

**KES Co., Ltd.**

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www.kes.co.kr

Report No.:

KES-EM-23T0782

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EMC TEST REPORT For RCM

Test Report No. : KES-EM-23T0782
Date of Issue : Sep. 07, 2023
Product name : NETWORK CAMERA
Model/Type No. : PNO-A9311R
Variant Model : -
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)
Date of Receipt : Aug. 24, 2023
Test date : Aug. 30, 2023
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Reviewed by

Jae Won, Lee
EMC Test Engineer

Dae Jung, Choi
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
Sep. 07, 2023	KES-EM-23T0782	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	1/1.8" CMOS
Resolution	3840x2160, 3072x1728, 2592x1944, 2688x1520, 2560x1440, 2048x1536, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800 x 600, 800 x 448, 720 x 576, 720x480, 640x480, 640x360
Max. Framerate	H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 30fps/25fps(60Hz/50Hz)
NETD	None
Pixel Size	None
Min. Illumination	Color: 0.05Lux(F1.6, 1/30sec) BW: 0.005Lux(F1.6, 1/30sec), 0Lux(IR LED on)
Video Out	CVBS: 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P) for installation USB: Micro USB Type B, 1280x720 for installation
Video Transmission Distance	None
Lens	
Focal Length (Zoom Ratio)	6.91~214.7mm (31x) motorized varifocal
Max. Aperture Ratio	F1.36(Wide)~F4.6(Tele)
Angular Field of View	H: 60.92°(Wide)~2.2°(Tele) / V: 35.26°(Wide)~1.24°(Tele) / D: 69.18°(Wide)~2.52°(Tele) [TBD]
Min. Object Distance	3m(9.84ft)
Focus Control	Simple focus
Lens Type	P iris
Mount Type	None
Optional Lens	None
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	None
Pan Range	None
Pan Speed	None
Tilt Range	None
Tilt Speed	None
Rotate Range	None
Sequence	None
Preset Accuracy	None
Operational	
Camera Title	Displayed up to 85 characters
Direction Indicator	None
Day & Night	Auto(ICR)
Backlight Compensation	BLC, WDR, SSDR
Wide Dynamic Range	None
Digital Noise Reduction	SSNRV, WiseNR II(using AI engine)
Digital Image Stabilization	Stabilization Support(built-in gyro sensor)
Defog	None
Motion Detection	8ea, polygonal zones
Privacy Masking	6ea, rectangle zones - Color: Gray/Black/White
Gain Control	Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC	Support
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (1/5~1/12,000sec) Auto prefer shutter control based on AI engine
Digital PTZ	None
Video Rotation	Flip, Mirror, Hallway view(90°/270°)
Analytics	Classified object type : Person/Face/Vehicle/License plate Attributes : Person(Gender, Color and Bag), Face(Age, Gender, Mask and Glasses), Vehicle(Type:car/bus/truck/motorcycle/bicycle and Color) Support Bestshot per object Analytics events based on AI engine - Object detection, Virtual line*(Crossing/Direction), Virtual area*(Loitering/Intrusion/Enter/Exit), Face mask detection, Digital auto tracking, Social distancing detection, Slip&Fall detection Analytics events - Defocus detection, Motion detection, Tampering, Audio detection, Sound classification, Shock detection, Virtual area(Appear/Disappear) *Some of the video analytics only works with people and vehicle detection
Business Intelligence	People/Vehicle/Crowd counting, Queue management, Heatmap based on AI engine
Serial Interface	None

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Alarm I/O	2 configurable I/O ports, DC 12V output(Max. 50mA)
Alarm Triggers	Analytics, Network disconnect, Alarm input
Alarm Events	File upload via FTP and e-mail Notification via e-mail SD/SDHC/SDXC or NAS recording at event triggers Alarm output Handover Audio playback
Audio In	Selectable(mic in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm
Audio Out	Line out, Max.output level: 1Vrms
IR Viewable Length	70m(229.66ft) TBD, testing up to 90m(295.28ft)
IR Illuminator (Optional)	None
Water Removal	None
Auto Tracking	None
Coaxial Protocol	None
Color Palettes	None
Radiometry	
Temperature detect range	None
Temperature accuracy	None
Temperature detection	None
Additional	None
Network	
Ethernet	Metal shielded RJ-45(10/100/1000 BASE-T)
Video Compression	H.265/H.264: Main/High, MJPEG
Audio Compression	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
Smart Codec	Manual(Sea area), WiseStreamII, WiseStreamIII(using AI engine)
Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Target bitrate level control
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR

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Streaming	Unicast(6 users) / Multicast Multiple streaming(Up to 6 profiles)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTSP (TCP, UDP Unicast)
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access log 802.1X Authentication(EAP-TLS, EAP-LEAP) Device Certificate(Hanwha Techwin Root CA) Secure boot
Application Programming Interface	ONVIF Profile S/G/T/M SUNAPI(HTTP API) Wisenet open platform
General	
Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish , Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 2slots 512GB
Memory	4096MB RAM, 1024MB Flash
Environmental & Electrical	
Operating Temperature / Humidity	-40°C ~ +55°C(-40°F ~ +131°F) / Less than 90% RH * Start up should be done at above -30°C
Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH
Certification	IP66/IP67, IK10, NEMA4X
Input Voltage	PoE+(IEEE802.3at), 12VDC
Power Consumption	PoE+: Max 20.0W, typical 17.00W 12VDC: Max 18.00W, typical 16.00W
Mechanical	
Color / Material	Dark gray / Aluminum
RAL Code	None
Product dimensions / weight	Ø136.2x358.7mm (Ø5.36" x 14.12") (Without sunshield), Weight : 0.00Kg (0.00lb) TBD, New design
Compatible Conduit hole / Gangbox	None
Hanging mount(Dome)	None
Skin cover(Dome)	None
Weather cap(Dome)	None
Power module	None
Backbox	None
DORI (EN62676-4 standard)	
Detect (25PPM/ 8PPF)	Wide: 73.5m(241ft) / Tele: 2,250m(7,382ft) [TBD]
Observe (63PPM/ 19PPF)	Wide: 29.4m(96.4ft) / Tele: 900m(2,953ft) [TBD]
Recognize (125PPM/ 38PPF)	Wide: 14.7m(48.2ft) / Tele: 450m(1,476ft) [TBD]
Identify (250PPM/ 76PPF)	Wide: 7.3m(24.1ft) / Tele: 225m(738.2ft) [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.

☒ AC 240 V, 50 Hz ☒ PoE

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	PNO-A9311R	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Adapter	2ACB022F	-	ChAnnel Well Technology (Guangzhou) Co.,Ltd.	-
PoE Adapter	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Laptop	P95G001	8KM8HT2	DELL INC.	-
Laptop Adapter	LA65NS2-01	-	LITE-ON TECHNOLOGY(CHANGZH OU)CO.,LTD.	-
Micro SD Card1	-	-	SanDisk	8 GB
Micro SD Card2	-	-	SanDisk	8 GB
Alarm	PRO-SL	-	SENSOR PRO	-
Button Alarm	-	-	-	-
Headset	K550	-	Britz®	-
Smartphone	-	-	SAMSUNG	-

1.6 External I/O Cabling

■ DC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45(LAN)	Laptop	RJ-45(LAN)	3.5	U
	Alarm OUT	Alarm	Alarm IN	3.5	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	Audio OUT	Headset	Audio IN	1.5	U
	Audio IN		Audio OUT	1.5	U
	Micro SD Card Slot	Micro SD Card1	Micro SD Card Slot	-	-
	Micro SD Card Slot	Micro SD Card2	Micro SD Card Slot	-	-
	DC Jack	Adapter	DC Jack	1.6	U
Laptop	DC Jack	Laptop Adapter	DC Jack	1.3	U
	3.5 mm	Smartphone	3.5 mm	1.0	U

* Unshielded=U, Shielded=S

■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45(PoE)	PoE Adapter	RJ-45(PoE)	3.5	U
	Alarm OUT	Alarm	Alarm IN	3.5	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	Audio OUT	Headset	Audio IN	1.5	U
	Audio IN		Audio OUT	1.5	U
	Micro SD Card Slot	Micro SD Card1	Micro SD Card Slot	-	-
	Micro SD Card Slot	Micro SD Card2	Micro SD Card Slot	-	-
	DC Jack	Laptop Adapter	DC Jack	1.3	U
Laptop	3.5 mm	Smartphone	3.5 mm	1.0	U

* Unshielded=U, Shielded=S

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1.7 EUT Operating Mode(s)

