

EMC TEST REPORT For CE

Test Report No. : KES-E1-16T0301-R3
Date of Issue : May. 15, 2019
Product name : NETWORK CAMERA
Model/Type No. : QNV-6070R
Variant Model : -
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 : Jun. 16, 2016
Test date : Jun. 28, 2016 – Jul. 03, 2016
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by



Kyeng-Sun, Min
EMC Test Engineer

Reviewed by



Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 05, 2016	KES-E1-16T0301	Issued
Jun. 22, 2017	KES-E1-16T0301-R1	Changed manufacturer and Updated standards
Jun. 27, 2018	KES-E1-16T0301-R2	Re-issue due to manufacturer change
May. 15, 2019	KES-E1-16T0301-R3	Re-issue due to regulations update

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1.0 General Product Description

Main Specifications of E.U.T are:

Video	
Imaging Device	1/2.9" 2.19M CMOS
Total Pixels	2,000(H) x 1,121(V)
Effective Pixels	1,984(H) x 1,105(V)
Scanning System	Progressive
Min. Illumination	Color : 0.095Lux, B/W : 0Lux
Lens	
Focal Length (Zoom Ratio)	Manual 2.8~12mm
Max. Aperture Ratio	F1.4
Angular Field of View	H 103.8~32.4° / V 53.7~18.4° / D 121.9~37.1°
Min. Object Distance	-
Lens Type	Manual
Focus control	DC auto iris
Mount Type	Board type
Pan / Tilt / Rotate	
Pan Range	0~350°
Tilt Range	0~67°
Rotate Range	0~355°
Operational	
IR Viewable Length	30m
Camera Title	Off / On (Displayed up to 20 characters per line) - 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	True Day & Night
Backlight Compensation	Off / BLC
Wide Dynamic Range	120dB
Digital Noise Reduction	SSNR(Off / On)
Motion Detection	Off / On (4ea polygon zones)
Privacy Masking	Off / On (6ea rectangler zones)
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC(Lens distortion control)	On/Off (5 levels with Min/Max)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker
Flip / Mirror	Flip / Mirror / Hallway view
Intelligent Video Analytics	Motion Detection with metadata, Tampering, Defocus
Alarm I/O	Input 1 / Output 1
Alarm Triggers	Motion detection, Tampering Detection, SD card error, NAS error, Alarm input, Defocus detection

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Alarm Events	File upload via FTP and E-Mail Local storage recording at Event Notification via E-Mail External output
Pixel Counter	Support (plug-in viewer only)
Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.265, H.264, MJPEG
Resolution	1920x1080/ 1280x1024/ 1280x960/ 1280x720/ 1024x768/ 800x600/ 720x576/ 720x480/ 640x480/ 320x240
Max. Framerate	H.265 : Max 30fps at 2M all resolutions H.264 : Max 30fps at 2M all resolutions MJPEG : Max 5fps
Smart codec	WiseStream
Video Quality Ajustment	H.265 : Target Bitrate Level Control H.264 : Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate control method	H.265 : CBR or VBR H.264 : CBR or VBR MJPEG : VBR
Streaming Capability	Multiple Streaming(Up to 3 Profiles)
Audio I/O	Line in
Audio Compression Format	G.711 u-law /G.726 Selectable G.726(ADPCM) : 8KHz, G.711 : 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps
Audio Communication	Uni-directional
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL, 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
Streaming Method	Unicast / Multicast
Max. User Access	6 users at Unicast Mode
Edge storage	Micro SD/SDHC/SDXC Max 128G, NAS - Motion images recorded in the SD memory card can be downloaded - Manual recording at Local PC

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Application Programming Inter	ONVIF Profile S, G SUNAPI(HTTP API)
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Portuguese, Czech, Polish, Turkish, Dutch, Hungary, Greek
Web Viewer	Supported OS: Windows 7, 8, 10, Mac OS X 10.8. 10.9. 10.10. 10.11 Non-plugin Webviewer Supported Browser: Google Chrome 47, MS Edge 20 Support Codec : Video : H.264, MJPEG (MAX 1M 15FPS) Audio : G.711 Plug-in Webviewer Supported Browser : MS Explore 11 , Mozilla Firefox 43 , Apple Safari 9 * Mac OS X only
Central Management Software	SmartViewer
Environmental	
Operating Temperature / Humi	-30°C ~ +55°C / Less than 90% RH * Start up should be done at above -20°C
Storage Temperature / Humidi	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66
Vandal Resistance	IK10
Electrical	
Input Voltage / Current	PoE(IEEE802.3af, Class3), DC 12V
Power Consumption	Max.6.7W(PoE), Max.5.5W(DC12V)
Mechanical	
Color / Material	Ivory / Metal
Dimension (WxHxD)	φ120 x H106.1
Weight	670g

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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 ☐ 220 Vac ☐ 230 Vac ☐ 240 Vac ☒ PoE ☒ 12 Vdc
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	QNV-6070R	-	Hanwha Techwin(Tianjin) Co., Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
notebook	NT63025J	JK9091EF400142M	Samsung	-
notebook adapter	A13-040N2A	CN60BA4400313AD0 N843KO2OO	Chicony Power Technology (suzhou)Co., Ltd.	-
PoE adapter	ANY4805C-LT1	10H300002	ANY ELECTRONICS CO., LTD	-
Alam	SIP-1201DD D0	C53R67JZ301878 L	SAMSUNG TECHWIN CO., LTD.	-
Micro SD Card	-	-	-	-
MIC	CMK-303	-	CAMAC	-

1.6 External I/O Cabling

- DC 12 V Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	Alarm JIG	Alarm	Alarm JIG	3.0	U
	LAN(RJ-45)	notebook	LAN(RJ-45)	3.0	U
	3.5 mm Line	MIC	3.5 mm Line	1.5	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-

- PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	Alarm JIG	Alarm	Alarm JIG	3.0	U
	PoE(RJ-45)	PoE	PoE(RJ-45)	3.0	U
	3.5 mm Line	MIC	3.5 mm Line	1.5	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
PoE adapter	LAN(RJ-45)	notebook	LAN(RJ-45)	3.3	U

* Unshielded=U, Shielded=S

1.7 E.U.T Operating Mode(s)

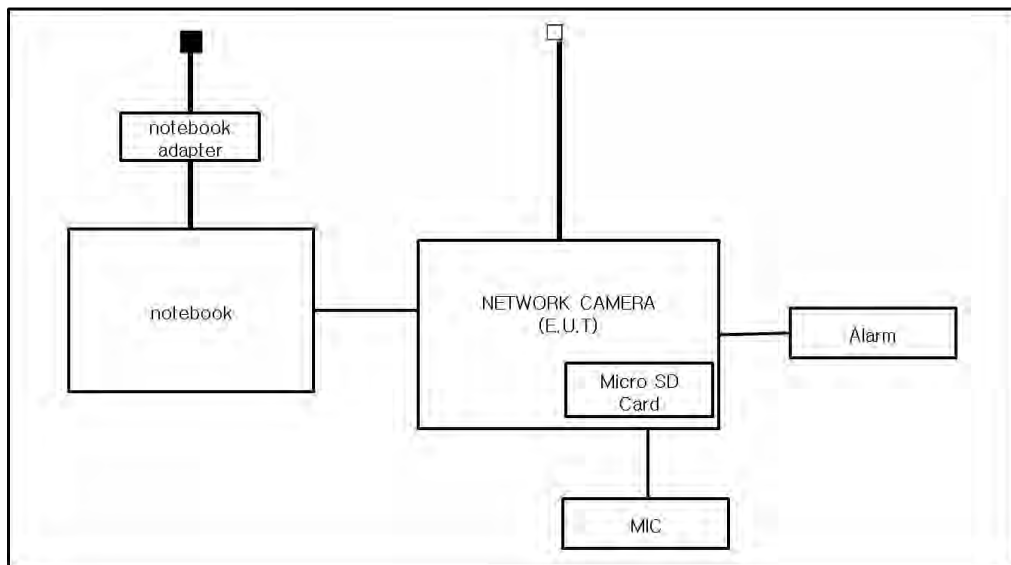
Equipment under test was operated during the measurement under the following conditions:

Test mode	Normal operating
OP	MONITORING NETWORK PING TEST

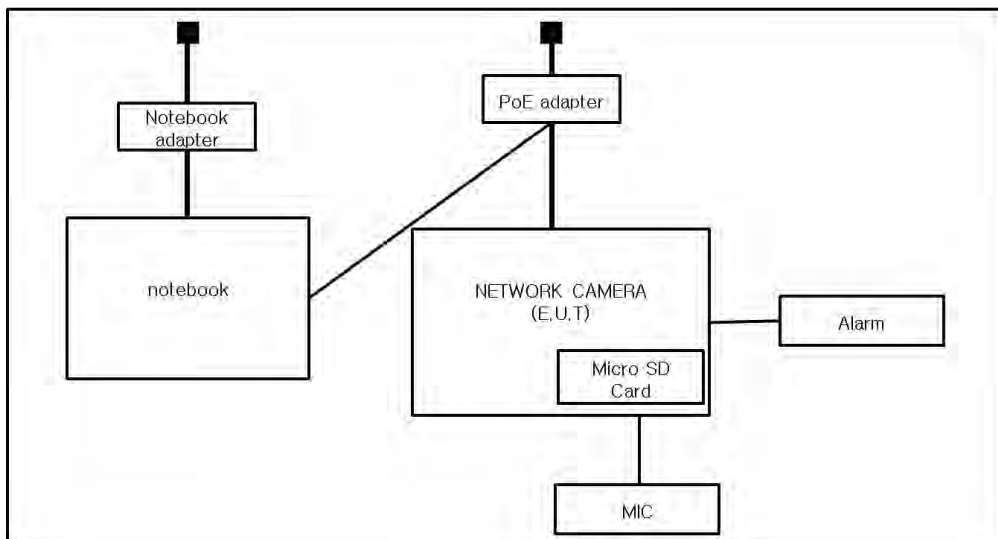
1.8 Configuration

■ AC Main
□ DC Main

- DC 12 V Mode



- PoE Mode



1.9 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.

