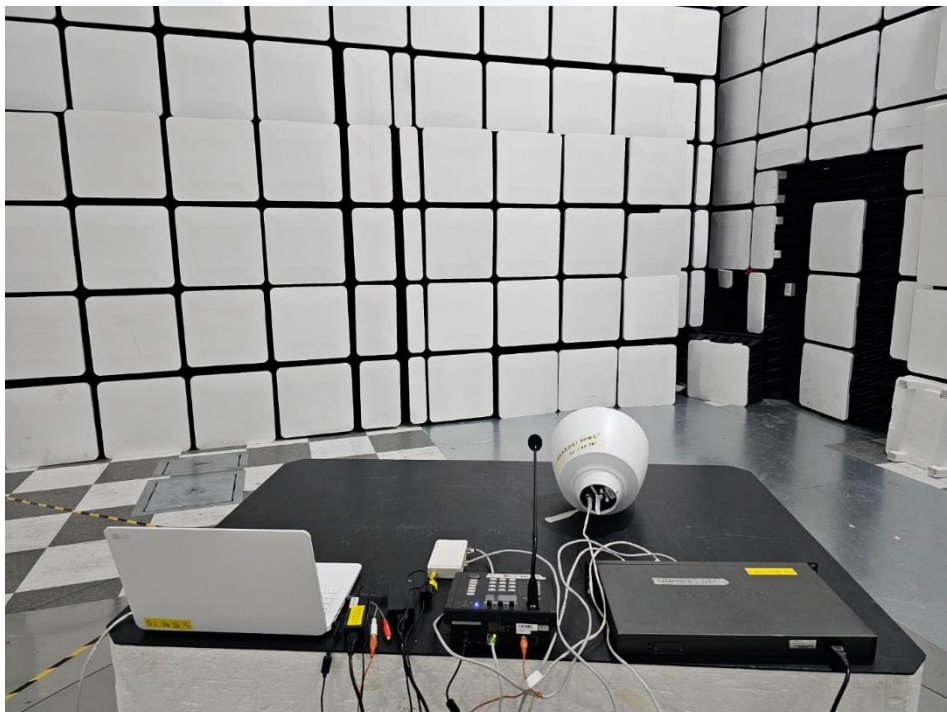
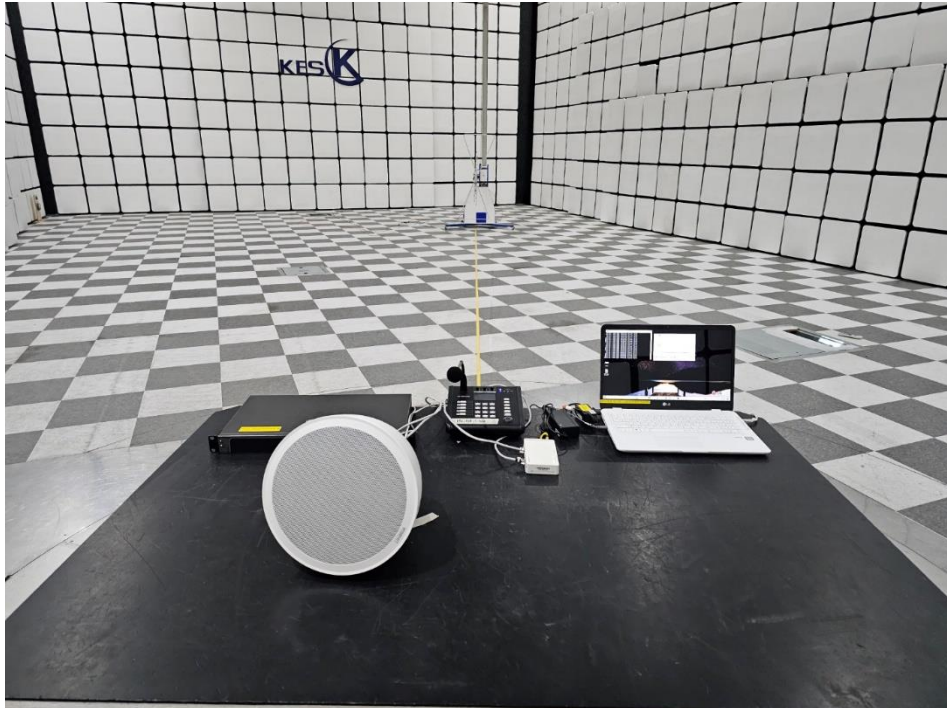
■ PoE Mode





