



EMC TEST REPORT For RCM

Test Report No. : KES-EM-21T0335
Date of Issue : May. 06, 2021
Product name : DVR
Model/Type No. : HRX-835
Variant Model : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea
Manufacturer : 1. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
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 : Apr. 09, 2021
Test date : Apr. 16, 2021 ~ Apr. 19, 2021
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Gi Man, Kim
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

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

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Report No.:
KES-EM-21T0335
Page (2) of (36)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
May. 06, 2021	KES-EM-21T0335	Issued

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TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency	9
1.2	Variant Model Differences	9
1.3	Device Modifications	9
1.4	Equipment Under Test.....	9
1.5	System Configuration	9
1.6	Support Equipments	10
1.7	External I/O Cabling	11
1.8	EUT Operating Mode(s)	11
1.9	Configuration	12
1.10	Remarks when standards applied	13
1.11	Calibration Details of Equipment Used for Measurement	13
1.12	Test Facility	13
1.13	Laboratory Accreditations and Listings	13
2.0	Test Regulations.....	14
2.1	Conducted Emissions at Mains Power Ports	16
2.2	Conducted Emissions at Telecommunication Ports.....	17
2.3	Radiated Electric Field Emissions(Below 1 GHz)	18
2.4	Radiated Electric Field Emissions(Above 1 GHz)	19
APPENDIX A – TEST DATA.....		20
Conducted Emissions at Mains Power Ports.....		20
Conducted Emissions at Telecommunication Ports		22
Radiated Electric Field Emissions(Below 1 GHz)		23
Radiated Electric Field Emissions(Above 1 GHz)		24
Test Setup Photos and Configuration		25
Conducted Emissions at Mains Power Ports.....		25
Conducted Emissions at Telecommunication Ports		26
Radiated Electric Field Emissions(Below 1 GHz)		27
Radiated Electric Field Emissions(Above 1 GHz)		28
EUT External Photographs		29
EUT Internal Photographs		30



1.0 General Product Description

Main Specifications of EUT are:

Analog camera	Inputs	
	Signal Type	AHD(8MP, 5MP, 4MP, 1080p, 720p) HDTVI(8MP, 5MP, 4MP, 1080p, 720p) HDCVI(5MP, 4MP, 1080p, 720p) CVBS(NTSC/PAL)
Network camera	Inputs	Max. 10CH
	Resolution	8MP ~ CIF
Live	Local Display	SUNAPI(Wisenet), ONVIF
	Multi Screen Display	1x HDMI, 1x VGA (Dual monitor)
	Resolution	[Local monitor] 1 / 2H / 2V / 3V / 4 / 6(1+5) / 12(4x3) / 8(1+7) / 9 / Auto sequence [Web] 1 / 4 / 9
Performance		
Operating System	Embedded	Linux
Record	Compression	H.265, H.264, MJPEG
	Record Rate(Analog)	Analog Camera (Main Stream) 5M 5/5fps, 4M 7/7fps, 2M 15/15fps, 720p 30/25fps, 960H/640H 30/25fps (NTSC/PAL per CH) (Sub Stream) 720p or higher : 640x360 full fps/CH, SD signal : upto SD full fps/CH * The maximum recording frame rate depends on the frame rate of the input camera.
	Recording Bandwidth	Max. 40Mbps
	Resolution	8MP ~ CIF



Event	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
	Event Action	E-mail, PTZ preset, Alarm out, Buzzer, Monitor out
Search & Play	Playback Bandwidth	Max. 32Mbps (10CH simultaneously)
	Resolution	8MP ~ CIF
	Playback Control	Fast Forward/Backward (x2, x4, x8, x16, x32, x64, x128, x256) Slow Forward/Backward (x1/2, x1/4, x1/8) ※Move one step up/down
Storage	Supported HDD	Up to 6TB
	HDD Slot	SATA 4ea(Max 24TB)
Backup	File backup	BU, EXE(Include Player), AVI(Webviewer only)
Network		
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)
DDNS		Wisenet DDNS



Transmission speed		Analog Camera(NTSC/PAL) (Main Stream) 8MP 8/8fps CH, 5M 12/12fps CH, 4M 15/12fps CH, 2M 30/25fps CH, 720p 30/25fps/CH, SD 30/25fps/CH, 720p 30/25fps/CH, SD 30/25fps/CH (Sub Stream) 720p or higher : 640x360 full fps/CH, SD signal : upto SD full fps/CH * The maximum recording frame rate depends on the frame rate of the input camera.
Audio	Input/Output	8 Line in / 1 Line out
	Compression	G.711 (N/W Cam G.711, 726)
	Audio Communication	2-Way
Max Remote Users	Search(3), Live Unicast(10), Multicast(20)	
Security	IP address filtering, User access log, 802.1x Authentication, Encryption (ID/PW, Recording, Transmission, Backup) Device Certificate(Hanwha Techwin Root CA)	
Web viewer	Supported OS	Window 10, Mac OS X (10.15 or above)
	Supported browser	Google Chrome 88 or above, MS Edge 88 or above, Safari 13 or above *support Plug-in free Web
Viewer Software		SSM, Webviewer, Smart Viewer, Wisenet mobile Support SDK/CGI(SUNAPI) for integration to 3'rd party VMS
Functions		
Camera Setup	Register	Auto, Manual

