



TEST REPORT



Report No. : KES-EM240487
Page 1 / 65

KES Co., Ltd.
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Dongan-gu, Anyang-si, Gyeonggi-do, 14057,
Republic of Korea
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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 VIDEO RECORDER
Model/Type No. : PRO-7511B4
Variant Model : -
Manufacturer : Dream I System co.,Ltd.
Manufacturer Address : 510.Daerung Post Tower 6. 50-3 Gasan-dong, Geumcheon-gu, Seoul, Korea

3. Date of Receipt : Feb. 02, 2024

4. Test date : Feb. 23, 2024 ~ Feb. 27, 2024

5. Date of Issue : Mar. 21, 2024

6. Test Results : In Compliance

Tested by

Reviewed by

Sung Keun, Park
EMC Test Engineer

Dong Hun, Jang
EMC Technical Manager

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



REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Mar. 21, 2024	KES-EM240487	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Division		Specificity																																																																																																																											
Internal highest clock frequency		3.4 GHz																																																																																																																											
Power	Rated Power	AC (100 ~ 240) V, (50 / 60) Hz																																																																																																																											
	Test Power	AC 230 V, 50 Hz																																																																																																																											
I/O Ports		VGA 1 EA, HDMI 1 EA, DISPLAY 1 EA, RJ-45 4 EA, USB 3.0 4 EA, S/PDIF 1 EA, AUDIO IN 1EA, AUDIO OUT 1EA, MIC IN 1 EA, AC IN 2 EA, HDD Slot 16 EA, USB 2.0 2 EA																																																																																																																											
Components		NETWORK VIEDO RECORDER 1 EA, USB Keyboard 1 EA, USB Mouse 1 EA																																																																																																																											
Other		<table><tr><th colspan="2">Functionality / Performance</th><th>PRO-7511B4</th></tr><tr><td colspan="2">Operating System</td><td>Windows 10 IoT Enterprise LTSC</td></tr><tr><td colspan="2">CMS</td><td>SSM Server preinstalled (v2.15.0)</td></tr><tr><td rowspan="24">Software</td><td rowspan="5">Camera</td><td>Input</td><td>Max. 360CH</td></tr><tr><td>Resolution</td><td>CIF ~ 12MP</td></tr><tr><td>Protocol</td><td>Wisenet, ONVIF Profile-S</td></tr><tr><td>Registration</td><td>Auto Discovery, Manual</td></tr><tr><td>Settings</td><td>Automatic device IP scanning, Add profile edit, Resolution, Fisheye dewarping mode, Halfway View Setup, Brightness/Contrast, Viewing the device settings(Device webpage), Exporting/importing devices settings, Updating the device firmware</td></tr><tr><td rowspan="3">Live</td><td>Monitor Output</td><td>via SSM Workstation</td></tr><tr><td>Display</td><td>via SSM Workstation</td></tr><tr><td>Split Screen</td><td>via SSM Workstation</td></tr><tr><td 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x2)/16GB ECC Memory DDR4 PC-17000 * 2), 최대 64GB까지 확장가능</td></tr><tr><td>OS DISK</td><td>Total 512GB(256 x2) (M.2 SSD (2@256GB)(For OS) _Mirror</td></tr><tr><td>DRIVER TYPE</td><td>SATA 6Gb/s</td></tr><tr><td>HDD</td><td>16Bay 3.5" HDD / 2.5" M.2</td></tr><tr><td>RAID</td><td>Host Raid Controller Onboard Raid 0, 1, 5, 6, 10, 50, 60</td></tr><tr><td>DISPLAY PORT</td><td></td></tr><tr><td>NETWORK</td><td>Gigabit Ethernet RJ-45 (1000 Base-T) x4 (2 ports on board, 2 ports on the Additional NiC)</td></tr><tr><td colspan="2">Electric/Environmental/Mechanical</td><td></td></tr><tr><td rowspan="2">Electric</td><td>AC INPUT</td><td>100 ~ 240VAC, 50 ~ 60Hz</td></tr><tr><td>POWER SUPPLY</td><td>550W (1+1@550W) / Dual</td></tr><tr><td rowspan="2">Environmental</td><td>CURRENT(Max)</td><td>8-4A</td></tr><tr><td>OPERATING</td><td>+5°C to +40°C(+41°F to +104°F) / Less than 80%</td></tr><tr><td rowspan="2">Mechanical</td><td>COLOR/MATERIAL</td><td>Silver/Metal</td></tr><tr><td>FORM FACTOR</td><td>3U, 19" Rackmount</td></tr><tr><td rowspan="2">Warranty</td><td>DIMENSIONS (WxHxD)</td><td></td></tr><tr><td>WEIGHT</td><td></td></tr><tr><td>WARRANTY</td><td>WARRANTY</td><td>3 Years limited warranty</td></tr></table>	Functionality / Performance		PRO-7511B4	Operating System		Windows 10 IoT Enterprise LTSC	CMS		SSM Server preinstalled (v2.15.0)	Software	Camera	Input	Max. 360CH	Resolution	CIF ~ 12MP	Protocol	Wisenet, ONVIF Profile-S	Registration	Auto Discovery, Manual	Settings	Automatic device IP scanning, Add profile edit, Resolution, Fisheye dewarping mode, Halfway View Setup, Brightness/Contrast, Viewing the device settings(Device webpage), Exporting/importing devices settings, Updating the device firmware	Live	Monitor Output	via SSM Workstation	Display	via SSM Workstation	Split Screen	via SSM Workstation	Recording	Bandwidth	Max. 700Mbps	Recording Mode	Normal, Schedule (Continuous / Event), Event (Pre / Post), ARB, Dual-Track	Event Types	Video loss, Camera event(Sensor, MD, Passing, 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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

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK VIDEO RECORDER	PRO-7511B4	-	Dream I System co.,Ltd.	EUT
CPU	Xeon(R) E-2226GE	-	Intel	3.40 GHz
Mainboard	C246M WS	-	ASRock	-
Memory	AD4E2666316G19-BSSC	-	ADATA	16 GB (2 EA)
SSD	IM2S3338	-	ADATA	256 GB (2 EA)
LAN CARD	I350-T2	-	Intel	-
PSU	U1A-D10550-DRB-H	-	Shenzhen Honor Electoric Co.,Ltd.	2 EA
USB Keyboard	SKP-900B	-	Youngmax Technology Industry Co.,LTD.	-
USB Mouse	SKP-900B	-	Youngmax Technology Industry Co.,LTD.	-



1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Monitor #1	SMT-2232	C95V67VF900025B	Weihai Daewoo Electronics Co., Ltd.	-
Monitor #2	SMT-2232	C95V67VF900038B	Weihai Daewoo Electronics Co., Ltd.	-
Monitor #3	HSTND-7041-L	6CM6020YQQ	HP Inc.	-
Serial Mouse	SMB-400	-	-	-
Headset	K550	-	Britz®	-
IP Camera	QNV-6023R	-	Hanwha Vision Co., Ltd	-
PoE Injector	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Speaker	Bar 2.0 CNTR	-	Harman International Industries, Incorporated	-
USB Memory	Mobile C80	-	-	-
HDD	WD3200AAJS	-	WD	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK VIDEO RECORDER (EUT)	HDMI	Monitor #1	HDMI	1.8	S
	VGA	Monitor #2	VGA	1.8	S
	DISPLAY	Monitor #3	DISPLAY	1.8	S
	RJ-45 #1	External Network	RJ-45	4.0	U
	RJ-45 #2	PoE Injector	RJ-45(LAN)	4.0	U
	MIC IN	Headset	3.5 mm	1.8	U
	AUDIO OUT		3.5 mm	1.8	U
	Serial	Serial Mouse	Serial	1.6	U
	USB 3.0	USB Memory	USB	-	-
	USB 2.0 #1	USB Mouse (EUT)	USB	1.5	U
	USB 2.0 #2	USB Keyboard (EUT)	USB	1.5	U
	S/PDIF	Speaker	S/PDIF	2.0	U
	HDD Slot	HDD	SATA	-	-
PoE Injector	RJ-45(PoE)	IP Camera	RJ-45	2.0	U

* Unshielded=U, Shielded=S

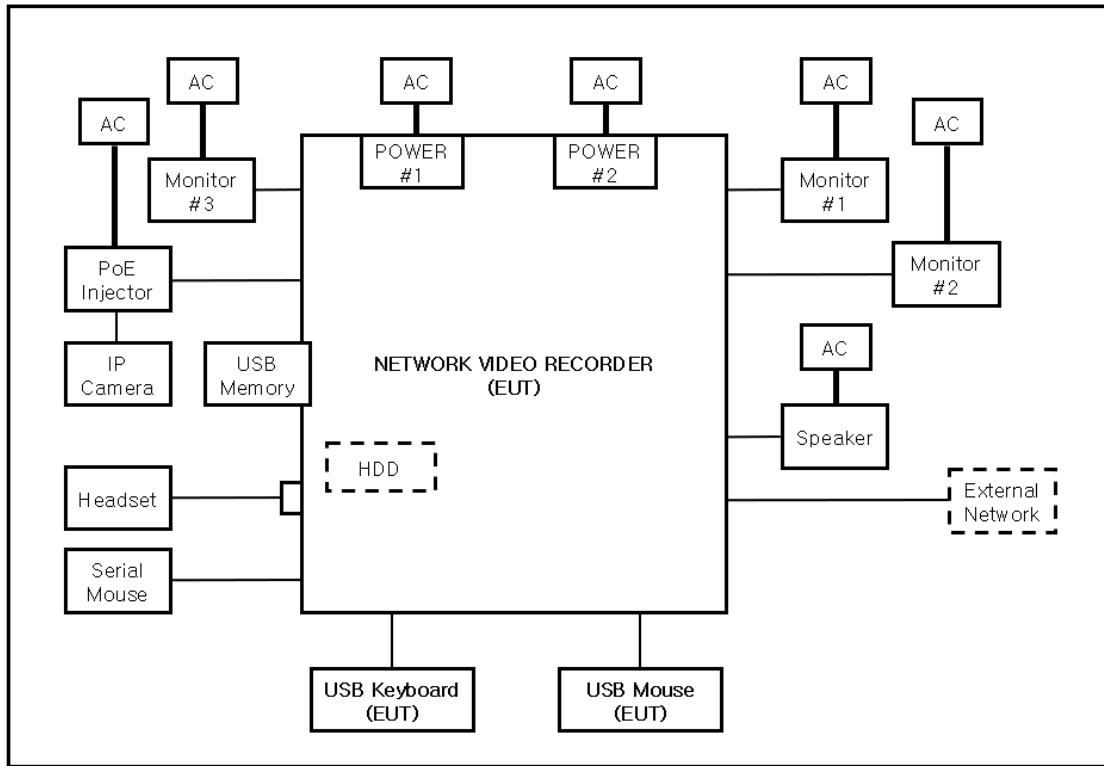
1.7 EUT Operating Mode(s)

Test mode	operating
Operating	1. After playing a color bar video containing 1 kHz tone Sound, check normal output on the monitor, speaker, and headset. 2. Ping Test Mode (External Network, IP Camera) 3. Check the operating status of connected memories by continuously reading/writing data files. 4. After running the provided program, checked the camera video output and the operating status of the EUT.

