EMC TEST REPORT For CE

Test Report No.	:	KES-E1-16T0315-R3
Date of Issue	:	May. 15, 2019
Product name	:	NETWORK CAMERA
7		
Model/Type No.	:	PNF-9010R
Variant Model	:	PNF-9010RP/DM, PNF-9010RP/VDM, PNF-9010R/DM
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. 02, 2016
Test date	:	Jun. 27, 2016 – Jun. 30, 2016
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Young-Jun Jo
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 06, 2016	KES-E1-16T0315	Issued
Jun. 15, 2017	KES-E1-16T0315-R1	Reissue due to manufacturer change and additional derivative model
Jun. 27, 2018	KES-E1-16T0315-R2	Re-issue due to manufacturer change
May. 15, 2019	KES-E1-16T0315-R3	Changed customer's address, factory addition, variant model addtion and application standard due to customer request.

TABLE OF CONTENTS

1.0 General Product Description

Main Specifications of E.U.T are:

	PNF-9010R
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 Mecury)
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
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
ax. 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
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

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

Variant Model	Differences
PNF-9010RP/DM	Customer-specific management model
PNF-9010RP/VDM	
PNF-9010R/DM	

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	PNF-9010R	-	Hanwha Techwin (Tianjin) Co.,Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adaper	POE36U-1AT-R	-	PHIHONG	-
Notebook	RV518	HSVX91HC801452M	SAMSUNG ELECTRONICS Co., Ltd.	-
Notebook Adapter	CPA-09-004A	-	CHICONY POWER TECHNOLOGY (SUZHOU) CO.,LTD,	-
Monitor	SMT-2232	C95V67VF900025B	Weihai Daewoo Electronics Co., Ltd.	-
Speaker	BR10000A CUVE	SN128458795701	BEIJING EDIFIER HI-TECH GROUP.	-
Alarm Jig	-	-	-	-
Mobile Phone	SHV-E210L	-	SAMSUNG ELECTRONICS Co., Ltd.	-
Micro SD Card	-	-	SanDisk	4 GB

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
	Micro SD Slot	Micro SD Card	Micro SD Slot	-	-

- 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 Adaper	RJ-45(PoE)	3.5	U
PoE Adaper	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
	Micro SD Slot	Micro SD Card	Micro SD Slot	-	-

* Unshielded=U, Shielded=S

1.7 E.U.T Operating Mode(s)

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

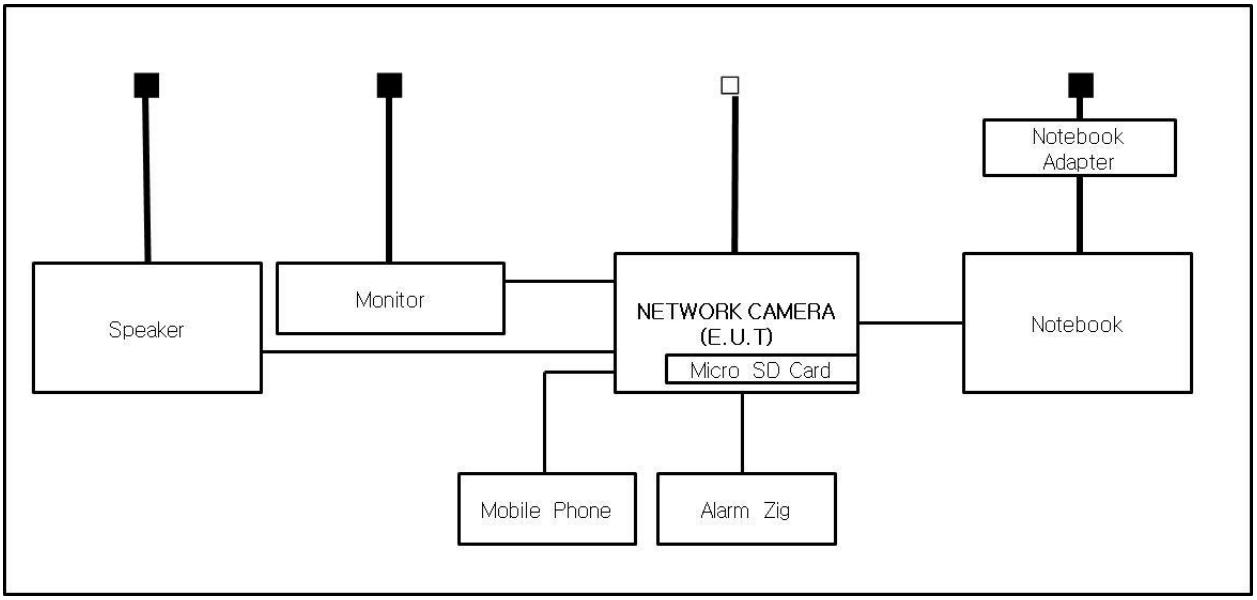
Test mode	Normal operating
DC 12 V	MONITORING, PING TEST
PoE	MONITORING, PING TEST

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

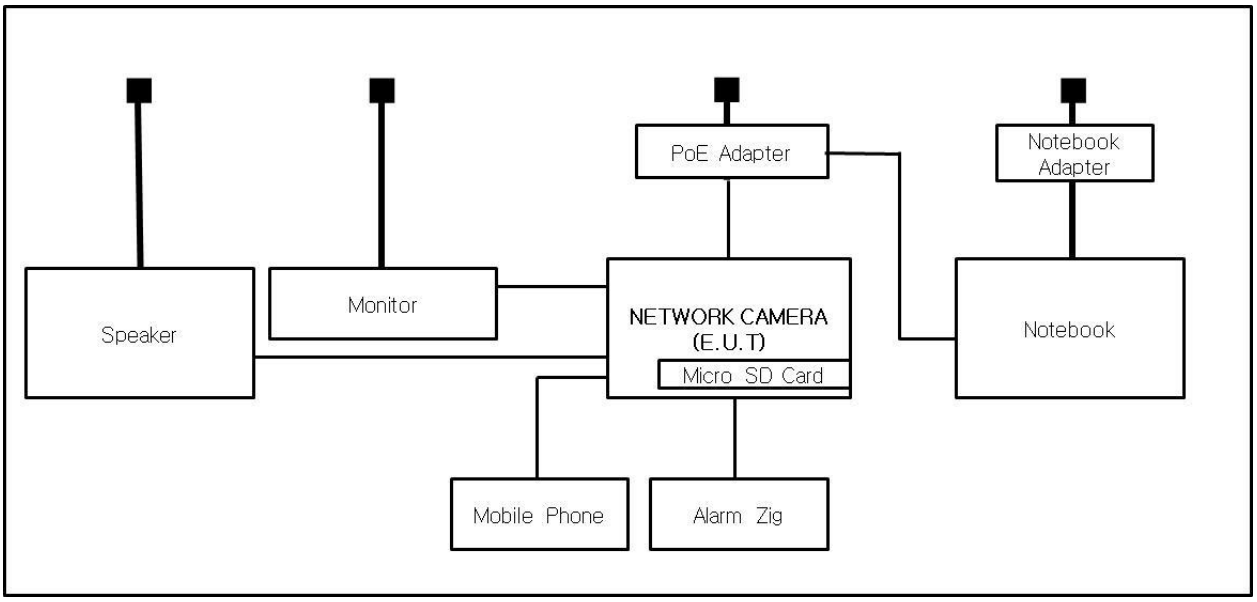
1.8 Configuration

■ 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 473-21 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 61547:2009

☒ EN 55032:2012/AC:2013 ☒ Class A ☐ Class B

☐ EN 55024:2010 +A1:2015

☒ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013

☐ **VCCI V-3 / 2015.04** ☐ Class A ☐ Class B

☐ **AS/NZS CISPR22:2009 +A1:2010** ☐ Class A ☐ Class B

☐ **47 CFR Part 15, Subpart B**

- ☐ CISPR 22:2009 +A1:2010 ☐ Class A ☐ Class B
- ☐ ANSI C63.4-2009

☐ **IC Regulation ICES-003 : 2016**

- ☐ CISPR 22:2009 +A1:2010 ☐ Class A ☐ Class B
- ☐ ANSI C63.4-2014

☐ **RE– Directive 2014/53/EU**

☐ EN 301 489-1 V1.9.2

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

☐ EN 301 489-3 V1.6.1

☐ EN 301 489-17 V2.2.1

☐ EN 60945:2002

2.1 Conducted Emissions at Mains Power Ports

Test Date
N/A

Test Location
Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test Receiver	ESR3	R&S	101783	05, 03, 2017
☐	LISN	ENV216	R&S	101137	02, 04, 2017
☐	LISN	ENV216	R&S	101786	05, 02, 2017
☐	Electro wave Shieldroom	-	SEMITEC	-	-

Test Conditions
Temperature: ℃
Relative Humidity: %

.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
N/A

2.2 Conducted Emissions at Telecommunication Ports

Test Date
Jun. 27, 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: 24,9 ℃
Relative Humidity: 42,1 %

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

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 ㎓)

Test Date
Jun. 28, 2016

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

Test Equipment

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

Test Conditions
Temperature: 31,4 ℃
Relative Humidity: 43,0 %

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Settings
IF Band Width: 120 ㎑

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 ㎓)

Test Date
Jun. 28, 2016

Test Location
Semi Anachoic 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 Anachoic Chamber #2	-	SEMITEC	-	-
☒	Antenna Mast	-	AUDIX	-	-
☒	Turn Table	-	AUDIX	-	-

Test Conditions
Temperature: 24,5 ℃
Relative Humidity: 47,7 %

Frequency Range of Measurement
1 ㎓ to 6 ㎓

Instrument Settings
IF Band Width: 1 ㎒

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: ℃
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

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: ℃
Relative Humidity: %

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
N/A

3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:
EN 50130-4:2011 +A1:2014 Alarm systems-Part 4: Electromagnetic compatibility Product family standard: Immunity requirements for components of fire, intruder and social alarm systems

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing that is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

which could be interpreted by associated equipment as a change, and no such

Flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change,

and no such flickering of indicators oeuvres at U = 130 $dB\mu V$.

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 $dB\mu V$, 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 $dB\mu V$, 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 $dB\mu V$.

