



EMC TEST REPORT For FCC

Test Report No. : KES-E1-17T0095-R1
Date of Issue : Feb. 24, 2023
Product name : NETWORK CAMERA
Model/Type No. : XNO-6020R
Variant Model : XNO-6010R
Applicant : Hanwha Vision Co., Ltd
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea
Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED
2. D-TECH CO.,LTD.
Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,
Korea (Suwon Industrial Complex)
Equipment authorization : ☐ Declaration of Conformity
☒ Verification
Date of Receipt : Jan, 20, 2017
Test date : Feb. 01, 2017
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by
Dae Hyun, Kim
EMC Test Engineer

Reviewed by

Tested by Yung Suk, Song
(Retired person)
Proxy signature : Dae Hyun, Kim

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KS Q ISO/IEC 17025 and KOLAS.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Feb. 06, 2017	KES-E1-17T0095	Issued
Feb. 24, 2023	KES-E1-17T0095-R1	Change the Model No, Applicant, Applicant address and manufacturer, manufacturer address at the request of the customer

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1.0 General Product Description

Main Specifications of EUT are:

	XNO-6020R
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 : 0.015 lux(F1.4, 1/30sec) B/W : 0Lux(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 installation
Lens	
Focal Length (Zoom Ratio)	4mm Fixed
Max. Aperture Ratio	F1.4
Angular Field of View	H: 88.8°, V: 47.5°, D: 104.8°
Min. Object Distance	0.4m
Focus Control	Manual
Lens Type	Fixed
Mount Type	Board-in type
Pan / Tilt / Rotate	
Pan / Tilt / Rotate range	0° ~ 354° / 0° ~ 67° / 0° ~ 355°
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	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&Dust 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

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Audio In	Selectable (Mic IN/Line IN), Built-in MIC. Max output level : 1Vrms 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	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264 : Max. 60fps 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-directional (2-Way)
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, 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
Max. User Access	20 users at Unicast Mode
Edge Storage	SD/SDHC/SDXC 2slot (up to 512 GB) - Continuous recording(1st slot to 2nd 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 Interface	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

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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 $\pm$ 10%, PoE(IEEE802.3af)
Power Consumption	Max. 7.8W(12VDC), Max. 8.8W(PoE)
Mechanical	
Color / Material	Dark Gray / Aluminum

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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

Variant Model	Difference
XNO-6010R	No circuit and hardware changes. Simple sales place distinction. different model.

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	XNO-6020R	-	HANWHA VISION VIETNAM COMPANY LIMITED	E.U.T

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1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
POE Adapter	PD-3001GC/AC	RD9356082016964200	Power Dsine	-
Notebook	X56K	HN11N5151FJ0045W	HANSUNG	CE, RE
Notebook Adapter	A12-120P1A	F180271552011758	CHICONY POWER TECHNOLOGY CO.,LTD.	CE, RE
Notebook	LG15N54	506NZGK000615	LG	POE CE
Notebook Adapter	PA-1650-43(65W)	OF58U63849302Y609	LG	POE CE
Phone	A1530	-	APPLE	-
MIC	CMK-303	-	CAMAC	-
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	-
Alarm	-	-	-	-
SD card	-	-	SanDisk	-

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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 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	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 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	U
	RJ-45 (DATA)	POE Adapter	RJ-45 (DATA)	3.0	U

* Unshielded = U, Shielded = S

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1.7 EUT Operating Mode(s)

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

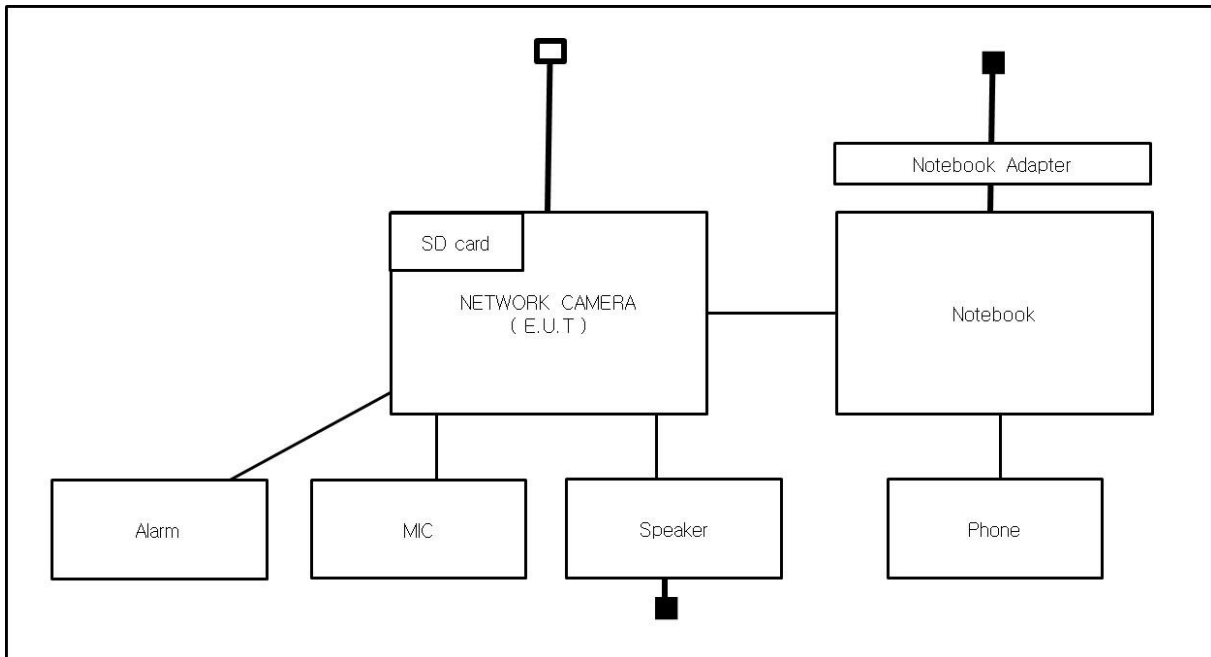
E.U.T Test operating S/W		
Name	Version	Manufacture Company
SmartViewer	-	Hanwha Vision Co., Ltd

