



TEST REPORT



Report No. : KES-EM252722

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KES Co., Ltd.

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1. Client

- Name : Hanwha Vision Co., Ltd.
- Address : 6, Pangyo-ro 319beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

2. Sample Description

- Product item : NETWORK CAMERA
- Model name : PNM-A13022RV
- Variant model : -
- Manufacturer etc. : HANWHA VISION VIETNAM COMPANY LIMITED
- Manufacturer address : Lot O-2, Que Vo Industrial Zone Extended Area, Nam Son Ward, Bac Ninh Province, Vietnam
- Manufacturer etc. : D-TECH CO.,LTD.
- Manufacturer address : 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do, Korea (Suwon Industrial Complex)

3. Date of test : 2025. 08. 06. ~ 2025. 08. 08.

4. Location of Test : Permanent Testing Lab
○ Address : 473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Republic of Korea

5. Test method used : EN 55032:2015/A1:2020, EN 50130-4:2011/A1:2014, EN IEC 61000-3-2:2019, EN 61000-3-3:2013/A2:2021

6. Test result : PASS

This test report is not related to KOLAS accreditation.

Affirmation	Tested by	Technical Manager by
	Name : KyeongJae Park	Name : DaeJung,Choi

2025. 08. 19.

KES Co., Ltd.

**REPORT REVISION HISTORY**

Date	Test Report No.	Revision History
2025. 08. 19.	KES-EM252722	Issued

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Use of uncertainty of measurement for decisions on conformity (decision rule):

- ☒ No decision rule is specified by the standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").
- ☐ Other (to be specified, for example when required by the standard or client)



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1 Laboratory Information

1.1 Test Location

Category	Details
Address	473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Republic of Korea
Telephone Number	070-4910-6200
Facsimile Number	031-341-3838

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

1.2 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 Test Summary

2.1 Class and Voltage

Test Class	Test Voltage
Class A	AC 230 V, 50 Hz / PoE

2.2 Summary of Test Results

Regulation
EMC Directive 2014/30/EU, EMC Regulations 2016/1091

Test Item	Test Standard		Test Result	Remark
Conducted Emissions at Mains Power Ports	EN 55032:2015/A1:2020		PASS	-
Conducted Emissions at Telecommunication Ports			PASS	-
Radiated Emissions(Below 1 GHz)			PASS	-
Radiated Emissions(Above 1 GHz)			PASS	-
Harmonic Current Emissions	EN IEC 61000-3-2:2019		PASS	-
Voltage Fluctuations and Flicker	EN 61000-3-3:2013/A2:2021		PASS	-
Electrostatic Discharge	EN 50130-4 :2011/A1:2014	EN 61000-4-2:2009	PASS	-
Continuous RF electromagnetic field disturbances		EN IEC 61000-4-3:2020	PASS	-
Electrical Fast Transients/Bursts		EN 61000-4-4:2012	PASS	-
Surge		EN 61000-4-5 :2014/A1:2017	PASS	-
Continuous Induced RF Disturbances		EN IEC 61000-4-6:2023	PASS	-
Voltage Dips and Interruptions		EN IEC 61000-4-11:2020	PASS	-



2.3 Remarks when standards applied

N/A

2.4 Variant Model Differences

N/A

2.5 Device Modifications

N/A





3 General Product Description

Division		Specificity
Internal highest clock frequency		1.2 GHz
Power	Rated power	DC 12 V (AC/DC Adapter Power), PoE Power
	Tested power	AC 120 V / 60 Hz
I/O Port	User Port	DC(2 Pin) 1 EA, RJ-45 1 EA, 7 Pin 1 EA, Micro SD Card Slot 2 EA
	Unused/Administrator Ports	USB Type-C 1 EA
features	product features	NETWORK CAMERA
	radio features	Not applicable
Components		EUT 1 EA, 7 Pin Cable 1 EA
communication speed		1 000 Mbps
etc		Please refer to product specifications



	PNM-A13022RV
Video	
Imaging Device	1/2.8" 5M CMOS (x3)
Resolution	5120x2592, 4112x2080, 3240x1640, 2940x1488, 2560x1296, 2016x1016, 1600x800, 1424x720, 1280x648,
Max. Framerate	H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 30fps(60Hz/50Hz)
NETD	None
Pixel Size	None
Min. Illumination	Color: 0.1Lux(F1.6, 1/30sec) BW: 0.01Lux(F1.6, 1/30sec), 0Lux(IR LED on)
Video Out	USB: USB Type C, for installation
Video Transmission Distance	None
Lens	
Focal Length (Zoom Ratio)	3.06mm fixed focal (x3)
Optical Zoom	None
Max. Aperture Ratio	F1.6
Angular Field of View	H: 194°, V: 93°
Min. Object Distance	5m(16.4ft)
Focus Control	Fixed
Lens Type	None
Mount Type	None
Optional Lens	None
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	0°~360° / 0°~50° / -
Pan Range	None
Pan Speed	None
Tilt Range	None
Tilt Speed	None
Rotate Range	None
Sequence	None
Preset Accuracy	None
Operational	
Camera Title	Displayed up to 85 characters
Direction Indicator	None
Day & Night	Auto(ICR)
Backlight Compensation	BLC, WDR, SDR, HLC
Wide Dynamic Range	120dB
Digital Noise Reduction	WiseNRII(Based on AI engine), SSNRV
Digital Image Stabilization	None
Defog	None
Motion Detection	8ea, 8point Polygonal zones
Privacy Masking	32ea, 4point quadrangle zones - Color : Gray, Green, Red, Blue, Black, White
Gain Control	Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC	None
Electronic Shutter Speed	Minimum / Maximum / Prefer / Anti flicker (2~1/12,000sec) Auto prefer shutter control(Based on AI engine)
Digital PTZ	None
Video Rotation	Flip, Mirror



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 Analytics events based on AI engine - Motion detection, Object detection, Virtual line(Crossing/Direction), Virtual area(Loitering/Intrusion/Enter/Exit/Appear/Disappear), FaceMask detection, Slip&Fall detection, Social Distancing detection, Analytics events - Defocus detection, Tampering, Audio detection, Virtual area(Appear/Disappear)
Business Intelligence	Based on AI engine: People/Vehicle/Crowd/Object counting, Queue management, Heatmap
Serial Interface	None
Alarm I/O	2 configurable I/O ports * Support extra alarm I/O via optional SPM-4210 I/O box
Alarm Triggers	Analytics, Network disconnect, Alarm input, Time schedule, MQTT subscription
Alarm Events	When alarm trigger occurred - File upload(Image): SMTP/SMTSPS/FTP/SFTP - File upload(video clip): FTP/SFTP - Notification: SMTP/SMTSPS/FTP/SFTP - 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 Streaming	None
Audio In	Selectable(mic In/line In) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm
Audio Out	Line out, Max.output level: 1Vrms
Light Type	IR LED
Light Viewable Length	None
IR Viewable Length	20m(65.62ft)
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 u-law /G.726 Selectable G.726(ADPCM) 8KHz, G.711 8KHz G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC: 48Kbps at 16KHz Opus: 48Kbps
Smart Codec	Manual(Sea area), WiseStream (AI-Based WiseStream)
Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Target bitrate level control
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
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/StartTLS, DHCP, FTP/SFTP, SMTP/SMTS, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTP (TCP, UDP Unicast), MQTT, SIP
Security	None
SIP support (VoIP, Peer-to-peer, SIP/P	Support
Application Programming Interface	ONVIF Profile S/G/T/M SUNAPI(HTTP API) Hanwha Vision Open Platform - WiseAI application included - Cloud connector application included
Security	
OS / Firmware Protect	Encrypted Firmware, Secure boot, Signed Firmware
User authentication	Digest Authentication, Prevent brute-force attack
Network authentication	IEEE 802.1X(EAP-TLS, EAP-LEAP, EAP-PEAP, MSCHAPv2), 802.1AE(MACsec)
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
Audit	Access / System / Event / Remote Log management
Device ID	Device Certificate(Hanwha vision Root CA)
Secure Storage	Secure element, SDcard partition encrypt
General	
Webpage Language	English, French, German, Spanish, Italian, Simplified Chinese, Traditional Chinese, Korean, Russian, Japanese, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 2slot Max. 2TB (1TB * 2)
Memory	8GB RAM, 8GB eMMC
Environmental & Electrical	
Operating Temperature / Humidity	-40°C~+55°C(-40°F~+131°F) 0~100%RH (condensing)
Storage Temperature / Humidity	-50°C~+60°C(-58°F~+140°F) / 0~90% RH
Wind Load	None
EPA(Effective Projected Area)	0.0286 m ²
Certification	IP66, NEMA4X, IK10
Input Voltage	PoE+(IEEE802.3at, Class4), 12VDC
Power Consumption	PoE+: Max 22.3W, typical 11.5W 12VDC: Max 20.0W, typical 10.0W Power redundancy failover



Mechanical	
Color / Material	White / Aluminum Bubble: Hard-coated dome
RAL Code	RAL9003
Product Dimensions / Weight	Ø253x170mm(9.96"x6.69"), 2800g(6.17lb)
Compatible Conduit hole / Gangbox	3/4"(M25) Single, Double, 4"Octagon, 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, IEC/EN 62262 IK10, NEMA 250 type 4X 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-250HWMW
Back Box	None
Ceiling Mount (Assy)	SBP-300CMW
Ceiling Mount (Single Unit)	SBP-300CMW1
Wall Mount	BP-250WMW, SBP-300WMW, SBP-300WMW1, SBP-400WMW
Wall Mount Adaptor	None
Pole Mount	SBP-250WMW, SBP-300PMW2
Corner Mount	SBP-156KMW
Parapet Mount	SBP-300LMW
Tilt Mount	None
Cabinet	None
Housing	None
Gang Plate	None
Skin Cover	None
Weather Cap	SBV-253WCW
Dome Cover	None
Conduit Adaptor	None
Power Module	None
Interface Box	None
Other Compatible Models	SPB-MDC21W
DORI (EN62676-4 standard)	
Detect (25PPM/ 8PPF)	43.8m(143.85ft)
Observe (63PPM/ 19PPF)	17.5m(57.54ft)
Recognize (125PPM/ 38PPF)	8.8m(28.77ft)
Identify (250PPM/ 76PPF)	4.4m(14.39ft)



4 EUT Setup and Operation Mode

4.1 EUT Configuration

Equipment Under Test

Product Name	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	PNM-A13022RV	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

Support Equipments

Product Name	Model Number	Serial Number	Manufacturer	Remarks
PoE Adapter	PT-PSE106GBR-AH-S	-	Dongguan PROCET Network Technology Co.,Ltd	-
Laptop	LG15N54	506NZGK000615	LG Electronics	-
Laptop Adapter	PA-1650-43(65W)	OF58U63849302Y60 9	LG Electronics	-
Micro SD Card 1	-	-	SanDisk	-
Micro SD Card 2	-	-	SanDisk	-
LED Alarm	PRO-SL	-	SENSOR PRO	-
Button Alarm	-	-	-	-
HEADSET	K550	-	Britz®	-
AC/DC Adapter	2ACB022F	-	ChAnnel Well Technology (Guangzhou) Co.,Ltd.	-

4.2 System Configuration

Product Name	Model Number	Serial Number	Manufacturer	Remarks
-	-	-	-	-

**4.3 External I/O Cabling**

Mode 1

Start		End		Cable Spec.	
Product Name	I/O Port	Product Name	Product Name	I/O Port	Product Name
NETWORK CAMERA (EUT)	2 Pin	AC/DC Adapter	DC JACK	1.6	U
	Micro SD Card Slot	Micro SD Card 1	Micro SD Card Slot	-	-
	Micro SD Card Slot	Micro SD Card 2	Micro SD Card Slot	-	-
	RJ-45 (LAN)	Laptop	RJ-45 (LAN)	3.1	U
	Alarm IN	Button Alarm	Alarm OUT	3.1	U
	Alarm OUT	LED Alarm	Alarm IN	3.1	U
	Audio IN	HEADSET	3.5 mm	1.4	U
	Audio OUT		3.5 mm	1.4	U
Laptop	DC JACK	Laptop Adapter	DC JACK	1.6	U

