EMC TEST REPORT For RCM

Test Report No.	:	KES-EM-22T0878-R1
Date of Issue	:	Feb. 24, 2023
Product Name	:	DVR
Model/Type No.	:	ARD-810
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	:	Oct. 13, 2022
Test date	:	Oct. 24, 2022 ~ Oct. 25, 2022
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Seong Min, Jang
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

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

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Nov. 03, 2022	KES-EM-22T0878	Issued
Feb. 24, 2023	KES-EM-22T0878-R1	Change the Applicant and manufacturer at the request of the customer

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1.0 General Product Description

Main Specifications of EUT are:

			ARD-810
Display	Display		
Analog camera	Analog camera	Inputs	
		Signal Type	
Network camera	Network camera	Inputs	Additional 2CH (Max. 8CH) TBD
		Resolution	5MP ~ CIF
		Protocols	SUNAP(Wisenet), ONVIF
Decoding	Decoding	Local Display	None
		Multi Screen Display	None
		Resolution	None
Live	Live	Local Display	1x HDMI, 1x VGA [Single Mode] - HDMI: 3840 x 2160, 2560x1440, 1920x1080, 1280x1024, 1280x720 [Dual Mode] Clone - HDMI: 1920x1080, 1280x1024, 1280x720 - VGA: 1920x1080, 1280x1024, 1280x720
		Multi Screen Display	[Local monitor] - Dynamic layout, Virtual channel view - up to 7 division [Web] 1 / 4 / 10
		Resolution	[Analog Camera(NTSC/PAL)] 5MP(5M Half 20fps/12fps) 4MP(4M Half 30fps/25fps) 2MP(2M Half 30fps/25fps) 1MP(1M Half 30fps/25fps) [Network Camera] - Typ. 2MP(120fps)
Performance	Performance		
Operating System	Operating System	Embedded	Linux
Record	Record	Compression	H.265, H.264, MJPEG
		Record Rate(Analog)	[Analog Camera(NTSC/PAL)] (Main Stream) 5MP(5M Half 20fps/12fps) 4MP(4M Half 30fps/25fps) 2MP(2M Half 30fps/25fps) 1MP(1M Half 30fps/25fps) (Sub Stream) 720p or higher : 640x368 full fps/CH SD signal : upto CIF 30/25fps/CH * The maximum recording frame rate depends on the frame rate of the input camera.
		Recording Bandwidth	Max. 80Mbps
		Resolution	5MP ~ CIF
		Mode	Manual, Schedule (Continuous/Event), Event(Pre/Post), Dual Track
		Event Trigger	Alarm input Analog Camera : Video Loss, Motion Detection,Tampering Network Camera : Camera Event (Sensor, MD, Video analytics), VA event (Tampering, Enter / Exit, Passing, Virtual- line, (Dis)Appear, face Detection, Audio detection), Defocus camera event, Dynamic camera event
		Event Action	E-mail,PTZ preset,Alarm out,Buzzer, Monitor out
Search & Play	Search & Play	Playback Bandwidth	Max. 32Mbps
		User	Max. 4 users (Set 1, Remote 3)
		Simultaneous playback	8CH(Local Monitor, CMS, Wisenet Mobile) 1Ch(Web)
		Fisheye Dewarping	WEB / CMS
		Mode	Date & Time (Calendar) / Event log list / Text search (POS), Back up, Motion, Smart search (Virtual Line w/ direction, Enter / Exit) * All Search included Preview function ARB search
		Resolution	5MP ~ CIF
		Playback Control	FastForward/Backward (x2,x4,x8,x16,x32,x64, x128, x256) Slow Forward/Backward (x1/2,x1/4,x1/8) ※Move one step up/down
Storage	Storage	Supported HDD	Up to 6TB
		HDD Slot	SATA 1ea(Max 6TB)
		External	None
		RAID	None

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Backup	Backup	File backup	BU, EXE(Include Player), AVI(Webviewer only)	BU, EXE(Include Player), AVI(Webviewer only)
		Function	Max. 10 CH play, Date-time/title display	Max. 16 CH play, Date-time/title display
Network	**Network**			
Protocol	Protocol		TCP/IP, UDP/IP, RTP (UDP), RTP (TCP), RTSP, NTP, HTTP, DHCP (Server, Client), PPPoE, SMTP, ICMP, IGMP, ARP, DNS, DDNS, uPnP, HTTPS, SNMP, ONVIF (Profile-S), SUNAPI(Server, Client)	TCP/IP, UDP/IP, RTP (UDP), RTP (TCP), RTSP, NTP, HTTP, DHCP (Server, Client), PPPoE, SMTP, ICMP, IGMP, ARP, DNS, DDNS, uPnP, HTTPS, SNMP, ONVIF (Profile-S), SUNAPI(Server, Client)
DDNS	DDNS		Wisenet DDNS	Wisenet DDNS
Transmission speed	Transmission speed		[Analog Camera(NTSC/PAL)] (Main Stream) 5MP(5M Half 20fps/12fps) 4MP(4M Half 30fps/25fps) 2MP(2M Half 30fps/25fps) 1MP(1M Half 30fps/25fps) (Sub Stream) 720p or higher : 640x368 full fps/CH SD signal : upto CIF 30/25fps/CH * The maximum recording frame rate depends on the frame rate of the input camera.	[Analog Camera(NTSC/PAL)] (Main Stream) 5MP(5M Half 20fps/12fps) 4MP(4M Half 30fps/25fps) 2MP(2M Half 30fps/25fps) 1MP(1M Half 30fps/25fps) (Sub Stream) 720p or higher : 640x368 full fps/CH SD signal : upto CIF 30/25fps/CH * The maximum recording frame rate depends on the frame rate of the input camera.
Transmission Bandwidth	Transmission Bandwidth		Max. 60Mbps	Max. 100Mbps
Transmission Bandwidth	Transmission Bandwidth		None	None
Wireless	Wireless	WIR	None	None
		3G/LTE	None	None
Audio	Audio	Input/Output	1 Line in / 1 Line out	1 Line in / 1 Line out
		Compression	G.711 (NVR Cam G.711, T26)	G.711 (NVR Cam G.711, T26)
		Audio Communication	2-Way	2-Way
Max Remote Users			None	None
Security			IP address filtering, User access log, 802.1x Authentication, Encryption (ID/PW, Recording, Transmission, Backup) Device Certificate(Hanwha Techwin Root CA)	IP address filtering, User access log, 802.1x Authentication, Encryption (ID/PW, Recording, Transmission, Backup) Device Certificate(Hanwha Techwin Root CA)
Web viewer	Web viewer	Supported OS	Windows 10, Mac OS 11 Big Sur and later	Windows 10, Mac OS 11 Big Sur and later
		Supported browser	Chrome v89 or above, Edge v89 or above, Safari v14.0.3 or above	Chrome v89 or above, Edge v89 or above, Safari v14.0.3 or above
Viewer Software	Viewer Software		SSM, Webviewer, Wisenet Viewer, Wisenet mobile Support SDK/CGI(SUNAPI) for integration to 3'rd party VMS	SSM, Webviewer, Wisenet Viewer, Wisenet mobile Support SDK/CGI(SUNAPI) for integration to 3'rd party VMS
Functions	**Functions**			
Camera Setup	Camera Setup	Register	Auto, Manual	Auto, Manual
		Black	None	None
PTZ	PTZ	Control	Via GUI, Webviewer, SSM, WisenetViewer, WisenetMobile Viewer, System Controller	Via GUI, Webviewer, SSM, WisenetViewer, Wisenet Mobile Viewer, System Controller
		Preset	300 presets	300 presets
Smart phone	Smart phone	Support Model	iOS, Android	iOS, Android
		Protocol Support	RTP, RTSP, HTTP, CGI(SUNAPI)	RTP, RTSP, HTTP, CGI(SUNAPI)
		Control	Live(16ch) : Multi-Profile Support Playback(4Ch Multi Playback, Max 2MP) Eventpush	Live(16ch) : Multi-Profile Support Playback(4Ch Multi Playback, Max 2MP) Eventpush
		Max. Remote Users	Search(3), Live Unicast(10)	Search(3), Live Unicast(10)
Redundancy	Redundancy	Failover	None	None
		ARB	Support	Support
Easy configuration	Easy configuration		Setup Wizard (Language Date/Time, Password, Network, Auto Camera Configuration), P2P (QR code)	Setup Wizard (Language Date/Time, Password, Network, Auto Camera Configuration), P2P (QR code)
Coaxial Control	Coaxial Control		CVBS(Pelco-C),(AHD)CVI/TVI	CVBS(Pelco-C),(AHD)CVI/TVI
Interface	**Interface**			
Front	Front	Indicator	LED(Status Indicator) : Power(1), Record(1), Network(1)	LED(Status Indicator) : Power(1), Record(1), Network(1)
Storage	Storage		None	None
Reset	Reset		Switch(1EA)	Switch(1EA)
HDD Key Lock	HDD Key Lock		None	None
HDMI	HDMI		1EA	1EA
VGA	VGA		1EA	1EA
BNC	BNC		8CH In / 1CH Out(Spot Output)	16CH In / 1CH Out(Spot Output)
DP	DP		None	None
DVI	DVI		None	None
e-SATA	e-SATA		None	None
Audio	Audio		Out(1EA, RCA, Line)	Out(1EA, RCA, Line)
Ethernet	Ethernet		RJ-45(10/100 BASE-T)	RJ-45(10/100 BASE-T)
Alarm	Alarm		In 4EA, Out 1EA - Relay Out1(NO/NC/COM)	In 4EA, Out 1EA - Relay Out1(NO/NC/COM)
USB	USB		2EA(Front/Rear USB2.0)	2EA(Front/Rear USB2.0)
GPS	GPS		None	None
WIR	WIR		None	None

