

**KES Co., Ltd.**

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www.kes.co.kr

Report No.:  
KES-EM-23T0784  
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# EMC TEST REPORT

Test Report No. : KES-EM-23T0784  
Date of Issue : Sep. 07, 2023  
Product name : NETWORK CAMERA  
Model/Type No. : PNO-A9311R  
Variant Model : -  
Applicant : Hanwha Vision Co., Ltd  
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,  
Gyeonggi-do, Republic of Korea  
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 commune, Bac Ninh city, Bac Ninh province, Vietnam  
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,  
Korea (Suwon Industrial Complex)  
Date of Receipt : Aug. 24, 2023  
Test date : Aug. 28, 2023 ~ Aug. 31, 2023  
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Jae Won, Lee  
EMC Test Engineer

Reviewed by

Dae Jung, Choi  
EMC Technical Manager

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

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### REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Sep. 07, 2023	KES-EM-23T0784	Issued

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## 1.0 General Product Description

### Main Specifications of EUT are:

<b>Video</b>	
Imaging Device	1/1.8" CMOS
Resolution	3840x2160, 3072x1728, 2592x1944, 2688x1520, 2560x1440, 2048x1536, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800 x 600, 800 x 448, 720 x 576, 720x480, 640x480, 640x360
Max. Framerate	H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 30fps/25fps(60Hz/50Hz)
NETD	None
Pixel Size	None
Min. Illumination	Color: 0.05Lux(F1.6, 1/30sec) BW: 0.005Lux(F1.6, 1/30sec), 0Lux(IR LED on)
Video Out	CVBS: 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P) for installation USB: Micro USB Type B, 1280x720 for installation
Video Transmission Distance	None
<b>Lens</b>	
Focal Length (Zoom Ratio)	6.91~214.7mm (31x) motorized varifocal
Max. Aperture Ratio	F1.36(Wide)~F4.6(Tele)
Angular Field of View	H: 60.92°(Wide)~2.2°(Tele) / V:35.26°(Wide)~1.24°(Tele) / D:69.18°(Wide)~2.52°(Tele) [TBD]
Min. Object Distance	3m(9.84ft)
Focus Control	Simple focus
Lens Type	P iris
Mount Type	None
Optional Lens	None
<b>Pan / Tilt / Rotate</b>	
Pan / Tilt / Rotate Range	None
Pan Range	None
Pan Speed	None
Tilt Range	None
Tilt Speed	None
Rotate Range	None
Sequence	None
Preset Accuracy	None
<b>Operational</b>	
Camera Title	Displayed up to 85 characters
Direction Indicator	None
Day & Night	Auto(ICR)
Backlight Compensation	BLC, WDR, SSDR
Wide Dynamic Range	None
Digital Noise Reduction	SSNRV, WiseNR II(using AI engine)
Digital Image Stabilization	Stabilization Support(built-in gyro sensor)
Defog	None
Motion Detection	8ea, polygonal zones
Privacy Masking	6ea, rectangle zones - Color: Gray/Black/White
Gain Control	Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC	Support
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (1/5~1/12,000sec) Auto prefer shutter control based on AI engine
Digital PTZ	None
Video Rotation	Flip, Mirror, Hallway view(90°/270°)
Analytics	Classified object type : Person/Face/Vehicle/License plate Attributes : Person(Gender, Color and Bag), Face(Age, Gender, Mask and Glasses), Vehicle(Type:car/bus/truck/motorcycle/bicycle and Color) Support Bestshot per object Analytics events based on AI engine - Object detection, Virtual line*(Crossing/Direction), Virtual area*(Loitering/Intrusion/Enter/Exit), Face mask detection, Digital auto tracking, Social distancing detection, Slip&Fall detection Analytics events - Defocus detection, Motion detection, Tampering, Audio detection, Sound classification, Shock detection, Virtual area(Appear/Disappear) *Some of the video analytics only works with people and vehicle detection
Business Intelligence	People/Vehicle/Crowd counting, Queue management, Heatmap based on AI engine
Serial Interface	None

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Alarm I/O	2 configurable I/O ports, DC 12V output(Max. 50mA)
Alarm Triggers	Analytics, Network disconnect, Alarm input
Alarm Events	File upload via FTP and e-mail Notification via e-mail SD/SDHC/SDXC or NAS recording at event triggers Alarm output Handover Audio playback
Audio In	Selectable(mic in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm
Audio Out	Line out, Max.output level: 1Vrms
IR Viewable Length	70m(229.66ft) TBD, testing up to 90m(295.28ft)
IR Illuminator (Optional)	None
Water Removal	None
Auto Tracking	None
Coaxial Protocol	None
Color Palettes	None
<b>Radiometry</b>	
Temperature detect range	None
Temperature accuracy	None
Temperature detection	None
Additional	None
<b>Network</b>	
Ethernet	Metal shielded RJ-45(10/100/1000 BASE-T)
Video Compression	H.265/H.264: Main/High, MJPEG
Audio Compression	G.711 u-law /G.726 Selectable G.726(ADPCM) 8KHz, G.711 8KHz G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC: 48Kbps at 16KHz
Smart Codec	Manual(Sea area), WiseStreamII, WiseStreamIII(using AI engine)
Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Target bitrate level control
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR

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Streaming	Unicast(6 users) / Multicast Multiple streaming(Up to 6 profiles)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTP (TCP, UDP Unicast)
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access log 802.1X Authentication(EAP-TLS, EAP-LEAP) Device Certificate(Hanwha Techwin Root CA) Secure boot
Application Programming Interface	ONVIF Profile S/G/T/M SUNAPI(HTTP API) Wisenet open platform
<b>General</b>	
Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, <del>Swedish</del> , Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 2slots 512GB
Memory	4096MB RAM, 1024MB Flash
<b>Environmental &amp; Electrical</b>	
Operating Temperature / Humidity	-40°C ~ +55°C(-40°F ~ +131°F) / Less than 90% RH * Start up should be done at above -30°C
Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH
Certification	IP66/IP67, IK10, NEMA4X
Input Voltage	PoE+(IEEE802.3at), 12VDC
Power Consumption	PoE+: Max 20.0W, typical 17.00W 12VDC: Max 18.00W, typical 16.00W
<b>Mechanical</b>	
Color / Material	Dark gray / Aluminum
RAL Code	None
Product dimensions / weight	Ø136.2x358.7mm (Ø5.36" x 14.12") (Without sunshield), Weight : 0.00Kg (0.00lb) TBD, New design
Compatible Conduit hole / Gangbox	None
Hanging mount(Dome)	None
Skin cover(Dome)	None
Weather cap(Dome)	None
Power module	None
Backbox	None
<b>DORI (EN62676-4 standard)</b>	
Detect (25PPM/ 8PPF)	Wide: 73.5m(241ft) / Tele: 2,250m(7,382ft) [TBD]
Observe (63PPM/ 19PPF)	Wide: 29.4m(96.4ft) / Tele: 900m(2,953ft) [TBD]
Recognize (125PPM/ 38PPF)	Wide: 14.7m(48.2ft) / Tele: 450m(1,476ft) [TBD]
Identify (250PPM/ 76PPF)	Wide: 7.3m(24.1ft) / Tele: 225m(738.2ft) [TBD]

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## 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 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Adapter	2ACB022F	-	ChAnnel Well Technology (Guangzhou) Co.,Ltd.	-
PoE Adapter	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Laptop	P95G001	8KM8HT2	DELL INC.	-
Laptop Adapter	LA65NS2-01	-	LITE-ON TECHNOLOGY(CHANGZH OU)CO.,LTD.	-
Micro SD Card1	-	-	SanDisk	8 GB
Micro SD Card2	-	-	SanDisk	8 GB
Alarm	PRO-SL	-	SENSOR PRO	-
Button Alarm	-	-	-	-
Headset	K550	-	Britz®	-
Smartphone	-	-	SAMSUNG	-

## 1.6 External I/O Cabling

### ■ DC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45(LAN)	Laptop	RJ-45(LAN)	3.5	U
	Alarm OUT	Alarm	Alarm IN	3.5	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	Audio OUT	Headset	Audio IN	1.5	U
	Audio IN		Audio OUT	1.5	U
	Micro SD Card Slot	Micro SD Card1	Micro SD Card Slot	-	-
	Micro SD Card Slot	Micro SD Card2	Micro SD Card Slot	-	-
	DC Jack	Adapter	DC Jack	1.6	U
Laptop	DC Jack	Laptop Adapter	DC Jack	1.3	U
	3.5 mm	Smartphone	3.5 mm	1.0	U

\* Unshielded=U, Shielded=S

### ■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45(PoE)	PoE Adapter	RJ-45(PoE)	3.5	U
	Alarm OUT	Alarm	Alarm IN	3.5	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	Audio OUT	Headset	Audio IN	1.5	U
	Audio IN		Audio OUT	1.5	U
	Micro SD Card Slot	Micro SD Card1	Micro SD Card Slot	-	-
	Micro SD Card Slot	Micro SD Card2	Micro SD Card Slot	-	-
	DC Jack	Laptop Adapter	DC Jack	1.3	U
Laptop	3.5 mm	Smartphone	3.5 mm	1.0	U

\* Unshielded=U, Shielded=S



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## 1.7 EUT Operating Mode(s)

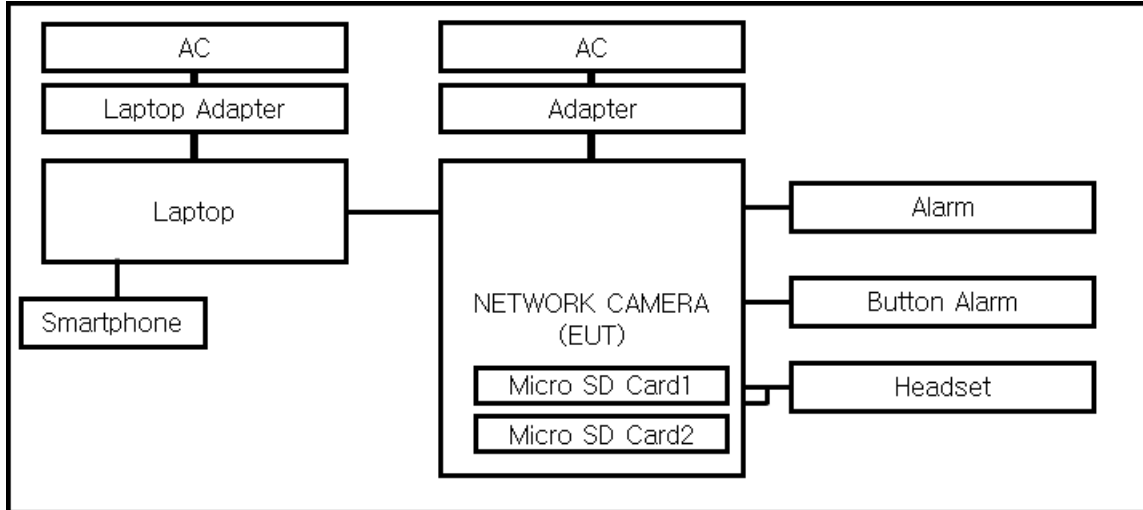
Test mode	operating
Operator	<p>After arranging the test equipment and peripherals as shown in the layout diagram below,</p> <ol style="list-style-type: none"><li>1. Run the Web Viewer on your laptop and check the camera video output</li><li>2. PingTest from your laptop to check the network status</li><li>3. Confirm the alarm output by pressing the alarm button</li><li>4. Play 1KHz tone on your smartphone and check the output on your headset</li><li>5. Record in the notebook and check the input in the headset microphone</li><li>6. After the test, the Micro SD Card storage file was checked.</li></ol>

EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Vision Co., Ltd

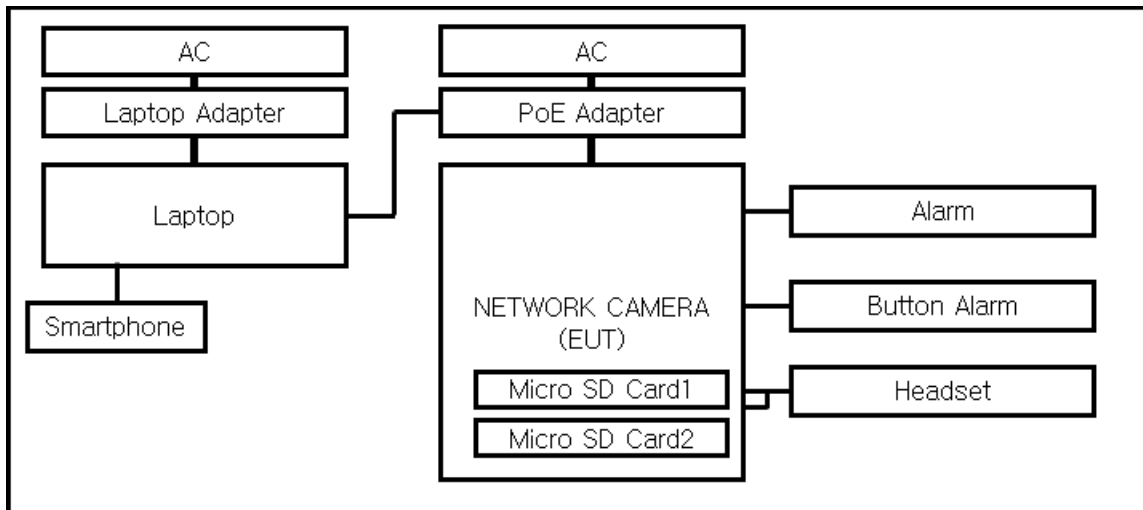
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## 1.8 Configuration

### ■ DC Mode



### ■ PoE Mode



## 1.9 Remarks when standards applied

- In PoE mode, the LAN port is regarded as a wired communication network port and power-related ports are not tested.
- Micro 5 Pin, VIDEO port is not tested because it is for administrators.

## 1.10 Calibration Details of Equipment Used for Measurement

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

## 1.11 Test Facility

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

## 1.12 Laboratory Accreditations and Listings

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

## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011/A1:2014

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

☒ **EMC – Regulations 2016**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011/A1:2014

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

## 2.1 Conducted Emissions at Mains Power Ports

### Test Date

Aug. 30, 2023

### Test Location

Electro wave Shieldroom #6

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	11, 11, 2023
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	11, 10, 2023
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023

### Test Conditions

Temperature: (24,4 ± 0,1) °C  
Relative Humidity: (48,5 ± 0,1) % 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

### Remarks

See Appendix A for test data.

## 2.2 Conducted Emissions at Telecommunication Ports

### Test Date

Aug. 30, 2023

### Test Location

Electro wave Shieldroom #6

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	11, 11, 2023
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	11, 10, 2023
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023
<input checked="" type="checkbox"/>	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	11, 22, 2023
<input type="checkbox"/>	CDN	CDNS502A	TESEQ	40431	11, 10, 2023

### Test Conditions

Temperature: (24,4 ± 0,1) °C  
Relative Humidity: (48,5 ± 0,1) % 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

### Remarks

- See Appendix A for test data.  
- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

## 2.3 Radiated Electric Field Emissions(Below 1 GHz)

**Test Date**

Aug. 30, 2023

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

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	R & S	100551	03, 21, 2024
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	11, 10, 2023
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
<input checked="" type="checkbox"/>	ATTENUATOR	8491A	HP	32173	03, 03, 2024

**Test Conditions**

Temperature: (24,7 ± 0,1) °C

Relative Humidity: (48,4 ± 0,1) % 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

**Remarks**See Appendix A for test data.

## 2.4 Radiated Electric Field Emissions(Above 1 GHz)

**Test Date**

Aug. 30, 2023

**Test Location**

SEMI ANECHOIC CHAMBER #3

**Test Equipment**

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

**Test Conditions**

Temperature: (24,5 ± 0,1) °C

Relative Humidity: (48,2 ± 0,1) % 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

**Remarks**See Appendix A for test data.





## 2.5 Harmonic Current Emissions

### Test Date

Aug. 30, 2023

### Test Location

Electro wave Shieldroom #3

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	net.control	EM TEST	2.1.4	-
<input checked="" type="checkbox"/>	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	03, 27, 2024
<input checked="" type="checkbox"/>	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

### Test Conditions

Temperature: (24,5 ± 0,1) °C  
Relative Humidity: (48,2 ± 0,1) % 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.

## 2.6 Voltage Fluctuations and Flicker

**Test Date**

Aug. 30, 2023

**Test Location**

Electro wave Shieldroom #3

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	net.control	EM TEST	2.1.4	-
<input checked="" type="checkbox"/>	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	03, 27, 2024
<input checked="" type="checkbox"/>	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

**Test Conditions**

Temperature: (24,5 ± 0,6) °C

Relative Humidity: (48,2 ± 0,6) % R.H.

**Test Results**

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

**Remarks**See Appendix A for test data.

### 3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011 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.

**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  $U = 130 \text{ dB}\mu\text{V}$ .

For component of CCTV systems, where the status is monitored by observing the TV picture,  
then deterioration of the picture is allowed at  $U = 140 \text{ dB}\mu\text{V}$ , 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  $U = 130 \text{ dB}\mu\text{V}$ , 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  $U = 120 \text{ dB}\mu\text{V}$ .

**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.

### 3.1 Electrostatic Discharge

#### Reference Standard

EN 61000-4-2:2009

#### Test Date

Aug. 29, 2023

#### Test Location

EMS-ESD: Electro wave Shieldroom #7

#### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	01, 31, 2024
<input checked="" type="checkbox"/>	HCP	-	KES	-	-
<input checked="" type="checkbox"/>	VCP	-	Noise Ken	-	-

#### Test Conditions

Temperature: (24,3 ± 0,1) °C  
Relative Humidity: (48,8 ± 0,1) % R.H.  
Atmospheric Pressure: (99,9 ± 0,0) kPa

#### Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

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

Discharge Voltage:	Contact	Air	HCP	VCP
	<input type="checkbox"/> 2 kV	<input checked="" type="checkbox"/> 2 kV	<input type="checkbox"/> 2 kV	<input type="checkbox"/> 2 kV
	<input type="checkbox"/> 4 kV	<input checked="" type="checkbox"/> 4 kV	<input type="checkbox"/> 4 kV	<input type="checkbox"/> 4 kV
	<input checked="" type="checkbox"/> 6 kV	<input type="checkbox"/> 6 kV	<input checked="" type="checkbox"/> 6 kV	<input checked="" type="checkbox"/> 6 kV
	<input type="checkbox"/> 8 kV	<input checked="" type="checkbox"/> 8 kV	<input type="checkbox"/> 8 kV	<input type="checkbox"/> 8 kV
	<input type="checkbox"/> 15 kV	<input type="checkbox"/> 15 kV	<input type="checkbox"/> 15 kV	<input type="checkbox"/> 15 kV

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

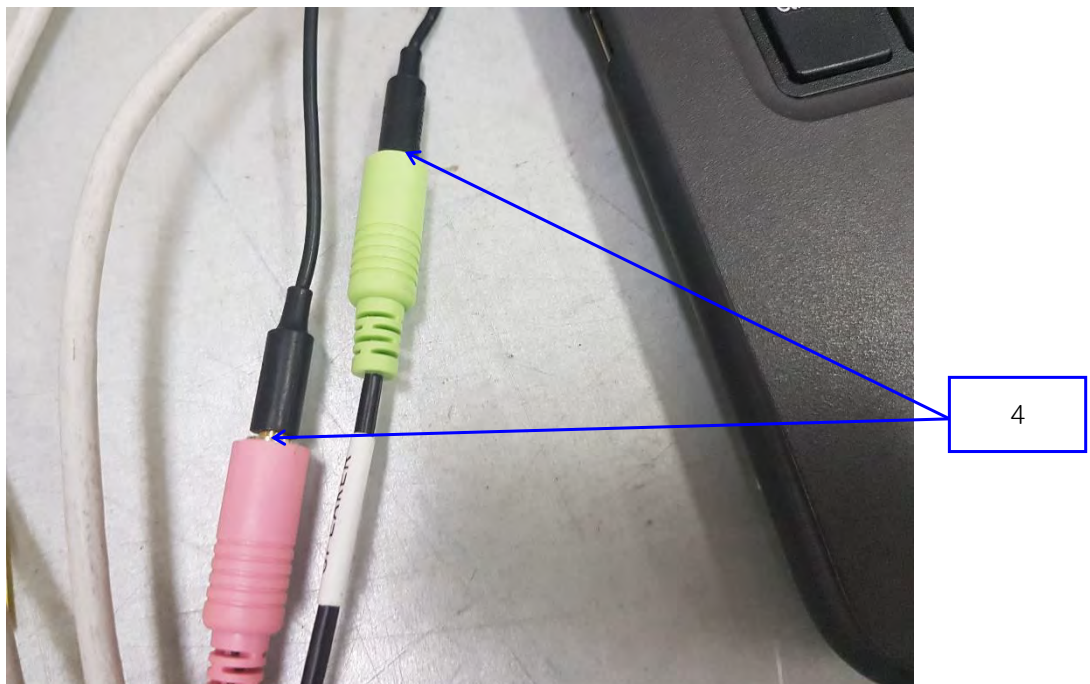
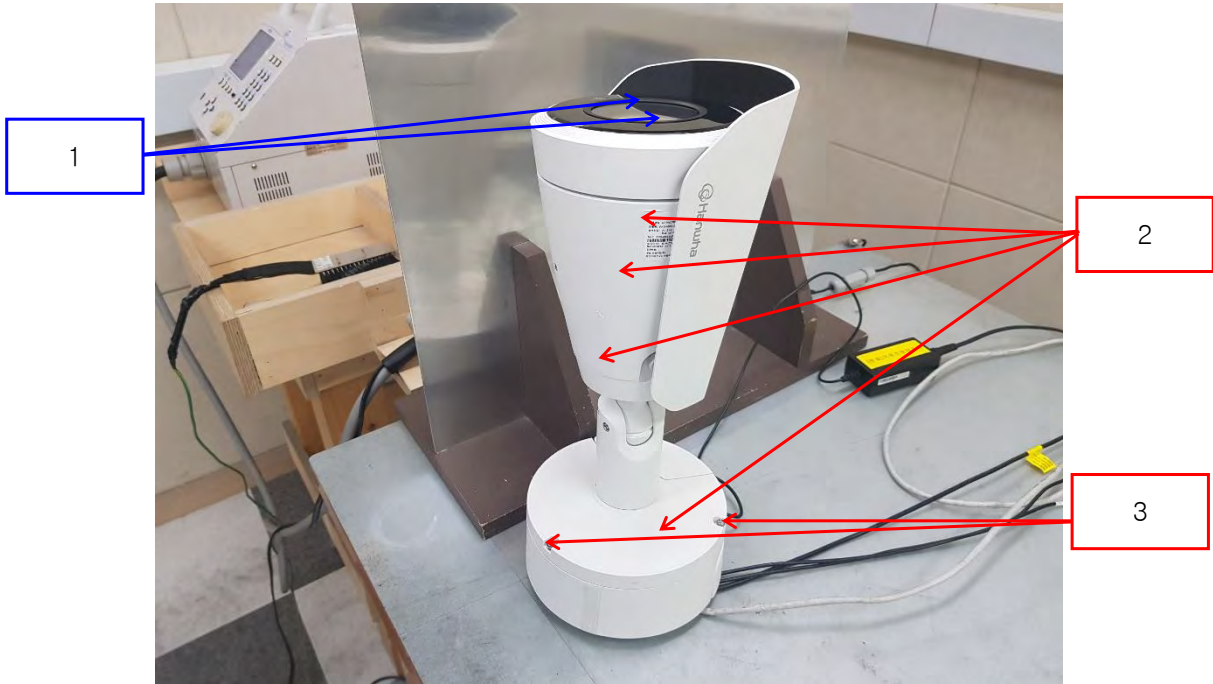
Required Performance Criteria: ☒ Complied

**Location of Discharge:**

Air
Contact



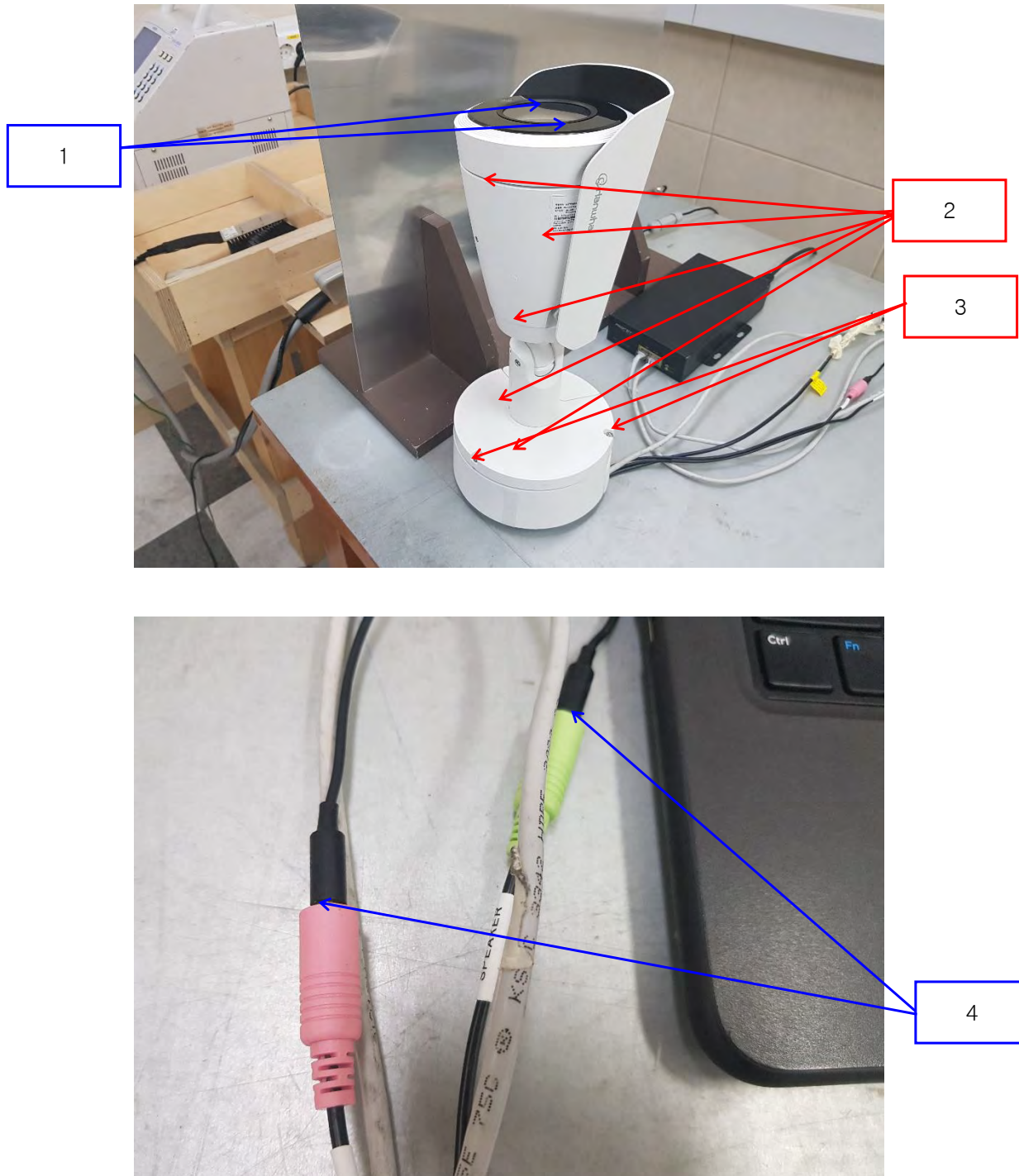
■ DC Mode



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■ PoE Mode



**Test Data**
**■ DC Mode**

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	Camera Lens	Air Discharge	Complied	-
2	Enclosure	Contact Discharge	Complied	-
3	Screw	Contact Discharge	Complied	-
4	Around the port	Air Discharge	Complied	-

**■ PoE Mode**
**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	Camera Lens	Air Discharge	Complied	-
2	Enclosure	Contact Discharge	Complied	-
3	Screw	Contact Discharge	Complied	-
4	Around the port	Air Discharge	Complied	-

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

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

**Remarks**

PASS Required Performance Criteria



## 3.2 Radiated Electric Field Immunity

### Reference Standard

EN IEC 61000-4-3:2020

### Test Date

Aug. 28, 2023

### Test Location

EMS-RS: ☐ SEMI ANECHOIC CHAMBER #2 ☒ SEMI ANECHOIC CHAMBER #3

### Test Equipment

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

### Test Conditions

Temperature: (24,6 ± 0,6) °C  
Relative Humidity: (49,0 ± 0,6) % R.H.  
Atmospheric Pressure: (100,2 ± 0,0) kPa



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### Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

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

Frequency Range: ☐ 80 MHz to 1 GHz ☐ 1,4 GHz to 2,7 GHz  
☒ 80 MHz to 2,7 GHz

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

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

# of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

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**Test Data****■ DC Mode**

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

**■ PoE Mode**

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

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

**Remarks**

PASS Required Performance Criteria

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### 3.3 Electrical Fast Transients/Bursts

#### Reference Standard

EN 61000-4-4:2012

#### Test Date

Aug. 29, 2023

#### Test Location

EMS-EFT: Electro wave Shieldroom #7

#### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMS Test S/W	iec.control	EM TEST	5.4.8	-
<input checked="" type="checkbox"/>	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 28, 2023
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 29, 2023
<input checked="" type="checkbox"/>	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 28, 2023

#### Test Conditions

Temperature: (24,3 ± 0,1) °C  
Relative Humidity: (48,8 ± 0,1) % R.H.  
Atmospheric Pressure: (99,9 ± 0,0) kPa

#### Test Specifications

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

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

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 klz ☒ 100 klz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

**Test Data**

## ■ DC Mode

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

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

☐ 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)	Complied	Complied
Alarm IN	Complied	Complied
Alarm OUT	Complied	Complied

■ PoE Mode

☐ 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)	Complied	Complied
Alarm IN	Complied	Complied
Alarm OUT	Complied	Complied

Note: “Blank” = Not performed

Observations:

Complied – No degradation of function

**Test Results**

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria

### 3.4 Surge Transients

**Reference Standard**

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

**Test Date**

Aug. 29, 2023

**Test Location**

EMS-Surge: Electro wave Shieldroom #7

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMS Test S/W	iec.control	EM TEST	5.4.8	-
<input checked="" type="checkbox"/>	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 28, 2023
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 29, 2023
<input checked="" type="checkbox"/>	CDN	CNV 508N1	EM TEST	P1610176296	11, 29, 2023

**Test Conditions**

Temperature: (24,3 ± 0,6) °C  
Relative Humidity: (48,8 ± 0,6) % R.H.  
Atmospheric Pressure: (99,9 ± 0,0) kPa



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### Test Specifications

#### AC Power Lines

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

Surge Amplitude :  
Common Mode  
☐ (0,5 / 1,0 / 2,0) kV  
Differential Mode  
☒ (0,5 / 1,0) kV

Number of Surges: ☒ 5 surges per angle

Angle: ☒ 0°, 90°, 180°, 270° (input a.c. power port)

Polarity: ☒ Positive & Negative

Repetition Rate: ☒ 1 surge per min ☐ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

#### Other supply / Signal Lines

Source Impedance: 42 ohm for common Mode

Surge Amplitude:  
Common Mode  
☒ (0,5 / 1,0) kV

Number of Surges: ☒ 5 Surges

Polarity: ☒ Positive & Negative

Repetition Rate: ☒ 1 surge per min ☐ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

