



TEST REPORT



Report No. : KES-EM251565

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KES Co., Ltd.

#3002, #3503, #3701, 40, Simin-daero365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Republic of Korea
Tel : +82-31-425-6200, Fax : +82-31-341-3838

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. : PNO-A7082R

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 : Apr. 28, 2025

4. Test date : Apr. 29, 2025 ~ Apr. 30, 2025

5. Date of Issue : May. 29, 2025

6. Test Results : In Compliance

Tested by

Reviewed by

Seong Min, Jang
EMC Test Engineer

Dong Hun, Jang
EMC Technical Manager

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

**REPORT REVISION HISTORY**

Date	Test Report No.	Revision History
May. 29, 2025	KES-EM251565	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Division		Specificity
Internal highest operating frequency		1.6 GHz
Power	Rated Power	DC 12 V, PoE
	Test Power	AC 230 V, 50 Hz
Ports	I/O Port	Micro SD Slot 2 EA, DC 12 V 1 EA, ALARMAUDIO 1 EA, PoE+ 1 EA
	Unused Port	USB 1 EA
Components		Main Body 1 EA, Cable 2 EA
Ethernet Speed		100 Mbps



	PNO-A7082R
Video	
Imaging Device	1/1.8" CMOS
Resolution	2592x1520, 2560x1440, 1920x1080, 1600x1200, 1280x960, 1280x720, 1024x768, 800x600, 640x480, 640x360, 320x240, 320x180
Max. Framerate	H.265/H.264: Max. 60fps/50fps(60Hz/50Hz) MJPEG: Max. 30fps(@4MP Max. 5fps)
NETD	None
Pixel Size	None
Video Out	USB: Micro USB Type C for installation
Video Transmission Distance	None
Lens	
Focal Length (Zoom Ratio)	4.6~9.35mm(2.0x) motorized varifocal
Optical Zoom	None
Max. Aperture Ratio	F1.3(Wide)~F2.15(Tele)
Angular Field of View	H: 105°(Wide)~47°(Tele) V: 58°(Wide)~27°(Tele) D: 128°(Wide)~55°(Tele)
Min. Object Distance	1.5m(4.92ft)
Focus Control	Simple focus
Lens Type	P-iris(IR corrected)
Mount Type	None
Optional Lens	None
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	0°~360° / 0°~90° / 0°~180°
Pan Range	None
Pan Speed	None
Tilt Range	None
Tilt Speed	None
Rotate Range	None
Sequence	None
Preset Accuracy	None
Operational	
Camera Title	Displayed up to 85 characters
Direction Indicator	None
Day & Night	Auto(ICR)
Backlight Compensation	BLC, HLC, WDR, SSDR
Wide Dynamic Range	120dB
Digital Noise Reduction	SSNR.V, WiseNR.II(Based on AI engine)
Digital Image Stabilization	Support
Defog	Support
Motion Detection	8ea, 8point polygonal zones
Privacy Masking	32ea, 8point polygonal zones - Color: gray/green/red/blue/black/white/purple/yellow - Mosaic Dynamic Privacy Mask(Based on AI engine) - Color: gray/green/red/blue/black/white/purple/yellow - 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(2~1/30,000sec) Prefer shutter control(Based on AI engine)
Digital PTZ	None
Video Rotation	Flip, mirror, hallway view(90°/270°)
Analytics	Classified object type: Person/Face/Vehicle(Type: car/bus/truck/motorcycle/bicycle)/License plate Attributes: Person(Gender, Clothing top/bottom color, Bag), Face(Age, Gender, Mask, Glasses), Vehicle(Type: car/bus/truck/motorcycle/bicycle, Color) Support BestShot Support Re-ID(Person) Analytics events based on AI engine - Motion detection, Object detection, Virtual line(Crossing/Direction), Virtual area(Loitering/Intrusion/Enter/Exit/Appear/Disappear), Slip & fall detection, Face mask detection, Social distancing detection, Sound classification(To be released) Analytics events - Defocus detection, Tampering, Shock detection, Audio detection
Business Intelligence	Based on AI engine: People/Vehicle/Crowd counting, Queue management, Heatmap
Serial Interface	None
Alarm I/O	2 configurable I/O ports, DC 12V output(Max. 50mA)



Operating Temperature / Humidity	-50°C~+55°C(-58°F~+131°F) / 0~100% RH +74°C(+165°F)(MAX) based on NEMA-TS 2(2.2.7) * Start up should be done at above -30°C Humidity control /w AIR vent
Storage Temperature / Humidity	-50°C~+60°C(-58°F~+140°F) / 0~90% RH
Wind Load	None
EPA(Effective Projected Area)	0.026m²
Certification	IP66/IP67, NEMA4X, IK10, NEMA-TS 2(2.2.7.2-8, 2.2.8, 2.2.9)
Input Voltage	PoE+(IEEE802.3at type2, Class4), 12VDC
Power Consumption	PoE: Max. 15.0W, typical 9.0W 12VDC: Max. 12.7W, typical 7.8W Support Wisepower - Power monitoring(Max./Current/Avg.) - Power Redundance Failover
Mechanical	
Color / Material	White / Aluminum Window: Hard-coated window
RAL Code	RAL9003
Product Dimensions / Weight	ø93.4x298.4mm(ø3.68x11.75"), 2.060g(4.54lb)
Compatible Conduit hole / Gang	19.1mm(3/4")(M25) single, double, 4" octagon, 4" square
Certifications & Standards	
Network	None
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/EN 62471
Environment	IEC/EN 63000 IEC/EN 60529 IP66/IP67/IP6K9K, IEC/EN 62262 IK11, NEMA 250 Type 4X, NEMA-TS 2(2.2.7.2-8, 2.2.8, 2.2.9) IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-14, IEC 60068-2-27, IEC 60068-2-78
Video	None
Compatible Models	
Hanging Adaptor	SBP-160HMMW1
Back Box	Included
Ceiling Mount (Assy)	SBP-150CMI, SBP-300CMI, SBP-300CMW1, SBP-900CMW, SBP-300CMTW, SBP-300CMTS
Ceiling Mount (Single Unit)	SBP-180CMB, SBP-140CMB, SBP-180CMS, SBP-900CMP, SBP-300CMP, SBP-150CMP, SBP-C15P, SBP-C15H
Wall Mount	SBP-160WMW1, SBP-400WMW, SBP-250WMW, SBP-300WMW, SBP-300WMW1
Wall Mount Adaptor	None
Pole Mount	SBD-180PMW, SBP-300PMW2
In-ceiling Mount	None
Corner Mount	SBP-156KMW, SBP-300KMW1
Parapet Mount	SBP-156LMW1, SBP-300LMW
Tilt Mount	None
Cabinet	SBP-150NBW, SBP-300NBW
Housing	None
Gang Plate	None
Skin Cover	None
Weather Cap	None
Dome Cover	None
Conduit Adaptor	SBP-060BA
Power Module	None
Interface Box	SPM-4210
Other Compatible Models	SBP-115PFA
DORI (EN62676-4 standard)	
Detect (25PPM/ 8PPF)	Wide: 39.8m(130.51ft) / Tele: 119.2m(391.15ft)
Observe (63PPM/ 19PPF)	Wide: 15.9m(52.20ft) / Tele: 47.7m(156.46ft)
Recognize (125PPM/ 38PPF)	Wide: 8.0m(26.10ft) / Tele: 23.8m(78.23ft)
Identify (250PPM/ 76PPF)	Wide: 4.0m(13.05ft) / Tele: 11.9m(39.12ft)



Alarm Triggers	Analytics, Network disconnection, Alarm input, Time schedule, MQTT subscription, Day/Night, Storage disruption, Case tampering
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(WAV, MP3) - MQTT: publication
Audio Streaming	None
Audio In	Selectable(mic in/line in)
Audio Out	Line out
Light Type	IR LED
Light Viewable Length	WiseIR 60m(196.85ft)
IR Viewable Length	None
IR Illuminator (Optional)	None
IR Radiation angle	None
IR LED	None
IR Wavelength	850nm
IR Operation	None
Water Removal	None
Auto Tracking	None
Coaxial Protocol	None
Color Palettes	None
Radiometry	
Temperature Detect Range	None
Temperature Accuracy	None
Temperature Detection	None
Additional	None
Network	
Ethernet	Metal shielded RJ-45(10/100/1000BASE-T)
Video Compression	H.265/H.264: Main/Baseline/High MJPEG
Audio Compression	G.711(PCM): 8kHz(64Kbps) G.726(ADPCM): 8kHz(16/24/32/40Kbps) AAC-LC: 16kHz(48Kbps) OPUS: 48kHz(64Kbps)
Smart Codec	WiseStream(Based on AI engine)
Video Quality Adjustment	None
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
Streaming	Unicast(20 users) / Multicast Multiple streaming(Up to 5 profiles, 3 virtual channel support)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP/SFTP, SMTP(StartTLS), ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTP(TCP, UDP Unicast), CDP, MQTT, Syslog
SIP support (VoIP, Peer-to-peer, S	None
Security	None
Application Programming Interfac	ONVIF Profile S/G/T/M SUNAPI(HTTP API) Hanwha Vision Open Platform
Security	
OS / Firmware Protect	Encrypted Firmware, Secure boot, Signed Firmware
User authentication	Digest Authentication, Prevent brute-force attack
Network authentication	802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2)
Secure Communication	HTTPS, SRTP, WSS(Websocket secure)
Access Control	IP-based access control, MAC-based access control, Auto logout
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	Secure element, SDcard partition encrypt
Security Certificate	ETSI EN 303 645, Secure element(RIPS 140-3 level3, CC EAL6+)
General	
Webpage Language	English, Korean, Simplified Chinese, Traditional Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 2slots 2TB(1TBx2)
Memory	4GB RAM, 8GB eMMC
Environmental & Electrical	



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

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	PNO-A7082R	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC/DC Adapter	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
PoE Adapter	PT-PSE109GBRO-A	-	Dongguan PROCET Network Technology Co.,Ltd	
Laptop	P95G001	9JM8HT2	DELL INC.	-
Laptop Adapter	HA65NM130	-	Chicony Power Technology(Suzhou)Co.,Ltd.	-
Alarm	-	-	-	-
Button Alarm	-	-	-	-
Phone	SHV-E330S	-	SAMSUNG	-
Headset	K550	-	Britz®	-
Micro SD Card1	-	-	Sandisk	8 GB
Micro SD Card2	-	-	Sandisk	8 GB



1.6 External I/O Cabling

■mode 1

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	PoE+	Laptop	RJ-45 (LAN)	3.1	U
	Micro SD Slot	Micro SD Card1	Micro SD Slot	-	-
	Micro SD Slot	Micro SD Card2	Micro SD Slot	-	-
	ALARMAUDIO (Alarm OUT)	Alarm	Alarm IN	3.1	U
	ALARMAUDIO (Alarm IN)	Button Alarm	Alarm OUT	3.2	U
	ALARMAUDIO (Mic)	Phone	3.5 mm	1.0	U
	ALARMAUDIO (Speaker)	Headset	3.5 mm	1.8	U
	DC 12 V	AC/DC Adapter	Line	1.2	U
Laptop	DC Jack	Laptop Adapter	Line	1.7	U