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. 29, 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: 23,8 ℃
Relative Humidity: 49,2 %
Atmospheric Pressure: 99,0 kPa

Test Specifications
Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

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

Discharge Voltage:

Contact	Air	HCP	VCP
☐ 2 kV	☒ 2 kV	☐ 2 kV	☐ 2 kV
☐ 4 kV	☒ 4 kV	☐ 4 kV	☐ 4 kV
☒ 6 kV	☐ 6 kV	☒ 6 kV	☒ 6 kV
☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

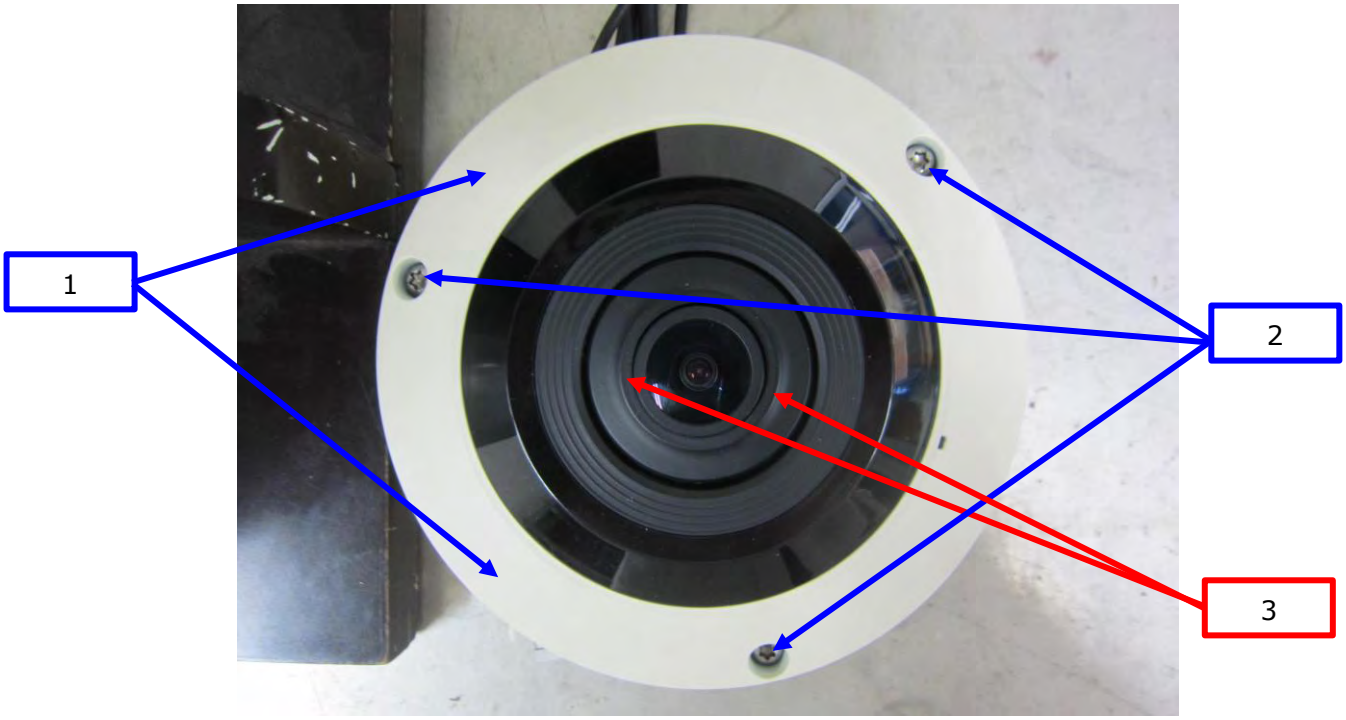
Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied

Location of Discharge:

Air
Contact

- DC 12 V, PoE Mode



Test Data

- DC 12 V Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Performance Observation	Remarks
1	Surface	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-
3	Lens	Air Discharge	Complied	-

- PoE Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Performance Observation	Remarks
1	Surface	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-
3	Lens	Air 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. 27, 2016

Test Location
EMS-RS: ☐ Semi Anachoic Chamber #1 ☒ Semi Anachoic 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 Anachoic Chamber #2		SEMITEC	-	-

Test Conditions

Temperature:	24,9 ℃
Relative Humidity:	42,1 %
Atmospheric Pressure:	99,0 kPa

Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☐ 1 V/m ☐ 3 V/m
☒ 10 V/m

Frequency Range: ☐ 80 MHz to 1 GHz ☐ 1,4 GHz to 2,7 GHz
☒ 80 MHz to 2,7 GHz

Modulation: ☒ AM, 80 %, 1 kHz sine wave
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

# of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

Test Data

- DC 12 V Mode

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

- 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. 29, 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	06, 27, 2017
☒	Capacitive Coupling Clamp	HFK	EM TEST	070925	06, 27, 2017
☒	Motor Variac	MV2616	EM TEST	V0936105123	06, 27, 2017

Test Conditions

Temperature:	23,8 ℃
Relative Humidity:	49,2 %
Atmospheric Pressure:	99,0 ㎪

Test Specifications

Pulse Amplitude & Polarity: (Power Lines)	☒ ± 1.0 ㎸ ☐ ± 4.0 ㎸	☐ ± 2.0 ㎸
Pulse Amplitude & Polarity: (Other supply / Signal Lines)	☐ ± 0.5 ㎸	☒ ± 1.0 ㎸ ☐ ± 2.0 ㎸
Burst Period:	☒ 300 ㎳	☐ 2 s
Repetition Rate:	☐ 5 ㎑	☒ 100 ㎑
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 (㎸)	(-) Burst (㎸)
-	-	-

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

Mode of Application	OBSERVATIONS	
	(+) Burst (㎸)	(-) Burst (㎸)
L1 – L2	Complied	Complied

☒ Signal ports and telecommunication ports – Coupling Clamp used

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

- PoE Mode

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	OBSERVATIONS	
	(+) Burst (㎸)	(-) Burst (㎸)
RJ - 45	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. 29, 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
☒	Motor Variac	MV2616	EM TEST	V0936105123	06, 27, 2017
☐	CDN	CNV 504N	EM TEST	V0936105121	03, 25, 2017
☒	CDN	CNV 508N1	EM TEST	P1551168979	04, 27, 2017
☐	CDN	CNV 508T5	EM TEST	P1549168422	04, 27, 2017

Test Conditions
Temperature: 23,8 ℃
Relative Humidity: 49,2 %
Atmospheric Pressure: 99,0 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

Other supply / Signal Lines

Source Impedance: 42 ohm for common mode
Surge Amplitude: Common Mode
☒ (0,5 / 1,0) kV

Number of Surges: ☒ 5 Surges

Polarity: ☒ Positive & Negative

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

Required Performance Criteria: ☒ Complied

Test Data

- DC 12 V Mode

☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

Mode of Application	OBSERVATIONS	
	(+) Surge (㎸)	(-) Surge (㎸)
L1 – PE	-	-
L2 - PE	-	-

Signal Lines

☒ Line to Earth – Common Mode

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

- PoE Mode

☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

Mode of Application	OBSERVATIONS	
	(+) Surge (㎸)	(-) Surge (㎸)
L - PE	-	-
N - PE	-	-

Signal Lines

☒ Line to Earth – Common Mode

Mode of Application	OBSERVATIONS	
	(+) Surge (㎸)	(-) Surge (㎸)
RJ - 45	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. 30, 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
☐	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: 23,9 ℃
Relative Humidity: 49,4 %
Atmospheric Pressure: 99,0 kPa

Test Specifications

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

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

Modulation: ☒ AM, 80 %, 1 ㎑ sine wave
☒ PM, 1 ㎐ (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
L – N	CDN (☒M2, ☐M3)	Complied

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observation
RJ – 45	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	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
☐	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☐	Motor Variac	MV2616	EM TEST	V0936105123	06, 27, 2017

Test Conditions
Temperature: ℃
Relative Humidity: %
Atmospheric Pressure: kPa

Test Specifications & Observations/Remarks

Test Level	Duration [in period/ms (50 ㎐)]	Results
☐ 20 % dip	☐ 250 /5000	Complied
☐ 30 % dip	☐ 25 /500	Complied
☐ 60 % dip	☐ 10 /200	Complied
☐ 100 % dip	☐ 250 /5000	Complied

- Voltage cariations

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

Observations:
Complied – No degradation 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.

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

N/A

[NEUTRAL]

N/A

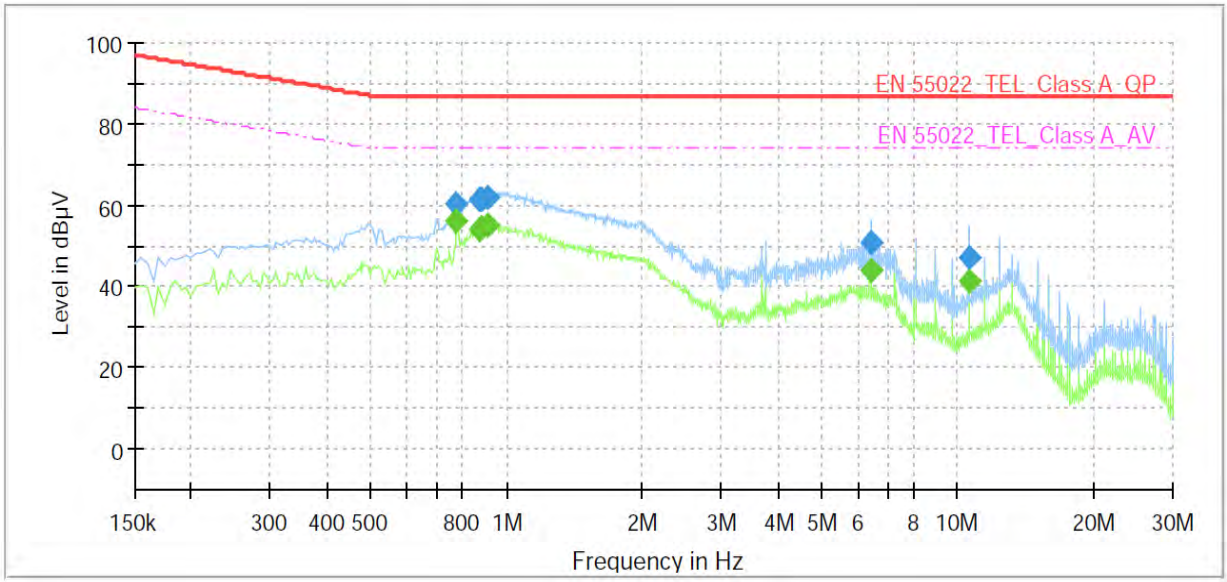
Conducted Emissions at Telecommunication Ports

- DC 12 V Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNF-9010RP
Mode	DC 12V_10Mbps
Operator Name:	KES



