



TEST REPORT



Report No. : KES-EM254271

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KES Co., Ltd.

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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 : NETWORK CAMERA

Model/Type No. : PNO-A9311R

Variant Model : -

Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED
2. D-TECH CO.,LTD.

Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended Area, Nam Son Ward, Bac Ninh Province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do, Korea (Suwon Industrial Complex)

3. Date of Receipt : Dec. 04, 2025

4. Test date : Dec. 16, 2025 ~ Dec. 18, 2025

5. Date of Issue : Dec. 22, 2025

6. Test Results : In Compliance

Tested by

Reviewed by

Eun Gu, Jeon
EMC Test Engineer

Dong Hun, Jang
EMC Technical Manager

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

KES-QP16-F01(00-23-01-01)

KES Co., Ltd.

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

**REPORT REVISION HISTORY**

Date	Test Report No.	Revision History
Dec. 22, 2025	KES-EM254271	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Video		
Imaging Device	Size	1/1.8"
	Type	CMOS
Resolution	1280x720, 1280x1024, 720x480, 1280x960, 720x576, 1920x1080, 640x360, 640x480, 2688x1520, 800x600, 800x448, 2048x1536, 3840x2160, 2560x1440, 1600x1200, 1024x768, 3072x1728, 2592x1944	
Max. Framerate	H.265/H.264	30fps/25fps(60Hz/50Hz)
	MJPEG	30fps
Min. Illumination (Lux)	Color(1/30sec, 30IRE)	0.075
	BW(1/30sec, 30IRE)	0.0075
Video Out	CVBS: 1.0 Vp-p / 75Ω composite for installation, USB: Micro USB Type B	
Lens		
Focal Length (mm)	6.91~214.7	
Zoom Ratio	Optical	31x
Max Aperture Ratio (F number)	Wide	1.36
	Tele	4.6
Angular Field of View	Horizontal	60.92°~2.2°
	Vertical	35.26°~1.24°
	Diagonal	69.18°~2.52°
Min. Object Distance	3m(9.84ft)	
Focus Control	Simple focus	
Lens Type	P Iris(IR corrected)	
Operational		
Day & Night	Auto(ICR)	
Backlight Compensation	SSDR, WDR, BLC	
Wide Dynamic Range (dB)	120	
Digital Noise Reduction	WiseNR II (Based on AI engine), SSNR V	
Digital Image Stabilization	Support(built-in gyro sensor)	
Motion Detection	Quantity	8ea
	Shape	8point Polygonal zones
Privacy Masking	Quantity	3ea
	Shape	Rectangular zones
	Color / Option	Black, Gray, White
Gain Control	Low, Middle, High	
White Balance	ATW, Indoor, Manual, Outdoor, AWC	
LDC	Support	
Electronic Shutter	Mode	Anti flicker, Prefer shutter control(Based on AI engine), Minimum, Maximum
	Speed Range	1/5~1/12,000sec
Video Rotation	Flip, Hallway view(90°/270°), Mirror	
Alarm Interface	In/Out	2 configurable I/O ports
	Others	12VDC output
Alarm Triggers	App event, Network disconnect, Alarm input, Analytics, Time schedule, MQTT subscription	
Alarm Events When Alarm Trigger Occurred	Recording: SD/SDHC/SDXC or NAS recording at event triggers, Notification: e-mail, Audio clip playback, Alarm output, Handover: PTZ preset, send message by HTTP/HTTPS/TCP, File upload(image): e-mail/FTP, MQTT: publication	
Audio In	Selectable(mic in/line in)	
Audio Out	Line out	
Light Type	IR LED	
Light Viewable Length	IR	WiseIR 70m(229.66ft)
IR Wavelength	850nm	



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Analytics		
Classified Object Type		Person, Face, License plate, Vehicle
Attributes	Person	Upper/Lower clothes color, Bag, Gender
	Vehicle	Color, Type(car, bus, truck, motorcycle, bicycle)
	Face	Gender, Glasses, Face mask, Age
Thumbnail		BestShot
Analytics Events	Based on AI Engine	Social distancing detection, Object detection, Face mask detection, Slip & fall detection, Virtual area(Loitering/Intrusion/Enter/Exit), Virtual line(Crossing/Direction)
	Normal	Defocus detection, Sound classification, Tampering, Shock detection, Motion detection, WiseDetector for adding custom objects, Audio detection, Virtual area(Appear/Disappear)
Business Intelligence	Based on AI Engine	Queue management, Heatmap, People counting, Crowd counting, Vehicle counting
Network		
Ethernet		Metal shielded RJ-45(10/100/1000BASE-T)
Video Compression		H.265/H.264: Main/High, MJPEG
Audio Compression		AAC-LC: 48Kbps at 16KHz, G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps, G.711 u-law/G.726 selectable, G.726(ADPCM) 8KHz, G.711 8KHz
Smart Codec		WiseStreamIII, Manual
Bitrate Control		H.265/H.264: CBR or VBR, MJPEG: VBR
Streaming	Unicast	Up to 6 users
	Multicast	Support
	Multiple Streaming	Up to 6 profiles
Protocol		FTP, RTP(UDP), IPv4, HTTPS, NTP, TCP/IP, ARP, DHCP, RTCP, IPv6, UDP/IP, Bonjour, DNS, SNMPv1/v2c/v3(MIB-2), RTP(TCP), SSL/TLS, QoS, SMTP, DDNS, IGMP, HTTP, UPnP, LLDP, MQTT, RTSP, ICMP, SRTP(TCP, UDP Unicast)
Application Programming Interface	ONVIF	M, T, S, G
	Others	Hanwha Vision Open Platform, SUNAPI(HTTP API)
Direct Cloud Connection		Support
Security		
OS / Firmware Protect		Encrypted firmware, Secure boot, Signed firmware
User authentication		Prevent brute-force attack, Digest authentication
Network authentication		IEEE 802.1X(EAP-TLS, EAP-LEAP, EAP-PEAP, MSCHAPv2)
Secure Communication		WSS(WebSocket Secure), SRTP, HTTPS
Access Control		IP-based access control
Data Protect		Encrypt compress for live recording file export, Encryption credentials
Audit		Access / System / Event Log management
Device ID		Device certificate(Hanwha Vision Root CA)
Secure Storage		TPM(Trusted platform module), SDcard partition encrypt(AES-256)
Security Certificate		TPM 2.0 with FIPS 140-2 level2
General		
Memory	RAM	4GB
	Flash	1GB
Edge Storage	Micro SD/SDHC/SDXC	Max. 256GB x 2slot(Total 512GB)
Environmental & Electrical		
Operating Condition	Temperature	-40°C~+55°C(-40°F~+131°F)
	Humidity	0~100% RH(condensing)
	Others	Start up should be done at above -30°C, Humidity control with AIR vent
Storage Condition	Temperature	-50°C~+60°C(-58°F~+140°F)
	Humidity	0~90% RH(non-condensing)
Input Voltage		12VDC, PoE+(IEEE802.3at, Class4)

KES-QP16-F01(00-23-01-01)

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Environmental & Electrical		
Power Consumption	PoE	Max 25.5W, typical 14.0W
	12VDC	Max 24.0W, typical 12.7W
Mechanical		
Color	White	
Material	Aluminum	
RAL Code	RAL9003	
Product Dimensions	ø136.2x358.7mm(ø5.36x14.12") (Without sunshield)	
Product Weight	3.200g(7.05lb)	
Compatible Conduit Hole	19.1mm(3/4")(M25)	
Compatible Gang Box	Square, 4" Octagon, Single, Double	
Certifications & Standards		
EMC	RCM AS-NZS CISPR 32 Class A, VCCI CISPR 32 Class A, ICES-3(A)/NMB-3(A), FCC 47 CFR 15 Subpart B Class A, CE/UKCA - EN55032 Class A, EN 50130-4, EN 61000-3-2, EN 61000-3-3	
Safety	UL 62368-1, CAN/CSA C22.2 NO. 62368-1, IEC 62471	
Environment	IEC 60529 IP67, IEC/EN 63000, IEC 60529 IP66, IEC 62262 IK10	
DORI (EN62676-4 standard)		
Detect (25PPM/ 8PPF)	Wide	130.6m(428.4ft)
	Tele	4.000m(13.122ft)
Observe (63PPM/ 19PPF)	Wide	52.2m(171.4ft)
	Tele	1600m(5,249ft)
Recognize (125PPM/ 38PPF)	Wide	26.1m(85.7ft)
	Tele	800m(2,625ft)
Identify (250PPM/ 76PPF)	Wide	13.1m(42.8ft)
	Tele	400m(1,312ft)



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
NETWORK CAMERA	PNO-A9311R	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 System Configuration

Description	Model Number	Serial Number	Manufacturer	Remarks
-	-	-	-	-



1.6 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC/DC Adapter	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
PoE Injector	PT-PSE109GBRO-A	-	Dongguan PROCET Network Technology Co.,Ltd	-
LED Alarm	-	-	-	-
Button Alarm	-	-	-	-
Headset	K550	-	Britz®	-
Cellphone	SHV-E330S	-	Samsung Electronics Co., Ltd.	-
Micro SD Card1	-	-	Sandisk	8 GB
Micro SD Card2	-	-	Sandisk	8 GB
Laptop	NT350XCR	-	Samsung Electronics Co., Ltd.	-
Laptop Adapter	A13-040N2A	-	Chicony Power Technology Co., Ltd.	-



1.7 External I/O Cabling

■ Mode 1

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
EUT	RJ-45 (LAN)	Laptop	RJ-45 (LAN)	3.1	U
	Micro SD Slot	Micro SD Card1	Micro SD Slot	-	-
	Micro SD Slot	Micro SD Card2	Micro SD Slot	-	-
	Alarm OUT	Alarm	Alarm IN	3.1	U
	Alarm IN	Button Alarm	Alarm OUT	3.1	U
	Audio IN	Cellphone	Line	1.2	U
	Audio OUT	Headset	Line	1.8	U
	DC(2 Pin)	AC/DC Adapter	Line	1.0	U
Laptop	DC Jack	Laptop Adapter	Line	1.7	U

* Unshielded=U, Shielded=S

■ Mode 2

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
EUT	RJ-45 (PoE)	PoE Adapter	RJ-45 (PoE)	3.1	U
	Micro SD Slot	Micro SD Card1	Micro SD Slot	-	-
	Micro SD Slot	Micro SD Card2	Micro SD Slot	-	-
	Alarm OUT	Alarm	Alarm IN	3.1	U
	Alarm IN	Button Alarm	Alarm OUT	3.1	U
	Audio IN	Cellphone	Line	1.2	U
	Audio OUT	Headset	Line	1.8	U
Laptop	RJ-45 (LAN)	PoE Adapter	RJ-45 (LAN)	1.0	U
	DC Jack	Laptop Adapter	Line	1.7	U

* Unshielded=U, Shielded=S



1.8 EUT Operating Mode(s)

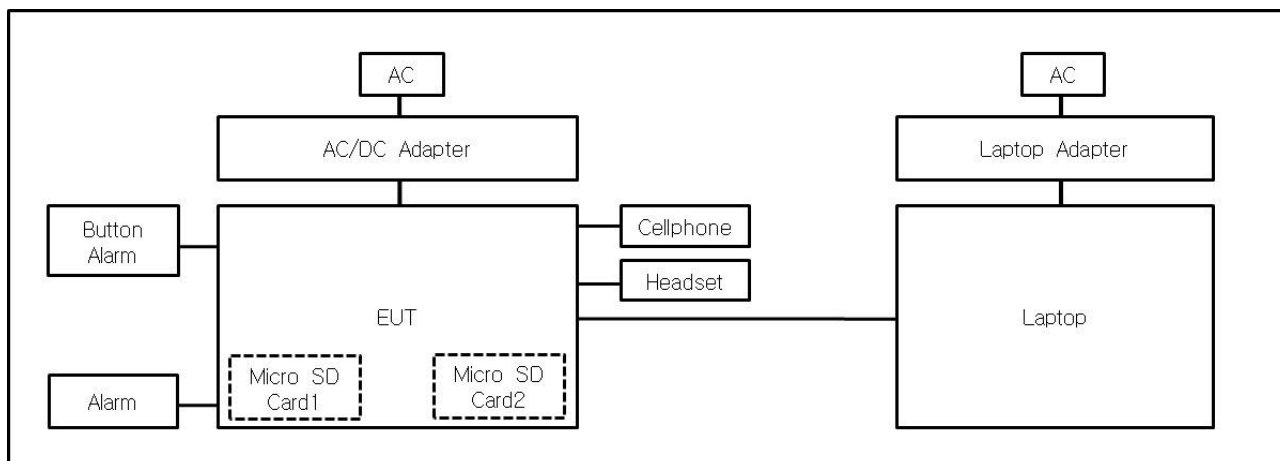
Test mode	Test Voltage	Test No.	operating
Mode 1	DC 12 V	1	- Check the network behavior of the EUT with the laptop's ping test - View images of the camera through the Web Viewer - Play 1 kHz tone through smartphone to check sound output through Headset
Mode 2	PoE	2	- When the alarm is pressed, make sure the button alarm is working - After testing, check the recording with Micro SD Card

EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	HANWHA VISION VIETNAM COMPANY LIMITED

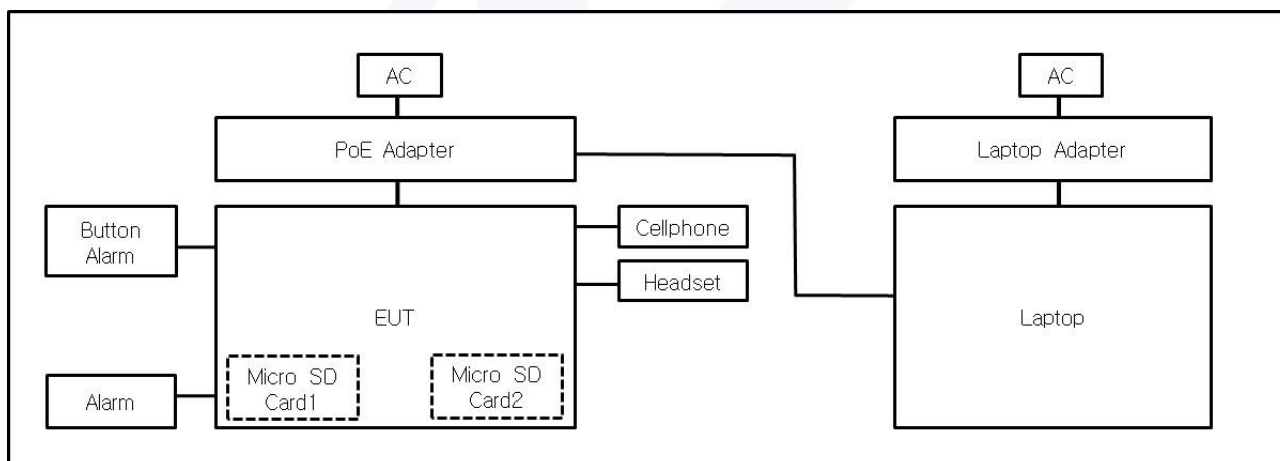


1.9 Configuration

■ Mode 1



■ Mode 2



**1.10 Remarks When Standards Applied**

N/A

1.11 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.

1.12 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

1.13 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



2.0 Test Regulations

The emissions tests were performed according to following regulations:

- ☒ **EMC – Directive 2014/30/EU**
- ☒ EN 50121-1:2017
- ☒ EN 50121-4:2016/A1:2019
- ☒ EN IEC 61000-3-2:2019
- ☒ EN 61000-3-3:2013/A2:2021





2.1 Conducted Emissions at Mains Power Ports

Test Date

Dec. 16, 2025

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test SW	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	11. 03, 2026
☒	LISN	ENV216	R & S	101786	01. 09, 2026
☒	ARTIFICIAL MAINS NETWORK	ESH2-Z5	R & S	100450	11. 03, 2026
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11. 03, 2026

Test Conditions

Temperature: (21,9 ~ 22,1) °C
Relative Humidity: (37,0 ~ 37,2) % 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

Dec. 16, 2025

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. 03, 2026
☒	LISN	ENV216	R & S	101786	01. 09, 2026
☒	ARTIFICIAL MAINS NETWORK	ESH2-Z5	R & S	100450	11. 03, 2026
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11. 03, 2026
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	11. 05, 2026

Test Conditions

Temperature: (21,9 ~ 22,1) °C
Relative Humidity: (37,0 ~ 37,2) % 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.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Dec. 18, 2025

Test Location☒ 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	02. 13, 2026
☒	AMPLIFIER	SCU 01	R & S	100603	11. 03, 2026
☒	BILOG ANTENNA	VULB 9168	SCHWARZBECK	9168-461	05. 09, 2026
☒	ATTENUATOR	6806.17.A	HUBER+SUHNER	-	02. 13, 2026

Test Conditions

Temperature: (20,3 ~ 20,5) °C

Relative Humidity: (37,8 ~ 38,0) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

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

Dec. 18, 2025

Test Location

SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	ES10/RE	TOYO Corporation	2022.01.000	-
☒	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	02. 13, 2026
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	414	01. 13, 2026
☒	PREAMPLIFIER	8449B	HP	3008A00538	04. 30, 2026
☒	ATTENUATOR	8491B	HP	23094	02. 13, 2026

Test Conditions

Temperature: (19,9 ~ 20,1) °C

Relative Humidity: (35,3 ~ 35,5) % 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

Dec. 18, 2025

Test Location

Electro wave Shieldroom #7

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. 31, 2026
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (21,8 ~ 22,0) °C

Relative Humidity: (34,9 ~ 35,1) % 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

Remarks

- See Appendix A for test data.

- The LAN port is regarded as a wired communication network port and power-related ports are not tested. (PoE Mode)



2.6 Voltage Fluctuations and Flicker

Test Date

Dec. 18, 2025

Test Location

Electro wave Shieldroom #7

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. 31, 2026
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (21,8 ~ 22,0) °C
Relative Humidity: (34,9 ~ 35,1) % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

- See Appendix A for test data.
- The LAN port is regarded as a wired communication network port and power-related ports are not tested. (PoE Mode)



3.0 Criteria for Compliance

Criteria for compliance was based on the following guidelines:

General performance criteria

The general principles (performance criteria) for the evaluation of the immunity test results are the following.

Performance criteria A

The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus 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, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criteria B

The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criteria C

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.



3.1 Electrostatic Discharge

Reference Standard

EN 61000-4-2:2009

Test Date

Dec. 18, 2025

Test Location

EMS-ESD: Electro wave Shieldroom#6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	01. 21, 2026
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (22,1 ~ 22,3) °C
Relative Humidity: (36,0 ~ 36,2) % R.H.
Atmospheric Pressure: (100,9 ~ 100,9) 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

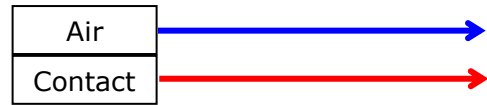
Notes: HCP: Horizontal Coupling Plane

VCP: Vertical Coupling Plane

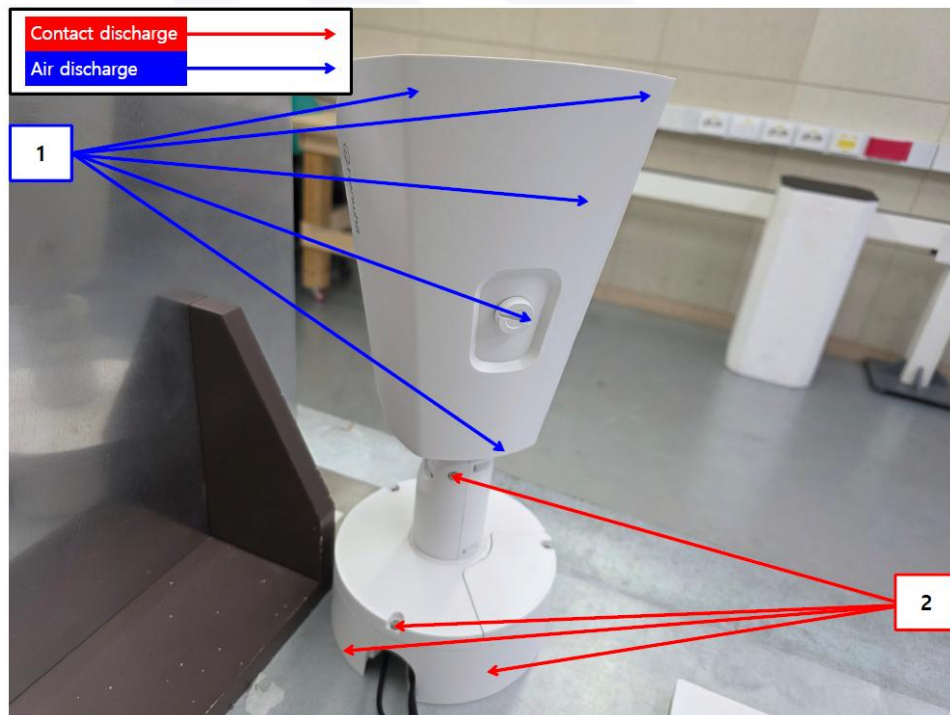
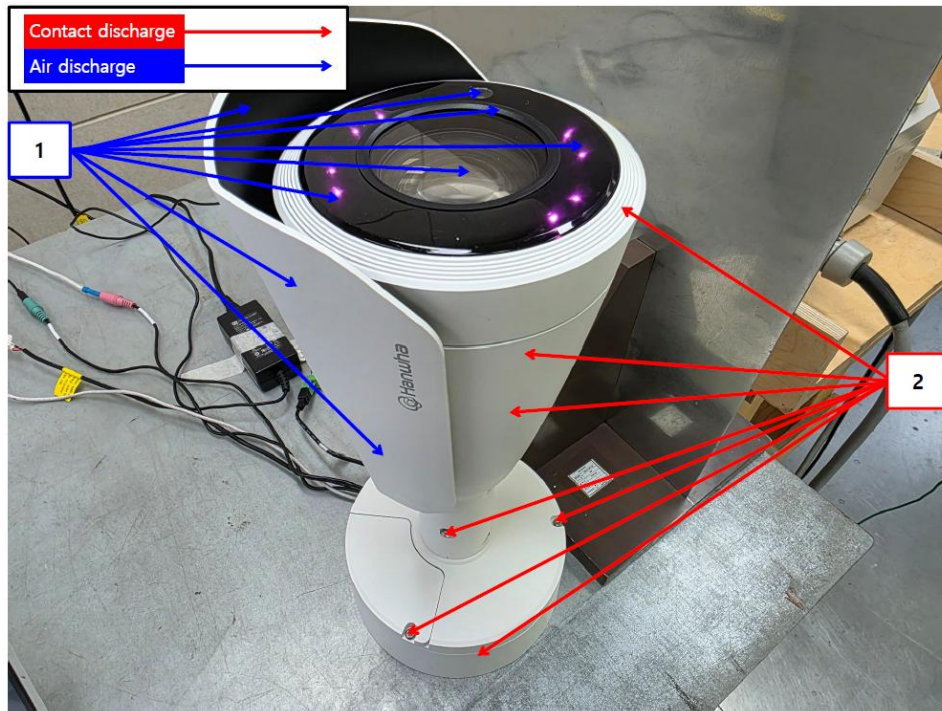
Required Performance Criteria: ☒ B

