



EMC TEST REPORT For VCCI

Test Report No. : KES-E1-16T0313

Date of Issue : Jul. 06, 2016

Product name : NETWORK CAMERA
7

Model/Type No. : PNF-9010RN

Variant Model : -

Applicant : Hanwha Techwin Co., Ltd.

Applicant Address : 1204, Changwon-daero, Seongsan-gu, Changwon-si,
Gyeongsangnam-do, Korea

Manufacturer : Tianjin Samsung Techwin Opto-Electronic Co., Ltd.

Manufacturer Address : No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA,
Tianjin, 300385, People's Republic of China

Date of Receipt : Jun. 02, 2016

Test date : Jun. 27, 2016 - Jun. 28, 2016

Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Young Jun, Jo
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

**KES Co., Ltd.**

C-3701, Simin-daero 365-40,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

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REPORT REVISION HISTORY

Date	Revision	Page No
Jul. 06, 2016	KES-E1-16T0313	Issued

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1.0 General Product Description

Main Specifications of EUT 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 Mercury)
Electronic Shutter Speed	2 ~ 1/12,000 sec
Digital Zoom	16x, Digital PTZ(Preset, Group)
Flip / Mirror	Off / On
Intelligent Video Analytics	Tampering(Scene Change), People counting, Heatmap, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection
Alarm I/O	Input 1ea / Output 1ea
Audio In	Line in/out Built-in Mic
Audio out	Line out
Alarm Triggers	Motion detection, Tampering, Audio Detection, Alarm Input, Network-Disconnection, Defocus detection
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

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KES Co., Ltd.

C-3701, Simin-daero 365-40,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
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View Composition		<Camera Side> 360 source view 180° Panorama 360° Panorama Double Panorama 360+4 PTZ view 180+4 PTZ view Quad PTZ view View 1/2/3/4 360+8 PTZ view
Network		
Ethernet		RJ-45 (10/100BASE-T)
Video Compression Format		H.265 / H.264 (MPEG-4 Part 10/AVC), Motion JPEG
Resolution	Original View	Max 12MP TBD
	Dewarped View	Max 9M
Max. Framera	H.265	12M 20fps, 9M 25fps
	H.264	12M 20fps, 9M 25fps
	MJPEG	Max 15fps at all resolutions
Smart Codec		Wise Stream
Video Quality Adjustment		H.264/H.265 : Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate Control Method		H.264/H.265 : CBR or VBR Motion JPEG : VBR
Streaming Capability		Multiple Streaming (Up to 10 profiles)
Audio Compression Format		G.711 u-law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC : 48Kbps at 16KHz
Audio Communication		Bi-directional
IP		IPv4, IPv6
Protocol		TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour, SIP
Security		HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication (EAP-TLS, EAP-LEAP)
Streaming Method		Unicast / Multicast
Max. User Access		20 users at Unicast Mode
Edge Storage		micro SD/SDHC/SDXC (128GB) - motion Images recorded in the SDX/SDHC/SD memory card can be downloaded. NAS(Network Attached Storage) Local PC
Application Programming Interface		ONVIF Profile S/G SUNAPI(HTTP API) v2.0 Samsung techwin open platrom
Webpage Language		English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Portuguese, Turkish, Polish, Czech, Dutch, Hungary, Greek
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

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

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1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage ☐ 100 Vac ☐ 110 Vac ☐ 120 Vac ☒ PoE ☒ 12 Vdc

Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

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

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adapter	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 Adapter	RJ-45(PoE)	3.5	U
PoE Adapter	RJ-45(LAN)	Notebook	RJ-45(LAN)	1.7	U
NETWORK CAMERA (E.U.T)	BNC	Monitor	BNC	4.0	S
	Audio In	Mobile Phone	Audio Out	1.7	U
	Audio Out	Speaker	Audio In	1.6	U
	Alarm	Alarm Jig	Alarm	3.0	U
	Micro SD Slot	Micro SD Card	Micro SD Slot	-	-

* Unshielded=U, Shielded=S



1.7 EUT Operating Mode(s)

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

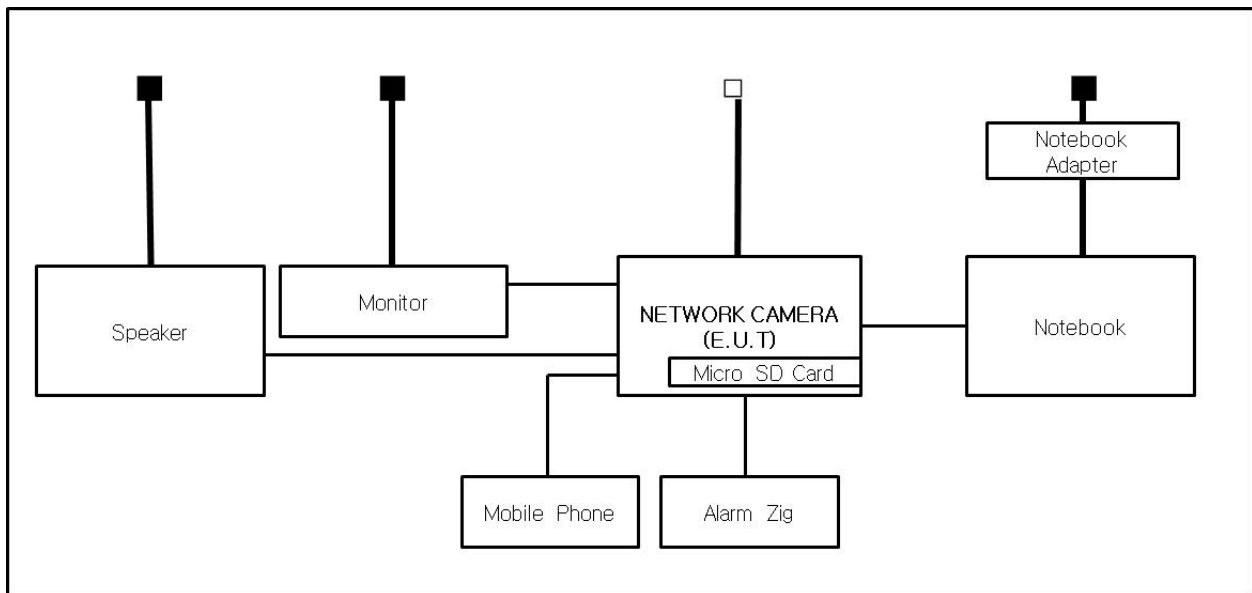
Test mode	Normal operating
DC 12 V	MONITORING, PING TEST
PoE	MONITORING, PING TEST