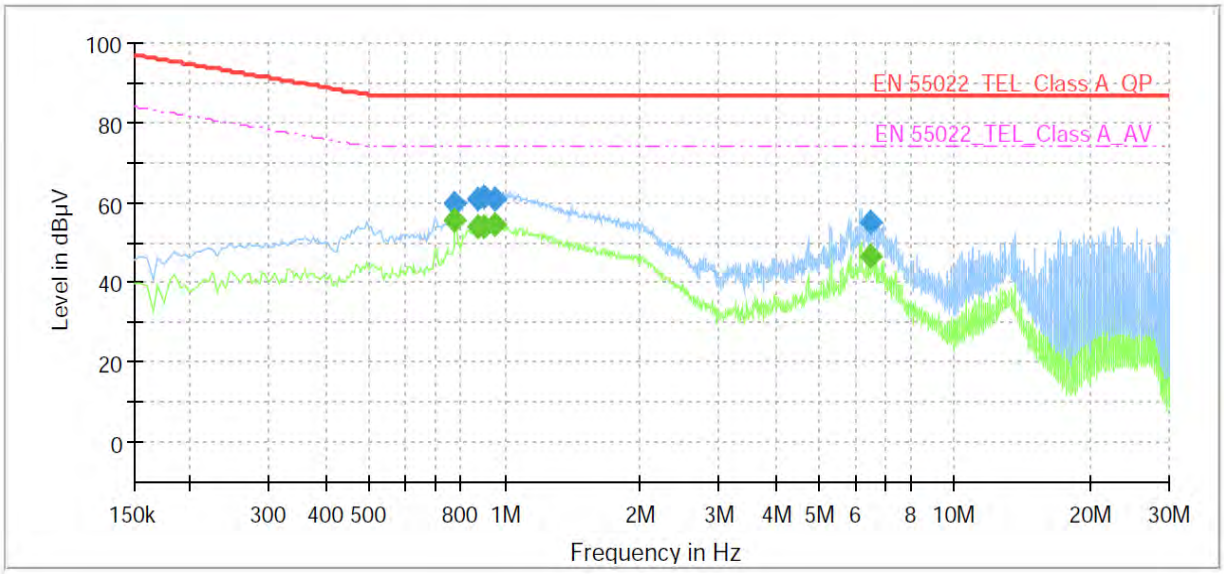
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.775000	---	56.31	74.00	17.69	1000.0	9.000	Single Line	9.9
0.775000	60.32	---	87.00	26.68	1000.0	9.000	Single Line	9.9
0.870000	---	54.19	74.00	19.81	1000.0	9.000	Single Line	9.9
0.870000	61.24	---	87.00	25.76	1000.0	9.000	Single Line	9.9
0.885000	---	54.57	74.00	19.43	1000.0	9.000	Single Line	9.9
0.885000	61.57	---	87.00	25.43	1000.0	9.000	Single Line	9.9
0.905000	---	54.81	74.00	19.19	1000.0	9.000	Single Line	9.9
0.905000	61.75	---	87.00	25.25	1000.0	9.000	Single Line	9.9
6.415000	---	44.19	74.00	29.81	1000.0	9.000	Single Line	10.0
6.415000	50.58	---	87.00	36.42	1000.0	9.000	Single Line	10.0
10.595000	---	41.54	74.00	32.46	1000.0	9.000	Single Line	10.1
10.595000	47.03	---	87.00	39.97	1000.0	9.000	Single Line	10.1

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNF-9010RP
Mode	DC 12V_100Mbps
Operator Name:	KES



Final_Result

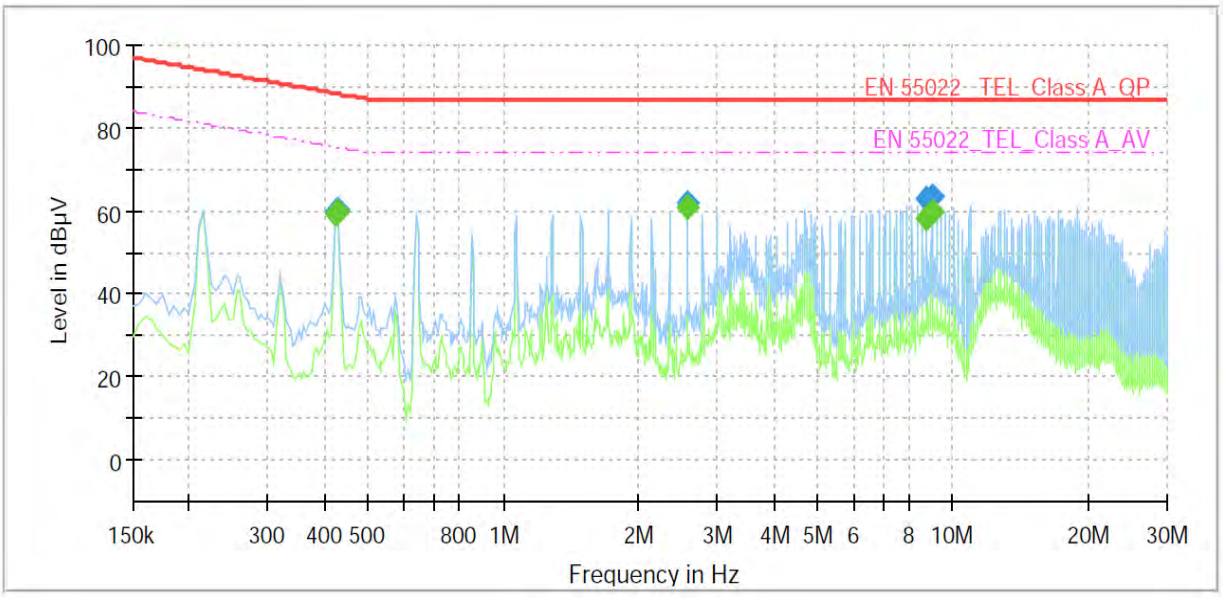
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.775000	---	55.77	74.00	18.23	1000.0	9.000	Single Line	9.4
0.775000	59.81	---	87.00	27.19	1000.0	9.000	Single Line	9.4
0.875000	---	53.97	74.00	20.03	1000.0	9.000	Single Line	9.4
0.875000	60.90	---	87.00	26.10	1000.0	9.000	Single Line	9.4
0.895000	---	54.19	74.00	19.81	1000.0	9.000	Single Line	9.4
0.895000	61.19	---	87.00	25.81	1000.0	9.000	Single Line	9.4
0.950000	---	54.42	74.00	19.58	1000.0	9.000	Single Line	9.4
0.950000	61.09	---	87.00	25.91	1000.0	9.000	Single Line	9.4
6.485000	---	46.53	74.00	27.47	1000.0	9.000	Single Line	9.5
6.485000	54.98	---	87.00	32.02	1000.0	9.000	Single Line	9.5

- PoE Mode

[10 Mbps]

Common Information

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



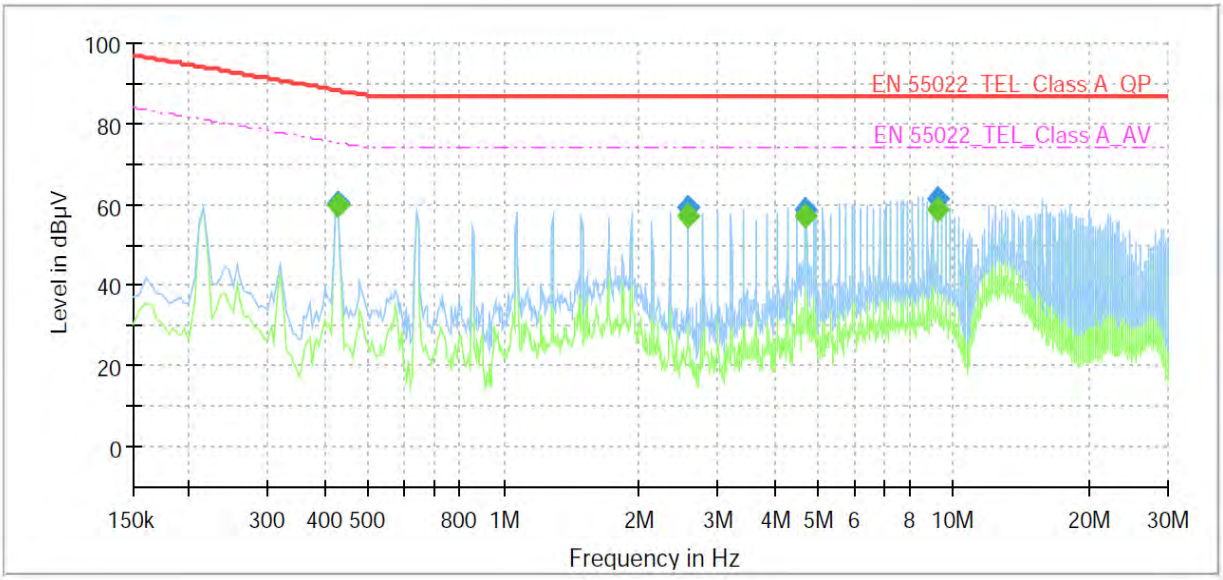
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.425000	---	59.51	75.35	15.84	1000.0	9.000	Single Line	10.0
0.425000	59.81	---	88.35	28.54	1000.0	9.000	Single Line	10.0
0.430000	---	59.84	75.25	15.41	1000.0	9.000	Single Line	10.0
0.430000	60.13	---	88.25	28.12	1000.0	9.000	Single Line	10.0
2.565000	---	60.92	74.00	13.08	1000.0	9.000	Single Line	9.8
2.565000	62.10	---	87.00	24.90	1000.0	9.000	Single Line	9.8
8.765000	---	58.02	74.00	15.98	1000.0	9.000	Single Line	10.0
8.765000	62.92	---	87.00	24.08	1000.0	9.000	Single Line	10.0
8.980000	---	59.67	74.00	14.33	1000.0	9.000	Single Line	10.0
8.980000	63.67	---	87.00	23.33	1000.0	9.000	Single Line	10.0

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNF-9010RP
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)
0.430000	---	59.85	75.25	15.40	1000.0	9.000	Single Line	9.5
0.430000	60.14	---	88.25	28.11	1000.0	9.000	Single Line	9.5
2.565000	---	57.38	74.00	16.62	1000.0	9.000	Single Line	9.3
2.565000	59.21	---	87.00	27.79	1000.0	9.000	Single Line	9.3
4.705000	---	56.92	74.00	17.08	1000.0	9.000	Single Line	9.4
4.705000	58.79	---	87.00	28.21	1000.0	9.000	Single Line	9.4
9.195000	---	58.81	74.00	15.19	1000.0	9.000	Single Line	9.5
9.195000	61.61	---	87.00	25.39	1000.0	9.000	Single Line	9.5

