



TEST REPORT



Report No. : KES-EM244076-R1

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KES Co., Ltd.

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1. Client

Applicant : Hanwha Vision Co., Ltd

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

2. Sample Description

Product name : NETWORK CAMERA

Model/Type No. : PNM-C16000QB

Variant Model : PNM-C20000QB

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 : Feb. 13, 2025

4. Test date : Nov. 25, 2024 ~ Nov. 28, 2024

5. Date of Issue : Feb. 17, 2025

6. Test Results : In Compliance

Tested by

Reviewed by

Dong Yun, Lee
EMC Test Engineer

Dae Jung, Choi
EMC Technical Manager

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

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

KES Co., Ltd.

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



REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Dec. 05, 2024	KES-EM244076	Issued
Feb. 17, 2025	KES-EM244076-R1	Reissuance due to the addition of a derivative

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1.0 General Product Description

Main Specifications of EUT are:

Internal highest operating frequency : 2.133 GHz

Video	
Imaging Device	None
Resolution	2592x1520, 2560x1440, 1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) (2MP) H.265/H.264: Max. 15fps/15fps(60Hz/50Hz) (4MP) MJPEG: Max. 30fps@4MP Max. 5fps
Video Out	HDMI(1920x1080, Single/Quad view), USB-C for installation
Lens	
Optional Lens	SLA-T1080FA, SLA-T2480A, SLA-T2480VA, SLA-T4680A, SLA-T4680VA, SLA-T2880BA (4MP Lenses - will be added as a separate project but the main unit has to be compatible with 4MP resolution lenses)
Operational	
Camera Title	Displayed up to 85 characters
Direction Indicator	None
Day & Night	Auto(Electrical)
Backlight Compensation	BLC, 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	16ea, 4point quadrangle zones - Color: All color - Mosaic
Gain Control	Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC	Support
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2~1/12,000sec)
Digital PTZ	None
Video Rotation	Flip, Mirror, Hallway view(90°/270°)
Analytics	Classified object type: Person/Face/Vehicle/License plate Attributes: Vehicle(Type: car/bus/truck/motorcycle/bicycle), Person (upper and bottom clothing color) Support Bestshot Analytics events based on AI engine Object detection, Virtual line(Crossing/Direction), Virtual area(Loitering/Intrusion/Enter/Exit) Analytics events* Defocus detection, Motion detection, Tampering, Virtual area(Appear/Disappear), Shock detection Some of the video analytics only works with people and vehicle detection
Business Intelligence	Based on AI engine: People counting, Vehicle counting Queue management, Heatmap (Performance will be confirmed during development)
Serial Interface	None
Alarm I/O	4ea selectable
Alarm Triggers	Analytics, Network disconnect, Alarm input, App event, Time schedule, MQTT subscription
Alarm Events	When alarm trigger occurred - File upload(image) : e-mail/FTP - Notification : e-mail - Recording : SD/SDHC/SDXC or NAS recording at event triggers - Alarm output - Handover(PTZ preset, Send message by HTTP/HTTPS/TCP/MQTT) - Audio clip playback
Audio Streaming	None



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Audio In	4 x Selectable (mic in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 25K ohm
Audio Out	Line out, Max. output level: 0.5Vrms
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
Smart Codec	Manual(Sea area), WiseStreamII, WiseStreamIII(Based on AI engine)
Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Quality Level control
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
Streaming	Unicast(20 users) / Multicast Multiple streaming(Up to 12 profiles)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS/StartTLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour, LLDP, CDP, SRTP (TCP, UDP Unicast), MQTT
SIP support (VoIP, Peer-to-peer, SIP/PBX integration)	None
Security	OS / Firmware Protect : Secure boot, Verify firmware forgery, Firmware encryption User authentication : Digest Authentication 12 Network authentication : 802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2) Secure Communication : HTTPS, WSS(Websocket secure) Access Control : IP address filtering Data Protect : Authentication information encryption, ZIP compression encryption Audit : User Access/System/Event log Device ID : Device Certificate(Hanwha Vision Root CA, preinstalled) Secure Storage :
Application Programming Interface	ONVIF Profile S/G/T/M SUNAPI(HTTP API)
Security	
OS / Firmware Protect	Secure boot, Signed firmware, Firmware encryption
User authentication	Digest Authentication,
Network authentication	802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2)
Secure Communication	HTTPS, SRTP, WSS(Websocket secure)
Access Control	IP address filtering
Data Protect	Authentication information encryption, ZIP compression encryption
Audit	User Access/System/Event log
Device ID	Device Certificate(HanwhaVision Root CA, pre-installed)
Secure Storage	TPM 2.0 with FIPS 140-3 level3
General	
Webpage Language	English, Korean, Chinese Simplified, Chinese Traditional, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek.
Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 2slot 2TB(1TB X 2)
Memory	8GB RAM, 16GB eMMC (TBD)
Environmental & Electrical	
Operating Temperature / Humidity	-10°C ~ +45°C(14°F ~ +113°F) / Less than 95% RH(Non condensing)
Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH
Certification	None
Input Voltage	PoE+(IEEE802.3at, Class4), 12VDC
Power Consumption	PoE : Max 25.5W 0.48A DC 12V : Max 23.1W 1.93A
Mechanical	
Color / Material	Black / Plastic, Dicasting
RAL Code	RAL9003
Product Dimensions / Weight	200(W)x37(H)x146(D)mm (7.87x1.46x5.75"), weight : TBD
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
Safety	UL 62368-1, CAN/CSA C22.2 NO. 62368-1 IEC/EN 62471
Environment	IEC/EN 63000 IEC/EN 60529, IEC/EN 62262

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

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1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

☒ AC 230 V, 50 Hz

☒ PoE

1.2 Variant Model Differences

Adding a Simple Variant Model on Customer Request

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	PNM-C16000QB	-	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-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Laptop	P95G001	8KM8HT2	DELL INC.	-
Laptop Adapter	LA65NS2-01	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	-
Micro SD Card	-	-	SanDisk	16 GB
Alarm	PRO-SL	-	SENSOR PRO	-
Button Alarm	-	-	-	-
Headset	K550	-	Britz®	-
Smartphone	-	-	SAMSUNG	-
Monitor	SMT-2232	C95V67VF900025B	Weihai Daewoo Electronics Co., Ltd.	-
Camera1	-	-	-	-
Camera2	-	-	-	-
Camera3	-	-	-	-
Camera4	-	-	-	-



1.6 External I/O Cabling

■ #1

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45(LAN)	Laptop	RJ-45(LAN)	3.1	U
	Alarm OUT	Alarm	Alarm IN	3.5	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	Audio OUT	Headset	Audio IN	1.5	U
	Audio IN		Audio OUT	1.5	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
	HDMI	Monitor	HDMI	1.7	S
	6 Pin(1)	Camera1	6 Pin(1)	5.0	U
	6 Pin(2)	Camera2	6 Pin(2)	5.0	U
	6 Pin(3)	Camera3	6 Pin(3)	5.0	U
	6 Pin(4)	Camera4	6 Pin(4)	5.0	U
	2 Pin (DC Power)	AC/DC Adapter	2 Pin (DC Power)	1.6	U
Laptop	DC Jack	Laptop Adapter	DC Jack	1.3	U
	3.5 mm	Smartphone	3.5 mm	1.0	U

* Unshielded=U, Shielded=S



■ #2

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45(PoE)	PoE Adapter	RJ-45(PoE)	3.1	U
	Alarm OUT	Alarm	Alarm IN	3.5	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	Audio OUT	Headset	Audio IN	1.5	U
	Audio IN		Audio OUT	1.5	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
	HDMI	Monitor	HDMI	1.7	S
	6 Pin(1)	Camera1	6 Pin(1)	5.0	U
	6 Pin(2)	Camera2	6 Pin(2)	5.0	U
	6 Pin(3)	Camera3	6 Pin(3)	5.0	U
	6 Pin(4)	Camera4	6 Pin(4)	5.0	U
Laptop	DC Jack	Laptop Adapter	DC Jack	1.3	U
	3.5 mm	Smartphone	3.5 mm	1.0	U
	RJ-45(LAN)	PoE Adapter	RJ-45(LAN)	1.8	U

* Unshielded=U, Shielded=S



1.7 EUT Operating Mode(s)

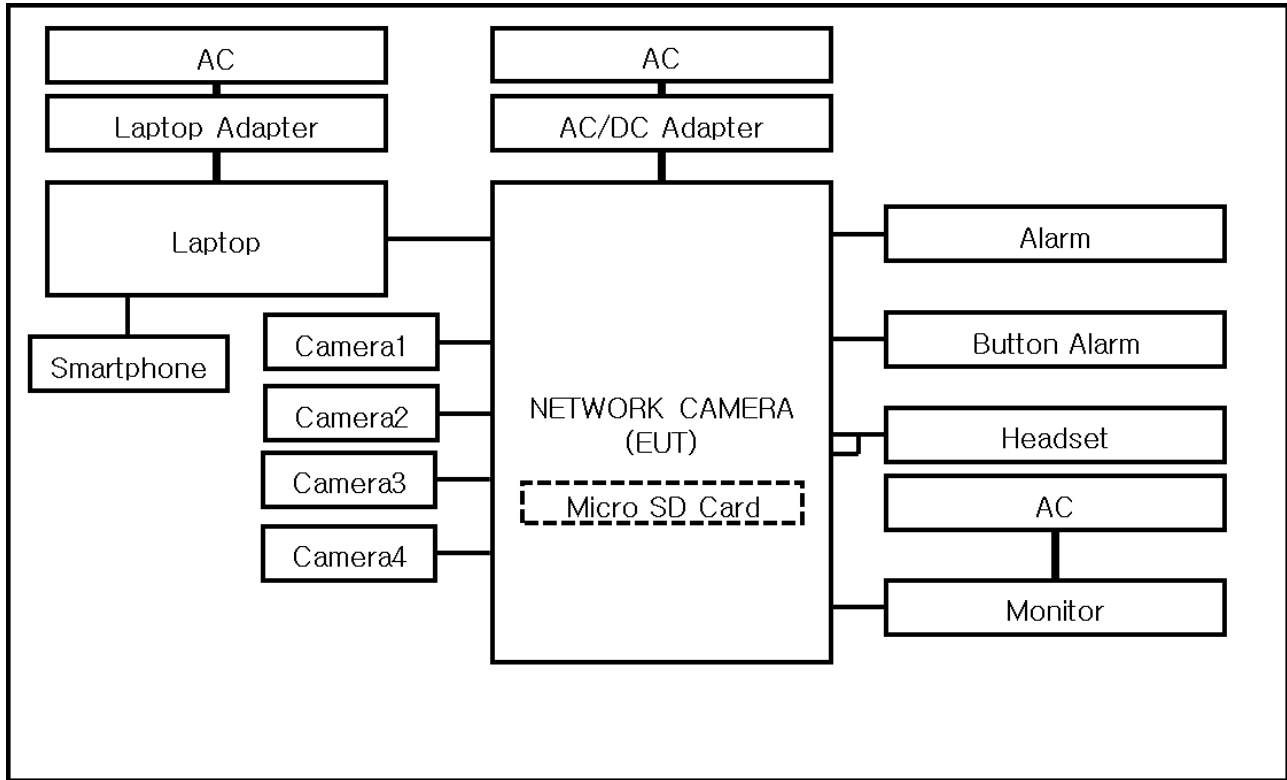
Dision	Mode name	Operating status
#1	AC/DC Adapter	-After connecting the test equipment and DC power supply, 1. Run the web viewer on your laptop and check the camera video output. 2. Check the network status by performing PingTest on your laptop. 3. Press the button alarm to check alarm output 4. Play 1kHz tone on your smartphone and check the output on the headset. 5. Record from laptop and check input with headset microphone 6. After the test, the Micro SD Card saved file was checked.
#2	PoE	- After connecting the test equipment and PoE adapter 1. Run the web viewer on your laptop and check the camera video output. 2. Check the network status by performing PingTest on your laptop. 3. Press the button alarm to check alarm output 4. Play 1kHz tone on your smartphone and check the output on the headset. 5. Record from laptop and check input with headset microphone 6. After the test, the Micro SD Card saved file was checked.