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

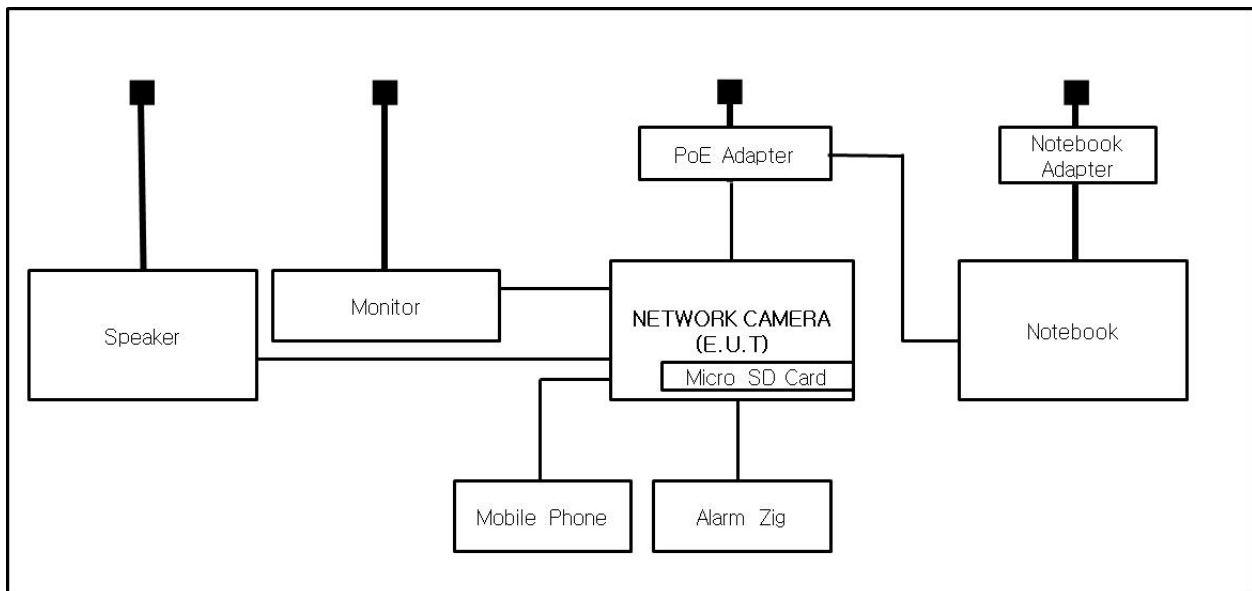
1.8 Configuration

■ 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 473-29 Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22.

1.11 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	
JAPAN	VCCI	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	 R-4308, C-4798, T-2311, G-914
KOREA	MSIP	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
Canada	IC	3 & 10 meter Open Area Test Sites and one conducted site	 4769B-1
Europe	CE	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	
International	KOLAS	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014 / 30 / EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55022:2010

☐ Class A

☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



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- | | | |
|---|---|----------------------------------|
| ☒ 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 | | |

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

Test Conditions

Temperature: °C
Relative Humidity: %

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks

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

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Jun. 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	-	AONE SHIELD	-	-

Test Conditions

Temperature: 24,9 °C

Relative Humidity: 42,1 %

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jun. 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 °C
Relative Humidity: 43,0 %

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jun. 28, 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	100552	04, 24, 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: 24,5 °C
Relative Humidity: 47,7 %

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



KES Co., Ltd.

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APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

N/A

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[NEUTRAL]

N/A

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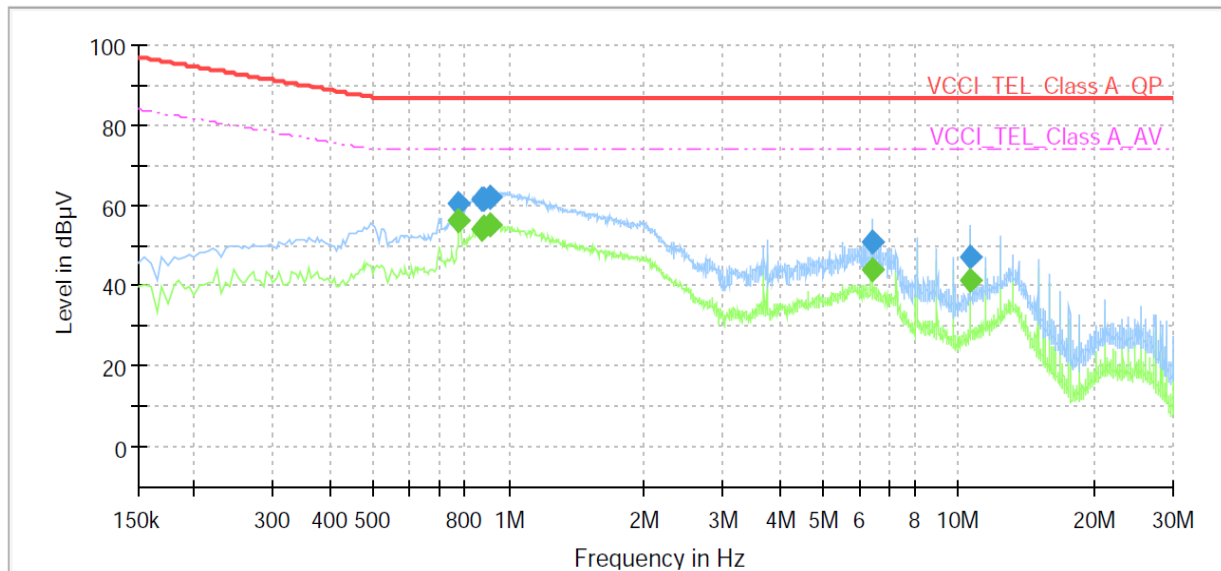
Conducted Emissions at Telecommunication Ports

