



EMC TEST REPORT

Test Report No. : KES-EM-22T0506
Date of Issue : Jun. 23, 2022
Product name : PC NVR
Model/Type No. : PRO-7510B4
Variant Model : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea
Manufacturer : Dream I System co.,Ltd.
Manufacturer Address : #510.Daerung Post Tower 6. 50-3 Gasan-dong, Geumcheon-gu,
Seoul, Korea
Date of Receipt : Jun. 13, 2022
Test date : Jun. 16, 2022 ~ Jun. 17, 2022
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

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EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

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

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 23, 2022	KES-EM-22T0506	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Features/Performance			
operating system		Windows 10 IoT Enterprise LTSC	
CMS		SSM Server preinstalled (v2.10.13)	
software	camera	input	Max. 360CH
		resolution	CIF ~ 12MP
		protocol	Wisenet, ONVIF Profile-S
		registration	Auto Discovery, Manual
		Set	Automatic device IP scanning, Add profile edit, Resolution, Fisheye dewarping mode, Hallway View Setup, Brightness/Contrast, Viewing the device settings(Device webpage), Exporting/Importing devices settings,, Updating the device firmware
	live	monitor output RLSM	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 type	Video loss, Camera event(Sensor, MD, Passing, Entering, Exiting, Disappearing (Appearing), Tampering, Tracking, Face Detection, Audio Detection)
		event action	Instant Viewer, Preset, Alarm Out, Pop-up, Sound and E-mail notification
	search / play	playback bandwidth	via SSM Workstation
		search mode	via SSM Workstation
		Simultaneous play	via SSM Workstation

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		playback control	via SSM Workstation
	back up	file format	AVI, SEC
		function	Manual Backup, Onetime Schedule Backup
	video	compression method	H.265, H.264, MJPEG, WiseStream(H.264, H.265)
		resolution	CIF ~ 12MP
		decoding performance	via SSM Workstation
		Fish Eye Dewarping	via SSM Workstation
	audio	compression method	G.711 u-law(PCM), G723, G726(ADPCM), AAC
		support	2-way
	Date/Time Synchronization		NTP Server
	PTZ	Control	via SSM Workstation
		preset	via SSM Workstation
	system stability	Failover / ARB	Yes(Active&Active)/Yes
	server clustering		Max 28EA (Server Clustering up-to Max 10,000 channels)
	system control		Mouse, Controller
	log information		System, Event, User, Device 180 Days
hardware	PROCESSOR		Intel® Xeon® Processor E3-1275V5(4C, 3.6Ghz)
	MEMORY		8GB ECC Memory DDR4 PC-17000 * 4
	OS DISK		M.2 SSD (2@128GB)(For OS _ Raid 10)
	DRIVER TYPE		NL-SAS / SAS 12Gb/s, SATA 6Gb/s (Recommended to use NL-SAS/SAS for stable performance)
	HDD		16Bay 3.5" HDD / 2.5" M.2 (Maximum Storage 288Tbye, 18TB*16=288Tbyte)
	RAID		Host Raid Controlle Onboard Raid 0, 1, 5, 6,
	DISPLAY PORT		VGA x 1, DVI x 1, HDMI x 1

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	NETWORK	Gigabit Ethernet RJ-45 (1000 Base-T) x4 (2 ports on board, 2 ports on the Additional NIC)
Power / Environment / Appliance		
Electric	AC INPUT	100 ~ 240VAC, 50 ~ 60Hz
	POWER SUPPLY	2@800W Dual
	CURRENT(Max)	8-4A
Environmental	OPERATING	+5°C to +40°C(+41°F to +104°F) / Less than 80%
Mechanical	COLOR/MATERIAL	Silver/Metal
	FORM FACTOR	3U, 19" Rackmount
	DIMENSIONS (WxHxD)	446.7 x 130.9 x 503.1mm
	WEIGHT	System W/O HDD: 17.6 kg
Warranty	WARRANTY	3 Years limited warranty

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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
PC NVR	PRO-7510B4	-	Dream I System co.,Ltd.	EUT
CPU	Intel® Xeon® Processor E3-1275 V5	-	Intel	1 EA
SMPS	U1A-D10800-DRB	-	Shenzhen Honor Electronics Co.,Ltd.	2 EA
Mainboard	115XSBP	-	FOXCONN	1 EA
SSD	IM2S3338-128GD	-	ADATA Technology Co., Ltd	2 EA
RAM	AD4U240038G17-BSSB	-	ADATA Technology Co., Ltd	2 EA
Network Adapter	00AG522	-	IBM	1 EA



1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Monitor1	LG15N54	503NZWY038929	LG	-
Monitor2	HSTND-7041-L	6CM6020YQQ	HP Inc.	-
Monitor3	QTM-OR24.9WB	-	Orion Information and Communication Co., Ltd.	-
Camera	QNO-7010RP	-	HANWHA TECHWIN CO.,LTD.	-
Camera Adapter	ATS065T-P120	-	Adapter Techonlogy Co., Ltd.	-
Keyboard1	SKP-900B	-	Samsung	-
Headset	K550	-	Britz®	-
USB Memory	-	-	SONY	64 GB
USB Memory	-	-	SONY	64 GB
Optical Speaker	BZ-T3400 AV Soundbar	-	AVIM AUDIO	-
Router	V504	-	ipTIME	-
Router Adapter	M090080E811	-	MOST Optoelectronics International Limited	-
PC	-	-	DELL	-
Monitor4	27UL550	105NTHM9Z249	LG Electronics Nanjing New Technology Co.,Ltd	-
Monitor4 Adapter	LCAP26B-E	-	Genmao Electronics (Suzhou) Co.,Ltd	-
Keyboard2	SPR-8695TU	-	SEJIN ELECTRON INC.	-
Mouse	1113	-	Microsoft	-
HDD	ST1200NM004J	-	Seagate Technology LLC	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
PC NVR (EUT)	HDMI	Monitor1	HDMI	1.5	S
	D-SUB	Monitor2	D-SUB	2.0	S
	DVI	Monitor3	DVI	2.0	S
	RJ-45	Camera	RJ-45	3.0	U
	RJ-45	Router	RJ-45	4.0	U
	PS/2	Mouse	PS/2	1.4	U
	USB	Keyboard1	USB	1.5	U
	MIC	Headset	Line-Out (3.5 mm)	1.4	U
	Speaker				
	USB	USB Memory	USB	-	-
	USB	USB Memory	USB	-	-
	Optical	Optical Speaker	Optical	1.0	-
PC	USB	Keyboard2	USB	1.2	U
	RJ-45	Router	RJ-45	3.0	U
	HDMI	Monitor4	HDMI	1.5	S
Camera	DC Jack (2 Pin)	Camera Adapter	DC Jack (2 Pin)	1.0	U
Router	DC Jack	Router Adapter	DC Jack	1.0	U
Monitor4	DC Jack	Monitor4 Adapter	DC Jack	1.2	U

* Unshielded=U, Shielded=S

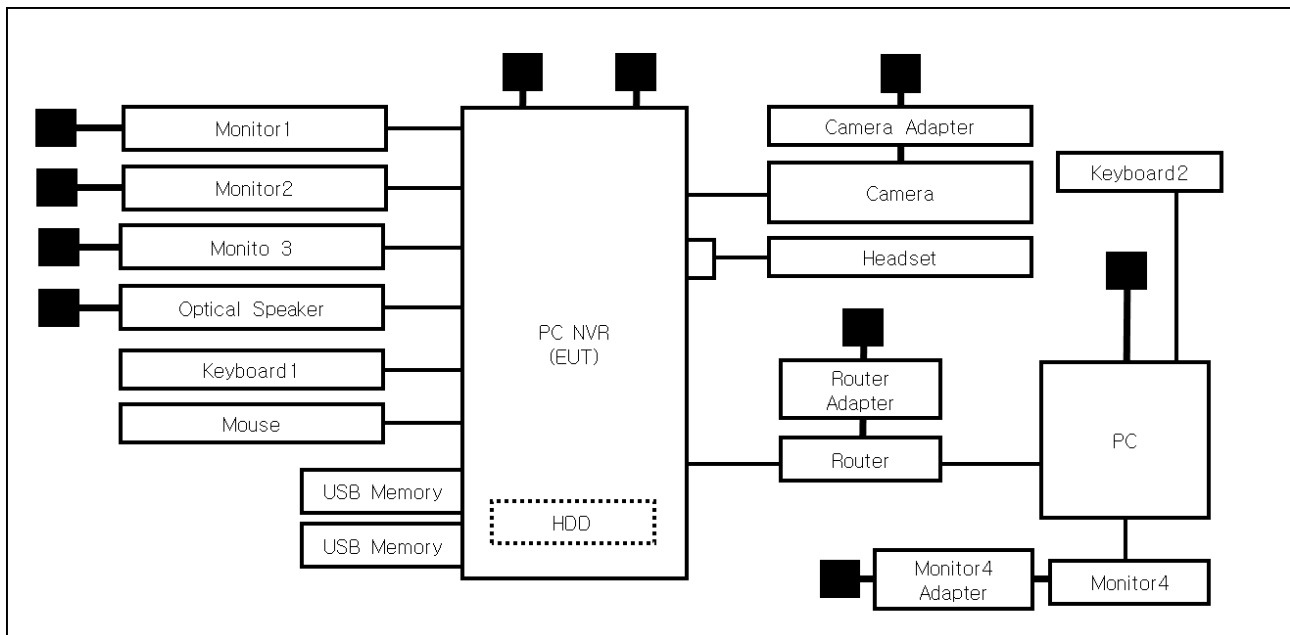
1.7 EUT Operating Mode(s)

Test Mode	operating
Operation	- In the test equipment, using the SSM Console program, it was checked whether the image of the camera connected to the test equipment was output normally. - Repeated reading/writing of data in connected memories using EMI TOOL program. - By playing the color bar on the test equipment, it was confirmed that the monitor outputs normally and that the 1 kHz tone sound is normally output from the headset.

