

EMC TEST REPORT

Project No. : LBE032165

Product : **PROJECTOR**

Model No. : **SP-H700AE**

Date of test : Oct 16 ~ Oct 17, 2003

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1. Introduction & Summary

1.1 Description of the EUT

Applicant	SAMSUNG ELECTRONICS Co., Ltd.
Project Number	LBE032165
Equipment Under Test	PROJECTOR
Trade Name	SAMSUNG
Model Number	SP-H700AE
Variant Model	-
FCC ID Number	A3LSPH700

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	E7405A	MY42000109	Agilent	03/04/18, 12Months
	Firmware versions : Rev.29.9.86			
10dB Attenuator	8491B	58226	Agilent	37537
RF Relais Matrix	PSU	861206/024	R & S	N/A
Measurement Software	EP5CE	-	TOYO	N/A
RF Selector	NS4900	0303-015	TOYO	N/A
Measurement Software	EP5RE	-	TOYO	N/A
Field strength meter	ESCS30	839809/022	R & S	03/07/25, 12Months
	Firmware versions : Main 1.08, OTP 02.01, GRA 02.03			
Field strength meter	ESCS30	100104	R & S	03/01/17, 12Months
L.I.S.N	ESH3-Z5	847265/028	R & S	03/07/16, 12Months
Bi-Log Antenna	CBL6112B	2766	SCHAFFNER	03/06/20, 12Months
EMC Analyzer	E7405A	US41110272	Agilent	03/06/14, 12Months

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
-	1280x720	Horizontal F.: 70kHz Vertical F. : 85Hz	-

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

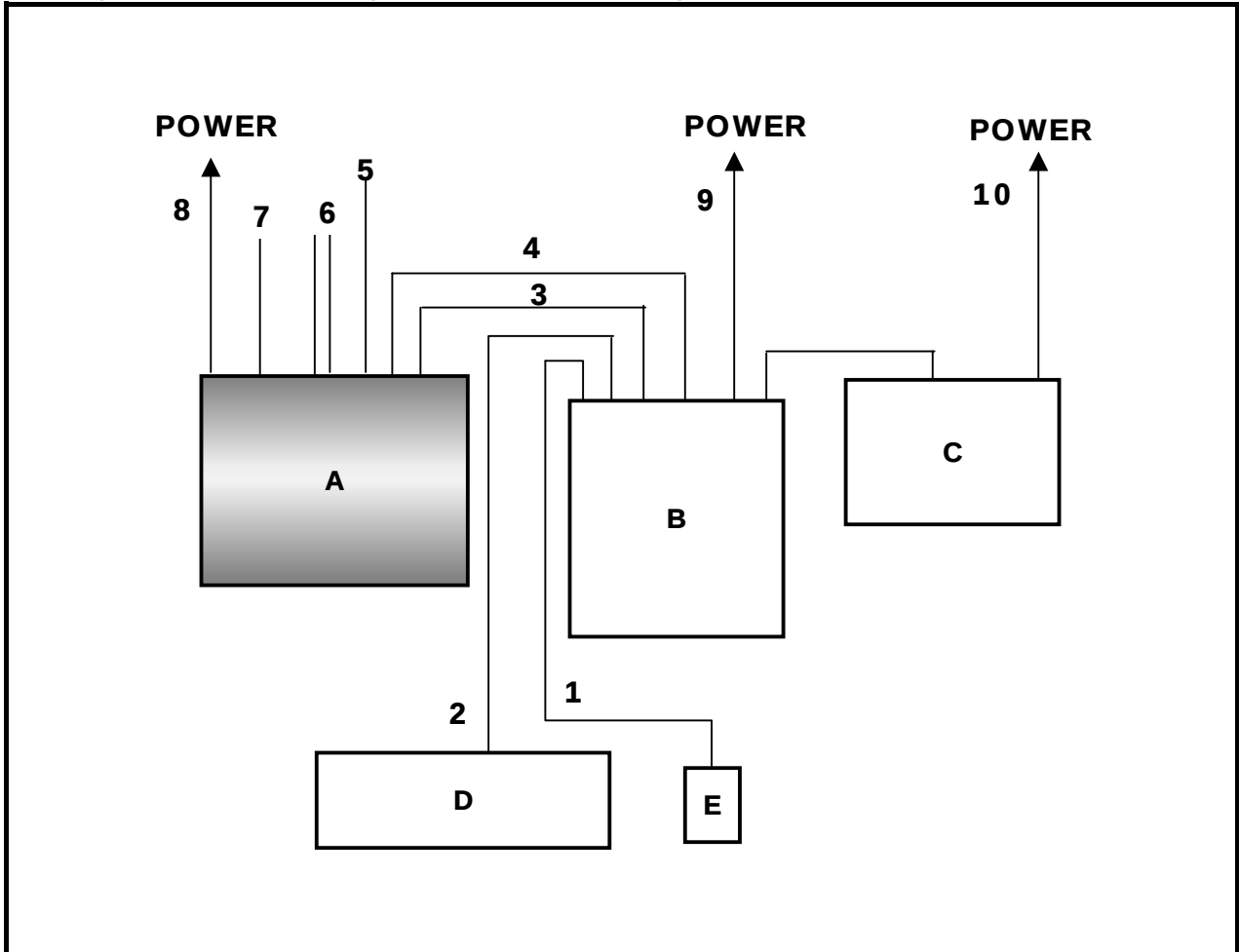
Mark	Item	Model No.	Serial No.	Manufacturer	FCC ID
A	PROJECTOR	SP-H700AE	-	Samsung	A3LSPH700
B	Personal Computer	Dimension 8200	7X37H11	DELL	
C	Printer	LQ-580H	CG2Y014504	EPSON	
D	PS/2 Keyboard	RT7D20	TH-04N454	DELL	AQ6-7D20
E	PS/2 Mouse	PS/2 Compatible	4431261-3	DELL	

