Declaration of Conformity

SAMSUNG TECHWIN

CE

Type of equipment:	**DIGITYAL VIDEO RECORDER**
Brand Name /Trade Mark:	**SAMSUNG**
Type designation /model:	**SRD-442P**
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 55022:2006+A1:2007	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	Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4:2004	Electrical fast transient/burst immunity test
EN 61000-4-5:2006	Surge immunity test
EN 61000-4-6:2007	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 / Fubtrary 20, 2012

Authorized Signatory: Name : Jei Soon, Kang

Title : Principal Research Engineer

Signature :



EMC TEST REPORT

Test report No:	**EMC-CE-2976**
Type of Equipment:	**DIGITYAL VIDEO RECORDER**
Model Name:	**SRD-442P**
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 55022:2006+A1:2007, 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.
This test report shall not be reproduced, except in full, without the written approval of EMC compliance Laboratory.

Date of receipt: 2012. 01. 17

Date of testing: 2012. 02. 15 ~ 02. 17

Issued date: 2012. 02. 20

Tested by: JUNG, YOUNG-JUN

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

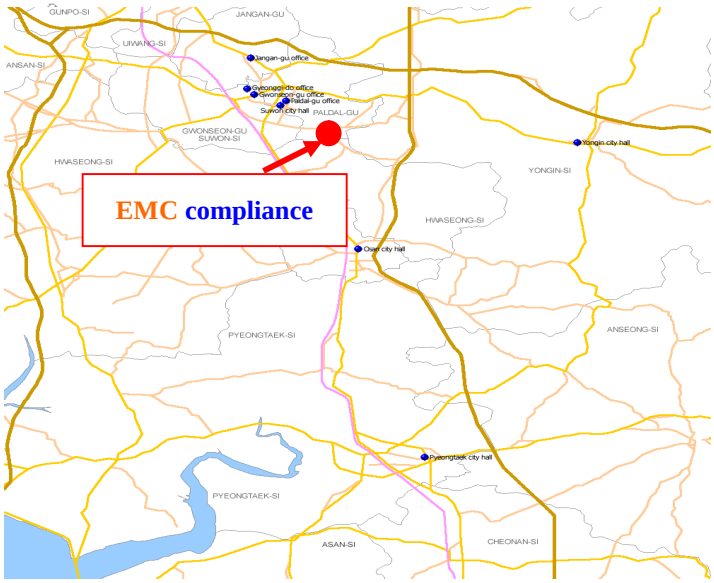
Address

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)	:	20 °C	10 % R.H.	-
Shielded room(CE)	:	20 °C	13 % R.H.	-
Shielded room(ESD)	:	22 °C	42 % R.H.	101.6 kPa

Test site

These testing items were performed following locations;

Test item	Test site
Conducted Emission	Shielded Room
Radiated Emission	10 m Chamber
Harmonics current	Immunity area
Voltage fluctuations and flickers	Immunity area
Electrostatic discharge	Shielded Room
Radiated RF immunity	Fully anechoic chamber (3 m)
Electric Fast Transient/BURST	Shielded Room
Surge	Shielded Room
Conducted RF immunity	Shielded Room
Voltage dip/interruption	Shielded Room
Mains supply voltage variations	Shielded Room

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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 %)		
Shielded Room (CE#1)	9 ㎑ ~ 150 ㎑: ± 3.77 [dB] 150 ㎑ ~ 30 ㎒: ± 3.35 [dB]	
Shielded Room (CE#2)	9 ㎑ ~ 150 ㎑: ± 3.95 [dB] 150 ㎑ ~ 30 ㎒: ± 3.55 [dB]	
Shielded Room (CE#3)	9 ㎑ ~ 150 ㎑: ± 3.88 [dB] 150 ㎑ ~ 30 ㎒: ± 3.50 [dB]	
Radiated Emission measurement :(k = 2, 95 %)		
10 m Chamber (#F4)	30 ㎒ ~ 300 ㎒	3 m: + 4.29 [dB], - 4.31 [dB] 10 m: + 4.28 [dB], - 4.30 [dB]
	300 ㎒ ~ 1 000 ㎒	3 m: + 4.57 [dB], - 4.57 [dB] 10 m: + 4.42 [dB], - 4.44 [dB]
	1 ㎓ ~ 6 ㎓	3 m: + 5.94 [dB], - 5.95 [dB]
10 m Chamber (#F2)	30 ㎒ ~ 300 ㎒	3 m: + 4.28 [dB], - 4.30 [dB] 10 m: + 4.27 [dB], - 4.28 [dB]
	300 ㎒ ~ 1 000 ㎒	3 m: + 4.56 [dB], - 4.57 [dB] 10 m: + 4.41 [dB], - 4.43 [dB]
	1 ㎓ ~ 6 ㎓	3 m: + 5.94 [dB], - 5.95 [dB]
Radio Frequency Electromagnetic Fields :(k = 2, 95 %)		
± 1.82 [dB]		
Disturbance power Electromagnetic Fields: (k = 2, 95 %)		
± 3.73 [dB]		

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4. Description of E.U.T.

4.1 General information

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
Display	LCD	4.3 Inch Built-In (감압식), 1 Touch (Click), 1초이상 Touch (Double Clock)
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	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 2 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 Composite	1 BNC (1 Vp-p, 75 ohm) ※ Main Composite Selectable
	Spot Composite	※ Main Composite Selectable
	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
General		
Electrical	Input Voltage/Current	DC12V Adaptor,4A,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)	215 x 88 x 354mm
	Weight (With hard disks)	Approx. 3 kg
	Rack mount kit	Not Support
Lauguage		Korean, Japanese, Chinese, English, French, German, Spanish, Italian, Russian, Polish, Czech, Turkish, Netherlands, Portuguese,Swedish,Danish, Thailandais, Rumania, Serbia, Croatia, Hungary, Greek (22

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4.2 Product description

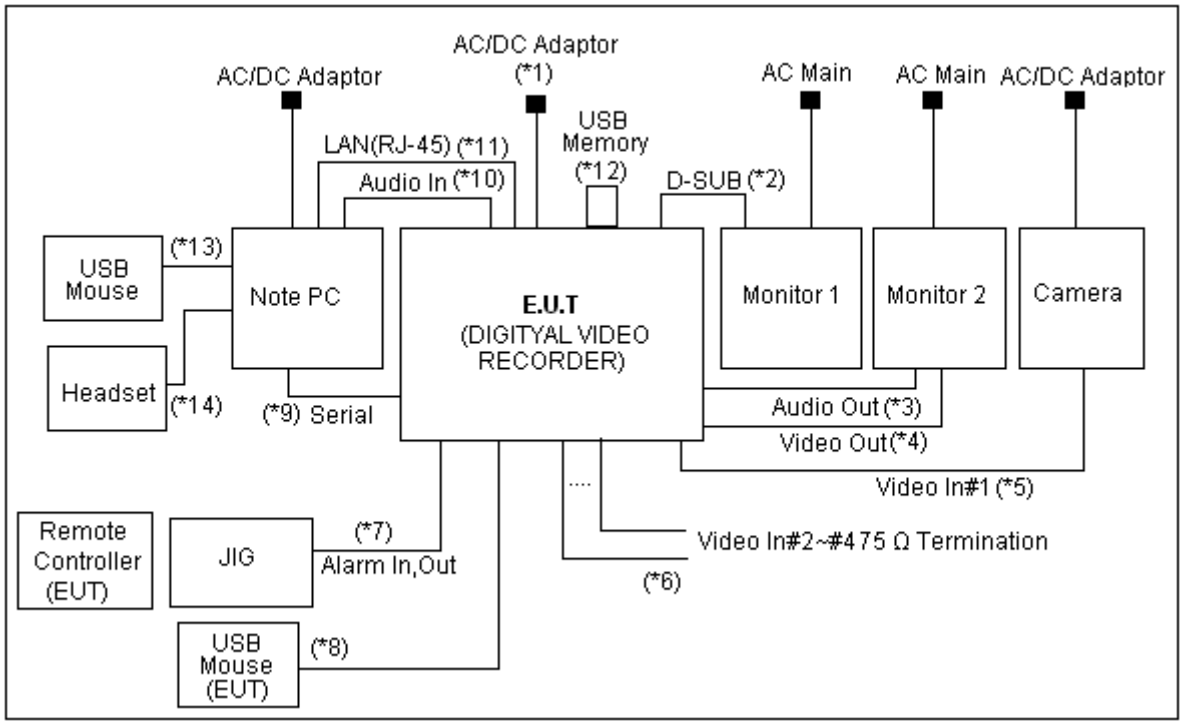
Type of product	DIGITYAL VIDEO RECORDER
Model name (Basic)	SRD-442P
Model name (Variant)	N/A
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	230 Ⅴ, 50 Hz
Product rating	AC/DC Adaptor (model name: ADP-4812) Input: AC 100 - 240 Ⅴ, 50 / 60 Hz, 1.2 A Output: DC 12 Ⅴ, 4 A
Internal clock frequency	400 ㎒
Note	AC/DC adaptor was provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Monitor 1	GH19PS	N865HVTP900897M	SAMSUNG
Monitor 2	PM24KO	YER8HVDBA00057E	SAMSUNG
Note PC	PSLQ0K-02N005	2A046497Q	TOSHIBA
USB Mouse	1088	8165906050943	Microsoft
Headset	SHS-250V	-	SAMSUNG
Camera	SNZ-5200	-	SAMSUNG Techwin
USB Memory(1GB)	-	888120418	-
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** (DIGITYAL VIDEO RECORDER)	Power	AC/DC Adaptor	Power	1.0	Non-Shield	-
2		D-SUB	Monitor 1	D-SUB	1.6	Shield	-
3		Audio Out	Monitor 2	Audio In	3.0	Shield	Out-door
4		Video Out	Monitor 2	Video In	3.0	Shield	Out-door
5		Video In#1	Camera	Video Out	3.0	Shield	Out-door
6		Video In#2~#4	75 Ω Termination	-	3.0	Shield	Out-door
7		Alarm In,Out	JIG	Alarm In,Out	3.0	Non-Shield	Out-door
8		USB	USB Mouse(EUT)	USB	1.6	Shield	-
9		Serial	Note PC	USB	1.4	Shield	-
10		Audio In	Note PC	Audio Out	3.0	Shield	Out-door
11		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Non-Shield	-
12		USB	USB Memory	USB	Direct	-	-
13	Note PC	USB	USB Mouse	USB	1.8	Shield	-
14		Speaker	Headset	Speaker	2.0	Non-Shield	-

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4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Web viewer test mode.
	Monitoring test mode.
	1㎑ MP3 Play Test mode.(Program: Window Media Player)
	Alarm operating mode.
	REC Test 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

Applied	Test items	Test method	Result
☒	Conducted Emission	EN 55022:2006+A1:2007	Complied
☒	Radiated Emission	EN 55022:2006+A1:2007	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

Applied	Test items	Test method	Result
☒	Electrostatic discharge	EN 61000-4-2:2009	Complied
☒	Radiated RF immunity	EN 61000-4-3:2006	Complied
☒	Electric Fast Transient/BURST	EN 61000-4-4:2004	Complied
☒	Surge	EN 61000-4-5:2006	Complied
☒	Conducted RF immunity	EN 61000-4-6:2007	Complied
☒	Voltage dip/interruption	EN 61000-4-11:2004	Complied
☒	Mains supply voltage variations	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 55022:2006+A1:2007, Class A		
Testing voltage	230 V, 50 Hz		
Test facility	Shielded room (CE#1)		
Date	2012. 02. 15		
Temperature (°C)	20 °C	Humidity (% R.H.)	13 % R.H.
Remarks	Complied		

6.1.1 Limits of conducted emission measurement

☒ AC main

Frequency [㎒]	Class A (dB(㎶))		Class B (dB(㎶))	
	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 [㎒]	Class A Voltage Limits (dB(㎶))		Current Limits (dB(㎂))	
	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
Frequency [㎒]	Class B Limits (dB(㎶))		Current Limits (dB(㎂))	
	Quasi-Peak	Average	Quasi-Peak	Average
0.15 ~ 0.5	84 to 74	74 to 64	40 to 30	30 to 20
0.5 ~ 30	74	64	30	20

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

* 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.
Both lines of power cord, hot and neutral, were measured.