Radiated Electric Field Emissions(Below 1 ㎓)

- DC 12 V Mode

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin [dB]
[㎒]	[dBμV]		[m]	ANT. [dB/m]	Cable [dB]	[dBμV/m]	[dBμV/m]	
147.50	8.29	H	3.87	8.14	2.45	18.88	40.00	21.12
151.23	7.43	V	1.04	8.24	2.49	18.16	40.00	21.84
216.83	11.02	H	4.00	11.83	3.02	25.87	40.00	14.13
268.04	9.24	V	1.28	12.86	3.47	25.57	47.00	21.43
325.77	11.05	V	1.37	13.96	3.80	28.81	47.00	18.19
360.03	17.37	H	4.00	14.70	3.96	36.03	47.00	10.97

* H : Horizontal, V : Vertical

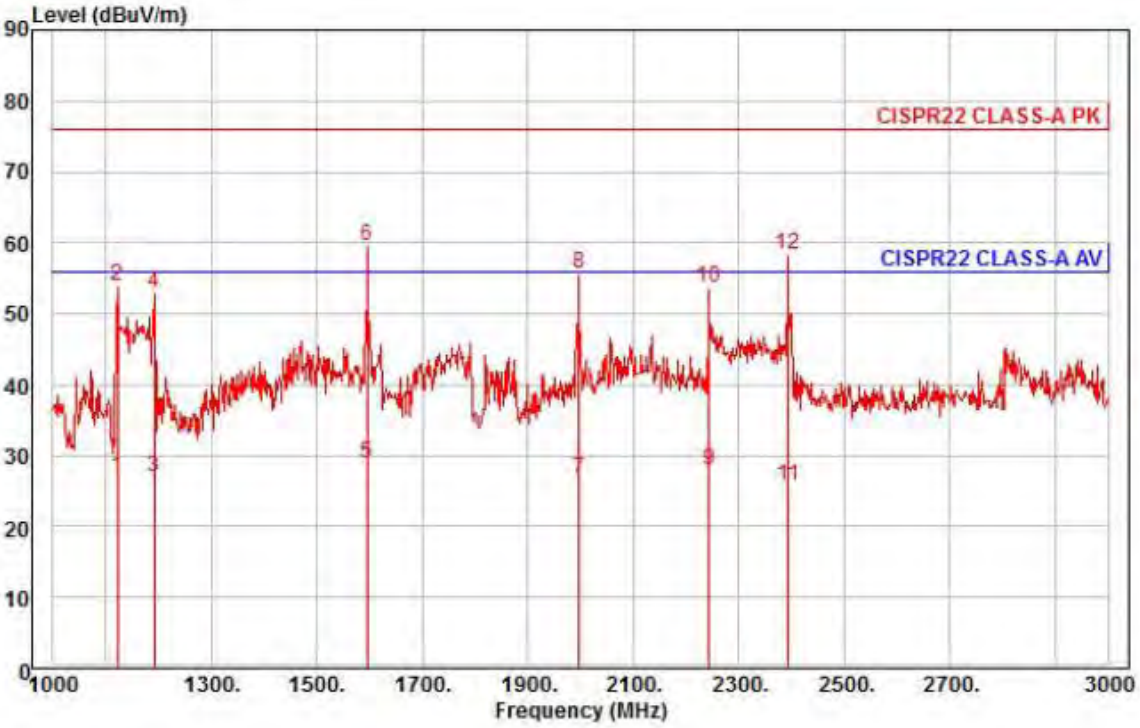
- PoE Mode

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin [dB]
[㎒]	[dBμV]		[m]	ANT. [dB/m]	Cable [dB]	[dBμV/m]	[dBμV/m]	
72.68	8.02	H	3.66	8.93	1.70	18.65	40.00	21.35
159.43	7.39	V	1.18	8.47	2.64	18.50	40.00	21.50
253.08	12.17	H	3.92	12.60	3.35	28.12	47.00	18.88
360.00	18.85	H	4.00	14.70	3.96	37.51	47.00	9.49
375.13	12.81	V	1.05	15.03	4.06	31.90	47.00	15.10
504.11	12.05	V	1.01	17.38	4.98	34.41	47.00	12.59

* H : Horizontal, V : Vertical

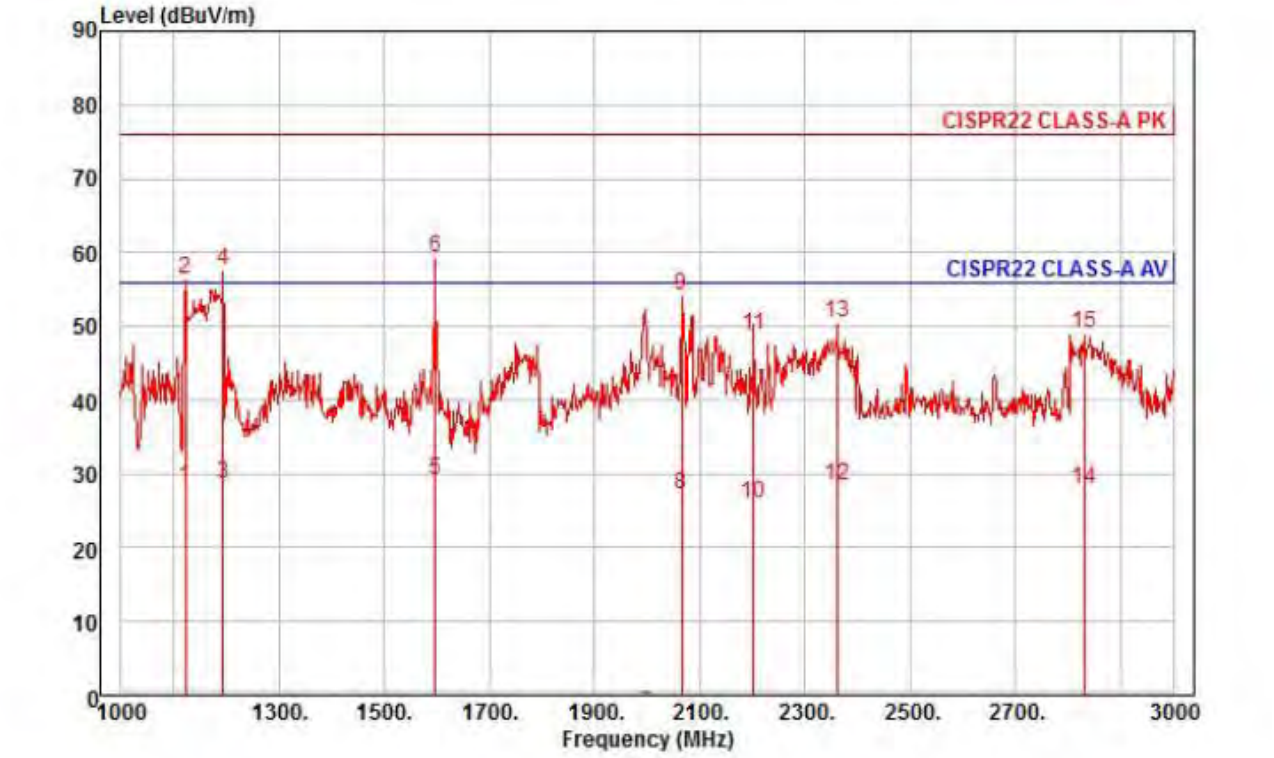
Radiated Electric Field Emissions(Above 1 ㎓)

- DC 12 V Mode



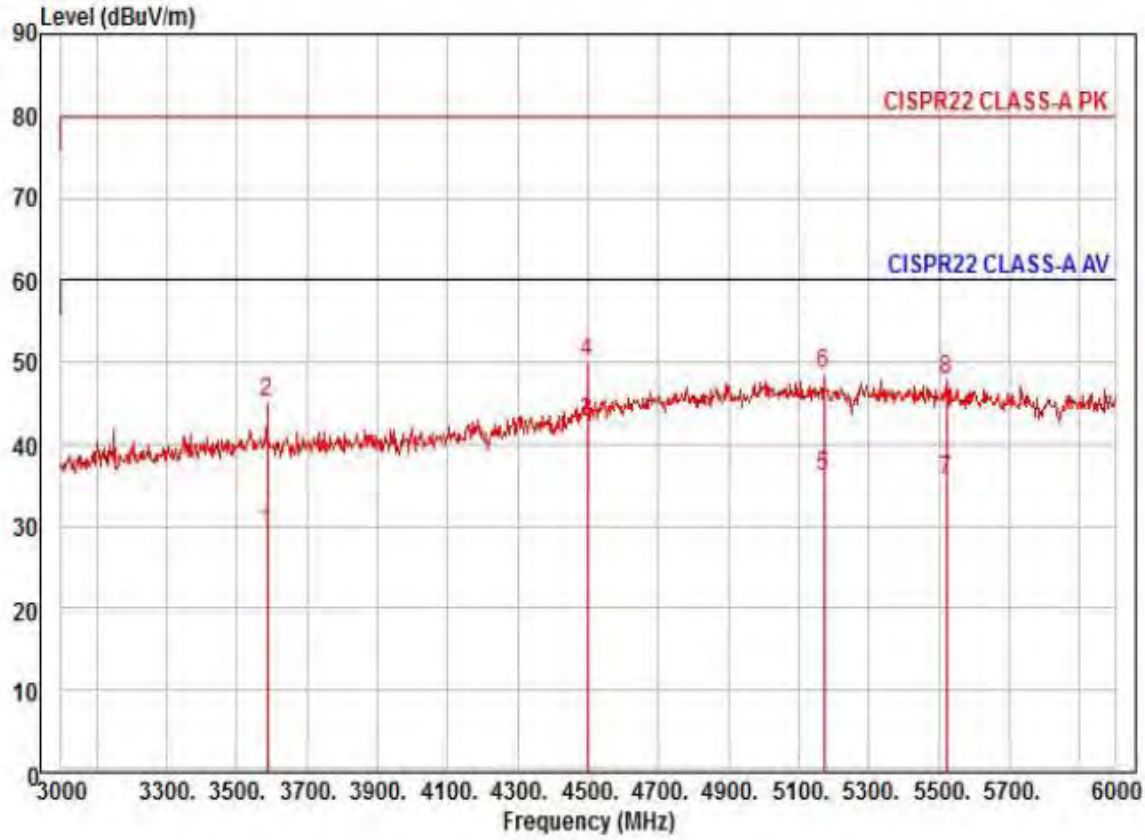
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNF-9010RP
Mode : DC 12V
Memo : 1 - 3 GHz

	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	1122.00	35.84	24.39	6.86	40.06	329	56.00	-28.97	horizontal	Average
2	1122.00	62.86	24.39	6.86	40.06	329	76.00	-21.95	horizontal	Peak
3	1192.00	35.23	24.67	7.07	40.03	327	56.00	-29.06	horizontal	Average
4	1192.00	61.23	24.67	7.07	40.03	327	76.00	-23.06	horizontal	Peak
5 av	1596.00	34.16	26.28	8.24	39.83	220	56.00	-27.15	horizontal	Average
6 pp	1596.00	64.94	26.28	8.24	39.83	220	76.00	-16.37	horizontal	Peak
7	1998.00	29.03	27.87	9.34	39.63	77	56.00	-29.39	horizontal	Average
8	1998.00	58.08	27.87	9.34	39.63	77	76.00	-20.34	horizontal	Peak
9	2244.00	29.55	28.48	9.72	39.77	12	56.00	-28.02	horizontal	Average
10	2244.00	55.20	28.48	9.72	39.77	12	76.00	-22.37	horizontal	Peak
11	2394.00	26.81	28.85	9.95	39.86	63	56.00	-30.25	horizontal	Average
12	2394.00	59.40	28.85	9.95	39.86	63	76.00	-17.66	horizontal	Peak



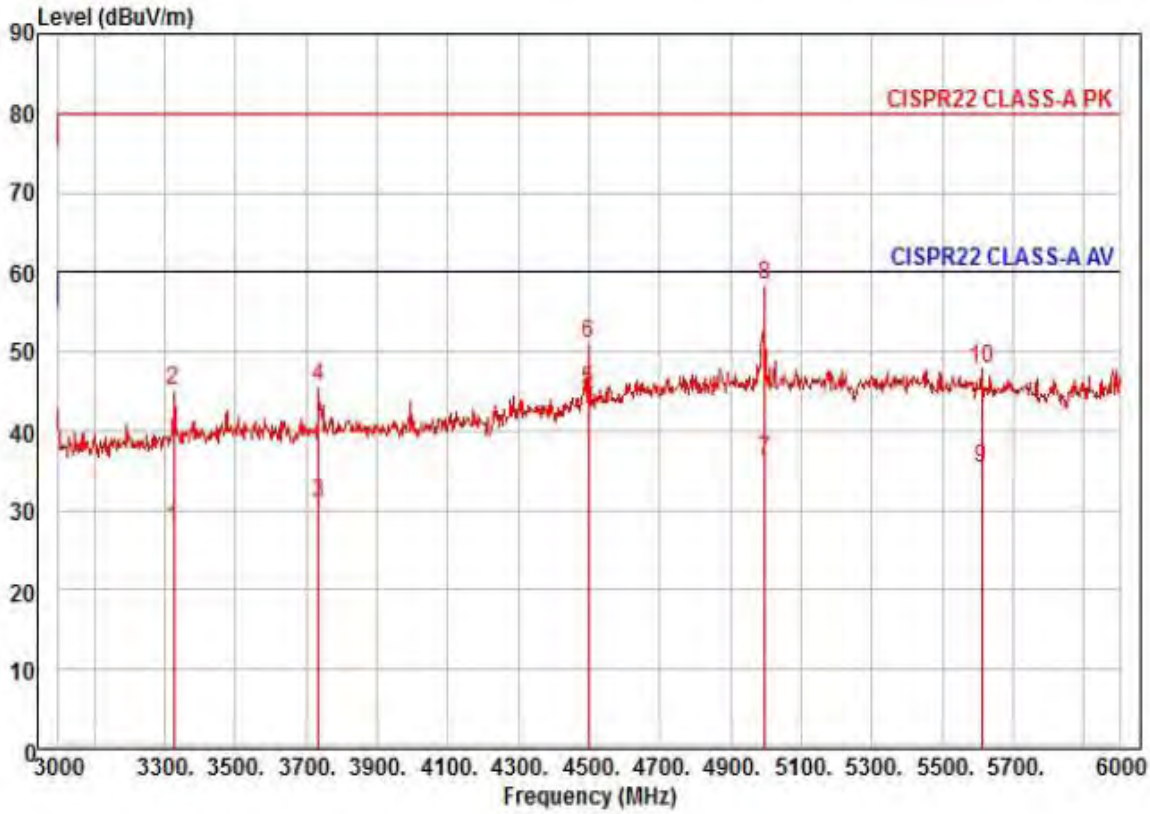
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNF-9010RP
Mode : DC 12V
Memo : 1 - 3 GHz

	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	1122.00	37.05	24.39	6.86	40.06	359	56.00	-27.76	vertical	Average
2	1122.00	65.31	24.39	6.86	40.06	359	76.00	-19.50	vertical	Peak
3	1194.00	36.91	24.68	7.07	40.02	312	56.00	-27.36	vertical	Average
4	1194.00	65.89	24.68	7.07	40.02	312	76.00	-18.38	vertical	Peak
5 av	1598.00	34.52	26.28	8.24	39.83	10	56.00	-26.79	vertical	Average
6 pp	1598.00	64.69	26.28	8.24	39.83	10	76.00	-16.62	vertical	Peak
7	1998.00	0.01	27.87	9.34	39.63	232	76.00	-78.41	vertical	Peak
8	2066.00	29.39	28.04	9.45	39.67	232	56.00	-28.79	vertical	Average
9	2066.00	56.32	28.04	9.45	39.67	232	76.00	-21.86	vertical	Peak
10	2202.00	27.68	28.37	9.66	39.75	226	56.00	-30.04	vertical	Average
11	2202.00	50.56	28.37	9.66	39.75	226	76.00	-27.16	vertical	Peak
12	2362.00	29.61	28.77	9.91	39.84	300	56.00	-27.55	vertical	Average
13	2362.00	51.65	28.77	9.91	39.84	300	76.00	-25.51	vertical	Peak
14	2830.00	27.24	29.91	10.82	40.11	324	56.00	-28.14	vertical	Average
15	2830.00	48.55	29.91	10.82	40.11	324	76.00	-26.83	vertical	Peak



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

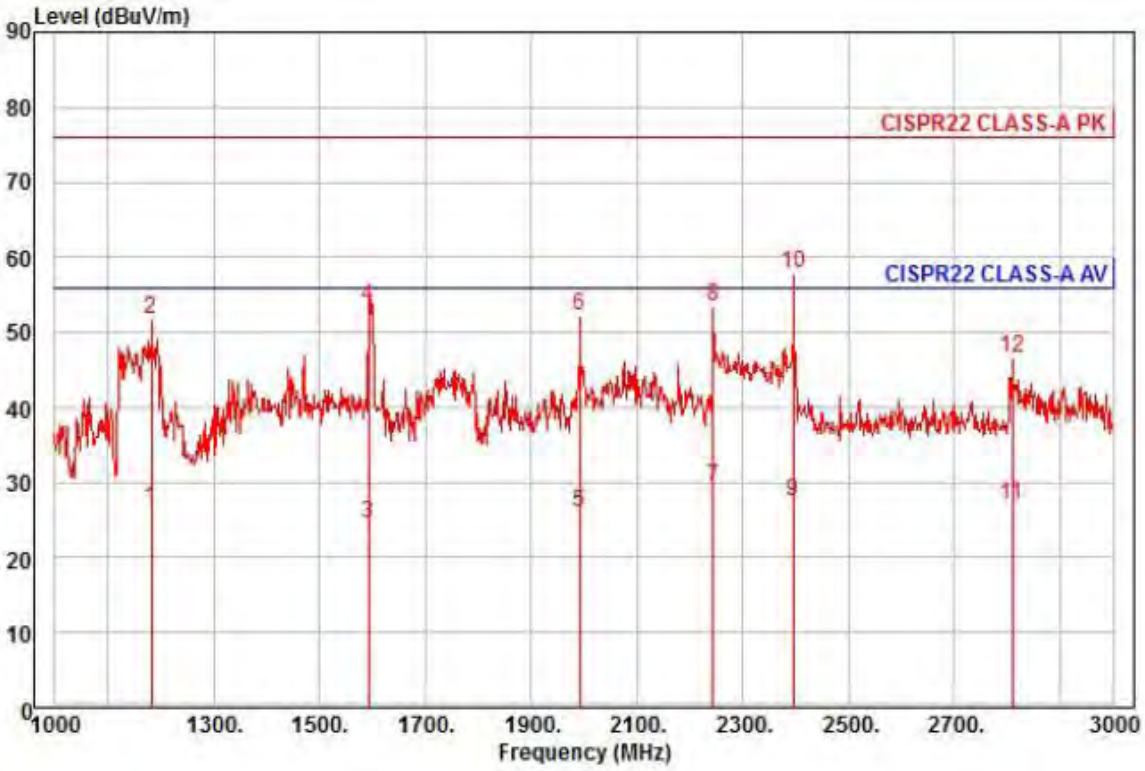
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3585.00	25.51	31.31	12.68	40.33	44	60.00	-30.83	horizontal	Average
2	3585.00	41.35	31.31	12.68	40.33	44	80.00	-34.99	horizontal	Peak
3 pp	4500.00	33.74	34.86	14.43	40.41	64	60.00	-17.38	horizontal	Average
4 pk	4500.00	41.12	34.86	14.43	40.41	64	80.00	-30.00	horizontal	Peak
5	5172.00	23.56	37.37	15.53	40.39	360	60.00	-23.93	horizontal	Average
6	5172.00	36.02	37.37	15.53	40.39	360	80.00	-31.47	horizontal	Peak
7	5520.00	23.22	36.67	15.96	40.34	282	60.00	-24.49	horizontal	Average
8	5520.00	35.65	36.67	15.96	40.34	282	80.00	-32.06	horizontal	Peak



