



EMC TEST REPORT For VCCI

Test Report No. : KES-E1-16T0179
Date of Issue : Apr. 28, 2016
Product name : NETWORK CAMERA
Model/Type No. : PNO-9080RN
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 : Apr. 14, 2016
Test date : Apr. 25, 2016 ~ Apr. 27, 2016
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dae Hyun, Kim
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

**KES Co., Ltd.**

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KES-E1-16T0179
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REPORT REVISION HISTORY

Date	Revision	Page No
Apr. 28, 2016	KES-E1-16T0179	Issued

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1.0 General Product Description

Main Specifications of EUT are:

	PNO-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), 0.01Lux(2sec, F1.6, 30IRE) 0 Lux (IR LED On)
S / N Ratio	50dB
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 704x480(N), 704x576(P), for installation - DIP 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) - 45.6°(Tele) / V : 49.7°(Wide) - 24.0°(Tele) [3840 x 2160] H : 92.9°(Wide) - 42.6°(Tele) / V : 49.7°(Wide) - 24.0°(Tele)
Min. Object Distance	0.5m(1.64ft)
Focus Control	Simple Focus (Motorized V/F) / Manual - Remote control via network (Manual, Simple Focus)
Lens Type	P-Iris mode
Mount Type	Board-in type
LDC(Lens Distortion Correction)	Off/On
Operational	
IR LED	4 EA
Viewable Length	30m
Camera Title	Off / On (Displayed up to 45 characters) - W/W : English/Numeric/Special 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 / BLC / WDR
Wide Dynamic Range	120dB
Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNR (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	-
Defog	Auto/Manual/Off
Motion Detection	Off / On(8ea, Polygonal)
Privacy Masking	Off / On (16ea, Polygonal with 4Lines 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 Hallway : 90° / 270°

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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
Remote Control Interface	-
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 • External output
Audio In	Selectable (Mic IN/Line IN), Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out (3.5mm stereo mini jack), Max output level: 1 Vrms

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Network	
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 / 2592x1944 / 2592x1464 / 1920x1080 / 1600x1200 / 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 : 4000 X 3000 : 2 fps 4096 X 2160 : 2 fps 3840 X 2160 : 2 fps 2592 X 1944 : 2 fps 2592 X 1464 : 2 fps 1920 X 1080 : 4 fps 1600 X 1200 : 4 fps 1280 X 1024 : 5 fps 1280 X 960 : 5 fps 1280 X 720 : 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, DNS, QoS, PIM-SM, UPnP, Bonjour
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

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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 SUNAPI(HTTP API) SVNP 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 10.8, 10.9, 10.10, 10.11 Non-plugin Webviewer Supported Browser: Google Chrome 47, MS Edge 20 Support Codec : Video : H.264, MJPEG (MAX 1M 15FPS) Audio : G.711 Plug-In Webviewer Supported Browser : MS Explore 11 , Mozilla Firefox 43 , Apple Safari 9 * Mac OS X only
Central Management Software	SmartViewer, SSM
Pixel Counter	support (plug-in viewer only)
Environmental	
Operating Temperature / Humidity	-40°C ~ +55°C(-40°F ~ +131°F) / Less than 90% RH * Start up should be done at above -35°C
Storage Temperature / Humidity	-40°C ~ +60°C (-40°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66
Vandal Resistance	IK10
Electrical	
Input Voltage / Current	24V AC, 12V DC, PoE(IEEE802.3af class3)
Power Consumption	- Heater On DC 12V : Max 11.55W PoE : Max 12.95W AC 24V : 14.08W - Heater Off DC 12V : Max 10.45W PoE : Max 11.77W AC 24V : 12.43W
Mechanical	
Color / Material	DARK GRAY / ALUMINIUM
Dimension (WxHxD)	Korea : W82.4 x H90.0 x D312.6 (with bracket) Export : W82.4 x H87.0 x D348.3 (with bracket/Backbox) Common : W82.4 x H87.0 x D178.0 (without bracket)
Weight	Korea : 1180g Export : 1420g

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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	PNO-9080RN	-	Tianjin Samsung Techwin Opto-Electronic Co., Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adapter	PD-3001GC	PD-6082G300	PowerDsine	-
Notebook	NT-R410Y	Z9YJ93CS300631H	Samsung Electronics co., ltd.	-
Notebook Adapter	AD-6019	-	LI SHIN INTERNATIONAL ENTERPRISE CORP.	-
Speaker	BR10000A CUVE	SN128458795701	BEIJING EDIFIER HI-TECH GROUP.	-
Microphone	CMK-303	-	CAMAC	-
Alarm Jig	-	-	-	-
Mobile Phone	SHV-E210L	R33D713KA3F	Samsung Electronics co., ltd.	-

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	Notebook	RJ-45	3.0	U
	Audio In	MicroPhone	Audio Out	1.3	U
	Audio Out	Speaker	Audio In	1.4	U
	Alarm	Alarm Jig	Alarm	3.0	U
Notebook	3.5 mm	Mobile Phone	3.5 mm	0.4	U

- PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	RJ-45(PoE)	PoE Adapter	RJ-45(PoE)	3.0	U
PoE Adapter	RJ-45(LAN)	Notebook	RJ-45(LAN)	0.3	U
NETWORK CAMERA (E.U.T)	Audio In	MicroPhone	Audio Out	1.3	U
	Audio Out	Speaker	Audio In	1.4	U
	Alarm	Alarm Jig	Alarm	3.0	U
Notebook	3.5 mm	Mobile Phone	3.5 mm	0.4	U

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

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

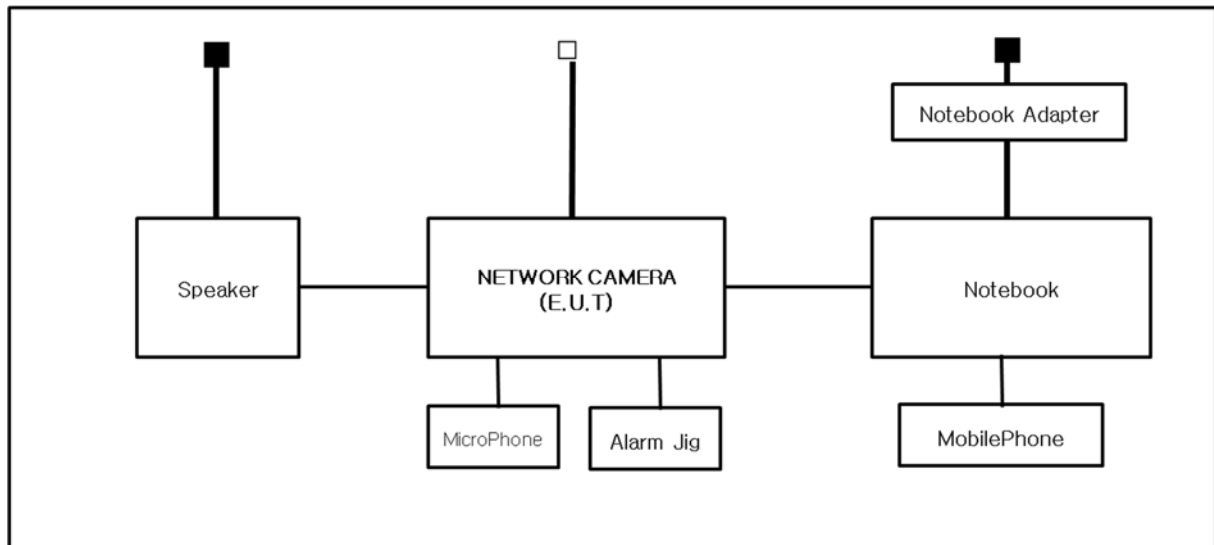
Test mode	Normal operating
OP	MONITORING Network ping test

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

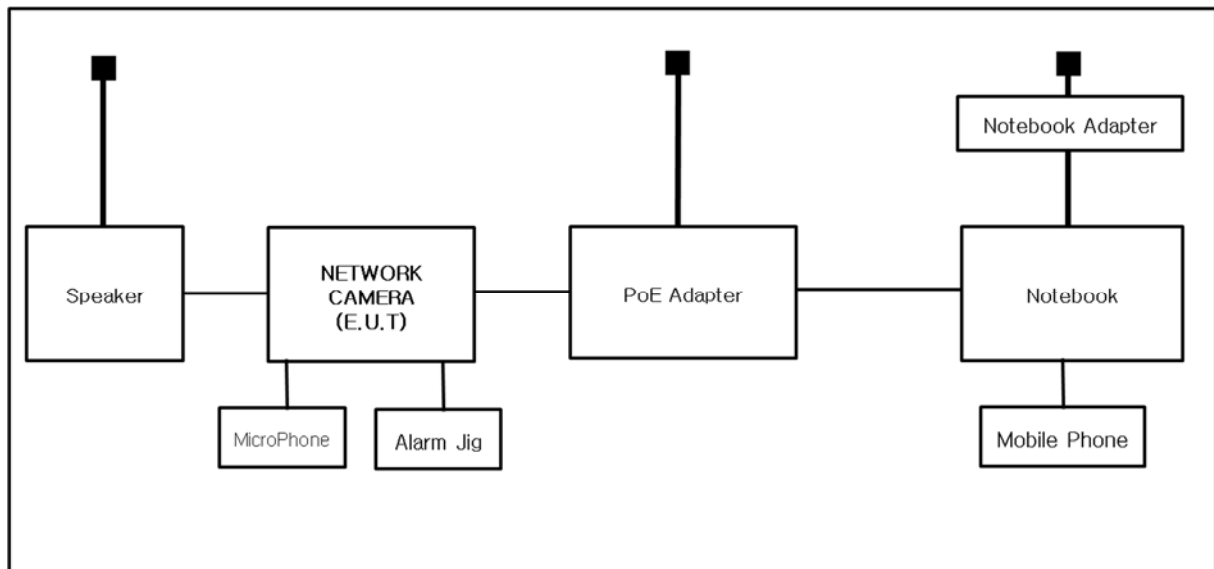
1.8 Configuration

- AC Main
- DC Main
- DC Main

- DC 12 V Mode



- PoE Mode



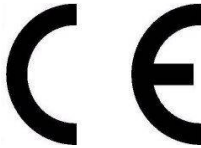
1.9 Calibration Details of Equipment Used for Measurement

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

☒ 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	-	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

Apr. 26, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Tesr 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	-	AONE SHIELD	-	-

Test Conditions

Temperature: 24.7 °C

Relative Humidity: 36.6 %

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. 25, 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	-	EMCO	-	-
☒	Turn Table	-	DAEIL EMC	-	-

Test Conditions

Temperature: 23.6 °C

Relative Humidity: 28.0 %

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

Apr. 27, 2016

Test Location

Semi Anchoic Chamber #2

Test Equipment

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

Test Conditions

Temperature: 22.5 °C
Relative Humidity: 33.0 %

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.



