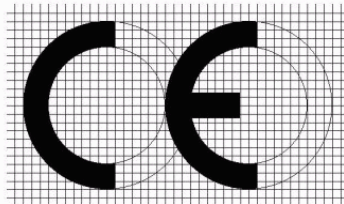


EU Declaration of Conformity (EMC)

Type of equipment: Digital Video Recorder
Model Name: KDMH-16S2C4N
Variant Model: KDMH-16S2C2, KDMH-08S2C2, KDMH-04S2H1
KDMH-16U2C4N, KDMH-08U2H2,
KDMH-04U2D1, KDMH-08S1C2, KDMH-04S1H1
Applicant: K-pro Tech Co., Ltd
Address: 2nd Floor, #202, Myung-ji e-Space II
218, An-yang 7 Dong, Man-an Gu,
An-yang City, Gyeong-gi Do, Korea
Manufacturer: K-pro Tech Co., Ltd
Address: 2nd Floor, #202, Myung-ji e-Space II
218, An-yang 7 Dong, Man-an Gu,
An-yang City, Gyeong-gi Do, Korea

We hereby declare, that all major safety requirements, concerning to CE Mark Directive (93/68/EEC) Electromagnetic Compatibility Directives (2004/108/EC, 92/31/EEC) are fulfilled, as laid out in the guideline set down by the member states of the EEC Commission.
This declaration is valid for all samples that are part of this declaration, which are manufactured according to the production charts appendix.



The standards relevant for the evaluation of EMC requirements are as follows :

EN 55022:2006, Class A, EN 50130-4:1995+A1:1998+A2:2003

EN 61000-3-2:2006, EN 61000-3-3:1995+A1+A2:2005

1. Certificate of conformity / Test report issued by :

EMC : EMC Compliance Laboratory

Report No : EMC-CE-1394

2. Technical documentation kept at : K-pro Tech Co., Ltd

which will be made available upon request.

K-pro Tech Co., Ltd

2nd Floor, #202, Myung-ji e-Space II

218, An-yang 7 Dong, Man-an Gu,

An-yang City, Gyeong-gi Do, Korea

(place and date of issue)

RECEIVED

By CHOICECYCLE at 8:22 am, Mar 17, 2009

(name and signature of authorized person)

EMC TEST REPORT

Test report No: EMC-CE-1394
Type of Equipment : Digital Video Recorder
Model Name: KDMH-16S2C4N
Variant Model: KDMH-16S2C2, KDMH-08S2C2, KDMH-04S2H1
KDMH-16U2C4N, KDMH-08U2H2,
KDMH-04U2D1, KDMH-08S1C2, KDMH-04S1H1
Applicant/ Manufacturer: K-pro Tech Co., Ltd
2nd Floor,#202,Myung-ji e-Space II
218,An-yang 7 Dong,Man-an Gu,
An-yang City,Gyeong-gi Do,Korea

Test standards :

EN 55022:2006, Class A, EN 50130-4:1995+A1:1998+A2:2003
EN 61000-3-2:2006, EN 61000-3-3:1995+A1+A2:2005

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.

Receipt date: 2008. 02. 19

Date of testing: 2008. 03. 18 ~ 03. 20

Issued date: 2008. 08. 04

Tested by: _____

CHOI, SUNG-HOH

Approved by: _____

YOO, SUNG-YUNG

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1. Applicant information

Applicant : K-pro Tech Co., Ltd
Address : 2nd Floor,#202,Myung-ji e-Space II
218, An-yang 7 Dong,Man-an Gu,
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Contact name : **Jang Ju Bong**

Manufacturer : K-pro Tech Co., Ltd
Address : 2nd Floor,#202,Myung-ji e-Space II
218, An-yang 7 Dong,Man-an Gu,
An-yang City,Gyeong-gi Do,Korea
Telephone : +82-31-445-9220
Fax. : +82-31-445-9226
E-mail : jang78@kprotech.co.kr
Contact name : **Jang Ju Bong**

2. Laboratory information

Address

EMC compliance Ltd.

82-1 Jeil-ri, Yangji-myun, Churingu, Yongin-city, Kyunggi-do 449-825, Korea

Telephone Number : 82 31 336 9919

Facsimile Number : 82 31 336 4767

CBTL Testing Laboratory

FCC Filing No.: 793334

FCC CAB.: KR0040

VCCI Registration No. : C-1713, R-2710, T-258

KOLAS NO.: 231

SITE MAP



EMC Compliance Ltd.

82-1 Jeil-ri, Yangji-myun, Churingu, Yongin-city, Kyunggi-do 449-825, Korea

TEL: 82 31 336 9919 FAX : 82 31 336 4767

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

3. Test system configuration

3.1 Operation environment

	Temperature	Humidity	Pressure
OATS	14 °C	32 %	-
Shielded room	22 °C	43 %	-
Immunity area	22 °C	44 %	1002 hPa

Test site

These testing items were performed following locations;

Shielded Room : Conducted Emission
OATS (10m) : Radiated Emission (#4)
Anechoic chamber (3m) : RS
Immunity area : ESD, EFT/Burst, Surge, CS,
Dip/Interruption, Harmonics, Flicker

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 NIS 80, 81, the measurement uncertainty level with a 95% confidence level was applied.

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

9kHz-150 kHz : ± 3.48 [dB]

150kHz-30 MHz : ± 3.04 [dB]

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

30-300 MHz ; 3 m: ±3.72 [dB], 10 m: ±3.71 [dB]

300-1000 MHz ; 3 m: ±3.82 [dB], 10 m: ±8.80 [dB]

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

± 1.0556 [dB]

4. Description of E.U.T.

4.1 General information

- KDMH-16S2C4N is a digital video recorder.

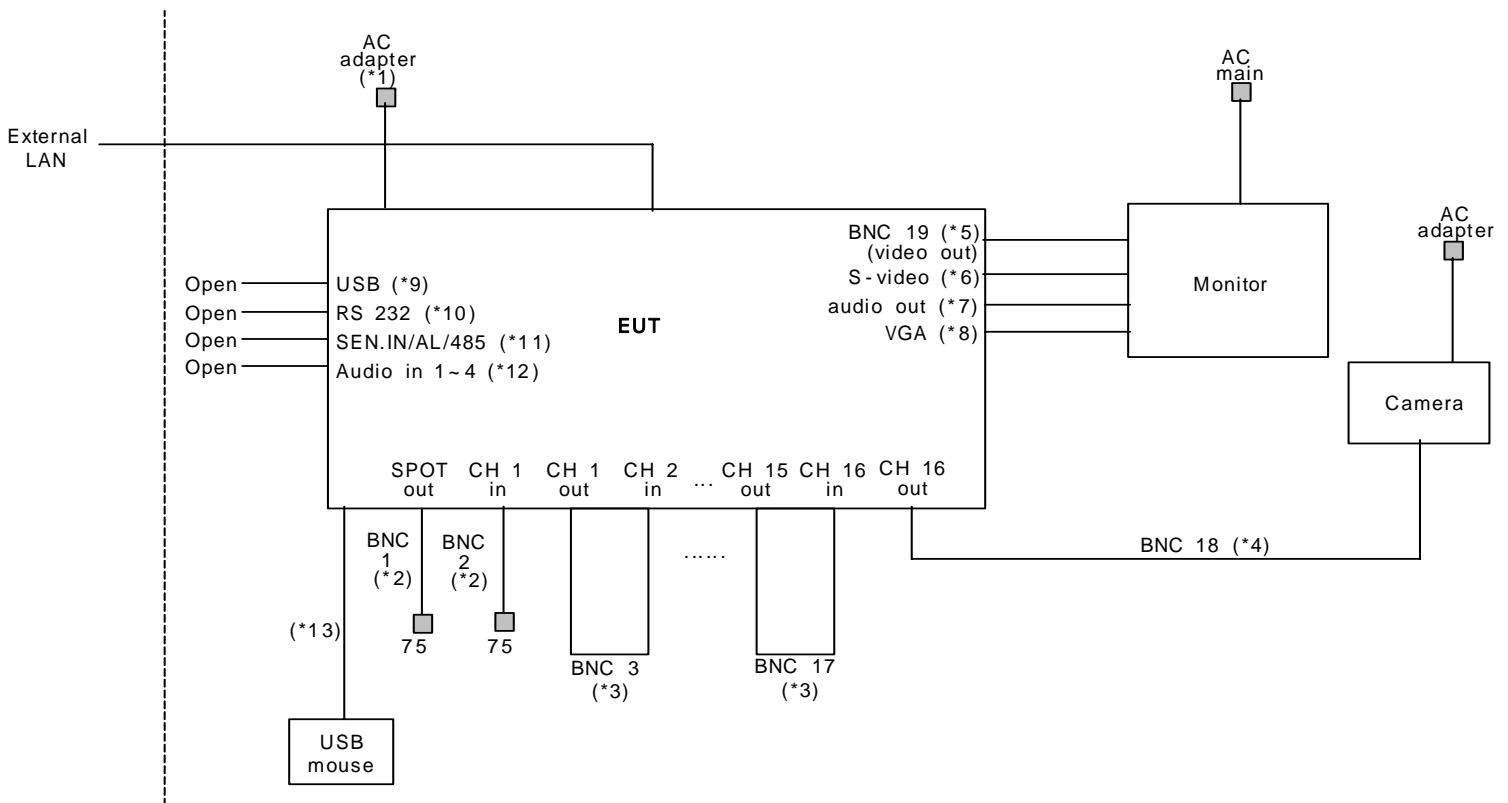
4.2 Product description

Type of product:	Digital Video Recorder
Model name (Basic):	KDMH-16S2C4N
Model name (Variant):	KDMH-16S2C2, KDMH-08S2C2, KDMH-04S2H1 KDMH-16U2C4N, KDMH-08U2H2, KDMH-04U2D1 KDMH-08S1C2, KDMH-04S1H1
Difference:	Channel
Serial no:	-
Testing Voltage:	230Vac, 50Hz
Product rating:	-
Note :	-