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

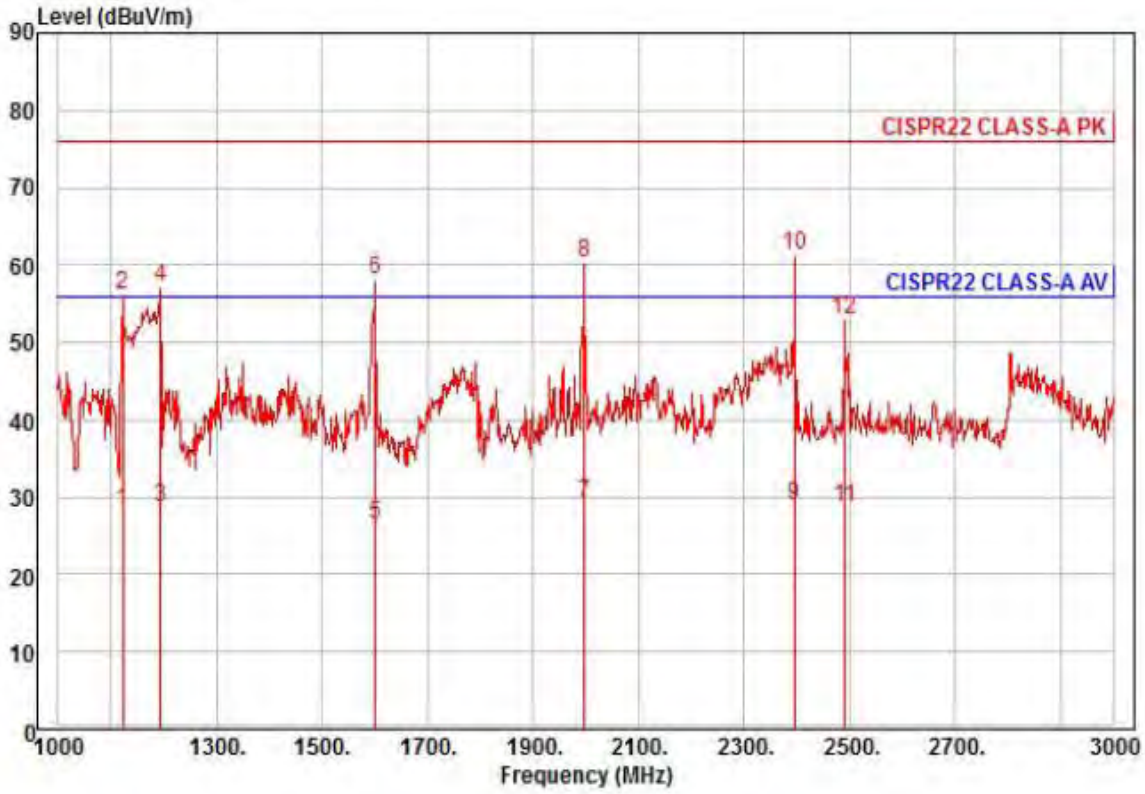
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3324.00	24.96	30.87	12.06	40.27	237	60.00	-32.38	vertical	Average
2	3324.00	42.46	30.87	12.06	40.27	237	80.00	-34.88	vertical	Peak
3	3735.00	26.76	31.56	12.98	40.36	93	60.00	-29.06	vertical	Average
4	3735.00	41.53	31.56	12.98	40.36	93	80.00	-34.29	vertical	Peak
5 pp	4500.00	36.19	34.86	14.43	40.41	237	60.00	-14.93	vertical	Average
6	4500.00	42.17	34.86	14.43	40.41	237	80.00	-28.95	vertical	Peak
7	4998.00	23.75	37.71	15.33	40.41	203	60.00	-23.62	vertical	Average
8 pk	4998.00	45.80	37.71	15.33	40.41	203	80.00	-21.57	vertical	Peak
9	5610.00	23.06	36.49	16.13	40.32	10	60.00	-24.64	vertical	Average
10	5610.00	35.53	36.49	16.13	40.32	10	80.00	-32.17	vertical	Peak

- PoE Mode



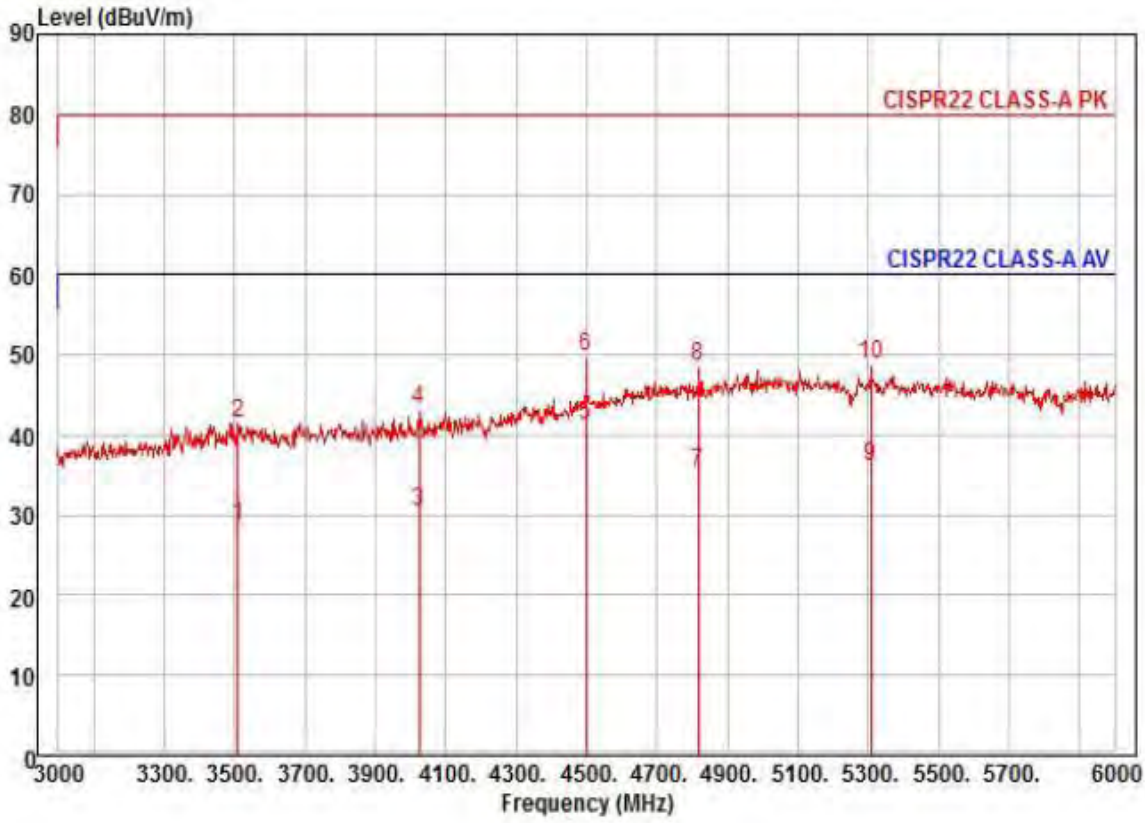
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNF-9010RP
Mode : PoE
Memo : 1 - 3 GHz

	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	1182.00	34.95	24.63	7.04	40.03	334	56.00	-29.41	horizontal	Average
2	1182.00	60.11	24.63	7.04	40.03	334	76.00	-24.25	horizontal	Peak
3	1592.00	29.99	26.26	8.23	39.83	110	56.00	-31.35	horizontal	Average
4	1592.00	58.86	26.26	8.23	39.83	110	76.00	-22.48	horizontal	Peak
5	1992.00	28.39	27.85	9.33	39.63	237	56.00	-30.06	horizontal	Average
6	1992.00	54.68	27.85	9.33	39.63	237	76.00	-23.77	horizontal	Peak
7 av	2244.00	30.92	28.48	9.72	39.77	38	56.00	-26.65	horizontal	Average
8	2244.00	55.03	28.48	9.72	39.77	38	76.00	-22.54	horizontal	Peak
9	2396.00	28.61	28.85	9.96	39.86	76	56.00	-28.44	horizontal	Average
10 pp	2396.00	58.93	28.85	9.96	39.86	76	76.00	-18.12	horizontal	Peak
11	2810.00	26.43	29.86	10.77	40.10	332	56.00	-29.04	horizontal	Average
12	2810.00	46.02	29.86	10.77	40.10	332	76.00	-29.45	horizontal	Peak



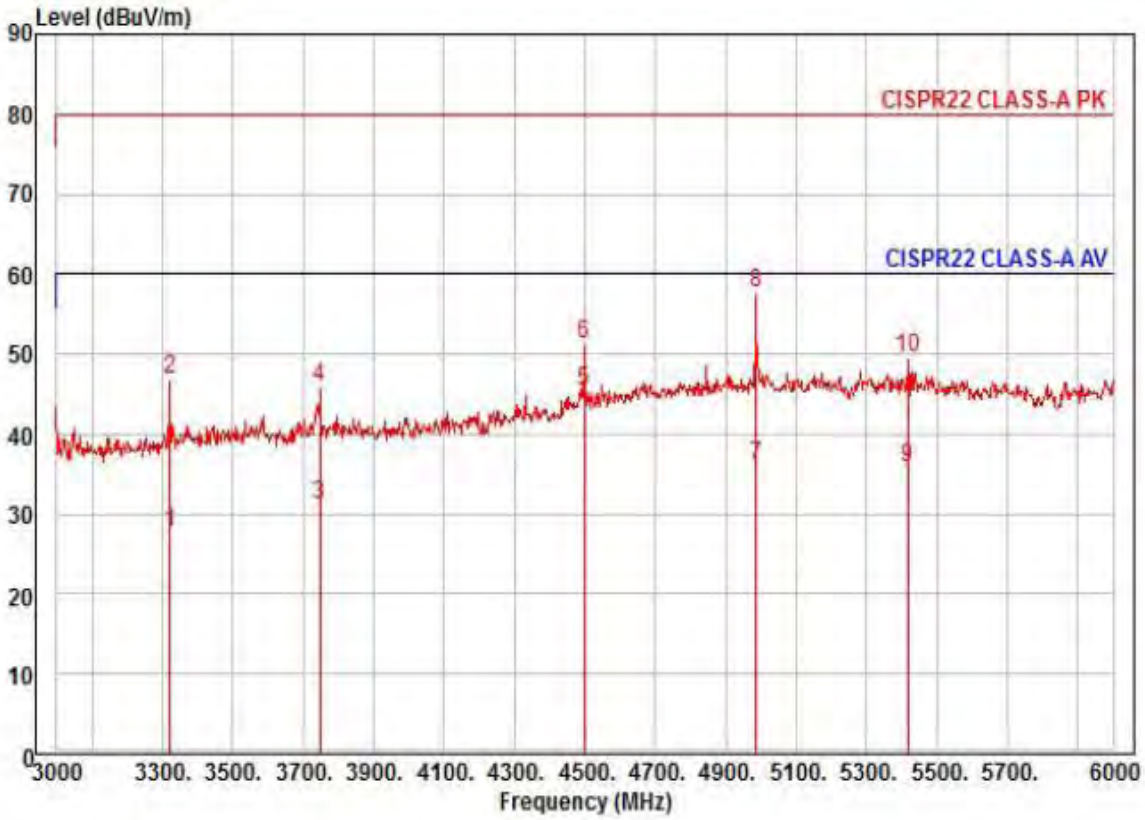
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNF-9010RP
Mode : PoE
Memo : 1 - 3 GHz