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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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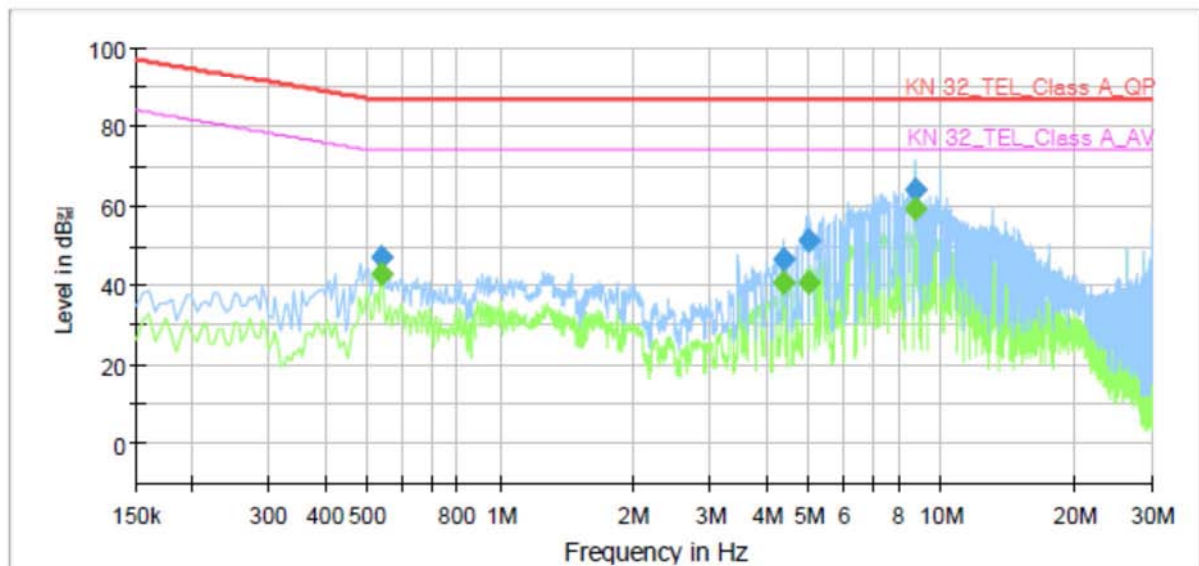
Conducted Emissions at Telecommunication Ports

- DC 12V Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNO-9080RN
Mode	# DC 12 V 10 Mbps
Operator Name:	KES



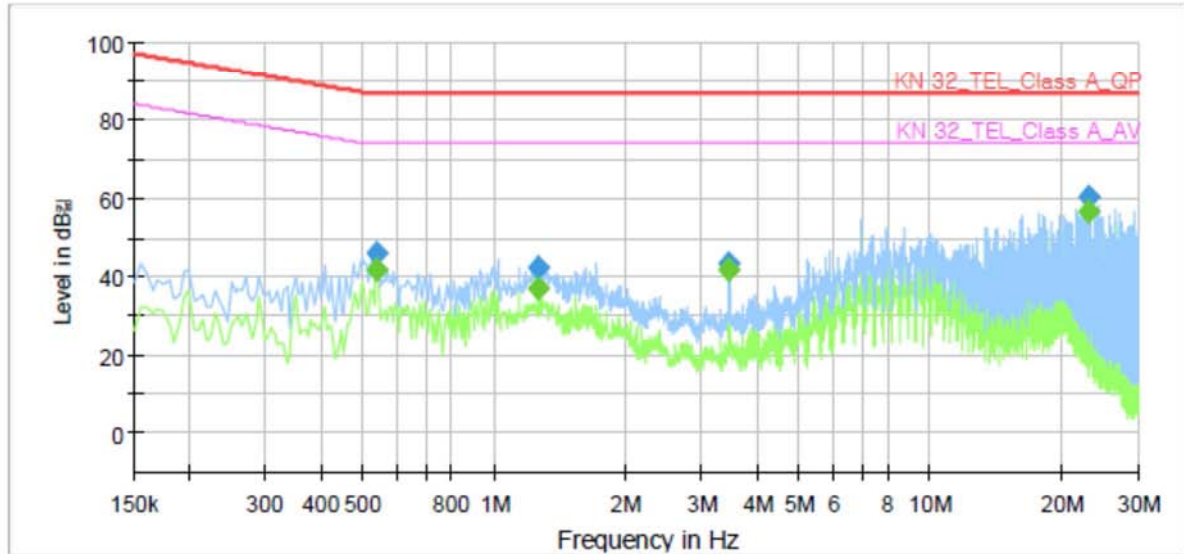
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.540000	---	43.05	74.00	30.95	1000.0	9.000	Single Line	9.9
0.540000	46.97	---	87.00	40.03	1000.0	9.000	Single Line	9.9
4.400000	---	40.99	74.00	33.01	1000.0	9.000	Single Line	9.8
4.400000	46.50	---	87.00	40.50	1000.0	9.000	Single Line	9.8
4.975000	---	40.53	74.00	33.47	1000.0	9.000	Single Line	9.9
4.975000	51.37	---	87.00	35.63	1000.0	9.000	Single Line	9.9
8.750000	---	59.31	74.00	14.69	1000.0	9.000	Single Line	10.0
8.750000	64.30	---	87.00	22.70	1000.0	9.000	Single Line	10.0

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNO-9080RN
Mode	# DC 12 V 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)
0.540000	---	41.66	74.00	32.34	1000.0	9.000	Single Line	9.5
0.540000	45.82	---	87.00	41.18	1000.0	9.000	Single Line	9.5
1.265000	---	37.25	74.00	36.75	1000.0	9.000	Single Line	9.3
1.265000	42.48	---	87.00	44.52	1000.0	9.000	Single Line	9.3
3.460000	---	41.61	74.00	32.39	1000.0	9.000	Single Line	9.3
3.460000	43.46	---	87.00	43.54	1000.0	9.000	Single Line	9.3
23.130000	---	56.66	74.00	17.34	1000.0	9.000	Single Line	9.5
23.130000	60.14	---	87.00	26.86	1000.0	9.000	Single Line	9.5



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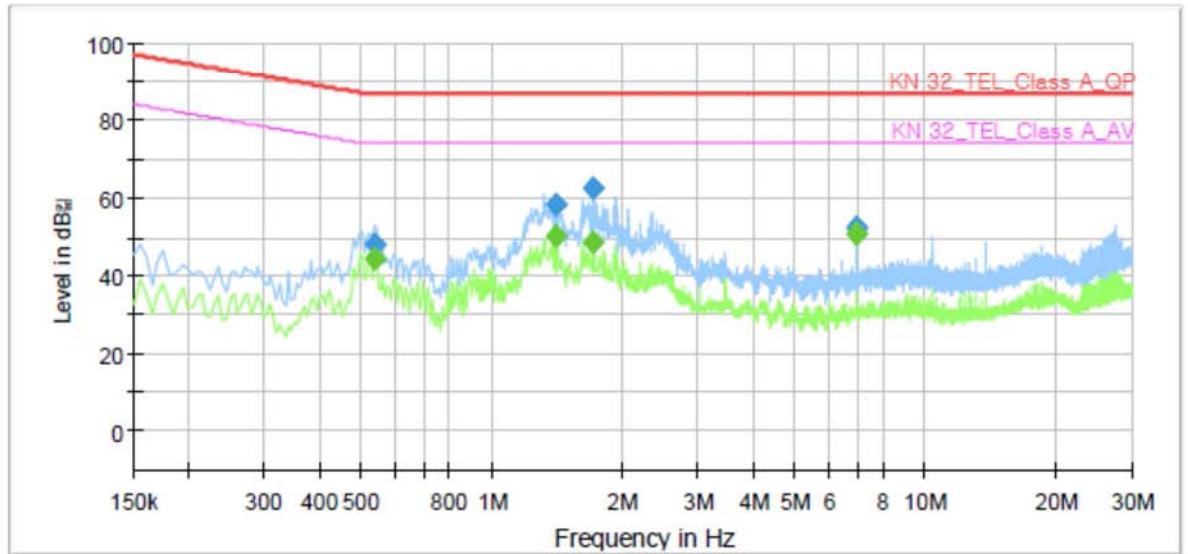
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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
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Test report No.:
KES-E1-16T0179
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[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PNO-9080RN
Mode: # DC 12 V 1 000 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.540000	---	44.69	74.00	29.31	1000.0	9.000	Single Line	9.3
0.540000	48.34	---	87.00	38.66	1000.0	9.000	Single Line	9.3
1.405000	---	50.13	74.00	23.87	1000.0	9.000	Single Line	9.2
1.405000	58.35	---	87.00	28.65	1000.0	9.000	Single Line	9.2
1.715000	---	48.94	74.00	25.06	1000.0	9.000	Single Line	9.2
1.715000	62.49	---	87.00	24.51	1000.0	9.000	Single Line	9.2
6.925000	---	50.65	74.00	23.35	1000.0	9.000	Single Line	9.3
6.925000	52.50	---	87.00	34.50	1000.0	9.000	Single Line	9.3

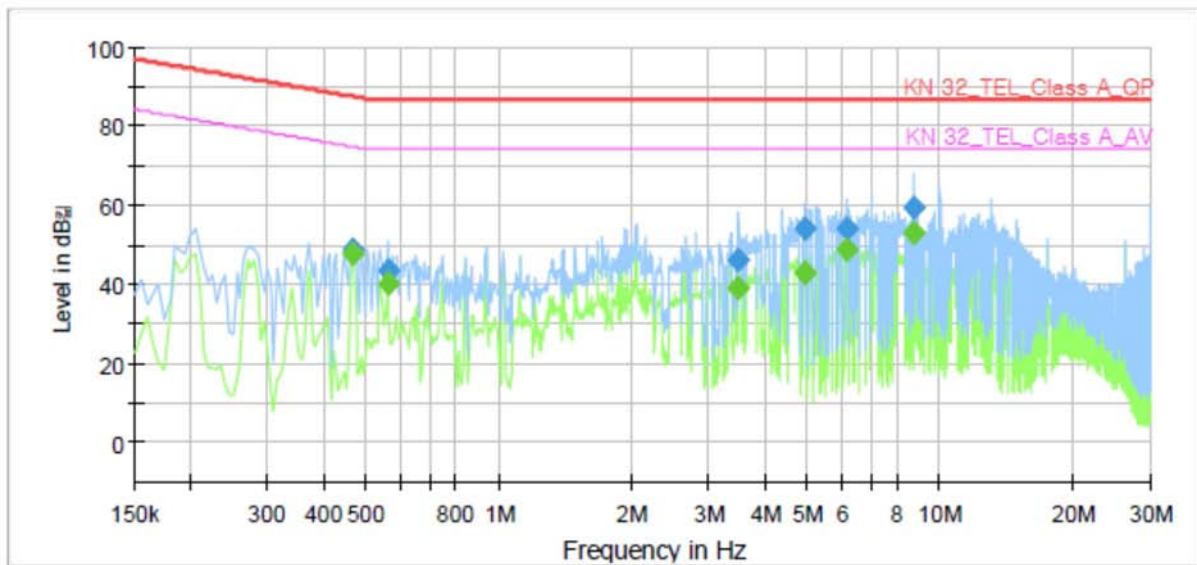
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- PoE Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNO-9080RN
Mode	# PoE 10 Mbps
Operator Name:	KES



