



TEST REPORT



Report No. : KES-EM-21T0243-R2

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KES Co., Ltd.

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1. Client

Applicant : Hanwha Vision Co., Ltd

Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

2. Sample Description

Product name : NETWORK CAMERA

Model/Type No. : XNV-6022RM

Variant Model : -

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

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

3. Date of Receipt : Jul. 10, 2024

4. Test date : Apr. 09, 2021 ~ Apr. 13, 2021

5. Date of Issue : Jul. 24, 2024

6. Test Results : In Compliance

Tested by

Reviewed by

Dong Il, Lee
EMC Test Engineer

Dong Hun, Jang
EMC Assistant Technical Manager

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

**REPORT REVISION HISTORY**

Date	Test Report No.	Revision History
Apr 15, 2021	KES-EM-21T0243	Issued
Jun. 08, 2022	KES-EM-21T0243-R1	Test Regulations update due to customer request.
Jul. 24, 2024	KES-EM-21T0243-R2	Change the Applicant and manufacturer at the request of the customer and Test Regulations update due to customer request

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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 : 0.055 lux(F2.0, 1/30sec) TBD B/W : 0Lux(IR LED On)
S / N Ratio	50dB
Video Out	USB : Micro USB type B, 1280x720, for installation
Lens	
Focal Length (Zoom Ratio)	3.6mm Fixed
Max. Aperture Ratio	F2.0
Angular Field of View	H 94.8° V 49.3° D 114.3°
Min. Object Distance	TBD
Focus Control	Manual
Lens Type	Fixed
Mount Type	Board-in type
Pan / Tilt / Rotate	
Pan / Tilt / Rotate range	±5°/0-67°/±90°
Operational	
IR Viewable Length	15m(49.21ft)
Camera Title	Off / On (Displayed up to 85 characters) - WW : 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(Masking/Dimming), 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



Defog	Auto(input from fog detection) / 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)
Contrast	level adjustment
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°
Video & Audio 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, People counting
Alarm I/O	-
Alarm Triggers	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 DPTZ preset
Audio In	Selectable (Mic IN/Line IN), Built-in microphone Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out, Max output level: 1 Vrms
Pixel Counter	Support
Network	
Ethernet	M12 (10/100BASE-T)
Video Compression Format	H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High , Motion JPEG
Resolution	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600,



	800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264 : Max. 60fps at all resolutions Motion JPEG : Max. 30fps
Smart Codec	Manual Mode (area-based : 5EA)
WiseStreamII	Support
Video Quality Adjustment	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 Format	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
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	SD/SDHC/SDXC 1slot (up to 256 GB) - Motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded. NAS(Network Attached Storage) Local PC for Instant Recording
Application Programming Interface	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, 8.1, 10, Mac OS X 10.10. 10.11 10.12 Non-plugin Webviewer Supported Browser: Google Chrome 54, MS Edge 38, Mozilla Firefox 49(Window 64bit only) , Apple Safari 9 (Mac OS X only) Plug-in Webviewer Supported Browser : MS Explore 11, Apple Safari 9 (Mac OS X only)
Central Management Software	SmartViewer, SSM
Environmental	
Operating Temperature / Humidity	-30°C ~ +55°C (-22°F ~ +131°F) / Less than 90% RH *Start up should be done at above -20°C
Storage Temperature /	-50°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH



Humidity	
Ingress Protection	IP66
Vibration Resistance	EN55011:2009+A1:2010, EN50581:2012, EN50121-3-2:2015, EN61000-4-2:2009 EN61000-4-3:2006+A2:2010, EN61000-4-4:2012, EN61000-4- 5:2014 EN61000-4-6:2009, EN50155:2007, NEMA 4X
Vandal Resistance	IK10, NEMA4X
Electrical	
Input Voltage / Current	PoE(IEEE802.3af, Class3)
Power Consumption	TBD
Mechanical	
Color / Material	Ivory / Metal
Dimension (WxHxD)	99 x 52 x 100
Weight	TBD



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.

☒ 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	XNV-6022RM	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 System Configuration

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

1.6 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Switch	PT-PSE109GBRO	-	PROCET PoE System	-
Notebook	LG15N54	506NZGK000615	LG Electronics.	-
Notebook Adapter	PA-1650-43(65W)	OF58U63849302Y6 09	LG Electronics.	-
Headset	RHS-2000	-	royche	-
Micro SD Card	-	-	SAMSUNG	-



1.7 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45(PoE)	PoE Switch(PoE)	RJ-45(PoE)	3.5	U
Notebook	RJ-45(LAN)	PoE Switch(LAN)	RJ-45(LAN)	3.5	U
NETWORK CAMERA (EUT)	Mic(3.5mm)	Headset	Mic(3.5mm)	1.8	U
	Audio(3.5mm)		Audio(3.5mm)	1.8	U
	Micro SD Slot	Micro SD Card	Micro SD Slot	-	-