- DC 12 V Mode

[10 Mbps]

Common Information

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



Final Result

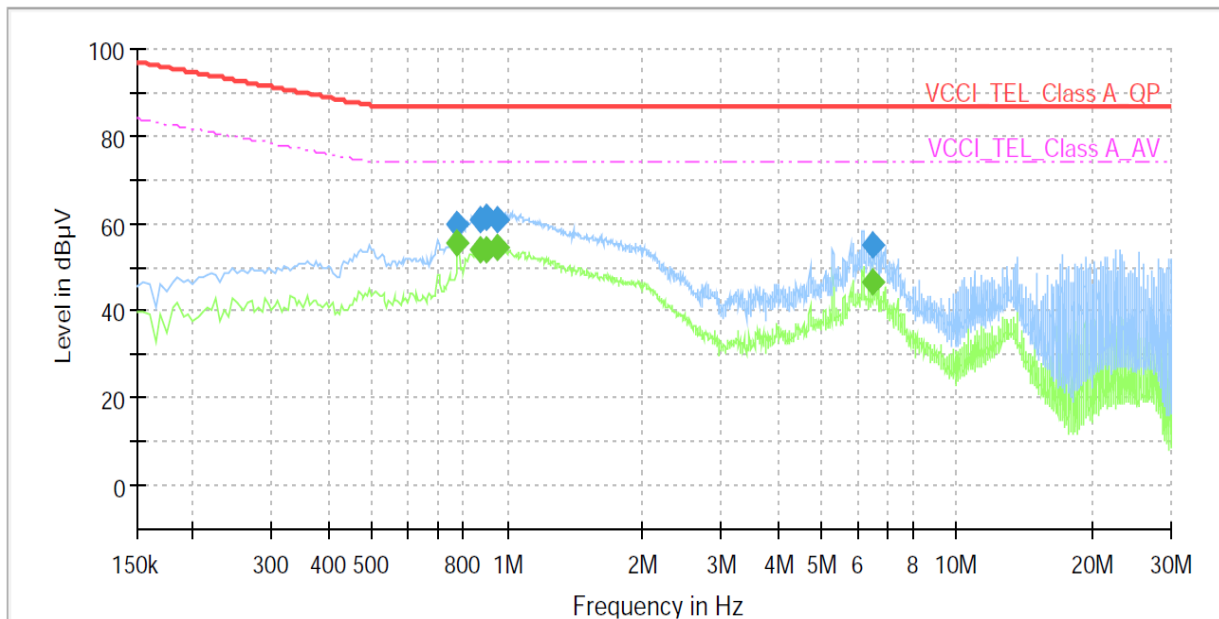
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.775000	---	56.31	74.00	17.69	1000.0	9.000	Single Line	9.9
0.775000	60.32	---	87.00	26.68	1000.0	9.000	Single Line	9.9
0.870000	---	54.19	74.00	19.81	1000.0	9.000	Single Line	9.9
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

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[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PNF-9010RN
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

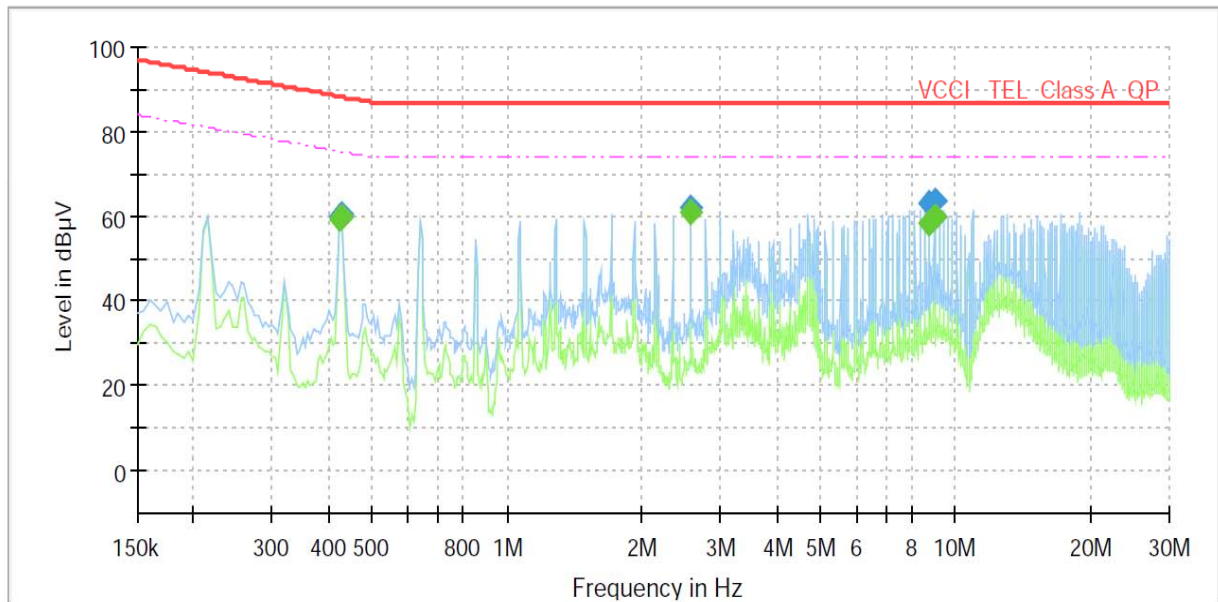
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The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