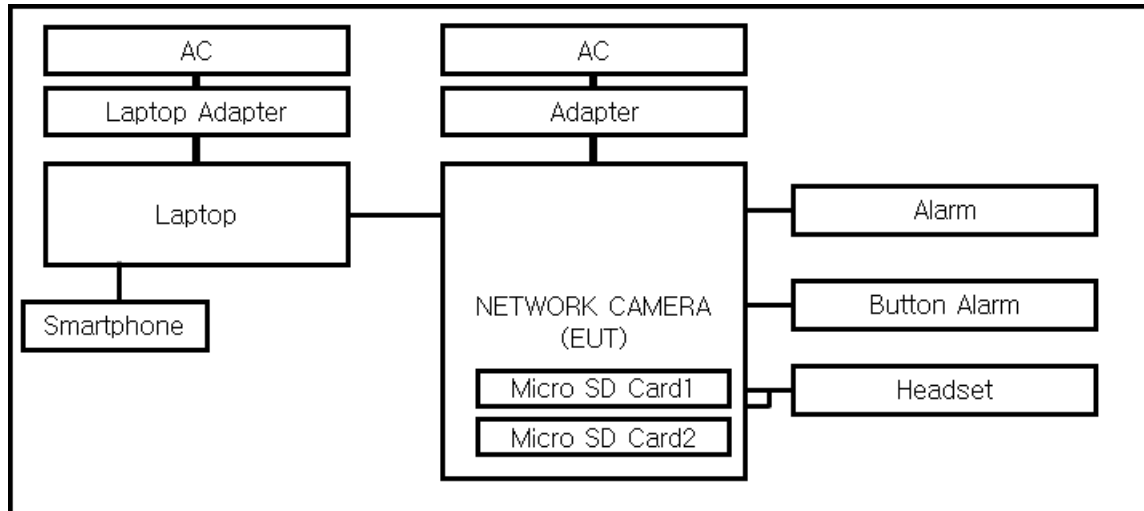
Test mode	operating
Operater	After arranging the test equipment and peripherals as shown in the layout diagram below, 1. Run the Web Viewer on your laptop and check the camera video output 2. PingTest from your laptop to check the network status 3. Confirm the alarm output by pressing the alarm button 4. Play 1KHz toon on your smartphone and check the output on your headset 5. Record in the notebook and check the input in the headset microphone 6. After the test, the Micro SD Card storage file was checked.

EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Vision Co., Ltd

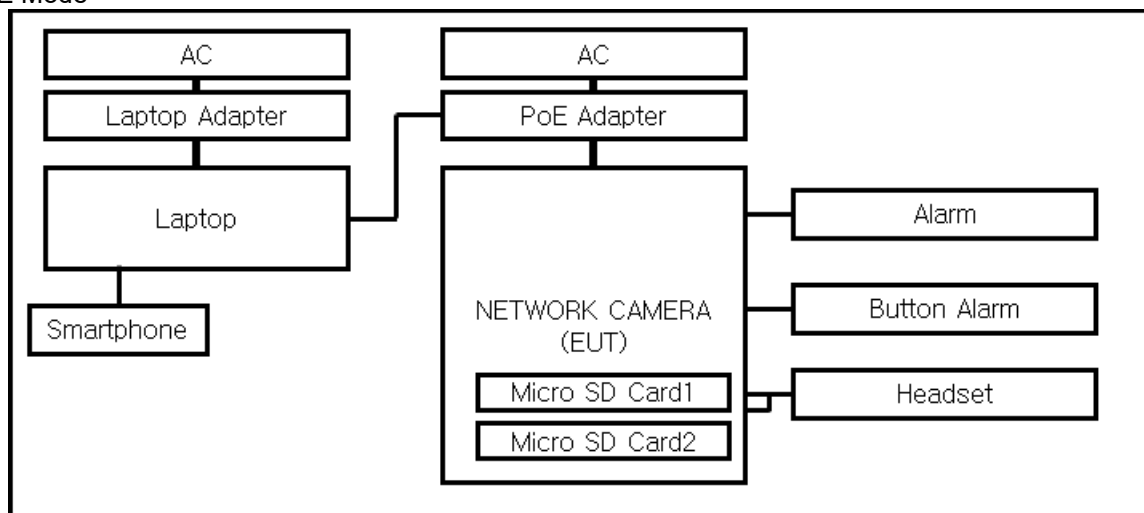
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1.8 Configuration

■ DC Mode



■ PoE Mode



1.9 Remarks when standards applied

- In PoE mode, the LAN port is regarded as a wired communication network port and power-related ports are not tested.
- Micro 5 Pin, VIDEO port is not tested because it is for administrators.

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, Yeosu-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

1.12 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



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2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ AS/NZS CISPR 32:2015 AMD 1:2020

☒ Class A

☐ Class B

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2.1 Conducted Emissions at Mains Power Ports

Test Date

Aug. 30, 2023

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	11, 11, 2023
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	11, 10, 2023
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023

Test Conditions

Temperature: (24,4 ± 0,1) °C

Relative Humidity: (48,5 ± 0,1) % R.H.

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

RemarksSee Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Aug. 30, 2023

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	11, 11, 2023
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	11, 10, 2023
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023
<input checked="" type="checkbox"/>	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	11, 22, 2023
<input type="checkbox"/>	CDN	CDNS502A	TESEQ	40431	11, 10, 2023

Test Conditions

Temperature: (24,4 ± 0,1) °C

Relative Humidity: (48,5 ± 0,1) % R.H.

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.- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Aug. 30, 2023

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

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	R & S	100551	03, 21, 2024
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	11, 10, 2023
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
<input checked="" type="checkbox"/>	ATTENUATOR	8491A	HP	32173	03, 03, 2024

Test Conditions

Temperature: (24,7 ± 0,1) °C

Relative Humidity: (48,4 ± 0,1) % R.H.

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

RemarksSee Appendix A for test data.

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Aug. 30, 2023

Test Location

SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR7	R & S	101190	07, 31, 2024
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	AGILENT	3008A01967	03, 06, 2024
<input checked="" type="checkbox"/>	ATTENUATOR	8491A	HP	35496	03, 03, 2024
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 06, 2024

Test Conditions

Temperature: (24,5 ± 0,1) °C

Relative Humidity: (48,2 ± 0,1) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

■ DC Mode

HOT LINE

Common Information

Test Description:

Model No.:

Phase:

Mode:

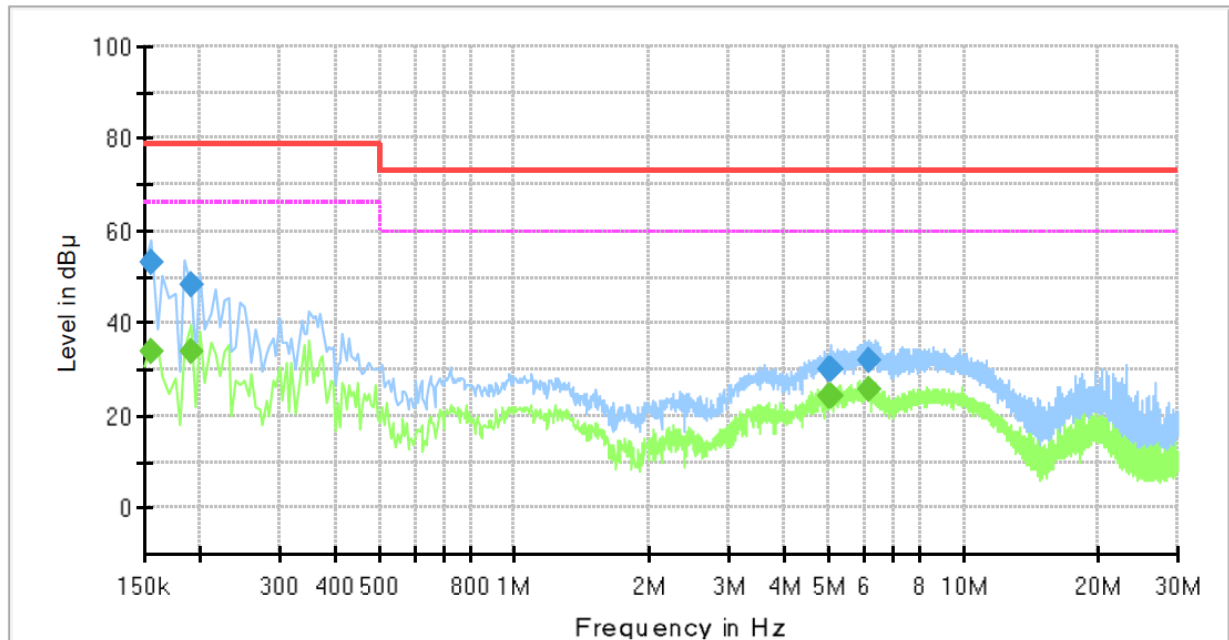
Operator Name:

Conducted Emission

PNO-A9311R

DC_L1

KES



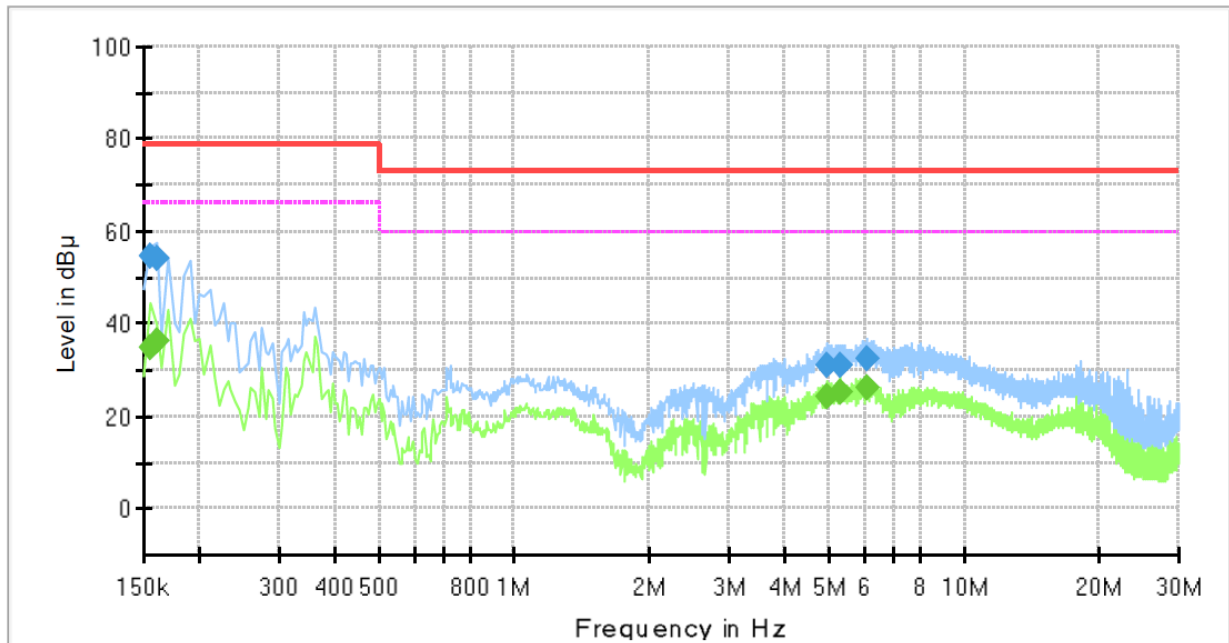
Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	33.78	66.00	32.22	1000.0	9.000	L1	19.4
0.155000	52.98	---	79.00	26.02	1000.0	9.000	L1	19.4
0.190000	---	33.80	66.00	32.20	1000.0	9.000	L1	19.4
0.190000	48.38	---	79.00	30.62	1000.0	9.000	L1	19.4
5.015000	---	24.33	60.00	35.67	1000.0	9.000	L1	19.7
5.015000	30.12	---	73.00	42.88	1000.0	9.000	L1	19.7
5.045000	---	24.33	60.00	35.67	1000.0	9.000	L1	19.7
5.045000	30.07	---	73.00	42.93	1000.0	9.000	L1	19.7
6.165000	---	25.48	60.00	34.52	1000.0	9.000	L1	19.8
6.165000	32.05	---	73.00	40.95	1000.0	9.000	L1	19.8

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	PNO-A9311R
Phase:	DC_N
Mode:	
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	---	34.64	66.00	31.36	1000.0	9.000	N	19.4
0.155000	54.47	---	79.00	24.53	1000.0	9.000	N	19.4
0.160000	---	36.46	66.00	29.54	1000.0	9.000	N	19.4
0.160000	54.15	---	79.00	24.85	1000.0	9.000	N	19.4
4.935000	---	24.43	60.00	35.57	1000.0	9.000	N	19.7
4.935000	31.03	---	73.00	41.97	1000.0	9.000	N	19.7
5.320000	---	25.37	60.00	34.63	1000.0	9.000	N	19.8
5.320000	31.15	---	73.00	41.85	1000.0	9.000	N	19.8
6.110000	---	26.12	60.00	33.88	1000.0	9.000	N	19.8
6.110000	32.49	---	73.00	40.51	1000.0	9.000	N	19.8

◆ Calculation

$$\text{QuasiPeak [dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value [dBuV]} + \text{Corr. [dB]}$$

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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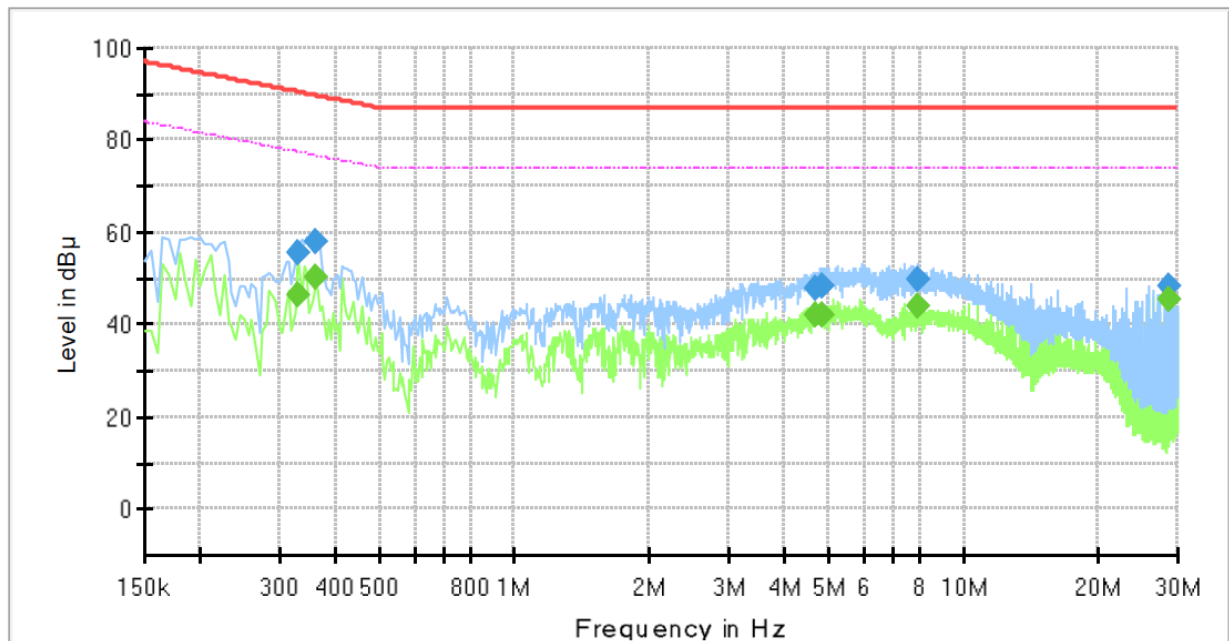
Conducted Emissions at Telecommunication Ports

■ DC Mode

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PNO-A9311R
Mode : DC_TEL 1 000 Mbps
Speed :
Operator Name: KES



Final Result

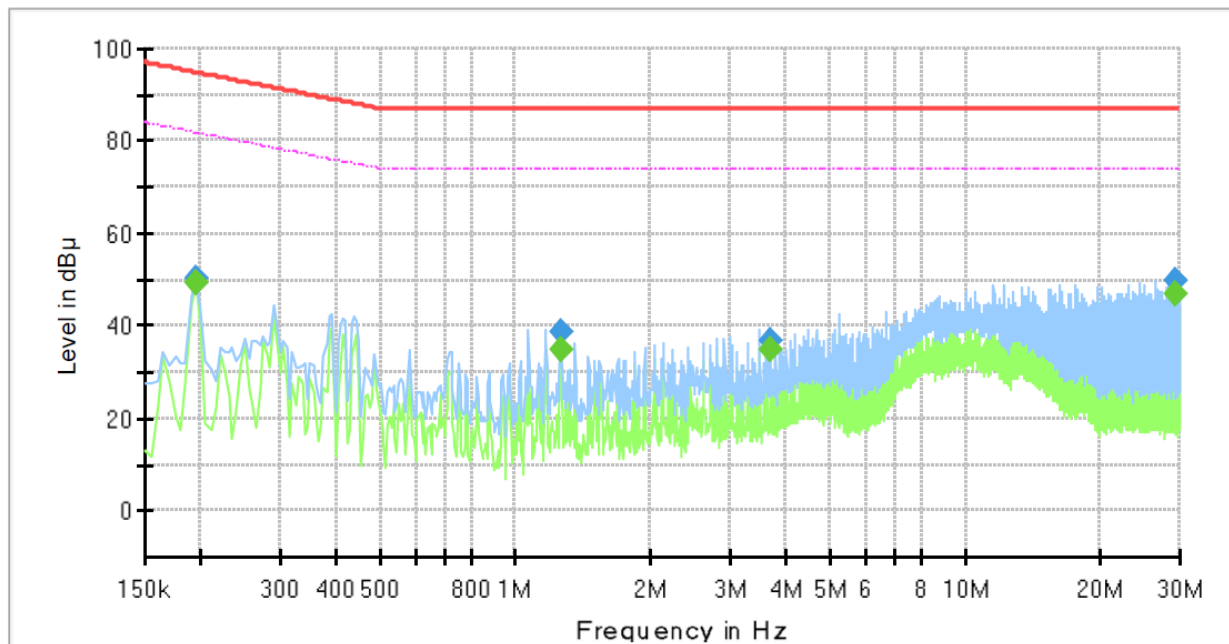
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.330000	---	46.27	77.45	31.18	1000.0	9.000	Single Line	19.5
0.330000	55.67	---	90.45	34.78	1000.0	9.000	Single Line	19.5
0.360000	---	50.18	76.73	26.55	1000.0	9.000	Single Line	19.5
0.360000	58.26	---	89.73	31.47	1000.0	9.000	Single Line	19.5
4.685000	---	42.29	74.00	31.71	1000.0	9.000	Single Line	19.4
4.685000	48.03	---	87.00	38.97	1000.0	9.000	Single Line	19.4
4.835000	---	41.98	74.00	32.02	1000.0	9.000	Single Line	19.4
4.835000	48.24	---	87.00	38.76	1000.0	9.000	Single Line	19.4
7.925000	---	44.13	74.00	29.87	1000.0	9.000	Single Line	19.6
7.925000	49.65	---	87.00	37.35	1000.0	9.000	Single Line	19.6
28.685000	---	45.60	74.00	28.40	1000.0	9.000	Single Line	20.1
28.685000	48.47	---	87.00	38.53	1000.0	9.000	Single Line	20.1