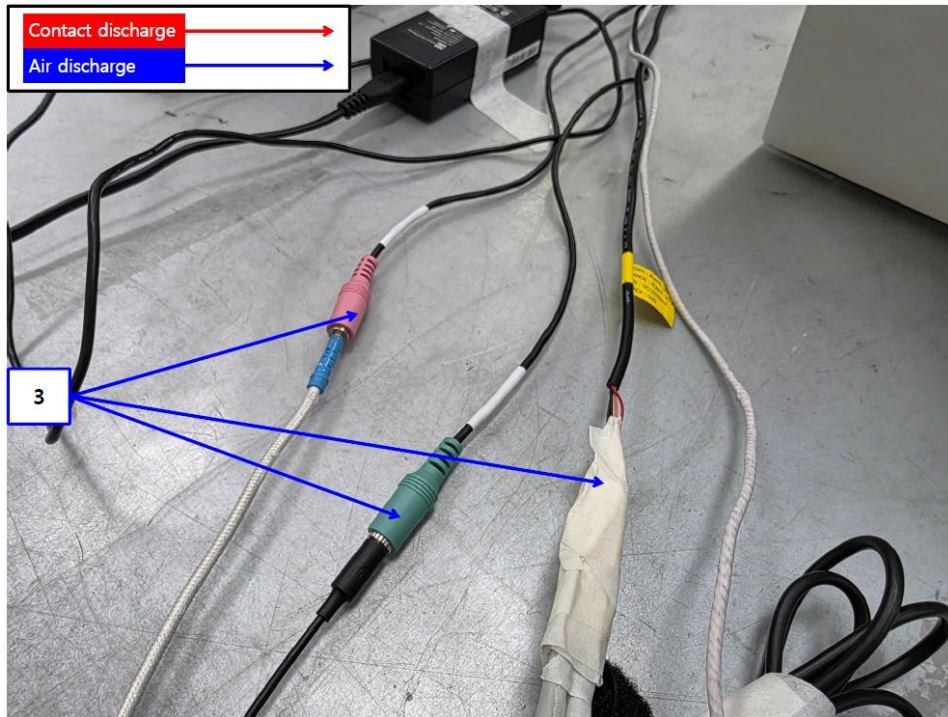


Location of Discharge:



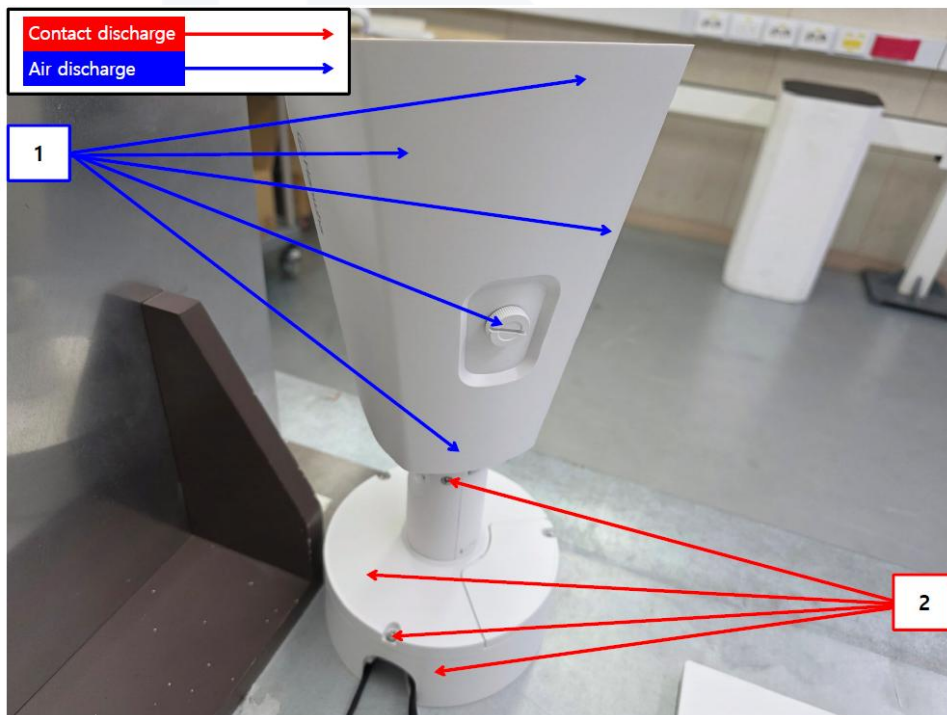
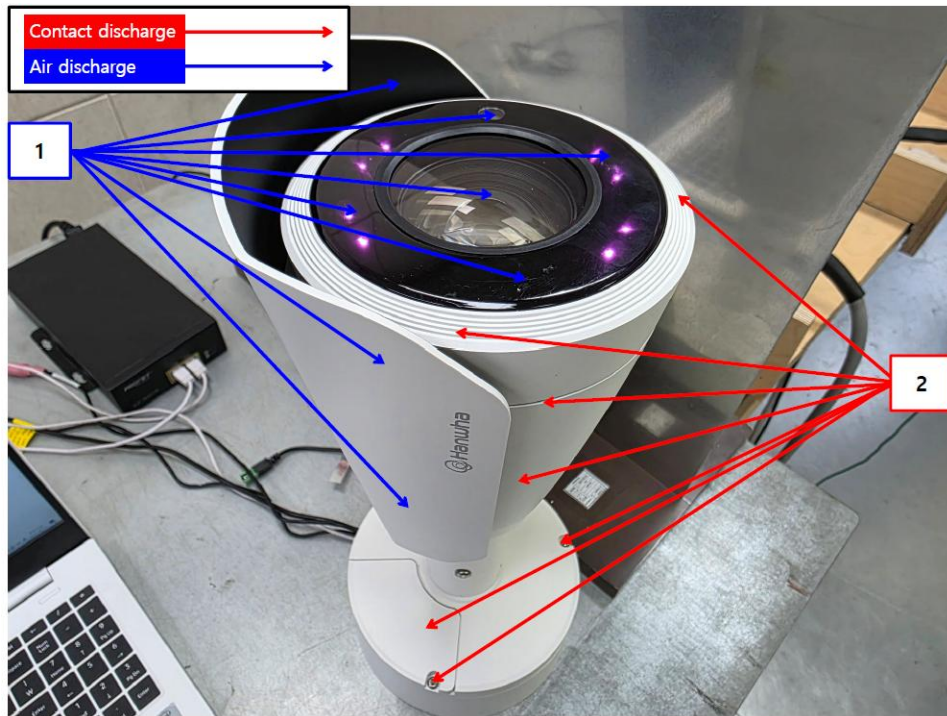
■ Mode 1

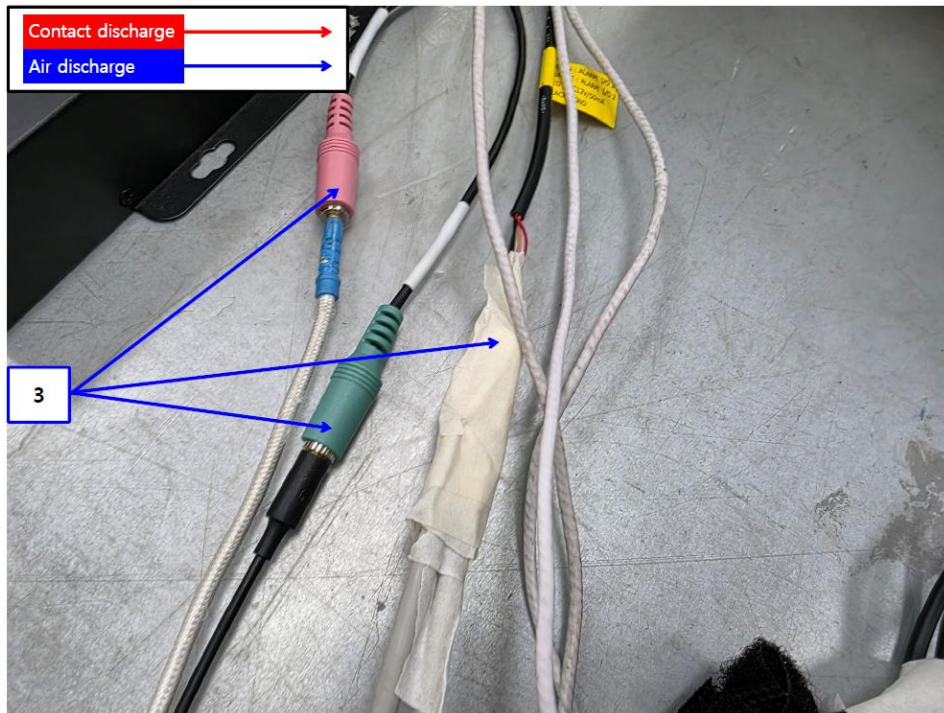






■ Mode 2





**Test Data**

■ Mode 1

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Enclosure 1, Screw 1	Air Discharge	A	-
2	Enclosure 2, Screw 2	Contact Discharge	A	-
3	Port	Air Discharge	A	-

■ Mode 2

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Enclosure 1, Screw 1	Air Discharge	A	-
2	Enclosure 2, Screw 2	Contact Discharge	A	-
3	Port	Air Discharge	A	-

Note: "Blank" = Not performed

Observations:

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

☒ Test result reference

☐ NOT APPLICABLE

Remarks

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



3.2 Radio-frequency Electromagnetic Field

Reference Standard

EN IEC 61000-4-3:2020

Test Date

Dec. 16, 2025

Test LocationEMS-RS: ☒ SEMI ANECHOIC CHAMBER #3 ☐ SEMI ANECHOIC CHAMBER #4(10 m)**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. 28, 2026
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	02. 13, 2026
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	02. 13, 2026
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	02. 13, 2026
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03. 05, 2026

Test Conditions

Temperature: (20,9 ~ 21,1) °C
Relative Humidity: (34,2 ~ 34,4) % R.H.
Atmospheric Pressure: (100,6 ~ 100,6) kPa



Test Specifications

Antenna Polarization: Horizontal & Vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Frequency Range: ☒ 80 MHz to 800 MHz [10V/m]
[Field Strength] ☒ 800 MHz to 1 GHz [20 V/m]
☒ 1,4 GHz to 2,0 GHz [10 V/m]
☒ 2,0 GHz to 2,7 GHz [5 V/m]
☒ 5,1 GHz to 6,0 GHz [3 V/m]

Modulation: ☒ 80 % AM, 1 kHz sine wave

Frequency Step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ A

**Test Data**

■ Mode 1

Side Exposed	Observations	
	Horizontal	Vertical
Front	A	A
Right	A	A
Back	A	A
Left	A	A

■ Mode 2

Side Exposed	Observations	
	Horizontal	Vertical
Front	A	A
Right	A	A
Back	A	A
Left	A	A

Note: "Blank" = Not performed

Observations:

- 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

- ☒ Test result reference
- ☐ NOT APPLICABLE

Remarks

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



3.3 Fast Transients

Reference Standard

EN 61000-4-4:2012

Test Date

Dec. 16, 2025

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. 05, 2026
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11. 05, 2026
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11. 05, 2026

Test Conditions

Temperature: (21,0 ~ 21,2) °C
Relative Humidity: (35,4 ~ 35,6) % R.H.
Atmospheric Pressure: (100,9 ~ 100,9) kPa

Test Specifications

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

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

Pulse Amplitude & Polarity: ☐ ± 1.0 kV
(Earth Lines)

Burst Period: ☒ 300 ms

Repetition Rate: ☒ 5 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ A

**Test Data**

■ Mode 1

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L	A	A
N	A	A
L – N	A	A

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-45 (LAN)	A	A
Alarm IN	A	A
Alarm OUT	A	A

☐ Earth ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

**■ Mode 2**☐ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-45 (PoE)	A	A
Alarm IN	A	A
Alarm OUT	A	A

☐ Earth ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

Note: "Blank" = Not performed

Observations:

- 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

- ☒ Test result reference
- ☐ NOT APPLICABLE

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



3.4 Surges

Reference Standard

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

Test Date

Dec. 16, 2025

Test Location

EMS-Surge: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test SW	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11. 05, 2026
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11. 05, 2026
☒	CDN	CNV 508N1	EM TEST	P1610176296	11. 05, 2026

Test Conditions

Temperature: (21,0 ~ 21,2) °C
Relative Humidity: (35,4 ~ 35,6) % R.H.
Atmospheric Pressure: (100,9 ~ 100,9) kPa

**Test Specifications****AC Power Lines**

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

Surge Amplitude :
Common Mode
☐ (2,0) kV
Differential Mode
☒ (1,0) kVNumber of Surges: ☒ 5 surges per angleAngle: ☒ 0°, 90°, 180°, 270° (input AC power port)Polarity: ☒ Positive & NegativeRepetition Rate: ☒ 1 surge per min ☐ 1 surge per 30 sec.Required Performance Criteria: ☒ B**DC Power Lines**Source Impedance: 42 ohm
Surge Amplitude: Common Mode
☐ (2,0) kV
Differential Mode
☐ (1,0) kVNumber of Surges: ☐ 5 SurgesPolarity: ☐ Positive & NegativeRepetition Rate: ☐ 1 surge per min ☐ 1 surge per 30 sec.Required Performance Criteria: ☐ B**Signal Lines**Source Impedance: 42 ohm
Surge Amplitude: Common Mode
☐ (2,0) kV
Differential Mode
☒ (1,0) kVNumber of Surges: ☒ 5 SurgesPolarity: ☒ Positive & NegativeRepetition Rate: ☒ 1 surge per min ☐ 1 surge per 30 sec.Required Performance Criteria: ☒ B

