VERIFICATION OF FCC PART 15 COMPLIANCE

KES hereby verify *that the subject product complies with all the electromagnetic emission specified in the FCC Rule Part 15*

Product Description:	NETWORK CAMERA
Model/Brand Name:	XNV-6080RN
Variant Model:	-
FCC Rule Part(s):	FCC 47CFR Part 15 Subpart B Class A Part 15.107(b) & Part 15.109(b)
FCC Procedure:	Verification
Applicant Name:	Hanwha Techwin Co., Ltd.
Applicant Address:	Changwon-dareri, Seongsan-gu Changwon-si, Gyeongsangn am-do
Manufacturer Name:	Hanwha Techwin (Tianjin) Co.,Ltd.
Manufacturer Address:	No.11 Weiliu Rd,Micro-Electronic Industrial Park,TEDA,Tianjin,300385,People's Republic of China
Test Report Reference No.:	KES-E1-16T0674

NETWORK CAMERA, Model **XNV-6080RN** has been tested in accordance with the measurement procedures specified in FCC 47CFR Part 15 Subpart B class A and has been shown to be complied with the electromagnetic emission limits specified in FCC Rule Part 15 Subpart B class A. A testing of the sample product has been valid for the sample tested based on the reference test report, KES-E1-16T0674

Date of Issue: 12. 23, 2016

Dong Hun, Jang
Technical Manager
Signature:



KES.Co., Ltd.
C-3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do,431-716, Korea
Tel: +82-31-425-6200 //Fax: +82-31-424-0450

EMC TEST REPORT For FCC

Test Report No.	:	KES-E1-16T0674
Date of Issue	:	Dec. 23, 2016
Product name	:	NETWORK CAMERA
Model/Type No.	:	XNV-6080RN
Variant Model	:	-
Applicant	:	Hanwha Techwin Co., Ltd.
Applicant Address	:	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
Equipment authorization	:	☐ Declaration of Conformity ☒ Verification ☐ Certification
Date of Receipt	:	Nov, 23, 2016
Test date	:	Dec. 16, 2016
Test Results	:	☒ In Compliance ☐ Not in Compliance

Tested by

Jin Bae, Lee
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. 23, 2016	KES-E1-16T0674	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	1/2.8" 2M CMOS
Total Pixels	1945(H) x 1109(V) 2.16M
Effective Pixels	1945(H) x 1097(V) 2.13M
Scanning System	Progressive Scan
Min. Illumination	Color : 0.03 lux(F1.4, 1./30sec) B/W : 0 Lux (F1.4, 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, for installation
Lens	
Focal Length (Zoom Ratio	2.8~12mm(4.3x) motorized varifocal
Max. Aperture Ratio	1.4(Wide) ~ 3.6(Tele)
Angular Field of View	H: 119.5°, V: 62.8°, D: 142.1° H: 27.9°, V: 15.7°, D: 32.0°
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	0° ~ 354° / 0° ~ 85°(TBD) / 0° ~ 355°
Operational	
IR LED	4EA
Viewable Length	(TBD)50m(164.04ft)
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	150dB
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), Hand over
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 →TBD)
Digital PTZ	24X, 'Digital PTZ(Preset, Group)

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Flip / Mirror	Flip : On/Off Mirror : On/Off Hallway view : 90°/270°
Video & Audio Analytics	Tampering, Loitering, Directional Detection, Defocus Detection, Fog 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, 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
Fan / Heater	N/A
Pixel Counter	Support
Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Forma	H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High , Motion JPEG
Resolution	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x450, 720x576, 640x480, 640x360, 320x240, 320x180
Max. Framerate	H.265/H.264 : Max. 60fps at all resolutions Motion JPEG : Max. 30fps
Smart Codec	Manual Mode (area-based : 5EA)
WiseStream	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 Forma	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	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication (EAP-TLS, EAP-LEAP)
Streaming Method	Unicast / Multicast

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Max. User Access	20 users at Unicast Mode
Edge Storage	SD/SDHC/SDXC 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	ONVIF Profile S/G SUNAPI(HTTP API) Open Platform
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Denish, Portuguese, Czech, Polish, Turkish, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek, Norsk, Finnish
Web Viewer	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)
Central Management Soft	SmartViewer, SSM
Environmental	
Operating Temperature / Humidity	-40°C ~ +55°C (-40°F ~ +131°F) / Less than 90% RH
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	24VAC ± 10%, 12VDC ± 10%, PoE(IEEE802.3af)
Power Consumption	TBD
Mechanical	
Color / Material	Ivory / Aluminum
Dimension (WxHxD)	기 SNV-6084R 사이즈 : (Ø 160 X H118.5)
Weight	기 SNV-6084R 중량 : 975g (2.15 lb)

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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 ☐ 120 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	XNV-6080RN	-	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	1.7 m
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	1.6 m
Alarm	-	-	-	-

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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 ㎜	1.7	U
		Speaker	3.5 ㎜	1.6	U
		Alarm	3 pin	3.0	U
Notebook	Audio in	Phone	Audio out	1.7	U

- 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	3 pin	3.0	U
Notebook	Audio in	Phone	Audio out	1.7	U

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- 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	3 pin	3.0	U
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 EUT Operating Mode(s)

operating
E.U.T Monitoring , Ping test, 1 ㎑

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

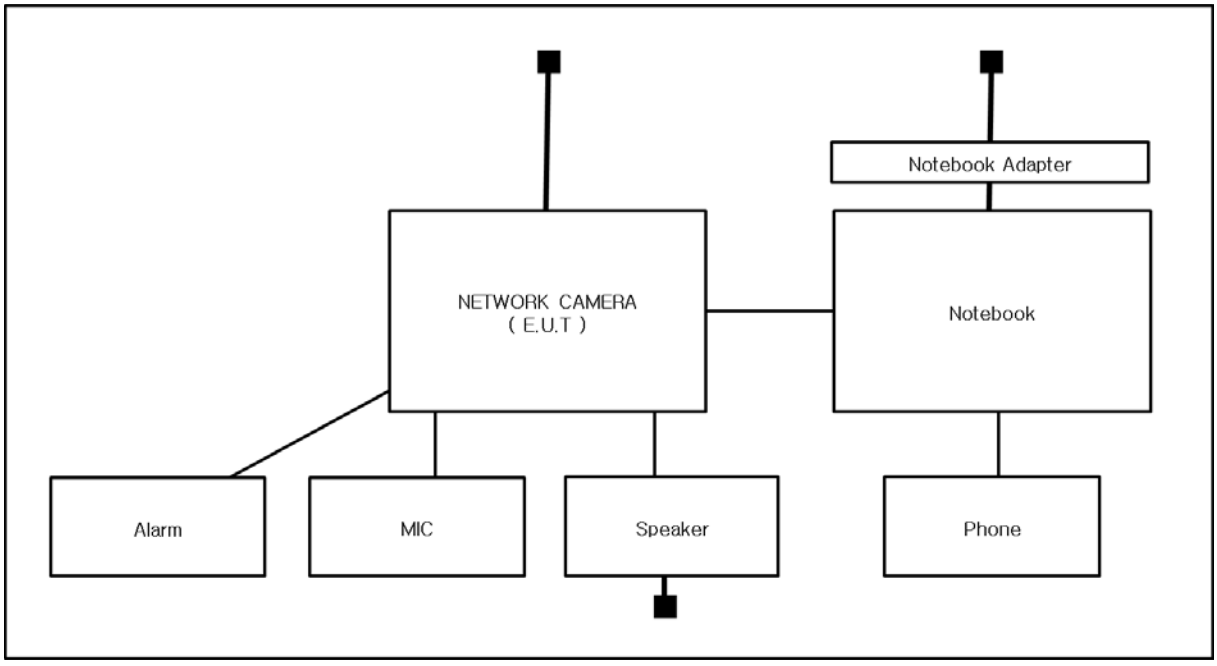
- Input power condition during the measurements was 24 v (ac) , 12 v (dc) , PoE.