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Serial(Protocol)	Serial(Protocol)		RS-485 (Samsung-T/Pelco-D/Pelco-p) * for PTZ	RS-485 (Samsung-T/Pelco-D/Pelco-p) * for PTZ
Power Inlet	Power Inlet		IEA DC Input Jack	IEA DC Input Jack
System	**System**			
Log	Log	Log List	Max. 100,000 (System Log, Event Log each)	Max. 100,000 (System Log, Event Log each)
System Control	System Control		Mouse, Webviewer, System Controller(SPC-7000, SPC-6000, SPC-2000)	Mouse, Webviewer, System Controller(SPC-7000, SPC-6000, SPC-2000)
Power Management	Power Management	Shutdown Delay	None	None
		Startup Delay	None	None
Language	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	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	**Environmental**			
Operating Temperature			0°C to +40°C(+32°F to +104°F)	0°C to +40°C(+32°F to +104°F)
Operating Humidity			20% ~ 85% RH	20% ~ 85% RH
Certification	Certification		UL, CE, FCC, KC	UL, CE, FCC, KC
Electrical	**Electrical**			
Power Input			DC12V	DC12V
Power Consumption			TBD	TBD
PoE Budget	PoE Budget		None	None
Mechanical	**Mechanical**			
Color / Material	Color / Material		Black / Metal	Black / Metal
Dimension (WxHxD)	Dimension (WxHxD)		300 x 47 x 208.7mm (11.8" x 1.9" x 8.22")	370.0x 44.0 x 320mm(14.57" x 1.73" x 12.6")
Weight	Weight		TBD	TBD
Control Box	**Control Box**			
Interface	Interface	Indicator		
		Emergency Button		
		Audio/Power Switch		
		Main I/O		
Mechanical	Mechanical	Color / Material		
		Dimension (WxHxD)		
		Weight		

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1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

☒ AC 240 V, 50 Hz

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
DVR	ARD-810	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT
Adapter	KPL-048F-VI	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
Mouse	MOKJUO	21H07051	Primax Electronics Ltd.	-
HDD	ST2000VX012	-	SEAGATE	-

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1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Laptop	LG15N54	503NZWY038929	LG	-
Laptop Adapter	PA-1900-14	OF2R263348701 7764	LITE-ON TECHNOLOGY COPORATION	-
Monitor 1	SMT-2232	C95V67VF90003 8B	Weihai Daewoo Electronics Co., Ltd.	-
Monitor 2	SMT-2233	ZC6U67VH50019 4D	Weihai Daewoo Electronics Co., Ltd.	-
Monitor 3	-	-	DELL. INC	-
Speaker	-	-	Britz	-
Controller	SPC-1010	C50E67WG10100 F	SamSung Techwin Co.,Ltd.	-
Controller Adapter	AP-12005A	-	A Power	-
Alarm	PRO-SL	-	SENSOR PRO	-
ButtonAlarm	-	-	-	-
Camera	SCD-6083RN	-	TB-eye Ltd.	-
Camera Adapter	KP-1220	-	Korea Power	-

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1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
DVR (EUT)	DC Jack	Adapter (EUT)	DC Jack	1.4	U
	USB A-type	Mouse (EUT)	USB A-type	1.5	U
	BNC(SPOT)	Monitor #1	BNC	3.5	S
	VGA	Monitor #2	VGA	1.5	U
	HDMI	Monitor #3	HDMI	1.4	S
	AUDIO OUT	Speaker	AUDIO OUT	2.0	U
	RS-485	Controller	RS-485	3.2	U
	Alarm OUT	Alarm	Alarm IN	3.1	U
	Alarm IN	ButtonAlarm	Alarm OUT	3.2	U
	VIDEO IN	Camera	BNC	3.5	S
	RJ-45	Laptop	RJ-45	3.0	U
	AUDIO IN	Laptop	AUDIO IN	1.5	U
Laptop	DC Jack	Laptop Adapter	DC Jack	1.4	S
Controller	DC Jack	Controller Adapter	DC Jack	1.4	S
Camera	DC Jack	Camera Adapter	DC Jack	1.4	S

