EMC TEST REPORT

Project No. :LBE030457

Product : COLOR MONITOR

Model No. : CK40PS

Date of test : March 5 ~ 11, 2003

Issued Date : March 13, 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.

SAMSUNG ELECTRONICS Co., Ltd.
EMC Test Laboratory
416 Maetan-3 Dong, Paldal-Ku, Suwon City, Kyungki-Do, Korea,442-742
Tel. : 81-31-200-2185 Fax. : 81-31-200-2189

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1. Introduction & Summary

1.1 Description of the EUT

Applicant	SAMSUNG ELECTRONICS Co., Ltd.
Project Number	LBE030457
Equipment Under Test	LCD Monitor
Trade Name	SAMSUNG
Model Number	CK40PS
Variant Model	-
Operating Frequency	60Hz
FCC ID Number	A3LCK40PS
Mains input	120V

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.

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1.3 Test equipment

Equipment	Model No.	Serial No.	Makers	Last calibration and Interval
Spectrum analyzer	8566B	3340A21744	H.P	02/04/18, 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	02/06/18, 12Months
	Firmware versions : Main 1.08, OTP 02.01, GRA 02.03			
Field strength meter	ESVP	860688/015	R & S	02/02/28, 12Months
L.I.S.N	3825-2	9208-1981	EMCO	02/03/23, 12Months
Bi-Log Antenna	CBL6112B	2767	SCHAFFNER	02/ 04/25, 12Months

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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	1280x768	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
0.45 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

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2.4 Tested System Details

1) Configuration of EUT and peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	FCC ID
A	LCD Monitor	CK40PS	-	Samsung	-
B	Personal Computer	M6050	812092FRC01962	Samsung	
C	Printer	LQ-580H	CG2Y016889	EPSON	
D	PS/2 Keyboard	Aopen	528982	Aopen	
E	USB Mouse	M-U48a	LZA95206393	Samsung	

* DOC : FCC Declaration of Conformity

2) Used Cable Description

No.	Item	Length[m]	Shielded(Y/N)	Remark
1	USB 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	AC Power Cable(Monitor)	1.2	N	
6	AC Power Cable(PC)	1.8	N	
7	Printer Cable	1.6	Y	
8	AC Power Cable(Printer)	1.8	N	

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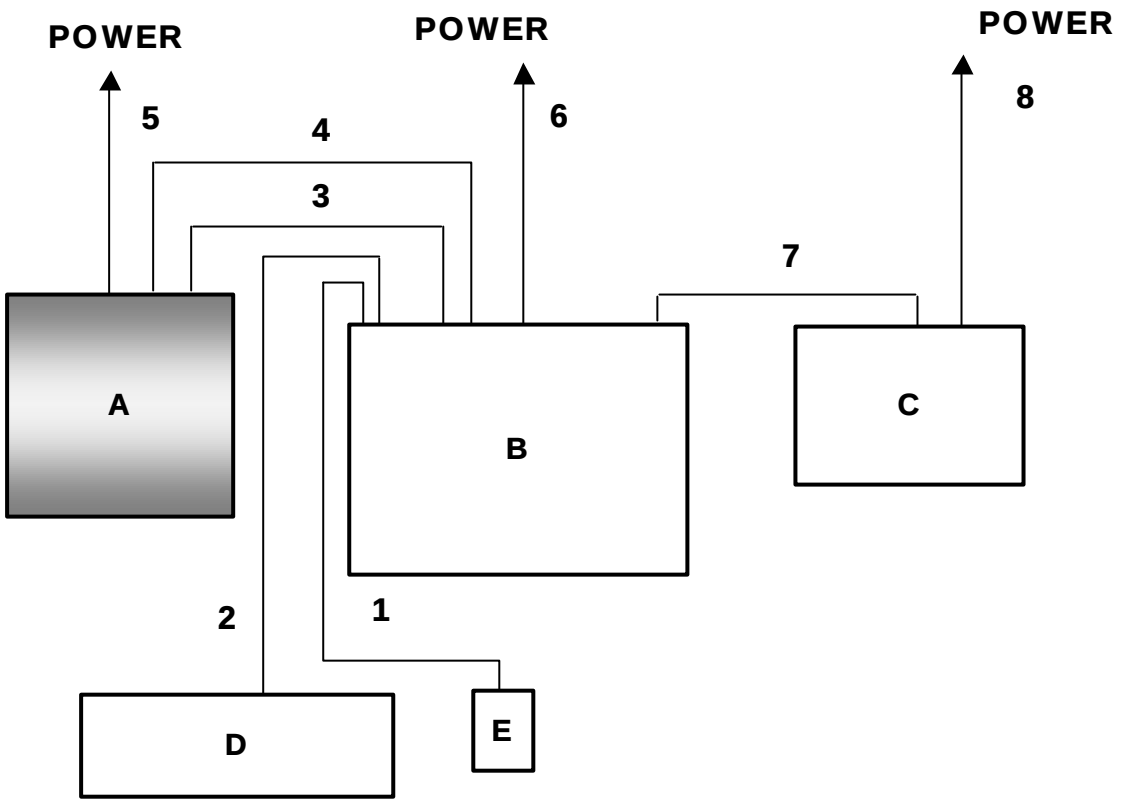
2.5 System Block Diagram of Test Configuration



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

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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 0.45MHz to 30MHz relative to the limit are recorded.

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3.1.2 Test Results

Test Data Sheet (Digital)

Frequency	LISN Pol.	Meter reading (a)		Total Loss	Results (a) + (b)		Limit	
		QP	AV	(b)	QP	AV	QP	AV
[MHz]	[L,N]	[dBuV]		[dB]	[dBuV]		[dBuV]	
0.150	Neutral	52.1	47.9	0.2	52.3	48.1	**66.0**	**56.0**
0.409	Neutral	42.5	39.1	0.1	42.6	39.2	**57.7**	**47.7**
0.500	Live	43.7	41.1	0.2	43.9	41.3	**56.0**	**46.0**
0.514	Neutral	40.0	33.9	0.2	40.2	34.1	**56.0**	**46.0**
1.305	Neutral	38.7	36.9	0.2	38.9	37.1	**56.0**	**46.0**
13.954	Neutral	39.1	29.5	0.9	40.0	30.4	**60.0**	**50.0**
14.535	Neutral	38.6	29.1	0.9	39.5	30.0	**60.0**	**50.0**

*** 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."

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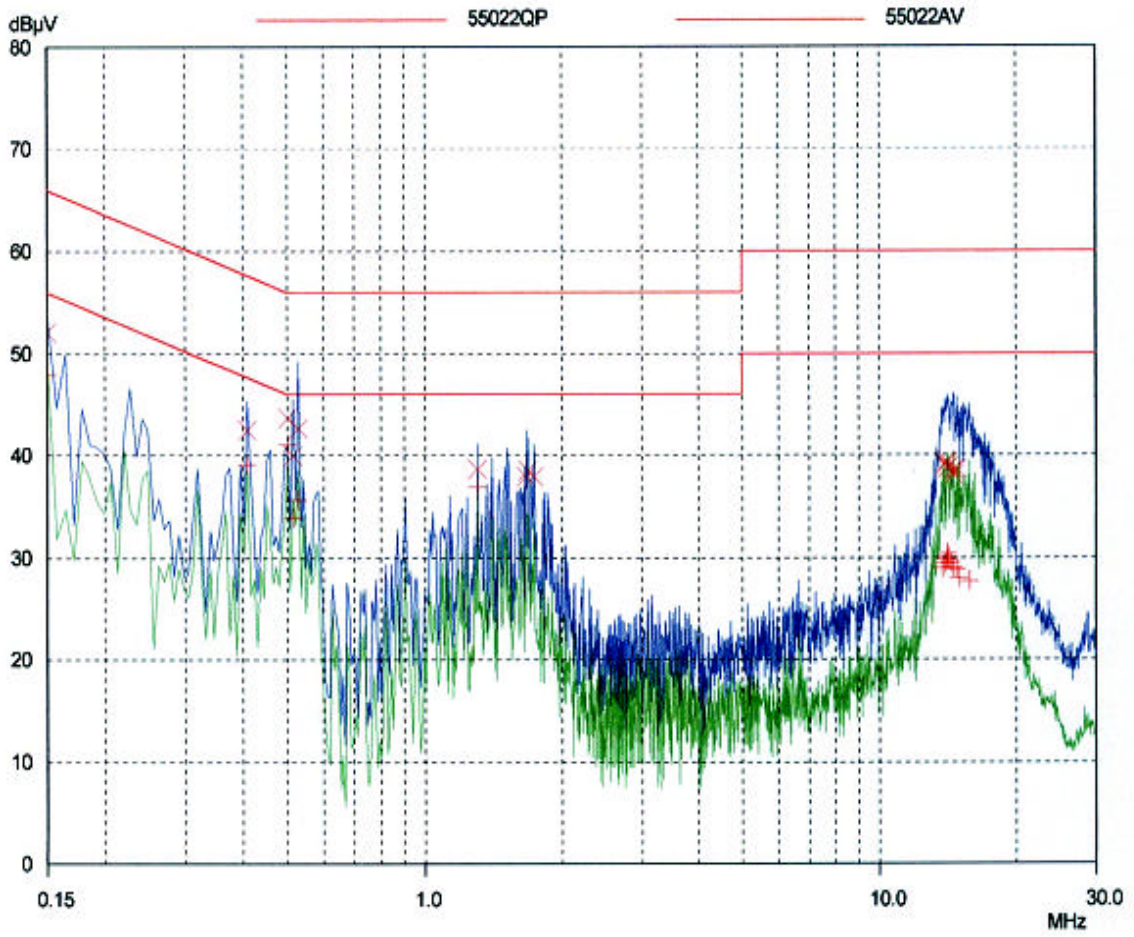
Graph (LISN Mode : Live & Neutral)_Digital