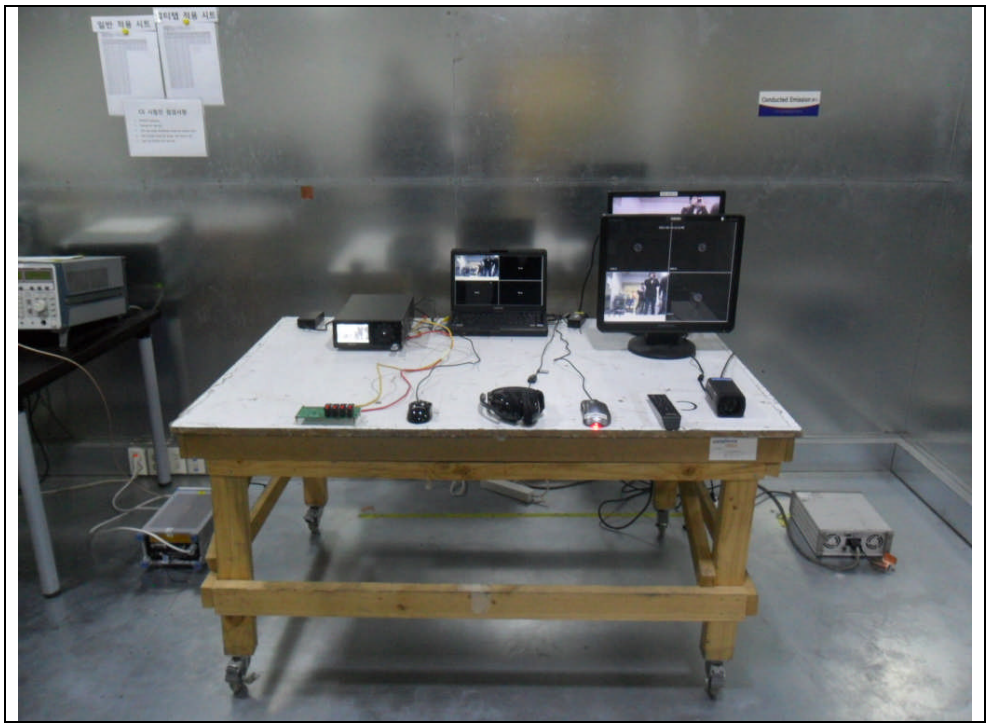
6.1.3 Used equipments

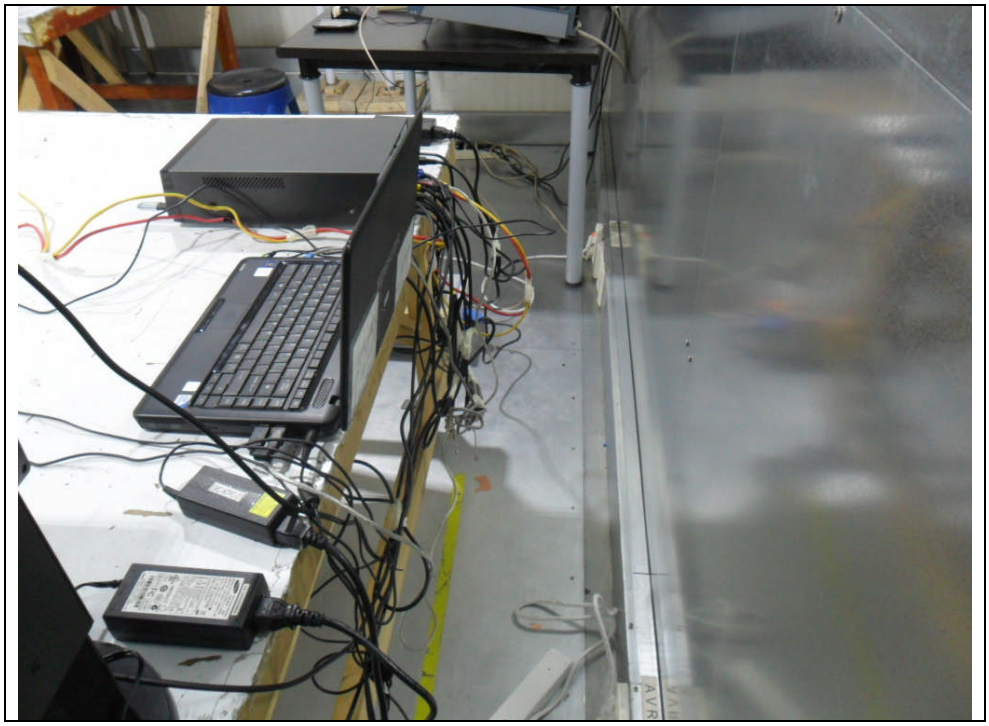
Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test Receiver	ESHS30	828765/009	R&S	2012.10.28	☒
LISN	ENV216	101358	R&S	2012.10.26	☒
LISN	L2-16A	0000J10705	PMM	-	☒
ISN	T800	24314	TESEQ	2012.12.12	☒

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6.1.4 Photographs of test setup

* AC Main





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* Telecommunication



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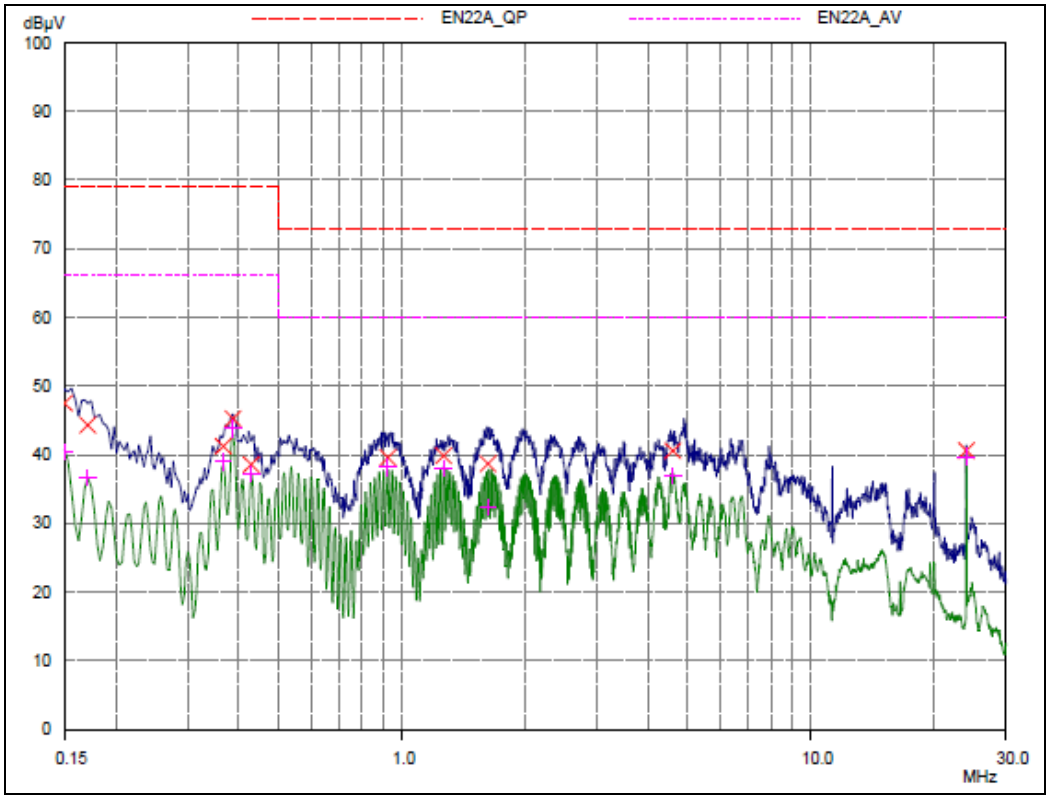
6.1.5 Conducted emission measurement result

*AC Main

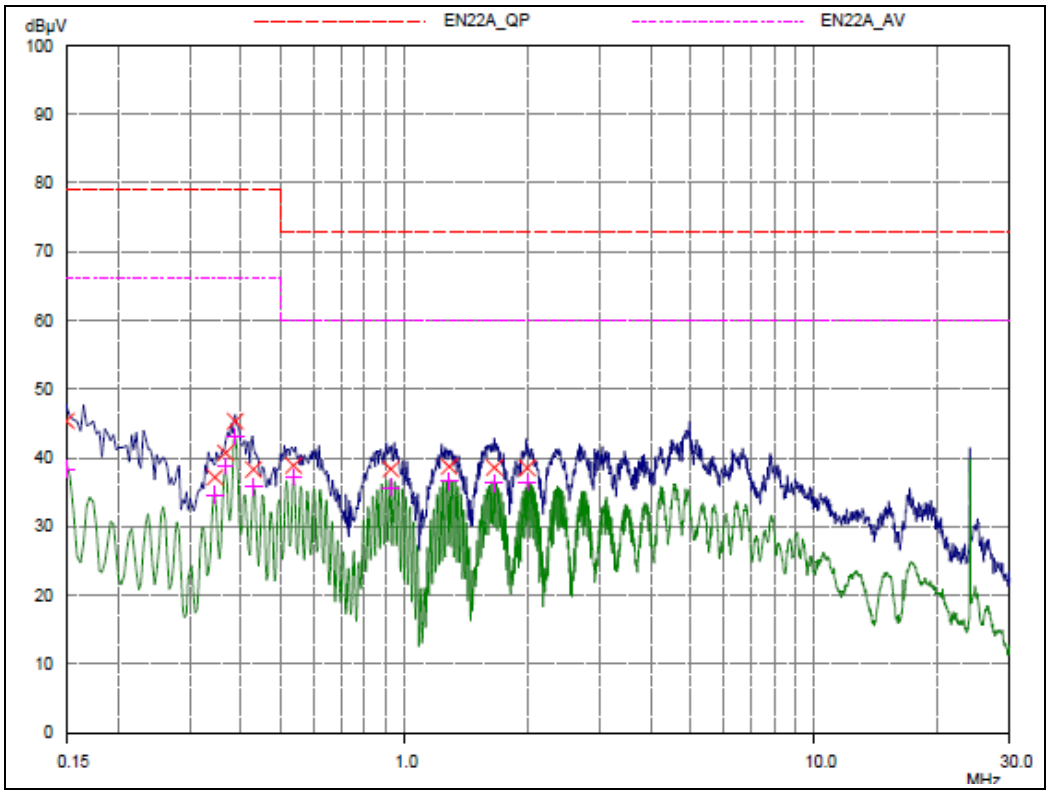
Frequency	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
[㎒]	LISN	Cable		[dB(㎶)]	[dB(㎶)]	[dB(㎶)]	[dB]	[dB(㎶)]	[dB(㎶)]	[dB(㎶)]	[dB]
0.150	9.82	0.03	H	79.00	37.65	47.50	31.50	66.00	30.56	40.41	25.59
0.171	9.82	0.03	H		34.44	44.29	34.71		26.81	36.66	29.34
0.345	9.92	0.03	N		27.22	37.17	41.83		24.66	34.61	31.39
0.366	9.93	0.03	H		31.28	41.24	37.76		29.02	38.98	27.02
0.387	9.94	0.03	N		35.35	45.32	33.68		33.17	43.14	22.86
0.429	9.96	0.03	H		28.57	38.56	40.44		27.15	37.14	28.86
0.537	9.96	0.03	N	73.00	28.88	38.87	34.13	60.00	27.15	37.14	22.86
0.924	9.80	0.04	H		29.74	39.58	33.42		28.37	38.21	21.79
1.266	9.77	0.04	H		30.07	39.88	33.12		28.26	38.07	21.93
1.287	9.77	0.04	N		28.92	38.73	34.27		26.76	36.57	23.43
4.595	9.63	0.07	H		30.92	40.62	32.38		27.23	36.93	23.07
24.000	9.60	0.14	H		30.97	40.71	32.29		30.00	39.74	20.26

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[Hot-Line]



[Neutral-Line]



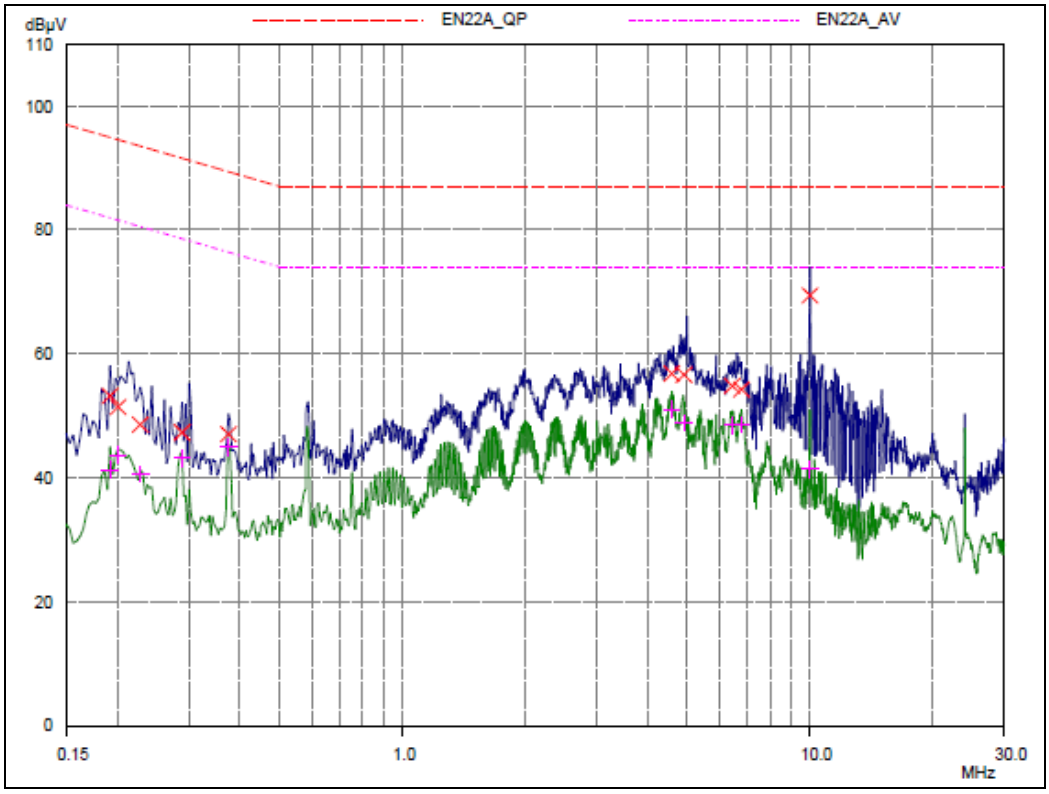
This test report shall not be reproduced, except in full, without the written approval.

* Telecommunication port

* LCL 55 dB (LAN(RJ-45) Port)_10Mbps

Frequency	Correction Factor		Quasi-peak				Average			
			Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
[㎒]	ISN	Cable	[dB(㎶)]	[dB(㎶)]	[dB(㎶)]	[dB]	[dB(㎶)]	[dB(㎶)]	[dB(㎶)]	[dB]
0.192	10.05	0.03	94.95	43.13	53.21	41.74	81.95	31.18	41.26	40.69
0.201	10.05	0.03	94.57	41.33	51.41	43.16	81.57	33.63	43.71	37.86
0.228	10.05	0.03	93.52	38.50	48.58	44.94	80.52	30.51	40.59	39.93
0.288	9.94	0.03	91.58	37.37	47.34	44.24	78.58	33.23	43.20	35.38
0.375	9.87	0.03	89.39	37.15	47.05	42.34	76.39	35.07	44.97	31.42
4.590	9.65	0.07	87.00	47.15	56.87	30.13	74.00	41.43	51.15	22.85
4.910	9.65	0.07		46.94	56.66	30.34		39.19	48.91	25.09
6.450	9.63	0.08		45.20	54.91	32.09		38.87	48.58	25.42
6.800	9.64	0.08		44.62	54.34	32.66		38.92	48.64	25.36
10.000	9.64	0.10		59.81	69.55	17.45		31.74	41.48	32.52

[TEL-Line]

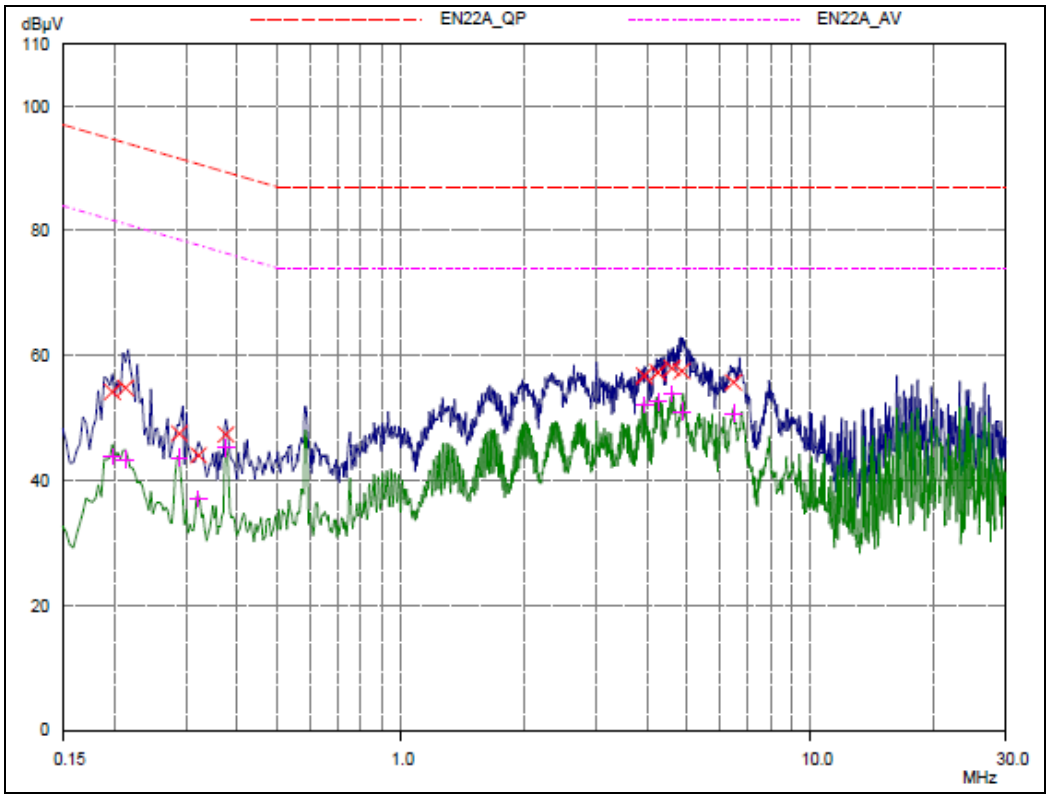


This test report shall not be reproduced, except in full, without the written approval.