* Unshielded=U, Shielded=S

■mode 2

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	PoE+	PoE Adaptor	RJ-45 (PoE)	3.1	U
	Micro SD Slot	Micro SD Card1	Micro SD Slot	-	-
	Micro SD Slot	Micro SD Card2	Micro SD Slot	-	-
	ALARMAUDIO (Alarm OUT)	Alarm	Alarm IN	3.1	U
	ALARMAUDIO (Alarm IN)	Button Alarm	Alarm OUT	3.2	U
	ALARMAUDIO (Mic)	Phone	3.5 mm	1.0	U
	ALARMAUDIO (Speaker)	Headset	3.5 mm	1.8	U
Laptop	RJ-45 (LAN)	PoE Adapter	RJ-45 (LAN)	3.1	U
	DC Jack	Laptop Adapter	Line	1.7	U

* Unshielded=U, Shielded=S



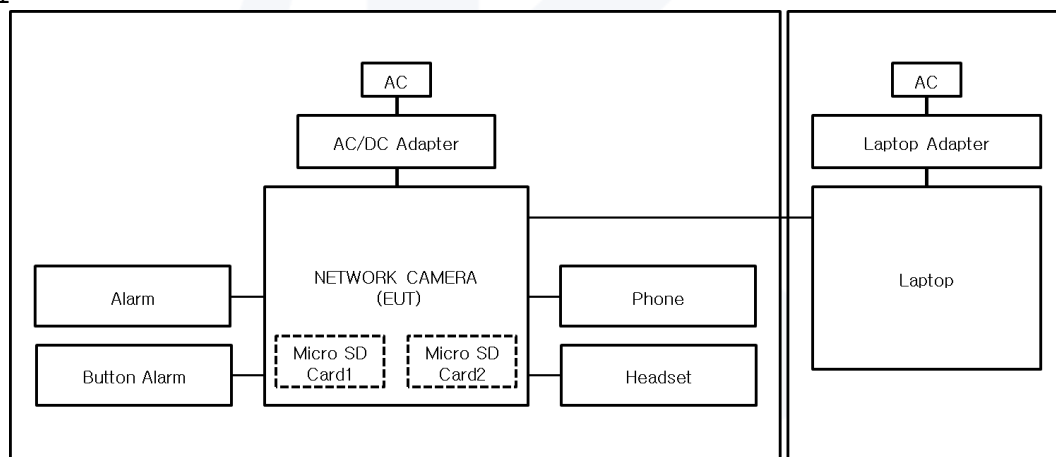
1.7 EUT Operating Mode(s)

Test mode	Normal operating
mode 1	- Check the network behavior of the EUT with the laptop's ping test - View images of the camera through the Web Viewer - Play the 1 kHz tone through the Phone to see the sound output with the headset - When the alarm is pressed, make sure the button alarm is working - After testing, check the recording with Micro SD Card
mode 2	

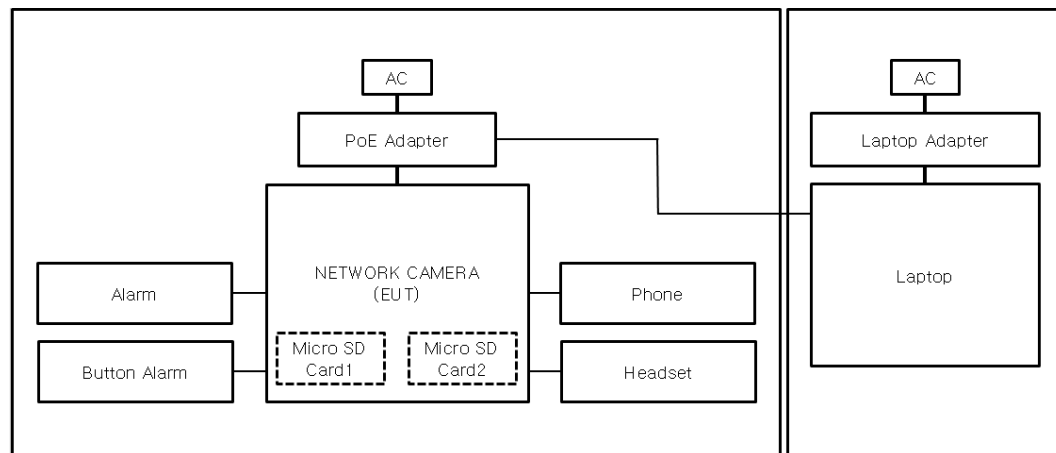
EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	HANWHA VISION VIETNAM COMPANY LIMITED

1.8 Configuration

■mode 1



■mode 2



**1.9 Remarks when standards applied**

- USB port is unused and have not been tested.
- PoE port is considered to be wired network port, so power-related test items are excluded.

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 0008



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☒ EN 55032:2015/A1:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011/A1:2014

☒ EN IEC 61000-3-2:2019

☒ EN 61000-3-3:2013/A2:2021

☒ **EMC – Regulations 2016**

☒ EN 55032:2015/A1:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011/A1:2014

☒ EN IEC 61000-3-2:2019

☒ EN 61000-3-3:2013/A2:2021



2.1 Conducted Emissions at Mains Power Ports

Test Date

Apr. 29, 2025

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	11, 06, 2025
☒	LISN	ENV216	R & S	101786	01, 09, 2026
☒	ARTIFICIAL MAINS NETWORK	ESH2-Z5	R & S	100450	11, 06, 2025
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 06, 2025

Test Conditions

Temperature: (23,5 ± 0,1) °C

Relative Humidity: (46,0 ± 0,1) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

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



2.2 Conducted Emissions at Telecommunication Ports

Test Date

Apr. 29, 2025

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	11, 06, 2025
☒	LISN	ENV216	R & S	101786	01, 09, 2026
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 06, 2025
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	11, 12, 2025

Test Conditions

Temperature: (23,4 ± 0,2) °C

Relative Humidity: (46,5 ± 0,1) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Apr. 29, 2025

Test Location☒ 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	ESW8	R & S	101319	03, 24, 2026
☒	AMPLIFIER	SCU 01	R & S	100603	11, 06, 2025
☒	BILOG ANTENNA	VULB 9168	SCHWARZBECK	9168-461	05, 09, 2026
☒	ATTENUATOR	6806.17.A	HUBER+SUHNER	-	02, 13, 2026

Test Conditions

Temperature: (23,0 ± 0,2) °C

Relative Humidity: (46,3 ± 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.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Apr. 29, 2025

Test Location

SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	ES10/RE	TOYO Corporation	2022.01.000	-
☒	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	02, 13, 2026
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	11, 04, 2025
☒	PREAMPLIFIER	8449B	HP	3008A00538	04, 30, 2025
☒	ATTENUATOR	8491B	HP	23094	02, 13, 2026

Test Conditions

Temperature: (23,4 ± 0,3) °C

Relative Humidity: (46,3 ± 0,1) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

- See Appendix A for test data.
- The Average of the test data is the cispr average result.



2.5 Harmonic Current Emissions

Test Date

Apr. 29, 2025

Test Location

Electro wave Shieldroom #7

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	03, 31, 2026
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (23,7 ± 0,2) °C

Relative Humidity: (46,5 ± 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

RemarksSee Appendix A for test data.



2.6 Voltage Fluctuations and Flicker

Test Date

Apr. 29, 2025

Test Location

Electro wave Shieldroom #7

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	03, 31, 2026
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (23,7 ± 0,2) °C

Relative Humidity: (46,5 ± 0,2) % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

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

Test Date

Apr. 29, 2025

Test Location

EMS-ESD: Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	01, 21, 2026
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (23,4 ± 0,2) °C
Relative Humidity: (46,5 ± 0,1) % R.H.
Atmospheric Pressure: (99,9 ± 0,1) 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

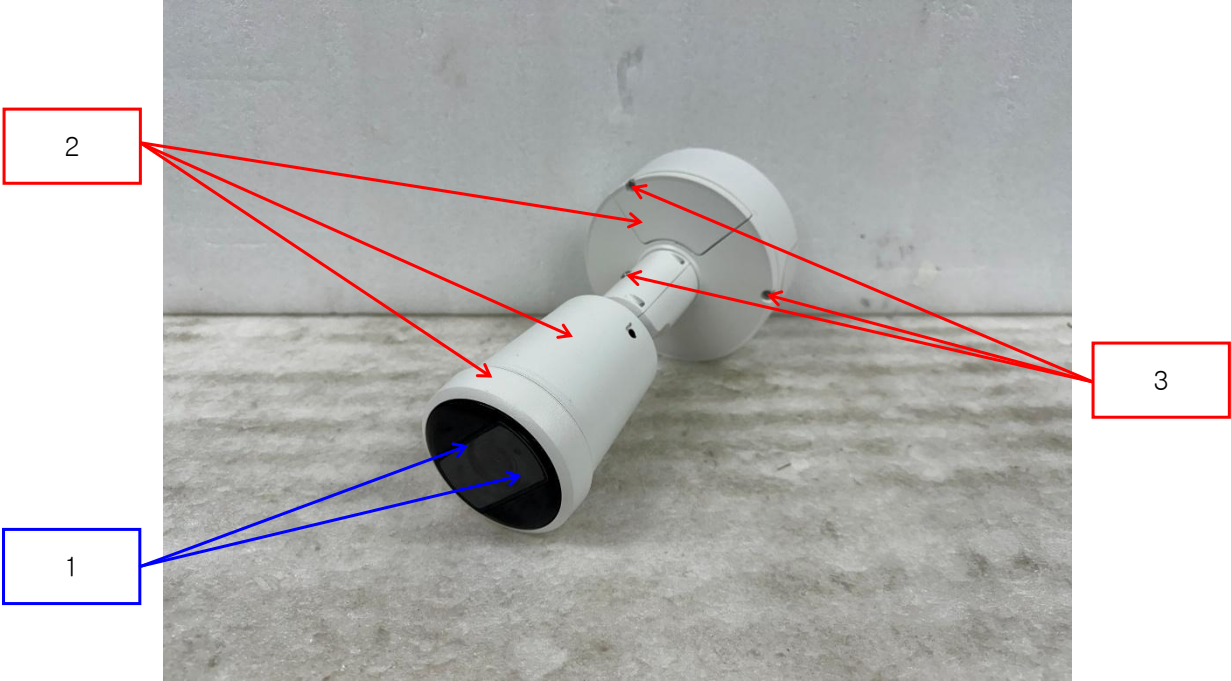
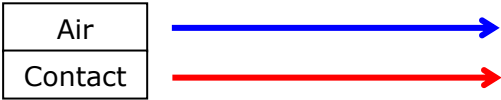
Discharge Voltage:	Contact	Air	HCP	VCP
	☐ 2 kV	☒ 2 kV	☐ 2 kV	☐ 2 kV
	☐ 4 kV	☒ 4 kV	☐ 4 kV	☐ 4 kV
	☒ 6 kV	☐ 6 kV	☒ 6 kV	☒ 6 kV
	☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
	☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied



Location of Discharge:



[인가부위 2]



**Test Data****mode 1**

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 1	Air Discharge	Complied	-
2	Enclosure 2	Contact Discharge	Complied	-
3	Screw	Contact Discharge	Complied	-
4	Port	Air Discharge	Complied	-

mode 2

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 1	Air Discharge	Complied	-
2	Enclosure 2	Contact Discharge	Complied	-
3	Screw	Contact 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

- Do not test the surface and points of the product that can no longer be contacted after a fixed installation.



