



EMC TEST REPORT

Test Report No. : KES-EM-22T0545-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)
Equipment authorization : **Supplier's Declaration of Conformity**
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.

**KES Co., Ltd.**

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-22T0545-R1

Page (2) of (43)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 04, 2022	KES-EM-22T0545	Issued
Feb. 24, 2023	KES-EM-22T0545-R1	Change the Applicant and manufacturer at the request of the customer

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd. This document may be altered or revised by KES Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by KES Co., Ltd. will constitute fraud and shall nullify the document.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

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-22T0545-R1

Page (3) of (43)

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	Radiated Electric Field Emissions(Below 1 GHz)	14
2.3	Radiated Electric Field Emissions(Above 1 GHz)	16
APPENDIX A – TEST DATA.....		18
Conducted Emissions at Mains Power Ports.....		18
Radiated Electric Field Emissions(Below 1 GHz)		22
Radiated Electric Field Emissions(Above 1 GHz)		24
Test Setup Photos and Configuration		25
Conducted Emissions at Mains Power Ports.....		25
Radiated Electric Field Emissions(Below 1 GHz)		26
Radiated Electric Field Emissions(Above 1 GHz)		27
EUT External Photographs		28
EUT Internal Photographs		29

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr



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), G723, G726(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		

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

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-22T0545-R1

Page (5) of (43)

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 (WdHxD)	440.0 x 132.0 x 548.1mm (Including Cover: 571.1mm)
Weight	14.05kg (w/o HDD)

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr



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 120 V, 60 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

**KES Co., Ltd.**

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-22T0545-R1

Page (7) of (43)

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Camera #1	LND-6070R	-	HANWHA VISION VIETNAM COMPANY LIMITED	-
Camera #2	SND-7084N	-	HANWHA VISION VIETNAM COMPANY LIMITED	-
Notebook PC	506NZGK000615	-	LG	-
Notebook PC Adapter	OF58U63849302Y60 9	-	LG	-
Monitor #1	PS321QR	-	MSI COMPUTER (SHENZHEN) CO.,LTD.	-
Monitor #2	SMT-2233	ZC6U67VH50019 4D	Weihai Daewoo Electronics Co., Ltd.	-
USB Memory #1	-	-	Sandisk	16 GB
USB Memory #2	-	-	Sandisk	16 GB
Ear Phone	-	-	Apple.	-
PoE Adapter	NEXT-POE2403JM	-	EasyNet.	-
HDD	SC HA500	-	Western Digital	2 TB

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr



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 #1	USB	-	-
	USB	USB Memory #2	USB	-	-
	HDMI	Monitor #1	HDMI	1.5	S
	HDMI	Monitor #2	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 #1	RJ-45 (PoE)	3.0	U
PoE Adapter	RJ-45 (PoE)	Camera #2	RJ-45 (PoE)	3.0	U
	RJ-45 (PoE)	Camera #2	RJ-45 (PoE)	3.0	U

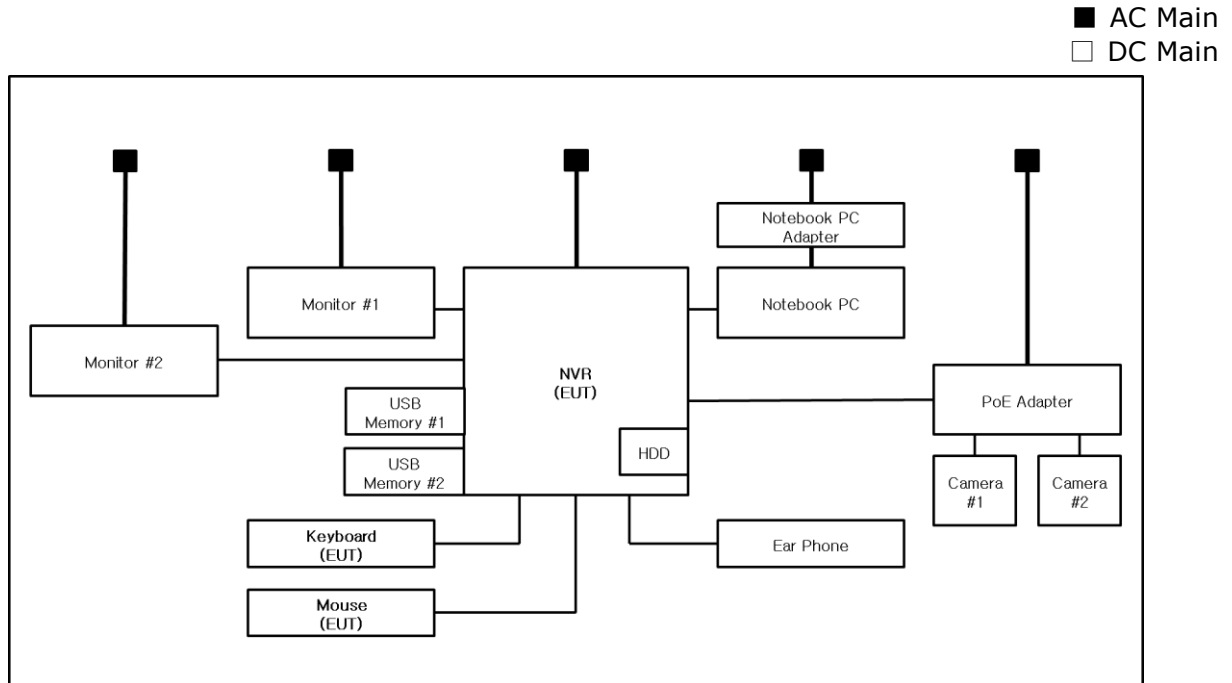
* Unshielded=U, Shielded=S

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



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:

☒ **47 CFR Part 15, Subpart B**

☐ CISPR 22:2009 +A1:2010

☐ Class A

☐ Class B

☒ ANSI C63.4a-2017

☒ Class A

☐ Class B

☒ **IC Regulation ICES-003 Issue 7**

☐ CAN/CSA-CISPR 32:17

☐ Class A

☐ Class B

☒ ANSI C63.4a-2017

☒ Class A

☐ Class B

2.1 Conducted Emissions at Mains Power Ports

Test Date

Jun. 23, 2022

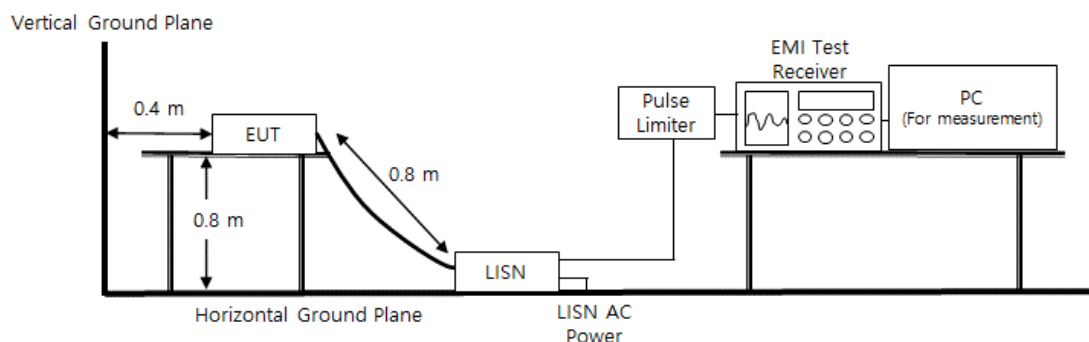
Test Location

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

Diagram of test setup





KES Co., Ltd.

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-22T0545-R1

Page (13) of (43)

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.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

2.2 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jun. 22, 2022

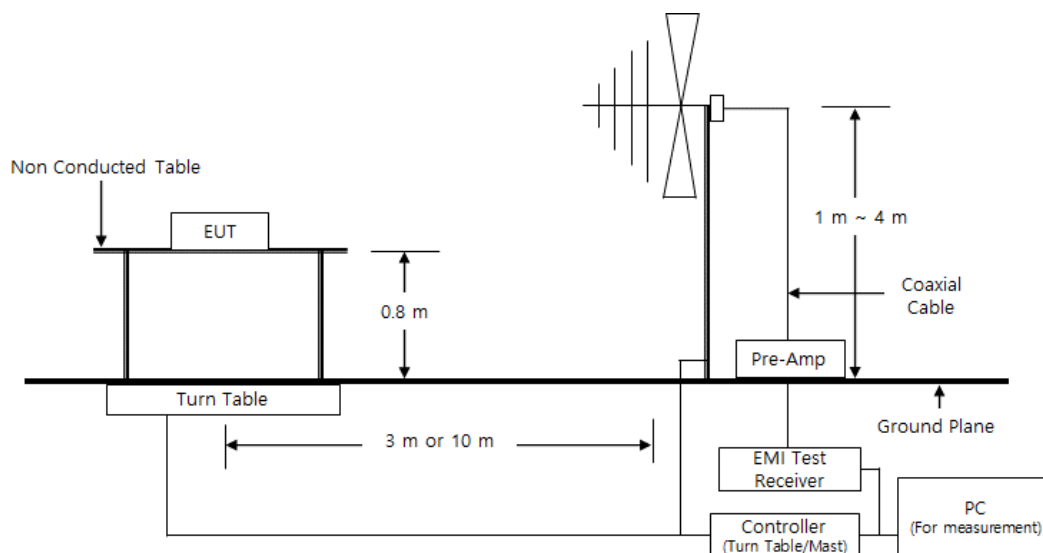
Test Location

☐ 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

Diagram of test setup





KES Co., Ltd.

