

**KES Co., Ltd.**

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Report No.:

KES-EM-22T0547-R1

Page (1) of (41)

EMC TEST REPORT For RCM

Test Report No. : KES-EM-22T0547-R1
Date of Issue : Feb. 24, 2023
Product name : NVR
Model/Type No. : XRP-4310DB4
Variant Model : -
Applicant : Hanwha Vision Co., Ltd
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea
Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED
2. D-TECH CO.,LTD.
Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,
Korea (Suwon Industrial Complex)
Date of Receipt : Jun. 22, 2022
Test date : Jun. 22, 2022 ~ Jun. 23, 2022
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Eun Gu, Jeon
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 No.:

KES-EM-22T0547-R1

Page (2) of (41)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 04, 2022	KES-EM-22T0547	Issued
Feb. 24, 2023	KES-EM-22T0547-R1	Change the Applicant and manufacturer at the request of the customer

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TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency	6
1.2	Variant Model Differences	6
1.3	Device Modifications	6
1.4	Equipment Under Test.....	6
1.5	Support Equipments	7
1.6	External I/O Cabling	8
1.7	EUT Operating Mode(s)	8
1.8	Configuration.....	9
1.9	Remarks when standards applied	10
1.10	Calibration Details of Equipment Used for Measurement	10
1.11	Test Facility	10
1.12	Laboratory Accreditations and Listings	10
2.0	Test Regulations.....	11
2.1	Conducted Emissions at Mains Power Ports	12
2.2	Conducted Emissions at Telecommunication Ports.....	13
2.3	Radiated Electric Field Emissions(Below 1 GHz)	14
2.4	Radiated Electric Field Emissions(Above 1 GHz)	15
APPENDIX A – TEST DATA.....		16
Conducted Emissions at Mains Power Ports.....		16
Conducted Emissions at Telecommunication Ports		20
Radiated Electric Field Emissions(Below 1 GHz)		21
Radiated Electric Field Emissions(Above 1 GHz).....		22
Test Setup Photos and Configuration		23
Conducted Emissions at Mains Power Ports.....		23
Conducted Emissions at Telecommunication Ports		24
Radiated Electric Field Emissions(Below 1 GHz)		25
Radiated Electric Field Emissions(Above 1 GHz).....		26
EUT External Photographs		27
EUT Internal Photographs		28



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KES-EM-22T0547-R1

Page (4) of (41)

1.0 General Product Description

Main Specifications of EUT are:

Display		
Network camera	Inputs	Max. 128CH (※ If clustering, 132CH)
	Resolution	32MP ~ CIF
	Protocols	Wisenet, ONVIF
Decoding	Local Display	Dual if Full HD monitor Single if UHD monitor
	Multi Screen Display	1/4/9/16/25/36/49/64/72/81/100/121/132/Custom/Auto Mode
	Resolution	1920fps@640x360 (128 division) 2160fps@720p (72 division) 1080fps@1080p (36 division)
Performance		
Operating System	Embedded	Windows 10 IoT Enterprise LTSC (SSM preinstalled)
Record	Compression	H.265, H.264, MJPEG, WiseStream(H.264, H.265)
	Recording Bandwidth	Max. 400Mbps
	Resolution	32MP ~ CIF
	Mode	Normal, Schedule (Continuous / Event), Event (Pre / Post), Event Profile, ARB, Dual-Track
	Event Trigger	Video loss, Camera event(Sensor, MD, Passing, Entering, Exiting, Disappearing (Appearing), Tampering, Tracking, Face Detection, Audio Detection, ANPR, Bestshot), AI Event (Face, Appearance, Face mask, Vehicle)
	Event Action	Instant Viewer, Preset, Alarm Out, Pop-up, Sound and E-mail notification
Search & Play	Playback Bandwidth	Max. 150Mbps
	User	Max. 1024 Users (132Ch concurrently)
	Simultaneous playback	Max. 128ch (1080p/720p) ※ if Clustering, 132CH
	Fisheye Dewarping	Console
Storage	Supported HDD	Up to 10TB
	HDD Slot	SATA 16ea (3.5" 16ea Hot Swap - Volume 2ea) Enterprise HDD (6TB,8TB,10TB)
	RAID	1/5/6/10/50
Backup	File backup	AVI, SEC
	Function	Manual Backup, Onetime Schedule Backup , Schedule Backup , Privacy Masking Backup
Network		
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP (UDP), RTP (TCP), RTSP, NTP, HTTP, DHCP (Client), SMTP, ICMP, IGMP, ARP, DNS, DDNS, SNMP(Client), HTTPS, ONVIF (Profile-S), SUNAPI(Client)	
DDNS	Wisenet DDNS	
Audio	GUI	128CH(network)
	Web	G.711 u-law(PCM), G.723, G.726(ADPCM), AAC
	Audio Communication	2-Way
Max Remote Users	1024 (Tested)	
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access log Device Certificate(Hanwha Techwin Root CA)	
Viewer Software	SSM Client, SSM Mobile	
Functions		

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Report No.:

KES-EM-22T0547-R1

Page (5) of (41)

Camera Setup	Item	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
PTZ	Control	Via GUI, Controller (SPC-2000, SPC-7000)
	Preset	300
Smart phone	Support Model	iOS, Android
	Protocol Support	RTP, RTSP, HTTP, HTTPS, CGI(SUNAPI)
	Control	Live(Multi-Profile Support), Playback
	Max. Remote Users	Max. 1024 Users (132Ch concurrently)
Redundancy	Fallover	Active&Active, Active-Standby
	ARB	Support

Interface

Front	Indicator	LED(Status Indicator) POWER, NETWORK, HDD, RECORD, BACKUP, ALARM
HDD Key Lock		Yes
HDMI		2EA
Audio		USB
Ethernet		Gigabit Ethernet RJ-45 (1000 Base-T) 3ea
USB		4EA(USB 3.0 2ea, USB 2.0 2EA)
Power Inlet		AC 2EA

System

System Control	Mouse, Keyboard
Language	English, French, German, Italian, Spanish, Russian, Turkish, Polish, Dutch, Swedish, Czech, Portuguese, Danish, Rumanian, Serbian, Croatian, Hungarian, Greek, Norwegian, Finnish, Korean, Chinese, Japanese, Thai, Vietnamese

Environmental

CPU	Intel Core i7-8700T
RAM	16GB RAM
OS HDD	M.2 SSD 128Gb
Operating Temperature	+0°C to +40°C(+32°F to +104°F)
Operating Humidity	Less or equal to 80%

Electrical

Power Input	100 ~ 240VAC, 50 ~ 60Hz
Power Consumption	285W Dual

Mechanical

Color / Material	Black / Metal
Dimension (WxDxH)	440.0 x 132.0 x 548.1mm (Including Cover: 571.1mm)
Weight	14.05kg (w/o HDD)

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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 240 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
NVR	XRP-4310DB4	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT
Mouse	MOKJUO	-	Primax Electronics Ltd.	MSIP- REM- PMX- MMOKJU O
Keyboard	PKB-650U	20040002525	SHENZHEN TYCHO TECHNOLOGT CO., LIMITED	R-R-DCK- PKB- 650Ua
Motherboard	EP16-002995C	-	-	-
CPU	i7-8700T	-	INTEL	-
RAM	M378A1K43EB2- CWE	-	SAMSUNG	8 GB, 2 EA
SMPS	AC-148 L	-	DELTA ELECTRONICS, INC.	DPS- 650AB- 16 D, 2 EA
SSD	TS128GMTS800	H07830-0153	Transcend	128 GB

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KES-EM-22T0547-R1

Page (7) of (41)

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Camera	LND-6070R	-	HANWHA VISION VIETNAM COMPANY LIMITED	-
Notebook PC	506NZGK000615	-	LG	-
Notebook PC Adapter	OF58U63849302Y60 9	-	LG	-
Monitor	PS321QR	-	MSI COMPUTER (SHENZHEN) CO.,LTD.	-
USB Memory	-	-	Sandisk	16 GB
Ear Phone	-	-	Apple.	-
PoE Adapter	NEXT-POE2403JM	-	EasyNet.	-
HDD	SC HA500	-	Western Digital	2 TB

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1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NVR (EUT)	RJ-45 (1)	PoE Adapter	RJ-45 (LAN)	3.0	U
	RJ-45 (2)	Notebook PC	RJ-45 (LAN)	3.0	U
	USB	Mouse (EUT)	USB	1.1	U
	USB	Keyboard (EUT)	USB	1.2	U
	USB	USB Memory	USB	-	-
	HDMI	Monitor	HDMI	1.5	S
	3.5 mm	Ear Phone	3.5 mm	1.2	U
	SATA	HDD	SATA	0.2	U
	DC Jack	Notebook PC Adapter	DC Jack	1.6	U
Notebook PC	RJ-45 (PoE)	Camera	RJ-45 (PoE)	3.0	U
PoE Adapter	RJ-45 (PoE)	Camera	RJ-45 (PoE)	3.0	U