	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	1122.00	37.11	24.39	6.86	40.06	327	56.00	-27.70	vertical	Average
2	1122.00	64.90	24.39	6.86	40.06	327	76.00	-19.91	vertical	Peak
3	1194.00	36.85	24.68	7.07	40.02	306	56.00	-27.42	vertical	Average
4	1194.00	65.39	24.68	7.07	40.02	306	76.00	-18.88	vertical	Peak
5	1600.00	31.86	26.29	8.25	39.83	54	56.00	-29.43	vertical	Average
6	1600.00	63.39	26.29	8.25	39.83	54	76.00	-17.90	vertical	Peak
7 av	1998.00	31.50	27.87	9.34	39.63	201	56.00	-26.92	vertical	Average
8	1998.00	62.64	27.87	9.34	39.63	201	76.00	-15.78	vertical	Peak
9	2396.00	30.06	28.85	9.96	39.86	163	56.00	-26.99	vertical	Average
10 pp	2396.00	62.41	28.85	9.96	39.86	163	76.00	-14.64	vertical	Peak
11	2492.00	29.31	29.09	10.10	39.92	157	56.00	-27.42	vertical	Average
12	2492.00	53.75	29.09	10.10	39.92	157	76.00	-22.98	vertical	Peak



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

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3510.00	25.27	31.19	12.53	40.31	24	60.00	-31.32	horizontal	Average
2	3510.00	38.03	31.19	12.53	40.31	24	80.00	-38.56	horizontal	Peak
3	4023.00	25.04	32.14	13.55	40.41	289	60.00	-29.68	horizontal	Average
4	4023.00	37.96	32.14	13.55	40.41	289	80.00	-36.76	horizontal	Peak
5 pp	4500.00	32.25	34.86	14.43	40.41	73	60.00	-18.87	horizontal	Average
6 pk	4500.00	40.79	34.86	14.43	40.41	73	80.00	-30.33	horizontal	Peak
7	4818.00	24.14	36.68	15.00	40.41	38	60.00	-24.59	horizontal	Average
8	4818.00	37.23	36.68	15.00	40.41	38	80.00	-31.50	horizontal	Peak
9	5307.00	23.52	37.10	15.69	40.37	274	60.00	-24.06	horizontal	Average
10	5307.00	36.28	37.10	15.69	40.37	274	80.00	-31.30	horizontal	Peak



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

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3321.00	25.06	30.87	12.05	40.27	49	60.00	-32.29	vertical	Average
2	3321.00	44.26	30.87	12.05	40.27	49	80.00	-33.09	vertical	Peak
3	3747.00	26.83	31.58	13.00	40.36	115	60.00	-28.95	vertical	Average
4	3747.00	41.76	31.58	13.00	40.36	115	80.00	-34.02	vertical	Peak
5 pp	4500.00	36.52	34.86	14.43	40.41	236	60.00	-14.60	vertical	Average
6	4500.00	42.45	34.86	14.43	40.41	236	80.00	-28.67	vertical	Peak
7	4986.00	23.56	37.64	15.30	40.41	44	60.00	-23.91	vertical	Average
8 pk	4986.00	45.21	37.64	15.30	40.41	44	80.00	-22.26	vertical	Peak
9	5418.00	23.55	36.88	15.82	40.35	69	60.00	-24.10	vertical	Average
10	5418.00	37.07	36.88	15.82	40.35	69	80.00	-30.58	vertical	Peak

Harmonic Current Emissions and Voltage Fluctuations and Flicker

Average harmonic current results

Hn	Ieff [A]	% of Limit	Limit [A]	Result
N/A	N/A	N/A	N/A	N/A

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	Ieff [A]	% of Limit	Limit [A]	Result
N/A	N/A	N/A	N/A	N/A

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

Test Data - Voltage Fluctuations

Maximum Flicker results

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

Test Setup Photos and Configuration

Conducted Voltage Emissions

N/A

N/A

Conducted Telecommunication Emissions

- DC 12 V Mode

- PoE Mode

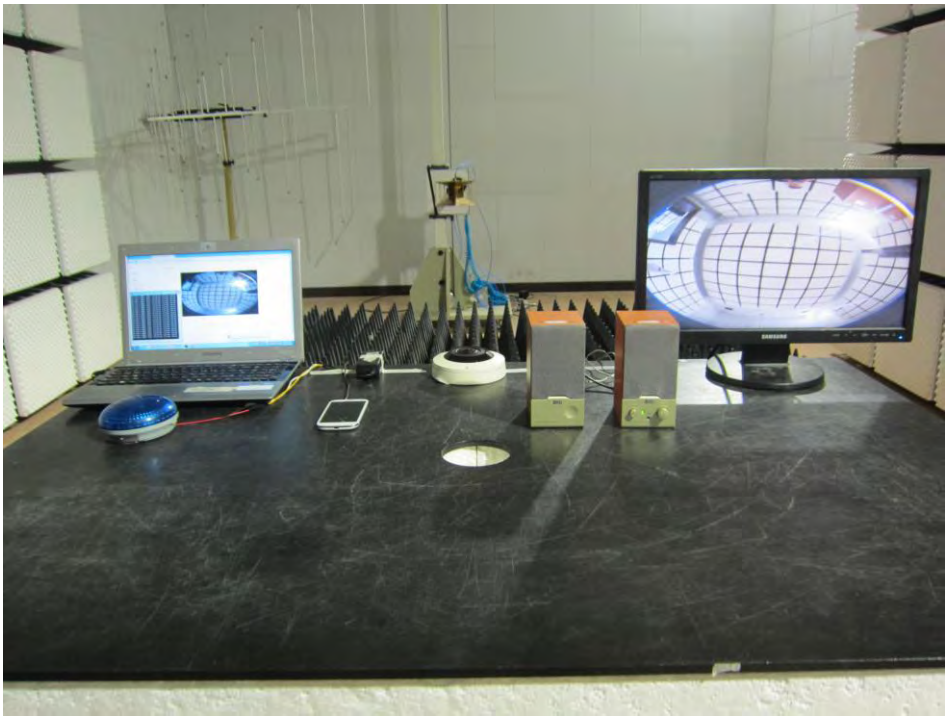
Radiated Electric Field Emissions(Below 1 ㎓)

- DC 12 V Mode

- PoE Mode

Radiated Electric Field Emissions(Above 1 ㎓)