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-22T0545-R1

Page (15) of (43)

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.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jun. 22, 2022

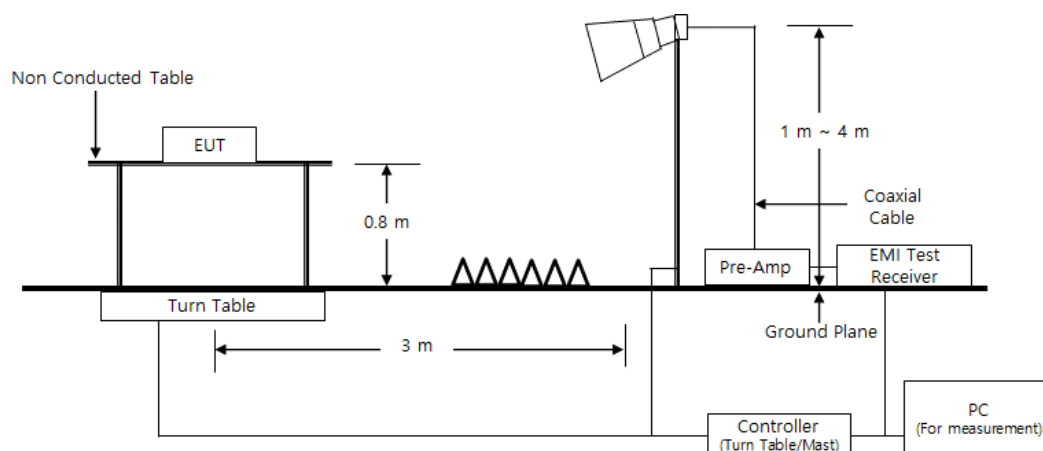
Test Location

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

Diagram of test setup





KES Co., Ltd.

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-22T0545-R1

Page (17) of (43)

Test Conditions

Temperature: (24,2 ± 0,1) °C

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

Frequency Range of Measurement

1 GHz to 5 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.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

APPENDIX A – TEST DATA

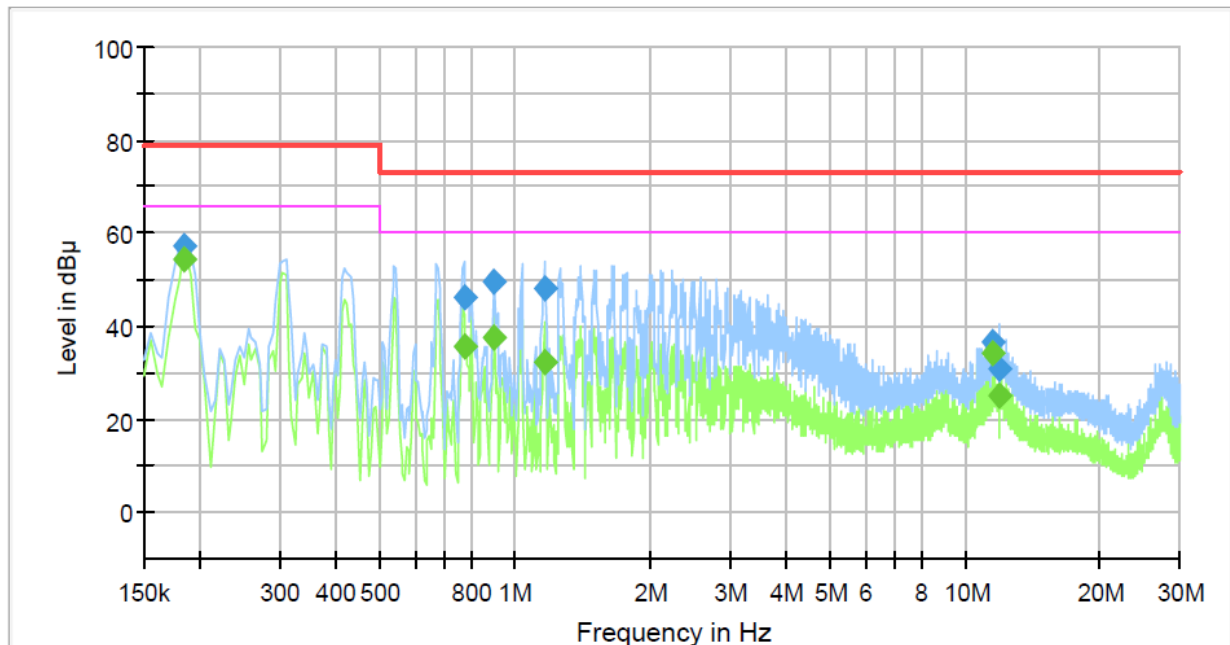
Conducted Emissions at Mains Power Ports

■ AC #1

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	XRP-4310DB4
Phase:	L1
Mode:	AC #1
Operator Name:	KES



Final Result

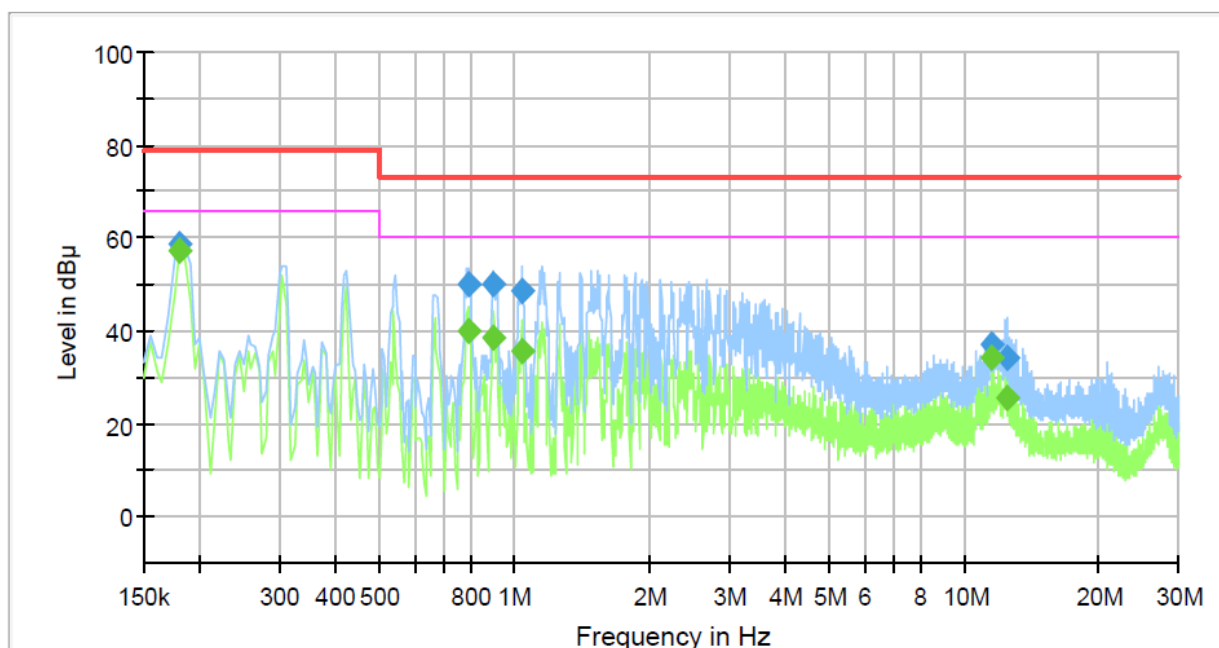
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.185000	---	54.18	66.00	11.82	1000.0	9.000	L1	19.4
0.185000	57.27	---	79.00	21.73	1000.0	9.000	L1	19.4
0.770000	---	35.83	60.00	24.17	1000.0	9.000	L1	20.0
0.770000	46.43	---	73.00	26.57	1000.0	9.000	L1	20.0
0.900000	---	37.49	60.00	22.51	1000.0	9.000	L1	20.1
0.900000	49.42	---	73.00	23.58	1000.0	9.000	L1	20.1
1.165000	---	32.32	60.00	27.68	1000.0	9.000	L1	20.1
1.165000	48.08	---	73.00	24.92	1000.0	9.000	L1	20.1
11.500000	---	34.08	60.00	25.92	1000.0	9.000	L1	20.0
11.500000	36.63	---	73.00	36.37	1000.0	9.000	L1	20.0
11.925000	---	24.98	60.00	35.02	1000.0	9.000	L1	20.0
11.925000	30.60	---	73.00	42.40	1000.0	9.000	L1	20.0

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

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	---	57.04	66.00	8.96	1000.0	9.000	N	19.4
0.180000	58.54	---	79.00	20.46	1000.0	9.000	N	19.4
0.790000	---	39.76	60.00	20.24	1000.0	9.000	N	20.0
0.790000	50.28	---	73.00	22.72	1000.0	9.000	N	20.0
0.900000	---	38.45	60.00	21.55	1000.0	9.000	N	20.1
0.900000	49.84	---	73.00	23.16	1000.0	9.000	N	20.1
1.040000	---	35.73	60.00	24.27	1000.0	9.000	N	20.1
1.040000	48.46	---	73.00	24.54	1000.0	9.000	N	20.1
11.500000	---	33.98	60.00	26.02	1000.0	9.000	N	20.0
11.500000	36.84	---	73.00	36.16	1000.0	9.000	N	20.0
12.455000	---	25.43	60.00	34.57	1000.0	9.000	N	20.0
12.455000	34.19	---	73.00	38.81	1000.0	9.000	N	20.0

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact kes@kes.co.kr

■ AC #2

HOT LINE

Common Information

Test Description:

Model No.:

Phase:

Mode:

Operator Name:

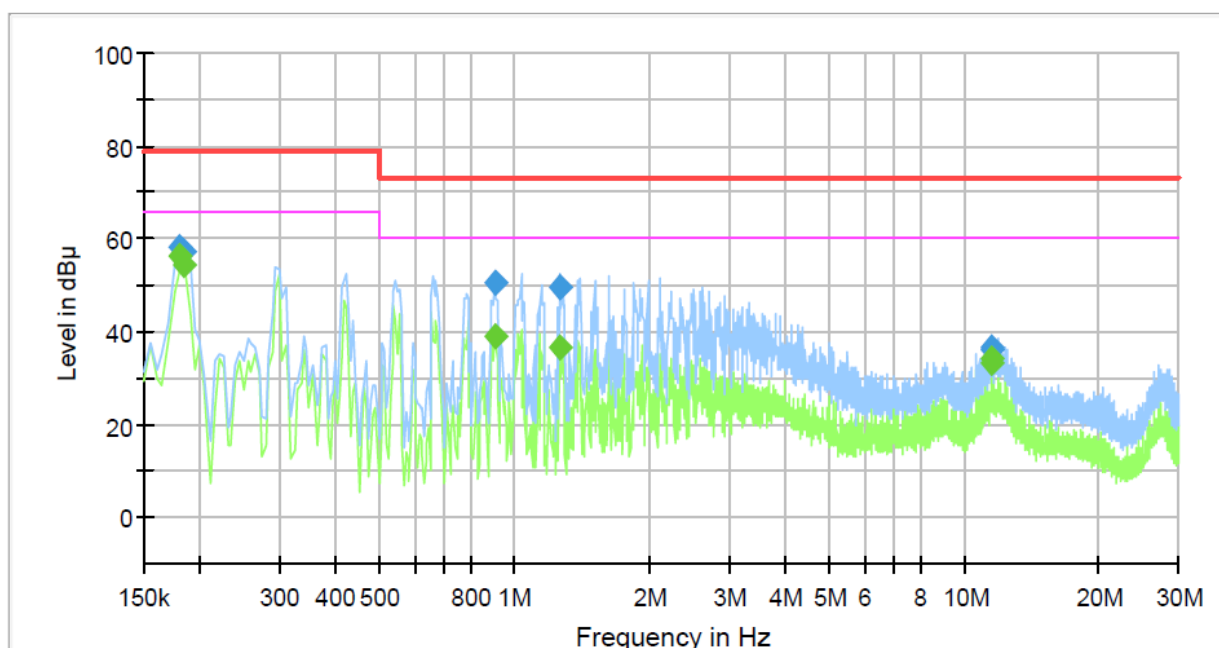
Conducted Emission

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	---	56.48	66.00	9.52	1000.0	9.000	L1	19.4
0.180000	58.21	---	79.00	20.79	1000.0	9.000	L1	19.4
0.185000	---	54.18	66.00	11.82	1000.0	9.000	L1	19.4
0.185000	57.17	---	79.00	21.83	1000.0	9.000	L1	19.4
0.905000	---	39.13	60.00	20.87	1000.0	9.000	L1	20.1
0.905000	50.36	---	73.00	22.64	1000.0	9.000	L1	20.1
1.265000	---	36.39	60.00	23.61	1000.0	9.000	L1	20.1
1.265000	49.57	---	73.00	23.43	1000.0	9.000	L1	20.1
11.495000	---	33.23	60.00	26.77	1000.0	9.000	L1	20.0
11.495000	36.09	---	73.00	36.91	1000.0	9.000	L1	20.0
11.500000	---	34.09	60.00	25.91	1000.0	9.000	L1	20.0
11.500000	36.75	---	73.00	36.25	1000.0	9.000	L1	20.0

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

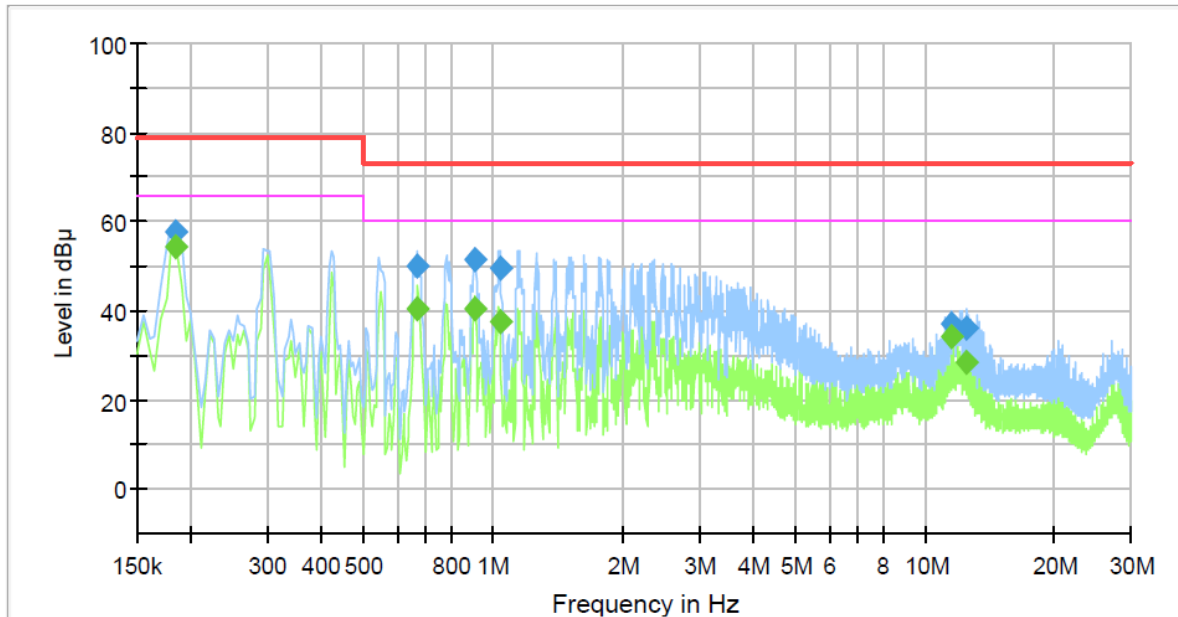
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact kes@kes.co.kr

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)
0.185000	---	54.26	66.00	11.74	1000.0	9.000	N	19.4
0.185000	57.51	---	79.00	21.49	1000.0	9.000	N	19.4
0.670000	---	40.36	60.00	19.64	1000.0	9.000	N	19.9
0.670000	50.06	---	73.00	22.94	1000.0	9.000	N	19.9
0.910000	---	40.36	60.00	19.64	1000.0	9.000	N	20.1
0.910000	51.25	---	73.00	21.75	1000.0	9.000	N	20.1
1.035000	---	37.34	60.00	22.66	1000.0	9.000	N	20.1
1.035000	49.48	---	73.00	23.52	1000.0	9.000	N	20.1
11.500000	---	33.98	60.00	26.02	1000.0	9.000	N	20.0
11.500000	36.90	---	73.00	36.10	1000.0	9.000	N	20.0
12.545000	---	28.44	60.00	31.56	1000.0	9.000	N	20.0
12.545000	35.94	---	73.00	37.06	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))

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

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

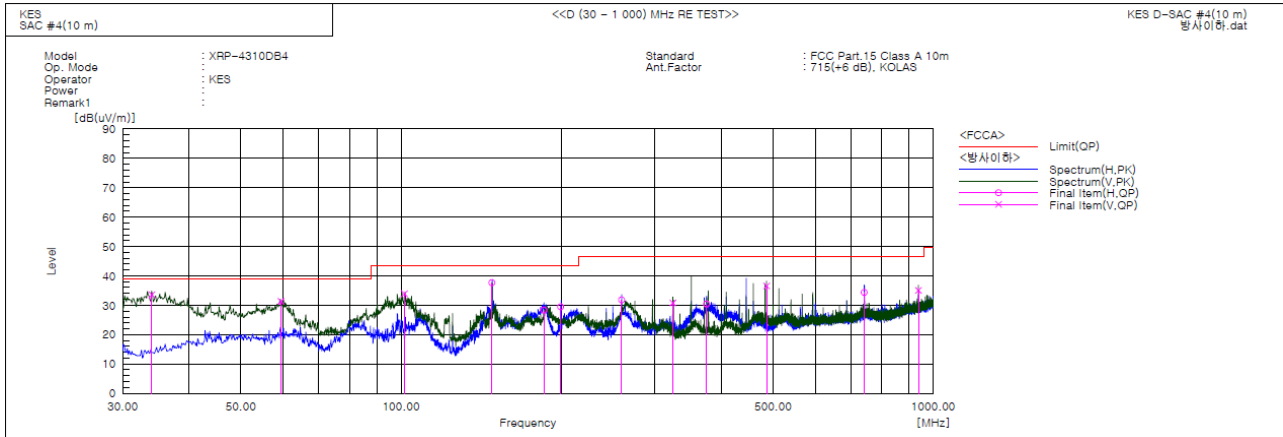
Report No.:

KES-EM-22T0545-R1

Page (22) of (43)

Radiated Electric Field Emissions(Below 1 GHz)

- 47 CFR Part 15, Subpart B



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	34.021	V	58.4	-24.8	33.6	39.0	5.4	133.0	142.0	
2	59.481	V	53.2	-21.9	31.3	39.0	7.7	100.0	306.1	
3	101.518	V	56.4	-22.5	33.9	43.5	9.6	134.0	125.0	
4	148.136	H	63.0	-25.3	37.7	43.5	5.8	374.0	215.2	
5	185.552	H	51.1	-22.8	28.3	43.5	15.2	347.0	269.2	
6	199.421	H	50.5	-21.0	29.5	43.5	14.0	368.0	70.5	
7	259.619	H	50.8	-19.0	31.8	46.5	14.7	400.0	233.0	
8	324.108	V	47.3	-16.5	30.8	46.5	15.7	118.0	89.0	
9	374.932	H	45.2	-14.8	30.4	46.5	16.1	347.0	306.9	
10	486.140	V	48.5	-11.9	36.6	46.5	9.9	141.0	125.0	
11	741.730	H	40.8	-6.4	34.4	46.5	12.1	400.0	305.0	
12	937.407	V	38.9	-3.8	35.1	46.5	11.4	133.0	105.7	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

