TEST REPORT

KES Co., Ltd.
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Tel : +82-31-425-6200, Fax : +82-31-341-3838

1. Client

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

2. Sample Description

◯ Product item	:	REMOTE HEAD CAMERA
◯ Model name	:	XNB-A8004B
◯ Variant model	:	-
◯ Manufacturer etc.	:	HANWHA VISION VIETNAM COMPANY LIMITED
◯ Manufacturer address	:	Lot O-2, Que Vo Industrial Zone Extended Area, Nam Son Ward, Bac Ninh Province, Vietnam
◯ Manufacturer etc.	:	D-TECH CO.,LTD.
◯ Manufacturer address	:	173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do, Korea (Suwon Industrial Complex)

3. Date of test : 2025. 09. 24. ~ 2025. 09. 26.

4. Location of Test : Permanent Testing Lab

○ Address : 473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Republic of Korea

5. Test method used : EN 55032:2015/A1:2020, EN 50130-4:2011/A1:2014, EN IEC 61000-3-2:2019, EN 61000-3-3:2013/A2:2021

6. Test result : PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
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Affirmation	Tested by	Technical Manager by
	Name : DaeSoo Kim [김대수]2025/10/29	Name : DongHun Jang [장동훈]2025/10/29

2025. 10. 29.

KES Co., Ltd.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
2025. 10. 29.	KES-EM253189	Issued

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Use of uncertainty of measurement for decisions on conformity (decision rule):

■ No decision rule is specified by the1 standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty(“simple acceptance” decision rule, previously known as “accuracy method”).

□ Other (to be specified, for example when required by the standard or client)

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1 Laboratory Information

1.1 Test Location

Category	Details
Addres	473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Republic of Korea
Telephone Number	031-883-5092
Facsimile Number	031-883-5169

The measurement facility is located at 473-21, Gayeo-ro, Yeoju-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

1.2 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 0008

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2 Test Summary

2.1 Class and Voltage

Test Class	Test Voltage
Class A	AC 230 V, 50 Hz

2.2 Summary of Test Results

Regulation
EMC Directive 2014/30/EU, EMC Regulations SI 2016/1091

Test Item	Test Standard		Test Result	Remark
Conducted Emissions at Mains Power Ports	EN 55032:2015/A1:2020		PASS	-
Conducted Emissions at Telecommunication Ports			PASS	-
Radiated Emissions(Below 1 ㎓)			PASS	-
Radiated Emissions(Above 1 ㎓)			PASS	-
Harmonic Current Emissions	EN IEC 61000-3-2:2019		PASS	-
Voltage Fluctuations and Flicker	EN 61000-3-3:2013/A2:2021		PASS	-
Electrostatic Discharge	EN 50130-4:2011/A1:2014	EN 61000-4-2:2009	PASS	-
Continuous RF electromagnetic field disturbances		EN IEC 61000-4-3:2020	PASS	-
Electrical Fast Transients/Bursts		EN 61000-4-4:2012	PASS	-
Surge		EN 61000-4-5 :2014/A1:2017	PASS	-
Continuous Induced RF Disturbances		EN IEC 61000-4-6:2023	PASS	-
Voltage Dips and Interruptions		EN IEC 61000-4-11:2020	PASS	-

* N/A: Not Applicable

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2.3 Remarks when standards applied
N/A

2.4 Variant Model Differences
N/A

2.5 Device Modifications
N/A

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3 General Product Description

Division		Specificity
maximum operating frequency		3 ㎓
Power	Rated power	DC 12 V / 0.72 A PoE 48 V / 0.22 A
	Test power	AC 230 V / 50 ㎐
I/O Port	User port	DC IN 1 EA, RJ-45(PoE) 1 EA, ALARM 1/O 4 EA, AUDIO IN 1 EA, AUDIO OUT 1 EA, CAM(6 PIN)
	Unused/Administrator Ports	USB-TYPE C 1 EA, VIDEO(2 PIN)1 EA
function	Product function	REMOTE HEAD CAMERA
	Wireless function	Not applicable
Components		Main 1 EA
Other		Not applicable

XNB-A8004B		
Video		
Resolution		2560x1920, 2560x1440, 1920x1080, 1600x1200, 1280x960, 1280x720, 1024x768, 800x600, 640x480, 640x360, 320x240, 320x180
Max. Framerate	H.265/H.264	30fps/25fps(60Hz/50Hz)
	MJPEG	30fps(@5MP Max. 5fps)
Video Out		CVBS: 1.0 Vp-p / 75Ω composite for installation, USB: Micro USB Type C
Lens		
Optional Lens		SLA-F2480A/F2480VA, SLA-F4780A/F4780VA, SLA-F1080FA
Operational		
Day & Night		Auto(Electrical)
Backlight Compensation		BLC, HLC, WDR, SSDR
Wide Dynamic Range (dB)		120
Digital Noise Reduction		WiseNR Ⅱ(Based on AI engine), SSNR Ⅴ
Digital Image Stabilization		Support
Defog		Support
Motion Detection	Quantity	8ea
	Shape	8point Polygonal zones
Privacy Masking	Quantity	32ea
	Shape	8point Polygonal zones

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	Color / Option	Gray, Green, Red, Blue, Black, White, Mosaic, Purple, Yellow
	Dynamic Privacy Masking: Color / Option	Gray, Green, Red, Blue, Black, White, Mosaic, Purple, Yellow
Gain Control		Off, Max gain, Manual
White Balance		ATW, NarrowATW, AWC, Manual, Indoor, Outdoor
LDC		Support(Not support for fisheye lens)
Electronic Shutter	Mode	Minimum, Maximum, Anti flicker, Prefer shutter control(Based on AI engine)
	Speed Range	2~1/30,000sec
Digital PTZ		None
Video Rotation		Flip, Mirror, Hallway view(90°/270°)
Serial Interface		None
Alarm Interface	In/Out	2 configurable I/O ports
	Others	Support extra alarm I/O via optional I/O box
Alarm Triggers		Analytics, Network disconnect, Alarm input, Time schedule, MQTT subscription, Day/Night, Storage disruption
Alarm Events When Alarm Trigger Occurred		File upload(image): e-mail/FTP/SFTP, File upload(video clip): FTP/SFTP, Notification: e-mail, Recording: SD/SDHC/SDXC or NAS recording at event triggers, Alarm output, Handover: PTZ preset, send message by HTTP/HTTPS/TCP, Audio clip playback, MQTT: publication
Audio In		Selectable(mic in/line in)
Audio Out		Line out
Analytics		
Classified Object Type		Person, Face, Vehicle, License plate
Attributes	Person	Upper/Lower clothes color, Gender, Bag
	Vehicle	Type(car, bus, truck, motorcycle, bicycle), Color
	Face	Age, Gender, Face mask, Glasses
Re-ID		Person
Thumbnail		BestShot
Analytics Events	Based on AI Engine	Object detection, Virtual line(Crossing/Direction), Motion detection, Face mask detection, Social distancing detection, Slip & fall detection, Virtual area(Loitering/Intrusion/Enter/Exit/Appear/Disappear)
	Normal	Defocus detection, Tampering, Audio detection, Shock detection
Business Intelligence	Based on AI Engine	People counting, Queue management, Heatmap, Vehicle counting, Crowd counting
Network		
Ethernet		Metal shielded RJ-45(10/100BASE-T)

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Video Compression		H.265/H.264: Main/Baseline/High, MJPEG
Audio Compression		G.711(PCM): 8kHz(64kbps), G.726(ADPCM): 8kHz(16/24/32/40kbps), AAC-LC: 16kHz(48kbps), OPUS: 48kHz(64kbps)
Smart Codec		WiseStream(Based on AI engine)
Bitrate Control		H.265/H.264: CBR or VBR, MJPEG: VBR
Streaming	Unicast	Up to 20 users
	Multicast	Support
	Multiple Streaming	Up to 5 profiles, 3 virtual channel support
Protocol		IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SFTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, CDP, SRTP(TCP, UDP Unicast), MQTT, SMTP(StartTLS), Syslog
Application Programming Interface	ONVIF	S, G, T, M
	Others	SUNAPI(HTTP API), Hanwha Vision Open Platform
Direct Cloud Connection		Support
Security		
OS / Firmware Protect		Encrypted firmware, Secure boot, Signed firmware
User authentication		Digest authentication, Prevent brute-force attack
Network authentication		IEEE 802.1X(EAP-TLS, EAP-LEAP, EAP-PEAP, MSCHAPv2)
Secure Communication		HTTPS, WSS(WebSocket Secure), SRTP
Access Control		IP-based access control, MAC-based access control, Auto logout
Data Protect		Encryption credentials, Encrypt compress for live recording file export
Audit		Access / System / Event Log management
Device ID		Device certificate(Hanwha Vision Root CA)
Secure Storage		SDcard partition encrypt(AES-256), Secure element
Supply Chain Security		SBOM
Security Certificate		Secure element(FIPS 140-3 level3, CC EAL6+), Consumer IoT Security Standard (ETSI EN 303 645), Security Built-in Process Certification (IEC 62443-4-1)
General		
Memory	RAM	4GB
	Flash	8GB eMMC
Edge Storage	Micro SD/SDHC/SDXC	Max. 1TB x 1slot

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Edge Storage(OnCloud)	Micro SD/SDHC/SDXC	Max. 1TB x 1slot *Hanwha Vision branded microSD cards have been certified and recommended for OnCloud edge recording.
Environmental & Electrical		
Operating Condition	Temperature	-10°C~+50°C(+14°F~+122°F)
	Humidity	0~95% RH(non-condensing)
Storage Condition	Temperature	-50°C~+60°C(-58°F~+140°F)
	Humidity	0~90% RH(non-condensing)
Input Voltage		PoE(IEEE802.3af, Class3), 12VDC
Power Consumption	PoE	Max. 10.6W, typical 9.3W
	12VDC	Max. 10.5W, typical 9.0W
Wisepower		Power monitoring
Power Redundance Failover		Support
Mechanical		
Color		Black
Material		Aluminum, PC(Polycarbonate)
Material Management	Declaration	RoHS(EU RoHS directive 2011/65/EU and IEC/EN 63000:2018), REACH(Regulation (EC) No. 1907/2006), Conflict mineral policy(Section 1502 of US Dodd Frank Act)
	Recycle Rate	None
RAL Code		RAL9005
Product Dimensions		131.1(W)x33.5(H)x86(D)mm(5.16x1.32x3.39")
Product Weight		467g(1.03lb)

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4 EUT Setup and Operation Mode

4.1 EUT Configuration

Equipment	Model	Manufacturing number	Manufacturer	Remarks
REMOTE HEAD CAMERA	XNB-A8004B	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT
LENS MODULE	SLA-F2480VA	-	HANWHA VISION VIETNAM COMPANY LIMITED	-
AC/DC ADAPTOR	FSP060-DIBAN2	-	Zhonghan Electronics(Shenzhen) Co., Ltd.	-
PoE Injector	PT-PSE109GBRO-AH	PT1933220259	Dongguan PROCET Network Technology Co.,Ltd	-
Micro SD CARD	-	-	Transcend	-
SMART PHONE	V50	-	LG	-
LAPTOP	NT630Z5J	JK9091EF400142M	SAMSUNG	-
LAPTOP ADAPTOR	PA-1400-14	AA-PA2N40W	LITEON	-
HEADSET	K550	-	Britz®	-
Button Alarm	-	-	-	-
LED Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-

4.2 System Configuration

Product Name	Model Number	Serial Number	Manufacturer	Remarks
-	-	-	-	-

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4.3 External I/O Cabling

Mode 1

Start		End		Cable Spec.	
Product Name	**I/O Port**	**Product Name**	**I/O Port**	**Length(m)**	**Shield**
REMOTE HEAD CAMERA (EUT)	DC IN (2 PIN)	AC/DC ADAPTOR	DC OUT (2 PIN)	1.0	U
	RJ-45 (PoE)	LAPTOP	RJ-45	3.1	U
	CAM (6 PIN)	LENS MODULE	CAM (6 PIN)	10.0	S
	Alarm In (2 PIN)	Button Alarm	Alarm OUT	3.1	U
	Alarm OUT (2 PIN)	LED Alarm	Alarm IN	3.1	U
	AUDIO OUT (3.5 mm)	HEADSET	3.5 mm	2.0	U
	AUDIO IN (3.5 mm)		3.5 mm		
	Micro SD SLOT	Micro SD CARD	Micro SD SLOT	-	-
LAPTOP	3.5 mm	SMARTPHONE	3.5 mm	1.5	U

Mode 2

Start		End		Cable Spec.	
Product Name	**I/O Port**	**Product Name**	**I/O Port**	**Length(m)**	**Shield**
REMOTE HEAD CAMERA (EUT)	RJ-45 (PoE)	PoE Injector	RJ-45 (PoE)	3.1	U
	CAM (6 PIN)	LENS MODULE	CAM (6 PIN)	10.0	S
	Alarm In (2 PIN)	Button Alarm	Alarm OUT	3.1	U
	Alarm OUT (2 PIN)	LED Alarm	Alarm IN	3.1	U
	AUDIO OUT (3.5 mm)	HEADSET	3.5 mm	2.0	U
	AUDIO IN (3.5 mm)		3.5 mm		
	Micro SD SLOT	Micro SD CARD	Micro SD SLOT	-	-
LAPTOP	3.5 mm	SMARTPHONE	3.5 mm	1.5	U
	RJ-45	PoE Injector	RJ-45 (LAN)	1.0	U

* Unshielded=U, Shielded=S

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4.4 EUT Operating Mode(s)

Category	Mode	Operating
Mode 1	DC	1. By connecting the test equipment and the DC power supply with a wired connection, the image output of the test equipment is confirmed by the WEB VIEWER. 2. After activating the operation of the microphone, run a 1 KHz Tone voice file on a smartphone connected to a laptop to check whether the headset outputs sound normally or not on the headset connected to the test equipment. 3. Check the ping test of the laptop to see if the network of the test equipment is operating normally or not. 4. After the test, it was confirmed that the recorded image stored in the Micro SD Card was checked.
Mode 2	PoE	1. By connecting the test equipment and the PoE Injector by wire, the image output of the test equipment is checked by WEB VIEWER. 2. After activating the operation of the microphone, run a 1 KHz Tone voice file on a smartphone connected to a laptop to check whether the headset outputs sound normally or not on the headset connected to the test equipment. 3. Check the ping test of the laptop to see if the network of the test equipment is operating normally or not. 4. After the test, it was confirmed that the recorded image stored in the Micro SD Card was checked.

4.5 Test operating S/W

Name	Version	Manufacture Company
WEB VIEWER	-	Hanwha Vision Co., Ltd.

