

**KES Co., Ltd.**

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Report No.:

KES-E1-18T0622-R3

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EMC TEST REPORT

Test Report No. : KES-E1-18T0622-R3

Date of Issue : Feb. 24, 2023

Product name : Network Camera

Model/Type No. : XNV-6081Z

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 : Nov. 02, 2018

Test date : Nov. 06, 2018 ~ Nov. 09, 2018

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Reviewed by

Jun Soo, Jung
EMC Test Engineer

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
Nov. 14, 2018	KES-E1-18T0622	Issued
May. 15, 2019	KES-E1-18T0622-R1	Re-issue due to regulations update
Jun. 08, 2022	KES-E1-18T0622-R2	Factory deletion and Test Regulations update due to customer request.
Feb. 24, 2023	KES-E1-18T0622-R3	Change the Applicant and manufacturer at the request of the customer

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1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	1/2.8" 2M CMOS
Total Pixels	1945(H) x 1109(V) 2.16M
Effective Pixels	1945(H) x 1097(V) 2.13M
Scanning System	Progressive Scan
Min. Illumination	Color : 0.015 lux(F1.4, 1./30sec) B/W : 0.0015 Lux (F1.4, 1/30sec)
S / N Ratio	50dB
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation USB : Micro USB type B, 1280x720, for installation
Lens	
Focal Length (Zoom Ratio)	2.8~12mm(4.3x) motorized varifocal
Max. Aperture Ratio	1.4(Wide) ~ 3.6(Tele)
Angular Field of View	H: 119.5°, V: 62.8°, D: 142.1° H: 27.9°, V: 15.7°, D: 32.0°
Min. Object Distance	0.5m (1.64ft)
Focus Control	Simple focus(Motorized V/F) / Manual, Remote control via network (Manual, Simple focus)
Lens Type	DC Auto Iris, P-iris
Mount Type	Board-in type
Pan / Tilt / Rotate	
Pan / Tilt / Rotate range	±175° / 0~85° / ±175°
PTR control	Remote adjustment (Max. 200 cycles)
Operational	
Camera Title	Off / On (Displayed up to 85 characters) - W/W : English/Numeric/Special Characters - China : English/Numeric/Special/Chinese Characters - Common : Multi-line (Max 5), Color (Grey/Green/Red/Blue/Black/White), Transparency, Auto Scale by Resolution
Day & Night	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off / BLC / HLC, WDR
Wide Dynamic Range	150dB
Contrast Enhancement	SSDR (Off / On)
Digital Noise Reduction	SSNR5 (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	Off / On (built-in Gyro Sensor)
Defog	Auto / Manual / Off
Motion Detection	Off / On(8ea, 8point Polygonal zones), Handover
Privacy Masking	Off / On (32ea, polygonal zones) - Color : Grey/Green/Red/Blue/Black/White - Mosaic
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor((included Mercury & Sodium)
LDC	On/Off (5 levels with Min/Max)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
Digital PTZ	24X, Digital PTZ(Preset, Group)
Flip / Mirror	Flip : On/Off Mirror : On/Off Hallway view : 90°/270°
Analytics	Tampering, Loitering, Directional Detection, Defocus Detection, Fog Detection, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection, Motion Detection, Digital Auto Tracking, Sound Classification, Audio Playback on event , Shock detection , Heatmap , People counting , Queue management
Alarm I/O	Input 1ea / Output 1ea
Alarm Triggers	Alarm Input, Motion Detection, Video & Audio Analytics, Network Disconnect
Alarm events	File upload via FTP, E-Mail Notification via E-Mail local storage(SD/SDHC/SDXC) or NAS recording at Event Triggers External output
Audio In	Selectable (Mic IN/Line IN), Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out, Max output level: 1 Vrms
Pixel Counter	Support

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Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Form	H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High , MJPEG
Resolution	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264 : Max. 60fps at all resolutions MJPEG : Max. 30fps
Smart Codec	Manual Mode (area-based : 5EA)
WiseStreamII	Support
Video Quality Adjustmen	H.264/H.265 : Target Bitrate Level Control MJPEG : Target Bitrate Level Control
Bitrate Control Method	H.264/H.265 : CBR or VBR MJPEG : VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)
Audio Compression Form	G.711 u-law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC : 48Kbps at 8/16/32/48KHz
Audio Communication	Bi-dierctional (2-Way)
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication (EAP-TLS, EAP-LEAP)
Streaming Method	Unicast / Multicast
Max. User Access	20 users at Unicast Mode
Edge Storage	Micro SD/SDHC/SDXC 2slot (up to 512 GB) - Continuous recording(1'st slot to 2'nd slot) - Motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded. - NAS(Network Attached Storage), Local PC for Instant Recording
Application Programmin	ONVIF Profile S/G SUNAPI(HTTP API) Open Platform
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish,, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Web Viewer	Supported OS : Windows 7, 8, 10, Mac OS X 10.10, 10.11, 10.12 Non-plugin Webviewer - Supported Browser : Google Chrome 56, MS Edge 39, Mozilla Firefox 56 (Window 64bit only), Apple Safari 10 (Mac OS X only) Plug-in Webviewer - Supported Browser : MS Explore 11, Apple Safari 10 (Mac OS X only)
Central Management So	SmartViewer, SSM
Environmental	
Operating Temperature / Humidity	-50°C ~ +60°C (-58°F ~ +140°F) / Less than 90% RH * Start up should be done at above -35°C
Storage Temperature / Humidity	-50°C ~ +60°C (-58°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP67, IP66, NEMA 4X
Vandal Resistance	IK10+
Electrical	
Input Voltage / Current	Power redundancy 12VDC ± 10%, PoE(IEEE802.3af, Class3) 24VAC ± 10%(optional)
Power Consumption	DC : Max 9.5W, PoE : Max 11W AC : Max 11W(optonal)
Mechanical	
Color / Material	White / Aluminum
Dimension (ØxH)	Ø 180
Weight	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.

Voltage ☐ 230Vac ☐ 100 Vac ☒ 24 Vac ☒ 12 Vdc ☒ PoE
Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

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	XNV-6081Z	-	HANWHA VISION VIETNAM COMPANY LIMITED	E.U.T
AC module	SPC-100AC	-	-	AC 24 V

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1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
POE Adapter	PD-9501GR/AC	-	CHANGZHOU WUJIN HONGGUANG RADIO CO., LTD.	-
Notebook	X56K	HN11N5151FJ0045W	HANSUNG	-
Notebook Adapter	A12-120P1A	F180271552011758	CHICONY POWER TECHNOLOGY CO.,LTD.	-
Speaker	BR1000A Cuve Black 2	-	DONGGUAN EDIFIER TECHNOLOGY Co., Ltd	-
Mike	MP1000	-	-	-
Gpad	LG-V480	-	LG	-
Alarm button	-	-	-	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-
Micro SD Card	-	-	Transcend	16 GB

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1.6 External I/O Cabling

■ AC 24 V, DC 12 V MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Network Camera (E.U.T)	RJ-45	Notebook	RJ-45	4.0	U
	3.5 mm	Speaker	3.5 mm	1.6	U
	3.5 mm	Mike	3.5 mm	1.7	U
	2Pin	Alarm IN	2Pin	3.0	U
	2Pin	Alarm Out	2Pin	3.0	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
Notebook	3.5 mm	Gpad	3.5 mm	1.4	U

■ PoE MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Network Camera (E.U.T)	RJ-45	POE Adapter	RJ-45	4.0	U
	3.5 mm	Speaker	3.5 mm	1.6	U
	3.5 mm	Mike	3.5 mm	1.7	U
	2Pin	Alarm IN	2Pin	3.0	U
	2Pin	Alarm Out	2Pin	3.0	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
Notebook	3.5 mm	Gpad	3.5 mm	1.4	U
	RJ-45	POE Adapter	RJ-45	4.0	U

* Unshielded=U, Shielded=S

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1.7 EUT Operating Mode(s)

Test Mode	operating
AC 24 V, DC 12 V, POE	EUT Monitoring, Ping Test

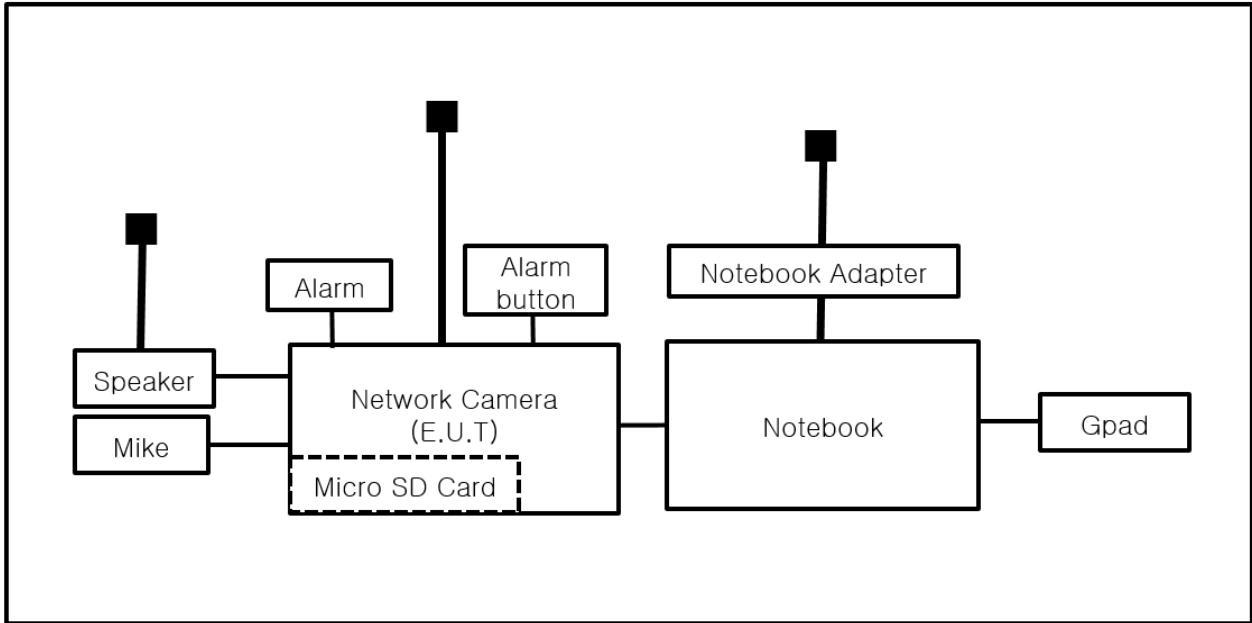
EUT Test operating S/W		
Name	Version	Manufacture Company
-	-	-

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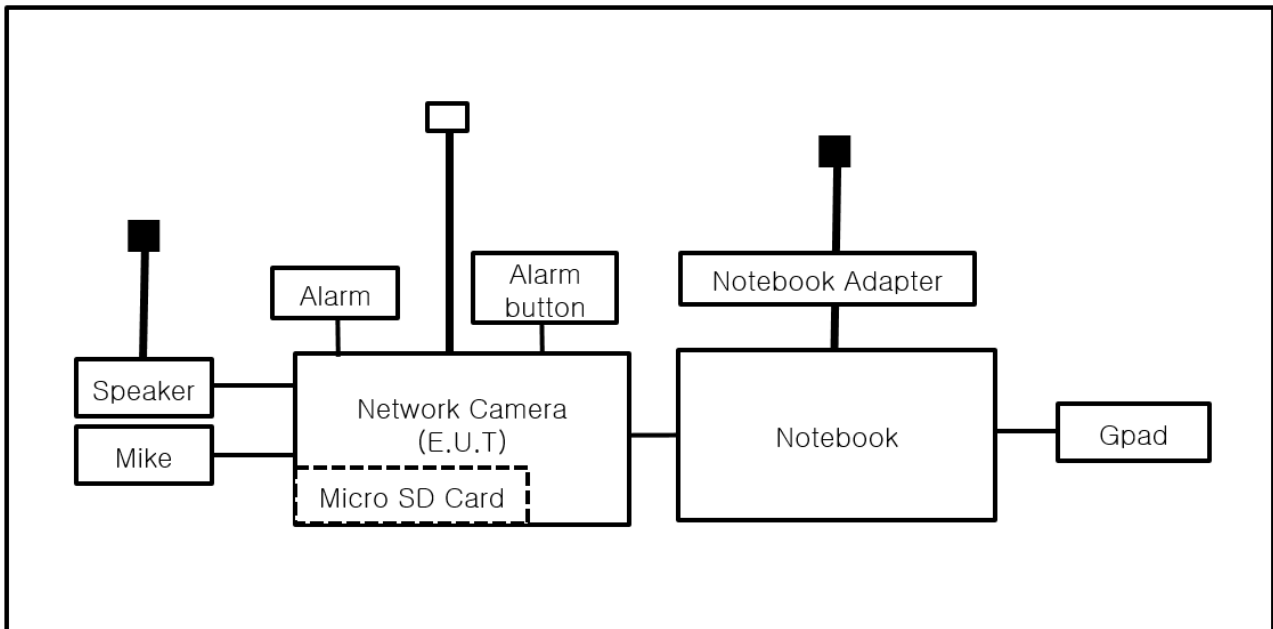
1.8 Configuration

