Nemko Korea Co., Ltd.

300-2, Osan-Ri, Mohyun-Myeon, Cheoin-Gu, Yongin-City, Gyeonggi-Do, Korea
TEL:+ 82 31 322 2333 FAX:+ 82 31 322 2332

FCC PART 15 Class II Permissive Change

Applicant :

D&T Inc.
Daedeok Valley, 59-9, Jang Dong, Yuseong Gu,
Daejeon, 305-343 Korea
Attn : Mr. W. W. Lee

Dates of Issue : November 14, 2008
Test Report No. : NK08E833
Test Site : Nemko Korea Co., Ltd.
EMC site, Korea

FCC ID	***THCFS-S5201C***
Brand Name	***TANDBERG***
Contact Person	**D&T Inc.** **Daedeok Valley, 59-9, Jang Dong, Yuseong Gu,** **Daejeon, 305-343 Korea** **Mr. W. W. Lee** **Telephone No. : + 82 42 360 0820**

Applied Standard: Part 15 & 2
Classification : FCC Class B Device
EUT Type: 52” LCD Monitor

The device bearing the brand name and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003.
I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested By : H. S. Shin
Engineer

Reviewed By : D.H. Ryu
Manager & Chief Engineer

TABLE OF CONTENTS

SCOPE	**3**
INTRODUCTION (Site Description)	**4**
TEST CONDITIONS & EUT INFORMATION	**5**
SUMMARY OF TEST RESULTS	**9**
RECOMMANDATION / CONCLUSION	**9**
SAMPLE CALCULATION	**9**
DESCRIPTION OF TESTS (Conducted Emissions)	**10**
DESCRIPTION OF TESTS (Radiated Emissions)	**11**
TEST DATA (Conducted Emissions)	**12**
TEST DATA (Radiated Emissions)	**13**
PLOT OF EMISSIONS (Conducted Emissions Diagram)	**16**
ACCURACY OF MEASUREMENT	**20**
LIST OF TEST EQUIPMENT	**21**
APPENDIX A - SAMPLE LABEL	**22**
APPENDIX B - PHOTOGRAPHS OF TEST SET-UP	**23**
APPENDIX C - EUT PHOTOGRAPHS	**25**
APPENDIX D – MODIFICATION LIST	**44**
APPENDIX E - BLOCK DIAGRAM	**46**
APPENDIX F - USER'S MANUAL	**47**
APPENDIX G - SCHEMATIC DIAGRAM	**48**

SCOPE

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC part 15.

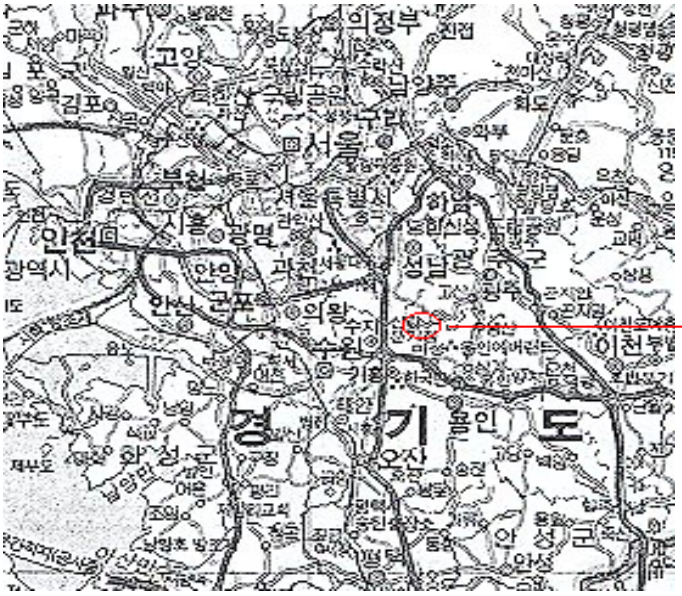
Responsible Party :	D&T Inc.
Contact Person :	Mr. W. W. Lee Tel No.: + 82 42 360 0820
Manufacturer :	D&T Inc. Daedeok Valley, 59-9, Jang Dong, Yuseong Gu, Daejeon, 305-343 Korea
Factory :	D&T Inc. Daedeok Valley, 59-9, Jang Dong, Yuseong Gu, Daejeon, 305-343 Korea

- FCC ID: THCFS-S5201C
- Model: FS-S5201C
- EUT Type: 52” LCD Monitor
- Electric Rating: a.c. 100-240 V, 50-60 Hz, 5 A (MAX)
- Test Voltage: a.c. 120 V, 60 Hz
- Port/Connector: HDMI x 3 EA, Analog x 1EA, Speaker In x 1 EA
- Classification: FCC Class B
- Applied Standard: FCC Part 15 & Part 2
- Test Procedure(s): ANSI C63.4 (2003)
- Dates of Test: October 30, 2008 to November 11, 2008
- Place of Tests: Nemko Korea Co., Ltd. EMC Site
- Test Report No.: NK08E833

INTRODUCTION

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003) was used in determining radiated and conducted emissions emanating from **D&T Inc.**
FCC ID : **THCFS-S5201C, 52" LCD Monitor.**

These measurement tests were conducted at ***Nemko Korea Co., Ltd. EMC Laboratory***.
The site address is 300-2, Osan-Ri, Mohyun-Myeon, Cheoin-Gu, Yongin-City, Gyeonggi-Do, KOREA
The area of Nemko Korea Corporation Ltd. EMC Test Site is located in a mountain area at 80 kilometers (48 miles) southeast and Incheon International Airport (Incheon Airport), 30 kilometers (18miles) south-southeast from central Seoul.
It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures.
The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4 on 2003.



Nemko Korea Co., Ltd.
OPEN AREA TEST SITE
300-2, Osan-Ri, Mohyun-Myeon,
Cheoin-Gu, Yongin-City, Gyeonggi-Do,
KOREA, 449-852
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Fig. 1. The map above shows the Seoul in Korea vicinity area.
The map also shows Nemko Korea Corporation Ltd. EMC Lab and Incheon Airport.

TEST CONDITIONS & EUT INFORMATION

Operating During Test

The EUT was connected to the PC and it displayed continuously an “H” pattern on the screen. The EUT was set to 1920 x 1080 video resolution, with 60 Hz vertical refresh rate.

