



**KES Co., Ltd.**

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www.kes.co.kr

Report No.:  
KES-EM-22T0279  
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# EMC TEST REPORT For RCM

Test Report No. : KES-EM-22T0279  
Date of Issue : Mar. 30, 2022  
Product name : DVR  
Model/Type No. : HRX-1634  
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 : Mar. 02, 2022  
Test date : Mar. 07, 2022 ~ Mar. 08, 2022  
Test Results :  **In Compliance**  **Not in Compliance**

*Tested by*

Dong Hyun, Won  
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**

<b>Date</b>	<b>Test Report No.</b>	<b>Revision History</b>
Mar. 30, 2022	KES-EM-22T0279	Issued

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## 1.0 General Product Description

### Main Specifications of EUT are:

Display		
Analog camera	Inputs	16CH(1Vp-p 75ohm, BNC)
	Signal Type	- AHD(8MP, 5MP, 4MP, 1080p, 720p) - HDTVI(8MP, 5MP, 4MP, 1080p, 720p) - HDCVI(8MP, 5MP, 4MP, 1080p, 720p) - NTSC/PAL
Network camera	Inputs	2CH (Up to 18CH)
	Resolution	8MP ~ CIF
	Protocols	SUNAPI(Wisenet), ONVIF
Live	Local Display	1x HDMI, 1x VGA (Dual monitor) HDMI: 3840 x 2160, 2560x1440, 1920x1080, 1280x1044, 1280x720 (Expand mode 1920x1080) VGA: 1920x1080, 1280x1024, 1280x720 (Expand 1024*768)
	Multi Screen Display	[Local monitor] Dynamic layout/Sequence, [Web] 1 / 4 / 9 / sequence
	Resolution	[Analog Camera(NTSC/PAL)] - 8MP(15/12fps), 5MP(20/12fps), 4MP(30/25fps), 2MP(30/25fps), 1MP(30/25fps), 960H(or 720H)(30/25fps) * per CH [Network Camera] - Typ. 2MP(480fps)
Performance		
Operating System	Embedded	Linux
Record	Compression	H.265, H.264, MJPEG
	Record Rate(Analog)	(Main Stream, NT/PAL) 8M 8/8fps, 5M 12/12fps, 4M 15/12fps, 2M 30/25fps, 720p 30/25fps, Under 960H 30/25fps/CH (Sub Stream) 720p/CH or Higher : 640x360 Full fps, SD : upto SD Full fps * The maximum recording frame rate depends on the frame rate of the input camera.
	Recording Bandwidth	Max. 128Mbps (HRX-1635)
	Resolution	8MP ~ CIF
	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	Playback Bandwidth	Max. 32Mbps (18CH simultaneously)
	User	Max. 4 users (Set 1, Remote 3)
	Simultaneous playback	18CH(Local Monitor), 16Ch (CMS), 4Ch (Wisenet Mobile), 1Ch(Web)
	Fisheye Dewarping	WEB / CMS
	Search 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	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 2ea(Max. 12TB)
Backup	File backup	BU, EXE(Include Player), AVI(Webviewer only)
	Function	Max. 16 CH play, Date-time/title display

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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 (Sub Stream) HD 640x360 full fps/CH, SD upto SD full fps/CH * The maximum recording frame rate depends on the frame rate of the input camera.
Transmission Bandwidth		Max. 100Mbps
Audio	Input/Output	4 Line in (RCA 4 Line/ 1Line 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	Windows 10, Mac OS 11 Big Sur and later
	Supported browser	Chrome v99 / Edge v99 /Safari v14.0.3 Higher (2022/03)
Viewer Software		SSM, Webviewer, SmartViewer, Wisenet Mobile Viewer, Wisenet Viewer Support SDK/CGI(SUNAPI) for integration to 3'rd party VMS
Functions		
Camera Setup	Register	Auto, Manual
	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(16ch) : Multi-Profile Support Playback(4Ch Multi Playback, Max 2MP) Event push
	Max. Remote Users	Search(3), Live Unicast(10)
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)
		Reset
HDMI		1EA
VGA		1EA
BNC		16CH In / 1CH Out(Spot Output)
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)
Serial(Protocols)		RS-485 (Samsung-T/Pelco-D/Pelco-p) * for PTZ
Power inlet		1EA DC Jack
System		
Log	Log List	Max. 100,000 (System Log, Event Log each), (HRX-1632)
System Control		Mouse, Webviewer, System Controller(SPC-7000, SPC-6000, SPC-2000)
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

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<b>Environmental</b>		
Operating Temperature		0°C to +40°C(+32°F to +104°F)
Operating Humidity		20% ~ 85% RH
Certification		UL, CE, FCC, KC, UKCA
<b>Electrical</b>		
Power Input		DC12V
Power Consumption		Max. 41W (6T HDD 2ea)
PoE Budget		None
<b>Mechanical</b>		
Color / Material		Black / Metal
Dimension (WxHxD)		W370.0x H44.0 xD320(14.57" x 1.73" x12.6")
Weight		Approx. 2.6Kg (4TB 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 (Adapter)

### 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-1634	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	EUT
Adapter	FSP060-DHAN3	HU10142-18167	Zhonghan Electronics (Shenzhen) Co., Ltd.	-
Mouse	MOKJUO	-	Primax Electronics Ltd.	-
HDD	ST4000VX000	ZGY8V4WJ	SEAGATE	4 TB

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### 1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	P98F004	21599158359	DELL INC.	-
Notebook Adapter	LA240PM190	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	-
Monitor 1	SMT-2232	C95V67VF90002 5B	Weihai Daewoo Electronics Co., Ltd.	-
Monitor 2	SMT-2232	C95V67VF90003 8B	Weihai Daewoo Electronics Co., Ltd.	-
Monitor 3	DELL E2222H DVT	8221TCM10D001 03X	DELL INC.	-
Speaker	E5	-	PreSonus®	-
Controller	SPC-1010	C50E67WG10100 F	SamSung Techwin Co.,Ltd.	-
Controller Adapter	-	-	-	-
Alarm	PRO-SL	-	SENSOR PRO	-
ButtonAlarm	-	-	-	-
Camera 1	SCD-6083RN	-	TB-eye Ltd.	-
Camera 1 Adapter	KP-1220	JH10099-15001	KEPCO	-
Camera 2	HCV-6070R	-	HANWHA TECHWIN CO.,LTD.	-
Camera 2 Adapter	DAD12050DKA	KTLSA10022- 8001	Dream Electronics Inc.	-
NETWORK VIDEO ENCODER 1	SPE-410	-	HANWHA TECHWIN CO.,LTD.	-
NETWORK VIDEO ENCODER 1 Adapter	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
NETWORK VIDEO ENCODER 2	SPE-410	-	HANWHA TECHWIN CO.,LTD.	-
NETWORK VIDEO ENCODER 2 Adapter	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
USB Memory	-	-	NOVOMATIC	-

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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 2.0	Mouse (EUT)	USB	1.5	U
	RJ-45	Notebook	RJ-45	-	S
	AUDIO IN	Notebook	3.5 mm	1.6	U
	SPOT	Monitor 1	BNC	3.5	S
	D-SUB	Monitor 2	D-SUB	1.8	S
	HDMI	Monitor 3	HDMI	2.0	S
	AUDIO OUT	Speaker	RCA	2.8	U
	RS-485	Controller	RS-485	4.0	U
	Alarm OUT	Alarm	Alarm IN	3.0	U
	Alarm IN	ButtonAlarm	Alarm OUT	3.0	U
	BNC	NETWORK VIDEO ENCODER 1	BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	BNC	NETWORK VIDEO ENCODER 2	BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	BNC		BNC	10.0	U
	USB 3.0	USB Memory	USB	-	-

