



EMC TEST REPORT For CE

Test Report No. : KES-E1-16T0186-R2

Date of Issue : May. 15, 2019

Product name : NETWORK CAMERA

Model/Type No. : PND-9080R

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 : Apr. 14, 2016

Test date : Apr. 19, 2016 – Apr. 22, 2016

Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Yeong Suk, Song
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
Apr. 28, 2016	KES-E1-16T0186	Issued
Sep. 26, 2017	KES-E1-16T0186-R1	Standard Revision
May. 15, 2019	KES-E1-16T0186-R2	Re-issue due to manufacturer change

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1.0 General Product Description

Main Specifications of E.U.T are:

	PND-9080R (DVT)
Video	
Imaging Device	1/1.7" 12.4M CMOS
Total Pixels	4,168(H) x 3,062(V)
Effective Pixels	4,072(H) x 3,046(V)
Scanning System	Progressive Scan
Min. Illumination	Color : 0.3 Lux(1/30sec, F1.6, 30IRE), 0.21Lux(2sec, F1.6, 30IRE) 0 Lux (IR LED On)
S / N Ratio	50dB
Video Out	CVBS : 1.8 Vp-p / 75Ω composite, 754x480(N), 754x576(P), for installation - BIF connector type
Lens	
Focal Length (Zoom Ratio)	4.5 ~ 10mm (2.2x) Motorized Varifocal
Max. Aperture Ratio	F1.6
Angular Field of View	[4096 x 2160] H : 100.3°(Wide) / V : 49.7°(Wide) [3840 x 2160] H : 92.9°(Wide) / V : 49.7°(Wide)
Min. Object Distance	0.5m(1.64ft)
Focus Control	Simple Focus (Motorized V/F) / Manual - Remote control via network (Manual, Simple Focus)
Lens Type	Pinis mode
Mount Type	Board-in type
LDC(Lens Distortion Correction)	Off/On
Operational	
IR LED	4 ea
Viewable Length	16m
Camera Title	Off / On (Displayed up to 45 characters) - W/W : English/Numeric/Special Characters - Korea : English/Numeric/Special/Korean Characters - China : English/Numeric/Special/Chinese Characters - Common : Multi-line (Max 6), Color (Grey/Green/Red/Blue/Black/White), Transparency, Auto Scale by Resolution
Day & Night	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off / SLC / WDR
Wide Dynamic Range	120dB
Contrast Enhancement	SDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SDNR (20+30 Noise Filter) (Off / On)
Digital Image Stabilization	Auto/Manual/Off
Defog	Auto/Manual/Off
Motion Detection	Off / On(8ea, Polygonal)
Privacy Masking	Off / On (16ea, Polygonal with 4 Lines Only) - Color : Gray, Green, Red, Blue, Black, White
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor (Included Mercury & Sodium)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
Rotate Image	Flip : On/Off Mirror : On/Off Rollway : 90° / 270°
Intelligent Video Analytics	Tampering(Scene Change), Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Defocus Detection, Digital Auto Tracking - with Metadata
Alarm I/O	Input 1ea / Output 1ea
Alarm Triggers	Alarm Input, Motion Detection, Video Analytics, Audio Detection, Network Disconnect
Alarm events	* File upload via FTP, E-Mail * Notification via E-Mail * local storage (SD/SDHC/SDXC) or NAS recording at Event Triggers
Audio In	Selectable (Mic IN/Line IN/Built-in mic) Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out (3.5mm stereo mini Jack), Max output level: 1 Vrms
Network	

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Ethernet	RJ-45 (10/100/1000BASE-T)
Video Compression Format	H.265/H.264 (MPEG-4 Part 10(AVC)) : Main/Baseline/High Motion JPEG
Resolution	4096x2160 / 3840x2160 / 3592x1944 / 3592x1464 / 1920x1080 / 1600x1300 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 720x576 / 720x480 / 640x480 / 320x240
Max. Framerate	H.265/H.264 : 3840x2160 @ 30Fps Max; 30fps at all resolutions (8 Mega Mode Under) Motion JPEG : 4096 X 3000 : 2 Fps 4096 X 1800 : 2 Fps 3840 X 2160 : 10 Fps 3592 X 1944 : 10 Fps 3592 X 1464 : 10 Fps 1920 X 1080 : 14 Fps 1600 X 1200 : 14 Fps 1280 X 1024 : 5 Fps 1280 X 960 : 5 Fps 1024 X 768 : 5 Fps 800 X 600 : 15 Fps 800 X 450 : 15 Fps 720 X 576 : 15 Fps 720 X 480 : 15 Fps 640 X 480 : 15 Fps 640 X 360 : 15 Fps 320 X 240 : 15 Fps
Smart Codec	Manual Mode (area-based : SEA)
Video Quality Adjustment	H.264/H.265 : Target Bitrate Level Control MJPEG : Target Bitrate Level Control
Bitrate Control Method	H.264/H.265 : CBR or VBR 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 (2-Way)
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, P2P-PM, UPnP, Bonjour
Security	HTTP(S) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication (EAP-TLS, EAP-LEAP)
Streaming Method	Unicast / Multicast
Max. User Access	20 users at Unicast Mode
Edge Storage	SD/SDHC/SDXC (up to 128Gb) - motion images recorded in the SD/SDHC/SDXC memory card can be downloaded. - camera can detect automatically when the memory is connected - memory status display (normal/error/active/formatting/lock) NAS(Network Attached Storage) Local PC for instant Recording (plug-in viewer only)
Application Programming Interface	ONVIF Profile S/G GUNAPI(HTTP API) ONVIF SAMSUNG TECHWIN Open Platform
Webpage Language	English, French, German, Spanish, Italian, Chinese, Russian, Japanese, Swedish, Danish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek
Web Viewer	Supported OS: Windows 7, 8, 10, Mac OS X 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, SSM
Pixel Counter	support (plug-in viewer only)
Environmental	
Operating Temperature / Humidity	-30°C ~ +55°C (-22°F ~ +131°F) / Less than 90% RH TBD * Start up should be done at above -10°C
Storage Temperature / Humidity	-40°C ~ +60°C (-40°F ~ +140°F) / Less than 90% RH
Ingress Protection	-
Vandal Resistance	IK08
Electrical	
Input Voltage / Current	DC12V, PoE (IEEE802.3af, Class3)
Power Consumption	DC 12V : Max 9.5W PoE : Max 10.5W
Mechanical	
Color / Material	Ivory / Polycarbonate(PC)+Aluminum
Dimension (WxHxD)	Ø141.3mm(5.56 in) x H113.0mm(4.45 in)
Weight	660g

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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	PND-9080R	-	Hanwha Techwin(Tianjin) Co., Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE	POE36U-1AT-R	-	PHIHONG	-
Monitor	SMT-2232	C95V67VF900025B	Weihai Daewoo Electronics Co., Ltd.	-
Notebook	NT630Z5J	JK9091EF400142M	Samsung Electronics Suzhou Computer Co., Ltd.	-
Notebook Adapter	A13-040N2A	CN60BA4400313ADON 843K020O	Chicony Power Technology (suzhou)Co., Ltd.	-
Mike	-	-	-	-
Alarm	SIE-0001 DO	C54167JB601268 F	SAMSUNG TECHWIN CO., LTD.	-
Micro SD card	-	-	Transcend	4 GB
Speaker	BR-1000A(CUVE)	-	BEIJING EDIFIER HI-TECH GROUP.	-

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)	BNC	Monitor	BNC	4.0	S
	Audio IN	Mike	Audio IN	2.0	U
	Audio OUT	Speaker	Audio OUT	2.0	U
	Alarm IN	Alarm	Alarm IN	3.0	U
	RJ-45	Notebook	RJ-45	4.0	U

- PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	BNC	Monitor	BNC	4.0	S
	Audio IN	Mike	Audio IN	2.0	U
	Audio OUT	Speaker	Audio OUT	2.0	U
	Alarm IN	Alarm	Alarm IN	3.0	U
	RJ-45	PoE	RJ-45	4.0	U
PoE	RJ-45	Notebook	RJ-45	4.0	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:

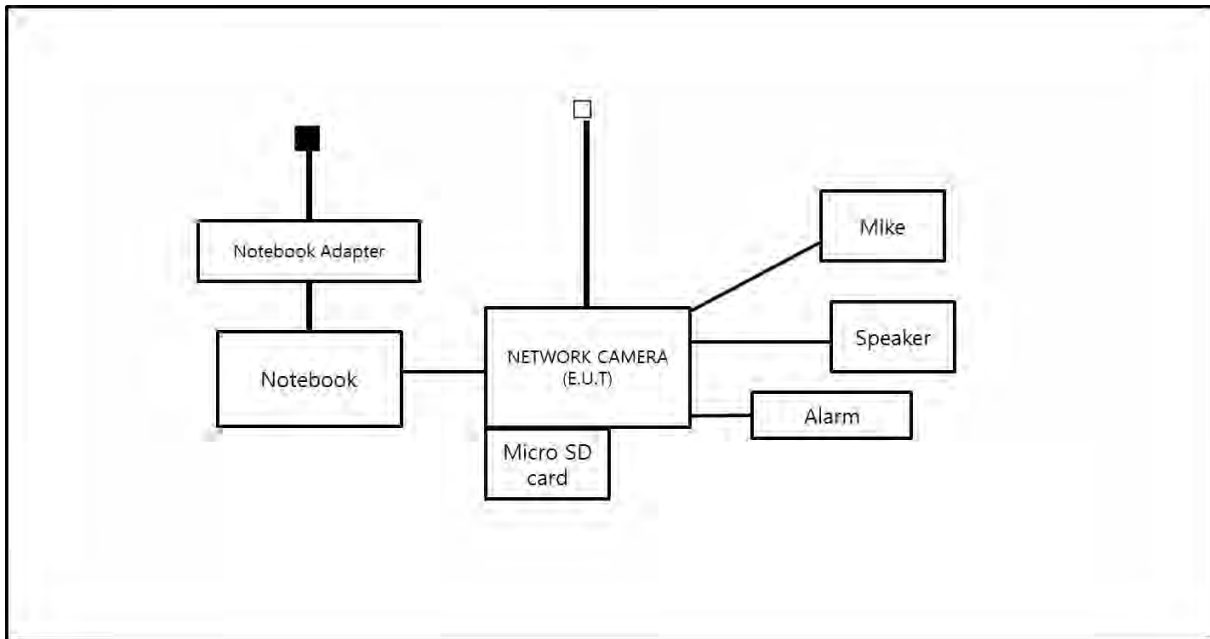
Test mode	Normal operating
OP	MONITORING Network ping test