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

1.8 Configuration

■ AC Main
 □ DC Main



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1.9 Remarks when standards applied

Optical Port was excluded from testing because it is the management port.

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. 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 , 10 m Open Area 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, 10 m Open Area and 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	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	 R-20056, C-20036, T-20040, G-20057
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area 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

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

☒ **EMC – Regulations 2016**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013



2.1 Conducted Emissions at Mains Power Ports

Test Date

Jun. 16, 2022

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	12, 28, 2022
☒	LISN	ENV216	R & S	101787	12, 27, 2022
☒	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022

Test Conditions

Temperature: (24,1 ± 0,3) °C

Relative Humidity: (44,3 ± 0,3) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.2 Conducted Emissions at Telecommunication Ports

Test Date

Jun. 16, 2022

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	12, 28, 2022
☒	LISN	ENV216	R & S	101787	12, 27, 2022
☒	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 28, 2022
☒	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	12, 28, 2022

Test Conditions

Temperature: (24,4 ± 0,3) °C

Relative Humidity: (44,6 ± 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

Remarks

- See Appendix A for test data.
- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jun. 16, 2022

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	03, 31, 2023
☒	AMPLIFIER	SCU 01	R & S	100603	11, 24, 2022
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 08, 2023

Test Conditions

Temperature: (24,4 ± 0,4) °C
Relative Humidity: (44,6 ± 0,3) % 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

Jun. 17, 2022

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, 31, 2023
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	12, 16, 2022
☒	PREAMPLIFIER	8449B	HP	3008A00538	06, 02, 2023

Test Conditions

Temperature: (23,5 ± 0,3) °C

Relative Humidity: (44,6 ± 0,3) % 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.



2.5 Harmonic Current Emissions

Test Date

Jun. 16, 2022

Test Location

Electro wave Shieldroom #3

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	04, 06, 2023
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (22,8 ± 0,2) °C
Relative Humidity: (44,5 ± 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

Remarks

See Appendix A for test data.



2.6 Voltage Fluctuations and Flicker

Test Date

Jun. 16, 2022

Test Location

Electro wave Shieldroom #3

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	04, 06, 2023
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (23,0 ± 1,0) °C
Relative Humidity: (44,6 ± 1,0) % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:
EN 50130-4:2011 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

Jun. 17, 2022

Test Location

EMS-ESD: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	02, 24, 2023
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (24,7 ± 0,3) °C
Relative Humidity: (44,0 ± 0,2) % R.H.
Atmospheric Pressure: (99,6 ± 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

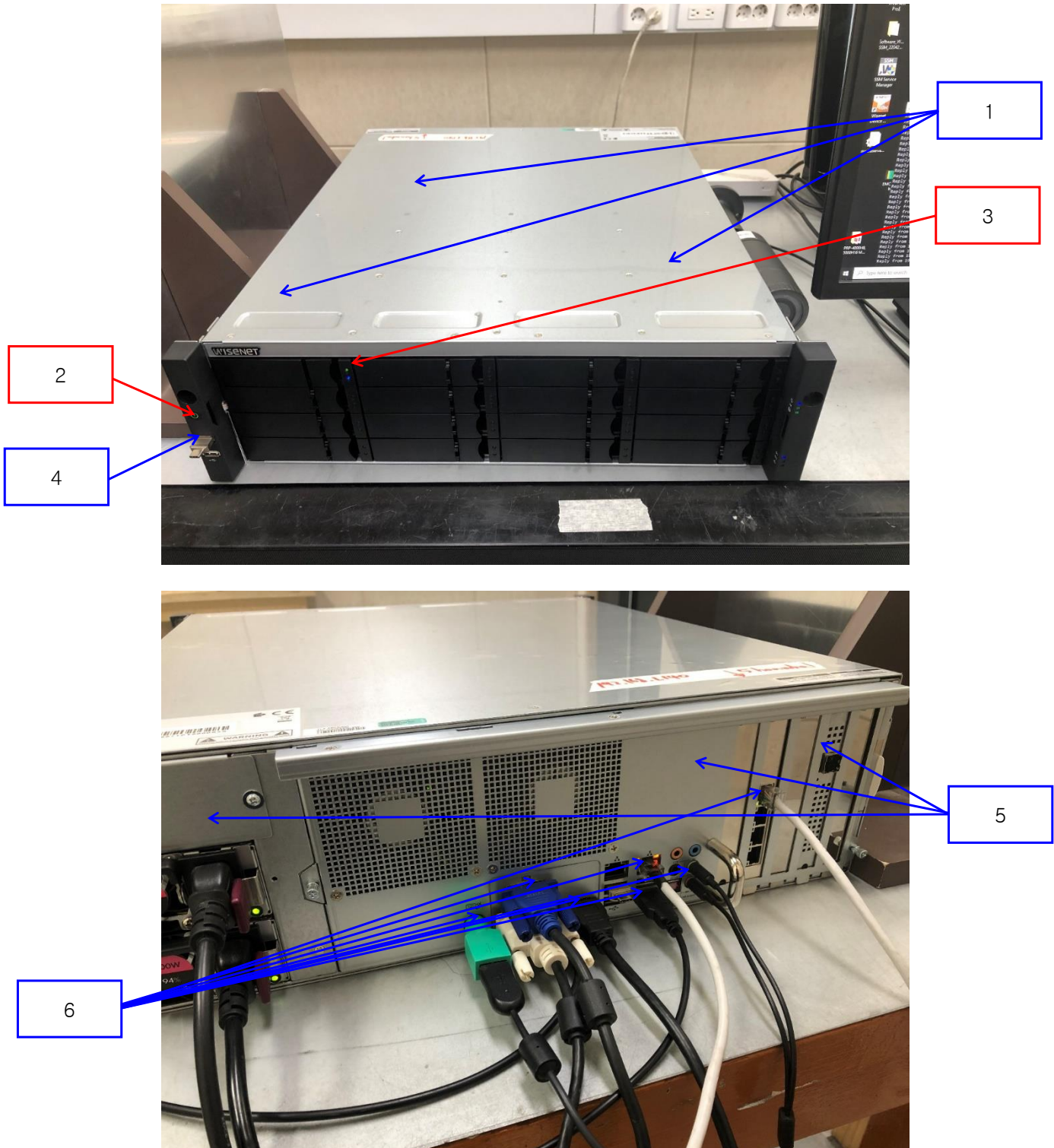
Discharge Voltage:	Contact	Air	HCP	VCP
	☐ 2 kV	☒ 2 kV	☐ 2 kV	☐ 2 kV
	☐ 4 kV	☒ 4 kV	☐ 4 kV	☐ 4 kV
	☒ 6 kV	☐ 6 kV	☒ 6 kV	☒ 6 kV
	☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
	☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

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

Required Performance Criteria: ☒ Complied

Location of Discharge:

Air
Contact



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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	Contact Discharge	Complied	-
2	Button	Air Discharge	Complied	-
3	LED	Air Discharge	Complied	-
4	Front port	Contact Discharge	Complied	-
5	Rear Enclosure	Contact Discharge	Complied	-
6	Back port	Contact 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

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3.2 Radiated Electric Field Immunity

Reference Standard

EN IEC 61000-4-3:2020

Test Date

Jun. 17, 2022

Test Location

EMS-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	08, 03, 2022
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	03, 31, 2023
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	04, 04, 2023
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	04, 04, 2023
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 03, 2023

Test Conditions

Temperature: (24,7 ± 1,2) °C
Relative Humidity: (44,2 ± 1,2) % R.H.
Atmospheric Pressure: (100,0 ± 0,0) kPa



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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

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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

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3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Jun. 17, 2022

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	12, 03, 2022
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	03, 31, 2023
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	12, 03, 2022

Test Conditions

Temperature: (24,7 ± 0,4) °C
Relative Humidity: (44,0 ± 0,3) % R.H.
Atmospheric Pressure: (99,6 ± 0,0) kPa

Test Specifications

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

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

Jun. 17, 2022

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	12, 03, 2022
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	03, 31, 2023
☒	CDN	CNV 508N1	EM TEST	P1610176296	12, 03, 2022

Test Conditions

Temperature: (24,9 ± 1,2) °C
Relative Humidity: (44,2 ± 1,1) % R.H.
Atmospheric Pressure: (99,6 ± 0,0) kPa



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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

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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 (2)	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
☐ NOT APPLICABLE

Remarks

PASS Required Performance Criteria

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3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Jun. 17, 2022

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, 24, 2022
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 24, 2022
☒	CDN	CDN M016	TESEQ	43694	11, 24, 2022
☒	CDN	CDN M016	TESEQ	43697	11, 24, 2022
☒	CDN	CDN T8RJ45	EM TEST	0909-09	08, 03, 2022
☐	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 25, 2022

Test Conditions

Temperature: (24,5 ± 1,2) °C
Relative Humidity: (44,0 ± 1,1) % R.H.
Atmospheric Pressure: (99,7 ± 0,0) kPa



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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

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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
Jun. 17, 2022

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	03, 31, 2023
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	03, 31, 2023

Test Conditions

Temperature: (24,5 ± 0,2) °C
Relative Humidity: (44,1 ± 0,2) % R.H.
Atmospheric Pressure: (99,6 ± 0,0) 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 by no operator's intervention.