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	Item	None
PTZ	Control	Via GUI, Webviewer, SSM, SmartViewer, Wisenet Mobile Viewer, System Controller
	Preset	300 presets
Smart phone	Support Model	iOS, Android
	Protocol Support	RTP, RTSP, HTTP, CGI(SUNAPI)
	Control	Live(8ch) : Multi-Profile Support Playback(4Ch Multi Playback, Max 2MP) Event push
	Max. Remote Users	Search(3), Live Unicast(10)
Redundancy	Failover	
	ARB	
Easy configuration		Setup Wizard (Language Date/Time, Password, Network, Auto Camera Configuration), P2P (QR code)
Coaxial Control		CVBS(Pelco-C)/AHD/CVI/TVI
Interface		
Front	Indicator	LED(Status indicator) : Power(1), HDD Action(1), Alarm(1), Record(1), Network(1), Backup(1)
Storage		None
Reset		Switch(1EA)
HDD Key Lock		None
HDMI		1EA
VGA		1EA
BNC		8CH In / 1CH Out(Spot Output)
Audio		Out(1EA, RCA, Line)
Ethernet		RJ-45(10/100/1000BASE-T)
Alarm		In 16EA, Out 4EA - Relay Out1(NO/NC/COM) - Relay Out2~4(NO/COM)
USB		2EA(Front USB2.0, Rear USB 3.0))

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Report No.:
KES-EM-21T0335
Page (8) of (36)

Serial(Protocols)		RS-485 (Samsung-T/Pelco-D/Pelco-p) * for PTZ
Power inlet		1EA AC
System		
Log	Log List	Max. 10,000 (System Log, Event Log each)
Power Management	Shutdown Delay	None
	Startup Delay	None
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
Environmental		
Operating Temperature	0°C to +40°C(+32°F to +104°F)	
Operating Humidity	20% ~ 85% RH	
Certification		UL, CE, FCC, KC
Electrical		
Power Input	100~240 VAC± 10%, 50/60 Hz	
Power Consumption	Max. 130W (6T HDD 4ea)	
PoE Budget		None
Mechanical		
Color / Material		Black / Metal
Dimension (WxHxD)		440 x 88 x 384.8mm(17.32" x 3.46" x 15.15")
Weight		Approx. 5.4Kg (3TB HDD 1ea)

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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	HRX-835	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	EUT

1.5 System Configuration

Description	Model Number	Serial Number	Manufacturer	Remarks
mouse	MOKJUO	-	Primax Electronics Ltd.	-
SMPS	FSAK250J	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
HDD	ST3000VX009	-	SEAGATE	3 TB

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Report No.:
KES-EM-21T0335
Page (10) of (36)

1.6 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Adaptor	MC12D-1200500	-	Shenzhen MaCable Technology Co.,Ltd. Dongguan Branch	-
Camera	HCD-7030RA		HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	-
Notebook	LG15N54	410NZGK015231	LG	-
Notebook Adaptor	ADP-90WH B	84ZW19F1663	DELTA ELECTRONICS (JIANGSU) LTD.	-
Alarm1	-	-	-	-
Alarm2	-	-	-	-
Monitor1	SMT-2233	ZC6U67VH50019 4D	Weihai Daewoo Electronics Co., Ltd.	-
Monitor2	23MA53D	303KKMH9Z019	LG	-
Monitor2 Adaptor	PSAB-L205A	EAY62850201	LG Innotek Yantai Co. Ltd.	-
Monitor3	LT23C350	009MHYCH10638 8P	SAMSUNG	-
Monitor3 Adaptor	A4514_DDY	CN07BN44- 00593BD07G690 189	SAMSUNG ELECTRONIC JAPAN Co., Ltd.	-
Smartphone	LG-SU760	108KPQJ0186212	LG	-
Speaker	E5	-	PreSonus®	-
Controller	SPC-1010	C50E67WG10100 F	SamSung Techwin Co.,Ltd.	-
Controller Adaptor	RS-AB1000	-	Dongguan Jinhuaasheng Power Technology Co.,Ltd.	-
USB Memory	-	-	Sandisk	32 GB

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1.7 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
DVR (EUT)	RJ-45	Notebook	RJ-45	3.5	U
	Alarm OUT	Alarm1	Alarm IN	3.0	U
	Alarm IN	Alarm2	Alarm OUT	3.0	U
	2 PIN	Controller	2 PIN	3.0	U
	Audio OUT	Speaker	Audio IN	1.4	U
	Audio IN	Smartphone	Audio OUT	1.6	U
	USB	USB Memory	USB	-	-
	BNC	Camera	BNC	3.0	S
	BNC	Monitor1	BNC	3.0	S
	HDMI	Monitor2	HDMI	1.6	S
	D-sub	Monitor3	D-sub	1.5	S
	USB	mouse (EUT)	USB	1.8	U
	External Ground	Ground	External Ground	2.0	U