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

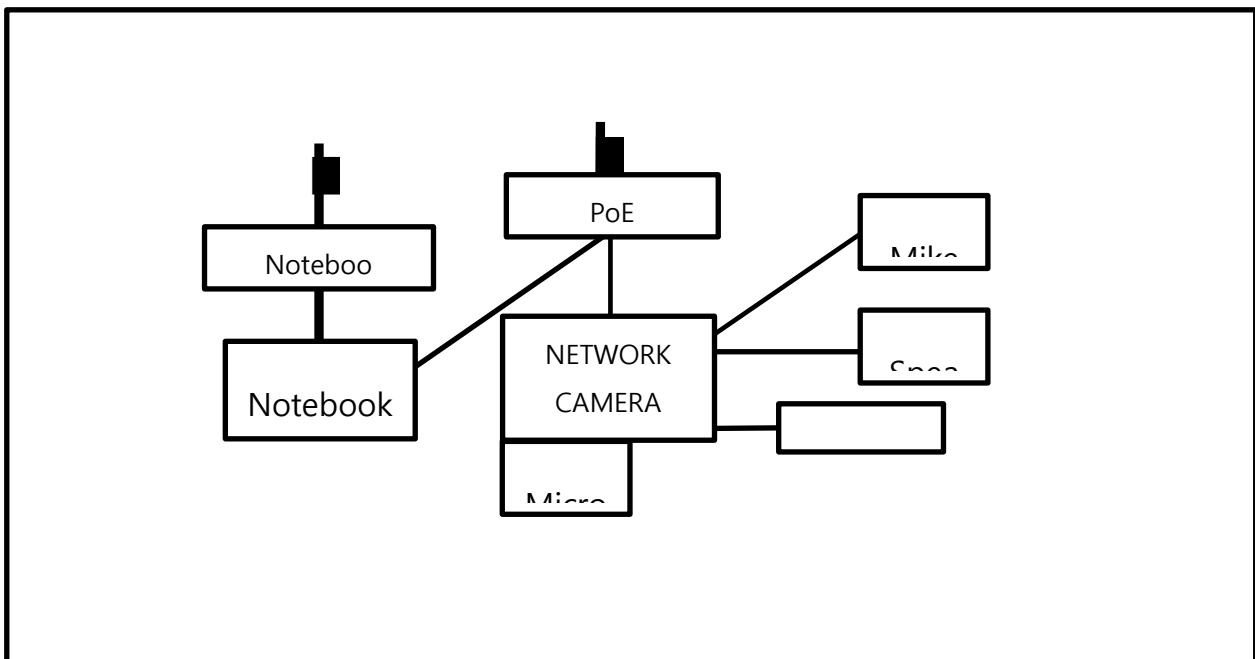
1.8 Configuration

■ AC Main
 □ DC Main

- DC 12 V Mode



- PoE Mode



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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, Yeoju-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 55032:2012/AC:2013

☒ Class A

☐ Class B

☐ EN 55024:2010

☒ EN 50130-4:2011

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013

☐ VCCI V-3 / 2013.04

☐ Class A

☐ Class B

☐ AS / NZS CISPR22:2009 +A1:2010

☐ Class A

☐ Class B

☐ 47 CFR Part 15, Subpart B / ANSI C63.4-2009

☐ Class A

☐ Class B

☐ IC Regulation ICES-003 : 2012
/ ANSI C63.4-2014

☐ Class A

☐ Class B

☐ CISPR 22:2009 +A1:2010

☐ Class A

☐ Class B



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☐ **R&TTE – Directive 1999/5/EC**

☐ 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

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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, 06, 2016
☐	LISN	ENV216	R&S	101137	02, 04, 2017
☐	LISN	ENV216	R&S	101786	05, 06, 2016
☐	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

Apr. 19, 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, 06, 2016
☒	LISN	ENV216	R&S	101137	02, 04, 2017
☒	LISN	ENV216	R&S	101786	05, 06, 2016
☒	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: 22,4 °C

Relative Humidity: 33,3 %

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

Apr. 19, 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, 06, 2016
☒	Trilog-Broadband Antenna	VULB 9163	SCHWARZBECK	9168-713	05, 15, 2017
☒	Open Area Test Site	-	KES	-	-
☒	Antenna Mast	-	DAEIL EMC	-	-
☒	Turn Table	-	DAEIL EMC	-	-

Test Conditions

Temperature: 23,5 °C

Relative Humidity: 29,0 %

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

Apr. 20, 2016

Test Location

Semi Anchoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 07, 2017
☒	EMI Test Receiver	ESU26	R&S	100551	04, 18, 2017
☒	Broadband Coaxial Preamplifier	BBV 9718	Schwarzbeck Mess - Elektronik	9718-246	10, 23, 2016
☒	Semi Anchoic Chamber #2	-	SEMITEC	-	-
☒	Antenna Mast	-	AUDIX	-	-
☒	Turn Table	-	AUDIX	-	-

Test Conditions

Temperature: 22,8 °C

Relative Humidity: 37,3 %

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



2.5 Harmonic Current Emissions

Test Date

N/A

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	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

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

Because the E.U.T power is 12 V (dc) power and PoE.

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

Apr. 22, 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: 22,0 °C
Relative Humidity: 44,2 %
Atmospheric Pressure: 99,1 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

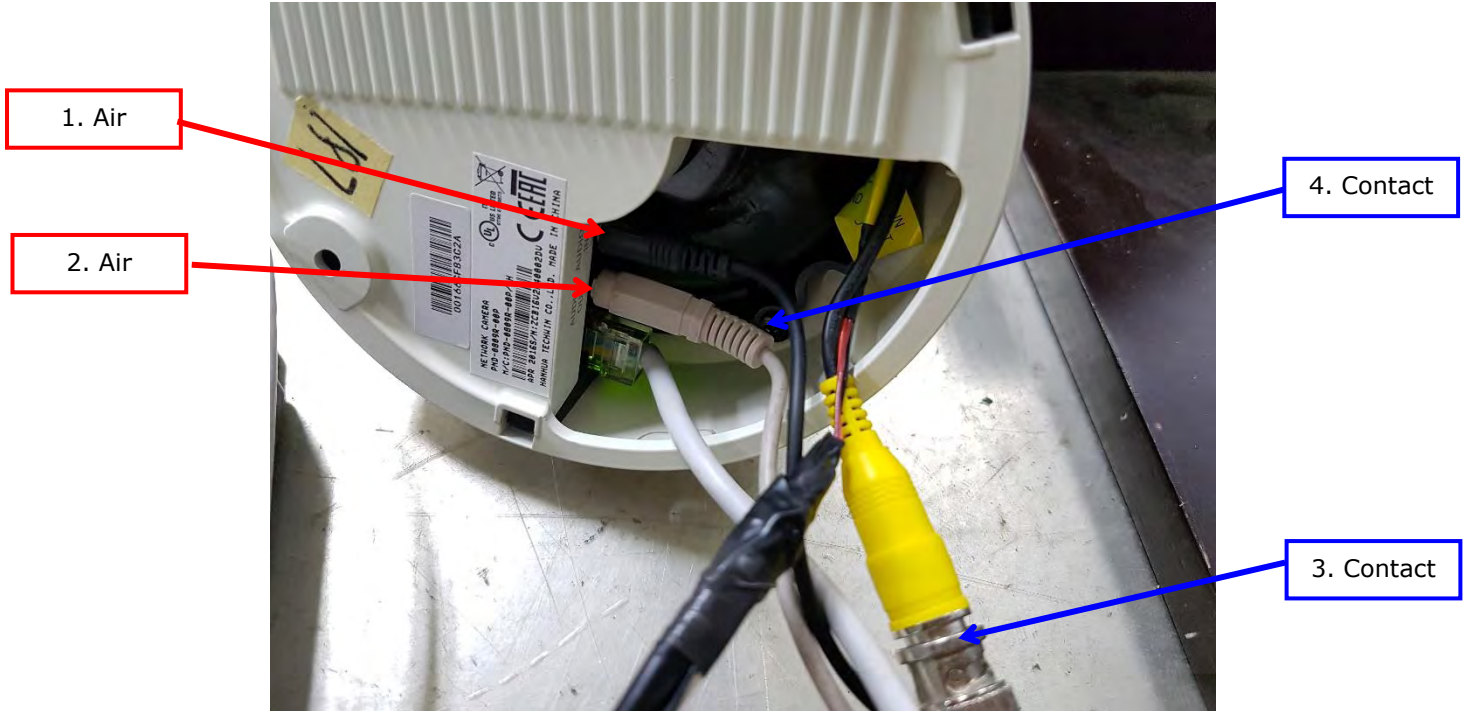
Required Performance Criteria: ☒ Complied

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Location of Discharge:

- DC 12V, PoE Mode

Air
Contact



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Test Data**- DC 12V 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	Audio IN	Air Discharge	Complied	-
2	Audio out	Air Discharge	Complied	-
3	BNC	Contact Discharge	Complied	-
4	Screw	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	Audio IN	Air Discharge	Complied	-
2	Audio out	Air Discharge	Complied	-
3	BNC	Contact Discharge	Complied	-
4	Screw	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

Apr. 20, 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	(주)광역텔레콤	KY150001	2016.09.25
☒	Semi Anchoic Chamber #2		SEMITEC	-	-



Test Conditions

Temperature: 22,8 °C
Relative Humidity: 37,3 %
Atmospheric Pressure: 100,2 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

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Test Data

- DC 12V Mode

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

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

Apr. 21, 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, 2016
☒	Capacitive Coupling Clamp	HFK	EM TEST	070925	07, 14, 2016
☒	MotorVariac	MV2616	EM TEST	V0936105123	07, 14, 2016

Test Conditions

Temperature: 21,4 °C
Relative Humidity: 57,1 %
Atmospheric Pressure: 98,9 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 12V Mode

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

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

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

Mode of Application	OBSERVATIONS	
	(+) Burst (kV)	(-) Burst (kV)
L – N	Complied	Complied

☒ Signal ports and telecommunication ports – Coupling Clamp used

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

Note: "Blank" = Not performed

Observations:

- A – No degradation of function
- B – Distortion/Error of function (self-recoverable)
- C – Loss 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

Apr. 20, 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	07, 14, 2016
☒	MotorVariac	MV2616	EM TEST	V0936105123	07, 14, 2016
☒	CDN	CNV 508T5	EM TEST	P1530162238	01, 25, 2017

Test Conditions

Temperature: 21,4 °C
Relative Humidity: 57,1 %
Atmospheric Pressure: 98,9 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

Signal lines
☒ (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 12V Mode

☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

Signal Lines

☒ Line to Earth – Common Mode

Mode of Application	OBSERVATIONS	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45	Complied	Complied
BNC	Complied	Complied

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- PoE Mode☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

Signal Lines☒ Line to Earth – Common Mode

Mode of Application	OBSERVATIONS	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45	Complied	Complied
BNC	Complied	Complied

Note: "Blank" = Not performed

Observations:

- A – No degradation of function
- B – Distortion/Error of function (self-recoverable)
- C – Loss 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 61000-4-6:2009

Test Date

Apr. 22, 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
☒	6dB Attenuator	ATT6	EM TEST	1208-34	08, 13, 2016
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 13, 2016
☐	CDN	CDN-T2-RJ11	EM TEST	0909-07	08, 13, 2016
☐	CDN	CDN-T4	EM TEST	0909-08	08, 13, 2016
☐	CDN	CDN-T8RJ45	EM TEST	0909-09	08, 13, 2016
☐	CDN	CDN-AF2	EM TEST	0909-10	08, 13, 2016
☐	CDN	CDN-AF4	EM TEST	0909-11	08, 13, 2016
☒	EM Injection Clamp	EM 101	Liithi	35943	02, 04, 2017

Test Conditions

Temperature: 22,0 °C
Relative Humidity: 44,2 %
Atmospheric Pressure: 99,1 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 12V 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
L – N	CDN (☒ M2, ☐ M3)	Complied

☒ Signal ports and telecommunication ports

Mode of Application	OBSERVATIONS	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45	Complied	Complied
BNC	Complied	Complied
Alarm IN	Complied	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

Mode of Application	OBSERVATIONS	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45	Complied	Complied
BNC	Complied	Complied
Alarm IN	Complied	Complied

Notes: CDN = Coupling Decoupling Network
EMC = Electro Magnetic Clamp
"blank" = Not performed

Observations:

A – No degradation of function
B – Distortion/Error of function (self-recoverable)
C – Loss 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 61000-4-6:2009

Test Date

N/A

Test Location

EMS-Voltage dip: 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, 2016
☐	MotorVariac	MV2616	EM TEST	V0936105123	07, 14, 2016

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 /10	_____
☐ 30 % dip	☐ 25 /10	_____
☐ 60 % dip	☐ 10 /10	_____
☐ 100 % dip	☐ 250 /10	_____

- Voltage variations

☐ Unom + 10 %	☐ 253 V (ac)	_____
☐ Unom - 15 %	☐ 195.5 V (ac)	_____

Observations:

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

Test Results

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

Remarks

Because the E.U.T power is 12 V (dc) power and PoE.



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APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

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[NEUTRAL]

N/A

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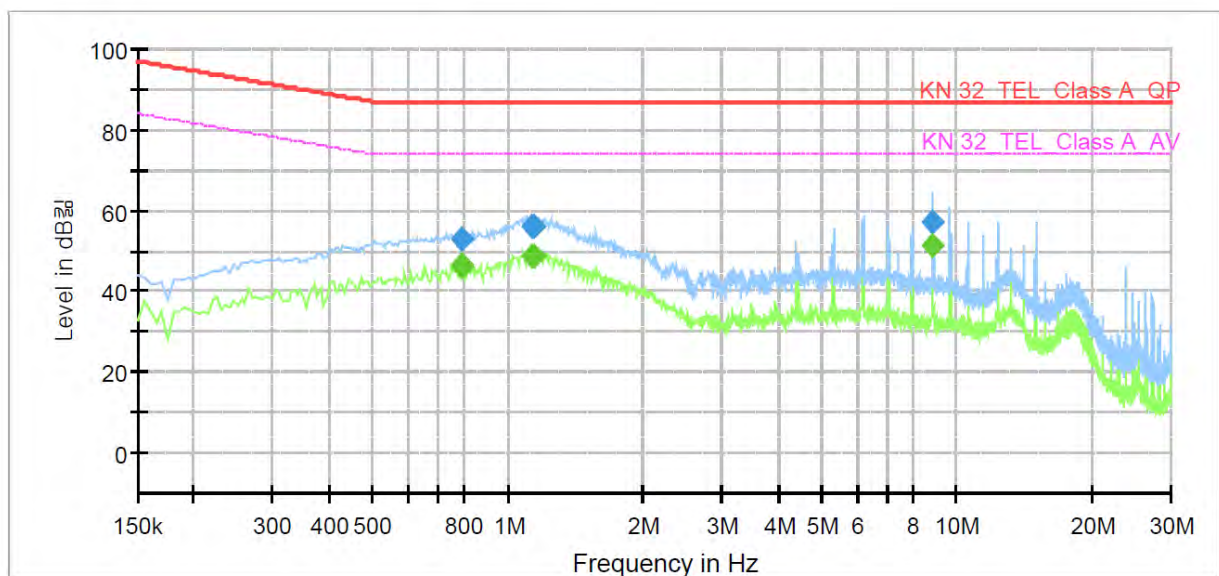
Conducted Emissions at Telecommunication Ports

- DC 12V Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PND-9080RP
Mode	DC 12V_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)
0.785000	---	45.89	74.00	28.11	1000.0	9.000	Single Line	9.9
0.785000	52.81	---	87.00	34.19	1000.0	9.000	Single Line	9.9
0.790000	---	46.33	74.00	27.67	1000.0	9.000	Single Line	9.9
0.790000	53.02	---	87.00	33.98	1000.0	9.000	Single Line	9.9
1.135000	---	48.94	74.00	25.06	1000.0	9.000	Single Line	9.9
1.135000	56.04	---	87.00	30.96	1000.0	9.000	Single Line	9.9
1.140000	---	48.56	74.00	25.44	1000.0	9.000	Single Line	9.9
1.140000	55.89	---	87.00	31.11	1000.0	9.000	Single Line	9.9
8.805000	---	51.33	74.00	22.67	1000.0	9.000	Single Line	10.0
8.805000	56.93	---	87.00	30.07	1000.0	9.000	Single Line	10.0



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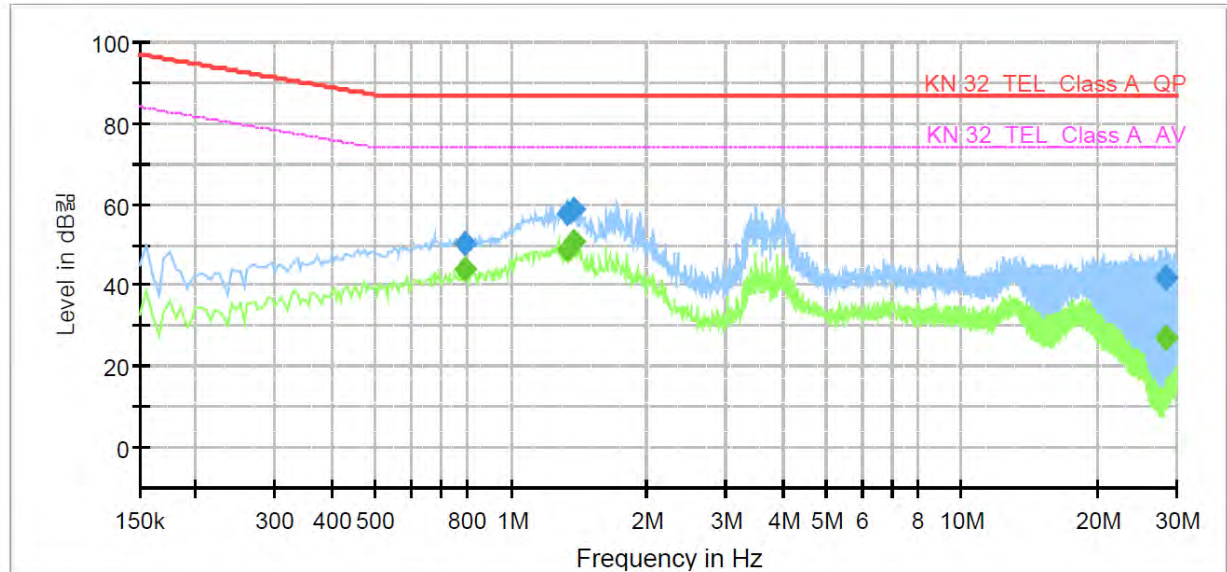
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[1000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PND-9080RP
Mode: DC 12V_1000 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.790000	---	43.93	74.00	30.07	1000.0	9.000	Single Line	9.3
0.790000	50.24	---	87.00	36.76	1000.0	9.000	Single Line	9.3
1.340000	---	48.57	74.00	25.43	1000.0	9.000	Single Line	9.2
1.340000	57.54	---	87.00	29.46	1000.0	9.000	Single Line	9.2
1.380000	---	50.69	74.00	23.31	1000.0	9.000	Single Line	9.2
1.380000	58.52	---	87.00	28.48	1000.0	9.000	Single Line	9.2
28.280000	---	27.16	74.00	46.84	1000.0	9.000	Single Line	9.4
28.280000	41.70	---	87.00	45.30	1000.0	9.000	Single Line	9.4
28.485000	---	27.22	74.00	46.78	1000.0	9.000	Single Line	9.4
28.485000	41.69	---	87.00	45.31	1000.0	9.000	Single Line	9.4

