EMC TEST REPORT

Project No. : LBE031150

Product : PDP Monitor

Model No. : NT50H3

Date of test : May. 23, 2003 ~ May. 30, 2003

Issued Date : June. 05, 2003

Tested by:
Kyung Chul,MIN / Test Engineer

Reviewed by:
No Cheon, PARK / Manager of EMC Lab.

Authorized by:
Kyu Baek, CHUNG / Chief of EMC Lab.

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Table of Contents

1. Introduction & Summary

1.1 Description of the EUT

Applicant	SAMSUNG ELECTRONICS Co., Ltd.
Project Number	LBE031150
Equipment Under Test	PDP Monitor
Trade Name	SAMSUNG
Model Number	NT50H3
Variant Model	-
FCC ID Number	A3LPPM50H3

1.2 Test facility

The EMI/EMS measurement facilities used to collect the tested data are located at 416 Maetan 3 Dong, Paldal-Ku, Suwon City, Kyungki Do, Korea.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1 & 16-2.
SAMSUNG Electronics Co.,Ltd is accredited by Korea Laboratory Accreditation Scheme(KOLAS) which signed the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(s).

Measured in Semi-anechoic chamber #1 that is FCC Registration Number 98856.

1.3 Test equipment

Equipment	Model No.	Serial No.	Makers	Last calibration and Interval
Spectrum analyzer	8566B	3340A21744	H.P	03/04/18, 12Months
	Firmware versions : Rev.29.9.86			
Quasi-peak adapter	85650A	2521A00687	H.P	02/10/09, 12Months
RF Preselector	85685A	2602A00224	H.P	02/10/09, 12Months
Field strength meter	ESCS30	839809/022	R & S	02/06/27, 12Months
	Firmware versions : Main 1.08, OTP 02.01, GRA 02.03			
Field strength meter	ESVP	880726/042	R & S	02/09/10, 12Months
L.I.S.N	ESH3-Z5	847265/028	R & S	02/10/09, 12Months
Bi-Log Antenna	CBL6112B	2767	SCHAFFNER	N/A

2. Test Set-up

2.1 Test mode

The EUT was tested in the following operating modes for the tests mention in this report:

Description of Testing operating mode & Tested Resolution

Operating Mode	Resolutions	Refresh rates	Colors
'H" Pattern display	1024x768	Horizontal F.: 60kHz	32bits
		Vertical F. : 75Hz	

Measured each about 2 input(PC VIDEO INPUT mode & Digital Video Interface)of EUT.
Further details of cabling and configuration are shown in the test system configuration.
The EUT exercise program used during radiated and conducted testing was designed
to exercise the various system components in a manner similar to typical use.

2.2 Justification

The system was configured for testing in typical fashion use. Cable were attached to each of the available I/O Ports.
The mode of operation utilized for testing was selected to best simulate typical EUT use.

2.3 Test equipment setup

The explanation of measuring equipment setup when respective function is used in any frequency band is as following:

Frequency Band [MHz]	Equipment	Detector function	Resolution Bandwidth	Video Bandwidth
0.15 to 30	EMI Test receiver	Quasi-Peak	9kHz	-
30 to 1000	Spectrum analyzer	Peak	100kHz	1MHz
	EMI Test receiver	Quasi-Peak	120kHz	-
Above 1000	EMI Test receiver	Peak	1MHz	1MHz

2.4 Tested System Details

1) Configuration of EUT and peripherals

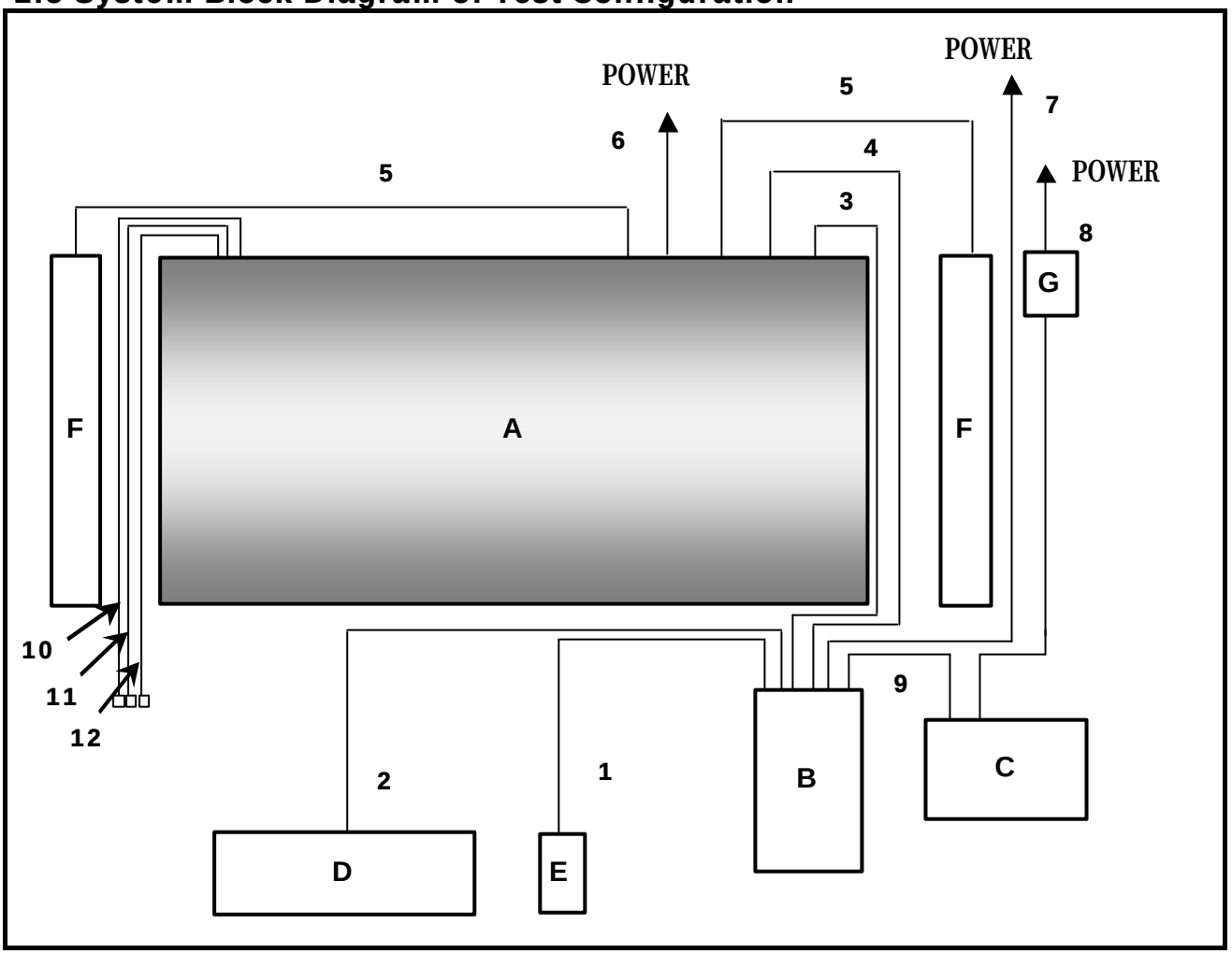
Mark	Item	Model No.	Serial No.	Manufacturer	FCC ID
A	PDP Monitor	NT50H3	-	Samsung	
B	Personal Computer	M6050	812092FRC00338	Samsung	
C	Printer	K10158	CLG001000275	CANON	
D	PS/2 Keyboard	7800	K08100020	Gateway	
E	PS/2 Mouse	SBM-602	9CAE002649	Samsung	
F	Speaker	-	-	Samsung	
G	AC Adapter	K30088	CLG001000275	CANON	For printer

* DOC : FCC Declaration of Conformity

2) Used Cable Description

No.	Item	Length[m]	Shielded(Y/N)	Remark
1	PS/2 Mouse Cable	1.8	N	
2	PS/2 Keyboard Cable	1.6	N	
3	Video Cable(Analog)	1.5	Y	
4	Video Cable(Digital)	1.5	Y	
5	Speaker Cable	1.2	N	
6	AC Power Cable(Monitor)	1.8	N	
7	AC Power Cable(PC)	1.8	N	
8	AC Power Cable(Printer)	1.8	N	
9	Printer Cable	1.5	Y	
10	A/V In Cable	1.2	N	
11	S-Video In Cable	1.2	N	
12	BNC Cable	1.2	N	

2.5 System Block Diagram of Test Configuration



2.6 Test rule and Procedure

FCC Rule Part 15, Subpart B : Unintentional Radiators
Test Procedure : ANSI C63.4-1992

2.7 Test Summary

Test item	Test Procedure	Result
AC POWERLINE CONDUCTED EMISSION	ANSI C63.4-1992	Pass
RADIATED EMISSION	ANSI C63.4-1992	Pass

* N/A : Test not applicable

3. Test Results

3.1 AC POWERLINE CONDUCTED EMISSION MEASUREMENT

3.1.1 Test Procedure

Configurate the EUT System in accordance with ANSI C63.4-1992 section 7 and 12.2.
Connect the EUT's AC line cord to the EUT port of LISN.
All input terminals are terminated in the proper impedance.
The output ports are connected to the cable provided with the device and the ending port are terminated in the proper impedance.