- PoE Mode

[10 Mbps]

Common Information

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



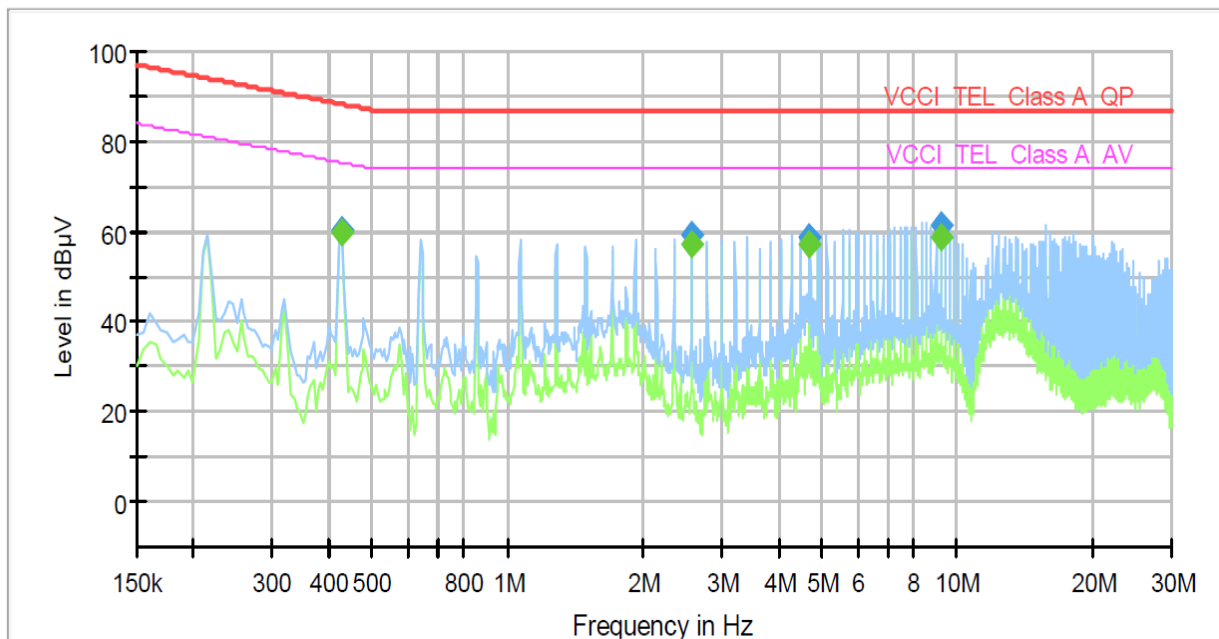
Final Result

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-9010RN
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 GHz)**

- DC 12 V Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
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

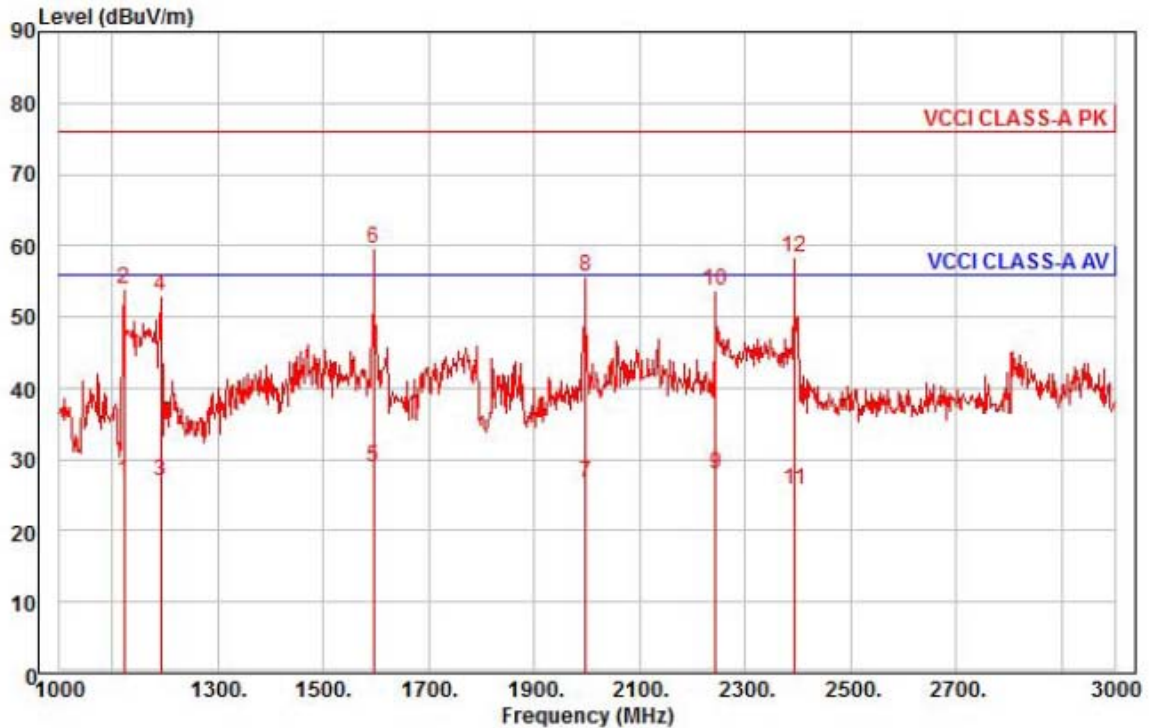
- PoE Mode

Frequency	Amplitude	ANT	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]
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 GHz)