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

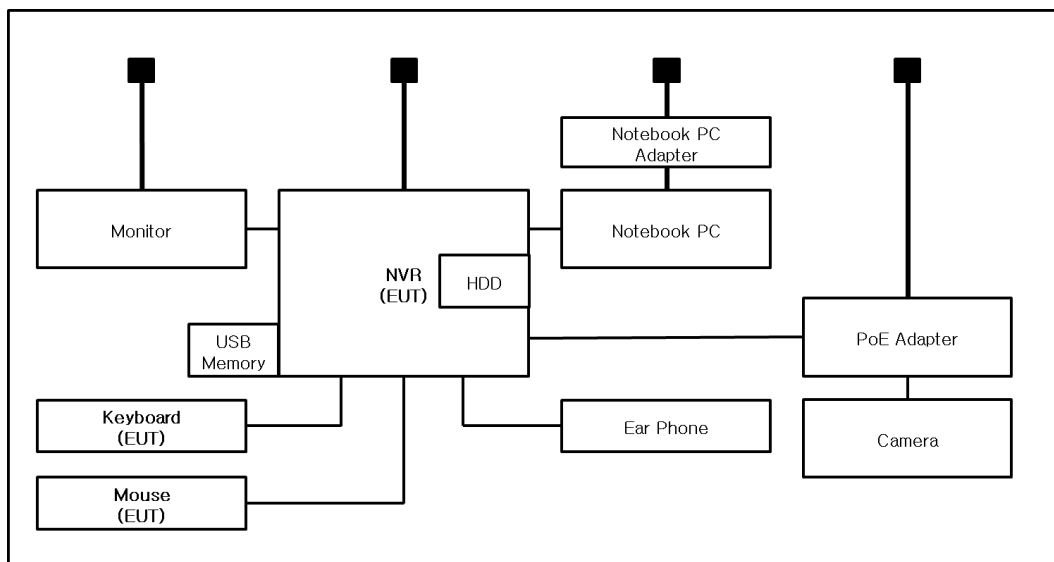
Test Mode	operating
Operation Mode	EUT Monitoring, Ping Test after testing, check if the recording is normally done on the HDD and USB Memory

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

1.8 Configuration

■ AC Main

□ DC Main



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



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Report No.:

KES-EM-22T0547-R1

Page (11) of (41)

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **AS/NZS CISPR32:2015**

☒ Class A

☐ Class B

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2.1 Conducted Emissions at Mains Power Ports

Test Date

Jun. 23, 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: (24,7 ± 0,1) °C

Relative Humidity: (44,8 ± 0,1) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Jun. 23, 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: (24,7 ± 0,2) °C

Relative Humidity: (44,8 ± 0,1) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

- See Appendix A for test data.
- 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. 22, 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: (24,5 ± 0,1) °C

Relative Humidity: (44,3 ± 0,1) % 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. 22, 2022

Test Location

SEMI ANECHOIC CHAMBER #3

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	ESR7	R & S	101190	08, 03, 2022
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 01, 2023
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 03, 2023

Test Conditions

Temperature: (24,6 ± 0,1) °C

Relative Humidity: (44,5 ± 0,1) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

■ AC #1

HOT LINE

Common Information

Test Description:

Conducted Emission

Model No.:

XRP-4310DB4

Phase:

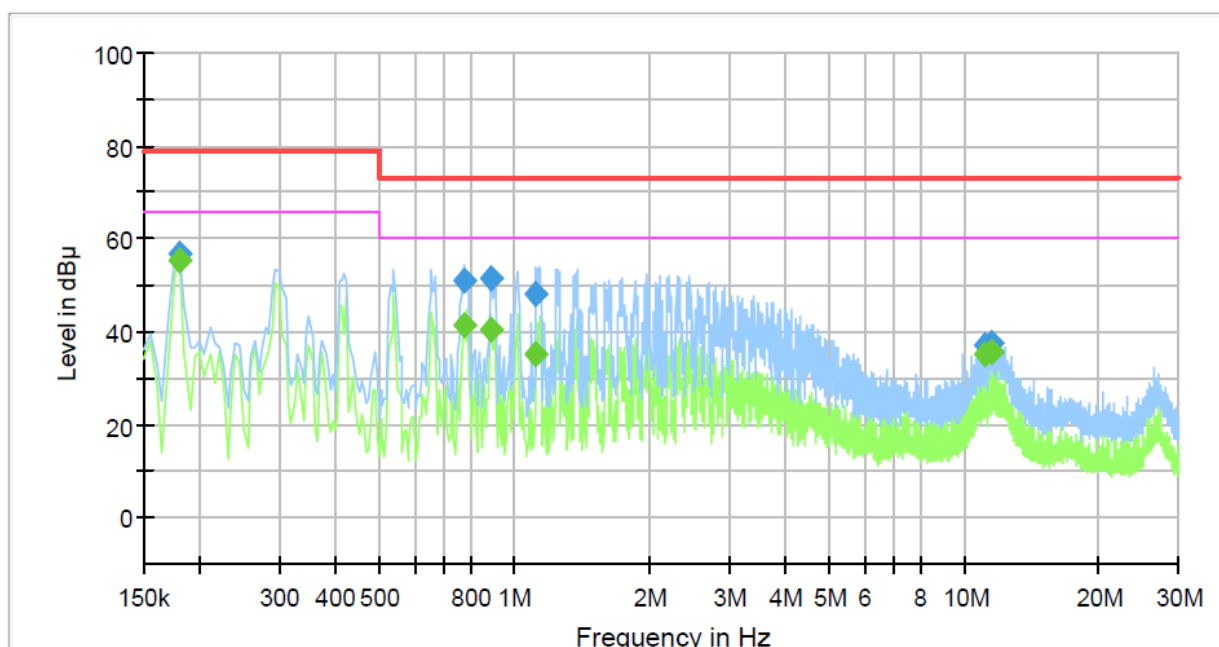
L1

Mode:

AC #1

Operator Name:

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.180000	---	55.42	66.00	10.58	1000.0	9.000	L1	19.4
0.180000	56.85	---	79.00	22.15	1000.0	9.000	L1	19.4
0.770000	---	41.21	60.00	18.79	1000.0	9.000	L1	20.0
0.770000	50.78	---	73.00	22.22	1000.0	9.000	L1	20.0
0.890000	---	40.41	60.00	19.59	1000.0	9.000	L1	20.1
0.890000	51.47	---	73.00	21.53	1000.0	9.000	L1	20.1
1.120000	---	35.08	60.00	24.92	1000.0	9.000	L1	20.1
1.120000	47.96	---	73.00	25.04	1000.0	9.000	L1	20.1
11.145000	---	35.37	60.00	24.63	1000.0	9.000	L1	19.9
11.145000	37.23	---	73.00	35.77	1000.0	9.000	L1	19.9
11.545000	---	35.57	60.00	24.43	1000.0	9.000	L1	20.0
11.545000	37.74	---	73.00	35.26	1000.0	9.000	L1	20.0

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Report No.:

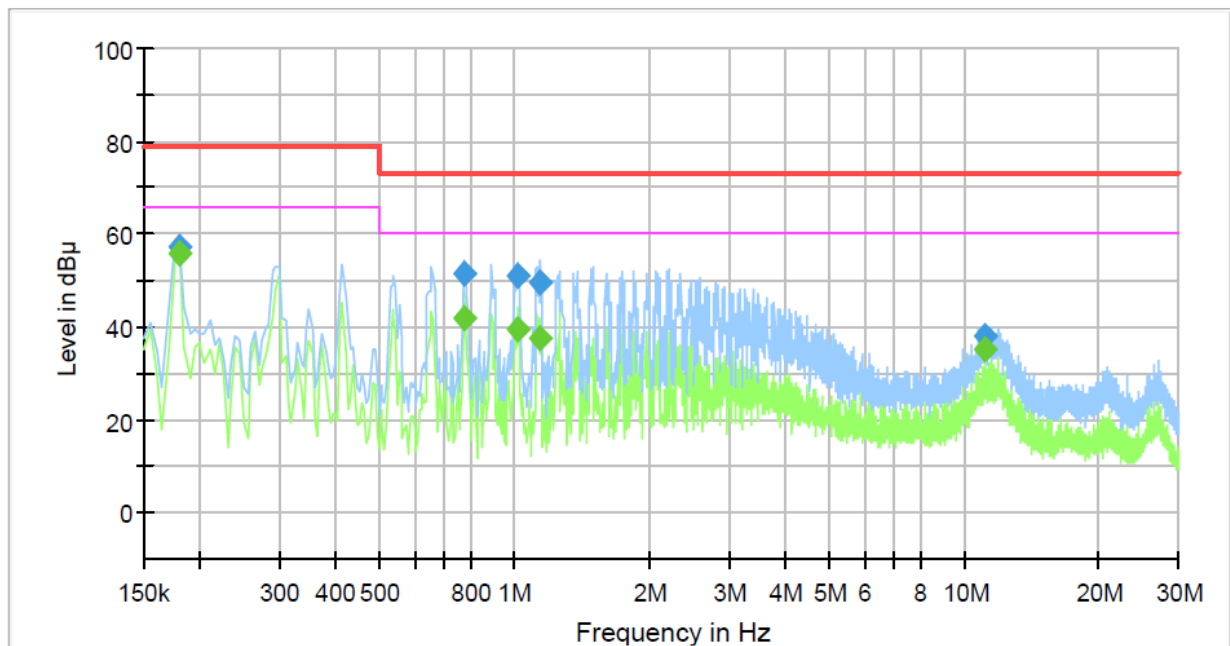
KES-EM-22T0547-R1

Page (17) of (41)

NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: XRP-4310DB4
Phase: N
Mode: AC #1
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.180000	---	55.78	66.00	10.22	1000.0	9.000	N	19.4
0.180000	57.29	---	79.00	21.71	1000.0	9.000	N	19.4
0.770000	---	41.84	60.00	18.16	1000.0	9.000	N	20.0
0.770000	51.50	---	73.00	21.50	1000.0	9.000	N	20.0
1.020000	---	39.31	60.00	20.69	1000.0	9.000	N	20.0
1.020000	51.20	---	73.00	21.80	1000.0	9.000	N	20.0
1.145000	---	37.73	60.00	22.27	1000.0	9.000	N	20.1
1.145000	49.37	---	73.00	23.63	1000.0	9.000	N	20.1
11.145000	---	35.31	60.00	24.69	1000.0	9.000	N	19.9
11.145000	38.13	---	73.00	34.87	1000.0	9.000	N	19.9

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■ AC #2

HOT LINE

Common Information

Test Description:

Model No.:

Phase:

Mode:

Operator Name:

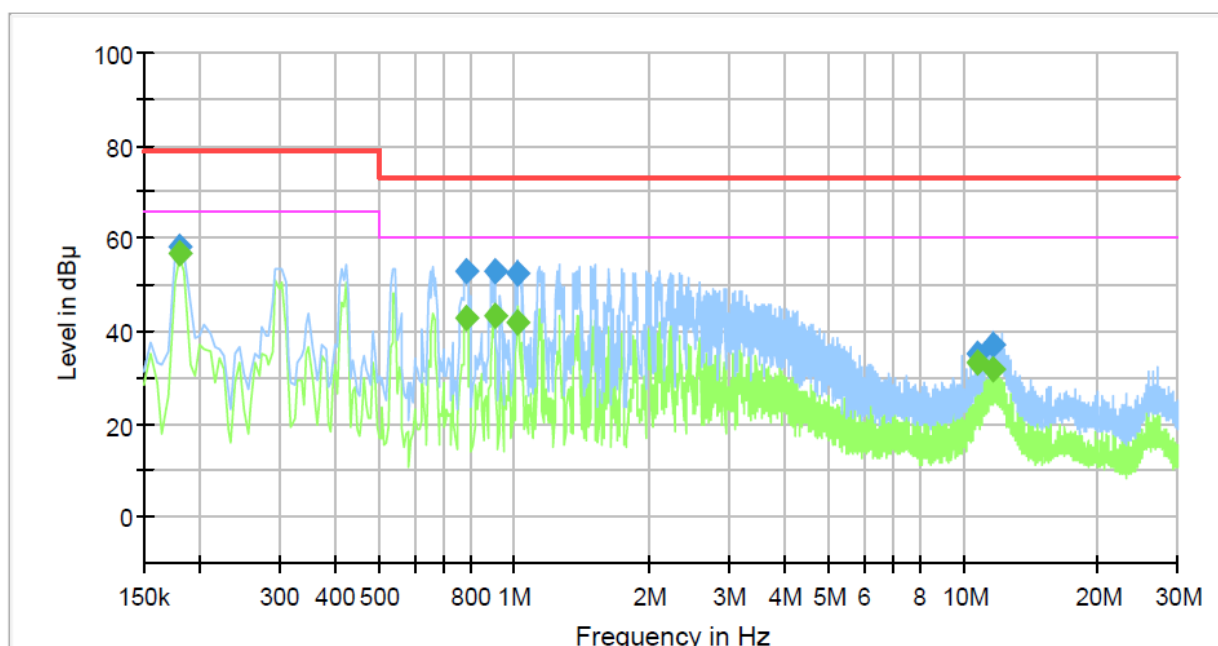
Conducted Emission

XRP-4310DB4

L1

AC #2

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.180000	---	56.66	66.00	9.34	1000.0	9.000	L1	19.4
0.180000	58.03	---	79.00	20.97	1000.0	9.000	L1	19.4
0.785000	---	43.00	60.00	17.00	1000.0	9.000	L1	20.0
0.785000	52.94	---	73.00	20.06	1000.0	9.000	L1	20.0
0.905000	---	43.20	60.00	16.80	1000.0	9.000	L1	20.1
0.905000	53.00	---	73.00	20.00	1000.0	9.000	L1	20.1
1.020000	---	42.10	60.00	17.90	1000.0	9.000	L1	20.0
1.020000	52.48	---	73.00	20.52	1000.0	9.000	L1	20.0
10.745000	---	33.27	60.00	26.73	1000.0	9.000	L1	19.9
10.745000	35.24	---	73.00	37.76	1000.0	9.000	L1	19.9
11.675000	---	31.93	60.00	28.07	1000.0	9.000	L1	20.0
11.675000	36.99	---	73.00	36.01	1000.0	9.000	L1	20.0

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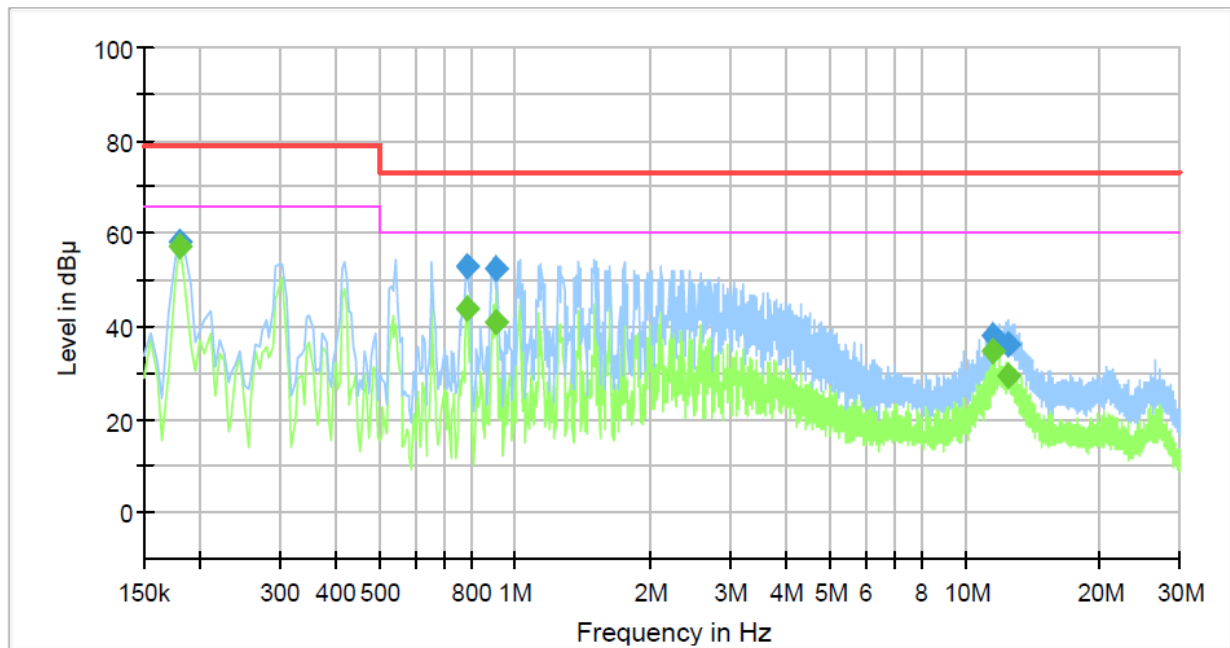
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NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	XRP-4310DB4
Phase:	N
Mode:	AC #2
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.180000	---	57.04	66.00	8.96	1000.0	9.000	N	19.4
0.180000	58.38	---	79.00	20.62	1000.0	9.000	N	19.4
0.780000	---	43.93	60.00	16.07	1000.0	9.000	N	20.0
0.780000	52.79	---	73.00	20.21	1000.0	9.000	N	20.0
0.910000	---	41.11	60.00	18.89	1000.0	9.000	N	20.1
0.910000	52.46	---	73.00	20.54	1000.0	9.000	N	20.1
11.545000	---	34.77	60.00	25.23	1000.0	9.000	N	20.0
11.545000	38.03	---	73.00	34.97	1000.0	9.000	N	20.0
12.495000	---	29.17	60.00	30.83	1000.0	9.000	N	20.0
12.495000	36.15	---	73.00	36.85	1000.0	9.000	N	20.0

