



EMC TEST REPORT For CE

Test Report No. : KES-E1-16T0173-R1
Date of Issue : Oct. 23, 2017
Product name : Digital Video Recorder
7
Model/Type No. : SRD-1694P
Variant Model : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 1204, Changwon-daero, Seongsan-gu, Changwon-si,
Gyeongsangnam-do, korea
Manufacturer : Hanwha Techwin(Tianjin) Co., Ltd.
Manufacturer Address : No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA, Tianjin,
300385, People's Republic of China
Date of Receipt : Mar. 31, 2016
Test date : Apr. 12, 2016 – Apr. 16, 2016
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Yeong Suk, Song
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

**KES Co., Ltd.**

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

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Apr. 22, 2016	KES-E1-16T0173	Issued
Oct. 23, 2017	KES-E1-16T0173-R1	Standard Revision

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1.0 General Product Description

Main Specifications of E.U.T are:

SRD-1694

		DIA
Video	Inputs	16channel BNC 1080P/720P AHD Camera NTSC/PAL
	Resolution	1920 x 1080, 1280 x 720, 960 x 480, 704 x 480 / 960 x 576, 704 x 576
Live	Frame rate	480fps , 400fps
	Resolution	1920 x 1080, 1280 x 720, 960 x 480, 704 x 480 / 960 x 576, 704 x 576
	Multi Screen display	1/4/7/9/13/16/18A/PIP/Sequence
Performance		
Operating System	Embedded	Linux
	Compression	H.264
Recording	Record Rate	Up to 480fps@1920 x 1080 / Up to 400fps@1920 x 1080
		Up to 480fps@1280 x 720 / Up to 400fps@1280 x 720
		NTSC: Up to 480fps @ 628x480 / PAL: Up to 400fps @ 528x576
		NTSC: Up to 480fps @ 704x480 / PAL: Up to 400fps @ 704x576
		NTSC: Up to 480fps @ 704x240 / PAL: Up to 400fps @ 704x288
		NTSC: Up to 480fps @ 352x240 / PAL: Up to 400fps @ 352x288
	Mode	NTSC: Manual, Schedule (Continuous/Event), Event(Pre/Post), Time lapse (1~30 fps)
		PAL: Manual, Schedule (Continuous/Event), Event(Pre/Post), Time lapse (1~25 fps)
	Event	Video Loss, Motion(Level 1~10), Alarm, Tampering(Level 1~3)
	Overwrite modes	Continuous
Search & Playback	Pre-alarm	Up to 30 sec (5,10,20,30 Sec)
	Post-Alarm	Up to 6 hour (5,10,20,30 sec,1,3,5,10,20 min,1,2,3,4,5,6 hour)
	Search mode	Date/time, Event, Back up, Pos, Motion (* All Search Included Preview Function)
Network (IPv4)	Playback function	Fast Forward/Backward (x2,x4,x8,x16,x32,x64) * Backward Play with I-frame Only.
		Slow Forward/Backward (x1/2,x1/4,x1/8)
		Step Forward/Backward (x2, x4,x8,x16,x32,x64) * Backward Play with I-frame Only
	Transmission speed	Option 1) 1M ~ 2M (NTSC : 480fps, PAL : 400fps), 4CIF (NTSC : 480fps, PAL : 400fps) Option 2) 4CIF / 2CIF / CIF (NTSC : 120 / 240 / 480fps, PAL : 100 / 200 / 400fps)
	Bandwidth	Up to 64Mbps
	Bandwidth control	Selectable
	Stream	H.264(1080P/720p/4CIF/2CIF/CIF Selectable)
	Remote users Maximum	Search(3)/Live Unicast(10)/Live Multicast(20)
Smart phone	Protocol support	TCP/IP,DHCP,PPPoE,SMTP,NTTP,HTTP,DDNS,RTP,RTSP,SNMP
	Monitoring	Smart viewer,Web viewer, SSM(CMS)
	Platform	Android , iOS
	Protocol support	RTP,RTSP,HTTP,CGI
Storage	Remote users Maximum	Live 4, Play back 1CH
	Internal HDD	Up to 8 SATA HDDs (MAX:6Tx8=48T)
	External (e-SATA Interface)	Up to 2 expansion bay
	DVD Writer (Back-up)	N/A
	USB (Mouse/Back-up)	USB 2.0, 2 ports (Front 1, Back1)
Security	File Format (Back-up)	BU(DVR Player), EXE(Include Player), AVI
	Password Protection	1 Admin, 10 Group , 10 User per 1 Group
	Data Authentication	Watermark
Interface		
Monitors	VGA	1 VGA (1280x720, 1280x1024, 1920x1080)
	HDMI	1 HDMI (1280x720, 1280x1024, 1920x1080)
	Main Composite	N/A
	Spot(Composite)	Digital Spot (1CH):OSD On Screen, Multi mode Support
	Loop Outputs	N/A
Audio	Inputs/Output	16CH line in (Built in 4CH, Option : Audio Extension Cable)/ 1CH line out
	Compression	G.711
	Sampling rate	8KHz
Alarm	Inputs/Outputs	Terminal 16 Inputs (NO/NC) / Terminal 4 relay Outputs (NO/NC), Rating : 30V DC/2A, 250V AC/0.25A
	Remote notification	Notification via e-mail

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**KES Co., Ltd.**

C-3701, Simin-daero 365-40,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
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Connections	Ethernet	1 RJ45 10/100/1000 Base-T
	Serial interface	RS-232/RS-485(Full Duplex) for PTZ, Samsung System Keyboard
	USB	USB 2.0, 2 ports
	e-SATA	2 External SATA ports
	Application Support	Mouse, Remote Controller
	Protocol support	Samsung-E/Samsung-T/Pelco-D/Pelco-p/Panasonic/ Phillips/ AD/ DIAMOND/ ERNA/ KALATEL/ VCL TP/VICON/ ELMO/GE PTZ Control via Coaxial Cable (ACP, Pelco-C (Coaxitron))
General		
Electrical	Input Voltage/Current	100 to 240 VAC $\pm 10\%$; 50/60 Hz, Autoranging
	Power consumption	SMPS SPEC : MAX. 150W SET : MAX. 30W (1x1T HDD)
Environmental	Operating Temperature/Humidity	+0°C to +40°C (+32°F to +104°F) / 20% to 85% RH
Mechanical	Dimension (W x H x D)	W440 x H88 x D384.8(17.32" x 3.48" x 15.14")
	Weight (With hard disks)	8.957 kg (15.3054 lb). PV阶段需要再测试
	Rack mount kit	2 EA
Lauguage		English, French, German, Spanish, Italian, Russian, Polish, Czech, Turkish, Netherlands Portuguese, Swedish, Danish, Rumania, Serbia, Croatia, Hungary, Greek, Finnish, Norwegian, Korean, Japanese, Chinese(Traditional), Thai, Chinese (Simplified) (25 Language)

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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.

Voltage ☐ 220 Vac ☒ 230 Vac ☐ 240 Vac ☐ 24 Vac ☐ PoE

Frequency ☒ 50 Hz ☐ 60 Hz ☐ 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
Digital Video Recorder	SRD-1694P	-	Hanwha Techwin(Tianjin) Co., Ltd.	E.U.T
HDD	WD10PURX	WCC4J0HVJPTC	WD	-
POWER	FSP250-50GUB	S5531150359	FSP GROUP INC.	-
Mouse 2	MOEIUOA, AA-SM2PCPB	-	Dongguan Primax Electronic & Telecommunication Products ITD.	-
Remote control	EP10-000329A	-	-	-



1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Monitor 1	HSTND-7041-L	6CM6020YQQ	L&T Display Technology(Fujian)Ltd.	-
Monitor 2	W2261VT	005NDCRDV451	LG Electronics Nanjing Display Co., Ltd.	-
Monitor 3	SMT-2232	C95V67VF900025B	Weihai Daewoo Electronics Co., Ltd.	-
Notebook	NT630Z5J	JK9091EF400142M	Samsung Electronics Suzhou Computer Co., Ltd.	-
Notebook adapter	A13-040N2A	CN60BA4400313ADON 843K0200	Chikoni Power	-
Speak	-	-	MASS	-
Mike 1	-	-	-	-
Mike 2	-	-	-	-
Mouse 1	CC-93-9F	LU139006416	LOGITECH	-
Alarm1	SIP-1201DD D0	C53R67JZ301878 L	SAMSUNG TECHWIN CO., LTD.	-
Alarm2	SIE-0001 DO	C54167JB601268 F	SAMSUNG TECHWIN CO., LTD.	-
External HDD	MDT-US2528	-	-	-
Camera adapter 1	FSP040-RHAN2	H00000039	FSP GROUP INC.	-
Camera adapter 2	FSP040-RHAN2	H00000031	FSP GROUP INC.	-
Camera	SDC-9441BCN	ZBPZ6V2G60001BX ZC4V6V2GB00E00T ZBPZ6V2G60001AE ZC4V6V2GB00E0KT ZC4V6VGB00E01N ZC4V6V2GB00E0JE	SAMSUNG TECHWIN CO., LTD.	-
Camera	SDC-8440BCN	ZBJ867ZGB012B8B ZBJ867ZGB012B7F ZBJ867ZGB012BEV ZBJ867ZGB012B9E ZBJ867ZGB012B6K ZBJ867ZGB012BCL ZBJ867ZGB012BAT ZBJ867ZGB012B5R ZBJ867ZGB012BDX ZBJ867ZGB012BBN	SAMSUNG TECHWIN CO., LTD.	-

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1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Digital Video Recorder (E.U.T)	HDMI	Monitor 1	HDMI	1.5	S
	D-SUB	Monitor 2	D-SUB	1.5	S
	BNC	Monitor 3	BNC	4.0	S
	Audio IN	Mike 1	Audio IN	2.0	U
	Audio IN	Mike 2	Audio IN	2.0	U
	Audio OUT	Speaker	Audio OUT	1.0	U
	Alarm IN	Alarm1	Alarm IN	3.0	U
	Alarm OUT	Alarm2	Alarm OUT	3.0	U
	BNC	Camera 16EA	BNC	4.0	S
	RJ-45	Notebook	RJ-45	3.0	U
	e-SATA	External HDD	e-SATA	0.5	U
	RS 232	Mouse 1	RS 232	2.5	U
	USB	Mouse 2	USB	1.8	U

* Unshielded=U, Shielded=S

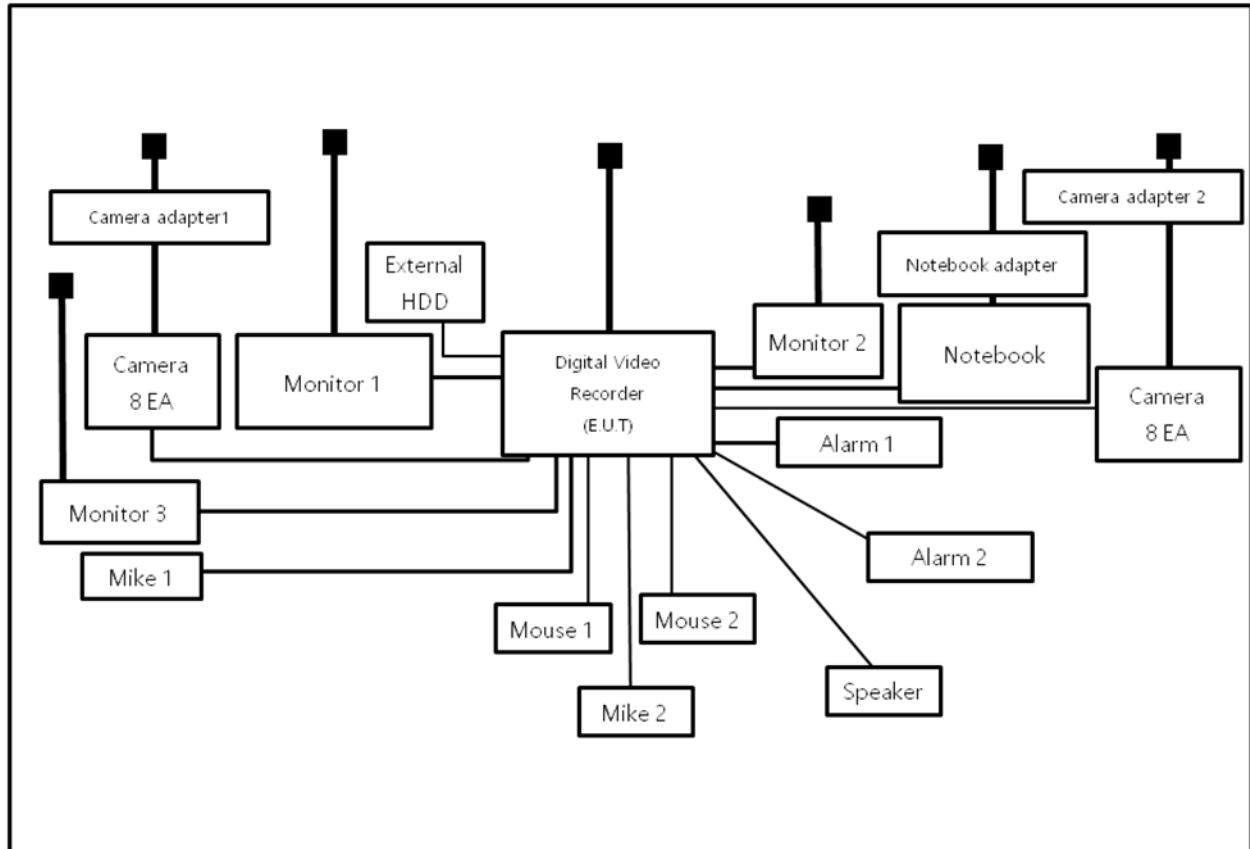
1.7 E.U.T Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

Test mode	Normal operating
	Tested by checking the movement whether it works well or not, with executing Ping test in a Notebook and outputting an image to a monitor after arrangement E.U.T with peripheral device as follows.

1.8 Configuration

■ AC Main
□ DC Main









1.9 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.

1.10 Test Facility

The measurement facility is located at 473-29 Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22.

1.11 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	 R-4308, C-4798, T-2311, G-914
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-4308, C-4798, T-2311, G-914
KOREA	MSIP	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
Canada	IC	3 & 10 meter Open Area Test Sites and one conducted site	 4769B-1
Europe	CE	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	
International	KOLAS	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	

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 55032:2012

☒ Class A

☐ Class B

☐ EN 55024:2010

☒ EN 50130-4:2011

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

☐ EN 61326-1:2013

☐ VCCI V-3 / 2013.04

☐ Class A

☐ Class B

☐ AS / NZS CISPR22:2009 +A1:2010

☐ Class A

☐ Class B

☐ 47 CFR Part 15, Subpart B / ANSI C63.4-2009

☐ Class A

☐ Class B

☐ IC Regulation ICES-003 : 2012
/ ANSI C63.4-2014

☐ Class A

☐ Class B

☐ CISPR 22:2009 +A1:2010

☐ Class A

☐ Class B



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☐ **R&TTE – Directive 1999/5/EC**

☐ EN 301 489-1 V1.9.2

- ☐ 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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2.1 Conducted Emissions at Mains Power Ports

Test Date

Apr. 12, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test Receiver	ESR3	R&S	101783	05, 06, 2016
<input checked="" type="checkbox"/>	LISN	ENV216	R&S	101137	02, 04, 2017
<input checked="" type="checkbox"/>	LISN	ENV216	R&S	101786	05, 06, 2016
<input checked="" type="checkbox"/>	Electro wave Shieldroom	-	SEMITEC	-	-

Test Conditions

Temperature: 21.5 °C

Relative Humidity: 32.5 %

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

Apr. 12, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test Receiver	ESR3	R&S	101783	05, 06, 2016
<input checked="" type="checkbox"/>	LISN	ENV216	R&S	101137	02, 04, 2017
<input checked="" type="checkbox"/>	LISN	ENV216	R&S	101786	05, 06, 2016
<input checked="" type="checkbox"/>	8-Wire ISN CAT3	CAT3 8158	Schwarzbeck Mess	8158-0019	04, 01, 2017
<input type="checkbox"/>	8-Wire ISN CAT5	CAT5 8158	Schwarzbeck Mess	8158-0030	04, 01, 2017
<input checked="" type="checkbox"/>	8-Wire ISN CAT6	NTFM 8158	Schwarzbeck Mess	8158-0029	08, 14, 2016
<input checked="" type="checkbox"/>	Electro wave Shieldroom	-	SEMITEC	-	-

Test Conditions

Temperature: 21.5 °C

Relative Humidity: 32.5 %

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.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Apr. 12, 2016

Test Location

☐ Open Area Test Site #1

☒ Open Area Test Site #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test Receiver	ESR3	R&S	101781	05, 06, 2016
<input checked="" type="checkbox"/>	Trilog-Broadband Antenna	VULB 9163	SCHWARZBECK	9168-713	05, 15, 2017
<input checked="" type="checkbox"/>	Open Area Test Site	-	KES	-	-
<input checked="" type="checkbox"/>	Antenna Mast	-	DAEIL EMC	-	-
<input checked="" type="checkbox"/>	Turn Table	-	DAEIL EMC	-	-

Test Conditions

Temperature: 21.3 °C

Relative Humidity: 32.0 %

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

Apr. 14, 2016

Test Location

Semi Anchoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test Receiver	ESU26	R&S	100552	05, 06, 2016
<input checked="" type="checkbox"/>	Broadband Coaxial Preamplifier	BBV 9718	Schwarzbeck Mess - Elektronik	9718-246	10, 23, 2016
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 07, 2017
<input checked="" type="checkbox"/>	Semi Anchoic Chamber #2	-	SEMITEC	-	-
<input checked="" type="checkbox"/>	Antenna Mast	-	AUDIX	-	-
<input checked="" type="checkbox"/>	Turn Table	-	AUDIX	-	-

Test Conditions

Temperature: 22.7 °C

Relative Humidity: 33.7 %

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.



2.5 Harmonic Current Emissions

Test Date

Apr. 15, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	AC Source	ACS 500 N	EM TEST	V1024106760	08, 13, 2016
<input checked="" type="checkbox"/>	Digital Power Analyzer	DPA 500 N	EM TEST	V1024106759	08, 13, 2016

Test Conditions

Temperature: 23.7 °C
Relative Humidity: 37.6 %

Classification of Equipment for Harmonic Current Emissions

- ☒ Class A
☐ Class B
☐ Class C(Below 25 W)
☐ Class C(Above 25 W)
☐ Class D

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.6 Voltage Fluctuations and Flicker

Test Date

Apr. 15, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	AC Source	ACS 500 N	EM test	V1024106760	08, 13, 2016
<input checked="" type="checkbox"/>	Digital Power Analyzer	DPA 500 N	EM test	V1024106759	08, 13, 2016

Test Conditions

Temperature: 23.7 °C
Relative Humidity: 37.6 %

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011 +A1:2014 Alarm systems-Part 4: Electromagnetic compatibility Product family standard: Immunity requirements for components of fire, intruder and social alarm systems

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing that is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such

Flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change,
and no such flickering of indicators oeuvres at $U = 130 \text{ dB}\mu\text{V}$.

For component of CCTV systems, where the status is monitored by observing the TV picture,
then deterioration of the picture is allowed at $U = 140 \text{ dB}\mu\text{V}$, providing:

- (a) there is no permanent damage or change to the EUT
(e.g. no corruption of memory or changes to programmable settings etc.)
- (b) at $U = 130 \text{ dB}\mu\text{V}$, any deterioration of the picture is so minor that the system could still be used; and
- (c) there in no observable deterioration of the picture at $U = 120 \text{ dB}\mu\text{V}$.

Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.