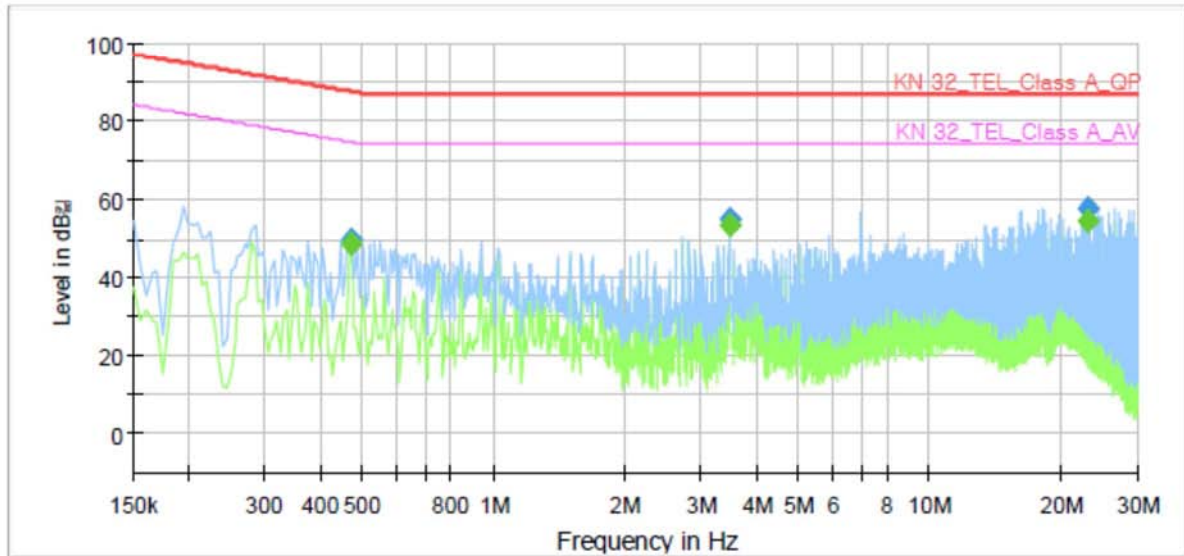
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.465000	---	47.81	74.60	26.79	1000.0	9.000	Single Line	10.0
0.465000	48.76	---	87.60	38.84	1000.0	9.000	Single Line	10.0
0.560000	---	40.12	74.00	33.88	1000.0	9.000	Single Line	9.9
0.560000	43.17	---	87.00	43.83	1000.0	9.000	Single Line	9.9
3.505000	---	39.29	74.00	34.71	1000.0	9.000	Single Line	9.8
3.505000	46.28	---	87.00	40.72	1000.0	9.000	Single Line	9.8
4.970000	---	42.90	74.00	31.10	1000.0	9.000	Single Line	9.9
4.970000	53.88	---	87.00	33.12	1000.0	9.000	Single Line	9.9
6.140000	---	48.52	74.00	25.48	1000.0	9.000	Single Line	9.9
6.140000	53.88	---	87.00	33.12	1000.0	9.000	Single Line	9.9
8.750000	---	53.19	74.00	20.81	1000.0	9.000	Single Line	10.0
8.750000	59.39	---	87.00	27.61	1000.0	9.000	Single Line	10.0

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNO-9080RN
Mode	# PoE 100 Mbps
Operator Name:	KES



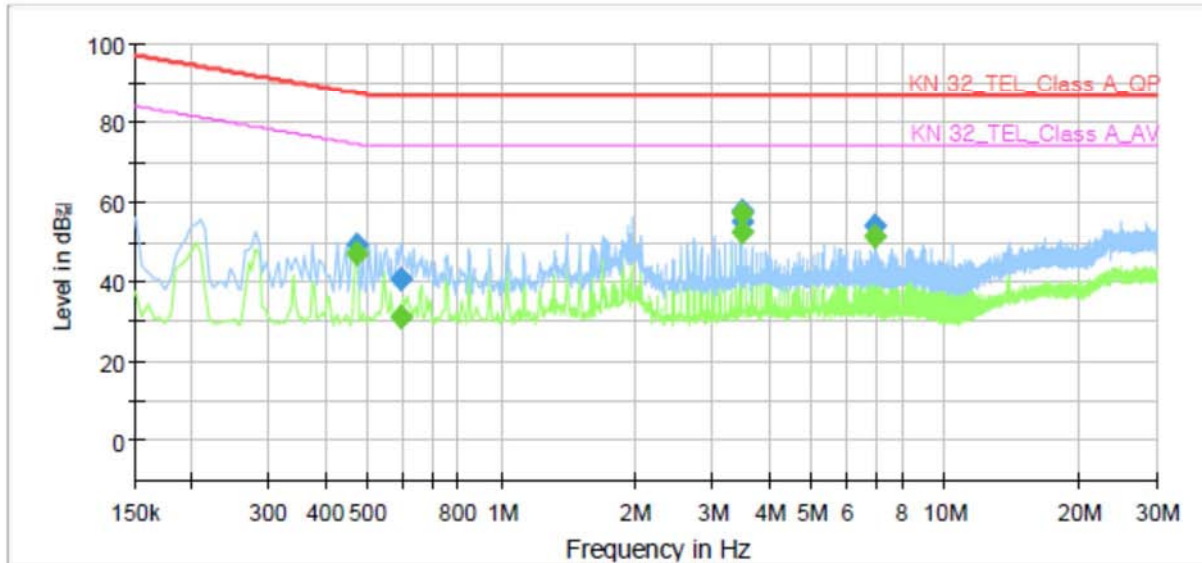
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.470000	---	48.44	74.51	26.07	1000.0	9.000	Single Line	9.5
0.470000	49.96	---	87.51	37.55	1000.0	9.000	Single Line	9.5
3.485000	---	53.24	74.00	20.76	1000.0	9.000	Single Line	9.3
3.485000	55.24	---	87.00	31.76	1000.0	9.000	Single Line	9.3
23.130000	---	54.47	74.00	19.53	1000.0	9.000	Single Line	9.5
23.130000	57.88	---	87.00	29.12	1000.0	9.000	Single Line	9.5

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNO-9080RN
Mode	# PoE 1 000 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.470000	---	47.24	74.51	27.27	1000.0	9.000	Single Line	9.4
0.470000	49.19	---	87.51	38.32	1000.0	9.000	Single Line	9.4
0.595000	---	31.40	74.00	42.60	1000.0	9.000	Single Line	9.3
0.595000	40.54	---	87.00	46.46	1000.0	9.000	Single Line	9.3
3.470000	---	57.32	74.00	16.68	1000.0	9.000	Single Line	9.2
3.470000	57.69	---	87.00	29.31	1000.0	9.000	Single Line	9.2
3.475000	---	52.59	74.00	21.41	1000.0	9.000	Single Line	9.2
3.475000	54.95	---	87.00	32.05	1000.0	9.000	Single Line	9.2
6.945000	---	51.51	74.00	22.49	1000.0	9.000	Single Line	9.3
6.945000	54.00	---	87.00	33.00	1000.0	9.000	Single Line	9.3

**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]
155.10	11.14	V	1.00	8.38	2.56	22.08	40.00	17.92
216.07	10.43	H	4.00	11.66	3.02	25.11	40.00	14.89
221.95	8.62	H	4.00	11.79	3.07	23.48	40.00	16.52
360.57	10.21	H	3.90	14.79	3.96	28.96	47.00	18.04
451.00	13.01	V	1.10	16.41	4.59	34.01	47.00	12.99
504.00	11.97	V	1.50	17.19	4.97	34.13	47.00	12.87

* H : Horizontal, V : Vertical

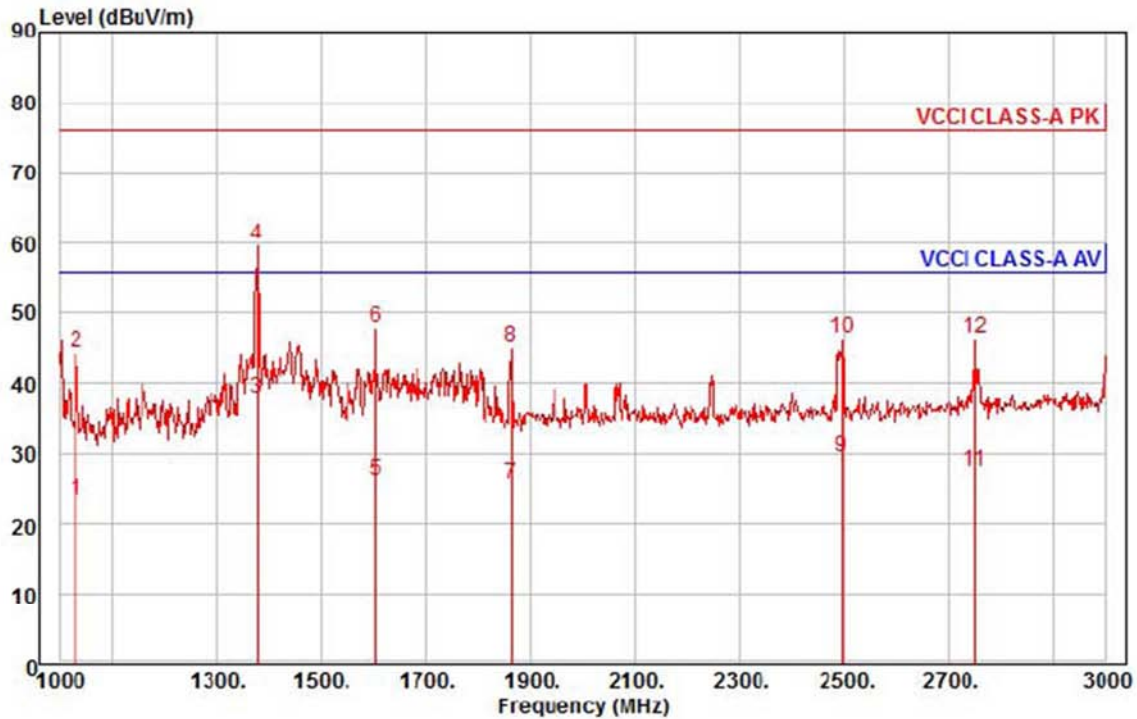
- PoE Mode

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]
55.96	14.18	V	1.00	13.20	1.42	28.80	40.00	11.20
63.50	17.03	V	1.00	11.64	1.55	30.22	40.00	9.78
70.37	18.00	V	1.10	9.58	1.69	29.27	40.00	10.73
152.09	14.61	H	4.00	8.28	2.51	25.40	40.00	14.60
216.07	15.90	H	3.90	11.66	3.02	30.58	40.00	9.42
221.92	11.14	H	4.00	11.79	3.07	26.00	40.00	14.00
504.07	11.93	V	1.70	17.19	4.98	34.10	47.00	12.90

* H : Horizontal, V : Vertical

Radiated Electric Field Emissions(Above 1 GHz)

- DC 12V Mode



Site : chamber
Condition: VCCI CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : PNO-9080RN
Mode : # DC 12 V
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	1030.00	33.00	24.03	6.60	40.11	200	56.00	-32.48	horizontal	Average
2	1030.00	53.97	24.03	6.60	40.11	200	76.00	-31.51	horizontal	Peak
3 av	1376.00	44.65	25.40	7.60	39.94	197	56.00	-18.29	horizontal	Average
4 pp	1376.00	66.88	25.40	7.60	39.94	197	76.00	-16.06	horizontal	Peak
5	1604.00	31.58	26.31	8.26	39.82	4	56.00	-29.67	horizontal	Average
6	1604.00	53.01	26.31	8.26	39.82	4	76.00	-28.24	horizontal	Peak
7	1864.00	29.09	27.34	8.98	39.70	88	56.00	-30.29	horizontal	Average
8	1864.00	48.38	27.34	8.98	39.70	88	76.00	-31.00	horizontal	Peak
9	2496.00	30.03	29.10	10.11	39.92	154	56.00	-26.68	horizontal	Average
10	2496.00	47.00	29.10	10.11	39.92	154	76.00	-29.71	horizontal	Peak
11	2750.00	27.15	29.72	10.63	40.06	191	56.00	-28.56	horizontal	Average
12	2750.00	46.02	29.72	10.63	40.06	191	76.00	-29.69	horizontal	Peak

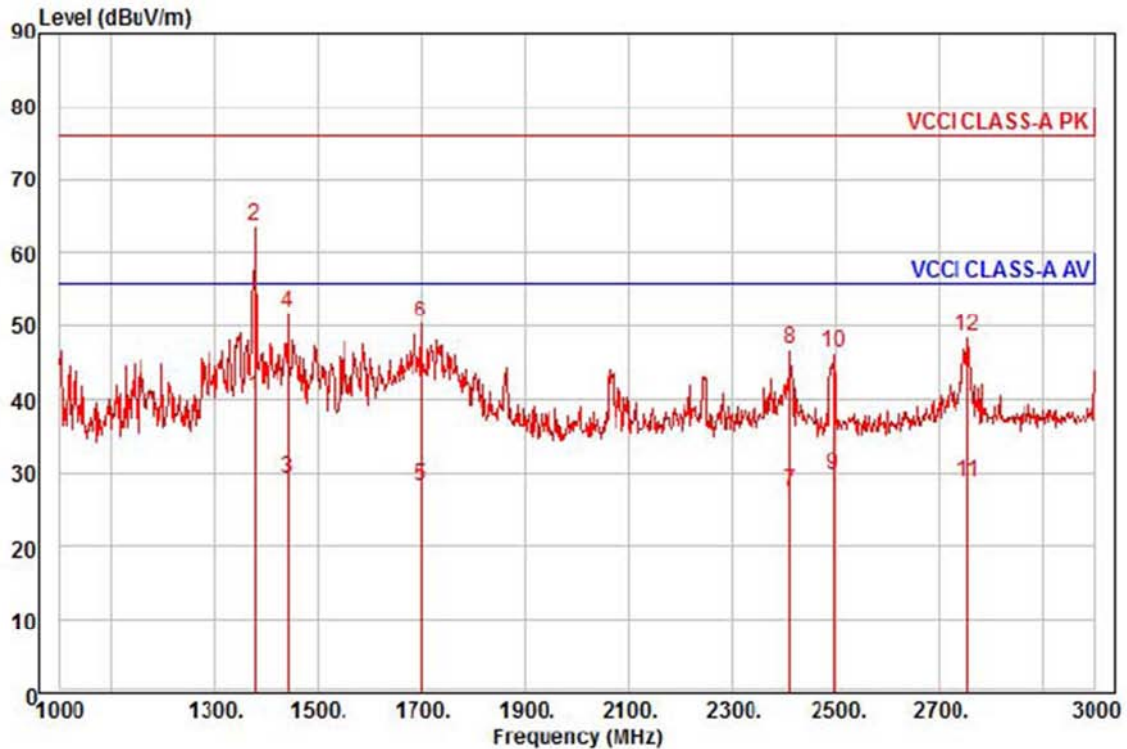
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Test report No.:
KES-EI-16T0179
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Site : chamber
Condition: VCCI CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : PNO-9080RN
Mode : # DC 12 V
Memo : 1 ~ 3 GHz

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1 av	1376.00	47.39	25.40	7.60	39.94	290	56.00	-15.55	vertical	Average
2 pp	1376.00	70.64	25.40	7.60	39.94	290	76.00	-12.30	vertical	Peak
3	1442.00	35.62	25.66	7.79	39.90	262	56.00	-26.83	vertical	Average
4	1442.00	58.49	25.66	7.79	39.90	262	76.00	-23.96	vertical	Peak
5	1700.00	32.88	26.69	8.52	39.78	3	56.00	-27.69	vertical	Average
6	1700.00	55.12	26.69	8.52	39.78	3	76.00	-25.45	vertical	Peak
7	2412.00	28.52	28.89	9.98	39.87	117	56.00	-28.48	vertical	Average
8	2412.00	47.80	28.89	9.98	39.87	117	76.00	-29.20	vertical	Peak
9	2496.00	30.39	29.10	10.11	39.92	195	56.00	-26.32	vertical	Average
10	2496.00	47.05	29.10	10.11	39.92	195	76.00	-29.66	vertical	Peak
11	2756.00	28.32	29.73	10.64	40.07	273	56.00	-27.38	vertical	Average
12	2756.00	48.22	29.73	10.64	40.07	273	76.00	-27.48	vertical	Peak

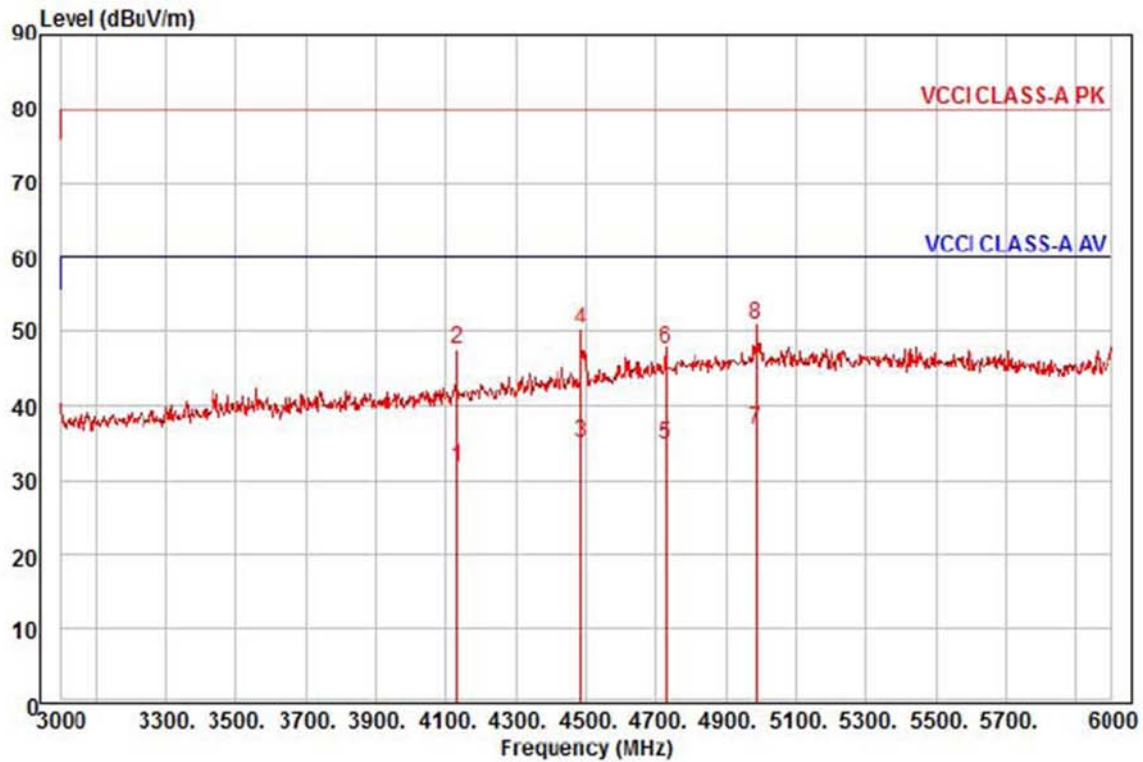
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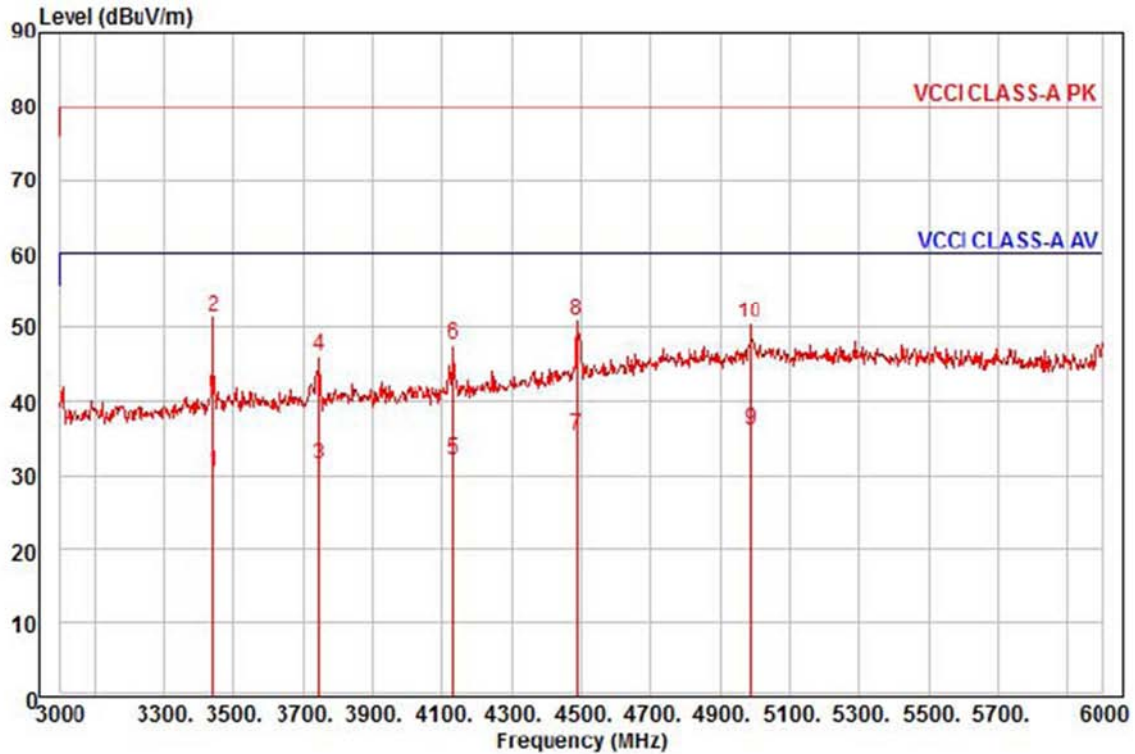
Test report No.:
KES-E1-16T0179
Page (29) of (48)



