Declaration of Conformity

SAMSUNG TECHWIN

CE

Type of equipment:	**DIGITAL VIDEO RECORDER**
Brand Name /Trade Mark:	**SAMSUNG**
Type designation /model:	**SRD-440P**
Applicant:	**SAMSUNG TECHWIN CO., LTD.**

In accordance with the following Directives:

2004/108/EC	The Electromagnetic Compatibility Directive

Including amendments by the CE Marking Directive 93/68/EEC

The following harmonized European standards or technical specifications have been applied:

EN 55022:2010	Limits and methods of measurement of radio disturbance characteristics of information technology equipment
EN 50130-4:1995 +A1:1998 +A2:2003	Product family standard: Immunity requirements for components of fire, intruder and social alarm systems
EN 61000-3-2:2006+A2:2009	Limits for harmonic current emissions
EN 61000-3-3:2008	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <=16 A per phase and not subject to conditional connection
EN 61000-4-2:2009	Electrostatic discharge immunity test
EN 61000-4-3:2006+A2:2010	Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4:2004+A1:2010	Electrical fast transient/burst immunity test
EN 61000-4-5:2006	Surge immunity test
EN 61000-4-6:2009	Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-11:2004	Voltage dips, short interruptions and voltage variations immunity tests

The CE Marking on the products and/or their packaging signifies that SAMSUNG TECHWIN CO., LTD. holds the reference technical file available to the European Union authorities.

Place and date of issue: #42 Seongju-Dong, Changwon-Shi, Kyungsangnam-Do,Korea / June 18, 2012

Authorized Signatory: Name : Jei Soon, Kang

Title : Principal Research Engineer

Signature :



EMC TEST REPORT

Test report No:	**EMC-CE-2646**
Type of Equipment:	**DIGITAL VIDEO RECORDER**
Model Name:	**SRD-440P**
Applicant:	**SAMSUNG TECHWIN CO., LTD.** **#42 Seongju-Dong, Changwon-Shi,** **Kyungsangnam-Do, Korea**
Manufacturer#1:	**SAMSUNG TECHWIN CO., LTD.** **#42 Seongju-Dong, Changwon-Shi,** **Kyungsangnam-Do, Korea**
Manufacturer#2:	**TIANJIN SAMSUNG TECHWIN** **OPTO-ELECTRONIC CO., LTD** **No.11 Weiliu Road. Micro-Electronic Industrial Park** **Jingang Road Tianjin 300385, China**
Test standards:	**EN 55022:2010, Class A** **EN 50130-4:1995+A1:1998+A2:2003** **EN 61000-3-2:2006+A2:2009** **EN 61000-3-3:2008**
Testing Laboratory:	**EMC Compliance Ltd.**
Test result:	**Complied**

This product complies with the requirements of the EMC Directive 2004/108/EC.
The results in this report apply only to the sample tested.
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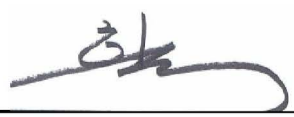
Date of receipt: 2011. 06. 23

Date of testing: 2011. 07. 01 ~ 07. 05

Issued date: 2012. 06. 18

Tested by: 

SUNG, KI-MUN

Approved by: 

YEOM, HAN-SEOK

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1. Applicant information

Applicant: SAMSUNG TECHWIN CO., LTD.
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Kyungsangnam-Do, Korea
Telephone: +82-70-7147-8361
Fax: +82-31-277-2784
E-mail: js2002.kang@samsung.com
Contact name: **Kang Jei Soon**

Manufacturer#1: SAMSUNG TECHWIN CO., LTD.
Address: #42 Seongju-Dong, Changwon-Shi,
Kyungsangnam-Do, Korea
Telephone: +82-70-7147-8361
Fax: +82-31-277-2784
E-mail: js2002.kang@samsung.com
Contact name: **Kang Jei Soon**

Manufacturer#2: TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD
Address: No.11 Weiliu Road. Micro-Electronic Industrial Park
Jingang Road Tianjin 300385, China

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2. Laboratory information

Address

EMC compliance Ltd.
480-5 Sin-dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, 443-390, Korea
Telephone Number: 82 31 336 9919
Facsimile Number: 82 31 336 4767

FCC CAB.: KR0040
VCCI Registration No.: R-3327, G-198, C-3706, T-1849
Industry Canada Registration No.: 8035A
KOLAS NO.: 231

SITE MAP





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3. Test system configuration

3.1 Operation environment

		Temperature	Humidity	Pressure
Chamber(10 m)	:	25~26 °C	59~63 % R.H.	-
Shielded room(CE)	:	24 °C	51~52 % R.H.	-
Shielded room(ESD)	:	25 °C	52 % R.H.	100.2 kPa

Test site

These testing items were performed following locations;

Shielded Room	: Conducted Emission, ESD, EFT/Burst, Surge, CS, Dip/Interruption, Voltage variation
Immunity area	: Harmonics, Flicker
Chamber (10 m)	: Radiated Emission (Test distance: 10 m, 3 m)
Fully anechoic chamber (3 m)	: RS

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3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are test receiver, cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, site imperfection, mismatch, and system repeatability. Based on CISPR 16-4-2, the measurement uncertainty level with a 95 % confidence level was applied.

Conducted emission measurement :(k = 2, 95 %)

9 ㎑ ~ 150 ㎑: ± 3.77 [㏈]

150 ㎑ ~ 30 ㎒: ± 3.35 [㏈]

Radiated Emission measurement :(k = 2, 95 %)

30 ㎒ ~ 300 ㎒: 3 m: ± 4.3 [㏈]

10 m: ± 4.3 [㏈]

300 ㎒ ~ 1 000 ㎒: 3 m: ± 4.4 [㏈]

10 m: ± 4.3 [㏈]

Radio Frequency Electromagnetic Fields :(k = 2, 95 %)

± 1.82 [㏈]

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4. Description of E.U.T.

4.1 General information

		SRD-440P
Video	Inputs	4 composite video 0.5~1 Vpp, 75 ohm
	Resolution	704x480 NTSC, 704x576 PAL
Live	Frame rate	120fps NTSC, 100fps PAL
	Resolution	704x480 NTSC, 704x576 PAL
	Multi Screen display	1/4/SEQUENCE/PIP
Performance		
Operating System	Embedded	Linux
Recording	Compression	H.264
	Record Rate	NTSC: Up to 30fps @ 704x480 / PAL: Up to 25fps @ 704x576
		NTSC: Up to 60fps @ 704x240 / PAL: Up to 50fps @ 704x288
		NTSC: Up to 120fps @ 352x240 / PAL: Up to 100fps @ 352x288
	Mode	NTSC: Manual, Schedule (Continuous/Event), Event(Pre/Post)
		PAL: Manual, Schedule (Continuous/Event), Event(Pre/Post)
	Overwrite modes	Continuous
	Pre-alarm	Up to 5 sec.
	Post-Alarm	Up to 6 hour. (5,10,20,30 sec,1,3,5,10,20 min,1,2,3,4,5,6hour)
Search & Playback	Search mode	Date/time, Event, Back up, Motion
	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
Network (IPv4)	Transmission speed	100/120fps
	Bandwidth	Up to (4)Mbps, Unlimited(4M)/2/1.5/1 Mbps/800/600/500/400/300/200/100/50 kbps
	Bandwidth control	Automatic
	Stream	CIF (H.264)
	Remote users Maximum	4 Persons (Search up to (2), Live Unicast/Live Multicast available)
	Protocol support	TCP/IP,DHCP,PPPoE,SMTP,NTP,HTTP,DDNS,RTP,RTSP
	Monitoring	Webviewer,CMS(Smart viewer,Net-I)
Smart phone	Smart Phone	Android, I-phone (iPad included)
	Protocol support	RTP,RTSP,HTTP,CGI
	Transmission speed	CIF Max 15fps(Single Channel)/ CIF Max 2fps(Quad Channel)
	Remote users Maximum	Live(1)
Storage	Internal HDD	Up to 1 SATA HDDs
	External HDD/DVD Writer	Not Support
	DVD Writer (Back-up)	Not Support
	USB (Back-up)	2 USB Ports
	File Format (Back-up)	BU(DVR Player), EXE(Include Player)
Security	Password Protection	1 Admin, 10 Group , 10 User per 1 Group
	Data Authentication	Watermark
Interface		
Monitors	VGA	1 VGA (1024x768) ※ Main Composite Selectable
	HDMI	Not Support
	Main/Spot Composite	1 BNC (1 Vp-p, 75 ohm)/Analog Spot (1 BNC, 1 Vp-p, 75 ohm) Selectable
	Spot Composite	Not Support
	Loop Outputs	Not Support
Audio	Inputs/Output	1 line in / 1 line out
	Compression	G.711 ULAW(8KHz, 16Bit)
	Sampling rate	8KHz
Alarm	Inputs/Outputs	Terminal 4 inputs (NO/NC) / Terminal 1 relay outputs (NO/NC), Rating : 24VDC/1A, 125V AC/0.5A
	Remote notification	Notification via e-mail
Connections	Ethernet	1 RJ45 10/100 Base-T
	Serial interface	RS-485(Half) for PTZ, System Keyboard ※ Support for POS Interface (VSI-Pro)
	USB	USB 2.0, 2 ports (Front/Rear)
	e-SATA	Not Support
	Application Supoort	Mouse(Not Include), Remote Controller
	Protocol support	Samsung-E/ Samsung-T/ Pelco-D/ Pelco-p/Panasonic/ Phillips/ AD/ DIAMOND/ ERNA/ GE/ VCL TP/VICON/ELMO
General		
Electrical	Input Voltage/Current	DC12V Adaptor,1.2A,100~240VAC, 50~60Hz, 48watt
	Power consumption	Max.36 W (with 1x HDD)
Environmental	Operating Temperature/Humidity	+0°C to +40°C (+32°F to +104°F)/ 20%RH to 85%RH
Mechanical	Dimension (W x H x D)	255 x 44 x 204mm
	Weight (With hard disks)	T.B.D
	Rack mount kit	Not Support
Language		Korean, Japanese, Chinese, English, French, German, Spanish, Italian, Russian, Netherlands, Portuguese,Swedish,Danish, Thailandais, Rumania, Serbia, Polish, Czech, Turkish, Croatia, Hungary, Greek (22 Language)