* LCL 65 dB (LAN(RJ-45) Port)_100Mbps

Frequency	Correction Factor		Quasi-peak				Average			
			Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
[㎒]	ISN	Cable	[dB(㎶)]	[dB(㎶)]	[dB(㎶)]	[dB]	[dB(㎶)]	[dB(㎶)]	[dB(㎶)]	[dB]
0.198	10.05	0.03	94.69	44.10	54.18	40.51	81.69	33.78	43.86	37.83
0.213	10.05	0.03	94.09	44.74	54.82	39.27	81.09	33.28	43.36	37.73
0.288	9.94	0.03	91.58	37.55	47.52	44.06	78.58	33.69	43.66	34.92
0.321	9.94	0.03	90.68	34.06	44.03	46.65	77.68	27.10	37.07	40.61
0.375	9.87	0.03	89.39	37.45	47.35	42.04	76.39	35.32	45.22	31.17
3.930	9.66	0.06	87.00	47.06	56.78	30.22	74.00	42.50	52.22	21.78
4.250	9.66	0.06		47.63	57.35	29.65		42.88	52.60	21.40
4.600	9.65	0.07		48.35	58.07	28.93		44.23	53.95	20.05
4.850	9.65	0.07		47.86	57.58	29.42		41.34	51.06	22.94
6.490	9.63	0.08		46.10	55.81	31.19		41.13	50.84	23.16

[TEL-Line]



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6.2 Radiated Emission

Test specification	EN 55022:2006+A1:2007, Class A		
Testing voltage	230 V, 50 Hz		
Test facility	10 m Chamber (#F2)		
Test distance	10 m, 3 m		
Date	2012. 02. 15		
Temperature (°C)	20 °C	Humidity (% R.H.)	10 % R.H.
Remarks	Complied		

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]	Class A @ 3 m		Class B @ 3 m	
	Average limit (dB(μV/m))	Peak limit (dB(μV/m))	Average limit (dB(μV/m))	Peak limit (dB(μV/m))
1 ~ 3	56	76	50	70
3 ~ 6	60	80	54	74
Note - The lower limit applies at the transition frequency.				

6.2.2 Measurement procedure

The test was done at a 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	2012.11.28	☒
Bi-Log Antenna	VULB 9168	9168-440	SCHWARZBECK	2013.10.04	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	2012.11.28	☒
3 dB Attenuator	8491A	27444	HP	2012.11.28	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Horn ANT	3115	00086706	ETS	2013.11.21	☒
Amplifier	8449B	3008A01802	AGILENT	2012.05.11	☒
Spectrum Analyzer	FSP7	100289	R&S	2012.12.19	☒

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

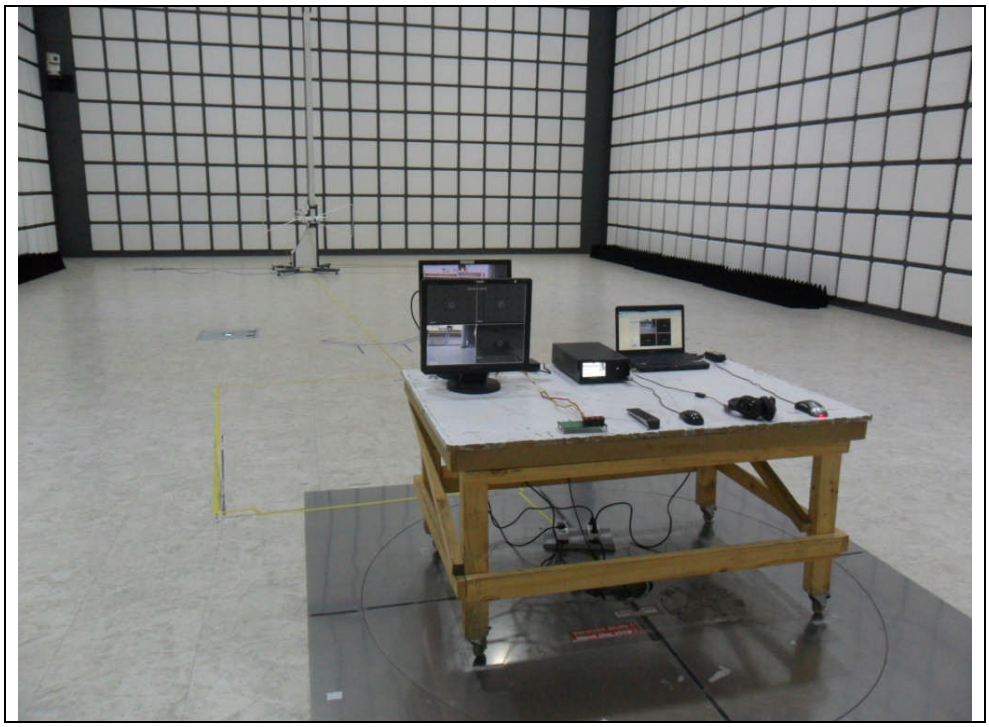
The result is

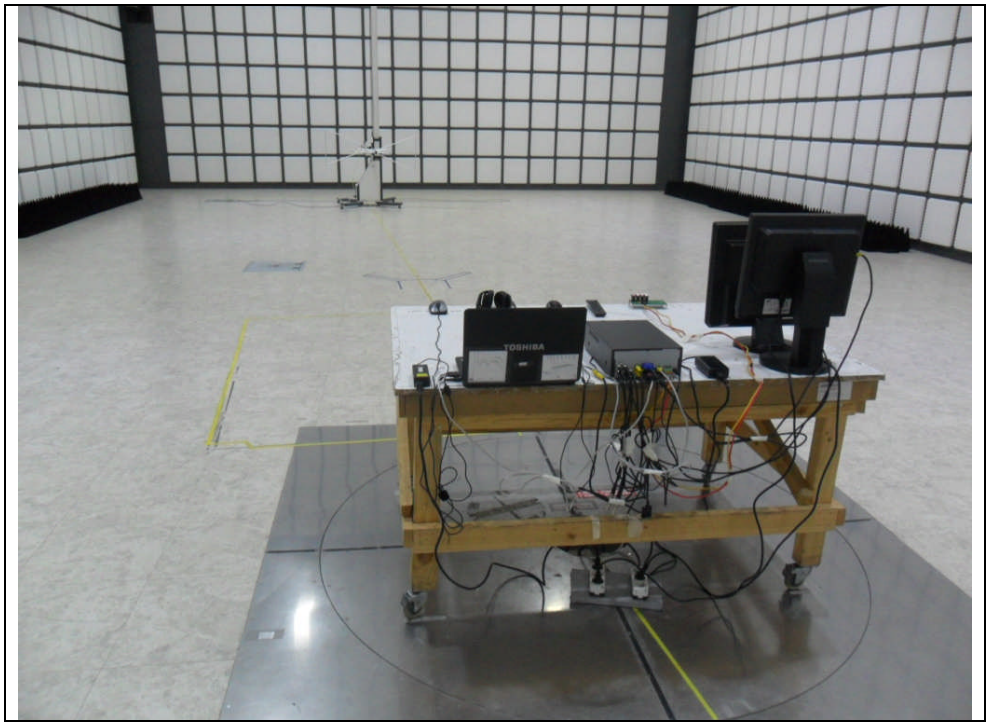
30 + 12 + 5 + 3 – 35 = 15 dB(μV/m)

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6.2.5 Photographs of test setup

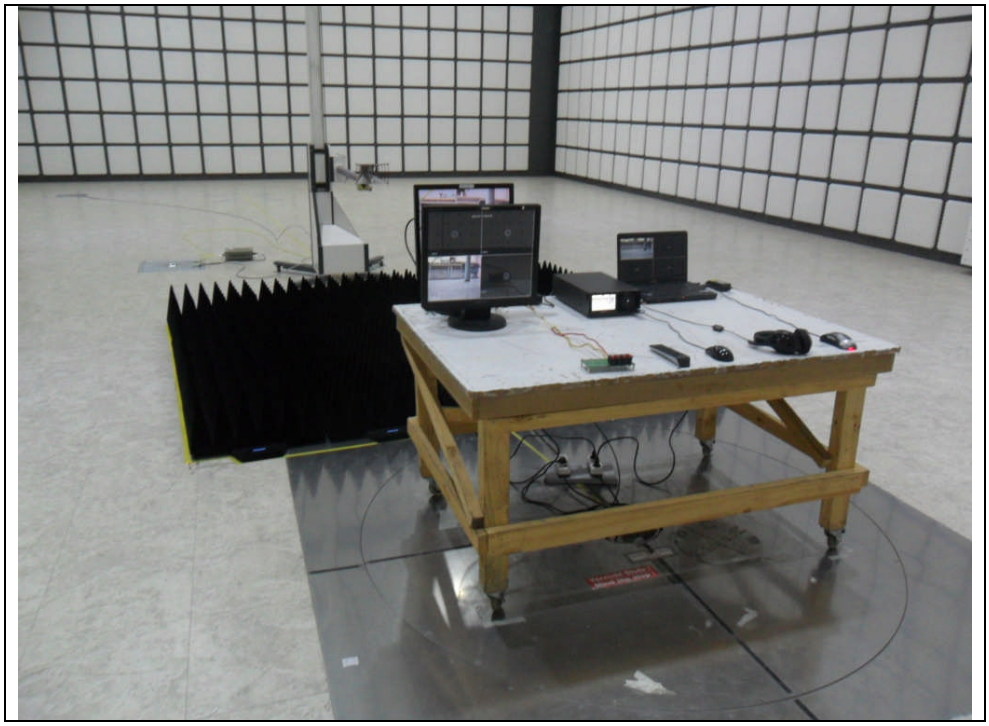
* 30 ㎒ ~ 1 ㎓

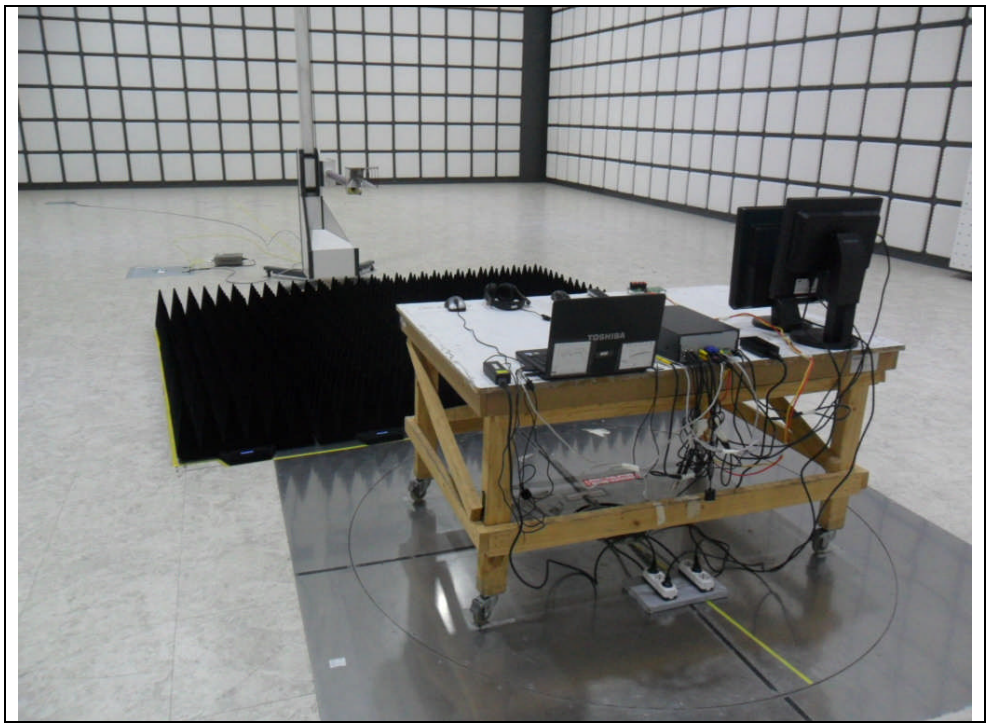




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* 1 ㎓ ~ 6 ㎓



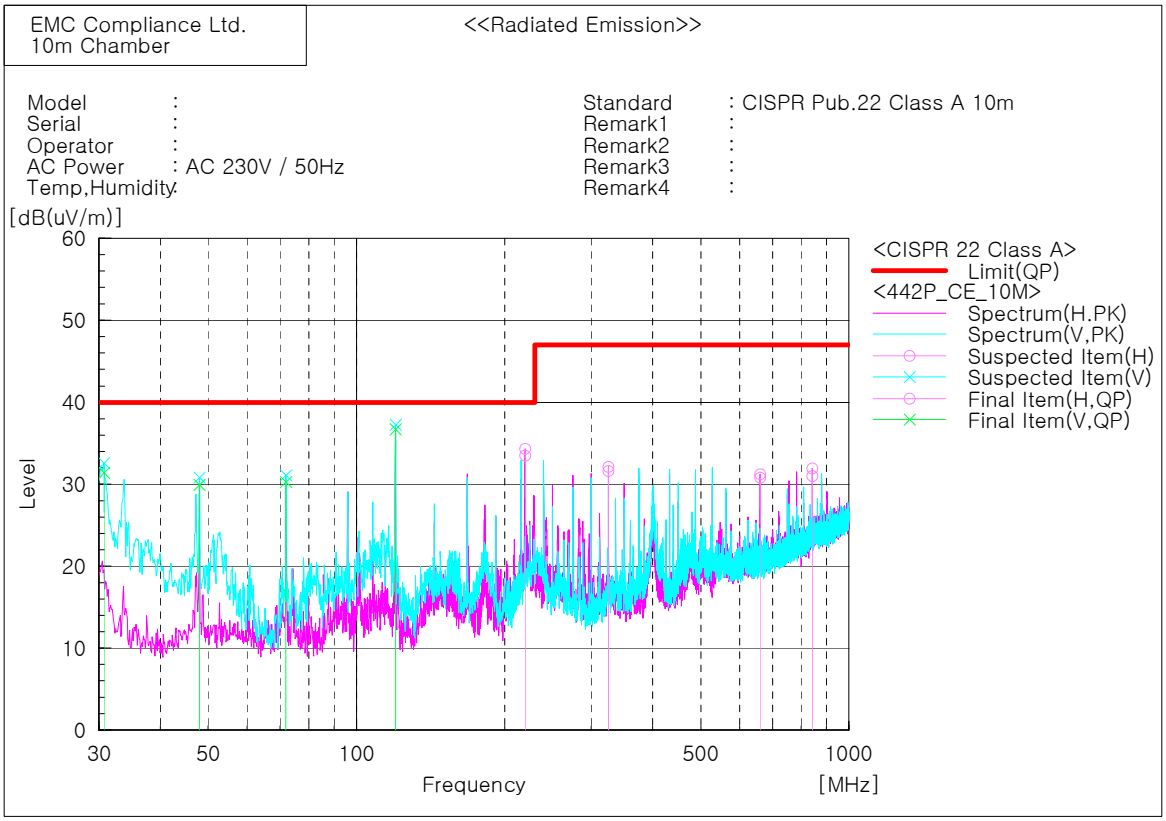


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6.2.6 Radiated emission measurement result

*** Graph and Data**

* 30 ㎒ ~ 1 ㎓

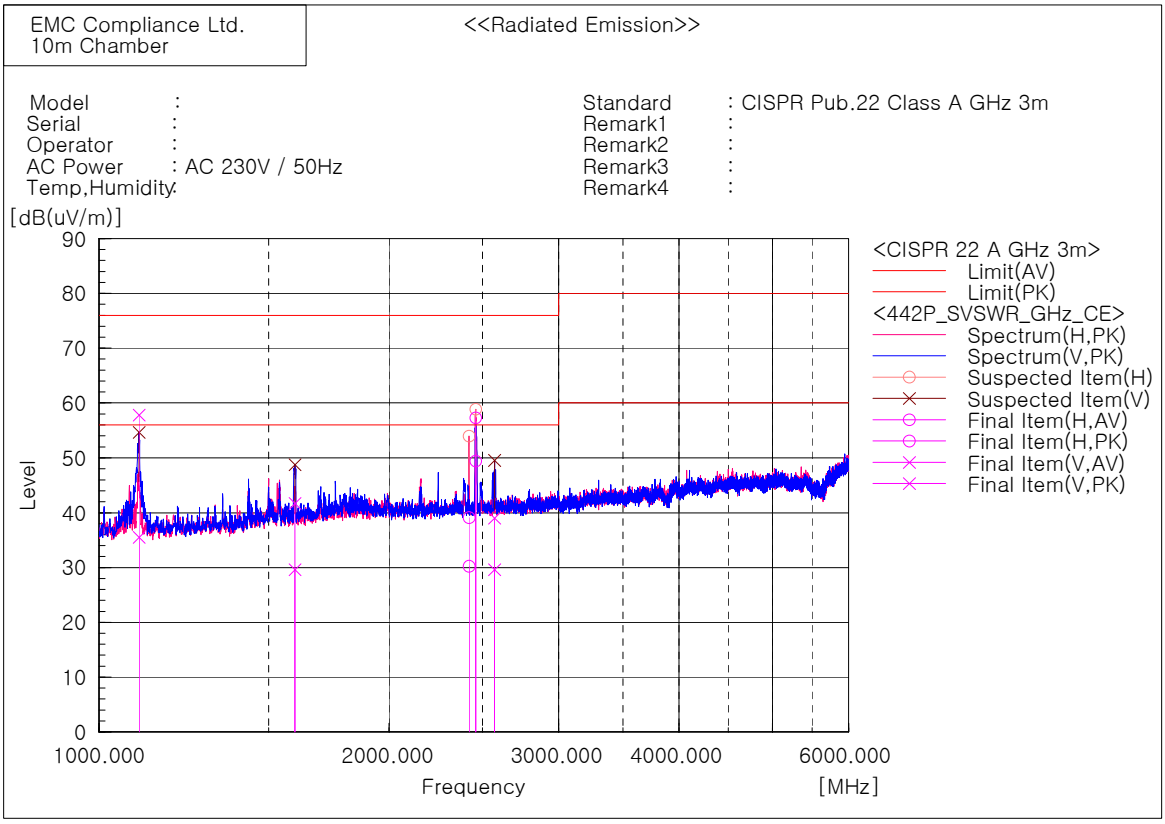


Final Result

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]	Remark
1	30.728	V	47.4	-16.0	31.4	40.0	8.6	100.0	50.0	
2	47.945	V	44.3	-14.4	29.9	40.0	10.1	100.0	36.6	
3	71.953	V	46.8	-16.5	30.3	40.0	9.7	100.0	262.8	
4	119.968	V	53.1	-16.4	36.7	40.0	3.3	100.0	71.0	
5	219.999	H	49.8	-16.3	33.5	40.0	6.5	400.0	287.9	
6	325.001	H	43.8	-12.2	31.6	47.0	15.4	400.0	292.4	
7	660.015	H	35.7	-4.9	30.8	47.0	16.2	400.0	50.0	
8	843.103	H	32.2	-1.2	31.0	47.0	16.0	400.0	301.4	

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* 1 GHz ~ 6 GHz



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	1100.625	V	47.0	69.3	-11.5	35.5	57.8	56.0	76.0	20.5	18.2	200.0	193.9
2	1598.125	V	36.9	49.0	-7.3	29.6	41.7	56.0	76.0	26.4	34.3	100.0	224.2
3	2422.500	H	33.8	42.7	-3.6	30.2	39.1	56.0	76.0	25.8	36.9	100.0	74.2
4	2460.625	H	52.9	60.8	-3.5	49.4	57.3	56.0	76.0	6.6	18.7	202.0	277.2
5	2573.125	V	32.9	42.3	-3.3	29.6	39.0	56.0	76.0	26.4	37.0	100.0	329.1

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6.3 Harmonics

Test specification	EN 61000-3-2:2006+A2:2009				
Testing voltage	230 V, 50 Hz				
Test facility	Immunity area				
Date	2012. 02. 17				
Temperature(°C)	22 °C	Humidity (% R.H.)	14 % R.H.	Pressure (kPa)	101.7 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.	2012.05.23	☒

6.3.3 Photographs of test setup



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6.3.4 Measurement result

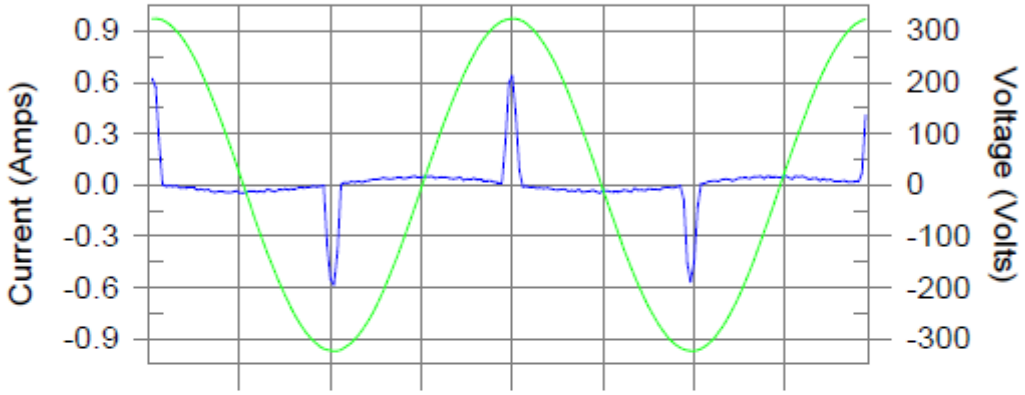
Harmonics – Class-A per Ed. 3.2 (2009)(Run time) incl. inter-harmonics

EUT: SRD-442P
Test category: Class-A per Ed. 3.2 (2009) (European limits)
Test date: 2012-02-17
Test duration (min): 2.5
Comment: Comment
Customer: Customer information

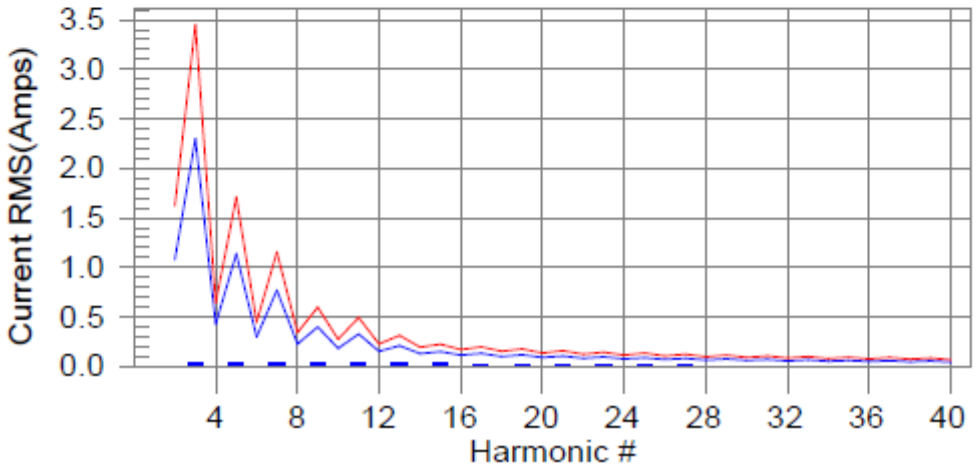
Tested by: Tested by
Test Margin: 100
Start time: 오후 2:04:06
End time: 오후 2:06:56
Data file name: H-000268.cts_data

Test Result: Pass
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line
European Limits



Test result: Pass
Worst harmonic was #15 with 18.75% of the limit.

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Current Test Result Summary (Run time)

EUT: SRD-442P
Test category: Class-A per Ed. 3.2 (2009) (European limits)
Tested by: Tested by
Test Margin: 100
Test date: 2012-02-17
Start time: 오후 2:04:06
End time: 오후 2:06:56
Test duration (min): 2.5
Data file name: H-000268.cts_data
Comment: Comment
Customer: Customer information

Test Result: Pass
Source qualification: Normal
THC(A): 0.11
I-THD(%): 201.42
POHC(A): 0.026
POHC Limit(A): 0.277
Highest parameter values during test:

V_RMS (Volts):	229.49	Frequency(Hz):	50.00
I_Peak (Amps):	0.665	I_RMS (Amps):	0.127
I_Fund (Amps):	0.054	Crest Factor:	5.294
Power (Watts):	10.3	Power Factor:	0.371

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	1.080	0.0	0.002	1.620	0.10	Pass
3	0.043	2.300	1.9	0.045	3.450	1.29	Pass
4	0.002	0.430	0.0	0.002	0.645	0.29	Pass
5	0.041	1.140	3.6	0.043	1.710	2.52	Pass
6	0.001	0.300	0.0	0.002	0.450	0.36	Pass
7	0.040	0.770	5.1	0.041	1.155	3.57	Pass
8	0.001	0.230	0.0	0.002	0.345	0.47	Pass
9	0.037	0.400	9.3	0.039	0.600	6.45	Pass
10	0.001	0.184	0.0	0.002	0.276	0.59	Pass
11	0.035	0.330	10.5	0.036	0.495	7.23	Pass
12	0.001	0.153	0.0	0.002	0.230	0.74	Pass
13	0.032	0.210	15.0	0.033	0.315	10.32	Pass
14	0.001	0.131	0.0	0.002	0.197	0.79	Pass
15	0.028	0.150	18.8	0.029	0.225	12.86	Pass
16	0.001	0.115	0.0	0.002	0.173	0.90	Pass
17	0.025	0.132	18.6	0.025	0.199	12.69	Pass
18	0.001	0.102	0.0	0.002	0.153	1.02	Pass
19	0.021	0.118	17.8	0.021	0.178	12.08	Pass
20	0.001	0.092	0.0	0.001	0.138	1.08	Pass
21	0.017	0.107	16.3	0.018	0.161	11.04	Pass
22	0.001	0.084	0.0	0.001	0.125	1.16	Pass
23	0.014	0.098	14.3	0.014	0.147	9.65	Pass
24	0.001	0.077	0.0	0.001	0.115	1.22	Pass
25	0.011	0.090	11.9	0.011	0.135	8.06	Pass
26	0.001	0.071	0.0	0.001	0.106	1.31	Pass
27	0.008	0.083	9.3	0.008	0.125	6.38	Pass
28	0.001	0.066	0.0	0.001	0.099	1.43	Pass
29	0.005	0.078	6.6	0.005	0.116	4.66	Pass
30	0.001	0.061	0.0	0.001	0.092	1.52	Pass
31	0.003	0.073	0.0	0.003	0.109	2.91	Pass
32	0.001	0.058	0.0	0.001	0.086	1.68	Pass
33	0.001	0.068	0.0	0.001	0.102	1.31	Pass
34	0.001	0.054	0.0	0.001	0.081	1.78	Pass
35	0.001	0.064	0.0	0.001	0.096	1.47	Pass
36	0.001	0.051	0.0	0.001	0.077	1.92	Pass
37	0.002	0.061	0.0	0.002	0.091	2.75	Pass
38	0.001	0.048	0.0	0.001	0.073	2.04	Pass
39	0.003	0.058	0.0	0.003	0.087	3.66	Pass
40	0.001	0.046	0.0	0.001	0.069	2.09	Pass

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Voltage Source Verification Data (Run time)

EUT: SRD-442P
Tested by: Tested by
Test category: Class-A per Ed. 3.2 (2009) (European limits)
Test Margin: 100
Test date: 2012-02-17
Start time: 오후 2:04:06
End time: 오후 2:06:56
Test duration (min): 2.5
Data file name: H-000268.cts_data
Comment: Comment
Customer: Customer information

Test Result: Pass
Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	229.49	Frequency(Hz):	50.00
I_Peak (Amps):	0.665	I_RMS (Amps):	0.127
I_Fund (Amps):	0.054	Crest Factor:	5.294
Power (Watts):	10.3	Power Factor:	0.371

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.101	0.459	21.98	OK
3	0.564	2.065	27.29	OK
4	0.021	0.459	4.59	OK
5	0.016	0.918	1.75	OK
6	0.022	0.459	4.71	OK
7	0.016	0.688	2.38	OK
8	0.016	0.459	3.58	OK
9	0.039	0.459	8.48	OK
10	0.008	0.459	1.73	OK
11	0.020	0.229	8.74	OK
12	0.024	0.229	10.42	OK
13	0.052	0.229	22.75	OK
14	0.008	0.229	3.35	OK
15	0.026	0.229	11.16	OK
16	0.015	0.229	6.41	OK
17	0.033	0.229	14.28	OK
18	0.017	0.229	7.41	OK
19	0.034	0.229	14.79	OK
20	0.006	0.229	2.78	OK
21	0.025	0.229	11.03	OK
22	0.010	0.229	4.25	OK
23	0.018	0.229	8.04	OK
24	0.014	0.229	5.91	OK
25	0.019	0.229	8.48	OK
26	0.015	0.229	6.71	OK
27	0.008	0.229	3.50	OK
28	0.005	0.229	2.11	OK
29	0.011	0.229	4.96	OK
30	0.015	0.229	6.58	OK
31	0.005	0.229	2.34	OK
32	0.007	0.229	2.90	OK
33	0.003	0.229	1.37	OK
34	0.008	0.229	3.57	OK
35	0.007	0.229	2.88	OK
36	0.008	0.229	3.61	OK
37	0.012	0.229	5.07	OK
38	0.006	0.229	2.82	OK
39	0.018	0.229	7.66	OK
40	0.010	0.229	4.38	OK

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6.4 Flicker

Test specification	EN 61000-3-3:2008				
Testing voltage	230 V, 50 Hz				
Test facility	Immunity area				
Date	2012. 02. 17				
Temperature(°C)	22 °C	Humidity (% R.H.)	14 % R.H.	Pressure (kPa)	101.4 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.

