



EMC TEST REPORT For VCCI

Test Report No. : KES-EM-20T0622
Date of Issue : Sep. 18, 2020
Product name : NETWORK CAMERA
Model/Type No. : PNM-9000QB
Variant Model : -
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 SECURITY VIETNAM CO.,LTD.
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. 04, 2020
Test date : Aug. 10, 2020 ~ Aug. 11, 2020
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dong Il, Lee
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.

**KES Co., Ltd.**

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Sep. 18, 2020	KES-EM-20T0622	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	None
Resolution	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264: 2MP Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 30fps/25fps(60Hz/50Hz)
NETD	None
Pixel Size	None
Min. Illumination	None
Video Out	HDMI(1920x1080, Single/Quad view)
Video Transmission Distance	None
Lens	
Focal Length (Zoom Ratio)	None
Max. Aperture Ratio	None
Angular Field of View	None
Min. Object Distance	None
Focus Control	None
Lens Type	None
Mount Type	None
Optional Lens	SLA-T1080FA, SLA-T2480A, SLA-T2480VA, SLA-T4680A, SLA-T4680VA
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

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Direction Indicator	None
Day & Night	Auto(Electrical)
Backlight Compensation	BLC, HLC, WDR, SSDR
Wide Dynamic Range	extreme WDR(150dB)
Digital Noise Reduction	SSNR V
Digital Image Stabilization	Support
Defog	Support
Motion Detection	8ea, 8point polygonal zones
Privacy Masking	32ea, polygonal zones - Color: Grey/Green/Red/Blue/Black/White - Mosaic
Gain Control	Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC	Support
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2~1/12,000sec)
Digital PTZ	None
Video Rotation	Flip, Mirror, Hallway view(90°/270°)
Analytics	Defocus detection, Directional detection, Motion detection, Enter/Exit, Tampering, Virtual line
Business Intelligence	None
Serial Interface	None
Alarm I/O	Input 2ea / Output 2ea
Alarm Triggers	Analytics, Network disconnect, Alarm input
Alarm Events	File upload via FTP and e-mail Notification via e-mail SD/SDHC/SDXC at event triggers Alarm output
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	None
IR Illuminator (Optional)	None
Water Removal	None
Auto Tracking	None
Coaxial Protocol	None

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Color Palettes	None
Radiometry	
Temperature detect range	None
Temperature accuracy	None
Temperature detection	None
Additional	None
Network	
Ethernet	RJ-45(10/100/1000BASE-T)
Video Compression	H.265/H.264: Main/Baseline/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), WiseStream II
Video Quality Adjustment	None
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
Streaming	Unicast(20 users) / Multicast Multiple streaming(Up to 10 profiles)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour, LLDP
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)
Application Programming Interface	ONVIF Profile S/T SUNAPI(HTTP API)
General	
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek

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Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 2slot [256 X 2 GB]
Memory	4GB(LPDDR4), 512MB(NAND)
Environmental & Electrical	
Operating Temperature / Humidity	-10°C ~ +45°C(-40°F ~ +113°F) / Less than 95% RH(Non condensing)
Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH
Certification	None
Input Voltage	PoE+(IEEE802.3at, Class4), 12VDC
Power Consumption	PoE : (Typical) 16.70W (Max) 22.00W DC : (Typical) 14.00W (Max) 19.00W
Mechanical	
Color / Material	White / Plastic
RAL Code	RAL9003
Product dimensions / weight	200(W)x37(H)x146(D)mm
Conduit hole	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)	None
Observe (63PPM/ 19PPF)	None
Recognize (125PPM/ 38PPF)	None
Identify (250PPM/ 76PPF)	None

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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 ☒ 100 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	PNM-9000QB	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	EUT



1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	P95G001	8KM8HT2	DELL	-
Notebook Adaptor	LA65NS2-01	-	LITE-ON TECHNOLOGY(CHANG ZHOU)CO.,LTD.	-
CAMERA 1	SLA-T4680V		HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	-
CAMERA 2	SLA-T2480V		HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	-
CAMERA 3	SLA-T4680		HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	-
CAMERA 4	SLA-T2480		HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	-
CAMERA 5	SLA-T1080F		HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	-
Micro SD Card 1	-	-	SanDisk	8 GB
Micro SD Card 2	-	-	SanDisk	16 GB
PoE Adaptor	PT-PSE109GBRO-AH	PT1850221049	Dongguan PROCET Network Technology Co.,Ltd	-
DC Adaptor	2ACB022F	-	Channel Well Technology (Guangzhou) Co.,Ltd.	-
Alarm	-	-	-	-
Alarm	-	-	-	-
Speaker	BR1000A Cuve Black 2	-	DONGGUAN EDIFIER TECHNOLOGY Co., Ltd	-
MIC	MP1000	-	-	-
Smart Phone	LG-SU760	108KPQJ0186212	LG	-
Monitor	SMT-2232	C95V67VF900025B	Weihai Daewoo Electronics Co., Ltd.	-



1.6 External I/O Cabling

■ DC_CAMERA(1,2,3,4)

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45	Notebook	PoE	3.0	S
	SLOT	Micro SD Card 1	SLOT	-	-
	SLOT	Micro SD Card 2	SLOT	-	-
	LAN(6Pin)	CAMERA 1	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 2	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 3	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 4	LAN(6Pin)	10.0	S
	HDMI	Monitor	HDMI	1.5	S
	3.5 mm	Speaker	3.5 mm	1.4	U
	3.5 mm	MIC	3.5 mm	1.6	U
	Alarm in	Alarm	Alarm out	3.0	U
	Alarm out	Alarm	Alarm in	3.0	U
Notebook	3.5 mm	Smart Phone	3.5 mm	1.0	U

* Unshielded=U, Shielded=S



■ DC_CAMERA(2,3,4,5)

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45	Notebook	PoE	3.0	S
	SLOT	Micro SD Card 1	SLOT	-	-
	SLOT	Micro SD Card 2	SLOT	-	-
	LAN(6Pin)	CAMERA 2	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 3	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 4	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 5	LAN(6Pin)	10.0	S
	HDMI	Monitor	HDMI	1.5	S
	3.5 mm	Speaker	3.5 mm	1.4	U
	3.5 mm	MIC	3.5 mm	1.6	U
	Alarm in	Alarm	Alarm out	3.0	U
	Alarm out	Alarm	Alarm in	3.0	U
Notebook	3.5 mm	Smart Phone	3.5 mm	1.0	U

* Unshielded=U, Shielded=S



■ PoE_CAMERA(1,2,3,4)

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45(PoE)	PoE Adaptor	PoE	5.0	S
	SLOT	Micro SD Card 1	SLOT	-	-
	SLOT	Micro SD Card 2	SLOT	-	-
	LAN(6Pin)	CAMERA 1	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 2	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 3	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 4	LAN(6Pin)	10.0	S
	HDMI	Monitor	HDMI	1.5	S
	3.5 mm	Speaker	3.5 mm	1.4	U
	3.5 mm	MIC	3.5 mm	1.6	U
	Alarm in	Alarm	Alarm out	3.0	U
	Alarm out	Alarm	Alarm in	3.0	U
Notebook	3.5 mm	Smart Phone	3.5 mm	1.0	U
	RJ-45	PoE Adaptor	RJ-45	5.0	S

* Unshielded=U, Shielded=S



■ PoE_CAMERA(2,3,4,5)

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45(PoE)	PoE Adaptor	PoE	5.0	S
	SLOT	Micro SD Card 1	SLOT	-	-
	SLOT	Micro SD Card 2	SLOT	-	-
	LAN(6Pin)	CAMERA 2	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 3	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 4	LAN(6Pin)	10.0	S
	LAN(6Pin)	CAMERA 5	LAN(6Pin)	10.0	S
	HDMI	Monitor	HDMI	1.5	S
	3.5 mm	Speaker	3.5 mm	1.4	U
	3.5 mm	MIC	3.5 mm	1.6	U
	Alarm in	Alarm	Alarm out	3.0	U
	Alarm out	Alarm	Alarm in	3.0	U
Notebook	3.5 mm	Smart Phone	3.5 mm	1.0	U
	RJ-45	PoE Adaptor	RJ-45	5.0	S

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

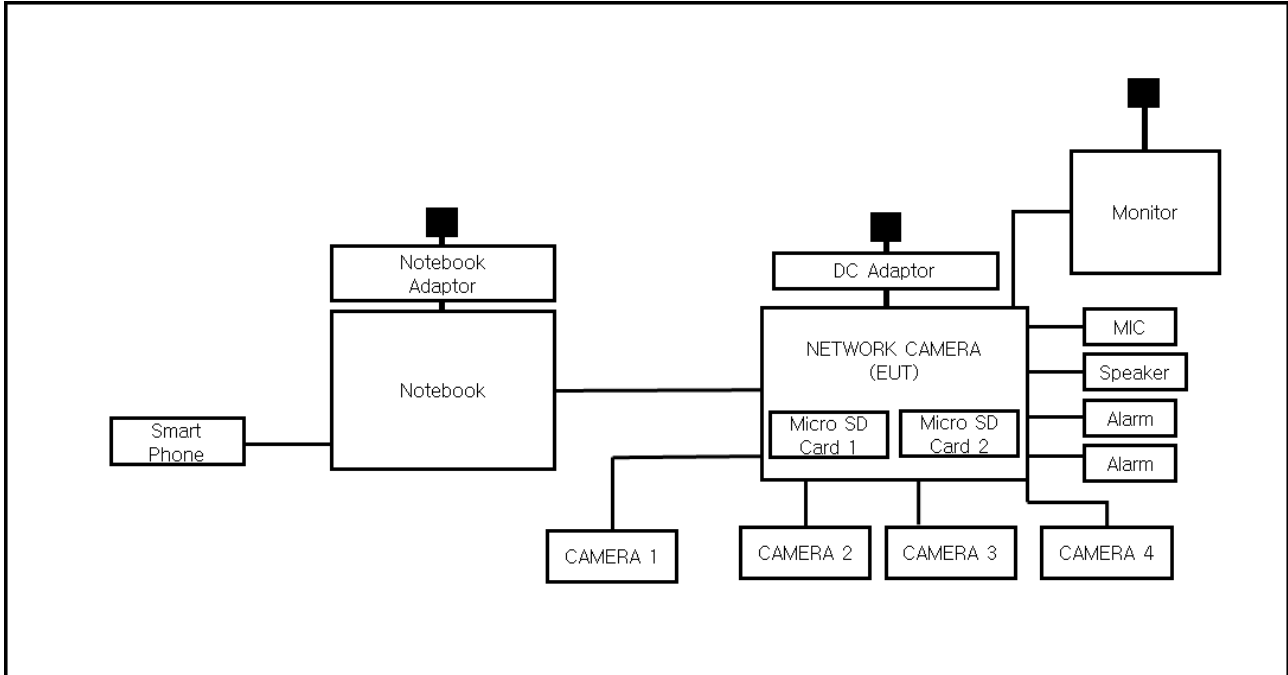
Test mode	operating
Operation mode	Monitoring EUT Using Web Viewer, Ping Test