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

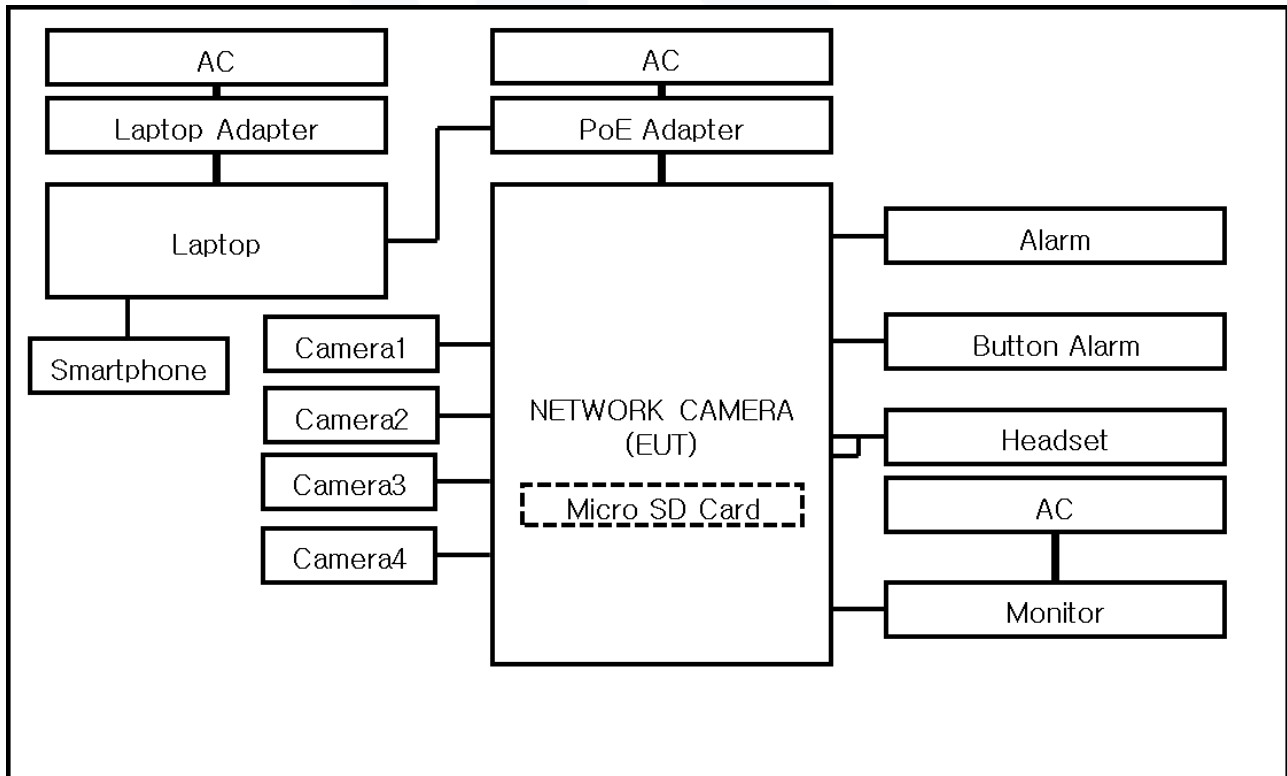


1.8 Configuration

■ #1



■ #2





1.9 Remarks when standards applied

- In PoE mode, the LAN port is regarded as a wired communication network port and power-related ports are not tested.
- USB Type-C port is not tested because it is for administrators.
- port picture for admin



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/A11:2020

☒ 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/A11:2020

☒ 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

Nov. 28, 2024

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test SW	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	11, 06, 2025
☒	LISN	ENV216	R & S	101786	01, 10, 2025
☒	LISN	ESH2-Z5	R & S	100450	11, 06, 2025
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 06, 2025

Test Conditions

Temperature: (22,6 ± 0,1) °C

Relative Humidity: (45,9 ± 0,1) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



2.2 Conducted Emissions at Telecommunication Ports

Test Date

Nov. 28, 2024

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, 10, 2025
☒	LISN	ESH2-Z5	R & S	100450	11, 06, 2025
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 06, 2025
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	11, 12, 2025
☒	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101666	03, 06, 2025

Test Conditions

Temperature: (22,6 ± 0,1) °C

Relative Humidity: (45,9 ± 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

Nov. 26, 2024

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	ESU26	R & S	100551	02, 13, 2025
☒	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, 2025

Test Conditions

Temperature: (22,9 ± 0,2) °C

Relative Humidity: (46,5 ± 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.-The Average of the test data is the cispr average result.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Nov. 27, 2024

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, 2025
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	11, 04, 2025
☒	PREAMPLIFIER	8449B	HP	3008A00538	04, 30, 2025
☒	ATTENUATOR	8491B	HP	23094	02, 13, 2025

Test Conditions

Temperature: (22,7 ± 0,2) °C

Relative Humidity: (46,3 ± 0,2) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

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



2.5 Harmonic Current Emissions

Test Date

Nov. 26, 2024

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, 28, 2025
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (22,2 ± 0,1) °C

Relative Humidity: (46,6 ± 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

Nov. 26, 2024

Test Location

Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test SW	net.control	EM TEST	2.1.4	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	03, 28, 2025
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (22,2 ± 0,3) °C

Relative Humidity: (46,6 ± 0,3) % 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

Nov. 25, 2024

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, 30, 2025
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (22,3 ± 0,1) °C
Relative Humidity: (46,4 ± 0,1) % R.H.
Atmospheric Pressure: (100,5 ± 0,0) kPa

Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

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

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

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

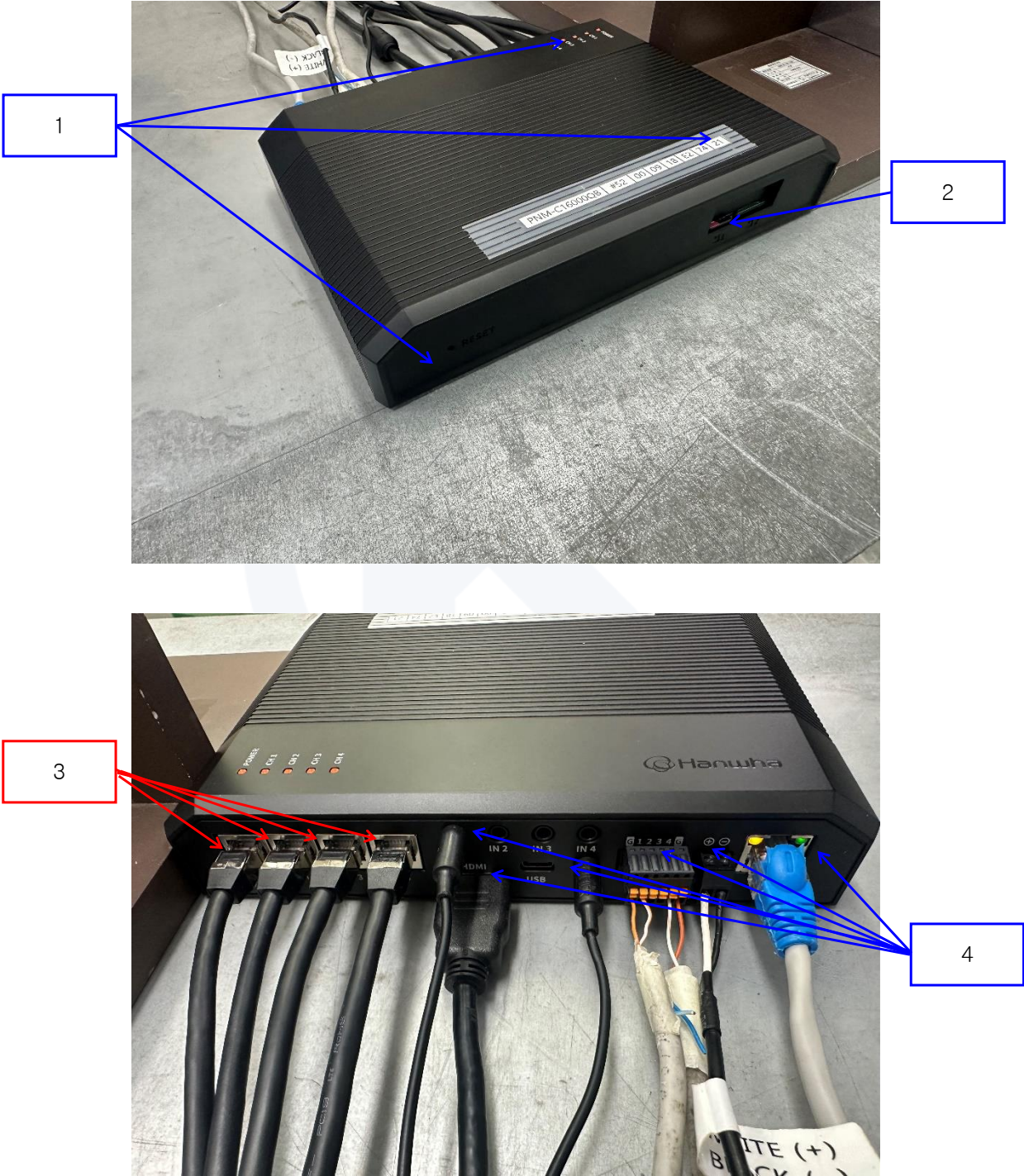
Required Performance Criteria: ☒ Complied



Location of Discharge:



■ #1





■ #2



**Test Data**

■ #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	Air Discharge	Complied	-
2	Around the Port 1	Air Discharge	Complied	-
3	Around the Port 2	Contact Discharge	Complied	-
4	Around the Port 3	Air Discharge	Complied	-

■ #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	Air Discharge	Complied	-
2	Around the Port 1	Air Discharge	Complied	-
3	Around the Port 2	Contact Discharge	Complied	-
4	Around the Port 3	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

Nov. 28, 2024

Test LocationEMS-RS: ☐ SEMI ANECHOIC CHAMBER #2☒ SEMI ANECHOIC CHAMBER #3**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	10.10.02	-
☒	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	07, 29, 2025
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	02, 13, 2025
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	02, 13, 2025
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	02, 13, 2025
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 05, 2025

Test Conditions

Temperature: (22,4 ± 0,4) °C
Relative Humidity: (45,8 ± 0,4) % R.H.
Atmospheric Pressure: (100,4 ± 0,0) 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**

■ #1

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

■ #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

Nov. 26, 2024

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: (22,2 ± 0,1) °C
Relative Humidity: (46,6 ± 0,1) % R.H.
Atmospheric Pressure: (100,0 ± 0,0) 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 kHz ☒ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

**Test Data**

■ #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)
RJ-45(LAN)	Complied	Complied
Alarm OUT	Complied	Complied
Alarm IN	Complied	Complied
6 Pin(1)	Complied	Complied
6 Pin(2)	Complied	Complied
6 Pin(3)	Complied	Complied
6 Pin(4)	Complied	Complied



■ #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)
RJ-45(PoE)	Complied	Complied
Alarm OUT	Complied	Complied
Alarm IN	Complied	Complied
6 Pin(1)	Complied	Complied
6 Pin(2)	Complied	Complied
6 Pin(3)	Complied	Complied
6 Pin(4)	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

Nov. 26, 2024

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
☒	CDN	CNV 508N1	EM TEST	P1610176296	11, 08, 2025

Test Conditions

Temperature: (22,2 ± 0,5) °C
Relative Humidity: (46,6 ± 0,5) % R.H.
Atmospheric Pressure: (100,0 ± 0,0) 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**

■ #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)
RJ-45(LAN)	CDN	Complied	Complied
	LINE	Complied	Complied

■ #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)
RJ-45(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

Nov. 27, 2024

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	7.2.0	-
☒	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 M016	TESEQ	43697	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: (22,5 ± 0,5) °C
Relative Humidity: (46,1 ± 0,5) % R.H.
Atmospheric Pressure: (100,2 ± 0,0) 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**

■ #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
RJ-45(LAN)	CDN	Complied
Alarm OUT	Clamp	Complied
Alarm IN	Clamp	Complied
6 Pin(1)	Clamp	Complied
6 Pin(2)	Clamp	Complied
6 Pin(3)	Clamp	Complied
6 Pin(4)	Clamp	Complied



■ #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
RJ-45(PoE)	CDN	Complied
Alarm OUT	Clamp	Complied
Alarm IN	Clamp	Complied
6 Pin(1)	Clamp	Complied
6 Pin(2)	Clamp	Complied
6 Pin(3)	Clamp	Complied
6 Pin(4)	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

Nov. 26, 2024

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: (22,2 ± 0,1) °C
Relative Humidity: (46,6 ± 0,1) % R.H.
Atmospheric Pressure: (100,0 ± 0,0) kPa

**Test Specifications & Observations/Remarks**

■ #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

RemarksPASS Required Performance Criteria.During the test(100%, 250cycle), EUT was turned off but after the test, it was recovered without operator's intervention.



APPENDIX A – TEST DATA

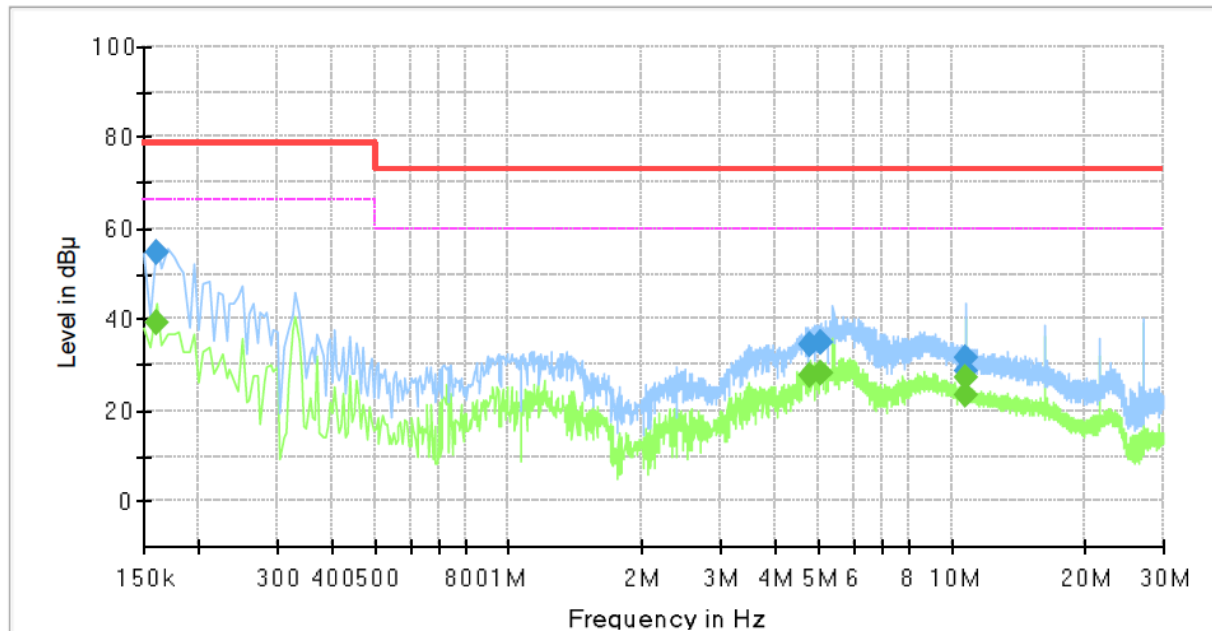
Conducted Emissions at Mains Power Ports

■ #1

[HOT]

Common Information

Test Description: Conducted Emission
Job No.: KES-EM244076
Phase: L
Mode: #1
Operator Name: KES



Final Result

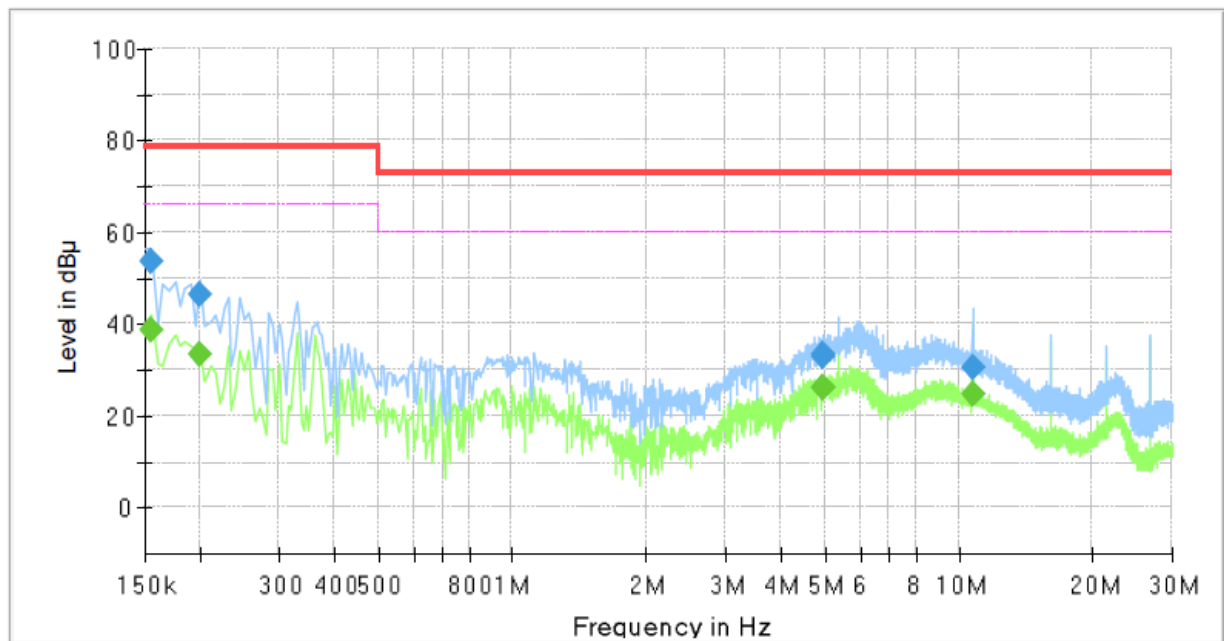
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	39.12	66.00	26.88	1000.0	9.000	L1	19.6
0.160000	54.80	---	79.00	24.20	1000.0	9.000	L1	19.6
4.805000	---	27.61	60.00	32.39	1000.0	9.000	L1	19.9
4.805000	34.20	---	73.00	38.80	1000.0	9.000	L1	19.9
5.045000	---	27.89	60.00	32.11	1000.0	9.000	L1	19.9
5.045000	34.71	---	73.00	38.29	1000.0	9.000	L1	19.9
10.790000	---	27.03	60.00	32.97	1000.0	9.000	L1	20.1
10.790000	31.47	---	73.00	41.53	1000.0	9.000	L1	20.1
10.795000	---	23.38	60.00	36.62	1000.0	9.000	L1	20.1
10.795000	28.82	---	73.00	44.18	1000.0	9.000	L1	20.1



[NEUTRAL]

Common Information

Test Description: Conducted Emission
Job No.: KES-EM244076
Phase: N
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	53.58	---	79.00	25.42	1000.0	9.000	N	19.5
0.155000	---	38.84	66.00	27.16	1000.0	9.000	N	19.5
0.200000	---	33.58	66.00	32.42	1000.0	9.000	N	19.5
0.200000	46.33	---	79.00	32.67	1000.0	9.000	N	19.5
4.960000	---	26.42	60.00	33.58	1000.0	9.000	N	19.9
4.960000	33.06	---	73.00	39.94	1000.0	9.000	N	19.9
4.985000	33.26	---	73.00	39.74	1000.0	9.000	N	19.9
4.985000	---	26.40	60.00	33.60	1000.0	9.000	N	19.9
10.705000	---	24.90	60.00	35.10	1000.0	9.000	N	20.1
10.705000	30.37	---	73.00	42.63	1000.0	9.000	N	20.1

♦ 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))