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Camera	-	260X	-
Monitor	CX911MW	N732H1IL900528X	SAMSUNG
USB mouse	M-UV69a	-	SAMSUNG

4.4 Test configuration



Type	Description	Connection (To)	Spec.	Length (m)	Note *
Power	AC adapter	AC main	Non-Shield	1.5	1
Signal	BNC cable 1~2	75 termination	Shield	3.0	2
	BNC cable 3~17	Loop	Shield	3.0	3
	BNC cable 18 (CH16 out)	Camera	Shield	3.0	4
	BNC cable 19 (video out)	Monitor	Shield	3.0	5
	S-video cable	Monitor	Shield	1.5	6
	Audio cable	Monitor	Shield	1.5	7
	VGA cable	Monitor	Shield	1.5	8
	USB cable	Open	Shield	1.2	9
	RS232 cable	Open	Shield	2.0	10
	SEN IN/AL/458 cable	Open	Shield	1.5	11
	Audio IN cable 1~4	Open	Shield	1.5	12
	USB mouse cable	USB mouse	Shield	1.5	13

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	LAN Ping test.
2	A camera was used for recording, displaying on the monitor.

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 port - LAN port	EN 55022, Class A	Complied
Radiated emission	EN 55022, Class A	Complied
Harmonics current	EN 61000-3-2	Complied
Voltage fluctuations and flickers	EN 61000-3-3	Complied

5.3 Summary of immunity test results

* EN 50130-4: Alarm systems *			
Items	Application	Test method	Test result
Electrostatic discharge	Enclosure	EN 61000-4-2:1995+A1+A2:2001	Complied
Radiated RF immunity	Enclosure	EN 61000-4-3:1995+A1:2002	Complied
Fast transient	AC main Signal Telecommunication	EN 61000-4-4:1995+A1+A2:2004	Complied
Surge	AC main Signal	EN 61000-4-5:1995+A1:2001	Complied
Conducted RF immunity	AC main Signal Telecommunication	EN 61000-4-6:1996+A1:2001	Complied
Magnetic field immunity	Enclosure	EN 61000-4-8:1994+A1:2001	N/A
Voltage dip/interruption	AC main	EN 61000-4-11:2004	Complied
Voltage variation	AC main	EN 50130-4:2003	Complied

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 3V/m. For components of CCTV systems, where the picture is allowed at 10V/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 3V/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 1V/m.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of discharge is permissible, providing That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators oeuvres at U=130DBuv.

For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at U=140BuV, 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 =130dBuV, 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 U +120dBuV.

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 occurs at U=130dBuV.

For component of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at U=140dBuV, providing:

- (d) there is no permanent damage or change to the EUT (e.g. no corruption of memory or changes to programmable settings etc.):
- (e) at U =130dBuV, any deterioration of the picture is so minor that the system could still be used; and
- (f) there is no observable deterioration of the picture at U +120dBuV.

Voltage dip/interruption

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.

6. Test results

6.1 Conducted Emission

Test specification	EN 55022 Section 5, Class A		
Test mode	Operating mode.		
Date:	2008.03.18		
Power supply	230V, 50Hz		
Test facility	Shielded room (CE#1)		
Temperature (°C)	22 °C	Humidity (%)	43 %
Remarks	Complied Minimum limit margin is 19.47 at 16.170 MHz.(Average) Telecommunication Minimum limit margin is 16.89 at 1.023 MHz.(Average)		

6.1.1 Limits of conducted emission measurement

- AC main

Frequency [MHz]	Class A(dBuV)		Class B (dBuV)	
	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(dBuV)		Current Limits(dBuA)	
	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 150Ω to the telecommunication port under test(conversion factor is $20 \log_{10} 150/I=44$ dB).

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 40 cm to the Horizontal metal ground 30 – 40 cm long. The power cord was bundles in the center. All peripheral equipment was powered from a sub LISN. The LISN and ISN were positioned 80 cm 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	844827/001	R&S	08.08.07	<input checked="" type="checkbox"/>
LISN	ESH3-Z5	846128/024	R&S	08.07.30	<input checked="" type="checkbox"/>
LISN	L3-32	0120J20305	PMM	-	<input checked="" type="checkbox"/>
4WIRE ISN	T800	24314	TESEQ	09.06.05	<input checked="" type="checkbox"/>

6.1.4 Photographs of test setup



* Telecommunication



6.1.5 Conducted emission measurement result

Test mode : AC main port

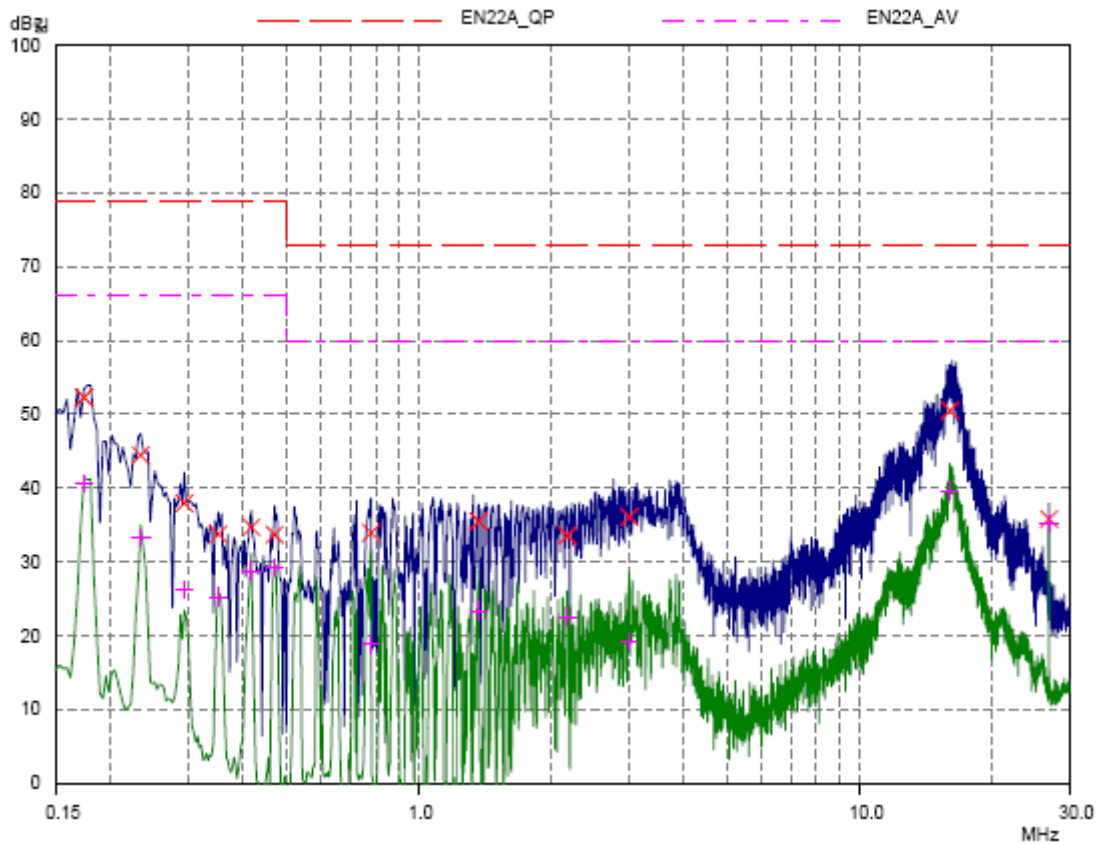
Frequency [MHz]	Correction Factor		Line	Quasi-peak			Average		
	LISN	Cable		Limit	Reading	Result	Limit	Reading	Result
				[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]
0.174	0.09	0.2	H	79.00	52.29	52.58	66.00	40.65	40.94
0.177	0.08	0.1	N		52.67	52.85		41.29	41.47
0.237	0.08	0.1	N		44.81	44.99		32.78	32.96
0.294	0.09	0.1	H		37.93	38.12		26.17	26.36
0.351	0.09	0.1	H		33.75	33.94		25.23	25.42
0.471	0.09	0.1	H		33.67	33.86		29.18	29.37
2.760	0.14	0.1	N	73.00	37.85	38.09	60.00	21.90	22.14
3.010	0.16	0.1	H		36.09	36.35		19.15	19.41
3.760	0.16	0.1	N		38.03	38.29		25.83	26.09
16.090	0.64	0.2	H		50.49	51.33		39.63	40.47
16.170	0.56	0.2	N		50.53	51.29		39.77	40.53
27.000	0.77	0.3	H		35.79	36.86		35.12	36.19

EUT:
 Manuf:
 Op Cond: H
 Operator:
 Test Spec: EN55022 Class A Conducted Emission
 Comment:

Result File: 0802057h.dat : 0802057_H

Scan Settings (2 Ranges)			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	

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

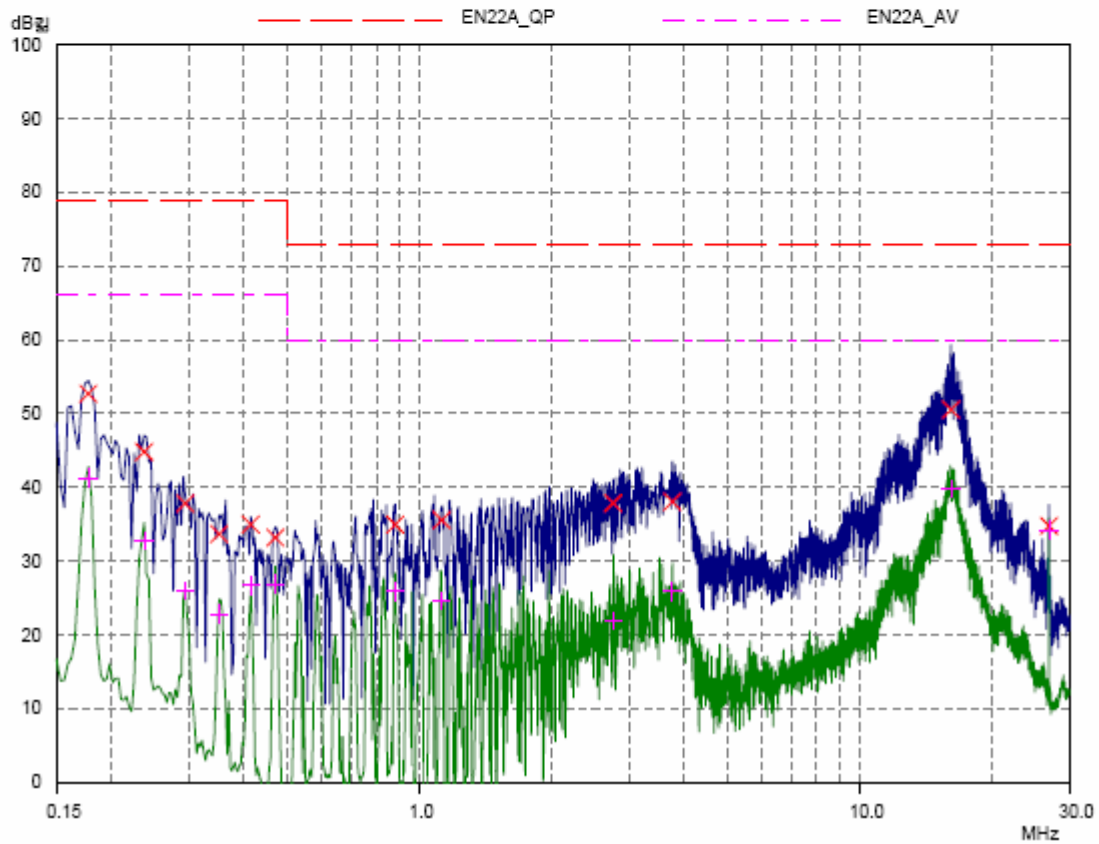


EUT:
 Manuf:
 Op Cond: N
 Operator:
 Test Spec: EN55022 Class A Conducted Emission
 Comment:

Result File: 0802057n.dat : 0802057_N

Scan Settings (2 Ranges)			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	

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



*** Telecommunication port**

*** LCL 65dB (LAN Port)**

Frequency [MHz]	Correction	Quasi-peak			Average		
	Factor	Limit	Reading	Result	Limit	Reading	Result
	Cable	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]
0.204	0.1	94.45	48.64	48.74	81.45	45.61	45.71
0.351	0.1	89.94	55.28	55.38	76.94	50.57	50.67
0.408	0.1	88.69	53.82	53.92	75.69	49.58	49.68
0.588	0.1	87.00	53.30	53.40	74.00	50.96	51.06
0.930	0.1		59.30	59.40		54.92	55.02
1.023	0.1		61.62	61.72		57.01	57.11
7.000	0.2		54.06	54.26		49.74	49.94
7.925	0.4		53.70	54.10		49.53	49.93
16.230	0.3		53.50	53.80		50.57	50.87
27.000	0.3		54.51	54.81		54.32	54.62

• Note. QP = Quasi-Peak, AV= Average.

EUT: KDMH-16S2C4N
 Manuf: DVR
 Op Cond:
 Operator:
 Test Spec: EN55022 Class A Conducted Emission
 Comment: Telecommunication port.

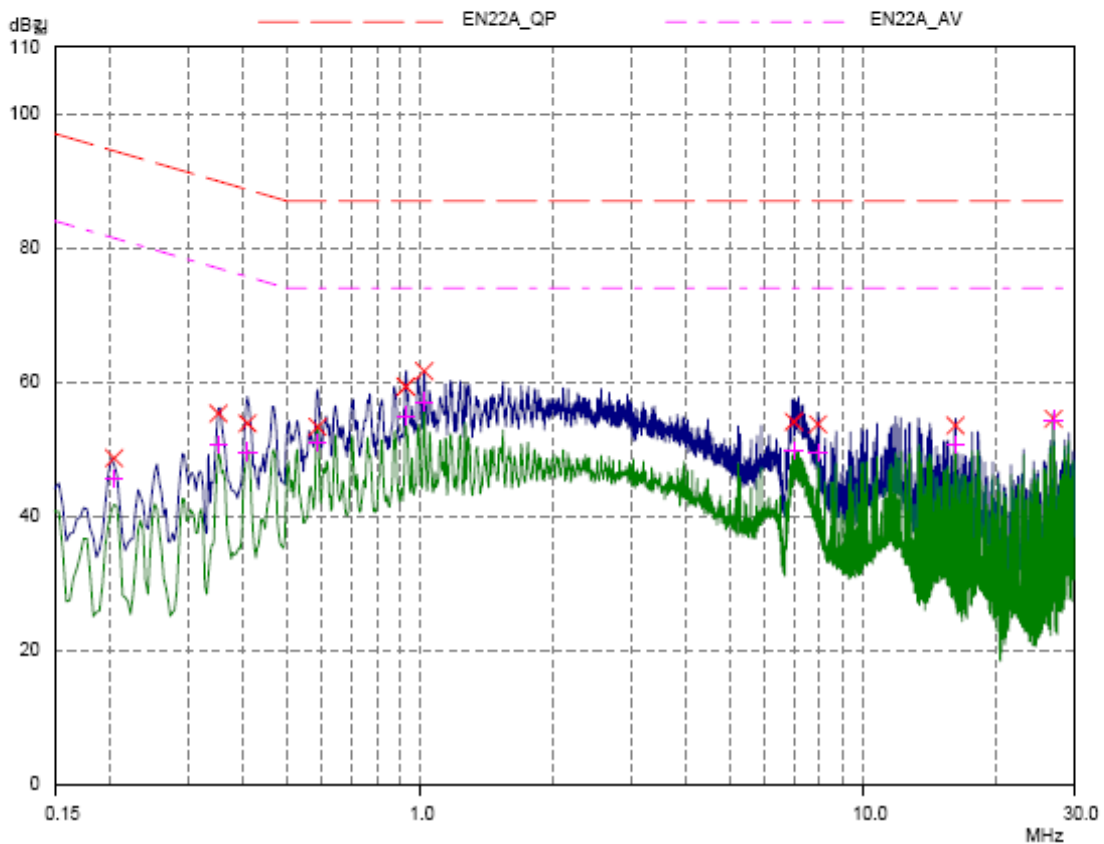
Result File: 02057.dat : 0802057

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	5kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	10kHz	30MHz	T800

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



6.2 Radiated Emission

Test specification	EN 55022 Sections 6, Class A		
Test mode	Operating mode.		
Date	2008.03.18		
Power supply	230V, 50Hz		
Test facility	Semi-anechoic chamber #4, 10m OATS		
Temperature (°C)	14 °C	Humidity (%)	32 %
Remarks	Complied Minimum limit margin is 3.57 dB at 866.68 MHz.		

6.2.1 Limits of radiated emission measurement

Frequency [MHz]	Class A(dBuV/m)@10m	Class B(dBuV/m)@10m
30-230	40	30
230-1000	47	37
Above 1000MHz		

6.2.2 Measurement procedure

A pretest was performed at 3m distance in a semi-anechoic chamber for searching correct frequency. The final test was done at a 10m open area test site with a quasi-peak detector. EUT was placed on a non-metallic table height of 0.8m above the reference ground plane. Cables were folded back and forth forming a bundle 0.3m to 0.4m long and were hanged at a 0.4m 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.

6.2.3 Used equipments

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test Receiver	ESCI	100001	R&S	08.11.16	<input checked="" type="checkbox"/>
TRILOG SUPER BROADBAND ANT	VULB9160	3228	Schwarz beck	10.02.21	<input checked="" type="checkbox"/>
Antenna Mast	A109	N/A	DAEIL	-	<input checked="" type="checkbox"/>
Turn Table	TS25	N/A	DAEIL	-	<input checked="" type="checkbox"/>
10m OATS	-	-	EMC Compliance	-	<input checked="" type="checkbox"/>

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:

$$FS = MR + AF + CL + AT - AG$$

MR = Meter Reading

AF = Antenna Factor

CL = Cable Loss

AP = Antenna Pad

AG=Amplifier Gain

If MR is 30dB, AF 12dB, CL 5dB, AP 10dB, AG 35dB

The result (MR) is

$$30 + 12 + 5 + 10 - 35 = 22\text{dBuV/m}$$

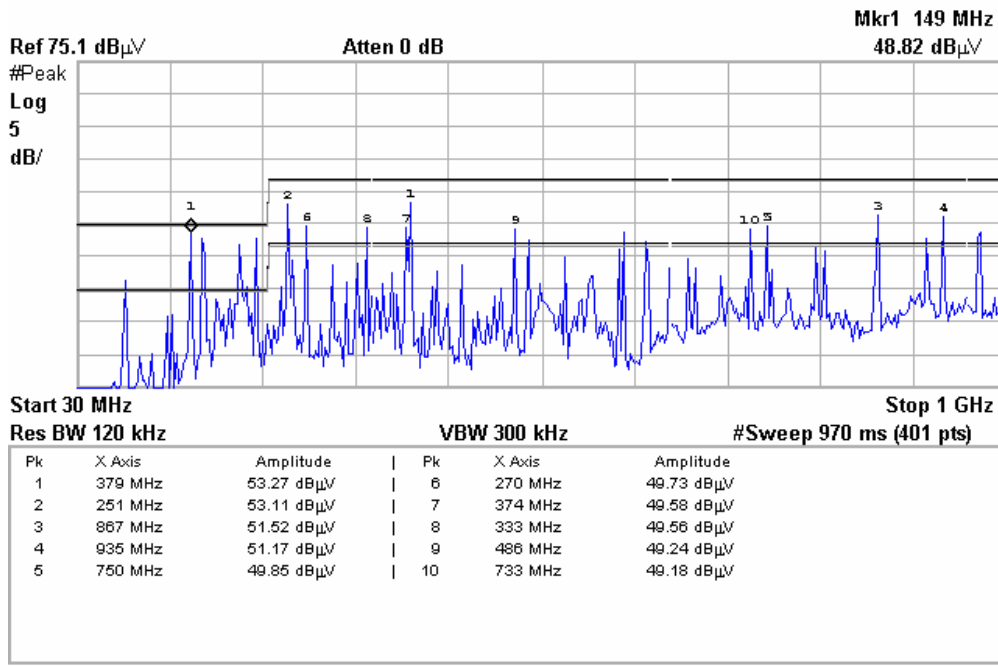
6.2.5 Photographs of test setup



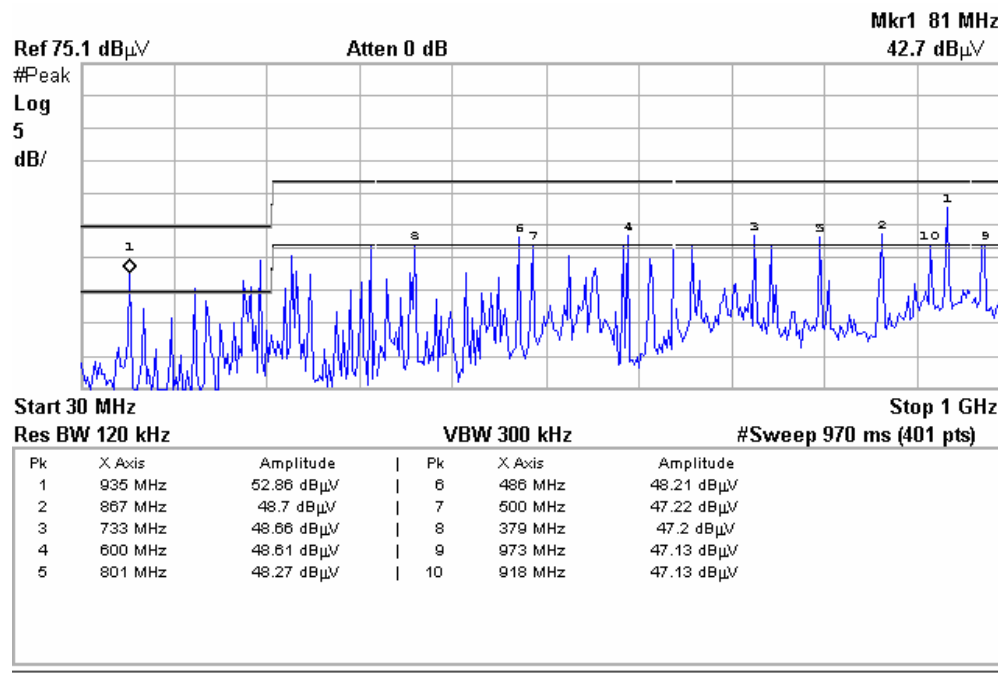
6.2.6 Radiated emission measurement result

***3m Semi-anechoic chamber Pre-scan Data (#4)**

-Horizontal



-Vertical



***10m OATS measurement data**

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	angle	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
					Antenna	Cable			
59.26	16.0	H	4.0	359	11.60	1.39	40.0	28.99	11.01
124.44	18.3	H	3.8	356	11.49	2.06	40.0	31.85	8.15
148.48	19.5	V	1.1	78	12.80	2.22	40.0	34.52	5.48
161.97	19.3	V	1.1	175	12.75	2.31	40.0	34.36	5.64
195.53	10.7	V	1.0	174	9.73	2.63	40.0	23.06	16.94
216.03	23.9	V	1.0	164	9.89	2.76	40.0	36.55	3.45
250.12	24.3	H	4.0	317	11.21	2.99	47.0	38.50	8.50
270.11	23.7	H	3.9	330	11.81	3.13	47.0	38.65	8.35
377.97	22.8	H	3.2	276	14.39	3.76	47.0	40.95	6.05
746.31	16.2	H	3.1	329	21.26	5.58	47.0	43.05	3.95
866.68	15.1	H	1.0	181	22.34	6.00	47.0	43.43	3.57
933.30	10.9	V	2.7	219	23.09	5.73	47.0	39.72	7.28

* Note : Reading = Test Receiver value,

6.3 Harmonics

Test specification	EN 61000-3-2:2006				
Test mode	Operating mode.				
Date	2008.03.20				
Power supply	230V, 50Hz				
Temperature(°C)	21°C	Humidity (%)	43%	Pressure (mb)	1002 mb
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.

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.	08.05.03	<input checked="" type="checkbox"/>
Test site	Immunity area	-	-	-	<input checked="" type="checkbox"/>

6.3.3 Photographs of test setup



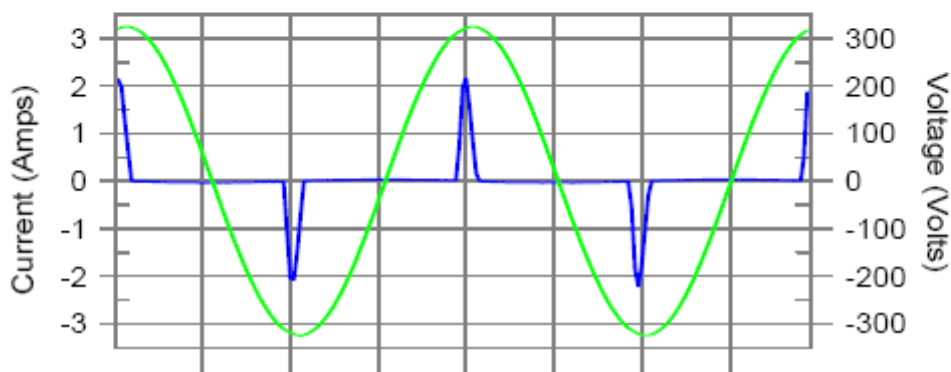
6.3.4 Measurement result

Harmonics – Class-A per Ed. 3.0 (2005-11)(Run time) incl. inter-harmonics

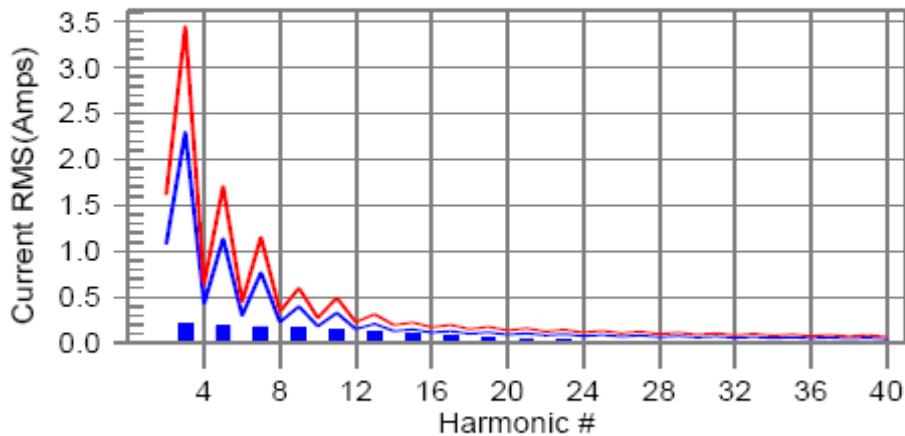
EUT: Tested by: Test Operator
 Test category: Class-A per Ed. 3.0 (2005-11) (European limits) Test Margin: 100
 Test date: 2008-03-19 Start time: 오후 2:17:59 End time: 오후 2:20:49
 Test duration (min): 2.5 Data file name: H-000174.cts_data
 Comment: Digital video recoder
 Customer: K-PRO

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 68.01% of the limit.