Using a calibrated coaxial cable, the TEST RECEIVER is connected to the measuring port of the LISN for EUT. To the find out an EUT condition procedures the maximum emission, the position of cables, EUT operations mode are the position of cables, EUT operations mode are checked under normal usage of EUT.
Then, the emission are scanned from 0.15MHz to 30MHz relative to the limit are recorded.

3.1.2 Test Results

EUT Mode : Analog mode

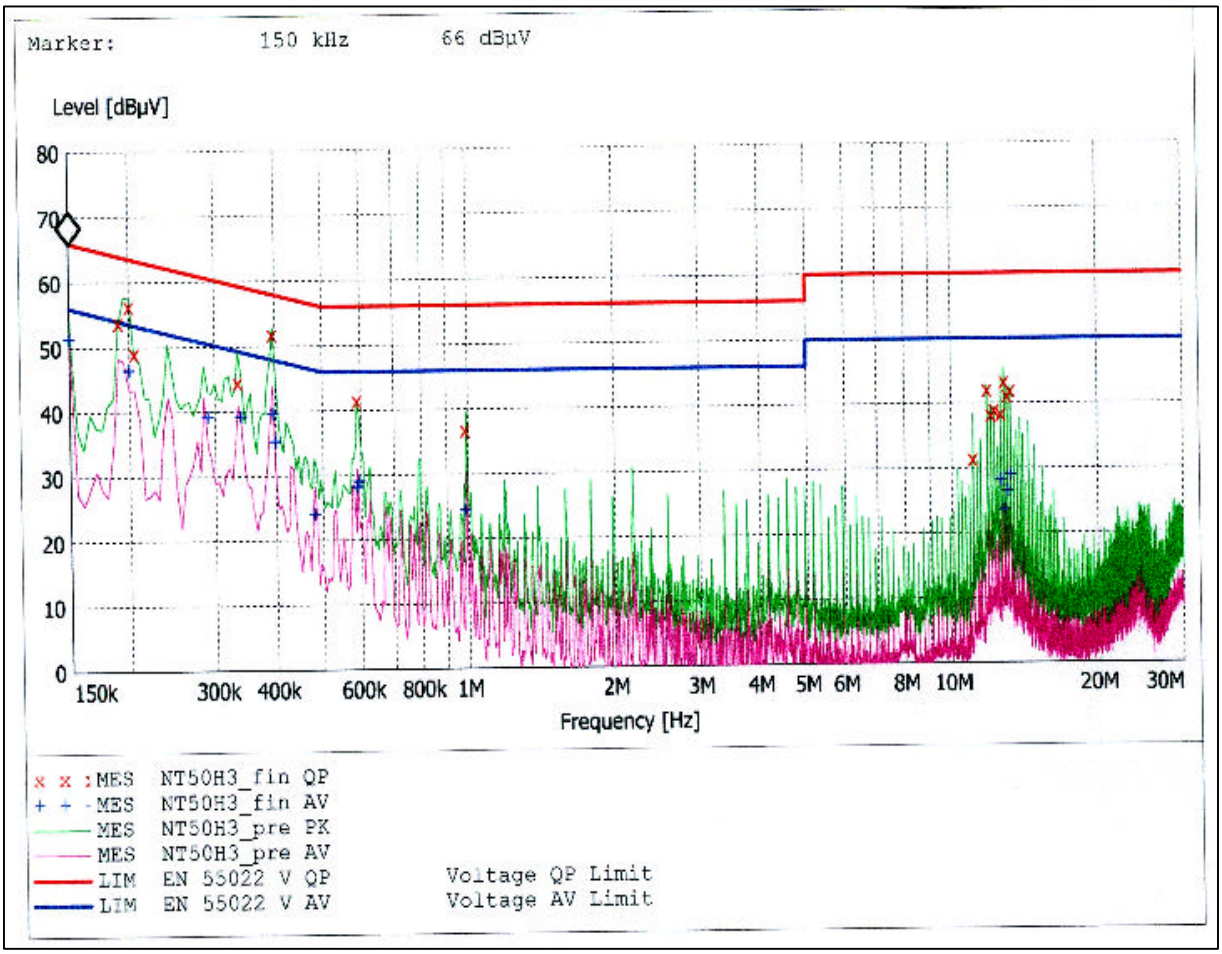
Frequency	LISN Pol.	Meter reading (a)		Total Loss	Results (a) + (b)		Limit		Margin (Limits-Result)	
		QP	AV	(b)	QP	AV	QP	AV	QP	AV
[MHz]	[L,N]	[dBuV]		[dB]	[dBuV]		[dBuV]		[dB]	
0.190	L	54.0	-	0.2	54.2	-	**64.0**	**54.0**	9.8	-
0.200	N	56.5	46.7	0.2	56.7	46.9	**63.6**	**53.6**	6.9	6.7
0.205	N	49.3	-	0.2	49.5	-	**63.4**	**53.4**	13.9	-
0.335	L	44.7	39.5	0.1	44.8	39.6	**59.3**	**49.3**	14.5	9.7
0.395	L	52.0	39.9	0.1	52.1	40.0	**58.0**	**48.0**	5.9	8.0
0.590	L	41.7	28.5	0.2	41.9	28.7	**56.0**	**46.0**	14.1	17.3
0.985	L	37.0	24.7	0.1	37.1	24.8	**56.0**	**46.0**	18.9	21.2
11.860	L	42.3	-	0.6	42.9	-	**60.0**	**50.0**	17.1	-
12.655	L	38.5	28.5	0.8	39.3	29.3	**60.0**	**50.0**	20.7	20.7
12.850	N	43.5	23.9	0.6	44.1	24.5	**60.0**	**50.0**	15.9	25.5
13.045	L	41.4	26.8	0.9	42.3	27.7	**60.0**	**50.0**	17.7	22.3
13.245	L	42.1	29.3	0.9	43.0	30.2	**60.0**	**50.0**	17.0	19.8

*** FCC Part 15, Subpart B, section 15.107**

"If the level of the emission measured using the quasi-peak instrumentation is 6 dB, or more, higher than the level of the same emission measured with instrumentation having an average detector and a 9kHz minimum bandwidth, that emission is considered broadband and the level obtained with the quasi-peak detector may be reduced by 13dB for comparison to the limits."

EUT Mode : Analog mode

Graph (LISN Mode : Live & Neutral)