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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.	2012.05.23	☒

6.4.3 Photographs of test setup



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6.4.4 Measurement result

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

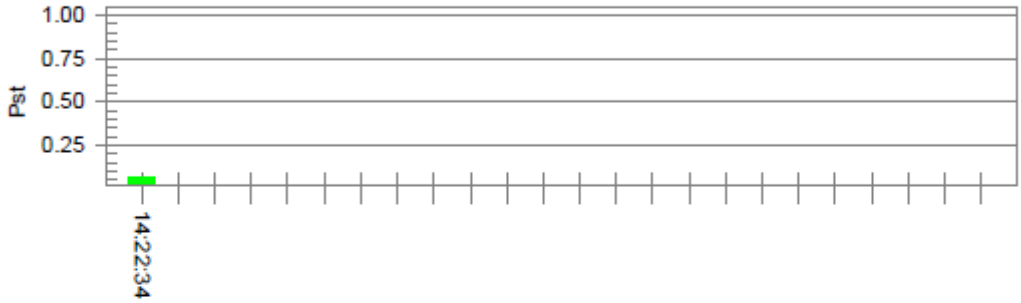
EUT: SRD-442P
Test category: All parameters (European limits)
Test date: 2012-02-17
Test duration (min): 10
Comment: Comment
Customer: Customer

Tested by: Tested by
Test Margin: 100
Start time: 오후 2:12:14
End time: 오후 2:22:35
Data file name: F-000269.cts_data

Test Result: Pass
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.43			
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

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6.5 Electrostatic Discharge

Test specification	EN 61000-4-2:2009				
Test level	☒ Contact: ± 2 kV, ± 4 kV, ± 6 kV ☒ Air: ± 2 kV, ± 4 kV, ± 8 kV ☒ HCP: ± 2 kV, ± 4 kV, ± 6 kV ☒ VCP: ± 2 kV, ± 4 kV, ± 6 kV				
Discharge impedance	330 Ω / 150 pF				
Number of discharge (Each polarity)	☒ Contact: 10 ☒ Air: 10 ☒ HCP / VCP: 10				
Interval between discharges	1 s				
Testing voltage	230 V, 50 Hz				
Test facility	Shielded room				
Date	2012. 02. 17				
Temperature(°C)	22 °C	Humidity (% R.H.)	42 % R.H.	Pressure (kPa)	101.6 kPa
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 m of insulating Support. In case of table top equipment, EUT was placed on a wooden table 0.8 m above the reference grounded floor. A horizontal coupling plane (HCP) was placed on the table, and Connected to the reference plane via a 470 kΩ resistor located in each end (0.5 mm insulating support between EUT and HCP). In both cases a vertical coupling plane(VCP) OF 0.5 X 0.5 m was located 0.1 m from the EUT's sides. The VCP was connected to the reference plane in the same matter as the HCP.

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6.5.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. Date	Used
ESD Tester	NSG 437	182	TESEQ	2012.05.23	☒
HCP	-	-	-	-	☒
VCP	-	-	-	-	☒

6.5.3 Photographs of test setup

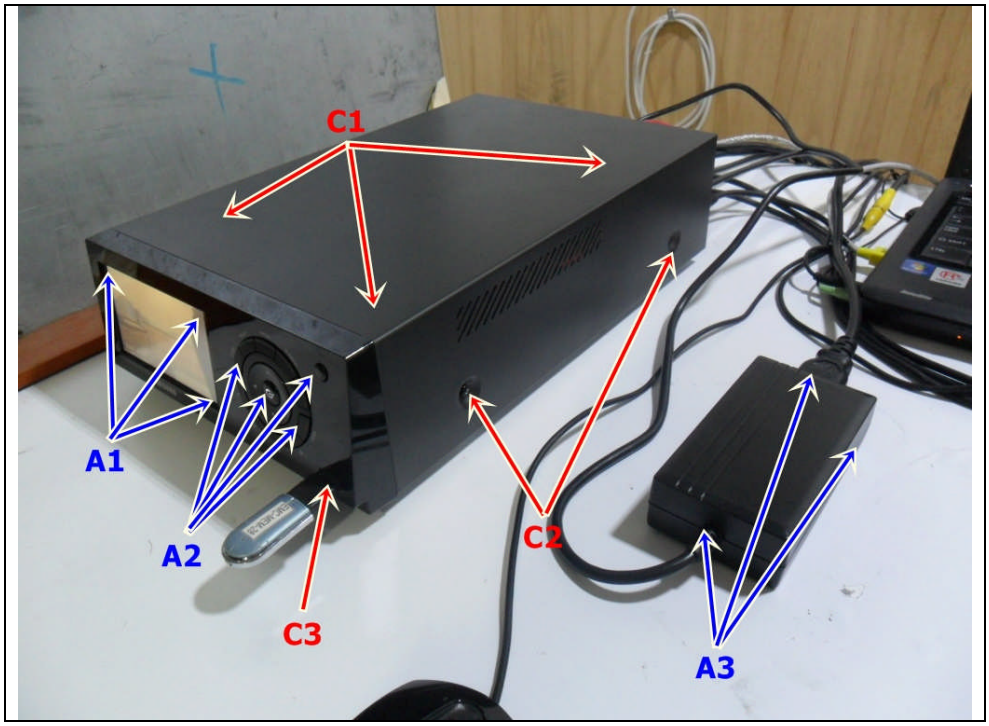


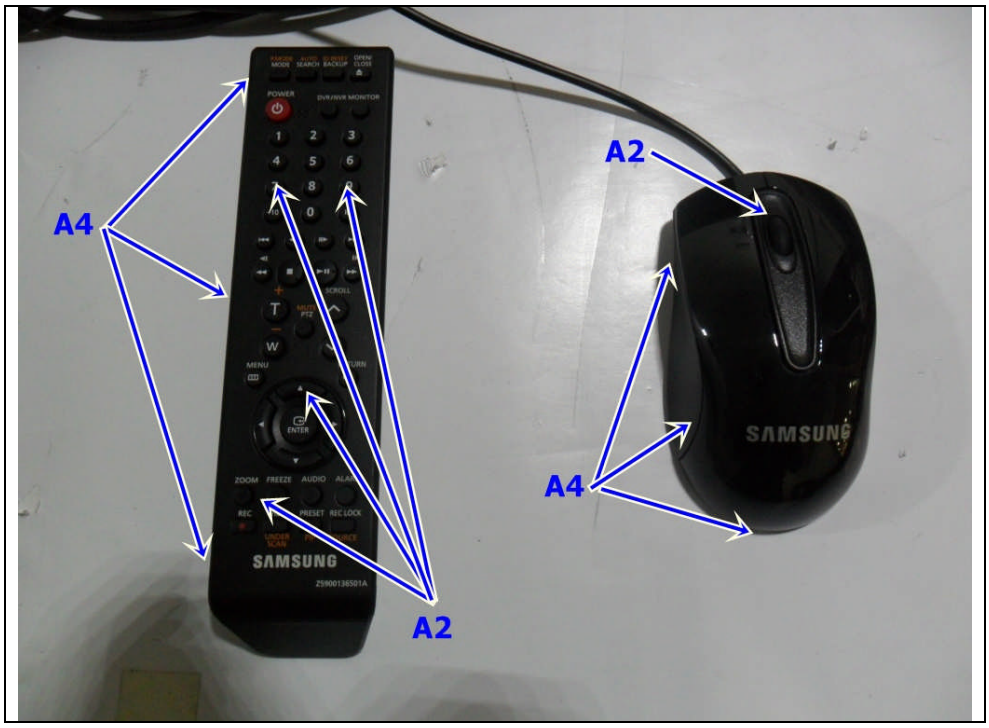
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6.5.4 Measurement result

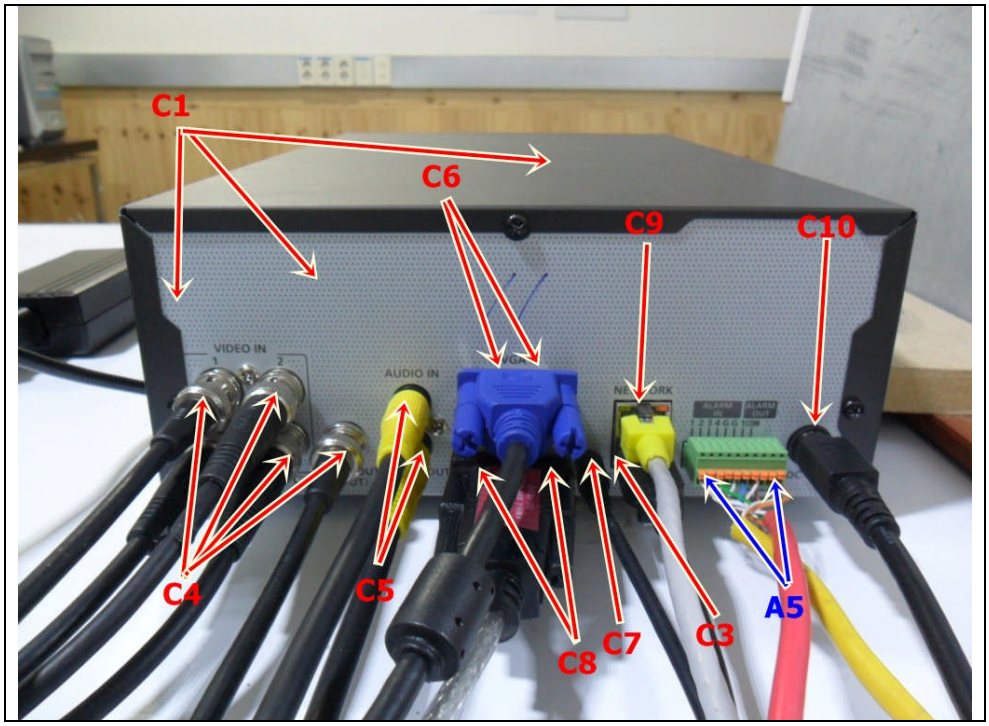
Electrostatic Discharge (Test Point)

Air discharge	→
Contact discharge	→





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HCP/VCP discharge

Location(EUT)	Applied level (±)	Result
HCP (All 4 sides)	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied
VCP (All 4 sides)	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied

Contact discharge

Location(EUT)		Applied level (±)	Result
C1	Case	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied
C2	Screw	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied
C3	USB Port	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied
C4	Video In, Out Port	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied
C5	Audio In, Out Port	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied
C6	Serial Port	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied
C7	RS-232 Port	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied
C8	D-SUB Port	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied
C9	LAN(RJ-45) Port	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied
C10	Power Port	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied

Air discharge

Location(EUT)		Applied level (±)	Result
A1	LCD	± 2 ㎸, ± 4 ㎸, ± 8 ㎸	Complied
A2	Button	± 2 ㎸, ± 4 ㎸, ± 8 ㎸	Complied
A3	Adaptor	± 2 ㎸, ± 4 ㎸, ± 8 ㎸	Complied
A4	Case	± 2 ㎸, ± 4 ㎸, ± 8 ㎸	Complied
A5	Alarm In,Out Port	± 2 ㎸, ± 4 ㎸, ± 8 ㎸	Complied

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6.6 Radio Frequency Electromagnetic Fields

Test specification	EN 61000-4-3:2006				
Tested frequency	80 ㎒ ~ 1 ㎓, 1 ㎓ ~ 2 ㎓				
Test level & Modulation	1, 3, 10 ㅿ/m, 80 % Amplitude Modulation (1 ㎑) 1, 3, 10 ㅿ/m, Pulse Modulation (1 ㎐ (0.5 s ON: 0.5 s OFF))				
Frequency Step	log 1 % step				
Dwell time	3 s				
Distance	3 m from EUT to tip of antenna				
Testing Voltage	230 ㅿ, 50 ㎐				
Test facility	Fully anechoic chamber (3 m)				
Date	2012. 02. 16				
Temperature(°C)	19 °C	Humidity (% R.H.)	13 % R.H.	Pressure (㎪)	101.7 ㎪
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.

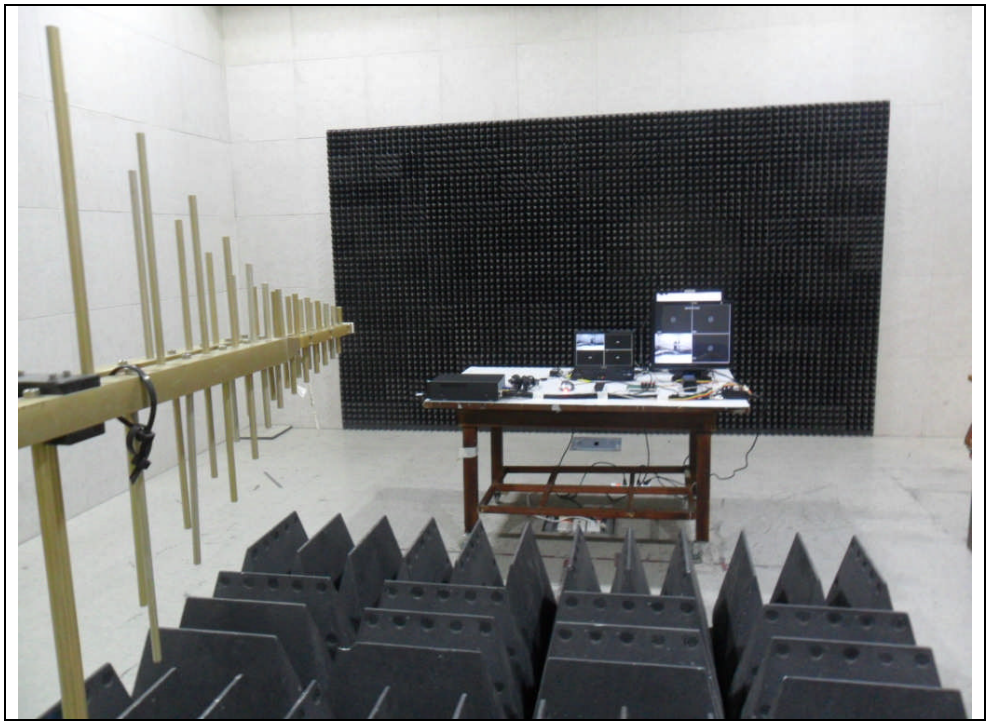
The EUT was tested all sides, horizontal and vertical polarization.