1.10 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

1.11 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-4308, C-4798, T-2311, G-914
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 17 07 01633 001



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 61547:2009

☒ EN 55032:2012/AC:2013

☒ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☒ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



☐ **VCCI V-3 / 2015.04**

☐ Class A

☐ Class B

☐ **AS/NZS CISPR22:2009 +A1:2010**

☐ Class A

☐ Class B

☐ **47 CFR Part 15, Subpart B**

☐ CISPR 22:2009 +A1:2010

☐ Class A

☐ Class B

☐ ANSI C63.4-2009

☐ **IC Regulation ICES-003 : 2016**

☐ CISPR 22:2009 +A1:2010

☐ Class A

☐ Class B

☐ ANSI C63.4-2014

☐ **RE- Directive 2014/53/EU**

☐ EN 301 489-1 V1.9.2

- ☐ Equipment for fixed use
- ☐ Equipment for vehicular use
- ☐ Equipment for portable use

☐ EN 301 489-3 V1.6.1

☐ EN 301 489-17 V2.2.1

☐ EN 60945:2002

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 Receiver	ESR3	R&S	101783	05, 03, 2017
☐	LISN	ENV216	R&S	101137	02, 04, 2017
☐	LISN	ENV216	R&S	101786	05, 02, 2017
☐	Electro wave Shieldroom	-	SEMITEC	-	-

Test Conditions

Temperature: °C

Relative Humidity: %

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

RemarksBecause the E.U.T power is 12 V (dc) power and PoE, limits are not specified.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Jun. 28, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESR3	R&S	101783	05, 03, 2017
☒	LISN	ENV216	R&S	101137	02, 04, 2017
☒	LISN	ENV216	R&S	101786	05, 02, 2017
☒	8-Wire ISN CAT3	CAT3 8158	Schwarzbeck Mess	8158-0019	04, 01, 2017
☒	8-Wire ISN CAT5	CAT5 8158	Schwarzbeck Mess	8158-0030	04, 01, 2017
☐	8-Wire ISN CAT6	NTFM 8158	Schwarzbeck Mess	8158-0029	08, 14, 2016
☒	Electro wave Shieldroom	-	SEMITEC	-	-

Test Conditions

Temperature: 24,5 °C

Relative Humidity: 47,7 %

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

Jun. 29, 2016

Test Location☒ Open Area Test Site #1 ☐ Open Area Test Site #2**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI TEST Receiver	ESU26	R&S	100551	04, 18, 2017
☒	Trilog-Broadband ANT	VULB 9163	Schwarzbeck	9163-715	04, 14, 2018
☒	Open Area Test Site	-	KES	-	-
☒	Antenna Mast	1070/1080	EMC	-	-
☒	Turn Table	-	DAEIL EMC	-	-

Test Conditions

Temperature: 29,4 °C

Relative Humidity: 46,0 %

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

Jul. 03, 2016

Test Location

Semi Anchoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESU26	R&S	100552	04, 24, 2017
☒	Broadband Coaxial Preamplifier	BBV 9718	Schwarzbeck Mess - Elektronik	9718-246	10, 23, 2016
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 07, 2017
☒	Semi Anchoic Chamber #2	-	SEMITEC	-	-
☒	Antenna Mast	-	AUDIX	-	-
☒	Turn Table	-	AUDIX	-	-

Test Conditions

Temperature: 21,9 °C
Relative Humidity: 50,8 %

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
☐	AC Source	ACS 500 N	EM TEST	V1024106760	08, 13, 2016
☐	Digital Power Analyzer	DPA 500 N	EM TEST	V1024106759	08, 13, 2016

Test Conditions

Temperature: °C
Relative Humidity: %

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 less than 75 W, 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
☐	AC Source	ACS 500 N	EM test	V1024106760	08, 13, 2016
☐	Digital Power Analyzer	DPA 500 N	EM test	V1024106759	08, 13, 2016

Test Conditions

Temperature: °C
Relative Humidity: %

Test Results

The requirements are:

- ☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks

N/A : Because the E.U.T power is 12 v (dc) power and PoE. limit are not specified.

3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011 +A1:2014 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

Jul. 02, 2016

Test Location

EMS-ESD: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS05X4620	02, 24, 2017
☒	HCP	-	Noise Ken	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: 21,6 °C
Relative Humidity: 43,3 %
Atmospheric Pressure: 98,6 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
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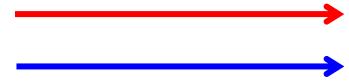
Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied

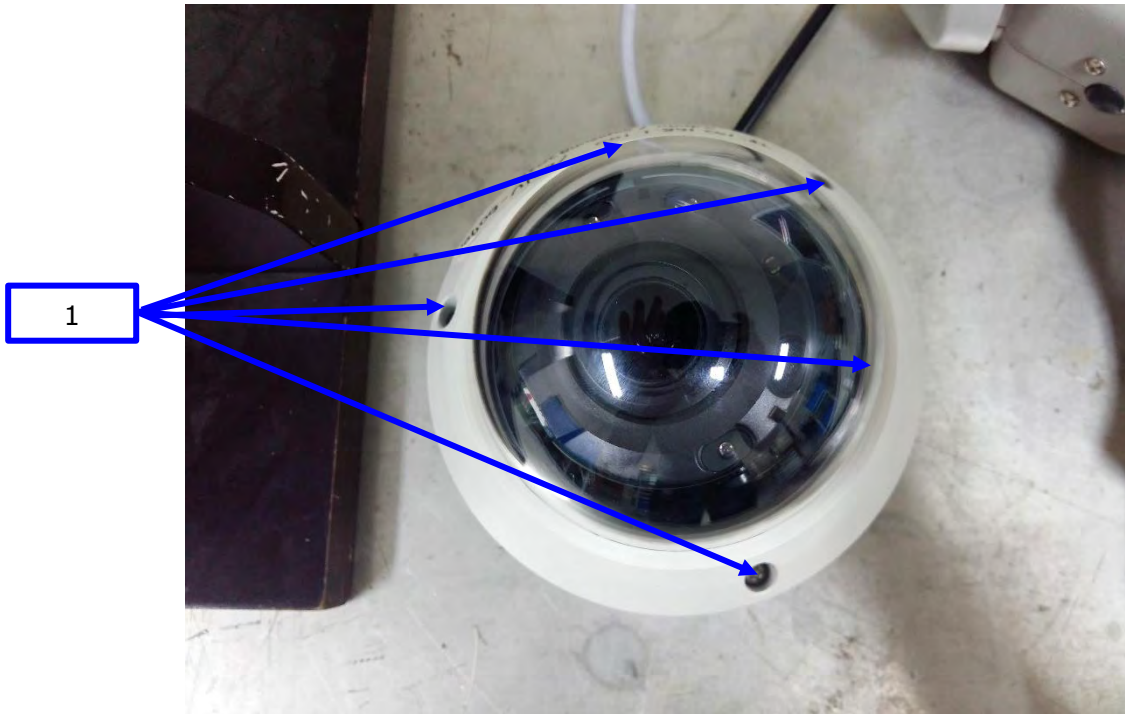
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Location of Discharge:

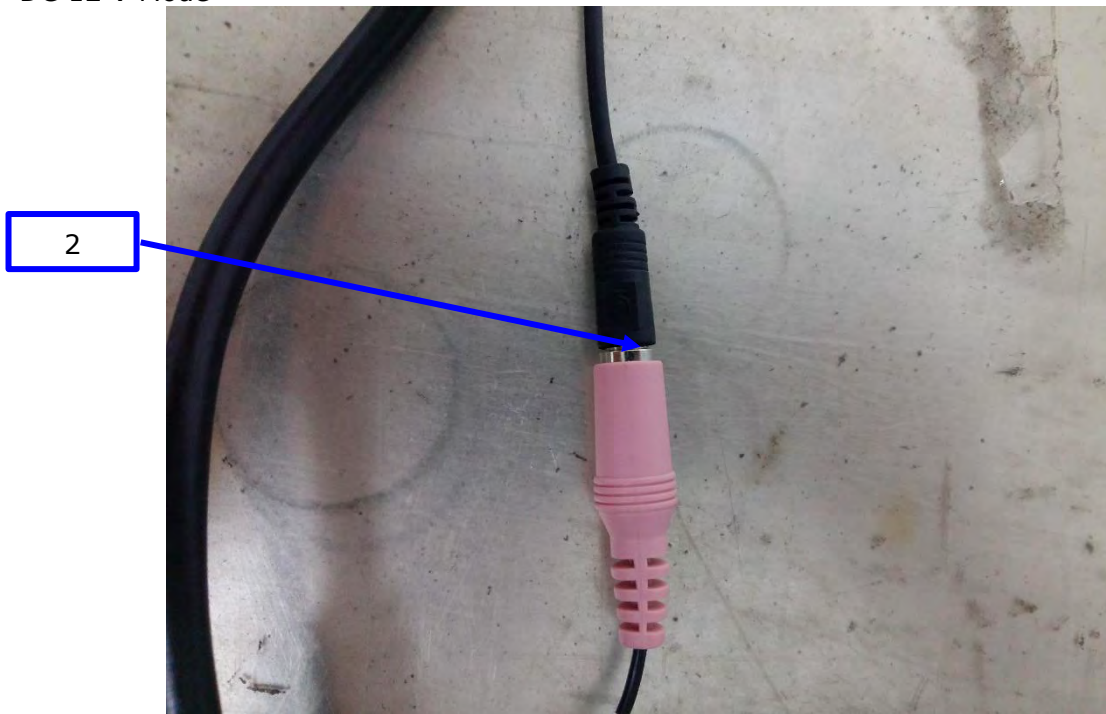
Air
Contact



- DC 12 V Mode

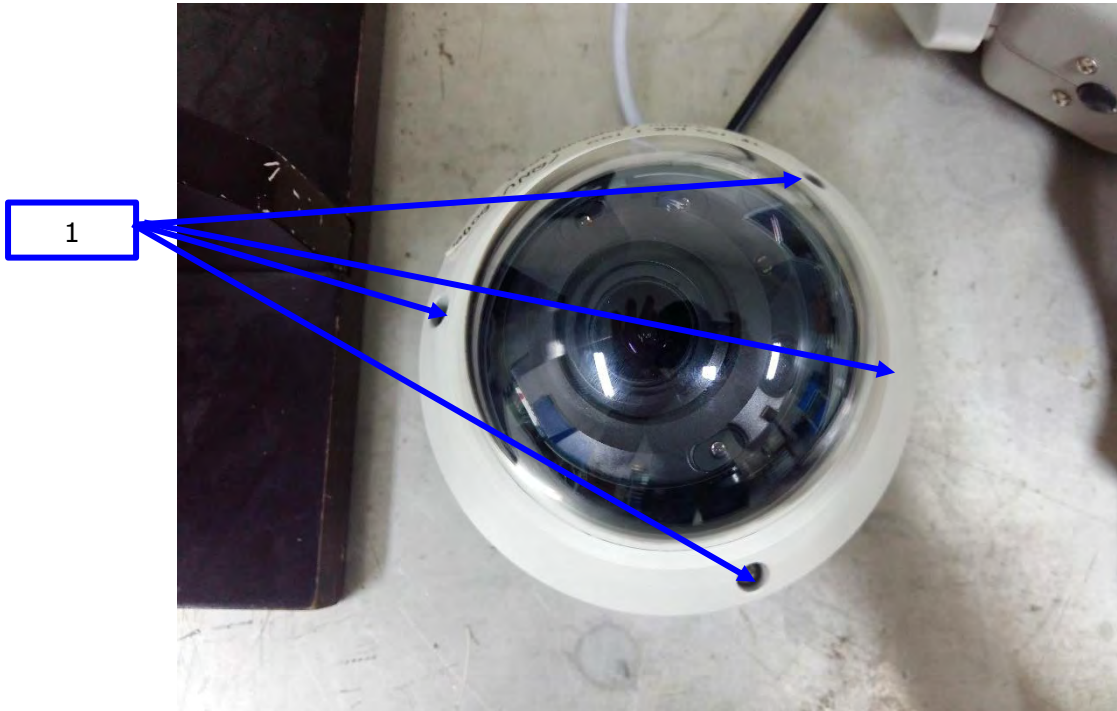


- DC 12 V Mode

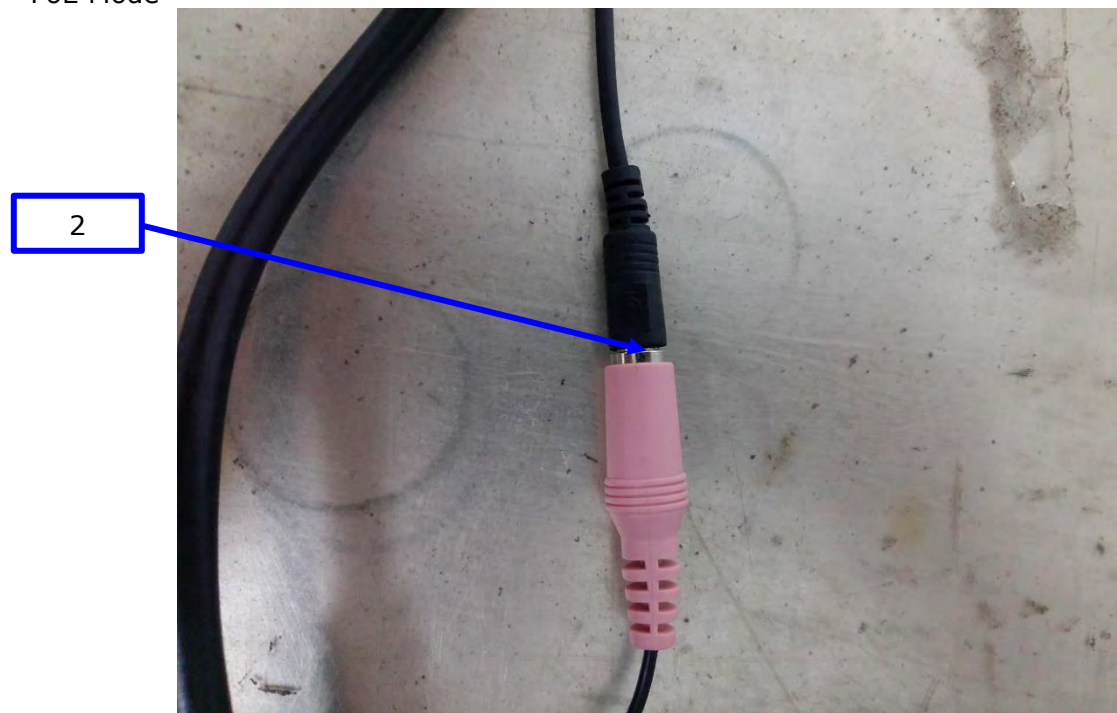


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- PoE Mode



- PoE Mode



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**Test Data****- DC 12 V Mode****Indirect Discharge**

No.	Test Point	Discharge Method	Performance	Remarks
			Observation	
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

Direct Discharge

No.	Test Point	Discharge Method	Performance	Remarks
			Observation	
1	Sar face	Contact Discharge	Complied	-
2	Mic Port	Contact Discharge	Complied	-

- PoE Mode**Indirect Discharge**

No.	Test Point	Discharge Method	Performance	Remarks
			Observation	
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

Direct Discharge

No.	Test Point	Discharge Method	Performance	Remarks
			Observation	
1	Surface	Contact Discharge	Complied	-
2	Mic Port	Contact Discharge	Complied	-

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.

3.2 Radiated Electric Field Immunity

Reference Standard

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

Test Date

Jul. 03, 2016

Test Location

EMS-RS: ☐ Semi Anchoic Chamber #1 ☒ Semi Anchoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	SIGNAL GENERATOR	SMB 100A	R&S	108252	08, 13, 2016
☒	BROADBAND AMPLIFIER	BBA100	R&S	101239	08, 13, 2016
☒	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 13, 2016
☒	POWER METER	NRP2	R&S	103475	08, 13, 2016
☒	AVG POWER SENSOR	NRP-Z91	R&S	102526	08, 13, 2016
☒	AVG POWER SENSOR	NRP-Z91	R&S	102527	08, 13, 2016
☒	Stacked Log.-Per.Antenna	STLP 9128 D	Schwarzbeck	9128D038	-
☒	DIRECTIONAL COUPLER	KYDC-D1070-DX40	KyTelecom Co., Ltd.	KY150001	09, 25, 2016
☒	Semi Anchoic Chamber #2		SEMITEC	-	-

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Test Conditions

Temperature: 21,9 °C
Relative Humidity: 50,8 %
Atmospheric Pressure: 99,1 kPa

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

Test Data

- DC 12 V Mode

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

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- PoE Mode

Side Exposed	Observation	
	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

-II

Test Date

Jul. 01, 2016

Test Location

EMS-EFT: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	07, 14, 2017
☒	Capacitive Coupling Clamp	HFK	EM TEST	070925	07, 14, 2017
☒	Motor Variac	MV2616	EM TEST	V0936105123	07, 14, 2017

Test Conditions

Temperature: 23,7 °C
Relative Humidity: 53,4 %
Atmospheric Pressure: 99,7 kPa

Test Specifications

Pulse Amplitude & Polarity: (Power Lines)	☐ ± 1.0 kV ☐ ± 4.0 kV	☐ ± 2.0 kV
Pulse Amplitude & Polarity: (Signal Lines)	☐ ± 0.5 kV ☐ ± 2.0 kV	☒ ± 1.0 kV
Burst Period:	☒ 300 ms	☐ 2 s
Repetition Rate:	☐ 5 kHz	☒ 100 kHz
Duration of Test Voltage:	☒ ≥ 1 min	
Required Performance Criteria:	☒ Complied	

Test Data

- DC 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)
L1 – L2	Complied	Complied

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	OBSERVATIONS	
	(+) Burst (kV)	(-) Burst (kV)
LAN (RJ-45)	Complied	Complied
Alarm	Complied	Complied

- PoE Mode

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

Mode of Application	OBSERVATIONS	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

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

Mode of Application	OBSERVATIONS	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	OBSERVATIONS	
	(+) Burst (kV)	(-) Burst (kV)
PoE (RJ-45)	Complied	Complied
Alarm	Complied	Complied

Note: “Blank” = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.

3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014

Test Date

Jul. 01, 2016

Test Location

EMS-Surge: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☒	MotorVariac	MV2616	EM TEST	V0936105123	06, 27, 2017
☐	CDN	CNV 508T5	EM TEST	P1549168422	04, 27, 2017
☒	CDN	CNV 508N1	EM TEST	P1551168979	04, 27, 2017

Test Conditions

Temperature: 23,7 °C
Relative Humidity: 53,4 %
Atmospheric Pressure: 99,7 kPa

Test Specifications
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

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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

- 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)
-	-	-

Signal Lines

☒ Line to Earth – Common Mode

Mode of Application	OBSERVATIONS	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45 (LAN)	Complied	Complied
Alarm	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 (PoE)	Complied	Complied
Alarm	Complied	Complied

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.

3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Jul. 02, 2016

Test Location

EMS-CS: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Continuous Wave Generator	CWS 500N1	EM TEST	V0936105119	09, 25, 2016
☒	6 dB Attenuator	ATT6	EM TEST	1208-34	08, 13, 2016
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 13, 2016
☒	EM Injection Clamp	EM 101	Liithi	35943	02, 04, 2017
☐	NTSC/PAL/SECAM PATTERN GENERATOR	408NPS	LEADER	577240	02, 04, 2017
☐	DTV MODULATOR	TVB599A	TELEVIEW	23.53.20.15.09.00.0022	11, 02, 2016
☐	TELEPHONE ANALYZER	DD-5601-CID JUNG	JUNG JIN	520304038	11, 03, 2016
☐	MICROPHONE	MP201	BSWA	512175	11, 02, 2016
☐	SOUND ACOUSTIC TESTER	TST-1000	TESTEK	150045	11, 03, 2016

Test Conditions

Temperature: 21,6 °C
Relative Humidity: 43,3 %
Atmospheric Pressure: 98,6 kPa

Test Specifications

- Frequency range: ☒ 150 kHz to 100 MHz ☐ 10 kHz to 30 MHz
☐ 150 kHz to 230 MHz ☐ 10 kHz to 100 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

- DC 12 V Mode

☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observation
-	CDN (☐ M2, ☐ M3)	-

☒ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observation
L1 – L2	CDN (☒ M2, ☐ M3)	Complied

☐ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observation
RJ-45 (LAN)	EM Injection Clamp	Complied
Alarm	EM Injection Clamp	Complied

- PoE Mode

☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observation
-	CDN (☐ M2, ☐ M3)	-

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observation
-	CDN (☐ M2, ☐ M3)	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observation
RJ-45 (PoE)	EM Injection Clamp	Complied
Alarm	EM Injection Clamp	Complied

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

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

N/A

Test Location

EMS-Voltage dip: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	Transient Test System	TRA3000F-S-D-V	EMC PARTNER AG	1524	03, 25, 2017
☐	MotorVariac	VAR-EXT1000	EMC PARTNER AG	1507	03, 25, 2017

Test Conditions

Temperature: °C
Relative Humidity: %
Atmospheric Pressure: kPa



Test Specifications & Observations/Remarks

Test Level	Duration [in period/ms (50 Hz)]	Results
☐ 20 % dip	☐ 250 /5000	_____
☐ 30 % dip	☐ 25 /500	_____
☐ 60 % dip	☐ 10 /200	_____
☐ 100 % dip	☐ 250 /5000	_____
- Voltage variations		
☐ Unom + 10 %	☐ 253 V (ac)	_____
☐ Unom - 15 %	☐ 195.5 V (ac)	_____

Observations:

Complied – No degradation of function

Test Results

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

Remarks

N/A : Because the E.U.T power is 12 v (dc) power and PoE, limits are not specified.



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APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

N/A

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[NEUTRAL]

N/A

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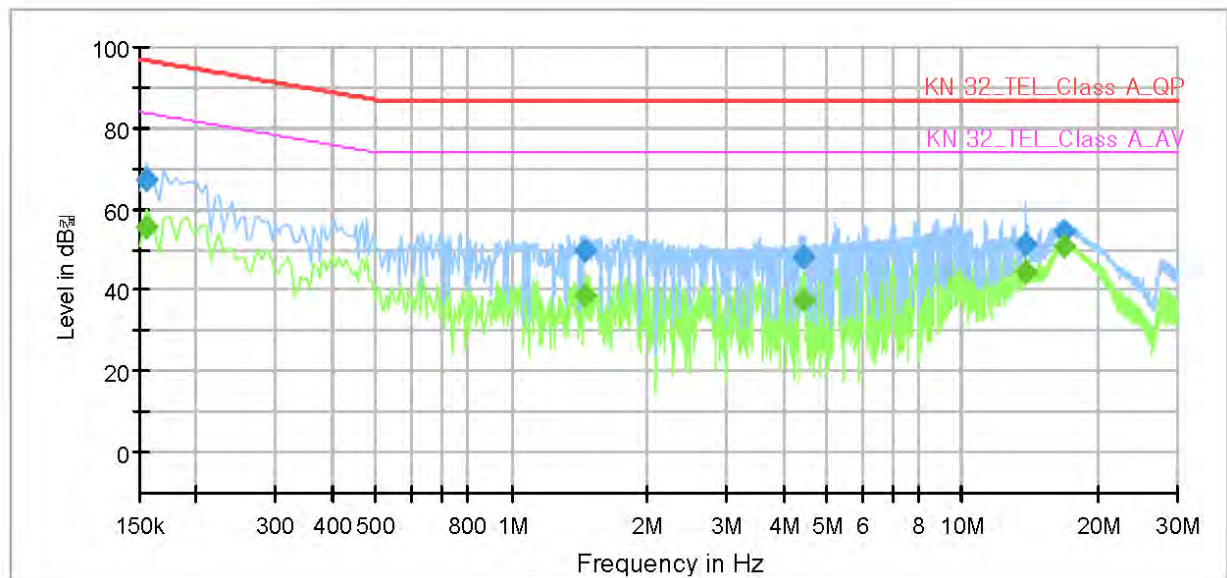
Conducted Emissions at Telecommunication Ports