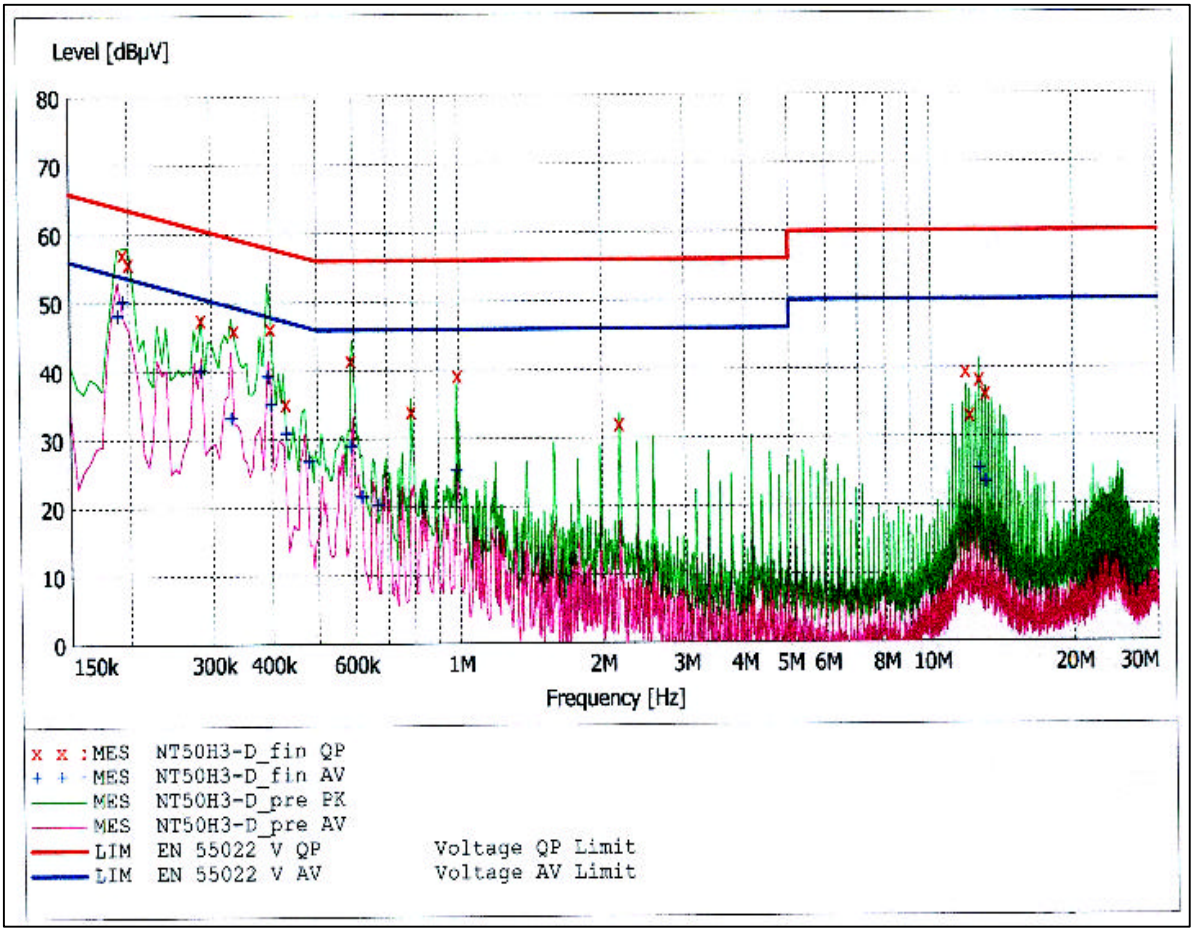
EUT Mode : DVI mode

Frequency	LISN Pol.	Meter reading (a)		Total Loss	Results (a) + (b)		Limit		Margin (Limits-Result)	
		QP	AV	(b)	QP	AV	QP	AV	QP	AV
[MHz]	[L,N]	[dBuV]		[dB]	[dBuV]		[dBuV]		[dB]	
0.195	N	57.3	50.5	0.2	57.5	50.7	**63.8**	**53.8**	6.3	3.1
0.200	L	55.9	-	0.2	56.1	-	**63.6**	**53.6**	7.5	-
0.285	L	47.7	40.4	0.1	47.8	40.5	**60.7**	**50.7**	12.9	10.2
0.335	L	46.2	33.4	0.1	46.3	33.5	**59.3**	**49.3**	13.0	15.8
0.400	L	46.4	35.4	0.1	46.5	35.5	**57.9**	**47.9**	11.4	12.4
0.430	L	35.4	31.2	0.1	35.5	31.3	**57.3**	**47.3**	21.8	16.0
0.590	L	41.7	29.2	0.2	41.9	29.4	**56.0**	**46.0**	14.1	16.6
0.790	L	34.2	-	0.2	34.4	-	**56.0**	**46.0**	21.6	-
0.990	L	39.4	-	0.1	39.5	-	**56.0**	**46.0**	16.5	-
2.175	N	32.2	-	0.2	32.4	-	**56.0**	**46.0**	23.6	-
11.860	N	39.7	-	0.5	40.2	-	**60.0**	**50.0**	19.8	-
12.055	L	33.3	-	0.6	33.9	-	**60.0**	**50.0**	26.1	-
12.650	L	38.5	25.5	0.8	39.3	26.3	**60.0**	**50.0**	20.7	23.7
13.045	L	36.4	23.6	0.9	37.3	24.5	**60.0**	**50.0**	22.7	25.5

*** FCC Part 15, Subpart B, section 15.107**

"If the level of the emission measured using the quasi-peak instrumentation is 6 dB, or more, higher than the level of the same emission measured with instrumentation having an average detector and a 9kHz minimum bandwidth, that emission is considered broadband and the level obtained with the quasi-peak detector may be reduced by 13dB for comparison to the limits."

EUT Mode : DVI mode
Graph (LISN Mode : Live & Neutral)



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 Test Procedure

Configurate the EUT System in accordance with ANSI C63.4-1992section 8 and 12.2.
Power cords for the EUT System are connected the receptacle on the ground plane.
The output ports are connected to the cable provided with the device and the ending port of the cable are terminated in the proper impedance.
To find out the maximum emission, change the position of the cable, and the EUT operation mode under normal usage of the EUT.
The spectrum analyzer are scanned from 30MHz to 1,000MHz.
And, detecting waves mode is peak mode, Graph's result in worst arrangement state of EUT. Spectrum analyzer result did horizontal and vertical polarization maxhold.

3.2.2 Radiated Emission Test Data

EUT Mode : Analog mode

Frequency Range [MHz]	Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Total Loss [B] [dB]	Antenna Height [Cm]	Turn table Degree [Deg]	Results [A+B] [dBuV/m]	Limits at 10m [dBuV/m]	Margin (Limit-Result) [dB]
30 - 230	30.000	V	5.7	18.2	100	260	23.9	**30.0**	6.1
	132.890	V	11.0	12.4	100	360	23.4		6.6
	167.200	H	14.2	10.8	20	360	25.0		5.0
	199.361	V	11.2	10.8	100	360	22.0		8.0
	200.600	H	14.5	10.9	10	360	25.4		4.6
230 - 1000	232.600	H	16.0	12.7	100	0	28.7	**37.0**	8.3
	233.110	V	14.4	12.8	100	360	27.2		9.8

** Receiving Antenna Mode : **Horizontal, Vertical***

** Test distance : 10m (Semi-Anechoic Chamber)*

** Results = Meter Reading + Total Loss(Antenna factor + Cable loss)*

EUT Mode : DVI mode

Frequency Range [MHz]	Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Total Loss [B] [dB]	Antenna Height [Cm]	Turn table Degree [Deg]	Results [A+B] [dBuV/m]	Limits at 10m [dBuV/m]	Margin (Limit-Result) [dB]
30 - 230	30.000	V	5.3	18.2	100	272	23.5	**30.0**	6.5
	132.890	V	11.6	12.4	100	331	24.0		6.0
	167.200	H	14.1	10.8	230	360	24.9		5.1
	199.361	V	11.8	10.8	100	0	22.6		7.4
	200.600	H	14.4	10.9	114	123	25.3		4.7
230 - 1000	232.600	H	16.1	12.7	100	360	28.8	**37.0**	8.2
	233.110	V	14.7	12.8	100	360	27.5		9.5

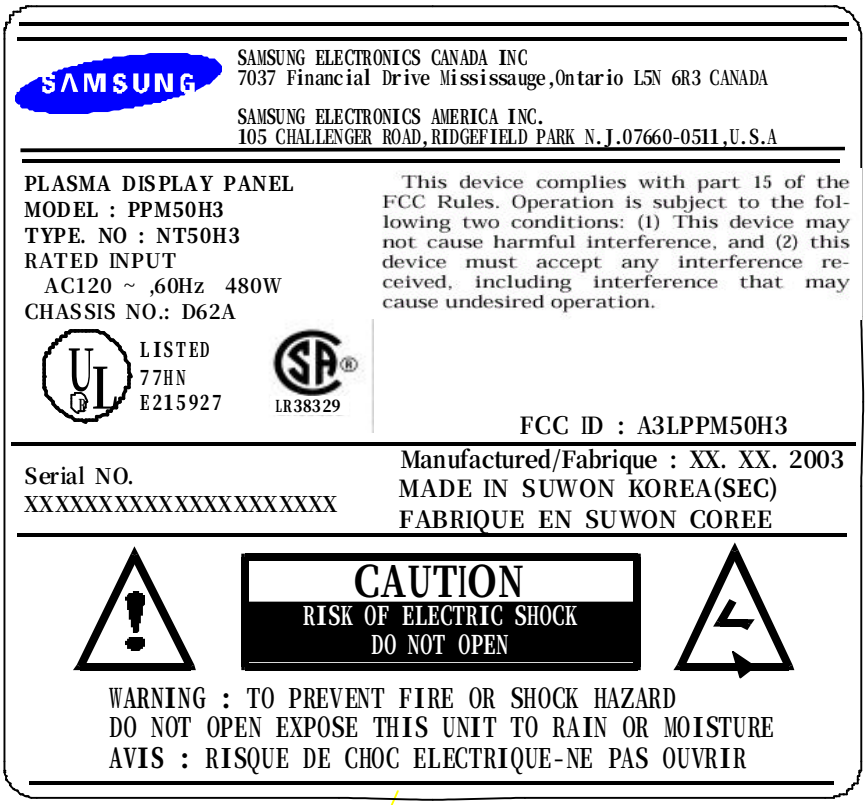
** Receiving Antenna Mode : **Horizontal, Vertical***

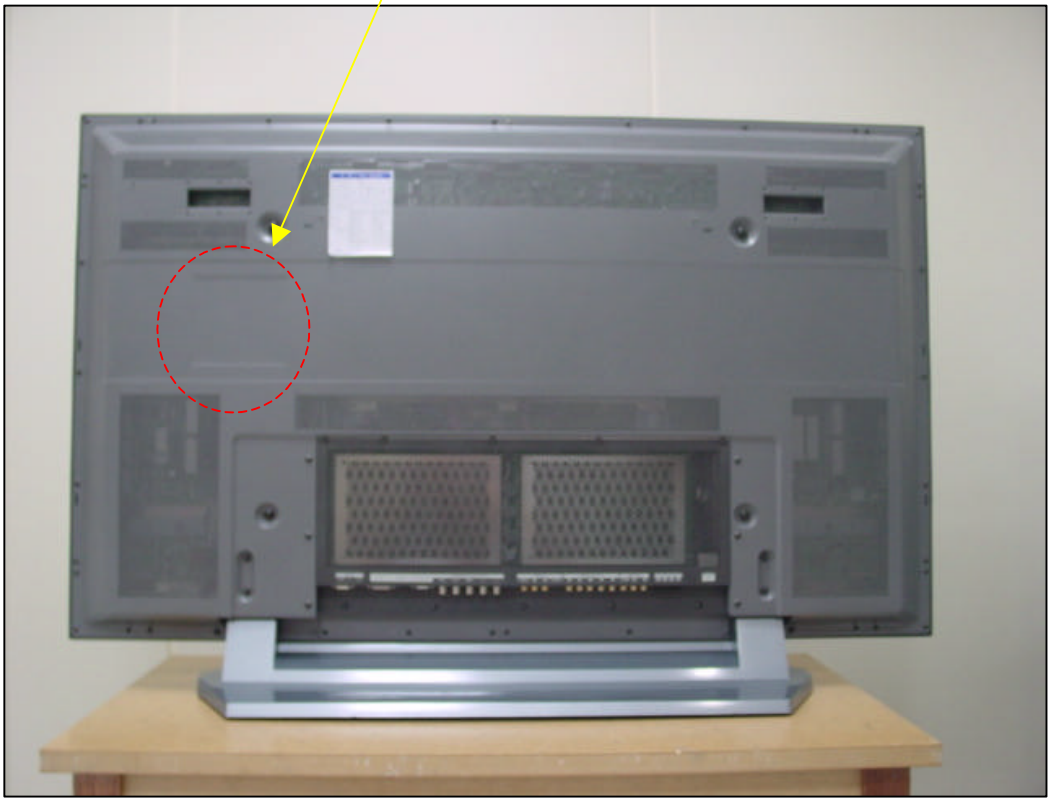
** Test distance : 10m (Semi-Anechoic Chamber)*

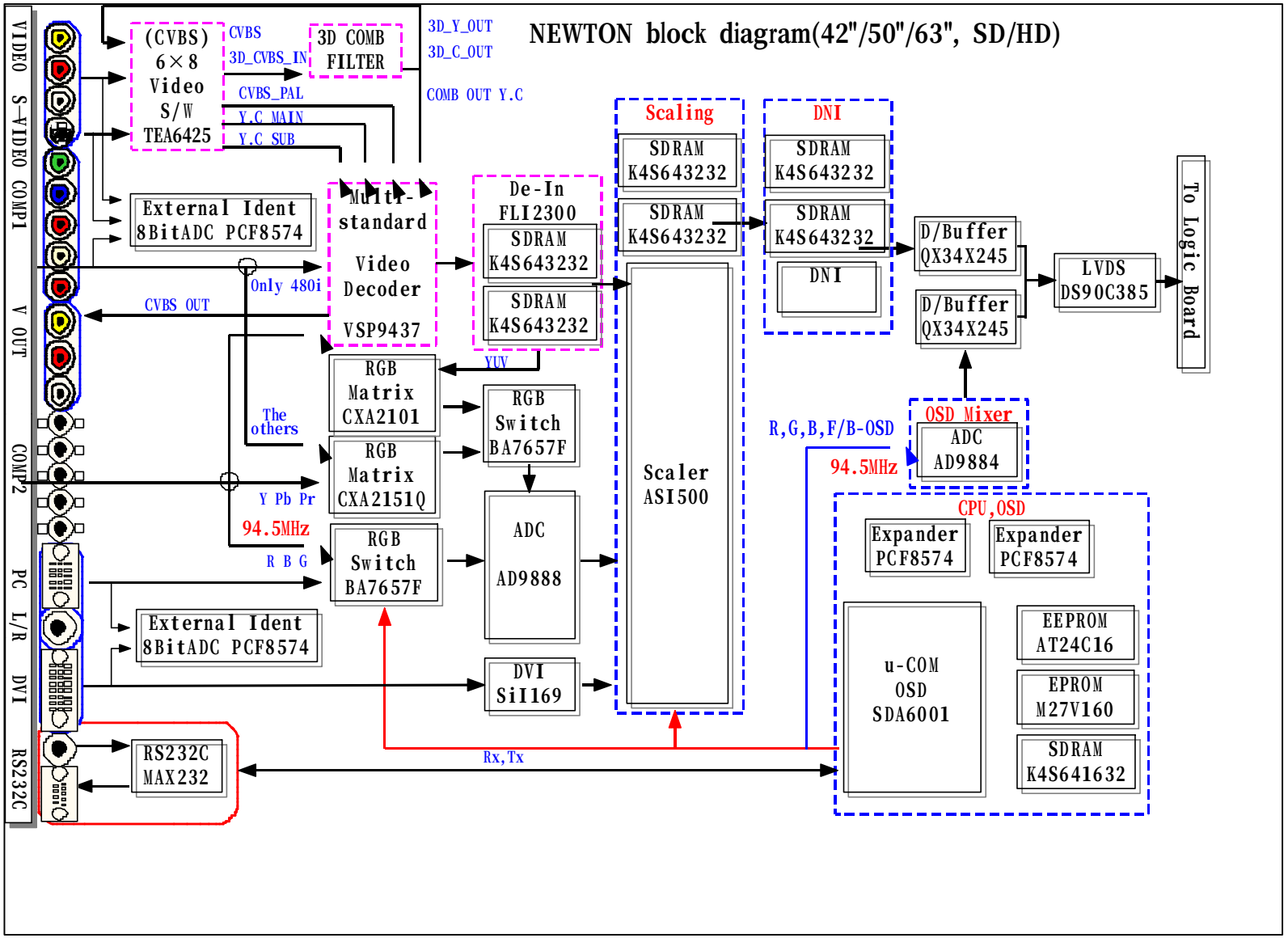
** Results = Meter Reading + Total Loss(Antenna factor + Cable loss)*

EUT Photographs

[Label and Label position]






NEWTON block diagram(42"/50"/63", SD/HD)
VIDEO
S-VIDEO
COMP1
V OUT
COMP2
PC L/R
DVI
RS232C
(CVBS)
6×8
Video
S/W
TEA6425
CVBS
3D_CVBS_IN
3D COMB
FILTER
3D_Y_OUT
3D_C_OUT
COMB OUT Y.C
CVBS_PAL
Y.C MAIN
Y.C SUB
External Ident
8BitADC PCF8574
Multi-
standard
Video
Decoder
VSP9437
Only 480i
CVBS OUT
De-In
FLI2300
SDRAM
K4S643232
SDRAM
K4S643232
YUV
RGB
Matrix
CXA2101
RGB
Switch
BA7657F
The
others
RGB
Matrix
CXA2151Q
Y Pb Pr
94.5MHz
R B G
RGB
Switch
BA7657F
ADC
AD9888
External Ident
8BitADC PCF8574
DVI
Sil169
RS232C
MAX232
Rx,Tx
Scaling
SDRAM
K4S643232
SDRAM
K4S643232
Scaler
ASI500
DNI
SDRAM
K4S643232
SDRAM
K4S643232
DNI
D/Buffer
QX34X245
D/Buffer
QX34X245
LVDS
DS90C385
To Logic Board
R,G,B,F/B-OSD
94.5MHz
OSD Mixer
ADC
AD9884
CPU,OSD
Expander
PCF8574
Expander
PCF8574
u-COM
OSD
SDA6001
EEPROM
AT24C16
EPROM
M27V160
SDRAM
K4S641632

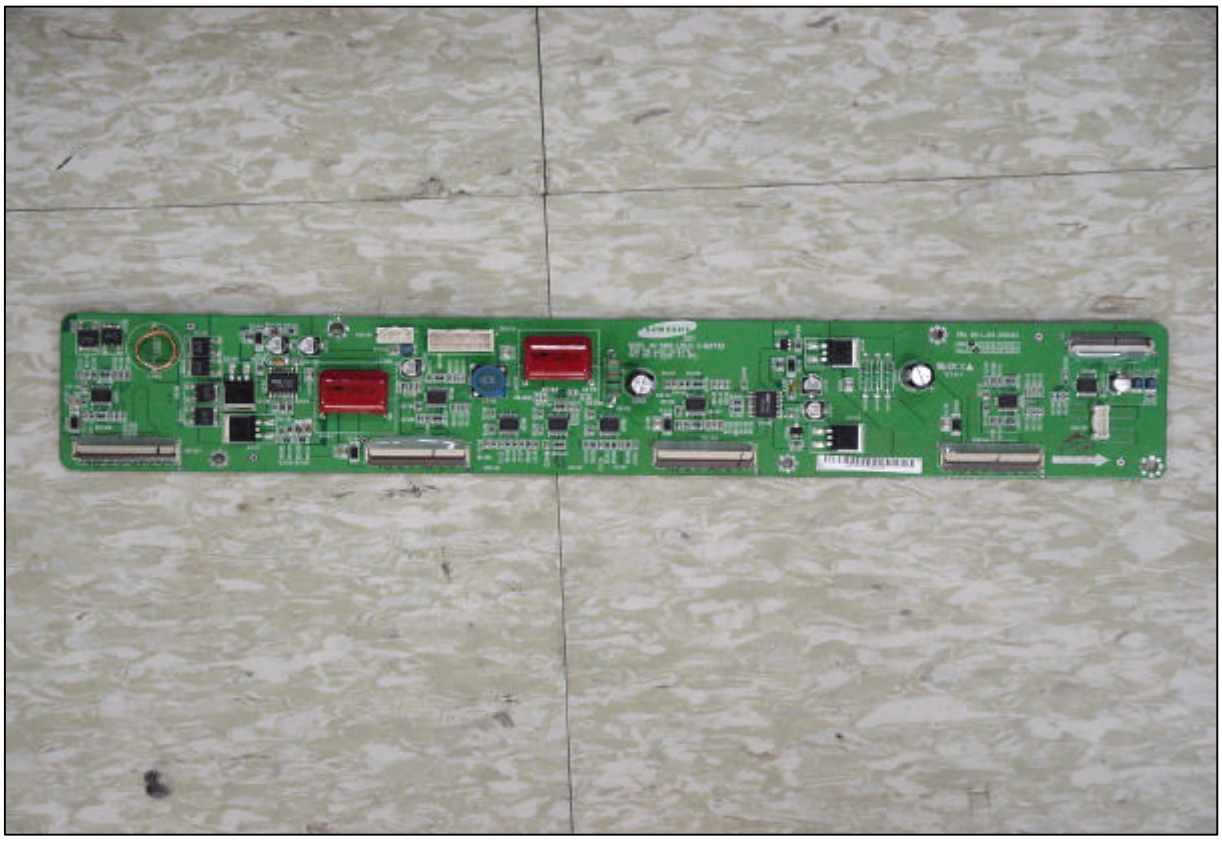
Test Set up Photographs

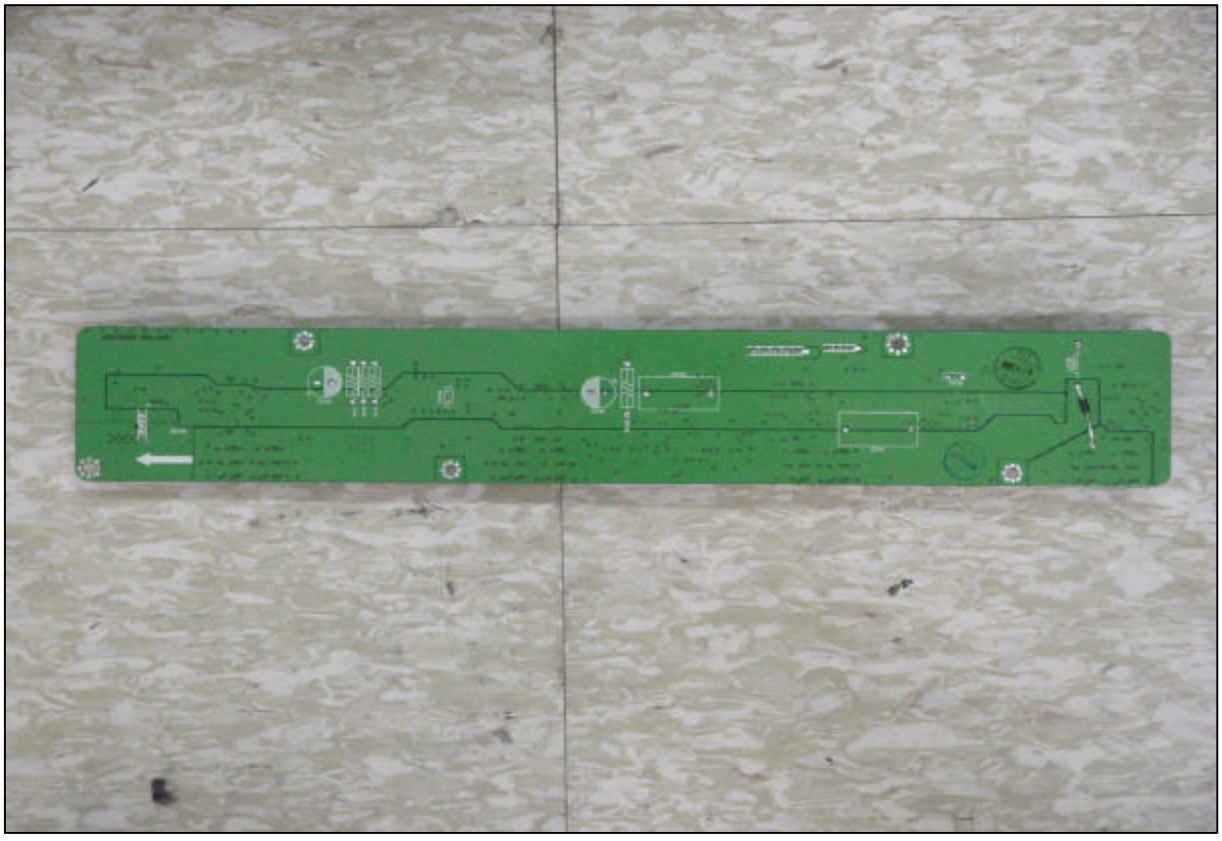
[AC POWERLINE CONDUCTED EMISSION MEASUREMENT]

[RADIATED EMISSION MEASUREMENT]

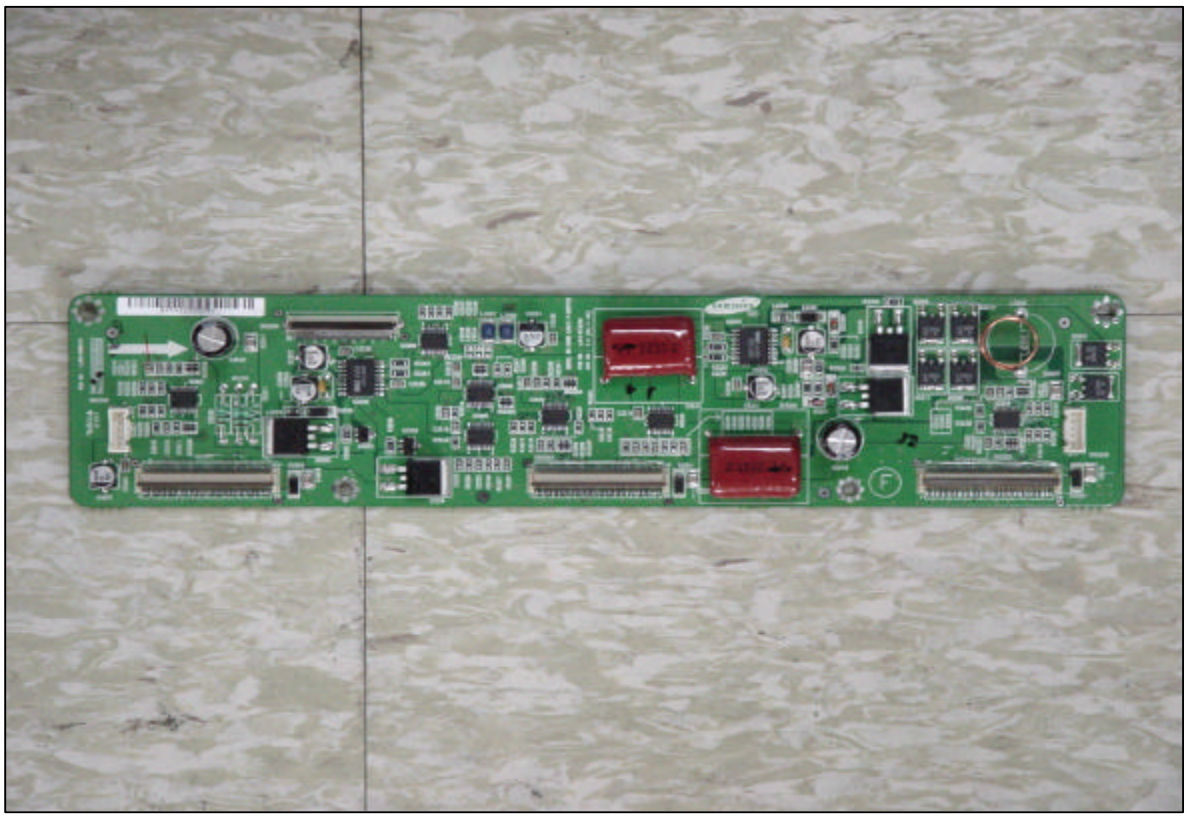
EUT Photographs

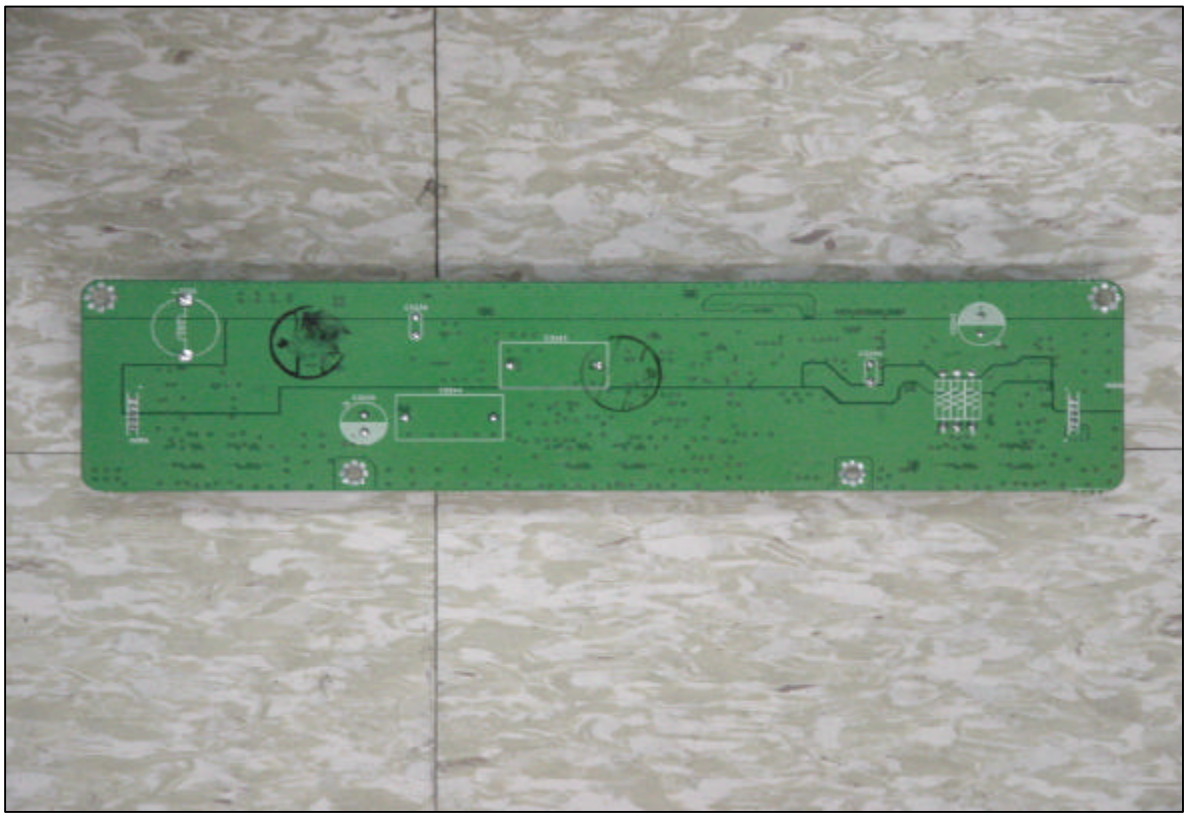
EUT Photographs





EUT Photographs





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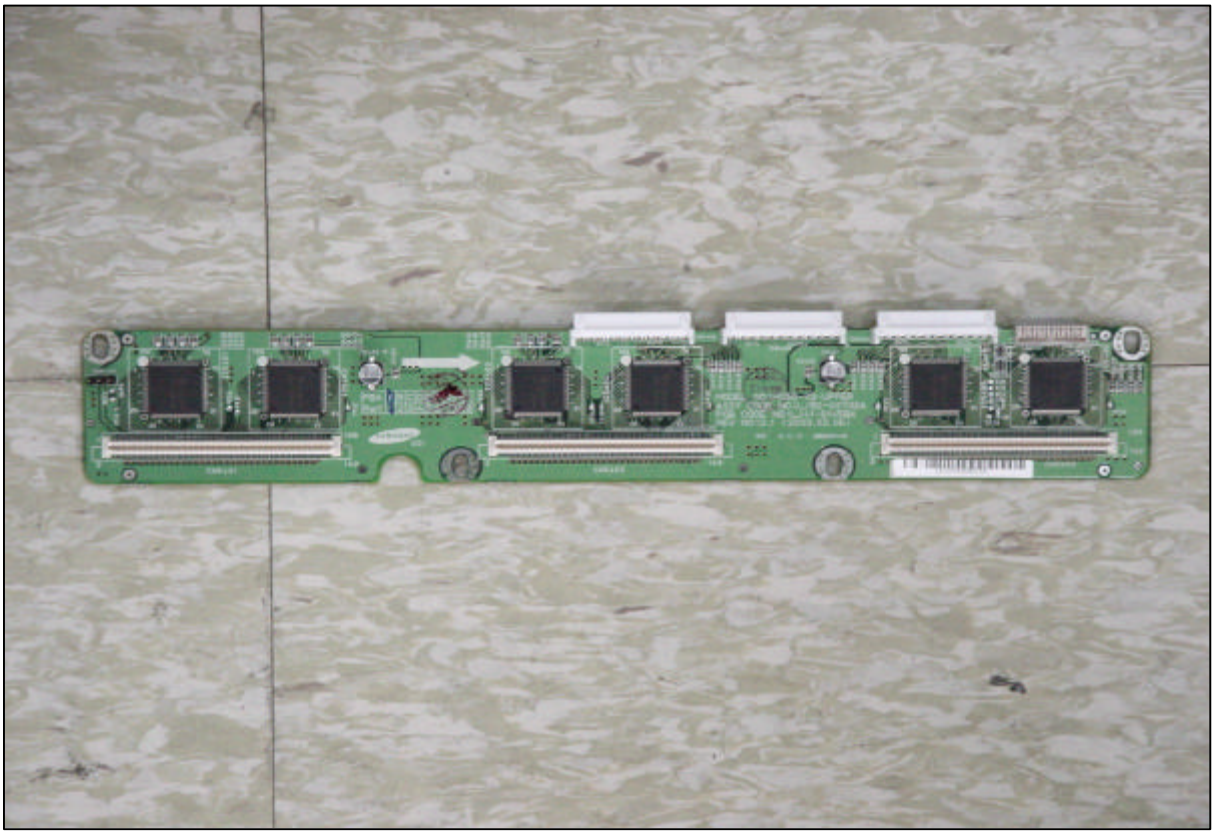

