EMC TEST REPORT

Test Report No.	:	KES-EM-20T0135
Date of Issue	:	Feb. 19, 2020
Product name	:	Network Camera
Model/Type No.	:	XNV-6022RM
Variant Mode	:	-
Applicant	:	Hanwha Techwin Co., Ltd.
Applicant Address	:	6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
Manufacturer	:	1. HANWHA TECHWIN (TIANJIN) CO.,LTD. 2. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. 3. D-TECH CO.,LTD.
Manufacturer Address	:	1. No.11 Weiliu Rd,Micro-Electronic Industrial Park, TEDA,Tianjin, 300385,People's Republic of China 2. Lot O-2, Que Vo Industrial Zone extended area, Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam 3. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do, Korea (Suwon Industrial Complex)
Equipment authorization	:	**Supplier's Declaration of Conformity**
Date of Receipt	:	Jan. 31, 2019
Test date	:	Feb. 11, 2020
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dae Jung, Choi
EMC Test Engineer

Reviewed by

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. 19, 2020	KES-EM-20T0135	Issued

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TABLE OF CONTENTS

1.0 General Product Description 4
1.1 Test Voltage & Frequency 5
1.2 Variant Model Differences 5
1.3 Device Modifications 5
1.4 Equipment Under Test 5
1.5 Support Equipments 5
1.6 External I/O Cabling 6
1.7 EUT Operating Mode(s) 6
1.8 Configuration 7
1.9 Remarks when standards applied 8
1.10 Calibration Details of Equipment Used for Measurement 8
1.11 Test Facility 8
1.12 Laboratory Accreditations and Listings 8
2.0 Test Regulations 9
2.1 Conducted Emissions at Mains Power Ports 11
2.2 Radiated Electric Field Emissions(Below 1 ㎓) 12
2.3 Radiated Electric Field Emissions(Above 1 ㎓) 13
APPENDIX A – TEST DATA 14
Conducted Emissions at Mains Power Ports 14
Radiated Electric Field Emissions(Below 1 ㎓) 16
Radiated Electric Field Emissions(Above 1 ㎓) 17
Test Setup Photos and Configuration 18
Radiated Electric Field Emissions(Below 1 ㎓) 19
Radiated Electric Field Emissions(Above 1 ㎓) 20
EUT External Photographs 21
EUT Internal Photographs 22

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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 : 0.055 lux(F2.0, 1/30sec) (TBD) B/W : 0Lux(IR LED On)
S / N Ratio	50dB
Video Out	USB : Micro USB type B, 1280x720, for installation
Lens	
Focal Length (Zoom Ratio)	3.6mm Fixed
Max. Aperture Ratio	F2.0
Angular Field of View	H 96.4° V 50.5° D 116° (TBD)
Min. Object Distance	TBD
Focus Control	Manual
Lens Type	Fixed
Mount Type	Board-in type
Pan / Tilt / Rotate	
Pan / Tilt / Rotate range	±5°/0-67°/±90°
Operational	
IR Viewable Length	15m(49.21ft)
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), 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 Detection, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection, Motion Detection, Digital Auto Tracking, Sound Classification
Alarm I/O	-
Alarm Triggers	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), Built-in micophone Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out, Max output level: 1 Vrms
Audio Noise Reduction	Off / On
Pixel Counter	Support
Network	
Ethernet	M12 (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)
WiseStreamII	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 16KHz
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
Max. User Access	20 users at Unicast Mode
Edge Storage	SD/SDHC/SDXC 1slot (up to 256 GB) - 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
Storage Temperature / Humidity	-50°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66
VIbration Resistance	EN55011:2009+A1:2010, EN50581:2012,EN50121-3-2:2015, EN61000-4-2:2009 EN61000-4-3:2006+A2:2010, EN61000-4-4:2012, EN61000-4-5:2014 EN61000-4-6:2009, EN50155:2007, NEMA 4X
Vandal Resistance	IK10, NEMA4X
Electrical	
Input Voltage / Current	PoE(IEEE802.3af,Class3)
Power Consumption	TBD
Mechanical	
Color / Material	Ivory / Metal
Dimension (WxHxD)	99 x 52 x 100
Weight	296g(TBD)

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1.1 Test Voltage & Frequency

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

Voltage ☐ 230 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-6022RM	-	HANWHA TECHWIN (TIANJIN) CO., LTD	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adaptor	GS728TPP	-	NETGEAR	-
Notebook	LG15N54	410NZGK015231	LG	-
Notebook Adaptor	ADP-90WH B	84ZW19F1663	DELTA ELECTRONICS(JIANGSU) LTD.	-
Speaker	BR1000A Cuve Black 2	-	DONGGUAN EDIFIER TECHNOLOGY Co., Ltd	-
MIC	MP1000	-	-	-
Smartphone	LG-SU760	108KPQJ0186212	LG	-
Micro SD Card	-	-	Sandisk	8 GB