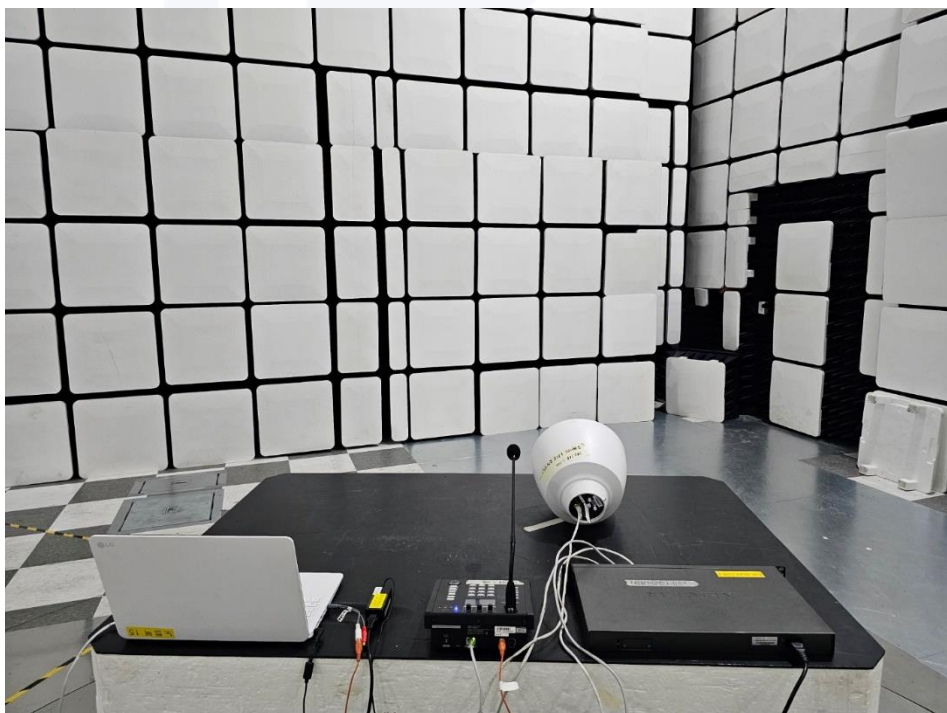
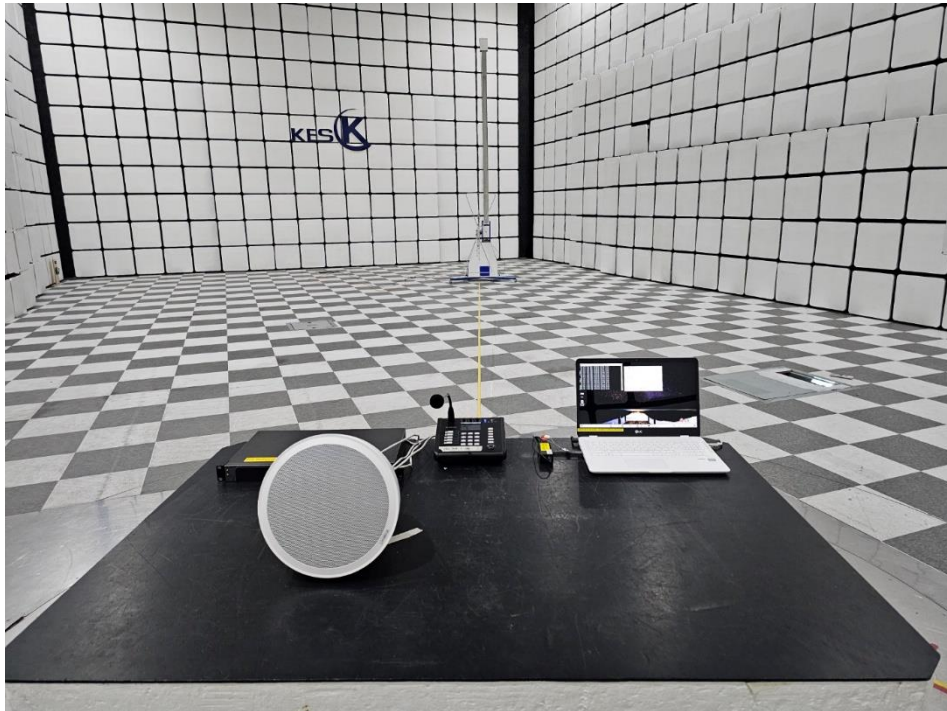
Radiated Electric Field Emissions(Below 1 GHz)