* Unshielded=U, Shielded=S

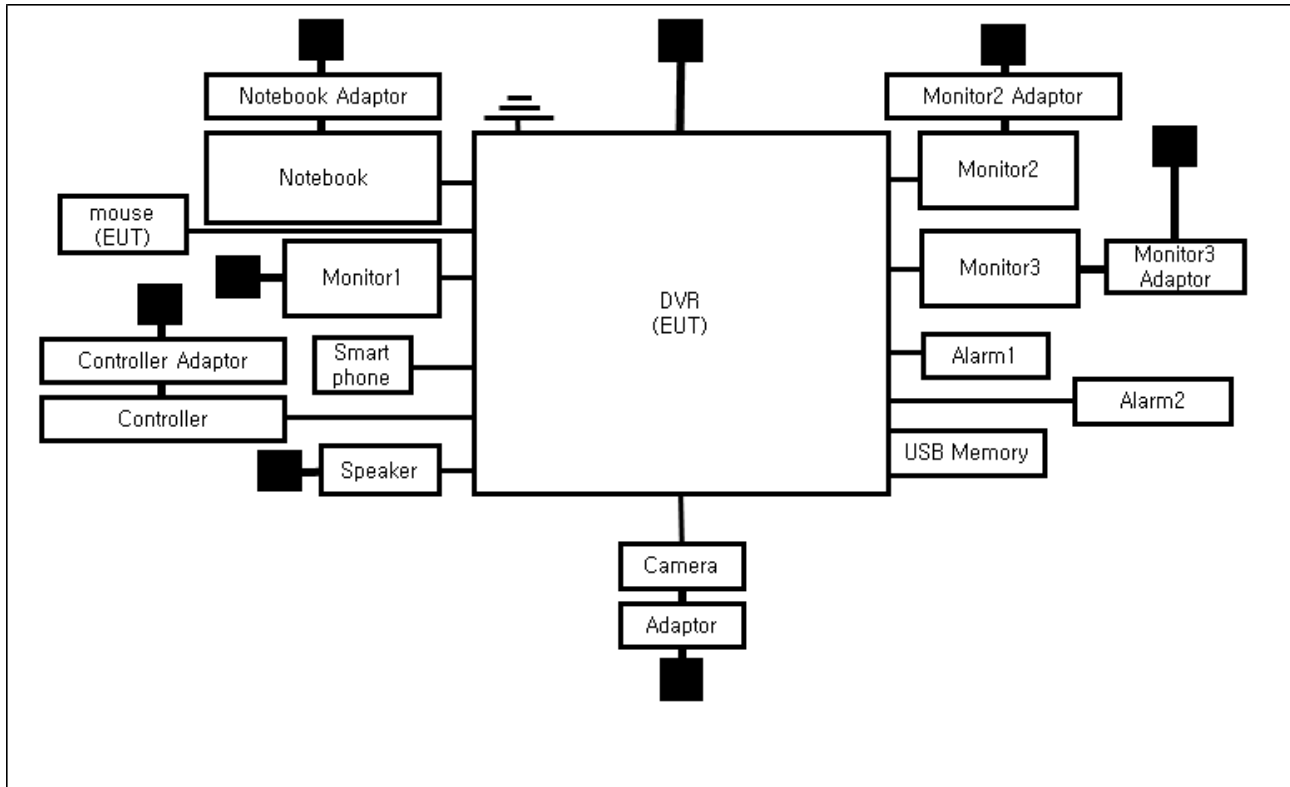
1.8 EUT Operating Mode(s)

Test Mode	operating
Operation	the test was conducted while checking the camera video output from the laptop and making sure that they operate normally while performing a ping test.

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

1.9 Configuration

■ AC Main
 □ DC Main



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1.10 Remarks when standards applied

N/A

1.11 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.

1.12 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4:2014 and CISPR 16-1-4:2019

1.13 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area 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, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298-1
JAPAN	VCCI	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	 R-20056, C-20036, T-20040, G-20057
Europe	TÜ V SÜ D	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area 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:

☐ EMC – Directive 2014/30/EU

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013

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Report No.:
KES-EM-21T0335
Page (15) of (36)

-
- | | | |
|---|---|----------------------------------|
| ☐ VCCI-CISPR 32:2016 | ☐ Class A | ☐ Class B |
| ☒ AS/NZS CISPR32:2015 | ☒ Class A | ☐ Class B |
|
☐ 47 CFR Part 15, Subpart B | | |
| ☐ CISPR 22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2017 | ☐ Class A | ☐ Class B |
|
☐ IC Regulation ICES-003 Issue 7 | | |
| ☐ CAN/CSA CISPR 32:17 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2017 | ☐ Class A | ☐ Class B |
|
☐ RE- Directive 2014/53/EU | | |
|
☐ EN 301 489-1 V2.2.3 | | |
| ☐ Equipment for fixed use | | |
| ☐ Equipment for vehicular use | | |
| ☐ Equipment for portable use | | |
|
☐ EN 301 489-3 V1.6.1 | | |
|
☐ EN 301 489-17 V2.2.1 | | |
|
☐ EN 60945:2002 | | |

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Report No.:
KES-EM-21T0335
Page (16) of (36)

2.1 Conducted Emissions at Mains Power Ports

Test Date
Apr. 16, 2021

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	01, 15, 2022
☒	LISN	ENV216	R & S	101787	12, 29, 2021
☒	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021

Test Conditions

Temperature: (23,8 ± 0,1) °C
Relative Humidity: (45,5 ± 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.

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Report No.:
KES-EM-21T0335
Page (17) of (36)

2.2 Conducted Emissions at Telecommunication Ports

Test Date
Apr. 16, 2021

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	01, 15, 2022
☒	LISN	ENV216	R & S	101787	12, 29, 2021
☒	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 30, 2021
☒	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	12, 30, 2021
☐	CDN	CDNS502A	TESEQ	40431	12, 29, 2021

Test Conditions

Temperature: (23,8 ± 0,1) °C
Relative Humidity: (45,5 ± 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.

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Report No.:
KES-EM-21T0335
Page (18) of (36)

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date
Apr. 16, 2021

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	04, 01, 2022
☒	AMPLIFIER	SCU 01	R & S	100603	11, 25, 2021
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 10, 2022

Test Conditions

Temperature: (23,1 ± 0,1) °C
Relative Humidity: (46,2 ± 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.

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2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date
Apr. 19, 2021

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, 05, 2021
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 07, 2022
☐	ATTENUATOR	8491A	HP	35496	03, 10, 2022
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022

Test Conditions

Temperature: (23,9 ± 0,1) °C
Relative Humidity: (46,2 ± 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.

