EMC TEST REPORT

Project No.	**LBE081805**	**Revision No.**	NONE
Applicant	**Name of organization**	Samsung Electronics Co., Ltd.	
	Address	416 Maetan 3-Dong,Yeongtong-Gu,Suwon-Si, Gyeonggi-Do, 443-742 Korea	
	Date of application	2008.05.30	
EUT Equipment Under Test	**Kind of product**	**LCD Monitor**	
	Model No.	**MG32PS**	
		Variant Model No.	NONE
	New / Alternative / Permissive change information	* New	
	Manufacturer	Samsung Electronics Co., Ltd. 416 Maetan 3-Dong,Yeongtong-Gu,Suwon-Si, Gyeonggi-Do, 443-742 Korea	
Applied Standards		EN55022:1998+A1:2000+A2:2003	
		EN55024:1998+A1:2001+A2:2003	
		EN61000-3-2:2000+A2:2005	
		EN61000-3-3:1995+A1:2001+A2:2005	
Issue date		2008.07.31	

Test result : **Complied**

The equipment under test has found to be compliant with the applied standards.
(Refer to the attached test result for more detail.)

Tested by : Hyun Jeong Jang

Reviewed by : No Cheon Park

This report is the test result about the sphere accredited by KOLAS which signed the Mutual Recognition Arrangement of International Laboratory Accreditation Cooperation.
The test results in this report only apply to the tested sample. This report must not be reproduced, except in full, without written permission from SEC EMC Laboratory.

SAMSUNG

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1. Summary of test results

1.1 Emission

The EUT has been tested according to the following specifications:

Applied	Test type	Applied standard	Result	Remarks
☒	Conducted Disturbance (Mains Port)	EN55022:1998+A1:2000+A2:2003	Complied	Meets Class B Limit Minimum margin is 3.4 dB at 0.539 MHz
☒	Radiated Disturbance		Complied	Meets Class B Limit Minimum margin is 6.0 dB at 633.412 MHz
☒	Harmonics current	EN61000-3-2:2000 +A2:2005	Complied	
☒	Voltage fluctuation & Flicker	EN61000-3-3:1995+A1:2001+A2:2005	Complied	

1.2 Immunity

Immunity test applied the normative documents of EN55024:1998+A1:2001+A2:2003.
The EUT has been tested according to the following specifications:

Applied	Test type	Applied standard	Performance Criterion	
			Result	Specification
☒	Electrostatic discharge	EN61000-4-2:1995	A☒ B☐ C☐	**B**
☒	Radiated, radio-frequency, electromagnetic field	EN61000-4-3:1995	A☒ B☐ C☐	**A**
☒	Electrical fast transient/burst	EN61000-4-4:1995	A☒ B☐ C☐	**B**
☒	Surge	EN61000-4-5:1995	A☒ B☐ C☐	**B**
☒	Radio-frequency conducted	EN61000-4-6:1996	A☒ B☐ C☐	**A**
☒	Voltage dips, short interruptions and voltage variations	EN61000-4-11:1994	A☒ B☐ C☐ A☒ B☐ C☐ A☐ B☒ C☐	B : > 95 % 0.5 Reduction C : 30 % 25 Reduction C : > 95 % 250 Reduction
☐	Power-frequency magnetic field	EN61000-4-8:1993	A☐ B☐ C☐	**A**

2. General Information

2.1 Test facility

The SEC EMC Laboratory is located on Samsung Electronics Co., Ltd. at 416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, South Korea.
All testing are performed in Semi-anechoic chambers conforming to the site attenuation Characteristics defined by ANSI C63.4, CISPR 22, 16-1 and 16-2. and Shielded rooms.

The SEC EMC Laboratory is operated as testing laboratory in accordance with the requirements of ISO/IEC 17025:2005.

2.2 Accreditation and listing

Laboratory Qualifications		Remarks
	KOLAS(Korea Laboratory Accreditation Scheme)	Accredited : 124
	Radio Research Laboratory	Accredited : KR0004
	FCC(Federal Communications Commission)	Accredited : KR0004
	National Voluntary Laboratory Accreditation Program	Lab Code: 200623-0
	Norges Elektriske Materiellkontroll	Accredited : ELA 195
	VCCI (Voluntary Control Council for Interference by Information Technology Equipment)	C-2421,R-2224
	China Quality Certification Center	5-053, 5-054
	TUV Rhineland	H9354285
	GOST(GOSTSTANDART)	ROSTEST
	Elektrotechnicky Zkusebni Ustav	Reg. No.: 001
	IC(Industry Canada)	Assigned Code: 5871

3. Test Setup configuration

3.1 Test Peripherals

The cables used for these peripherals are either permanently attached by the peripheral manufacturer or coupled with an assigned cable as defined below.
The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

Description	Model No.	Serial No.	Manufacturer	Note
LCD Monitor	MG32PS	-	Samsung	EUT
PC	DM-V65	156X96BP600169L	Samsung	-
USB Keyboard	SEM-DT35	40037574	Samsung	-
USB Mouse	M-SBF69	HCA53112273	Samsung	-
USB Mouse	MS201U	69G0536	Samsung	-
USB Mouse	MS201U	69G0513	Samsung	-
USB Mouse	MS201U	69G1500	Samsung	-

3.2 EUT operating mode

To achieve compliance applied standard specification, the following mode(s) were made during compliance testing:

Operating Mode 1	PC Video In(Analog)
Operating Mode 2	DVI Input(Digital)
Operating Mode 3	DVI to HDMI Connected
Operating Mode 4	Magic Network

3.3 Details of Sampling

Customer selected, single unit.

3.4 Used cable description

The EUT is configured, installed, arranged and operated in a manner consistent with typical applications. Interface cables/loads/devices are connected to at least one of each type of interface port of the EUT, and where practical, each cable shall be terminated in a device typical of actual usage. The type(s) of interconnecting cables to be used and the interface port (of the EUT) to which these were connected;

No	Connect Cable	Length [m]	Ferrite core [Y/N]	Remark
1	Power	1.8	N	For EUT
2	Power	1.8	N	For PC
3	Power	1.8	N	For Printer
4	PC Video In(Analog)	1.5	N	-
5	DVI Input(Digital)	1.5	N	-
6	DVI to HDMI	1.5	Y	-
7	USB Keyboard	1.5	N	-
8	USB Mouse	1.5	N	-
9	USB Mouse	1.0	Y	-
10	USB Mouse	1.0	Y	-
11	USB Mouse	1.0	Y	-
12	PC Audio In	1.5	Y	-
13	LAN	2.0	Y	-
14	A/V Out	1.0	N	-
15	Audio In	1.0	N	-
16	RS232C IN	1.5	Y	-
17	RS232C OUT	1.5	Y	-
18	USB Printer	1.0	N	

3.5 EUT Description

The following features describe EUT represented by this report:

Items	Description
Optimum Resoultion	1 360 x 768 @ 60Hz
Maximum Resolution	1 360 x 768 @ 60Hz
Horizontal Frequency(kHz)	30 ~ 70KHz
Vertical Frequency(Hz)	50 ~ 85Hz

3.6 Description of the EUT exercising method

The EUT exercise program used during EMI and Immunity (EMS) testing was the SEC EMC Laboratory standardized test program for MS Windows. The program repetitively sends a screen of H - Character to the display.
Connect video output of computer on EUT's PC IN(D-sub)port and scrolled H – character continuously on EUT's screen.
Also, when EUT has loudspeaker, it was regenerative through EUT's audio input reproducing "digital white noise" by MS Windows Media player in computer.

3.7 Performance Criteria

Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention.
No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.
During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.
If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.
Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

3.8 Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus: (According to CISPR 16-4 and UKAS Lab 34.)

3.8.1 Emission

Test type		Measurement uncertainty (C.L. 95 %, k = 2)
Conducted disturbance		± 2.8 dB
Radiated Disturbance	Horizontal	± 4.82 dB
	Vertical	± 5.42 dB

4. Results of individual test

4.1 Conducted disturbance

Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration. The EUT measured in accordance with the methods described in Clause 9.

Limits for conducted disturbance at the mains ports of class A ITE

Frequency range Limits MHz	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	79	66
0,50 to 30	73	60
NOTE The lower limit shall apply at the transition frequency		

Limits for conducted disturbance at the mains ports of class B ITE

Frequency range Limits MHz	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50
NOTE 1 The lower limit shall apply at the transition frequency NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

4.1.1 Test instrumentation

Test instrumentation used in the Conducted disturbance test was as follows:

Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
Test Software	EMC 32	R&S	Ver. 4.40.0	N/A	N/A
Measuring receiver	ESCI	R&S	100368	2008-06-11	12
Artificial mains network	ENV216	R&S	100116	2007-09-13	12

4.1.2 Photograph of the test Configuration

(Front)

(Rear)

4.1.3 Test results

Operating condition	PC Video In(Analog)_Ping test					
Test date	2008-07-31		**Test engineer**		Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.1 ℃	**Relative humidity**	40 %	**Atmospheric pressure**	100.7 kPa
Test place	Shielded Room #1					
Note	* QP : Quasi-peak, AV: Average * Result = Level(QP or AV) + Corr. (LISN Insertion loss + Cable loss – Amplifier Gain) * Margin = Limit - Level					

Hardware Setup: Voltage with ENV 2-Line-LISN - [EMI conducted]

Subrange 1

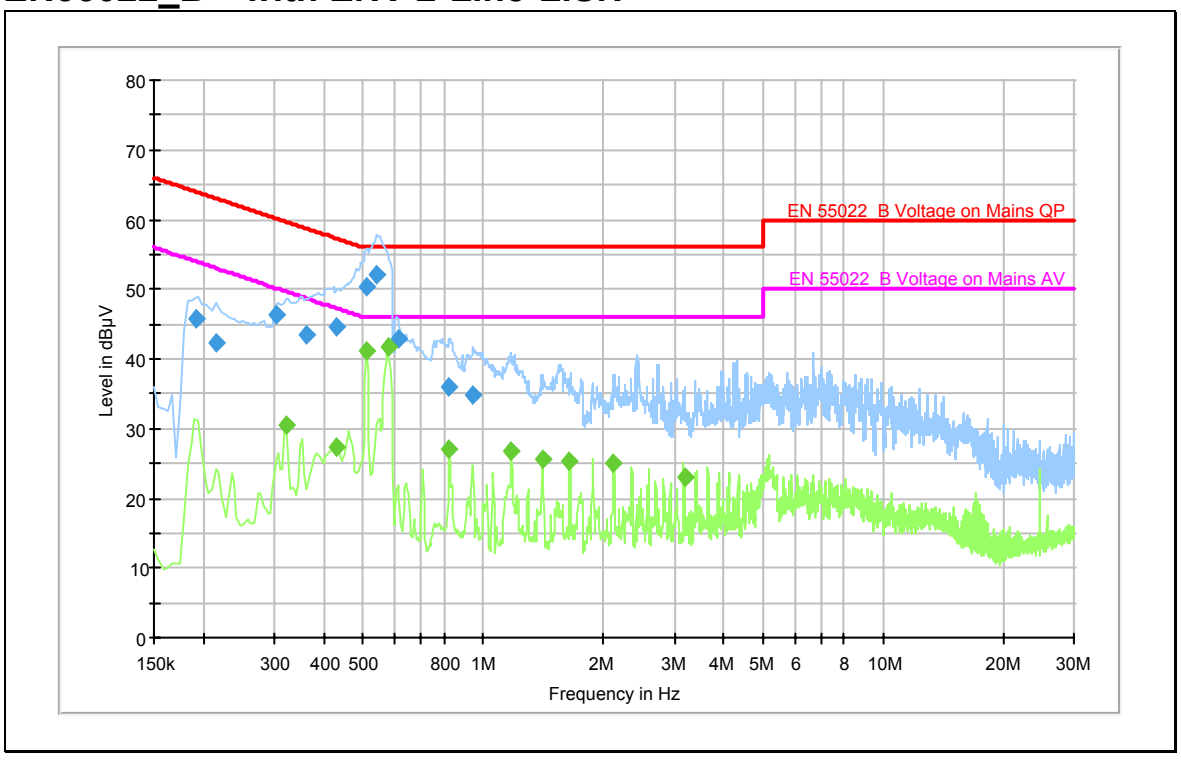
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55022_B_ENV 2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with ENV 2-Line-LISN
Level Unit:	dB μ V

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	15s	ESCI 3

EN55022_B with ENV 2-Line-LISN



Final Measurement Detector 1

Frequency (MHz)	Quasi Peak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.191 500	45.9	L1	9.6	18.1	64.0
0.213 500	42.4	N	9.6	20.7	63.1
0.304 500	46.2	N	9.6	13.9	60.1
0.361 500	43.3	N	9.6	15.4	58.7
0.427 500	44.7	N	9.6	12.6	57.3
0.510 500	50.3	N	9.6	5.7	56.0
0.541 500	52.1	N	9.6	3.9	56.0
0.611 500	42.9	L1	9.6	13.1	56.0
0.818 500	35.9	L1	9.7	20.1	56.0
0.941 500	34.9	L1	9.7	21.1	56.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.320 500	30.5	N	9.6	19.1	49.7
0.429 500	27.3	N	9.6	19.9	47.3
0.510 500	41.2	N	9.6	4.8	46.0
0.576 500	41.6	N	9.6	4.4	46.0
0.822 500	26.9	L1	9.7	19.1	46.0
1.174 500	26.7	L1	9.7	19.3	46.0
1.409 500	25.7	L1	9.7	20.3	46.0
1.645 500	25.2	N	9.7	20.8	46.0
2.116 500	25.0	L1	9.7	21.0	46.0
3.179 500	23.1	L1	9.8	22.9	46.0

Operating condition	DVI Input(Digital)_Ping test					
Test date	2008-07-31		**Test engineer**		Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.1 ℃	**Relative humidity**	40 %	**Atmospheric pressure**	100.7 kPa
Test place	Shielded Room #1					
Note	* QP : Quasi-peak, AV: Average * Result = Level(QP or AV) + Corr. (LISN Insertion loss + Cable loss – Amplifier Gain) * Margin = Limit - Level					

Hardware Setup: Voltage with ENV 2-Line-LISN - [EMI conducted]

Subrange 1

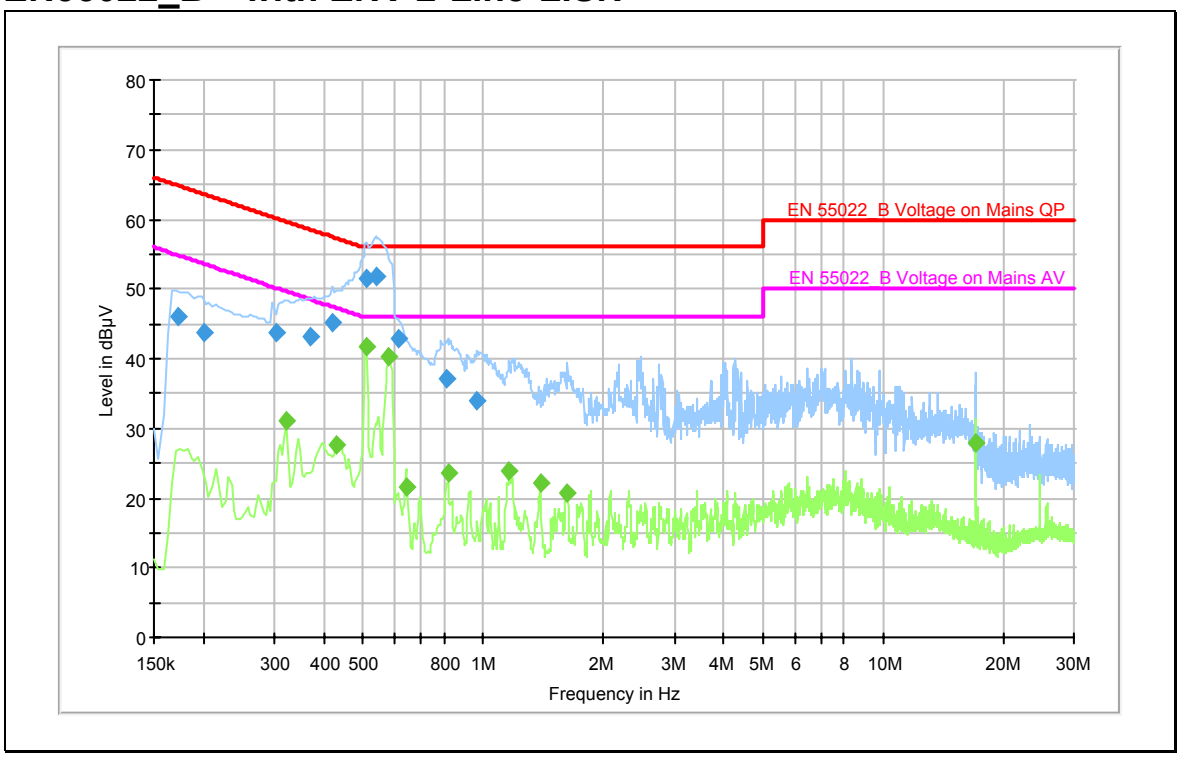
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55022_B_ENV 2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with ENV 2-Line-LISN
Level Unit:	dB μ V

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	15s	ESCI 3

EN55022_B with ENV 2-Line-LISN



Final Measurement Detector 1

Frequency (MHz)	Quasi Peak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.172 500	45.9	L1	9.6	18.9	64.8
0.199 500	43.6	N	9.6	20.0	63.6
0.303 500	43.9	N	9.6	16.3	60.1
0.368 500	43.2	N	9.6	15.3	58.5
0.419 500	45.2	N	9.6	12.3	57.5
0.509 500	51.4	N	9.6	4.6	56.0
0.537 500	51.7	N	9.6	4.3	56.0
0.616 500	42.9	L1	9.6	13.1	56.0
0.812 500	37.0	L1	9.7	19.0	56.0
0.966 500	33.9	L1	9.7	22.1	56.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.321 500	31.1	N	9.6	18.5	49.7
0.429 500	27.5	N	9.6	19.7	47.3
0.508 500	41.7	L1	9.6	4.3	46.0
0.579 500	40.4	N	9.6	5.6	46.0
0.642 500	21.7	L1	9.7	24.3	46.0
0.814 500	23.7	L1	9.7	22.3	46.0
1.158 500	23.8	L1	9.7	22.2	46.0
1.389 500	22.1	L1	9.7	23.9	46.0
1.623 500	20.8	L1	9.7	25.2	46.0
17.080 500	27.9	N	10.1	22.1	50.0

Operating condition	HDMI to DVI connected _ Ping test					
Test date	2008-07-31		**Test engineer**		Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.1 ℃	**Relative humidity**	40 %	**Atmospheric pressure**	100.7 kPa
Test place	Shielded Room #1					
Note	* QP : Quasi-peak, AV: Average * Result = Level(QP or AV) + Corr. (LISN Insertion loss + Cable loss – Amplifier Gain) * Margin = Limit - Level					

Hardware Setup: Voltage with ENV 2-Line-LISN - [EMI conducted]

Subrange 1

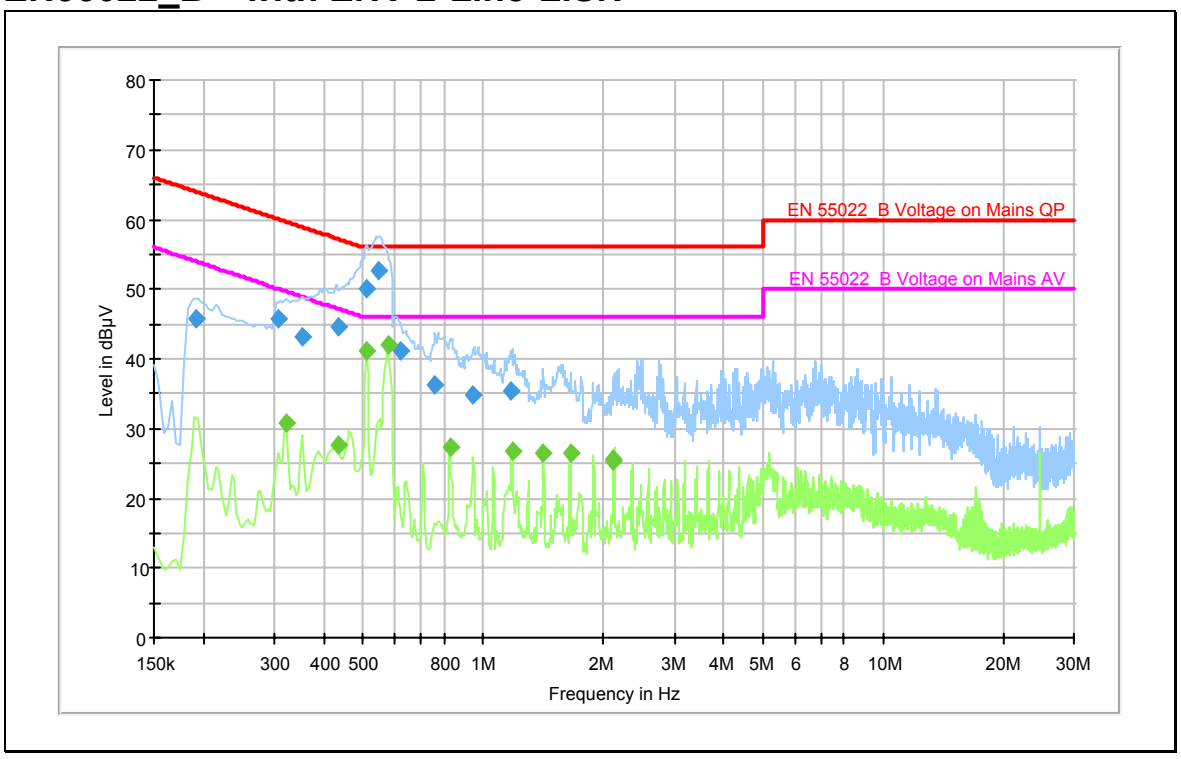
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55022_B_ENV 2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with ENV 2-Line-LISN
Level Unit:	dB μ V

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	15s	ESCI 3

EN55022_B with ENV 2-Line-LISN



Final Measurement Detector 1

Frequency (MHz)	Quasi Peak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.191 500	45.8	L1	9.6	18.1	64.0
0.306 500	45.6	N	9.6	14.4	60.1
0.352 500	43.3	N	9.6	15.6	58.9
0.433 500	44.5	N	9.6	12.7	57.2
0.512 500	50.1	N	9.6	5.9	56.0
0.549 500	52.7	N	9.6	3.3	56.0
0.617 500	41.1	L1	9.6	14.9	56.0
0.752 500	36.3	L1	9.7	19.7	56.0
0.943 500	34.9	L1	9.7	21.1	56.0
1.176 500	35.3	L1	9.7	20.7	56.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.320 500	30.9	N	9.6	18.8	49.7
0.431 500	27.6	N	9.6	19.6	47.2
0.510 500	41.1	N	9.6	4.9	46.0
0.576 500	41.9	N	9.6	4.1	46.0
0.824 500	27.4	L1	9.7	18.6	46.0
1.178 500	26.8	L1	9.7	19.2	46.0
1.414 500	26.4	L1	9.7	19.6	46.0
1.649 500	26.5	L1	9.7	19.5	46.0
2.119 500	25.6	L1	9.7	20.4	46.0
2.120 500	25.4	N	9.7	20.6	46.0

Operating condition	Magic Network _ Ping test					
Test date	2008-07-31		**Test engineer**		Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.1 ℃	**Relative humidity**	40 %	**Atmospheric pressure**	100.7 kPa
Test place	Shielded Room #1					
Note	* QP : Quasi-peak, AV: Average * Result = Level(QP or AV) + Corr. (LISN Insertion loss + Cable loss – Amplifier Gain) * Margin = Limit - Level					

Hardware Setup: Voltage with ENV 2-Line-LISN - [EMI conducted]

Subrange 1

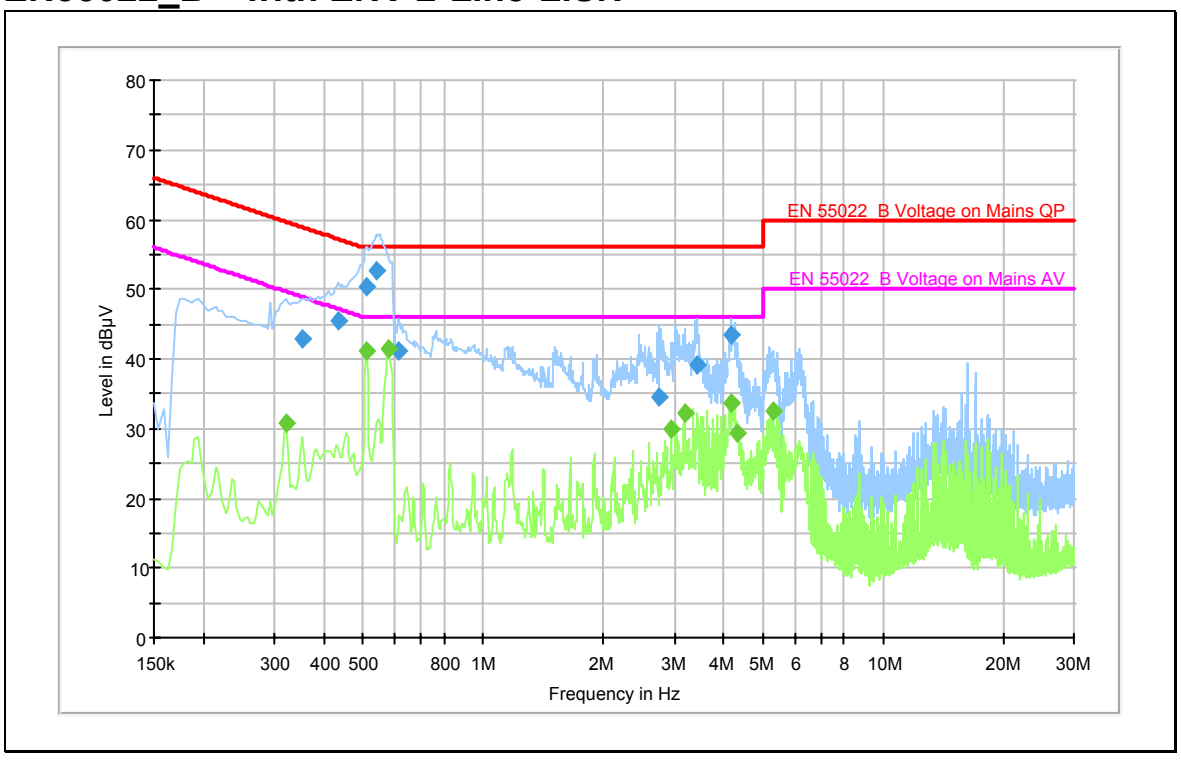
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55022_B_ENV 2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with ENV 2-Line-LISN
Level Unit:	dB μ V

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	15s	ESCI 3

EN55022_B with ENV 2-Line-LISN



Final Measurement Detector 1

Frequency (MHz)	Quasi Peak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.350 500	43.0	N	9.6	16.0	59.0
0.434 500	45.6	N	9.6	11.6	57.2
0.511 500	50.3	N	9.6	5.7	56.0
0.539 500	52.6	N	9.6	3.4	56.0
0.614 500	41.2	L1	9.6	14.8	56.0
2.739 500	34.5	L1	9.7	21.5	56.0
3.412 500	39.1	L1	9.8	16.9	56.0
4.182 500	43.3	L1	9.8	12.7	56.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.320 500	30.9	N	9.6	18.8	49.7
0.509 500	41.1	N	9.6	4.9	46.0
0.577 500	41.3	N	9.6	4.7	46.0
2.951 500	30.0	N	9.7	16.0	46.0
3.188 500	32.2	N	9.7	13.8	46.0
4.183 500	33.7	N	9.8	12.3	46.0
4.304 500	29.3	N	9.8	16.7	46.0
5.311 500	32.6	L1	9.8	17.4	50.0

Operating condition	LAN TEST _ 100M Full Duplex					
Test date	2008-07-31		**Test engineer**		Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.1 ℃	**Relative humidity**	40 %	**Atmospheric pressure**	100.7 kPa
Test place	Shielded Room #1					
Note	* QP : Quasi-peak, AV: Average * Result = Level(QP or AV) + Corr. (LISN Insertion loss + Cable loss – Amplifier Gain) * Margin = Limit - Level					

Hardware Setup: ISN T400A Cat5 - [EMI conducted]

Subrange 1

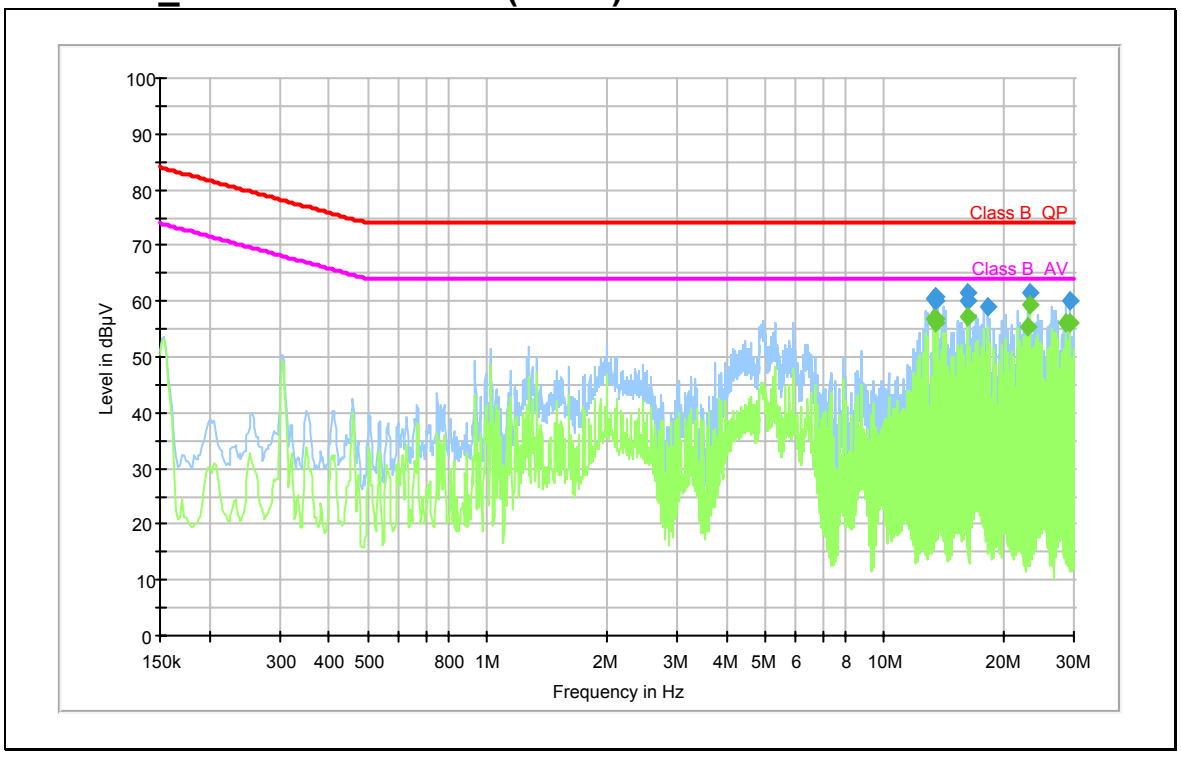
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ISN T400A Cat5 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55022_B_T400A Cat5 ISN fin [EMI conducted]

Hardware Setup:	ISN T400A Cat5
Level Unit:	dB μ V

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	5s	ESCI 3

EN55022_B with T400A Cat5(100M) ISN



Final Measurement Detector 1

Frequency (MHz)	Quasi Peak (dB μ V)	Corr. (dB)	Margin (dB)	Limit (dB μ V)
13.359 500	60.6	9.5	13.4	74.0
13.419 500	60.8	9.5	13.2	74.0
13.480 500	59.9	9.5	14.1	74.0
16.167 500	60.1	9.6	13.9	74.0
16.228 500	61.3	9.6	12.7	74.0
18.244 500	59.1	9.6	14.9	74.0
23.129 500	61.4	9.6	12.6	74.0
29.236 500	59.9	9.7	14.1	74.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB μ V)	Corr. (dB)	Margin (dB)	Limit (dB μ V)
13.358 500	56.9	9.5	7.1	64.0
13.420 500	56.9	9.5	7.1	64.0
13.480 500	56.3	9.5	7.7	64.0
16.229 500	57.3	9.6	6.7	64.0
23.067 500	55.3	9.6	8.7	64.0
23.129 500	59.3	9.6	4.7	64.0
28.686 500	56.1	9.7	7.9	64.0
29.236 500	56.1	9.7	7.9	64.0

4.2 Radiated disturbance

Of those disturbances above (*L* - 20dB), where *L* is the limit level in logarithmic units, record at least the disturbance levels and the frequencies of the six highest disturbances.
The following data lists the significant emission frequencies, measured levels, correction factors (for antenna and cables), orientation of table, polarization and height of antenna, the corrected reading, the limit, and the amount of margin. All measurements were taken utilizing quasi-peak detection unless stated otherwise. Measurements were performed at an antenna to EUT distance of 10 meters and elevated between 1 and 4 meters. Both vertical and horizontal antenna polarizations were measured.

Limits for radiated disturbance of ITE at a measuring distance of 10 m

Frequency range Limits MHz	Quasi-peak Limits dB dB(μV/m)	
	Class A	Class B
30 to 230	40	30
230 to 1000	47	37
NOTE 1 The lower limit shall apply at the transition frequency NOTE 2 Additional provisions may be required for cases where interference occurs.		

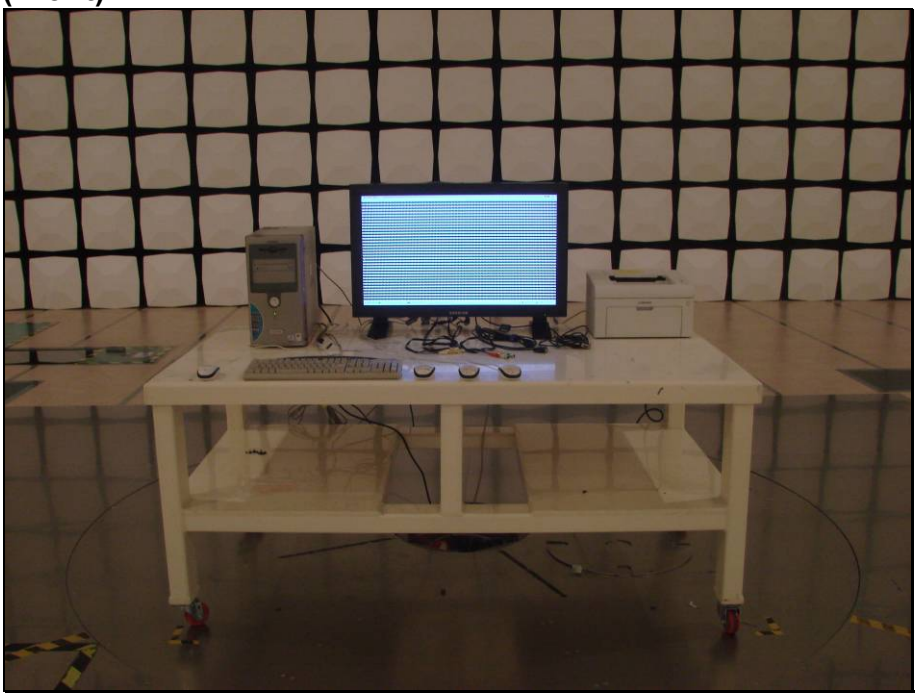
4.2.1 Test instrumentation

Test instrumentation used in the Radiated disturbance was as follows:

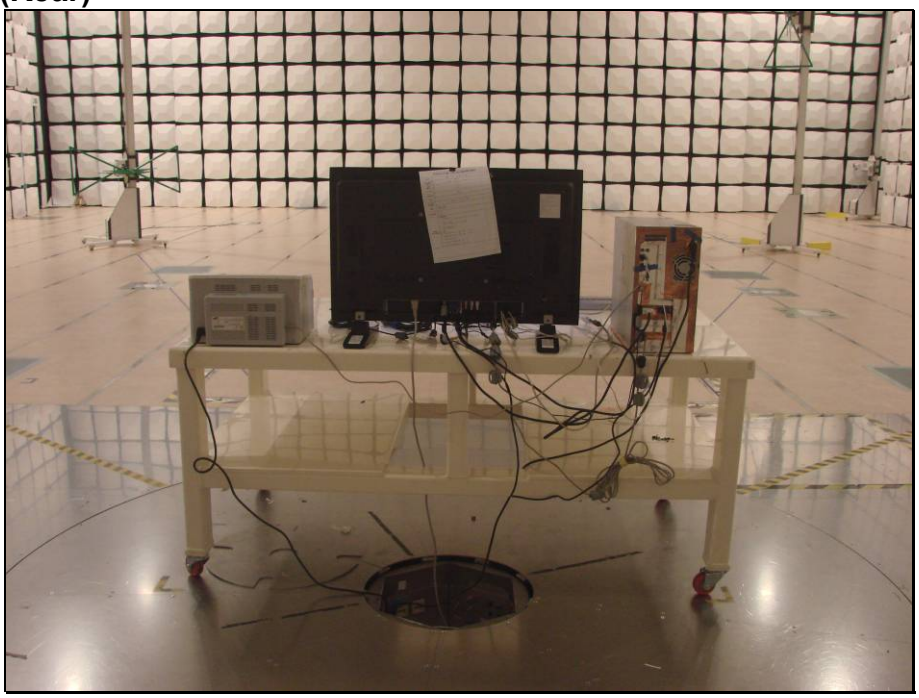
Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
EMI Test Receiver	ESIB-26	R&S	832692/002	2008-03-18	12
EMI Test Receiver	ESIB-26	R&S	100290	2008-03-27	12
Ant. Mast	MA4000	inn-co	-	N/A	N/A
Ant. Mast	MA4000	inn-co	-	N/A	N/A
Mast Controller	CO2000	inn-co	-	N/A	N/A
Amplifier	310N	SONOMA	251674	2008-03-13	12
Amplifier	310N	SONOMA	186465	2008-04-09	12
RF selector	NS4900	inn-co	-	N/A	N/A
RF selector	NS4900	inn-co	-	N/A	N/A
Bi-log Antenna	CBL6112D	SCHAFFNER	22248	2007-10-18	24
Bi-log Antenna	CBL6112D	SCHAFFNER	22603	2007-04-02	24

4.2.2 Photograph of the test Configuration

(Front)

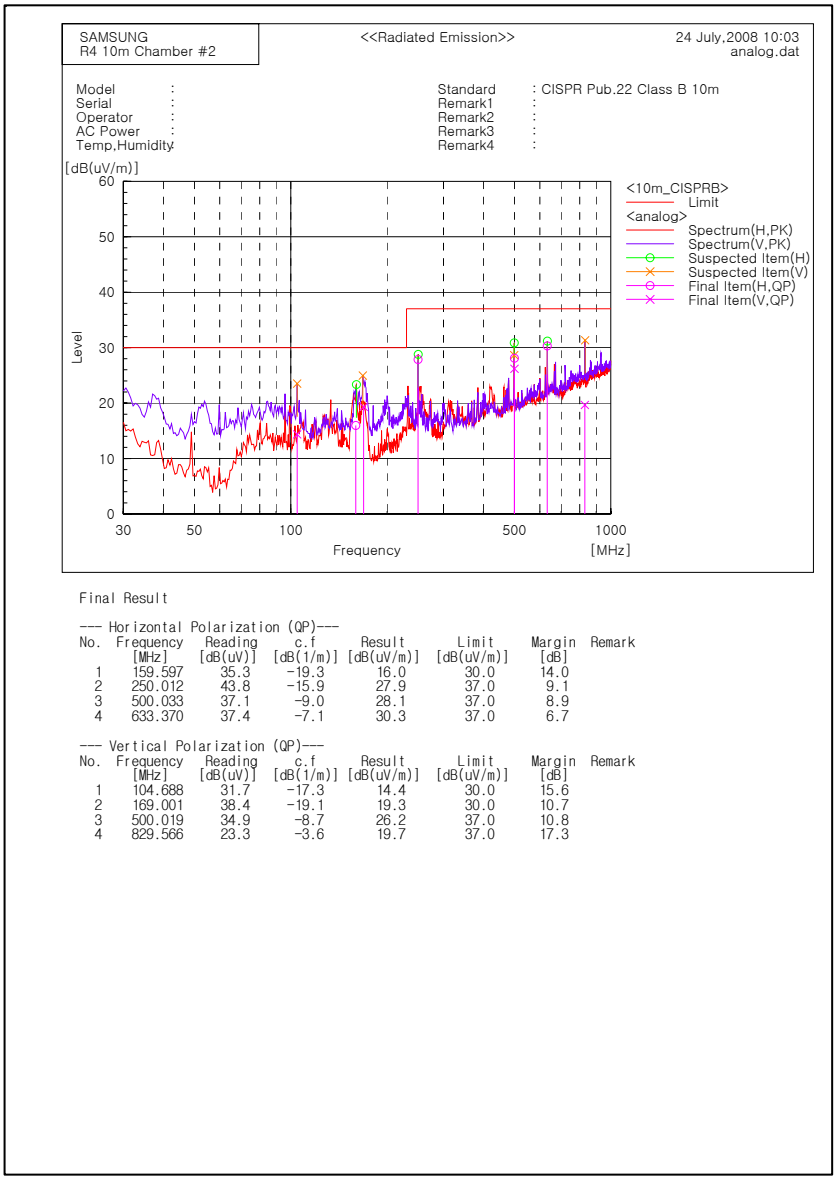


(Rear)



4.2.3 Test results

Operating condition	PC Video In(Analog) _ Ping test			
Test date	2008-07-30	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	23.4 ℃	**Relative humidity**	42%
	Atmospheric pressure	101.0 kPa		
Test place	10m Semi-Anechoic Chamber #2			
Note	* Receiving antenna mode : Horizontal, Vertical * Test distance : 10 m (RF Semi Anechoic Chamber) * Result = Reading + c.f (Antenna factor + Cable loss- Amp Gain) * Margin = Limit – Result			



Final Result

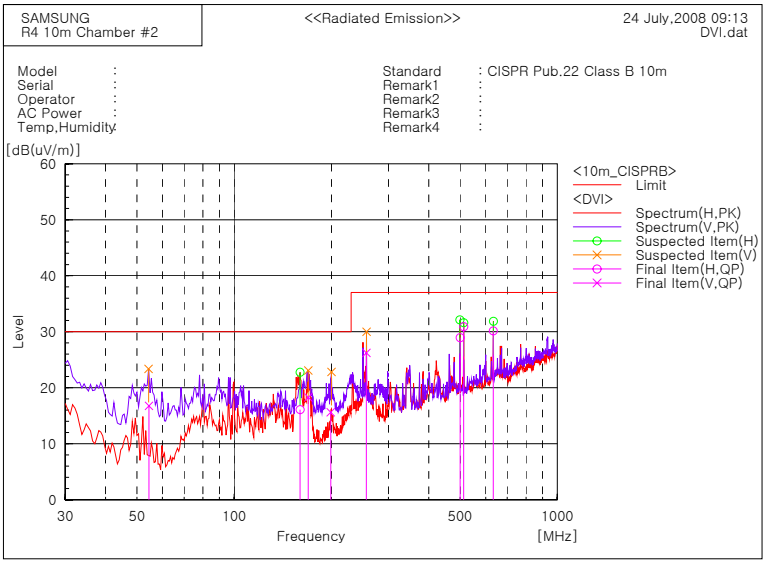
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	159.597	35.3	-19.3	16.0	30.0	14.0	
2	250.012	43.8	-15.9	27.9	37.0	9.1	
3	500.033	37.1	-9.0	28.1	37.0	8.9	
4	633.370	37.4	-7.1	30.3	37.0	6.7	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	104.688	31.7	-17.3	14.4	30.0	15.6	
2	169.001	38.4	-19.1	19.3	30.0	10.7	
3	500.019	34.9	-8.7	26.2	37.0	10.8	
4	829.566	23.3	-3.6	19.7	37.0	17.3	

Operating condition	DVI Input(Digital) _ Ping test			
Test date	2008-07-30	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	23.4 ℃	**Relative humidity**	42%
	Atmospheric pressure	101.0 kPa		
Test place	10m Semi-Anechoic Chamber #2			
Note	* Receiving antenna mode : Horizontal, Vertical * Test distance : 10 m (RF Semi Anechoic Chamber) * Result = Reading + c.f (Antenna factor + Cable loss- Amp Gain) * Margin = Limit – Result			



Final Result

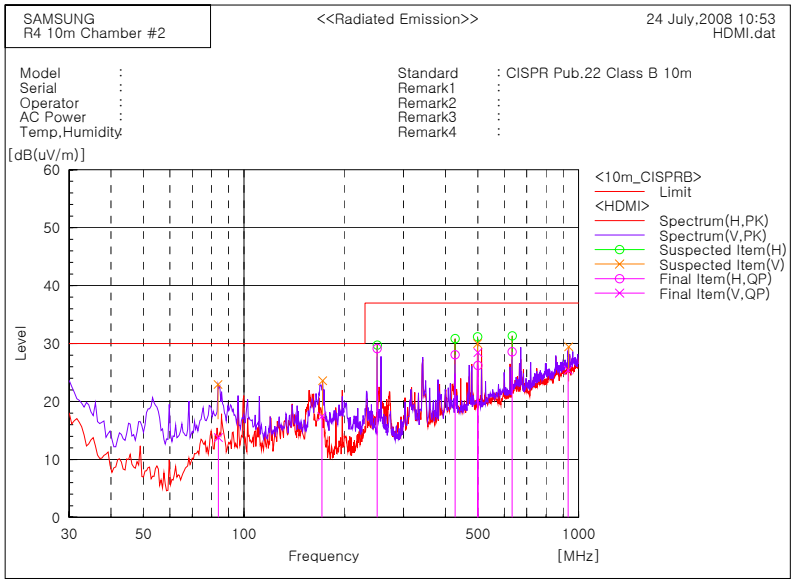
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	160.025	35.4	-19.3	16.1	30.0	13.9	
2	500.019	37.9	-9.0	28.9	37.0	8.1	
3	513.079	39.9	-9.0	30.9	37.0	6.1	
4	633.356	37.3	-7.1	30.2	37.0	6.8	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	54.470	40.2	-23.4	16.8	30.0	13.2	
2	169.515	37.4	-19.1	18.3	30.0	11.7	
3	198.912	34.5	-18.9	15.6	30.0	14.4	
4	256.548	41.2	-15.0	26.2	37.0	10.8	

Operating condition	HDMI to DVI connected _ Ping test			
Test date	2008-07-30	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	23.4 ℃	**Relative humidity**	42%
	Atmospheric pressure	101.0 kPa		
Test place	10m Semi-Anechoic Chamber #2			
Note	* Receiving antenna mode : Horizontal, Vertical * Test distance : 10 m (RF Semi Anechoic Chamber) * Result = Reading + c.f (Antenna factor + Cable loss- Amp Gain) * Margin = Limit – Result			



Final Result

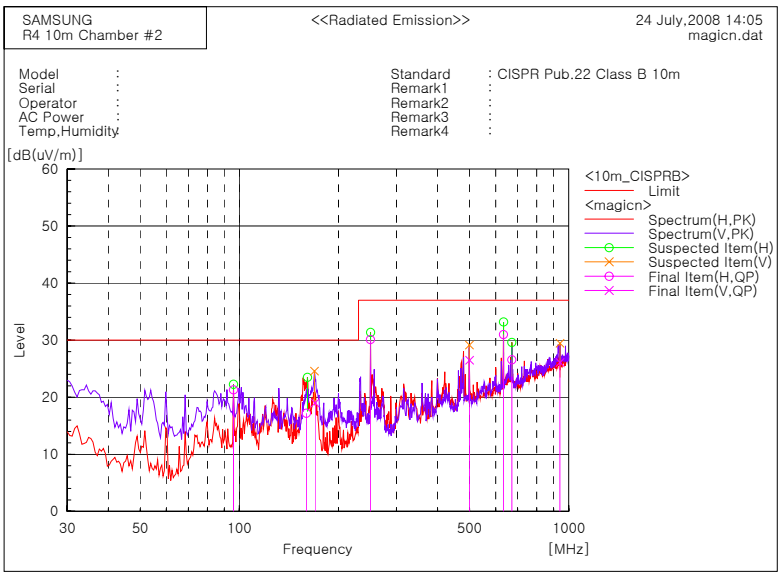
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	250.007	45.0	-15.9	29.1	37.0	7.9	
2	427.536	38.4	-10.3	28.1	37.0	8.9	
3	500.033	35.2	-9.0	26.2	37.0	10.8	
4	633.384	35.7	-7.1	28.6	37.0	8.4	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	83.846	35.4	-21.6	13.8	30.0	16.2	
2	170.917	36.6	-19.2	17.4	30.0	12.6	
3	500.033	37.2	-8.7	28.5	37.0	8.5	
4	930.961	27.2	-1.8	25.4	37.0	11.6	

Operating condition	Magic Network _ Ping test			
Test date	2008-07-30	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	23.4 ℃	**Relative humidity**	42%
	Atmospheric pressure	101.0 kPa		
Test place	10m Semi-Anechoic Chamber #2			
Note	* Receiving antenna mode : Horizontal, Vertical * Test distance : 10 m (RF Semi Anechoic Chamber) * Result = Reading + c.f (Antenna factor + Cable loss- Amp Gain) * Margin = Limit – Result			



Final Result

--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	95.998	41.2	-19.9	21.3	30.0	8.7	
2	159.743	36.5	-19.3	17.2	30.0	12.8	
3	250.023	46.0	-15.9	30.1	37.0	6.9	
4	633.412	38.1	-7.1	31.0	37.0	6.0	
5	672.017	33.7	-7.1	26.6	37.0	10.4	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	169.797	38.1	-19.1	19.0	30.0	11.0	
2	500.033	35.2	-8.7	26.5	37.0	10.5	
3	940.682	27.8	-1.7	26.1	37.0	10.9	

4.3 Harmonics current

The EUT operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
The power consumption, steady state harmonic currents were measured in the tested operating mode(s).
The EUT measured in accordance with the test conditions described in Annex C (C.10).

Limits for Class D equipment

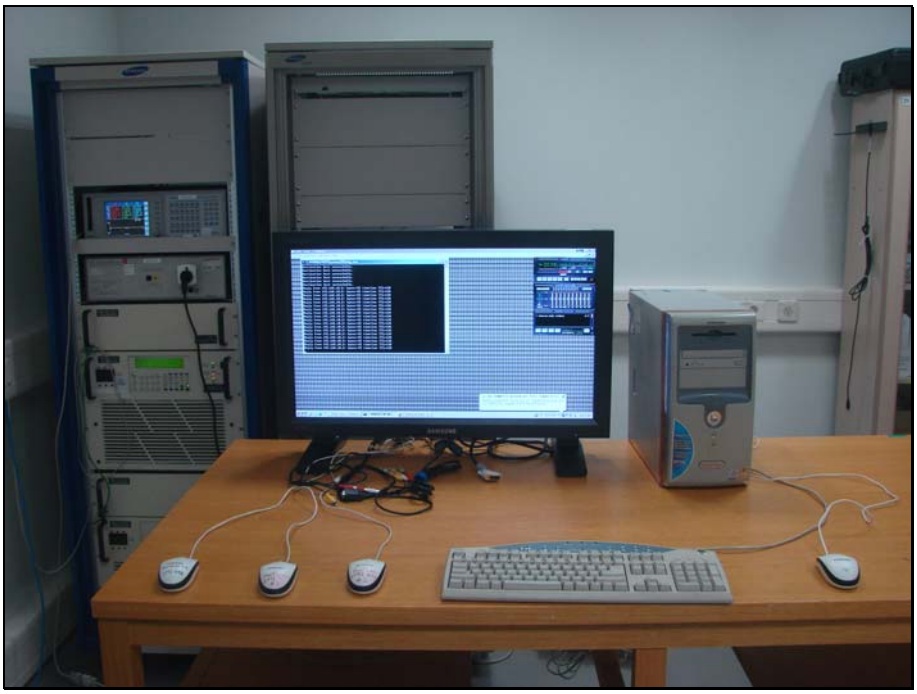
Harmonic order n	Maximum permissible harmonic current per watt mA/W	Maximum permissible harmonic current A
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13 ≤ n ≤ 39 (odd harmonics only)	3.85/n	See Table 1

4.3.1 Test instrumentation

Test instrumentation used in the Harmonics current test was as follows:

Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
Power Analyzer	PM6000	Voltech	100006700167	2007-10-12	12
IEC Network	555	ZIMMER	IB10/9466	N/A	N/A
Test Software	IEC1000-3	Voltech	Ver 3.13.08	N/A	N/A

4.3.2 Photograph of the test Configuration



4.3.3 Test results

Operating condition	PC Video In(Analog) _ Ping test			
Test date	2008-08-04	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.2 ℃	**Relative humidity**	40 %
	Atmospheric pressure	100.5 kPa		
Test place	Shielded Room #3			

Product:	MONITOR	2008 Aug 02 5:07pm
Serial no:	None	Page 1 of 1
Description:		
Test Date:	2008 Aug 02 4:06pm	
Result Name:	HAR_PC	
Type of Test:	EN61000:2006 Harmonics inc. interharmonics to EN61000-4-7:2002	
Limits:	Class D	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware version: v1.20.06RC3	
	Channel(s):	
	1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007.	
	3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
	Shunt(s):	
	1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007.	
	3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Harmonic Results Against Chosen Limits:	**Notes:** Voltage Crest Factor outside permitted limits	
PASS		

Test Parameter Details	**User Entered**	**Measured**
Operating Frequency:	50	49.9840
Operating Voltage:	230	230.2034
Specified Power:	192.0000	189.7964
Fundamental Current:	0.0000	0.8555
Power Factor:	0.0000	0.9606
Average Input Current:		0.8582
Maximum POHC:		0.0060
POHC Limit:		0.0826
Maximum THC:		0.0701
Minimum Power:	75	
Class Multiplier:	1.0000	
Test Duration:	00:02:30	

Product:	MONITOR	2008 Aug 02 5:07pm
Serial no:	None	Page 1 of 1
Description:		
Result Name:	HAR_PC	
Voltech IEC61000-3 Windows Software 1.10.04RC5		Test Date: 2008 Aug 02 4:06pm
Type of Test:	Fluctuating Harmonics Test - Worst Case Table (2006)	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware version: v1.20.06RC3 Channel(s): 1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007. 3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None Shunt(s): 1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007. 3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**	Notes: Voltage Crest Factor outside permitted limits	

Class	Class D
Class Multiplier	1

Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL	Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL
2	None	None	1.139mA		1.217mA		N/A	3	652.8mA	979.2mA	52.60mA	✓ ✓	52.75mA	✓	Pass
4	None	None	0.482mA		0.520mA		N/A	5	364.8mA	547.2mA	27.75mA	✓ ✓	27.80mA	✓	Pass
6	None	None	0.462mA		0.512mA		N/A	7	192.0mA	288.0mA	25.82mA	✓ ✓	25.91mA	✓	Pass
8	None	None	0.276mA		0.427mA		N/A	9	96.00mA	144.0mA	18.49mA	✓ ✓	18.58mA	✓	Pass
10	None	None	0.425mA		0.454mA		N/A	11	67.19mA	100.7mA	13.02mA	✓ ✓	13.06mA	✓	Pass
12	None	None	0.299mA		0.327mA		N/A	13	56.86mA	85.29mA	8.336mA	✓ ✓	8.372mA	✓	Pass
14	None	None	0.349mA		0.375mA		N/A	15	49.27mA	73.91mA	5.103mA	✓ ✓	5.162mA	✓	N/A
16	None	None	0.223mA		0.248mA		N/A	17	43.48mA	65.22mA	4.970mA	✓ ✓	5.008mA	✓	N/A
18	None	None	0.254mA		0.281mA		N/A	19	38.90mA	58.35mA	3.834mA	✓ ✓	3.876mA	✓	N/A
20	None	None	0.310mA		0.340mA		N/A	21	35.20mA	52.79mA	2.041mA	✓ ✓	2.084mA	✓	N/A
22	None	None	0.250mA		0.279mA		N/A	23	32.13mA	48.20mA	0.657mA	✓ ✓	0.687mA	✓	N/A
24	None	None	0.501mA		0.537mA		N/A	25	29.56mA	44.35mA	0.936mA	✓ ✓	0.975mA	✓	N/A
26	None	None	0.207mA		0.226mA		N/A	27	27.37mA	41.06mA	0.907mA	✓ ✓	0.946mA	✓	N/A
28	None	None	0.185mA		0.213mA		N/A	29	25.48mA	38.23mA	1.723mA	✓ ✓	1.753mA	✓	N/A
30	None	None	0.190mA		0.207mA		N/A	31	23.84mA	35.76mA	2.667mA	✓ ✓	2.710mA	✓	N/A
32	None	None	0.214mA		0.241mA		N/A	33	22.40mA	33.59mA	2.758mA	✓ ✓	2.788mA	✓	N/A
34	None	None	0.237mA		0.267mA		N/A	35	21.12mA	31.68mA	2.472mA	✓ ✓	2.506mA	✓	N/A
36	None	None	0.216mA		0.238mA		N/A	37	19.97mA	29.96mA	1.820mA	✓ ✓	1.852mA	✓	N/A
38	None	None	0.221mA		0.247mA		N/A	39	18.95mA	28.43mA	1.280mA	✓ ✓	1.312mA	✓	N/A
40	None	None	0.232mA		0.259mA		N/A								

<L1 : Reading is below limit 1.

<L2 : Reading is below limit 2.

N/A : Harmonic current below 0.6% of rated current or 5mA, whichever is greater, are disregarded.

Operating condition	DVI Input (Digital)			
Test date	2008-08-04	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.2 ℃	**Relative humidity**	40 %
	Atmospheric pressure	100.5 kPa		
Test place	Shielded Room #3			

Product:	MONITOR	2008 Aug 02 6:07pm
Serial no:	None	Page 1 of 1
Description:		
Test Date:	2008 Aug 02 4:20pm	
Result Name:	HAR_DVI	
Type of Test:	EN61000:2006 Harmonics inc. interharmonics to EN61000-4-7:2002	
Limits:	Class D	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware version: v1.20.06RC3	
	Channel(s):	
	1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007.	
	3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
	Shunt(s):	
	1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007.	
	3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	

Harmonic Results Against Chosen Limits:	**Notes:**
PASS	Voltage Crest Factor outside permitted limits

Test Parameter Details	**User Entered**	**Measured**
Operating Frequency:	50	49.9840
Operating Voltage:	230	230.2049
Specified Power:	192.0000	189.7326
Fundamental Current:	0.0000	0.8552
Power Factor:	0.0000	0.9605
Average Input Current:		0.8578
Maximum POHC:		0.0059
POHC Limit:		0.0826
Maximum THC:		0.0701
Minimum Power:	75	
Class Multiplier:	1.0000	
Test Duration:	00:02:30	

Product:	MONITOR	2008 Aug 02 6:07pm
Serial no:	None	Page 1 of 1
Description:		
Result Name:	HAR_DVI	
Voltech IEC61000-3 Windows Software 1.10.04RC5		Test Date: 2008 Aug 02 4:20pm
Type of Test:	Fluctuating Harmonics Test - Worst Case Table (2006)	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware version: v1.20.06RC3 Channel(s): 1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007. 3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None Shunt(s): 1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007. 3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**	Notes: Voltage Crest Factor outside permitted limits	

Class	Class D
Class Multiplier	1

Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL	Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL
2	None	None	1.072mA		1.150mA		N/A	3	652.8mA	979.2mA	52.69mA	✓ ✓	52.82mA	✓	Pass
4	None	None	0.410mA		0.478mA		N/A	5	364.8mA	547.2mA	27.82mA	✓ ✓	27.88mA	✓	Pass
6	None	None	0.439mA		0.518mA		N/A	7	192.0mA	288.0mA	25.83mA	✓ ✓	25.92mA	✓	Pass
8	None	None	0.295mA		0.429mA		N/A	9	96.00mA	144.0mA	18.53mA	✓ ✓	18.64mA	✓	Pass
10	None	None	0.456mA		0.508mA		N/A	11	67.19mA	100.7mA	12.99mA	✓ ✓	13.02mA	✓	Pass
12	None	None	0.367mA		0.405mA		N/A	13	56.86mA	85.29mA	8.243mA	✓ ✓	8.295mA	✓	Pass
14	None	None	0.436mA		0.490mA		N/A	15	49.27mA	73.91mA	5.070mA	✓ ✓	5.131mA	✓	N/A
16	None	None	0.315mA		0.368mA		N/A	17	43.48mA	65.22mA	4.989mA	✓ ✓	5.022mA	✓	N/A
18	None	None	0.259mA		0.286mA		N/A	19	38.90mA	58.35mA	3.867mA	✓ ✓	3.912mA	✓	N/A
20	None	None	0.298mA		0.329mA		N/A	21	35.20mA	52.79mA	2.019mA	✓ ✓	2.056mA	✓	N/A
22	None	None	0.255mA		0.287mA		N/A	23	32.13mA	48.20mA	0.660mA	✓ ✓	0.699mA	✓	N/A
24	None	None	0.512mA		0.541mA		N/A	25	29.56mA	44.35mA	0.940mA	✓ ✓	0.986mA	✓	N/A
26	None	None	0.237mA		0.270mA		N/A	27	27.37mA	41.06mA	0.915mA	✓ ✓	0.948mA	✓	N/A
28	None	None	0.233mA		0.259mA		N/A	29	25.48mA	38.23mA	1.747mA	✓ ✓	1.785mA	✓	N/A
30	None	None	0.244mA		0.272mA		N/A	31	23.84mA	35.76mA	2.664mA	✓ ✓	2.701mA	✓	N/A
32	None	None	0.241mA		0.266mA		N/A	33	22.40mA	33.59mA	2.738mA	✓ ✓	2.771mA	✓	N/A
34	None	None	0.232mA		0.258mA		N/A	35	21.12mA	31.68mA	2.467mA	✓ ✓	2.502mA	✓	N/A
36	None	None	0.197mA		0.217mA		N/A	37	19.97mA	29.96mA	1.819mA	✓ ✓	1.851mA	✓	N/A
38	None	None	0.208mA		0.237mA		N/A	39	18.95mA	28.43mA	1.287mA	✓ ✓	1.318mA	✓	N/A
40	None	None	0.214mA		0.242mA		N/A								

<L1 : Reading is below limit 1.

<L2 : Reading is below limit 2.

N/A : Harmonic current below 0.6% of rated current or 5mA, whichever is greater, are disregarded.

Operating condition	HDMI to DVI connected			
Test date	2008-08-04	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.2 ℃	**Relative humidity**	40 %
	Atmospheric pressure	100.5 kPa		
Test place	Shielded Room #3			

Product:	MONITOR	2008 Aug 02 5:07pm
Serial no:	None	Page 1 of 1
Description:		
Test Date:	2008 Aug 02 4:12pm	
Result Name:	HAR_HDMI	
Type of Test:	EN61000:2006 Harmonics inc. interharmonics to EN61000-4-7:2002	
Limits:	Class D	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware version: v1.20.06RC3	
	Channel(s):	
	1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007.	
	3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
	Shunt(s):	
	1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007.	
	3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	

Harmonic Results Against Chosen Limits:	**Notes:**
PASS	Voltage Crest Factor outside permitted limits

Test Parameter Details	**User Entered**	**Measured**
Operating Frequency:	50	49.9840
Operating Voltage:	230	230.2049
Specified Power:	192.0000	189.7326
Fundamental Current:	0.0000	0.8552
Power Factor:	0.0000	0.9605
Average Input Current:		0.8578
Maximum POHC:		0.0059
POHC Limit:		0.0826
Maximum THC:		0.0701
Minimum Power:	75	
Class Multiplier:	1.0000	
Test Duration:	00:02:30	

Product:	MONITOR	2008 Aug 02 5:07pm
Serial no:	None	Page 1 of 1
Description:		
Result Name:	HAR_HDMI	
Voltech IEC61000-3 Windows Software 1.10.04RC5		Test Date: 2008 Aug 02 4:12pm
Type of Test:	Fluctuating Harmonics Test - Worst Case Table (2006)	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware version: v1.20.06RC3 Channel(s): 1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007. 3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None Shunt(s): 1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007. 3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**	Notes: Voltage Crest Factor outside permitted limits	

Class	Class D
Class Multiplier	1

Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL	Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL
2	None	None	0.723mA		0.797mA		N/A	3	652.8mA	979.2mA	52.68mA	✓ ✓	52.82mA	✓	Pass
4	None	None	0.493mA		0.558mA		N/A	5	364.8mA	547.2mA	27.80mA	✓ ✓	27.84mA	✓	Pass
6	None	None	0.459mA		0.492mA		N/A	7	192.0mA	288.0mA	25.80mA	✓ ✓	25.90mA	✓	Pass
8	None	None	0.313mA		0.467mA		N/A	9	96.00mA	144.0mA	18.50mA	✓ ✓	18.60mA	✓	Pass
10	None	None	0.484mA		0.523mA		N/A	11	67.19mA	100.7mA	13.01mA	✓ ✓	13.05mA	✓	Pass
12	None	None	0.332mA		0.367mA		N/A	13	56.86mA	85.29mA	8.294mA	✓ ✓	8.331mA	✓	Pass
14	None	None	0.352mA		0.381mA		N/A	15	49.27mA	73.91mA	5.068mA	✓ ✓	5.133mA	✓	N/A
16	None	None	0.249mA		0.285mA		N/A	17	43.48mA	65.22mA	4.969mA	✓ ✓	5.031mA	✓	N/A
18	None	None	0.231mA		0.261mA		N/A	19	38.90mA	58.35mA	3.851mA	✓ ✓	3.890mA	✓	N/A
20	None	None	0.285mA		0.312mA		N/A	21	35.20mA	52.79mA	2.020mA	✓ ✓	2.051mA	✓	N/A
22	None	None	0.242mA		0.272mA		N/A	23	32.13mA	48.20mA	0.658mA	✓ ✓	0.698mA	✓	N/A
24	None	None	0.504mA		0.536mA		N/A	25	29.56mA	44.35mA	0.946mA	✓ ✓	0.988mA	✓	N/A
26	None	None	0.205mA		0.225mA		N/A	27	27.37mA	41.06mA	0.912mA	✓ ✓	0.937mA	✓	N/A
28	None	None	0.186mA		0.206mA		N/A	29	25.48mA	38.23mA	1.731mA	✓ ✓	1.766mA	✓	N/A
30	None	None	0.212mA		0.232mA		N/A	31	23.84mA	35.76mA	2.662mA	✓ ✓	2.700mA	✓	N/A
32	None	None	0.230mA		0.255mA		N/A	33	22.40mA	33.59mA	2.750mA	✓ ✓	2.778mA	✓	N/A
34	None	None	0.234mA		0.265mA		N/A	35	21.12mA	31.68mA	2.477mA	✓ ✓	2.510mA	✓	N/A
36	None	None	0.212mA		0.234mA		N/A	37	19.97mA	29.96mA	1.821mA	✓ ✓	1.849mA	✓	N/A
38	None	None	0.211mA		0.234mA		N/A	39	18.95mA	28.43mA	1.273mA	✓ ✓	1.307mA	✓	N/A
40	None	None	0.208mA		0.227mA		N/A								

<L1 : Reading is below limit 1.

<L2 : Reading is below limit 2.

N/A : Harmonic current below 0.6% of rated current or 5mA, whichever is greater, are disregarded.

Operating condition	Magic Network _ Ping test			
Test date	2008-08-04	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.2 ℃	**Relative humidity**	40 %
	Atmospheric pressure	100.5 kPa		
Test place	Shielded Room #3			

Product:	MONITOR
Serial no:	None
Description:	
Test Date:	2008 Aug 02 3:56pm
Result Name:	HAR_MAGICN

2008 Aug 02 5:07pm
Page 1 of 1

Type of Test:	EN61000:2006 Harmonics inc. interharmonics to EN61000-4-7:2002
Limits:	Class D
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware version: v1.20.06RC3
	Channel(s):
	1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007.
	3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None
	Shunt(s):
	1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007.
	3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None
AC Source:	Mains / Manual Source

Harmonic Results Against Chosen Limits:

PASS

Notes:
Voltage Crest Factor outside permitted limits

Test Parameter Details	**User Entered**	**Measured**
Operating Frequency:	50	49.9840
Operating Voltage:	230	230.1991
Specified Power:	192.0000	189.8328
Fundamental Current:	0.0000	0.8556
Power Factor:	0.0000	0.9606
Average Input Current:		0.8582
Maximum POHC:		0.0061
POHC Limit:		0.0826
Maximum THC:		0.0708
Minimum Power:	75	
Class Multiplier:	1.0000	
Test Duration:	00:02:30	

Product:	MONITOR	2008 Aug 02 5:07pm
Serial no:	None	Page 1 of 1
Description:		
Result Name:	HAR_MAGICN	
Voltech IEC61000-3 Windows Software 1.10.04RC5		Test Date: 2008 Aug 02 3:56pm
Type of Test:	Fluctuating Harmonics Test - Worst Case Table (2006)	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware version: v1.20.06RC3 Channel(s): 1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007. 3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None Shunt(s): 1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007. 3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**	Notes: Voltage Crest Factor outside permitted limits	

Class	Class D
Class Multiplier	1

Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL	Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL
2	None	None	1.117mA		1.199mA		N/A	3	652.8mA	979.2mA	52.57mA	✓ ✓	52.91mA	✓	Pass
4	None	None	0.458mA		0.510mA		N/A	5	364.8mA	547.2mA	27.73mA	✓ ✓	28.11mA	✓	Pass
6	None	None	0.430mA		0.495mA		N/A	7	192.0mA	288.0mA	25.83mA	✓ ✓	26.31mA	✓	Pass
8	None	None	0.274mA		0.439mA		N/A	9	96.00mA	144.0mA	18.47mA	✓ ✓	18.93mA	✓	Pass
10	None	None	0.467mA		0.517mA		N/A	11	67.19mA	100.7mA	13.03mA	✓ ✓	13.38mA	✓	Pass
12	None	None	0.349mA		0.383mA		N/A	13	56.86mA	85.29mA	8.380mA	✓ ✓	8.708mA	✓	Pass
14	None	None	0.369mA		0.398mA		N/A	15	49.27mA	73.91mA	5.131mA	✓ ✓	5.432mA	✓	N/A
16	None	None	0.248mA		0.276mA		N/A	17	43.48mA	65.22mA	4.967mA	✓ ✓	5.236mA	✓	N/A
18	None	None	0.290mA		0.325mA		N/A	19	38.90mA	58.35mA	3.822mA	✓ ✓	4.029mA	✓	N/A
20	None	None	0.310mA		0.341mA		N/A	21	35.20mA	52.79mA	2.057mA	✓ ✓	2.239mA	✓	N/A
22	None	None	0.234mA		0.261mA		N/A	23	32.13mA	48.20mA	0.652mA	✓ ✓	0.813mA	✓	N/A
24	None	None	0.501mA		0.532mA		N/A	25	29.56mA	44.35mA	0.933mA	✓ ✓	1.058mA	✓	N/A
26	None	None	0.216mA		0.237mA		N/A	27	27.37mA	41.06mA	0.909mA	✓ ✓	0.991mA	✓	N/A
28	None	None	0.202mA		0.235mA		N/A	29	25.48mA	38.23mA	1.722mA	✓ ✓	1.791mA	✓	N/A
30	None	None	0.224mA		0.254mA		N/A	31	23.84mA	35.76mA	2.673mA	✓ ✓	2.730mA	✓	N/A
32	None	None	0.252mA		0.275mA		N/A	33	22.40mA	33.59mA	2.767mA	✓ ✓	2.795mA	✓	N/A
34	None	None	0.253mA		0.283mA		N/A	35	21.12mA	31.68mA	2.478mA	✓ ✓	2.510mA	✓	N/A
36	None	None	0.196mA		0.220mA		N/A	37	19.97mA	29.96mA	1.817mA	✓ ✓	1.853mA	✓	N/A
38	None	None	0.197mA		0.217mA		N/A	39	18.95mA	28.43mA	1.275mA	✓ ✓	1.313mA	✓	N/A
40	None	None	0.209mA		0.231mA		N/A								

<L1 : Reading is below limit 1.

<L2 : Reading is below limit 2.

N/A : Harmonic current below 0.6% of rated current or 5mA, whichever is greater, are disregarded.

4.4 Voltage fluctuation & Flicker

The EUT operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.
During the flicker measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes.

Limits of voltage fluctuations and flicker at the supply terminals

short-term flicker indicator, Pst	the relative steady-state voltage change, dc	the value of *d(t)* during a voltage change, d(t) >3.3 %	the maximum relative voltage change, dmax
1.0	**3.3 %**	**500 ms**	**4 %**

4.4.1 Test instrumentation

Test instrumentation used in the Voltage fluctuation & Flicker test was as follows:

Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
Power Analyzer	PM6000	Voltech	100006700167	2007-10-12	12
IEC Network	555	ZIMMER	IB10/9466	N/A	N/A
Test Software	IEC1000-3	Voltech	Ver 3.13.08	N/A	N/A

4.4.2 Photograph of the test Configuration

Is Same the Harmonic current test photograph.

4.4.3 Test results

Operating condition	PC Video In(Analog) _ Ping test			
Test date	2008-08-04	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.2 ℃	**Relative humidity**	40 %
	Atmospheric pressure	100.5 kPa		
Test place	Shielded Room #3			

Product:	MONITOR	2008 Jul 29 10:47am
Serial no:	None	Page 1 of 1
Description:		
Result Name:	FLI_ANALOG	
Voltech IEC61000-3 Windows Software 1.10.04RC5		Test Date: 2008 Jul 29 9:33am
Type of Test:	Flickermeter Test - Table	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware Version: v1.20.06RC3 Channel(s): 1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007. 3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None Shunt(s): 1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007. 3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**	Notes: Measurement method - Voltage	

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.118	0.002	0.403	0

Operating condition	DVI Input (Digital) _ Ping test			
Test date	2008-08-04	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.2 ℃	**Relative humidity**	40 %
	Atmospheric pressure	100.5 kPa		
Test place	Shielded Room #3			

Product:	MONITOR	2008 Jul 29 10:47am
Serial no:	None	Page 1 of 1
Description:		
Result Name:	FLI_DIGITAL	
Voltech IEC61000-3 Windows Software 1.10.04RC5		Test Date: 2008 Jul 29 9:56am
Type of Test:	Flickermeter Test - Table	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware Version: v1.20.06RC3	
	Channel(s):	
	1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007.	
	3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
	Shunt(s):	
	1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007.	
	3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**	Notes: Measurement method - Voltage	

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.161	0.002	0.412	0

Operating condition	HDMI to DVI connected _ Ping test			
Test date	2008-08-04	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.2 ℃	**Relative humidity**	40 %
	Atmospheric pressure	100.5 kPa		
Test place	Shielded Room #3			

Product:	MONITOR	2008 Jul 29 10:47am
Serial no:	None	Page 1 of 1
Description:		
Result Name:	FLI_HDMI	
Voltech IEC61000-3	Windows Software 1.10.04RC5	Test Date: 2008 Jul 29 9:14am
Type of Test:	Flickermeter Test - Table	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware Version: v1.20.06RC3	
	Channel(s):	
	1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007.	
	3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
	Shunt(s):	
	1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007.	
	3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**	Notes: Measurement method - Voltage	

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.153	0.006	0.368	0

Operating condition	Magic Network _ Ping test			
Test date	2008-08-04	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.2 ℃	**Relative humidity**	40 %
	Atmospheric pressure	100.5 kPa		
Test place	Shielded Room #3			

Product:	MONITOR	2008 Jul 29 10:47am
Serial no:	None	Page 1 of 1
Description:		
Result Name:	FLI_MAGICN	
Voltech IEC61000-3 Windows Software 1.10.04RC5		Test Date: 2008 Jul 29 10:23am
Type of Test:	Flickermeter Test - Table	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware Version: v1.20.06RC3 Channel(s): 1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007. 3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None Shunt(s): 1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007. 3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**	Notes: Measurement method - Voltage	

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.152	0.002	0.406	0

Operating condition	Manual Switching			
Test date	2008-08-04	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	24.2 ℃	**Relative humidity**	40 %
	Atmospheric pressure	100.5 kPa		
Test place	Shielded Room #3			

Product:	MONITOR	2008 Aug 04 6:42pm
Serial no:	None	Page 1 of 1
Description:		
Result Name:	MANUAL SWITCHING	
Voltech IEC61000-3 Windows Software 1.10.04RC5		Test Date: 2008 Aug 04 5:12pm
Type of Test:	Manual Switching - Table	
Power Analyzer:	Voltech PM6000 SN: 100006700167 Firmware Version: v1.20.06RC3	
	Channel(s): 1. SN: 090015500508, 25 Adjusted Date: 22 JUL 2007. 2. SN: 090015500521, 25 Adjusted Date: 23 JUL 2007. 3. SN: 090015500543, 25 Adjusted Date: 5 AUG 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None Shunt(s): 1. SN: 091024300502, 4 Adjusted Date: 14 JUL 2007. 2. SN: 091024300503, 4 Adjusted Date: 14 JUL 2007. 3. SN: 091024300504, 4 Adjusted Date: 14 JUL 2007. 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**	Notes: Measurement method - Voltage	

Average dmax	1.386
dmax limit	4

Result	dc	dt > dc	dmax	dmax pass / fail	included
1	0.104	0.000	1.681	Pass	✓
2	0.107	0.000	1.210	Pass	✓
3	0.099	0.000	1.555	Pass	✓
4	0.098	0.000	1.619	Pass	✓
5	0.099	0.000	0.735	Pass	✓
6	0.102	0.000	1.709	Pass	✓
7	0.098	0.000	2.116	Pass	✓
8	0.105	0.000	0.612	Pass	✓
9	0.104	0.000	0.670	Pass	✓
10	0.104	0.000	1.820	Pass	✓
11	0.104	0.000	0.902	Pass	✓
12	0.104	0.000	2.538	Pass	✗
13	0.108	0.000	1.808	Pass	✓
14	0.105	0.000	1.485	Pass	✓
15	0.104	0.000	1.860	Pass	✓
16	0.105	0.000	1.460	Pass	✓
17	0.102	0.000	1.173	Pass	✓
18	0.101	0.000	1.540	Pass	✓
19	0.102	0.000	0.716	Pass	✓
20	0.101	0.000	2.283	Pass	✓
21	0.105	0.000	1.277	Pass	✓
22	0.101	0.000	1.685	Pass	✓
23	0.102	0.000	0.566	Pass	✓
24	0.102	0.000	0.511	Pass	✗

4.5 Electrostatic discharge

Contact discharges to the conductive surfaces and coupling planes:

The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points are subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane.
The remaining three test points are each receive at least 50 direct contact discharges.

If no direct contact test points are available, then at least 200 indirect discharges be applied in the indirect mode. Test is performed at a maximum repetition rate of one discharge per second.

Air discharges at slots and apertures and insulating surfaces:

On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur.
Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled by the user.

A minimum of 10 single air discharges shall be applied to the selected test point for each such area. The EUT was tested with all I/O ports exercised. Test results are listed below.
The basic test procedure was in accordance with IEC 61000-4-2.

Performance criteria

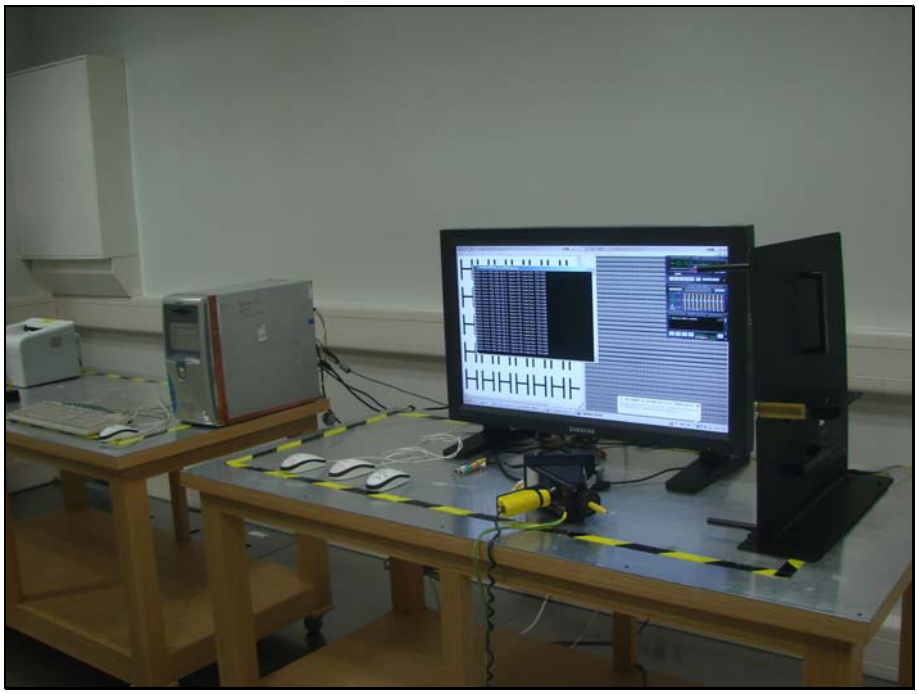
Application of discharge	Test specification (kV)	Performance criteria
Contact discharge	**4**	**B**
Air Discharge	**8**	**B**

4.5.1 Test instrumentation

Test instrumentation used in the Electrostatic discharge test was as follows:

Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
ESD Gun	NSG435	SCHAFFNER	001506	2008-03-27	12
Vertical Plane	VCP-1	Thermo Keytek	-	-	-

4.5.2 Photograph of the test Configuration



4.5.3 Test results

Operating condition	PC Video In(Analog)			
Test date	2008-08-04	**Test engineer**	Hyun Jeong, Jang	
Climate condition	**Ambient temperature**	24.0 ℃	**Relative humidity**	56 %
	Atmospheric pressure	100.5 kPa		
Test place	Shielded Room #3			

Test Method	No	Applied Point	Discharge Method	Test Level(KV)	Observation [Note No.]	Performance Result
Indirect	-	HCP	Contact	±2☒ ±4☒ ±8☐	**Note 1**☒ **2**☐	A☒ B☐ C☐
		VCP	Contact	±2☒ ±4☒ ±8☐	**Note 1**☒ **2**☐	A☒ B☐ C☐
Direct	1	LCD Panel	Air	±2☒ ±4☒ ±8☒	**Note 1**☒ **2**☐	A☒ B☐ C☐
	2	Switch	Air	±2☒ ±4☒ ±8☒	**Note 1**☒ **2**☐	A☒ B☐ C☐
	3	AC In	Air	±2☒ ±4☒ ±8☒	**Note 1**☒ **2**☐	A☒ B☐ C☐
	4	RS232C In/Out	Contact	±2☒ ±4☒ ±8☐	**Note 1**☒ **2**☐	A☒ B☐ C☐
	5	PC Audio In	Contact	±2☒ ±4☒ ±8☐	**Note 1**☒ **2**☐	A☒ B☐ C☐
	6	HDMI	Contact	±2☒ ±4☒ ±8☐	**Note 1**☒ **2**☐	A☒ B☐ C☐
	7	PC Video In	Contact	±2☒ ±4☒ ±8☐	**Note 1**☒ **2**☐	A☒ B☐ C☐
	8	DVI Input	Contact	±2☒ ±4☒ ±8☐	**Note 1**☒ **2**☐	A☒ B☐ C☐
	9	A/V Out	Contact	±2☒ ±4☒ ±8☐	**Note 1**☒ **2**☐	A☒ B☐ C☐
	10	Audio In	Contact	±2☒ ±4☒ ±8☐	**Note 1**☒ **2**☐	A☒ B☐ C☐
	11	LAN	Contact	±2☒ ±4☒ ±8☐	**Note 1**☒ **2**☐	A☒ B☐ C☐
	12	USB Port	Contact	±2☒ ±4☒ ±8☐	**Note 1**☒ **2**☐	A☒ B☐ C☐

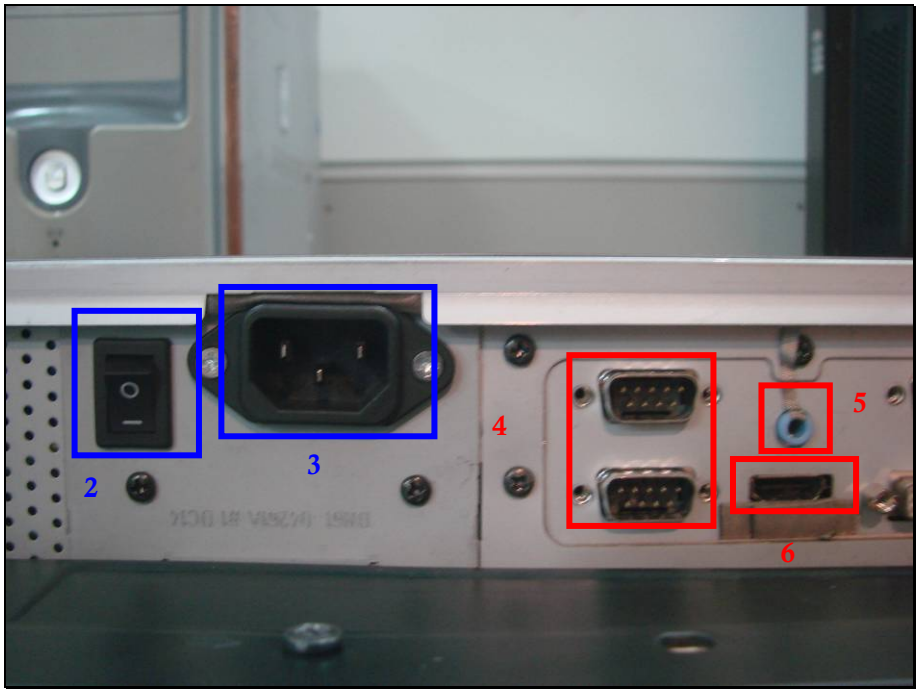
NOTE
1. There was no change compared with initial operation during the test.
2. While the electrostatic discharge tests, malfunction appeared in normal operate, but self-recoverable after the test.

4.5.4 Tested points

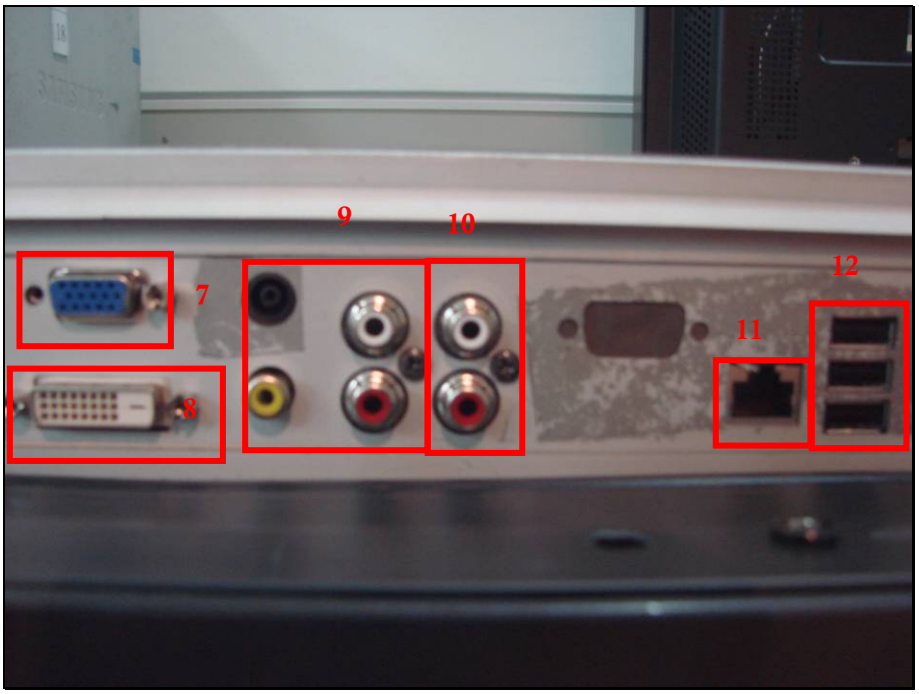
■ Air discharge points	■ Contact discharge points	■ Air/Contact discharge points

■ **Front**

■ **Rear 1**



■ Rear 2



4.6 Radiated, radio-frequency, electromagnetic field

The test was performed with the EUT exposed to both vertically and horizontally polarized fields. on each of the four sides.
The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond. The basic test procedure was in accordance with IEC 61000-4-3.

Performance criteria

Test range [MHz]	Test specification	Performance criteria	Remarks
80 ~ 1000	**3 V/m(unmodulated, r.m.s) 80 % AM(1 kHz)**	**A**	The test level specified is prior to modulation See *)
*) The frequency range is scanned as specified. However, when specified in Annex A, EN55024, an additional comprehensive functional test shall be carried out at a limited number of frequencies. The selected frequencies are: 80, 120, 160, 230, 434, 460, 600, 863 and 900 MHz (±1 %).			

4.6.1 Test conditions

Test condition in the Radiated, radio-frequency, and electromagnetic field test was as follows:

1. Representative operating conditions of EUT	☒ PC Video In(Analog) _ Ping test	
2. Type of the EUT	☒ **Table-top**	☐ **a combination of the two**
	☐ **Floor-standing**	**a height above the ground plane;** ☐ **0.1 m** ☐ **0.8 m**
3. Type of test facility	3m Fully anechoic chamber	
4. Position of the radiating antennas	a distance of 3 meters from the EUT	
5. Type of antennas	Log-periodic	
6. Frequency sweep rate	1.5 x 10-3 decades/s	
7. Dwell time and frequency steps	Dwell time : 3 s, Step size : 1 %	
8. Applied test level	3 V/m	

4.6.2 Test instrumentation

Test instrumentation used in the Radiated, radio-frequency, and electromagnetic field test was as follows:

Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				date	Interval
Mast Controller	CO2000	INNCO	-	N/A	-
Sinal Generator	SML03	R&S	102191	2007-09-07	12
Milivolt Meter	URV5	R&S	100243	2008-04-07	12
10V Insertion Unit	URV5-Z2	R&S	100240	2008-04-07	12
10V Insertion Unit	URV5-Z2	R&S	100241	2008-04-07	12
Amplifier	250W1000A	AR	312241	N/A	N/A
Amplifier	60SIG3	AR	311853	N/A	N/A
Antenna	AT1080	AR	310700	N/A	N/A
Antenna Mast	TP1000A	AR	311200	N/A	N/A
Relay Switching Unit	TS-RSP	AR	-	N/A	N/A

4.6.2 Photograph of the test Configuration

4.6.3 Test results

Test date	2008-08-05	Test engineer	Hyun Jeong Jang
Climate condition	Ambient temperature	21.0 ℃	Relative humidity 42 %
	Atmospheric pressure	100.5 kPa	

Frequency [MHz]	Table Azimuth [degree]	Polarity	Observation	Performance Result
80 ~ 1 000	0	Horizontal	See Note	A ☒ B ☐
		Vertical		A ☒ B ☐
	90	Horizontal		A ☒ B ☐
		Vertical		A ☒ B ☐
	180	Horizontal		A ☒ B ☐
		Vertical		A ☒ B ☐
	270	Horizontal		A ☒ B ☐
		Vertical		A ☒ B ☐

NOTE: There was no change compared with initial operation during the test.

4.7 Electrical fast transient/burst

■ Test on power supply ports and on protective earth terminals

Stationary, floor-mounted equipment

The test voltage applied between a reference ground plane and each of the power supply terminals, a.c. or d.c., and on the terminal for the protective or function earth on the cabinet of the EUT.
The EFT/B-generator shall be located on the reference plane.
The length of the “hot wire” from the coaxial output of the EFT/B-generator to the terminals on the EUT is not exceeding 1 m. This connection was unshielded but well insulated.
All other connections of the EUT are in accordance with its functional requirements.

Non-stationary mounted EUT, connected to the mains supply by flexible cord and plugs

The test voltage is applied between each of the power supply conductors and the protective earth at the power supply outlet to which the EUT is to be connected.

■ Test on I/O and communication ports

As far as possible, the capacitive coupling clamp is used for coupling the test voltage into the lines. However, if the clamp cannot be used due to mechanical problems (size, cable routing) in the cabling, it may be replaced by a tape or a conductive foil enveloping the lines under test. The capacitance of this coupling arrangement with foil or tape is equivalent to that of the standard coupling clamp.

In other cases, it is useful to couple the EFT/B-generator to the terminals of the lines via discrete 100 pF capacitors instead of the distributed capacitance of the clamp or of the foil or tape arrangement.

All tests carried out in shielded room.
The EUT was tested with all I/O ports exercised. Test results are listed below.

Performance criteria

Applied conditions	Test specification	Performance criteria
Open-circuit output test voltage		**B**
a.c. power ports	**1 kV(Peak)**	
signal and telecommunication ports	**0.5 kV(Peak)**	
d.c. power ports	**0.5 kV(Peak)**	
Wave shape of the pulse	**5/50 Tr/Th ns**	
Repetition Frequency	**5 kHz**	

4.7.1 Test conditions

Test condition in the Electrical fast transient/burst immunity test was as follows:

1. Representative operating conditions of the EUT		☒ PC Video In(Analog) _ Ping test
2. the Type of the EUT	☐ **Stationary, floor-mounted equipment**	
	☒ **Non-stationary mounted EUT**	
3. the type of test facility		Shielded Room #2
4. Test level		☐ **0.5 kV** ☒ **1 kV**
5. Polarity of the test voltage		☒ **Positive** ☒ **Negative**
6. Duration of the test		18 min
7. EUT's ports to be tested	**a.c. power ports**	☒ **Live** ☒ **Neutral** ☒ **Live + Neutral** ☒ **Live + PE** ☒ **Neutral + PE** ☒ **Live + Neutral + PE**
	Others ports	☐ **I/O ports** ☐ **Communication ports** ☐ **d.c. power ports**

4.7.2 Test instrumentation

Test instrumentation used in the Electrical fast transient/burst test was as follows:

Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
EFT/Burst Generator	NSG 2025	SCHAFFNER	19873	2007-09-06	12
CDN	CDN 8015	SCHAFFNER	19073	N/A	N/A

4.7.3 Photograph of the test Configuration

4.7.4 Test results

Test date	2008-08-04	Test engineer	Hyun Jeong Jang
Climate condition	Ambient temperature	25.0 ℃	Relative humidity 48 %
	Atmospheric pressure	100.7 kPa	

Test Point		Polarity	Test Level (kV)	Tr/Th [ns]	Observation [Note No.]	Performance Result
a.c. power ports	Live	+/-	1	5/50ns, 5kHz	Note 1☒ 2☐	A ☒ B ☐
	Neutral	+/-	1	5/50ns, 5kHz	Note 1☒ 2☐	A ☒ B ☐
	PE (Ground)	+/-	1	5/50ns, 5kHz	Note 1☒ 2☐	A ☒ B ☐
	Live + PE	+/-	1	5/50ns, 5kHz	Note 1☒ 2☐	A ☒ B ☐
	Neutral + PE	+/-	1	5/50ns, 5kHz	Note 1☒ 2☐	A ☒ B ☐
	Live + Neutral	+/-	1	5/50ns, 5kHz	Note 1☒ 2☐	A ☒ B ☐
	Live + Neutral + PE	+/-	1	5/50ns, 5kHz	Note 1☒ 2☐	A ☒ B ☐
LAN Ports		+/-	0.5	5/50ns, 5kHz	Note 1☐ 2☐	A ☐ B ☐

NOTE

1. There was no change compared with initial operation during the test.

2. The transmission of data was stopped during the test, but self-recoverable after the test.

4.8 Surge

The basic test procedure was in accordance with IEC 61000-4-5.

Performance criteria

Applied conditions	Test specification	Performance criteria
Combination wave **a.c. power ports** **signal and telecommunication ports** **d.c. power ports**	**Line to Line 1 kV(Peak)** ① **Line to earth 2 kV(Peak)** ① **Line to ground 1 kV(Peak)** ② **0.5 kV(Peak)** ③	**B**
Waveform parameter **Open-circuit voltage** **Short-circuit current**	**1.2/50 Tr/Th μs** **8/20 Tr/Th μs**	

① Applicable only to ports which according to the manufacturer's specification may connect directly to outdoor cables. Where normal functioning cannot be achieved because of the impact of the CDN on the EUT, no test shall be required.

② When the manufacturer specifies protection measures and it is impractical to simulate these measures during the tests, then the applied test levels shall be reduced to 0,5 kV and 1 kV.

③ Applicable only to ports which according to the manufacturer's specification may connect directly to outdoor cables.

4.8.1 Test instrumentation

Test instrumentation used in the Surge test was as follows:

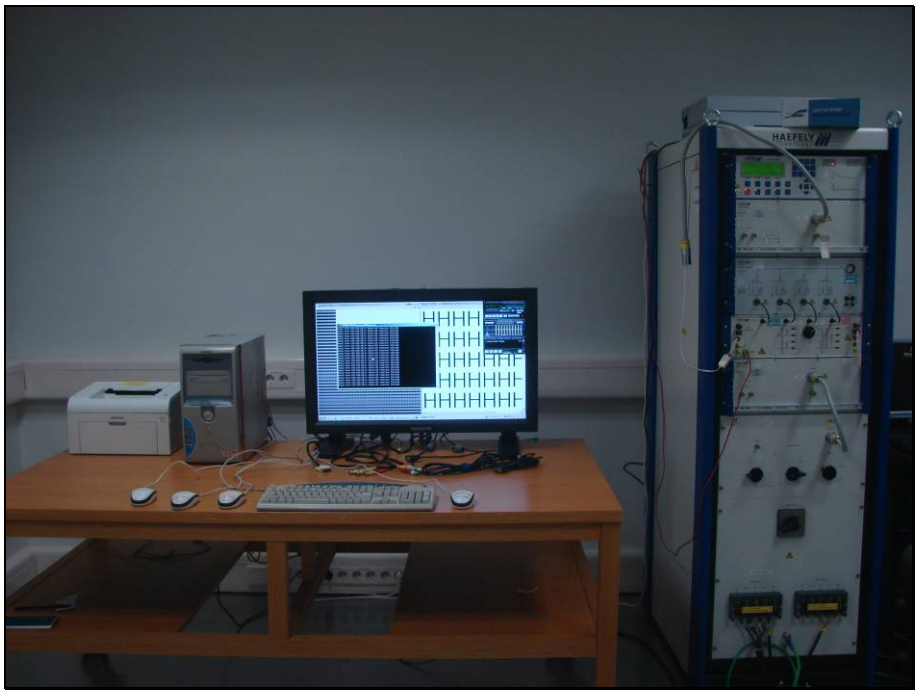
Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
Surge Tester	PSURGE 8000	HAEFELY	152602	2008-01-30	12
Surge Impulse Module	PIM 100	HAEFELY	152288	2008-01-23	12
Coupling Decoupling Network	PCD 120	HAEFELY	148918	2008-01-23	12
Coupling Decoupling Network	FP-SURGE 100M	HAEFELY	152636	2008-01-23	12
Impulse Module	PIM 120	HAEFELY	150663	2008-01-30	12

4.8.2 Test conditions

Test condition in the Surge immunity test was as follows:

1. Representative operating conditions of the EUT		☒ PC Video In(Analog) _ Ping test
2. Type of LINE	☒ **EUT power supply**	
	☐ **unshielded asymmetrically operated interconnection lines**	
	☐ **unshielded symmetrically operated interconnection / telecommunication lines**	
	☐ **shielded lines**	
	☐ **potential differences**	
3. the type of test facility		Shielded Room #3
4. Test level		☐ **0.5 kV** ☒ **1 kV** ☒ **2 kV**
5. Polarity of the surge		☒ **Positive** ☒ **Negative**
6. Number of test(at selected points)		40
7. Repetition rate		60 **sec**
8. EUT's ports to be tested	**a.c. power ports**	☒ **Live + Neutral** ☒ **Live + PE** ☒ **Neutral + PE**
	others ports	☐ **I/O ports** ☐ **Communication ports** ☐ **d.c. power ports**

4.8.3 Photograph of the test Configuration



4.8.4 Test results

Test date	2008-08-02	Test engineer	Hyun Jeong Jang
Climate condition	Ambient temperature	24.0 ℃	Relative humidity 56 %
	Atmospheric pressure	100.1 kPa	

Test Point			Polarity	Test Level (kV)	Phase wave Shape [μs]	Observation [Note No.]	Performance Result
a.c. power ports	Live + PE		+/-	2	1.2/50(8/20)	Note 1☒ 2☐	A ☒ B ☐
	Neutral + PE		+/-	2	1.2/50(8/20)	Note 1☒ 2☐	A ☒ B ☐
	Live + Neutral		+/-	1	1.2/50(8/20)	Note 1☒ 2☐	A ☒ B ☐
I/O Ports		Line to Earth	+/-	1	1.2/50(8/20)	Note 1☐ 2☐	A ☐ B ☐
LAN Ports			+/-	1	1.2/50(8/20)	Note 1☐ 2☐	A ☐ B ☐
Modem Ports			+/-	1	1.2/50(8/20)	Note 1☐ 2☐	A ☐ B ☐
d.c. power ports			+/-	0.5	1.2/50(8/20)	Note 1☐ 2☐	A ☐ B ☐

NOTE

1. There was no change compared with initial operation during the test.

2. The transmission of data was stopped during the test, but self-recoverable after the test.

4.9 Conducted disturbances, induced by radio-frequency fields

The test was performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.

Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility. Test results are listed below.
The basic test procedure was in accordance with IEC 61000-4-6.

Performance criteria

Test range [MHz]	Test specification	Performance criteria	Remarks
0.15 ~ 80	**3 V(unmodulated, r.m.s) 80 % AM(1 kHz)**	**A**	See 1), 2)

1) The frequency range is scanned as specified. However, when specified in Annex A, an additional comprehensive functional test shall be carried out at a limited number of frequencies. The selected frequencies for conducted tests are: 0,2; 1; 7,1; 13,56; 21; 27,12 and 40,68 MHz (±1 %).
2) Applicable only to cables which according to the manufacturer's specification supports communication on cable lengths greater than 3m.

4.9.1 Test conditions

Test condition in the Radiated, radio-frequency, and electromagnetic field test was as follows:

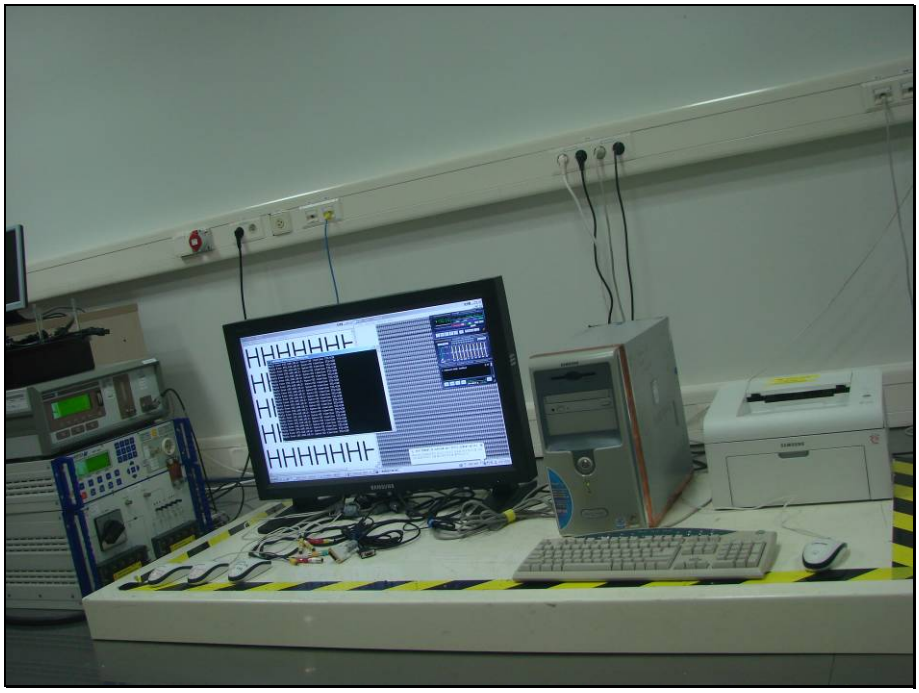
1. Representative operating conditions of EUT		☒ PC Video In(Analog) _ Ping test
2. Type of EUT' unit	☒ **Single**	☐ **Multiple**
3. Type of test facility used		Shielded Room #2
4. Frequency range of application the test		0.15 ~ 80 MHz
5. Frequency sweep rate		1.5 x 10-3 decades/s
6. Dwell time and frequency steps		Dwell time : 3 s, Step size : 1 %
7. Applied test level		3 V

4.9.2 Test instrumentation

Test instrumentation used in the Conducted disturbances, induced by radio-frequency fields test was as follows:

Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				date	Interval (Month)
RF - Generator	NSG2070	Schaffner	1118	2008-06-16	12
Attenuator	INA2070-1	Schaffner	2118	2008-03-06	12
Test Software	Win 2070	Schaffner	V01.05	N/A	N/A
Coupling Decoupling Network	CDN M016	Schaffner	21246	2008-04-21	12

4.9.4 Photograph of the test Configuration



4.9.5 Test results

Test date	2008-08-02	Test engineer	Hyun Jeong Jang
Climate condition	Ambient temperature	23.7 ℃	Relative humidity 51 %
	Atmospheric pressure	100.3 kPa	

Frequency (MHz)	Field Strength (Vr.m.s.)	Injection Method	Inject Points (Cable length)	Observation [Note No.]	Performance Result
0.15 ~ 80	3	CDN-M3	AC power line(1.8m)	Note 1☒ 2☐	A ☒ B ☐
	3	CDN-T4	LAN (10m)	Note 1☐ 2☐	A ☐ B ☐
	3	CDN-T2	Telephone (10m)	Note 1☐ 2☐	A ☐ B ☐
	3	CLAMP	DC (1.8m)	Note 1☐ 2☐	A ☐ B ☐
	3	CLAMP	Printer (2m)	Note 1☐ 2☐	A ☐ B ☐
	3	CLAMP	VGA (1.8m)	Note 1☐ 2☐	A ☐ B ☐

NOTE

1. **There was no change compared with initial operation during the test.**
2. **The transmission of data from modem port stopped during the test, but self-recoverable after the test. This permissive loss of performance is specified by the manufacturer, and this phenomenon will be put as a clear statement in the User's Manual to avoid misunderstanding.**

4.10 Voltage dips, short interruptions and voltage variations

The EUT is tested for each selected combination of test levels and duration with a sequence of tree dips/interruptions with intervals of 10 s minimum (between each test event).
Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform. The basic test procedure was in accordance with IEC 61000-4-11.

Performance criteria

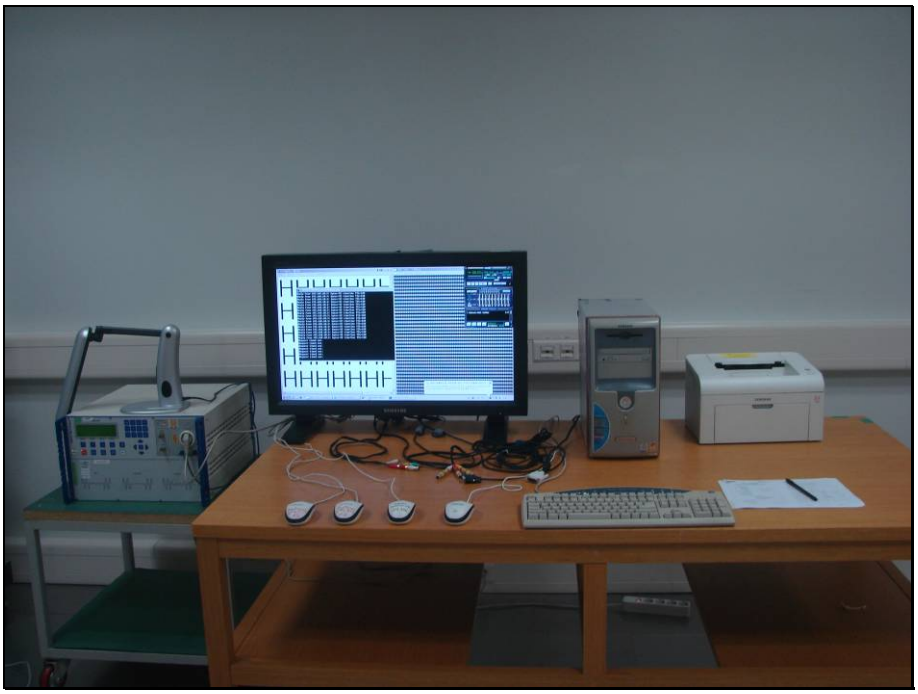
Environmental phenomenon	Test specification	Units	Performance criteria	Remarks
Voltage dips	>95 0,5	% reduction periods	B	See NOTE
	30 25		C	
Voltage interruptions	>95 250		C	
[NOTE] Changes to occur at 0 degree crossover point of the voltage waveform.				

4.10.1 Test instrumentation

Test instrumentation used in the Voltage dips, short interruptions and voltage variations test was as follows:

Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				date	Interval (Month)
Voltage Dip & Interruption	☐ PFS 503	EM TEST	PFS503/63A -0513100236	2007-06-16	12
	☒ PLINE 1610	HAEFELY	083690-21	2008-05-13	12

4.10.2 Photograph of the test Configuration



4.10.3 Test results

Operating condition	PC Video In(Analog) _ Ping test			
Test date	2008-08-02	**Test engineer**	Hyun Jeong Jang	
Climate condition	**Ambient temperature**	25.0℃	**Relative humidity**	48%
	Atmospheric pressure	100.7kPa		

Test Voltage	Period	Number of Applications	Angle [Degrees]	Observation [Note No.]	Performance Result
>95 % UT	0.5	**10**	**0, 180**	**Note 1**☒ **2**☐	**A** ☒ **B** ☐ **C** ☐
30 % UT	25	**10**	**0**	**Note 1**☒ **2**☐	**A** ☒ **B** ☐ **C** ☐
>95 % UT	250	**10**	**0**	**Note 1**☐ **2**☒	**A** ☐ **B** ☒ **C** ☐

NOTE

1. There was no change compared with initial operation during the test.

2. While The Voltage Dip & Interruption tests, malfunction appeared in normal operate, but self-recoverable after the test.

Appendix – EUT photography

Front View

Rear View