EMC Test Report

According to FCC Part 15 Subpart B

Project No.		**LBE041242**
Equipment under Test		
	Address	416 Maetan3-Dong,Yeongtong-Gu,Suwon-City,Gyeonggi-Do, Korea,443-742
	Product Name	**DLP PROJECTION TV**
	Model Name	**AT56L7**
	Manufacturer	SAMSUNG
	Brand Name	SAMSUNG
	FCC ID	A3LAT56L7
	Variant Model	See Page 3
Date of Test		June 14 ~ 16 , 2004
Issued Date		June 17, 2004

	Name/Position	Signature
Tested by	Sung Wook Choi Test Engineer	S.W.Choi
Reviewed by	No Cheon, Park Manager of EMC Lab.	N. C. Park
Authorized by	Kyu Baek, Chung Chief of EMC Lab.	K. B. Chung

1. This test reports does not constitute an endorsement by NIST/NVLAP or U.S Government.
2. This test report is to certify that the tested device properly complies with the requirements of FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.
   All tests necessary to show compliance to the requirements were and these results met the specifications requirement.

This laboratory is registered by the NIST/NVLAP, U.S.A.
The test reported herein have been performed in accordance with its terms of registration.

NVLAP LAB CODE 200623-0

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1. General Information

1.1 Basic Information related Product

Applicant	Samsung Electronics Co. Ltd;
Model name	AT56L7
Applicant Address	Samsung Electronics Co. Ltd; 416 Maetan3- Dong, Yeongtong-Gu, Suwon-City, Gyeonggi-Do, Korea, 443-742
Contact Person	SEUNG CHEOL LEE
Kind of product	DLP PROJECTION TV
Valiant list	None
Manufacturer	Samsung Electronics Co.Ltd;

1.2 Detail Information related Product

Specification

Resolution	1280 * 720
Horizontal Frequency	45kHz
Vertical Frequency	60Hz

Operating Frequency

1.3 Operating Mode and Condition

The system was configured for testing in typical fashion use.

The mode of operation utilized for testing was selected to best simulate typical EUT use.

- PC Video Input
- PC DVI Input

1.4 Equipment Modifications

No equipment modifications were required.

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1.5 Test Configuration

Used EUT and Peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	FCC ID
A	DLP PROJECTION TV	AT56L7	-	Samsung	A3LAT56L7
B	Personal Computer	M6050	810292FRC02822	SAMSUNG	DOC
C	Printer	K10158	CLG001000275	Canon	DOC
D	Printer Adapter	K30088	CLG001000275	Canon	DOC
E	PS/2 Keyboard	SEM-DT35	K1C111342	SAMSUNG	DOC
F	PS/2 Mouse	P801	01117287	SAMSUNG	DOC

Used Cable Description

	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	Parallel (Printer)	1.7	Yes	
2	DLP PROJECTION TV	1.5	Yes	
3	DVI	1.5	Yes	
4	PS/2	1.5	Yes	
5	Component Video Out	1.5	No	
6	AV IN	1.5	No	
7	Component Audio Out	1.5	No	
8	S -Video Out	1.5	Yes	
9	AV Out	1.5	No	

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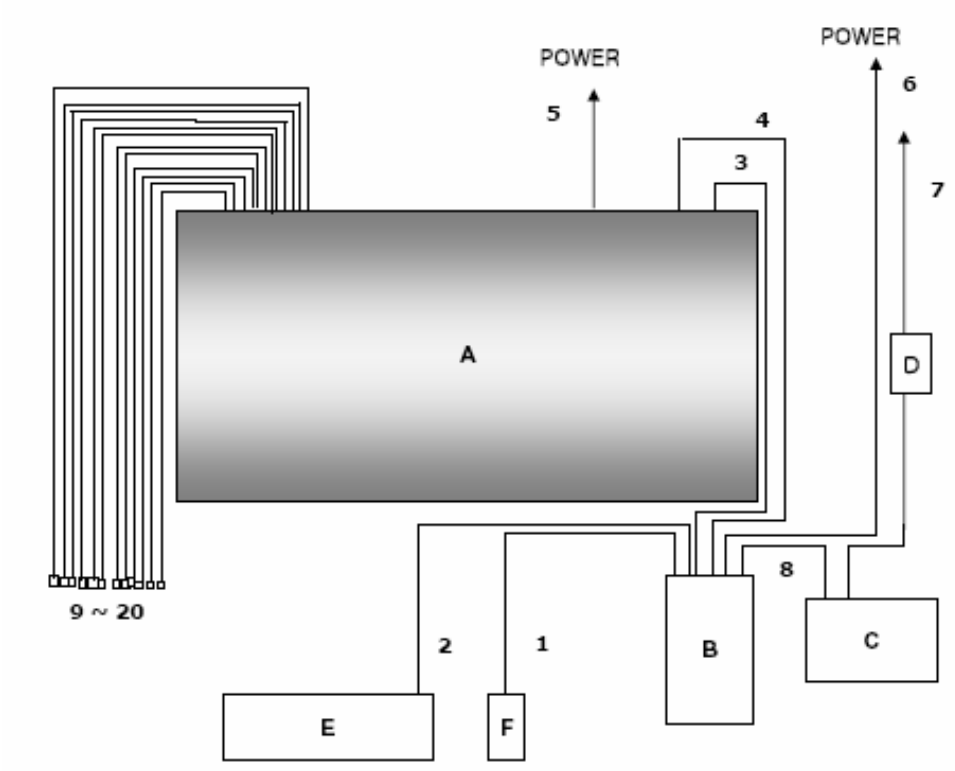
Block Diagram



