



EMC TEST REPORT For VCCI

Test Report No. : KES-EM-22T0536-R1
Date of Issue : Feb. 24, 2023
Product name : NVR
Model/Type No. : XRN-6410B4
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

Dong-Yun, Lee
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-22T0536-R1
Page (2) of (45)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 30, 2022	KES-EM-22T0536	Issued
Feb. 24, 2023	KES-EM-22T0536-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.



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-22T0536-R1
Page (3) of (45)

TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency	7
1.2	Variant Model Differences	7
1.3	Device Modifications	7
1.4	Equipment Under Test.....	7
1.5	Support Equipments	8
1.6	External I/O Cabling	9
1.7	EUT Operating Mode(s)	9
1.8	Configuration	10
1.9	Remarks when standards applied	11
1.10	Calibration Details of Equipment Used for Measurement	11
1.11	Test Facility.....	11
1.12	Laboratory Accreditations and Listings	11
2.0	Test Regulations.....	12
2.1	Conducted Emissions Mains Power Ports.....	13
2.2	Conducted Emissions at Telecommunication Ports.....	14
2.3	Radiated Electric Field Emissions(Below 1 GHz).....	15
2.4	Radiated Electric Field Emissions(Above 1 GHz)	16
APPENDIX A – TEST DATA.....		17
Conducted Emissions at Mains Power Ports.....		17
Conducted Emissions at Telecommunication Ports		19
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



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-22T0536-R1
Page (4) of (45)

1.0 General Product Description

Main Specifications of EUT are:

Display		
Network camera	Inputs	Max. 64CH
	Resolution	32MP ~ CIF
	Protocols	SUNAPI, ONVIF
Decoding	Local Display	[Dual Display] HDMI 1: 3840 x 2160 (30Hz) HDMI 2: 1920x1080 (60Hz)
	Multi Screen Display	[Local Monitor] - Dynamic layout, Virtual channel view - Clone Mode : Up to 64 Division - Expand Mode : HDMI1 up to 36 Div. HDMI2 up to 16 Div. [Web] 1/ 2H/ 2V/ 3V/ 4/ 6/ 8/ 9
	Resolution	32M(15fps, H.265 Only), 12M(30fps, H.265 Only), 8.3M(120fps), 1080p(480fps), 720P(960fps), D1(1920fps)
Performance		
Operating System	Embedded	Linux
Record	Compression	H.265, H.264, MJPEG
	Recording Bandwidth	Distributed mode : Up to 400 Mbps Normal mode : Up to 150 Mbps {RAID mode} Normal : Up to 400 Mbps Degrade/ Rebuild : Up to 320 Mbps
	Resolution	32MP ~ CIF
	Mode	Normal, Dual Stream, Schedule(Continuous/Event), Event (Pre/Post), Bookmark
	Event Trigger	Alarm Input, Video Loss, Camera Event(Sensor, MD, Video Analytics, Defocus, Audio), Dynamic Event, User Event
	Event Action	e-Mail, Event Push, PTZ Preset, Alarm Out, Buzzer, Monitor Out, FTP, SUNAPI Command, Shutdown
Search & Play	Playback Bandwidth	RAID Mode : Max. 64Mbps(64CH simultaneously) Non-RAID Mode : Max. 32Mbps
	User	Max. 4 Users (Local 1, Remote 3)
	Simultaneous playback	Max. 112CH(Local 64CH, Remote 16CH per user)
	Fisheye Dewarping	Support (Local 1CH), CMS
	Mode	Date & Time(Calendar), Event list, Text Search, Smart Search
	Resolution	CIF ~ 32MP (Up to H.264 9MP, H.265 32MP)
	Playback Control	Fast/Slow Forward / Backward, Move one step Up / Down
Storage	Supported HDD	Up to 10TB
	HDD Slot	SATA 16ea(Max. 160TB, Non-RAID mode)
	External	iSCSI storage
	RAID	RAID-5/6(Array Size : 8 HDDs x 2 Array)
Backup	File backup	BU/Exe/AVI(GUI), JPG/AVI(Network)
	Function	Multi channel(Up to 16CH) Play, Date-Time/Title display
	Compression	G.711, G.726, AAC(16/48KHz)
	Audio Communication	2-Way
Max Remote Users		Search(3), Live Unicast(10), Multicast(20)
Security		IP address filtering, User access Log, 802.1x, Encryption Device certificate(Hanwha Techwin Root CA), Signed firmware
Web viewer	Supported OS	Windows 10, macOS 10.13
	Supported browser	Google Chrome, Microsoft Edge, Mac Safari
Viewer Software		SSM, Webviewer, Smart Viewer, Wisenet mobile Support CGI(SUNAPI) for integration to 3'rd party VMS

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-22T0536-R1
Page (5) of (45)

Functions

Camera Setup	Register	Auto, Manual
	Item	IP address, Add profile edit, Bitrate, Compression, GOP, Quality, Camera MD setup (4, 8 point polygon) Camera video setup (Simple focus, Brightness/Contrast, Flip/Mirror, IRIS, WDR, D&N, SSNR, Shutter, SSDR, DIS), Fisheye Dewarping Mode, Hallway View Setup, Camera Webpage
PTZ	Control	Via GUI, Webviewer, SPC-2000
	Preset	300 Presets
Smart phone	Support Model	iOS, Android
	Protocol Support	RTP, RTSP, HTTP, CGI(SUNAPI)
	Control	Live 16CH(Multi-Profile Support), Playback 4CH
	Max. Remote Users	Search(3), Live Unicast(10)
Redundancy	Failover	N+1
	ARB	Support
Easy configuration		P2P(QR code)

Interface

Front	Indicator	HDD, Alarm, Power, Record, Backup, Network, RAID
Storage		OK
Reset		Power button
HDD Key Lock		OK
HDMI		2EA (Playback/Setup → HDMI1) HDMI1 : 3840x2160 30Hz HDMI2 : 1920x1080 60Hz
Audio		Out 1EA (3.5mm Audio Jack)
Ethernet		RJ-45 3EA (LAN/WAN, 1Gbps)
Alarm		In 8EA, Out 4EA
USB		4EA(Front 2 x USB 2.0, Rear 2 x USB 3.0)
Power Inlet		AC 1EA

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-22T0536-R1
Page (6) of (45)

System

Log	Log List	Max. 100,000 (System Log, Event Log each)
System Control		Mouse, Keyboard, Web, Controller (SPC-2000)
Language		English, French, German, Italian, Spanish, Russian, Turkish, Polish, Dutch, Czech, Portuguese, Danish, Rumanian, Serbian, Croatian, Hungarian, Greek, Norwegian, Finnish, Korean, Chinese, Japanese, Thai, Vietnamese

Environmental

Operating Temperature	0°C to +40°C (32°F to 104°F)
Operating Humidity	20% ~ 85% RH

Electrical

Power Input	100 ~ 240 VAC $\pm$ 10%; 50/60 Hz, 2.7A (Single SMPS)
Power Consumption	Max. 265W (904.2 BTU with HDD 16ea)

Mechanical

Color / Material	Black / Metal
Dimension (WxHxD)	440.0 x 132.0 x 571.1mm
Weight	Approx. 13.4Kg(29.6 lb, HDD not included)

Intelligent Analysis

AI Search	Object Attribute	Compatible for Wisenet AI Camera
-----------	------------------	----------------------------------

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 100 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	XRN-6410B4	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT
Mouse	MOKJUO	-	Primax Electronics Ltd.	-
SWITCHING POWER SUPPLY	DPS-500AB-33 C	-	Delta Electronics Power (Dongguan)Co., Ltd.	-
Main Board	EP16-002995C	-	-	-
CPU	INTEL PENTIUM G5400T SR3XB 3.10GHz	-	INTEL	-
RAM	8GB 1Rx8 PC4- 3200AA-UA2-11	-	SAMSUNG	8 GB x 2 EA
SSD	TS32GMTS800	-	Transcend	32 GB



1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Camera	XNV-6020R	-	HANWHA VISION VIETNAM COMPANY LIMITED	-
PoE Adapter	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Laptop	LG15N54	503NZWY038929	LG Electronics	-
Laptop Adapter	PA-1900-14	OF2R263348701 7764	LITE-ON TECHNOLOGY COPORATION	-
Monitor	QTM-OR24.9WB	-	Topsync	-
Keyboard	KU-0316	-	Chicony Electronics Co., Ltd.	-
Earphone	-	-	-	-
Alarm	-	-	-	-
Button alarm	-	-	-	-
HDD	WD40PURX- 64N96Y0	-	WD	4 TB
Smart phone	-	-	LG Electronics	-
USB Memory1	-	-	Sandisk	32 GB
USB Memory2	-	-	Sandisk	32 GB

1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NVR (EUT)	RJ-45 (LAN1)	PoE Adapter	RJ-45 (LAN1)	3.0	U
	RJ-45 (LAN2)	Laptop	RJ-45 (LAN2)	3.0	U
	USB	Mouse (EUT)	USB	1.4	U
	USB	USB Memory1	USB	-	-
	USB	USB Memory2	USB	-	-
	HDMI	Monitor	HDMI	1.6	S
	USB	Keyboard	USB	1.5	U
	3.5mm	Earphone	3.5mm	1.6	U
	Alarm out	Alarm	Alarm in	3.0	U
	Alarm in	Button alarm	Alarm out	3.0	U
	SATA	HDD	SATA	0.2	U
PoE Adapter	RJ-45 (PoE)	Camera	RJ-45 (PoE)	3.0	U
Laptop	DC Jack	Laptop Adapter	DC Jack	1.7	U
	3.5 mm	Smart phone	3.5 mm	1.4	U

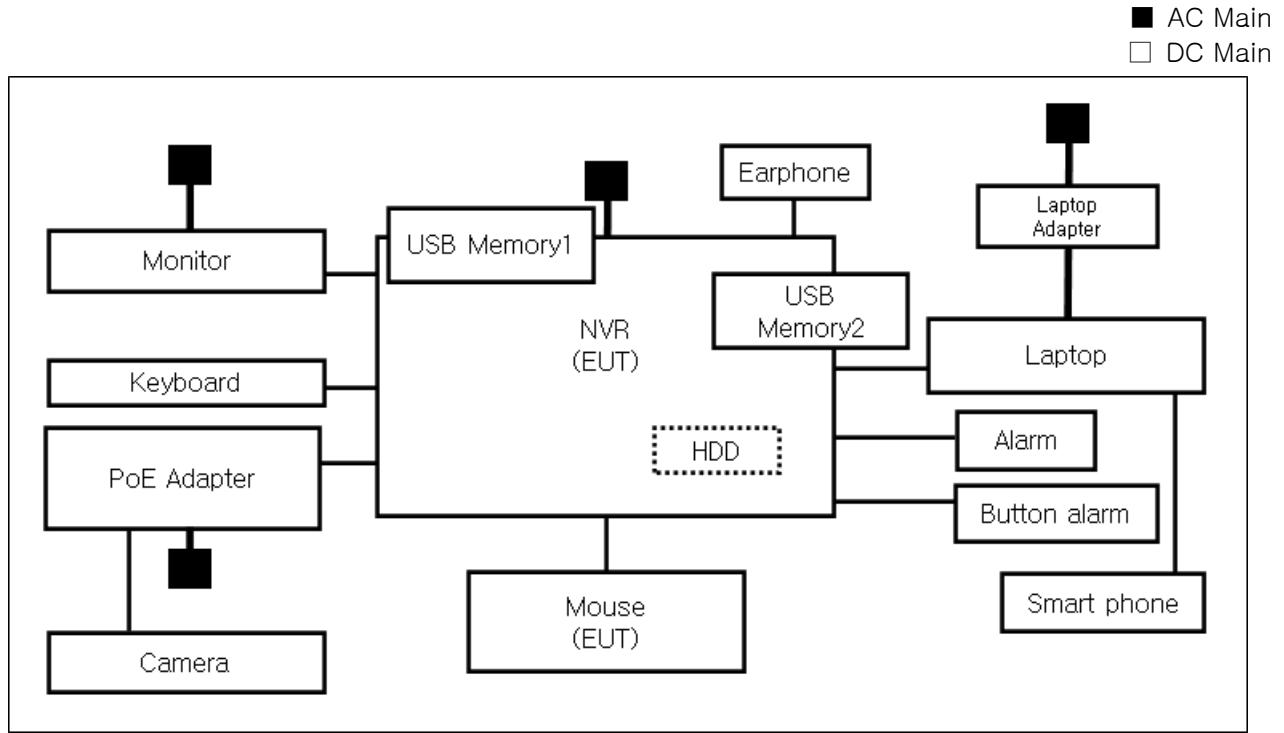
* Unshielded=U, Shielded=S

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:

☒ **VCCI-CISPR 32:2016**

☒ Class A

☐ Class B



2.1 Conducted Emissions Mains Power Ports

Test Date

Jun. 22, 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: (24,3 ± 0,2) °C

Relative Humidity: (44,5 ± 0,2) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Jun. 22, 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: (24,3 ± 0,2) °C

Relative Humidity: (44,5 ± 0,2) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

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 ± 0,3) °C
Relative Humidity: (44,3 ± 0,2) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jun. 23, 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: (24,9 ± 0,2) °C

Relative Humidity: (44,8 ± 0,2) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



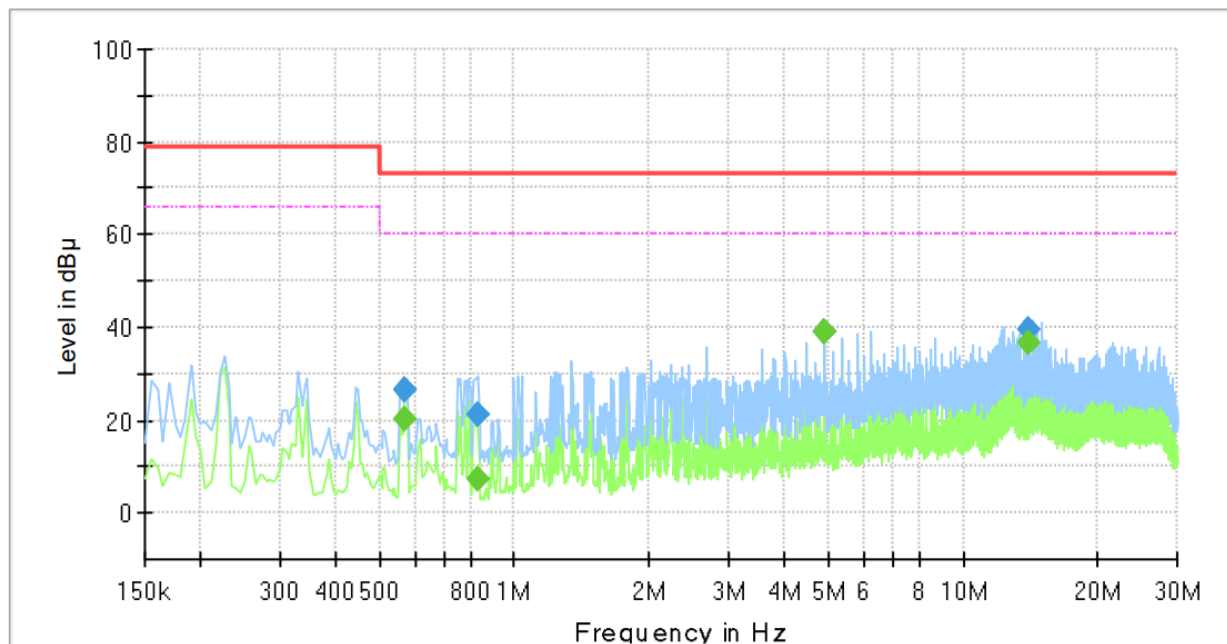
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: XRN-6410B4
Phase: L1
Mode:
Operator Name: KES