■ PoE Mode

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PNO-A9311R
Mode : PoE_TEL 1 000 Mbps
Speed :
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.195000	---	49.38	81.82	32.44	1000.0	9.000	Single Line	19.6
0.195000	50.12	---	94.82	44.70	1000.0	9.000	Single Line	19.6
1.265000	---	34.93	74.00	39.07	1000.0	9.000	Single Line	19.3
1.265000	38.69	---	87.00	48.31	1000.0	9.000	Single Line	19.3
3.690000	---	34.94	74.00	39.06	1000.0	9.000	Single Line	19.4
3.690000	36.84	---	87.00	50.16	1000.0	9.000	Single Line	19.4
29.235000	---	46.71	74.00	27.29	1000.0	9.000	Single Line	20.1
29.235000	50.02	---	87.00	36.98	1000.0	9.000	Single Line	20.1

◆ Calculation

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

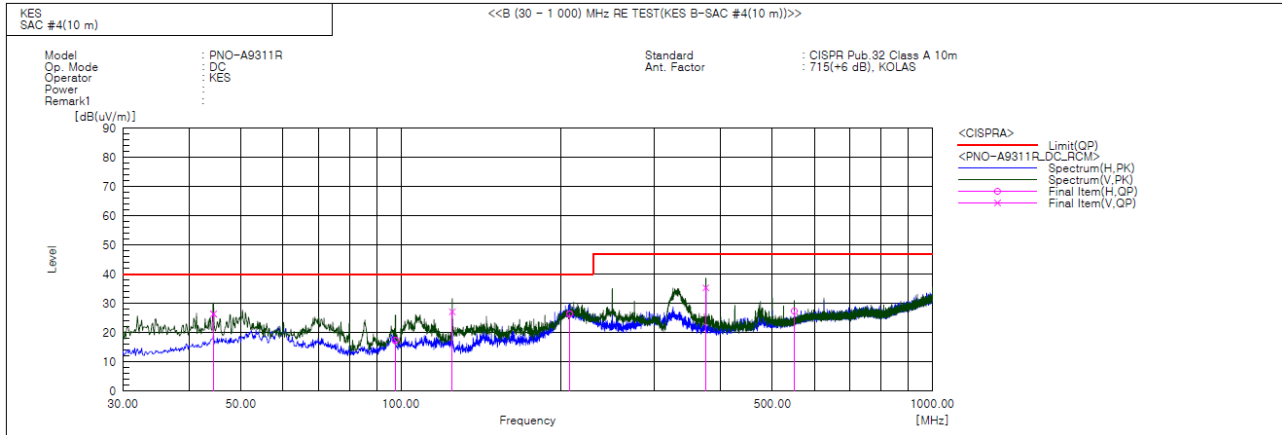
QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

Radiated Electric Field Emissions(Below 1 GHz)

■ DC Mode



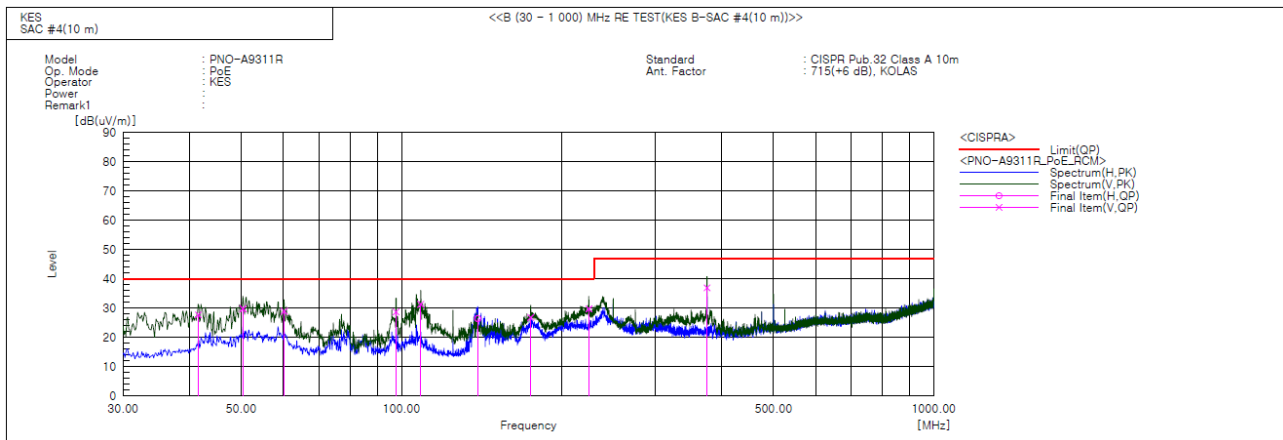
Final Result

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	44.429	V	47.4	-21.0	26.4	40.0	13.6	112.0	4.0	
2	97.658	H	39.6	-22.2	17.4	40.0	22.6	197.0	172.0	
3	124.939	V	51.4	-24.3	27.1	40.0	12.9	145.0	113.0	
4	207.874	H	46.7	-20.3	26.4	40.0	13.6	397.0	128.0	
5	374.956	V	49.3	-14.0	35.3	47.0	11.7	115.0	161.0	
6	550.041	H	36.9	-9.5	27.4	47.0	19.6	397.0	94.0	

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■ PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	41.519	V	49.4	-21.7	27.7	40.0	12.3	113.0	299.0	
2	50.370	V	50.2	-20.4	29.8	40.0	10.2	107.0	150.0	
3	60.191	V	50.5	-21.6	28.9	40.0	11.1	114.0	157.0	
4	97.658	V	50.9	-22.2	28.7	40.0	11.3	115.0	198.0	
5	108.691	V	53.7	-22.4	31.3	40.0	8.7	142.0	213.0	
6	139.125	H	51.5	-25.1	26.4	40.0	13.6	195.0	180.0	
7	174.894	V	50.5	-23.7	26.8	40.0	13.2	111.0	318.0	
8	224.970	V	49.1	-19.4	29.7	40.0	10.3	115.0	198.0	
9	374.956	V	50.9	-14.0	36.9	47.0	10.1	142.0	154.0	

◆ Calculation

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

Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/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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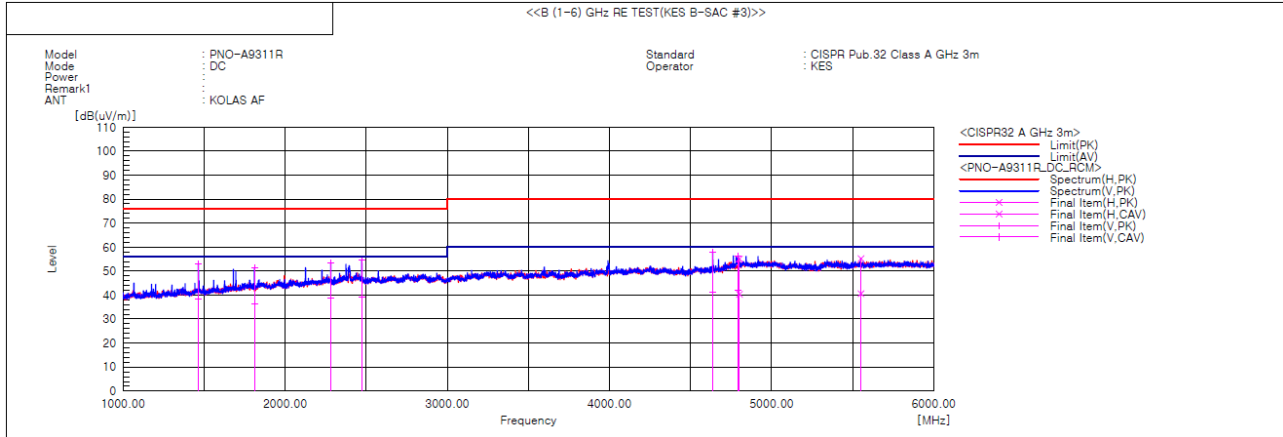
Report No.:

KES-EM-23T0782

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Radiated Electric Field Emissions(Above 1 GHz)

■ DC Mode



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	1464.458	V	53.3	38.7	-0.2	53.1	38.5	76.0	56.0	22.9	17.5	100.0	60.3	
2	1810.272	V	48.4	33.4	2.9	51.3	36.3	76.0	56.0	24.7	19.7	100.0	104.6	
3	2281.857	V	47.7	33.0	5.6	53.3	38.6	76.0	56.0	22.7	17.4	100.0	107.5	
4	2472.273	V	48.2	32.7	6.4	54.6	39.1	76.0	56.0	21.4	16.9	100.0	81.4	
5	4637.263	V	44.9	28.1	13.0	57.9	41.1	80.0	60.0	22.1	18.9	100.0	217.2	
6	4794.631	V	42.1	27.9	14.3	56.4	42.2	80.0	60.0	23.6	17.8	100.0	162.0	
7	4800.867	H	40.7	26.0	14.4	55.1	40.4	80.0	60.0	24.9	19.6	100.0	163.0	
8	5550.740	H	39.6	25.0	15.6	55.2	40.6	80.0	60.0	24.8	19.4	100.0	24.7	

