



EMC TEST REPORT For IC

Test Report No. : KES-E1-16T0622
Date of Issue : Dec, 11, 2016
Product name : NETWORK CAMERA
Model/Type No. : XNO-8080RN
Variant Model : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : Changwon-daero, Seongsan-gu Changwon-si, Gyeongsangnam-do
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 : Nov, 23, 2016
Test date : Dec, 02, 2016 ~ Dec, 03, 2016
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Kyeng Sun, Min
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Dec. 11, 2016	KES-E1-16T0622	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	1/1.8" 6M CMOS
Total Pixels	3096(H) x 2094(V)
Effective Pixels	2616(H) x 1976(V)
Scanning System	Progressive Scan
Min. Illumination	Color : 0.1 lux (TBD) B/W : 0 Lux (IR LED On)
S / N Ratio	50dB
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation USB : Micro USB type B, 1920 x 1080(TBD), for installation
Lens	
Focal Length (Zoom Ratio)	3.9~9.4mm(2.4x) motorized varifocal (Wide 확대검토중)
Max. Aperture Ratio	F1.3
Angular Field of View	TBD
Min. Object Distance	0.5m (1.64ft)
Focus Control	Simple focus(Motorized V/F) / Manual, Remote control via network(Manual, Simple focus)
Lens Type	DC Auto Iris, P-iris
Mount Type	Board-in type
Pan / Tilt / Rotate	
Pan / Tilt / Rotate range	
Operational	
IR LED	TBD
Viewable Length	(TBD)50m(164.04ft)
Camera Title	Off / On (Displayed up to 55 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 / HLC(Masking/Dimming), WDR(Seamless transition TBD)
Wide Dynamic Range	120dB(TBD)
Contrast Enhancement	SSDR (Off / On)
Digital Noise Reduction	SSNR5 (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	Off / On
Defog	Auto(input from fog&Dust detection) / Manual / Off
Motion Detection	Yes(8ea, 4point Polygonal zones)
Privacy Masking	Off / On (32ea, polygonal zones) - Color : Grey/Green/Red/Blue/Black/White - Mosaic ※ Zoom ratio option for mask mode (TBD)
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor((included Mercury & Sodium)
Contrast	level adjustment
LDC	On/Off (5 levels with Min/Max)

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Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec →TBD)
Digital PTZ	24X, 'Digital PTZ(Preset, Group)
Flip / Mirror	Flip : On/Off Mirror : On/Off Hallway view : 90°/270°
Intelligent Video & Audio Analy	Tampering, Loitering, Directional Detection, Defocus Detection, Fog&Dust Detection, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Motion Detection, Digital Auto Tracking, Sound Classification
Alarm I/O	Input 1ea / Output 1ea
Remote Control Interface	-
RS-485 Protocol	-
Alarm Triggers	Alarm Input, Motion Detection, Intelligent Video Analytics, 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 DPTZ preset
Audio In	Selectable (Mic IN/Line IN), Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out, Max output level: 1 Vrms
Fan / Heater	-
Pixel Counter	Support
Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High , Motion JPEG
Resolution	5M mode : 2592 x 1944, 2592 x 1464, 1920 x 1080, 1600 x 1200, 1280 x 1024, 1280 x 960 1280 x 720, 1024 x 768, 800 x 600, 720 x 576, 720 x 480, 640 x 480, 320 x 240 2M mode : 1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x450, 720x576 640x480, 640x360, 320x240, 320x180
Max. Framerate	5M mode : H.265/H.264 : Max. 30fps at all resolutions Motion JPEG : Max. 30fps 2M mode : H.265/H.264 : Max. 60fps at all resolutions Motion JPEG : Max. 30fps
Smart Codec	Manual Mode (area-based : 5EA)
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, with WiseStream MJPEG : 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 8/16/32/48KHz
Audio Communication	Bi-directional (2-Way)
IP	IPv4, IPv6

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Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, 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 Encryption 기능구현
Streaming Method	Streaming Method
Max. User Access	20 users at Unicast Mode(TBD)
Edge Storage	SD/SDHC/SDXC 2slot (up to 512 GB) - Continuous recording(1'st slot to 2'nd slot) - (TBD) Redundant recording - Motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded. NAS(Network Attached Storage) Local PC for Instant Recording
Application Programming Interface	ONVIF Profile S/G SUNAPI(HTTP API) Open Platform
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Danish, Portuguese, Czech, Polish, Turkish, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek, Norsk, Finnish
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	
Environmental	
Operating Temperature / Humidity	-30°C ~ +55°C (-22°F ~ +131°F) / Less than 90% RH *Start up should be done at above -20°C
Storage Temperature / Humidity	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP67, IP66, NEMA 4X
Vandal Resistance	IK10
Electrical	
Input Voltage / Current	24VAC ± 10%, 12VDC ± 10%, PoE(IEEE802.3af)
Power Consumption	TBD
Mechanical	
Color / Material	Dark gray / Aluminum
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 ☒ 24 Vac ☒ 12 Vdc ☒ PoE
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	XNO-8080RN	-	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/AC	RD9356082016964200	Power Dsine	-
Notebook	X56K	HN11N5151FJ0045W	HANSUNG	-
Notebook Adapter	A12-120P1A	F180271552011758	CHICONY POWER TECHNOLOGY CO.,LTD.	-
Phone	A1530	-	APPLE	-
MIC	CMK-303	-	CAMAC	1.7 m
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	1.6 m
Alarm	-	-	-	-
SD card	-	-	SanDisk	16 GB



1.6 External I / O Cabling

- AC 24 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
	7 Pin	MIC	3.5 mm	1.7	U
		Speaker	3.5 mm	1.6	U
		Alarm	2 pin	3.0	U
	Slot	SD card	Slot	-	-
Notebook	Audio in	Phone	Audio out	1.7	-

- 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
	7 Pin	MIC	3.5 mm	1.7	U
		Speaker	3.5 mm	1.6	U
		Alarm	2 pin	3.0	U
	Slot	SD card	Slot	-	-
Notebook	Audio in	Phone	Audio out	1.7	-



- 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
	7 Pin	MIC	3.5 mm	1.7	U
		Speaker	3.5 mm	1.6	U
		Alarm	2 pin	3.0	U
	Slot	SD card	Slot	-	-
Notebook	Audio in	Phone	Audio out	1.7	-
	RJ-45 (DATA)	POE Adapter	RJ-45 (DATA)	3.0	U

* Unshielded = U, Shielded = S

1.7 EUT Operating Mode(s)

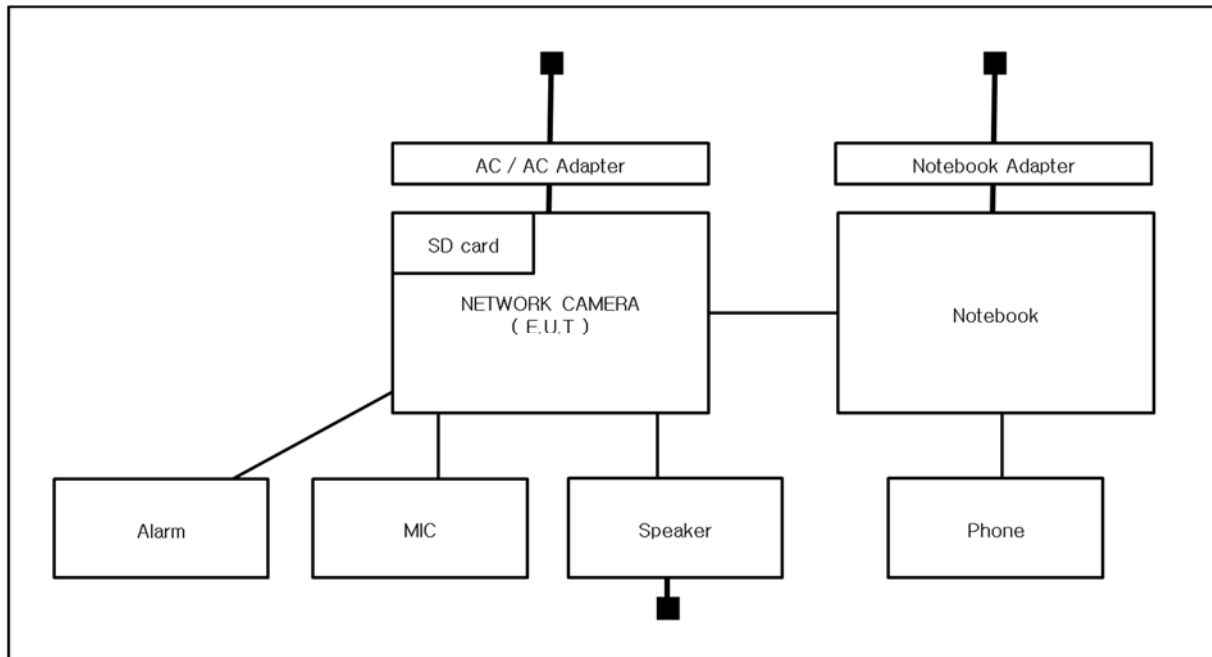
Test mode	Normal operating
E.U.T Monitoring , Ping test, 1 kHz	

E.U.T Test operating S/W		
Name	Version	Manufacture Company
SmartViewer	-	Hanwha Techwin Co., Ltd.