■ AC Main
 □ DC Main

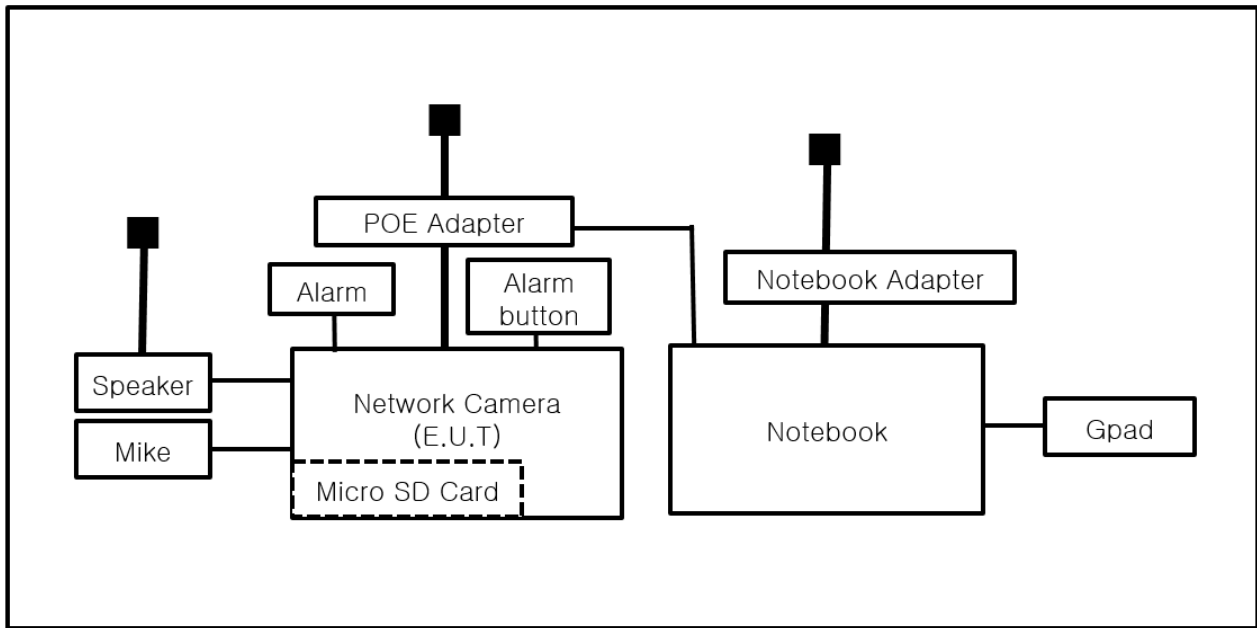
■ AC 24 V MODE



■ DC 12 V MODE



■ PoE MODE



1.9 Remarks when standards applied

N/A

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

☒ 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

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

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2.1 Conducted Emissions at Mains Power Ports

Test Date

Nov. 06, 2018

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	04, 25, 2019
☒	LISN	ENV216	R & S	101137	01, 31, 2019
☒	LISN	ENV216	R & S	101786	04, 25, 2019

Test Conditions

Temperature: 22,9 °C
Relative Humidity: 52,6 % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.

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2.2 Conducted Emissions at Telecommunication Ports

Test Date

Nov. 06, 2018

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	SHIELD ROOM #3	-	SEMITEC	-	-
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	04, 25, 2019
☒	LISN	ENV216	R & S	101137	01, 31, 2019
☒	LISN	ENV216	R & S	101786	04, 25, 2018
☒	8-WIRE ISN CAT3	CAT3 8158	SCHWARZBECK	8158-0019	03, 22, 2019
☒	8-WIRE ISN CAT5	CAT5 8158	SCHWARZBECK	8158-0030	03, 22, 2019
☐	8-WIRE ISN CAT6	NTFM 8158	SCHWARZBECK	8158-0029	08, 10, 2019

Test Conditions

Temperature: 22,9 °C
Relative Humidity: 52,6 % 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.

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2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Nov. 06, 2018

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

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 11, 2019
☒	AMPLIFIER	SCU 01	R & S	100603	11, 27, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	714	11, 28, 2018

Test Conditions

Temperature: 20,7 °C

Relative Humidity: 52,1 % 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

RemarksSee Appendix A for test data.

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2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Nov. 07, 2018

Test Location

SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESR7	R & S	101190	08, 06, 2019
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2019
☐	ATTENUATOR	8491A	HP	35496	03, 21, 2019
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test Conditions

Temperature: 22,2 °C
Relative Humidity: 53,1 % 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

RemarksSee Appendix A for test data.

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2.5 Harmonic Current Emissions

Test Date

Nov. 09, 2018

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	dpa.control	EM TEST	5.4.11.0	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 08, 2019
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: 23,0 °C
Relative Humidity: 55,3 % R.H.

Classification of Equipment for Harmonic Current Emissions

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

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

The test was performed with the input of the Adapter using the AC/AC Adapter.



2.6 Voltage Fluctuations and Flicker

Test Date

Nov. 09, 2018

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	dpa.control	EM TEST	5.4.11.0	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 08, 2019
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: 23,0 °C
Relative Humidity: 55,3 % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

The test was performed with the input of the Adapter using the AC/AC Adapter.

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

Nov. 09, 2018

Test Location

EMS-ESD: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	10, 11, 2019
☒	HCP	-	KES	-	-
☒	VCP	-	KES	-	-

Test Conditions

Temperature: 22,0 °C
Relative Humidity: 53,8 % R.H.
Atmospheric Pressure: 100,0 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 ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	Air ☒ 2 kV ☒ 4 kV ☐ 6 kV ☒ 8 kV ☐ 15 kV	HCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	VCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV
--------------------	---	---	---	---

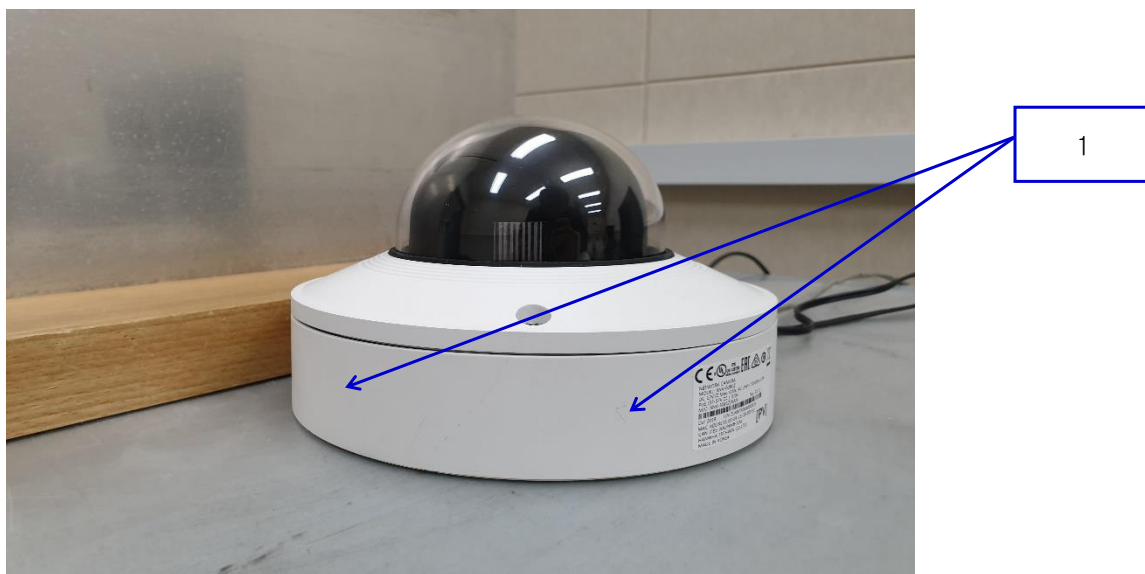
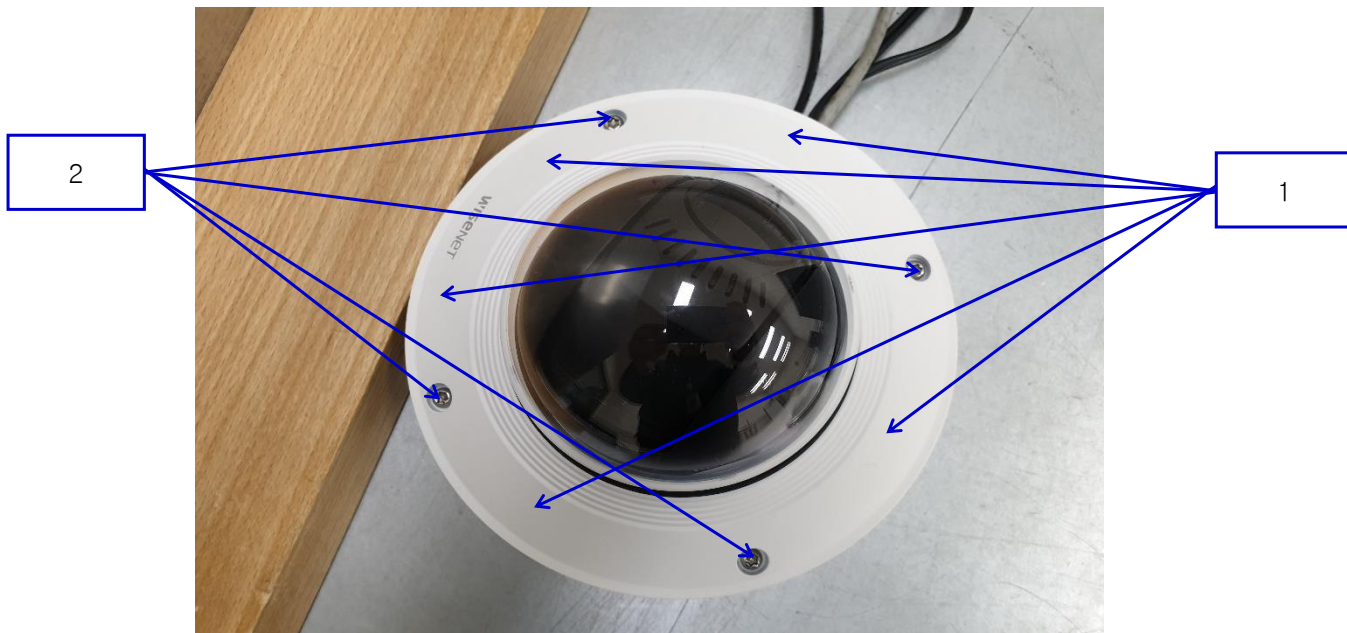
Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied

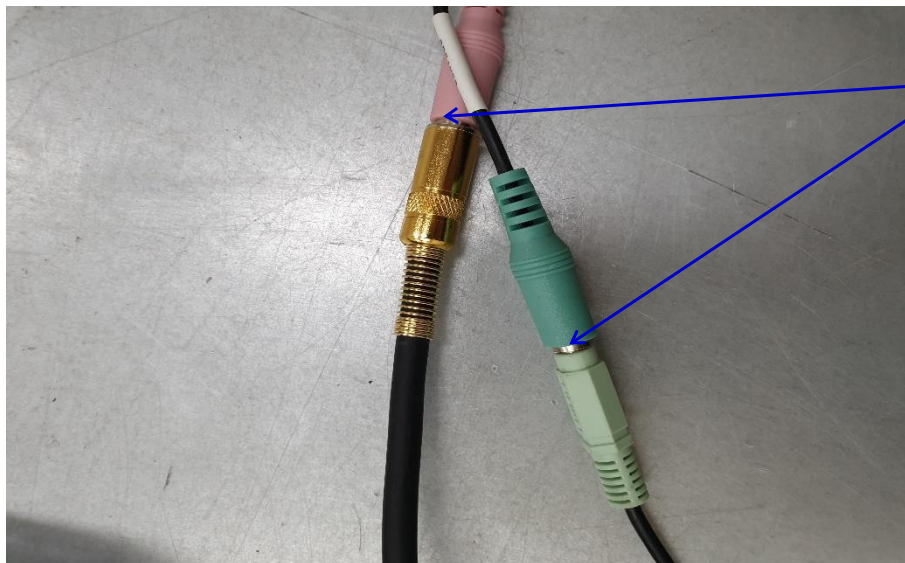
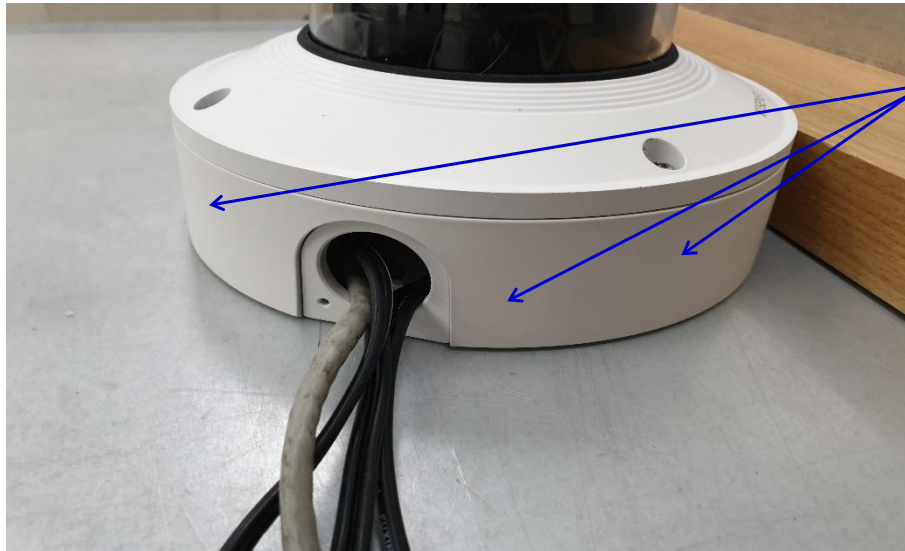
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Location of Discharge:

Air
Contact



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Test Data**■ AC 24 V 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	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-
3	3.5 mm	Contact Discharge	Complied	-

Note: "Blank" = Not performed

■ DC 12 V 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	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-
3	3.5 mm	Contact Discharge	Complied	-

Note: "Blank" = Not performed

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■ 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	Surface	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-
3	3.5 mm	Contact Discharge	Complied	-

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

RemarksPASS Required Performance Criteria

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3.2 Radiated Electric Field Immunity

Reference Standard

EN 61000-4-3:2006 +A2:2010

Test Date

Nov. 08, 2018

Test LocationEMS-RS: ☐ SEMI ANECHOIC CHAMBER #2☒ SEMI ANECHOIC CHAMBER #3**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	10.10.02	-
☒	SIGNAL GENERATOR	SMB 100A	R & S	177586	08, 06, 2019
☒	BROADBAND AMPLIFIER	BBA100	R & S	101239	08, 06, 2019
☒	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 06, 2019
☒	POWER METER	NRP2	R & S	103475	08, 06, 2019
☒	AVG POWER SENSOR	NRP-Z91	R & S	102526	08, 06, 2019
☒	AVG POWER SENSOR	NRP-Z91	R & S	102527	08, 06, 2019
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DIRECTIONAL COUPLER	KYDC-D1070-DX40	KY TELECOM	KY150001	08, 06, 2019
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM, INC	781	05, 02, 2019

Test Conditions

Temperature: 22,7 °C
Relative Humidity: 54,0 % R.H.
Atmospheric Pressure: 101,0 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

■ AC 24 V MODE

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

■ DC 12 V 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

3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Nov. 09, 2018

Test Location

EMS-EFT: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.7	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 27, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 27, 2018
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 27, 2018

Test Conditions

Temperature: 22,0 °C
Relative Humidity: 53,8 % R.H.
Atmospheric Pressure: 100,0 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

■ AC 24 V MODE

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
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	Complied	Complied
Alarm In	Complied	Complied
Alarm Out	Complied	Complied

■ DC 12 V MODE

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
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	Complied	Complied
Alarm In	Complied	Complied
Alarm Out	Complied	Complied

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■ 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	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

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3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014

Test Date

Nov. 05, 2018

Test Location

EMS-Surge: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.7	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 27, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 27, 2018
☐	CDN	CNV 508N1	EM TEST	P1610176296	11, 28, 2018
☐	CDN	CNV 504N7.3	EM TEST	P1744207079	12, 18, 2018

Test Conditions

Temperature: 22,0 °C
Relative Humidity: 53,8 % R.H.
Atmospheric Pressure: 100,0 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

Test Data

■ AC 24 V 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	Complied	Complied
N - PE	Complied	Complied

Signal Lines

☒ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45	Complied	Complied
Alarm In	Complied	Complied
Alarm Out	Complied	Complied

■ DC 12 V 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)
L – PE	Complied	Complied
N - PE	Complied	Complied

Signal Lines

☒ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45	Complied	Complied
Alarm In	Complied	Complied
Alarm Out	Complied	Complied

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■ 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	Observations	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45	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

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3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Nov. 07, 2018

Test Location

EMS-CS: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.7	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1	EM TEST	V0936105119	08, 09, 2019
☒	ATTENUATOR	ATT6	EM TEST	1208-34	08, 08, 2019
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 06, 2019
☒	CDN	CDN T8RJ45	EM TEST	0909-09	08, 06, 2019
☒	EM INJECTION CLAMP	EM 101	Liithi	35943	02, 02, 2019

Test Conditions

Temperature: 23,0 °C
Relative Humidity: 52,8 % R.H.
Atmospheric Pressure: 101,2 kPa

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

Test Data

■ AC 24 V 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	CDN T800	Complied
Alarm In	Clamp	Complied
Alarm Out	Clamp	Complied

■ DC 12 V 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
L1 – L2	CDN	Complied

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN T800	Complied
Alarm In	Clamp	Complied
Alarm Out	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	CDN T800	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

RemarksPASS Required Performance Criteria

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3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

Nov. 07, 2018

Test Location

EMS-Voltage dip: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.7	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 27, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 27, 2018

Test Conditions

Temperature: 22,0 °C
Relative Humidity: 53,8 % R.H.
Atmospheric Pressure: 100,0 kPa

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Report No.:
KES-E1-18T0622-R3
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Test Specifications & Observations/Remarks**■ AC 24 V MODE**

(Test Voltage : 230 V)

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Results</u>
☒ 20 % dip	☒ 250 / 5 000	<u>Complied</u>
☒ 30 % dip	☒ 25 / 500	<u>Complied</u>
☒ 60 % dip	☒ 10 / 200	<u>Complied</u>
☒ 100 % dip	☒ 250 / 5 000	<u>Complied</u>

- Voltage variations

☒ Unom + 10 %	☒ 253.0 V (ac)	<u>Complied</u>
☒ Unom - 15 %	☒ 195.5 V (ac)	<u>Complied</u>

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria

The test was performed with the input of the Adapter using the AC/AC Adapter.

APPENDIX A – TEST DATA

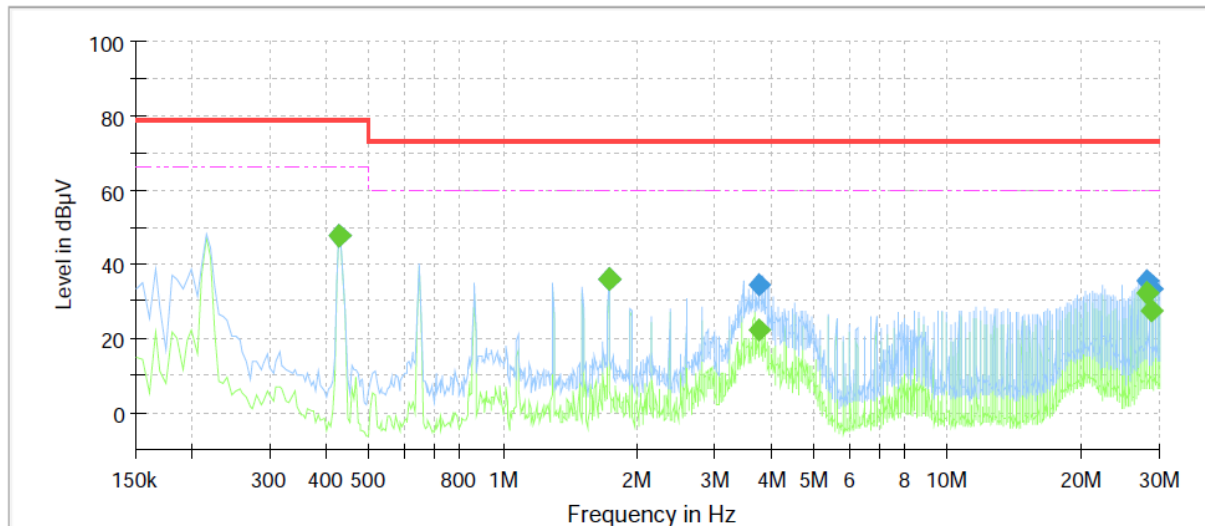
Conducted Emissions at Mains Power Ports

■ AC 24 V MODE

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	XNV-6081Z
Mode	AC 24 V_H
Operator Name:	KES



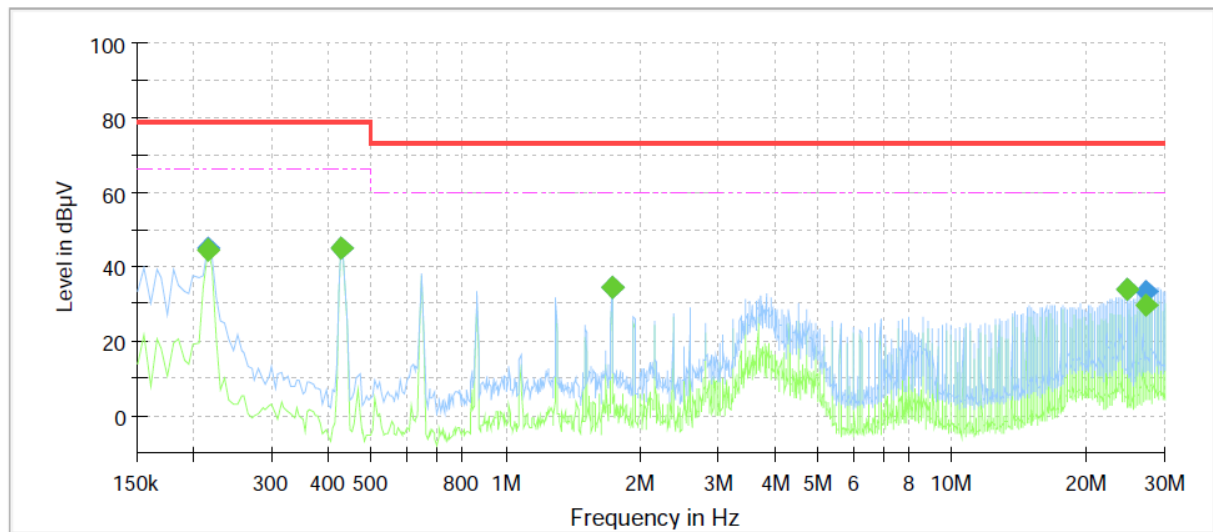
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.430000	---	47.38	66.00	18.62	1000.0	9.000	L1	9.7
0.430000	47.43	---	79.00	31.57	1000.0	9.000	L1	9.7
1.725000	---	35.92	60.00	24.08	1000.0	9.000	L1	10.1
1.725000	36.16	---	73.00	36.84	1000.0	9.000	L1	10.1
3.750000	---	22.35	60.00	37.65	1000.0	9.000	L1	10.1
3.750000	34.19	---	73.00	38.81	1000.0	9.000	L1	10.1
28.050000	---	32.16	60.00	27.84	1000.0	9.000	L1	10.3
28.050000	35.71	---	73.00	37.29	1000.0	9.000	L1	10.3
28.695000	---	27.79	60.00	32.21	1000.0	9.000	L1	10.3
28.695000	33.35	---	73.00	39.65	1000.0	9.000	L1	10.3

[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: XNV-6081Z
Mode: AC 24 V_N
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.215000	---	44.54	66.00	21.46	1000.0	9.000	N	9.7
0.215000	44.94	---	79.00	34.06	1000.0	9.000	N	9.7
0.430000	---	45.13	66.00	20.87	1000.0	9.000	N	9.8
0.430000	45.19	---	79.00	33.81	1000.0	9.000	N	9.8
1.725000	---	34.25	60.00	25.75	1000.0	9.000	N	10.1
1.725000	34.49	---	73.00	38.51	1000.0	9.000	N	10.1
24.575000	---	33.78	60.00	26.22	1000.0	9.000	N	10.2
24.575000	34.07	---	73.00	38.93	1000.0	9.000	N	10.2
27.190000	---	29.87	60.00	30.13	1000.0	9.000	N	10.3
27.190000	33.49	---	73.00	39.51	1000.0	9.000	N	10.3