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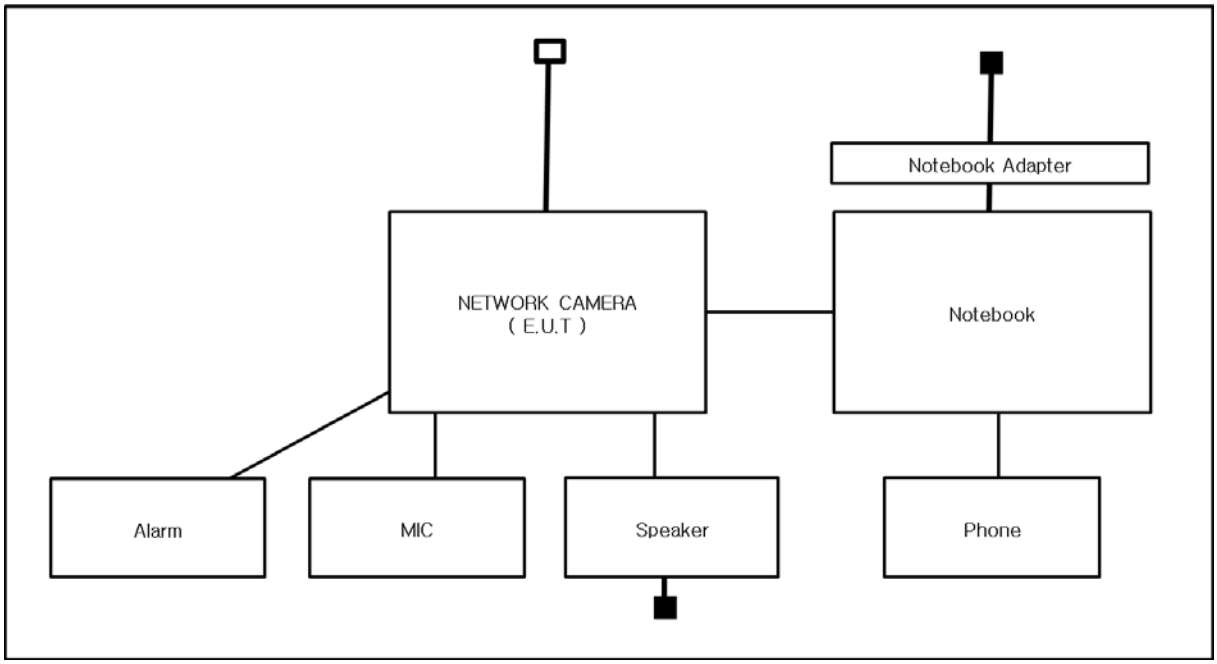
1.8 Configuration

■ AC Main
□ DC Main

- AC 24 V Mode

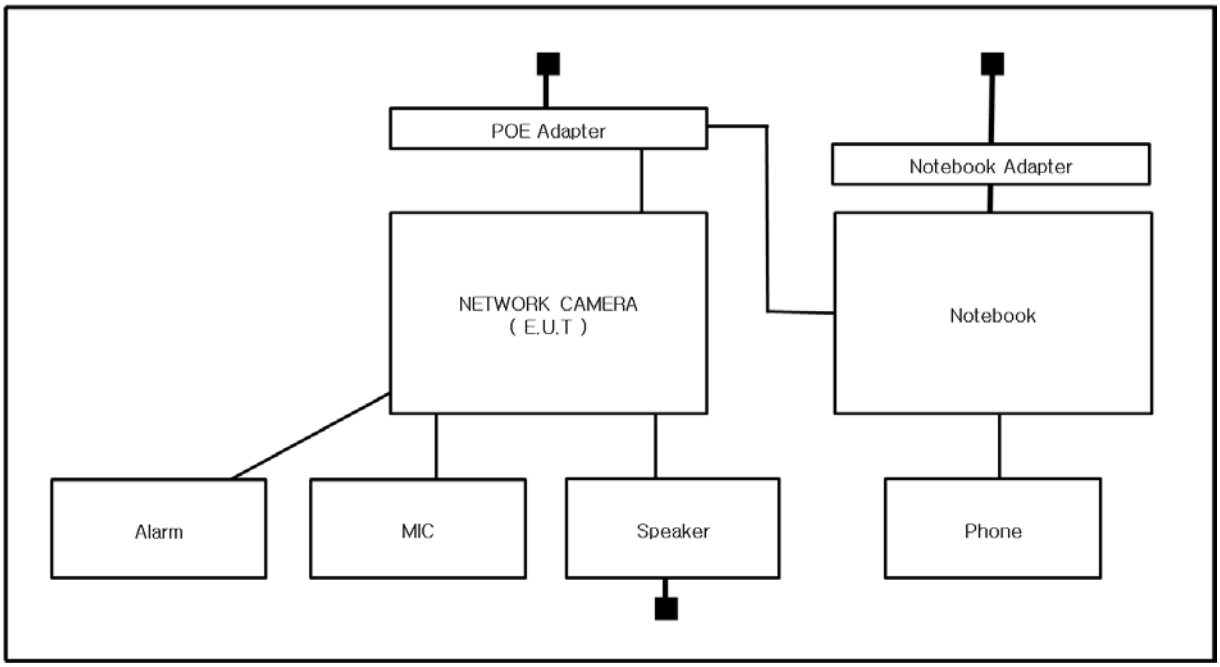


- DC 12 V Mode



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- PoE Mode



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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)	KOREA LABORATORY ACCREDITATION SCHEME KOLAS TESTING NO. 489

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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 ☐ Group 2
☐ Class A ☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55022:2010 ☐ Class A ☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013

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

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

☒ 47 CFR Part 15, Subpart B

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

☐ IC Regulation ICES-003 : 2016

- ☐ CAN/CSA CISPR 22-10 ☐ Class A ☐ Class B
- ☐ ANSI C63.4-2014

☐ MEDICAL – Directive 93/42/EEC

- ☐ EN 60601-1-2 :2007

☐ RE– Directive 2014/53/EU

☐ EN 301 489-1 V1.9.2

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

☐ EN 301 489-3 V1.6.1

☐ EN 301 489-17 V2.2.1

☐ EN 60945:2002

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2.1 Conducted Emissions at Mains Power Ports

Test Date
Dec, 16, 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: 19,5 ℃
Relative Humidity: 36,5 %

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, limits are not specified

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2.2 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Dec, 16, 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 ANT	VULB 9163	Schwarzbeck	9163-713	05, 15, 2017
☒	OATS	-	KES	-	-
☒	Antenna Mast	-	DAEIL EMC	-	-
☒	Turn Table	-	DAEIL EMC	-	-
☒	EMI Test S/W	-	-	-	-

Test Conditions
Temperature: -1,0 ℃
Relative Humidity: 38,0 %

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.