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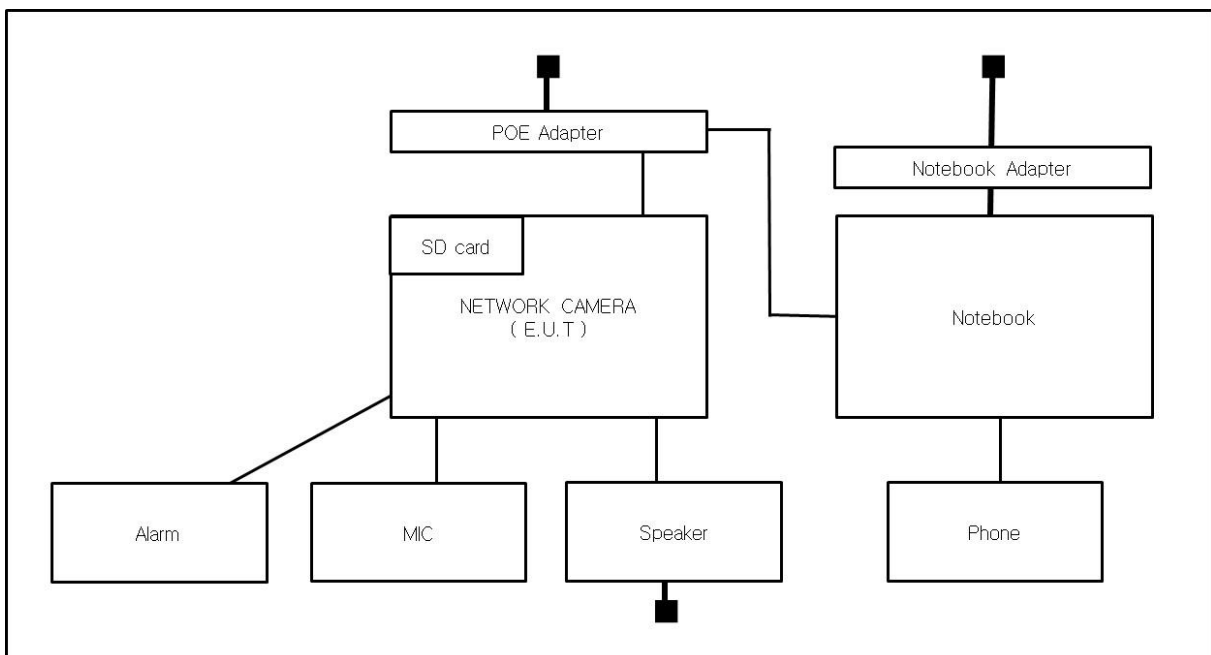
1.8 Configuration

■ 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, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

1.11 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	KOLAS	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298
JAPAN	VCCI	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55022:2010

☐ Class A

☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



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- | | | |
|--|---|----------------------------------|
| ☐ VCCI V-3 / 2015.04 | ☐ Class A | ☐ Class B |
| ☐ AS/NZS CISPR22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☒ 47 CFR Part 15, Subpart B | | |
| ☐ CISPR 22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☒ ANSI C63.4-2014 | ☒ 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

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	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: 24,7 °C

Relative Humidity: 35,1 %

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.2 Radiated Electric Field Emissions(Below 1 GHz)

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 Antenna	VULB9163	Schwarzbeck	714	11, 28, 2018
☒	OATS	-	KES	-	-
☒	Antenna Mast	-	DAEIL EMC	-	-
☒	Turn Table	-	DAEIL EMC	-	-
☒	EMI Test S/W	-	-	-	-

Test Conditions

Temperature: 2,2 °C
Relative Humidity: 40,0 %

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

Feb, 01, 2017

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	SCU 18	R&S	102232	06, 29, 2017
☒	Semi Anechoic Chamber #1	-	KES	-	-
☒	Tilt Antenna Mast	TAM 4.0-E	maturro	18100116	-
☒	Turn Table	DT 2000-1,5T	INN-CO	-	-
☒	EMI Test S/W	N/A	N/A	N/A	N/A

Test Conditions

Temperature: 23,0 °C

Relative Humidity: 40,1 %

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

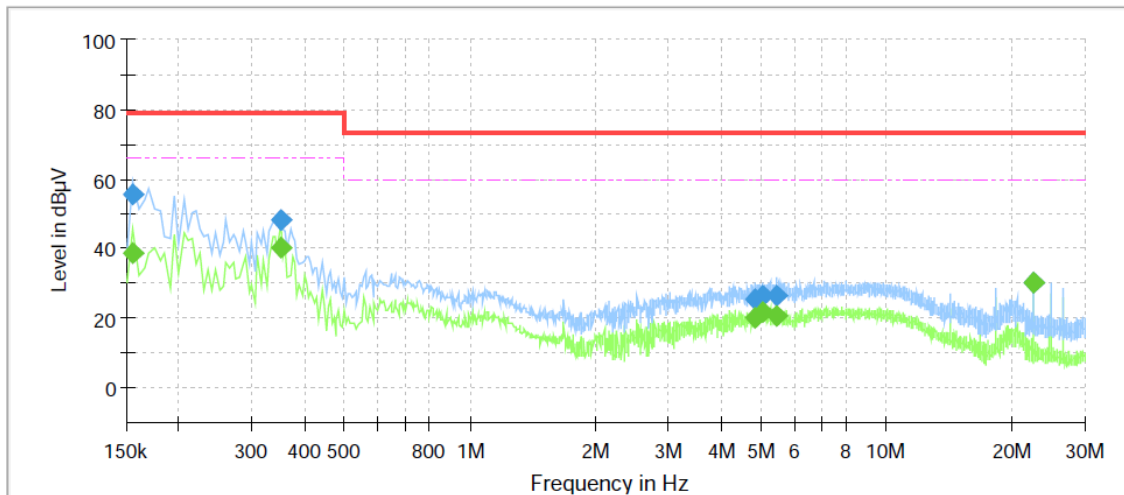
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

- DC 12 V Mode
[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	XNO-6020R
Mode	DC 12 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)
0.155000	---	38.49	66.00	27.51	1000.0	9.000	L1	21.1
0.155000	55.81	---	79.00	23.19	1000.0	9.000	L1	21.1
0.350000	---	40.42	66.00	25.58	1000.0	9.000	L1	20.8
0.350000	48.15	---	79.00	30.85	1000.0	9.000	L1	20.8
4.840000	---	19.92	60.00	40.08	1000.0	9.000	L1	19.8
4.840000	25.36	---	73.00	47.64	1000.0	9.000	L1	19.8
5.040000	---	21.52	60.00	38.48	1000.0	9.000	L1	19.8
5.040000	26.68	---	73.00	46.32	1000.0	9.000	L1	19.8
5.460000	---	20.79	60.00	39.21	1000.0	9.000	L1	19.8
5.460000	26.31	---	73.00	46.69	1000.0	9.000	L1	19.8
22.530000	---	30.12	60.00	29.88	1000.0	9.000	L1	20.3
22.530000	30.40	---	73.00	42.60	1000.0	9.000	L1	20.3