EUT Test operating S/W		
Name	Version	Manufacture Company
WISENET SSM	2.15.00	Hanwha Vision Co., Ltd
WebPAM ProE	-	PROMISE TECHNOLOGY



1.8 Configuration



**1.9 Remarks when standards applied**

N/A

1.10 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

1.11 Test Facility

The measurement facility is located at 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	KOLAS	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298
JAPAN	VCCI	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011/A1:2014

☒ EN IEC 61000-3-2:2019

☒ EN 61000-3-3:2013/A1:2021

☒ **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/A1:2021



2.1 Conducted Emissions at Mains Power Ports

Test Date

Feb. 27, 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, 08, 2024
☒	LISN	ENV216	R & S	101787	11, 08, 2024
☒	LISN	ESH2-Z5	R & S	100450	11, 08, 2024
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 08, 2024

Test Conditions

Temperature: (21,9 ± 0,2) °C

Relative Humidity: (45,5 ± 0,2) % 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

Feb. 27, 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, 08, 2024
☒	LISN	ENV216	R & S	101787	11, 08, 2024
☒	LISN	ESH2-Z5	R & S	100450	11, 08, 2024
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 08, 2024
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	11, 09, 2024
☒	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	11, 09, 2024

Test Conditions

Temperature: (21,9 ± 0,2) °C

Relative Humidity: (45,5 ± 0,2) % 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

Feb. 23, 2024

Test Location

☐ OPEN AREA TEST SITE #2☒ SEMI ANECHOIC CHAMBER #4(10m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	02, 13, 2025
☒	AMPLIFIER	SCU 01	R & S	100603	11, 08, 2024
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
☒	ATTENUATOR	8491A	HP	32173	02, 13, 2025

Test Conditions

Temperature: (22,5 ± 0,2) °C

Relative Humidity: (45,9 ± 0,2) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Feb. 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	03, 21, 2024
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	11, 03, 2024
☒	PREAMPLIFIER	8449B	HP	3008A00538	05, 31, 2024
☒	ATTENUATOR	8491B	HP	23094	02, 13, 2025

Test Conditions

Temperature: (22,6 ± 0,2) °C

Relative Humidity: (45,8 ± 0,2) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



2.5 Harmonic Current Emissions

Test Date

Feb. 26, 2024

Test Location

Electro wave Shieldroom #3

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, 27, 2024
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (22,3 ± 0,2) °C

Relative Humidity: (46,2 ± 0,2) % 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

Feb. 26, 2024

Test Location

Electro wave Shieldroom #3

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, 27, 2024
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (22,3 ± 0,2) °C

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

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011/A1 :2014 Alarm systems-Part 4: Electromagnetic compatibility Product family standard:

Immunity requirements for components of fire, intruder and social alarm systems

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

If as a result of the application of the tests defined in this standard, the apparatus

becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

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

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

Radiated electromagnetic fields

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

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

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

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

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

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

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

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



Fast transient burst / slow high energy voltage surge

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

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

Conducted RF immunity

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

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators oeuvres at $U = 130 \text{ dB}\mu\text{V}$.

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

- (a) there is no permanent damage or change to the EUT
(e.g. no corruption of memory or changes to programmable settings etc.)
- (b) at $U = 130 \text{ dB}\mu\text{V}$, any deterioration of the picture is so minor that the system could still be used; and
- (c) there in no observable deterioration of the picture at $U = 120 \text{ dB}\mu\text{V}$.

Voltage dip/interruption / Voltage variation

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

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



3.1 Electrostatic Discharge

Reference Standard

EN 61000-4-2:2009

Test Date

Feb. 23, 2024

Test Location

EMS-ESD: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS05X4620	03, 06, 2024
☒	HCP	-	Noise Ken	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (22,7 ± 0,1) °C
Relative Humidity: (46,6 ± 0,1) % R.H.
Atmospheric Pressure: (100,4 ± 0,1) kPa

Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

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

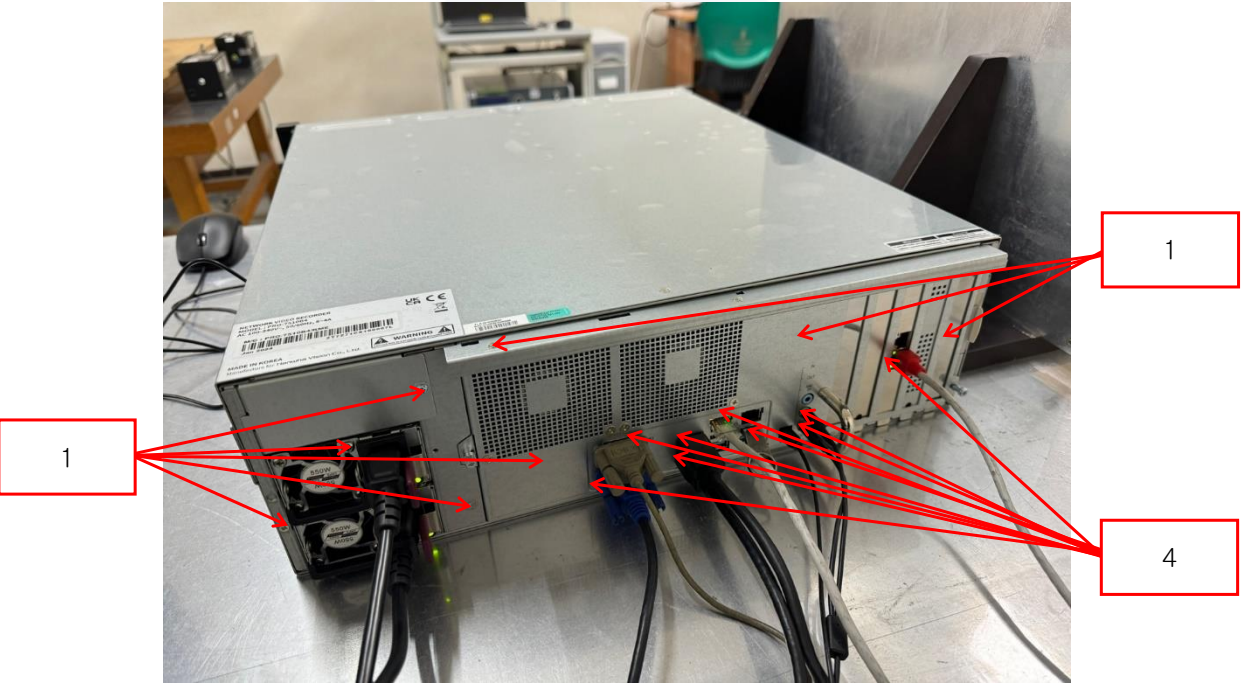
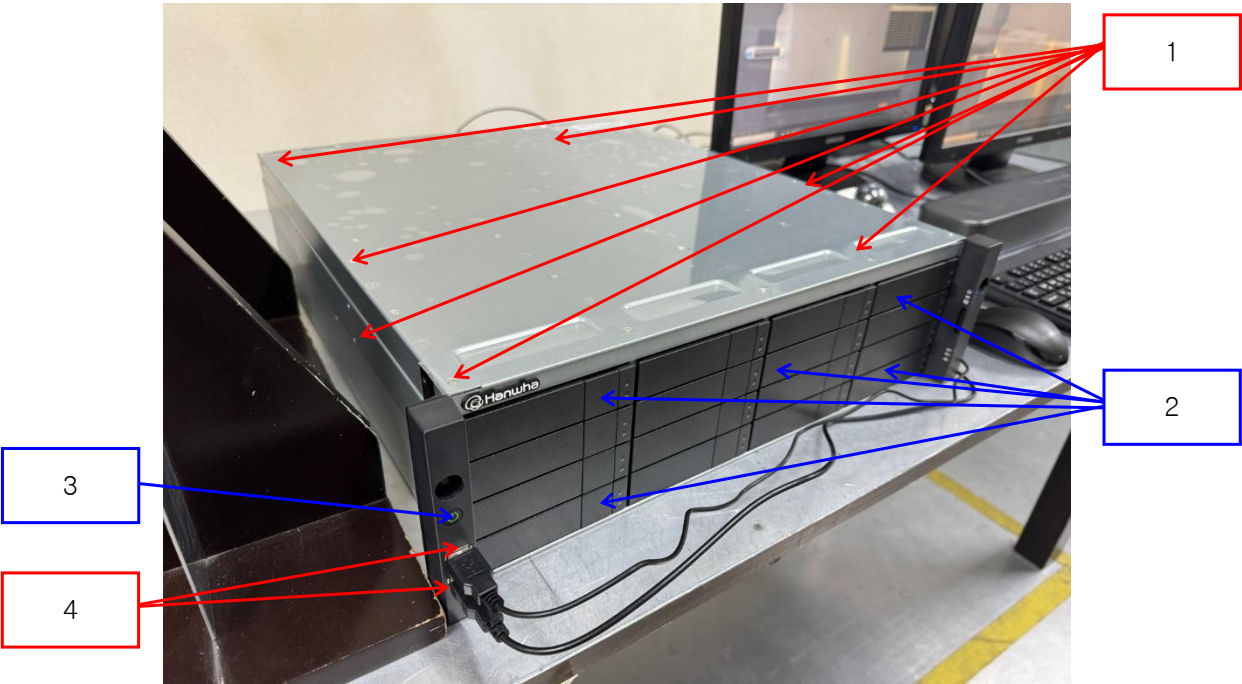
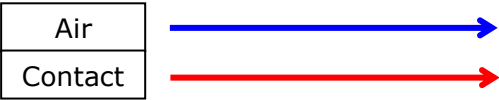
Discharge Voltage:	Contact	Air	HCP	VCP
	☐ 2 kV	☒ 2 kV	☐ 2 kV	☐ 2 kV
	☐ 4 kV	☒ 4 kV	☐ 4 kV	☐ 4 kV
	☒ 6 kV	☐ 6 kV	☒ 6 kV	☒ 6 kV
	☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
	☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

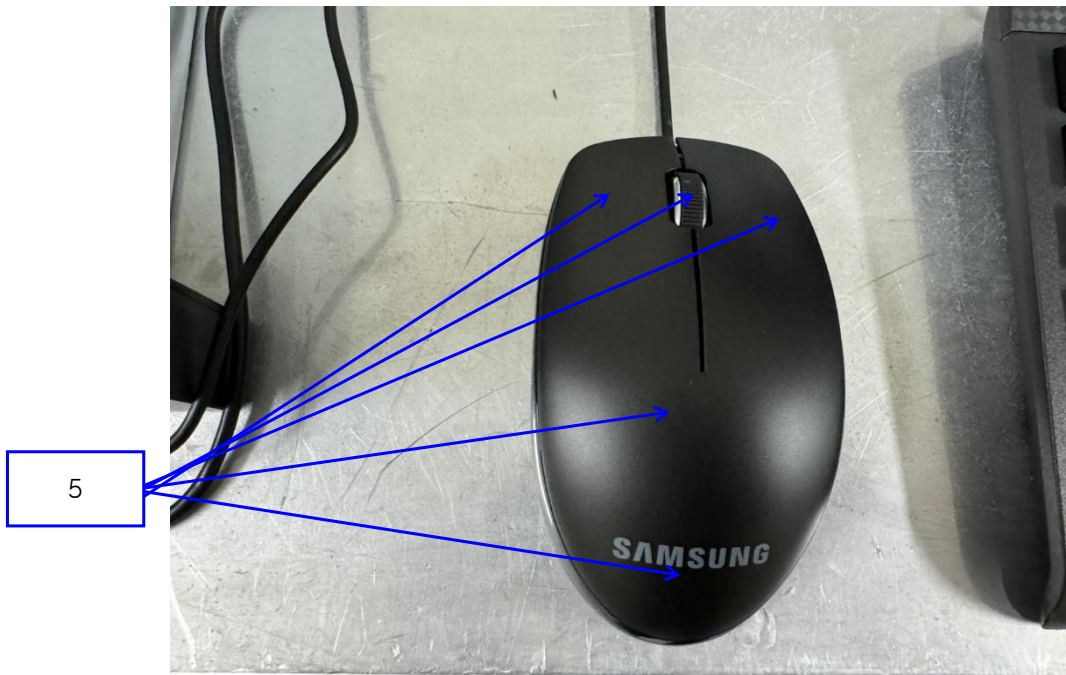
Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied



Location of Discharge:





**Test Data**

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, Screw	Contact Discharge	Complied	-
2	Enclosure 2	Air Discharge	Complied	-
3	Button	Air Discharge	Complied	-
4	Around the I/O Ports	Contact Discharge	Complied	-
5	USB Mouse	Air Discharge	Complied	-
6	USB Keyboard	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



3.2 Radiated Electric Field Immunity

Reference Standard

EN IEC 61000-4-3:2020

Test Date

Feb. 24, 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, 31, 2024
☒	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, 06, 2024

Test Conditions

Temperature: (22,0 ± 0,2) °C
Relative Humidity: (46,1 ± 0,2) % R.H.
Atmospheric Pressure: (100,8 ± 0,2) kPa



Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

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

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

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

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

**Test Data**

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 61000-4-4:2012

Test Date

Feb. 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, 09, 2024
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 09, 2024
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 10, 2024

Test Conditions

Temperature: (22,1 ± 0,2) °C
Relative Humidity: (45,6 ± 0,2) % R.H.
Atmospheric Pressure: (100,6 ± 0,2) 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**☒ Input a.c. power ports – Coupling/Decoupling Network used

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-45 #1	Complied	Complied
RJ-45 #2	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 61000-4-5:2014/A1:2017

Test Date

Feb. 26, 2024

Test Location

EMS-Surge: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test SW	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 09, 2024
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 09, 2024
☒	CDN	CNV 508N1	EM TEST	P1610176296	11, 10, 2024

Test Conditions

Temperature: (22,1 ± 0,2) °C
Relative Humidity: (45,6 ± 0,2) % R.H.
Atmospheric Pressure: (100,6 ± 0,2) 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**☒ Line to Line – Differential Mode

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

☒ Line to Earth – Common Mode

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

Signal Lines☒ Line to Earth – Common Mode

Mode of Application	Coupling Method	Observations	
		(+) Surge (kV)	(-) Surge (kV)
RJ-45 #1	CDN	Complied	Complied
	LINE	Complied	Complied
RJ-45 #1	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 61000-4-6:2014

Test Date

Feb. 25, 2024

Test Location

EMS-CS: Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.12	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	11, 08, 2024
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 08, 2024
☒	CDN	CDN M016	TESEQ	43694	11, 08, 2024
☒	CDN	CDN M016	TESEQ	43697	11, 08, 2024
☒	CDN	CDN T8RJ45	EM TEST	0909-09	07, 31, 2024
☐	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 09, 2024

Test Conditions

Temperature: (22,6 ± 0,2) °C
Relative Humidity: (46,0 ± 0,2) % R.H.
Atmospheric Pressure: (100,4 ± 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**☒ Input a.c. power ports

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

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45 #1	CDN	Complied
RJ-45 #2	CDN	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 61000-4-11:2020

Test Date

Feb. 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, 09, 2024
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 09, 2024

Test Conditions

Temperature: (22,1 ± 0,2) °C
Relative Humidity: (45,6 ± 0,2) % R.H.
Atmospheric Pressure: (100,6 ± 0,2) kPa

**Test Specifications & Observations/Remarks****- Voltage Dips and Short Interruptions**

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

- Voltage variations

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

Observations:

Complied – No degradation of function

Degradation - See "Remarks "

Test Results

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

Remarks

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



APPENDIX A – TEST DATA

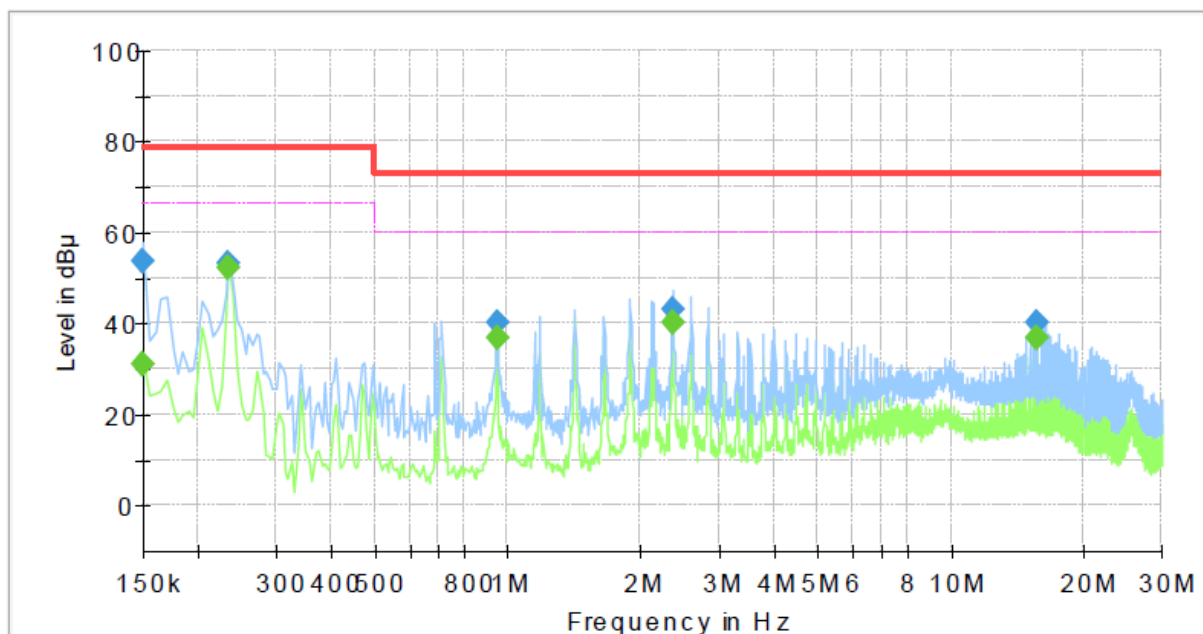
Conducted Emissions at Mains Power Ports

■ POWER#1

[HOT]

Common Information

Test Description: Conducted Emission
Model No.: PRO-7511B4
Phase: L1
Mode: POWER#1
Operator Name: KES



Final Result

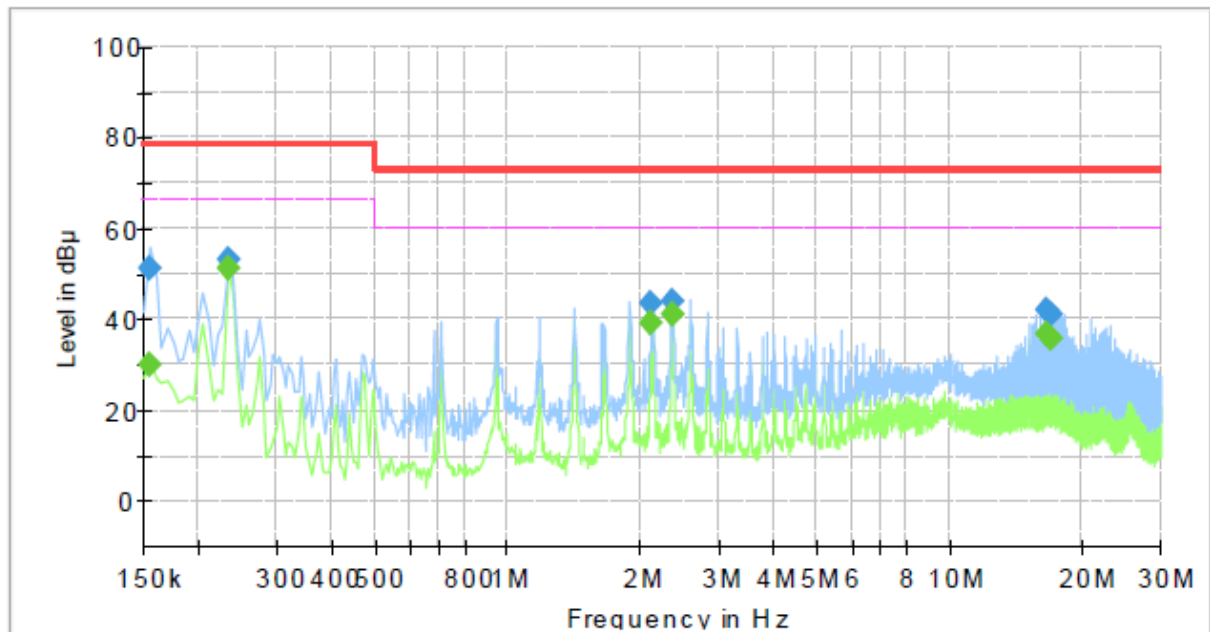
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	53.74	---	79.00	25.26	1000.0	9.000	L1	19.4
0.150000	---	31.22	66.00	34.78	1000.0	9.000	L1	19.4
0.235000	53.38	---	79.00	25.62	1000.0	9.000	L1	19.4
0.235000	---	52.09	66.00	13.91	1000.0	9.000	L1	19.4
0.945000	39.94	---	73.00	33.06	1000.0	9.000	L1	19.4
0.945000	---	36.98	60.00	23.02	1000.0	9.000	L1	19.4
2.355000	43.24	---	73.00	29.76	1000.0	9.000	L1	19.5
2.355000	---	40.01	60.00	19.99	1000.0	9.000	L1	19.5
15.740000	---	36.86	60.00	23.14	1000.0	9.000	L1	20.1
15.740000	40.36	---	73.00	32.64	1000.0	9.000	L1	20.1



[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: PRO-7511B4
Phase: N
Mode: POWER#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	---	30.25	66.00	35.75	1000.0	9.000	N	19.3
0.155000	51.14	---	79.00	27.86	1000.0	9.000	N	19.3
0.235000	---	51.51	66.00	14.49	1000.0	9.000	N	19.3
0.235000	52.97	---	79.00	26.03	1000.0	9.000	N	19.3
2.120000	---	39.43	60.00	20.57	1000.0	9.000	N	19.5
2.120000	43.34	---	73.00	29.66	1000.0	9.000	N	19.5
2.360000	---	41.15	60.00	18.85	1000.0	9.000	N	19.5
2.360000	44.08	---	73.00	28.92	1000.0	9.000	N	19.5
16.640000	---	37.01	60.00	22.99	1000.0	9.000	N	20.2
16.640000	42.26	---	73.00	30.74	1000.0	9.000	N	20.2
16.985000	---	35.90	60.00	24.10	1000.0	9.000	N	20.2
16.985000	40.94	---	73.00	32.06	1000.0	9.000	N	20.2