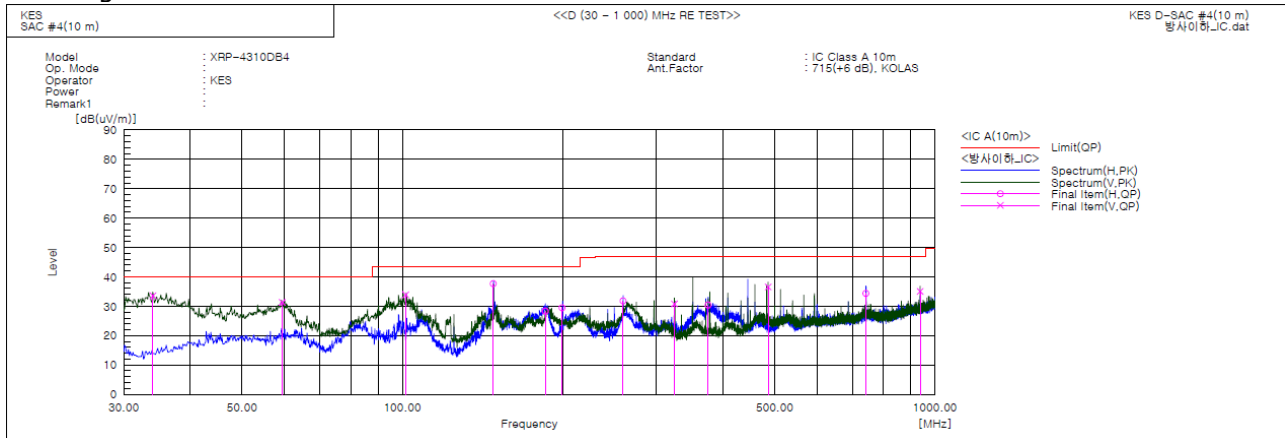
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-22T0545-R1

Page (23) of (43)

- IC Regulation ICES-003 Issue 7



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	34.021	V	58.4	-24.8	33.6	40.0	6.4	133.0	142.0	
2	59.481	V	53.2	-21.9	31.3	40.0	8.7	100.0	306.1	
3	101.518	V	56.4	-22.5	33.9	43.5	9.6	134.0	125.0	
4	148.136	H	63.0	-25.3	37.7	43.5	5.8	374.0	215.2	
5	185.552	H	51.1	-22.8	28.3	43.5	15.2	347.0	269.2	
6	199.421	H	50.5	-21.0	29.5	43.5	14.0	368.0	70.5	
7	259.619	H	50.8	-19.0	31.8	47.0	15.2	400.0	233.0	
8	324.108	V	47.3	-16.5	30.8	47.0	16.2	118.0	89.0	
9	374.932	H	45.2	-14.8	30.4	47.0	16.6	347.0	306.9	
10	486.140	V	48.5	-11.9	36.6	47.0	10.4	141.0	125.0	
11	741.730	H	40.8	-6.4	34.4	47.0	12.6	400.0	305.0	
12	937.407	V	38.9	-3.8	35.1	47.0	11.9	133.0	105.7	

◆ Calculation - SAC #4(10 m)

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

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

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

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

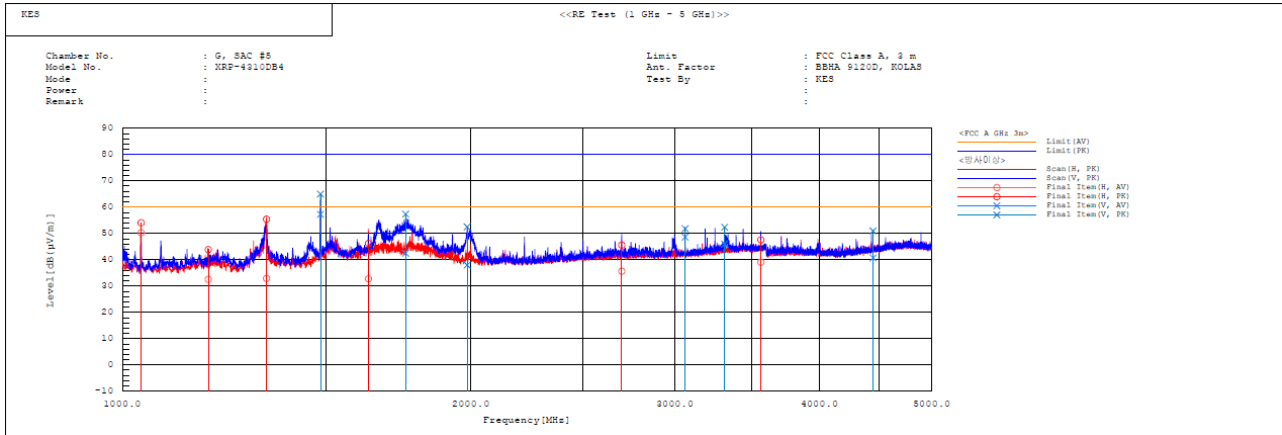
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact kes@kes.co.kr



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	Rema
		[MHz]		AV	PK		AV	PK	AV	PK	AV	PK	[cm]	[deg]	
				[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]			
1	Range1	1038.446	H	57.9	61.7	-7.6	50.3	54.1	60.0	80.0	9.7	25.9	113.0	349.7	
2	Range1	1186.829	H	39.3	50.6	-6.7	32.6	43.9	60.0	80.0	27.4	36.1	233.0	215.8	
3	Range1	1332.400	H	38.7	61.2	-5.8	32.9	55.4	60.0	80.0	27.1	24.6	112.0	13.6	
4	Range1	1483.203	V	62.4	70.1	-5.1	57.3	65.0	60.0	80.0	2.7	15.0	101.0	333.7	
5	Range1	1631.817	H	37.3	50.7	-4.5	32.8	46.2	60.0	80.0	27.2	33.8	376.0	330.5	
6	Range1	1757.200	V	46.4	61.3	-3.9	42.5	57.4	60.0	80.0	17.5	22.6	123.0	358.1	
7	Range1	1985.200	V	40.8	55.3	-2.8	38.0	52.5	60.0	80.0	22.0	27.5	166.0	6.7	
8	Range1	2700.027	H	35.9	45.8	-0.2	35.7	45.6	60.0	80.0	24.3	34.4	398.0	264.4	
9	Range1	3062.581	V	47.5	50.7	1.1	48.6	51.8	60.0	80.0	11.4	28.2	110.0	4.9	
10	Range1	3312.587	V	44.4	50.8	1.6	46.0	52.4	60.0	80.0	14.0	27.6	133.0	18.8	
11	Range1	3560.371	H	37.2	45.7	1.9	39.1	47.6	60.0	80.0	20.9	32.4	377.0	19.3	
12	Range1	4450.450	V	35.5	45.8	5.2	40.7	51.0	60.0	80.0	19.3	29.0	100.0	359.4	

◆ Calculation

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

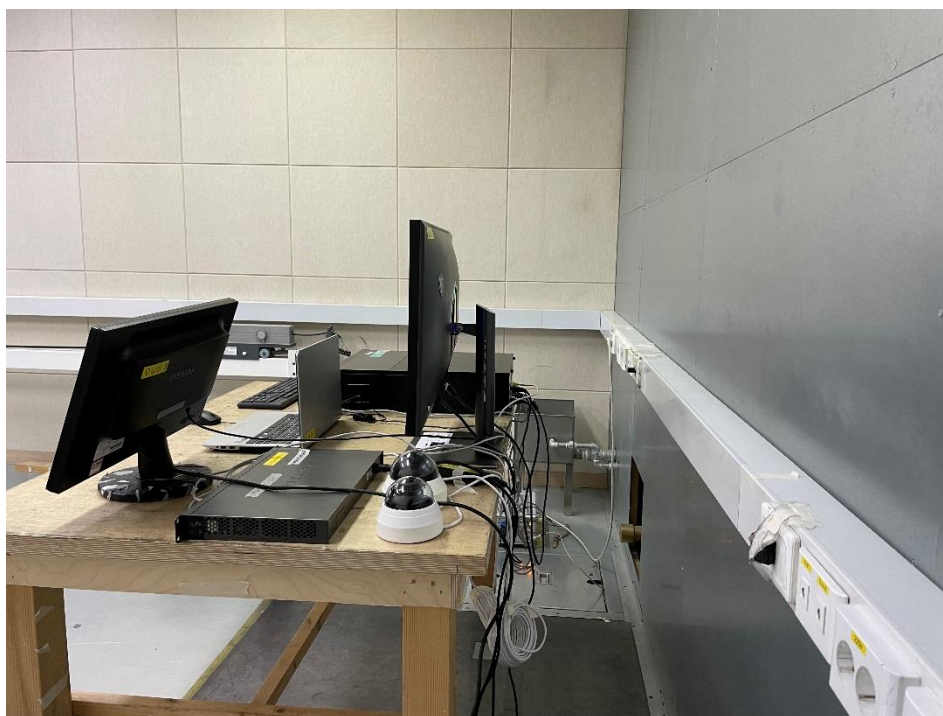
Margin(PK/CAV)[dB] = Limit[dB(μV/m)] - Result(PK/CAV) [dB(μV/m)]

