EMC TEST REPORT For CE

Test Report No.	:	KES-E1-17T0084-R1
Date of Issue	:	Oct, 02, 2017
Product name	:	NETWORK CAMERA
Model/Type No.	:	XNO-8020RP
Variant Model	:	XNO-8030RP, XNO-8040RP
Applicant	:	Hanwha Techwin Co., Ltd.
Applicant Address	:	1204, Changwon-daero, Seongsan-gu, Changwon-si, Gyeongsangnam-do
Manufacturer	:	Hanwha Techwin (Tianjin) Co.,Ltd.
Manufacturer Address	:	No.11 Weiliu Rd,Micro-Electronic Industrial Park,TEDA,Tianjin,300385,People's Republic of China
Date of Receipt	:	Jan, 20, 2017
Test date	:	Feb, 01, 2017 – Feb, 03, 2017
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Young Suk, Song
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Feb. 06, 2017	KES-E1-17T0084	Issued
Oct. 02, 2017	KES-E1-17T0084-R1	Standard Revision

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1.0 General Product Description

Main Specifications of E.U.T are:

	XNO-8020R
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 : 0.2 lux(F1.6, 1/30sec) 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, 1280x720, for installatior
Lens	
Focal Length (Zoom Ratio)	3.7mm Fixed
Max. Aperture Ratio	F1.6
Angular Field of View	H: 97.5°, V:71.9°, D: 126.2°
Min. Object Distance	0.4m
Focus Control	Manual
Lens Type	Fixed
Mount Type	Board-in type
Operational	
IR Viewable Length	30m(98.43ft)
Camera Title	Off / On (Displayed up to 85 characters) - 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	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off / BLC / HLC(Masking/Dimming), WDR
Wide Dynamic Range	120dB
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 detection) / Manual / Off
Motion Detection	Off/ On(8ea, 8point Polygonal zones), Handover
Privacy Masking	Off / On (32ea, polygonal zones) - Color : Grey/Green/Red/Blue/Black/White - Mosaic
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)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
Digital PTZ	24X, 'Digital PTZ(Preset, Group)
Flip / Mirror	Flip : On/Off Mirror : On/Off Hallway view : 90°/270°
Video & Audio Analytics	Tampering, Loitering, Directional Detection, Defocus Detection, Fog&Dust Detection, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection, Motion Detection, Digital Auto Tracking, Sound Classification, People counting, Heat map, Queue management
Alarm I/O	Input 1ea / Output 1ea
Alarm Triggers	Alarm Input, Motion Detection, Video & Audio 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
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	2560 x 1920, 2560 x 1440, 1920 x 1080, 1600 x 1200, 1280 x 1024, 1280 x 960 1280 x 720, 1024 x 768, 800 x 600, 800 x 448, 720 x 576, 720 x 480, 640 x 480, 640 x 360, 320 x 240
Max. Framerate	H.265/H.264 : Max. 30fps at all resolutions Motion JPEG : Max. 30fps
Smart Codec	Manual Mode (area-based : 5EA)
WiseStream II	Support
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 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-dierctional (2-Way)
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour
Security	Supported OS: Windows 7, 8, 10, Mac OS X 10.10. 10.11 10.12 **Non-plugin Webviewer** Supported Browser: Google Chrome 54, MS Edge 38, Mozilla Firefox 49 , Apple Safari 9 (Mac OS X only) **Plug-in Webviewer** Supported Browser : MS Explore 11, Apple Safari 9 (Mac OS X only)
Streaming Method	Streaming Method
Max. User Access	20 users at Unicast Mode
Edge Storage	SD/SDHC/SDXC 2slot (up to 512 GB) - Continuous recording(1'st slot to 2'nd slot) - Motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded. NAS(Network Attached Storage) Local PC for Instant Recording
Application Programming Interfa	ONVIF Profile S/G SUNAPI(HTTP API) Open Platform
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish,, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Web Viewer	Supported OS: Windows 7, 8.1, 10, Mac OS X 10.10. 10.11 10.12 **Non-plugin Webviewer** Supported Browser: Google Chrome 54, MS Edge 38, Mozilla Firefox 49(Window 64bit only) , Apple Safari 9 (Mac OS X only) **Plug-in Webviewer** Supported Browser : MS Explore 11, 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	-50°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP67, IP66, NEMA 4X
Vandal Resistance	IK10
Electrical	
Input Voltage / Current	12VDC ± 10%, PoE(IEEE802.3af)
Power Consumption	Max. 8.8W(12VDC), Max. 9.8W(PoE)
Mechanical	
Color / Material	Ivory / Aluminum
Dimension (WxHxD)	Ø120x296mm(Ø4.72" x 11.65")
Weight	1.3Kg

1.1 Test Voltage & Frequency

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

Voltage ☐ 220 Vac ☐ 230 Vac ☐ 24 Vac ☒ 12 Vdc ☒ PoE

Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

1.2 Variant Model Differences

Variant Model	Difference
XNO-8030RP	No circuit and hardware changes. Simple sales place distinction. different model.
XNO-8040RP	

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	XNO-8020RP	-	Hanwha Techwin(Tianjin) 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	-
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	-
Alarm	-	-	-	-
SD card	-	-	SanDisk	-

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

* Unshielded=U, Shielded=S

1.7 E.U.T Operating Mode(s)

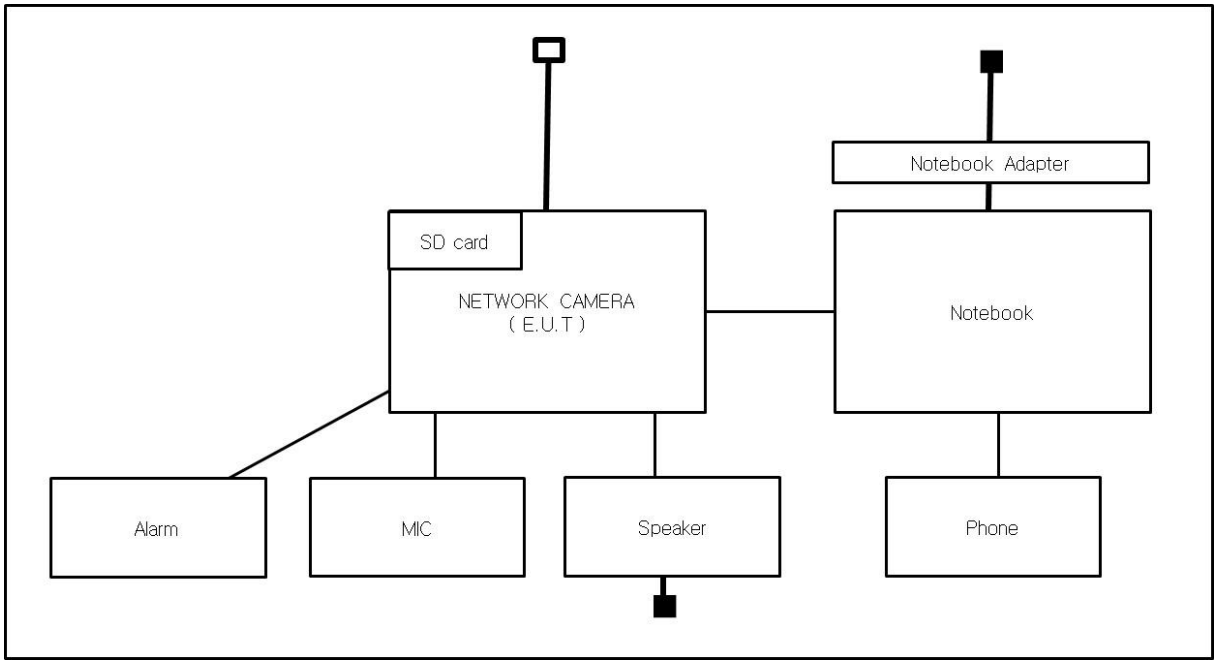
Test mode	operating
DC, POE	E.U.T Monitoring, 1 ㎑, Ping Test

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

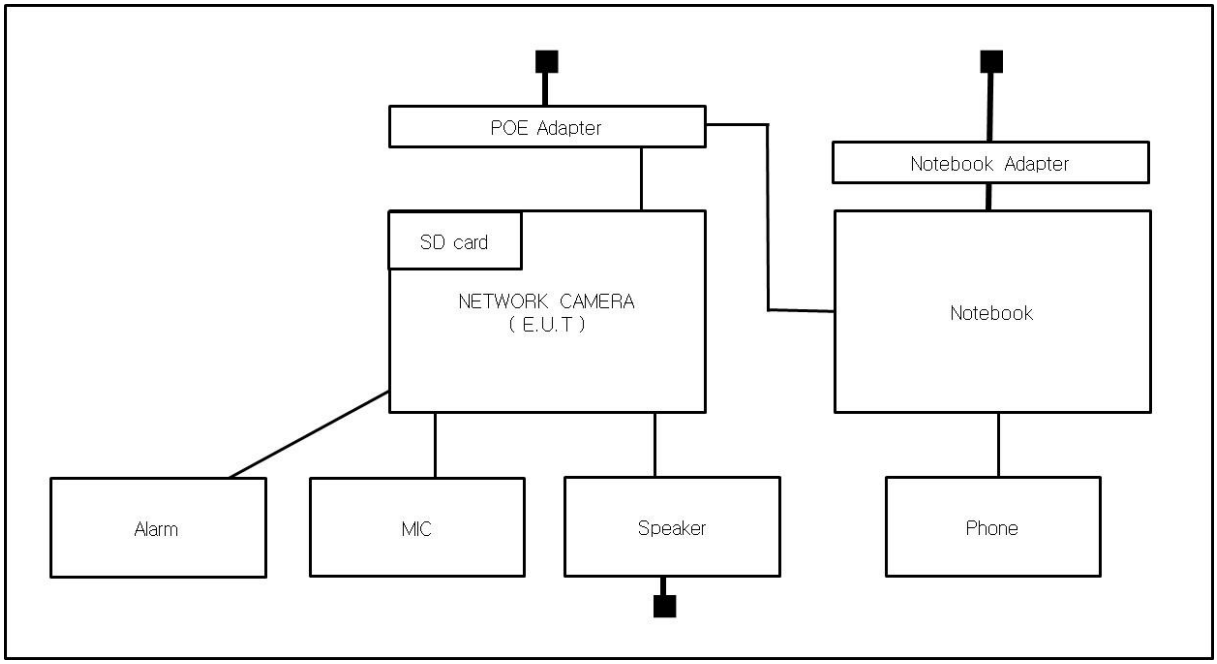
1.8 Configuration

■ AC Main
□ DC Main

- DC 12 V Mode



- PoE Mode



1.9 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

1.10 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4 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 55032:2012	☒ Class A	☐ Class B
☐ EN 55024:2010 +A1:2015		
☒ EN 50130-4:2011		
☐ EN 61000-3-2:2014		
☐ EN 61000-3-3:2013		
☐ EN 61326-1:2013		

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

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

☐ **47 CFR Part 15, Subpart B**

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

☐ **IC Regulation ICES-003 : 2016**

- ☐ 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

2.1 Conducted Emissions at Mains Power Ports

Test Date
N/A

Test Location
Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test Receiver	ESR3	R & S	101783	05, 03, 2017
☐	LISN	ENV216	R & S	101137	02, 04, 2017
☐	LISN	ENV216	R & S	101786	05, 02, 2017
☐	Electro wave Shieldroom	-	SEMITEC	-	-
☐	EMI Test S/W	EMC32	R&S	9.12.00	-

Test Conditions
Temperature: ℃
Relative Humidity: %

.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
DC 12 V, PoE Mode N/A : E.U.T Power is 12 V(dc) Power and PoE, linits are not Specified.

2.2 Conducted Emissions at Telecommunication Ports

Test Date
Feb, 01, 2017

Test Location
Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESR3	R & S	101783	2017.05.03
☒	LISN	ENV216	R & S	101137	2017.02.04
☒	LISN	ENV216	R & S	101786	2017.05.02
☒	8-Wire ISN CAT3	CAT3 8158	Schwarzbeck Mess	8158-0019	2017.04.01
☒	8-Wire ISN CAT5	CAT5 8158	Schwarzbeck Mess	8158-0030	2017.04.01
☒	PULSE LIMITER	ESH3-Z2	R&S	101914	2017.12.13
☒	Shield Room #3	-	SEMITEC	-	-
☒	EMI Test S/W	EMC32	R & S	9.12.00	-

Test Conditions
Temperature: 24,7 ℃
Relative Humidity: 35,1 %

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

2.3 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Feb, 01, 2017

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 ANT	VULB 9163	Schwarzbeck	714	11, 28, 2018
☒	Open Area Test Site	-	KES	-	-
☒	Antenna Mast	-	DAEIL EMC	-	-
☒	Turn Table	-	DAEIL EMC	-	-
☒	EMI Test S/W	-	-	-	-

Test Conditions
Temperature: 2,2 ℃
Relative Humidity: 40,0 %

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Settings
IF Band Width: 120 ㎑

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

2.4 Radiated Electric Field Emissions(Above 1 ㎓)

Test Date
Feb, 01, 2017

Test Location
Semi Anechoic 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, 14, 2017
☒	Semi Anachoic Chamber #2	-	SEMITEC	-	-
☒	Antenna Mast	-	AUDIX	-	-
☒	Turn Table	-	AUDIX	-	-
☒	EMI Test S/W	e3	AUDIX	8.083b	-

Test Conditions
Temperature: 24,7 ℃
Relative Humidity: 35,1 %

Frequency Range of Measurement
1 ㎓ to 6 ㎓

Instrument Settings
IF Band Width: 1 ㎒

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

2.5 Harmonic Current Emissions

Test Date
N/A

Test Location
Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	AC Source	ACS 500 N	EM TEST	V1024106760	08, 08, 2017
☐	Digital Power Analyzer	DPA 500 N	EM TEST	V1024106759	08, 08, 2017
☐	EMI Test S/W	dpa.control	EM TEST AG	5.4.8.0	-

Test Conditions
Temperature: ℃
Relative Humidity: %

Classification of Equipment for Harmonic Current Emissions
☐ Class A
☐ Class B
☐ Class C(Below 25 W)
☐ Class C(Above 25 W)
☐ Class D

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
DC 12 V, PoE Mode N/A : E.U.T Power is 12 V(dc) Power and PoE, linits are not Specified.

2.6 Voltage Fluctuations and Flicker

Test Date
N/A

Test Location
Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	AC Source	ACS 500 N	EM test	V1024106760	08, 08, 2017
☐	Digital Power Analyzer	DPA 500 N	EM test	V1024106759	08, 08, 2017
☐	EMI Test S/W	dpa.control	EM TEST AG	5.4.8.0	-

Test Conditions
Temperature: ℃
Relative Humidity: %

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
DC 12 V, PoE Mode N/A : E.U.T Power is 12 V(dc) Power and PoE, linits are not Specified.

3.0 Criteria for compliance

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

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

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

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

Electrostatic discharge

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

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

Radiated electromagnetic fields

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

Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such Flickering of indicators occurs at a field strength of 3 V/m.

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

(a) there is no permanent damage or change to EUT
(e.g. no corruption of memory or changes to programmable setting etc.)

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

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

Fast transient burst / slow high energy voltage surge

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

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

That there is no residual is permissible, providing that there is no residual change in the EUT or any

change in outputs, which could be interpreted by associated equipment as a change.

Conducted RF immunity

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

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

That there is no residual is permissible, providing that there is no residual change in the EUT or any

change in outputs, which could be interpreted by associated equipment as a change,

and no such flickering of indicators oeuvres at U = 130 dBμV.

For component of CCTV systems, where the status is monitored by observing the TV picture,

then deterioration of the picture is allowed at U = 140 dBμV, providing:

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

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

(b) at U = 130 dBμV, any deterioration of the picture is so minor that the system could

still be used; and

(c) there in no observable deterioration of the picture at U = 120 dBμV.

Voltage dip/interruption / Voltage variation

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

Flickering of an indicator during the conditioning is permissible, providing that there is no residual

change in the EUT or any change in outputs, which could be interpreted by associated equipment

as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

3.1 Electrostatic Discharge

Reference Standard
EN 61000-4-2:2009

Test Date
Feb, 02, 2017

Test Location
EMS-ESD: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS05X4620	02, 24, 2017
☒	HCP	-	Noise Ken	-	-
☒	VCP	-	Noise Ken	-	-
☒	EMS Test S/W	-	-	-	-

Test Conditions
Temperature: 22,8 ℃
Relative Humidity: 36,4 %
Atmospheric Pressure: 101,7 kPa

Test Specifications
Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

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

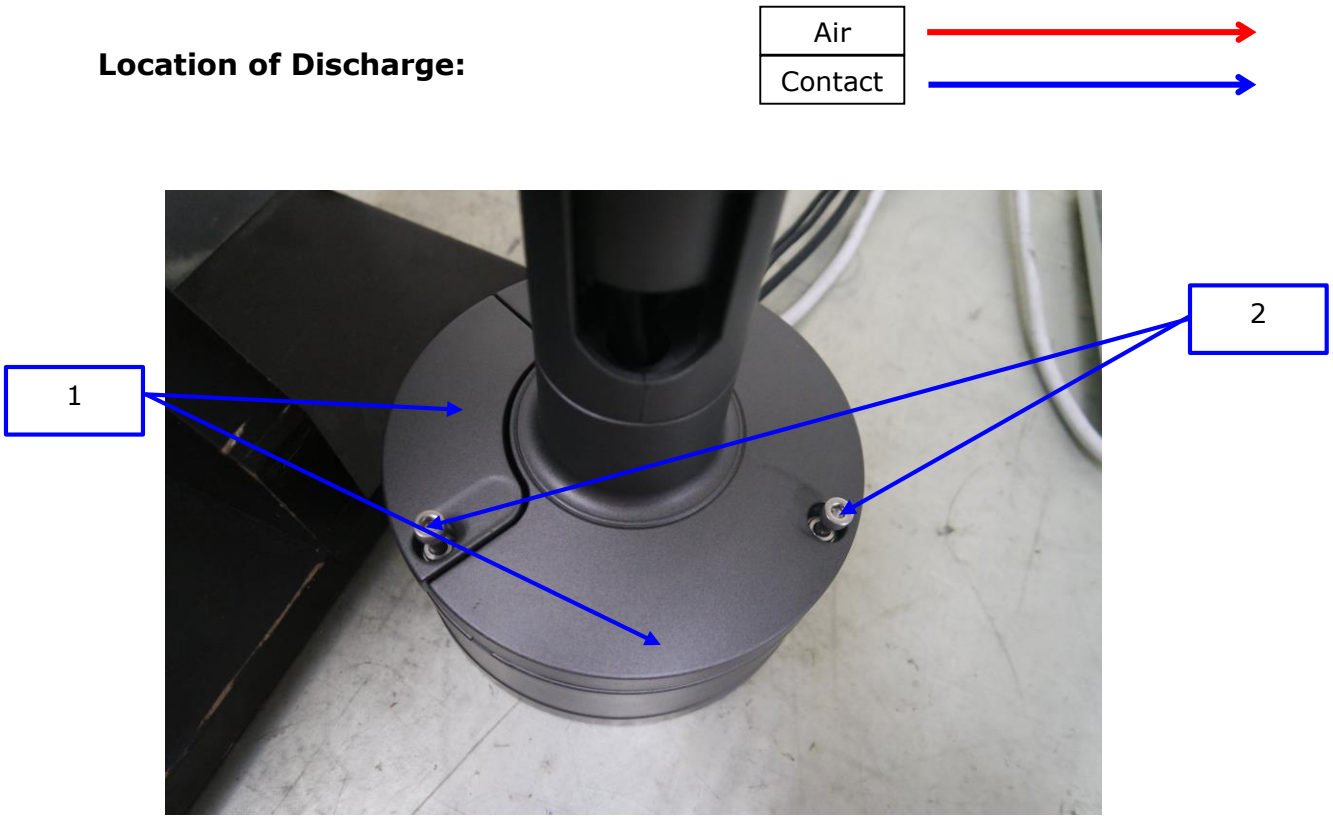
Discharge Voltage:

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

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

Required Performance Criteria: ☒ Complied

Location of Discharge:



Test Data

- DC 12 V Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Surface	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-

- PoE Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Surface	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.

3.2 Radiated Electric Field Immunity

Reference Standard
EN 61000-4-3:2006 +A2:2010

Test Date
Feb, 02, 2017

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

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Signal Generator	ESG-3000A	HP	US37040210	11, 01, 2017
☒	Amplifier	ITA0300-200	Infinitech	-	11, 01, 2017
☒	Amplifier	ITA0750-200	Infinitech	-	11, 01, 2017
☒	Amplifier	ITA1500-100	Infinitech	-	11, 01, 2017
☒	Amplifier	ITA2500-100	Infinitech	-	11, 01, 2017
☒	GPIB INTERFACE CONTROL	SYSTEM CONTROL UNIT	Infinitech	-	-
☒	POWER SUPPLY	SYSTEM POWER SUPPLY	Infinitech	-	-
☒	Power Meter	E4419B	Agilent	MY45101506	06, 27, 2017
☒	Average Power Sensor	E9301A	Agilent	-	06, 27, 2017
☒	Average Power Sensor	E9301A	Agilent	MY41495698	11, 17, 2017
☒	Stacked Double Log-Per- Antenna	STPL9128 D	SCHWARZBECK	9128D038	06, 27, 2017
☒	Amplifier	TK-PA8/3W	TESTEK	150008	06, 27, 2017
☒	COUPLER	ZARC-25-63-S+	Mini-Circuits	FM14101424	08, 08, 2017
☒	SIGNAL GENERATOR	SMB100A	Rohde & Schwarz	177586	
☒	Semi Anechoic Chamber #2	-	SEMITEC	-	-
☒	EMS Test S/W	EMS Test S/W	KTI_RS2012	KOREA TECHNOLOGY INSTITUDE CO., LTD	2.1.1

Test Conditions

Temperature:	22,8 ℃
Relative Humidity:	36,4 %
Atmospheric Pressure:	101,7 kPa

Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

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

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

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

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

# of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

Test Data

- DC 12 V Mode

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

- PoE Mode

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

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.

3.3 Electrical Fast Transients/Bursts

Reference Standard
EN 61000-4-4:2012

Test Date
Feb, 03, 2017

Test Location
EMS-EFT: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	2017.06.27
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	2017.06.27
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	070925	2017.06.27
☒	EMS Test S/W	iec.control	EM TEST	5.0.9.0	-

Test Conditions

Temperature:	23,1 ℃
Relative Humidity:	35,6 %
Atmospheric Pressure:	101,6 kPa

Test Specifications

Pulse Amplitude & Polarity: (DC Power Lines)	☐ ± 1.0 kV ☐ ± 4.0 kV	☐ ± 2.0 kV
Pulse Amplitude & Polarity: (Other supply / Signal Lines)	☐ ± 0.5 kV	☒ ± 1.0 kV ☐ ± 2.0 kV
Burst Period:	☒ 300 ms	☐ 2 s
Repetition Rate:	☐ 5 kHz	☒ 100 kHz
Duration of Test Voltage:	☒ ≥ 1 min	
Required Performance Criteria:	☒ Complied	

Test Data

- DC 12 V Mode

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

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

- PoE Mode

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

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

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.

3.4 Surge Transients

Reference Standard
EN 61000-4-5:2014

Test Date
Feb, 03, 2017

Test Location
EMS-Surge: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	2017.06.27
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	2017.06.27
☒	CDN	CNV 508N1	EM TEST	P1551168979	2017.04.27
☐	CDN	CNV 508T5	EM TEST	P1549168422	2017.04.27
☒	EMS Test S/W	iec.control	EM TEST	5.0.9.0	-

Test Conditions
Temperature: 23,1 ℃
Relative Humidity: 35,6 %
Atmospheric Pressure: 101,6 kPa

Test Specifications

AC Power Lines

Source Impedance: 12 ohm for common mode and 2 ohm for differential mode

Surge Amplitude : Common Mode
☐ (0,5 / 1,0 / 2,0) kV
Differential Mode
☐ (0,5 / 1,0) kV

Number of Surges: ☐ 5 surges per angle

Angle: ☐ 0°, 90°, 180°, 270° (input a.c. power port)

Polarity: ☐ Positive & Negative

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

Required Performance Criteria: ☐ Complied

Other supply / Signal Lines

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

Number of Surges: ☒ 5 Surges

Polarity: ☒ Positive & Negative

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

Required Performance Criteria: ☒ Complied

Test Data

- DC 12 V Mode

☐ Line to Line – Differential Mode

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

☒ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (㎸)	(-) Surge (㎸)
L1-PE	Complied	Complied
L2-PE	Complied	Complied

Signal Lines

☒ Line to Earth – Common Mode

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

- PoE Mode

☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

Signal Lines

☒ Line to Earth – Common Mode

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

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.

3.5 Conducted Disturbance

Reference Standard
EN 61000-4-6:2014

Test Date
Feb, 03, 2017

Test Location
EMS-CS: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Continuous Wave Generator	CWS 500N1	EM TEST	V0936105119	2017.08.08
☒	6 dB Attenuator	ATT6	EM TEST	1208-34	2017.08.08
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	2017.08.08
☒	EM Injection Clamp	EM 101	Liithi	35943	2017.02.04
☒	EMS Test S/W	icd.control	EM TEST	5.3.7	-

Test Conditions
Temperature: 23,1 ℃
Relative Humidity: 35,6 %
Atmospheric Pressure: 101,6 kPa

Test Specifications

Frequency range:	☒ 150 ㎑ to 100 ㎒	☐ 150 ㎑ to 80 ㎒
Voltage Level:	☐ 1 Vrms ☒ 10 Vrms	☐ 3 Vrms
Modulation:	☒ AM, 80 %, 1 ㎑ sine wave ☒ PM, 1 ㎐ (0,5 s ON : 0,5 s OFF)	
Frequency step:	☒ 1 % step	
Dwell Time:	☒ 1 s	☐ 3 s
Required Performance Criteria:	☒ Complied	

Test Data

- DC 12 V Mode

☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN (☐M2, ☐M3)	-

☒ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L1 – L2	CDN (☒M2, ☐M3)	Complied

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	Complied	Complied
Alarm	Complied	Complied

- PoE Mode

☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN (☐M2, ☐M3)	-

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN (☐M2, ☐M3)	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	Complied	Complied
Alarm	Complied	Complied

Notes: CDN = Coupling Decoupling Network
"blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.

3.6 Voltage Dips and Short Interruptions

Reference Standard
EN 61000-4-11:2004

Test Date
N/A

Test Location
EMS-Voltage dip: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☐	Motor Variac	MV2616	EM TEST	V0936105123	06, 27, 2017
☐	EMS Test S/W	iec.control	EM TEST AG	5.0.9.0	-

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

Test Specifications & Observations/Remarks

(Test Voltage :)

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

- Voltage cariations

☐ Unom + 10 %	☐ 253 V (ac)	N/A
☐ Unom - 15 %	☐ 195.5 V (ac)	N/A

Observations:
Complied – No degradation of function

Test Results

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

Remarks

N/A Because the E.U.T power is 12 v (dc) power and PoE, limits are not specified.

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

N/A

♦ Calculation
QuasiPeak[㏈uV] / CAverage [㏈uV] = Reading Value[㏈uV] + Corr. [㏈]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR+ Cable Loss)

[NEUTRAL]

N/A

♦ Calculation
QuasiPeak[㏈uV] / CAverage [㏈uV] = Reading Value[㏈uV] + Corr. [㏈]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR+ Cable Loss)

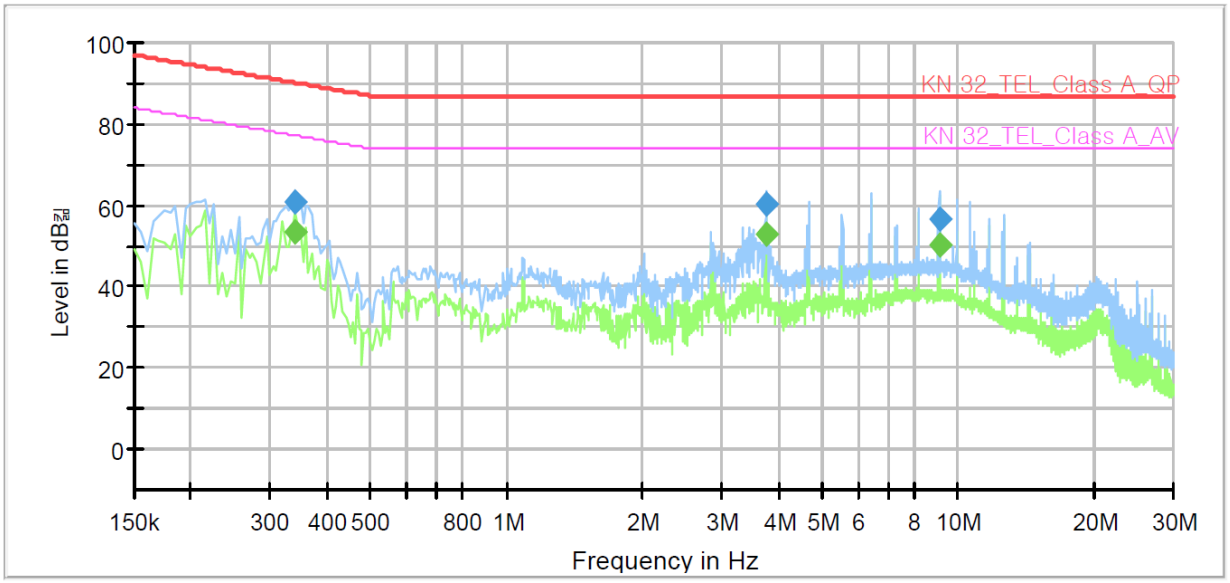
Conducted Emissions at Telecommunication Ports

- DC 12 V Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XNO-8020RP
Mode	DC 12V_10M
Operator Name:	KES



Final_Result

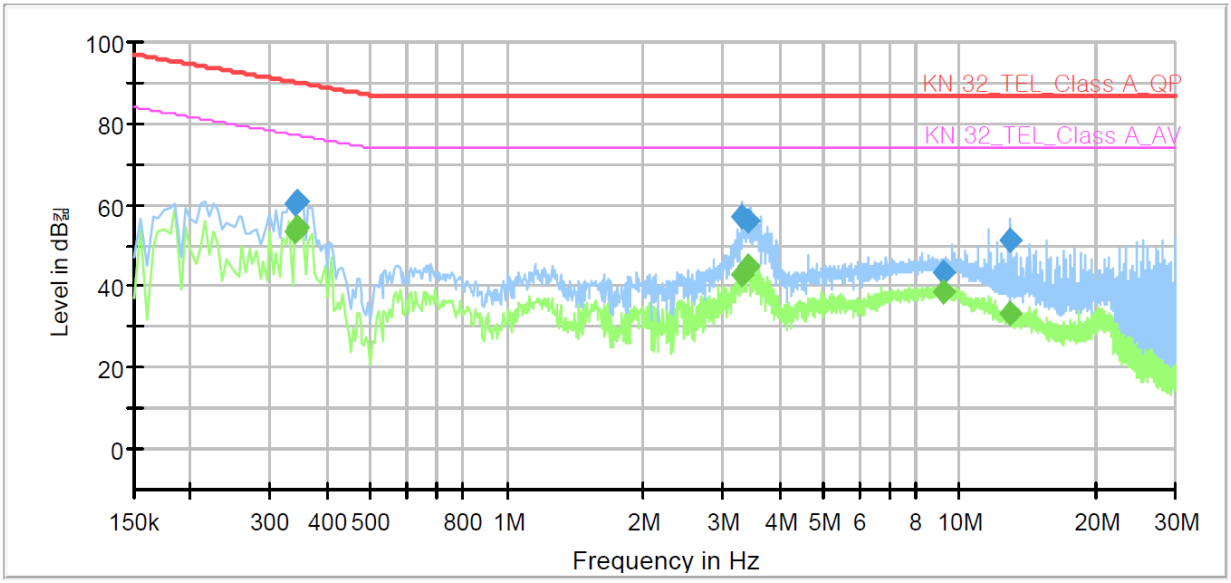
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.340000	---	53.58	77.20	23.62	1000.0	9.000	Single Line	21.1
0.340000	60.74	---	90.20	29.46	1000.0	9.000	Single Line	21.1
3.750000	---	52.68	74.00	21.32	1000.0	9.000	Single Line	19.8
3.750000	60.21	---	87.00	26.79	1000.0	9.000	Single Line	19.8
9.075000	---	50.26	74.00	23.74	1000.0	9.000	Single Line	20.0
9.075000	56.57	---	87.00	30.43	1000.0	9.000	Single Line	20.0

♦ 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 (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XNO-8020RP
Mode	DC 12V_100M
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.340000	---	53.35	77.20	23.85	1000.0	9.000	Single Line	20.6
0.340000	60.53	---	90.20	29.67	1000.0	9.000	Single Line	20.6
0.345000	---	54.41	77.08	22.67	1000.0	9.000	Single Line	20.6
0.345000	61.06	---	90.08	29.02	1000.0	9.000	Single Line	20.6
3.315000	---	42.89	74.00	31.11	1000.0	9.000	Single Line	19.3
3.315000	57.35	---	87.00	29.65	1000.0	9.000	Single Line	19.3
3.430000	---	45.06	74.00	28.94	1000.0	9.000	Single Line	19.3
3.430000	56.27	---	87.00	30.73	1000.0	9.000	Single Line	19.3
9.265000	---	38.71	74.00	35.29	1000.0	9.000	Single Line	19.5
9.265000	43.46	---	87.00	43.54	1000.0	9.000	Single Line	19.5
13.005000	---	33.16	74.00	40.84	1000.0	9.000	Single Line	19.5
13.005000	51.29	---	87.00	35.71	1000.0	9.000	Single Line	19.5

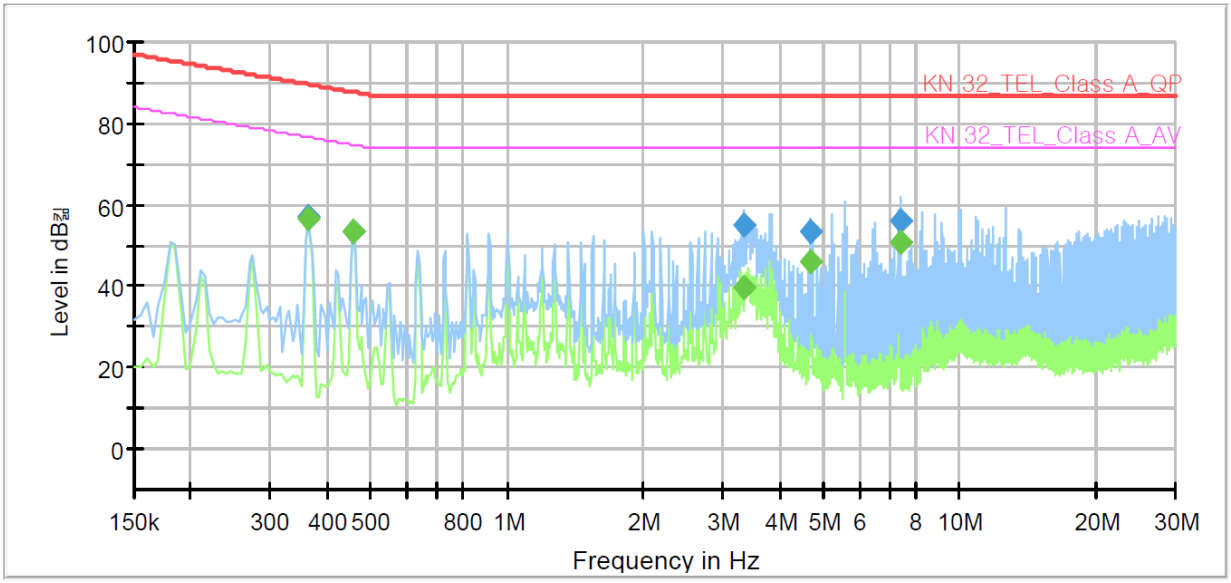
♦ Calculation
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

- PoE Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XNO-8020RP
Mode	POE_10M
Operator Name:	KES



Final_Result

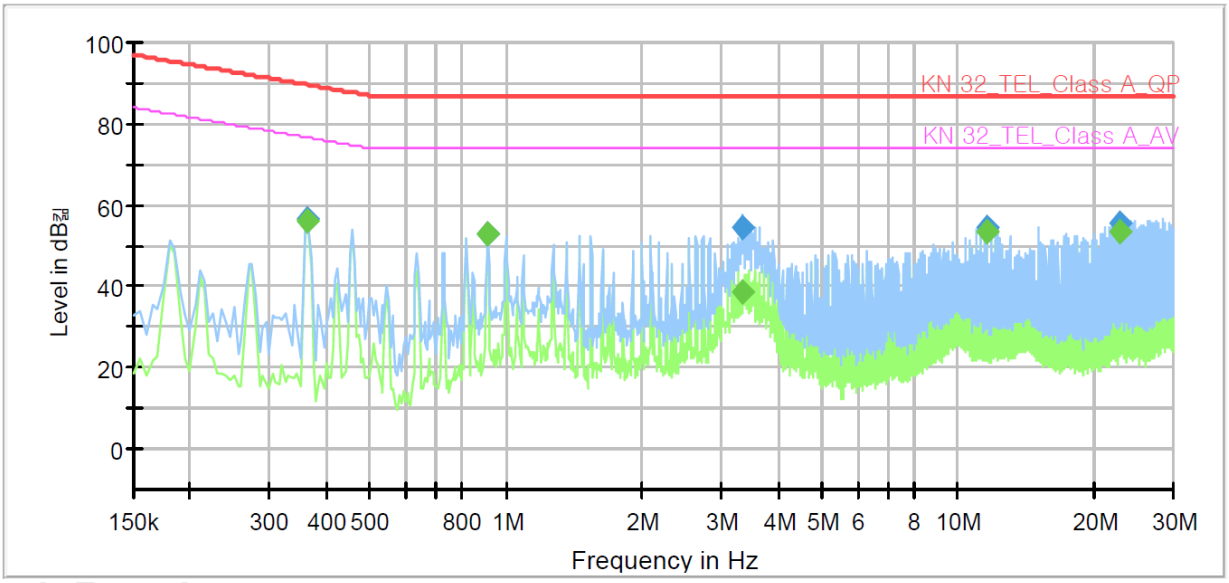
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.365000	---	56.81	76.61	19.80	1000.0	9.000	Single Line	21.1
0.365000	57.08	---	89.61	32.53	1000.0	9.000	Single Line	21.1
0.455000	---	53.41	74.78	21.37	1000.0	9.000	Single Line	20.9
0.455000	53.69	---	87.78	34.09	1000.0	9.000	Single Line	20.9
3.330000	---	39.89	74.00	34.11	1000.0	9.000	Single Line	19.8
3.330000	55.00	---	87.00	32.00	1000.0	9.000	Single Line	19.8
4.675000	---	46.31	74.00	27.69	1000.0	9.000	Single Line	19.8
4.675000	53.49	---	87.00	33.51	1000.0	9.000	Single Line	19.8
7.390000	---	50.80	74.00	23.20	1000.0	9.000	Single Line	19.9
7.390000	56.13	---	87.00	30.87	1000.0	9.000	Single Line	19.9

♦ 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 (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XNO-8020RP
Mode	POE_100M
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.365000	---	56.12	76.61	20.49	1000.0	9.000	Single Line	20.6
0.365000	56.43	---	89.61	33.18	1000.0	9.000	Single Line	20.6
0.910000	---	52.69	74.00	21.31	1000.0	9.000	Single Line	19.9
0.910000	52.74	---	87.00	34.26	1000.0	9.000	Single Line	19.9
3.320000	---	38.46	74.00	35.54	1000.0	9.000	Single Line	19.3
3.320000	54.35	---	87.00	32.65	1000.0	9.000	Single Line	19.3
11.640000	---	53.34	74.00	20.66	1000.0	9.000	Single Line	19.5
11.640000	54.77	---	87.00	32.23	1000.0	9.000	Single Line	19.5
22.855000	---	53.65	74.00	20.35	1000.0	9.000	Single Line	19.5
22.855000	55.41	---	87.00	31.59	1000.0	9.000	Single Line	19.5

♦ 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 (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

Radiated Electric Field Emissions(Below 1 ㎓)

- DC 12 V Mode

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[㎒]	[dB㎶]		[m]	ANT. [dB/m]	Cable [dB]	[dB㎶/m]	[dB㎶/m]	[dB]
232.67	12.33	H	2.31	12.25	4.51	29.09	47.00	17.91
266.51	11.96	V	1.25	12.80	4.86	29.62	47.00	17.38
370.38	13.22	V	2.33	14.96	5.86	34.04	47.00	12.96
370.43	16.21	H	1.95	14.96	5.86	37.03	47.00	9.97
459.69	10.32	V	3.01	16.65	6.84	33.81	47.00	13.19
459.79	17.25	H	2.01	16.65	6.84	40.74	47.00	6.26
603.15	12.63	V	2.09	19.33	7.85	39.81	47.00	7.19
646.97	14.87	H	1.03	19.48	8.13	42.48	47.00	4.52

* H : Horizontal, V : Vertical

♦ Calculation
Corrected Amplitude [㏈uV] = Amplitude[㏈uV] + Correction Factor [㏈]
Corrected Amplitude : The Final Value, Amplitude : Reading Value,
Correction Factor : ANT FACTOR + Cable loss

- PoE Mode

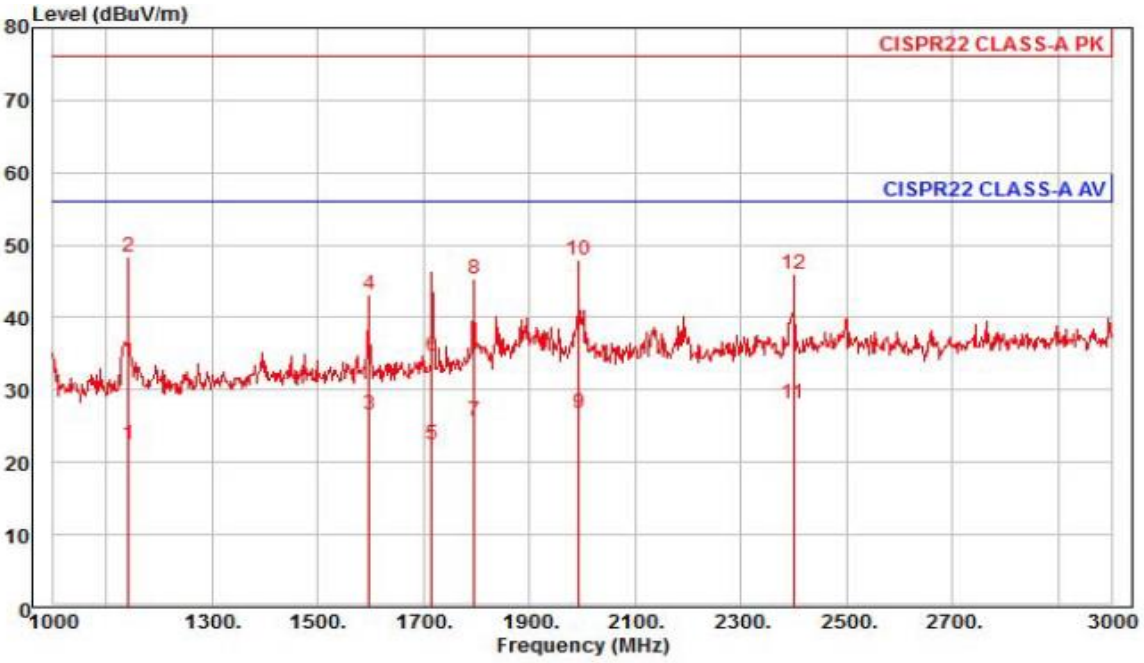
Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[㎒]	[dBμV]		[m]	ANT. [dB/m]	Cable [dB]	[dBμV/m]	[dBμV/m]	[dB]
138.62	12.33	H	1.26	7.64	3.43	23.40	40.00	16.60
259.76	13.93	V	3.01	12.67	4.80	31.40	47.00	15.60
282.17	13.25	H	2.00	13.09	5.00	31.34	47.00	15.66
351.05	12.36	V	1.96	14.54	5.65	32.55	47.00	14.45
360.65	11.91	H	3.01	14.75	5.75	32.41	47.00	14.59
459.79	10.09	V	1.25	16.65	6.84	33.58	47.00	13.42
602.32	11.32	V	1.02	19.33	7.85	38.50	47.00	8.50
607.08	10.85	H	3.01	19.34	7.88	38.07	47.00	8.93

* H : Horizontal, V : Vertical

♦ Calculation
Corrected Amplitude [㏈uV] = Amplitude[㏈uV] + Correction Factor [㏈]
Corrected Amplitude : The Final Value, Amplitude : Reading Value,
Correction Factor : ANT FACTOR + Cable loss

Radiated Electric Field Emissions(Above 1 ㎓)

- DC 12 V Mode



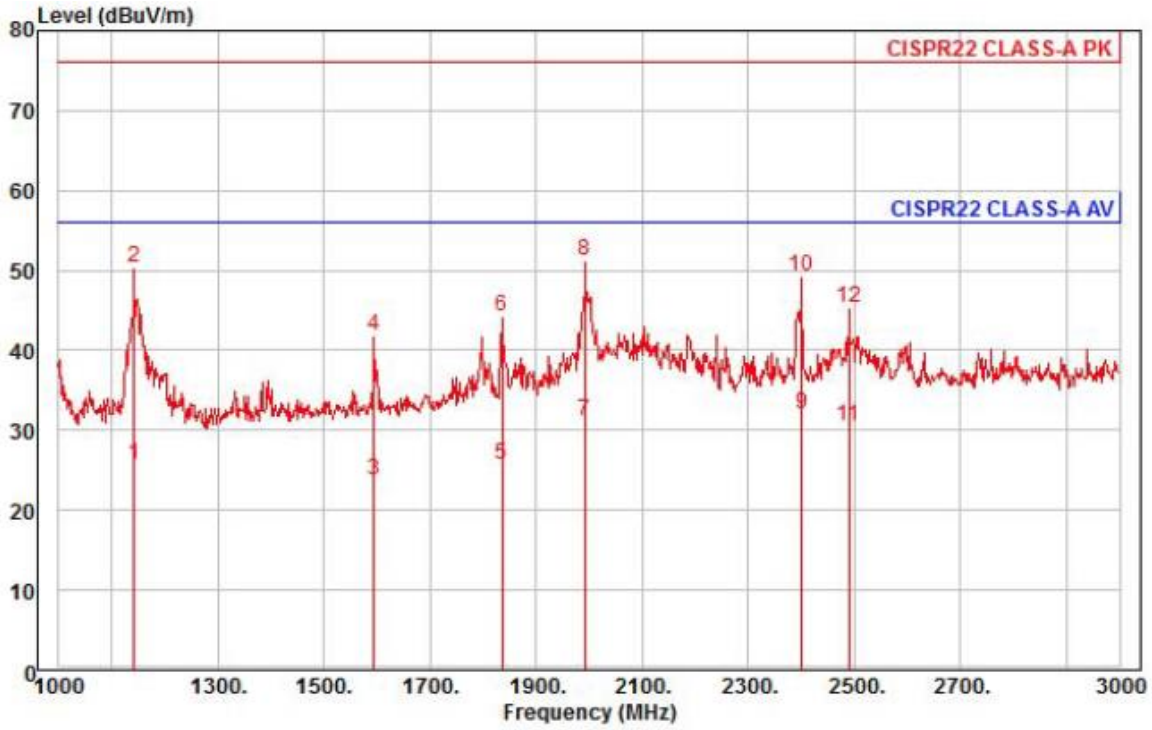

```
Site      : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
         : RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project   :
Model     : XNO-8020RP
Mode      : DC 12V
Memo      : 1 ~ 3 GHz
```

	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	1142.00	30.71	24.47	6.95	39.75	141	56.00	-33.62	horizontal	Average
2 pp	1142.00	56.82	24.47	6.95	39.75	141	76.00	-27.51	horizontal	Peak
3	1598.00	31.23	26.28	8.31	39.22	9	56.00	-29.40	horizontal	Average
4	1598.00	47.85	26.28	8.31	39.22	9	76.00	-32.78	horizontal	Peak
5	1716.00	26.31	26.75	8.61	39.28	214	56.00	-33.61	horizontal	Average
6	1716.00	38.60	26.75	8.61	39.28	214	76.00	-41.32	horizontal	Peak
7	1796.00	29.11	27.07	8.82	39.31	69	56.00	-30.31	horizontal	Average
8	1796.00	48.66	27.07	8.82	39.31	69	76.00	-30.76	horizontal	Peak
9	1994.00	29.05	27.86	9.32	39.41	32	56.00	-29.18	horizontal	Average
10	1994.00	50.12	27.86	9.32	39.41	32	76.00	-28.11	horizontal	Peak
11 av	2400.00	28.44	28.86	10.32	39.42	49	56.00	-27.80	horizontal	Average
12	2400.00	46.19	28.86	10.32	39.42	49	76.00	-30.05	horizontal	Peak

♦ Calculation

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

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



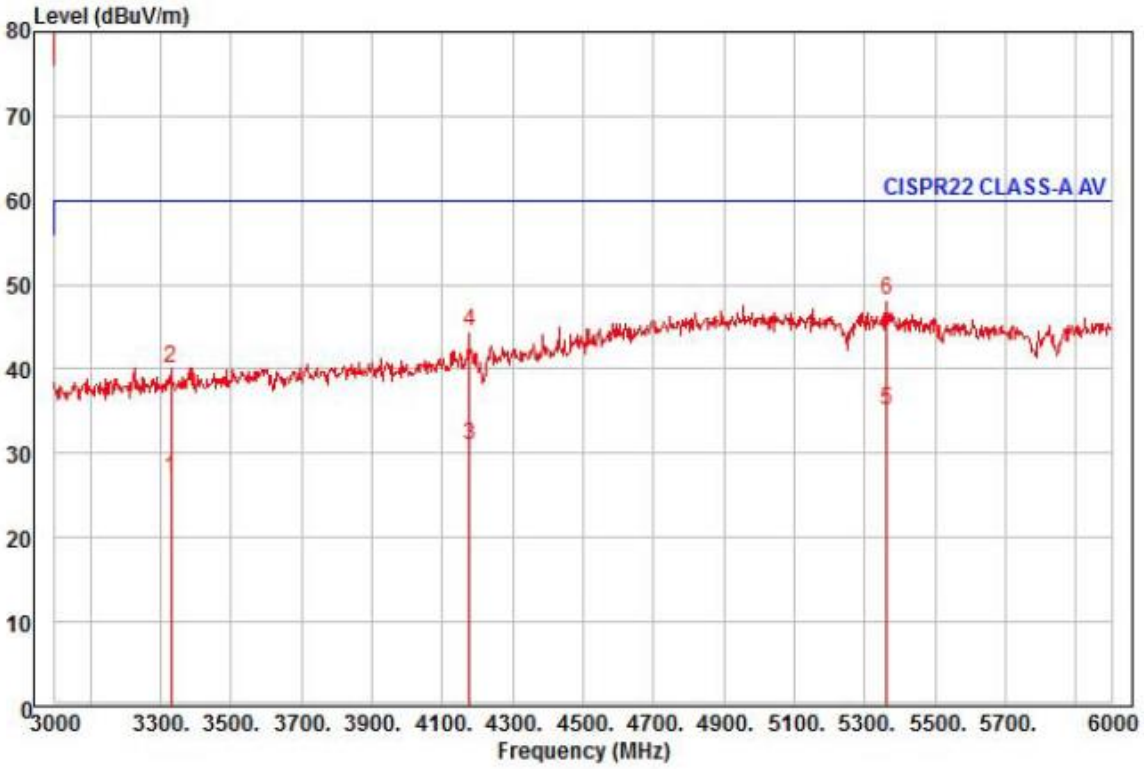
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8020RP
Mode : DC 12V
Memo : 1 ~ 3 GHz

	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	1142.00	34.05	24.47	6.95	39.75	121	56.00	-30.28	vertical	Average
2	1142.00	58.73	24.47	6.95	39.75	121	76.00	-25.60	vertical	Peak
3	1594.00	28.32	26.27	8.29	39.22	273	56.00	-32.34	vertical	Average
4	1594.00	46.50	26.27	8.29	39.22	273	76.00	-34.16	vertical	Peak
5	1836.00	28.81	27.23	8.92	39.33	93	56.00	-30.37	vertical	Average
6	1836.00	47.40	27.23	8.92	39.33	93	76.00	-31.78	vertical	Peak
7	1992.00	33.33	27.85	9.32	39.41	113	56.00	-24.91	vertical	Average
8 pk	1992.00	53.49	27.85	9.32	39.41	113	76.00	-24.75	vertical	Peak
9 pp	2400.00	32.23	28.86	10.32	39.42	50	56.00	-24.01	vertical	Average
10	2400.00	49.60	28.86	10.32	39.42	50	76.00	-26.64	vertical	Peak
11	2490.00	30.34	29.08	10.51	39.52	315	56.00	-25.59	vertical	Average
12	2490.00	45.18	29.08	10.51	39.52	315	76.00	-30.75	vertical	Peak

♦ Calculation

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

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



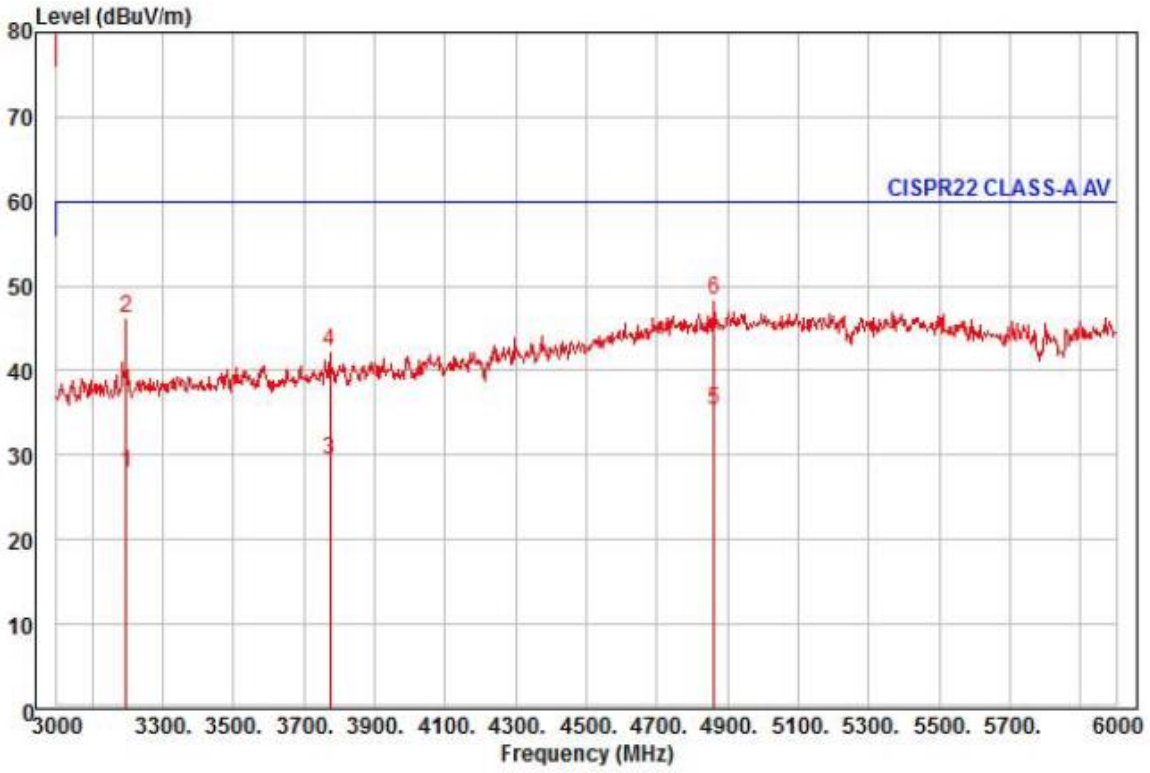
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8020RP
Mode : DC 12V
Memo : 3 ~ 6 GHz

	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	3330.00	24.45	30.88	12.31	40.62	296	60.00	-32.98	horizontal	Average
2	3330.00	37.44	30.88	12.31	40.62	296	80.00	-39.99	horizontal	Peak
3	4179.00	24.76	33.03	13.90	40.73	104	60.00	-29.04	horizontal	Average
4	4179.00	38.26	33.03	13.90	40.73	104	80.00	-35.54	horizontal	Peak
5 pp	5361.00	23.11	36.99	15.97	40.87	143	60.00	-24.80	horizontal	Average
6 pk	5361.00	36.02	36.99	15.97	40.87	143	80.00	-31.89	horizontal	Peak

♦ Calculation

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

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

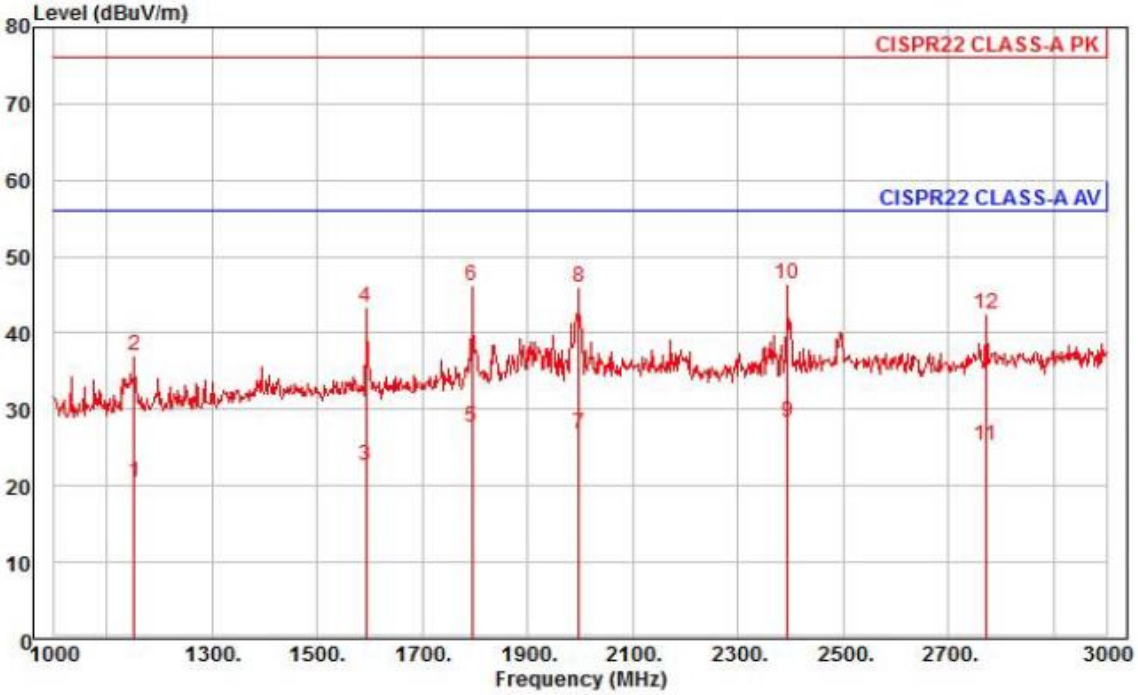


Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8020RP
Mode : DC 12V
Memo : 3 ~ 6 GHz

	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	3198.00	25.69	30.66	12.05	40.41	21	60.00	-32.01	vertical	Average
2	3198.00	43.93	30.66	12.05	40.41	21	80.00	-33.77	vertical	Peak
3	3774.00	25.51	31.63	13.13	40.78	273	60.00	-30.51	vertical	Average
4	3774.00	38.41	31.63	13.13	40.78	273	80.00	-37.61	vertical	Peak
5 pp	4860.00	23.69	36.92	15.16	40.41	268	60.00	-24.64	vertical	Average
6 pk	4860.00	36.68	36.92	15.16	40.41	268	80.00	-31.65	vertical	Peak

♦ Calculation
Over Limit [㏈] = (Read Level[㏈uV] + Ant Factor[㏈/m] + Cable Loss [㏈] − Preamp Factor [㏈]) − Limit Line[㏈uV]
Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor, Cable Loss : Cable loss, Preamp Factor : Preamp Factor

- PoE Mode



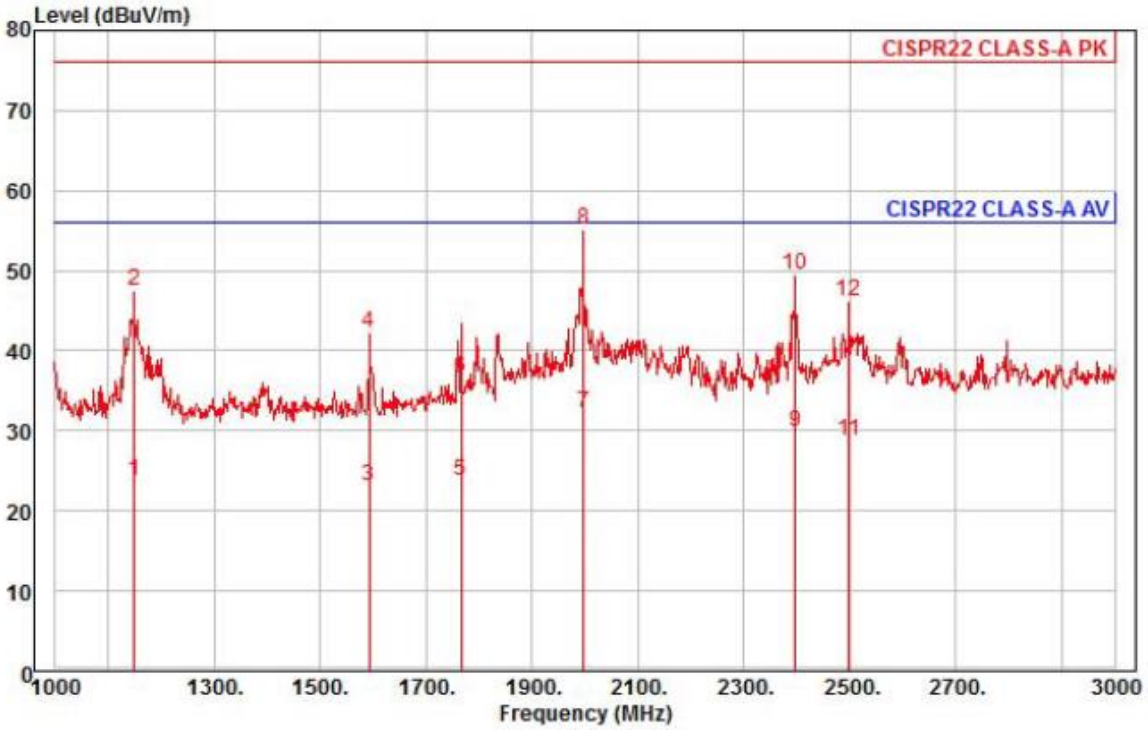

```
Site      : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
          : RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project   :
Model     : XNO-8020RP
Mode      : POE
Memo      : 1 ~ 3 GHz
```

		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		1152.00	28.78	24.51	6.98	39.73	307	56.00	-35.46	horizontal	Average
2		1152.00	45.38	24.51	6.98	39.73	307	76.00	-38.86	horizontal	Peak
3		1592.00	27.34	26.26	8.29	39.22	7	56.00	-33.33	horizontal	Average
4		1592.00	48.06	26.26	8.29	39.22	7	76.00	-32.61	horizontal	Peak
5		1794.00	31.03	27.06	8.81	39.31	66	56.00	-28.41	horizontal	Average
6		1794.00	49.58	27.06	8.81	39.31	66	76.00	-29.86	horizontal	Peak
7		1998.00	29.10	27.87	9.33	39.41	176	56.00	-29.11	horizontal	Average
8		1998.00	48.12	27.87	9.33	39.41	176	76.00	-30.09	horizontal	Peak
9	pp	2394.00	28.63	28.85	10.31	39.42	52	56.00	-27.63	horizontal	Average
10	pk	2394.00	46.69	28.85	10.31	39.42	52	76.00	-29.57	horizontal	Peak
11		2772.00	24.14	29.77	11.16	39.85	244	56.00	-30.78	horizontal	Average
12		2772.00	41.46	29.77	11.16	39.85	244	76.00	-33.46	horizontal	Peak

♦ Calculation

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

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



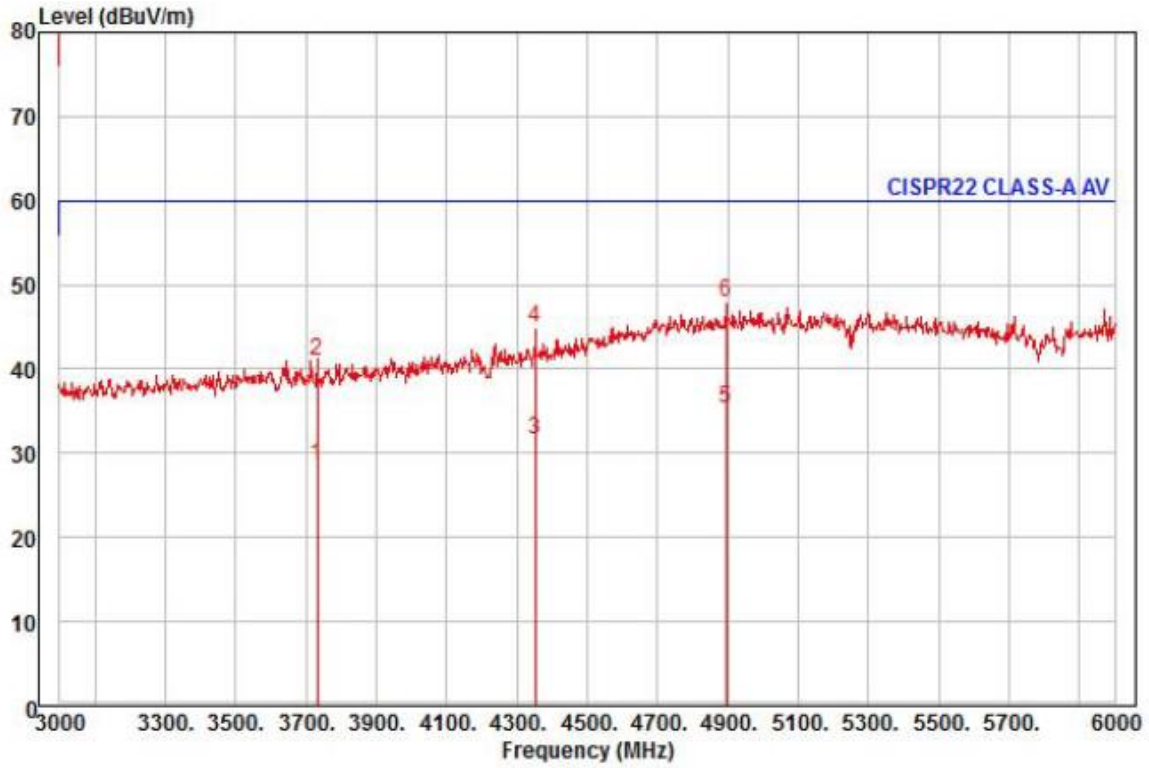
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8020RP
Mode : POE
Memo : 1 ~ 3 GHz

	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	1148.00	32.06	24.50	6.97	39.73	236	56.00	-32.20	vertical	Average
2	1148.00	55.87	24.50	6.97	39.73	236	76.00	-28.39	vertical	Peak
3	1592.00	27.69	26.26	8.29	39.22	351	56.00	-32.98	vertical	Average
4	1592.00	46.89	26.26	8.29	39.22	351	76.00	-33.78	vertical	Peak
5	1766.00	27.31	26.95	8.74	39.30	131	56.00	-32.30	vertical	Average
6	1766.00	40.23	26.95	8.74	39.30	131	76.00	-39.38	vertical	Peak
7 av	1998.00	34.38	27.87	9.33	39.41	348	56.00	-23.83	vertical	Average
8 pp	1998.00	57.39	27.87	9.33	39.41	348	76.00	-20.82	vertical	Peak
9	2398.00	30.12	28.86	10.32	39.42	45	56.00	-26.12	vertical	Average
10	2398.00	49.73	28.86	10.32	39.42	45	76.00	-26.51	vertical	Peak
11	2498.00	28.64	29.10	10.53	39.53	306	56.00	-27.26	vertical	Average
12	2498.00	46.12	29.10	10.53	39.53	306	76.00	-29.78	vertical	Peak

♦ Calculation

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

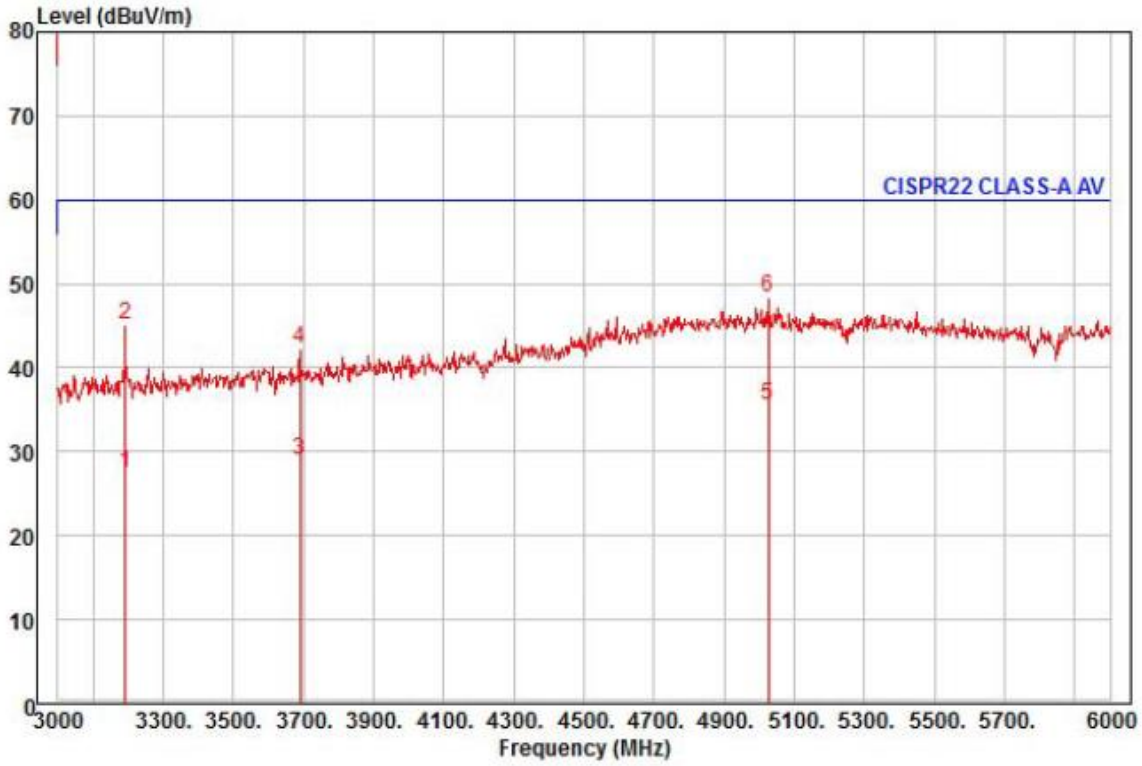
Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor, Cable Loss : Cable loss, Preamp Factor : Preamp Factor



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XNO-8020RP
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	3732.00	24.77	31.56	13.05	40.80	111	60.00	-31.42	horizontal	Average
2	3732.00	37.21	31.56	13.05	40.80	111	80.00	-38.98	horizontal	Peak
3	4353.00	24.22	34.03	14.19	40.75	52	60.00	-28.31	horizontal	Average
4	4353.00	37.50	34.03	14.19	40.75	52	80.00	-35.03	horizontal	Peak
5 pp	4896.00	23.33	37.13	15.20	40.37	206	60.00	-24.71	horizontal	Average
6 pk	4896.00	36.03	37.13	15.20	40.37	206	80.00	-32.01	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-8020RP
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	3192.00	25.16	30.65	12.04	40.41	132	60.00	-32.56	vertical	Average
2	3192.00	42.81	30.65	12.04	40.41	132	80.00	-34.91	vertical	Peak
3	3690.00	25.42	31.49	12.97	40.81	283	60.00	-30.93	vertical	Average
4	3690.00	38.62	31.49	12.97	40.81	283	80.00	-37.73	vertical	Peak
5 pp	5025.00	22.81	37.67	15.37	40.31	202	60.00	-24.46	vertical	Average
6 pk	5025.00	35.68	37.67	15.37	40.31	202	80.00	-31.59	vertical	Peak

♦ Calculation

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

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

Harmonic Current Emissions and Voltage Fluctuations and Flicker

Average harmonic current results

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

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

Test Data - Harmonics (continued)

Maximum harmonic current results

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

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

Test Data - Voltage Fluctuations

Maximum Flicker results

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

Test Setup Photos and Configuration

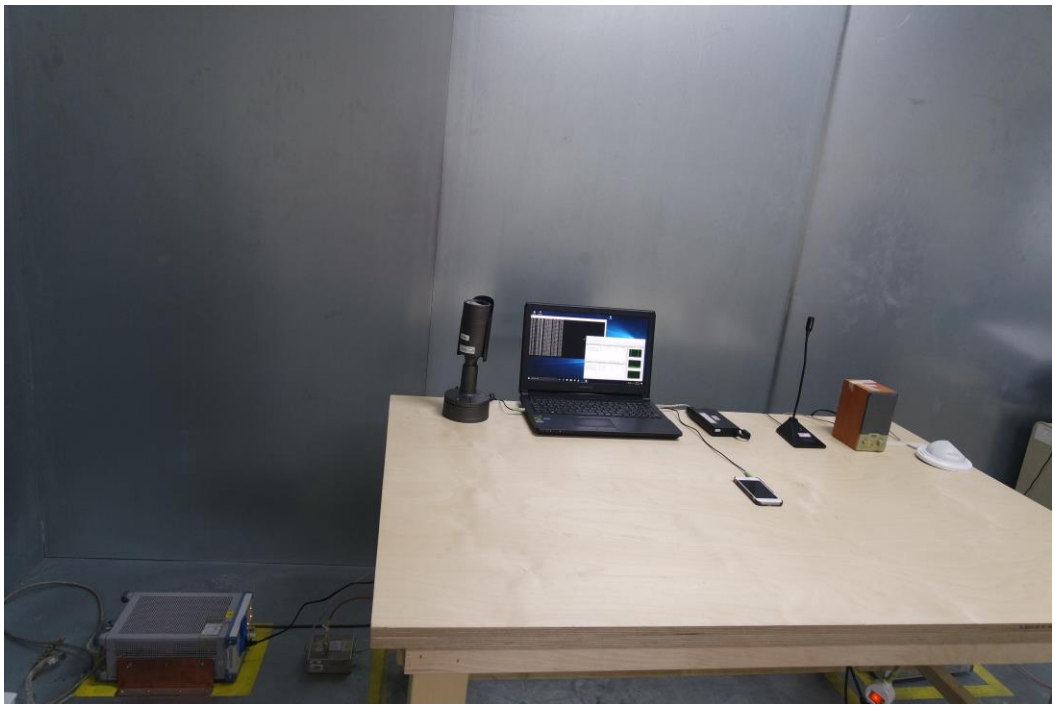
Conducted Voltage Emissions

N/A

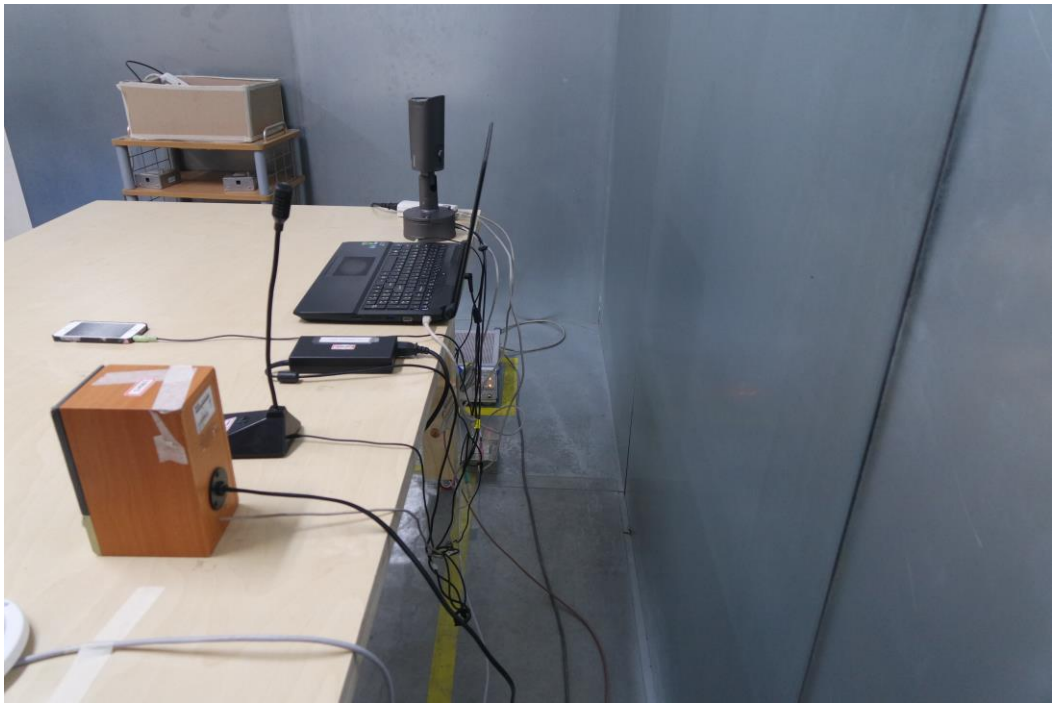
N/A

Conducted Telecommunication Emissions

- DC 12 V Mode

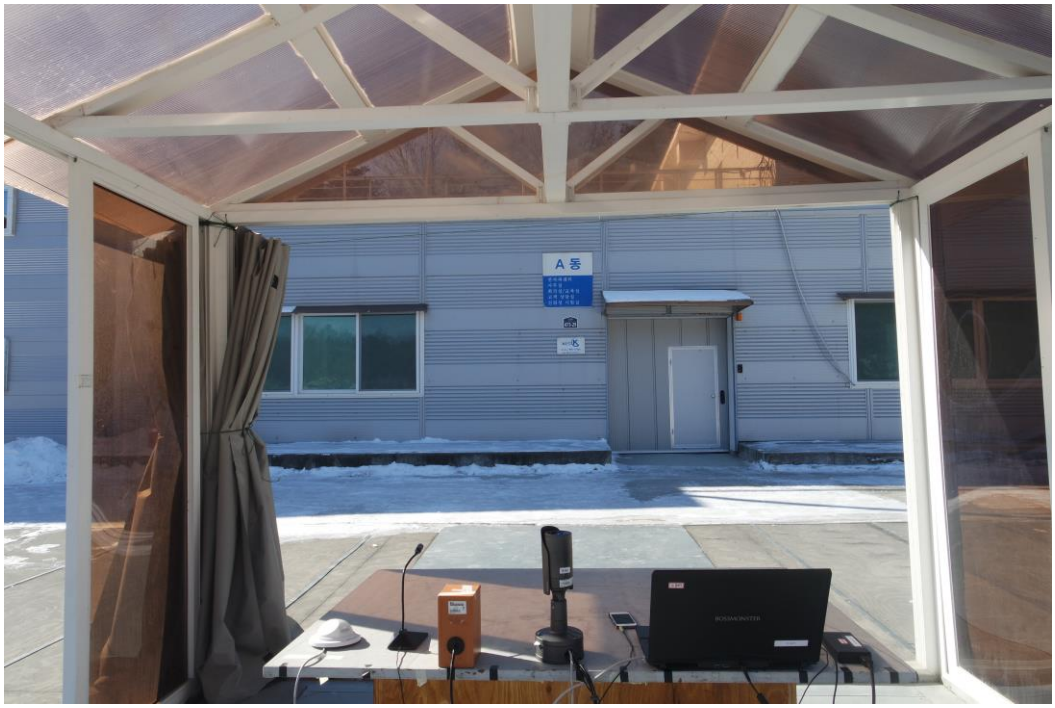


- PoE Mode



Radiated Electric Field Emissions(Below 1 ㎓)

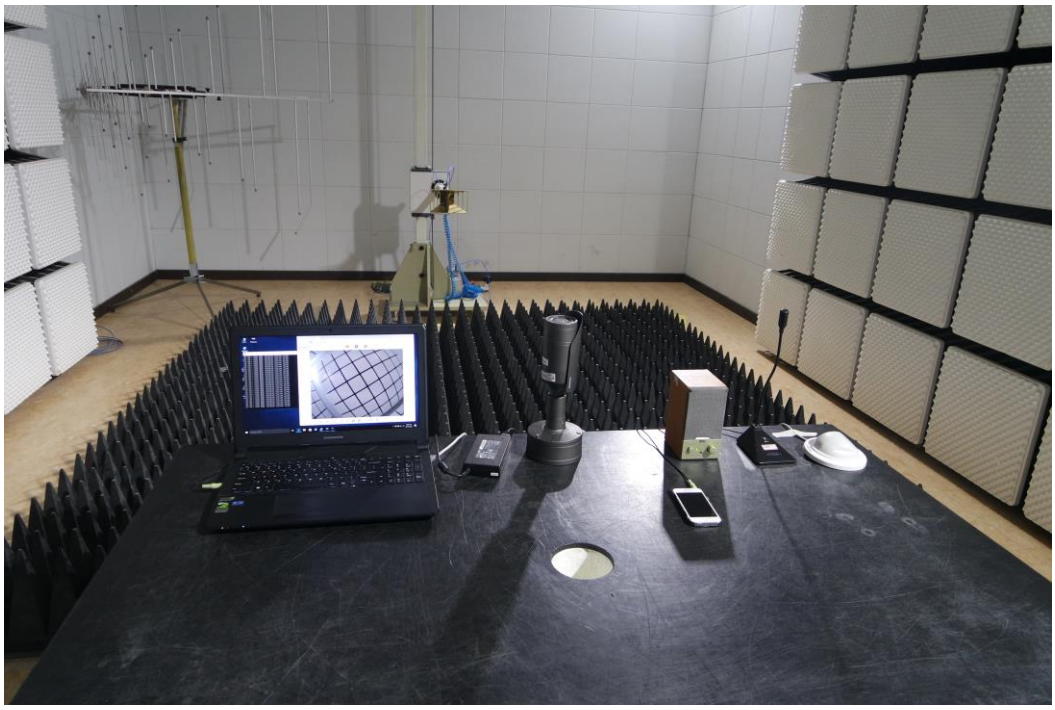
- DC 12 V Mode



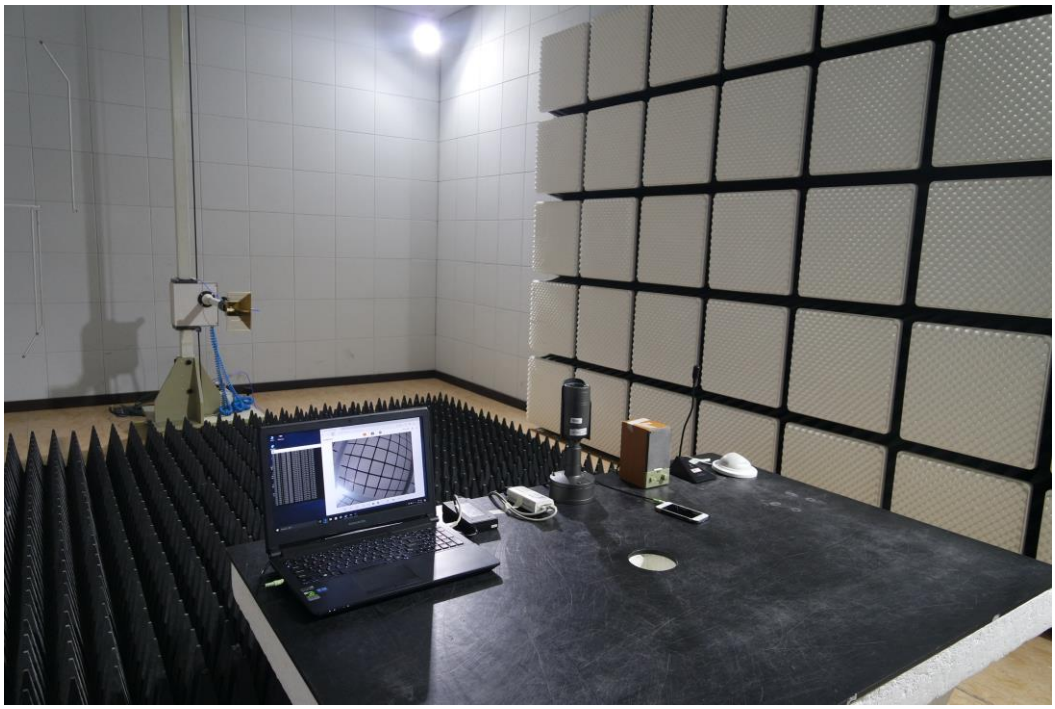
- PoE Mode

Radiated Electric Field Emissions(Above 1 ㎓)

- DC 12 V Mode



- PoE Mode



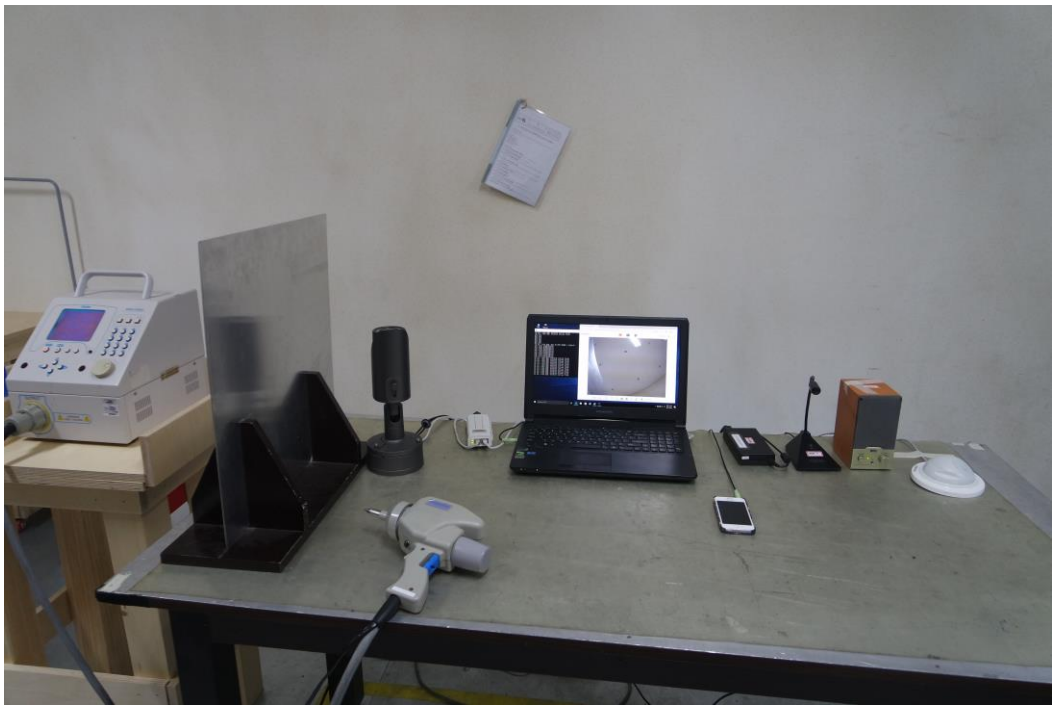
Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

Electrostatic Discharge

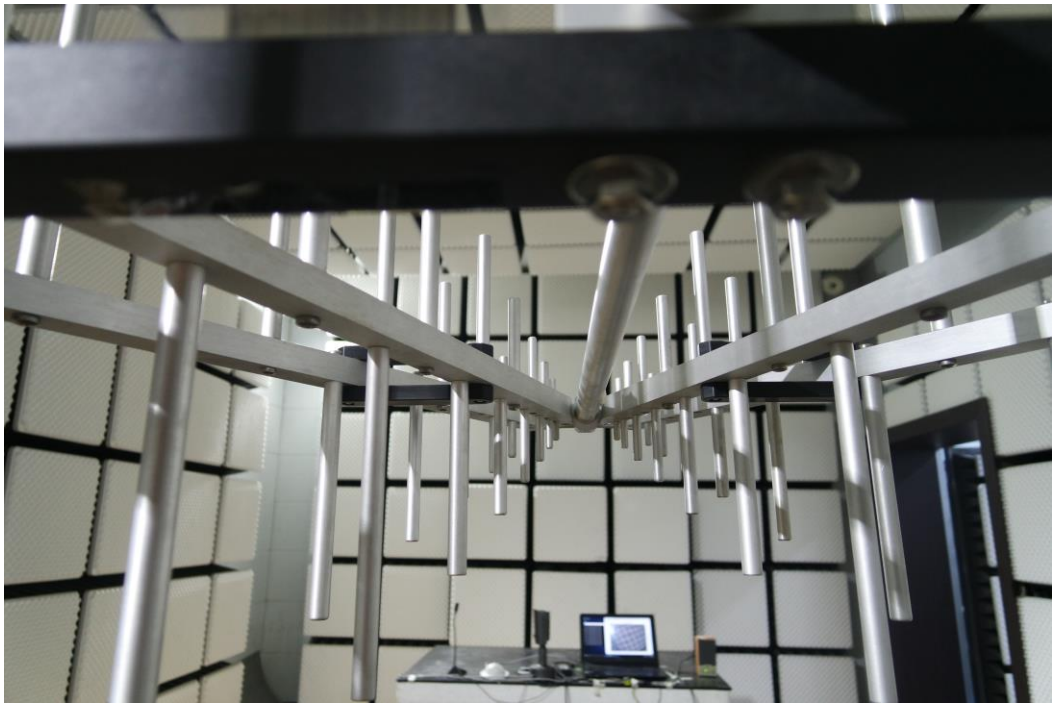
- DC 12 V Mode

- PoE Mode

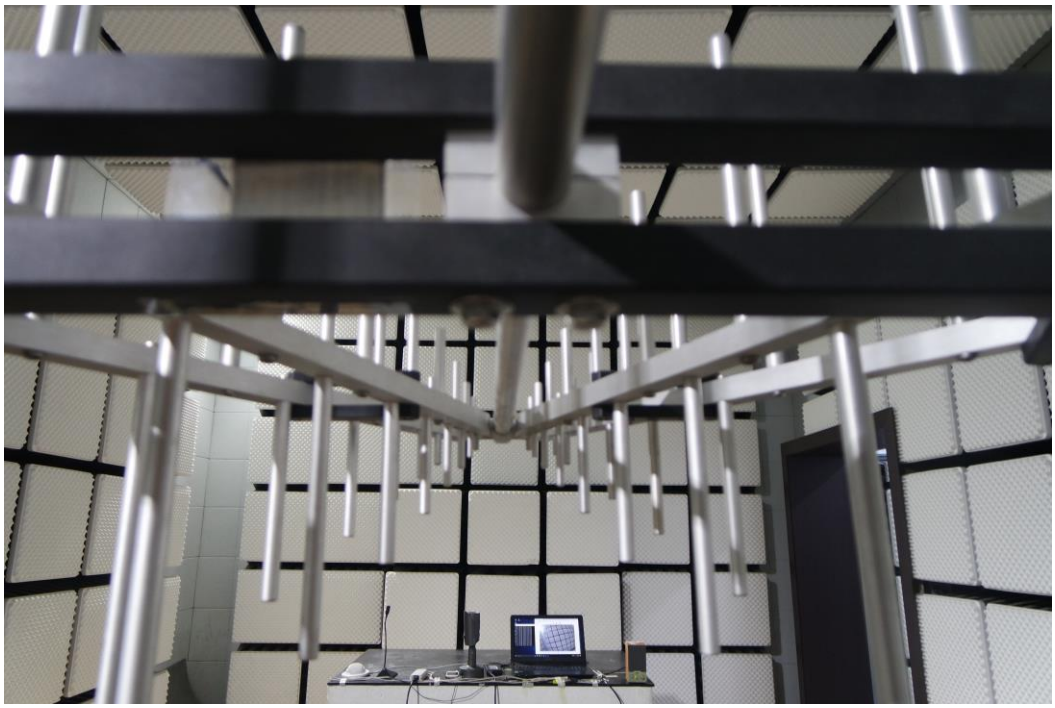


Radiated Electric Field Immunity

- DC 12 V Mode

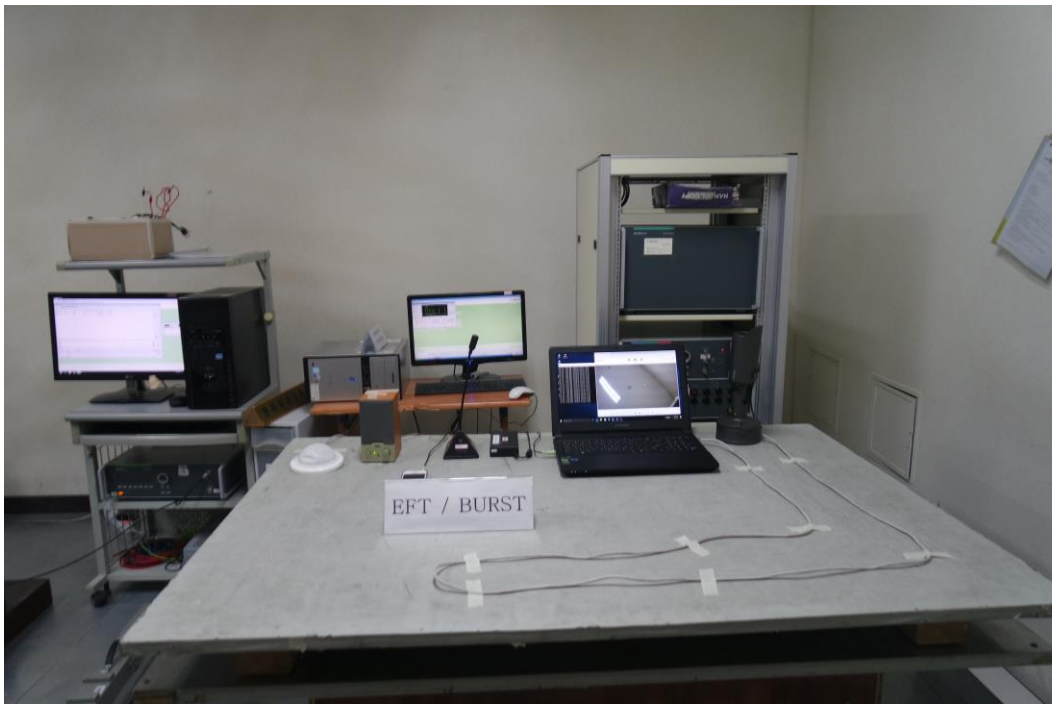


- PoE Mode



Electrical Fast Transients/Bursts

- DC 12 V Mode



- PoE Mode

N/A

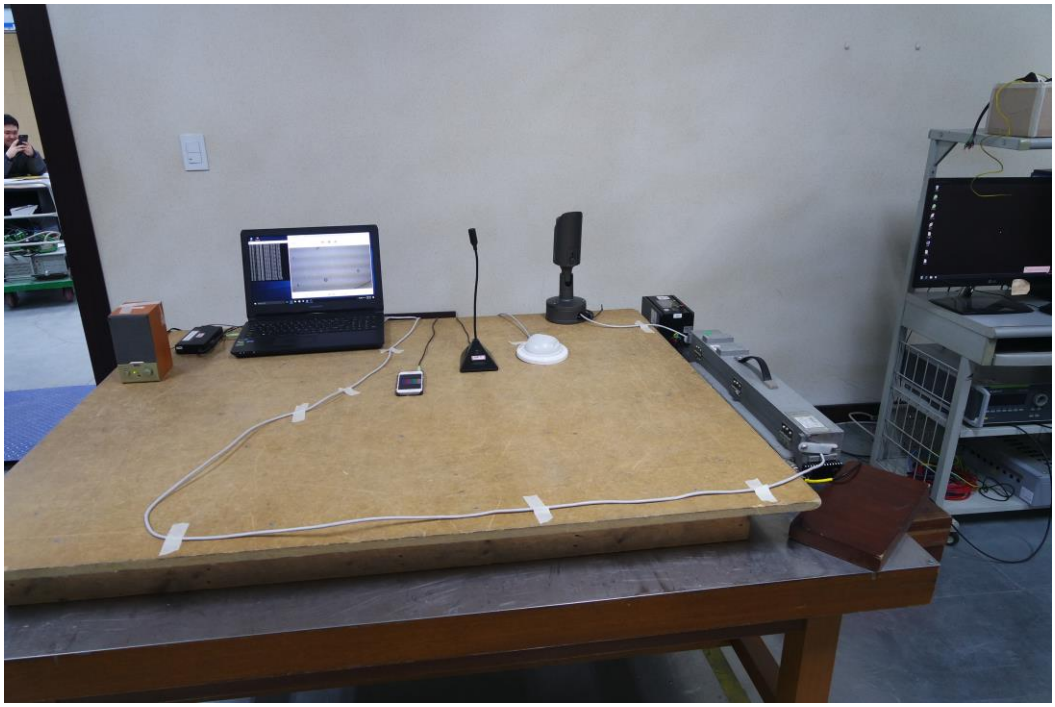
Surge Transients

- DC 12 V Mode

- PoE Mode

Conducted Disturbance

- DC 12 V Mode



- PoE Mode

N/A

Voltage Dips and Short Interruptions

N/A

EUT External Photographs

(Top)

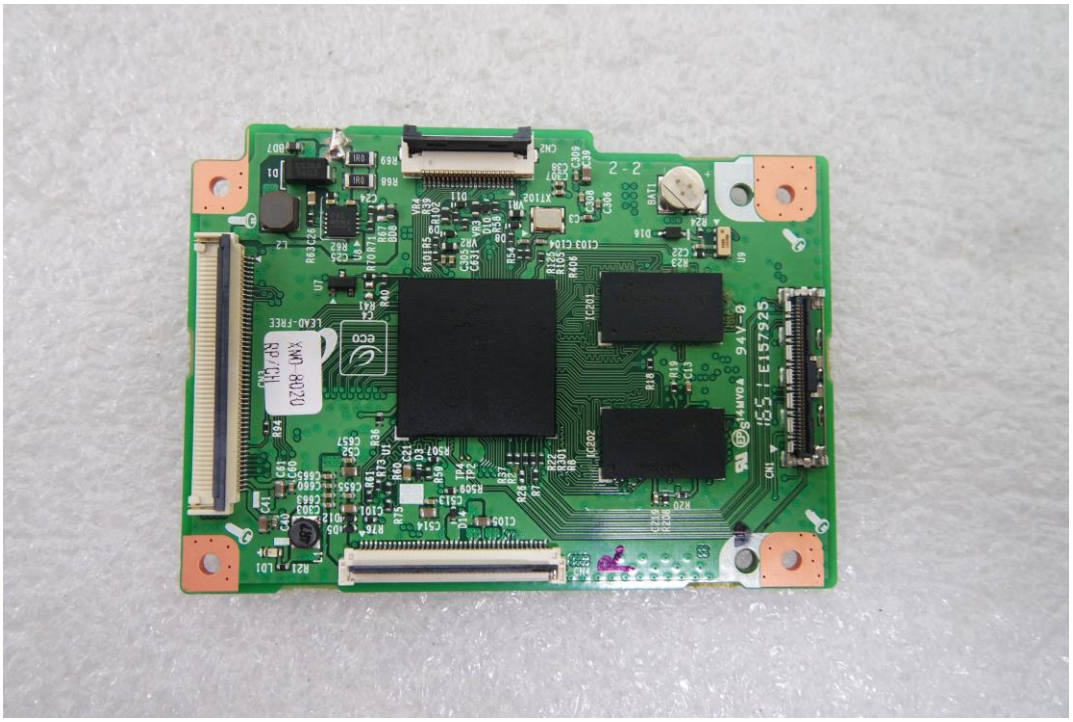
(Bottom)

EUT Internal Photographs

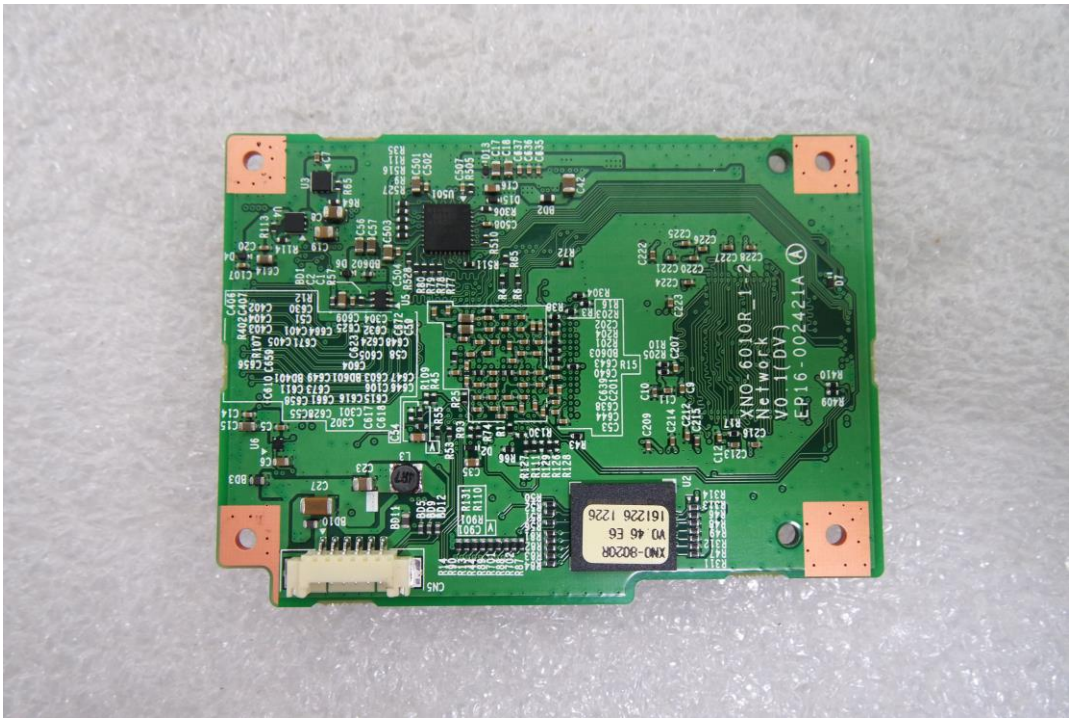
(Internal View)

EUT Internal View – Main Board

(Top)

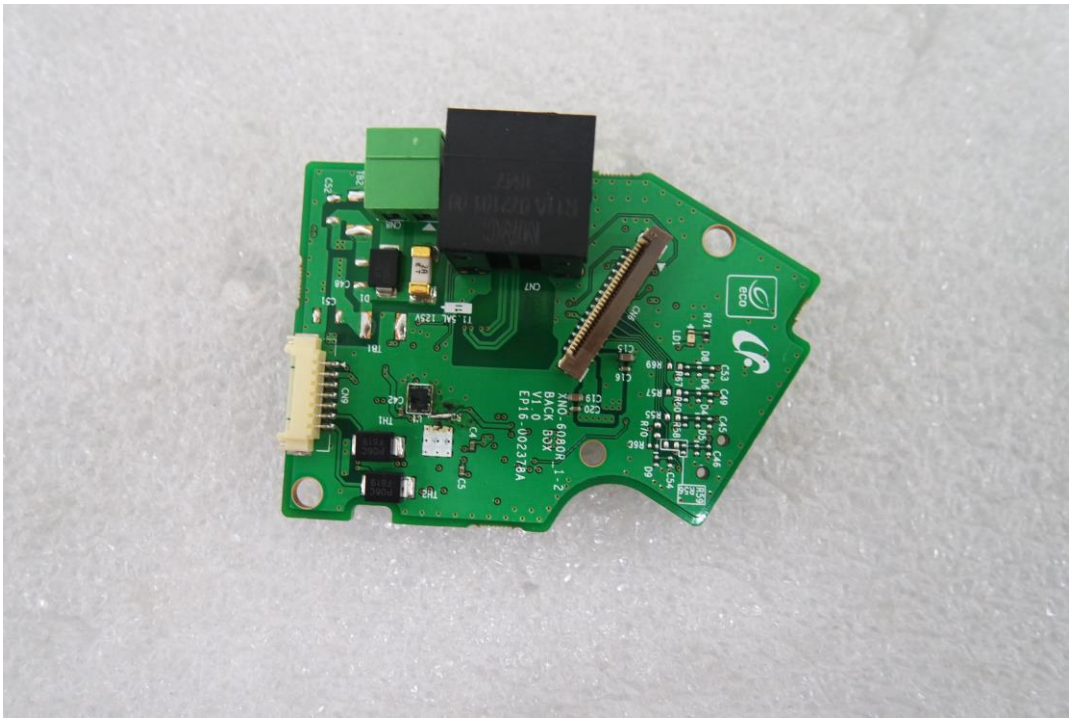


(Bottom)



EUT Internal View – Sub Board 1

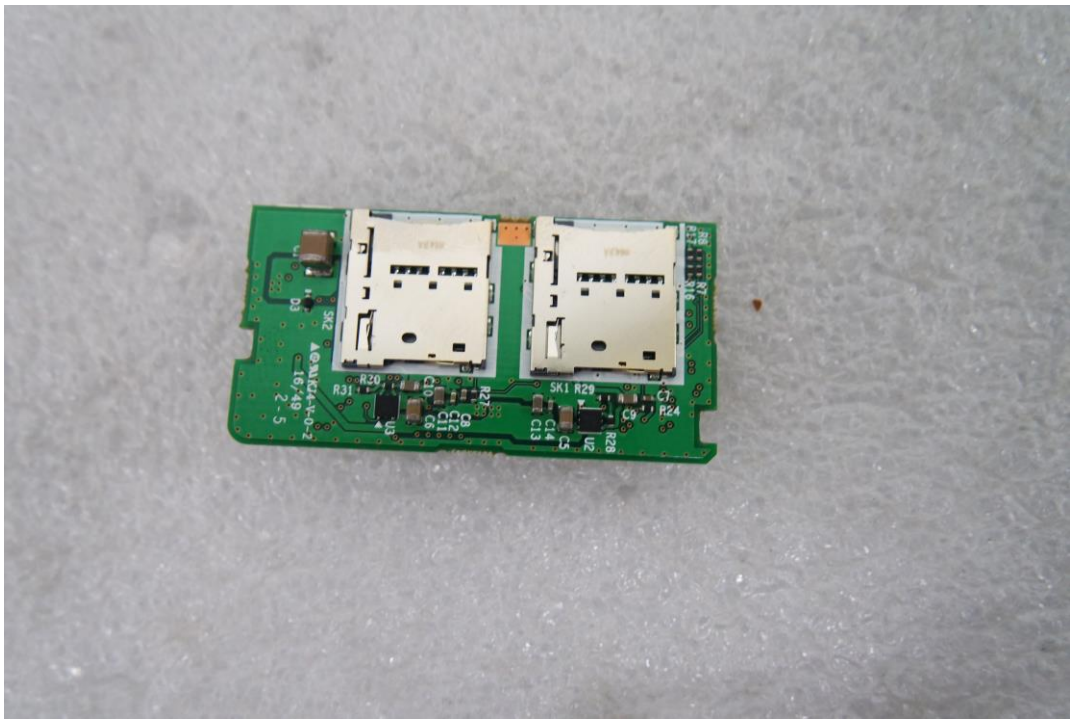
(Top)



(Bottom)

EUT Internal View – Sub Board 2

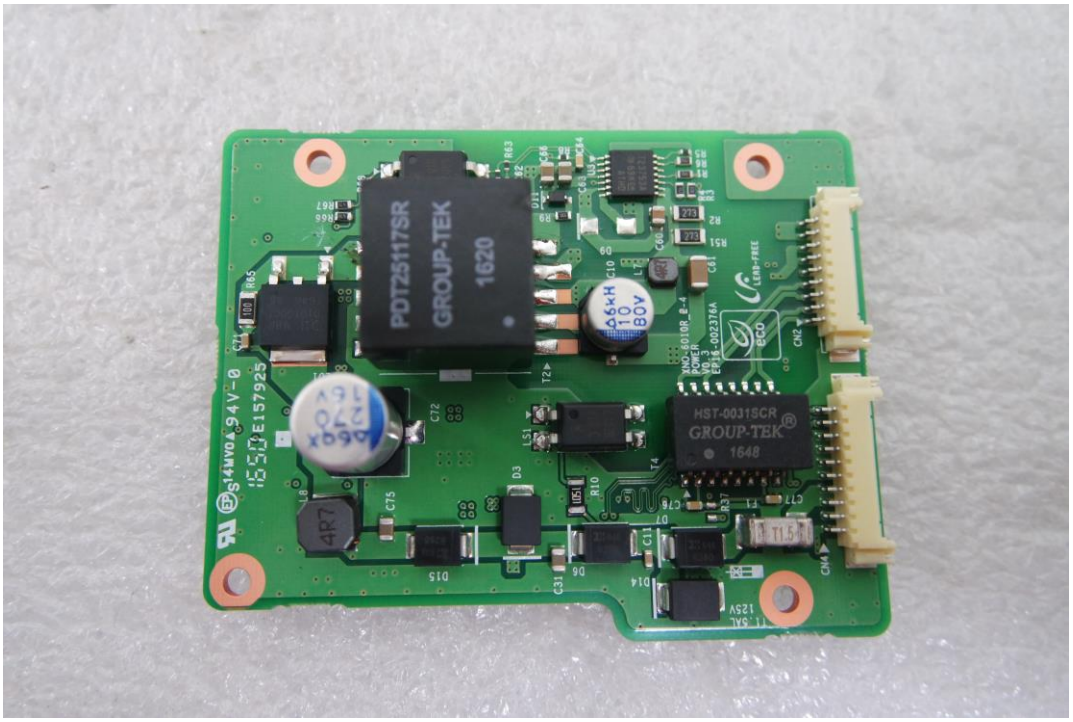
(Top)



(Bottom)

EUT Internal View – Sub Board 3

(Top)



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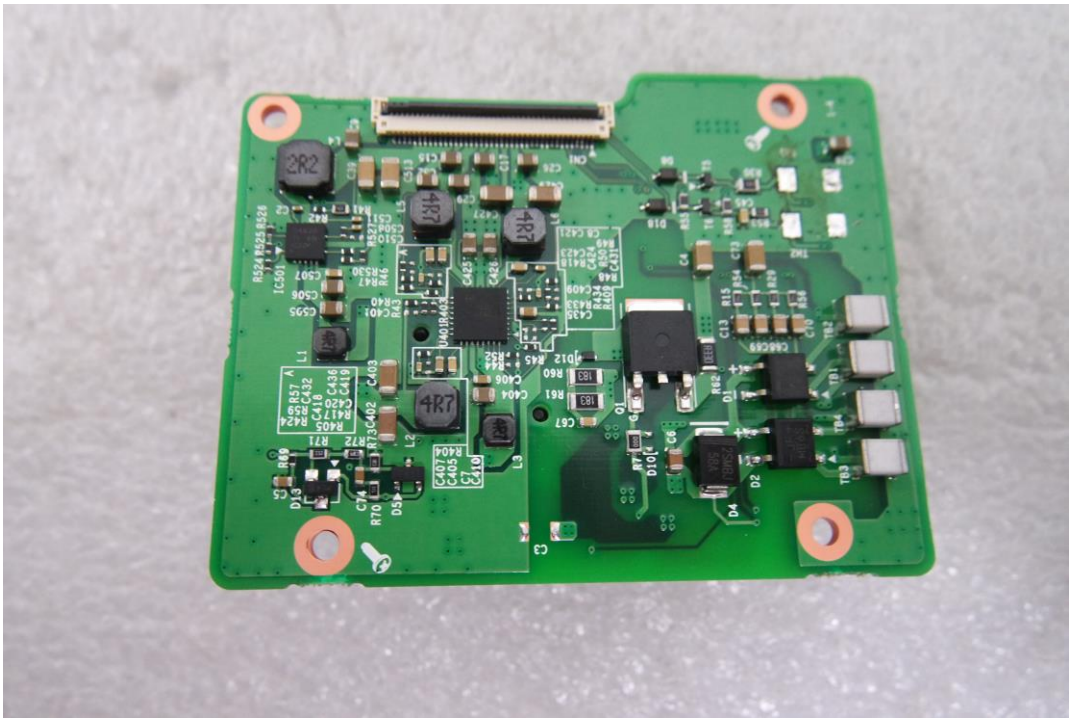
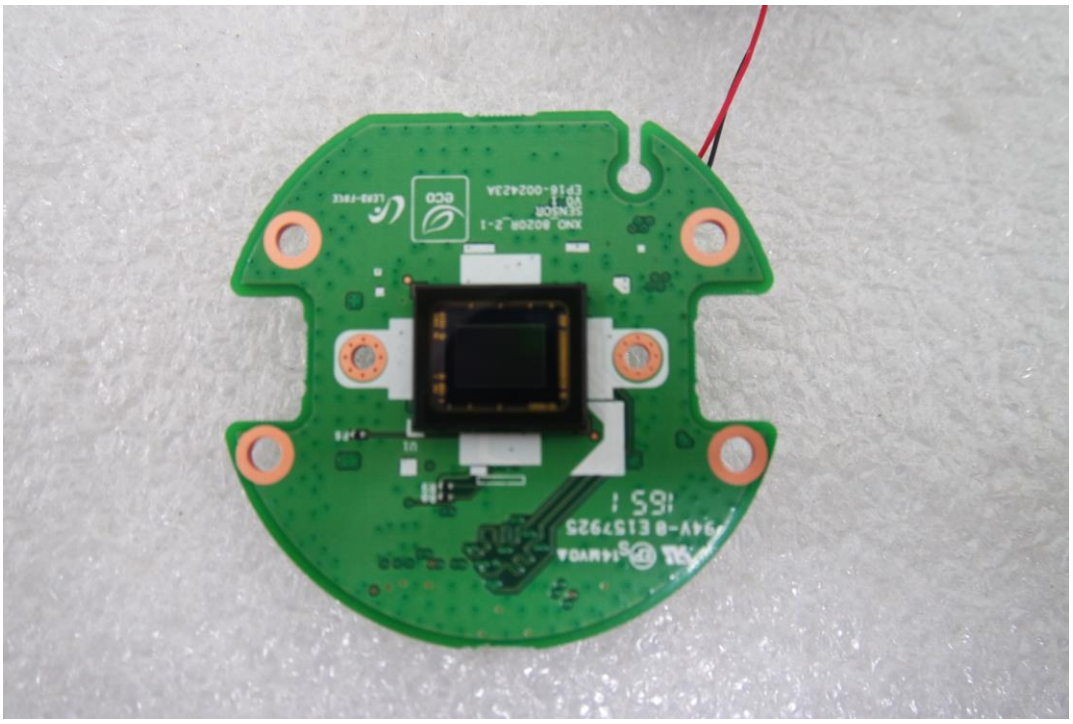
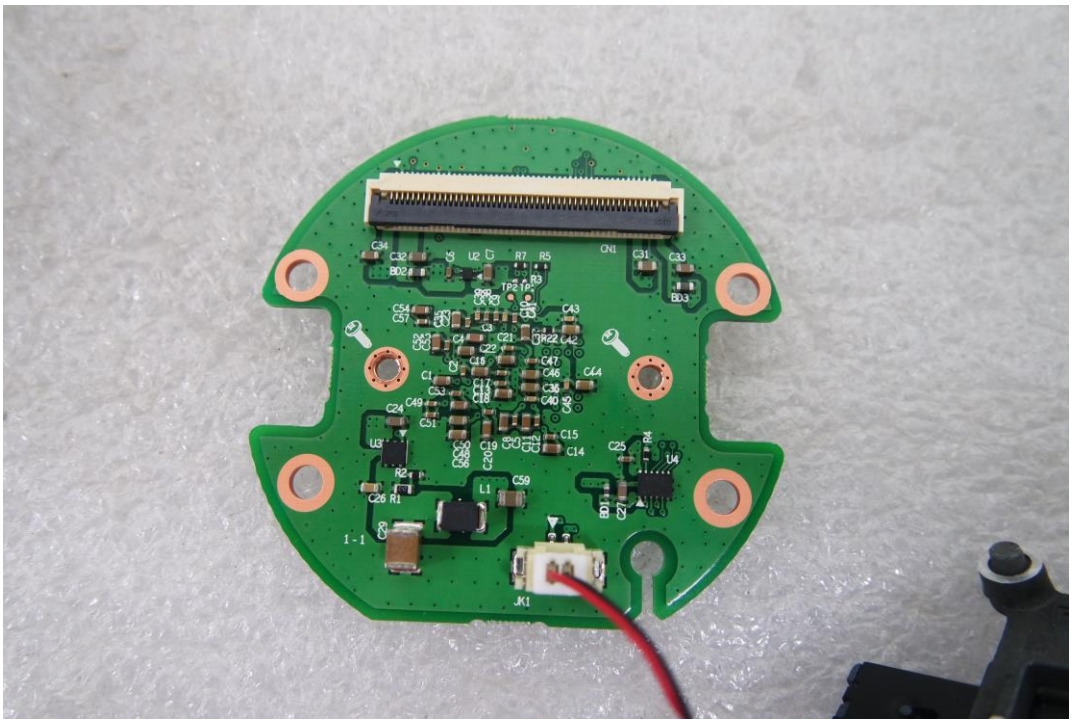


EUT Internal View – Lens Board

(Top)

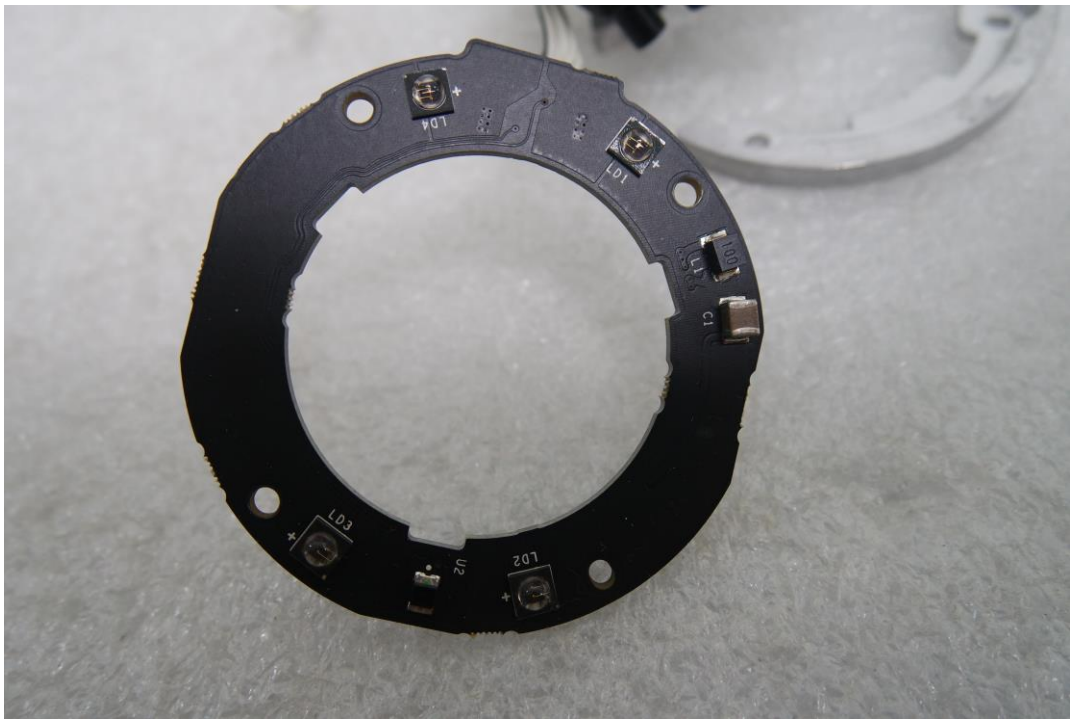


(Bottom)

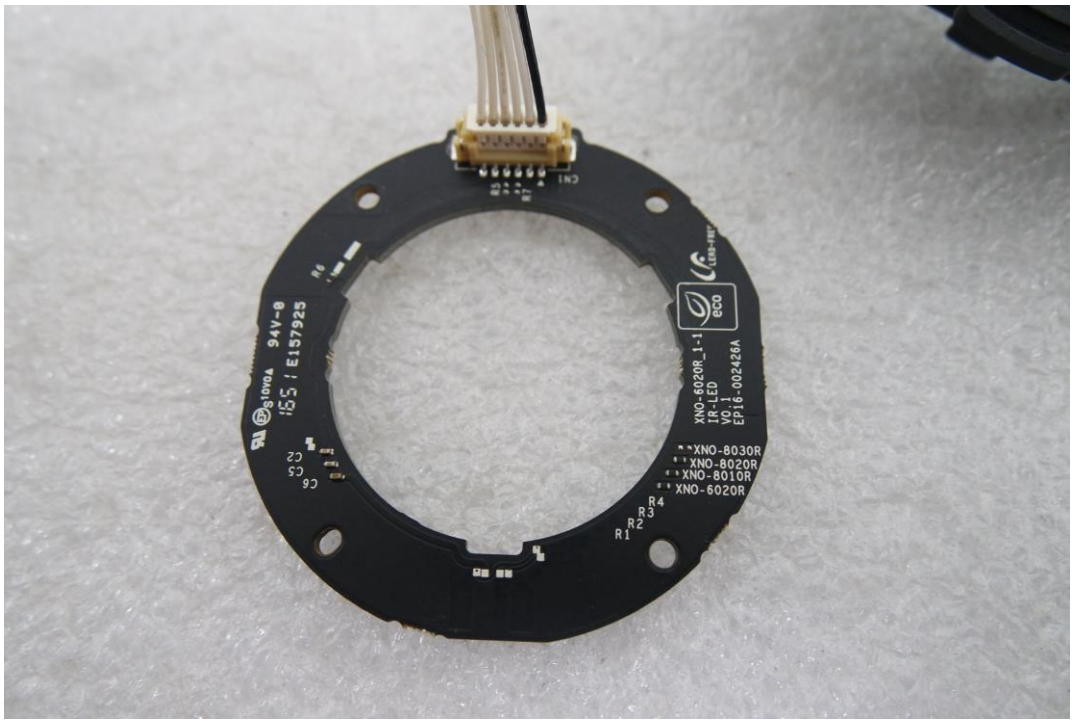


EUT Internal View – LED Board

(Top)



(Bottom)



Label and Location

NETWORK CAMERA

Model No : XNO-8020RP

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

Made in China