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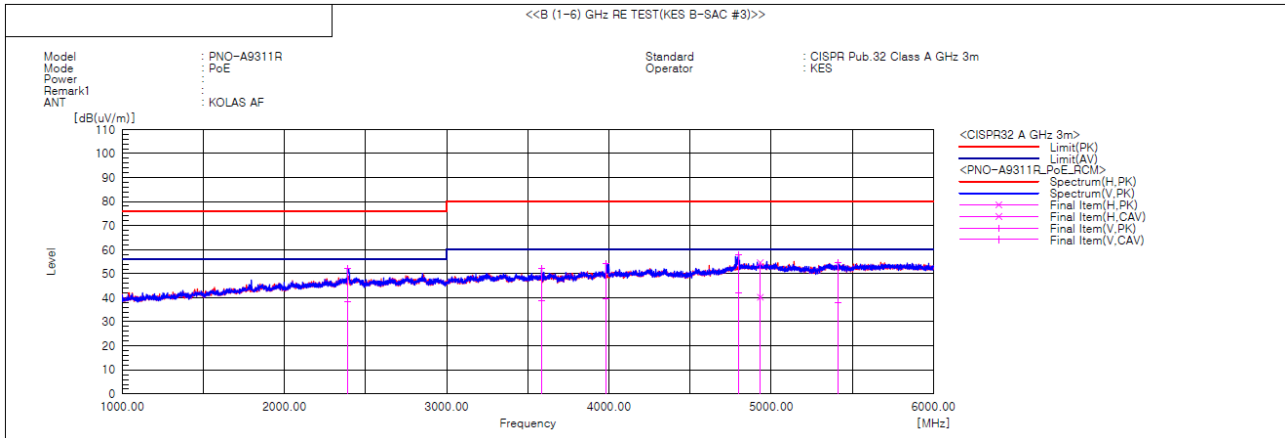
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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Report No.:

KES-EM-23T0782

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■ PoE Mode



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	2390.163	V	46.0	32.2	6.3	52.3	38.5	76.0	56.0	23.7	17.5	100.0	144.5	
2	3585.152	V	42.4	28.8	9.9	52.3	38.7	80.0	60.0	27.7	21.3	100.0	53.8	
3	3982.857	V	43.3	28.8	10.9	54.2	39.7	80.0	60.0	25.8	20.3	100.0	176.5	
4	4799.732	V	43.3	27.7	14.4	57.7	42.1	80.0	60.0	22.3	17.9	100.0	168.5	
5	4931.867	H	39.5	25.1	15.1	54.6	40.2	80.0	60.0	25.4	19.8	100.0	256.6	
6	5410.262	V	39.0	22.3	15.8	54.8	38.1	80.0	60.0	25.2	21.9	100.0	220.8	

◆ Calculation

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

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

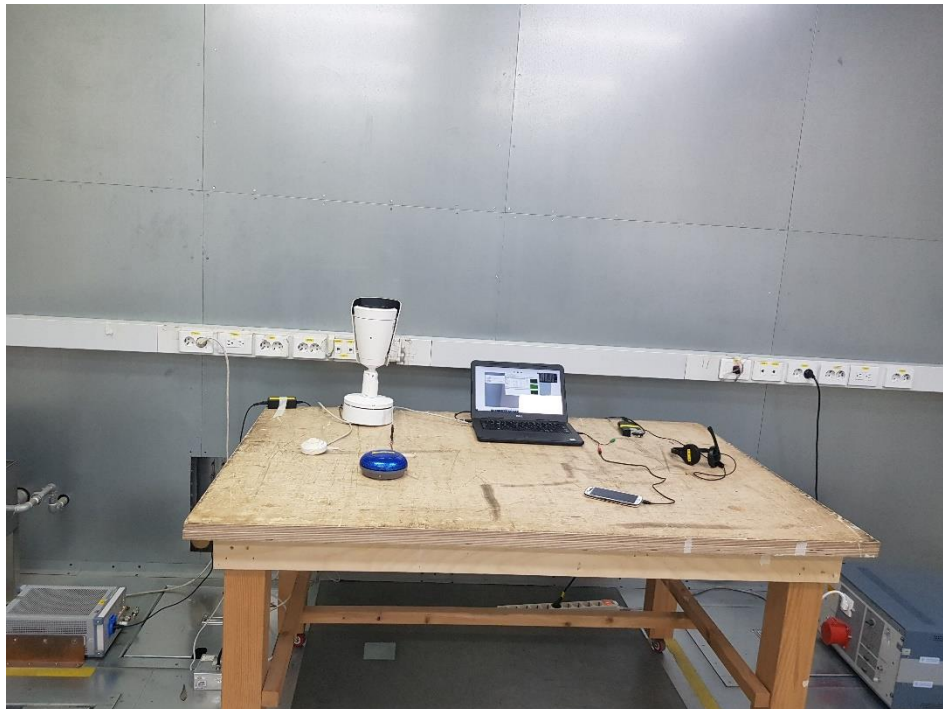
■ DC Mode



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Conducted Emissions at Telecommunication Ports

■ DC Mode



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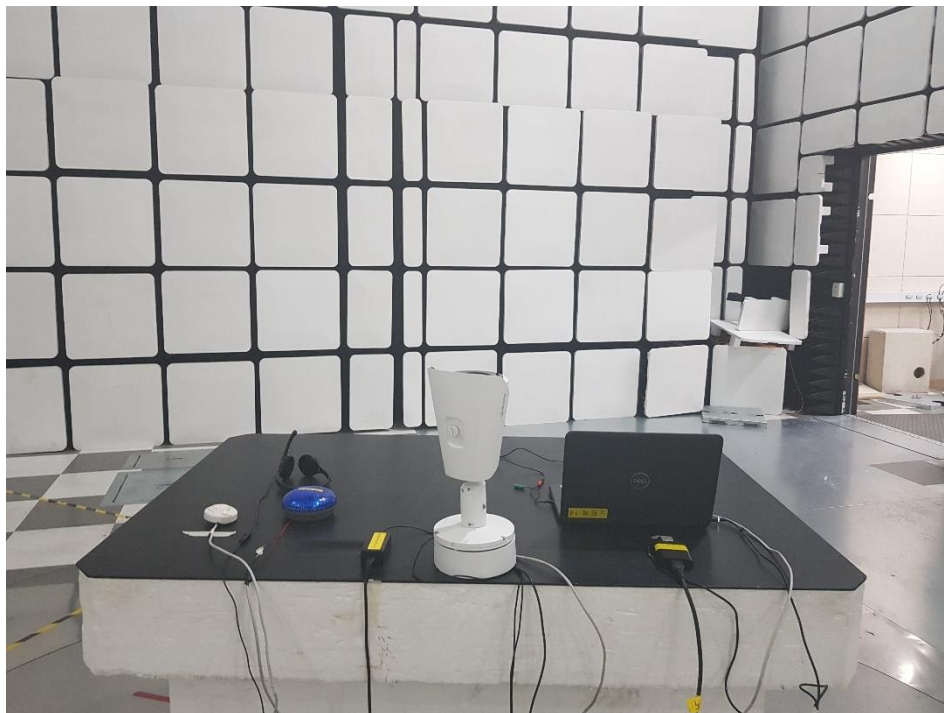
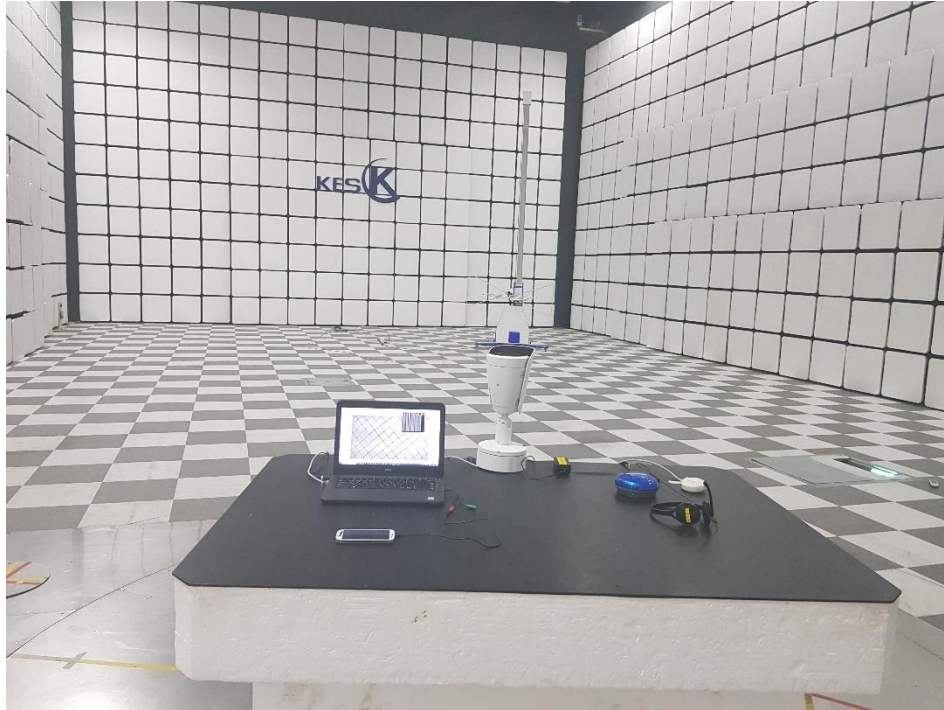
■ PoE Mode