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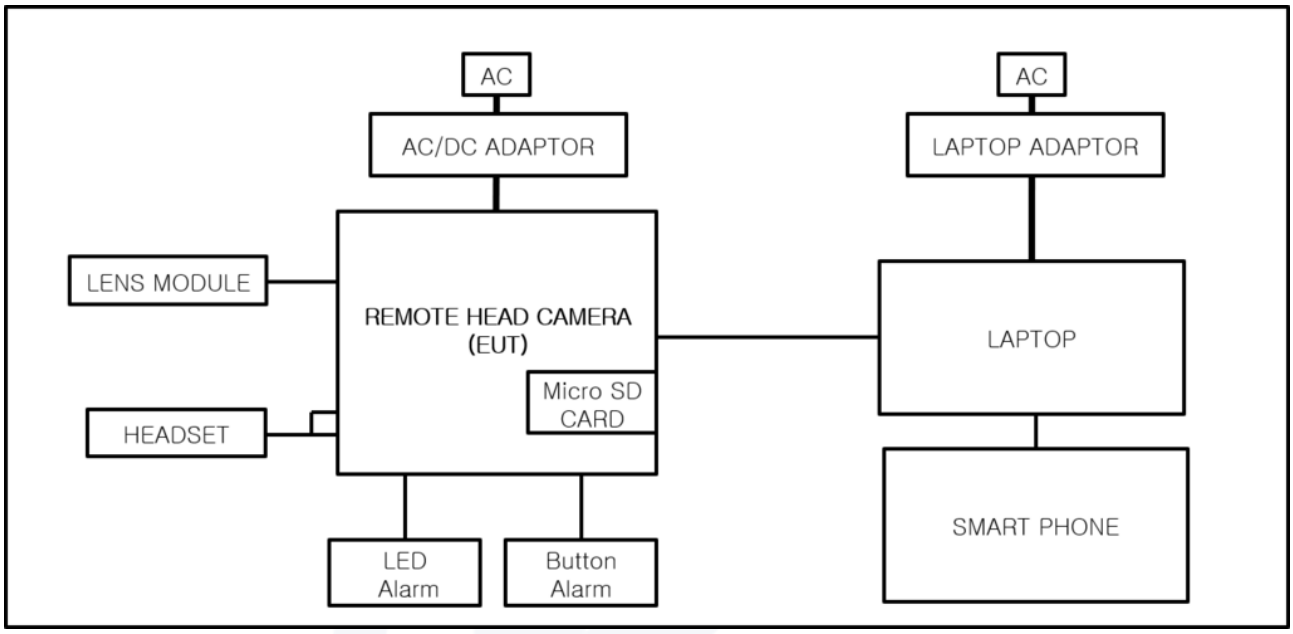
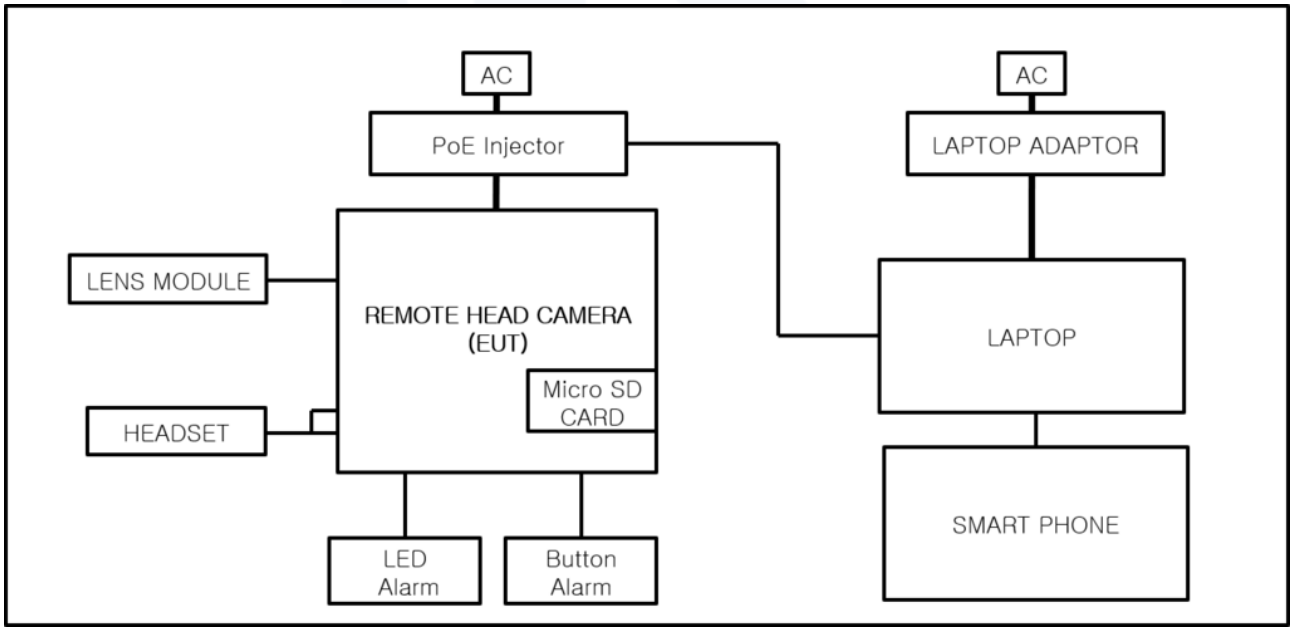
4.6 Configuration



Mode 1



Mode 2

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5 General Performance Criteria

Criteria for compliance was based on the following guidelines:

EN 50130-4 Alarm systems-Part 4: Electromagnetic compatibility Product family standard: Immunity requirements for components of fire, intruder and social alarm systems

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus

becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test

report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing that is no

residual change in the EUT or any change in outputs, which could be interpreted by associated

equipment as a change.

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

which could be interpreted by associated equipment as a change, and no such

Flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any

change in outputs, which could be interpreted by associated equipment as a change.

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Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any

change in outputs, which could be interpreted by associated equipment as a change,

and no such flickering of indicators oeuvres at U = 130 dBμV.

For component of CCTV systems, where the status is monitored by observing the TV picture,

then deterioration of the picture is allowed at U = 140 dBμV, providing:

(a) there is no permanent damage or change to the EUT

(e.g. no corruption of memory or changes to programmable settings etc.)

(b) at U = 130 dBμV, any deterioration of the picture is so minor that the system could

still be used; and

(c) there in no observable deterioration of the picture at U = 120 dBμV.

Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual

change in the EUT or any change in outputs, which could be interpreted by associated equipment

as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

♦ Calculation

- Conducted Emissions

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

- Radiated Emissions(Below 1 GHz)

Result(QP) [dB(μV/m)] = (Reading(QP)[dB(μV)] + c.f[dB(1/m)]
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/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 Emissions(Above 1 GHz)

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

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6 Test Item

6.1 Conducted Emissions at Mains Power Ports

6.1.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #6	-	DYMSTEC	-	-	-	■
EMC32 Measurement Software	EMC32	R&S	9.12.00	-	-	■
EMI TEST RECEIVER	ESR3	Rohde & Schwarz	101783	2024-11-06	2025-11-06	■
LISN	ENV216	Rohde & Schwarz	101786	2025-01-09	2026-01-09	■
ARTIFICIAL MAINS NETWORK	ESH2-Z5	Rohde & Schwarz	100450	2024-11-06	2025-11-06	■
PULSE LIMITER	ESH3-Z2	Rohde & Schwarz	101915	2024-11-06	2025-11-06	■

6.1.2 Test Location : SHIELD ROOM #6

6.1.3 Test Conditions :

Temperature	Relative Humidity
(24.5 ~ 24.6) °C	(57.2 ~ 57.3) % R.H.

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6.1.4 Test Result

○ Test Date : 2025-09-26
● Test Mode : Mode 1

Test Report

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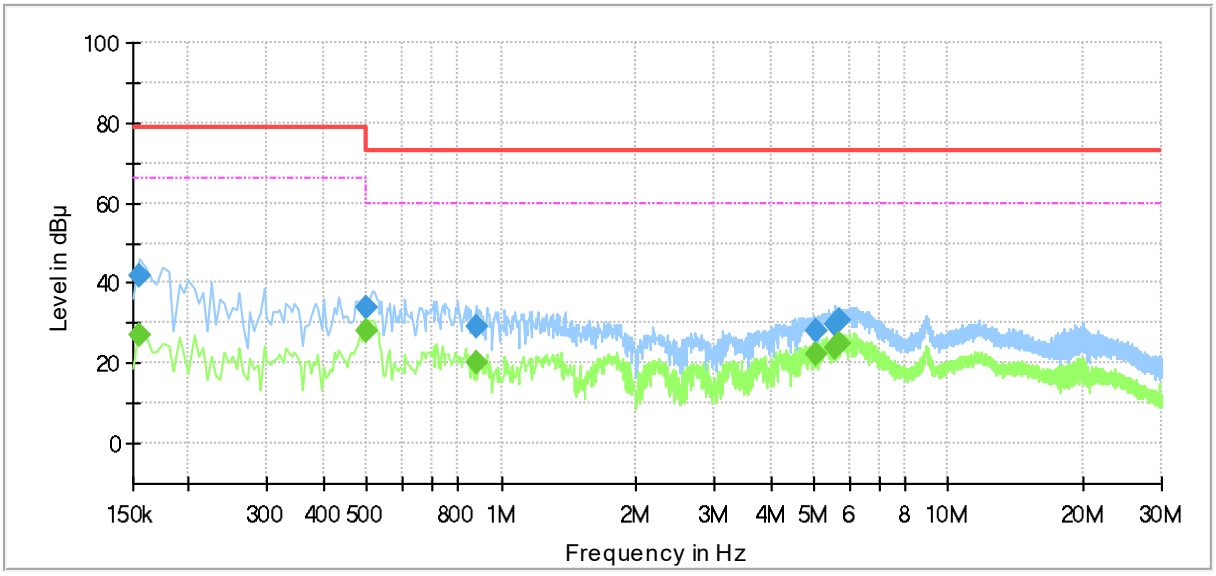
Test Description:	Conducted Emission
Job No.:	KES-EM253189
Phase:	L
Mode:	Mode 1
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	27.01	66.00	38.99	1000.0	9.000	L1	19.5
0.155000	41.85	---	79.00	37.15	1000.0	9.000	L1	19.5
0.500000	---	27.94	66.00	38.06	1000.0	9.000	L1	19.6
0.500000	33.80	---	73.00	39.20	1000.0	9.000	L1	19.6
0.880000	---	19.94	60.00	40.06	1000.0	9.000	L1	19.6
0.880000	29.30	---	73.00	43.70	1000.0	9.000	L1	19.6
5.070000	---	22.23	60.00	37.77	1000.0	9.000	L1	19.9
5.070000	28.28	---	73.00	44.72	1000.0	9.000	L1	19.9
5.585000	---	23.80	60.00	36.20	1000.0	9.000	L1	19.9
5.585000	29.83	---	73.00	43.17	1000.0	9.000	L1	19.9
5.705000	---	25.03	60.00	34.97	1000.0	9.000	L1	19.9
5.705000	30.51	---	73.00	42.49	1000.0	9.000	L1	19.9

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○ Test Date : 2025-09-26
● Test Mode : Mode 1

Test Report

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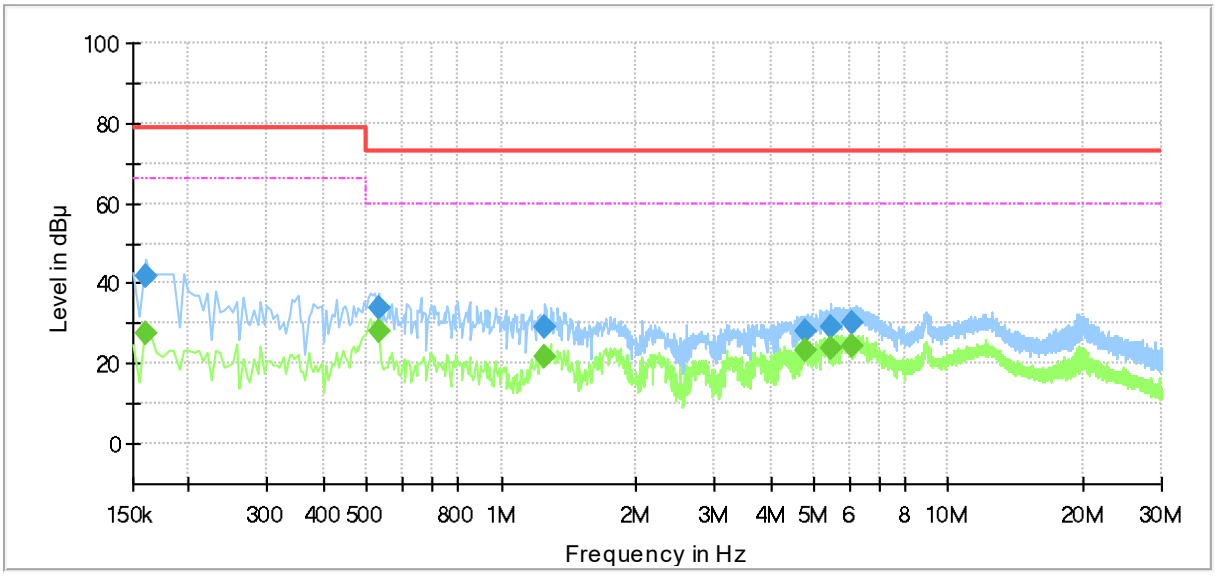
Test Description:	Conducted Emission
Job No.:	KES-EM253189
Phase:	N
Mode:	Mode 1
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	27.53	66.00	38.47	1000.0	9.000	N	19.5
0.160000	41.68	---	79.00	37.32	1000.0	9.000	N	19.5
0.530000	---	28.15	60.00	31.85	1000.0	9.000	N	19.5
0.530000	33.93	---	73.00	39.07	1000.0	9.000	N	19.5
1.255000	---	21.81	60.00	38.19	1000.0	9.000	N	19.6
1.255000	28.93	---	73.00	44.07	1000.0	9.000	N	19.6
4.765000	---	23.37	60.00	36.63	1000.0	9.000	N	19.9
4.765000	28.34	---	73.00	44.66	1000.0	9.000	N	19.9
5.465000	---	23.70	60.00	36.30	1000.0	9.000	N	19.9
5.465000	29.31	---	73.00	43.69	1000.0	9.000	N	19.9
6.070000	---	24.40	60.00	35.60	1000.0	9.000	N	19.9
6.070000	30.14	---	73.00	42.86	1000.0	9.000	N	19.9

6.1.5 Remark

Complies with the test requirements.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.2 Conducted Emissions at Telecommunication Ports

6.2.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #6	-	DYMSTEC	-	-	-	■
EMC32 Measurement Software	EMC32	R&S	9.12.00	-	-	■
EMI TEST RECEIVER	ESR3	Rohde & Schwarz	101783	2024-11-06	2025-11-06	■
LISN	ENV216	Rohde & Schwarz	101786	2025-01-09	2026-01-09	■
ARTIFICIAL MAINS NETWORK	ESH2-Z5	Rohde & Schwarz	100450	2024-11-06	2025-11-06	■
PULSE LIMITER	ESH3-Z2	Rohde & Schwarz	101915	2024-11-06	2025-11-06	■
8-WIRE ISN CAT3,5	ENY81	Rohde & Schwarz	100174	2024-11-12	2025-11-12	■