1.6 Applied Standards

List

Product or Generic Standards	Basic Standards
FCC Part15 Subpart B	ANSI 63.4 : 2000

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1.7 Test Facility

General Information

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 22, 16-1, 16-2, 11.

This EMC Testing Lab. 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).

This Lab. is operated as testing laboratory in accordance with the requirements of ISO/IEC 17025:1998.

Accreditation and Listing

Uncertainty (According to NAMAS Pub.NIS81)

Test Item	Expanded Uncertainty
Radiated Disturbance	5.09
Disturbance voltage at the mains terminals	1.64
Disturbance Power	2.46

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2. Summary of Test Results

Result : PASS

The equipment under test(EUT) has been found to comply with the applied standards.

Test Name		Applied Standard	Result
Electromagnetic Emission Test			
3.1	Conducted Emission	FCC Part15 Subpart B	Complied
3.2	Radiated Emission	FCC Part15 Subpart B	Complied

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3. Description of Individual Tests

3.1 Conducted Emission

Test Information		
	Test Engineer	Sung Wook Choi
	Test Date	June 16, 2004
	Climate Condition	Ambient Temperature : 23℃ Relative Humidity : 37%
	Test Place	Shield Room #5

Test Equipments

Equipment	Modal Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Spectrum Analyzer	E7405A	Agilent	US4110272	2005-07-14	12
L.I.S.N	ESH3-Z5	R&S	100261	2004-07-16	12
Field strength meter	ESS	R&S	844661	2005-05-31	12
RF Relais Matrix	PSU	R&S	861206/024	N/A	12
L.I.S.N	ESH3-Z5	R&S	100260	2004-07-16	12
Test Software	EP5CE	TOYO	None	N/A	N/A

EUT Test Setup

The EUT was set up as per normal use on a wooden table 0.4m from a vertical ground reference plane, at least 0.8m from other conduction surfaces and 0.8m from the LISN.

See photo..

Test Result

Measurement Results	Pass No Operation errors were detected during or after the applied test.

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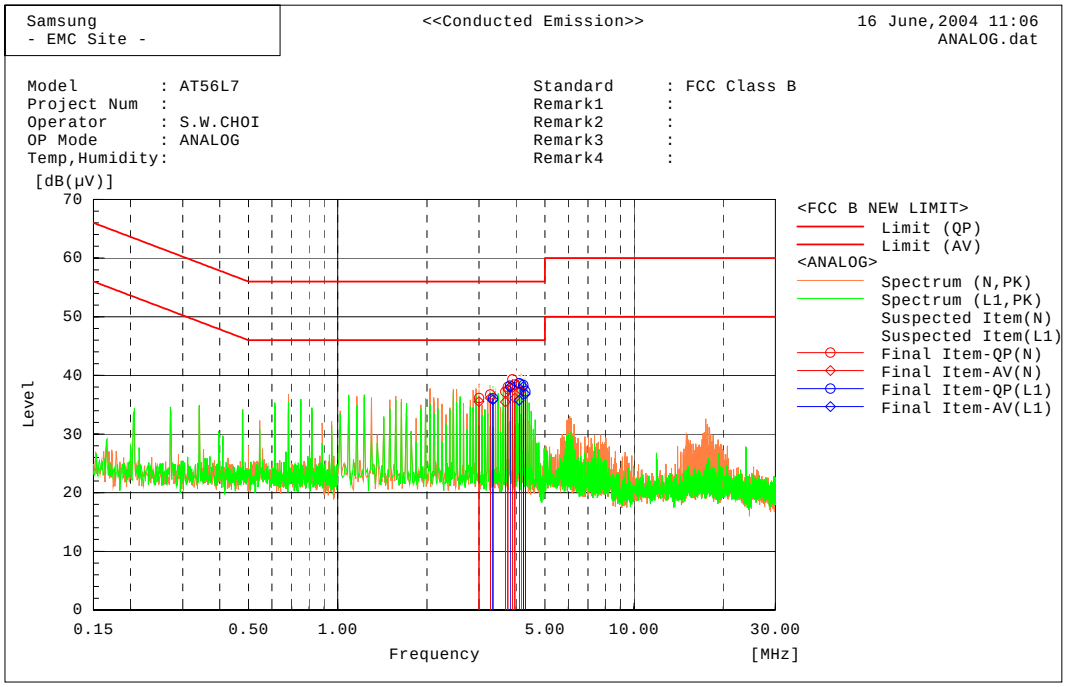
Test Data

■ Operating Mode : Analog

[Graph and Data]



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	3.0014	36.0	35.4	0.1	36.1	35.5	56.0	46.0	19.9	10.5
2	3.2738	36.7	36.0	0.1	36.8	36.1	56.0	46.0	19.2	9.9
3	3.6827	37.1	35.4	0.1	37.2	35.5	56.0	46.0	18.8	10.5
4	3.7514	38.0	37.4	0.1	38.1	37.5	56.0	46.0	17.9	8.5
5	3.8875	39.2	37.8	0.1	39.3	37.9	56.0	46.0	16.7	8.1
6	3.9566	38.3	36.0	0.1	38.4	36.1	56.0	46.0	17.6	9.9
7	4.1601	38.4	37.3	0.1	38.5	37.4	56.0	46.0	17.5	8.6

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	3.342	36.0	35.8	0.1	36.1	35.9	56.0	46.0	19.9	10.1
2	3.8199	38.1	37.9	0.1	38.2	38.0	56.0	46.0	17.8	8.0
3	4.0921	38.6	35.6	0.1	38.7	35.7	56.0	46.0	17.3	10.3
4	4.2288	38.3	38.0	0.1	38.4	38.1	56.0	46.0	17.6	8.0
5	4.2967	37.3	36.8	0.0	37.3	36.8	56.0	46.0	18.7	9.2

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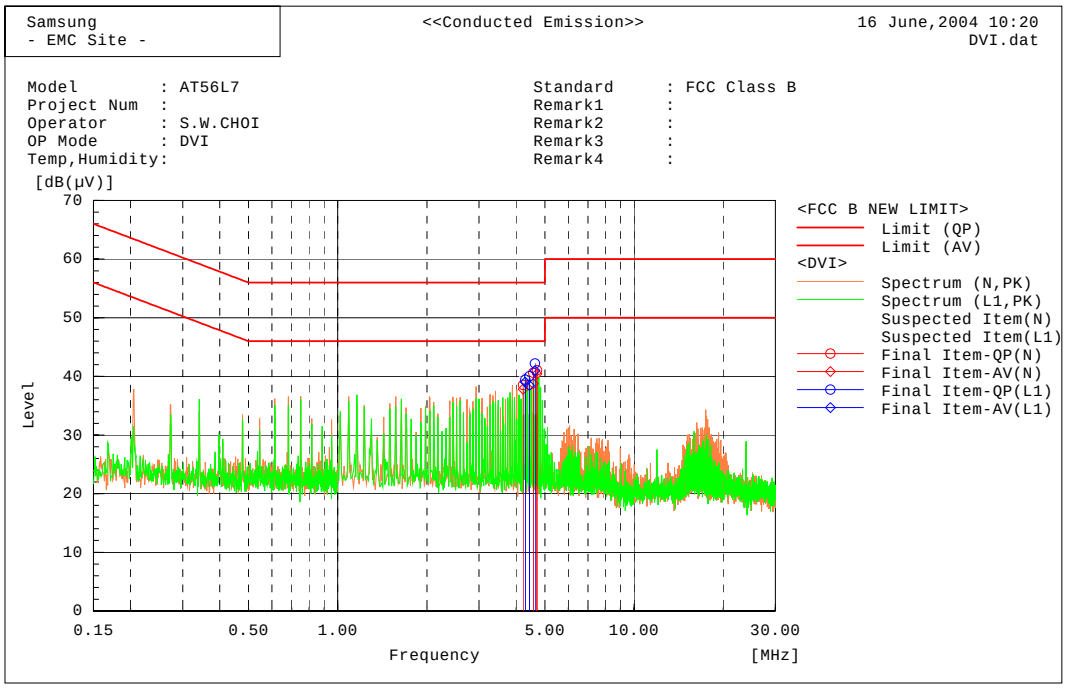
■ Operating Mode : DVI

[Graph and Data]



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	4.2265	38.5	37.7	0.1	38.6	37.8	56.0	46.0	17.4	8.2
2	4.5671	40.6	38.8	0.0	40.6	38.8	56.0	46.0	15.4	7.2
3	4.7042	41.1	40.4	0.0	41.1	40.4	56.0	46.0	15.0	5.6