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

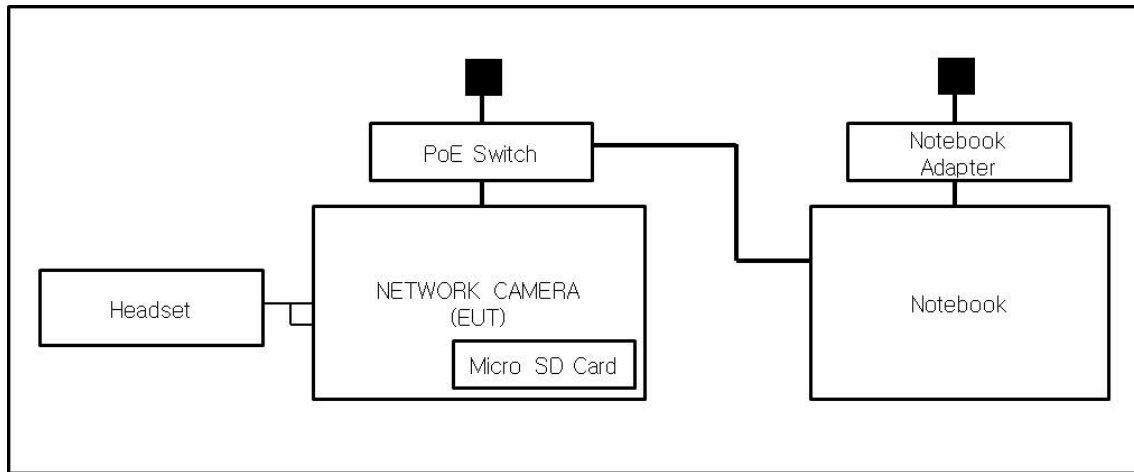
Test Mode	operating
PoE	EUT Monitoring, Ping Test

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



1.8 Configuration

■ AC Main(AC 230 V, 50 Hz)
□ DC Main



**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. The sites are constructed in conformance with the requirements of ANSI C63.4:2017 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 , 10 m Open Area 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, 10 m Open Area and 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	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	TÜV SÜD	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 0008



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☒ EN 55011:2016/A2:2021

☒ Group 1
☒ Class A

☐ Group 2
☐ Class B

☒ EN 50121-3-2:2016/A1:2019

☒ **EMC – Regulations 2016**

☒ EN 55011:2016/A2:2021

☒ Group 1
☒ Class A

☐ Group 2
☐ Class B

☒ EN 50121-3-2:2016/A1:2019





2.1 Conducted Emissions at Mains Power Ports

Test Date

N/A

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test SW	EMC32	R & S	9.12.00	-
☐	EMI TEST RECEIVER	ESR3	R & S	101783	Jan 15, 2022
☐	LISN	ENV216	R & S	101787	Dec 29, 2021
☐	LISN	ESH2-Z5	R & S	100450	Dec 29, 2021
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	Dec 29, 2021

Test Conditions

Temperature: (±) °C

Relative Humidity: (±) % 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

RemarksPower is supplied by PoE, so excluded from the test.



2.2 Impulse Noise (click)

Test Date

N/A

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	AFJ Click Meter	AFJ	6.05	-
☐	CLICK METER	CL55C	AFJ INSTRUMENTS	55041222168	Aug 05, 2021
☐	LISN	ENV216	R & S	101787	Dec 29, 2021

Test Conditions

Temperature: °C

Relative Humidity: % 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

RemarksPower is supplied by PoE, so excluded from the test.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Apr 09, 2021

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

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	Apr 01, 2022
☒	AMPLIFIER	SCU 01	R & S	100603	Nov 25, 2021
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	Dec 08, 2022
☒	ATTENUATOR	8491A	HP	32173	Mar 10, 2022

Test Conditions

Temperature: (24,1 ± 0,2) °C

Relative Humidity: (45,4 ± 0,2) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Apr 12, 2021

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	Aug 05, 2021
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	Apr 07, 2022
☐	ATTENUATOR	8491A	HP	35496	Mar 10, 2022
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	Mar 11, 2022

Test Conditions

Temperature: (24,2 ± 0,1) °C

Relative Humidity: (45,9 ± 0,1) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



2.5 Harmonic Current Emissions

Test Date

N/A

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	net.control	EM TEST	2.1.4	-
☐	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	Apr 06, 2022
☐	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (±) °C

Relative Humidity: (±) % 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

RemarksPower is supplied by PoE, so excluded from the test.



2.6 Voltage Fluctuations and Flicker

Test Date

N/A

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test SW	net.control	EM TEST	2.1.4	-
☐	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	Apr 06, 2022
☐	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (±) °C
Relative Humidity: (±) % R.H.

Test Results

The requirements are:

- ☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

RemarksPower is supplied by PoE, so excluded from the test.