APPENDIX A – TEST DATA

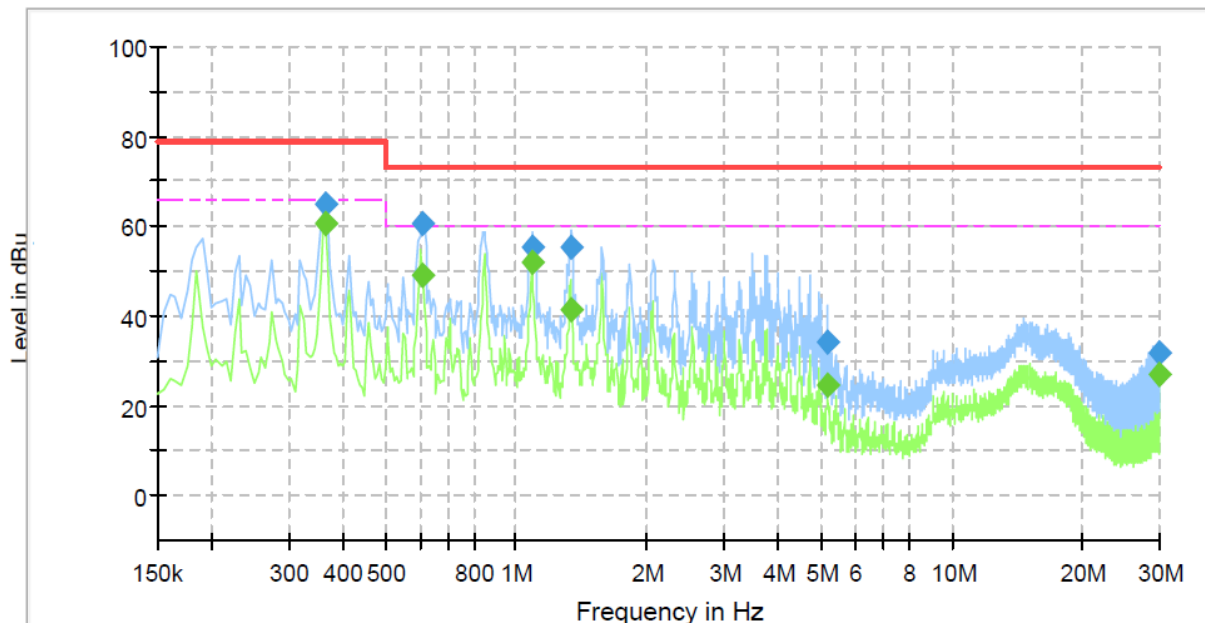
Conducted Emissions at Mains Power Ports

- POWER 1

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	PRO-7510B4
Phase:	L1
Mode:	Power1
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.365000	---	60.63	66.00	5.37	1000.0	9.000	L1	19.6
0.365000	65.08	---	79.00	13.92	1000.0	9.000	L1	19.6
0.610000	---	48.85	60.00	11.15	1000.0	9.000	L1	19.8
0.610000	60.41	---	73.00	12.59	1000.0	9.000	L1	19.8
1.085000	---	51.81	60.00	8.19	1000.0	9.000	L1	20.1
1.085000	55.44	---	73.00	17.56	1000.0	9.000	L1	20.1
1.340000	---	41.61	60.00	18.39	1000.0	9.000	L1	20.2
1.340000	55.10	---	73.00	17.90	1000.0	9.000	L1	20.2
5.200000	---	24.76	60.00	35.24	1000.0	9.000	L1	19.6
5.200000	34.17	---	73.00	38.83	1000.0	9.000	L1	19.6
29.885000	---	27.13	60.00	32.87	1000.0	9.000	L1	20.3
29.885000	31.60	---	73.00	41.40	1000.0	9.000	L1	20.3

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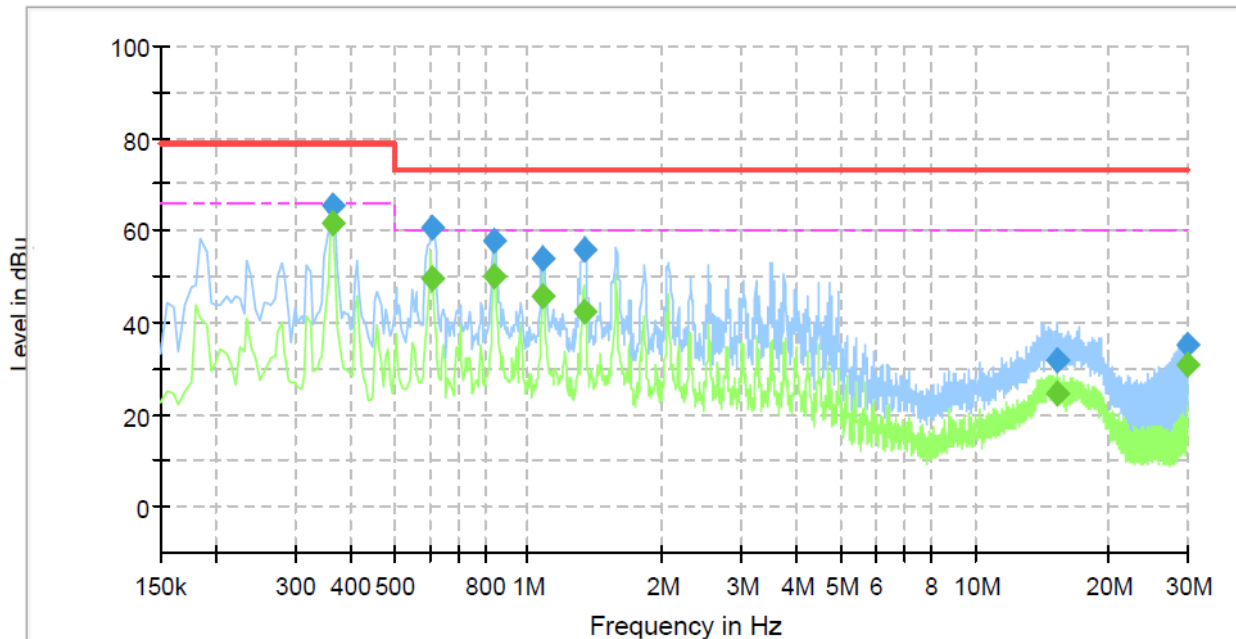
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[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: PRO-7510B4
Phase: N
Mode: Power1
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.365000	65.24	---	79.00	13.76	1000.0	9.000	N	19.6
0.365000	---	61.34	66.00	4.66	1000.0	9.000	N	19.6
0.610000	---	49.71	60.00	10.29	1000.0	9.000	N	19.8
0.610000	60.75	---	73.00	12.25	1000.0	9.000	N	19.8
0.840000	57.52	---	73.00	15.48	1000.0	9.000	N	20.0
0.840000	---	50.27	60.00	9.73	1000.0	9.000	N	20.0
1.080000	---	45.91	60.00	14.09	1000.0	9.000	N	20.1
1.080000	53.81	---	73.00	19.19	1000.0	9.000	N	20.1
1.340000	---	42.38	60.00	17.62	1000.0	9.000	N	20.2
1.340000	55.88	---	73.00	17.12	1000.0	9.000	N	20.2
15.265000	---	24.78	60.00	35.22	1000.0	9.000	N	19.9
15.265000	31.93	---	73.00	41.07	1000.0	9.000	N	19.9
29.840000	---	30.73	60.00	29.27	1000.0	9.000	N	20.4
29.840000	35.10	---	73.00	37.90	1000.0	9.000	N	20.4

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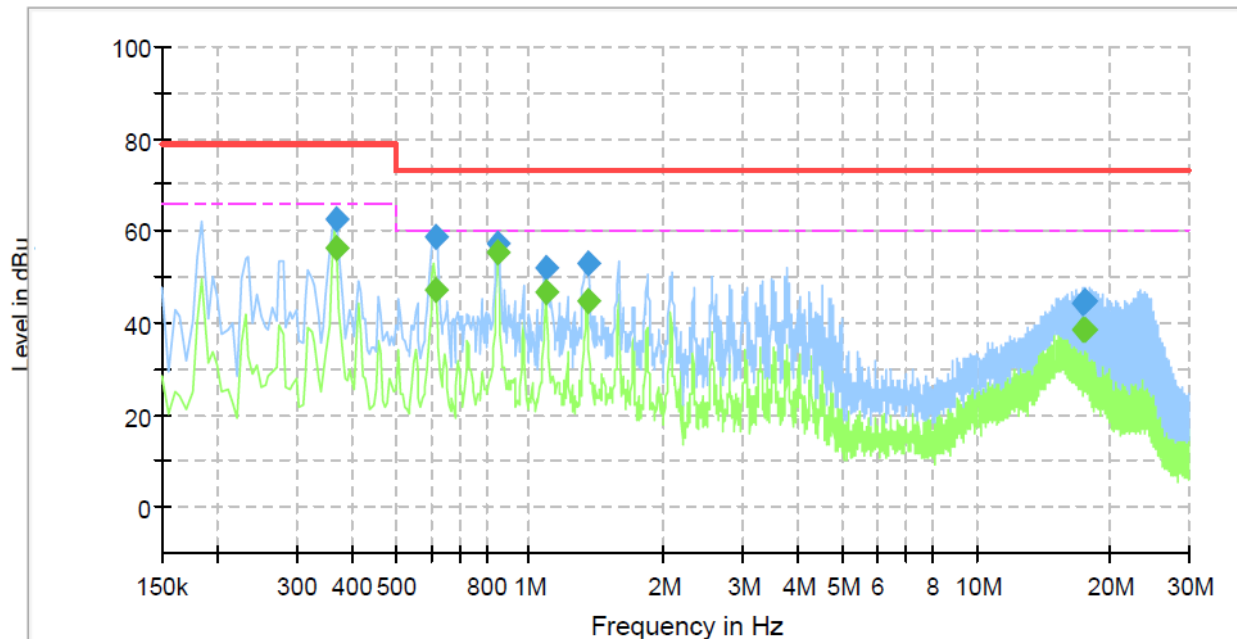
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- POWER 2

[HOT]

Common Information

Test Description: Conducted Emission
Model No.: PRO-7510B4
Phase: L1
Mode: Power2
Operator Name: KES