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Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK VIDEO ENCODER 1	BNC	Camera 1	BNC	1.6	U
NETWORK VIDEO ENCODER 2	BNC	Camera 2	BNC	1.5	U
Notebook	DC Jack	Notebook Adapter	DC Jack	2.2	S
Controller	DC Jack	Controller Adapter	DC Jack	1.8	U
NETWORK VIDEO ENCODER 1	2 Pin	NETWORK VIDEO ENCODER 1 Adapter	2 Pin	2.0	U
NETWORK VIDEO ENCODER 2	2 Pin	NETWORK VIDEO ENCODER 2 Adapter	2 Pin	2.0	U
Camera 1	2 Pin	Camera 1 Adapter	2 Pin	1.8	U
Camera 2	2 Pin	Camera 2 Adapter	2 Pin	2.0	U

\* Unshielded=U, Shielded=S

### 1.7 EUT Operating Mode(s)

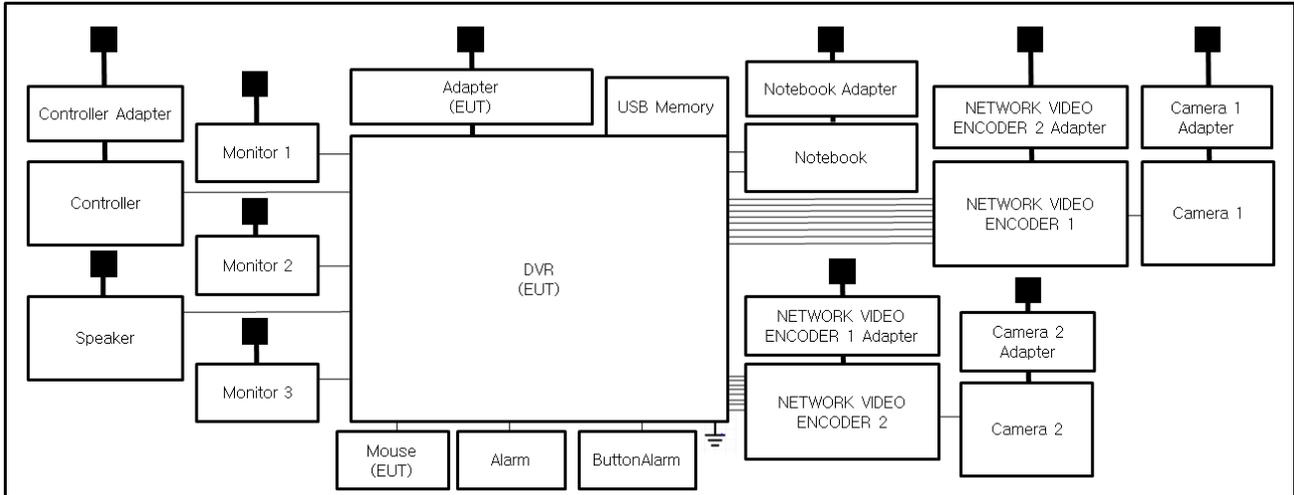
Test Mode	operating
Operating Mode	EUT Monitoring, Ping Test

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

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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, Yeosu-si, Gyeonggi-do, 12658, Korea. 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 , 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	TÜV SÜD	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

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## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

**AS/NZS CISPR32:2015**

Class A

Class B

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## 2.1 Conducted Emissions at Mains Power Ports

### Test Date

Mar. 07, 2022

### Test Location

Electro wave Shieldroom #6

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	12, 28, 2022
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	12, 27, 2022
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022

### Test Conditions

Temperature: (23,4 ± 0,1) °C

Relative Humidity: (43,5 ± 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.

## 2.2 Conducted Emissions at Telecommunication Ports

### Test Date

Mar. 07, 2022

### Test Location

Electro wave Shieldroom #6

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	12, 28, 2022
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	12, 27, 2022
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022
<input type="checkbox"/>	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 28, 2022
<input checked="" type="checkbox"/>	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 07, 2023

### Test Conditions

Temperature: (23,4 ± 0,1) °C

Relative Humidity: (43,5 ± 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.

- 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

Mar. 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
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	R & S	100551	04, 01, 2022
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	11, 24, 2022
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
<input checked="" type="checkbox"/>	ATTENUATOR	8491A	HP	32173	03, 08, 2023

### Test Conditions

Temperature: (23,7 ± 0,2) °C  
Relative Humidity: (43,7 ± 0,1) % R.H.

### Frequency Range of Measurement

30 MHz to 1 GHz

### Instrument Settings

IF Band Width: 120 kHz

### Test Results

The requirements are:

- PASS  
 NOT PASS  
 NOT APPLICABLE

### Remarks

See Appendix A for test data.



## 2.4 Radiated Electric Field Emissions(Above 1 GHz)

### Test Date

Mar. 08, 2022

### Test Location

SEMI ANECHOIC CHAMBER #5

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.120	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	04, 01, 2022
<input checked="" type="checkbox"/>	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	12, 16, 2022
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	HP	3008A00538	06, 21, 2022

### Test Conditions

Temperature: (23,2 ± 0,2) °C

Relative Humidity: (43,1 ± 0,1) % 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

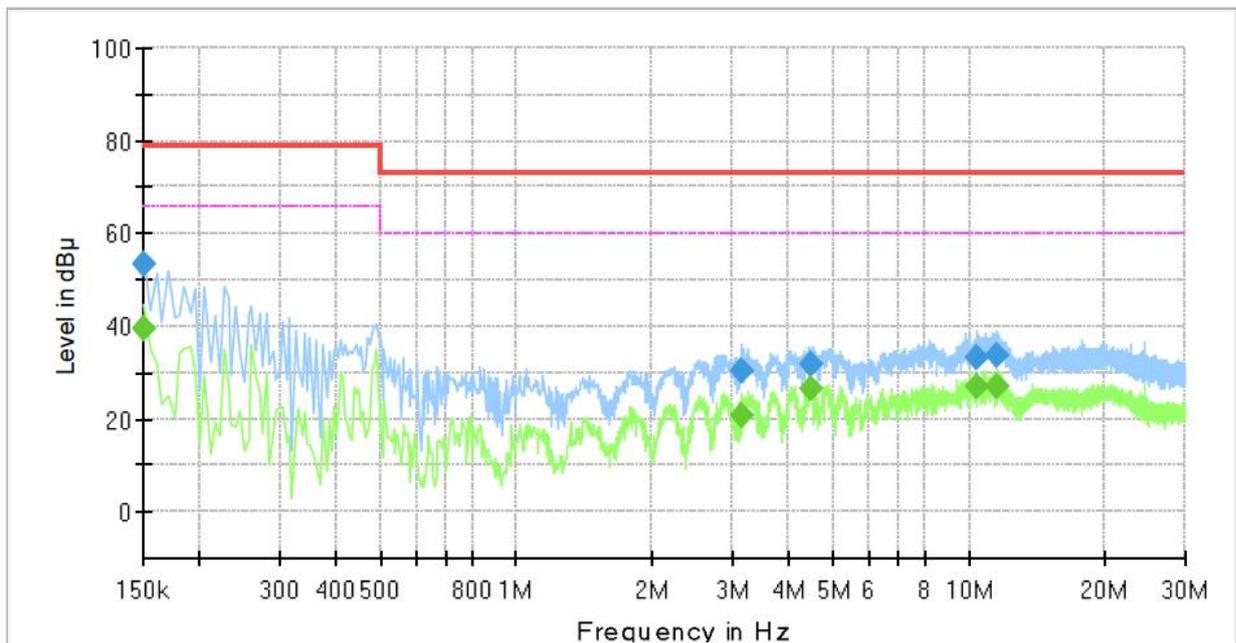
See Appendix A for test data.