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

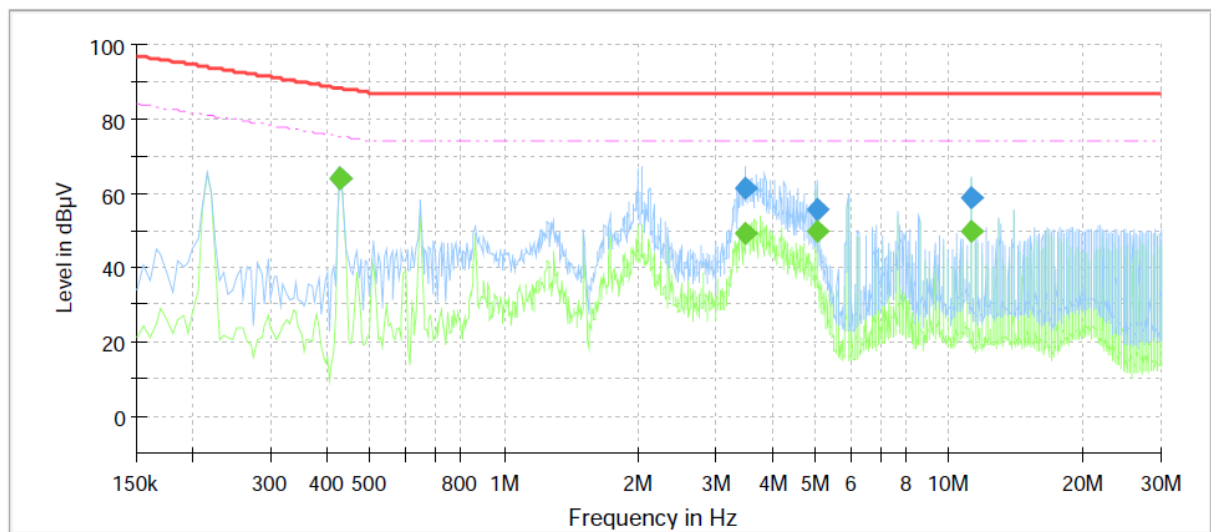
Conducted Emissions at Telecommunication Ports

■ AC 24 V MODE

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XNV-6081Z
Mode	AC 24 V_10 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.430000	---	63.97	75.25	11.28	1000.0	9.000	Single Line	10.1
0.430000	64.05	---	88.25	24.20	1000.0	9.000	Single Line	10.1
3.485000	---	49.04	74.00	24.96	1000.0	9.000	Single Line	10.3
3.485000	61.55	---	87.00	25.45	1000.0	9.000	Single Line	10.3
5.055000	---	49.63	74.00	24.37	1000.0	9.000	Single Line	10.2
5.055000	55.73	---	87.00	31.27	1000.0	9.000	Single Line	10.2
11.250000	---	49.71	74.00	24.29	1000.0	9.000	Single Line	10.0
11.250000	58.85	---	87.00	28.15	1000.0	9.000	Single Line	10.0



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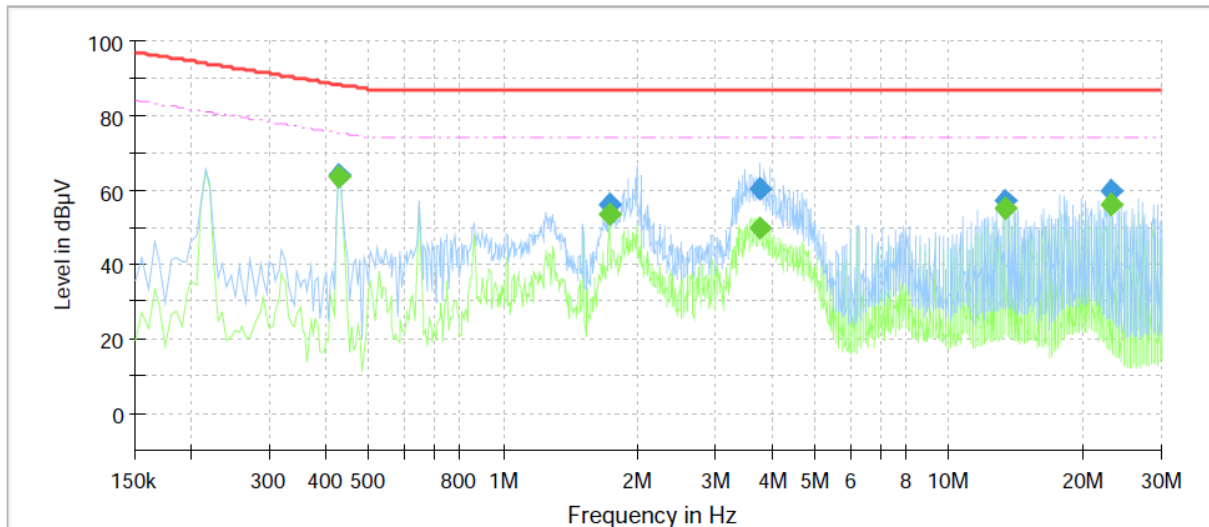
3701, 40, Simin-daero 365beon-gil,
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Report No.:
KES-E1-18T0622-R3
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[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: XNV-6081Z
Mode: AC 24 V_100 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.430000	---	63.77	75.25	11.48	1000.0	9.000	Single Line	9.6
0.430000	63.89	---	88.25	24.36	1000.0	9.000	Single Line	9.6
1.725000	---	53.32	74.00	20.68	1000.0	9.000	Single Line	9.8
1.725000	56.24	---	87.00	30.76	1000.0	9.000	Single Line	9.8
3.755000	---	49.58	74.00	24.42	1000.0	9.000	Single Line	9.7
3.755000	60.57	---	87.00	26.43	1000.0	9.000	Single Line	9.7
13.420000	---	54.94	74.00	19.06	1000.0	9.000	Single Line	9.6
13.420000	57.01	---	87.00	29.99	1000.0	9.000	Single Line	9.6
23.130000	---	56.19	74.00	17.81	1000.0	9.000	Single Line	9.6
23.130000	59.73	---	87.00	27.27	1000.0	9.000	Single Line	9.6

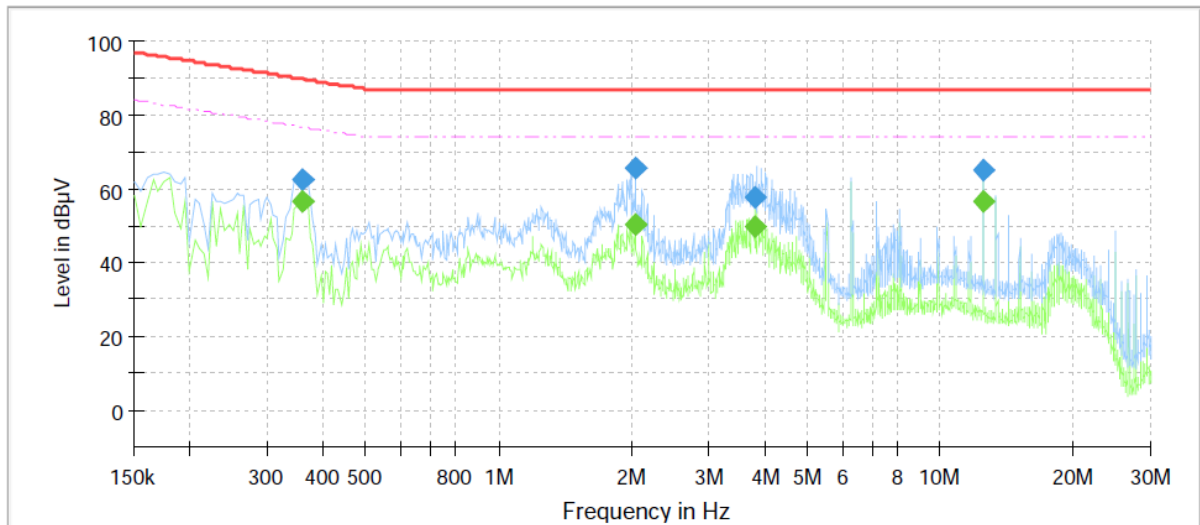
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■ DC 12 V MODE

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XNV-6081Z
Mode	DC 12 V_10 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.360000	---	56.66	76.73	20.07	1000.0	9.000	Single Line	10.1
0.360000	62.62	---	89.73	27.11	1000.0	9.000	Single Line	10.1
2.040000	---	50.20	74.00	23.80	1000.0	9.000	Single Line	10.3
2.040000	65.74	---	87.00	21.26	1000.0	9.000	Single Line	10.3
3.805000	---	49.70	74.00	24.30	1000.0	9.000	Single Line	10.2
3.805000	57.58	---	87.00	29.42	1000.0	9.000	Single Line	10.2
12.500000	---	56.84	74.00	17.16	1000.0	9.000	Single Line	10.0
12.500000	65.11	---	87.00	21.89	1000.0	9.000	Single Line	10.0



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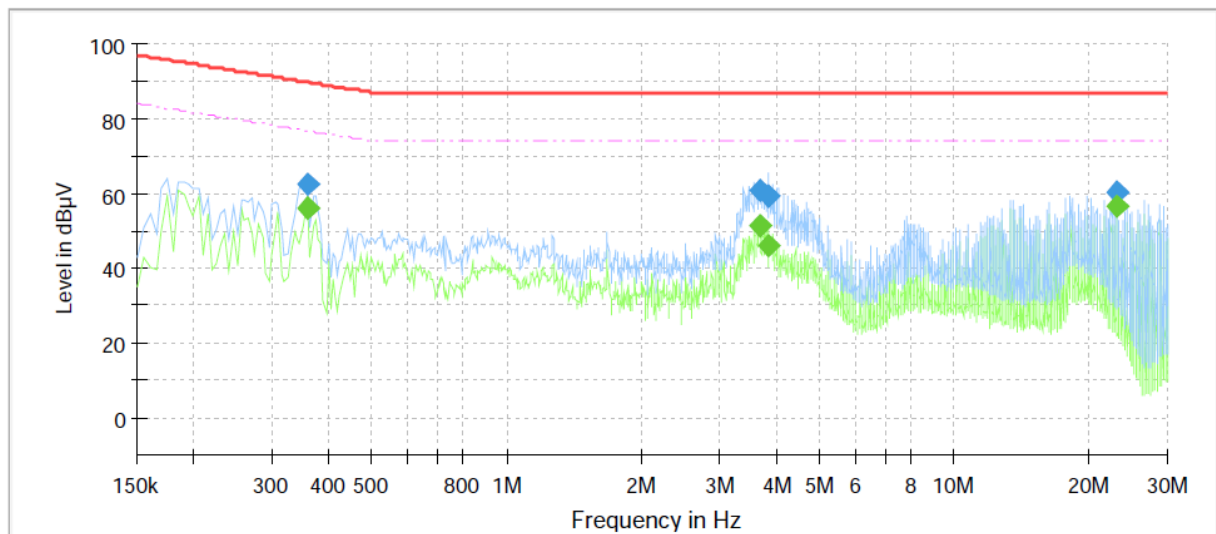
KES-E1-18T0622-R3

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[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: XNV-6081Z
Mode: DC 12 V_100 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.360000	---	56.37	76.73	20.36	1000.0	9.000	Single Line	9.6
0.360000	62.46	---	89.73	27.27	1000.0	9.000	Single Line	9.6
3.665000	---	51.26	74.00	22.74	1000.0	9.000	Single Line	9.7
3.665000	60.70	---	87.00	26.30	1000.0	9.000	Single Line	9.7
3.840000	---	45.86	74.00	28.14	1000.0	9.000	Single Line	9.7
3.840000	59.34	---	87.00	27.66	1000.0	9.000	Single Line	9.7
23.130000	---	56.45	74.00	17.55	1000.0	9.000	Single Line	9.6
23.130000	60.18	---	87.00	26.82	1000.0	9.000	Single Line	9.6

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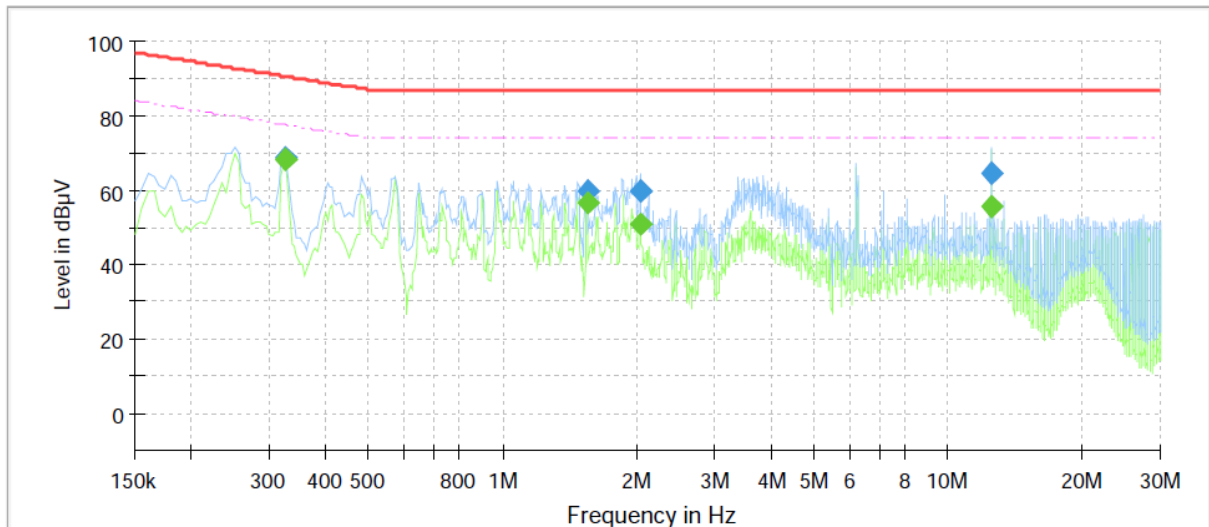
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■ PoE MODE