Final Result

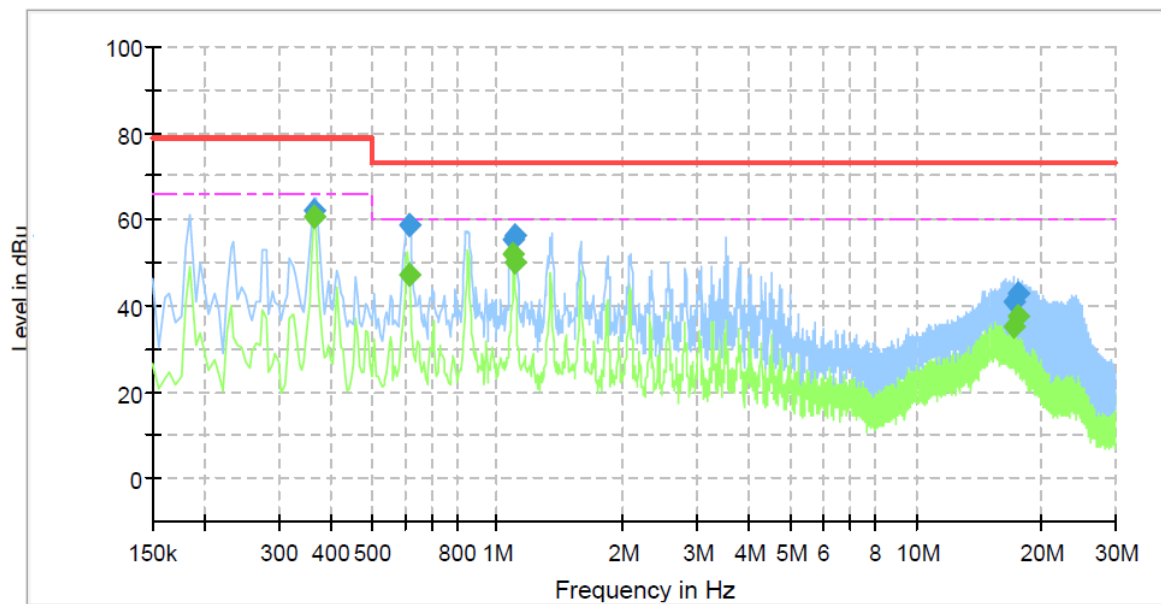
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.370000	62.77	---	79.00	16.23	1000.0	9.000	L1	19.6
0.370000	---	56.37	66.00	9.63	1000.0	9.000	L1	19.6
0.615000	---	47.18	60.00	12.82	1000.0	9.000	L1	19.8
0.615000	58.58	---	73.00	14.42	1000.0	9.000	L1	19.8
0.850000	57.35	---	73.00	15.65	1000.0	9.000	L1	20.0
0.850000	---	55.10	60.00	4.90	1000.0	9.000	L1	20.0
1.090000	---	46.54	60.00	13.46	1000.0	9.000	L1	20.1
1.090000	52.11	---	73.00	20.89	1000.0	9.000	L1	20.1
1.345000	---	44.54	60.00	15.46	1000.0	9.000	L1	20.2
1.345000	52.96	---	73.00	20.04	1000.0	9.000	L1	20.2
17.340000	---	38.68	60.00	21.32	1000.0	9.000	L1	19.9
17.340000	44.35	---	73.00	28.65	1000.0	9.000	L1	19.9
17.480000	---	38.71	60.00	21.29	1000.0	9.000	L1	20.0
17.480000	44.72	---	73.00	28.28	1000.0	9.000	L1	20.0

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[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	PRO-7510B4
Phase:	N
Mode:	Power2
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.365000	---	60.38	66.00	5.62	1000.0	9.000	N	19.6
0.365000	62.05	---	79.00	16.95	1000.0	9.000	N	19.6
0.615000	---	47.13	60.00	12.87	1000.0	9.000	N	19.8
0.615000	58.55	---	73.00	14.45	1000.0	9.000	N	19.8
1.095000	---	51.85	60.00	8.15	1000.0	9.000	N	20.1
1.095000	55.24	---	73.00	17.76	1000.0	9.000	N	20.1
1.100000	---	50.02	60.00	9.98	1000.0	9.000	N	20.1
1.100000	56.26	---	73.00	16.74	1000.0	9.000	N	20.1
17.160000	---	35.08	60.00	24.92	1000.0	9.000	N	19.9
17.160000	41.09	---	73.00	31.91	1000.0	9.000	N	19.9
17.525000	---	37.51	60.00	22.49	1000.0	9.000	N	20.0
17.525000	43.05	---	73.00	29.95	1000.0	9.000	N	20.0

◆ 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))

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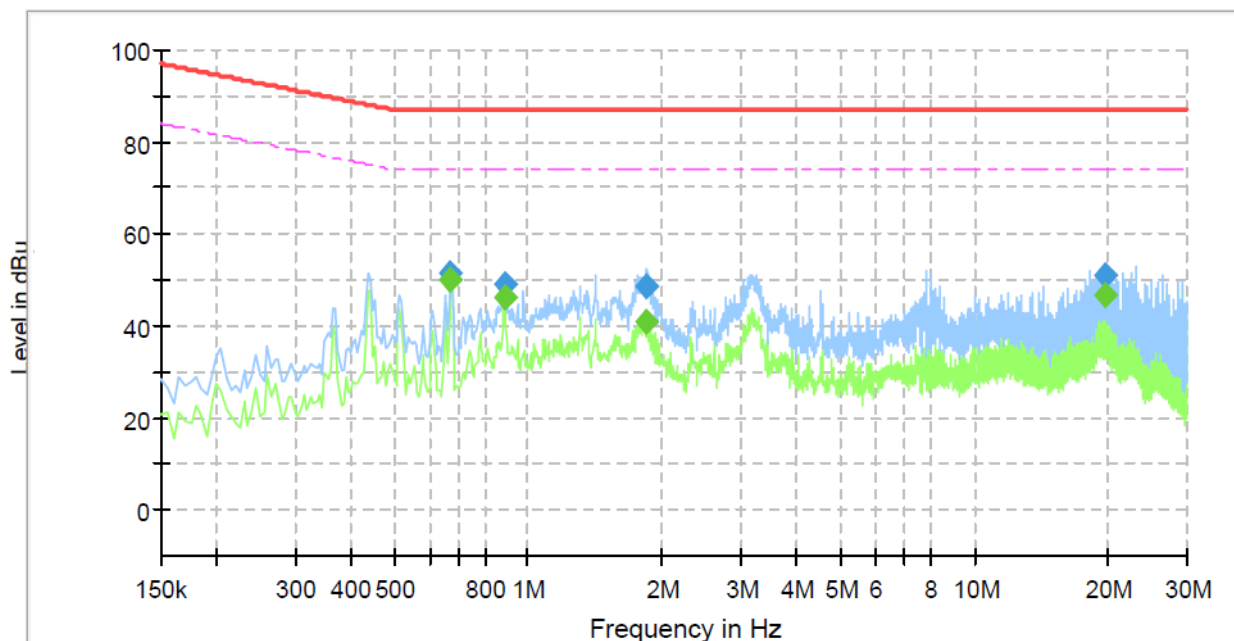
Conducted Emissions at Telecommunication Ports

- Main

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PRO-7510B4
Mode : Main
Speed : 1000
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.670000	---	49.87	74.00	24.13	1000.0	9.000	Single Line	19.8
0.670000	51.41	---	87.00	35.59	1000.0	9.000	Single Line	19.8
0.885000	---	45.97	74.00	28.03	1000.0	9.000	Single Line	20.0
0.885000	48.85	---	87.00	38.15	1000.0	9.000	Single Line	20.0
1.850000	---	40.93	74.00	33.07	1000.0	9.000	Single Line	20.1
1.850000	48.46	---	87.00	38.54	1000.0	9.000	Single Line	20.1
19.710000	---	46.70	74.00	27.30	1000.0	9.000	Single Line	19.8
19.710000	50.84	---	87.00	36.16	1000.0	9.000	Single Line	19.8

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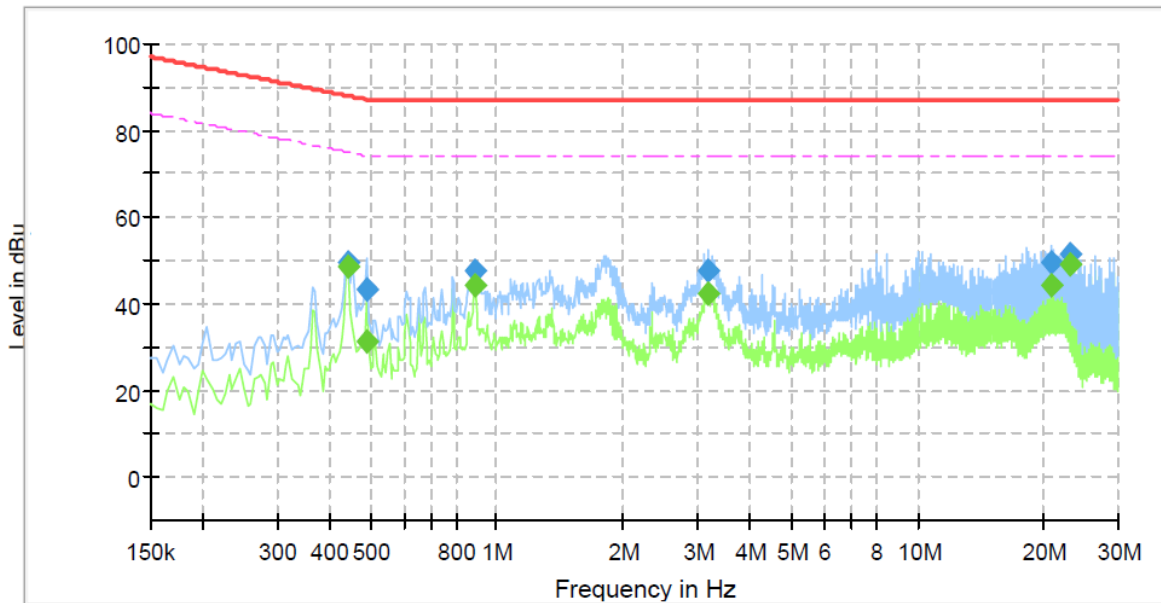
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- SUB