## APPENDIX A – TEST DATA

### Conducted Emissions at Mains Power Ports HOT LINE

#### Common Information

Test Description:	Conducted Emission
Model No.:	HRX-1634
Phase:	
Mode:	H
Operator Name:	KES



#### Final Result

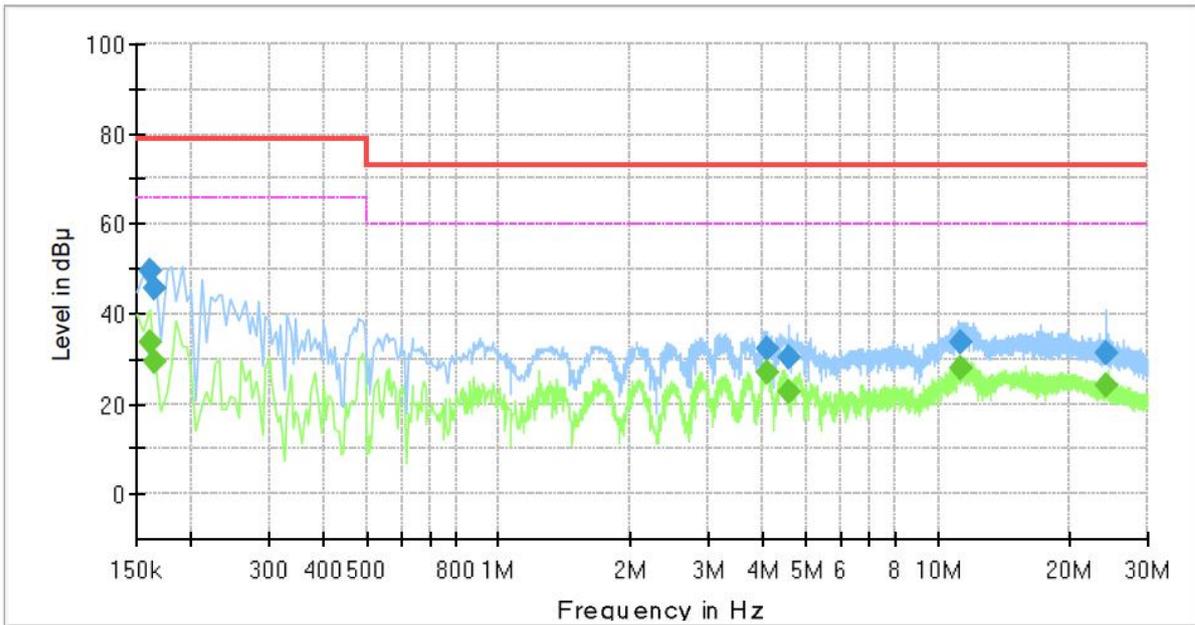
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	39.58	66.00	26.42	1000.0	9.000	L1	19.4
0.150000	53.18	---	79.00	25.82	1000.0	9.000	L1	19.4
3.150000	---	20.85	60.00	39.15	1000.0	9.000	L1	20.1
3.150000	30.49	---	73.00	42.51	1000.0	9.000	L1	20.1
4.455000	---	26.27	60.00	33.73	1000.0	9.000	L1	19.8
4.455000	31.67	---	73.00	41.33	1000.0	9.000	L1	19.8
10.430000	---	26.75	60.00	33.25	1000.0	9.000	L1	19.9
10.430000	33.31	---	73.00	39.69	1000.0	9.000	L1	19.9
11.505000	---	26.86	60.00	33.14	1000.0	9.000	L1	20.0
11.505000	33.59	---	73.00	39.41	1000.0	9.000	L1	20.0

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NEUTRAL LINE

**Common Information**

Test Description:	Conducted Emission
Model No.:	HRX-1634
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)
0.160000	---	33.92	66.00	32.08	1000.0	9.000	N	19.4
0.160000	49.46	---	79.00	29.54	1000.0	9.000	N	19.4
0.165000	---	29.19	66.00	36.81	1000.0	9.000	N	19.4
0.165000	45.93	---	79.00	33.07	1000.0	9.000	N	19.4
4.070000	---	26.99	60.00	33.01	1000.0	9.000	N	19.9
4.070000	32.48	---	73.00	40.52	1000.0	9.000	N	19.9
4.575000	---	22.50	60.00	37.50	1000.0	9.000	N	19.7
4.575000	30.40	---	73.00	42.60	1000.0	9.000	N	19.7
11.300000	---	27.76	60.00	32.24	1000.0	9.000	N	20.0
11.300000	33.93	---	73.00	39.07	1000.0	9.000	N	20.0
24.215000	---	23.87	60.00	36.13	1000.0	9.000	N	20.1
24.215000	31.13	---	73.00	41.87	1000.0	9.000	N	20.1

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

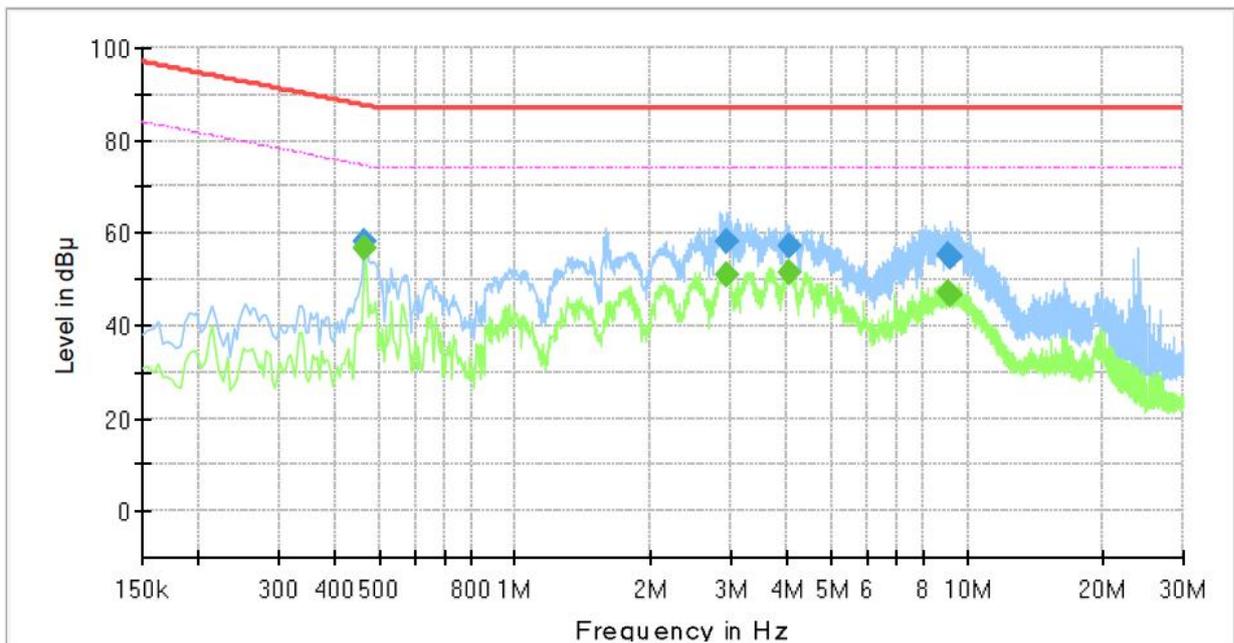
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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## Conducted Emissions at Telecommunication Ports [1 000 Mbps]