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1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
Network Camera (EUT)	RJ-45	PoE Adaptor	RJ-45	3.0	U
	3.5 mm	MIC	XLR	1.5	U
	3.5 mm	Speaker	3.5 mm	1.5	U
	Slot	Micro SD Card	-	-	-
Notebook	RJ-45	PoE Adaptor	RJ-45	1.0	U
	3.5 mm	Smartphone	3.5 mm	1.0	U

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

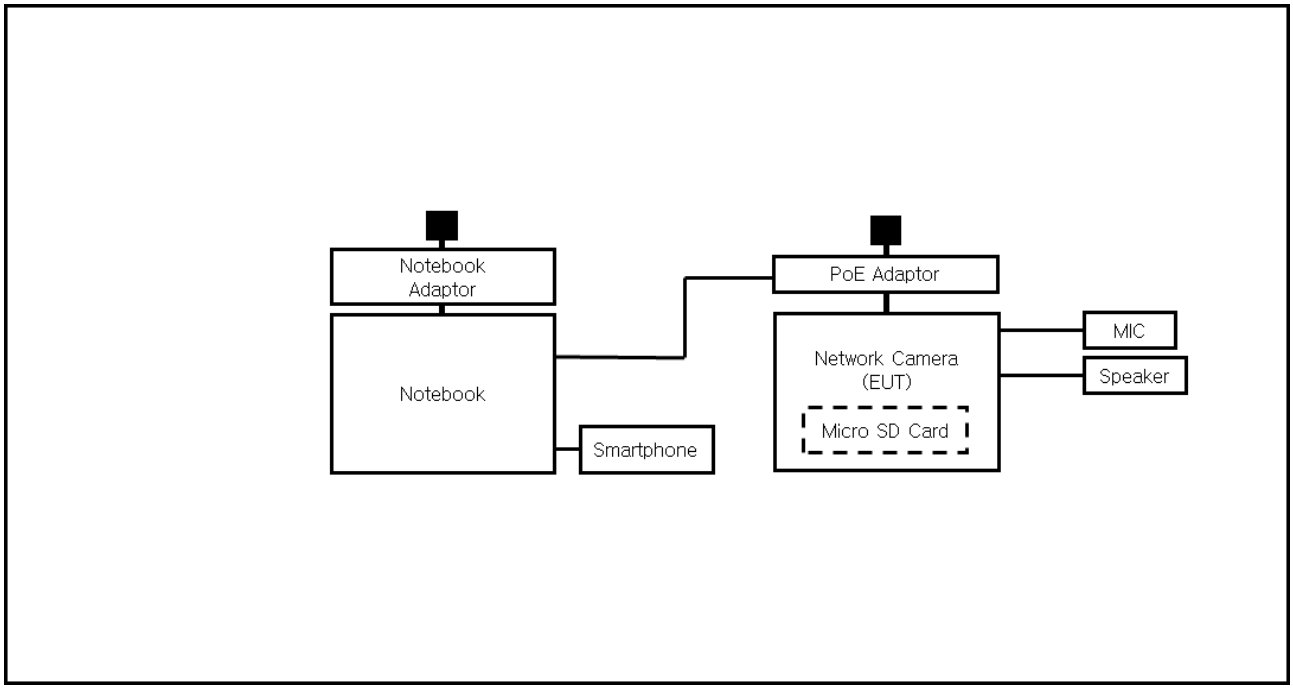
Test mode	operating
OP	Monitoring EUT Using Web Viewer, Ping Test

EUT Test operating S/W		
Name	**Version**	**Manufacture Company**
Web Viewer	-	-

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1.8 Configuration

■ AC Main
□ DC Main



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1.9 Remarks when standards applied

N/A

1.10 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.

1.11 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 C63.4:2014 and CISPR 16-1-4:2012

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	**RRA**	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area 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, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	KR0100
Canada	**ISED**	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	23298-1
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-20056, C-20036, T-20040, G-20057
Europe	**TÜV SÜD**	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	CARAT 001633 0003

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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 ☐ Class A ☐ Group 2 ☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55032:2015 ☐ 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-CISPR 32:2016**	☐ Class A	☐ Class B
☐ **AS/NZS CISPR32:2015**	☐ 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	☒ Class A	☐ Class B

☐ **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
N/A

Test Location
Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	EMC32	R & S	9.12.00	-
☐	EMI TEST RECEIVER	ESU26	R & S	100552	04, 19, 2020
☐	LISN	ENV216	R & S	101787	01, 02, 2021
☐	LISN	ESH2-Z5	R & S	100450	01, 02, 2021
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	01, 02, 2021

Test Conditions
Temperature: ℃
Relative Humidity: % R.H.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
It is not tested apply because it is powered by PoE.