3.2 Radiated Electric Field Immunity

Reference Standard

EN IEC 61000-4-3

Test Date

Apr. 30, 2025

Test LocationEMS-RS: ☐ SEMI ANECHOIC CHAMBER #2☒ SEMI ANECHOIC CHAMBER #4(10 m)**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	07, 29, 2025
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	02, 13, 2026
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	02, 13, 2026
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	02, 13, 2026
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 05, 2026

Test Conditions

Temperature: (23,3 ± 0,3) °C
Relative Humidity: (46,6 ± 0,2) % R.H.
Atmospheric Pressure: (100,6 ± 0,2) kPa



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

**Test Data**

■ mode 1

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

■ mode 2

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

Remarks

PASS Required Performance Criteria



3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4

Test Date

Apr. 30, 2025

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	11, 06, 2025
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 07, 2025
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 06, 2025

Test Conditions

Temperature: (23,8 ± 0,1) °C
Relative Humidity: (46,1 ± 0,1) % R.H.
Atmospheric Pressure: (99,9 ± 0,1) kPa

Test Specifications

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

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

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 klz ☒ 100 klz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

**Test Data**

■ mode 1

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L	Complied	Complied
N	Complied	Complied
L – N	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)
PoE+	Complied	Complied
ALARMAUDIO(Alarm OUT), ALARMAUDIO(Alarm IN)	Complied	Complied



■ mode 2

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

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

☐ 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)
PoE+	Complied	Complied
ALARMAUDIO(Alarm OUT), ALARMAUDIO(Alarm IN)	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



3.4 Surge Transients

Reference Standard

EN 61000-4-5

Test Date

Apr. 30, 2025

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	11, 07, 2025
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 07, 2025

Test Conditions

Temperature: (23,8 ± 0,3) °C
Relative Humidity: (46,1 ± 0,2) % R.H.
Atmospheric Pressure: (99,9 ± 0,1) kPa



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

**Test Data**

■ mode 1

☒ 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)
-	-	-

Signal Lines☒ Line to Earth – Common Mode

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

☒ mode 2☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

Signal Lines☒ Line to Earth – Common Mode

Mode of Application	Coupling Method	Observations	
		(+) Surge (kV)	(-) Surge (kV)
PoE+	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**Remarks**PASS Required Performance Criteria



3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6

Test Date

Apr. 30, 2025

Test Location

EMS-CS: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	8.0.0	-
☒	TEST SYSTEM FOR CONDUCTED AND RADIATED	NSG4070	TESEQ	65585	11, 18, 2025
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 06, 2025
☒	CDN	CDN M016	TESEQ	43694	11, 07, 2025
☒	CDN	CDN T8RJ45	EM TEST	0909-09	07, 29, 2025
☒	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 08, 2025

Test Conditions

Temperature: (23,8 ± 0,2) °C
Relative Humidity: (46,1 ± 0,2) % R.H.
Atmospheric Pressure: (99,9 ± 0,1) kPa

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

**Test Data**

■ mode 1

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N	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
PoE+	CDN	Complied
ALARMAUDIO(Alarm OUT), ALARMAUDIO(Alarm IN)	Clamp	Complied

■ mode 2

☐ Input a.c. power ports

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

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
PoE+	CDN	Complied
ALARMAUDIO(Alarm OUT), ALARMAUDIO(Alarm IN)	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**Remarks**PASS Required Performance Criteria



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN IEC 61000-4-11

Test Date

Apr. 30, 2025

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	11, 07, 2025
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 07, 2025

Test Conditions

Temperature: (23,8 ± 0,1) °C
Relative Humidity: (46,1 ± 0,1) % R.H.
Atmospheric Pressure: (99,9 ± 0,1) kPa

**Test Specifications & Observations/Remarks**

■ mode 1

- 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 without operator's intervention.



APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

■ mode 1

[HOT]

Test Description:

Conducted Emission

Job No.:

KES-EM251565

Phase:

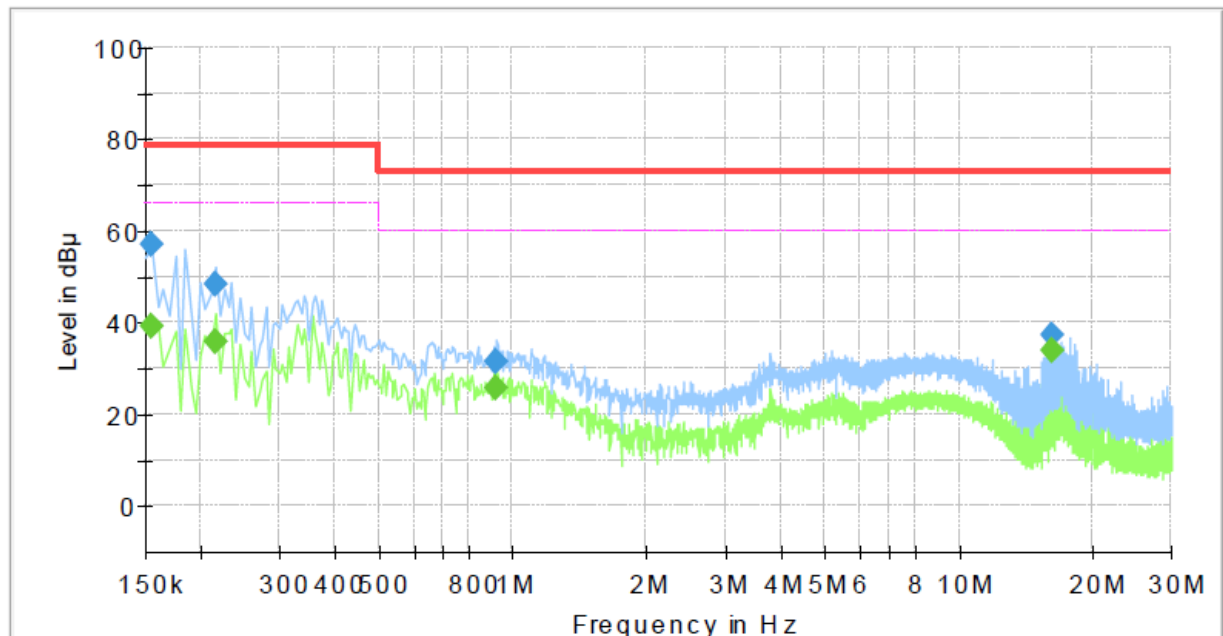
L

Mode:

mode 1

Operator Name:

KES



Final_Result

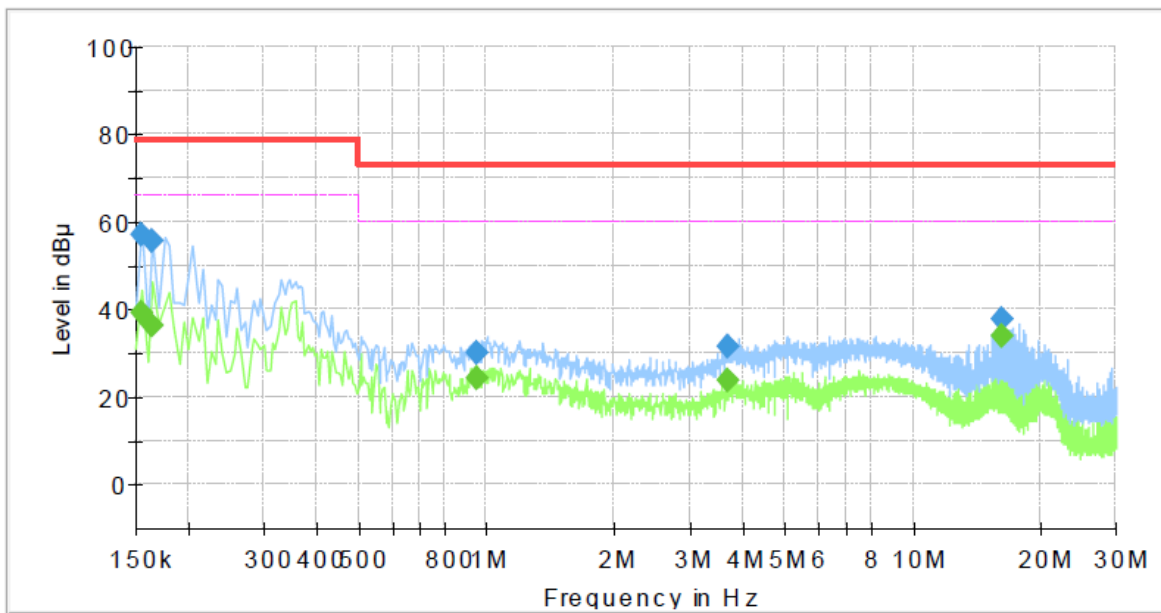
Frequency (MHz)	QuasiPeak (dB μV)	CAverage (dB μV)	Limit (dB μV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	39.31	66.00	26.69	1000.0	9.000	L1	19.5
0.155000	56.83	---	79.00	22.17	1000.0	9.000	L1	19.5
0.215000	---	35.85	66.00	30.15	1000.0	9.000	L1	19.5
0.215000	48.48	---	79.00	30.52	1000.0	9.000	L1	19.5
0.920000	---	25.80	60.00	34.20	1000.0	9.000	L1	19.6
0.920000	31.31	---	73.00	41.69	1000.0	9.000	L1	19.6
16.230000	---	33.69	60.00	26.31	1000.0	9.000	L1	20.3
16.230000	37.11	---	73.00	35.89	1000.0	9.000	L1	20.3



[NEUTRAL]

1 / 1

Test Description: Conducted Emission
Job No.: KES-EM251565
Phase: N
Mode: mode 1
Operator Name: KES

