



TEST REPORT



Report No. : KES-EM242647

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KES Co., Ltd.

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1. Client

Applicant : Hanwha Vision Co., Ltd

Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

2. Sample Description

Product name : NETWORK CAMERA

Model/Type No. : XNF-9010RVM

Variant Model : -

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 Ward, Bac Ninh City, Bac Ninh Province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do, Korea (Suwon Industrial Complex)

3. Date of Receipt : Aug. 01, 2024

4. Test date : Aug. 07, 2024 ~ Aug. 09, 2024

5. Date of Issue : Aug. 23, 2024

6. Test Results : In Compliance

Tested by

Reviewed by

Dong Yun, Lee
EMC Test Engineer

Dae Jung, Choi
EMC Technical Manager

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

KES-QP16-F01(00-23-01-01)

KES Co., Ltd.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).



REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Aug. 23, 2024	KES-EM242647	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	1/2.3" CMOS
Resolution	Original view(1:1): 3008x3008~480x480 Double panorama(2:1): 3584x1792~640x320 Single panorama(4:1): 3584x896~640x160 Quad view: 3584x2688~640x480 Q1/Q2/Q3/Q4(4:3): 1792x1344~640x480
Max. Framerate	H.265/H.264: Original view-Max. 30fps/25fps@3008x3008(60Hz/50Hz), Double panorama-Max. 30fps/25fps@3584x1792(60Hz/50Hz) Single panorama-Max. 30fps/25fps@3584x896(60Hz/50Hz) MJPEG: Max. 30fps(@9MP Max. 5fps)
Min. Illumination	Color: 0.39Lux(F2.2, 1/30sec, 30IRE) BW: 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
Lens	
Focal Length (Zoom Ratio)	1.08mm fixed focal
Max. Aperture Ratio	F2.2
Angular Field of View	H: 187° / V: 187° / D: 187°
Min. Object Distance	0.5m(1.64ft)
Focus Control	Simple focus
Operational	
Camera Title	Displayed up to 85 characters
Day & Night	Auto(ICR)
Backlight Compensation	BLC, HLC, WDR, SSDR
Wide Dynamic Range	extremeWDR(120dB)
Digital Noise Reduction	SSNR V
Motion Detection	8ea, 8point Polygonal zones
Privacy Masking	32ea, 4point Quadrangle zones - Color: Gray/Green/Red/Blue/Black/White - Mosaic
Gain Control	Off / Max Gain / Manual
White Balance	ATW / NarrowATW / AWC / Manual / Indoor / Outdoor
LDC	Support(Fill/stretch mode)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker(2~1/12,000sec) prefer shutter control
Video Rotation	Flip, Mirror
Analytics	Analytics events - Defocus detection, Directional detection, Motion detection, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line, Audio detection, Sound classification
Business Intelligence	People counting, Queue management, Heatmap



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Alarm I/O	2 configurable I/O ports
Alarm Triggers	Analytics, Network disconnect, Alarm input, App event, Time schedule, MQTT subscription
Alarm Events	When alarm trigger occurred - File upload(image): e-mail/FTP/SFTP - File upload(video clip): FTP/SFTP - Notification: e-mail - Recording: SD/SDHC/SDXC or NAS recording at event triggers - Alarm output - Handover: PTZ preset, send message by HTTP/HTTPS/TCP - Audio clip playback - MQTT: publication
Audio In	Selectable(mic in/line in/built-in mic)
Audio Out	Line out
IR Viewable Length	WiseIR 10m(32.8ft)
Network	
Ethernet	Metal shielded M12(through RJ45 to M12 cable)
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
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/SFTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, CDP, SRTP(TCP, UDP Unicast), MQTT
Application Programming Interface	ONVIF Profile S/G/T SUNAPI(HTTP API) Wisenet open platform
Security	
OS / Firmware Protect	Encrypted Firmware, Secure boot, Signed Firmware
User authentication	Digest Authentication, Prevent brute-force attacks
Network authentication	IEEE 802.1X(EAP-TLS, EAP-LEAP, EAP-PEAP, MSCHAPv2)
Secure Communication	HTTPS, WSS(WebSocket Secure), SRTP
Access Control	IP-based access control
Data Protect	Encryption Credentials, Encrypt compress for live recording file export
Audit	Access / System / Event Log management
Device ID	Device certificate(Hanwha Vision Root CA)
Secure Storage	HTPM(Hanwha trusted platform module), SDcard partition encrypt
General	
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Edge Storage	Micro SD/SDHC/SDXC 2slot Max. 1TB(512GBx2)
Memory	4GB RAM, 512MB Flash
Environmental & Electrical	
Operating Temperature / Humidity	-40°C~+60°C(-40°F~+140°F) / 0~95% RH(non-condensing)
Storage Temperature / Humidity	-50°C~+60°C(-58°F~+140°F) / 0~90% RH
Certification	IP66, NEMA4X, IK10, EN50155 class T3 EN45545-2, NFPA130, BSS7239



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Input Voltage	PoE(IEEE802.3af, class3), 12VDC
Power Consumption	PoE: Max 12.95W, typical 11W 12VDC: Max 11W, typical 9.1W
Mechanical	
Color / Material	White / Aluminum Bubble: Hard-coated dome
RAL Code	RAL9003
Product Dimensions / Weight	ø160x72mm(ø6.30x2.83"), 1100g(2.43 lb)
Compatible Conduit hole / Gangbox	single, double, 4" octagon, 4" square
Hanging Mount (Dome)	SBP-167HMM
Ceiling Mount (Assy)	SBP-300CMW
Wall Mount	SBP-300MMW/MMW1, SBP-390MMW2
Pole Mount	SBP-300PMW1
In-ceiling Mount	SHD-1600FPW
Parapet Mount	SBP-300LMW
Corner Mount	SBP-300KMW1
Tilt Mount	SBP-160TMW1
Cabinet	SBP-300NBW
Certifications & Standards	
EMC	FCC 47 CFR 15 Subpart B Class A ICES-3(A)/NMB-3(A) CE/UKCA - EN 55032 Class A, EN 50130-4, EN 61000-3-2, EN 61000-3-3 VCCI CISPR 32 Class A RCM AS/NZS CISPR 32 Class A KS C 9832 Class A, KS C 9835
Safety	UL 62368-1, CAN/CSA C22.2 NO. 62368-1 IEC 62471
Environment	EN IEC 63000 IEC 60529 IP66, IEC 62262 IK10 NEMA 250 type 4X, EN50155 class T3 EN45545-2, NFPA130, BSS7239
DORI (EN62676-4 standard)	
Detect (25PPM/ 8PPF)	34.9m(114.49ft)
Observe (63PPM/ 19PPF)	13.9m(45.60ft)
Recognize (125PPM/ 38PPF)	7.0m(22.96ft)
Identify (250PPM/ 76PPF)	3.5m(11.48ft)



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 (DC Adapter Input Power)
☒ 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	XNF-9010RVM	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 System Configuration

Description	Model Number	Serial Number	Manufacturer	Remarks
-	-	-	-	-



1.6 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Laptop	P95G001	9JM8HT2	DELL INC.	-
Laptop Adapter	HA65NM130	-	Chicony Power Technology(Suzhou)Co.,Ltd.	-
PoE Injector	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Micro SD Card	-	-	SanDisk	16 GB
AC/DC Adapter	2ACB022F	-	ChAnnel Well Technology (Guangzhou) Co.,Ltd.	-
Alarm	-	-	-	-
Button Alarm	-	-	-	-
Smartphone	-	-	Samsung Electronics	-
Headset	K550	-	Britz®	-



1.7 External I/O Cabling

■ #1

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	2 Pin	AC/DC Adapter	2 Pin	1.5	U
	RJ-45 (LAN)	Laptop	RJ-45 (LAN)	3.3	U
	Audio OUT	Headset	Audio IN	1.8	U
	Audio IN		Audio OUT	1.8	U
	Alarm OUT	Alarm	Alarm IN	3.5	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	Micro SD Card SLOT	Micro SD Card	Micro SD Card SLOT	-	-
Laptop	3.5 mm	Smartphone	3.5 mm	1.0	U
	DC Jack	Laptop Adaptor	DC Jack	1.5	U

* Unshielded=U, Shielded=S

■ #2

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)	3.3	U
	Audio OUT	Headset	Audio IN	1.8	U
	Audio IN		Audio OUT	1.8	U
	Alarm OUT	Alarm	Alarm IN	3.5	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	Micro SD Card SLOT	Micro SD Card	Micro SD Card SLOT	-	-
PoE Injector	RJ-45 (LAN)	Laptop	RJ-45 (LAN)	2.0	U
Laptop	3.5 mm	Smartphone	3.5 mm	1.0	U
	DC Jack	Laptop Adapter	DC Jack	1.5	U

* Unshielded=U, Shielded=S



1.8 EUT Operating Mode(s)

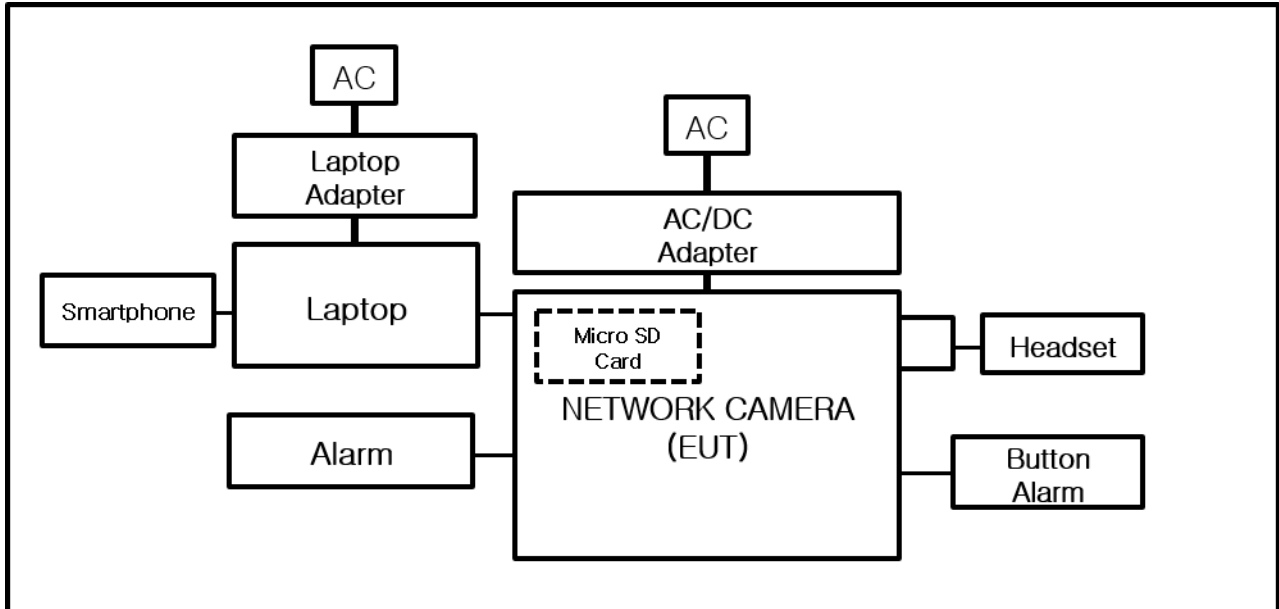
Division	Mode name	Operating status
#1	AC/DC Adapter	1. After connecting EUT and AD/DC Adapter. 2. Check the camera video output on the Laptop. 3. Check if the network status is operating normally during PING TEST. 4. Check the output of the 1 kHz tone output from the smartphone and the microphone input from the headset. 5. Press the alarm button to check the normal operation of the button alarm. 6. After testing, I checked the files stored on Micro SD Card.
#2	PoE	1. After connecting EUT and PoE Injector. 2. Check the camera video output on the Laptop. 3. Check if the network status is operating normally during PING TEST. 4. Check the output of the 1 kHz tone output from the Laptop and the microphone input from the headset. 5. Press the alarm button to check the normal operation of the button alarm. 6. After testing, I checked the files stored on Micro SD Card.