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XNV-6081Z
Mode	POE_10 Mbps
Operator Name:	KES



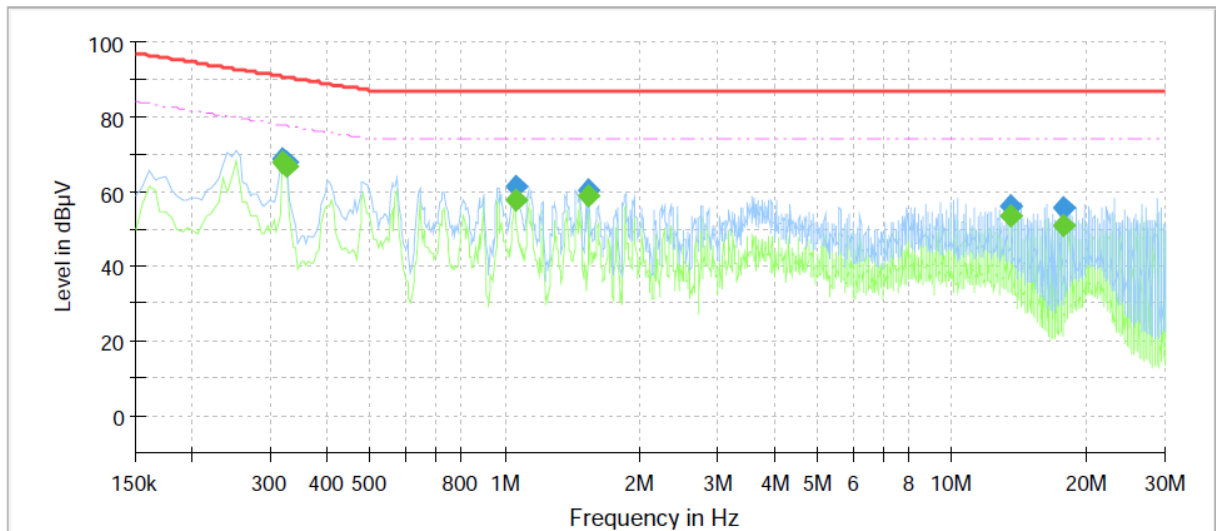
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.325000	---	68.52	77.58	9.06	1000.0	9.000	Single Line	10.1
0.325000	68.83	---	90.58	21.75	1000.0	9.000	Single Line	10.1
1.550000	---	56.46	74.00	17.54	1000.0	9.000	Single Line	10.3
1.550000	59.64	---	87.00	27.36	1000.0	9.000	Single Line	10.3
2.035000	---	50.75	74.00	23.25	1000.0	9.000	Single Line	10.3
2.035000	59.93	---	87.00	27.07	1000.0	9.000	Single Line	10.3
12.500000	---	55.66	74.00	18.34	1000.0	9.000	Single Line	10.0
12.500000	64.32	---	87.00	22.68	1000.0	9.000	Single Line	10.0

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XNV-6081Z
Mode	POE_100 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.320000	---	67.90	77.71	9.81	1000.0	9.000	Single Line	9.6
0.320000	68.68	---	90.71	22.03	1000.0	9.000	Single Line	9.6
0.325000	---	66.73	77.58	10.85	1000.0	9.000	Single Line	9.6
0.325000	67.68	---	90.58	22.90	1000.0	9.000	Single Line	9.6
1.055000	---	57.75	74.00	16.25	1000.0	9.000	Single Line	9.8
1.055000	61.65	---	87.00	25.35	1000.0	9.000	Single Line	9.8
1.540000	---	58.93	74.00	15.07	1000.0	9.000	Single Line	9.8
1.540000	60.49	---	87.00	26.51	1000.0	9.000	Single Line	9.8
13.480000	---	53.60	74.00	20.40	1000.0	9.000	Single Line	9.6
13.480000	56.21	---	87.00	30.79	1000.0	9.000	Single Line	9.6
17.690000	---	50.95	74.00	23.05	1000.0	9.000	Single Line	9.7
17.690000	55.59	---	87.00	31.41	1000.0	9.000	Single Line	9.7

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



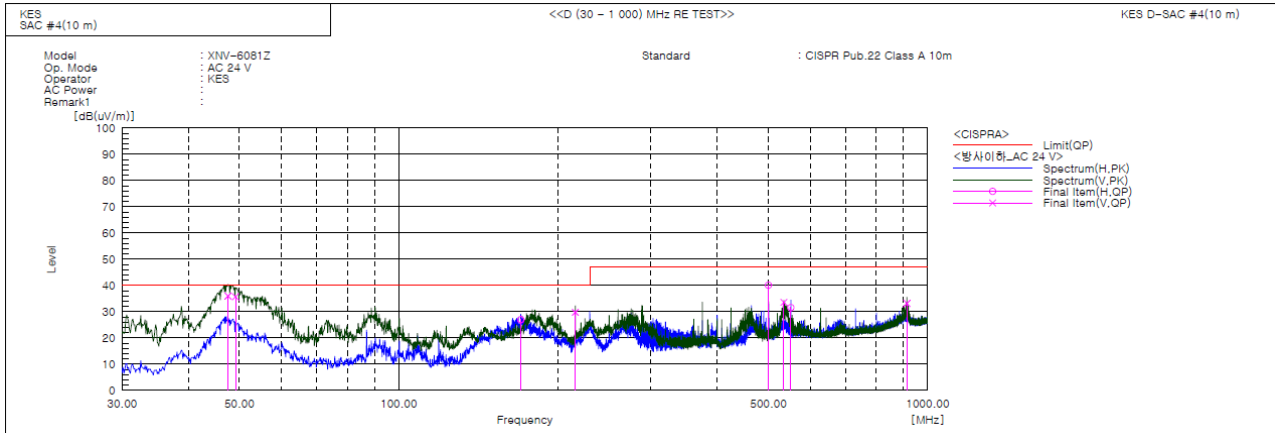
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Radiated Electric Field Emissions(Below 1 GHz)

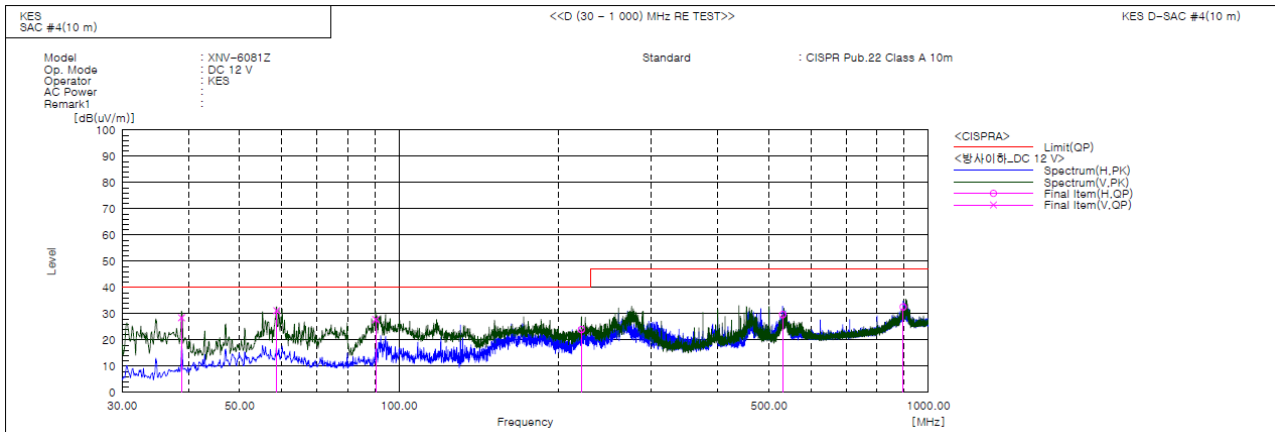
■ AC 24 V MODE



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	47.581	V	64.5	-28.5	36.0	40.0	4.0	104.0	260.0	
2	49.158	V	64.2	-28.5	35.7	40.0	4.3	109.0	260.0	
3	170.165	H	58.2	-31.2	27.0	40.0	13.0	395.0	115.0	
4	215.755	V	57.0	-27.2	29.8	40.0	10.2	391.0	48.0	
5	499.965	H	58.9	-18.8	40.1	47.0	6.9	199.0	205.0	
6	534.764	V	51.3	-17.7	33.6	47.0	13.4	106.0	51.0	
7	551.254	H	48.8	-17.2	31.6	47.0	15.4	117.0	175.0	
8	913.549	V	44.6	-11.4	33.2	47.0	13.8	101.0	276.0	

■ DC 12 V 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	38.851	V	59.0	-30.5	28.5	40.0	11.5	149.0	273.0	
2	58.736	V	60.5	-29.3	31.2	40.0	8.8	103.0	257.0	
3	90.383	V	58.7	-30.9	27.8	40.0	12.2	168.0	253.0	
4	221.090	H	51.1	-27.1	24.0	40.0	16.0	393.0	337.0	
5	530.520	H	47.6	-17.9	29.7	47.0	17.3	202.0	226.0	
6	895.846	H	44.1	-11.5	32.6	47.0	14.4	386.0	325.0	

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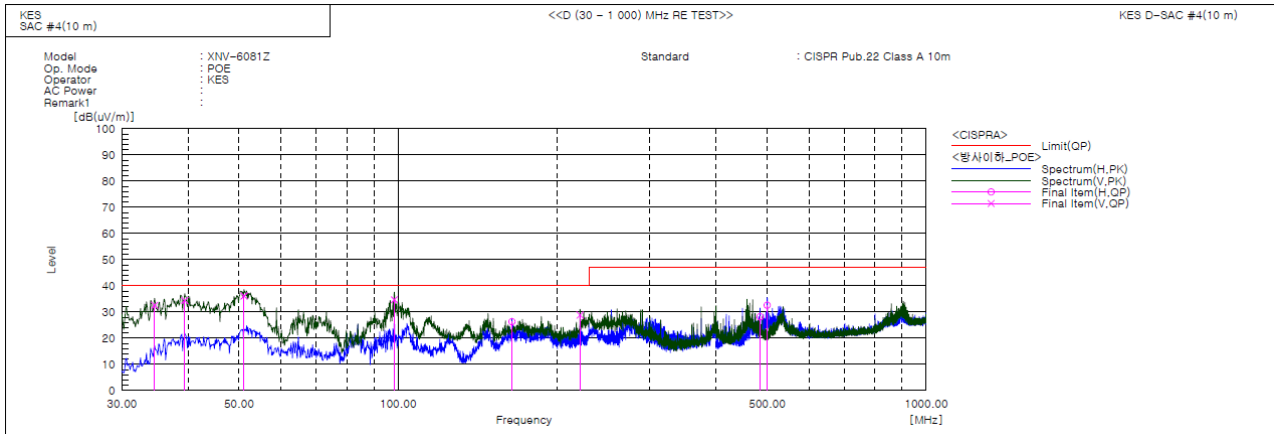


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Report No.:
KES-E1-18T0622-R3
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■ PoE MODE



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	34.608	V	64.9	-32.3	32.6	40.0	7.4	105.0	237.0	
2	39.458	V	64.6	-30.2	34.4	40.0	5.6	117.0	197.0	
3	51.098	V	64.5	-28.4	36.1	40.0	3.9	156.0	238.0	
4	98.385	V	63.8	-29.1	34.7	40.0	5.3	134.0	87.0	
5	164.345	H	57.7	-31.4	26.3	40.0	13.7	395.0	87.0	
6	221.090	V	55.9	-27.1	28.8	40.0	11.2	101.0	332.0	
7	484.566	H	47.5	-19.3	28.2	47.0	18.8	186.0	241.0	
8	499.965	H	51.4	-18.8	32.6	47.0	14.4	209.0	58.0	