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**Test Data**

☒ DC Mode

☒ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

**Signal Lines**

☒ Line to Earth – Common Mode

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

■ PoE Mode

☐ 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 Earth – Common Mode

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria

### 3.5 Conducted Disturbance

**Reference Standard**

EN 61000-4-6:2014

**Test Date**

Aug. 31, 2023

**Test Location**

EMS-CS: Electro wave Shieldroom #6

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMS Test S/W	icd.control	EM TEST	5.3.12	-
<input checked="" type="checkbox"/>	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	11, 10, 2023
<input checked="" type="checkbox"/>	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 10, 2023
<input checked="" type="checkbox"/>	CDN	CDN M016	TESEQ	43694	11, 10, 2023
<input checked="" type="checkbox"/>	CDN	CDN M016	TESEQ	43697	11, 10, 2023
<input checked="" type="checkbox"/>	CDN	CDN T8RJ45	EM TEST	0909-09	07, 31, 2024
<input checked="" type="checkbox"/>	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 14, 2023

**Test Conditions**

Temperature: (24,5 ± 0,6) °C  
Relative Humidity: (48,6 ± 0,6) % R.H.  
Atmospheric Pressure: (99,9 ± 0,0) kPa



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### Test Specifications

Frequency range: ☒ 150 kHz to 100 MHz ☐ 150 kHz to 80 MHz

Voltage Level: ☐ 1 Vrms ☐ 3 Vrms  
☒ 10 Vrms

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

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

Required Performance Criteria: ☒ Complied

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**Test Data**
**■ DC Mode**
☒ Input a.c. power ports

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

☐ 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	Complied
Alarm IN	Clamp	Complied
Alarm OUT	Clamp	Complied

**■ PoE Mode**
☐ 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	Complied
Alarm IN	Clamp	Complied
Alarm OUT	Clamp	Complied

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

Observations:

Complied – No degradation of function

**Test Results**
☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

**Remarks**
PASS Required Performance Criteria

### 3.6 Voltage Dips and Short Interruptions

**Reference Standard**

EN IEC 61000-4-11:2020

**Test Date**

Aug. 29, 2023

**Test Location**

EMS-Voltage dip: Electro wave Shieldroom #7

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMS Test S/W	iec.control	EM TEST	5.4.8	-
<input checked="" type="checkbox"/>	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 29, 2023
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 29, 2023

**Test Conditions**

Temperature: (24,3 ± 0,1) °C  
Relative Humidity: (48,8 ± 0,1) % R.H.  
Atmospheric Pressure: (99,9 ± 0,0) kPa

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**Test Specifications & Observations/Remarks****■ DC Mode****- Voltage Dips and Short Interruptions**

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Results</u>
<input checked="" type="checkbox"/> 20 % dip	<input checked="" type="checkbox"/> 250 / 5 000	<u>Complied</u>
<input checked="" type="checkbox"/> 30 % dip	<input checked="" type="checkbox"/> 25 / 500	<u>Complied</u>
<input checked="" type="checkbox"/> 60 % dip	<input checked="" type="checkbox"/> 10 / 200	<u>Complied</u>
<input checked="" type="checkbox"/> 100 % dip	<input checked="" type="checkbox"/> 250 / 5 000	<u>Degradation</u>

**- Voltage variations**

<input checked="" type="checkbox"/> Unom + 10 %	<input checked="" type="checkbox"/> 253.0 V (ac)	<u>Complied</u>
<input checked="" type="checkbox"/> Unom - 15 %	<input checked="" type="checkbox"/> 195.5 V (ac)	<u>Complied</u>

**Observations:**

Complied – No degradation of function

Degradation - See "Remarks "

**Test Results**

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

**Remarks**

During the test, EUT was turned off but after the test, it was recovered without operator's intervention.

## APPENDIX A – TEST DATA

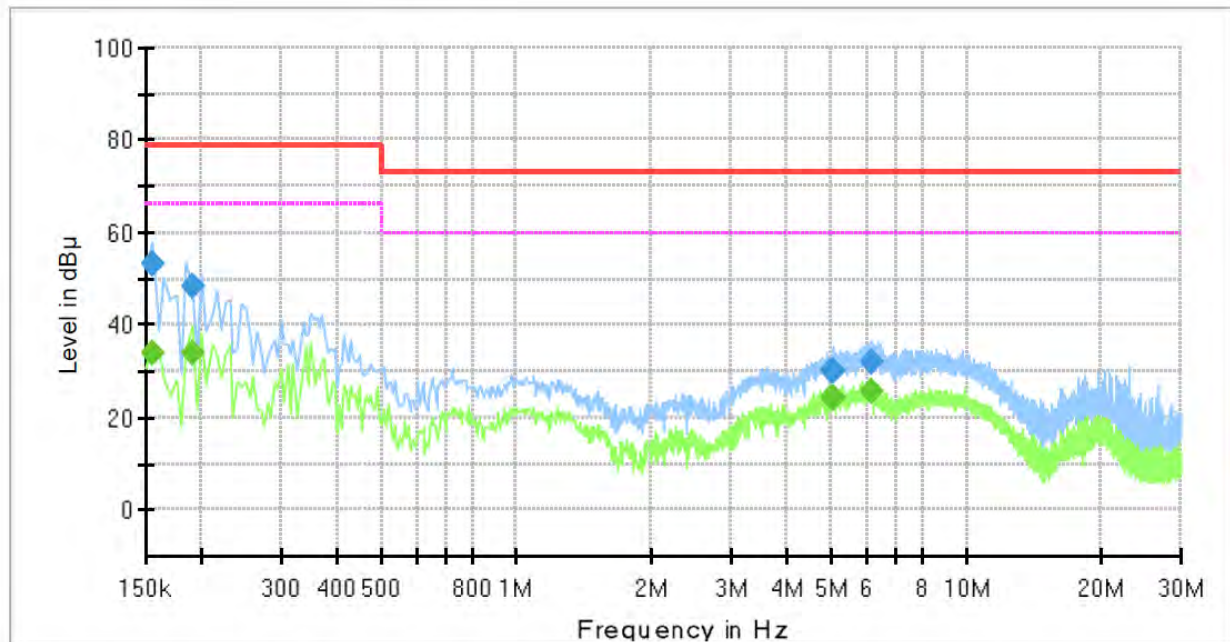
### Conducted Emissions at Mains Power Ports

■ DC Mode

[HOT]

### Common Information

Test Description:	Conducted Emission
Model No.:	PNO-A9311R
Phase:	DC_L1
Mode:	
Operator Name:	KES



### Final\_Result

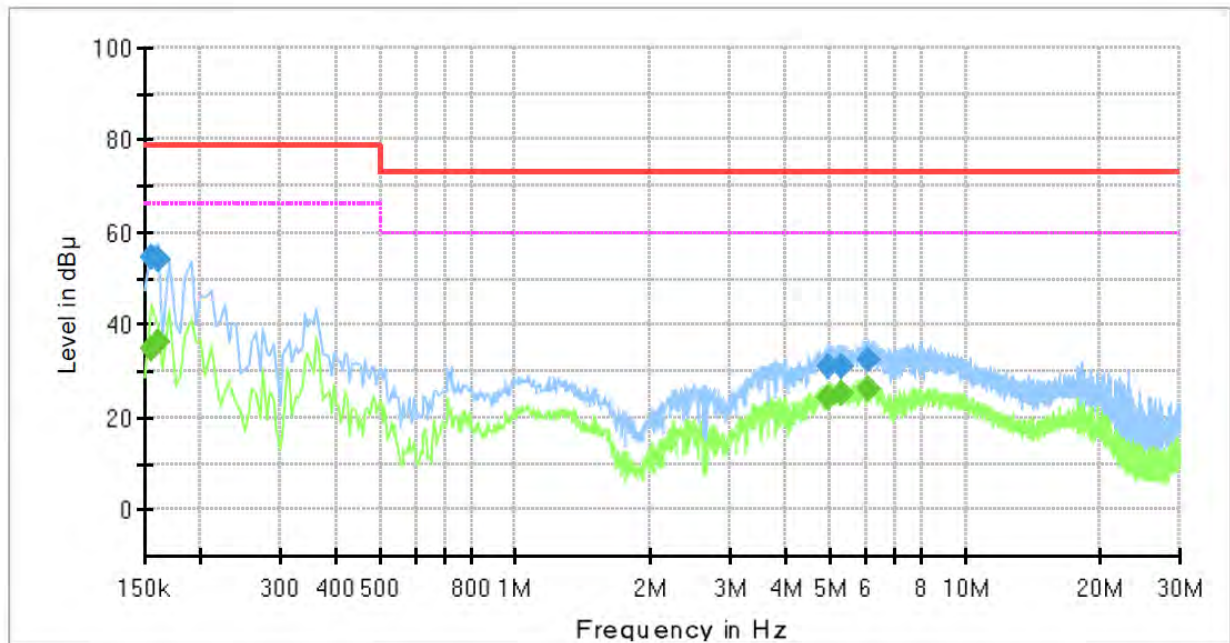
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	33.78	66.00	32.22	1000.0	9.000	L1	19.4
0.155000	52.98	---	79.00	26.02	1000.0	9.000	L1	19.4
0.190000	---	33.80	66.00	32.20	1000.0	9.000	L1	19.4
0.190000	48.38	---	79.00	30.62	1000.0	9.000	L1	19.4
5.015000	---	24.33	60.00	35.67	1000.0	9.000	L1	19.7
5.015000	30.12	---	73.00	42.88	1000.0	9.000	L1	19.7
5.045000	---	24.33	60.00	35.67	1000.0	9.000	L1	19.7
5.045000	30.07	---	73.00	42.93	1000.0	9.000	L1	19.7
6.165000	---	25.48	60.00	34.52	1000.0	9.000	L1	19.8
6.165000	32.05	---	73.00	40.95	1000.0	9.000	L1	19.8



[NEUTRAL]

## Common Information

Test Description: Conducted Emission  
 Model No.: PNO-A9311R  
 Phase: DC\_N  
 Mode:  
 Operator Name: KES



## Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	34.64	66.00	31.36	1000.0	9.000	N	19.4
0.155000	54.47	---	79.00	24.53	1000.0	9.000	N	19.4
0.160000	---	36.46	66.00	29.54	1000.0	9.000	N	19.4
0.160000	54.15	---	79.00	24.85	1000.0	9.000	N	19.4
4.935000	---	24.43	60.00	35.57	1000.0	9.000	N	19.7
4.935000	31.03	---	73.00	41.97	1000.0	9.000	N	19.7
5.320000	---	25.37	60.00	34.63	1000.0	9.000	N	19.8
5.320000	31.15	---	73.00	41.85	1000.0	9.000	N	19.8
6.110000	---	26.12	60.00	33.88	1000.0	9.000	N	19.8
6.110000	32.49	---	73.00	40.51	1000.0	9.000	N	19.8