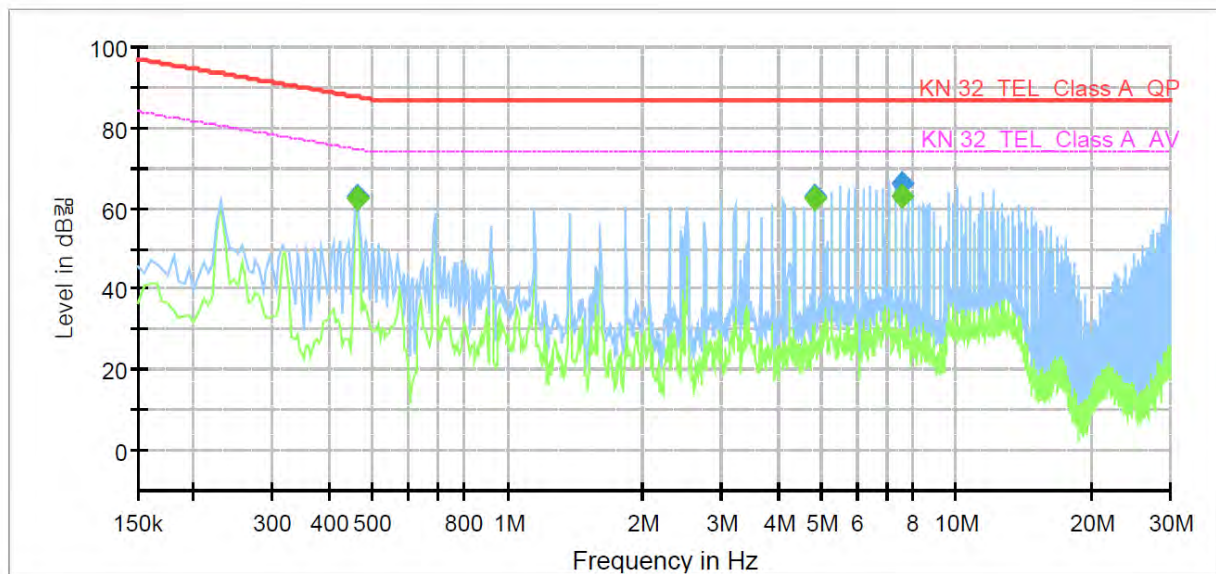
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- PoE Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PND-9080RP
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)
0.460000	---	62.20	74.69	12.49	1000.0	9.000	Single Line	10.0
0.460000	62.91	---	87.69	24.78	1000.0	9.000	Single Line	10.0
4.820000	---	62.24	74.00	11.76	1000.0	9.000	Single Line	9.9
4.820000	62.81	---	87.00	24.19	1000.0	9.000	Single Line	9.9
7.575000	---	62.83	74.00	11.17	1000.0	9.000	Single Line	10.0
7.575000	66.41	---	87.00	20.59	1000.0	9.000	Single Line	10.0



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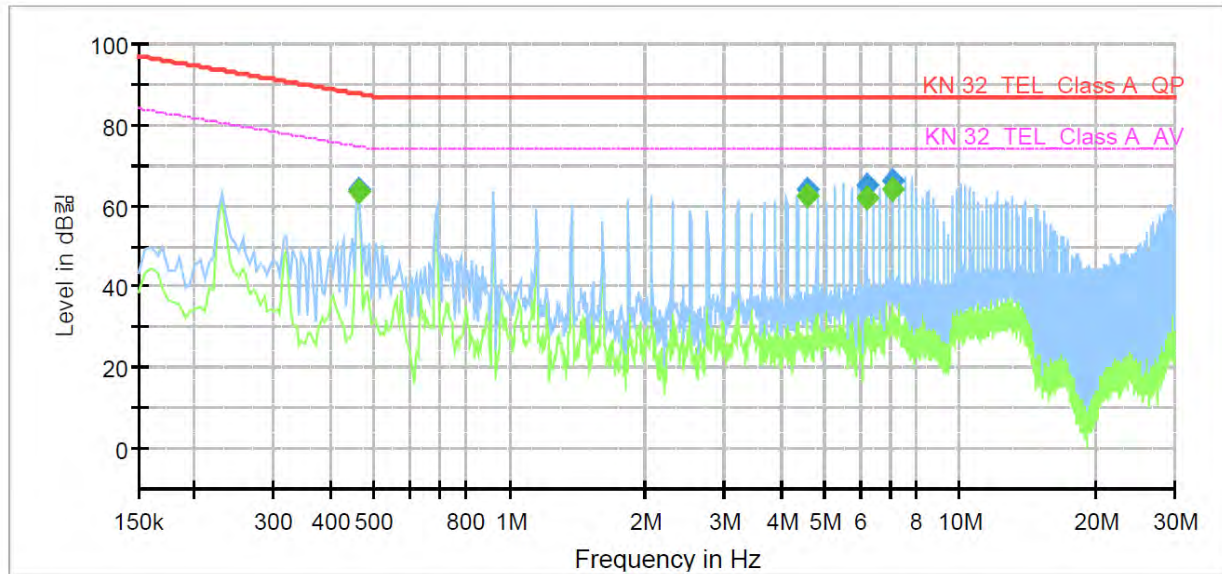
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[1000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PND-9080RP
Mode: PoE_1000 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dB _{μV})	CAverage (dB _{μV})	Limit (dB _{μV})	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.460000	---	63.46	74.69	11.23	1000.0	9.000	Single Line	9.4
0.460000	63.97	---	87.69	23.72	1000.0	9.000	Single Line	9.4
4.590000	---	62.35	74.00	11.65	1000.0	9.000	Single Line	9.2
4.590000	63.78	---	87.00	23.22	1000.0	9.000	Single Line	9.2
6.200000	---	62.12	74.00	11.88	1000.0	9.000	Single Line	9.3
6.200000	64.85	---	87.00	22.15	1000.0	9.000	Single Line	9.3
7.115000	---	64.00	74.00	10.00	1000.0	9.000	Single Line	9.3
7.115000	66.01	---	87.00	20.99	1000.0	9.000	Single Line	9.3

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Radiated Electric Field Emissions(Below 1 GHz)

- DC 12V 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]
50.18	12.66	H	4.00	13.93	1.46	28.05	40.00	11.95
148.51	24.82	V	1.53	8.15	2.76	35.73	40.00	4.27
149.07	23.53	H	3.70	8.17	2.77	34.47	40.00	5.53
248.85	15.52	V	1.00	12.38	3.79	31.69	47.00	15.31
500.94	16.72	H	4.00	17.12	5.76	39.60	47.00	7.40
644.20	14.19	V	1.00	19.48	6.73	40.40	47.00	6.60

* H : Horizontal, V : Vertical

- PoE Mode

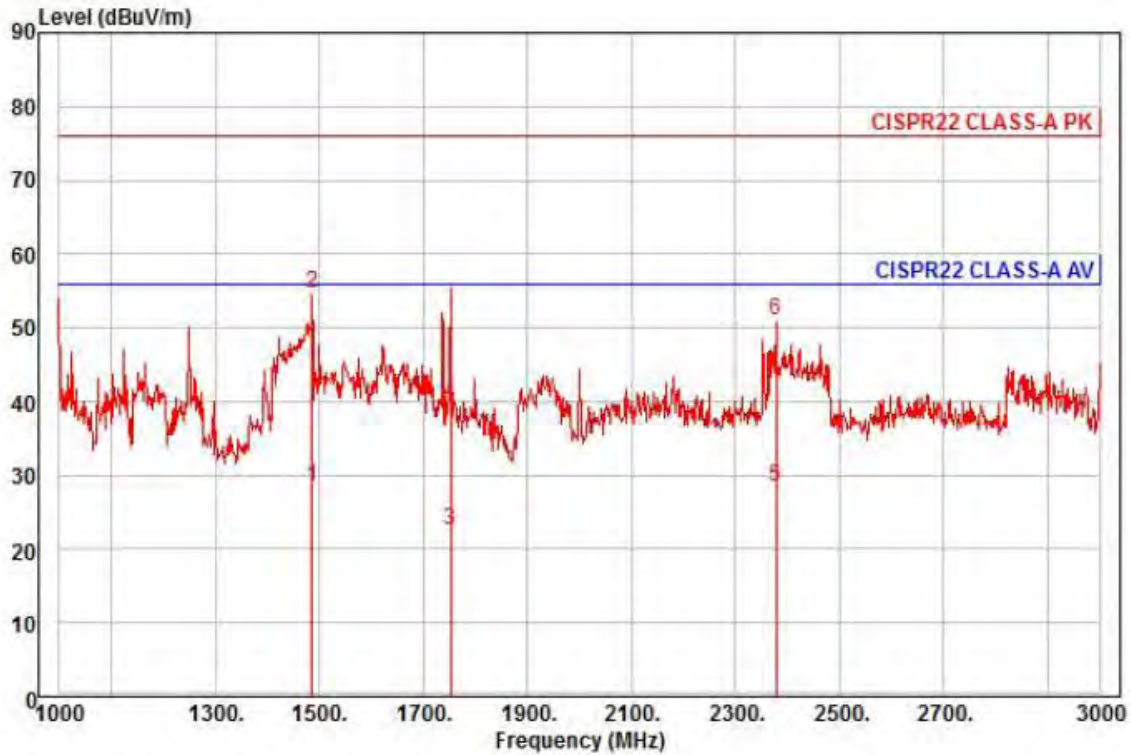
Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
46.25	12.28	V	1.00	13.78	1.39	27.45	40.00	12.55
216.76	14.13	H	4.00	11.67	3.45	29.25	40.00	10.75
360.49	11.01	V	1.00	14.78	4.74	30.53	47.00	16.47
500.12	13.54	H	3.86	17.10	5.75	36.39	47.00	10.61
647.99	13.41	V	1.00	19.49	6.77	39.67	47.00	7.33
648.26	12.69	H	4.00	19.49	6.77	38.95	47.00	8.05

* H : Horizontal, V : Vertical



Radiated Electric Field Emissions(Above 1 GHz)

- DC 12V Mode



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PND-9080RP
Mode : DC 12V
Memo :