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	4.2955	39.5	39.0	0.0	39.5	39.0	56.0	46.0	16.6	7.0
2	4.4324	40.0	38.4	0.0	40.0	38.4	56.0	46.0	16.0	7.6
3	4.6366	42.2	41.0	0.0	42.2	41.0	56.0	46.0	13.8	5.0

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3.2 Radiated Emission

Test Information		
	Test Engineer	Sung Wook Choi
	Test Date	June 15, 2004
	Climate Condition	Ambient Temperature : 23℃ Relative Humidity : 37%
	Test Place	10m Semi-anechoic chamber

Test Equipments

Equipment	Modal Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Field strength meter	ESCS	R&S	100104	2004-10-17	12
RF Selector	NS4900	TOYO	0303-015	N/A	N/A
Biconilog Antenna	6112B	SCHAFFNER	2766	2005-06-03	12
Mast Controller	HD2000	HD	HD20000902027	N/A	N/A
Test Software	EP5RE	TOYO	None	N/A	12
Spectrum Analyzer	E7405A	Agilent	MY42000109	2004-11-27	12

EUT Test Setup

EUT set up in semi-anechoic chamber. EUT positioned at 3m from antenna in center of table. All ports terminated into characteristic loads.

Test Result

Measurement Results	Pass No Operation errors were detected during or after the applied test.

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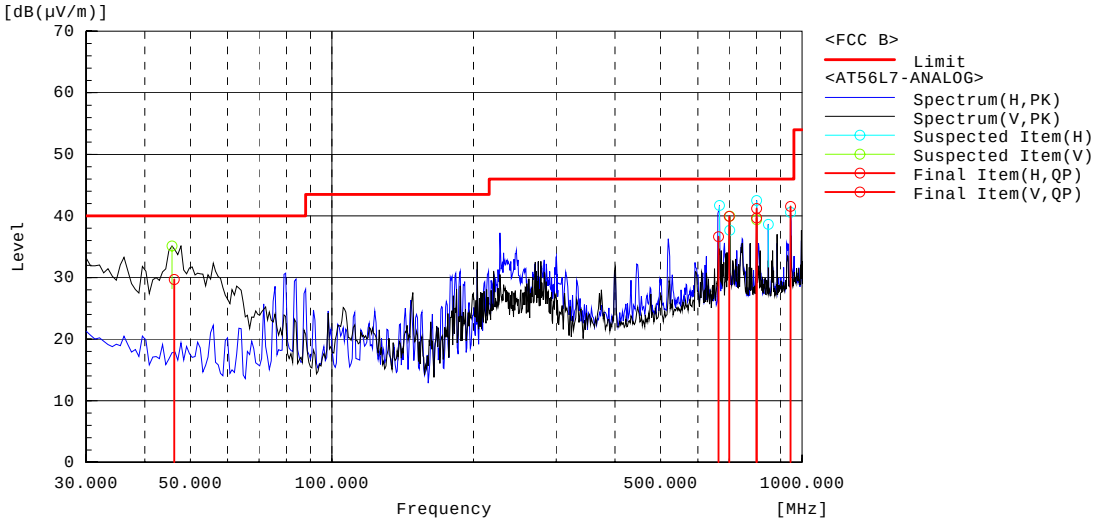
Test Data (Other Frequency)

■ Operating Mode : Analog Low_1G

SAMSUNG EMC LAB. <<Radiated Emission>> AT56L7-ANALOG.dat

Model :
Serial : -
Operator :
AC Power :
Temp,Humidity:

Standard : FCC Part.15 Class B 3m
Project Num :
OP Mode :
Remark3 :
Remark4 :



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]	Remark
1	800.010	42.2	-1.0	41.2	46.0	4.8	
2	664.610	39.2	-2.6	36.6	46.0	9.4	
3	944.960	39.8	1.8	41.6	46.0	4.4	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	46.200	46.8	-17.1	29.7	40.0	10.3	
2	700.000	41.8	-1.8	40.0	46.0	6.1	
3	800.010	40.7	-1.0	39.7	46.0	6.3	