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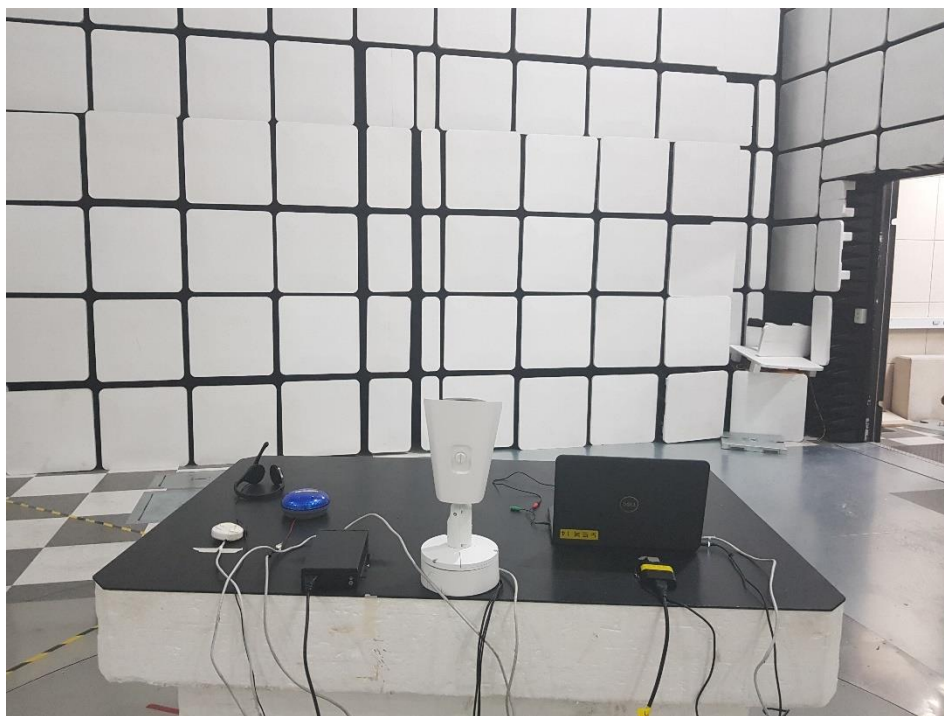
Radiated Electric Field Emissions(Below 1 GHz)

■ DC Mode



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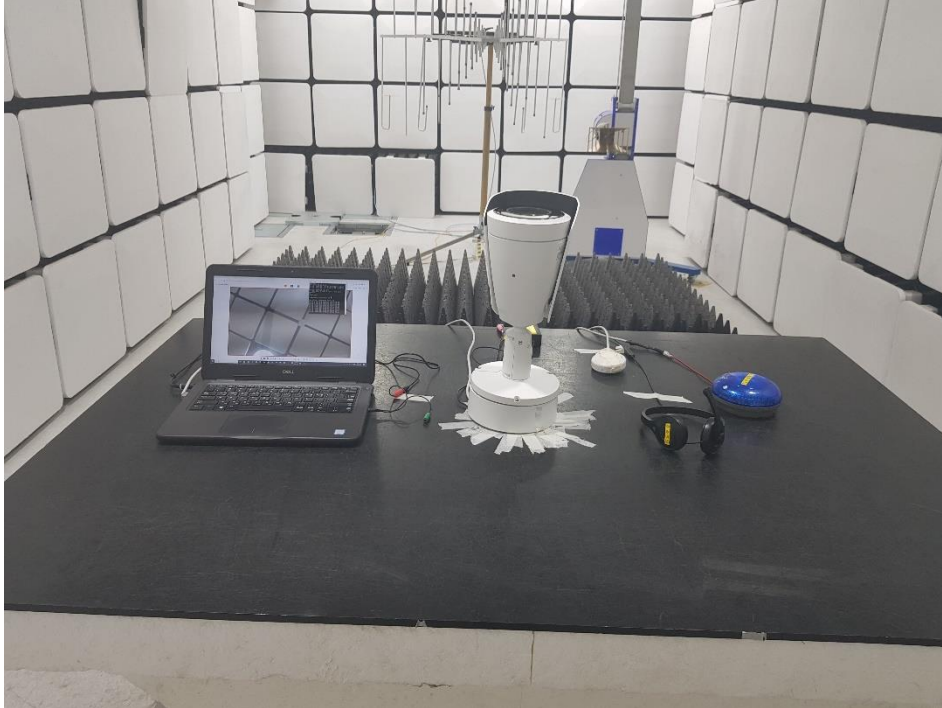
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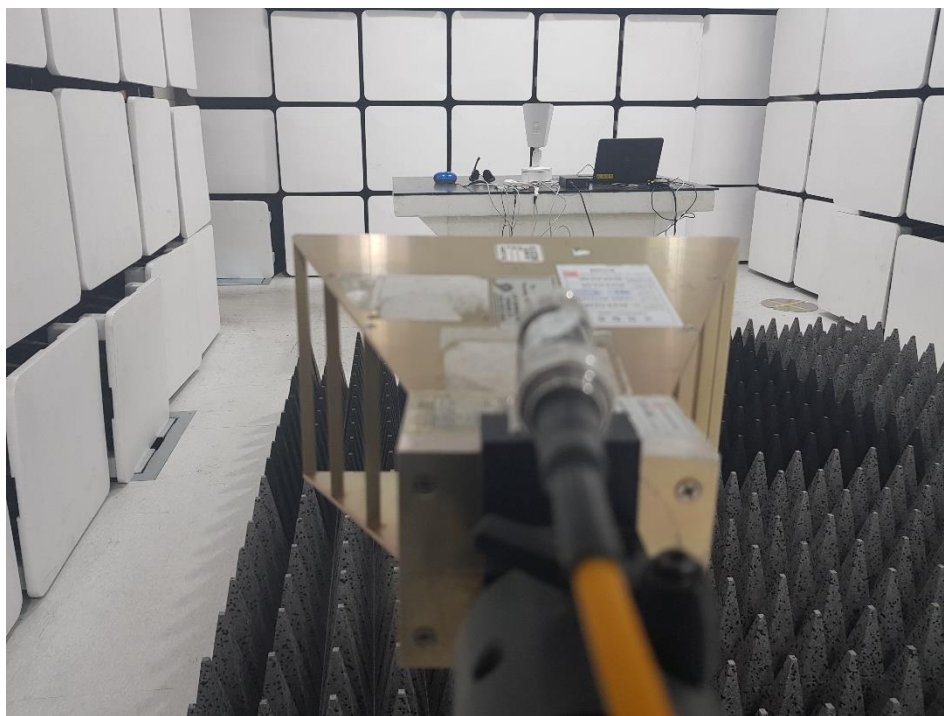
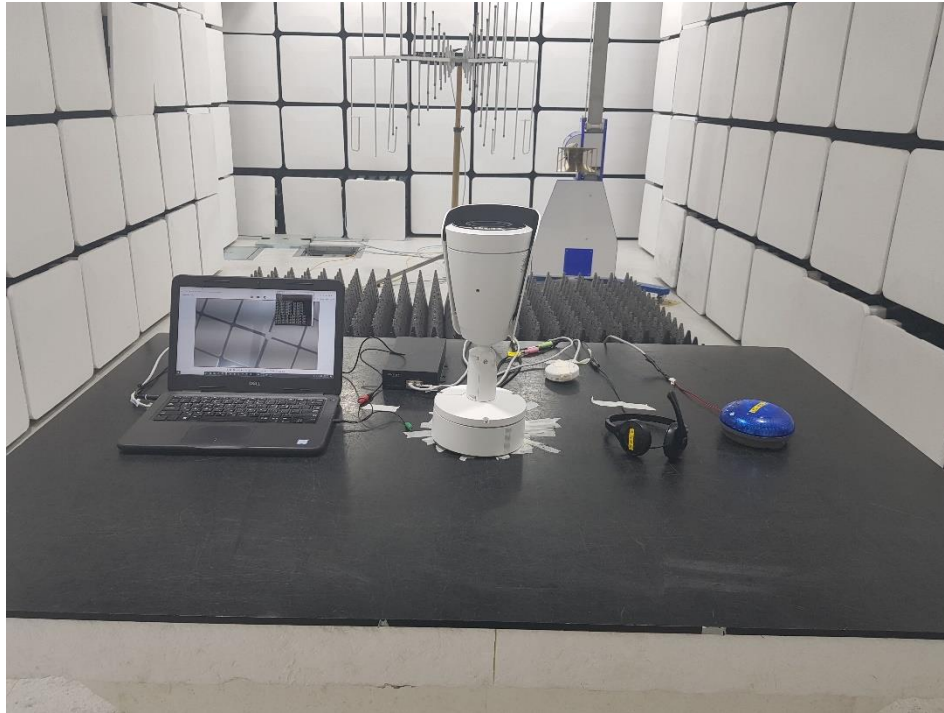
Radiated Electric Field Emissions(Above 1 GHz)