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	7kHz	9kHz	PK+AV	1msec	Auto	OFF	60dB

Final Measurement:

Detectors:	X QP / + AV
Meas Time:	1sec
Peaks:	16
Acc Margin:	30 dB



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Test Data Sheet (Analog)

Frequency	LISN Pol.	Meter reading (a)		Total Loss	Results (a) + (b)		Limit	
		QP	AV	(b)	QP	AV	QP	AV
[MHz]	[L,N]	[dBuV]		[dB]	[dBuV]		[dBuV]	
0.486	Live	40.5	39.0	0.1	40.6	39.1	**56.2**	**46.2**
0.528	Live	42.5	35.6	0.2	42.7	35.8	**56.0**	**46.0**
1.403	Neutral	40.2	36.4	0.2	40.4	36.6	**56.0**	**46.0**
13.821	Neutral	42.3	33.0	0.8	43.1	33.8	**60.0**	**50.0**
14.885	Neutral	44.0	32.8	1.0	45.0	33.8	**60.0**	**50.0**
15.081	Neutral	43.4	34.5	1.0	44.4	35.5	**60.0**	**50.0**

*** 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."

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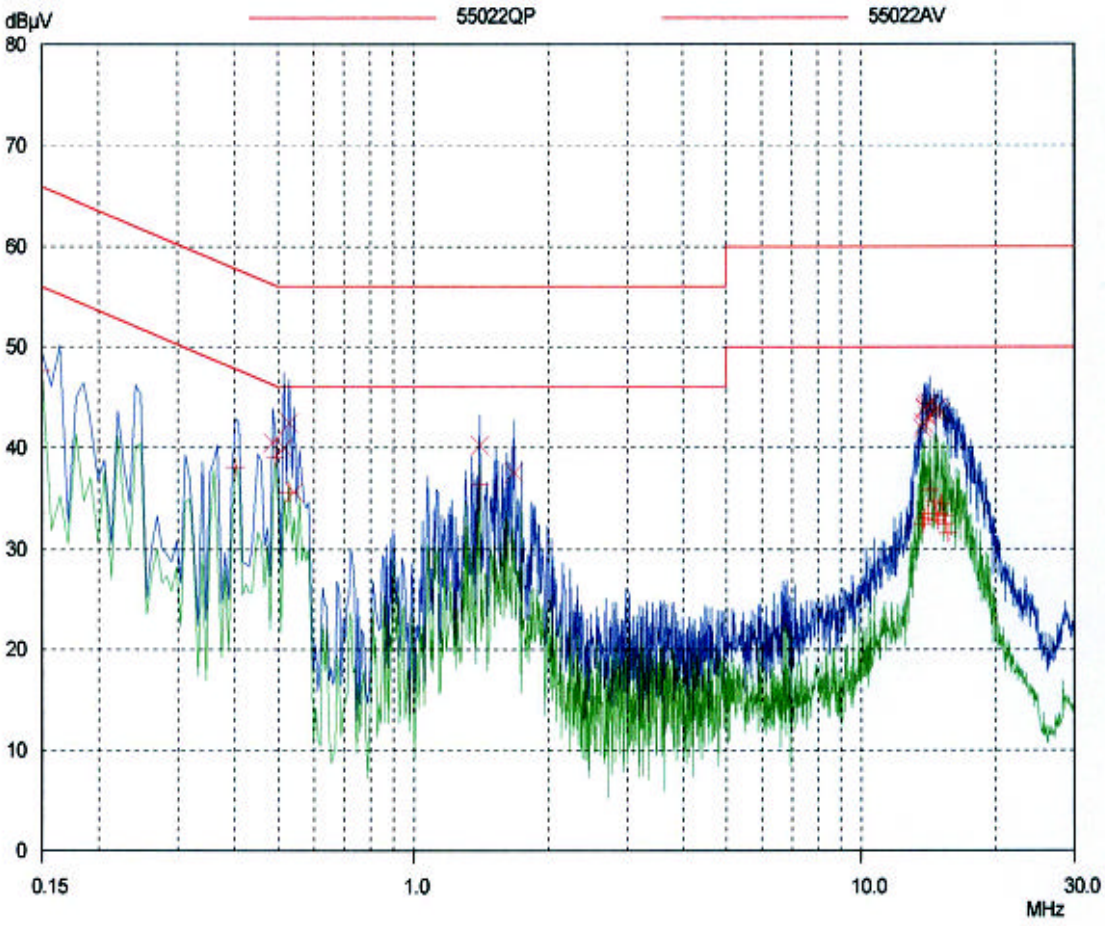
Graph (LISN Mode : Live & Neutral)_Analog

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	7kHz	9kHz	PK+AV	1msec	Auto	OFF	60dB

Final Measurement:

Detectors:	X QP / + AV
Meas Time:	1sec
Peaks:	16
Acc Margin:	30 dB



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.

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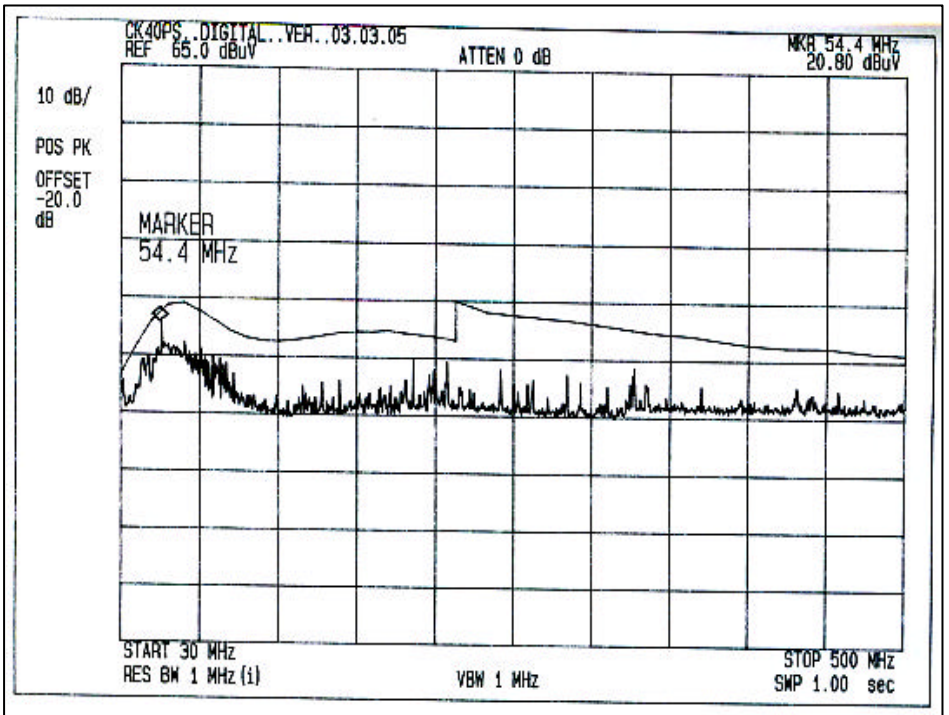
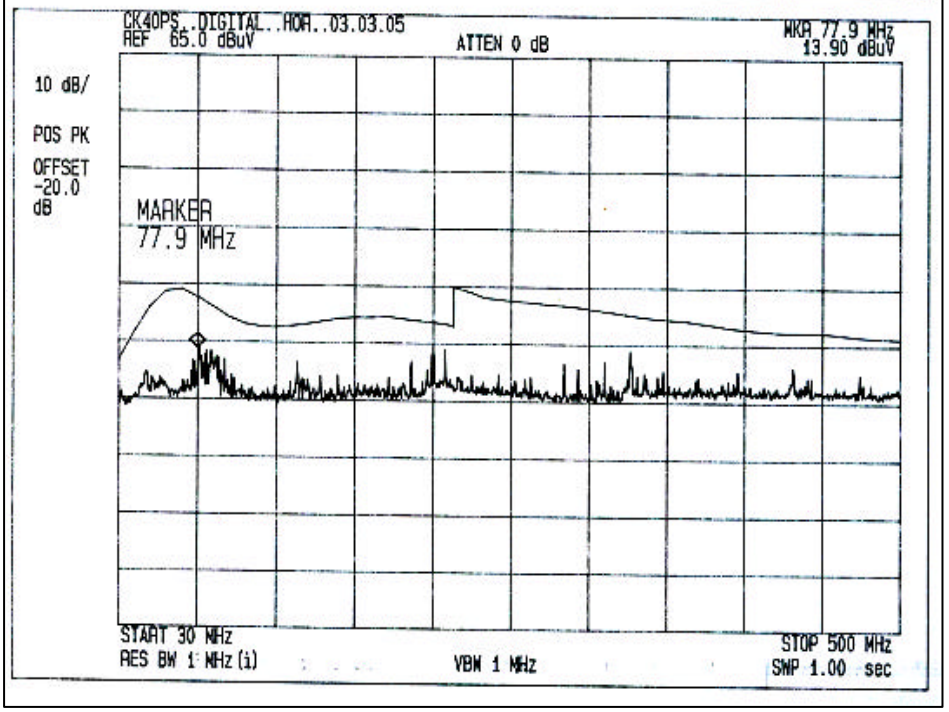
3.2.2 Test Results

EUT Mode : Digital INPUT mode

[Test range : 30 - 500MHz] **Test Distance : 10m**





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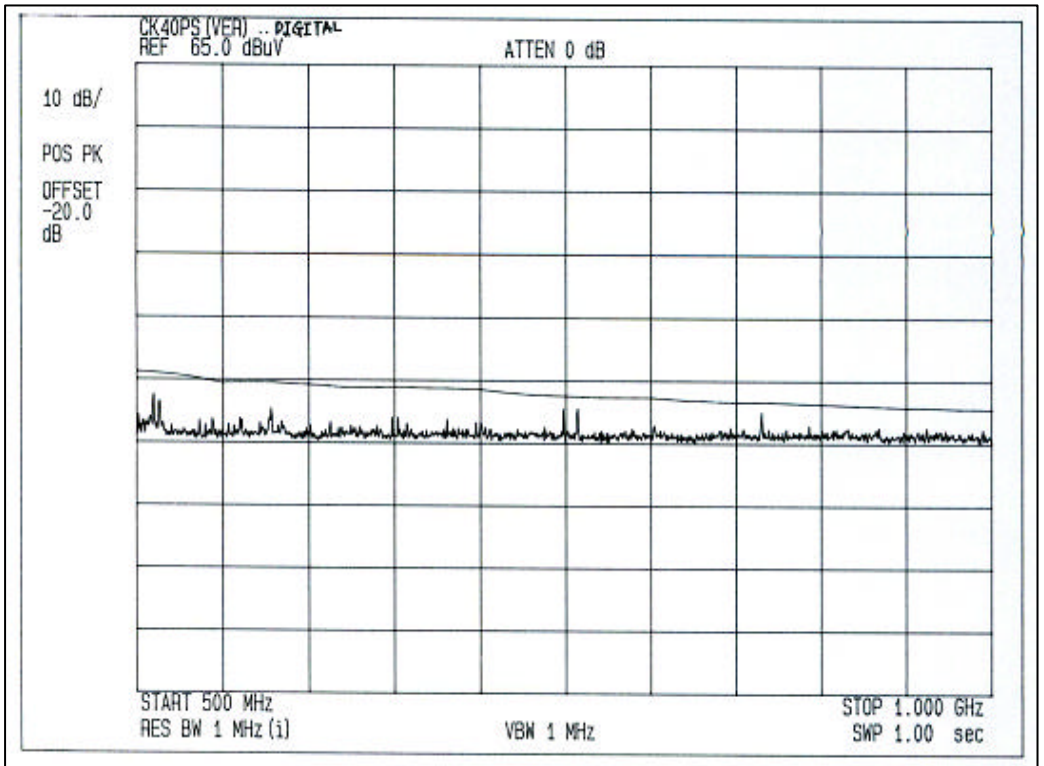
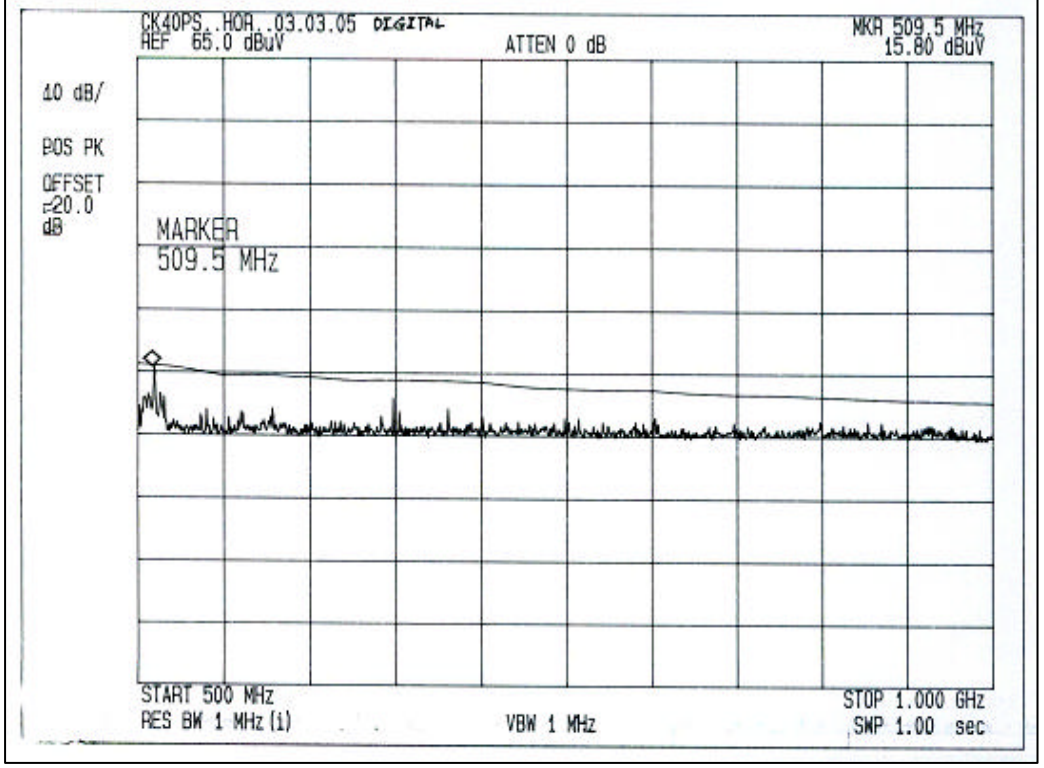
EUT Mode : Digital INPUT mode

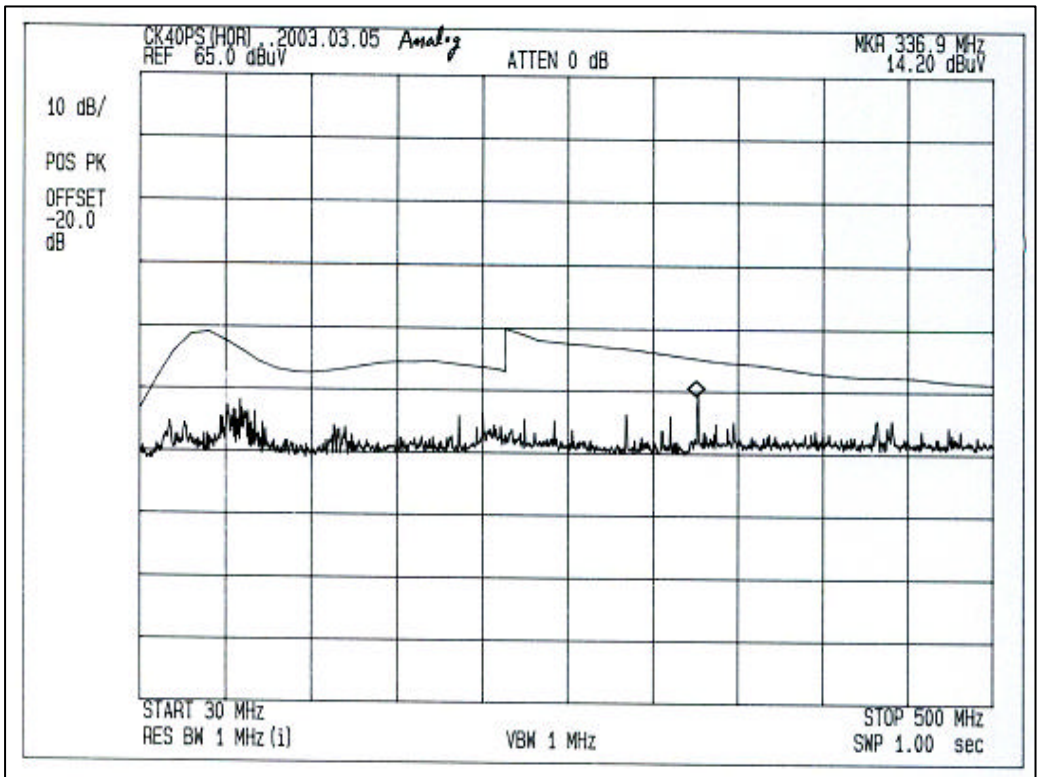
[Test range : 500 - 1000MHz] **Test Distance : 10m**