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2.3 Radiated Electric Field Emissions(Above 1 ㎓)

Test Date
Dec, 16, 2016

Test Location
Semi Anechoic Chamber #1

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Log-Periodic Antenna	STLP 9149	SCHWARZBECK	9149-255	05, 17, 2018
☒	EMI TEST Receiver	ESU26	R&S	100551	04, 18, 2017
☒	Preamplifier	EMI TEST Receiver	R&S	102232	06, 29, 2017
☒	Semi Anechoic Chamber #1	-	KES	-	-
☒	Tilt Antenna Mast	TAM 4.0-E	maturo	18100116	-
☒	Turn Table	DT 2000-1,5T	INN-CO	-	-
☒	EMI Test S/W	-	-	-	-

Test Conditions
Temperature: 20,0 ℃
Relative Humidity: 46,9 %

Frequency Range of Measurement
1 ㎓ to 5 ㎓

Instrument Settings
IF Band Width: 1 ㎒

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

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APPENDIX A – TEST DATA

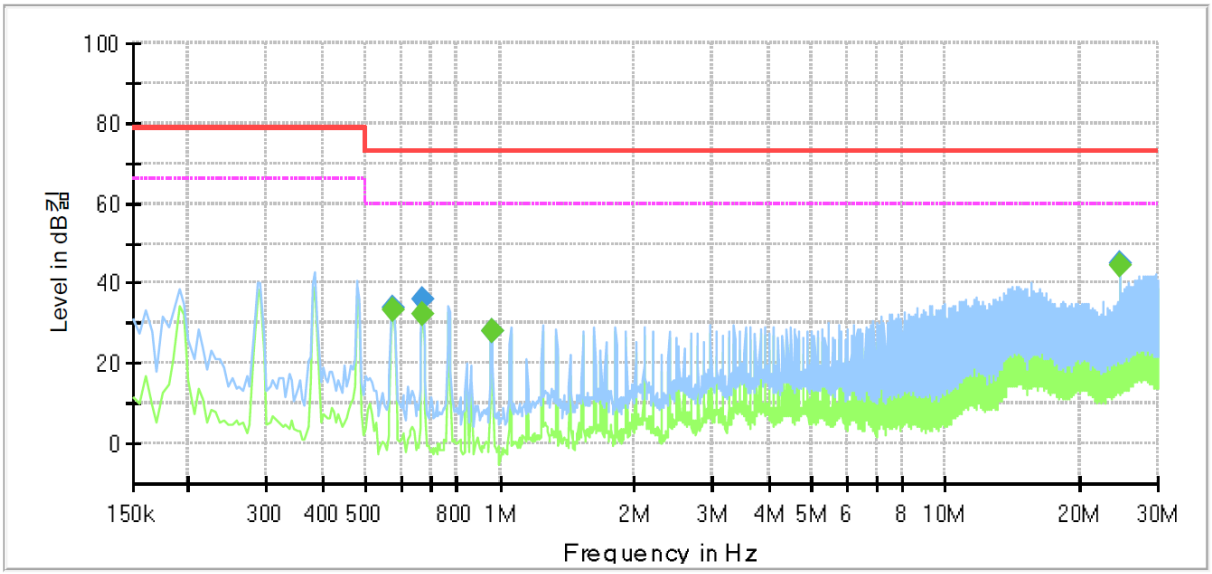
Conducted Emissions at Mains Power Ports

- AC 24 V Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	XNV-6080RN
Mode	AC 24 V _ H
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.575000	---	33.51	60.00	26.49	1000.0	9.000	L1	9.9
0.575000	34.13	---	73.00	38.87	1000.0	9.000	L1	9.9
0.670000	---	32.34	60.00	27.66	1000.0	9.000	L1	9.9
0.670000	35.90	---	73.00	37.10	1000.0	9.000	L1	9.9
0.960000	---	27.85	60.00	32.15	1000.0	9.000	L1	10.0
0.960000	28.34	---	73.00	44.66	1000.0	9.000	L1	10.0
24.575000	---	44.45	60.00	15.55	1000.0	9.000	L1	10.3
24.575000	44.82	---	73.00	28.18	1000.0	9.000	L1	10.3

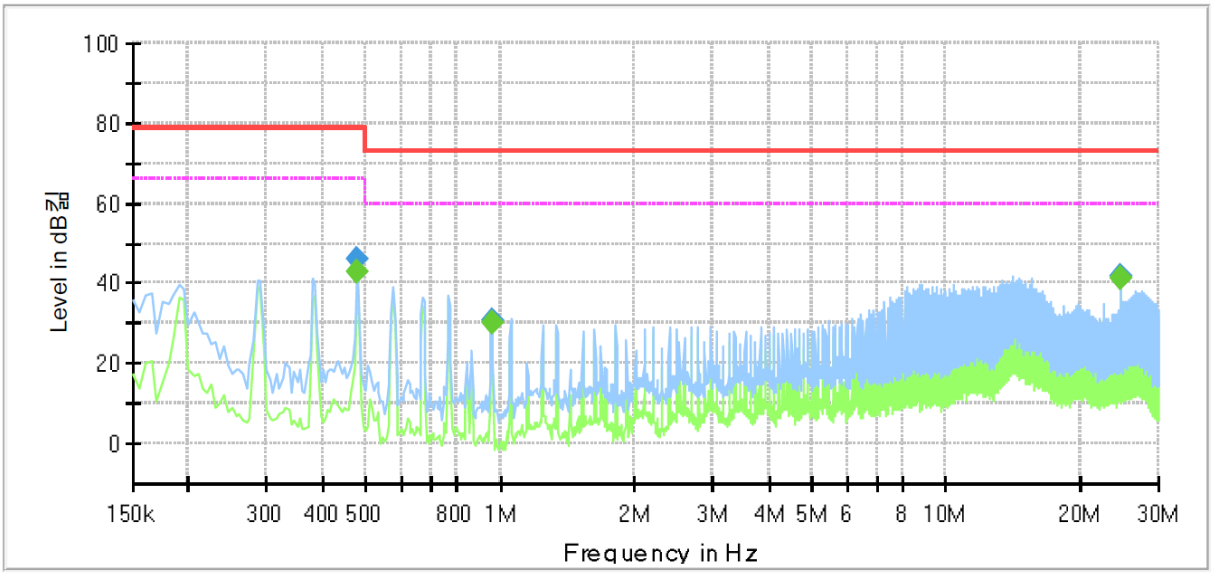
♦ Calculation
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR+ Cable Loss)

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[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	XNV-6080RN
Mode	AC 24 V _ N
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.480000	---	43.01	66.00	22.99	1000.0	9.000	N	9.8
0.480000	46.23	---	79.00	32.77	1000.0	9.000	N	9.8
0.960000	---	30.34	60.00	29.66	1000.0	9.000	N	10.0
0.960000	30.79	---	73.00	42.21	1000.0	9.000	N	10.0
24.575000	---	41.53	60.00	18.47	1000.0	9.000	N	10.3
24.575000	41.89	---	73.00	31.11	1000.0	9.000	N	10.3

♦ 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)

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Radiated Electric Field Emissions(Below 1 ㎓)

- AC 24 V Mode

Frequency	Amplitude	ANT Polar.	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[㎒]	[dB㎶]	(H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB㎶/m]	[dB㎶/m]	[dB]
147.37	8.29	H	3.74	8.11	3.54	19.94	43.50	20.06
227.69	9.29	H	4.00	11.91	4.45	25.65	46.40	14.35
325.68	13.31	V	1.29	13.98	5.40	32.69	46.40	14.31
400.05	8.14	H	4.00	15.70	6.17	30.01	46.40	16.99
530.34	17.23	V	1.15	17.77	7.25	42.25	46.40	4.75
624.33	8.71	V	1.28	19.40	7.99	36.10	46.40	10.90

* 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

- DC 12 V Mode

Frequency	Amplitude	ANT Polar.	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[㎒]	[dB㎶]	(H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB㎶/m]	[dB㎶/m]	[dB]
152.62	8.38	H	3.90	8.29	3.60	20.27	43.50	19.73
221.26	9.27	H	3.94	11.77	4.37	25.41	46.40	14.59
336.98	12.61	V	1.36	14.24	5.51	32.36	46.40	14.64
475.81	8.69	H	3.61	16.76	6.90	32.35	46.40	14.65
530.33	14.26	V	1.00	17.77	7.25	39.28	46.40	7.72
624.33	8.67	V	1.28	19.40	7.99	36.06	46.40	10.94

* 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

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Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin [dB]
[㎒]	[dBμV]		[m]	ANT. [dB/m]	Cable [dB]	[dBμV/m]	[dBμV/m]	
147.62	8.15	V	1.57	8.11	3.54	19.80	43.50	20.20
224.36	9.14	H	3.88	11.84	4.41	25.39	46.40	14.61
325.87	11.15	H	3.79	13.98	5.40	30.53	46.40	16.47
400.03	7.92	V	1.21	15.70	6.17	29.79	46.40	17.21
538.28	9.12	H	3.76	17.94	7.31	34.37	46.40	12.63
624.60	9.31	V	1.00	19.40	7.99	36.70	46.40	10.30

* 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

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Radiated Electric Field Emissions(Above 1 ㎓)

- AC 24 V Mode

- PK

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor			Corrected Amplitude	Applicable Limit	Margin [dB]
[㎒]	[dB㎶]		[m]	ANT. [dB /m]	Cable [dB]	AMP [dB]	[dB㎶/m]	[dB㎶/m]	
1 000.000	55.900	V	1.000	20.490	3.110	43.640	35.860	80.000	44.140
1 596.000	56.420	H	1.000	23.540	3.860	43.660	40.160	80.000	39.840
1 794.000	56.050	V	1.000	24.550	4.290	43.720	41.170	80.000	38.830
1 993.000	64.260	H	1.000	25.560	4.400	43.780	50.440	80.000	29.560
2 000.000	55.730	V	1.000	25.600	4.400	43.780	41.950	80.000	38.050
2 057.000	62.310	H	1.000	25.840	4.510	43.810	48.850	80.000	31.150
2 057.000	56.230	V	1.000	25.840	4.510	43.810	42.770	80.000	37.230
2 282.000	63.840	V	1.000	26.780	4.840	43.910	51.550	80.000	28.450
2 397.000	64.060	H	1.000	27.260	4.900	43.960	52.260	80.000	27.740
2 660.000	58.820	H	1.000	28.370	5.220	44.070	48.340	80.000	31.660
4 871.000	50.100	H	1.000	32.990	7.000	44.310	45.780	80.000	34.220
4 903.000	49.830	V	1.000	33.050	6.990	44.320	45.550	80.000	34.450

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- AV

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor			Corrected Amplitude	Applicable Limit	Margin [dB]
[㎒]	[dBμV]		[m]	ANT. [dB /m]	Cable [dB]	AMP [dB]	[dBμV/m]	[dBμV/m]	
1 788.000	41.660	V	1.000	24.520	4.270	43.720	26.730	60.000	33.270
1 993.000	51.940	H	1.000	25.560	4.400	43.780	38.120	60.000	21.880
2 057.000	53.040	H	1.000	25.840	4.510	43.810	39.580	60.000	20.420
2 057.000	46.360	V	1.000	25.840	4.510	43.810	32.900	60.000	27.100
2 288.000	50.170	H	1.000	26.810	4.840	43.910	37.910	60.000	22.090
2 288.000	44.550	V	1.000	26.810	4.840	43.910	32.290	60.000	27.710
2 397.000	51.070	H	1.000	27.260	4.900	43.960	39.270	60.000	20.730
2 397.000	42.980	V	1.000	27.260	4.900	43.960	31.180	60.000	28.820
2 737.000	43.730	V	1.000	28.690	5.250	44.100	33.570	60.000	26.430
2 743.000	51.950	H	1.000	28.710	5.250	44.100	41.810	60.000	18.190
4 884.000	38.480	H	1.000	33.020	7.000	44.310	34.190	60.000	25.810
4 891.000	38.310	V	1.000	33.030	7.000	44.310	34.030	60.000	25.970

♦ 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

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- DC 12 V Mode

- PK

Frequency [㎒]	Amplitude [dB㎶]	ANT Polar. (H/V)	ANT. Height [m]	Correction Factor			Corrected Amplitude [dB㎶/m]	Applicable Limit [dB㎶/m]	Margin [dB]
				ANT. [dB /m]	Cable [dB]	AMP [dB]			
1 000.000	58.380	H	1.000	20.490	3.110	43.640	38.340	80.000	41.660
1 596.000	55.030	H	1.000	23.540	3.860	43.660	38.770	80.000	41.230
1 596.000	53.770	V	1.000	23.540	3.860	43.660	37.510	80.000	42.490
1 987.000	64.510	H	1.000	25.530	4.390	43.780	50.650	80.000	29.350
1 987.000	54.790	V	1.000	25.530	4.390	43.780	40.930	80.000	39.070
2 057.000	74.170	H	1.000	25.840	4.510	43.810	60.710	80.000	19.290
2 057.000	57.300	V	1.000	25.840	4.510	43.810	43.840	80.000	36.160
2 294.000	62.750	H	1.000	26.830	4.840	43.920	50.500	80.000	29.500
2 294.000	59.800	V	1.000	26.830	4.840	43.920	47.550	80.000	32.450
2 512.000	60.940	H	1.000	27.750	5.070	44.010	49.750	80.000	30.250
2 737.000	53.890	V	1.000	28.690	5.250	44.100	43.730	80.000	36.270
4 955.000	48.850	V	1.000	33.150	6.990	44.320	44.670	80.000	35.330

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- AV

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor			Corrected Amplitude	Applicable Limit	Margin [dB]
[㎒]	[dBμV]		[m]	ANT. [dB /m]	Cable [dB]	AMP [dB]	[dBμV/m]	[dBμV/m]	
1 192.000	43.820	H	1.000	21.470	3.370	43.640	25.020	60.000	34.980
2 057.000	55.920	H	1.000	25.840	4.510	43.810	42.460	60.000	17.540
2 057.000	48.450	V	1.000	25.840	4.510	43.810	34.990	60.000	25.010
2 288.000	49.690	H	1.000	26.810	4.840	43.910	37.430	60.000	22.570
2 288.000	44.000	V	1.000	26.810	4.840	43.910	31.740	60.000	28.260
2 397.000	49.800	H	1.000	27.260	4.900	43.960	38.000	60.000	22.000
2 397.000	44.150	V	1.000	27.260	4.900	43.960	32.350	60.000	27.650
2 660.000	48.460	H	1.000	28.370	5.220	44.070	37.980	60.000	22.020
2 737.000	46.060	V	1.000	28.690	5.250	44.100	35.900	60.000	24.100
2 775.000	41.060	V	1.000	28.850	5.260	44.110	31.060	60.000	28.940
4 884.000	38.200	H	1.000	33.020	7.000	44.310	33.910	60.000	26.090
4 910.000	38.260	V	1.000	33.060	6.990	44.320	33.990	60.000	26.010

♦ 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

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- PoE Mode

- PK

Frequency [㎒]	Amplitude [dB㎶]	ANT Polar. (H/V)	ANT. Height [m]	Correction Factor			Corrected Amplitude [dB㎶/m]	Applicable Limit [dB㎶/m]	Margin [dB]
				ANT. [dB/m]	Cable [dB]	AMP [dB]			
1 000.000	58.940	H	1.000	20.490	3.110	43.640	38.900	80.000	41.100
1 596.000	52.620	V	1.000	23.540	3.860	43.660	36.360	80.000	43.640
1 737.000	54.710	V	1.000	24.260	4.160	43.700	39.430	80.000	40.570
1 987.000	54.510	V	1.000	25.530	4.390	43.780	40.650	80.000	39.350
1 993.000	64.780	H	1.000	25.560	4.400	43.780	50.960	80.000	29.040
2 064.000	59.850	H	1.000	25.870	4.520	43.810	46.430	80.000	33.570
2 397.000	59.820	H	1.000	27.260	4.900	43.960	48.020	80.000	31.980
2 397.000	56.710	V	1.000	27.260	4.900	43.960	44.910	80.000	35.090
2 737.000	52.100	V	1.000	28.690	5.250	44.100	41.940	80.000	38.060
2 750.000	57.990	H	1.000	28.740	5.250	44.110	47.870	80.000	32.130
4 884.000	49.180	H	1.000	33.020	7.000	44.310	44.890	80.000	35.110
4 903.000	49.250	V	1.000	33.050	6.990	44.320	44.970	80.000	35.030

