

EMI TEST REPORT

According to FCC Part 15 Subpart B/Class B

Product : Laser Beam Printer

Model No. : ML-1710P

FCC ID : A3LML-1710P

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3. 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.
4. That data in this report are traceable to National or International Standards.

Date of test : December 3, 2003

Issued Date : December 3, 2003

Tested by:

Choon Kil, KIM / Test Engineer of EMC Lab.

Reviewed by:

No Cheon, PARK / Manager of EMC Lab.

Authorized by:

Kyu Baek, CHUNG / Chief of EMC Lab.

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 Code: 200623-

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Distribution

This test report has been made available as follows:

CS Management Center, EMC Laboratory	1 original
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1. General Information

Applicant : **Samsung Electronics Co., Ltd.**

Full Address : **416 Maetan 3 Dong, YeoungTon-Ku,
Suwon City, Kyungki Do, Korea, 442-742**

Kind of Product : **Laser Beam Printer**

FCC ID : **A3LML-1710P**

Project Name : **-**

Model & Variant Names : **ML-1510P** (Brand : Samsung)
Phaser 3121 (Brand : Xerox)

Remark) Variant Model ML-1510P is identical to the Basic Model ML-1710P except for printing speed as 14ppm, A4.

Variant Model Phaser 3121 is identical to the Basic Model ML-1710P except for Model and Brand Name.

Test Report Produced by : Choon Kil, KIM / Test Engineer of EMC Lab.

1.1 Product Description

1) Justification

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

In each test mode, Finally we found worst case emission that is above configuration with the Worst case components(in the above table). So, the DATA of the maximum EUT operation was reported.

Further details of cabling and configuration are shown in the test system configuration.

2) Operating Frequency :

Video Clock: 14.7456 MHz
Main Clock : 10 MHz
CPU Clock : 48 MHz
SD-RAM : 66 MHz

3) Description of Testing operating mode

Operating Mode	Operating section of EUT
USB Printing	Continuously H pattern printing by Computer
Parallel Printing	Continuously H pattern printing by Computer

EUT was tested all operating mode as above. Finally EUT was tested USB Printing mode as maximum emission.

4) Tested Resolution : N/A

Tested Video mode	Resolutions	Refresh rates	Colors

5) Manufacturer : Samsung Electronics Co., Ltd.

259, Gongdan-Dong, Gumi-City, Kyung-Buk, 730-030, Korea

Shandong Samsung Telecommunications Co. Ltd.

Sanxing Road, Weihai Hi-Tech. IDZ Shandong Province, 264209
China

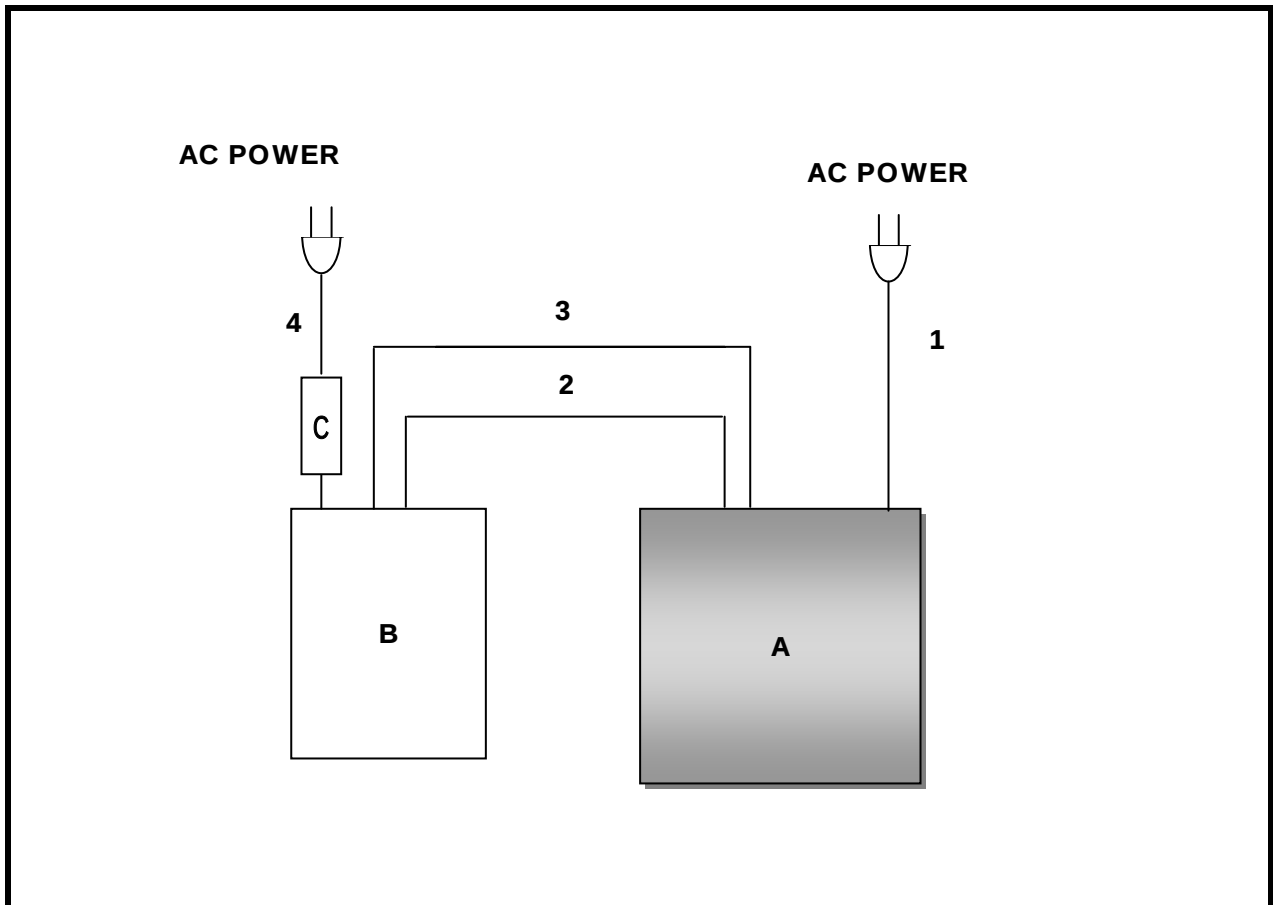
1.2 Configuration of EUT and peripherals