### Common Information

Test Description:	Telecommunication Emission
Model No.:	HRX-1634
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)
0.466000	---	56.81	74.58	17.77	1000.0	9.000	Single Line	19.5
0.466000	58.34	---	87.58	29.24	1000.0	9.000	Single Line	19.5
2.926000	---	50.96	74.00	23.04	1000.0	9.000	Single Line	20.1
2.926000	58.20	---	87.00	28.80	1000.0	9.000	Single Line	20.1
4.038000	---	51.26	74.00	22.74	1000.0	9.000	Single Line	19.7
4.038000	57.05	---	87.00	29.95	1000.0	9.000	Single Line	19.7
9.034000	---	46.94	74.00	27.06	1000.0	9.000	Single Line	19.6
9.034000	55.20	---	87.00	31.80	1000.0	9.000	Single Line	19.6
9.186000	---	46.85	74.00	27.15	1000.0	9.000	Single Line	19.6
9.186000	55.01	---	87.00	31.99	1000.0	9.000	Single Line	19.6

#### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

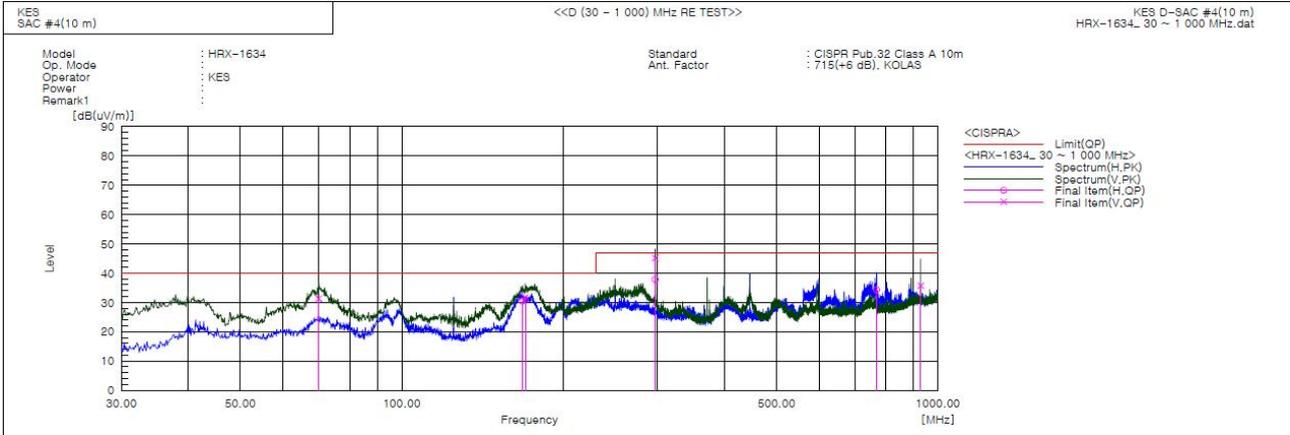
Reading Value : Not shown in the table.

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

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## 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	70.013	V	56.2	-24.9	31.3	40.0	8.7	154.0	115.0	
2	167.740	H	54.7	-24.3	30.4	40.0	9.6	395.0	202.0	
3	169.923	V	56.0	-24.2	31.8	40.0	8.2	118.0	184.0	
4	296.993	H	56.0	-18.1	37.9	47.0	9.1	400.0	266.0	
5	297.017	V	63.3	-18.1	45.2	47.0	1.8	106.0	188.0	
6	768.170	H	40.9	-6.6	34.3	47.0	12.7	359.0	318.0	
7	928.220	V	39.7	-3.9	35.8	47.0	11.2	148.0	175.0	

### ◆ Calculation

$$\text{Result(QP)} [\text{dB}(\mu\text{V}/\text{m})] = (\text{Reading(QP)}[\text{dB}(\mu\text{V})] + \text{c.f}[\text{dB}(1/\text{m})])$$

$$\text{Margin(QP)}[\text{dB}] = \text{Limit}[\text{dB}(\mu\text{V}/\text{m})] - \text{Result(QP)} [\text{dB}(\mu\text{V}/\text{m})]$$

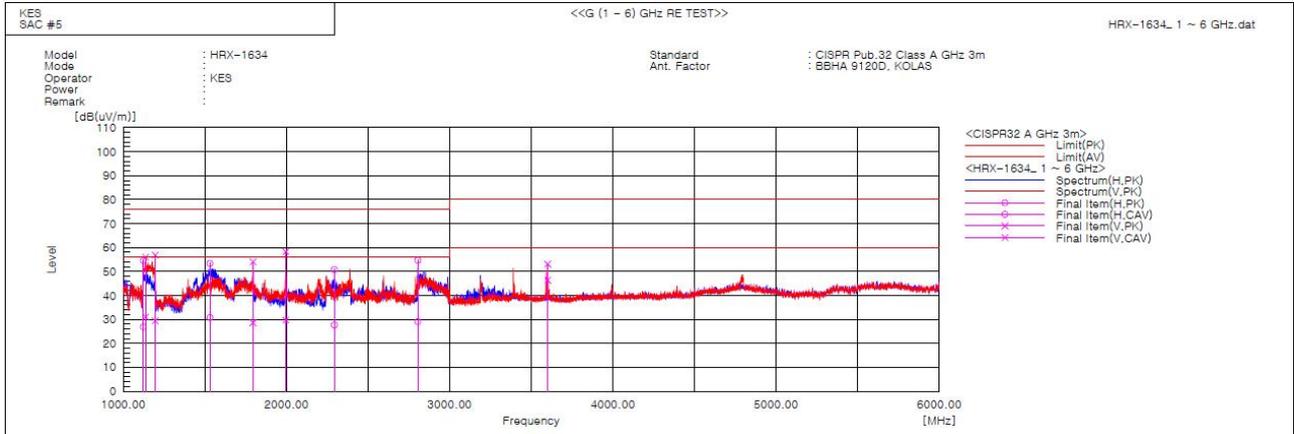
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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 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	1122.627	H	61.5	33.9	-7.0	54.5	26.9	76.0	56.0	21.5	29.1	100.0	23.9	
2	1137.142	V	62.9	38.0	-6.9	56.0	31.1	76.0	56.0	20.0	24.9	100.0	356.1	
3	1194.842	V	63.6	36.2	-6.7	56.9	29.5	76.0	56.0	19.1	26.5	100.0	358.0	
4	1530.600	H	58.2	35.6	-4.8	53.4	30.8	76.0	56.0	22.6	25.2	100.0	287.2	
5	1794.128	V	57.8	32.3	-3.7	54.1	28.6	76.0	56.0	21.9	27.4	100.0	128.8	
6	1995.554	V	61.2	32.6	-2.9	58.3	29.7	76.0	56.0	17.7	26.3	100.0	97.5	
7	2293.030	H	52.8	29.7	-2.0	50.8	27.7	76.0	56.0	25.2	28.3	100.0	57.2	
8	2804.774	H	54.3	28.7	0.4	54.7	29.1	76.0	56.0	21.3	26.9	100.0	300.8	
9	3599.944	V	51.2	44.5	1.9	53.1	46.4	80.0	60.0	26.9	13.6	100.0	193.8	

### ◆ Calculation

$$\text{Result(PK/CAV)} [\text{dB}(\mu\text{V}/\text{m})] = (\text{Reading(PK/CAV)}[\text{dB}(\mu\text{V})] + \text{c.f}[\text{dB}(1/\text{m})])$$

$$\text{Margin(PK/CAV)}[\text{dB}] = \text{Limit}[\text{dB}(\mu\text{V}/\text{m})] - \text{Result(PK/CAV)} [\text{dB}(\mu\text{V}/\text{m})]$$

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

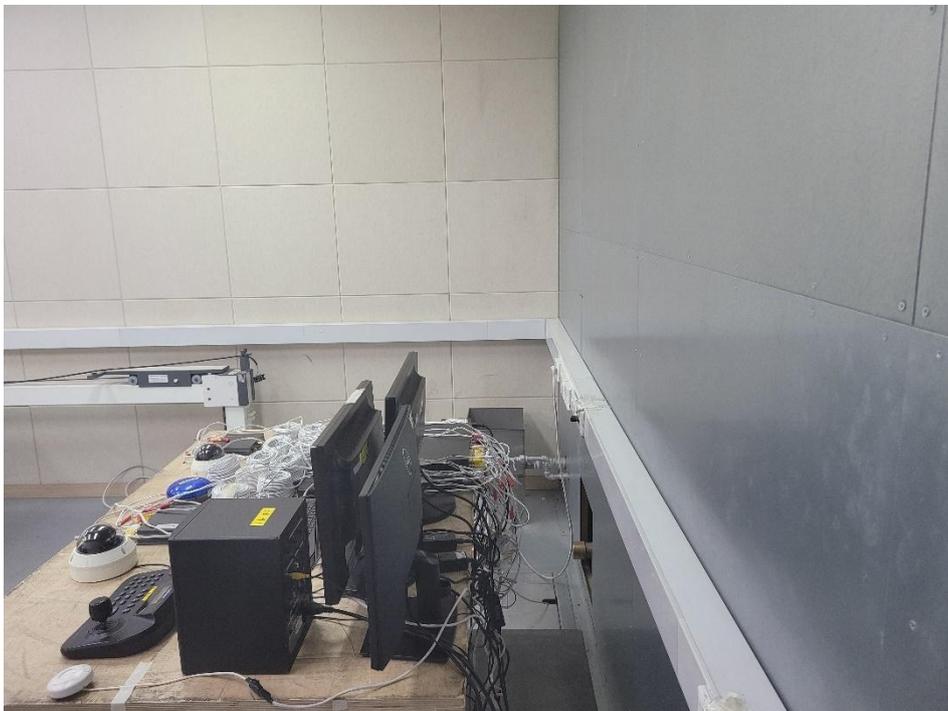
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

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## Test Setup Photos and Configuration

### Conducted Emissions at Mains Power Ports



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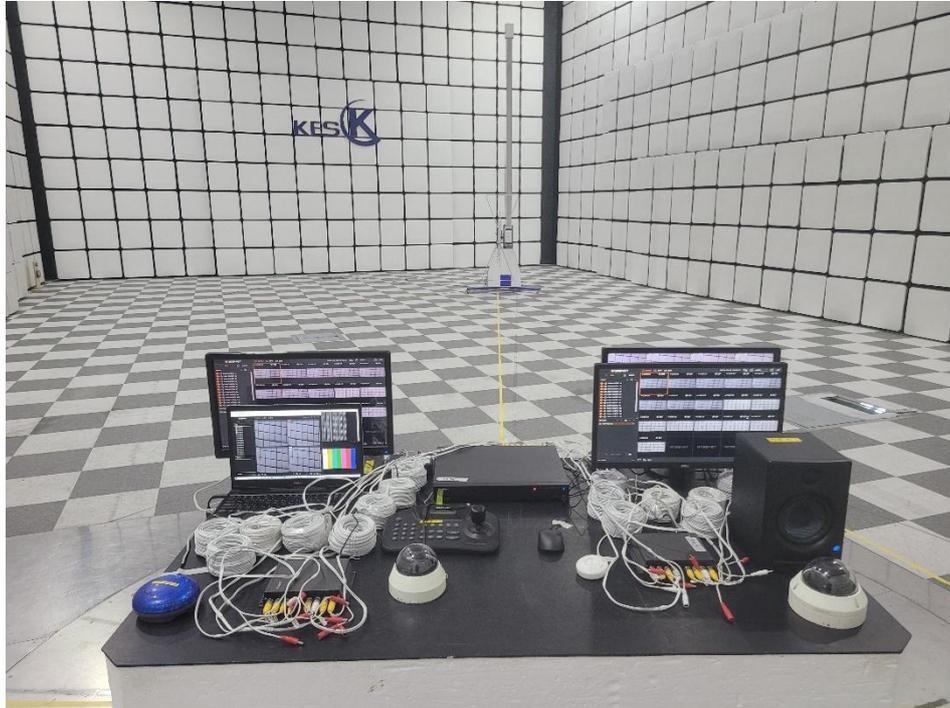
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## Conducted Emissions at Telecommunication Ports



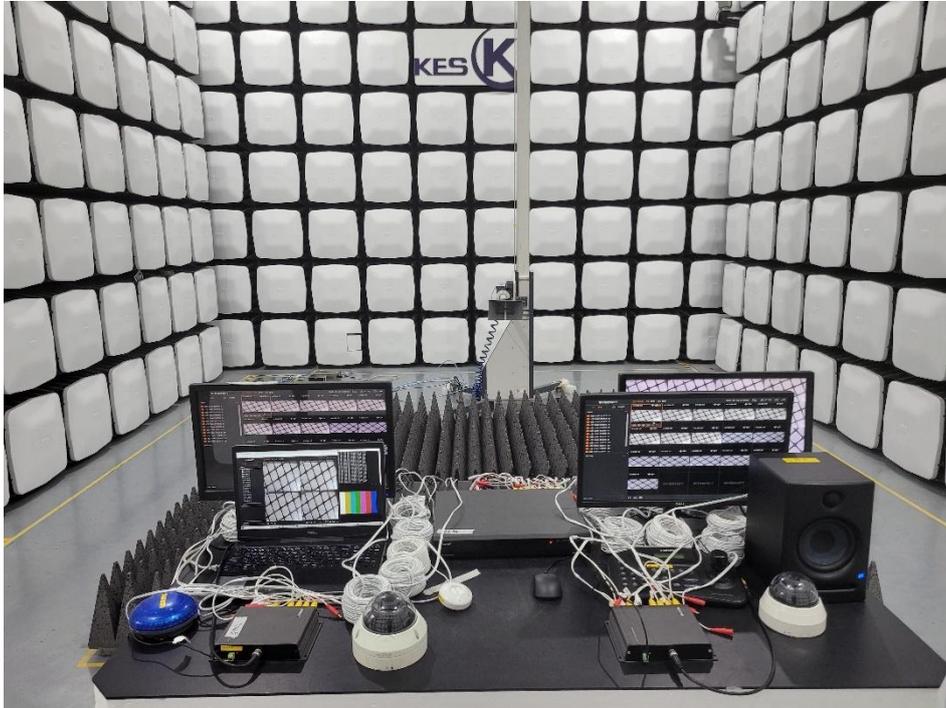
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## Radiated Electric Field Emissions(Below 1 GHz)