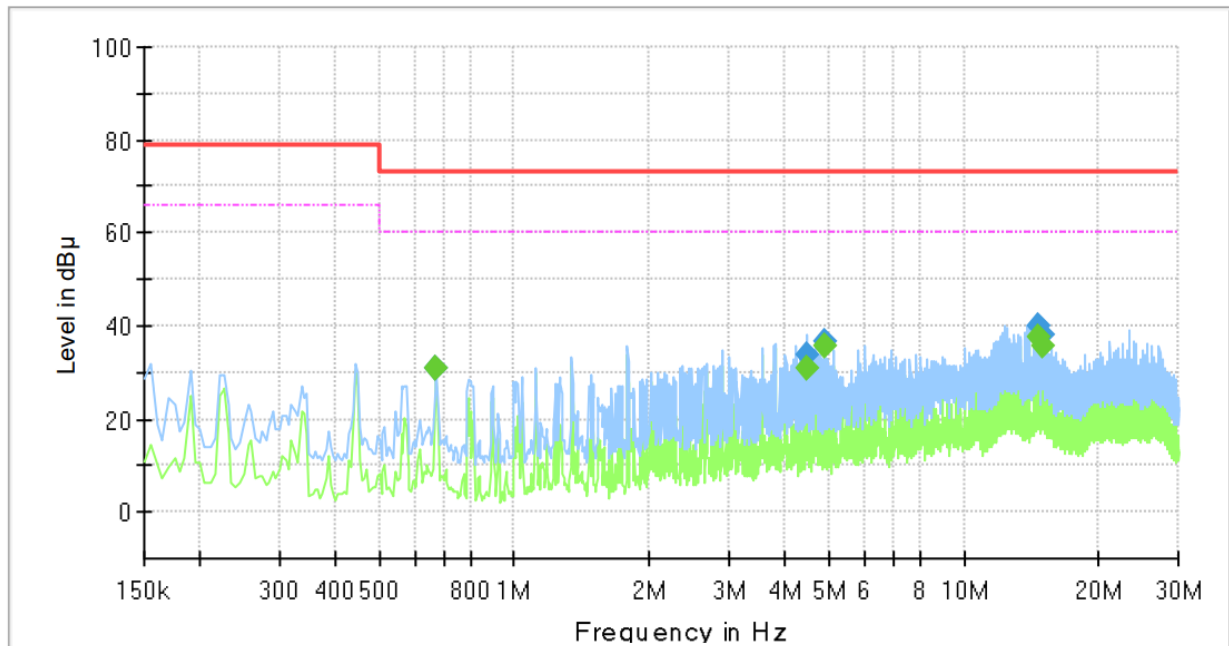
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.570000	---	20.12	60.00	39.88	1000.0	9.000	L1	19.8
0.570000	26.63	---	73.00	46.37	1000.0	9.000	L1	19.8
0.830000	---	7.22	60.00	52.78	1000.0	9.000	L1	20.0
0.830000	21.12	---	73.00	51.88	1000.0	9.000	L1	20.0
4.910000	---	38.89	60.00	21.11	1000.0	9.000	L1	19.6
4.910000	39.13	---	73.00	33.87	1000.0	9.000	L1	19.6
14.045000	---	36.51	60.00	23.49	1000.0	9.000	L1	19.9
14.045000	39.44	---	73.00	33.56	1000.0	9.000	L1	19.9

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	XRN-6410B4
Phase:	N
Mode:	
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	---	30.88	60.00	29.12	1000.0	9.000	N	19.9
0.670000	31.01	---	73.00	41.99	1000.0	9.000	N	19.9
4.460000	---	31.03	60.00	28.97	1000.0	9.000	N	19.8
4.460000	33.94	---	73.00	39.06	1000.0	9.000	N	19.8
4.910000	---	35.49	60.00	24.51	1000.0	9.000	N	19.6
4.910000	36.78	---	73.00	36.22	1000.0	9.000	N	19.6
14.680000	---	37.42	60.00	22.58	1000.0	9.000	N	19.9
14.680000	39.75	---	73.00	33.25	1000.0	9.000	N	19.9
14.890000	---	35.56	60.00	24.44	1000.0	9.000	N	19.9
14.890000	37.99	---	73.00	35.01	1000.0	9.000	N	19.9

◆ 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

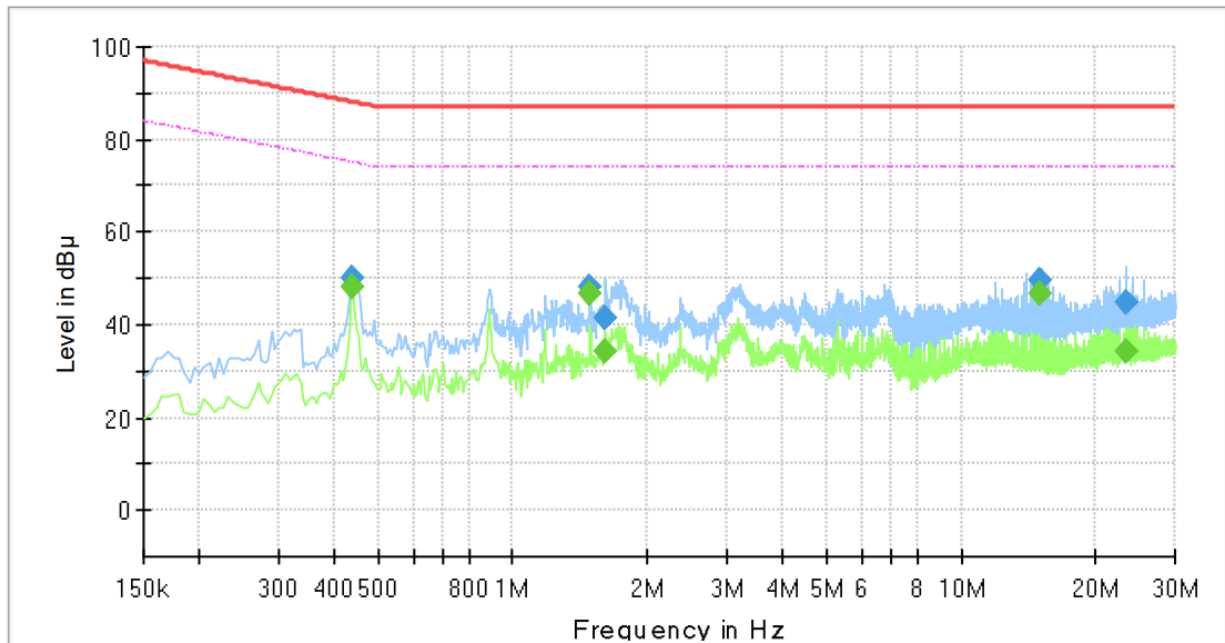
Conducted Emissions at Telecommunication Ports

■ LAN 1

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XRN-6410B4
Mode :	LAN1_TEL 1 000 Mbps
Speed :	
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.440000	---	48.15	75.06	26.91	1000.0	9.000	Single Line	19.7
0.440000	50.03	---	88.06	38.03	1000.0	9.000	Single Line	19.7
1.490000	---	46.56	74.00	27.44	1000.0	9.000	Single Line	20.1
1.490000	48.01	---	87.00	38.99	1000.0	9.000	Single Line	20.1
1.610000	---	34.38	74.00	39.62	1000.0	9.000	Single Line	20.1
1.610000	41.39	---	87.00	45.61	1000.0	9.000	Single Line	20.1
14.890000	---	46.63	74.00	27.37	1000.0	9.000	Single Line	19.6
14.890000	49.51	---	87.00	37.49	1000.0	9.000	Single Line	19.6
23.325000	---	34.25	74.00	39.75	1000.0	9.000	Single Line	19.9
23.325000	44.75	---	87.00	42.25	1000.0	9.000	Single Line	19.9