- DC 12 V Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	QNV-6070RP
Mode	12 V (dc) 10 Mbps
Operator Name:	KES



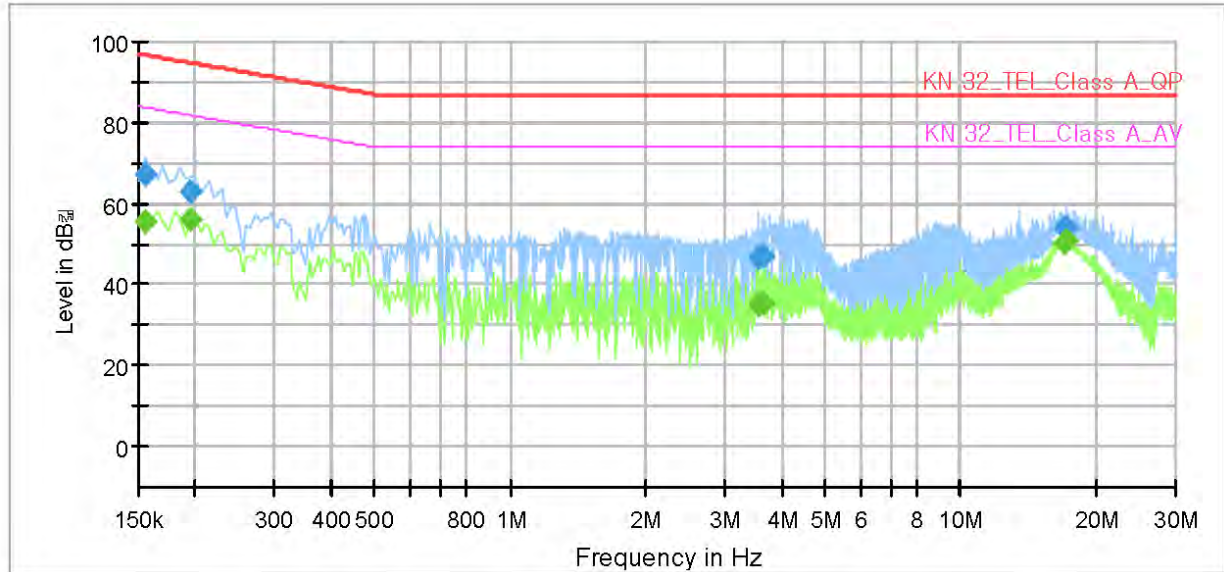
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	55.83	83.73	27.90	1000.0	9.000	Single Line	10.1
0.155000	67.47	---	96.73	29.26	1000.0	9.000	Single Line	10.1
1.450000	---	38.79	74.00	35.21	1000.0	9.000	Single Line	9.8
1.450000	49.85	---	87.00	37.15	1000.0	9.000	Single Line	9.8
4.450000	---	37.73	74.00	36.27	1000.0	9.000	Single Line	9.8
4.450000	48.11	---	87.00	38.89	1000.0	9.000	Single Line	9.8
13.750000	---	44.60	74.00	29.40	1000.0	9.000	Single Line	10.1
13.750000	51.09	---	87.00	35.91	1000.0	9.000	Single Line	10.1
16.905000	---	51.08	74.00	22.92	1000.0	9.000	Single Line	10.1
16.905000	54.39	---	87.00	32.61	1000.0	9.000	Single Line	10.1

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	QNV-6070RP
Mode	12 V (dc) 100 Mbps
Operator Name:	KES



Final Result

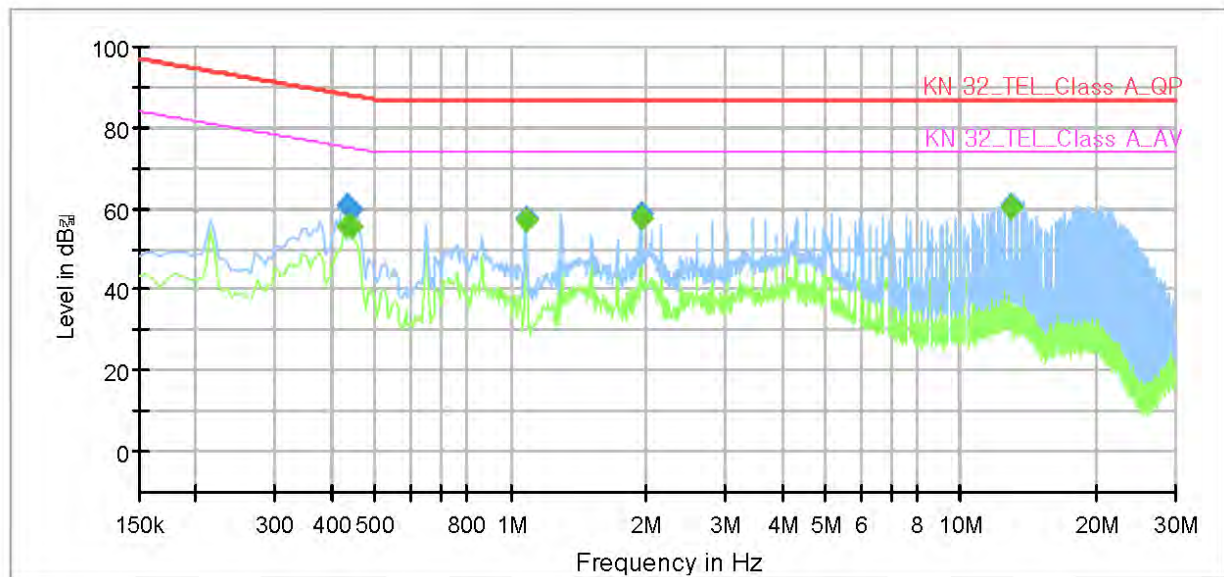
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	--	55.49	83.73	28.24	1000.0	9.000	Single Line	9.6
0.155000	67.20	--	96.73	29.53	1000.0	9.000	Single Line	9.6
0.195000	--	55.99	81.82	25.83	1000.0	9.000	Single Line	9.6
0.195000	63.09	--	94.82	31.73	1000.0	9.000	Single Line	9.6
3.555000	--	35.06	74.00	38.94	1000.0	9.000	Single Line	9.3
3.555000	46.82	--	87.00	40.18	1000.0	9.000	Single Line	9.3
3.655000	--	35.25	74.00	38.75	1000.0	9.000	Single Line	9.3
3.655000	46.96	--	87.00	40.04	1000.0	9.000	Single Line	9.3
17.060000	--	50.52	74.00	23.48	1000.0	9.000	Single Line	9.5
17.060000	53.80	--	87.00	33.20	1000.0	9.000	Single Line	9.5
17.100000	--	50.57	74.00	23.43	1000.0	9.000	Single Line	9.5
17.100000	54.14	--	87.00	32.86	1000.0	9.000	Single Line	9.5

- PoE Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	QNV-6070RP
Mode	PoE 10 Mbps
Operator Name:	KES



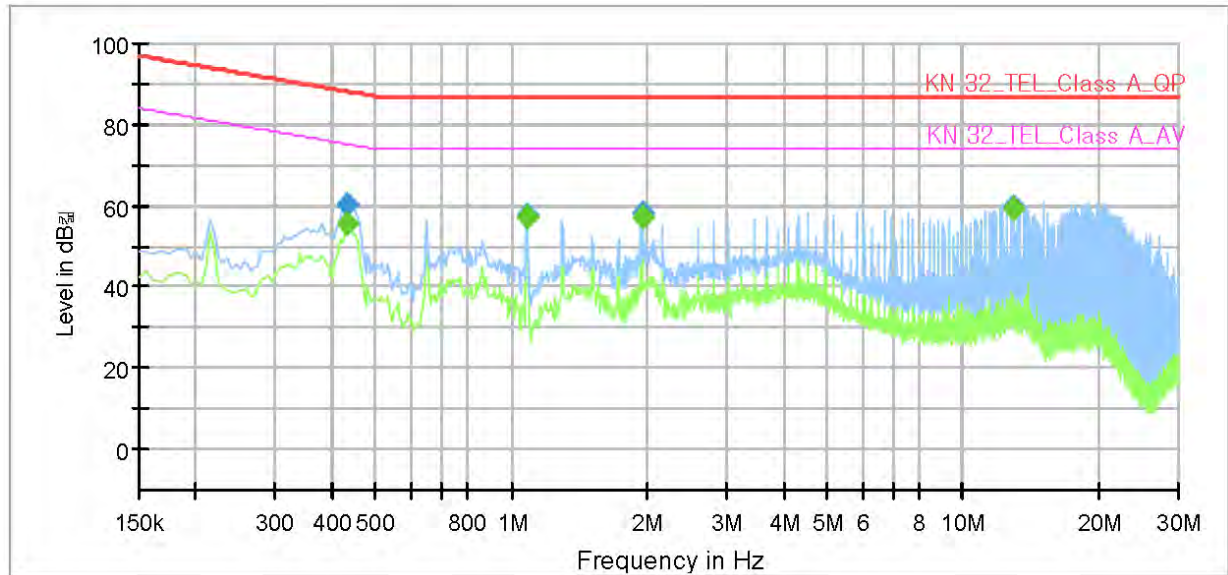
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.435000	--	55.78	75.16	19.38	1000.0	9.000	Single Line	10.0
0.435000	60.94	--	88.16	27.22	1000.0	9.000	Single Line	10.0
0.440000	--	55.36	75.06	19.70	1000.0	9.000	Single Line	10.0
0.440000	60.05	--	88.06	28.01	1000.0	9.000	Single Line	10.0
1.080000	--	57.40	74.00	16.60	1000.0	9.000	Single Line	9.9
1.080000	57.89	--	87.00	29.11	1000.0	9.000	Single Line	9.9
1.945000	--	57.56	74.00	16.44	1000.0	9.000	Single Line	9.8
1.945000	58.83	--	87.00	28.17	1000.0	9.000	Single Line	9.8
12.960000	--	60.32	74.00	13.68	1000.0	9.000	Single Line	10.1
12.960000	61.09	--	87.00	25.91	1000.0	9.000	Single Line	10.1

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	QNV-6070RP
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)
0.435000	--	55.36	75.16	19.80	1000.0	9.000	Single Line	9.5
0.435000	60.45	--	88.16	27.71	1000.0	9.000	Single Line	9.5
1.080000	--	56.95	74.00	17.05	1000.0	9.000	Single Line	9.4
1.080000	57.48	--	87.00	29.52	1000.0	9.000	Single Line	9.4
1.945000	--	57.10	74.00	16.90	1000.0	9.000	Single Line	9.3
1.945000	58.28	--	87.00	28.72	1000.0	9.000	Single Line	9.3
12.960000	--	59.27	74.00	14.73	1000.0	9.000	Single Line	9.6
12.960000	59.87	--	87.00	27.13	1000.0	9.000	Single Line	9.6

Radiated Electric Field Emissions(Below 1 GHz)

- DC 12 V Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
225.15	12.84	V	1.00	12.01	3.10	27.95	40.00	12.05
225.36	14.67	H	4.00	12.02	3.10	29.79	40.00	10.21
425.32	13.40	H	3.30	16.01	4.40	33.81	47.00	13.19
425.73	12.08	V	1.70	16.02	4.41	32.51	47.00	14.49
445.51	21.24	H	2.80	16.36	4.55	42.15	47.00	4.85
475.00	19.62	V	2.20	16.87	4.77	41.26	47.00	5.74