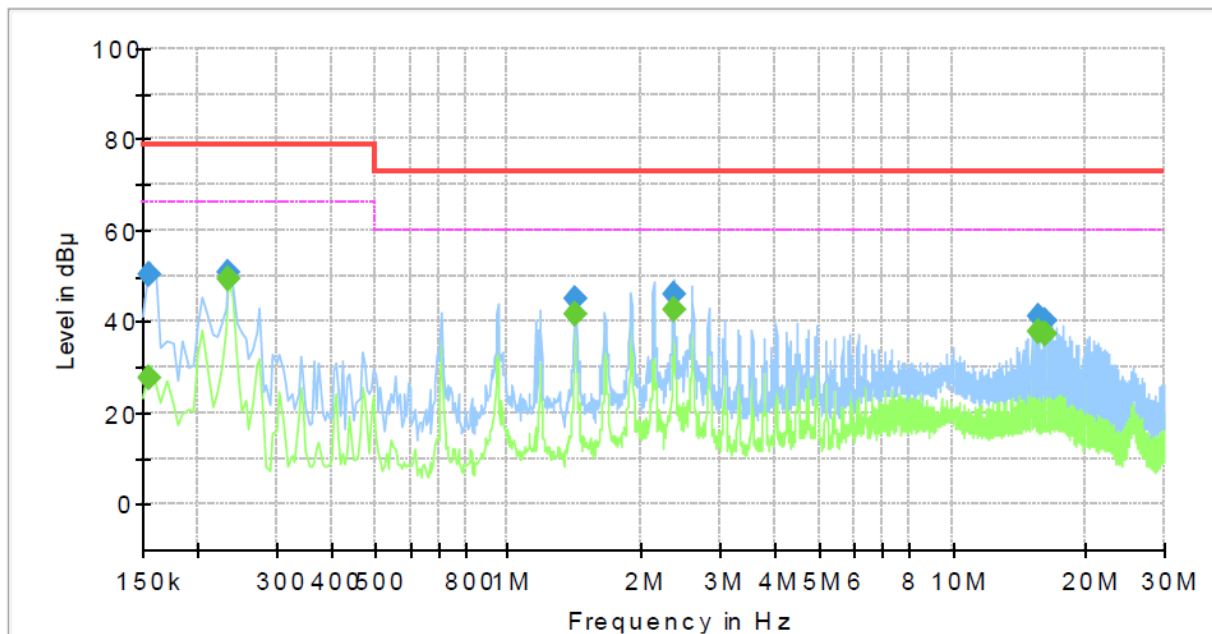


■ POWER#2

[HOT]

Common Information

Test Description: Conducted Emission
Model No.: PRO-7511B4
Phase: L1
Mode: POWER#2
Operator Name: KES

**Final_Result**

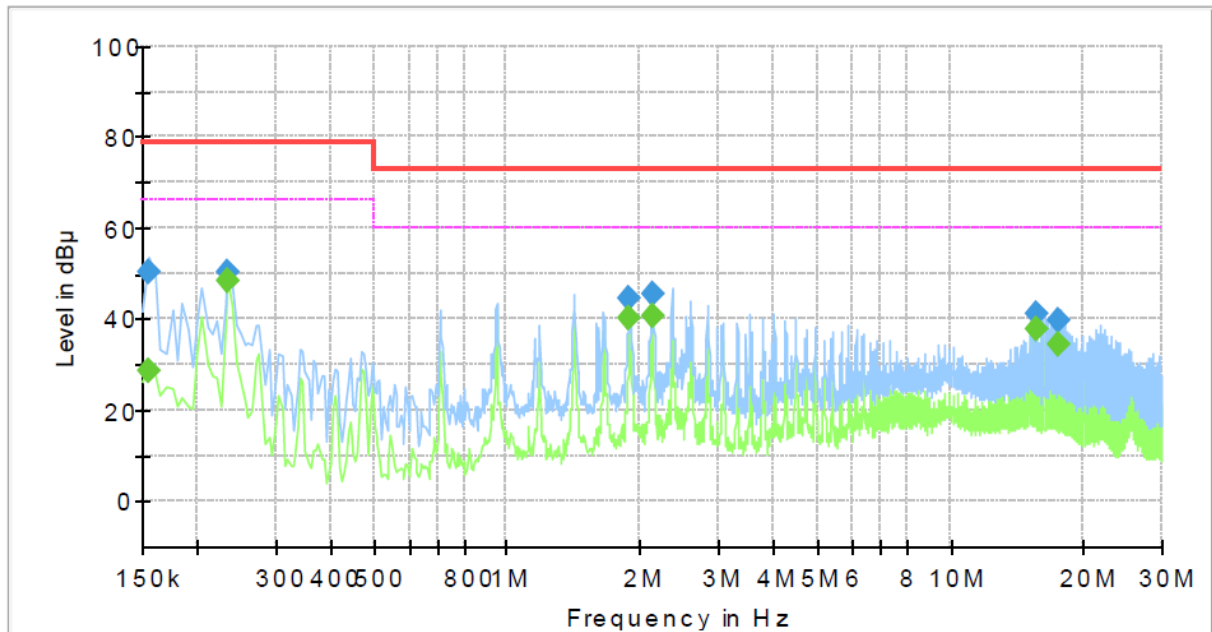
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	27.47	66.00	38.53	1000.0	9.000	L1	19.4
0.155000	50.20	---	79.00	28.80	1000.0	9.000	L1	19.4
0.235000	---	49.15	66.00	16.85	1000.0	9.000	L1	19.4
0.235000	50.98	---	79.00	28.02	1000.0	9.000	L1	19.4
1.415000	---	41.84	60.00	18.16	1000.0	9.000	L1	19.5
1.415000	44.84	---	73.00	28.16	1000.0	9.000	L1	19.5
2.360000	---	42.71	60.00	17.29	1000.0	9.000	L1	19.5
2.360000	45.90	---	73.00	27.10	1000.0	9.000	L1	19.5
15.740000	---	37.68	60.00	22.32	1000.0	9.000	L1	20.1
15.740000	41.15	---	73.00	31.85	1000.0	9.000	L1	20.1
16.190000	---	37.50	60.00	22.50	1000.0	9.000	L1	20.1
16.190000	40.35	---	73.00	32.65	1000.0	9.000	L1	20.1



[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: PRO-7511B4
Phase: N
Mode: POWER#2
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	---	28.44	66.00	37.56	1000.0	9.000	N	19.3
0.155000	50.13	---	79.00	28.87	1000.0	9.000	N	19.3
0.235000	---	48.27	66.00	17.73	1000.0	9.000	N	19.3
0.235000	50.26	---	79.00	28.74	1000.0	9.000	N	19.3
1.890000	---	40.04	60.00	19.96	1000.0	9.000	N	19.5
1.890000	44.73	---	73.00	28.27	1000.0	9.000	N	19.5
2.125000	---	40.78	60.00	19.22	1000.0	9.000	N	19.5
2.125000	45.67	---	73.00	27.33	1000.0	9.000	N	19.5
15.740000	---	37.85	60.00	22.15	1000.0	9.000	N	20.1
15.740000	41.12	---	73.00	31.88	1000.0	9.000	N	20.1
17.625000	---	34.62	60.00	25.38	1000.0	9.000	N	20.2
17.625000	39.83	---	73.00	33.17	1000.0	9.000	N	20.2

♦ 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))

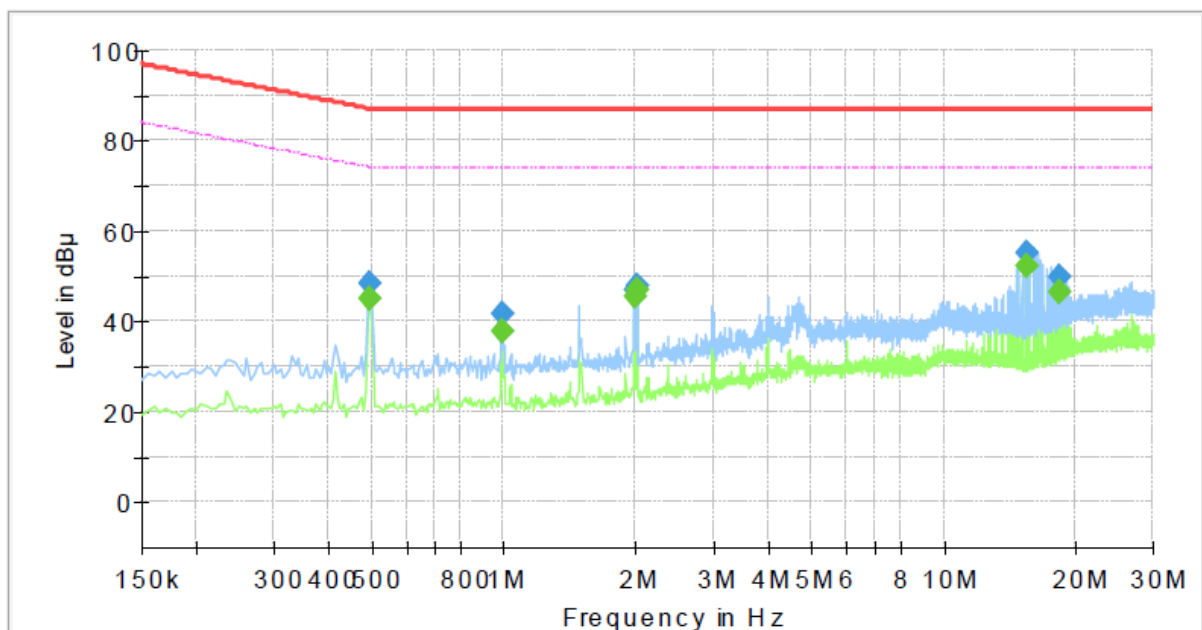
**Conducted Emissions at Telecommunication Ports**

■ POWER#1

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PRO-7511B4
Mode : RJ-45#1
Speed : 1 000 Mbps
Operator Name: KES

**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.495000	48.58	---	87.08	38.50	1000.0	9.000	Single Line	19.3
0.495000	---	45.10	74.08	28.98	1000.0	9.000	Single Line	19.3
0.990000	---	37.81	74.00	36.19	1000.0	9.000	Single Line	19.3
0.990000	41.50	---	87.00	45.50	1000.0	9.000	Single Line	19.3
2.000000	---	45.40	74.00	28.60	1000.0	9.000	Single Line	19.2
2.000000	47.03	---	87.00	39.97	1000.0	9.000	Single Line	19.2
2.005000	48.12	---	87.00	38.88	1000.0	9.000	Single Line	19.2
2.005000	---	47.02	74.00	26.98	1000.0	9.000	Single Line	19.2
15.515000	---	52.20	74.00	21.80	1000.0	9.000	Single Line	19.7
15.515000	55.00	---	87.00	32.00	1000.0	9.000	Single Line	19.7
18.435000	---	46.44	74.00	27.56	1000.0	9.000	Single Line	19.8
18.435000	49.68	---	87.00	37.32	1000.0	9.000	Single Line	19.8