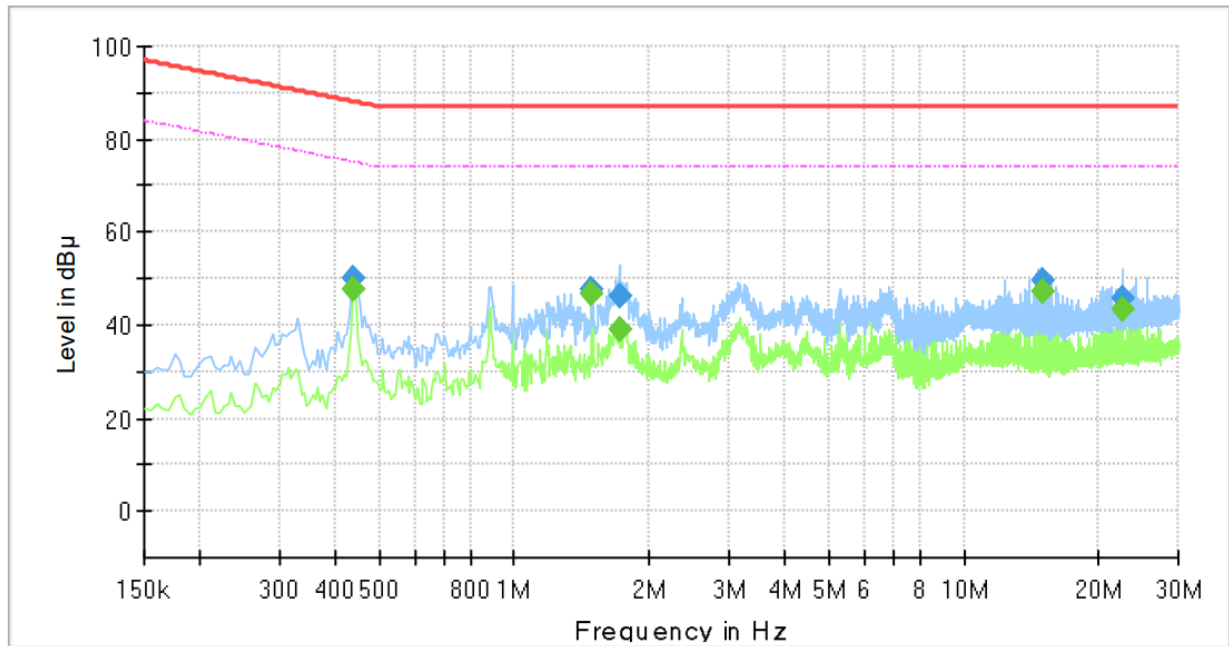
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

LAN 2
[1 000 Mbps]
Common Information

Test Description: Telecommunication Emission
Model No.: XRN-6410B4
Mode : LAN2_TEL 1 000 Mbps
Speed :
Operator Name: KES


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.440000	---	47.72	75.06	27.34	1000.0	9.000	Single Line	19.7
0.440000	50.04	---	88.06	38.02	1000.0	9.000	Single Line	19.7
1.490000	---	46.45	74.00	27.55	1000.0	9.000	Single Line	20.1
1.490000	47.85	---	87.00	39.15	1000.0	9.000	Single Line	20.1
1.710000	---	38.89	74.00	35.11	1000.0	9.000	Single Line	20.1
1.710000	46.21	---	87.00	40.79	1000.0	9.000	Single Line	20.1
14.890000	---	46.96	74.00	27.04	1000.0	9.000	Single Line	19.6
14.890000	49.66	---	87.00	37.34	1000.0	9.000	Single Line	19.6
22.530000	---	43.11	74.00	30.89	1000.0	9.000	Single Line	19.9
22.530000	45.90	---	87.00	41.10	1000.0	9.000	Single Line	19.9

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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.

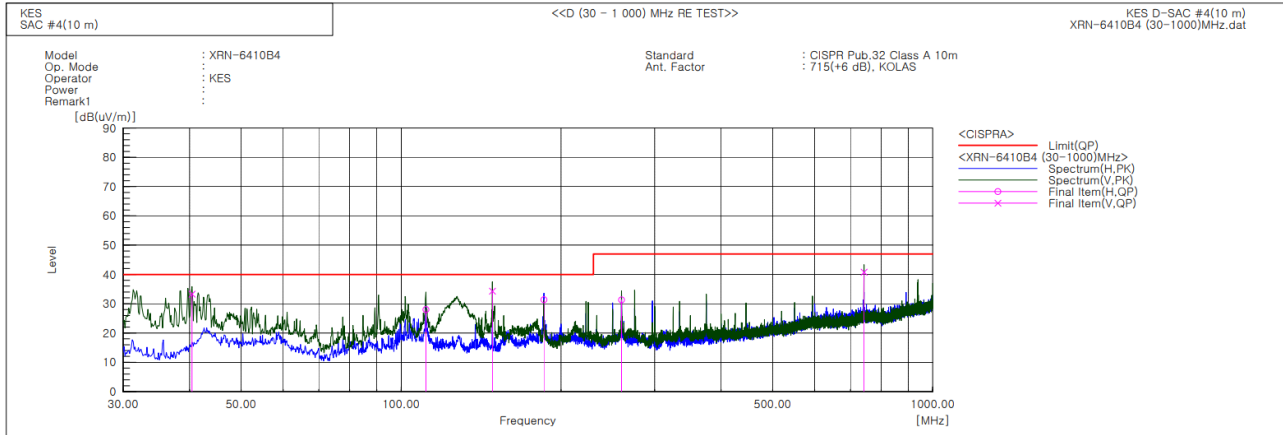
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-22T0536-R1

Page (21) of (45)

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	40.428	V	55.7	-22.4	33.3	40.0	6.7	106.0	243.6	
2	111.359	H	50.4	-22.4	28.0	40.0	12.0	394.0	276.7	
3	148.461	V	59.6	-25.3	34.3	40.0	5.7	110.0	189.7	
4	185.564	H	54.2	-22.8	31.4	40.0	8.6	391.0	204.7	
5	259.890	H	50.3	-19.0	31.3	47.0	15.7	388.0	150.8	
6	742.586	V	47.2	-6.4	40.8	47.0	6.2	107.0	279.0	

◆ Calculation

Corrected Amplitude [dBuV] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss

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.

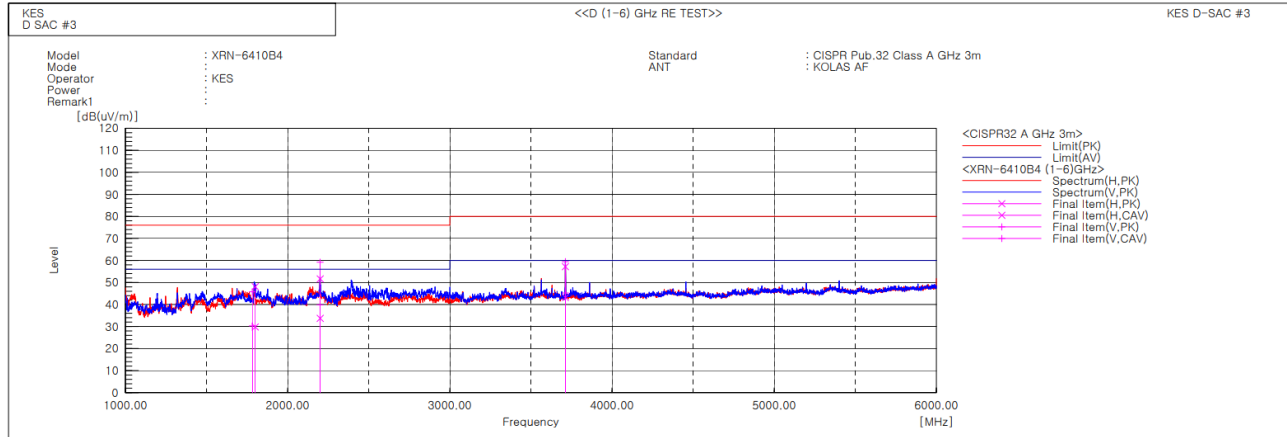
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-22T0536-R1

Page (22) of (45)

Radiated Electric Field Emissions(Above 1 GHz)



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1782.042	V	48.2	32.7	-2.4	45.8	30.3	76.0	56.0	30.2	25.7	100.0	209.5	
2	1800.379	H	50.3	32.0	-2.2	48.1	29.8	76.0	56.0	27.9	26.2	100.0	49.7	
3	2199.950	V	59.5	40.1	-0.3	59.2	39.8	76.0	56.0	16.8	16.2	100.0	337.9	
4	2200.480	H	51.9	34.0	-0.3	51.6	33.7	76.0	56.0	24.4	22.3	100.0	277.6	
5	3712.570	V	54.9	40.6	4.6	59.5	45.2	80.0	60.0	20.5	14.8	100.0	38.2	
6	3712.590	H	52.6	38.6	4.6	57.2	43.2	80.0	60.0	22.8	16.8	100.0	40.9	