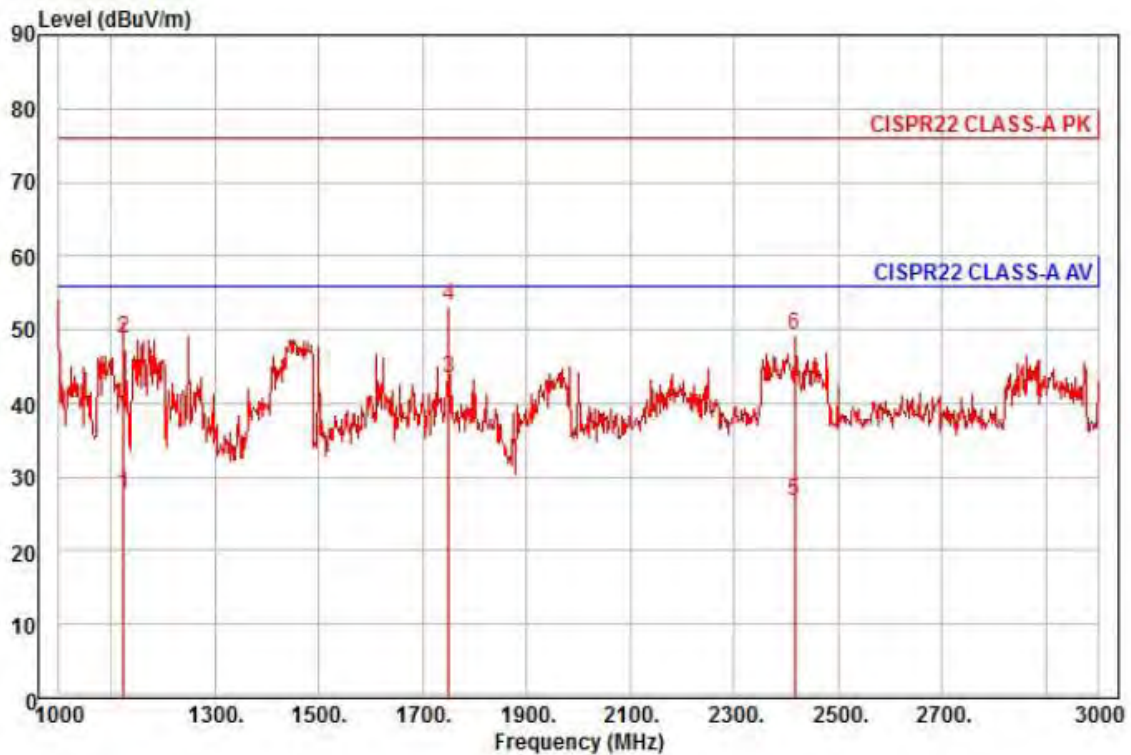
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1486.00	34.49	25.84	7.92	39.88	357	56.00	-27.63	horizontal	Average
2 pp	1486.00	60.90	25.84	7.92	39.88	357	76.00	-21.22	horizontal	Peak
3	1752.00	26.71	26.90	8.67	39.75	177	56.00	-33.47	horizontal	Average
4	1752.00	43.93	26.90	8.67	39.75	177	76.00	-36.25	horizontal	Peak
5 av	2378.00	29.66	28.81	9.93	39.85	38	56.00	-27.45	horizontal	Average
6	2378.00	52.07	28.81	9.93	39.85	38	76.00	-25.04	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 : PND-9080RP
Mode : DC 12V
Memo :

	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	1124.00	36.58	24.40	6.87	40.06	226	56.00	-28.21	vertical	Average
2	1124.00	57.66	24.40	6.87	40.06	226	76.00	-27.13	vertical	Peak
3 pp	1750.00	47.57	26.89	8.66	39.75	339	56.00	-12.63	vertical	Average
4 pk	1750.00	57.38	26.89	8.66	39.75	339	76.00	-22.82	vertical	Peak
5	2416.00	27.61	28.90	9.99	39.87	6	56.00	-29.37	vertical	Average
6	2416.00	50.32	28.90	9.99	39.87	6	76.00	-26.66	vertical	Peak

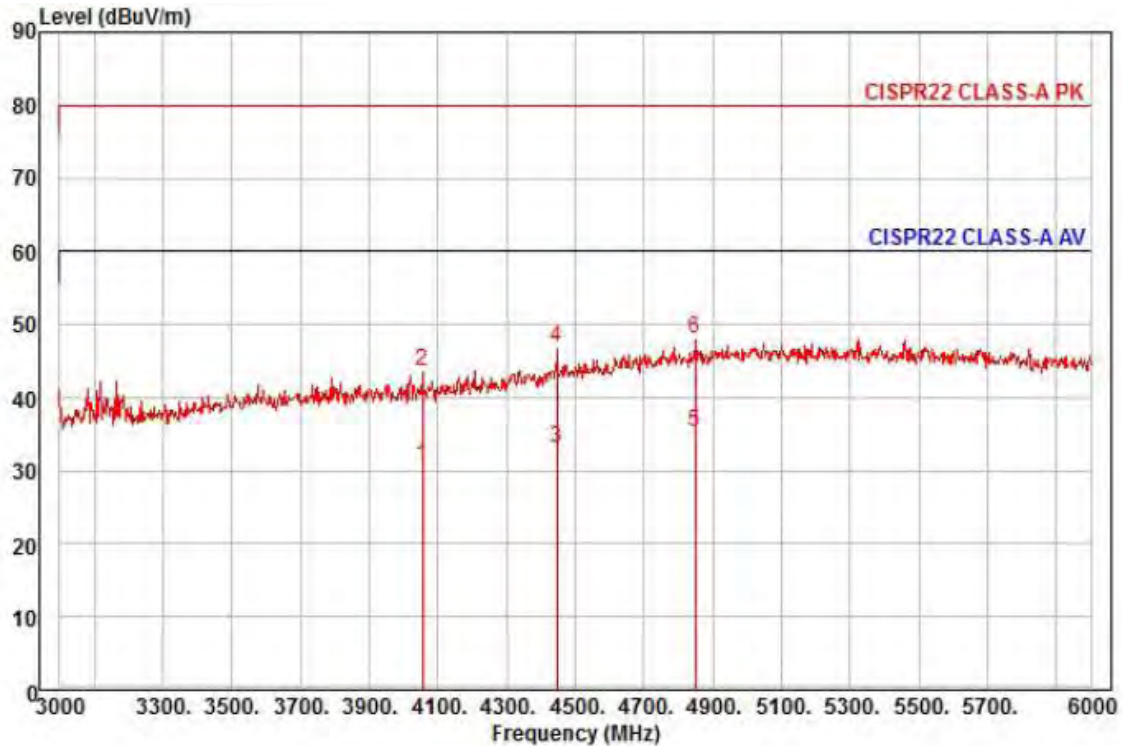
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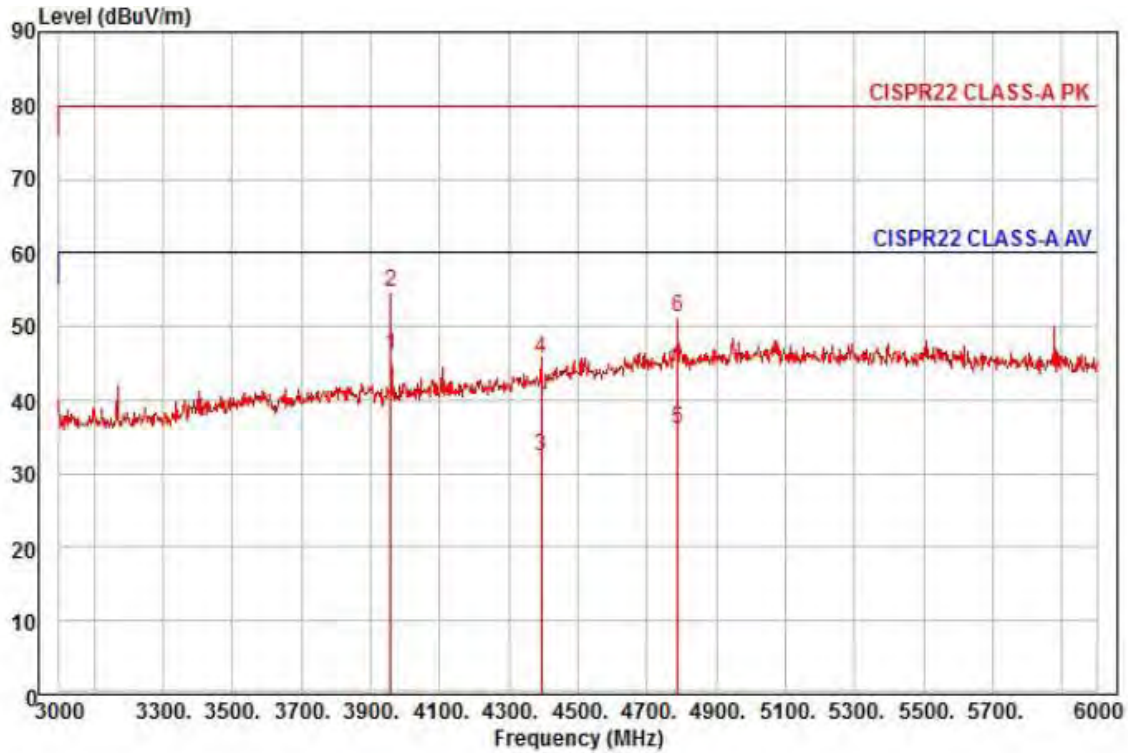
Test report No.:
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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PND-9080RP
Mode : DC 12V
Memo :

	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	4056.00	25.17	32.33	13.61	40.41	267	60.00	-29.30	horizontal	Average
2	4056.00	38.20	32.33	13.61	40.41	267	80.00	-36.27	horizontal	Peak
3	4446.00	24.65	34.56	14.33	40.41	131	60.00	-26.87	horizontal	Average
4	4446.00	38.31	34.56	14.33	40.41	131	80.00	-33.21	horizontal	Peak
5 pp	4848.00	23.81	36.85	15.06	40.41	357	60.00	-24.69	horizontal	Average
6 pk	4848.00	36.52	36.85	15.06	40.41	357	80.00	-31.98	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 : PND-9080RP
Mode : DC 12V
Memo :

	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 pp	3960.00	41.18	31.94	13.43	40.40	260	60.00	-13.85	vertical	Average
2 pk	3960.00	49.70	31.94	13.43	40.40	260	80.00	-25.33	vertical	Peak
3	4395.00	24.23	34.27	14.24	40.41	120	60.00	-27.67	vertical	Average
4	4395.00	37.40	34.27	14.24	40.41	120	80.00	-34.50	vertical	Peak
5	4788.00	24.95	36.51	14.95	40.41	190	60.00	-24.00	vertical	Average
6	4788.00	40.21	36.51	14.95	40.41	190	80.00	-28.74	vertical	Peak