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

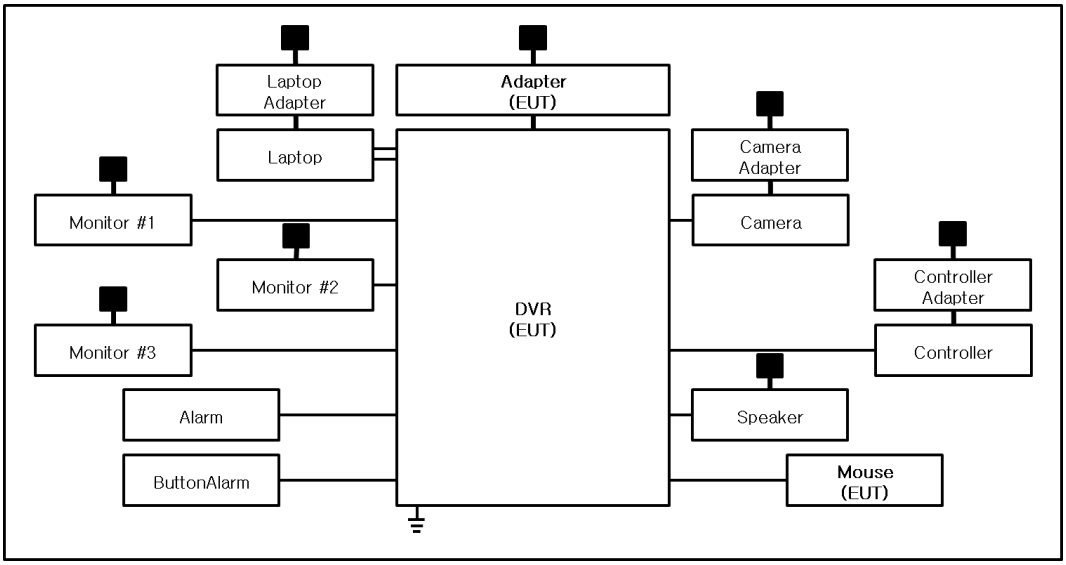
Test Mode	operating
Operating Mode	EUT Monitoring, Ping Test

EUT Test operating S/W		
Name	Version	Manufacture Company
-	-	-

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1.8 Configuration

■ AC Main
□ DC Main



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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, Yeoju-si, Gyeonggi-do, 12658, Korea, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	**RRA**	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KR0100
International	**KOLAS**	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KT489
USA	**FCC**	3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.	KR0100
Canada	**ISED**	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	23298
JAPAN	**VCCI**	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	C-20136, T-20137, R-20181, G-20176
Europe	**TÜV SÜD**	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	CARAT 001633 0004

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2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **AS/NZS CISPR 32:2015 AMD 1:2020** ☒ Class A ☐ Class B

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2.1 Conducted Emissions at Mains Power Ports

Test Date
Oct. 25, 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: (23,0 ± 0,2) ℃
Relative Humidity: (47,0 ± 0,1) % R.H.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
Refer to ‘Remarks when standards applied’.

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2.2 Conducted Emissions at Telecommunication Ports

Test Date
Oct. 25, 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 CAT6	ENY81-CAT6	R & S	101665	12, 28, 2022

Test Conditions
Temperature: (23,0 ± 0,2) ℃
Relative Humidity: (47,0 ± 0,1) % R.H.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

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.

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2.3 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Oct. 25, 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: (22,5 ± 0,2) ℃
Relative Humidity: (47,0 ± 0,1) % R.H.

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Settings
IF Band Width: 120 ㎑

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

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2.4 Radiated Electric Field Emissions(Above 1 ㎓)

Test Date
Oct. 25, 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, 01, 2023
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 01, 2023
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 03, 2023

Test Conditions
Temperature: (22,7 ± 0,2) ℃
Relative Humidity: (47,8 ± 0,1) % R.H.

Frequency Range of Measurement
1 ㎓ to 6 ㎓

Instrument Settings
IF Band Width: 1 ㎒

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

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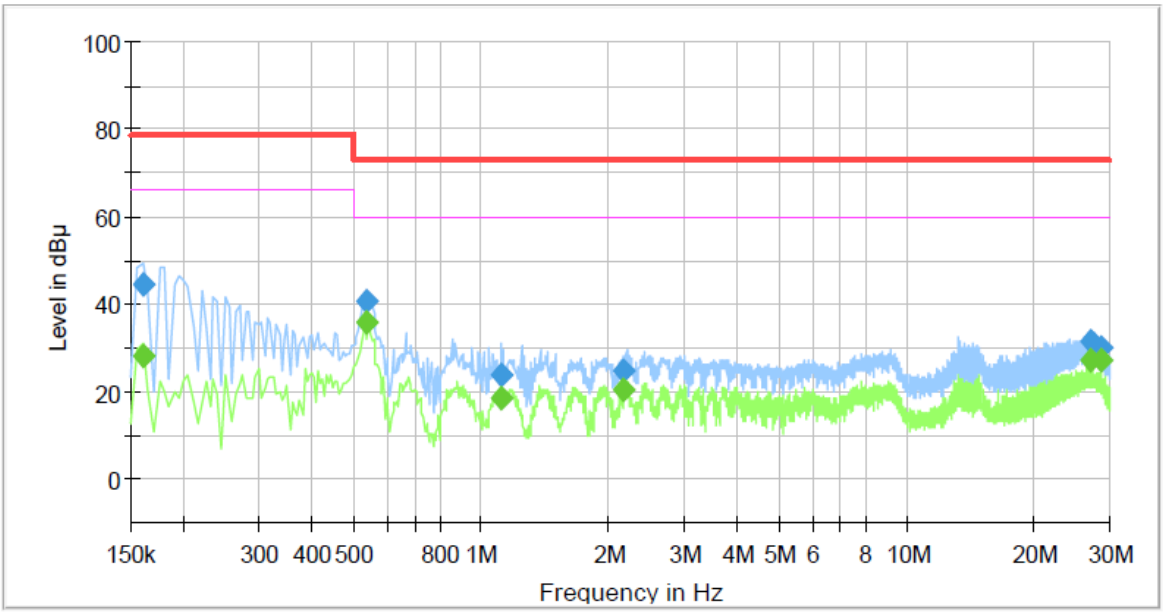
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	ARD-810
Phase:	
Mode:	L1
Operator Name:	KES



