



EMC TEST REPORT For VCCI

Test Report No. : KES-EM-22T0475-R1
Date of Issue : Feb. 24, 2023
Product name : Network Video Recorder
Model/Type No. : QRN-430S
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. 02, 2022
Test date : Jun. 07, 2022 ~ Jun. 08, 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-22T0475-R1
Page (2) of (35)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 17, 2022	KES-EM-22T0475	Issued
Feb. 24, 2023	KES-EM-22T0475-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



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	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 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		18
Radiated Electric Field Emissions(Below 1 GHz)		20
Radiated Electric Field Emissions(Above 1 GHz).....		21
Test Setup Photos and Configuration		22
Conducted Emissions at Mains Power Ports.....		22
Conducted Emissions at Telecommunication Ports		23
Radiated Electric Field Emissions(Below 1 GHz)		24
Radiated Electric Field Emissions(Above 1 GHz).....		25
EUT External Photographs		26
EUT Internal Photographs		27



1.0 General Product Description

Main Specifications of EUT are:

Display		
Video	Inputs	Max. 4CH
	Resolution	CIF ~ 8MP
	Protocols	sunapi, ONVIF
Live	Local Display	HDMI
	Multi Screen Display	[Local Monitor] 1 / 2V/ 2H / 3V / 4 / Sequence [Web] 1 / 2V/ 2H / 3V / 4
	Resolution	[Local Monitor] 8M(30fps), 1080p(120fps), 720P(120fps), D1(120fps)
Intelligent Analysis		
Search	Object image	N/A
Comparison	Event Trigger	N/A
Attribute (AI)	Person	N/A
	Face	N/A
	Vehicle	N/A
Performance		
System	Operating System	Linux
Record	Compression	H.265, H.264, MJPEG, WiseStream(H.265, H.264)
	Recording Bandwidth	50Mbps
	Resolution	CIF ~ 8MP
	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
	Event Action	e-Mail, Event Push, PTZ Preset, Alarm Out, Buzzer, Monitor Out
Search & Play	Playback Bandwidth	Max 32Mbps
	User	Max. 4 Users (Local 1, Remote 3)
	Mode	Time, Event, Text, Export, ARB, Bookmark
	Simultaneous playback	Max 16CH - Set : 4CH - Remote : 4CH Per User
	Resolution	CIF ~ 8MP
	Fisheye Dewarping	N/A
	Playback Control	Fast/Slow Forward / Backward, Move one step Up / Down
Storage	Built-In	2TB ~ 6TB
	Internal HDD	1ea (Max 6TB)
	External	N/A
	RAID	N/A
Backup	File backup	BU/Exe(GUI), JPG/AVI(Web)
	Function	Multi channel(Upto 4 CH) Play, Date-Time/Title display
Sensor	I/O	N/A
Audio	Input/Output	4CH (network)
	Compression	G.711, G.726, AAC(16/48KHz)
	Audio Communication	2-Way

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-22T0475-R1

Page (5) of (35)

Network		
Interface		4 Port PoE, RJ-45(10/100Mbps)
Protocol		TCP/IP, UDP/IP, RTP (UDP), RTP (TCP), RTSP, NTP, HTTP, DHCP (Server, Client), SMTP, ICMP, IGMP, ARP, DNS, DDNS, uPnP, HTTPS, SNMP, ONVIF (Profile-S), SUNAPI(Server, Client)
DDNS		Hanwha DDNS
Transmission Bandwidth		50Mbps
Max Remote Users		Search (3), Live Unicast (10), Multicast (20)
IP Version		IPv4/v6
Security		IP address filtering, User access Log, 802.1x, Encryption
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, Vietnam
OS		Window 10, Mac OS X(10.13)
Web Browser		Google Chrome, Mac Safari, Firefox, Edge
Viewer Software	Type	WAVE(Sunapi 연동), SSM, Webviewer, Smart Viewer, Wisenet Mobile
	CMS Support	Support SDK/CGI(SUNAPI) for integration to 3rd party VMS
Functions		
Camera Setup	Register	Auto, Manual
	Setup Items	IP address, Add profile edit, Bitrate, Camera MD setup (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
	Preset	300 Presets
Smart phone	Support Model	iOS, Android
	Protocol Support	RTP, RTSP, HTTP, CGI(SUNAPI)
	Control	Live(4ch) : Multi-Profile Support Playback(4ch)
	Max. Remote Users	Search (3), Live Unicast (10)
Redundancy	Failover	N+1
	ARB	Yes
Easy configuration		P2P(QR code)
System Control		Mouse, Web

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-22T0475-R1

Page (6) of (35)

Indicator/Interface		
Front	Indicator	LED(Status indicator) : - Power(1), Record(1), Network(1)
Connectors	HDMI	3840x2160 30Hz
	VGA	N/A
	Audio	N/A
	Ethernet	PoE RJ-45(LAN, 10/100) 4 ea ,RJ-45 1ea (WAN, 10/100)
	Alarm	N/A
	USB	2EA(Front 1 x USB 2.0, Rear 1 x USB 2.0)
	Storage	N/A
	Serial	N/A
	Reset	Switch(1EA, PW clear)
	Power Cord	DC Adaptor
	POE Budget	Max. 35W
System		
Log	Log List	Max. 100,000 (System, Event each log)
Environmental		
Operating Temperature / Humidity		+0°C to +40°C(+32°F to +104°F)
Humidity		20% ~ 85% RH
Noise		47 db
Electrical		
Power		100 ~ 240 VAC ±10%; 50/60 Hz
Power Consumption		최대 56W(1HDDs, PoE on)
Mechanical		
Color / Material		Black
Dimension (WxHxD)		W370.0 x H44.0 x D320mm (1U)

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
Network Video Recorder	QRN-430S	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT
Mouse	MOKJUO	-	Primax Electronics Ltd.	-
AC/DC Adapter	FSP065-DWAN2-HW	-	FSP GROUP INC.	-
HDD	ST4000VX000	-	SEAGATE	4 TB

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Camera	QNV-6023R	-	HANWHA VISION VIETNAM COMPANY LIMITED	-
Laptop	LG15N54	503NZWY038929	LG Electronics	-
Laptop Adapter	PA-1900-14	OF2R263348701 7764	LITE-ON TECHNOLOGY COPORATION	-
Monitor	QTM-OR24.9WB	-	TOPSYNC	-
USB Memory	-	-	Transcend	32 GB