**Test Data**☒ Mode 1☒ Line to Line – Differential Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L – N	A	A

☐ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
-	-	-

Signal Lines☒ Line to Line – Differential Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45 (LAN)	A	A

☐ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
-	-	-



☒ Mode 2

☐ Line to Line – Differential Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
-	-	-

☐ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
-	-	-

Signal Lines

☒ Line to Line – Differential Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45 (PoE)	A	A

☐ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
-	-	-

Note: “Blank” = Not performed

Observations:

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

☒ Test result reference

☐ NOT APPLICABLE

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

Dec. 17, 2025

Test Location

EMS-CS: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	8.0.0	-
☒	TEST SYSTEM FOR CONDUCTED AND RADIATED	NSG4070	TESEQ	65585	11. 03, 2026
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11. 03, 2026
☒	CDN	CDN M016	TESEQ	43694	11. 03, 2026
☒	CDN	CDN M016	TESEQ	43697	11. 03, 2026
☒	EM CLAMP	KEMZ 801A	TESEQ	44099	11. 05, 2026
☒	CDN	CDN T8 RJ45	SCHWARZBECK	00103	07. 07, 2026

Test Conditions

Temperature: (21,3 ~ 21,5) °C
Relative Humidity: (34,5 ~ 34,7) % R.H.
Atmospheric Pressure: (100,6 ~ 100,6) kPa

Test Specifications

Frequency Range: ☒ 150 kHz to 80 MHz
Voltage Level: ☒ 10 Vrms
Modulation: ☒ 80 % AM, 1 kHz sine wave
Frequency Step: ☒ 1 % step
Dwell Time: ☐ 1 s ☒ 3 s
Required Performance Criteria: ☒ A

**Test Data**☒ Mode 1☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N	CDN	A

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45 (LAN)	CDN	A
Alarm IN	Clamp	A
Alarm OUT	Clamp	A

☐ Earth ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

**■ Mode 2**☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45 (PoE)	CDN	A
Alarm IN	Clamp	A
Alarm OUT	Clamp	A

☐ Earth ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

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

Observations:

- 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

- ☒ Test result reference
- ☐ NOT APPLICABLE

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

Dec. 17, 2025

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	-
☒	EMS Test S/W	NET.CONTROL	EM TEST	1.2.11	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11. 05, 2026
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11. 05, 2026
☒	MAGNETIC FIELD COIL	MS 100N	EM TEST	P1536163691	11. 05, 2026
☒	CURRENT TRANSFORMER	MC 26100	EM TEST	P1550168963	02. 14, 2026
☒	MULTIFUNCTION AC/DC POWER SOURCE	NETWAVE 7-400	EM TEST	P1614178393	11. 05, 2026
☒	MAGNETICFIELD COIL	INA 703	Teseq AG	3006	02. 14, 2026

Test Conditions

Temperature: (22,7 ~ 22,9) °C
Relative Humidity: (34,6 ~ 34,8) % R.H.
Atmospheric Pressure: (100,8 ~ 100,8) kPa

Test Specifications

Field Strength(Power Source): ☒ 100 A/m (ac)
☒ 300 A/m (dc)
Frequency (ac): ☒ 16.7 Hz ☒ 50 Hz ☐ 60 Hz
Frequency (dc): ☒ 0 Hz
Required Performance Criteria: ☒ A

**Test Data**☒ Mode 1☒ Immersion method

Coil orientation	Observations
X	A
Y	A
Z	A

☐ Proximity method

Coil orientation	Observations
X	-
Y	-
Z	-

☒ Mode 2☒ Immersion method

Coil orientation	Observations
X	A
Y	A
Z	A

☐ Proximity method

Coil orientation	Observations
X	-
Y	-
Z	-

Note: "blank" = Not performed

Observations:

- 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☒ Test result reference☐ NOT APPLICABLE**Remarks**Any degradations of performance was not observed during in the test.



APPENDIX A – TEST DATA

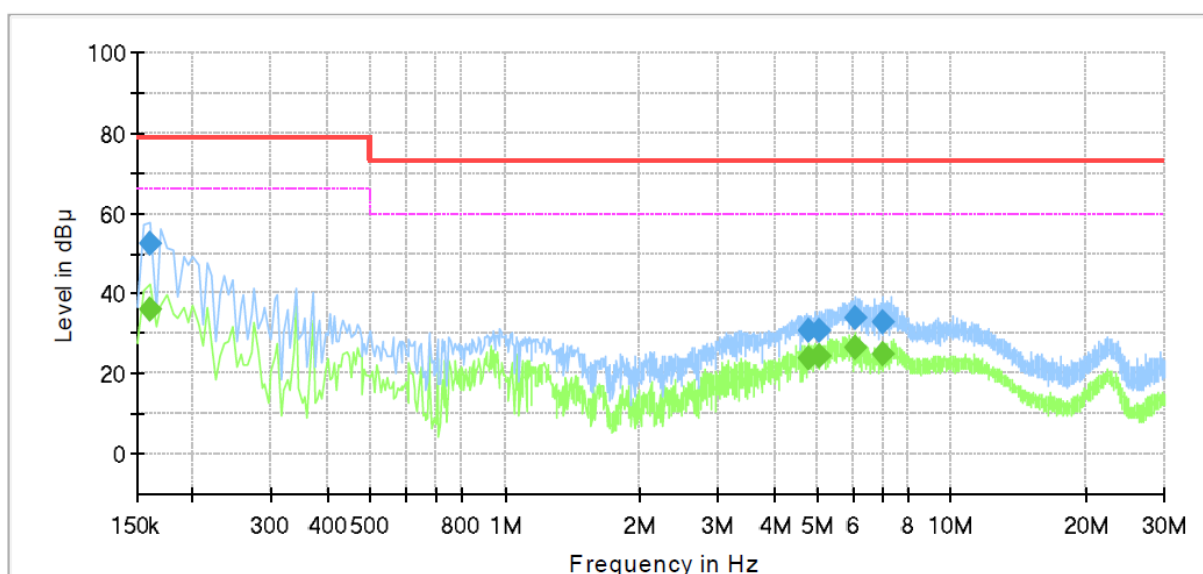
Conducted Emissions at Mains Power Ports

■ Mode 1

[HOT]

Common Information

Test Description: Conducted Emission
Job No.: KES-EM254271
Phase: L
Mode: Mode 1
Operator Name: KES



Final_Result

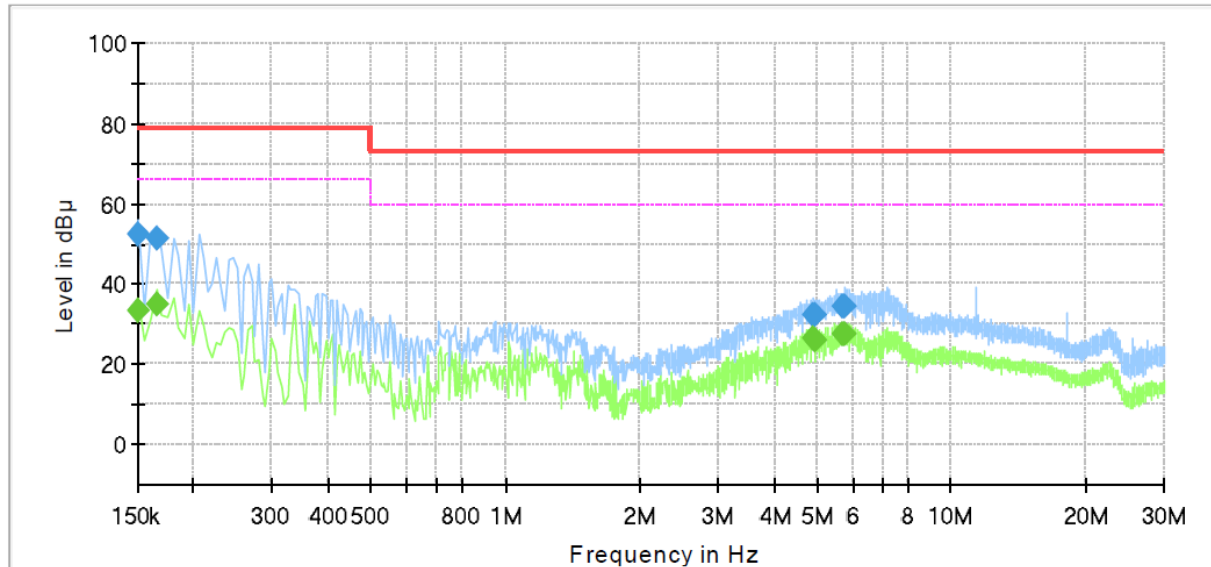
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	35.99	66.00	30.01	1000.0	9.000	L1	19.5
0.160000	52.44	---	79.00	26.56	1000.0	9.000	L1	19.5
4.790000	---	24.06	60.00	35.94	1000.0	9.000	L1	19.9
4.790000	30.66	---	73.00	42.34	1000.0	9.000	L1	19.9
5.040000	---	24.56	60.00	35.44	1000.0	9.000	L1	19.9
5.040000	30.88	---	73.00	42.12	1000.0	9.000	L1	19.9
6.085000	---	26.46	60.00	33.54	1000.0	9.000	L1	20.0
6.085000	33.64	---	73.00	39.36	1000.0	9.000	L1	20.0
6.990000	---	24.96	60.00	35.04	1000.0	9.000	L1	20.0
6.990000	32.96	---	73.00	40.04	1000.0	9.000	L1	20.0



[NEUTRAL]

Common Information

Test Description: Conducted Emission
Job No.: KES-EM254271
Phase: N
Mode: Mode 1
Operator Name: KES



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	33.40	66.00	32.60	1000.0	9.000	N	19.5
0.150000	52.42	---	79.00	26.58	1000.0	9.000	N	19.5
0.165000	---	34.96	66.00	31.04	1000.0	9.000	N	19.5
0.165000	51.44	---	79.00	27.56	1000.0	9.000	N	19.5
4.900000	---	26.37	60.00	33.63	1000.0	9.000	N	19.9
4.900000	32.47	---	73.00	40.53	1000.0	9.000	N	19.9
4.965000	---	26.02	60.00	33.98	1000.0	9.000	N	19.9
4.965000	32.28	---	73.00	40.72	1000.0	9.000	N	19.9
5.725000	---	27.73	60.00	32.27	1000.0	9.000	N	19.9
5.725000	34.33	---	73.00	38.67	1000.0	9.000	N	19.9
5.780000	---	27.69	60.00	32.31	1000.0	9.000	N	19.9
5.780000	34.54	---	73.00	38.46	1000.0	9.000	N	19.9

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

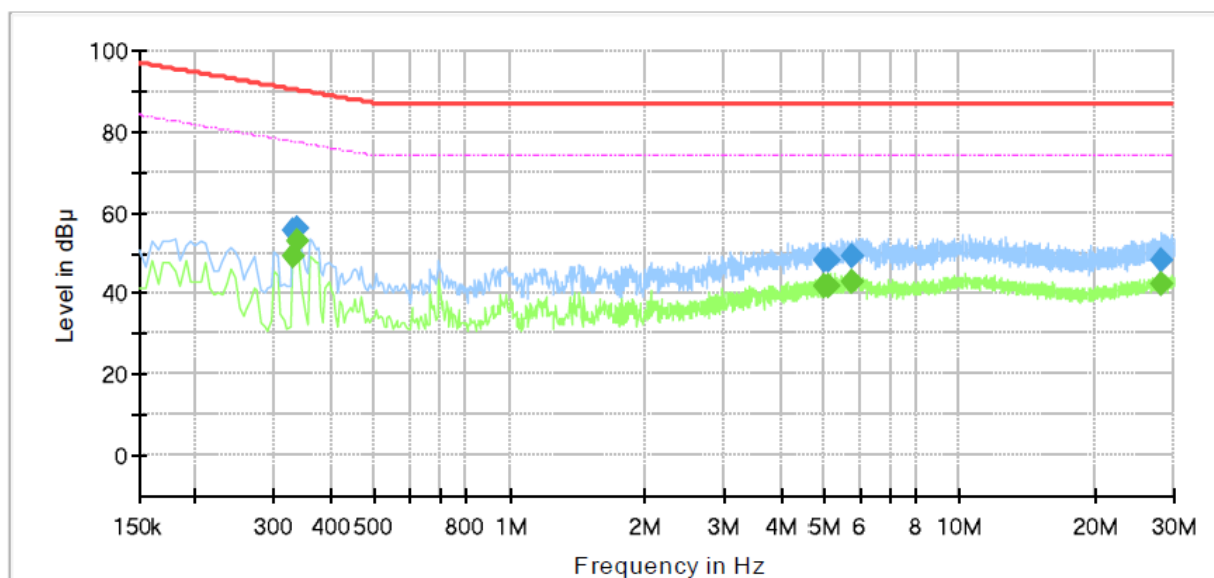
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