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

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



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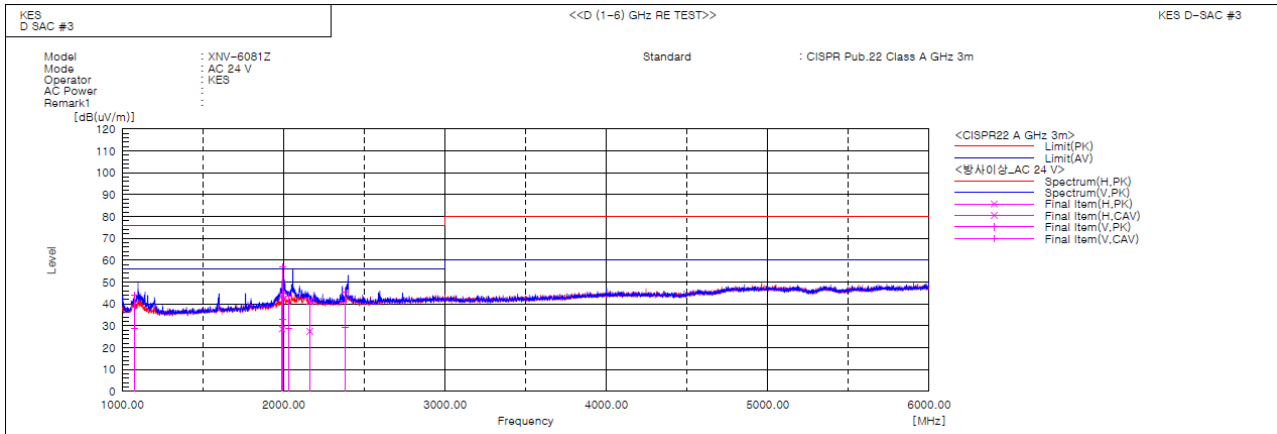
Report No.:

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Radiated Electric Field Emissions(Above 1 GHz)

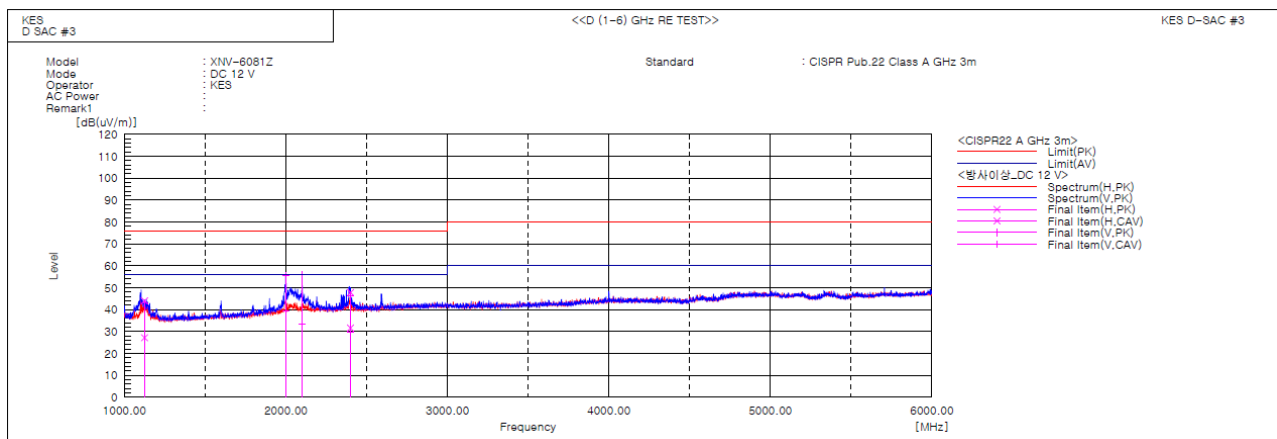
■ AC 24 V MODE



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	1077.304	V	51.7	36.3	-7.6	44.1	28.7	76.0	56.0	31.9	27.3	100.0	131.2	
2	1991.202	H	46.0	30.8	-2.2	43.8	28.6	76.0	56.0	32.2	27.4	100.0	296.3	
3	1991.841	V	59.0	34.9	-2.1	56.9	32.8	76.0	56.0	19.1	23.2	100.0	26.7	
4	2033.155	V	45.3	30.9	-1.9	43.4	29.0	76.0	56.0	32.6	27.0	100.0	71.7	
5	2162.655	H	42.6	28.8	-1.3	41.3	27.5	76.0	56.0	34.7	28.5	100.0	271.8	
6	2381.944	V	46.0	29.6	-0.4	45.6	29.2	76.0	56.0	30.4	26.8	100.0	55.7	

■ DC 12 V 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	1125.485	H	51.6	34.7	-7.5	44.1	27.2	76.0	56.0	31.9	28.8	100.0	223.9	
2	1999.850	V	57.8	41.3	-2.1	55.7	39.2	76.0	56.0	20.3	16.8	100.0	352.2	
3	2099.710	V	57.7	35.0	-1.6	56.1	33.4	76.0	56.0	19.9	22.6	100.0	349.3	
4	2400.188	H	48.3	32.0	-0.4	47.9	31.6	76.0	56.0	28.1	24.4	100.0	60.0	
5	2400.730	V	46.8	30.2	-0.4	46.4	29.8	76.0	56.0	29.6	26.2	100.0	100.6	

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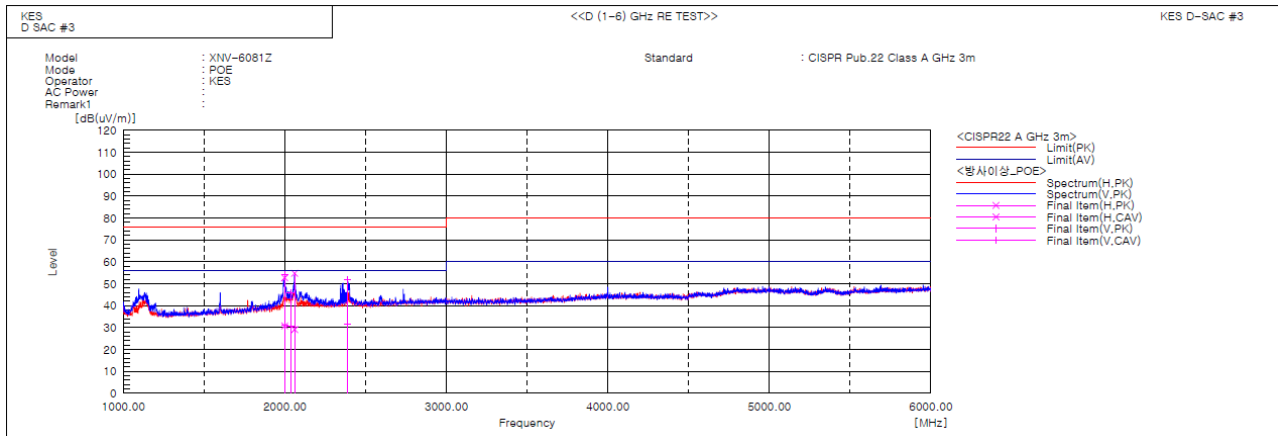
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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www.kes.co.kr

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KES-E1-18T0622-R3

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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	1999.090	V	56.3	33.2	-2.1	54.2	31.1	76.0	56.0	21.8	24.9	100.0	36.9	
2	1999.170	H	54.8	32.9	-2.1	52.7	30.8	76.0	56.0	23.3	25.2	100.0	338.9	
3	2035.175	V	47.7	32.7	-1.9	45.8	30.8	76.0	56.0	30.2	25.2	100.0	23.5	
4	2060.631	H	56.6	30.9	-1.8	54.8	29.1	76.0	56.0	21.2	26.9	100.0	309.3	
5	2389.091	V	52.2	32.2	-0.4	51.8	31.8	76.0	56.0	24.2	24.2	100.0	27.0	

◆ Calculation

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

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

Average harmonic current results				
Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	176.250E-3			
2	1.948E-3			PASS
3	59.784E-3	2.888	2.07	PASS
4	1.610E-3			PASS
5	31.036E-3	3.025	1.03	PASS
6	672.745E-6			PASS
7	12.495E-3	1.803	693.00E-3	PASS
8	974.111E-6			PASS
9	11.677E-3	3.243	360.00E-3	PASS
10	651.696E-6			PASS
11	4.954E-3			PASS
12	586.895E-6			PASS
13	2.865E-3			PASS
14	740.243E-6			PASS
15	1.538E-3			PASS
16	712.448E-6			PASS
17	1.966E-3			PASS
18	563.144E-6			PASS
19	1.803E-3			PASS
20	757.603E-6			PASS
21	1.567E-3			PASS
22	647.772E-6			PASS
23	1.138E-3			PASS
24	696.764E-6			PASS
25	685.967E-6			PASS
26	629.441E-6			PASS
27	845.586E-6			PASS
28	650.930E-6			PASS
29	1.078E-3			PASS
30	674.597E-6			PASS
31	649.752E-6			PASS
32	585.109E-6			PASS
33	1.013E-3			PASS
34	831.111E-6			PASS
35	558.871E-6			PASS
36	599.101E-6			PASS
37	903.083E-6			PASS
38	652.382E-6			PASS
39	583.197E-6			PASS
40	717.581E-6			PASS

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.



Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	176.350E-3			
2	2.257E-3			PASS
3	59.929E-3	1.303	4.60	PASS
4	1.764E-3			PASS
5	31.158E-3	1.367	2.28	PASS
6	957.519E-6			PASS
7	12.613E-3	0.819	1.54	PASS
8	1.094E-3			PASS
9	11.773E-3	1.472	800.00E-3	PASS
10	733.397E-6			PASS
11	5.128E-3	0.777	660.00E-3	PASS
12	635.560E-6			PASS
13	2.974E-3			PASS
14	850.342E-6			PASS
15	1.625E-3			PASS
16	771.856E-6			PASS
17	2.208E-3			PASS
18	748.697E-6			PASS
19	1.864E-3			PASS
20	829.570E-6			PASS
21	1.672E-3			PASS
22	761.401E-6			PASS
23	1.215E-3			PASS
24	754.492E-6			PASS
25	952.743E-6			PASS
26	699.435E-6			PASS
27	982.211E-6			PASS
28	812.422E-6			PASS
29	1.162E-3			PASS
30	749.643E-6			PASS
31	759.902E-6			PASS
32	649.500E-6			PASS
33	1.094E-3			PASS
34	925.458E-6			PASS
35	620.111E-6			PASS
36	656.159E-6			PASS
37	987.229E-6			PASS
38	783.662E-6			PASS
39	672.436E-6			PASS
40	832.081E-6			PASS

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.

**KES Co., Ltd.**

3701, 40, Simin-daero 365beon-gil,
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Test Data - Voltage Fluctuations**Maximum Flicker results**

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.046	4.00	PASS
Tmax [s]	0.000	0.50	PASS

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Test Setup Photos and Configuration

Conducted Voltage Emissions



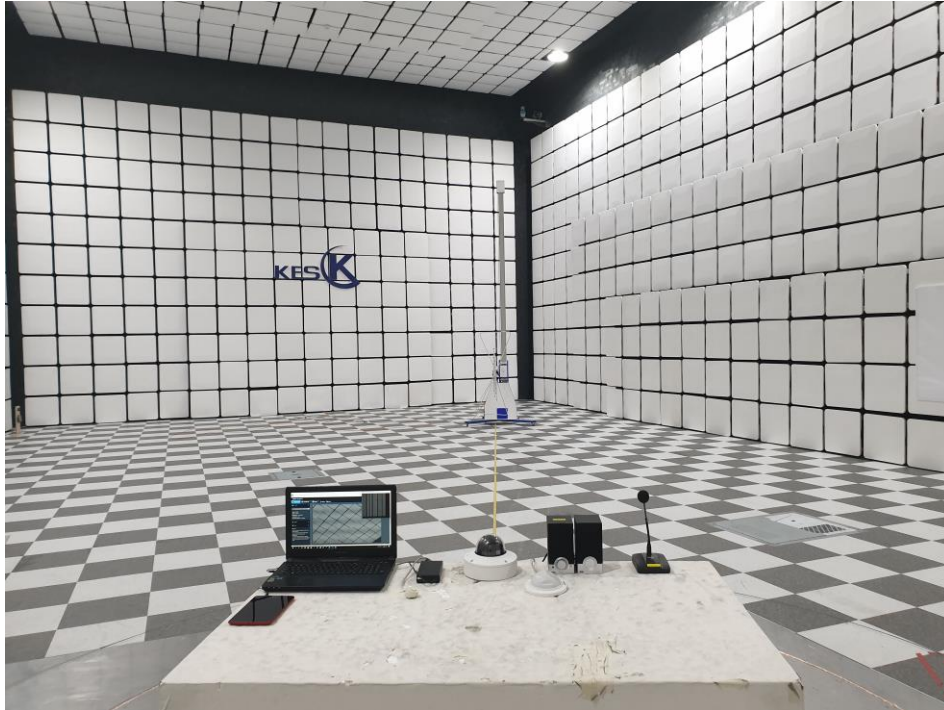
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Conducted Telecommunication Emissions