**Final_Result**

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	39.17	66.00	26.83	1000.0	9.000	N	19.5
0.155000	56.84	---	79.00	22.16	1000.0	9.000	N	19.5
0.165000	---	36.51	66.00	29.49	1000.0	9.000	N	19.5
0.165000	55.46	---	79.00	23.54	1000.0	9.000	N	19.5
0.950000	---	24.48	60.00	35.52	1000.0	9.000	N	19.6
0.950000	30.07	---	73.00	42.93	1000.0	9.000	N	19.6
3.675000	---	23.86	60.00	36.14	1000.0	9.000	N	19.8
3.675000	31.62	---	73.00	41.38	1000.0	9.000	N	19.8
16.230000	---	34.13	60.00	25.87	1000.0	9.000	N	20.3
16.230000	37.74	---	73.00	35.26	1000.0	9.000	N	20.3

◆ 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))

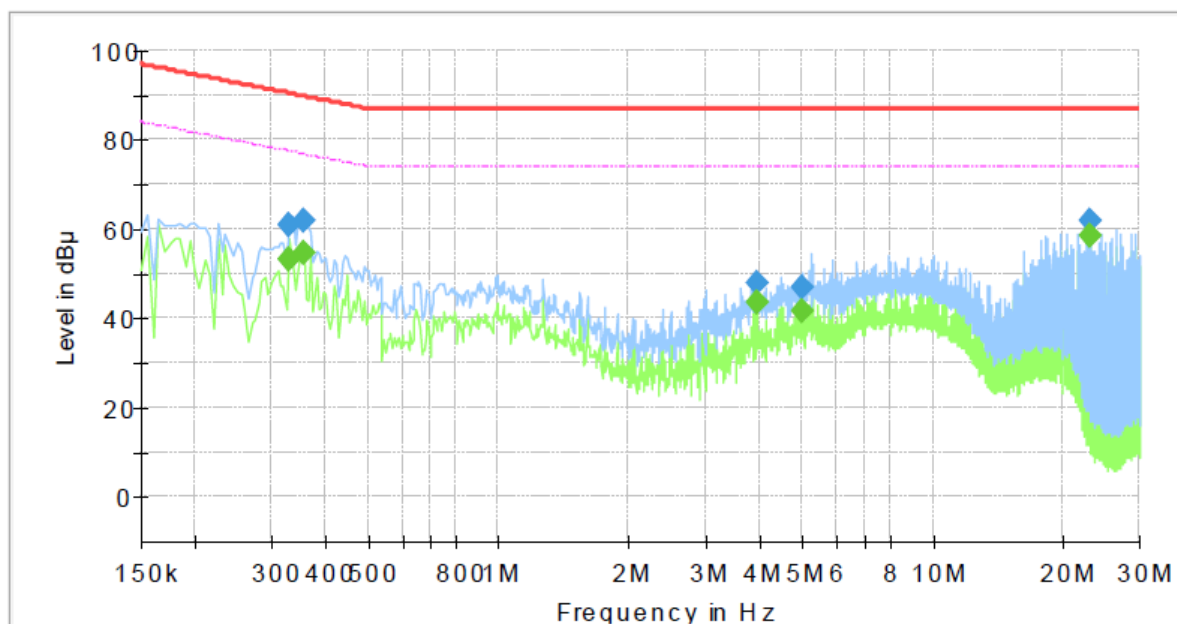
**Conducted Emissions at Telecommunication Ports**

■ mode 1

[100 Mbps]

1 / 1

Test Description: Telecommunication Emission
Job No.: KES-EM251565
Mode : mode 1
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)
0.330000	---	53.10	77.45	24.35	1000.0	9.000	Single Line	19.5
0.330000	60.98	---	90.45	29.47	1000.0	9.000	Single Line	19.5
0.355000	---	54.43	76.84	22.41	1000.0	9.000	Single Line	19.5
0.355000	61.79	---	89.84	28.05	1000.0	9.000	Single Line	19.5
3.955000	---	43.70	74.00	30.30	1000.0	9.000	Single Line	19.5
3.955000	48.13	---	87.00	38.87	1000.0	9.000	Single Line	19.5
5.025000	---	41.75	74.00	32.25	1000.0	9.000	Single Line	19.5
5.025000	47.09	---	87.00	39.91	1000.0	9.000	Single Line	19.5
23.130000	---	58.67	74.00	15.33	1000.0	9.000	Single Line	20.1
23.130000	61.81	---	87.00	25.19	1000.0	9.000	Single Line	20.1

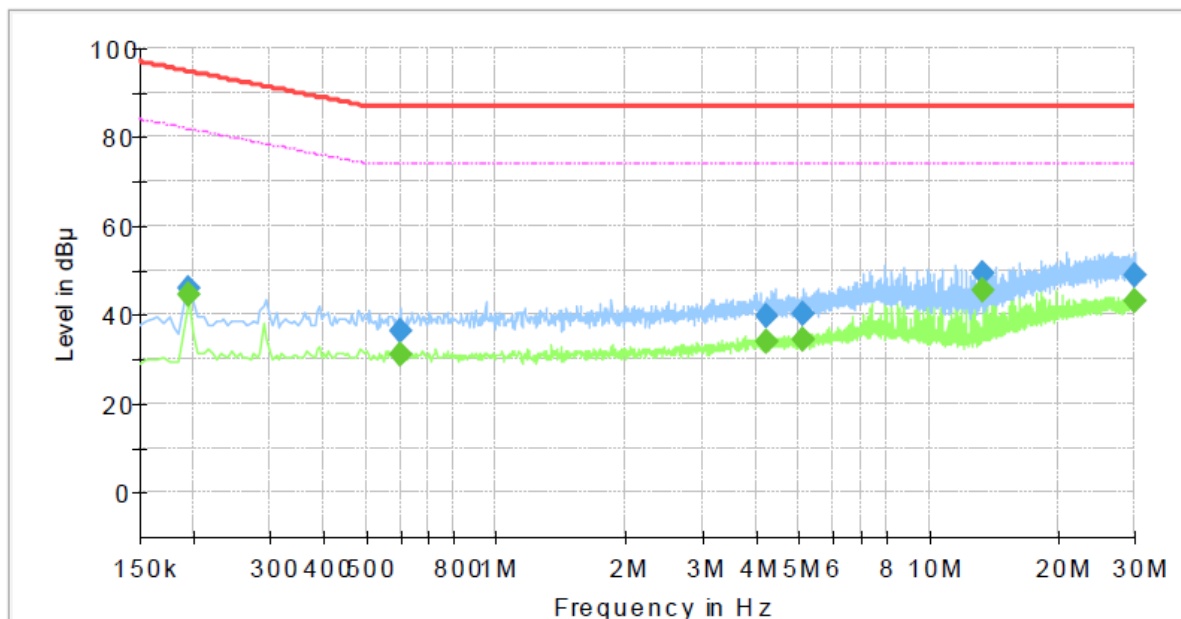


■ mode 2

[100 Mbps]

1 / 1

Test Description: Telecommunication Emission
Job No.: KES-EM251565
Mode : mode 2
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)
0.195000	---	44.30	81.82	37.52	1000.0	9.000	Single Line	19.7
0.195000	45.97	---	94.82	48.85	1000.0	9.000	Single Line	19.7
0.600000	---	30.86	74.00	43.14	1000.0	9.000	Single Line	19.5
0.600000	36.50	---	87.00	50.50	1000.0	9.000	Single Line	19.5
4.205000	---	33.88	74.00	40.12	1000.0	9.000	Single Line	19.5
4.205000	39.65	---	87.00	47.35	1000.0	9.000	Single Line	19.5
5.110000	---	34.27	74.00	39.73	1000.0	9.000	Single Line	19.5
5.110000	39.98	---	87.00	47.02	1000.0	9.000	Single Line	19.5
13.360000	---	45.65	74.00	28.35	1000.0	9.000	Single Line	19.7
13.360000	49.27	---	87.00	37.73	1000.0	9.000	Single Line	19.7
29.980000	---	43.09	74.00	30.91	1000.0	9.000	Single Line	20.3
29.980000	48.82	---	87.00	38.18	1000.0	9.000	Single Line	20.3

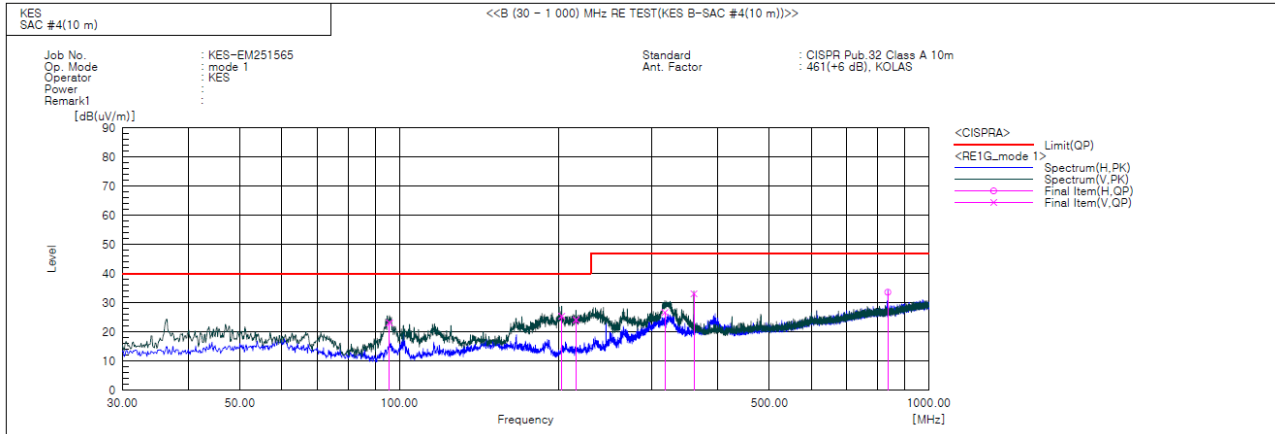
◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

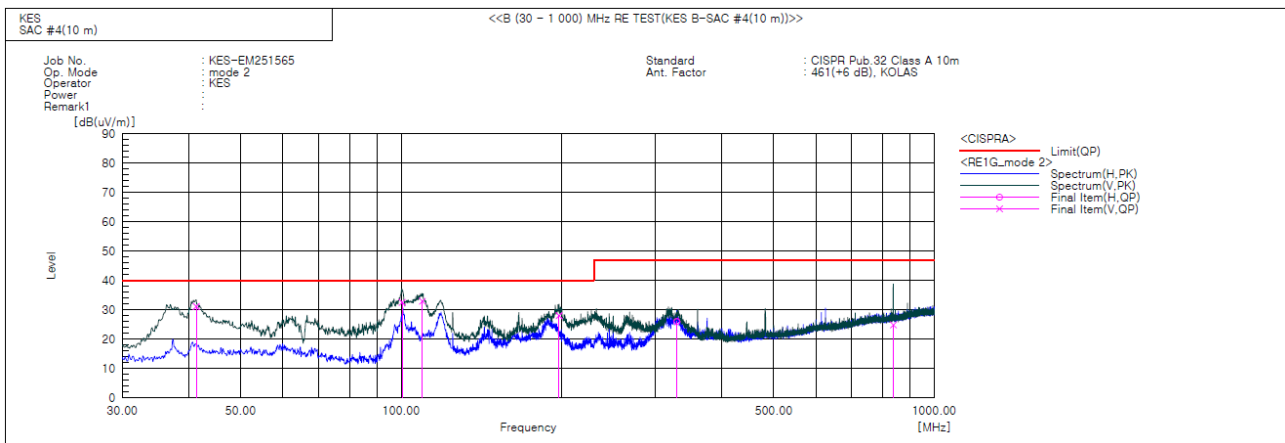
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