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2.2 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Feb. 11, 2020

Test Location
☐ OPEN AREA TEST SITE #2 ☒ SEMI ANECHOIC CHAMBER #4(10 m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 09, 2020
☒	AMPLIFIER	SCU 01	R & S	100603	11, 25, 2020
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 29, 2020
☒	ATTENUATOR	8491A	HP	32173	03, 11, 2020

Test Conditions
Temperature: 23,0 ℃
Relative Humidity: 41,1 % R.H.

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
Feb. 11, 2020

Test Location
SEMI ANECHOIC CHAMBER #4(10 m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 09, 2020
☒	PREAMPLIFIER	8449B	AGILENT	3008A01742	01, 02, 2021
☐	ATTENUATOR	8491A	HP	35496	03, 11, 2020
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	12, 13, 2020

Test Conditions
Temperature: 23,0 ℃
Relative Humidity: 41,1 % R.H.

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

HOT LINE

N/A

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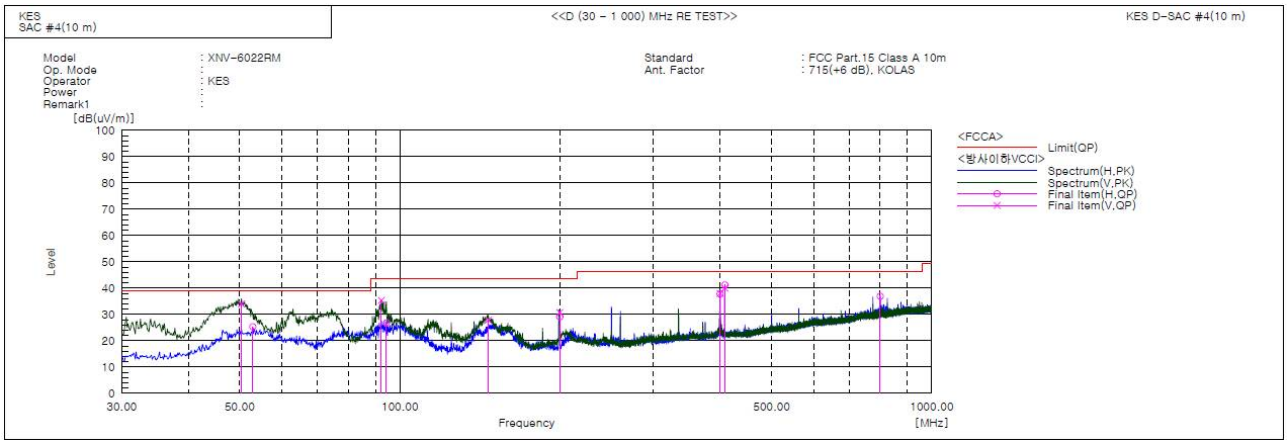
NEUTRAL LINE

N/A

◆ 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 + Pulse Limiter FACTOR))

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Radiated Electric Field Emissions(Below 1 ㎓)



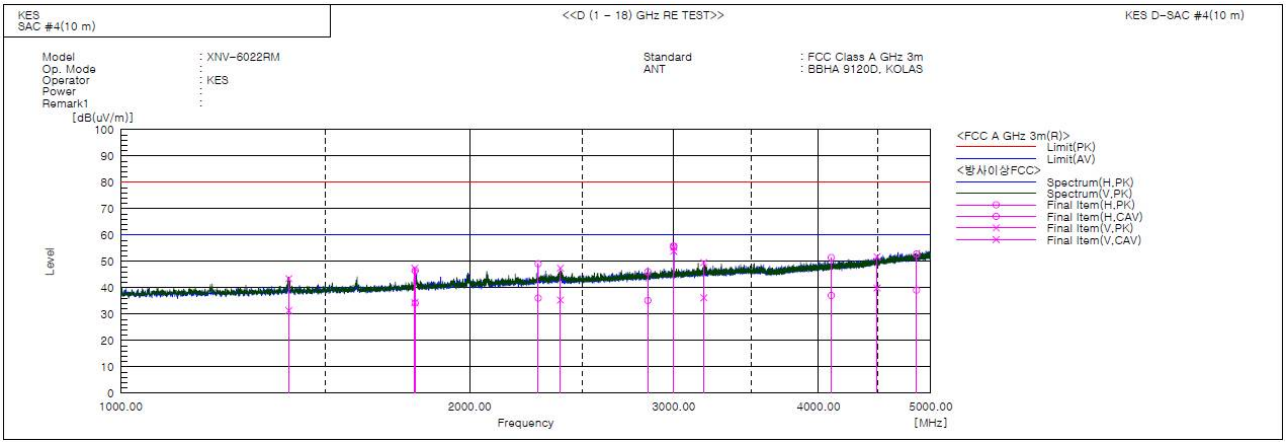
Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	50.370	V	55.4	-21.4	34.0	39.0	5.0	142.0	263.0	
2	52.916	H	46.8	-21.5	25.3	39.0	13.7	400.0	20.0	
3	92.323	V	59.4	-24.1	35.3	43.5	8.2	166.0	211.0	
4	94.384	H	50.3	-23.5	26.8	43.5	16.7	356.0	36.0	
5	146.643	V	53.9	-26.0	27.9	43.5	15.6	100.0	30.0	
6	199.871	V	52.4	-21.7	30.7	43.5	12.8	121.0	268.0	
7	199.871	H	50.8	-21.7	29.1	43.5	14.4	400.0	334.0	
8	400.055	V	53.1	-15.1	38.0	46.5	8.5	168.0	63.0	
9	400.055	H	52.9	-15.1	37.8	46.5	8.7	235.0	237.0	
10	408.300	H	56.1	-14.9	41.2	46.5	5.3	199.0	234.0	
11	408.421	V	54.9	-14.9	40.0	46.5	6.5	100.0	220.0	
12	800.059	H	44.5	-7.6	36.9	46.5	9.6	100.0	207.0	