Mode 2

Start		End		Cable Spec.	
Product Name	I/O Port	Product Name	Product Name	I/O Port	차폐여부
NETWORK CAMERA (EUT)	RJ-45 (PoE)	PoE Adapter	RJ-45 (PoE)	3.1	U
	Micro SD Card Slot	Micro SD Card 1	Micro SD Card Slot	-	-
	Micro SD Card Slot	Micro SD Card 2	Micro SD Card Slot	-	-
	Alarm IN	Button Alarm	Alarm OUT	3.1	U
	Alarm OUT	LED Alarm	Alarm IN	3.1	U
	Audio IN	HEADSET	3.5 mm	1.4	U
	Audio OUT		3.5 mm	1.4	U
PoE Adapter	RJ-45 (LAN)	Laptop	RJ-45 (LAN)	1.8	U
Laptop	DC JACK	Laptop Adapter	DC JACK	1.6	U

* Unshielded=U, Shielded=S

**4.4 EUT Operating Mode(s)**

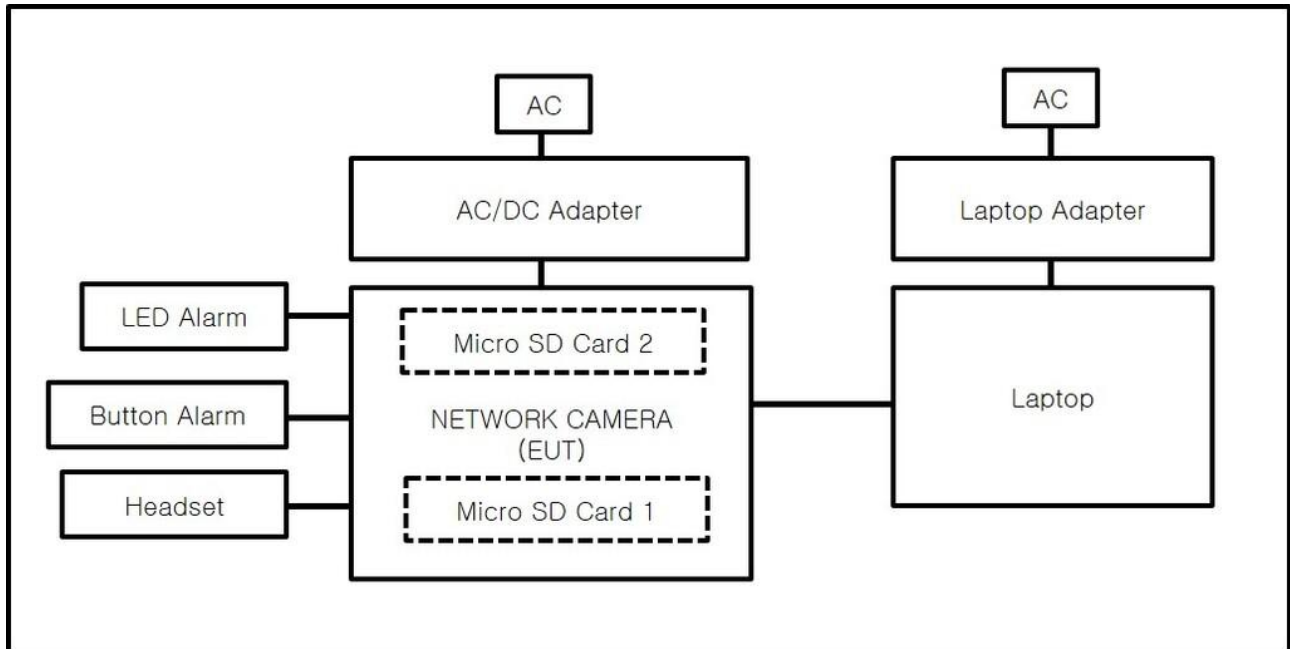
Category	Mode	Operating
Mode 1	AC/DC Adpater	- Monitoring EUT Using Web Viewer, Ping Test - When the Button Alarm is pressed, make sure the Alarm is working - Uploaded the 1 kHz tone sound to the Web Viewer and checked if the sound is output to the headset. - After the test, the recorded video stored on the Micro SD Card was checked and the microphone motion was also confirmed.
Mode 2	PoE	

4.5 Test operating S/W

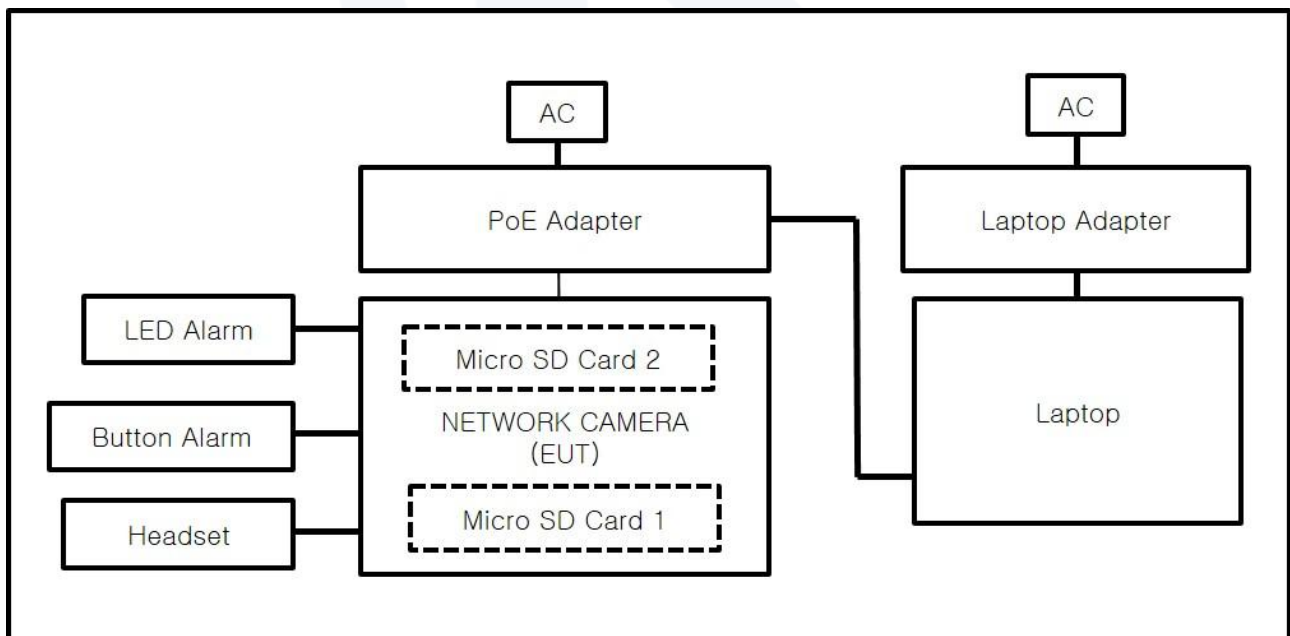
Name	Version	Manufacture Company
Web Viewer	-	HANWHA VISION VIETNAM COMPANY LIMITED



4.6 Configuration



Mode 1



Mode 2



5 General Performance Criteria

Criteria for compliance was based on the following guidelines:

EN 50130-4 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 $U = 130 \text{ dB}\mu V$.

For component of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at $U = 140 \text{ dB}\mu V$, 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 $U = 130 \text{ dB}\mu V$, 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 $U = 120 \text{ dB}\mu V$.

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.



6 Test Item

6.1 Conducted Emissions at Mains Power Ports

6.1.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #6	-	DYMSTEC	-	-	-	■
EMC32 Measurement Software	EMC32	R&S	9.12.00	-	-	■
EMI TEST RECEIVER	ESR3	Rohde & Schwarz	101783	2024-11-06	2025-11-06	■
LISN	ENV216	Rohde & Schwarz	101786	2025-01-09	2026-01-09	■
ARTIFICIAL MAINS NETWORK	ESH2-Z5	Rohde & Schwarz	100450	2024-11-06	2025-11-06	■
PULSE LIMITER	ESH3-Z2	Rohde & Schwarz	101915	2024-11-06	2025-11-06	■

6.1.2 Test Location : SHIELD ROOM #6

6.1.3 Test Conditions :

Temperature	Relative Humidity
(25.6 ~ 25.7) °C	(52.3 ~ 52.4) % R.H.

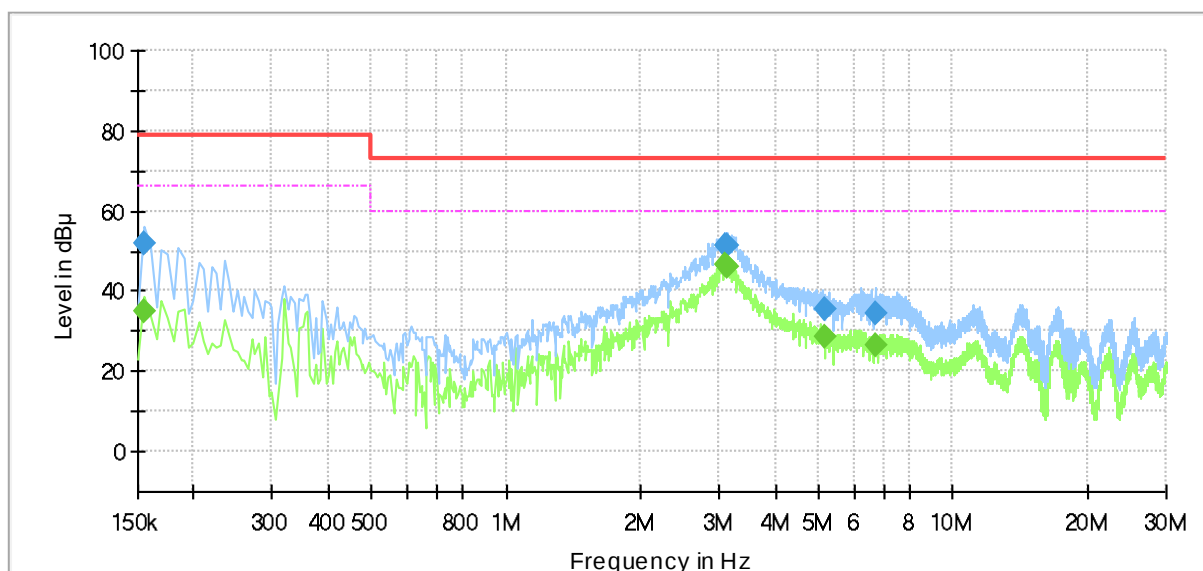


6.1.4 Test Result

- Test Date : 2025-08-07
- Test Mode : Mode 1

Test Report

Test Description: Conducted Emission
Job No.: KES-EM252722
Phase: L
Mode: Mode 1
Operator Name: KES



Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	—	34.78	66.00	31.22	1000.0	9.000	L1	19.5
0.155000	51.72	—	79.00	27.28	1000.0	9.000	L1	19.5
3.085000	—	46.40	60.00	13.60	1000.0	9.000	L1	19.7
3.085000	51.48	—	73.00	21.52	1000.0	9.000	L1	19.7
3.135000	—	46.12	60.00	13.88	1000.0	9.000	L1	19.8
3.135000	51.25	—	73.00	21.75	1000.0	9.000	L1	19.8
5.140000	—	28.87	60.00	31.13	1000.0	9.000	L1	19.9
5.140000	35.36	—	73.00	37.64	1000.0	9.000	L1	19.9
6.730000	—	26.63	60.00	33.37	1000.0	9.000	L1	20.0
6.730000	34.40	—	73.00	38.60	1000.0	9.000	L1	20.0



Report No. : KES-EM252722

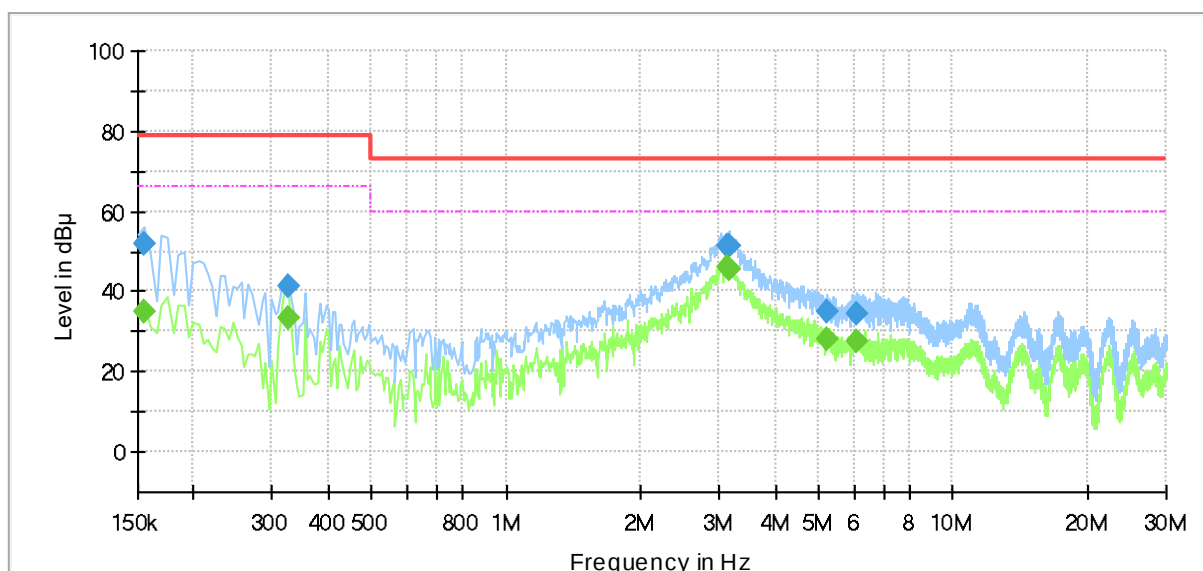
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○ Test Date : 2025-08-07

● Test Mode : Mode 1

Test Report

Test Description: Conducted Emission
Job No.: KES-EM252722
Phase: N
Mode: Mode 1
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	—	35.05	66.00	30.95	1000.0	9.000	N	19.5
0.155000	51.67	—	79.00	27.33	1000.0	9.000	N	19.5
0.325000	—	33.32	66.00	32.68	1000.0	9.000	N	19.5
0.325000	41.28	—	79.00	37.72	1000.0	9.000	N	19.5
3.125000	—	46.04	60.00	13.96	1000.0	9.000	N	19.7
3.125000	51.29	—	73.00	21.71	1000.0	9.000	N	19.7
3.155000	—	45.79	60.00	14.21	1000.0	9.000	N	19.7
3.155000	51.10	—	73.00	21.90	1000.0	9.000	N	19.7
5.200000	—	28.20	60.00	31.80	1000.0	9.000	N	19.9
5.200000	34.91	—	73.00	38.09	1000.0	9.000	N	19.9
6.055000	—	27.63	60.00	32.37	1000.0	9.000	N	19.9
6.055000	34.58	—	73.00	38.42	1000.0	9.000	N	19.9

6.1.5 Remark

Complies with the test requirements.



6.2 Conducted Emissions at Telecommunication Ports

6.2.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #6	-	DYMSTEC	-	-	-	■
EMC32 Measurement Software	EMC32	R&S	9.12.00	-	-	■
EMI TEST RECEIVER	ESR3	Rohde & Schwarz	101783	2024-11-06	2025-11-06	■
LISN	ENV216	Rohde & Schwarz	101786	2025-01-09	2026-01-09	■
ARTIFICIAL MAINS NETWORK	ESH2-Z5	Rohde & Schwarz	100450	2024-11-06	2025-11-06	■
PULSE LIMITER	ESH3-Z2	Rohde & Schwarz	101915	2024-11-06	2025-11-06	■
8-WIRE ISN CAT6	ENY81-CAT6	Rohde & Schwarz	101666	2025-02-27	2026-02-27	■

6.2.2 Test Location : SHIELD ROOM #6

6.2.3 Test Conditions :

Temperature	Relative Humidity
(25.6 ~ 25.7) °C	(52.3 ~ 52.4) % R.H.

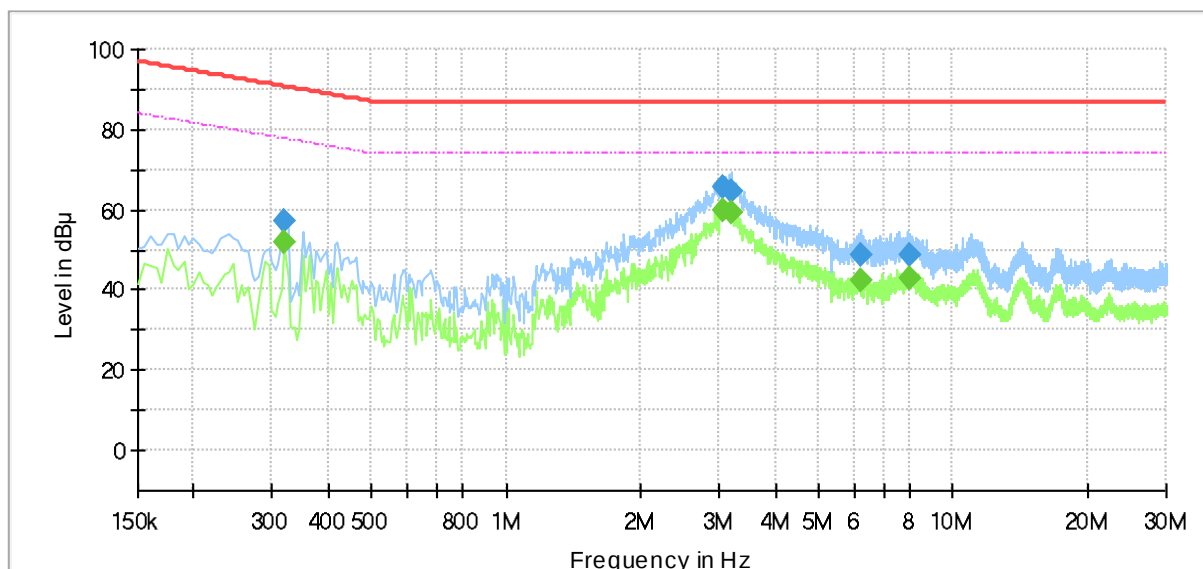


6.2.4 Test Result

- Test Date : 2025-08-07
- Test Mode : Mode 1

Test Report

Test Description: Telecommunication Emission
Job No.: KES-EM252722
Mode : Mode 1
Speed : 1 000 Mbps
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)
0.320000	—	51.97	77.71	25.74	1000.0	9.000	Single Line	19.5
0.320000	57.02	—	90.71	33.69	1000.0	9.000	Single Line	19.5
3.060000	—	60.04	74.00	13.96	1000.0	9.000	Single Line	19.3
3.060000	65.38	—	87.00	21.62	1000.0	9.000	Single Line	19.3
3.205000	—	59.05	74.00	14.95	1000.0	9.000	Single Line	19.4
3.205000	64.71	—	87.00	22.29	1000.0	9.000	Single Line	19.4
6.245000	—	42.35	74.00	31.65	1000.0	9.000	Single Line	19.5
6.245000	48.91	—	87.00	38.09	1000.0	9.000	Single Line	19.5
8.015000	—	42.68	74.00	31.32	1000.0	9.000	Single Line	19.6
8.015000	48.96	—	87.00	38.04	1000.0	9.000	Single Line	19.6



Report No. : KES-EM252722

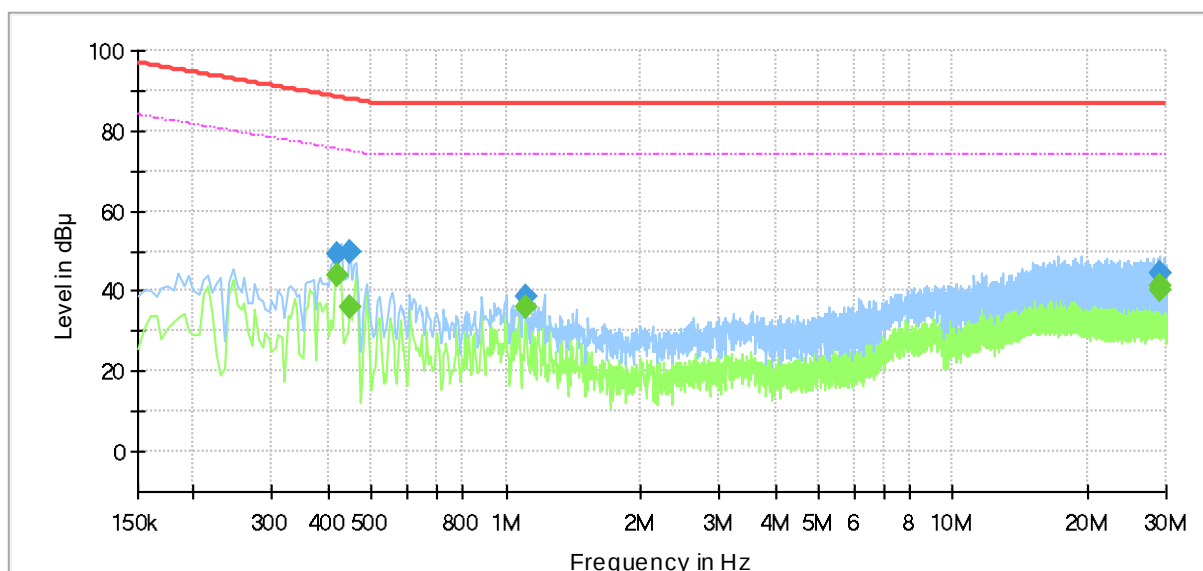
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○ Test Date : 2025-08-07

● Test Mode : Mode 2

Test Report

Test Description: Telecommunication Emission
Job No.: KES-EM252722
Mode : Mode 2
Speed : 1 000 Mbps
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)
0.420000	—	44.06	75.45	31.39	1000.0	9.000	Single Line	19.4
0.420000	49.39	—	88.45	39.06	1000.0	9.000	Single Line	19.4
0.445000	—	35.91	74.97	39.06	1000.0	9.000	Single Line	19.4
0.445000	49.78	—	87.97	38.19	1000.0	9.000	Single Line	19.4
1.105000	—	36.13	74.00	37.87	1000.0	9.000	Single Line	19.3
1.105000	38.82	—	87.00	48.18	1000.0	9.000	Single Line	19.3
29.060000	—	41.06	74.00	32.94	1000.0	9.000	Single Line	20.0
29.060000	44.70	—	87.00	42.30	1000.0	9.000	Single Line	20.0
29.155000	—	40.13	74.00	33.87	1000.0	9.000	Single Line	20.0
29.155000	44.28	—	87.00	42.72	1000.0	9.000	Single Line	20.0

6.2.5 Remark

Complies with the test requirements.



6.3 Radiated Emissions(Below 1 GHz)

6.3.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SEMI ANECHOIC CHAMBER #4(10 m)	-	DYMSTEC	-	-	-	■
EP5/RE Software	EP5/RE	TOYO	6.0.0	-	-	■
EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100551	2025-02-13	2026-02-13	■
AMPLIFIER	SCU 01	Rohde & Schwarz	100603	2024-11-06	2025-11-06	■
BILOG ANTENNA	VULB 9168	SCHWARZBEC K	9168-461	2024-05-09	2026-05-09	■
ATTENUATOR	6806.17.A	HUBER+SUHNE R	-	2025-02-13	2026-02-13	■

6.3.2 Test Location : SEMI ANECHOIC CHAMBER #4(10 m) Measurement Distance : □ 3 m, ■ 10 m

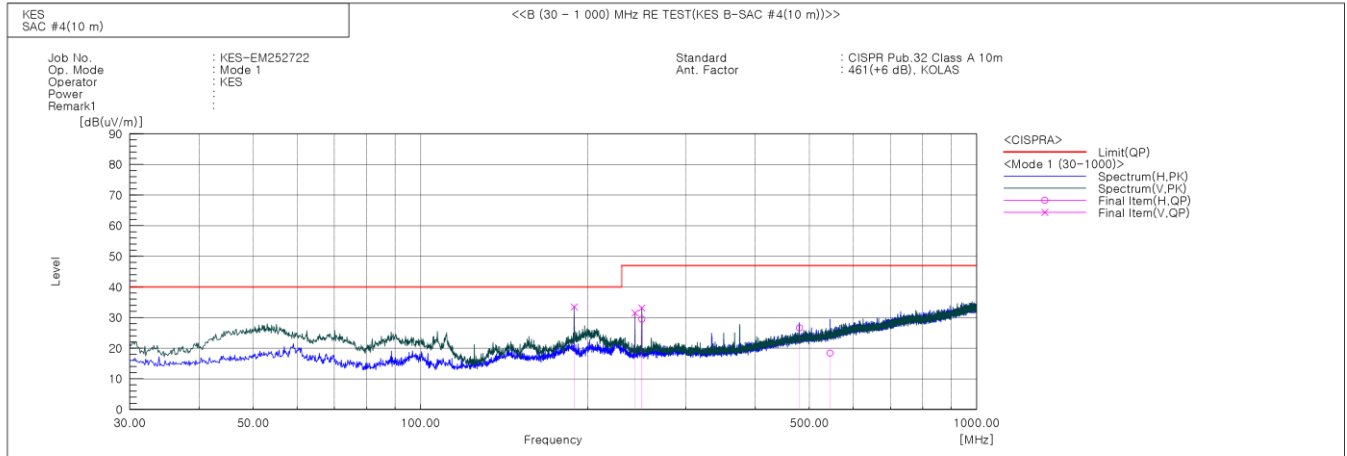
6.3.3 Test Conditions :

Temperature	Relative Humidity
(26.1 ~ 26.2) °C	(55.9 ~ 56.0) % R.H.



6.3.4 Test Result

- Test Date : 2025-08-06
- Test Mode : Mode 1



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	188.991	V	55.0	-21.5	33.5	40.0	6.5	108.0	144.0	
2	242.995	V	51.4	-19.9	31.5	47.0	15.5	109.0	6.0	
3	249.990	V	52.5	-19.4	33.1	47.0	13.9	105.0	42.0	
4	249.996	H	48.9	-19.4	29.5	47.0	17.5	398.0	245.0	
5	480.016	H	37.2	-10.6	26.6	47.0	20.4	390.0	344.0	
6	544.779	H	27.5	-9.1	18.4	47.0	28.6	388.0	181.0	

※ The data is the result measured by the detector in Quasi-Peak mode on the Peak graph.

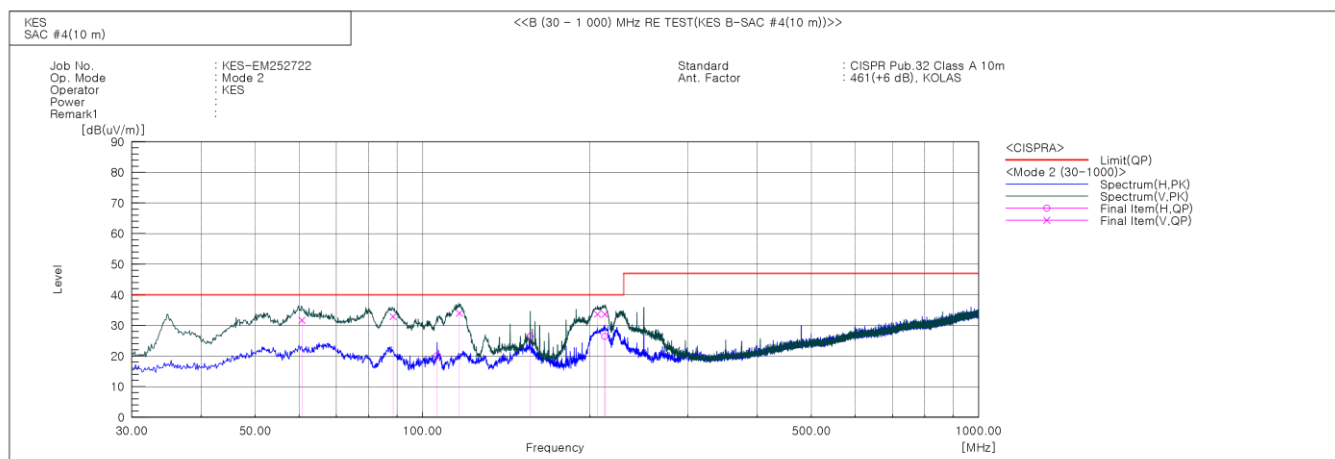


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○ Test Date : 2025-08-06

● Test Mode : Mode 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	60.688	V	53.1	-21.4	31.7	40.0	8.3	155.0	113.0	
2	88.526	V	59.0	-26.1	32.9	40.0	7.1	153.0	109.0	
3	106.248	H	44.0	-23.9	20.1	40.0	19.9	395.0	282.0	
4	116.489	V	56.7	-22.7	34.0	40.0	6.0	110.0	191.0	
5	156.282	H	45.7	-19.3	26.4	40.0	13.6	398.0	135.0	
6	206.310	V	55.4	-21.7	33.7	40.0	6.3	104.0	168.0	
7	212.485	H	47.9	-21.5	26.4	40.0	13.6	395.0	86.0	
8	212.660	V	55.2	-21.5	33.7	40.0	6.3	109.0	179.0	

※ The data is the result measured by the detector in Quasi-Peak mode on the Peak graph.

6.3.5 Remark

Complies with the test requirements.



6.4 Radiated Emissions(Above 1 GHz)

6.4.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SEMI ANECHOIC CHAMBER #5	-	SY Corporation	-	-	-	■
ES10/RE Software	ES10/RE	TOYO	2022.01.000	-	-	■
EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	2025-02-13	2026-02-13	■
PREAMPLIFIER	8449B	HP	3008A00538	2025-04-30	2026-04-30	■
ATTENUATOR	8491B	HP	23094	2025-02-13	2026-02-13	■
HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	2024-11-04	2025-11-04	■

6.4.2 Test Location : SEMI ANECHOIC CHAMBER #5

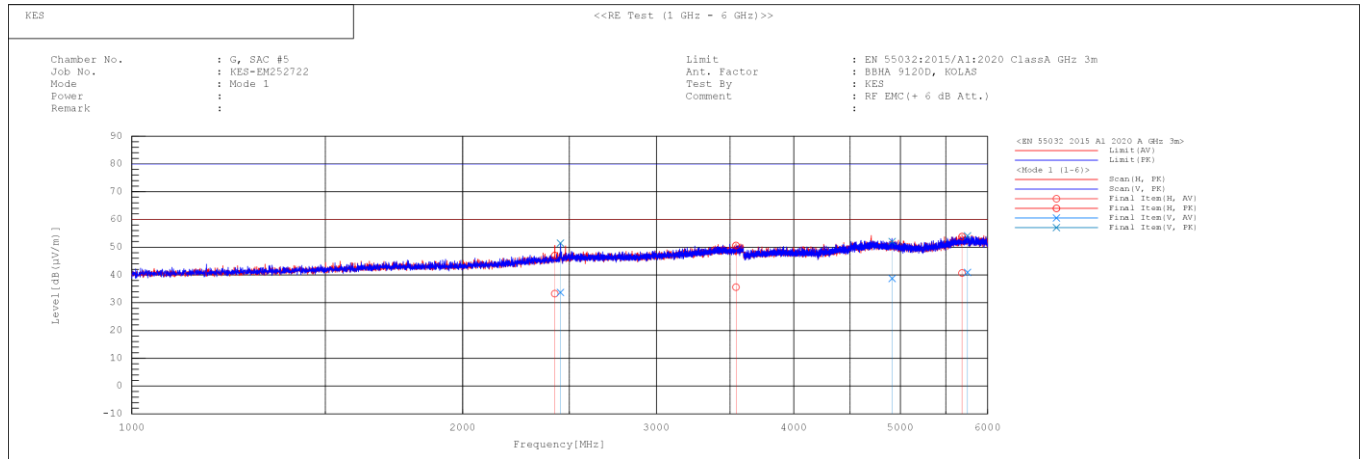
6.4.3 Test Conditions :

Temperature	Relative Humidity
(25.7 ~ 25.8) °C	(57.5 ~ 57.6) % R.H.



6.4.4 Test Result

- Test Date : 2025-08-07
- Test Mode : Mode 1



Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB (μV)]	Reading PK [dB (μV)]	c.f. [dB (1/m)]	Result AV [dB (μV/m)]	Result PK [dB (μV/m)]	Limit AV [dB (μV/m)]	Limit PK [dB (μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	2425.353	H	28.5	42.2	4.8	33.3	47.0	60.0	80.0	26.7	33.0	100.0	70.7	
2	2453.817	V	28.8	46.6	4.9	33.7	51.5	60.0	80.0	26.3	28.5	100.0	244.4	
3	3543.544	H	28.2	43.2	7.4	35.6	50.6	60.0	80.0	24.4	29.4	100.0	32.2	
4	4913.784	V	26.5	39.8	12.2	38.7	52.0	60.0	80.0	21.3	28.0	100.0	2.8	
5	5689.483	H	26.9	40.0	13.8	40.7	53.8	60.0	80.0	19.3	26.2	100.0	347.2	
6	5755.211	V	26.9	40.1	14.0	40.9	54.1	60.0	80.0	19.1	25.9	100.0	359.0	

- ※ The data is the result of measured by the detector in PK and CISPR Average on the Peak graph.
- ※ The Average of the test data is the cispr average result.

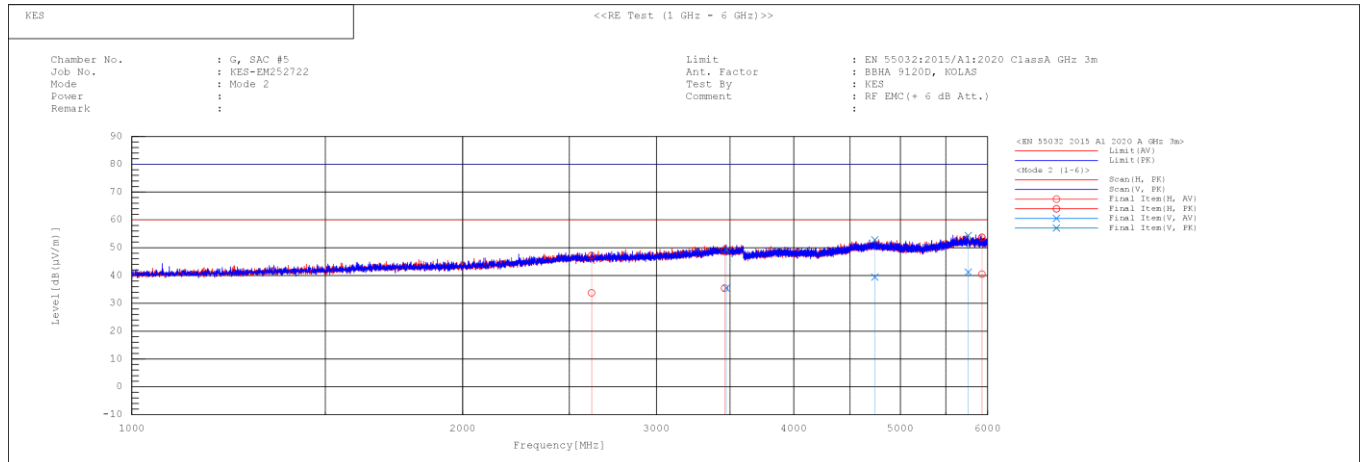


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○ Test Date : 2025-08-07

● Test Mode : Mode 2



Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	2619.242	H	28.5	41.9	5.3	33.8	47.2	60.0	80.0	26.2	32.8	100.0	170.6	
2	3459.362	H	28.3	41.7	7.2	35.5	48.9	60.0	80.0	24.5	31.1	100.0	191.0	
3	3473.209	V	28.3	42.0	7.2	35.5	49.2	60.0	80.0	24.5	30.8	100.0	271.2	
4	4739.733	V	27.8	41.2	11.6	39.4	52.8	60.0	80.0	20.6	27.2	100.0	35.1	
5	5762.961	V	27.2	40.4	14.0	41.2	54.4	60.0	80.0	18.8	25.6	100.0	334.2	
6	5929.975	H	26.2	39.4	14.3	40.5	53.7	60.0	80.0	19.5	26.3	100.0	356.9	

✘ The data is the result of measured by the detector in PK and CISPR Average on the Peak graph.

✘ The Average of the test data is the cispr average result.

6.4.5 Remark

Complies with the test requirements.



6.5 Harmonic Current Emissions

6.5.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
net.control Software	net.control	EM TEST	2.1.4	-	-	■
DIGITAL POWER ANALYZER (Harmonic/Flicker)	DPA 500N	EM TEST	V1024106759	2025-03-31	2026-03-31	■
POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-	-	■

6.5.2 Test Location : SHIELD ROOM #7

6.5.3 Test Conditions :

Temperature	Relative Humidity
(23.5 ~ 23.6) °C	(53.4 ~ 53.5) % R.H.

6.5.4 Classification of Equipment for Harmonic Current Emissions

- Limits for Class A equipment
- Limits for Class B equipment
- Limits for Class C equipment(Rated Power > 25 W)
- Limits for Class C equipment(Rated Power ≥ 5 W and ≤ 25 W)
- Limits for Class D equipment

**6.5.5 Test Result**

- Test Date : 2025-08-10
- Test Mode : Mode 1

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.072			
2	0.003	0.193	1.620	n/a
3	0.066	1.922	3.450	PASS
4	0.004	0.586	0.645	n/a
5	0.065	3.819	1.710	PASS
6	0.004	0.838	0.450	n/a
7	0.063	5.429	1.155	PASS
8	0.004	1.082	0.345	n/a
9	0.057	9.573	0.600	PASS
10	0.004	1.286	0.276	n/a
11	0.053	10.692	0.495	PASS
12	0.004	1.551	0.230	n/a
13	0.048	15.235	0.315	PASS
14	0.004	1.777	0.197	n/a
15	0.043	18.917	0.225	PASS
16	0.004	2.055	0.173	n/a
17	0.037	18.767	0.199	PASS
18	0.003	2.268	0.153	n/a
19	0.032	18.125	0.178	PASS
20	0.003	2.528	0.138	n/a
21	0.027	17.093	0.161	PASS
22	0.003	2.713	0.125	n/a
23	0.023	15.565	0.147	PASS
24	0.003	2.923	0.115	n/a
25	0.019	14.224	0.135	PASS
26	0.003	3.077	0.106	n/a
27	0.016	13.068	0.125	PASS
28	0.003	3.271	0.099	n/a
29	0.014	12.316	0.116	PASS
30	0.003	3.394	0.092	n/a
31	0.013	11.932	0.109	PASS
32	0.003	3.505	0.086	n/a
33	0.012	11.913	0.102	PASS
34	0.003	3.580	0.081	n/a
35	0.012	12.445	0.096	PASS
36	0.003	3.615	0.077	n/a
37	0.011	12.458	0.091	PASS
38	0.003	3.622	0.073	n/a
39	0.011	12.650	0.087	PASS
40	0.002	3.585	0.069	n/a

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.



Test Data - Harmonics (continued)

Average harmonic current results				
Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.072			
2	0.002	0.178	1.080	n/a
3	0.065	2.825	2.300	PASS
4	0.002	0.542	0.430	n/a
5	0.065	5.679	1.140	PASS
6	0.002	0.786	0.300	n/a
7	0.062	8.078	0.770	PASS
8	0.002	0.975	0.230	n/a
9	0.057	14.219	0.400	PASS
10	0.002	1.173	0.184	n/a
11	0.053	15.912	0.330	PASS
12	0.002	1.380	0.153	n/a
13	0.048	22.731	0.210	PASS
14	0.002	1.622	0.131	n/a
15	0.042	28.243	0.150	PASS
16	0.002	1.870	0.115	n/a
17	0.037	28.007	0.132	PASS
18	0.002	2.094	0.102	n/a
19	0.032	27.031	0.118	PASS
20	0.002	2.294	0.092	n/a
21	0.027	16.995	0.161	PASS
22	0.002	2.543	0.084	n/a
23	0.023	15.429	0.147	PASS
24	0.002	2.747	0.077	n/a
25	0.019	14.086	0.135	PASS
26	0.002	2.916	0.071	n/a
27	0.016	12.928	0.125	PASS
28	0.002	3.060	0.066	n/a
29	0.014	12.152	0.116	PASS
30	0.002	3.220	0.061	n/a
31	0.013	11.792	0.109	PASS
32	0.002	3.342	0.058	n/a
33	0.012	11.743	0.102	PASS
34	0.002	3.420	0.054	n/a
35	0.012	12.256	0.096	PASS
36	0.002	3.477	0.051	n/a
37	0.011	12.229	0.091	PASS
38	0.002	3.439	0.048	n/a
39	0.011	12.387	0.087	PASS
40	0.002	3.485	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.



6.5.6 Remark

Complies with the test requirements.





6.6 Voltage Fluctuations and Flicker

6.6.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
net.control Software	net.control	EM TEST	2.1.4	-	-	■
DIGITAL POWER ANALYZER (Harmonic/Flicker)	DPA 500N	EM TEST	V1024106759	2025-04-01	2026-04-01	■
POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-	-	■

6.6.2 Test Location : SHIELD ROOM #7

6.6.3 Test Conditions :

Temperature	Relative Humidity
(23.5 ~ 23.8) °C	(53.4 ~ 53.7) % R.H.



6.6.4 Test Result

- Test Date : 2025-08-10
- Test Mode : Mode 1

Flicker Measurements					
	P _{lt}	Max P _{st}	Max D _c	Max D _{max}	Max T _{max}
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

6.6.5 Remark

Complies with the test requirements.



6.7 Electrostatic Discharge

6.7.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #6	-	DYMSTEC	-	-	-	■
ESD SIMULATOR	ESS-2000	NoiseKen	ESS01Z0454	2025-01-21	2026-01-21	■
HCP	-	KES	-	-	-	■
VCP	-	Noise Ken	-	-	-	■

6.7.2 Test Location : SHIELD ROOM #6

6.7.3 Test Conditions :

Temperature	Relative Humidity
Temperature(15 ~ 35) °C	(25.4 ~ 25.5) °C
Relative Humidity(30 ~ 60) % R.H.	(52.4 ~ 52.5) % R.H.
Atmospheric Pressure(86 ~ 106) kPa	(99.2 ~ 99.2) kPa

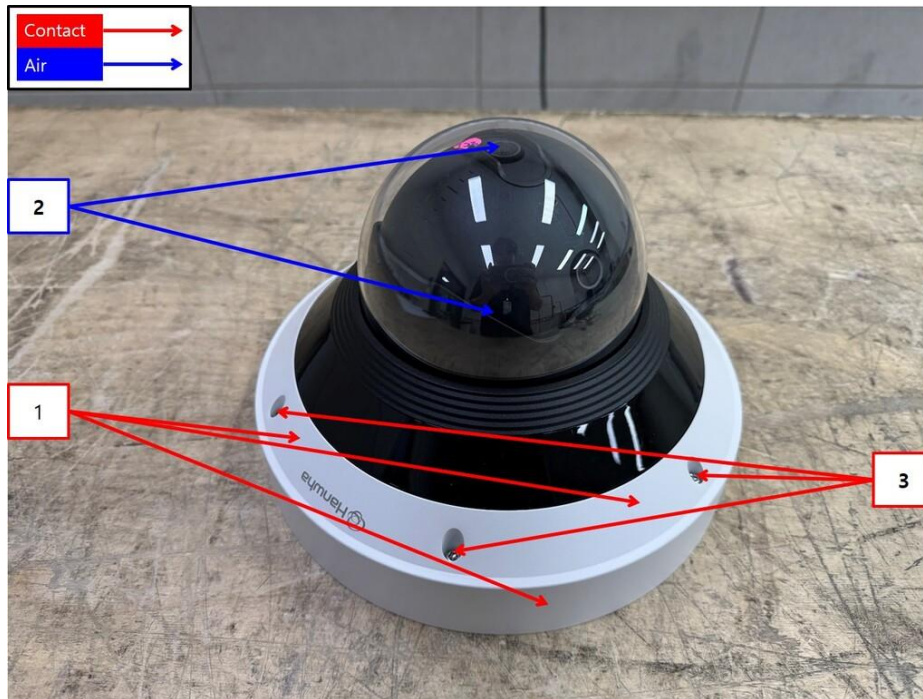
6.7.4 Test Specifications :

Discharge Factor	:	1 s
Discharge Impedance	:	330 Ω / 150 pF
Kind of Discharge	:	Direct Discharge - Contact Discharge, Air Discharge Indirect Discharge - HCP, VCP
Polarity	:	Positive and Negative
Number of Discharge	:	10 at all locations for Contact Discharge, 10 at all locations for Air Discharge
Performance Criteria	:	Complied
Discharge Voltage	:	

Type	Direct Discharge		Indirect Discharge	
	Contact Discharge	Air Discharge	Horizontal Coupling Plane	Vertical Coupling Plane
Test Voltage	-	± 2 kV	-	-
	± 6 kV	± 4 kV	± 6 kV	± 6 kV
	-	± 8 kV	-	-



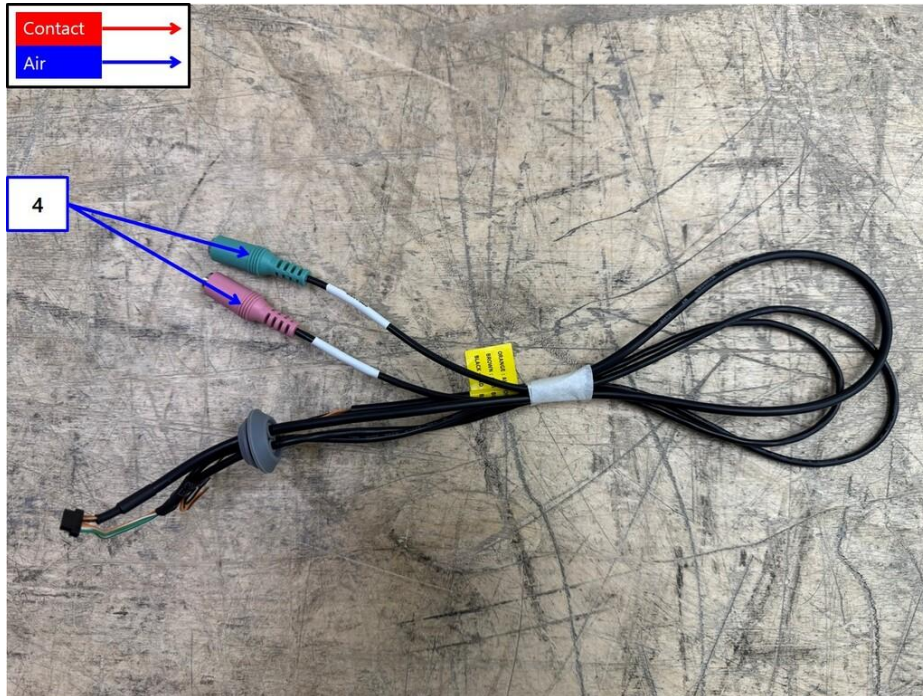
6.7.5 Location of Discharge



<Location of Discharge-1> Mode 1, Mode 2



<Location of Discharge-2> Mode 1, Mode 2



<Location of Discharge-3> Mode 1, Mode 2



6.7.6 Test Result

○ Test Date : 2025-08-08

● Test Mode : Mode 1

○ 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 1	Contact Discharge	Complied	-
2	Enclosure 2	Air Discharge	Complied	-
3	Screw	Contact Discharge	Complied	-
4	3.5 mm Ports	Air Discharge	Complied	-

○ Test Date : 2025-08-08

● Test Mode : Mode 2

○ 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 1	Contact Discharge	Complied	-
2	Enclosure 2	Air Discharge	Complied	-
3	Screw	Contact Discharge	Complied	-
4	3.5 mm Ports	Air Discharge	Complied	-

6.7.7 Remark

No loss of performance of function.

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



6.8 Continuous RF electromagnetic field disturbances

6.8.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SEMI ANECHOIC CHAMBER #3	-	DYMSTEC	-	-	-	■
EMC32 Measurement Software	EMC32	R&S	10.10.02	-	-	■
SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	2025-07-28	2026-07-28	■
HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-	-	■
POWER METER	E4419B	Agilent	GB40203000	2025-02-13	2026-02-13	■
DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H. SYSTEM,INC	781	2025-03-05	2026-03-05	■
AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	2025-02-13	2026-02-13	■
AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	2025-02-13	2026-02-13	■
STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	SCHWARZBEC K	9128ES-121	-	-	■

6.8.2 Test Location : SEMI ANECHOIC CHAMBER #3

6.8.3 Test Conditions :

Temperature	Relative Humidity
(24.3 ~ 24.4) °C	(57.6 ~ 57.7) % R.H.



6.8.4 Test Specifications :

Antenna Polarization	:	Horizontal & Vertical unless indicated otherwise
Antenna Distance	:	3 m
Field Strength	:	10 V/m (rms)
Frequency Range	:	80 MHz ~ 2.7 GHz
Modulation	:	AM 80 %, 1 kHz, Sine wave PM 1 Hz (0.5 s ON : 0.5 s OFF)
Dwell Time	:	3 s
Frequency Step	:	1 %
Application method	:	4
Performance Criteria	:	Complied



6.8.5 Test Result

- Test Date : 2025-08-08
- Test Mode : Mode 1
- Enclosure Port

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

- Test Date : 2025-08-08
- Test Mode : Mode 2
- Enclosure Port

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

6.8.6 Remark

No loss of performance of function.



6.9 Electrical Fast Transients/Bursts

6.9.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
iec.control Software	iec.control	EM TEST	5.4.8	-	-	■
ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	2024-11-06	2025-11-06	■
MOTOR VARIAC	MV 2616	EM TEST	P1552169719	2024-11-07	2025-11-07	■
CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	2024-11-06	2025-11-06	■

6.9.2 Test Location : SHIELD ROOM #7

6.9.3 Test Conditions :

Temperature	Relative Humidity
(25.1 ~ 25.2) °C	(55.8 ~ 55.9) % R.H.

6.9.4 Test Specifications :

Pulse Amplitude & Polarity	: Input a.c power ports ± 2.0 kV Other supply and Signal ports ± 1 kV
Repetition Rate	: 100 kHz
Impulse Rise Time	: 5 ns ± 30 %
Impulse Period	: 50 ns ± 30 %
Burst Duration	: 15 ms ± 20 %
Burst Period	: 300 ms ± 20 %
Duration of Test Voltage	: 1 min
Application Method	: a.c / d.c power ports (Coupling / Decoupling Network) Other than a.c / d.c power poerts (Capacitive Coupling Clamp)
Performance Criteria	: Complied

**6.9.5 Test Result**

○ Test Date : 2025-08-07

● Test Mode : Mode 1

○ Input a.c power ports

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

○ Input d.c power ports

Mode of Application	Observations	
	(+) Burst	(-) Burst
N/A	-	-

○ Signal ports and telecommunication ports

Mode of Application	Observations	
	(+) Burst	(-) Burst
RJ-45(LAN)	Complied	Complied
Alarm IN	Complied	Complied
Alarm OUT	Complied	Complied



○ Test Date : 2025-08-07

● Test Mode : Mode 2

○ Input a.c power ports

Mode of Application	Observations	
	(+) Burst	(-) Burst
N/A	-	-

○ Input d.c power ports

Mode of Application	Observations	
	(+) Burst	(-) Burst
N/A	-	-

○ Signal ports and telecommunication ports

Mode of Application	Observations	
	(+) Burst	(-) Burst
RJ-45(PoE)	Complied	Complied
Alarm IN	Complied	Complied
Alarm OUT	Complied	Complied

6.9.6 Remark

No loss of performance of function.



6.10 Surge

6.10.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
iec.control Software	iec.control	EM TEST	5.4.8	-	-	■
ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	2024-11-07	2025-11-07	■
MOTOR VARIAC	MV 2616	EM TEST	P1552169719	2024-11-07	2025-11-07	■
CDN	CNV 508N1	EM TEST	P1610176296	2024-11-08	2025-11-08	■

6.10.2 Test Location : SHIELD ROOM #7

6.10.3 Test Conditions :

Temperature	Relative Humidity
(23.5 ~ 23.6) °C	(55.8 ~ 55.9) % R.H.

6.10.4 Test Specifications :

Surge	: Input a.c power ports	Line to Line ±0.5 kV, ±1.0 kV
		Line to Ground ±0.5 kV, ±1.0 kV, ±2.0 kV
	Other supply / Signal lines	Line to Ground ±0.5 kV, ±1.0 kV
Input a.c / Other supply / Signal lines		
Open-Circuit Voltage Waveform	: 1.2/50 μs	
Short-Circuit Current Waveform	: 8/20 μs	
Number of Applications	: Apply 5 surges for each polarity	
Phase Angle	: 0° ~ 270° (Input a.c. power port)	
Polarity	: Positive and Negative	
Repetition Rate	: 1 surge per 30 s	
Performance Criteria	: Complied	

**6.10.5 Test Result**

○ Test Date : 2025-08-07

● Test Mode : Mode 1

○ Input a.c power ports

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

○ Signal ports and telecommunication ports

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

○ Test Date : 2025-08-07

● Test Mode : Mode 2

○ Input a.c power ports

Mode of Application	Observations	
	(+) Surge	(-) Surge
N/A	-	-

○ Signal ports and telecommunication ports

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

6.10.6 Remark

No loss of performance of function.



6.11 Continuous Induced RF Disturbances

6.11.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
icd.control Software	icd.control	EM TEST	8.0.0	-	-	■
TEST SYSTEM FOR CONDUCTED AND RADIATED	NSG4070	TESEQ	65585	2024-11-18	2025-11-18	■
ATTENUATOR	ATT 6/80	EM TEST	P1614178148	2024-11-06	2025-11-06	■
CDN	CDN M016	TESEQ	43694	2024-11-07	2025-11-07	■
CDN	CDN M016	TESEQ	43697	2024-11-07	2025-11-07	■
CDN	CDN T8 RJ45	SCHWARZBECK	00103	2025-07-07	2026-07-07	■
EM CLAMP	KEMZ 801A	TESEQ	44099	2024-11-08	2025-11-08	■

6.11.2 Test Location : SHIELD ROOM #7

6.11.3 Test Conditions :

Temperature	Relative Humidity
(23.5 ~ 23.6°)C	(53.4 ~ 53.5) % R.H.

6.11.4 Test Specifications

Frequency range and Voltage Level	: 0.15 MHz ~ 100 MHz : 10 V(r.m.s)
Modulation	: AM 80 %, 1 kHz, Sine wave PM 1 Hz (0.5 s ON : 0.5 s OFF)
Dwell Time	: 3 s
Frequency Step	: 1 %
Performance Criteria	: Complied

**6.11.5 Test Result**

○ Test Date : 2025-08-08

● Test Mode : 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
N/A	-	-

○ Signal ports and telecommunication ports

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

○ Test Date : 2025-08-08

● Test Mode : Mode 2

○ Input a.c power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
N/A	-	-

○ Input d.c power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
N/A	-	-

○ Signal ports and telecommunication ports

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



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6.11.6 Remark

No loss of performance of function.





6.12 Voltage Dips and Interruptions

6.12.1 Test Equipment

Equipment Name	Model Number	Manufacturer	Serial No.	Cal. Date	Next Cal. Date	Used
SHIELD ROOM #7	-	DYMSTEC	-	-	-	■
iec.control Software	iec.control	EM TEST	5.4.8	-	-	■
ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	2024-11-07	2025-11-07	■
MOTOR VARIAC	MV 2616	EM TEST	P1552169719	2024-11-07	2025-11-07	■

6.12.2 Test Location : SHIELD ROOM #7

6.12.3 Test Conditions :

Temperature	Relative Humidity
(25.1 ~ 25.2) °C	(55.8 ~ 55.9) % R.H.

6.12.4 Test Specifications

Instantaneous peak overshoot/undershoot of the actual voltage	: Less than 5 %
Voltage Rise Time, Voltage Fall Time	: Between 1 μs and 5 μs
Test Voltage Frequency Deviation for Voltage Dips	: with in ± 2 %
EUT Voltage	: AC 230 V, 50 Hz
Number of Applications	: 3 cycles
Test Interval	: 10 s
Performance Criteria	: Complied

Voltage Dips and Interruptions	Duration [in period]
20 % Voltage reduction	250 T
30 % Voltage reduction	25 T
60 % Voltage reduction	10 T
100 % Voltage reduction	250 T

Voltage Variations	Supply Voltage
Supply Voltage max (Umax)	Unom a + 10 %
Supply Voltage min (Umin)	Unom a - 15 %



6.12.5 Test Result

- Test Date: 2025-08-07
- Test Mode: Mode 1

○ Voltage Dips and Short Interruptions

Depth	Duration [in period]	Observations
20 % Voltage reduction	250 / 5 000	Complied
30 % Voltage reduction	25 / 500	Complied
60 % Voltage reduction	10 / 200	Complied
100 % Voltage reduction	250 / 5 000	Degradation

○ Voltage variations

Voltage Variations	Supply Voltage	Observations
Supply Voltage max ($U_{\max} = U_{\text{nom}} + 10 \%$)	253 V	Complied
Supply Voltage min ($U_{\min} = U_{\text{nom}} - 15 \%$)	195.5 V	Complied

U_{nom} = Nominal mains voltage, $U_{\max}$ = (Maximum U_{nom}) + 10 %, $U_{\min}$ = (Minimum U_{nom}) – 15 %.

6.12.6 Remark

No loss of performance of function.

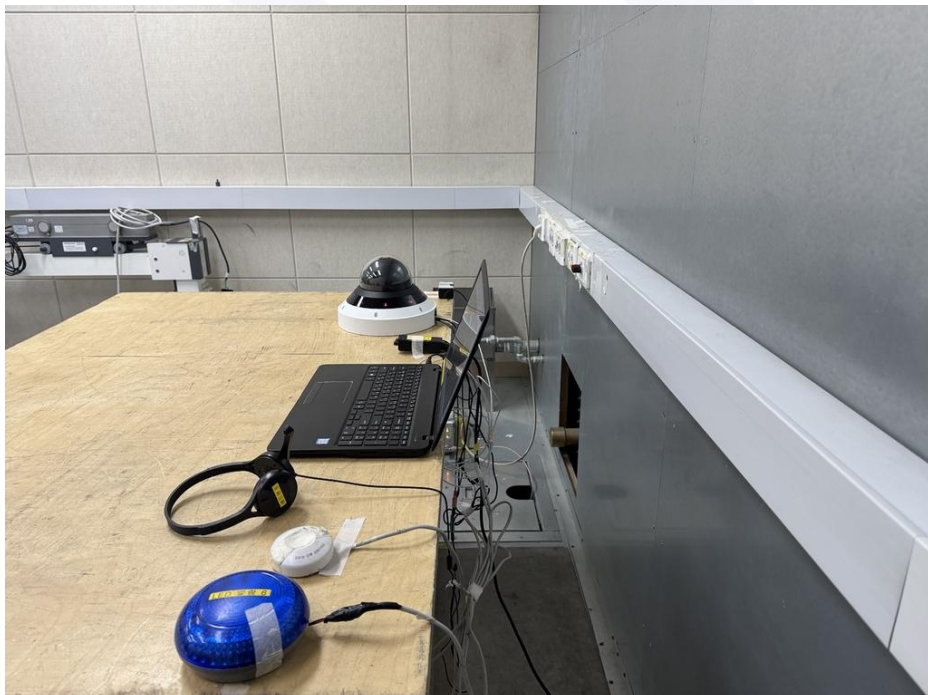


7 Test Setup Photos and EUT Photographs

7.1 Test Setup Photos



<Conducted Emissions at Mains Power Ports - Front> Mode 1



<Conducted Emissions at Mains Power Ports - Rear> Mode 1



<Conducted Emissions at Telecommunication Ports - Front>Mode 1



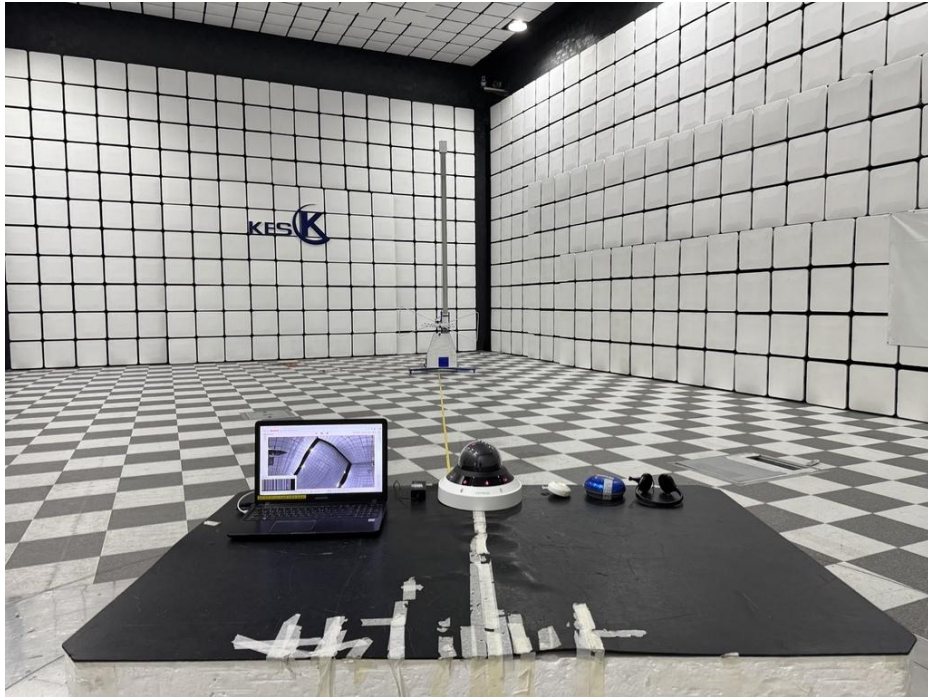
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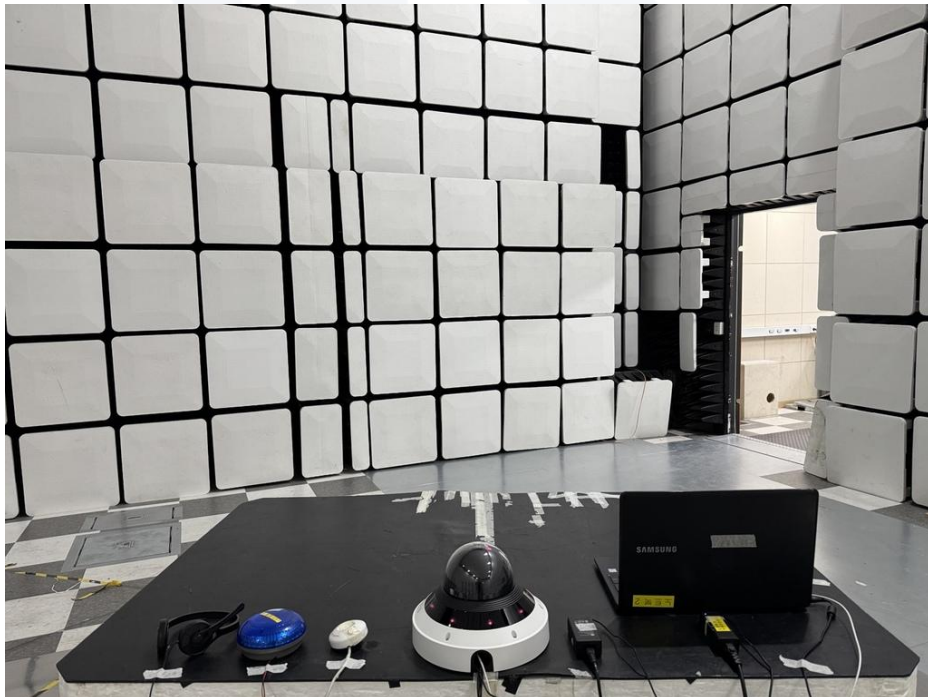
<Conducted Emissions at Telecommunication Ports - Front>Mode 2



<Conducted Emissions at Telecommunication Ports - Rear> Mode 2



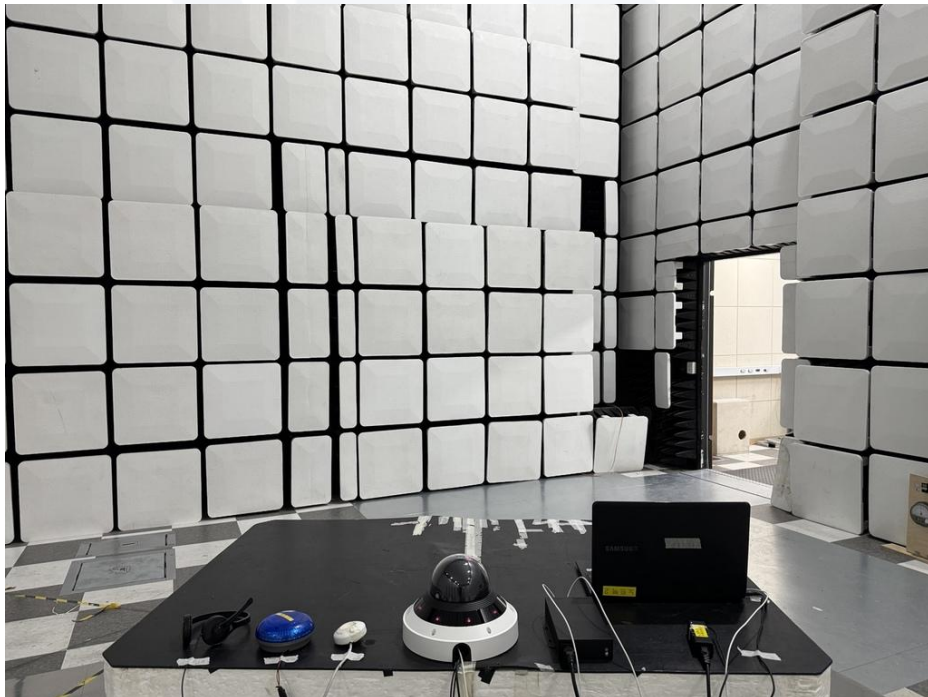
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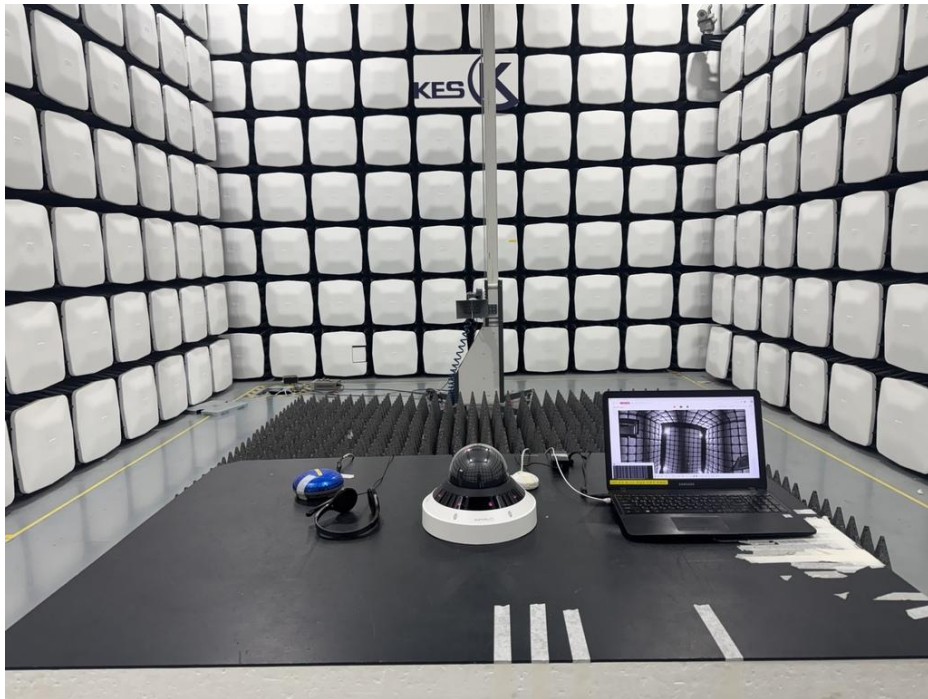
<Radiated Emissions(Below 1 GHz) - Rear> Mode 1



<Radiated Emissions(Below 1 GHz) - Front> Mode 2



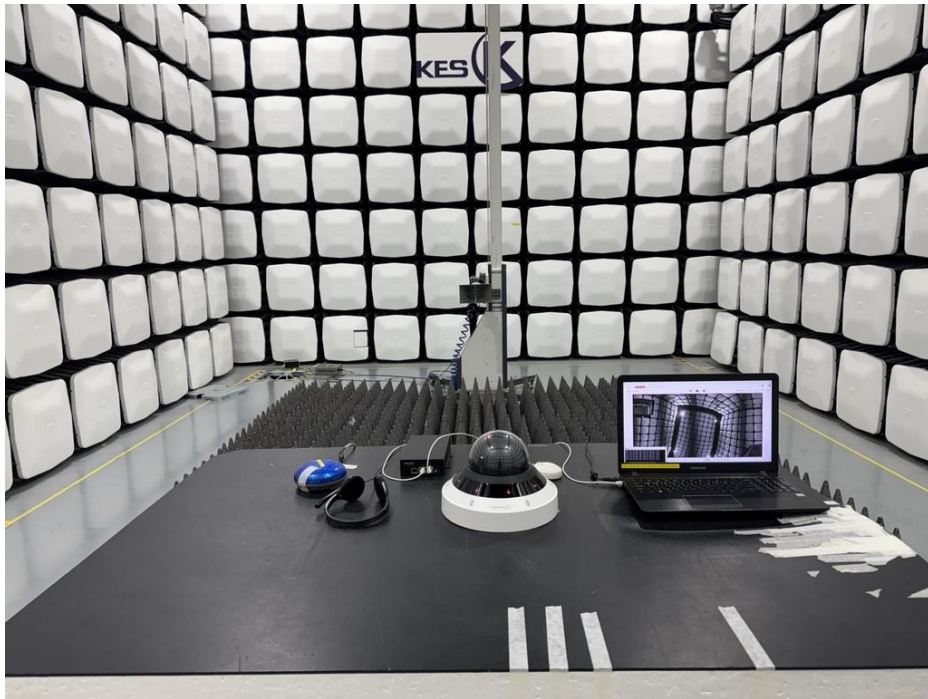
<Radiated Emissions(Below 1 GHz) - Rear> Mode 2



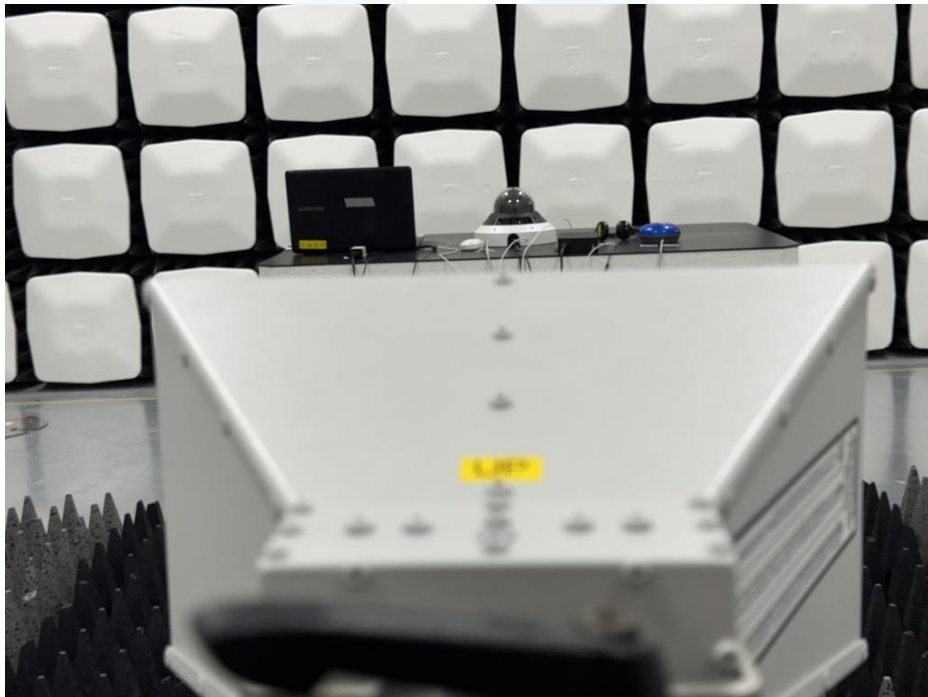
<Radiated Emissions(Above 1 GHz) - Front> Mode 1



<Radiated Emissions(Above 1 GHz) - Rear> Mode 1



<Radiated Emissions(Above 1 GHz) - Front> Mode 2



<Radiated Emissions(Above 1 GHz) - Rear> Mode 2



<Harmonic Current Emissions and Voltage Fluctuations and Flicker> Mode 1



<Electrostatic Discharge> Mode 1



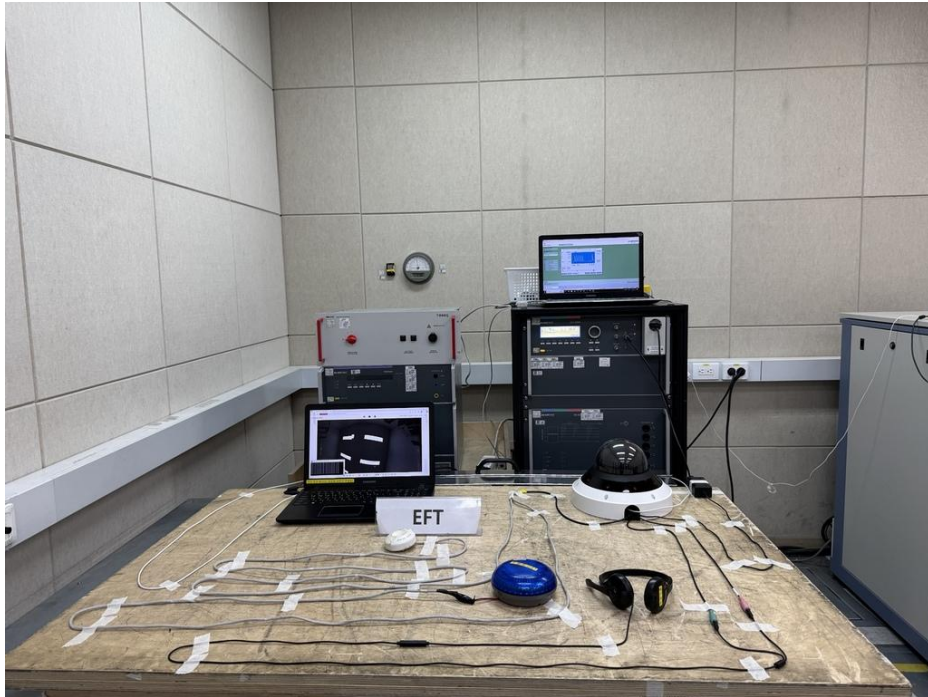
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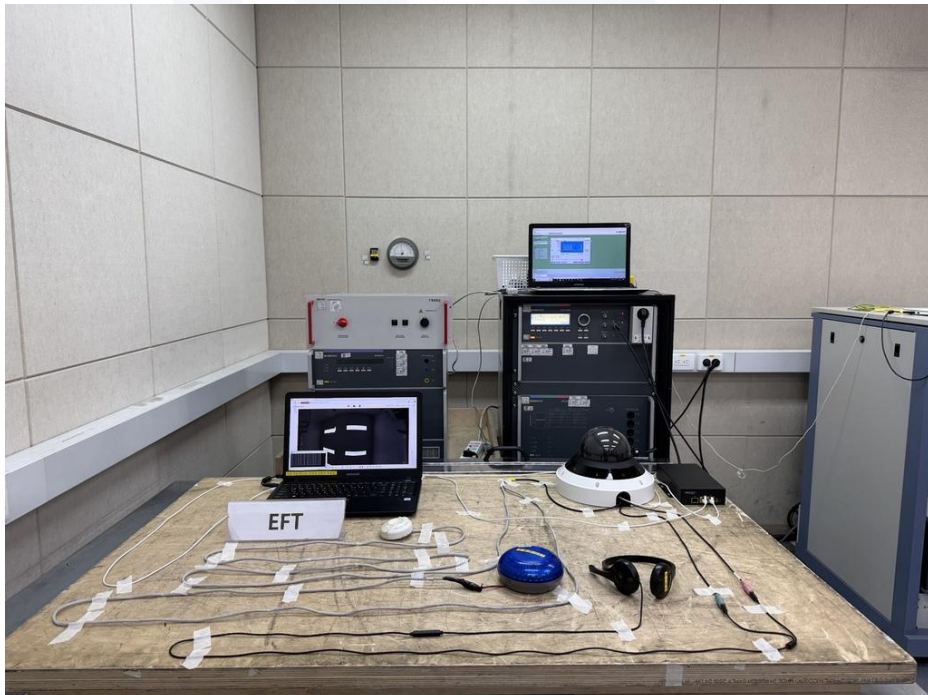
<Continuous RF electromagnetic field disturbances> Mode 1



<Continuous RF electromagnetic field disturbances> Mode 2



<Electrical Fast Transients/Bursts> Mode 1



<Electrical Fast Transients/Bursts> Mode 2



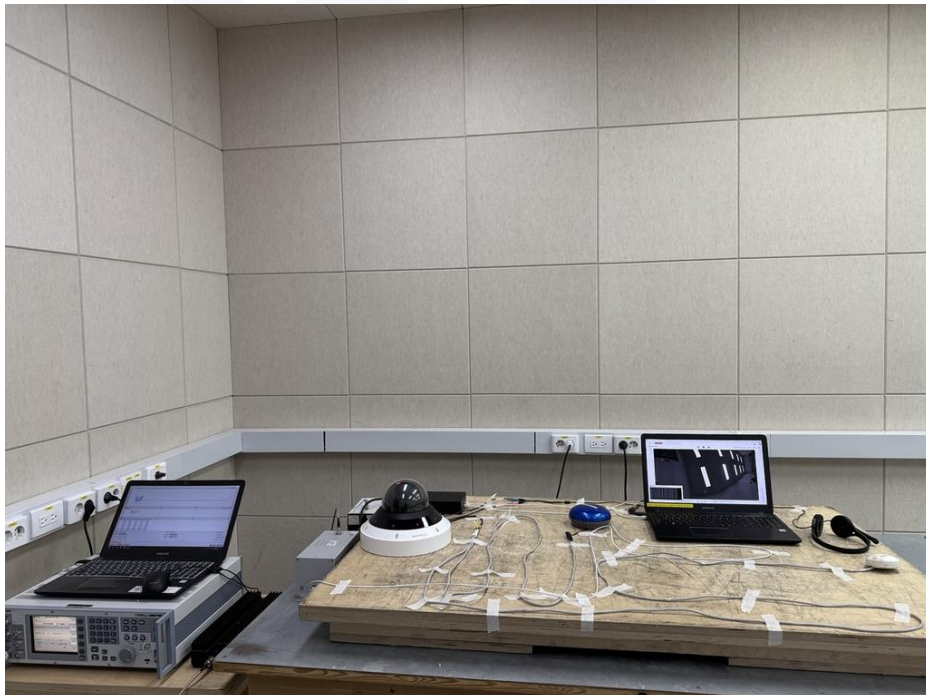
<Surge> Mode 1



<Surge> Mode 2



<Continuous Induced RF Disturbances> Mode 1



<Continuous Induced RF Disturbances> Mode 2



<Voltage Dips and Interruptions> Mode 1



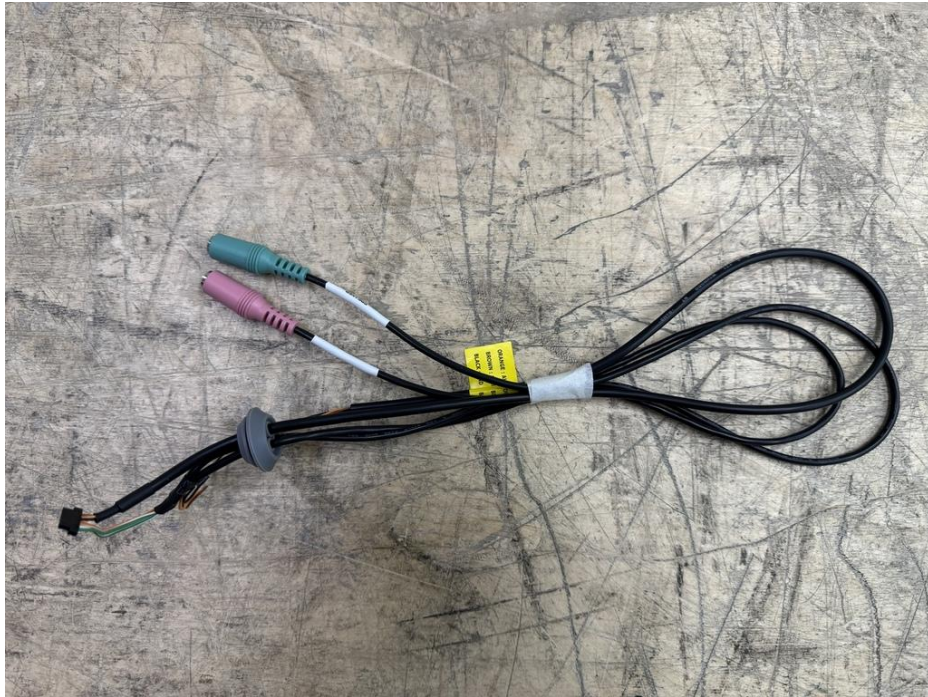
7.2 EUT Photographs



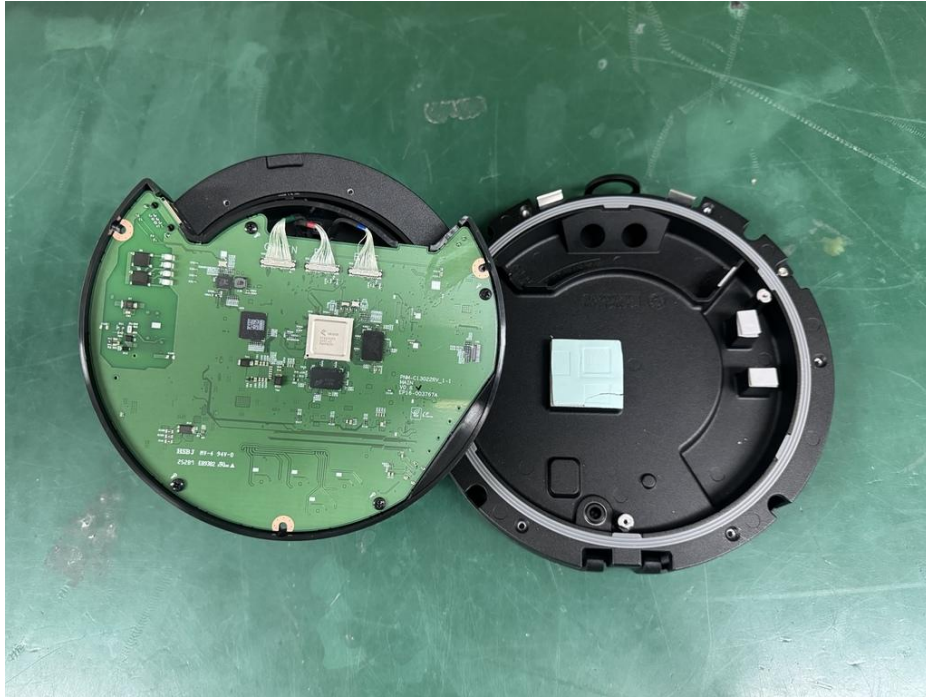
<EUT External Photographs - Top>



<EUT External Photographs - Bottom>



<Components>



<EUT Internal Photographs>



7.3 Label



Name : Hanwha Vision Co., Ltd.
Product item : NETWORK CAMERA
Model name : PNM-A13022RV

The End.