◆ Calculation

QuasiPeak[dBμV] / CAverage [dBμV] = Reading Value[dBμV] + 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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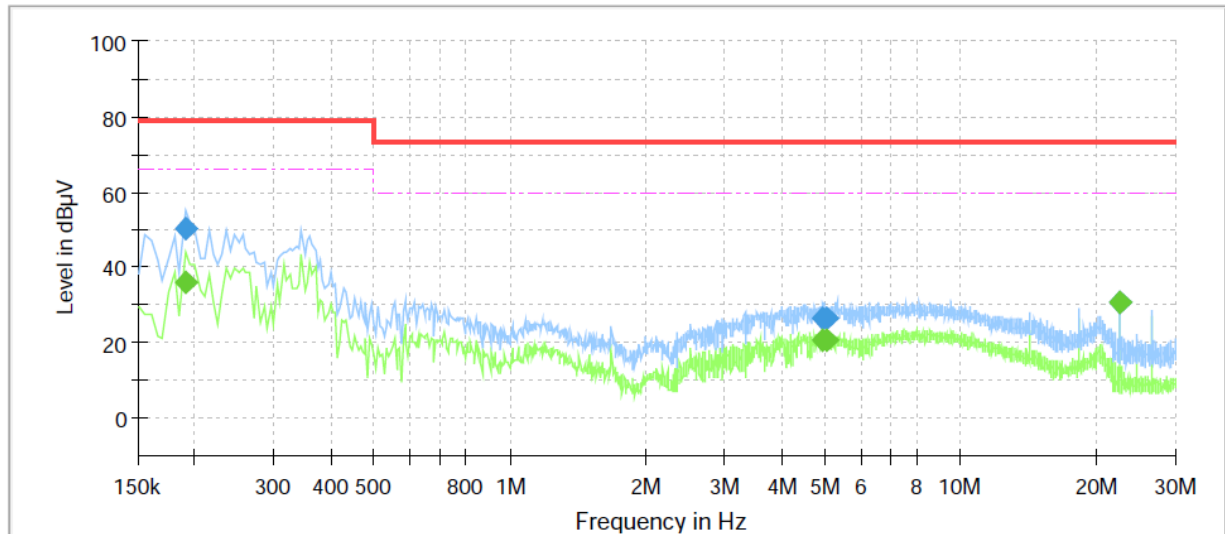
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[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	XNO-6020R
Mode	DC 12 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)
0.190000	---	35.81	66.00	30.19	1000.0	9.000	N	20.9
0.190000	50.29	---	79.00	28.71	1000.0	9.000	N	20.9
4.925000	---	20.61	60.00	39.39	1000.0	9.000	N	19.8
4.925000	26.39	---	73.00	46.61	1000.0	9.000	N	19.8
5.040000	---	20.92	60.00	39.08	1000.0	9.000	N	19.8
5.040000	26.27	---	73.00	46.73	1000.0	9.000	N	19.8
22.530000	---	30.48	60.00	29.52	1000.0	9.000	N	20.3
22.530000	30.71	---	73.00	42.29	1000.0	9.000	N	20.3

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

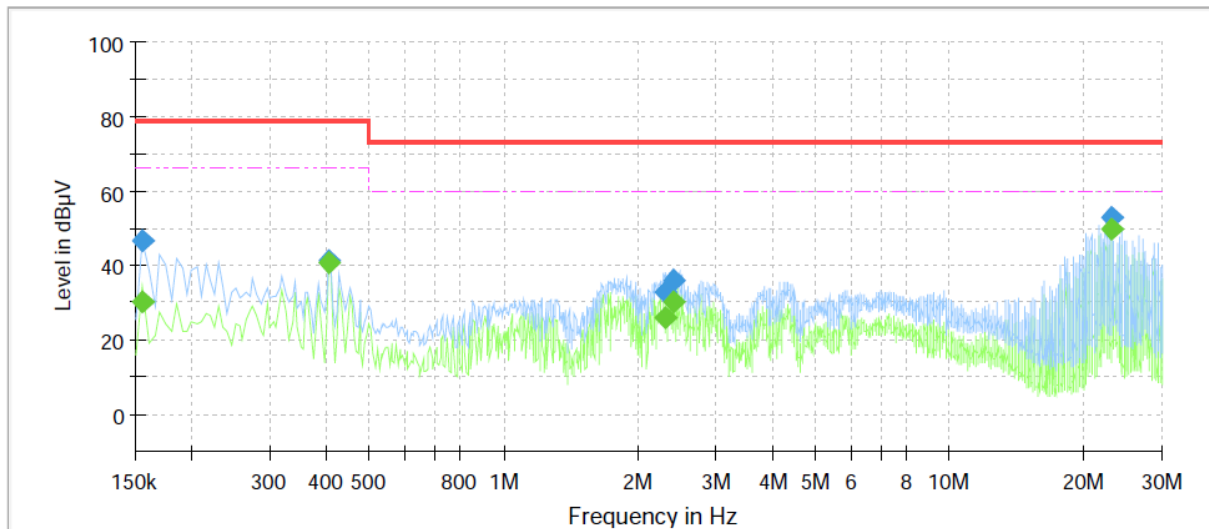
Corr. : Correction values (LISN FACTOR+ Cable Loss)

- PoE Mode

[HOT]

Common Information

Test Description: Conducted Emission
 Model No.: XNO-6020RN
 Mode: PoE L1
 Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	30.11	66.00	35.89	1000.0	9.000	L1	21.0
0.155000	46.43	---	79.00	32.57	1000.0	9.000	L1	21.0
0.405000	---	40.55	66.00	25.45	1000.0	9.000	L1	20.6
0.405000	41.55	---	79.00	37.45	1000.0	9.000	L1	20.6
2.310000	---	26.06	60.00	33.94	1000.0	9.000	L1	19.8
2.310000	32.71	---	73.00	40.29	1000.0	9.000	L1	19.8
2.405000	---	29.99	60.00	30.01	1000.0	9.000	L1	19.8
2.405000	36.16	---	73.00	36.84	1000.0	9.000	L1	19.8
23.130000	---	49.94	60.00	10.06	1000.0	9.000	L1	20.4
23.130000	52.96	---	73.00	20.04	1000.0	9.000	L1	20.4

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

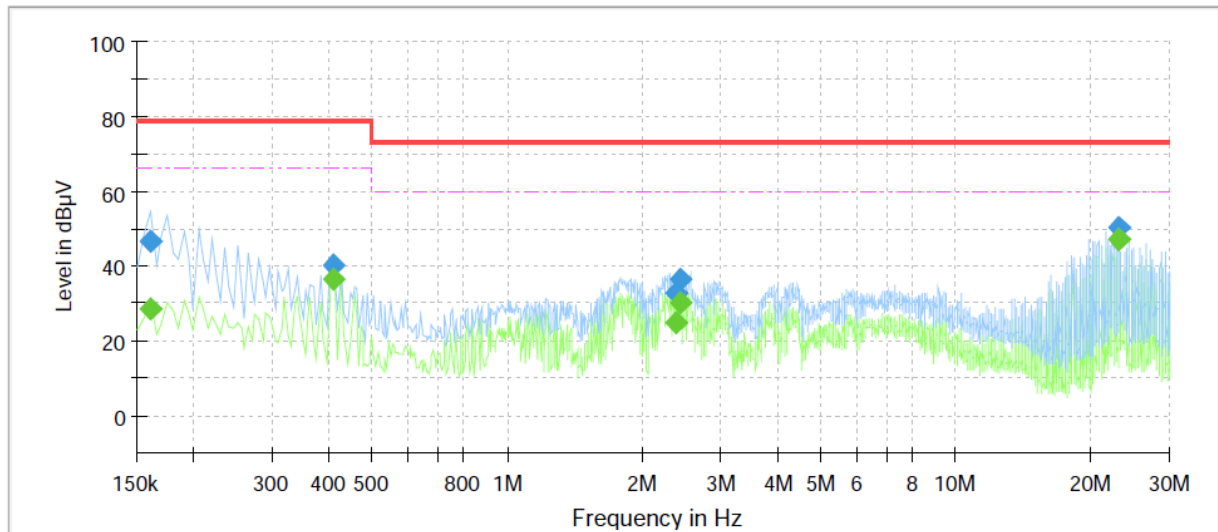
Reading Value : Not shown in the table.