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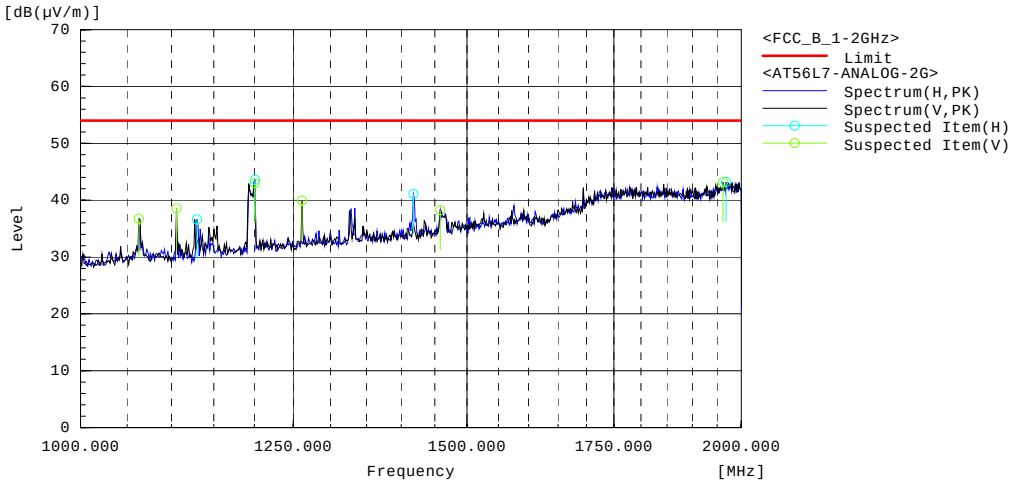
■ Operating Mode : Analog_Upper 1GHz

SAMSUNG EMC LAB. <<Radiated Emission>> AT56L7-ANALOG-2G.dat

Model : 15 June,2004 15:46
Serial : -
Operator :
AC Power :
Temp,Humidity:

Standard : FCC Part.15 Class B 3m
Project Num :
OP Mode :
Remark3 :
Remark4 :



Spectrum Selection

--- Horizontal Polarization ---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	1200.738	37.6	6.0	43.6	54.0	10.4	
2	1968.387	23.2	20.0	43.2	54.0	10.8	
3	1417.887	31.8	9.3	41.1	54.0	12.9	
4	1130.038	31.9	4.7	36.6	54.0	17.4	

--- Vertical Polarization ---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	1962.075	23.3	19.9	43.2	54.0	10.8	
2	1200.738	37.0	6.0	43.0	54.0	11.0	
3	1261.337	32.9	7.0	39.9	54.0	14.1	
4	1106.050	34.2	4.4	38.6	54.0	15.4	
5	1458.287	28.0	10.2	38.2	54.0	15.8	
6	1063.125	33.1	3.7	36.8	54.0	17.2	

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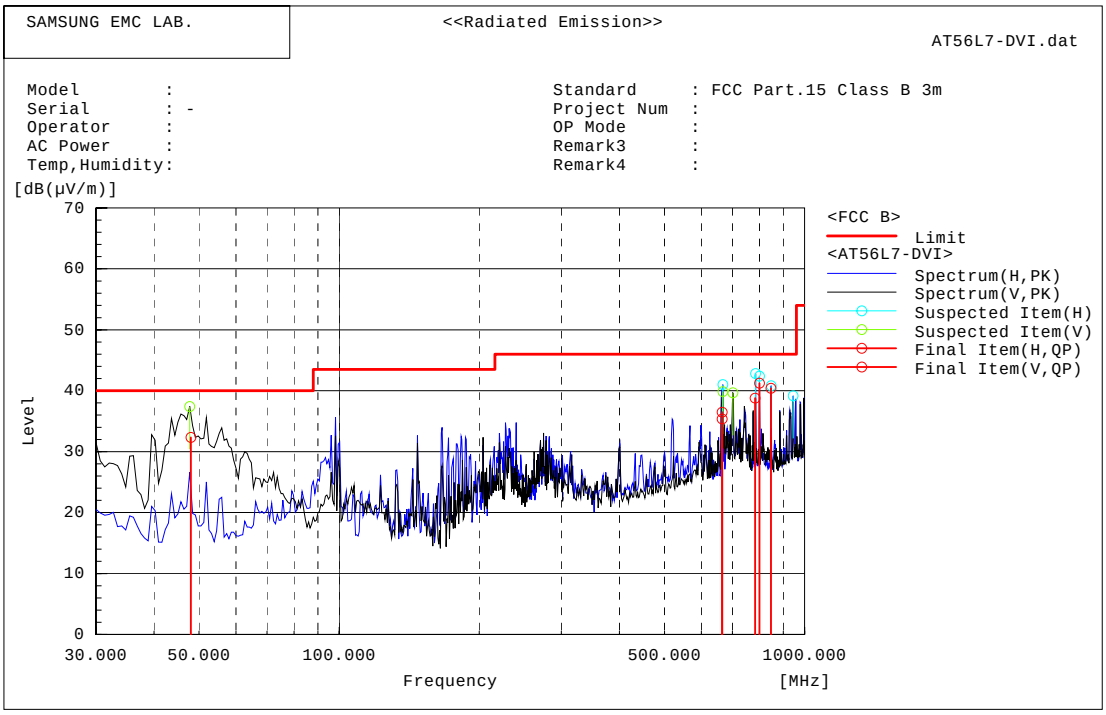
■ Operating Mode : DVI_Lower 1GHz



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]	Remark
1	783.000	39.9	-1.1	38.8	46.0	7.2	
2	800.010	42.2	-1.0	41.2	46.0	4.8	
3	664.790	39.1	-2.6	36.5	46.0	9.5	
4	847.030	41.0	-0.6	40.4	46.0	5.6	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	48.002	50.2	-17.9	32.3	40.0	7.7	
2	665.230	38.0	-2.6	35.4	46.0	10.6	

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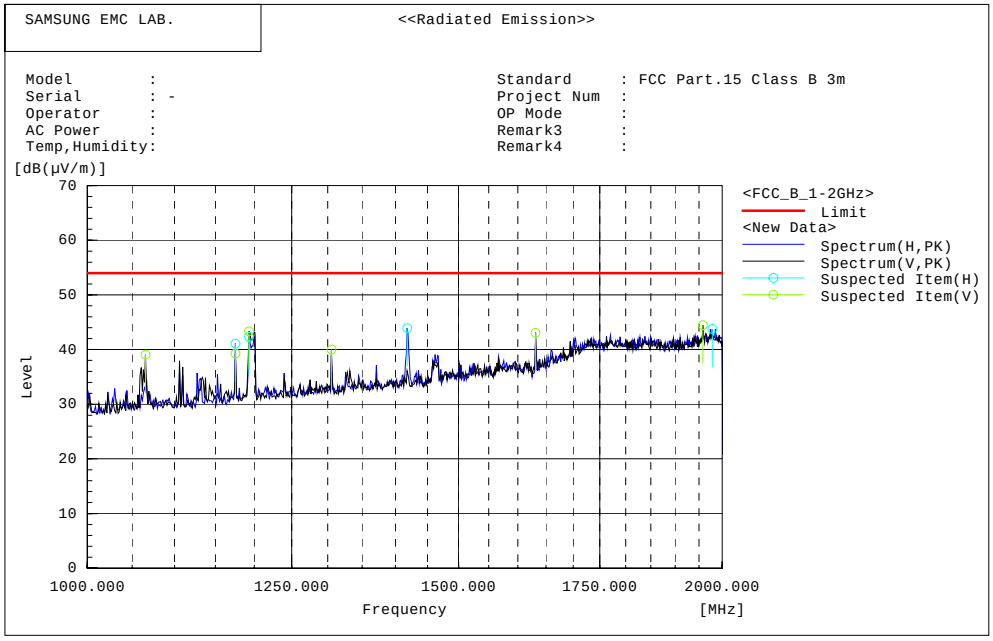
■ Operating Mode : DVI_ Upper 1GHz



Spectrum Selection

--- Horizontal Polarization ---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	1417.887	34.6	9.3	43.9	54.0	10.1	
2	1978.487	23.6	20.2	43.8	54.0	10.2	
3	1193.163	36.6	5.8	42.4	54.0	11.6	
4	1175.488	35.7	5.4	41.1	54.0	12.9	

--- Vertical Polarization ---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	1958.287	24.7	19.8	44.5	54.0	9.5	
2	1193.163	37.5	5.8	43.3	54.0	10.7	
3	1631.300	29.6	13.5	43.1	54.0	10.9	
4	1305.525	32.3	7.7	40.0	54.0	14.0	
5	1175.488	33.9	5.4	39.3	54.0	14.7	
6	1065.650	35.3	3.8	39.1	54.0	14.9	

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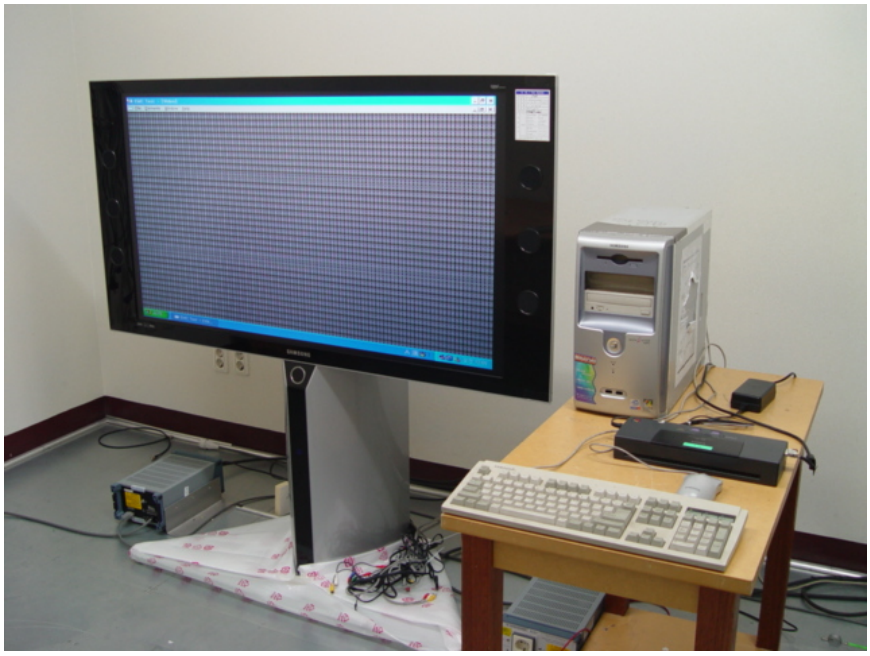
4. Appendix A