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

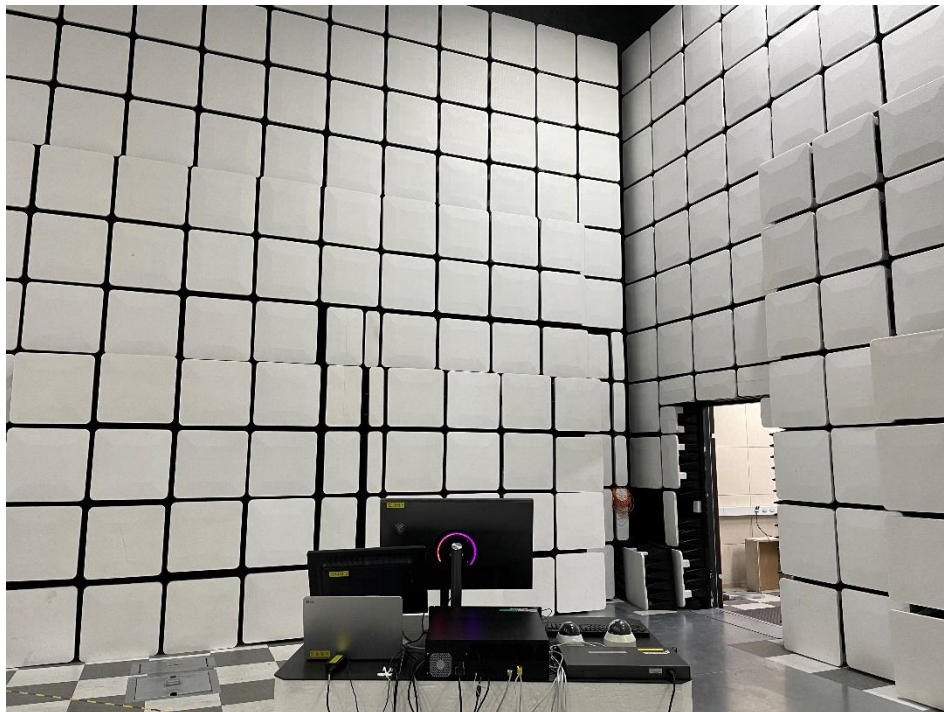
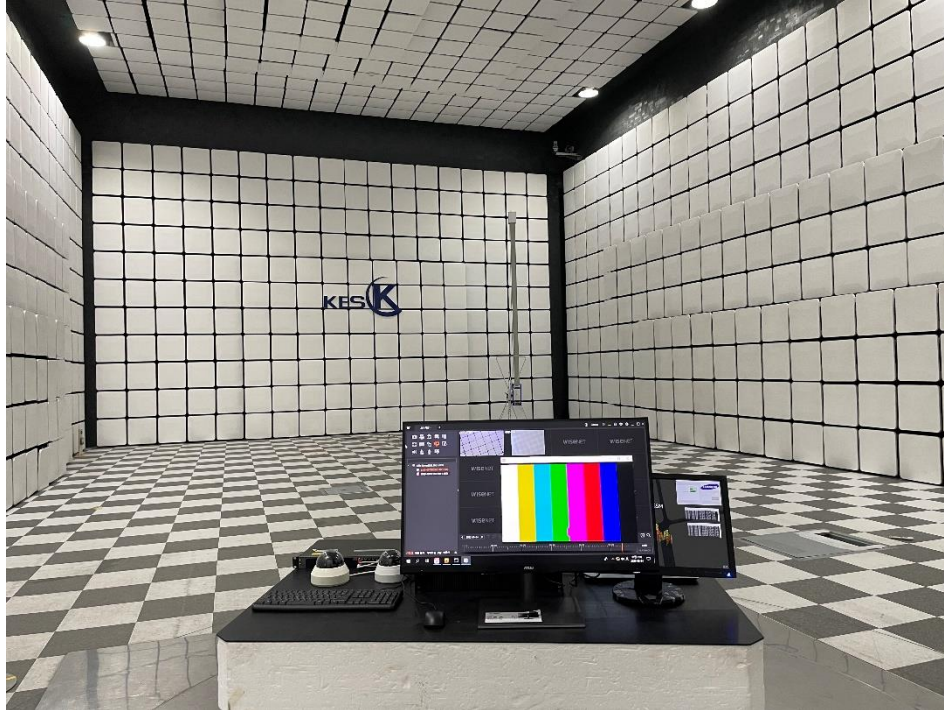
Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



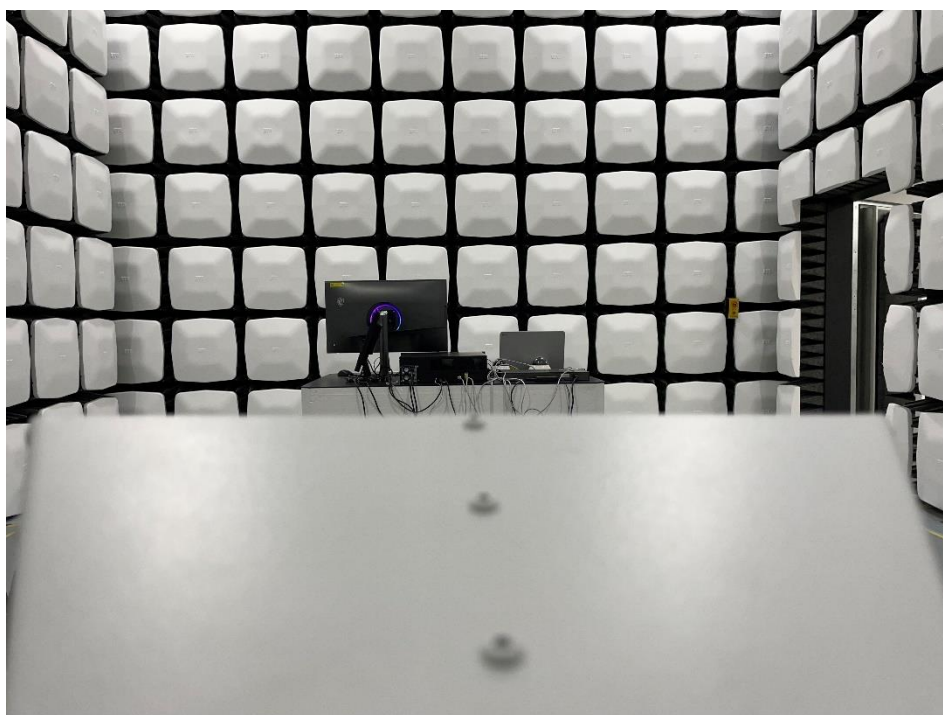
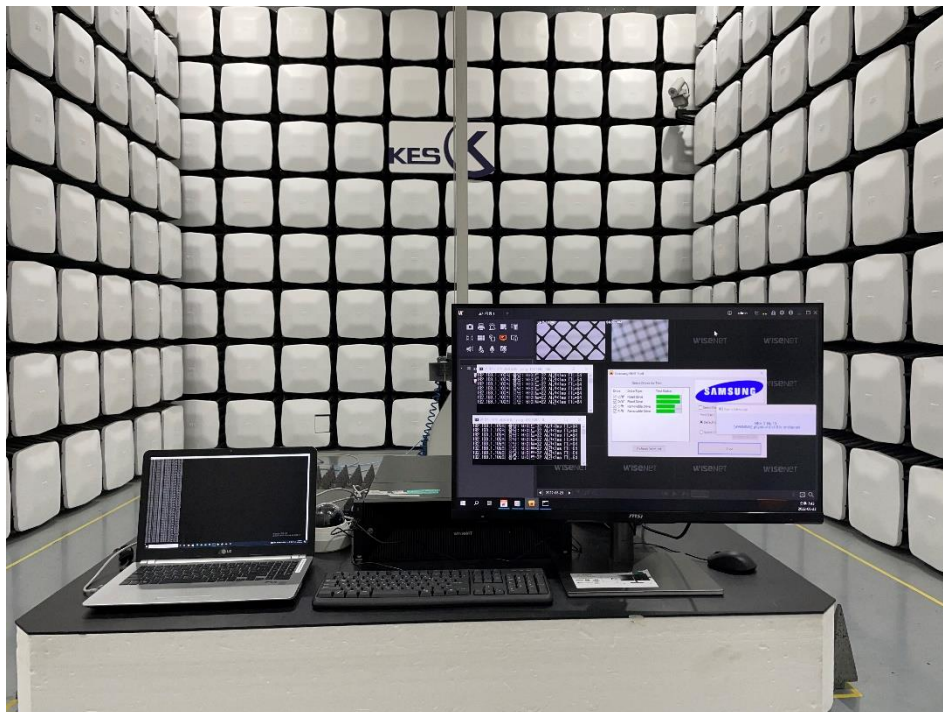
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Radiated Electric Field Emissions(Below 1 GHz)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Radiated Electric Field Emissions(Above 1 GHz)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT External Photographs

(Top)



