



**KES Co., Ltd.**

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Test report No.:  
KES-E1-18T0094-R2  
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# EMC TEST REPORT For CE

Test Report No. : KES-E1-18T0094-R2  
Date of Issue : Jan. 27, 2020  
Product name : Network Camera  
Model/Type No. : XNV-6080RS  
Variant Model : XNV-6080RSA  
Applicant : Hanwha Techwin Co., Ltd.  
Applicant Address : 6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si,  
Gyeonggi-do, 13488, KOREA  
Manufacturer : 1. Hanwha Techwin (Tianjin) Co.,Ltd.  
2. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.  
3. D-TECH CO.,LTD.  
Manufacturer Address : 1. No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA, Tianjin,  
300385, People's Republic of China  
2. Lot O-2, Que Vo Industrial Zone extended area,  
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam  
3. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,  
Korea (Suwon Industrial Complex)  
Date of Receipt : Jan. 03, 2018  
Test date : Jan. 03, 2018 ~ Jan. 06, 2018  
Test Results :  **In Compliance**  **Not in Compliance**

Tested by

\_\_\_\_\_  
Dong Il, Lee  
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**

<b>Date</b>	<b>Test Report No.</b>	<b>Revision History</b>
Jan. 17, 2018	KES-E1-18T0094	Issued
May. 15, 2019	KES-E1-18T0094-R1	Re-issue due to manufacturer change
Jan. 27, 2020	KES-E1-18T0094-R2	Reissue due to the addition of a derived model

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## 1.0 General Product Description

### Main Specifications of E.U.T are:

<b>Video</b>	
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 Lux (IR LED On)
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
<b>Lens</b>	
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
<b>Pan / Tilt / Rotate</b>	
Pan / Tilt / Rotate range	0° ~ 354° / 0° ~ 67° / 0° ~ 355°
<b>Operational</b>	
IR Viewable Length	50m(164.04ft)
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(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 / 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
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 DPTZ preset
Pixel Counter	Support

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<b>Network</b>	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Form	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)
WiseStream II	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 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
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-directional (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 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 Programming	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 <b>Non-plugin Webviewer</b> Supported Browser: Google Chrome, MS Edge, Mozilla Firefox(Window 64bit only) , Apple Safari 10 (Mac OS X only) <b>Plug-in Webviewer</b> Supported Browser : MS Explore 11, Apple Safari(Mac OS X only)
Central Management Soft	SmartViewer, SSM
<b>Environmental</b>	
Operating Temperature / Humidity	-40°C ~ +55°C (-40°F ~ +131°F) / Less than 90% RH
Storage Temperature / Humidity	-50°C ~ +60°C (-58°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP67, IP66, NEMA 4X
Vandal Resistance	IK10+
<b>Electrical</b>	
Input Voltage / Current	24VAC ± 10%, 12VDC ± 10%, PoE(IEEE802.3af)
Power Consumption	Max. 11.5W(12VDC), Max. 12.95W(PoE), Max. 14W(24VAC)
<b>Mechanical</b>	
Color / Material	Silver / SUS316L
Dimension (WxHxD)	Ø 162 X H120.5mm (Ø6.38" x 4.74")
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

## 1.2 Variant Model Differences

Added a simple variant model for the purpose of the vendor management and a country of origin for the dualization.

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
Network Camera	XNV-6080RS	-	Hanwha Techwin (Tianjin) Co.,Ltd	E.U.T

## 1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adaptor	ANY4805C-LT1	10H300002	ANY ELECTRONICS CO., LTD	-
Notebook	X56K	HN11N5151FJ0045W	HanSung Corporation	-
Notebook AC/DC Adaptor	A12-120P1A	F180271552011758	CHICONY POWER TECHNOLOGY CO.,LTD.	-
Micro SD Card1	-	-	SanDisk	-
Micro SD Card2	-	-	SanDisk	-
MIC	CMK-303	-	CAMAC	-
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	-
Alarm1	-	-	-	-
Alarm2	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-

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## 1.6 External I/O Cabling

### ■ AC 24 V Mode, 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	3.0	U
Network Camera (E.U.T)	Micro SD Slot	Micro SD Card1	Micro SD Slot	-	-
Network Camera (E.U.T)	Micro SD Slot	Micro SD Card2	Micro SD Slot	-	-
Network Camera (E.U.T)	3.5 mm	MIC	3.5 mm	1.7	U
Network Camera (E.U.T)	3.5 mm	Speaker	3.5 mm	1.6	U
Network Camera (E.U.T)	2 PIN	Alarm1	2 PIN	3.0	U
Network Camera (E.U.T)	2 PIN	Alarm2	2 PIN	3.0	U

\* Unshielded=U, Shielded=S

### ■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Network Camera (E.U.T)	RJ-45	PoE Adaptor	RJ-45	3.0	U
PoE Adaptor	RJ-45	Notebook	RJ-45	3.0	U
Network Camera (E.U.T)	Micro SD Slot	Micro SD Card1	Micro SD Slot	-	-
Network Camera (E.U.T)	Micro SD Slot	Micro SD Card2	Micro SD Slot	-	-
Network Camera (E.U.T)	3.5 mm	MIC	3.5 mm	1.7	U
Network Camera (E.U.T)	3.5 mm	Speaker	3.5 mm	1.6	U
Network Camera (E.U.T)	2 PIN	Alarm1	2 PIN	3.0	U
Network Camera (E.U.T)	2 PIN	Alarm2	2 PIN	3.0	U

\* Unshielded=U, Shielded=S

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## 1.7 E.U.T Operating Mode(s)

Test Mode	operating
AC, DC, PoE	E.U.T Monitoring, Ping Test

E.U.T Test operating S/W		
Name	Version	Manufacture Company
Webviewer	-	Hanwha Techwin Co., Ltd.

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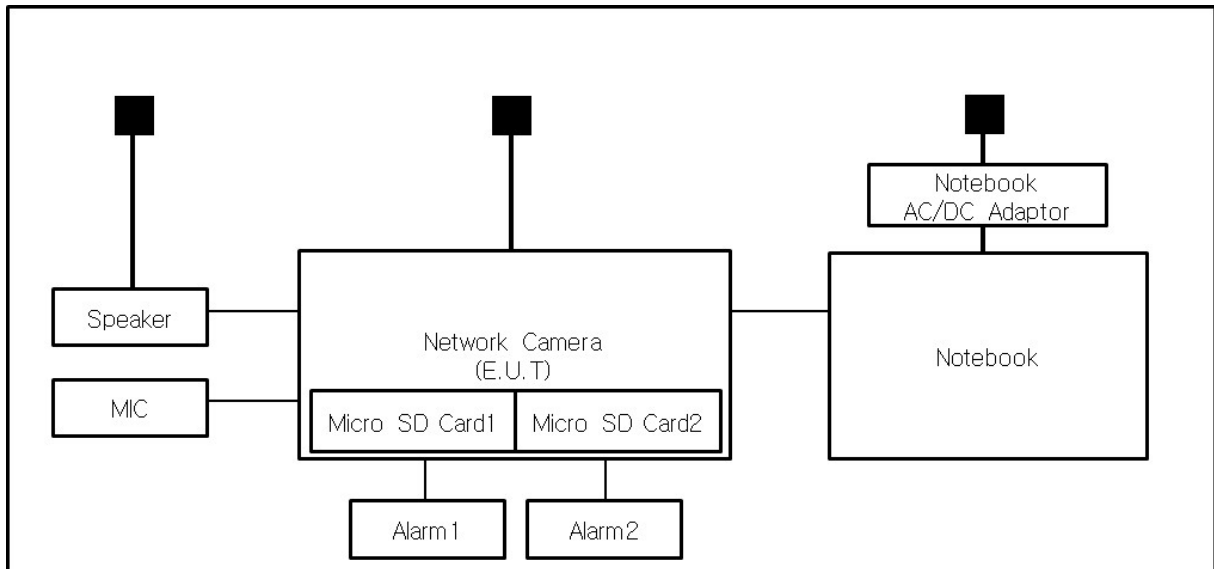
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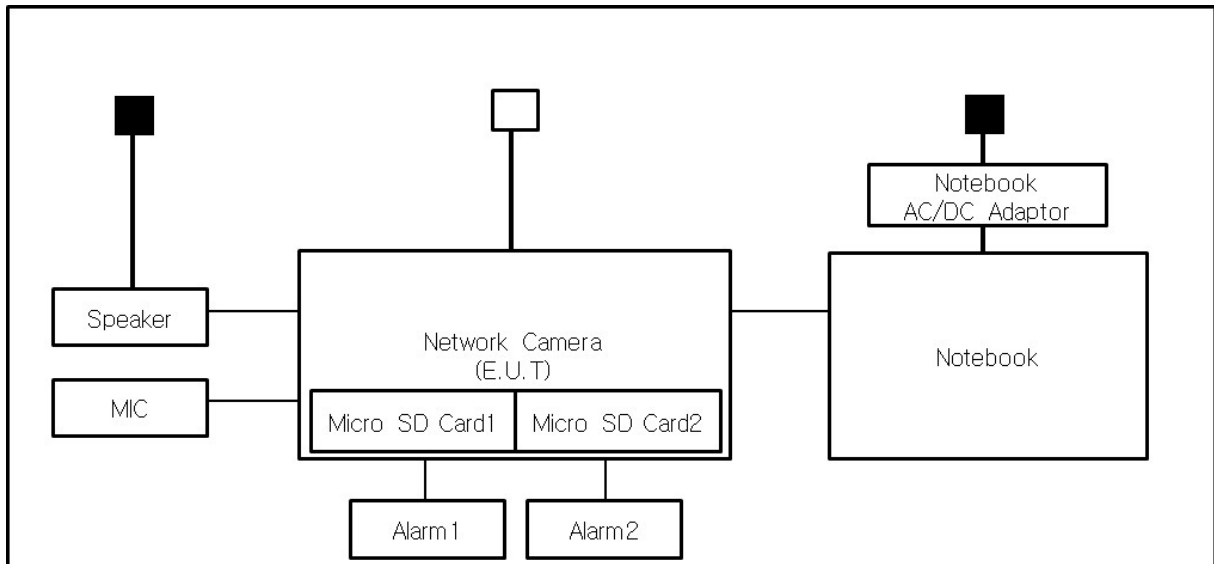
## 1.8 Configuration