■ AC/DC Adaptor Mode





■ PoE Mode





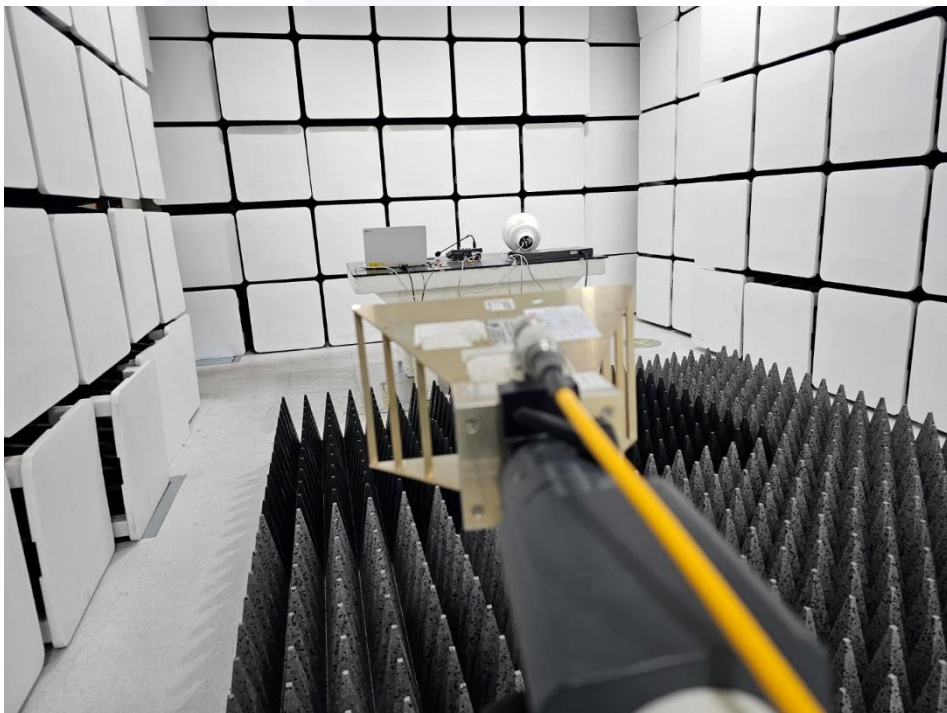
Radiated Electric Field Emissions(Above 1 GHz)