3.1 Electrostatic Discharge

Reference Standard

EN 61000-4-2:2009

Test Date

Apr. 16, 2016

Test Location

EMS-ESD: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	ESD SIMULATOR	ESS-2000	Noise Ken	ESS05X4620	02, 24, 2017
<input checked="" type="checkbox"/>	HCP	-	Noise Ken	-	-
<input checked="" type="checkbox"/>	VCP	-	Noise Ken	-	-

Test ConditionsTemperature: 23.4 °C
Relative Humidity: 34.9 %
Atmospheric Pressure: 99,3 kPa**Test Specifications**Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

Kind of Discharge: Air, Contact (direct and indirect)

Polarity: Positive and Negative

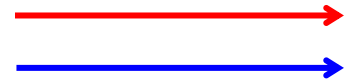
Number of Discharge: 10 at all locations for Air discharge
10 at all locations for Contact discharge

Discharge Voltage:	Contact	Air	HCP	VCP
	<input type="checkbox"/> 2 kV	<input checked="" type="checkbox"/> 2 kV	<input type="checkbox"/> 2 kV	<input type="checkbox"/> 2 kV
	<input type="checkbox"/> 4 kV	<input checked="" type="checkbox"/> 4 kV	<input type="checkbox"/> 4 kV	<input type="checkbox"/> 4 kV
	<input checked="" type="checkbox"/> 6 kV	<input type="checkbox"/> 6 kV	<input checked="" type="checkbox"/> 6 kV	<input checked="" type="checkbox"/> 6 kV
	<input type="checkbox"/> 8 kV	<input checked="" type="checkbox"/> 8 kV	<input type="checkbox"/> 8 kV	<input type="checkbox"/> 8 kV
	<input type="checkbox"/> 15 kV	<input type="checkbox"/> 15 kV	<input type="checkbox"/> 15 kV	<input type="checkbox"/> 15 kV

Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling planeRequired Performance Criteria: ☒ CompliedThis report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
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Location of Discharge:

Air
Contact

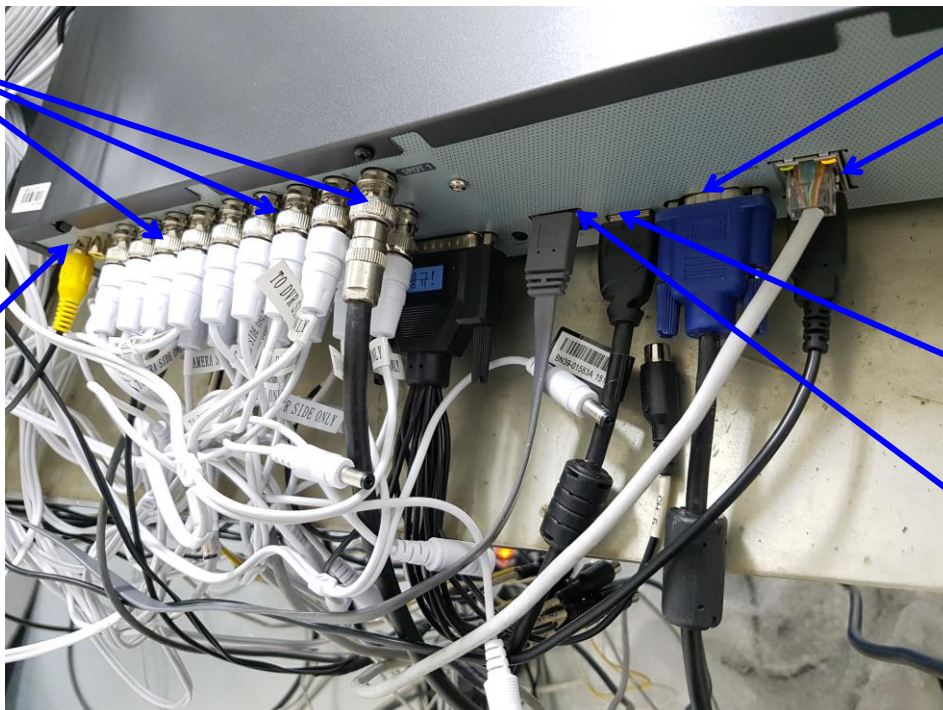


Contact



1. Contact

6. Contact



3. Contact

2. Contact

7. Contact

4. Contact

5. Contact

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Test Data

Indirect Discharge

No.	Test Point	Discharge Method	Performance	Remarks
			Observation	
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

Direct Discharge

No.	Test Point	Discharge Method	Performance	Remarks
			Observation	
1	Enclosure	Contact Discharge	Complied	-
2	RJ-45	Contact Discharge	Complied	-
3	D-SUB	Contact Discharge	Complied	-
4	e-SATA	Contact Discharge	Complied	-
5	HDMI	Contact Discharge	Complied	-
6	BNC	Contact Discharge	Complied	-
7	Audio IN	Contact Discharge	Complied	-

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.



3.2 Radiated Electric Field Immunity

Reference Standard

EN 61000-4-3:2006 +A2:2010

Test Date

Apr. 14, 2016

Test Location

EMS-RS: ☐ Semi Anchoic Chamber #1

☒ Semi Anchoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	SIGNAL GENERATOR	SMB 100A	R&S	108252	08, 13, 2016
<input checked="" type="checkbox"/>	BROADBAND AMPLIFIER	BBA100	R&S	101239	08, 13, 2016
<input checked="" type="checkbox"/>	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 13, 2016
<input checked="" type="checkbox"/>	POWER METER	NRP2	R&S	103475	08, 13, 2016
<input checked="" type="checkbox"/>	AVG POWER SENSOR	NRP-Z91	R&S	102526	08, 13, 2016
<input checked="" type="checkbox"/>	AVG POWER SENSOR	NRP-Z91	R&S	102527	08, 13, 2016
<input checked="" type="checkbox"/>	Stacked Log.-Per.Antenna	STLP 9128 D	Schwarzbeck	9128D038	-
<input checked="" type="checkbox"/>	Semi Anchoic Chamber #2		SEMITEC	-	-



Test Conditions

Temperature: 22,7 °C
Relative Humidity: 33,7 %
Atmospheric Pressure: 99,5 kPa

Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☐ 1 V/m ☐ 3 V/m
☒ 10 V/m

Frequency Range: ☐ 80 MHz to 1 GHz ☐ 1,4 GHz to 2,7 GHz
☒ 80 MHz to 2,7 GHz

Modulation: ☒ AM, 80 %, 1 kHz sine wave
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

Test Data

Side Exposed	Observation	
	Horizontal	Vertical
Front	Complied	Complied
Right	Complied	Complied
Back	Complied	Complied
Left	Complied	Complied

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.



3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Apr. 15, 2016

Test Location

EMS-EFT: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	07, 14, 2016
<input checked="" type="checkbox"/>	Capacitive Coupling Clamp	HFK	EM TEST	070925	07, 14, 2016
<input checked="" type="checkbox"/>	MotorVariac	MV2616	EM TEST	V0936105123	07, 14, 2016

Test Conditions

Temperature: 23.7 °C
Relative Humidity: 37.6 %
Atmospheric Pressure: 99.9 kPa

Test Specifications

Pulse Amplitude & Polarity:
(Power Lines) ☒ ± 1.0 kV ☐ ± 2.0 kV
☐ ± 4.0 kV

Pulse Amplitude & Polarity:
(Signal Lines) ☐ ± 0.5 kV ☒ ± 1.0 kV
☐ ± 2.0 kV

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 kHz ☒ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

Test Data☒ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	OBSERVATIONS	
	(+) Burst (kV)	(-) Burst (kV)
L – N – PE	Complied	Complied

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	OBSERVATIONS	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	OBSERVATIONS	
	(+) Burst (kV)	(-) Burst (kV)
BNC	Complied	Complied
RJ-45	Complied	Complied
Alarm IN, OUT	Complied	Complied

Note: “Blank” = Not performed

Observations:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**

PASS Required Performance Criteria.

3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014

Test Date

Apr. 15, 2016

Test Location

EMS-Surge: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	07, 14, 2016
<input checked="" type="checkbox"/>	MotorVariac	MV2616	EM TEST	V0936105123	07, 14, 2016
<input type="checkbox"/>	CDN	CNV 508T5	EM TEST	P1530162238	01, 25, 2017

Test Conditions

Temperature: 23.7 °C
Relative Humidity: 37.6 %
Atmospheric Pressure: 99,9 kPa

Test Specifications

Power Lines

Source Impedance: 12 ohm for common mode and 2 ohm for differential mode

Surge Amplitude :

Common Mode

☐ (0,5 / 1,0 / 2,0) kV

Differential Mode

☐ (0,5 / 1,0) kV

Signal lines

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 surges per angle

Angle:

☐ 0°, 90°, 180°, 270° (input a.c. power port)

Polarity:

☒ Positive & Negative

Repetition Rate:

☐ 1 surge per min ☒ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

**KES Co., Ltd.**

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

Test report No.:

KES-EI-16T0173-R1

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Signal Lines

Source Impedance: 42 ohm for common mode

Surge Amplitude: Common Mode
☐ (0,5 / 1,0) kVNumber of Surges: ☐ 5 SurgesPolarity: ☐ Positive & NegativeRepetition Rate: ☐ 1 surge per min ☐ 1 surge per 30 sec.Required Performance Criteria: ☐ Complied**Test Data**☒ Line to Line – Differential Mode

Mode of Application	OBSERVATIONS	
	(+) Surge (kV)	(-) Surge (kV)
L – N	Complied	Complied

☒ Line to Earth – Common Mode

Mode of Application	OBSERVATIONS	
	(+) Surge (kV)	(-) Surge (kV)
L – PE	Complied	Complied
N – PE	Complied	Complied

Signal Lines☒ Line to Earth – Common Mode

Mode of Application	OBSERVATIONS	
	(+) Surge (kV)	(-) Surge (kV)
BNC	Complied	Complied

Note: "Blank" = Not performed

Observations:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**

PASS Required Performance Criteria.

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3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2009

Test Date

Apr. 16, 2016

Test Location

EMS-CS: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	Continuous Wave Generator	CWS 500N1	EM TEST	V0936105119	09, 25, 2016
<input checked="" type="checkbox"/>	6dB Attenuator	ATT6	EM TEST	1208-34	08, 13, 2016
<input checked="" type="checkbox"/>	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 13, 2016
<input checked="" type="checkbox"/>	EM Injection Clamp	EM 101	Liithi	35943	02, 04, 2017

Test ConditionsTemperature: 23.4 °C
Relative Humidity: 34.9 %
Atmospheric Pressure: 99,3 kPa**Test Specifications**

Frequency range: ☒ 150 kHz to 100 MHz ☐ 10 kHz to 30 MHz
☐ 150 kHz to 230 MHz ☐ 10 kHz to 100 MHz

Voltage Level: ☐ 1 Vrms ☐ 3 Vrms
☒ 10 Vrms

Modulation: ☒ AM, 80 %, 1 kHz sine wave
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

Required Performance Criteria: ☒ Complied

Test Data

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observation
L – N – PE	CDN (<input type="checkbox"/> M2, <input checked="" type="checkbox"/> M3)	Complied

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observation
-	CDN (<input type="checkbox"/> M2, <input type="checkbox"/> M3)	-

☒ Signal ports and telecommunication ports

Mode of Application	OBSERVATIONS	
	(+) Surge (kV)	(-) Surge (kV)
BNC	Complied	Complied
RJ-45	Complied	Complied
Alarm IN, OUT	Complied	Complied

Notes: CDN = Coupling Decoupling Network
EMC = Electro Magnetic Clamp
"blank" = Not performed

Observations:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-6:2009

Test Date

Apr. 15, 2016

Test Location

EMS-Voltage dip: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	07, 14, 2016
<input checked="" type="checkbox"/>	MotorVariac	MV2616	EM TEST	V0936105123	07, 14, 2016

Test Conditions

Temperature: 23.7 °C
Relative Humidity: 37.6 %
Atmospheric Pressure: 99.9 kPa



Test Specifications & Observations/Remarks

Test Level	Duration [in period/ms (50 Hz)]	Results
<input checked="" type="checkbox"/> 20 % dip	<input checked="" type="checkbox"/> 250 /10	<u>Complied</u>
<input checked="" type="checkbox"/> 30 % dip	<input checked="" type="checkbox"/> 25 /10	<u>Complied</u>
<input checked="" type="checkbox"/> 60 % dip	<input checked="" type="checkbox"/> 10 /10	<u>Complied</u>
<input checked="" type="checkbox"/> 100 % dip	<input checked="" type="checkbox"/> 250 /10	<u>Complied</u>

- Voltage variations

<input checked="" type="checkbox"/> Unom + 10 %	<input checked="" type="checkbox"/> 253 V (ac)	<u>Complied</u>
<input checked="" type="checkbox"/> Unom - 15 %	<input checked="" type="checkbox"/> 195.5 V (ac)	<u>Complied</u>

Observations:

- A - No response observed from E.U.T
- B - Unit shuts down then automatically restarts when full voltage is restored.
- C - Unit shuts down then manually restarts when full voltage is restored or Loss of function.

Test Results

- ☒ PASS Required Performance Criteria
- ☐ NOT PASS Required Performance Criteria
- ☐ NOT APPLICABLE

Remarks

PASS Required Performance Criteria.

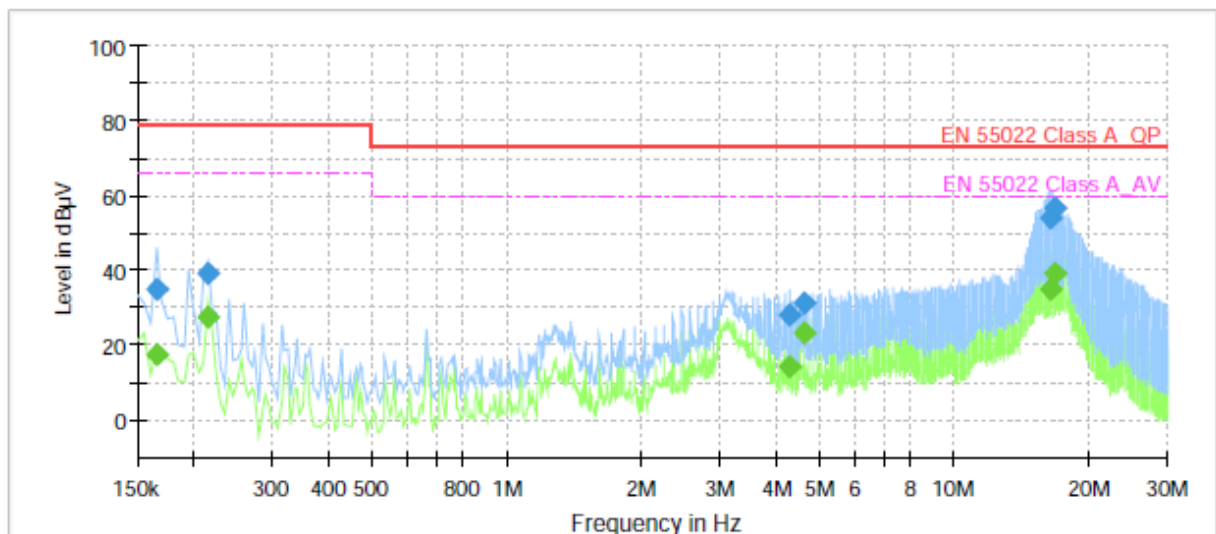
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

Common Information

Test Description: Conducted Emission
Model No.: SRD-1694P
Mode
Operator Name: KES



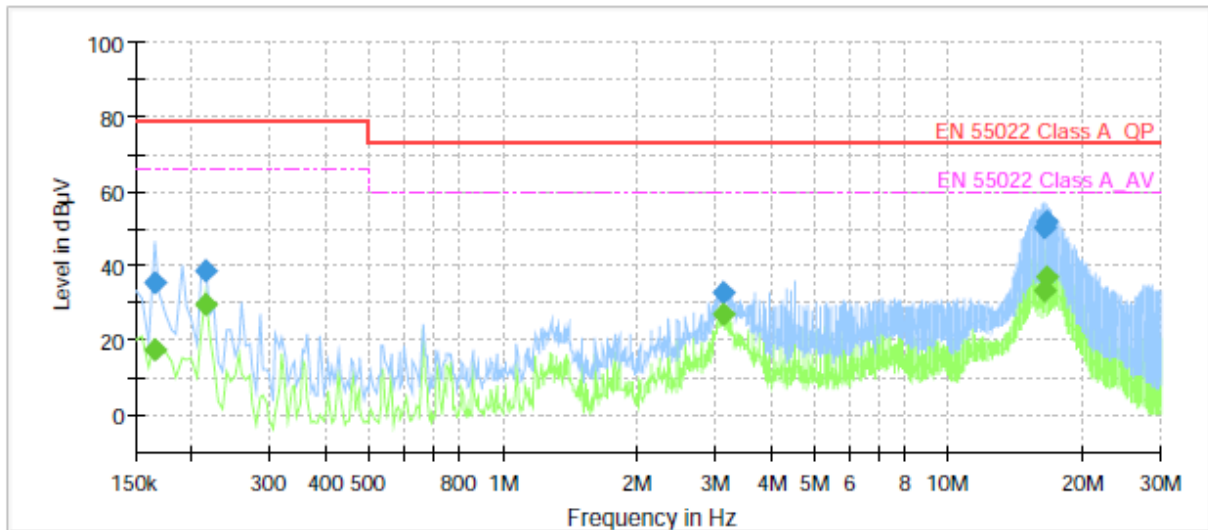
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	17.25	66.00	48.75	1000.0	9.000	L1	9.7
0.165000	35.19	---	79.00	43.81	1000.0	9.000	L1	9.7
0.215000	---	27.60	66.00	38.40	1000.0	9.000	L1	9.7
0.215000	38.95	---	79.00	40.05	1000.0	9.000	L1	9.7
4.305000	---	14.29	60.00	45.71	1000.0	9.000	L1	9.8
4.305000	28.20	---	73.00	44.80	1000.0	9.000	L1	9.8
4.620000	---	23.41	60.00	36.59	1000.0	9.000	L1	9.8
4.620000	31.14	---	73.00	41.86	1000.0	9.000	L1	9.8
16.395000	---	35.18	60.00	24.82	1000.0	9.000	L1	10.1
16.395000	53.99	---	73.00	19.01	1000.0	9.000	L1	10.1
16.765000	---	39.09	60.00	20.91	1000.0	9.000	L1	10.1
16.765000	56.50	---	73.00	16.50	1000.0	9.000	L1	10.1

[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: SRD-1694P
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	---	17.32	66.00	48.68	1000.0	9.000	N	9.6
0.165000	35.23	---	79.00	43.77	1000.0	9.000	N	9.6
0.215000	---	29.66	66.00	36.34	1000.0	9.000	N	9.6
0.215000	38.82	---	79.00	40.18	1000.0	9.000	N	9.6
3.115000	---	27.14	60.00	32.86	1000.0	9.000	N	9.7
3.115000	32.72	---	73.00	40.28	1000.0	9.000	N	9.7
16.395000	---	33.21	60.00	26.79	1000.0	9.000	N	10.1
16.395000	50.40	---	73.00	22.60	1000.0	9.000	N	10.1
16.660000	---	37.01	60.00	22.99	1000.0	9.000	N	10.1
16.660000	51.90	---	73.00	21.10	1000.0	9.000	N	10.1



KES Co., Ltd.

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

Test report No.:

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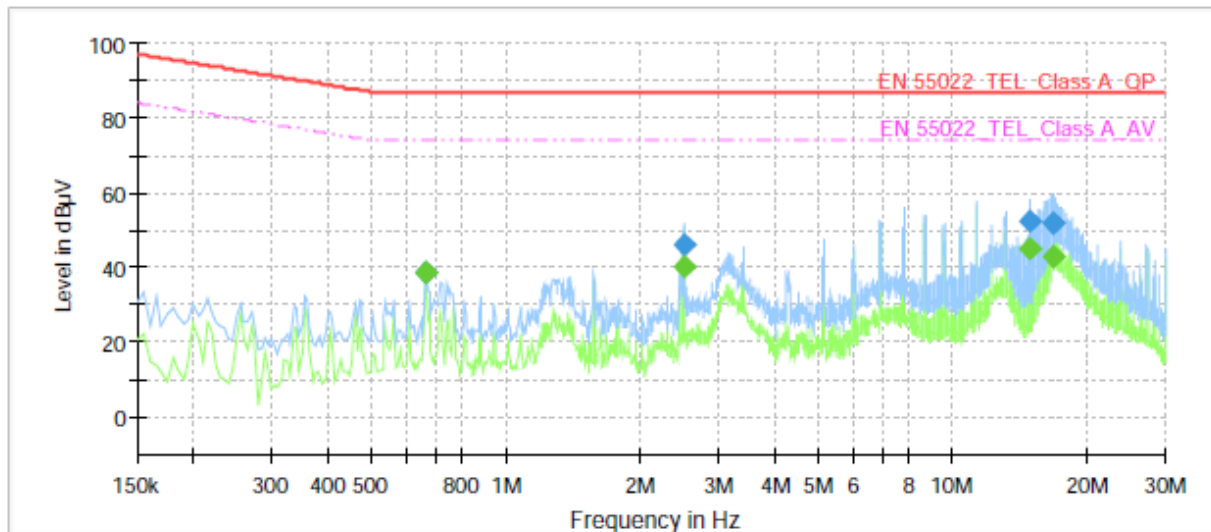
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Conducted Emissions at Telecommunication Ports

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SRD-1694P
Mode	10 Mbps
Operator Name:	KES



Final Result

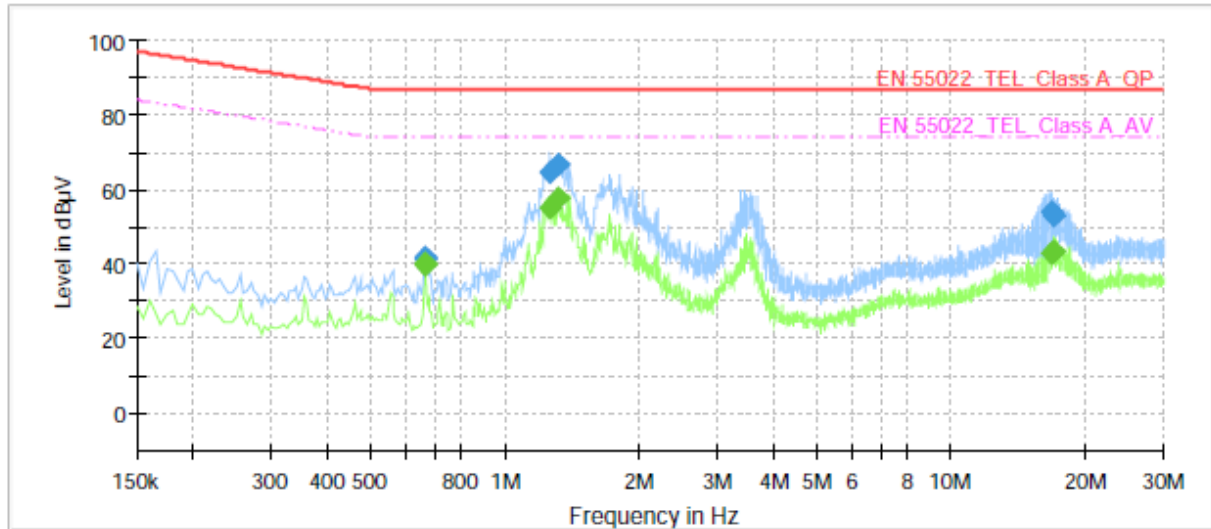
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.665000	---	38.40	74.00	35.60	1000.0	9.000	Single Line	9.9
0.665000	38.70	---	87.00	48.30	1000.0	9.000	Single Line	9.9
2.500000	---	40.31	74.00	33.69	1000.0	9.000	Single Line	9.8
2.500000	45.81	---	87.00	41.19	1000.0	9.000	Single Line	9.8
14.945000	---	45.14	74.00	28.86	1000.0	9.000	Single Line	10.1
14.945000	52.37	---	87.00	34.63	1000.0	9.000	Single Line	10.1
16.820000	---	43.04	74.00	30.96	1000.0	9.000	Single Line	10.1
16.820000	52.05	---	87.00	34.95	1000.0	9.000	Single Line	10.1

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[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SRD-1694P
Mode	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)
0.660000	---	39.72	74.00	34.28	1000.0	9.000	Single Line	9.3
0.660000	41.19	---	87.00	45.81	1000.0	9.000	Single Line	9.3
0.665000	---	40.18	74.00	33.82	1000.0	9.000	Single Line	9.3
0.665000	42.05	---	87.00	44.95	1000.0	9.000	Single Line	9.3
1.265000	---	55.10	74.00	18.90	1000.0	9.000	Single Line	9.2
1.265000	64.40	---	87.00	22.60	1000.0	9.000	Single Line	9.2
1.325000	---	57.56	74.00	16.44	1000.0	9.000	Single Line	9.2
1.325000	66.91	---	87.00	20.09	1000.0	9.000	Single Line	9.2
16.830000	---	42.85	74.00	31.15	1000.0	9.000	Single Line	9.5
16.830000	53.94	---	87.00	33.06	1000.0	9.000	Single Line	9.5
17.090000	---	43.58	74.00	30.42	1000.0	9.000	Single Line	9.5
17.090000	52.89	---	87.00	34.11	1000.0	9.000	Single Line	9.5

**KES Co., Ltd.**

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

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Radiated Electric Field Emissions(Below 1 GHz)

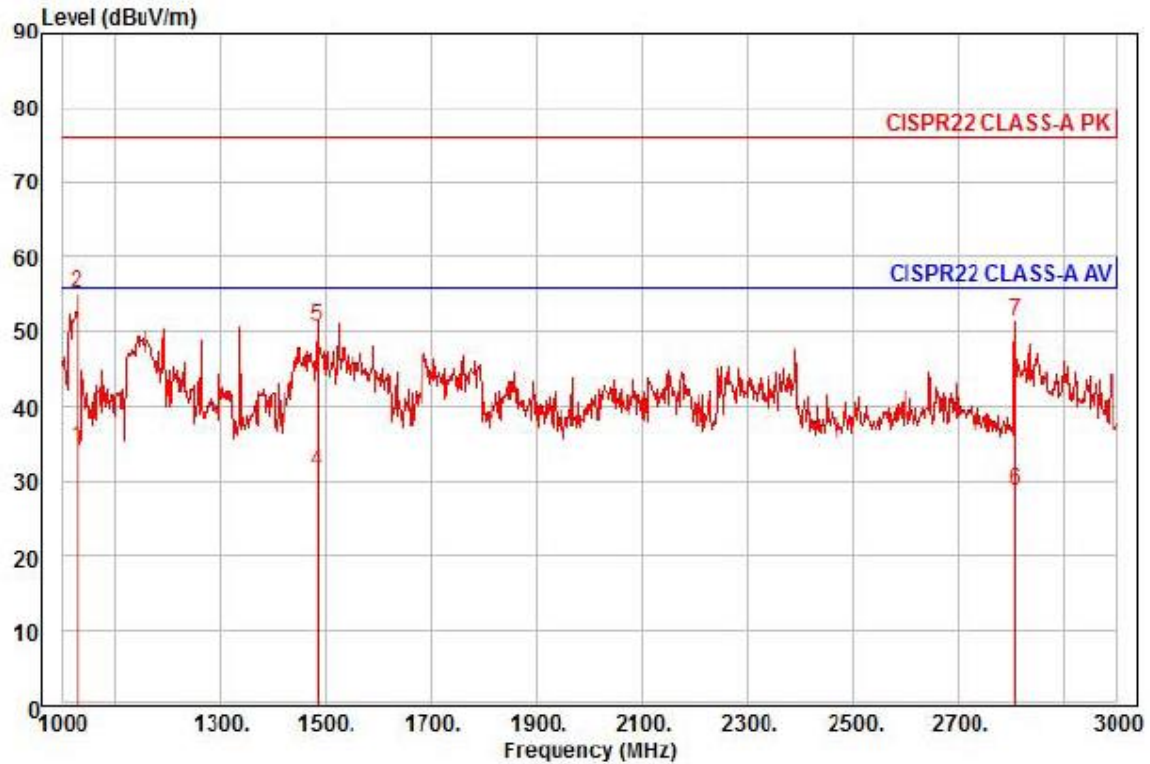
Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
149.82	24.79	H	4.00	8.19	2.77	35.75	40.00	4.25
252.04	23.53	H	3.54	12.45	3.82	39.80	47.00	7.20
287.75	20.16	V	1.00	13.14	4.11	37.41	47.00	9.59
446.11	17.18	V	1.00	16.35	5.37	38.90	47.00	8.10
594.61	14.77	H	3.21	19.18	6.29	40.24	47.00	6.76
706.94	14.36	V	1.00	19.78	7.28	41.42	47.00	5.58

* H : Horizontal, V : Vertical

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Radiated Electric Field Emissions(Above 1 GHz)



Site : chamber

Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto

Project :

Model : SRD-1694P

Mode :

Memo :

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	av	1028.00	44.03	24.02	6.59	40.11	58	56.00	-21.47	horizontal Average
2	pp	1028.00	64.64	24.02	6.59	40.11	58	76.00	-20.86	horizontal Peak
3		1192.00	0.00	24.67	7.07	40.03	340	76.00	-84.29	horizontal Peak
4		1484.00	37.51	25.83	7.91	39.88	4	56.00	-24.63	horizontal Average
5		1484.00	56.85	25.83	7.91	39.88	4	76.00	-25.29	horizontal Peak
6		2808.00	28.19	29.86	10.76	40.10	32	56.00	-27.29	horizontal Average
7		2808.00	51.04	29.86	10.76	40.10	32	76.00	-24.44	horizontal Peak

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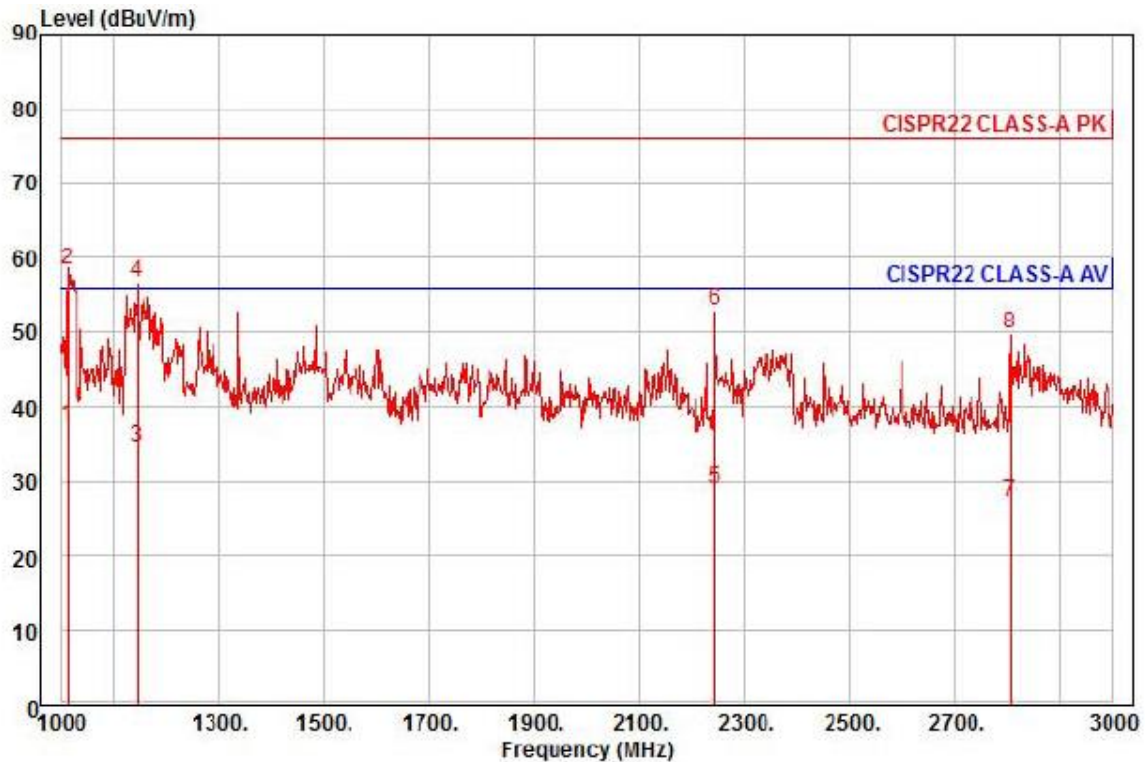
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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Test report No.:

KES-EI-16T0173-R1

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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SRD-1694P
Mode :
Memo :