4.1 Test Photography



Picture 1. Conducted Emission (Front)

Picture 2. Conducted Emission (Rear)

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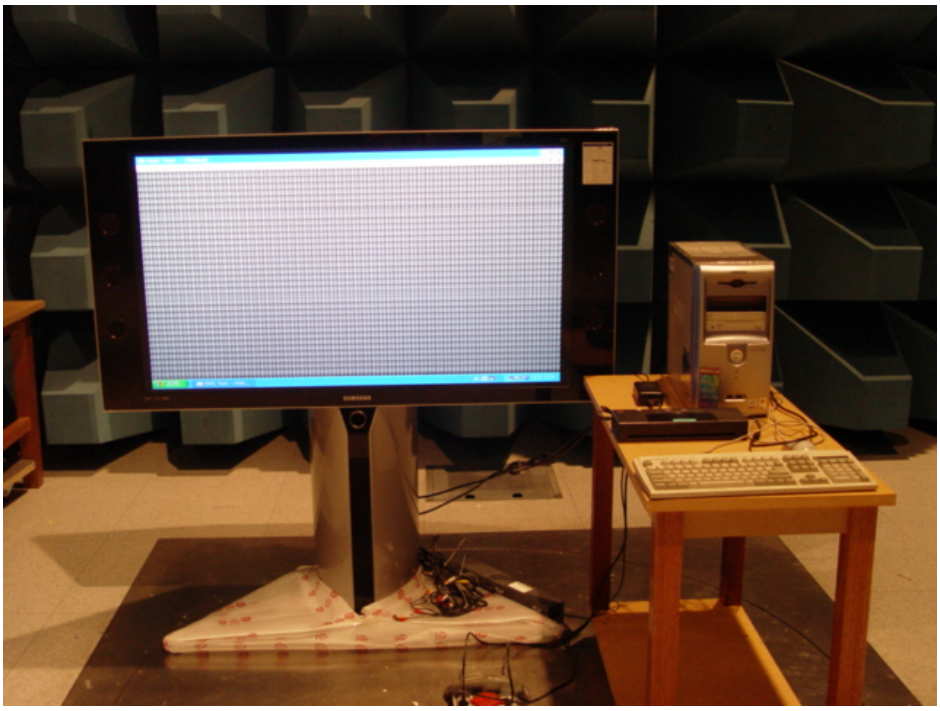
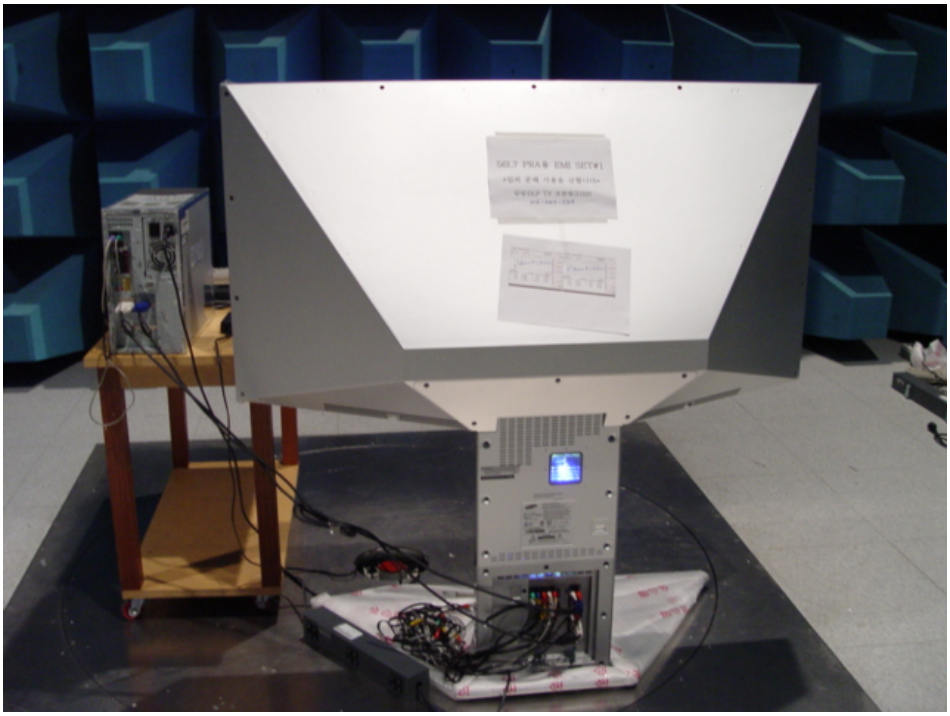