◆ 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 (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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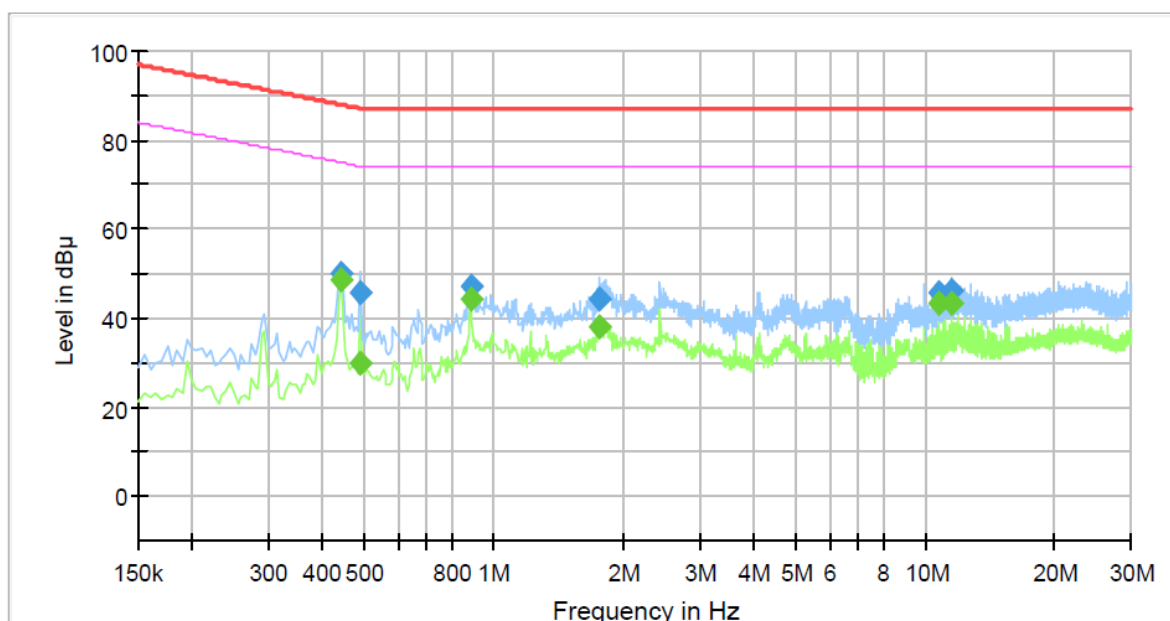
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Conducted Emissions at Telecommunication Ports [1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XRP-4310DB4
Mode :	
Speed :	1000 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.445000	---	48.68	74.97	26.29	1000.0	9.000	Single Line	19.7
0.445000	49.89	---	87.97	38.08	1000.0	9.000	Single Line	19.7
0.490000	---	30.01	74.17	44.16	1000.0	9.000	Single Line	19.7
0.490000	45.60	---	87.17	41.57	1000.0	9.000	Single Line	19.7
0.885000	---	44.42	74.00	29.58	1000.0	9.000	Single Line	20.0
0.885000	46.98	---	87.00	40.02	1000.0	9.000	Single Line	20.0
1.760000	---	38.08	74.00	35.92	1000.0	9.000	Single Line	20.1
1.760000	44.27	---	87.00	42.73	1000.0	9.000	Single Line	20.1
10.745000	---	43.40	74.00	30.60	1000.0	9.000	Single Line	19.6
10.745000	45.73	---	87.00	41.27	1000.0	9.000	Single Line	19.6
11.545000	---	43.41	74.00	30.59	1000.0	9.000	Single Line	19.7
11.545000	46.10	---	87.00	40.90	1000.0	9.000	Single Line	19.7

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

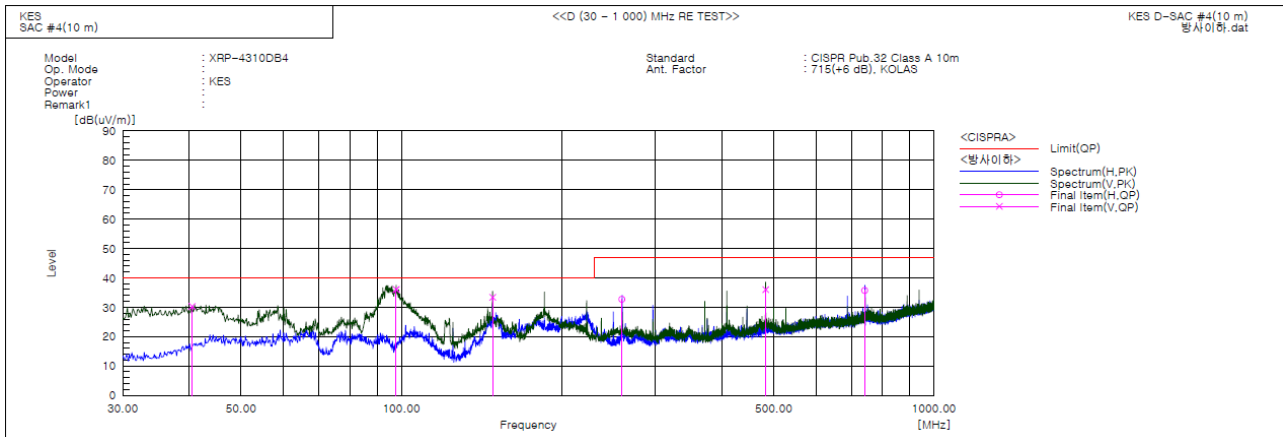
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Radiated Electric Field Emissions(Below 1 GHz)



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	40.486	V	52.7	-22.4	30.3	40.0	9.7	111.0	307.4	
2	97.813	V	58.9	-22.8	36.1	40.0	3.9	133.0	35.6	
3	148.363	V	58.7	-25.3	33.4	40.0	6.6	120.0	290.5	
4	259.322	H	51.7	-19.0	32.7	47.0	14.3	400.0	234.6	
5	482.831	V	48.0	-12.0	36.0	47.0	11.0	100.0	272.3	
6	741.164	H	42.1	-6.4	35.7	47.0	11.3	377.0	114.5	

◆ 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



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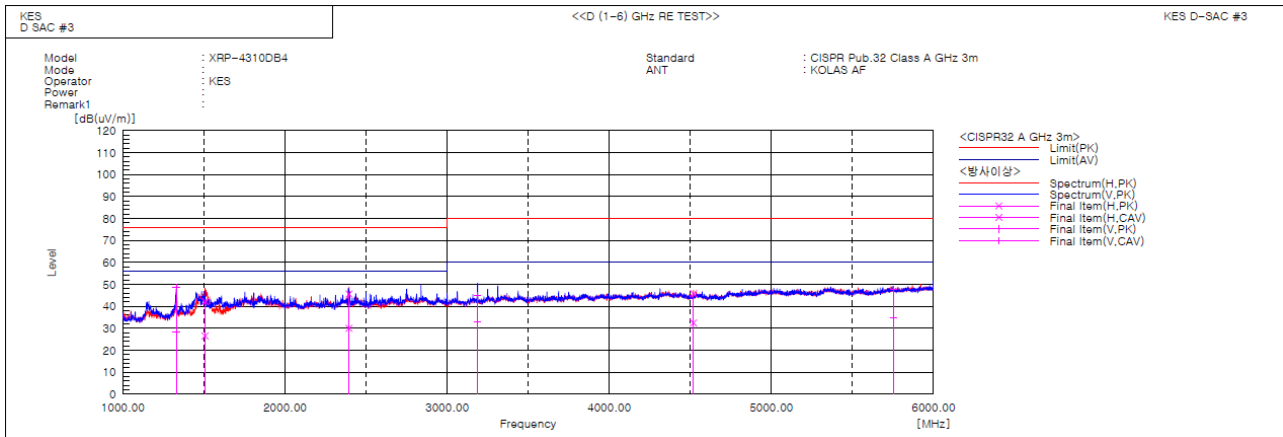
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-22T0547-R1

Page (22) of (41)

Radiated Electric Field Emissions(Above 1 GHz)



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1329.265	V	55.8	35.3	-7.0	48.8	28.3	76.0	56.0	27.2	27.7	100.0	355.5	
2	1507.791	H	48.0	32.3	-5.8	42.2	26.5	76.0	56.0	33.8	29.5	100.0	57.8	
3	2395.369	H	44.4	28.8	1.2	45.6	30.0	76.0	56.0	30.4	26.0	100.0	355.9	
4	3188.632	V	41.8	30.0	3.1	44.9	33.1	80.0	60.0	35.1	26.9	100.0	17.0	
5	4519.417	H	39.3	26.0	6.5	45.8	32.5	80.0	60.0	34.2	27.5	100.0	158.7	
6	5751.963	V	37.5	24.4	10.2	47.7	34.6	80.0	60.0	32.3	25.4	100.0	190.1	

◆ Calculation

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

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

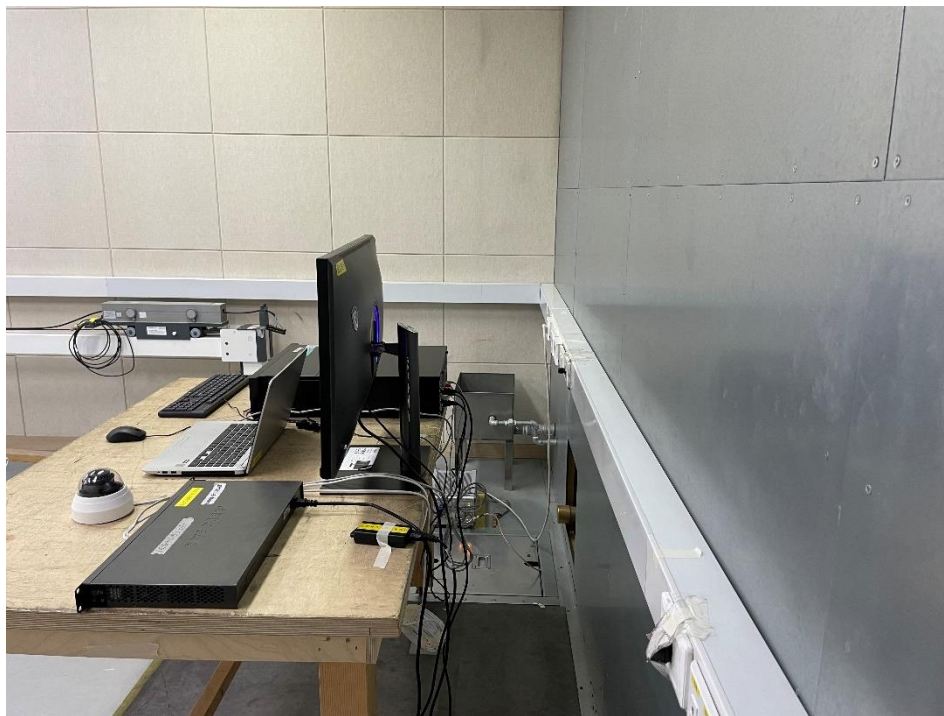
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Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