6.2.2 Test Location : SHIELD ROOM #6

6.2.3 Test Conditions :

Temperature	Relative Humidity
(24.5 ~ 24.6) °C	(57.2 ~ 57.3) % R.H.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

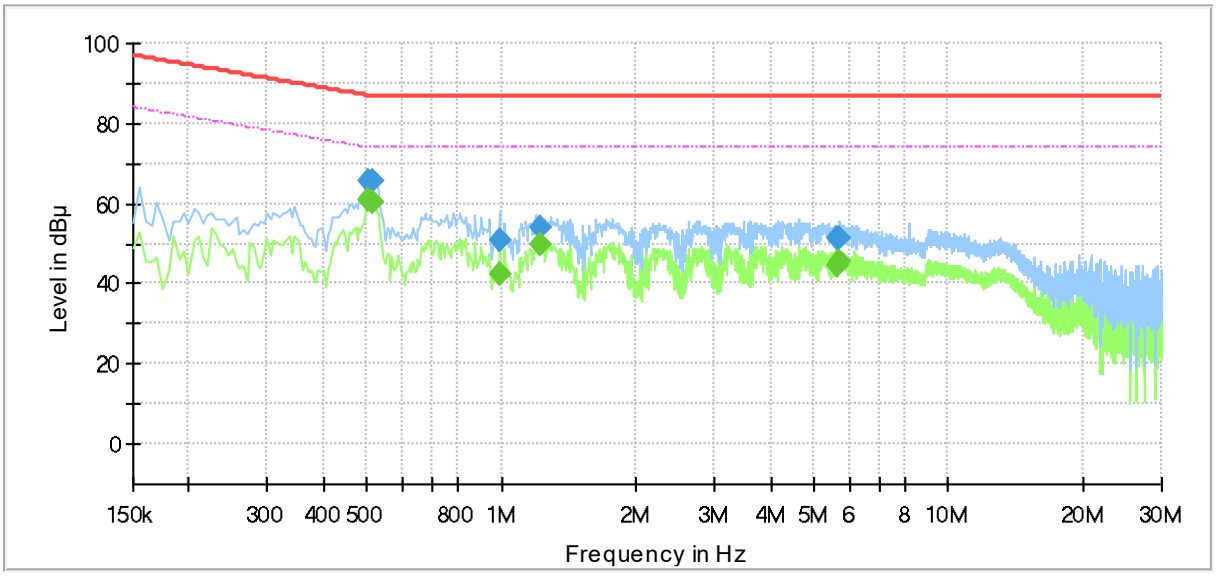
6.2.4 Test Result

○ Test Date : 2025-09-26
● Test Mode : Mode 1

Test Report

1 / 1

Test Description:	Telecommunication Emission
Job No.:	KES-EM253189
Mode :	Mode 1
Speed :	100 Mbps
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.505000	---	61.00	74.00	13.00	1000.0	9.000	Single Line	19.4
0.505000	65.50	---	87.00	21.50	1000.0	9.000	Single Line	19.4
0.515000	---	60.17	74.00	13.83	1000.0	9.000	Single Line	19.4
0.515000	65.56	---	87.00	21.44	1000.0	9.000	Single Line	19.4
0.990000	---	42.27	74.00	31.73	1000.0	9.000	Single Line	19.3
0.990000	50.64	---	87.00	36.36	1000.0	9.000	Single Line	19.3
1.220000	---	49.63	74.00	24.37	1000.0	9.000	Single Line	19.3
1.220000	53.75	---	87.00	33.25	1000.0	9.000	Single Line	19.3
5.610000	---	44.67	74.00	29.33	1000.0	9.000	Single Line	19.5
5.610000	51.10	---	87.00	35.90	1000.0	9.000	Single Line	19.5
5.695000	---	45.62	74.00	28.38	1000.0	9.000	Single Line	19.5
5.695000	51.51	---	87.00	35.49	1000.0	9.000	Single Line	19.5

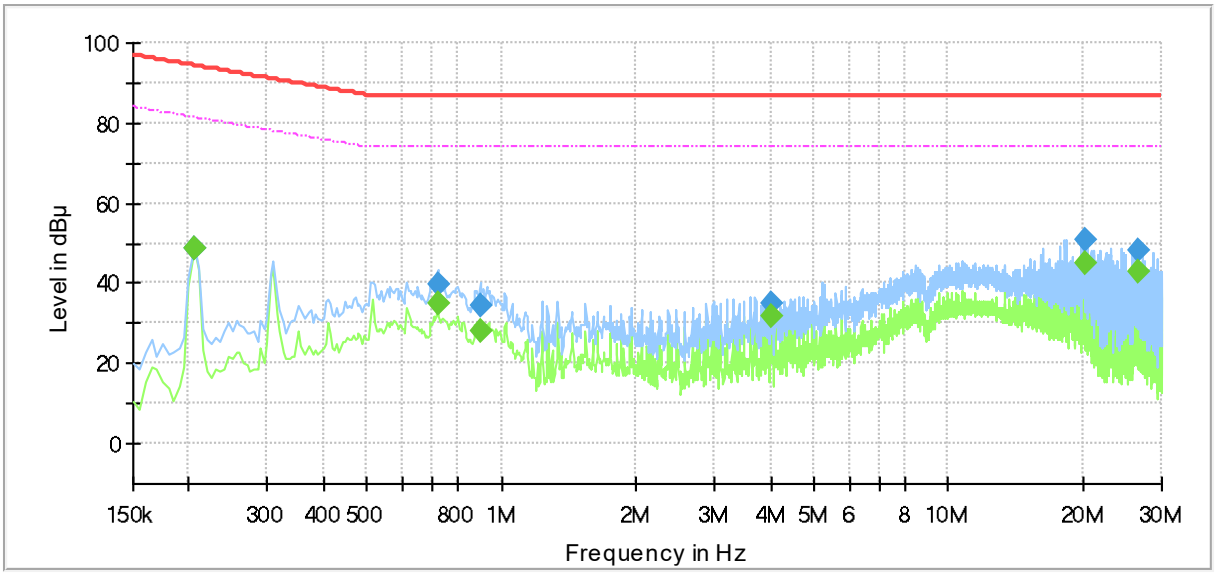
The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

○ Test Date : 2025-09-26
● Test Mode : Mode 2

Test Report

1 / 1

Test Description:	Telecommunication Emission
Job No.:	KES-EM253189
Mode :	Mode 2
Speed :	100 Mbps
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.205000	---	48.54	81.41	32.87	1000.0	9.000	Single Line	19.6
0.205000	48.58	---	94.41	45.83	1000.0	9.000	Single Line	19.6
0.720000	---	35.06	74.00	38.94	1000.0	9.000	Single Line	19.3
0.720000	39.77	---	87.00	47.23	1000.0	9.000	Single Line	19.3
0.895000	---	28.34	74.00	45.66	1000.0	9.000	Single Line	19.3
0.895000	34.28	---	87.00	52.72	1000.0	9.000	Single Line	19.3
4.010000	---	31.89	74.00	42.11	1000.0	9.000	Single Line	19.4
4.010000	34.83	---	87.00	52.17	1000.0	9.000	Single Line	19.4
20.260000	---	45.06	74.00	28.94	1000.0	9.000	Single Line	19.9
20.260000	50.58	---	87.00	36.42	1000.0	9.000	Single Line	19.9
26.490000	---	42.82	74.00	31.18	1000.0	9.000	Single Line	20.0
26.490000	48.16	---	87.00	38.84	1000.0	9.000	Single Line	20.0

6.2.5 Remark

Complies with the test requirements.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.3 Radiated Emissions(Below 1 ㎓)

6.3.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SEMI ANECHOIC CHAMBER #4(10 m)	-	DYMSTEC	-	-	-	■
EP5/RE Software	EP5/RE	TOYO	6.0.0	-	-	■
EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100551	2025-02-13	2026-02-13	■
AMPLIFIER	SCU 01	Rohde & Schwarz	100603	2024-11-06	2025-11-06	■
BILOG ANTENNA	VULB 9168	SCHWARZBECK	9168-461	2024-05-09	2026-05-09	■
ATTENUATOR	6806.17.A	HUBER+SUHNER	-	2025-02-13	2026-02-13	■

6.3.2 Test Location : SEMI ANECHOIC CHAMBER #4(10 m) Measurement Distance : □ 3 m, ■ 10 m

6.3.3 Test Conditions :

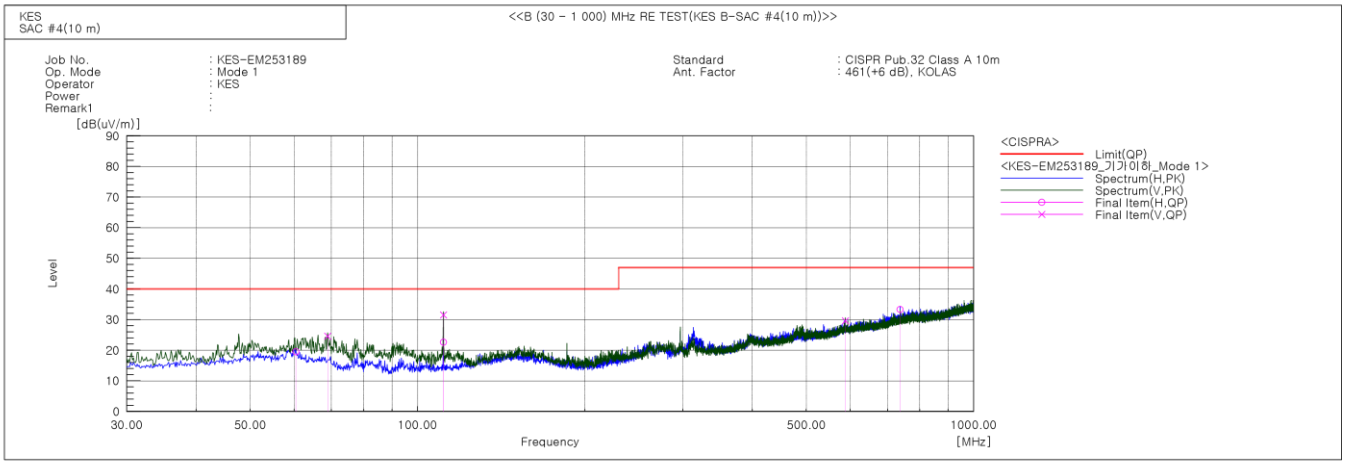
Temperature	Relative Humidity
(23.5 ~ 23.7) °C	(58.1 ~ 58.3) % R.H.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.3.4 Test Result

○ Test Date : 2025-09-24

● Test Mode : Mode 1



Final Result

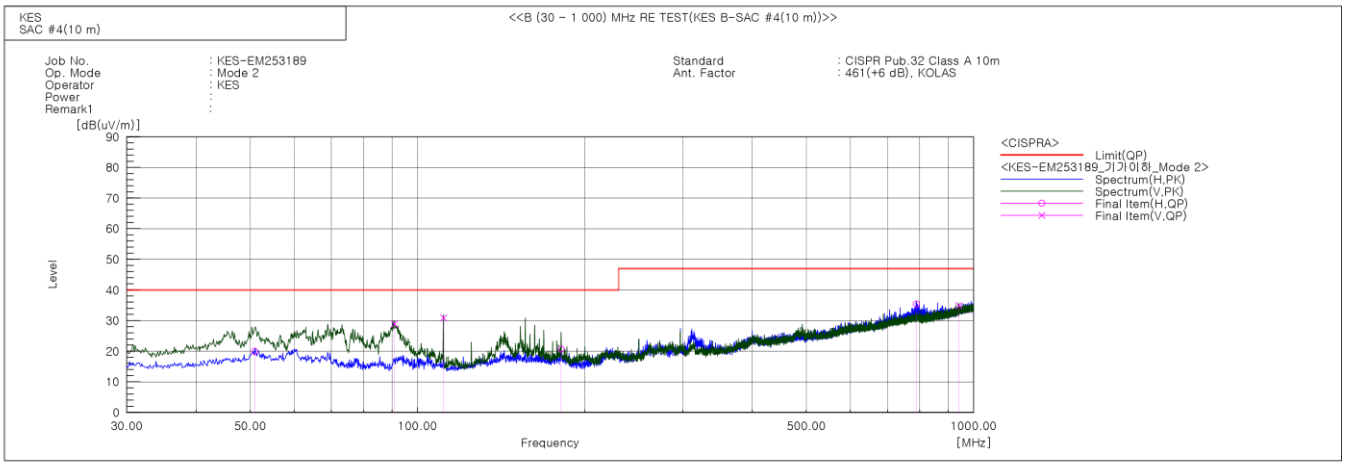
No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	60.434	H	41.0	-21.5	19.5	40.0	20.5	356.0	272.0	
2	68.921	V	47.1	-22.5	24.6	40.0	15.4	157.0	221.0	
3	111.359	H	46.0	-23.4	22.6	40.0	17.4	400.0	14.0	
4	111.359	V	54.9	-23.4	31.5	40.0	8.5	142.0	58.0	
5	587.750	V	37.1	-7.5	29.6	47.0	17.4	100.0	16.0	
6	737.373	H	37.3	-4.0	33.3	47.0	13.7	367.0	353.0	

※ The data is the result measured by the detector in Quasi-Peak mode on the Peak graph.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

○ Test Date : 2025-09-24

● Test Mode : Mode 2



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	50.976	H	40.9	-21.0	19.9	40.0	20.1	392.0	108.0	
2	90.868	V	55.0	-26.1	28.9	40.0	11.1	133.0	256.0	
3	111.359	V	54.3	-23.4	30.9	40.0	9.1	162.0	87.0	
4	181.199	H	41.7	-21.0	20.7	40.0	19.3	400.0	319.0	
5	789.025	H	39.2	-3.8	35.4	47.0	11.6	284.0	245.0	
6	940.466	V	35.7	-0.8	34.9	47.0	12.1	102.0	305.0	

※ The data is the result measured by the detector in Quasi-Peak mode on the Peak graph.

6.3.5 Remark

Complies with the test requirements.