Site : chamber
Condition: VCCI CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : PNO-9080RN
Mode : # DC 12 V
Memo : 3 ~ 6 GHz

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4131.00	25.85	32.76	13.75	40.41	210	60.00	-28.05	horizontal	Average
2	4131.00	41.39	32.76	13.75	40.41	210	80.00	-32.51	horizontal	Peak
3	4485.00	26.32	34.78	14.40	40.41	347	60.00	-24.91	horizontal	Average
4	4485.00	41.45	34.78	14.40	40.41	347	80.00	-29.78	horizontal	Peak
5	4728.00	24.20	36.17	14.84	40.41	36	60.00	-25.20	horizontal	Average
6	4728.00	37.01	36.17	14.84	40.41	36	80.00	-32.39	horizontal	Peak
7 pp	4983.00	24.20	37.62	15.30	40.41	360	60.00	-23.29	horizontal	Average
8 pk	4983.00	38.56	37.62	15.30	40.41	360	80.00	-28.93	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 : NETWORK CAMERA

Model : PNO-9080RN

Mode : # DC 12 V

Memo : 3 ~ 6 GHz

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3441.00	27.25	31.07	12.36	40.30	339	60.00	-29.62	vertical	Average
2 pk	3441.00	48.26	31.07	12.36	40.30	339	80.00	-28.61	vertical	Peak
3	3744.00	27.17	31.58	13.00	40.36	295	60.00	-28.61	vertical	Average
4	3744.00	41.99	31.58	13.00	40.36	295	80.00	-33.79	vertical	Peak
5	4131.00	26.01	32.76	13.75	40.41	115	60.00	-27.89	vertical	Average
6	4131.00	41.43	32.76	13.75	40.41	115	80.00	-32.47	vertical	Peak
7	4488.00	26.48	34.80	14.41	40.41	39	60.00	-24.72	vertical	Average
8	4488.00	42.16	34.80	14.41	40.41	39	80.00	-29.04	vertical	Peak
9 pp	4986.00	23.56	37.64	15.30	40.41	185	60.00	-23.91	vertical	Average
10	4986.00	38.03	37.64	15.30	40.41	185	80.00	-29.44	vertical	Peak

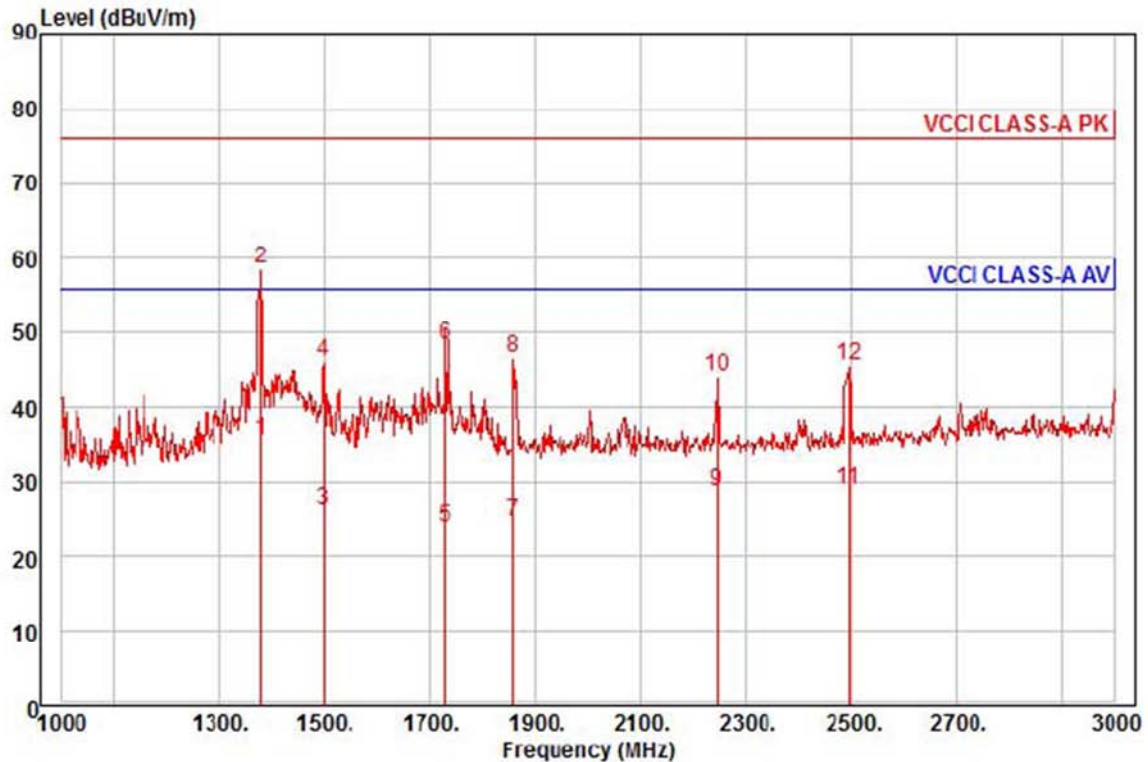


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www.kes.co.kr

Test report No.:
KES-E1-16T0179
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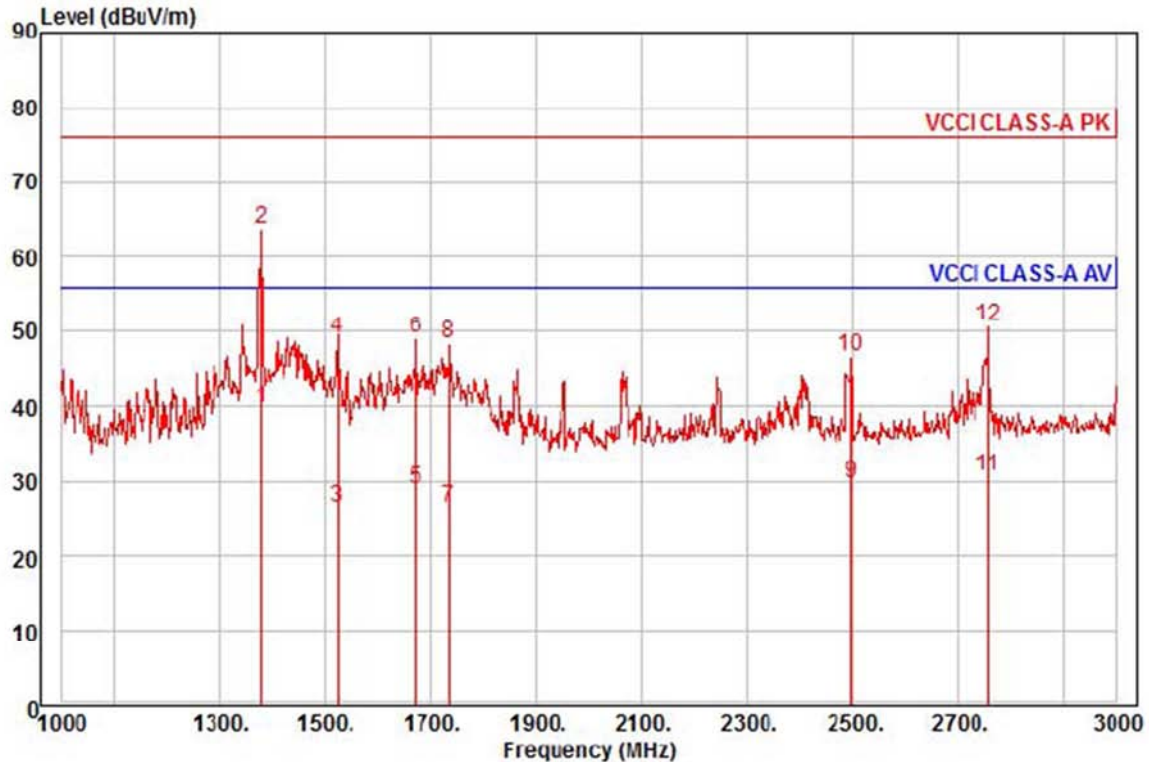
- PoE Mode



Site : chamber
Condition: VCCI CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : PNO-9080RN
Mode : # PoE
Memo : 1 ~ 3 GHz

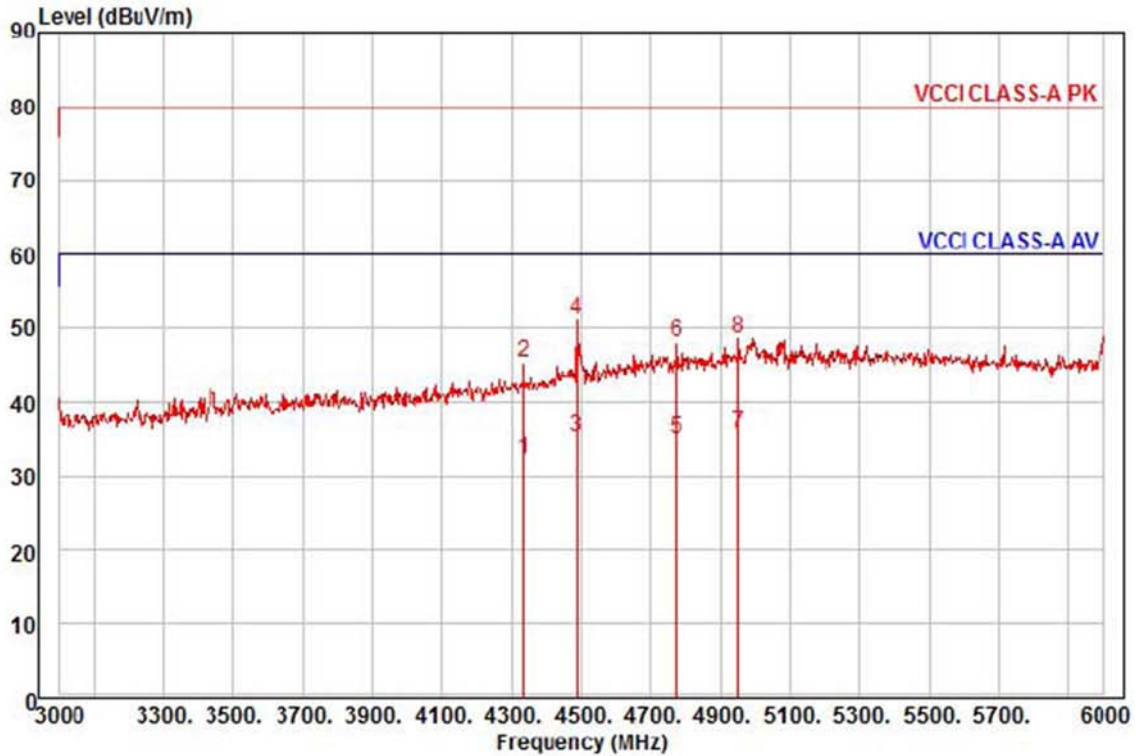
		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	av	1378.00	42.39	25.41	7.61	39.93	228	56.00	-20.52	horizontal Average
2	pp	1378.00	65.42	25.41	7.61	39.93	228	76.00	-17.49	horizontal Peak
3		1498.00	32.26	25.89	7.95	39.88	231	56.00	-29.78	horizontal Average
4		1498.00	52.11	25.89	7.95	39.88	231	76.00	-29.93	horizontal Peak
5		1730.00	28.41	26.81	8.61	39.76	297	56.00	-31.93	horizontal Average
6		1730.00	52.76	26.81	8.61	39.76	297	76.00	-27.58	horizontal Peak
7		1858.00	28.18	27.32	8.96	39.70	197	56.00	-31.24	horizontal Average
8		1858.00	49.90	27.32	8.96	39.70	197	76.00	-29.52	horizontal Peak
9		2246.00	30.24	28.48	9.73	39.77	11	56.00	-27.32	horizontal Average
10		2246.00	45.77	28.48	9.73	39.77	11	76.00	-31.79	horizontal Peak
11		2496.00	29.56	29.10	10.11	39.92	223	56.00	-27.15	horizontal Average
12		2496.00	46.31	29.10	10.11	39.92	223	76.00	-30.40	horizontal Peak

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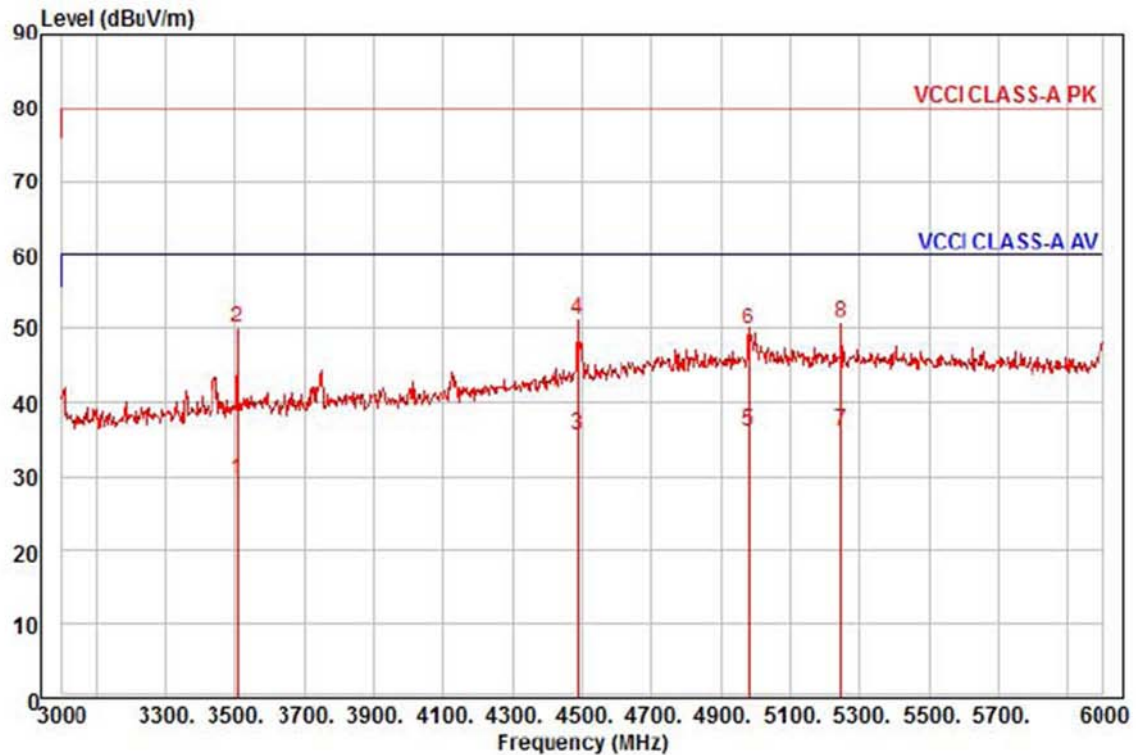
Site : chamber
Condition: VCCI CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : PNO-9080RN
Mode : # PoE
Memo : 1 ~ 3 GHz

		Read	Ant	Cable	Preamp	TPos	Limit	Over			
		Freq	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark	
		MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	av	1378.00	46.67	25.41	7.61	39.93	288	56.00	-16.24	vertical	Average
2	pp	1378.00	70.70	25.41	7.61	39.93	288	76.00	-12.21	vertical	Peak
3		1522.00	32.29	25.98	8.02	39.86	152	56.00	-29.57	vertical	Average
4		1522.00	55.02	25.98	8.02	39.86	152	76.00	-26.84	vertical	Peak
5		1670.00	33.70	26.57	8.44	39.79	293	56.00	-27.08	vertical	Average
6		1670.00	53.74	26.57	8.44	39.79	293	76.00	-27.04	vertical	Peak
7		1734.00	30.91	26.82	8.62	39.76	142	56.00	-29.41	vertical	Average
8		1734.00	52.65	26.82	8.62	39.76	142	76.00	-27.67	vertical	Peak
9		2498.00	30.37	29.10	10.11	39.92	190	56.00	-26.34	vertical	Average
10		2498.00	47.21	29.10	10.11	39.92	190	76.00	-29.50	vertical	Peak
11		2758.00	30.45	29.74	10.65	40.07	127	56.00	-25.23	vertical	Average
12		2758.00	50.47	29.74	10.65	40.07	127	76.00	-25.21	vertical	Peak



Site : chamber
Condition: VCCI CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : PNO-9080RN
Mode : # PoE
Memo : 3 ~ 6 GHz

	Read	Ant	Cable	Preamp	TPos	Limit	Over		
Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4335.00	24.71	33.92	14.13	40.41	77	60.00	-27.65	horizontal Average
2	4335.00	37.66	33.92	14.13	40.41	77	80.00	-34.70	horizontal Peak
3	4488.00	26.55	34.80	14.41	40.41	345	60.00	-24.65	horizontal Average
4 pk	4488.00	42.56	34.80	14.41	40.41	345	80.00	-28.64	horizontal Peak
5	4773.00	24.10	36.42	14.92	40.41	120	60.00	-24.97	horizontal Average
6	4773.00	37.19	36.42	14.92	40.41	120	80.00	-31.88	horizontal Peak
7 pp	4950.00	23.47	37.43	15.24	40.41	255	60.00	-24.27	horizontal Average
8	4950.00	36.27	37.43	15.24	40.41	255	80.00	-31.47	horizontal Peak



Site : chamber

Condition: VCCI CLASS-A PK 3m HORN781(2015.05.07) vertical

: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto

Project : NETWORK CAMERA

Model : PNO-9080RN

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	3507.00	25.99	31.18	12.52	40.31	146	60.00	-30.62	vertical	Average
2	3507.00	46.59	31.18	12.52	40.31	146	80.00	-30.02	vertical	Peak
3	4488.00	26.85	34.80	14.41	40.41	276	60.00	-24.35	vertical	Average
4 pk	4488.00	42.50	34.80	14.41	40.41	276	80.00	-28.70	vertical	Peak
5	4980.00	23.64	37.61	15.29	40.41	113	60.00	-23.87	vertical	Average
6	4980.00	37.35	37.61	15.29	40.41	113	80.00	-30.16	vertical	Peak
7 pp	5247.00	23.70	37.22	15.62	40.38	283	60.00	-23.84	vertical	Average
8	5247.00	38.18	37.22	15.62	40.38	283	80.00	-29.36	vertical	Peak



Test Setup Photos and Configuration

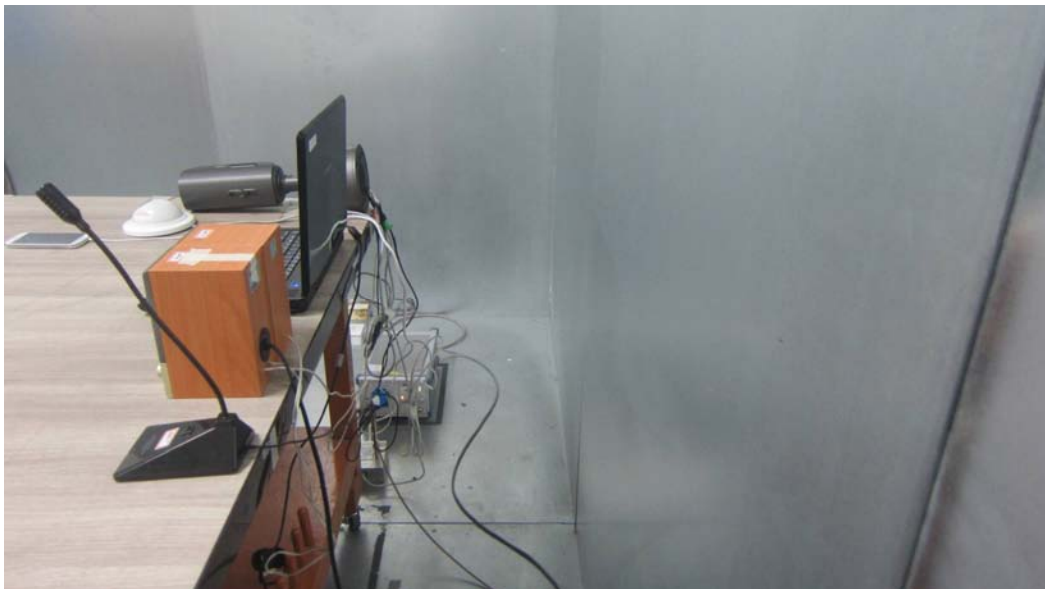
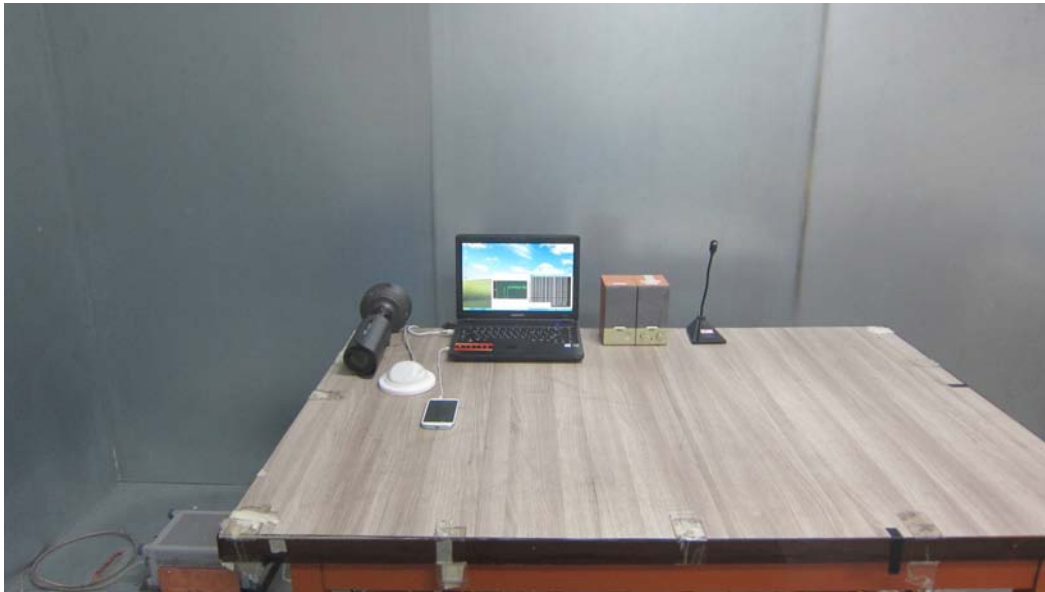
Conducted Voltage Emissions

N/A

N/A

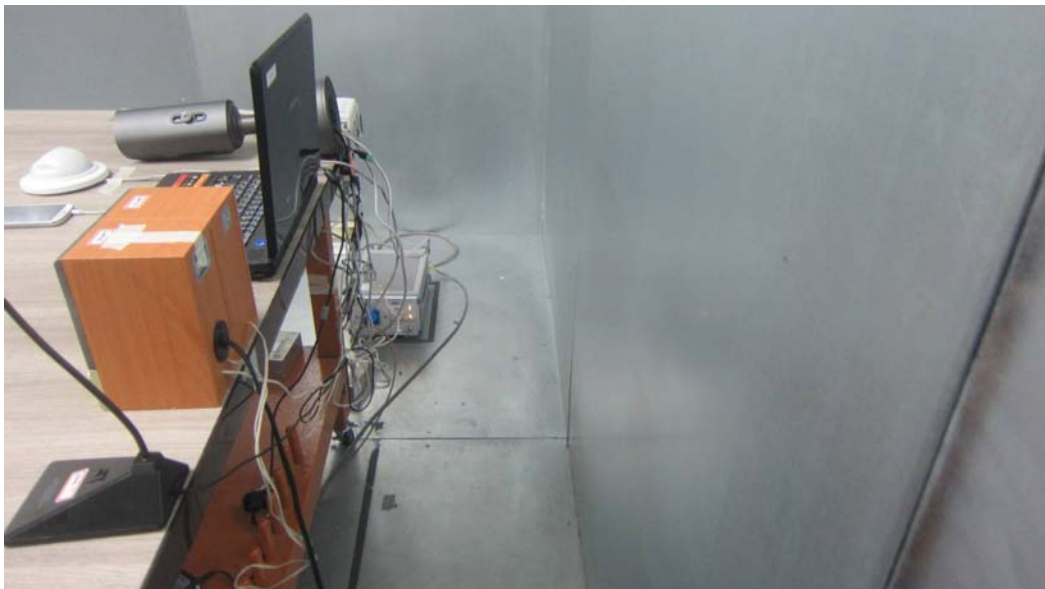
Conducted Telecommunication Emissions

- DC 12V Mode



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- PoE Mode



Radiated Electric Field Emissions(Below 1 GHz)

- DC 12V Mode



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- PoE Mode



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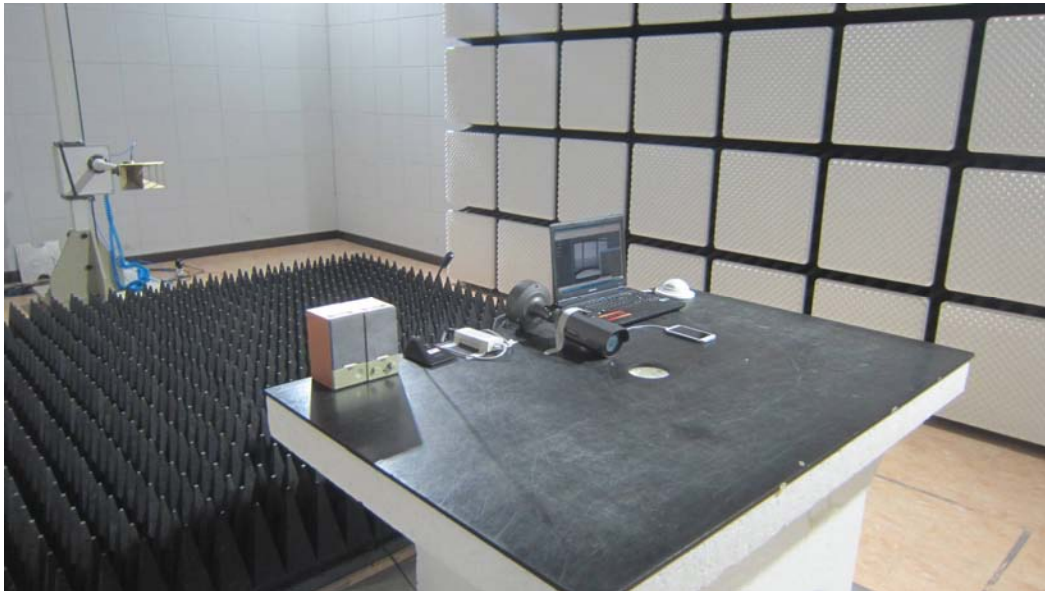
Radiated Electric Field Emissions(Above 1 GHz)

- DC 12V Mode



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- PoE Mode



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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

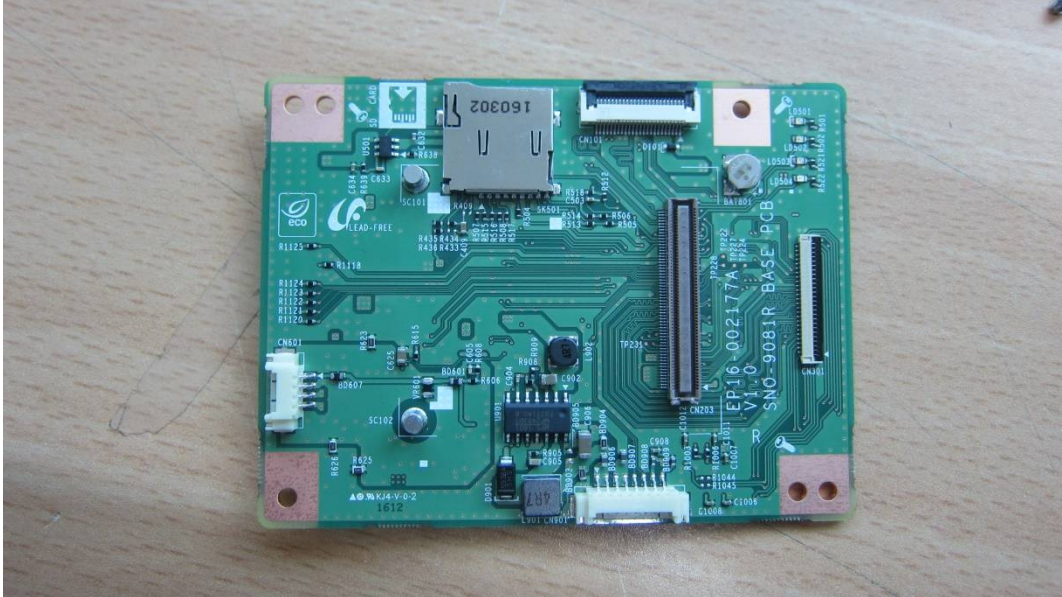
(Internal View)



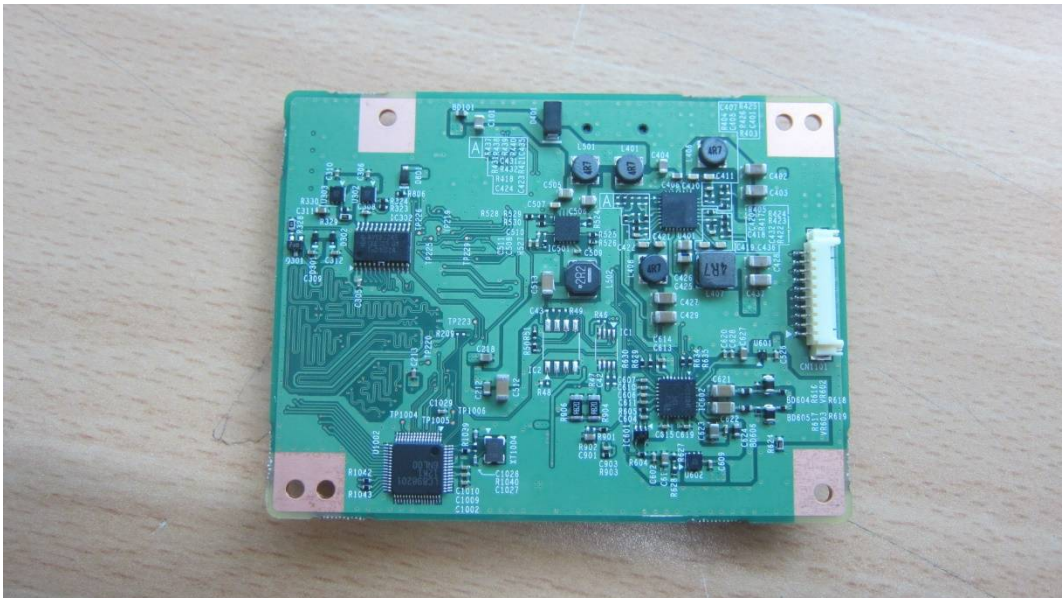
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Main Board EUT Internal View – Main Board

(Top)



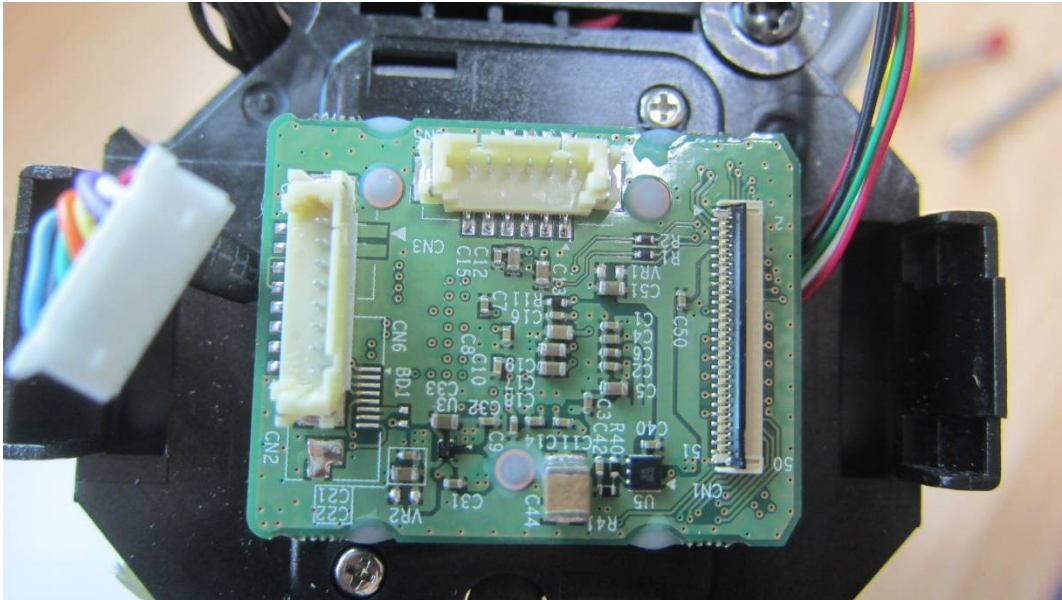
(Bottom)