Support Equipment

52” LCD Monitor (EUT)	D&T Inc. FCC ID : THCFS-S5201C 1.8 m shielded HDMI cable 1.5 m shielded D-Sub cable 1.8 m unshielded AC power cable	S/N: N/A
PC	Dell ASIA PACIFIC SDN. FCC DOC (Model) : Dimension 4550 1.8 m unshielded AC power cable	S/N: N/A
Keyboard	Samsung Electro-Mechanics Co., Ltd. FCC DOC (Model) : SEM-DT35 1.5 m shielded Din cable	S/N: N/A
PS/2 Mouse	KYE SYSTEMS FCC DOC (Model) : SCROLL MOUSE P801 1.5 m unshielded Din cable	S/N: 1181250
Serial Mouse	ALL SPIRIT CO., LTD. FCC DOC (Model) : WS-V1-400 1.5 m unshielded D-Sub cable	S/N: B050402
USB Mouse	SUZHOU LOGITECH ELECTRONICS CO., LTD. FCC DOC (Model) : M-UR69 1.5 m unshielded USB cable	S/N: LNA31701862
Printer	HP FCC DOC (Model) : C6429A 1.8 m shielded parallel cable 1.8 m unshielded AC power cable	S/N: N/A

EUT Information

Clock	27.00 MHz (Y1), 28.322 MHz(Y2)
Chipset(s)	U4(SII8185), U9(PW338C), U10(SII9185),
	U14/U15(K4H561638H-UCCC), U12(M29W800DT),
	U27(AD9984A), U29(ATmega88V)
LCD Panel Type	A-si TFT Active matrix
Screen size	106.7 cm (Diagonal)
Maximum Resolution	1920 x 1080 @ 60 Hz
Pixel pitch	0.6 (H) mm x 0.6 (V) mm
Display colors	16.7 M (RGB 8-bit data)
Contrast Ratio(Typ.)	1700:1
Viewing Angle(Typ.)	88/88/88/88
Response Time(Typ.)	8 ms
Luminance(Typ.)	600 cd/m2
Synchronization	Horizontal Frequency : 25 ~ 90 kHz
	Vertical Frequency : 24 ~ 120 Hz
Power Consumption	Maximum : 500 W
Port(s)	HDMI, Analog
Size and weight	1206 x 170 x 926.5 / 68 kg

Description of Test Modes

The EUT was pre-tested under the following resolutions mode:

1. 800 X 600 (60 Hz / 37 kHz) : Clock 35.5 MHz
2. 1280 X 720 (60 Hz / 45 kHz) : Clock 74.25 MHz
3. 1366 X 768 (60 Hz / 48.3 kHz) : Clock 87.75 MHz
4. 1680 X 1050 (60 Hz / 64.7 kHz) : Clock 119.125 MHz
5. 1920 X 1080 (60 Hz / 76.5 kHz) : Clock 148.5 MHz

The worst emission level was found when the EUT was tested under 1920 x 1080 resolution, therefore, the test data of this mode was recorded in the report.