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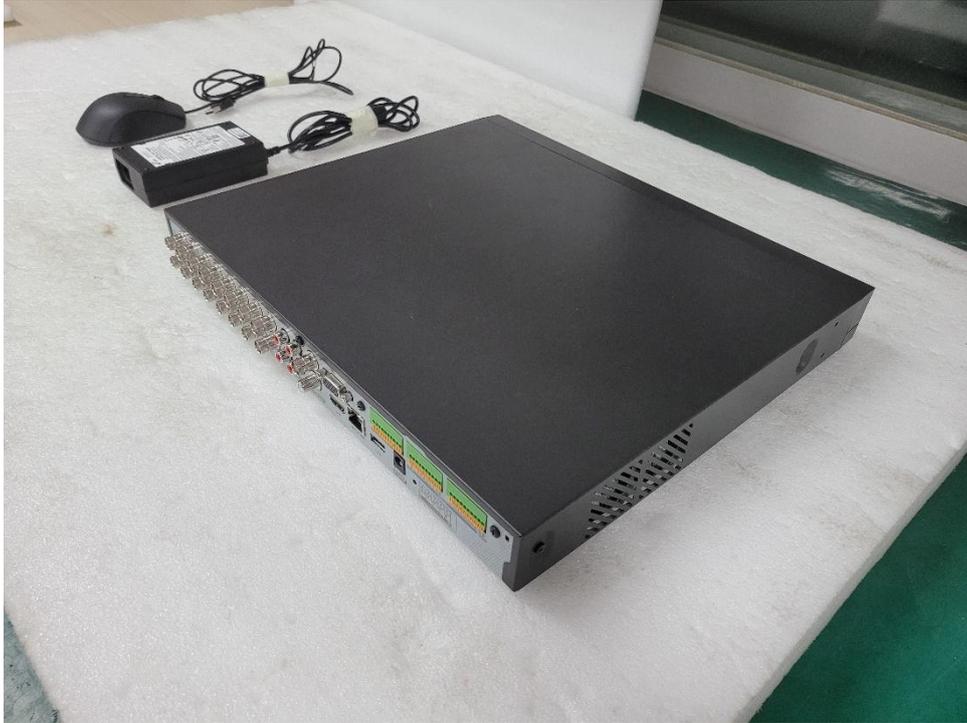
## Radiated Electric Field Emissions(Above 1 GHz)



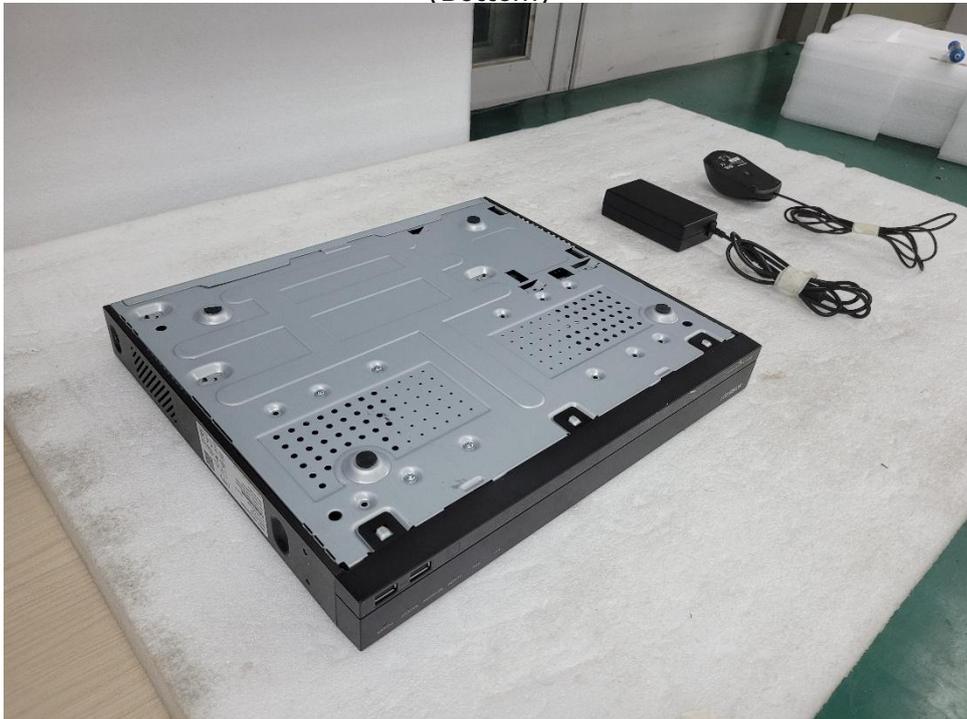
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## EUT External Photographs

(Top)



(Bottom)



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## EUT Internal Photographs

(Internal View)