* H : Horizontal, V : Vertical

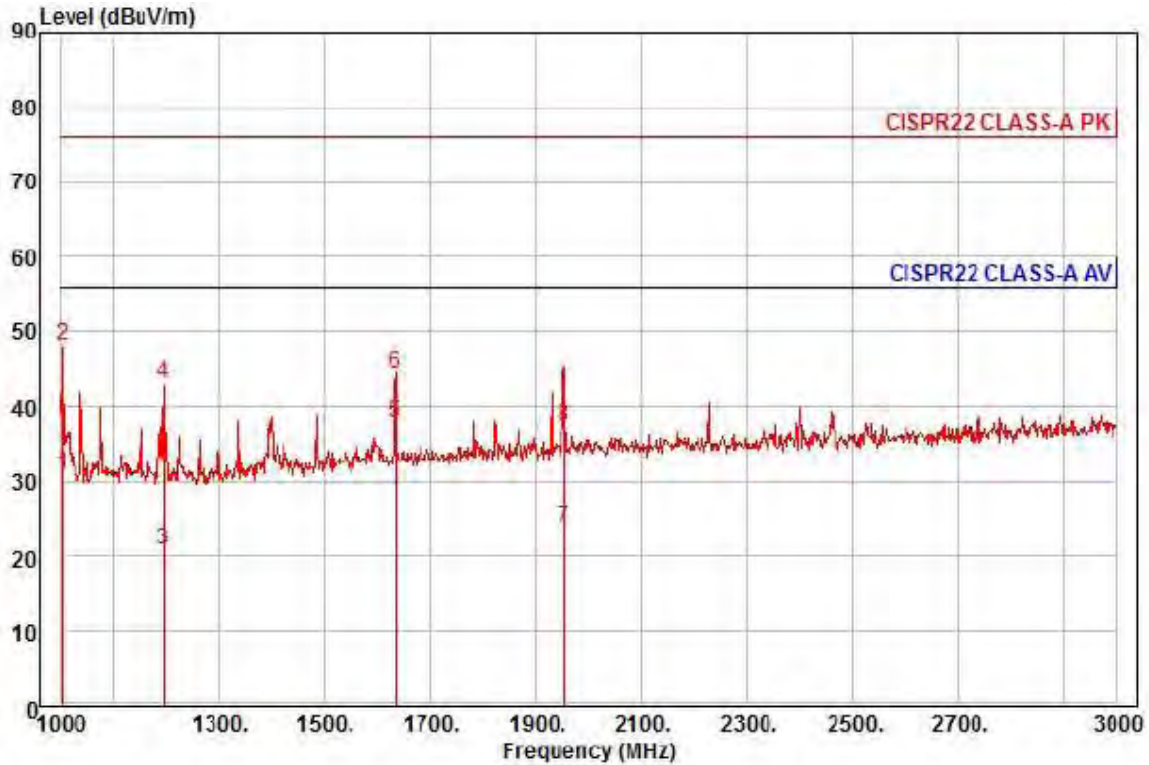
- PoE Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
375.99	24.01	H	2.90	15.05	4.06	43.12	47.00	3.88
400.28	21.57	H	3.10	15.57	4.22	41.36	47.00	5.64
425.16	15.24	V	1.50	16.01	4.40	35.65	47.00	11.35
446.10	19.04	H	3.40	16.37	4.56	39.97	47.00	7.03
451.00	17.44	V	1.90	16.45	4.59	38.48	47.00	8.52
500.37	14.87	H	3.50	17.31	4.95	37.13	47.00	9.87

* H : Horizontal, V : Vertical

Radiated Electric Field Emissions(Above 1 GHz)

- DC 12 V Mode



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNV-6070RP
Mode : 12 V (dc)
Memo : (1 ~ 3) GHz

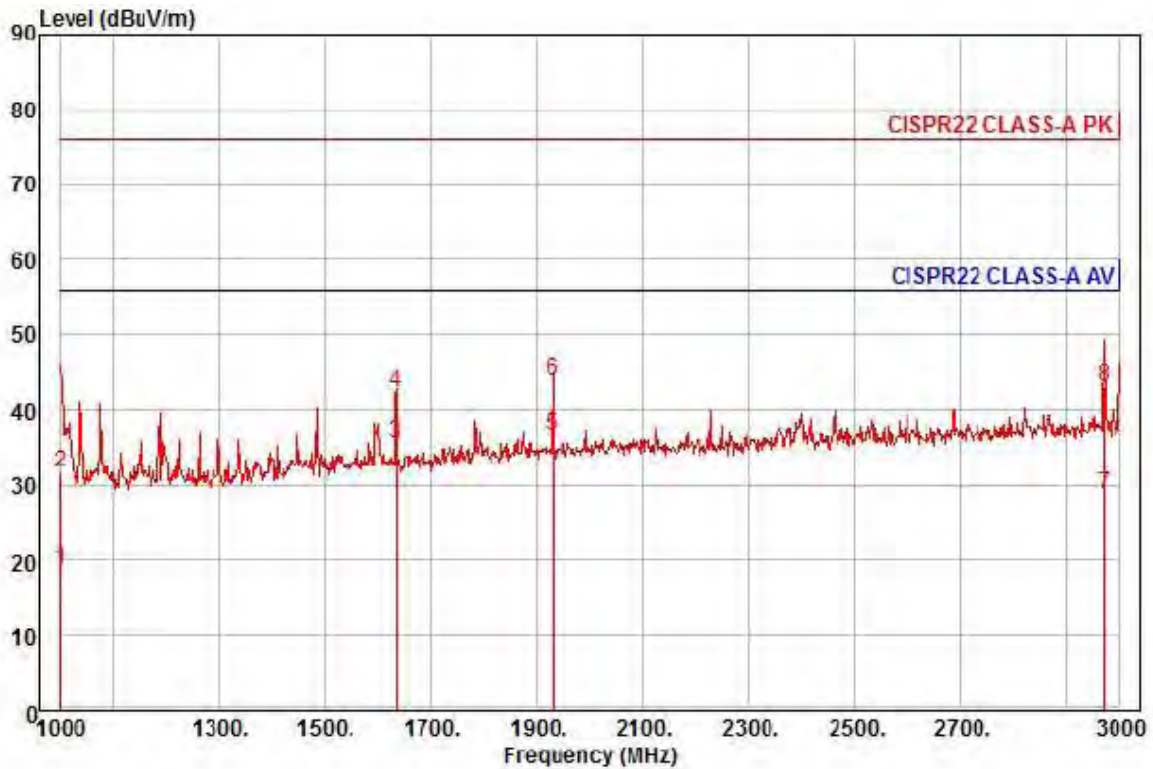
	Read	Ant	Cable	Preamp	TPos	Limit	Over		
Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1002.00	40.55	23.92	6.52	40.12	164	56.00	-25.13	horizontal Average
2 pk	1002.00	57.75	23.92	6.52	40.12	164	76.00	-27.93	horizontal Peak
3	1196.00	29.13	24.69	7.08	40.02	38	56.00	-35.12	horizontal Average
4	1196.00	51.53	24.69	7.08	40.02	38	76.00	-32.72	horizontal Peak
5 pp	1634.00	42.84	26.43	8.34	39.81	147	56.00	-18.20	horizontal Average
6	1634.00	49.46	26.43	8.34	39.81	147	76.00	-31.58	horizontal Peak
7	1954.00	26.41	27.70	9.22	39.65	269	56.00	-32.32	horizontal Average
8	1954.00	39.91	27.70	9.22	39.65	269	76.00	-38.82	horizontal Peak



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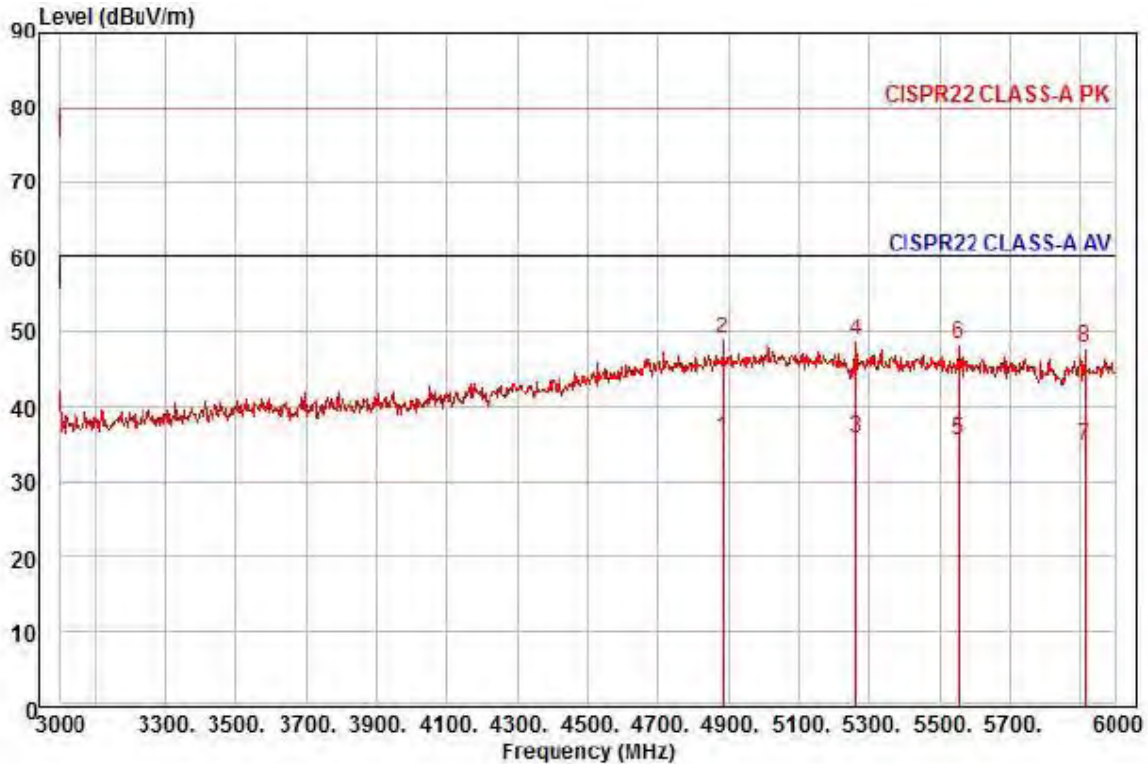
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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNV-6070RP
Mode : 12 V (dc)
Memo : (1 ~ 3) GHz

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1000.00	28.45	23.91	6.51	40.12	315	56.00	-37.25	vertical	Average
2	1000.00	41.30	23.91	6.51	40.12	315	76.00	-44.40	vertical	Peak
3	1634.00	40.69	26.43	8.34	39.81	134	56.00	-20.35	vertical	Average
4	1634.00	47.44	26.43	8.34	39.81	134	76.00	-33.60	vertical	Peak
5 pp	1930.00	39.52	27.60	9.16	39.66	318	56.00	-19.38	vertical	Average
6 pk	1930.00	46.70	27.60	9.16	39.66	318	76.00	-32.20	vertical	Peak
7	2972.00	27.55	30.26	11.15	40.19	177	56.00	-27.23	vertical	Average
8	2972.00	41.97	30.26	11.15	40.19	177	76.00	-32.81	vertical	Peak

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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNV-6070RP
Mode : 12 V (dc)
Memo : (3 ~ 6) GHz