♦ Calculation – SAC #4(10 m)
Result(QP) [㏈(㎶/m)] = (Reading(QP)[㏈(㎶)] + c.f[㏈(1/m)]
Margin(QP)[㏈] = Limit[㏈(㎶/m)] - Result(QP) [㏈(㎶/m)]
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

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Radiated Electric Field Emissions(Above 1 ㎓)



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1396.500	V	46.4	34.3	-2.9	43.5	31.4	80.0	60.0	36.5	28.6	378.0	259.0	
2	1793.500	V	48.4	35.4	-1.0	47.4	34.4	80.0	60.0	32.6	25.6	244.0	274.0	
3	1795.000	H	47.5	35.2	-1.0	46.5	34.2	80.0	60.0	33.5	25.8	375.0	190.0	
4	2292.000	H	47.9	34.9	1.2	49.1	36.1	80.0	60.0	30.9	23.9	322.0	194.0	
5	2395.000	V	45.8	33.7	1.7	47.5	35.4	80.0	60.0	32.5	24.6	384.0	259.0	
6	2850.000	H	42.1	31.2	4.0	46.1	35.2	80.0	60.0	33.9	24.8	225.0	234.0	
7	3000.000	V	50.7	49.2	4.7	55.4	53.9	80.0	60.0	24.6	6.1	400.0	231.0	
8	3000.000	H	51.0	51.1	4.7	55.7	55.8	80.0	60.0	24.3	4.2	398.0	202.0	
9	3185.500	V	44.2	30.8	5.4	49.6	36.2	80.0	60.0	30.4	23.8	344.0	215.0	
10	4103.500	H	42.7	28.3	8.8	51.5	37.1	80.0	60.0	28.5	22.9	100.0	187.0	
11	4494.000	V	41.2	29.3	10.6	51.8	39.9	80.0	60.0	28.2	20.1	321.0	299.0	
12	4860.500	H	40.2	26.5	12.6	52.8	39.1	80.0	60.0	27.2	20.9	346.0	121.0	

♦ Calculation

Result(PK/CAV) [dB(㎶/m)] = (Reading(PK/CAV)[dB(㎶)] + c.f[dB(1/m)]

Margin(PK/CAV)[dB] = Limit[dB(㎶/m)] - Result(PK/CAV) [dB(㎶/m)]

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

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Test Setup Photos and Configuration

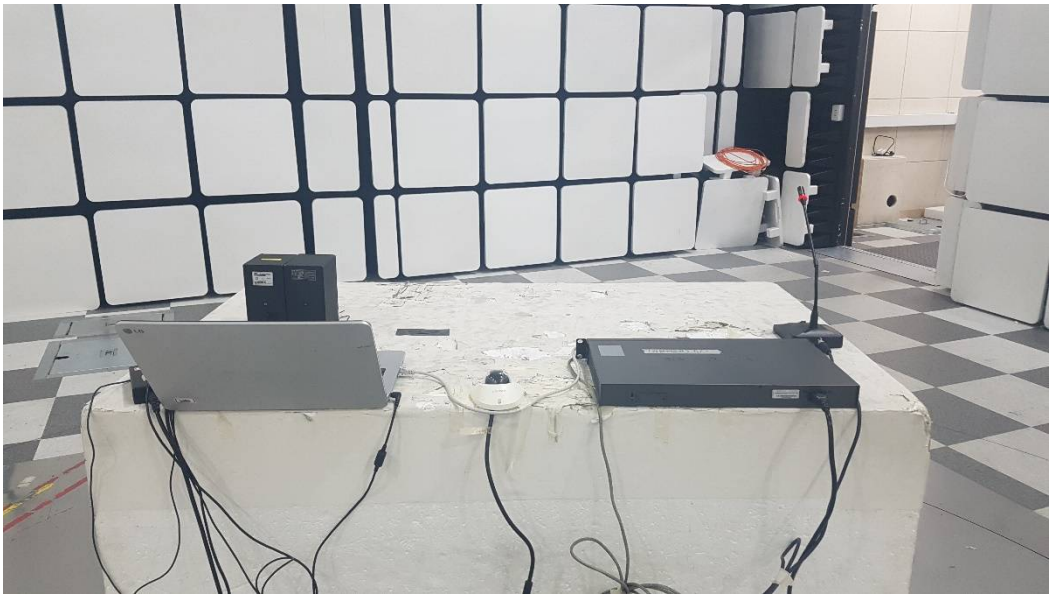
Conducted Emissions at Mains Power Ports