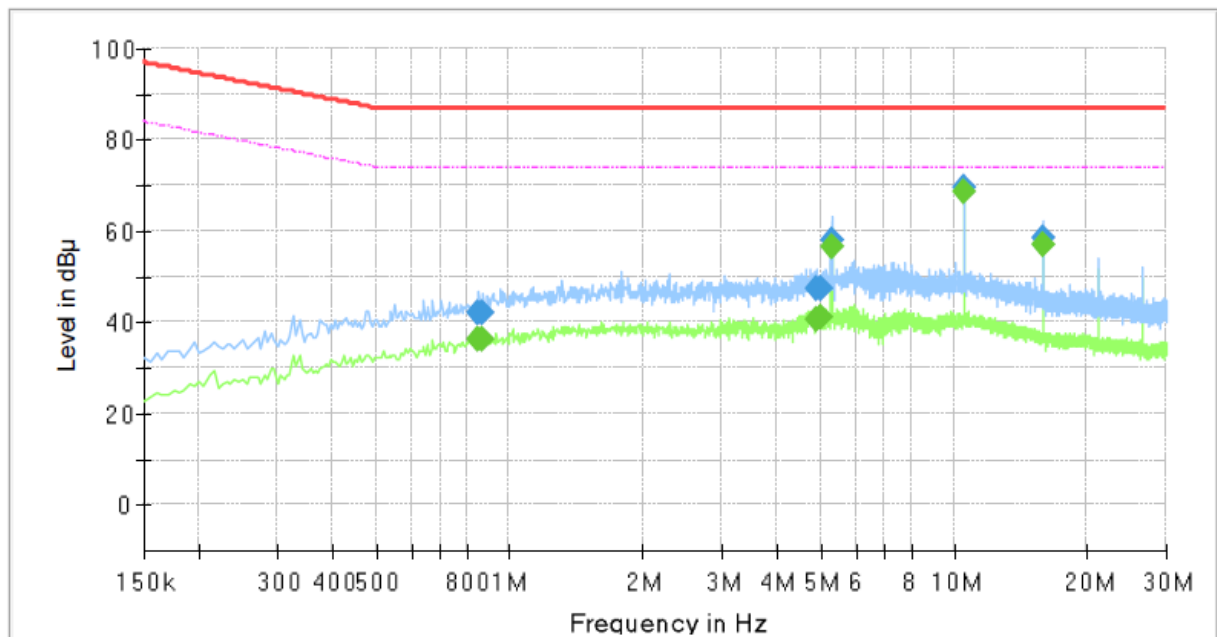
**Conducted Emissions at Telecommunication Ports**

■ #1

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Job No.: KES-EM244076
Mode : #1
Speed : 1000 Mbps
Operator Name: KES

**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.850000	42.16	---	87.00	44.84	1000.0	9.000	Single Line	19.5
0.850000	---	36.45	74.00	37.55	1000.0	9.000	Single Line	19.5
0.870000	42.03	---	87.00	44.97	1000.0	9.000	Single Line	19.5
0.870000	---	36.23	74.00	37.77	1000.0	9.000	Single Line	19.5
4.920000	47.24	---	87.00	39.76	1000.0	9.000	Single Line	19.6
4.920000	---	40.86	74.00	33.14	1000.0	9.000	Single Line	19.6
5.040000	47.21	---	87.00	39.79	1000.0	9.000	Single Line	19.6
5.040000	---	40.91	74.00	33.09	1000.0	9.000	Single Line	19.6
5.285000	57.83	---	87.00	29.17	1000.0	9.000	Single Line	19.6
5.285000	---	56.56	74.00	17.44	1000.0	9.000	Single Line	19.6
10.565000	---	68.79	74.00	5.21	1000.0	9.000	Single Line	19.7
10.565000	69.54	---	87.00	17.46	1000.0	9.000	Single Line	19.7
15.845000	---	57.00	74.00	17.00	1000.0	9.000	Single Line	19.8
15.845000	58.59	---	87.00	28.41	1000.0	9.000	Single Line	19.8

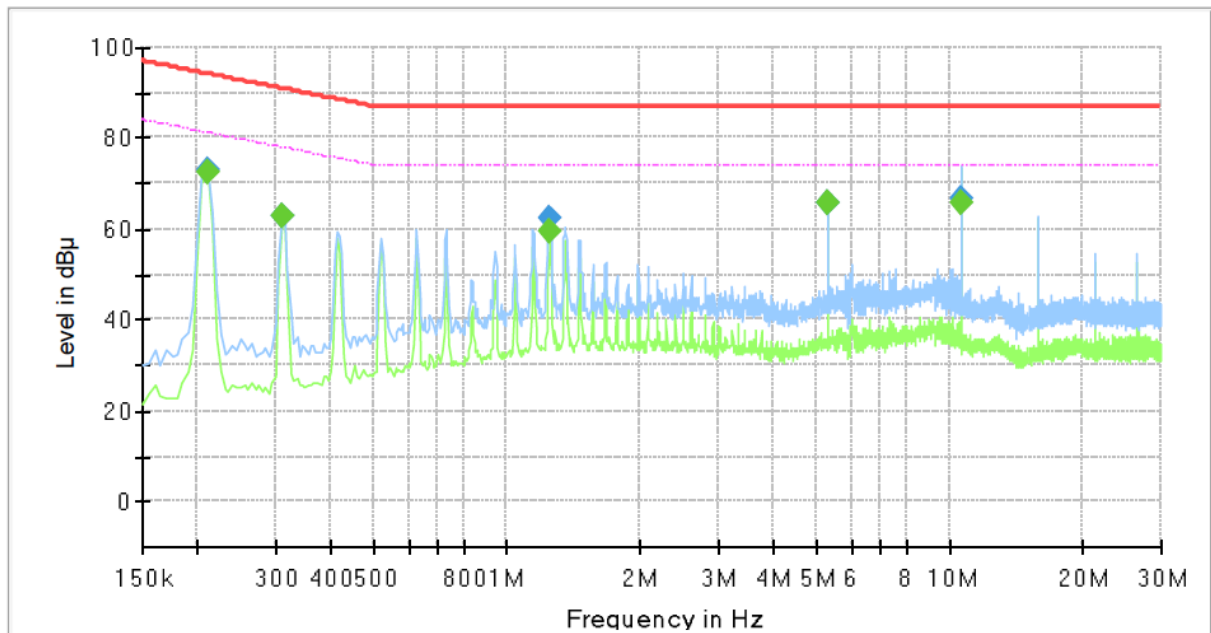


#2

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Job No.: KES-EM244076
Mode : #2
Speed : 1000 Mbps
Operator Name: KES



Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.210000	72.91	---	94.21	21.30	1000.0	9.000	Single Line	19.7
0.210000	---	72.71	81.21	8.50	1000.0	9.000	Single Line	19.7
0.310000	63.00	---	90.97	27.97	1000.0	9.000	Single Line	19.6
0.310000	---	62.77	77.97	15.20	1000.0	9.000	Single Line	19.6
1.250000	62.49	---	87.00	24.51	1000.0	9.000	Single Line	19.5
1.250000	---	59.46	74.00	14.54	1000.0	9.000	Single Line	19.5
5.300000	---	65.75	74.00	8.25	1000.0	9.000	Single Line	19.6
5.300000	65.94	---	87.00	21.06	1000.0	9.000	Single Line	19.6
10.605000	---	65.56	74.00	8.44	1000.0	9.000	Single Line	19.7
10.605000	66.91	---	87.00	20.09	1000.0	9.000	Single Line	19.7

◆ Calculation

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

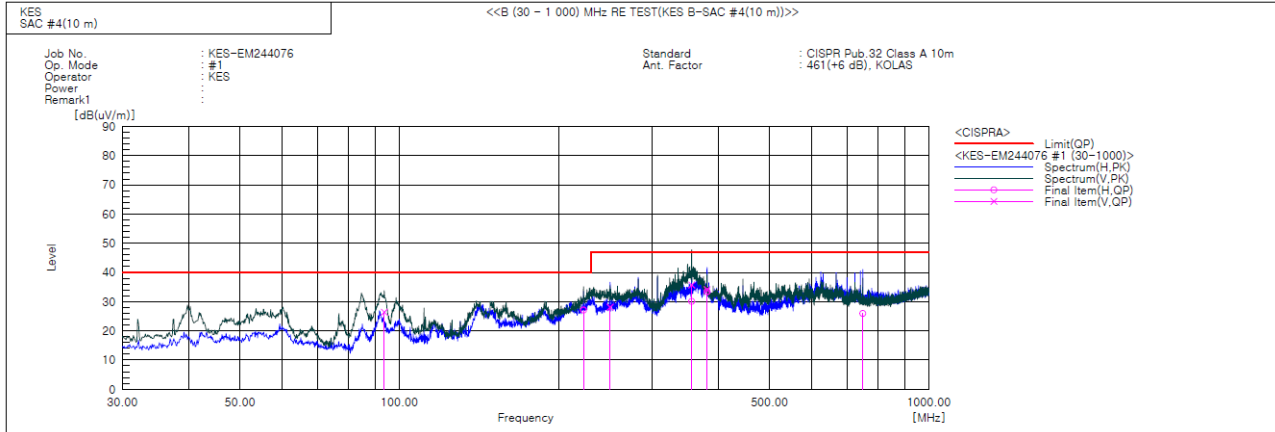
QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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

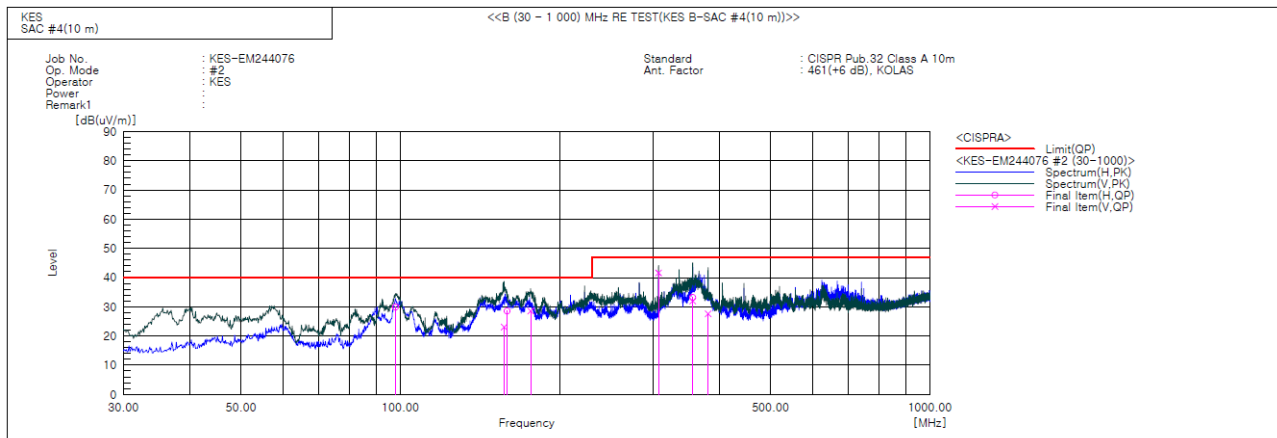
■ #1

**Final Result**

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	93.656	V	52.4	-26.0	26.4	40.0	13.6	104.0	131.0	
2	222.788	H	48.4	-21.3	27.1	40.0	12.9	391.0	53.0	
3	249.948	V	47.7	-19.6	28.1	47.0	18.9	107.0	188.0	
4	356.284	H	45.5	-15.4	30.1	47.0	16.9	397.0	258.0	
5	356.285	V	51.1	-15.4	35.7	47.0	11.3	112.0	229.0	
6	380.896	V	48.7	-14.5	34.2	47.0	12.8	113.0	248.0	
7	380.898	H	47.9	-14.5	33.4	47.0	13.6	390.0	135.0	
8	750.104	H	29.9	-3.9	26.0	47.0	21.0	383.0	1.0	