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PRO-7510B4
Mode :	SUB
Speed :	1000
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.445000	---	48.75	74.97	26.22	1000.0	9.000	Single Line	19.7
0.445000	49.73	---	87.97	38.24	1000.0	9.000	Single Line	19.7
0.490000	---	31.39	74.17	42.78	1000.0	9.000	Single Line	19.7
0.490000	43.54	---	87.17	43.63	1000.0	9.000	Single Line	19.7
0.890000	---	44.11	74.00	29.89	1000.0	9.000	Single Line	20.0
0.890000	47.41	---	87.00	39.59	1000.0	9.000	Single Line	20.0
3.185000	---	42.54	74.00	31.46	1000.0	9.000	Single Line	19.9
3.185000	47.84	---	87.00	39.16	1000.0	9.000	Single Line	19.9
20.810000	---	44.44	74.00	29.56	1000.0	9.000	Single Line	19.9
20.810000	49.43	---	87.00	37.57	1000.0	9.000	Single Line	19.9
23.130000	---	49.08	74.00	24.92	1000.0	9.000	Single Line	19.9
23.130000	51.34	---	87.00	35.66	1000.0	9.000	Single Line	19.9

◆ 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))

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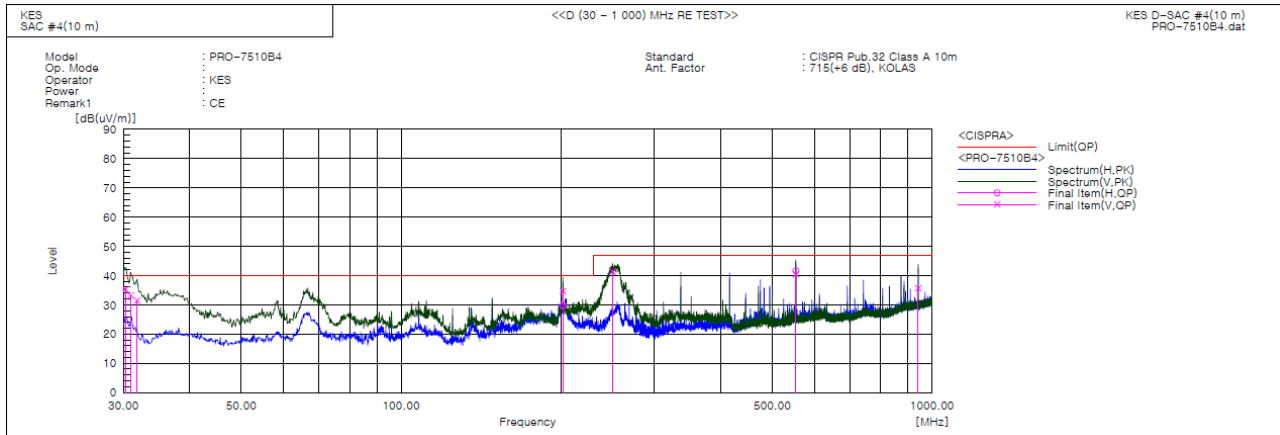


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Radiated Electric Field Emissions(Below 1 GHz)



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	30.243	V	60.6	-25.3	35.3	40.0	4.7	101.0	41.0	
2	30.970	V	58.4	-25.2	33.2	40.0	6.8	104.0	82.0	
3	31.819	V	56.5	-25.0	31.5	40.0	8.5	100.0	267.0	
4	201.690	V	55.5	-20.9	34.6	40.0	5.4	197.0	192.0	
5	201.690	H	50.6	-20.9	29.7	40.0	10.3	366.0	204.0	
6	250.190	V	60.7	-19.3	41.4	47.0	5.6	111.0	170.0	
7	554.043	V	50.6	-10.1	40.5	47.0	6.5	100.0	237.0	
8	554.043	H	51.8	-10.1	41.7	47.0	5.3	346.0	356.0	
9	941.558	V	39.5	-3.8	35.7	47.0	11.3	209.0	309.0	

◆ Calculation – SEMI ANECHOIC CHAMBER #4(10 m)

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

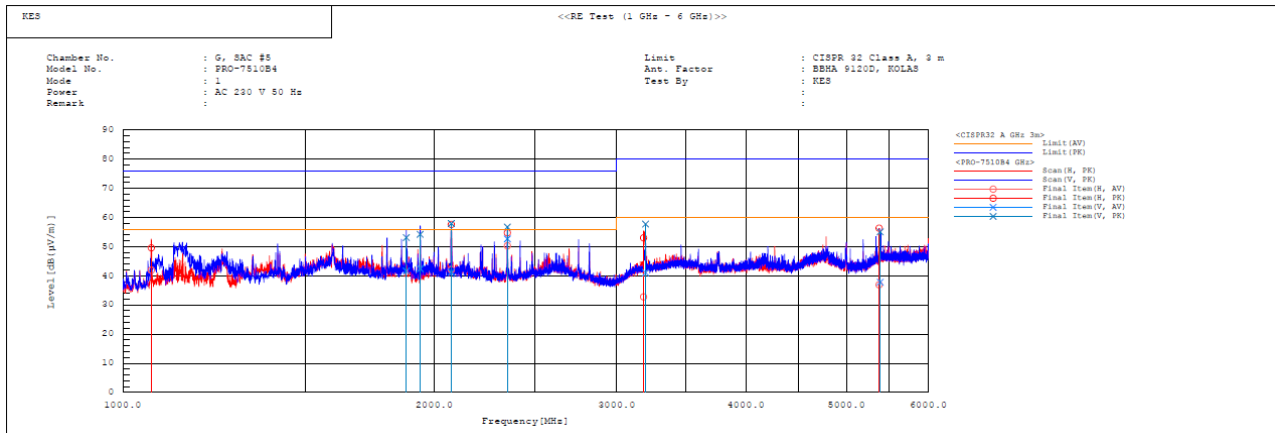


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KES-EM-22T0506
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Radiated Electric Field Emissions(Above 1 GHz)



Final Result

No.	Range	Frequency	Pol	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin	Height	Angle	Remark
		[MHz]		AV	PK		AV	PK	AV	PK	AV	PK	[cm]	[deg]	
1	Range1	1065.500	H	49.3	57.0	-7.4	41.9	49.6	56.0	76.0	14.1	26.4	100.0	16.3	
2	Range1	1879.000	V	44.9	56.4	-3.3	41.6	53.1	56.0	76.0	14.4	22.9	100.0	0.1	
3	Range1	1938.500	V	45.4	57.2	-3.0	42.4	54.2	56.0	76.0	13.6	21.8	100.0	294.1	
4	Range1	2077.000	H	44.6	60.1	-2.5	42.1	57.6	56.0	76.0	13.9	18.4	100.0	248.4	
5	Range1	2077.000	V	43.9	60.4	-2.5	41.3	57.9	56.0	76.0	14.7	18.1	100.0	352.0	
6	Range1	2353.500	H	51.9	56.4	-1.6	50.3	54.8	56.0	76.0	5.7	21.2	100.0	39.8	
7	Range1	2353.500	V	54.2	58.3	-1.6	52.6	56.7	56.0	76.0	3.4	19.3	100.0	24.8	
8	Range1	3185.000	H	31.3	51.6	1.4	32.7	53.0	60.0	80.0	27.3	27.0	100.0	39.5	
9	Range1	3200.000	V	39.5	56.2	1.5	41.0	57.7	60.0	80.0	19.0	22.3	100.0	359.5	
10	Range1	5379.000	H	28.7	48.2	8.2	36.9	56.4	60.0	80.0	23.1	23.6	100.0	59.8	
11	Range1	5392.500	V	29.5	46.8	8.3	37.8	55.1	60.0	80.0	22.2	24.9	100.0	18.6	

◆ 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

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Harmonic Current Emissions and Voltage Fluctuations and Flicker

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.545			
2	0.007	0.630	1.080	PASS
3	0.065	2.839	2.300	PASS
4	0.002	0.467	0.430	n/a
5	0.060	5.231	1.140	PASS
6	0.004	1.206	0.300	n/a
7	0.042	5.404	0.770	PASS
8	0.002	0.795	0.230	n/a
9	0.039	9.745	0.400	PASS
10	0.002	1.115	0.184	n/a
11	0.027	8.075	0.330	PASS
12	0.002	1.302	0.153	n/a
13	0.023	11.189	0.210	PASS
14	0.002	1.492	0.131	n/a
15	0.015	10.115	0.150	PASS
16	0.002	1.682	0.115	n/a
17	0.019	14.225	0.132	PASS
18	0.002	1.617	0.102	n/a
19	0.014	11.807	0.118	PASS
20	0.002	2.262	0.092	n/a
21	0.010	6.131	0.161	PASS
22	0.002	2.126	0.084	n/a
23	0.013	8.718	0.147	PASS
24	0.002	3.007	0.077	n/a
25	0.013	9.760	0.135	PASS
26	0.002	2.935	0.071	n/a
27	0.011	9.054	0.125	PASS
28	0.002	2.768	0.066	n/a
29	0.008	6.901	0.116	PASS
30	0.001	2.149	0.061	n/a
31	0.007	6.748	0.109	PASS
32	0.002	3.032	0.058	n/a
33	0.006	6.329	0.102	PASS
34	0.002	3.456	0.054	n/a
35	0.010	10.460	0.096	PASS
36	0.002	4.295	0.051	n/a
37	0.010	10.545	0.091	PASS
38	0.002	4.494	0.048	n/a
39	0.007	7.528	0.087	PASS
40	0.002	4.273	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	0.554			
2	0.007	0.452	1.620	PASS
3	0.067	1.953	3.450	PASS
4	0.002	0.383	0.645	n/a
5	0.061	3.584	1.710	PASS
6	0.004	0.920	0.450	n/a
7	0.044	3.816	1.155	PASS
8	0.002	0.605	0.345	n/a
9	0.040	6.615	0.600	PASS
10	0.002	0.818	0.276	n/a
11	0.028	5.589	0.495	PASS
12	0.002	1.047	0.230	n/a
13	0.024	7.759	0.315	PASS
14	0.002	1.118	0.197	n/a
15	0.016	7.208	0.225	PASS
16	0.002	1.356	0.173	n/a
17	0.020	10.185	0.199	PASS
18	0.002	1.259	0.153	n/a
19	0.015	8.260	0.178	PASS
20	0.002	1.787	0.138	n/a
21	0.010	6.424	0.161	PASS
22	0.002	1.621	0.125	n/a
23	0.014	9.514	0.147	PASS
24	0.003	2.270	0.115	n/a
25	0.014	10.527	0.135	PASS
26	0.002	2.290	0.106	n/a
27	0.012	9.633	0.125	PASS
28	0.002	2.109	0.099	n/a
29	0.010	8.428	0.116	PASS
30	0.002	1.638	0.092	n/a
31	0.008	7.522	0.109	PASS
32	0.002	2.404	0.086	n/a
33	0.007	6.729	0.102	PASS
34	0.002	2.723	0.081	n/a
35	0.012	12.120	0.096	PASS
36	0.003	3.301	0.077	n/a
37	0.011	11.871	0.091	PASS
38	0.002	3.441	0.073	n/a
39	0.007	8.612	0.087	PASS
40	0.002	3.319	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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Report No.:
KES-EM-22T0506
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Test Data - Voltage Fluctuations