[illegible]

1.3 Used Cable Description

No.	Item	Length[m]	Shielded (Y/N)	Remark
1	AC Power Cable	1.7	N	For EUT
2	USB Cable	1.5	Y	-
3	Parallel Cable	1.5	Y	-
4	AC Power Cable	1.5	N	For PC

1.4 System Block Diagram of Test Configuration



1.5 Test Facility

All test described in this report were performed by :
SAMSUNG ELECTRONICS CO., LTD.
EMC TESTING LABORATORY
416 Maetan 3 Dong, Paldal-Ku, Suwon City, Kyungki Do, Korea, 442-742
Semi Anechoic Chamber #2(Registration Number:873282) and Shielded Room.

This test facility has been filed in FCC under the criteria in ANSI C63.4-1995.

2. System Test Configuration

2.1 Configuration of Radiated and Conducted Interference Measurement

* Cabling was taken into consideration and test data was taken under worse case conditions.

1)Conduction(Front View)



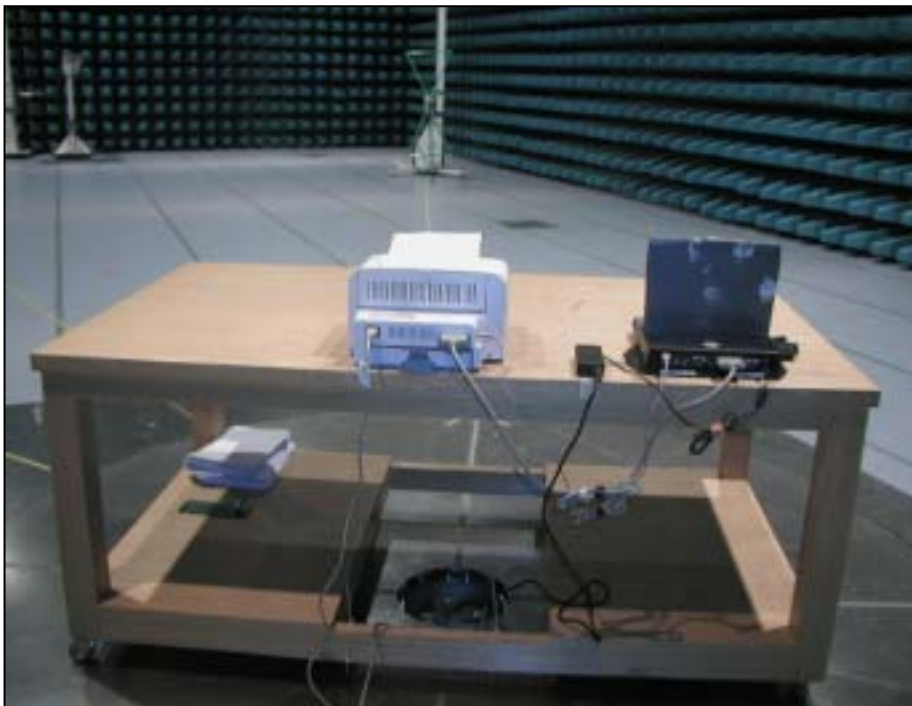
2)Conduction(Rear View)