#2



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	97.900	H	55.2	-25.3	29.9	40.0	10.1	381.0	175.0	
2	156.949	V	42.6	-19.5	23.1	40.0	16.9	118.0	144.0	
3	159.010	H	48.2	-19.6	28.6	40.0	11.4	399.0	130.0	
4	176.106	V	49.2	-20.6	28.6	40.0	11.4	109.0	46.0	
5	307.178	V	58.5	-16.9	41.6	47.0	5.4	112.0	215.0	
6	356.284	V	47.4	-15.4	32.0	47.0	15.0	105.0	226.0	
7	356.405	H	48.6	-15.4	33.2	47.0	13.8	392.0	288.0	
8	380.898	V	42.1	-14.5	27.6	47.0	19.4	110.0	301.0	

◆ Calculation

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

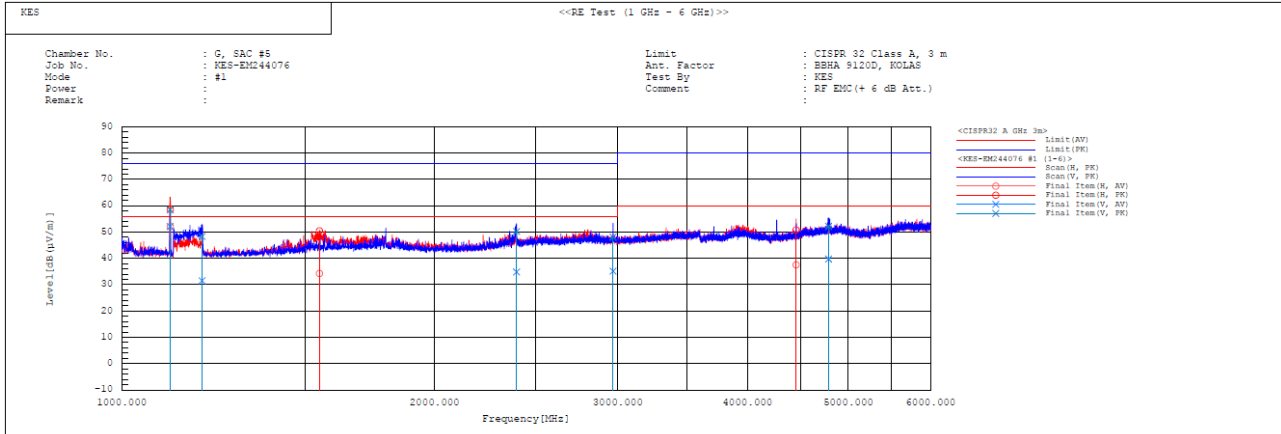
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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

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

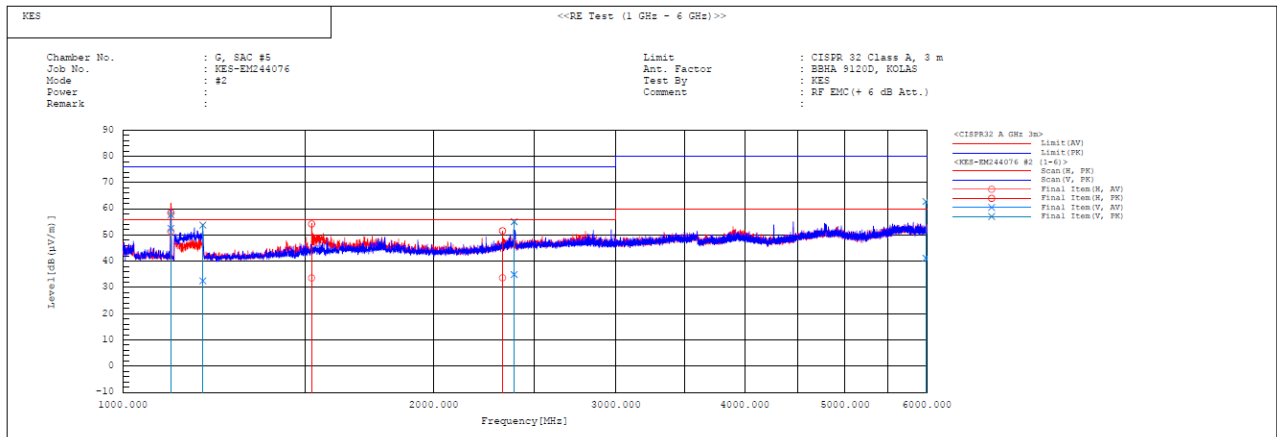
■ #1

**Final Result**

No.	Frequency [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	1113.457	V	53.2	59.6	-1.1	52.1	58.5	56.0	76.0	3.9	17.5	100.0	31.2	
2	1113.631	H	53.2	59.7	-1.1	52.1	58.6	56.0	76.0	3.9	17.4	100.0	37.3	
3	1195.187	V	32.1	48.9	-0.6	31.5	48.3	56.0	76.0	24.5	27.7	100.0	0.0	
4	1549.500	H	33.1	49.3	1.2	34.3	50.5	56.0	76.0	21.7	25.5	100.0	295.4	
5	2398.448	V	30.4	45.8	4.4	34.8	50.2	56.0	76.0	21.2	25.8	100.0	272.4	
6	2969.689	V	28.9	41.9	6.2	35.1	48.1	56.0	76.0	20.9	27.9	100.0	317.9	
7	4454.560	H	27.4	40.7	10.1	37.5	50.8	60.0	80.0	22.5	29.2	100.0	344.2	
8	4787.285	V	28.4	40.9	11.3	39.7	52.2	60.0	80.0	20.3	27.8	100.0	170.2	



#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	1113.242	H	52.5	59.6	-1.1	51.4	58.5	56.0	76.0	4.6	17.5	100.0	329.9	
2	1113.179	V	53.6	58.8	-1.1	52.5	57.7	56.0	76.0	3.5	18.3	100.0	310.6	
3	1195.538	V	33.1	54.4	-0.6	32.5	53.8	56.0	76.0	23.5	22.2	100.0	0.5	
4	1523.279	H	32.5	53.1	1.1	33.6	54.2	56.0	76.0	22.4	21.8	100.0	44.0	
5	2331.308	H	29.5	47.4	4.2	33.7	51.6	56.0	76.0	22.3	24.4	100.0	44.0	
6	2391.667	V	30.5	50.7	4.4	34.9	55.1	56.0	76.0	21.1	20.9	100.0	31.2	
7	5987.339	V	27.0	48.6	14.2	41.2	62.8	60.0	80.0	18.8	17.2	100.0	357.0	

◆ Calculation

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

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

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

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

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

■ #1

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.083			
2	0.002	0.227	1.080	n/a
3	0.076	3.287	2.300	PASS
4	0.003	0.774	0.430	n/a
5	0.074	6.492	1.140	PASS
6	0.003	1.083	0.300	n/a
7	0.071	9.236	0.770	PASS
8	0.003	1.420	0.230	n/a
9	0.064	16.111	0.400	PASS
10	0.003	1.696	0.184	n/a
11	0.058	17.572	0.330	PASS
12	0.003	1.986	0.153	n/a
13	0.052	24.577	0.210	PASS
14	0.003	2.313	0.131	n/a
15	0.045	29.805	0.150	PASS
16	0.003	2.647	0.115	n/a
17	0.038	28.620	0.132	PASS
18	0.003	2.941	0.102	n/a
19	0.032	26.772	0.118	PASS
20	0.003	3.225	0.092	n/a
21	0.026	16.316	0.161	PASS
22	0.003	3.490	0.084	n/a
23	0.021	14.553	0.147	PASS
24	0.003	3.754	0.077	n/a
25	0.018	13.229	0.135	PASS
26	0.003	4.013	0.071	n/a
27	0.016	12.469	0.125	PASS
28	0.003	4.183	0.066	n/a
29	0.015	12.572	0.116	PASS
30	0.003	4.470	0.061	n/a
31	0.014	12.936	0.109	PASS
32	0.003	4.629	0.058	n/a
33	0.014	13.390	0.102	PASS
34	0.003	4.784	0.054	n/a
35	0.013	13.779	0.096	PASS
36	0.003	4.895	0.051	n/a
37	0.012	13.640	0.091	PASS
38	0.002	4.881	0.048	n/a
39	0.011	13.241	0.087	PASS
40	0.002	4.965	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	0.085			
2	0.003	0.169	1.620	n/a
3	0.077	2.244	3.450	PASS
4	0.004	0.567	0.645	n/a
5	0.076	4.428	1.710	PASS
6	0.004	0.802	0.450	n/a
7	0.073	6.299	1.155	PASS
8	0.004	1.032	0.345	n/a
9	0.066	10.973	0.600	PASS
10	0.003	1.239	0.276	n/a
11	0.059	11.946	0.495	PASS
12	0.003	1.460	0.230	n/a
13	0.053	16.675	0.315	PASS
14	0.003	1.698	0.197	n/a
15	0.045	20.171	0.225	PASS
16	0.003	1.972	0.173	n/a
17	0.038	19.329	0.199	PASS
18	0.003	2.189	0.153	n/a
19	0.032	18.040	0.178	PASS
20	0.003	2.389	0.138	n/a
21	0.026	16.468	0.161	PASS
22	0.003	2.585	0.125	n/a
23	0.022	14.733	0.147	PASS
24	0.003	2.762	0.115	n/a
25	0.018	13.436	0.135	PASS
26	0.003	3.003	0.106	n/a
27	0.016	12.748	0.125	PASS
28	0.003	3.114	0.099	n/a
29	0.015	12.966	0.116	PASS
30	0.003	3.334	0.092	n/a
31	0.015	13.454	0.109	PASS
32	0.003	3.453	0.086	n/a
33	0.014	13.919	0.102	PASS
34	0.003	3.557	0.081	n/a
35	0.014	14.272	0.096	PASS
36	0.003	3.666	0.077	n/a
37	0.013	14.144	0.091	PASS
38	0.003	3.620	0.073	n/a
39	0.012	13.671	0.087	PASS
40	0.003	3.702	0.069	n/a