* 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	1.5	Y	
4	DVI Cable	1.5	Y	
5	Super Cable	1.0	N	
6	AV Cable	1.5	N	2EA
7	Composite Cable	1.0	N	
8	AC Power Cable(Projector)	1.2	N	
9	AC Power Cable(PC)	1.8	N	
10	AC Power Cable(Pirinter)	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

Configure 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.

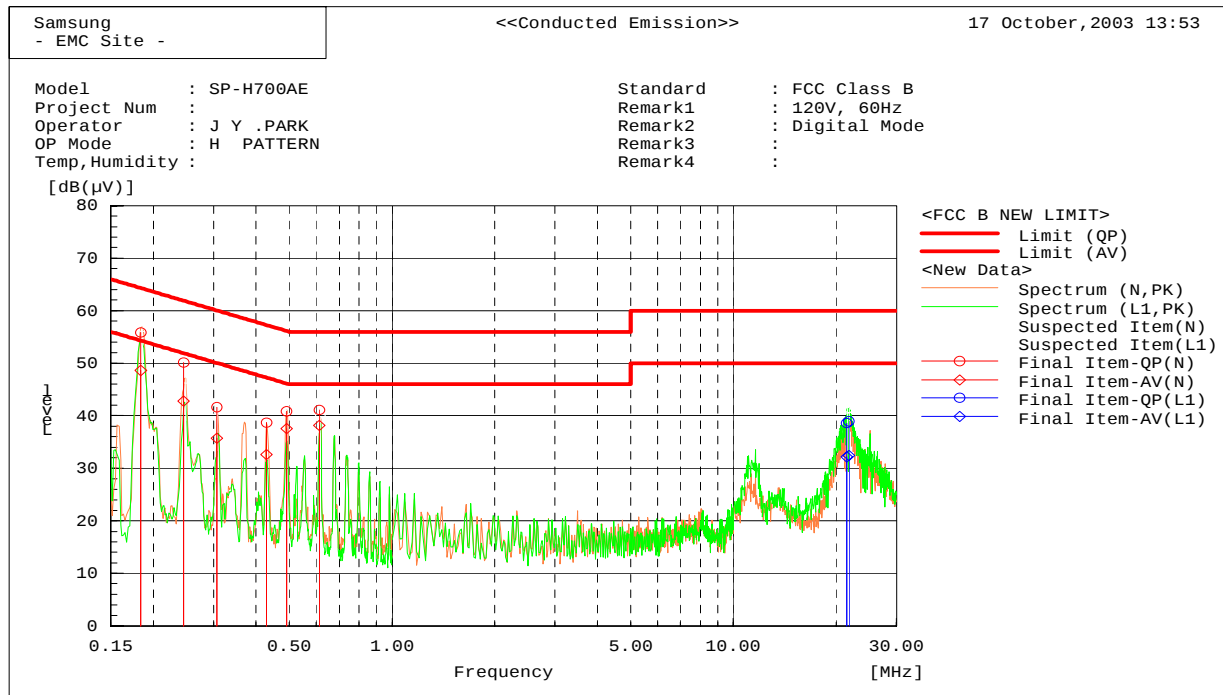
All input terminals are terminated in the proper impedance.