6.4 Radiated Emissions(Above 1 ㎓)

6.4.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SEMI ANECHOIC CHAMBER #5	-	SY Corporation	-	-	-	■
ES10/RE Software	ES10/RE	TOYO	2022.01.000	-	-	■
EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	2025-02-13	2026-02-13	■
PREAMPLIFIER	8449B	HP	3008A00538	2025-04-30	2026-04-30	■
ATTENUATOR	8491B	HP	23094	2025-02-13	2026-02-13	■
HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	2024-11-04	2025-11-04	■

6.4.2 Test Location : SEMI ANECHOIC CHAMBER #5

6.4.3 Test Conditions :

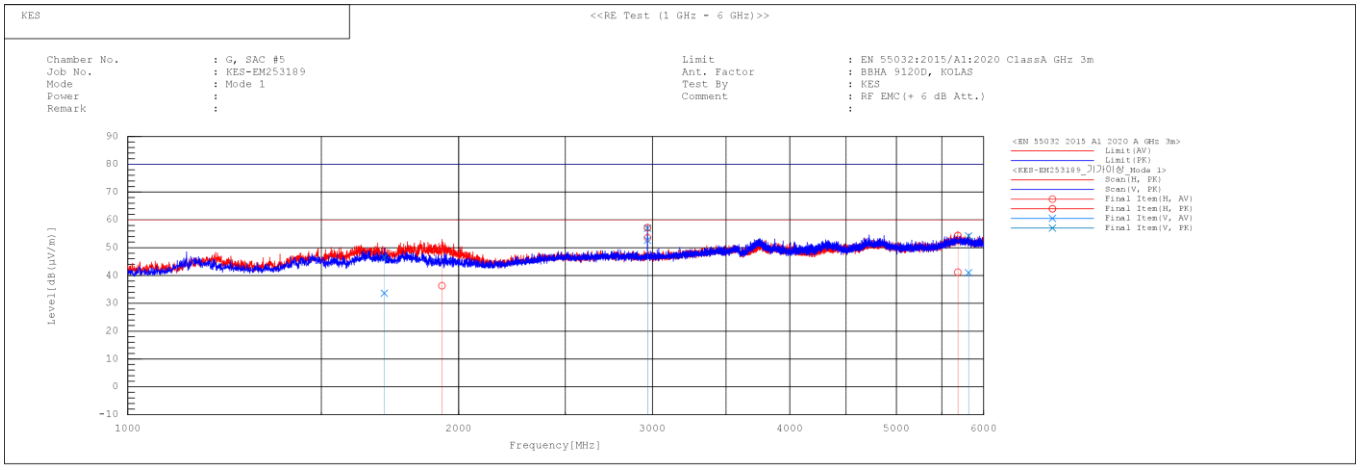
Temperature	Relative Humidity
(24.3 ~ 24.5) °C	(57.1 ~ 57.3) % R.H.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.4.4 Test Result

○ Test Date : 2025-09-24

● Test Mode : Mode 1



Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1711.585	V	31.6	44.6	2.0	33.6	46.6	60.0	80.0	26.4	33.4	100.0	24.7
2	1931.149	H	33.6	47.0	2.7	36.3	49.7	60.0	80.0	23.7	30.3	100.0	336.4
3	2969.969	V	46.2	50.5	6.5	52.7	57.0	60.0	80.0	7.3	23.0	100.0	333.5
4	2969.972	H	47.1	50.7	6.5	53.6	57.2	60.0	80.0	6.4	22.8	100.0	168.7
5	5685.242	H	27.3	40.5	13.9	41.2	54.4	60.0	80.0	18.8	25.6	100.0	339.4
6	5817.408	V	26.8	40.0	14.2	41.0	54.2	60.0	80.0	19.0	25.8	100.0	242.7

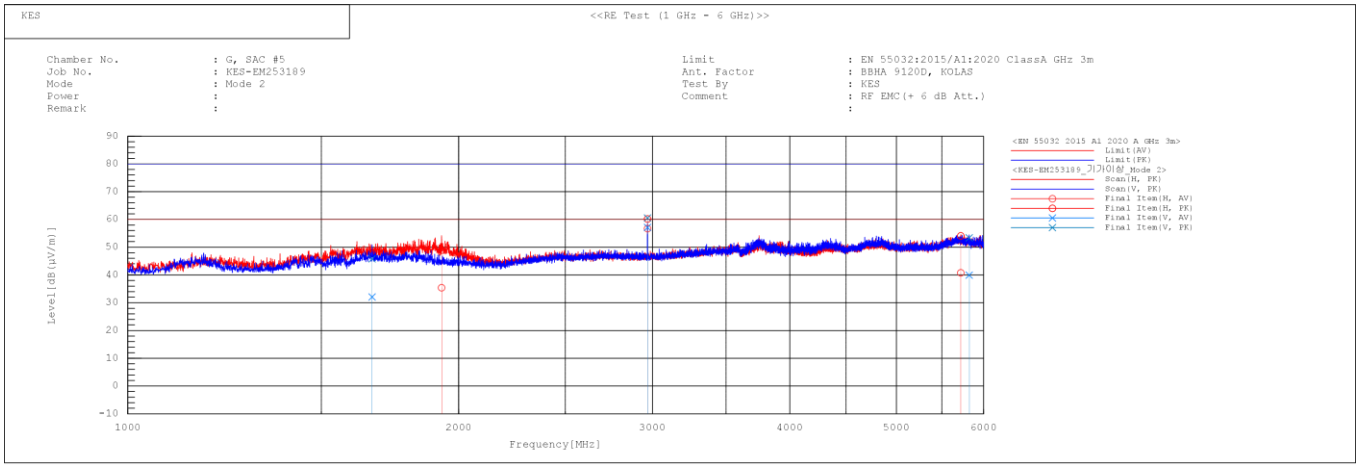
※ The data is the result of measured by the detector in PK and CISPR Average on the Peak graph.

※ The Average of the test data is the cispr average result.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

○ Test Date : 2025-09-24

● Test Mode : Mode 2



Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1668.128	V	30.3	44.0	1.8	32.1	45.8	60.0	80.0	27.9	34.2	100.0	28.1
2	1929.525	H	32.7	46.2	2.7	35.4	48.9	60.0	80.0	24.6	31.1	100.0	334.8
3	2969.972	V	50.6	54.0	6.5	57.1	60.5	60.0	80.0	2.9	19.5	100.0	277.0
4	2969.974	H	50.2	53.7	6.5	56.7	60.2	60.0	80.0	3.3	19.8	100.0	334.8
5	5721.839	H	26.8	40.1	14.0	40.8	54.1	60.0	80.0	19.2	25.9	100.0	195.7
6	5824.646	V	25.7	39.2	14.2	39.9	53.4	60.0	80.0	20.1	26.6	100.0	233.5

※ The data is the result of measured by the detector in PK and CISPR Average on the Peak graph.

※ The Average of the test data is the cispr average result.

6.4.5 Remark

Complies with the test requirements.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.5 Harmonic Current Emissions

6.5.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
net.control Software	net.control	EM TEST	2.1.4	-	-	■
DIGITAL POWER ANALYZER (Harmonic)	DPA 500N	EM TEST	V1024106759	2025-03-31	2026-03-31	■
POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-	-	■

6.5.2 Test Location : SHIELD ROOM #7

6.5.3 Test Conditions :

Temperature	Relative Humidity
(23.6 ~ 23.6) °C	(57.2 ~ 57.2) % R.H.

6.5.4 Classification of Equipment for Harmonic Current Emissions

■ Limits for Class A equipment
□ Limits for Class B equipment
□ Limits for Class C equipment(Rated Power > 25 W)
□ Limits for Class C equipment(Rated Power ≥ 5 W and ≤ 25 W)
□ Limits for Class D equipment

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.5.5 Test Result

○ Test Date : 2025-09-26

● Test Mode : Mode 1

Average and Maximum harmonic current results									
Hn	Average (100% / 150% *)				Maximum (150%)				Harmonic Result
	Ieff [A]	of Limit [%]	Limit [A]	Result	Ieff [A]	of Limit [%]	Limit [A]	Result	
1	0.046				0.047				
2	0.004	0.374	1.080	n/a	0.004	0.275	1.620	n/a	n/a
3	0.039	1.692	2.300	PASS	0.039	1.136	3.450	PASS	PASS
4	0.004	1.005	0.430	n/a	0.005	0.750	0.645	n/a	n/a
5	0.038	3.325	1.140	PASS	0.038	2.241	1.710	PASS	PASS
6	0.005	1.736	0.300	PASS	0.006	1.265	0.450	PASS	PASS
7	0.037	4.847	0.770	PASS	0.038	3.266	1.155	PASS	PASS
8	0.004	1.803	0.230	n/a	0.005	1.363	0.345	n/a	n/a
9	0.037	9.259	0.400	PASS	0.037	6.221	0.600	PASS	PASS
10	0.004	2.087	0.184	n/a	0.004	1.578	0.276	n/a	n/a
11	0.036	10.915	0.330	PASS	0.036	7.336	0.495	PASS	PASS
12	0.004	2.517	0.153	n/a	0.004	1.900	0.230	n/a	n/a
13	0.035	16.444	0.210	PASS	0.035	11.036	0.315	PASS	PASS
14	0.004	2.993	0.131	n/a	0.004	2.232	0.197	n/a	n/a
15	0.033	21.897	0.150	PASS	0.033	14.699	0.225	PASS	PASS
16	0.004	3.296	0.115	n/a	0.004	2.449	0.173	n/a	n/a
17	0.031	23.587	0.132	PASS	0.032	15.895	0.199	PASS	PASS
18	0.004	3.565	0.102	n/a	0.004	2.640	0.153	n/a	n/a
19	0.030	25.077	0.118	PASS	0.030	16.835	0.178	PASS	PASS
20	0.003	3.655	0.092	n/a	0.004	2.740	0.138	n/a	n/a
21	0.028	17.260	0.161	PASS	0.028	17.401	0.161	PASS	PASS
22	0.003	3.913	0.084	n/a	0.004	2.907	0.125	n/a	n/a
23	0.026	17.744	0.147	PASS	0.026	17.863	0.147	PASS	PASS
24	0.003	4.035	0.077	n/a	0.003	3.020	0.115	n/a	n/a
25	0.024	17.877	0.135	PASS	0.024	17.995	0.135	PASS	PASS
26	0.003	3.944	0.071	n/a	0.003	3.005	0.106	n/a	n/a
27	0.022	17.677	0.125	PASS	0.022	17.782	0.125	PASS	PASS
28	0.003	4.111	0.066	n/a	0.003	3.074	0.099	n/a	n/a
29	0.020	17.398	0.116	PASS	0.020	17.490	0.116	PASS	PASS
30	0.002	3.928	0.061	n/a	0.003	3.007	0.092	n/a	n/a
31	0.018	16.642	0.109	PASS	0.018	16.757	0.109	PASS	PASS
32	0.002	3.867	0.058	n/a	0.003	2.951	0.086	n/a	n/a
33	0.016	15.841	0.102	PASS	0.016	15.961	0.102	PASS	PASS
34	0.002	3.808	0.054	n/a	0.002	2.885	0.081	n/a	n/a

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

35	0.014	14.962	0.096	PASS	0.015	15.068	0.096	PASS	PASS
36	0.002	3.396	0.051	n/a	0.002	2.685	0.077	n/a	n/a
37	0.012	13.574	0.091	PASS	0.012	13.704	0.091	PASS	PASS
38	0.002	3.337	0.048	n/a	0.002	2.519	0.073	n/a	n/a
39	0.011	12.396	0.087	PASS	0.011	12.495	0.087	PASS	PASS
40	0.001	2.992	0.046	n/a	0.002	2.349	0.069	n/a	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.*

Voltage Source Verification

Harmonic voltage results				
Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	232.213	100.962		
2	0.045	0.019	0.200	PASS
3	0.065	0.028	0.900	PASS
4	0.047	0.020	0.200	PASS
5	0.039	0.017	0.400	PASS
6	0.033	0.014	0.200	PASS
7	0.052	0.023	0.300	PASS
8	0.023	0.010	0.200	PASS
9	0.096	0.042	0.200	PASS
10	0.007	0.003	0.200	PASS
11	0.069	0.030	0.100	PASS
12	0.010	0.004	0.100	PASS
13	0.038	0.016	0.100	PASS
14	0.025	0.011	0.100	PASS
15	0.066	0.029	0.100	PASS
16	0.030	0.013	0.100	PASS
17	0.043	0.019	0.100	PASS
18	0.014	0.006	0.100	PASS
19	0.055	0.024	0.100	PASS
20	0.023	0.010	0.100	PASS
21	0.059	0.026	0.100	PASS
22	0.020	0.009	0.100	PASS
23	0.053	0.023	0.100	PASS
24	0.006	0.003	0.100	PASS
25	0.032	0.014	0.100	PASS
26	0.017	0.007	0.100	PASS
27	0.040	0.017	0.100	PASS
28	0.015	0.007	0.100	PASS
29	0.051	0.022	0.100	PASS

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

30	0.013	0.005	0.100	PASS
31	0.019	0.008	0.100	PASS
32	0.015	0.006	0.100	PASS
33	0.031	0.014	0.100	PASS
34	0.016	0.007	0.100	PASS
35	0.053	0.023	0.100	PASS
36	0.013	0.006	0.100	PASS
37	0.017	0.007	0.100	PASS
38	0.010	0.004	0.100	PASS
39	0.039	0.017	0.100	PASS
40	0.015	0.007	0.100	PASS

6.5.6 Remark

Complies with the test requirements.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.6 Voltage Fluctuations and Flicker

6.6.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
net.control Software	net.control	EM TEST	2.1.4	-	-	■
DIGITAL POWER ANALYZER (Flicker)	DPA 500N	EM TEST	V1024106759	2025-04-01	2026-04-01	■
POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-	-	■

6.6.2 Test Location : SHIELD ROOM #7

6.6.3 Test Conditions :

Temperature	Relative Humidity
(23.6 ~ 23.8) °C	(57.2 ~ 57.4) % R.H.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.6.4 Test Result

○ Test Date : 2025-09-26

● Test Mode : Mode 1

Flicker Measurements					
	P_{lt}	Max P_{st}	Max D_c	Max D_{max}	Max T_{max}
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

6.6.5 Remark

Complies with the test requirements.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.7 Electrostatic Discharge

6.7.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #6	-	DYMSTEC	-	-	-	■
ESD SIMULATOR	ESS-2000	NoiseKen	ESS01Z0454	2025-01-21	2026-01-21	■
HCP	-	KES	-	-	-	■
VCP	-	Noise Ken	-	-	-	■

6.7.2 Test Location : SHIELD ROOM #6

6.7.3 Test Conditions :

Temperature	Relative Humidity
Temperature(15 ~ 35) °C	(24.7 ~ 24.8) °C
Relative Humidity(30 ~ 60) % R.H.	(55.6 ~ 55.7) % R.H.
Atmospheric Pressure(86 ~ 106) kPa	(100.6 ~ 100.7) kPa

6.7.4 Test Specifications :

Discharge Factor : 1 s

Discharge Impedance : 330 Ω / 150 pF

Kind of Discharge : Direct Discharge - Contact Discharge, Air Discharge
Indirect Discharge - HCP, VCP