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

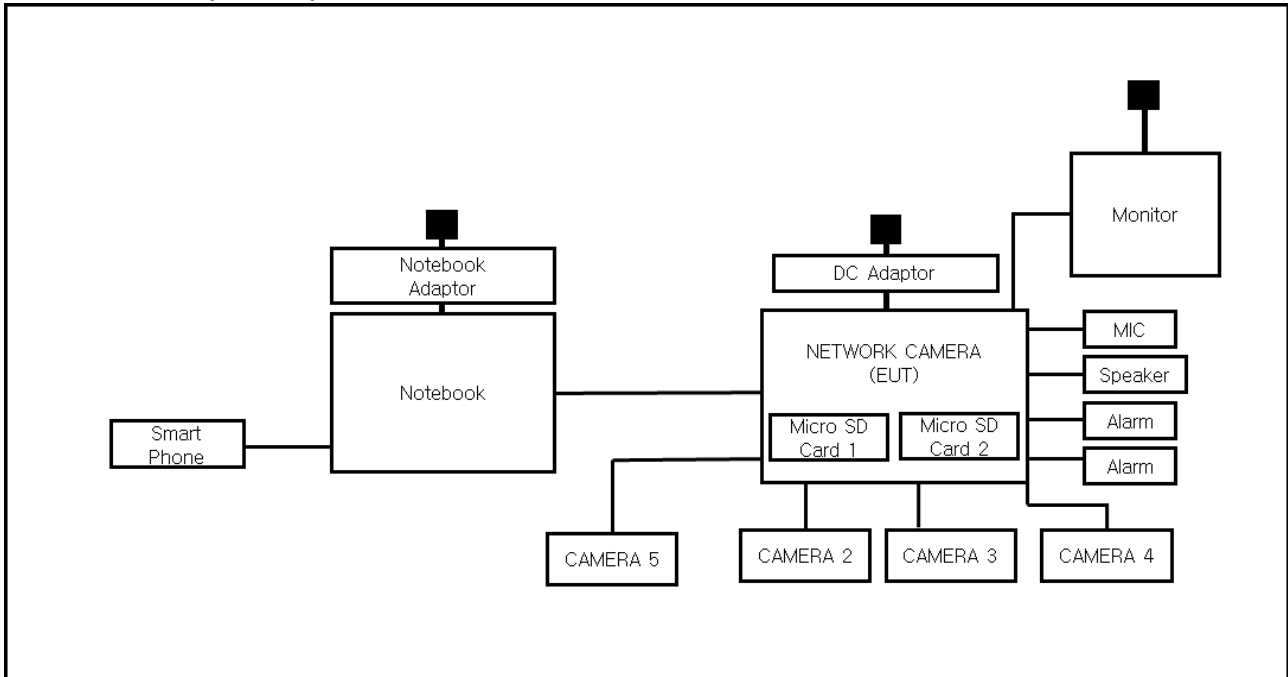
1.8 Configuration

■ AC Main
 □ DC Main

■ DC_CAMERA(1,2,3,4)

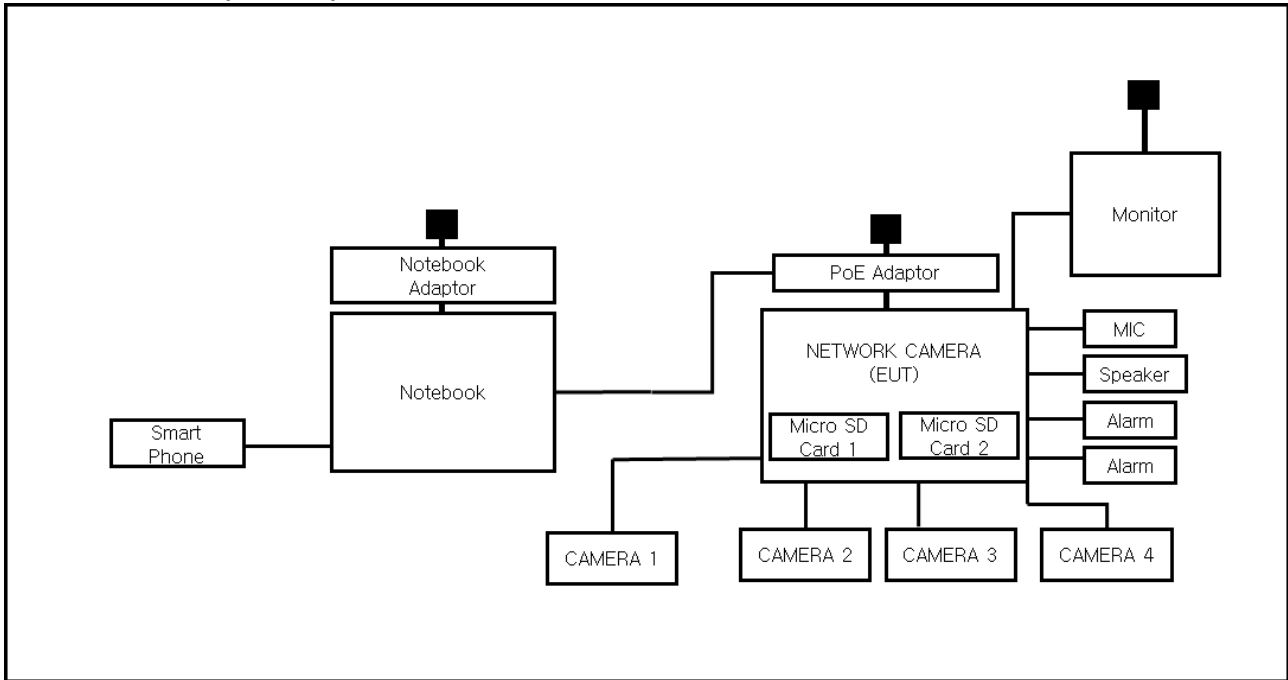


■ DC_CAMERA(2,3,4,5)

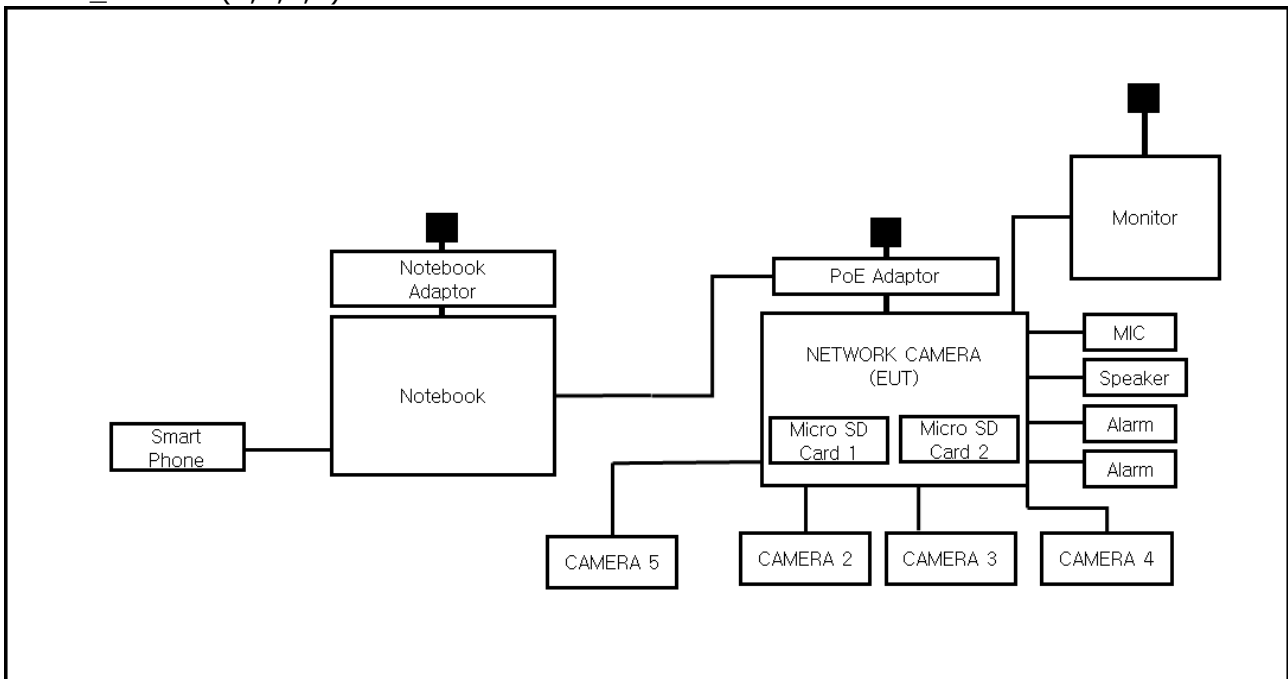


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■ PoE_CAMERA(1,2,3,4)



■ PoE_CAMERA(2,3,4,5)



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, Yeosu-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

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 61547 :2009

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☐ 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 C63.4-2009 | | |
| ☐ IC Regulation ICES-003 : 2016 | | |
| ☐ CAN/CSA CISPR 22-10 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2014 | | |
|
☐ RE- Directive 2014/53/EU | | |
| ☐ EN 301 489-1 V1.9.2 | | |
| ☐ Equipment for fixed use | | |
| ☐ Equipment for vehicular use | | |
| ☐ Equipment for portable use | | |
| ☐ EN 301 489-3 V1.6.1 | | |
| ☐ EN 301 489-17 V2.2.1 | | |
| ☐ EN 60945:2002 | | |

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2.1 Conducted Emissions Mains Power Ports

Test Date

Aug. 10, 2020

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	01, 20, 2021
☒	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: 25,0 °C
Relative Humidity: 56,5 % 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.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Aug. 10, 2020

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	ESR3	R & S	101783	100552	01, 20, 2021
☒	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
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	01, 07, 2021
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	01, 07, 2021
☒	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 10, 2021
☐	CDN	CDNS502A	TESEQ	40431	01, 02, 2021

Test Conditions

Temperature: 25,0 °C
Relative Humidity: 56,5 % 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.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Aug. 10, 2020

Test Location

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

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, 01, 2021
☒	AMPLIFIER	SCU 01	R & S	100603	11, 25, 2020
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 29, 2020
☒	ATTENUATOR	8491A	HP	32173	03, 10, 2021

Test Conditions

Temperature: 23,3 °C
Relative Humidity: 50,9 % 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

Remarks

See Appendix A for test data.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Aug. 11, 2020

Test Location

SEMI ANECHOIC CHAMBER #3

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	ESR7	R & S	101190	08, 05, 2021
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 20, 2021
☐	ATTENUATOR	8491A	HP	35496	03, 10, 2021
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2021

Test Conditions

Temperature: 23,3 °C
Relative Humidity: 54,8 % 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

Remarks

See Appendix A for test data.