■ DC Mode



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■ PoE Mode



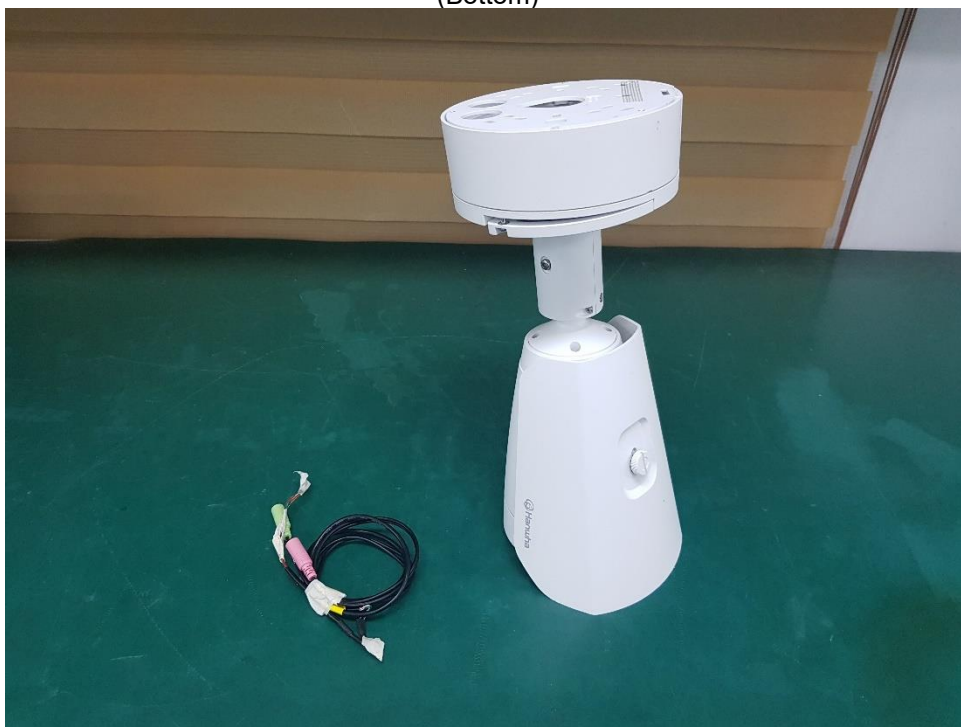
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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

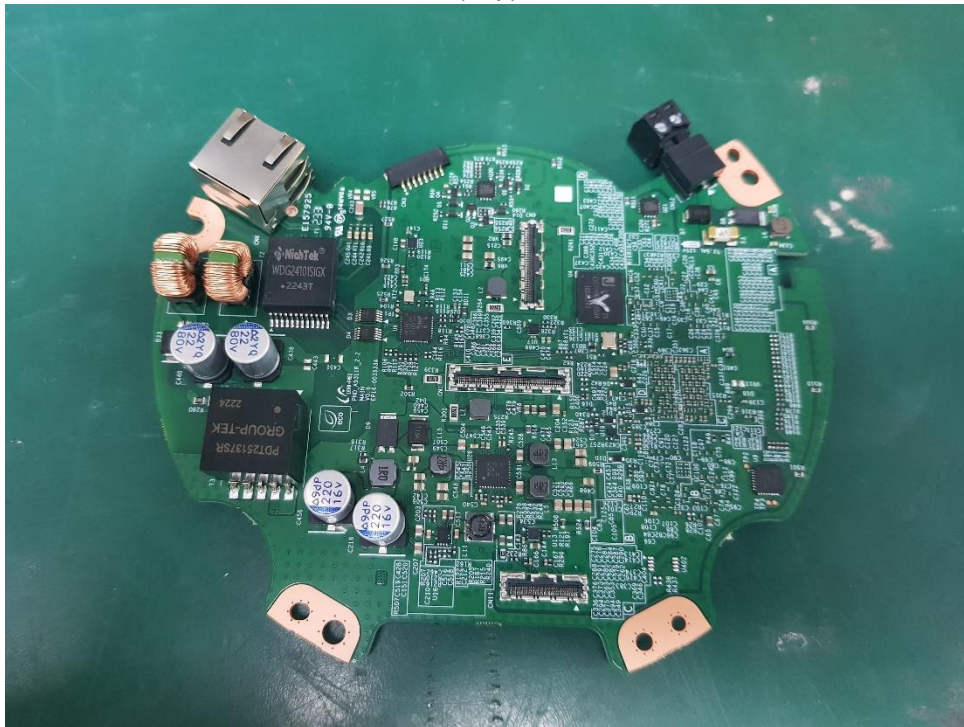
(Internal View)



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EUT Internal View – Main Board

(Top)



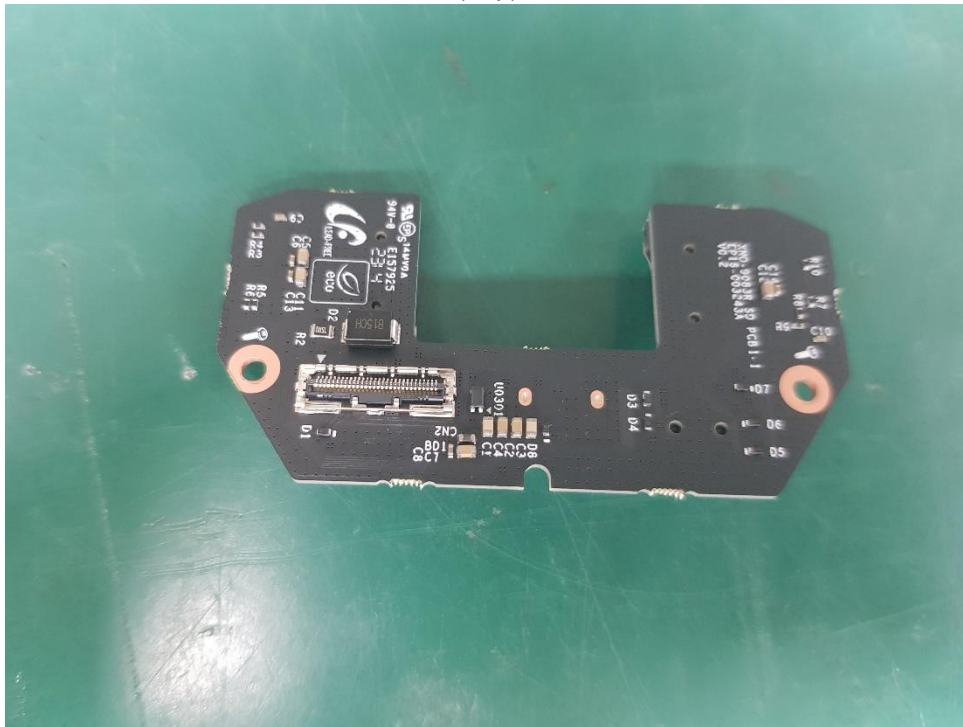
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EUT Internal View – Sub Board 1

(Top)



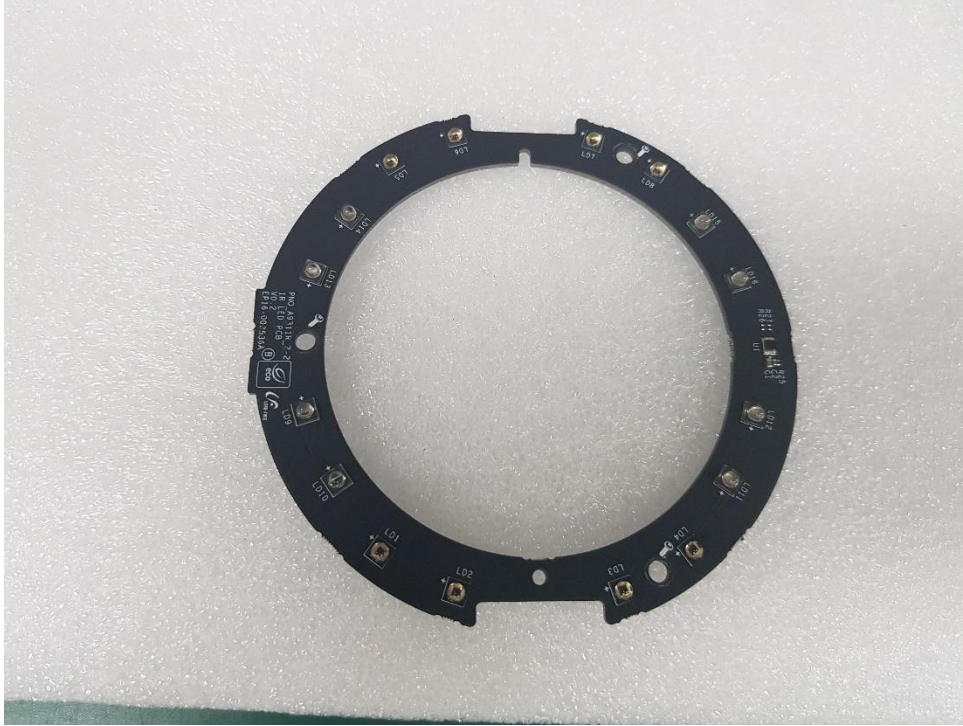
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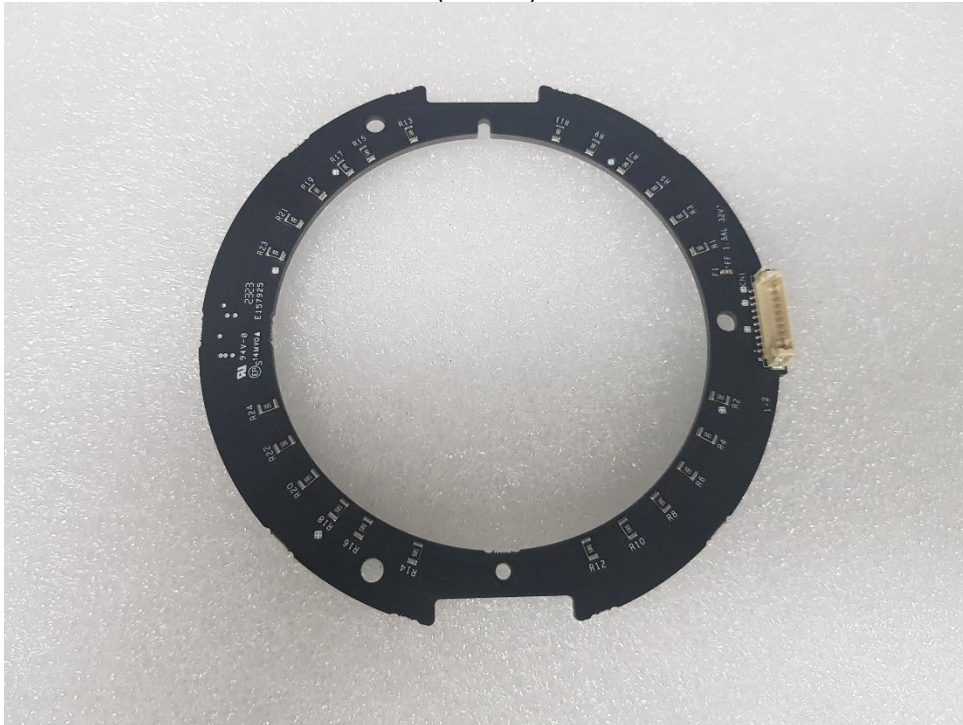
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EUT Internal View – Sub Board 2