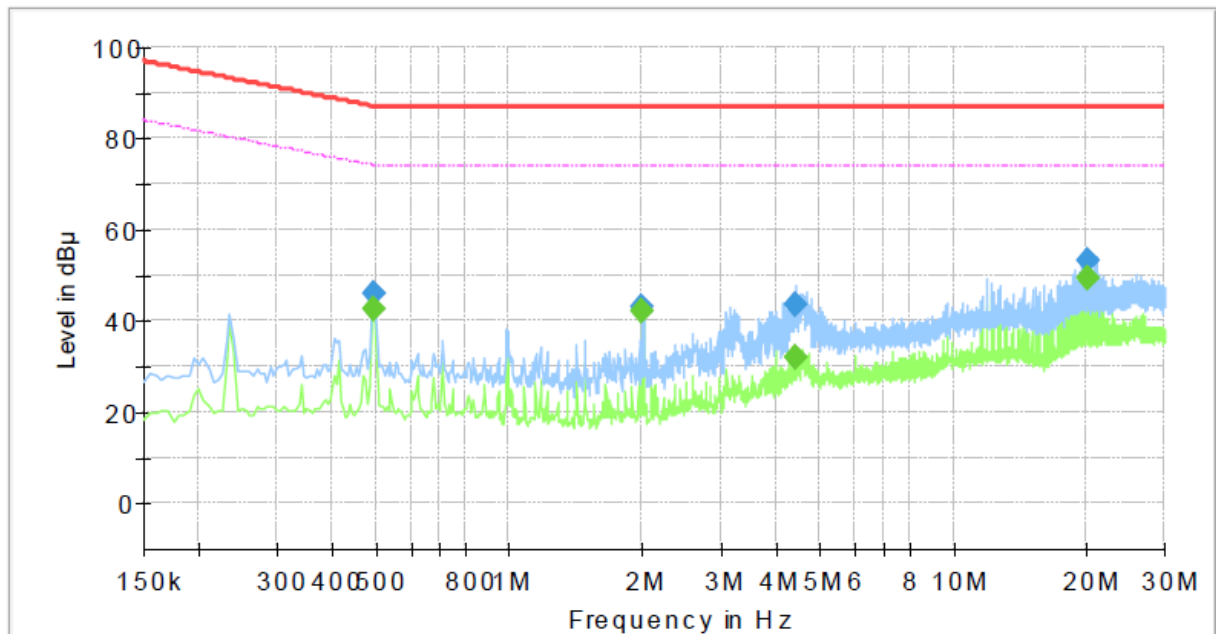


■ POWER#2

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PRO-7511B4
Mode : RJ-45#2
Speed : 1 000 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.495000	---	42.61	74.08	31.47	1000.0	9.000	Single Line	19.3
0.495000	45.85	---	87.08	41.23	1000.0	9.000	Single Line	19.3
2.000000	---	42.31	74.00	31.69	1000.0	9.000	Single Line	19.2
2.000000	42.86	---	87.00	44.14	1000.0	9.000	Single Line	19.2
4.435000	---	32.19	74.00	41.81	1000.0	9.000	Single Line	19.4
4.435000	43.62	---	87.00	43.38	1000.0	9.000	Single Line	19.4
20.235000	---	49.31	74.00	24.69	1000.0	9.000	Single Line	19.8
20.235000	53.24	---	87.00	33.76	1000.0	9.000	Single Line	19.8

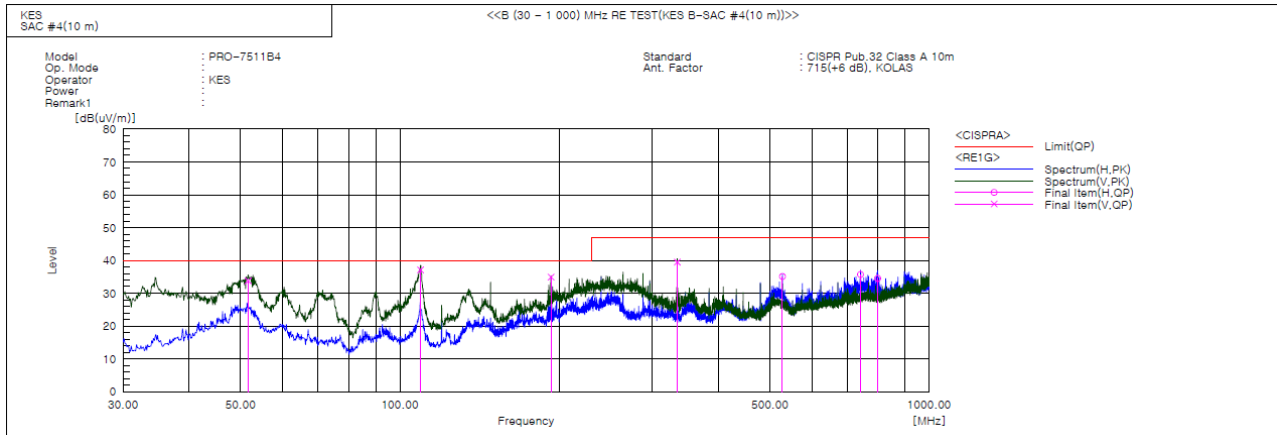
◆ Calculation

$$\text{QuasiPeak [dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value [dBuV]} + \text{Corr. [dB]}$$

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)****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	51.704	V	54.9	-21.1	33.8	40.0	6.2	119.0	41.0	
2	109.419	V	59.9	-22.8	37.1	40.0	2.9	125.0	197.0	
3	192.960	V	56.5	-21.6	34.9	40.0	5.1	163.0	329.0	
4	334.095	V	55.3	-15.8	39.5	47.0	7.5	191.0	47.0	
5	527.974	H	45.5	-10.4	35.1	47.0	11.9	216.0	37.0	
6	741.738	H	41.0	-5.3	35.7	47.0	11.3	178.0	142.0	
7	798.968	H	40.1	-5.6	34.5	47.0	12.5	237.0	18.0	

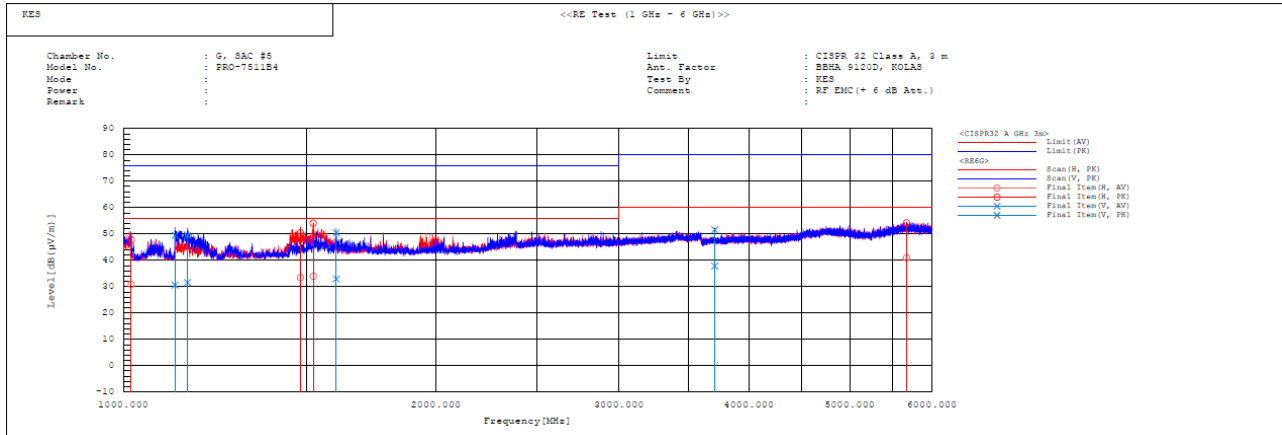
◆ Calculation

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)****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	1017.986	H	32.4	49.3	-1.5	30.9	47.8	56.0	76.0	25.1	28.2	100.0	93.1	
2	1121.831	V	31.5	50.4	-0.9	30.6	49.5	56.0	76.0	25.4	26.5	100.0	285.7	
3	1153.418	V	32.3	50.1	-0.7	31.6	49.4	56.0	76.0	24.4	26.6	100.0	280.0	
4	1481.254	H	32.6	49.6	0.9	33.5	50.5	56.0	76.0	22.5	25.5	100.0	71.1	
5	1523.711	H	32.9	53.0	1.1	34.0	54.1	56.0	76.0	22.0	21.9	100.0	332.6	
6	1603.612	V	31.4	48.9	1.5	32.9	50.4	56.0	76.0	23.1	25.6	100.0	352.2	
7	3708.801	V	30.0	43.8	7.8	37.8	51.6	60.0	80.0	22.2	28.4	100.0	126.6	
8	5671.812	H	27.1	40.3	13.9	41.0	54.2	60.0	80.0	19.0	25.8	100.0	57.6	

◆ 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**

■ POWER#1

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.175			
2	0.002	0.159	1.080	n/a
3	0.023	0.990	2.300	PASS
4	0.001	0.284	0.430	n/a
5	0.018	1.605	1.140	PASS
6	0.001	0.339	0.300	n/a
7	0.010	1.292	0.770	PASS
8	0.001	0.370	0.230	n/a
9	0.005	1.186	0.400	n/a
10	0.001	0.462	0.184	n/a
11	0.005	1.476	0.330	n/a
12	0.001	0.503	0.153	n/a
13	0.004	1.893	0.210	n/a
14	0.001	0.790	0.131	n/a
15	0.003	2.012	0.150	n/a
16	0.001	0.817	0.115	n/a
17	0.005	4.132	0.132	PASS
18	0.001	0.920	0.102	n/a
19	0.002	2.026	0.118	n/a
20	0.001	0.969	0.092	n/a
21	0.005	3.028	0.161	n/a
22	0.001	1.131	0.084	n/a
23	0.004	2.714	0.147	n/a
24	0.001	1.320	0.077	n/a
25	0.002	1.745	0.135	n/a
26	0.001	1.106	0.071	n/a
27	0.002	1.926	0.125	n/a
28	0.001	1.327	0.066	n/a
29	0.002	1.607	0.116	n/a
30	0.001	1.209	0.061	n/a
31	0.001	1.110	0.109	n/a
32	0.001	1.401	0.058	n/a
33	0.002	2.084	0.102	n/a
34	0.001	1.439	0.054	n/a
35	0.002	2.086	0.096	n/a
36	0.001	1.470	0.051	n/a
37	0.001	1.445	0.091	n/a
38	0.001	1.563	0.048	n/a
39	0.002	2.638	0.087	n/a
40	0.001	1.713	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	0.182			
2	0.002	0.133	1.620	n/a
3	0.023	0.673	3.450	PASS
4	0.002	0.274	0.645	n/a
5	0.019	1.093	1.710	PASS
6	0.001	0.279	0.450	n/a
7	0.011	0.916	1.155	PASS
8	0.001	0.284	0.345	n/a
9	0.005	0.847	0.600	PASS
10	0.001	0.370	0.276	n/a
11	0.005	1.048	0.495	PASS
12	0.001	0.399	0.230	n/a
13	0.005	1.458	0.315	n/a
14	0.001	0.602	0.197	n/a
15	0.004	1.633	0.225	n/a
16	0.001	0.628	0.173	n/a
17	0.006	2.862	0.199	PASS
18	0.001	0.751	0.153	n/a
19	0.003	1.970	0.178	n/a
20	0.001	0.795	0.138	n/a
21	0.005	3.186	0.161	PASS
22	0.001	0.865	0.125	n/a
23	0.005	3.366	0.147	n/a
24	0.001	1.021	0.115	n/a
25	0.003	1.954	0.135	n/a
26	0.001	0.883	0.106	n/a
27	0.003	2.071	0.125	n/a
28	0.001	0.995	0.099	n/a
29	0.002	1.827	0.116	n/a
30	0.001	0.927	0.092	n/a
31	0.002	1.575	0.109	n/a
32	0.001	1.022	0.086	n/a
33	0.002	2.262	0.102	n/a
34	0.001	1.108	0.081	n/a
35	0.002	2.508	0.096	n/a
36	0.001	1.107	0.077	n/a
37	0.002	2.033	0.091	n/a
38	0.001	1.165	0.073	n/a
39	0.002	2.830	0.087	n/a
40	0.001	1.302	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.



■ POWER#2

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.175			
2	0.002	0.155	1.080	n/a
3	0.023	0.987	2.300	PASS
4	0.001	0.282	0.430	n/a
5	0.018	1.607	1.140	PASS
6	0.001	0.324	0.300	n/a
7	0.010	1.291	0.770	PASS
8	0.001	0.355	0.230	n/a
9	0.005	1.180	0.400	n/a
10	0.001	0.445	0.184	n/a
11	0.005	1.473	0.330	n/a
12	0.001	0.489	0.153	n/a
13	0.004	1.898	0.210	n/a
14	0.001	0.773	0.131	n/a
15	0.003	1.991	0.150	n/a
16	0.001	0.787	0.115	n/a
17	0.006	4.175	0.132	PASS
18	0.001	0.867	0.102	n/a
19	0.002	1.968	0.118	n/a
20	0.001	0.925	0.092	n/a
21	0.005	3.057	0.161	n/a
22	0.001	1.098	0.084	n/a
23	0.004	2.685	0.147	n/a
24	0.001	1.288	0.077	n/a
25	0.002	1.744	0.135	n/a
26	0.001	1.059	0.071	n/a
27	0.002	1.939	0.125	n/a
28	0.001	1.304	0.066	n/a
29	0.002	1.600	0.116	n/a
30	0.001	1.213	0.061	n/a
31	0.001	1.068	0.109	n/a
32	0.001	1.357	0.058	n/a
33	0.002	2.103	0.102	n/a
34	0.001	1.441	0.054	n/a
35	0.002	2.086	0.096	n/a
36	0.001	1.417	0.051	n/a
37	0.001	1.462	0.091	n/a
38	0.001	1.580	0.048	n/a
39	0.002	2.638	0.087	n/a
40	0.001	1.663	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	0.179			
2	0.002	0.125	1.620	n/a
3	0.023	0.680	3.450	PASS
4	0.002	0.243	0.645	n/a
5	0.019	1.089	1.710	PASS
6	0.001	0.249	0.450	n/a
7	0.010	0.893	1.155	PASS
8	0.001	0.282	0.345	n/a
9	0.005	0.825	0.600	n/a
10	0.001	0.341	0.276	n/a
11	0.005	1.025	0.495	PASS
12	0.001	0.368	0.230	n/a
13	0.004	1.345	0.315	n/a
14	0.001	0.588	0.197	n/a
15	0.004	1.637	0.225	n/a
16	0.001	0.593	0.173	n/a
17	0.006	2.872	0.199	PASS
18	0.001	0.687	0.153	n/a
19	0.003	1.647	0.178	n/a
20	0.001	0.713	0.138	n/a
21	0.005	3.193	0.161	PASS
22	0.001	0.859	0.125	n/a
23	0.004	2.976	0.147	n/a
24	0.001	0.980	0.115	n/a
25	0.003	2.000	0.135	n/a
26	0.001	0.813	0.106	n/a
27	0.003	2.061	0.125	n/a
28	0.001	1.014	0.099	n/a
29	0.002	1.792	0.116	n/a
30	0.001	0.940	0.092	n/a
31	0.001	1.366	0.109	n/a
32	0.001	1.003	0.086	n/a
33	0.002	2.311	0.102	n/a
34	0.001	1.089	0.081	n/a
35	0.002	2.265	0.096	n/a
36	0.001	1.053	0.077	n/a
37	0.002	1.775	0.091	n/a
38	0.001	1.197	0.073	n/a
39	0.002	2.772	0.087	n/a
40	0.001	1.271	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.



Test Data - Voltage Fluctuations

■ POWER#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

■ POWER#2

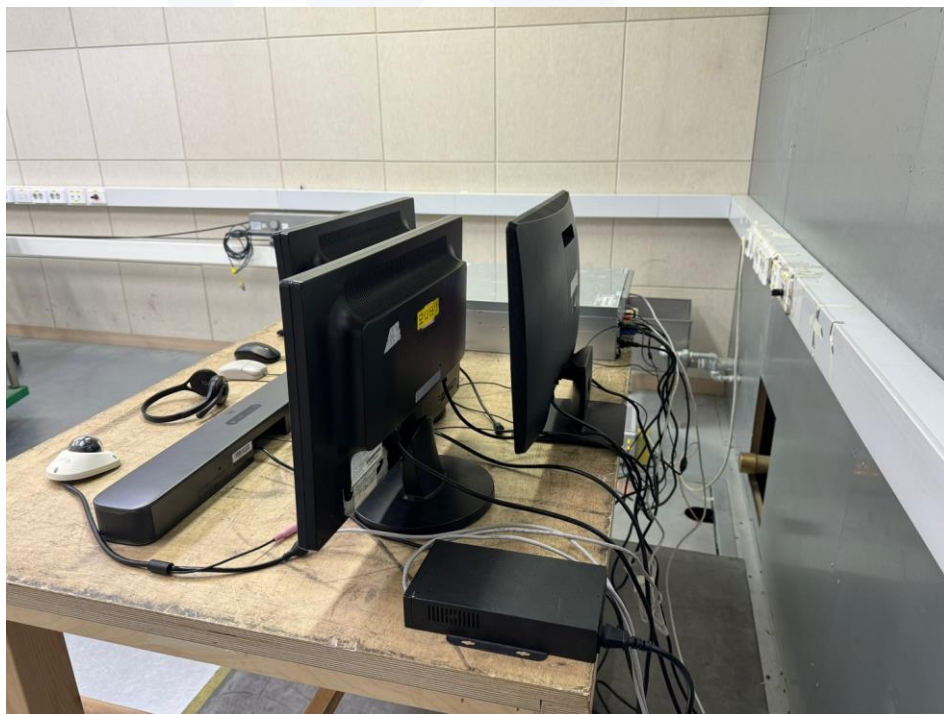
Maximum Flicker results

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



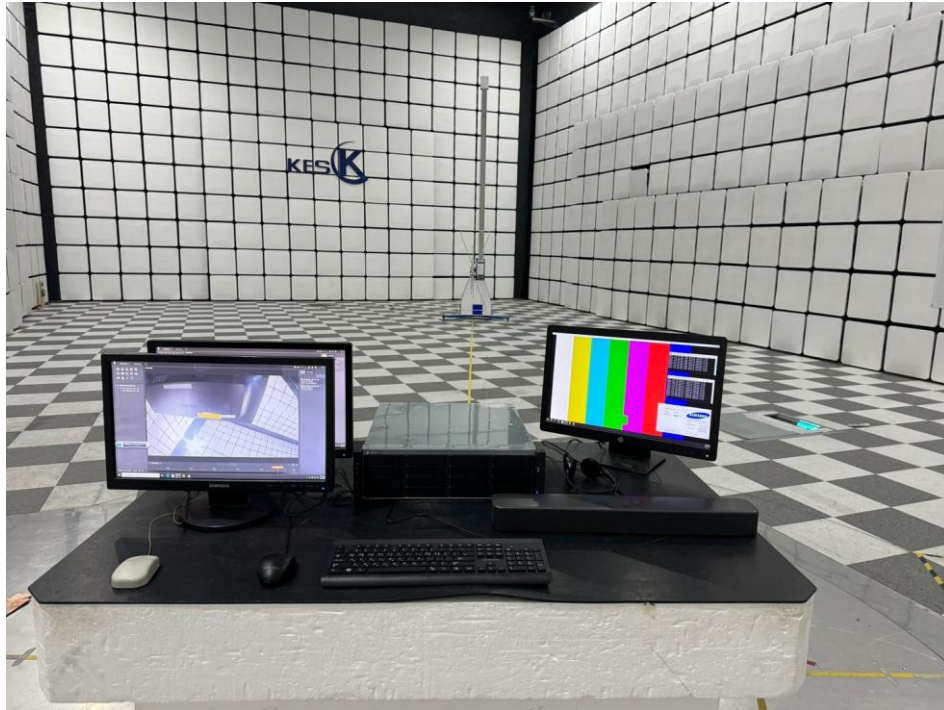


Conducted Emissions at Telecommunication Ports



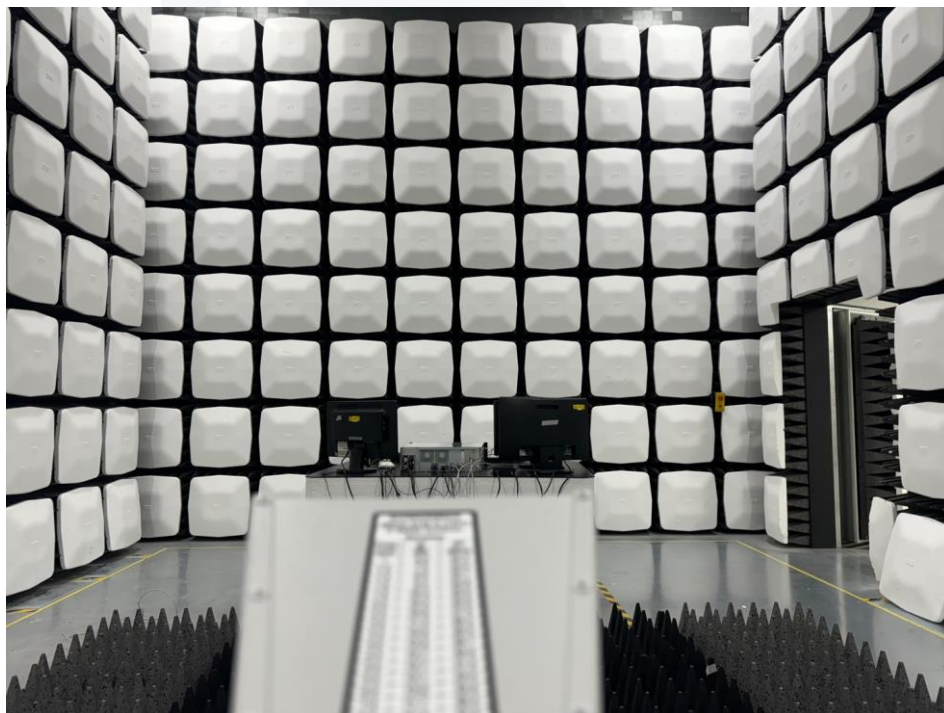
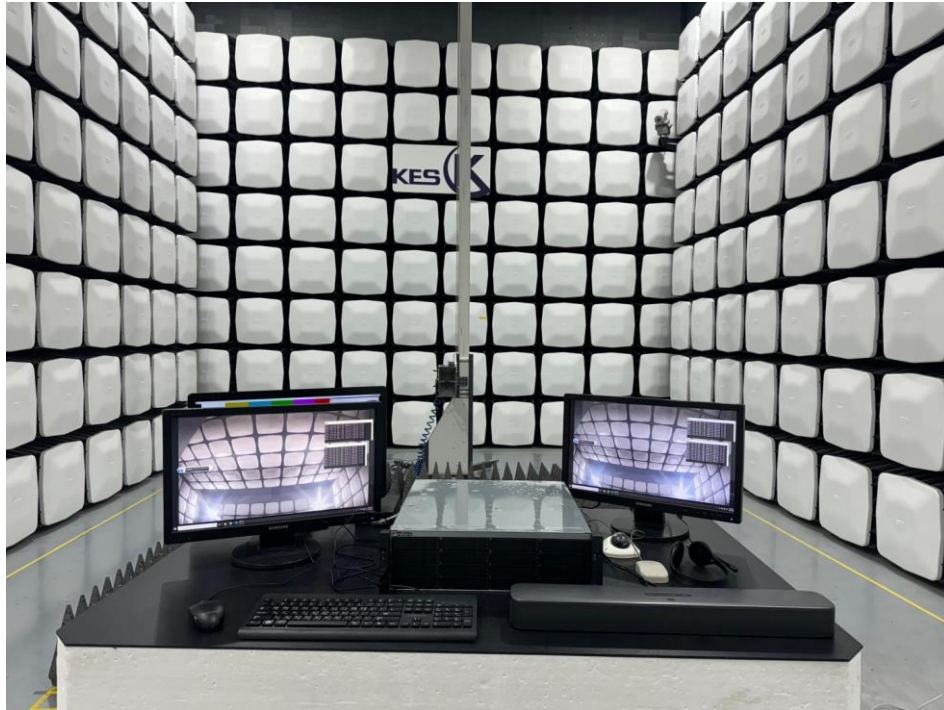


Radiated Electric Field Emissions(Below 1 GHz)



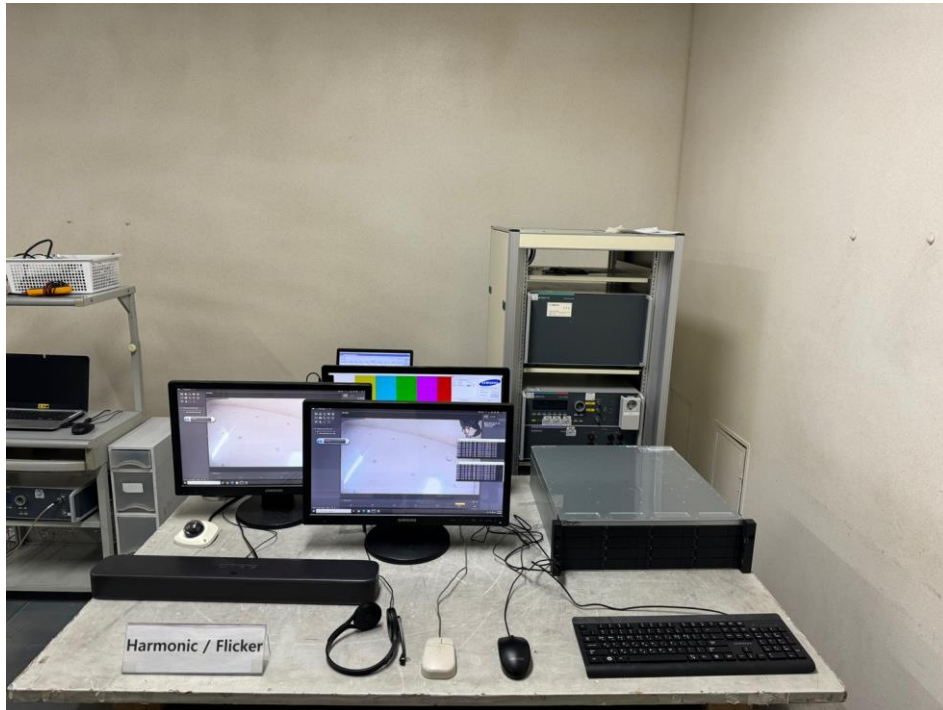


Radiated Electric Field Emissions(Above 1 GHz)





Harmonic Current Emissions and Voltage Fluctuations and Flicker

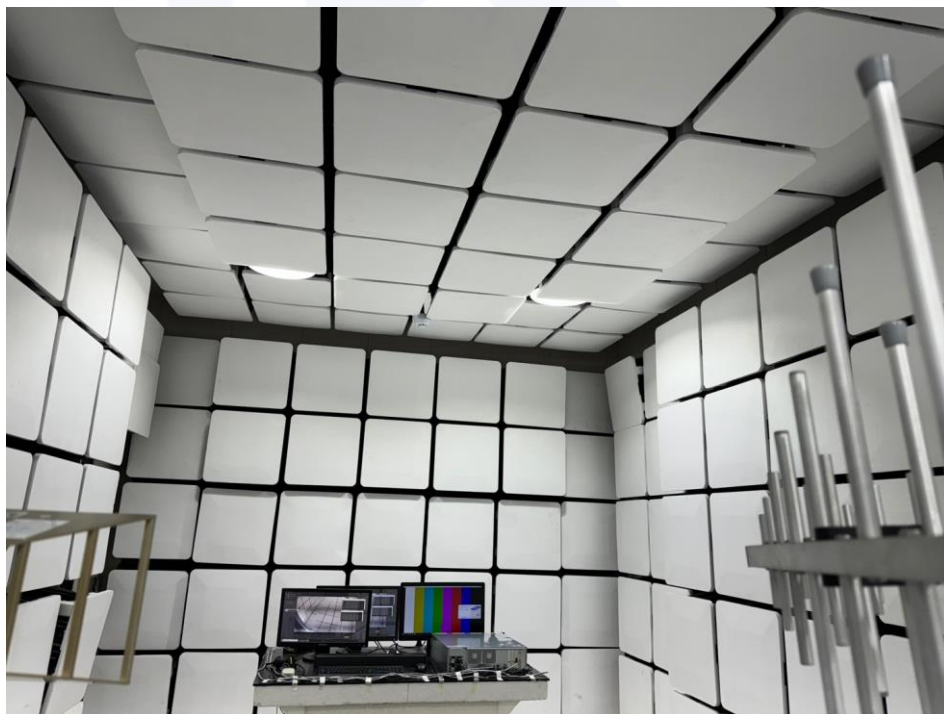




Electrostatic Discharge



Radiated Electric Field Immunity





Electrical Fast Transients/Bursts

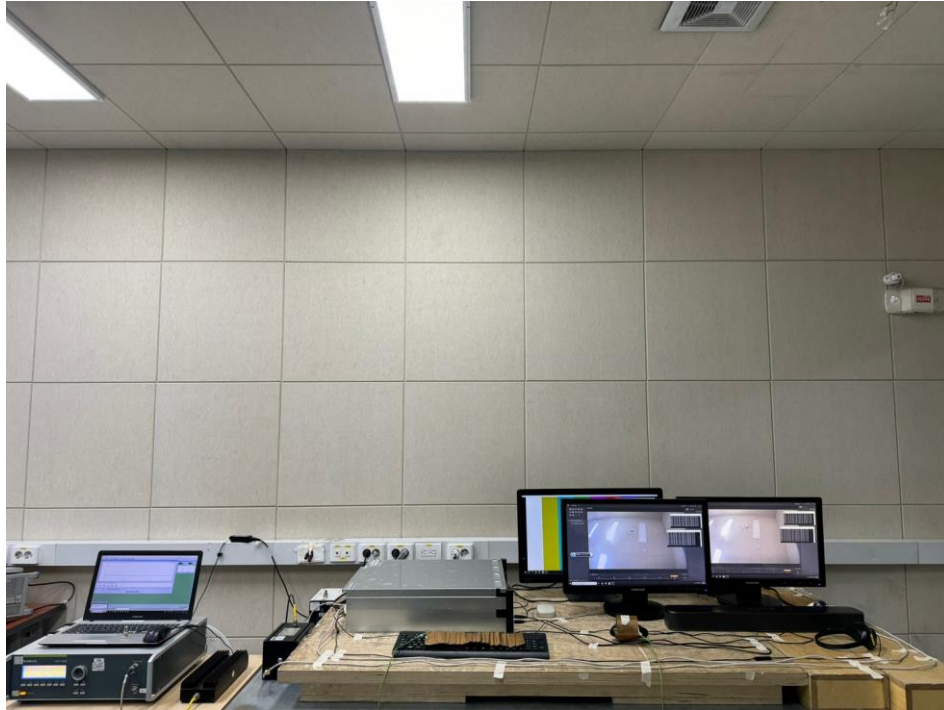


Surge Transients

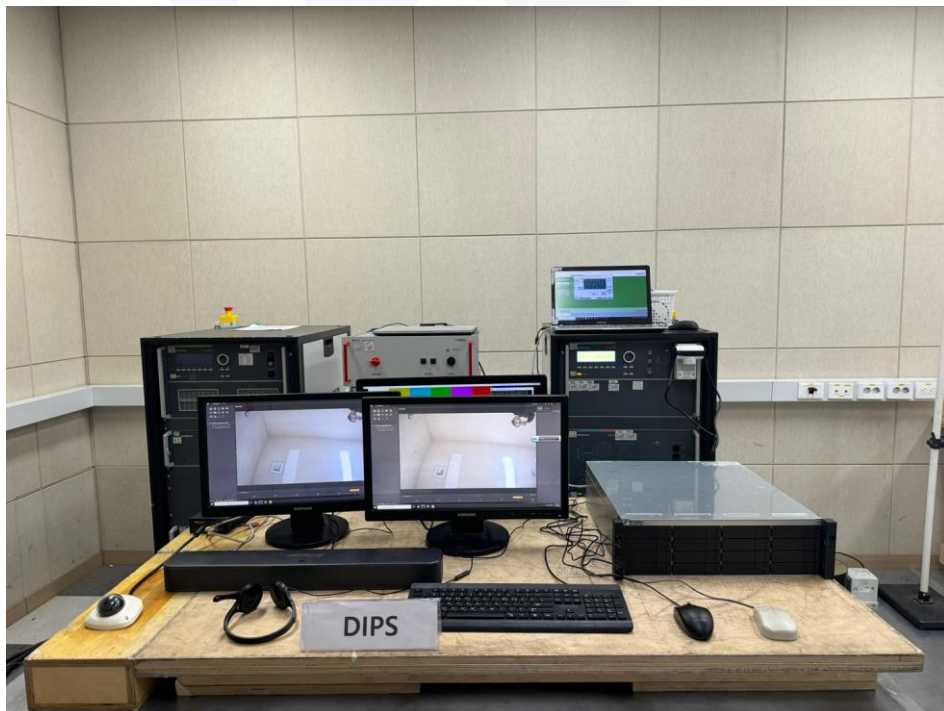




Conducted Disturbance



Voltage Dips and Short Interruptions





EUT External Photographs

(Top)