◆ 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

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

Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



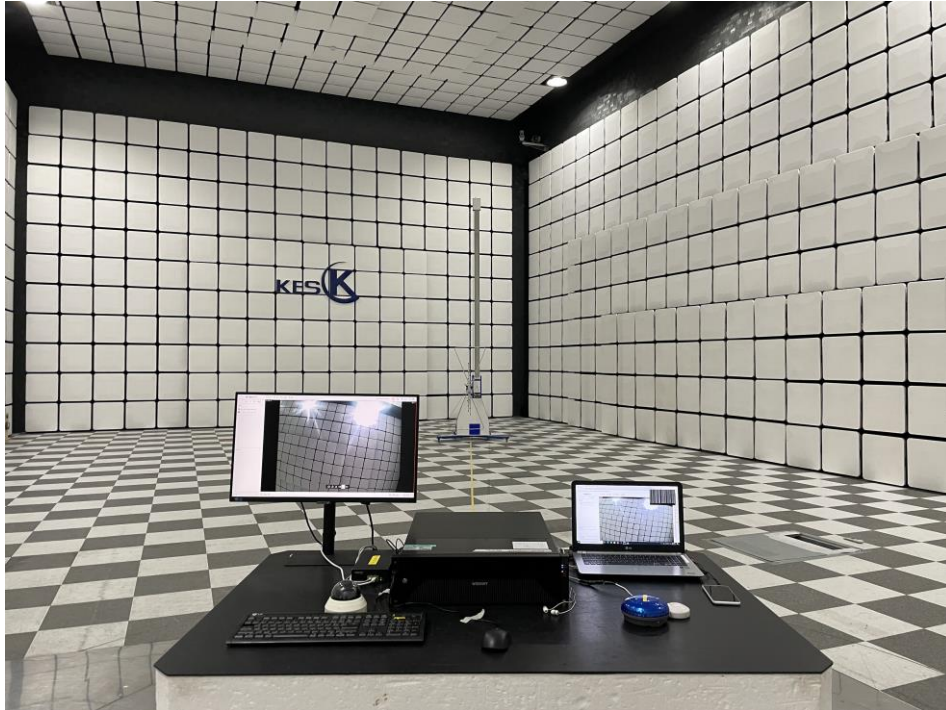
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Conducted Emissions at Telecommunication Ports



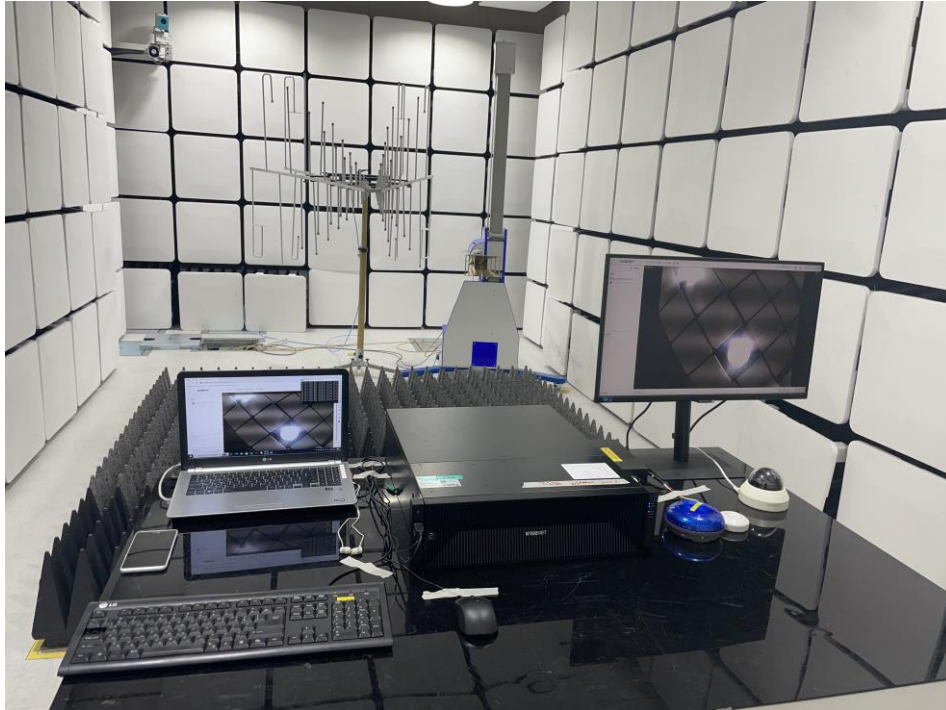
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

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)



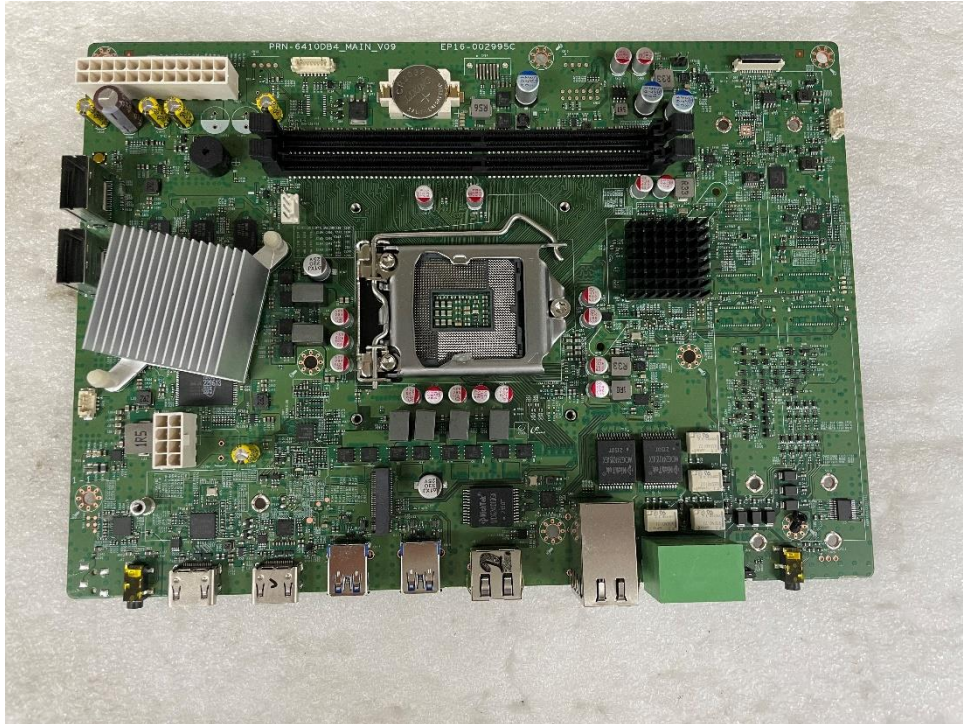
EUT Internal Photographs

(Internal View)