1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Network Video Recorder (EUT)	RJ-45 (PoE)	Camera	RJ-45 (PoE)	3.0	U
	RJ-45 (LAN)	Laptop	RJ-45 (LAN)	3.0	U
	USB	Mouse (EUT)	USB	1.4	U
	USB	USB Memory	USB	-	-
	HDMI	Monitor	HDMI	1.5	S
	grounding	grounding	grounding	1.2	-
	SATA	HDD (EUT)	SATA	0.2	U
	DC Jack	AC/DC Adapter (EUT)	DC Jack	1.6	U
Laptop	DC Jack	Laptop Adapter	DC Jack	1.6	U

* Unshielded=U, Shielded=S

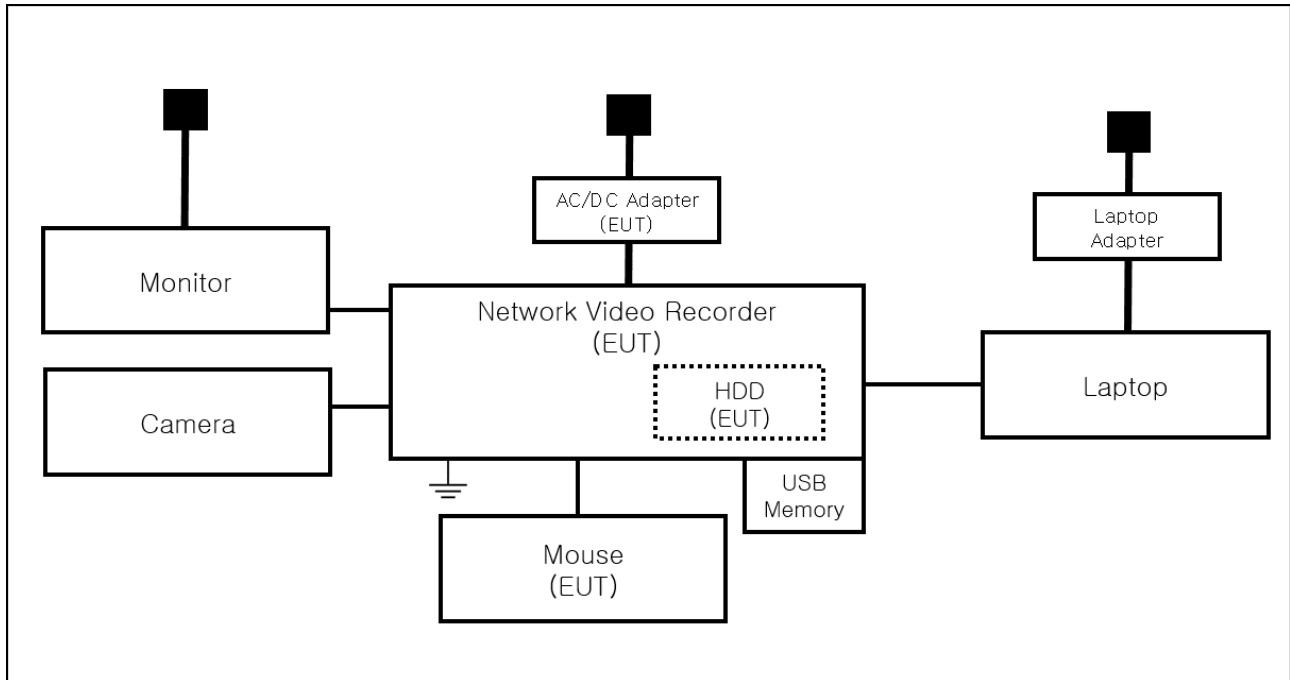
1.7 EUT Operating Mode(s)

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



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-22T0475-R1
Page (11) of (35)

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **VCCI-CISPR 32:2016**

☒ Class A

☐ Class B

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



2.1 Conducted Emissions Mains Power Ports

Test Date

Jun. 07, 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: (23,4 ± 0,1) °C

Relative Humidity: (44,6 ± 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. 07, 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: (23,4 ± 0,1) °C

Relative Humidity: (44,6 ± 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.

**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-22T0475-R1

Page (14) of (35)

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jun. 07, 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: (23,0 ± 0,1) °C

Relative Humidity: (44,9 ± 0,2) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee 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



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jun. 08, 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: (23,7 ± 0,2) °C

Relative Humidity: (44,2 ± 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.

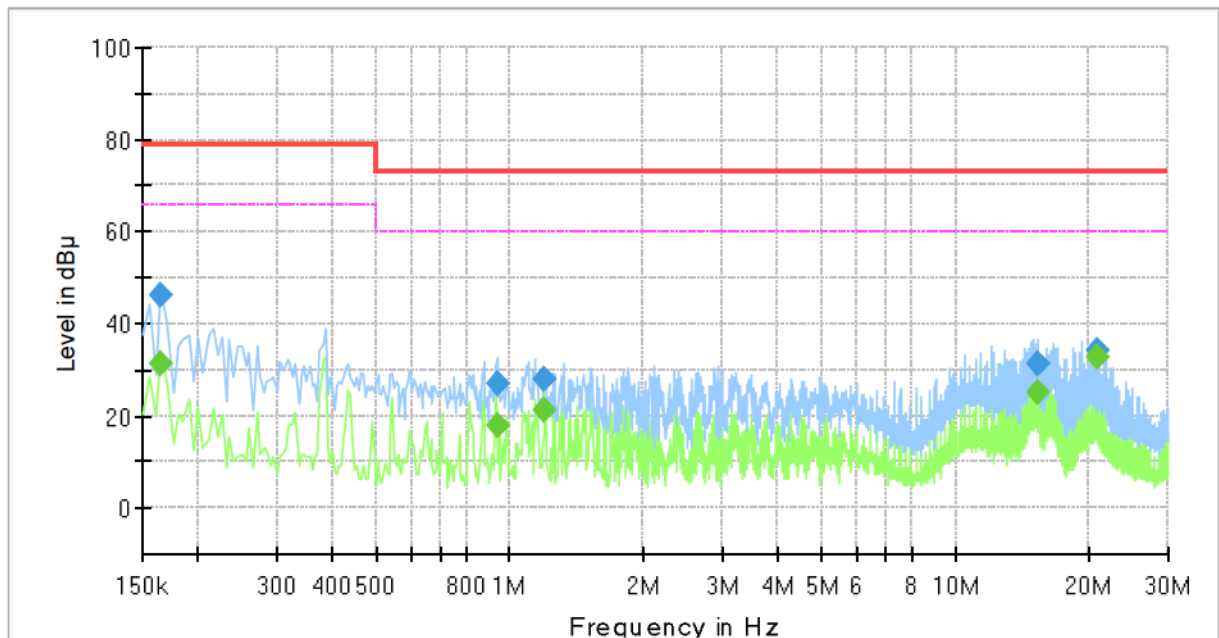
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: QRN-430S
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)
0.165000	---	31.48	66.00	34.52	1000.0	9.000	L1	19.4
0.165000	46.37	---	79.00	32.63	1000.0	9.000	L1	19.4
0.935000	---	17.88	60.00	42.12	1000.0	9.000	L1	20.1
0.935000	26.95	---	73.00	46.05	1000.0	9.000	L1	20.1
1.195000	---	21.02	60.00	38.98	1000.0	9.000	L1	20.1
1.195000	27.88	---	73.00	45.12	1000.0	9.000	L1	20.1
15.240000	---	24.91	60.00	35.09	1000.0	9.000	L1	19.9
15.240000	31.30	---	73.00	41.70	1000.0	9.000	L1	19.9
20.830000	---	32.73	60.00	27.27	1000.0	9.000	L1	20.1
20.830000	34.07	---	73.00	38.93	1000.0	9.000	L1	20.1