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

O Test Data (LISN Mode : Live & Neutral)

Final Result

--- N Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.18387	46.1	38.8	9.8	55.9	48.6	64.3	54.3	8.4	5.7
2	0.24511	40.2	32.9	9.9	50.1	42.8	61.9	51.9	11.8	9.1
3	0.30672	31.7	25.9	9.9	41.6	35.8	60.1	50.1	18.5	14.3
4	0.42906	28.7	22.6	10.0	38.7	32.6	57.3	47.3	18.6	14.7
5	0.49011	30.9	27.5	10.0	40.9	37.5	56.2	46.2	15.3	8.7
6	0.61248	31.1	28.2	10.0	41.1	38.2	56.0	46.0	14.9	7.8

--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	21.49439	28.0	21.6	10.6	38.6	32.2	60.0	50.0	21.4	17.8
2	21.801	28.3	21.8	10.6	38.9	32.4	60.0	50.0	21.1	17.6

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 Test Procedure

Configure the EUT System in accordance with ANSI C63.4-1992 section 8 and 12.2.

Power cords for the EUT System are connected to the receptacle on the ground plane.

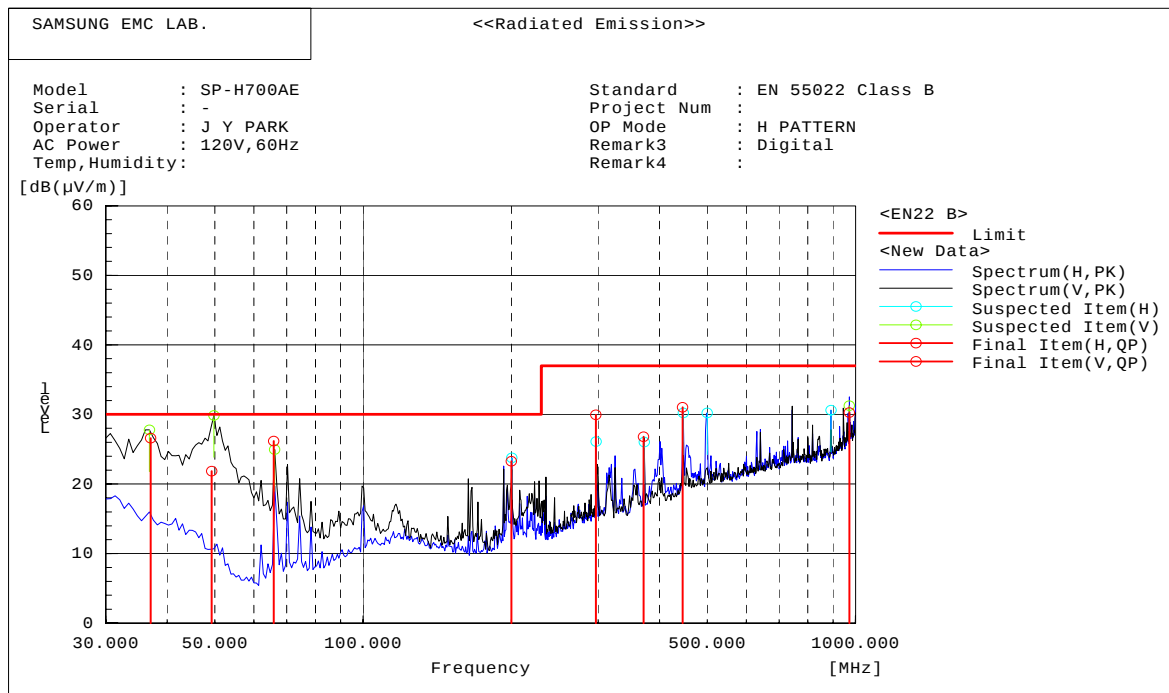
The output ports are connected to the cable provided with the device and the ending port of the cable are terminated in the proper impedance.