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4.2 Product description

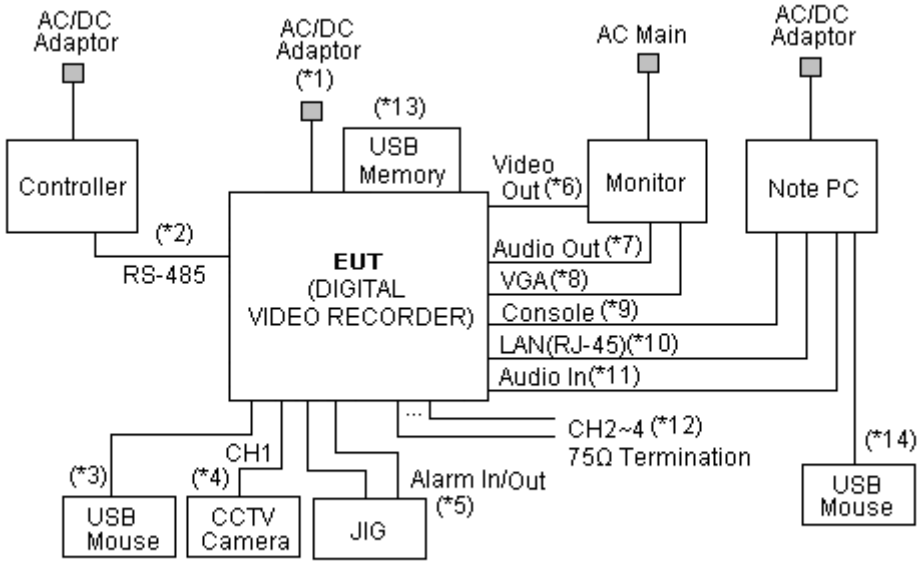
Type of product	DIGITAL VIDEO RECORDER
Model name (Basic)	SRD-440P
Model name (Variant)	N/A
Difference	-
Serial no	Engineering Sample
Trade name	-
Testing voltage	230 V, 50 Hz
Product rating	AC 100 - 240 V, 50 / 60 Hz, 1.2 A
Internal clock ferquence	440 MHz
Note	* AC/DC adaptor was provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Monitor	GH19PS	N727HVZLC04632H	SAMSUNG
Note PC	C1321	472680432036	FUJITSU
USB Memory(8GB)	-	-	-
Controller	SCC-2000	-	SAMSUNG
USB Mouse	1088	8165900241827	Microsoft
CCTV Camera	SDC-435P	C08C6V3Z245129	SAMSUNGTECHWIN
JIG	-	-	-

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4.4 Test configuration



Note *	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	**EUT** (DIGITAL VIDEO RECORDER)	Power	AC/DC Adaptor	Power	1.0	Non-Shield	-
2		RS-485	Controller	RS-485	3.0	Non-Shield	Out-door
3		USB	USB Mouse	USB	1.7	Shield	-
4		CH1	CCTV Camera	CH1	3.0	Shield	Out-door
5		Alarm In/Out	JIG	Alarm In/Out	3.0	Non-Shield	-
6		Video Out	Monitor	Video In	3.0	Shield	
7		Audio Out	Monitor	Audio In	1.4	Shield	-
8		VGA	Monitor	VGA	1.5	Shield	-
9		Console	Note PC	Console	1.6	Non-Shield	-
10		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Non-Shield	-
11		Audio In	Note PC	Audio Out	1.4	Shield	-
12		CH2~4	75Ω Termination	CH2~4	1.0	Shield	Out-door
13		USB	USB Memory	USB	Direct	-	-
14	Note PC	USB	USB Mouse	USB	2.0	Shield	-

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4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Monitoring REC Test Mode
	Web View Test Mode
	Alarm/RS-485 operating Mode

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5. Summary of test results

5.1 Modification to the E.U.T.

None

5.2 Summary of EMI emission test results

Application	Test method	Test result
Conducted emission - AC main - Telecommunication	EN 55022:2010	Complied
Radiated emission	EN 55022:2010	Complied
Harmonics current	EN 61000-3-2:2006+A2:2009	Complied
Voltage fluctuations and flickers	EN 61000-3-3:2008	Complied

5.3 Summary of immunity test results

Items	Application	Test method	Test result
Electrostatic discharge	Enclosure	EN 61000-4-2:2009	Complied
Radiated RF immunity	Enclosure	EN 61000-4-3:2006+A2:2010	Complied
Electric Fast Transient/BURST	AC main, Signal, Telecommunication	EN 61000-4-4:2004+A1:2010	Complied
Surge	AC main, Signal	EN 61000-4-5:2006	Complied
Conducted RF immunity	AC main, Signal, Telecommunication	EN 61000-4-6:2009	Complied
Voltage dip/interruption	AC main	EN 61000-4-11:2004	Complied
Voltage variation	AC main	EN 50130-4:1995+A1:1998+A2:2003	Complied

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5.4 Performance criteria

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 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

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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 dBμV.

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 **dBμV**, 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 dBμV, 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 dBμV.

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.

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6. Test results

6.1 Conducted Emission

Test specification	EN 55022:2010, Class A		
Test mode	Operating mode.		
Date	2011. 07. 01		
Testing voltage	230 V, 50 Hz		
Test facility	Shielded room (CE#1)		
Temperature (°C)	24 °C	Humidity (% R.H.)	51~52 % R.H.
Remarks	Complied AC main Minimum limit margin is 20.70 dB at 0.969 MHz. (Average) Telecommunication Minimum limit margin is 17.66 dB at 16.230 MHz. (Average)		

6.1.1 Limits of conducted emission measurement

- AC main

Frequency [MHz]	Class A (dB(μV))		Class B (dB(μV))	
	Quasi-peak	Average	Quasi-peak	Average
0.15 ~ 0.5	79	66	66 ~ 56 *	56 ~ 46*
0.5 ~ 5	73	60	56	46
5 ~ 30	73	60	60	50

*The limit decreases linearly with the logarithm of frequency.

- Telecommunication

Frequency [MHz]	Class A Voltage Limits (dB(μV))		Current Limits (dB(μA))	
	Quasi-Peak	Average	Quasi-Peak	Average
0.15 ~ 0.5	97 to 87	84 to 74	53 to 43	40 to 30
0.5 ~ 30	87	74	43	30

* The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz

* The current and voltage disturbance limits are derived for use with an impedance stabilization Network (ISN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication port under test (conversion factor is 20 $\log_{10}$ 150/I = 44 dB).

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6.1.2 Measurement procedure

The measurements were performed in a shielded room. EUT was setup as shown in photograph and placed on a non-metallic table height of 0.8 m above the reference ground plane. The rear of table was located 0.4 m to the vertical conducted plane. EUT was power through the LISN, which was bonded to the ground plane. The LISN power was filtered. Each EUT power lead, except ground (safety) lead was individually connected through a LISN to input power source. EUT signal cables that hung closer than 0.4 m to the Horizontal metal ground 0.3 m ~ 0.4 m long. The power cord was bundles in the center. All peripheral equipment was powered from a sub LISN. The LISN and ISN were positioned 0.8 m from the EUT. Peak and Average detection were used in preliminary testing and Quasi-peak and Average detections were used at final measurement.

6.1.3 Used equipments

Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test Receiver	ESHS10	843276/003	R&S	12.06.14	☒
LISN	ESH3-Z5	100267	R&S	11.07.05	☒
LISN	L2-16A	0000J10705	PMM	-	☒
ISN	T800	24314	TESEQ	11.12.06	☒

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6.1.4 Photographs of test setup

* AC main





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* Telecommunication



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6.1.5 Conducted emission measurement result

* AC main

Frequency	Correction Factor		Line	Quasi-peak			Average		
				Limit	Reading	Result	Limit	Reading	Result
[㎒]	LISN	Cable		[dB(㎶)]	[dB(㎶)]	[dB(㎶)]	[dB(㎶)]	[dB(㎶)]	[dB(㎶)]
0.165	0.07	0.03	H	79.00	47.44	47.54	66.00	40.44	40.54
0.183	0.08	0.01	H		40.07	40.16		33.83	33.92
0.267	0.07	0.01	N		37.62	37.70		34.34	34.42
0.348	0.07	0.01	N		38.49	38.57		35.82	35.90
0.372	0.07	0.01	N		46.79	46.87		44.40	44.48
0.471	0.07	0.01	H		35.61	35.69		32.54	32.62
0.555	0.07	0.01	N	73.00	41.58	41.66	60.00	38.82	38.90
0.969	0.09	0.03	N		41.90	42.02		39.18	39.30
1.359	0.09	0.03	N		42.27	42.39		39.14	39.26
2.142	0.09	0.06	N		41.73	41.88		37.69	37.84
4.430	0.12	0.08	N		41.74	41.94		36.03	36.23
4.510	0.12	0.08	H		41.34	41.54		34.61	34.81

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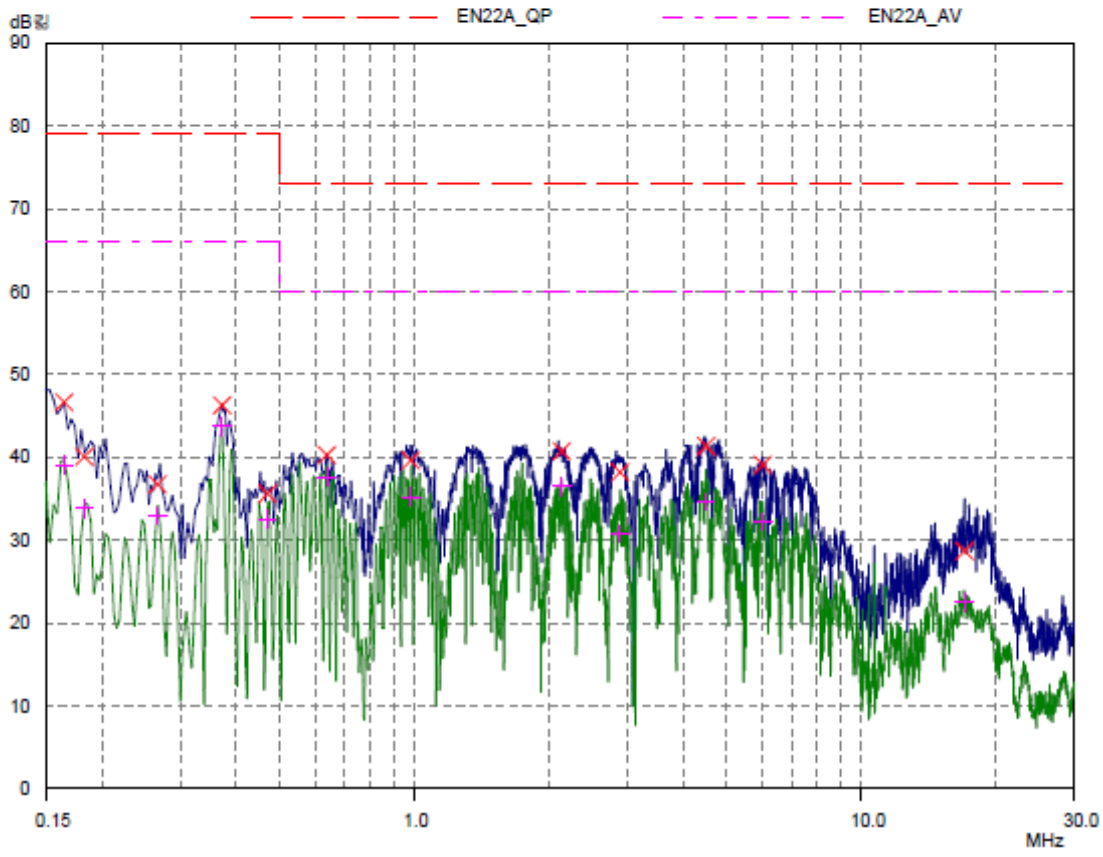
EUT: SRD-440P
Manuf:
Op Cond: H
Operator:
Test Spec: EN55022 Class A Conducted Emission
Comment:

Result File: 440_h.dat :

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	2msec	Auto	OFF	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



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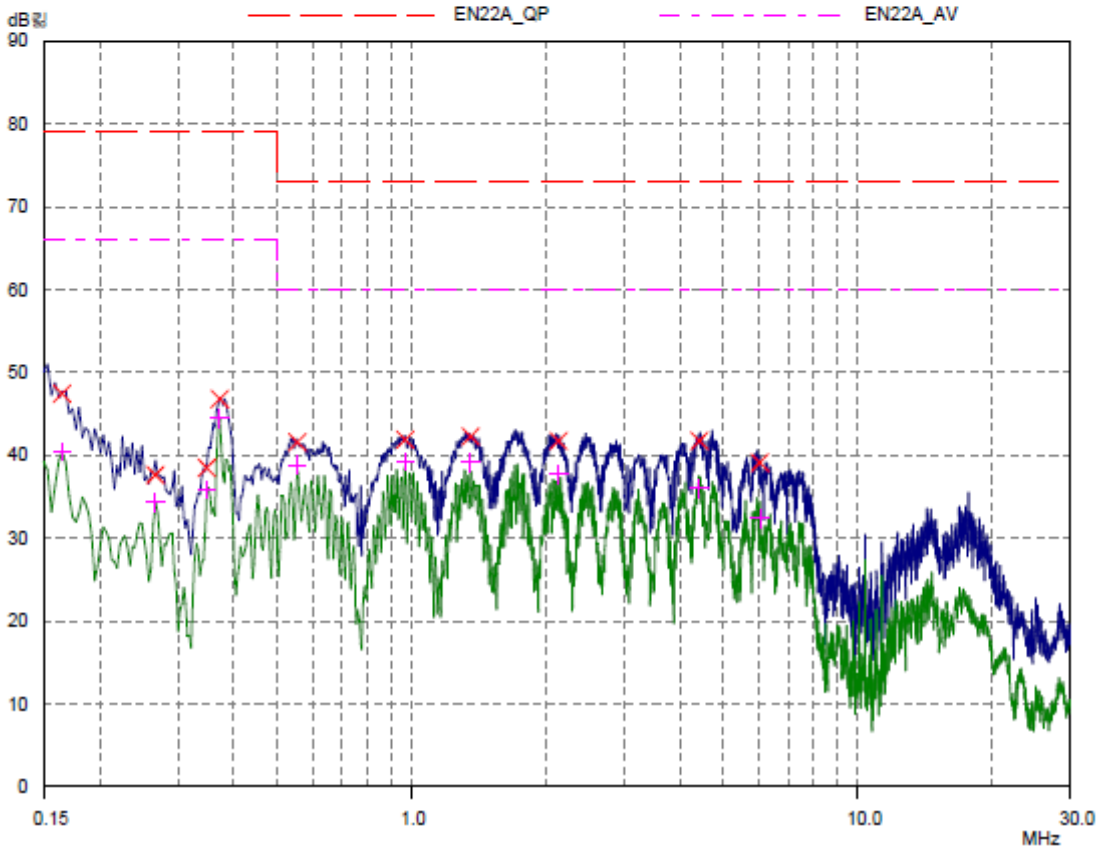
EUT: SRD-440P
Manuf:
Op Cond: N
Operator:
Test Spec: EN55022 Class A Conducted Emission
Comment:

Result File: 440_n.dat :

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	2msec	Auto	OFF	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



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* Telecommunication port

*** LCL 65 dB (Network(RJ-45) Port)**

Frequency [㎒]	Correction Factor Cable	Quasi-peak			Average		
		Limit [dB(㎶)]	Reading [dB(㎶)]	Result [dB(㎶)]	Limit [dB(㎶)]	Reading [dB(㎶)]	Result [dB(㎶)]
0.321	0.01	90.68	38.21	38.22	77.68	34.25	34.26
0.369	0.01	89.52	42.66	42.67	76.52	33.81	33.82
0.657	0.01	87.00	45.63	45.64	74.00	40.83	40.84
1.008	0.03		51.09	51.12		47.25	47.28
2.178	0.06		56.69	56.75		51.92	51.98
3.740	0.08		57.58	57.66		50.82	50.90
4.530	0.08		59.82	59.90		53.06	53.14
6.450	0.09		55.05	55.14		47.56	47.65
13.480	0.17		59.85	60.02		55.66	55.83
16.230	0.20		60.41	60.61		56.14	56.34
26.610	0.27		57.00	57.27		53.97	54.24

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EUT: SRD-440P
Manuf:
Op Cond: TEL
Operator:
Test Spec: EN55022 CLASS A Conducted Emission
Comment: Telecommunication port.

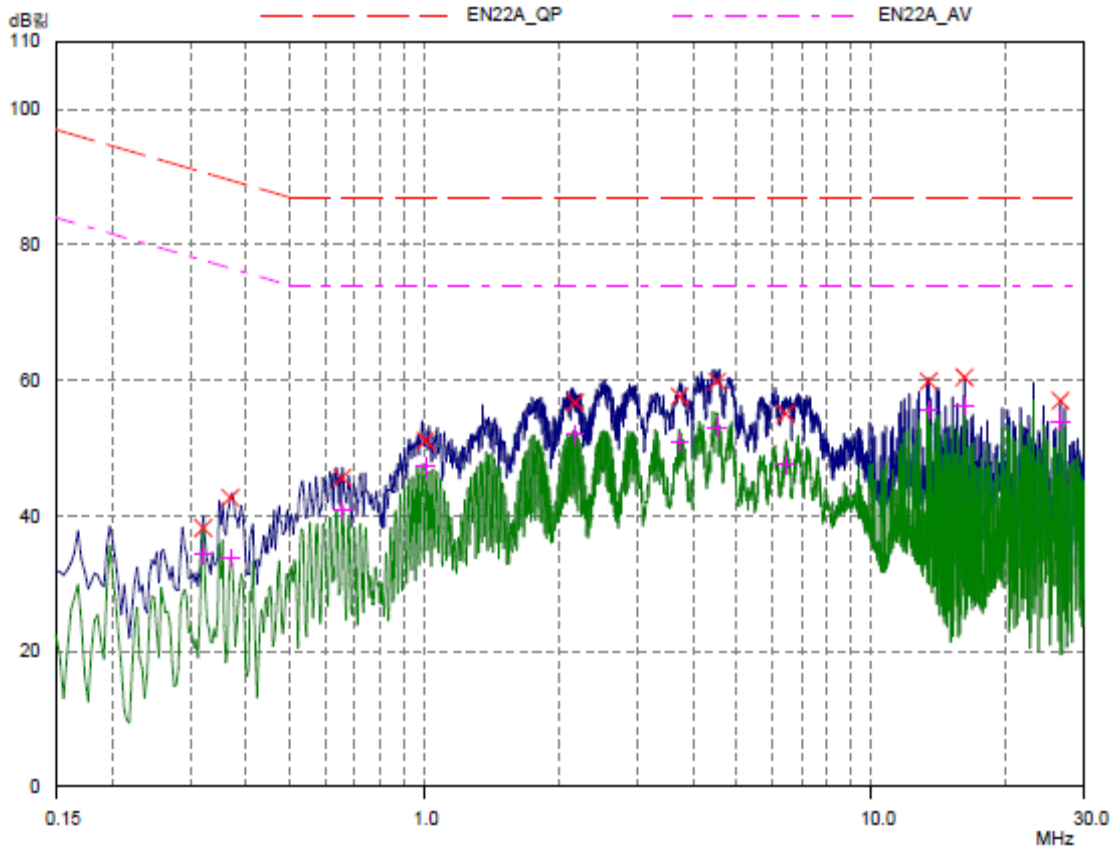
Result File: srd440_t.dat :

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	T800

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



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6.2 Radiated Emission

Test specification	EN 55022:2010, Class A		
Test mode	Operating mode.		
Date	2011. 07. 01		
Testing Voltage	230 V, 50 Hz		
Test facility	10 m Chamber (Test distance: 10 m, 3 m)		
Temperature (°C)	25~26 °C	Humidity (% R.H.)	59~63 % R.H.
Remarks	Complied Minimum limit margin is 3.1 dB at 750.002 MHz. (30 MHz ~ 1 GHz) Minimum limit margin is 25.4 dB at 2390.000 MHz. (1 GHz ~ 6 GHz_Average)		

6.2.1 Limits of radiated emission measurement

* Limits below 1 GHz

Frequency [MHz]	Class A (dB(μV/m)) @10 m	Class B (dB(μV/m)) @10 m
30 ~ 230	40	30
230 ~ 1 000	47	37

* Limits above 1 GHz

Frequency [GHz]	Average limit (dB(μV/m))	Peak limit (dB(μV/m))
1 ~ 3	56	76
3 ~ 6	60	80
Note - The lower limit applies at the transition frequency.		

6.2.2 Measurement procedure

The test was done at a 10 m, 3 m distance at 10 m chamber with a quasi-peak detector.
EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane.
Cables were folded back and forth forming a bundle 0.3 m to 0.4 m long and were hanged at a 0.4 m height to the ground plane. Cables connected to EUT were fixed to cause maximum emission.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

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6.2.3 Used equipments

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test Receiver	ESCI	100710	R&S	11.12.01	☒
Bi-Log Antenna	VULB 9160	3228	SCHWARZBECK	12.09.13	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	11.12.01	☒
3 dB Attenuator	8491A	27444	HP	11.11.30	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Amplifier	8449B	3008A01802	AGILENT	12.05.11	☒
Horn ANT	3115	00086706	ETS	11.12.22	☒
Spectrum Analyzer	FSP7	100289	R&S	11.12.17	☒

6.2.4 Sample calculation

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.

The sample calculation is as follow:

Result = M.R + C.F(A.F + C.L +3 dB Att – A.G)

M.R = Meter Reading

C.F = Correction Factor

A.F = Antenna Factor

C.L = Cable Loss

A.G= Amplifier Gain

3 dB Att = 3 dB Attenuator

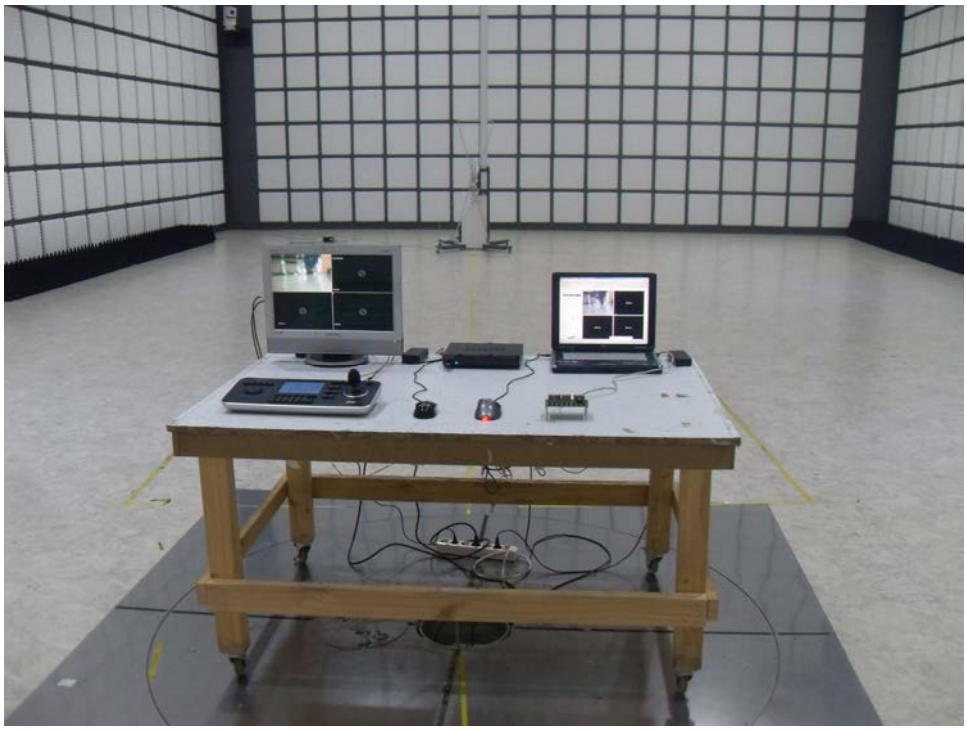
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

The result is 30 + 12 + 5 + 3 – 35 = 15 dB(μV/m)

This test report shall not be reproduced, except in full, without the written approval.

6.2.5 Photographs of test setup

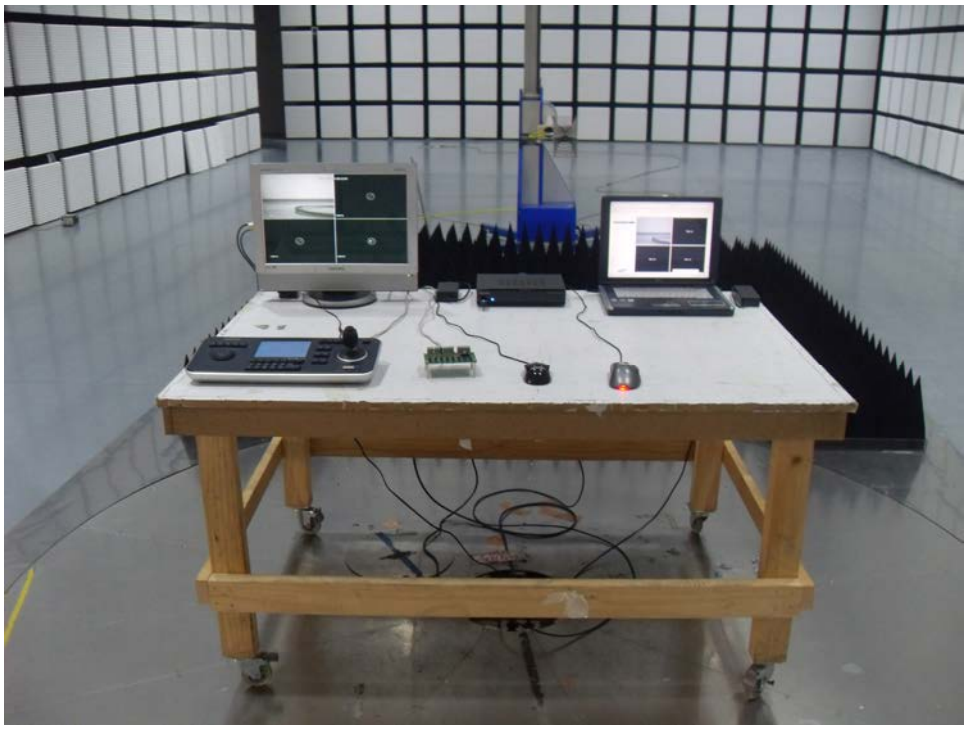
* 30 ㎒ ~ 1 ㎓





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* 1 ㎓ ~ 6 ㎓



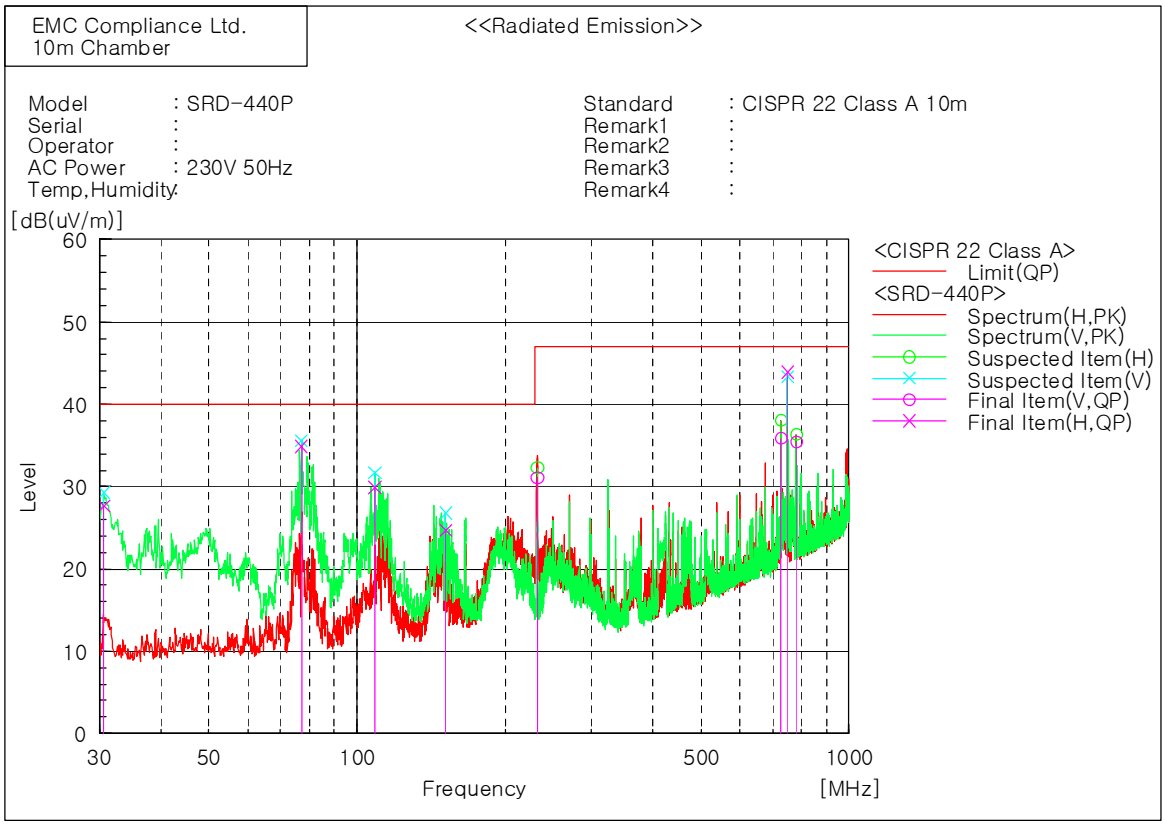


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6.2.6 Radiated emission measurement result

*** Graph and Data**

* 30 ㎒ ~ 1 ㎓

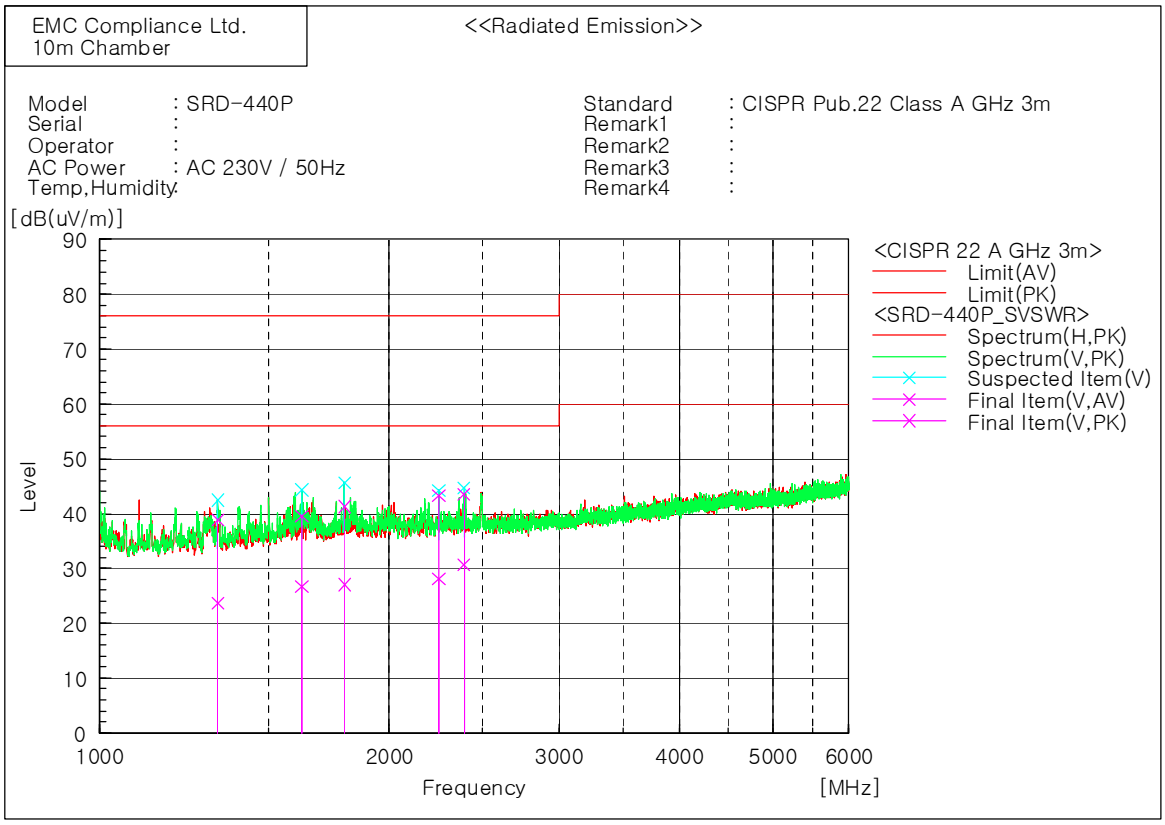


Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	30.606	V	45.6	-17.9	27.7	40.0	12.3	100.0	5.9
2	77.185	V	55.3	-20.4	34.9	40.0	5.1	100.0	56.3
3	108.813	V	47.6	-17.7	29.9	40.0	10.1	199.0	247.8
4	151.493	V	39.7	-15.0	24.7	40.0	15.3	100.0	105.2
5	232.851	H	47.9	-16.8	31.1	47.0	15.9	400.0	39.7
6	729.128	H	40.5	-4.7	35.8	47.0	11.2	100.0	181.2
7	750.002	V	48.2	-4.3	43.9	47.0	3.1	300.0	319.3
8	783.084	H	39.1	-3.7	35.4	47.0	11.6	100.0	169.2