APPENDIX A – TEST DATA

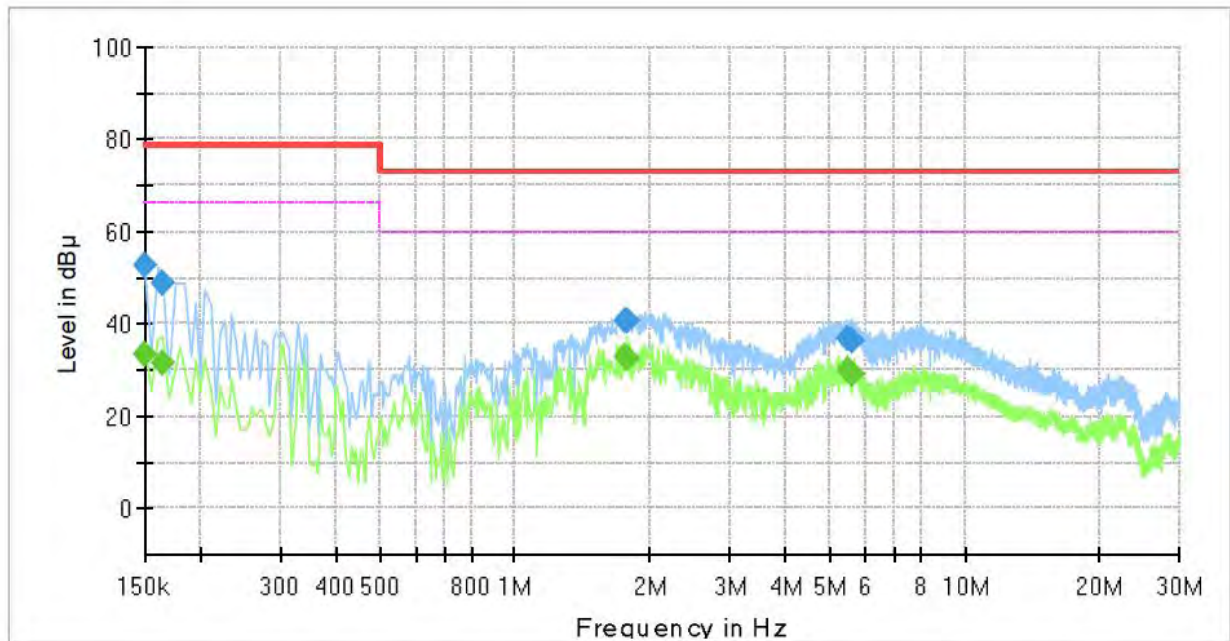
Conducted Emissions at Mains Power Ports

■ DC_CAMERA(1,2,3,4)

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	PNM-9000QB
Phase:	L1
Mode:	DC_CAMERA(1,2,3,4)
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	33.56	66.00	32.44	1000.0	9.000	L1	19.5
0.150000	52.65	---	79.00	26.35	1000.0	9.000	L1	19.5
0.165000	---	31.62	66.00	34.38	1000.0	9.000	L1	19.5
0.165000	49.07	---	79.00	29.93	1000.0	9.000	L1	19.5
1.760000	---	33.13	60.00	26.87	1000.0	9.000	L1	20.2
1.760000	40.81	---	73.00	32.19	1000.0	9.000	L1	20.2
1.785000	---	32.59	60.00	27.41	1000.0	9.000	L1	20.2
1.785000	40.65	---	73.00	32.35	1000.0	9.000	L1	20.2
5.475000	---	30.22	60.00	29.78	1000.0	9.000	L1	19.5
5.475000	36.91	---	73.00	36.09	1000.0	9.000	L1	19.5
5.600000	---	29.21	60.00	30.79	1000.0	9.000	L1	19.6
5.600000	36.17	---	73.00	36.83	1000.0	9.000	L1	19.6

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NEUTRAL LINE

Common Information

Test Description:

Model No.:

Phase:

Mode:

Operator Name:

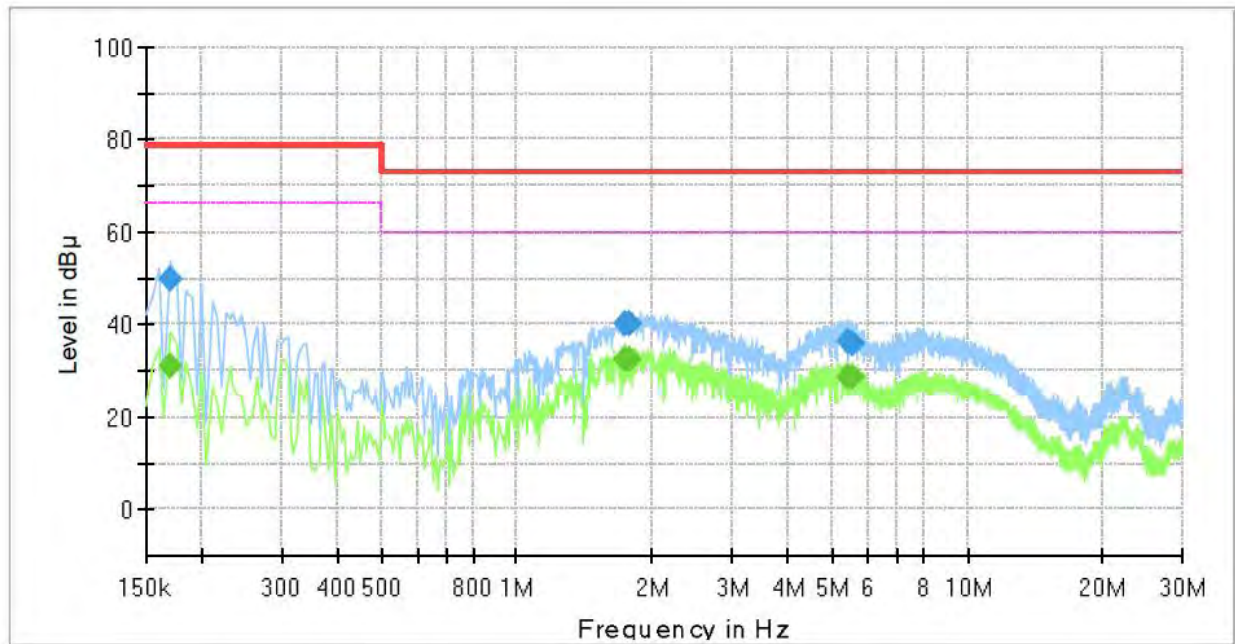
Conducted Emission

PNM-9000QB

N

DC_CAMERA(1,2,3,4)

KES



Final_Result

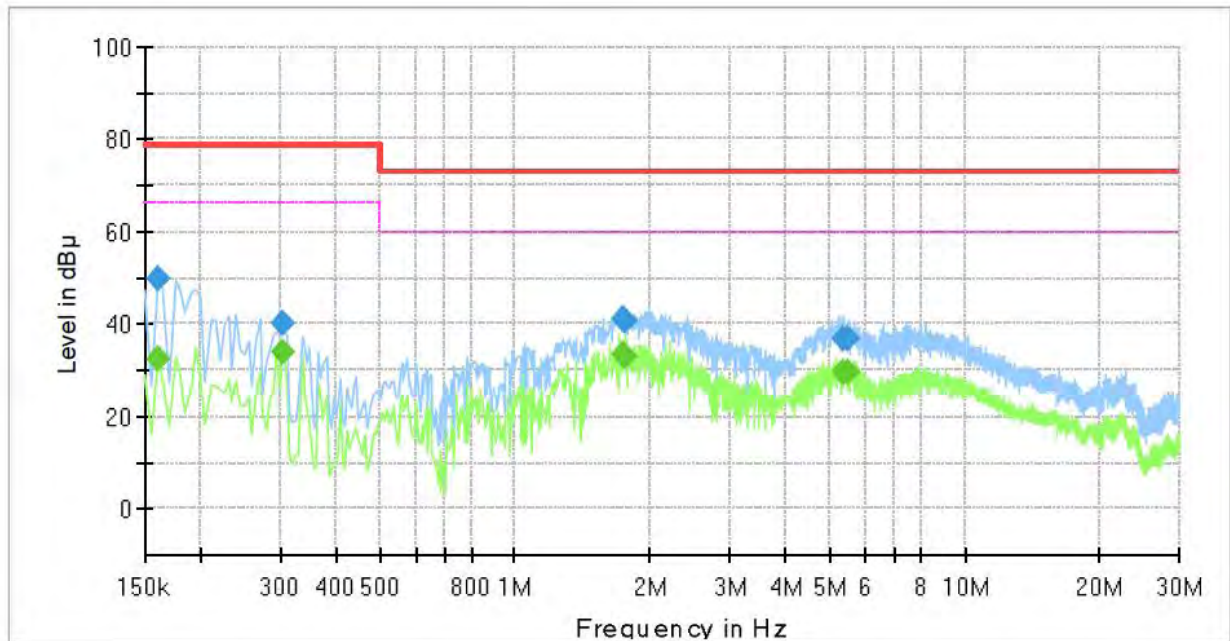
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.170000	---	31.02	66.00	34.98	1000.0	9.000	N	19.5
0.170000	49.82	---	79.00	29.18	1000.0	9.000	N	19.5
1.740000	---	32.66	60.00	27.34	1000.0	9.000	N	20.2
1.740000	40.41	---	73.00	32.59	1000.0	9.000	N	20.2
1.780000	---	32.52	60.00	27.48	1000.0	9.000	N	20.2
1.780000	40.30	---	73.00	32.70	1000.0	9.000	N	20.2
5.425000	---	28.82	60.00	31.18	1000.0	9.000	N	19.6
5.425000	36.10	---	73.00	36.90	1000.0	9.000	N	19.6
5.575000	---	28.46	60.00	31.54	1000.0	9.000	N	19.6
5.575000	35.79	---	73.00	37.21	1000.0	9.000	N	19.6

■ DC_CAMERA(2,3,4,5)

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	PNM-9000QB
Phase:	L1
Mode:	DC_CAMERA(2,3,4,5)
Operator Name:	KES



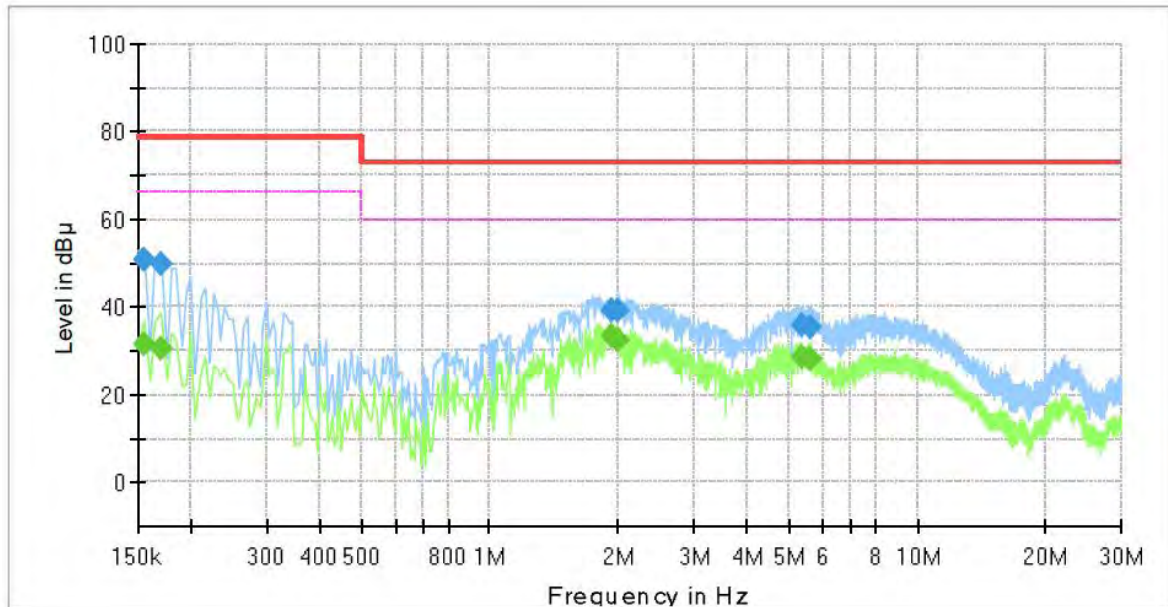
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	32.45	66.00	33.55	1000.0	9.000	L1	19.5
0.160000	49.72	---	79.00	29.28	1000.0	9.000	L1	19.5
0.305000	---	33.88	66.00	32.12	1000.0	9.000	L1	19.6
0.305000	40.28	---	79.00	38.72	1000.0	9.000	L1	19.6
1.740000	---	33.22	60.00	26.78	1000.0	9.000	L1	20.2
1.740000	41.03	---	73.00	31.97	1000.0	9.000	L1	20.2
1.765000	---	32.94	60.00	27.06	1000.0	9.000	L1	20.2
1.765000	40.57	---	73.00	32.43	1000.0	9.000	L1	20.2
5.365000	---	29.43	60.00	30.57	1000.0	9.000	L1	19.5
5.365000	36.61	---	73.00	36.39	1000.0	9.000	L1	19.5
5.485000	---	29.79	60.00	30.21	1000.0	9.000	L1	19.5
5.485000	36.86	---	73.00	36.14	1000.0	9.000	L1	19.5