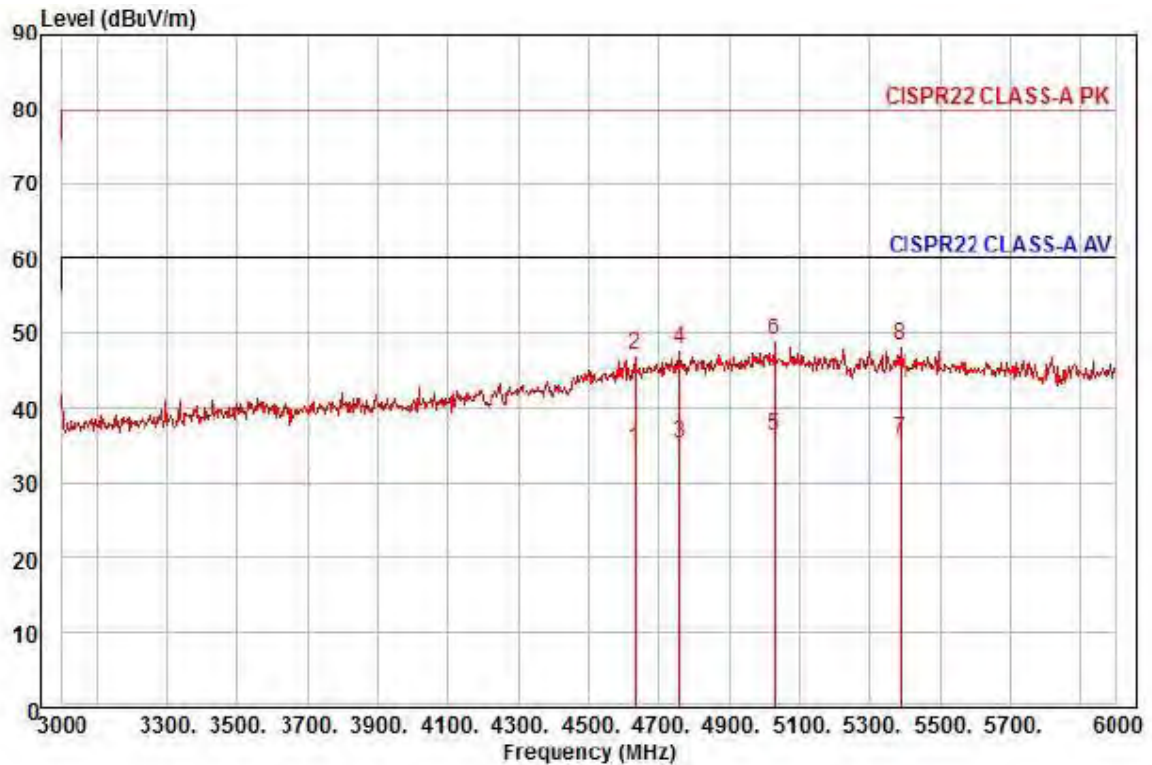
	Read	Ant	Cable	Preamp	TPos	Limit	Over		
Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4884.00	24.05	37.06	15.12	40.41	31	60.00	-24.18	horizontal Average
2 pk	4884.00	37.37	37.06	15.12	40.41	31	80.00	-30.86	horizontal Peak
3 pp	5262.00	23.38	37.19	15.64	40.37	31	60.00	-24.16	horizontal Average
4	5262.00	36.24	37.19	15.64	40.37	31	80.00	-31.30	horizontal Peak
5	5553.00	23.17	36.60	16.02	40.33	180	60.00	-24.54	horizontal Average
6	5553.00	35.96	36.60	16.02	40.33	180	80.00	-31.75	horizontal Peak
7	5913.00	22.54	35.88	16.70	40.28	39	60.00	-25.16	horizontal Average
8	5913.00	35.42	35.88	16.70	40.28	39	80.00	-32.28	horizontal Peak



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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNV-6070RP
Mode : 12 V (dc)
Memo : (3 ~ 6) GHz

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4635.00	24.60	35.64	14.67	40.41	226	60.00	-25.50	vertical	Average
2	4635.00	37.17	35.64	14.67	40.41	226	80.00	-32.93	vertical	Peak
3	4758.00	24.48	36.34	14.89	40.41	0	60.00	-24.70	vertical	Average
4	4758.00	37.11	36.34	14.89	40.41	0	80.00	-32.07	vertical	Peak
5 pp	5031.00	23.58	37.66	15.37	40.41	6	60.00	-23.80	vertical	Average
6 pk	5031.00	36.34	37.66	15.37	40.41	6	80.00	-31.04	vertical	Peak
7	5385.00	23.39	36.94	15.78	40.36	155	60.00	-24.25	vertical	Average
8	5385.00	36.03	36.94	15.78	40.36	155	80.00	-31.61	vertical	Peak

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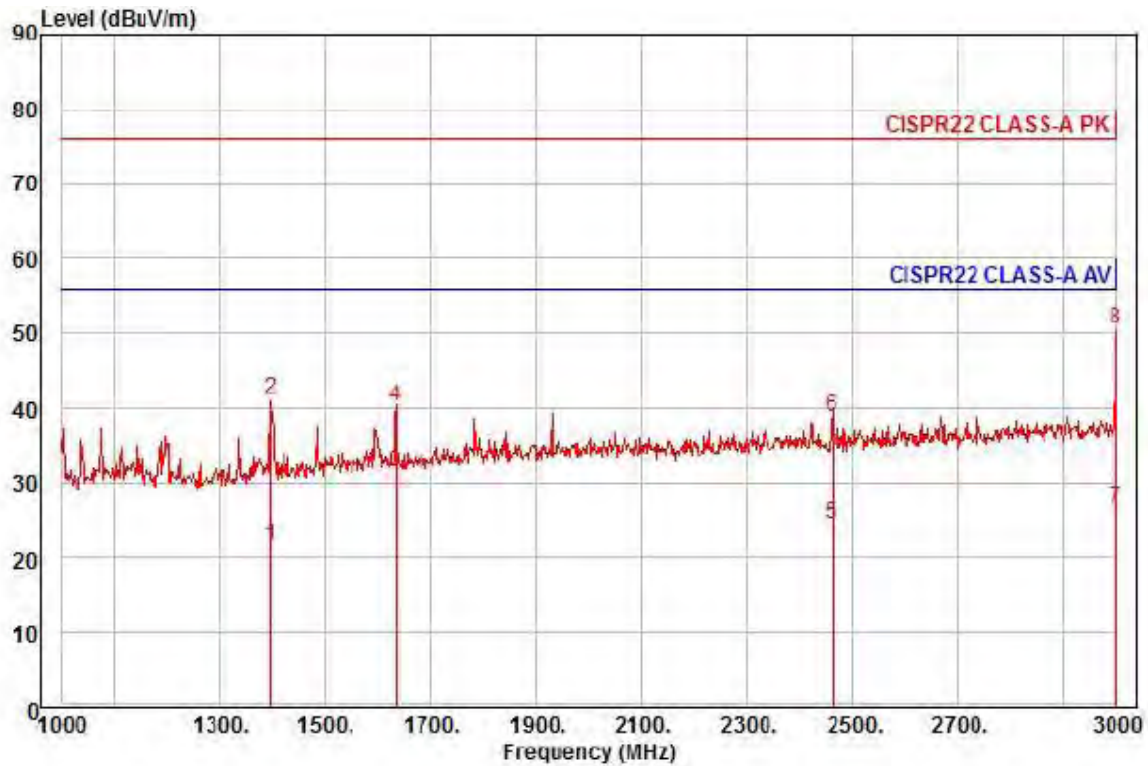


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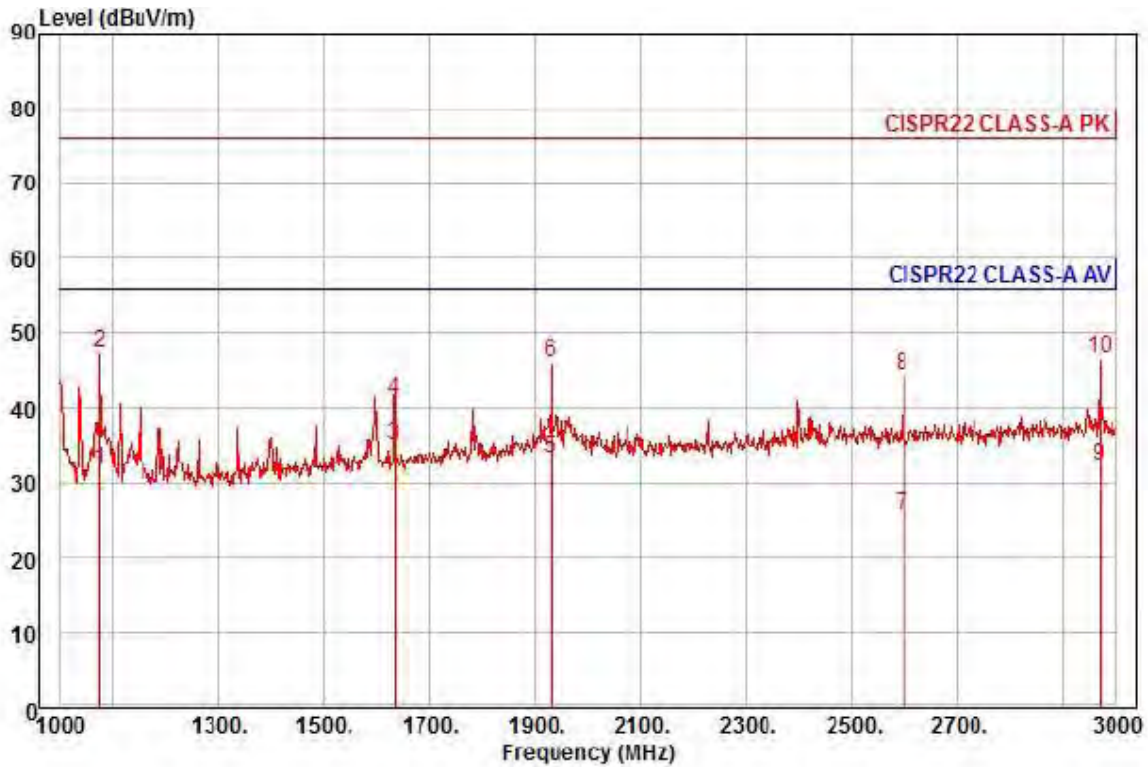
- PoE Mode



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNV-6070RP
Mode : PoE
Memo : (1 ~ 3) GHz