N/A

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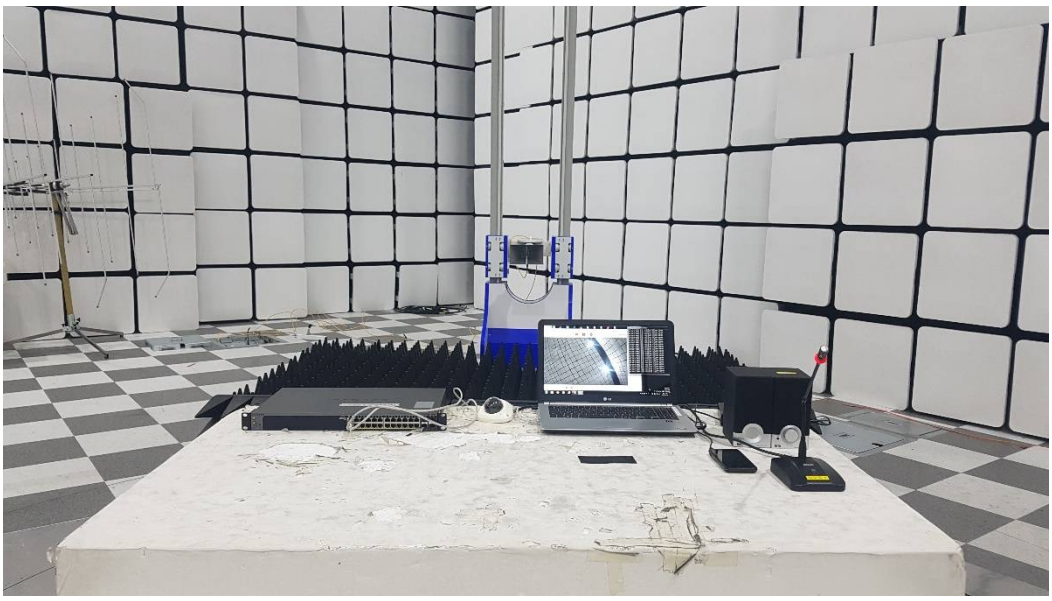
Radiated Electric Field Emissions(Below 1 ㎓)





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Radiated Electric Field Emissions(Above 1 ㎓)





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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

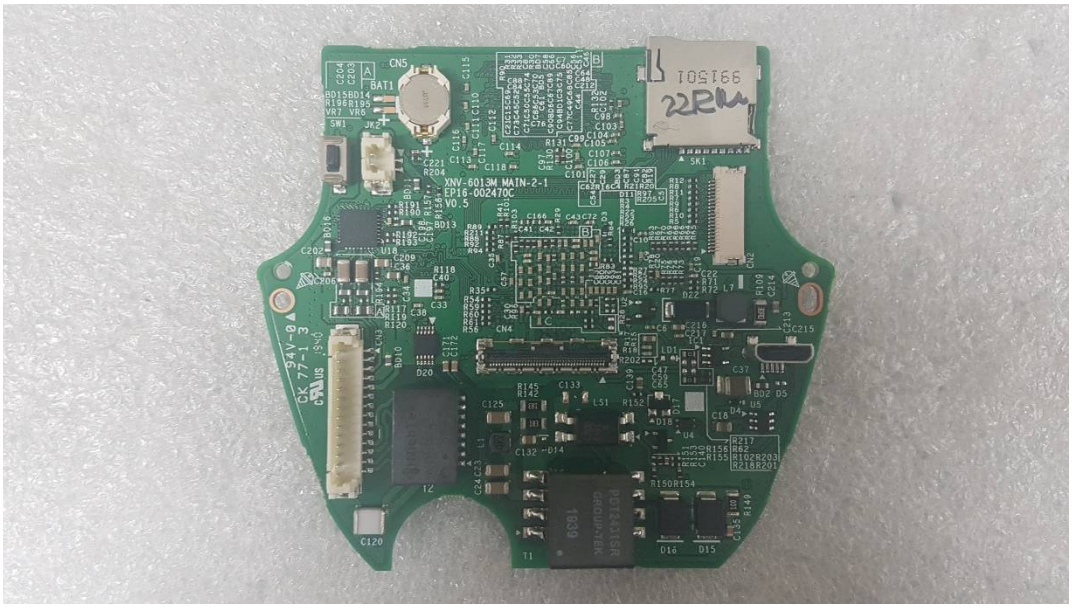
(Internal View)