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

[NEUTRAL]

Common Information

Test Description: Conducted Emission
 Model No.: XNO-6020RN
 Mode: PoE N
 Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	28.56	66.00	37.44	1000.0	9.000	N	21.0
0.160000	46.51	---	79.00	32.49	1000.0	9.000	N	21.0
0.410000	---	36.66	66.00	29.34	1000.0	9.000	N	20.6
0.410000	40.03	---	79.00	38.97	1000.0	9.000	N	20.6
2.380000	---	25.05	60.00	34.95	1000.0	9.000	N	19.8
2.380000	32.85	---	73.00	40.15	1000.0	9.000	N	19.8
2.435000	---	29.96	60.00	30.04	1000.0	9.000	N	19.8
2.435000	36.44	---	73.00	36.56	1000.0	9.000	N	19.8
23.130000	---	46.87	60.00	13.13	1000.0	9.000	N	20.2
23.130000	50.36	---	73.00	22.64	1000.0	9.000	N	20.2

◆ 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)

- DC 12 V Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
133.61	10.84	H	3.98	7.95	3.35	22.14	43.50	21.36
200.19	9.98	H	4.00	11.81	4.12	25.91	43.50	17.59
351.65	9.17	V	1.03	14.55	5.66	29.38	46.40	17.02
466.84	9.28	V	1.04	16.77	6.87	32.92	46.40	13.48
483.24	10.14	H	3.94	17.06	6.94	34.14	46.40	12.26
566.31	17.33	V	1.00	18.66	7.54	43.53	46.40	2.87

* H : Horizontal, V : Vertical

◆ Calculation

Corrected Amplitude [dB μ V] = 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]
241.84	9.74	V	1.03	12.38	4.62	26.74	46.40	19.66
330.27	8.86	H	3.99	14.08	5.45	28.39	46.40	18.01
467.94	8.73	H	3.96	16.79	6.87	32.39	46.40	14.01
566.33	17.59	V	1.01	18.66	7.54	43.79	46.40	2.61
615.19	9.34	H	3.95	19.37	7.93	36.64	46.40	9.76
859.64	9.14	V	1.04	22.00	9.77	40.91	46.40	5.49

* H : Horizontal, V : Vertical

◆ Calculation

Corrected Amplitude [dBμV] = 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)

- DC 12 V Mode

- PK

Frequency [MHz]	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]			
1 131.000	74.550	V	3.680	21.160	3.290	43.640	55.360	80.000	24.640
1 135.000	70.450	H	3.640	21.180	3.290	43.640	51.280	80.000	28.720
1 500.000	57.760	V	3.840	23.050	3.760	43.630	40.940	80.000	39.060
1 550.000	60.410	H	3.980	23.300	3.810	43.650	43.870	80.000	36.130
1 997.000	65.160	H	3.940	25.580	4.400	43.780	51.360	80.000	28.640
1 999.000	73.870	V	3.660	25.590	4.400	43.780	60.080	80.000	19.920
2 391.000	59.780	H	1.130	27.240	4.900	43.960	47.960	80.000	32.040
2 398.000	61.630	V	1.650	27.270	4.900	43.960	49.840	80.000	30.160
2 587.000	58.760	V	1.680	28.060	5.180	44.040	47.960	80.000	32.040
3 523.000	45.480	V	1.610	30.630	6.080	44.250	37.940	80.000	42.060
3 568.000	46.120	H	1.940	30.700	6.160	44.240	38.740	80.000	41.260
4 892.000	41.170	H	1.640	33.030	7.000	44.310	36.890	80.000	43.110

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www.kes.co.kr

Test report No.:

KES-E1-17T0095-R1

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- AV

Frequency [MHz]	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]			
1 131.000	51.350	V	3.680	21.160	3.290	43.640	32.160	60.000	27.840
1 135.000	50.190	H	3.640	21.180	3.290	43.640	31.020	60.000	28.980
1 500.000	44.750	V	3.840	23.050	3.760	43.630	27.930	60.000	32.070
1 550.000	52.520	H	3.980	23.300	3.810	43.650	35.980	60.000	24.020
1 997.000	44.540	H	3.940	25.580	4.400	43.780	30.740	60.000	29.260
1 999.000	48.800	V	3.660	25.590	4.400	43.780	35.010	60.000	24.990
2 391.000	40.940	H	1.130	27.240	4.900	43.960	29.120	60.000	30.880
2 398.000	42.190	V	1.650	27.270	4.900	43.960	30.400	60.000	29.600
2 587.000	37.860	V	1.680	28.060	5.180	44.040	27.060	60.000	32.940
3 523.000	32.370	V	1.610	30.630	6.080	44.250	24.830	60.000	35.170
3 568.000	32.690	H	1.940	30.700	6.160	44.240	25.310	60.000	34.690
4 892.000	28.420	H	1.640	33.030	7.000	44.310	24.140	60.000	35.860

◆ 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

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Test report No.:

KES-E1-17T0095-R1

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- PK

Frequency [MHz]	Amplitude [dB μ V]	ANT Polar. (H/V)	ANT. Height [m]	Correction Factor			Corrected Amplitude [dB μ V/m]	Applicable Limit [dB μ V/m]	Margin [dB]
				ANT. [dB /m]	Cable [dB]	AMP [dB]			
1 593.000	62.970	H	3.000	23.520	3.850	43.660	46.680	80.000	33.320
1 602.000	63.920	V	3.000	23.570	3.860	43.660	47.690	80.000	32.310
1 999.000	65.460	H	3.000	25.590	4.400	43.780	51.670	80.000	28.330
1 999.000	71.820	V	3.000	25.590	4.400	43.780	58.030	80.000	21.970
2 391.000	57.540	H	3.000	27.240	4.900	43.960	45.720	80.000	34.280
2 399.000	62.480	V	3.000	27.270	4.900	43.960	50.690	80.000	29.310
3 130.000	46.260	H	1.630	30.000	5.570	44.210	37.620	80.000	42.380
3 199.000	51.490	V	1.900	30.110	5.680	44.220	43.060	80.000	36.940
3 584.000	46.100	V	1.690	30.720	6.180	44.240	38.760	80.000	41.240
3 599.000	45.190	H	1.490	30.750	6.210	44.240	37.910	80.000	42.090
4 935.000	41.160	V	1.600	33.110	6.990	44.320	36.940	80.000	43.060
4 997.000	40.960	H	1.850	33.220	6.990	44.330	36.840	80.000	43.160