■ AC/DC Adaptor Mode





■ PoE Mode





Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ AC/DC Adaptor Mode





Electrostatic Discharge

■ AC/DC Adaptor Mode



■ PoE Mode



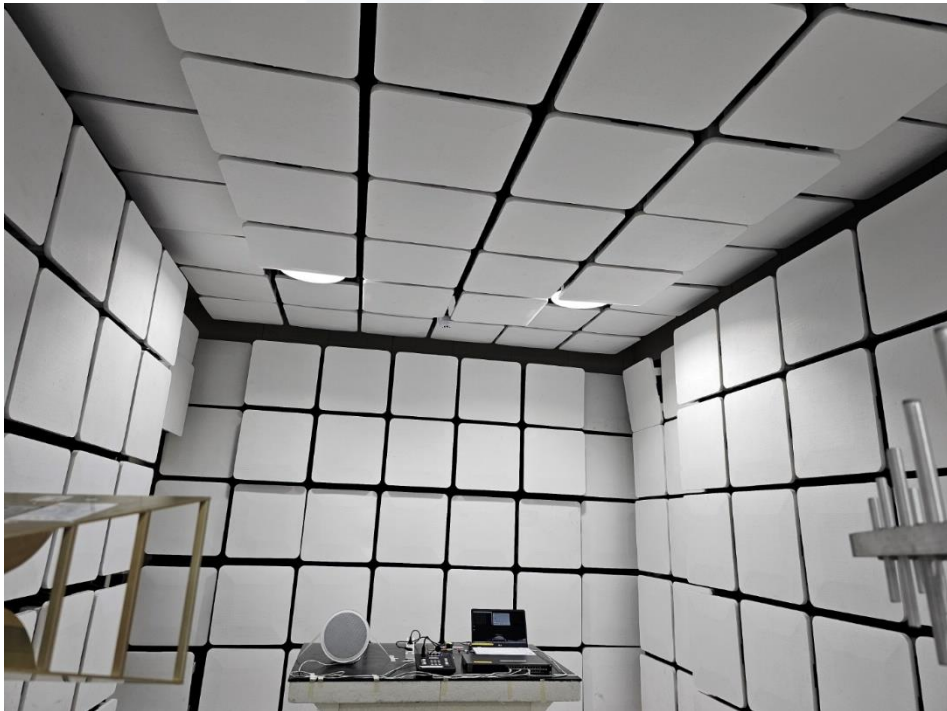


Radiated Electric Field Immunity

■ AC/DC Adaptor Mode



■ PoE Mode





Electrical Fast Transients/Bursts

■ AC/DC Adaptor Mode



■ PoE Mode





Surge Transients

■ AC/DC Adaptor Mode



■ PoE Mode





Conducted Disturbance

■ AC/DC Adaptor Mode



■ PoE Mode





Power Frequency Magnetic Field Immunity

N/A





Voltage Dips and Short Interruptions

■ AC/DC Adaptor Mode





APPENDIX C – EUT Photographs

EUT External Photographs

(Top)



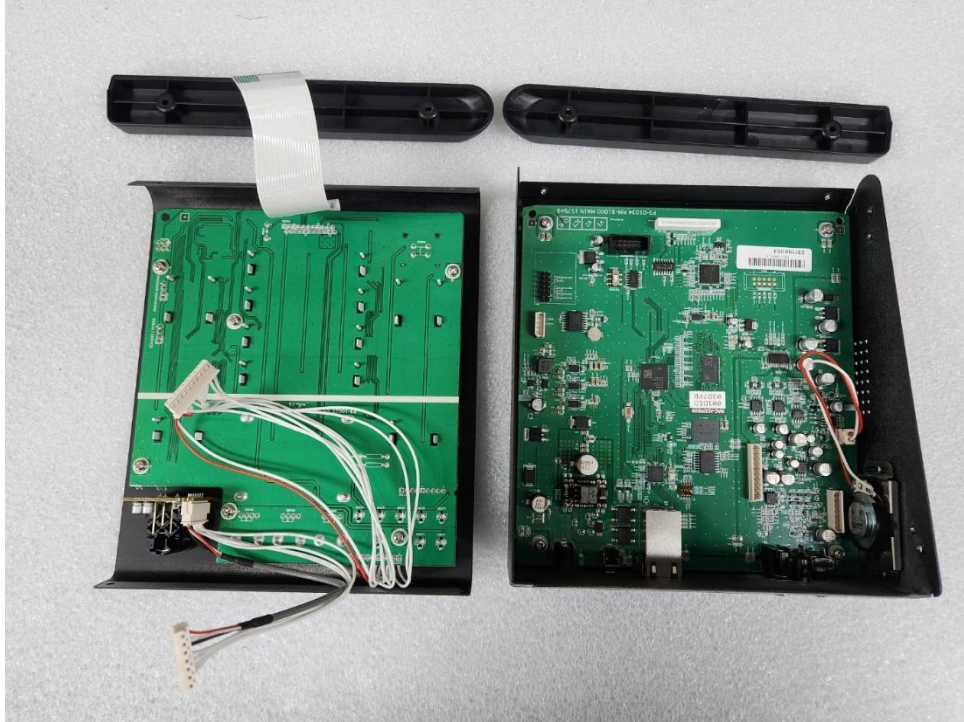
(Bottom)