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* 1 ㎓ ~ 6 ㎓



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	c.f [dB(1/m)]	Result AV [dB(uV/m)]	Result PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1327.500	V	36.3	51.4	-12.6	23.7	38.8	56.0	76.0	32.3	37.2	100.0	177.5
2	1621.875	V	37.2	50.1	-10.5	26.7	39.6	56.0	76.0	29.3	36.4	100.0	34.7
3	1795.000	V	36.5	50.8	-9.5	27.0	41.3	56.0	76.0	29.0	34.7	100.0	311.7
4	2250.000	V	35.9	51.1	-7.8	28.1	43.3	56.0	76.0	27.9	32.7	100.0	34.7
5	2390.000	V	38.2	51.1	-7.6	30.6	43.5	56.0	76.0	25.4	32.5	100.0	12.1

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6.3 Harmonics

Test specification	EN 61000-3-2:2006+A2:2009				
Test mode	Operating mode.				
Date	2011. 07. 01				
Testing voltage	230 V, 50 Hz				
Temperature(°C)	24 °C	Humidity (% R.H.)	52 % R.H.	Pressure (kPa)	100.4 kPa
Remarks	Complied				

6.3.1 Measurement procedure

The equipment is supplied in series with shunt(s) Rm or current transformer(s) from a source having the same nominal voltage and frequency as the rated supply voltage and frequency of the equipment. Measurements shall be made under normal load, or conditions for adequate heat discharge, and under normal operating conditions. User's operation controls or automatic programmers shall be set to produce the maximum harmonic component, for each successive harmonic component in turn. For the purpose of harmonic current limitation, equipment is classified as follows :

Class A : Equipment not specified in one of the three other Classes shall be considered as Class A equipment.

- Balanced three-phase equipment;
- Household appliances excluding equipment identified as Class D;
- Tools excluding portable tools;
- Dimmers for incandescent lamps;
- Audio equipment.

Class B : Portable tools; Arc welding equipment which is not professional equipment.

Class C : Lighting equipment.

Class D : Equipment having a specified power according to 6.2.2 less than or equal to 600 w, of the following types:

- Personal computers and personal computer monitors;
- Television receivers.

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6.3.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Harmonics/Flicker meter	5001x-CTS -400-413	54984	C.I.	12.05.23	☒

6.3.3 Photographs of test setup



This test report shall not be reproduced, except in full, without the written approval.

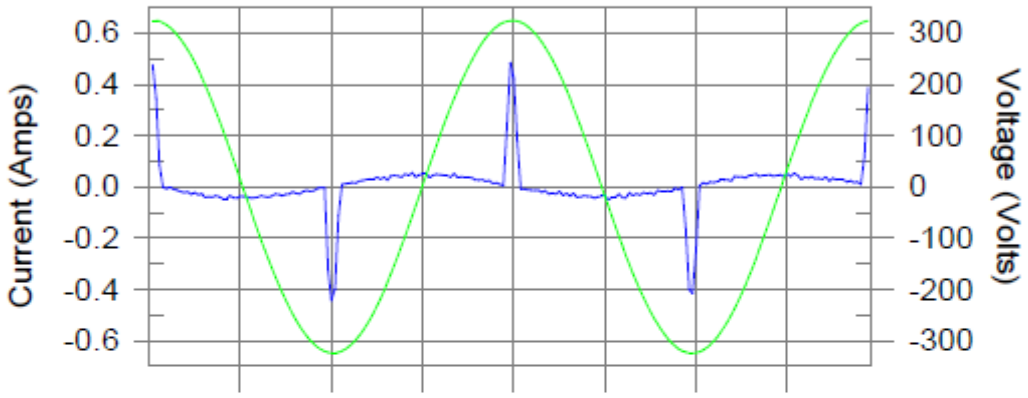
6.3.4 Measurement result

Harmonics – Class-A per Ed. 3.2 (2009)(Run time) incl. inter-harmonics

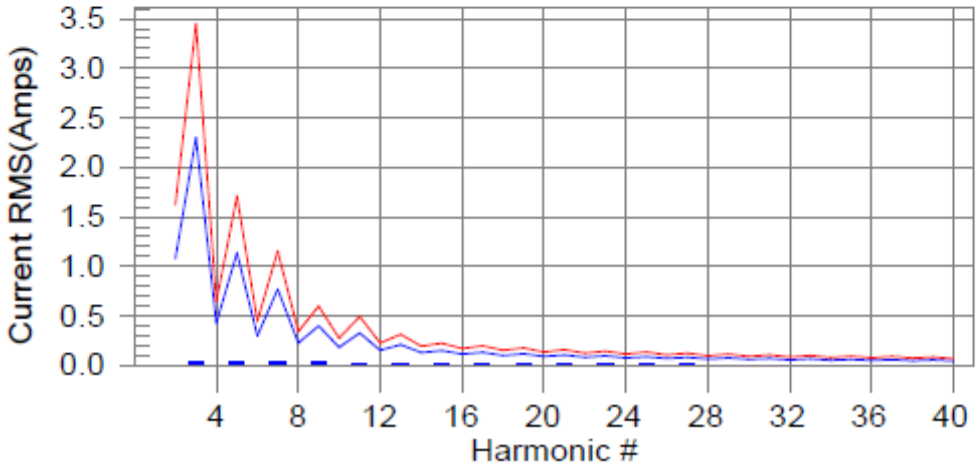
EUT: SRD-440P
Tested by: EMC Compliance
Test category: Class-A per Ed. 3.2 (2009) (European limits)
Test Margin: 100
Test date: 2011-07-01
Start time: 오후 1:26:58
End time: 오후 1:29:48
Test duration (min): 2.5
Data file name: H-000355.cts_data
Comment: Comments
Customer: SAMSUNG TECHWIN

Test Result: Pass
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line
European Limits



Test result: Pass
Worst harmonic was #17 with 15.72% of the limit.

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Current Test Result Summary (Run time)

EUT: SRD-440P
Tested by: EMC Compliance
Test category: Class-A per Ed. 3.2 (2009) (European limits)
Test Margin: 100
Test date: 2011-07-01
Start time: 오후 1:26:58
End time: 오후 1:29:48
Test duration (min): 2.5
Data file name: H-000355.cts_data
Comment: Comments
Customer: SAMSUNG TECHWIN

Test Result: Pass
Source qualification: Normal
THC(A): 0.09
I-THD(%): 188.83
POHC(A): 0.025
POHC Limit(A): 0.277
Highest parameter values during test:

V_RMS (Volts):	229.64	Frequency(Hz):	50.00
I_Peak (Amps):	0.516	I_RMS (Amps):	0.098
I_Fund (Amps):	0.046	Crest Factor:	5.261
Power (Watts):	7.8	Power Factor:	0.349

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	0.0	0.001	1.620	0.09	Pass
3	0.034	2.300	1.5	0.034	3.450	0.98	Pass
4	0.001	0.430	0.0	0.001	0.645	0.23	Pass
5	0.033	1.140	2.9	0.033	1.710	1.92	Pass
6	0.001	0.300	0.0	0.001	0.450	0.28	Pass
7	0.031	0.770	4.1	0.031	1.155	2.73	Pass
8	0.001	0.230	0.0	0.001	0.345	0.33	Pass
9	0.030	0.400	7.5	0.030	0.600	4.98	Pass
10	0.001	0.184	0.0	0.001	0.276	0.37	Pass
11	0.028	0.330	8.5	0.028	0.495	5.64	Pass
12	0.001	0.153	0.0	0.001	0.230	0.44	Pass
13	0.026	0.210	12.2	0.026	0.315	8.18	Pass
14	0.001	0.131	0.0	0.001	0.197	0.46	Pass
15	0.023	0.150	15.5	0.023	0.225	10.38	Pass
16	0.001	0.115	0.0	0.001	0.173	0.49	Pass
17	0.021	0.132	15.7	0.021	0.199	10.46	Pass
18	0.001	0.102	0.0	0.001	0.153	0.50	Pass
19	0.018	0.118	15.3	0.018	0.178	10.24	Pass
20	0.001	0.092	0.0	0.001	0.138	0.54	Pass
21	0.015	0.107	14.4	0.016	0.161	9.65	Pass
22	0.001	0.084	0.0	0.001	0.125	0.58	Pass
23	0.013	0.098	13.1	0.013	0.147	8.82	Pass
24	0.001	0.077	0.0	0.001	0.115	0.61	Pass
25	0.010	0.090	11.5	0.010	0.135	7.74	Pass
26	0.001	0.071	0.0	0.001	0.106	0.64	Pass
27	0.008	0.083	9.6	0.008	0.125	6.47	Pass
28	0.001	0.066	0.0	0.001	0.099	0.75	Pass
29	0.006	0.078	7.5	0.006	0.116	5.14	Pass
30	0.001	0.061	0.0	0.001	0.092	0.82	Pass
31	0.004	0.073	0.0	0.004	0.109	3.68	Pass
32	0.001	0.058	0.0	0.001	0.086	0.98	Pass
33	0.002	0.068	0.0	0.002	0.102	2.29	Pass
34	0.001	0.054	0.0	0.001	0.081	1.10	Pass
35	0.001	0.064	0.0	0.001	0.096	1.05	Pass
36	0.001	0.051	0.0	0.001	0.077	1.30	Pass
37	0.001	0.061	0.0	0.001	0.091	0.91	Pass
38	0.001	0.048	0.0	0.001	0.073	1.45	Pass
39	0.002	0.058	0.0	0.002	0.087	1.85	Pass
40	0.001	0.046	0.0	0.001	0.069	1.59	Pass

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Voltage Source Verification Data (Run time)

EUT: SRD-440P
Tested by: EMC Compliance
Test category: Class-A per Ed. 3.2 (2009) (European limits)
Test Margin: 100
Test date: 2011-07-01
Start time: 오후 1:26:58
End time: 오후 1:29:48
Test duration (min): 2.5
Data file name: H-000355.cts_data
Comment: Comments
Customer: SAMSUNG TECHWIN

Test Result: Pass
Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	229.64	Frequency(Hz):	50.00
I_Peak (Amps):	0.516	I_RMS (Amps):	0.098
I_Fund (Amps):	0.046	Crest Factor:	5.261
Power (Watts):	7.8	Power Factor:	0.349