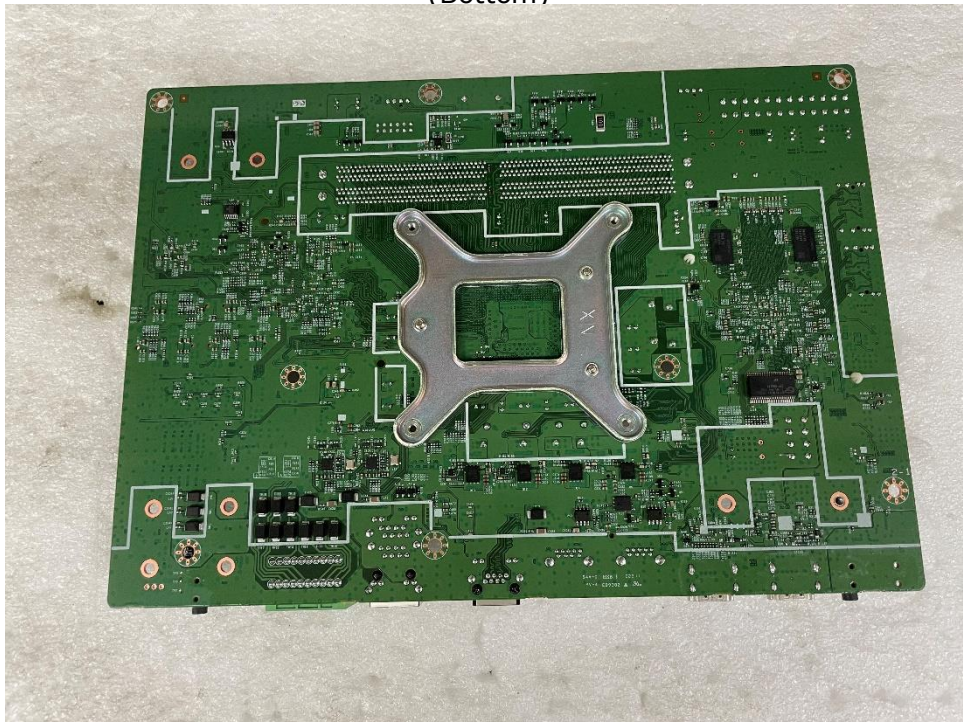


EUT Internal View – Main Board

(Top)



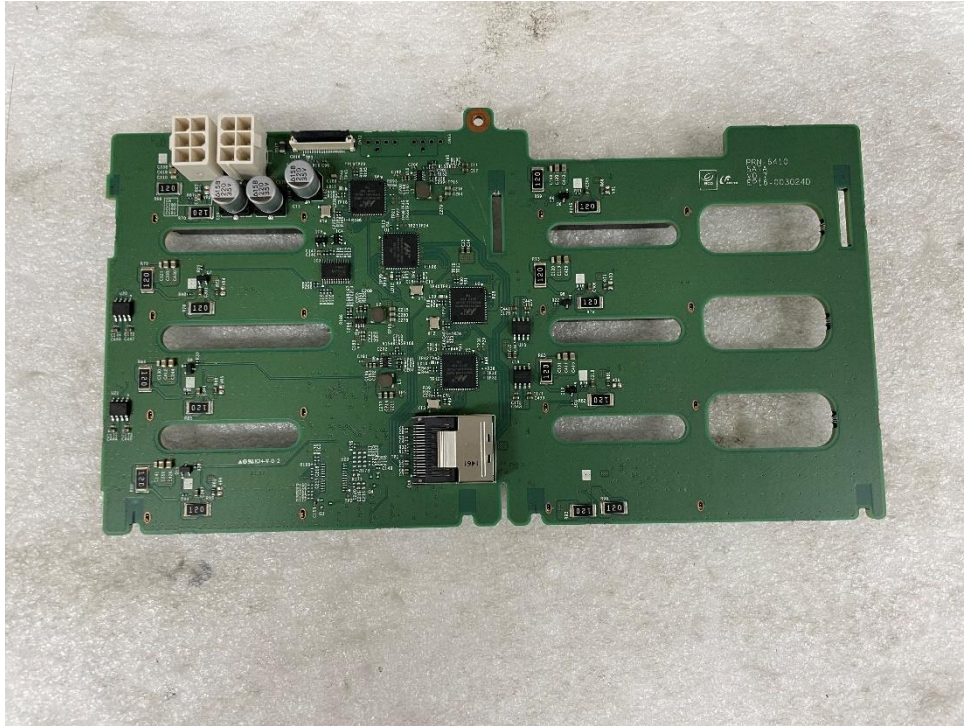
(Bottom)



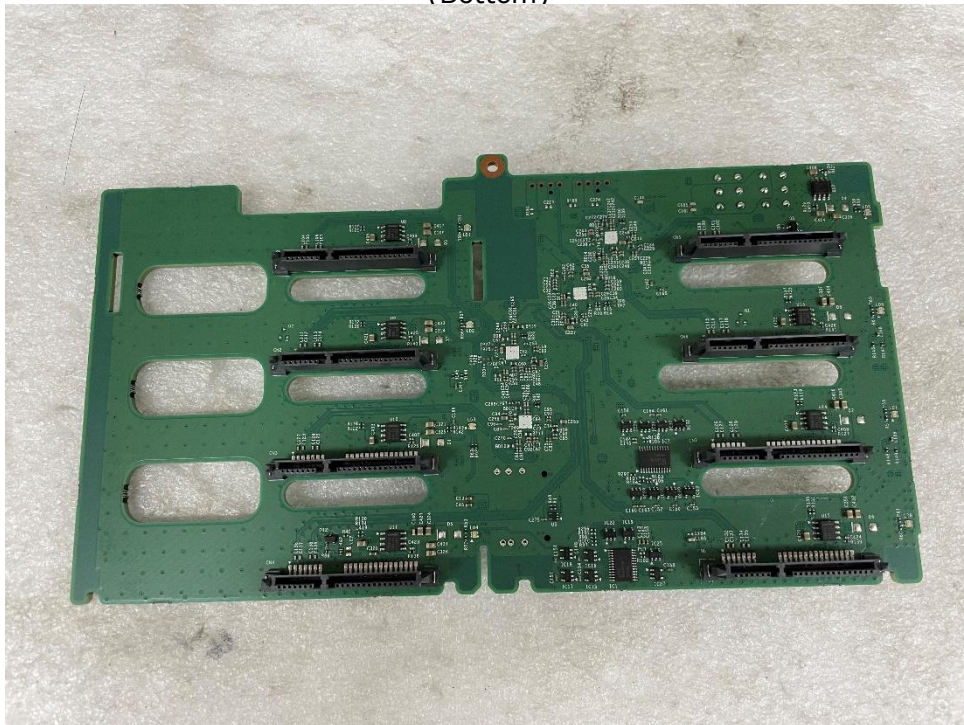
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Sub Board 1

(Top)



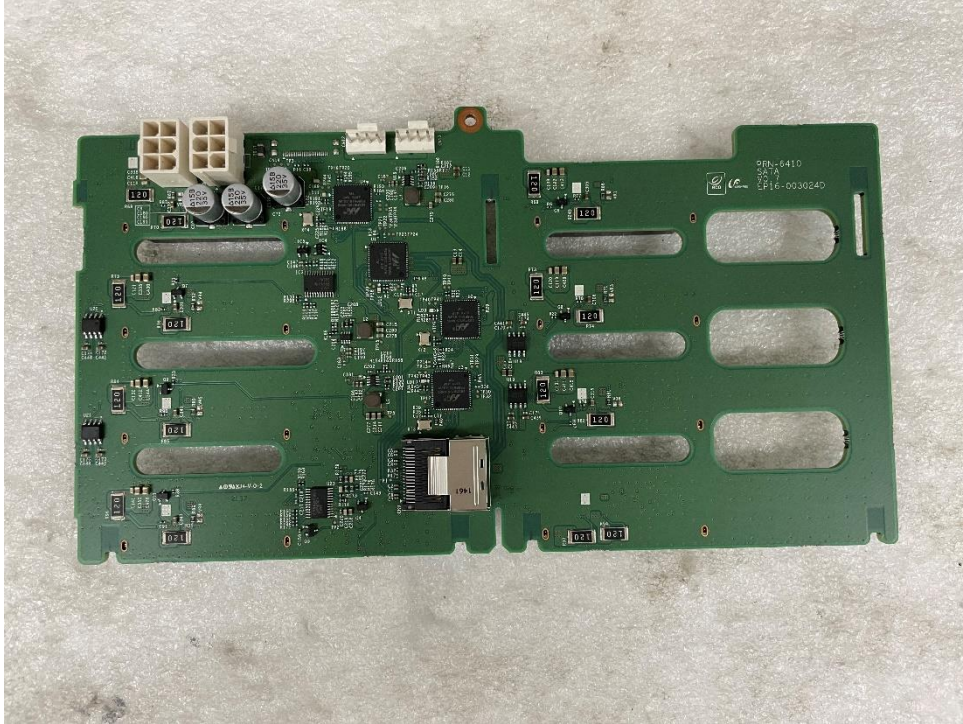
(Bottom)