**Conducted Emissions at Telecommunication Ports**

■ Mode 1

[1 000 Mbps]

Test Description: Telecommunication Emission
Job No.: KES-EM254271
Mode : Mode 1
Speed : 1 000 Mbps
Operator Name: KES

**Final_Result**

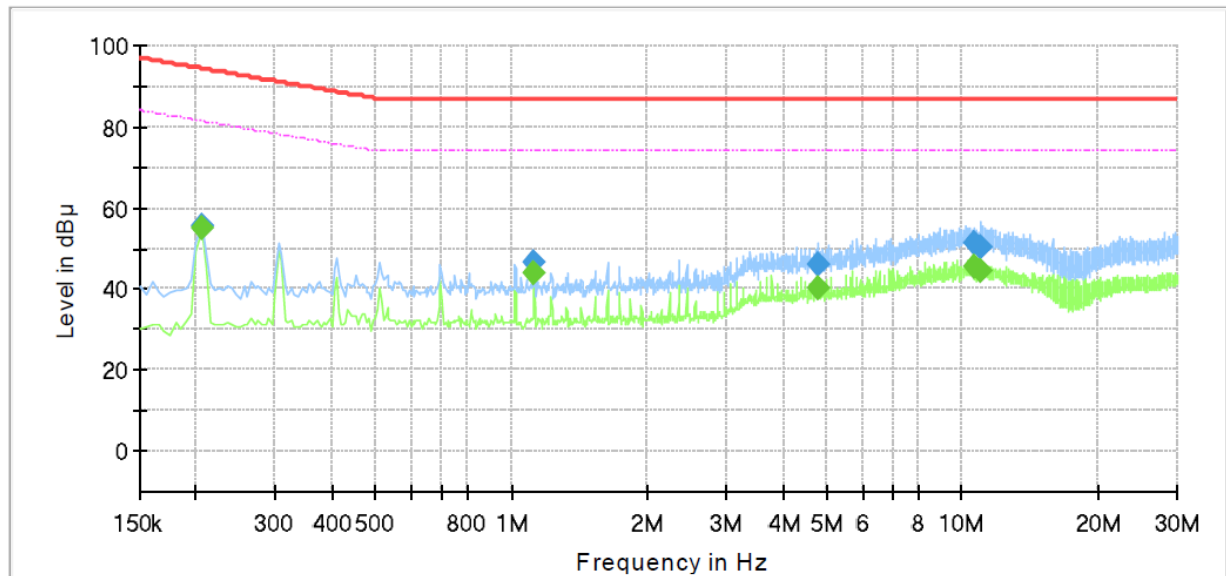
Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.330000	---	49.04	77.45	28.41	1000.0	9.000	Single Line	19.4
0.330000	55.63	---	90.45	34.82	1000.0	9.000	Single Line	19.4
0.335000	---	52.92	77.33	24.41	1000.0	9.000	Single Line	19.4
0.335000	56.12	---	90.33	34.21	1000.0	9.000	Single Line	19.4
4.975000	---	42.03	74.00	31.97	1000.0	9.000	Single Line	19.4
4.975000	48.08	---	87.00	38.92	1000.0	9.000	Single Line	19.4
5.100000	---	41.89	74.00	32.11	1000.0	9.000	Single Line	19.4
5.100000	47.99	---	87.00	39.01	1000.0	9.000	Single Line	19.4
5.750000	---	42.88	74.00	31.12	1000.0	9.000	Single Line	19.4
5.750000	49.27	---	87.00	37.73	1000.0	9.000	Single Line	19.4
28.045000	---	42.54	74.00	31.46	1000.0	9.000	Single Line	19.9
28.045000	48.14	---	87.00	38.86	1000.0	9.000	Single Line	19.9



■ Mode 2

[1 000 Mbps]

Test Description: Telecommunication Emission
Job No.: KES-EM254271
Mode : Mode 2
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)
0.205000	---	54.98	81.41	26.43	1000.0	9.000	Single Line	19.4
0.205000	55.38	---	94.41	39.03	1000.0	9.000	Single Line	19.4
1.125000	---	43.83	74.00	30.17	1000.0	9.000	Single Line	19.2
1.125000	46.37	---	87.00	40.63	1000.0	9.000	Single Line	19.2
4.800000	---	40.08	74.00	33.92	1000.0	9.000	Single Line	19.4
4.800000	45.83	---	87.00	41.17	1000.0	9.000	Single Line	19.4
10.625000	---	45.58	74.00	28.42	1000.0	9.000	Single Line	19.5
10.625000	51.27	---	87.00	35.73	1000.0	9.000	Single Line	19.5
11.030000	---	44.69	74.00	29.31	1000.0	9.000	Single Line	19.5
11.030000	50.36	---	87.00	36.64	1000.0	9.000	Single Line	19.5

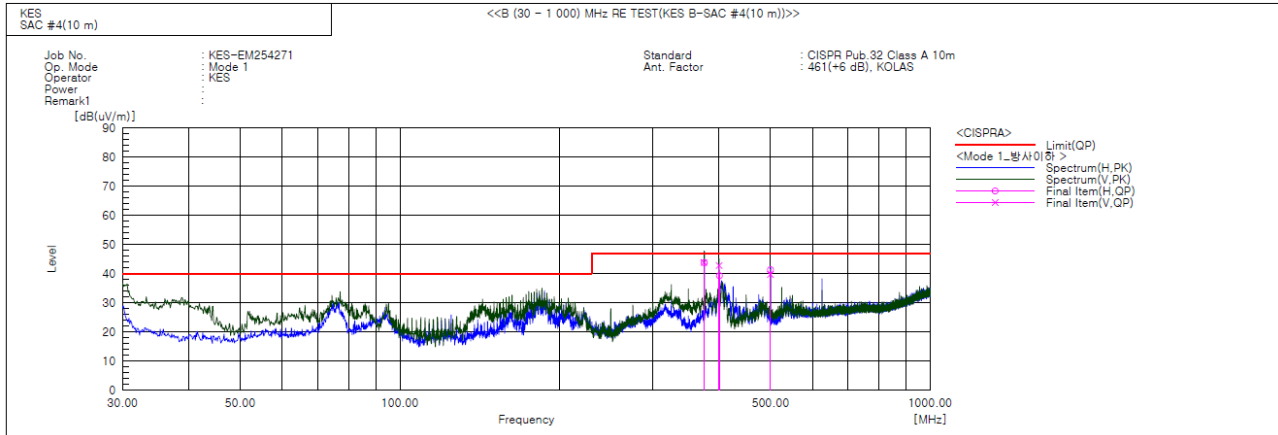
◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

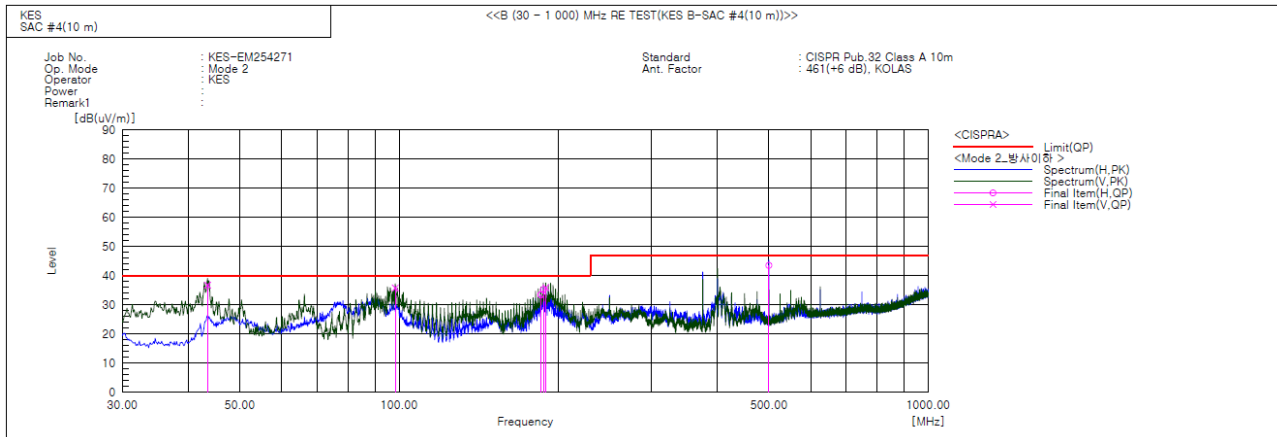
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

**Radiated Electric Field Emissions(Below 1 GHz)****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	374.360	V	58.2	-14.4	43.8	47.0	3.2	142.0	309.0	
2	374.956	H	58.0	-14.3	43.7	47.0	3.3	351.0	226.0	
3	400.055	V	56.1	-13.3	42.8	47.0	4.2	211.0	45.0	
4	400.492	H	52.6	-13.3	39.3	47.0	7.7	311.0	188.0	
5	499.624	V	49.4	-9.7	39.7	47.0	7.3	168.0	179.0	
6	499.988	H	51.0	-9.7	41.3	47.0	5.7	389.0	196.0	



■ Mode 2



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	43.459	V	57.6	-20.9	36.7	40.0	3.3	142.0	330.0	
2	98.385	V	60.7	-24.9	35.8	40.0	4.2	155.0	262.0	
3	185.321	H	54.7	-21.3	33.4	40.0	6.6	327.0	345.0	
4	187.383	H	56.7	-21.5	35.2	40.0	4.8	332.0	345.0	
5	189.444	V	57.6	-21.7	35.9	40.0	4.1	100.0	43.0	
6	499.965	H	53.2	-9.7	43.5	47.0	3.5	272.0	302.0	

◆ Calculation

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

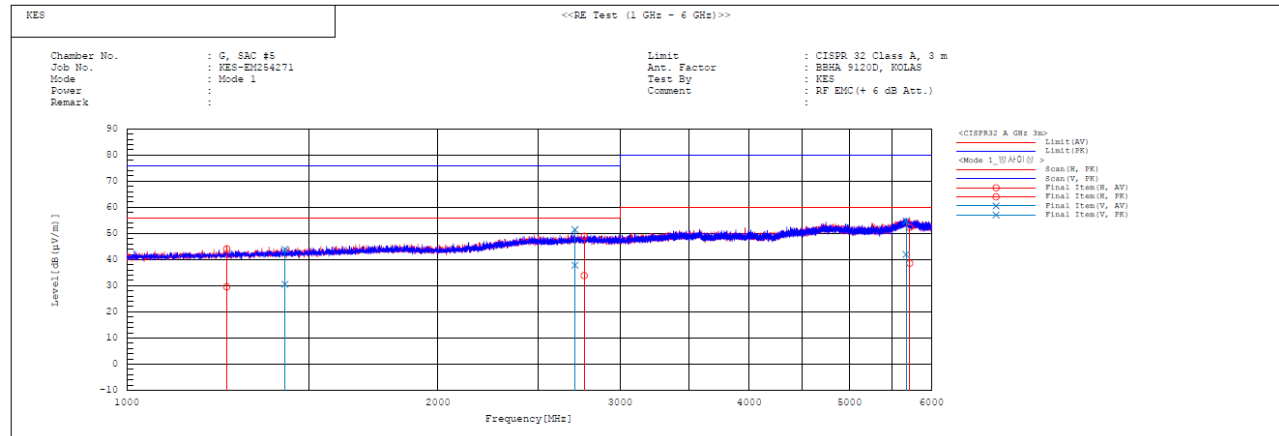
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



Radiated Electric Field Emissions(Above 1 GHz)

Mode 1

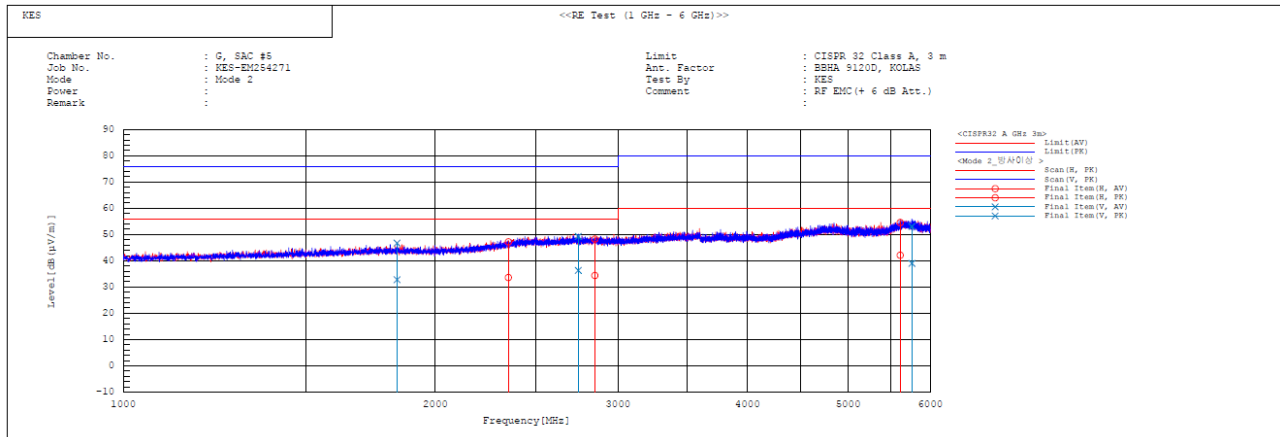


Final Result

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]	Remark
1	1249.433	H	29.7	44.2	-0.1	29.6	44.1	56.0	76.0	26.4	31.9	100.0	325.1	
2	1422.235	V	29.7	43.1	0.8	30.5	43.9	56.0	76.0	25.5	32.1	100.0	218.5	
3	2713.428	V	31.8	45.5	6.0	37.8	51.5	56.0	76.0	18.2	24.5	100.0	100.0	
4	2770.264	H	27.7	42.7	6.2	33.9	48.9	56.0	76.0	22.1	27.1	100.0	24.7	
5	5670.921	V	27.9	40.7	14.0	41.9	54.7	60.0	80.0	18.1	25.3	100.0	33.1	
6	5718.072	H	24.5	38.2	14.1	38.6	52.3	60.0	80.0	21.4	27.7	100.0	358.6	



■ Mode 2



Final Result

No.	Frequency	Pol	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin	Height	Angle	Remark
	[MHz]		AV	PK		AV	PK	AV	PK	AV	PK			
			[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[deg]	
1	1837.351	V	30.2	44.1	2.6	32.8	46.7	56.0	76.0	23.2	29.3	100.0	206.4	
2	2352.192	H	28.9	42.5	4.7	33.6	47.2	56.0	76.0	22.4	28.8	100.0	0.1	
3	2747.074	V	30.2	43.2	6.1	36.3	49.3	56.0	76.0	19.7	26.7	100.0	4.0	
4	2849.343	H	28.0	41.9	6.4	34.4	48.3	56.0	76.0	21.6	27.7	100.0	144.8	
5	5613.741	H	28.2	40.7	13.9	42.1	54.6	60.0	80.0	17.9	25.4	100.0	51.2	
6	5762.433	V	24.8	38.8	14.2	39.0	53.0	60.0	80.0	21.0	27.0	100.0	203.2	

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

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

■ Mode 1

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.069			
2	0.002	0.148	1.080	n/a
3	0.062	2.695	2.300	PASS
4	0.002	0.417	0.430	n/a
5	0.062	5.411	1.140	PASS
6	0.002	0.557	0.300	n/a
7	0.060	7.739	0.770	PASS
8	0.002	0.678	0.230	n/a
9	0.055	13.645	0.400	PASS
10	0.001	0.695	0.184	n/a
11	0.050	15.248	0.330	PASS
12	0.001	0.848	0.153	n/a
13	0.046	21.824	0.210	PASS
14	0.001	1.065	0.131	n/a
15	0.041	27.171	0.150	PASS
16	0.001	1.134	0.115	n/a
17	0.036	26.987	0.132	PASS
18	0.001	1.288	0.102	n/a
19	0.031	26.102	0.118	PASS
20	0.001	1.411	0.092	n/a
21	0.026	16.465	0.161	PASS
22	0.001	1.656	0.084	n/a
23	0.022	14.997	0.147	PASS
24	0.001	1.806	0.077	n/a
25	0.018	13.674	0.135	PASS
26	0.001	1.920	0.071	n/a
27	0.016	12.610	0.125	PASS
28	0.001	2.093	0.066	n/a
29	0.014	11.842	0.116	PASS
30	0.001	2.218	0.061	n/a
31	0.013	11.520	0.109	PASS
32	0.001	2.385	0.058	n/a
33	0.012	11.364	0.102	PASS
34	0.001	2.315	0.054	n/a
35	0.011	11.881	0.096	PASS
36	0.001	2.442	0.051	n/a
37	0.011	11.931	0.091	PASS
38	0.001	2.366	0.048	n/a
39	0.010	12.057	0.087	PASS
40	0.001	2.405	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	0.084			
2	0.002	0.136	1.620	n/a
3	0.077	2.240	3.450	PASS
4	0.002	0.363	0.645	n/a
5	0.075	4.382	1.710	PASS
6	0.002	0.483	0.450	n/a
7	0.071	6.187	1.155	PASS
8	0.002	0.607	0.345	n/a
9	0.065	10.881	0.600	PASS
10	0.002	0.607	0.276	n/a
11	0.059	11.951	0.495	PASS
12	0.002	0.758	0.230	n/a
13	0.052	16.662	0.315	PASS
14	0.002	0.962	0.197	n/a
15	0.046	20.253	0.225	PASS
16	0.002	1.018	0.173	n/a
17	0.039	19.516	0.199	PASS
18	0.002	1.122	0.153	n/a
19	0.032	18.262	0.178	PASS
20	0.002	1.223	0.138	n/a
21	0.027	16.832	0.161	PASS
22	0.002	1.433	0.125	n/a
23	0.022	15.133	0.147	PASS
24	0.002	1.507	0.115	n/a
25	0.019	13.831	0.135	PASS
26	0.002	1.620	0.106	n/a
27	0.017	13.226	0.125	PASS
28	0.002	1.785	0.099	n/a
29	0.016	13.449	0.116	PASS
30	0.002	1.865	0.092	n/a
31	0.015	13.877	0.109	PASS
32	0.002	2.014	0.086	n/a
33	0.015	14.301	0.102	PASS
34	0.002	1.944	0.081	n/a
35	0.014	14.774	0.096	PASS
36	0.002	2.077	0.077	n/a
37	0.013	14.584	0.091	PASS
38	0.001	2.063	0.073	n/a
39	0.012	14.368	0.087	PASS
40	0.001	2.002	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

Maximum Flicker results

■ Mode 1

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





Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

■ Mode 1





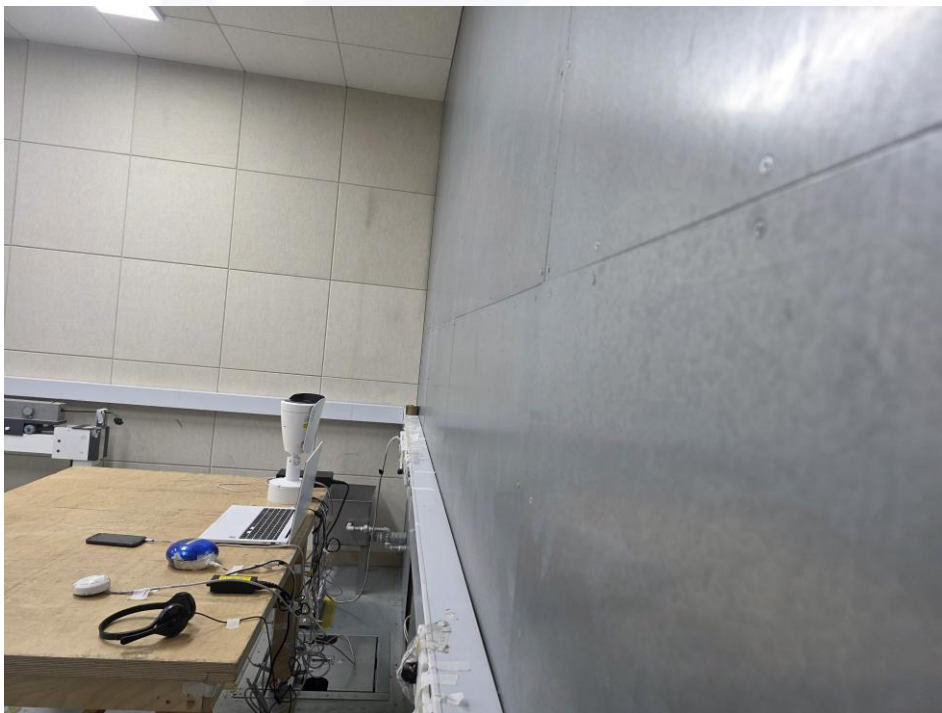
Conducted Emissions at Telecommunication Ports