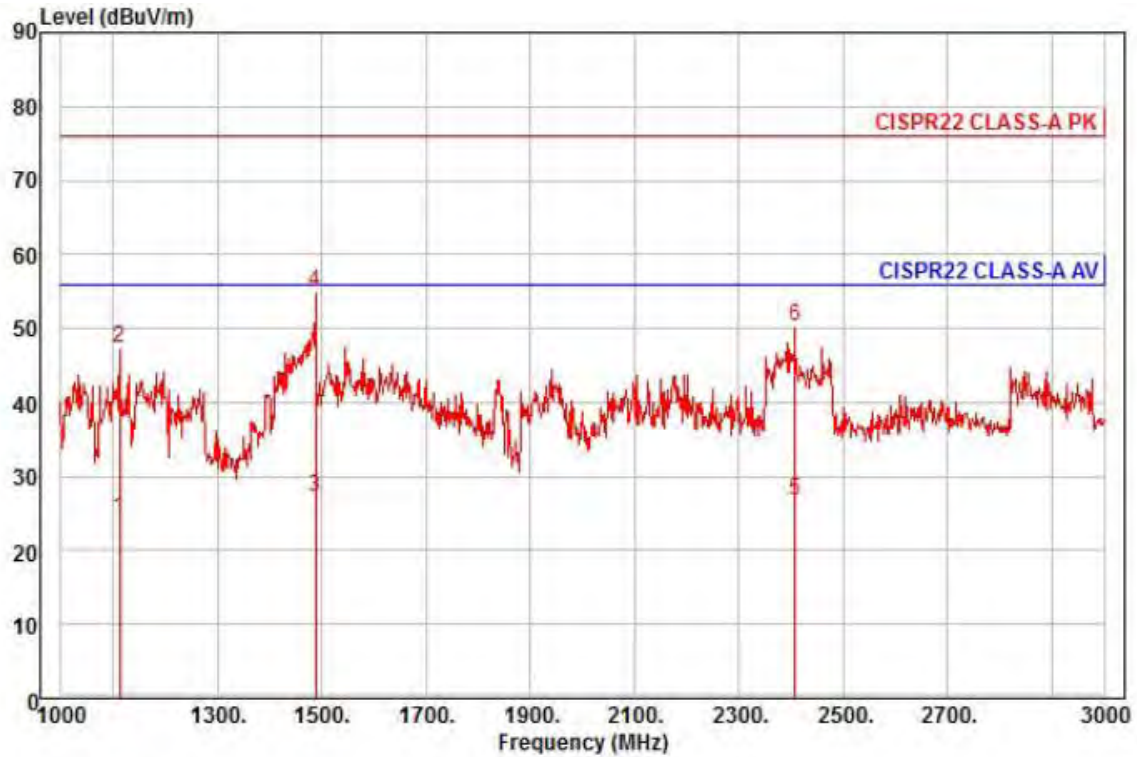


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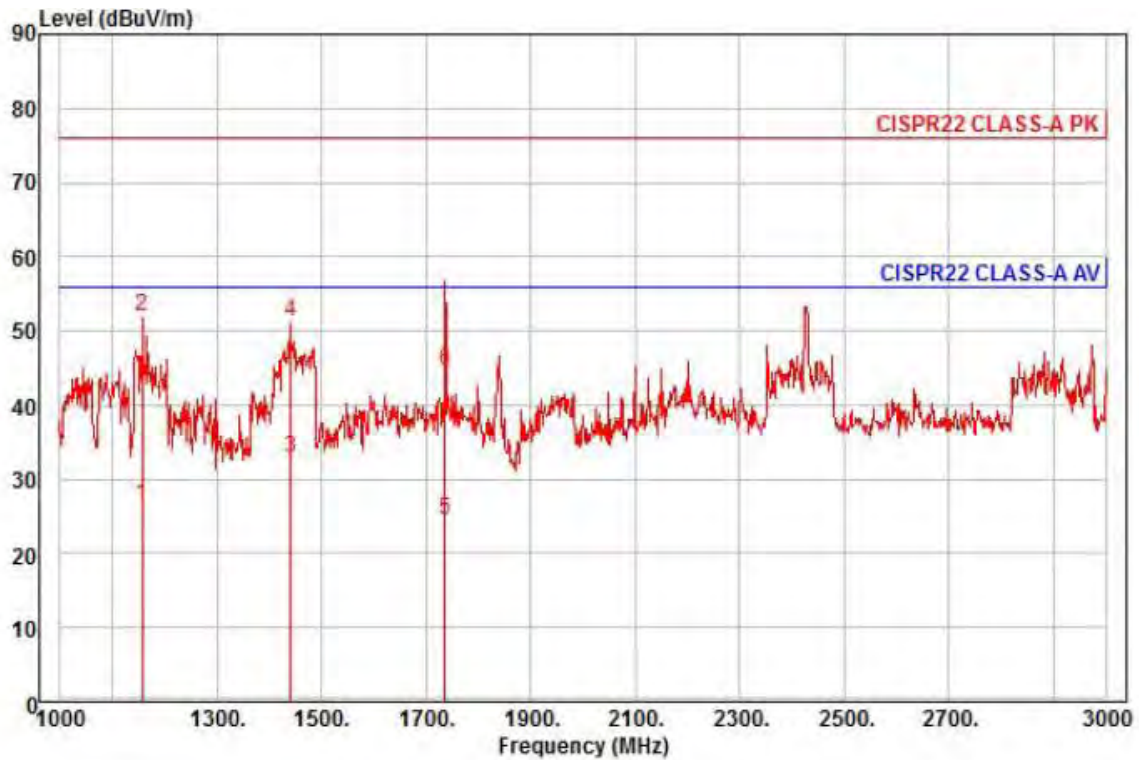
- PoE Mode



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PND-9080RP
Mode : PoE
Memo :

		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	1112.00	33.07	24.35	6.83	40.07	30	56.00	-31.82	horizontal	Average
2	1112.00	56.26	24.35	6.83	40.07	30	76.00	-28.63	horizontal	Peak
3 av	1488.00	33.28	25.85	7.93	39.88	352	56.00	-28.82	horizontal	Average
4 pp	1488.00	61.04	25.85	7.93	39.88	352	76.00	-21.06	horizontal	Peak
5	2408.00	27.77	28.88	9.98	39.87	33	56.00	-29.24	horizontal	Average
6	2408.00	51.28	28.88	9.98	39.87	33	76.00	-25.73	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 : PND-9080RP
 Mode : PoE
 Memo :

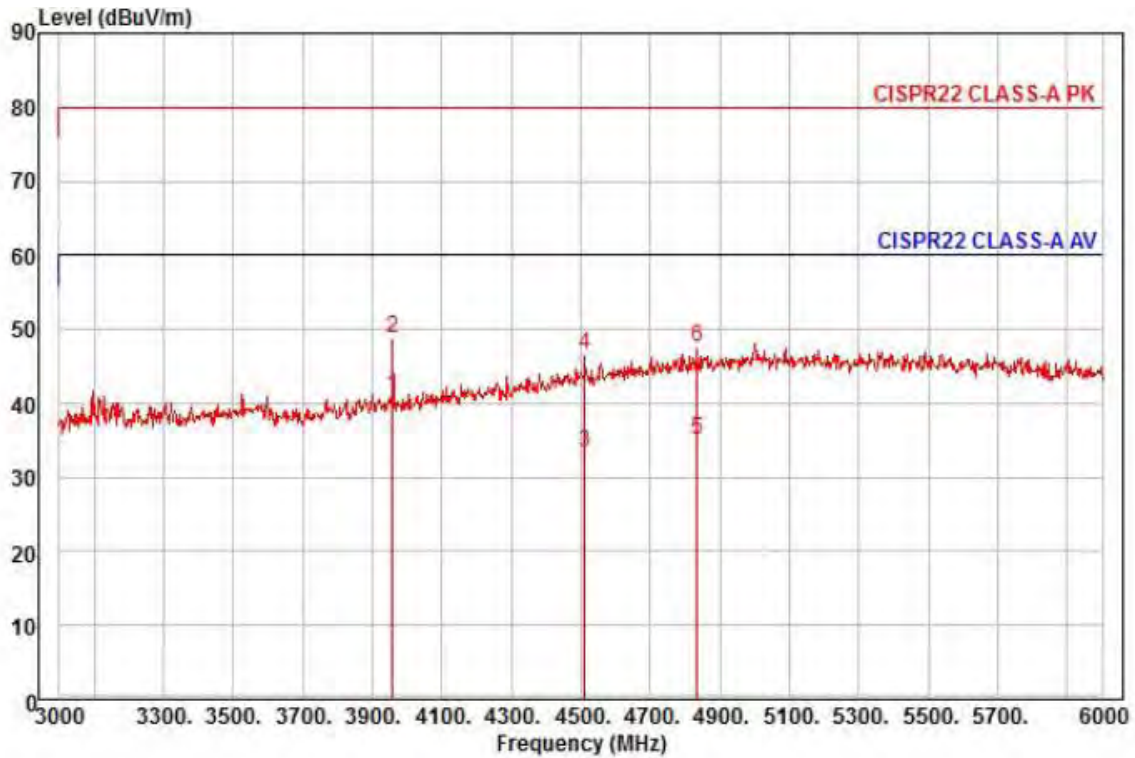
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1158.00	35.10	24.54	6.97	40.04	10	56.00	-29.43	vertical	Average
2 pk	1158.00	60.53	24.54	6.97	40.04	10	76.00	-24.00	vertical	Peak
3 pp	1440.00	39.22	25.66	7.79	39.90	1	56.00	-23.23	vertical	Average
4	1440.00	57.78	25.66	7.79	39.90	1	76.00	-24.67	vertical	Peak
5	1736.00	28.83	26.83	8.62	39.76	28	56.00	-31.48	vertical	Average
6	1736.00	48.85	26.83	8.62	39.76	28	76.00	-31.46	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 : PND-9080RP
Mode : PoE
Memo :