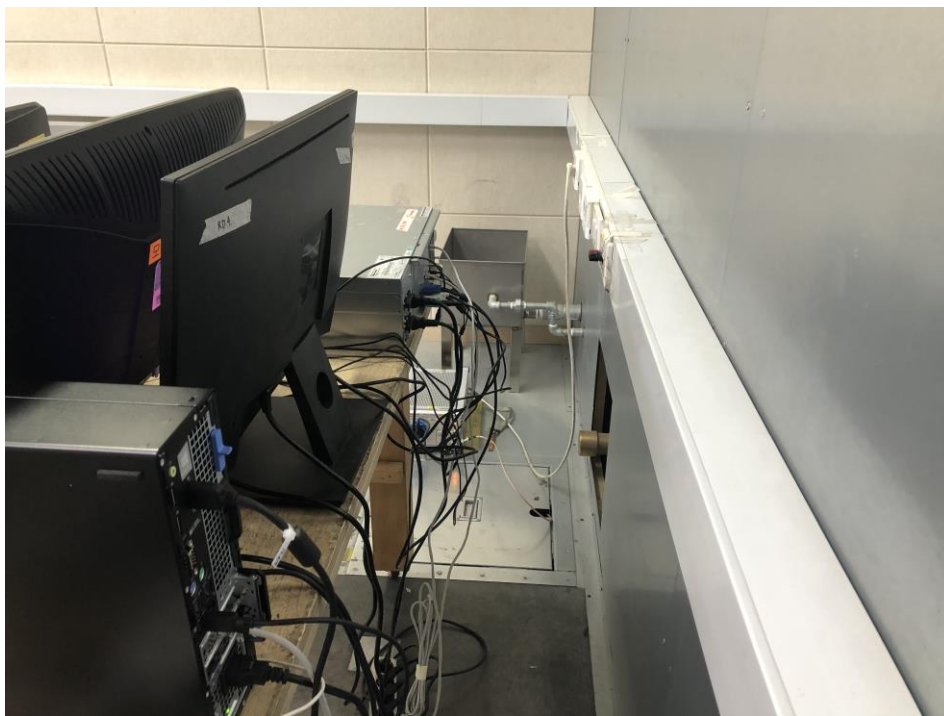
Maximum Flicker results

Flicker Measurements					
	Plt	Max Pst	Max Dc	Max Dmax	Max Tmax
Line 1:	0.028	0.028	0.012	< 0.2	0
Limits:	0.65	1	3.3	4	0.5
Results:	PASS	PASS	PASS	PASS	PASS

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Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



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Conducted Emissions at Telecommunication Ports



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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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Harmonic Current Emissions and Voltage Fluctuations and Flicker

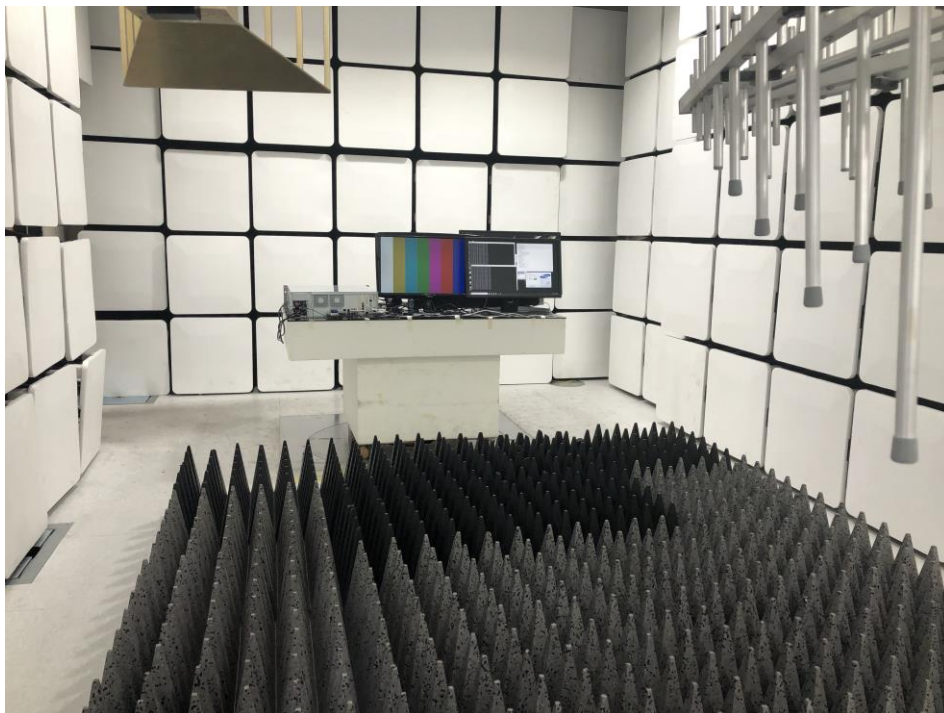


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Electrostatic Discharge



Radiated Electric Field Immunity



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Electrical Fast Transients/Bursts



Surge Transients



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Conducted Disturbance



Voltage Dips and Short Interruptions



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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

(Internal View)



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EUT Internal View – Main Board

(Top)



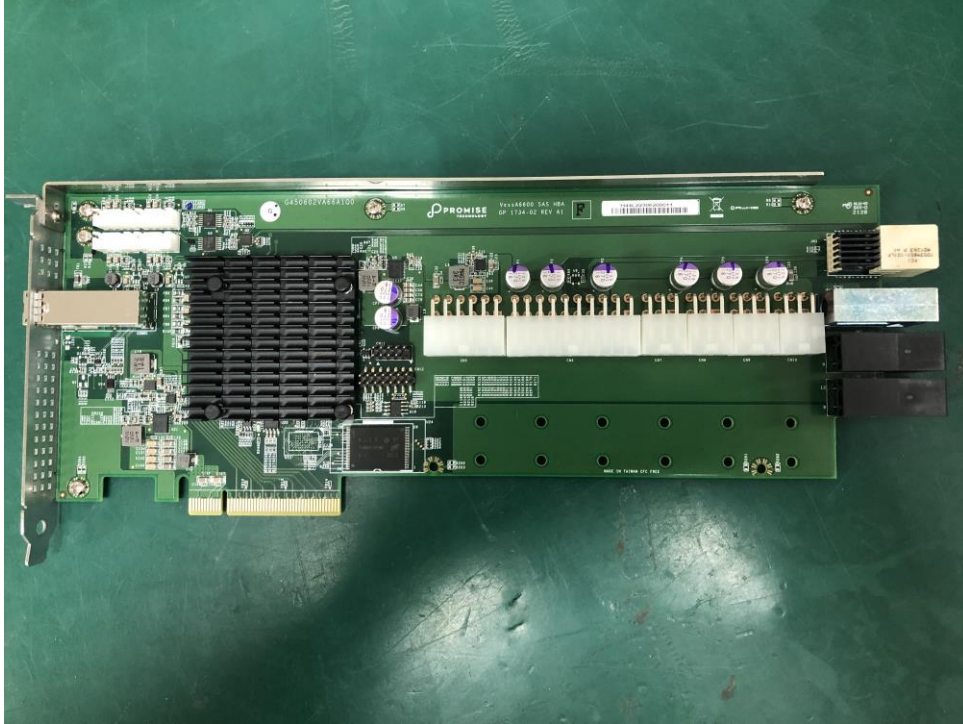
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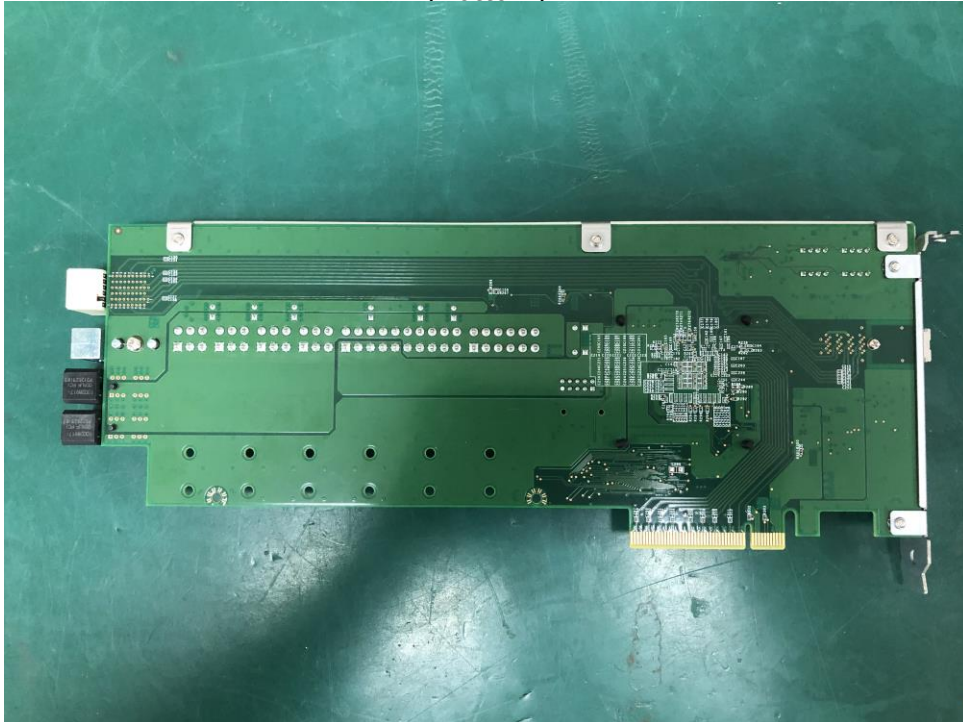
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EUT Internal View – Board 1