■ Mode 1





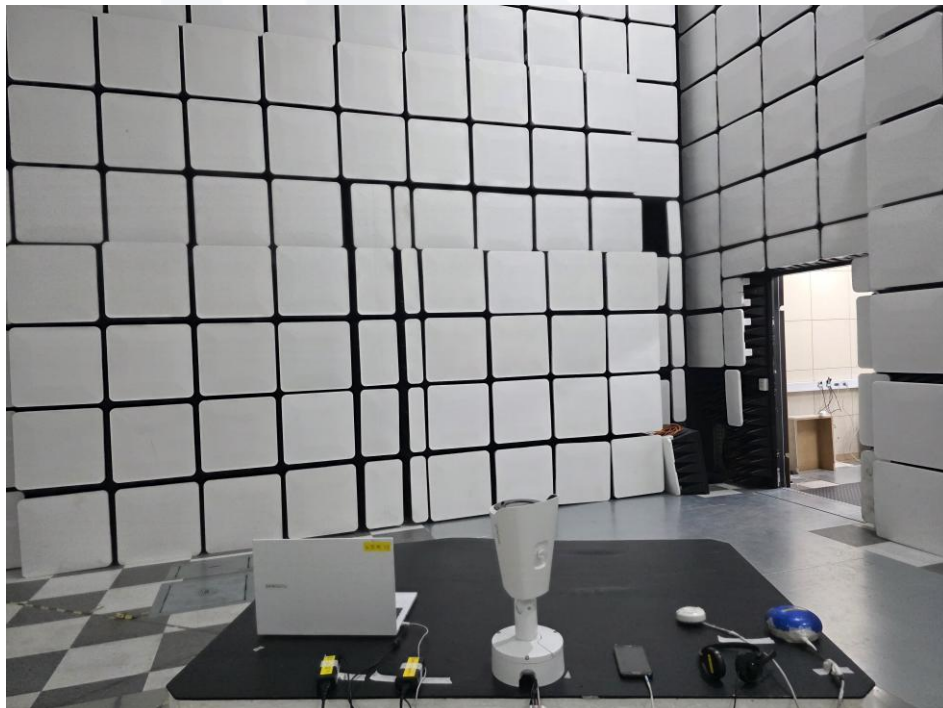
■ Mode 2





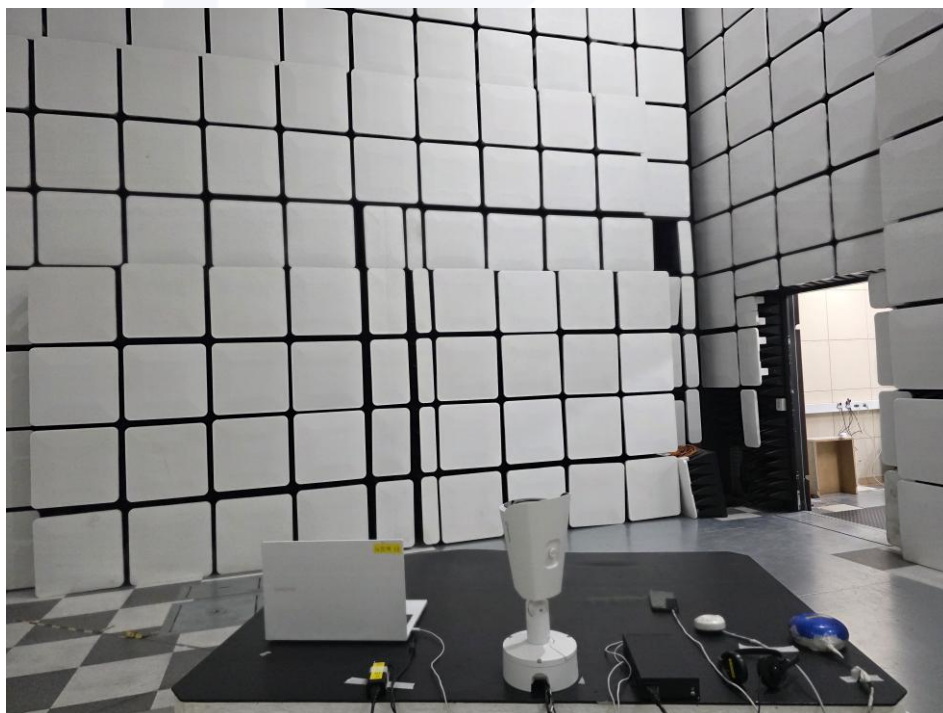
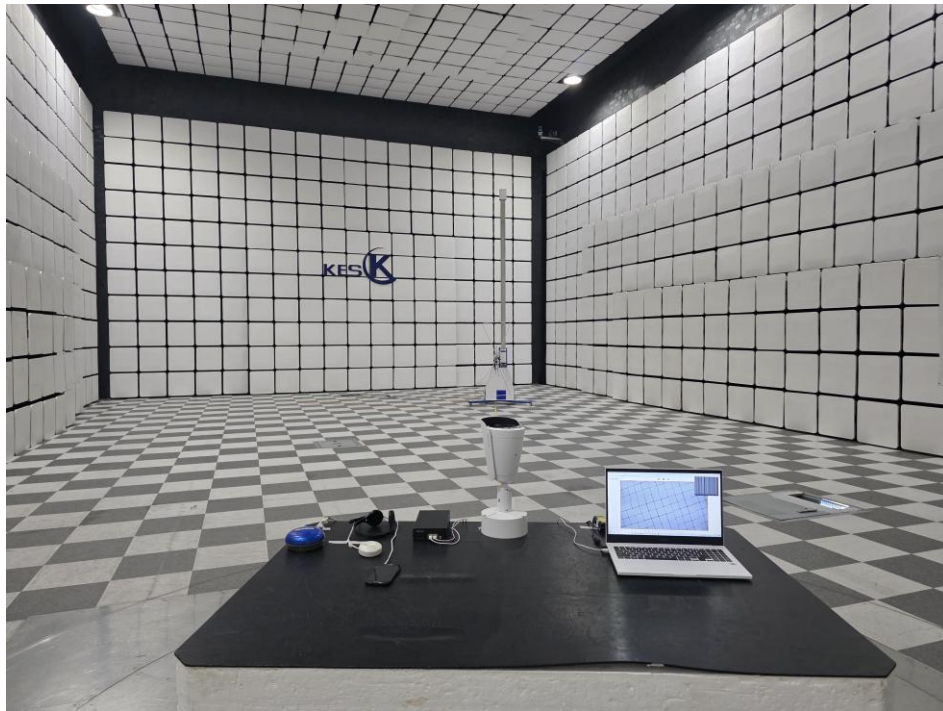
Radiated Electric Field Emissions(Below 1 GHz)

■ Mode 1





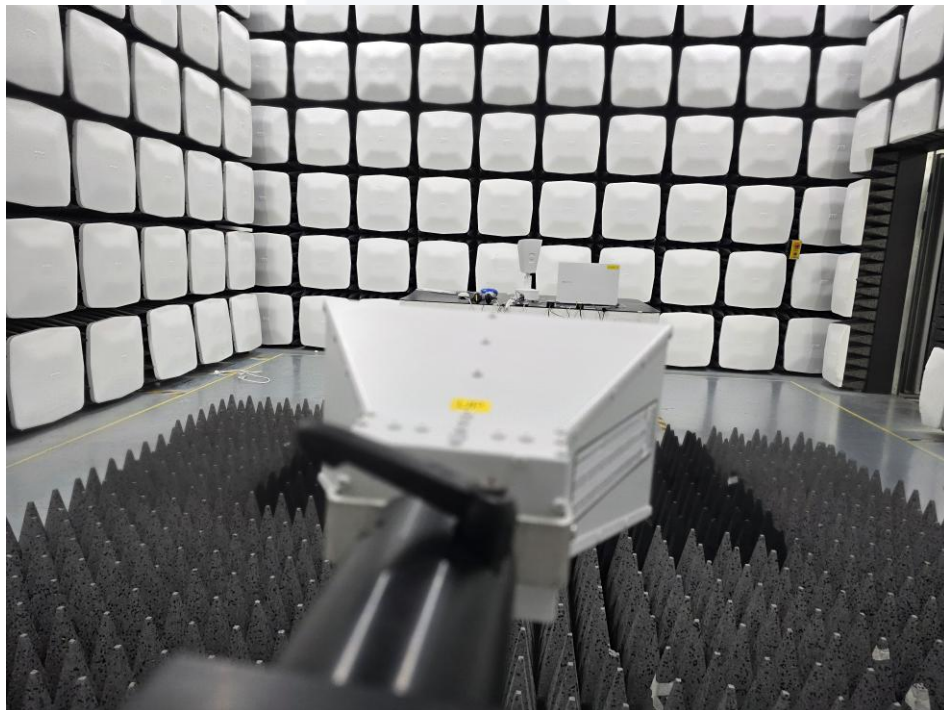
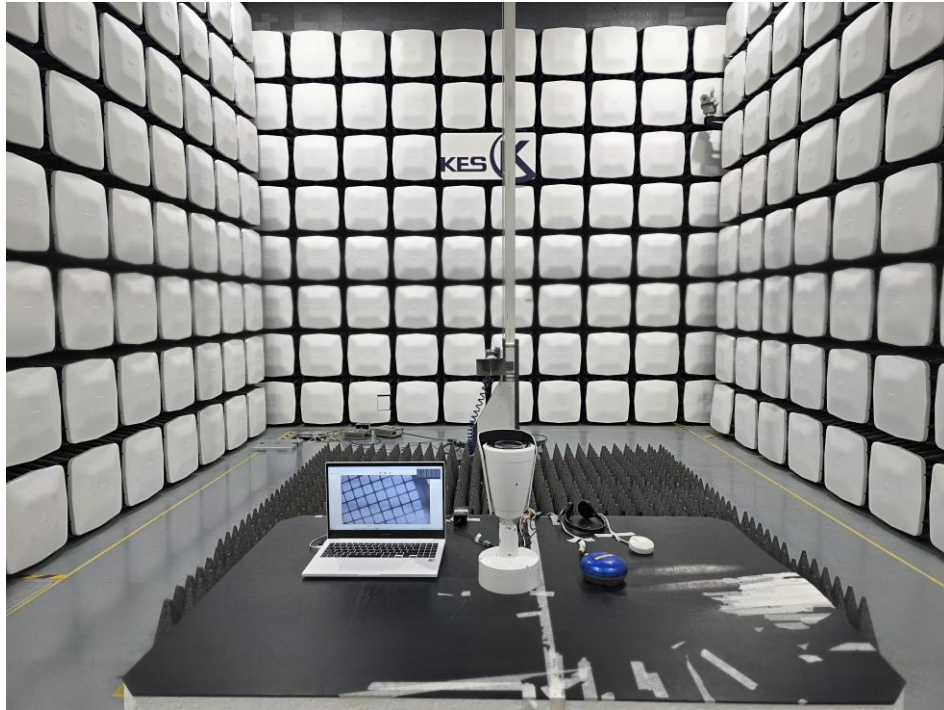
■ Mode 2





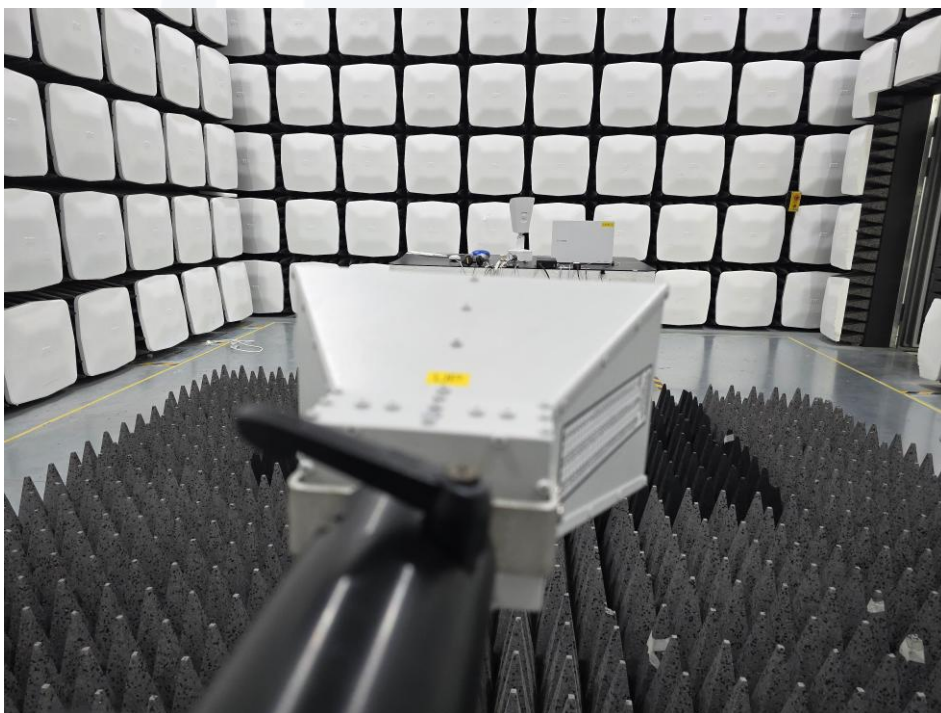
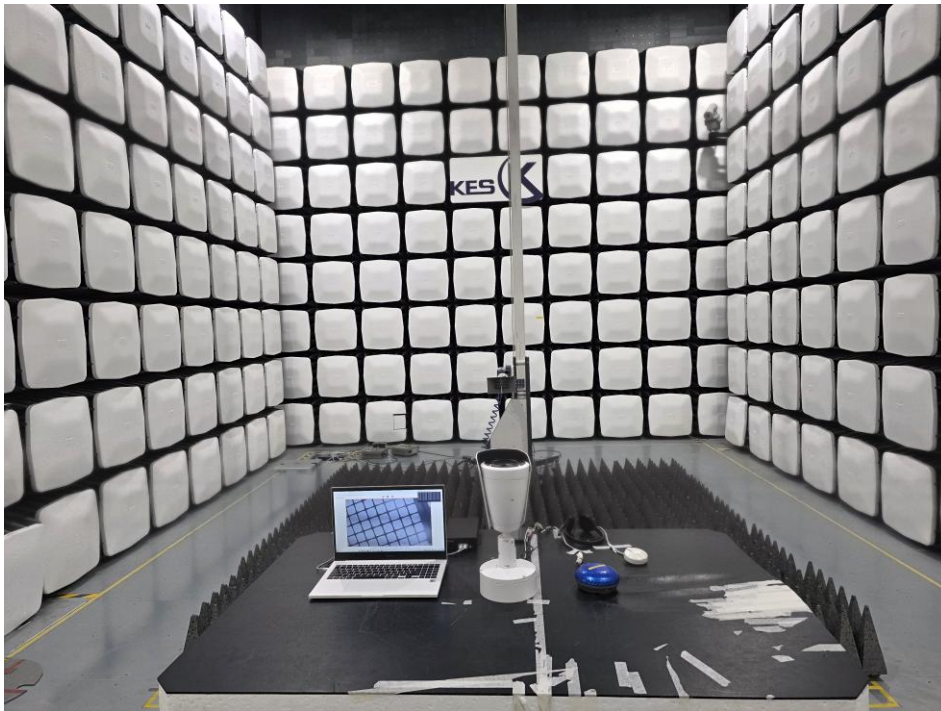
Radiated Electric Field Emissions(Above 1 GHz)