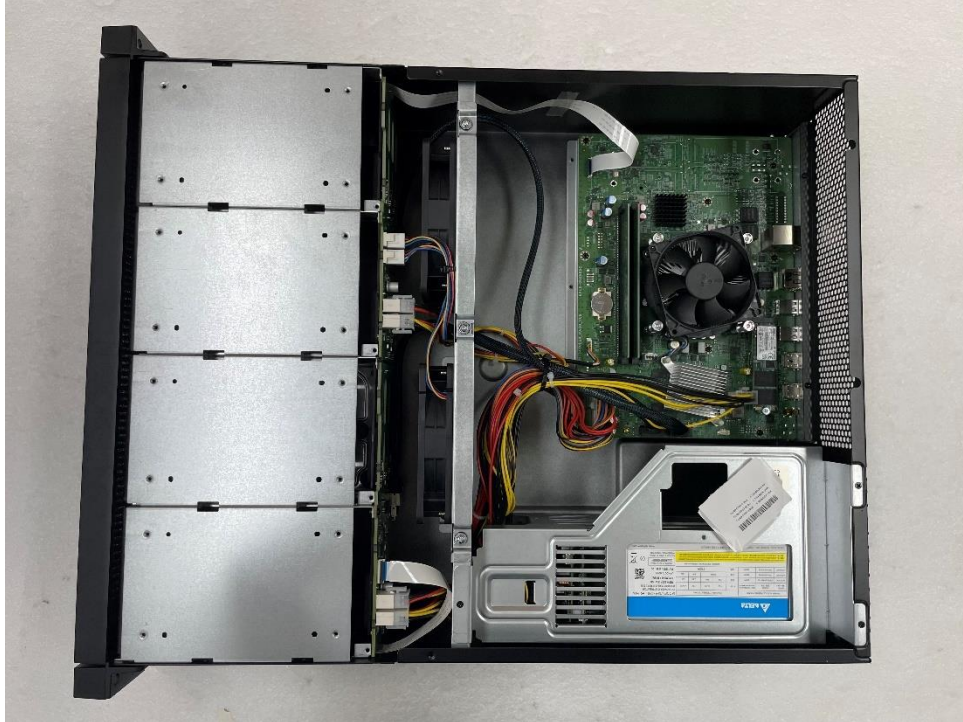
(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal Photographs

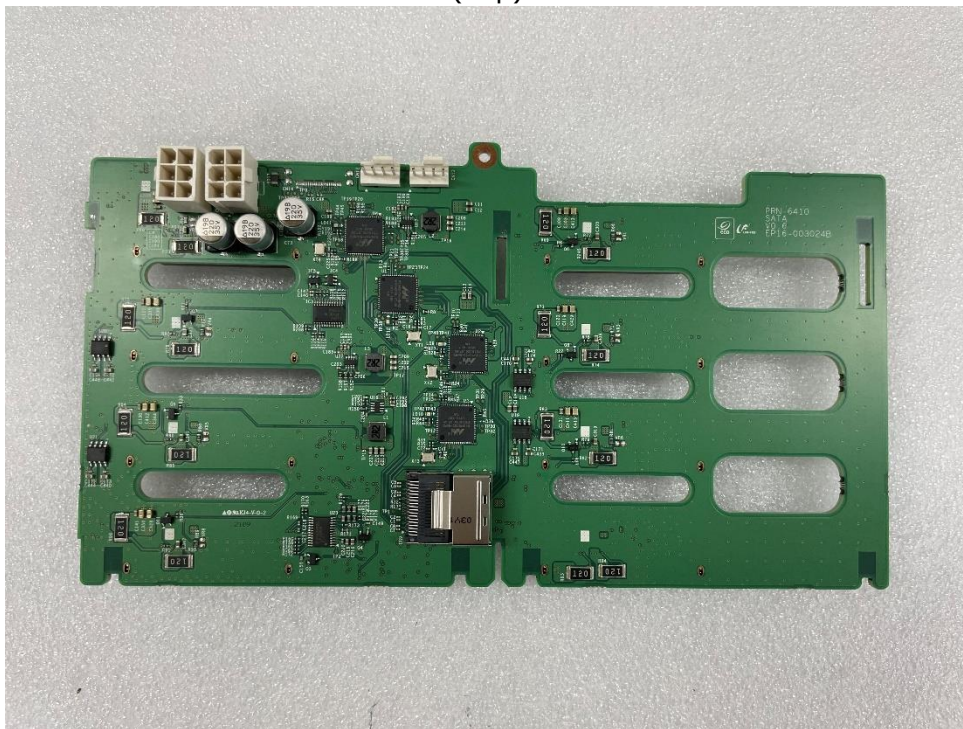
(Internal View)



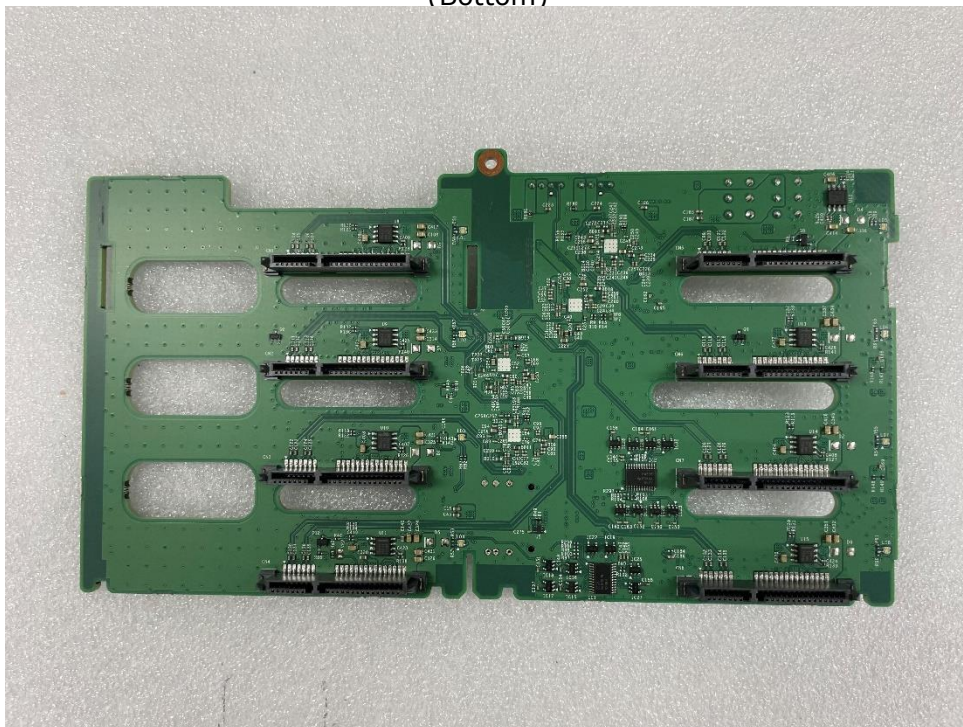
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Board 1

(Top)



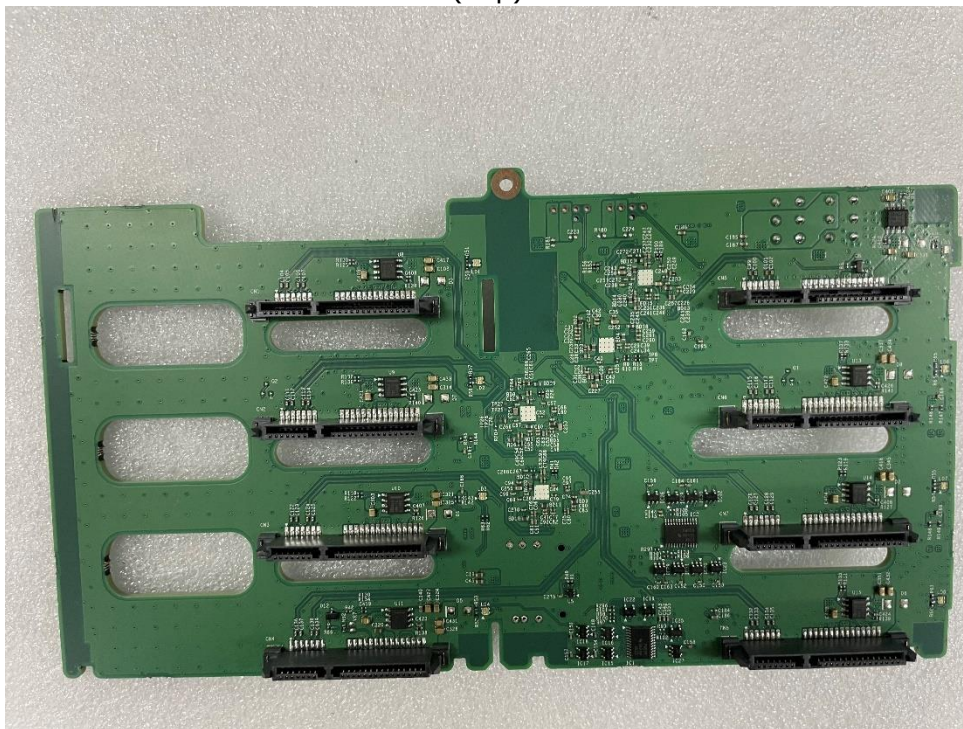
(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Board 2

(Top)



(Bottom)



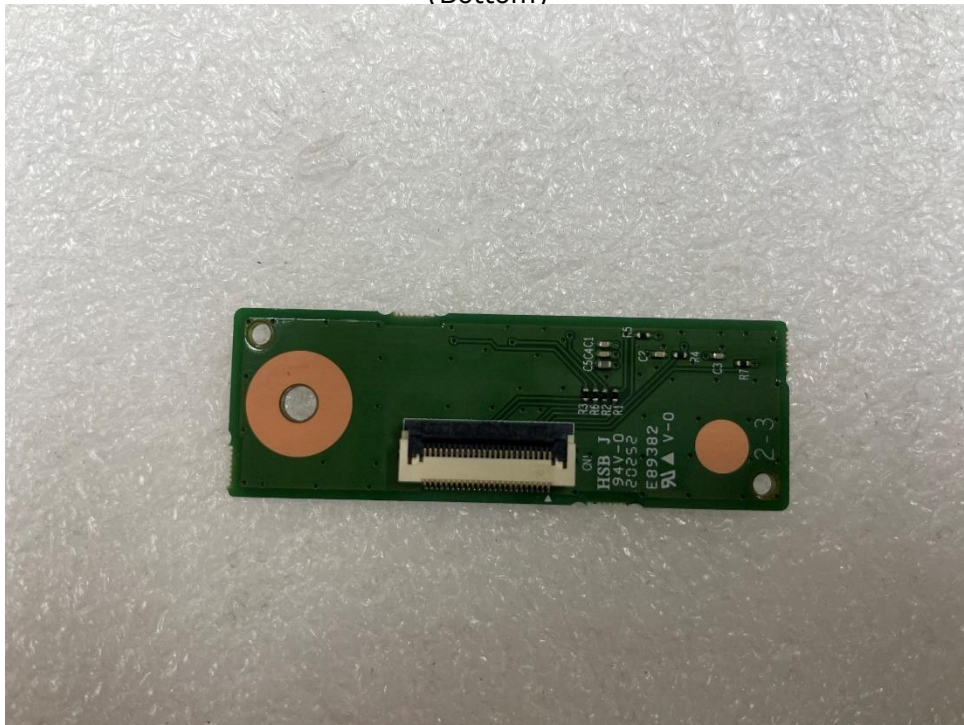
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Board 3