Description of the Changes according to FCC part 2.1043

1. Please see appendix D of the test report. (page 44 ~ 45)

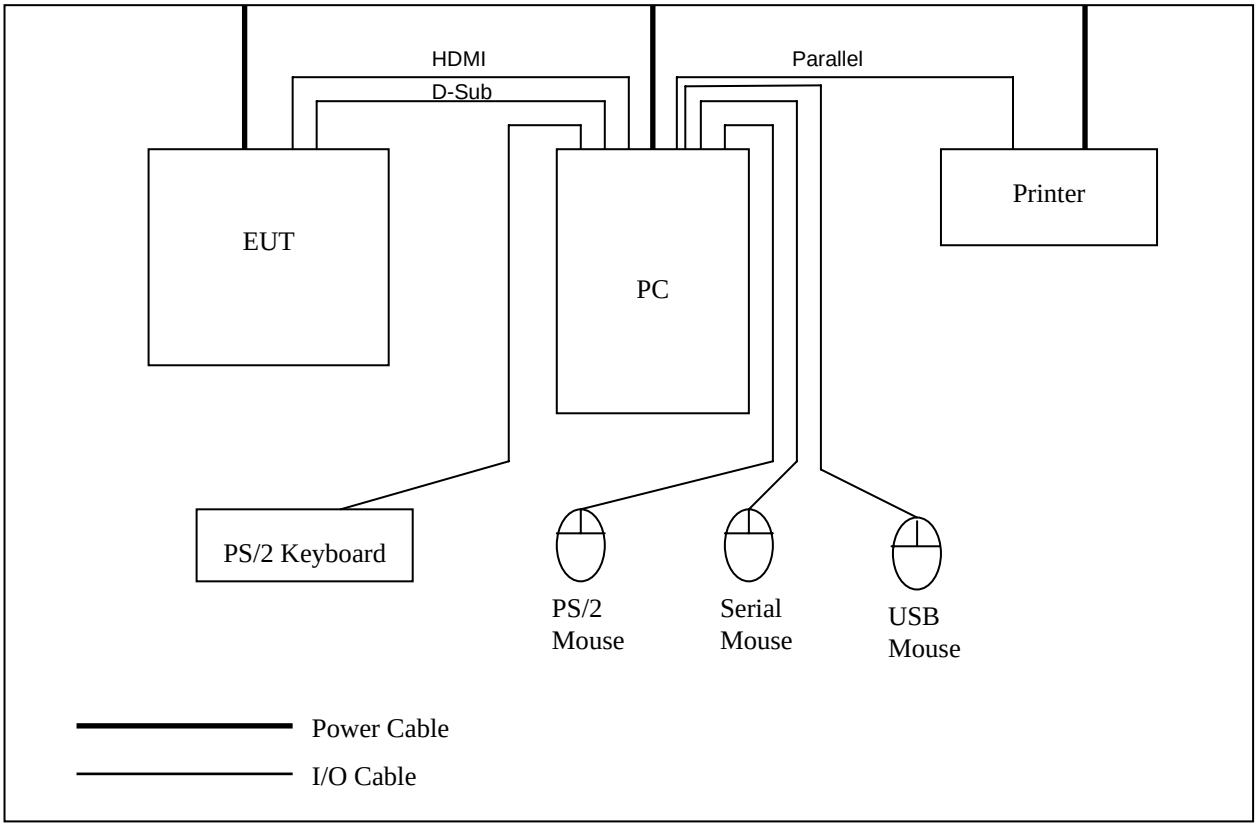
EUT System

Equipment		Model	Manufacturer	Serial Number
LCD Panel		LTI520HB01	Samsung	8H8D04LF0F
AD Board		LB506 Main Board R03	D&T Inc.	N/A
AC Divide Board		AC Divide Board R03A	D&T Inc.	N/A
IO Board		LB506 IO Board R03	D&T Inc.	N/A
Before	SMPS Board [1] (Right)	0627D04349 Transformer : 5124-0611-0 [2]	Li Shin International Enterprise Corp.	N/A
	SMPS Board [1] (Left)	0627D04349 Transformer : 5124-0611-0 [2]	Li Shin International Enterprise Corp.	N/A
After	SMPS Board [1] (Right)	0627D04349(R1) Transformer : PSP8004FL [2]	Li Shin International Enterprise Corp.	N/A
	SMPS Board [1] (Left)	0627D04349(R1) Transformer : PSP8004FL [2]	Li Shin International Enterprise Corp.	N/A

1) Now the manufacture (D&T Inc.) will use 2 kinds of SMPS Board (0627D04349, 0627D04349(R1)). Because the 0627D04349 will be EOL (End Of Line) a few months later, and they will use new one 0627D04349(R1).

2) The type PSP8004FL is similar to type 5124-0611-0, except for the size of core and outer insulation tapes on the windings (see appendix C)

Setup Drawing



SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specification:

Name of Test	Paragraph No.	Result	Remark
Conducted Emission	15.107(a)	Complies	
Radiated Emission	15.109(a)	Complies	Below 1 GHz
Radiated Emission	15.109(a)	Complies	Above 1 GHz

RECOMMENDATION/CONCLUSION

The data collected shows that the **D&T Inc.**
FCC ID : **THCFS-S5201C, 52" LCD Monitor.**
The highest emission observed was at **0.28 MHz** for conducted emissions with a A.V margin of **7.5 dB,** at **742.49 MHz** for radiated emissions with a margin of **8.6 dB.**

SAMPLE CALCULATION

$$\text{dB}\,\mu\text{N} = 20 \log_{10}(\mu\text{N/m})$$

$$\mu\text{N} = 10^{(\text{dB}\,\mu\text{N}/20)}$$

EX. 1.

@57.7 MHz Class B limit = 100 μN/m = 40.0 dB μN/m

Reading = 19.1 dB μN(calibrated level)
Antenna factor + Cable Loss = 10.12 dB
Total = 29.22 dB μN/m
Margin = 40.0 - 29.22 = 10.78
10.78 dB below the limit

DESCRIPTION OF TESTS

Conducted Emissions

The Line conducted emission test facility is located inside a 4 X 7 X 2.5 m shielded enclosure.
It is manufactured by EM engineering. The shielding effectiveness of the shielded room is in accordance with MIL-STD-285 or NSA 65-6.
A 1 m X 1.5 m wooden table 0.8 m height is placed 0.4 m away from the vertical wall and 0.5 m away from the side of wall of the shielded room
Rohde & Schwarz (ESH2-Z5) and Kyoritsu (KNW-407) of the 50 ohm / 50 uH Line Impedance Stabilization Network(LISN) are bonded to the shielded room.
The EUT is powered from the Rohde & Schwarz LISN and the support equipment is powered from the Kyoritsu LISN. Power to the LISN s are filtered by high-current high insertion loss Power line filters. The purpose of filter is to attenuate ambient signal interference and this filter is also bonded to shielded enclosure. All electrical cables are shielded by tinned copper zipper tubing with inner diameter of 1/2".
If DC power device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the LISNs,
All interconnecting cables more than 1 m were shortened by non inductive bundling (serpentine fashion) to a 1 m length.
Sufficient time for EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.
The spectrum was scanned from 150 kHz to 30 MHz with 20 ms sweep time.
The frequency producing the maximum level was re-examined using the EMI test receiver. (Rohde & Schwarz ESCS30).
The detector function were set to CISPR quasi-peak mode & average mode.
The bandwidth of receiver was set to 9 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.
Each emission was maximized by; switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and of support equipment, and powering the monitor from the floor mounted outlet box and computer aux AC outlet, if applicable; which ever determined the worst case emission.
Each EME reported was calibrated using the R&S signal generator.

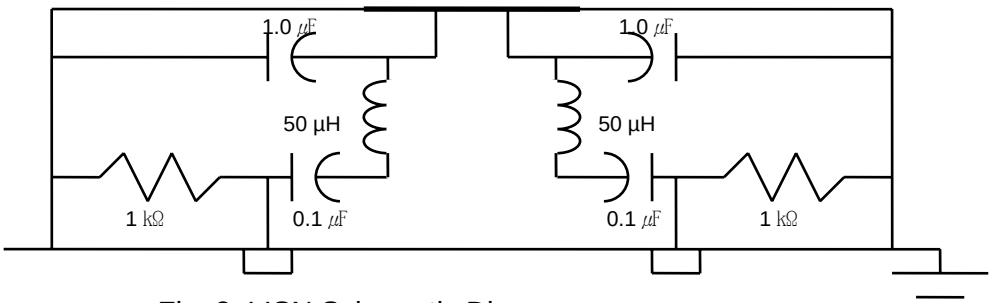


Fig. 2. LISN Schematic Diagram

DESCRIPTION OF TESTS

Radiated Emissions

Preliminary measurement were made indoors at 3 meter using broad band antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The Technology configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna was note for each frequency found. The spectrum was scanned from 30 to 1000 MHz using Biconical log Antenna(ARA, LPB-2520/A). Above 1 GHz, Double Ridged Broadband Horn Antenna (SCHWARTZBECK, BBHA9120D) was used.
Final Measurements were made outdoors at 3 m or 10 m test range using Trilog-Broadband Antenna (Shwarzbeck, VULB9168) or Double Ridged Broadband Horn Antenna (SCHWARTZBECK, BBHA9120D). The test equipment was placed on a wooden table. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.
Each frequency found during pre-scan measurements was reexamined and investigated using EMI test receiver. (ESCS30)
The detector function were set to CISPR quasi-peak and peak mode and the bandwidth of the receiver were set to 120 kHz and 1 MHz depending on the frequency or type of signal.
The half wave dipole antenna was tuned to the frequency found during preliminary radiated measurements.
The EUT support equipment and interconnecting cables were re configured to the setup producing the maximum emission for the frequency and were placed on top of a 0.8 m high non- metallic 1.0 X 1.5 meter table.
The EUT, support equipment and interconnecting cables were re-arranged and manipulated to maximize each EME emission.
The turn table containing the Technology was rotated; the antenna height was varied 1 to 4 meter and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by : switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and of support equipment, and powering the monitor from the floor mounted outlet box and computer aux AC outlet, if applicable; which ever determined the worst case emission.
Each EME reported was calibrated using the R/S signal generator.