	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 pp	3960.00	36.01	31.94	13.43	40.40	347	60.00	-19.02	horizontal	Average
2 pk	3960.00	43.74	31.94	13.43	40.40	347	80.00	-31.29	horizontal	Peak
3	4512.00	24.37	34.93	14.45	40.41	18	60.00	-26.66	horizontal	Average
4	4512.00	37.52	34.93	14.45	40.41	18	80.00	-33.51	horizontal	Peak
5	4836.00	23.61	36.78	15.03	40.41	295	60.00	-24.99	horizontal	Average
6	4836.00	36.12	36.78	15.03	40.41	295	80.00	-32.48	horizontal	Peak

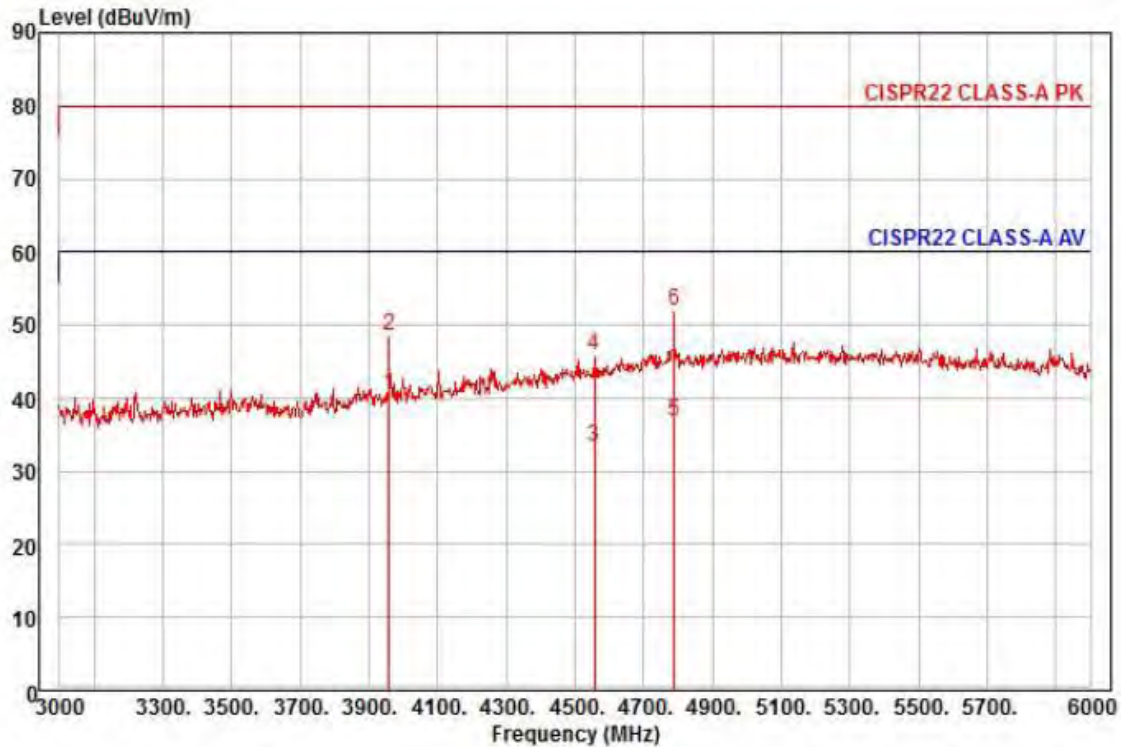
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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PND-9080RP
Mode : PoE
Memo :

	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 pp	3960.00	35.60	31.94	13.43	40.40	202	60.00	-19.43	vertical	Average
2	3960.00	43.70	31.94	13.43	40.40	202	80.00	-31.33	vertical	Peak
3	4557.00	24.15	35.19	14.53	40.41	353	60.00	-26.54	vertical	Average
4	4557.00	36.65	35.19	14.53	40.41	353	80.00	-34.04	vertical	Peak
5	4788.00	25.72	36.51	14.95	40.41	336	60.00	-23.23	vertical	Average
6 pk	4788.00	41.05	36.51	14.95	40.41	336	80.00	-27.90	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				
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37				
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39				
40				

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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				
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21				
22				
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35				
36				
37				
38				
39				
40				

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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

N/A

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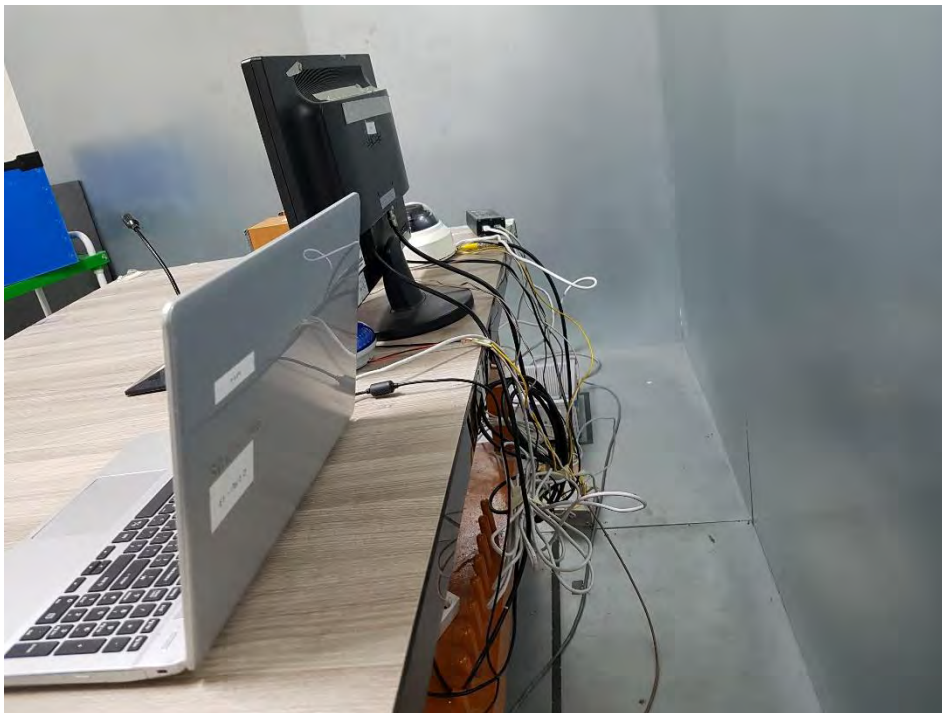
Conducted Telecommunication Emissions

- DC 12V Mode



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- PoE Mode



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Radiated Electric Field Emissions(Below 1 GHz)

- DC 12V Mode



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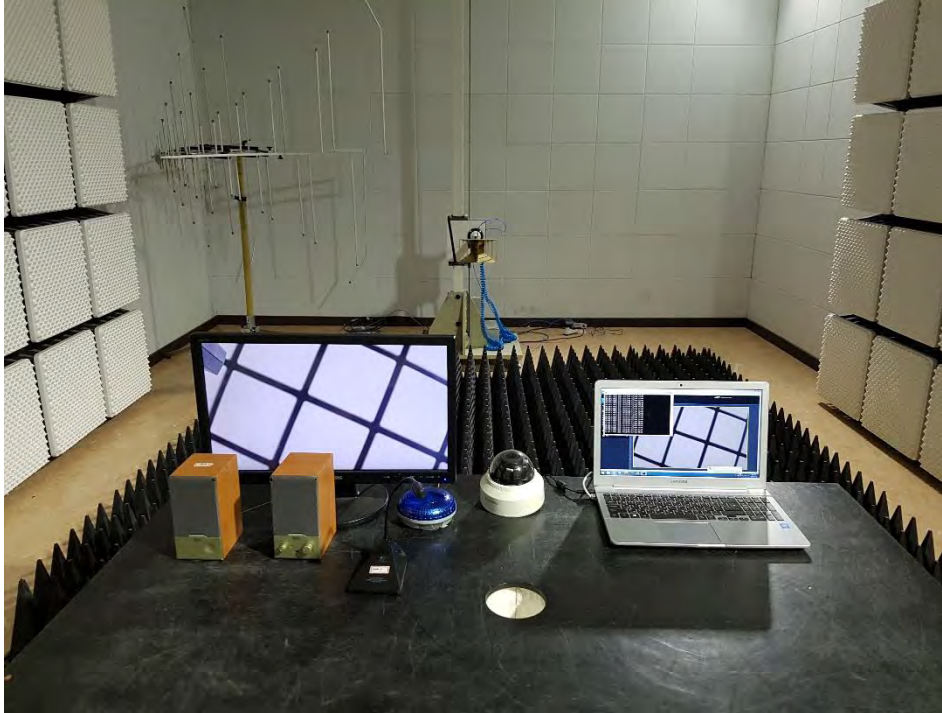
- PoE Mode



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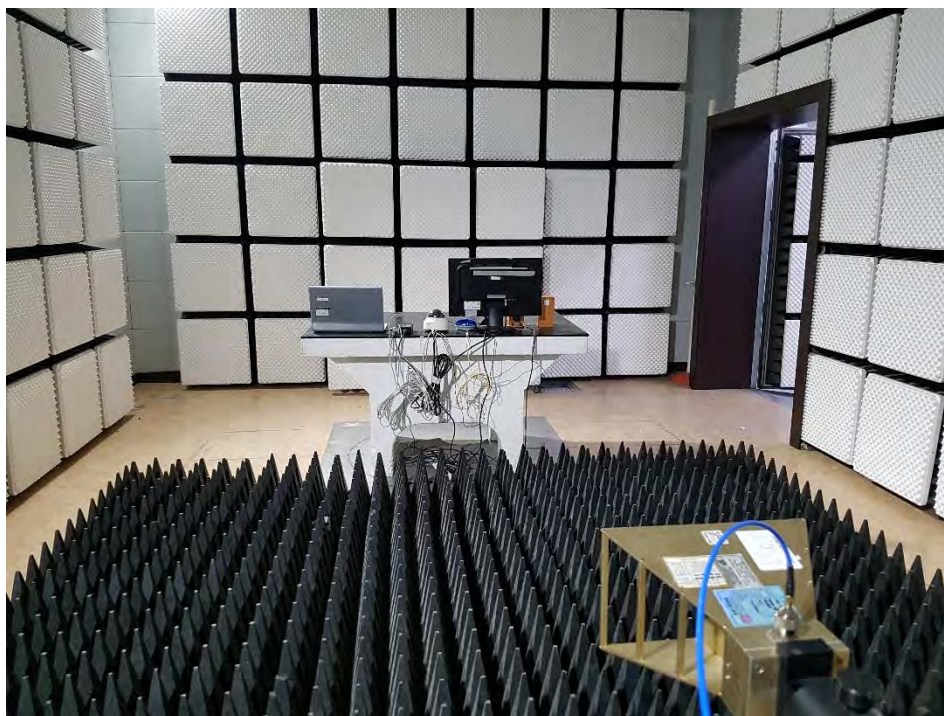
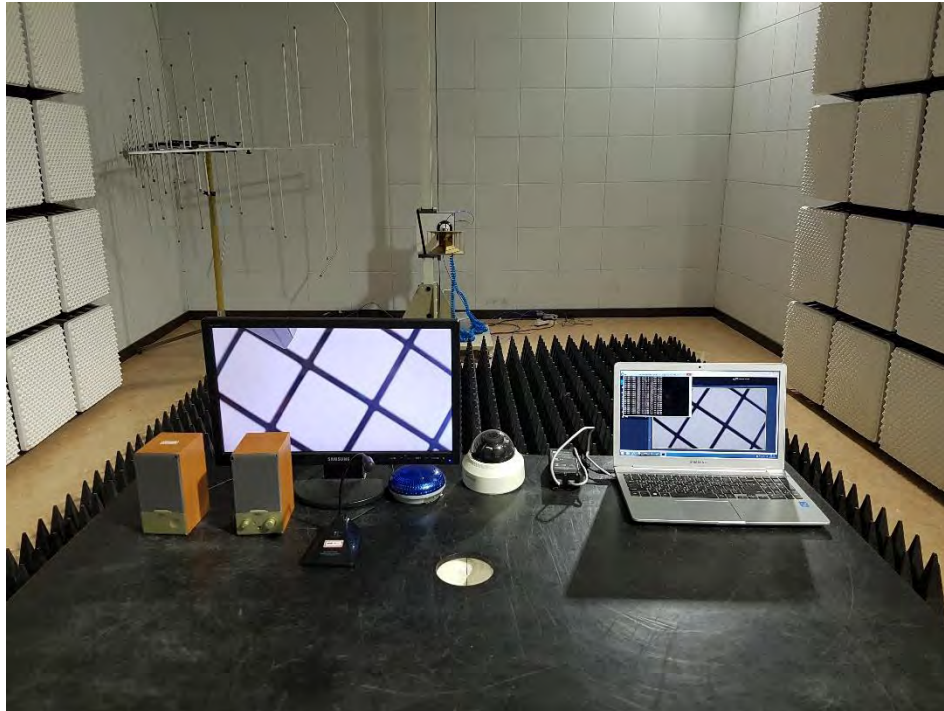
Radiated Electric Field Emissions(Above 1 GHz)

- DC 12V Mode



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- PoE Mode



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Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

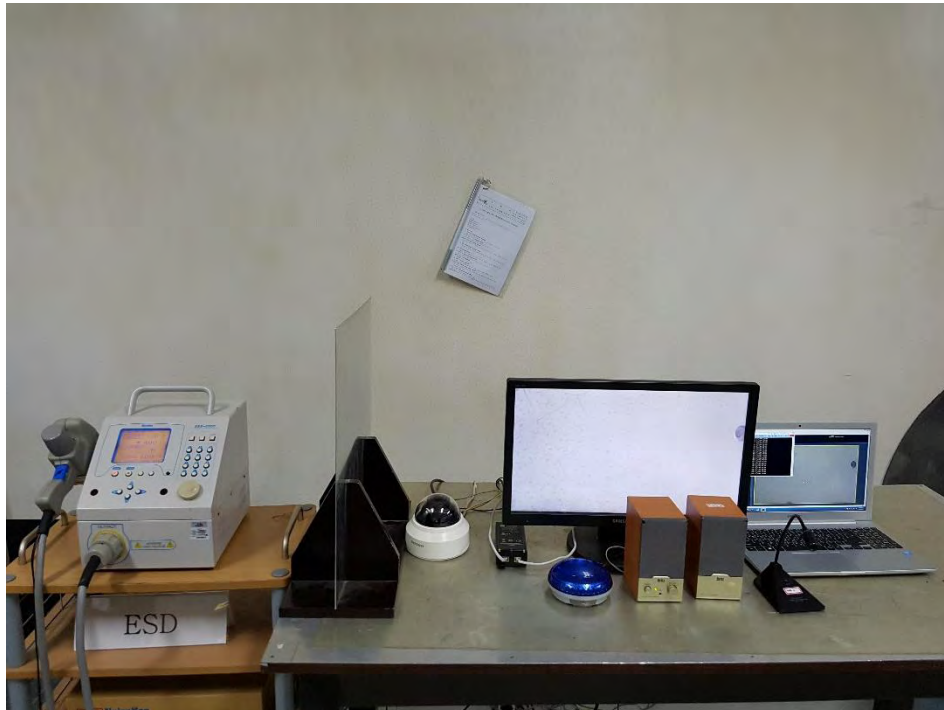
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Electrostatic Discharge

- DC 12V Mode



- PoE Mode



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Radiated Electric Field Immunity

- DC 12V Mode



- PoE Mode



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Electrical Fast Transients/Bursts

- DC 12V Mode



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- PoE Mode



Surge Transients

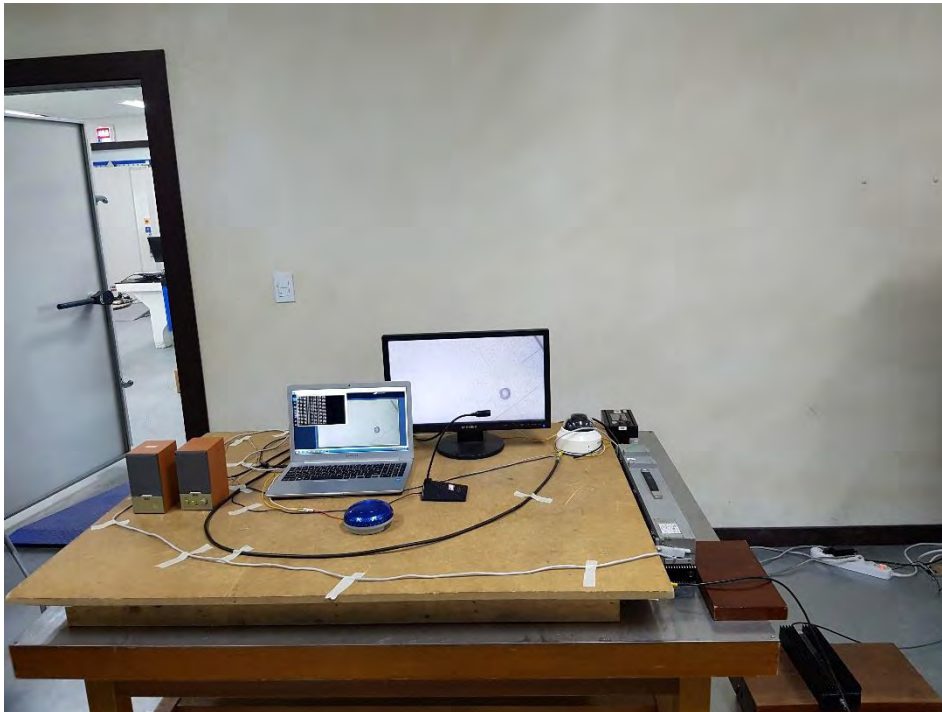
- DC 12V Mode



- PoE Mode

Conducted Disturbance

- DC 12V Mode



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- PoE Mode





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KES-E1-16T0186-R2
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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)



Main Board EUT Internal View – Board 1

(Top)



(Bottom)



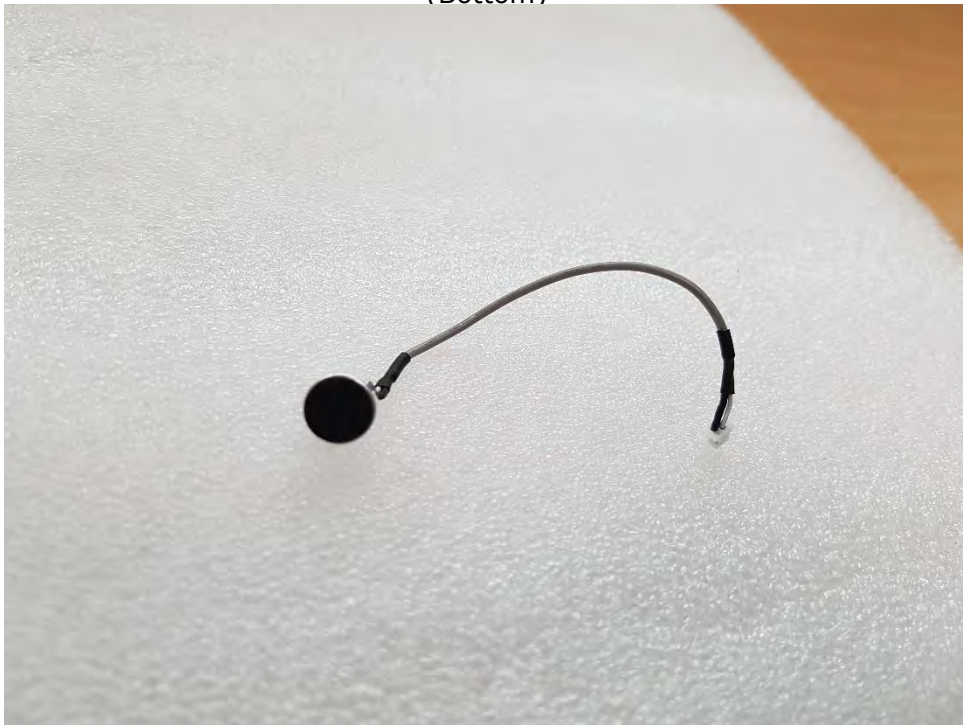
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Main Board EUT Internal View – Board 2

(Top)



(Bottom)



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Main Board EUT Internal View – Board 3

(Top)



(Bottom)



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Main Board EUT Internal View – Board 4

(Top)



(Bottom)



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Main Board EUT Internal View – Board 5

(Top)



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Label and Location



NETWORK CAMERA

Model No : PND-9080R

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

Made in China