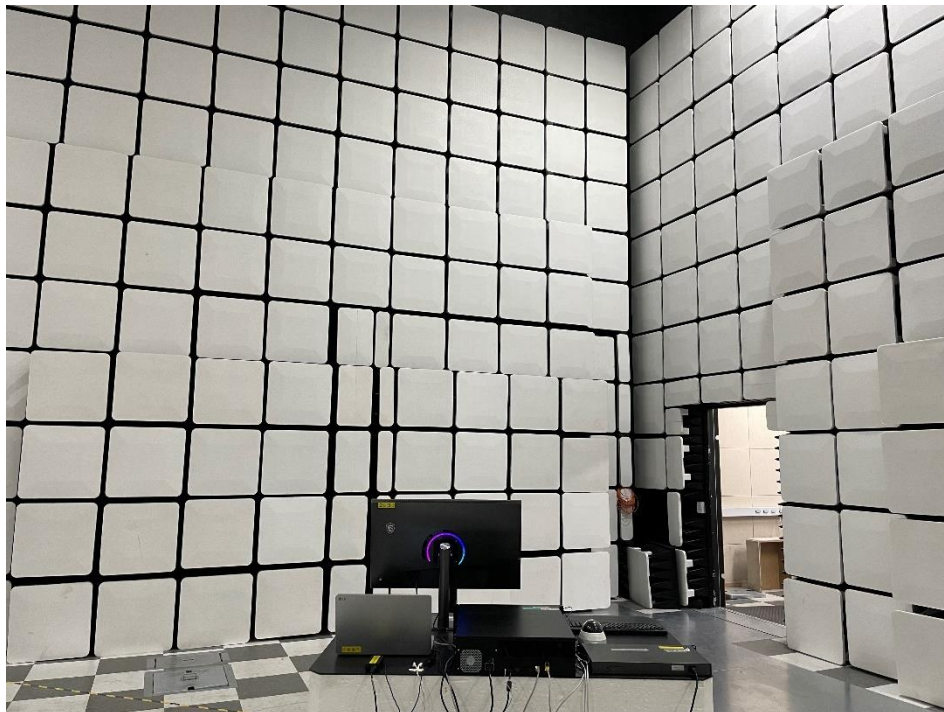
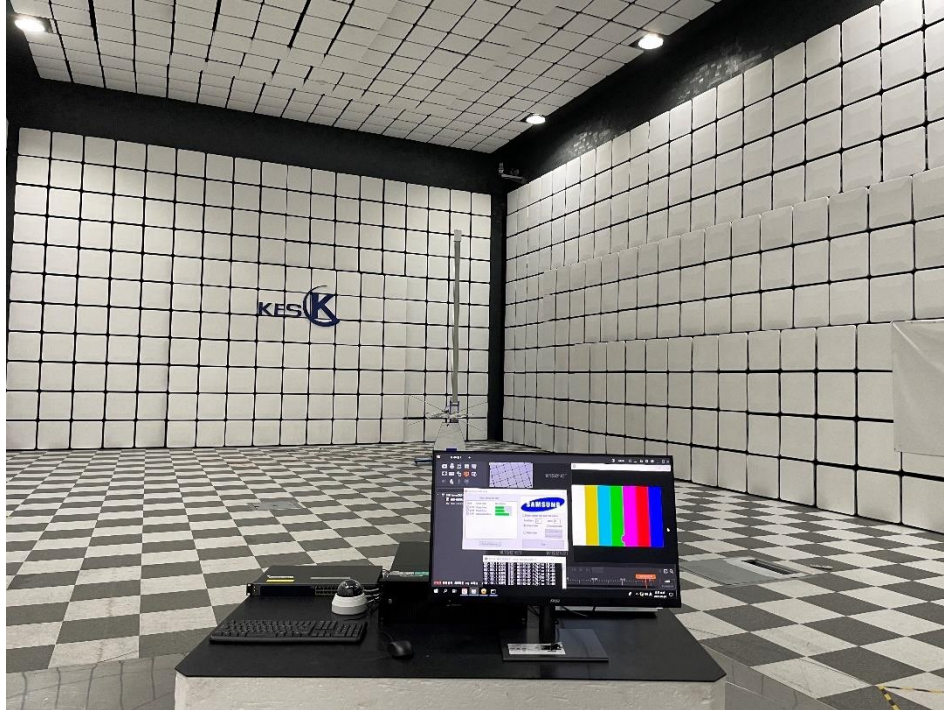
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Conducted Emissions at Telecommunication Ports



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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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EUT External Photographs

(Top)



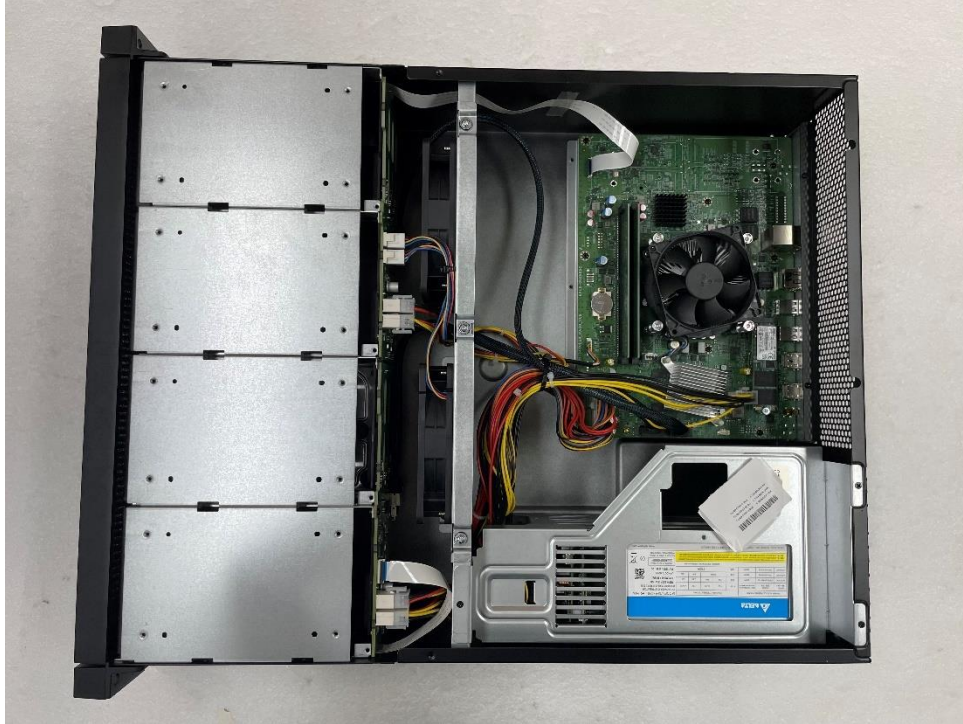
(Bottom)



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EUT Internal Photographs

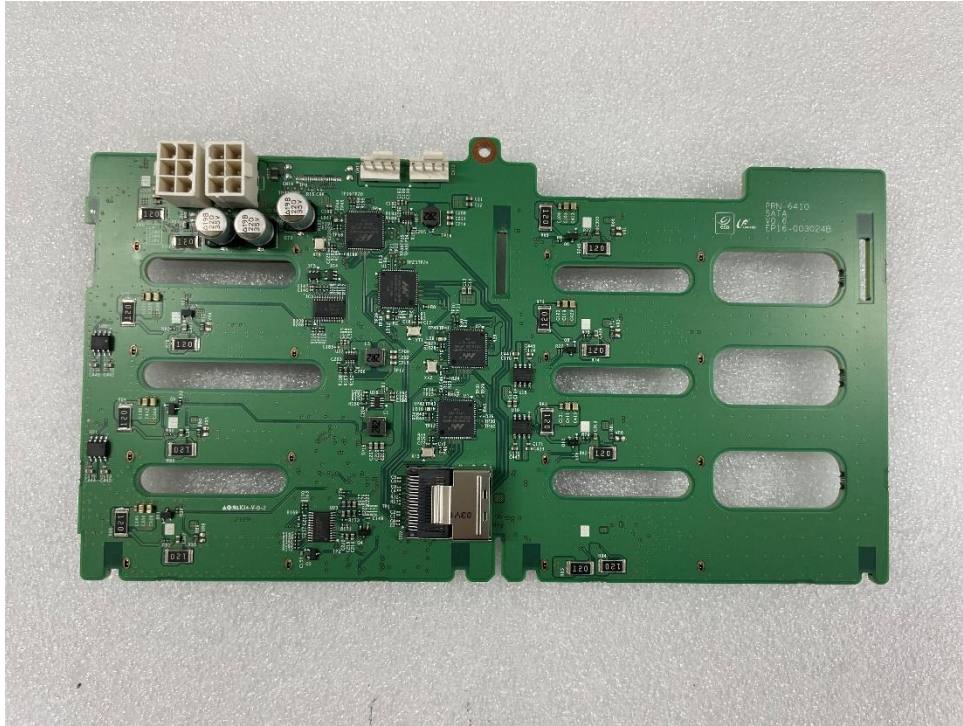
(Internal View)