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	PNM-9000QB
Phase:	N
Mode:	DC_CAMERA(2,3,4,5)
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	---	31.42	66.00	34.58	1000.0	9.000	N	19.4
0.155000	50.79	---	79.00	28.21	1000.0	9.000	N	19.4
0.170000	---	30.49	66.00	35.51	1000.0	9.000	N	19.5
0.170000	49.76	---	79.00	29.24	1000.0	9.000	N	19.5
1.935000	---	33.30	60.00	26.70	1000.0	9.000	N	20.3
1.935000	38.99	---	73.00	34.01	1000.0	9.000	N	20.3
2.000000	---	32.25	60.00	27.75	1000.0	9.000	N	20.3
2.000000	39.16	---	73.00	33.84	1000.0	9.000	N	20.3
5.340000	---	28.65	60.00	31.35	1000.0	9.000	N	19.6
5.340000	35.88	---	73.00	37.12	1000.0	9.000	N	19.6
5.615000	---	28.14	60.00	31.86	1000.0	9.000	N	19.6
5.615000	35.33	---	73.00	37.67	1000.0	9.000	N	19.6

◆ 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))

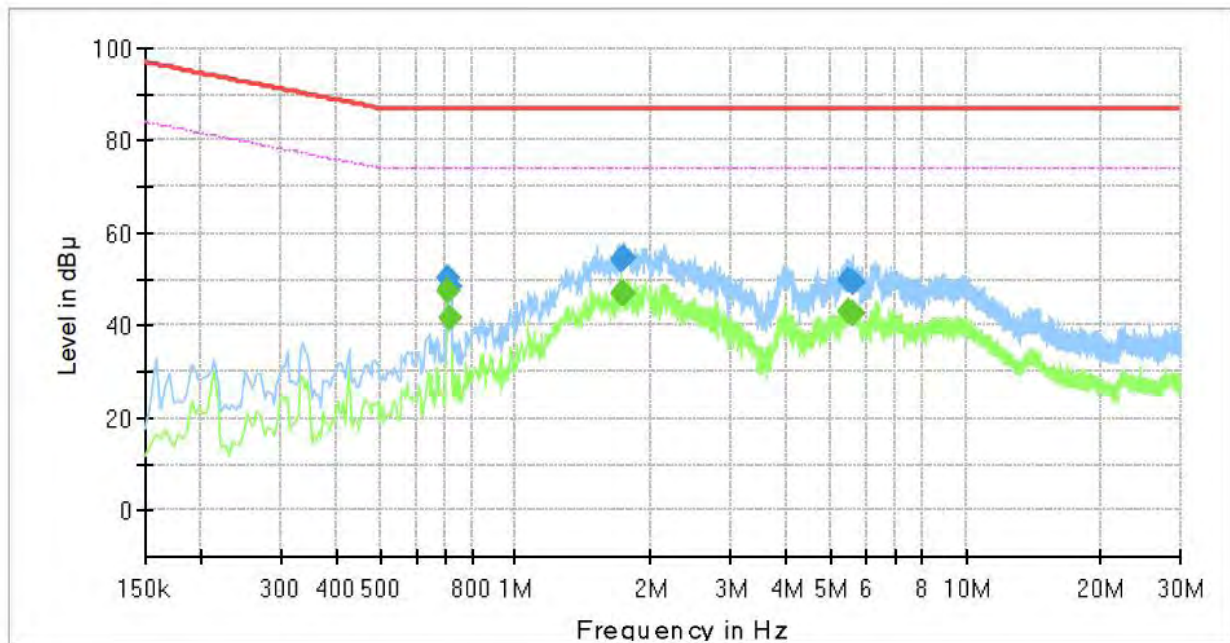
Conducted Emissions at Telecommunication Ports

■ DC_CAMERA(1,2,3,4)

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNM-9000QB
Mode :	DC_CAMERA(1,2,3,4)
Speed :	1 000 Mbps
Operator Name:	KES



Final Result

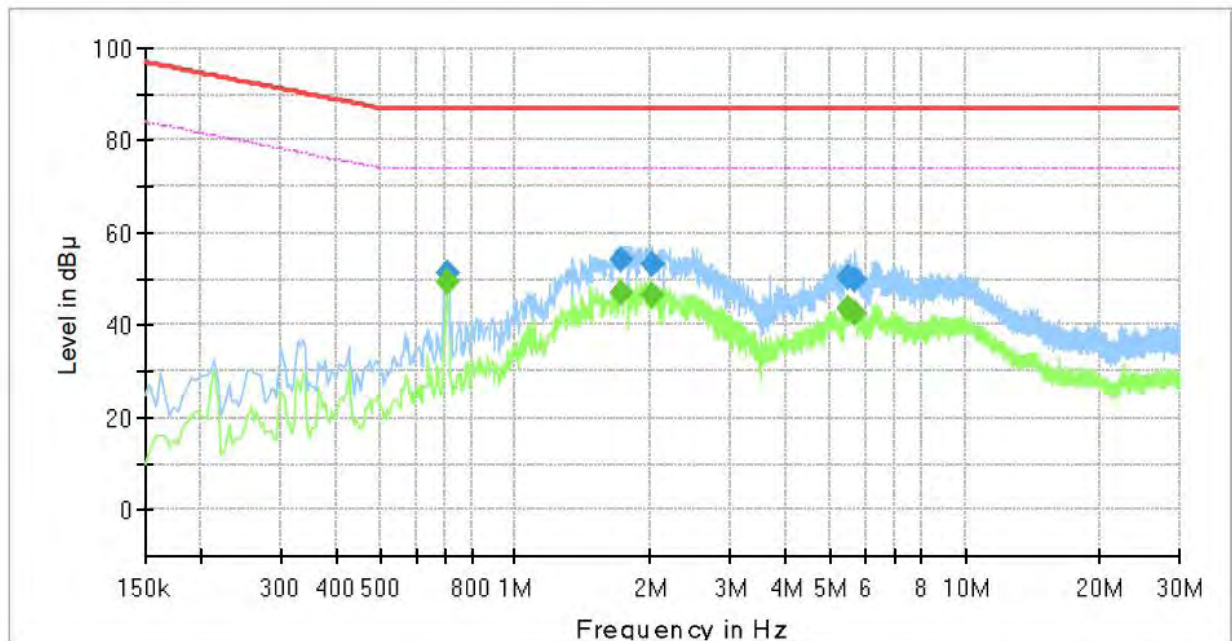
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.710000	---	47.28	74.00	26.72	1000.0	9.000	Single Line	19.9
0.710000	50.28	---	87.00	36.72	1000.0	9.000	Single Line	19.9
0.718000	---	41.72	74.00	32.28	1000.0	9.000	Single Line	19.9
0.718000	48.35	---	87.00	38.65	1000.0	9.000	Single Line	19.9
1.722000	---	46.78	74.00	27.22	1000.0	9.000	Single Line	20.1
1.722000	54.16	---	87.00	32.84	1000.0	9.000	Single Line	20.1
1.746000	---	47.16	74.00	26.84	1000.0	9.000	Single Line	20.1
1.746000	54.52	---	87.00	32.48	1000.0	9.000	Single Line	20.1
5.494000	---	42.93	74.00	31.07	1000.0	9.000	Single Line	19.4
5.494000	49.97	---	87.00	37.03	1000.0	9.000	Single Line	19.4
5.626000	---	42.57	74.00	31.43	1000.0	9.000	Single Line	19.4
5.626000	49.38	---	87.00	37.62	1000.0	9.000	Single Line	19.4

■ DC_CAMERA(2,3,4,5)

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNM-9000QB
Mode :	DC_CAMERA(2,3,4,5)
Speed :	1 000 Mbps
Operator Name:	KES



Final Result

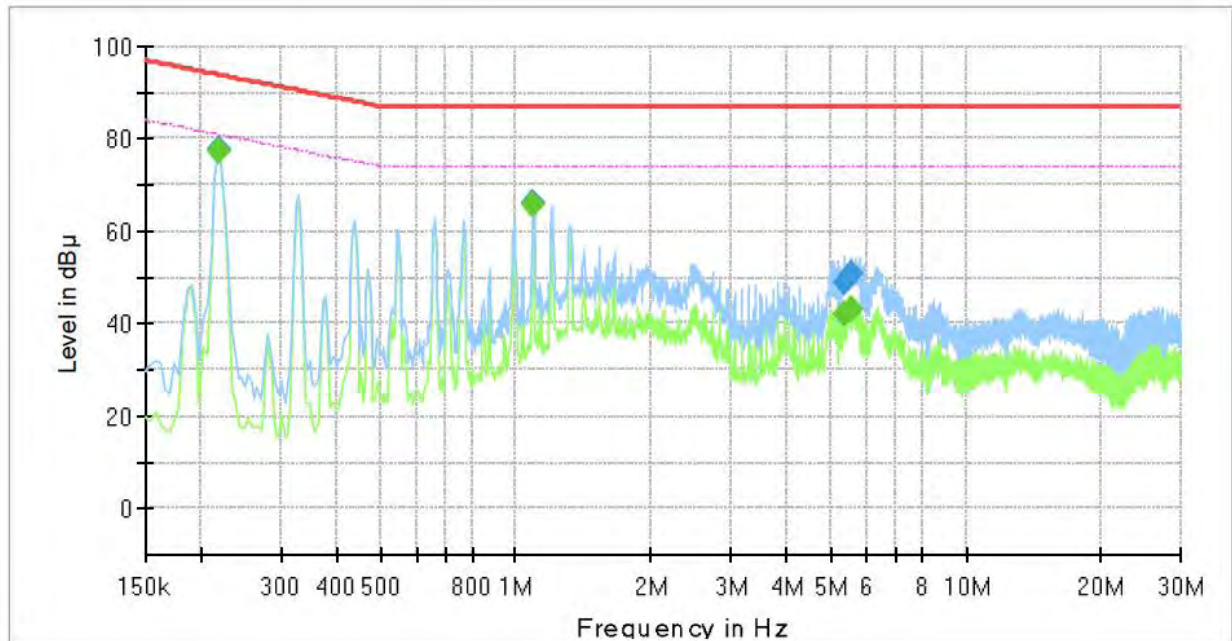
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.706000	---	49.23	74.00	24.77	1000.0	9.000	Single Line	19.9
0.706000	51.13	---	87.00	35.87	1000.0	9.000	Single Line	19.9
1.718000	---	46.94	74.00	27.06	1000.0	9.000	Single Line	20.1
1.718000	54.17	---	87.00	32.83	1000.0	9.000	Single Line	20.1
2.010000	---	46.47	74.00	27.53	1000.0	9.000	Single Line	20.2
2.010000	53.33	---	87.00	33.67	1000.0	9.000	Single Line	20.2
5.502000	---	43.53	74.00	30.47	1000.0	9.000	Single Line	19.4
5.502000	50.32	---	87.00	36.68	1000.0	9.000	Single Line	19.4
5.682000	---	42.79	74.00	31.21	1000.0	9.000	Single Line	19.4
5.682000	49.78	---	87.00	37.22	1000.0	9.000	Single Line	19.4

■ PoE_CAMERA(1,2,3,4)

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNM-9000QB
Mode :	PoE_CAMERA(1,2,3,4)
Speed :	1 000 Mbps
Operator Name:	KES