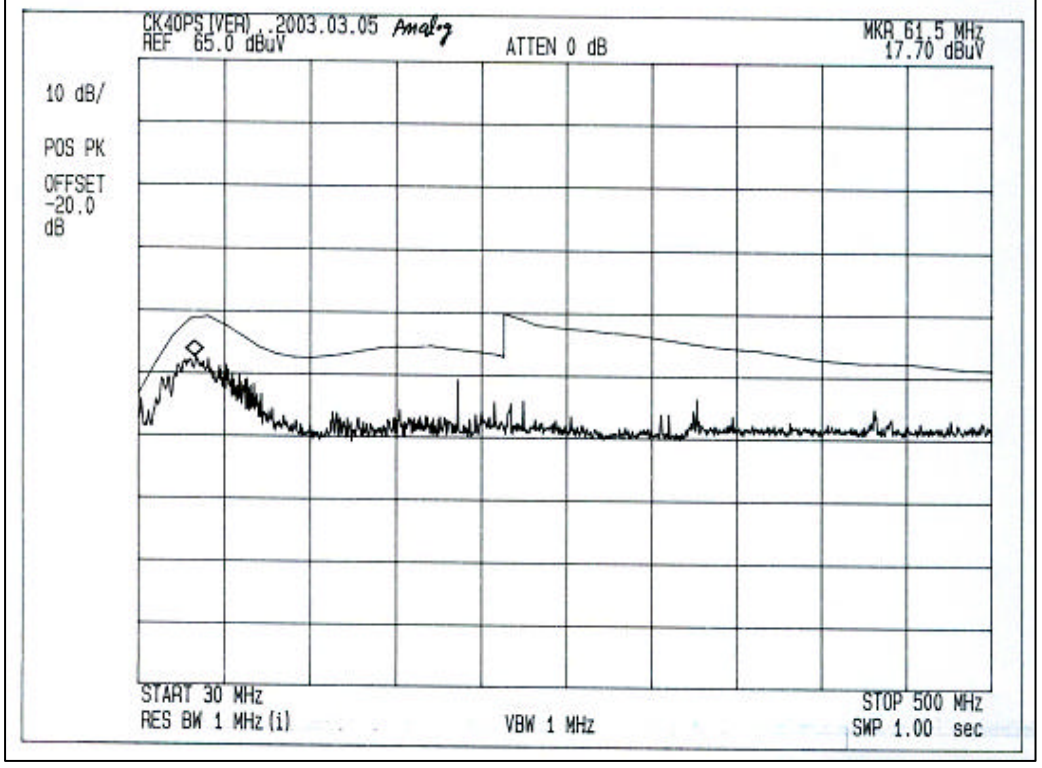




EUT Mode : Analog INPUT mode

[Test range : 30 - 500MHz] **Test Distance : 10m**





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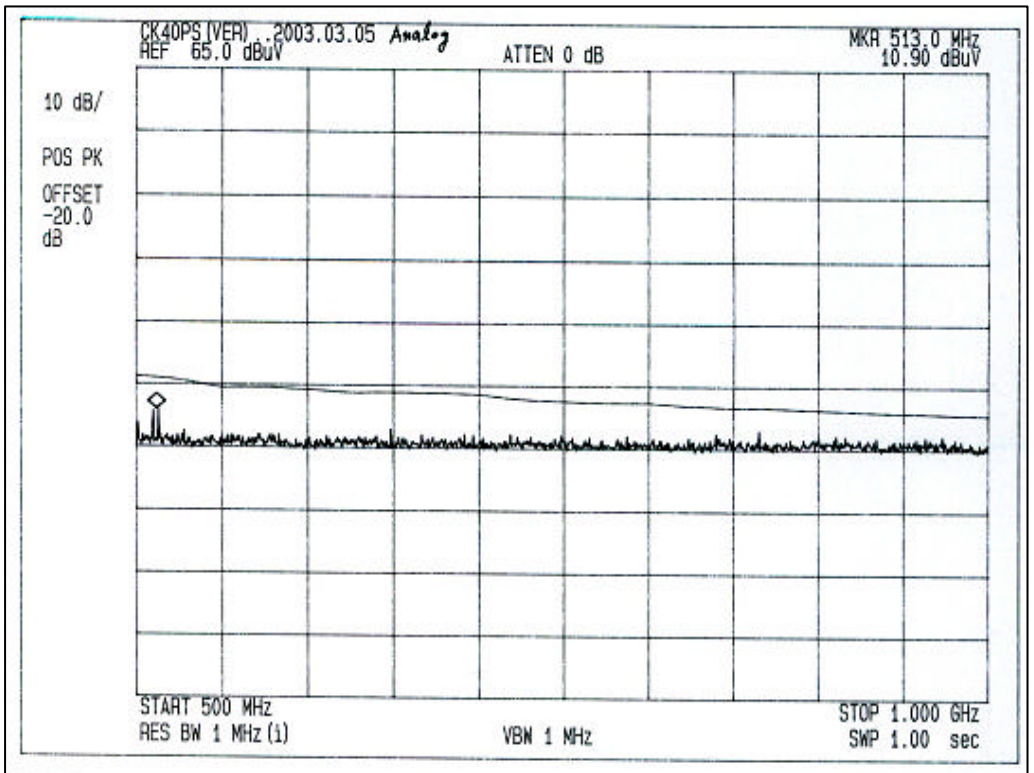
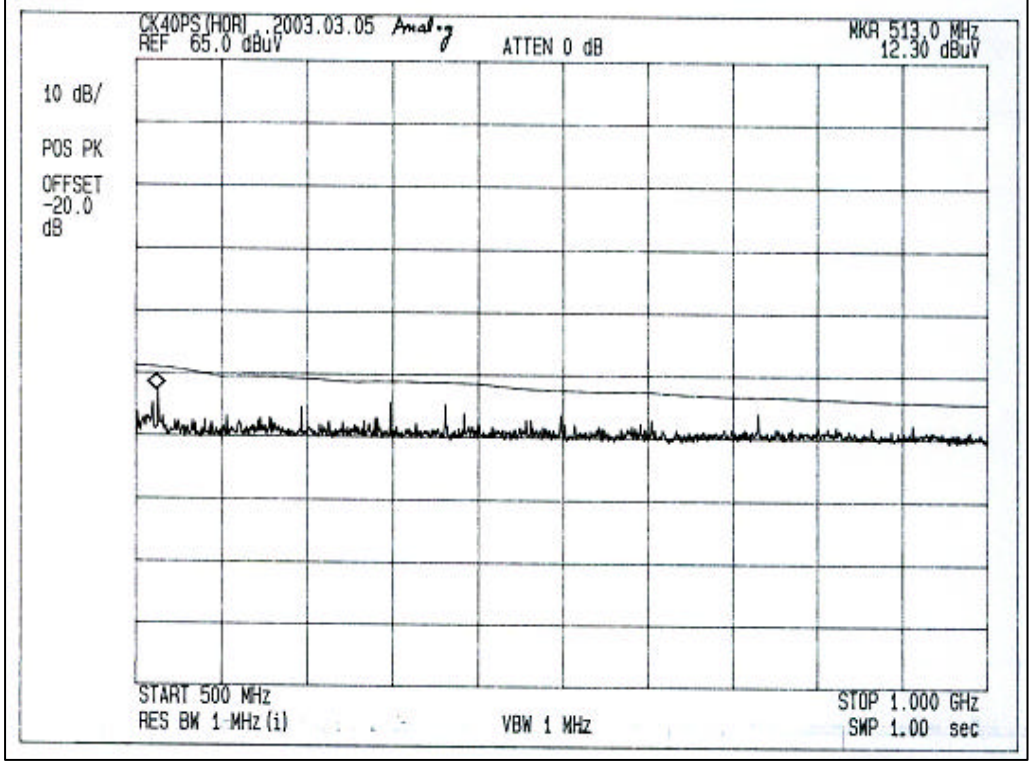
EUT Mode : Analog INPUT mode

[Test range : 500 - 1000MHz] **Test Distance : 10m**





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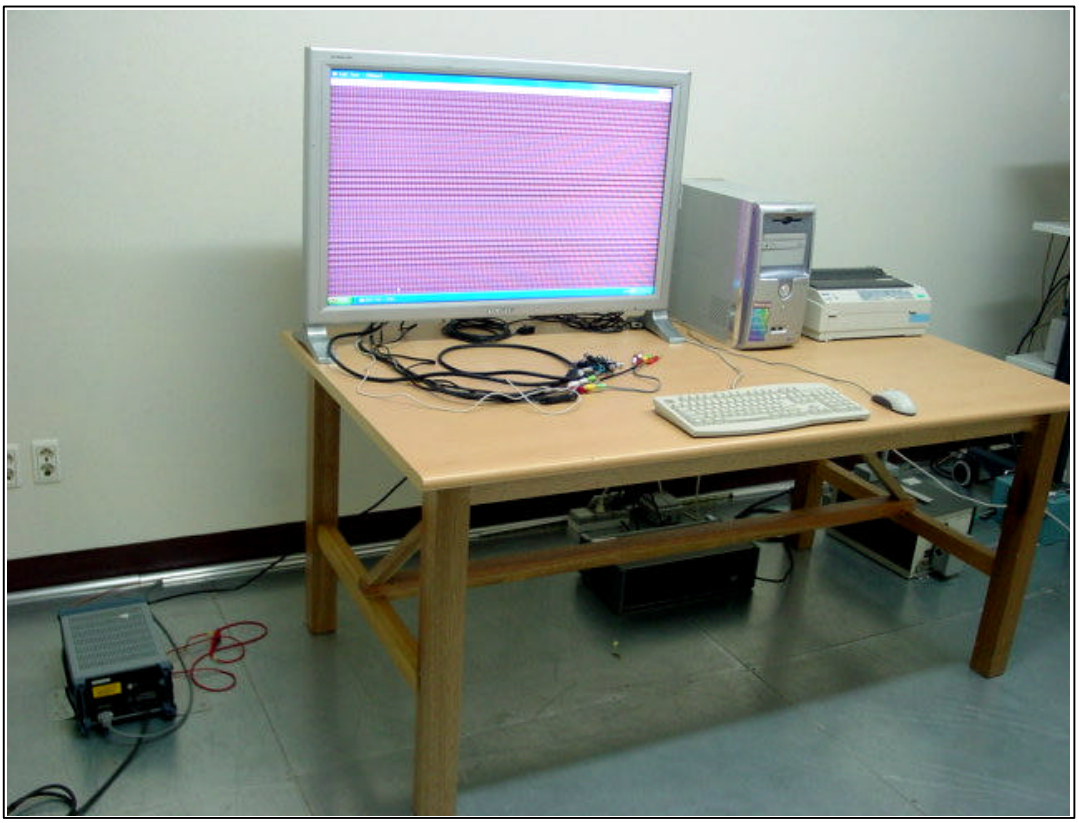
Test Set up Photographs

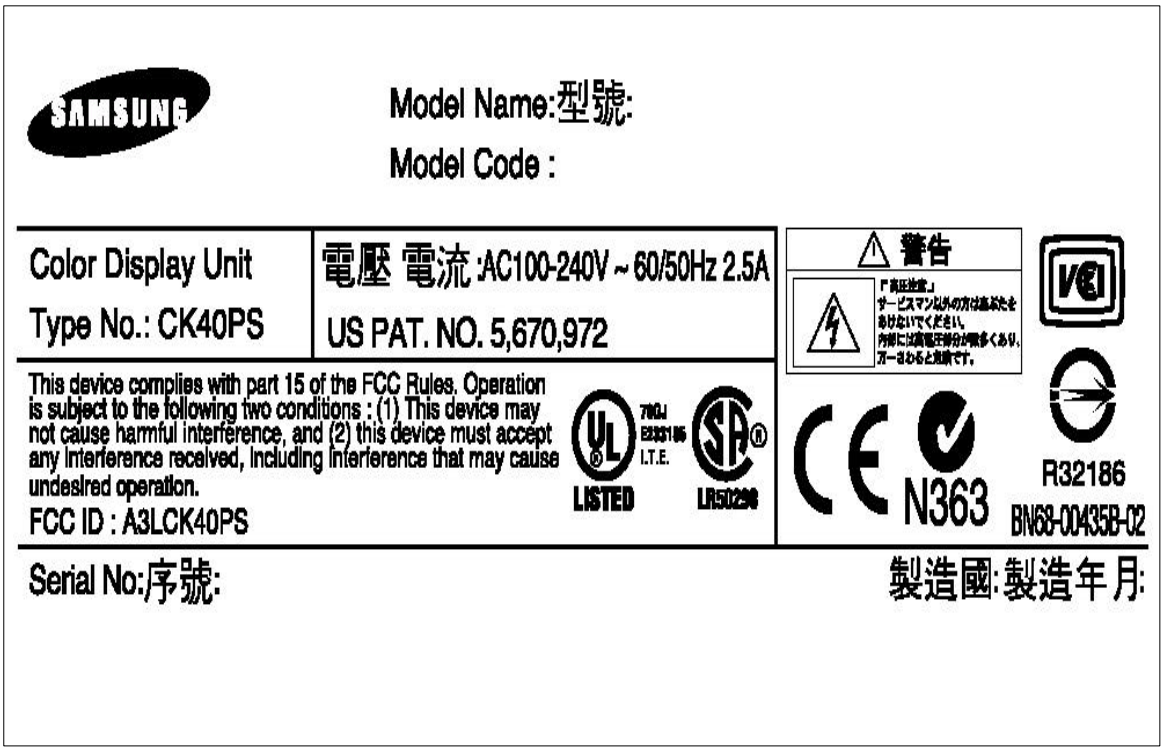
[AC POWERLINE CONDUCTED EMISSION MEASUREMENT]



[RADIATED EMISSION MEASUREMENT]

EUT Photographs

[Label]