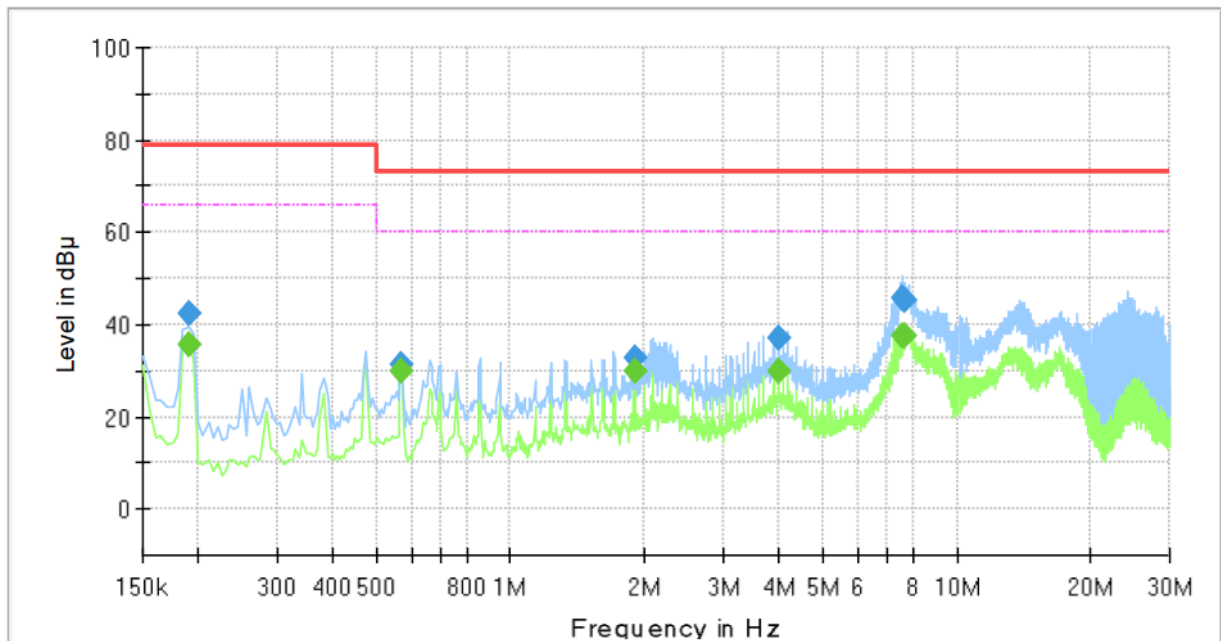
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
 Model No.: HRX-835
 Phase: L1
 Mode:
 Operator Name: KES



Final Result

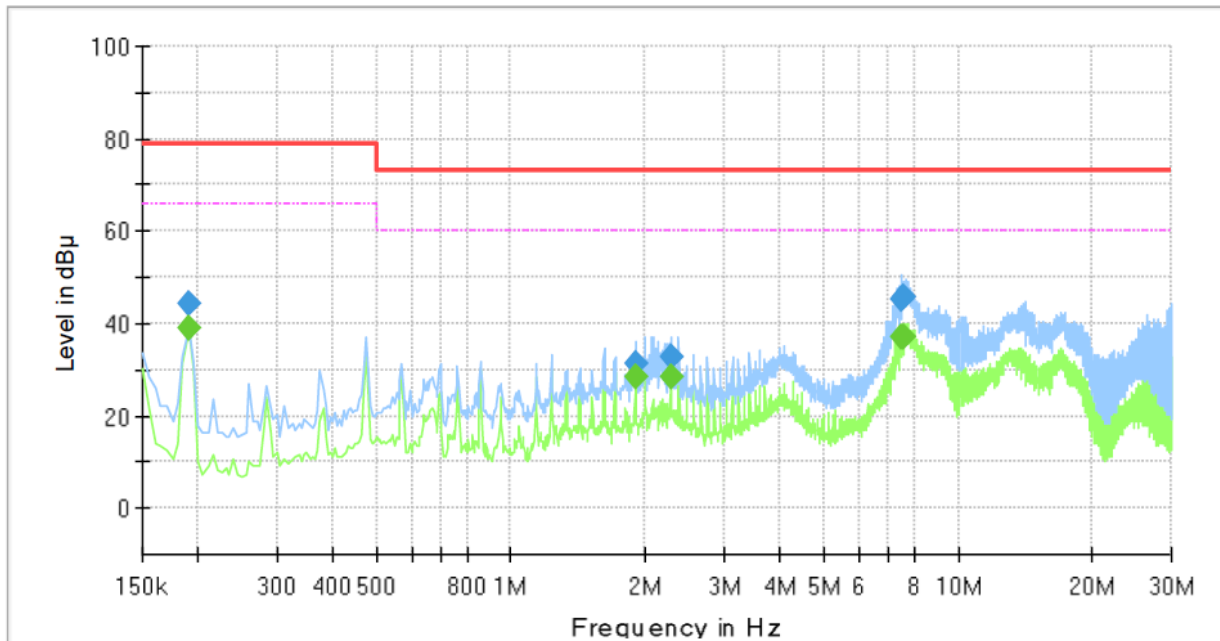
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.190000	---	35.67	66.00	30.33	1000.0	9.000	L1	19.4
0.190000	42.38	---	79.00	36.62	1000.0	9.000	L1	19.4
0.570000	---	30.06	60.00	29.94	1000.0	9.000	L1	19.8
0.570000	31.38	---	73.00	41.62	1000.0	9.000	L1	19.8
1.895000	---	30.08	60.00	29.92	1000.0	9.000	L1	20.3
1.895000	32.86	---	73.00	40.14	1000.0	9.000	L1	20.3
3.980000	---	29.98	60.00	30.02	1000.0	9.000	L1	19.9
3.980000	37.03	---	73.00	35.97	1000.0	9.000	L1	19.9
7.595000	---	37.63	60.00	22.37	1000.0	9.000	L1	19.6
7.595000	45.62	---	73.00	27.38	1000.0	9.000	L1	19.6
7.640000	---	37.41	60.00	22.59	1000.0	9.000	L1	19.6
7.640000	45.33	---	73.00	27.67	1000.0	9.000	L1	19.6