(Bottom)





EUT Internal Photographs

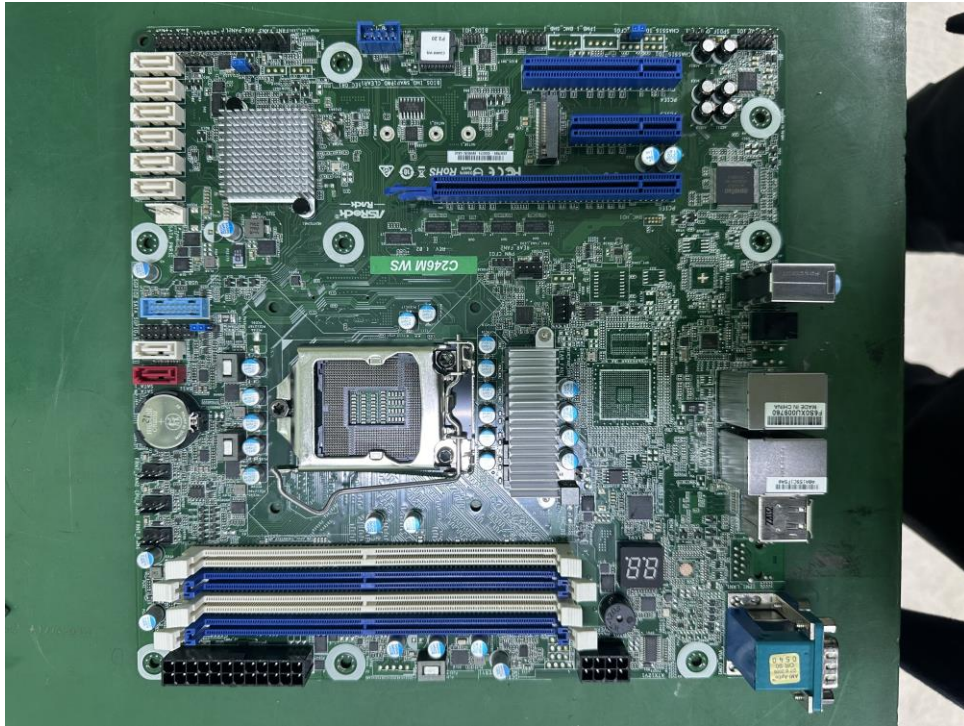
(Internal View)





EUT Internal View – Board 1

(Top)



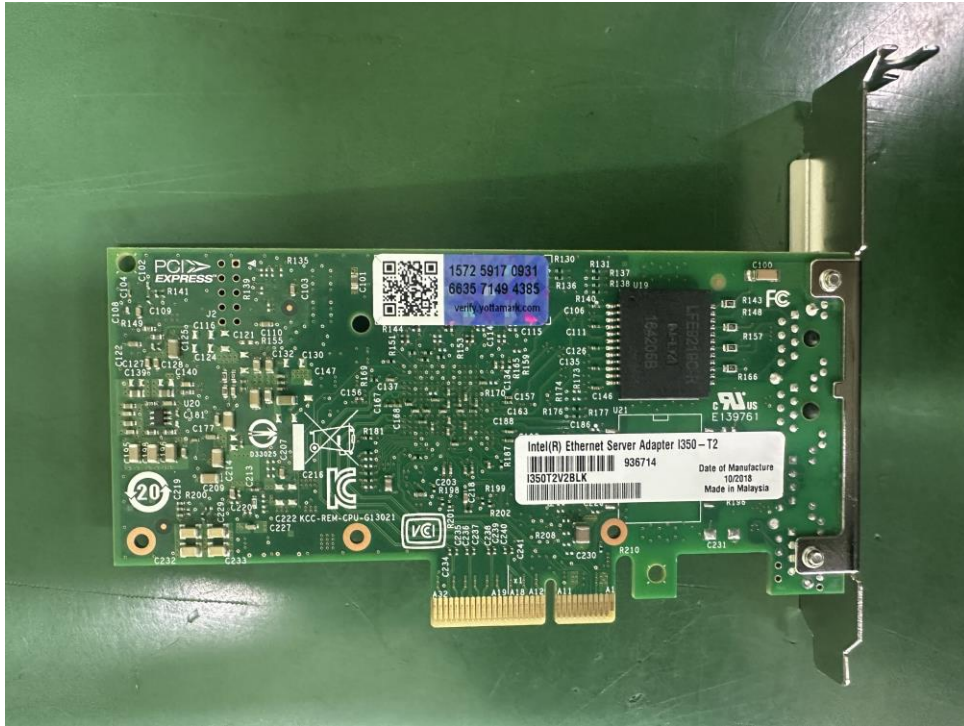
(Bottom)



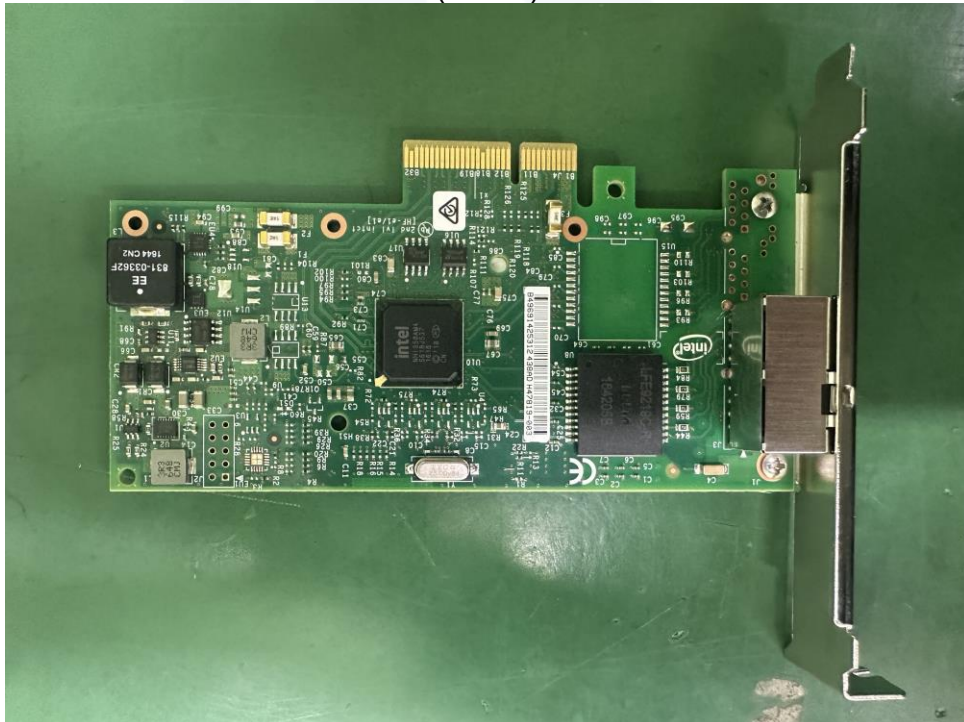


EUT Internal View – Ethernet Server Adapter

(Top)



(Bottom)





EUT Internal View – CPU

(Top)



(Bottom)





EUT Internal View – PSU

(Top)



(Bottom)





EUT Internal View – SSD

(Top)



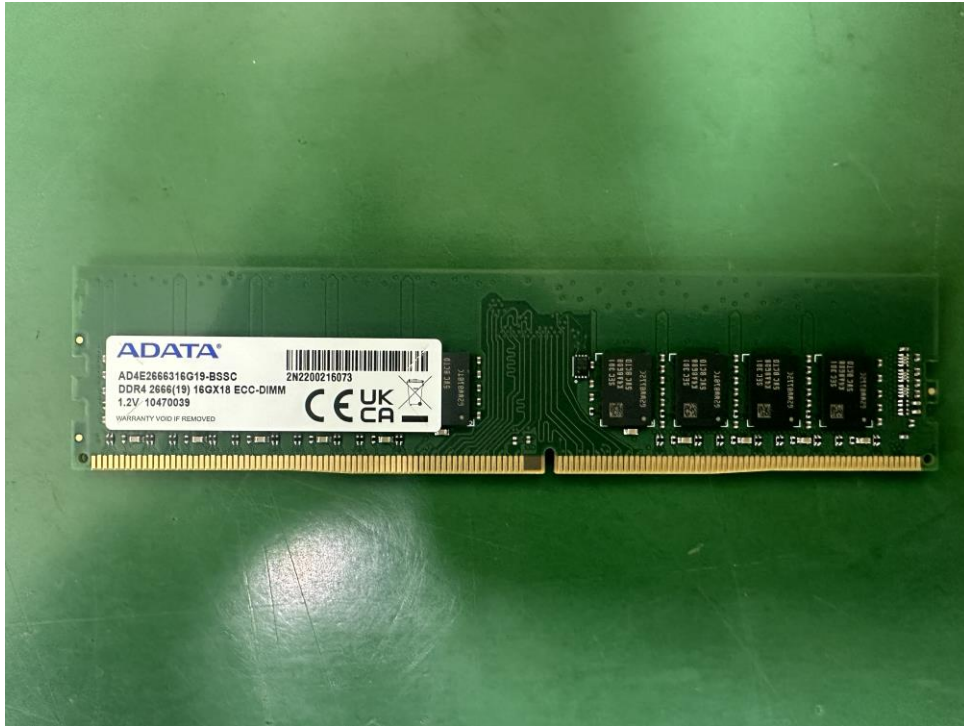
(Bottom)





EUT Internal View – Memory 1

(Top)



(Bottom)





EUT Internal View – Memory 2

(Top)

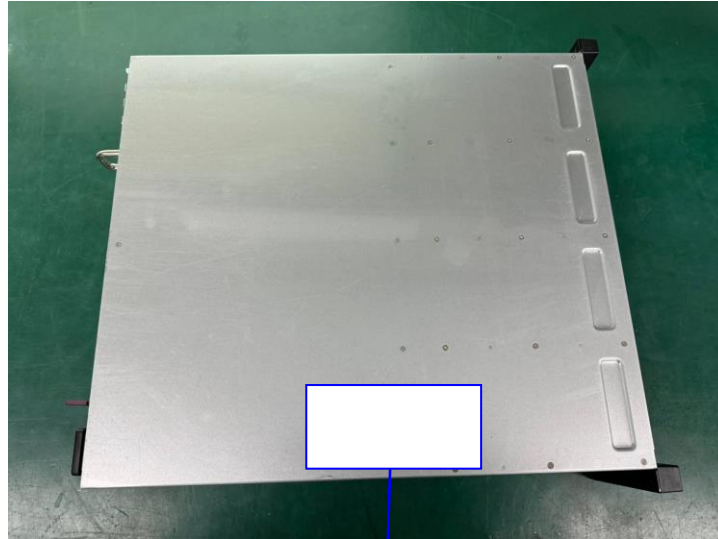


(Bottom)





Label and Location



NETWORK VIDEO RECORDER

Model No : PRO-7511B4

Manufacturer : Dream I System co.,Ltd.

Made in Korea