### ◆ 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))

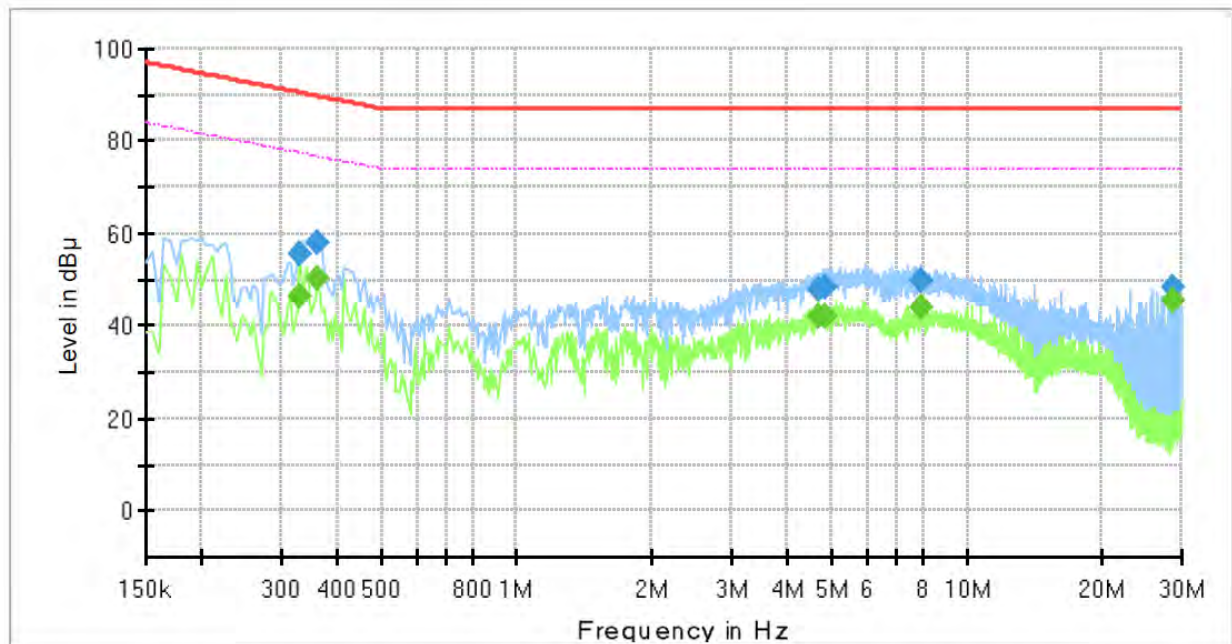
## Conducted Emissions at Telecommunication Ports

■ DC Mode

[1 000 Mbps]

### Common Information

Test Description:	Telecommunication Emission
Model No.:	PNO-A9311R
Mode :	DC_TEL 1 000 Mbps
Speed :	
Operator Name:	KES



### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.330000	---	46.27	77.45	31.18	1000.0	9.000	Single Line	19.5
0.330000	55.67	---	90.45	34.78	1000.0	9.000	Single Line	19.5
0.360000	---	50.18	76.73	26.55	1000.0	9.000	Single Line	19.5
0.360000	58.26	---	89.73	31.47	1000.0	9.000	Single Line	19.5
4.685000	---	42.29	74.00	31.71	1000.0	9.000	Single Line	19.4
4.685000	48.03	---	87.00	38.97	1000.0	9.000	Single Line	19.4
4.835000	---	41.98	74.00	32.02	1000.0	9.000	Single Line	19.4
4.835000	48.24	---	87.00	38.76	1000.0	9.000	Single Line	19.4
7.925000	---	44.13	74.00	29.87	1000.0	9.000	Single Line	19.6
7.925000	49.65	---	87.00	37.35	1000.0	9.000	Single Line	19.6
28.685000	---	45.60	74.00	28.40	1000.0	9.000	Single Line	20.1
28.685000	48.47	---	87.00	38.53	1000.0	9.000	Single Line	20.1

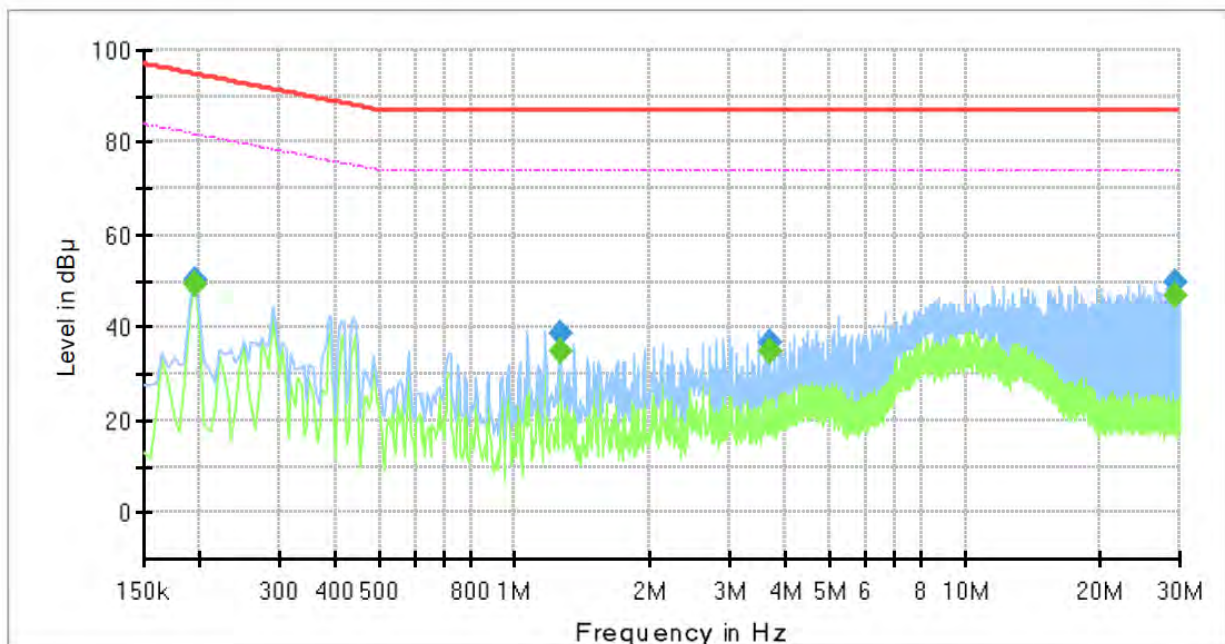
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■ PoE Mode

[100 Mbps]

## Common Information

Test Description: Telecommunication Emission  
 Model No.: PNO-A9311R  
 Mode: PoE\_TEL 1 000 Mbps  
 Speed:  
 Operator Name: KES



## Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.195000	---	49.38	81.82	32.44	1000.0	9.000	Single Line	19.6
0.195000	50.12	---	94.82	44.70	1000.0	9.000	Single Line	19.6
1.265000	---	34.93	74.00	39.07	1000.0	9.000	Single Line	19.3
1.265000	38.69	---	87.00	48.31	1000.0	9.000	Single Line	19.3
3.690000	---	34.94	74.00	39.06	1000.0	9.000	Single Line	19.4
3.690000	36.84	---	87.00	50.16	1000.0	9.000	Single Line	19.4
29.235000	---	46.71	74.00	27.29	1000.0	9.000	Single Line	20.1
29.235000	50.02	---	87.00	36.98	1000.0	9.000	Single Line	20.1

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

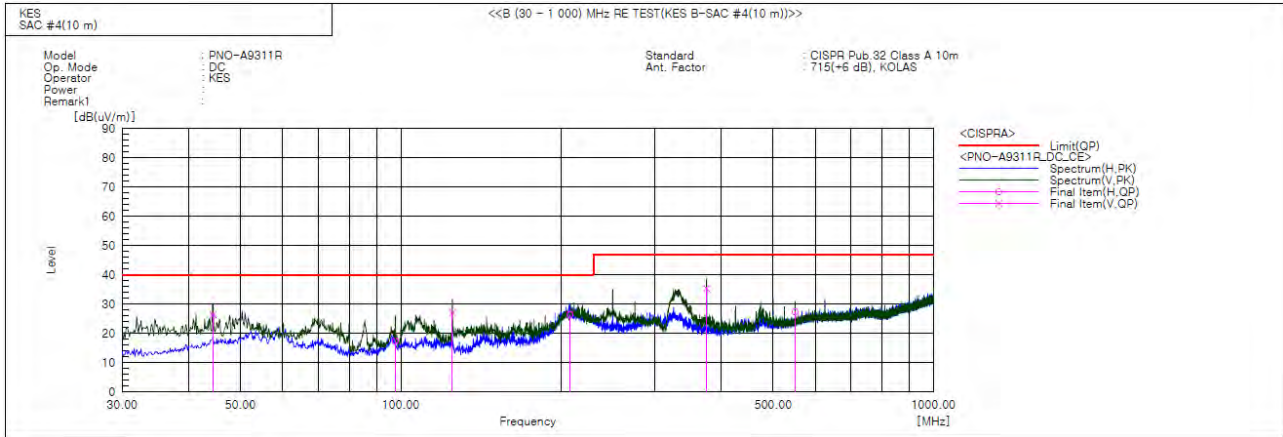
Reading Value : Not shown in the table.

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



## Radiated Electric Field Emissions(Below 1 GHz)

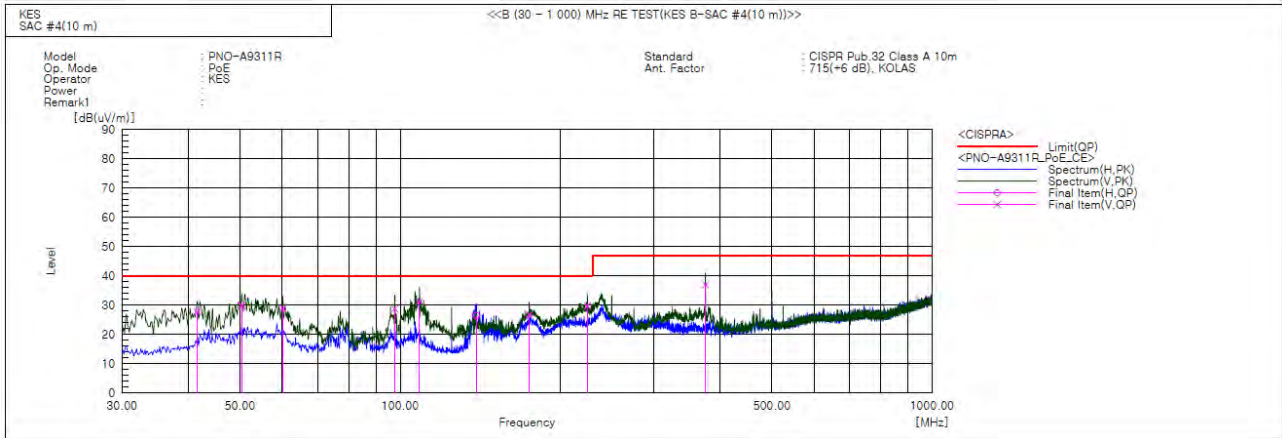
### ■ DC Mode



### Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	44.429	V	47.4	-21.0	26.4	40.0	13.6	112.0	4.0	
2	97.658	H	39.6	-22.2	17.4	40.0	22.6	197.0	172.0	
3	124.939	V	51.4	-24.3	27.1	40.0	12.9	145.0	113.0	
4	207.874	H	46.7	-20.3	26.4	40.0	13.6	397.0	128.0	
5	374.956	V	49.3	-14.0	35.3	47.0	11.7	115.0	161.0	
6	550.041	H	36.9	-9.5	27.4	47.0	19.6	397.0	94.0	

## ■ PoE Mode



## Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	41.519	V	49.4	-21.7	27.7	40.0	12.3	113.0	299.0	
2	50.370	V	50.2	-20.4	29.8	40.0	10.2	107.0	150.0	
3	60.191	V	50.5	-21.6	28.9	40.0	11.1	114.0	157.0	
4	97.658	V	50.9	-22.2	28.7	40.0	11.3	115.0	198.0	
5	108.691	V	53.7	-22.4	31.3	40.0	8.7	142.0	213.0	
6	139.125	H	51.5	-25.1	26.4	40.0	13.6	195.0	180.0	
7	174.894	V	50.5	-23.7	26.8	40.0	13.2	111.0	318.0	
8	224.970	V	49.1	-19.4	29.7	40.0	10.3	115.0	198.0	
9	374.956	V	50.9	-14.0	36.9	47.0	10.1	142.0	154.0	

## ◆ Calculation

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)]

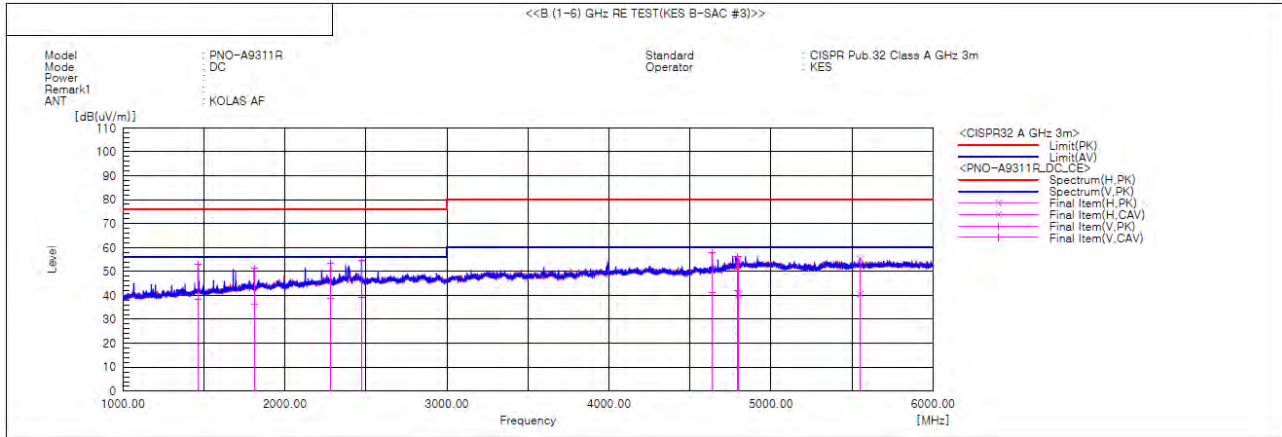
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



## Radiated Electric Field Emissions(Above 1 GHz)

### ■ DC Mode

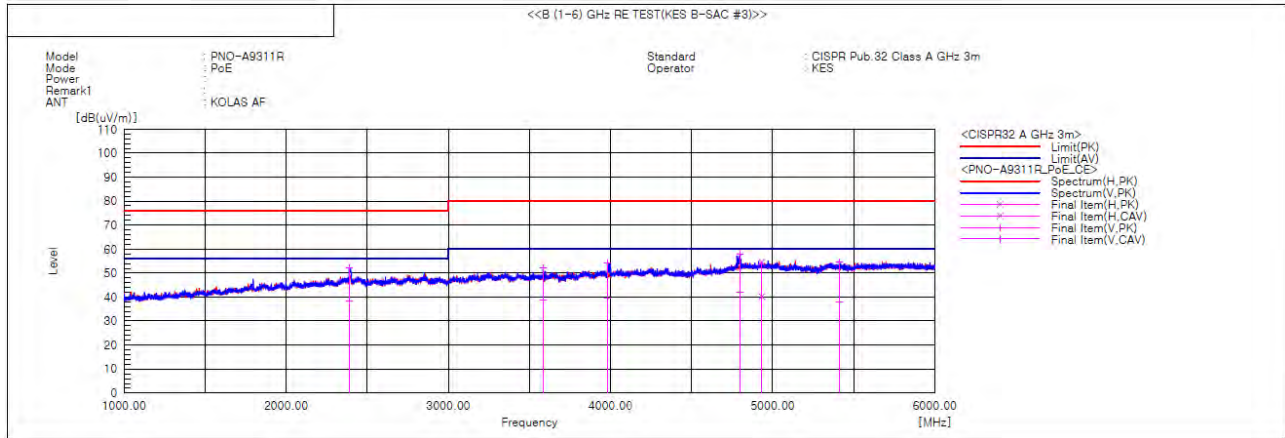


### Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1464.458	V	53.3	38.7	-0.2	53.1	38.5	76.0	56.0	22.9	17.5	100.0	60.3	
2	1810.272	V	48.4	33.4	2.9	51.3	36.3	76.0	56.0	24.7	19.7	100.0	104.6	
3	2281.857	V	47.7	33.0	5.6	53.3	38.6	76.0	56.0	22.7	17.4	100.0	107.5	
4	2472.273	V	48.2	32.7	6.4	54.6	39.1	76.0	56.0	21.4	16.9	100.0	81.4	
5	4637.263	V	44.9	28.1	13.0	57.9	41.1	80.0	60.0	22.1	18.9	100.0	217.2	
6	4794.631	V	42.1	27.9	14.3	56.4	42.2	80.0	60.0	23.6	17.8	100.0	162.0	
7	4800.867	H	40.7	26.0	14.4	55.1	40.4	80.0	60.0	24.9	19.6	100.0	163.0	
8	5550.740	H	39.6	25.0	15.6	55.2	40.6	80.0	60.0	24.8	19.4	100.0	24.7	

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## ■ PoE Mode



## Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	2390.163	V	46.0	32.2	6.3	52.3	38.5	76.0	56.0	23.7	17.5	100.0	144.5	
2	3585.152	V	42.4	28.8	9.9	52.3	38.7	80.0	60.0	27.7	21.3	100.0	53.8	
3	3982.857	V	43.3	28.8	10.9	54.2	39.7	80.0	60.0	25.8	20.3	100.0	176.5	
4	4799.732	V	43.3	27.7	14.4	57.7	42.1	80.0	60.0	22.3	17.9	100.0	168.5	
5	4931.867	H	39.5	25.1	15.1	54.6	40.2	80.0	60.0	25.4	19.8	100.0	256.6	
6	5410.262	V	39.0	22.3	15.8	54.8	38.1	80.0	60.0	25.2	21.9	100.0	220.8	

## ◆ Calculation

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

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

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

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

## Harmonic Current Emissions and Voltage Fluctuations and Flicker

### ■ DC Mode

#### Average harmonic current results

Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	0.042			
2	0.001	0.125	1.080	n/a
3	0.035	1.504	2.300	PASS
4	0.002	0.468	0.430	n/a
5	0.035	3.055	1.140	PASS
6	0.001	0.438	0.300	n/a
7	0.035	4.519	0.770	PASS
8	0.001	0.600	0.230	n/a
9	0.033	8.150	0.400	PASS
10	0.001	0.727	0.184	n/a
11	0.031	9.310	0.330	PASS
12	0.001	0.833	0.153	n/a
13	0.029	13.796	0.210	PASS
14	0.001	1.106	0.131	n/a
15	0.027	18.012	0.150	PASS
16	0.001	1.099	0.115	n/a
17	0.025	18.905	0.132	PASS
18	0.001	1.188	0.102	n/a
19	0.023	19.367	0.118	PASS
20	0.001	1.280	0.092	n/a
21	0.021	12.953	0.161	PASS
22	0.001	1.462	0.084	n/a
23	0.019	12.628	0.147	PASS
24	0.001	1.610	0.077	n/a
25	0.017	12.233	0.135	PASS
26	0.001	1.670	0.071	n/a
27	0.015	11.623	0.125	PASS
28	0.001	1.903	0.066	n/a
29	0.012	10.709	0.116	PASS
30	0.001	1.852	0.061	n/a
31	0.011	9.930	0.109	PASS
32	0.001	2.070	0.058	n/a
33	0.009	8.897	0.102	PASS
34	0.001	2.073	0.054	n/a
35	0.008	8.071	0.096	PASS
36	0.001	2.163	0.051	n/a
37	0.007	7.339	0.091	PASS
38	0.001	2.363	0.048	n/a
39	0.006	6.650	0.087	PASS
40	0.001	2.232	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 <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	0.050			
2	0.002	0.117	1.620	n/a
3	0.043	1.238	3.450	PASS
4	0.003	0.422	0.645	n/a
5	0.043	2.503	1.710	PASS
6	0.002	0.476	0.450	n/a
7	0.042	3.676	1.155	PASS
8	0.002	0.623	0.345	n/a
9	0.040	6.593	0.600	PASS
10	0.002	0.770	0.276	n/a
11	0.037	7.495	0.495	PASS
12	0.002	0.860	0.230	n/a
13	0.035	10.979	0.315	PASS
14	0.002	1.058	0.197	n/a
15	0.032	14.149	0.225	PASS
16	0.002	1.057	0.173	n/a
17	0.029	14.627	0.199	PASS
18	0.002	1.131	0.153	n/a
19	0.026	14.721	0.178	PASS
20	0.002	1.243	0.138	n/a
21	0.023	14.482	0.161	PASS
22	0.002	1.416	0.125	n/a
23	0.020	13.766	0.147	PASS
24	0.002	1.455	0.115	n/a
25	0.018	13.007	0.135	PASS
26	0.002	1.514	0.106	n/a
27	0.015	12.018	0.125	PASS
28	0.002	1.682	0.099	n/a
29	0.013	10.952	0.116	PASS
30	0.002	1.668	0.092	n/a
31	0.011	10.242	0.109	PASS
32	0.002	1.862	0.086	n/a
33	0.009	9.216	0.102	PASS
34	0.002	1.863	0.081	n/a
35	0.008	8.306	0.096	PASS
36	0.002	2.040	0.077	n/a
37	0.007	7.800	0.091	PASS
38	0.002	2.077	0.073	n/a
39	0.007	7.774	0.087	PASS
40	0.001	2.106	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.