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Test report No.:

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- AV

Frequency [MHz]	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]			
1 593.000	44.220	H	3.000	23.520	3.850	43.660	27.930	60.000	32.070
1 602.000	51.250	V	3.000	23.570	3.860	43.660	35.020	60.000	24.980
1 999.000	44.750	H	3.000	25.590	4.400	43.780	30.960	60.000	29.040
1 999.000	48.700	V	3.000	25.590	4.400	43.780	34.910	60.000	25.090
2 391.000	40.090	H	3.000	27.240	4.900	43.960	28.270	60.000	31.730
2 399.000	42.020	V	3.000	27.270	4.900	43.960	30.230	60.000	29.770
3 130.000	33.280	H	1.630	30.000	5.570	44.210	24.640	60.000	35.360
3 199.000	34.960	V	1.900	30.110	5.680	44.220	26.530	60.000	33.470
3 584.000	33.340	V	1.690	30.720	6.180	44.240	26.000	60.000	34.000
3 599.000	32.630	H	1.490	30.750	6.210	44.240	25.350	60.000	34.650
4 935.000	27.900	V	1.600	33.110	6.990	44.320	23.680	60.000	36.320
4 997.000	27.790	H	1.850	33.220	6.990	44.330	23.670	60.000	36.330

◆ 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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Test Setup Photos and Configuration

Conducted Voltage Emissions

- DC 12 V Mode



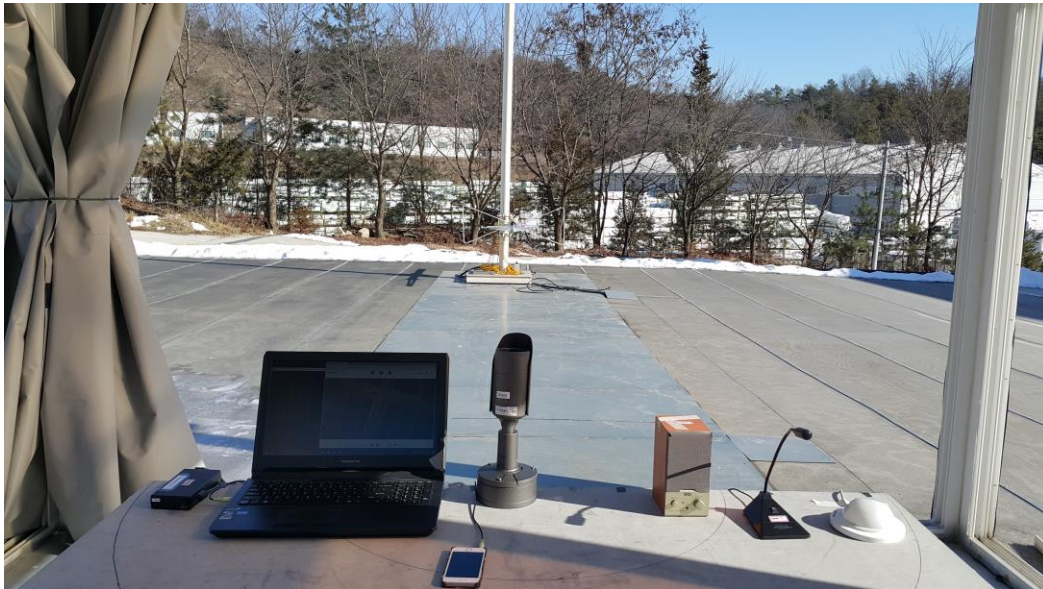
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- PoE Mode



Radiated Electric Field Emissions(Below 1 GHz)

- DC 12 V Mode



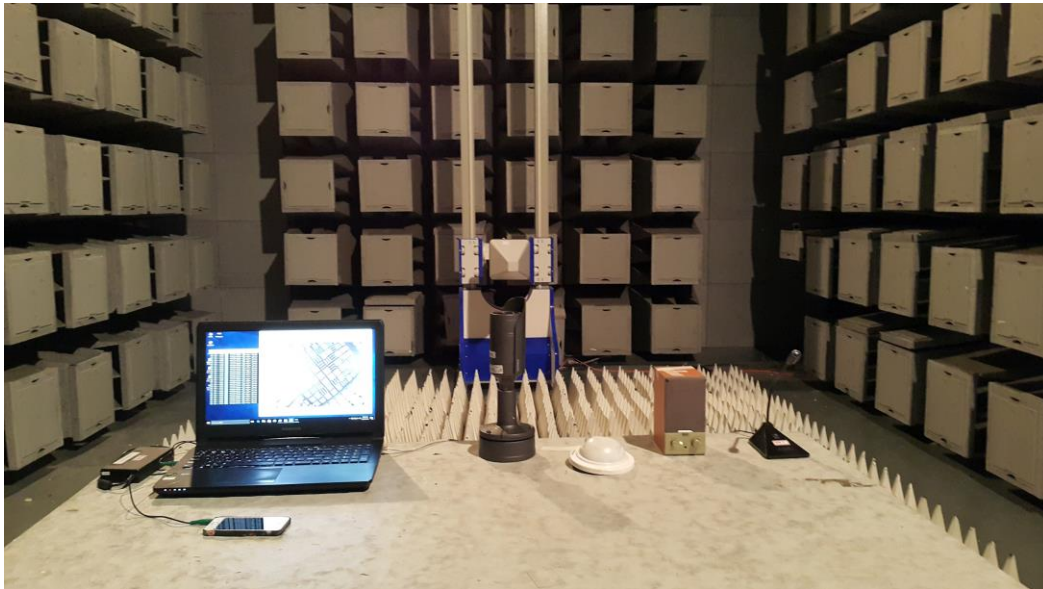
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- PoE Mode



Radiated Electric Field Emissions(Above 1 GHz)

- DC 12 V Mode



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- PoE Mode



EUT External Photographs

(Top)



(Bottom)