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6.6.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Power meter	PM2002	302852	AR	2012.04.11	☒
Power sensor	PH2000	303224	AR	2012.04.11	☒
Power sensor	PH2000	303222	AR	2012.04.11	☒
Directional coupler	DC6180	303976	AR	2012.04.11	☒
Directional coupler	DC7144M1	320279	AR	2012.02.23	☒
Signal generator	E4421B	GB40052295	AGILENT	2012.10.12	☒
Amplifier	150W1000M2	303843	AR	2012.04.11	☒
Amplifier	60S1G3M2	320444	AR	2012.04.11	☒
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				
Coupling	☒ AC main ☒ Signal / Control: Clamp ☒ Telecommunication: Clamp				
Test level	☒ AC main: ± 2 kV Peak ☒ Signal / Control: ± 1 kV Peak ☒ Telecommunication: ± 1 kV Peak				
Repetition frequency	5 kHz, Tr/Th = 5 / 50 ns				
Coupling time	60 s				
Testing Voltage	230 V, 50 Hz				
Test facility	Shielded room				
Date	2012. 02. 17				
Temperature(°C)	21 °C	Humidity (% R.H.)	12 % R.H.	Pressure (kPa)	101.6 kPa
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	2013.02.08	☒
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 / Control

EFT coupling point	(+)	(-)	Result
Alarm In/Out	+ 1 ㎸	- 1 ㎸	Complied
Video In/Out	+ 1 ㎸	- 1 ㎸	Complied
Audio In/Out	+ 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: Direct ☒ Signal / Control: Direct / CDN				
Test level	☒ AC main: ☒Differential mode: ± 0.5 kV, ± 1 kV ☒Common mode: ± 0.5 kV, ± 1 kV, ± 2 kV ☒ Signal / Control: ± 0.5 kV, ± 1 kV				
Coupling Impedance	☒ Differential mode: 18 μF ☒ Common mode: 10 Ω + 9 μF ☒ 40 Ω ☒ Direct				
Surge pulse shape	Tr/Th = 1.2 / 50 μs				
Angles	0 °, 90 °, 180 °, 270 °				
Number of surge	5				
Coupling time	1 min				
Testing Voltage	230 V, 50 Hz				
Test facility	Shielded room				
Date	2012. 02. 17				
Temperature(°C)	21 °C	Humidity (% R.H.)	12 % R.H.	Pressure (kPa)	101.6 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.8.1 Measurement procedure

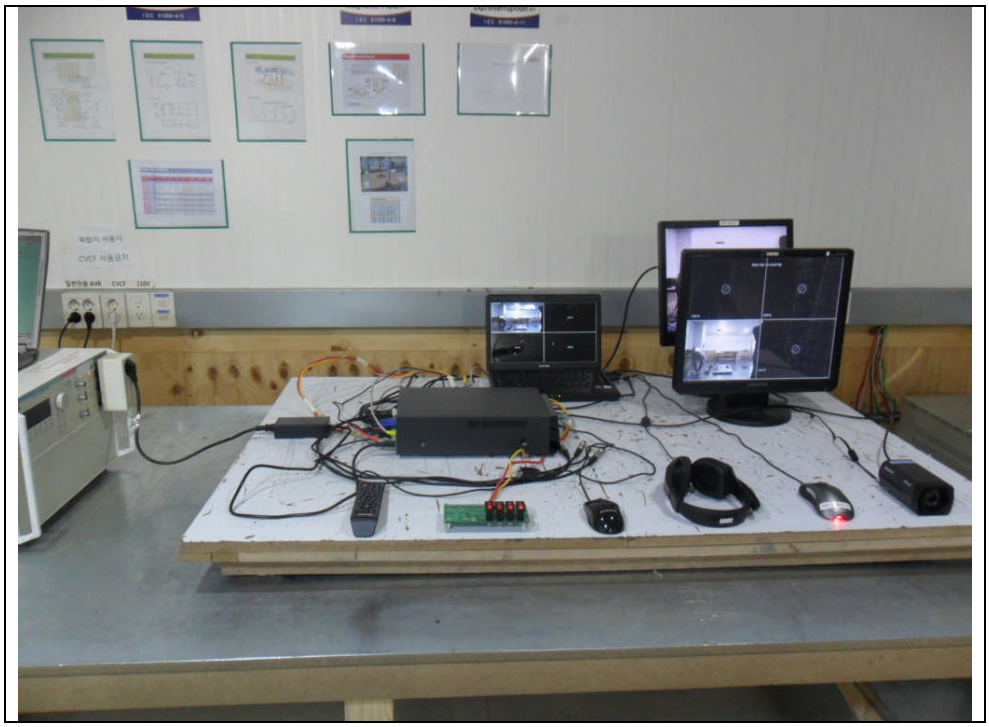
A ground reference plane was located on the floor. SURGE generator was connected to reference ground plane via low impedance connection. For floor standing equipment & table top equipment, EUT was placed on a wooden table.

6.8.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	0701-03	EM TEST	2012.06.14	☒
CDN	CNV 508 N1	V1108108861	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 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied
L+PE	+ 0.5 kV, + 1 kV, + 2 kV	- 0.5 kV, - 1 kV, - 2 kV	Complied
N+PE	+ 0.5 kV, + 1 kV, + 2 kV	- 0.5 kV, - 1 kV, - 2 kV	Complied

* Signal / Control

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

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6.9 Conducted Immunity

Test specification	EN 61000-4-6:2007				
Tested frequency	0.15 ㎒ ~ 100 ㎒				
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))				
Frequency Step	log 1 % step				
Coupling method	☒ AC main: CDN(M3) ☒ Signal / Control: Clamp ☒ Telecommunication: Clamp				
Testing Voltage	230 Ⅴ, 50 ㎐				
Test facility	Shielded room				
Date	2012. 02. 16				
Temperature(°C)	21 °C	Humidity (% R.H)	43 % R.H	Pressure(㎪)	101.7 ㎪
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.

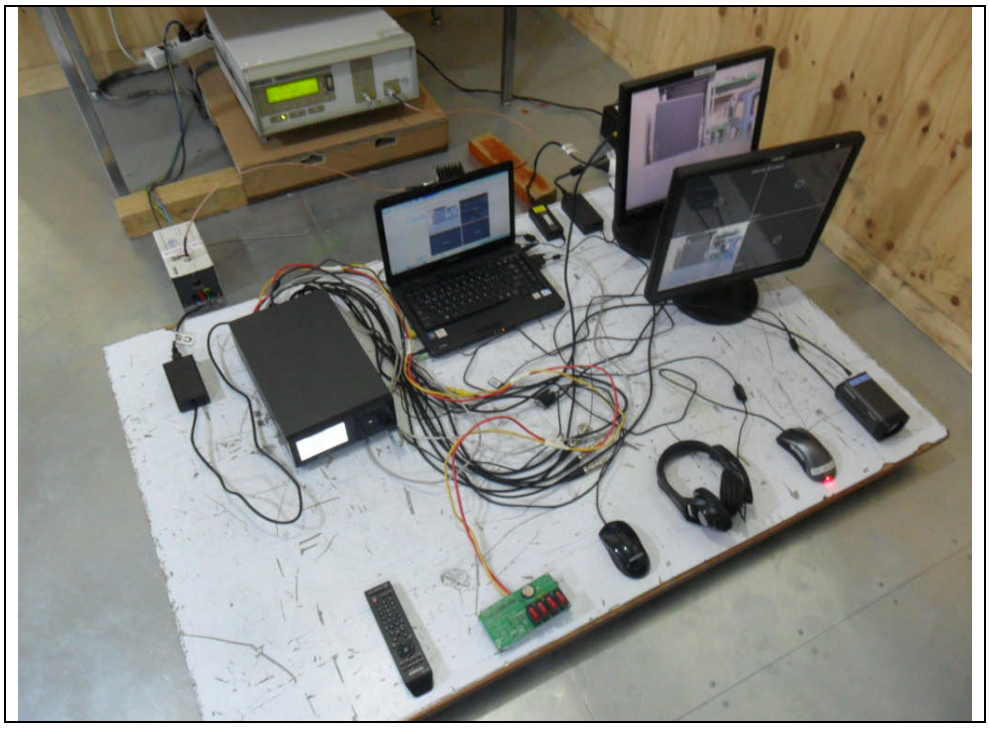
The power and all network cable, I/O cables longer than 3 m length were tested.

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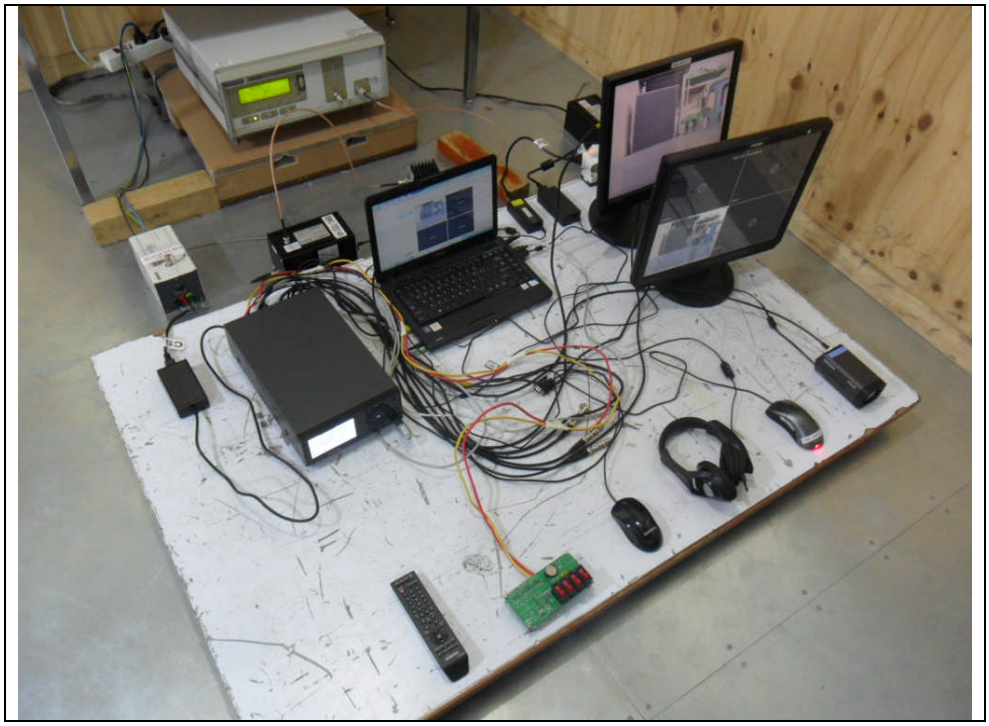
6.9.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
CS generator	NSG 2070	1054	Schaffner	2012.05.29	☒
CDN	M016	16674	Schaffner	2012.03.23	☒
CDN	CDN M2/M3N	0111-04	EM TEST	2013.02.07	☒
Attenuator	INA2070-1	2054	Schaffner	2012.03.23	☒
EM Clamp	KEMZ 801	17643	Schaffner	2012.04.25	☒
CDN	CDN S1/75	0410-28	EM TEST	2012.05.17	☒
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 / Control

Coupling point	Coupling method	Result
Video In/Out	Clamp	Complied
Audio In/Out	Clamp	Complied
Alarm In/Out	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	230 Ⅴ, 50 ㎐				
Test facility	Shielded room				
Test Date	2012. 02. 17				
Temperature (°C)	21 °C	Humidity (% R.H)	12 % R.H	Pressure (㎪)	101.6 ㎪
Remarks	Complied				

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	2013.02.08	☒

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6.10.3 Photographs of test setup



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	230 V, 50 Hz				
Date	2012. 02. 17				
Temperature (°C)	21 °C	Humidity (% R.H)	12 % R.H	Pressure (kPa)	101.6 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	2013.02.08	☒

6.11.2 Measurement result

* 230 V, 50 Hz

Supply voltage		Result
+ 10 %	253 V	Complied
- 15 %	196 V	Complied

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

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7. E.U.T. photographs

Whole





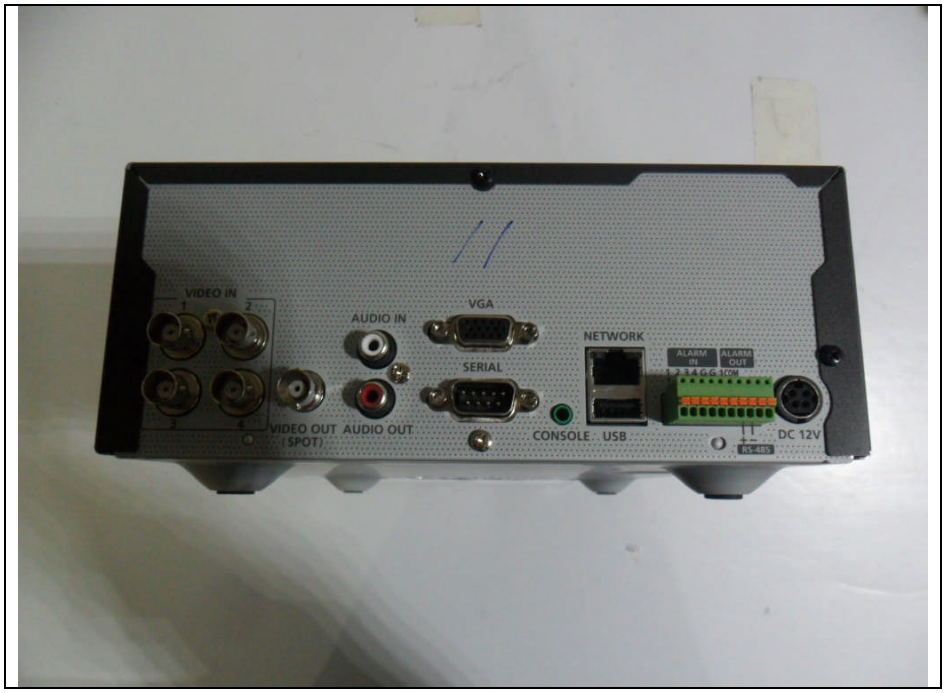
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*** Main**

Front View



Rear View



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Left View



Right View



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Top View

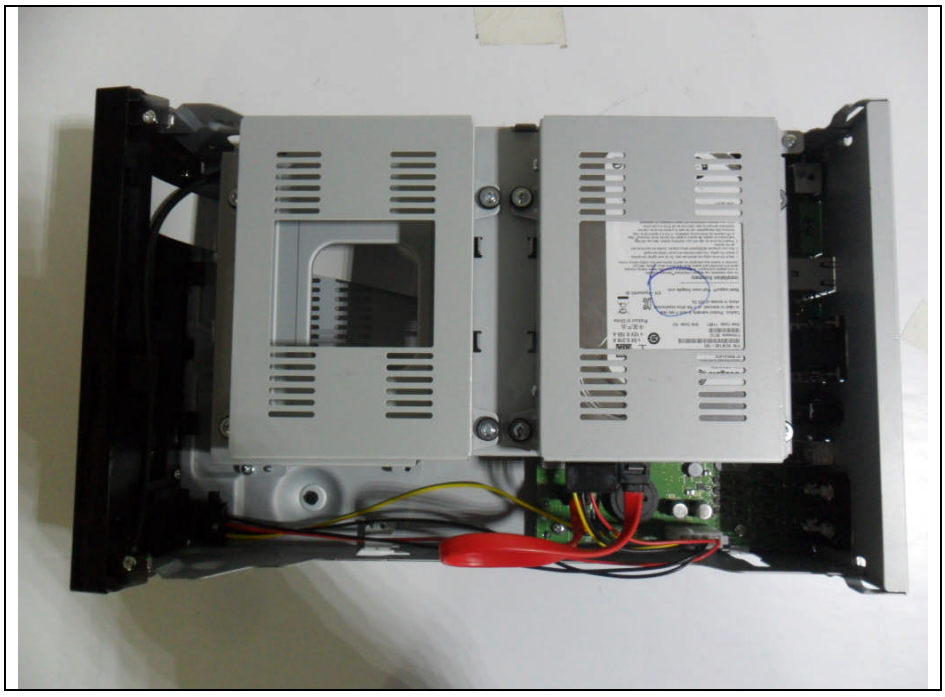


Bottom View



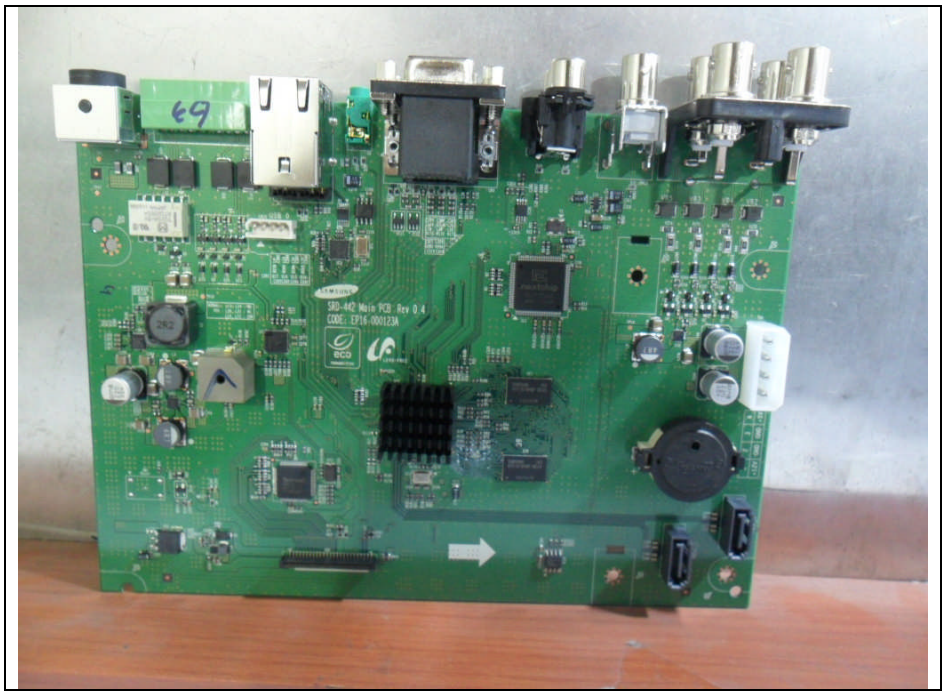
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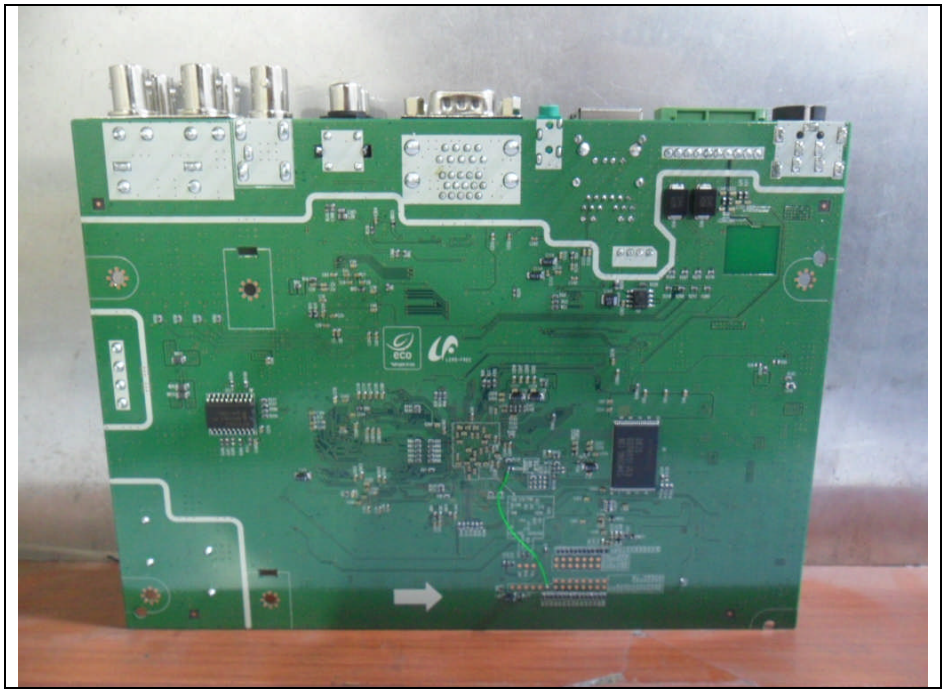
Inside



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Main Board





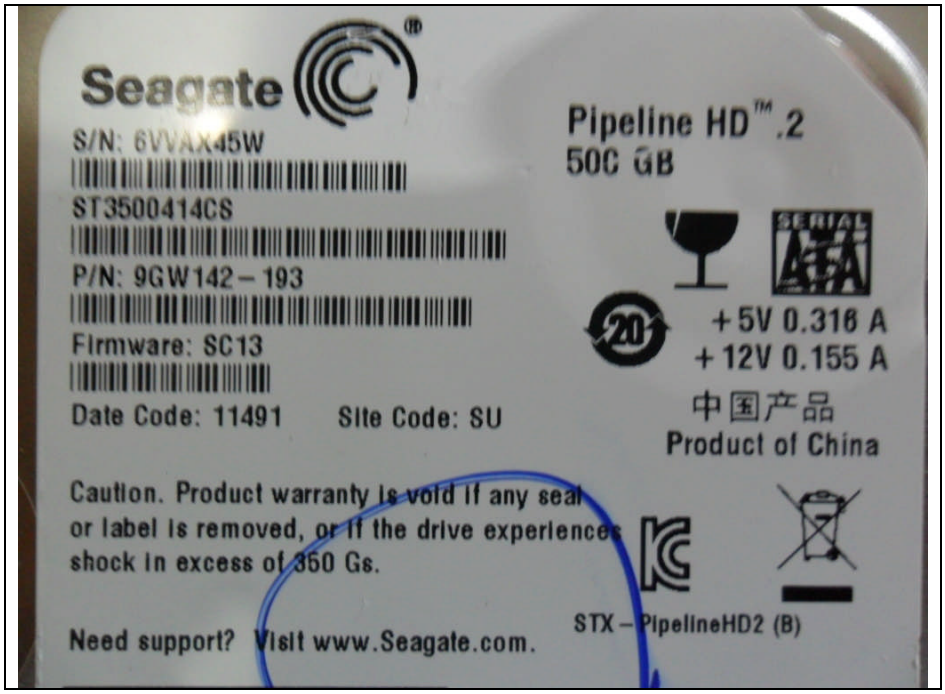
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HDD(500GB)



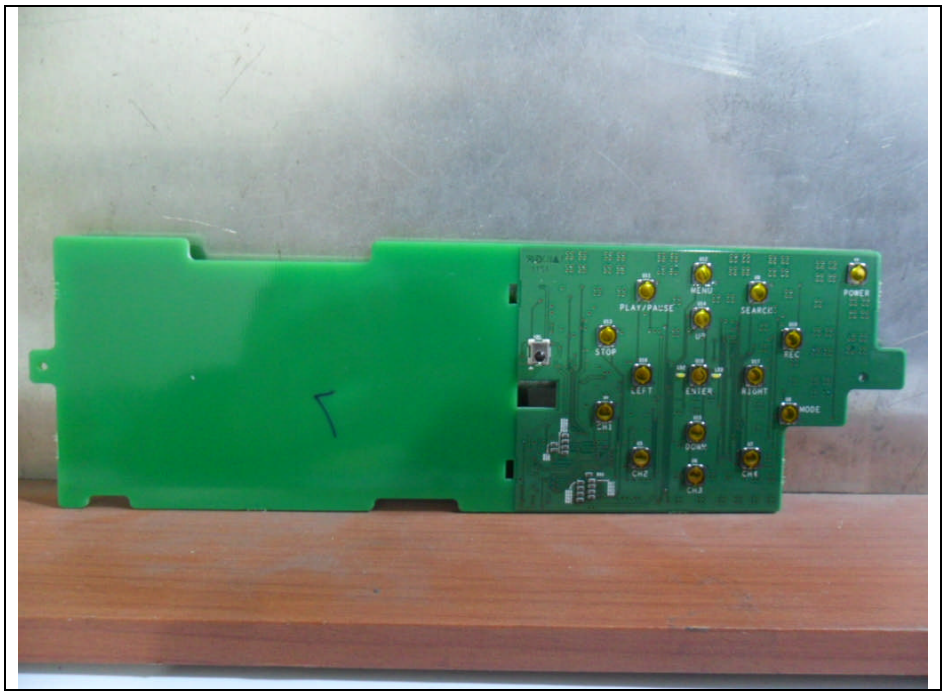


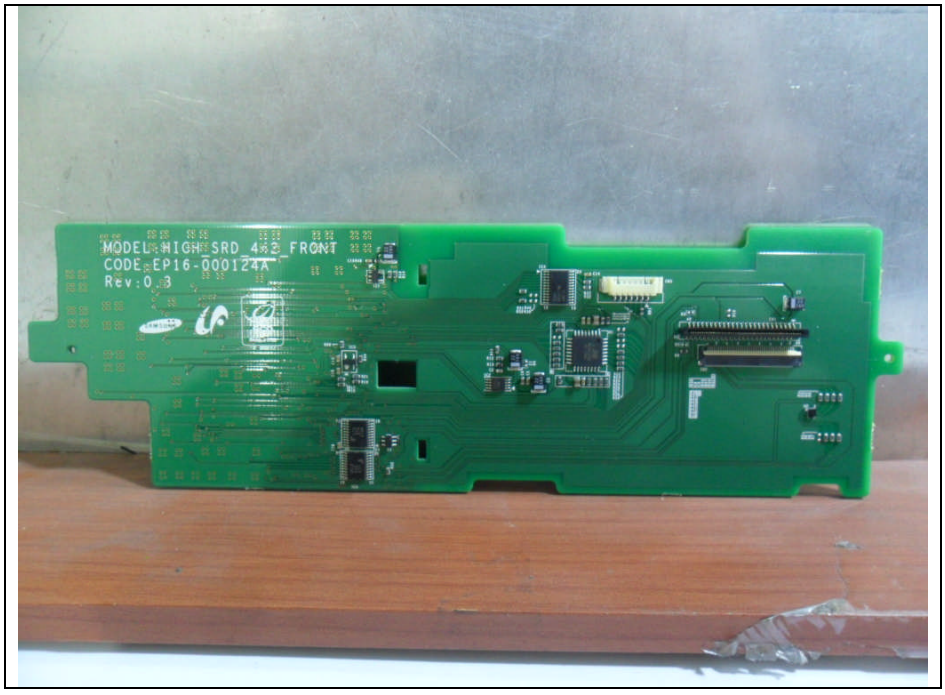
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Front Board