3.0 Criteria for Compliance

Criteria for compliance was based on the following guidelines:

General performance criteria

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

Performance criterion A

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

Performance criterion B

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

Performance criterion C

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



3.1 Electrostatic Discharge

Reference Standard

EN 61000-4-2:2009

Test Date

Apr 13, 2021

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	Feb 01, 2022
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (23,5 ± 0,1) °C
Relative Humidity: (46,0 ± 0,1) % 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:	Contact	Air	HCP	VCP
	☒ 2 kV	☒ 2 kV	☐ 2 kV	☐ 2 kV
	☒ 4 kV	☒ 4 kV	☐ 4 kV	☐ 4 kV
	☒ 6 kV	☐ 6 kV	☒ 6 kV	☒ 6 kV
	☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
	☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

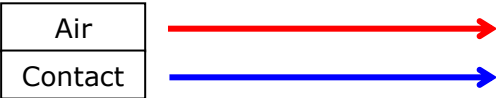
Notes: HCP: Horizontal Coupling Plane

VCP: Vertical Coupling Plane

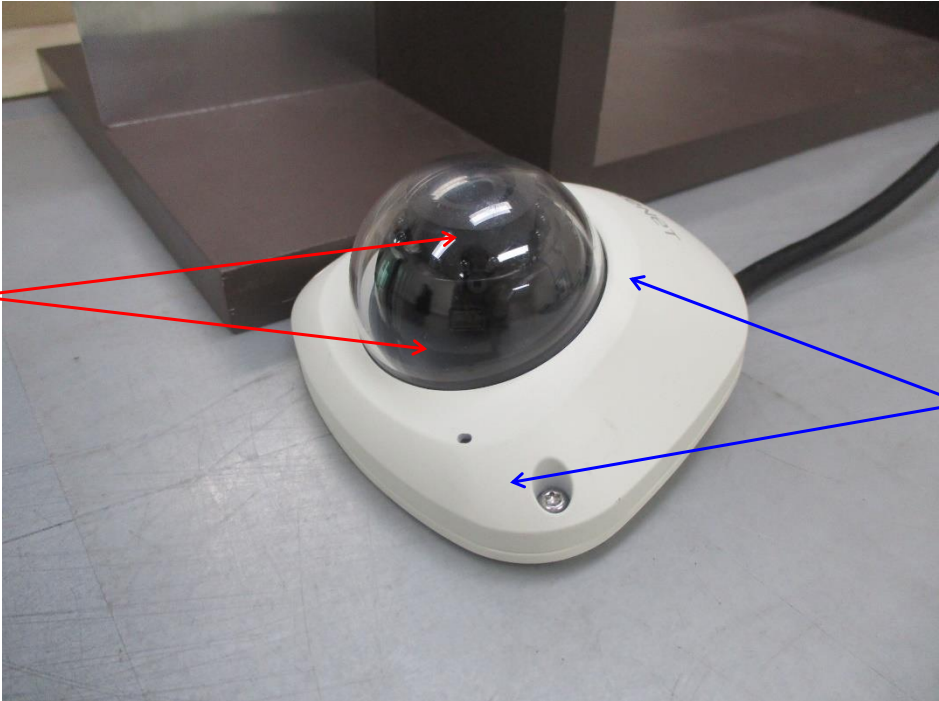
Required Performance Criteria: ☒ B



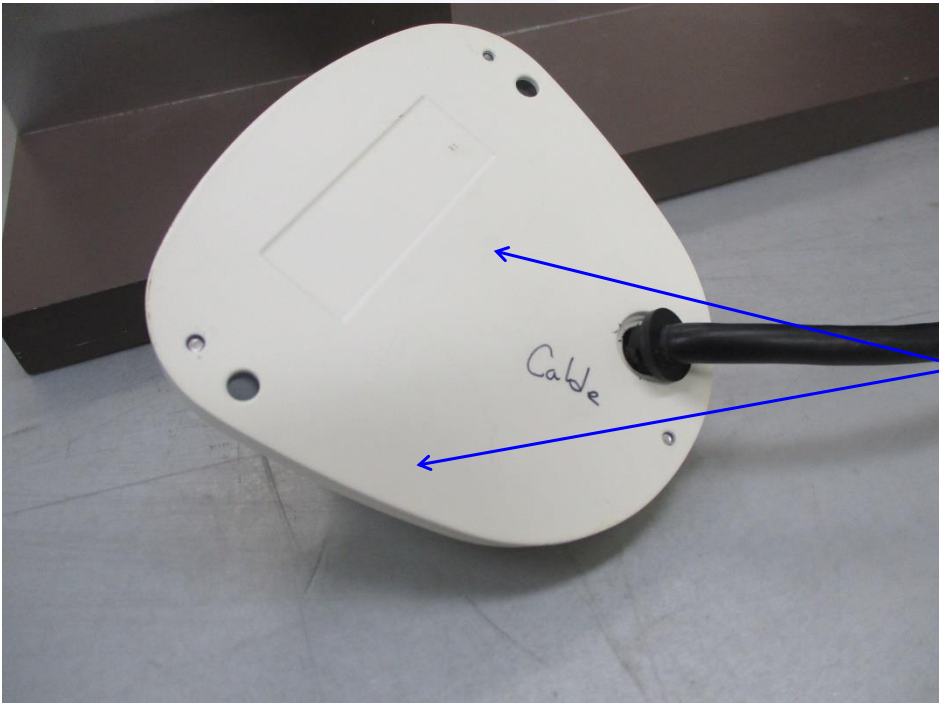
Location of Discharge:



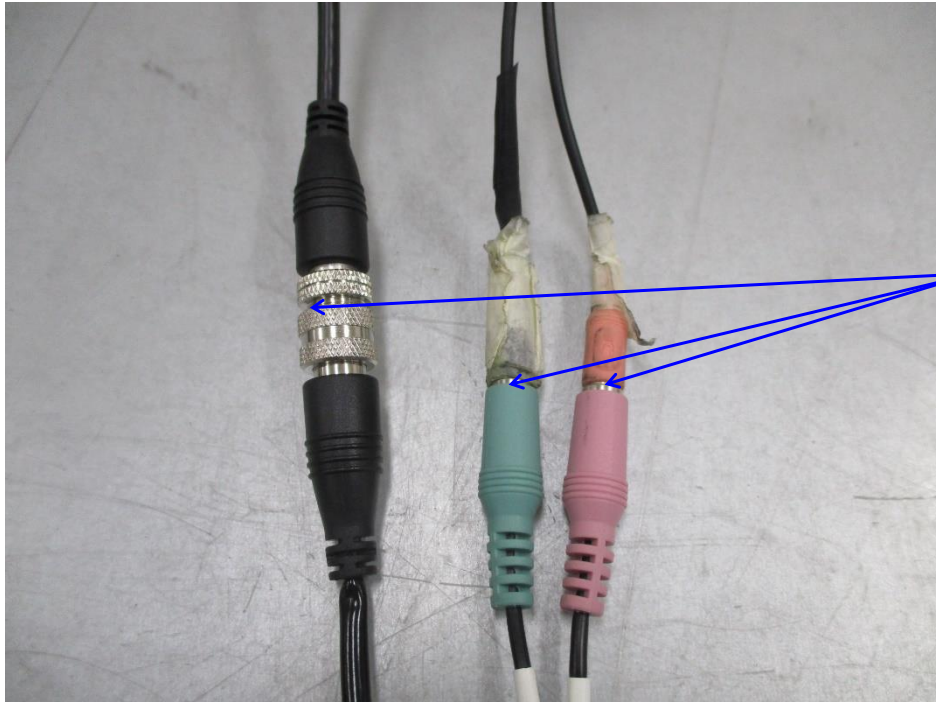
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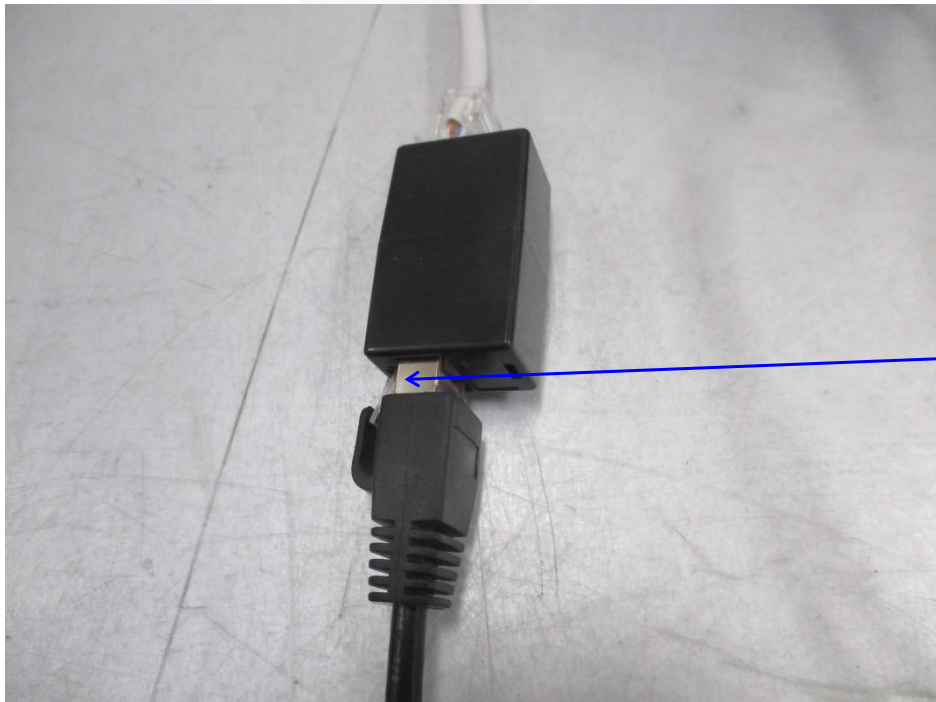
2



3



4



5

**Test Data**

Indirect Discharge

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

Direct Discharge

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

Note: "Blank" = Not performed

Observations:

- A – No response observed from EUT
- B – Unit shuts down then automatically restarts when full voltage is restored.
- C – Unit shuts down then manually restarts when full voltage is restored or Loss of function.

Test Results

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

Remarks

PASS Required Performance Criteria.



3.2 Radio-frequency Electromagnetic Field

Reference Standard

EN IEC 61000-4-3:2020

Test Date

Apr 12, 2021

Test LocationEMS-RS: ☒ SEMI ANECHOIC CHAMBER #3 ☐ SEMI ANECHOIC CHAMBER #4(10 m)**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	9.12.00	-
☒	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	Aug 05, 2021
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	Apr 01, 2022
☒	CW POWER SENSOR	E4412A	Agilent	US38488240	Apr 01, 2022
☒	CW POWER SENSOR	E4412A	Agilent	MY41501662	Apr 01, 2022
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	Mar 11, 2022

Test Conditions

Temperature: (24,2 ± 1,3) °C
Relative Humidity: (45,9 ± 1,5) % R.H.
Atmospheric Pressure: (100,0 ± 0,0) kPa



Test Specifications

Antenna Polarization: Horizontal & Vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

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

Modulation: ☒ 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: ☒ A

**Test Data**

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

Note: "Blank" = Not performed

Observations:

- A – No response observed from EUT
- B – Unit shuts down then automatically restarts when full voltage is restored.
- C – Unit shuts down then manually restarts when full voltage is restored or Loss of function.

Test Results

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

Remarks

PASS Required Performance Criteria.



3.3 Fast Transients

Reference Standard

EN 61000-4-4:2012

Test Date

Apr 13, 2021

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	Nov 26, 2021
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	Nov 26, 2021
☐	3-PHASE CDN	CNI 503B8	EM TEST	P1622180299	Nov 27, 2021
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	Nov 26, 2021

Test Conditions

Temperature: (23,5 ± 0,1) °C
Relative Humidity: (46,0 ± 0,1) % R.H.
Atmospheric Pressure: (99,7 ± 0,0) kPa

Test Specifications

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

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

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☒ 5 kHz ☐ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ A

**Test Data**☐ 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	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

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

Note: “Blank” = Not performed

Observations:

- A – No response observed from EUT
- B – Unit shuts down then automatically restarts when full voltage is restored.
- C – Unit shuts down then manually restarts when full voltage is restored or Loss of function.

Test Results

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

RemarksPASS Required Performance Criteria.



3.4 Surges

Reference Standard

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

Test Date

N/A

Test Location

EMS-Surge: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMS Test SW	iec.control	EM TEST	5.4.7	-
☐	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	Nov 26, 2021
☐	MOTOR VARIAC	MV2616	EM TEST	P1552169719	Nov 26, 2021
☐	3-PHASE CDN	CNI 503B8	EM TEST	P1622180299	Nov 26, 2021
☐	CDN	CNV 508N1	EM TEST	P1610176296	Nov 27, 2021
☐	CDN	CNV 504N7.3	EM TEST	P1744207079	Nov 26, 2021

Test Conditions

Temperature: (±) °C
Relative Humidity: (±) % R.H.
Atmospheric Pressure: (±) kPa



Test Specifications

AC Power Lines

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

Surge Amplitude : Common Mode

☐ (2,0) kV

Differential Mode

☐ (1,0) kV

Number of Surges: ☐ 5 surges per angle

Angle: ☐ 0°, 90°, 180°, 270° (input AC power port)

Polarity: ☐ Positive & Negative

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

Required Performance Criteria: ☐ B

DC Power Lines

Source Impedance: 42 ohm

Surge Amplitude: Common Mode

☐ (2,0) kV

Differential Mode

☐ (1,0) kV

Number of Surges: ☐ 5 Surges

Polarity: ☐ Positive & Negative

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

Required Performance Criteria: ☐ B

**Test Data**☐ 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	-	-

Note: "Blank" = Not performed

Observations:

- A – No response observed from EUT
- B – Unit shuts down then automatically restarts when full voltage is restored.
- C – Unit shuts down then manually restarts when full voltage is restored or Loss of function.

Test Results

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

RemarksPower is supplied by PoE, so excluded from the test.



3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Apr 09, 2021

Test Location

EMS-CS: Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.11	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	Nov 25, 2021
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	Nov 25, 2021
☒	CDN	CDN M016	TESEQ	43694	Nov 25, 2021
☒	CDN	CDN M016	TESEQ	43697	Nov 25, 2021
☐	CDN	CDN T800	TESEQ	42800	Nov 25, 2021
☒	CDN	CDN T8RJ45	EM TEST	0909-09	Aug 05, 2021

Test Conditions

Temperature: (23,8 ± 0,2) °C
Relative Humidity: (45,7 ± 0,2) % R.H.
Atmospheric Pressure: (100,1 ± 0,0) kPa

Test Specifications

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

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

Modulation: ☒ AM, 80 %, 1 kHz sine wave

Frequency Step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

Required Performance Criteria: ☒ A

**Test Data**☐ Input a.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45 (PoE)	CDN	A

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

Observations:

- A – No response observed from EUT
- B – Unit shuts down then automatically restarts when full voltage is restored.
- C – Unit shuts down then manually restarts when full voltage is restored or Loss of function.

Test Results

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

Remarks

PASS Required Performance Criteria.



APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]





[NEUTRAL]

N/A

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

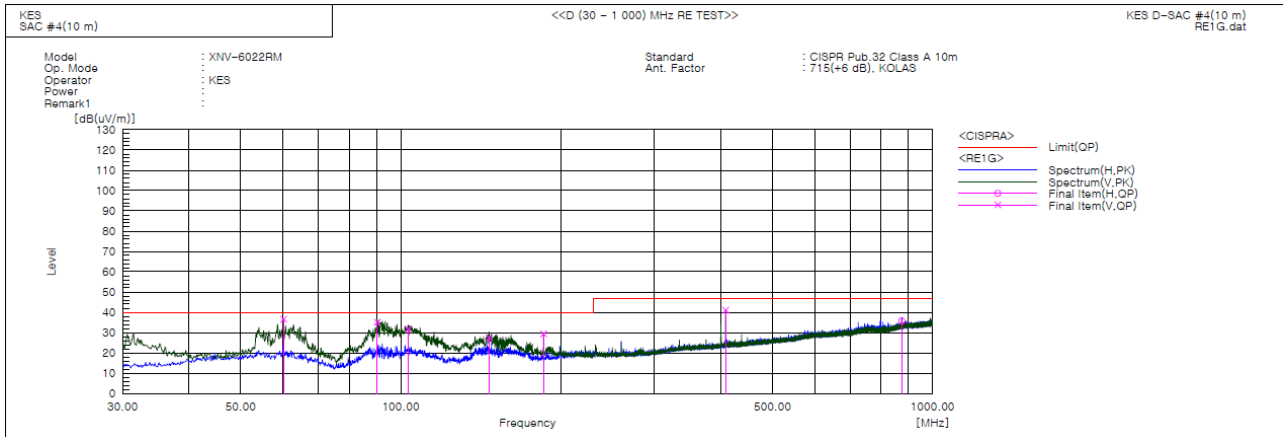
Reading Value : Not shown in the table.

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



Impulse Noise (click)

N/A

**Radiated Electric Field Emissions(Below 1 GHz)****Final Result**

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	60.213	V	58.6	-22.0	36.6	40.0	3.4	100.0	253.0	
2	90.349	V	59.2	-24.1	35.1	40.0	4.9	147.0	278.0	
3	103.310	V	54.2	-22.5	31.7	40.0	8.3	100.0	227.0	
4	146.673	V	52.7	-25.2	27.5	40.0	12.5	214.0	136.0	
5	185.634	V	52.1	-22.7	29.4	40.0	10.6	193.0	9.0	
6	408.384	V	55.2	-14.1	41.1	47.0	5.9	100.0	207.0	
7	874.990	H	40.2	-4.3	35.9	47.0	11.1	364.0	158.0	

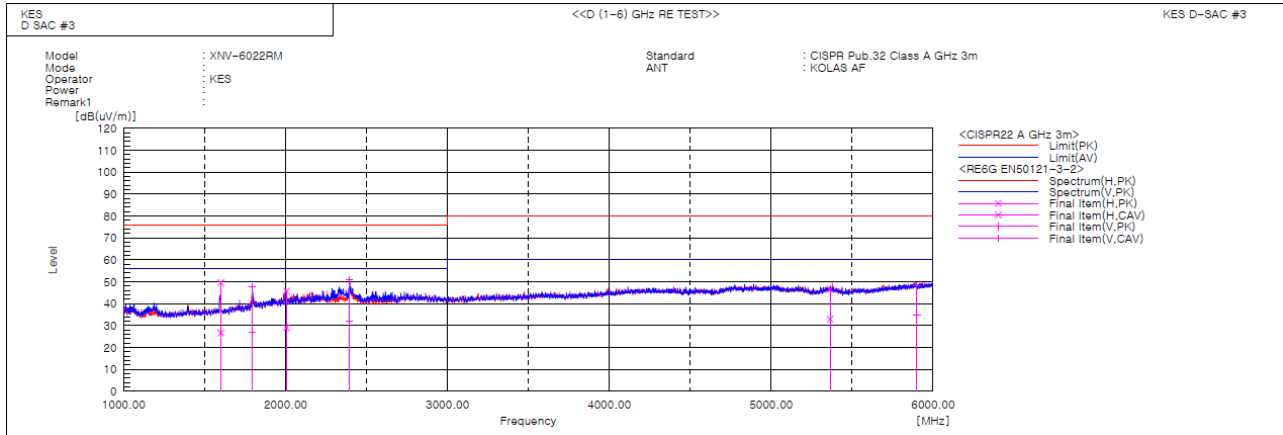
◆ Calculation – SAC #4(10 m)

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

**Radiated Electric Field Emissions(Above 1 GHz)****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	1600.039	H	54.8	31.9	-5.2	49.6	26.7	76.0	56.0	26.4	29.3	100.0	50.7	
2	1795.370	V	50.8	30.0	-3.0	47.8	27.0	76.0	56.0	28.2	29.0	100.0	150.5	
3	2006.358	H	46.6	29.8	-0.8	45.8	29.0	76.0	56.0	30.2	27.0	100.0	98.2	
4	2394.491	V	50.9	31.8	0.2	51.1	32.0	76.0	56.0	24.9	24.0	100.0	198.3	
5	5363.983	H	38.2	24.7	8.3	46.5	33.0	80.0	60.0	33.5	27.0	100.0	41.5	
6	5899.288	V	37.9	24.3	10.4	48.3	34.7	80.0	60.0	31.7	25.3	100.0	203.2	

◆ Calculation

Over Limit [dB] = (Read Level[dB μ V] + Ant Factor[dB/m] + Cable Loss [dB] – Preamp Factor [dB]) – Limit Line[dB μ V]

Over Limit : Marjin, Read Level : Reading value, Ant Factor : ANT Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

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Test Data - Voltage Fluctuations

Maximum Flicker results

Flicker Measurements					
	Plt	Max Pst	Max Dc	Max Dmax	Max Tmax
Line 1:			N/A		
Limits:					
Results:					





Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

N/A





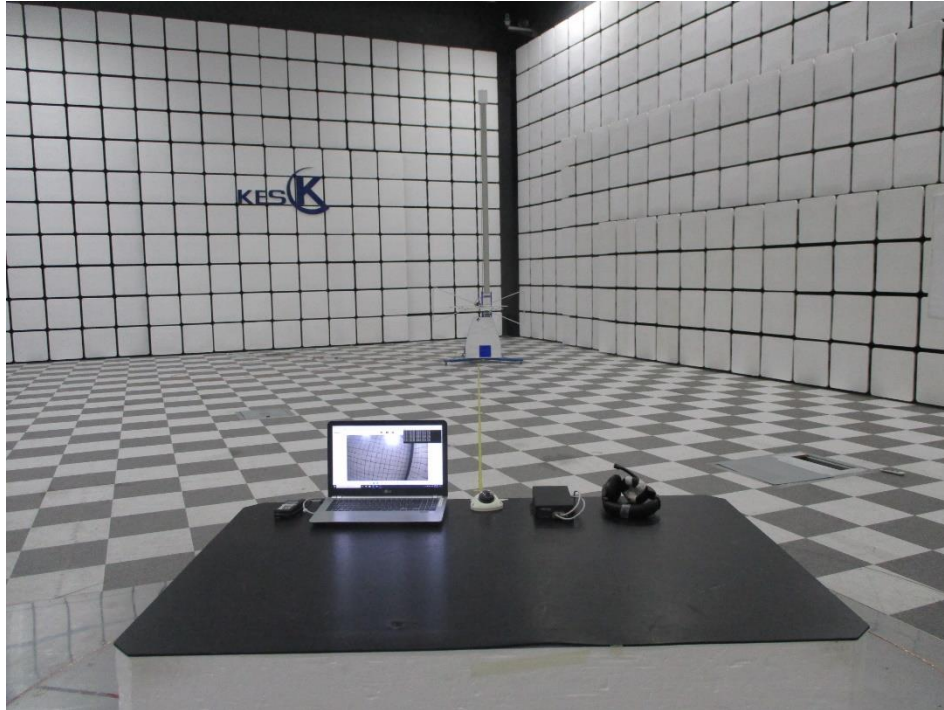
Impulse Noise (click)

N/A





Radiated Electric Field Emissions(Below 1 GHz)





Radiated Electric Field Emissions(Above 1 GHz)





Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A





Electrostatic Discharge



Radio-frequency Electromagnetic Field





Fast Transients



Surges

N/A



Conducted Disturbance





EUT External Photographs

(Top)



(Bottom)





EUT Internal Photographs



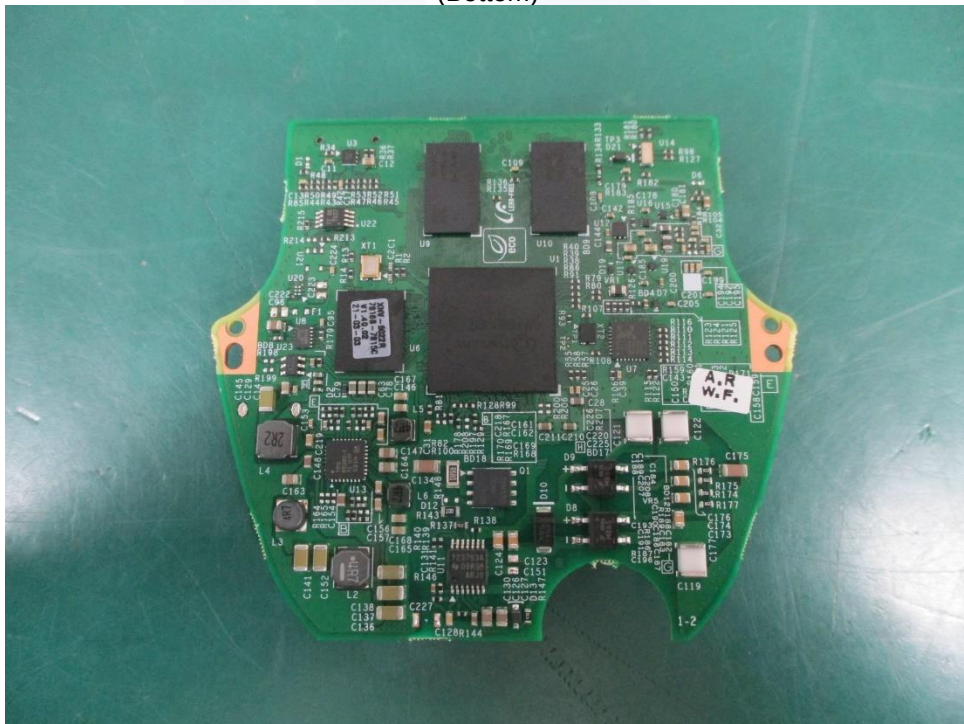


EUT Internal View – Main Board

(Top)



(Bottom)





EUT Internal View – Sub Board 1

(Top)



(Bottom)



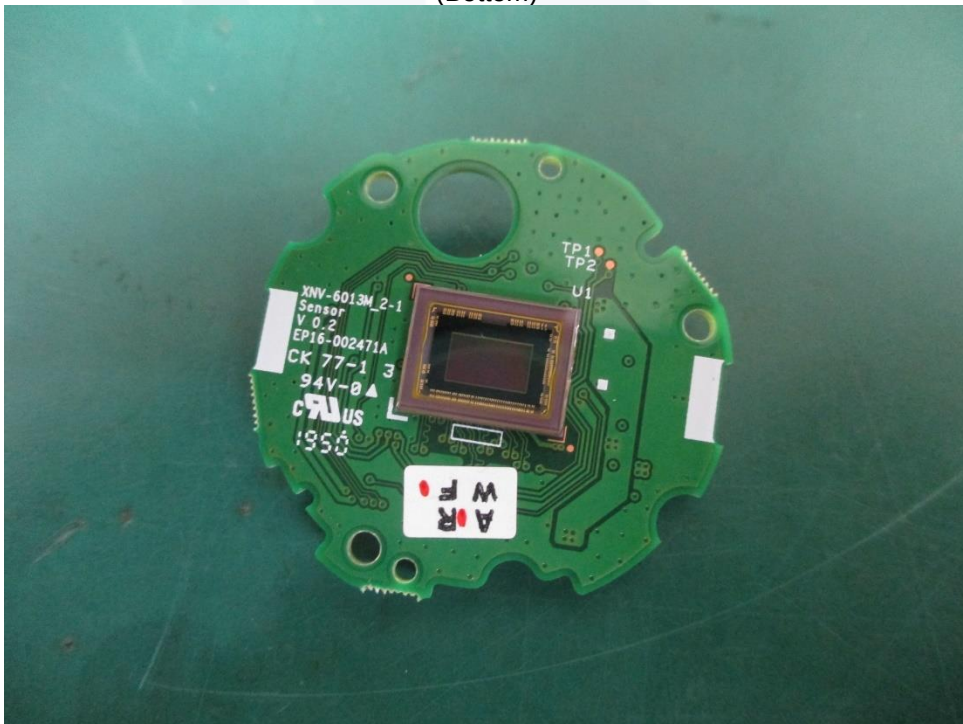


EUT Internal View – Sub Board 2

(Top)



(Bottom)





EUT Internal View – Lens

(Top)

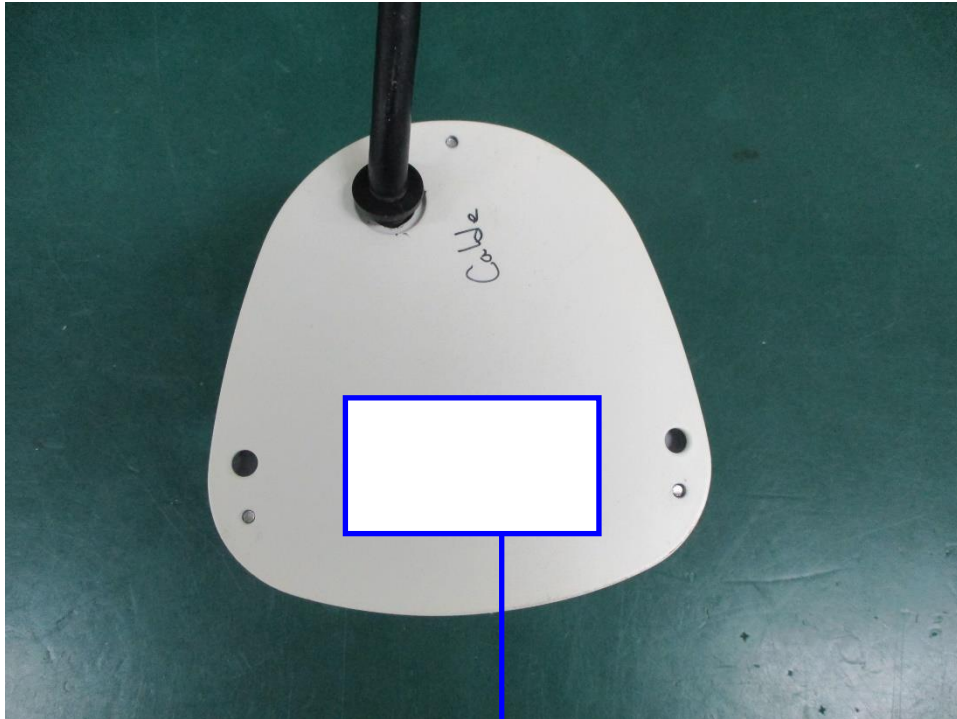


(Bottom)





Label and Location



NETWORK CAMERA

Model No : XNV-6022RM

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam