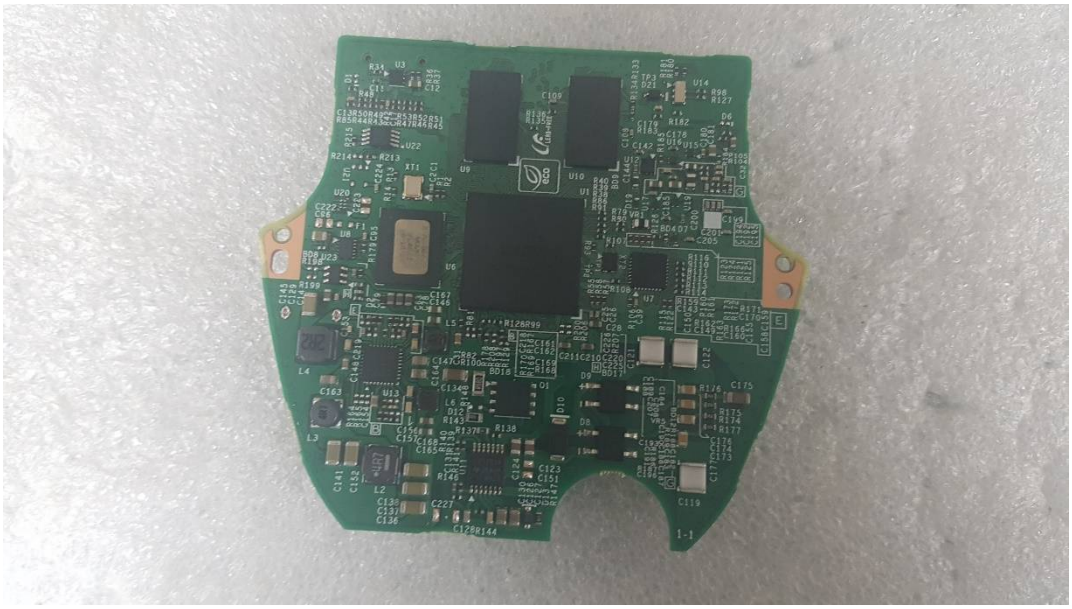
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EUT Internal View – Board

(Top)



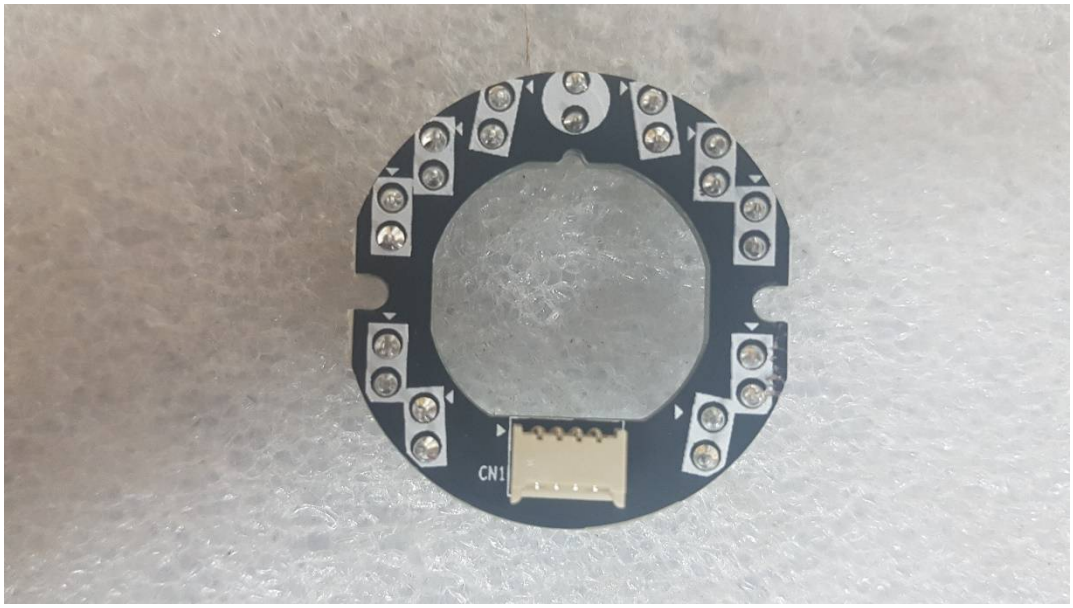
(Bottom)