**Radiated Electric Field Emissions(Below 1 GHz)****mode 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	95.839	V	48.6	-25.5	23.1	40.0	16.9	102.0	240.0	
2	202.660	V	47.2	-21.8	25.4	40.0	14.6	101.0	295.0	
3	215.634	V	45.5	-21.4	24.1	40.0	15.9	102.0	287.0	
4	317.241	V	43.1	-16.4	26.7	47.0	20.3	103.0	244.0	
5	360.043	V	48.2	-15.1	33.1	47.0	13.9	101.0	40.0	
6	836.919	H	36.6	-3.0	33.6	47.0	13.4	399.0	48.0	



mode 2



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	41.276	V	52.8	-21.7	31.1	40.0	8.9	103.0	283.0	
2	100.446	V	57.3	-24.8	32.5	40.0	7.5	113.0	158.0	
3	109.540	V	56.4	-23.5	32.9	40.0	7.1	106.0	256.0	
4	197.810	V	49.9	-21.9	28.0	40.0	12.0	106.0	233.0	
5	329.124	H	42.1	-16.1	26.0	47.0	21.0	399.0	279.0	
6	838.374	V	27.8	-3.0	24.8	47.0	22.2	100.0	327.0	

◆ Calculation

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

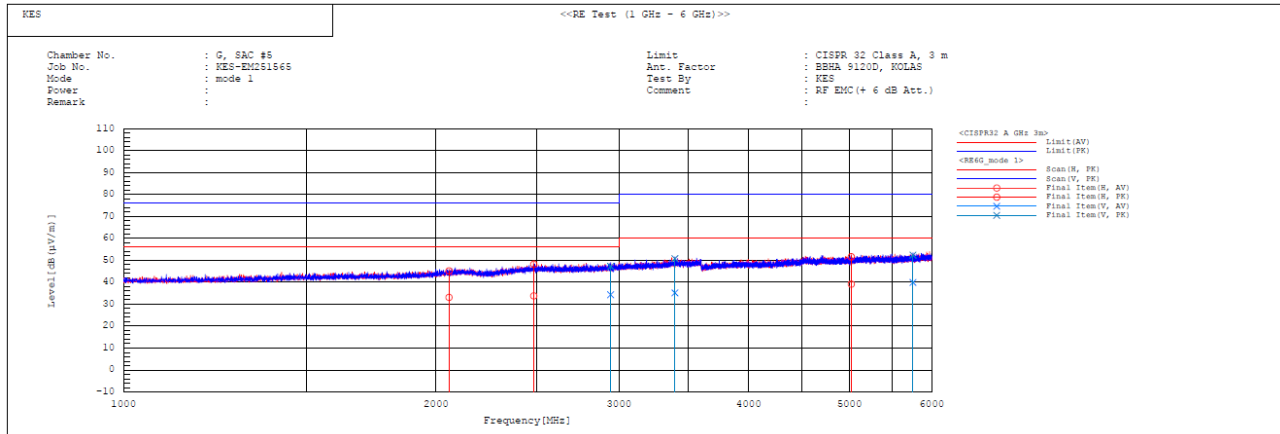
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

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)**

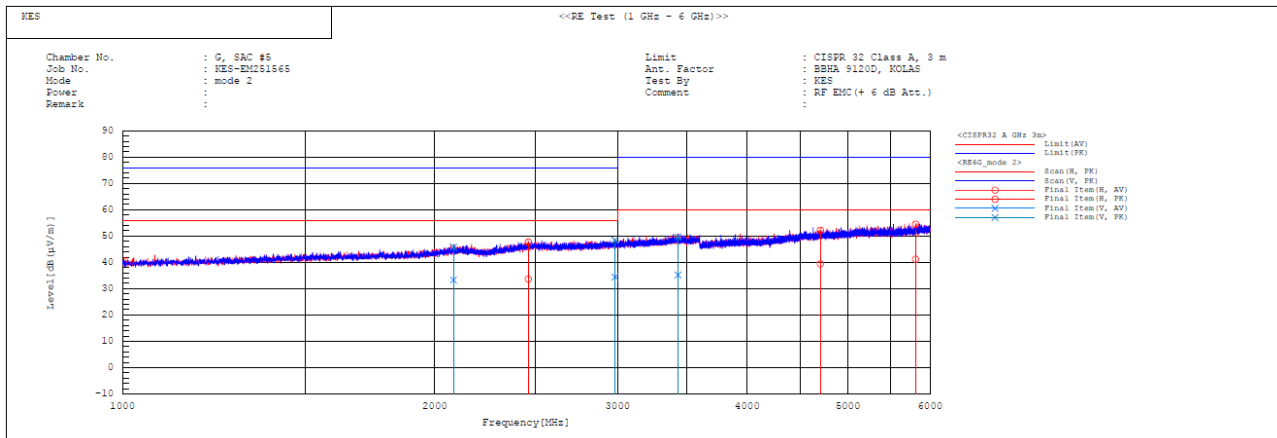
mode 1

**Final Result**

No.	Frequency	Pol	Reading AV	Reading PK	c.f	Result PK	Limit AV	Limit PK	Margin AV	Margin PK	Height	Angle	Remark
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[deg]	
1	2058.319	H	29.7	41.8	3.4	45.2	56.0	76.0	22.9	30.8	100.0	8.4	
2	2483.204	H	28.8	43.2	5.0	48.2	56.0	76.0	22.2	27.8	100.0	260.3	
3	2945.394	V	28.2	41.1	6.1	47.2	56.0	76.0	21.7	28.8	100.0	48.3	
4	3396.700	V	27.9	43.6	7.2	50.8	60.0	80.0	24.9	29.2	100.0	27.9	
5	5020.185	H	27.5	40.0	11.6	51.6	60.0	80.0	20.9	28.4	100.0	322.8	
6	5756.006	V	27.0	39.5	12.9	52.4	60.0	80.0	20.1	27.6	100.0	78.0	



mode 2



Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Margin Height [cm]	Angle [deg]	Remark
1	2085.102	V	29.9	42.4	3.4	45.8	56.0	76.0	22.7	30.2	100.0	338.1	
2	2460.698	H	28.7	42.8	4.9	47.7	56.0	76.0	22.4	28.3	100.0	299.0	
3	2983.006	V	28.0	42.0	6.4	48.4	56.0	76.0	21.6	27.6	100.0	216.8	
4	3430.134	V	28.1	42.5	7.6	49.6	60.0	80.0	24.8	30.4	100.0	149.6	
5	4705.332	H	27.9	40.7	10.8	52.2	60.0	80.0	20.6	27.8	100.0	187.6	
6	5811.254	H	27.0	40.3	13.2	54.5	60.0	80.0	18.8	25.5	100.0	220.9	

◆ 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(PK/CAV) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

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

■ mode 1

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.039			
2	0.002	0.160	1.080	n/a
3	0.032	1.391	2.300	PASS
4	0.002	0.515	0.430	n/a
5	0.033	2.868	1.140	PASS
6	0.002	0.660	0.300	n/a
7	0.032	4.189	0.770	PASS
8	0.002	0.845	0.230	n/a
9	0.030	7.475	0.400	PASS
10	0.002	1.069	0.184	n/a
11	0.028	8.627	0.330	PASS
12	0.002	1.238	0.153	n/a
13	0.027	12.832	0.210	PASS
14	0.002	1.491	0.131	n/a
15	0.025	16.579	0.150	PASS
16	0.002	1.562	0.115	n/a
17	0.023	17.416	0.132	PASS
18	0.002	1.722	0.102	n/a
19	0.021	17.842	0.118	PASS
20	0.002	1.902	0.092	n/a
21	0.019	11.837	0.161	PASS
22	0.002	2.055	0.084	n/a
23	0.017	11.529	0.147	PASS
24	0.002	2.224	0.077	n/a
25	0.015	11.071	0.135	PASS
26	0.002	2.261	0.071	n/a
27	0.013	10.562	0.125	PASS
28	0.002	2.464	0.066	n/a
29	0.011	9.514	0.116	PASS
30	0.002	2.502	0.061	n/a
31	0.009	8.622	0.109	PASS
32	0.001	2.572	0.058	n/a
33	0.008	7.804	0.102	PASS
34	0.001	2.706	0.054	n/a
35	0.006	6.608	0.096	PASS
36	0.001	2.670	0.051	n/a
37	0.005	5.906	0.091	PASS
38	0.001	2.839	0.048	n/a
39	0.004	5.056	0.087	n/a
40	0.001	2.762	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	0.043			
2	0.002	0.143	1.620	n/a
3	0.036	1.047	3.450	PASS
4	0.003	0.472	0.645	n/a
5	0.037	2.151	1.710	PASS
6	0.003	0.631	0.450	n/a
7	0.036	3.129	1.155	PASS
8	0.003	0.821	0.345	n/a
9	0.034	5.585	0.600	PASS
10	0.003	1.016	0.276	n/a
11	0.032	6.401	0.495	PASS
12	0.003	1.155	0.230	n/a
13	0.030	9.483	0.315	PASS
14	0.003	1.388	0.197	n/a
15	0.027	12.154	0.225	PASS
16	0.003	1.471	0.173	n/a
17	0.025	12.660	0.199	PASS
18	0.003	1.636	0.153	n/a
19	0.023	12.890	0.178	PASS
20	0.002	1.764	0.138	n/a
21	0.020	12.702	0.161	PASS
22	0.020	12.702	0.161	PASS
23	0.002	1.890	0.125	n/a
24	0.018	12.201	0.147	PASS
25	0.002	2.035	0.115	n/a
26	0.016	11.642	0.135	PASS
27	0.002	2.048	0.106	n/a
28	0.014	10.954	0.125	PASS
29	0.002	2.181	0.099	n/a
30	0.011	9.739	0.116	PASS
31	0.002	2.269	0.092	n/a
32	0.010	8.780	0.109	PASS
33	0.002	2.287	0.086	n/a
34	0.008	7.997	0.102	PASS
35	0.002	2.295	0.081	n/a
36	0.007	6.910	0.096	PASS
37	0.002	2.335	0.077	n/a
38	0.006	6.159	0.091	PASS
39	0.002	2.457	0.073	n/a
40	0.005	5.416	0.087	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