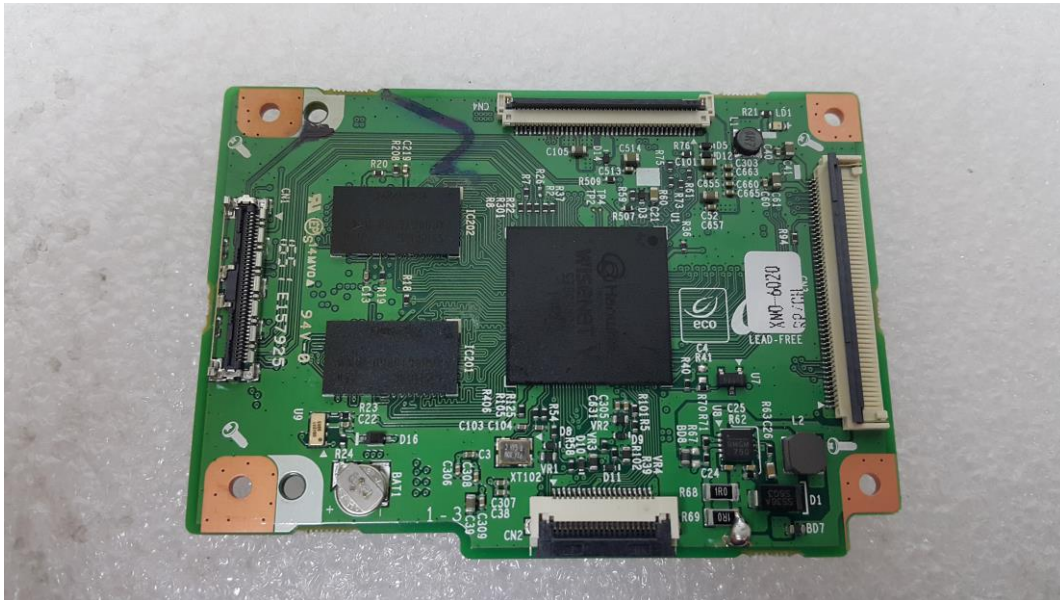
EUT Internal Photographs

(Internal View)

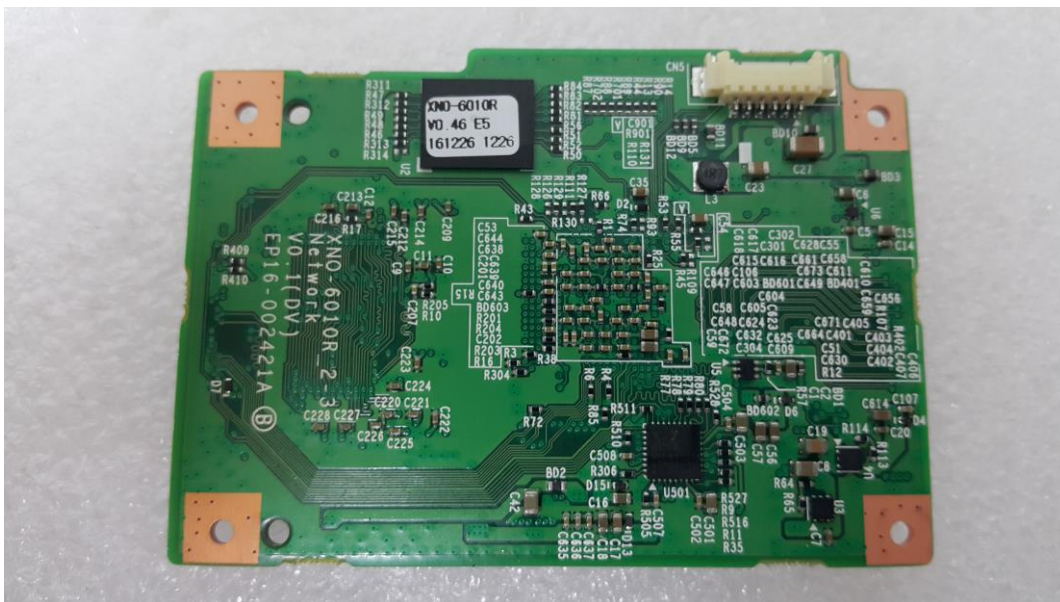


EUT Internal View – Main Board

(Top)



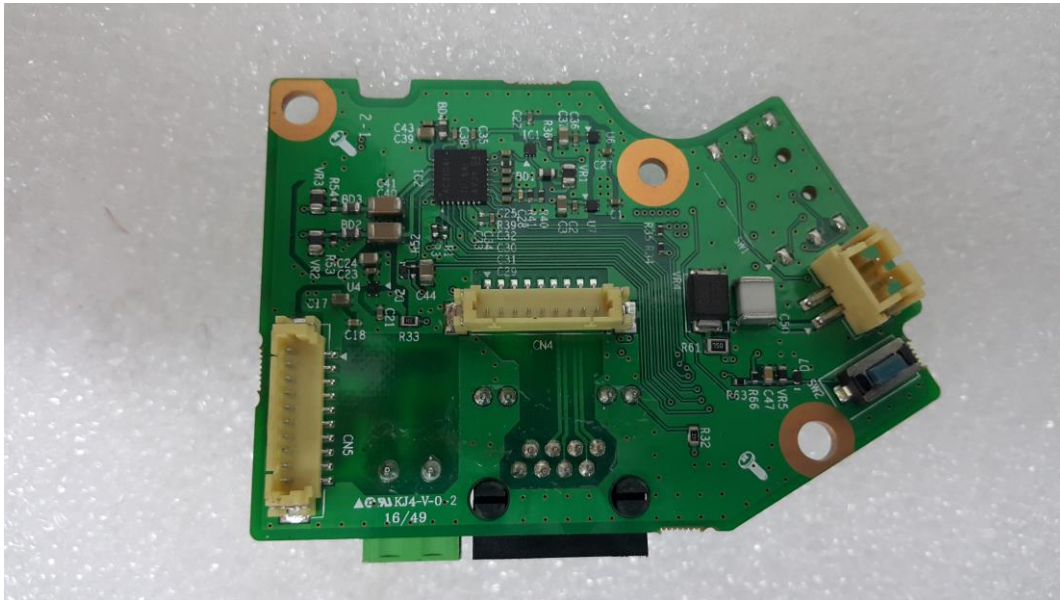
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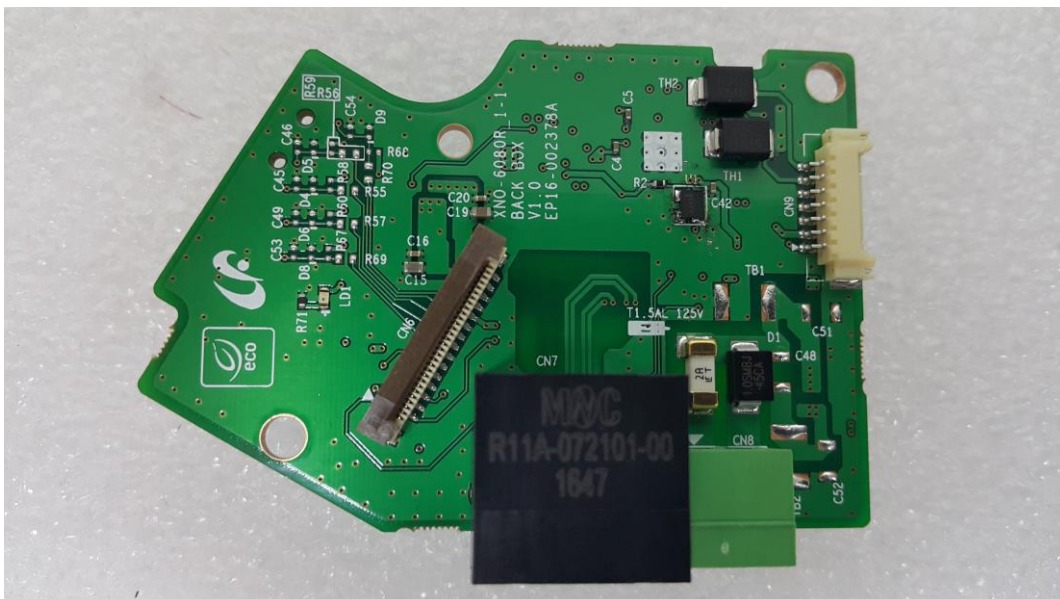
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EUT Internal View – Sub Board 1

(Top)



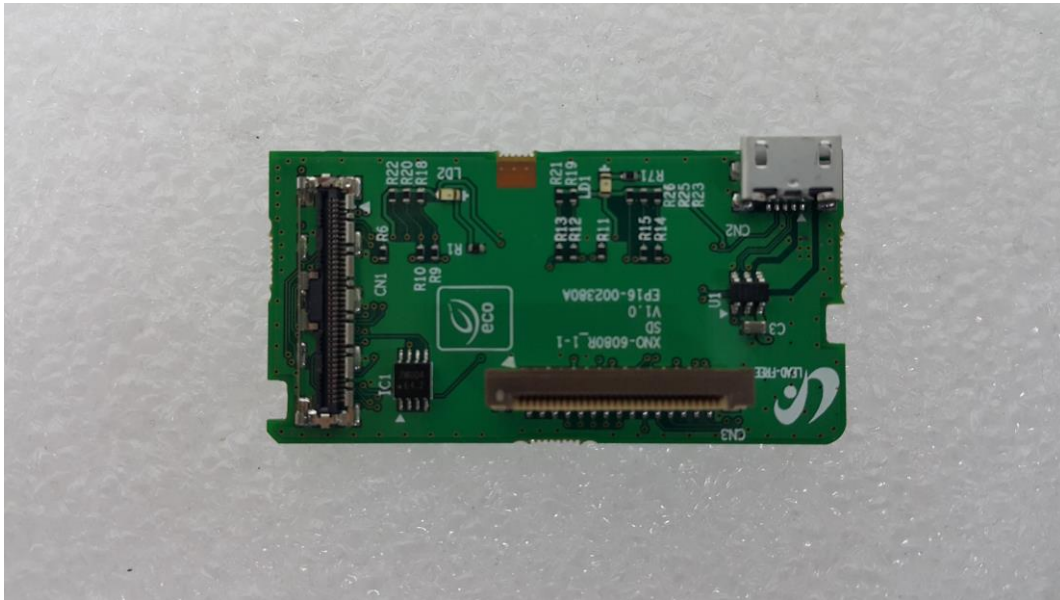
(Bottom)



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EUT Internal View – Sub Board 2

(Top)

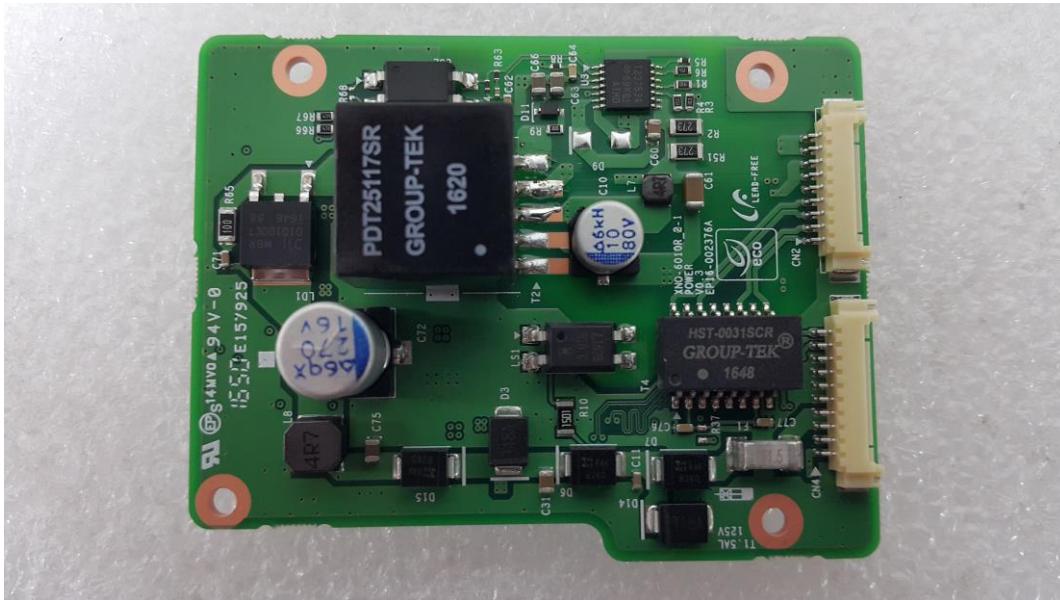


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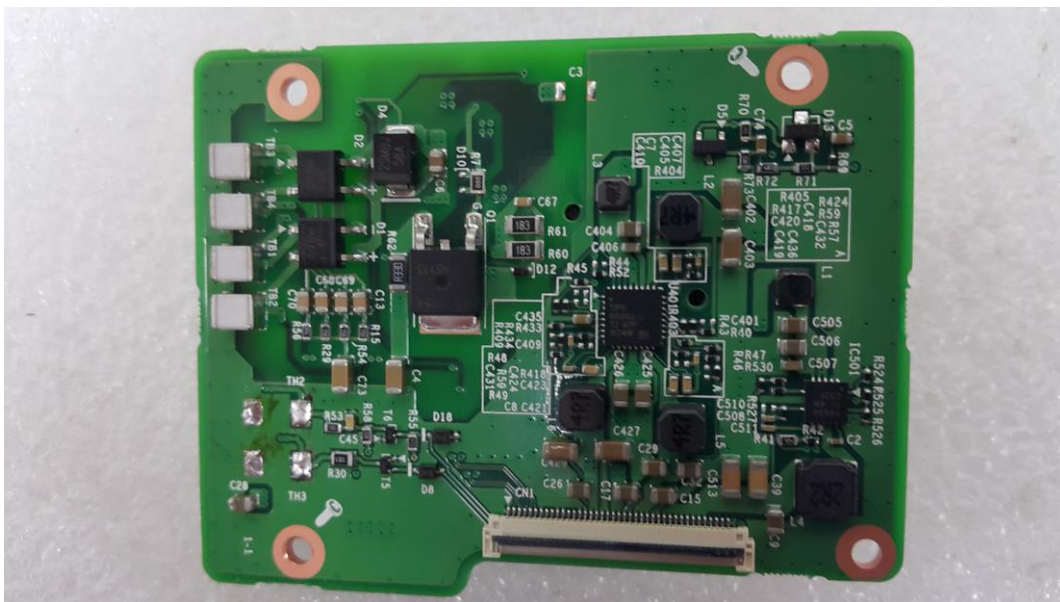