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

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



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Test Data - Voltage Fluctuations

■ #1

Maximum Flicker results

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





Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

■ #1





Conducted Emissions at Telecommunication Ports

■ #1





■ #2





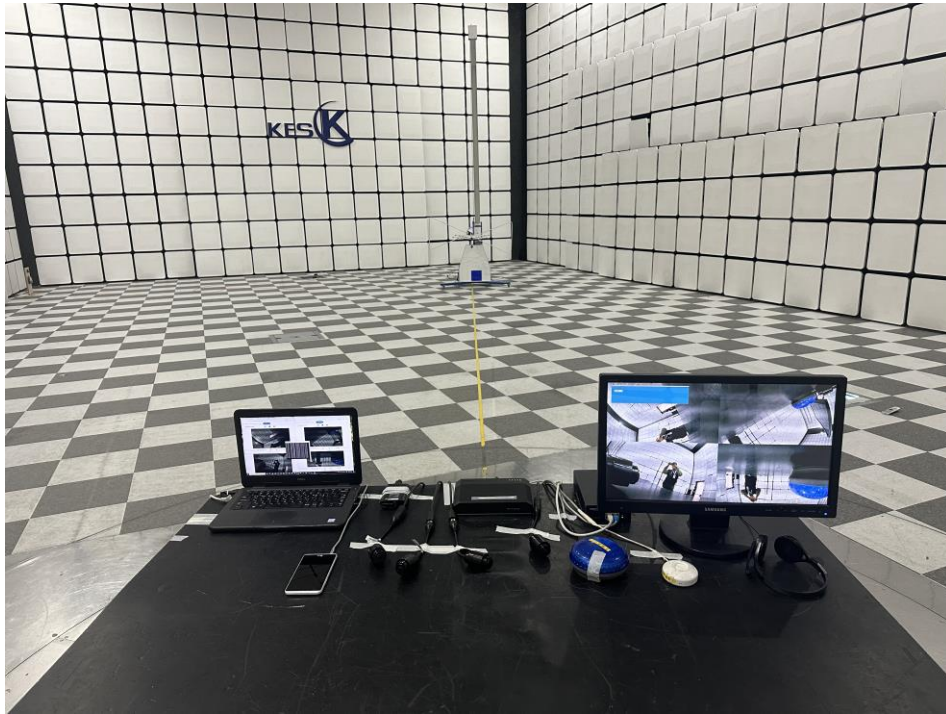
Radiated Electric Field Emissions(Below 1 GHz)

■ #1





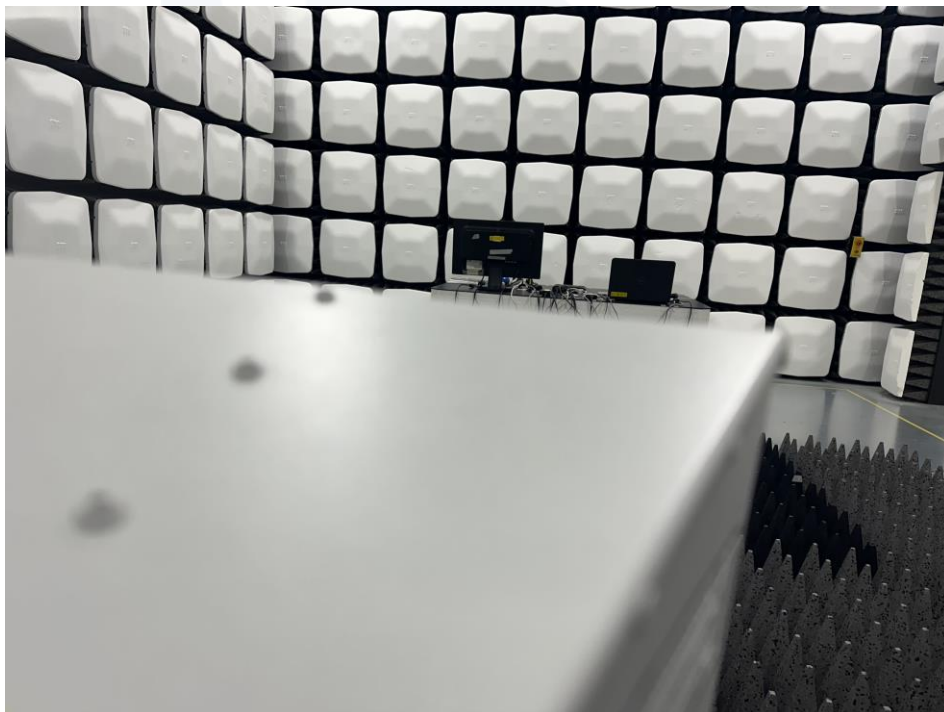
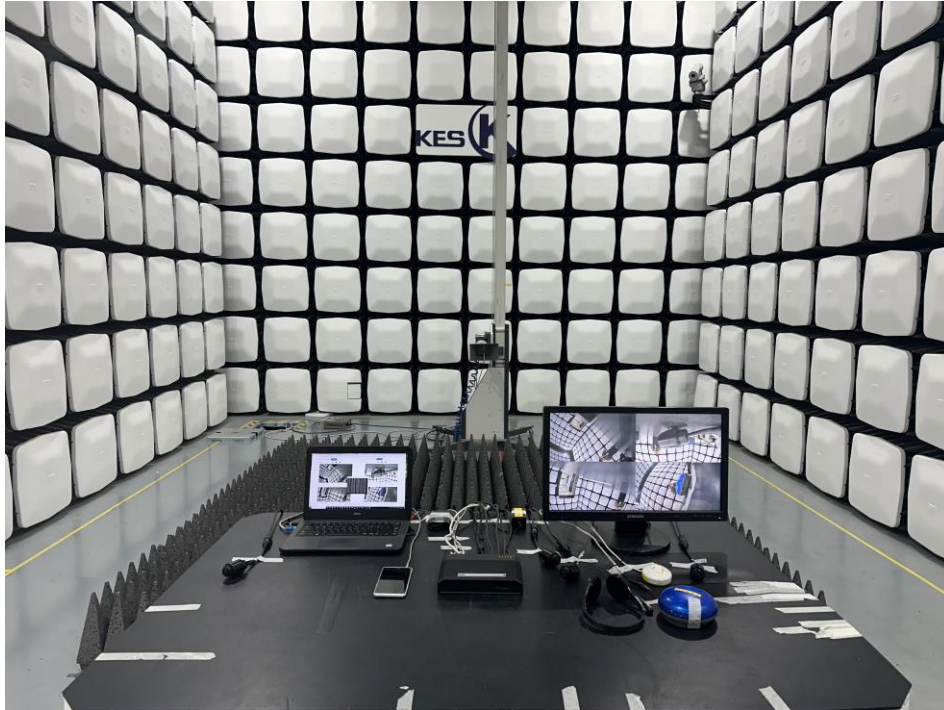
■ #2





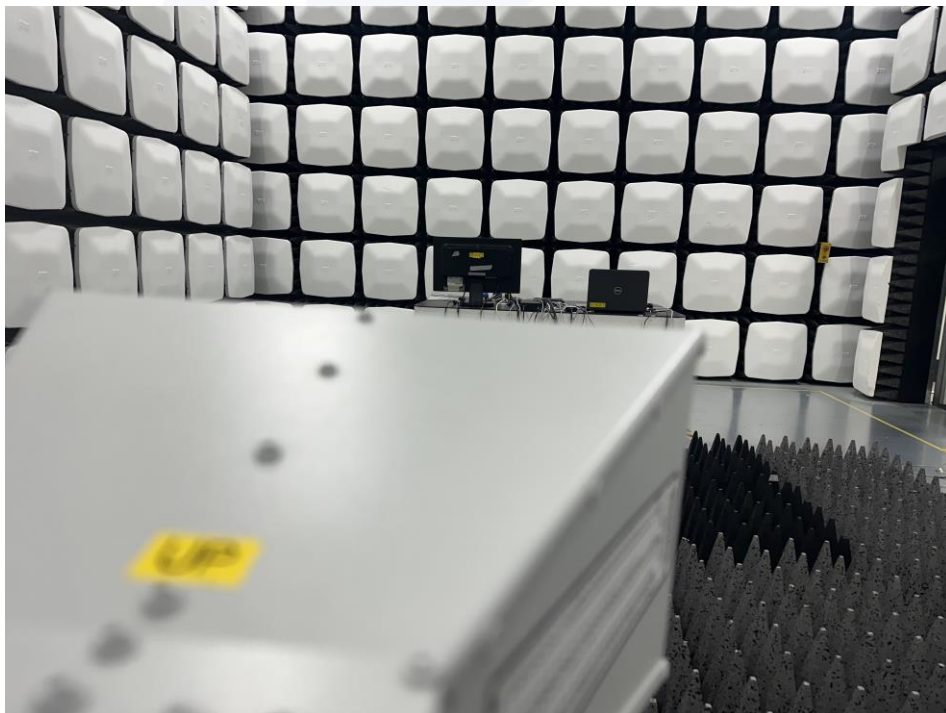
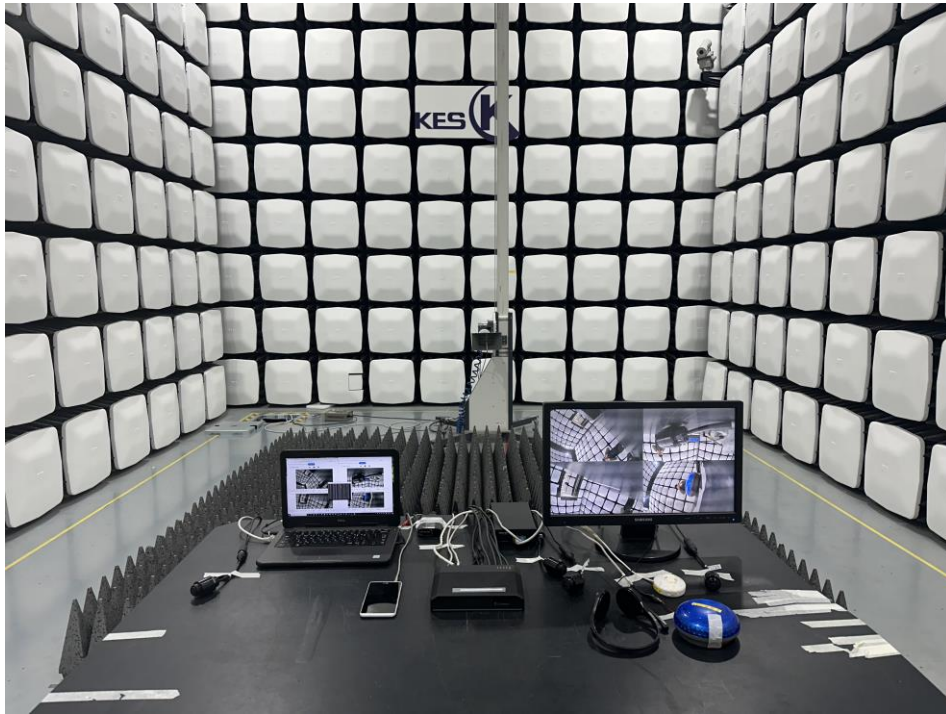
Radiated Electric Field Emissions(Above 1 GHz)

■ #1





■ #2





Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ #1



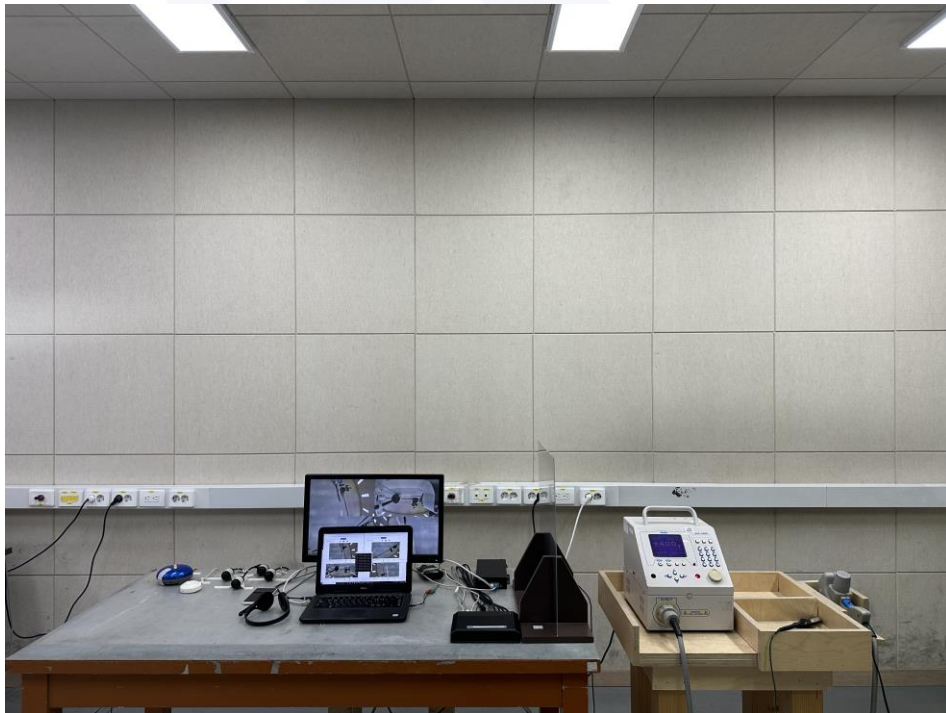


Electrostatic Discharge

■ #1



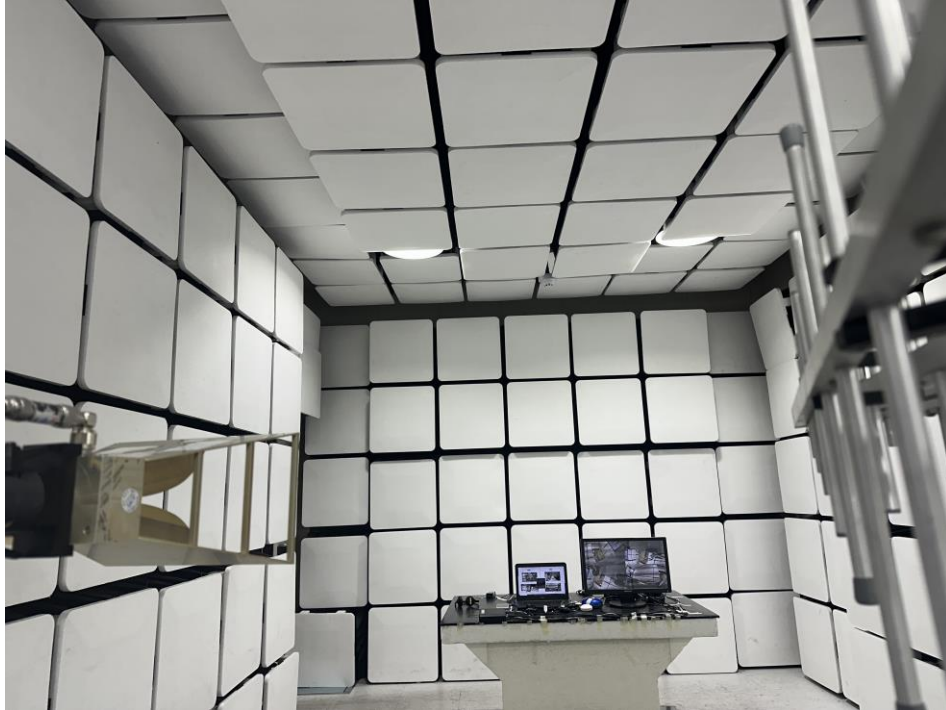
■ #2



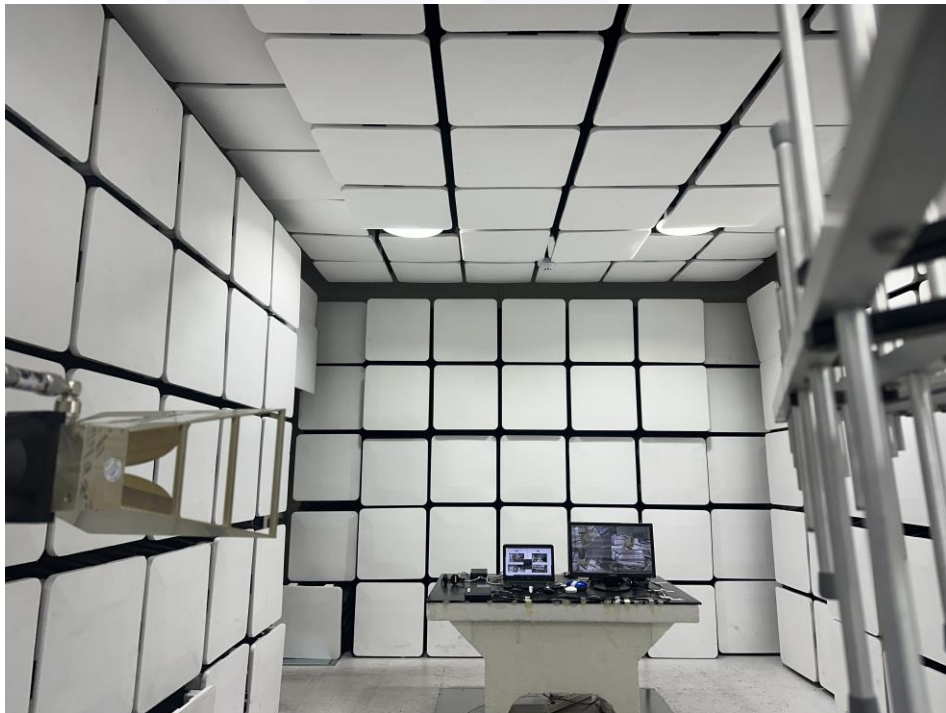


Radiated Electric Field Immunity

■ #1



■ #2





Electrical Fast Transients/Bursts

■ #1



■ #2





Surge Transients

■ #1



■ #2





Conducted Disturbance

■ #1



■ #2





Voltage Dips and Short Interruptions

■ #1





EUT External Photographs

(Top)



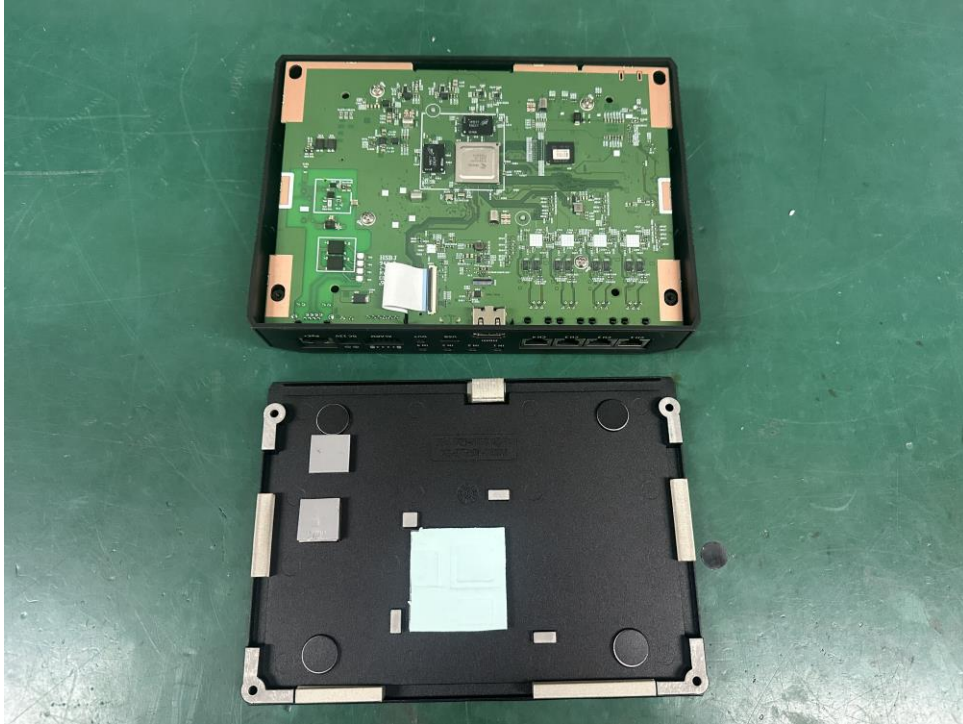
(Bottom)





EUT Internal Photographs

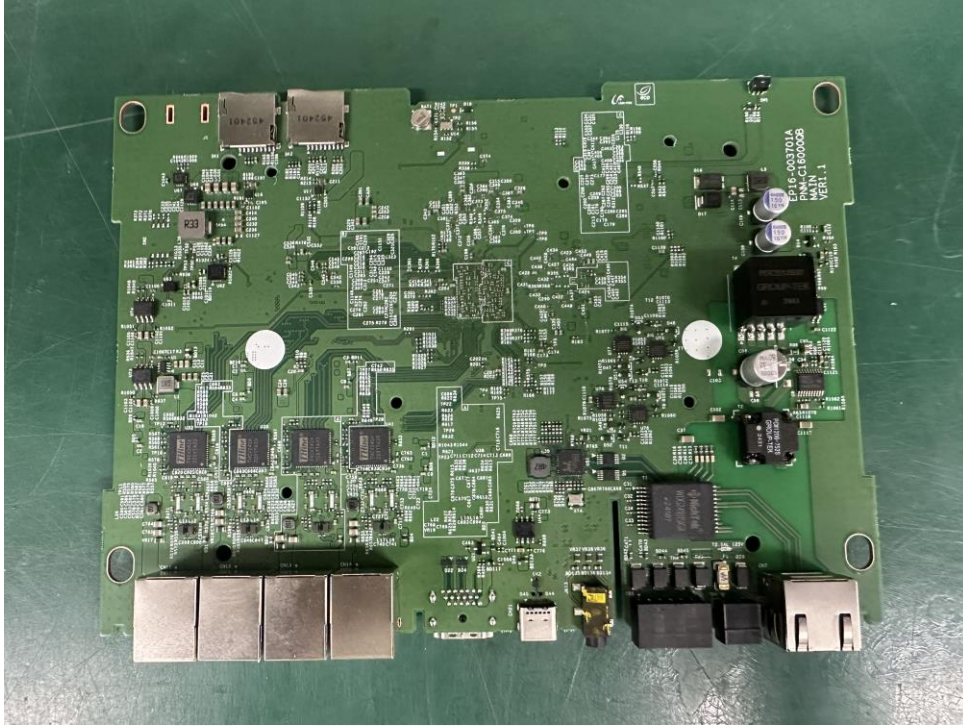
(Internal View)



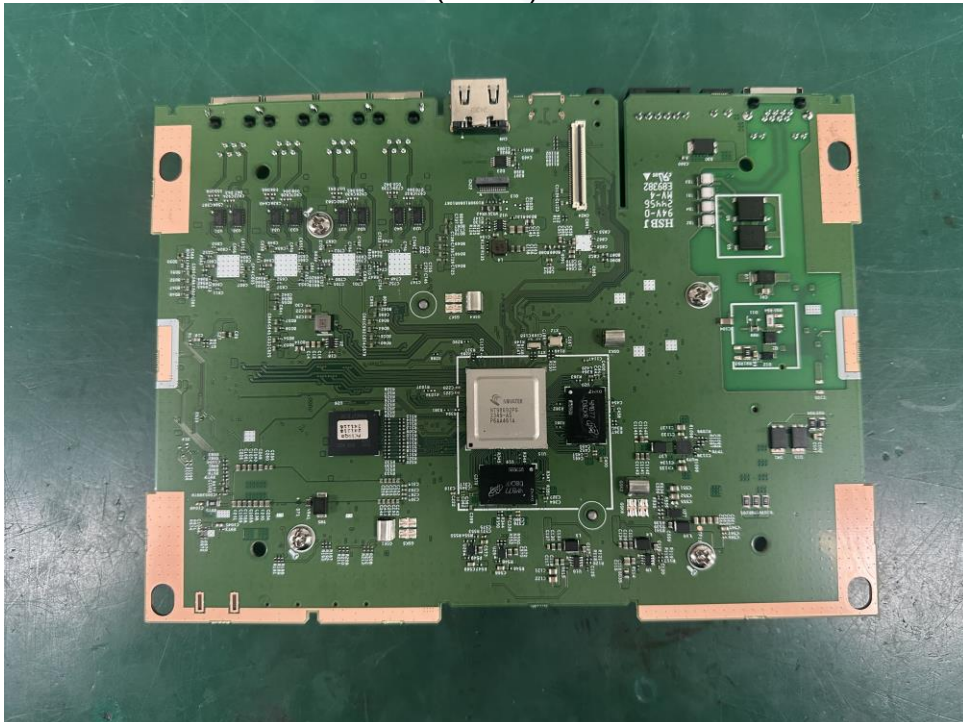


EUT Internal View – Board 1

(Top)



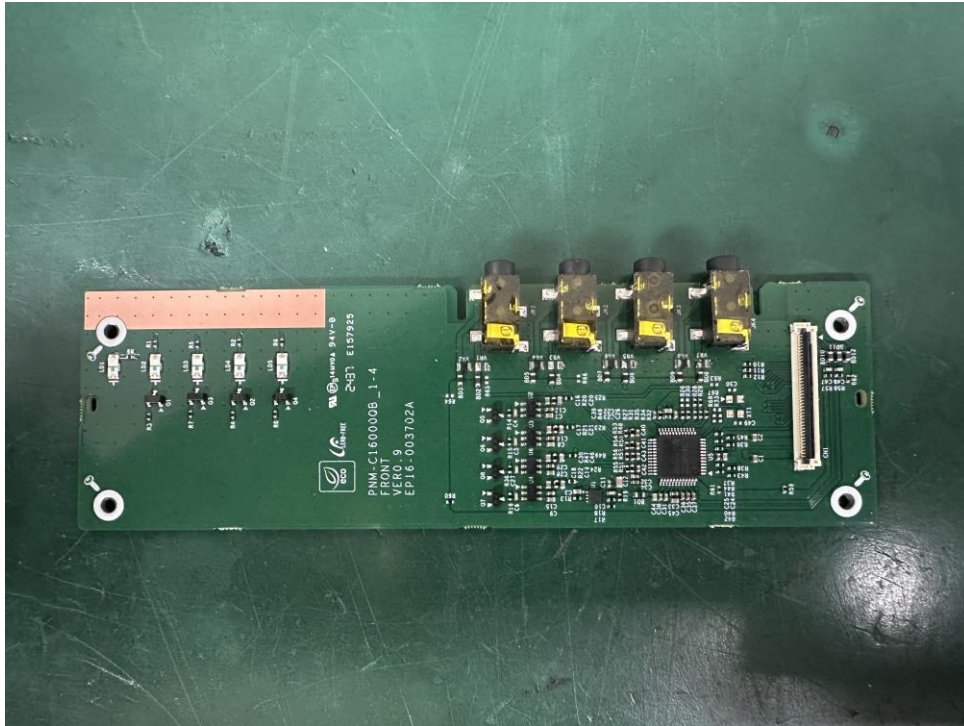
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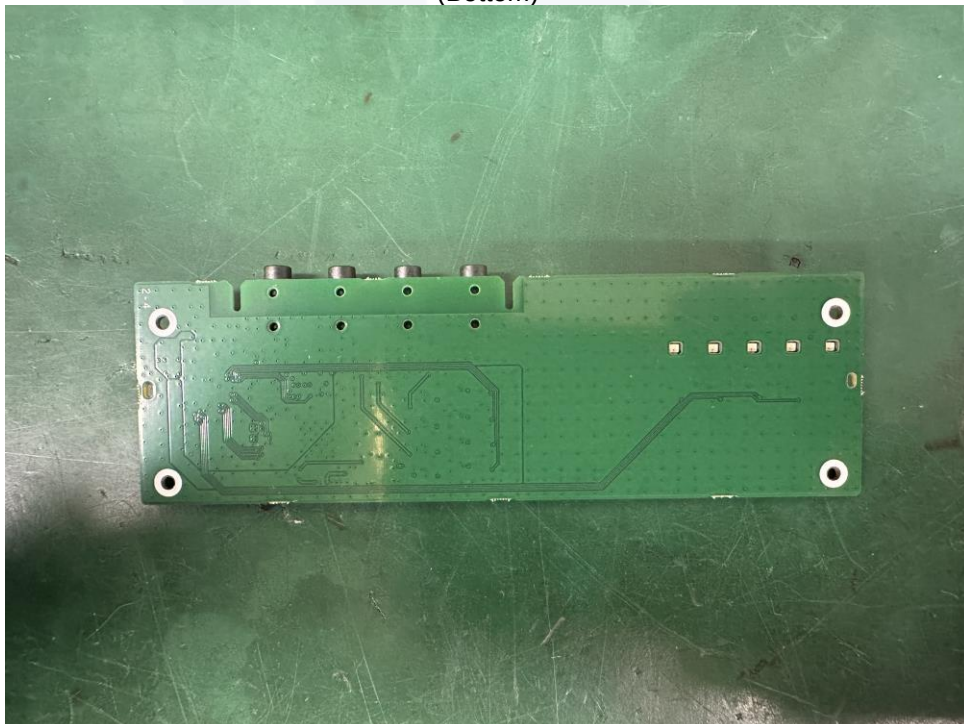


EUT Internal View – Board 2

(Top)

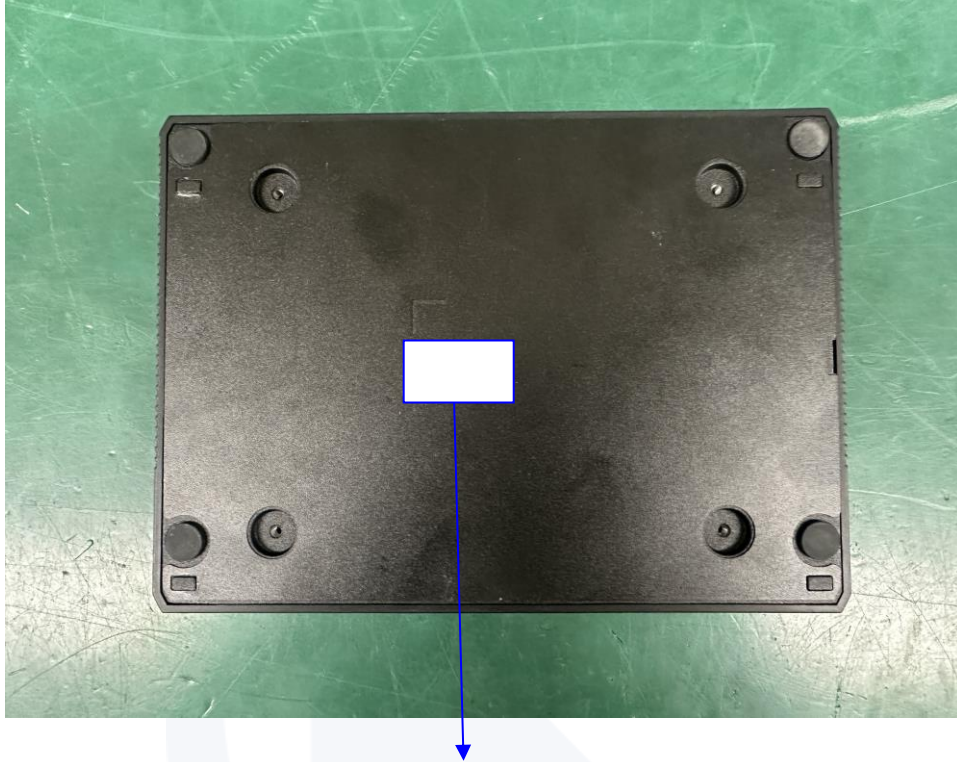


(Bottom)





Label and Location



NETWORK CAMERA

Model No : PNM-C16000QB

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam



The End.