EUT Internal Photographs

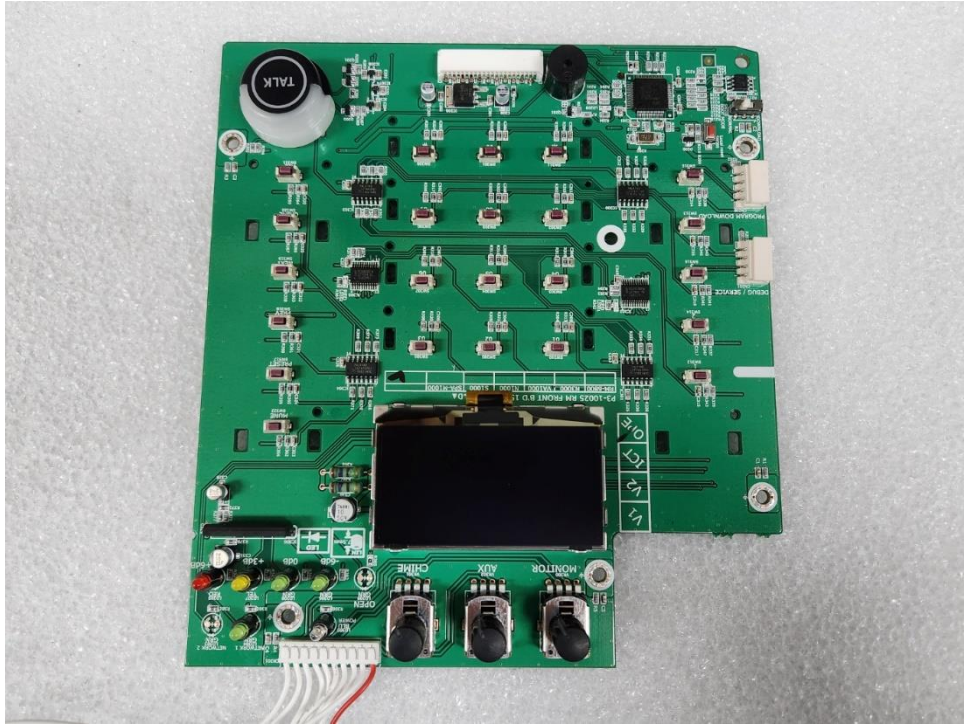
(Internal View)