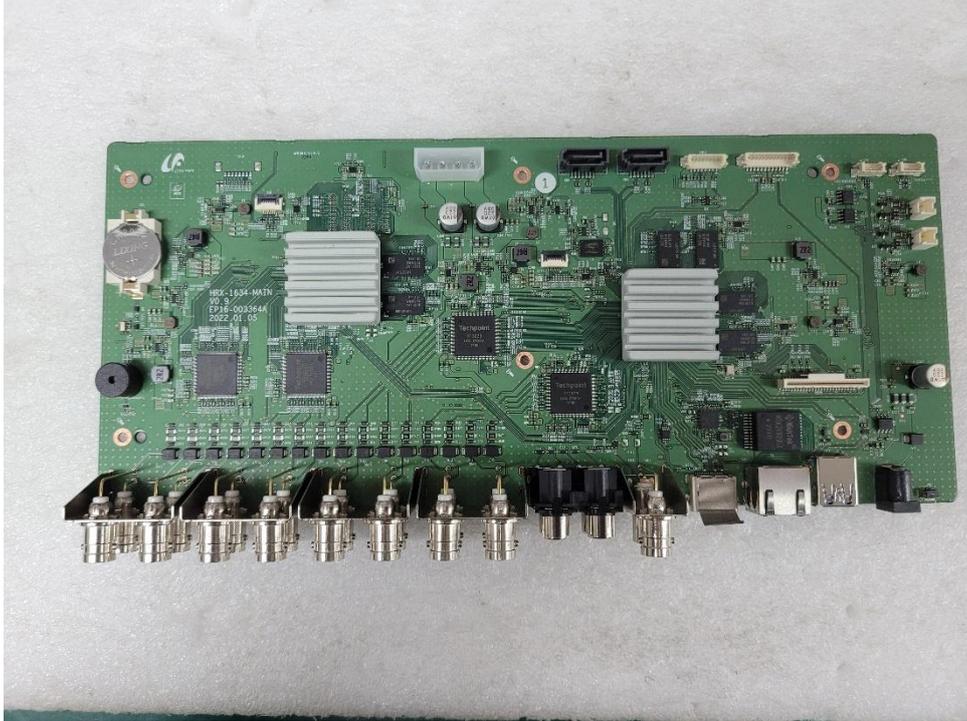


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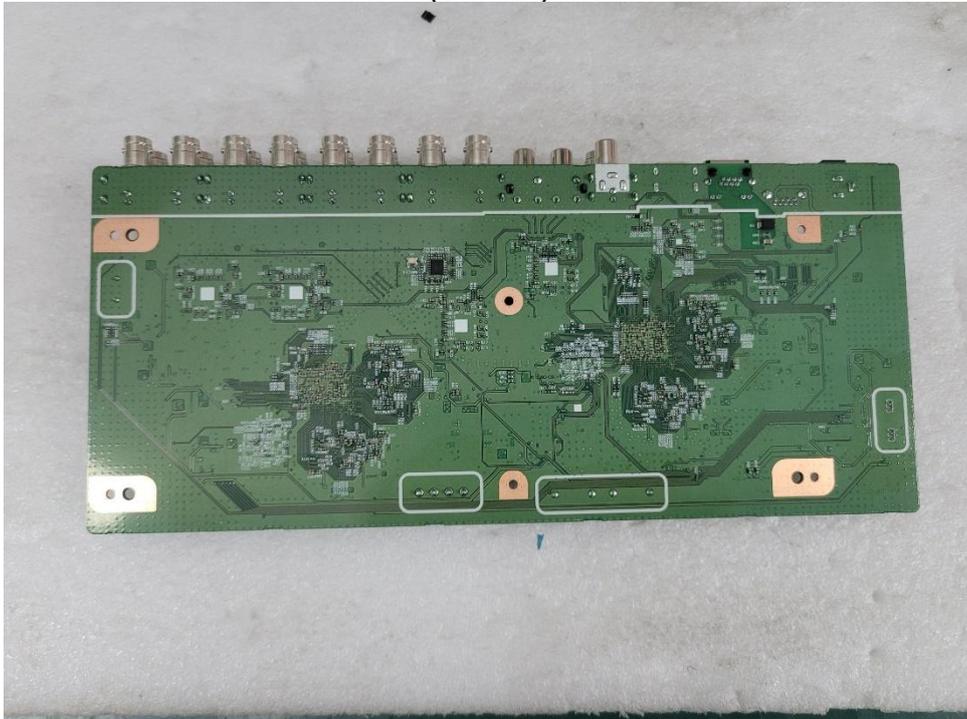
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## EUT Internal View – Main Board

(Top)



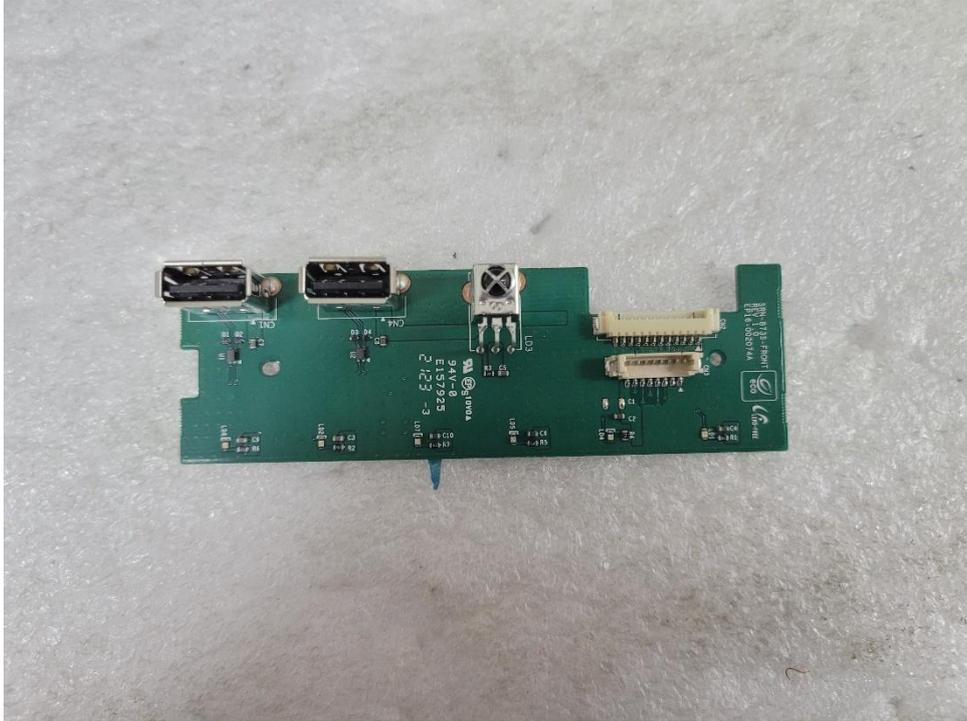
(Bottom)



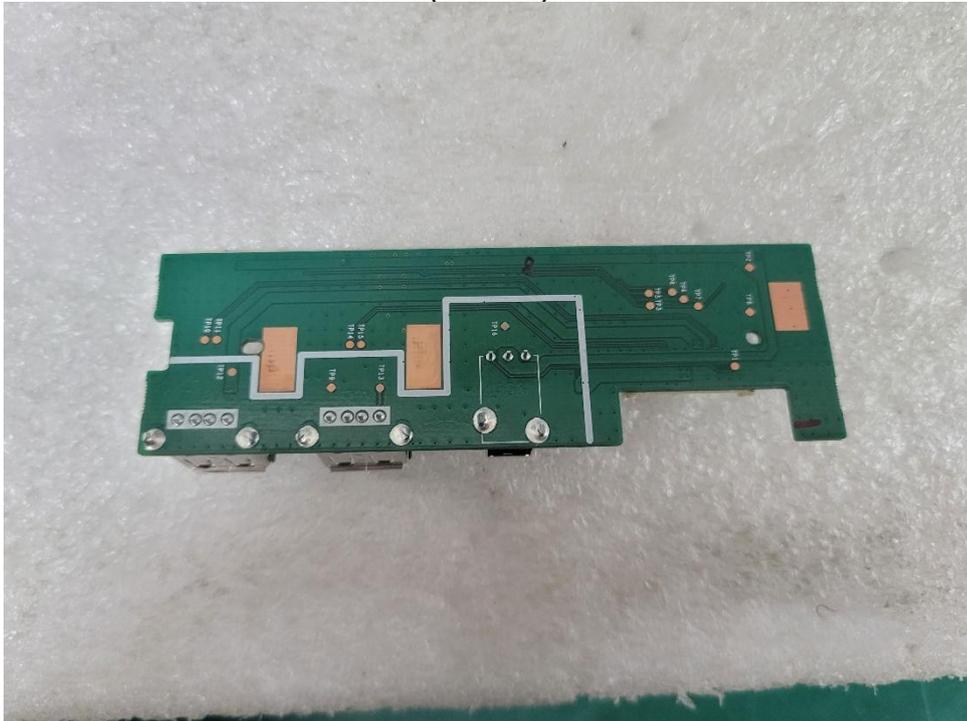
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## EUT Internal View – USB Port Board

(Top)



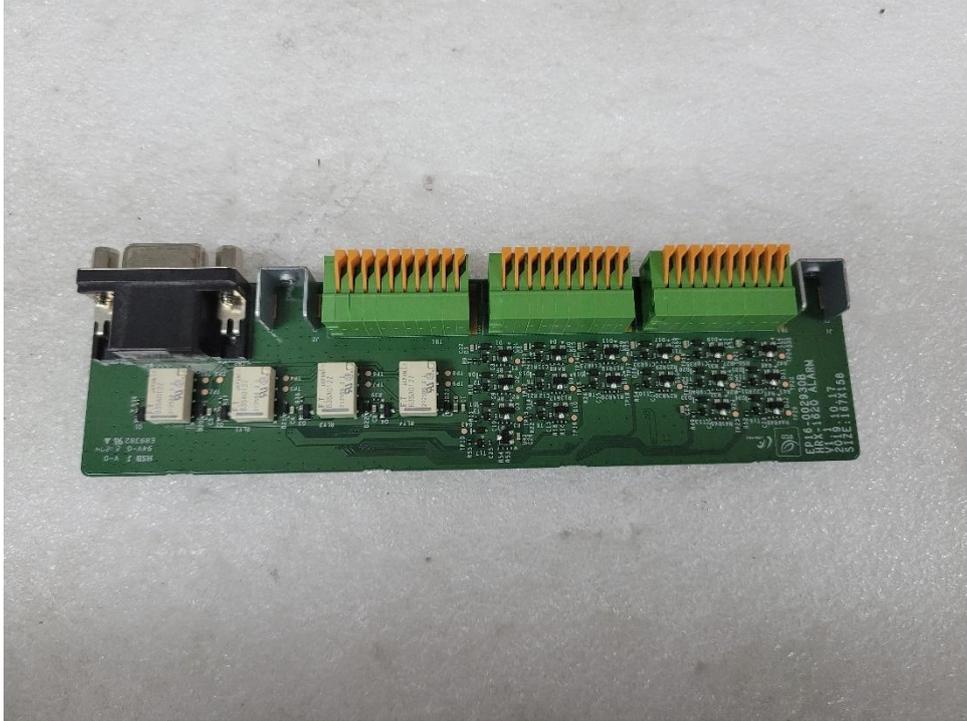
(Bottom)