Final_Result

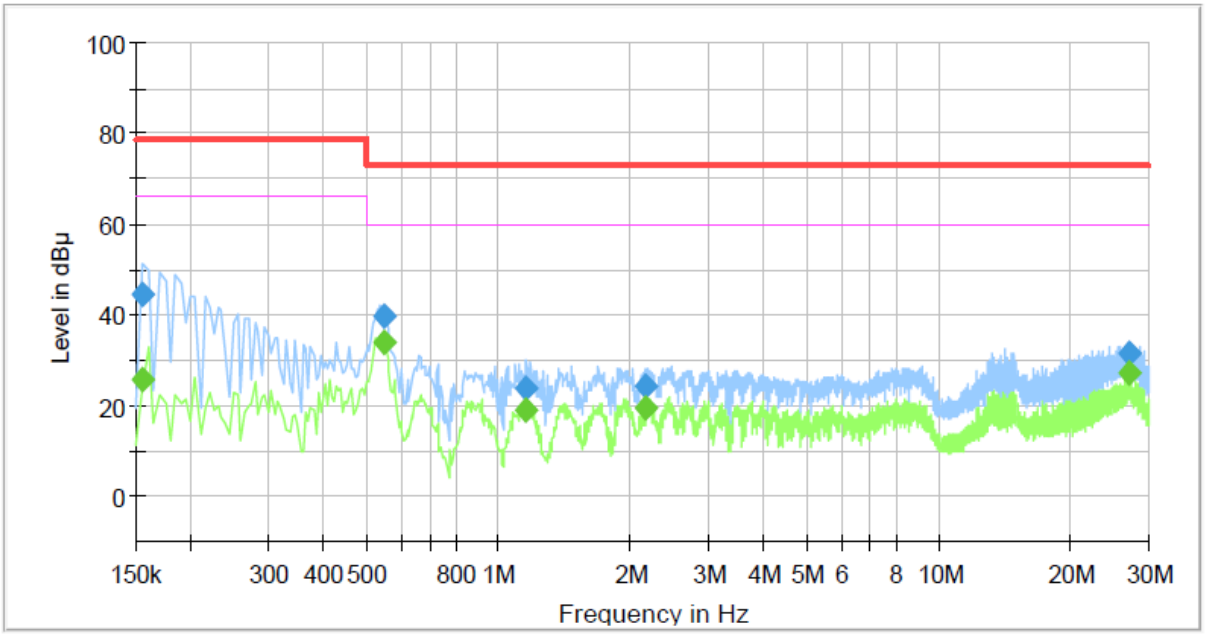
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	28.06	66.00	37.94	1000.0	9.000	L1	19.4
0.160000	44.31	---	79.00	34.69	1000.0	9.000	L1	19.4
0.535000	---	35.80	60.00	24.20	1000.0	9.000	L1	19.8
0.535000	40.84	---	73.00	32.16	1000.0	9.000	L1	19.8
1.115000	---	18.65	60.00	41.35	1000.0	9.000	L1	20.1
1.115000	23.71	---	73.00	49.29	1000.0	9.000	L1	20.1
2.170000	---	20.19	60.00	39.81	1000.0	9.000	L1	20.3
2.170000	24.96	---	73.00	48.04	1000.0	9.000	L1	20.3
27.160000	---	27.24	60.00	32.76	1000.0	9.000	L1	20.2
27.160000	31.50	---	73.00	41.50	1000.0	9.000	L1	20.2
28.685000	---	27.01	60.00	32.99	1000.0	9.000	L1	20.3
28.685000	30.24	---	73.00	42.76	1000.0	9.000	L1	20.3

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NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	ARD-810
Phase:	
Mode:	N
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	25.61	66.00	40.39	1000.0	9.000	N	19.4
0.155000	44.55	---	79.00	34.45	1000.0	9.000	N	19.4
0.550000	---	33.86	60.00	26.14	1000.0	9.000	N	19.8
0.550000	39.77	---	73.00	33.23	1000.0	9.000	N	19.8
1.155000	---	18.96	60.00	41.04	1000.0	9.000	N	20.1
1.155000	23.73	---	73.00	49.27	1000.0	9.000	N	20.1
2.150000	---	19.57	60.00	40.43	1000.0	9.000	N	20.3
2.150000	24.36	---	73.00	48.64	1000.0	9.000	N	20.3
27.160000	---	27.26	60.00	32.74	1000.0	9.000	N	20.3
27.160000	31.34	---	73.00	41.66	1000.0	9.000	N	20.3

♦ Calculation
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

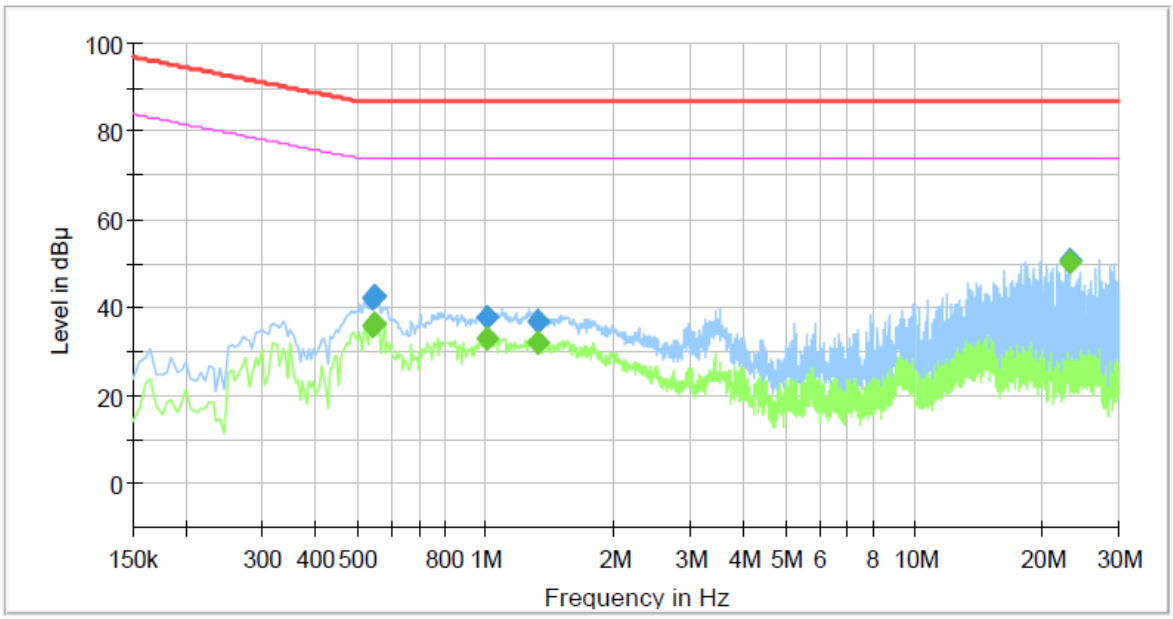
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Conducted Emissions at Telecommunication Ports

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	ARD-810
Mode :	
Speed :	1000 Mbps
Operator Name:	KES



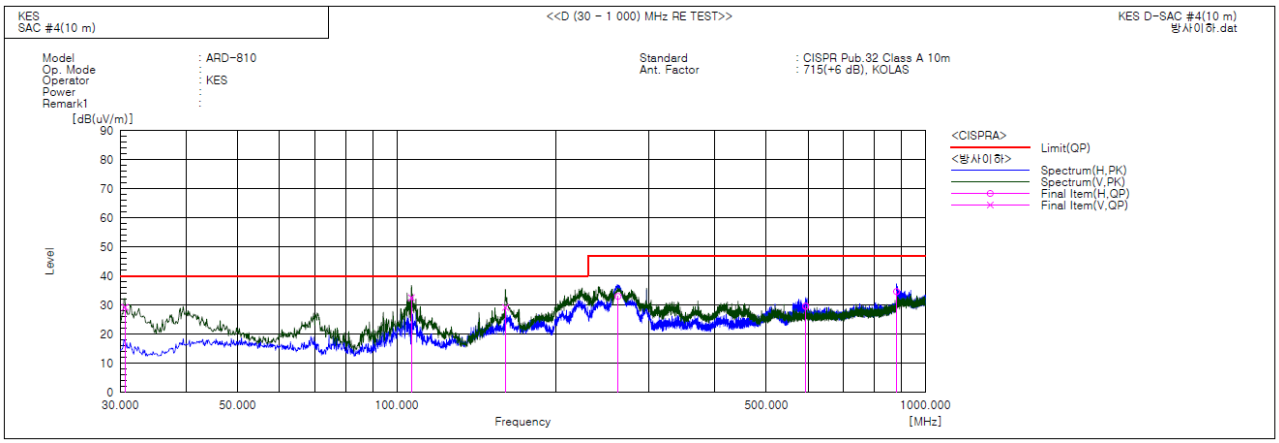
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.545000	---	35.77	74.00	38.23	1000.0	9.000	Single Line	19.8
0.545000	42.04	---	87.00	44.96	1000.0	9.000	Single Line	19.8
0.550000	---	36.53	74.00	37.47	1000.0	9.000	Single Line	19.8
0.550000	42.50	---	87.00	44.50	1000.0	9.000	Single Line	19.8
1.010000	---	32.88	74.00	41.12	1000.0	9.000	Single Line	19.9
1.010000	37.74	---	87.00	49.26	1000.0	9.000	Single Line	19.9
1.325000	---	31.93	74.00	42.07	1000.0	9.000	Single Line	20.0
1.325000	36.71	---	87.00	50.29	1000.0	9.000	Single Line	20.0
23.130000	---	50.46	74.00	23.54	1000.0	9.000	Single Line	19.9
23.130000	50.65	---	87.00	36.35	1000.0	9.000	Single Line	19.9