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NEUTRAL LINE

Common Information

Test Description: Conducted Emission
 Model No.: HRX-835
 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)
0.190000	---	38.95	66.00	27.05	1000.0	9.000	N	19.4
0.190000	44.19	---	79.00	34.81	1000.0	9.000	N	19.4
1.900000	---	28.54	60.00	31.46	1000.0	9.000	N	20.3
1.900000	31.47	---	73.00	41.53	1000.0	9.000	N	20.3
2.275000	---	28.66	60.00	31.34	1000.0	9.000	N	20.3
2.275000	32.70	---	73.00	40.30	1000.0	9.000	N	20.3
7.490000	---	36.87	60.00	23.13	1000.0	9.000	N	19.5
7.490000	45.22	---	73.00	27.78	1000.0	9.000	N	19.5
7.520000	---	37.29	60.00	22.71	1000.0	9.000	N	19.5
7.520000	45.57	---	73.00	27.43	1000.0	9.000	N	19.5

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

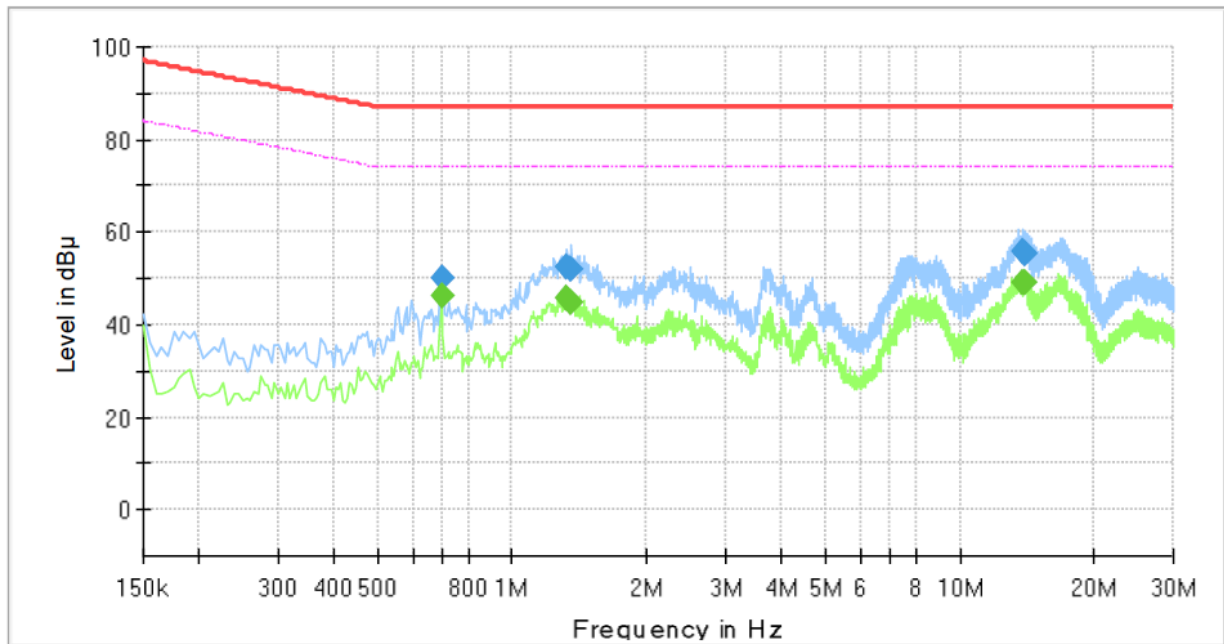
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

Conducted Emissions at Telecommunication Ports

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
 Model No.: HRX-835
 Mode :
 Speed : 1 000 Mbps
 Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.695000	---	46.40	74.00	27.60	1000.0	9.000	Single Line	19.9
0.695000	50.14	---	87.00	36.86	1000.0	9.000	Single Line	19.9
1.325000	---	45.51	74.00	28.49	1000.0	9.000	Single Line	20.1
1.325000	52.50	---	87.00	34.50	1000.0	9.000	Single Line	20.1
1.360000	---	44.92	74.00	29.08	1000.0	9.000	Single Line	20.1
1.360000	51.96	---	87.00	35.04	1000.0	9.000	Single Line	20.1
13.755000	---	49.29	74.00	24.71	1000.0	9.000	Single Line	19.7
13.755000	55.62	---	87.00	31.38	1000.0	9.000	Single Line	19.7
13.915000	---	48.99	74.00	25.01	1000.0	9.000	Single Line	19.7
13.915000	55.26	---	87.00	31.74	1000.0	9.000	Single Line	19.7