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- AV

Frequency [㎒]	Amplitude [dBμV]	ANT Polar. (H/V)	ANT. Height [m]	Correction Factor			Corrected Amplitude [dBμV/m]	Applicable Limit [dBμV/m]	Margin [dB]
				ANT. [dB /m]	Cable [dB]	AMP [dB]			
1 000.000	42.690	V	1.000	20.490	3.110	43.640	22.650	60.000	37.350
1 128.000	47.610	H	1.000	21.140	3.280	43.640	28.390	60.000	31.610
1 743.000	53.830	H	1.000	24.290	4.170	43.700	38.590	60.000	21.410
1 993.000	49.330	H	1.000	25.560	4.400	43.780	35.510	60.000	24.490
1 993.000	43.570	V	1.000	25.560	4.400	43.780	29.750	60.000	30.250
2 051.000	49.670	H	1.000	25.810	4.500	43.800	36.180	60.000	23.820
2 288.000	53.340	H	1.000	26.810	4.840	43.910	41.080	60.000	18.920
2 288.000	47.100	V	1.000	26.810	4.840	43.910	34.840	60.000	25.160
2 397.000	43.940	V	1.000	27.260	4.900	43.960	32.140	60.000	27.860
2 750.000	42.450	V	1.000	28.740	5.250	44.110	32.330	60.000	27.670
4 891.000	38.140	H	1.000	33.030	7.000	44.310	33.860	60.000	26.140
4 897.000	38.160	V	1.000	33.040	7.000	44.320	33.880	60.000	26.120

♦ Calculation

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

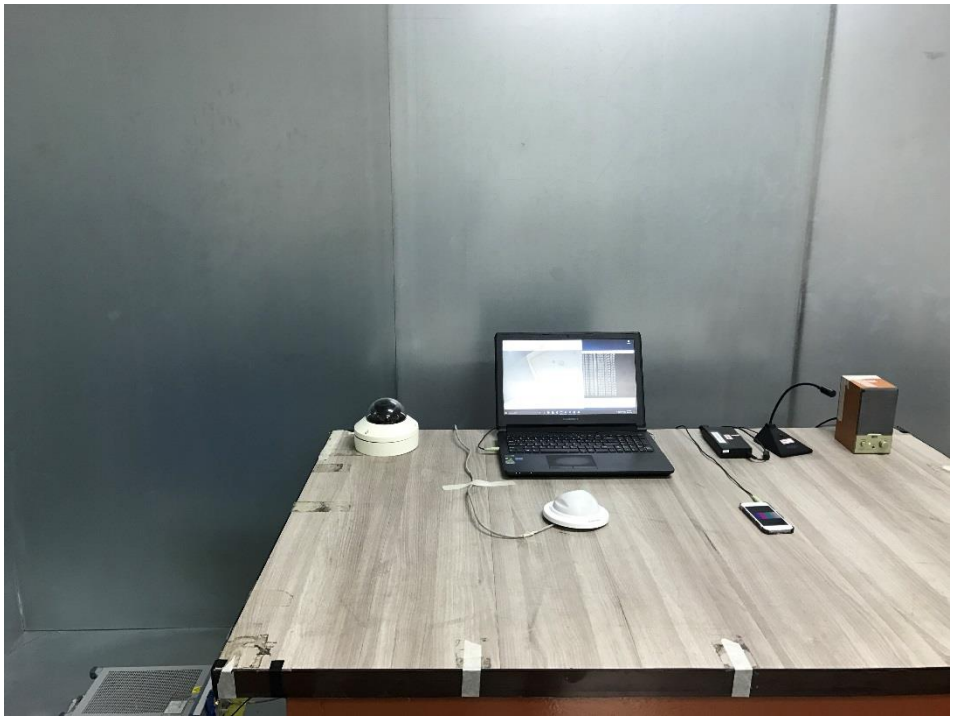
Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

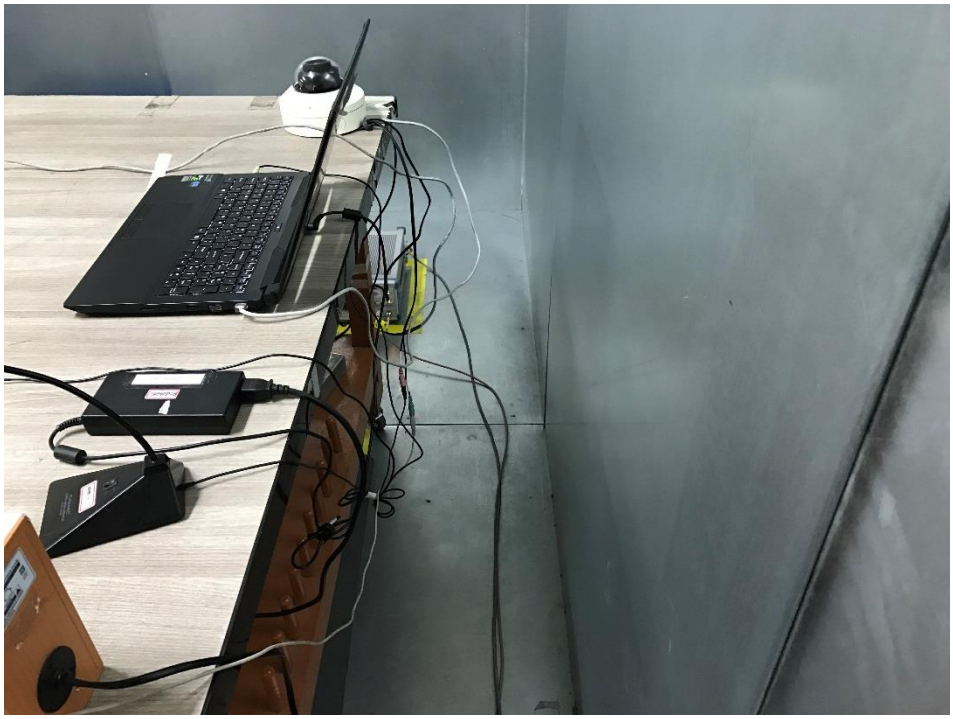
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Test Setup Photos and Configuration

Conducted Voltage Emissions

- AC 24 V Mode



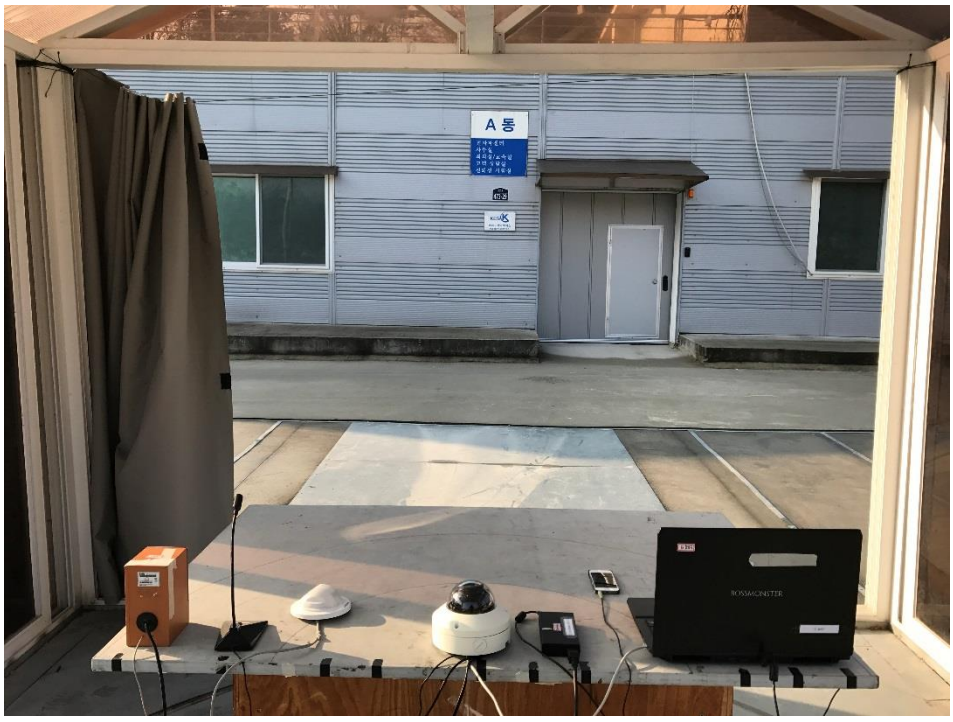


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Radiated Electric Field Emissions(Below 1 ㎓)

- AC 24 V Mode





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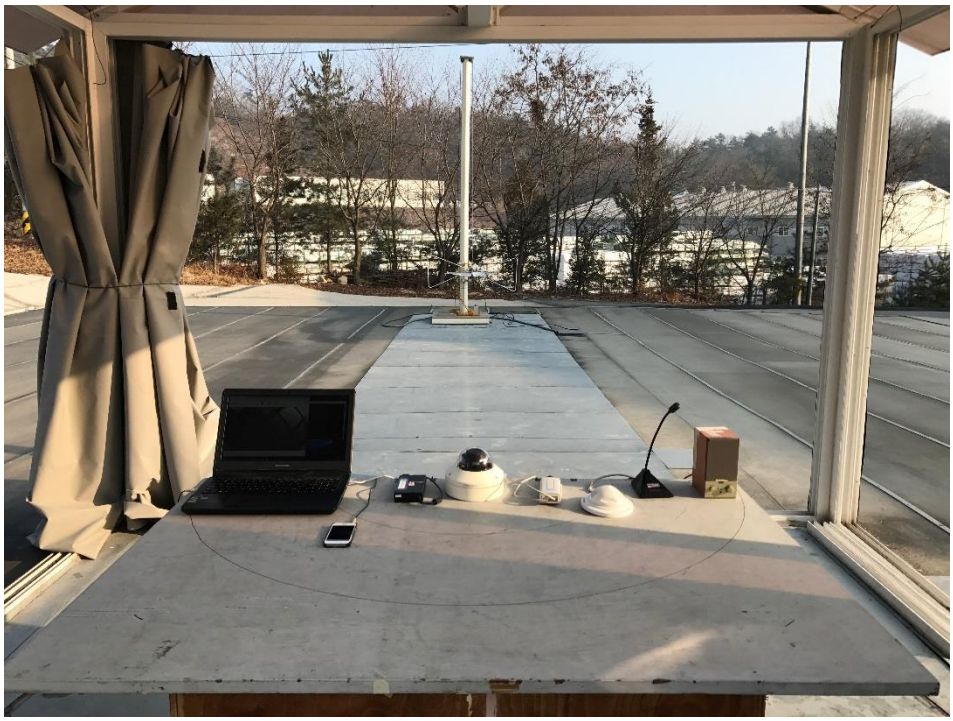
- DC 12 V Mode





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- PoE Mode

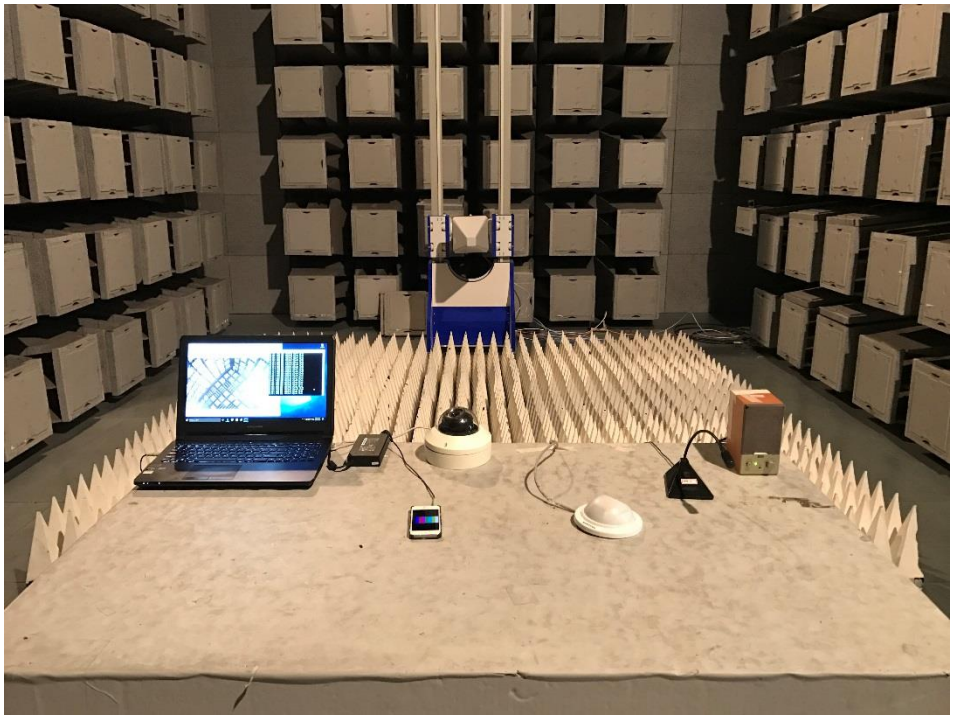


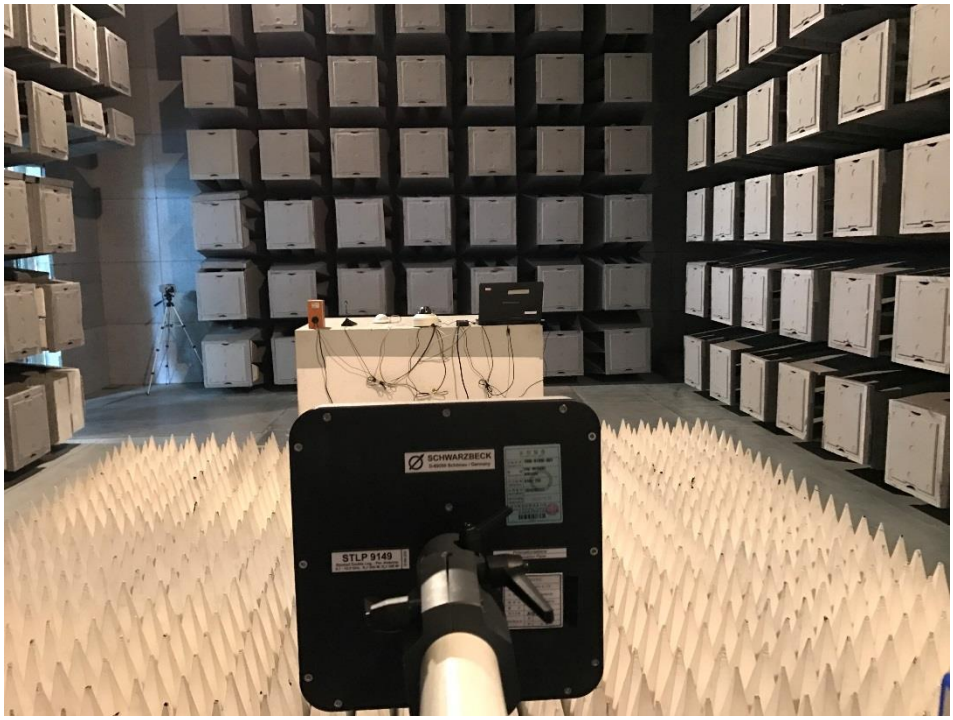


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Radiated Electric Field Emissions(Above 1 ㎓)

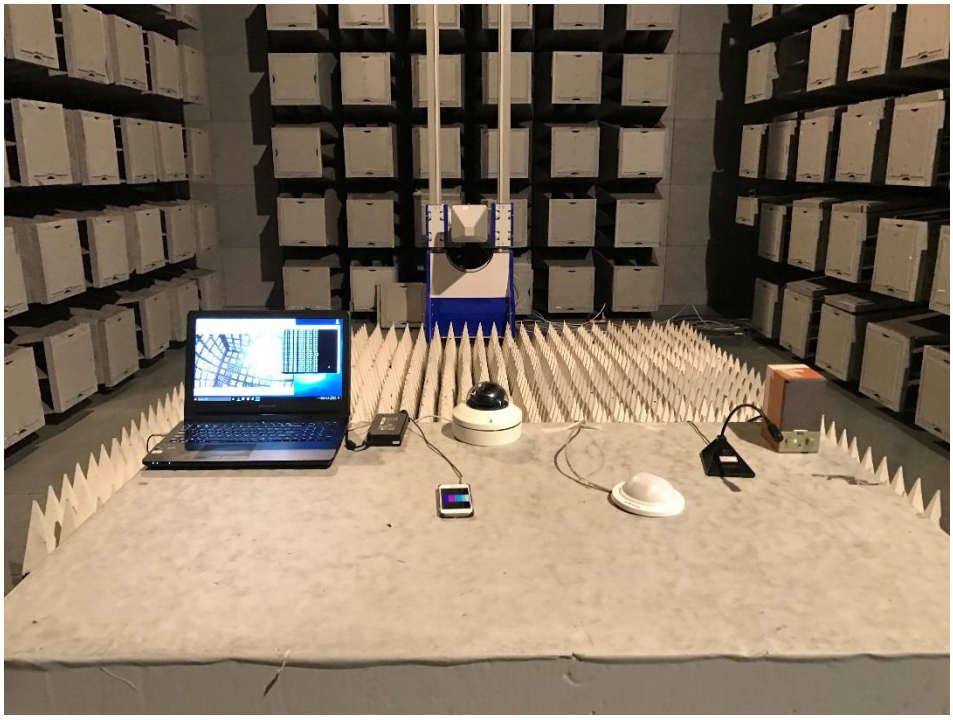
- AC 24 V Mode





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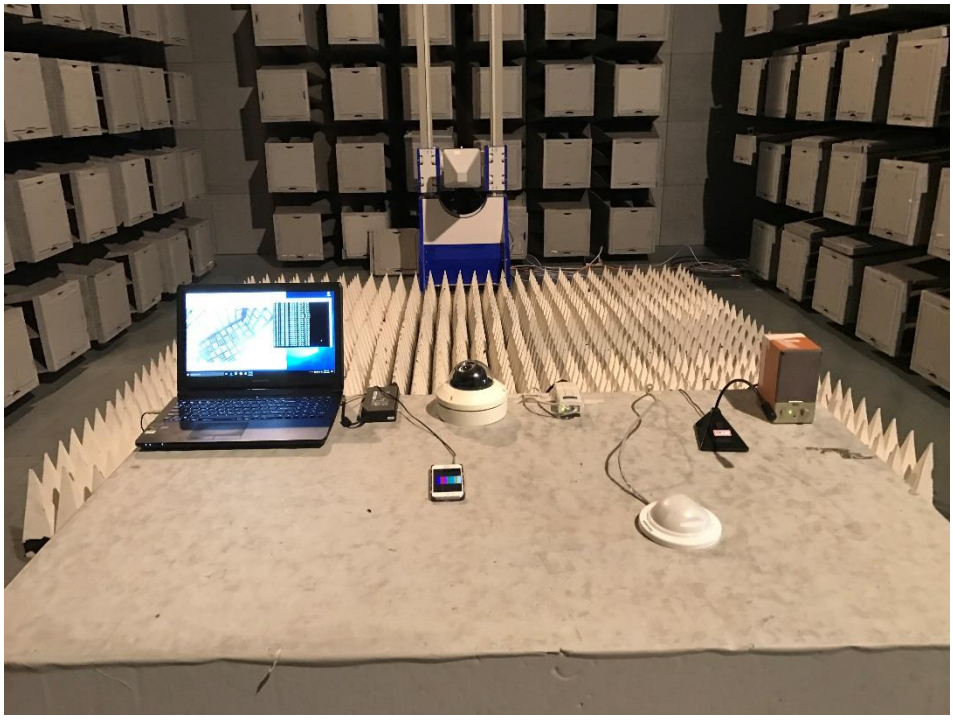
- DC 12 V Mode





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- PoE Mode





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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

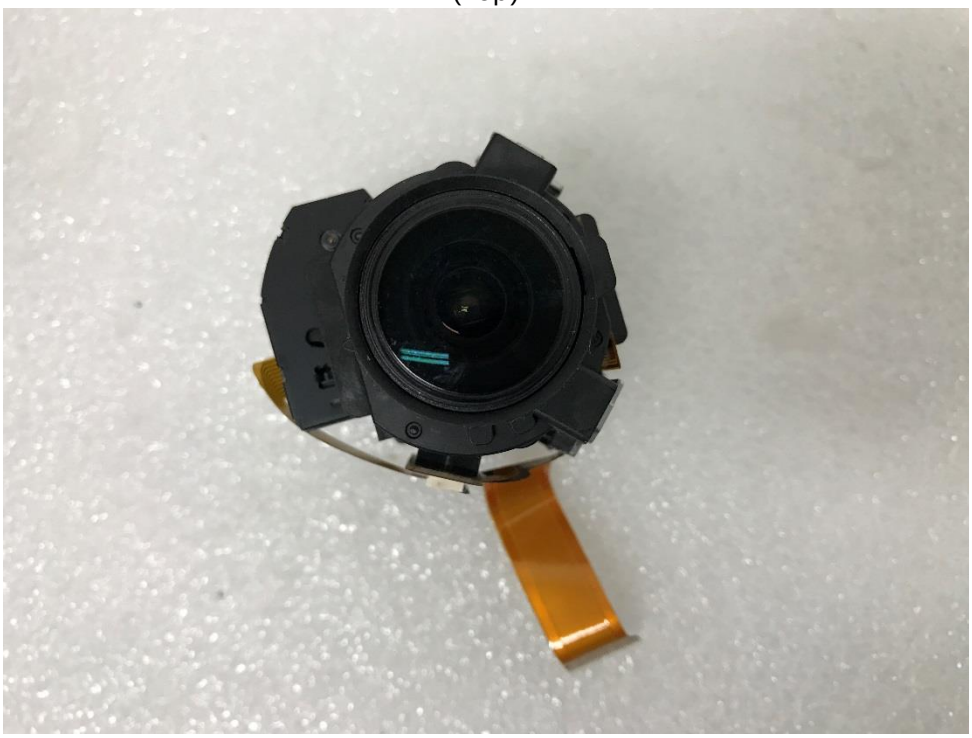
(Internal View)