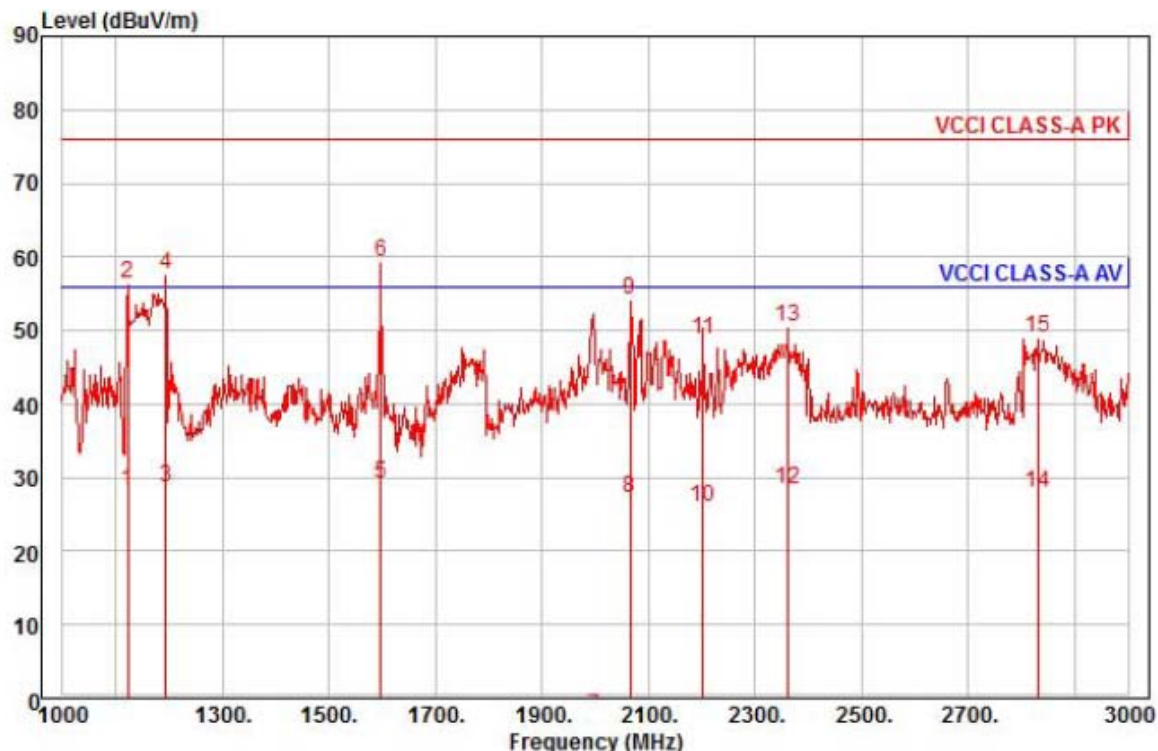
- DC 12 V Mode



Site : chamber
Condition: VCCI CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNF-9010RN
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

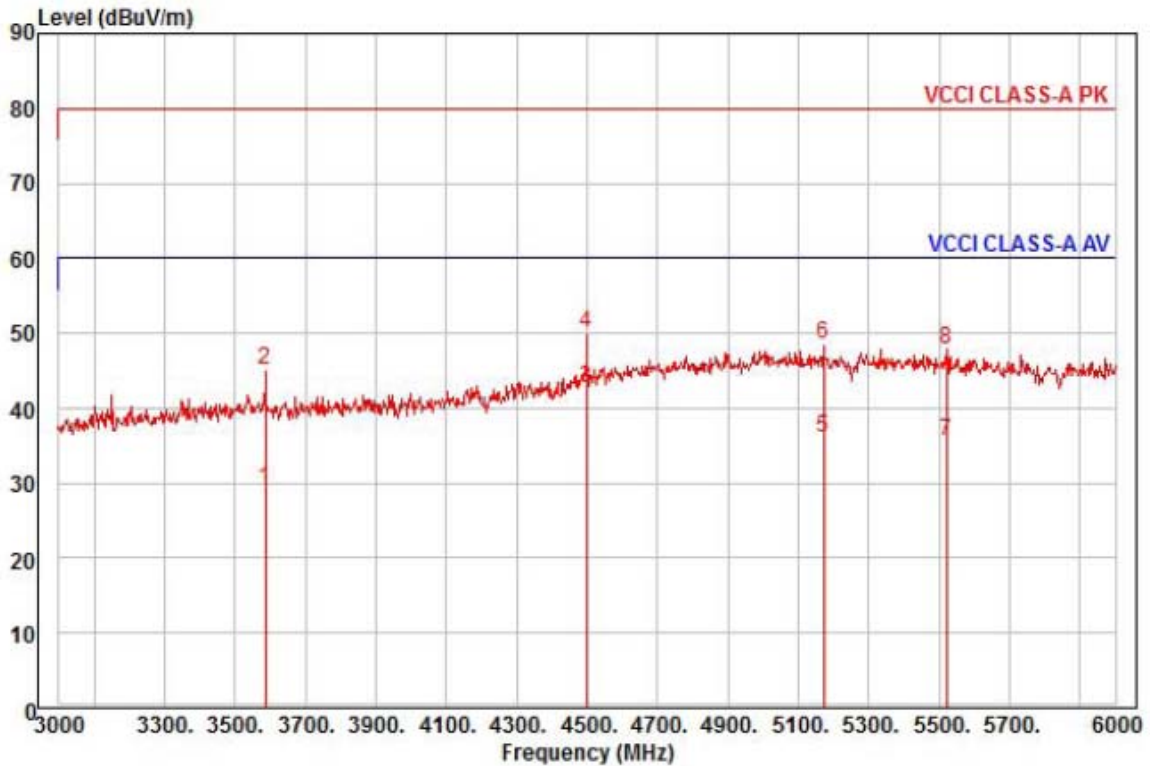
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Site : chamber
Condition: VCCI CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNF-9010RN
Mode : DC 12V
Memo : 1 - 3 GHz

