



## EMC TEST REPORT For CE

Test Report No. : KES-EM-21T0585  
Date of Issue : Jul. 13, 2021  
Product name : NETWORK CAMERA  
Model/Type No. : XNO-8083R  
Variant Model : -  
Applicant : Hanwha Techwin Co., Ltd.  
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,  
Gyeonggi-do, Republic of Korea  
Manufacturer : 1. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.  
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 : Jun. 15, 2021  
Test date : Jul. 01, 2021 ~ Jul. 08, 2021  
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Ki Man, Kim  
EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
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
Jul. 13, 2021	KES-EM-21T0585	Issued

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## 1.0 General Product Description

### Main Specifications of EUT are:

<b>Video</b>	
Imaging Device	1/1.8" progressive CMOS
Resolution	3328x1872, 3072x1728, 2592x1944, 2688x1520, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 15fps/12fps(60Hz/50Hz)
NETD	None
Pixel Size	None
Min. Illumination	(TBD) Color: 0.04Lux(F1.3, 1/30sec, 30IRE) B/W : 0.004Lux(F1.3, 1/30sec, 30IRE), 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)	4.4~9.3mm(2.1x) motorized varifocal
Max. Aperture Ratio	F1.3
Angular Field of View	H : 112.1°(Wide)~47.5°(Tele) V : 58.0°(Wide)~26.6°(Tele) D : 137.5°(Wide)~54.6°(Tele)
Min. Object Distance	0.5m(1.64ft)
Focus Control	Simple focus, Manual
Lens Type	P-iris(IR corrected)
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, HLC, WDR, SSDR
Wide Dynamic Range	extremeWDR (120dB)
Digital Noise Reduction	WiseNR II (Based on AI engine), SSNRV
Digital Image Stabilization	Support(built-in gyro sensor)
Defog	Support
Motion Detection	8ea, 8point Polygonal zones
Privacy Masking	32ea, Quadrangle zones - Color : Gray, Green, Red, Blue, Black, White - Mosaic
Gain Control	Support
White Balance	ATW / Narrow ATW / AWC / Manual / Indoor / Outdoor
LDC	Support (Fill/stretch mode)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2~1/12,000sec) Auto prefer shutter control(Based on AI engine)

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Digital PTZ	Support
Video Rotation	Flip, Mirror, Hallway view(90°/270°)
Analytics	<ul style="list-style-type: none"> <li>- Analytics events based on AI engine(NPU) : Object detection (Person/Face/Vehicle(car/truck/bus/bicycle/motorcycle)/Licence plate), IVA (Virtual line/Area, Enter/Exit, Loitering, direction, intrusion)</li> <li>- Analytics events : Defocus detection, Motion detection, Tampering, Fog detection, Audio detection, Sound classification, Shock detection, Appear/Disappear</li> </ul>
Business Intelligence	Based on AI engine(NPU) : People counting, Queue management, Heatmap
Serial Interface	None
Alarm I/O	2 configurable I/O ports, DC 12V output(Max. 50mA)
Alarm Triggers	Analytics, Network disconnect, Alarm input, App event, Time schedule
Alarm Events	When alarm trigger occurred <ul style="list-style-type: none"> <li>- File upload(image) : e-mail/FTP</li> <li>- Notification : e-mail</li> <li>- Recording : SD/SDHC/SDXC or NAS recording at event triggers</li> <li>- Alarm output</li> <li>- Handover(PTZ preset, Send message by HTTP/HTTPS/TCP)</li> <li>- Audio clip playback</li> <li>- PTZ preset</li> </ul>
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	WiseIR 50m(164.04ft)(TBD)
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(10/100/1000BASE-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(Based on 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
Streaming	Unicast(20 users) / Multicast Multiple streaming(Up to 10 profiles, 3 virtual channel support)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTP (TCP, UDP Unicast)
Security	TPM 2.0 (FIPS 140-2 level 2) HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access log 802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2) Device Certificate(Hanwha Techwin Root CA, pre-installed) Secure by default certificate(TBD) Secure OS/Boot/Storage, Verify firmware forgery

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Application Programming Interface	ONVIF Profile S/G/T SUNAPI(HTTP API) Wisenet open platform
<b>General</b>	
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish,, Portuguese, Czech, Polish, Turkish, Dutch, Greek, Hungarian
Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 2slot Max. 1TB (512GB * 2)
Memory	4GB RAM, 512MB Flash
<b>Environmental &amp; Electrical</b>	
Operating Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) NEMA TS-2 : 74°C * Start up should be done at above -30°C less than 95%RH(non-condensing) Humidity control /w GORE vent
Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH
Certification	IP66/IP67, NEMA4X, IK10
Input Voltage	PoE+(IEEE802.3at, Class4), 12VDC
Power Consumption	TBD Power redundancy failover
<b>Mechanical</b>	
Color / Material	White / Aluminum Hard-coated window
RAL Code	RAL7022
Product Dimensions / Weight	Ø91x368.6mm(Ø3.85"x14.51"), 2.2kg(4.85 lb) (TBD)
Compatible Conduit hole / Gangbox	3/4" (M25) single, double, 4" octagon, 4" square
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: 44.8m(147.02ft) / Tele: 151.3m(496.29ft)
Observe (63PPM/ 19PPF)	Wide: 17.9m(58.81ft) / Tele: 60.5m(198.52ft)
Recognize (125PPM/ 38PPF)	Wide: 9.0m(29.4ft) / Tele: 30.3m(99.26ft)
Identify (250PPM/ 76PPF)	Wide: 4.5m(14.7ft) / Tele: 15.1m(49.63ft)

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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, 50Hz      ☒ 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	XNO-8083R	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	EUT

## 1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Adaptor	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
PoE Adaptor	PSE156G 4-Pair,Hi- Power	-	-	-
Notebook	P95G001	8KM8HT2	DELL	-
Notebook Adaptor	LA65NS2-01	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	-
Alarm1	-	-	-	-
Alarm2	-	-	-	-
Smartphone	LG-SU760	108KPQJ0186212	LG	-
Headset	K550	-	Britz®	-
Micro SD Card1	-	-	Sandisk	8 GB
Micro SD Card2	-	-	Sandisk	8 GB

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## 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)	Notebook	RJ-45 (LAN)	3.0	S
	Slot	Micro SD Card1	Slot	-	-
	Slot	Micro SD Card2	Slot	-	-
	3 Pin	Alarm1	3 Pin	3.0	U
	2 Pin	Alarm2	2 Pin	3.0	U
	3.5 mm	Headset	3.5 mm	1.7	U
	3.5 mm			1.7	U
	2 Pin	Adaptor	2 Pin	1.6	U
Notebook	3.5 mm	Smartphone	3.5 mm	0.8	U
	JACK	Notebook Adaptor	JACK	1.7	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 Adaptor	RJ-45 (PoE)	3.0	S
	Slot	Micro SD Card1	Slot	-	-
	Slot	Micro SD Card2	Slot	-	-
	3 Pin	Alarm1	3 Pin	3.0	U
	2 Pin	Alarm2	2 Pin	3.0	U
	3.5 mm	Headset	3.5 mm	1.7	U
	3.5 mm			1.7	U
Notebook	RJ-45 (LAN)	PoE Adaptor	RJ-45 (LAN)	3.5	S
	3.5 mm	Smartphone	3.5 mm	0.8	U
	JACK	Notebook Adaptor	JACK	1.7	U

\* Unshielded=U, Shielded=S

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## 1.7 EUT Operating Mode(s)

Test Mode	operating
DC Mode	EUT Monitoring, Ping Test
PoE Mode	

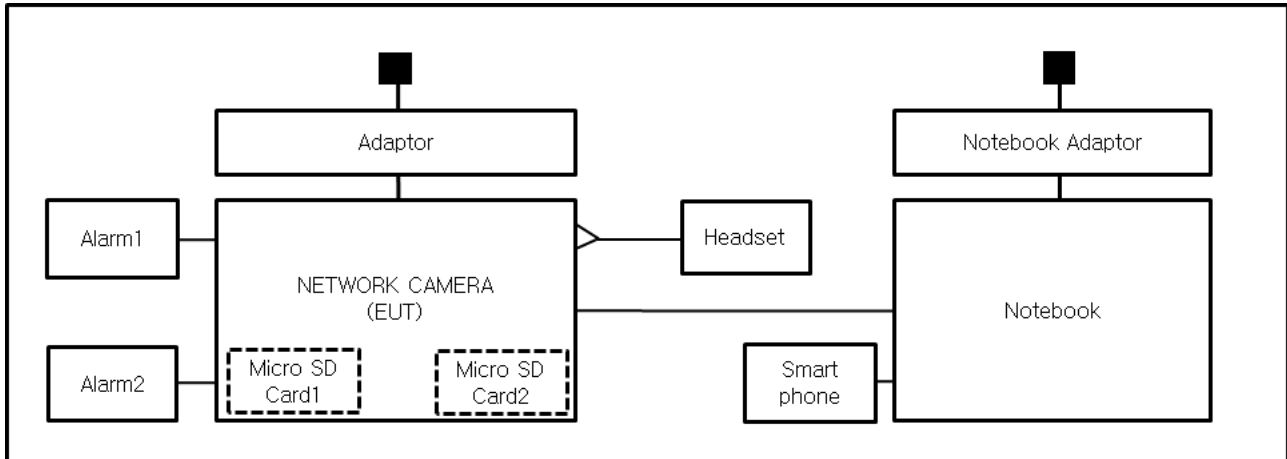
EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Techwin Co., Ltd.

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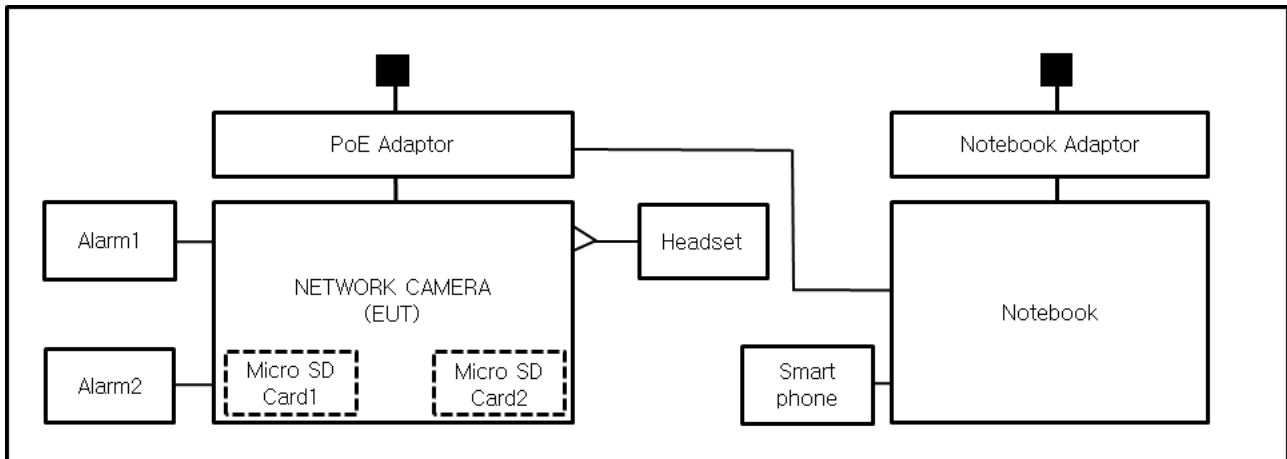
## 1.8 Configuration

■ AC Main  
 □ DC Main

### ■ DC Mode



### ■ PoE Mode



## 1.9 Remarks when standards applied

- USB ports, VIDEO ports are not used and have not been tested.






## 1.10 Calibration Details of Equipment Used for Measurement

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

## 1.11 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4:2014 and CISPR 16-1-4:2019

## 1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	<b>RRA</b>	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	<b>KOLAS</b>	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	<b>FCC</b>	3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	<b>ISED</b>	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298-1
JAPAN	<b>VCCI</b>	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	 R-20056, C-20036, T-20040, G-20057
Europe	<b>TÜV SÜD</b>	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area 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 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1  
☐ Class A

☐ Group 2  
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 61547:2009

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☒ EN 50130-4:2011

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

☐ EN 61326-1:2013

☒ **EMC – Regulations 2016/1091**

☒ BS EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ BS EN 50130-4:2011

☒ BS EN 61000-3-2:2014

☒ BS EN 61000-3-3:2013



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- |   |                                  |                                  |
|---|----------------------------------|----------------------------------|
| <input type="checkbox"/> <b>VCCI-CISPR 32:2016</b>            | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>AS/NZS CISPR32:2015</b>           | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>47 CFR Part 15, Subpart B</b>     |                                  |                                  |
| <input type="checkbox"/> CISPR 22:2009 +A1:2010               | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2014                      |                                  |                                  |
| <input type="checkbox"/> <b>IC Regulation ICES-003 : 2016</b> |                                  |                                  |
| <input type="checkbox"/> CAN/CSA CISPR 22-10                  | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2014                      |                                  |                                  |
| <input type="checkbox"/> <b>RE- Directive 2014/53/EU</b>      |                                  |                                  |
| <input type="checkbox"/> EN 301 489-1 V1.9.2                  |                                  |                                  |
| <input type="checkbox"/> Equipment for fixed use              |                                  |                                  |
| <input type="checkbox"/> Equipment for vehicular use          |                                  |                                  |
| <input type="checkbox"/> Equipment for portable use           |                                  |                                  |
| <input type="checkbox"/> EN 301 489-3 V1.6.1                  |                                  |                                  |
| <input type="checkbox"/> EN 301 489-17 V2.2.1                 |                                  |                                  |
| <input type="checkbox"/> EN 60945:2002                        |                                  |                                  |

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## 2.1 Conducted Emissions at Mains Power Ports

### Test Date

Jul. 01, 2021

### 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	01, 15, 2022
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	12, 29, 2021
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021

### Test Conditions

Temperature: (24,6 ± 0,2) °C

Relative Humidity: (46,7 ± 0,2) % R.H.

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.

## 2.2 Conducted Emissions at Telecommunication Ports

### Test Date

Jul. 01, 2021

### 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	01, 15, 2022
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	12, 29, 2021
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021
<input type="checkbox"/>	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 30, 2021
<input type="checkbox"/>	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	12, 30, 2021
<input checked="" type="checkbox"/>	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	12, 29, 2021

### Test Conditions

Temperature: (24,6 ± 0,2) °C

Relative Humidity: (46,7 ± 0,2) % R.H.

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### 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

Jul. 01, 2021

### 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	04, 01, 2022
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	11, 25, 2021
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
<input checked="" type="checkbox"/>	ATTENUATOR	8491A	HP	32173	03, 10, 2022

### Test Conditions

Temperature: (24,4 ± 0,2) °C  
Relative Humidity: (46,5 ± 0,3) % 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

Jul. 04, 2021

### 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	08, 05, 2021
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 07, 2022
<input type="checkbox"/>	ATTENUATOR	8491A	HP	35496	03, 10, 2022
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022

### Test Conditions

Temperature: (24,9 ± 0,3) °C

Relative Humidity: (47,1 ± 0,4) % R.H.

### Frequency Range of Measurement

1 GHz to 6 GHz

### Instrument Settings

IF Band Width: 1 MHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.



## 2.5 Harmonic Current Emissions

### Test Date

Jul. 07, 2021

### 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	04, 06, 2022
<input checked="" type="checkbox"/>	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

### Test Conditions

Temperature: (23,7 ± 0,1) °C

Relative Humidity: (47,4 ± 0,2) % R.H.

### Classification of Equipment for Harmonic Current Emissions

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

### Test Results

The requirements are:

- ☒ PASS
- ☐ NOT PASS
- ☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.



## 2.6 Voltage Fluctuations and Flicker

### Test Date

Jul. 07, 2021

### 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	04, 06, 2022
<input checked="" type="checkbox"/>	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

### Test Conditions

Temperature: (23,7 ± 0,3) °C  
Relative Humidity: (47,4 ± 0,4) % 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 / BS 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  
BS EN 61000-4-2:2009

#### Test Date

Jul. 04, 2021

#### 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	02, 01, 2022
<input checked="" type="checkbox"/>	HCP	-	KES	-	-
<input checked="" type="checkbox"/>	VCP	-	Noise Ken	-	-

#### Test Conditions

Temperature: (24,8 ± 0,2) °C  
Relative Humidity: (46,6 ± 0,3) % R.H.  
Atmospheric Pressure: (99,7 ± 0,0) kPa

#### Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

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

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

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

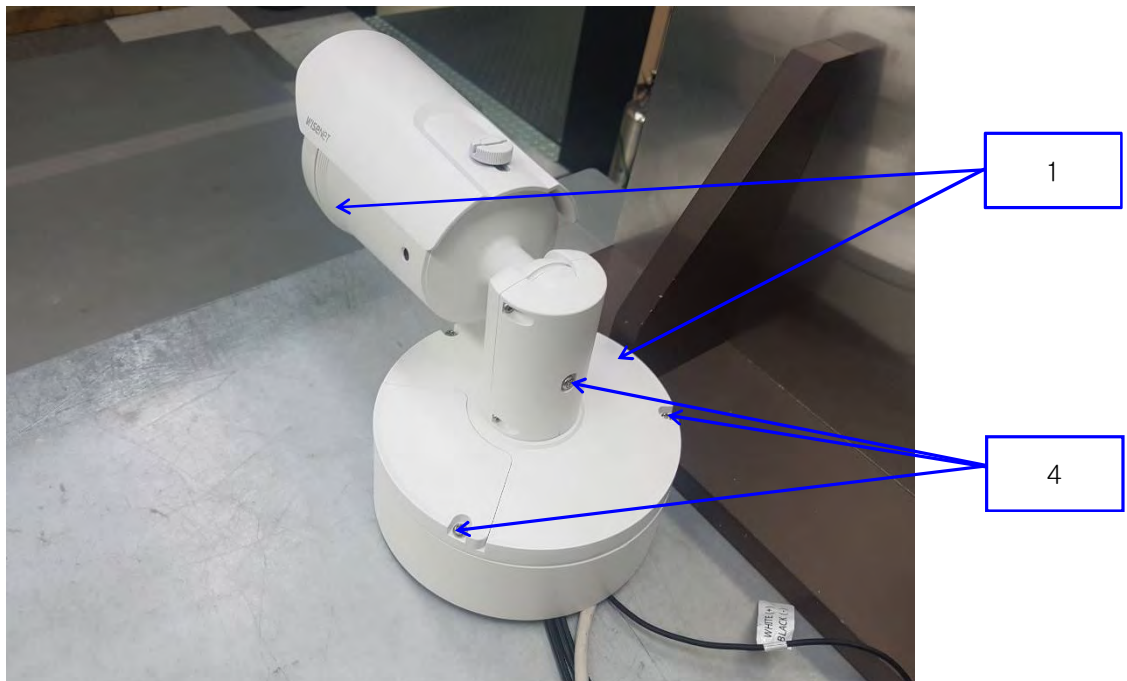
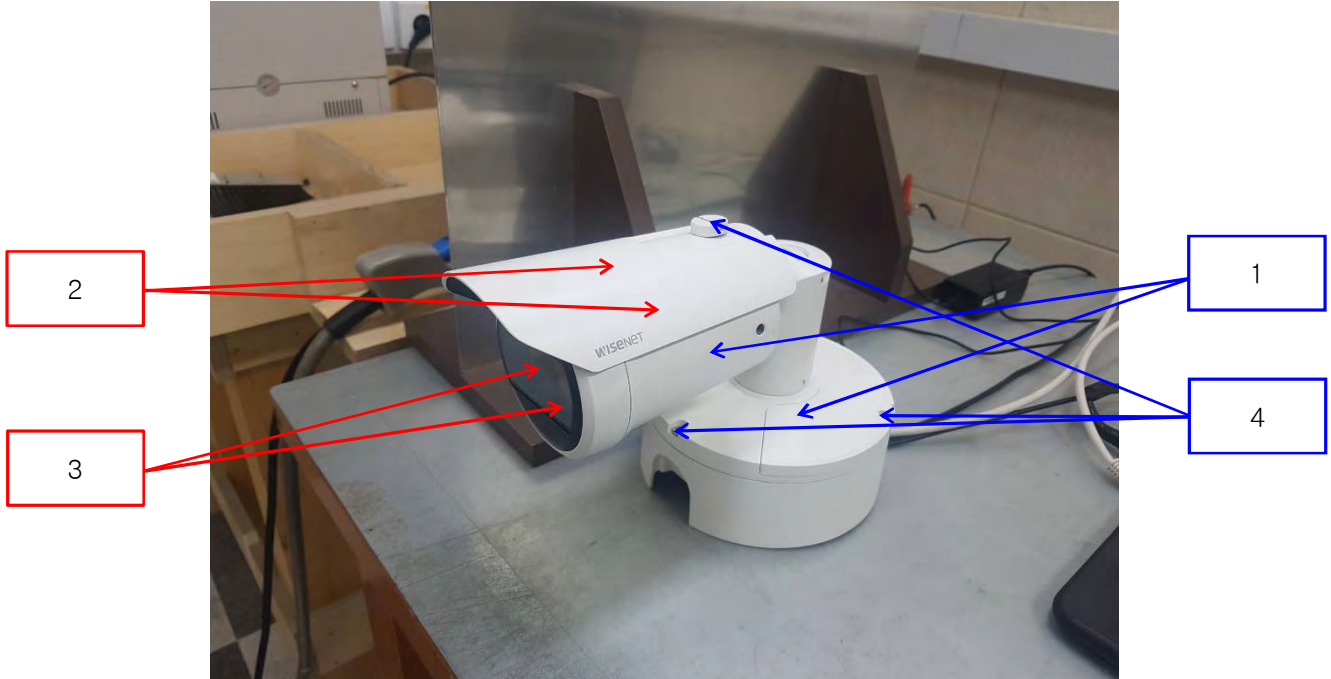
Required Performance Criteria: ☒ Complied

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## Location of Discharge:

■ DC Mode

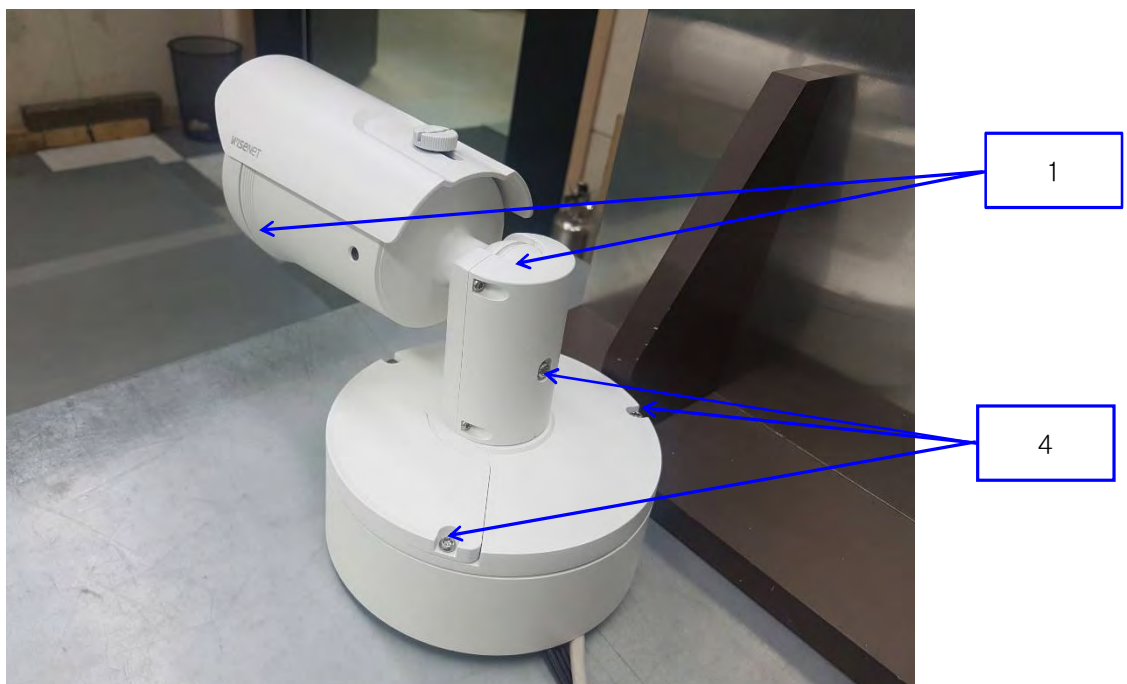
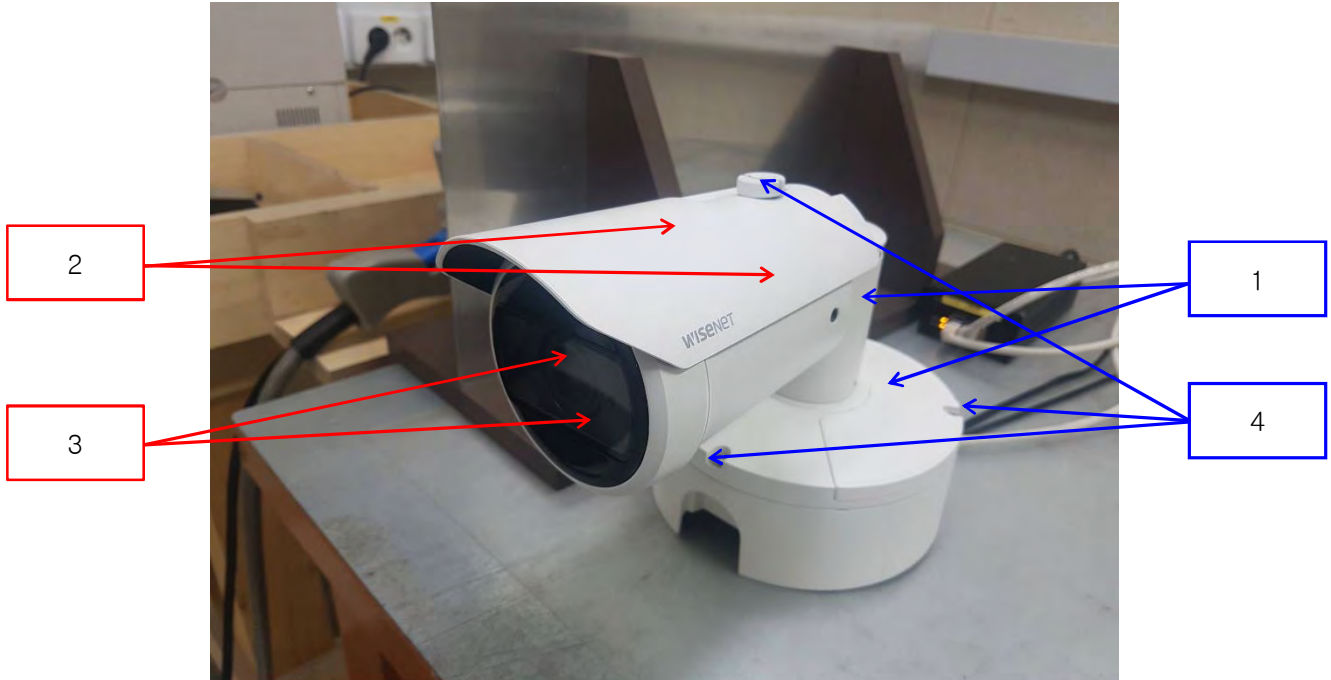
Air
Contact



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■ PoE Mode





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**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	Enclosure 1	Contact Discharge	Complied	-
2	Enclosure 2	Air Discharge	Complied	-
3	Lens	Air Discharge	Complied	-
4	Screw	Contact 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	Enclosure 1	Contact Discharge	Complied	-
2	Enclosure 2	Air Discharge	Complied	-
3	Lens	Air Discharge	Complied	-
4	Screw	Contact 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 61000-4-3:2006 +A2:2010  
BS EN 61000-4-3:2006 +A2:2010

### Test Date

Jul. 06, 2021

### 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	08, 05, 2021
<input checked="" type="checkbox"/>	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
<input checked="" type="checkbox"/>	POWER METER	E4419B	Agilent	GB40203000	04, 01, 2022
<input checked="" type="checkbox"/>	CW POWER SENSOR	E4412A	Agilent	US38488240	04, 01, 2022
<input checked="" type="checkbox"/>	CW POWER SENSOR	E4412A	Agilent	MY41501662	04, 01, 2022
<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, 11, 2022

### Test Conditions

Temperature: (24,7 ± 0,3) °C  
Relative Humidity: (46,9 ± 0,5) % R.H.  
Atmospheric Pressure: (99,7 ± 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  
BS EN 61000-4-4:2012

#### Test Date

Jul. 08, 2021

#### 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, 26, 2021
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 26, 2021
<input checked="" type="checkbox"/>	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 26, 2021

#### Test Conditions

Temperature: (25,0 ± 0,2) °C  
Relative Humidity: (46,8 ± 0,3) % R.H.  
Atmospheric Pressure: (99,8 ± 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 kHz ☒ 100 kHz

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
PE	-	-
L – N	Complied	Complied
L – PE	-	-
N – PE	-	-
L – N – PE	-	-

☐ 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 1	Complied	Complied
Alarm 2	Complied	Complied

☒ PoE Mode

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

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

☐ 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 1	Complied	Complied
Alarm 2	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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### 3.4 Surge Transients

**Reference Standard**

EN 61000-4-5:2014

BS EN 61000-4-5:2014

**Test Date**

Jul. 08, 2021

**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, 26, 2021
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 26, 2021
<input checked="" type="checkbox"/>	CDN	CNV 508N1	EM TEST	P1610176296	11, 27, 2021

**Test Conditions**

Temperature: (25,0 ± 0,3) °C  
Relative Humidity: (46,8 ± 0,4) % R.H.  
Atmospheric Pressure: (99,8 ± 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

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☒ PoE Mode☐ Line to Line – Differential Mode

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

☐ 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 (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☐ NOT APPLICABLE**Remarks**PASS Required Performance Criteria

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### 3.5 Conducted Disturbance

#### Reference Standard

EN 61000-4-6:2014  
BS EN 61000-4-6:2014

#### Test Date

Jul. 05, 2021

#### 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, 25, 2021
<input checked="" type="checkbox"/>	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 25, 2021
<input checked="" type="checkbox"/>	CDN	CDN M016	TESEQ	43694	11, 25, 2021
<input checked="" type="checkbox"/>	CDN	CDN M016	TESEQ	43697	11, 25, 2021
<input checked="" type="checkbox"/>	CDN	CDN ST08A	TESEQ	43886	11, 25, 2021
<input checked="" type="checkbox"/>	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 26, 2021

#### Test Conditions

Temperature: (24,7 ± 0,4) °C  
Relative Humidity: (46,5 ± 0,5) % R.H.  
Atmospheric Pressure: (99,5 ± 0,0) kPa



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www.kes.co.kr

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KES-EM-21T0585  
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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 1	Clamp	Complied
Alarm 2	Clamp	Complied

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**■ 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 1	Clamp	Complied
Alarm 2	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

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### 3.6 Voltage Dips and Short Interruptions

**Reference Standard**

EN 61000-4-11:2004

BS EN 61000-4-11:2004

**Test Date**

Jul. 08, 2021

**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, 26, 2021
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 26, 2021

**Test Conditions**

Temperature: (25,0 ± 0,1) °C  
Relative Humidity: (46,8 ± 0,2) % R.H.  
Atmospheric Pressure: (99,8 ± 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(100%, 250cycle), EUT was turned off but after the test, it was recovered without operator's intervention.

## APPENDIX A – TEST DATA

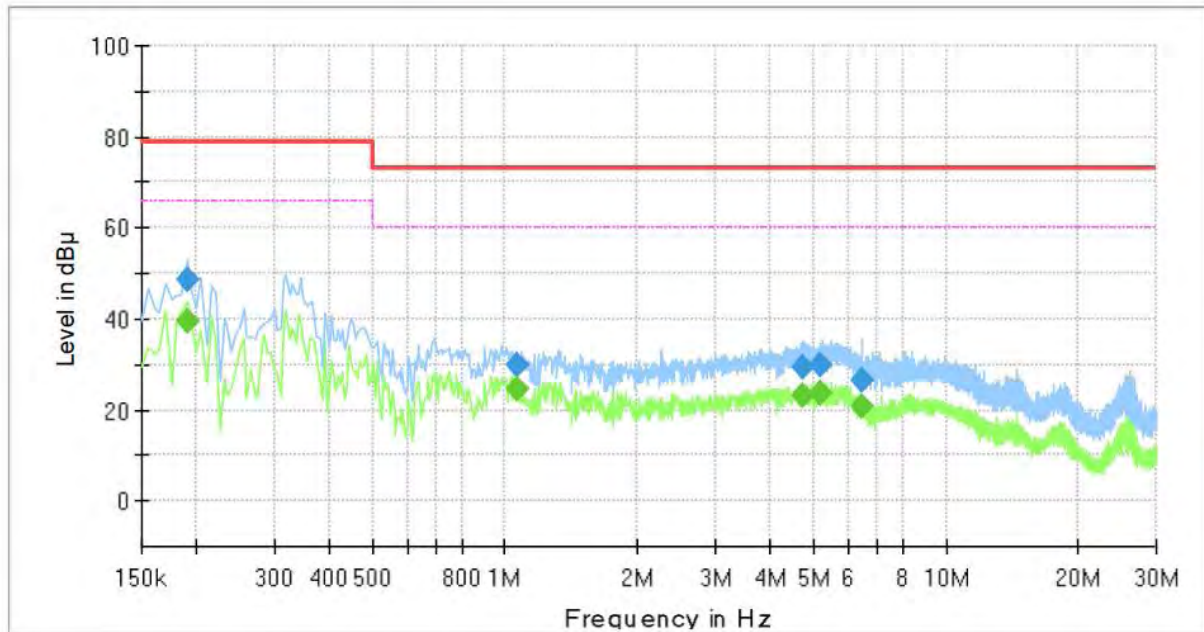
### Conducted Emissions at Mains Power Ports

■ DC Mode

[HOT]

#### Common Information

Test Description:	Conducted Emission
Model No.:	XNO-8083R
Phase:	L1
Mode:	DC
Operator Name:	KES



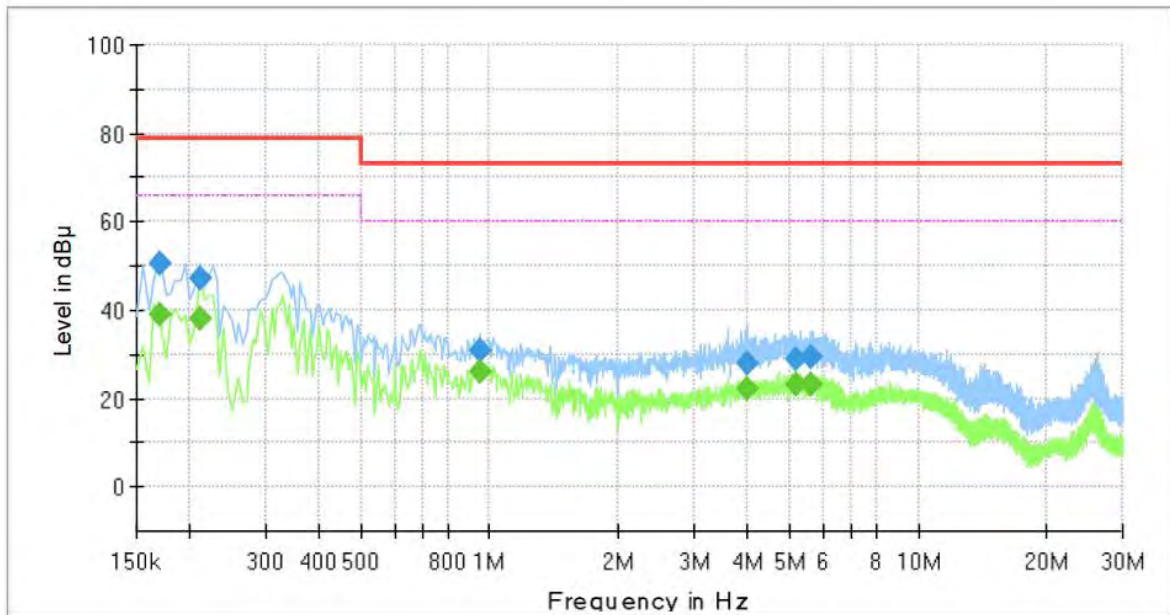
#### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.190000	---	39.24	66.00	26.76	1000.0	9.000	L1	19.4
0.190000	48.64	---	79.00	30.36	1000.0	9.000	L1	19.4
1.070000	---	24.75	60.00	35.25	1000.0	9.000	L1	20.1
1.070000	29.75	---	73.00	43.25	1000.0	9.000	L1	20.1
4.730000	---	23.32	60.00	36.68	1000.0	9.000	L1	19.7
4.730000	29.16	---	73.00	43.84	1000.0	9.000	L1	19.7
5.170000	---	23.74	60.00	36.26	1000.0	9.000	L1	19.6
5.170000	29.92	---	73.00	43.08	1000.0	9.000	L1	19.6
6.425000	---	20.59	60.00	39.41	1000.0	9.000	L1	19.5
6.425000	26.70	---	73.00	46.30	1000.0	9.000	L1	19.5

## [NEUTRAL]

### Common Information

Test Description:	Conducted Emission
Model No.:	XNO-8083R
Phase:	N
Mode:	DC
Operator Name:	KES



### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.170000	---	38.85	66.00	27.15	1000.0	9.000	N	19.4
0.170000	50.41	---	79.00	28.59	1000.0	9.000	N	19.4
0.210000	---	38.15	66.00	27.85	1000.0	9.000	N	19.4
0.210000	47.22	---	79.00	31.78	1000.0	9.000	N	19.4
0.950000	---	26.09	60.00	33.91	1000.0	9.000	N	20.0
0.950000	30.92	---	73.00	42.08	1000.0	9.000	N	20.0
4.010000	---	22.15	60.00	37.85	1000.0	9.000	N	19.9
4.010000	27.96	---	73.00	45.04	1000.0	9.000	N	19.9
5.160000	---	23.09	60.00	36.91	1000.0	9.000	N	19.6
5.160000	29.12	---	73.00	43.88	1000.0	9.000	N	19.6
5.590000	---	23.05	60.00	36.95	1000.0	9.000	N	19.6
5.590000	29.40	---	73.00	43.60	1000.0	9.000	N	19.6

#### ◆ 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))

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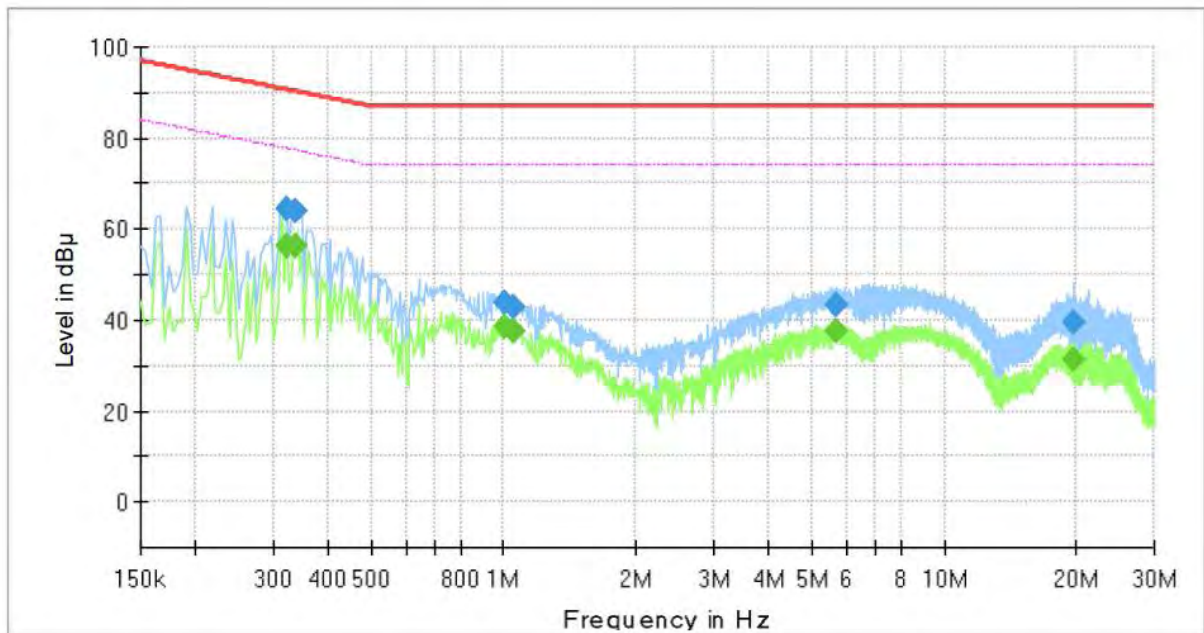
## Conducted Emissions at Telecommunication Ports

■ DC Mode

[1 000 Mbps]

### Common Information

Test Description:	Telecommunication Emission
Model No.:	XNO-8083R
Mode :	DC
Speed :	1 000 Mbps
Operator Name:	KES

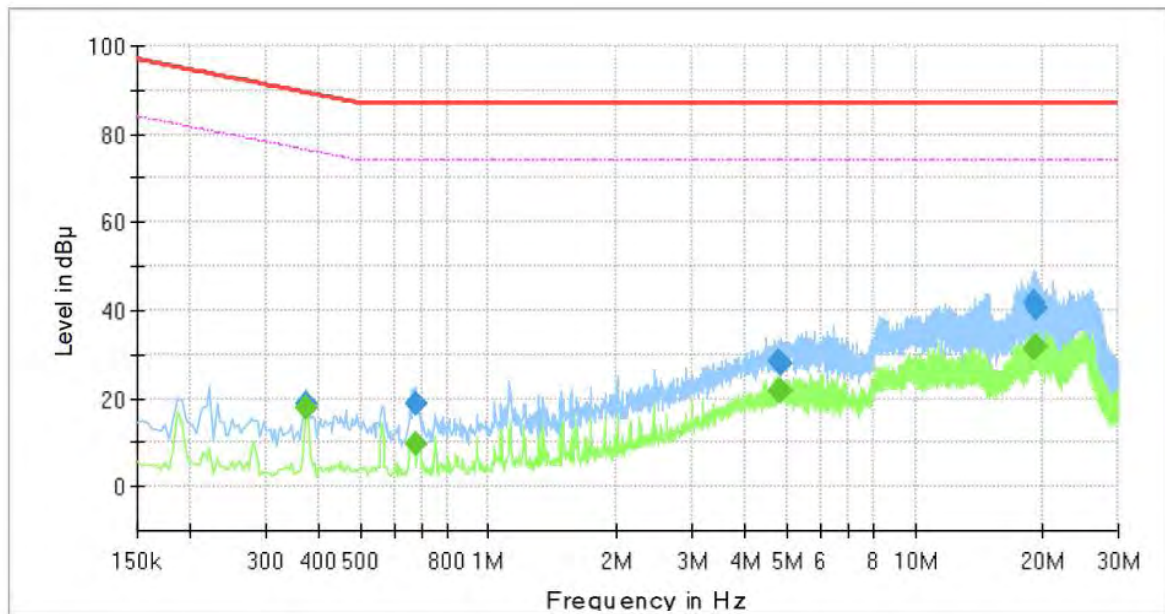


### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.322000	---	56.07	77.66	21.59	1000.0	9.000	Single Line	19.5
0.322000	64.47	---	90.66	26.19	1000.0	9.000	Single Line	19.5
0.338000	---	56.26	77.25	20.99	1000.0	9.000	Single Line	19.5
0.338000	63.92	---	90.25	26.33	1000.0	9.000	Single Line	19.5
1.010000	---	38.49	74.00	35.51	1000.0	9.000	Single Line	19.9
1.010000	43.58	---	87.00	43.42	1000.0	9.000	Single Line	19.9
1.054000	---	37.63	74.00	36.37	1000.0	9.000	Single Line	19.9
1.054000	42.60	---	87.00	44.40	1000.0	9.000	Single Line	19.9
5.662000	---	37.32	74.00	36.68	1000.0	9.000	Single Line	19.4
5.662000	43.22	---	87.00	43.78	1000.0	9.000	Single Line	19.4
19.746000	---	31.39	74.00	42.61	1000.0	9.000	Single Line	20.1
19.746000	39.58	---	87.00	47.42	1000.0	9.000	Single Line	20.1

**PoE Mode**
**[1 000 Mbps]**
**Common Information**

Test Description:	Telecommunication Emission
Model No.:	XNO-8083R
Mode :	PoE
Speed :	1 000 Mbps
Operator Name:	KES


**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.374000	---	17.99	76.41	58.42	1000.0	9.000	Single Line	19.5
0.374000	19.01	---	89.41	70.40	1000.0	9.000	Single Line	19.5
0.674000	---	9.85	74.00	64.15	1000.0	9.000	Single Line	19.8
0.674000	18.67	---	87.00	68.33	1000.0	9.000	Single Line	19.8
4.818000	---	21.58	74.00	52.42	1000.0	9.000	Single Line	19.5
4.818000	28.20	---	87.00	58.80	1000.0	9.000	Single Line	19.5
4.838000	---	21.58	74.00	52.42	1000.0	9.000	Single Line	19.5
4.838000	27.74	---	87.00	59.26	1000.0	9.000	Single Line	19.5
18.938000	---	31.54	74.00	42.46	1000.0	9.000	Single Line	20.1
18.938000	42.01	---	87.00	44.99	1000.0	9.000	Single Line	20.1
19.146000	---	31.79	74.00	42.21	1000.0	9.000	Single Line	20.1
19.146000	40.46	---	87.00	46.54	1000.0	9.000	Single Line	20.1

**♦ Calculation**

$$\text{QuasiPeak [dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value [dBuV]} + \text{Corr. [dB]}$$

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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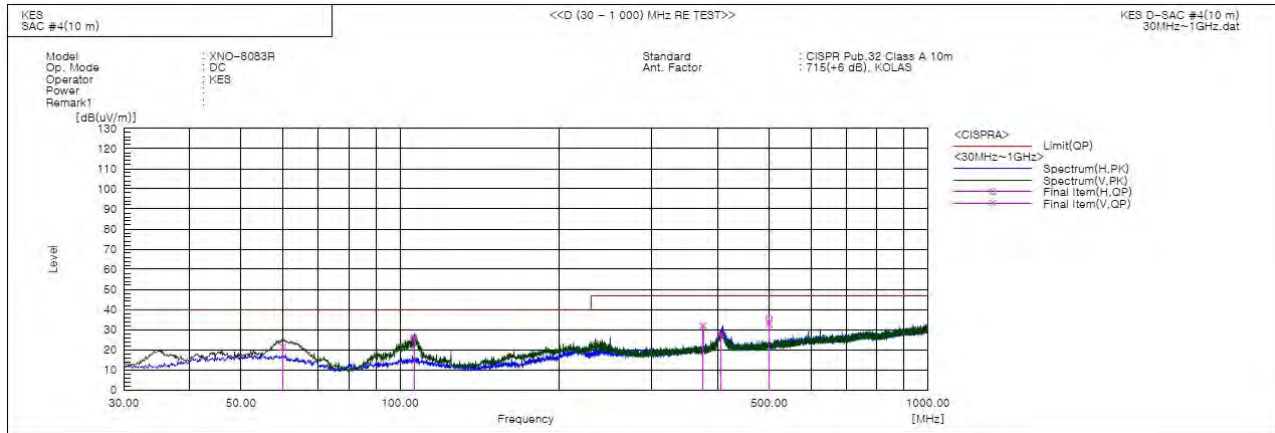
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## Radiated Electric Field Emissions(Below 1 GHz)

### ■ 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	60.070	V	43.3	-22.0	21.3	40.0	18.7	100.0	256.0	
2	106.388	V	48.4	-22.4	26.0	40.0	14.0	356.0	348.0	
3	374.956	V	46.7	-14.8	31.9	47.0	15.1	221.0	172.0	
4	404.663	V	41.9	-14.2	27.7	47.0	19.3	101.0	156.0	
5	499.965	V	44.4	-11.6	32.8	47.0	14.2	100.0	172.0	
6	499.965	H	47.4	-11.6	35.8	47.0	11.2	251.0	270.0	

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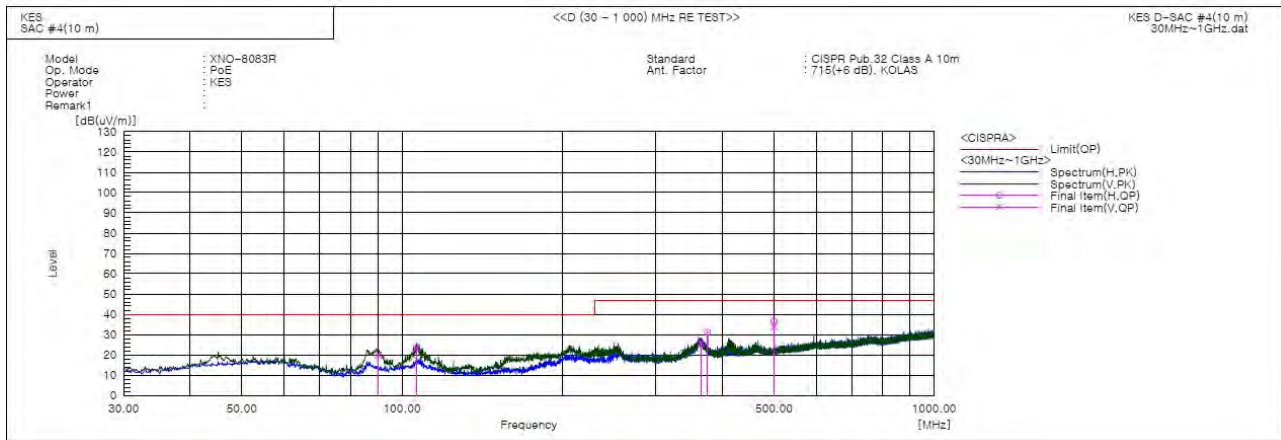


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### ■ PoE Mode



### 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	90.261	V	44.0	-24.1	19.9	40.0	20.1	125.0	13.0	
2	106.509	V	45.7	-22.4	23.3	40.0	16.7	119.0	0.0	
3	364.286	V	40.9	-15.0	25.9	47.0	21.1	100.0	0.0	
4	374.956	H	46.0	-14.8	31.2	47.0	15.8	351.0	268.0	
5	499.965	V	45.3	-11.6	33.7	47.0	13.3	100.0	224.0	
6	499.965	H	48.4	-11.6	36.8	47.0	10.2	220.0	329.0	

### ◆ Calculation – SEMI ANECHOIC CHAMBER #4(10 m)

Result(QP) [dB( $\mu$ V/m)] = (Reading(QP)[dB( $\mu$ V)] + c.f[dB(1/m)]

Margin(QP)[dB] = Limit[dB( $\mu$ V/m)] - Result(QP) [dB( $\mu$ 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



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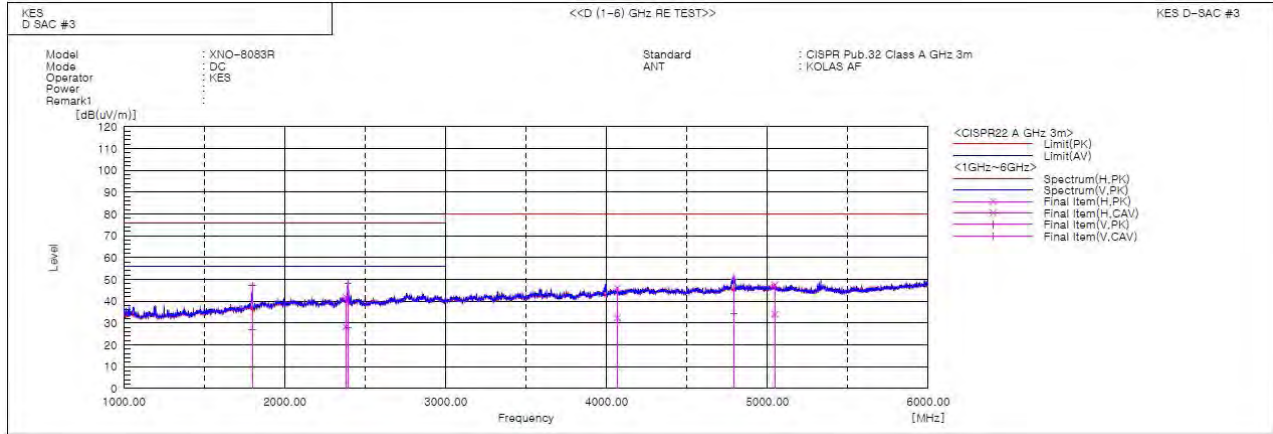
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## Radiated Electric Field Emissions(Above 1 GHz)

### ■ 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	1798.099	V	50.0	29.7	-2.9	47.1	26.8	76.0	56.0	28.9	29.2	100.0	234.7	
2	2379.423	H	41.7	28.1	0.2	41.9	28.3	76.0	56.0	34.1	27.7	100.0	170.5	
3	2393.000	V	47.9	27.9	0.2	48.1	28.1	76.0	56.0	27.9	27.9	100.0	320.3	
4	4067.000	H	39.9	26.1	6.2	46.1	32.3	80.0	60.0	33.9	27.7	100.0	356.8	
5	4790.000	V	41.5	26.0	8.5	50.0	34.5	80.0	60.0	30.0	25.5	100.0	22.3	
6	5047.746	H	38.5	25.1	9.0	47.5	34.1	80.0	60.0	32.5	25.9	100.0	359.4	

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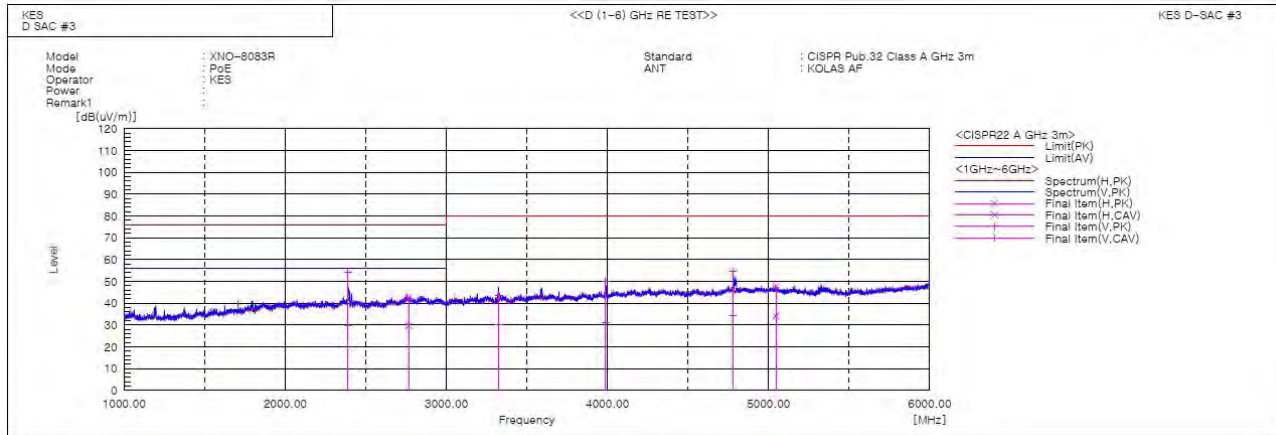
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### PoE Mode



#### 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	2390.000	V	53.8	29.5	0.2	54.0	29.7	76.0	56.0	22.0	26.3	100.0	13.2	
2	2765.642	H	40.5	27.4	2.2	42.7	29.6	76.0	56.0	33.3	26.4	100.0	304.2	
3	3323.000	V	40.7	27.4	3.0	43.7	30.4	80.0	60.0	36.3	29.6	100.0	320.6	
4	3989.520	V	44.5	25.6	5.6	50.1	31.2	80.0	60.0	29.9	28.8	100.0	168.7	
5	4780.901	V	46.3	25.9	8.4	54.7	34.3	80.0	60.0	25.3	25.7	100.0	25.4	
6	5045.007	H	38.9	25.2	9.0	47.9	34.2	80.0	60.0	32.1	25.8	100.0	332.1	

### ◆ Calculation

Result(PK/CAV) [dB( $\mu$ V/m)] = (Reading(PK/CAV)[dB( $\mu$ V)] + c.f[dB(1/m)])

Margin(PK/CAV)[dB] = Limit[dB( $\mu$ V/m)] - Result(PK/CAV) [dB( $\mu$ V/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

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**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	0.052			
2	0.002	0.204	1.080	n/a
3	0.045	1.971	2.300	PASS
4	0.003	0.588	0.430	n/a
5	0.046	4.035	1.140	PASS
6	0.003	0.848	0.300	n/a
7	0.045	5.792	0.770	PASS
8	0.003	1.105	0.230	n/a
9	0.041	10.333	0.400	PASS
10	0.002	1.340	0.184	n/a
11	0.039	11.855	0.330	PASS
12	0.002	1.594	0.153	n/a
13	0.036	17.346	0.210	PASS
14	0.002	1.893	0.131	n/a
15	0.033	22.167	0.150	PASS
16	0.002	2.106	0.115	n/a
17	0.030	22.829	0.132	PASS
18	0.002	2.347	0.102	n/a
19	0.027	22.875	0.118	PASS
20	0.002	2.576	0.092	n/a
21	0.024	14.964	0.161	PASS
22	0.002	2.877	0.084	n/a
23	0.021	14.139	0.147	PASS
24	0.002	3.110	0.077	n/a
25	0.018	13.368	0.135	PASS
26	0.002	3.331	0.071	n/a
27	0.016	12.411	0.125	PASS
28	0.002	3.584	0.066	n/a
29	0.013	11.236	0.116	PASS
30	0.002	3.714	0.061	n/a
31	0.011	10.459	0.109	PASS
32	0.002	3.924	0.058	n/a
33	0.010	9.608	0.102	PASS
34	0.002	4.003	0.054	n/a
35	0.009	9.389	0.096	PASS
36	0.002	4.101	0.051	n/a
37	0.008	8.969	0.091	PASS
38	0.002	4.107	0.048	n/a
39	0.008	9.155	0.087	PASS
40	0.002	4.094	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	0.052			
2	0.003	0.184	1.620	n/a
3	0.047	1.362	3.450	PASS
4	0.003	0.440	0.645	n/a
5	0.046	2.710	1.710	PASS
6	0.003	0.645	0.450	n/a
7	0.045	3.887	1.155	PASS
8	0.003	0.838	0.345	n/a
9	0.042	6.958	0.600	PASS
10	0.003	1.020	0.276	n/a
11	0.039	7.949	0.495	PASS
12	0.003	1.196	0.230	n/a
13	0.037	11.626	0.315	PASS
14	0.003	1.423	0.197	n/a
15	0.034	14.907	0.225	PASS
16	0.003	1.591	0.173	n/a
17	0.030	15.332	0.199	PASS
18	0.003	1.785	0.153	n/a
19	0.027	15.336	0.178	PASS
20	0.003	1.923	0.138	n/a
21	0.024	15.038	0.161	PASS
22	0.003	2.148	0.125	n/a
23	0.021	14.233	0.147	PASS
24	0.003	2.371	0.115	n/a
25	0.018	13.476	0.135	PASS
26	0.003	2.475	0.106	n/a
27	0.016	12.514	0.125	PASS
28	0.003	2.667	0.099	n/a
29	0.013	11.371	0.116	PASS
30	0.003	2.867	0.092	n/a
31	0.012	10.563	0.109	PASS
32	0.002	2.897	0.086	n/a
33	0.010	9.732	0.102	PASS
34	0.002	3.056	0.081	n/a
35	0.009	9.608	0.096	PASS
36	0.002	3.052	0.077	n/a
37	0.008	9.137	0.091	PASS
38	0.002	3.101	0.073	n/a
39	0.008	9.317	0.087	PASS
40	0.002	3.131	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-21T0585  
Page (52) of (75)

**Test Data - Voltage Fluctuations**

■ DC Mode

**Maximum Flicker results**

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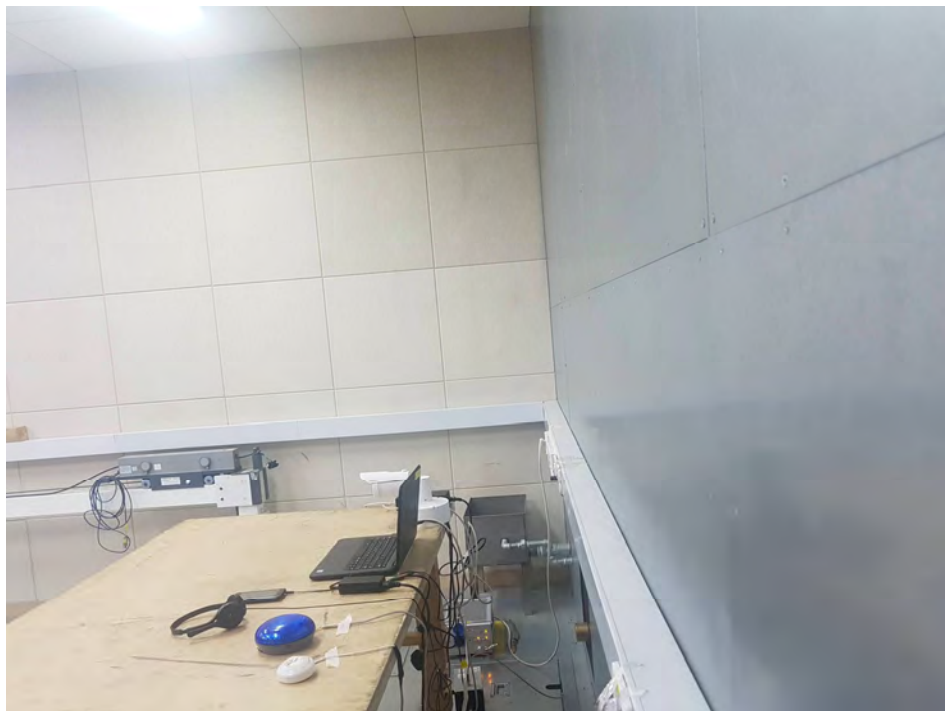


## Conducted Emissions at Telecommunication Ports

### ■ DC Mode



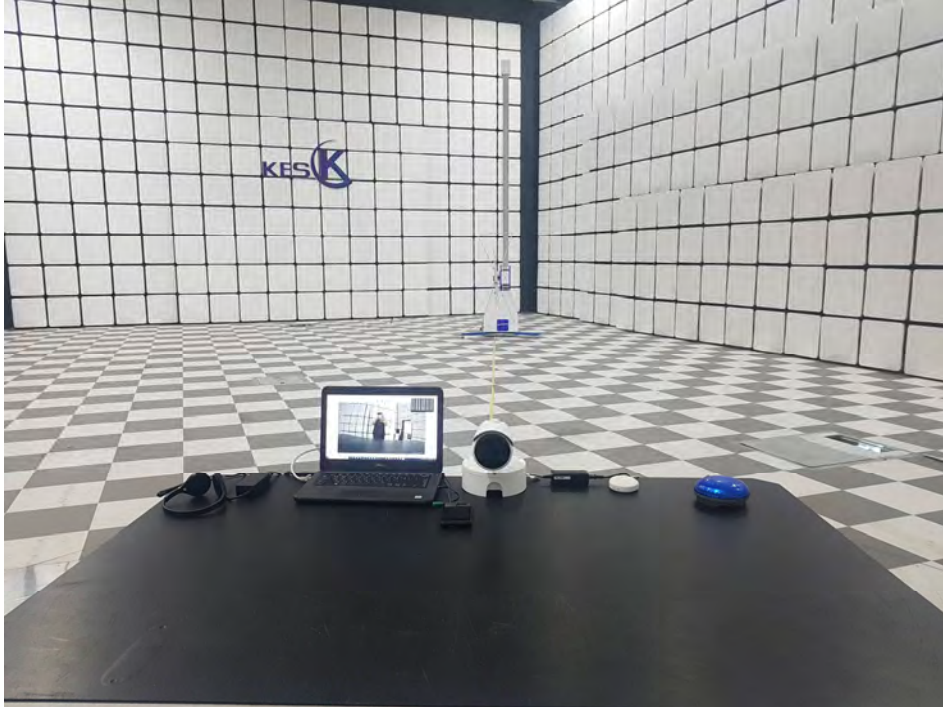
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**■ PoE Mode**

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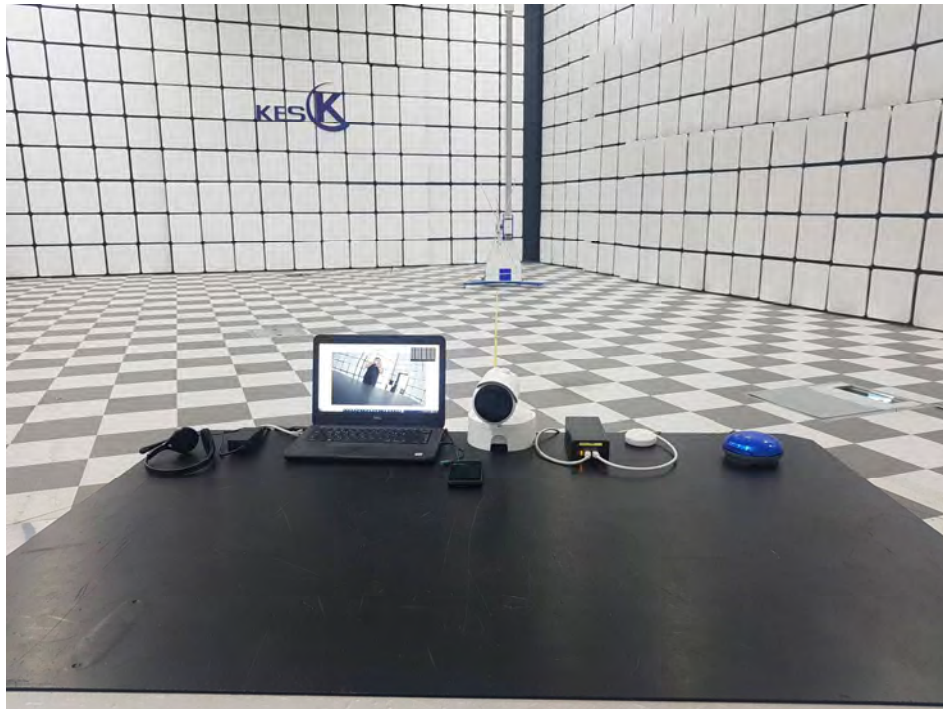
## Radiated Electric Field Emissions(Below 1 GHz)

### ■ DC Mode



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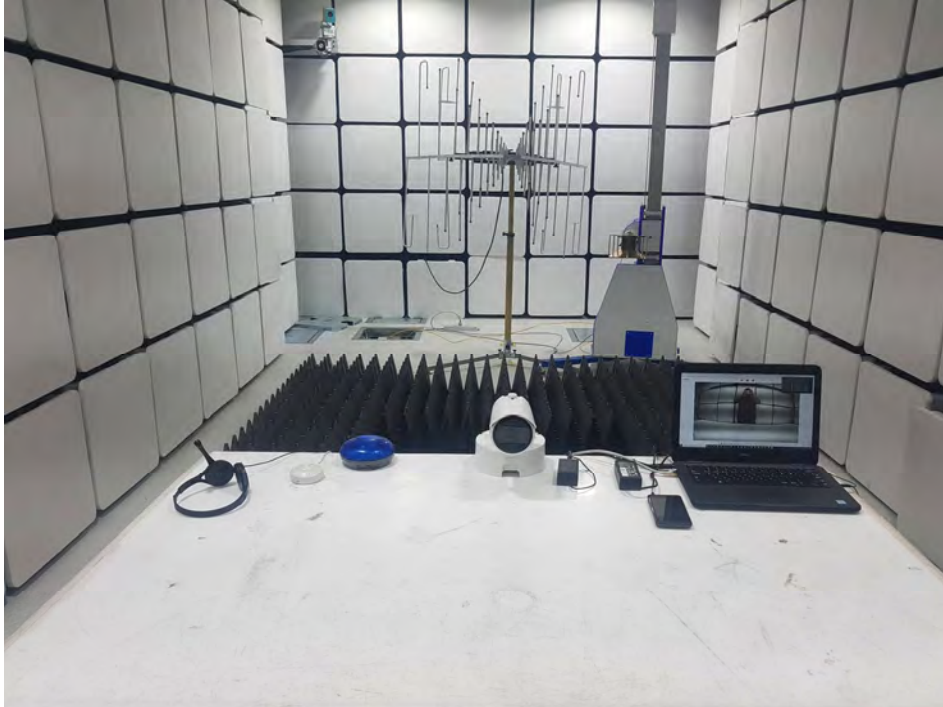


**■ PoE Mode**

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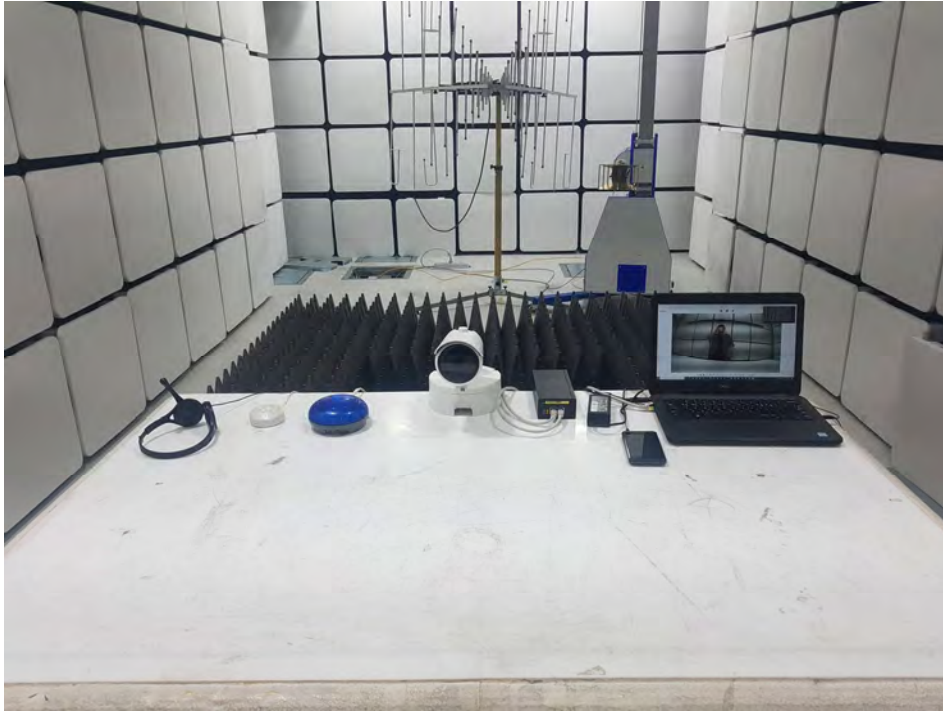
## Radiated Electric Field Emissions(Above 1 GHz)

### ■ DC Mode



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## ■ PoE Mode





## Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ DC Mode



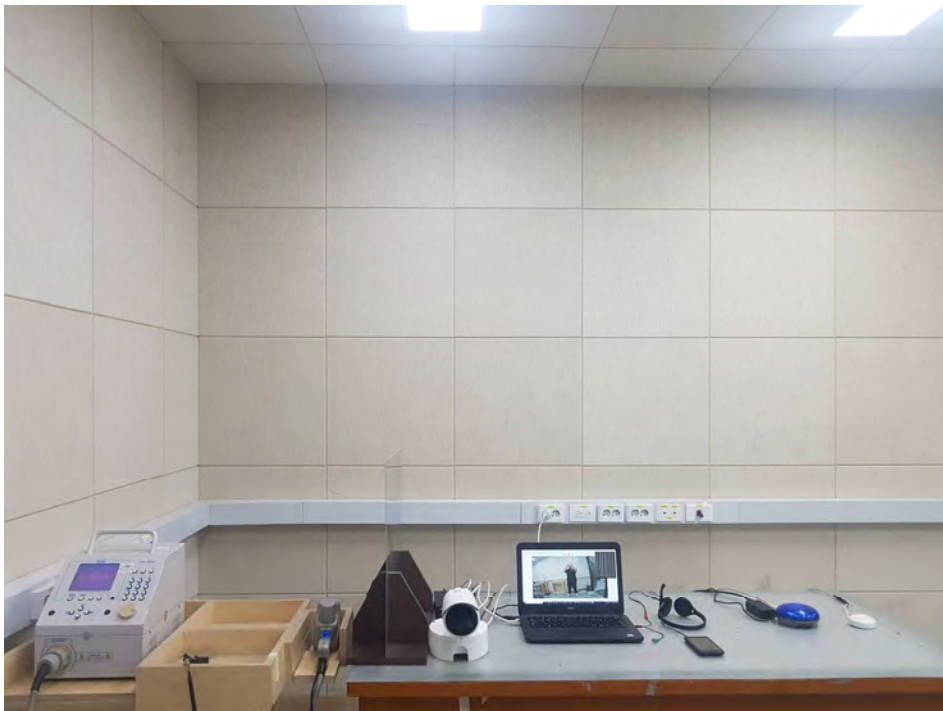
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## Electrostatic Discharge

### ■ 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)

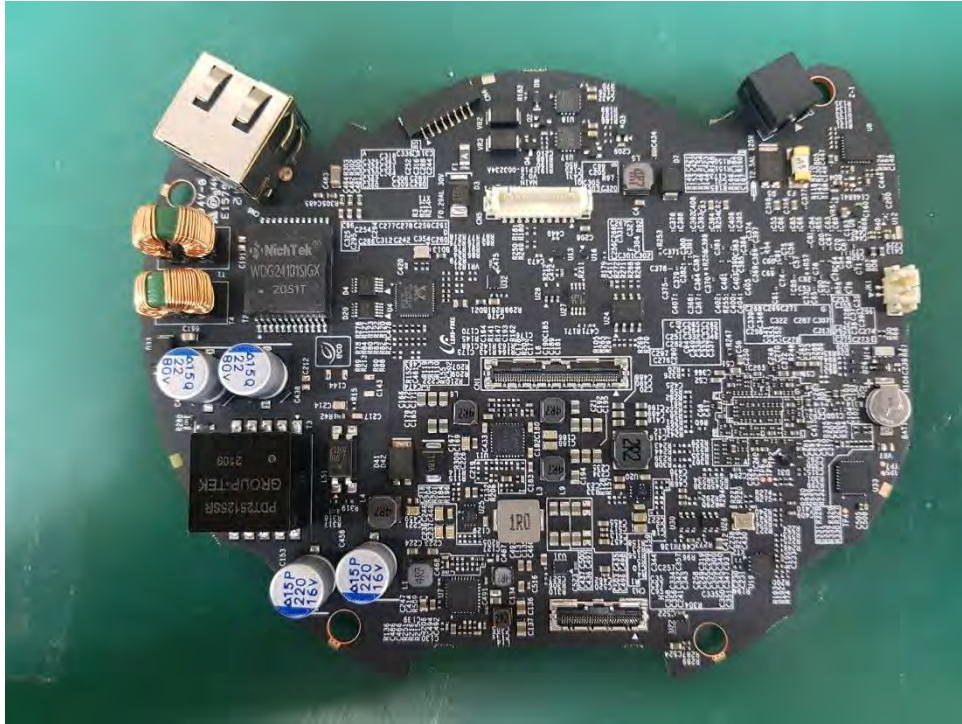


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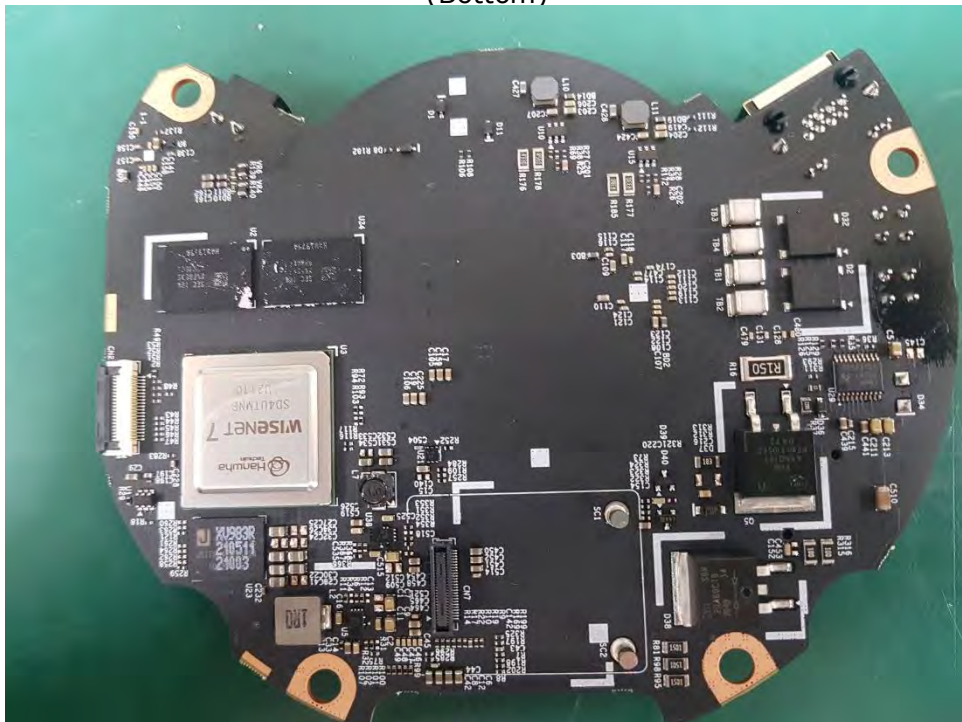


## EUT Internal View – Board 1

(Top)



(Bottom)



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## EUT Internal View – Board 2

(Top)



(Bottom)

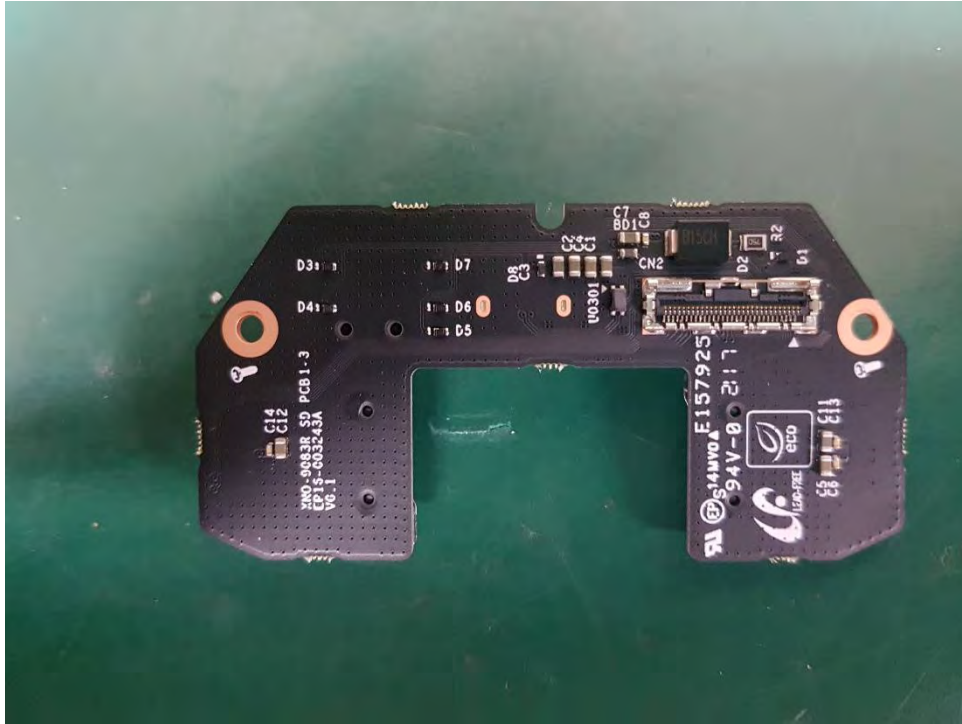


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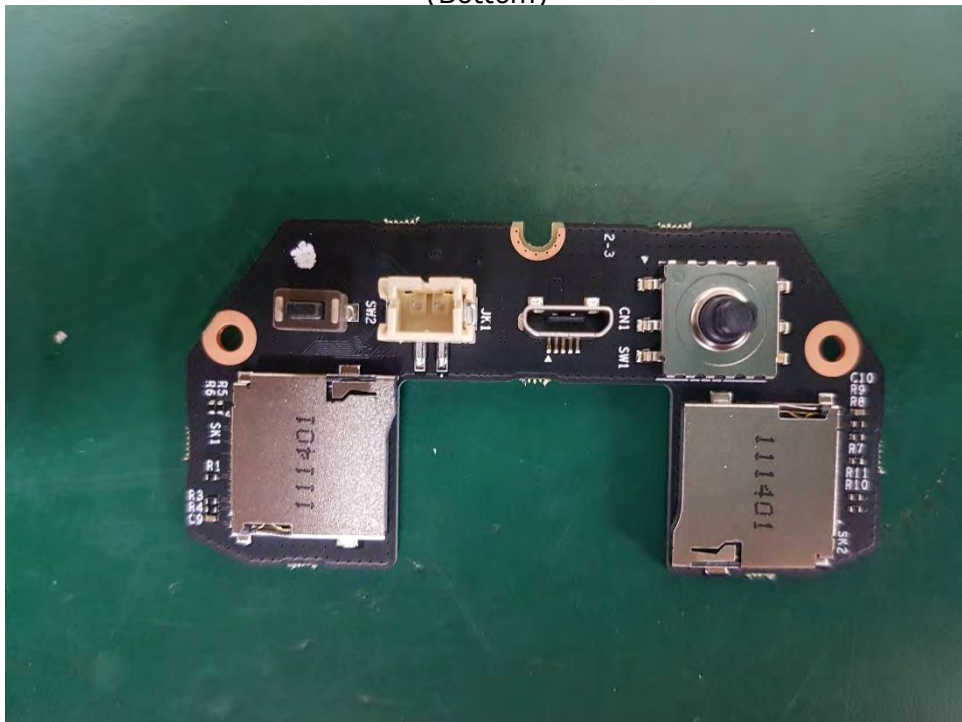


## EUT Internal View – Board 3

(Top)



(Bottom)



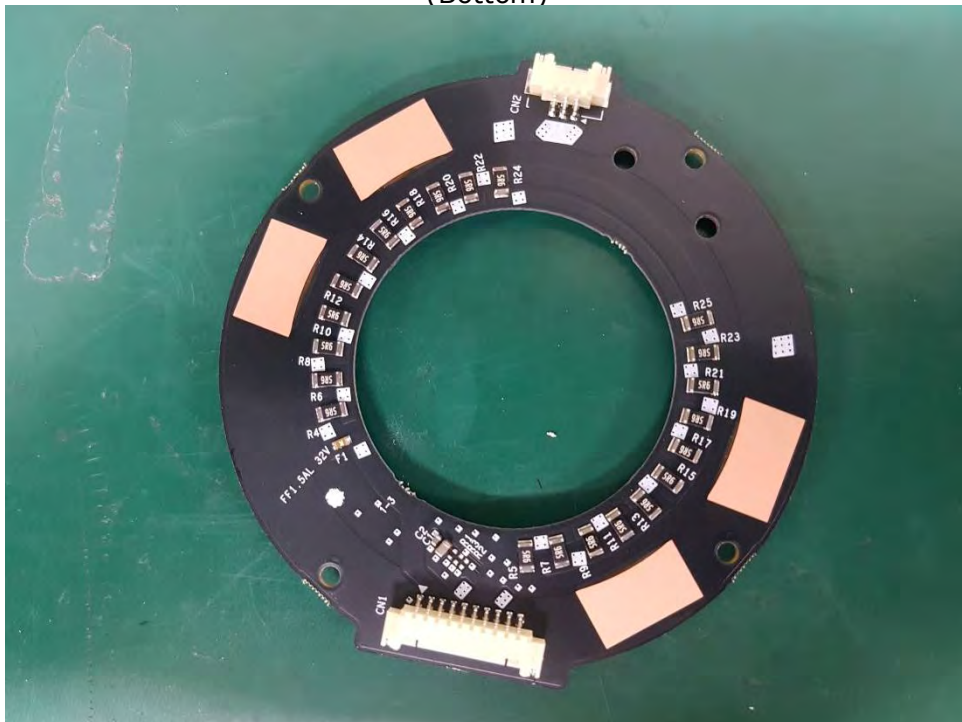
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## EUT Internal View – Board 4

(Top)



(Bottom)

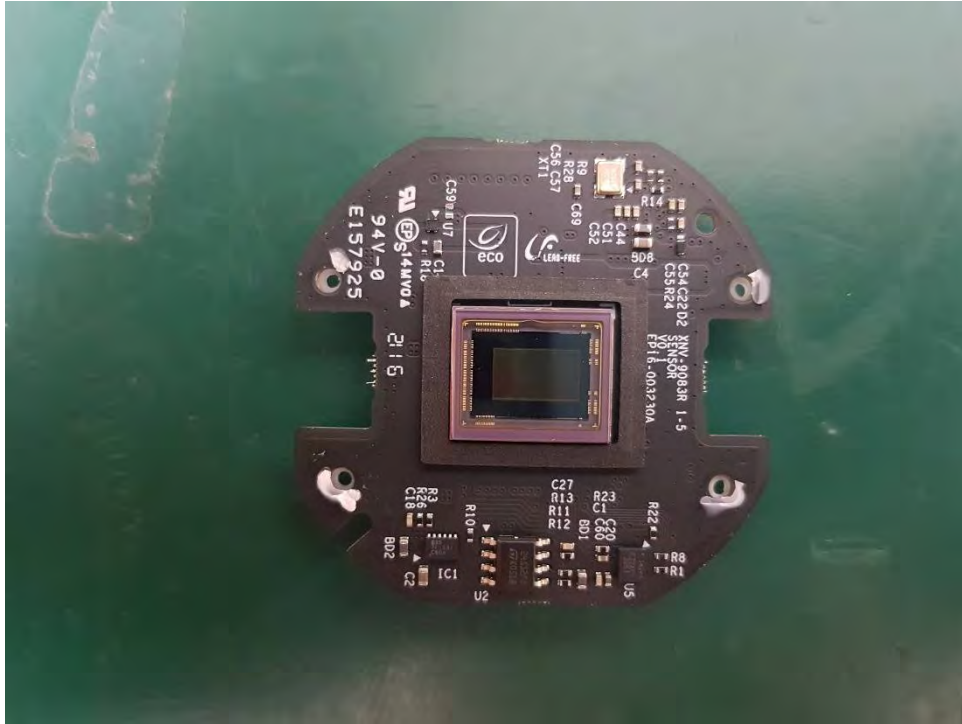


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## EUT Internal View – Board 5

(Top)



(Bottom)



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## EUT Internal View – Lens

(Top)

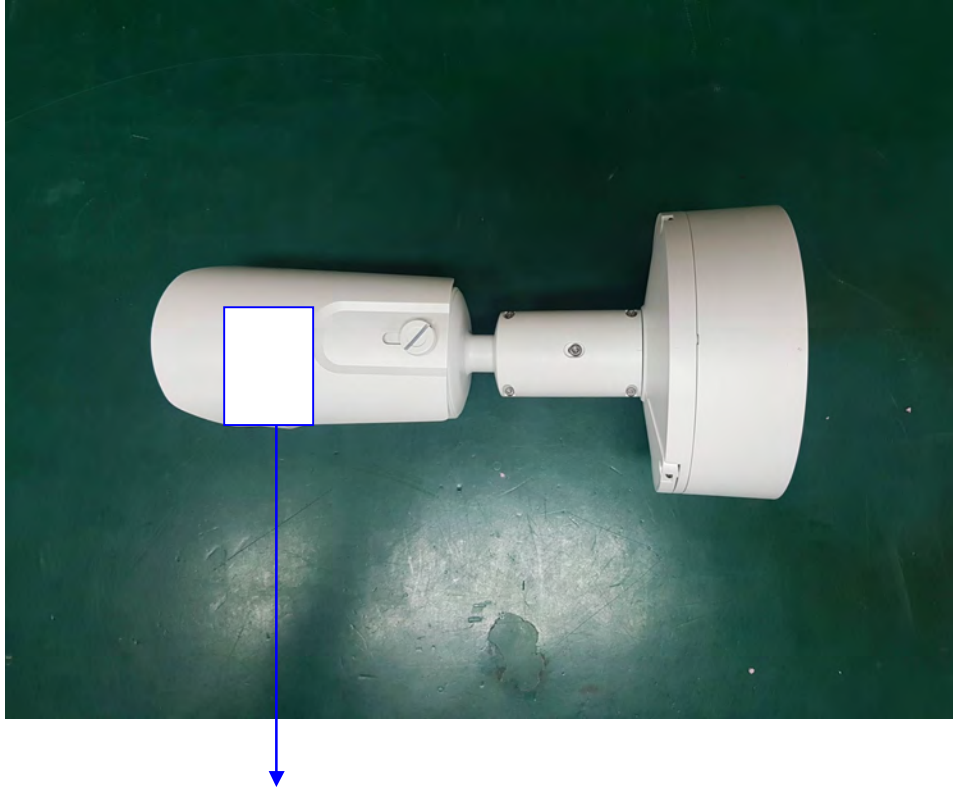


(Bottom)



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## Label and Location



**NETWORK CAMERA**

Model No : XNO-8083R

Manufacturer : HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.

Made in Vietnam