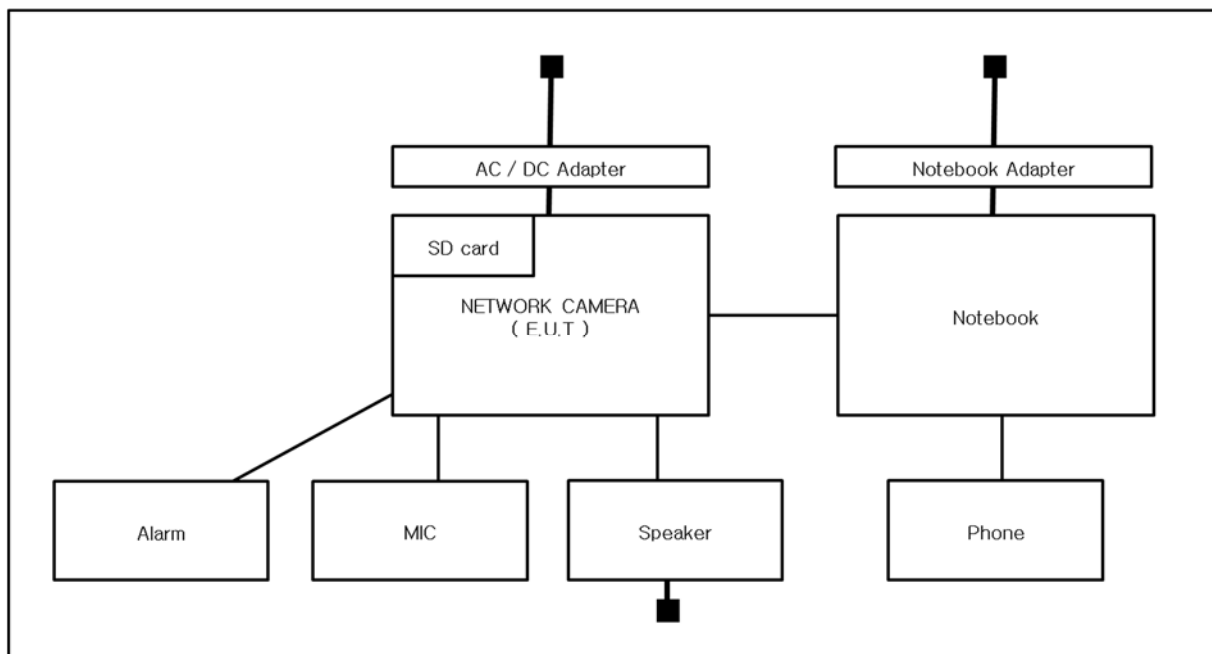
1.8 Configuration

■ AC 24 VMain
 □ DC 12 VMain

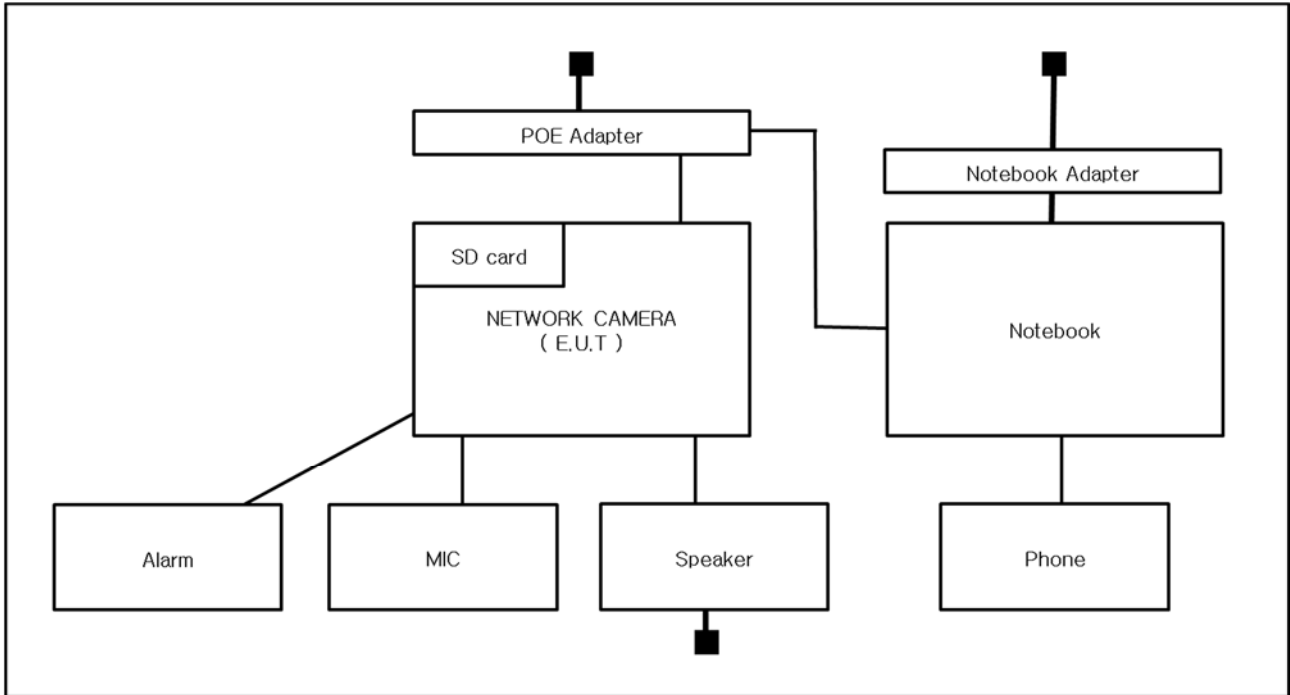
- AC 24V Mode



- DC 12V 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, 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 61547 :2009

☐ EN 55022:2010

☐ 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



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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 | | |
| ☒ CAN/CSA CISPR 22-10 | ☒ 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 Mains Power Ports

Test Date

Dec, 02, 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
☒	Electro wave Shieldroom	-	SEMITEC	-	-
☒	EMI Test S/W	EMC32	R & S	9.12.00	-

Test Conditions

Temperature: 16,5 °C
Relative Humidity: 39,8 %

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.



2.2 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Dec, 03, 2016

Test Location

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

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESR3	R&S	101781	05, 03, 2017
☒	Trilog-Broadband Antenna	VULB 9163	SCHWARZBECK	9168-713	05, 15, 2017
☒	Open Area Test Site	-	KES	-	-
☒	Antenna Mast	-	DAEIL EMC	-	-
☒	Turn Table	-	DAEIL EMC	-	-
☒	EMI Test S/W	-	-	-	-

Test Conditions

Temperature: 9,8 °C
Relative Humidity: 35,0 %

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.



2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Dec, 03, 2016

Test Location

Semi Anechoic 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, 24, 2017
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM, INC	781	05, 07, 2017
☒	Semi Anechoic Chamber #2	-	SEMITEC	-	-
☒	Antenna Mast	-	AUDIX	-	-
☒	Turn Table	-	AUDIX	-	-
☒	EMI Test S/W	e3	AUDIX	8.083b	-

Test Conditions

Temperature: 17,8 °C

Relative Humidity: 47,2 %

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

- AC 24V Mode

[HOT]

Common Information

Test Description:

Model No.:

Mode

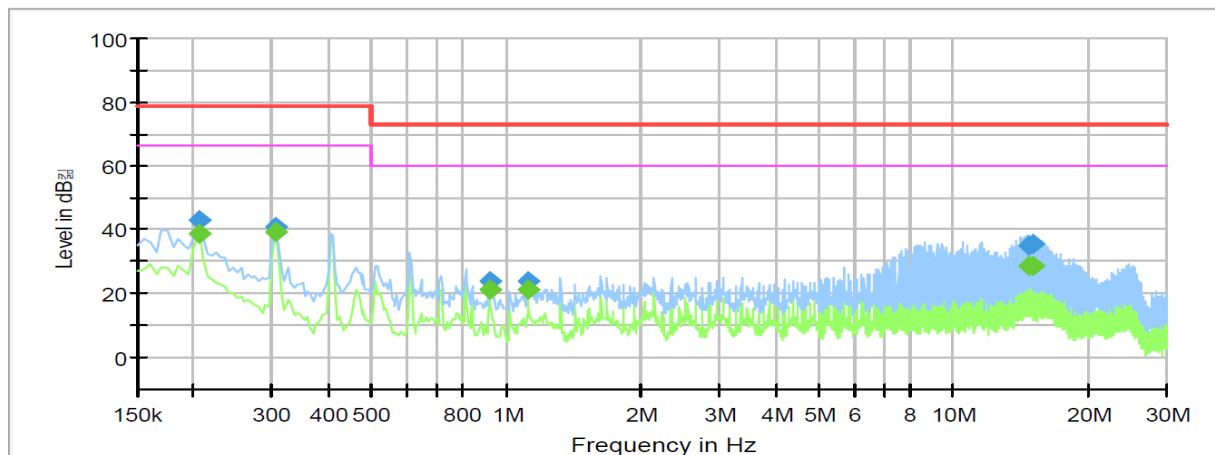
Operator Name:

Conducted Emission

XNO-8080RN

AC 24 V

KES



Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.205000	---	38.81	66.00	27.19	1000.0	9.000	L1	9.7
0.205000	42.85	---	79.00	36.15	1000.0	9.000	L1	9.7
0.305000	---	39.41	66.00	26.59	1000.0	9.000	L1	9.7
0.305000	40.68	---	79.00	38.32	1000.0	9.000	L1	9.7
0.915000	---	21.04	60.00	38.96	1000.0	9.000	L1	10.0
0.915000	23.73	---	73.00	49.27	1000.0	9.000	L1	10.0
1.120000	---	21.02	60.00	38.98	1000.0	9.000	L1	10.1
1.120000	24.11	---	73.00	48.89	1000.0	9.000	L1	10.1
14.775000	---	28.39	60.00	31.61	1000.0	9.000	L1	10.1
14.775000	34.76	---	73.00	38.24	1000.0	9.000	L1	10.1
15.080000	---	28.65	60.00	31.35	1000.0	9.000	L1	10.1
15.080000	35.70	---	73.00	37.30	1000.0	9.000	L1	10.1

◆ Calculation

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

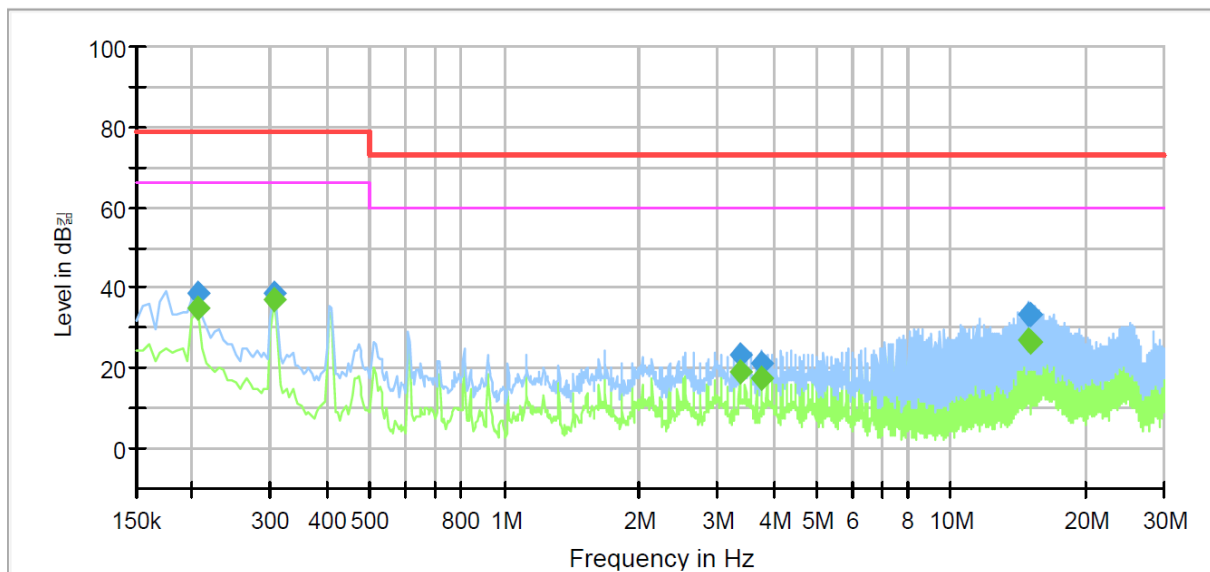
Corr. : Correction values (LISN FACTOR+ Cable Loss)



[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: XNO-8080RN
Mode: AC 24 V
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.205000	---	34.81	66.00	31.19	1000.0	9.000	N	9.7
0.205000	38.89	---	79.00	40.11	1000.0	9.000	N	9.7
0.305000	---	37.25	66.00	28.75	1000.0	9.000	N	9.7
0.305000	38.58	---	79.00	40.42	1000.0	9.000	N	9.7
3.360000	---	18.83	60.00	41.17	1000.0	9.000	N	10.1
3.360000	23.57	---	73.00	49.43	1000.0	9.000	N	10.1
3.770000	---	17.41	60.00	42.59	1000.0	9.000	N	10.1
3.770000	21.06	---	73.00	51.94	1000.0	9.000	N	10.1
14.875000	---	26.92	60.00	33.08	1000.0	9.000	N	10.1
14.875000	33.41	---	73.00	39.59	1000.0	9.000	N	10.1
15.080000	---	26.31	60.00	33.69	1000.0	9.000	N	10.1
15.080000	33.60	---	73.00	39.40	1000.0	9.000	N	10.1

◆ Calculation

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (LISN FACTOR+ Cable Loss)

**Radiated Electric Field Emissions(Below 1 GHz)**

- AC 24V 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]
196.60	20.02	H	4.00	10.98	4.08	35.08	40.00	4.92
221.18	20.33	H	4.00	11.77	4.37	36.47	40.00	3.53
221.19	19.48	V	1.00	11.77	4.37	35.62	40.00	4.38
319.49	22.41	H	4.00	13.83	5.34	41.58	47.00	5.42
344.15	20.85	H	4.00	14.40	5.58	40.83	47.00	6.17
491.09	16.37	H	3.30	16.98	6.97	40.32	47.00	6.68

* H : Horizontal, V : Vertical

◆ Calculation

Corrected Amplitude [dB μ V] = Amplitude[dB μ V] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss

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Test report No.:
KES-E1-16T0622
Page (21) of (50)

- DC 12V Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dBμV]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dBμV/m]	[dBμV/m]	[dB]
196.63	19.86	H	4.00	10.98	4.08	34.92	40.00	5.08
221.18	19.94	H	4.00	11.77	4.37	36.08	40.00	3.92
221.23	19.46	V	1.00	11.77	4.37	35.60	40.00	4.40
319.77	21.16	H	4.00	13.84	5.34	40.34	47.00	6.66
344.29	20.67	H	4.00	14.41	5.58	40.66	47.00	6.34
491.50	16.81	H	3.50	16.98	6.97	40.76	47.00	6.24

* H : Horizontal, V : Vertical

◆ Calculation

Corrected Amplitude [dBuV] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss

- POE Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dBμV]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dBμV/m]	[dBμV/m]	[dB]
196.62	19.76	H	4.00	10.98	4.08	34.82	40.00	5.18
221.18	20.23	H	4.00	11.77	4.37	36.37	40.00	3.63
319.47	22.34	V	1.10	13.83	5.34	41.51	47.00	5.49
319.50	21.84	H	3.90	13.83	5.34	41.01	47.00	5.99
344.13	20.71	H	4.00	14.40	5.58	40.69	47.00	6.31
369.63	18.35	H	4.00	15.00	5.85	39.20	47.00	7.80

* H : Horizontal, V : Vertical

◆ Calculation

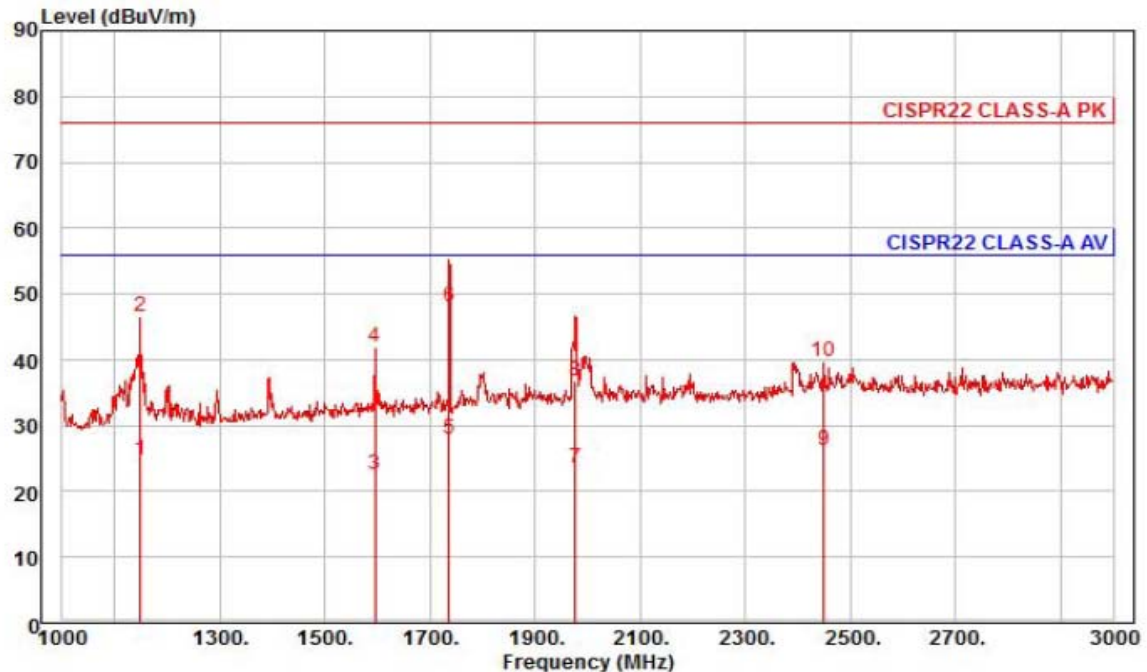
Corrected Amplitude [dBuV] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss

Radiated Electric Field Emissions(Above 1 GHz)

- AC 24V Mode



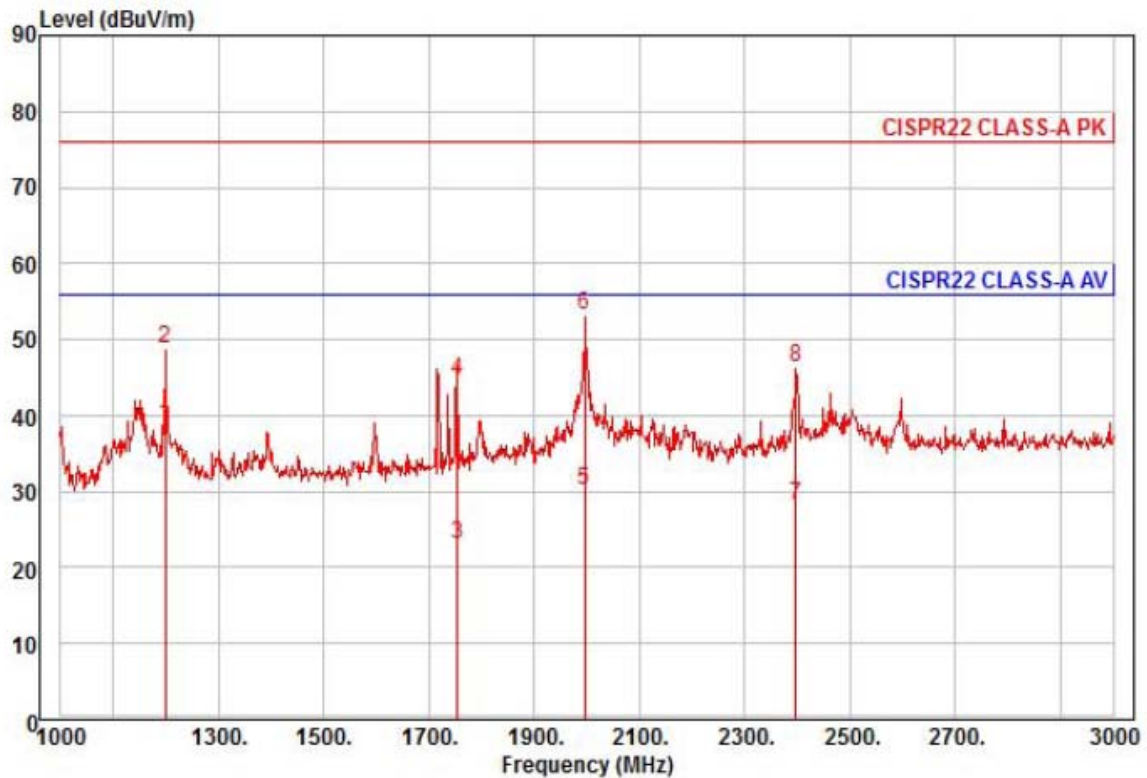
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8080RN
Mode : AC 24 V
Memo : (1 ~ 3) GHz

	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	1148.00	33.12	24.50	6.97	39.73	37	56.00	-31.14	horizontal	Average
2	1148.00	54.82	24.50	6.97	39.73	37	76.00	-29.44	horizontal	Peak
3	1596.00	27.26	26.28	8.30	39.22	275	56.00	-33.38	horizontal	Average
4	1596.00	46.47	26.28	8.30	39.22	275	76.00	-34.17	horizontal	Peak
5 av	1736.00	31.85	26.83	8.66	39.29	337	56.00	-27.95	horizontal	Average
6 pp	1736.00	51.92	26.83	8.66	39.29	337	76.00	-27.88	horizontal	Peak
7	1976.00	25.90	27.78	9.27	39.40	242	56.00	-32.45	horizontal	Average
8	1976.00	39.11	27.78	9.27	39.40	242	76.00	-39.24	horizontal	Peak
9	2450.00	26.28	28.98	10.43	39.48	83	56.00	-29.79	horizontal	Average
10	2450.00	39.91	28.98	10.43	39.48	83	76.00	-36.16	horizontal	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



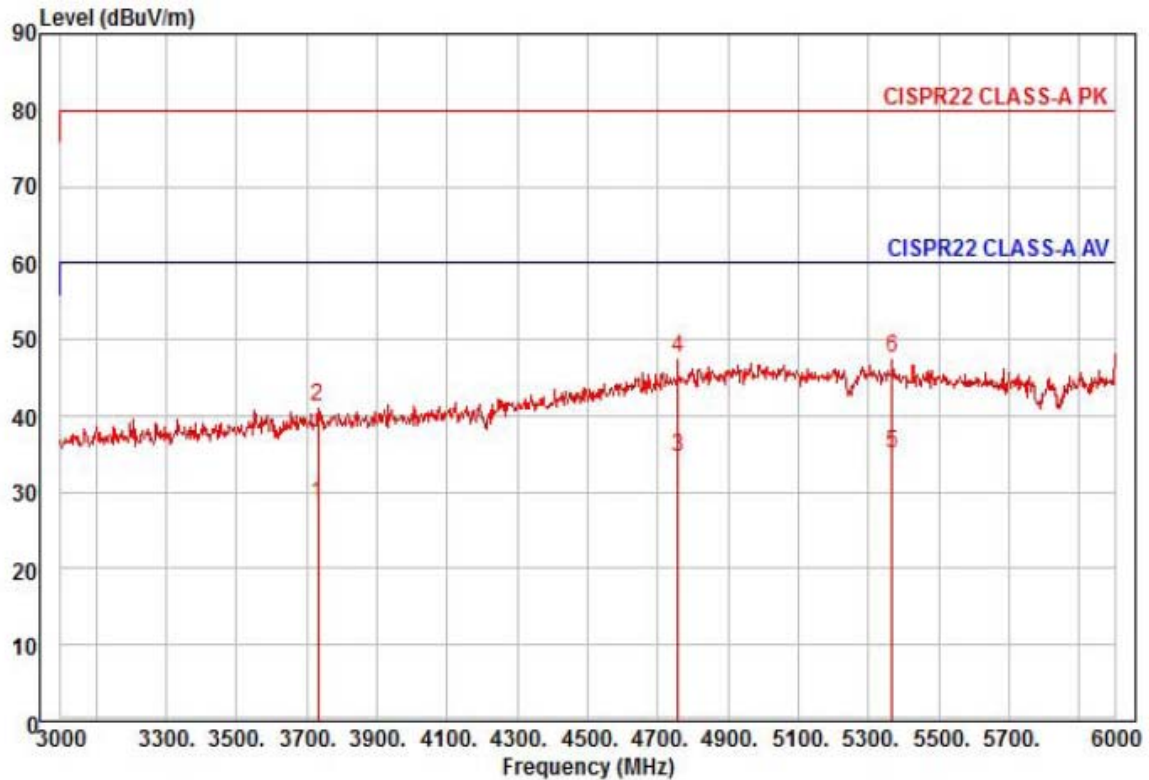
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8080RN
Mode : AC 24 V
Memo : (1 ~ 3) GHz

	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 pp	1200.00	46.56	24.70	7.14	39.61	217	56.00	-17.21	vertical	Average
2	1200.00	56.60	24.70	7.14	39.61	217	76.00	-27.17	vertical	Peak
3	1754.00	26.76	26.90	8.71	39.30	209	56.00	-32.93	vertical	Average
4	1754.00	48.36	26.90	8.71	39.30	209	76.00	-31.33	vertical	Peak
5	1996.00	32.42	27.86	9.33	39.41	320	56.00	-25.80	vertical	Average
6 pk	1996.00	55.52	27.86	9.33	39.41	320	76.00	-22.70	vertical	Peak
7	2398.00	28.43	28.86	10.32	39.42	112	56.00	-27.81	vertical	Average
8	2398.00	46.60	28.86	10.32	39.42	112	76.00	-29.64	vertical	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



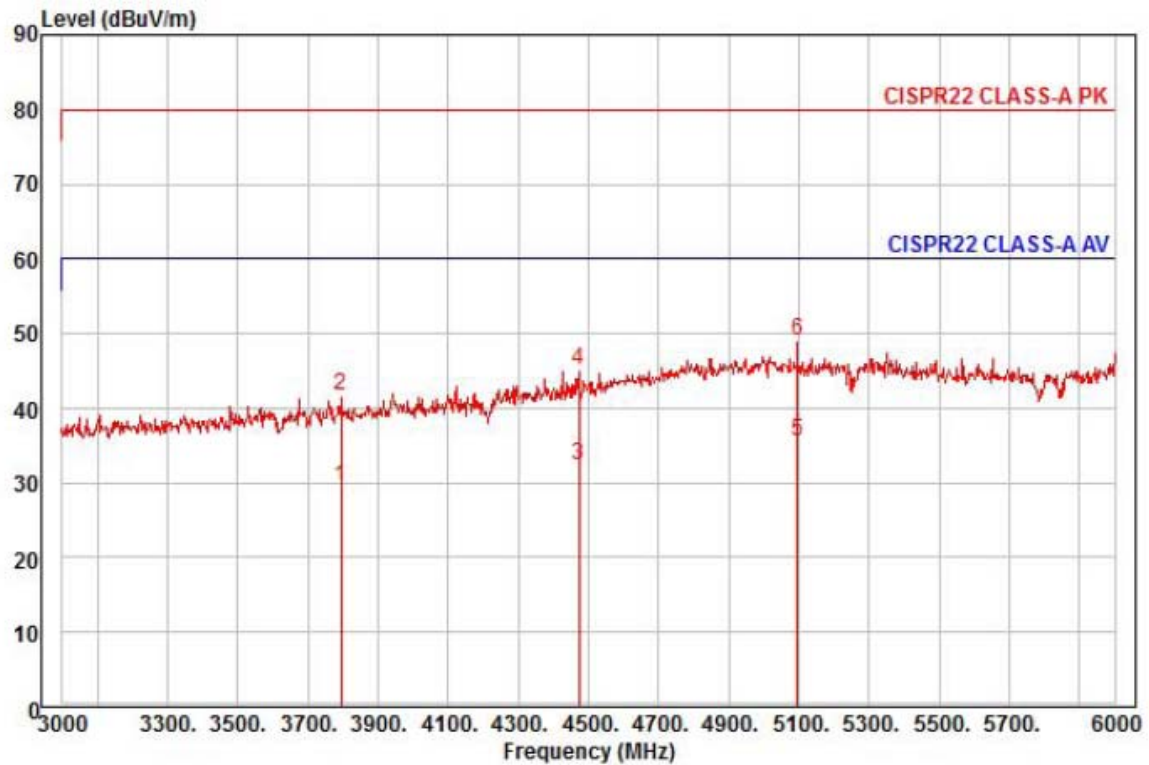
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8080RN
Mode : AC 24 V
Memo : (3 ~ 6) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3732.00	24.71	31.56	13.05	40.80	232	60.00	-31.48	horizontal	Average
2	3732.00	37.50	31.56	13.05	40.80	232	80.00	-38.69	horizontal	Peak
3	4758.00	23.67	36.34	15.01	40.51	166	60.00	-25.49	horizontal	Average
4 pk	4758.00	36.86	36.34	15.01	40.51	166	80.00	-32.30	horizontal	Peak
5 pp	5367.00	22.87	36.98	15.98	40.88	343	60.00	-25.05	horizontal	Average
6	5367.00	35.59	36.98	15.98	40.88	343	80.00	-32.33	horizontal	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



Site : chamber

Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical

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

Project :

Model : XNO-8080RN

Mode : AC 24 V

Memo : (3 ~ 6) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3795.00	25.31	31.67	13.17	40.77	346	60.00	-30.62	vertical	Average
2	3795.00	37.68	31.67	13.17	40.77	346	80.00	-38.25	vertical	Peak
3	4473.00	24.01	34.71	14.41	40.77	301	60.00	-27.64	vertical	Average
4	4473.00	36.76	34.71	14.41	40.77	301	80.00	-34.89	vertical	Peak
5 pp	5097.00	22.85	37.52	15.51	40.43	210	60.00	-24.55	vertical	Average
6 pk	5097.00	36.34	37.52	15.51	40.43	210	80.00	-31.06	vertical	Peak

Calculation

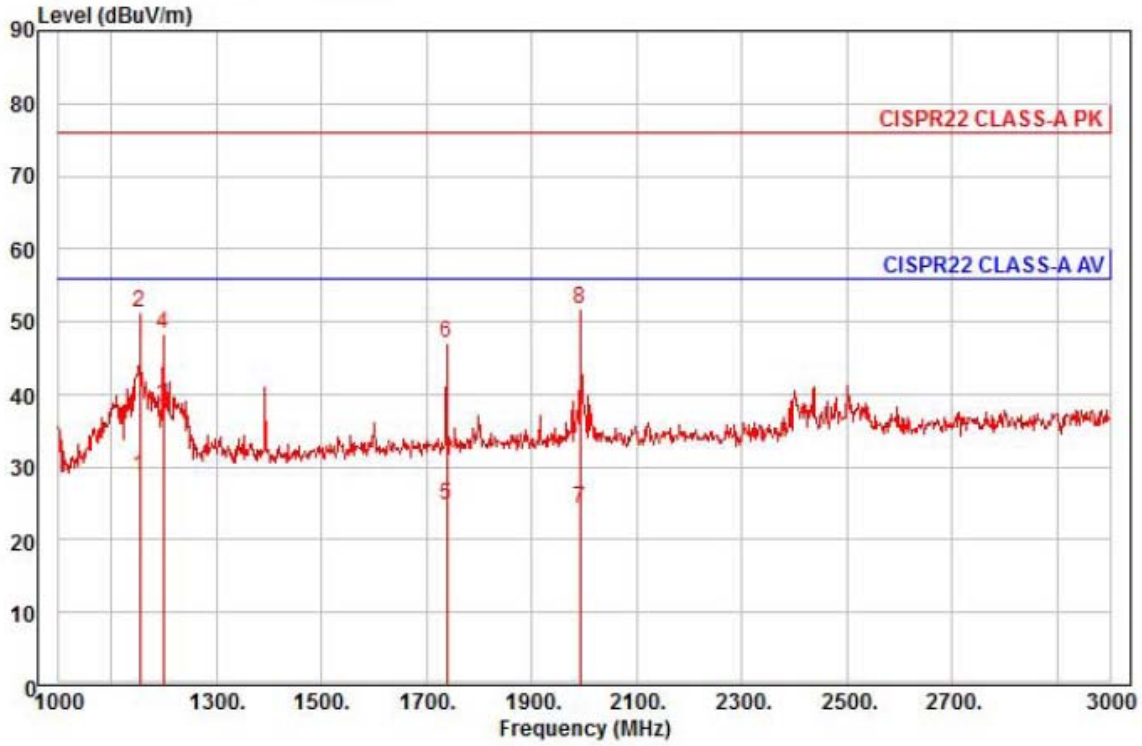
Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,

Cable Loss : Cable loss, Preamp Factor : Preamp Factor



- DC 12V Mode



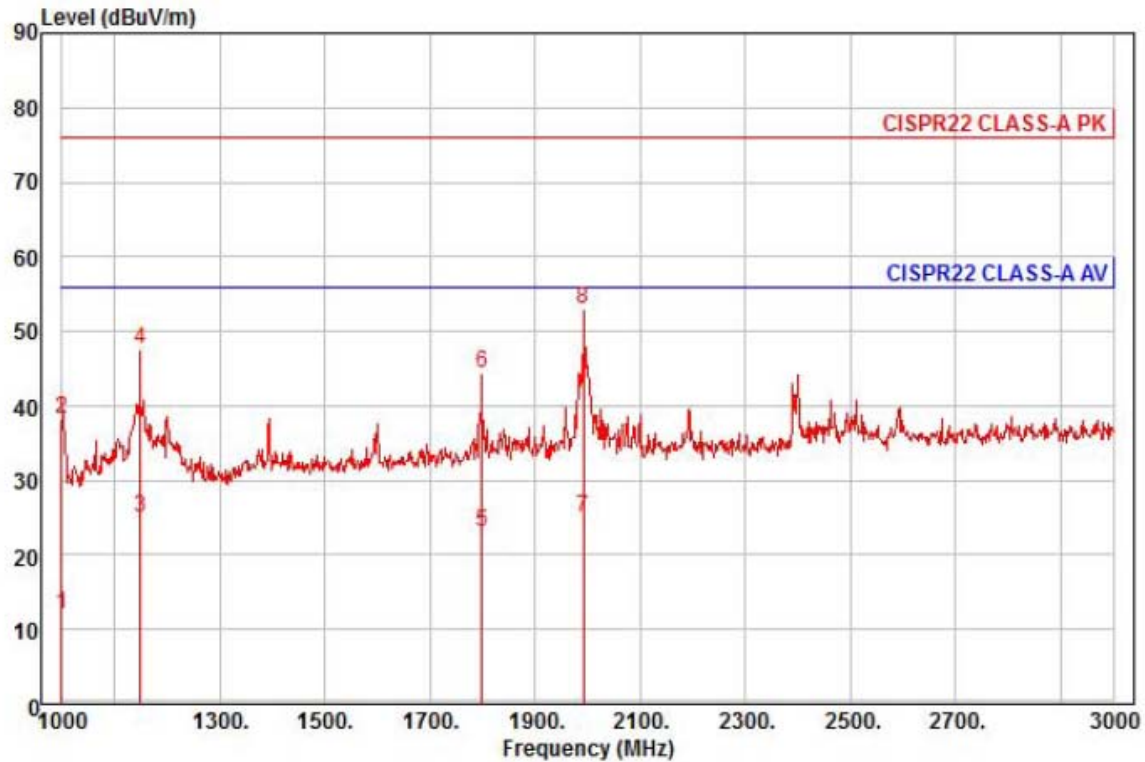
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8080RN
Mode : DC 12 V
Memo : (1 ~ 3) GHz

	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	1154.00	36.83	24.52	6.99	39.72	149	56.00	-27.38	horizontal	Average
2	1154.00	59.53	24.52	6.99	39.72	149	76.00	-24.68	horizontal	Peak
3 pp	1200.00	45.92	24.70	7.14	39.61	149	56.00	-17.85	horizontal	Average
4	1200.00	56.10	24.70	7.14	39.61	149	76.00	-27.67	horizontal	Peak
5	1738.00	28.55	26.84	8.67	39.29	158	56.00	-31.23	horizontal	Average
6	1738.00	50.97	26.84	8.67	39.29	158	76.00	-28.81	horizontal	Peak
7	1992.00	26.61	27.85	9.32	39.41	25	56.00	-31.63	horizontal	Average
8 pk	1992.00	53.96	27.85	9.32	39.41	25	76.00	-24.28	horizontal	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



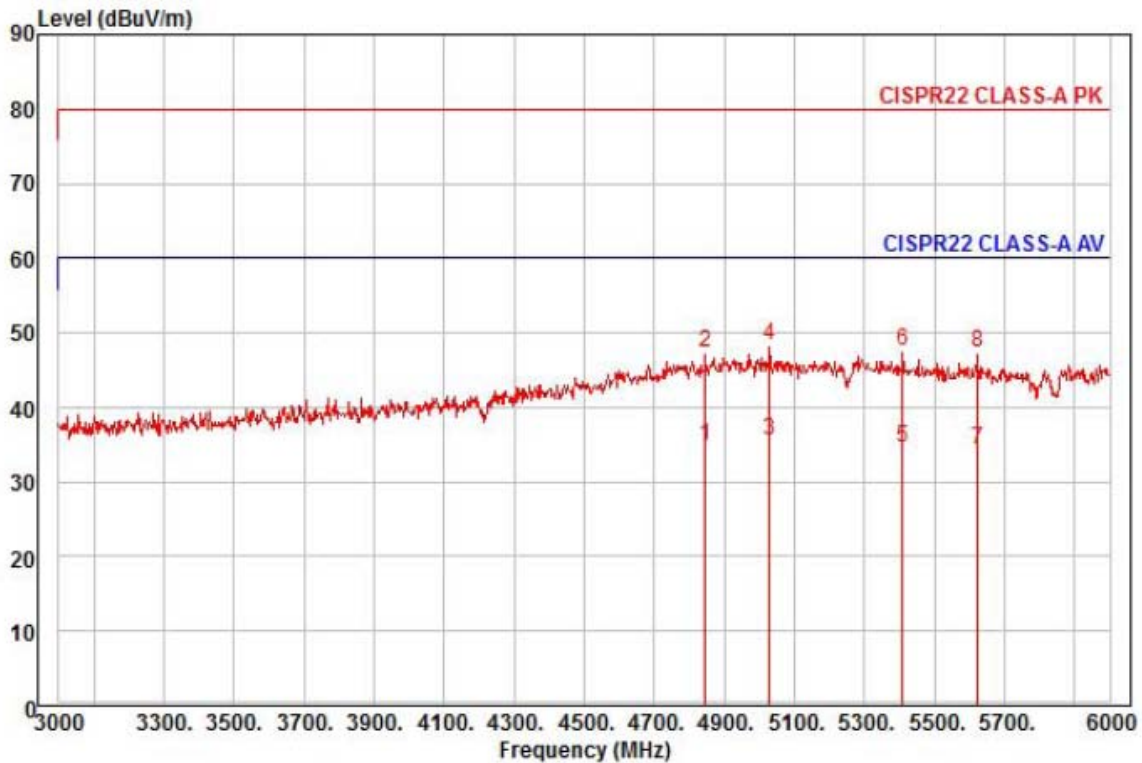
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8080RN
Mode : DC 12 V
Memo : (1 ~ 3) GHz

	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	1000.00	21.76	23.91	6.48	40.09	191	56.00	-43.94	vertical	Average
2	1000.00	48.02	23.91	6.48	40.09	191	76.00	-37.68	vertical	Peak
3 av	1148.00	33.28	24.50	6.97	39.73	169	56.00	-30.98	vertical	Average
4	1148.00	55.82	24.50	6.97	39.73	169	76.00	-28.44	vertical	Peak
5	1800.00	26.42	27.09	8.83	39.32	266	56.00	-32.98	vertical	Average
6	1800.00	47.88	27.09	8.83	39.32	266	76.00	-31.52	vertical	Peak
7	1992.00	27.17	27.85	9.32	39.41	149	56.00	-31.07	vertical	Average
8 pp	1992.00	55.16	27.85	9.32	39.41	149	76.00	-23.08	vertical	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



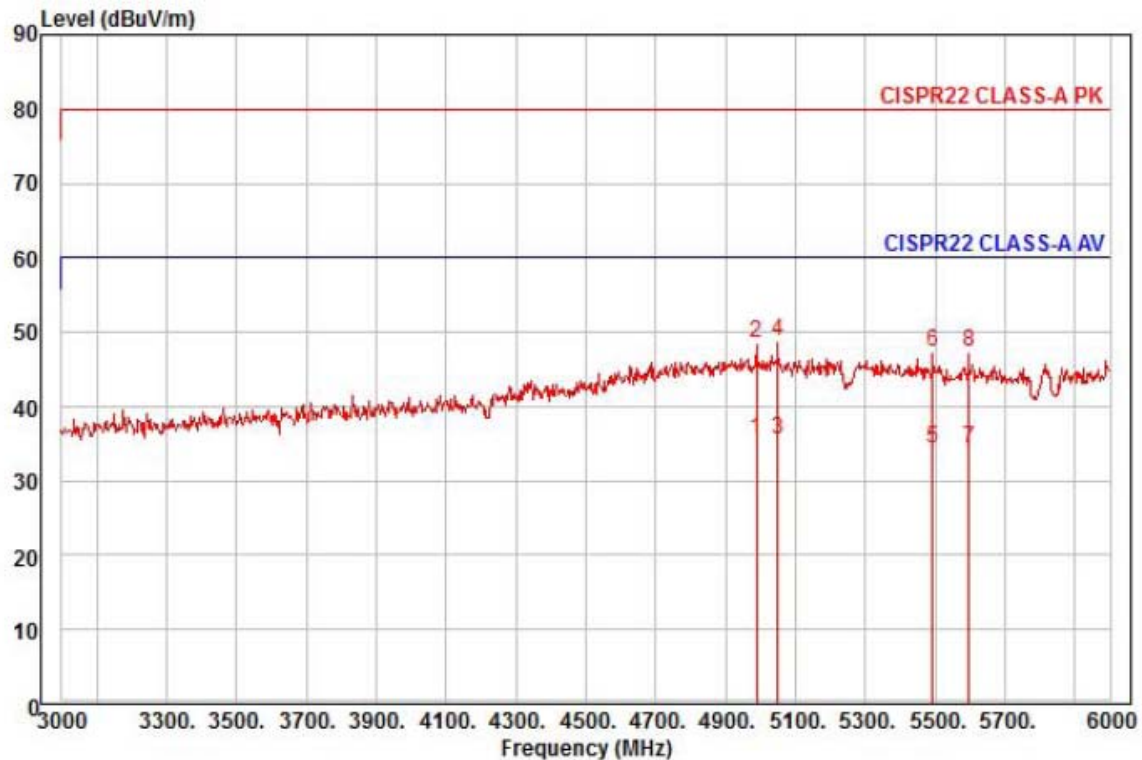
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Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8080RN
Mode : DC 12 V
Memo : (3 ~ 6) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4845.00	23.36	36.83	15.15	40.42	18	60.00	-25.08	horizontal	Average
2	4845.00	35.82	36.83	15.15	40.42	18	80.00	-32.62	horizontal	Peak
3 pp	5028.00	22.80	37.66	15.37	40.32	140	60.00	-24.49	horizontal	Average
4 pk	5028.00	35.63	37.66	15.37	40.32	140	80.00	-31.66	horizontal	Peak
5	5409.00	22.69	36.89	16.05	40.95	350	60.00	-25.32	horizontal	Average
6	5409.00	35.68	36.89	16.05	40.95	350	80.00	-32.33	horizontal	Peak
7	5622.00	22.39	36.46	16.38	40.94	309	60.00	-25.71	horizontal	Average
8	5622.00	35.33	36.46	16.38	40.94	309	80.00	-32.77	horizontal	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8080RN
Mode : DC 12 V
Memo : (3 ~ 6) GHz

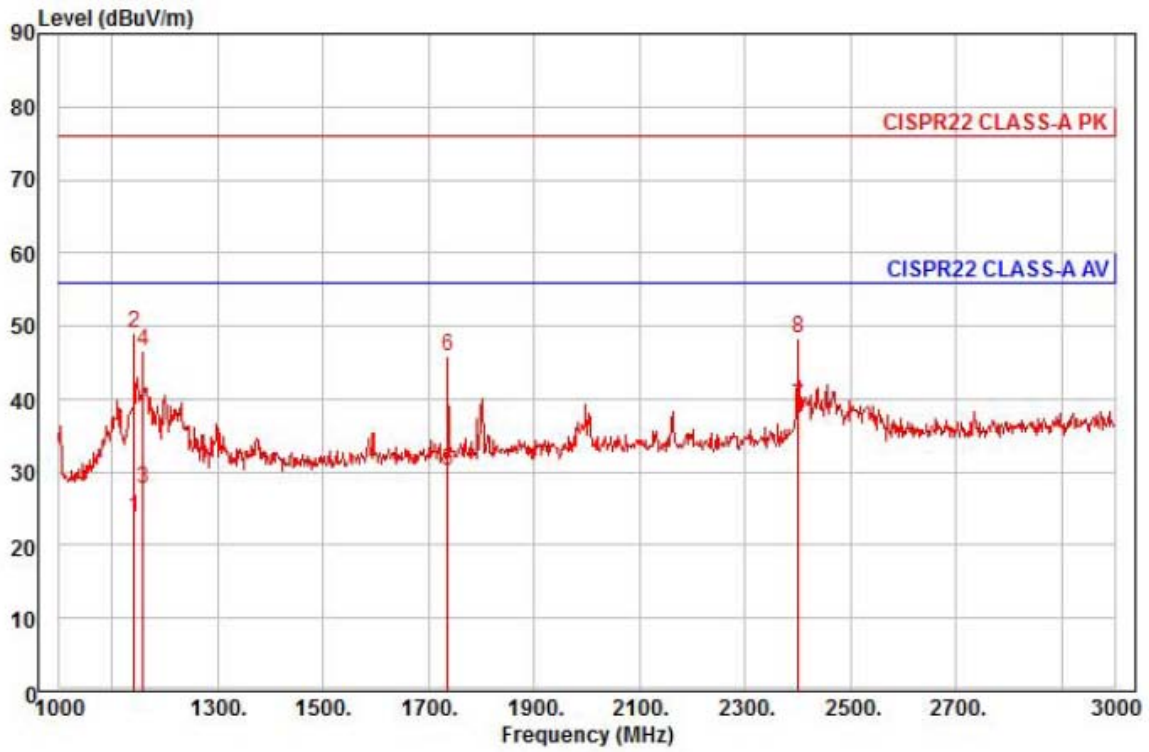
		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1 pp	4989.00	22.90	37.66	15.30	40.28	172	60.00	-24.42	vertical	Average
2	4989.00	35.77	37.66	15.30	40.28	172	80.00	-31.55	vertical	Peak
3	5049.00	22.76	37.62	15.41	40.35	337	60.00	-24.56	vertical	Average
4 pk	5049.00	36.12	37.62	15.41	40.35	337	80.00	-31.20	vertical	Peak
5	5493.00	22.63	36.72	16.18	41.09	255	60.00	-25.56	vertical	Average
6	5493.00	35.59	36.72	16.18	41.09	255	80.00	-32.60	vertical	Peak
7	5598.00	22.50	36.51	16.34	40.97	353	60.00	-25.62	vertical	Average
8	5598.00	35.57	36.51	16.34	40.97	353	80.00	-32.55	vertical	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

- POE Mode



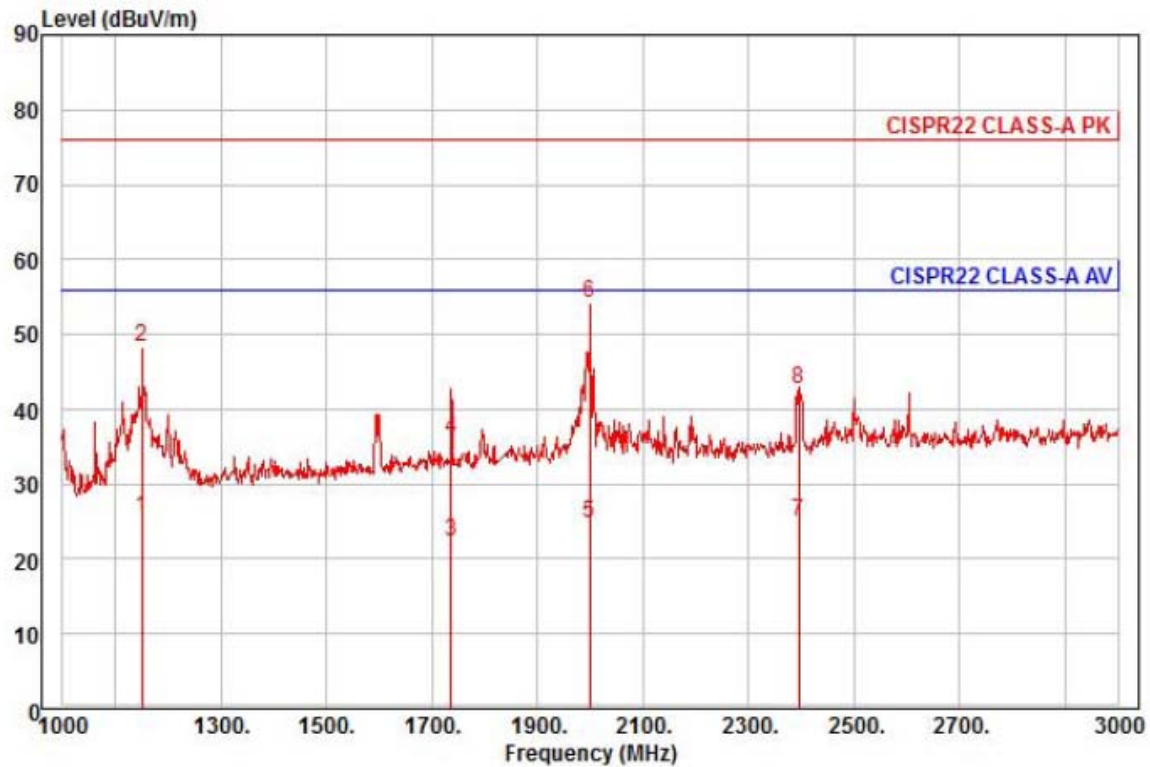
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8080RN
Mode : PoE
Memo : (1 ~ 3) GHz

	Read Freq	Ant Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1142.00	32.20	24.47	6.95	39.75	7	56.00	-32.13	horizontal	Average
2 pk	1142.00	57.39	24.47	6.95	39.75	7	76.00	-26.94	horizontal	Peak
3	1160.00	35.82	24.55	7.01	39.71	103	56.00	-28.33	horizontal	Average
4	1160.00	54.75	24.55	7.01	39.71	103	76.00	-29.40	horizontal	Peak
5	1736.00	33.85	26.83	8.66	39.29	158	56.00	-25.95	horizontal	Average
6	1736.00	49.54	26.83	8.66	39.29	158	76.00	-30.26	horizontal	Peak
7 pp	2400.00	39.13	28.86	10.32	39.42	244	56.00	-17.11	horizontal	Average
8	2400.00	48.65	28.86	10.32	39.42	244	76.00	-27.59	horizontal	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8080RN
Mode : PoE
Memo : (1 ~ 3) GHz

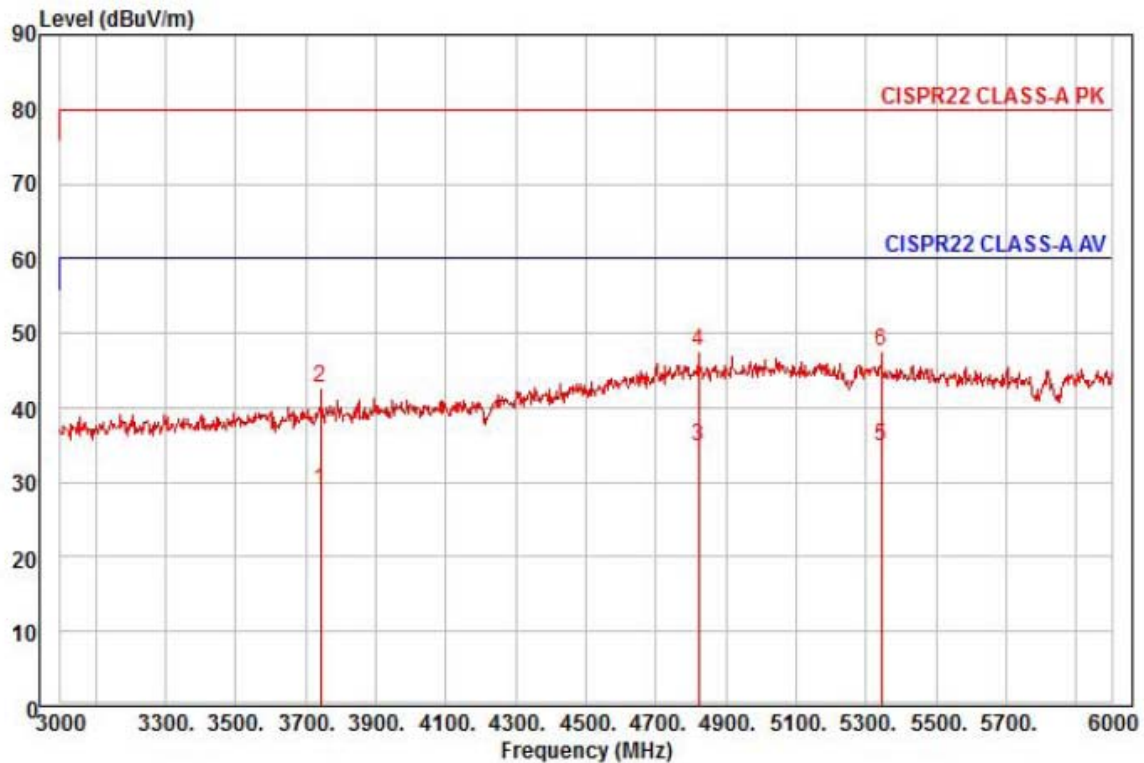
		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1 av	1150.00	33.81	24.51	6.97	39.73	214	56.00	-30.44	vertical	Average
2	1150.00	56.46	24.51	6.97	39.73	214	76.00	-27.79	vertical	Peak
3	1736.00	26.06	26.83	8.66	39.29	119	56.00	-33.74	vertical	Average
4	1736.00	39.83	26.83	8.66	39.29	119	76.00	-39.97	vertical	Peak
5	2000.00	26.89	27.88	9.34	39.41	300	56.00	-31.30	vertical	Average
6 pp	2000.00	56.27	27.88	9.34	39.41	300	76.00	-21.92	vertical	Peak
7	2396.00	25.34	28.85	10.31	39.42	272	56.00	-30.92	vertical	Average
8	2396.00	43.04	28.85	10.31	39.42	272	76.00	-33.22	vertical	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,

Cable Loss : Cable loss, Preamp Factor : Preamp Factor



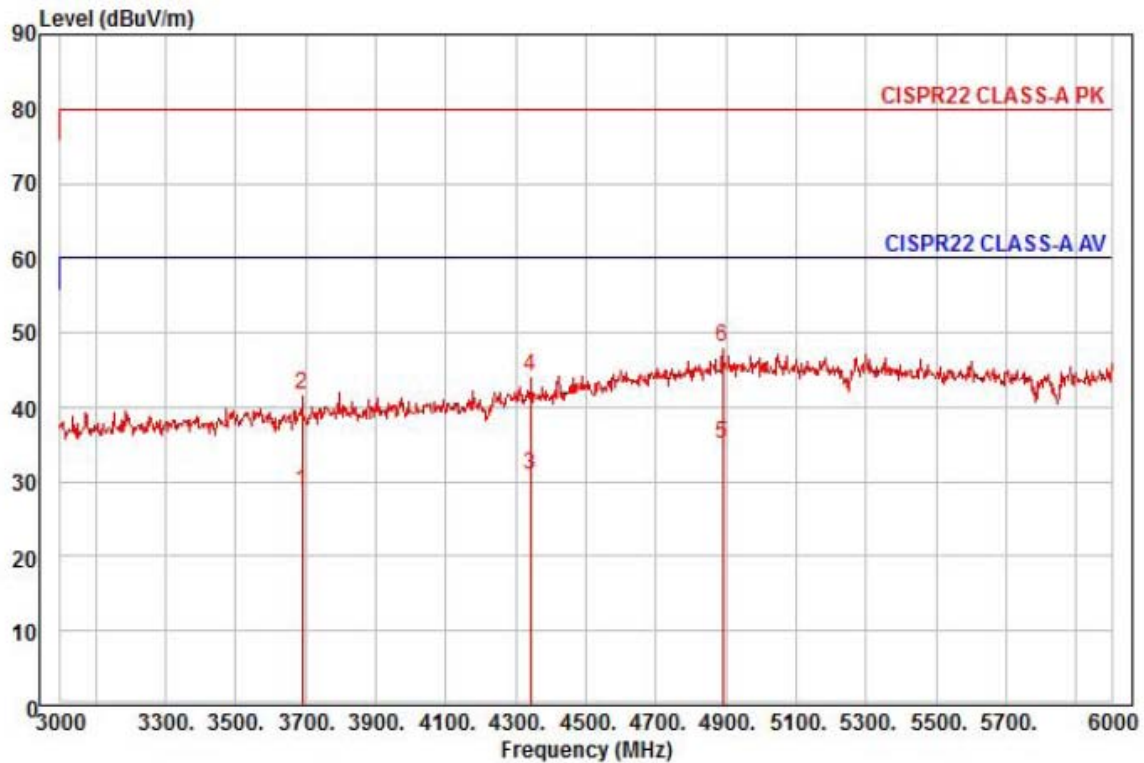
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8080RN
Mode : PoE
Memo : (3 ~ 6) GHz

	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	3741.00	25.04	31.57	13.07	40.79	225	60.00	-31.11	horizontal Average
2	3741.00	38.70	31.57	13.07	40.79	225	80.00	-37.45	horizontal Peak
3	4821.00	23.36	36.70	15.12	40.45	113	60.00	-25.27	horizontal Average
4	4821.00	36.15	36.70	15.12	40.45	113	80.00	-32.48	horizontal Peak
5 pp	5343.00	22.75	37.03	15.94	40.84	158	60.00	-25.12	horizontal Average
6 pk	5343.00	35.50	37.03	15.94	40.84	158	80.00	-32.37	horizontal Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8080RN
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	3690.00	25.08	31.49	12.97	40.81	25	60.00	-31.27	vertical	Average
2	3690.00	38.07	31.49	12.97	40.81	25	80.00	-38.28	vertical	Peak
3	4341.00	23.59	33.96	14.17	40.75	282	60.00	-29.03	vertical	Average
4	4341.00	36.84	33.96	14.17	40.75	282	80.00	-35.78	vertical	Peak
5 pp	4890.00	23.28	37.09	15.20	40.38	79	60.00	-24.81	vertical	Average
6 pk	4890.00	36.26	37.09	15.20	40.38	79	80.00	-31.83	vertical	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

Test Setup Photos and Configuration Conducted Voltage Emissions

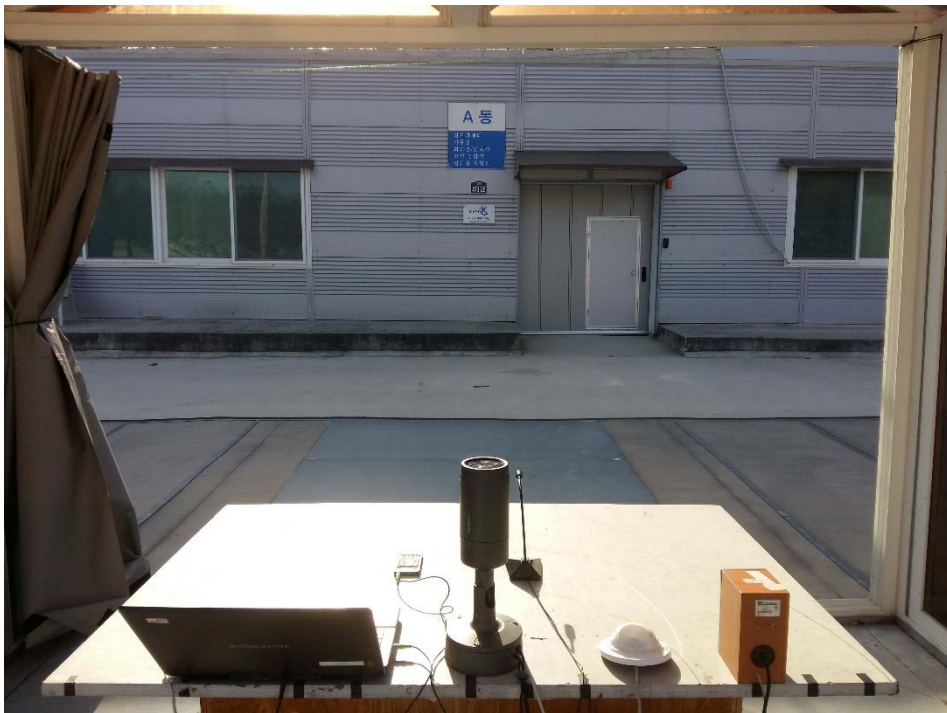
- AC 24V Mode



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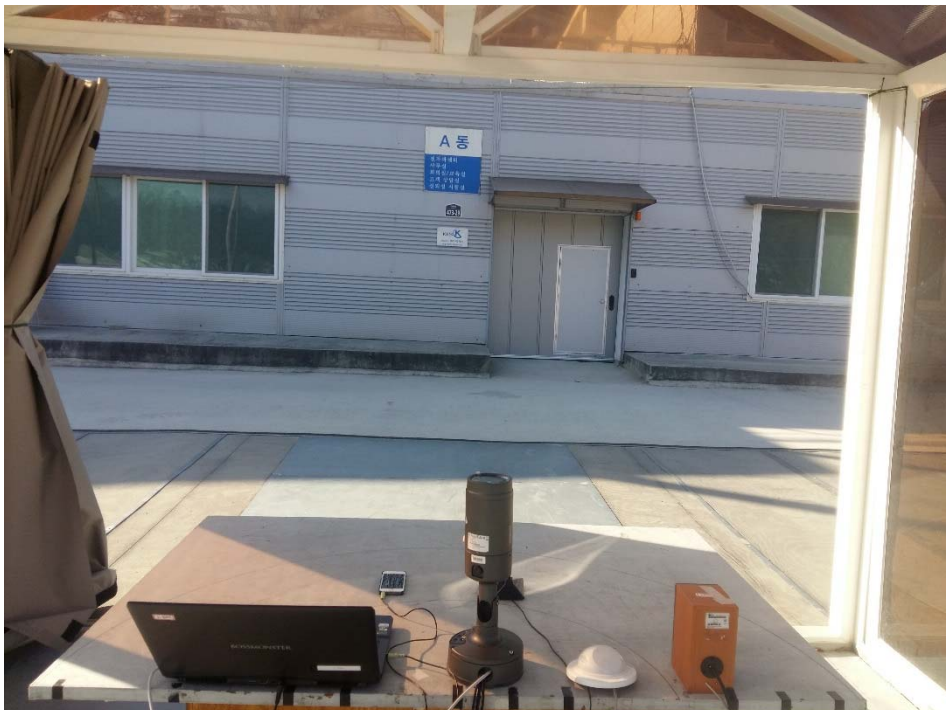
Radiated Electric Field Emissions(Below 1 GHz)

- AC 24V Mode



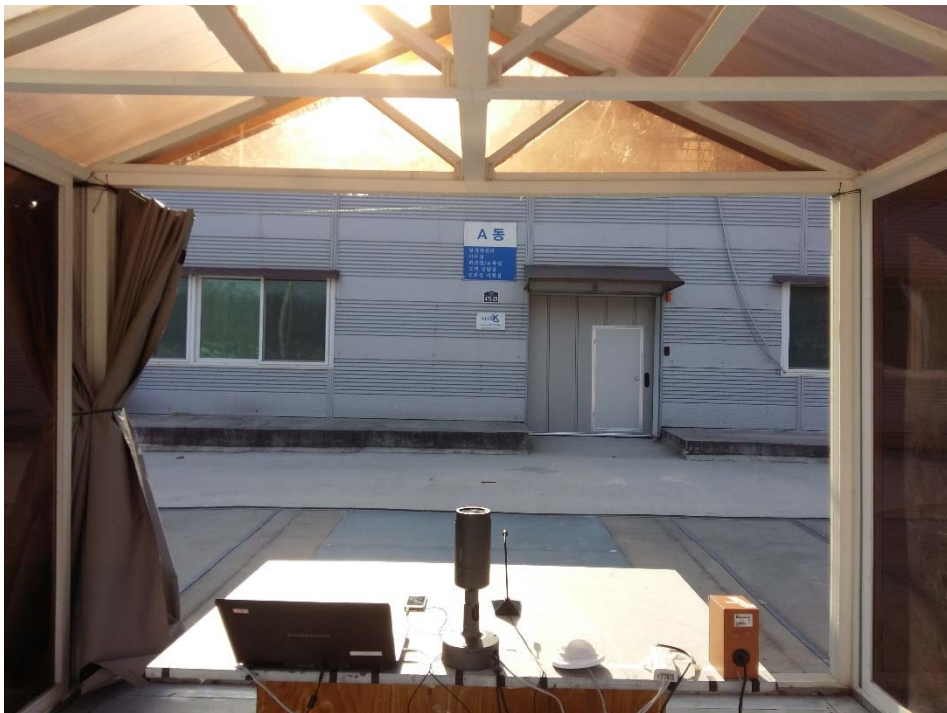
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- DC 12V Mode



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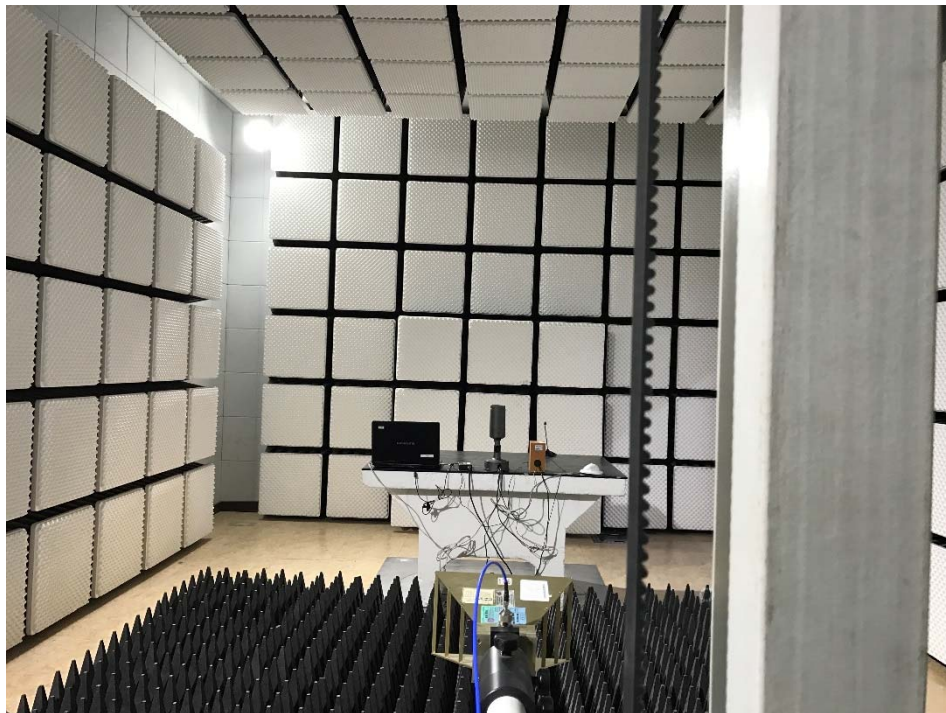
- POE Mode



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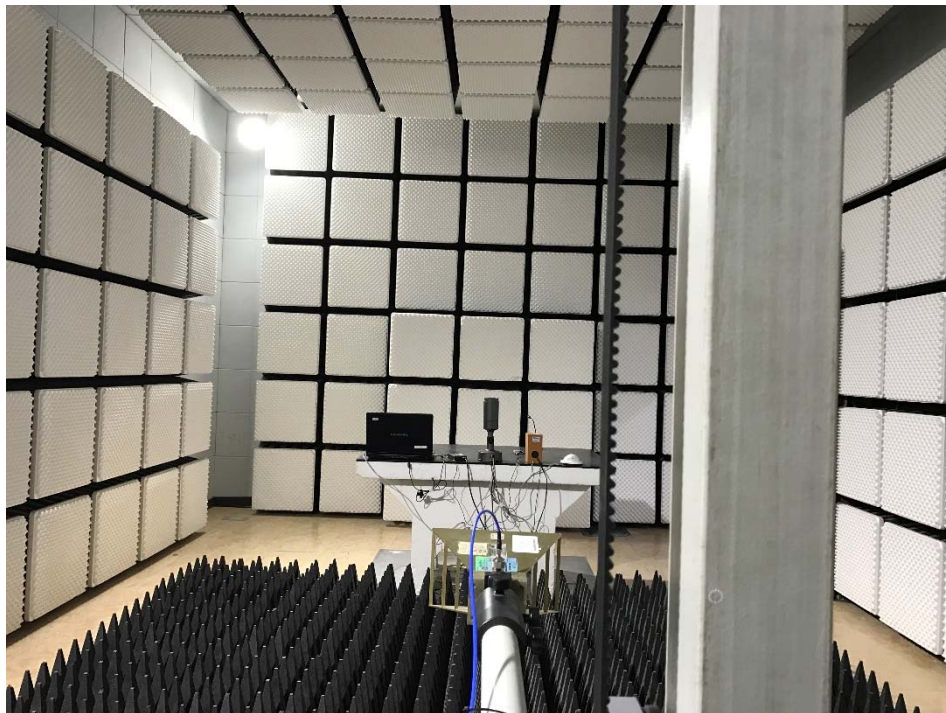
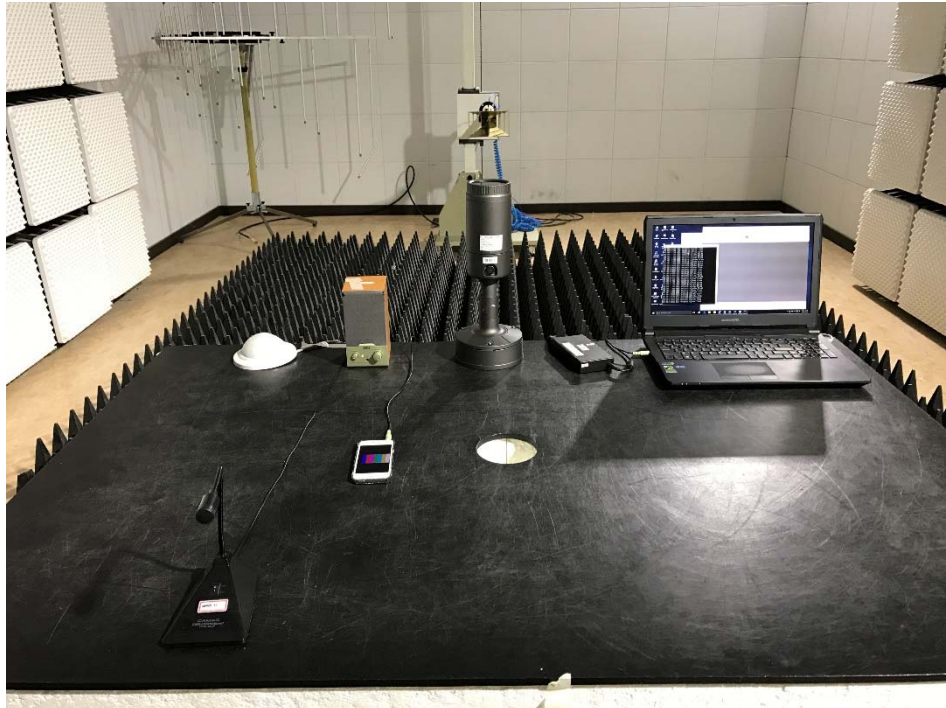
Radiated Electric Field Emissions(Above 1 GHz)

- AC 24V Mode



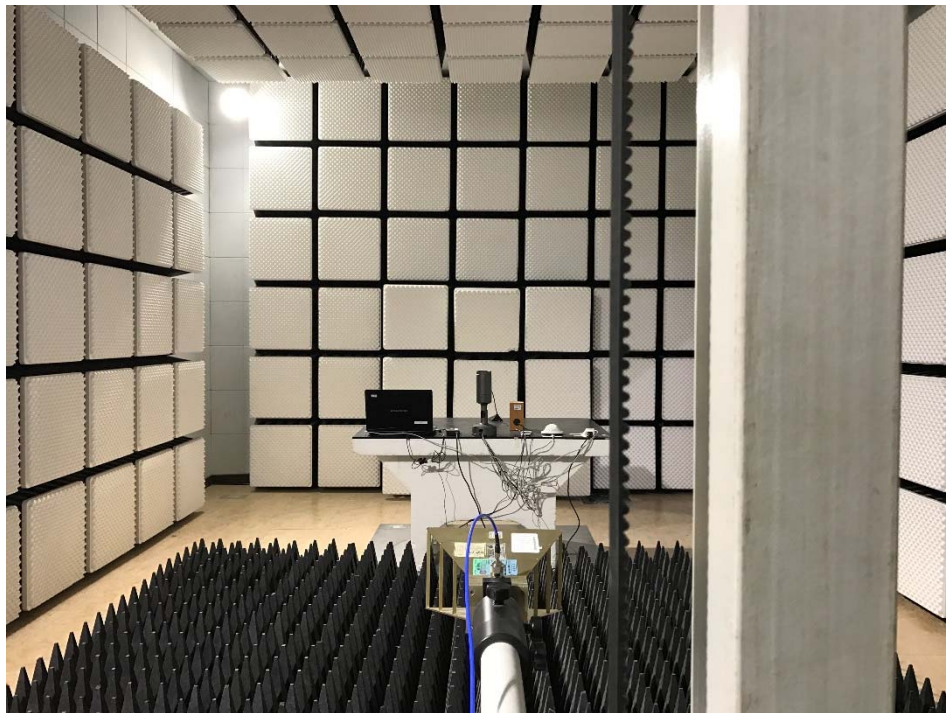
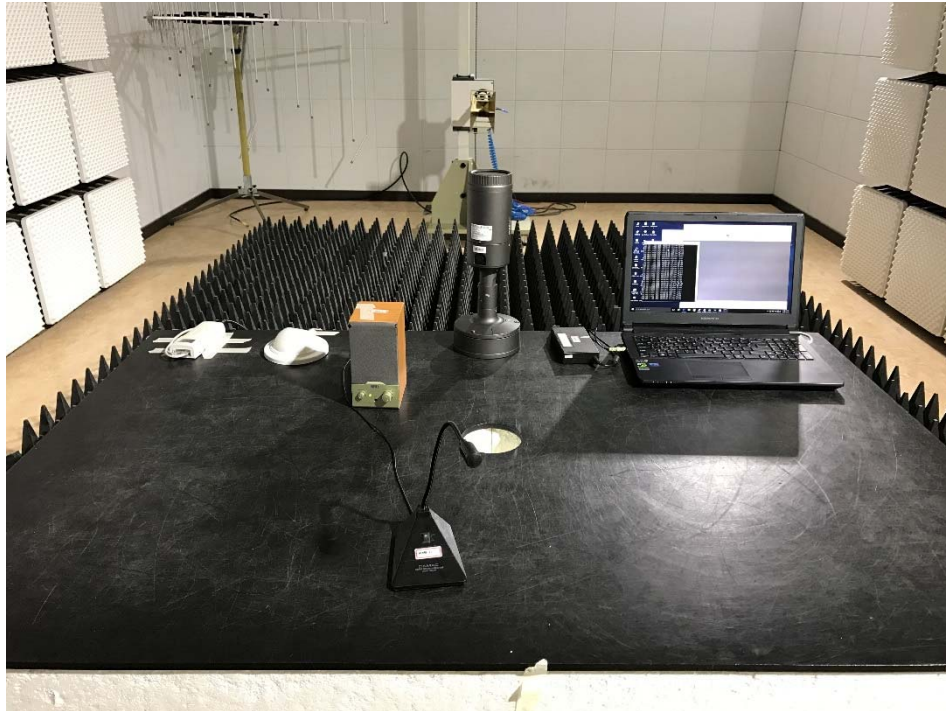
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- DC 12V Mode



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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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EUT Internal View – Main Board

(Top)



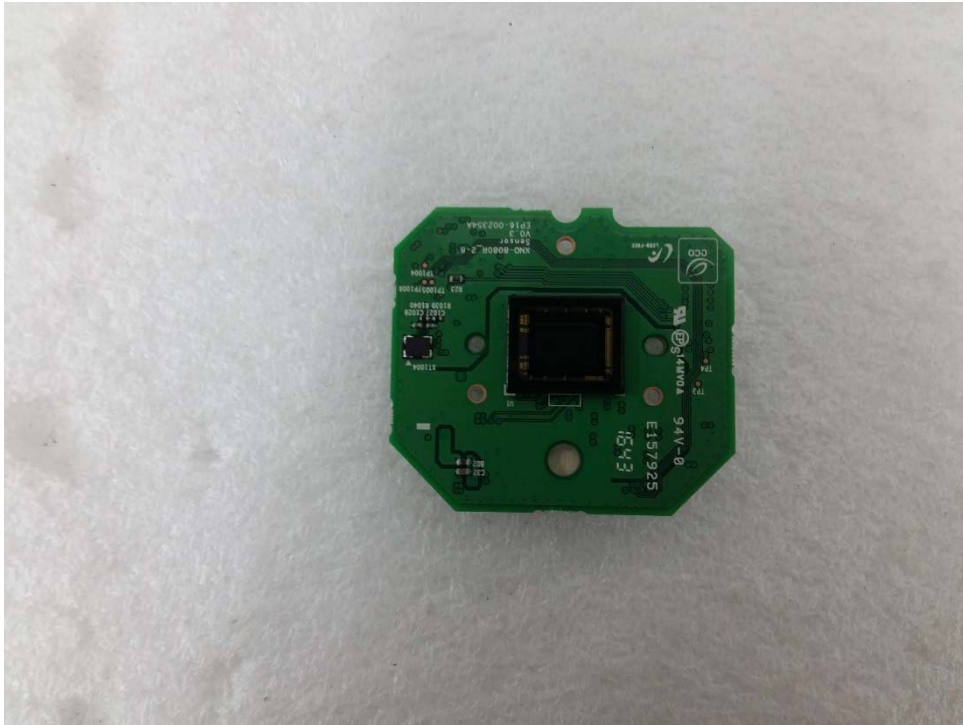
(Bottom)



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EUT Internal View – Lens Board

(Top)



(Bottom)



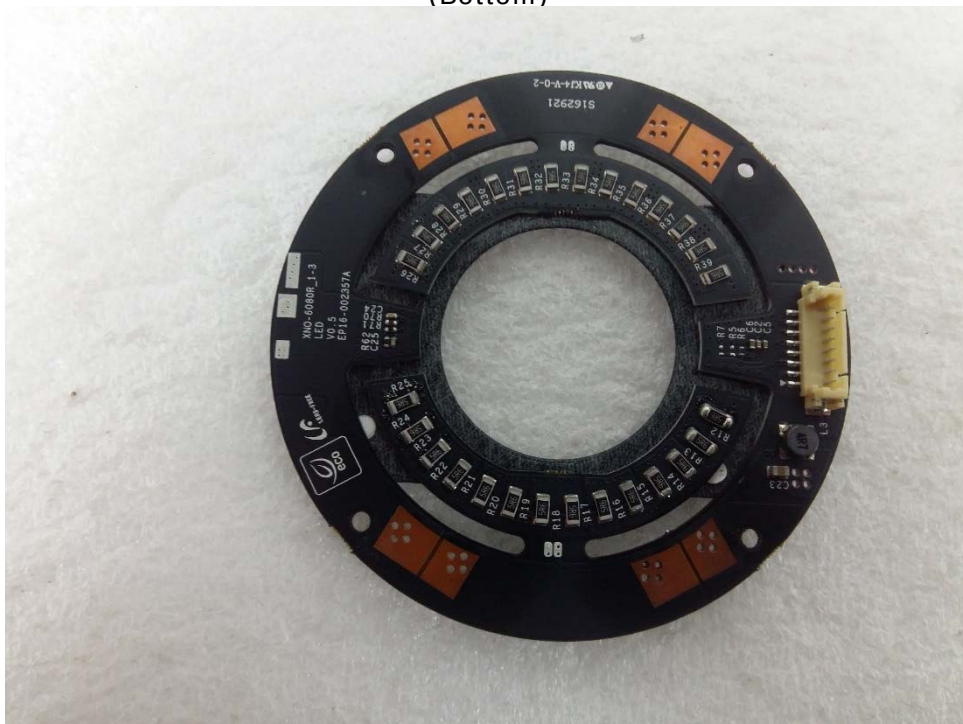
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EUT Internal View – Sub Board 1

(Top)



(Bottom)



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EUT Internal View – Sub Board 2

(Top)



(Bottom)



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EUT Internal View – Sub Board 3

(Top)



(Bottom)



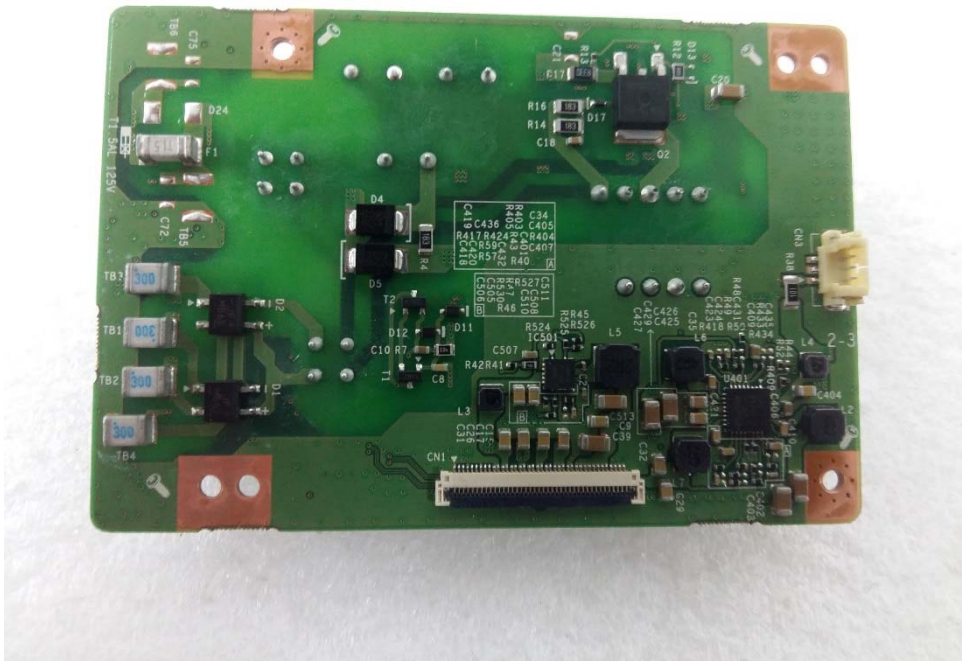
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EUT Internal View – Power Board

(Top)



(Bottom)



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EUT Internal View - Camera Lens

(Top)

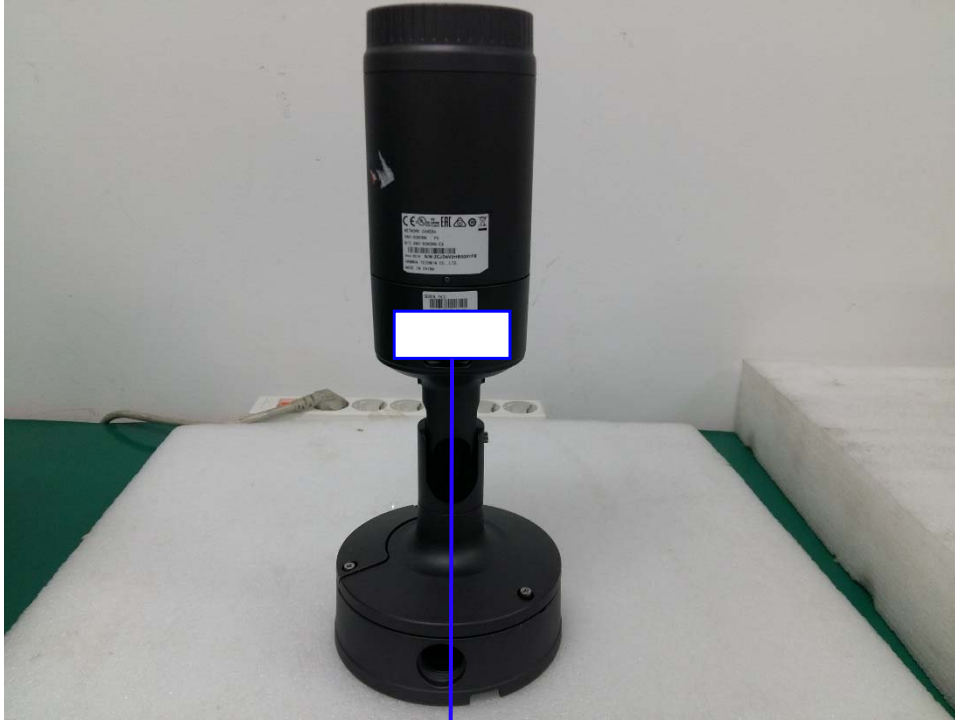


(Bottom)



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Label Photographs



CAN ICES-3 (A)/NMB-3(A)

[LABEL VIEW]