■ AC Main  
□ DC Main

### ■ AC 24 V Mode

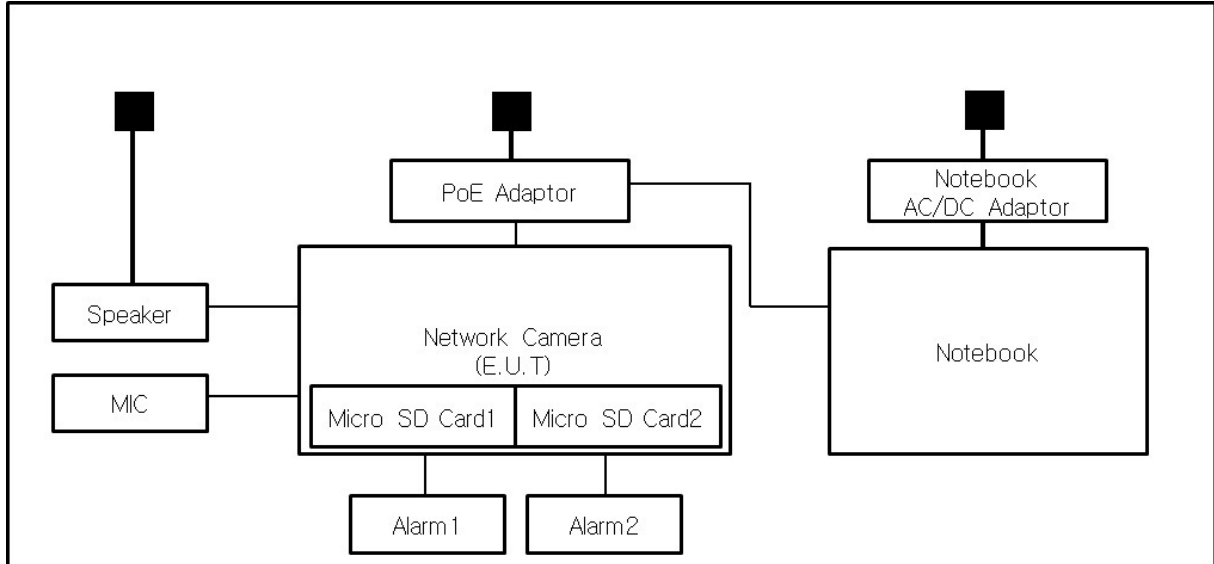


### ■ DC 12 V Mode



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■ PoE Mode



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## 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 C63.4:2014 and CISPR 16-1-4:2012

## 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	 23298-1
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 0003

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## 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

Group 2

Class A

Class B

EN 55014-1:2006 +A2:2011

EN 55014-2:1997 +A2:2008

EN 55015:2013

EN 61547:2009

EN 55032:2012/AC:2013

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



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- |   |                                  |                                  |
|---|----------------------------------|----------------------------------|
| <input type="checkbox"/> <b>VCCI V-3 / 2015.04</b>            | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>AS/NZS CISPR22:2009 +A1:2010</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 C63.4-2009                      |                                  |                                  |
| <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

Jan. 05, 2018

### 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	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	04, 27, 2018
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101137	02, 03, 2018
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101786	04, 27, 2018
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101914	11, 27, 2018
<input type="checkbox"/>	LISN	NNBM8124	SCHWARZBECK	8124-1002	08, 07, 2018
<input type="checkbox"/>	LISN	NNBM8124	SCHWARZBECK	8124-1003	08, 07, 2018

### Test Conditions

Temperature: 24,1 °C  
Relative Humidity: 42,9 % 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

Jan. 05, 2018

### 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	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	04, 27, 2018
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101137	02, 03, 2018
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101786	04, 27, 2018
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101914	11, 27, 2018
<input checked="" type="checkbox"/>	8-WIRE ISN CAT3	CAT3 8158	SCHWARZBECK	8158-0019	03, 29, 2018
<input checked="" type="checkbox"/>	8-WIRE ISN CAT5	CAT5 8158	SCHWARZBECK	8158-0030	03, 29, 2018
<input type="checkbox"/>	8-WIRE ISN CAT6	NTFM 8158	SCHWARZBECK	8158-0029	08, 10, 2018

### Test Conditions

Temperature: 24,1 °C  
Relative Humidity: 42,9 % 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.

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

**Test Date**

Jan. 03, 2018

**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, 18, 2018
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	11, 27, 2018
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	716	11, 28, 2018

**Test Conditions**Temperature: 24,1 °C  
Relative Humidity: 42,0 % R.H.**Frequency Range of Measurement**

30 MHz to 1 GHz

**Instrument Settings**

IF Band Width: 120 kHz

**Test Results**

The requirements are:

- PASS  
 NOT PASS  
 NOT APPLICABLE

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



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

### Test Date

Jan. 04, 2018

### 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, 07, 2018
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2018
<input type="checkbox"/>	ATTENUATOR	8491A	HP	32173	03, 24, 2018
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

### Test Conditions

Temperature: 22,8 °C  
Relative Humidity: 41,5 % R.H.

### Frequency Range of Measurement

1 GHz to 6 GHz

### Instrument Settings

IF Band Width: 1 MHz

### Test Results

The requirements are:

- PASS
- NOT PASS
- NOT APPLICABLE

### Remarks

See 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
<input type="checkbox"/>	EMI Test S/W	dpa.control	EM TEST	5.4.11.0	-
<input type="checkbox"/>	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 09, 2018
<input type="checkbox"/>	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

### Test Conditions

Relative Humidity:  $^{\circ}\text{C}$   
% 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

N/A : Because the E.U.T power is PoE, DC 12 V and AC 24 V, limits are not specified.



## 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
<input type="checkbox"/>	EMI Test S/W	dpa.control	EM TEST	5.4.11.0	-
<input type="checkbox"/>	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 08, 2018
<input type="checkbox"/>	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

### Test Conditions

Relative Humidity:                          °C  
    % R.H.

### Test Results

The requirements are:

- PASS
- NOT PASS
- NOT APPLICABLE

### Remarks

N/A : Because the E.U.T power is PoE, DC 12 V and AC 24 V, limits are not specified.

### 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

Jan. 06, 2018

#### 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	10, 11, 2018
<input checked="" type="checkbox"/>	HCP	-	KES	-	-
<input checked="" type="checkbox"/>	VCP	-	KES	-	-

#### Test Conditions

Temperature: 24,1 °C  
 Relative Humidity: 41,9 % R.H.  
 Atmospheric Pressure: 101,0 kPa

#### Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

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

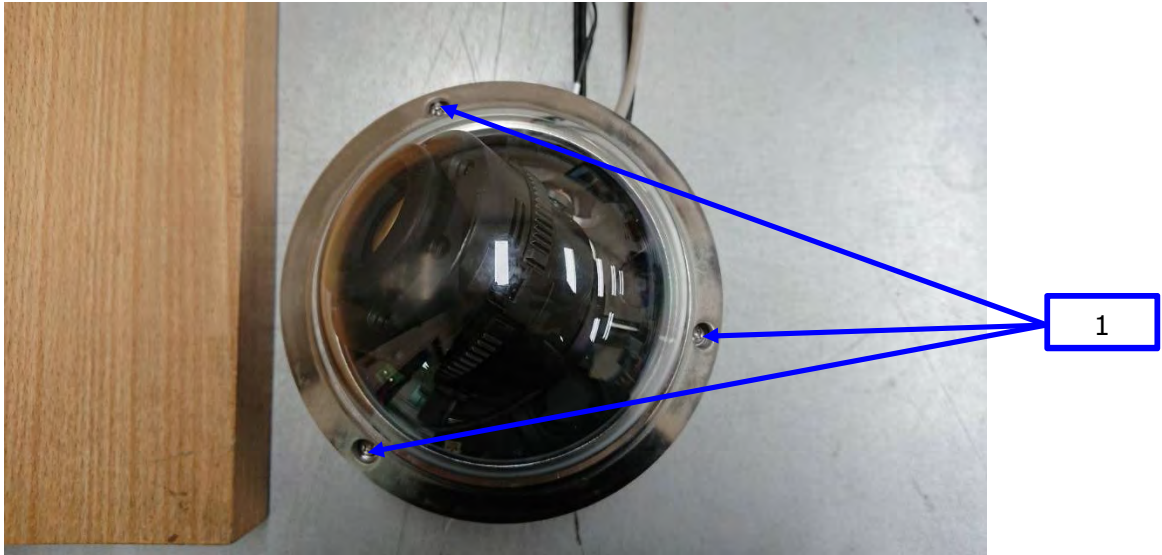
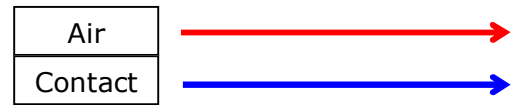
Discharge Voltage:	Contact	Air	HCP	VCP
	<input type="checkbox"/> 2 kV	<input checked="" type="checkbox"/> 2 kV	<input type="checkbox"/> 2 kV	<input type="checkbox"/> 2 kV
	<input type="checkbox"/> 4 kV	<input checked="" type="checkbox"/> 4 kV	<input type="checkbox"/> 4 kV	<input type="checkbox"/> 4 kV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