	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

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

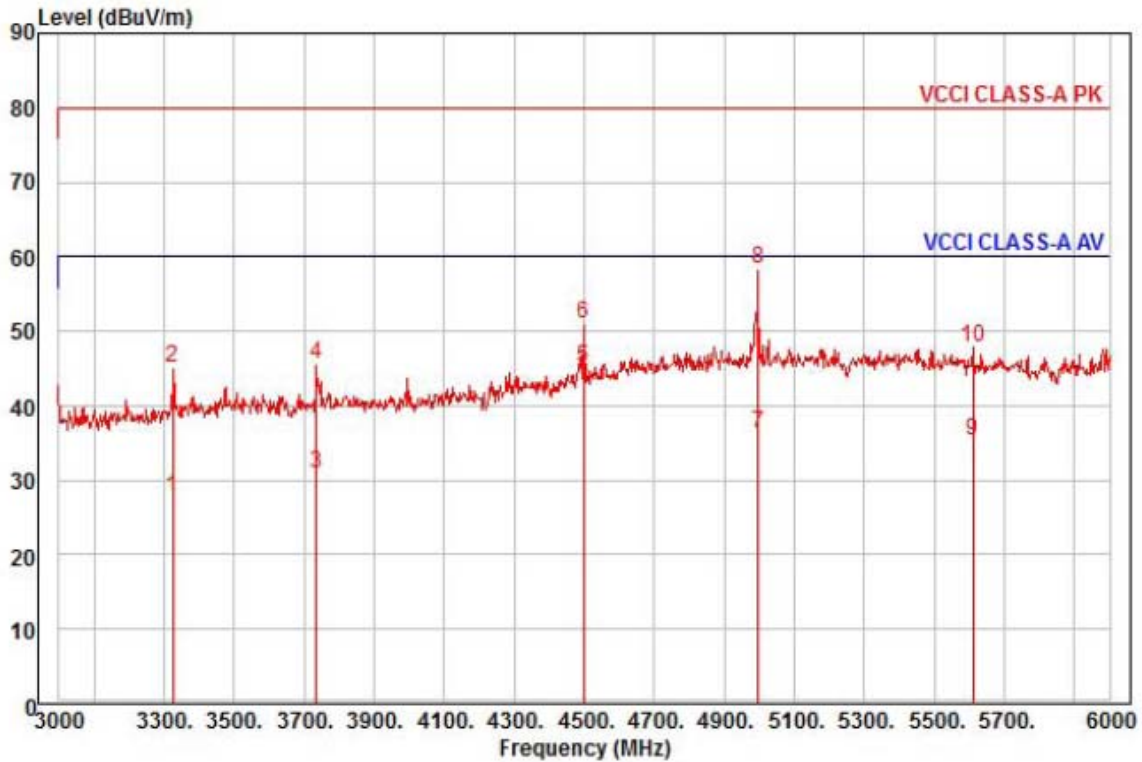
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3585.00	25.51	31.31	12.68	40.33	44	60.00	-30.83	horizontal	Average
2	3585.00	41.35	31.31	12.68	40.33	44	80.00	-34.99	horizontal	Peak
3 pp	4500.00	33.74	34.86	14.43	40.41	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



KES Co., Ltd.