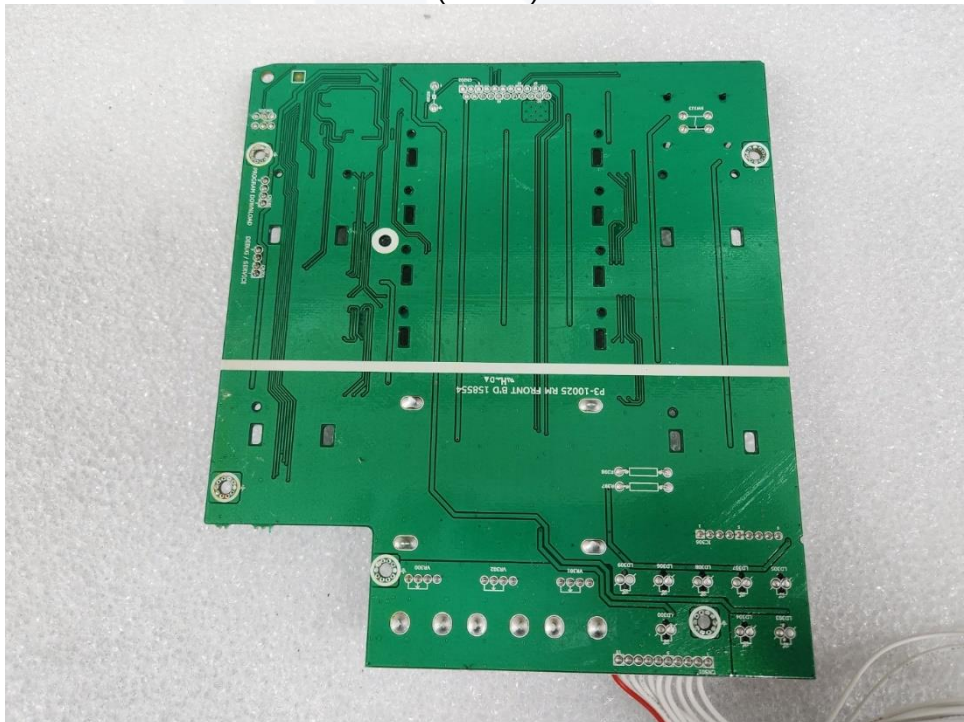


EUT Internal View – Board 2

(Top)



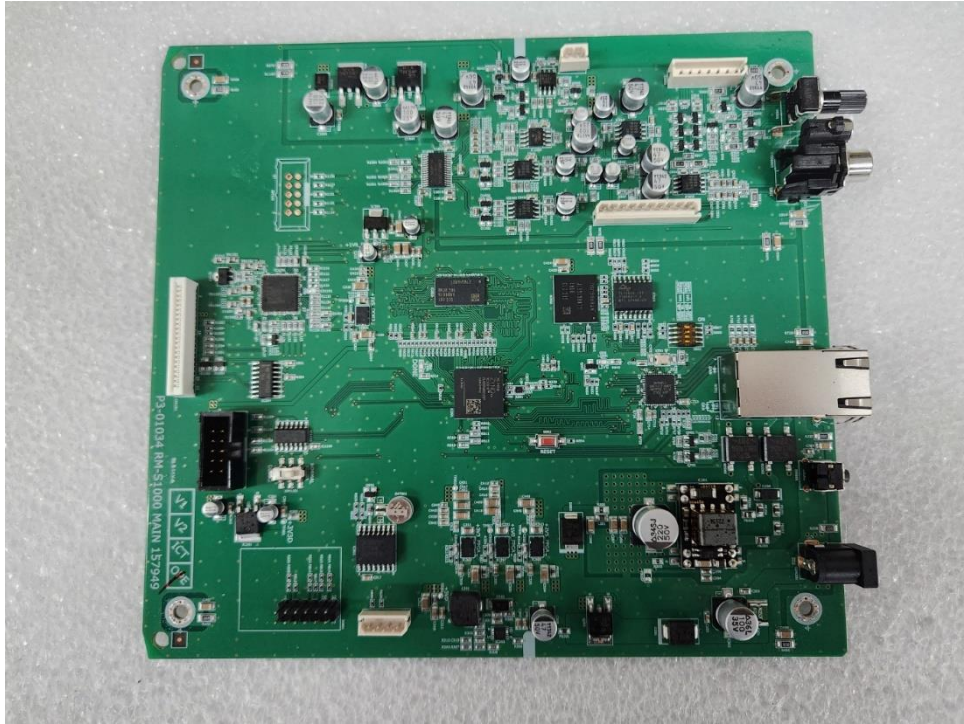
(Bottom)