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.100	0.459	21.80	OK
3	0.574	2.067	27.78	OK
4	0.021	0.459	4.60	OK
5	0.019	0.919	2.12	OK
6	0.024	0.459	5.17	OK
7	0.013	0.689	1.88	OK
8	0.017	0.459	3.65	OK
9	0.027	0.459	5.93	OK
10	0.006	0.459	1.31	OK
11	0.016	0.230	7.08	OK
12	0.023	0.230	10.17	OK
13	0.045	0.230	19.64	OK
14	0.006	0.230	2.65	OK
15	0.020	0.230	8.77	OK
16	0.020	0.230	8.57	OK
17	0.028	0.230	12.27	OK
18	0.014	0.230	6.15	OK
19	0.032	0.230	13.83	OK
20	0.006	0.230	2.60	OK
21	0.022	0.230	9.51	OK
22	0.005	0.230	2.05	OK
23	0.018	0.230	8.03	OK
24	0.009	0.230	4.05	OK
25	0.020	0.230	8.51	OK
26	0.010	0.230	4.20	OK
27	0.009	0.230	4.04	OK
28	0.007	0.230	2.88	OK
29	0.014	0.230	6.07	OK
30	0.012	0.230	5.35	OK
31	0.006	0.230	2.65	OK
32	0.012	0.230	5.22	OK
33	0.004	0.230	1.76	OK
34	0.006	0.230	2.63	OK
35	0.005	0.230	2.32	OK
36	0.009	0.230	3.71	OK
37	0.012	0.230	5.44	OK
38	0.007	0.230	3.09	OK
39	0.012	0.230	5.25	OK
40	0.011	0.230	4.58	OK

This test report shall not be reproduced, except in full, without the written approval.

6.4 Flicker

Test specification	EN 61000-3-3:2008				
Test mode	Operating mode.				
Date	2011. 07. 01				
Testing voltage	230 V, 50 Hz				
Temperature(°C)	24 °C	Humidity (% R.H.)	52 % R.H.	Pressure (kPa)	100.4 kPa
Remarks	Complied				

6.4.1 Measurement procedure

EUT was connected to the power analyzer system.

Measurement was performed to obtain the desired flicker parameters.

The measuring time depends on which parameters are to be measured.

P_{lt} = 2 h

P_{st} = 10 min

Controls and automatic programs shall be set to produce the most unfavorable sequence of voltage changes, using only those combinations of controls and programs are mentioned by the manufacturer in the instruction manual.

This test report shall not be reproduced, except in full, without the written approval.

6.4.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Harmonics/Flicker meter	5001x-CTS -400-413	54984	C.I.	12.05.23	☒

6.4.3 Photographs of test setup



This test report shall not be reproduced, except in full, without the written approval.

6.4.4 Measurement result

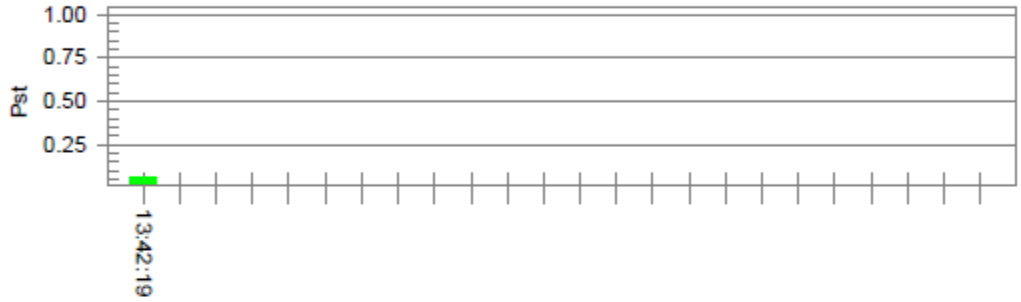
Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: SRD-440P
Test category: All parameters (European limits)
Test date: 2011-07-01
Test duration (min): 10
Comment: Comments
Customer: SAMSUNG TECHWIN

Tested by: EMC Compliance
Test Margin: 100
Start time: 오후 1:31:59
End time: 오후 1:42:20
Data file name: F-000356.cts_data

Test Result: Pass
Status: Test Completed

Pst and limit line
European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.58			
Highest dt (%):	0.00	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650	Pass

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6.5 Electrostatic Discharge

Test specification	EN 61000-4-2:2009				
Test level	Contact: ± 2, 4, 6 ㎸ Air: ± 2, 4, 8 ㎸ HCP / VCP: ± 2, 4, 6 ㎸				
Discharge impedance	330 Ω / 150 ㎊				
Testing voltage	230 Ⅴ, 50 ㎐				
Date	2011. 07. 04				
Number of discharge (Each polarity)	10				
Interval between discharges	1 s				
Temperature(°C)	25 °C	Humidity (% R.H.)	52 % R.H.	Pressure (㎪)	100.2 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.5.1 Measurement procedure

A ground reference plane was located on the floor, and connected to earth via a low Impedance connection. The return cable of the ESD generator was connected to the reference plane. In case of floor standing equipment, EUT was placed on the reference plane on 0.1 ㎡ of insulating Support. In case of table top equipment, EUT was placed on a wooden table 0.8 ㎡ above the reference grounded floor. A horizontal coupling plane (HCP) was placed on the table, and Connected to the reference plane via a 470 ㏀ resistor located in each end (0.5 ㎜ insulating support between EUT and HCP). In both cases a vertical coupling plane(VCP) OF 0.5 X 0.5 ㎡ was located 0.1 ㎡ from the EUT's sides. The VCP was connected to the reference plane in the same matter as the HCP.

This test report shall not be reproduced, except in full, without the written approval.

6.5.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. Date	Used
ESD Tester	NSG 437	182	TESEQ	12.05.23	☒
HCP	-	-	-	-	☒
VCP	-	-	-	-	☒

6.5.3 Photographs of test setup

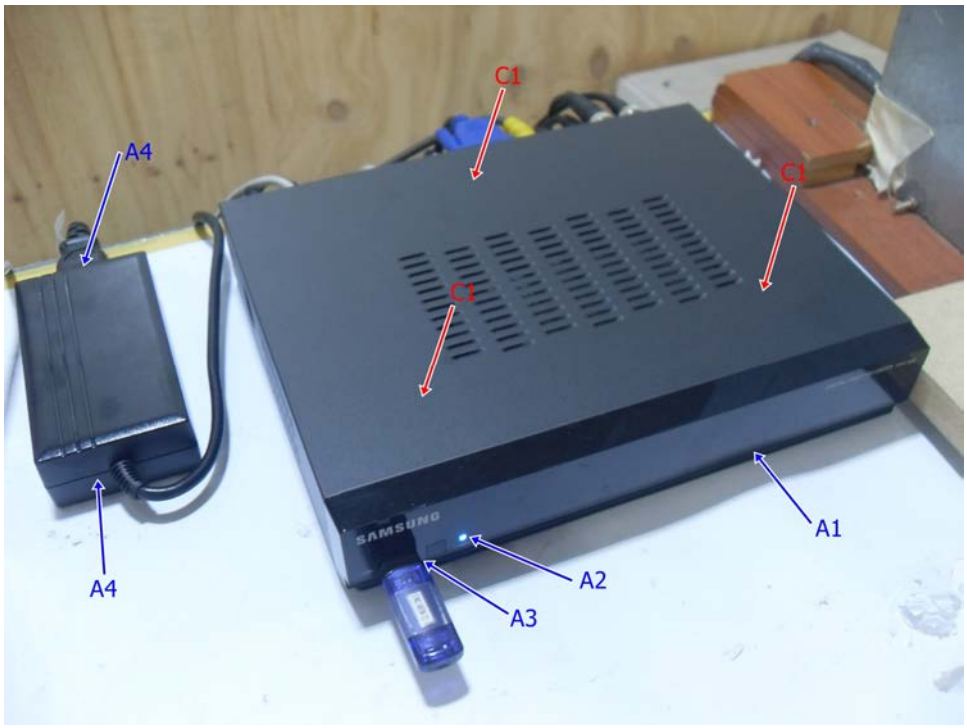


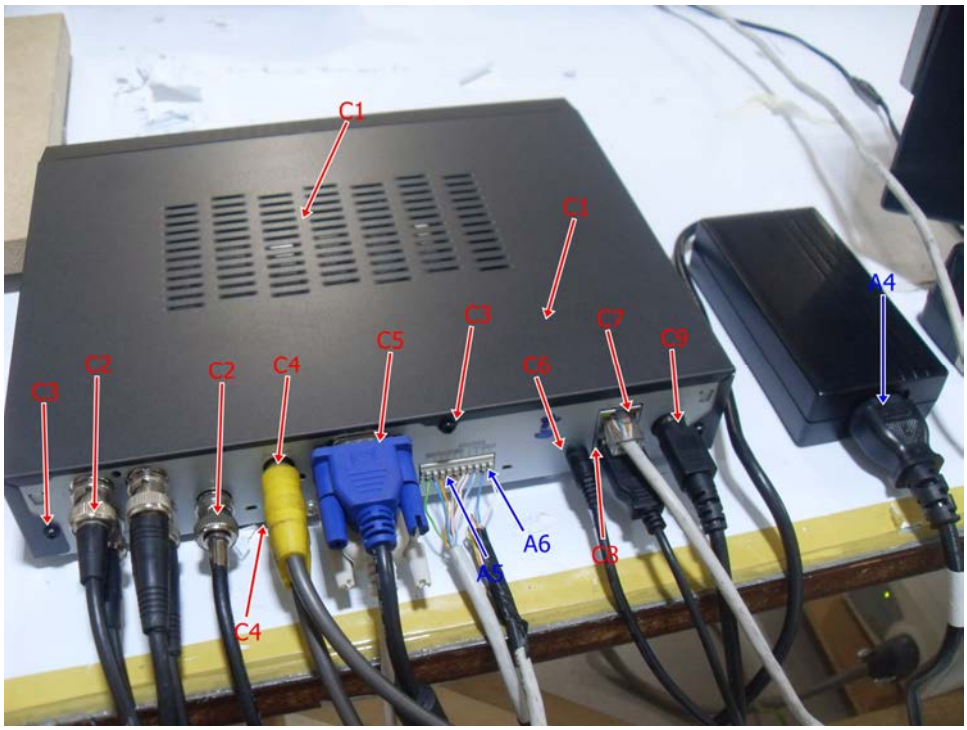
This test report shall not be reproduced, except in full, without the written approval.

6.5.4 Measurement result

Electrostatic Discharge (Test Point)

Air discharge →
Contact discharge →





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Contact discharge

Location(EUT)		Applied level (±)	Result
C1	Case	± 2, 4, 6 kV	Complied
C2	BNC Port	± 2, 4, 6 kV	Complied
C3	Screw	± 2, 4, 6 kV	Complied
C4	Audio In/Out Port	± 2, 4, 6 kV	Complied
C5	VGA Port	± 2, 4, 6 kV	Complied
C6	Console Port	± 2, 4, 6 kV	Complied
C7	LAN(RJ-45) Port	± 2, 4, 6 kV	Complied
C8	USB Port	± 2, 4, 6 kV	Complied
C9	Power Port	± 2, 4, 6 kV	Complied
	HCP (All 4 sides)	± 2, 4, 6 kV	Complied
	VCP (All 4 sides)	± 2, 4, 6 kV	Complied

Air discharge

Location(EUT)		Applied level (±)	Result
A1	Case	± 2, 4, 8 kV	Complied
A2	LED	± 2, 4, 8 kV	Complied
A3	USB Port	± 2, 4, 8 kV	Complied
A4	Adaptor	± 2, 4, 8 kV	Complied
A5	Alarm In/Out	± 2, 4, 8 kV	Complied
A6	RS-485	± 2, 4, 8 kV	Complied

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6.6 Radio Frequency Electromagnetic Fields

Test specification	EN 61000-4-3:2006+A2:2010				
Tested frequency	80 ㎒ ~ 1 ㎓, 1 ㎓ ~ 2 ㎓ log 1 % step				
Test level & Modulation	1, 3, 10 ㅧ/m, 80 % Amplitude Modulation (1 ㎑) 1, 3, 10 ㅧ/m, Pulse Modulation (1 ㎐ (0.5 s ON: 0.5 s OFF))				
Distance	3 m from EUT to tip of antenna				
Dwell time	3 s				
Step size	log 1 % step				
Testing voltage	230 ㅧ, 50 ㎐				
Date	2011. 07. 04				
Temperature(°C)	25°C	Humidity (% R.H.)	51 % R.H.	Pressure (㎪)	100.2 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.6.1 Measurement procedure

The test was performed at 3 m full anechoic chamber.

For floor standing equipment, the EUT was standing on the floor.

For tabletop equipment, the EUT was located on a wooden table 0.8 m above the floor.

The EUT was tested all sides, horizontal and vertical polarization.

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6.6.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Power meter	PM2002	302852	AR	12.04.11	☒
Power sensor	PH2000	303224	AR	12.04.11	☒
Power sensor	PH2000	303222	AR	12.04.11	☒
Directional coupler	DC6180	303976	AR	12.04.11	☒
Directional coupler	DC7144M1	320279	AR	12.02.23	☒
Signal generator	E4421B	GB40052295	AGILENT	11.10.25	☒
Amplifier	150W1000M2	303843	AR	12.04.11	☒
Amplifier	60S1G3M2	320444	AR	12.04.11	☒
Broadband Ant.	LPDA-0803	130269	ETS	-	☒
Field monitor	SI-300	-	TDK	-	☒
Antenna master	-	-	ETS	-	☒

6.6.3 Photographs of test setup



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6.6.4 Measurement result

Location(EUT)	Antenna polarization	Result
Front side	Horizontal	Complied
	Vertical	Complied
Rear side	Horizontal	Complied
	Vertical	Complied
Left side	Horizontal	Complied
	Vertical	Complied
Right side	Horizontal	Complied
	Vertical	Complied

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6.7 Electric Fast Transient/BURST

Test specification	EN 61000-4-4:2004+A1:2010				
Coupling	AC main Signal: Clamp Telecommunication : Clamp				
Test level	AC main: ± 2 kV Peak Signal: ± 1 kV Peak Telecommunication: ± 1 kV Peak				
Repetition frequency	5 ㎑, Tr/Th = 5 / 50 ns				
Coupling time	60 s				
Testing voltage	230 V, 50 Hz				
Date	2011. 07. 05				
Temperature(°C)	24 °C	Humidity (% R.H.)	49 % R.H.	Pressure (㎪)	100.4 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.7.1 Measurement procedure

A ground reference plane was located on the floor.
EFT generator was connected to reference ground plane via low impedance connection.
For floor standing equipment, EUT was placed on a 0.1 m wooden table.
For tabletop equipment, EUT was placed on a 0.1 m above the ground reference plane.
Test generator and coupling/decoupling network was placed on, and bounded to, the ground reference plane. When using the coupling clamp, the minimum distance between the coupling plates and all other conductive surfaces, except the ground reference plane beneath the coupling clamp, Shall be 0.5 m.

6.7.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	V0545100858	EM TEST	12.02.09	☒
Capacitive Coupling Clamp	-	-	EM TEST	-	☒

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6.7.3 Photographs of test setup





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6.7.4 Measurement result

* AC Main

EFT coupling point	(+)	(-)	Result
L+N+PE	+ 2 ㎸	- 2 ㎸	Complied

* Signal

EFT coupling point	(+)	(-)	Result
Alarm In/Out	+ 1 ㎸	- 1 ㎸	Complied
Video Out/In	+ 1 ㎸	- 1 ㎸	Complied
RS-485	+ 1 ㎸	- 1 ㎸	Complied

* Telecommunication

EFT coupling point	(+)	(-)	Result
LAN(RJ-45)	+ 1 ㎸	- 1 ㎸	Complied

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6.8 Surge

Test specification	EN 61000-4-5:2006				
Coupling	AC Main Signal: CDN				
Test level	AC main Differential mode: ± 0.5, 1 ㎸ Common mode: ± 0.5, 1, 2 ㎸ Signal: ± 0.5, 1 ㎸				
Surge pulse shape	Tr/Th = 1.2 / 50 ㎲				
Coupling Impedance	AC main Differential mode: 18 ㎌ Common mode: 10 Ω + 9 ㎌ Signal(Alarm In/Out): 40 Ω/signal(Video In):Direct				
Number of surge & Coupling time	5 / 1 min				
Angles	0 °, 90 °, 180 °, 270 °				
Testing voltage	230 ㎸, 50 ㎐				
Date	2011. 07. 15				
Temperature(°C)	24 °C	Humidity (% R.H.)	51 % R.H.	Pressure (㎪)	100.2 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.8.1 Measurement procedure

A ground reference plane was located on the floor. SURGE generator was connected to reference ground plane via low impedance connection. For floor standing equipment & table top equipment, EUT was placed on a wooden table.

6.8.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	V0545100858	EM TEST	12.02.09	☒
CDN	CNV 508	1001-10	EM TEST	-	☒

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6.8.3 Photographs of test setup





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6.8.4 Measurement result

* AC Main

Coupling point	(+)	(-)	Result
L-N	+ 0.5, 1 kV	- 0.5, 1 kV	Complied
L-PE	+ 0.5, 1, 2 kV	- 0.5, 1, 2 kV	Complied
N-PE	+ 0.5, 1, 2 kV	- 0.5, 1, 2 kV	Complied

* Signal

Coupling point	(+)	(-)	Result
Alarm In/Out	+ 0.5, 1 kV	- 0.5, 1 kV	Complied
Video In	+ 0.5, 1 kV	- 0.5, 1 kV	Complied

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6.9 Conducted Immunity

Test specification	EN 61000-4-6:2009				
Tested frequency	0.15 ㎒ ~ 100 ㎒ log 1 % step				
Test level & Modulation	1, 3, 10 Ⅴ, 80 % Amplitude Modulation (1 ㎑) 1, 3, 10 Ⅴ, Pulse Modulation (1 ㎐ (0.5 s ON: 0.5 s OFF))				
Coupling method	AC mian: M3 Signal: Clamp Telecommunication : Clamp				
Testing voltage	230 Ⅴ, 50 ㎐				
Date	2011. 07. 04				
Temperature(°C)	24 °C	Humidity (% R.H.)	49 % R.H.	Pressure (㎪)	100.2 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.9.1 Measurement procedure

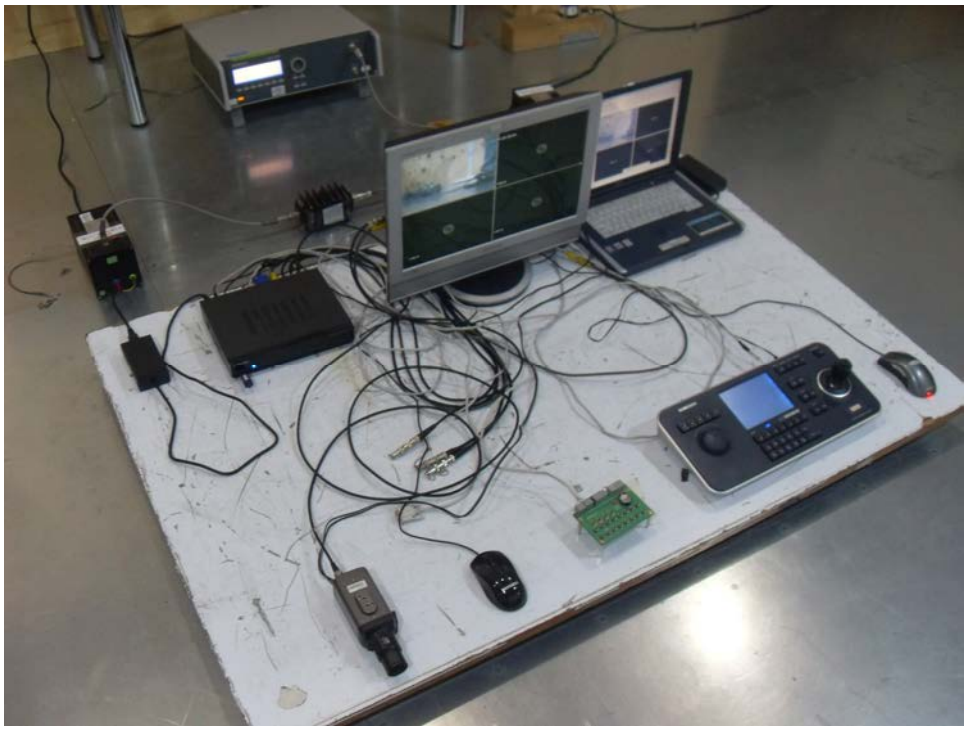
A ground reference plane was located on the floor. The test was performed on a ground reference plane on a 0.1 m wooden table. This test were performed using CDN for mains, clamp for signal and injection probe. The frequency range was swept from 0.15 ㎒ to 100 ㎒. This frequency range was Modulated with 1 ㎑ sine wave at 80 %. The signal generators provided the modulated frequency at a 1 % step size. The power and all network cable, I/O cables longer than 3 m length were tested.