EUT Photographs

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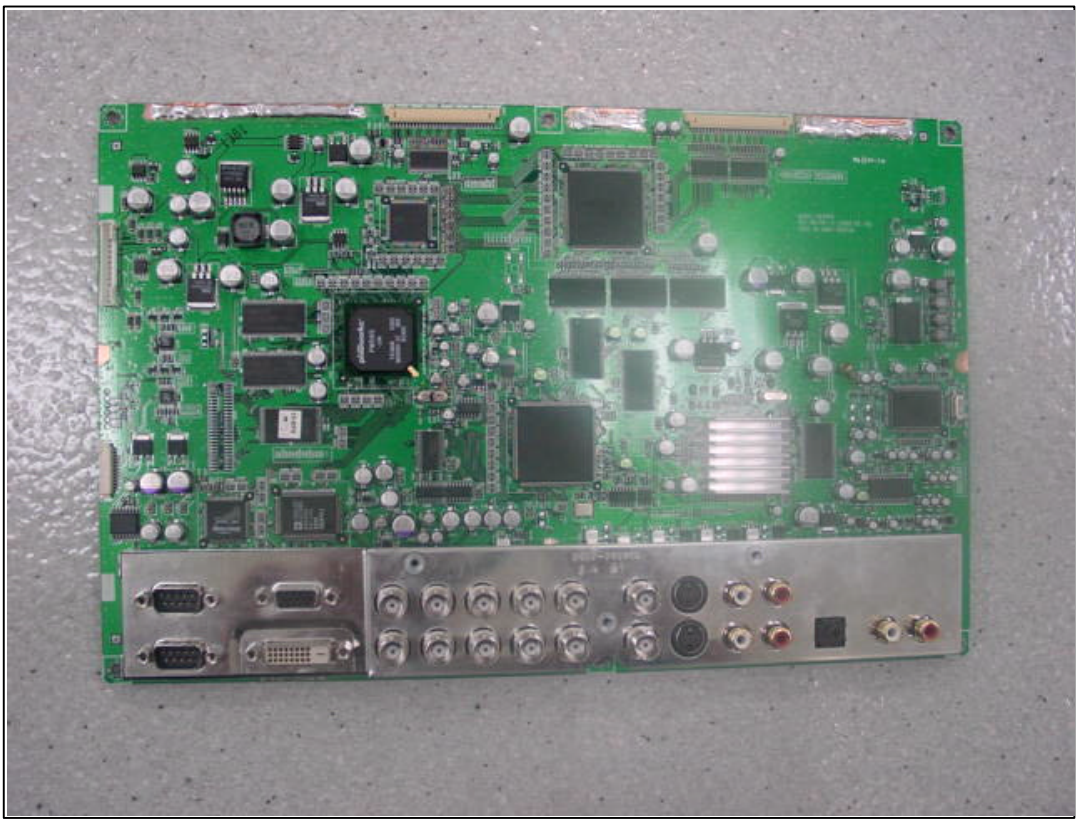
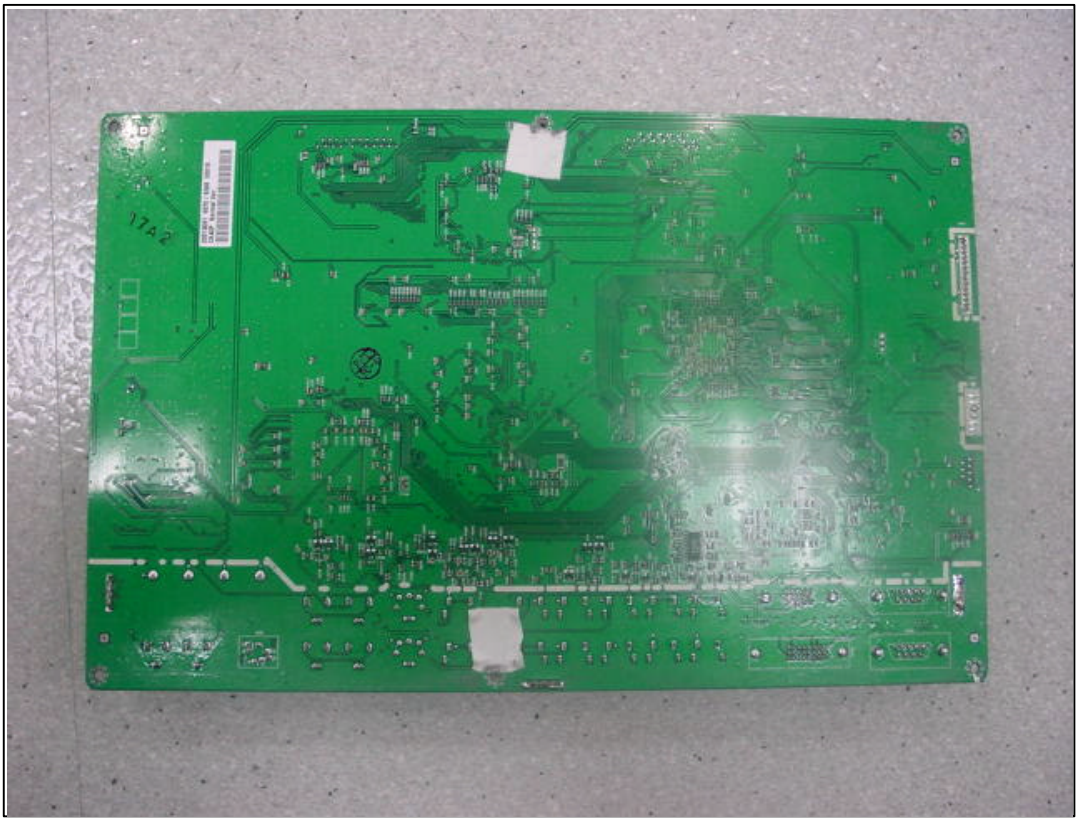
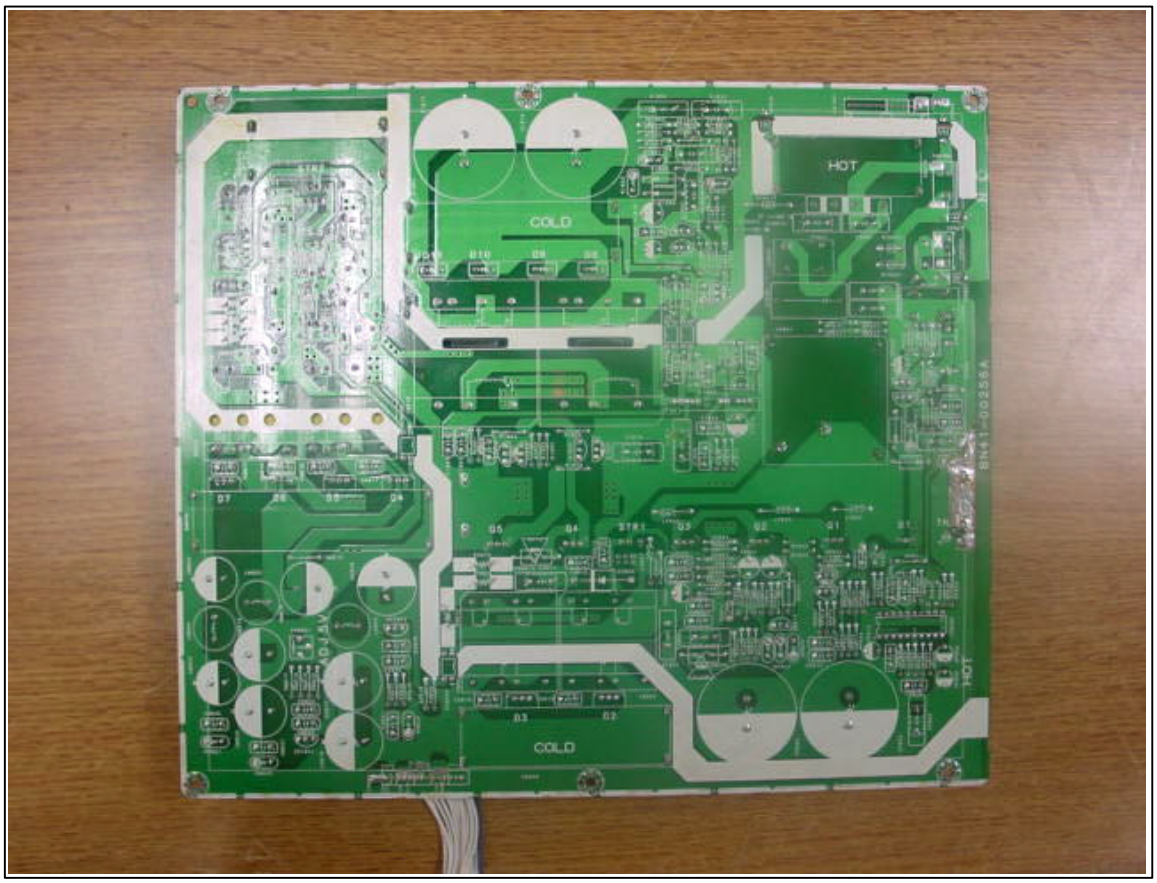