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 is scanned from 30MHz to 1,000MHz.

And, detecting wave 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



Final Result

--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	199.999	40.2	-16.9	23.3	30.0	6.7
2	445.500	39.4	-8.4	31.0	37.0	6.0
3	498.380	-----	-6.9	-----	37.0	-----
4	890.980	-----	-2.3	-----	37.0	-----
5	296.996	41.3	-11.3	30.0	37.0	7.1
6	371.240	36.5	-9.7	26.8	37.0	10.2

--- Vertical Polarization (QP)---

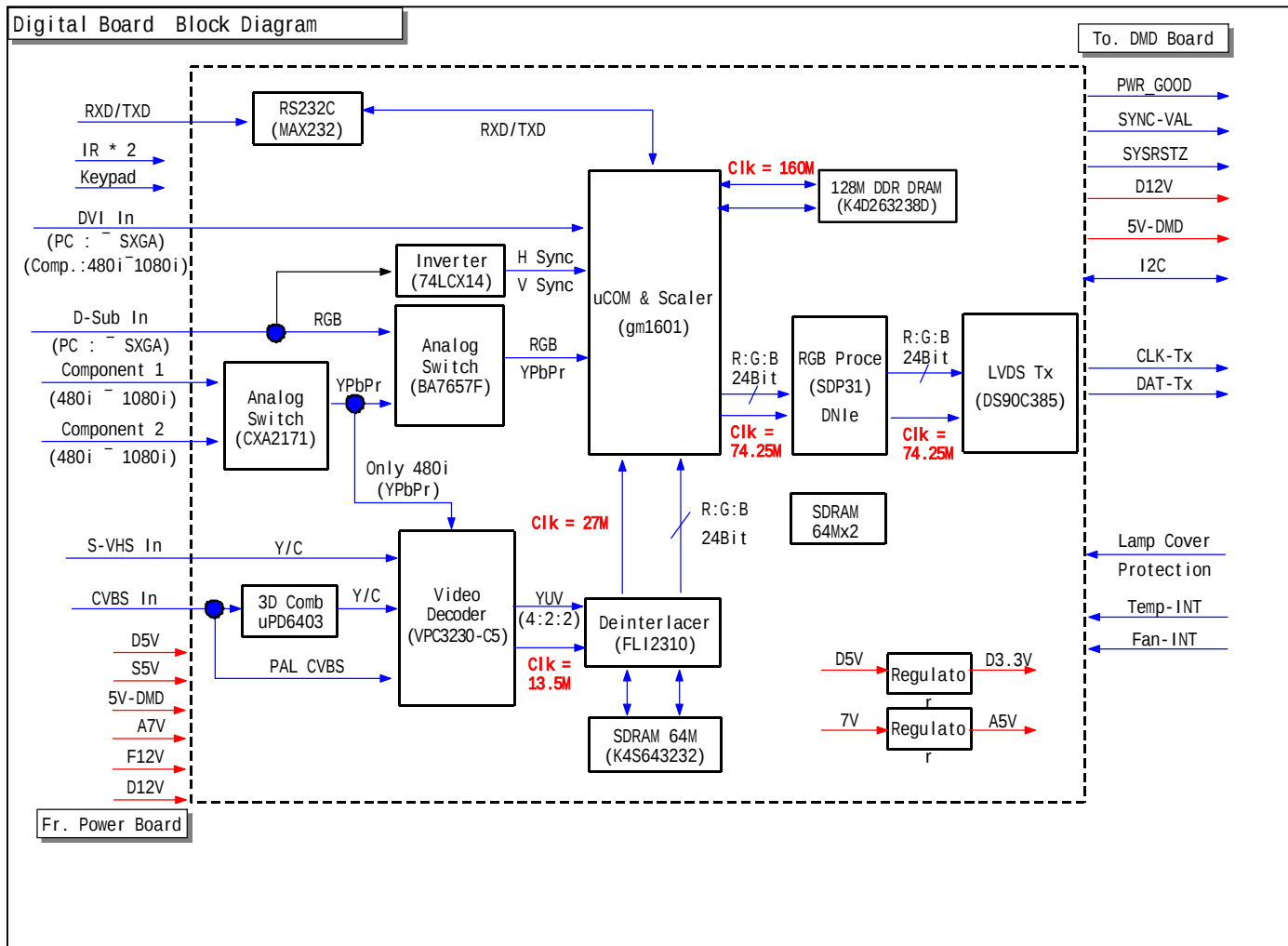
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	49.271	40.9	-19.1	21.8	30.0	8.2
2	65.822	48.3	-22.1	26.2	30.0	3.9
3	971.980	30.5	-0.2	30.3	37.0	6.7
4	37.007	39.8	-13.2	26.6	30.0	3.4

EUT Photographs

[Label and Label position]

		Model :型號: Model Code :
Color Display Unit Type No.: SP-H700AE	電壓 電流: AC100-240V – 50/60Hz 3.5A US PAT.NO.5,670,972	
 706J I.T.E. E233185	Canada ICES-003 Class B / Canada NMB-003 Classe B FCC ID : A3LSPH700  N363  R33475 	
S/N:序號:	製造國:製造年月:	
BN68-00533C-00		





Test Set up Photographs

[AC POWERLINE CONDUCTED EMISSION MEASUREMENT]



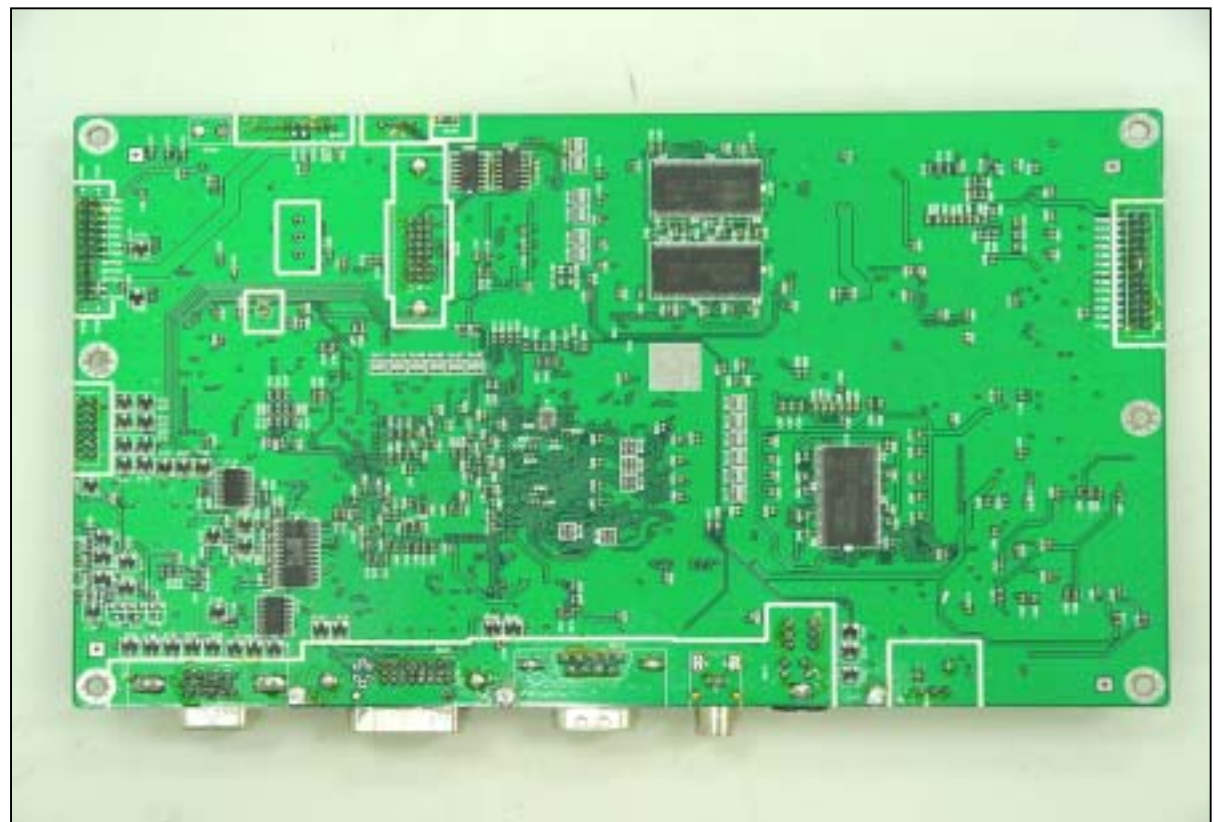
[RADIATED EMISSION MEASUREMENT]