♦ Calculation
QuasiPeak[㏈uV] / CAverage [㏈uV] = Reading Value[㏈uV] + Corr. [㏈]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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Radiated Electric Field Emissions(Below 1 ㎓)



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	54.3	-25.0	29.3	40.0	10.7	110.0	75.0	
2	106.630	V	54.7	-22.2	32.5	40.0	7.5	110.0	194.0	
3	160.586	V	53.7	-24.5	29.2	40.0	10.8	110.0	12.0	
4	262.073	H	51.7	-18.7	33.0	47.0	14.0	378.0	178.0	
5	593.691	H	37.8	-8.2	29.6	47.0	17.4	376.0	319.0	
6	881.903	H	38.6	-4.0	34.6	47.0	12.4	376.0	334.0	

♦ Calculation

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

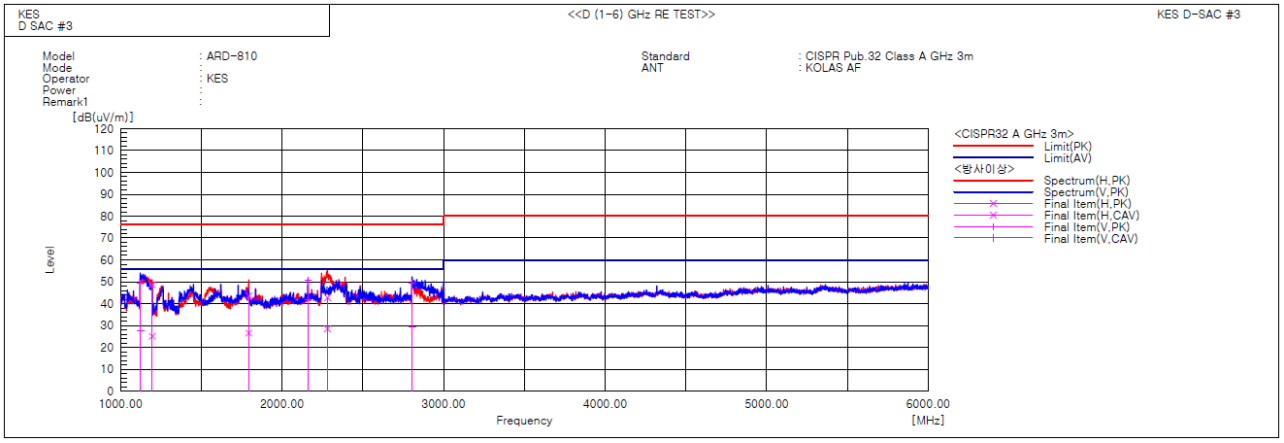
Margin(QP)[dB] = Limit[dB(㎶/m)] - Result(QP) [dB(㎶/m)]

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

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

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Radiated Electric Field Emissions(Above 1 ㎓)



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	1122.487	V	58.5	36.5	-9.0	49.5	27.5	76.0	56.0	26.5	28.5	100.0	12.7	
2	1195.475	H	57.3	33.7	-8.6	48.7	25.1	76.0	56.0	27.3	30.9	100.0	355.7	
3	1793.582	H	46.4	29.4	-2.8	43.6	26.6	76.0	56.0	32.4	29.4	100.0	74.0	
4	2160.689	V	51.2	42.6	-0.7	50.5	41.9	76.0	56.0	25.5	14.1	100.0	194.8	
5	2280.892	H	43.0	28.8	-0.3	42.7	28.5	76.0	56.0	33.3	27.5	100.0	63.9	
6	2805.637	V	47.8	27.7	1.7	49.5	29.4	76.0	56.0	26.5	26.6	100.0	38.8	

♦ Calculation
Result(PK/CAV) [㏈(㎶/m)] = (Reading(PK/CAV)[㏈(㎶)] + c.f[㏈(1/m)]
Margin(PK/CAV)[㏈] = Limit[㏈(㎶/m)] - Result(PK/CAV) [㏈(㎶/m)]
Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

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Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