EUT Photographs



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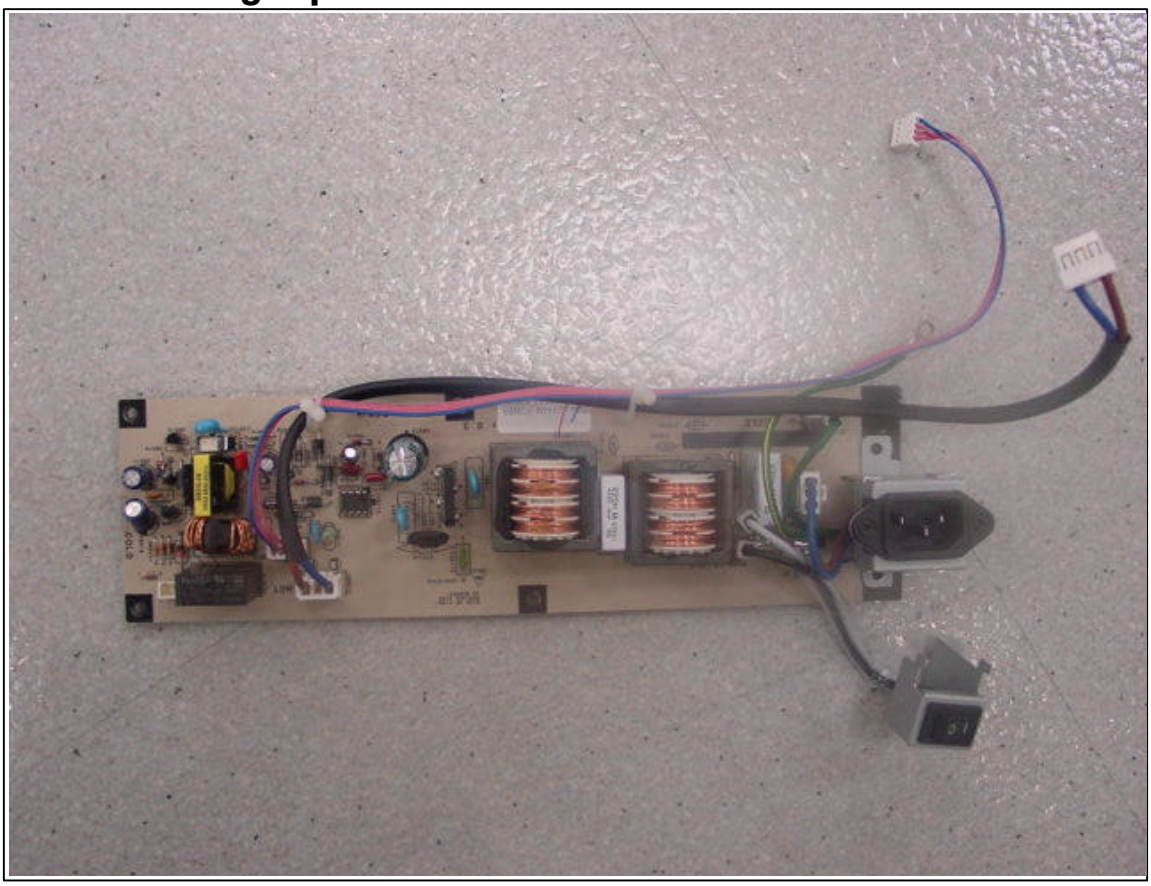
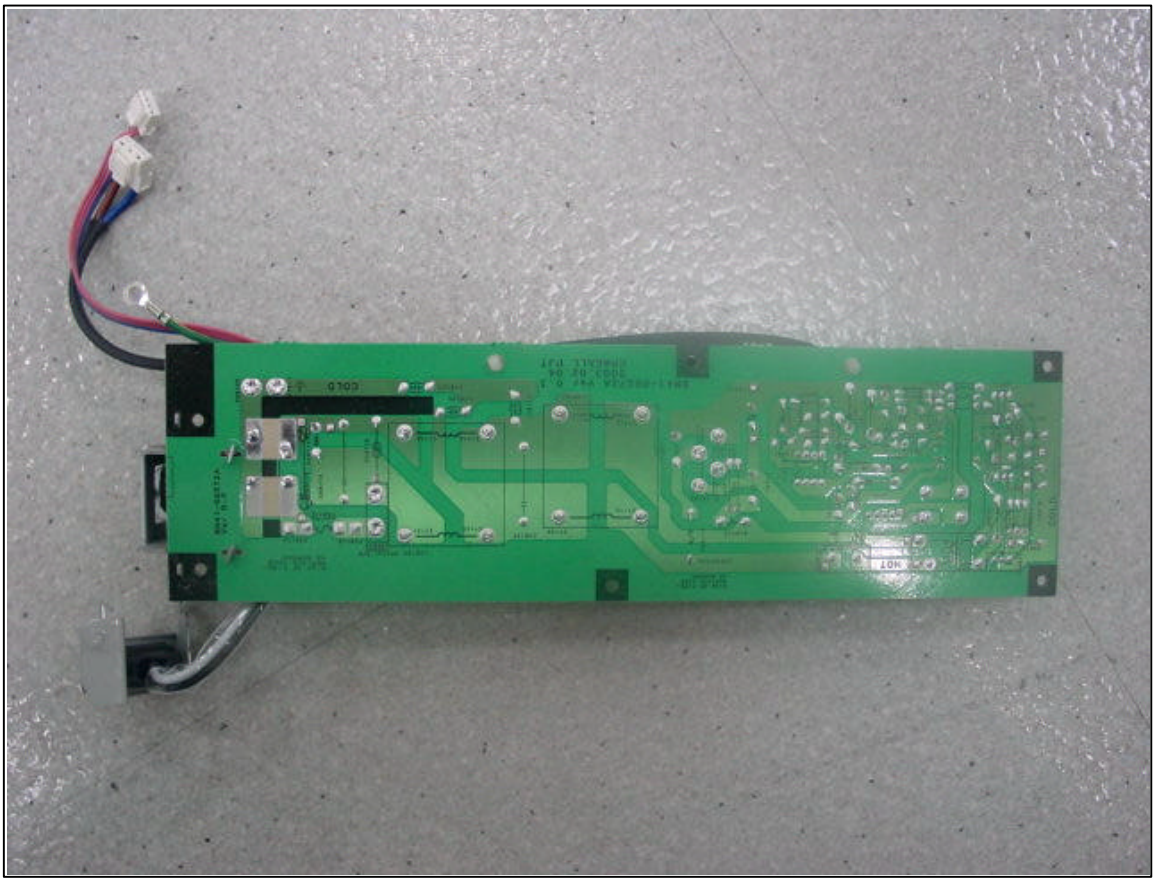
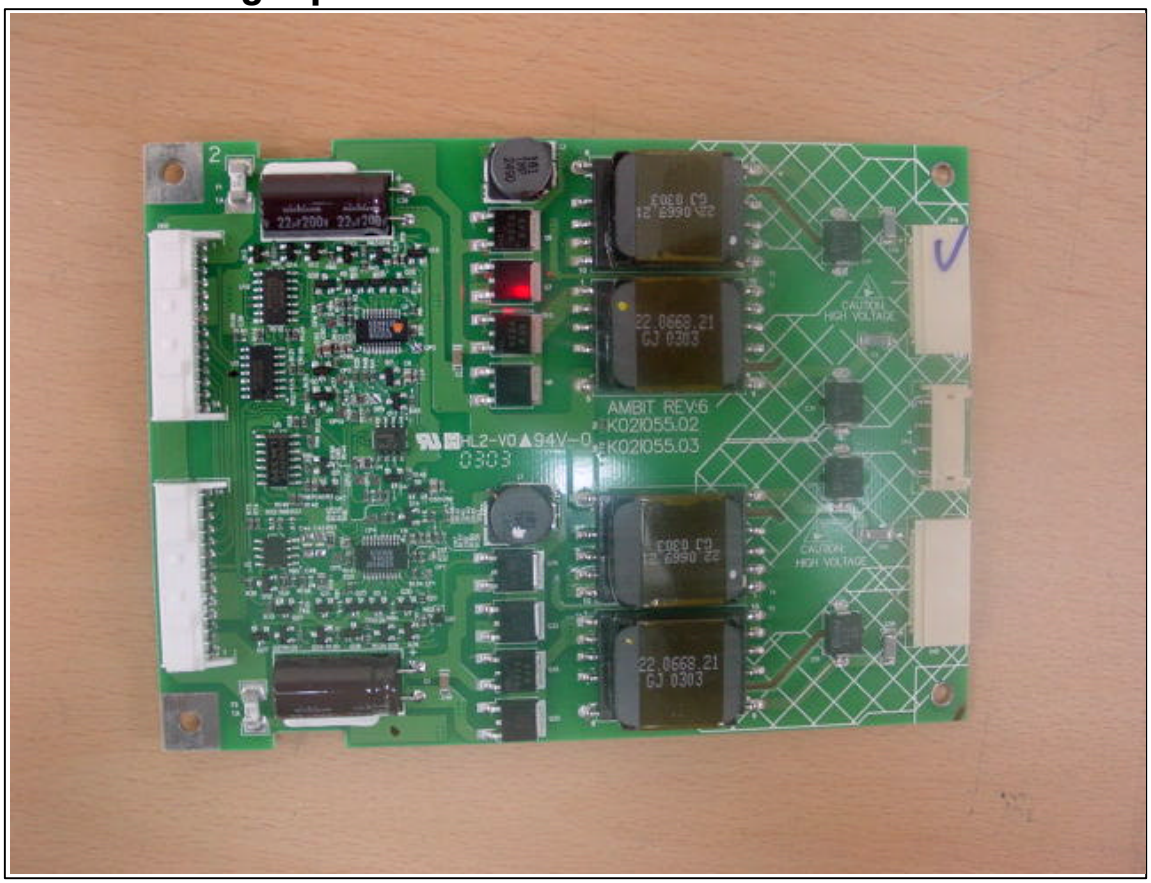