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

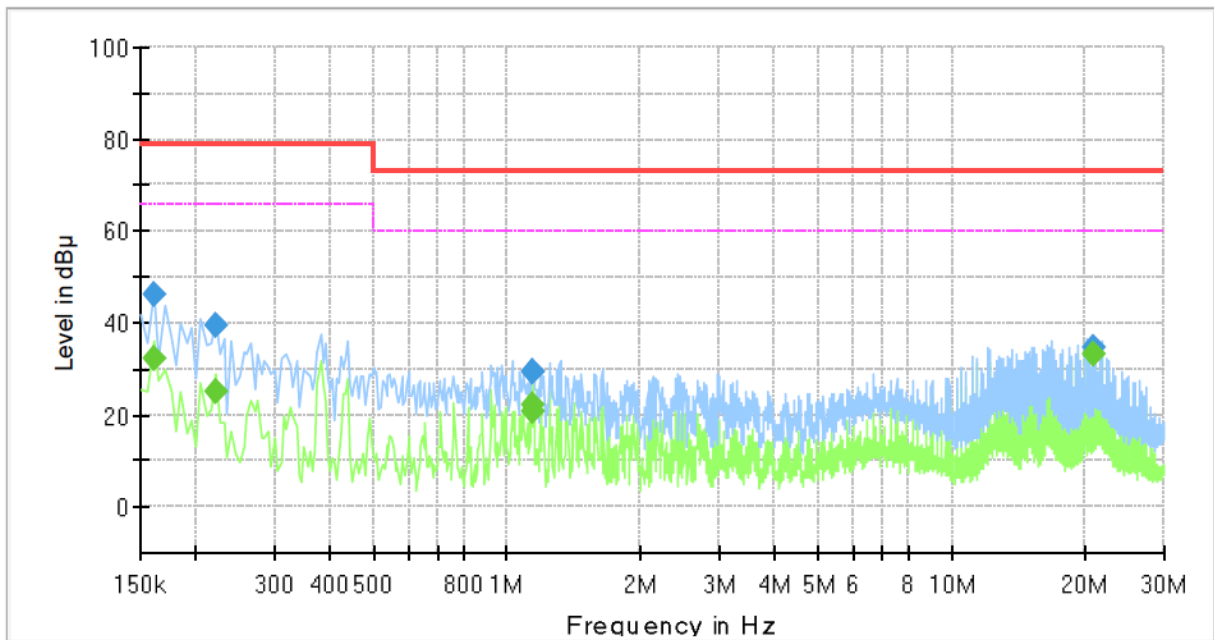
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

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

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	QRN-430S
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)
0.160000	46.36	---	79.00	32.64	1000.0	9.000	N	19.4
0.160000	---	32.16	66.00	33.84	1000.0	9.000	N	19.4
0.220000	---	25.26	66.00	40.74	1000.0	9.000	N	19.4
0.220000	39.27	---	79.00	39.73	1000.0	9.000	N	19.4
1.135000	---	20.90	60.00	39.10	1000.0	9.000	N	20.1
1.135000	29.53	---	73.00	43.47	1000.0	9.000	N	20.1
1.145000	29.37	---	73.00	43.63	1000.0	9.000	N	20.1
1.145000	---	22.28	60.00	37.72	1000.0	9.000	N	20.1
20.825000	---	33.47	60.00	26.53	1000.0	9.000	N	20.2
20.825000	34.76	---	73.00	38.24	1000.0	9.000	N	20.2

◆ 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

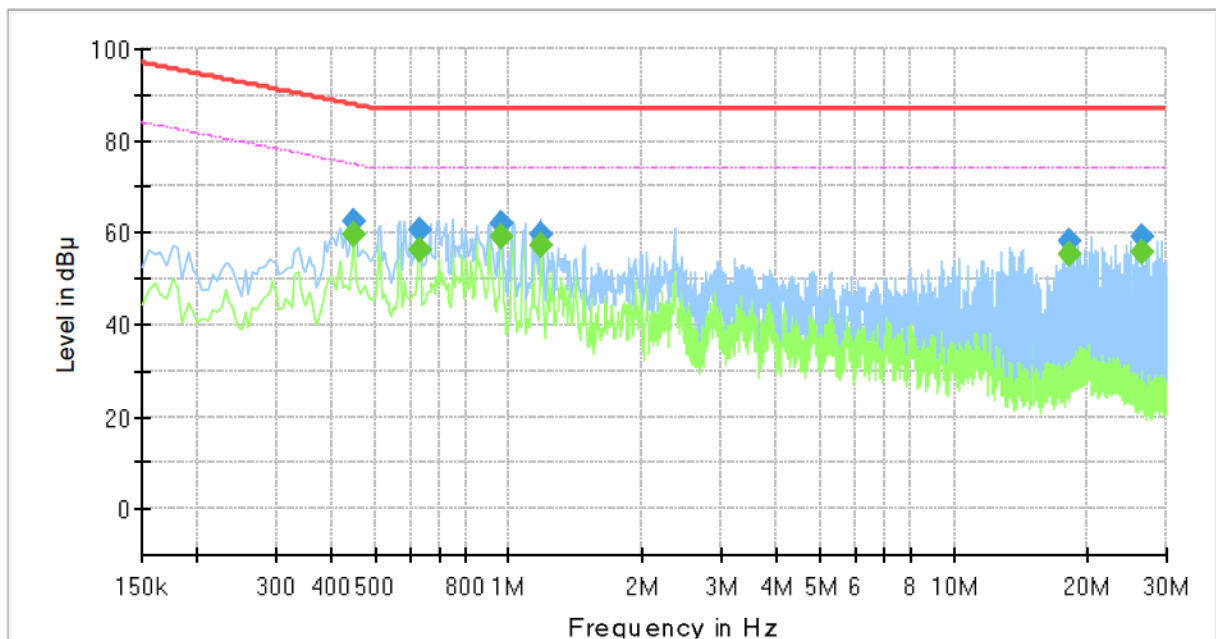
Conducted Emissions at Telecommunication Ports