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6.9.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
CS generator	CWS500N1	EM TEST	V1041107702	12.06.21	☒
CDN	CDN M2/M3	0906-12	EM TEST	11.10.13	☒
CDN	CDN M3-32A	0506-29	EM TEST	12.02.11	☒
CDN	CDN S1/75	0410-28	EM TEST	12.05.17	☒
Attenuator	73-6-34	MU918	MCE/WEINSCHEL	11.10.13	☒
EM Clamp	KEMZ 801	17643	Schaffner	12.04.25	☐
Current probe	MD720	W1345167/M6/0068	Schaffner	-	☐

6.9.3 Photographs of test setup



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6.9.4 Measurement result

* AC Main

Coupling point	Coupling method	Result
Power	CDN(M3)	Complied

* Signal

Coupling point	Coupling method	Result
Alarm In/Out	Clamp	Complied
Video Out/In	CDN(S1/75)	Complied
RS-485	Clamp	Complied

* Telecommunication

Coupling point	Coupling method	Result
LAN(RJ-45)	Clamp	Complied

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6.10 Dips and Interruptions

Test specification	EN 61000-4-11:2004				
Number of dips	3 T				
Duration	10 s				
Phase	Zero crossing (0 °, 180 °)				
Testing voltage	100 ㎷, 50 ㎐ / 240 ㎷, 50 ㎐				
Date	2011. 07. 05				
Temperature (°C)	24 °C	Humidity (% R.H)	51 % R.H	Pressure (㎪)	100.4 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.10.1 Measurement procedure

The dips/interruption test is only applicable to AC mains.

The dips/interruptions were applied at zero crossing.

6.10.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	V0545100858	EM TEST	12.02.09	☒

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6.10.3 Photographs of test setup



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6.10.4 Measurement result

* 230 V, 50 Hz

Test Level (%UT)	Dip/Int. (%UT)	Duration /Period	Phase (°)	Count number	Result
0 %	100 %	0.5, 1, 5 Period	0 / 180	3T	Complied
40 %	60 %	0.5, 1, 5, 10 Period	0 / 180	3T	Complied
70 %	30 %	0.5, 1, 5, 10 Period	0 / 180	3T	Complied

Comment:

- There was no change of operation status during above testing.

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6.11 Mains supply voltage variations

Test specification	EN 50130-4:1995+A1:1998+A2:2003				
Supply voltage	*U nom* + 10 %, *U nom* - 15 %				
Testing voltage	100 V, 50 Hz / 240 V, 50 Hz				
Date	2011. 07. 05				
Temperature (°C)	24 °C	Humidity (% R.H)	51 % R.H	Pressure (kPa)	100.4 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.11.1 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Generator	UCS 500 M6	V0545100858	EM TEST	12.02.09	☒

6.11.2 Measurement result

***** 230 V, 50 Hz

Supply voltage		Result
+ 10 %	253 V	Complied
- 15 %	195 V	Complied

- There was no change of operation status during above testing.

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7. E.U.T. photographs

Front View



Rear View



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Left View



Right View



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Top View



Bottom View



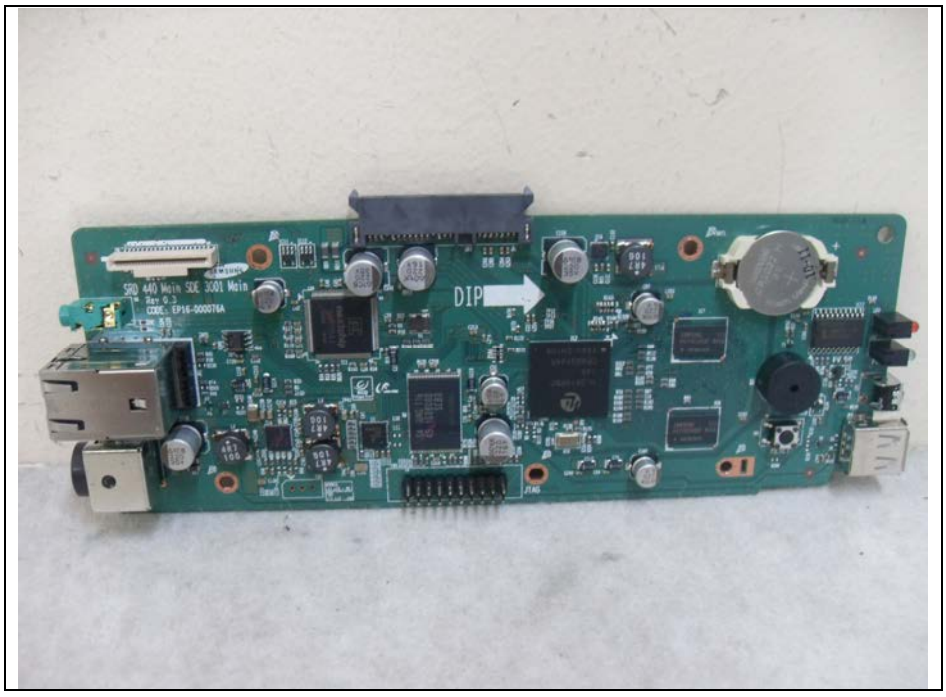
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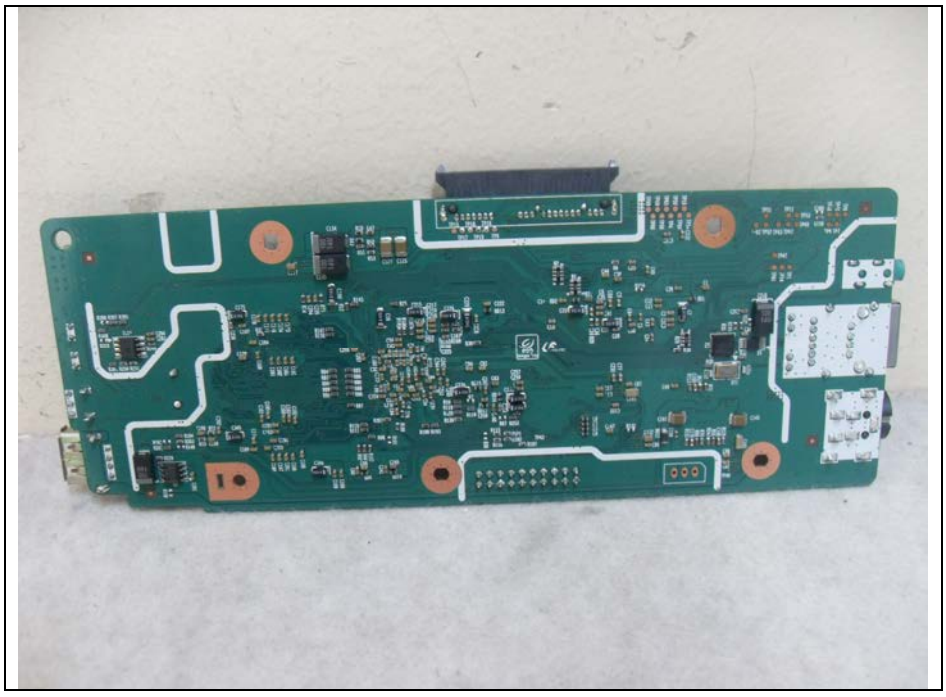
Inside



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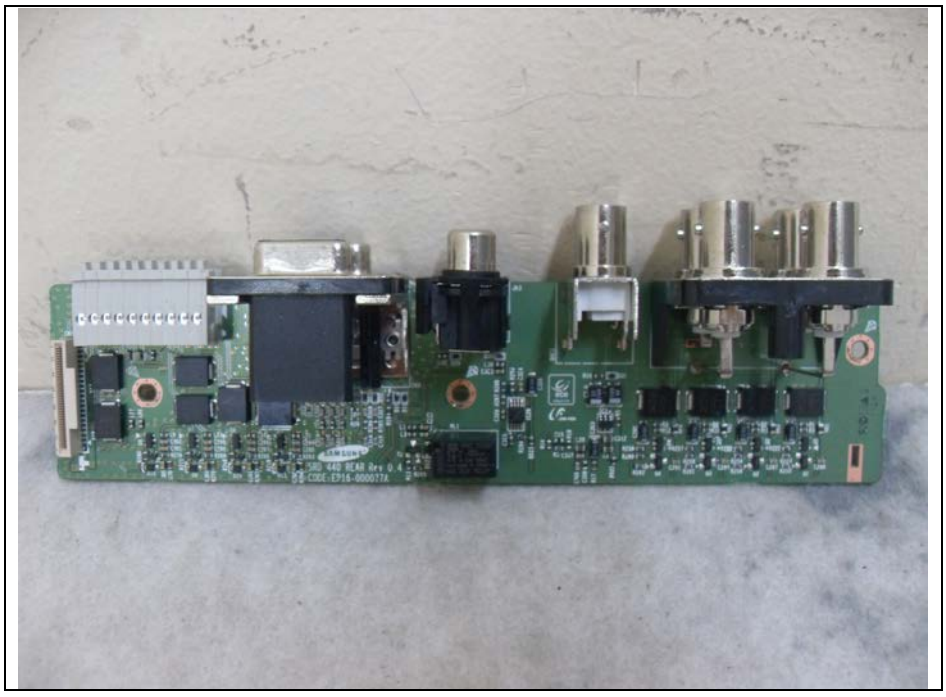
Main Board

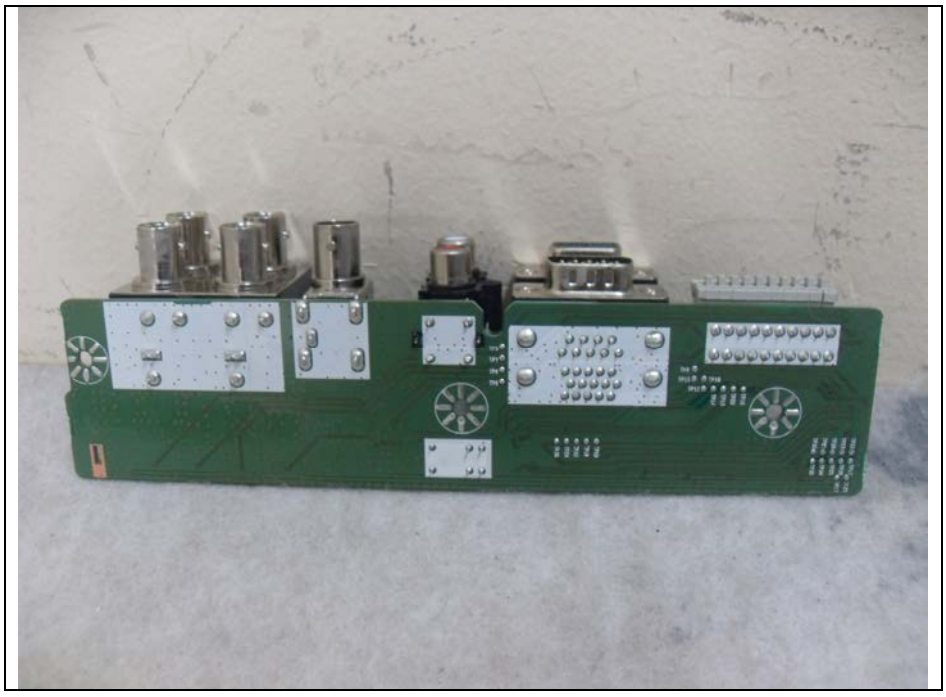




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Rear Board





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HDD(500GB)





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Adaptor





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