■mode 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

■mode 1





Conducted Emissions at Telecommunication Ports

■ mode 1





■mode 2





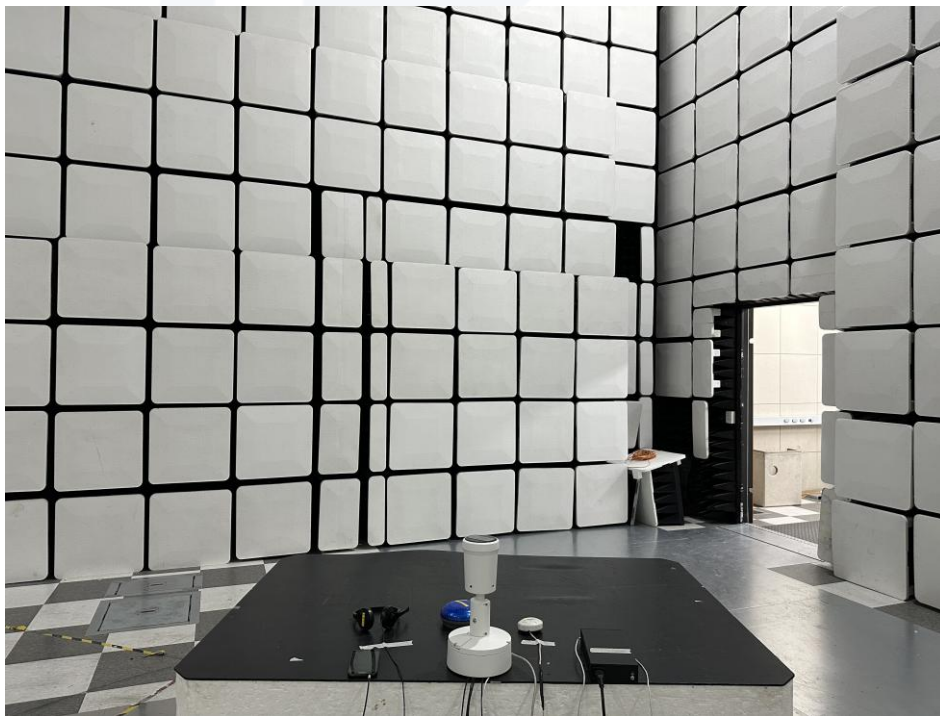
Radiated Electric Field Emissions(Below 1 GHz)

■mode 1





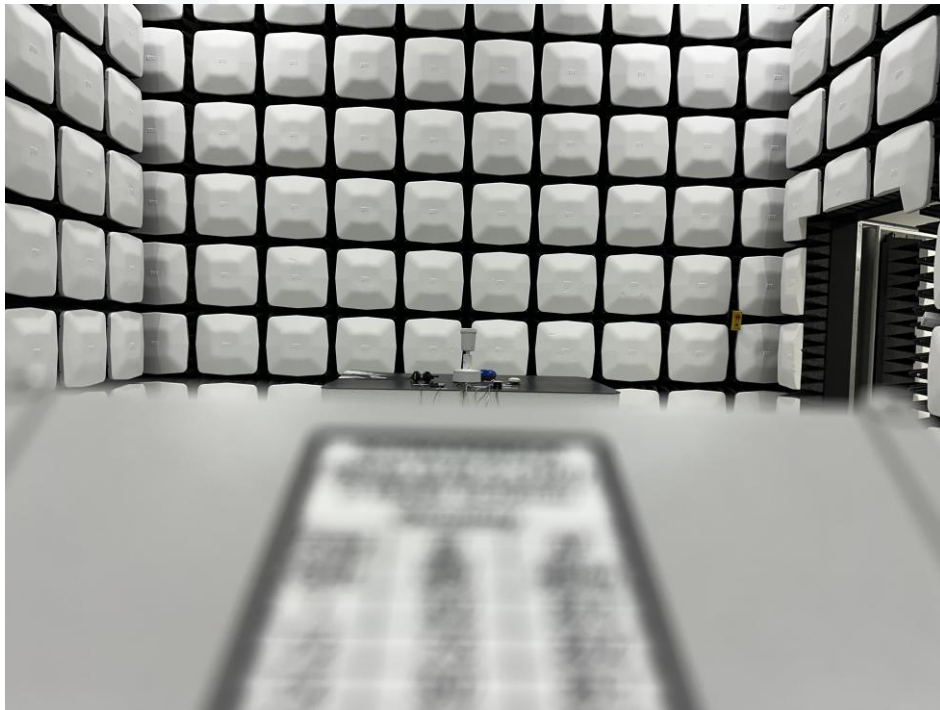
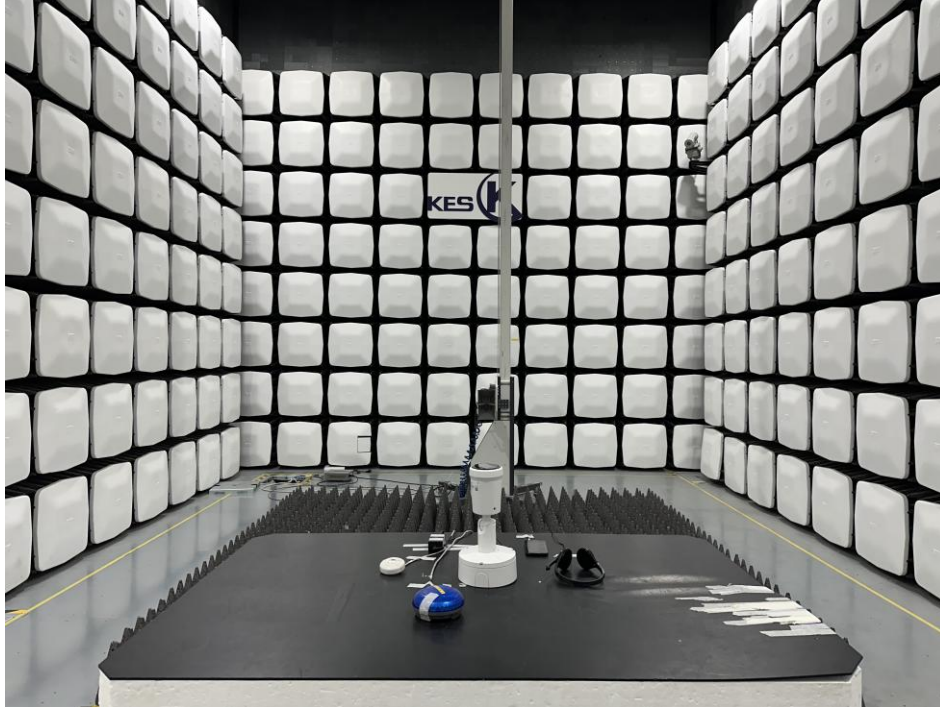
■mode 2





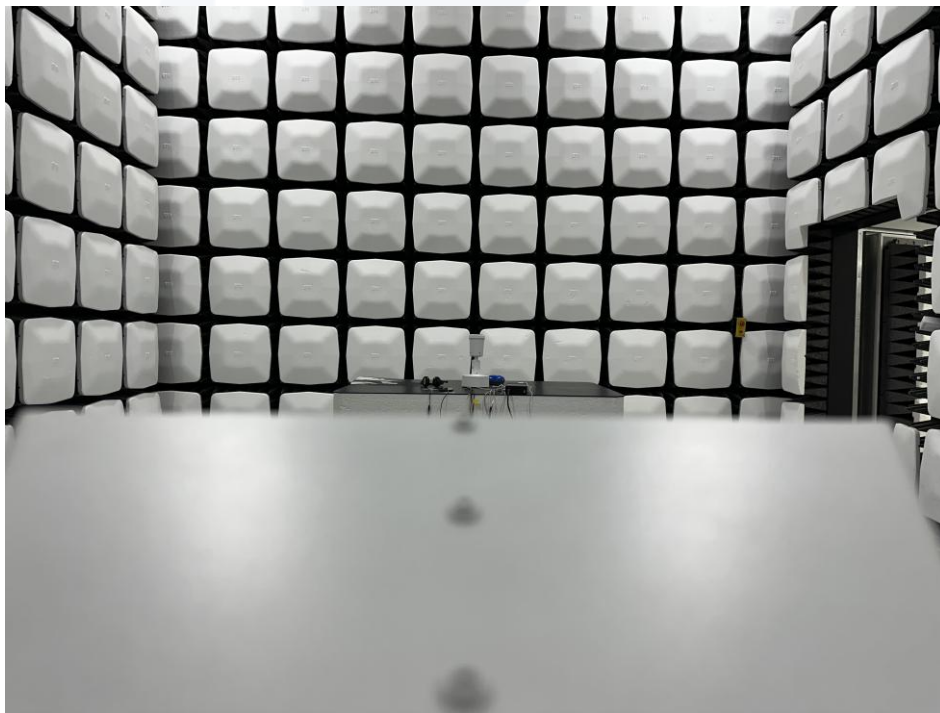
Radiated Electric Field Emissions(Above 1 GHz)

■mode 1





■mode 2





Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ mode 1



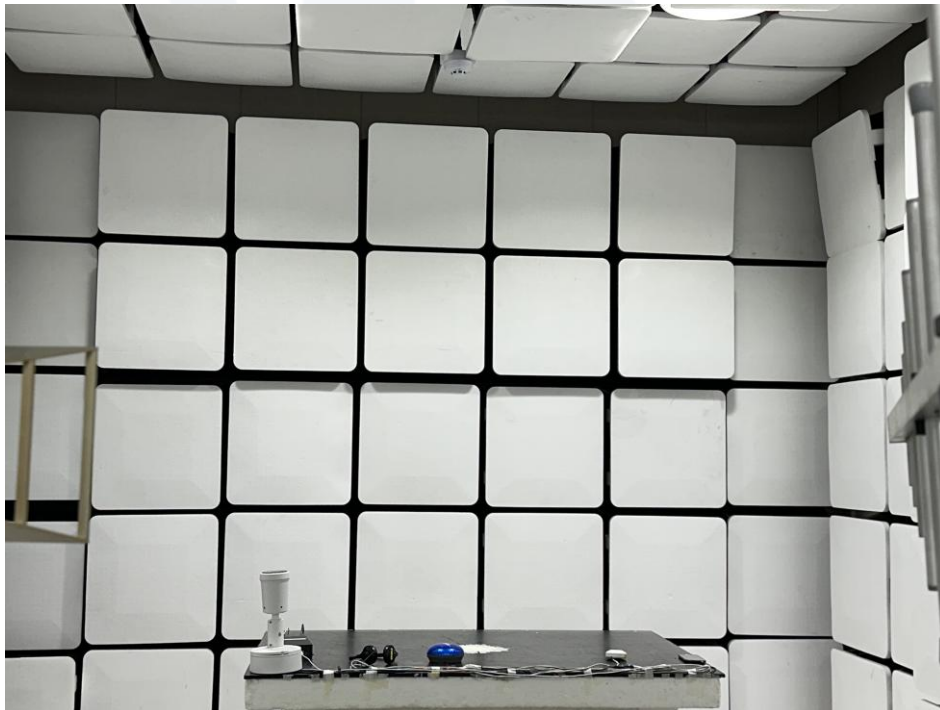


Radiated Electric Field Immunity

■ mode 1



■ mode 2





Electrical Fast Transients/Bursts

■mode 1



■mode 2





Surge Transients

■mode 1



■mode 2



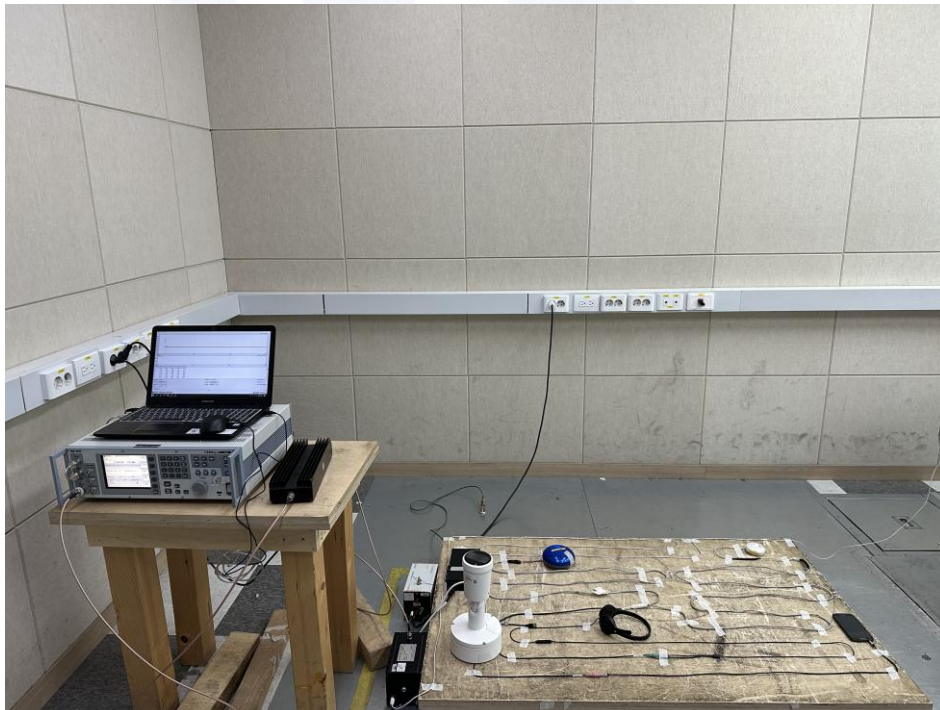


Conducted Disturbance

■ mode 1



■ mode 2





Voltage Dips and Short Interruptions

■ mode 1





EUT External Photographs

(Top)



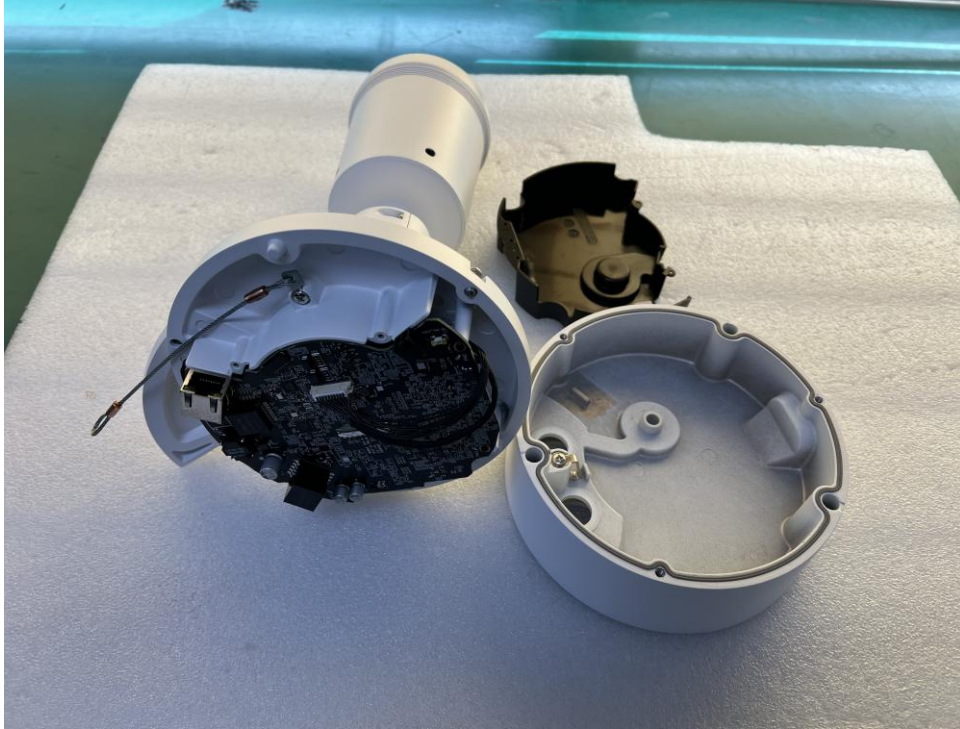
(Bottom)





EUT Internal Photographs

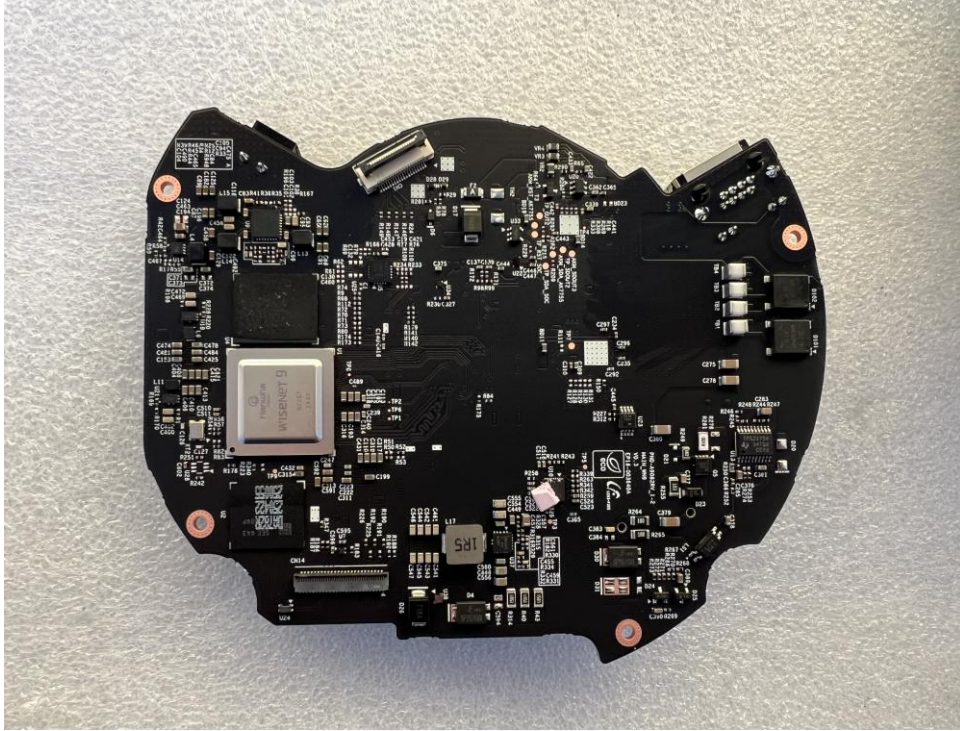
(Internal View)



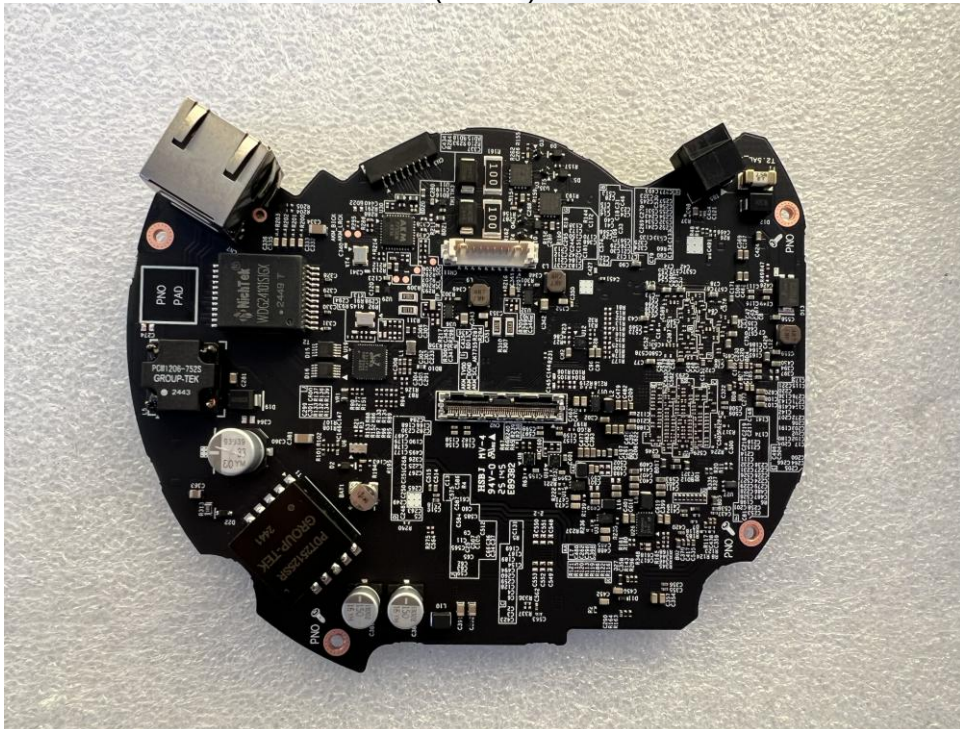


EUT Internal View – Board 1

(Top)



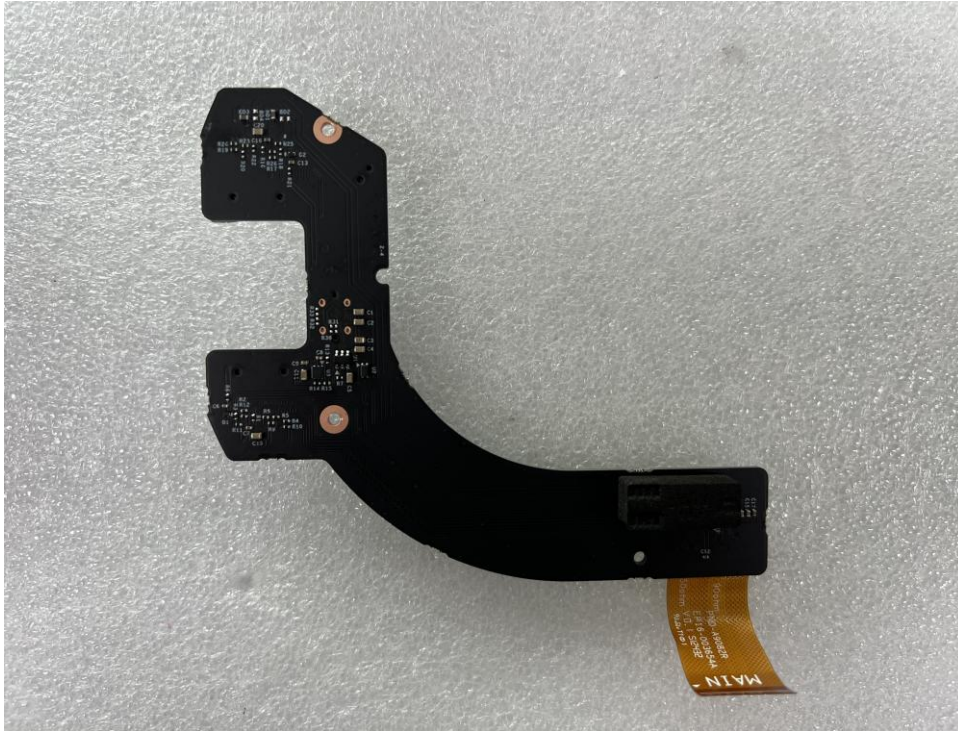
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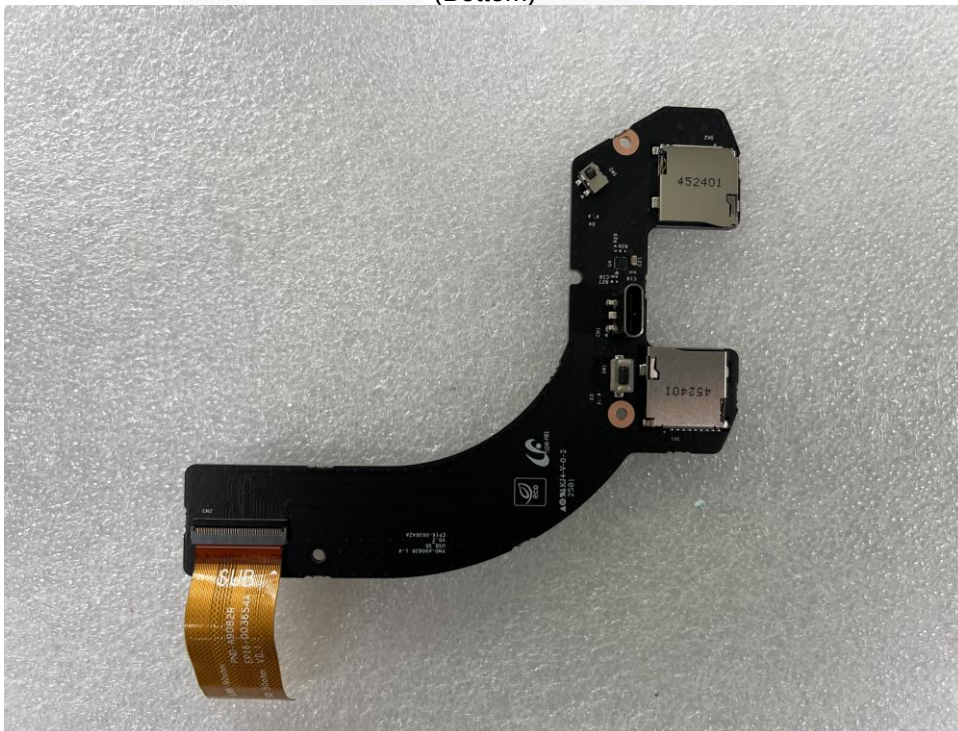


EUT Internal View – Board 2

(Top)



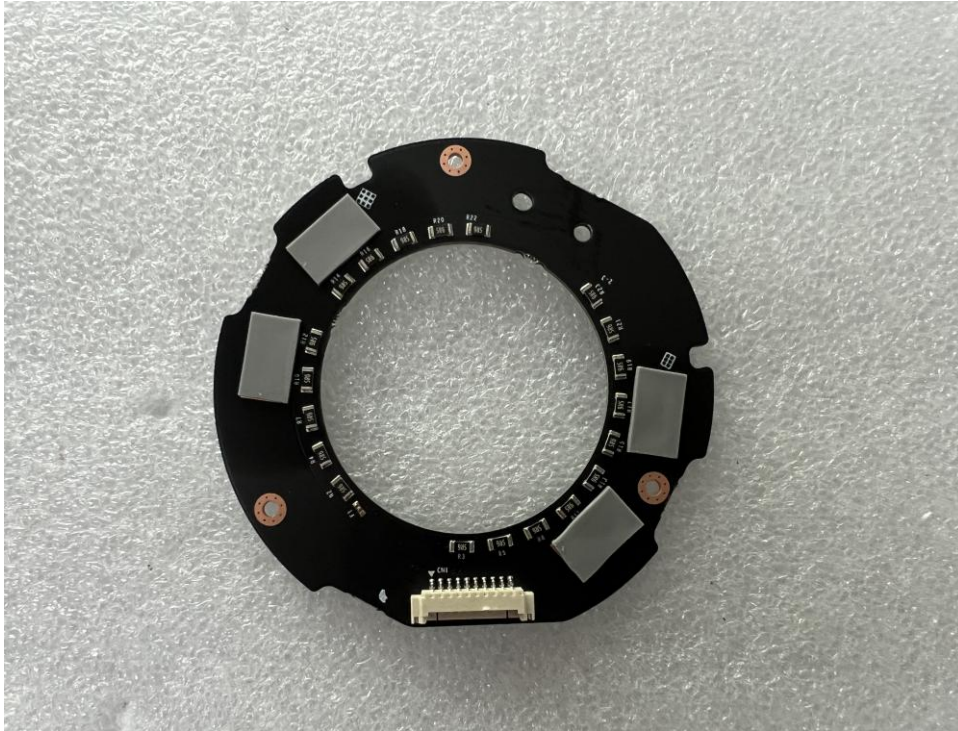
(Bottom)





EUT Internal View – Board 3

(Top)



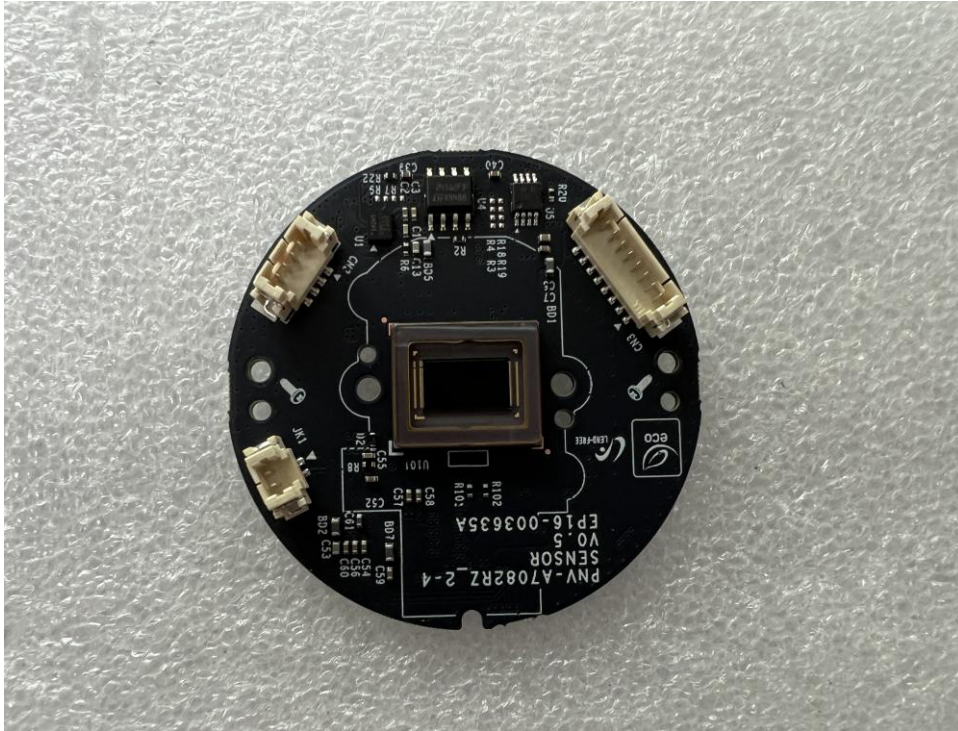
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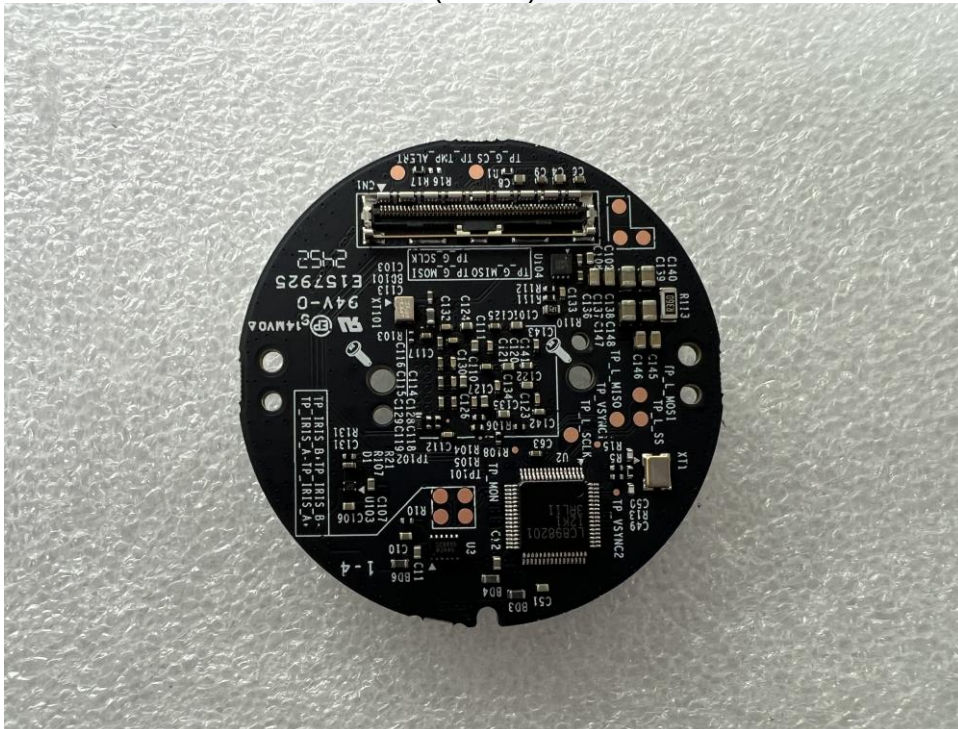


EUT Internal View – Board 4

(Top)



(Bottom)





Label and Location



NETWORK CAMERA

Model No : PNO-A7082R

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam



The End.