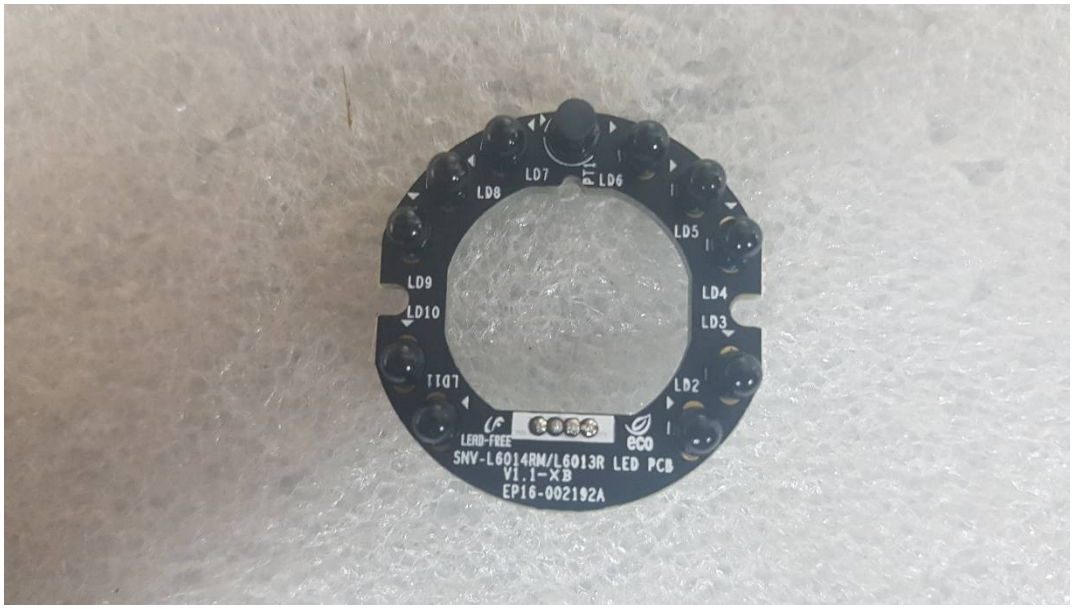
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EUT Internal View – Sensor Board

(Top)



(Bottom)



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EUT Internal View – Buzzer

(Top)



(Bottom)



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EUT Internal View – Lens

(Top)



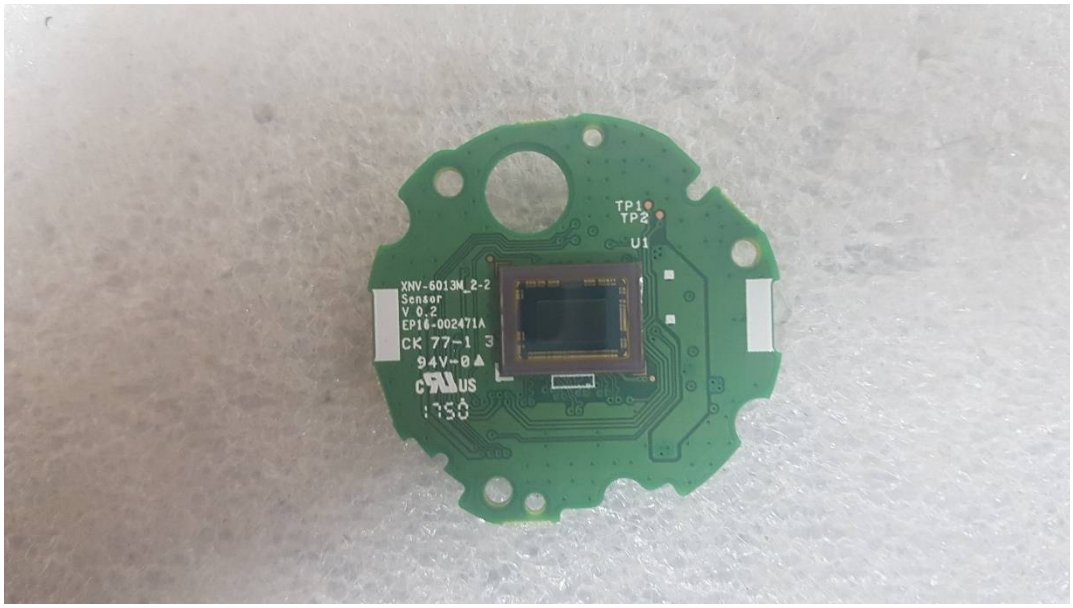
(Bottom)