■ LAN

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	QRN-430S
Mode :	LAN
Speed :	100 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.450000	---	59.57	74.88	15.31	1000.0	9.000	Single Line	19.7
0.450000	62.42	---	87.88	25.46	1000.0	9.000	Single Line	19.7
0.630000	---	56.06	74.00	17.94	1000.0	9.000	Single Line	19.9
0.630000	60.66	---	87.00	26.34	1000.0	9.000	Single Line	19.9
0.960000	---	59.39	74.00	14.61	1000.0	9.000	Single Line	20.0
0.960000	61.86	---	87.00	25.14	1000.0	9.000	Single Line	20.0
1.180000	---	57.44	74.00	16.56	1000.0	9.000	Single Line	20.0
1.180000	59.75	---	87.00	27.25	1000.0	9.000	Single Line	20.0
18.245000	---	55.11	74.00	18.89	1000.0	9.000	Single Line	19.8
18.245000	58.16	---	87.00	28.84	1000.0	9.000	Single Line	19.8
26.610000	---	55.88	74.00	18.12	1000.0	9.000	Single Line	20.2
26.610000	59.32	---	87.00	27.68	1000.0	9.000	Single Line	20.2

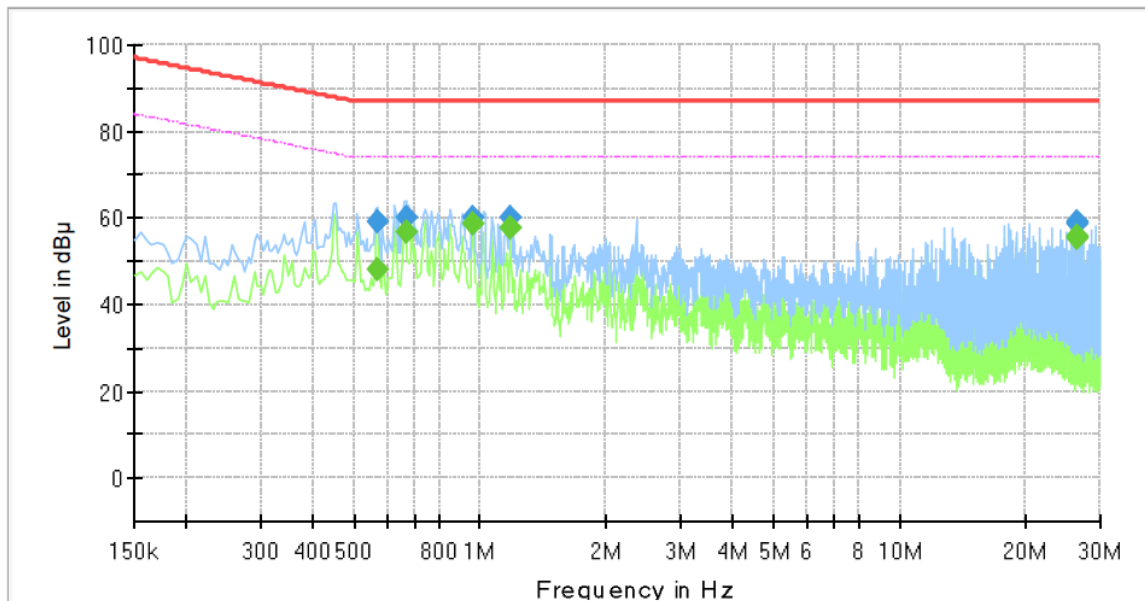
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

PoE
[100 Mbps]
Common Information

Test Description:	Telecommunication Emission
Model No.:	QRN-430S
Mode :	PoE
Speed :	100 Mbps
Operator Name:	KES


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.570000	---	48.35	74.00	25.65	1000.0	9.000	Single Line	19.8
0.570000	59.20	---	87.00	27.80	1000.0	9.000	Single Line	19.8
0.665000	---	56.53	74.00	17.47	1000.0	9.000	Single Line	19.9
0.665000	60.10	---	87.00	26.90	1000.0	9.000	Single Line	19.9
0.965000	---	58.45	74.00	15.55	1000.0	9.000	Single Line	20.0
0.965000	60.26	---	87.00	26.74	1000.0	9.000	Single Line	20.0
1.180000	---	57.95	74.00	16.05	1000.0	9.000	Single Line	20.0
1.180000	60.22	---	87.00	26.78	1000.0	9.000	Single Line	20.0
26.485000	---	55.11	74.00	18.89	1000.0	9.000	Single Line	20.2
26.485000	58.49	---	87.00	28.51	1000.0	9.000	Single Line	20.2
26.610000	---	55.64	74.00	18.36	1000.0	9.000	Single Line	20.2
26.610000	59.20	---	87.00	27.80	1000.0	9.000	Single Line	20.2

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

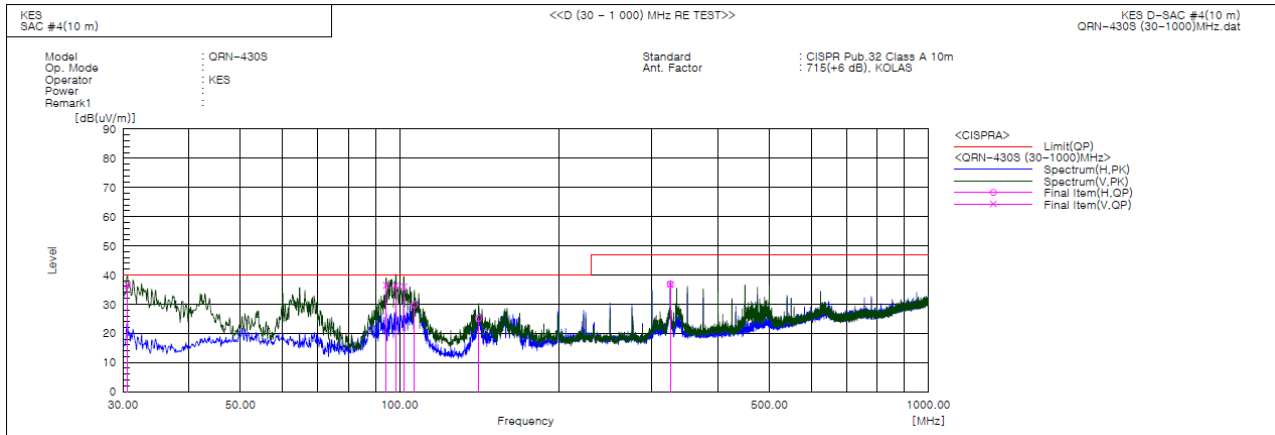
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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)



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	30.606	V	61.7	-25.2	36.5	40.0	3.5	104.0	15.0	
2	94.384	V	60.1	-23.6	36.5	40.0	3.5	107.0	157.0	
3	98.385	V	59.1	-22.7	36.4	40.0	3.6	113.0	112.0	
4	101.901	V	58.6	-22.5	36.1	40.0	3.9	110.0	109.0	
5	106.630	H	52.2	-22.4	29.8	40.0	10.2	390.0	50.0	
6	141.186	H	50.7	-25.5	25.2	40.0	14.8	386.0	87.0	
7	325.001	H	53.4	-16.5	36.9	47.0	10.1	388.0	42.0	
8	325.001	V	53.2	-16.5	36.7	47.0	10.3	102.0	176.0	

◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss



KES Co., Ltd.