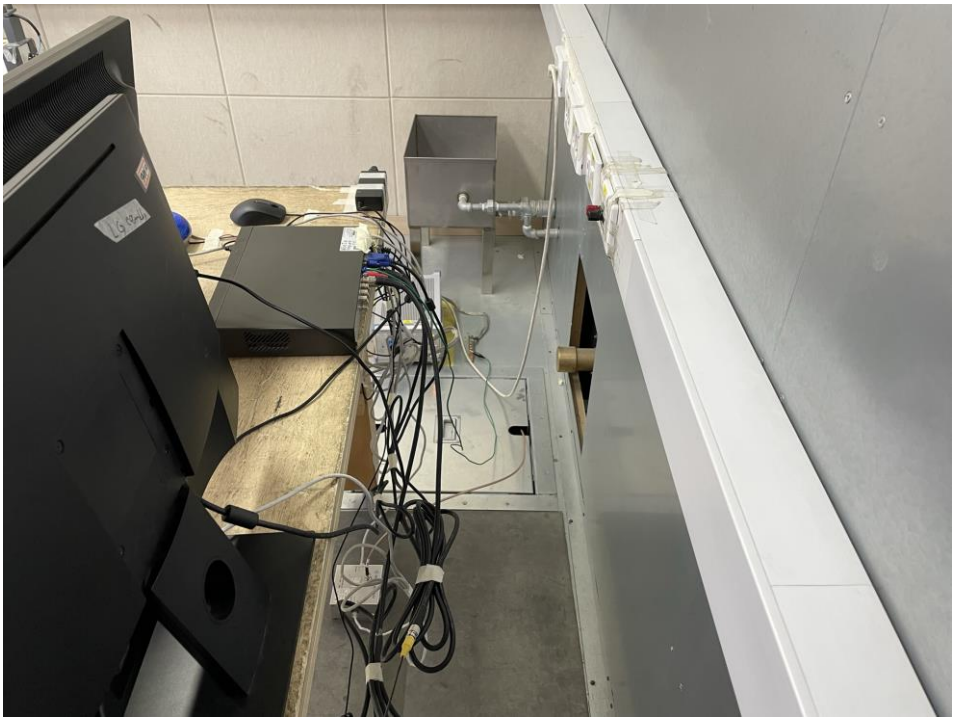




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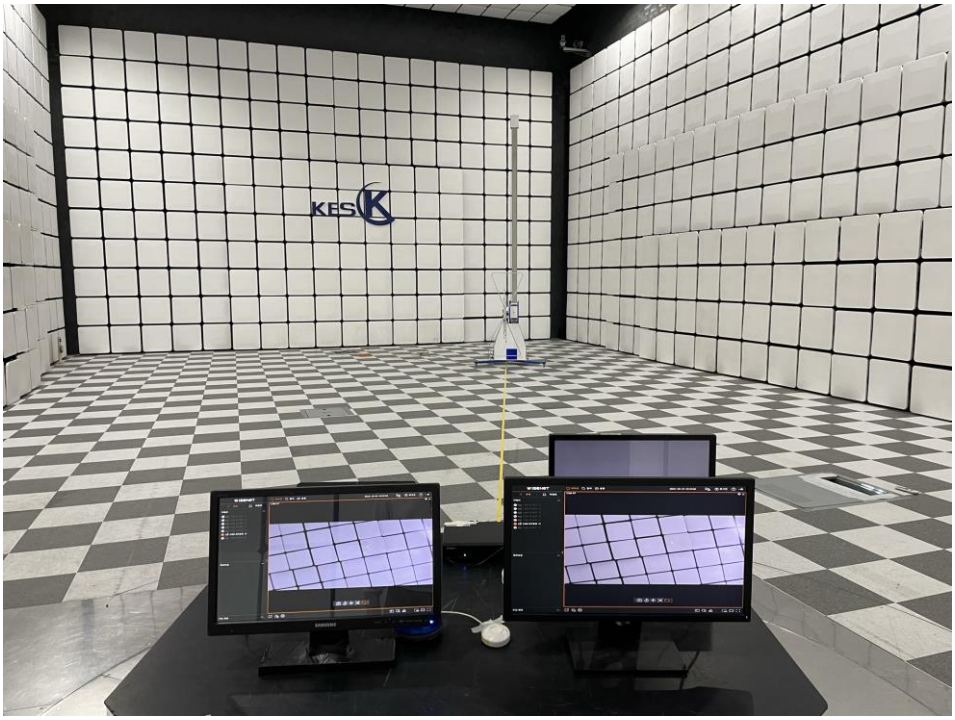
Conducted Emissions at Telecommunication Ports





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Radiated Electric Field Emissions(Below 1 ㎓)

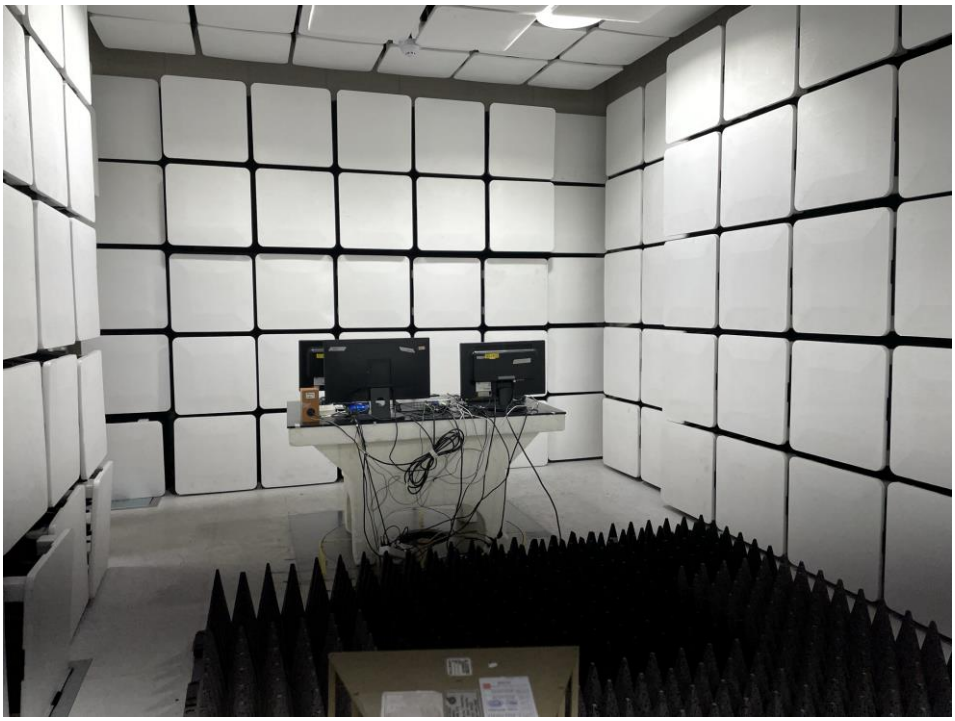




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Radiated Electric Field Emissions(Above 1 ㎓)





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EUT External Photographs

(Top)



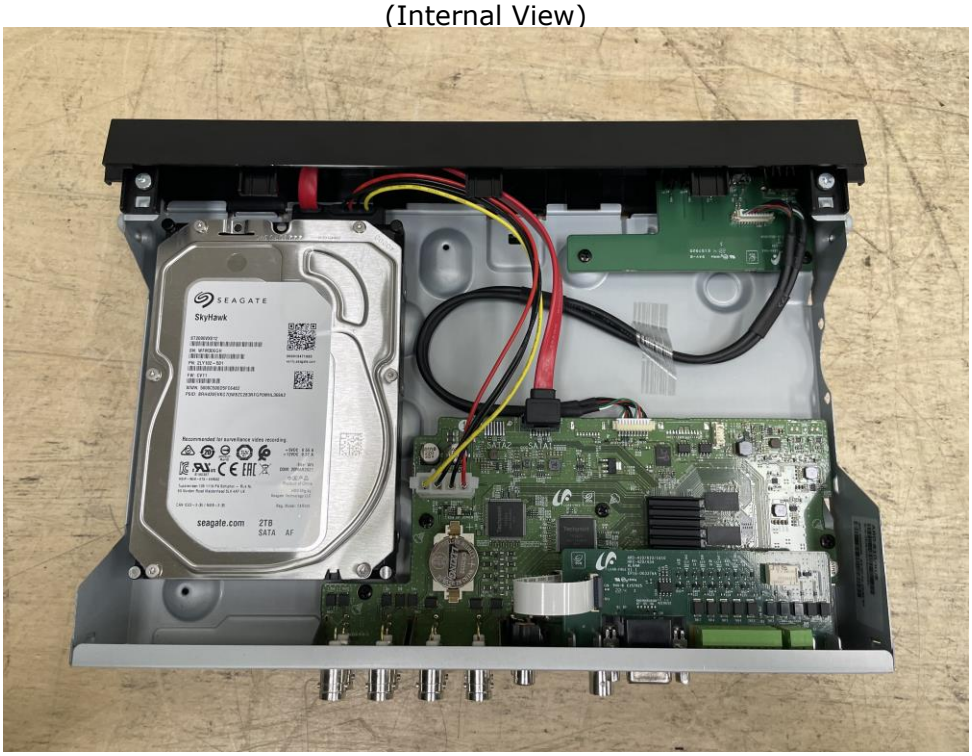
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EUT Internal Photographs