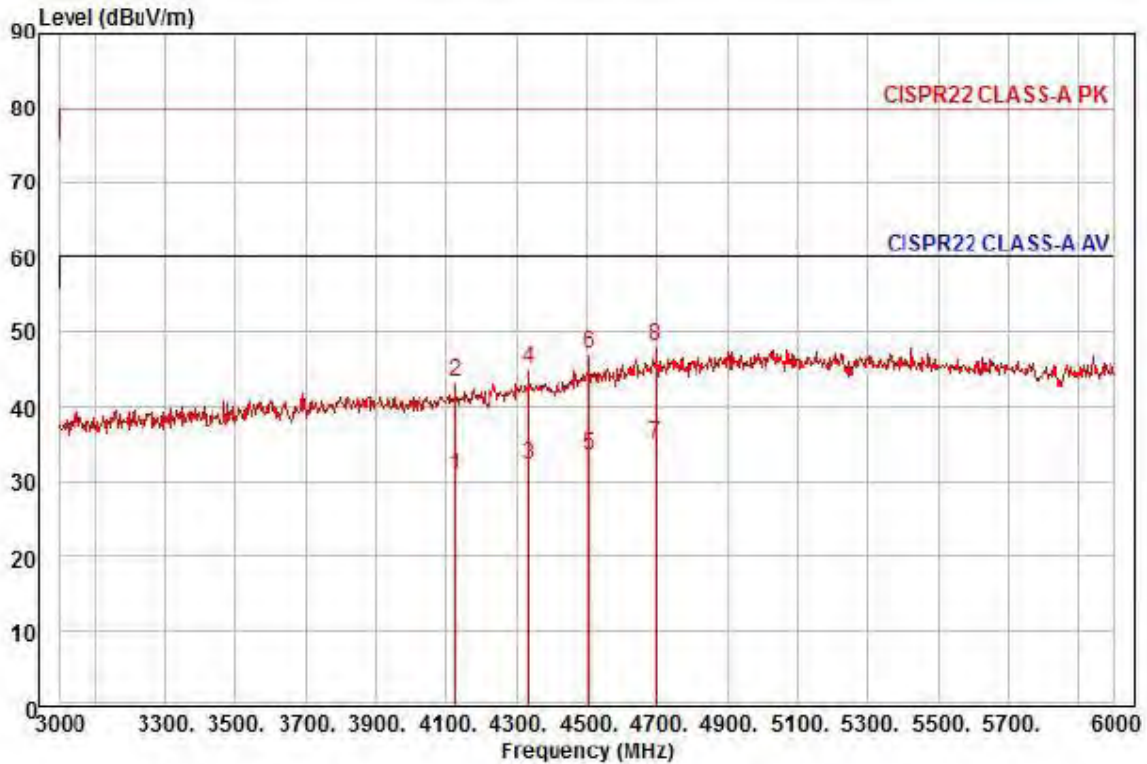
		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1396.00	28.25	25.48	7.66	39.93	75	56.00	-34.54	horizontal	Average
2	1396.00	48.03	25.48	7.66	39.93	75	76.00	-34.76	horizontal	Peak
3 pp	1634.00	36.38	26.43	8.34	39.81	24	56.00	-24.66	horizontal	Average
4	1634.00	45.33	26.43	8.34	39.81	24	76.00	-35.71	horizontal	Peak
5	2462.00	25.43	29.01	10.06	39.90	44	56.00	-31.40	horizontal	Average
6	2462.00	39.48	29.01	10.06	39.90	44	76.00	-37.35	horizontal	Peak
7	3000.00	25.26	30.33	11.22	40.21	170	56.00	-29.40	horizontal	Average
8 pk	3000.00	49.06	30.33	11.22	40.21	170	76.00	-25.60	horizontal	Peak

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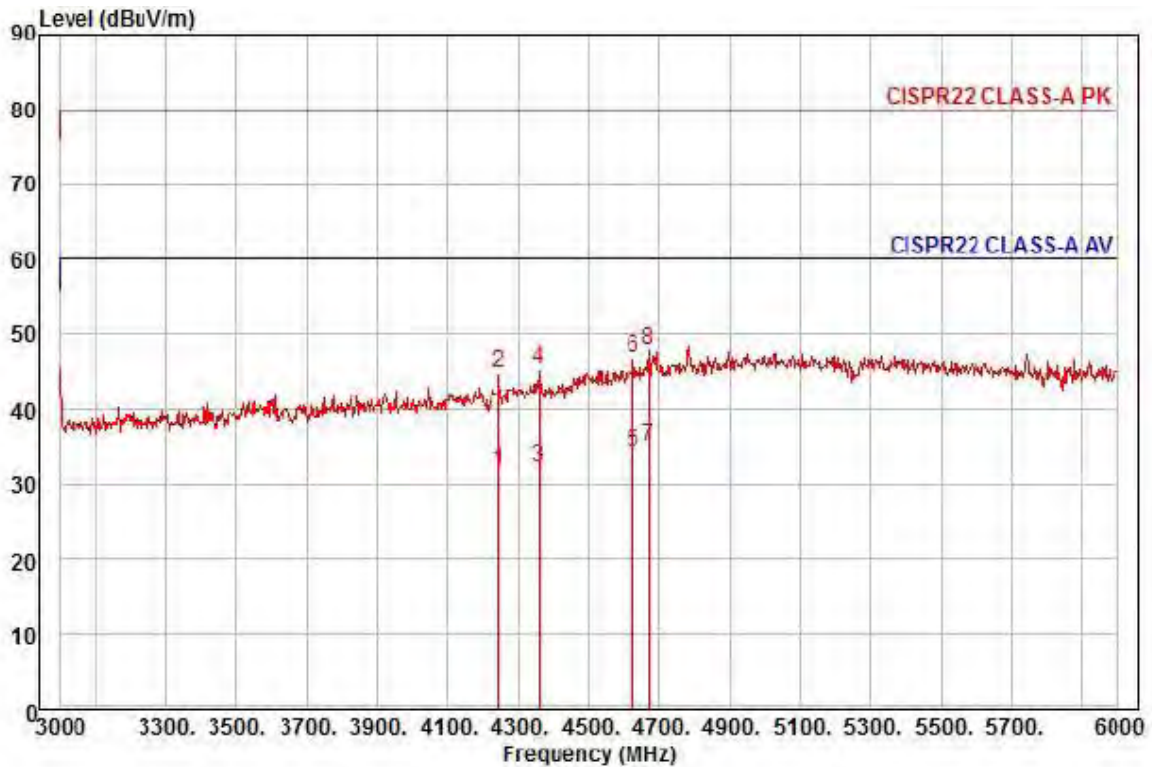
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNV-6070RP
Mode : PoE
Memo : (1 ~ 3) GHz

	Read	Ant	Cable	Preamp	TPos	Limit	Over		
Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1076.00	41.13	24.21	6.73	40.08	1	56.00	-24.01	vertical
2	pk 1076.00	56.43	24.21	6.73	40.08	1	76.00	-28.71	vertical
3	pp 1634.00	40.10	26.43	8.34	39.81	158	56.00	-20.94	vertical
4	1634.00	46.30	26.43	8.34	39.81	158	76.00	-34.74	vertical
5	1930.00	36.18	27.60	9.16	39.66	294	56.00	-22.72	vertical
6	1930.00	48.89	27.60	9.16	39.66	294	76.00	-30.01	vertical
7	2598.00	26.05	29.35	10.27	39.98	68	56.00	-30.31	vertical
8	2598.00	44.63	29.35	10.27	39.98	68	76.00	-31.73	vertical
9	2970.00	31.25	30.26	11.15	40.19	0	56.00	-23.53	vertical
10	2970.00	45.29	30.26	11.15	40.19	0	76.00	-29.49	vertical



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNV-6070RP
Mode : PoE
Memo : (3 ~ 6) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4125.00	24.89	32.72	13.74	40.41	93	60.00	-29.06	horizontal	Average
2	4125.00	37.29	32.72	13.74	40.41	93	80.00	-36.66	horizontal	Peak
3	4335.00	24.85	33.92	14.13	40.41	127	60.00	-27.51	horizontal	Average
4	4335.00	37.47	33.92	14.13	40.41	127	80.00	-34.89	horizontal	Peak
5	4506.00	24.70	34.90	14.44	40.41	278	60.00	-26.37	horizontal	Average
6	4506.00	38.06	34.90	14.44	40.41	278	80.00	-33.01	horizontal	Peak
7 pp	4698.00	24.71	36.00	14.79	40.41	96	60.00	-24.91	horizontal	Average
8 pk	4698.00	37.71	36.00	14.79	40.41	96	80.00	-31.91	horizontal	Peak



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNV-6070RP
Mode : PoE
Memo : (3 ~ 6) GHz

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4245.00	25.01	33.41	13.96	40.41	150	60.00	-28.03	vertical	Average
2	4245.00	37.91	33.41	13.96	40.41	150	80.00	-35.13	vertical	Peak
3	4359.00	24.60	34.06	14.17	40.41	22	60.00	-27.58	vertical	Average
4	4359.00	37.61	34.06	14.17	40.41	22	80.00	-34.57	vertical	Peak
5	4626.00	24.47	35.58	14.66	40.41	164	60.00	-25.70	vertical	Average
6	4626.00	37.07	35.58	14.66	40.41	164	80.00	-33.10	vertical	Peak
7 pp	4671.00	24.79	35.84	14.74	40.41	213	60.00	-25.04	vertical	Average
8 pk	4671.00	37.76	35.84	14.74	40.41	213	80.00	-32.07	vertical	Peak



Harmonic Current Emissions and Voltage Fluctuations and Flicker

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	N/A			
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

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 _{eff} [A]	% of Limit	Limit [A]	Result
1	N/A			
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

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

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

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Test Setup Photos and Configuration

Conducted Voltage Emissions

N/A

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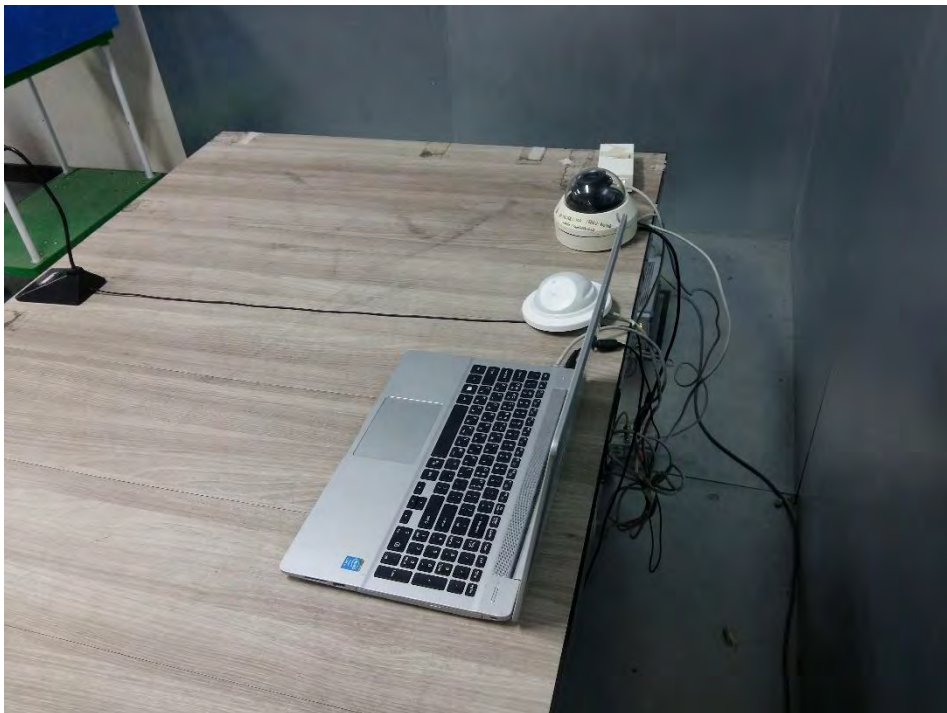
Conducted Telecommunication Emissions

- DC 12 V Mode



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- PoE Mode



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Radiated Electric Field Emissions(Below 1 GHz)

- DC 12 V Mode



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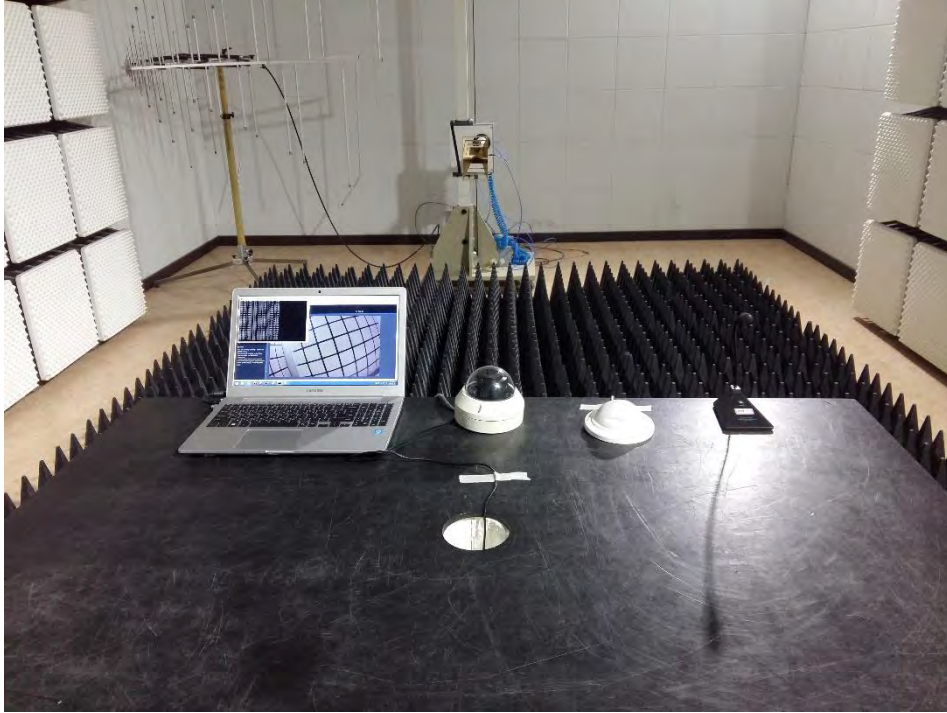
- PoE Mode



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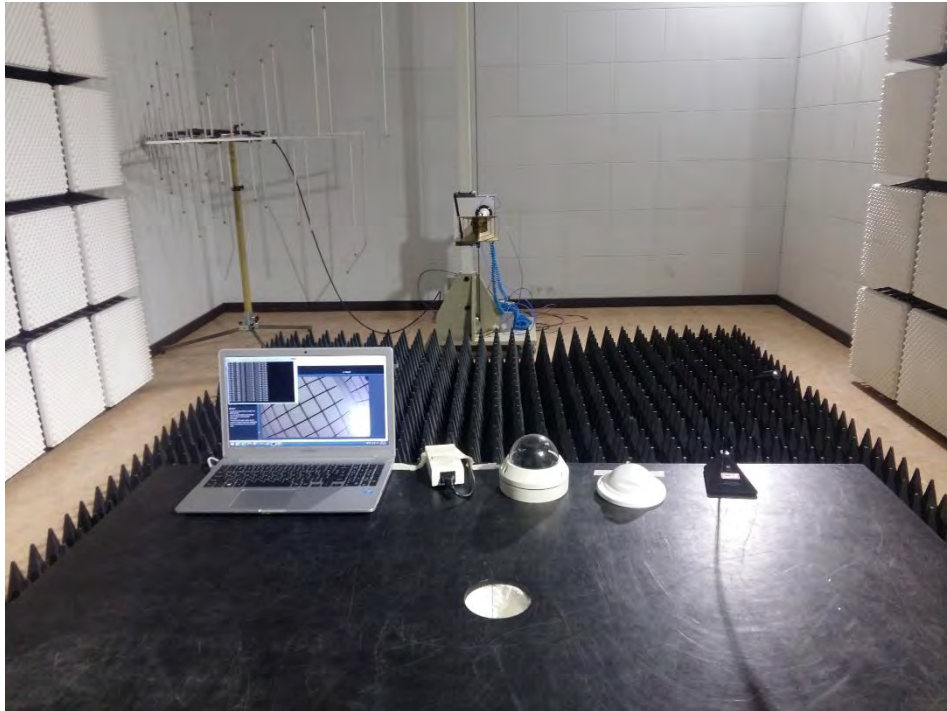
Radiated Electric Field Emissions(Above 1 GHz)

- DC 12 V Mode



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- PoE Mode



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Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

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Electrostatic Discharge

- DC 12 V Mode



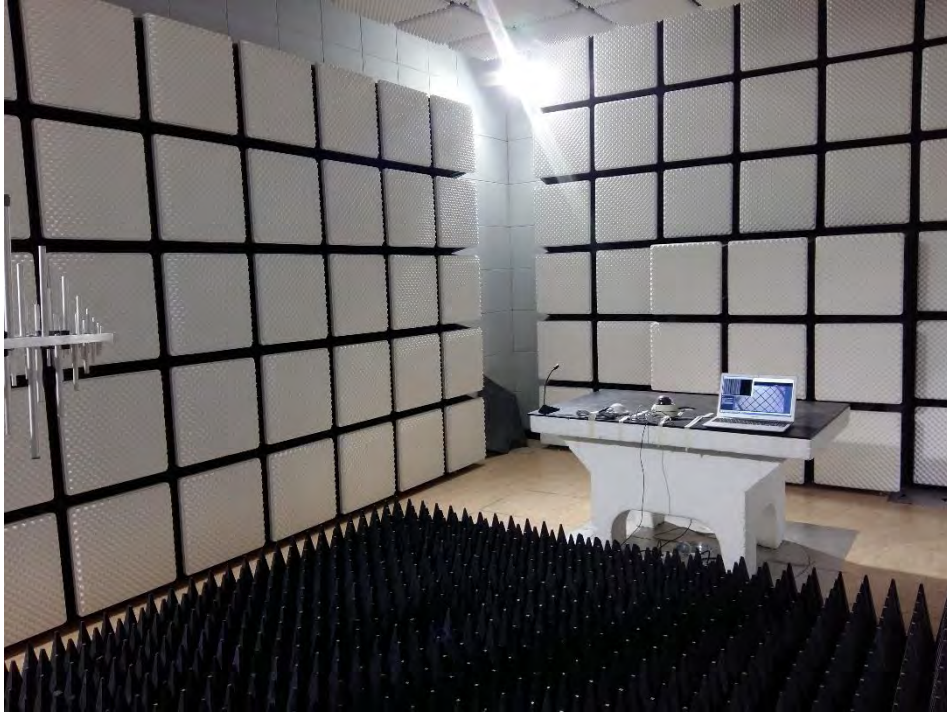
- PoE Mode



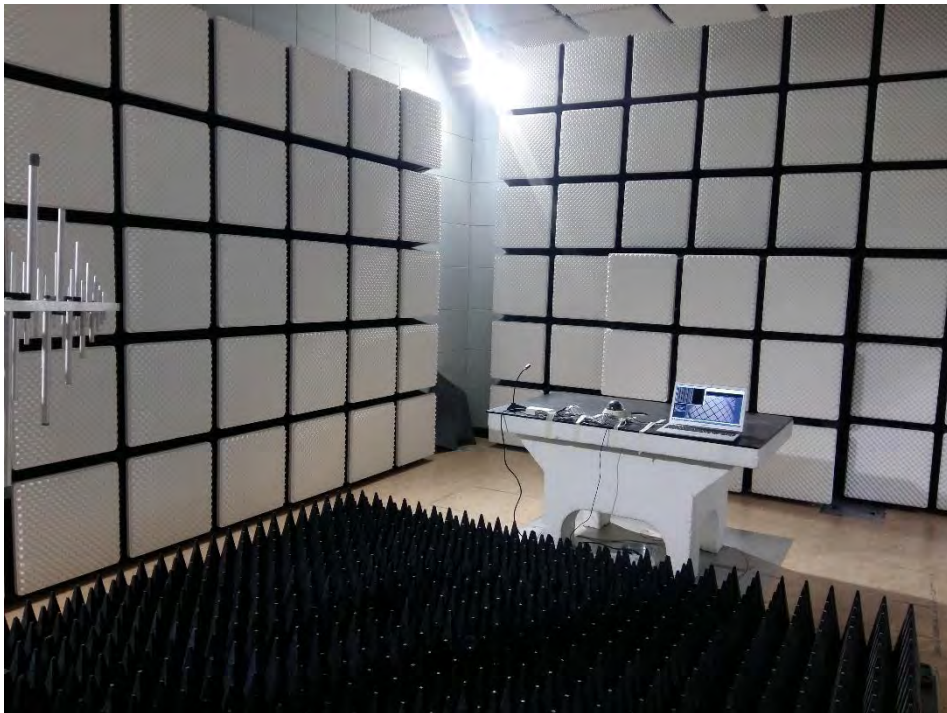
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Radiated Electric Field Immunity

- DC 12 V Mode



- PoE Mode



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Electrical Fast Transients/Bursts

- DC 12 V Mode



- PoE Mode



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Surge Transients

- DC 12 V Mode



- PoE Mode



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Conducted Disturbance

- DC 12 V Mode



- PoE Mode



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Voltage Dips and Short Interruptions

N/A

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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

(Internal View)

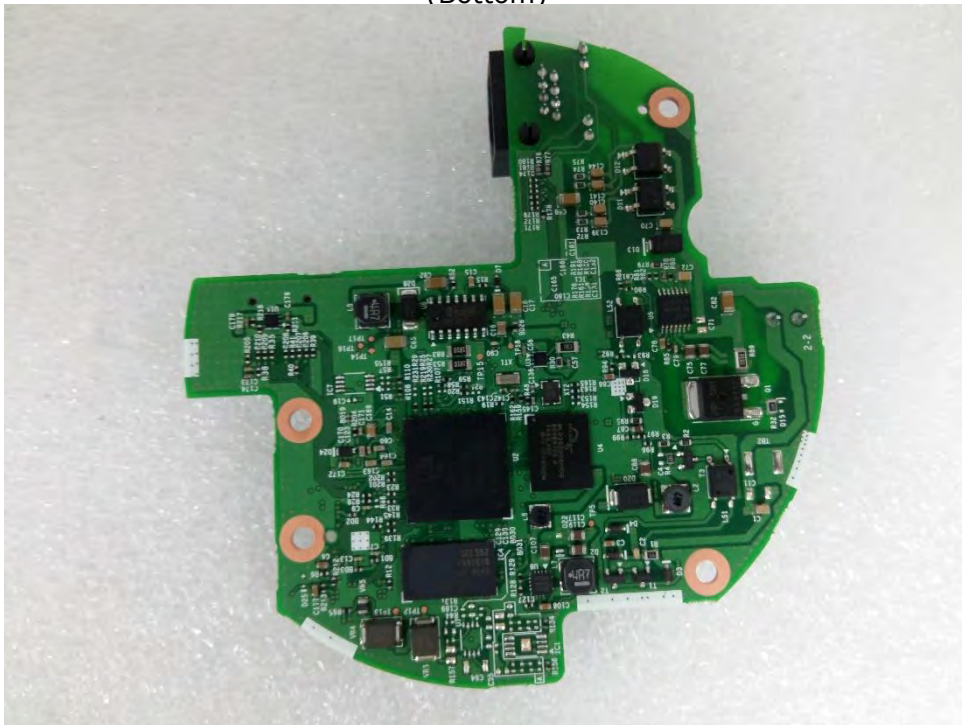


EUT Internal View – Main Board

(Top)



(Bottom)



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EUT Internal View – Iens Board

(Top)



(Bottom)



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Label and Location



NETWORK CONTROLLER

Model No : QNV-6070R

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

Made in China

