



EMC TEST REPORT For CE

Test Report No. : KES-EM-22T0176-R1
Date of Issue : Feb. 24, 2023
Product name : NETWORK CAMERA
Model/Type No. : QNV-7012R
Variant Model : QNV-7022R, QNV-7032R
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 : Jan. 14, 2022
Test date : Jan. 20, 2022 ~ Jan. 22, 2022
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dae Soo, Kim
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. 04, 2022	KES-EM-22T0176	Issued
Feb. 24, 2023	KES-EM-22T0176-R1	Change the Applicant and manufacturer at the request of the customer

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1.0 General Product Description

Main Specifications of EUT are:

Video		Preset Accuracy	None
Imaging Device	1/3" CMOS	Operational	
Resolution	2560 x 1440, 1920 x 1080, 1280 x 960, 1280 x 720, 800 x 600, 800 x 448, 720 x 576, 720 x 480, 640 x 480, 640 x 360, 320 x 240	Camera Title	Displayed up to 85 characters
Max. Framerate	H.265/H.264 : Max. 30fps at 4M all resolutions, MJPEG : Max. 15fps	Direction Indicator	None
NETD	None	Day & Night	Auto(ICR)
Pixel Size	None	Backlight Compensation	BLC, WDR, SDR
Min. Illumination	Color : 0.15Lux (F2.0, 1/30sec) B/W : 0Lux (IR LED On) (TBD)	Wide Dynamic Range	120dB
Video Out	CVBS : 1.0 Vpp/75Ω composite, 720x480(N), 720x576(P) for installation	Digital Noise Reduction	SSNR
Video Transmission Distance	None	Digital Image Stabilization	None
Lens		Defog	None
Focal Length (Zoom Ratio)	2.8mm fixed focal	Motion Detection	4ea, polygonal zones
Max. Aperture Ratio	F2.0	Privacy Masking	6ea, rectangular zones
Angular Field of View	H : 113.8°, V : 61.5°, D : 134.5° (TBD)	Gain Control	Low / Middle / High
Min. Object Distance	None	White Balance	ATW / AWC / Manual / Indoor / Outdoor
Focus Control	Fixed	LDC	Support
Lens Type	None	Electronic Shutter Speed	Minimum/Maximum/Anti flicker (1/5~1/12,000sec)
Mount Type	None	Digital PTZ	None
Optional Lens	None	Video Rotation	Flip, Mirror, Hallway view(90°/270°)
Pan / Tilt / Rotate		Analytics	Defocus detection, Directional detection, Motion detection, Enter/Exit, Tampering, Virtual line
Pan / Tilt / Rotate Range	0° ~ 350° / 0° ~ 67° / 0° ~ 355°	Business Intelligence	None
Pan Range	None	Serial Interface	None
Pan Speed	None	Alarm I/O	Input 1ea / Output 1ea
Tilt Range	None	Alarm Triggers	Analytics, Network disconnect, Alarm input
Tilt Speed	None	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
Rotate Range	None	Audio In	Built-in MIC
Sequence	None	Audio Out	None
		IR Viewable Length	20m (65.62ft)



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IR Illuminator (Optional)	None	Application Programming Interface	ONVIF Profile S/G/T, SUNAPI (HTTP API)
Water Removal	None	General	
Auto Tracking	None	Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Coaxial Protocol	None	Web Viewer	
Color Palettes	None	Edge Storage	Micro SD/SDHC/SDXC 1slot 128GB
Radiometry		Memory	512MB RAM, 256MB Flash
Temperature Detect Range	None	Environmental & Electrical	
Temperature Accuracy	None	Operating Temperature / Humidity	-10°C~+55°C (+14°F~+131°F) / Less than 95% RH (TBD)
Temperature Detection	None	Storage Temperature / Humidity	-30°C~+60°C (-22°F~+140°F) / Less than 95% RH (TBD)
Additional	None	Certification	
Network		Input Voltage	PoE(IEEE802.3af, Class3), 12VDC
Ethernet	RJ-45 (10/100BASE-T)	Power Consumption	PoE: Max 7.4W, typical 6W 12VDC: Max 6.4W, typical 5.1W (TBD)
Video Compression	H.265/H.264 : Main/High, MJPEG	Mechanical	
Audio Compression	G.711 u-law / G.726 Selectable G.726(ADPCM) 8KHz, G.711 8KHz, G.726 16Kbps, 24Kbps, 32Kbps, 40Kbps	Color / Material	White / Plastic
Smart Codec	Manual (Sea area), WiseStreamII	RAL Code	RAL9003
Video Quality Adjustment	H.265/H.264 : Target bitrate level control, MJPEG : Quality level control	Product Dimensions / Weight	Ø110.0 x 86.0mm (Ø4.33 x 3.39"), 255g (0.562 lb)
Bitrate Control	H.264/H.265 : CBR or VBR MJPEG : VBR		
Streaming	Unicast (6 users) / Multicast Multiple streaming (Up to 3 profiles)		
Protocol	IPv4, IPv6, 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, LLDP		
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication		

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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 230 V, 50 Hz ☒ PoE

1.2 Variant Model Differences

Addition of derivative models for place of sale management

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	QNV-7012R	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Adapter	FSP060-DIBAN2	H00000669	Zhonghan Electronics(Shenzhen) Co., Ltd.	-
PoE INJECTOR	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Notebook	LG15N54	410NZGK015231	LG	-
Notebook Adapter	ADP-90WH B	84ZW19F1663	DELTA ELECTRONICS(JIANGSU) LTD.	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-
Button alarm	-	-	-	-
MIC	MP1000	-	-	-
Micro SD Card	-	-	Transcend	16 GB

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	Notebook	RJ-45	3.0	U
	Alarm OUT	Alarm	Alarm IN	3.0	U
	Alarm IN	Button alarm	Alarm OUT	3.0	U
	Audio IN	MIC	Audio IN	1.4	U
	SLOT	Micro SD Card	SLOT	-	-

* 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 INJECTOR	RJ-45 (PoE)	3.0	U
	Alarm OUT	Alarm	Alarm IN	3.0	U
	Alarm IN	Button alarm	Alarm OUT	3.0	U
	Audio IN	MIC	Audio IN	1.4	U
	SLOT	Micro SD Card	SLOT	-	-
Notebook	RJ-45 (LAN)	PoE INJECTOR	RJ-45 (LAN)	2.5	U

* Unshielded=U, Shielded=S

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1.7 EUT Operating Mode(s)

Test Mode	operating
OP	the test was conducted while checking the camera video output from the laptop and making sure that they operate normally while performing a ping test. micro sd card : after testing, check if the recording is normally done on the micro sd card

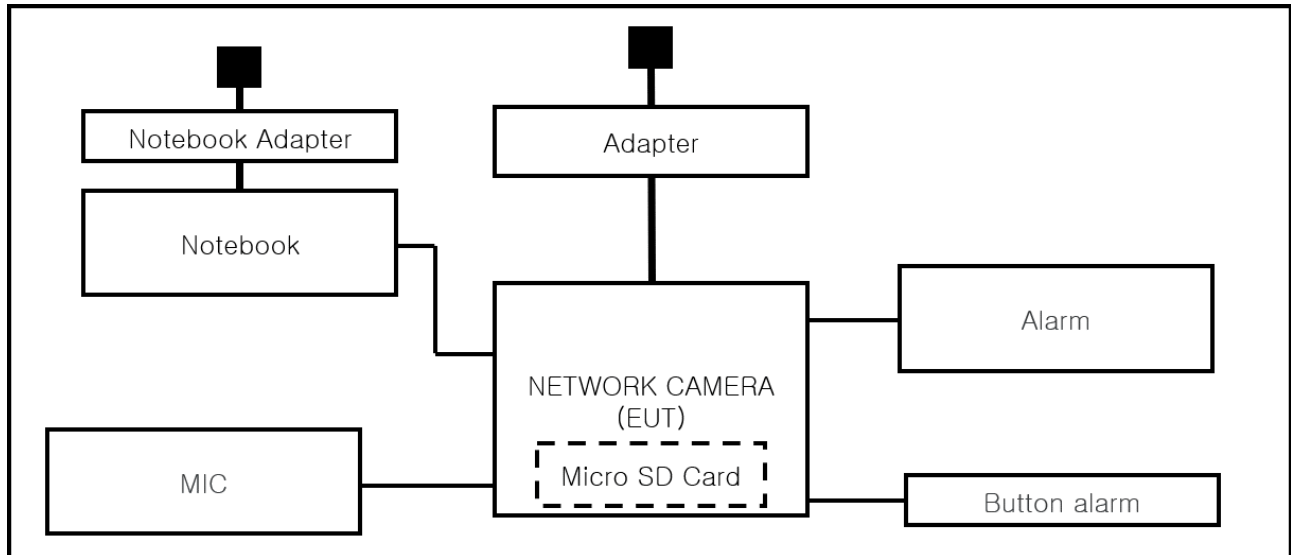
EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Vision Co., Ltd

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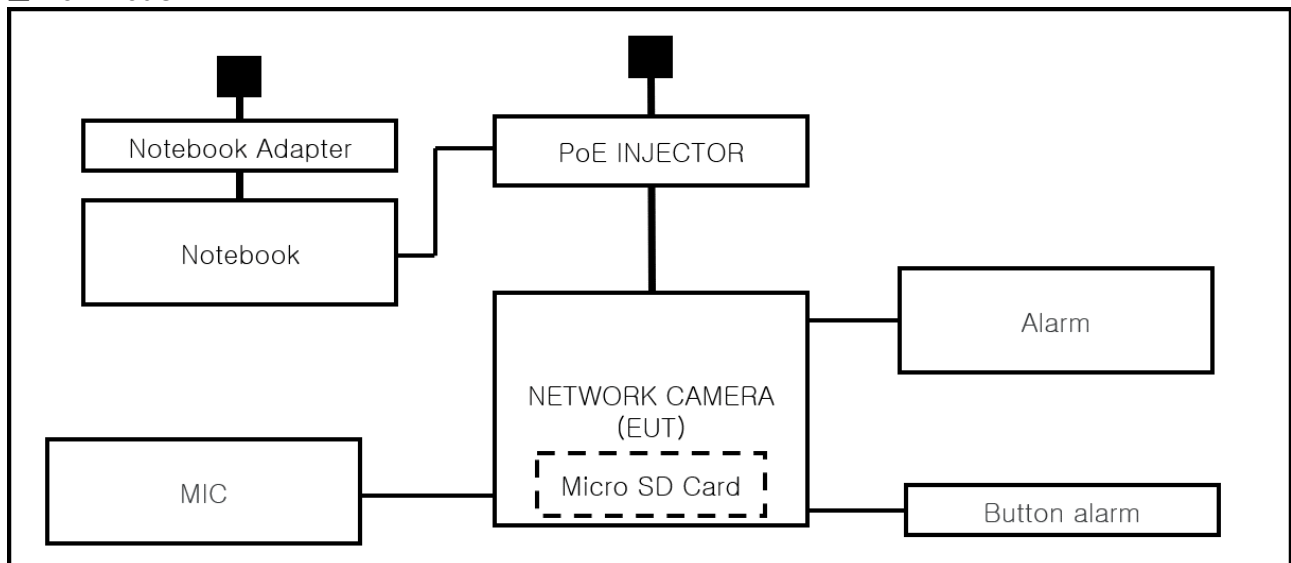
1.8 Configuration

■ AC Main
 □ DC Main

■ DC Mode



■ PoE Mode



1.9 Remarks when standards applied

VIDEO port are for administrator use and are excluded from testing.

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



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

☒ **EMC – Regulations 2016/1091**

☒ BS EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ BS EN 50130-4:2011

☒ BS EN 61000-3-2:2014

☒ BS EN 61000-3-3:2013



2.1 Conducted Emissions at Mains Power Ports

Test Date

Jan. 20, 2022

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	12, 28, 2022
☒	LISN	ENV216	R & S	101787	12, 27, 2022
☒	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022

Test Conditions

Temperature: (22,1 ± 0,2) °C

Relative Humidity: (42,9 ± 0,0) % 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

Jan. 20, 2022

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	12, 28, 2022
☒	LISN	ENV216	R & S	101787	12, 27, 2022
☒	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 28, 2022
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	12, 28, 2022
☐	CDN	CDNS502A	TESEQ	40431	12, 27, 2022

Test Conditions

Temperature: (22,1 ± 0,2) °C

Relative Humidity: (42,9 ± 0,0) % 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.

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2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jan. 20, 2022

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, 2022
☒	AMPLIFIER	SCU 01	R & S	100603	11, 24, 2022
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 10, 2022

Test Conditions

Temperature: (22,5 ± 0,0) °C
Relative Humidity: (42,7 ± 0,2) % 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

Jan. 20, 2022

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, 03, 2022
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 07, 2022
☐	ATTENUATOR	8491A	HP	35496	03, 10, 2022
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022

Test Conditions

Temperature: (22,6 ± 0,2) °C

Relative Humidity: (43,1 ± 0,2) % 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.



2.5 Harmonic Current Emissions

Test Date

Jan. 21, 2022

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	net.control	EM TEST	2.1.4	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	04, 06, 2022
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (23,6 ± 0,4) °C
Relative Humidity: (43,5 ± 0,4) % R.H.

Classification of Equipment for Harmonic Current Emissions

- ☒ Class A
☐ Class B
☐ Class C(Below 25 W)
☐ Class C(Above 25 W)
☐ Class D

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.6 Voltage Fluctuations and Flicker

Test Date

Jan. 21, 2022

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	net.control	EM TEST	2.1.4	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	04, 06, 2022
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (23,6 ± 0,4) °C
Relative Humidity: (43,5 ± 0,4) % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011 / BS EN 50130-4:2011/A1:2014 Alarm systems-Part 4: Electromagnetic compatibility Product family standard: Immunity requirements for components of fire, intruder and social alarm systems

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test

report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing that is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such

Flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing
That there is no residual is permissible, providing that there is no residual change in the EUT or
any
change in outputs, which could be interpreted by associated equipment as a change.

Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing
That there is no residual is permissible, providing that there is no residual change in the EUT or
any
change in outputs, which could be interpreted by associated equipment as a change,
and no such flickering of indicators oeuvres at $U = 130 \text{ dB}\mu\text{V}$.
For component of CCTV systems, where the status is monitored by observing the TV picture,
then deterioration of the picture is allowed at $U = 140 \text{ dB}\mu\text{V}$, providing:
(a) there is no permanent damage or change to the EUT
(e.g. no corruption of memory or changes to programmable settings etc.)
(b) at $U = 130 \text{ dB}\mu\text{V}$, any deterioration of the picture is so minor that the system could
still be used; and
(c) there in no observable deterioration of the picture at $U = 120 \text{ dB}\mu\text{V}$.

Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the conditioning is permissible, providing that there is no
residual
change in the EUT or any change in outputs, which could be interpreted by associated
equipment
as a change. The EUT shall meet the acceptance criteria for the functional test, after the
conditioning.

3.1 Electrostatic Discharge

Reference Standard

EN 61000-4-2:2009
BS EN 61000-4-2:2009

Test Date

Jan. 22, 2022

Test Location

EMS-ESD: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	02, 01, 2022
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (22,7 ± 0,0) °C
Relative Humidity: (42,8 ± 0,0) % R.H.
Atmospheric Pressure: (100,7 ± 0,0) kPa

Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

Kind of Discharge: Air, Contact (direct and indirect)

Polarity: Positive and Negative

Number of Discharge: 10 at all locations for Air discharge
10 at all locations for Contact discharge

Discharge Voltage:	Contact ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	Air ☒ 2 kV ☒ 4 kV ☐ 6 kV ☒ 8 kV ☐ 15 kV	HCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	VCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV
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Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied

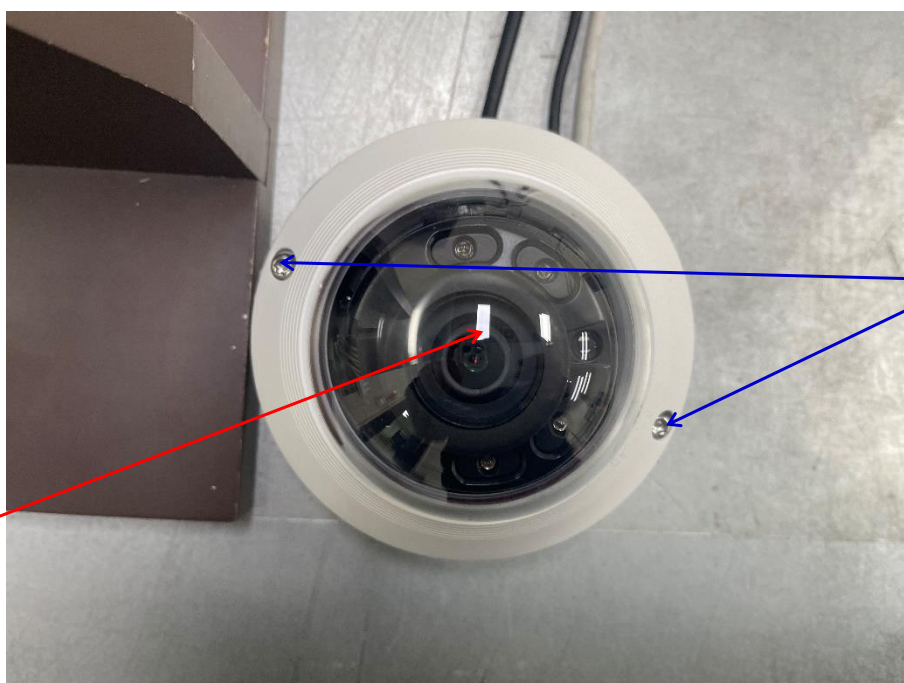
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Location of Discharge:

Air
Contact



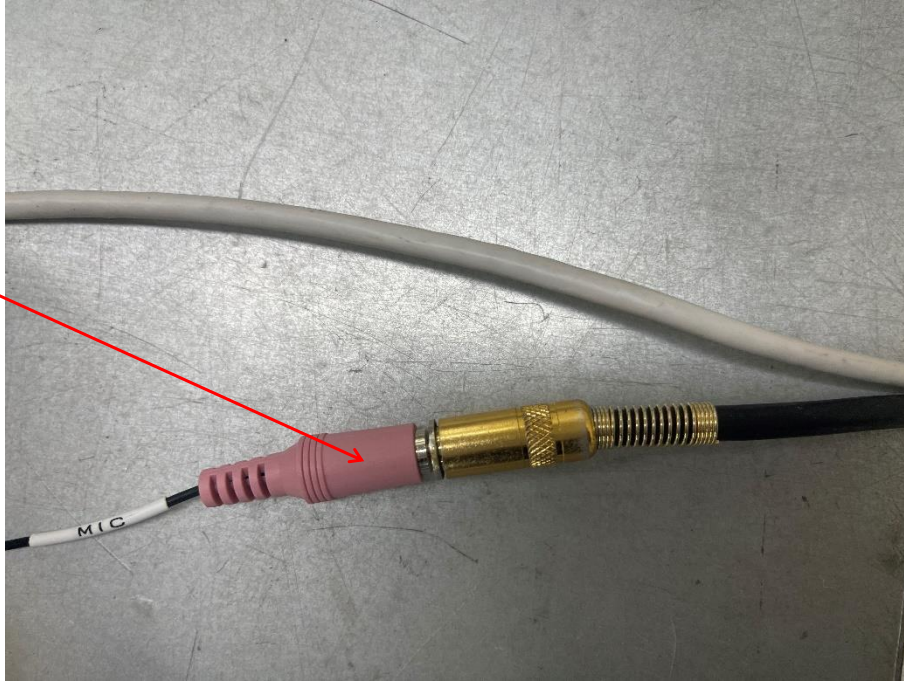
1

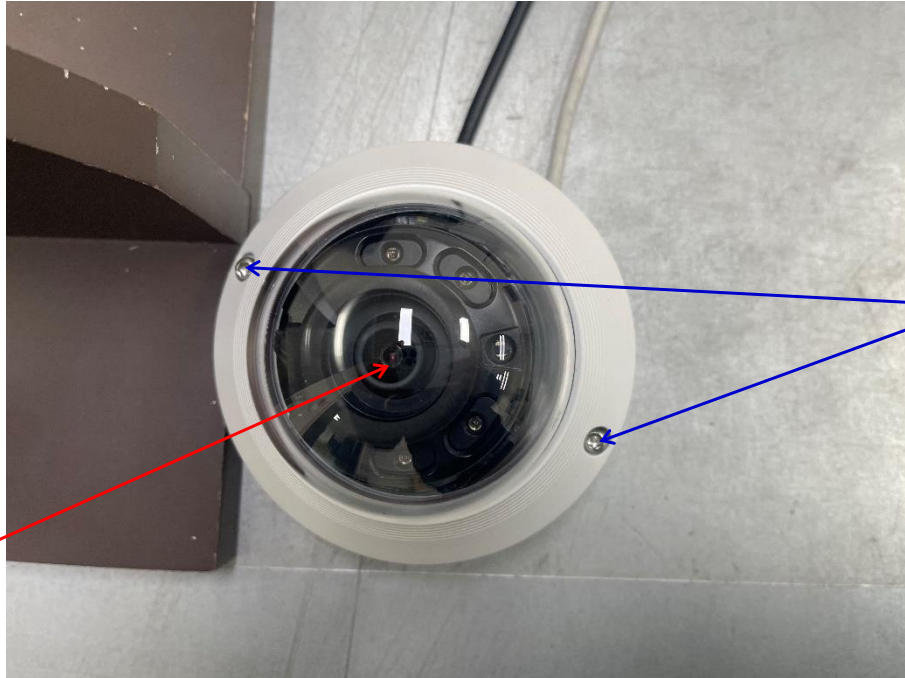


2

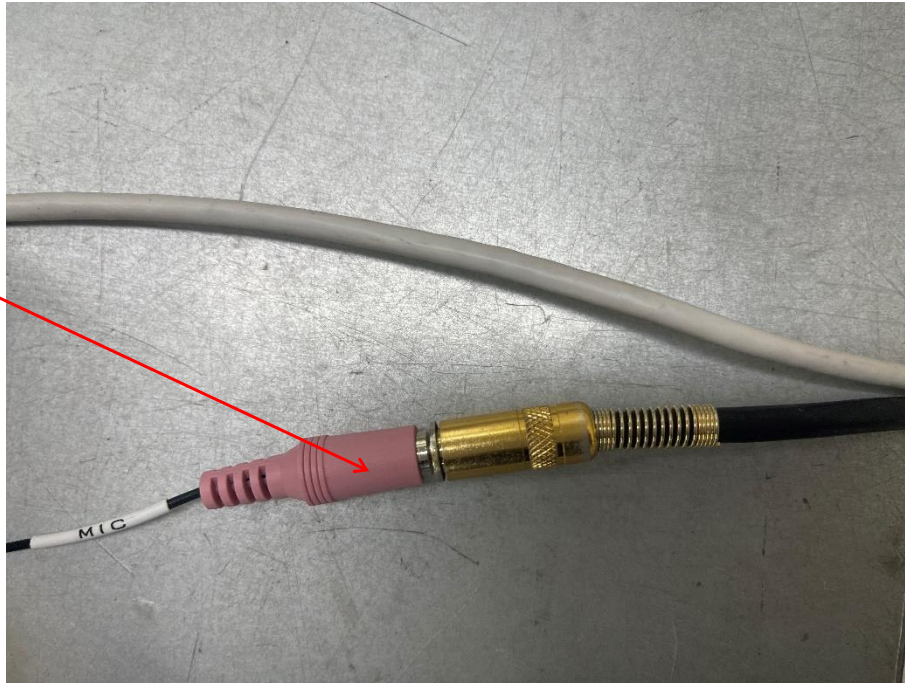
3

4





4



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Test Data**■ DC Mode**

No.	Test Point	Discharge Method	Observations	Remarks
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Enclosure	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-
3	Lens	Air Discharge	Complied	-
4	Port	Air Discharge	Complied	-

■ PoE Mode**Indirect Discharge**

No.	Test Point	Discharge Method	Observations	Remarks
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Enclosure	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-
3	Lens	Air Discharge	Complied	-
4	Port	Air Discharge	Complied	-

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria

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3.2 Radiated Electric Field Immunity

Reference Standard

EN 61000-4-3:2006 +A2:2010
BS EN 61000-4-3:2006 +A2:2010

Test Date

Jan. 21, 2022

Test Location

EMS-RS: ☐ SEMI ANECHOIC CHAMBER #2 ☒ SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	10.10.02	-
☒	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	08, 03, 2022
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	04, 01, 2022
☒	CW POWER SENSOR	E4412A	Agilent	US38488240	04, 01, 2022
☒	CW POWER SENSOR	E4412A	Agilent	MY41501662	04, 01, 2022
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022

Test Conditions

Temperature: (23,0 ± 0,4) °C
Relative Humidity: (43,9 ± 0,2) % R.H.
Atmospheric Pressure: (100,7 ± 0,0) kPa



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Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☐ 1 V/m ☐ 3 V/m
☒ 10 V/m

Frequency Range: ☐ 80 MHz to 1 GHz ☐ 1,4 GHz to 2,7 GHz
☒ 80 MHz to 2,7 GHz

Modulation: ☒ AM, 80 %, 1 kHz sine wave
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

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Test Data

■ DC Mode

Side Exposed	Observations	
	Horizontal	Vertical
Front	Complied	Complied
Right	Complied	Complied
Back	Complied	Complied
Left	Complied	Complied

■ PoE Mode

Side Exposed	Observations	
	Horizontal	Vertical
Front	Complied	Complied
Right	Complied	Complied
Back	Complied	Complied
Left	Complied	Complied

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

RemarksPASS Required Performance Criteria

3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012
BS EN 61000-4-4:2012

Test Date

Jan. 22, 2022

Test Location

EMS-EFT: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	12, 03, 2022
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	04, 01, 2022
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	12, 03, 2022

Test Conditions

Temperature: (22,7 ± 0,0) °C
Relative Humidity: (42,8 ± 0,2) % R.H.
Atmospheric Pressure: (100,7 ± 0,0) kPa

Test Specifications

Pulse Amplitude & Polarity:
(AC Power Lines) ☐ ± 1.0 kV ☒ ± 2.0 kV
☐ ± 4.0 kV

Pulse Amplitude & Polarity:
(Other supply / Signal Lines) ☐ ± 0.5 kV ☒ ± 1.0 kV
☐ ± 2.0 kV

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 kHz ☒ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

Test Data

■ DC Mode

☒ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L	Complied	Complied
N	Complied	Complied
PE	Complied	Complied
L – N	Complied	Complied
L – PE	Complied	Complied
N – PE	Complied	Complied
L – N – PE	Complied	Complied

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-45	Complied	Complied
ALARM IN	Complied	Complied
ALARM OUT	Complied	Complied

☒ PoE Mode

☐ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L	-	-
N	-	-
PE	-	-
L – N	-	-
L – PE	-	-
N – PE	-	-
L – N – PE	-	-

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-45	Complied	Complied
ALARM IN	Complied	Complied
ALARM OUT	Complied	Complied

Note: “Blank” = Not performed

Observations:

Complied – No degradation of function

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria

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3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014

BS EN 61000-4-5:2014

Test Date

Jan. 22, 2022

Test Location

EMS-Surge: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	12, 03, 2022
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	04, 01, 2022
☒	CDN	CNV 508N1	EM TEST	P1610176296	12, 03, 2022

Test Conditions

Temperature: (22,7 ± 0,4) °C
Relative Humidity: (42,8 ± 0,4) % R.H.
Atmospheric Pressure: (100,7 ± 0,0) kPa

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Test Specifications

AC Power Lines

Source Impedance: 12 ohm for common Mode and 2 ohm for differential Mode

Surge Amplitude : Common Mode
☒ (0,5 / 1,0 / 2,0) kV
Differential Mode
☒ (0,5 / 1,0) kV

Number of Surges: ☒ 5 surges per angle

Angle: ☒ 0°, 90°, 180°, 270° (input a.c. power port)

Polarity: ☒ Positive & Negative

Repetition Rate: ☒ 1 surge per min ☐ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

Other supply / Signal Lines

Source Impedance: 42 ohm for common Mode

Surge Amplitude: Common Mode
☒ (0,5 / 1,0) kV

Number of Surges: ☒ 5 Surges

Polarity: ☒ Positive & Negative

Repetition Rate: ☒ 1 surge per min ☐ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

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Test Data

■ DC Mode

☒ Line to Line – Differential Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L – N	Complied	Complied

☒ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L – PE	Complied	Complied
N – PE	Complied	Complied

Signal Lines☒ Line to Earth – Common Mode

Mode of Application	Coupling Method	Observations	
		(+) Surge (kV)	(-) Surge (kV)
RJ-45	CDN	Complied	Complied
	LINE	Complied	Complied

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☒ PoE Mode

☐ Line to Line – Differential Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L – N	-	-

☐ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L – PE	-	-
N – PE	-	-

Signal Lines

☒ Line to Earth – Common Mode

Mode of Application	Coupling Method	Observations	
		(+) Surge (kV)	(-) Surge (kV)
RJ-45	CDN	Complied	Complied
	LINE	Complied	Complied

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

☐ NOT APPLICABLE

Remarks

PASS Required Performance Criteria

3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014
BS EN 61000-4-6:2014

Test Date

Jan. 21, 2022

Test Location

EMS-CS: Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.7	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1	EM TEST	V0936105119	08, 03, 2022
☒	ATTENUATOR	ATT6	EM TEST	1208-34	08, 03, 2022
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 03, 2022
☒	CDN	CDN T8RJ45	EM TEST	0909-09	08, 03, 2022
☒	EM INJECTION CLAMP	EM 101	Liithi	35943	08, 03, 2022

Test Conditions

Temperature: (23,6 ± 0,2) °C
Relative Humidity: (43,5 ± 0,2) % R.H.
Atmospheric Pressure: (100,5 ± 0,0) kPa



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Test Specifications

Frequency range:

☒ 150 kHz to 100 MHz

☐ 150 kHz to 80 MHz

Voltage Level:

☐ 1 Vrms

☐ 3 Vrms

☒ 10 Vrms

Modulation:

☒ AM, 80 %, 1 kHz sine wave

☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step:

☒ 1 % step

Dwell Time:

☐ 1 s

☒ 3 s

Required Performance Criteria: ☒ Complied

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Test Data**■ DC Mode**☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N – PE	CDN	Complied

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN	Complied
ALARM IN	Clamp	Complied
ALARM OUT	Clamp	Complied

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■ PoE Mode☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N	CDN	-

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN	Complied
ALARM IN	Clamp	Complied
ALARM OUT	Clamp	Complied

Notes: CDN = Coupling Decoupling Network
"blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

RemarksPASS Required Performance Criteria

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3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004
BS EN 61000-4-11:2004

Test Date

Jan. 22, 2022

Test Location

EMS-Voltage dip: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	04, 01, 2022
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	04, 01, 2022

Test Conditions

Temperature: (22,7 ± 0,0) °C
Relative Humidity: (42,8 ± 0,0) % R.H.
Atmospheric Pressure: (100,7 ± 0,0) kPa

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Test Specifications & Observations/Remarks

■ DC Mode

- Voltage Dips and Short Interruptions

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Results</u>
☒ 20 % dip	☒ 250 / 5 000	<u>Complied</u>
☒ 30 % dip	☒ 25 / 500	<u>Complied</u>
☒ 60 % dip	☒ 10 / 200	<u>Complied</u>
☒ 100 % dip	☒ 250 / 5 000	<u>Degradation</u>

- Voltage variations

☒ Unom + 10 %	☒ 253.0 V (ac)	<u>Complied</u>
☒ Unom - 15 %	☒ 195.5 V (ac)	<u>Complied</u>

Observations:

Complied – No degradation of function

Degradation - See "Remarks "

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria
☐ NOT APPLICABLE

Remarks

During the test(100%, 250cycle), EUT was turned off but after the test, it was recovered by no operator's intervention.

APPENDIX A – TEST DATA

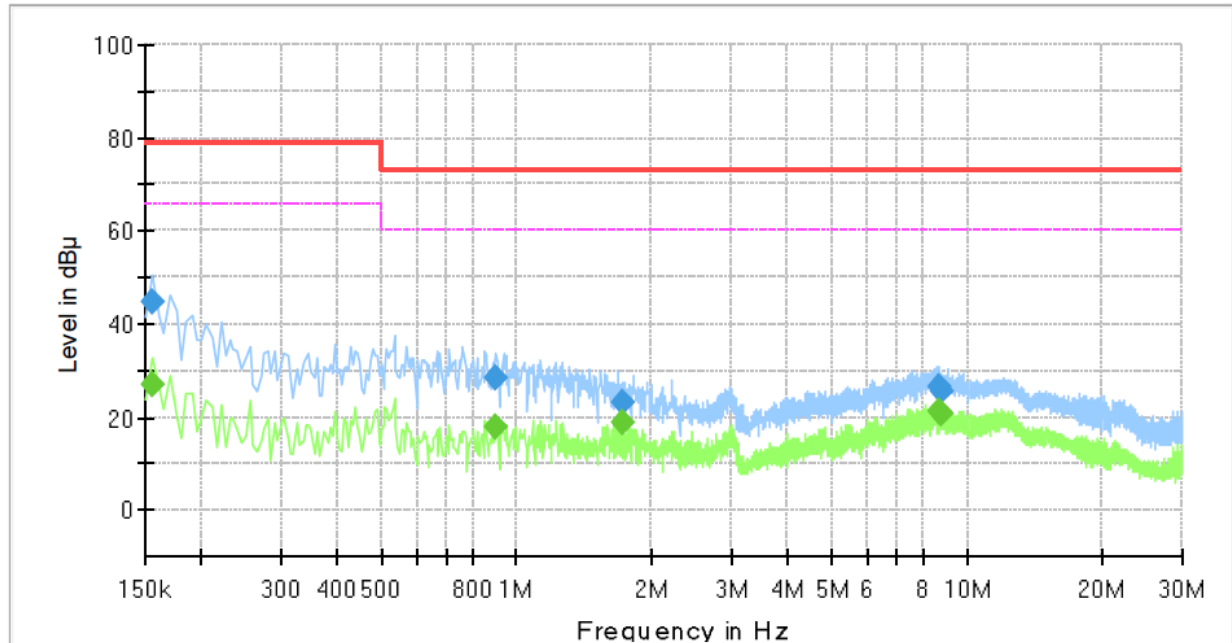
Conducted Emissions at Mains Power Ports

■ DC Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	QNV-7012R
Phase:	H
Mode:	DC
Operator Name:	KES



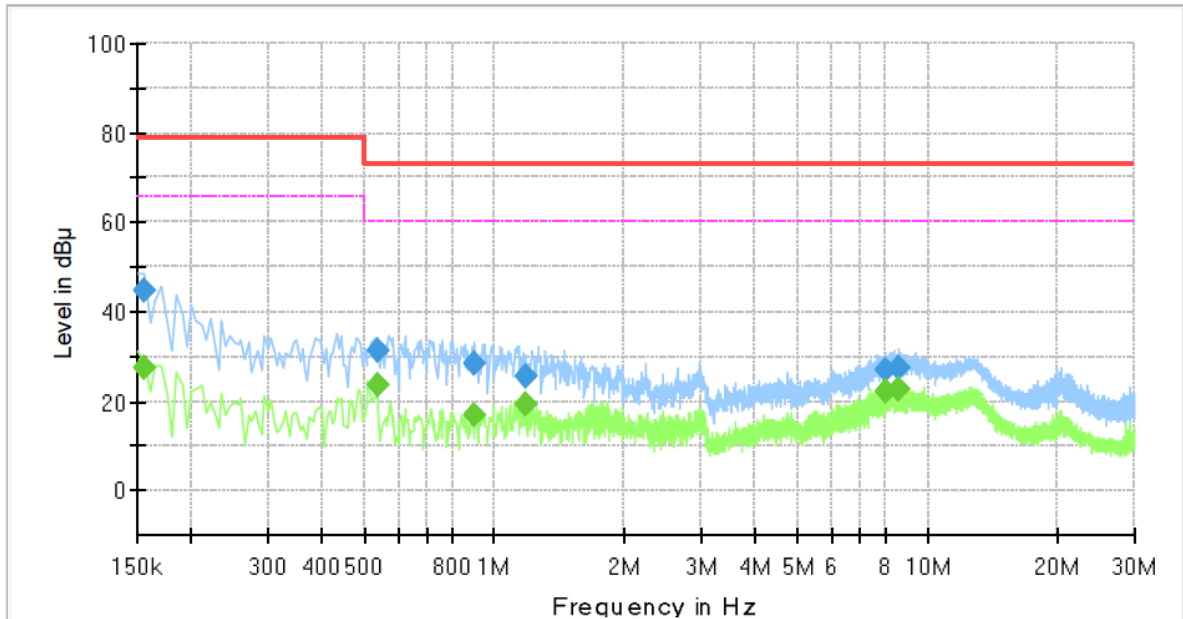
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	26.98	66.00	39.02	1000.0	9.000	L1	19.5
0.155000	44.55	---	79.00	34.45	1000.0	9.000	L1	19.5
0.900000	---	18.07	60.00	41.93	1000.0	9.000	L1	20.1
0.900000	28.44	---	73.00	44.56	1000.0	9.000	L1	20.1
1.710000	---	18.88	60.00	41.12	1000.0	9.000	L1	20.3
1.710000	23.30	---	73.00	49.70	1000.0	9.000	L1	20.3
8.685000	---	21.40	60.00	38.60	1000.0	9.000	L1	19.7
8.685000	26.32	---	73.00	46.68	1000.0	9.000	L1	19.7
8.780000	---	20.70	60.00	39.30	1000.0	9.000	L1	19.7
8.780000	25.72	---	73.00	47.28	1000.0	9.000	L1	19.7

[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	QNV-7012R
Phase:	DC
Mode:	N
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	27.42	66.00	38.58	1000.0	9.000	N	19.4
0.155000	44.81	---	79.00	34.19	1000.0	9.000	N	19.4
0.535000	---	23.83	60.00	36.17	1000.0	9.000	N	19.8
0.535000	31.40	---	73.00	41.60	1000.0	9.000	N	19.8
0.900000	---	16.86	60.00	43.14	1000.0	9.000	N	20.1
0.900000	28.65	---	73.00	44.35	1000.0	9.000	N	20.1
1.180000	---	19.14	60.00	40.86	1000.0	9.000	N	20.1
1.180000	25.46	---	73.00	47.54	1000.0	9.000	N	20.1
8.040000	---	22.01	60.00	37.99	1000.0	9.000	N	19.6
8.040000	27.00	---	73.00	46.00	1000.0	9.000	N	19.6
8.525000	---	22.90	60.00	37.10	1000.0	9.000	N	19.7
8.525000	27.70	---	73.00	45.30	1000.0	9.000	N	19.7

◆ 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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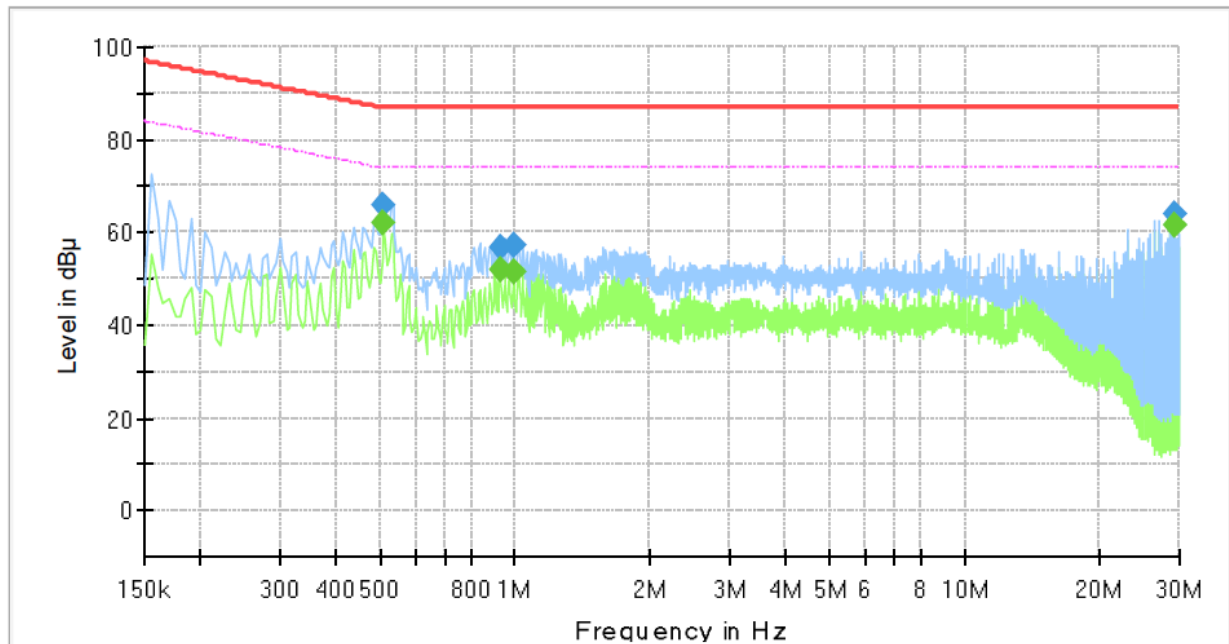
Conducted Emissions at Telecommunication Ports

■ DC Mode

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	QNV-7012R
Mode :	DC
Speed :	100 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.510000	---	61.86	74.00	12.14	1000.0	9.000	Single Line	19.8
0.510000	66.08	---	87.00	20.92	1000.0	9.000	Single Line	19.8
0.925000	---	52.10	74.00	21.90	1000.0	9.000	Single Line	20.0
0.925000	56.83	---	87.00	30.17	1000.0	9.000	Single Line	20.0
0.995000	---	51.62	74.00	22.38	1000.0	9.000	Single Line	20.0
0.995000	57.20	---	87.00	29.80	1000.0	9.000	Single Line	20.0
29.235000	---	61.44	74.00	12.56	1000.0	9.000	Single Line	20.4
29.235000	63.98	---	87.00	23.02	1000.0	9.000	Single Line	20.4

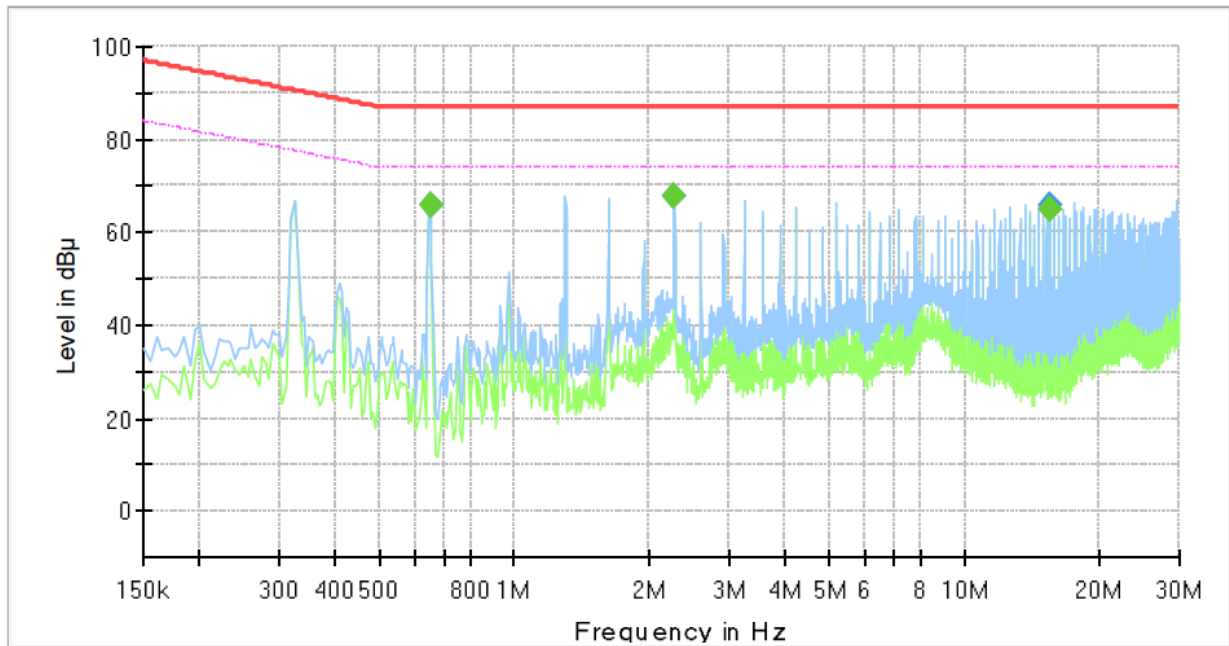
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PoE Mode
[100 Mbps]
Common Information

Test Description:	Telecommunication Emission
Model No.:	QNV-7012R
Mode :	PoE
Speed :	100 Mbps
Operator Name:	KES


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.650000	---	65.79	74.00	8.21	1000.0	9.000	Single Line	19.9
0.650000	65.79	---	87.00	21.21	1000.0	9.000	Single Line	19.9
2.270000	---	67.86	74.00	6.14	1000.0	9.000	Single Line	20.2
2.270000	68.00	---	87.00	19.00	1000.0	9.000	Single Line	20.2
15.555000	---	64.94	74.00	9.06	1000.0	9.000	Single Line	19.7
15.555000	65.79	---	87.00	21.21	1000.0	9.000	Single Line	19.7

◆ 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))



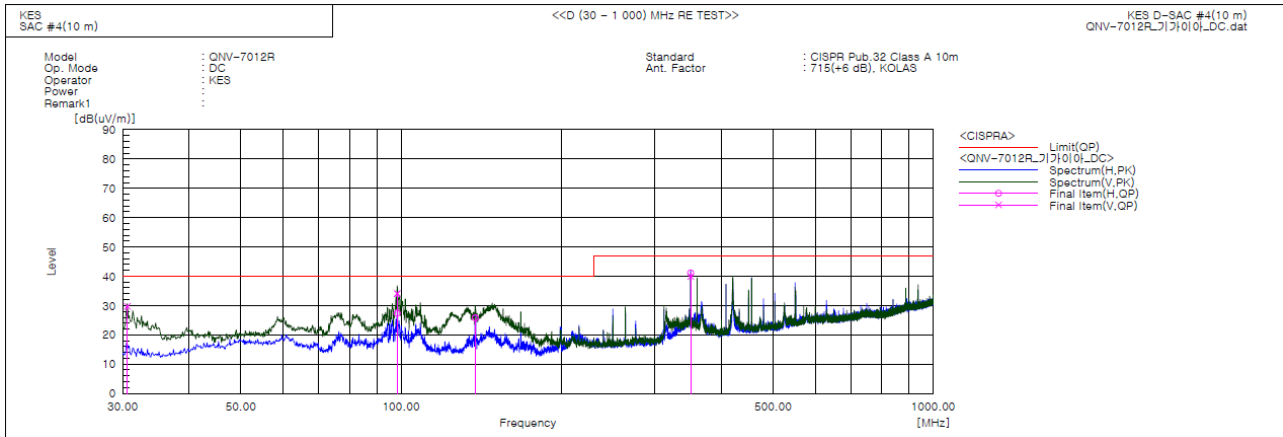
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Radiated Electric Field Emissions(Below 1 GHz)

■ 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	30.606	V	54.7	-25.0	29.7	40.0	10.3	115.0	281.0	
2	98.385	H	50.0	-22.6	27.4	40.0	12.6	391.0	309.0	
3	98.385	V	56.7	-22.6	34.1	40.0	5.9	108.0	65.0	
4	137.913	H	51.2	-25.4	25.8	40.0	14.2	354.0	328.0	
5	349.979	H	56.3	-15.2	41.1	47.0	5.9	297.0	263.0	
6	349.979	V	55.1	-15.2	39.9	47.0	7.1	122.0	346.0	

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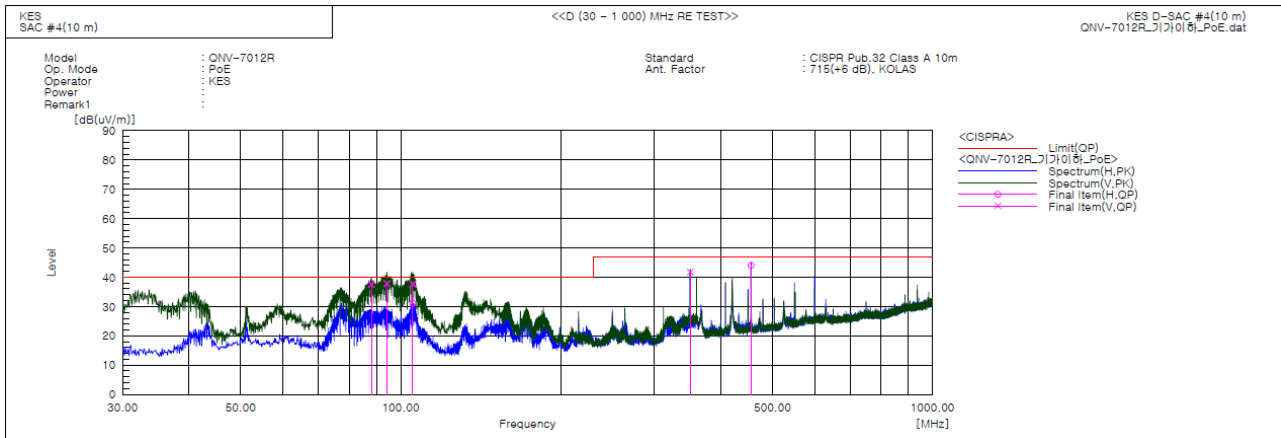


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PoE Mode



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	88.079	V	62.3	-24.7	37.6	40.0	2.4	150.0	80.0	
2	94.263	V	61.4	-23.5	37.9	40.0	2.1	150.0	57.0	
3	105.296	V	60.0	-22.3	37.7	40.0	2.3	100.0	98.0	
4	105.296	H	53.5	-22.3	31.2	40.0	8.8	400.0	158.0	
5	349.979	V	57.0	-15.2	41.8	47.0	5.2	100.0	90.0	
6	455.830	H	56.8	-12.7	44.1	47.0	2.9	200.0	54.0	

◆ Calculation – SEMI ANECHOIC CHAMBER #4(10 m)

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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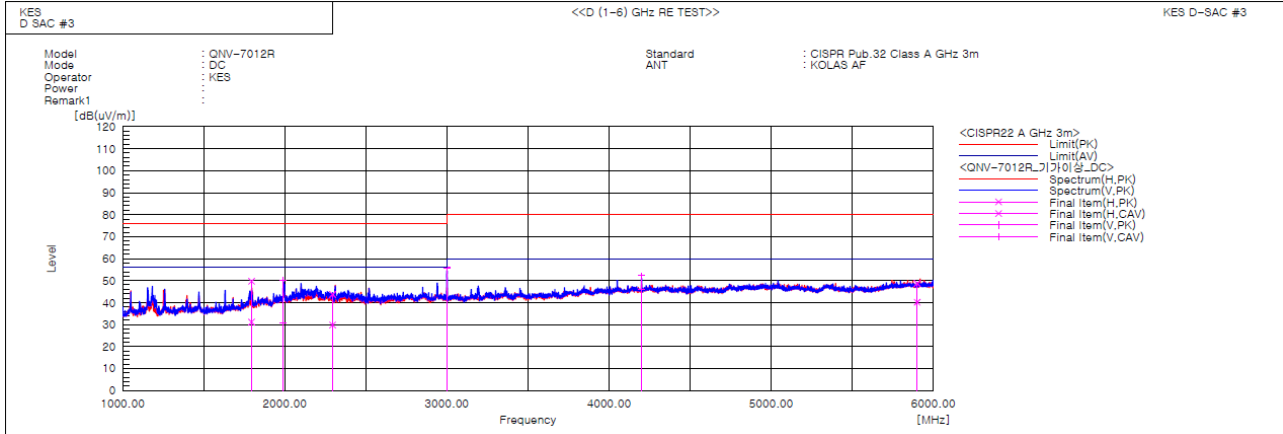
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Radiated Electric Field Emissions(Above 1 GHz)

■ 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	1794.370	H	52.8	34.3	-3.1	49.7	31.2	76.0	56.0	26.3	24.8	100.0	47.0	
2	1990.550	V	51.3	31.9	-1.1	50.2	30.8	76.0	56.0	25.8	25.2	100.0	249.2	
3	2294.753	H	43.8	29.9	-0.1	43.7	29.8	76.0	56.0	32.3	26.2	100.0	36.4	
4	3000.120	V	54.0	54.3	1.6	55.6	55.9	80.0	60.0	24.4	4.1	100.0	166.4	
5	4200.470	V	45.3	39.0	6.9	52.2	45.9	80.0	60.0	27.8	14.1	100.0	316.9	
6	5900.294	H	38.6	30.0	10.1	48.7	40.1	80.0	60.0	31.3	19.9	100.0	302.4	

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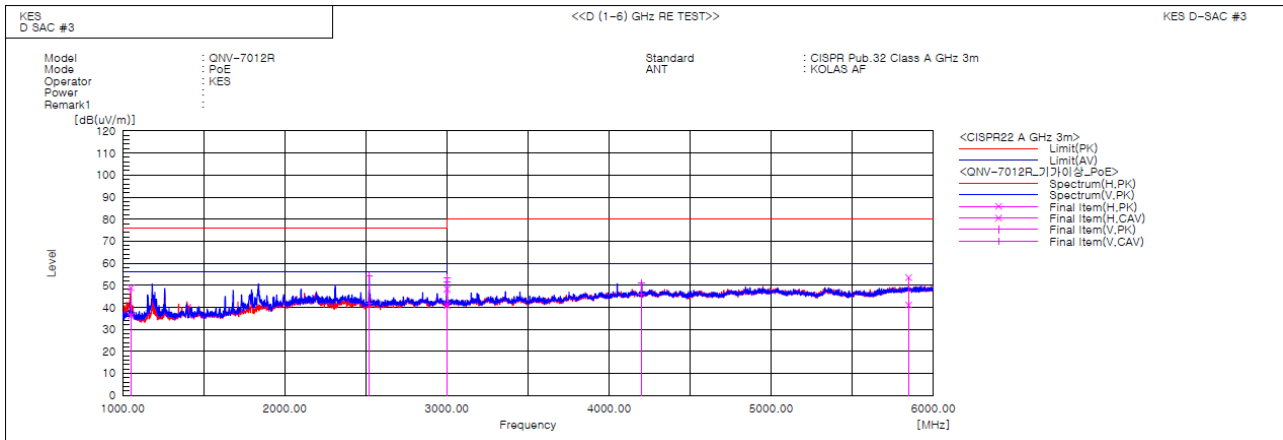
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PoE Mode



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	1050.498	H	58.3	45.6	-9.5	48.8	36.1	76.0	56.0	27.2	19.9	100.0	358.4	
2	2521.220	V	54.0	41.5	0.1	54.1	41.6	76.0	56.0	21.9	14.4	100.0	256.8	
3	2999.956	V	51.6	49.9	1.6	53.2	51.5	76.0	56.0	22.8	4.5	100.0	161.0	
4	2999.892	H	46.6	39.2	1.6	48.2	40.8	76.0	56.0	27.8	15.2	100.0	156.4	
5	4201.518	V	44.3	38.9	6.9	51.2	45.8	80.0	60.0	28.8	14.2	100.0	320.0	
6	5847.180	H	43.4	31.0	10.1	53.5	41.1	80.0	60.0	26.5	18.9	100.0	226.6	

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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Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ DC Mode

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.031			
2	0.004	0.344	1.080	n/a
3	0.020	0.850	2.300	PASS
4	0.003	0.700	0.430	n/a
5	0.019	1.663	1.140	PASS
6	0.005	1.569	0.300	n/a
7	0.019	2.434	0.770	PASS
8	0.003	1.372	0.230	n/a
9	0.019	4.689	0.400	PASS
10	0.002	1.307	0.184	n/a
11	0.018	5.553	0.330	PASS
12	0.003	1.694	0.153	n/a
13	0.018	8.415	0.210	PASS
14	0.003	2.251	0.131	n/a
15	0.017	11.306	0.150	PASS
16	0.003	2.648	0.115	n/a
17	0.016	12.269	0.132	PASS
18	0.003	2.875	0.102	n/a
19	0.016	13.199	0.118	PASS
20	0.003	2.808	0.092	n/a
21	0.015	9.053	0.161	PASS
22	0.002	2.943	0.084	n/a
23	0.014	9.514	0.147	PASS
24	0.002	3.161	0.077	n/a
25	0.013	9.805	0.135	PASS
26	0.002	3.081	0.071	n/a
27	0.012	9.842	0.125	PASS
28	0.002	3.255	0.066	n/a
29	0.012	10.024	0.116	PASS
30	0.002	3.106	0.061	n/a
31	0.011	9.773	0.109	PASS
32	0.002	2.910	0.058	n/a
33	0.010	9.550	0.102	PASS
34	0.002	3.113	0.054	n/a
35	0.009	9.483	0.096	PASS
36	0.001	2.747	0.051	n/a
37	0.008	8.845	0.091	PASS
38	0.001	2.706	0.048	n/a
39	0.007	8.490	0.087	PASS
40	0.001	2.649	0.046	n/a

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.



Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.034			
2	0.004	0.269	1.620	n/a
3	0.023	0.672	3.450	PASS
4	0.004	0.551	0.645	n/a
5	0.023	1.317	1.710	PASS
6	0.005	1.196	0.450	PASS
7	0.022	1.923	1.155	PASS
8	0.004	1.074	0.345	n/a
9	0.022	3.697	0.600	PASS
10	0.003	1.050	0.276	n/a
11	0.022	4.374	0.495	PASS
12	0.003	1.325	0.230	n/a
13	0.021	6.603	0.315	PASS
14	0.003	1.740	0.197	n/a
15	0.020	8.869	0.225	PASS
16	0.003	2.019	0.173	n/a
17	0.019	9.717	0.199	PASS
18	0.003	2.184	0.153	n/a
19	0.018	10.323	0.178	PASS
20	0.003	2.167	0.138	n/a
21	0.017	10.627	0.161	PASS
22	0.003	2.261	0.125	n/a
23	0.016	11.137	0.147	PASS
24	0.003	2.434	0.115	n/a
25	0.015	11.372	0.135	PASS
26	0.003	2.407	0.106	n/a
27	0.014	11.319	0.125	PASS
28	0.002	2.488	0.099	n/a
29	0.013	11.456	0.116	PASS
30	0.002	2.538	0.092	n/a
31	0.012	11.095	0.109	PASS
32	0.002	2.336	0.086	n/a
33	0.011	10.794	0.102	PASS
34	0.002	2.420	0.081	n/a
35	0.010	10.612	0.096	PASS
36	0.002	2.274	0.077	n/a
37	0.009	9.877	0.091	PASS
38	0.002	2.150	0.073	n/a
39	0.008	9.388	0.087	PASS
40	0.002	2.208	0.069	n/a

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.

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Test Data - Voltage Fluctuations
Maximum Flicker results

■ DC Mode

Flicker Measurements					
	Plt	Max Pst	Max Dc	Max Dmax	Max Tmax
Line 1:	0.028	0.028	0	< 0.2	0
Limits:	0.65	1	3.3	4	0.5
Results:	PASS	PASS	PASS	PASS	PASS

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Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

■ DC Mode



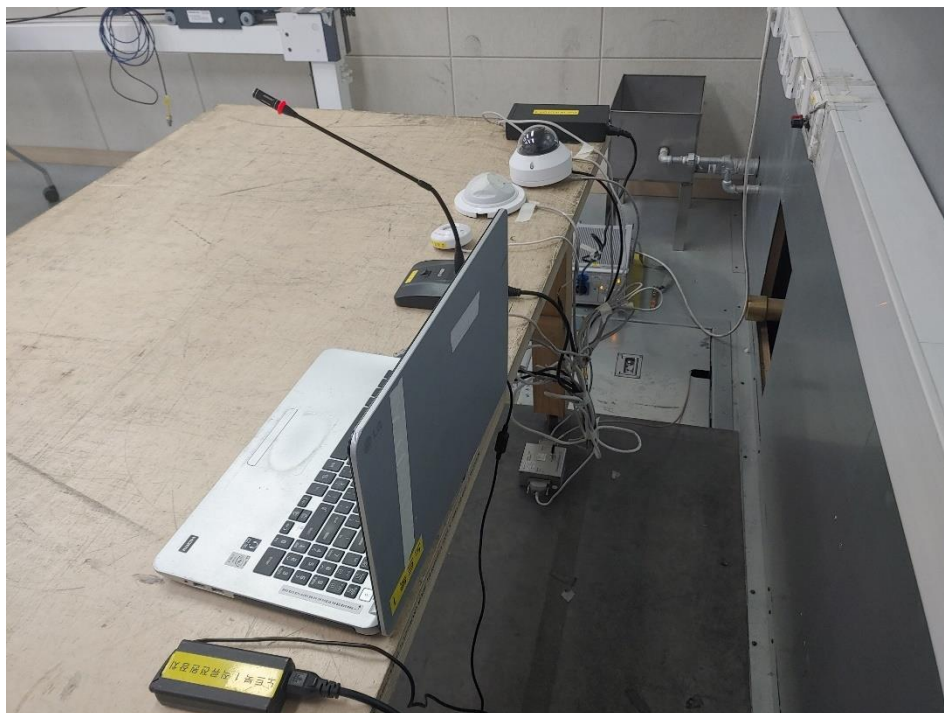
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Conducted Emissions at Telecommunication Ports

■ DC Mode

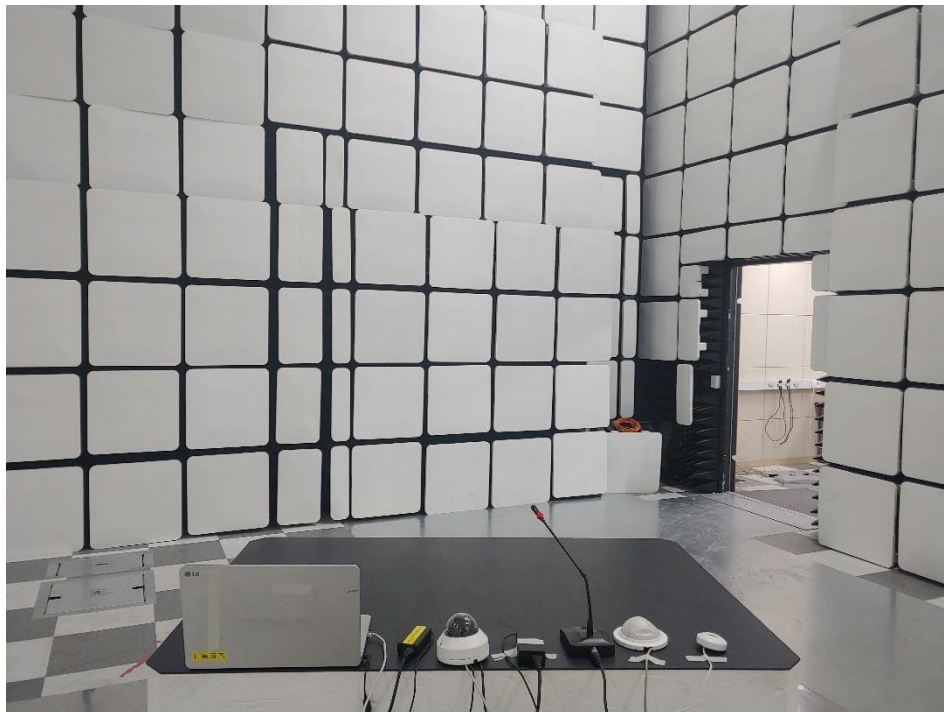
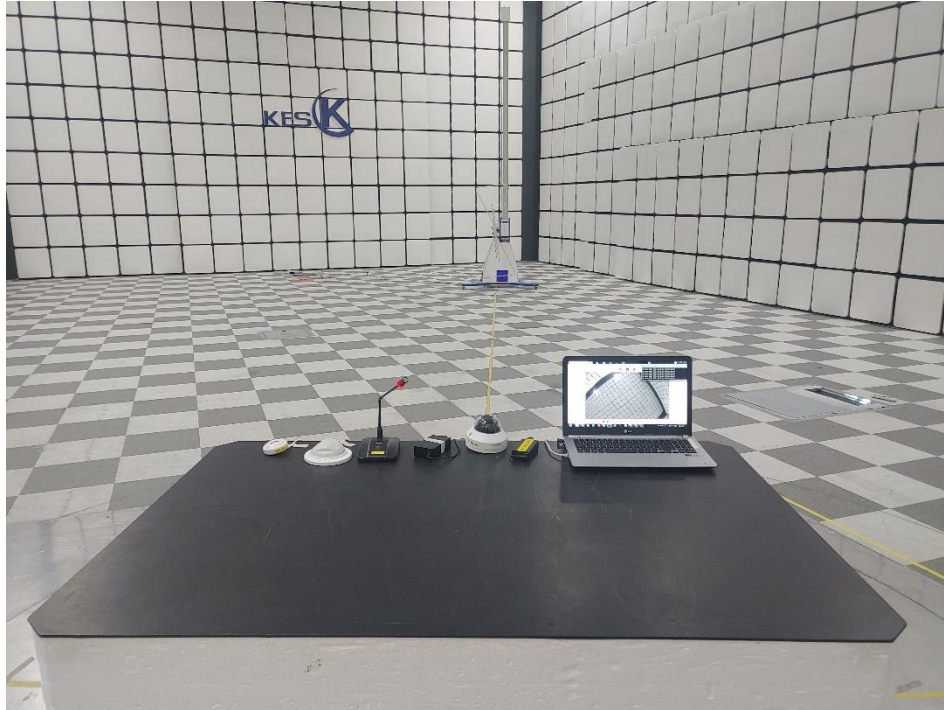


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■ PoE Mode

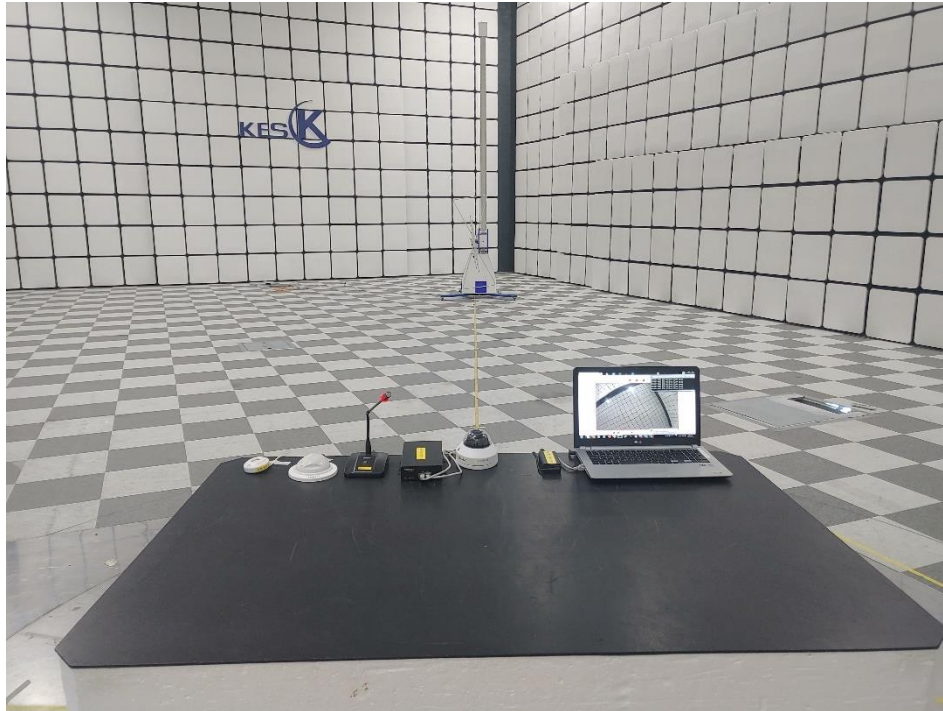
Radiated Electric Field Emissions(Below 1 GHz)

■ DC Mode



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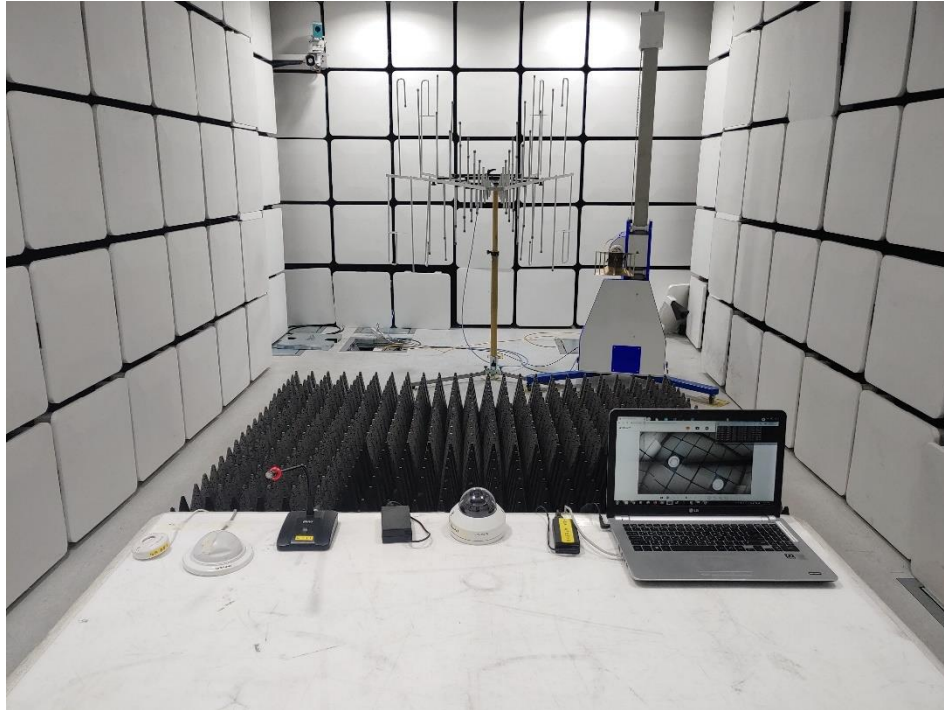
■ PoE Mode



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Radiated Electric Field Emissions(Above 1 GHz)

■ DC Mode



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■ PoE Mode



Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ DC Mode

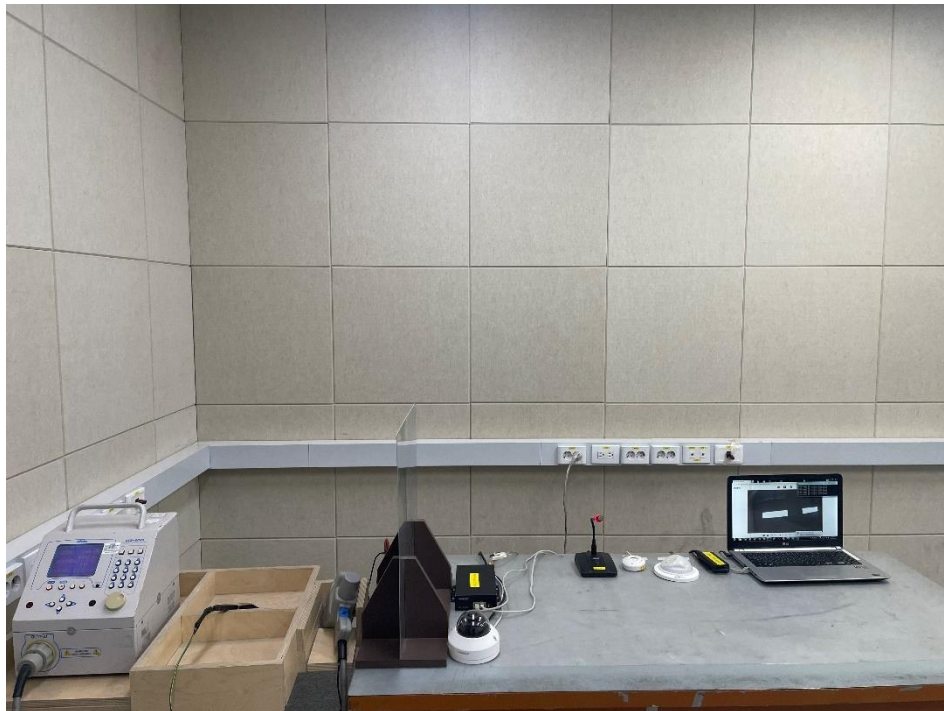


Electrostatic Discharge

■ DC Mode



■ PoE Mode

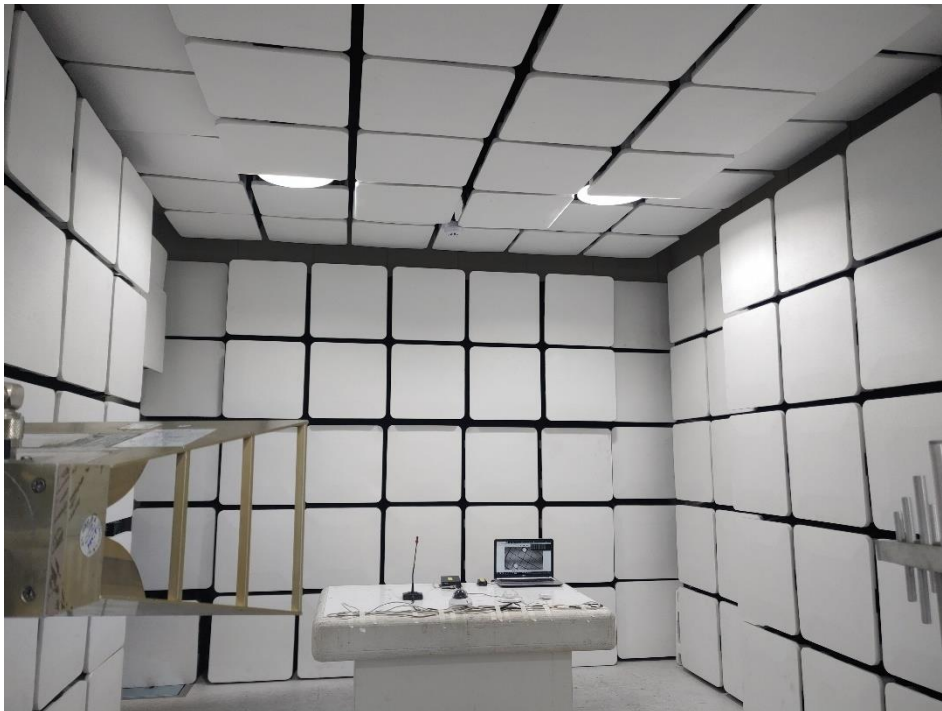


Radiated Electric Field Immunity

■ DC Mode

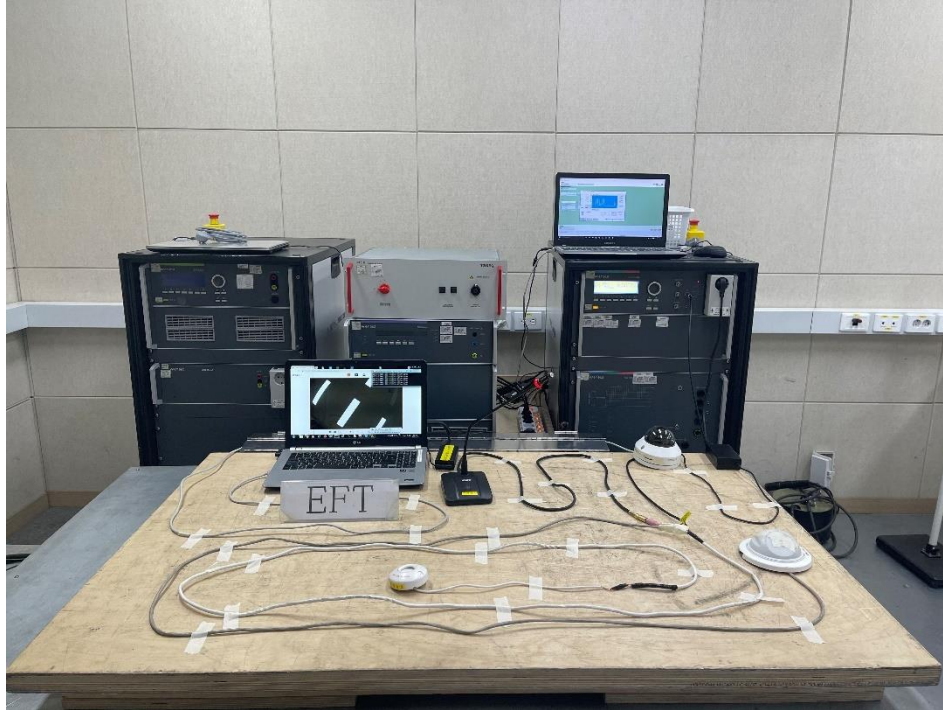


■ PoE Mode



Electrical Fast Transients/Bursts

■ DC Mode



■ PoE Mode



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Surge Transients

■ DC Mode



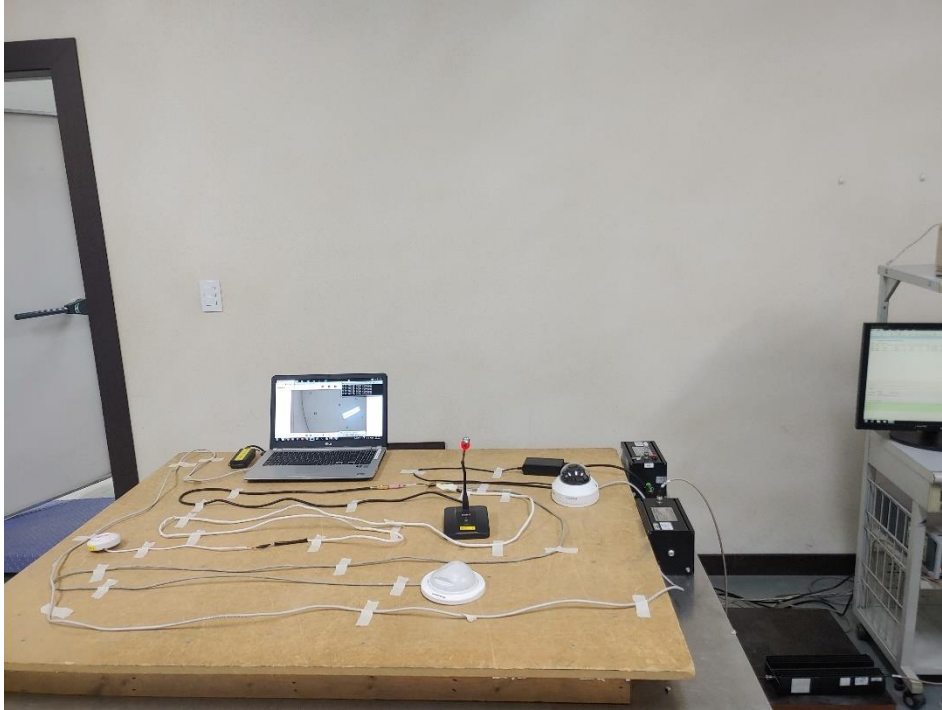
■ PoE Mode



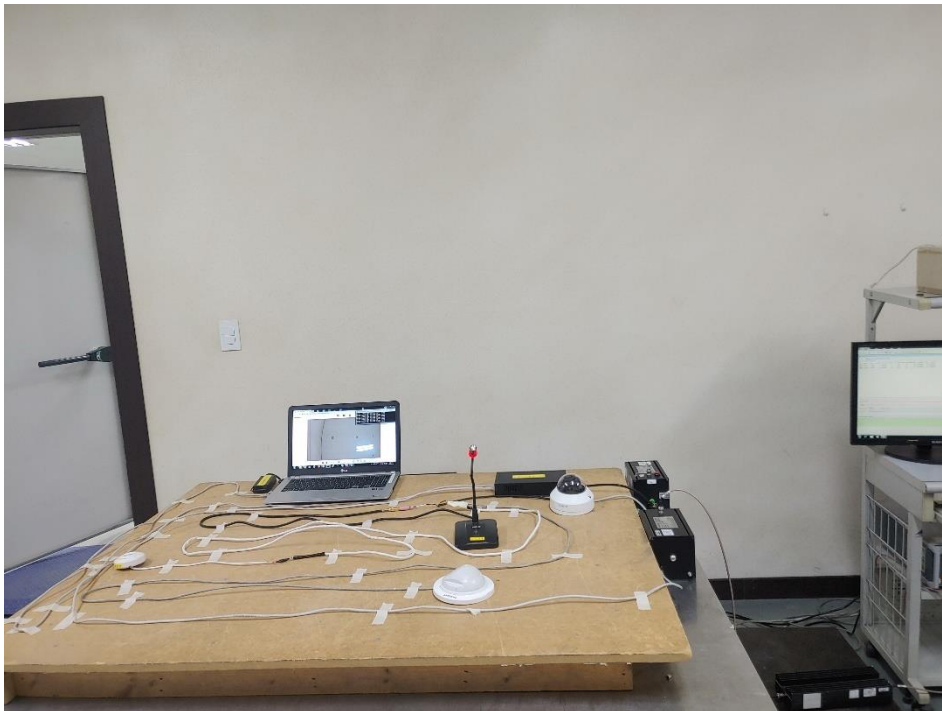
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Conducted Disturbance

■ DC Mode



■ PoE Mode



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Voltage Dips and Short Interruptions

■ DC Mode



EUT External Photographs

(Top)



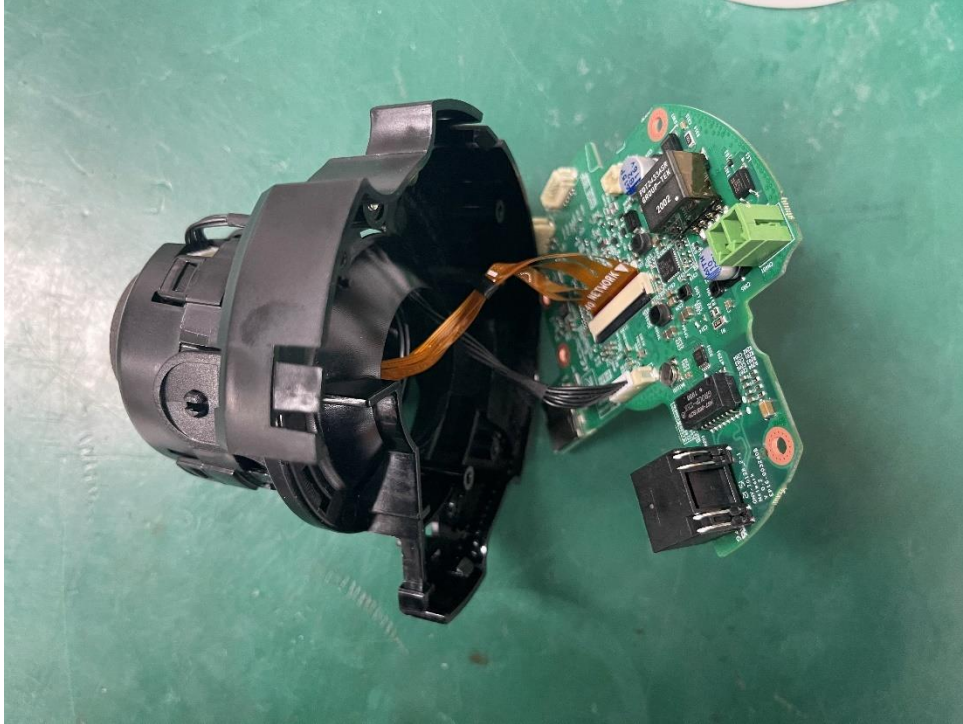
(Bottom)



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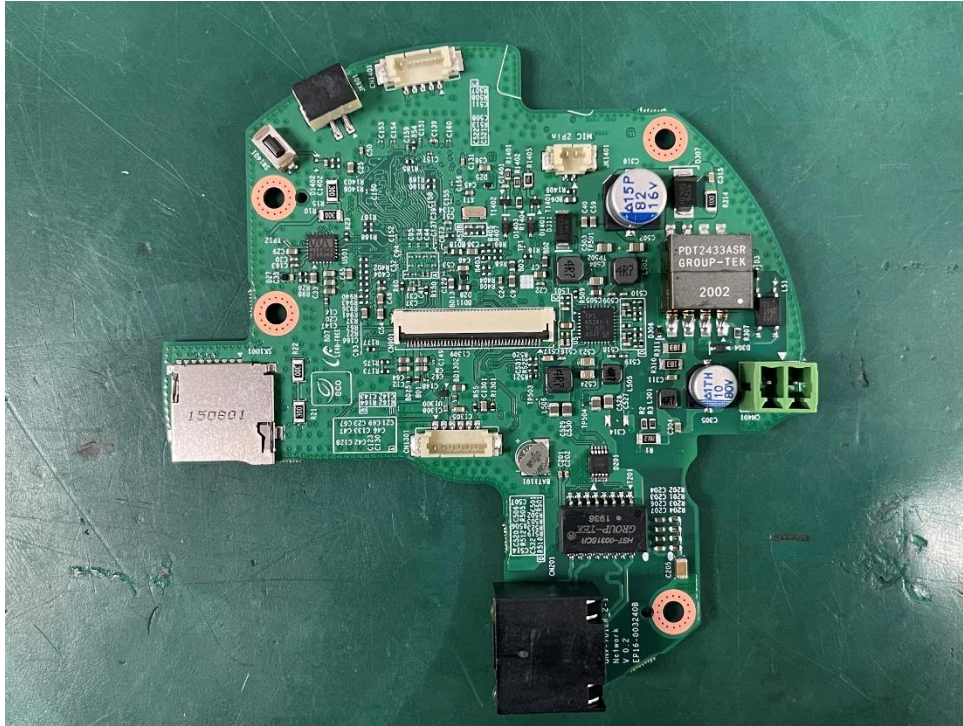
EUT Internal Photographs

(Internal View)

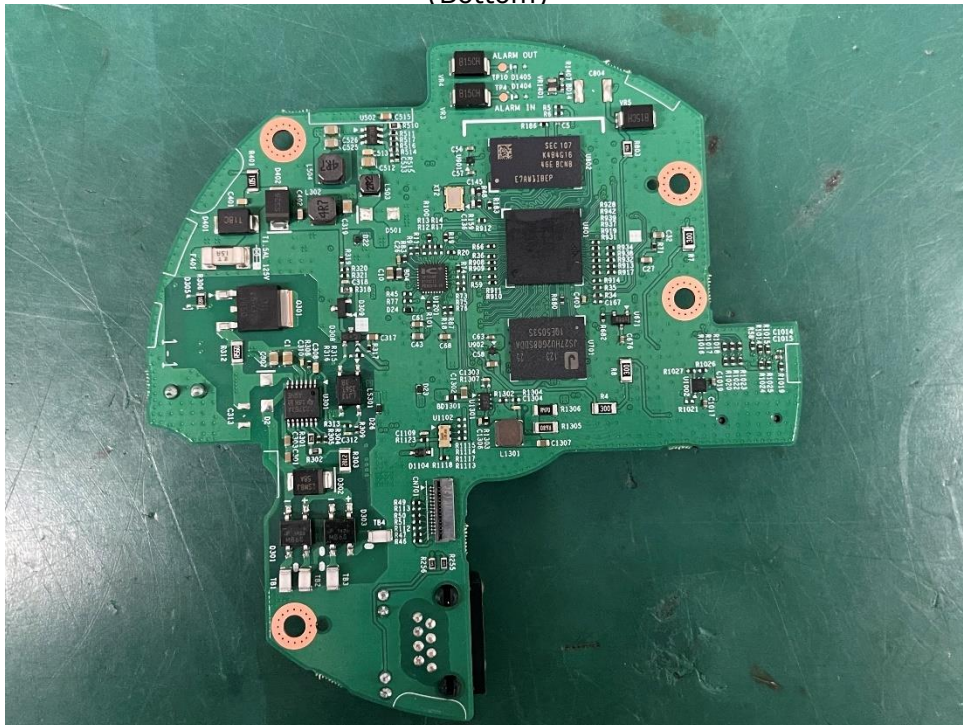


EUT Internal View – Board 1

(Top)



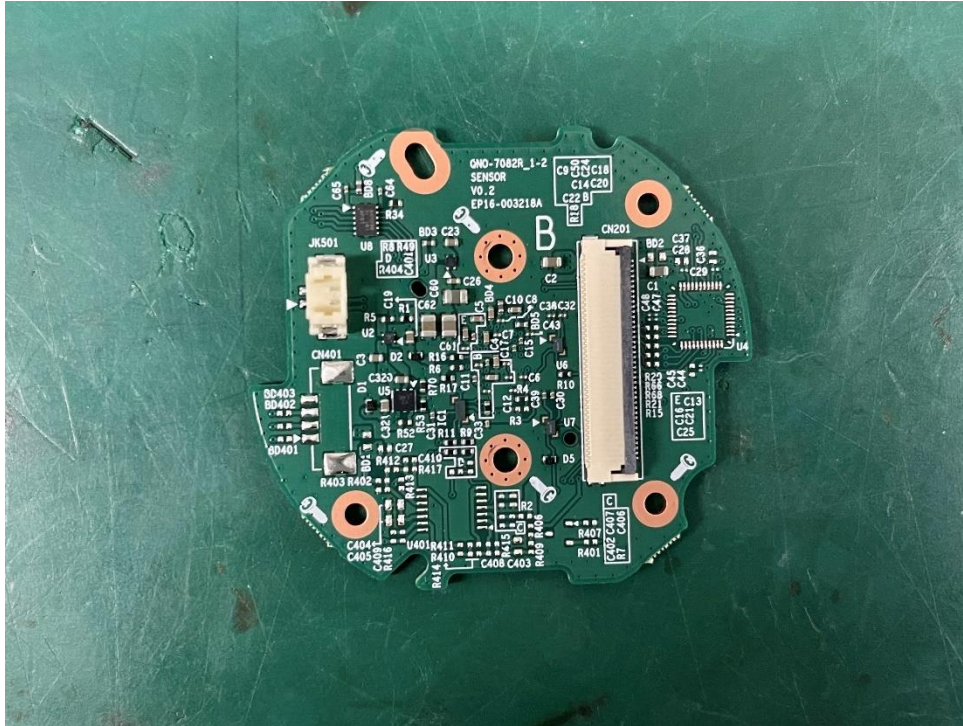
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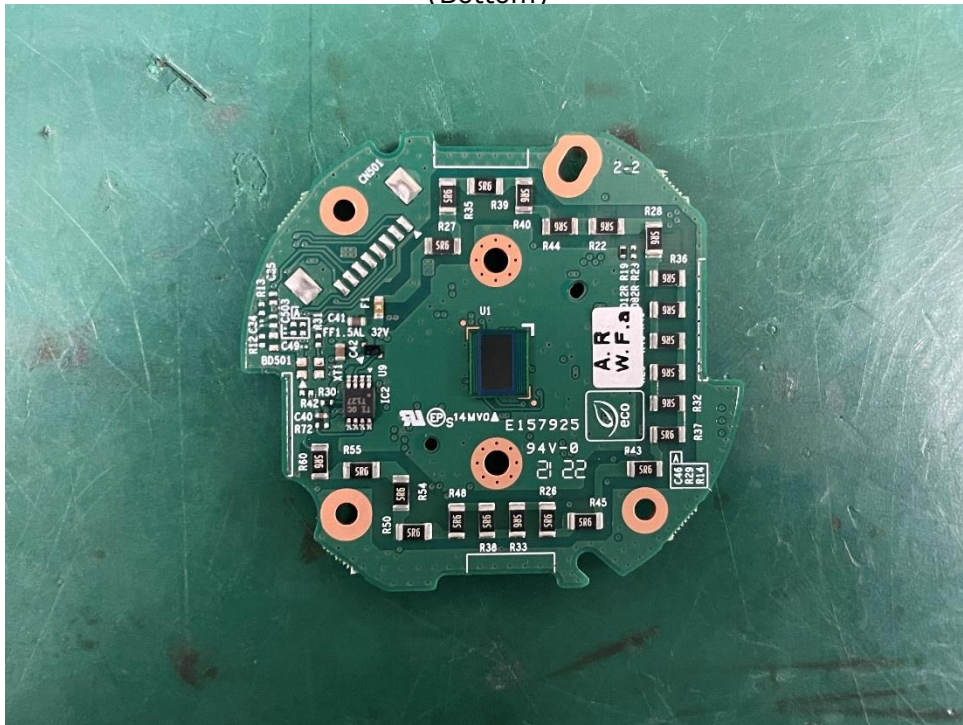
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EUT Internal View – Board 2

(Top)



(Bottom)



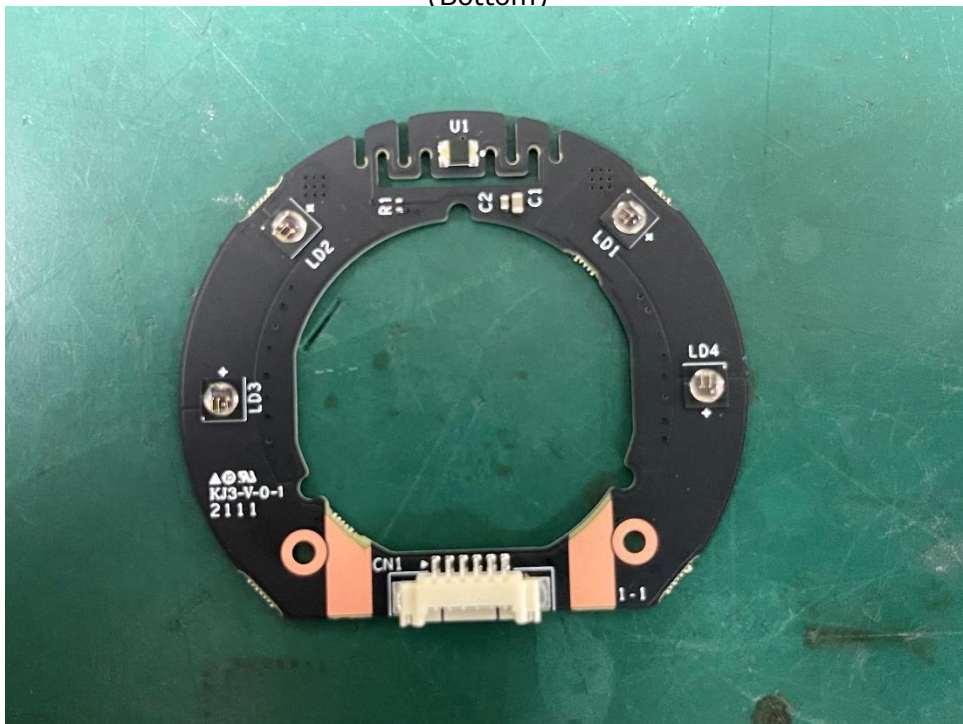
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EUT Internal View – Board 3

(Top)



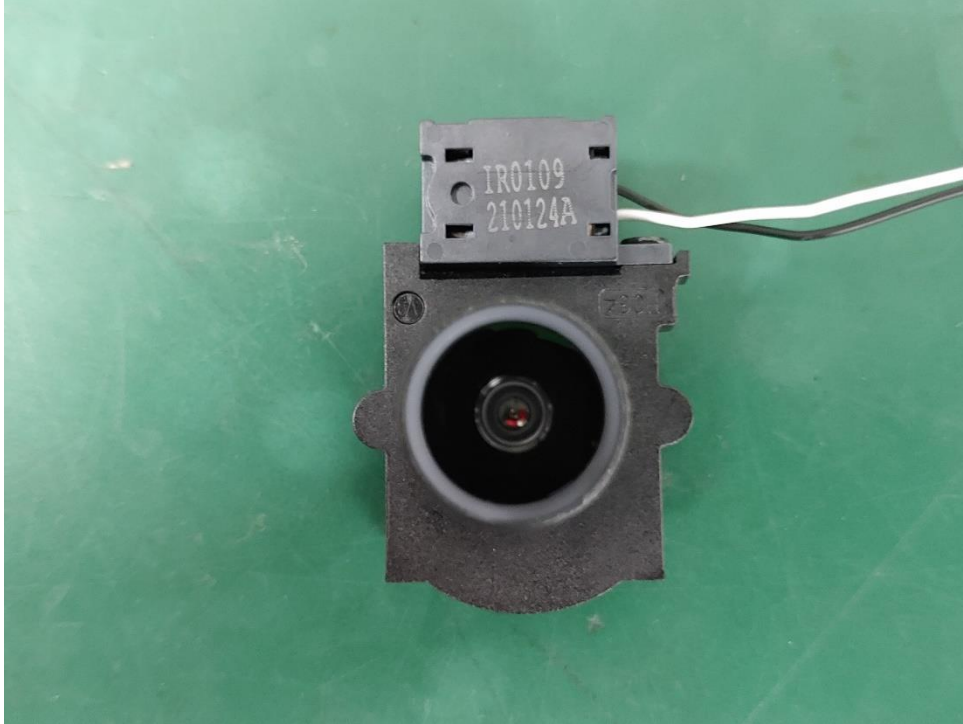
(Bottom)



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EUT Internal View – Lens

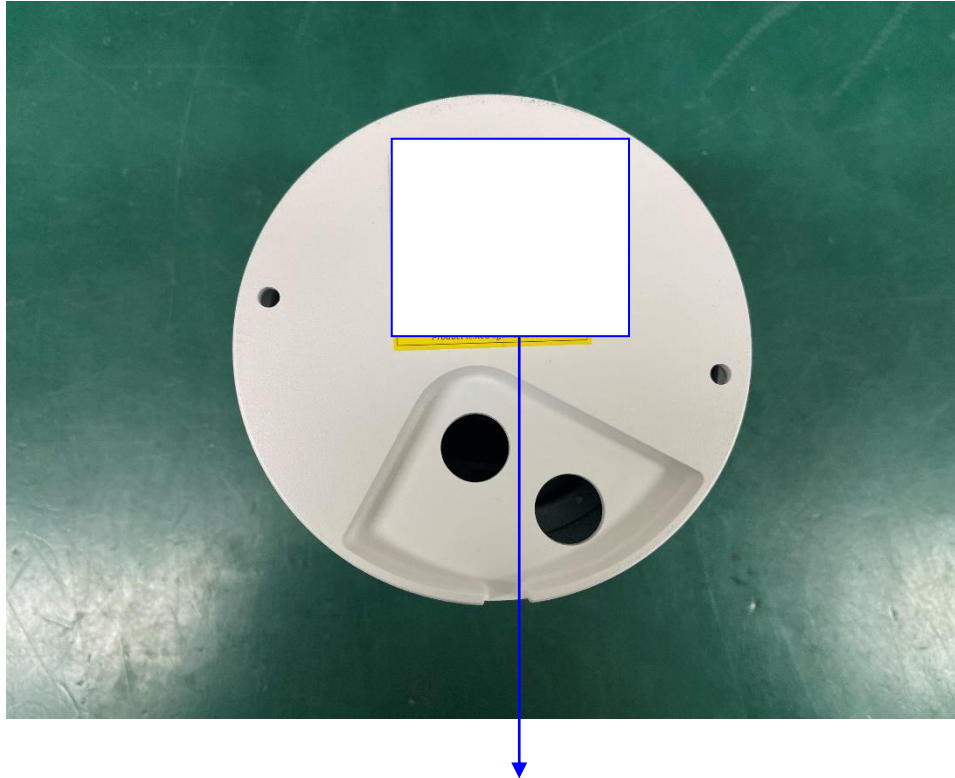
(Top)



(Bottom)



Label and Location



NETWORK CAMERA

Model No : QNV-7012R

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam