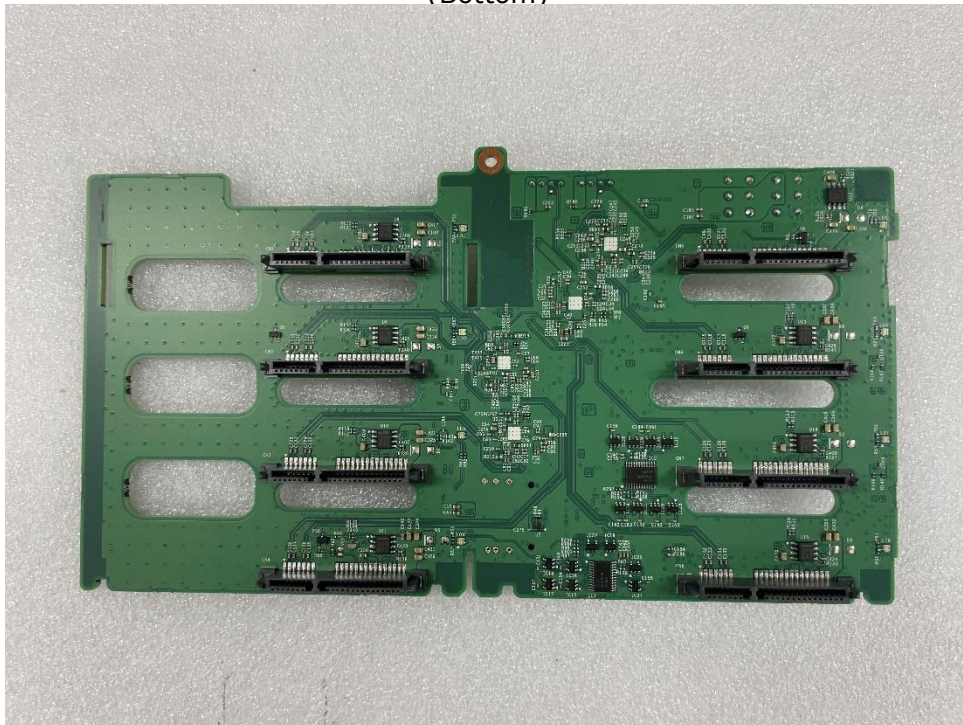
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EUT Internal View – Board 1

(Top)



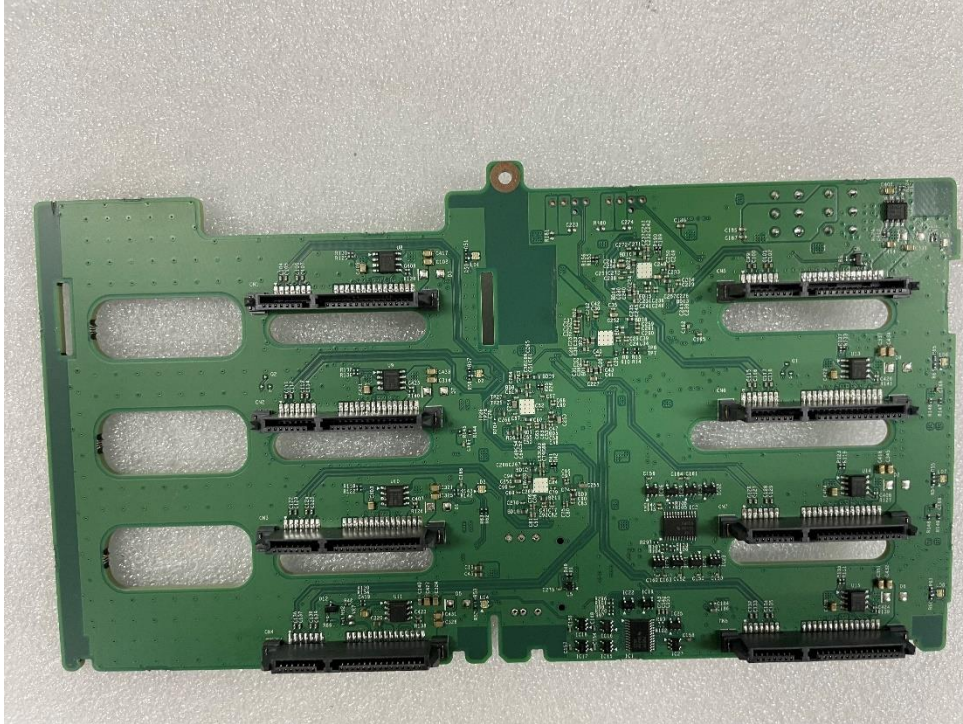
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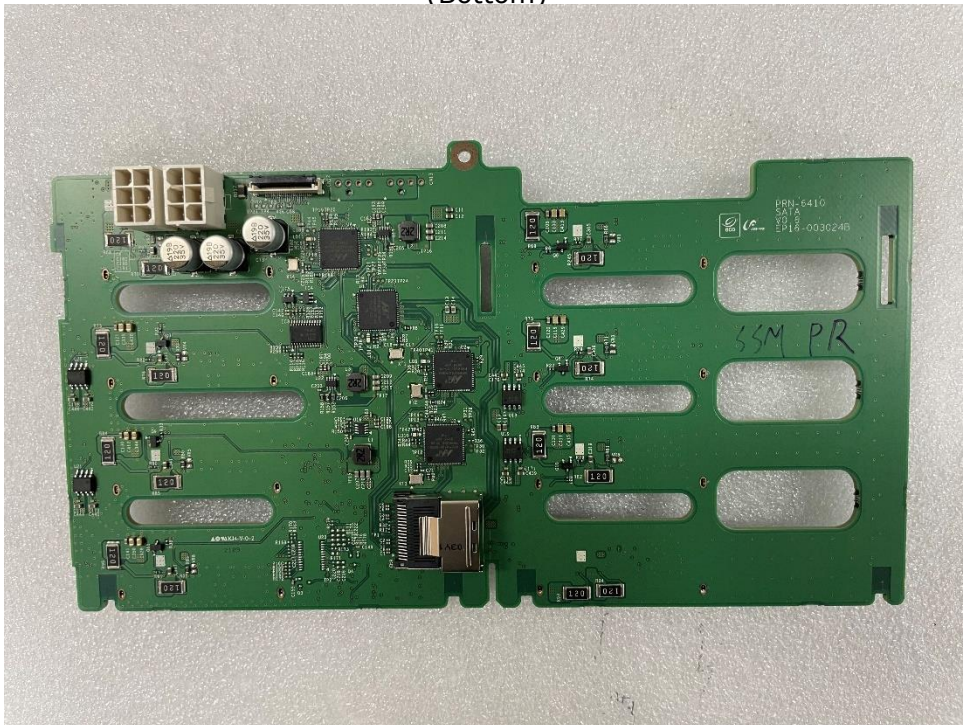
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EUT Internal View – Board 2

(Top)



(Bottom)



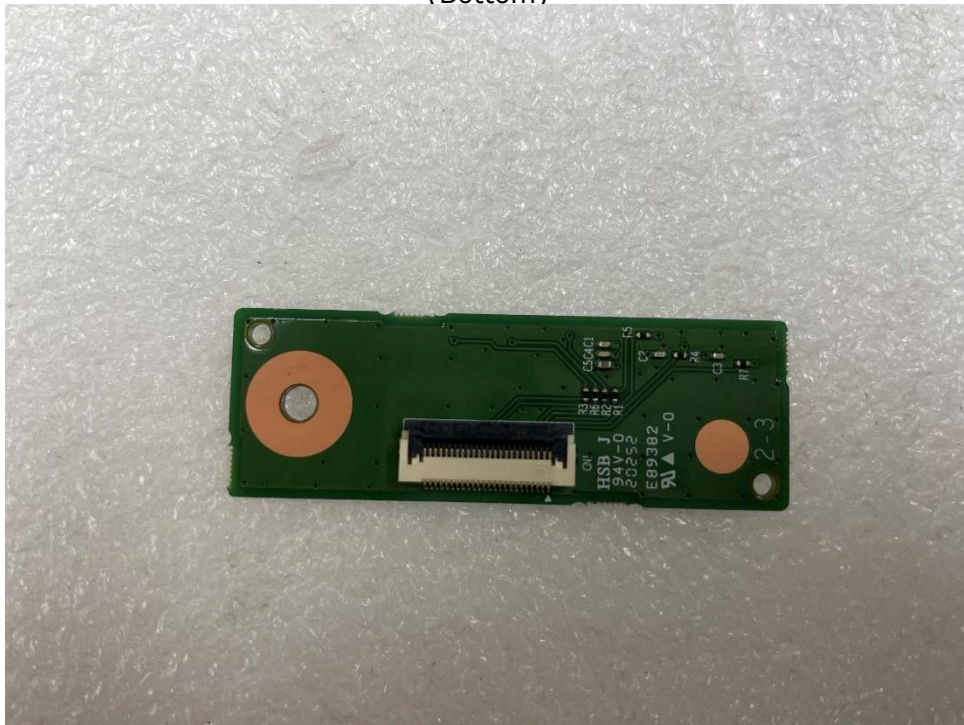
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EUT Internal View – Board 3

(Top)



(Bottom)



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EUT Internal View – Board 4

(Top)



(Bottom)



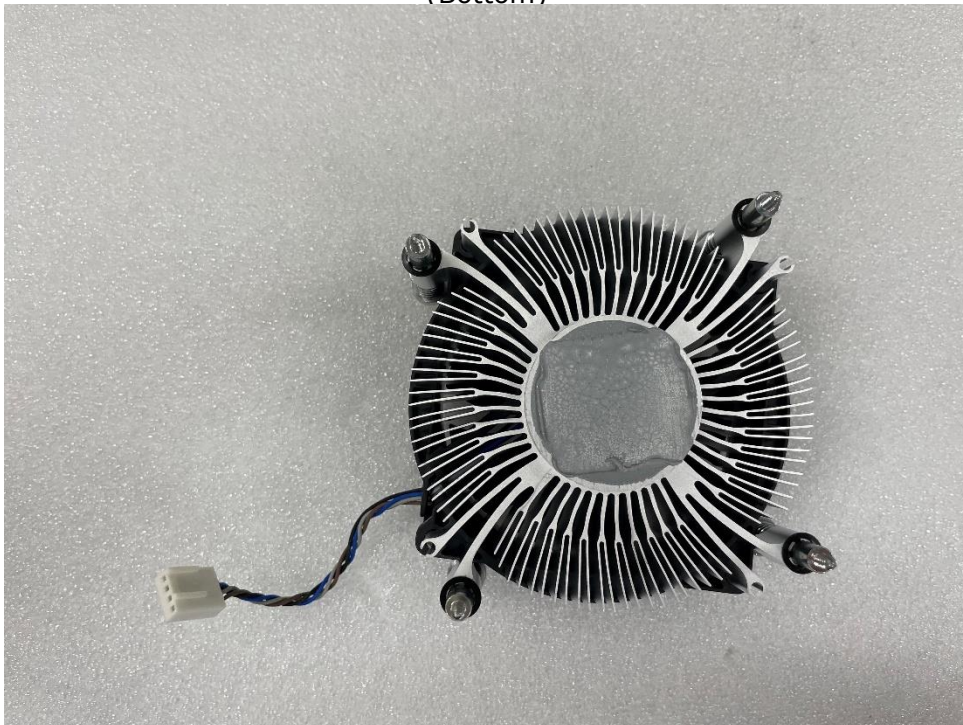
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EUT Internal View – Cooler

(Top)



(Bottom)



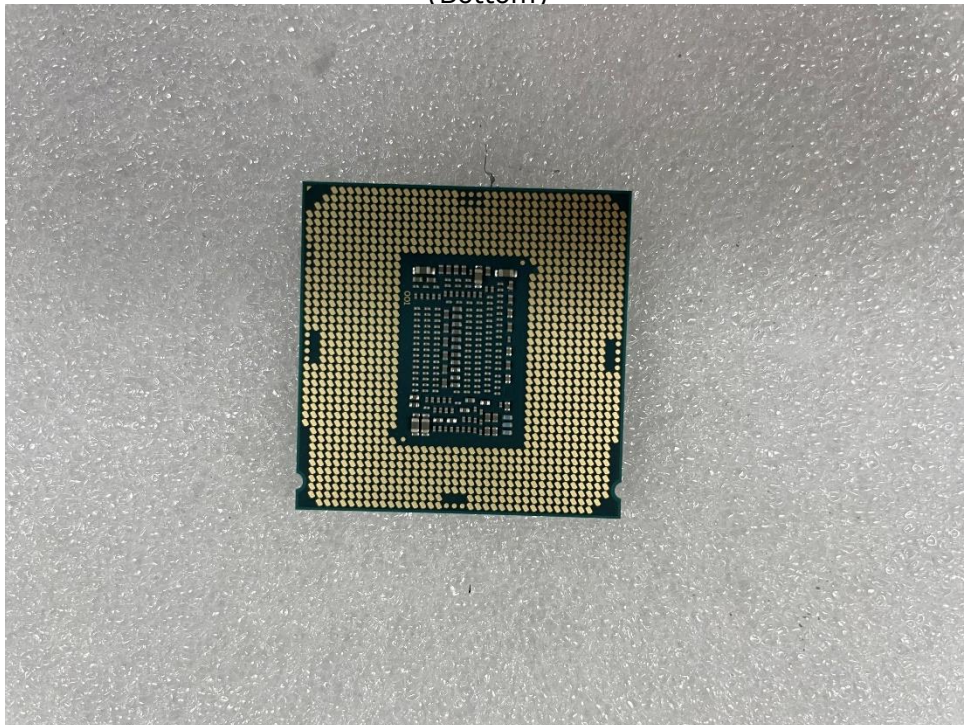
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EUT Internal View – CPU

(Top)



(Bottom)



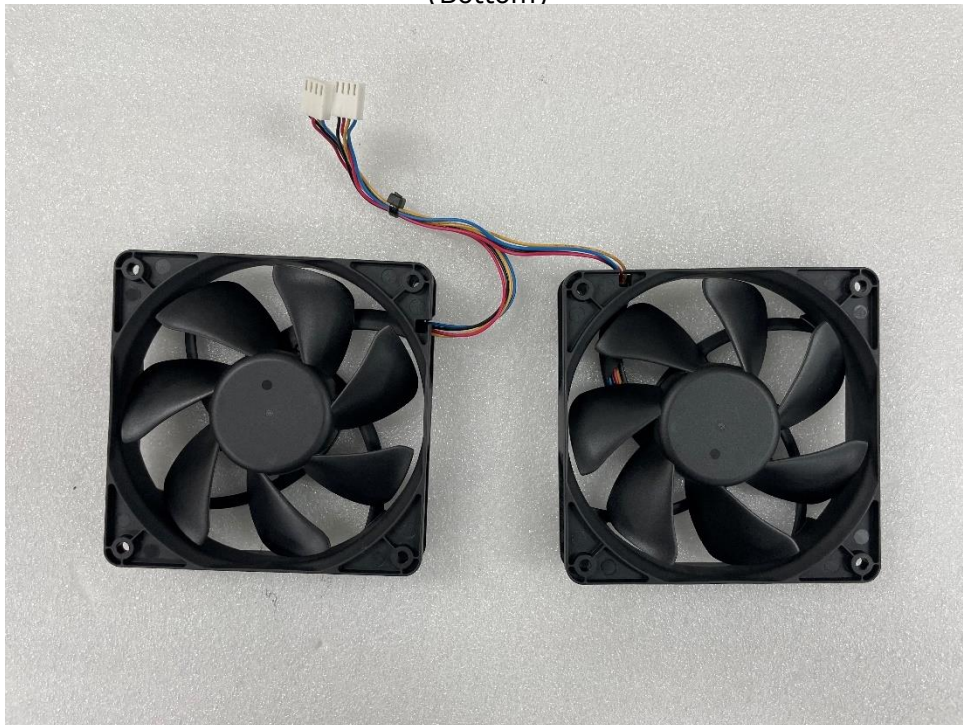
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EUT Internal View – FAN

(Top)



(Bottom)



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EUT Internal View – HDD

(Top)



(Bottom)



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EUT Internal View – SMPS

(Top)



(Bottom)



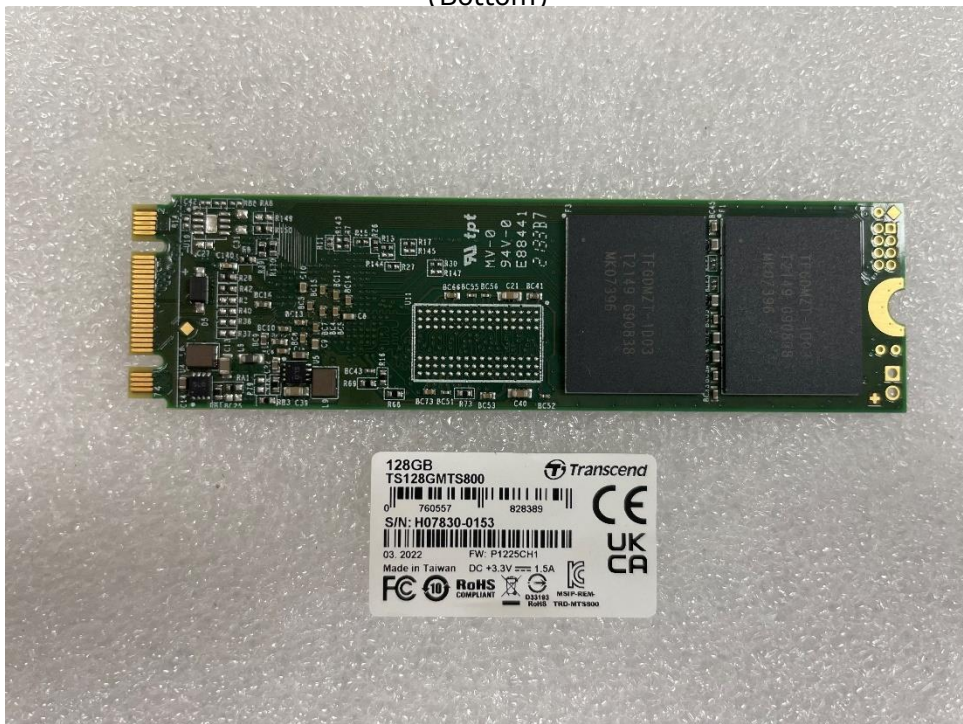
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EUT Internal View – SSD

(Top)



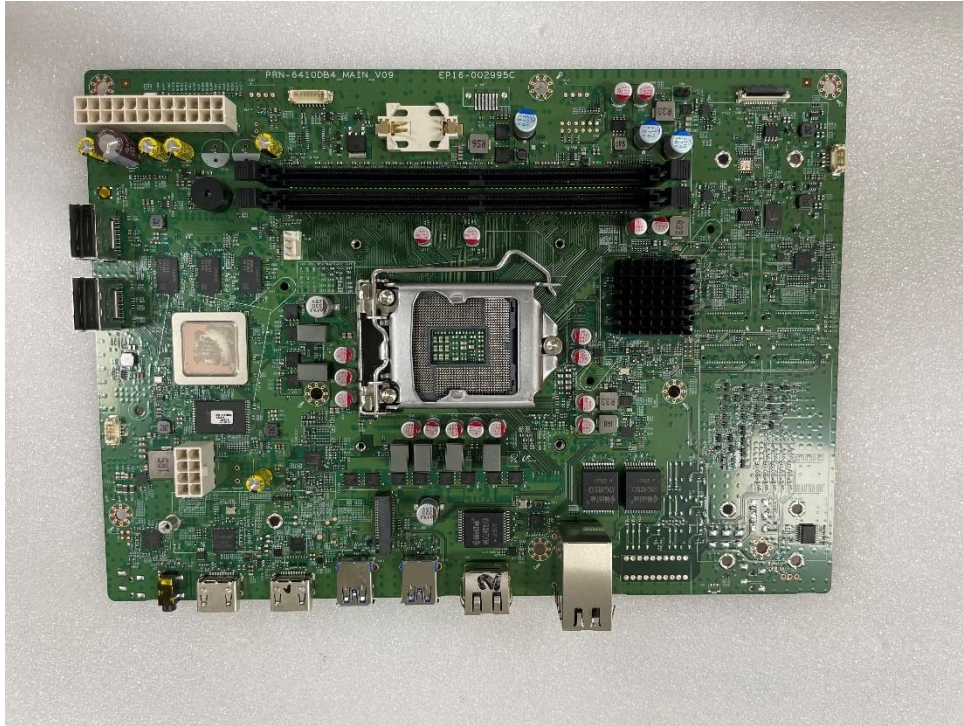
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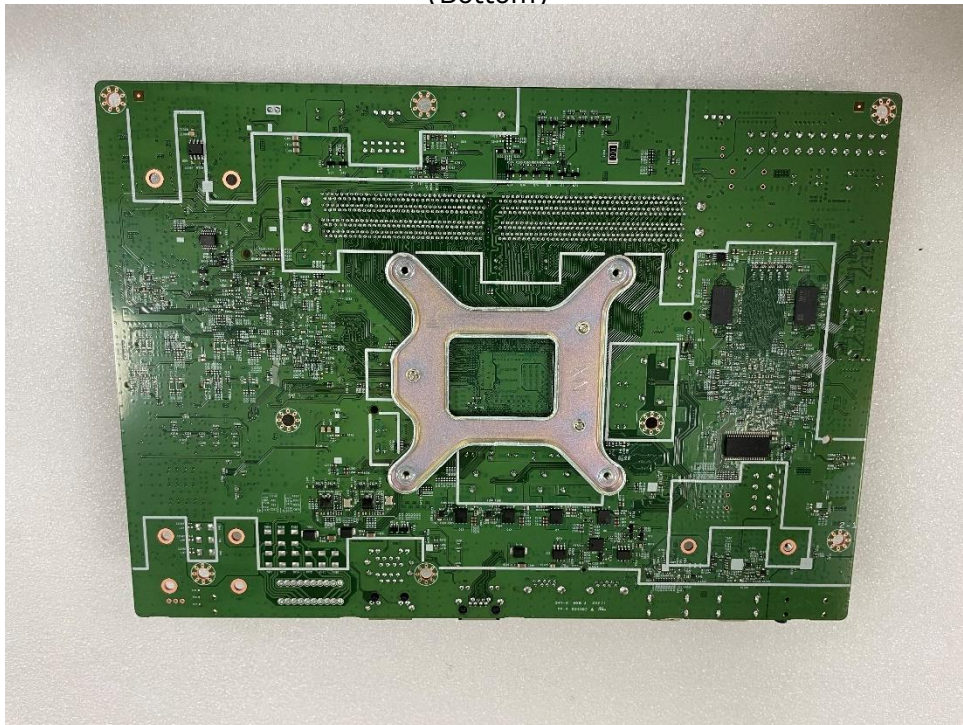
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EUT Internal View – Mother Board

(Top)



(Bottom)



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EUT Internal View – Memory 1

(Top)



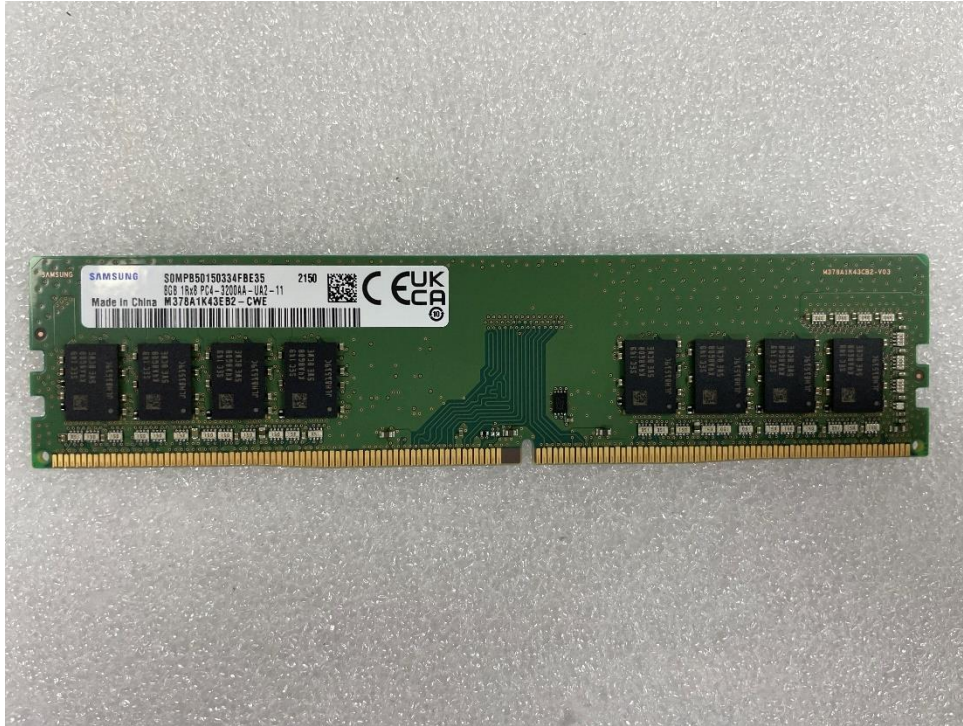
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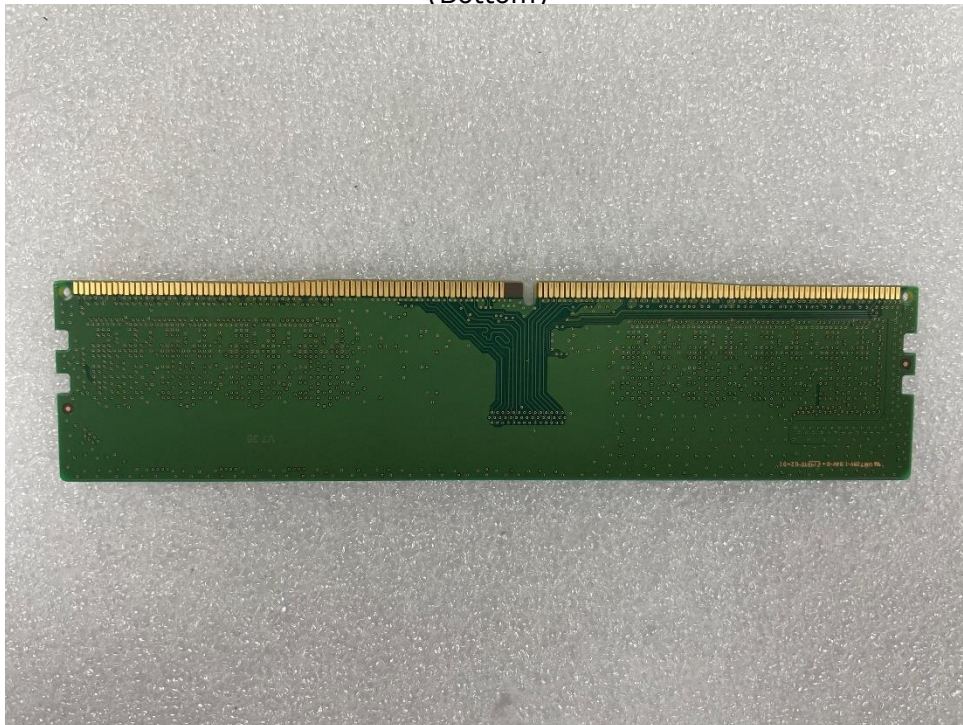
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EUT Internal View – Memory 2

(Top)



(Bottom)



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