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	av	1012.00	46.99	23.96	6.54	40.11	164	56.00	-18.62	vertical
2	pp	1012.00	67.88	23.96	6.54	40.11	164	76.00	-17.73	vertical
3		1144.00	43.21	24.48	6.93	40.05	16	56.00	-21.43	vertical
4		1144.00	65.25	24.48	6.93	40.05	16	76.00	-19.39	vertical
5		2244.00	30.44	28.48	9.72	39.77	321	56.00	-27.13	vertical
6		2244.00	54.55	28.48	9.72	39.77	321	76.00	-23.02	vertical
7		2806.00	26.65	29.85	10.76	40.10	34	56.00	-28.84	vertical
8		2806.00	49.28	29.85	10.76	40.10	34	76.00	-26.21	vertical

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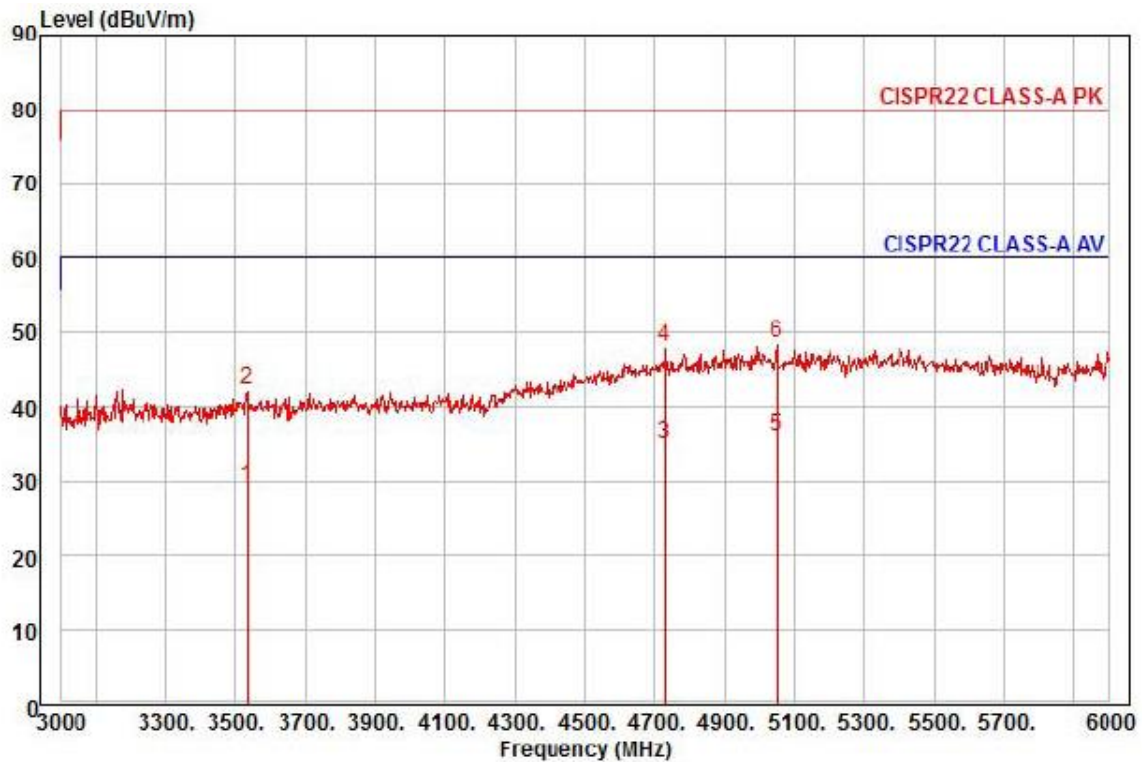
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Test report No.:

KES-EI-16T0173-R1

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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SRD-1694P
Mode :
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3534.00	25.80	31.23	12.58	40.32	31	60.00	-30.71	horizontal	Average
2	3534.00	39.04	31.23	12.58	40.32	31	80.00	-37.47	horizontal	Peak
3	4728.00	24.45	36.17	14.84	40.41	134	60.00	-24.95	horizontal	Average
4	4728.00	37.36	36.17	14.84	40.41	134	80.00	-32.04	horizontal	Peak
5 pp	5052.00	23.45	37.61	15.39	40.40	154	60.00	-23.95	horizontal	Average
6 pk	5052.00	36.06	37.61	15.39	40.40	154	80.00	-31.34	horizontal	Peak

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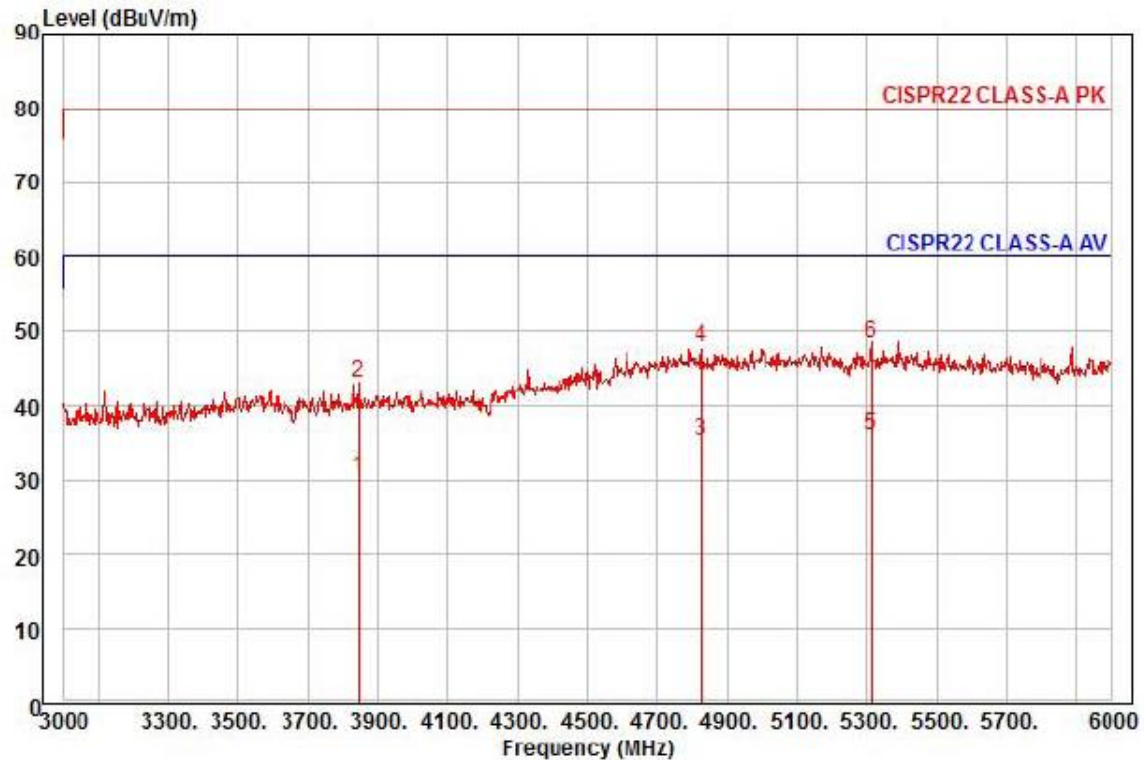
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Test report No.:

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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SRD-1694P
Mode :
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3846.00	25.72	31.75	13.20	40.38	63	60.00	-29.71	vertical	Average
2	3846.00	38.57	31.75	13.20	40.38	63	80.00	-36.86	vertical	Peak
3	4827.00	23.90	36.73	15.02	40.41	77	60.00	-24.76	vertical	Average
4	4827.00	36.49	36.73	15.02	40.41	77	80.00	-32.17	vertical	Peak
5 pp	5313.00	23.51	37.09	15.70	40.37	268	60.00	-24.07	vertical	Average
6 pk	5313.00	35.84	37.09	15.70	40.37	268	80.00	-31.74	vertical	Peak

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**Harmonic Current Emissions and Voltage Fluctuations and Flicker****Average harmonic current results**

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	145.384E-3			
2	30.329E-3	3.120	972.00E-3	PASS
3	89.669E-3	4.332	2.07	PASS
4	6.320E-3	1.633	387.00E-3	PASS
5	11.819E-3	1.152	1.03	PASS
6	5.959E-3	2.207	270.00E-3	PASS
7	10.532E-3	1.520	693.00E-3	PASS
8	2.193E-3			PASS
9	10.310E-3	2.864	360.00E-3	PASS
10	1.515E-3			PASS
11	7.438E-3	2.505	297.00E-3	PASS
12	1.925E-3			PASS
13	4.765E-3			PASS
14	1.237E-3			PASS
15	3.313E-3			PASS
16	1.573E-3			PASS
17	1.798E-3			PASS
18	1.488E-3			PASS
19	3.327E-3			PASS
20	1.475E-3			PASS
21	2.923E-3			PASS
22	1.449E-3			PASS
23	1.841E-3			PASS
24	896.132E-6			PASS
25	519.025E-6			PASS
26	594.820E-6			PASS
27	613.879E-6			PASS
28	619.037E-6			PASS
29	852.060E-6			PASS
30	386.950E-6			PASS
31	635.680E-6			PASS
32	417.406E-6			PASS
33	343.312E-6			PASS
34	366.103E-6			PASS
35	279.073E-6			PASS
36	411.769E-6			PASS
37	366.987E-6			PASS
38	380.663E-6			PASS
39	521.168E-6			PASS
40	397.335E-6			PASS



Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	146.256E-3			
2	32.357E-3	1.498	2.16	PASS
3	91.189E-3	1.982	4.60	PASS
4	7.324E-3	0.852	860.00E-3	PASS
5	13.338E-3	0.585	2.28	PASS
6	6.548E-3	1.091	600.00E-3	PASS
7	11.531E-3	0.749	1.54	PASS
8	2.867E-3			PASS
9	10.863E-3	1.358	800.00E-3	PASS
10	2.166E-3			PASS
11	7.908E-3	1.198	660.00E-3	PASS
12	2.535E-3			PASS
13	5.171E-3	1.231	420.00E-3	PASS
14	1.571E-3			PASS
15	3.655E-3			PASS
16	2.083E-3			PASS
17	2.082E-3			PASS
18	1.775E-3			PASS
19	3.668E-3			PASS
20	2.033E-3			PASS
21	3.127E-3			PASS
22	1.700E-3			PASS
23	2.162E-3			PASS
24	1.164E-3			PASS
25	706.928E-6			PASS
26	833.591E-6			PASS
27	854.326E-6			PASS
28	796.514E-6			PASS
29	1.165E-3			PASS
30	597.960E-6			PASS
31	876.991E-6			PASS
32	598.356E-6			PASS
33	540.709E-6			PASS
34	539.585E-6			PASS
35	486.597E-6			PASS
36	618.537E-6			PASS
37	589.018E-6			PASS
38	499.662E-6			PASS
39	695.085E-6			PASS
40	661.794E-6			PASS

**KES Co., Ltd.**

C-3701, Simin-daero 365-40,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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Test report No.:

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Test Data - Voltage Fluctuations

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.033	1.00	PASS
Plt	0.033	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.165	4.00	PASS
Tmax [s]	0.000	0.50	PASS

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Test Setup Photos and Configuration

Conducted Voltage Emissions



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Conducted Telecommunication Emissions



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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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Harmonic Current Emissions and Voltage Fluctuations and Flicker

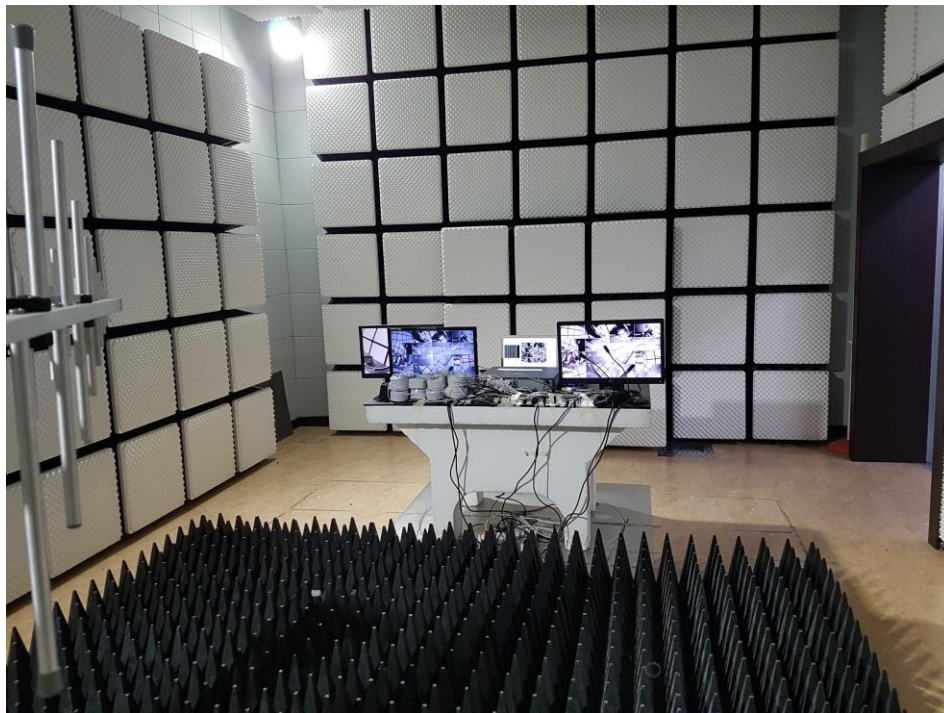


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Electrostatic Discharge



Radiated Electric Field Immunity



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Electrical Fast Transients/Bursts



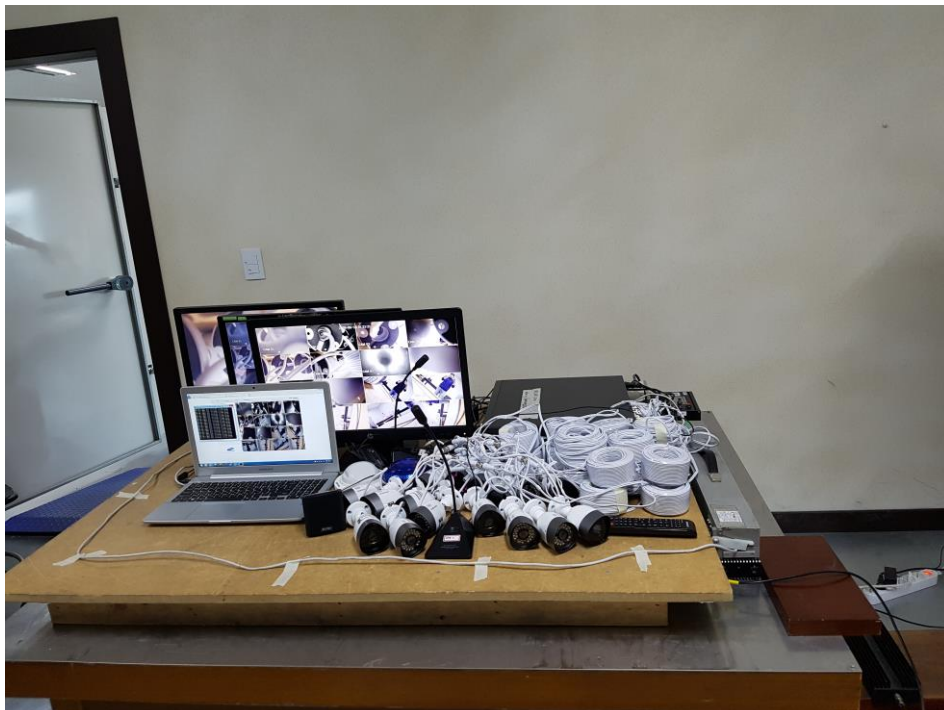
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Surge Transients



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Conducted Disturbance



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Voltage Dips and Short Interruptions



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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

(Internal View)



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Main Board EUT Internal View – Board 1

(Top)



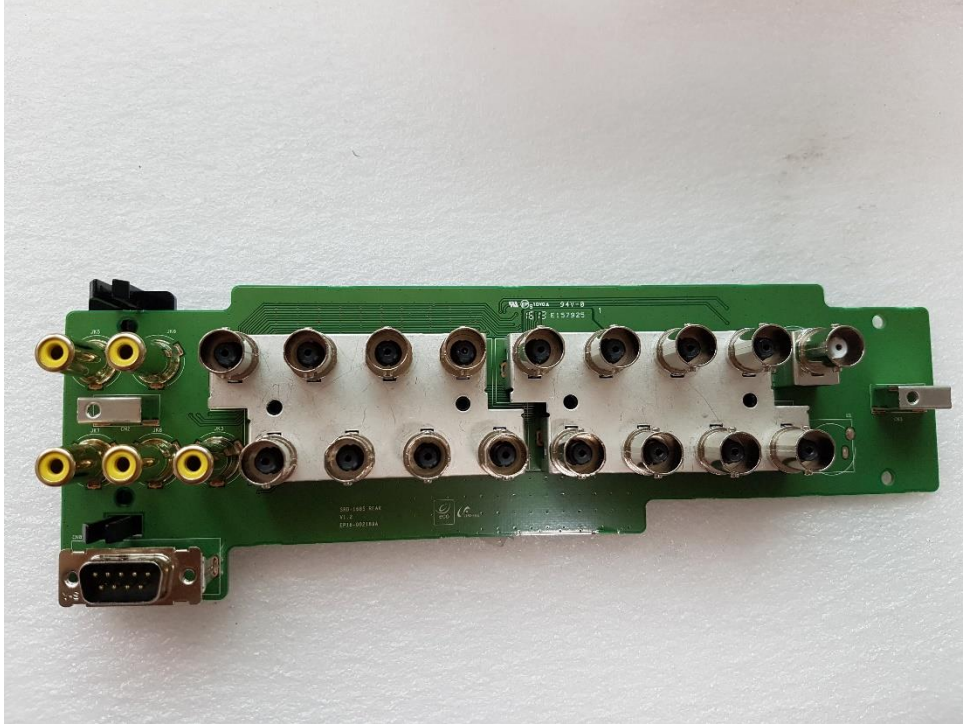
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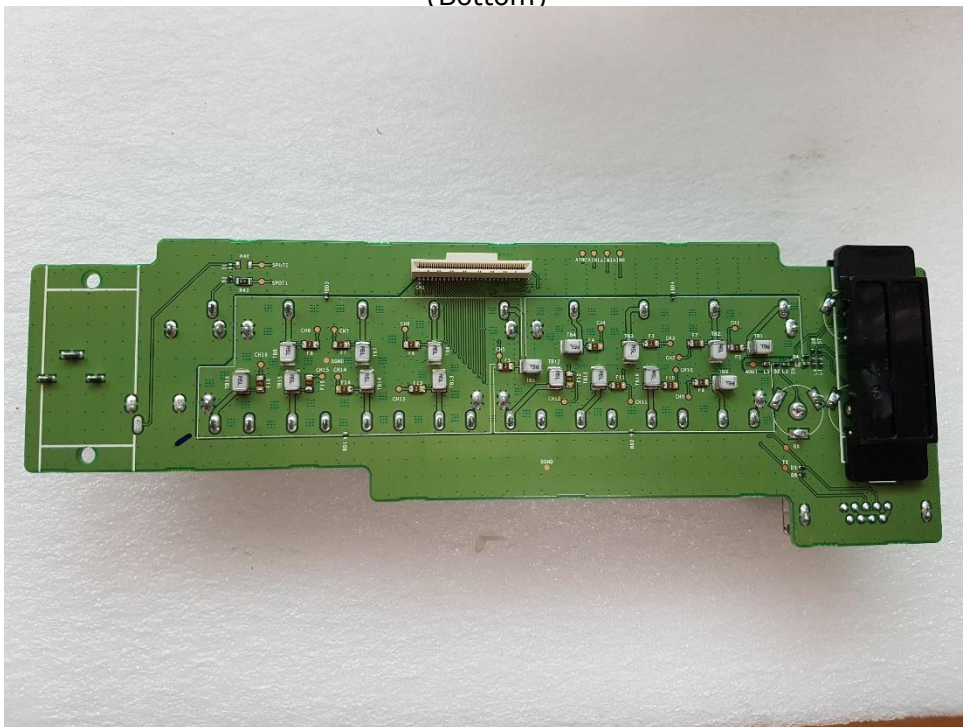
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Main Board EUT Internal View – Board 2

(Top)