C-3701, Simin-daero 365-40,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

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KES-E1-16T0313
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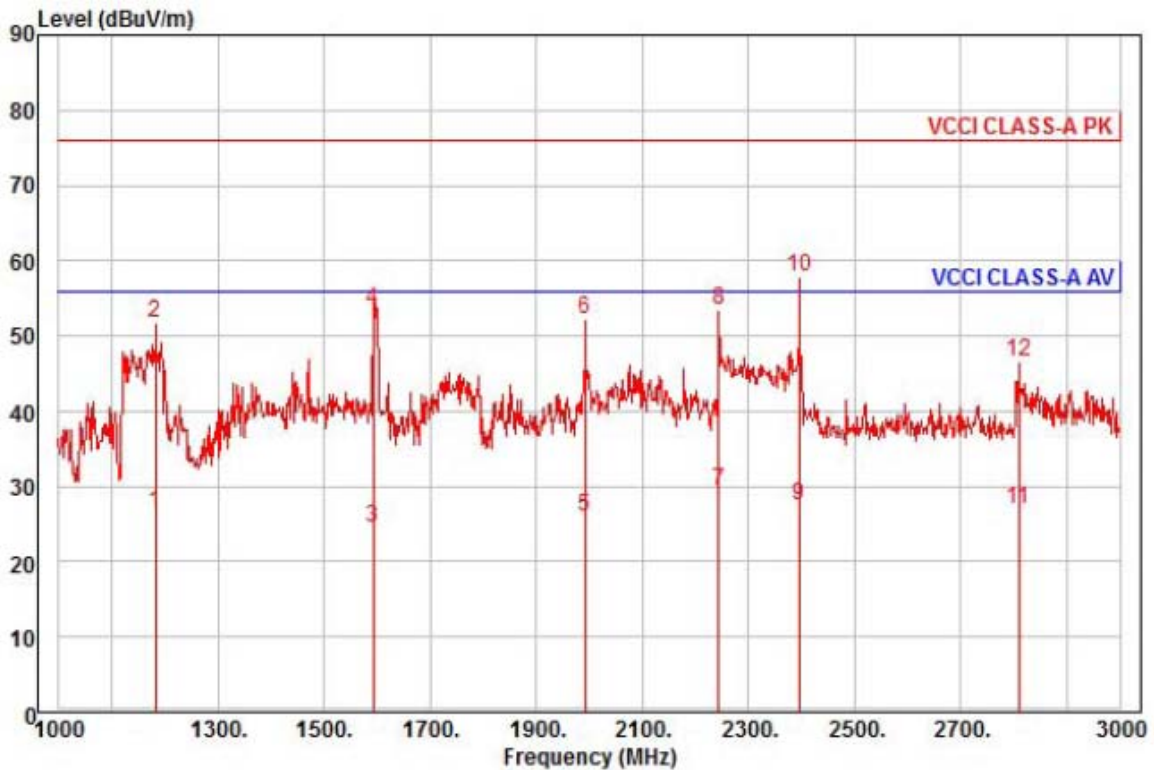
Site : chamber
Condition: VCCI CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNF-9010RN
Mode : DC 12V
Memo : 3 - 6 GHz

	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

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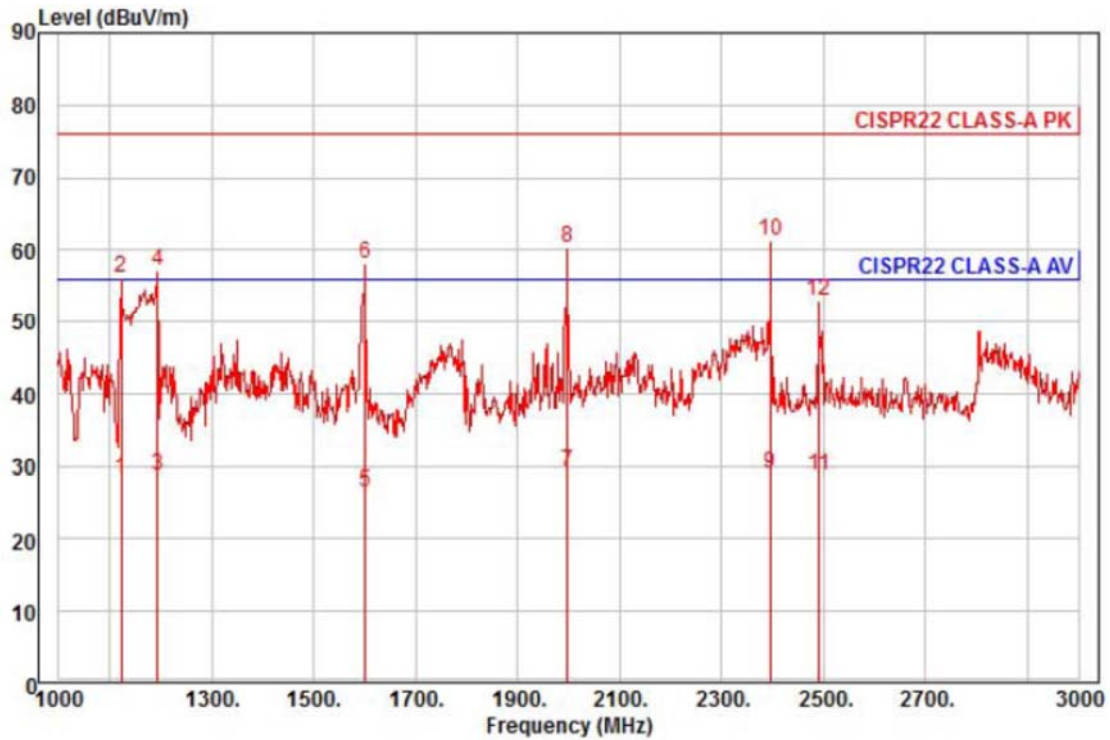
- PoE Mode



Site : chamber
Condition: VCCI CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNF-9010RN
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

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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 : PNF-9010RN
Mode : PoE
Memo : 1 - 3 GHz