Final Result

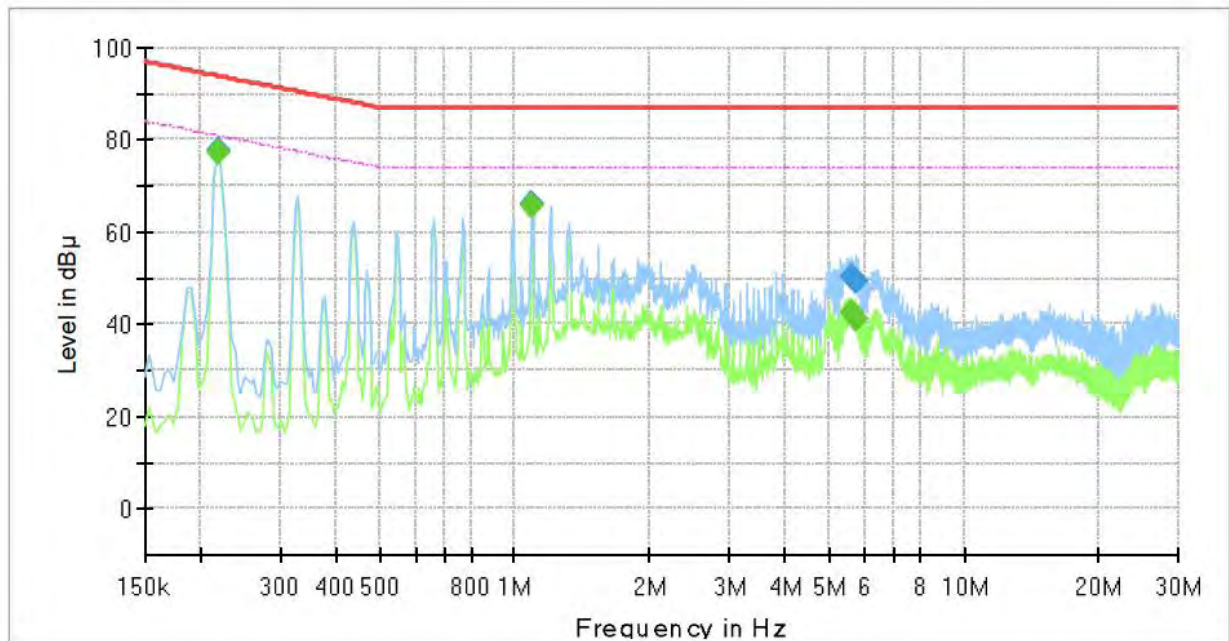
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.218000	---	77.47	80.89	3.42	1000.0	9.000	Single Line	19.5
0.218000	77.58	---	93.89	16.31	1000.0	9.000	Single Line	19.5
1.094000	---	65.59	74.00	8.41	1000.0	9.000	Single Line	20.0
1.094000	66.24	---	87.00	20.76	1000.0	9.000	Single Line	20.0
5.358000	---	41.94	74.00	32.06	1000.0	9.000	Single Line	19.4
5.358000	49.09	---	87.00	37.91	1000.0	9.000	Single Line	19.4
5.550000	---	43.08	74.00	30.92	1000.0	9.000	Single Line	19.4
5.550000	50.69	---	87.00	36.31	1000.0	9.000	Single Line	19.4

■ PoE_CAMERA(2,3,4,5)

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNM-9000QB
Mode :	PoE_CAMERA(2,3,4,5)
Speed :	1 000 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.218000	---	77.49	80.89	3.40	1000.0	9.000	Single Line	19.5
0.218000	77.60	---	93.89	16.29	1000.0	9.000	Single Line	19.5
1.094000	---	65.61	74.00	8.39	1000.0	9.000	Single Line	20.0
1.094000	66.31	---	87.00	20.69	1000.0	9.000	Single Line	20.0
5.638000	---	42.74	74.00	31.26	1000.0	9.000	Single Line	19.4
5.638000	50.45	---	87.00	36.55	1000.0	9.000	Single Line	19.4
5.754000	---	41.29	74.00	32.71	1000.0	9.000	Single Line	19.4
5.754000	49.32	---	87.00	37.68	1000.0	9.000	Single Line	19.4

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



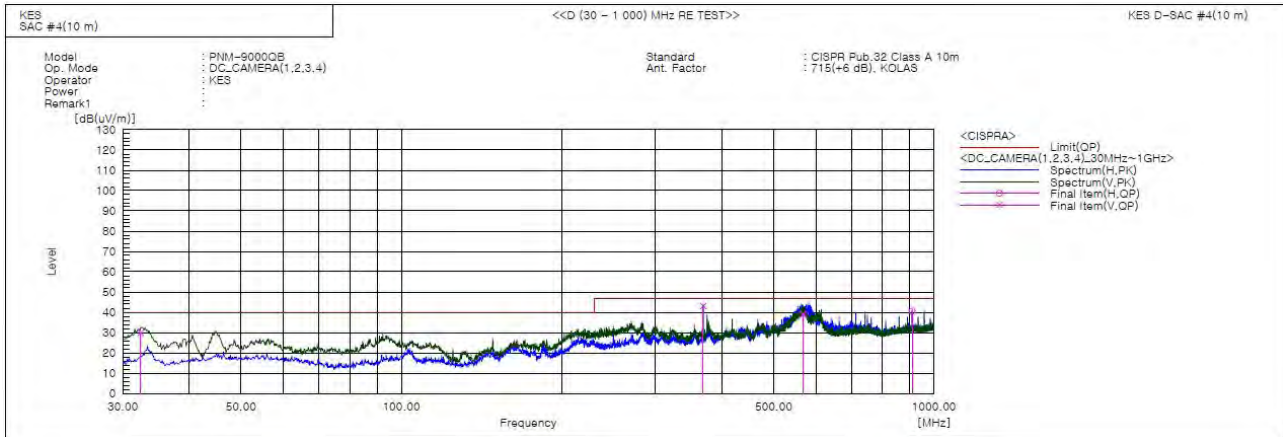
KES Co., Ltd.

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Radiated Electric Field Emissions(Below 1 GHz)

■ DC_CAMERA(1,2,3,4)



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	32.425	V	54.9	-25.0	29.9	40.0	10.1	178.0	255.0	
2	368.651	V	59.0	-15.9	43.1	47.0	3.9	162.0	31.0	
3	568.350	V	50.0	-11.0	39.0	47.0	8.0	142.0	16.0	
4	909.305	H	46.2	-5.6	40.6	47.0	6.4	352.0	333.0	

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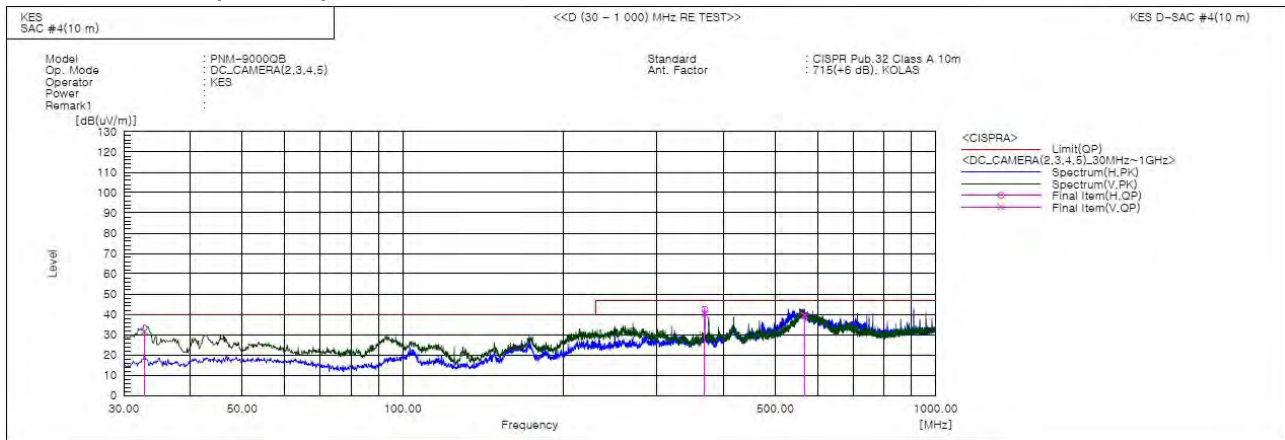


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■ DC_CAMERA(2,3,4,5)



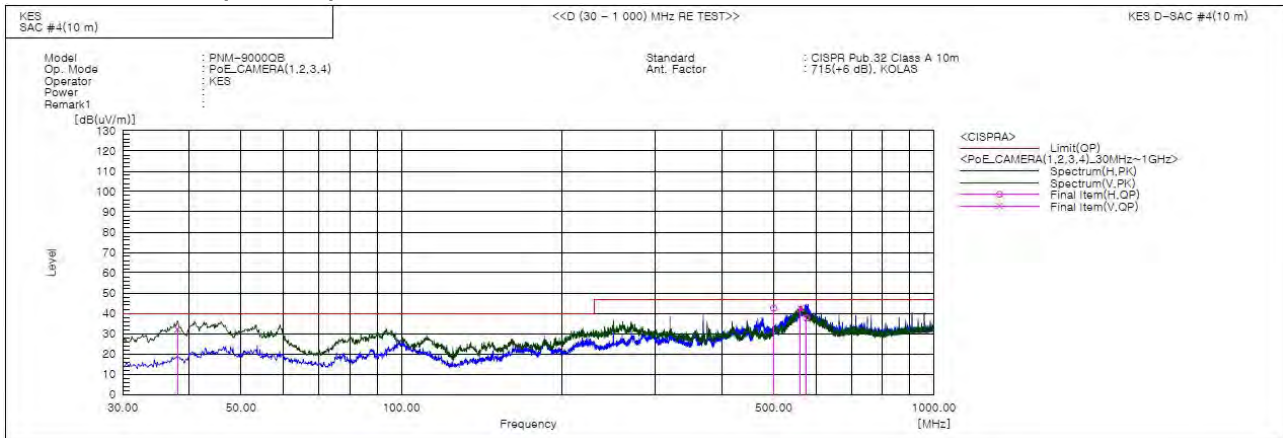
Final Result

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	32.789	V	56.6	-24.9	31.7	40.0	8.3	145.0	191.0	
2	368.651	V	55.9	-15.9	40.0	47.0	7.0	100.0	23.0	
3	368.651	H	58.4	-15.9	42.5	47.0	4.5	207.0	129.0	
4	566.895	V	50.5	-11.1	39.4	47.0	7.6	116.0	188.0	

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■ PoE_CAMERA(1,2,3,4)



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	38.003	V	56.0	-23.9	32.1	40.0	7.9	122.0	294.0	
2	499.965	H	55.3	-12.8	42.5	47.0	4.5	152.0	282.0	
3	561.318	V	53.7	-11.4	42.3	47.0	4.7	100.0	12.0	
4	576.110	H	48.2	-10.6	37.6	47.0	9.4	200.0	35.0	