(Top)



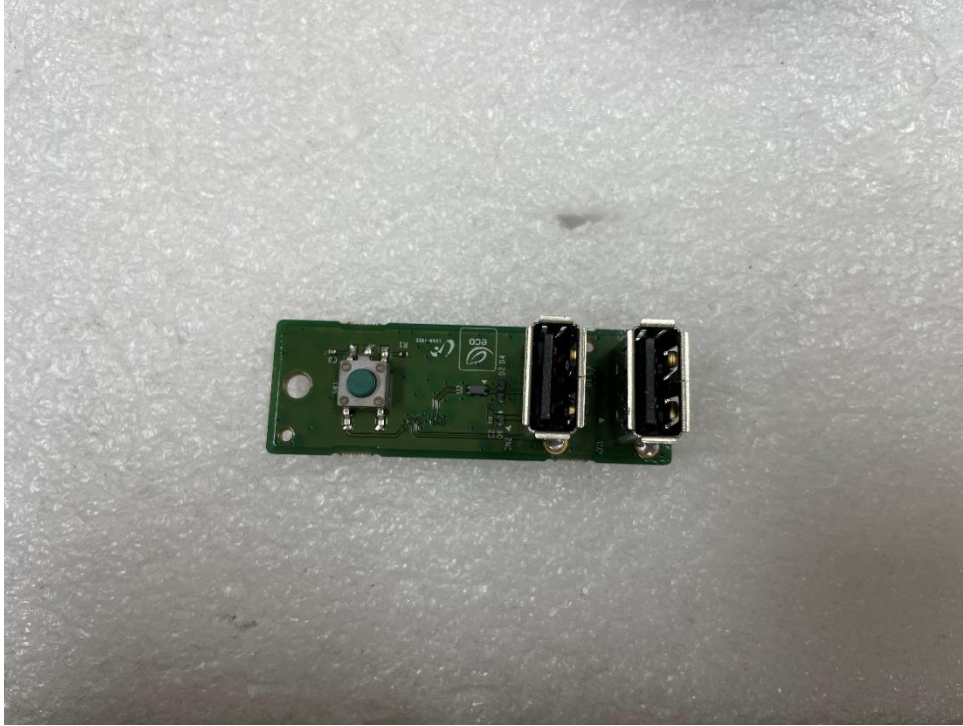
(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Board 4

(Top)



(Bottom)



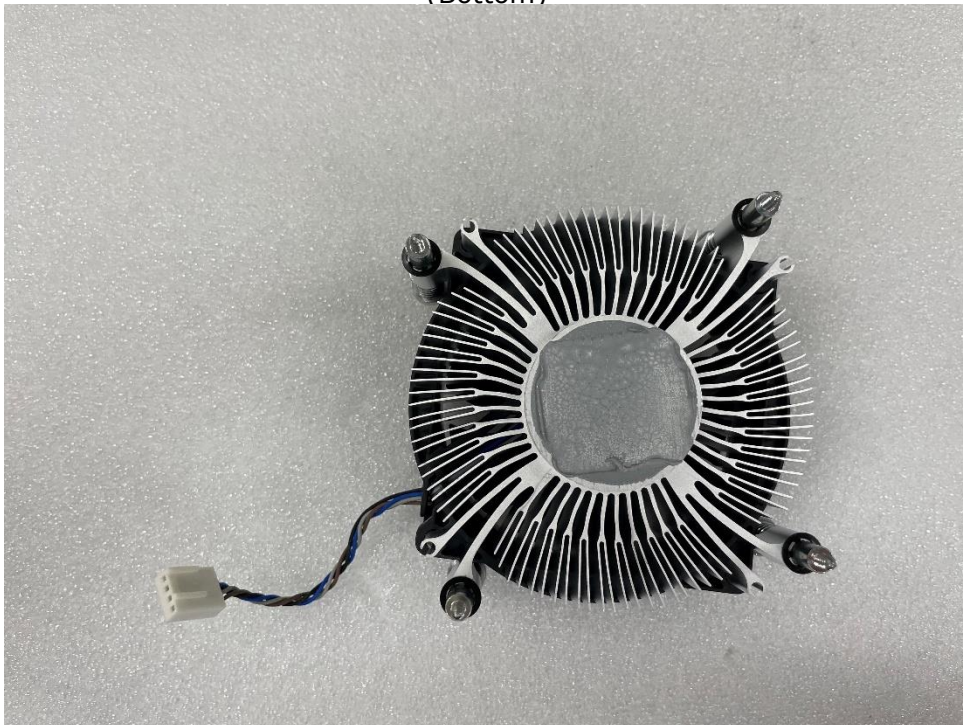
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Cooler

(Top)



(Bottom)



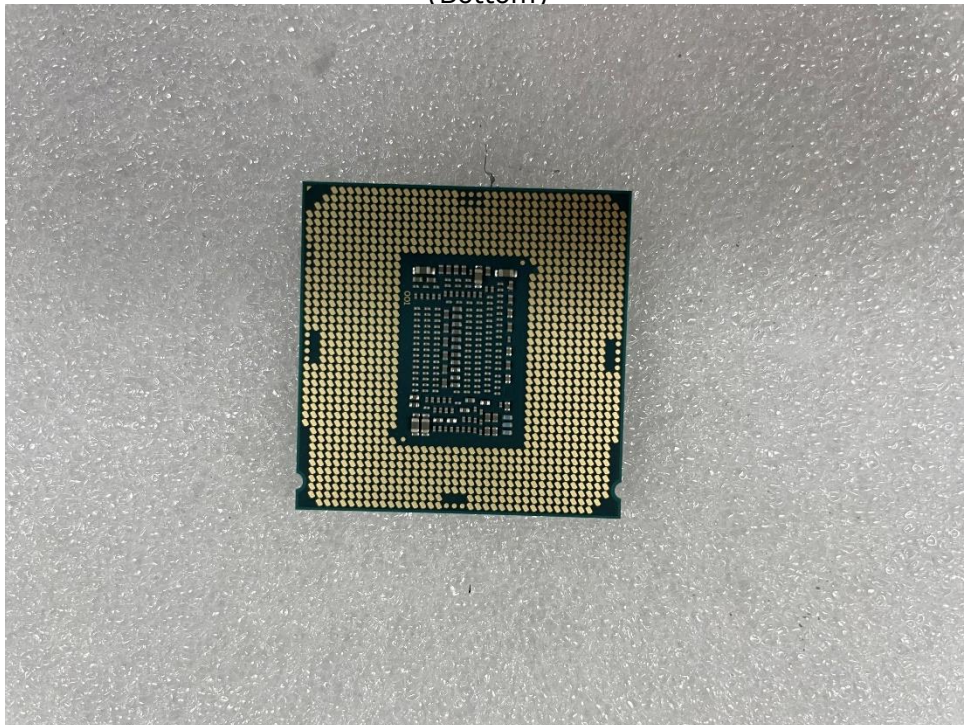
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – CPU

(Top)



(Bottom)



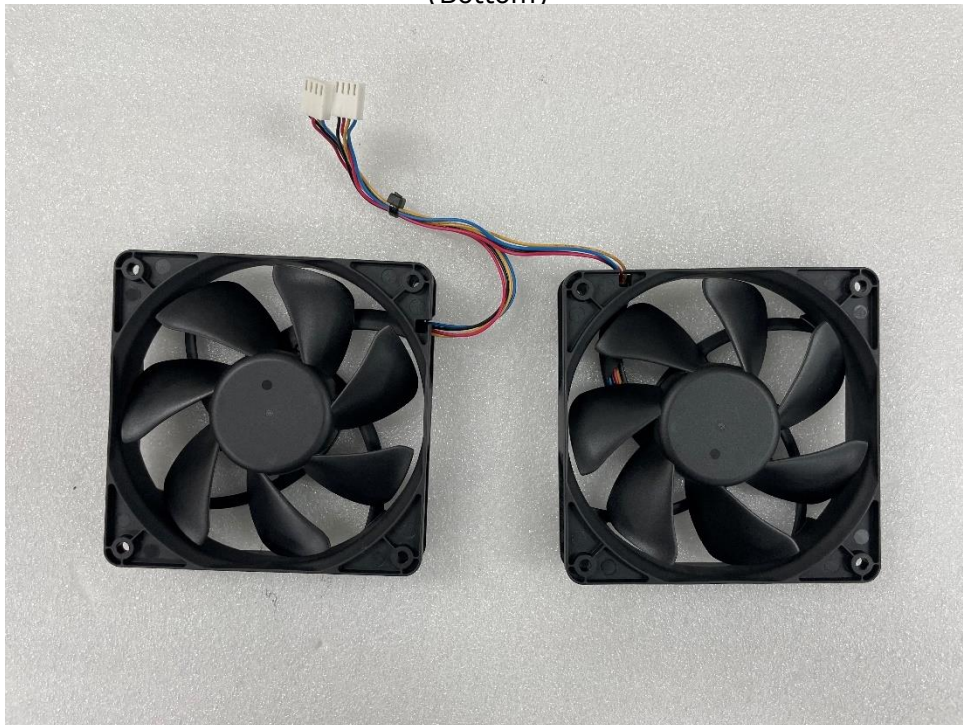
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – FAN