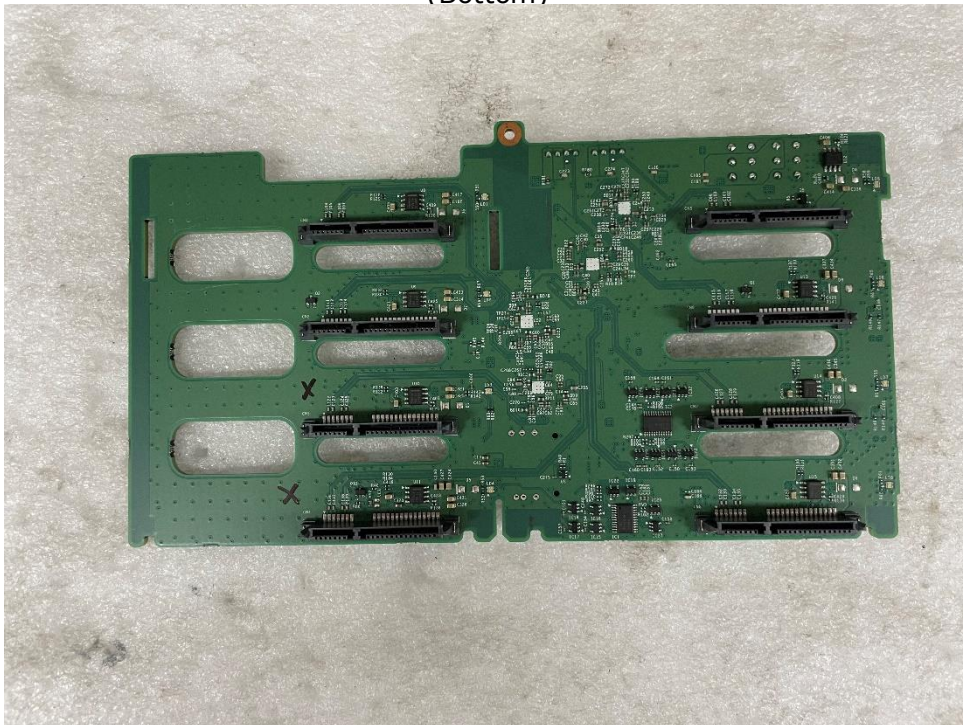
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Sub 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 – Power

(Top)



(Bottom)



(Label)

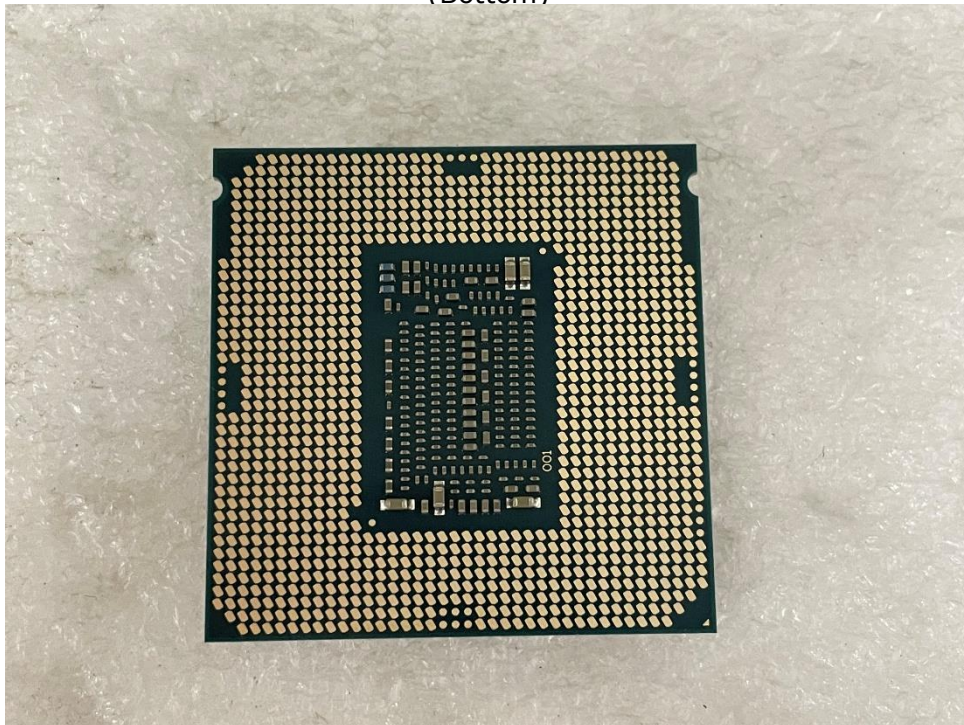


EUT Internal View – CPU

(Top)



(Bottom)



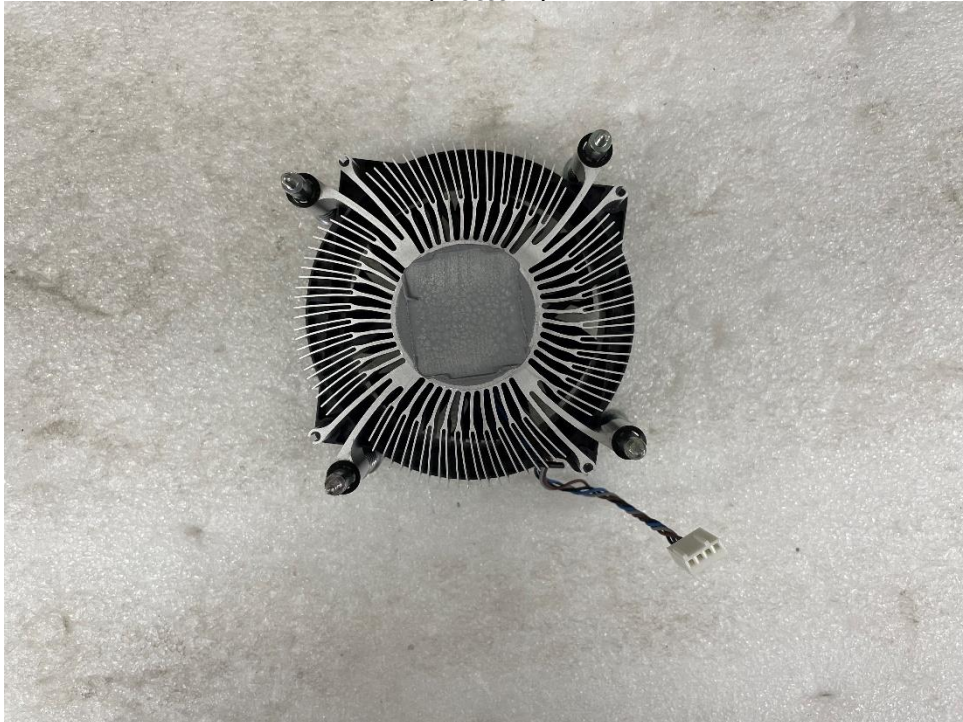
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – CPU 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 – RAM 1

(Top)

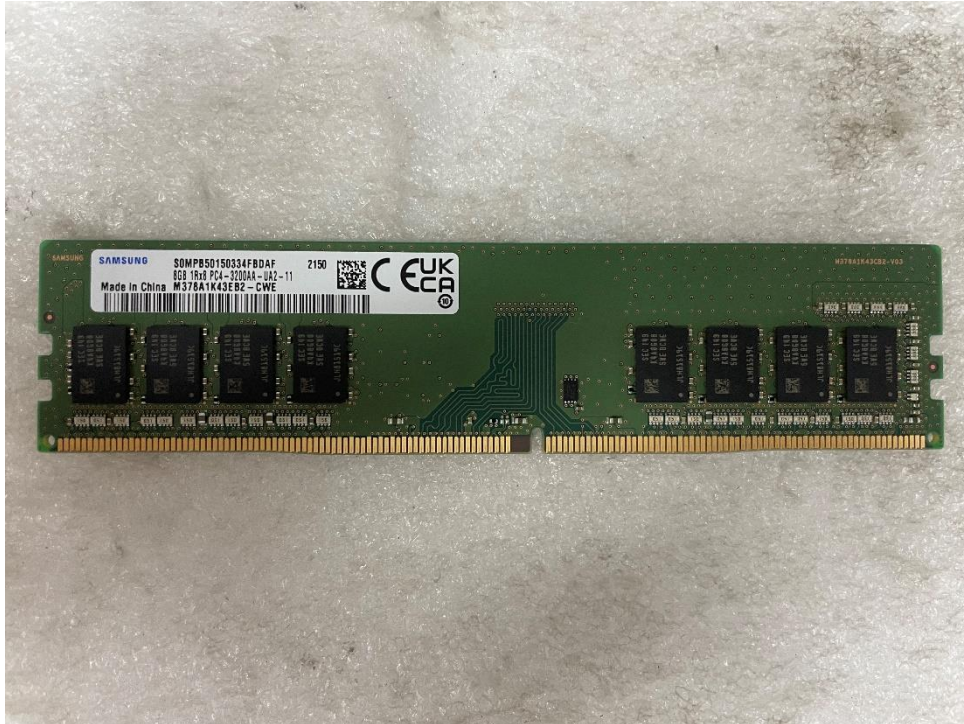


(Bottom)



EUT Internal View – RAM 2

(Top)



(Bottom)



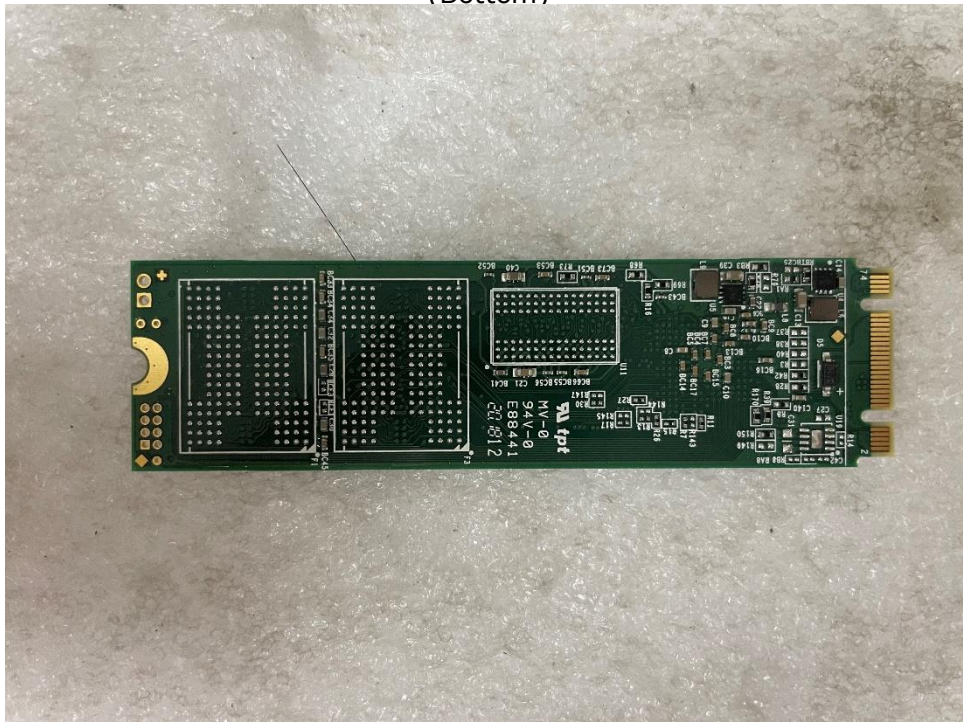
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – SSD

(Top)



(Bottom)



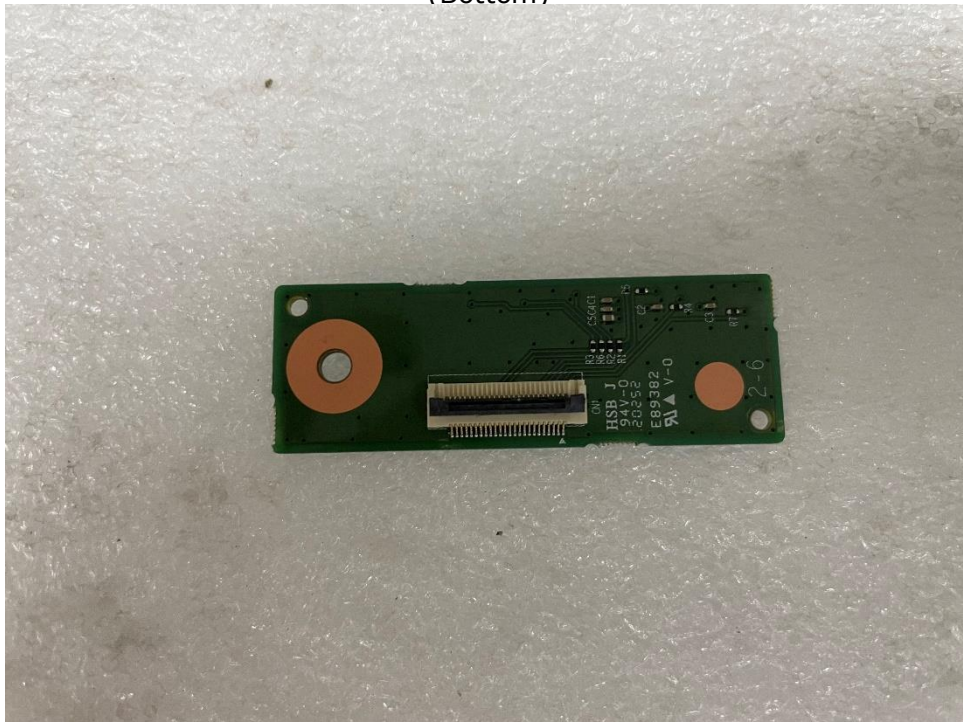
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – LED 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 – USB Board

(Top)



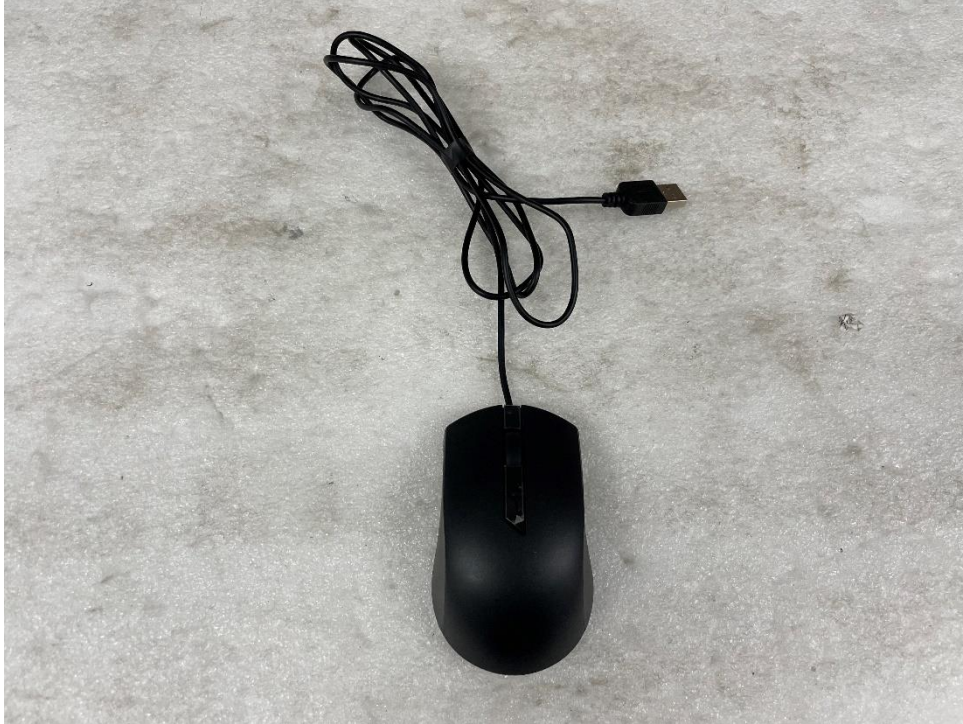
(Bottom)



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 – MOUSE

(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)



EUT Internal View – COOLER

(Top)



(Bottom)



(Label)



Label Photographs



この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A