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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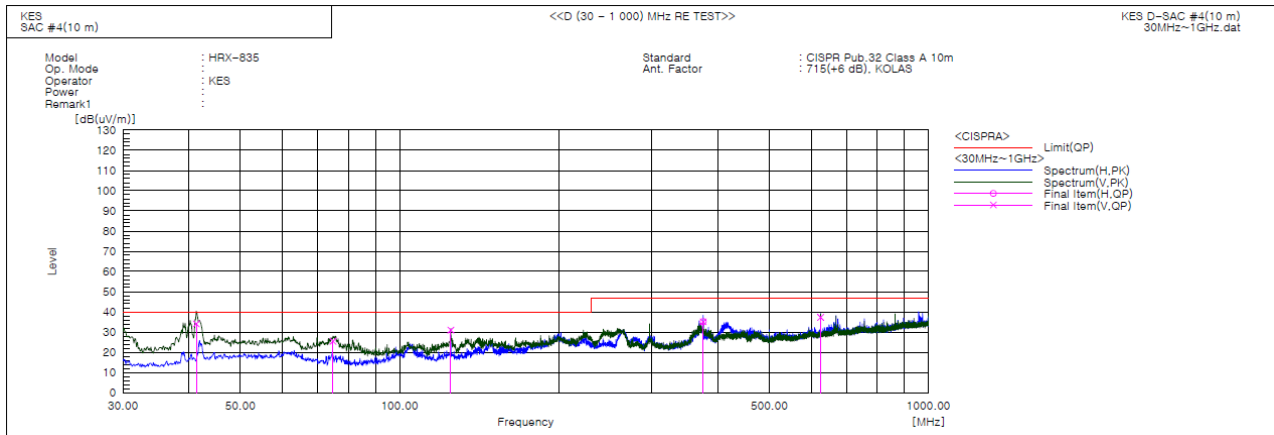
3701, 40, Simin-daero 365beon-gil,
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Report No.:

KES-EM-21T0335

Page (23) of (36)

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	41.276	V	56.3	-22.2	34.1	40.0	5.9	215.0	207.0	
2	74.863	V	52.3	-26.8	25.5	40.0	14.5	216.0	162.0	
3	124.939	V	55.8	-24.8	31.0	40.0	9.0	162.0	351.0	
4	374.956	H	50.0	-14.8	35.2	47.0	11.8	351.0	8.0	
5	374.956	V	49.9	-14.8	35.1	47.0	11.9	378.0	23.0	
6	624.974	V	45.5	-8.2	37.3	47.0	9.7	400.0	323.0	

◆ Calculation

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

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

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

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

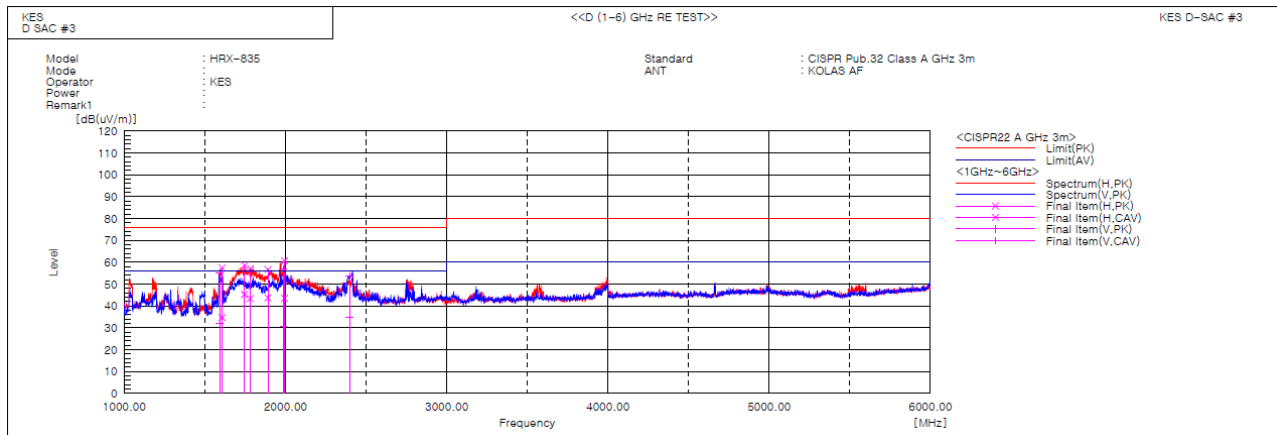


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Report No.:
KES-EM-21T0335
Page (24) of (36)

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	1592.089	V	60.6	37.4	-5.3	55.3	32.1	76.0	56.0	20.7	23.9	100.0	357.0	
2	1607.477	H	62.5	39.7	-5.1	57.4	34.6	76.0	56.0	18.6	21.4	100.0	332.8	
3	1746.418	H	62.2	48.9	-3.6	58.6	45.3	76.0	56.0	17.4	10.7	100.0	48.3	
4	1782.493	H	60.2	46.5	-3.1	57.1	43.4	76.0	56.0	18.9	12.6	100.0	56.8	
5	1891.274	H	58.5	45.5	-1.8	56.7	43.7	76.0	56.0	19.3	12.3	100.0	58.0	
6	1988.616	V	57.7	31.7	-0.9	56.8	30.8	76.0	56.0	19.2	25.2	100.0	47.4	
7	1994.156	H	61.6	44.4	-0.9	60.7	43.5	76.0	56.0	15.3	12.5	100.0	61.9	
8	2397.904	V	53.7	34.5	0.2	53.9	34.7	76.0	56.0	22.1	21.3	100.0	357.6	

◆ 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)]