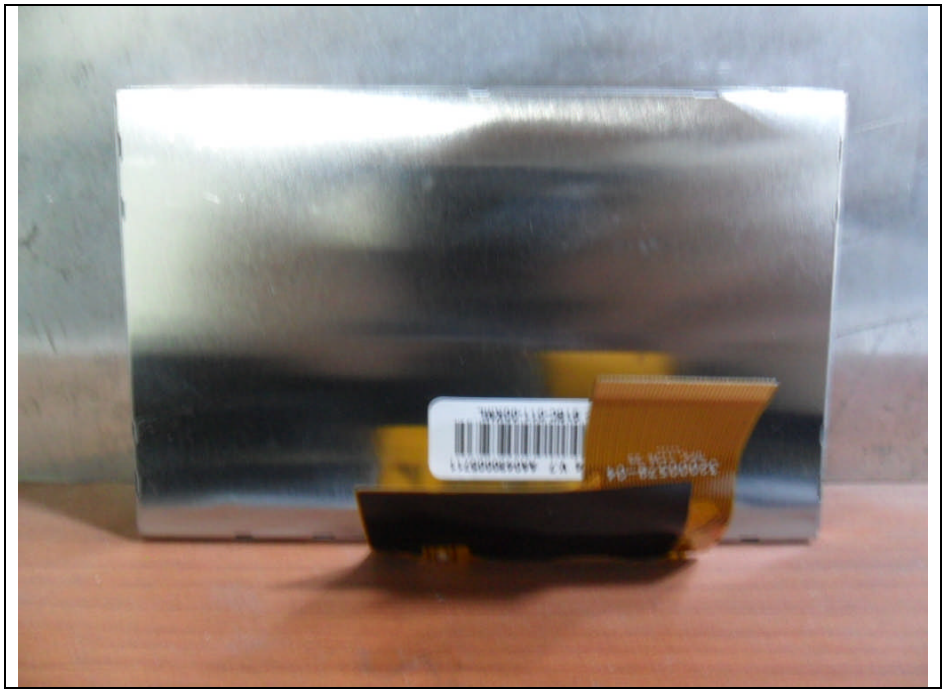




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LCD



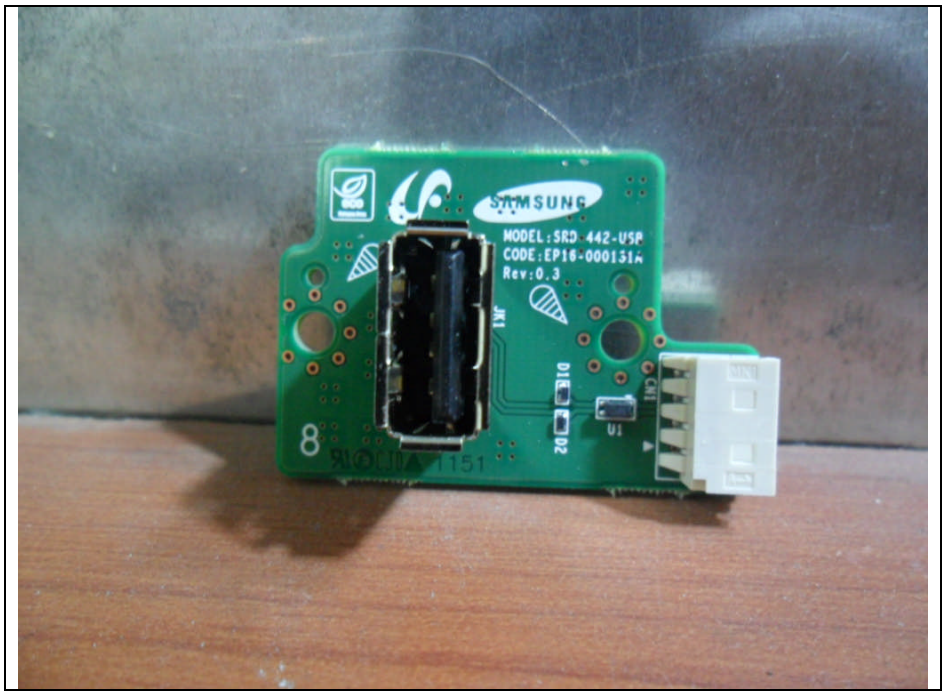


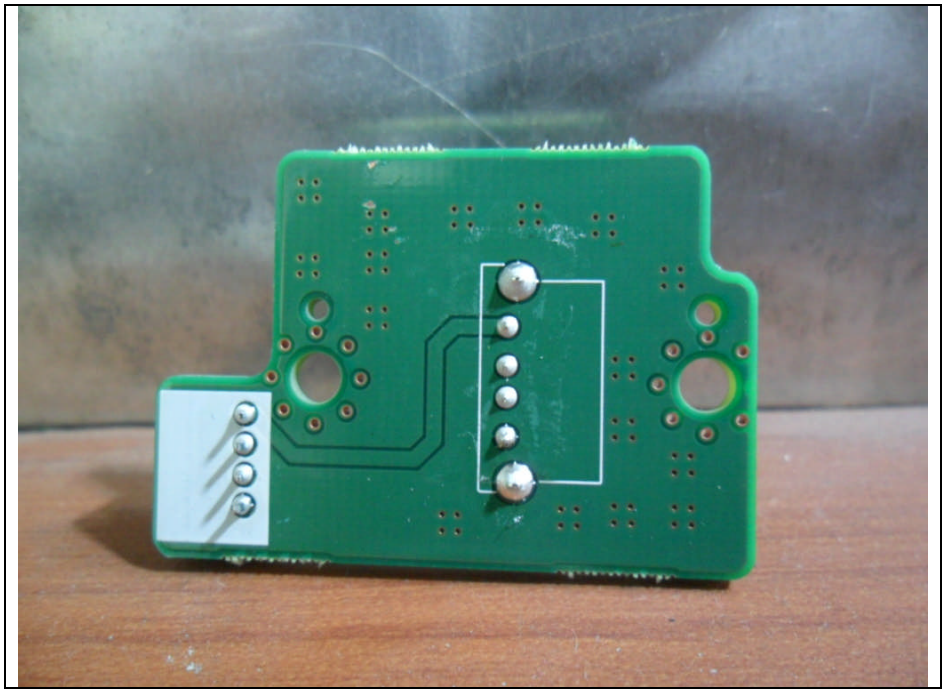
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USB Board





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Adaptor





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*** USB Mouse**

Front View



Rear View



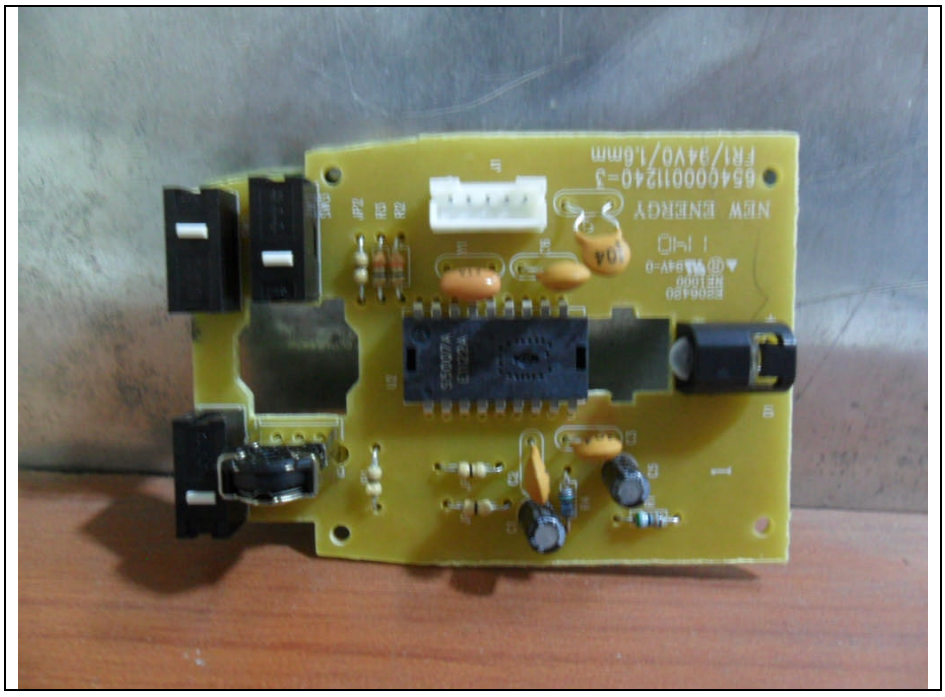
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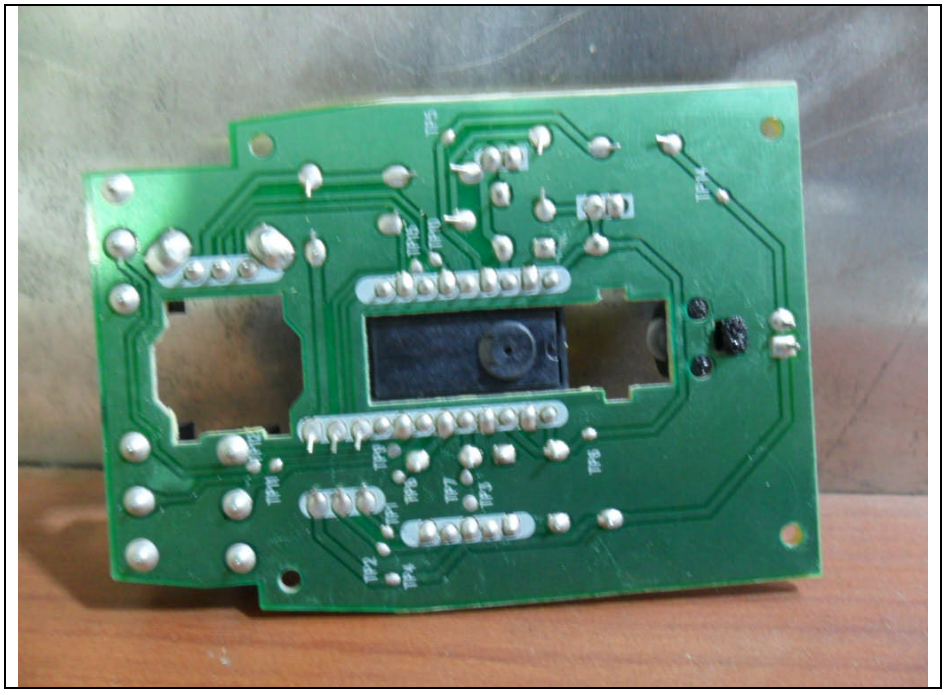
Inside



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* Remote Controller

Front View

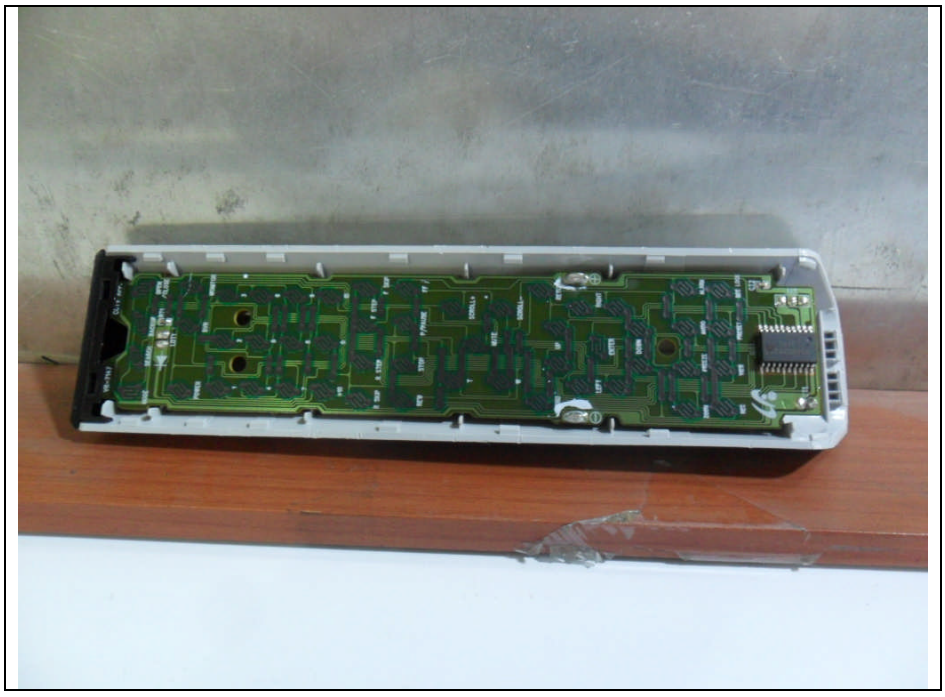


Rear View



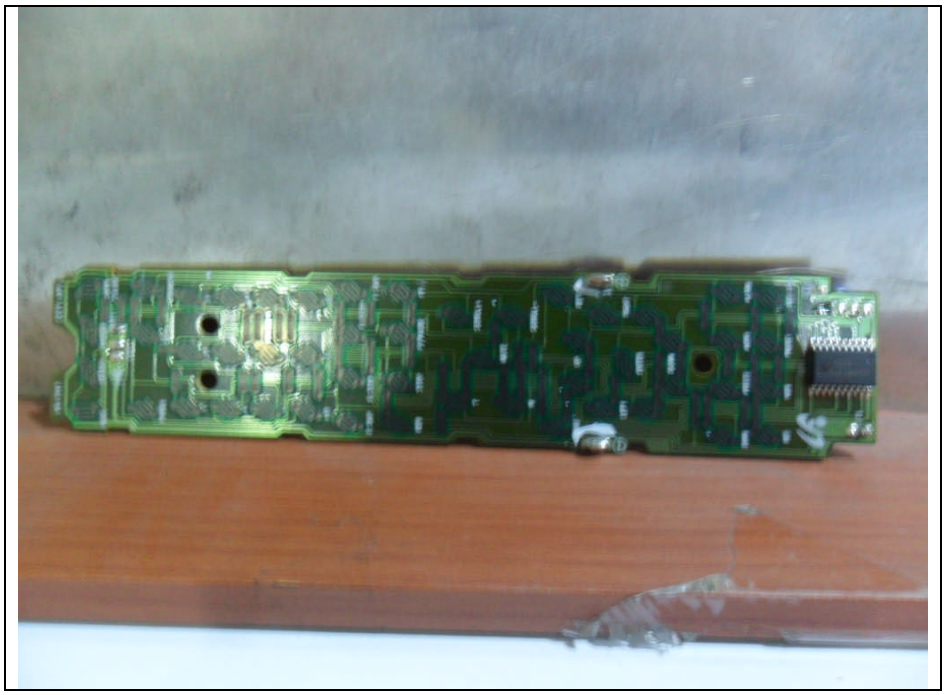
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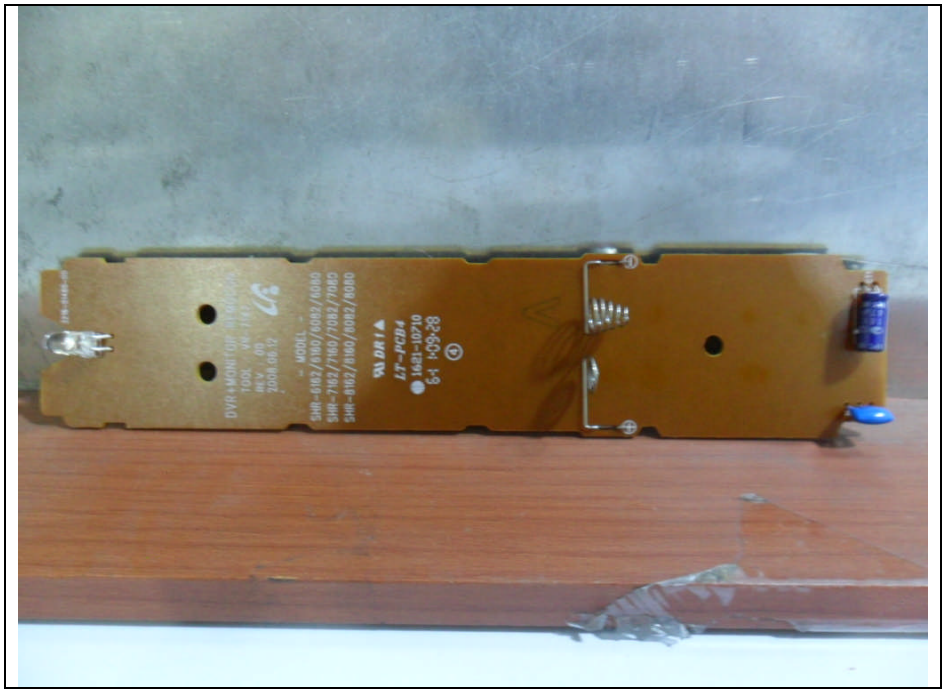
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