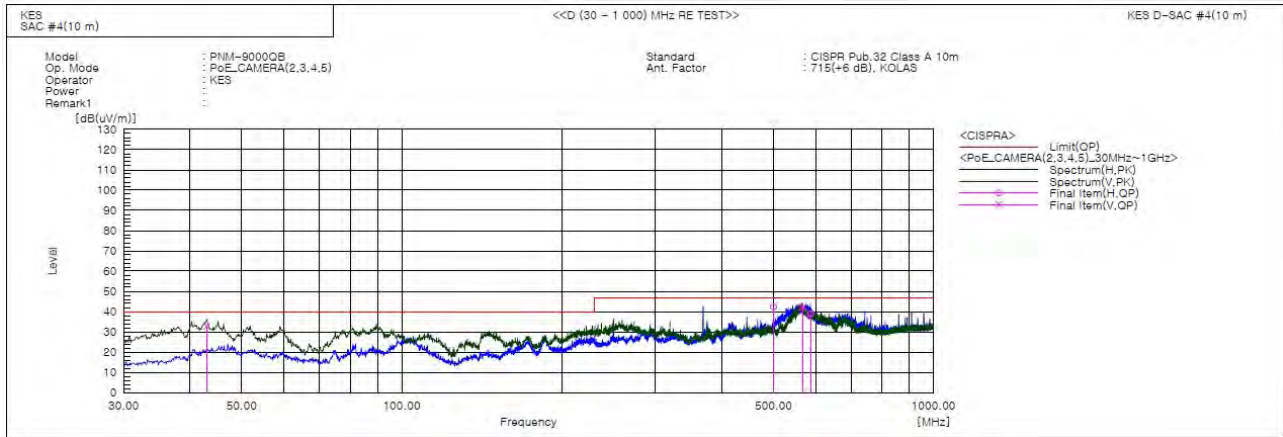


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■ PoE_CAMERA(2,3,4,5)



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	42.974	V	54.8	-22.1	32.7	40.0	7.3	144.0	244.0	
2	499.965	H	55.1	-12.8	42.3	47.0	4.7	209.0	267.0	
3	566.895	V	53.3	-11.1	42.2	47.0	4.8	142.0	9.0	
4	586.901	H	48.9	-10.1	38.8	47.0	8.2	241.0	45.0	

◆ 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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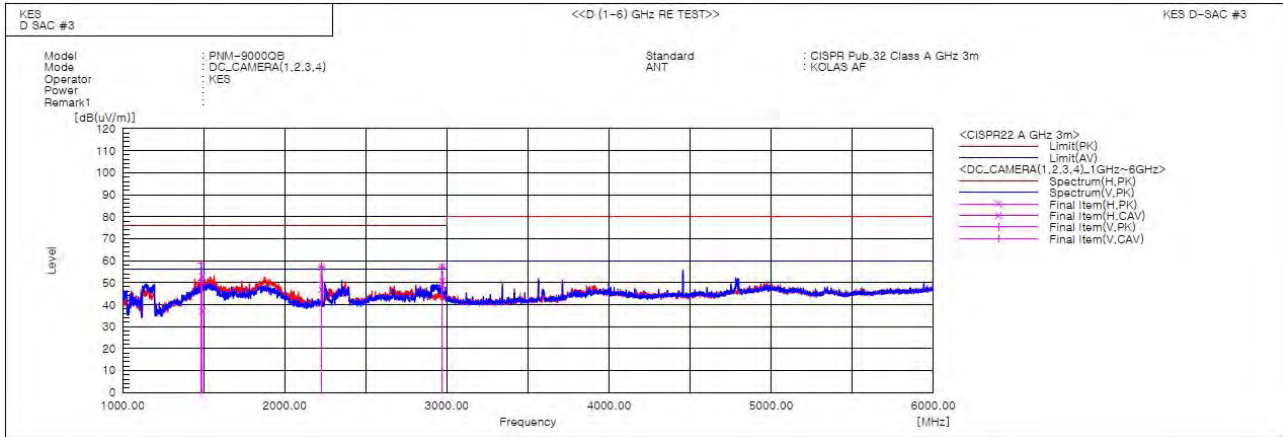
KES Co., Ltd.

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Report No.:
KES-EM-20T0622
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Radiated Electric Field Emissions(Above 1 GHz)

■ DC_CAMERA(1,2,3,4)



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	1484.780	V	65.5	57.8	-6.7	58.8	51.1	76.0	56.0	17.2	4.9	100.0	322.1	
2	1489.749	H	59.4	43.8	-6.7	52.7	37.1	76.0	56.0	23.3	18.9	100.0	45.0	
3	2227.550	V	58.2	51.2	-1.2	57.0	50.0	76.0	56.0	19.0	6.0	100.0	245.7	
4	2227.960	H	58.0	48.0	-1.2	56.8	46.8	76.0	56.0	19.2	9.2	100.0	52.2	
5	2969.820	H	55.8	49.2	1.5	57.3	50.7	76.0	56.0	18.7	5.3	100.0	43.8	
6	2969.890	V	55.5	46.4	1.5	57.0	47.9	76.0	56.0	19.0	8.1	100.0	352.6	

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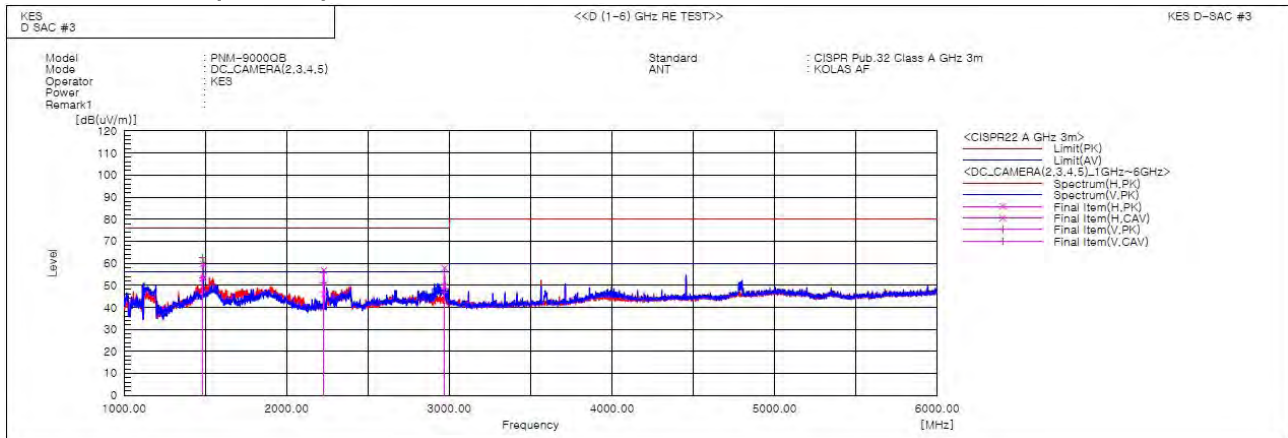


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KES-EM-20T0622
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DC_CAMERA(2,3,4,5)



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	1485.000	V	69.3	59.9	-6.7	62.6	53.2	76.0	56.0	13.4	2.8	100.0	297.3	
2	1485.110	H	66.4	59.8	-6.7	59.7	53.1	76.0	56.0	16.3	2.9	100.0	24.5	
3	2228.000	V	57.0	52.0	-1.2	55.8	50.8	76.0	56.0	20.2	5.2	100.0	9.7	
4	2228.360	H	58.0	47.1	-1.2	56.8	45.9	76.0	56.0	19.2	10.1	100.0	85.7	
5	2968.000	V	54.6	45.3	1.5	56.1	46.8	76.0	56.0	19.9	9.2	100.0	26.5	
6	2970.100	H	56.3	48.0	1.5	57.8	49.5	76.0	56.0	18.2	6.5	100.0	337.3	

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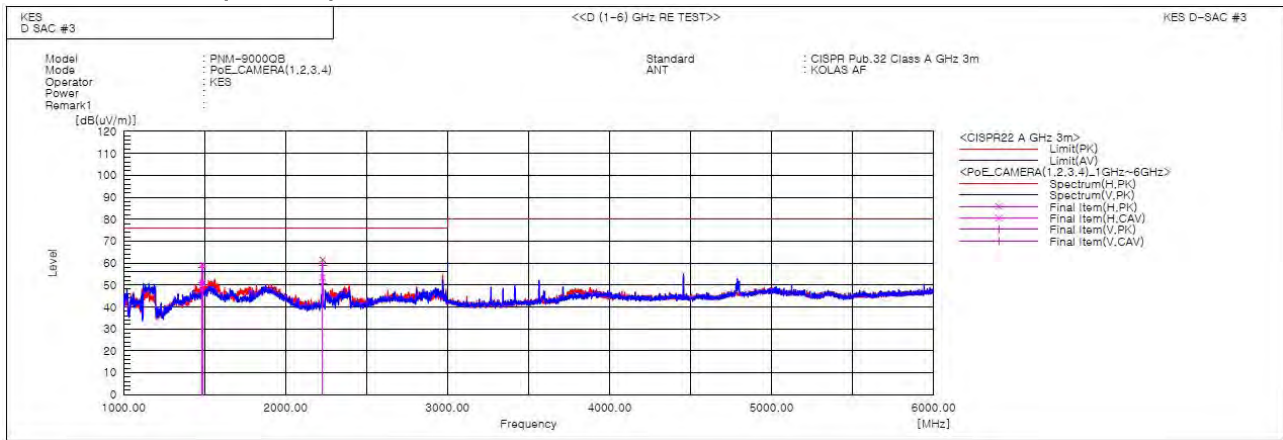


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■ PoE_CAMERA(1,2,3,4)



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	1484.760	V	64.6	57.6	-6.7	57.9	50.9	76.0	56.0	18.1	5.1	100.0	213.0	
2	1485.740	H	66.0	57.7	-6.7	59.3	51.0	76.0	56.0	16.7	5.0	100.0	6.6	
3	2227.630	H	62.7	54.6	-1.2	61.5	53.4	76.0	56.0	14.5	2.6	100.0	94.5	
4	2228.330	V	60.3	51.9	-1.2	59.1	50.7	76.0	56.0	16.9	5.3	100.0	342.7	

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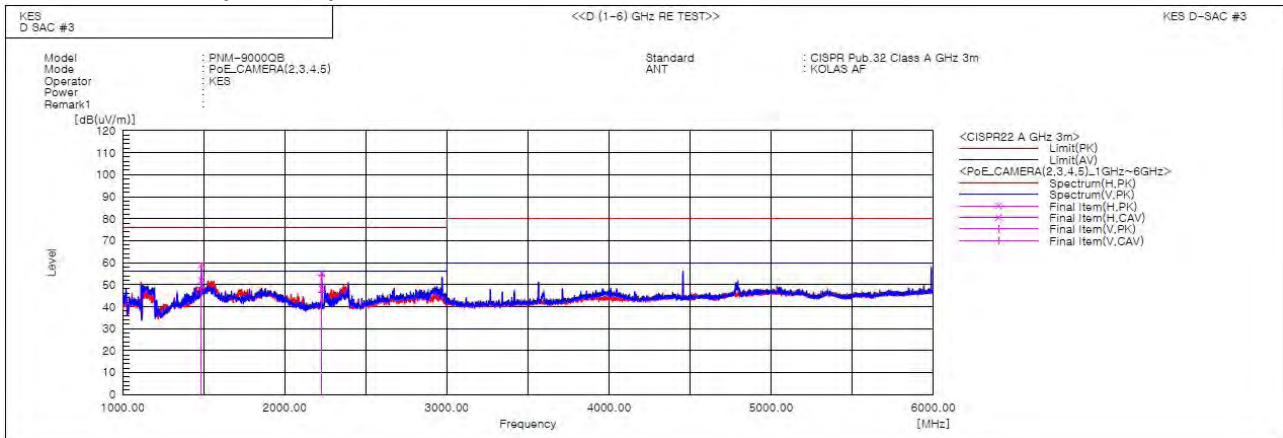


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■ PoE_CAMERA(2,3,4,5)



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	1484.930	H	65.6	58.6	-6.7	58.9	51.9	76.0	56.0	17.1	4.1	100.0	78.3	
2	1485.250	V	62.7	55.4	-6.7	56.0	48.7	76.0	56.0	20.0	7.3	100.0	178.4	
3	2227.240	V	55.6	47.4	-1.2	54.4	46.2	76.0	56.0	21.6	9.8	100.0	337.9	
4	2227.350	H	56.2	49.4	-1.2	55.0	48.2	76.0	56.0	21.0	7.8	100.0	184.2	