- DC 12 V Mode



- PoE Mode

Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

Electrostatic Discharge

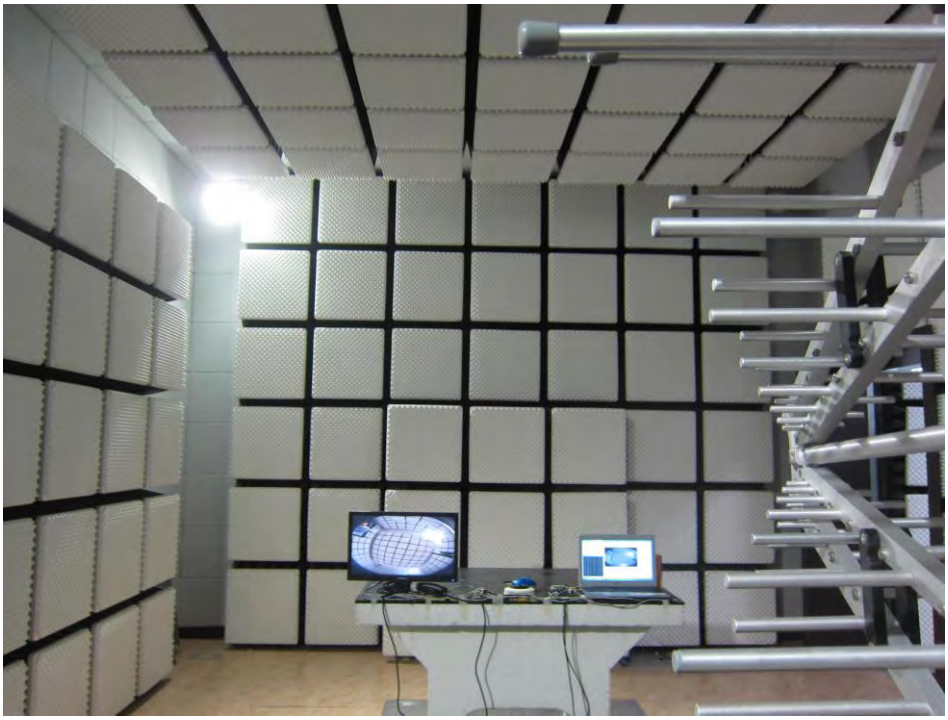
- DC 12 V Mode

- PoE Mode

Radiated Electric Field Immunity

- DC 12 V Mode

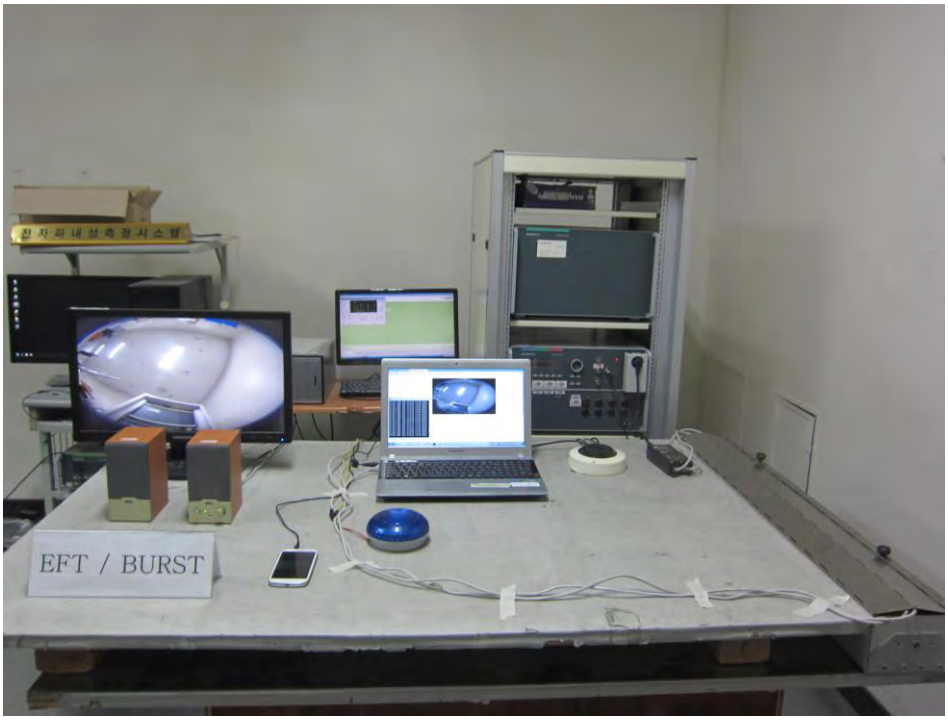
- PoE Mode



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

Voltage Dips and Short Interruptions

N/A

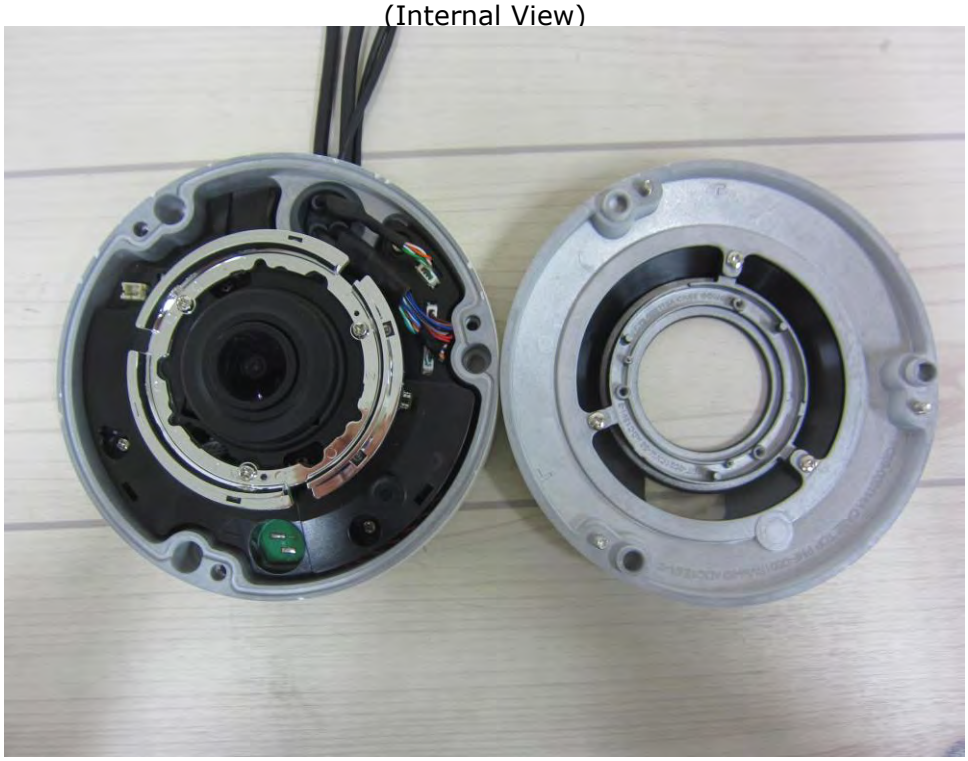
EUT External Photographs

(Top)

(Bottom)

EUT Internal Photographs

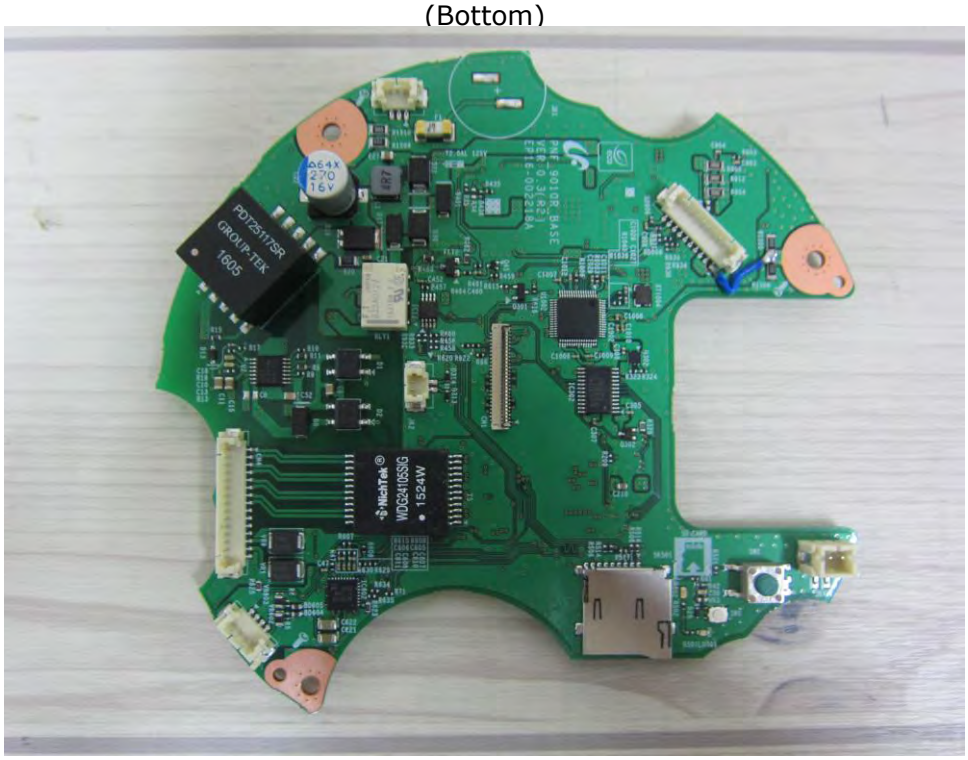
(Internal View)



EUT Internal View – MAIN BOARD

(Top)

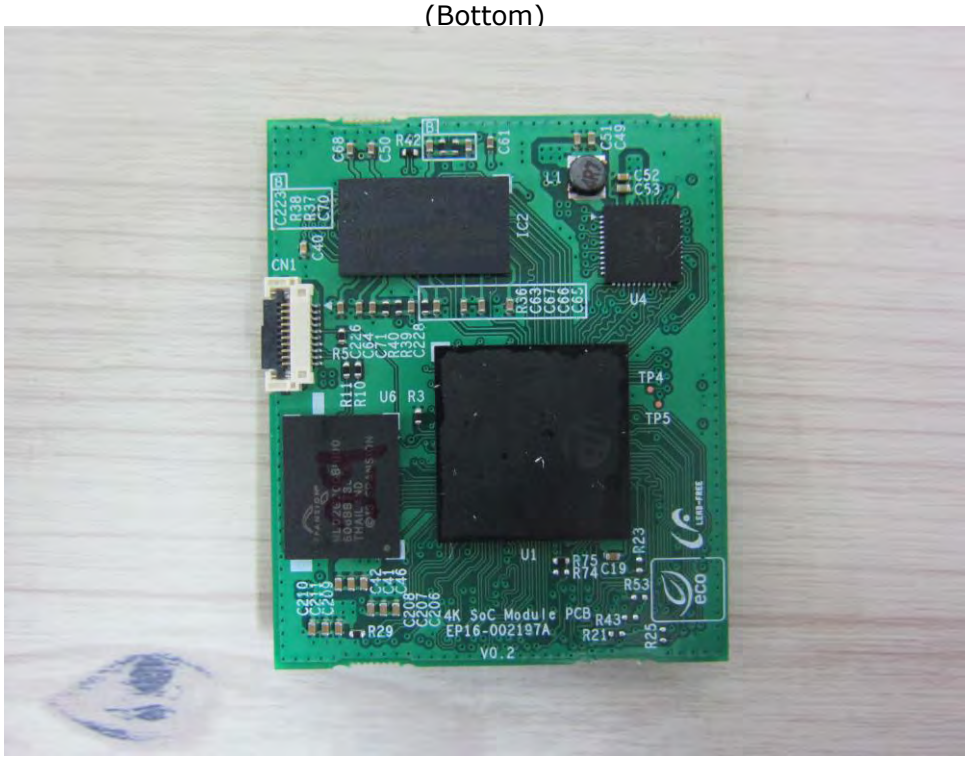
(Bottom)



EUT Internal View – SUB BOARD1

(Top)

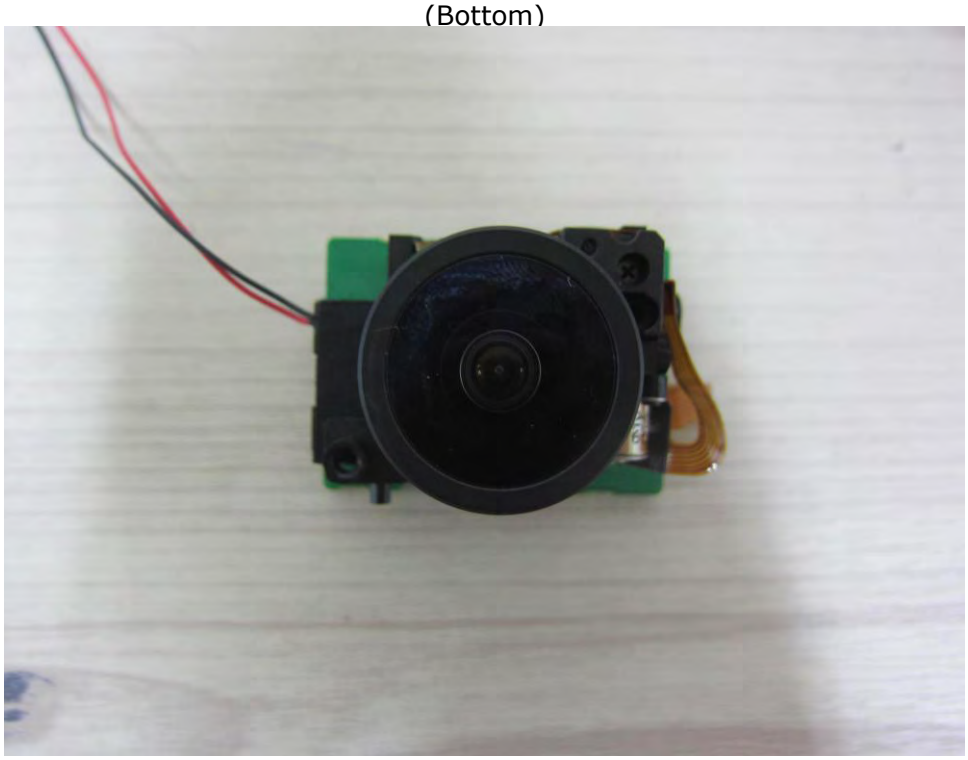
(Bottom)



EUT Internal View – SUB BOARD2

(Top)

(Bottom)



EUT Internal View – SUB BOARD3

(Top)

(Bottom)

Label and Location

NETWORK CAMERA

Model No : PNF-9010R

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

Made in China