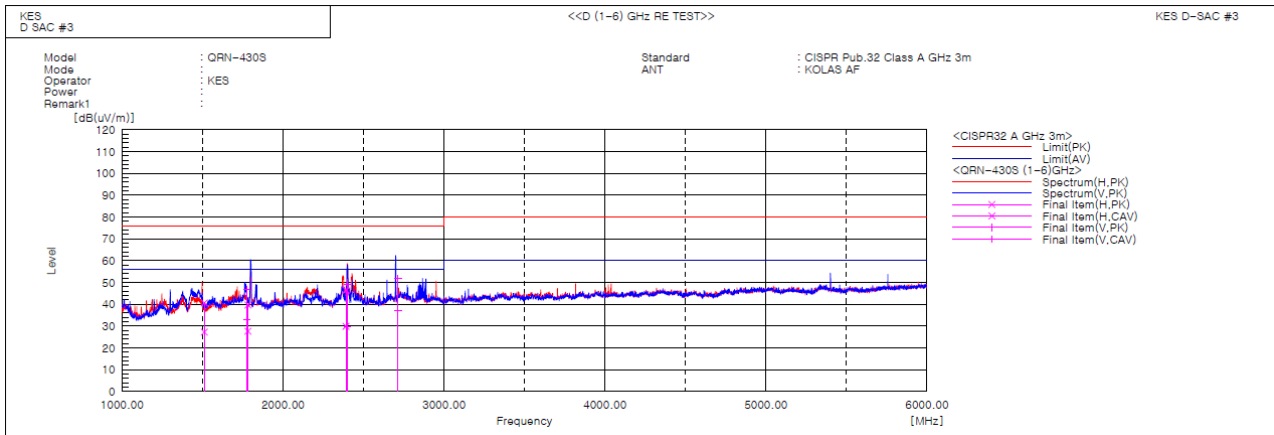
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-22T0475-R1

Page (21) of (35)

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	1511.817	H	46.4	33.0	-5.7	40.7	27.3	76.0	56.0	35.3	28.7	100.0	197.6	
2	1776.630	V	49.2	35.2	-2.4	46.8	32.8	76.0	56.0	29.2	23.2	100.0	63.2	
3	1782.030	H	42.1	30.1	-2.4	39.7	27.7	76.0	56.0	36.3	28.3	100.0	283.3	
4	2390.982	H	45.3	28.7	1.2	46.5	29.9	76.0	56.0	29.5	26.1	100.0	236.8	
5	2399.720	V	47.8	28.7	1.2	49.0	29.9	76.0	56.0	27.0	26.1	100.0	27.0	
6	2715.410	V	49.9	35.2	1.9	51.8	37.1	76.0	56.0	24.2	18.9	100.0	66.1	

◆ 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

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

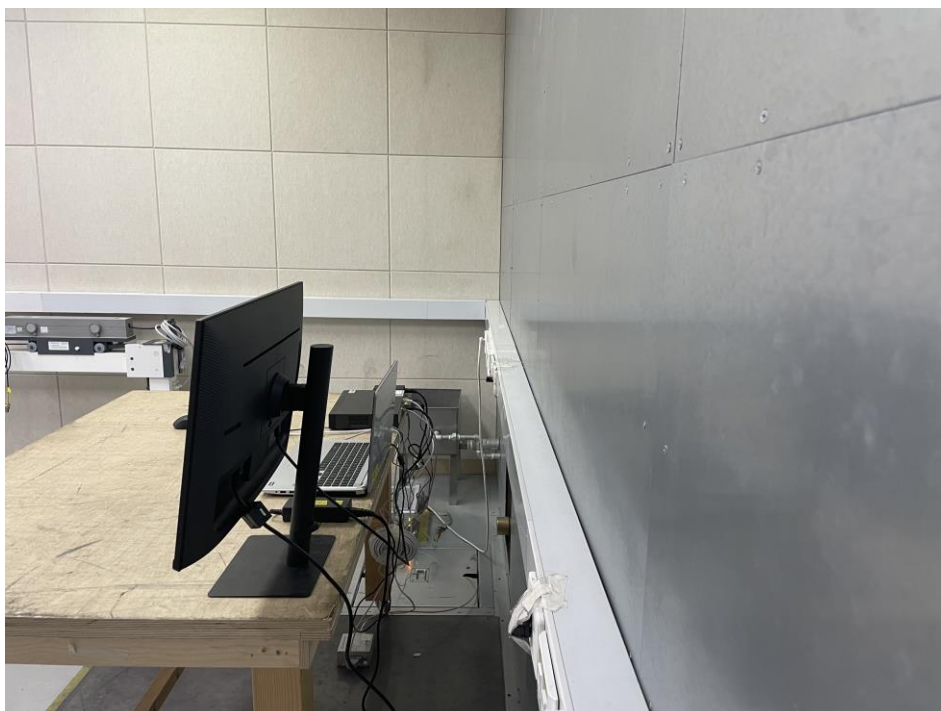
Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