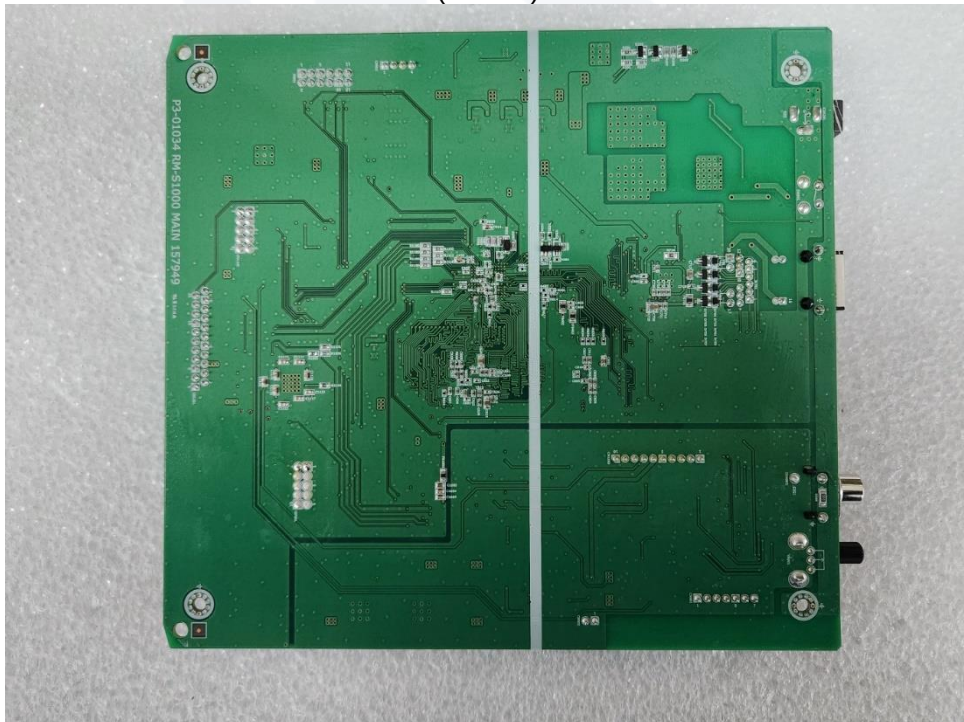


EUT Internal View – Board 3

(Top)

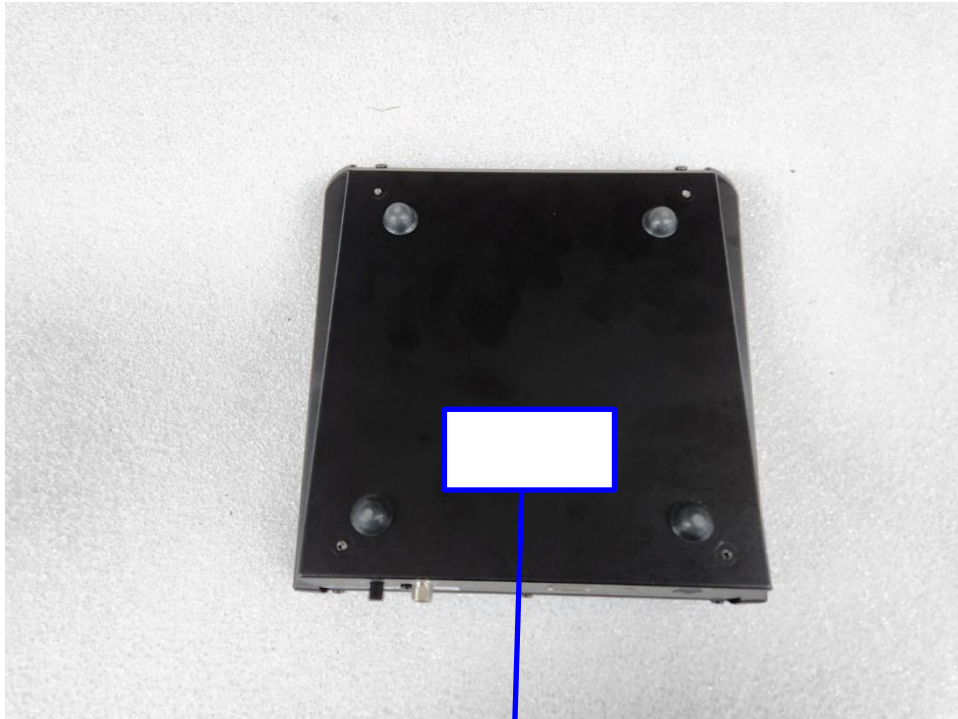


(Bottom)





Label and Location



SIP MIC

Model No : SPA-M2000

Manufacturer : Inter-M Corporation

Made in Korea