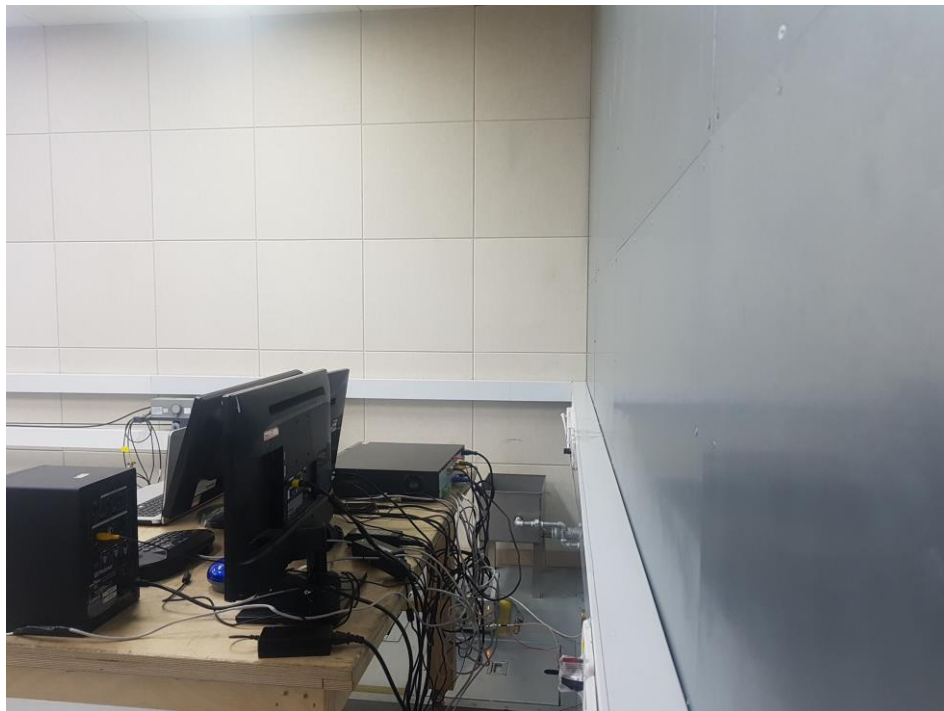
Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

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

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Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



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Conducted Emissions at Telecommunication Ports



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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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EUT External Photographs

(Top)



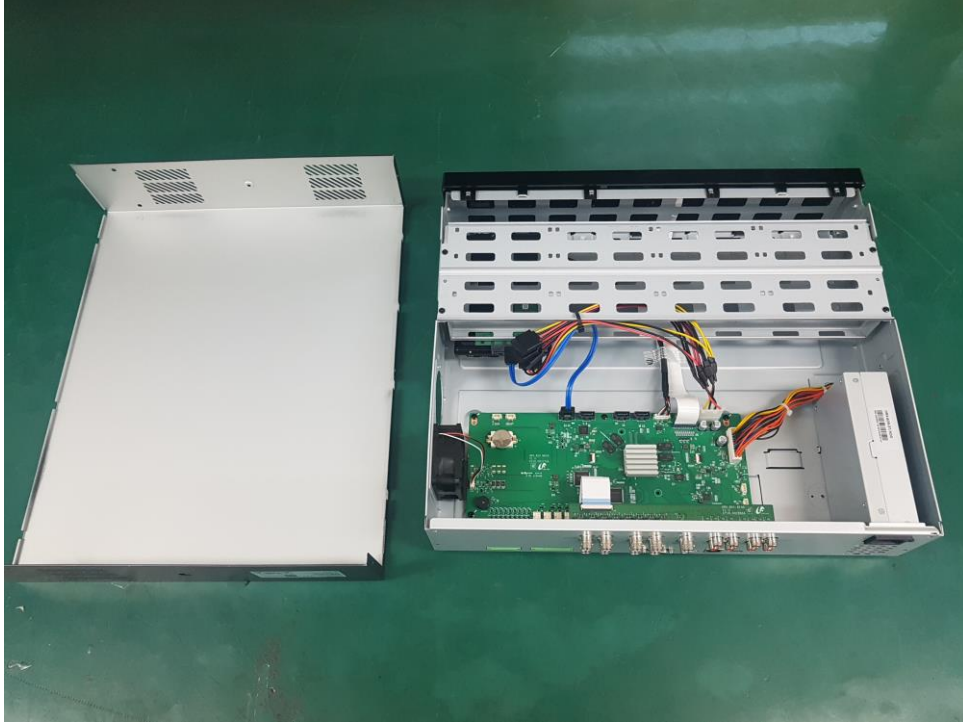
(Bottom)



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EUT Internal Photographs

(Internal View)



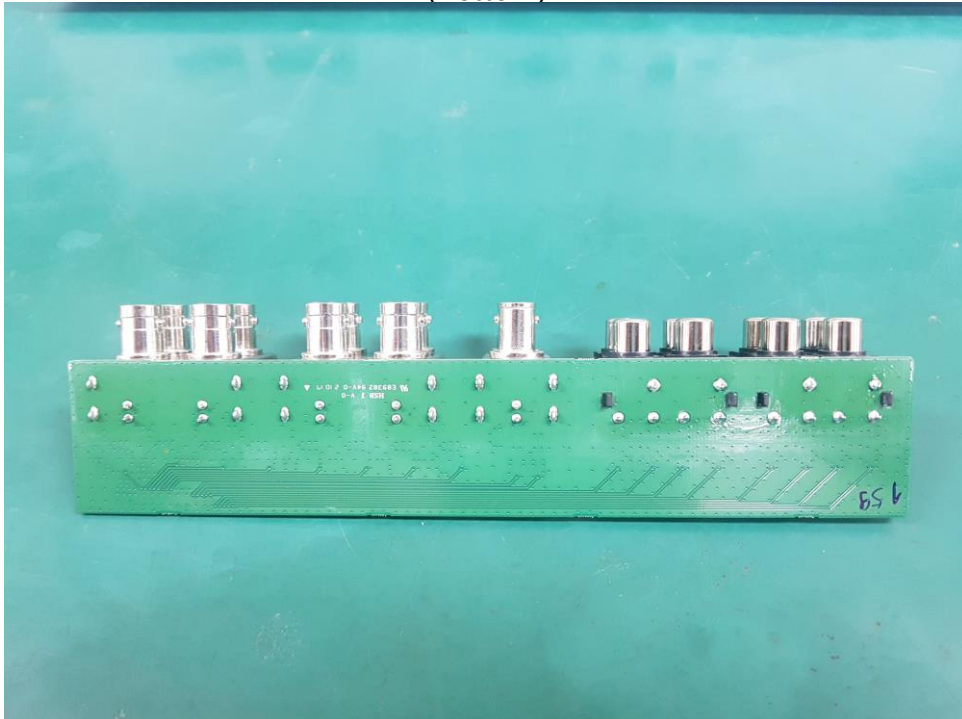
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EUT Internal View – Board 1