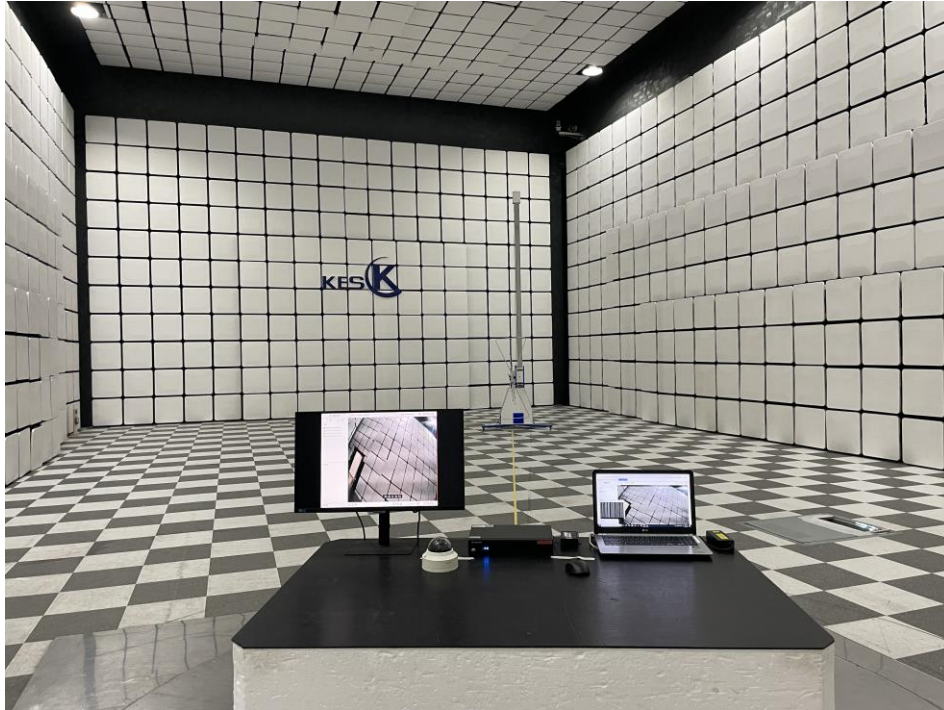
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Conducted Emissions at Telecommunication Ports



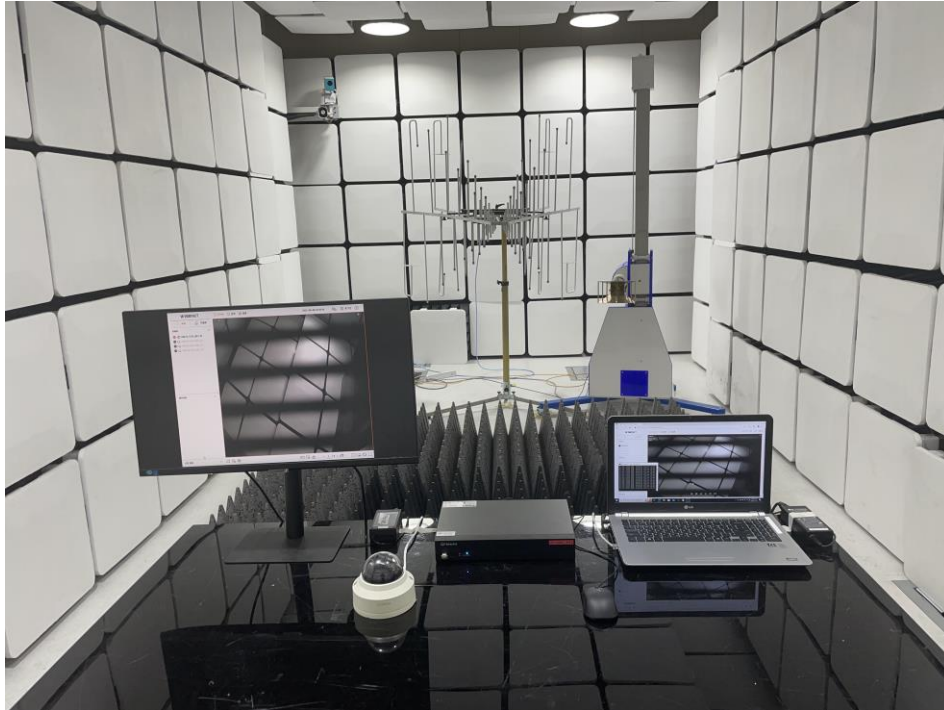
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

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)



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

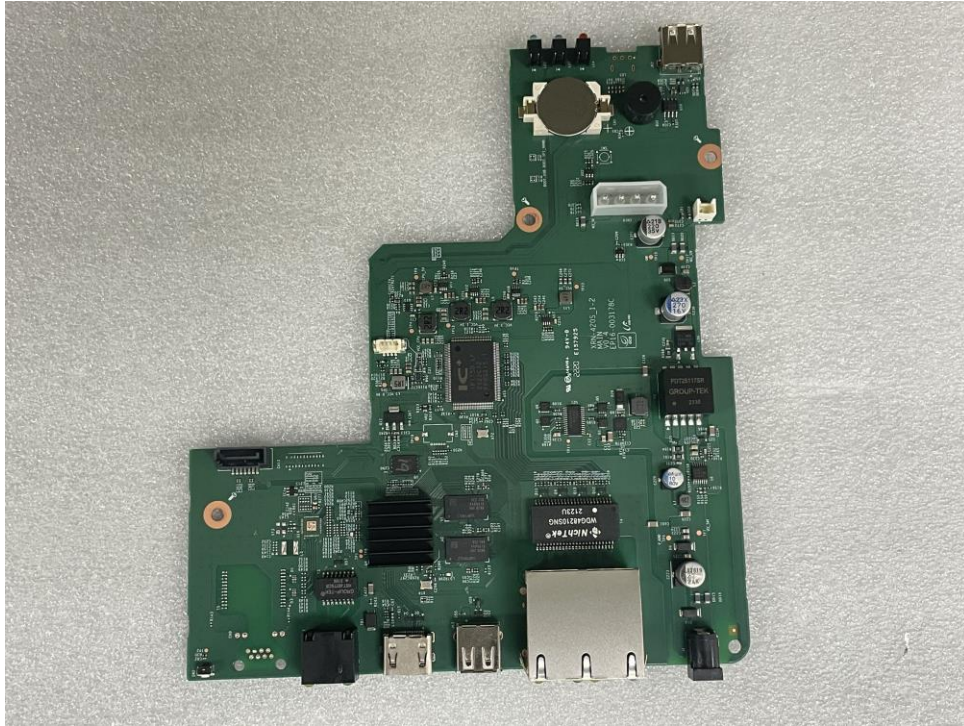
EUT Internal Photographs

(Internal View)