Picture 3. Radiated Emission (Front)



Picture 4. Radiated Emission (Rear)

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4.2 EUT Photography

Picture 5. EUT (Front)

Picture 6. EUT (Rear)

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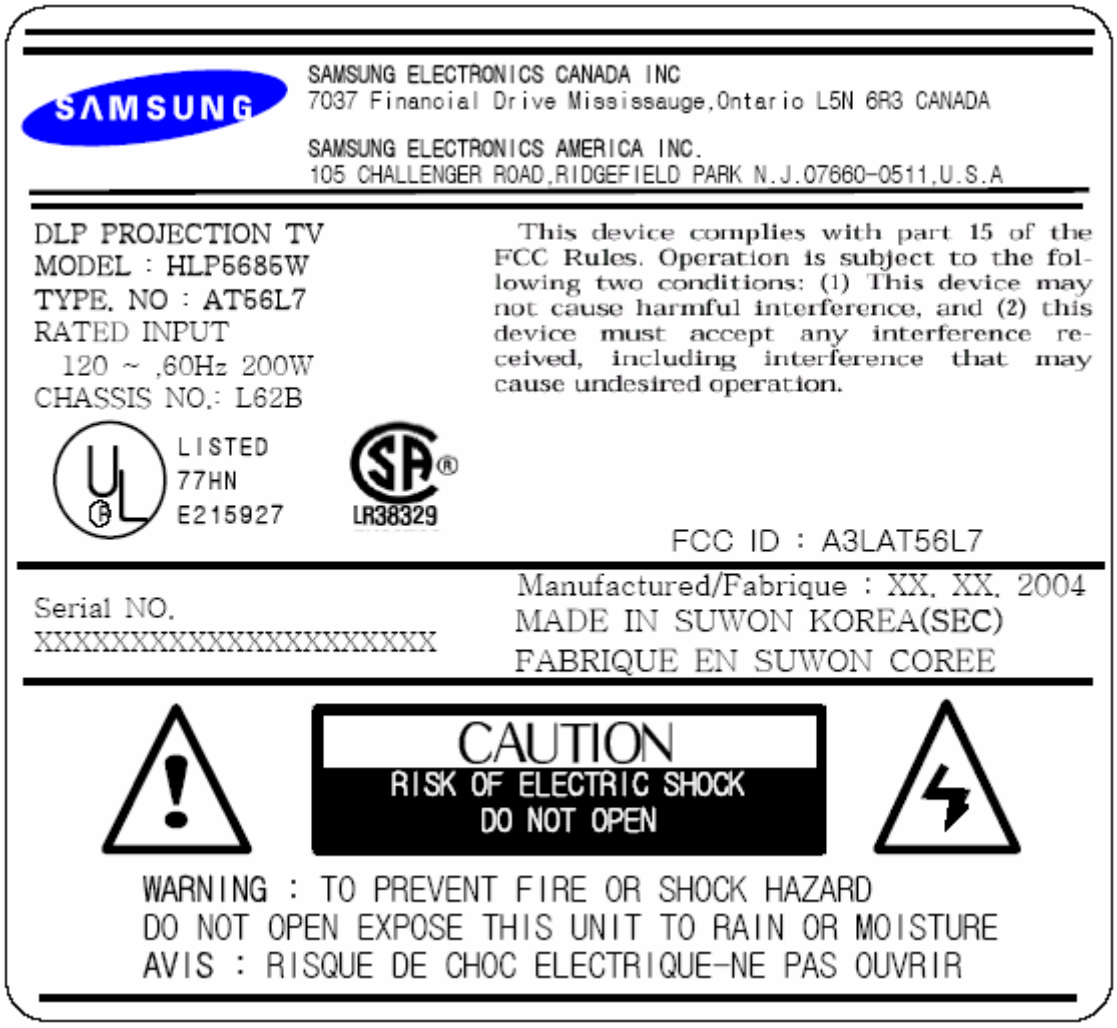

Pic. 7 EUT (Label)

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