(Top)



(Bottom)



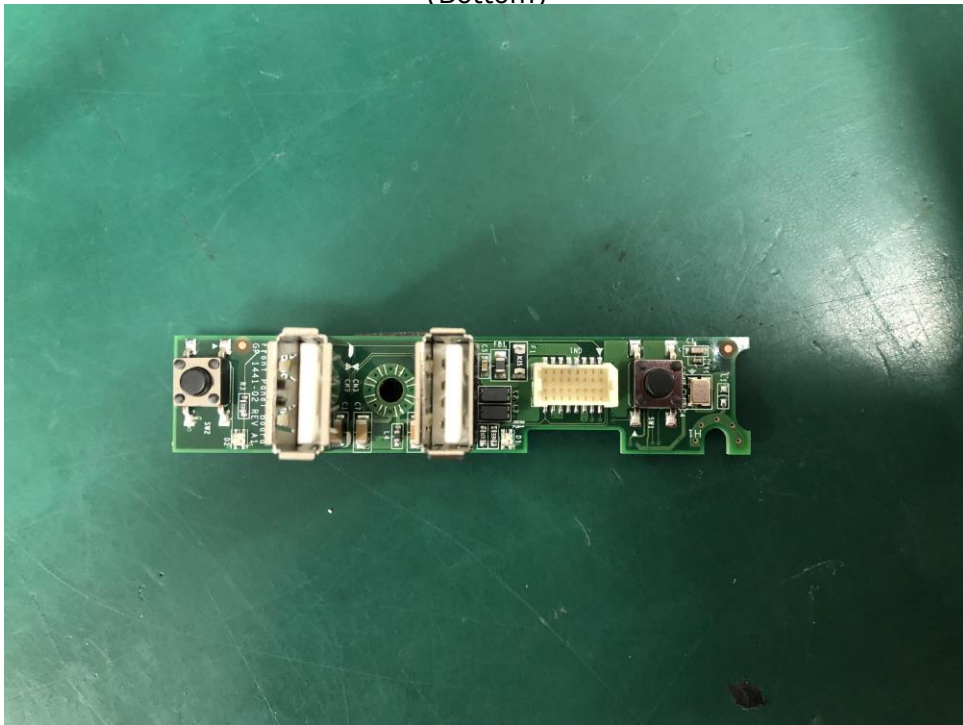
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EUT Internal View – Board 2

(Top)



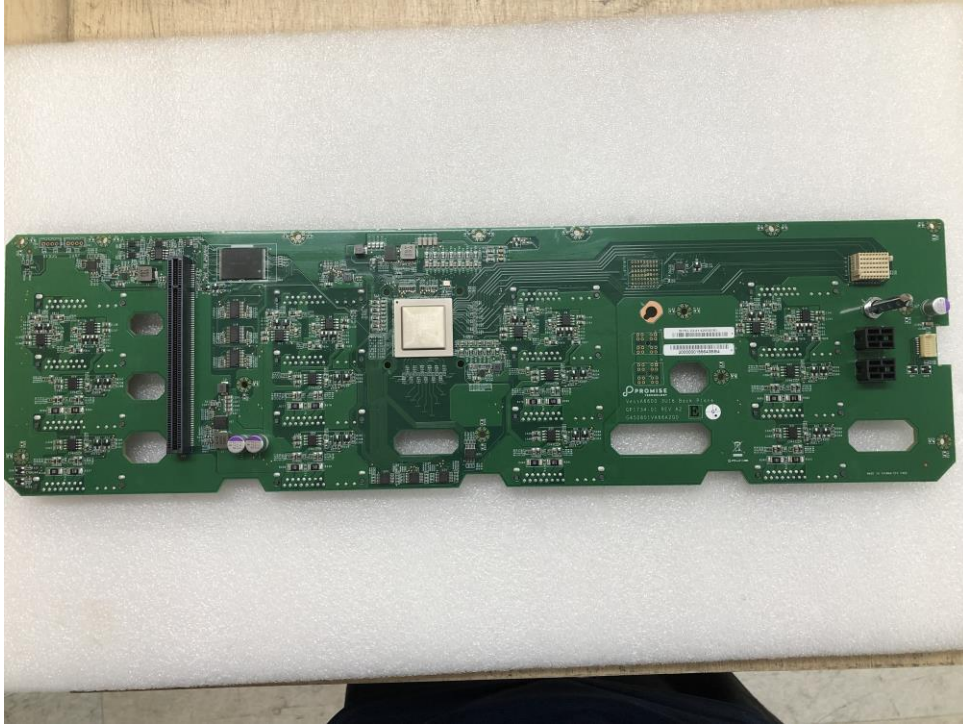
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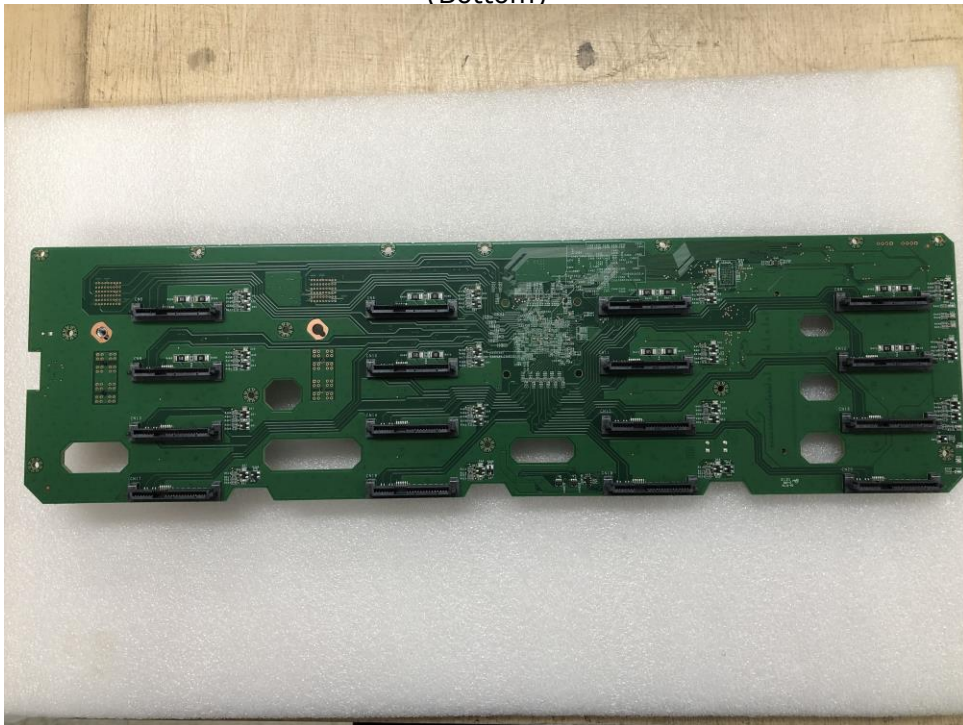
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EUT Internal View – Raid Board

(Top)