Polarity : Positive and Negative

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

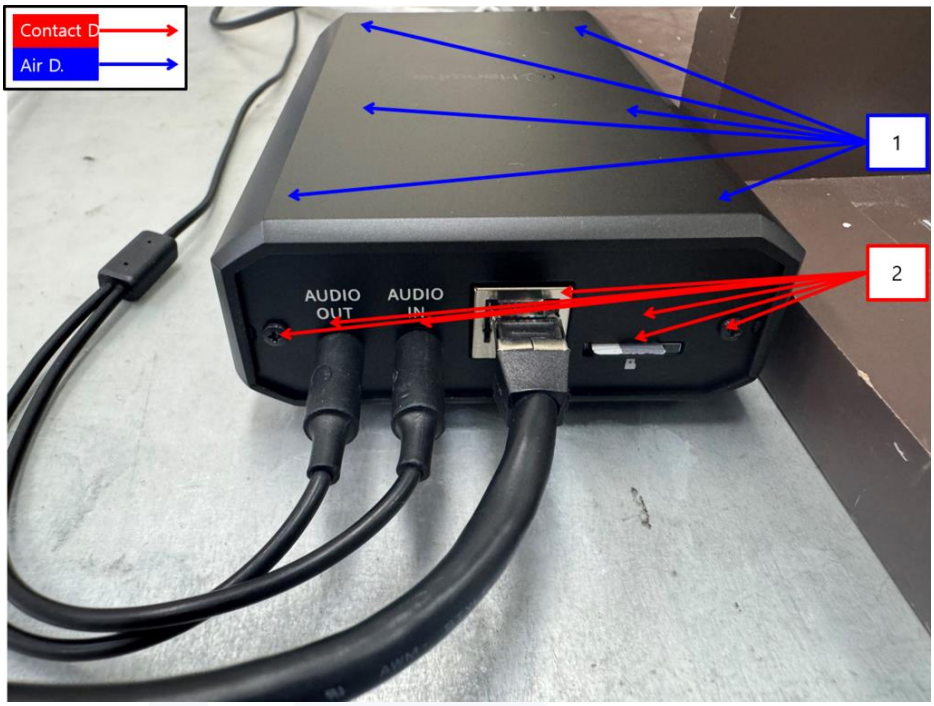
Performance Criteria : Complied

Discharge Voltage :

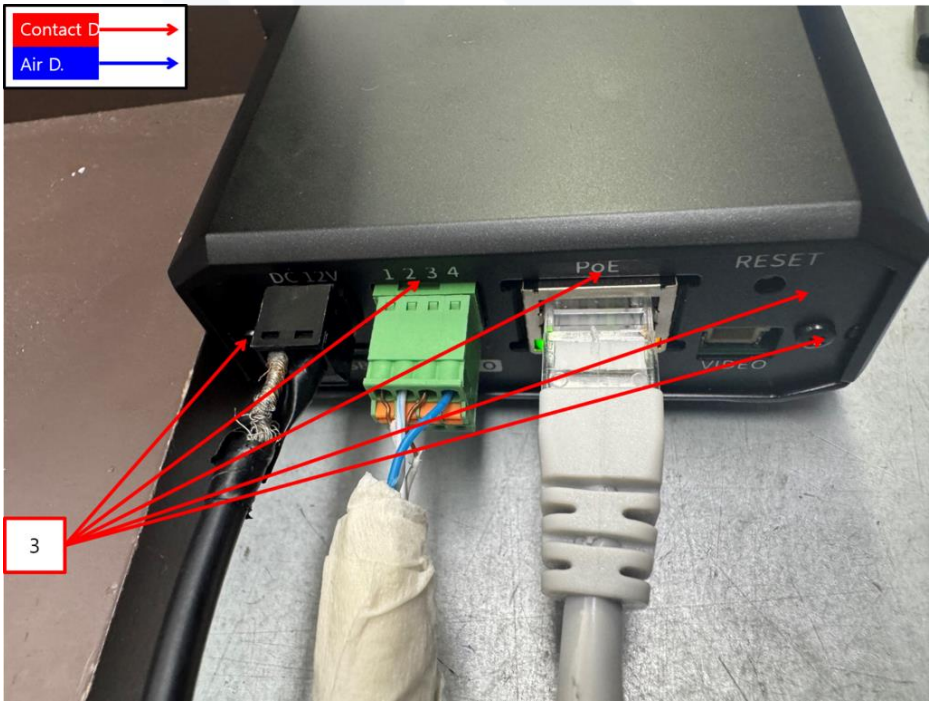
Type	Direct Discharge		Indirect Discharge	
	Contact Discharge	Air Discharge	Horizontal Coupling Plane	Vertical Coupling Plane
Test Voltage	-	± 2 kV	-	-
	± 6 kV	± 4 kV	± 6 kV	± 6 kV
	-	± 8 kV	-	-

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.7.5 Location of Discharge

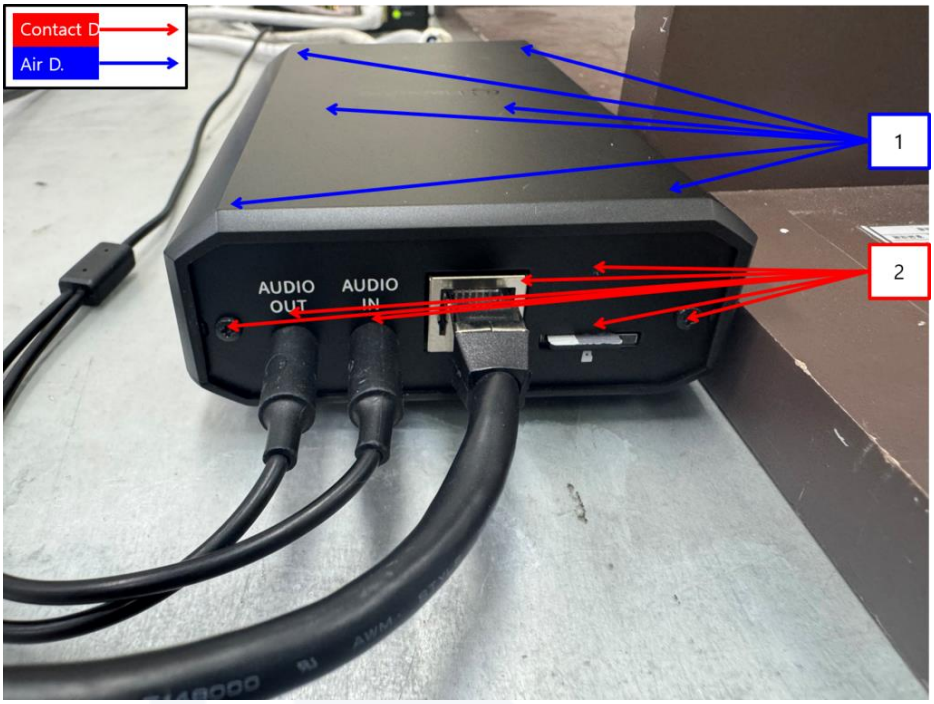


<Location of Discharge-1_Mode 1>

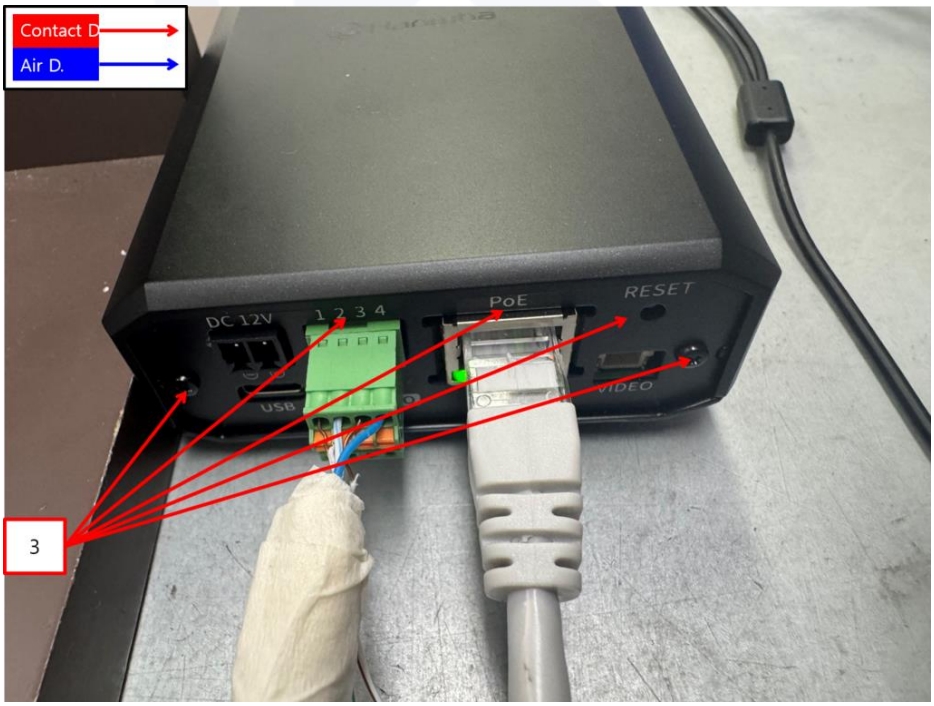


<Location of Discharge-2_Mode 1>

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).



<Location of Discharge-1_Mode 2>



<Location of Discharge-2_Mode 2>

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.7.6 Test Result

○ Test Date : 2025-09-26
● Test Mode : Mode 1

○ **Indirect Discharge**

No.	Test Point	Discharge Method	Observations	Remarks
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

○ **Direct Discharge**

No.	Test Point	Discharge Method	Observations	Remarks
1	Enclosure	Air Discharge	Complied	-
2	Front Enclosure, Around the Port, Screw	Contact Discharge	Complied	-
3	Back Enclosure, Around the Port, Screw	Contact Discharge	Complied	-

○ Test Date : 2025-09-26
● Test Mode : Mode 2

○ **Indirect Discharge**

No.	Test Point	Discharge Method	Observations	Remarks
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

○ **Direct Discharge**

No.	Test Point	Discharge Method	Observations	Remarks
1	Enclosure	Air Discharge	Complied	-
2	Front Enclosure, Around the Port, Screw	Contact Discharge	Complied	-
3	Back Enclosure, Around the Port, Screw	Contact Discharge	Complied	-

6.7.7 Remark

No loss of performance of function.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.8 Continuous RF electromagnetic field disturbances

6.8.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SEMI ANECHOIC CHAMBER #3	-	DYMSTEC	-	-	-	■
EMC32 Measurement Software	EMC32	R&S	10.10.02	-	-	■
SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	2025-07-28	2026-07-28	■
HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-	-	■
POWER METER	E4419B	Agilent	GB40203000	2025-02-13	2026-02-13	■
DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H. SYSTEM,INC	781	2025-03-05	2026-03-05	■
AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	2025-02-13	2026-02-13	■
AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	2025-02-13	2026-02-13	■
STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	SCHWARZBECK	9128ES-121	-	-	■

6.8.2 Test Location : SEMI ANECHOIC CHAMBER #3

6.8.3 Test Conditions :

Temperature	Relative Humidity
(24.1 ~ 24.4) °C	(57.2 ~ 57.5) % R.H.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.8.4 Test Specifications :

Antenna Polarization	:	Horizontal & Vertical unless indicated otherwise
Antenna Distance	:	3 m
Field Strength	:	10 V/m (rms)
Frequency Range	:	80 MHz ~ 2.7 GHz
Modulation	:	AM 80 %, 1 kHz, Sine wave PM 1 Hz (0.5 s ON : 0.5 s OFF)
Dwell Time	:	3 s
Frequency Step	:	1 %
Application method	:	4
Performance Criteria	:	Complied

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.8.5 Test Result

○ Test Date : 2025-09-25
● Test Mode : Mode 1

○ Enclosure Port

Side Exposed	Observations	
	Horizontal	Vertical
Front	Complied	Complied
Rear	Complied	Complied
Right	Complied	Complied
Left	Complied	Complied

○ Test Date : 2025-09-25
● Test Mode : Mode 2

○ Enclosure Port

Side Exposed	Observations	
	Horizontal	Vertical
Front	Complied	Complied
Rear	Complied	Complied
Right	Complied	Complied
Left	Complied	Complied

6.8.6 Remark

No loss of performance of function.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.9 Electrical Fast Transients/Bursts

6.9.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
iec.control Software	iec.control	EM TEST	5.4.8	-	-	■
ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	2024-11-06	2025-11-06	■
MOTOR VARIAC	MV 2616	EM TEST	P1552169719	2024-11-07	2025-11-07	■
CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	2024-11-06	2025-11-06	■

6.9.2 Test Location : SHIELD ROOM #7

6.9.3 Test Conditions :

Temperature	Relative Humidity
(23.6 ~ 23.7) °C	(57.2 ~ 57.3) % R.H.

6.9.4 Test Specifications :

Pulse Amplitude & Polarity	:	Input a.c power ports ± 2.0 kV
		Other supply and Signal ports ± 1 kV
Repetition Rate	:	100 kHz
Impulse Rise Time	:	5 ns ± 30 %
Impulse Period	:	50 ns ± 30 %
Burst Duration	:	15 ms ± 20 %
Burst Period	:	300 ms ± 20 %
Duration of Test Voltage	:	1 min
Application Method	:	a.c / d.c power ports (Coupling / Decoupling Network)
		Other than a.c / d.c power poerts (Capacitive Coupling Clamp)
Performance Criteria	:	Complied

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.9.5 Test Result

○ Test Date : 2025-09-26
● Test Mode : Mode 1

○ Input a.c power ports

Mode of Application	Observations	
	(+) Burst	(-) Burst
L	Complied	Complied
N	Complied	Complied
PE	Complied	Complied
L-N	Complied	Complied
L-PE	Complied	Complied
N-PE	Complied	Complied
L-N-PE	Complied	Complied

○ Input d.c power ports

Mode of Application	Observations	
	(+) Burst	(-) Burst
N/A	-	-

○ Signal ports and telecommunication ports

Mode of Application	Observations	
	(+) Burst	(-) Burst
RJ-45(PoE)	Complied	Complied
CAM(6 PIN)	Complied	Complied
ALARM IN(2 PIN)	Complied	Complied
ALARM OUT(2 PIN)	Complied	Complied

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

○ Test Date : 2025-09-26
● Test Mode : Mode 2

○ Input a.c power ports

Mode of Application	Observations	
	(+) Burst	(-) Burst
N/A	-	-

○ Input d.c power ports

Mode of Application	Observations	
	(+) Burst	(-) Burst
N/A	-	-

○ Signal ports and telecommunication ports

Mode of Application	Observations	
	(+) Burst	(-) Burst
RJ-45(PoE)	Complied	Complied
CAM(6 PIN)	Complied	Complied
ALARM IN(2 PIN)	Complied	Complied
ALARM OUT(2 PIN)	Complied	Complied

6.9.6 Remark

No loss of performance of function.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.10 Surge

6.10.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
iec.control Software	iec.control	EM TEST	5.4.8	-	-	■
ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	2024-11-07	2025-11-07	■
MOTOR VARIAC	MV 2616	EM TEST	P1552169719	2024-11-07	2025-11-07	■
CDN	CNV 508N1	EM TEST	P1610176296	2024-11-08	2025-11-08	■

6.10.2 Test Location : SHIELD ROOM #7

6.10.3 Test Conditions :

Temperature	Relative Humidity
(23.6 ~ 23.8) °C	(57.2 ~ 57.4) % R.H.