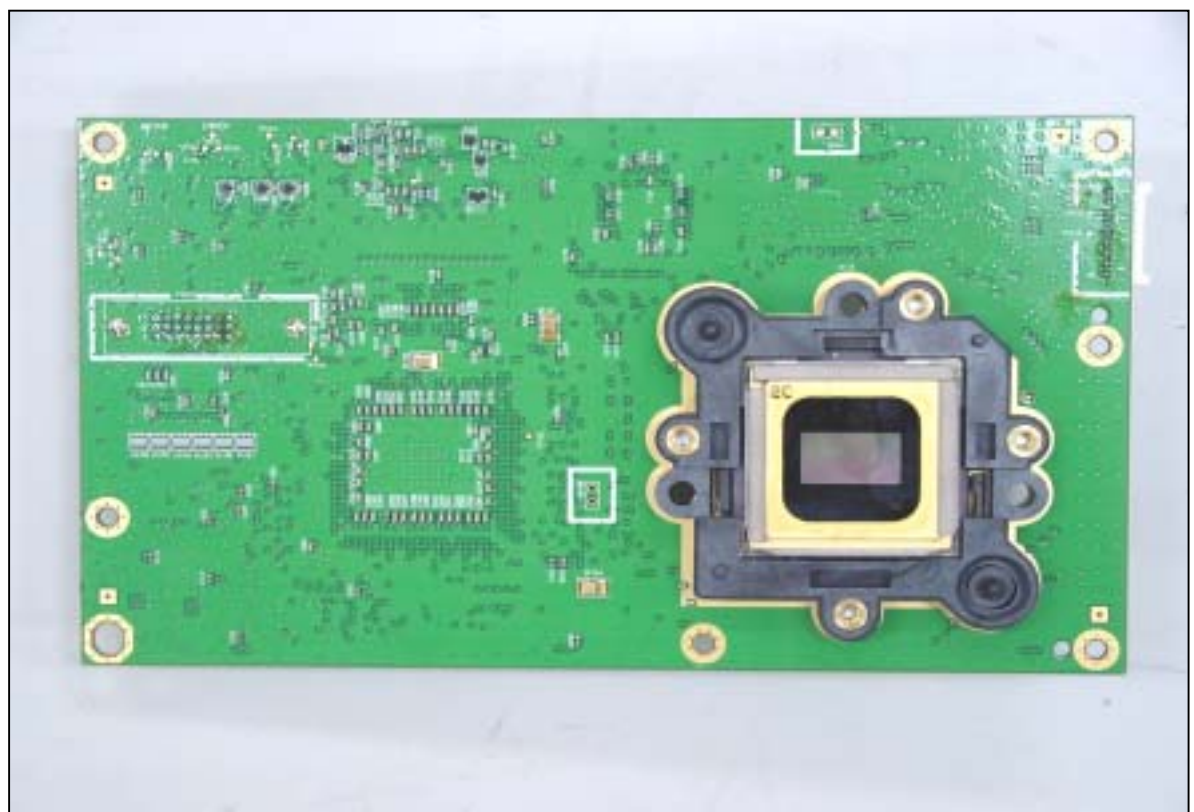
EUT Photographs



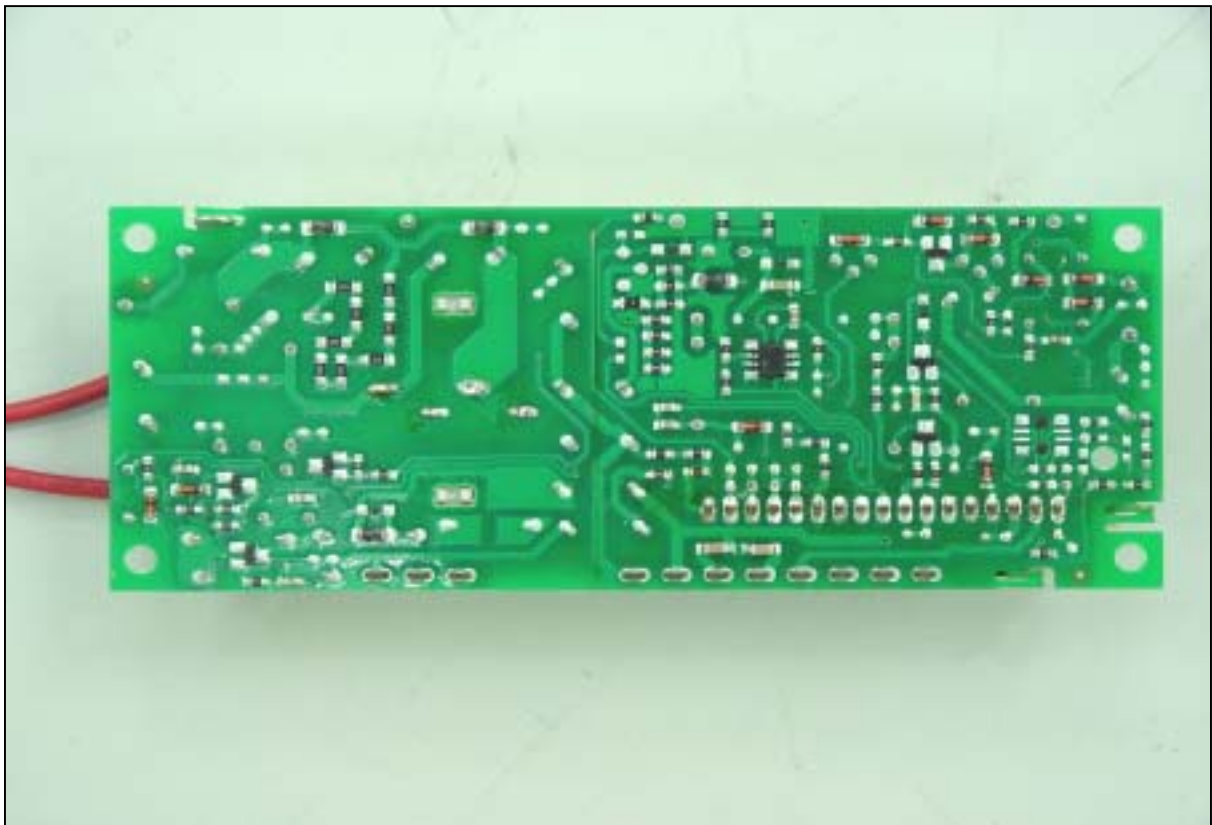