■ Mode 1





■ Mode 2





Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ Mode 1





Electrostatic Discharge

■ Mode 1



■ Mode 2



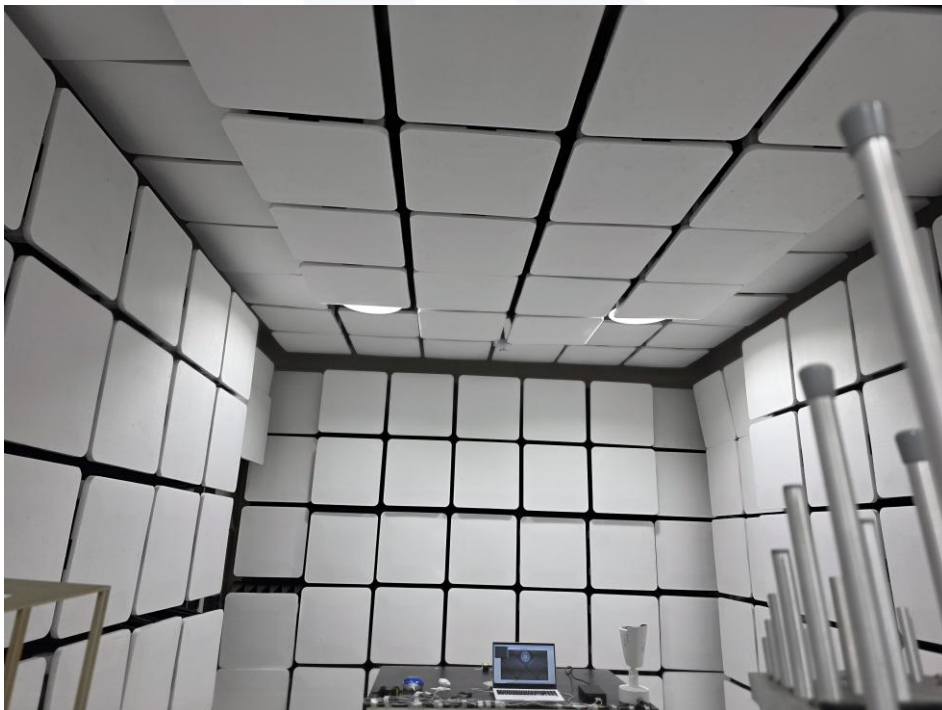


Radio-frequency Electromagnetic Field

■ Mode 1



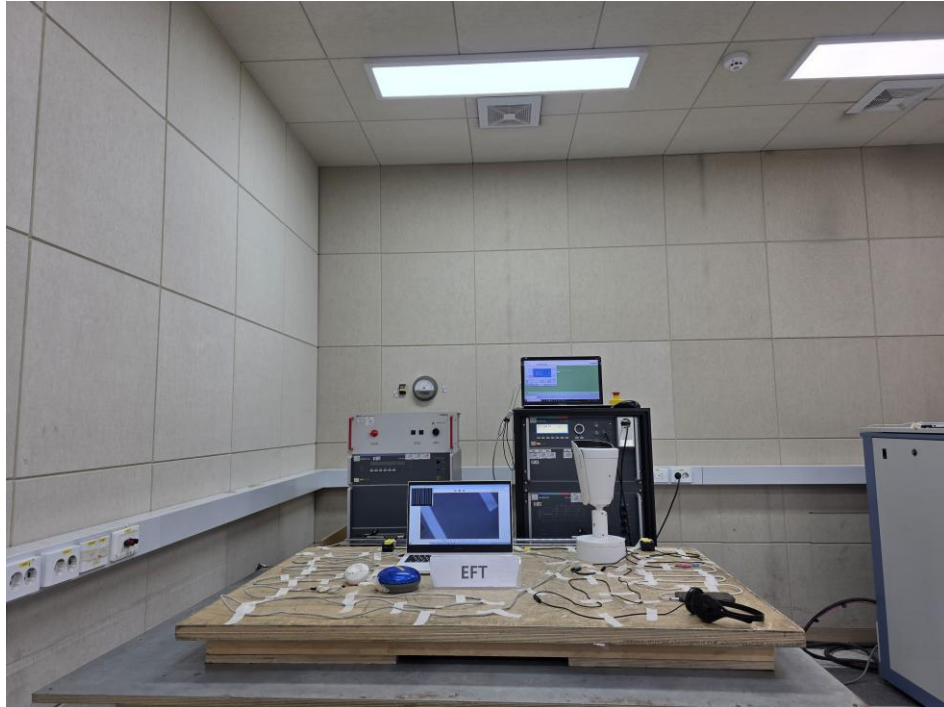
■ Mode 2



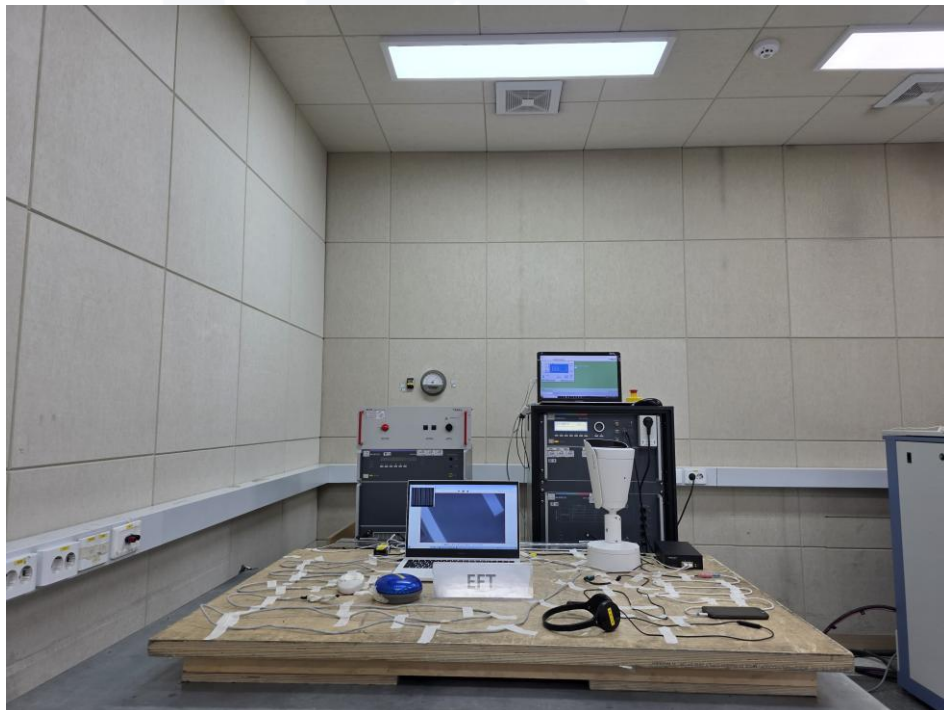


Fast Transients

■ Mode 1



■ Mode 2





Surges

■ Mode 1



■ Mode 2



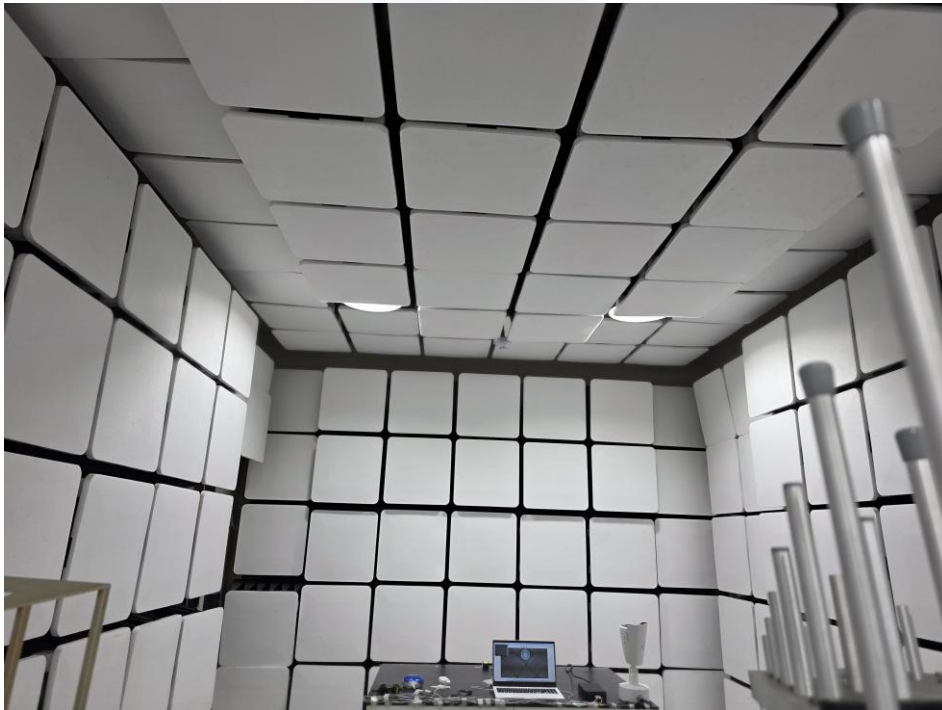


Conducted Disturbance

■ Mode 1



■ Mode 2





Power Frequency Magnetic Field Immunity

■ Mode 1

[16.7 Hz (AC), 100 A/m]



[50 Hz (AC), 100 A/m]





[0 Hz (DC), 300 A/m]





■ Mode 2

[16.7 Hz (AC), 100 A/m]



[50 Hz (AC), 100 A/m]





[0 Hz (DC), 300 A/m]





EUT External Photographs

(Top)

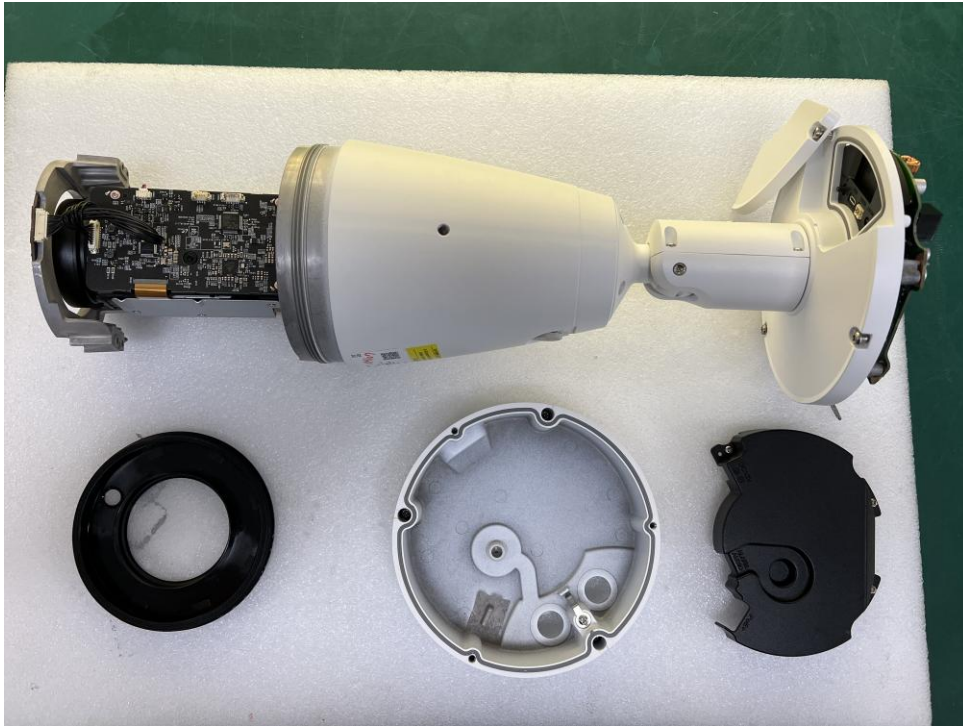


(Bottom)





EUT Internal Photographs





Label



Name : Hanwha Vision Co., Ltd.
Product item : NETWORK CAMERA
Model name : PNO-A9311R

The End.