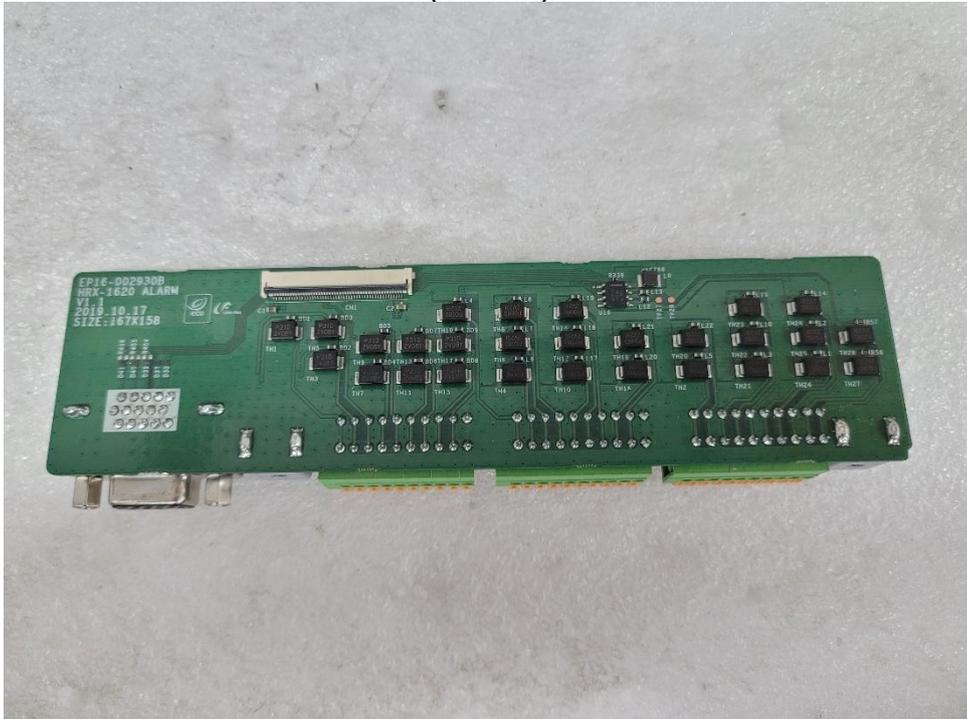
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## EUT Internal View – Alarm Port Board

(Top)



(Bottom)



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## EUT Internal View – HDD

(Top)



(Bottom)

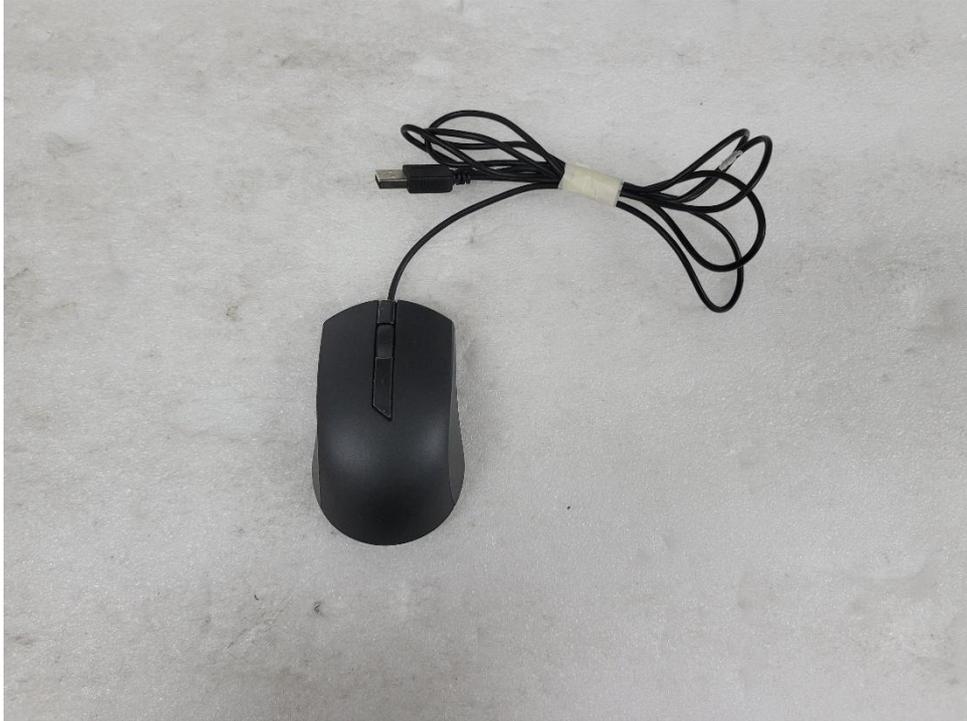


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## EUT Internal View – Mouse

(Top)



(Bottom)



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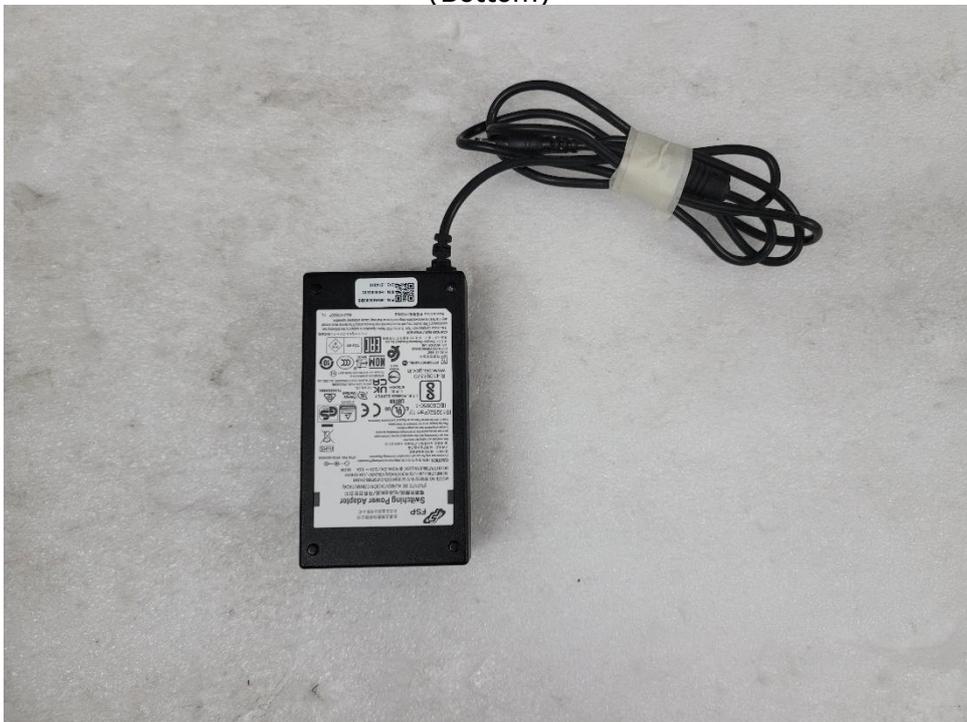
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## EUT Internal View – Adapter

(Top)



(Bottom)



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