EUT Internal View – Sub Board 3

(Top)



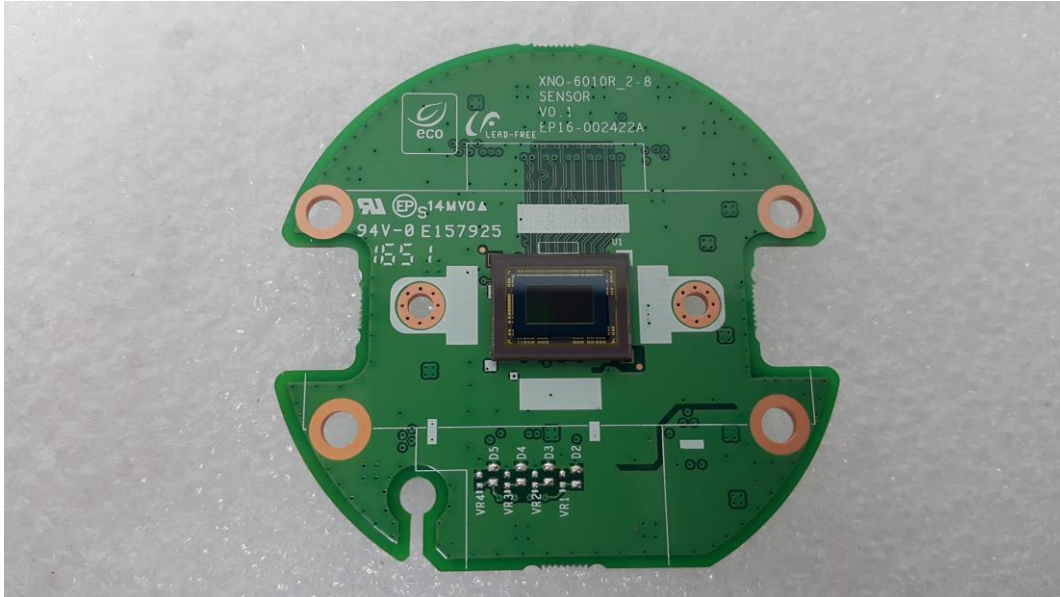
(Bottom)



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EUT Internal View – Lens Board

(Top)



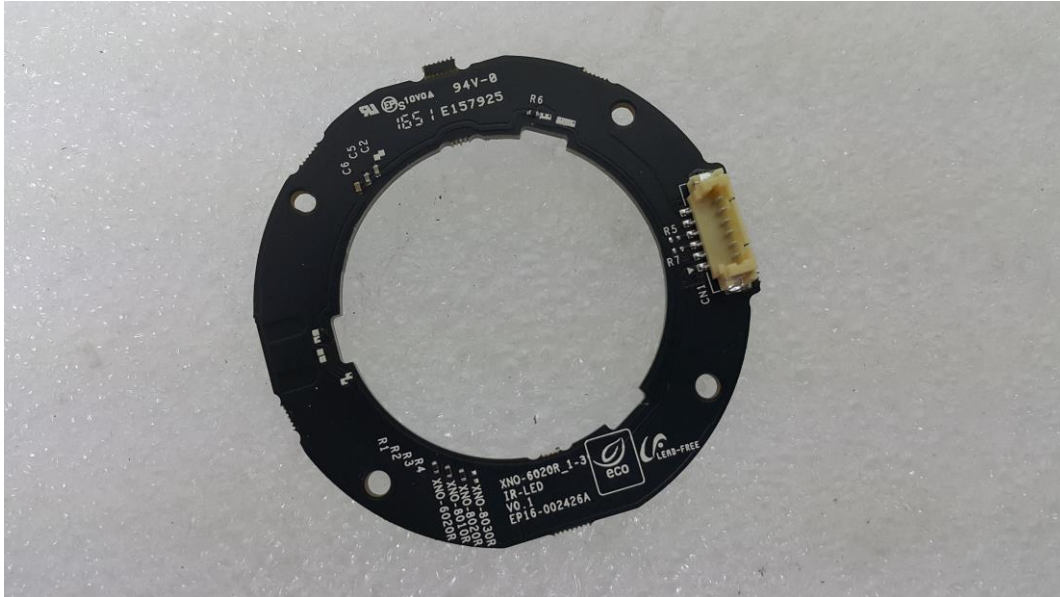
(Bottom)



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EUT Internal View – LED Board

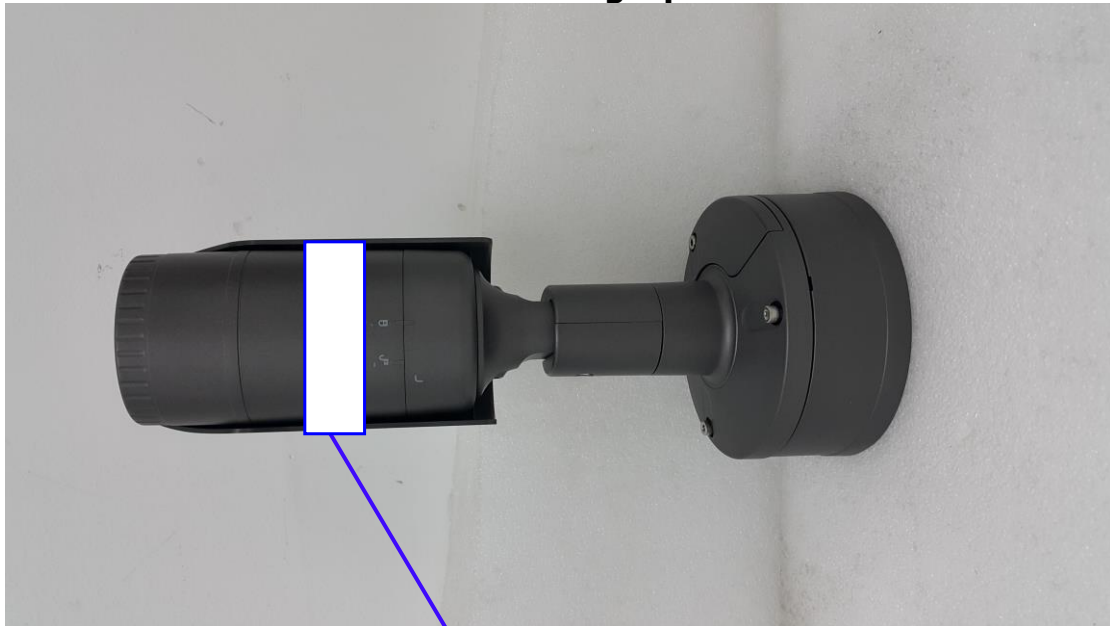
(Top)



(Bottom)



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.