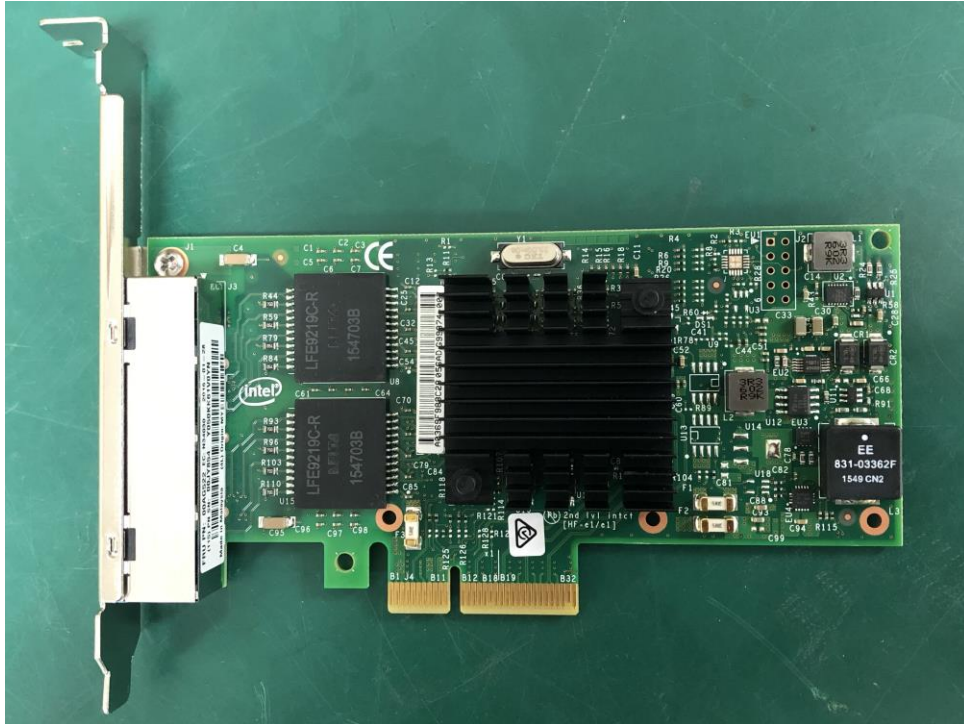
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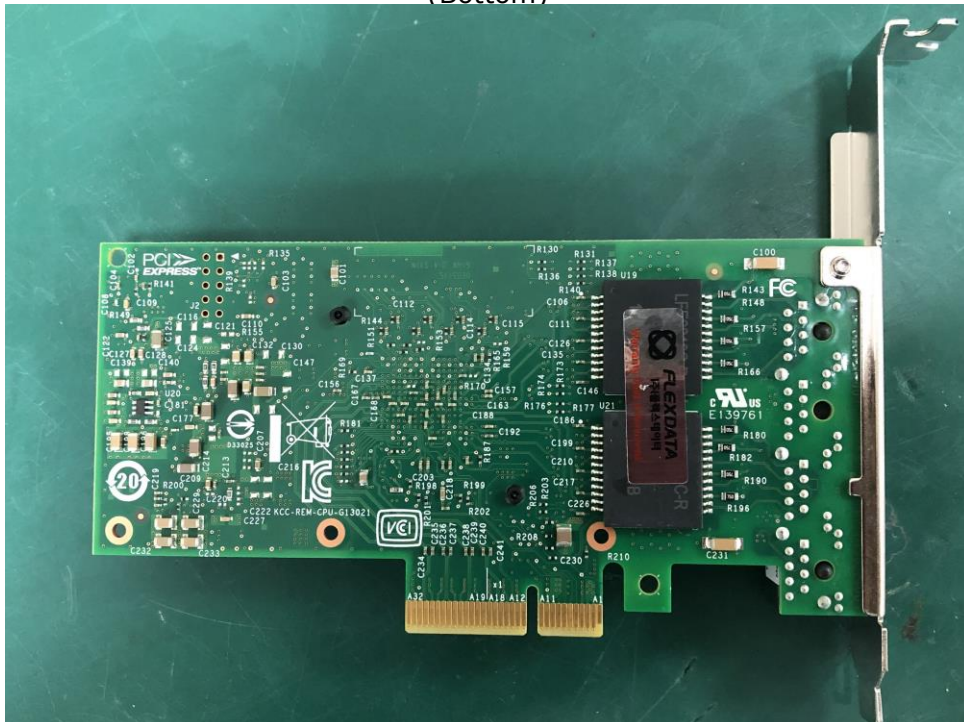
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EUT Internal View – Network Adapter Board

(Top)



(Bottom)



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EUT Internal View – CPU

(Top)



(Bottom)



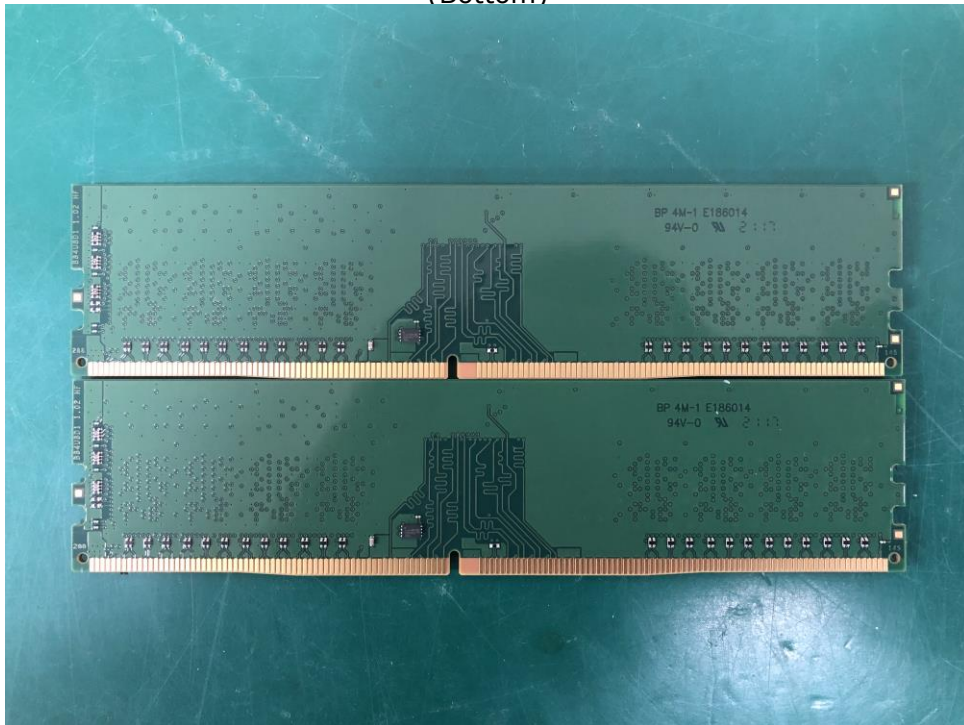
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EUT Internal View – RAM

(Top)



(Bottom)



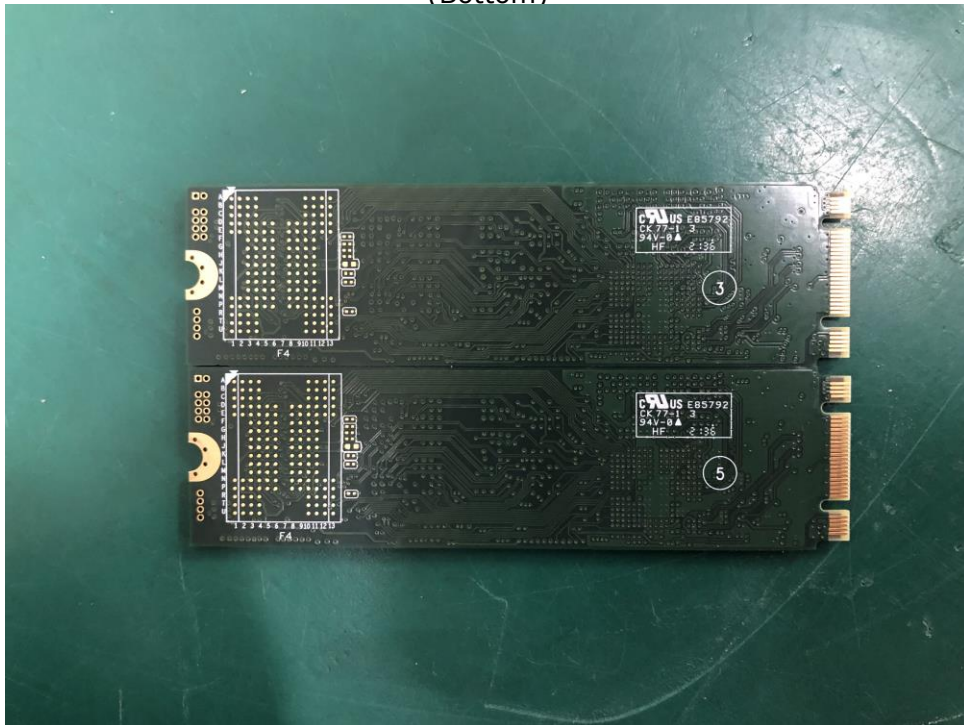
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EUT Internal View – SSD

(Top)



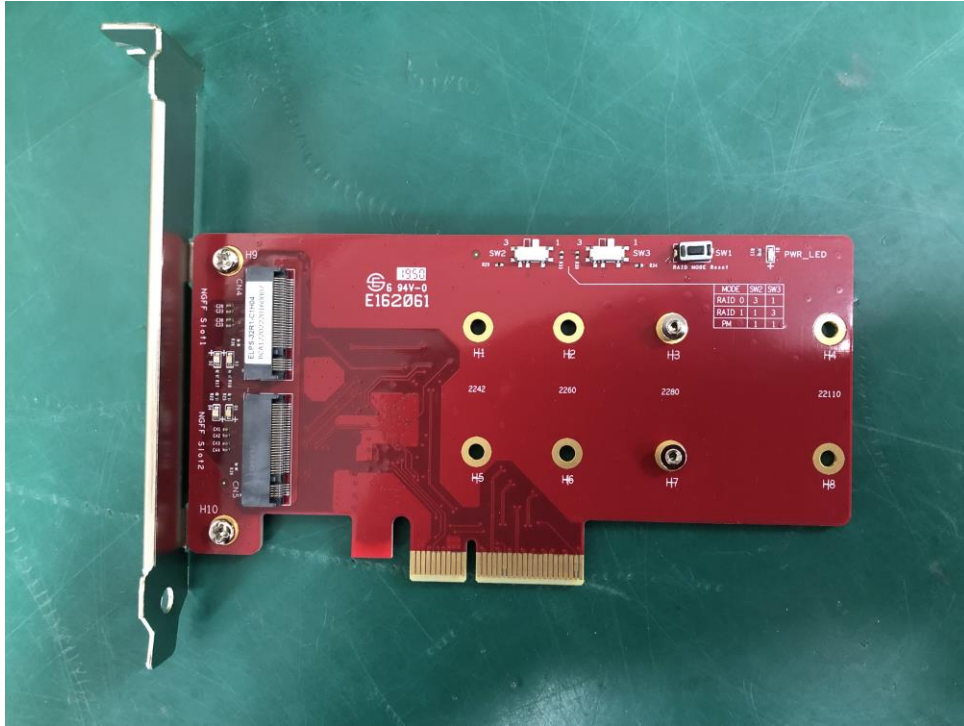
(Bottom)



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EUT Internal View – SSD Slot Board

(Top)



(Bottom)



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EUT Internal View – SMPS

(Top)



(Bottom)



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Label and Location



PC NVR

Model No : PRO-7510B4

Manufacturer : Dream I System co.,Ltd.

Made in Korea