6.10.4 Test Specifications :

Surge : Input a.c power ports — Line to Line ±0.5 kV, ±1.0 kV; Line to Ground ±0.5 kV, ±1.0 kV, ±2.0 kV

Other supply / Signal lines — Line to Ground ±0.5 kV, ±1.0 kV

Input a.c / Other supply / Signal lines

Open-Circuit Voltage Waveform : 1.2/50 μs

Short-Circuit Current Waveform : 8/20 μs

Number of Applications : Apply 5 surges for each polarity

Phase Angle : 0˚ ~ 270˚ (input a.c. power port)

Polarity : Positive and Negative

Repetition Rate : 1 surge per 30 s

Performance Criteria : Complied

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.10.5 Test Result

○ Test Date : 2025-09-26
● Test Mode : Mode 1

○ Input a.c power ports

Mode of Application	Observations	
	(+) Surge	(-) Surge
L-N	Complied	Complied
L-PE	Complied	Complied
N-PE	Complied	Complied

○ Signal ports and telecommunication ports

Mode of Application	Coupling Method	Observations	
		(+) Surge	(-) Surge
RJ-45 (PoE)	CDN	Complied	Complied
RJ-45 (PoE)	LINE	Complied	Complied

○ Test Date : 2025-09-26
● Test Mode : Mode 2

○ Input a.c power ports

Mode of Application	Observations	
	(+) Surge	(-) Surge
N/A	-	-

○ Signal ports and telecommunication ports

Mode of Application	Coupling Method	Observations	
		(+) Surge	(-) Surge
RJ-45(PoE)	CDN	Complied	Complied
RJ-45(PoE)	LINE	Complied	Complied

6.10.6 Remark

No loss of performance of function.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.11 Continuous Induced RF Disturbances

6.11.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
icd.control Software	icd.control	EM TEST	8.0.0	-	-	■
TEST SYSTEM FOR CONDUCTED AND RADIATED	NSG4070	TESEQ	65585	2024-11-18	2025-11-18	■
ATTENUATOR	ATT 6/80	EM TEST	P1614178148	2024-11-06	2025-11-06	■
CDN	CDN M016	TESEQ	43694	2024-11-07	2025-11-07	■
CDN	CDN M016	TESEQ	43697	2024-11-07	2025-11-07	■
CDN	CDN T8 RJ45	SCHWARZBECK	00103	2025-07-07	2026-07-07	■
EM CLAMP	KEMZ 801A	TESEQ	44099	2024-11-08	2025-11-08	■

6.11.2 Test Location : SHIELD ROOM #7

6.11.3 Test Conditions :

Temperature	Relative Humidity
(24.0 ~ 24.3)°C	(54.9 ~ 55.2) % R.H.

6.11.4 Test Specifications

Frequency range and Voltage Level	:	0.15 MHz ~ 100 MHz : 10 V(r.m.s)
Modulation	:	AM 80 %, 1 kHz, Sine wave
		PM 1 Hz (0.5 s ON : 0.5 s OFF)
Dwell Time	:	3 s
Frequency Step	:	1 %
Performance Criteria	:	Complied

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.11.5 Test Result

○ Test Date : 2025-09-25

● Test Mode : Mode 1

○ Input a.c power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L-N-PE	CDN	Complied

○ Input d.c power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
N/A	-	-

○ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45(PoE)	CDN	Complied
CAM(6 PIN)	Clamp	Complied
ALARM IN(2 PIN)	Clamp	Complied
ALARM OUT(2 PIN)	Clamp	Complied

○ Test Date : 2025-09-25

● Test Mode : Mode 2

○ Input a.c power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
N/A	CDN	-

○ Input d.c power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
N/A	-	-

○ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45(PoE)	CDN	Complied
CAM(6 PIN)	Clamp	Complied
ALARM IN(2 PIN)	Clamp	Complied
ALARM OUT(2 PIN)	Clamp	Complied

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.11.6 Remark

No loss of performance of function.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.12 Voltage Dips and Interruptions

6.12.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
iec.control Software	iec.control	EM TEST	5.4.8	-	-	■
ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	2024-11-07	2025-11-07	■
MOTOR VARIAC	MV 2616	EM TEST	P1552169719	2024-11-07	2025-11-07	■

6.12.2 Test Location : SHIELD ROOM #7

6.12.3 Test Conditions :

Temperature	Relative Humidity
(23.6 ~ 23.6) °C	(57.2 ~ 57.2) % R.H.

6.12.4 Test Specifications

Instantaneous peak overshoot/undershoot of the actual voltage	:	Less than 5 %
Voltage Rise Time, Voltage Fall Time	:	Between 1 μs and 5 μs
Test Voltage Frequency Deviation for Voltage Dips	:	with in ± 2 %
EUT Voltage	:	AC 230 V, 50 Hz
Number of Applications	:	3 cycles
Test Interval	:	10 s
Performance Criteria	:	Complied

Voltage Dips and Interruptions	Duration [in period]
20 % Voltage reduction	250 T
30 % Voltage reduction	25 T
60 % Voltage reduction	10 T
100 % Voltage reduction	250 T

Voltage Variations	Supply Voltage
Supply Voltage max (Umax)	Unom a + 10 %
Supply Voltage min (Umin)	Unom a - 15 %

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

6.12.5 Test Result

○ Test Date: 2025-09-26
● Test Mode: Mode 1

○ Voltage Dips and Short Interruptions

Depth	Duration [in period]	Observations
20 % Voltage reduction	250 T	Complied
30 % Voltage reduction	25 T	Complied
60 % Voltage reduction	10 T	Complied
100 % Voltage reduction	250 T	Degradation

○ Voltage variations

Voltage Variations	Supply Voltage	Observations
Supply voltage max (Umax = Unom a + 10 %)	253 V	Complied
Supply voltage min (Umin = Unom a - 15 %)	195.5 V	Complied

U_{nom} = Nominal mains voltage, U_{max} = (Maximum U_{nom}) + 10 %, U_{min} = (Minimum U_{nom}) – 15 %.

○ Test Date: 2025-09-26
● Test Mode: Mode 2

○ Voltage Dips and Short Interruptions

Depth	Duration [in period]	Observations
20 % Voltage reduction	250 T	Complied
30 % Voltage reduction	25 T	Complied
60 % Voltage reduction	10 T	Complied
100 % Voltage reduction	250 T	Degradation

○ Voltage variations

Voltage Variations	Supply Voltage	Observations
Supply voltage max (Umax = Unom a + 10 %)	253 V	Complied
Supply voltage min (Umin = Unom a - 15 %)	195.5 V	Complied

U_{nom} = Nominal mains voltage, U_{max} = (Maximum U_{nom}) + 10 %, U_{min} = (Minimum U_{nom}) – 15 %.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

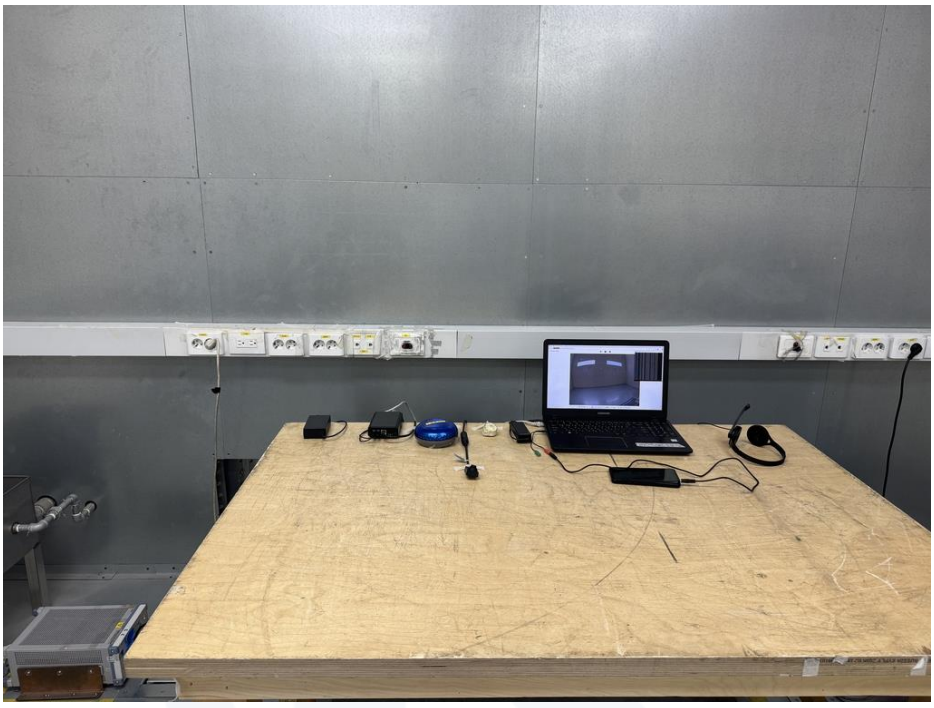
6.12.6 Remark

Degradation : During the test(100%, 250cycle), EUT was turned off but after the test, it was recovered without operator’s intervention

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

7 Test Setup Photos and EUT Photographs

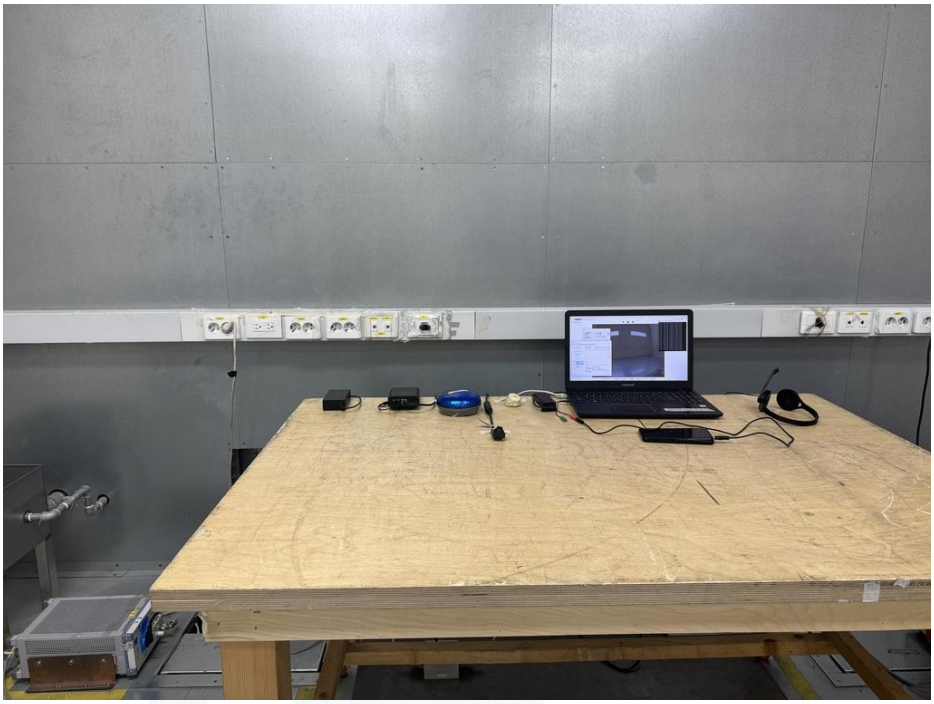
7.1 Test Setup Photos



<Conducted Emissions at Mains Power Ports - Front> Mode 1

<Conducted Emissions at Mains Power Ports - Rear> Mode 1

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).



<Conducted Emissions at Telecommunication Ports - Front>Mode 1

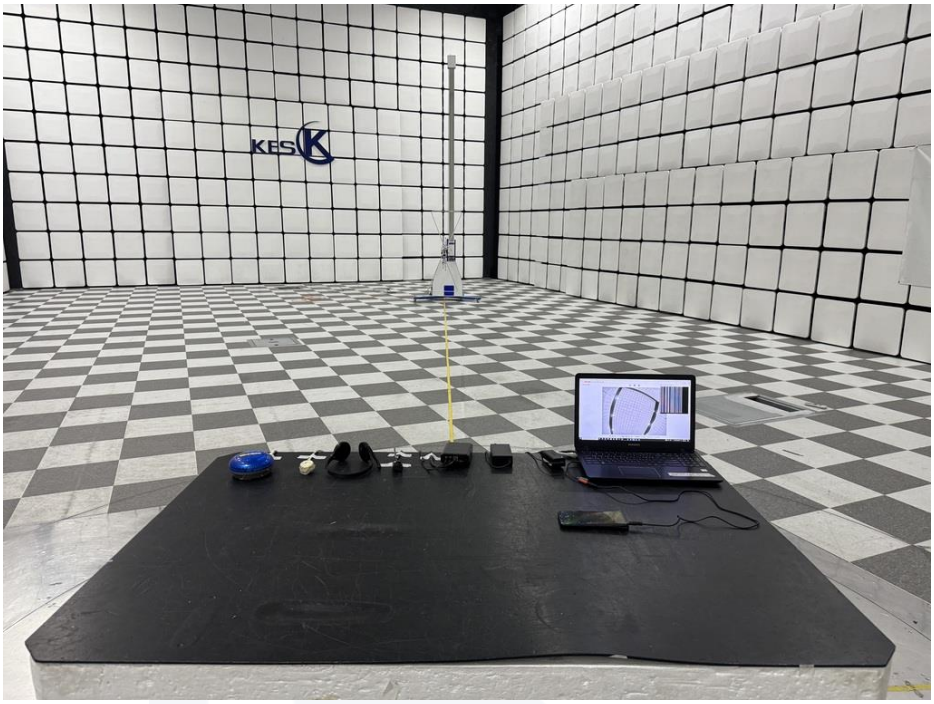
<Conducted Emissions at Telecommunication Ports - Rear> Mode 1

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

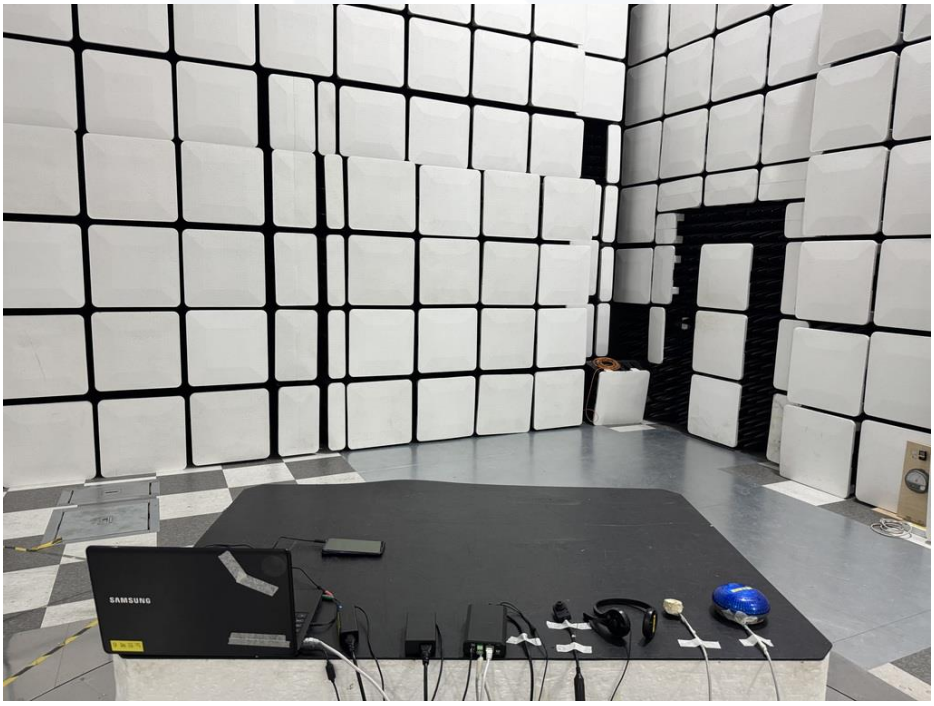
<Conducted Emissions at Telecommunication Ports - Front>Mode 2