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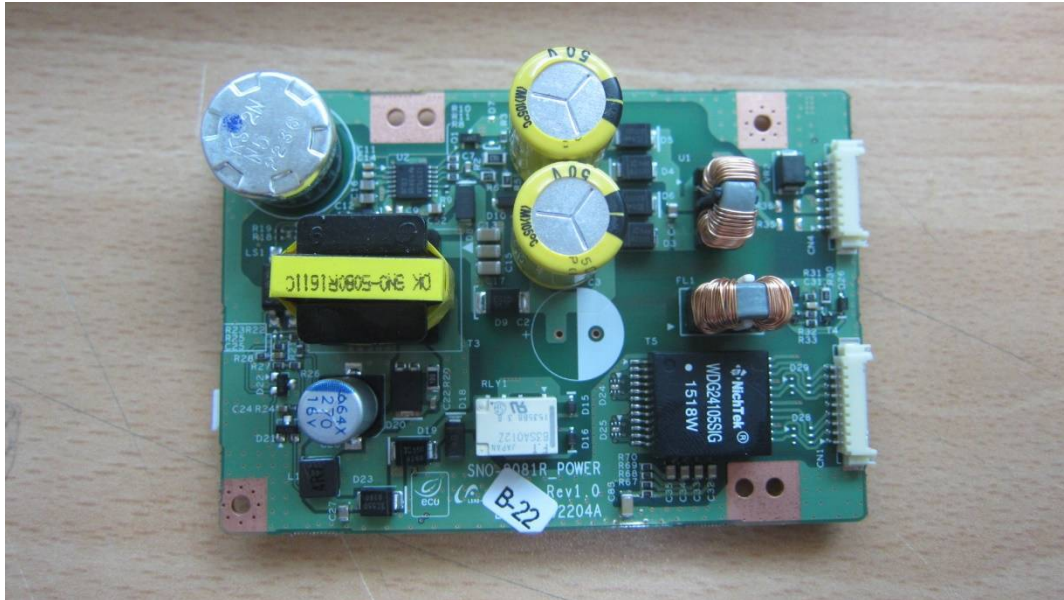
Main Board EUT Internal View – Sub Board 1

(Top)

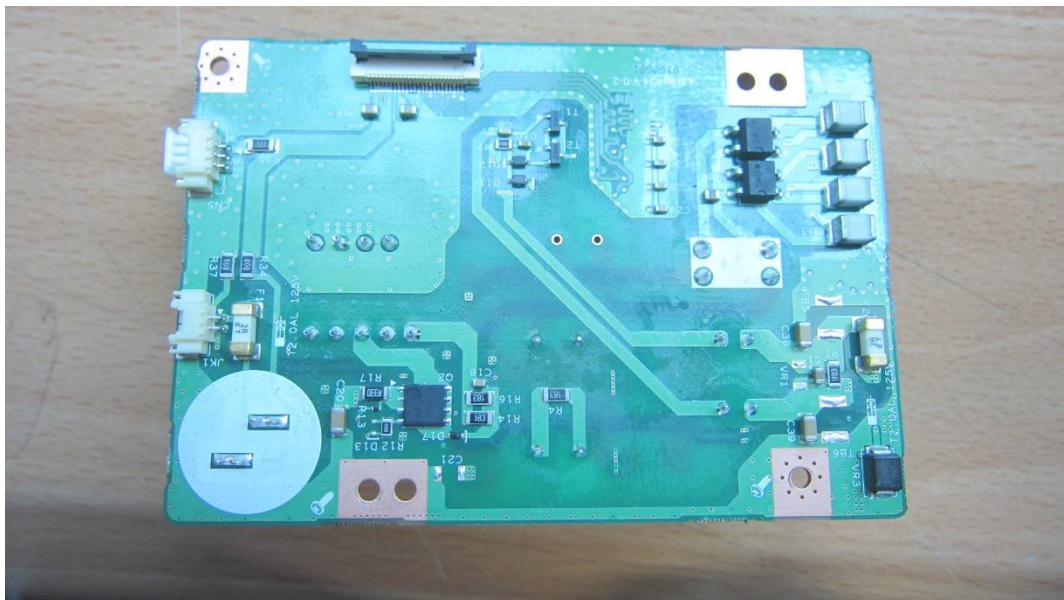


Main Board EUT Internal View – Sub Board 2

(Top)



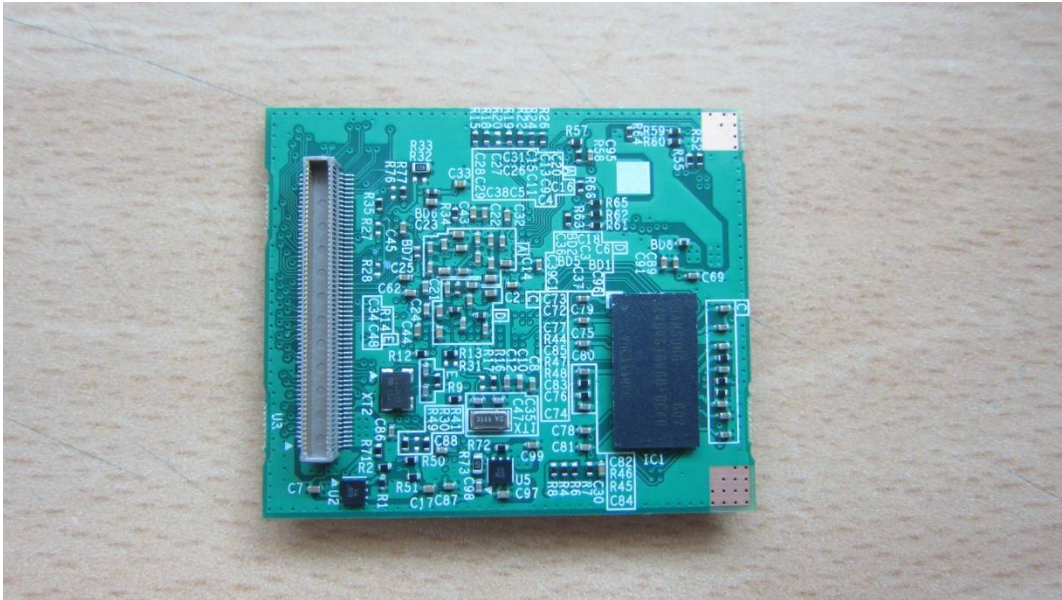
(Bottom)



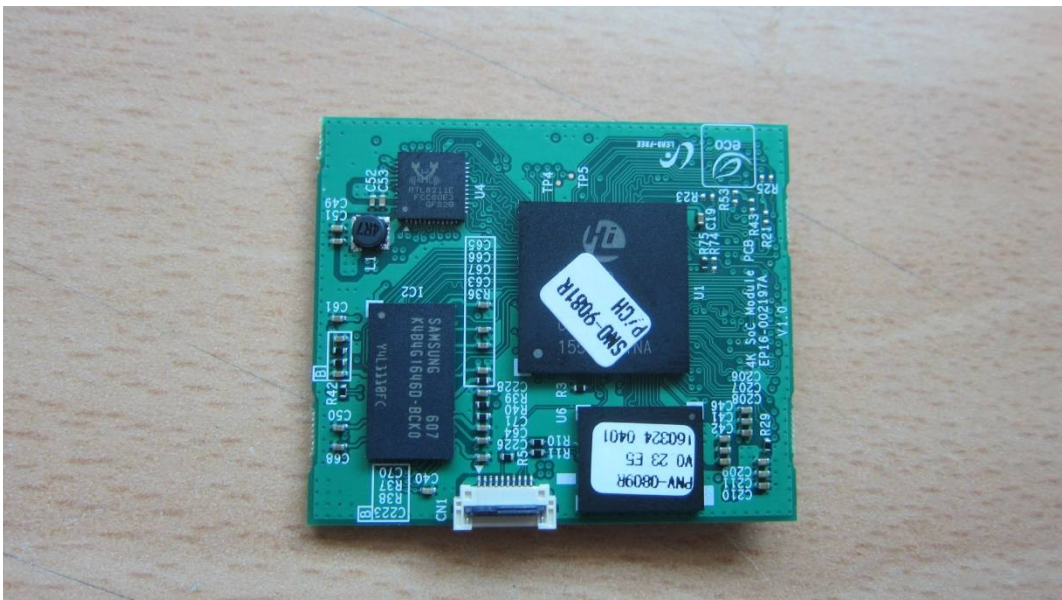
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Main Board EUT Internal View – Sub Board 3

(Top)



(Bottom)



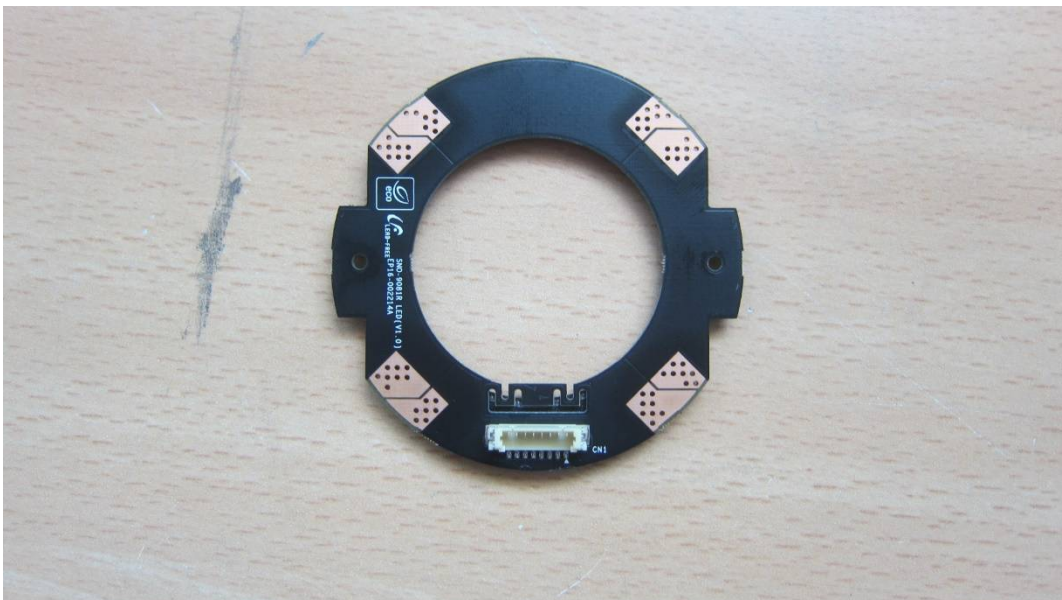
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Main Board EUT Internal View – IR Board

(Top)



(Bottom)



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