3) Radiation(Front View)



4) Radiation(Rear View)



2.2 Operation Environment

	Conduction	Radiation
Temperature [C] :	22.9	20
Humidity [%]	22	50
Power supply	: AC110V/60Hz	AC110V/60Hz

2.3 Test Procedure

2.3.1 Conducted Emissions

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting ground plane.

The rear of EUT, including peripherals was aligned and flush with rear of tabletop. All other surfaces of tabletop was at least 80cm from any other grounded conducting surface. I/O cables and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

Each EUT current-carrying power lead, except the ground(safety) lead, were individually connected through a LISN to the input power source.

All unused 50 ohm connectors of the LISN were resistively terminated in 50 ohm when not connected to the measuring equipment.

The EUT was switched on and allowed to warm up to its normal operating condition.

A quick scan, from 150kHz to 30MHz, was made on the L1 & L2 line by LISN.

High peaks, relative to the limit line, over the frequency range were then selected.

The EMI TEST RECEIVER was then tuned to the selected frequencies.

CISPR quasi-peak measurements with a receiver bandwidth setting of 10kHz, were taken.

2.3.2 Radiated Emissions

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.

The rear of EUT, including peripherals was aligned and flush with rear of tabletop. I/O cables that were connected to the peripherals were bundle in center.

They were folded back and forth forming a bundle 30cm to 40cm long and were hanged 40cm height to the ground plane.

The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000 MHz using biconiLog antenna.

Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment; powering the monitor from the floor mounted outlet box and the computer aux AC outlet if applicable, and changing the polarity of the antenna; whichever determined the worst-case emission.

3. Conducted Emission Test Data

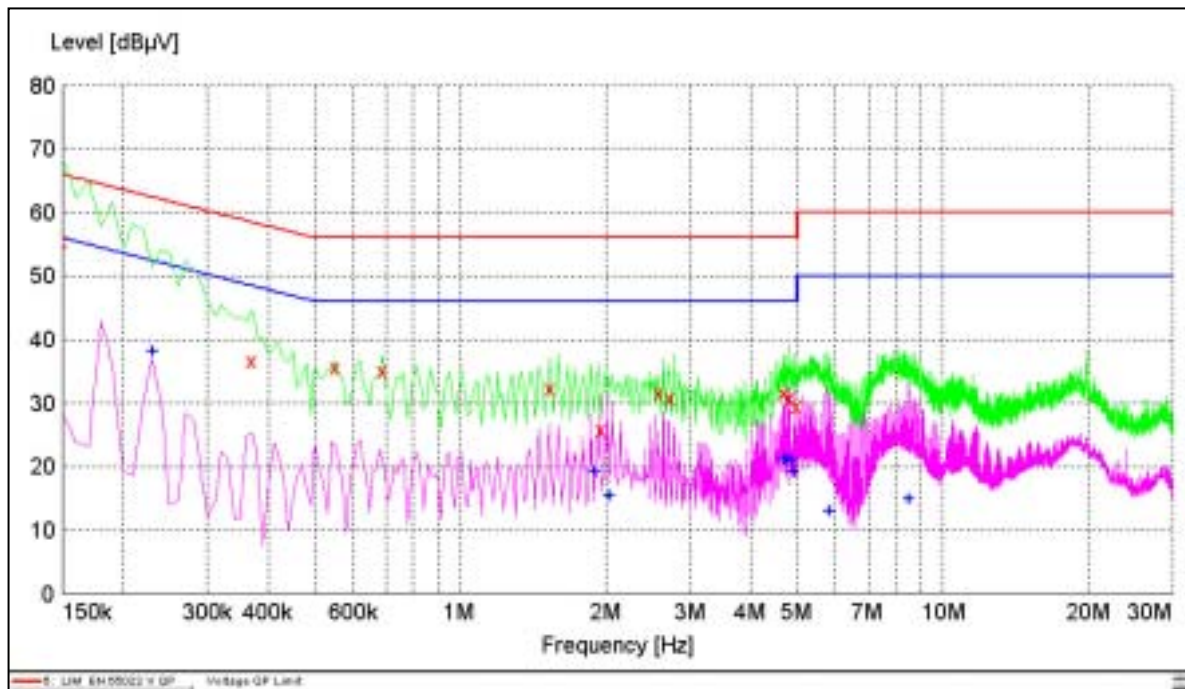
O Test Mode : USB Printing

Frequency [MHz]	Meter reading (a)		Total Loss (b) [dB]	Results (a) + (b)		Limits		Margin (Limits-Result)	
	QP	AV		QP	AV	QP	AV	QP	AV
	[dBuV]			[dBuV]		[dBuV]		[dB]	
0.150	55.6	-	0.6	56.2	-	66.0	56.0	9.8	-
0.230	-	38.3	0.6	-	38.9	62.4	52.4	-	13.5
0.370	36.6	-	0.5	37.1	-	58.5	48.5	21.4	-
0.550	35.7	-	0.6	36.3	-	56.0	46.0	19.7	-
0.690	35.1	-	0.5	35.6	-	56.0	46.0	20.4	-
1.540	32.4	-	0.5	32.9	-	56.0	46.0	23.1	-
1.960	26.0	-	0.6	26.6	-	56.0	46.0	29.4	-
2.730	30.8	-	0.5	31.3	-	56.0	46.0	24.7	-
4.830	30.8	21.2	0.8	31.6	22.0	56.0	46.0	24.4	24.0
5.820	-	13.0	0.9	-	13.9	60.0	50.0	-	36.1
8.480	-	15.0	1.1	-	16.1	60.0	50.0	-	33.9

* Results = Meter Reading(QP) + Total Loss(LISN Insertion loss + Cable loss)

* Margin = Limits - Result

3-1. Conducted Emission Test Graph



4. Radiated Emission Test Data

Frequency Range	Tested Frequency	ANT Pol.	Meter Reading [A]	Total Loss [B]	Antenna Height	Turn table Degree	Results [A+B]	Limits at 10m	Margin (Limit-Result)
[MHz]	[MHz]		[dBuV/m]		[Cm]	[Deg]	[dBuV/m]	[dBuV/m]	[dB]
30 - 230									
	37.200	V	7.7	15.2	100	269	22.9	30.0	7.1
	39.520	V	5.4	13.9	103	180	19.3	30.0	10.7
	57.600	V	12.0	7.0	303	160	19.0	30.0	11.0
	100.000	H	9.3	12.0	286	180	21.3	30.0	8.7
	140.080	V	5.7	12.3	184	332	18.0	30.0	12.0
	198.320	V	5.0	10.9	100	329	15.9	30.0	14.1
	218.880	V	8.1	10.5	104	297	18.6	30.0	11.4
	221.760	V	6.3	10.9	139	321	17.2	30.0	12.8
	226.560	V	5.1	11.4	112	309	16.5	30.0	13.5
	229.600	V	6.5	11.9	147	325	18.4	30.0	11.6
230 - 1000									
	726.960	H	2.0	24.3	107	240	26.3	37.0	10.7
	919.120	V	-0.3	25.4	128	240	25.1	37.0	11.9

* "<" Means equal or less then 5dB

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

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

* Measurement detector function and bandwidth

Detector function : CISPR quasi-peak(Above 1000MHz: Peak)

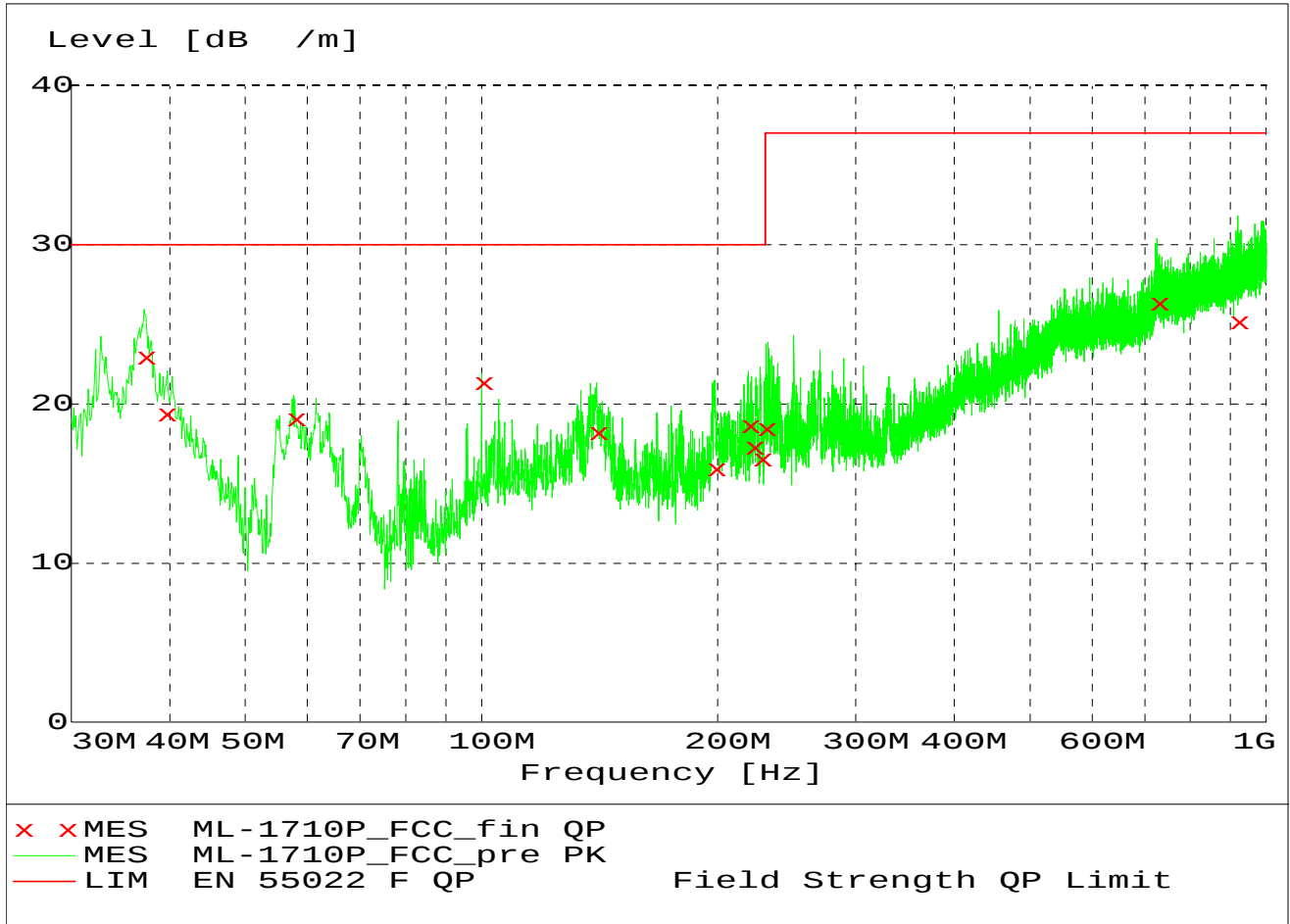
Resolution Bandwidth : 120kHz(Above 1000MHz: 1MHz)

* Test distance

- Below 1000MHz: 10m(Quasi-peak)

- Above 1000MHz: 10m(Peak)

4-2. Radiated Emission Test Graph



5. FCC Label Configuration and Location

5.1 Label Configuration

	Model No. ML-1710P	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: 1) This device may not cause harmful interference, and 2) This device must accept any interference received, including interference that may cause undesired operation. FCC ID: A3LML-1710P This product complies with 21 CFR Chapter 1, subchapter J. COMPANY NAME: Samsung Electronics Co., Ltd. ADDRESS: 259, Gongdeon-Dong, Gumi-City, Kyung-Buk, 730-030, Korea Place M269 This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada. MADE IN KOREA J508-00004R Rev.3.0
	Volts AC 110-127V	
Hertz 50/60Hz		
Amps 4.0A		
Manufactured AUGUST 2003		LISTED 51Y7 E149091 I.T.E.
Serial No.:		'SYP-01'

5.2 Location of Label



6. Test Equipment Used

Equipment	Model No.	Serial No.	Makers	Calibration Last calibration and Interval
Field strength meter	ESCS30	830986/004	R & S	03/04/03, 12Months
	Firmware versions : Main 1.08, OTP 02.01, GRA 02.03			
Field strength meter	ESI26	100019	R&S	03/07/09, 11Months
L.I.S.N	3810/2NM	EMCO	2251	03/02/07, 12Months
L.I.S.N	ESH3-Z5	831856/0006	R & S	03/02/07, 12Months
Bi-Log Antenna	CBL6112B	2805	Schaffner	03/04/02, 12Months