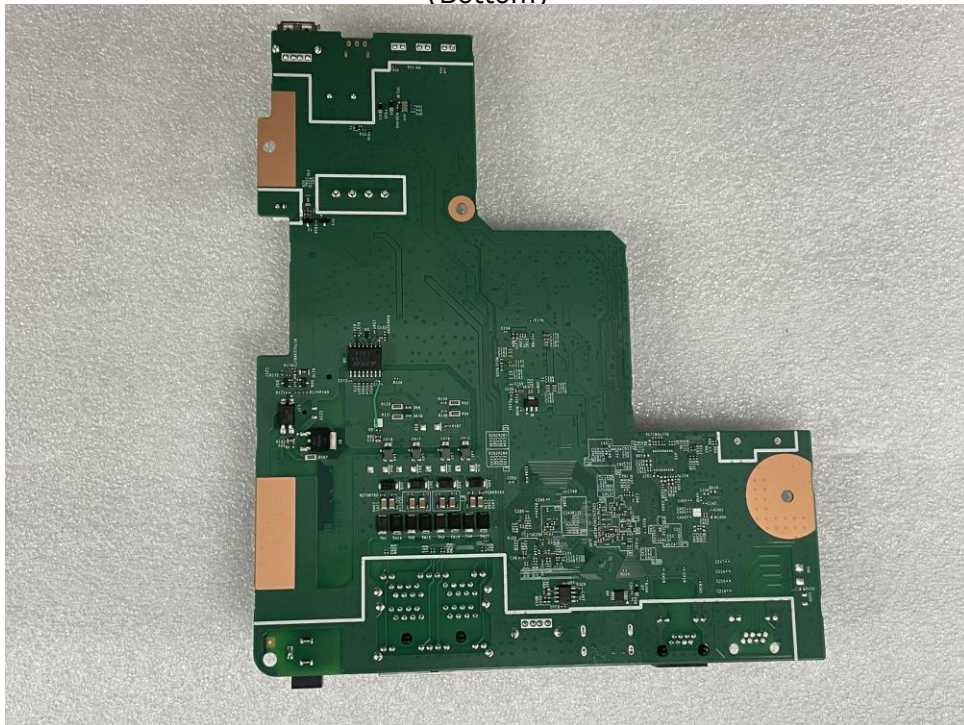


EUT Internal View – Main Board

(Top)



(Bottom)



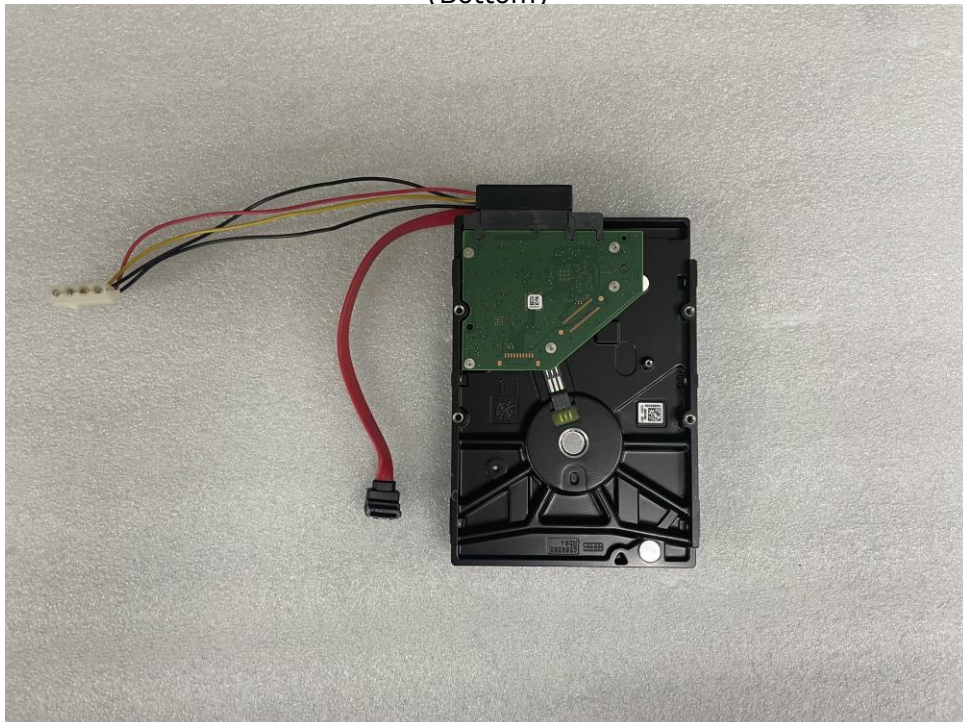
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – HDD

(Top)



(Bottom)



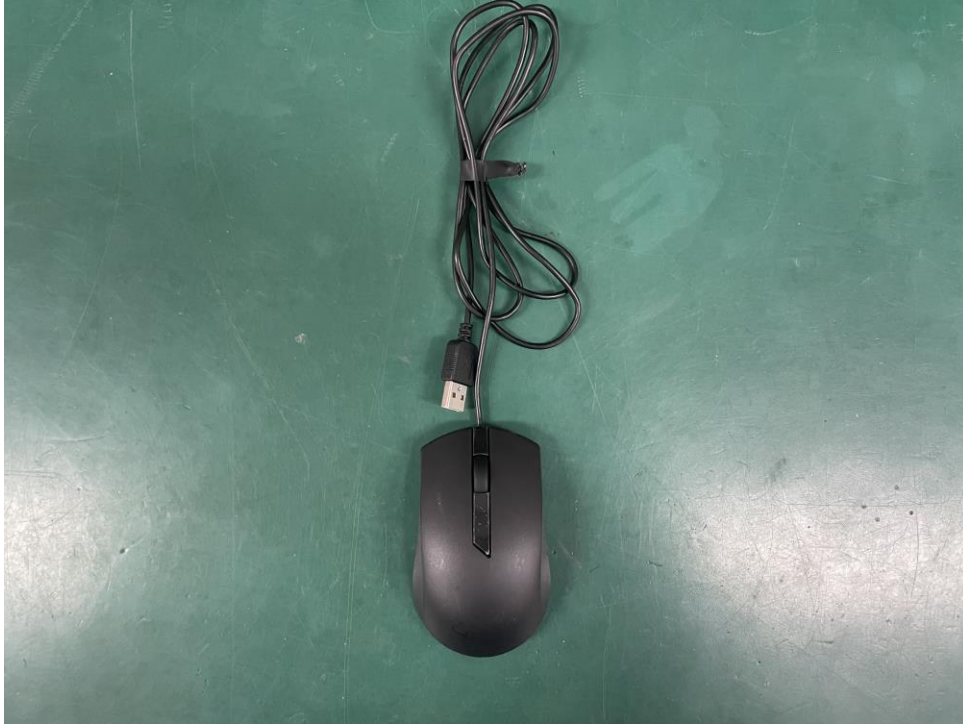
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

(Label)



EUT Internal View – Mouse

(Top)