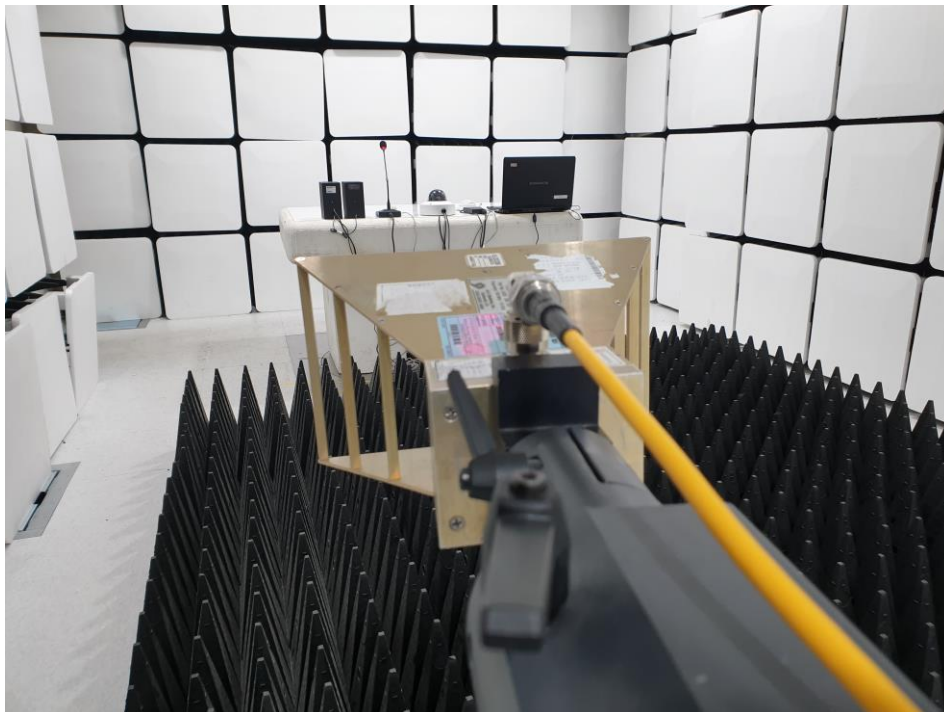
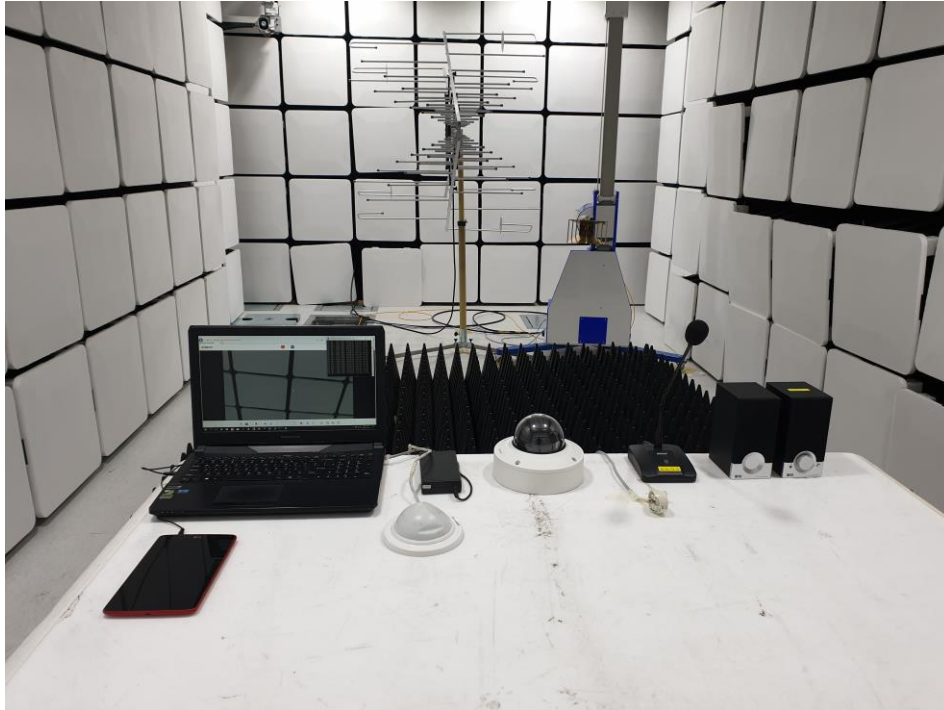
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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Harmonic Current Emissions and Voltage Fluctuations and Flicker



Electrostatic Discharge



Radiated Electric Field Immunity



Electrical Fast Transients/Bursts



Surge Transients



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Conducted Disturbance



Voltage Dips and Short Interruptions



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EUT External Photographs

(Top)



(Bottom)



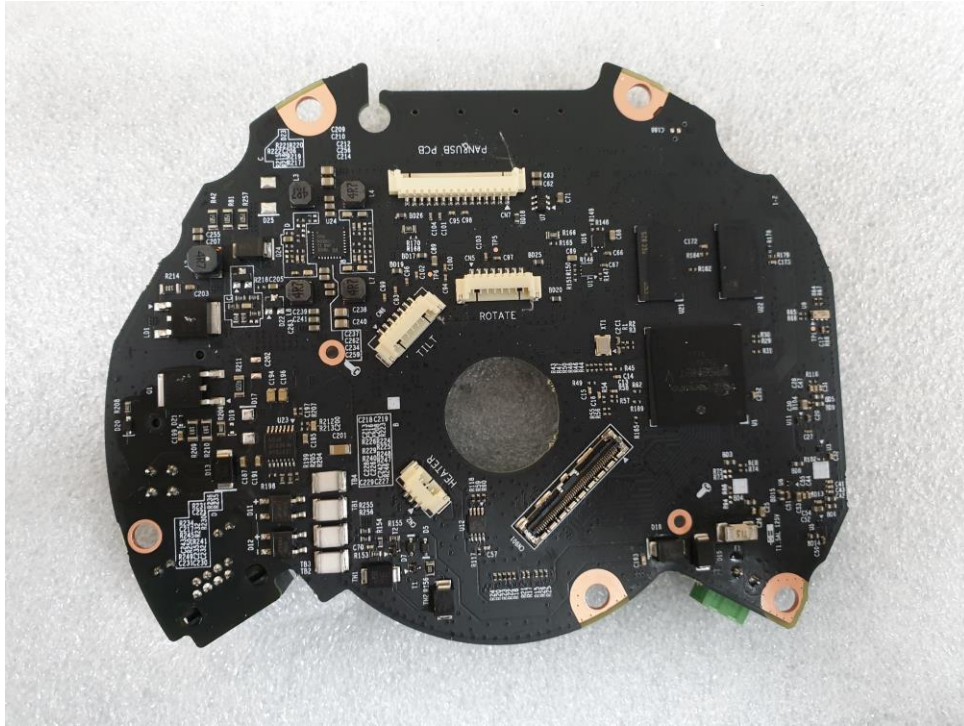
EUT Internal Photographs

(Internal View)

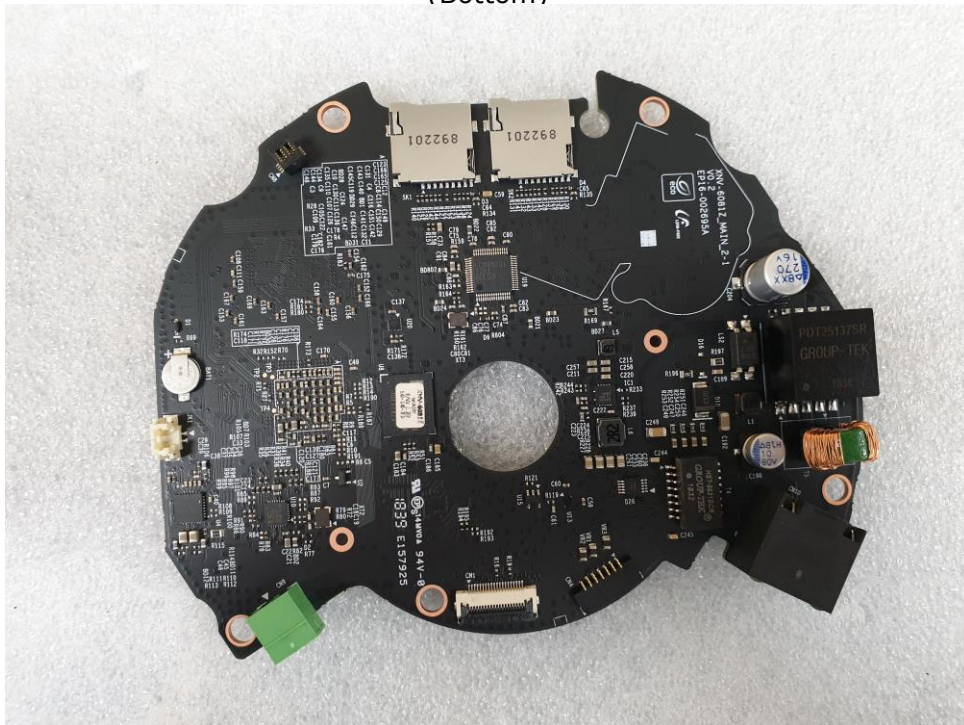


EUT Internal View – Main Board

(Top)



(Bottom)



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EUT Internal View – AC Module Board

(Top)



(Bottom)



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EUT Internal View – AC Module

(Top)



(Bottom)



EUT Internal View – Board 1

(Top)



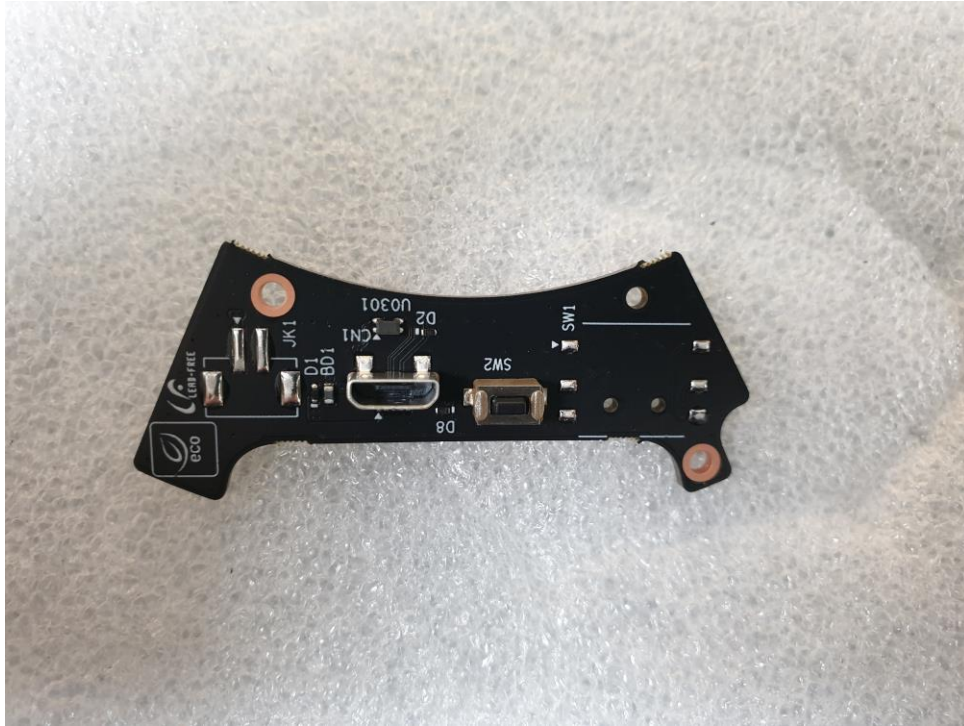
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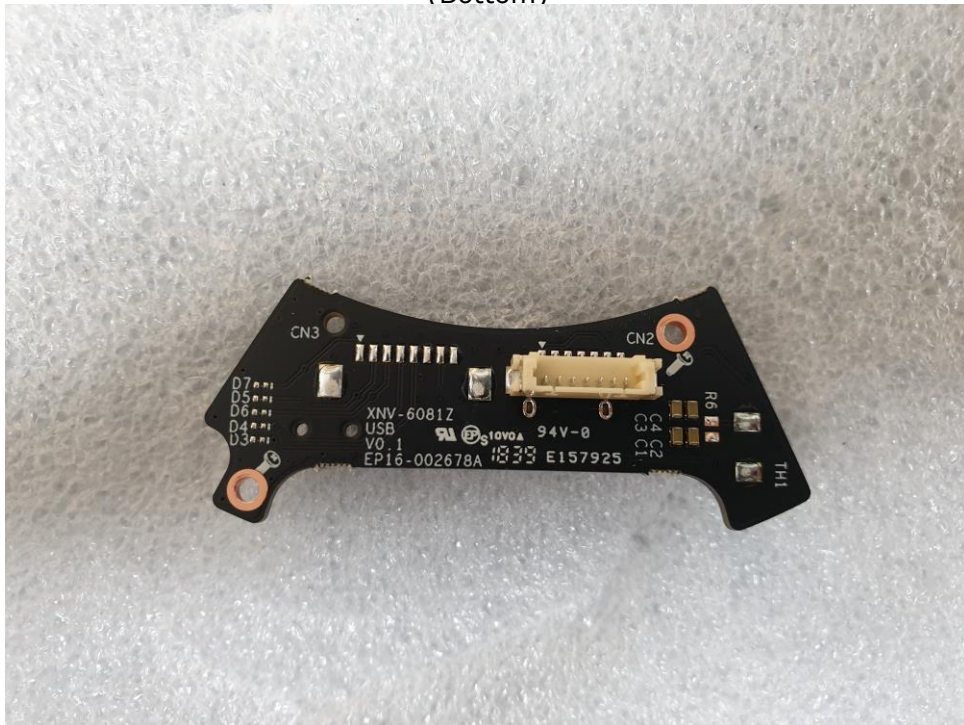
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EUT Internal View – Board 2

(Top)



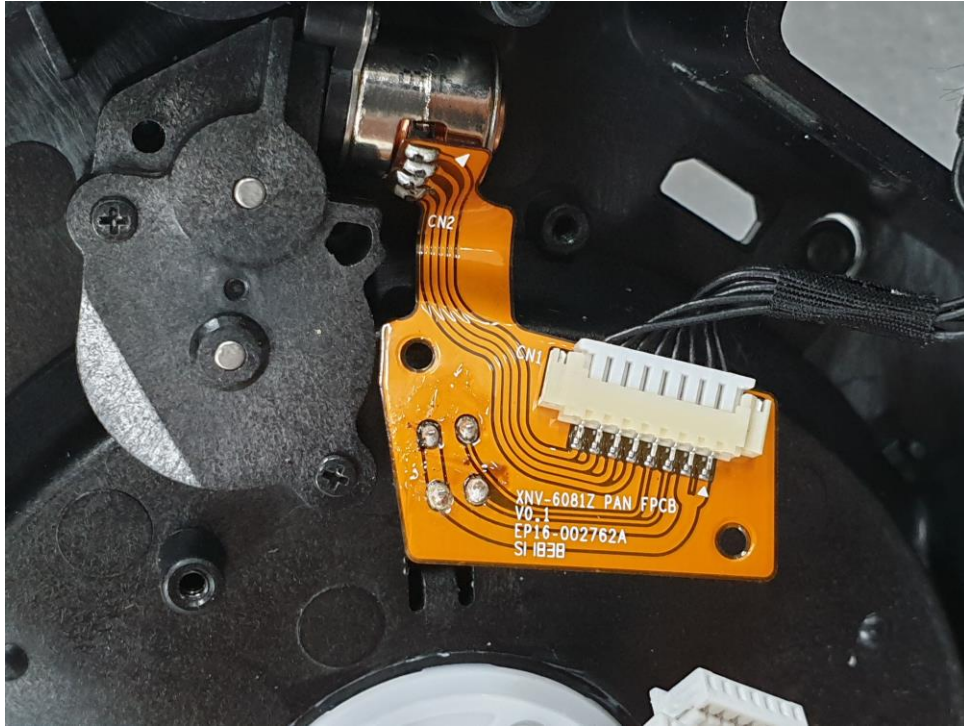
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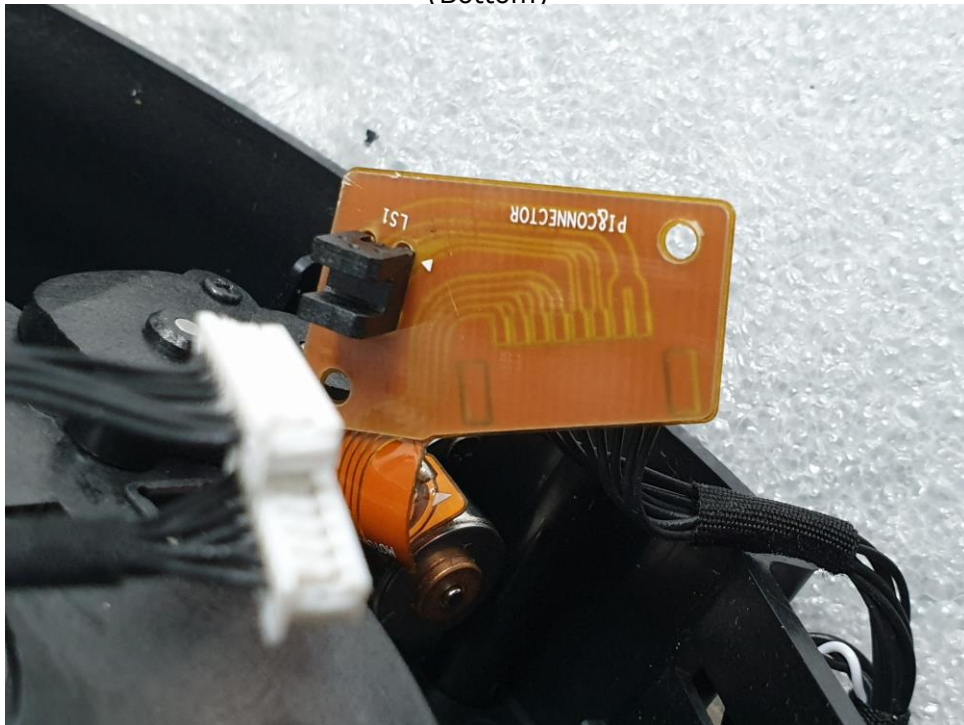
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EUT Internal View – Board 3

(Top)



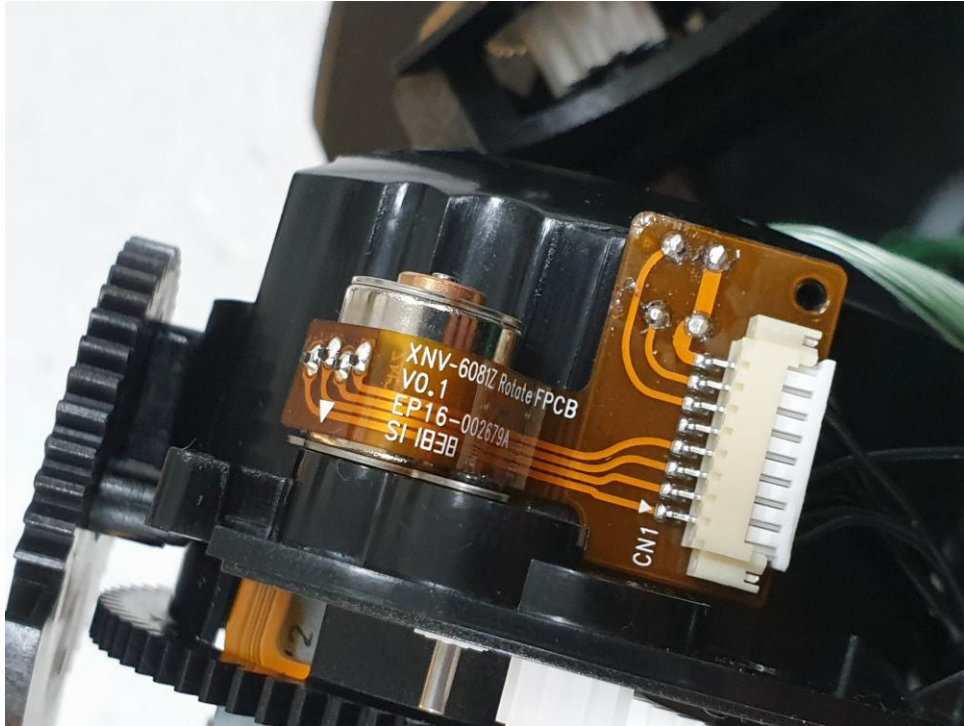
(Bottom)



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EUT Internal View – Board 4

(Top)

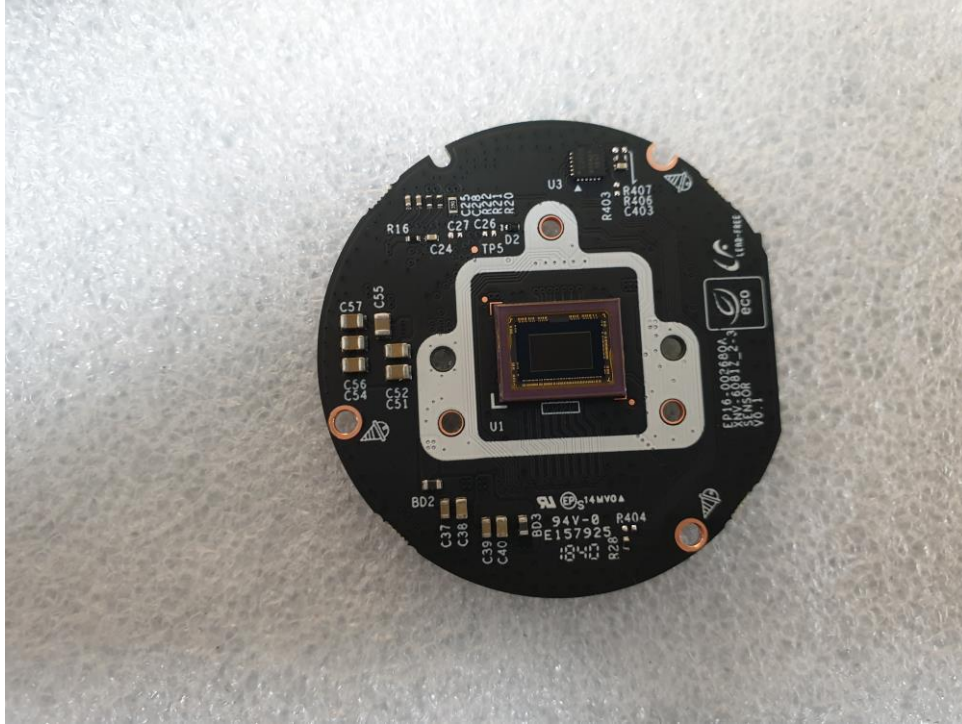


(Bottom)



EUT Internal View – Camera Board

(Top)



(Bottom)



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EUT Internal View – Camera

(Top)

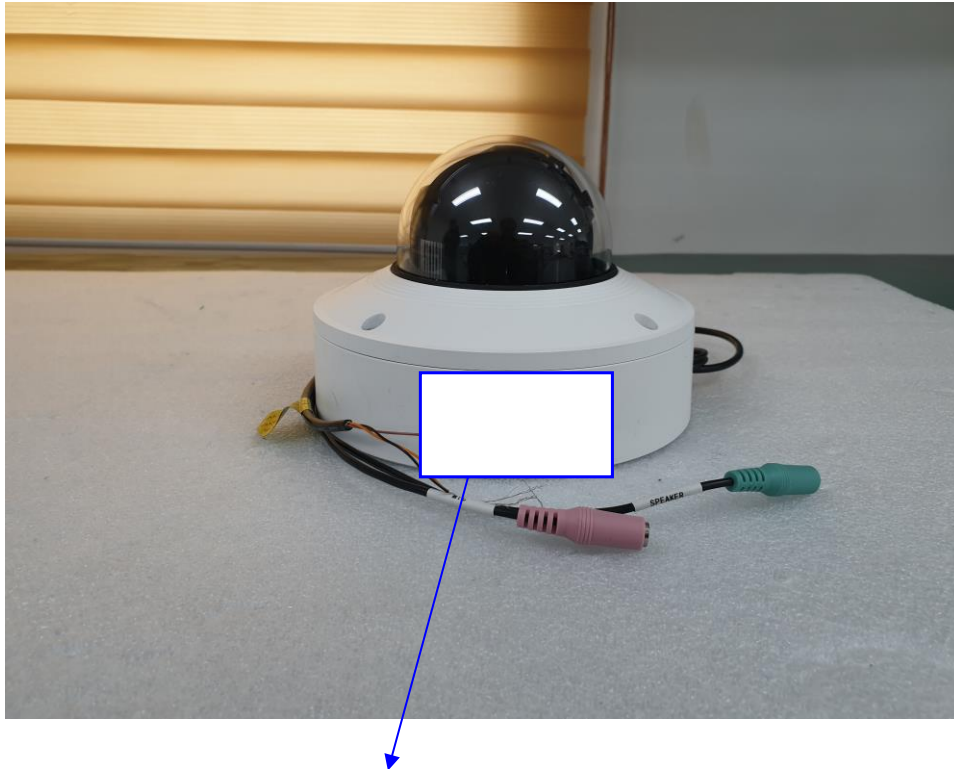


(Bottom)



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Label and Location



Network Camera

Model No : XNV-6081Z

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam