

EMC TEST REPORT For CE

Test Report No. : KES-E1-16T0326-R2

Date of Issue : May. 15, 2019

Product name : NETWORK CAMERA
7

Model/Type No. : PNF-9010RV

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. 09, 2016

Test date : Jun. 21, 2016 – Jun. 28, 2016

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

Tested by

Dae Hyun, Kim
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

**KES Co., Ltd.**

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 08, 2016	KES-E1-16T0326	Issued
Sep. 27, 2017	KES-E1-16T0326-R1	Standard Revision
May. 15, 2019	KES-E1-16T0326-R2	Re-issue due to manufacturer change

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1.0 General Product Description

Main Specifications of E.U.T are:

Video	
Imaging Device	1/1.7"
Total Pixels	4168x3062
Effective Pixels	2992x2992
Scanning System	Progressive
Min. Illumination	Color : 0.7Lux(F2.8, 30IRE) B/W : 0 Lux (IR LED On)
S / N Ratio	50dB
Video Out	CVBS : 1.0Vpp DIP connector type
Lens	
Focal Length (Zoom Ratio)	1.98mm
Max. Aperture Ratio	F2.8
Angular Field of View	H : 180° / V : 180° / D : 180°
Min. Object Distance	0.3m ~ Infinity
Focus Control	ABF
Lens Type	Fixed Lens
Mount Type	Board Type (M12)
Operational	
Viewable Length	15m
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 D&N
Backlight Compensation	BLC / WDR
Wide Dynamic Range	120dB
Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	DNR(2D+3D Noise Filter), Function Name : SSNR
Digital Image Stabilization	Not support
Defog	Support
Motion Detection	Off / On (8ea Polygonal zones)
Privacy Masking	Off / On (16ea Polygonal zones)
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor (Included Mercury)
Electronic Shutter Speed	2 ~ 1/12,000 sec
Digital Zoom	16x, Digital PTZ(Preset, Group)
Flip / Mirror	Off / On
Intelligent Video Analytics	Tampering(Scene Change), People counting, Heatmap, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection
Alarm I/O	Input 1ea / Output 1ea
Audio In	Line in/out Built-in Mic
Audio out	Line out
Alarm Triggers	Motion detection, Tampering, Audio Detection, Alarm Input, Network-Disconnection, Defocus detection

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Alarm events		File upload via FTP and E-Mail Notification via E-Mail, TCP and HTTP local storage(SD/SDHC/SDXC) or NAS recording at Event (Alarm Triggers) External output
View Composition		<Camera Side> 360 source view 180° Panorama 360° Panorama Double Panorama 360+4 PTZ view 180+4 PTZ view Quad PTZ view View 1/2/3/4 360+8 PTZ view
Network		
Ethernet		RJ-45 (10/100BASE-T)
Video Compression Format		H.265 / H.264 (MPEG-4 Part 10/AVC), Motion JPEG
Resolution	Original View	Max 12MP TBD
	Dewarped View	Max 9M
Max. Framera	H.265	12M 20fps, 9M 25fps
	H.264	12M 20fps, 9M 25fps
	MJPEG	Max 15fps at all resolutions
Smart Codec		Wise Stream
Video Quality Adjustment		H.264/H.265 : Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate Control Method		H.264/H.265 : CBR or VBR Motion JPEG : VBR
Streaming Capability		Multiple Streaming (Up to 10 profiles)
Audio Compression Format		G.711 u-law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC : 48Kbps at 16KHz
Audio Communication		Bi-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, SIP
Security		HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication (EAP-TLS, EAP-LEAP)
Streaming Method		Unicast / Multicast
Max. User Access		20 users at Unicast Mode
Edge Storage		micro SD/SDHC/SDXC (128GB) - motion Images recorded in the SDX/SDHC/SD memory card can be downloaded. NAS(Network Attached Storage) Local PC
Application Programming Interface		ONVIF Profile S/G SUNAPI(HTTP API) v2.0 Samsung techwin open platrom
Webpage Language		English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Portuguese, Turkish, Polish, Czech, Dutch, Hungary, Greek

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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	SSM, Smart Viewer
Pixel counter	support (plug-in viewer only)
Environmental	
Operating Temperature / Humidity	SNF-9010RV : -40°C ~ +55°C(+14°F ~ +131°F) / Less than 90% RH TBD * Startup should be done at above -20°C
Storage Temperature / Humidity	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66
Vandal Resistance	IK10
Standard Certification	UL, CE, FCC, RoHS, Gost, KC, EN61373, EN50155, EN50121, NEMA 4X, VCCI, C-TICK
Electrical	
Input Voltage / Current	DC12V±10%,PoE(IEEE802.3af,Class3)
Power Consumption	DC12V: TBD, PoE: TBD
Mechanical	
Color / Material	Ivory/Metal
Dimension (WxHxD)	TBD
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 ☐ 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	PNF-9010RV	-	Hanwha Techwin(Tianjin) Co., Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adapter	RP-PEG048I	-	REPOTEC	-
Notebook	HP ProBook 4430s	CNU2084CVW	HP	-
Notebook Adapter	Series PPP00H	F12921201063695	CHICONY POWER TECHNOLOGY (SUZHOU) CO.,LTD,	-
Monitor	SMT-2232	C95V67VF900038B	Weihai Daewoo Electronics Co., Ltd.	-
Speaker	BR10000A CUVE	SN128458950887	BEIJING EDIFIER HI-TECH GROUP.	-
Alarm Jig	-	-	-	-
Mobile Phone	A1688	-	Apple	-

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)	RJ-45(LAN)	Notebook	RJ-45(LAN)	3.0	U
	BNC	Monitor	BNC	4.0	S
	Audio In	Mobile Phone	Audio Out	1.7	U
	Audio Out	Speaker	Audio In	1.6	U
	Alarm	Alarm Jig	Alarm	3.0	U

- PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	RJ-45(PoE)	PoE Adapter	RJ-45(PoE)	3.5	U
PoE Adapter	RJ-45(LAN)	Notebook	RJ-45(LAN)	1.7	U
NETWORK CAMERA (E.U.T)	BNC	Monitor	BNC	4.0	S
	Audio In	Mobile Phone	Audio Out	1.7	U
	Audio Out	Speaker	Audio In	1.6	U
	Alarm	Alarm Jig	Alarm	3.0	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:

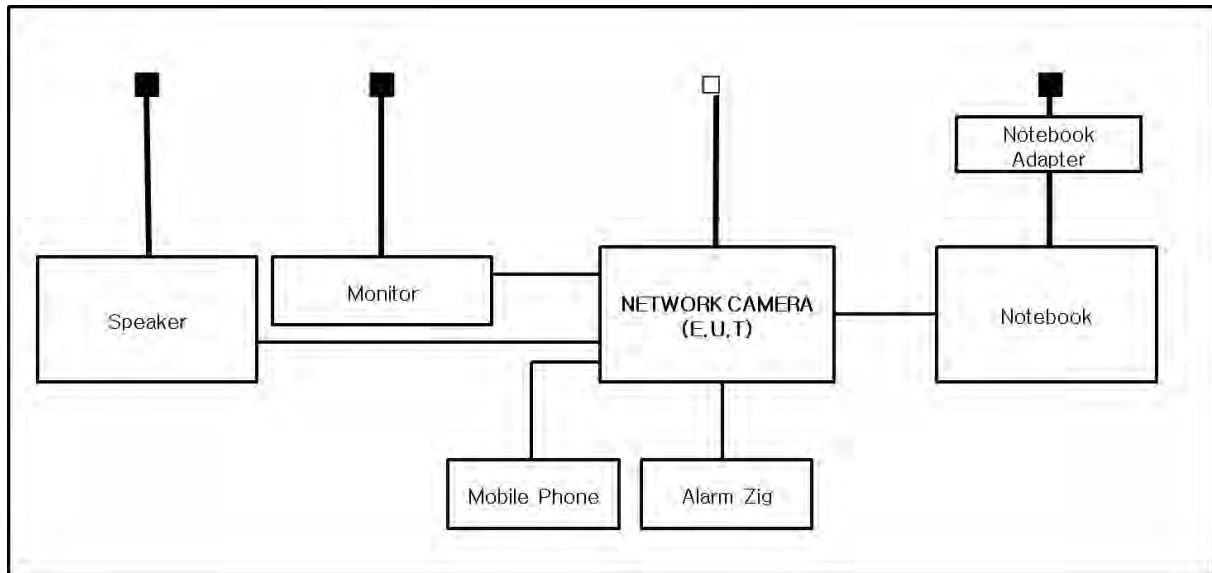
Test mode	Normal operating
OP	MONITORING PING TEST

- Input power condition during the measurements was 12 V (dc) , PoE

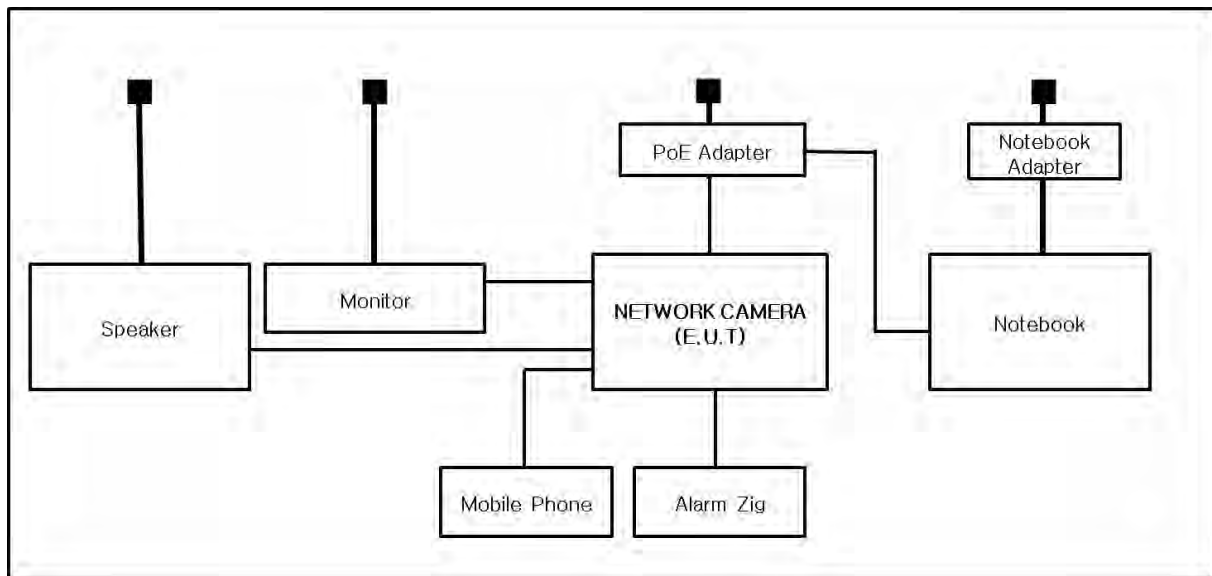
1.8 Configuration

■ 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 473-29 Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 32.

1.11 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	
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
KOREA	MSIP	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
Canada	IC	3 & 10 meter Open Area Test Sites and one conducted site	 4769B-1
Europe	CE	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	
International	KOLAS	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	

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

☐ 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

Remarks

Because 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. 21, 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	ESR3	R&S	101781	05, 03, 2017
☒	Trilog-Broadband ANT	VULB 9163	Schwarzbeck	9163-713	05, 15, 2018
☒	Open Area Test Site	-	KES	-	-
☒	Antenna Mast	-	DAEIL EMC	-	-
☒	Turn Table	-	DAEIL EMC	-	-

Test Conditions

Temperature: 30,5 °C
Relative Humidity: 43,0 %

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

Remarks

See Appendix A for test data.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jun. 21, 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: 23,8 °C

Relative Humidity: 43,6 %

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 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

Jun. 21, 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: 26,0 °C
Relative Humidity: 49,7 %
Atmospheric Pressure: 98,5 kPa

Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

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

Discharge Voltage:	Contact ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	Air ☒ 2 kV ☒ 4 kV ☐ 6 kV ☒ 8 kV ☐ 15 kV	HCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	VCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV
--------------------	---	---	---	---

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

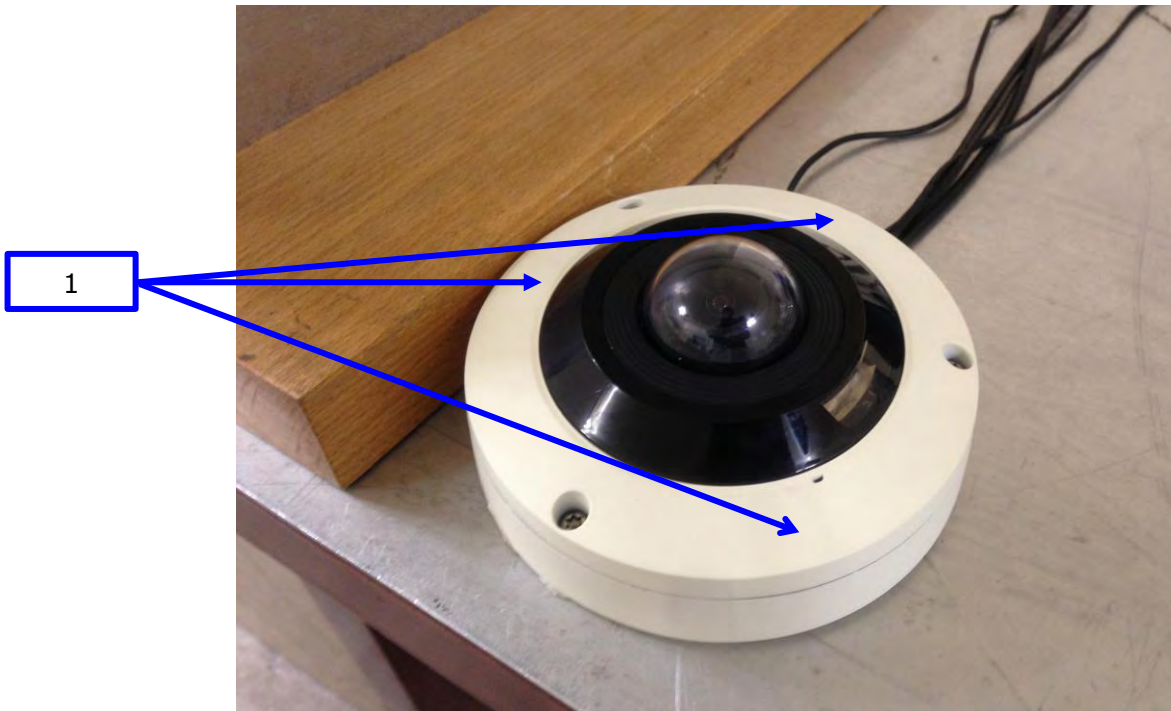
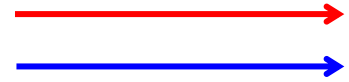
Required Performance Criteria: ☒ Complied

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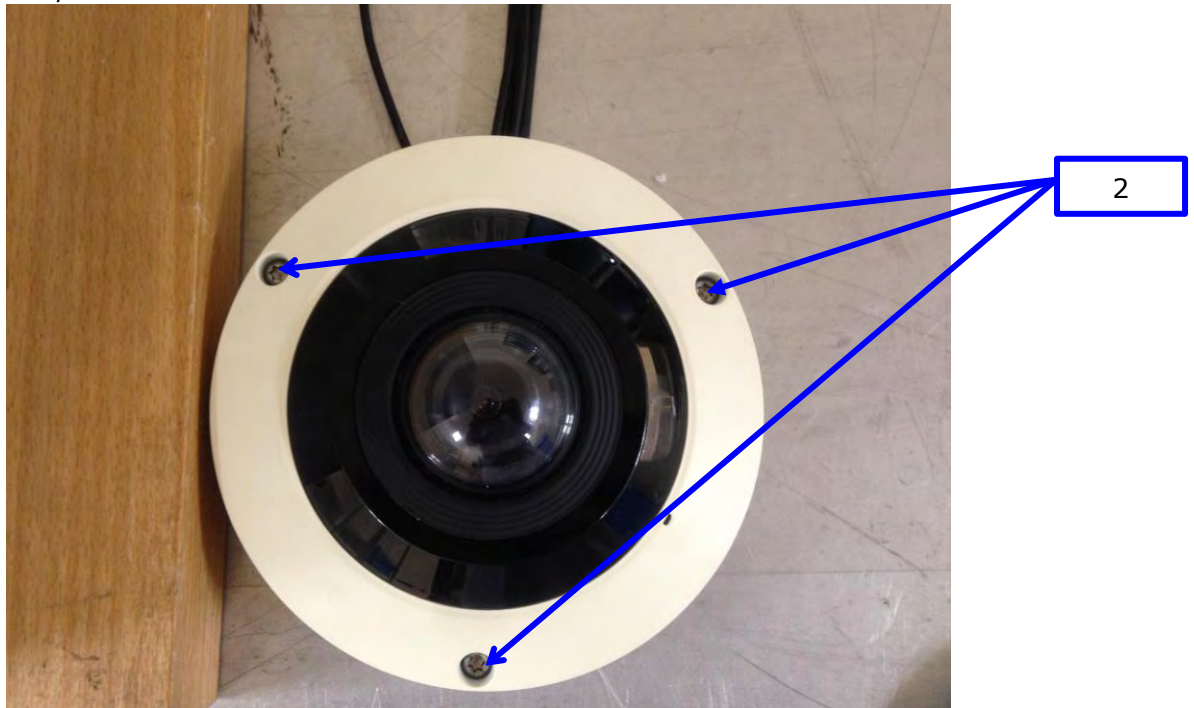
Location of Discharge:

- DC 12 V Mode / PoE Mode

Air
Contact

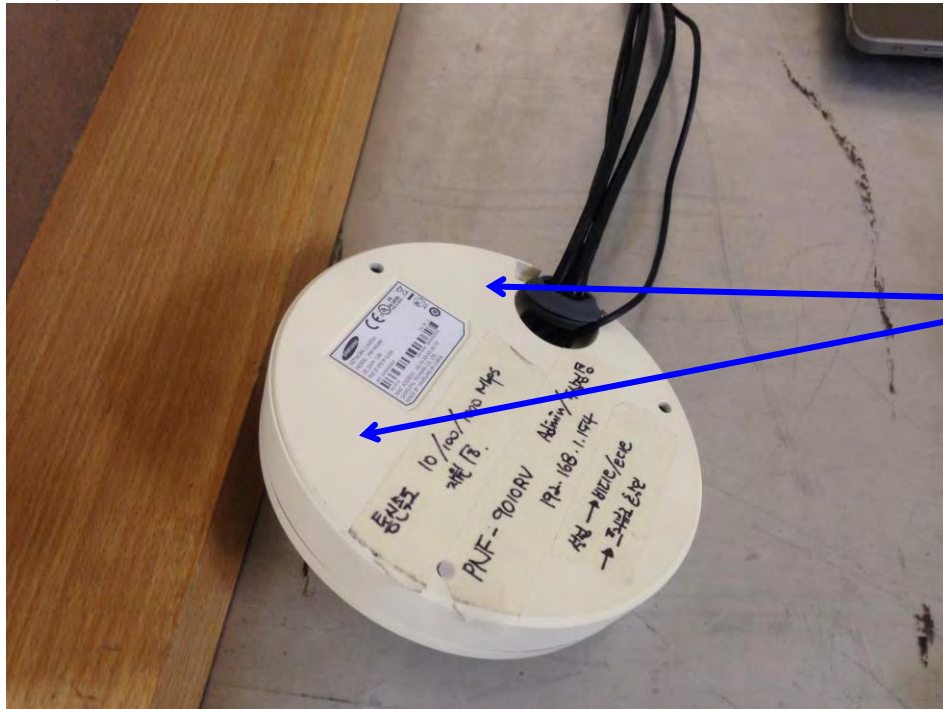


- DC 12 V Mode / PoE Mode



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- DC 12 V Mode / PoE Mode



**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	Enclosure 1	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-
3	Enclosure 2	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	Enclosure 1	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-
3	Enclosure 2	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

Jun. 23, 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: 23,8 °C
Relative Humidity: 43,6 %
Atmospheric Pressure: 98,7 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 % stepDwell Time: ☒ 1 s ☐ 3 s# of Sides Radiated: ☒ 4Required 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

Test Date

Jun. 25, 2016

Test Location

EMS-EFT: 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
☒	Capacitive Coupling Clamp	CN-EFT1000	EMC PARTNER AG	1528	03, 25, 2017

Test Conditions

Temperature: 24,2 °C
Relative Humidity: 48,3 %
Atmospheric Pressure: 98,4 kPa

Test Specifications

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



Test Data

- DC 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)
RJ-45 (LAN)	Complied	Complied
BNC	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)
RJ-45 (PoE)	Complied	Complied
BNC	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

Jun. 28, 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: 24,5 °C
Relative Humidity: 47,7 %
Atmospheric Pressure: 99,1 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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Other supply / Signal Lines

Source Impedance: 42 ohm for common mode

Surge Amplitude: Common Mode
☒ (0,5 / 1,0) kVNumber of Surges: ☒ 5 SurgesPolarity: ☒ Positive & NegativeRepetition 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
BNC	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
BNC	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

Jun. 24, 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: 23,6 °C
Relative Humidity: 52,1 %
Atmospheric Pressure: 99,7 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
BNC	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
BNC	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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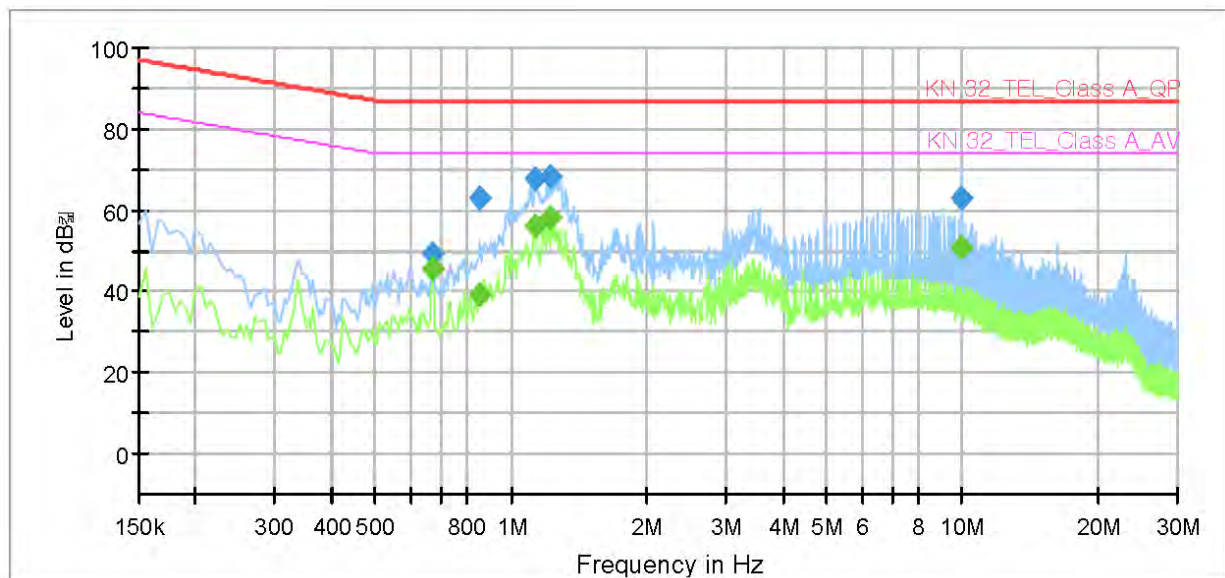
Conducted Emissions at Telecommunication Ports

- DC 12 V Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNF-9010RVP
Mode	10 Mbps
Operator Name:	KES



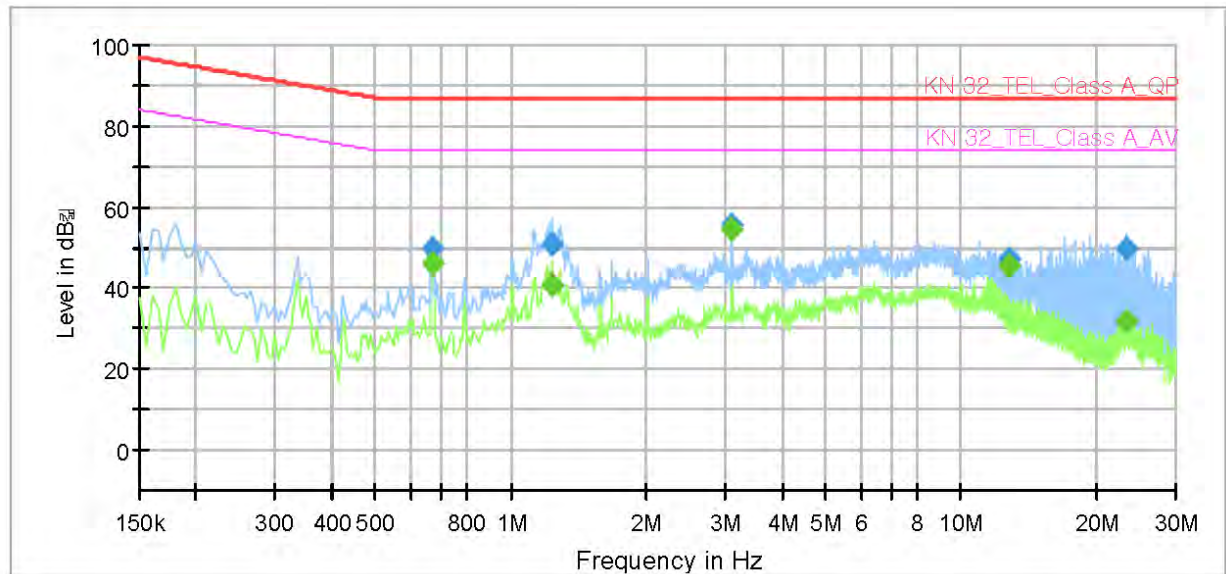
Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.670000	—	45.58	74.00	28.42	1000.0	9.000	Single Line	9.9
0.670000	49.10	—	87.00	37.90	1000.0	9.000	Single Line	9.9
0.855000	—	39.09	74.00	34.91	1000.0	9.000	Single Line	9.9
0.855000	62.75	—	87.00	24.25	1000.0	9.000	Single Line	9.9
1.130000	—	56.32	74.00	17.68	1000.0	9.000	Single Line	9.9
1.130000	67.68	—	87.00	19.32	1000.0	9.000	Single Line	9.9
1.225000	—	58.17	74.00	15.83	1000.0	9.000	Single Line	9.8
1.225000	68.23	—	87.00	18.77	1000.0	9.000	Single Line	9.8
10.000000	—	51.04	74.00	22.96	1000.0	9.000	Single Line	10.1
10.000000	63.02	—	87.00	23.98	1000.0	9.000	Single Line	10.1

[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PNF-9010RVP
Mode: 100 Mbps
Operator Name: KES



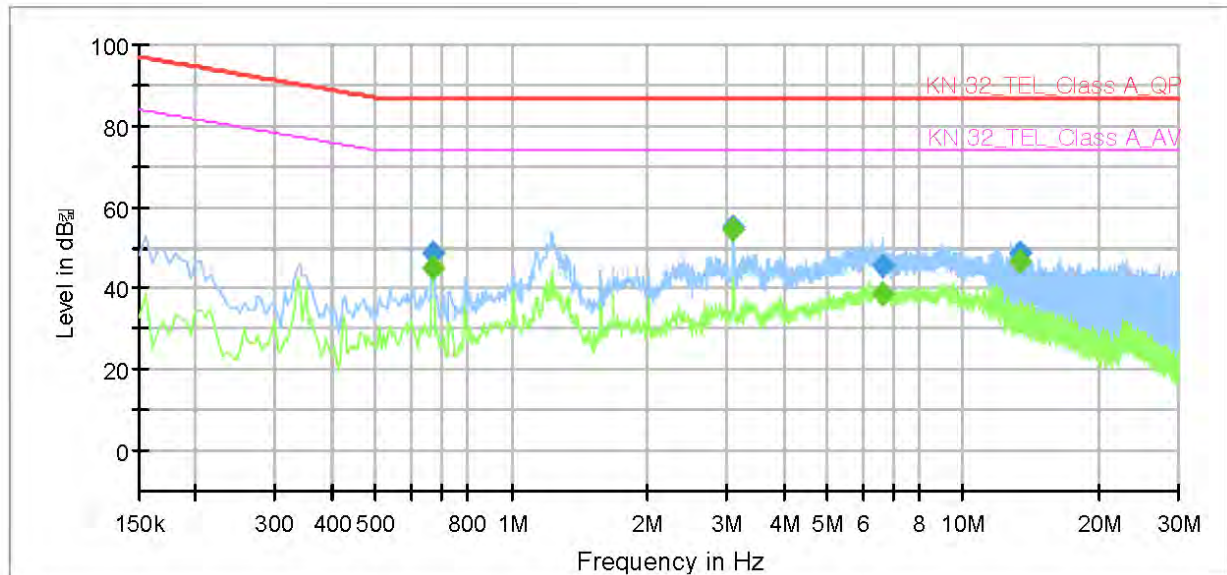
Final_Result

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.670000	—	45.80	74.00	28.20	1000.0	9.000	Single Line	9.4
0.670000	49.62	—	87.00	37.38	1000.0	9.000	Single Line	9.4
1.235000	—	40.77	74.00	33.23	1000.0	9.000	Single Line	9.3
1.235000	50.71	—	87.00	36.29	1000.0	9.000	Single Line	9.3
3.100000	—	54.65	74.00	19.35	1000.0	9.000	Single Line	9.3
3.100000	55.51	—	87.00	31.49	1000.0	9.000	Single Line	9.3
12.810000	—	45.42	74.00	28.58	1000.0	9.000	Single Line	9.6
12.810000	47.16	—	87.00	39.84	1000.0	9.000	Single Line	9.6
23.325000	—	31.73	74.00	42.27	1000.0	9.000	Single Line	9.5
23.325000	49.82	—	87.00	37.18	1000.0	9.000	Single Line	9.5

[1000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNF-9010RVP
Mode	1 000 Mbps
Operator Name:	KES



Final_Result

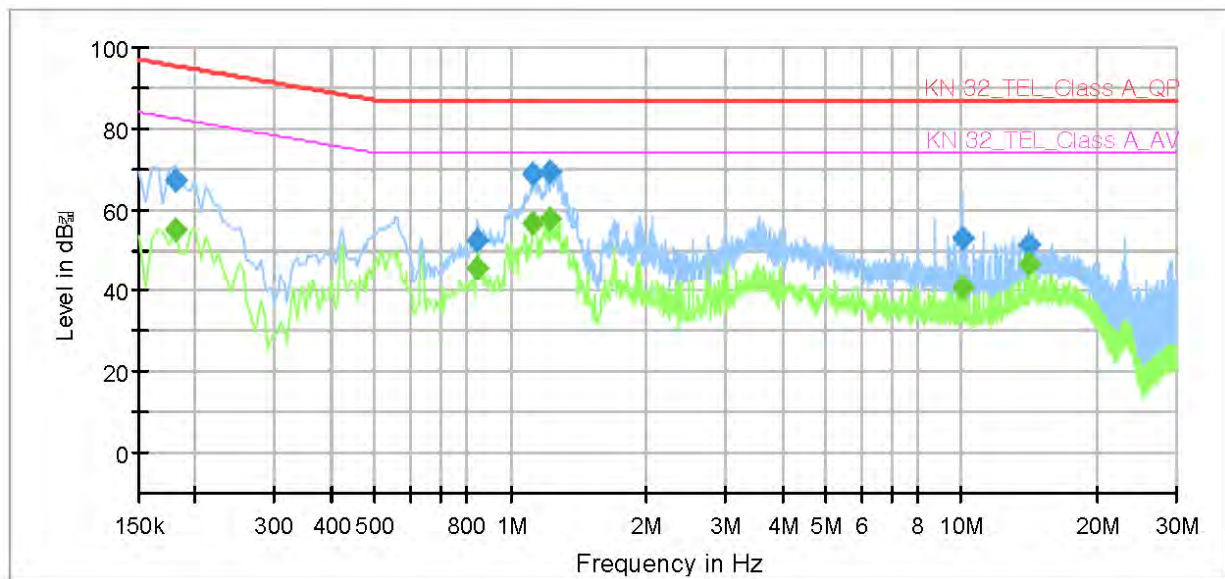
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.670000	--	45.20	74.00	28.80	1000.0	9.000	Single Line	9.3
0.670000	48.86	--	87.00	38.14	1000.0	9.000	Single Line	9.3
3.100000	--	54.30	74.00	19.70	1000.0	9.000	Single Line	9.2
3.100000	55.23	--	87.00	31.77	1000.0	9.000	Single Line	9.2
6.655000	--	38.43	74.00	35.57	1000.0	9.000	Single Line	9.3
6.655000	45.45	--	87.00	41.55	1000.0	9.000	Single Line	9.3
13.420000	--	46.83	74.00	27.17	1000.0	9.000	Single Line	9.5
13.420000	48.50	--	87.00	38.50	1000.0	9.000	Single Line	9.5

- PoE Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNF-9010RVP
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)
0.180000	--	54.81	82.49	27.68	1000.0	9.000	Single Line	10.1
0.180000	67.40	--	95.49	28.09	1000.0	9.000	Single Line	10.1
0.845000	--	45.49	74.00	28.51	1000.0	9.000	Single Line	9.9
0.845000	52.31	--	87.00	34.69	1000.0	9.000	Single Line	9.9
1.125000	--	56.79	74.00	17.21	1000.0	9.000	Single Line	9.9
1.125000	68.99	--	87.00	18.01	1000.0	9.000	Single Line	9.9
1.220000	--	57.84	74.00	16.16	1000.0	9.000	Single Line	9.8
1.220000	69.09	--	87.00	17.91	1000.0	9.000	Single Line	9.8
10.020000	--	41.00	74.00	33.00	1000.0	9.000	Single Line	10.1
10.020000	53.07	--	87.00	33.93	1000.0	9.000	Single Line	10.1
14.185000	--	46.47	74.00	27.53	1000.0	9.000	Single Line	10.1
14.185000	51.42	--	87.00	35.58	1000.0	9.000	Single Line	10.1



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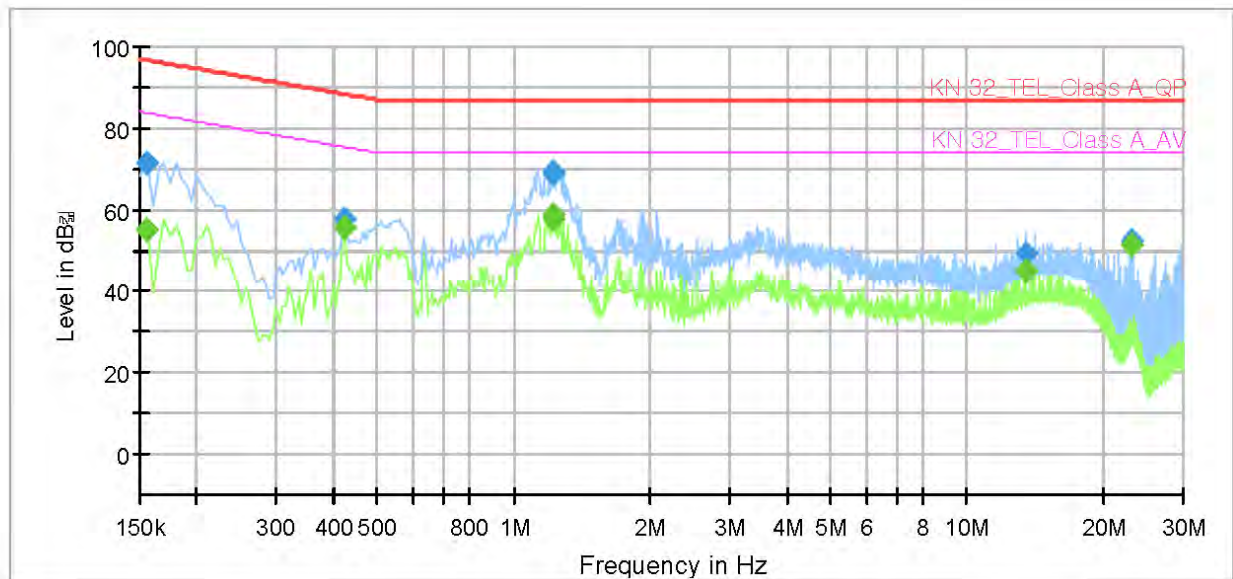
KES-E1-16T0326-R2

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[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PNF-9010RVP
Mode: PoE 100 Mbps
Operator Name: KES



Final Result

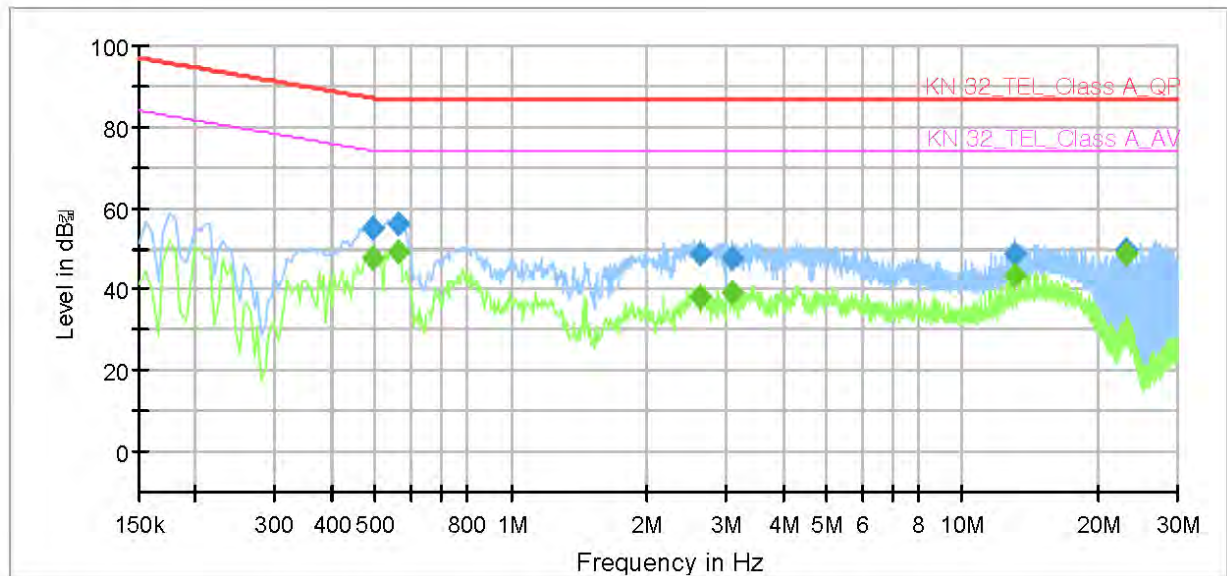
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	--	55.24	83.73	28.49	1000.0	9.000	Single Line	9.6
0.155000	71.51	--	96.73	25.22	1000.0	9.000	Single Line	9.6
0.425000	--	55.70	75.35	19.65	1000.0	9.000	Single Line	9.5
0.425000	57.63	--	88.35	30.72	1000.0	9.000	Single Line	9.5
1.220000	--	58.94	74.00	15.06	1000.0	9.000	Single Line	9.3
1.220000	69.34	--	87.00	17.66	1000.0	9.000	Single Line	9.3
1.225000	--	57.80	74.00	16.20	1000.0	9.000	Single Line	9.3
1.225000	68.69	--	87.00	18.31	1000.0	9.000	Single Line	9.3
13.550000	--	45.06	74.00	28.94	1000.0	9.000	Single Line	9.6
13.550000	49.48	--	87.00	37.52	1000.0	9.000	Single Line	9.6
23.130000	--	51.54	74.00	22.46	1000.0	9.000	Single Line	9.5
23.130000	52.58	--	87.00	34.42	1000.0	9.000	Single Line	9.5

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[1000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNF-9010RVP
Mode	PoE 1 000 Mbps
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.495000	—	47.87	74.08	26.21	1000.0	9.000	Single Line	9.4
0.495000	55.12	—	87.08	31.96	1000.0	9.000	Single Line	9.4
0.565000	—	49.25	74.00	24.75	1000.0	9.000	Single Line	9.3
0.565000	55.98	—	87.00	31.02	1000.0	9.000	Single Line	9.3
2.615000	—	38.30	74.00	35.70	1000.0	9.000	Single Line	9.2
2.615000	48.83	—	87.00	38.17	1000.0	9.000	Single Line	9.2
3.100000	—	39.34	74.00	34.66	1000.0	9.000	Single Line	9.2
3.100000	47.75	—	87.00	39.25	1000.0	9.000	Single Line	9.2
13.125000	—	43.66	74.00	30.34	1000.0	9.000	Single Line	9.5
13.125000	48.81	—	87.00	38.19	1000.0	9.000	Single Line	9.5
23.130000	—	48.63	74.00	25.37	1000.0	9.000	Single Line	9.4
23.130000	49.83	—	87.00	37.17	1000.0	9.000	Single Line	9.4

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**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]
360.56	21.53	V	1.00	14.78	4.74	41.05	47.00	5.95
432.29	13.61	H	4.00	16.15	5.27	35.03	47.00	11.97
450.99	11.41	V	1.10	16.41	5.40	33.22	47.00	13.78
504.00	18.49	V	2.00	17.19	5.77	41.45	47.00	5.55
576.13	9.23	H	2.50	18.77	6.18	34.18	47.00	12.82
648.52	14.30	H	1.90	19.49	6.77	40.56	47.00	6.44

* H : Horizontal, V : Vertical

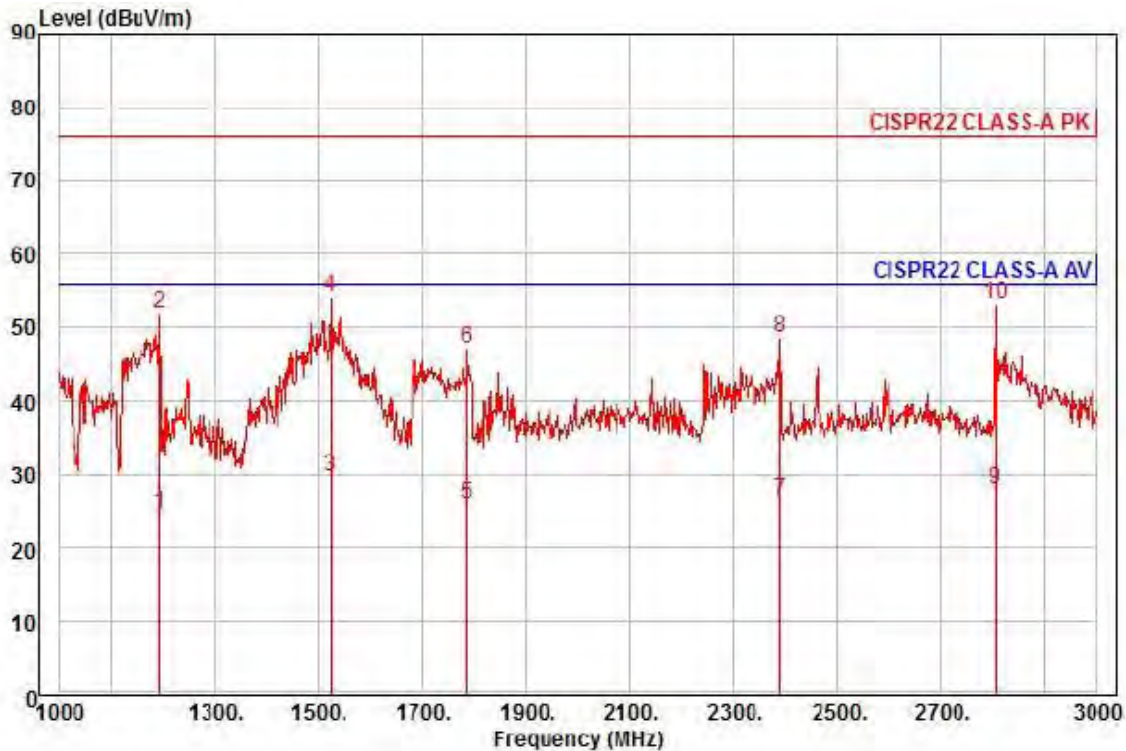
- PoE Mode

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]
155.03	19.93	H	4.00	8.38	2.80	31.11	40.00	8.89
360.63	21.41	H	4.00	14.79	4.74	40.94	47.00	6.06
432.42	14.72	V	1.20	16.15	5.27	36.14	47.00	10.86
450.39	18.42	H	3.20	16.41	5.40	40.23	47.00	6.77
503.99	18.79	V	1.70	17.19	5.77	41.75	47.00	5.25
648.72	13.42	H	2.90	19.49	6.77	39.68	47.00	7.32

* 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 : NETWORK CAMERA

Model : PNF-9010RVP

Mode : DC 12 V

Memo : 1 ~ 3 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1194.00	32.93	24.68	7.07	40.02	324	56.00	-31.34	horizontal	Average
2	1194.00	60.34	24.68	7.07	40.02	324	76.00	-23.93	horizontal	Peak
3 av	1522.00	35.46	25.98	8.02	39.86	298	56.00	-26.40	horizontal	Average
4 pp	1522.00	60.14	25.98	8.02	39.86	298	76.00	-21.72	horizontal	Peak
5	1786.00	29.82	27.03	8.76	39.73	338	56.00	-30.12	horizontal	Average
6	1786.00	51.05	27.03	8.76	39.73	338	76.00	-28.89	horizontal	Peak
7	2390.00	27.45	28.84	9.95	39.86	342	56.00	-29.62	horizontal	Average
8	2390.00	49.71	28.84	9.95	39.86	342	76.00	-27.36	horizontal	Peak
9	2806.00	27.49	29.85	10.76	40.10	292	56.00	-28.00	horizontal	Average
10	2806.00	52.73	29.85	10.76	40.10	292	76.00	-22.76	horizontal	Peak

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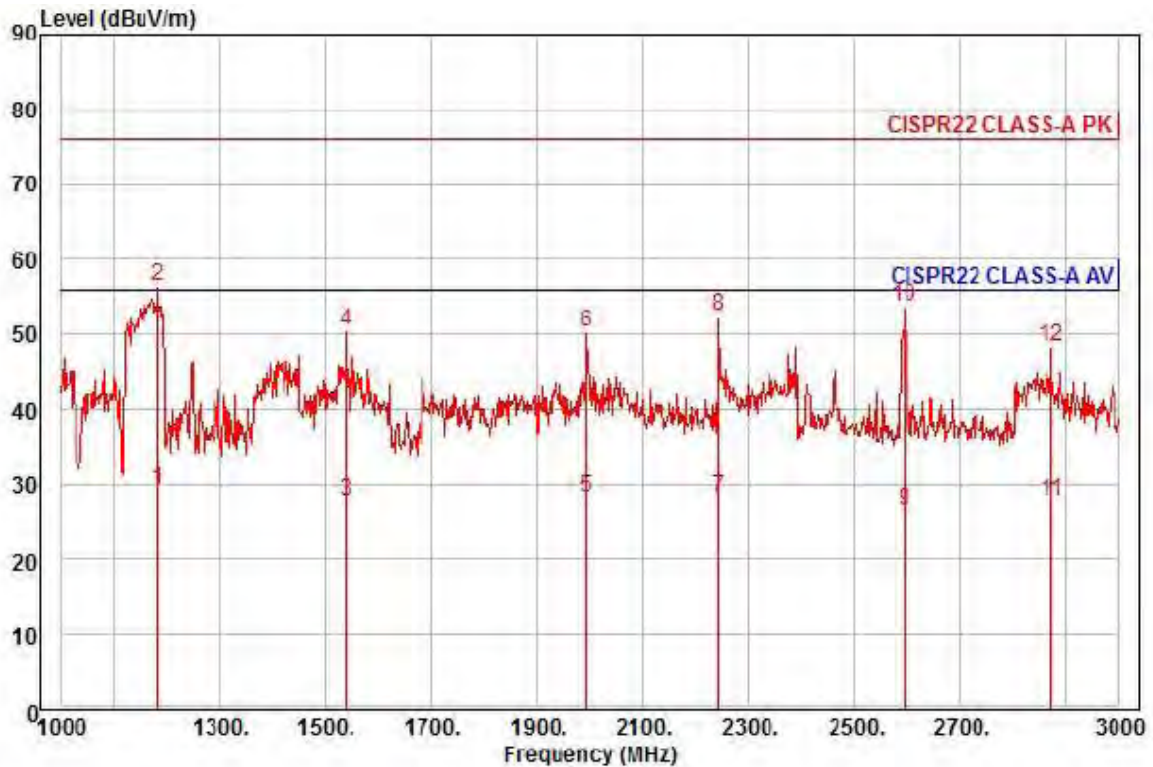
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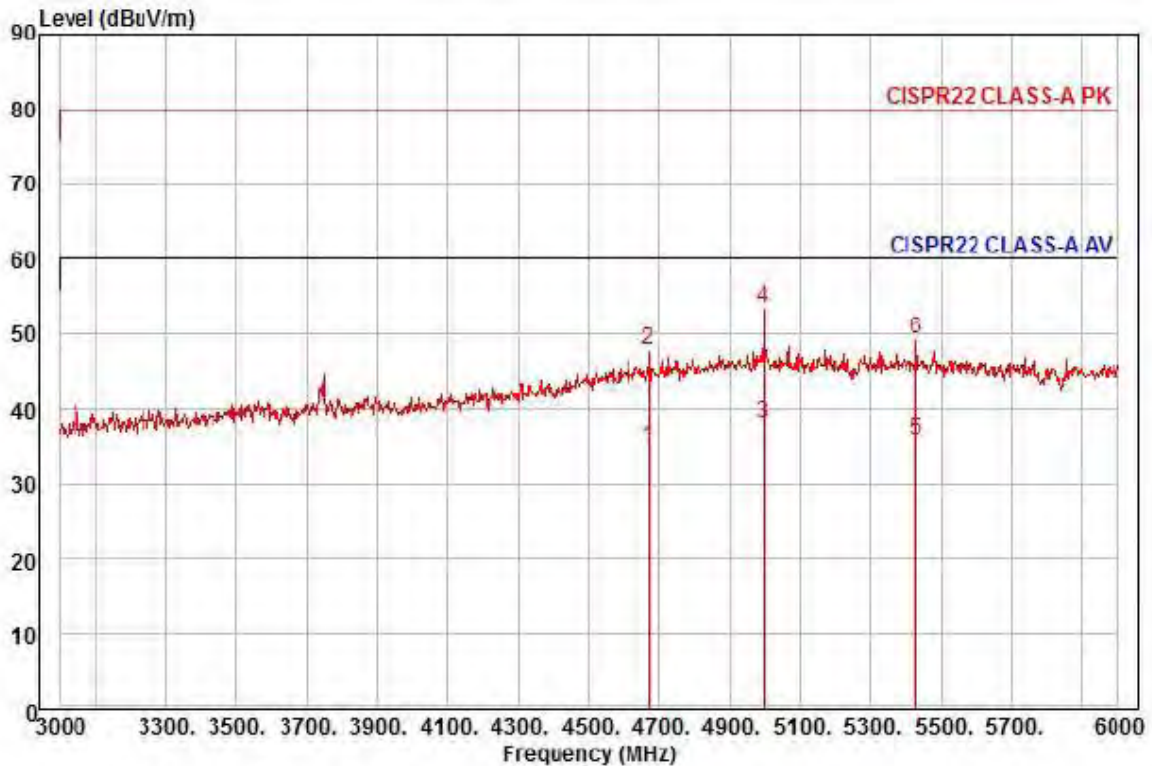
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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : PNF-9010RVP
Mode : DC 12 V
Memo : 1 ~ 3 GHz

		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	av	1184.00	37.61	24.64	7.04	40.03	6	56.00	-26.74	vertical	Average
2	pp	1184.00	64.66	24.64	7.04	40.03	6	76.00	-19.69	vertical	Peak
3		1538.00	33.47	26.05	8.07	39.86	338	56.00	-28.27	vertical	Average
4		1538.00	56.14	26.05	8.07	39.86	338	76.00	-25.60	vertical	Peak
5		1994.00	30.70	27.86	9.33	39.63	350	56.00	-27.74	vertical	Average
6		1994.00	52.83	27.86	9.33	39.63	350	76.00	-25.61	vertical	Peak
7		2244.00	29.75	28.48	9.72	39.77	312	56.00	-27.82	vertical	Average
8		2244.00	54.02	28.48	9.72	39.77	312	76.00	-23.55	vertical	Peak
9		2596.00	26.94	29.34	10.26	39.98	222	56.00	-29.44	vertical	Average
10		2596.00	54.02	29.34	10.26	39.98	222	76.00	-22.36	vertical	Peak
11		2874.00	26.94	30.02	10.92	40.14	303	56.00	-28.26	vertical	Average
12		2874.00	47.49	30.02	10.92	40.14	303	76.00	-27.71	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 : NETWORK CAMERA
Model : PNF-9010RVP
Mode : DC 12 V
Memo : 3 ~ 6 GHz

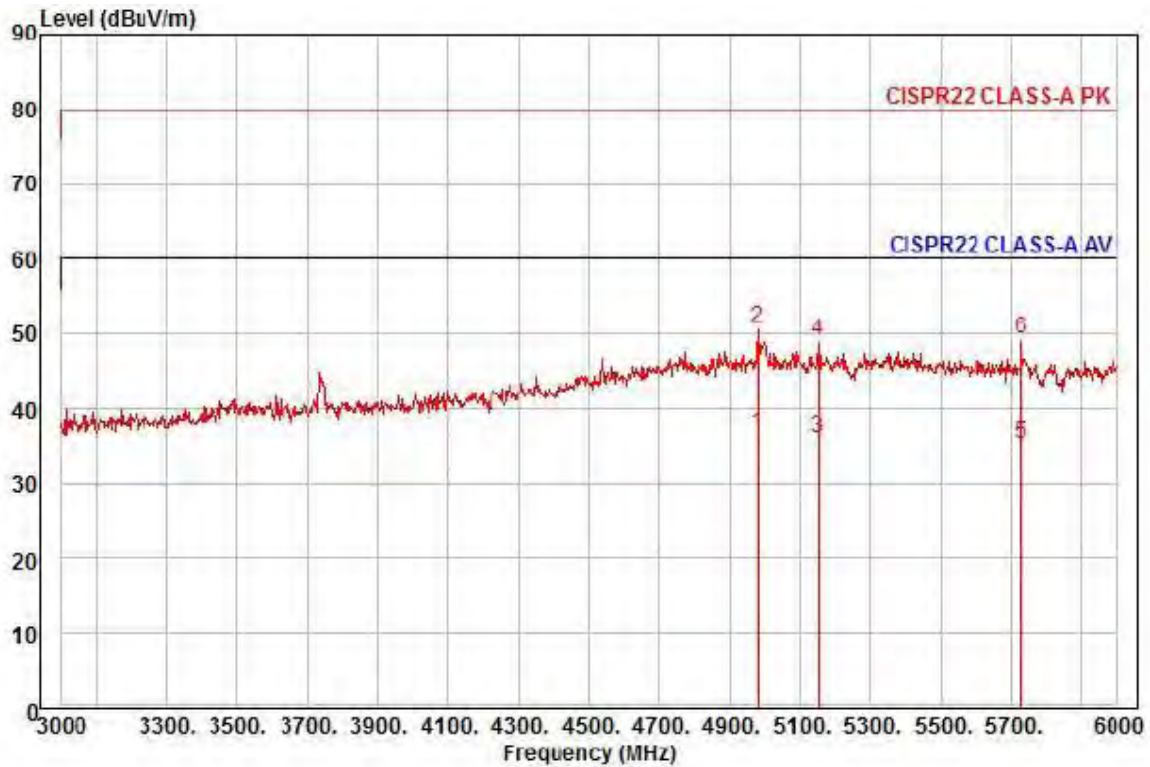
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4671.00	24.70	35.84	14.74	40.41	178	60.00	-25.13	horizontal	Average
2	4671.00	37.74	35.84	14.74	40.41	178	80.00	-32.09	horizontal	Peak
3 pp	4995.00	25.43	37.69	15.32	40.41	146	60.00	-21.97	horizontal	Average
4 pk	4995.00	40.87	37.69	15.32	40.41	146	80.00	-26.53	horizontal	Peak
5	5430.00	23.55	36.85	15.84	40.35	79	60.00	-24.11	horizontal	Average
6	5430.00	36.84	36.85	15.84	40.35	79	80.00	-30.82	horizontal	Peak



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Page (51) of (79)

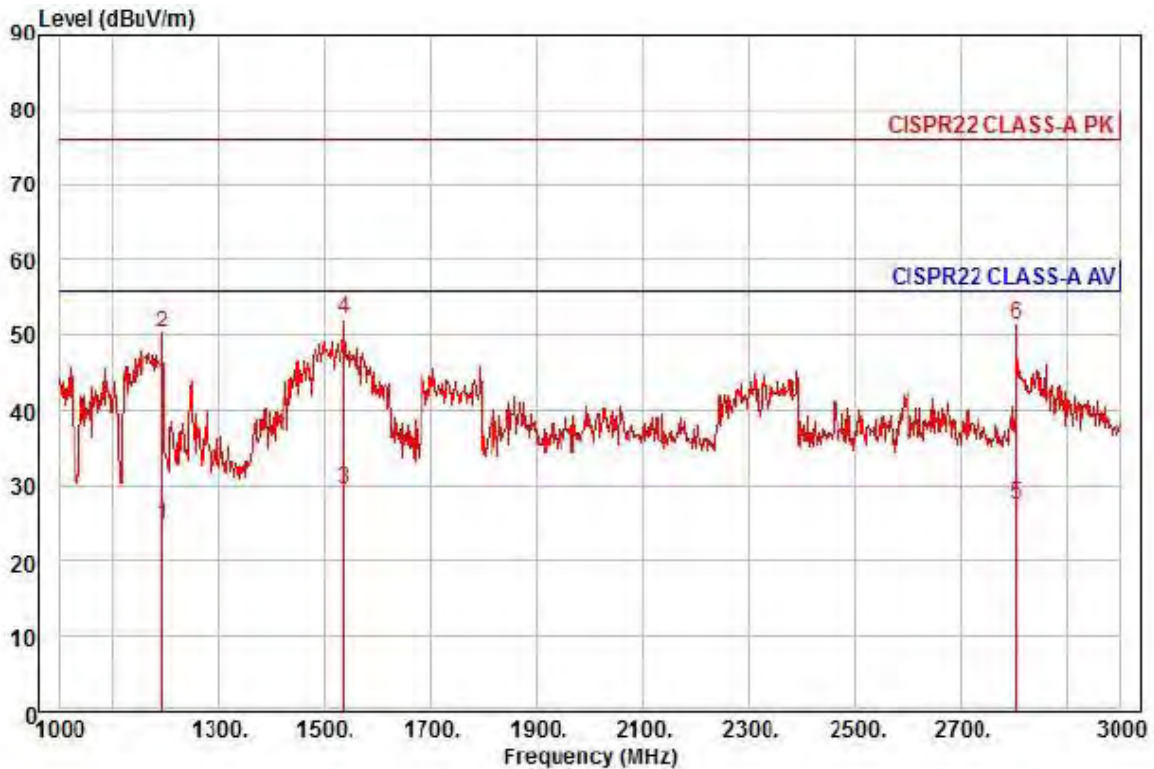


Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : PNF-9010RVP
Mode : DC 12 V
Memo : 3 ~ 6 GHz

		Read Freq	Ant 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	pp	4980.00	23.94	37.61	15.29	40.41	262	60.00	-23.57	vertical	Average
2	pk	4980.00	38.38	37.61	15.29	40.41	262	80.00	-29.13	vertical	Peak
3		5151.00	23.49	37.41	15.51	40.39	230	60.00	-23.98	vertical	Average
4		5151.00	36.52	37.41	15.51	40.39	230	80.00	-30.95	vertical	Peak
5		5727.00	23.10	36.25	16.35	40.31	85	60.00	-24.61	vertical	Average
6		5727.00	36.95	36.25	16.35	40.31	85	80.00	-30.76	vertical	Peak

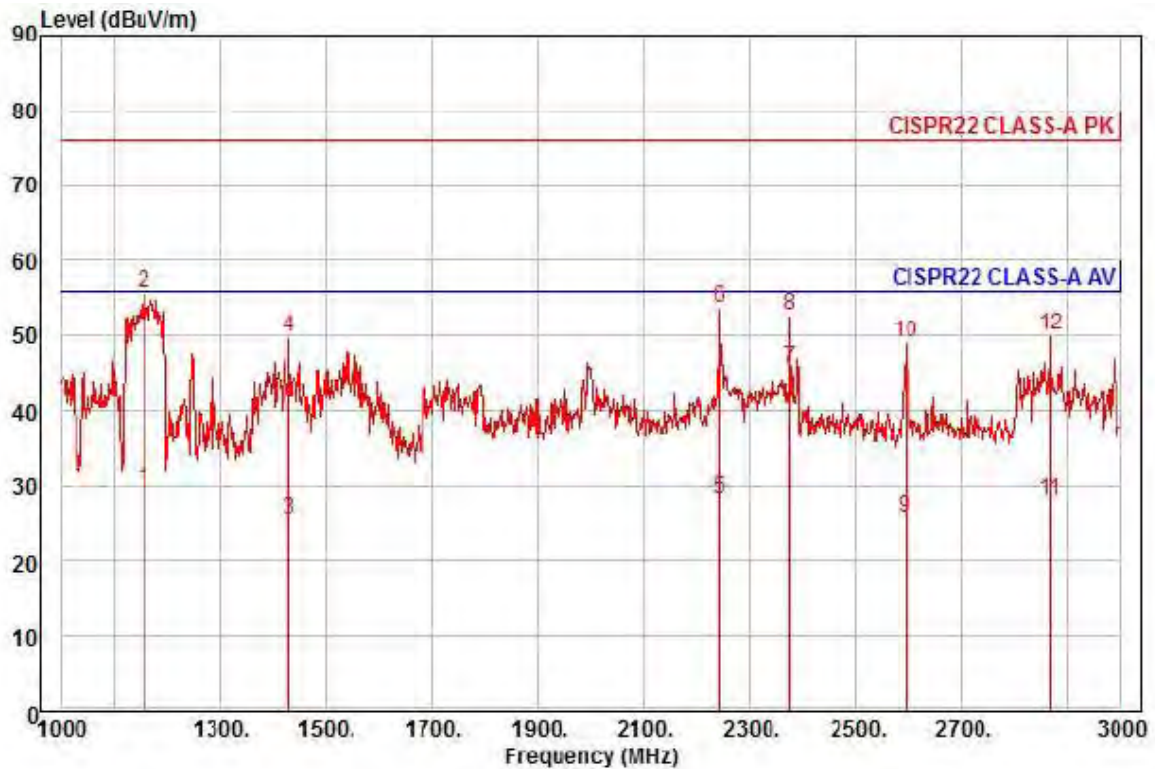
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- PoE Mode



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : PNF-9010RVP
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	1194.00	33.12	24.68	7.07	40.02	310	56.00	-31.15	horizontal	Average
2	1194.00	58.63	24.68	7.07	40.02	310	76.00	-25.64	horizontal	Peak
3 av	1534.00	35.11	26.03	8.06	39.86	287	56.00	-26.66	horizontal	Average
4 pp	1534.00	57.95	26.03	8.06	39.86	287	76.00	-23.82	horizontal	Peak
5	2804.00	26.85	29.85	10.75	40.10	299	56.00	-28.65	horizontal	Average
6	2804.00	50.92	29.85	10.75	40.10	299	76.00	-24.58	horizontal	Peak



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : PNF-9010RVP
Mode : PoE
Memo : 1 ~ 3 GHz

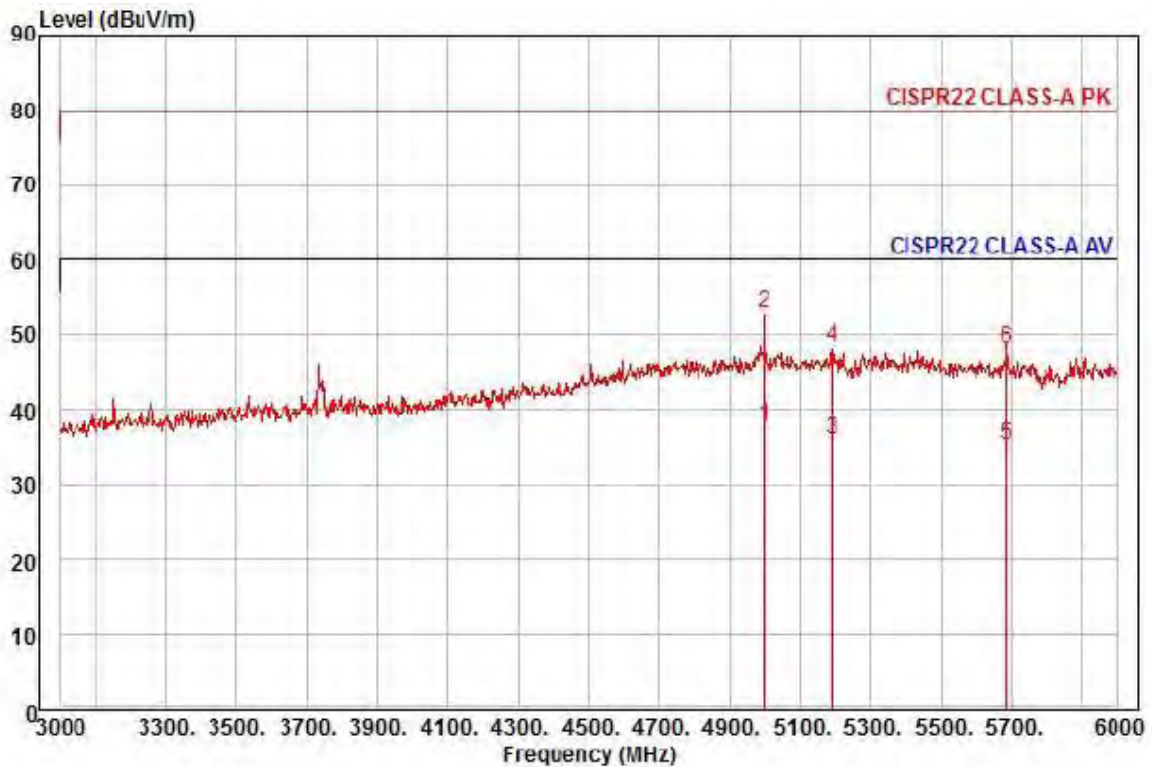
	Read Freq	Ant Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1158.00	37.84	24.54	6.97	40.04	360	56.00	-26.69	vertical	Average
2 pk	1158.00	64.20	24.54	6.97	40.04	360	76.00	-20.33	vertical	Peak
3	1430.00	32.13	25.62	7.76	39.91	9	56.00	-30.40	vertical	Average
4	1430.00	56.22	25.62	7.76	39.91	9	76.00	-26.31	vertical	Peak
5	2244.00	29.68	28.48	9.72	39.77	309	56.00	-27.89	vertical	Average
6	2244.00	55.27	28.48	9.72	39.77	309	76.00	-22.30	vertical	Peak
7 pp	2376.00	46.63	28.80	9.93	39.85	219	56.00	-10.49	vertical	Average
8	2376.00	53.85	28.80	9.93	39.85	219	76.00	-23.27	vertical	Peak
9	2594.00	26.12	29.34	10.26	39.97	27	56.00	-30.25	vertical	Average
10	2594.00	49.30	29.34	10.26	39.97	27	76.00	-27.07	vertical	Peak
11	2868.00	27.27	30.01	10.91	40.13	297	56.00	-27.94	vertical	Average
12	2868.00	49.13	30.01	10.91	40.13	297	76.00	-26.08	vertical	Peak



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KES-E1-16T0326-R2
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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 : NETWORK CAMERA
Model : PNF-9010RVP
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	pp	4998.00	25.17	37.71	15.33	40.41	121	60.00	-22.20	horizontal Average
2	pk	4998.00	40.36	37.71	15.33	40.41	121	80.00	-27.01	horizontal Peak
3		5190.00	23.47	37.34	15.55	40.38	38	60.00	-24.02	horizontal Average
4		5190.00	35.82	37.34	15.55	40.38	38	80.00	-31.67	horizontal Peak
5		5685.00	23.05	36.34	16.27	40.31	190	60.00	-24.65	horizontal Average
6		5685.00	35.79	36.34	16.27	40.31	190	80.00	-31.91	horizontal Peak

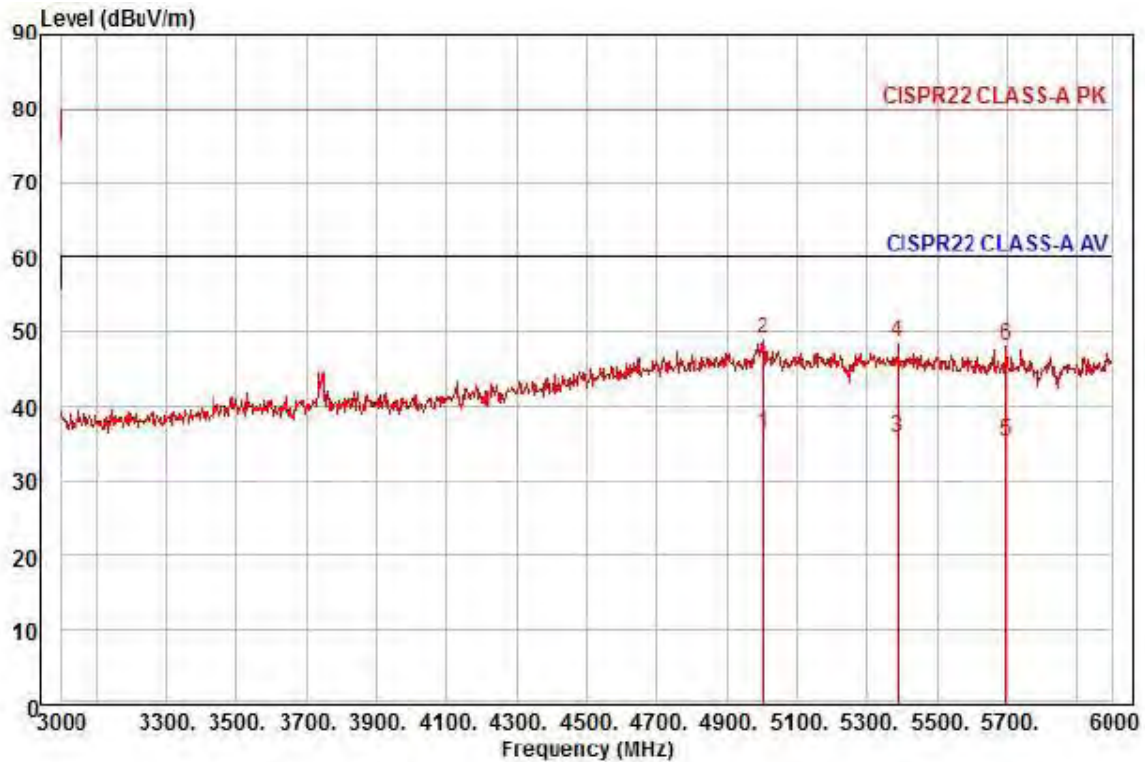
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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : PNF-9010RVP
Mode : PoE
Memo : 3 ~ 6 GHz

		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	pp	5001.00	23.67	37.72	15.33	40.41	141	60.00	-23.69 vertical	Average
2	pk	5001.00	36.53	37.72	15.33	40.41	141	80.00	-30.83 vertical	Peak
3		5385.00	23.50	36.94	15.78	40.36	89	60.00	-24.14 vertical	Average
4		5385.00	36.20	36.94	15.78	40.36	89	80.00	-31.44 vertical	Peak
5		5697.00	23.03	36.31	16.29	40.31	52	60.00	-24.68 vertical	Average
6		5697.00	35.73	36.31	16.29	40.31	52	80.00	-31.98 vertical	Peak

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Harmonic Current Emissions and Voltage Fluctuations and Flicker

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	N/A			
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
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26				
27				
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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				
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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

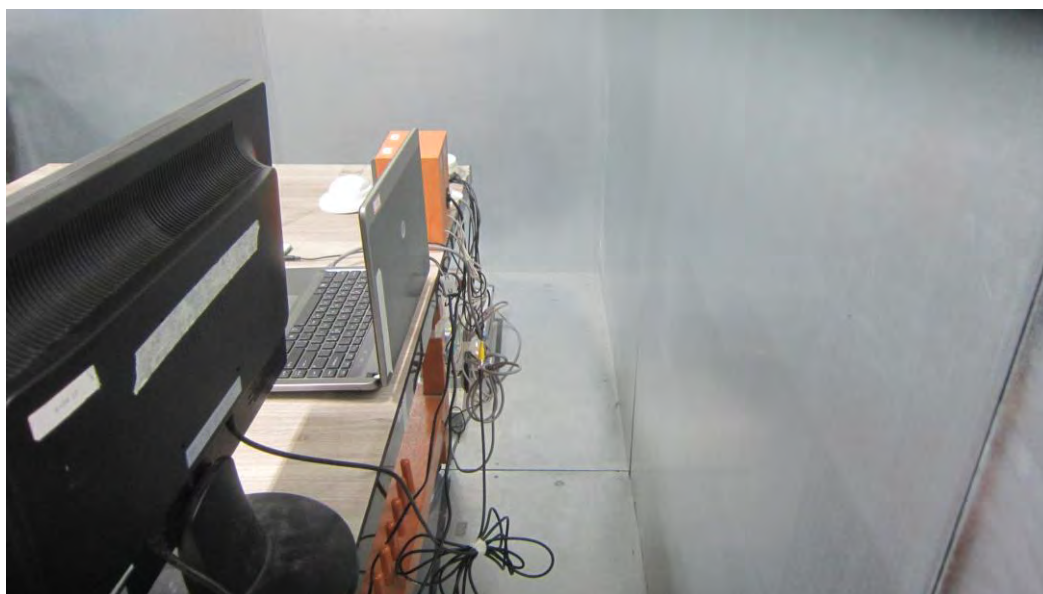
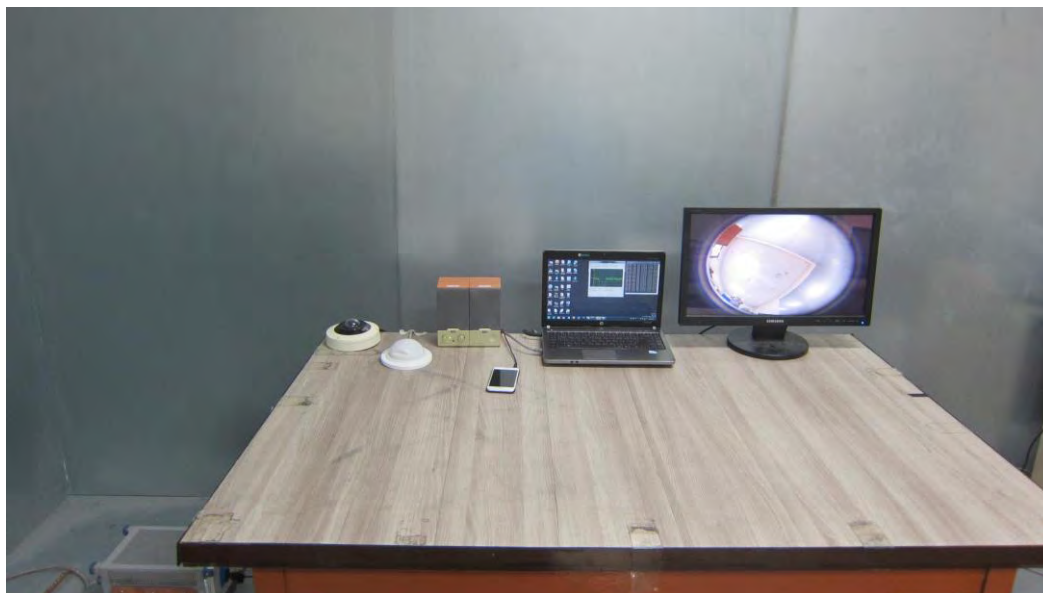
Conducted Voltage Emissions

N/A

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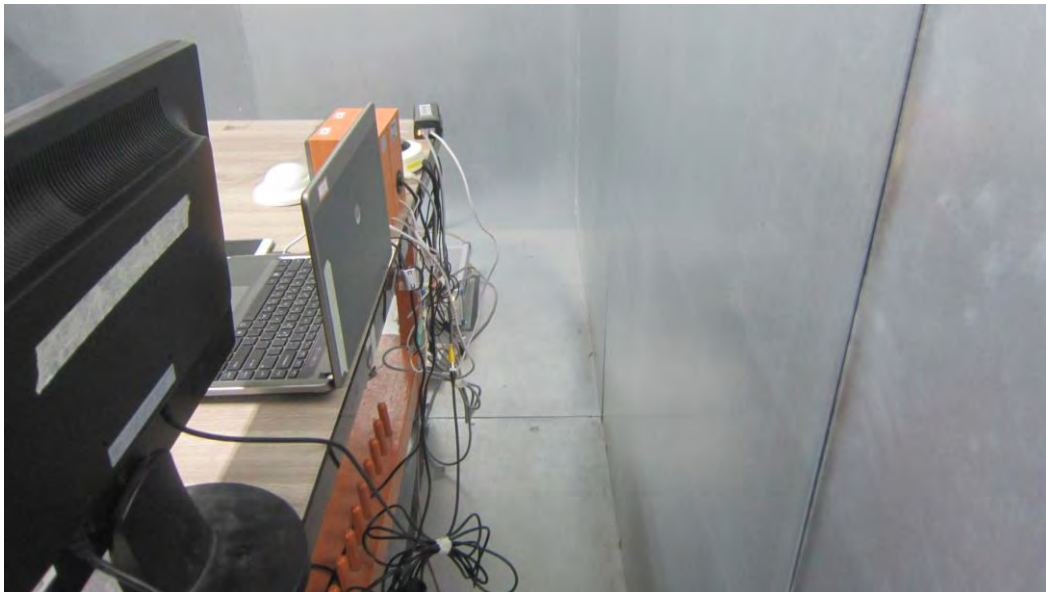
Conducted Telecommunication Emissions

- DC 12 V Mode



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- PoE Mode



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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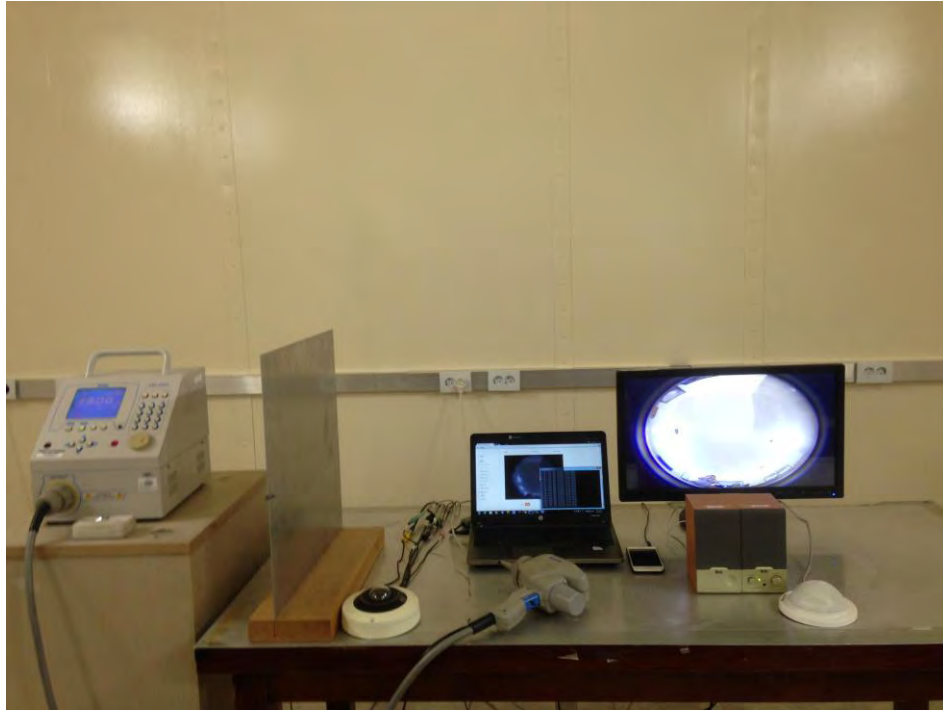
Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

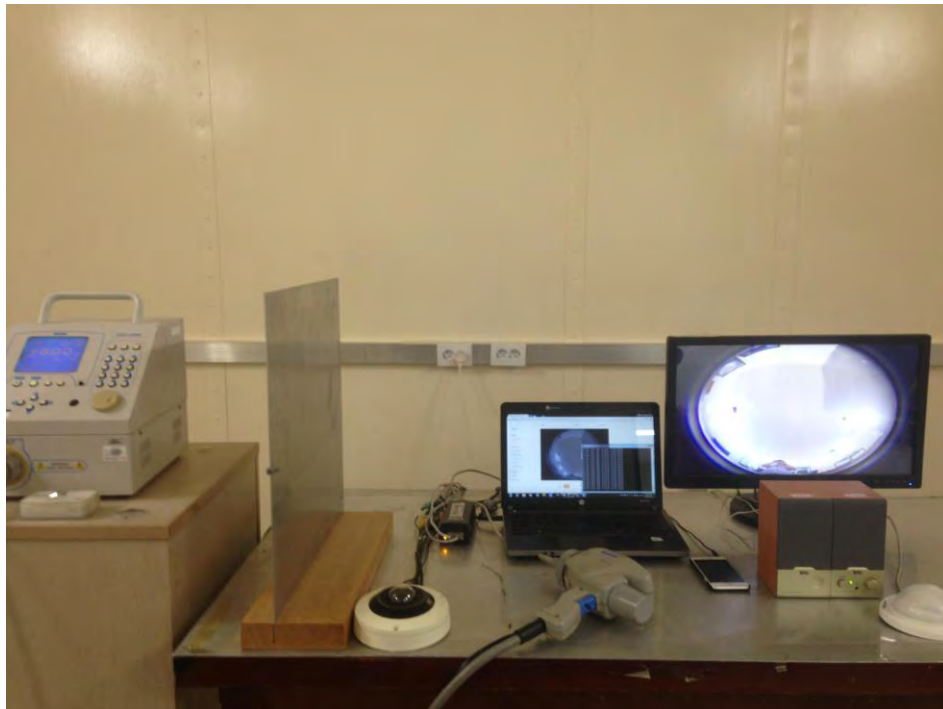
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Electrostatic Discharge

- DC 12 V Mode



- PoE Mode



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Radiated Electric Field Immunity

- DC 12 V Mode



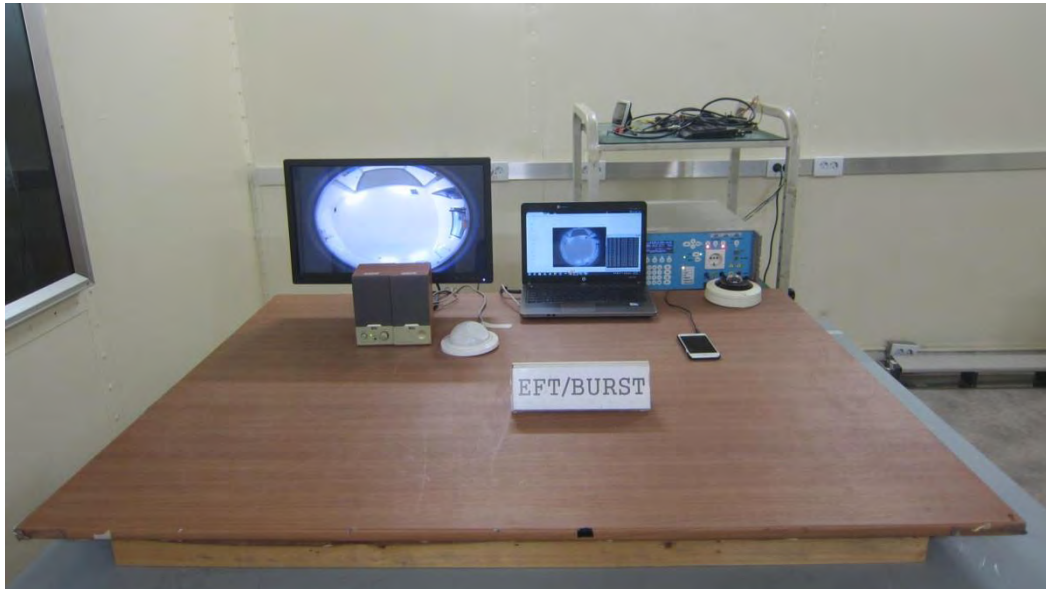
- PoE Mode



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Electrical Fast Transients/Bursts

- DC 12 V Mode



- PoE Mode



Surge Transients

- DC 12 V Mode

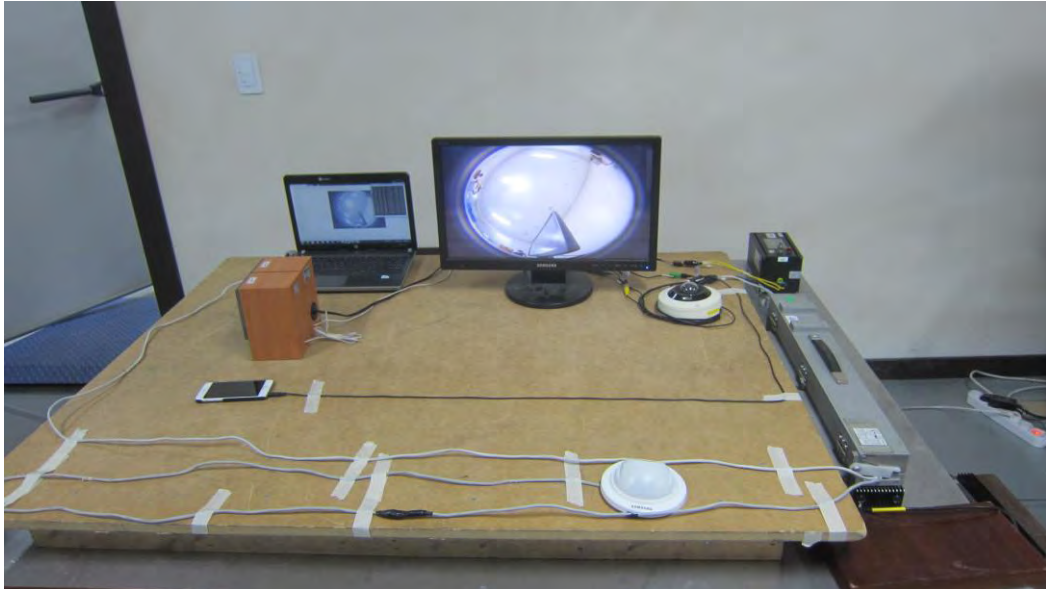


- PoE Mode



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)



EUT Internal Photographs

(Internal View)

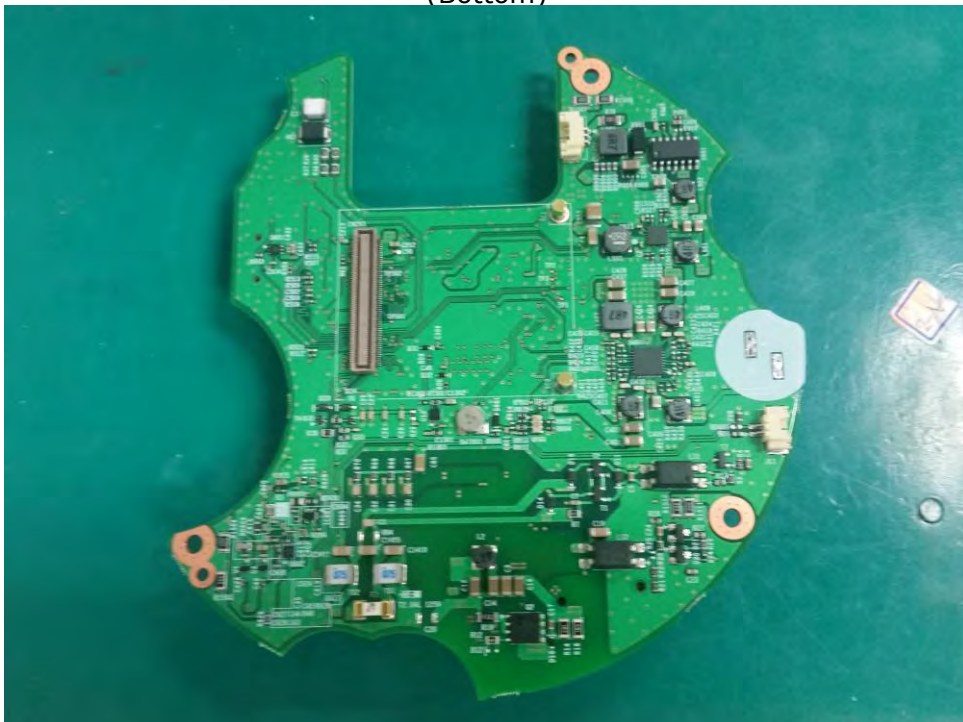


EUT Internal View – Main Board

(Top)



(Bottom)



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EUT Internal View – Sub Board

(Top)



(Bottom)



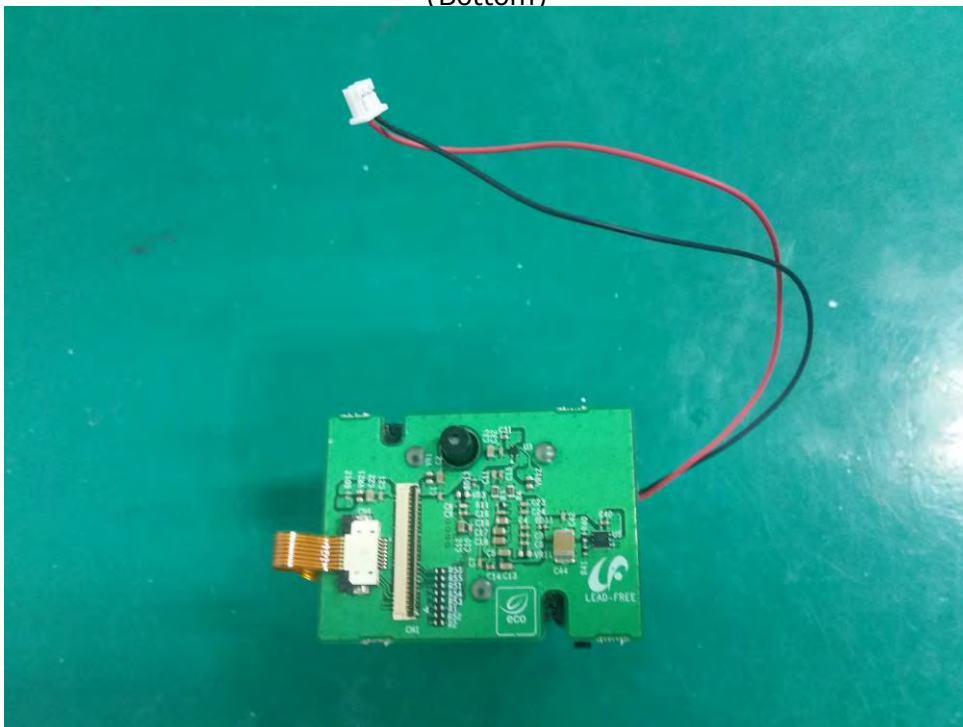
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EUT Internal View – Lens Board

(Top)



(Bottom)



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EUT Internal View – IR Board

(Top)



(Bottom)



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Label and Location



NETWORK CONTROLLER

Model No : PNF-9010RV

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

Made in China