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

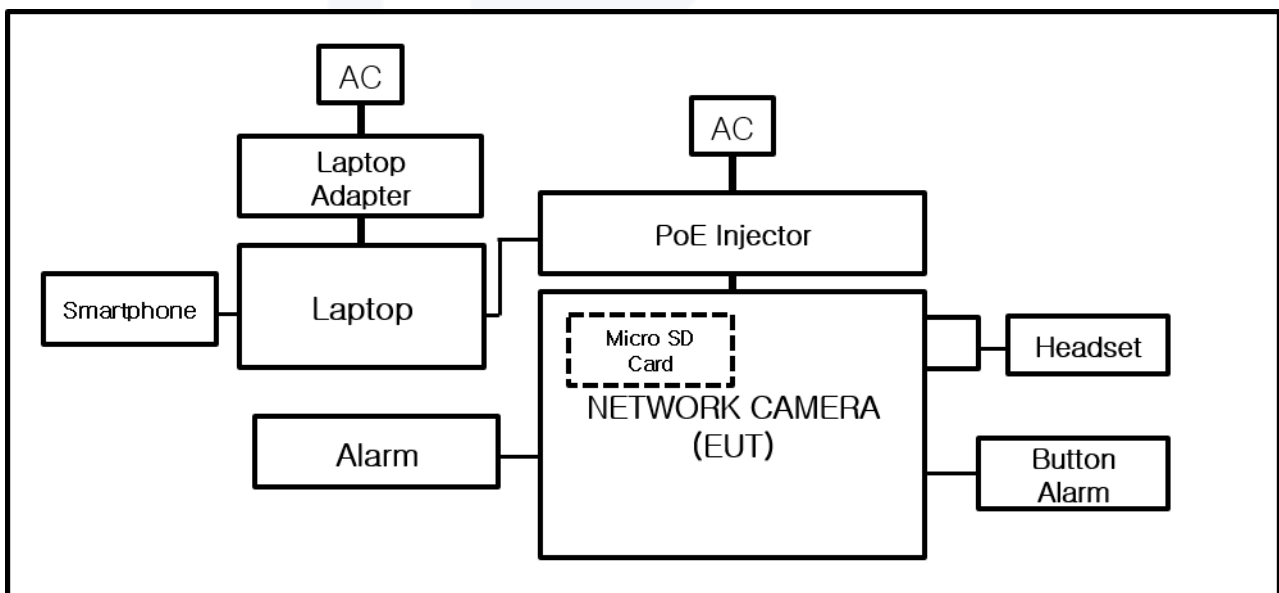


1.9 Configuration

■ #1



■ #2



**1.10 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 USB 5 Pin, Video ports are for administrator use only and are not tested.

1.11 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.

1.12 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

1.13 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 0008



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☒ EN 50121-3-2:2016/A1:2019

☒ EN IEC 61000-3-2:2019

☒ EN 61000-3-3:2013/A2:2021

☒ **EMC – Regulations 2016**

☒ EN 50121-3-2:2016/A1:2019

☒ EN IEC 61000-3-2:2019

☒ EN 61000-3-3:2013/A2:2021



2.1 Conducted Emissions at Mains Power Ports

Test Date

Aug. 07, 2024

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test SW	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	Nov 08, 2024
☒	LISN	ENV216	R & S	101787	Nov 08, 2024
☒	LISN	ESH2-Z5	R & S	100450	Nov 08, 2024
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	Nov 08, 2024

Test Conditions

Temperature: (24,4 ± 0,1) °C

Relative Humidity: (46,3 ± 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 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Aug. 07, 2024

Test Location

SEMI ANECHOIC CHAMBER #4(10 m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	Feb 13, 2025
☒	AMPLIFIER	SCU 01	R & S	100603	Nov 08, 2024
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	Nov 17, 2024
☒	ATTENUATOR	8491A	HP	32173	Feb 13, 2025

Test Conditions

Temperature: (24,8 ± 0,2) °C
Relative Humidity: (46,9 ± 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

RemarksSee Appendix A for test data.



2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Aug. 07, 2024

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	Jul 29, 2025
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	Mar 05, 2025
☒	ATTENUATOR	8491A	HP	35496	Feb 13, 2025
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	Mar 05, 2025

Test Conditions

Temperature: (23,1 ± 0,2) °C

Relative Humidity: (46,8 ± 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

RemarksSee Appendix A for test data.



2.4 Harmonic Current Emissions

Test Date

Aug. 08, 2024

Test Location

SHIELD ROOM #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test SW	net.control	EM TEST	2.1.4	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	Mar 28, 2025
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (23,8 ± 0,1) °C

Relative Humidity: (48,9 ± 0,1) % 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.

- The LAN port is regarded as a wired communication network port and power related ports are not tested.



2.5 Voltage Fluctuations and Flicker

Test Date

Aug. 08, 2024

Test Location

SHIELD ROOM #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test SW	net.control	EM TEST	2.1.4	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	Mar 28, 2025
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (23,8 ± 0,3) °C

Relative Humidity: (48,9 ± 0,3) % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks- See Appendix A for test data.- The LAN port is regarded as a wired communication network port and power related ports are not tested.



3.0 Criteria for Compliance

Criteria for compliance was based on the following guidelines:

General performance criteria

The general principles (performance criteria) for the evaluation of the immunity test results are the following.

Performance criteria A

The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criteria B

The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criteria C

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.



3.1 Electrostatic Discharge

Reference Standard

EN 61000-4-2

Test Date

Aug. 08, 2024

Test Location

EMS-ESD: SHIELD ROOM #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	Jan 30, 2025
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (22,8 ± 0,1) °C
Relative Humidity: (45,8 ± 0,1) % R.H.
Atmospheric Pressure: (99,4 ± 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	Air	HCP	VCP
	☐ 2 kV	☒ 2 kV	☐ 2 kV	☐ 2 kV
	☐ 4 kV	☒ 4 kV	☐ 4 kV	☐ 4 kV
	☒ 6 kV	☐ 6 kV	☒ 6 kV	☒ 6 kV
	☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
	☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

Notes: HCP: Horizontal Coupling Plane

VCP: Vertical Coupling Plane

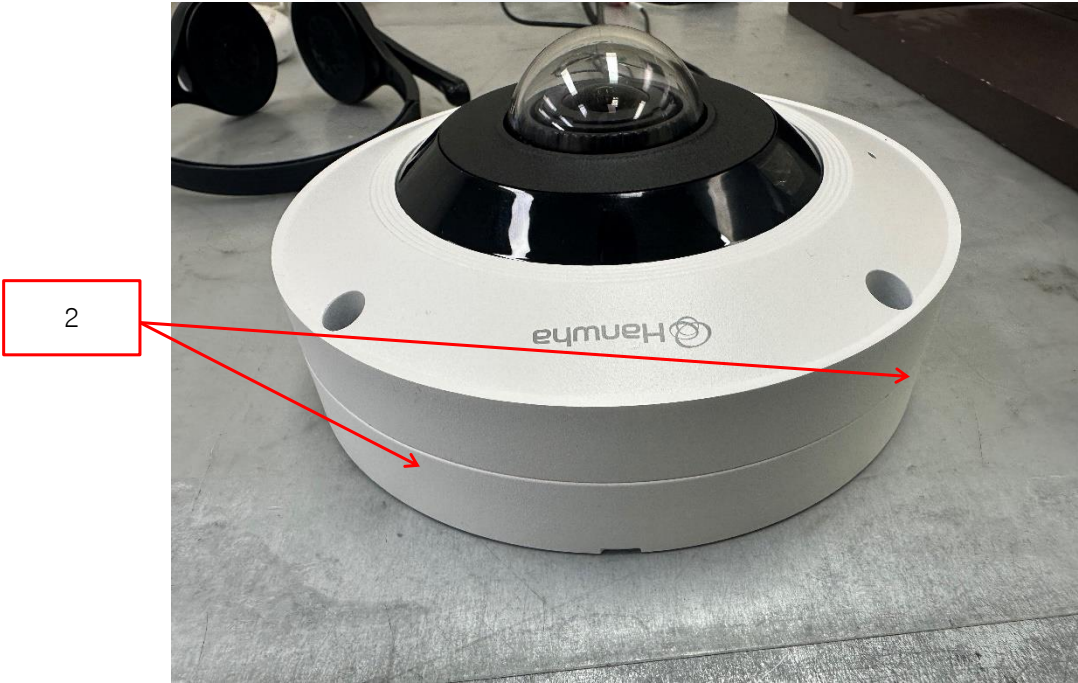
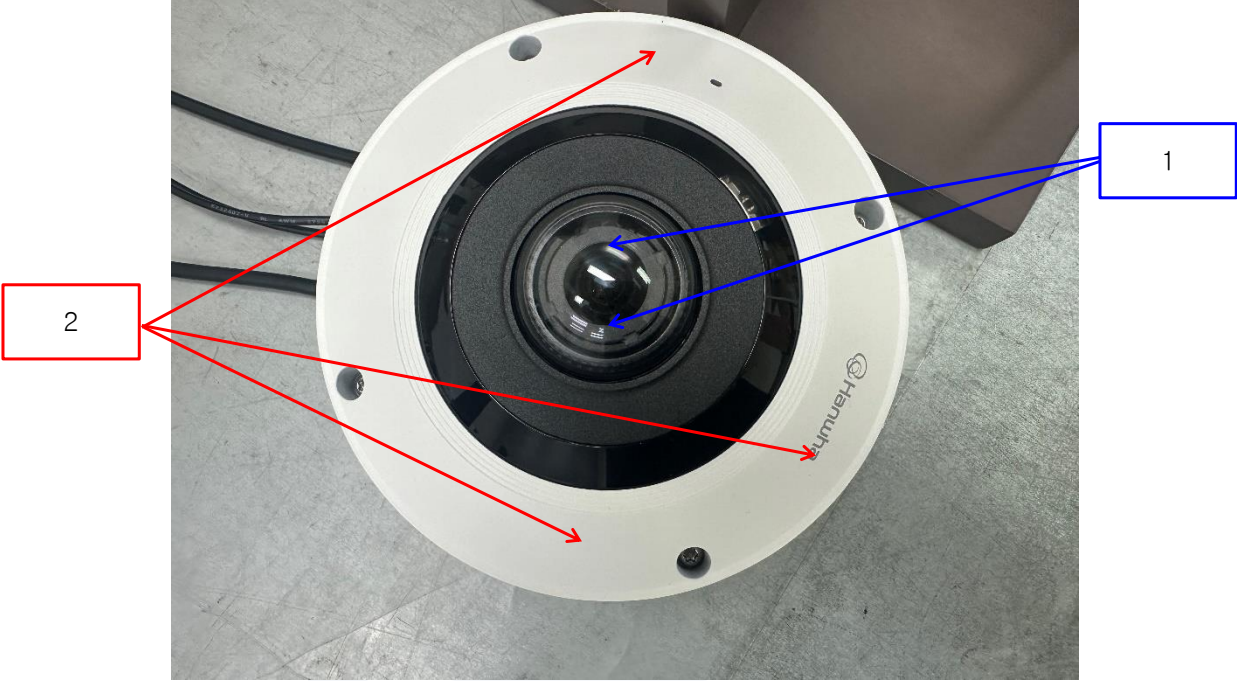
Required Performance Criteria: ☒ B

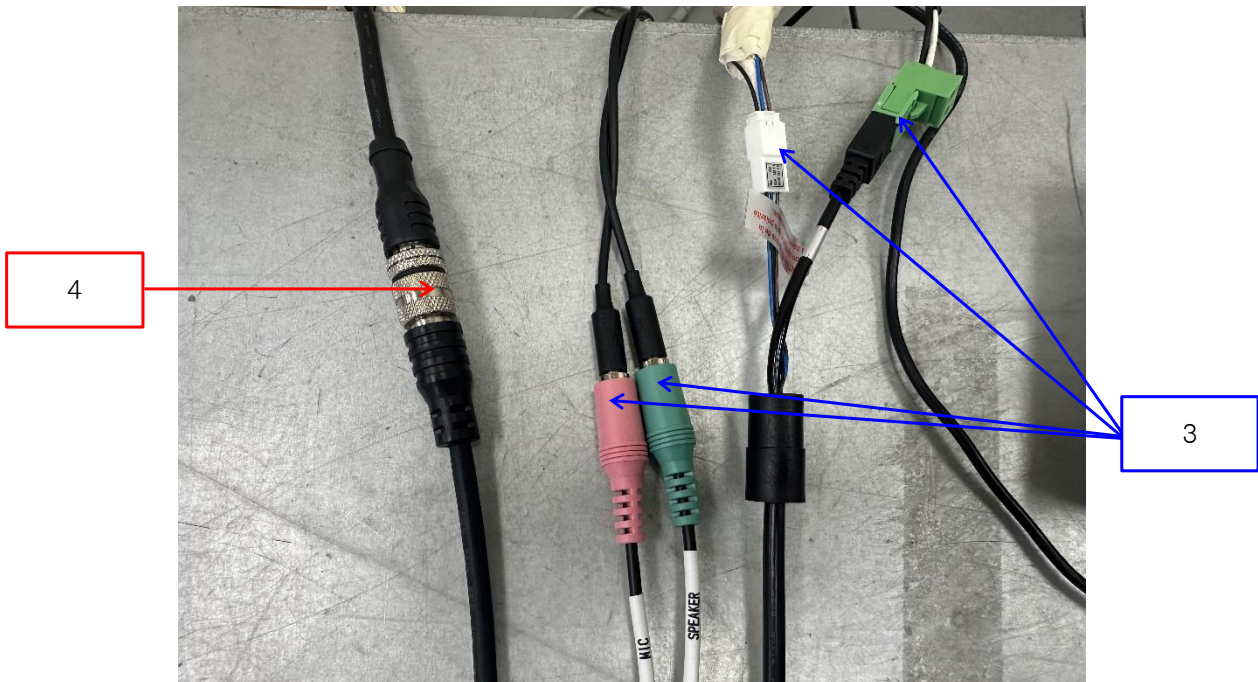


Location of Discharge:



■ #1

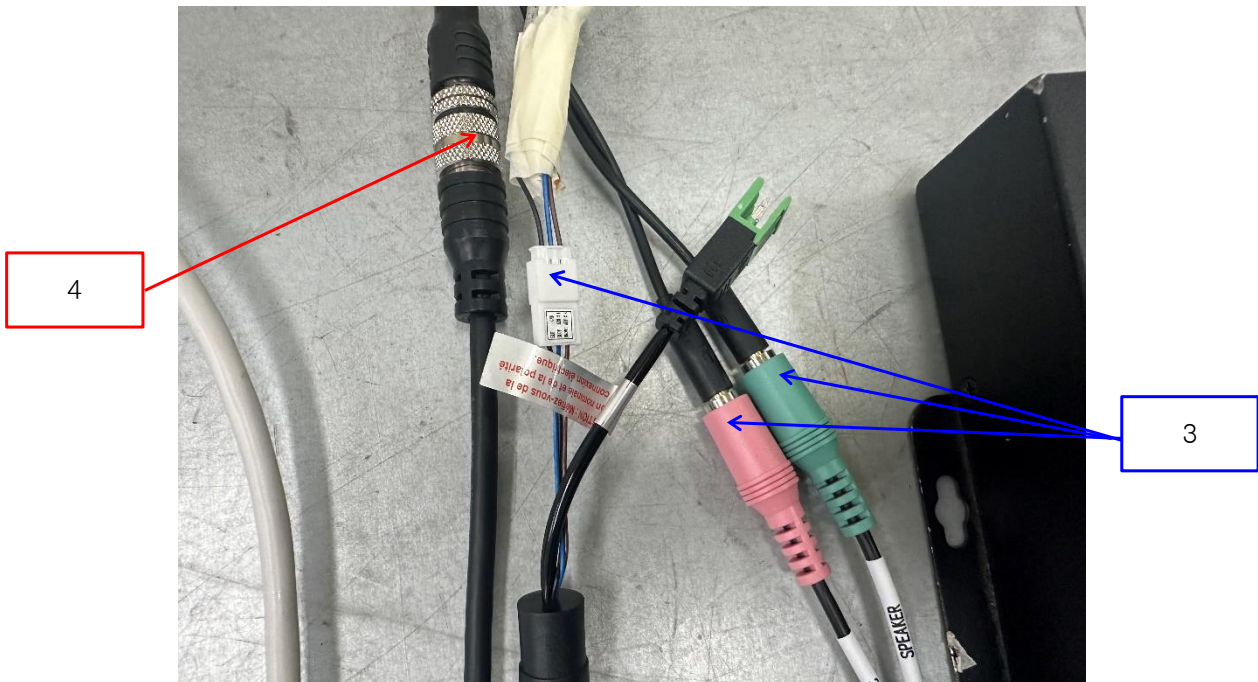






■ #2





**Test Data**

■ #1

Indirect Discharge

No.	Test Point	Discharge Method	Performance	
			Criteria	Results
1	HCP Contact	Contact Discharge	B	A
2	VCP Contact	Contact Discharge	B	A

Direct Discharge

No.	Test Point	Discharge Method	Performance	
			Criteria	Results
1	Camera Lens	Air Discharge	B	A
2	Enclosure	Contact Discharge	B	A
3	Around the Port	Air Discharge	B	A
4	LAN connector	Contact Discharge	B	A

■ #2

Indirect Discharge

No.	Test Point	Discharge Method	Performance	
			Criteria	Results
1	HCP Contact	Contact Discharge	B	A
2	VCP Contact	Contact Discharge	B	A

Direct Discharge

No.	Test Point	Discharge Method	Performance	
			Criteria	Results
1	Camera Lens	Air Discharge	B	A
2	Enclosure	Contact Discharge	B	A
3	Around the Port	Air Discharge	B	A
4	LAN connector	Contact Discharge	B	A

Note: "Blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

Any degradations of performance was not observed during in the test.



3.2 Radio-frequency Electromagnetic Field

Reference Standard

EN IEC 61000-4-3

Test Date

Aug. 09, 2024

Test LocationEMS-RS: ☒ SEMI ANECHOIC CHAMBER #3 ☐ SEMI ANECHOIC CHAMBER #4(10 m)**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	9.12.00	-
☒	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	Jul 29, 2025
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	Feb 13, 2025
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	Feb 13, 2025
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	Feb 13, 2025
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	Mar 05, 2025

Test Conditions

Temperature: (23,0 ± 0,4) °C
Relative Humidity: (47,2 ± 0,4) % R.H.
Atmospheric Pressure: (99,7 ± 0,0) kPa



Test Specifications

Antenna Polarization: Horizontal & Vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Frequency Range: ☒ 80 MHz to 800 MHz [20 V/m]
[Field Strength] ☒ 800 MHz to 1 GHz [20 V/m]
☒ 1,4 GHz to 2,0 GHz [10 V/m]
☒ 2,0 GHz to 2,7 GHz [5 V/m]
☒ 5,1 GHz to 6,0 GHz [3 V/m]

Modulation: ☒ 80 % AM, 1 kHz sine wave

Frequency Step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ A

**Test Data**

■ #1

Side Exposed	Performance Criteria	Results	
		Horizontal	Vertical
Front	A	A	A
Right	A	A	A
Back	A	A	A
Left	A	A	A

■ #2

Side Exposed	Performance Criteria	Results	
		Horizontal	Vertical
Front	A	A	A
Right	A	A	A
Back	A	A	A
Left	A	A	A

Note: "Blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

Any degradations of performance was not observed during in the test.



3.3 Fast Transients

Reference Standard

EN 61000-4-4

Test Date

Aug. 08, 2024

Test Location

EMS-EFT: SHIELD ROOM #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	Nov 09, 2024
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	Nov 09, 2024
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	Nov 10, 2024

Test Conditions

Temperature: (23,7 ± 0,1) °C
Relative Humidity: (48,6 ± 0,1) % R.H.
Atmospheric Pressure: (99,7 ± 0,0) kPa

Test Specifications

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

Pulse Amplitude & Polarity: ☒ ± 2.0 kV ☐ ± 4.0 kV
(Signal Lines)

Pulse Amplitude & Polarity: ☐ ± 1.0 kV
(Earth Lines)

Burst Period: ☒ 300 ms

Repetition Rate: ☒ 5 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ A

**Test Data**

■ #1

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

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
L	A	A	A
N	A	A	A
L – N	A	A	A

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
RJ-45 (LAN)	A	A	A
Alarm IN	A	A	A
Alarm OUT	A	A	A

☐ Earth ports – Coupling Clamp used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	A	-	-

■ #2

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

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	A	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
RJ-45 (PoE)	A	A	A
Alarm IN	A	A	A
Alarm OUT	A	A	A

☐ Earth ports – Coupling Clamp used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	A	-	-



Note: "Blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

Any degradations of performance was not observed during in the test.





3.4 Surges

Reference Standard

EN 61000-4-5

Test Date

Aug. 08, 2024

Test Location

EMS-Surge: SHIELD ROOM #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test SW	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	Nov 09, 2024
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	Nov 09, 2024
☒	CDN	CNV 504N7.3	EM TEST	P1744207079	Nov 10, 2024

Test Conditions

Temperature: (23,7 ± 0,3) °C
Relative Humidity: (48,6 ± 0,3) % R.H.
Atmospheric Pressure: (99,7 ± 0,0) kPa

**Test Specifications****AC Power Lines**Source Impedance: ☒ 42 Ω + 0.5 μF Surge Amplitude: Common Mode
☐ (2,0) kV
Differential Mode
☒ (1,0) kVVoltage waveform: ☒ 1,2 / 50 μs Current waveform: ☒ 8 / 20 μs Number of Surges: ☒ 5 surges per angleAngle: ☒ 0°, 90°, 180°, 270° (input AC power port)Polarity: ☒ Positive & NegativeRepetition Rate: ☒ 1 surge per min ☐ 1 surge per 30 sec.Required Performance Criteria: ☒ B**DC Power Lines**Source Impedance: ☐ 42 Ω + 0.5 μF Surge Amplitude: Common Mode
☐ (2,0) kV
Differential Mode
☐ (1,0) kVVoltage waveform: ☐ 1,2 / 50 μs Current waveform: ☐ 8 / 20 μs Number of Surges: ☐ 5 SurgesPolarity: ☐ Positive & NegativeRepetition Rate: ☐ 1 surge per min ☐ 1 surge per 30 sec.Required Performance Criteria: ☐ B

**Test Data**

■ #1

AC Power Lines☒ Line to Line – Differential Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
L – N	B	A	A

☐ Line to Earth – Common Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
-	B	-	-

DC Power Lines☐ Line to Line – Differential Mode

Mode of Application	Performance Criteria	Observations	
		(+) Surge (kV)	(-) Surge (kV)
-	B	-	-

☐ Line to Earth – Common Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
-	B	-	-

Note: "Blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**Any degradations of performance was not observed during in the test.



3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6

Test Date

Aug. 09, 2024

Test Location

EMS-CS: SHIELD ROOM #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.12	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	Nov 08, 2024
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	Nov 08, 2024
☒	CDN	CDN M016	TESEQ	43694	Nov 08, 2024
☒	CDN	CDN M016	TESEQ	43697	Nov 08, 2024
☒	CDN	CDN T8RJ45	EM TEST	0909-09	Jul 29, 2025
☒	EM CLAMP	KEMZ 801A	TESEQ	44099	Nov 09, 2024

Test Conditions

Temperature: (23,2 ± 0,3) °C
Relative Humidity: (48,5 ± 0,3) % R.H.
Atmospheric Pressure: (99,9 ± 0,0) kPa

Test Specifications

Frequency Range: ☒ 150 kHz to 80 MHz
Voltage Level: ☒ 10 Vrms
Modulation: ☒ 80 % AM, 1 kHz sine wave
Frequency Step: ☒ 1 % step
Dwell Time: ☐ 1 s ☒ 3 s
Required Performance Criteria: ☒ A

**Test Data**

■ #1

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
L – N	CDN	A	A

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
RJ-45 (LAN)	CDN	A	A
Alarm IN	Clamp	A	A
Alarm OUT	Clamp	A	A

☐ Earth ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	-	-	-

■ #2

☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	CDN	-	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
RJ-45 (PoE)	CDN	A	A
Alarm IN	Clamp	A	A
Alarm OUT	Clamp	A	A

☐ Earth ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	-	-	-

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

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**Any degradations of performance was not observed during in the test.



APPENDIX A – TEST DATA

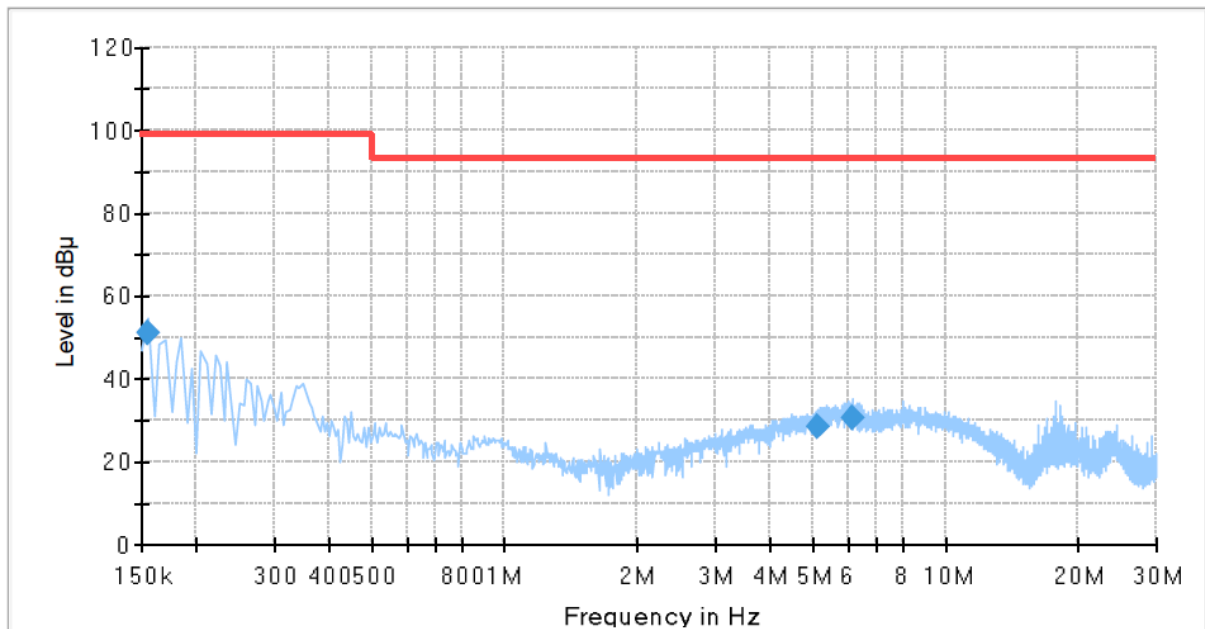
Conducted Emissions at Mains Power Ports

■ #1

[HOT]

Common Information

Test Description: Conducted Emission
Job No.: KES-EM242647
Phase: L
Mode:
Operator Name: KES



Final_Result

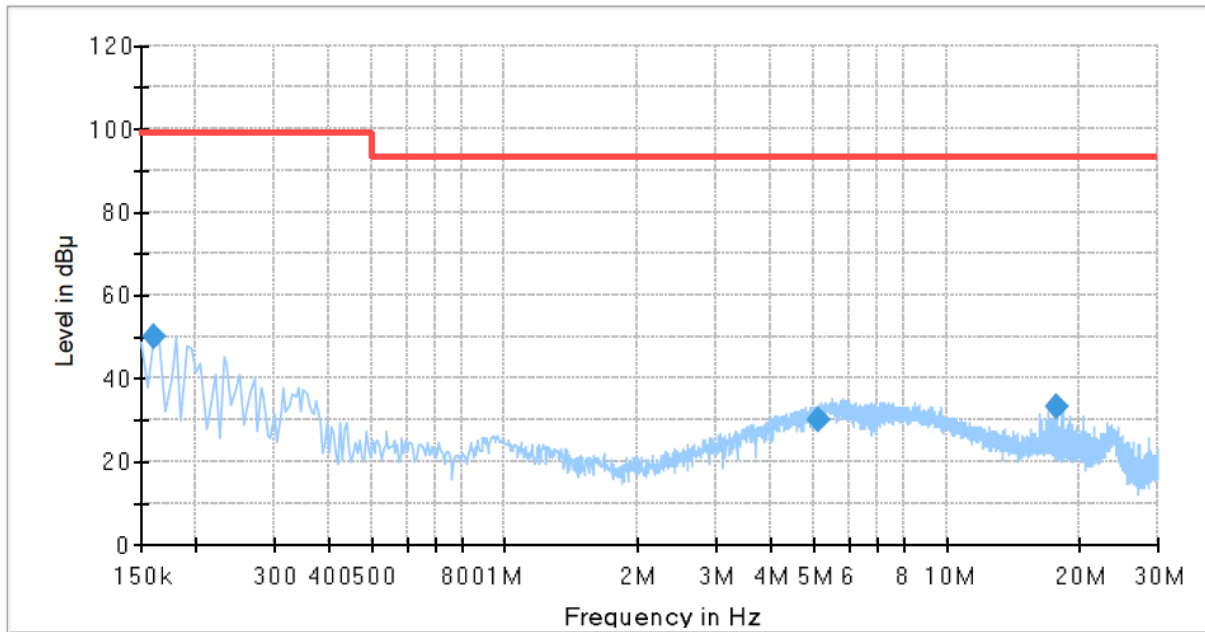
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	51.20	---	99.00	47.80	1000.0	9.000	L1	19.6
5.105000	28.23	---	93.00	64.77	1000.0	9.000	L1	20.0
6.135000	30.32	---	93.00	62.68	1000.0	9.000	L1	20.0



[NEUTRAL]

Common Information

Test Description: Conducted Emission
Job No.: KES-EM242647
Phase: 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)
0.160000	49.85	---	99.00	49.15	1000.0	9.000	N	19.5
5.115000	30.05	---	93.00	62.95	1000.0	9.000	N	20.0
17.695000	33.17	---	93.00	59.83	1000.0	9.000	N	20.4

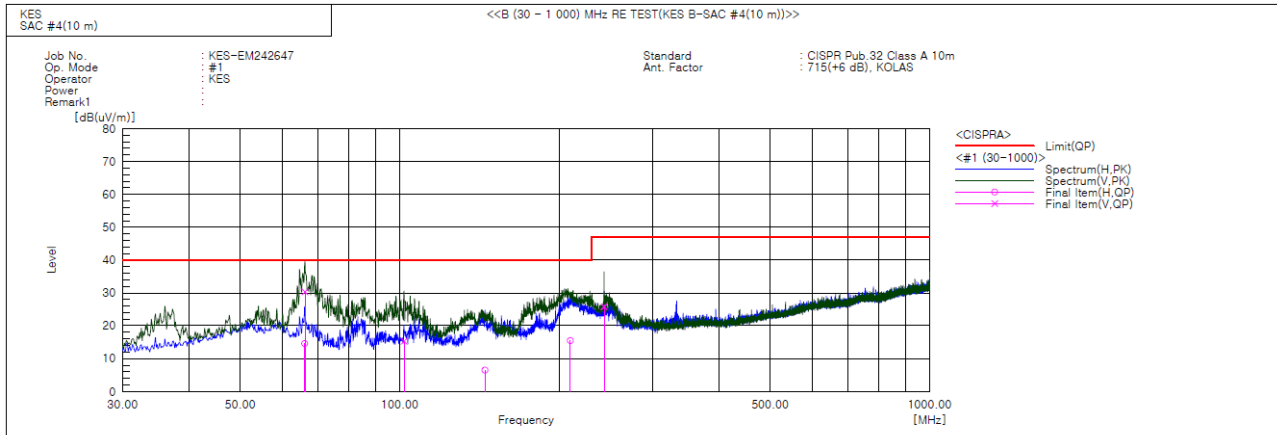
◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

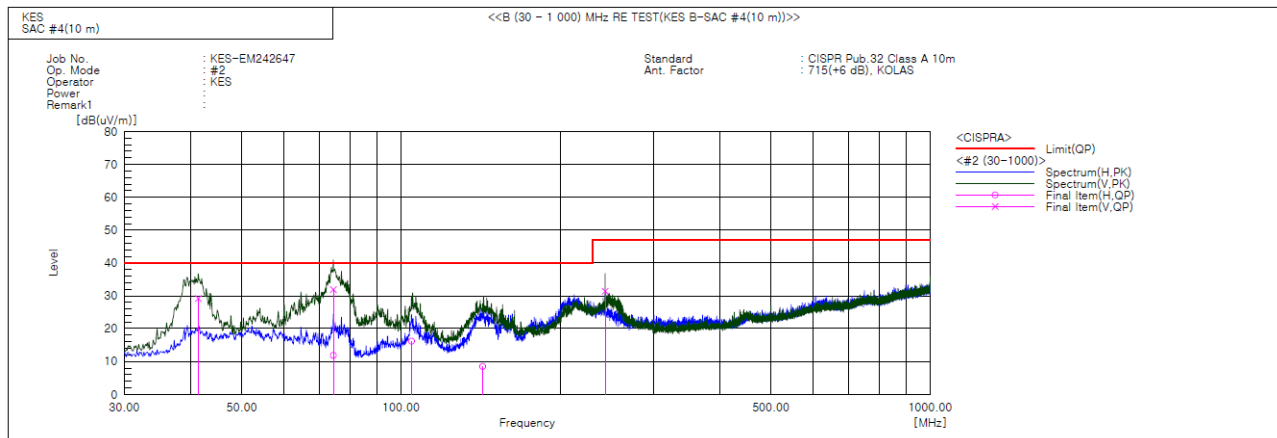
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

**Radiated Electric Field Emissions(Below 1 GHz)****#1****Final Result**

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	66.133	H	38.3	-23.7	14.6	40.0	25.4	120.0	185.0	
2	66.254	V	54.0	-23.7	30.3	40.0	9.7	147.0	297.0	
3	101.901	V	37.7	-22.4	15.3	40.0	24.7	140.0	257.0	
4	144.824	H	31.7	-25.2	6.5	40.0	33.5	393.0	245.0	
5	209.814	H	35.5	-20.0	15.5	40.0	24.5	396.0	119.0	
6	243.036	V	44.6	-18.8	25.8	47.0	21.2	161.0	49.0	



■ #2



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	41.398	V	51.6	-22.4	29.2	40.0	10.8	166.0	271.0	
2	74.499	V	58.5	-26.6	31.9	40.0	8.1	395.0	101.0	
3	74.501	H	38.5	-26.6	11.9	40.0	28.1	391.0	95.0	
4	104.690	H	38.7	-22.5	16.2	40.0	23.8	395.0	151.0	
5	142.641	H	33.7	-25.2	8.5	40.0	31.5	379.0	233.0	
6	243.036	V	50.2	-18.8	31.4	47.0	15.6	111.0	75.0	

◆ Calculation

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

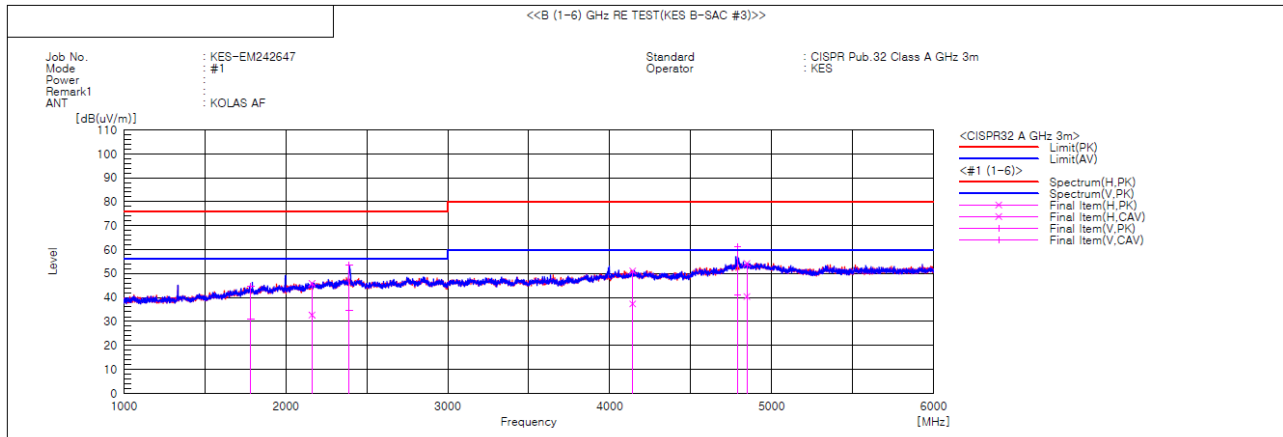
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

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

**Radiated Electric Field Emissions(Above 1 GHz)**

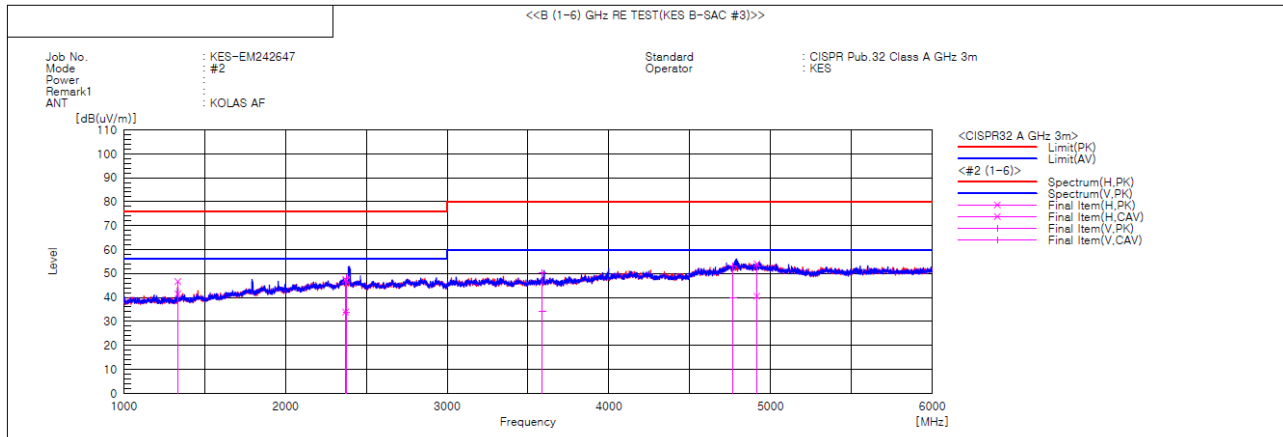
■ #1

**Final Result**

No.	Frequency	(P)	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin	Height	Angle	Remark
	[MHz]		PK	CAV		PK	CAV	PK	AV	PK	CAV	[cm]	[deg]	
			[dB(uV)]	[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[dB]			
1	1784.092	V	42.1	28.7	2.5	44.6	31.2	76.0	56.0	31.4	24.8	100.0	159.0	
2	2160.870	H	40.8	27.6	5.1	45.9	32.7	76.0	56.0	30.1	23.3	100.0	5.0	
3	2390.810	V	47.2	28.4	6.4	53.6	34.8	76.0	56.0	22.4	21.2	100.0	334.3	
4	4141.428	H	39.3	25.5	11.8	51.1	37.3	80.0	60.0	28.9	22.7	100.0	45.9	
5	4789.089	V	45.5	25.4	15.7	61.2	41.1	80.0	60.0	18.8	18.9	100.0	32.3	
6	4847.241	H	38.2	24.4	16.0	54.2	40.4	80.0	60.0	25.8	19.6	100.0	117.5	



#2



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	1333.090	H	48.6	43.5	-1.9	46.7	41.6	76.0	56.0	29.3	14.4	100.0	334.7	
2	2371.374	H	41.2	27.6	6.3	47.5	33.9	76.0	56.0	28.5	22.1	100.0	246.5	
3	2376.834	V	41.6	27.4	6.4	48.0	33.8	76.0	56.0	28.0	22.2	100.0	286.1	
4	3588.332	V	41.2	24.9	9.1	50.3	34.0	80.0	60.0	29.7	26.0	100.0	63.4	
5	4769.284	V	37.7	24.3	15.6	53.3	39.9	80.0	60.0	26.7	20.1	100.0	41.1	
6	4915.293	H	37.9	24.4	16.1	54.0	40.5	80.0	60.0	26.0	19.5	100.0	355.7	

◆ Calculation

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

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

**Harmonic Current Emissions and Voltage Fluctuations and Flicker**

■ #1

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.036			
2	0.001	0.128	1.080	n/a
3	0.028	1.213	2.300	PASS
4	0.002	0.450	0.430	n/a
5	0.028	2.483	1.140	PASS
6	0.002	0.516	0.300	n/a
7	0.029	3.728	0.770	PASS
8	0.002	0.701	0.230	n/a
9	0.027	6.733	0.400	PASS
10	0.002	0.875	0.184	n/a
11	0.026	7.732	0.330	PASS
12	0.002	1.007	0.153	n/a
13	0.024	11.637	0.210	PASS
14	0.002	1.253	0.131	n/a
15	0.023	15.395	0.150	PASS
16	0.002	1.341	0.115	n/a
17	0.022	16.410	0.132	PASS
18	0.002	1.479	0.102	n/a
19	0.020	17.099	0.118	PASS
20	0.001	1.623	0.092	n/a
21	0.019	11.621	0.161	PASS
22	0.001	1.762	0.084	n/a
23	0.017	11.611	0.147	PASS
24	0.001	1.933	0.077	n/a
25	0.016	11.520	0.135	PASS
26	0.001	1.966	0.071	n/a
27	0.014	11.274	0.125	PASS
28	0.001	2.178	0.066	n/a
29	0.012	10.586	0.116	PASS
30	0.001	2.158	0.061	n/a
31	0.011	10.009	0.109	PASS
32	0.001	2.248	0.058	n/a
33	0.009	9.287	0.102	PASS
34	0.001	2.373	0.054	n/a
35	0.008	8.262	0.096	PASS
36	0.001	2.360	0.051	n/a
37	0.007	7.453	0.091	PASS
38	0.001	2.541	0.048	n/a
39	0.006	6.399	0.087	PASS
40	0.001	2.512	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	0.036			
2	0.003	0.159	1.620	n/a
3	0.029	0.845	3.450	PASS
4	0.003	0.522	0.645	n/a
5	0.029	1.678	1.710	PASS
6	0.002	0.518	0.450	n/a
7	0.029	2.535	1.155	PASS
8	0.002	0.708	0.345	n/a
9	0.027	4.562	0.600	PASS
10	0.003	0.937	0.276	n/a
11	0.026	5.270	0.495	PASS
12	0.002	1.048	0.230	n/a
13	0.025	7.879	0.315	PASS
14	0.003	1.354	0.197	n/a
15	0.024	10.458	0.225	PASS
16	0.002	1.423	0.173	n/a
17	0.022	11.135	0.199	PASS
18	0.002	1.545	0.153	n/a
19	0.021	11.712	0.178	PASS
20	0.002	1.703	0.138	n/a
21	0.019	11.799	0.161	PASS
22	0.002	1.898	0.125	n/a
23	0.017	11.813	0.147	PASS
24	0.002	1.994	0.115	n/a
25	0.016	11.742	0.135	PASS
26	0.002	2.121	0.106	n/a
27	0.014	11.555	0.125	PASS
28	0.002	2.412	0.099	n/a
29	0.013	10.909	0.116	PASS
30	0.002	2.284	0.092	n/a
31	0.011	10.280	0.109	PASS
32	0.002	2.337	0.086	n/a
33	0.010	9.609	0.102	PASS
34	0.002	2.647	0.081	n/a
35	0.008	8.635	0.096	PASS
36	0.002	2.570	0.077	n/a
37	0.007	7.812	0.091	PASS
38	0.002	2.654	0.073	n/a
39	0.006	6.792	0.087	PASS
40	0.002	2.574	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.



Report No. : KES-EM242647

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Test Data - Voltage Fluctuations

■ #1

Maximum Flicker results

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

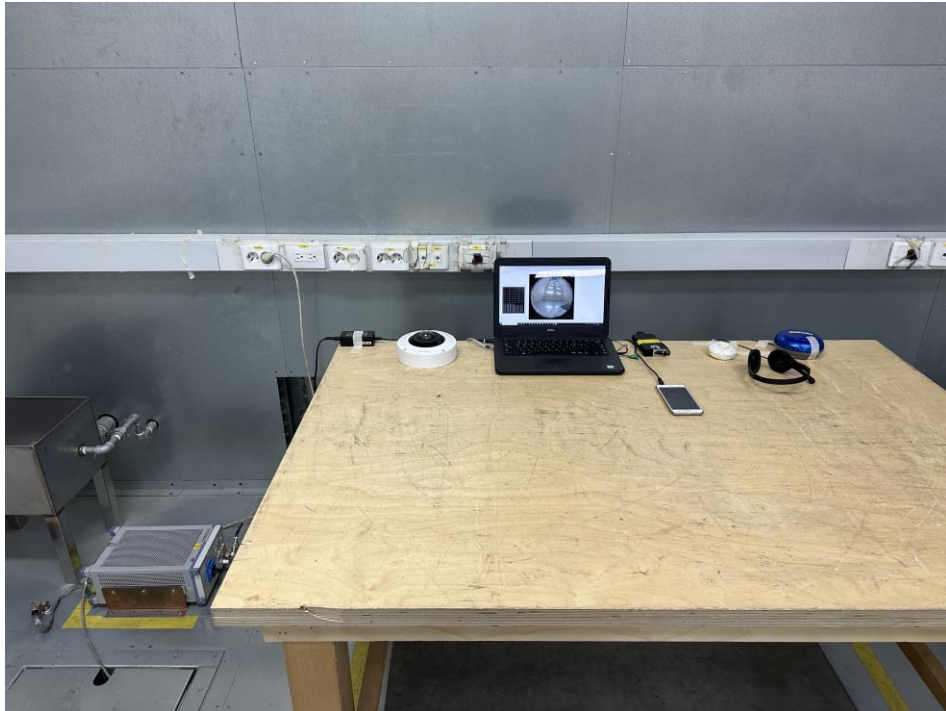




Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

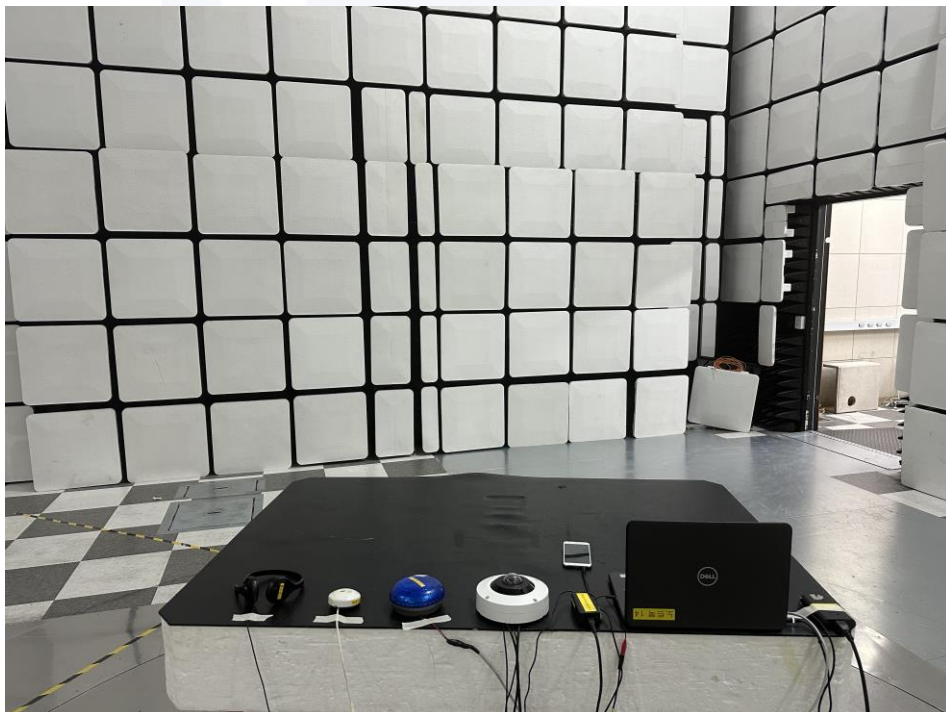
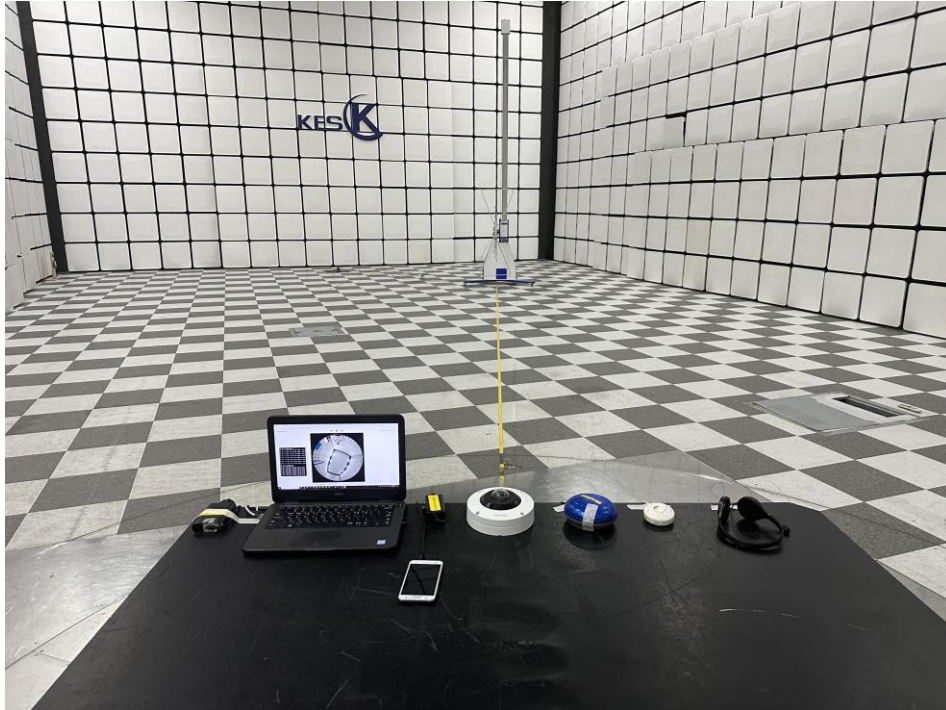
■ #1





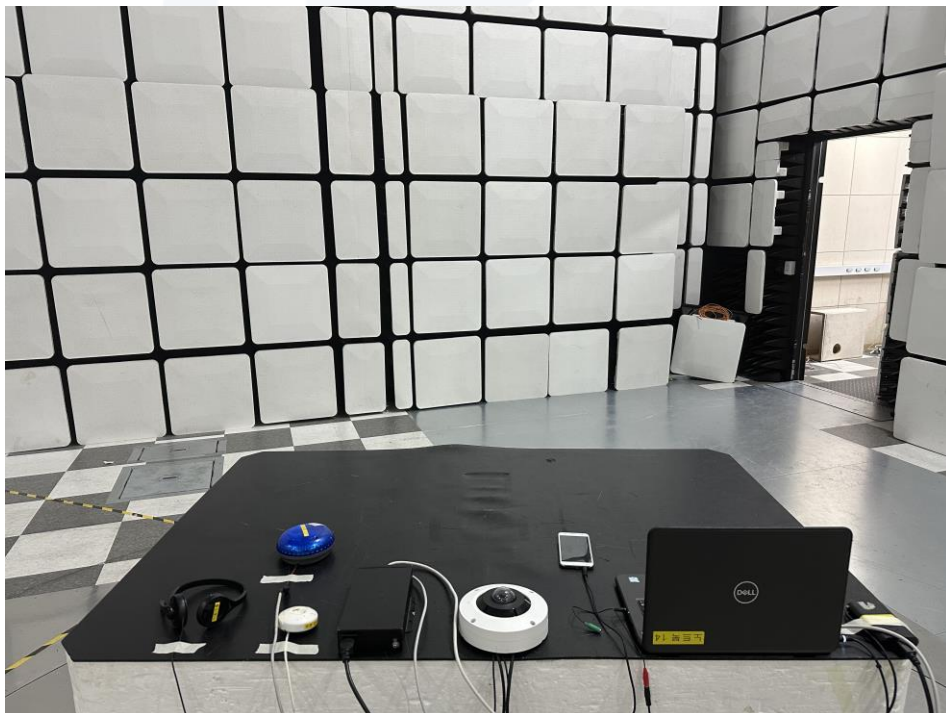
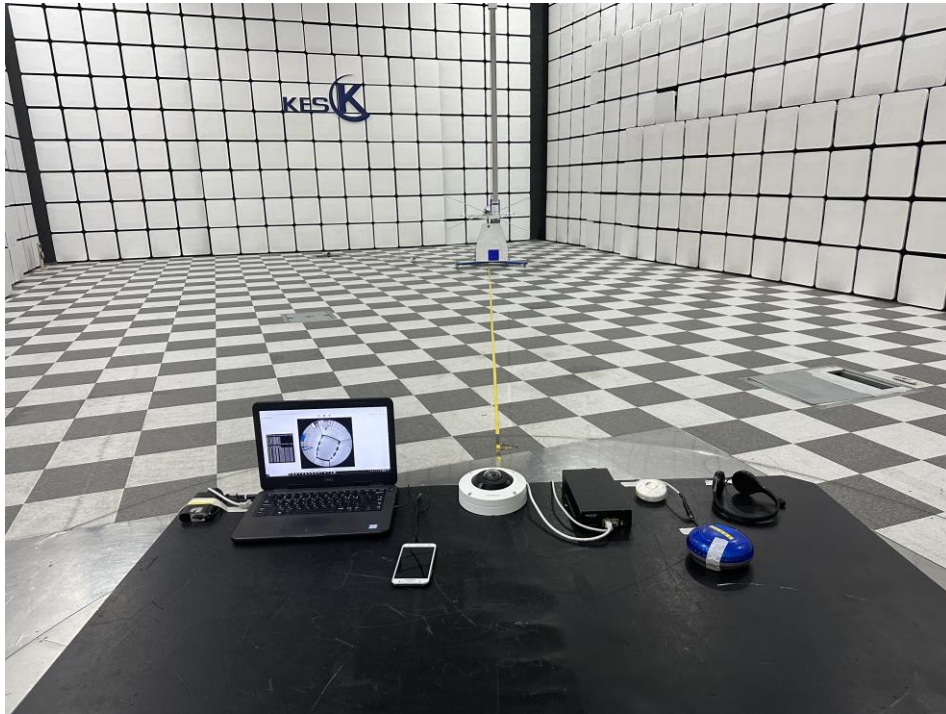
Radiated Electric Field Emissions(Below 1 GHz)

■ #1





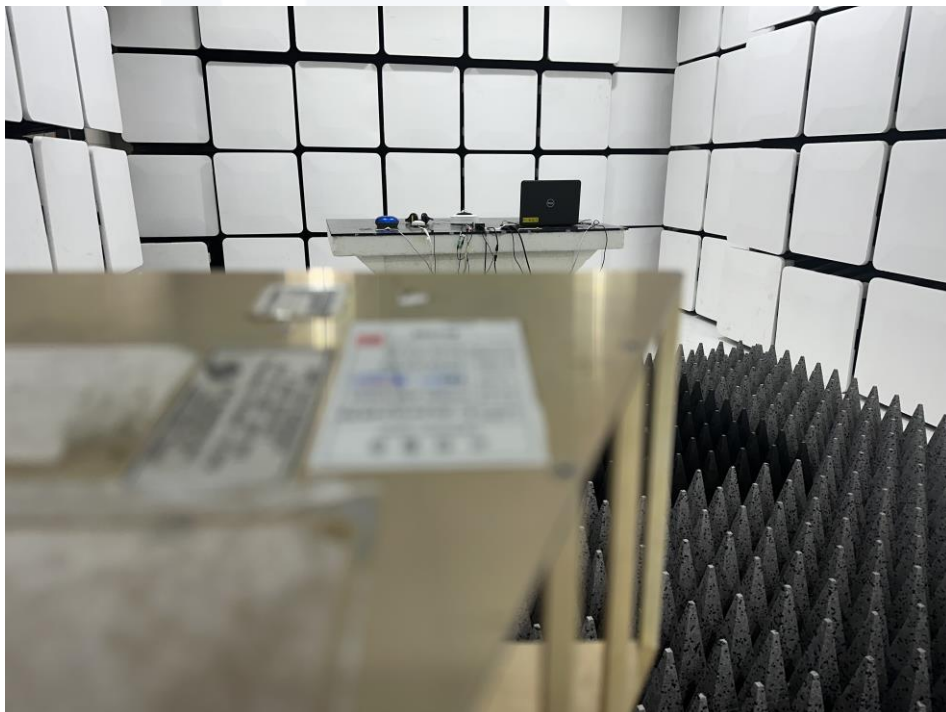
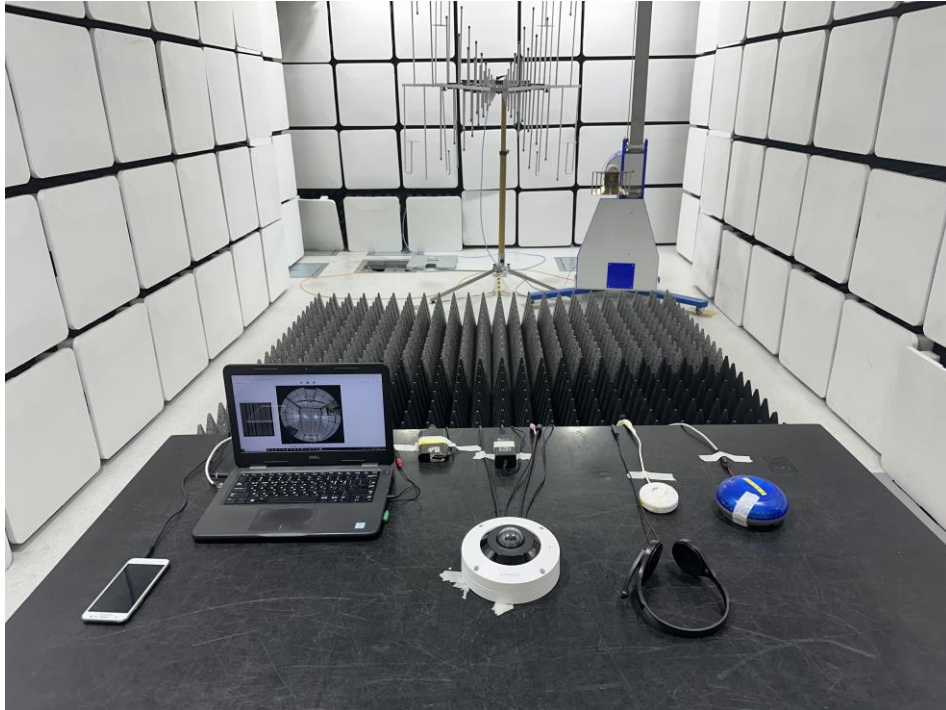
■ #2





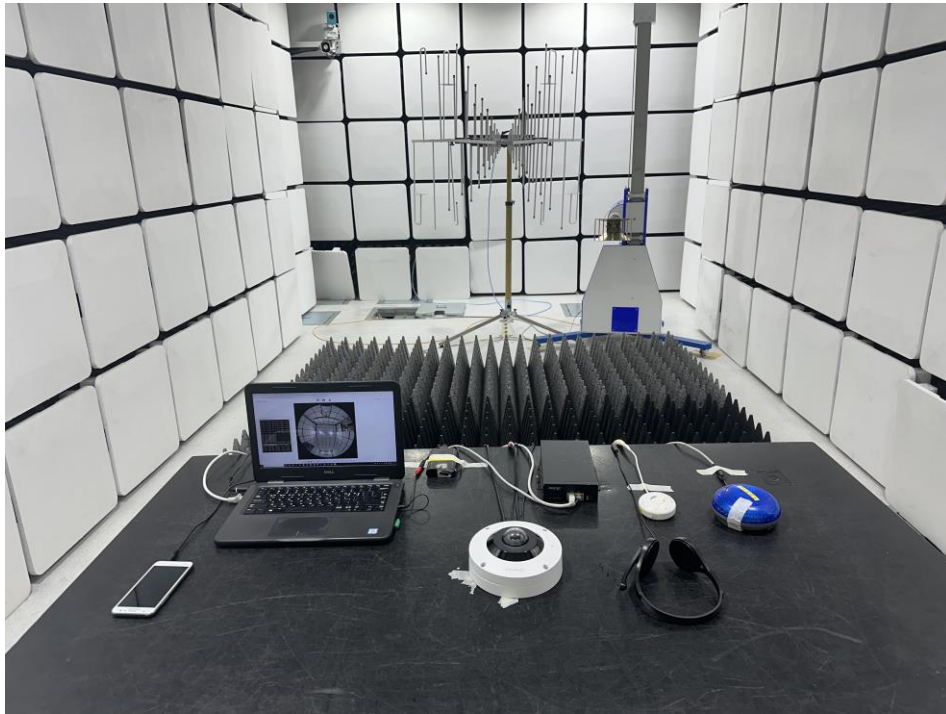
Radiated Electric Field Emissions(Above 1 GHz)

■ #1





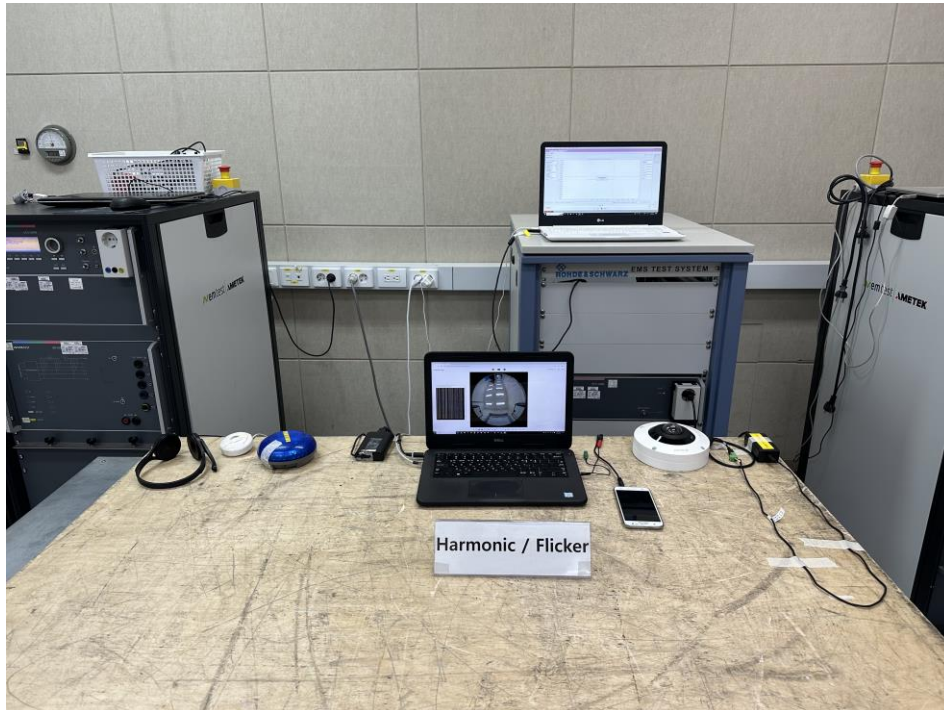
■ #2





Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ #1





Electrostatic Discharge

■ #1



■ #2



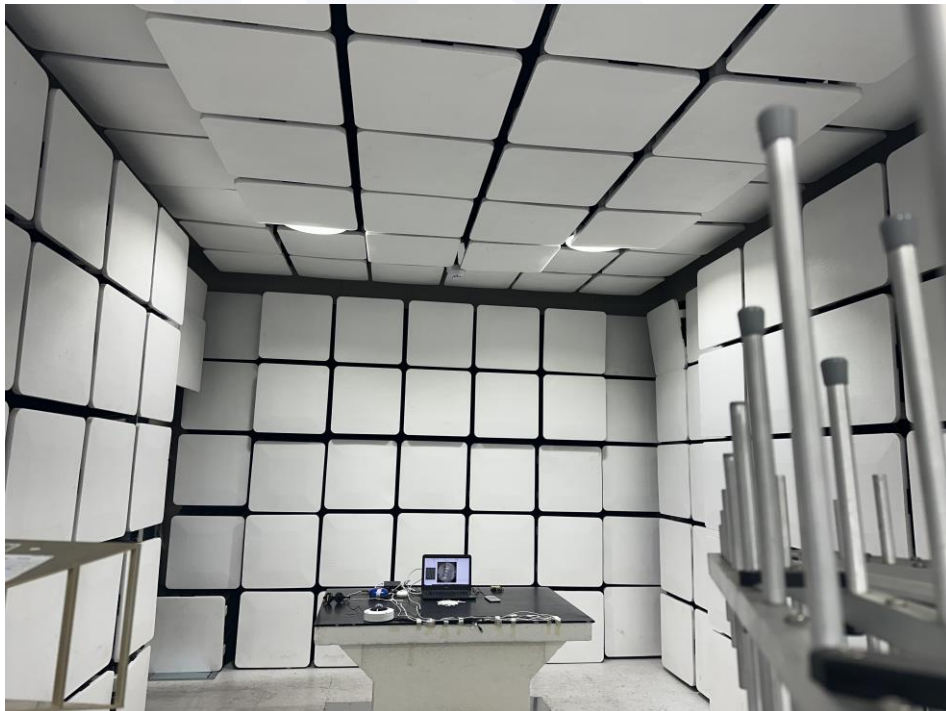


Radio-frequency Electromagnetic Field

■ #1



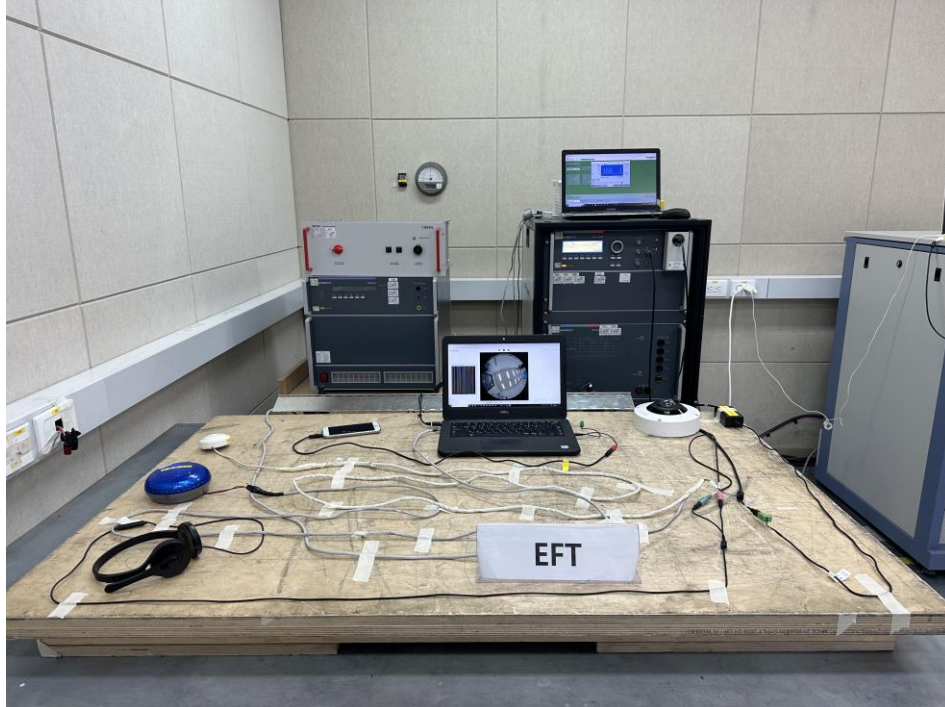
■ #2



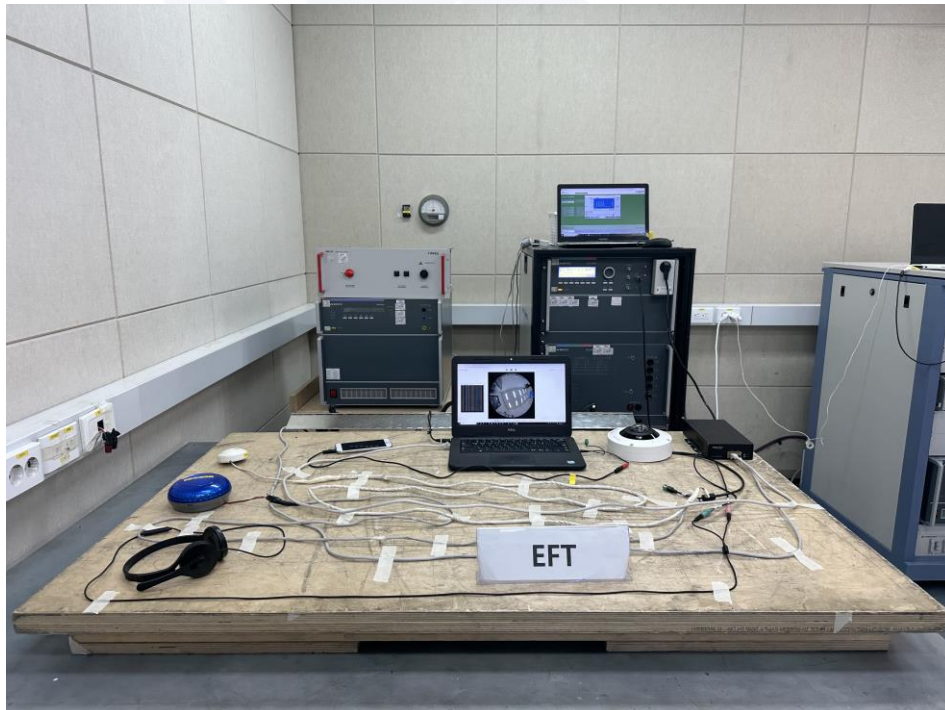


Fast Transients

■ #1



■ #2





Surges

■ #1



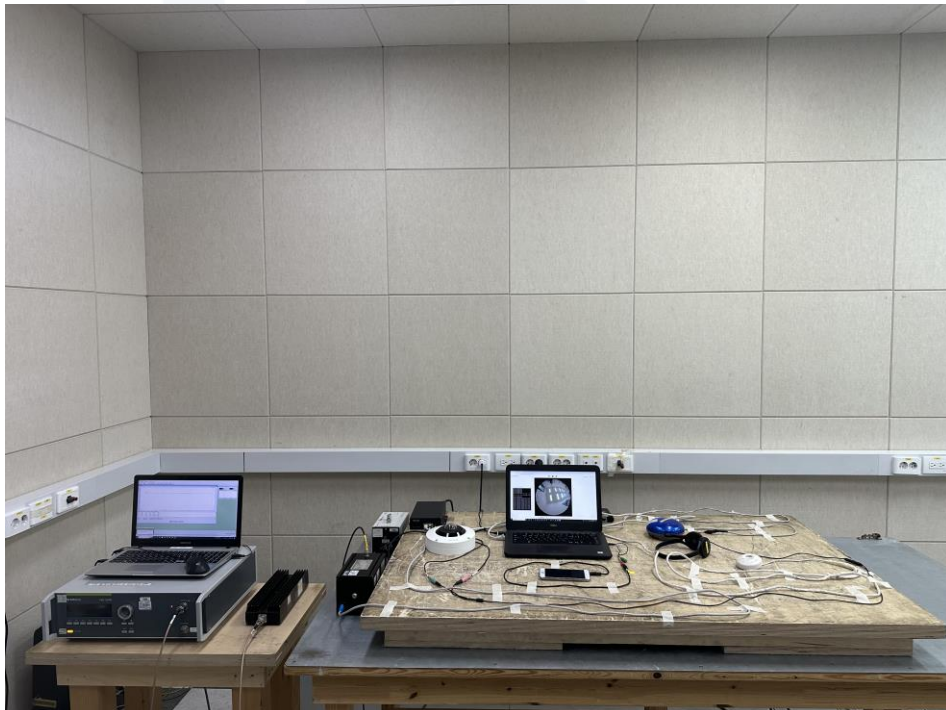


Conducted Disturbance

■ #1



■ #2





EUT External Photographs

(Top)



(Bottom)





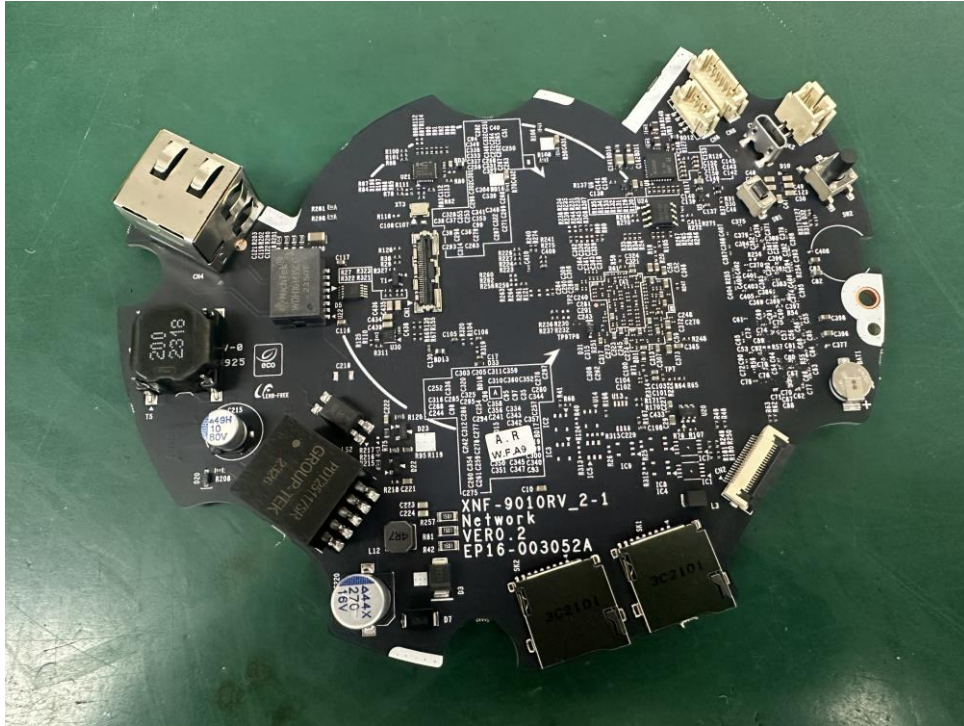
EUT Internal Photographs



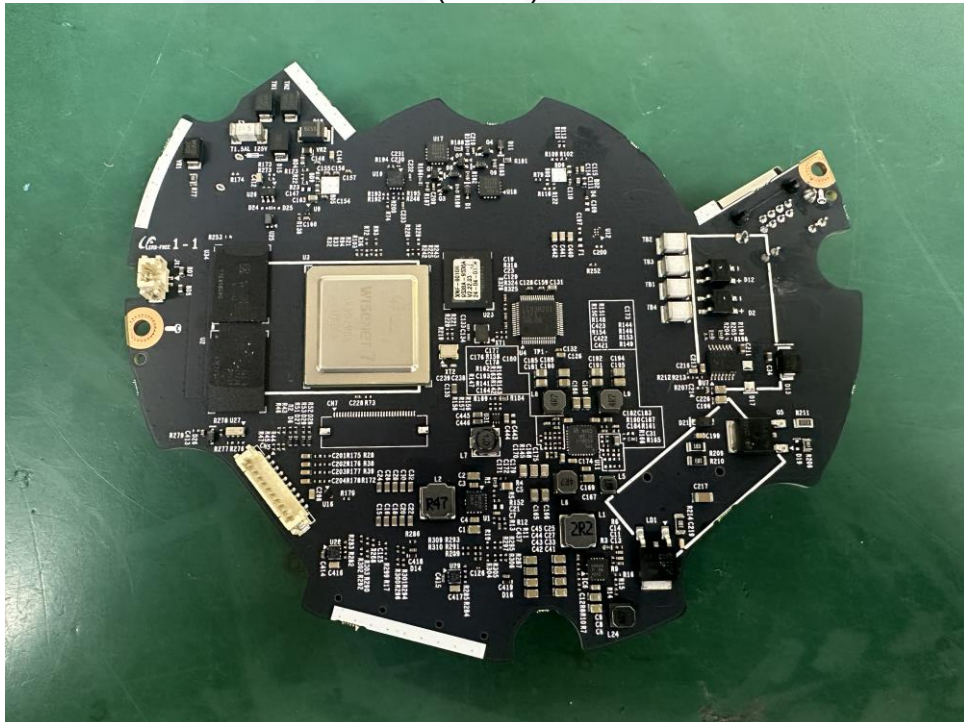


EUT Internal View – Main Board

(Top)



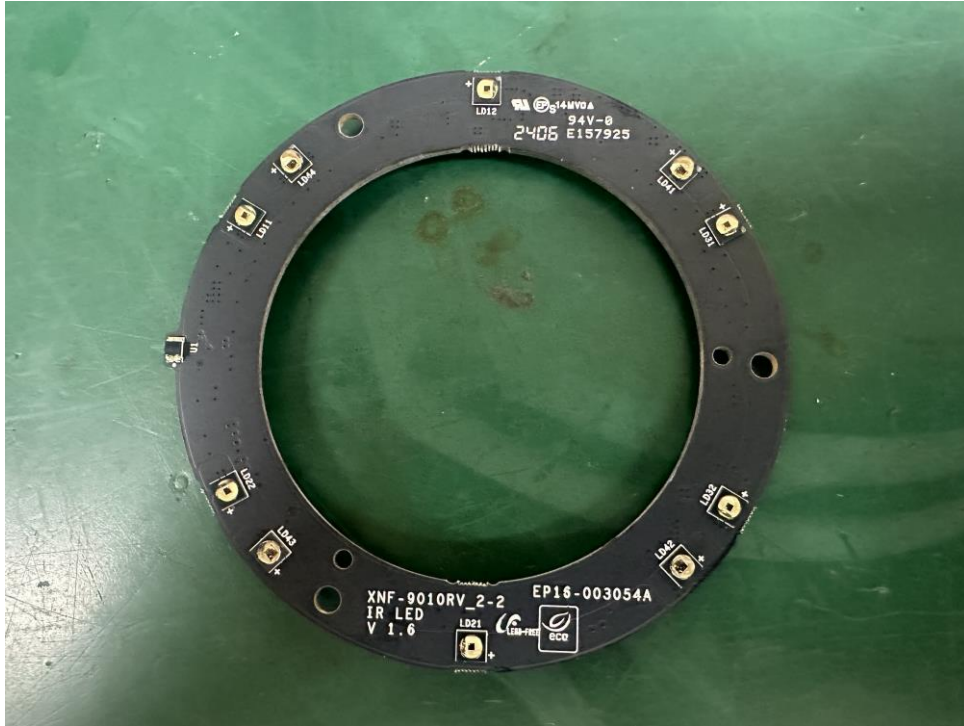
(Bottom)



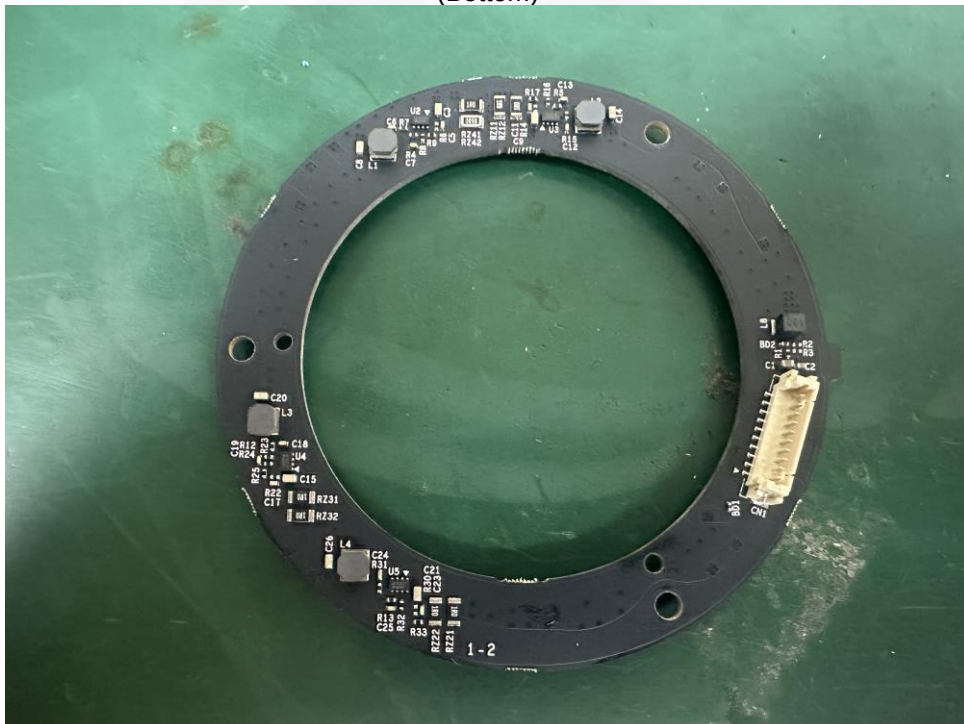


EUT Internal View – LED Board

(Top)



(Bottom)





EUT Internal View – Camera Board

(Top)

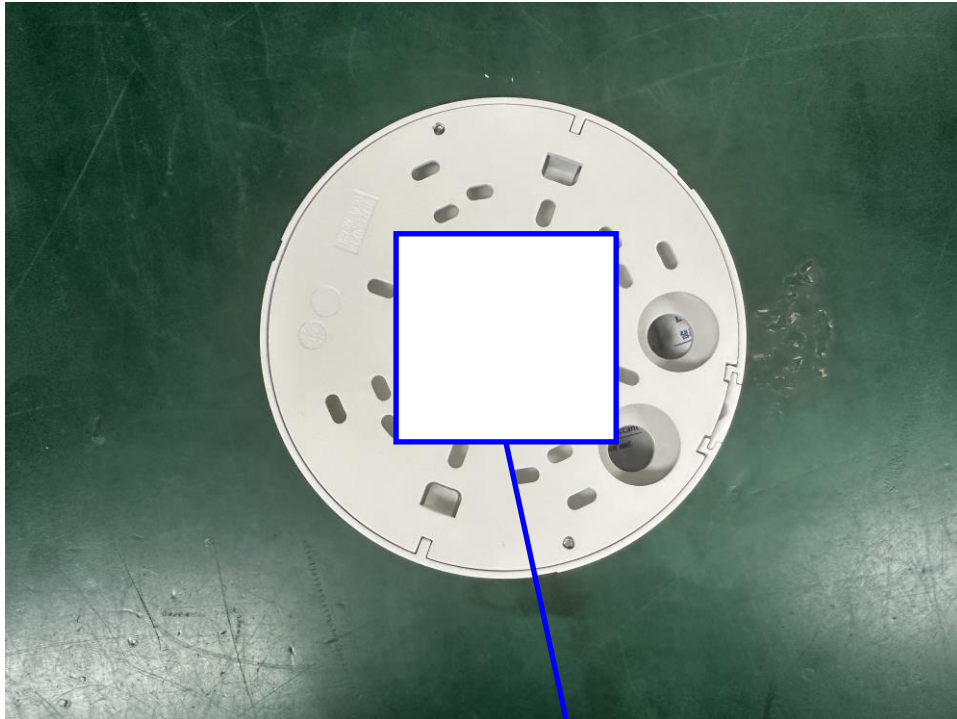


(Bottom)





Label and Location



NETWORK CAMERA

Model No : XNF-9010RVM

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam

UK CA CE