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – HDD

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – SMPS

(Top)



(Bottom)



EUT Internal View – SSD

(Top)



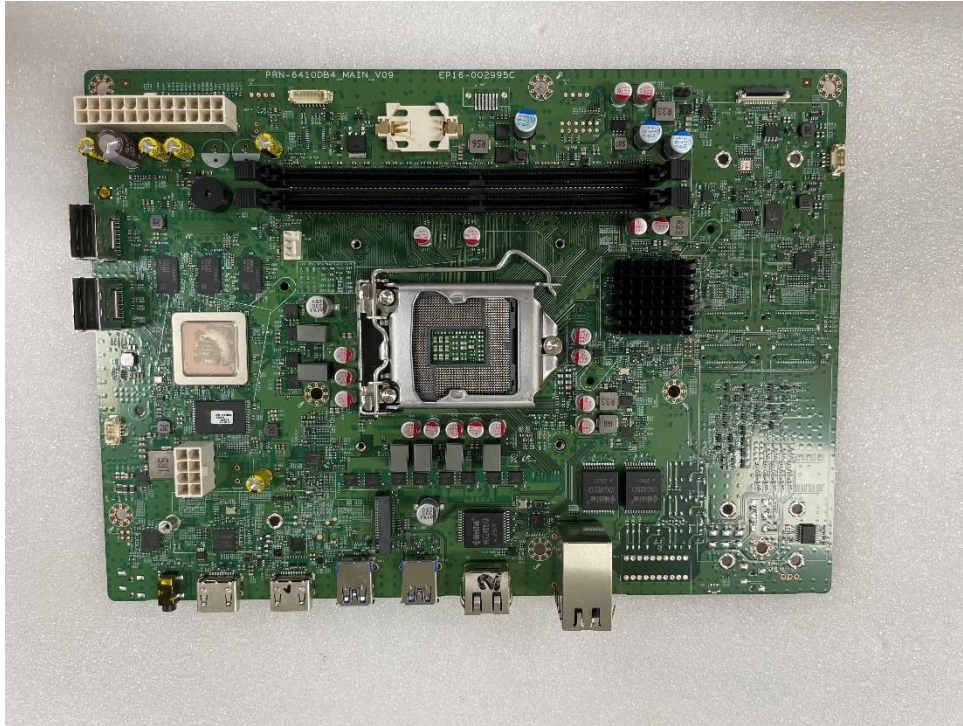
(Bottom)



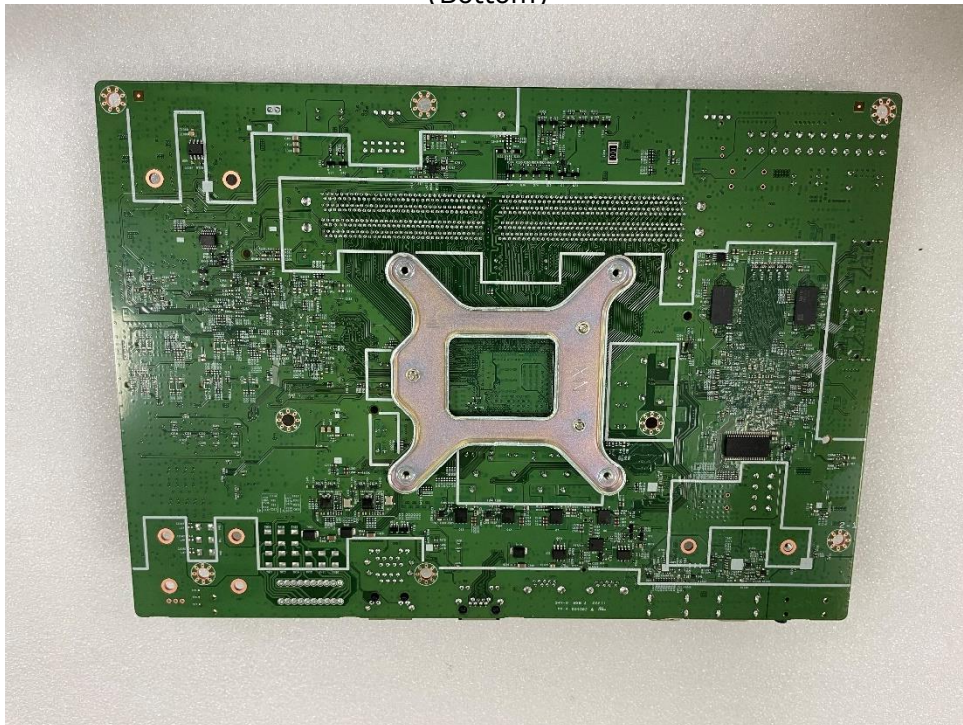
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Mother Board

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Memory 1

(Top)



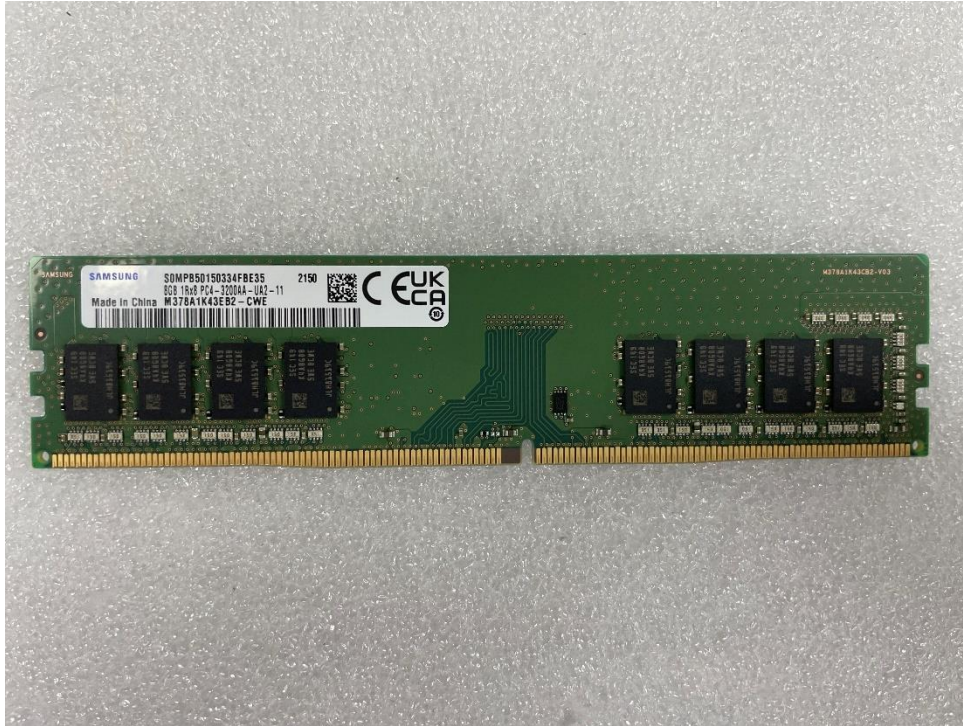
(Bottom)



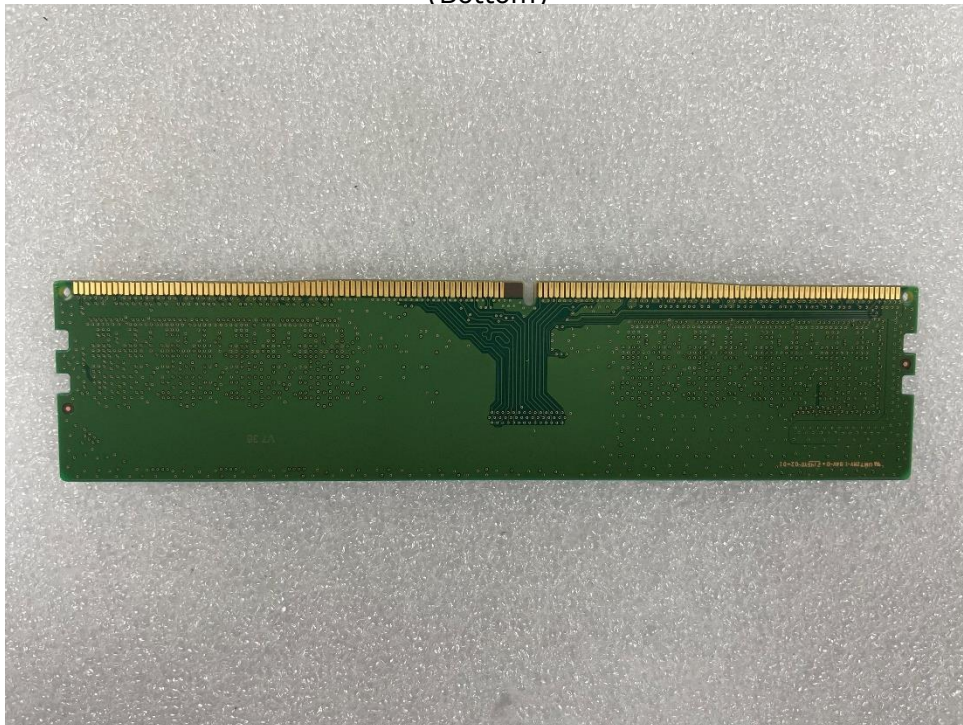
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Memory 2

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Label Photographs

FCC Label



HANWHA VISION VIETNAM COMPANY
LIMITED

XRP-4310DB4

IC Label

CAN ICES-003(A) / NMB-003(A)

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:
(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.