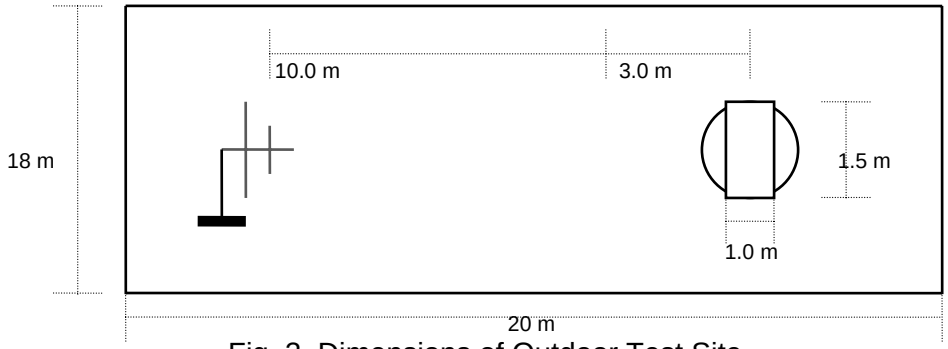


Fig. 3. Dimensions of Outdoor Test Site

TEST DATA

Conducted Emissions

FCC ID : THCFS-S5201C

▶HDMI mode

Frequency	Level(dBμV)		Line	Limit(dBμV)		Margin(dB)	
(MHz)	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.21	40.1	33.6	L	63.2	53.2	23.1	19.6
0.27	47.2	42.5	L	61.1	51.1	13.9	8.6
0.83	39.2	34.6	N	56.0	46.0	16.8	11.4
2.50	40.2	31.2	L	56.0	46.0	15.8	14.8
3.04	39.9	29.1	N	56.0	46.0	16.1	16.9
4.49	38.8	27.4	N	56.0	46.0	17.2	18.6

Table 1. Line Conducted Emissions Tabulated Data

▶D-Sub mode

Frequency	Level(dBμV)		Line	Limit(dBμV)		Margin(dB)	
(MHz)	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.28	48.1	43.3	L	60.8	50.8	12.7	7.5
1.39	39.5	34.0	L	56.0	46.0	16.5	12.0
2.64	39.9	29.8	N	56.0	46.0	16.1	16.2
3.20	40.0	28.6	L	56.0	46.0	16.0	17.4
4.85	39.1	27.4	L	56.0	46.0	16.9	18.6
20.07	42.7	32.1	L	60.0	50.0	17.3	17.9

Table 2. Line Conducted Emissions Tabulated Data

NOTES:

1. Measurements using CISPR quasi-peak mode & average mode.

2. All modes of operation were investigated and the worst -case emission are reported. See attached Plots.

3. LINE : L =Line , N = Neutral

4. The limit for Class B device is on the FCC Part section 15.107(a).

*Tested by : **H. S. Shin***

TEST DATA

Radiated Emissions

FCC ID : THCFS-S5201C

▶HDMI mode (30 MHz ~ 1 GHz)

Frequency (MHz)	Reading (dBμV)	Pol* (H/V)	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
80.10	42.2	V	-16.5	25.7	40.0	14.3
148.49	33.3	V	-6.6	26.7	43.5	16.8
299.83	32.7	V	-1.2	31.5	46.0	14.5
350.99	31.6	V	-0.4	31.2	46.0	14.8
593.98	28.3	V	3.8	32.1	46.0	13.9
742.49	33.6	V	3.8	37.4	46.0	8.6

Table 3. Radiated Measurements at 3 meters (1920 x 1080, 60 Hz)

▶D-Sub mode (30 MHz ~ 1 GHz)

Frequency (MHz)	Reading (dBμV)	Pol* (H/V)	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
63.94	40.7	V	-16.5	24.2	40.0	15.8
148.05	34.8	H	-6.6	28.2	43.5	15.3
259.69	29.0	V	-1.2	27.8	46.0	18.2
298.62	31.8	V	-0.4	31.4	46.0	14.6
594.89	31.9	V	3.8	35.7	46.0	10.3
647.99	28.3	V	3.8	32.1	46.0	13.9

Table 4. Radiated Measurements at 3 meters (1920 x 1080, 60 Hz)

▶HDMI mode (1 GHz ~ 2 GHz)

Frequency	Reading (dBμV)		Pol*	AF+CL+Amp	Limit (dBμV/m)		Final Result(dBμV/m)	
(MHz)	Peak	Average	(H/V)	(dB)**	Peak	Average	Peak	Average
1010.62	52.2	48.4	V	-6.68	74.0	54.0	45.5	41.7
1039.53	62.3	46.5	V	-6.64	74.0	54.0	55.7	39.9
1161.00	56.1	52.1	V	-6.36	74.0	54.0	49.7	45.7
1296.09	55.9	52.9	V	-5.88	74.0	54.0	50.0	47.0
1485.03	57.1	48.3	V	-5.34	74.0	54.0	51.8	43.0
1930.39	51.9	41.6	V	-3.72	74.0	54.0	48.2	37.9

NOTES : Measurements using peak mode & average mode.

Table 5. Radiated Measurements at 3 meters (1920 x 1080, 60 Hz)

▶D-Sub mode (1 GHz ~ 2 GHz)

Frequency	Reading (dBμV)		Pol*	AF+CL+Amp	Limit (dBμV/m)		Final Result(dBμV/m)	
(MHz)	Peak	Average	(H/V)	(dB)**	Peak	Average	Peak	Average
1016.10	51.7	46.6	V	-6.68	74.0	54.0	45.0	39.9
1039.90	61.3	42.0	V	-6.64	74.0	54.0	54.7	35.4
1160.31	51.6	43.6	V	-6.36	74.0	54.0	45.2	37.2
1346.29	53.2	40.4	V	-5.67	74.0	54.0	47.5	34.7
1619.81	51.2	41.9	V	-5.20	74.0	54.0	46.0	36.7
1664.12	50.2	39.3	V	-5.05	74.0	54.0	45.1	34.2

NOTES : Measurements using peak mode & average mode.

Table 6. Radiated Measurements at 3 meters (1920 x 1080, 60 Hz)

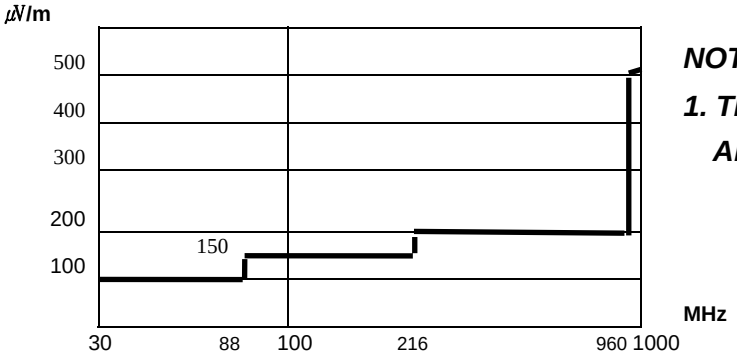


Fig. 4. Limits at 3 meters

NOTES:

1. The radiated limits are shown on Figure 5. Above 1 GHz the limit is 500 μV/m.

NOTES:

1. *Pol. H =Horizontal V=Vertical

2. **AF+CL+Amp. = Antenna Factor + Cable Loss + Amplifier.

3. *** average limit is met when using a peak detector receiver, the EUT was deemed to meet both limits and measurement with the average detector receiver is unnecessary.

4. The limit for Class B device is on the FCC Part section 15.109(a).

5. All modes of operations were invested and the worst -case emission was reported.

6. Above 1 GHz, peak detector function mode is used using a resolution bandwidth of 1 MHz and a video bandwidth of 1 MHz, average detector function mode is used using a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz.
Peak mode is used with linearly polarized horn antenna and low-loss microwave cable.

Tested by : **H. S. Shin**

PLOTS OF EMISSIONS

- ***Conducted Emission at the Mains port (HDMI mode, Line)***

NEMKO KOREA (NK-08-E-833) 11 Nov 2008 09:18

Conducted Emissions

EUT:	52"LCD Monitor
Manuf:	D&T Inc.
Op Cond:	a.c. 120 V / 60 Hz , HDMI
Operator:	shin hyun sik
Test Spec:	FCC Part 15 Subpart B
Comment:	MODEL : FS-S5201C
	LINE : Line - PE
Result File:	e833h-l.dat : FCC Part 15 Class B

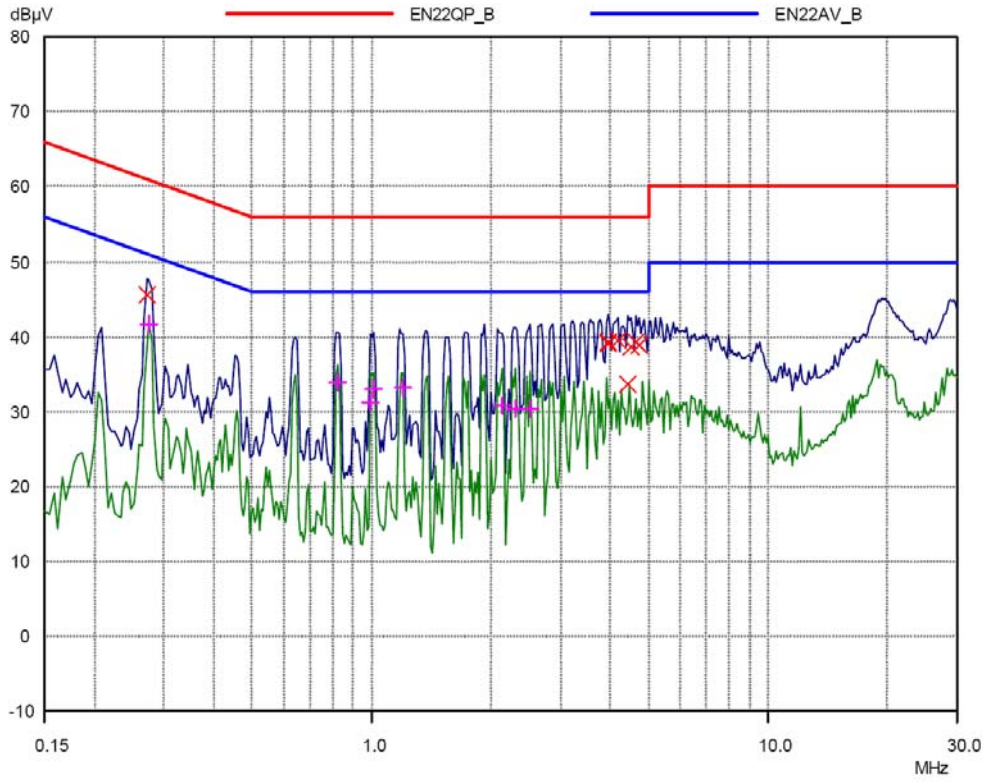
Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	Z5_LINE

Final Measurement:

Detectors:	X QP / + AV
Meas Time:	1sec
Peaks:	8
Acc Margin:	60 dB



PLOTS OF EMISSIONS

- ***Conducted Emission at the Mains port (HDMI mode, Neutral)***

NEMKO KOREA (NK-08-E-833) 11 Nov 2008 09:32

Conducted Emissions

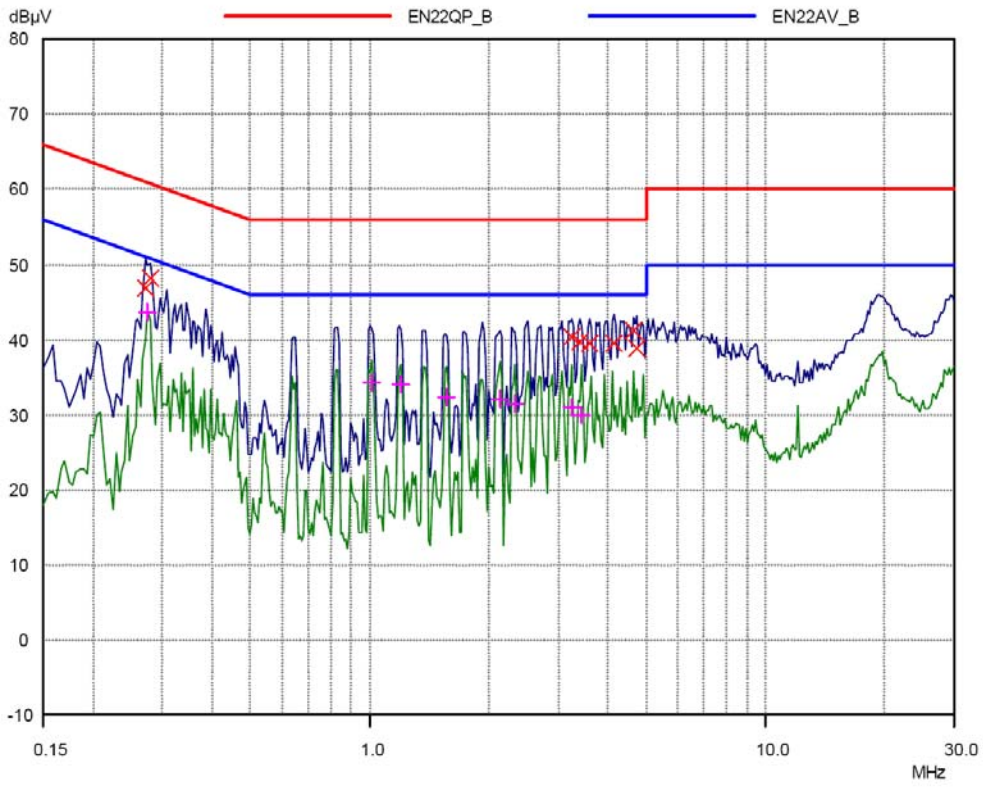
EUT:	52"LCD Monitor
Manuf:	D&T Inc.
Op Cond:	a.c. 120 V / 60 Hz , HDMI
Operator:	shin hyun sik
Test Spec:	FCC Part 15 Subpart B
Comment:	MODEL : FS-S5201C
	LINE : Neutral - PE
Result File:	e833h-n.dat : FCC Part 15 Class B

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	Z5_NEUT

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	60 dB



PLOTS OF EMISSIONS

- ***Conducted Emission at the Mains port (D-Sub mode, Line)***

NEMKO KOREA (NK-08-E-833) 11 Nov 2008 09:52

Conducted Emissions

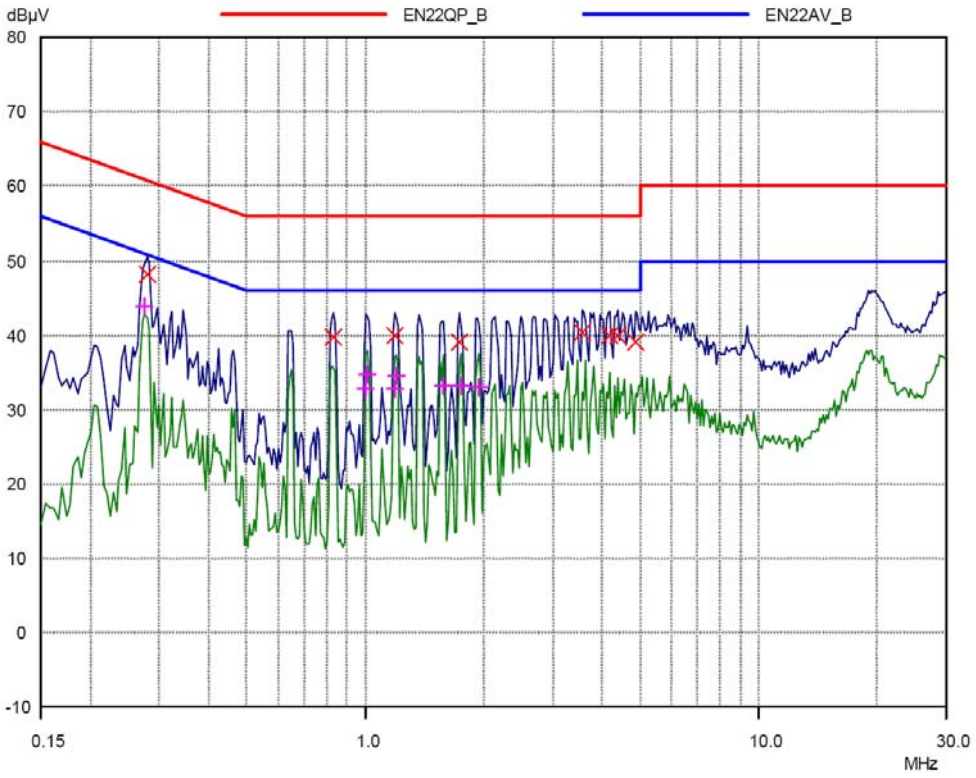
EUT:	52"LCD Monitor
Manuf:	D&T Inc.
Op Cond:	a.c. 120 V / 60 Hz , D-SUB
Operator:	shin hyun sik
Test Spec:	FCC Part 15 Subpart B
Comment:	MODEL : FS-S5201C
	LINE : Line - PE
Result File:	e833d-l.dat : FCC Part 15 Class B

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	Z5_LINE

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	60 dB



PLOTS OF EMISSIONS

- ***Conducted Emission at the Mains port (D-Sub mode, Neutral)***

NEMKO KOREA (NK-08-E-833) 11 Nov 2008 09:41

Conducted Emissions

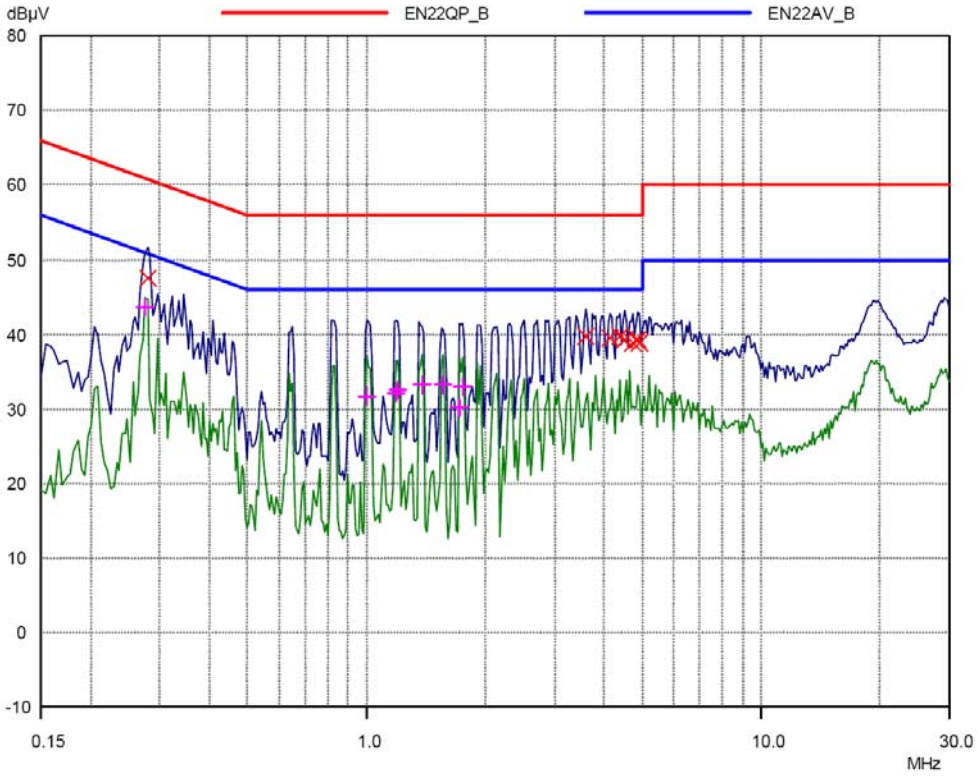
EUT:	52"LCD Monitor
Manuf:	D&T Inc.
Op Cond:	a.c. 120 V / 60 Hz , D-SUB
Operator:	shin hyun sik
Test Spec:	FCC Part 15 Subpart B
Comment:	MODEL : FS-S5201C
	LINE : Neutral - PE
Result File:	e833d-n.dat : FCC Part 15 Class B

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	Z5_NEUT

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	60 dB



ACCURACY OF MEASUREMENT

The Measurement Uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 with the confidence level of 95 %

1. Radiation Uncertainty Calculation

Contribution	*Probability Distribution*	*Uncertainty(+/-dB)*
Antenna Factor	Normal (k = 2)	± 0.5
Cable Loss	Normal (k = 2)	± 0.04
Receiver Specification	Rectangular	± 2.0
Antenna directivity	Rectangular	± 1.0
Antenna Factor variation with Height		
Antenna Phase Center Variation		
Antenna Factor Frequency Interpolation		
Measurement Distance Variation		
Site Inperfections	Rectangular	± 2.0
Mismatch:Receiver VRC ri=0.3 Antenna VRC rR=0.1(Bi)0.4(Lp) Uncertainty Limits 20Log(1+/-ri rR)	U-Shaped	+ 0.25 / - 0.26
System Repeatibilty	Std.deviation	± 0.05
Repeatability of EUT	-	-
Combined Standard Uncertainty	Normal	± 1.77
Expended Uncertainty U	Normal (k = 2)	± 3.5

2. Conducted Uncertainty Calculation

Contribution	*Probability Distribution*	*Uncertainty(+/-dB)*
Receiver Specification	Normal (k = 2)	± 2.0
LISN coupling spec.	Normal (k = 2)	± 0.4
Cable and input attenuator cal.	Rectangular	± 0.4
Mismatch:Receiver VRC ri=0.3 LISN vrc rg=0.1 Uncertainty Limits 20Log(1+/-ri rR)	U-Shaped	± 0.26
System Repeatibilty	Std.deviation	± 0.68
Repeatability of EUT	-	-
Combined Standard Uncertainty	Normal	± 1.18
Expended Uncertainty U	Normal (k = 2)	± 2.4

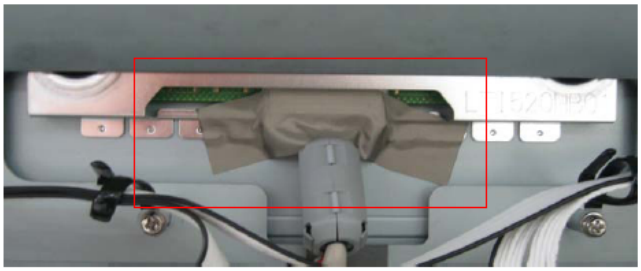
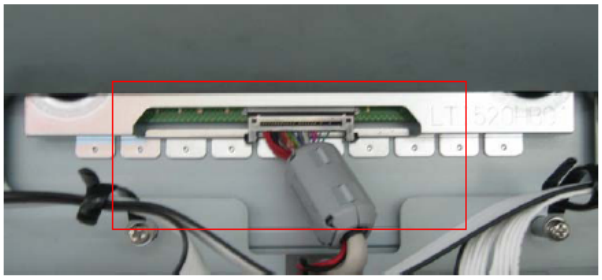
LIST OF TEST EQUIPMENT

No.	Instrument	Manufacturer	Model	Serial No.	Calibration Date	Calibration Interval
1	*Test Receiver	R & S	ESCS 30	833364/020	Apr. 01 2008	1year
2	*Test Receiver	R & S	ESCS 30	100302	Dec. 03 2007	1year
3	*Amplifier	HP	8447F	2805A03427	Jul. 21 2008	1year
4	Amplifier	HP	8447F	2805A03351	Oct. 23 2008	1year
5	*Amplifier	HP	8447F	2805A03406	Apr. 17 2008	1year
6	*Pre Amplifier	HP	8449B	3008A00107	Feb. 27 2008	1year
7	Spectrum Analyzer	Advantest	R3265A	45060401	Dec. 04 2007	1year
8	*Spectrum Analyzer	R & S	FSP40	100361	Sep. 04,2008	1year
9	*Spectrum Analyzer	Agilent	E4440A	MY44022567	Dec. 04, 2007	1year
10	Spectrum Analyzer	HP	8566B	2607A03469	Feb. 27 2008	1year
11	Loop Antenna	EMCO	EMCO/6502	8911-2436	Dec. 13 2007	1year
12	Biconical Log Antenna	ARA	LPB-2520/A	1180	Apr. 21 2008	1year
13	*Biconical Log Antenna	ARA	LPB-2520/A	1209	Dec. 31 2007	1year
14	*Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-257	Apr. 21 2008	1year
15	*Double Ridged Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-474	June. 13 2008	1year
16	Signal Generater	R & S	SMP02	833286/003	Jul. 21 2008	1year
17	*LISN	R & S	ESH2-Z5	100227	Sep. 02 2008	1year
18	*LISN	Kyoritsu	KNW-407	8-1034-10	Feb. 27 2008	1year
19	*Position Controller	DAEIL EMC	N/A	N/A	N/A	N/A
20	*Turn Table	DAEIL EMC	N/A	N/A	N/A	N/A
21	*Antenna Mast	DAEIL EMC	N/A	N/A	N/A	N/A
22	*Anechoic Chamber	EM Eng.	N/A	N/A	N/A	N/A
23	*Shielded Room	EM Eng.	N/A	N/A	N/A	N/A
24	*Position Controller	Seo-Young EMC	N/A	N/A	N/A	N/A
25	*Turn Table	Seo-Young EMC	N/A	N/A	N/A	N/A
26	*Antenna Mast	Seo-Young EMC	N/A	N/A	N/A	N/A
27	*Anechoic Chamber	Seo-Young EMC	N/A	N/A	N/A	N/A
28	*Shielded Room	Seo-Young EMC	N/A	N/A	N/A	N/A

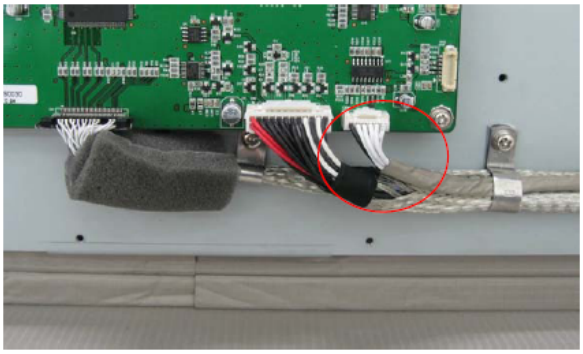
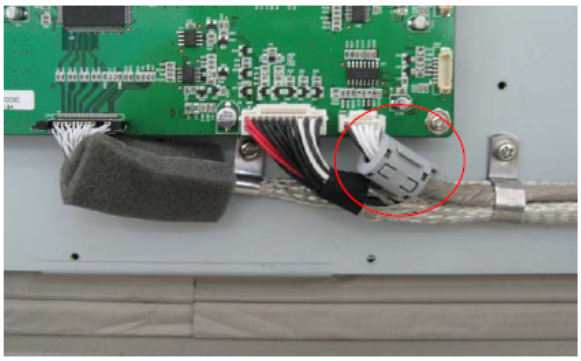
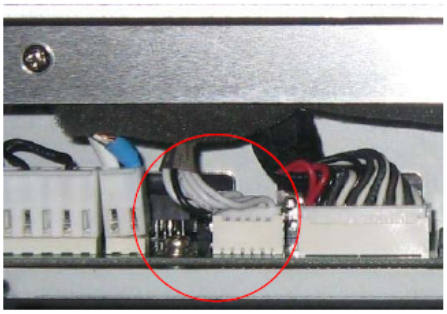
) Test equipment used during the test

APPENDIX D – MODIFICATION LIST

1. On the LVDS cable

Before	After
	
1) EMI tape removed on the LVDS Cable	

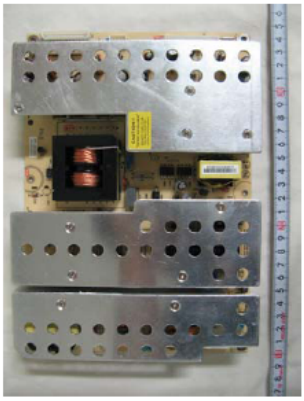
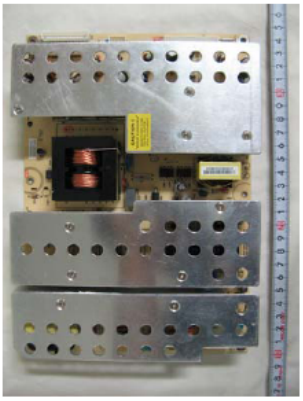
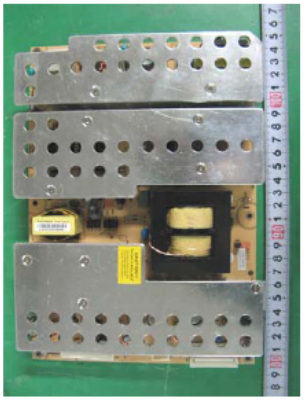
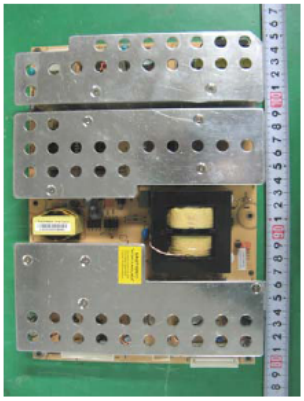
2. On the RS232C cable

Before	After
	
	
1) Two ferrite core(ZCAT1518-0730A, TDK) installed on the RS232C cable.	

3. In the IO box

Before	After
	
1) Fence installed between AC switch and IO board to prevent interference of high frequency.	

4. Add the SMPS Boards

Before		After	
			
(Left)	(Right)	(Left)	(Right)

APPENDIX E – BLOCK DIAGRAM

APPENDIX F – USER'S MANUAL

APPENDIX G – SCHEMATIC DIAGRAM