<Conducted Emissions at Telecommunication Ports - Rear> Mode 2

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

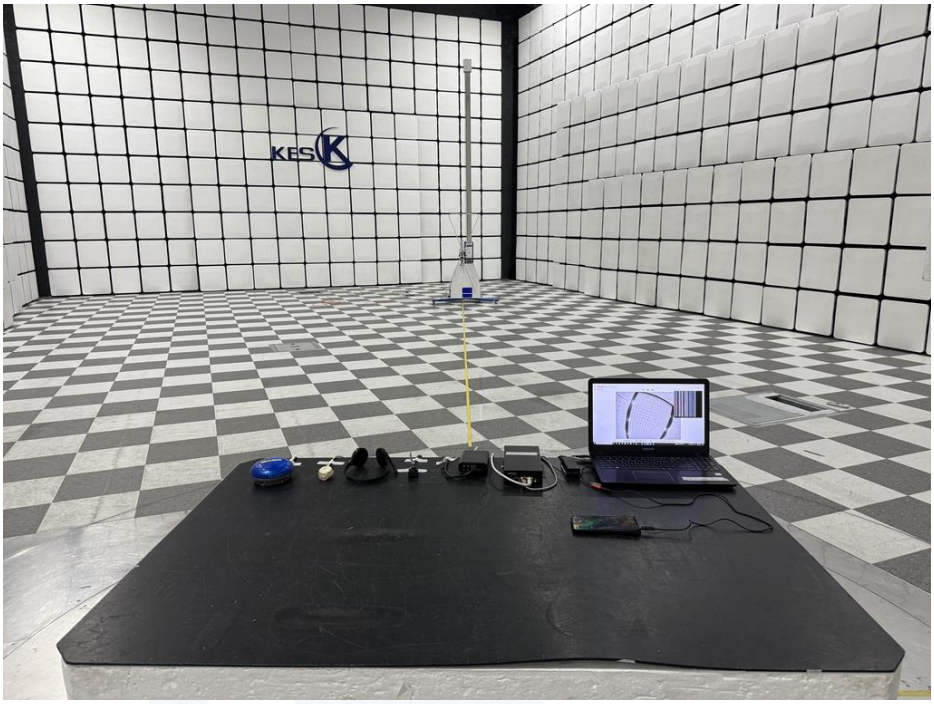


<Radiated Emissions(Below 1 ㎓) - Front> Mode 1

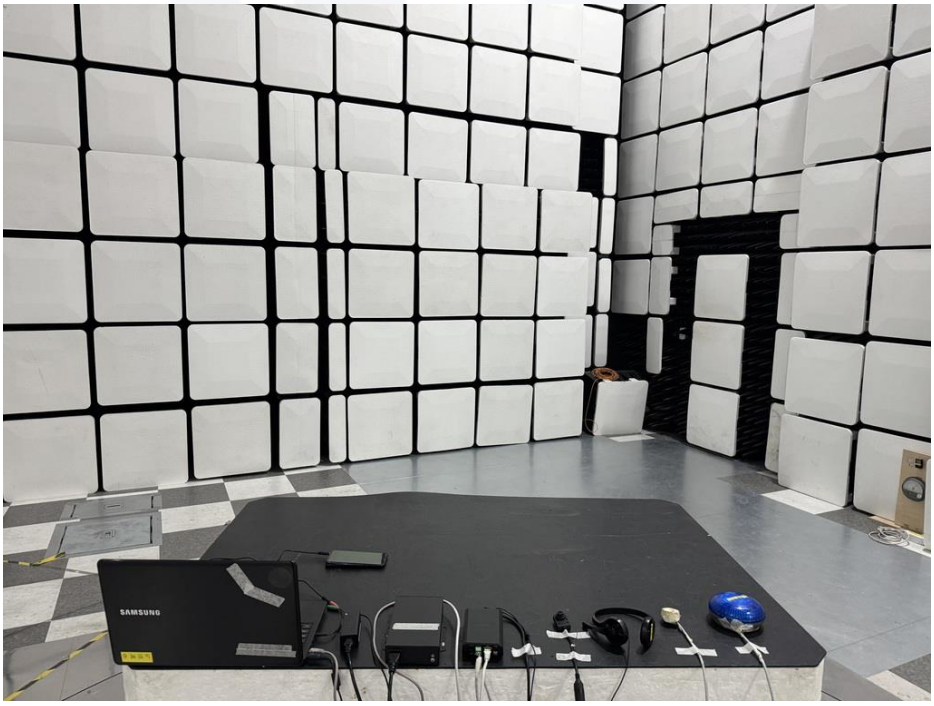


<Radiated Emissions(Below 1 ㎓) - Rear> Mode 1

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

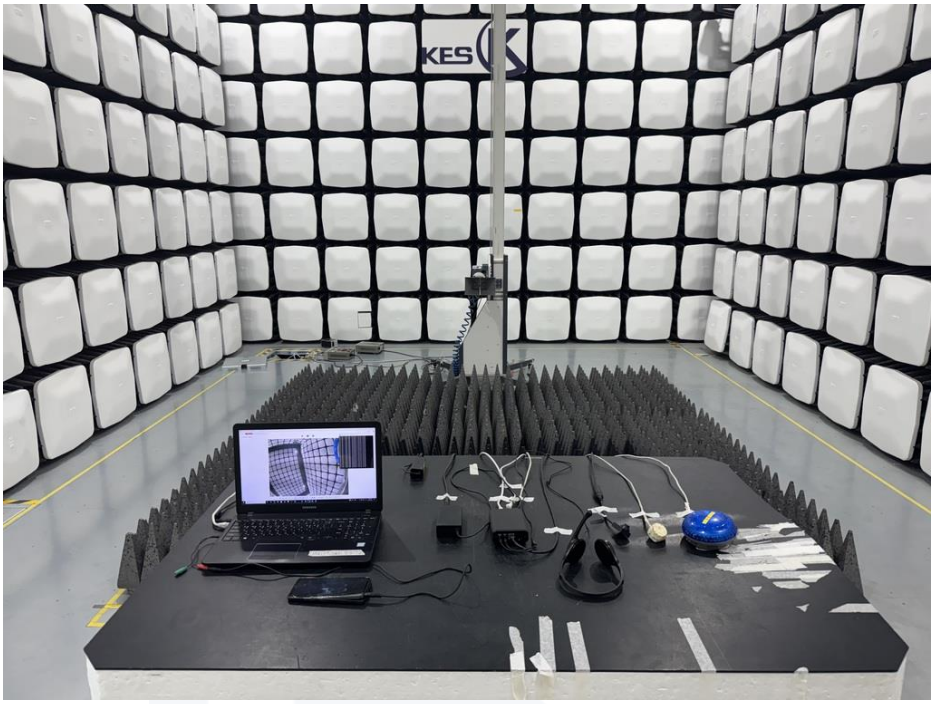


<Radiated Emissions(Below 1 ㎓) - Front> Mode 2

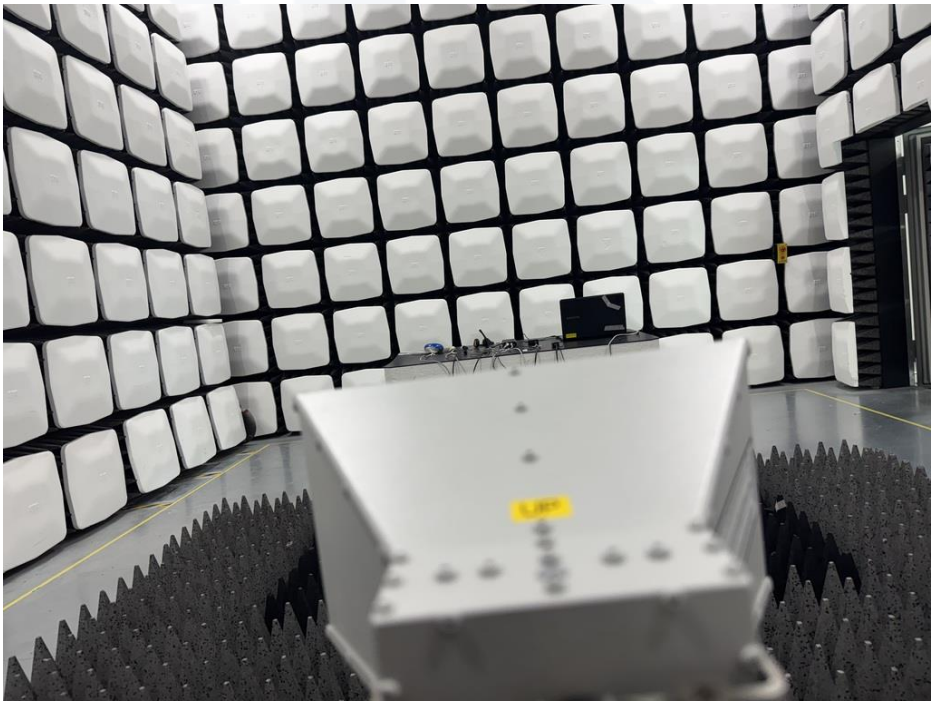


<Radiated Emissions(Below 1 ㎓) - Rear> Mode 2

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

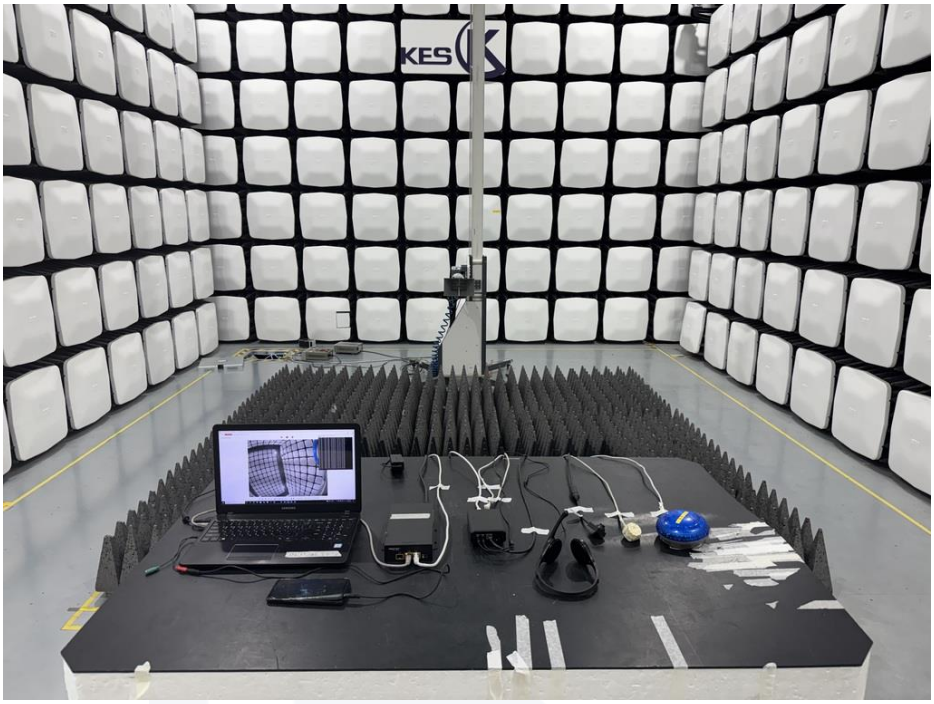


<Radiated Emissions(Above 1 ㎓) - Front> Mode 1

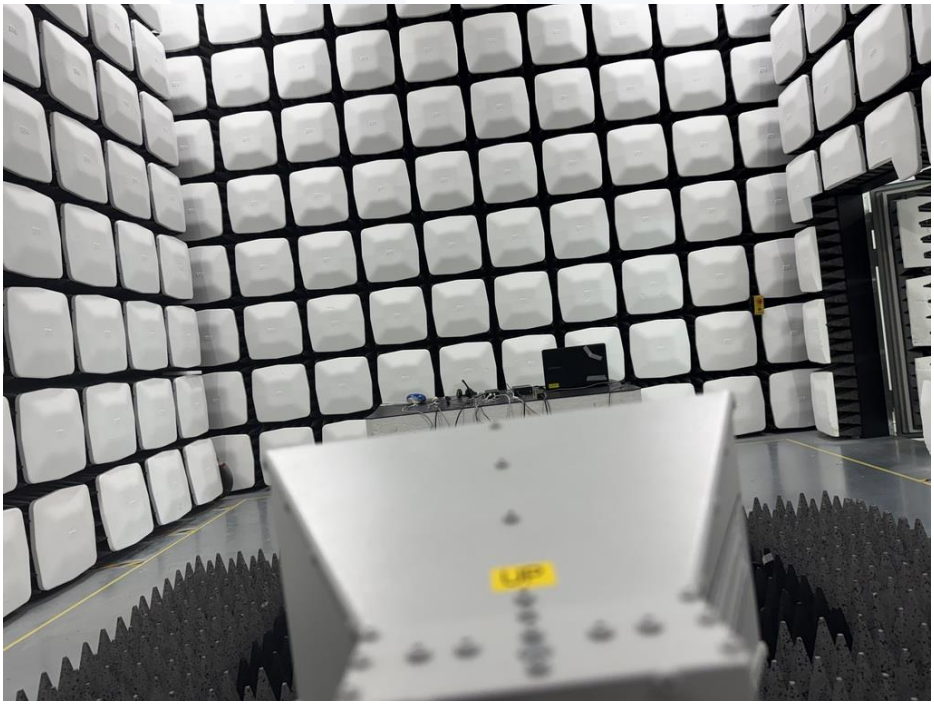


<Radiated Emissions(Above 1 ㎓) - Rear> Mode 1

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).