(Top)



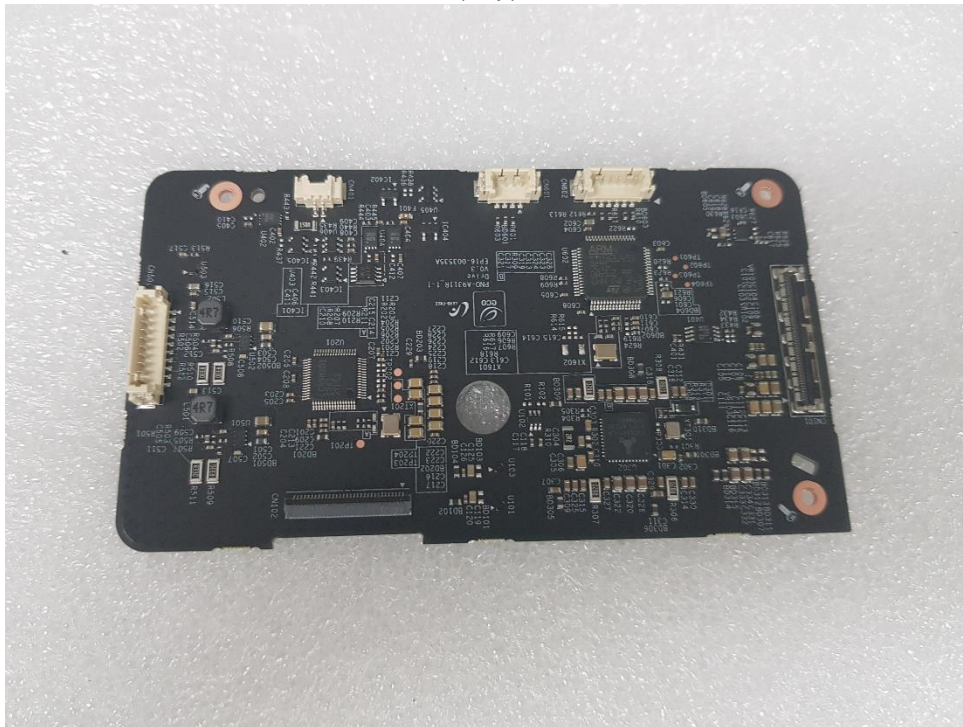
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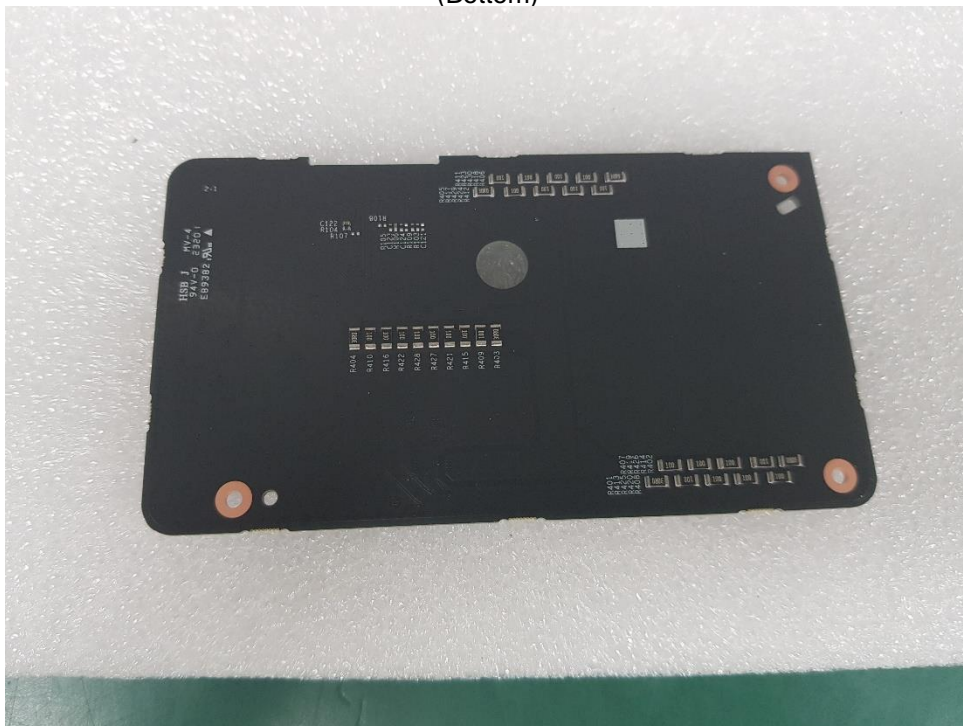
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EUT Internal View – Sub Board 3

(Top)



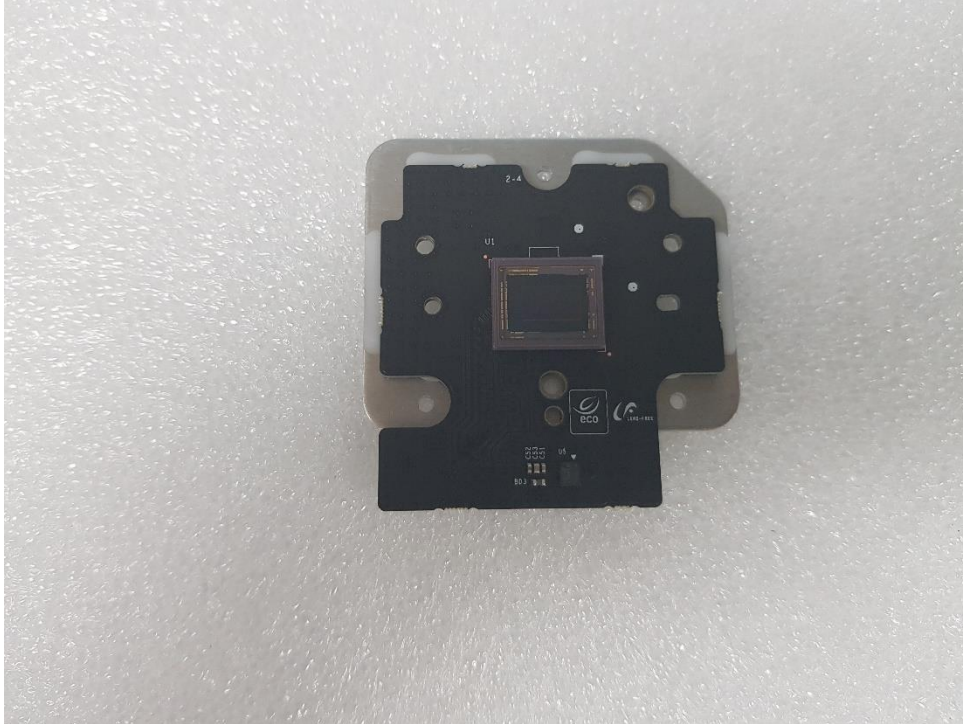
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EUT Internal View – Sub Board 4

(Top)



(Bottom)



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EUT Internal View – Camera Lens

(Top)



(Bottom)



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