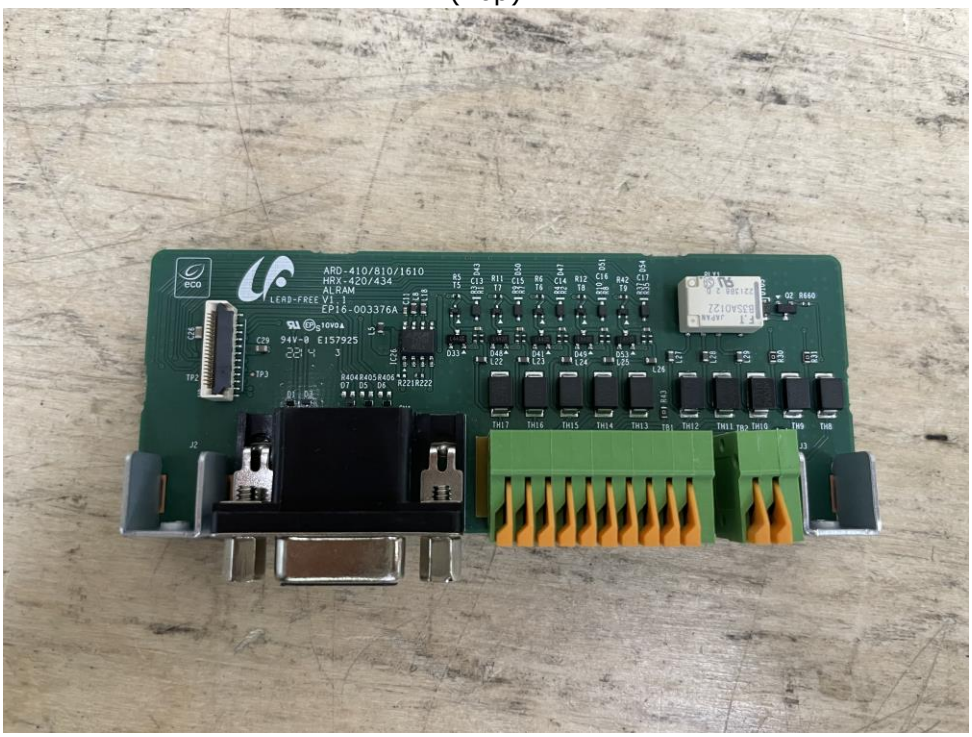
(Internal View)



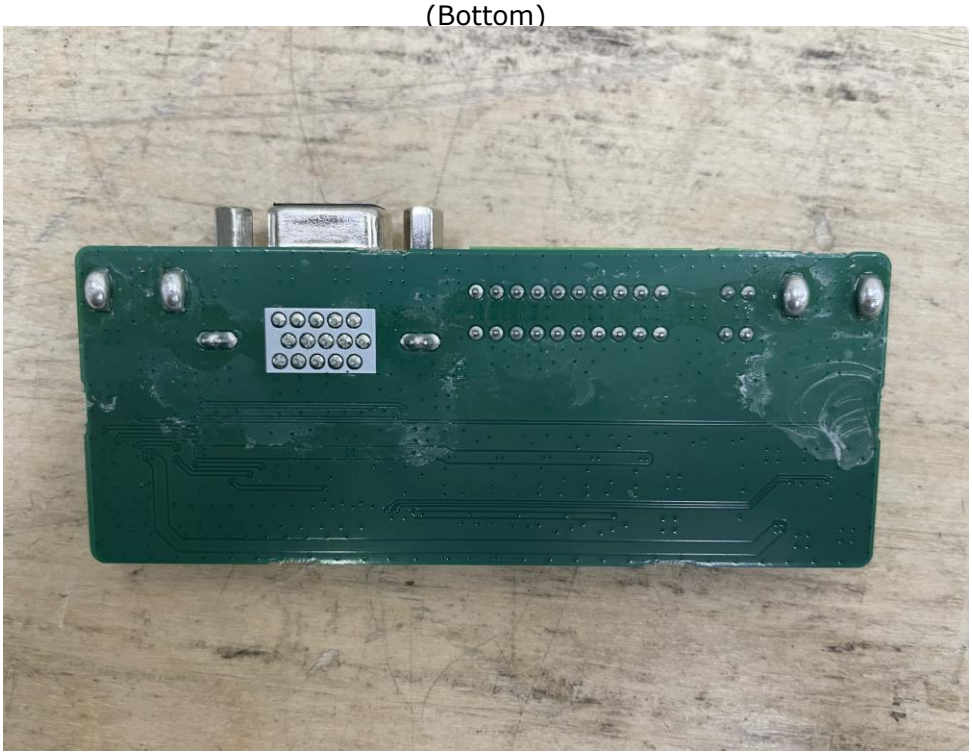
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EUT Internal View – Board 1

(Top)



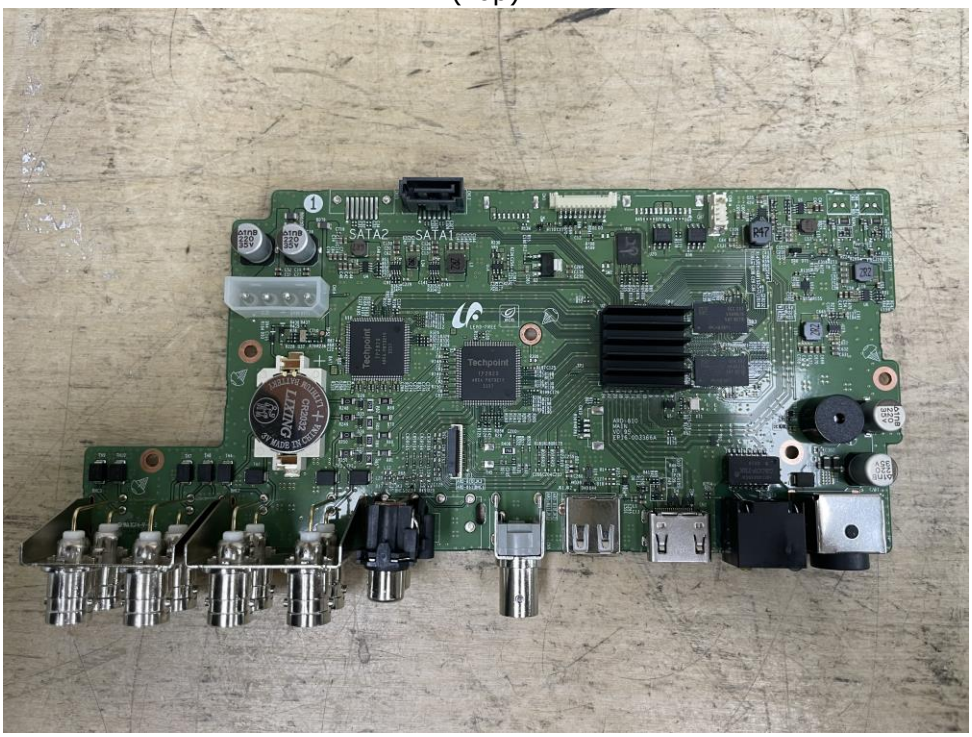
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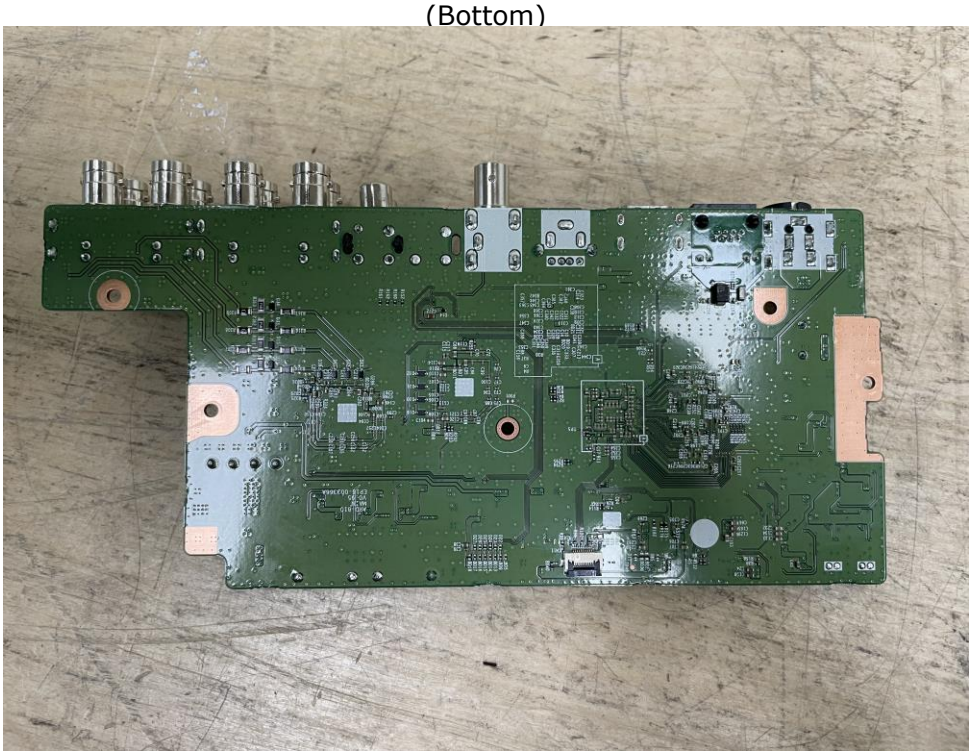
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EUT Internal View – Board 2