◆ Calculation

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

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

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

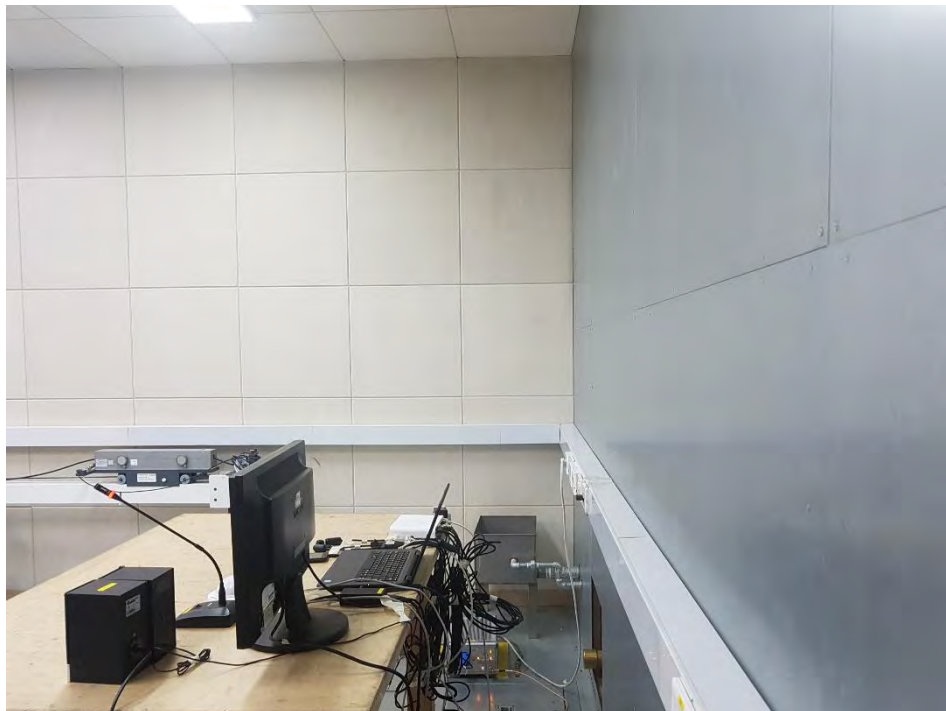
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

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Test Setup Photos and Configuration

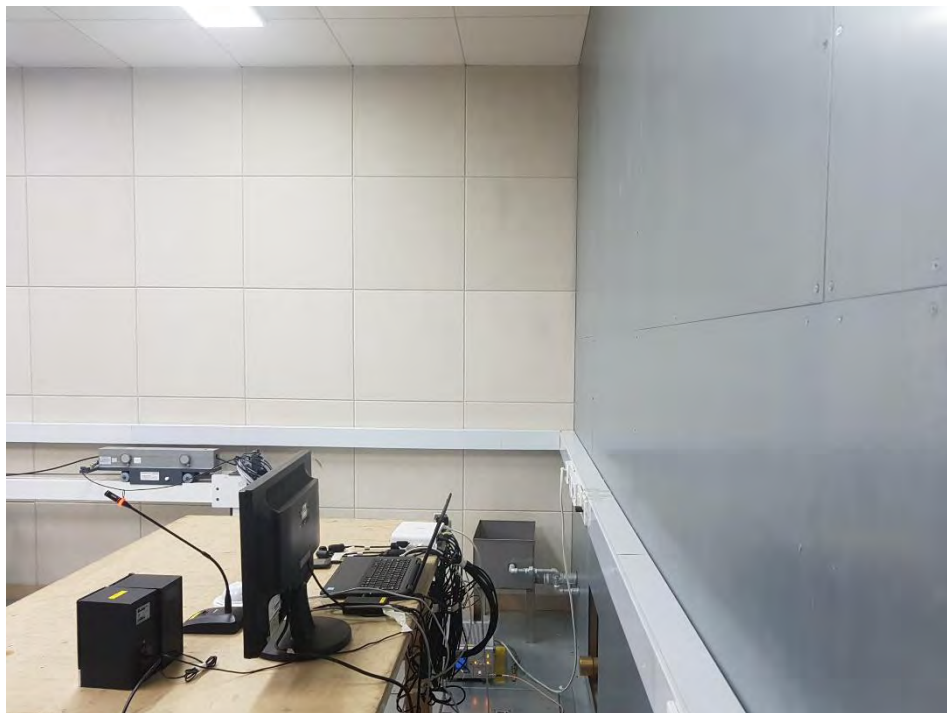
Conducted Emissions at Mains Power Ports

■ DC_CAMERA(1,2,3,4)



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■ DC_CAMERA(2,3,4,5)



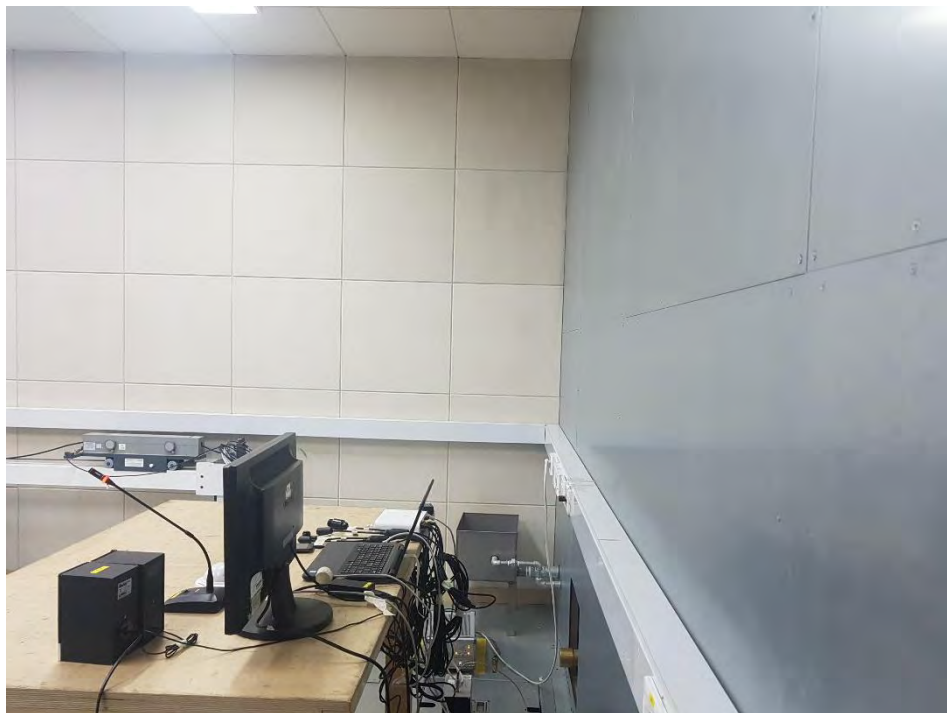
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Conducted Emissions at Telecommunication Ports

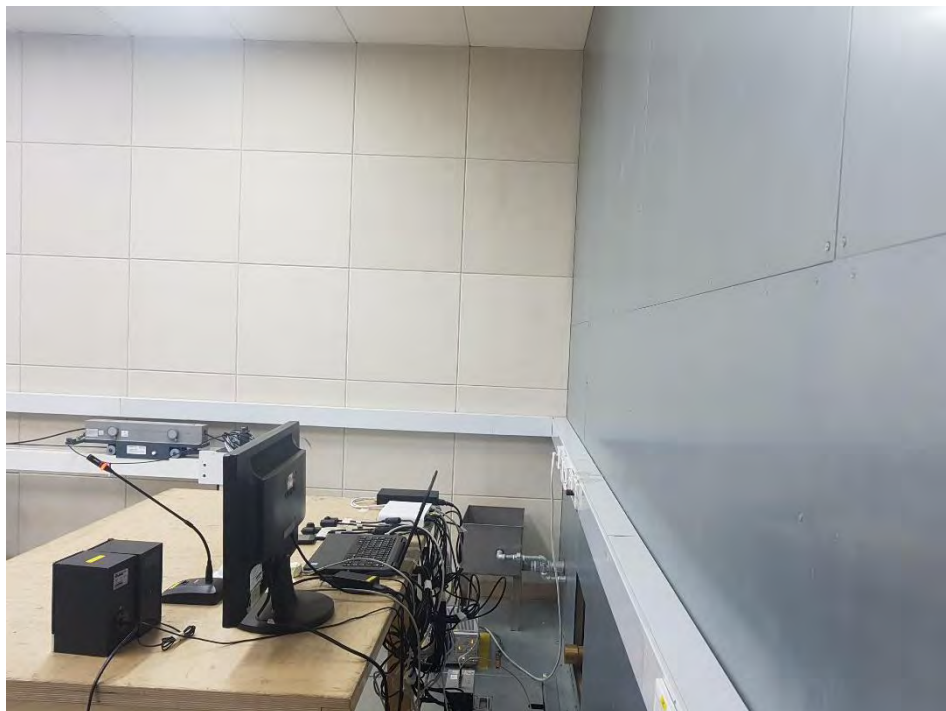
■ DC_CAMERA(1,2,3,4)

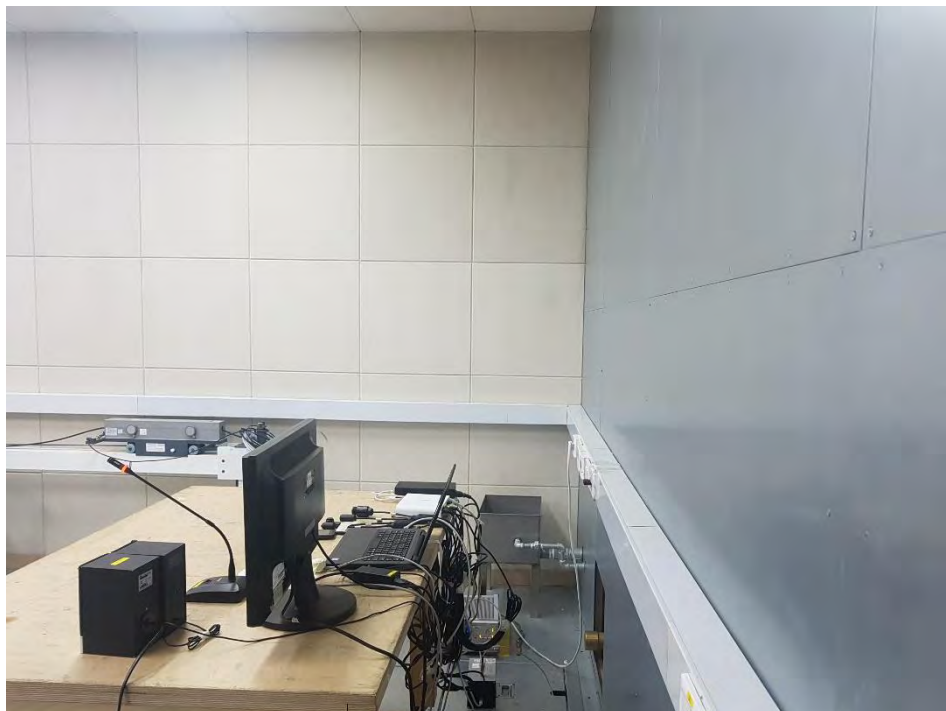


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■ PoE_CAMERA(1,2,3,4)

■ PoE_CAMERA(2,3,4,5)

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Radiated Electric Field Emissions(Below 1 GHz)

■ DC_CAMERA(1,2,3,4)



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■ DC_CAMERA(2,3,4,5)

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■ PoE_CAMERA(1,2,3,4)

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■ PoE_CAMERA(2,3,4,5)