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EUT Internal View – Lens

(Top)



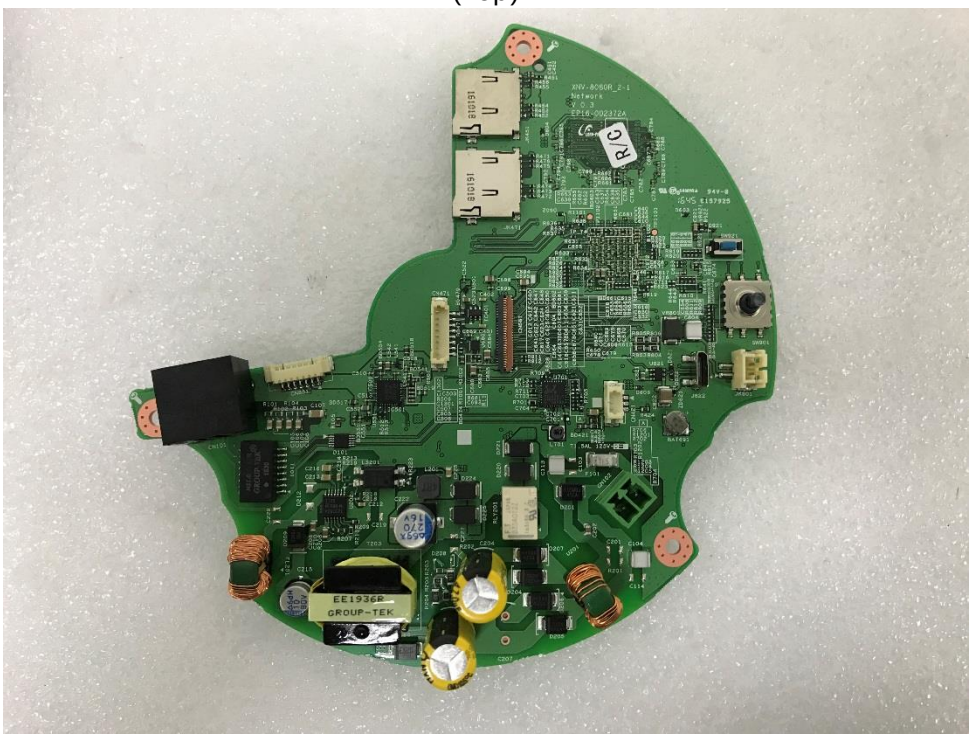
(Bottom)



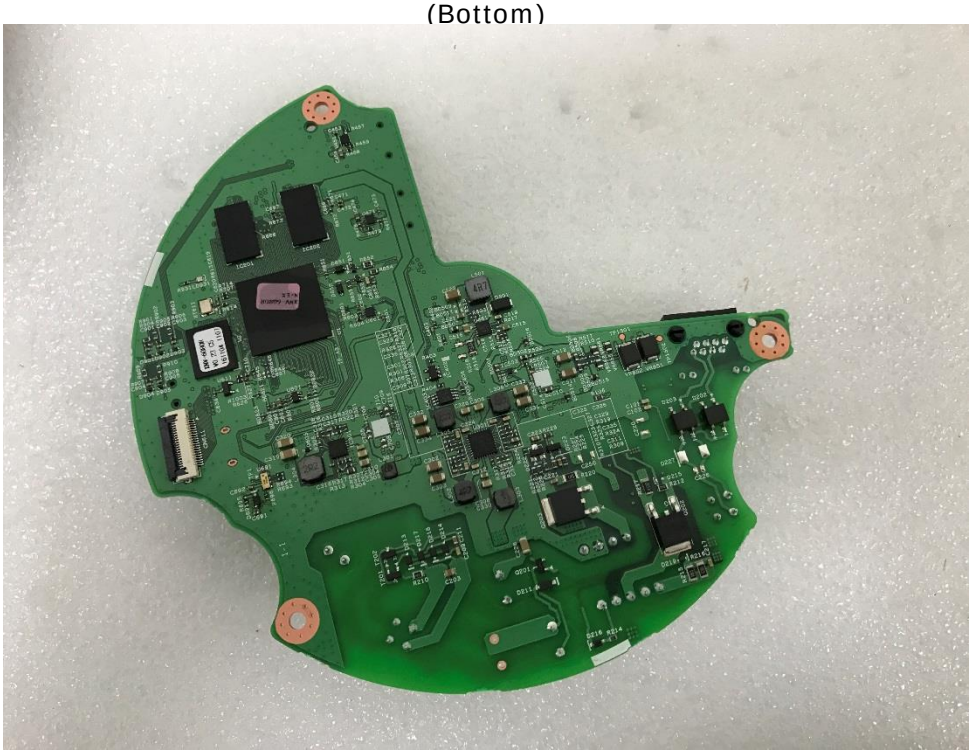
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EUT Internal View – Board 1

(Top)



(Bottom)



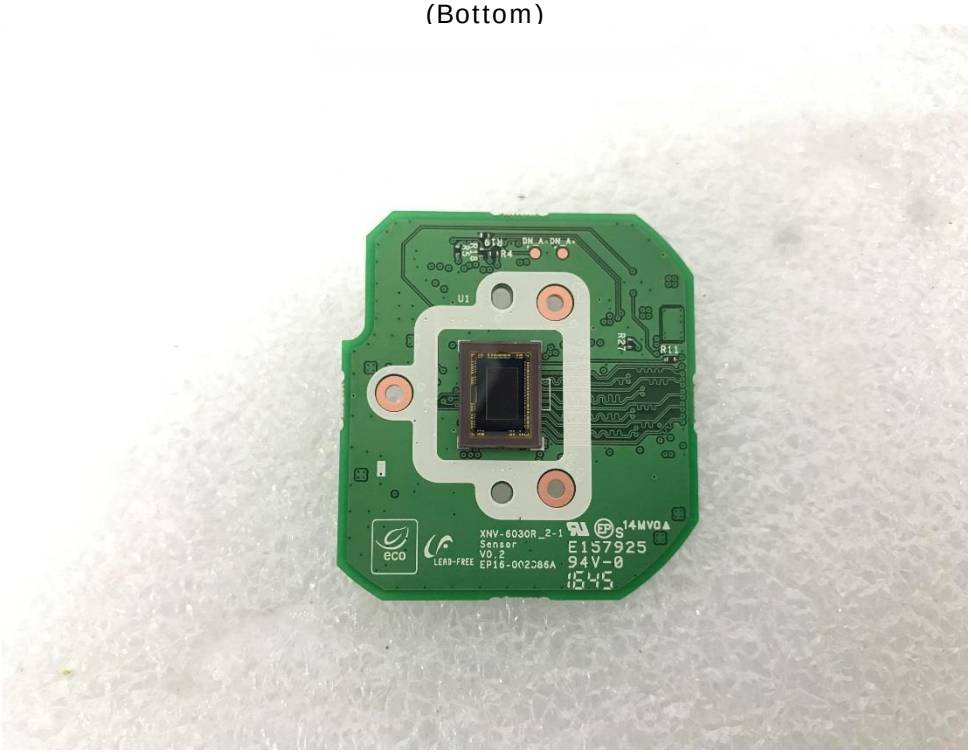
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EUT Internal View – Board 2

(Top)



(Bottom)



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EUT Internal View – Board 3

(Top)



(Bottom)



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Label Photographs



This device complies with part 15 of the FCC Rules. Operation in subject to the following two conditions: (1) This device Sep not cause harmful interference, and (2) this device must accept any interference received, including interference that Sep cause undesired operation.

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