Current Test Result Summary (Run time)

EUT: | Tested by: Test Operator
 Test category: Class-A per Ed. 3.0 (2005-11) (European limits) Test Margin: 100
 Test date: 2008-03-19 Start time: 오후 2:17:59 End time: 오후 2:20:49
 Test duration (min): 2.5 Data file name: H-000174.cts_data
 Comment: Digital video recorder
 Customer: K-PRO

Test Result: Pass Source qualification: Normal
 THC(A): 0.44 I-THD(%): 213.58 POHC(A): 0.071 POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 229.54	Frequency(Hz): 50.00
I_Peak (Amps): 2.336	I_RMS (Amps): 0.509
I_Fund (Amps): 0.214	Crest Factor: 4.717
Power (Watts): 49.1	Power Factor: 0.421

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.003	1.080	0.3	0.003	1.620	0.20	Pass
3	0.198	2.300	8.6	0.201	3.450	5.84	Pass
4	0.003	0.430	0.7	0.003	0.645	0.52	Pass
5	0.189	1.140	16.5	0.192	1.710	11.23	Pass
6	0.003	0.300	1.0	0.003	0.450	0.77	Pass
7	0.176	0.770	22.9	0.179	1.155	15.49	Pass
8	0.003	0.230	1.5	0.004	0.345	1.11	Pass
9	0.160	0.400	40.0	0.163	0.600	27.14	Pass
10	0.004	0.184	1.9	0.004	0.276	1.45	Pass
11	0.142	0.330	43.0	0.144	0.495	29.18	Pass
12	0.004	0.153	2.4	0.004	0.230	1.79	Pass
13	0.122	0.210	58.2	0.124	0.315	39.52	Pass
14	0.004	0.131	2.7	0.004	0.197	1.99	Pass
15	0.102	0.150	68.0	0.104	0.225	46.20	Pass
16	0.003	0.115	2.9	0.004	0.173	2.12	Pass
17	0.082	0.132	62.1	0.084	0.199	42.08	Pass
18	0.003	0.102	3.0	0.003	0.153	2.23	Pass
19	0.063	0.118	53.4	0.065	0.178	36.43	Pass
20	0.003	0.092	2.9	0.003	0.138	2.15	Pass
21	0.046	0.107	43.4	0.048	0.161	29.76	Pass
22	0.002	0.084	2.6	0.003	0.125	2.06	Pass
23	0.032	0.098	33.2	0.034	0.147	22.94	Pass
24	0.002	0.077	2.3	0.002	0.115	1.82	Pass
25	0.022	0.090	24.6	0.023	0.135	17.14	Pass
26	0.001	0.071	2.0	0.002	0.106	1.63	Pass
27	0.016	0.083	19.6	0.017	0.125	13.64	Pass
28	0.001	0.066	1.8	0.001	0.099	1.49	Pass
29	0.015	0.078	19.1	0.015	0.116	13.29	Pass
30	0.001	0.061	1.8	0.001	0.092	1.52	Pass
31	0.015	0.073	20.8	0.016	0.109	14.43	Pass
32	0.001	0.058	2.0	0.001	0.086	1.67	Pass
33	0.015	0.068	22.4	0.016	0.102	15.30	Pass
34	0.001	0.054	2.2	0.001	0.081	1.82	Pass
35	0.014	0.064	22.2	0.015	0.096	15.16	Pass
36	0.001	0.051	2.4	0.001	0.077	1.87	Pass
37	0.012	0.061	20.3	0.013	0.091	13.96	Pass
38	0.001	0.048	2.5	0.001	0.073	1.90	Pass
39	0.010	0.058	16.9	0.010	0.087	11.65	Pass
40	0.001	0.046	1.9	0.001	0.069	1.47	Pass

Voltage Source Verification Data (Run time)

EUT: Tested by: Test Operator
 Test category: Class-A per Ed. 3.0 (2005-11) (European limits) Test Margin: 100
 Test date: 2008-03-19 Start time: 오후 2:17:59 End time: 오후 2:20:49
 Test duration (min): 2.5 Data file name: H-000174.cts_data
 Comment: Digital video recorder
 Customer: K-PRO

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms): 229.54	Frequency(Hz): 50.00
I_Peak (Amps): 2.336	I_RMS (Amps): 0.509
I_Fund (Amps): 0.214	Crest Factor: 4.717
Power (Watts): 49.1	Power Factor: 0.421

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.098	0.459	21.34	OK
3	0.627	2.066	30.37	OK
4	0.022	0.459	4.82	OK
5	0.036	0.918	3.97	OK
6	0.019	0.459	4.06	OK
7	0.082	0.689	11.96	OK
8	0.015	0.459	3.36	OK
9	0.083	0.459	18.19	OK
10	0.010	0.459	2.19	OK
11	0.102	0.230	44.49	OK
12	0.018	0.230	7.74	OK
13	0.083	0.230	36.09	OK
14	0.009	0.230	3.86	OK
15	0.093	0.230	40.36	OK
16	0.012	0.230	5.29	OK
17	0.071	0.230	30.88	OK
18	0.020	0.230	8.69	OK
19	0.069	0.230	29.85	OK
20	0.009	0.230	4.13	OK
21	0.055	0.230	24.18	OK
22	0.008	0.230	3.52	OK
23	0.044	0.230	19.09	OK
24	0.006	0.230	2.51	OK
25	0.032	0.230	13.77	OK
26	0.012	0.230	5.27	OK
27	0.021	0.230	9.24	OK
28	0.010	0.230	4.32	OK
29	0.026	0.230	11.32	OK
30	0.011	0.230	4.90	OK
31	0.019	0.230	8.37	OK
32	0.012	0.230	5.07	OK
33	0.037	0.230	16.02	OK
34	0.009	0.230	3.89	OK
35	0.030	0.230	13.15	OK
36	0.005	0.230	2.25	OK
37	0.029	0.230	12.71	OK
38	0.006	0.230	2.76	OK
39	0.027	0.230	11.75	OK
40	0.005	0.230	2.16	OK

6.4 Flicker

Test specification	EN 61000-3-3:2005				
Test mode	Operating mode				
Date	2008.06.20				
Power supply	230V, 50Hz				
Temperature(°C)	21°C	Humidity (%)	43%	Pressure (mb)	1002 mb
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.

$$P_{it} = 2 \text{ h}$$

$$P_{st} = 10 \text{ min}$$

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.

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.	08.05.03	<input checked="" type="checkbox"/>
Test site	Immunity area	-	-	-	<input checked="" type="checkbox"/>

6.4.3 Photographs of test setup



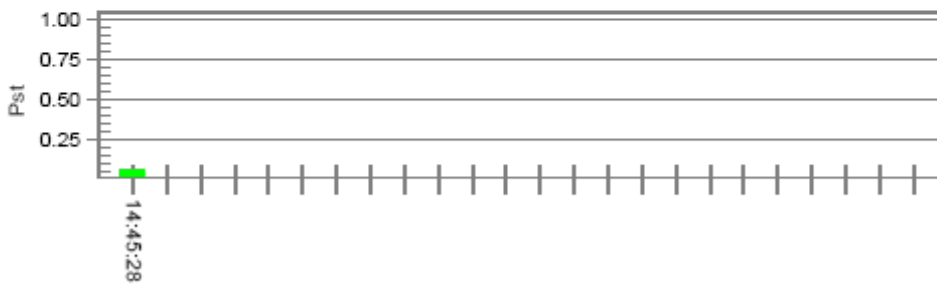
6.4.4 Measurement result

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

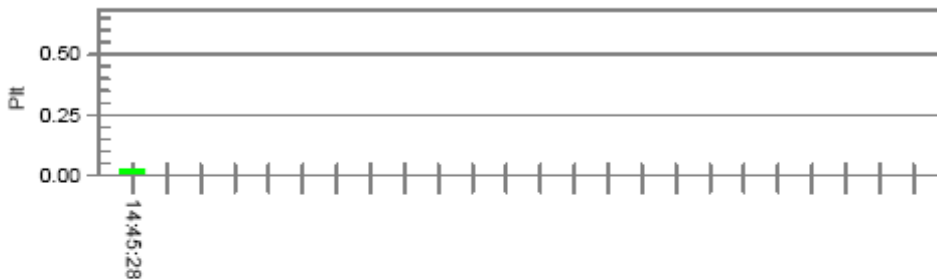
EUT: Tested by: Test Operator
 Test category: All parameters (European limits) Test Margin: 100
 Test date: 2008-03-19 Start time: 오후 2:35:08 End time: 오후 2:45:29
 Test duration (min): 10 Data file name: F-000175.cts_data
 Comment: DVR
 Customer: K-PRO

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):	229.38		
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

6.5 Electrostatic Discharge test result

Test specification	EN61000-4-2:2001				
Test level	Contact: $\pm 2, 4, 6$ kV Air: $\pm 2, 4, 8$ kV HCP / VCP : $\pm 2, 4, 6$ kV				
Discharge impedance	330 Ω /150pF				
Date	2008.03.19				
Power supply	230V, 50Hz				
Number of discharge	10				
Interval between discharges	: ≥ 1 s				
Temperature($^{\circ}$ C)	22 $^{\circ}$ C	Humidity (%)	44%	Pressure (mb)	1002 mb
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 0.8m above the reference grounded floor.

A horizontal coupling plane(HCP) was placed on the table, and Connected to the reference plane via a 470k Ω resistor located in each end (0.5mm insulating support between EUT and HCP). In both cases a vertical coupling plane(VCP) OF 0.5 X 0.5m was located 10cm from the EUT's sides. The VCP was connected to the reference plane in the same matter as the HCP.

6.5.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. Date	Used
ESD Tester	PESD 1600	H011 309	HAEFELY	08.06.26	<input checked="" type="checkbox"/>
HCP	-	-	-	-	<input checked="" type="checkbox"/>
VCP	-	-	-	-	<input checked="" type="checkbox"/>

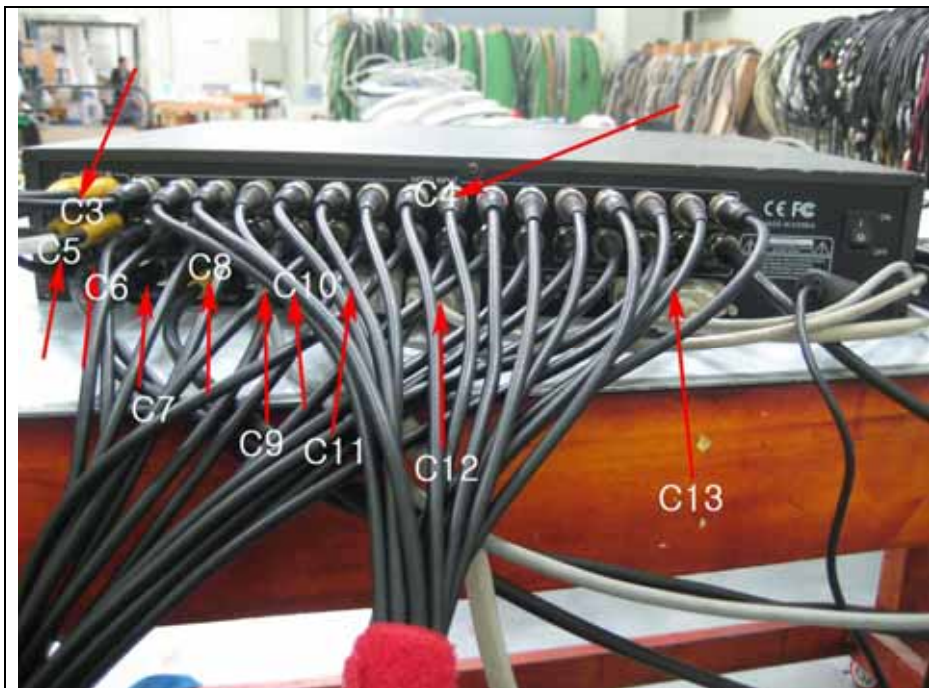
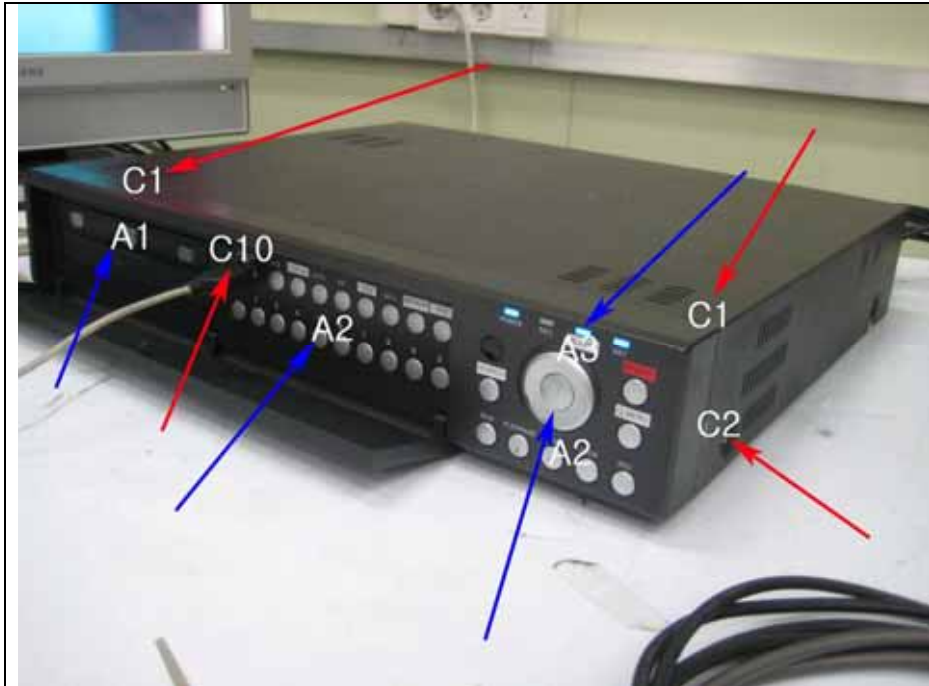
6.5.3 Photographs of test setup



6.5.4 Measurement result

Electrostatic Discharge (Test Point)

Air discharge	→
Contact discharge	→



Contact discharge

Location(EUT)		Applied level (±)	Result
C1	Case	±2,4,6KV	Complied
C2	Screw	±2,4,6KV	Complied
C3	Audio in port	±2,4,6KV	Complied
C4	BNC port (CH1~CH16)	±2,4,6KV	Complied
C5	SPOT out port	±2,4,6KV	Complied
C6	S-video port	±2,4,6KV	Complied
C7	Audio out port	±2,4,6KV	Complied
C8	LAN port	±2,4,6KV	Complied
C9	USB port	±2,4,6KV	Complied
C10	VGA port	±2,4,6KV	Complied
C11	RS232 port	±2,4,6KV	Complied
C12	SEN.IN/AL/485 port	±2,4,6KV	Complied
	HCP (All 4 sides)	±2,4,6KV	Complied
	VCP (All 4 sides)	±2,4,6KV	Complied

Air discharge

Location(EUT)		Applied level(±)	Result
A1	DVD	±2,4,8KV	Complied
A2	Button	±2,4,8KV	Complied
A3	LED	±2,4,8KV	Complied

6.6 Radio Frequency Electromagnetic Fields

Test specification	EN 61000-4-3:2002				
Tested frequency	80MHz – 2000MHz log 1% step				
Test level & Modulation	1,3,10 Vrms, 80% Amplitude Modulation(1kHz) 1,3,10 Vrms, Pulse Modulation (1Hz (0.5s ON: 0.5 s OFF))				
Distance	3m from EUT to tip of antenna				
Dwell time	3S				
Step size	log 1% step				
Power supply	230V, 50Hz				
Date	2008.03.19				
Temperature(°C)	22 °C	Humidity (%)	44 %	Pressure (mb)	1002 mb
Remarks	Complied - There was no change of operation status during above testing.				

6.6.1 Measurement procedure

The test was performed at 3m 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 0.8m above the floor.

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

The field uniformity was calibrated for 1V/m, 3V/m, 10V/m.

6.6.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Power meter	PM2002	302852	AR	08.05.03	<input checked="" type="checkbox"/>
Power sensor (with adapter)	PH2000	303224	AR	08.05.03	<input checked="" type="checkbox"/>
Power sensor (with adapter)	PH2000	303222	AR	08.05.03	<input checked="" type="checkbox"/>
Directional coupler	DC6180	303976	AR	08.05.03	<input checked="" type="checkbox"/>
Signal generator	E4421B	GB40052295	AGILENT	08.10.25	<input checked="" type="checkbox"/>
Amplifier	150W1000M2	303843	AR	08.04.11	<input checked="" type="checkbox"/>
Directional Coupler	DC7144M1	320279	AR	09.02.19	<input checked="" type="checkbox"/>

Amplifier	60S1G3M2	320444	AR	08.04.11	☒
BiconiLog Ant.	LPDA-0803	130269	ETS	-	☒
BiconiLog Antenna	3142B	1786	EMCO	-	☒
Field monitor	SI-300	-	TDK	-	☒
Controller	HD 100	-	Deisel	-	☒
Turn table	DS 412S	-	Deisel	-	☒
Antenna mast	MA 220	-	Deisel	-	☒

6.6.3 Photographs of test setup



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

6.7 Electric Fast Transient/BURST

Test specification	EN61000-4-4 : 2004				
Coupling	AC main Signal: Clamp Telecommunication: Clamp				
Test level	AC Power : ± 2 kV Peak Signal : ± 1 kV Peak Telecommunication: ± 1 kV Peak				
Repetition frequency	5 kHz, Tr/Th = 5/50nS				
Coupling time	60s				
Power supply	230V, 50Hz				
Date	2008.03.19				
Temperature(°C)	22°C	Humidity (%)	44%	Pressure (mb)	1002 mb
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 0.8m 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 0.5m.

6.7.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	0701-03	EM TEST	08.05.03	<input checked="" type="checkbox"/>
Capacitive Coupling Clamp	CNV 508 S2	1001-10	EM TEST	-	<input checked="" type="checkbox"/>

6.7.3 Photographs of test setup



6.7.4 Measurement result

AC main

EFT coupling point	(+)	(-)	Result
Live	+2KV	-2KV	Complied
Neutral	+2KV	-2KV	Complied
PE	+2KV	-2KV	Complied
Live + Neutral	+2KV	-2KV	Complied
Live + PE	+2KV	-2KV	Complied
Neutral + PE	+2KV	-2KV	Complied
Live +Neutral+PE	+2KV	-2KV	Complied

Signal

EFT coupling point	(+)	(-)	Result
BNC cable	+1KV	-1KV	Complied

Telecommunication

EFT coupling point	(+)	(-)	Result
LAN cable	+1KV	-1KV	Complied

6.8 Surge

Test specification	EN 61000-4-5 :2001				
Coupling	AC main				
Test level	AC main Differential mode : 0.5,1KV Common mode : 0.5, 1,2KV Signal line: 0.5,1KV				
Surge pulse shape	Tr/Th =1.2/50uS				
Coupling Impedance	Differential mode: 18 μ F Common mode: 10 Ω +9 μ F BNC: Direct				
Angles	0°, 90°, 180°, 270°, 360°				
Number of surge & Coupling time	5T/1min				
Power supply	230V, 50Hz				
Date	2008.03.20				
Temperature(°C)	21°C	Humidity (%)	43 %	Pressure (mb)	1002 mb
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, EUT was placed on a 0.8 m wooden table. For tabletop equipment, EUT was placed on a wooden table (0.8m) above the reference plane.

6.8.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	V0545100858	EM TEST	09.01.07	<input checked="" type="checkbox"/>
CDN	CNV 508 S2	0402-1	EM TEST	-	<input checked="" type="checkbox"/>

6.8.3 Photographs of test setup



6.8.4 Measurement result

AC main

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

Signal

Coupling point	(+)	(-)	Result
BNC cable	+0.5,1KV	-0.5,1KV	Complied

6.9 Conducted Immunity

Test specification	EN 61000-4-6:2001				
Tested frequency	150 KHz – 100 MHz 1% step				
Test level & Modulation	1,3,10 Vrms, 80% Amplitude Modulation(1kHz) 1,3,10 Vrms, Pulse Modulation (1Hz (0.5s ON: 0.5 s OFF))				
Coupling method	AC main : M3 Signal : clamp Telecommunication: clamp				
Power supply	230V, 50Hz				
Step size	1% step				
Date	2008.03.20				
Temperature(°C)	21 °C	Humidity (%)	43 %	Pressure (mb)	1002 mb
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 0.1m wooden table.

This test were performed using CDN for mains, clamp for signal and injection probe.

The frequency range was swept from 150 kHz to 100MHz. This frequency range was Modulated with 1 kHz sine wave at 80%.

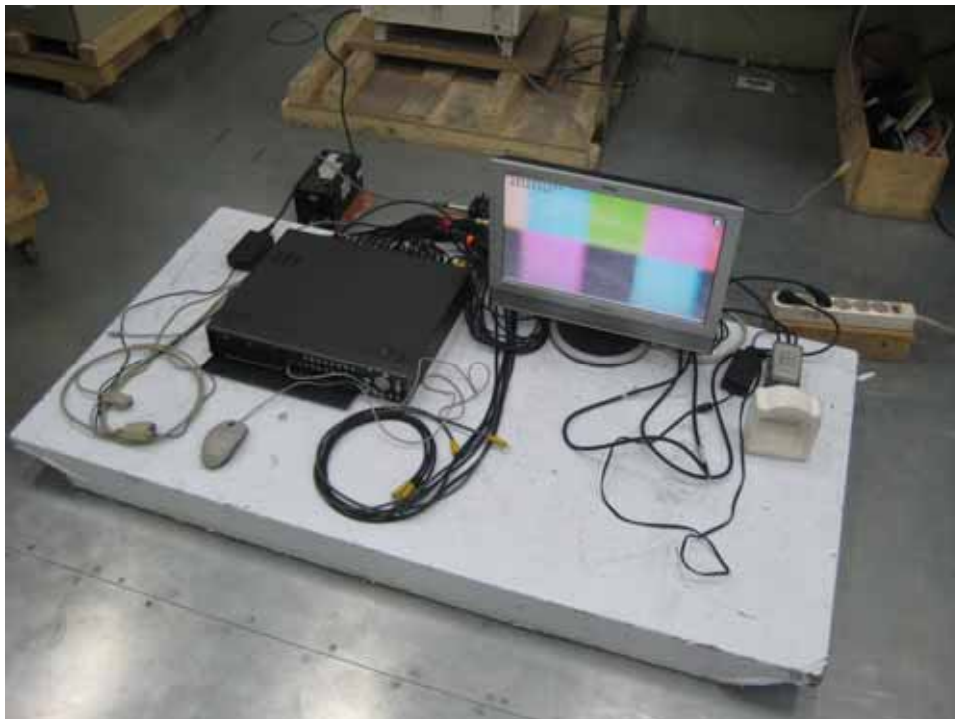
The signal generators provided the modulated frequency at a 1% step size.

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

6.9.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
CS generator	CWS 500 C S1	V0635101750	EM TEST	08.10.15	<input checked="" type="checkbox"/>
CDN	CDN M2/M3	0906-12	EM TEST	08.10.06	<input checked="" type="checkbox"/>
Attenuator	73-6-34	MU918	MCE/ WEINSCHEL	08.03.22	<input checked="" type="checkbox"/>
EM Clamp	KEMZ 801	17643	Schaffner	08.03.20	<input checked="" type="checkbox"/>
EM Clamp	KEMA 801	17899	Schaffner	-	<input type="checkbox"/>
Current probe	MD720	W1345167/M6/ 0068	Schaffner	-	<input checked="" type="checkbox"/>

6.9.3 Photographs of test setup





6.9.4 Measurement result

Coupling point	Coupling method	Result
Power	CDN(M3)	Complied
BNC cable	Clamp	Complied
LAN cable	Clamp	Complied

6.10 Dips and Interruptions

Test specification	EN 61000-4-11:2004				
Number of dips	3T				
Duration	60S				
Phase	Zero crossing (0°, 180°)				
Power supply	240Vac				
Date	2008.03.20				
Temperature (°C)	21°C	Humidity (%)	43%	Pressure (mb)	1002mb
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
dips/interruption generator	UCS 500M6	V0545100858	EM TEST	09.01.07	<input checked="" type="checkbox"/>

6.10.3 Photographs of test setup



6.10.4 Measurement result

- 240Vac

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

Comment :

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

6.11 Mains supply voltage variations

Test specification	EN 50130-4:2003				
Tested Voltage	$U_{nom} + 10 \%$, $U_{nom} - 15 \%$				
Power supply	240Vac				
Date	2008.03.20				
Temperature (°C)	21°C	Humidity (%)	43%	Pressure (mb)	1002mb
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	09.01.07	<input checked="" type="checkbox"/>

6.11.2 Measurement result

Tested voltage : 240Vac

Supply voltage		Result
+ 10 %	264V	Complied
- 15 %	204V	Complied

7. E.U.T. photographs

Front View



Rear View



Inside



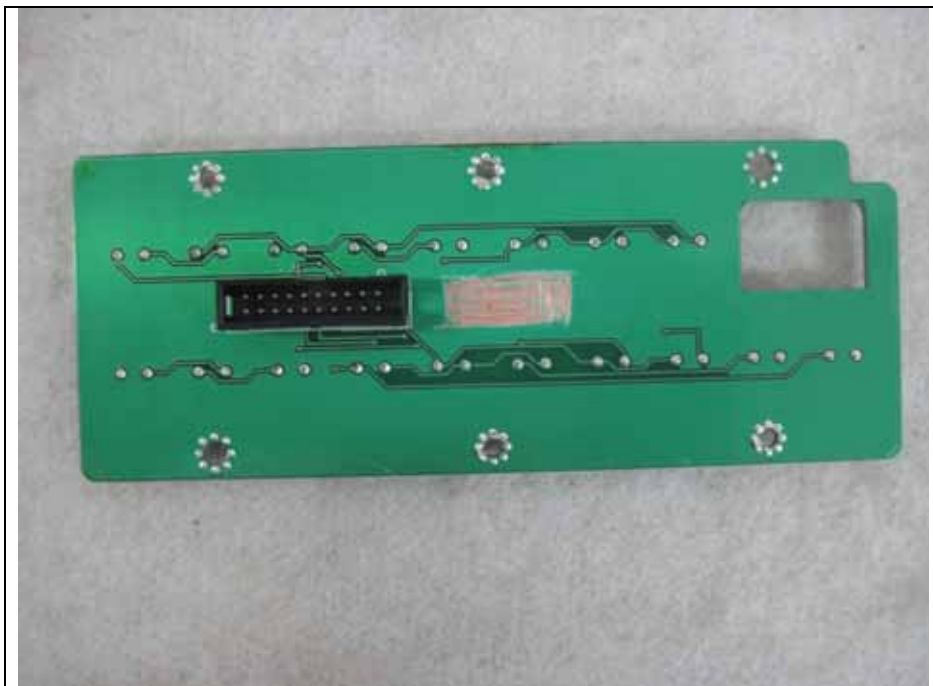
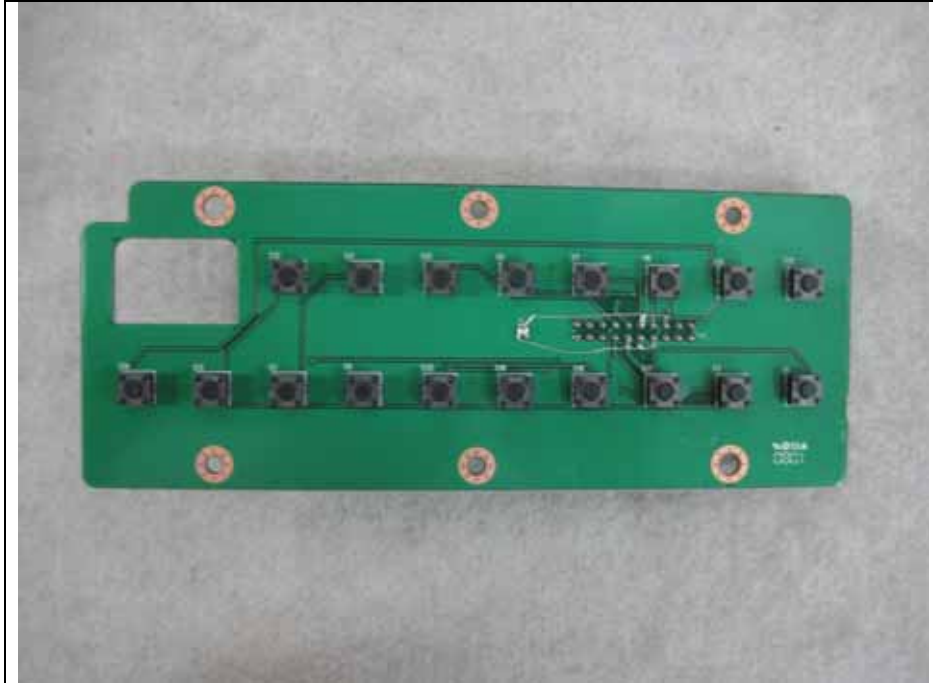
Main Board



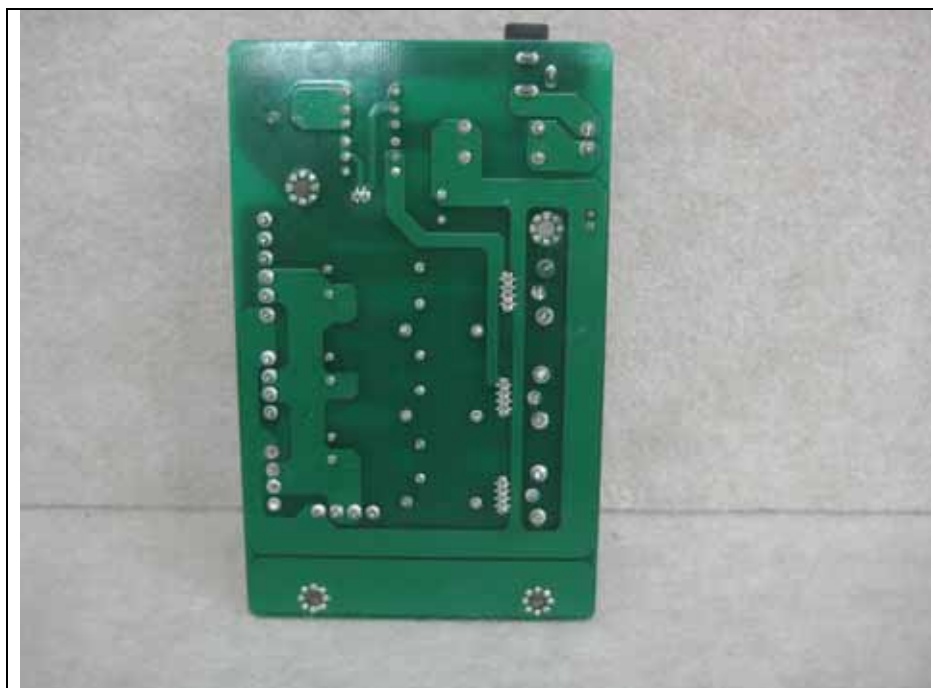
Button Board 1



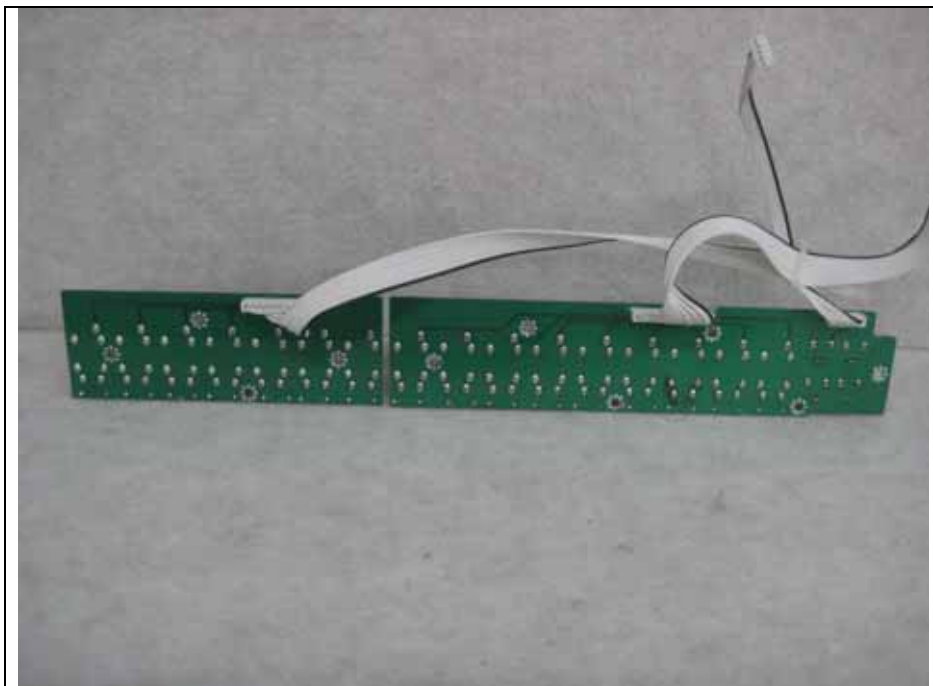
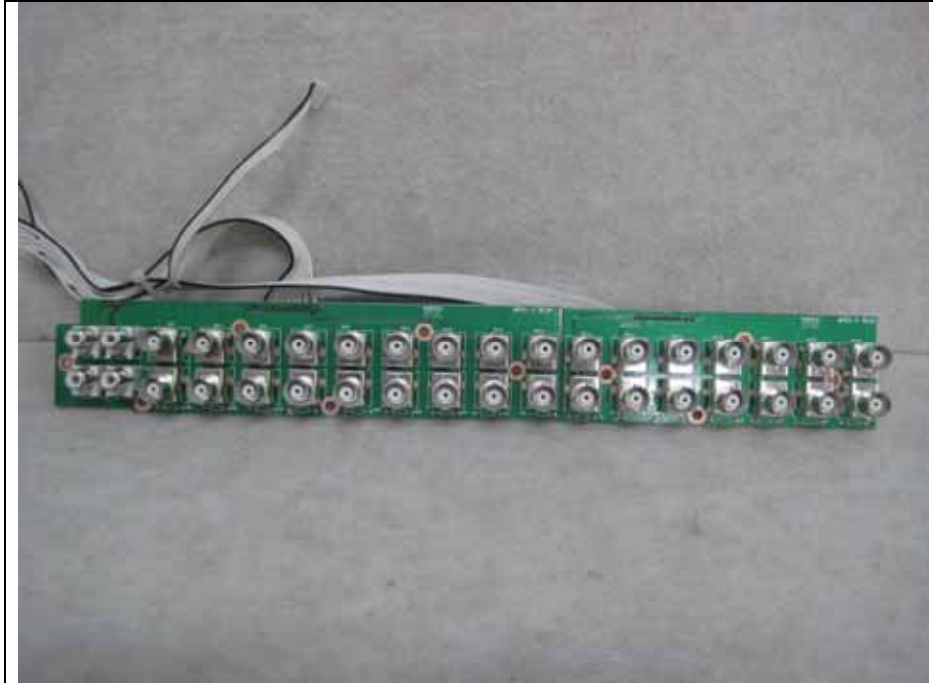
Button Board 2



Power Board



BNC Board



HDD



BNC cable



AV cable



RS232 cable



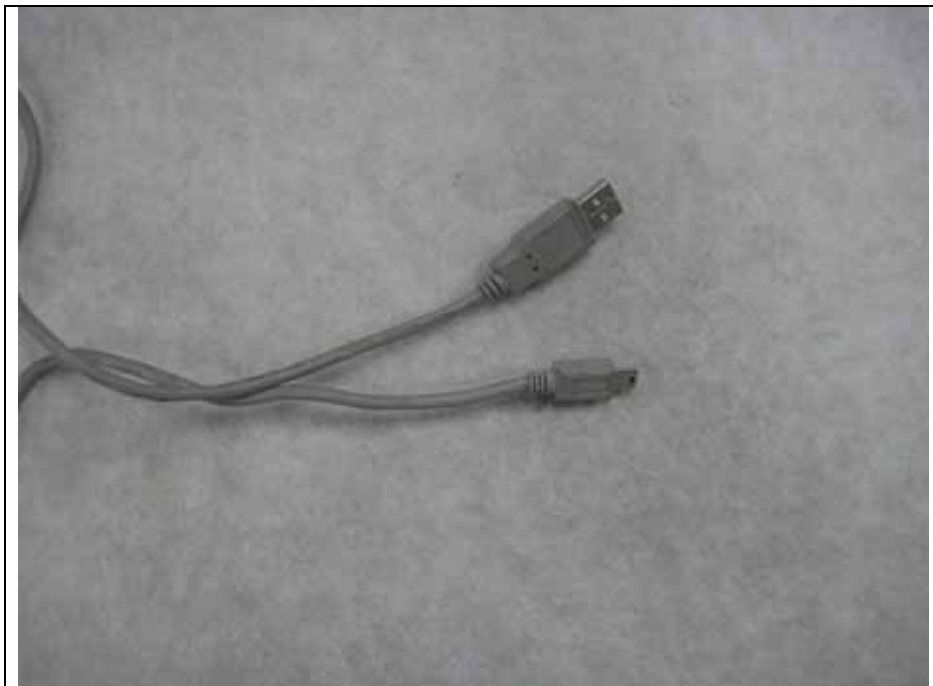
SEN IN/AL/485 cable



S-video cable



USB cable



VGA cable