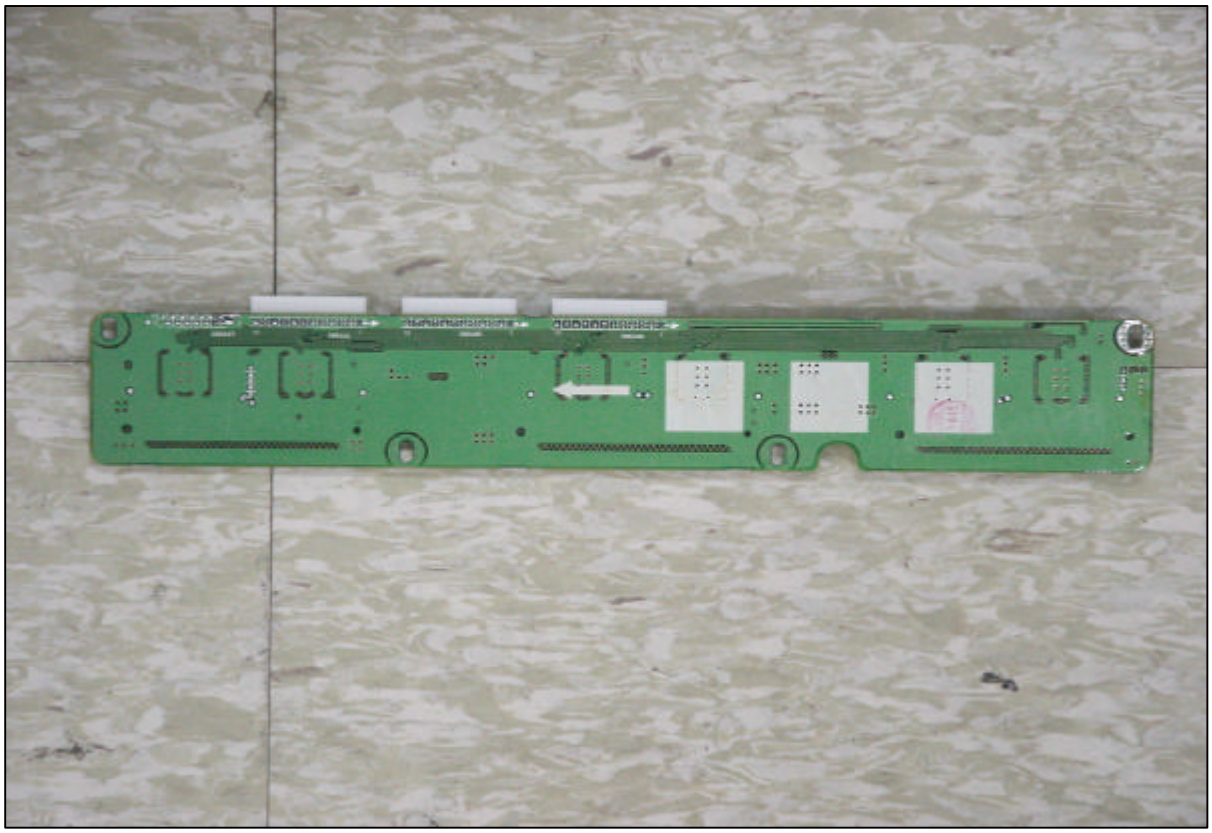

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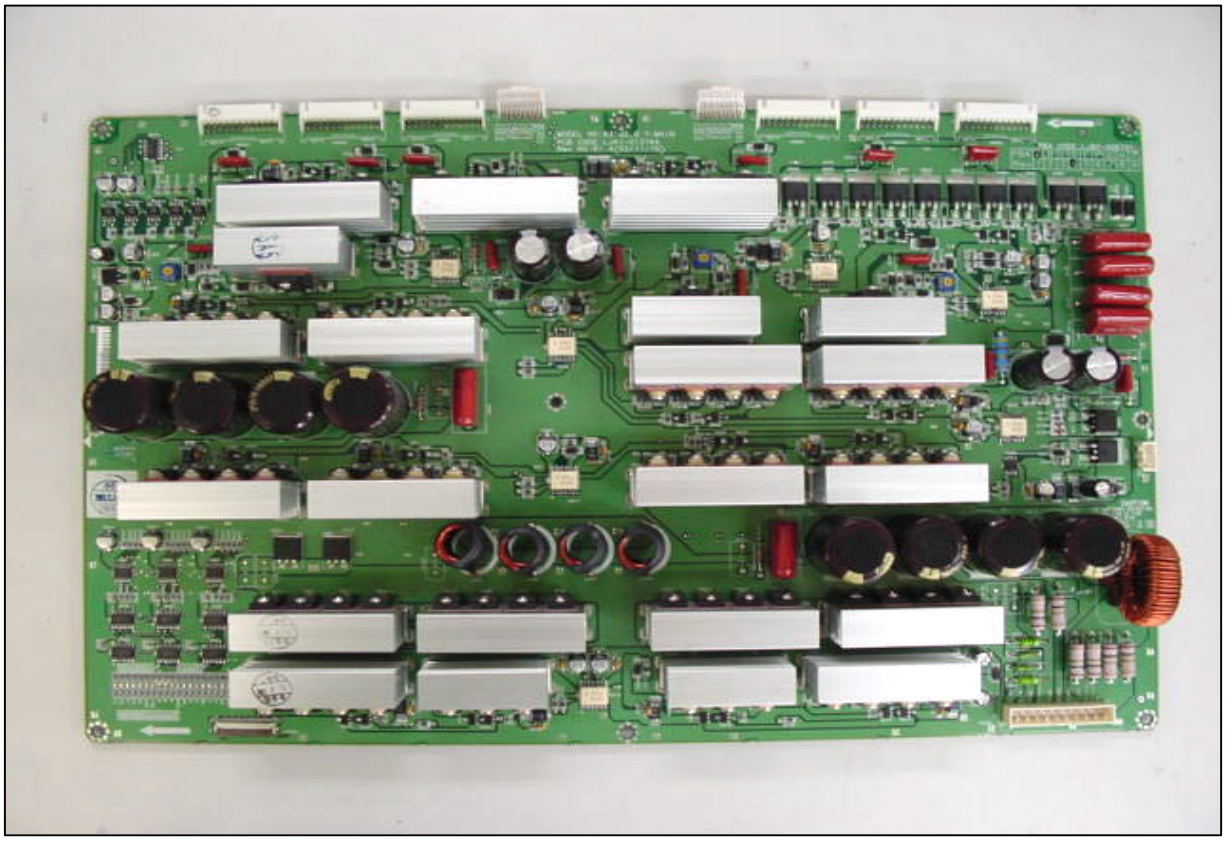