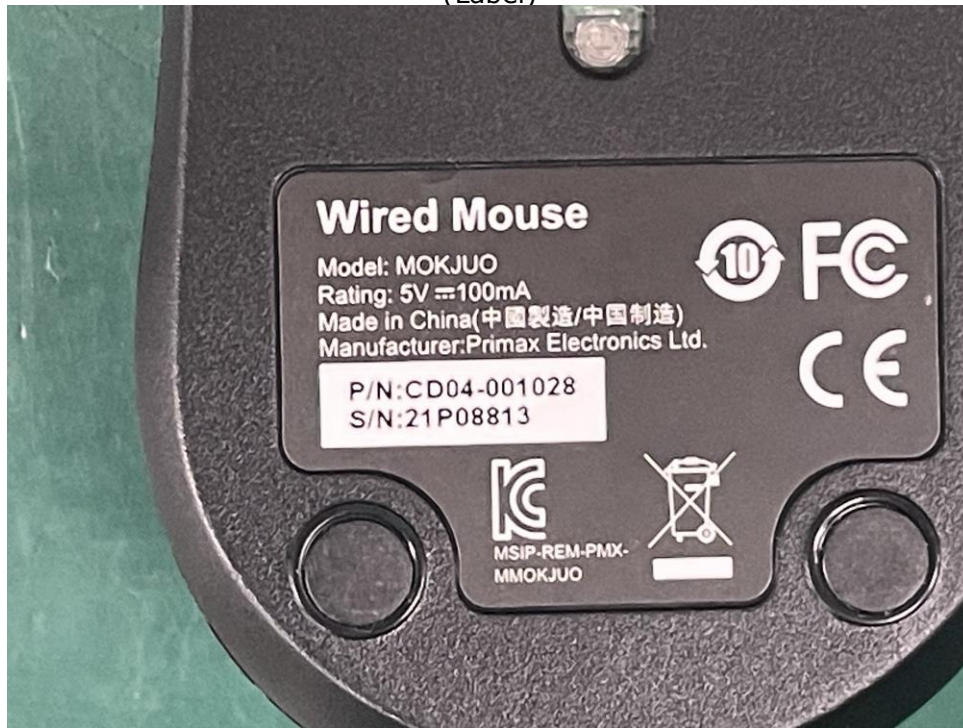


(Bottom)



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)

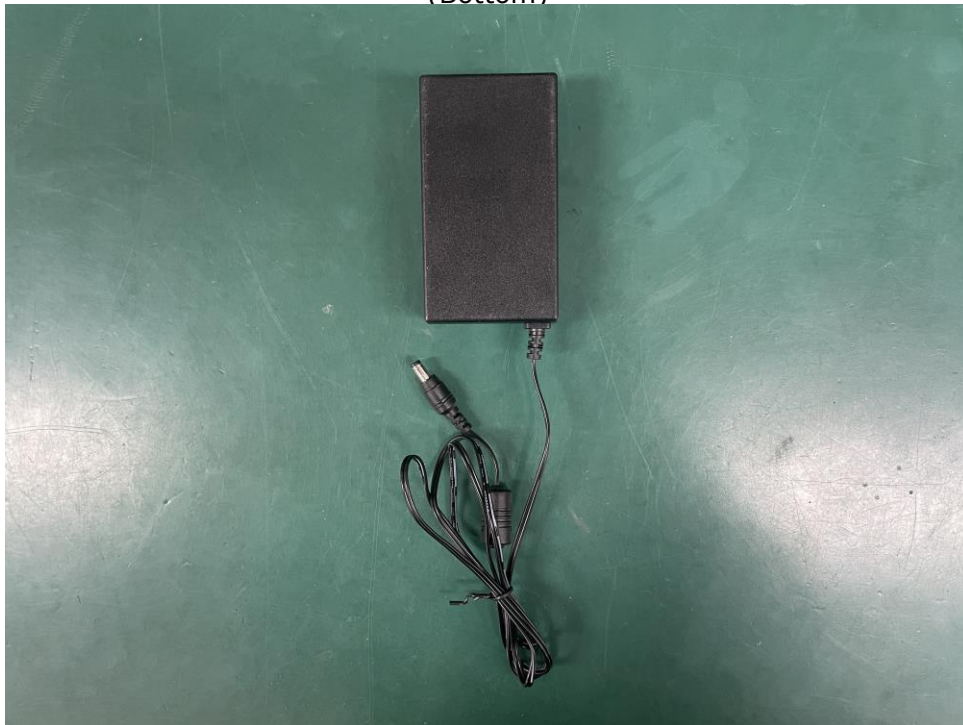


EUT Internal View – AC/DC Adapter

(Top)



(Bottom)

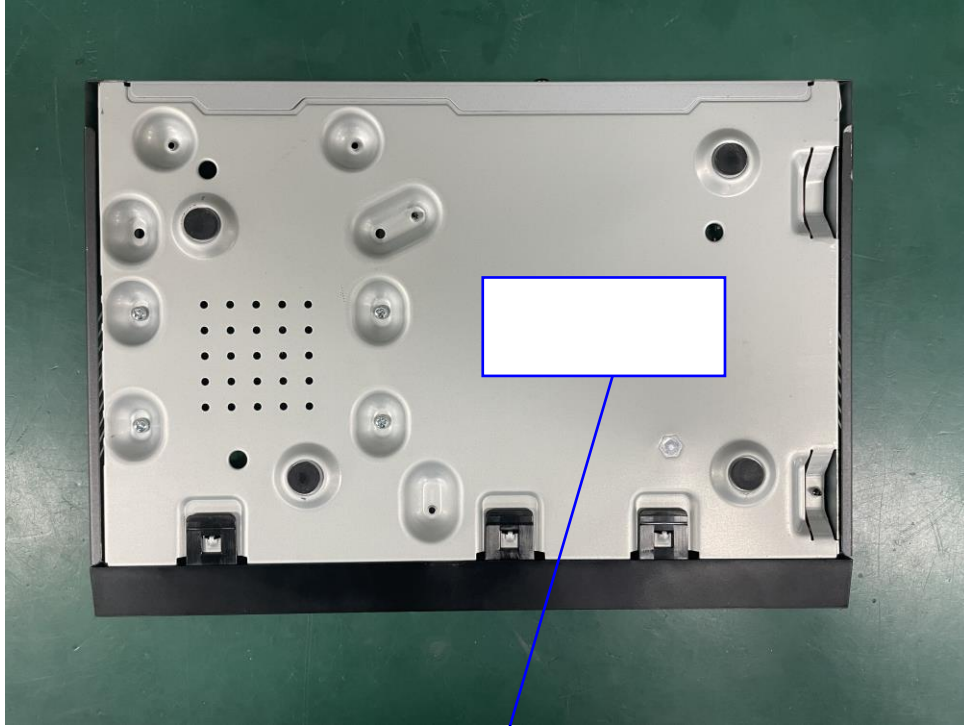


This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact kes@kes.co.kr

(Label)



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