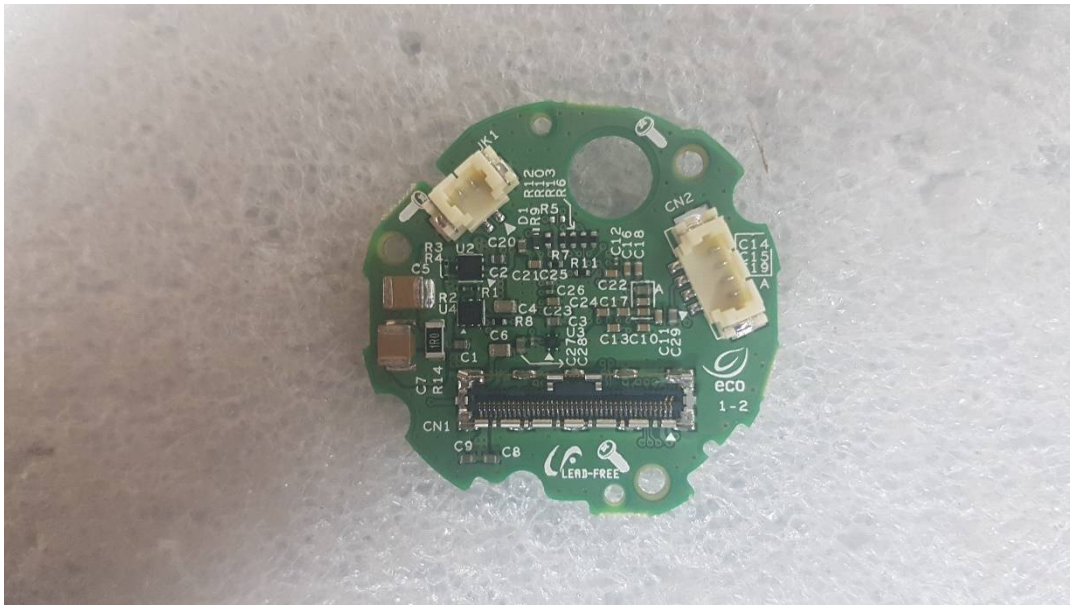
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EUT Internal View – Camera Board

(Top)

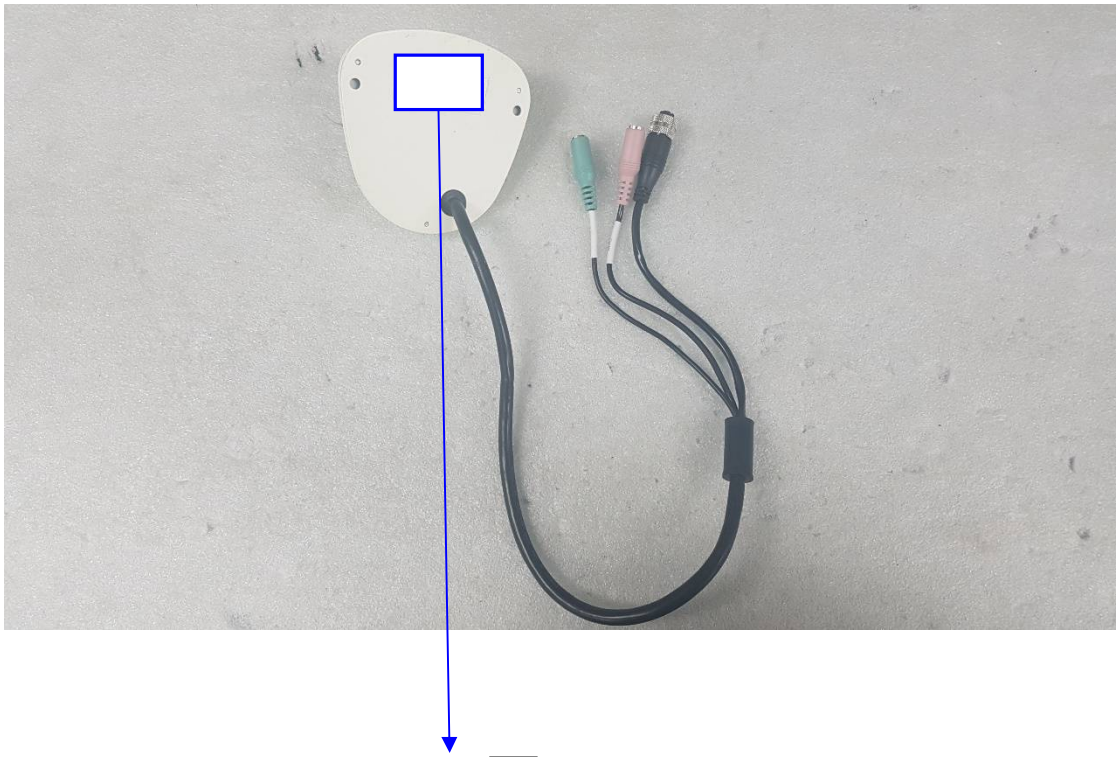


(Bottom)



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Label Photographs



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

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

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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