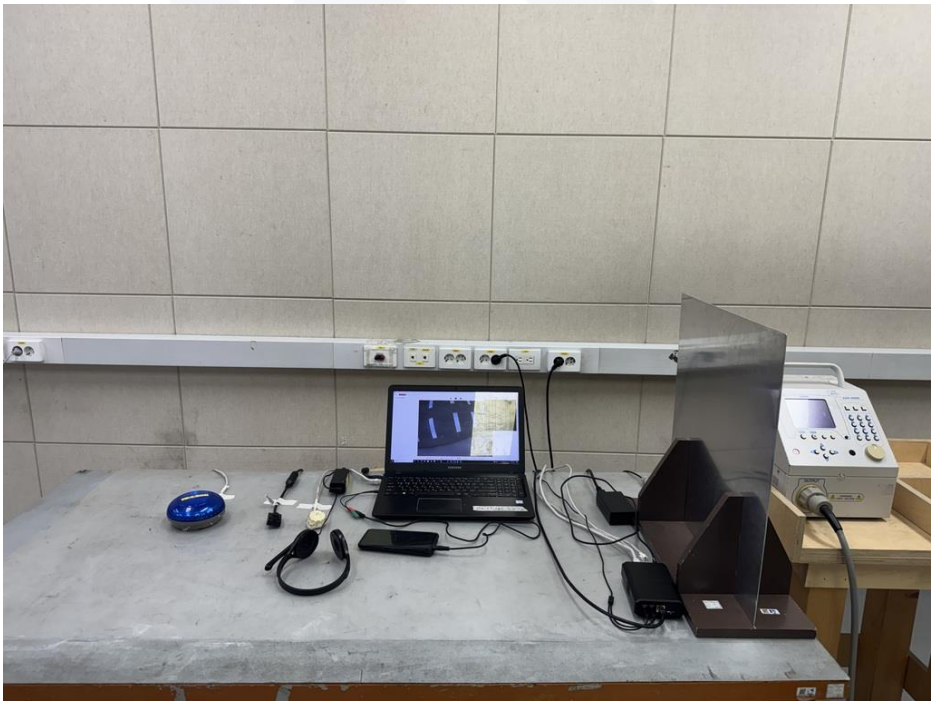
<Radiated Emissions(Above 1 ㎓) - Front> Mode 2



<Radiated Emissions(Above 1 ㎓) - Rear> Mode 2

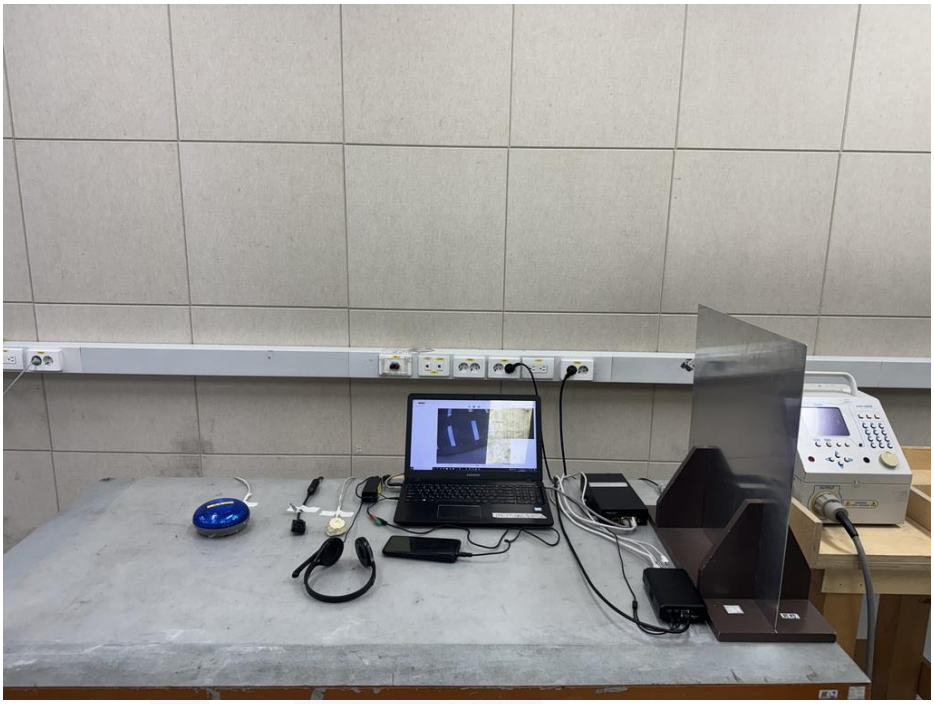
The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

<Harmonic Current Emissions and Voltage Fluctuations and Flicker> Mode 1

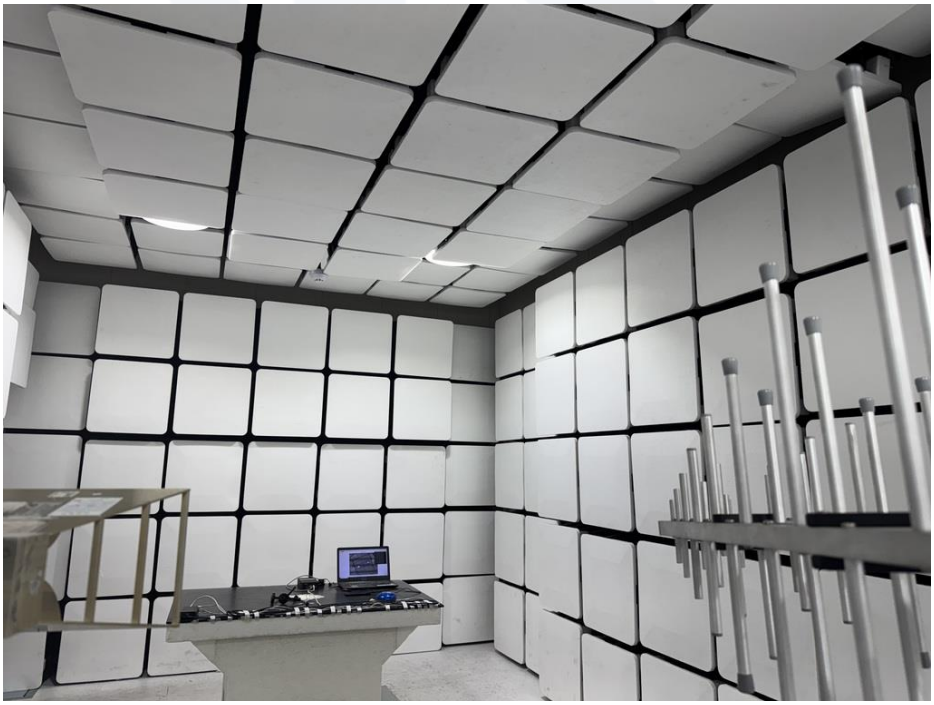


<Electrostatic Discharge> Mode 1

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).



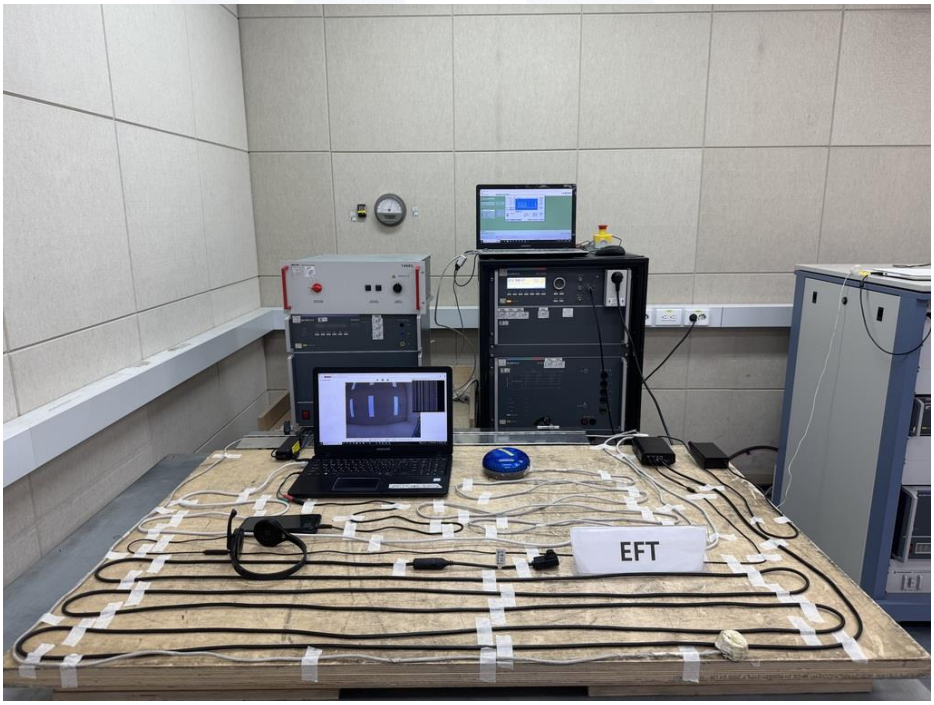
<Electrostatic Discharge> Mode 2



<Continuous RF electromagnetic field disturbances> Mode 1

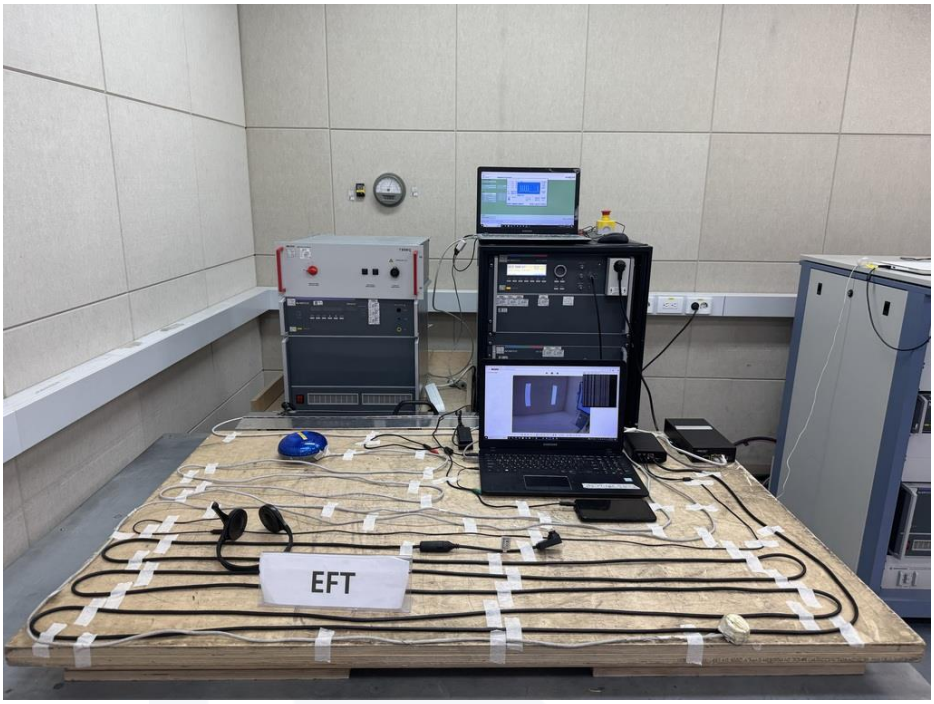
The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

<Continuous RF electromagnetic field disturbances> Mode 2



<Electrical Fast Transients/Bursts> Mode 1

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

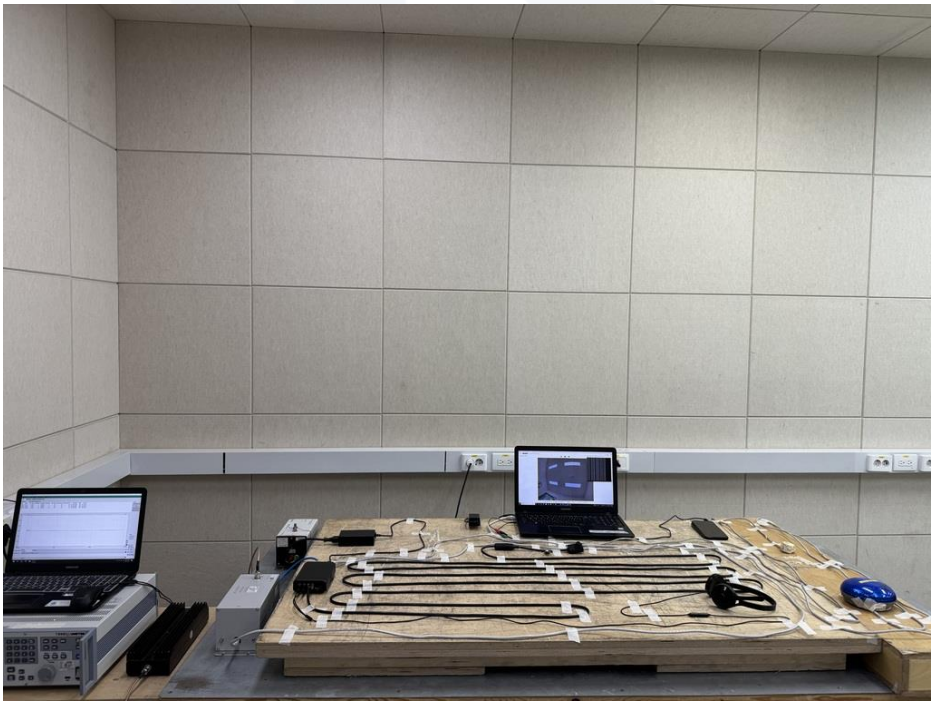


<Electrical Fast Transients/Bursts> Mode 2

<Surge> Mode 1

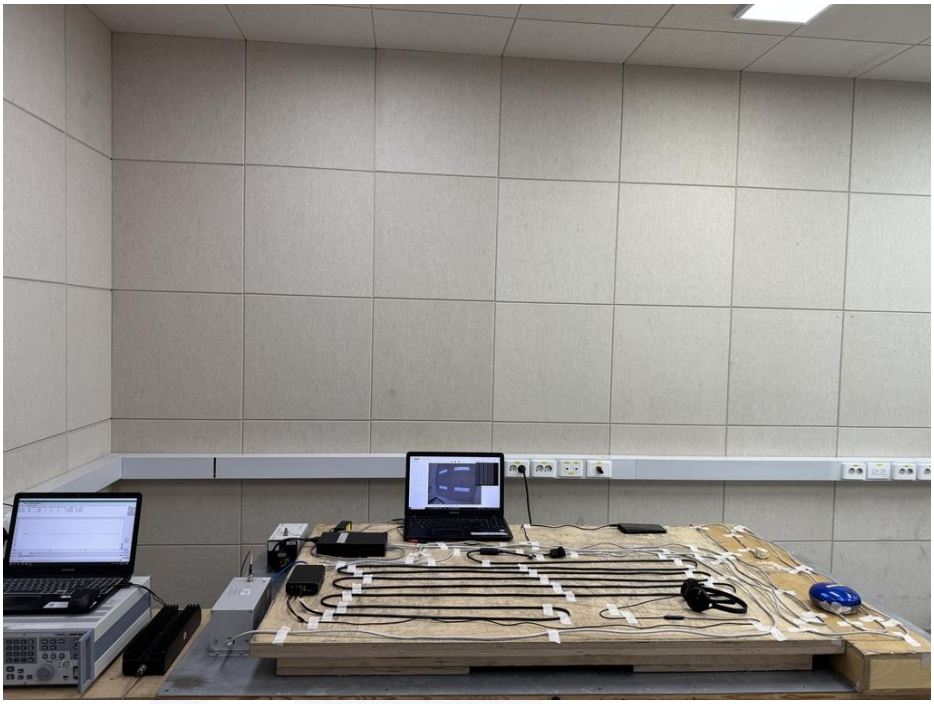
The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

<Surge> Mode 2



<Continuous Induced RF Disturbances> Mode 1

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).



<Continuous Induced RF Disturbances> Mode 2

<Voltage Dips and Interruptions> Mode 1

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

7.2 EUT Photographs

<EUT External Photographs - Top>

<EUT External Photographs - Bottom>

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

<Port-1>

<Port-2>

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

<EUT Internal Photographs>

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).

7.3 Label

Name	:	Hanwha Vision Co., Ltd.
Product item	:	REMOTE HEAD CAMERA
Model name	:	XNB-A8004B

The End.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).