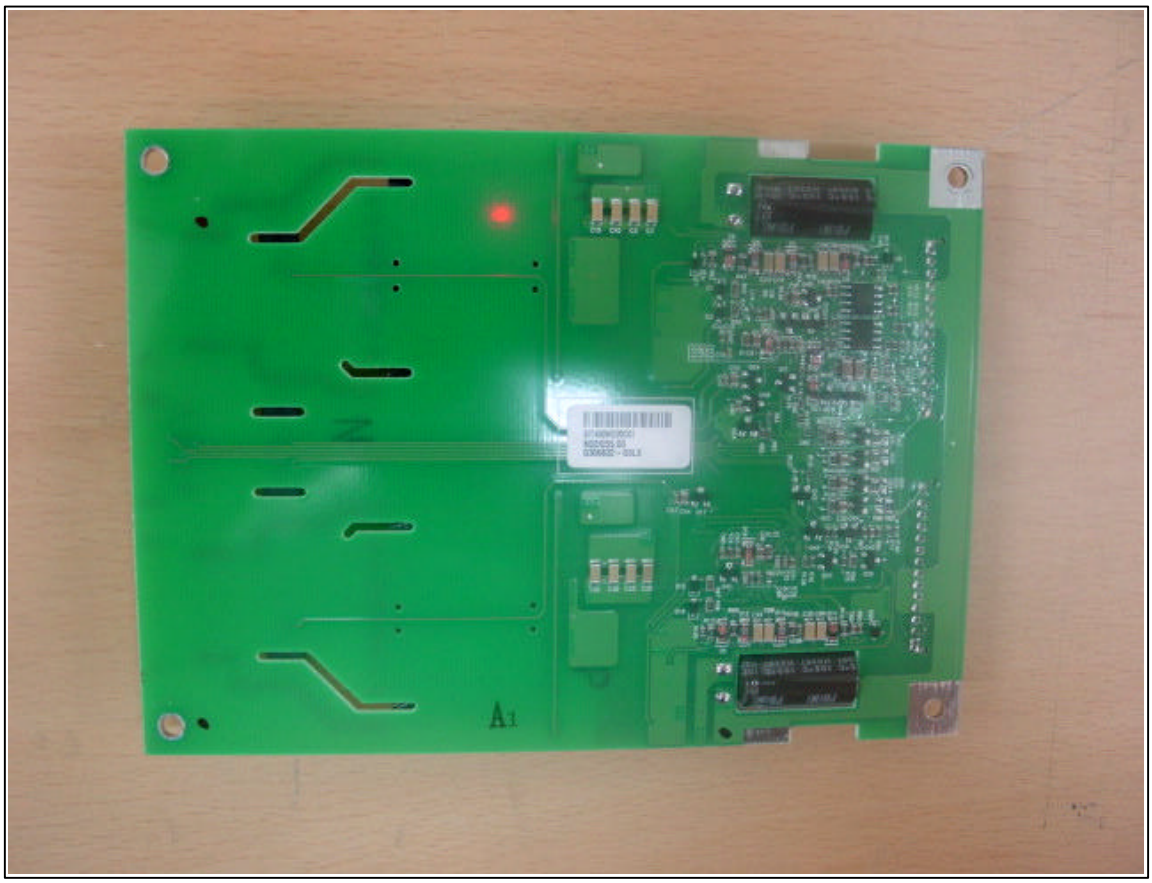
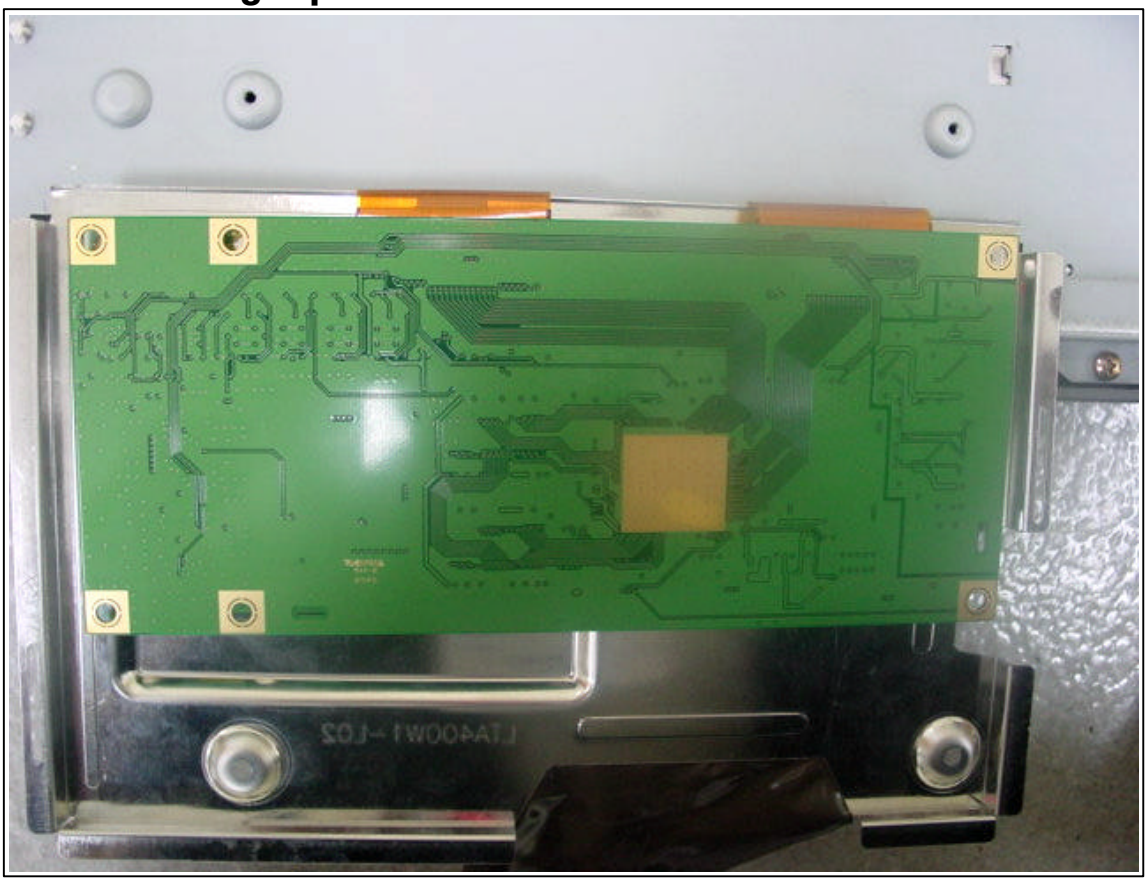
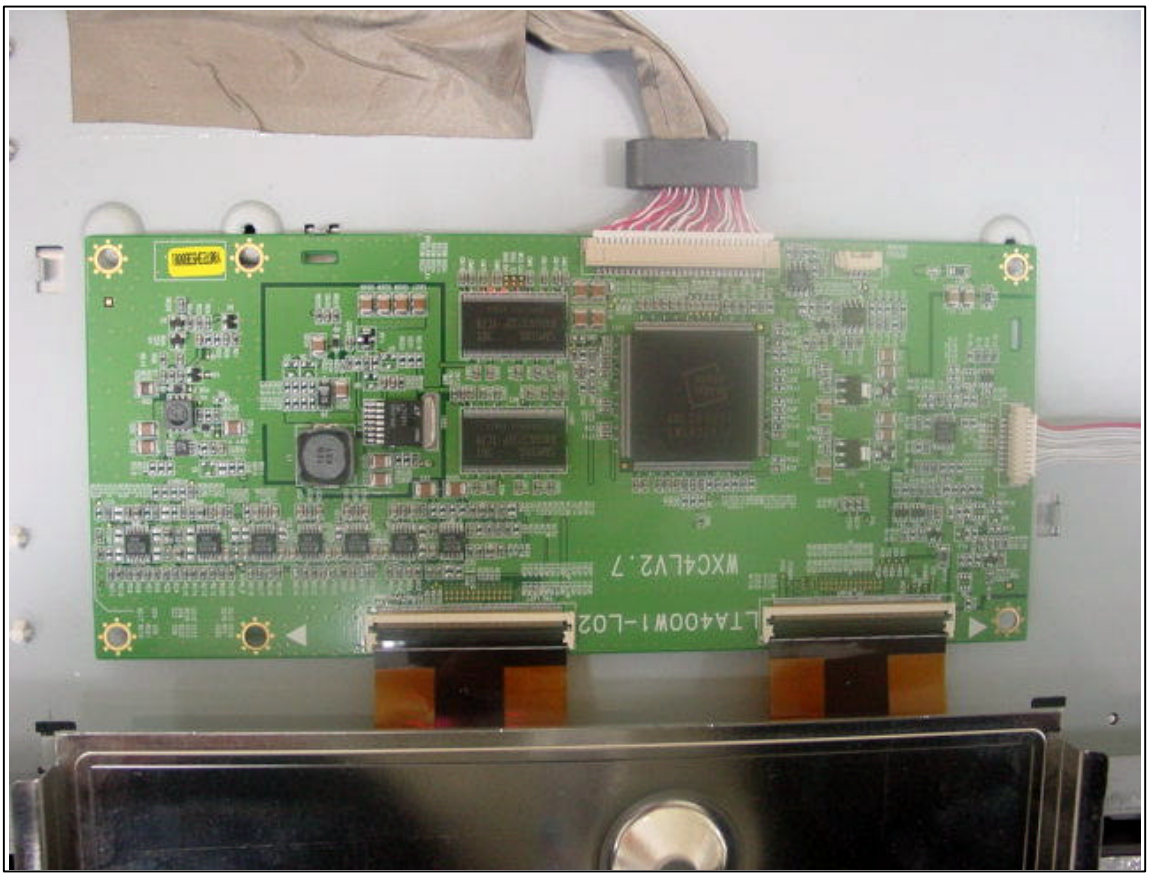




EUT Photographs





EUT Photographs