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Radiated Electric Field Emissions(Above 1 GHz)

■ DC_CAMERA(1,2,3,4)



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■ DC_CAMERA(2,3,4,5)

■ PoE_CAMERA(1,2,3,4)

■ PoE_CAMERA(2,3,4,5)

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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

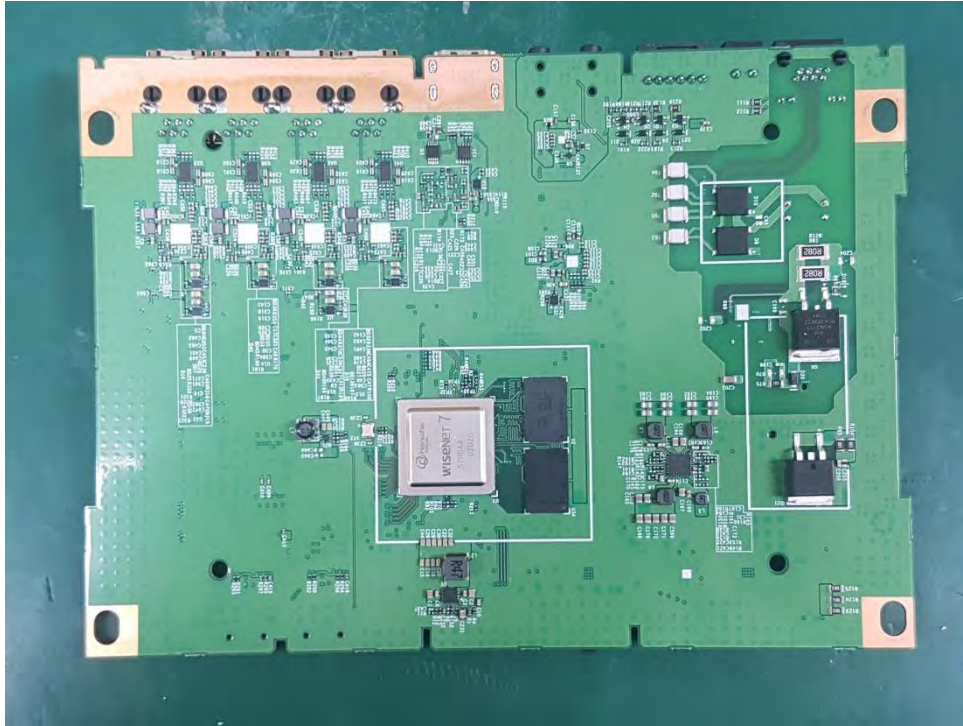
(Internal View)



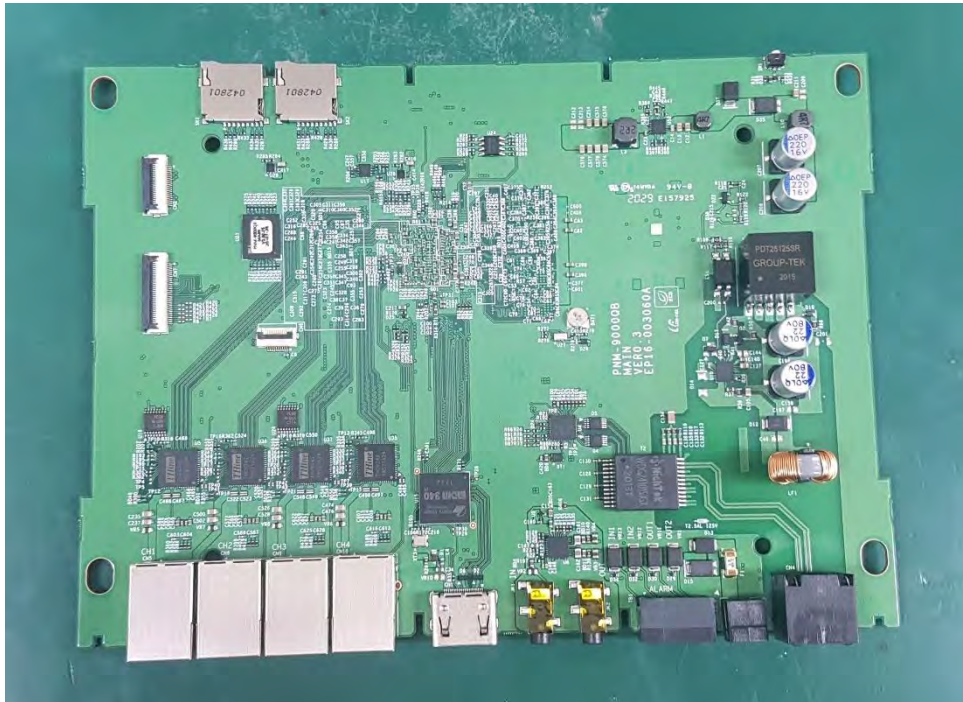
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EUT Internal View – Main Board

(Top)



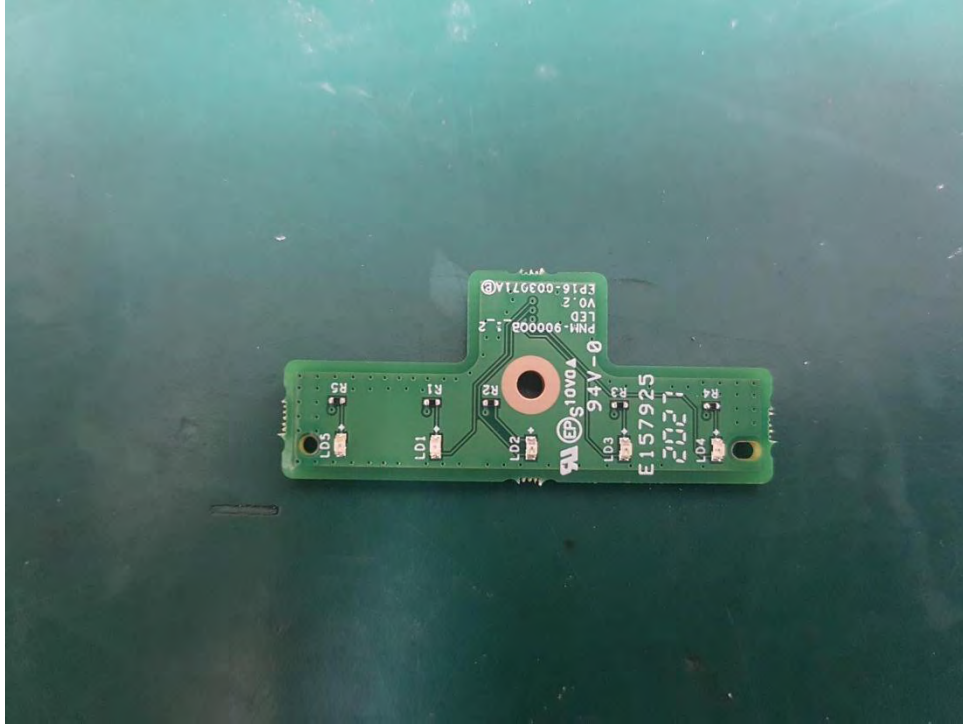
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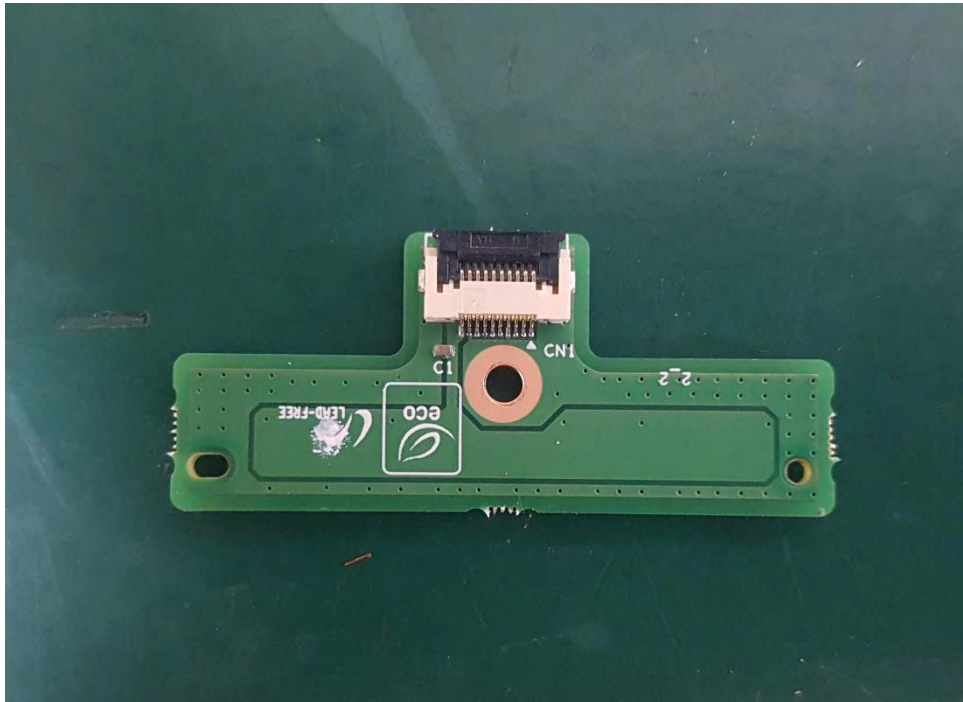
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EUT Internal View – SUB Board

(Top)

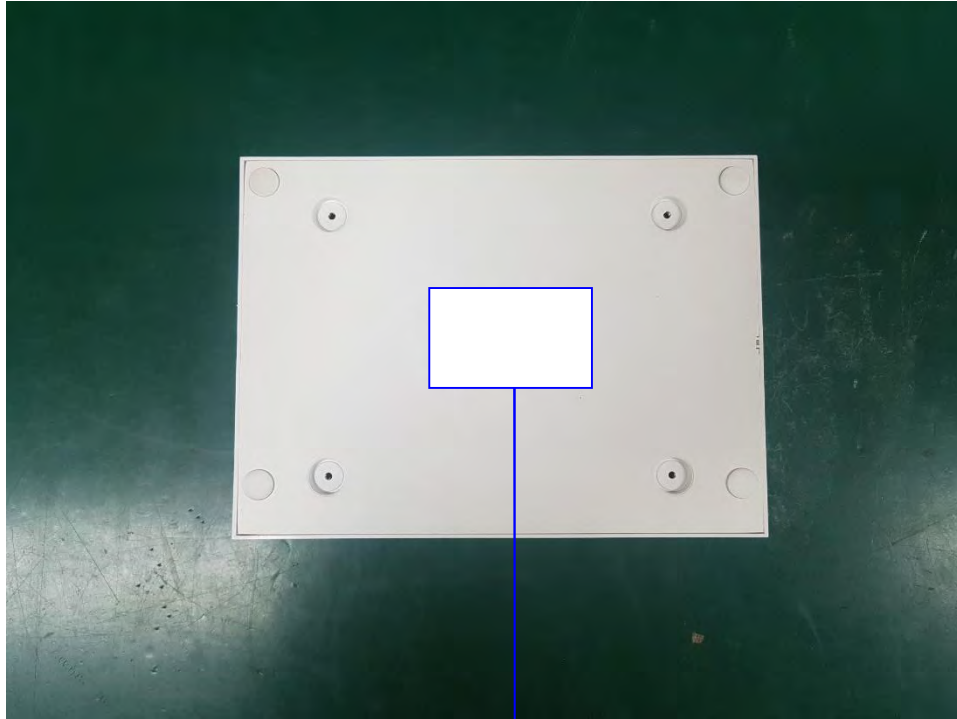


(Bottom)



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