**KES Co., Ltd.**

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KES-EM-23T0784  
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Test Data - Voltage Fluctuations

## Maximum Flicker results

■ DC Mode

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

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## Test Setup Photos and Configuration

### Conducted Emissions at Mains Power Ports

#### ■ DC Mode



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## Conducted Emissions at Telecommunication Ports

### ■ DC Mode



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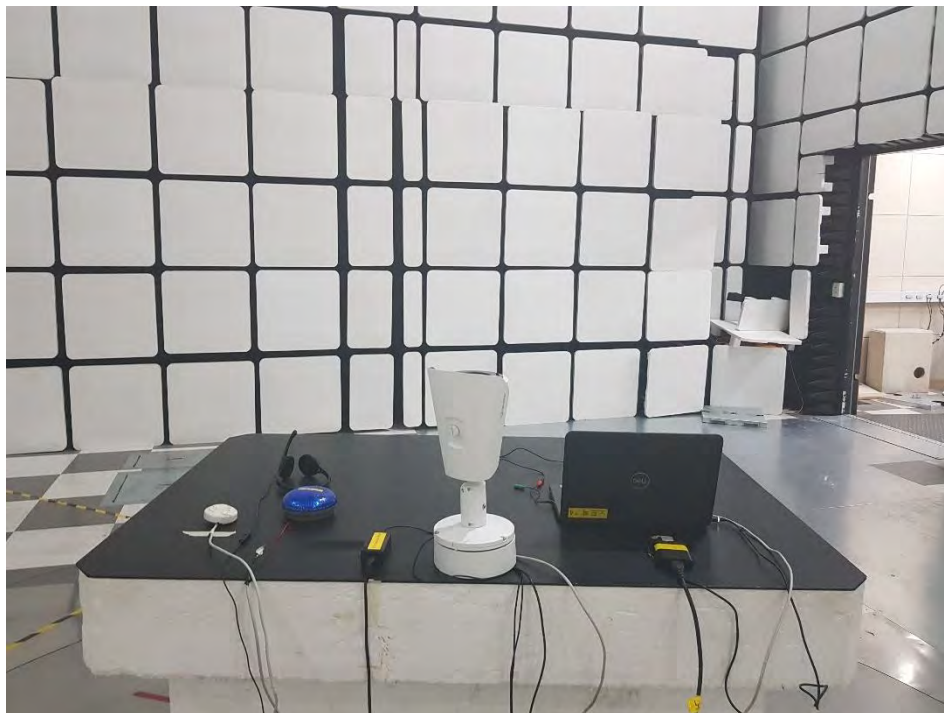
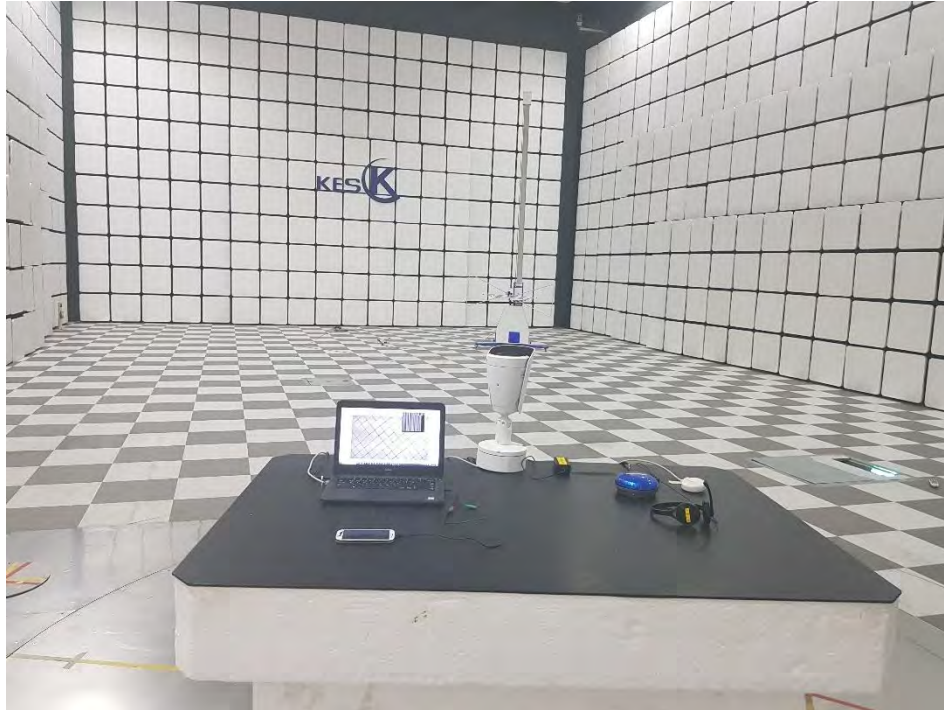
## ■ PoE Mode



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## Radiated Electric Field Emissions(Below 1 GHz)

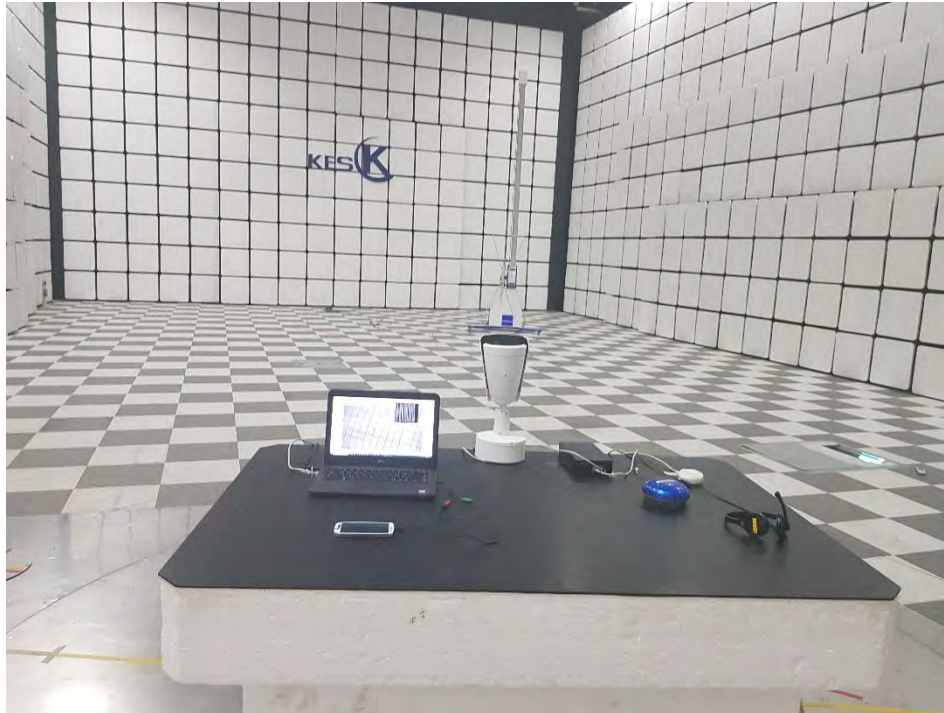
### ■ DC Mode



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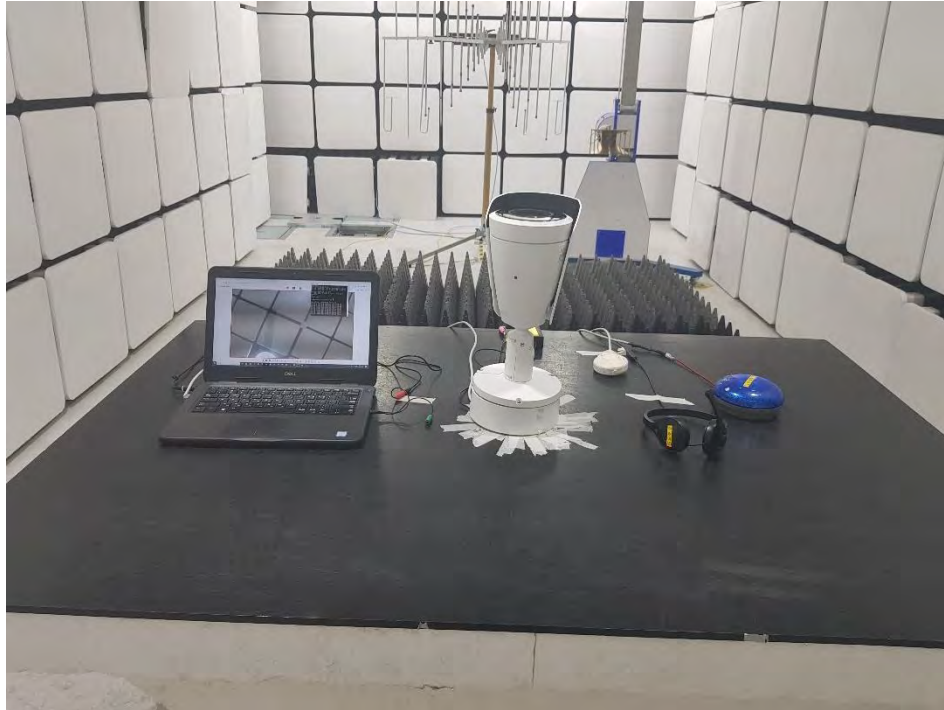
## ■ PoE Mode



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## Radiated Electric Field Emissions(Above 1 GHz)

### ■ DC Mode



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## ■ PoE Mode



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## Harmonic Current Emissions and Voltage Fluctuations and Flicker

### ■ DC Mode



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## Electrostatic Discharge

### ■ DC Mode



### ■ PoE Mode





**Radiated Electric Field Immunity**

## ■ DC Mode



## ■ PoE Mode



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## Electrical Fast Transients/Bursts

### ■ DC Mode



### ■ PoE Mode



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## Surge Transients

### ■ DC Mode



### ■ PoE Mode



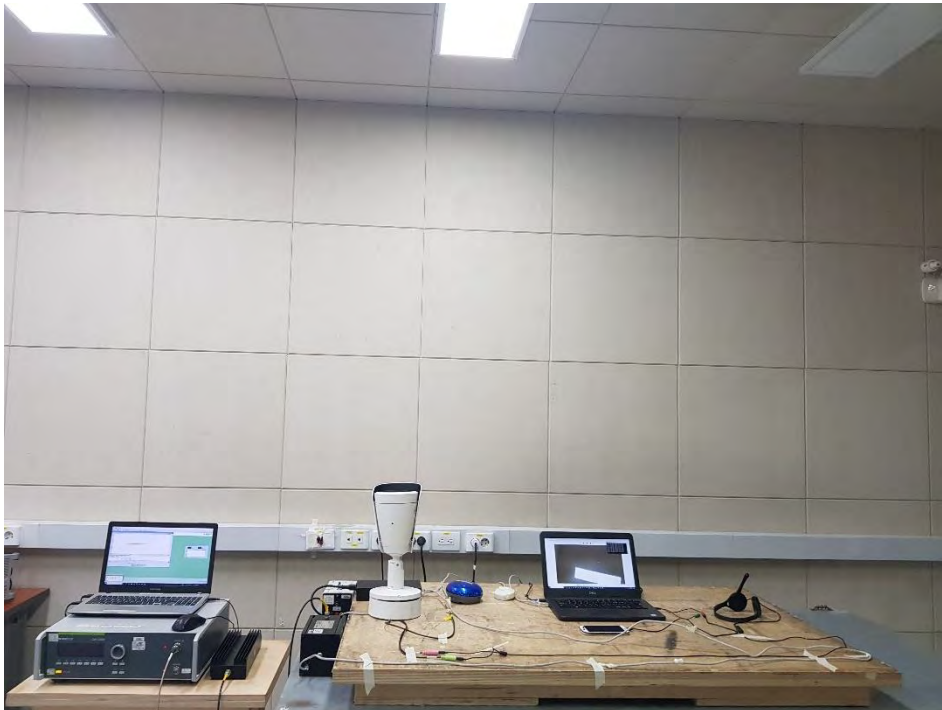
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**Conducted Disturbance**

## ■ DC Mode



## ■ PoE Mode



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## Voltage Dips and Short Interruptions

### ■ DC Mode



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## EUT External Photographs

(Top)



(Bottom)



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## EUT Internal Photographs

(Internal View)



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## EUT Internal View – Main Board

(Top)



(Bottom)

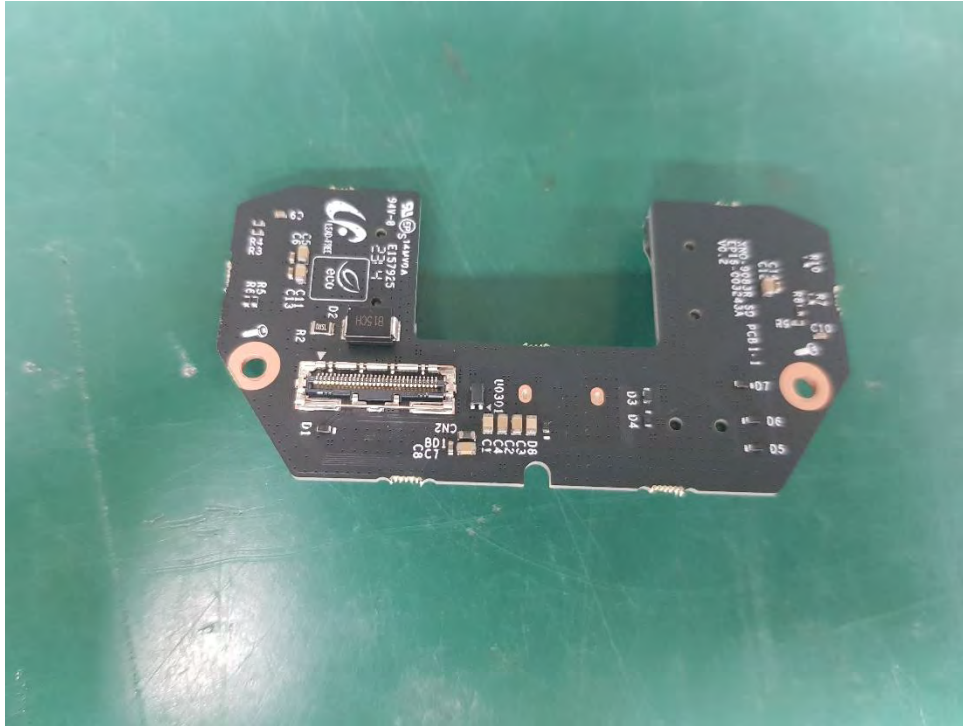


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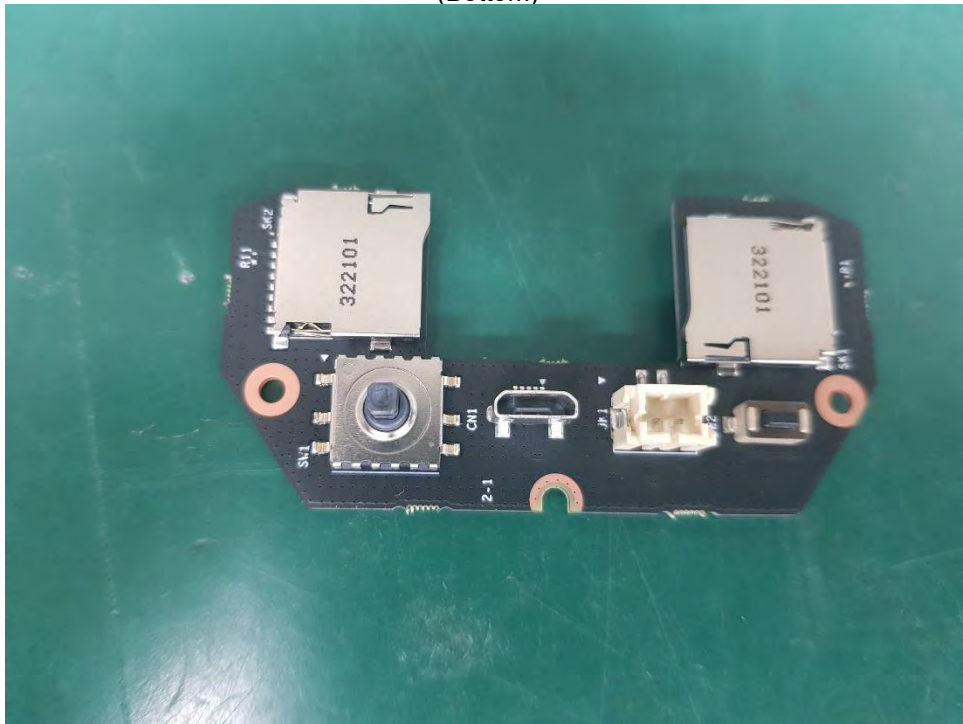


## EUT Internal View – Sub Board 1

(Top)



(Bottom)



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**EUT Internal View – Sub Board 2**

(Top)



(Bottom)



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### EUT Internal View – Sub Board 3

(Top)



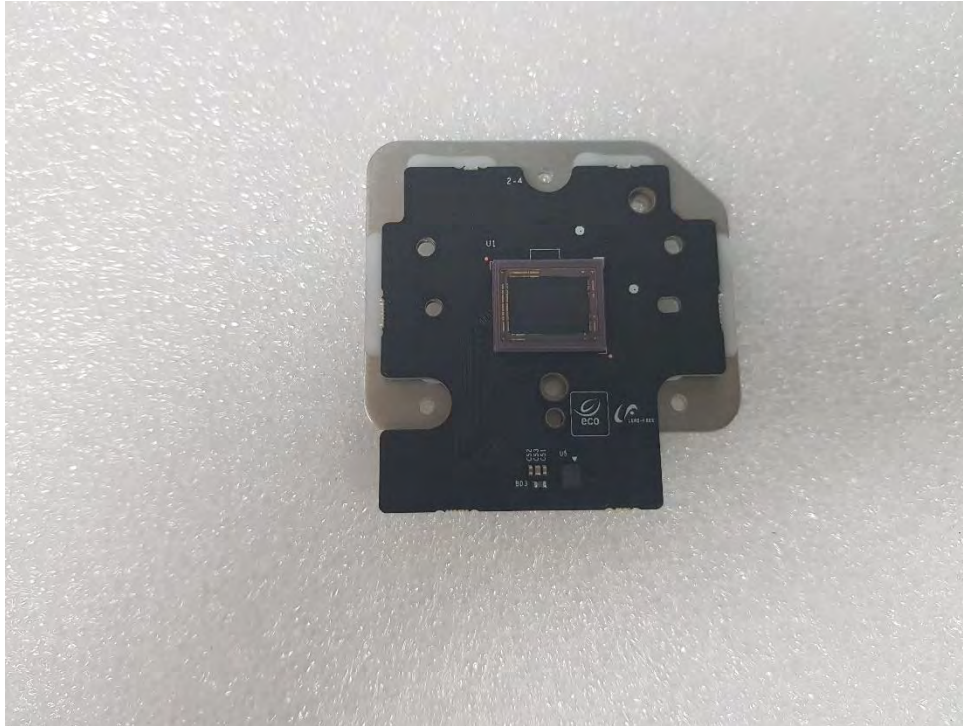
(Bottom)



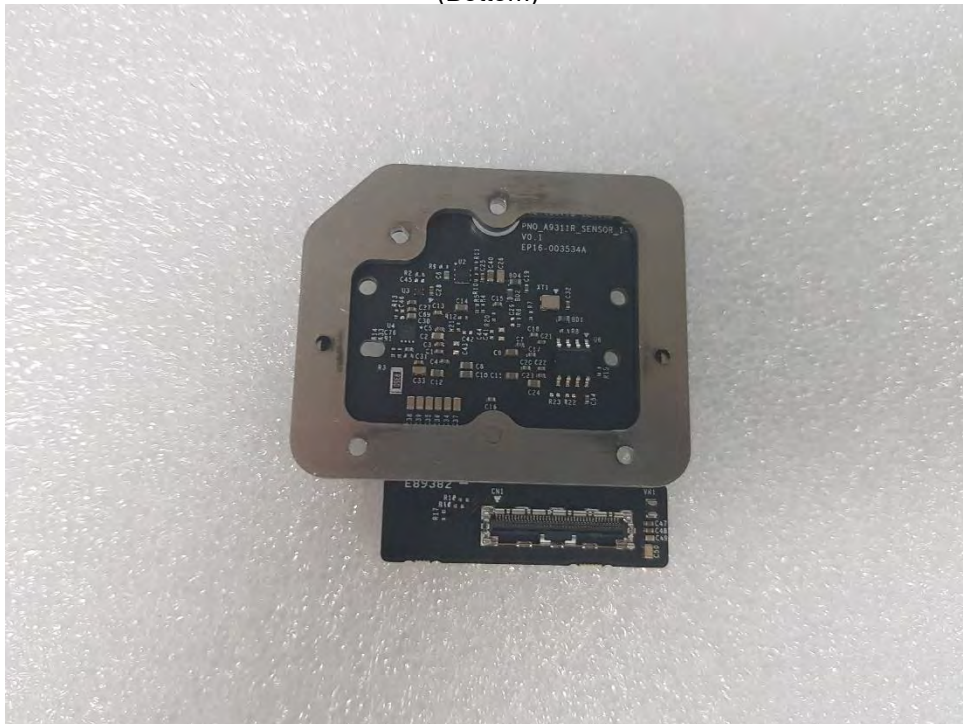
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## EUT Internal View – Sub Board 4

(Top)



(Bottom)



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## EUT Internal View – Camera Lens

(Top)



(Bottom)



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## Label and Location

**NETWORK CAMERA**

Model No : PNO-A9311R

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam