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

Required Performance Criteria:  Complied

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**Location of Discharge:**



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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	Surface	Contact Discharge	Complied	-

#### ■ 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	Surface	Contact Discharge	Complied	-

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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	-

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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## 3.2 Radiated Electric Field Immunity

### Reference Standard

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

### Test Date

Jan. 03, 2018

### 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	R & S	177586	08, 07, 2018
<input checked="" type="checkbox"/>	BROADBAND AMPLIFIER	BBA100	R & S	101239	08, 07, 2018
<input checked="" type="checkbox"/>	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 07, 2018
<input checked="" type="checkbox"/>	POWER METER	NRP2	R & S	103475	08, 07, 2018
<input checked="" type="checkbox"/>	AVG POWER SENSOR	NRP-Z91	R & S	102526	08, 07, 2018
<input checked="" type="checkbox"/>	AVG POWER SENSOR	NRP-Z91	R & S	102527	08, 07, 2018
<input checked="" type="checkbox"/>	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
<input checked="" type="checkbox"/>	DIRECTIONAL COUPLER	KYDC-D1070-DX40	KY TELECOM	KY150001	08, 07, 2018
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

### Test Conditions

Temperature: 23,0 °C  
Relative Humidity: 40,7 % 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**

Jan. 06, 2018

**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	5.4.7	-
<input checked="" type="checkbox"/>	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 27, 2018
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 27, 2018
<input checked="" type="checkbox"/>	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 27, 2018

**Test Conditions**

Temperature: 24,1 °C  
Relative Humidity: 41,9 % R.H.  
Atmospheric Pressure: 101,0 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

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### 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 (LAN)	Complied	Complied
Alarm 1	Complied	Complied
Alarm 2	Complied	Complied

#### ■ DC 12 V 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)
L - N	Complied	Complied

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

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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 (LAN)	Complied	Complied
Alarm	Complied	Complied
controller	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

Jan. 06, 2018

#### Test Location

EMS-Surge: Electro wave Shieldroom #7

#### Test Equipment

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

#### Test Conditions

Temperature: 24,1 °C  
Relative Humidity: 41,9 % R.H.  
Atmospheric Pressure: 101,0 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

■ AC 24 V Mode

Line to Line – Differential Mode

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

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 (LAN)	Complied	Complied
Alarm 1	Complied	Complied
Alarm 2	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)
L1 – PE	Complied	Complied
L2 – PE	Complied	Complied

### Signal Lines

Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45 (LAN)	Complied	Complied
Alarm 1	Complied	Complied
Alarm 2	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 (LAN)	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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### 3.5 Conducted Disturbance

**Reference Standard**

EN 61000-4-6:2014

**Test Date**

Jan. 05, 2018

**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	5.3.11	-
<input checked="" type="checkbox"/>	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	11, 27, 2018
<input checked="" type="checkbox"/>	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 27, 2018
<input checked="" type="checkbox"/>	CDN	CDN M016	TESEQ	43694	11, 27, 2018
<input type="checkbox"/>	CDN	CDN M016	TESEQ	43697	11, 27, 2018
<input checked="" type="checkbox"/>	CDN	CDN T800	TESEQ	42800	11, 27, 2018
<input checked="" type="checkbox"/>	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 28, 2018

**Test Conditions**

Temperature: 23,6 °C  
 Relative Humidity: 43,3 % R.H.  
 Atmospheric Pressure: 100,9 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

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## Test Data

### ■ AC 24 V Mode

Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L - N	CDN ( <input checked="" type="checkbox"/> M2, <input type="checkbox"/> M3)	Complied

Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3)	-

Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45 (LAN)	CDN T800	Complied
Alarm 1	Clamp	Complied
Alarm 2	Clamp	Complied

### ■ DC 12 V Mode

Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3)	-

Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L - N	CDN ( <input checked="" type="checkbox"/> M2, <input type="checkbox"/> M3)	Complied

Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45 (LAN)	CDN T800	Complied
Alarm 1	Clamp	Complied
Alarm 2	Clamp	Complied



**KES Co., Ltd.**

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Test report No.:  
KES-E1-18T0094-R2  
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■ PoEMode

Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3)	-

Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3)	-

Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45 (LAN)	CDN T800	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

**Test Date**

Jan. 06, 2018

**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	5.4.7	-
<input checked="" type="checkbox"/>	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 27, 2018
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 27, 2018

**Test Conditions**Temperature: 24,1 °C  
Relative Humidity: 41,9 % R.H.  
Atmospheric Pressure: 101,0 kPa



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KES-E1-18T0094-R2  
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### Test Specifications & Observations/Remarks

#### ■ AC 24 V Mode

(Test Voltage : AC 230 V)

<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>Complied</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

#### Test Results

- PASS Required Performance Criteria
- NOT PASS Required Performance Criteria
- NOT APPLICABLE

#### Remarks

\*The test has been tested using the AC / AC Adaptor.

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## APPENDIX A – TEST DATA

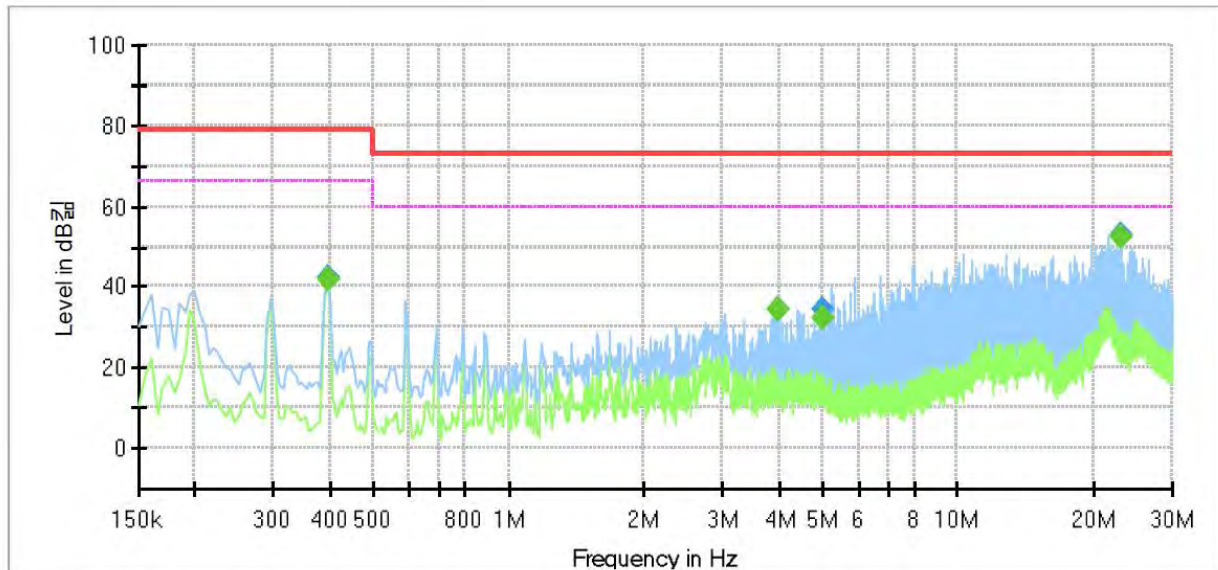
### Conducted Emissions at Mains Power Ports

■ AC 24 V Mode

[HOT]

#### Common Information

Test Description:	Conducted Emission
Model No.:	XNV-6080RS
Mode	AC
Operator Name:	KES



### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.395000	---	41.59	66.00	24.41	1000.0	9.000	L1	19.5
0.395000	42.47	---	79.00	36.53	1000.0	9.000	L1	19.5
3.955000	---	34.17	60.00	25.83	1000.0	9.000	L1	19.9
3.955000	34.38	---	73.00	38.62	1000.0	9.000	L1	19.9
5.025000	---	32.10	60.00	27.90	1000.0	9.000	L1	19.9
5.025000	34.49	---	73.00	38.51	1000.0	9.000	L1	19.9
23.130000	---	52.35	60.00	7.65	1000.0	9.000	L1	20.2
23.130000	52.78	---	73.00	20.22	1000.0	9.000	L1	20.2