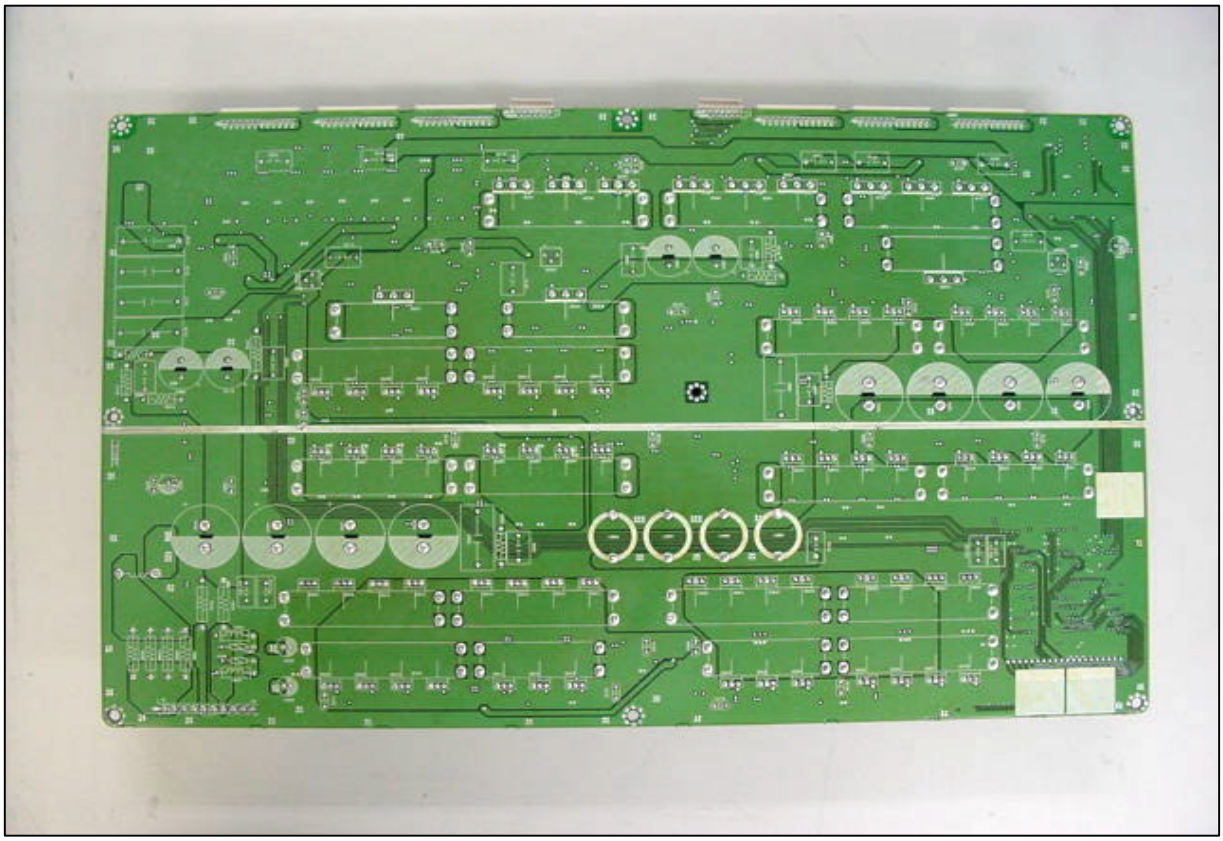

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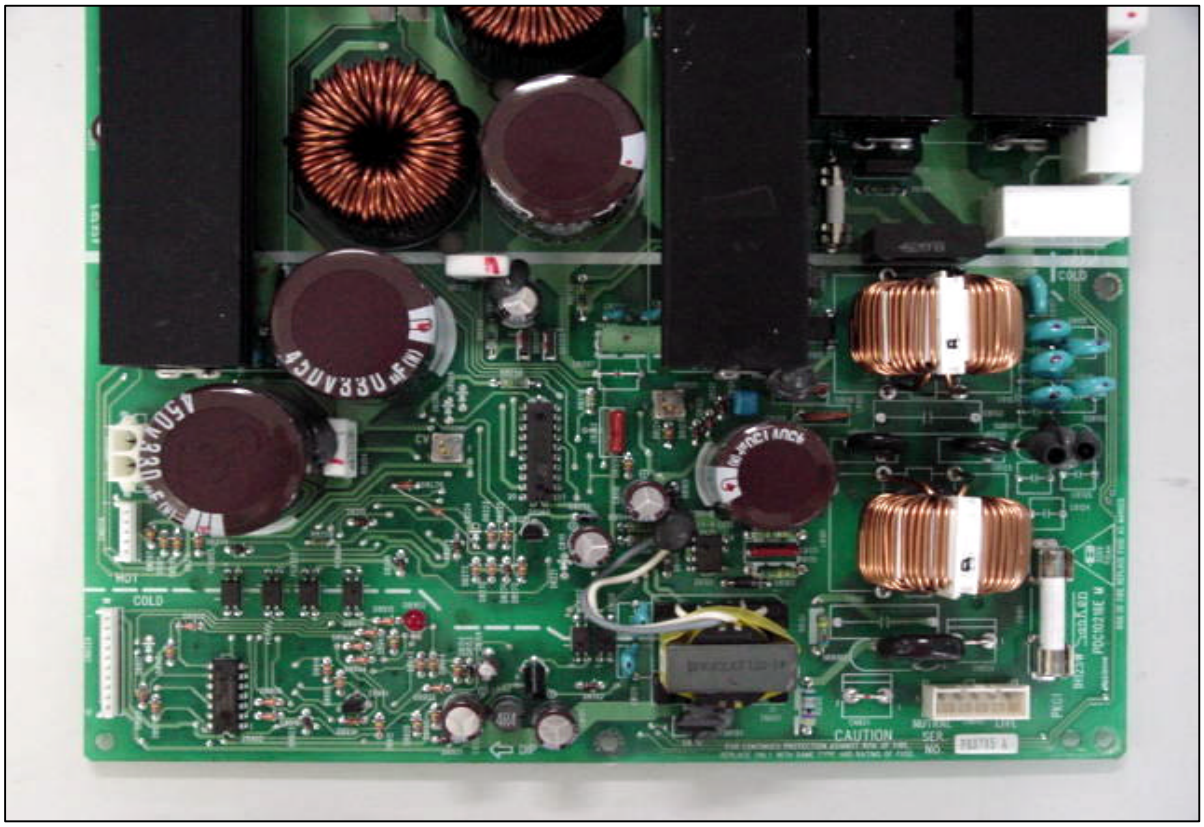

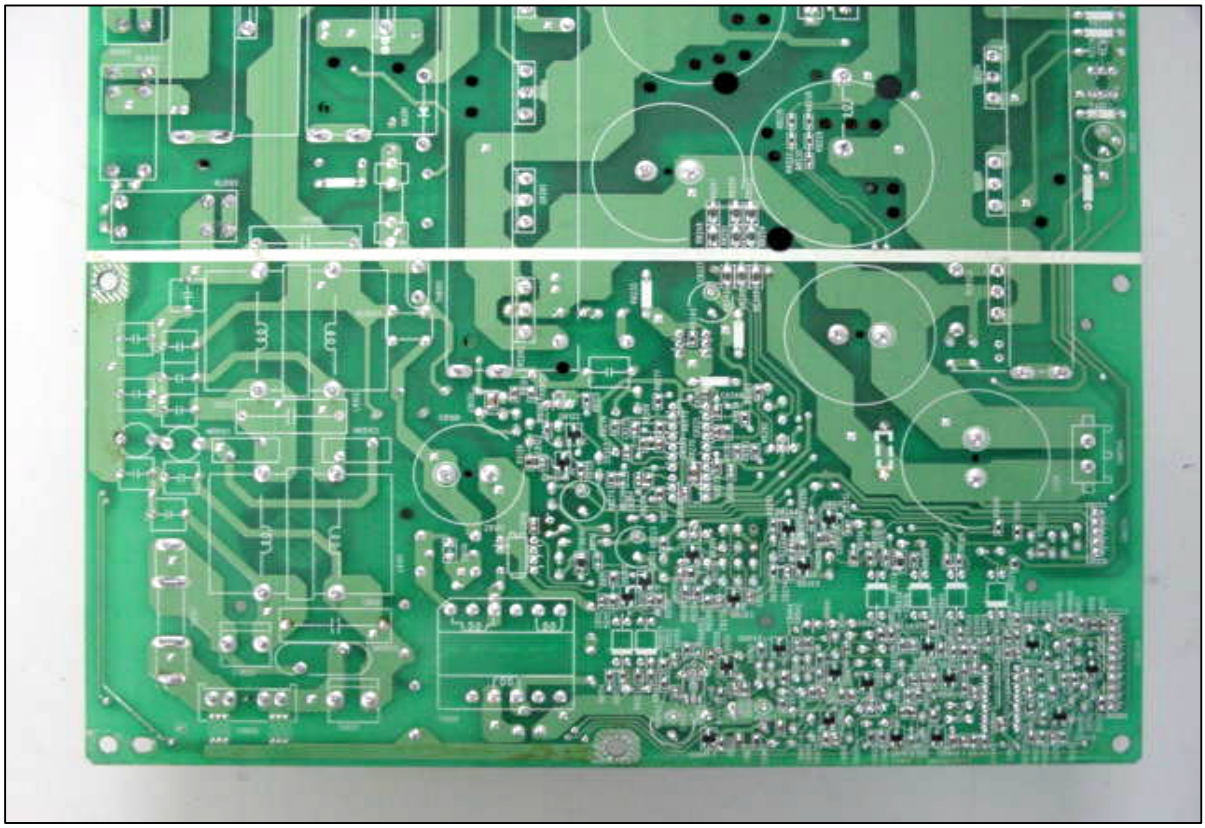

EUT Photographs