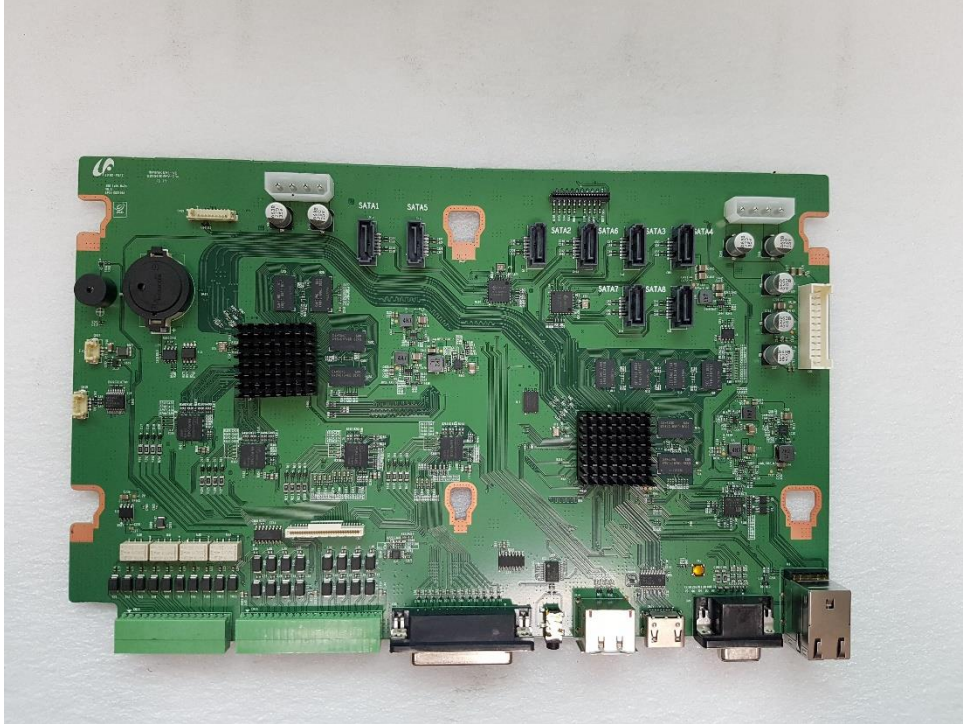
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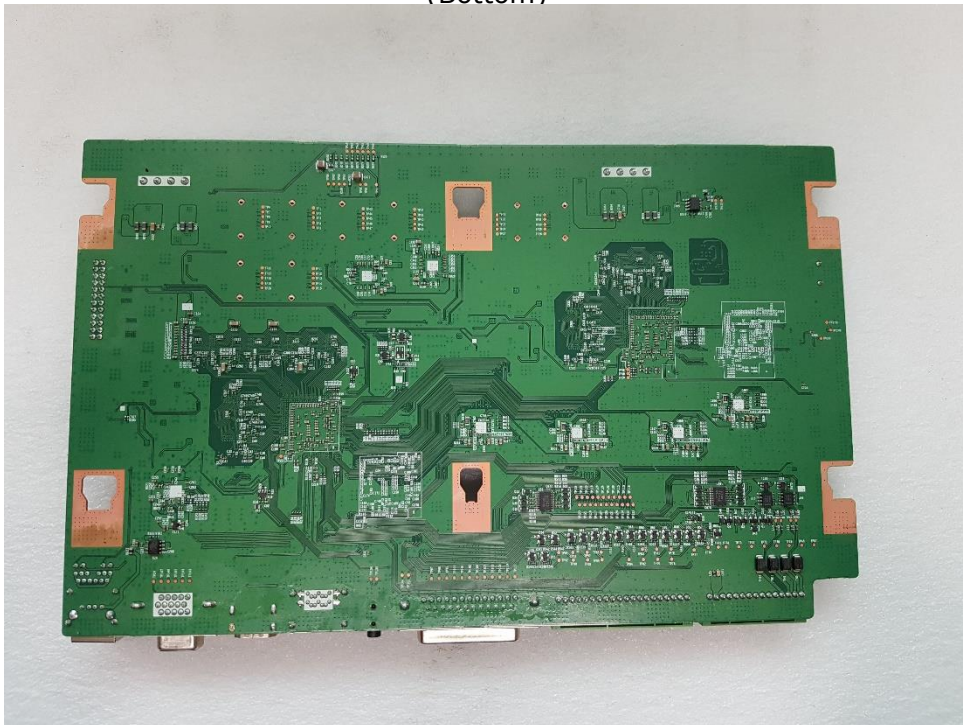
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Main Board EUT Internal View – Board 3

(Top)



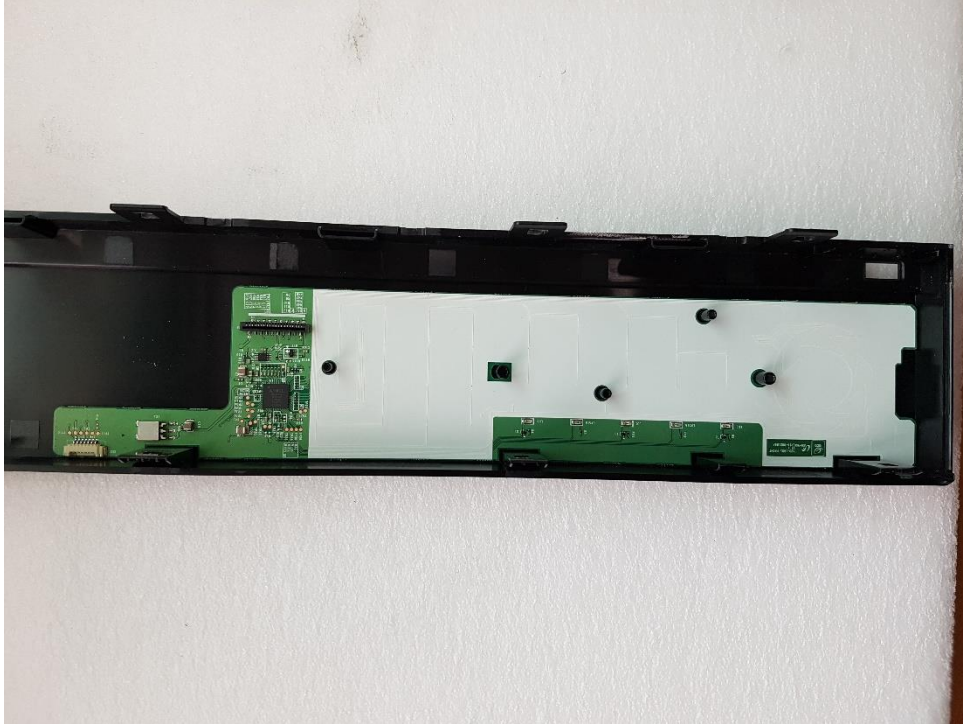
(Bottom)



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Main Board EUT Internal View – Board 4

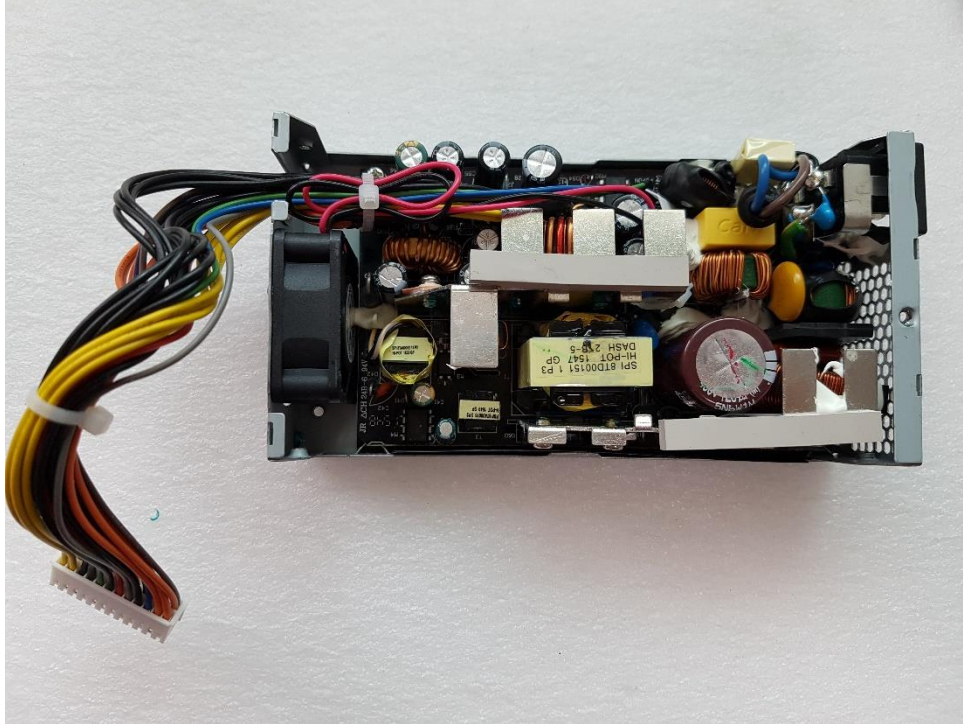
(Top)



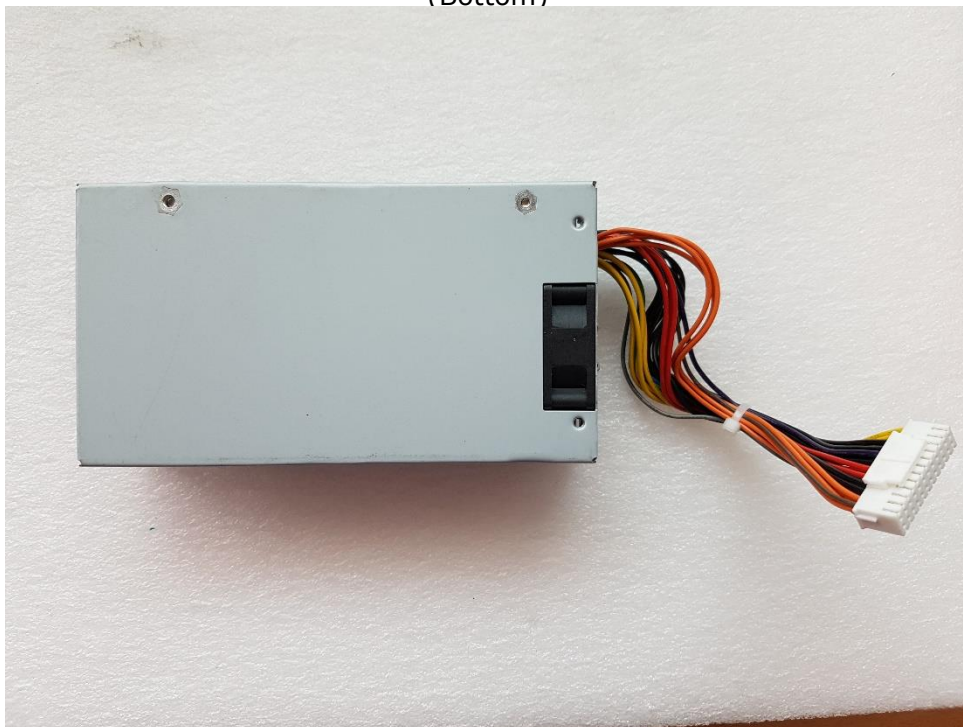
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Main Board EUT Internal View – Power Board

(Top)



(Bottom)



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Main Board EUT Internal View – HDD

(Top)



(Bottom)



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Main Board EUT Internal View – POWER

(Top)



(Bottom)



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Label and Location



Digital Video Recorder

Model No : SRD-1694P

Manufacturer : Hanwha Techwin(Tianjin) Co., Ltd.

Made in of China