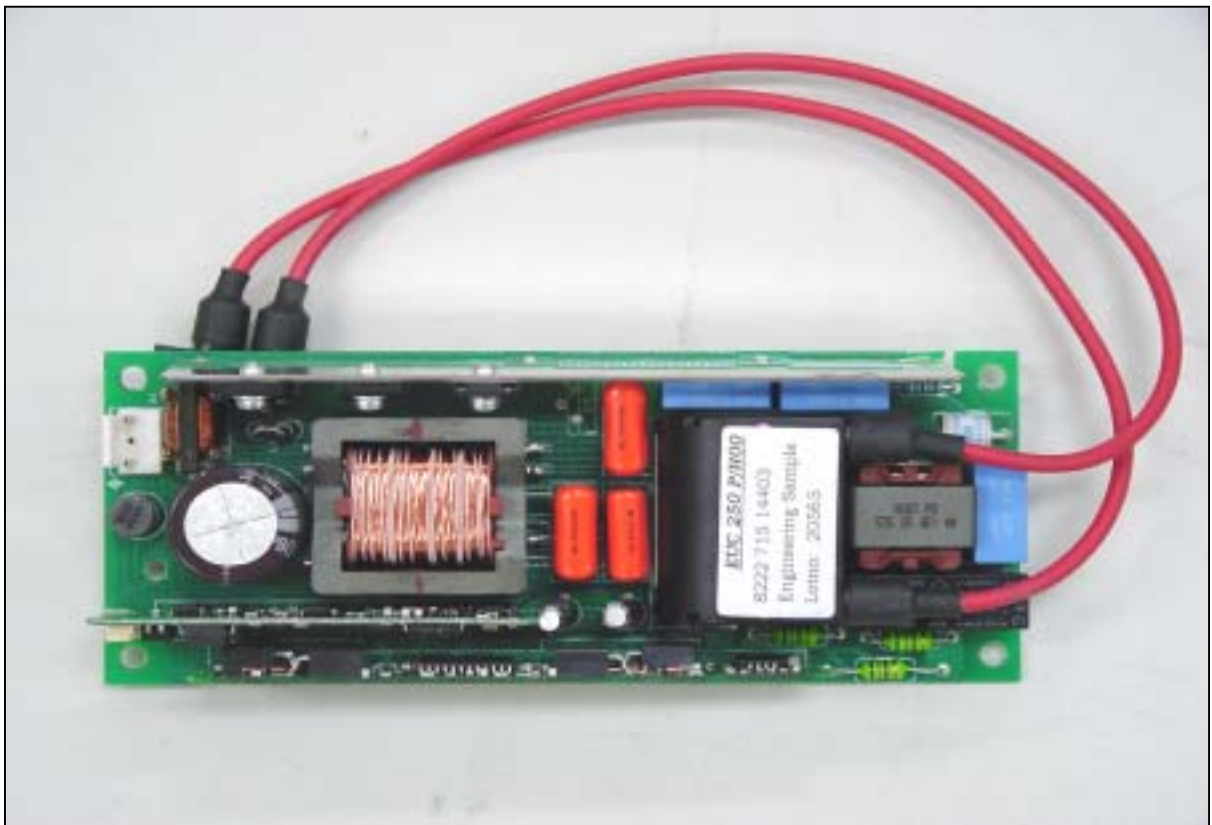
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