(Top)



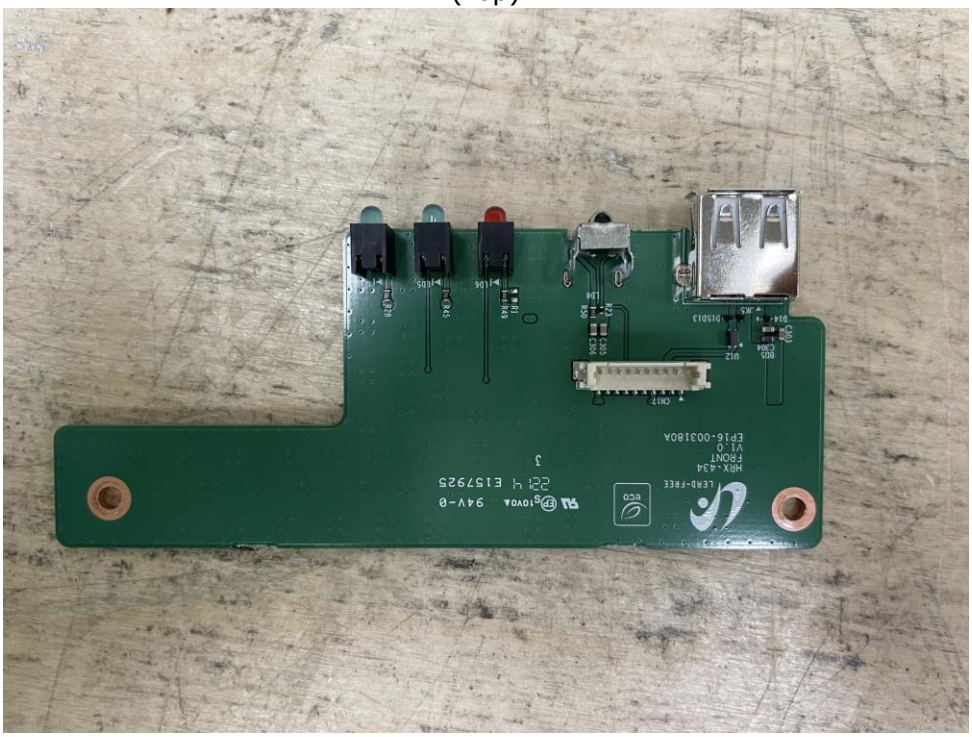
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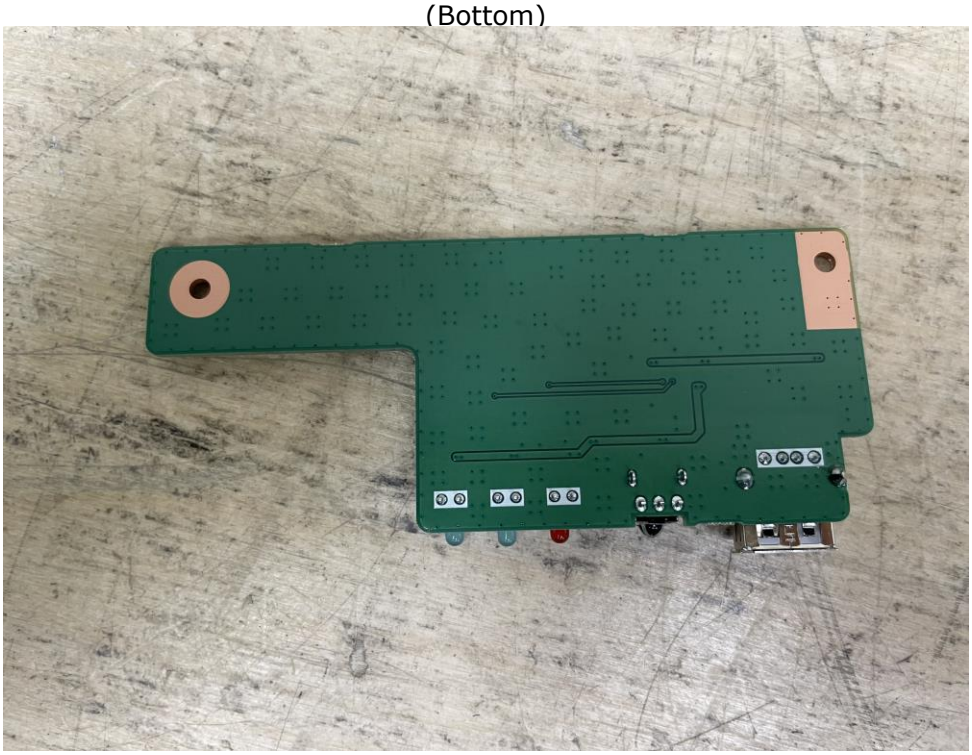
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EUT Internal View – Board 3

(Top)



(Bottom)



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EUT Internal View – HDD

(Top)



(Bottom)



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