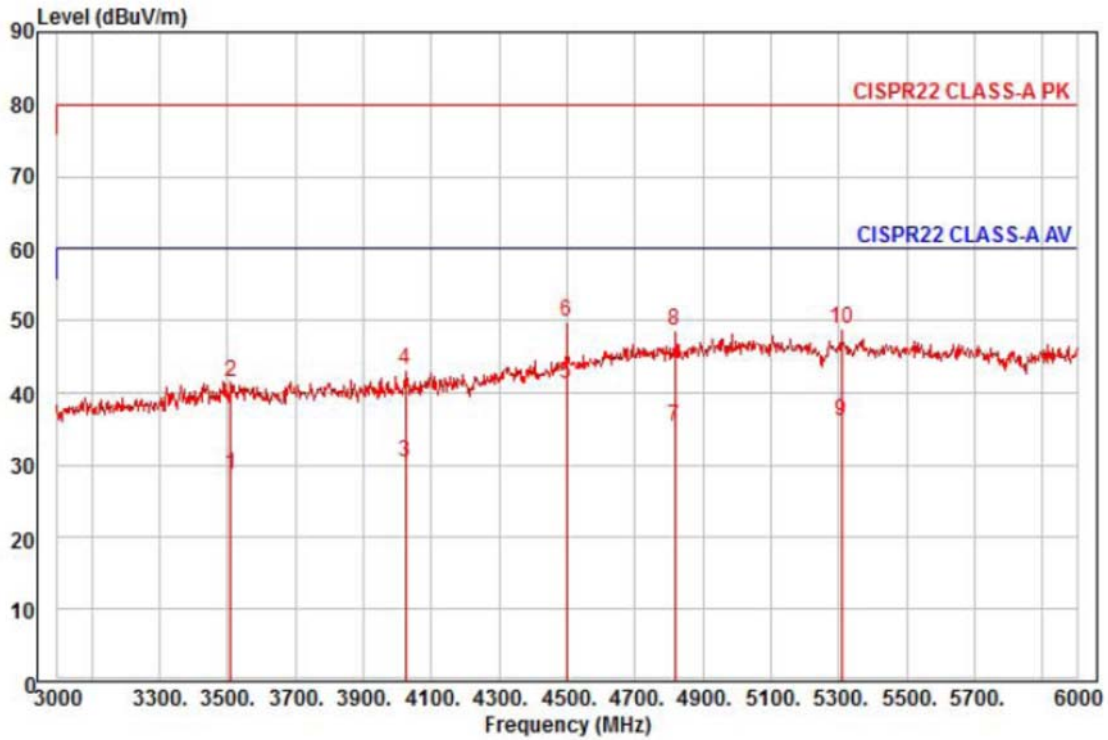
	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1122.00	37.11	24.39	6.86	40.06	327	56.00	-27.70	vertical	Average
2	1122.00	64.90	24.39	6.86	40.06	327	76.00	-19.91	vertical	Peak
3	1194.00	36.85	24.68	7.07	40.02	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



KES Co., Ltd.

C-3701, Simin-daero 365-40,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

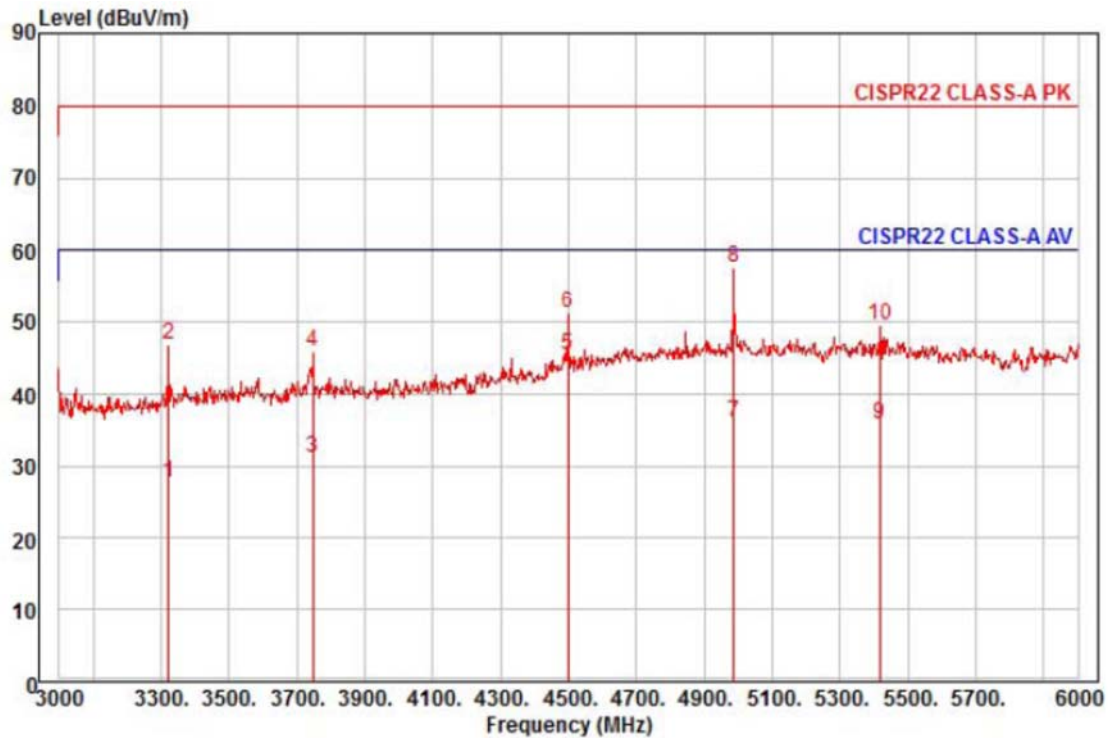
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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNF-9010RN
Mode : PoE
Memo : 3 - 6 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	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

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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 : PNF-9010RN
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



KES Co., Ltd.

C-3701, Simin-daero 365-40,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
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Test Setup Photos and Configuration

Conducted Voltage Emissions

N/A

N/A

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Conducted Telecommunication Emissions

- DC 12 V Mode



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- PoE Mode



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Radiated Electric Field Emissions(Below 1 GHz)

- DC 12 V Mode



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- PoE Mode



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Radiated Electric Field Emissions(Above 1 GHz)

- DC 12 V Mode



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- PoE Mode



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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

(Internal View)



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EUT Internal View – MAIN BOARD

(Top)



(Bottom)



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EUT Internal View – SUB BOARD1

(Top)



(Bottom)



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EUT Internal View – SUB BOARD2

(Top)



(Bottom)



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EUT Internal View – SUB BOARD3

(Top)



(Bottom)



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