(Top)



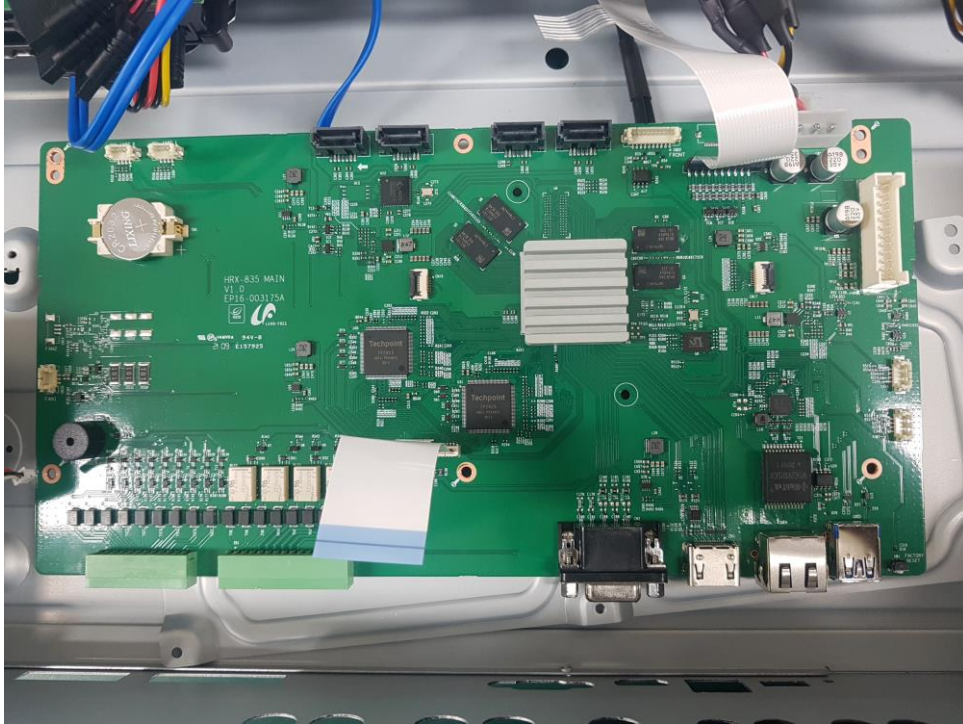
(Bottom)



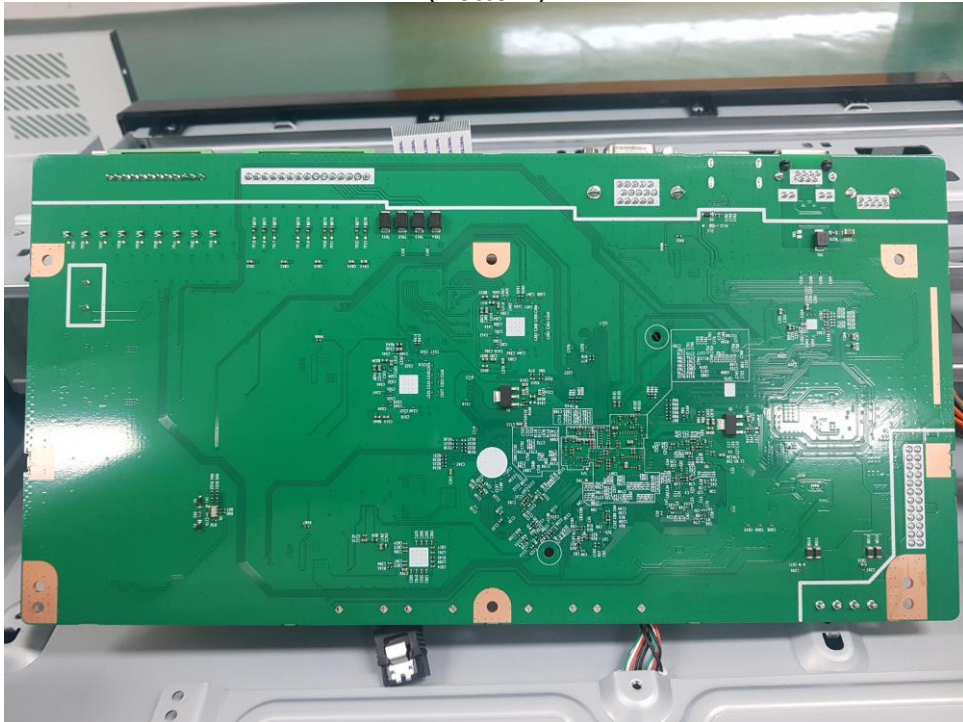
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EUT Internal View – Board 2

(Top)



(Bottom)



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EUT Internal View – Board 3

(Top)



(Bottom)



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EUT Internal View – Board 4

(Top)



(Bottom)



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EUT Internal View – HDD

(Top)



(Bottom)



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EUT Internal View – SMPS

(Top)



(Bottom)



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