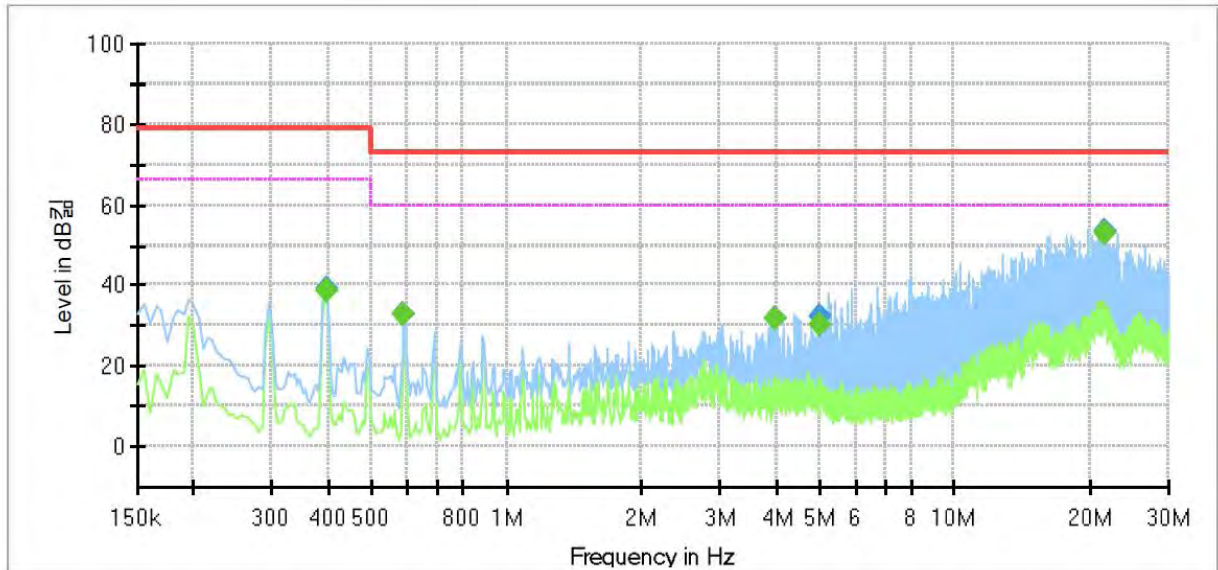
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[ NEUTRAL ]

**Common Information**

Test Description: Conducted Emission  
 Model No.: XNV-6080RS  
 Mode: AC  
 Operator Name: KES



**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.395000	---	38.47	66.00	27.53	1000.0	9.000	N	19.5
0.395000	39.39	---	79.00	39.61	1000.0	9.000	N	19.5
0.590000	---	32.93	60.00	27.07	1000.0	9.000	N	19.6
0.590000	33.02	---	73.00	39.98	1000.0	9.000	N	19.6
3.955000	---	31.53	60.00	28.47	1000.0	9.000	N	19.9
3.955000	31.70	---	73.00	41.30	1000.0	9.000	N	19.9
5.025000	---	29.98	60.00	30.02	1000.0	9.000	N	19.9
5.025000	32.23	---	73.00	40.77	1000.0	9.000	N	19.9
21.665000	---	52.69	60.00	7.31	1000.0	9.000	N	20.1
21.665000	53.35	---	73.00	19.65	1000.0	9.000	N	20.1

◆ 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))

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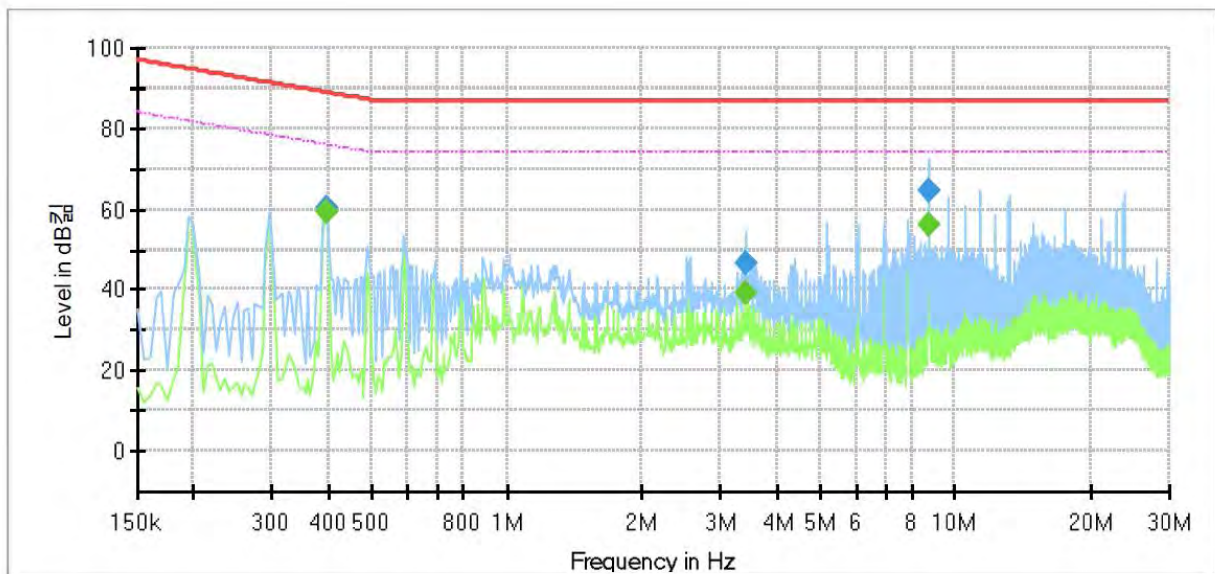
## Conducted Emissions at Telecommunication Ports

■ AC 24 V Mode

[10 Mbps]

### Common Information

Test Description:	Telecommunication Emission
Model No.:	XNV-6080RS
Mode:	AC, 10 Mbps
Operator Name:	KES



### Final Result

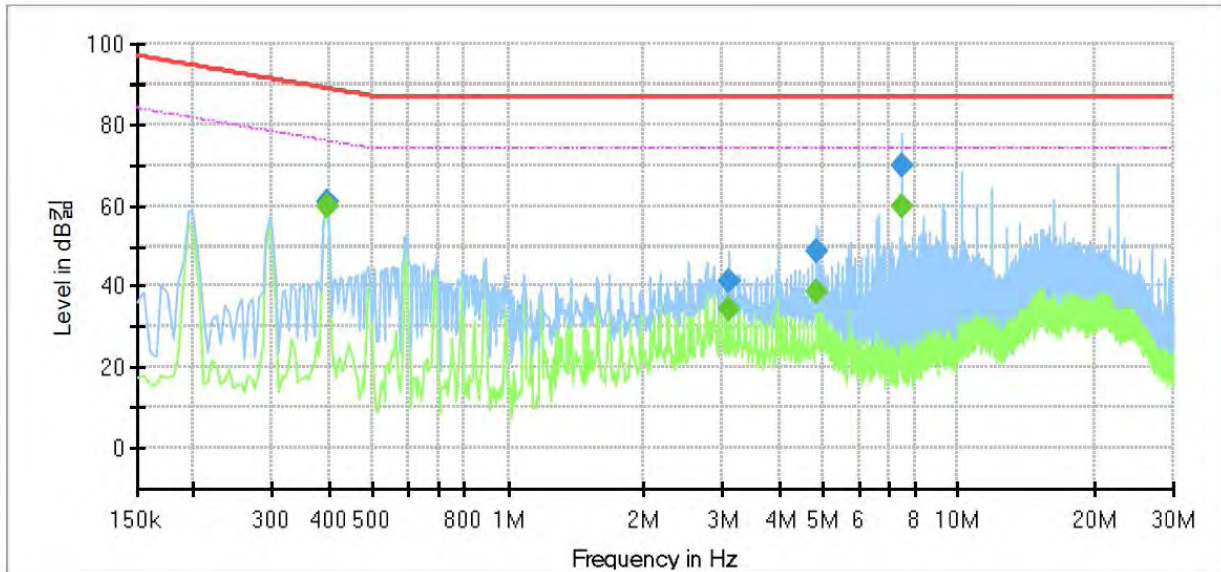
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.395000	---	59.16	75.96	16.80	1000.0	9.000	Single Line	19.9
0.395000	60.22	---	88.96	28.74	1000.0	9.000	Single Line	19.9
3.425000	---	39.42	74.00	34.58	1000.0	9.000	Single Line	20.0
3.425000	46.46	---	87.00	40.54	1000.0	9.000	Single Line	20.0
8.750000	---	56.14	74.00	17.86	1000.0	9.000	Single Line	19.8
8.750000	64.67	---	87.00	22.33	1000.0	9.000	Single Line	19.8

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**[100 Mbps]**

**Common Information**

Test Description:	Telecommunication Emission
Model No.:	XNV-6080RS
Mode	AC , 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)
0.395000	---	59.88	75.96	16.08	1000.0	9.000	Single Line	19.4
0.395000	60.61	---	88.96	28.35	1000.0	9.000	Single Line	19.4
3.100000	---	34.36	74.00	39.64	1000.0	9.000	Single Line	19.5
3.100000	41.15	---	87.00	45.85	1000.0	9.000	Single Line	19.5
4.840000	---	38.87	74.00	35.13	1000.0	9.000	Single Line	19.5
4.840000	48.53	---	87.00	38.47	1000.0	9.000	Single Line	19.5
7.500000	---	59.95	74.00	14.05	1000.0	9.000	Single Line	19.3
7.500000	70.07	---	87.00	16.93	1000.0	9.000	Single Line	19.3

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

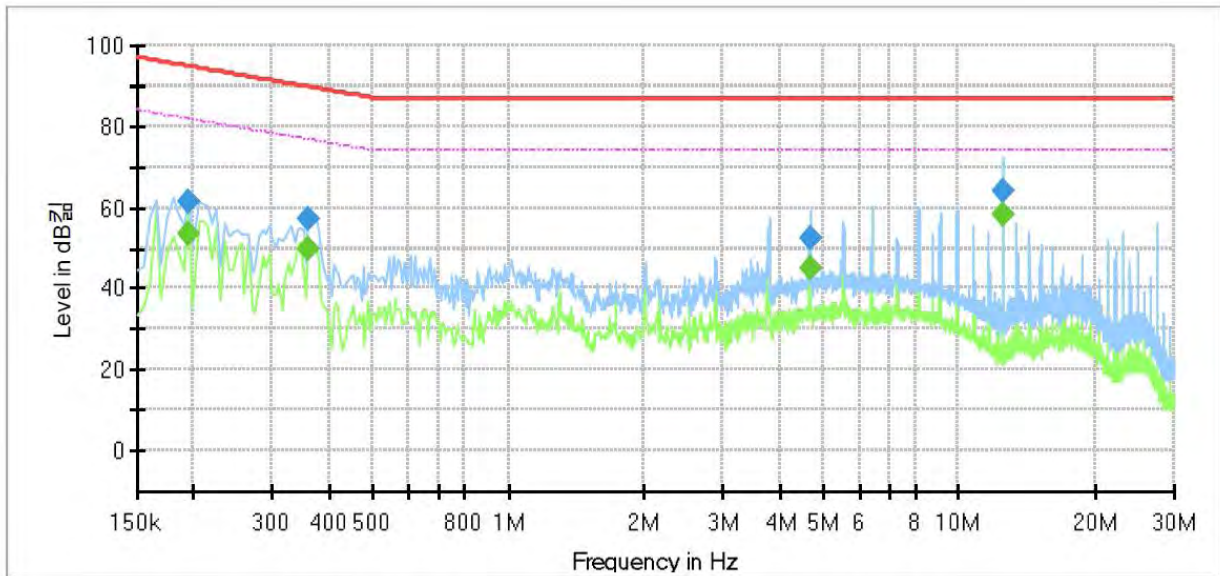
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

■ DC 12 V Mode

**[10 Mbps]**

**Common Information**

Test Description:	Telecommunication Emission
Model No.:	XNV-6080RS
Mode	DC , 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)
0.195000	---	53.32	81.82	28.50	1000.0	9.000	Single Line	19.9
0.195000	61.52	---	94.82	33.30	1000.0	9.000	Single Line	19.9
0.360000	---	49.72	76.73	27.01	1000.0	9.000	Single Line	19.9
0.360000	57.23	---	89.73	32.50	1000.0	9.000	Single Line	19.9
4.675000	---	44.80	74.00	29.20	1000.0	9.000	Single Line	20.0
4.675000	52.40	---	87.00	34.60	1000.0	9.000	Single Line	20.0
12.500000	---	57.99	74.00	16.01	1000.0	9.000	Single Line	19.8
12.500000	64.18	---	87.00	22.82	1000.0	9.000	Single Line	19.8

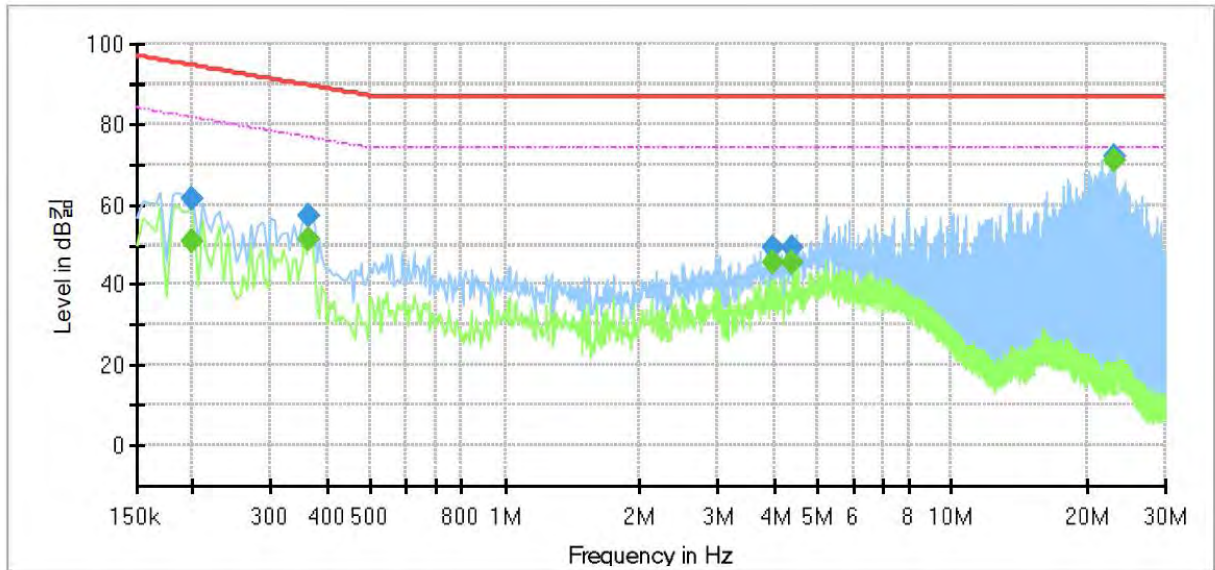
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**[100 Mbps]**

**Common Information**

Test Description:	Telecommunication Emission
Model No.:	XNV-6080RS
Mode	DC , 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)
0.200000	---	51.04	81.61	30.57	1000.0	9.000	Single Line	19.4
0.200000	61.17	---	94.61	33.44	1000.0	9.000	Single Line	19.4
0.365000	---	51.26	76.61	25.35	1000.0	9.000	Single Line	19.4
0.365000	57.13	---	89.61	32.48	1000.0	9.000	Single Line	19.4
3.955000	---	45.74	74.00	28.26	1000.0	9.000	Single Line	19.5
3.955000	49.49	---	87.00	37.51	1000.0	9.000	Single Line	19.5
4.410000	---	45.40	74.00	28.60	1000.0	9.000	Single Line	19.5
4.410000	49.13	---	87.00	37.87	1000.0	9.000	Single Line	19.5
23.130000	---	70.94	74.00	3.06	1000.0	9.000	Single Line	19.4
23.130000	72.04	---	87.00	14.96	1000.0	9.000	Single Line	19.4

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

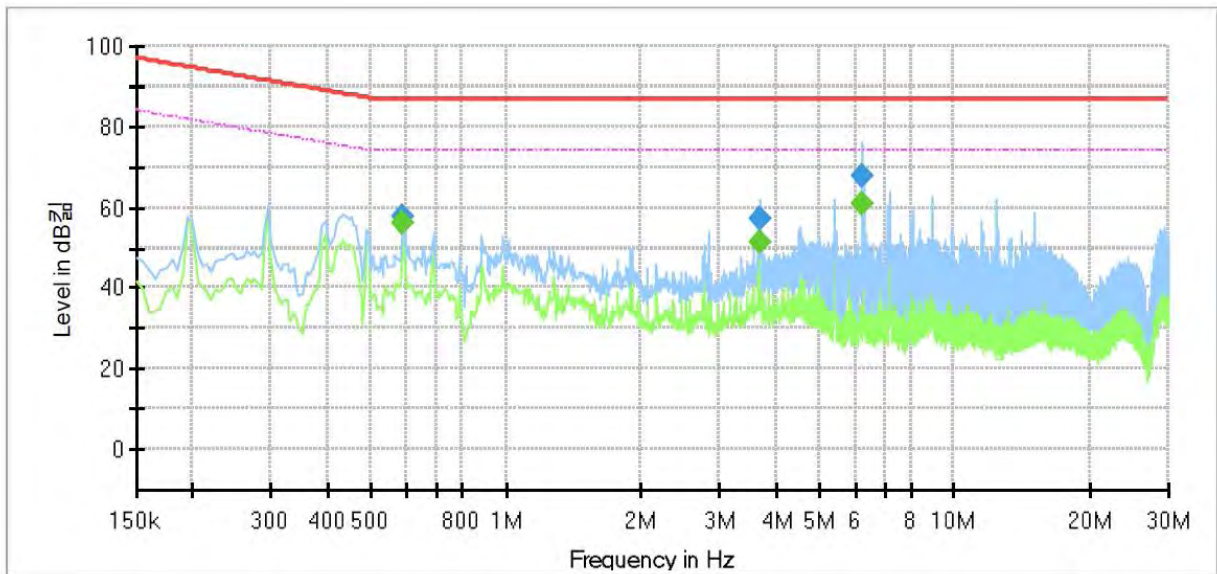
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■ PoE Mode

**[10 Mbps]**

**Common Information**

Test Description:	Telecommunication Emission
Model No.:	XNV-6080RS
Mode	POE , 10 Mbps
Operator Name:	KES



**Final Result**

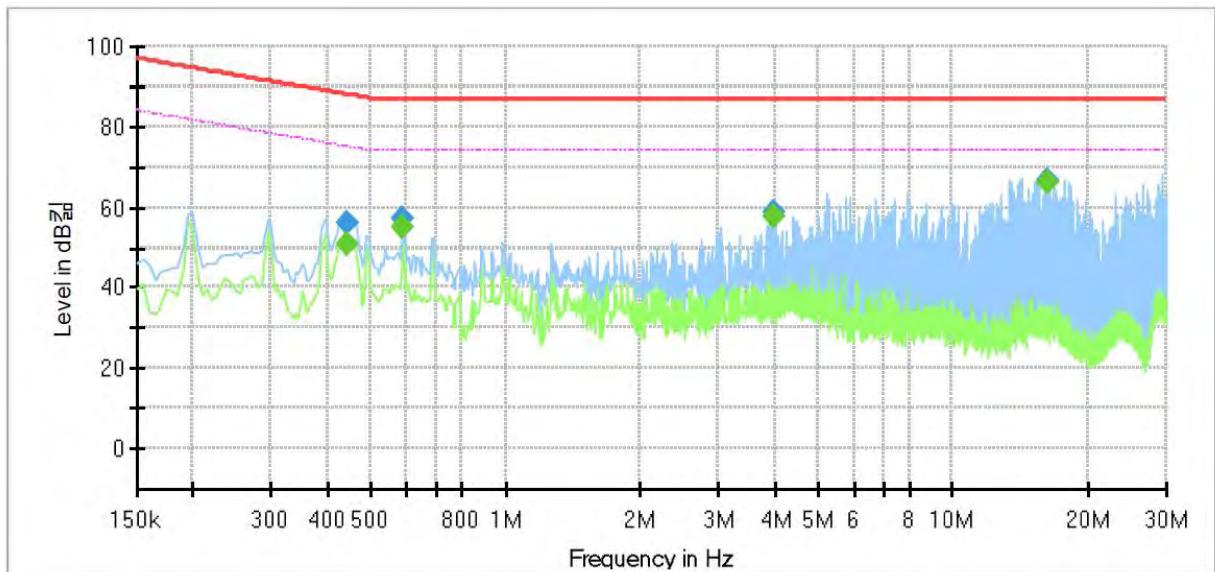
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.590000	---	56.00	74.00	18.00	1000.0	9.000	Single Line	19.9
0.590000	57.69	---	87.00	29.31	1000.0	9.000	Single Line	19.9
3.695000	---	51.41	74.00	22.59	1000.0	9.000	Single Line	20.0
3.695000	57.16	---	87.00	29.84	1000.0	9.000	Single Line	20.0
6.250000	---	60.86	74.00	13.14	1000.0	9.000	Single Line	19.9
6.250000	67.76	---	87.00	19.24	1000.0	9.000	Single Line	19.9

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**[100 Mbps]**

**Common Information**

Test Description:	Telecommunication Emission
Model No.:	XNV-6080RS
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)
0.440000	---	50.67	75.06	24.39	1000.0	9.000	Single Line	19.4
0.440000	55.93	---	88.06	32.13	1000.0	9.000	Single Line	19.4
0.590000	---	55.02	74.00	18.98	1000.0	9.000	Single Line	19.4
0.590000	56.93	---	87.00	30.07	1000.0	9.000	Single Line	19.4
3.955000	---	57.89	74.00	16.11	1000.0	9.000	Single Line	19.5
3.955000	58.63	---	87.00	28.37	1000.0	9.000	Single Line	19.5
16.230000	---	66.39	74.00	7.61	1000.0	9.000	Single Line	19.5
16.230000	66.50	---	87.00	20.50	1000.0	9.000	Single Line	19.5

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

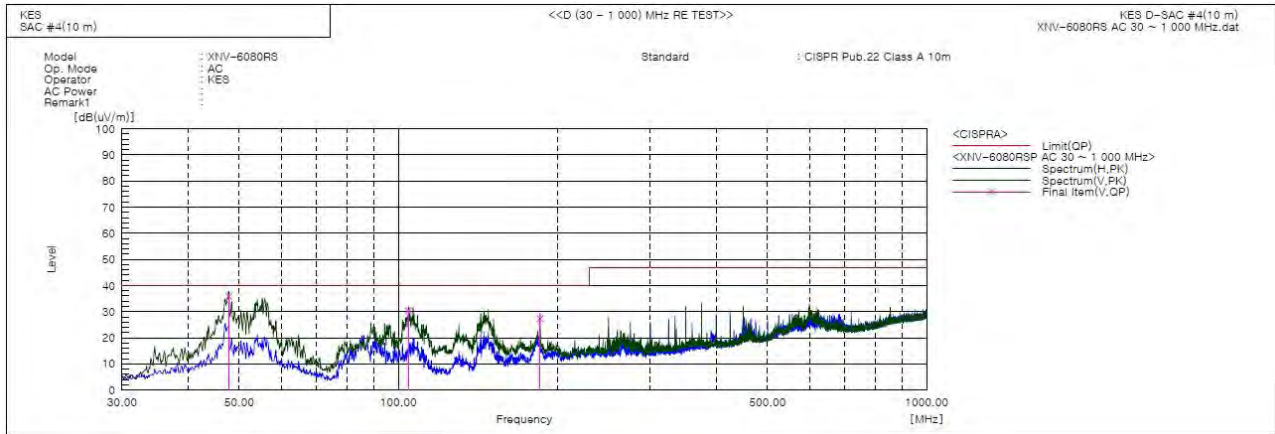
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))





## Radiated Electric Field Emissions(Below 1 GHz)

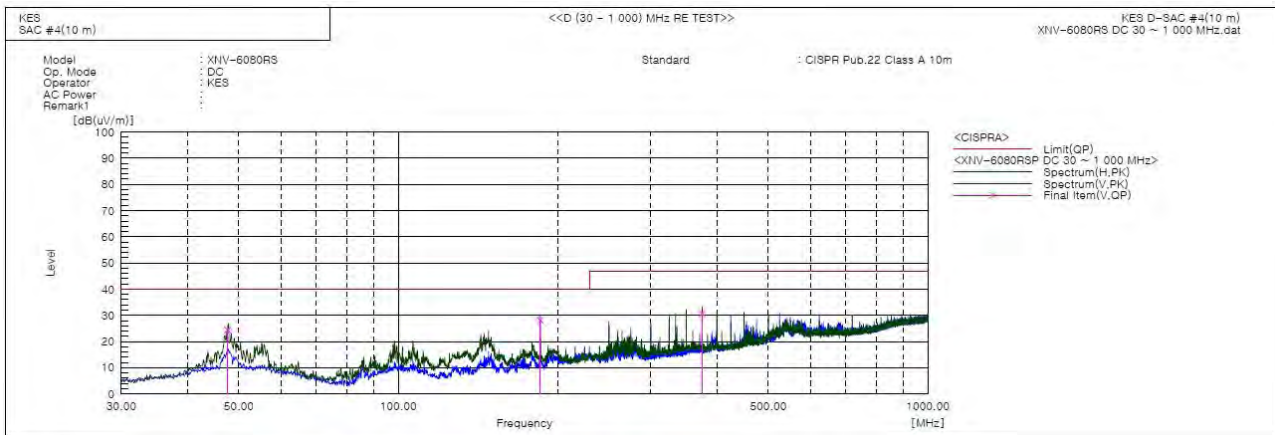
### ■ AC 24 V Mode



#### 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	47.824	V	63.8	-27.9	35.9	40.0	4.1	100.0	201.0	
2	104.525	V	58.9	-28.5	30.4	40.0	9.6	100.0	211.0	
3	185.419	V	56.0	-28.7	27.3	40.0	12.7	100.0	32.0	

### ■ AC 24 V Mode

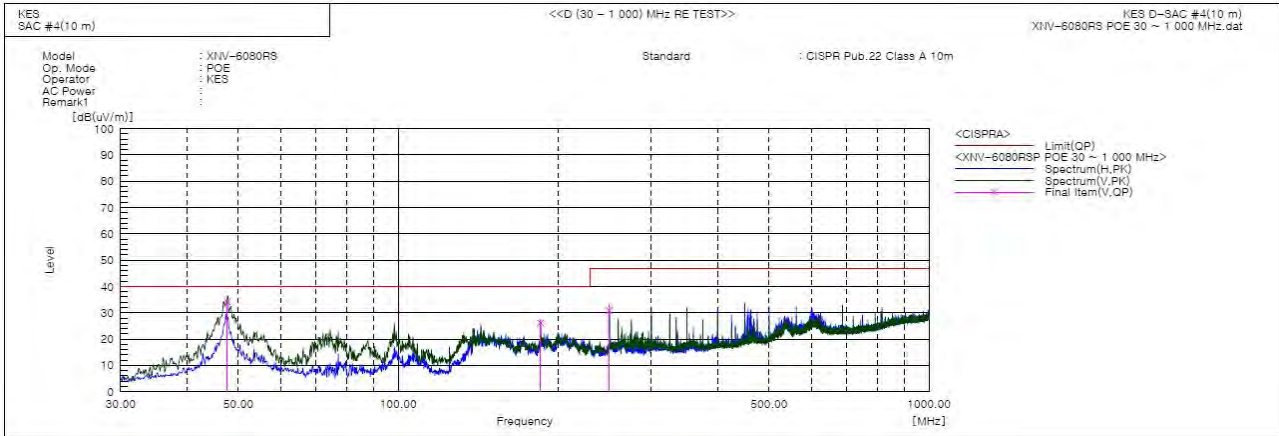


#### Final Result

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	47.634	V	52.3	-27.9	24.4	40.0	15.6	100.0	221.0	
2	185.437	V	56.8	-28.7	28.1	40.0	11.9	100.0	284.0	
3	374.830	V	52.0	-21.3	30.7	47.0	16.3	100.0	162.0	

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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	47.664	V	62.1	-27.9	34.2	40.0	5.8	10.0	28.0	
2	185.494	V	54.8	-28.7	26.1	40.0	13.9	100.0	38.0	
3	249.835	V	56.2	-25.4	30.8	47.0	16.2	100.0	152.0	

◆ 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)]

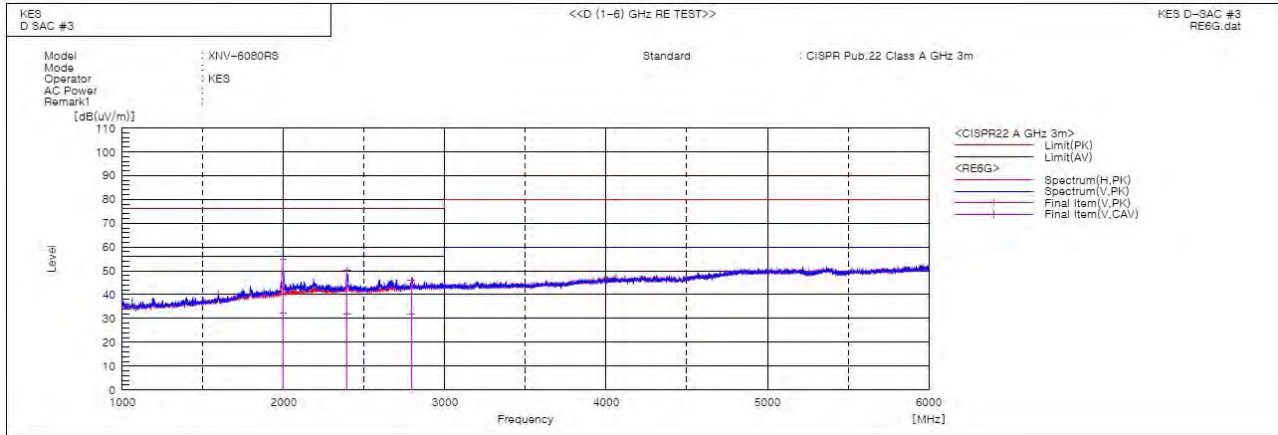
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



## Radiated Electric Field Emissions(Above 1 GHz)

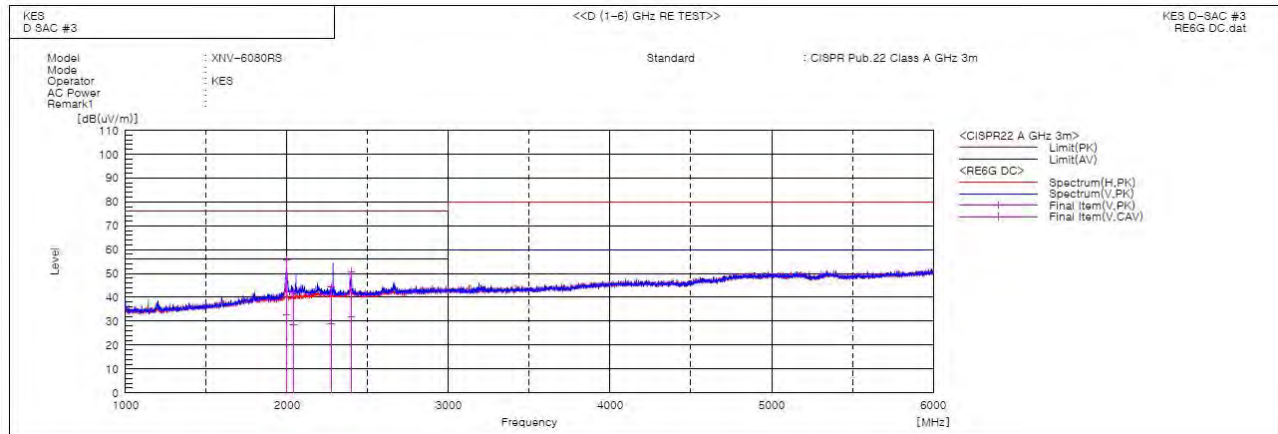
### ■ AC 24 V Mode



#### 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	1996.670	V	56.6	34.1	-1.7	54.9	32.4	76.0	56.0	21.1	23.6	100.0	11.3	
2	2394.551	V	50.1	31.8	0.2	50.3	32.0	76.0	56.0	25.7	24.0	100.0	6.5	
3	2790.942	V	44.1	29.8	1.9	46.0	31.7	76.0	56.0	30.0	24.3	100.0	59.0	

### ■ 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	1996.270	V	57.2	34.6	-1.7	55.5	32.9	76.0	56.0	20.5	23.1	100.0	341.1	
2	2037.814	V	43.5	29.8	-1.4	42.1	28.4	76.0	56.0	33.9	27.6	100.0	106.8	
3	2272.583	V	44.7	29.3	-0.3	44.4	29.0	76.0	56.0	31.6	27.0	100.0	357.3	
4	2399.278	V	50.6	31.7	0.2	50.8	31.9	76.0	56.0	25.2	24.1	100.0	12.9	

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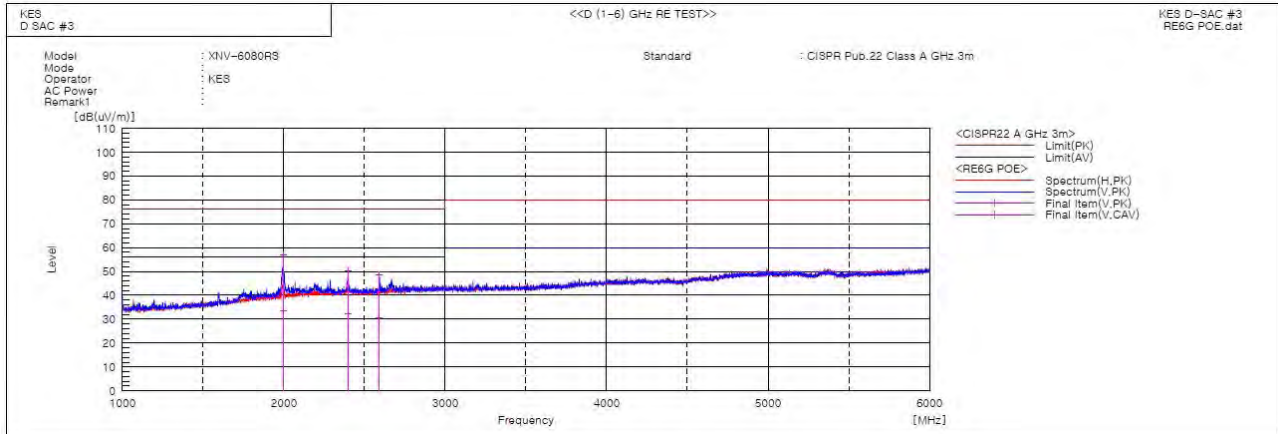


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 KES-E1-18T0094-R2  
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## ■ PoE Mode



### 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	1998.309	V	58.7	35.1	-1.7	57.0	33.4	76.0	56.0	19.0	22.6	100.0	343.5	
2	2396.570	V	49.9	31.9	0.2	50.1	32.1	76.0	56.0	25.9	23.9	100.0	357.4	
3	2589.391	V	47.6	29.6	0.9	48.5	30.5	76.0	56.0	27.5	25.5	100.0	2.7	

## ◆ Calculation

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

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

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**

<b>Average harmonic current results</b>				
Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
N/A				

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.

---

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Test Data - Harmonics (continued)

**Maximum harmonic current results**

Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
N/A				

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.

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Test Data - Voltage Fluctuations

**Maximum Flicker results**

	<b>EUT values</b>	<b>Limit</b>	<b>Result</b>
Pst	N/A		
Plt			
dc [%]			
dmax [%]			
Tmax [s]			

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## Test Setup Photos and Configuration

### Conducted Voltage Emissions



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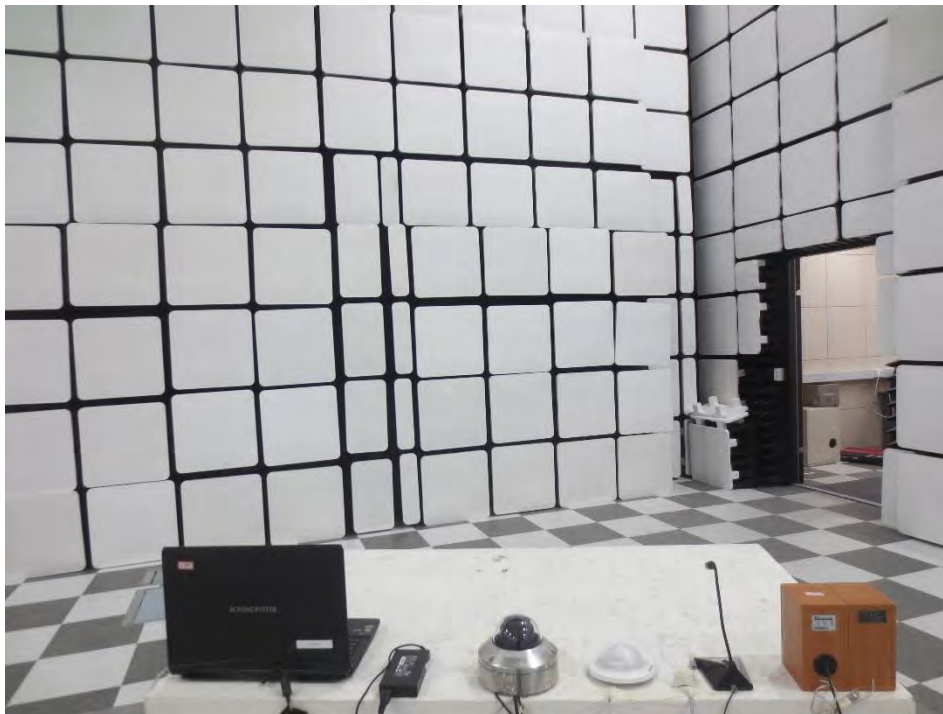
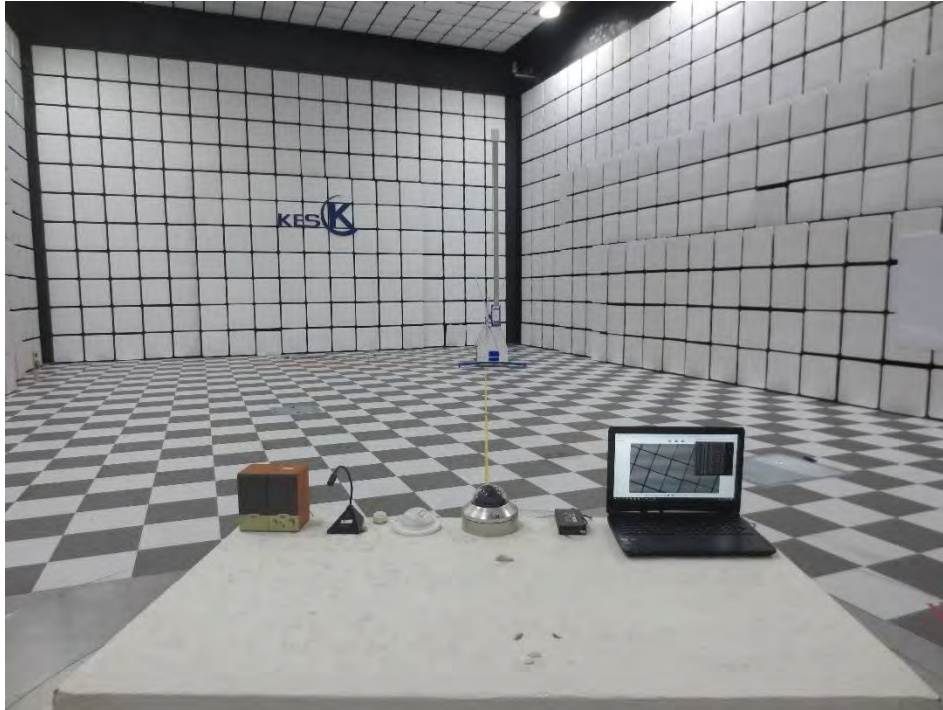
## Conducted Telecommunication Emissions



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## Radiated Electric Field Emissions(Below 1 GHz)



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## Radiated Electric Field Emissions(Above 1 GHz)



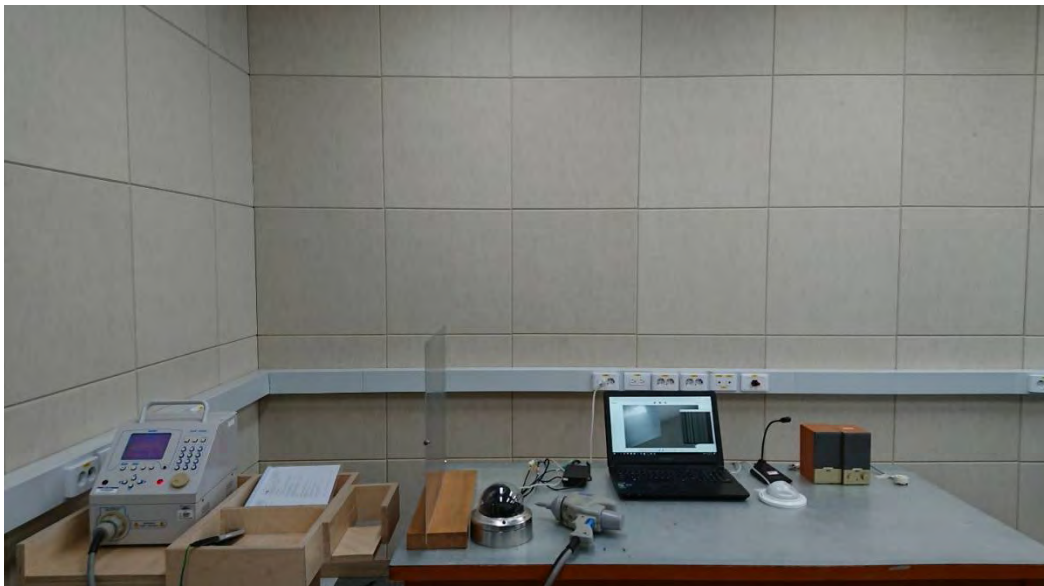
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## Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

## Electrostatic Discharge



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## Radiated Electric Field Immunity



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## Electrical Fast Transients/Bursts

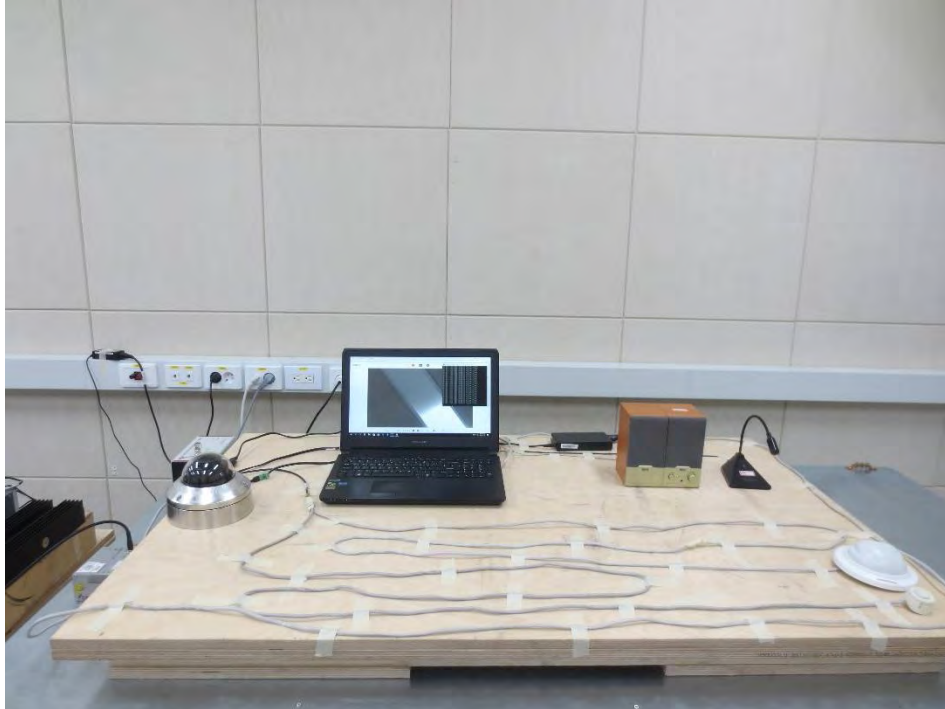


## Surge Transients



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## Conducted Disturbance



## Voltage Dips and Short Interruptions



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## EUT External Photographs

(Top)



(Bottom)



---

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## EUT Internal Photographs

(Internal View)



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## EUT Internal View – Main board

(Top)



(Bottom)



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## EUT Internal View – Sub board 1

(Top)



(Bottom)



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## EUT Internal View – Sub board 2

(Top)



(Bottom)



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## EUT Internal View – Lens

(Top)



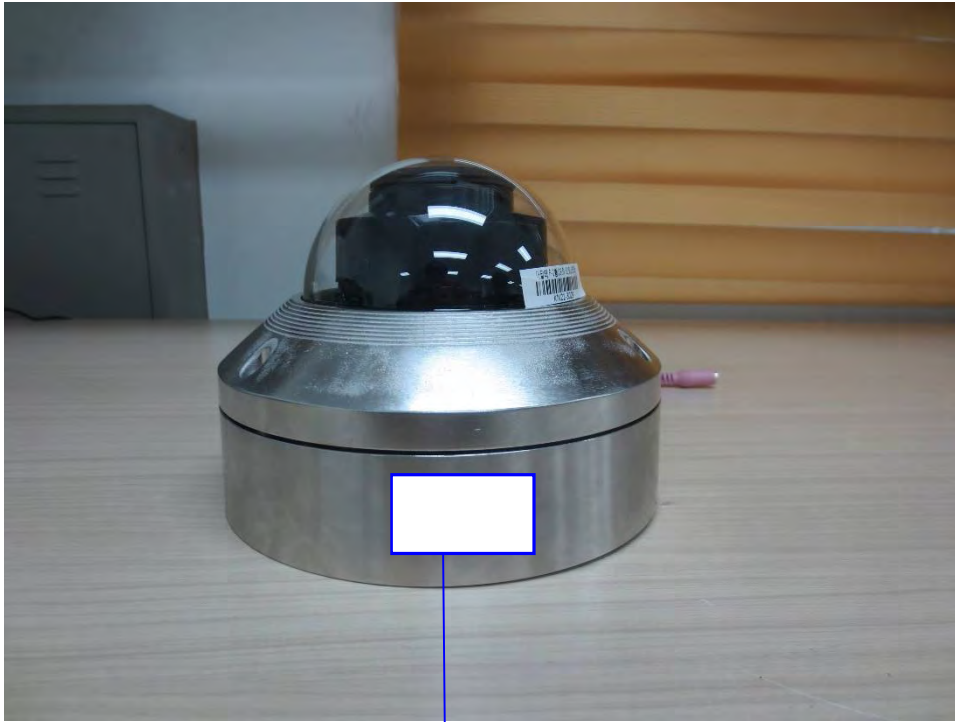
(Bottom)



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## Label and Location



### **Network Camera**

Model No : XNV-6080RS

Manufacturer : Hanwha Techwin (Tianjin) Co.,Ltd.

Made in China

