

EMI TEST REPORT

Product : Notebook Computer

Model No. : StudyPro II

FCC ID : A3LNS2

DATE : May 24, 1999

SAMSUNG Reference NO. : 990548

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.

1. Applicant Name : SAMSUNG ELECTRONICS CO., LTD.
(Company name & Address) 416 Maetan 3 Dong, Paldal-Ku,
Suwon City, Kyungki Do, Korea,
442-742

2. Identification of tested device

2.1 FCC ID : A3LNS2
2.2 Device Name : Notebook Computer
2.3 Brand (Trade Name) : SAMSUNG
2.4 Model Number : StudyPro II

3. Test Procedure and Items

3.1 AC Powerline Conducted Emissions Measurement : ANSI C63.4-1992
3.2 Radiated Emissions Measurement : ANSI C63.4-1992

4. Issued Date : May 24, 1999

TESTED BY :N. G. Park
No-Cheon, PARK / Test Engineer**REVIEWED BY :**S. K. Cha
Seung-Kyu, CHA / Manager of EMC Lab.**APPROVED BY :**T. J. Shin
Taek-Jeong, SHIN / Chief of EMC Lab.

TABLE OF CONTENTS

1. GENERAL INFORMATION

- 1.1 Product Description
- 1.2 Grants
- 1.3 Tested System Details
- 1.4 Test Methodology
- 1.5 Test Facility

2. PRODUCT LABELING

3. SYSTEM TEST CONFIGURATION

- 3.1 Justification
- 3.2 Video Mode Justification
- 3.3 EUT Exercise Software
- 3.4 Special Accessories
- 3.5 Equipment Modification
- 3.6 Figure(Test System configuration)
- 3.7 Photographs

4. CONDUCTED EMISSION DATA

5. RADIATED EMISSION DATA

6. LIST OF TEST INSTRUMENT

1. General Information

1.1 Production Description

The Samsung Electronics Co., Ltd. Notebook Computer Model StudyPro II(FCC ID :A3LNS2)is based on the powerful pentium processor(CPU200MHz) and has internal clock speeds of 14.318, 24, 33 and 48MHz and internal Modem(56Kbps). It can be operated from rechargeable battery pack or by 100-120V AC Adapter(with ferrite bead). See attached StudyPro II User's Guide for more information.

1.2 Grants

N/A

1.3 Test System Details

The FCC IDs for all equipment plus descriptions of all cables used with the tested system (including inserted cards which have grant) are:

FCC ID	DESCRIPTION (Model Name)	CABLE DESCRIPTION
A3LNS2	EUT (StudyPro II)	-
EW425-1040D	Serial Mouse (25-1040D)	Unshielded Cable
N/A	AC Adapter (AD-2019)	Unshielded Power Cord (with Ferrite bead)
N/A	TelePhone (SSP-2501)	Unshielded Cable
DSI16XU222	Inkjet Printer (2225C+)	Unshielded Cable
N/A	HeadPhone (HP-100CD)	Unshielded Cable

1.4 Test Methodology

Both radiated and conducted tests were performed according to the procedure in ANSI C63.4. Radiated testing was performed at an antenna-to-EUT distance of three meters.

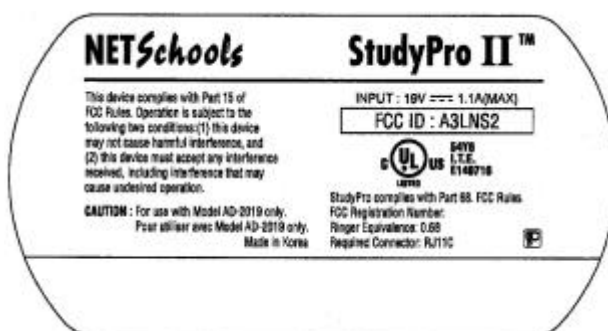
1.5 Test Facility

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, 441-742
Open field test site (3 meter) and Shielded Room.

This test facility has been filed in FCC under the criteria in ANSI C63.4-1992.

2. PRODUCT LABELING



3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in typical fashion (as a customer would use it). The EUT has internal clock speeds of 14.318, 24, 33 and 48MHz.

The EUT's video circuitry is capable of operating at a maximum non-interlaced resolution of 640*480 pixels. The EUT was observed while scrolling a continuous stream for capital "H's" in the 640*480 resolution mode. The EUT has no external Monitor Port.

The EUT was tested with a Samsung AC Adapter Model number AD-2019. Further details of cabling and configuration are shown in the test system configuration.

3.2 Video Mode Justification

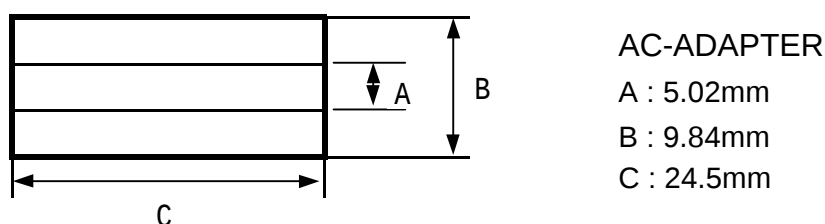
The system was tested in 640*480 resolution mode and in the highest resolution mode of 640*480. This mode was used to collect the included data. The EUT has no external monitor port.

3.3 EUT Exercise Software

The EUT exercise program used during testing was designed to exercise the system in a manner similar to a typical use. This program was stored in Flash Memory. Once loaded, the program sequentially exercise each system component in turn. The sequence used was : 1) serial "H's" scrolled to the LCD(10.0"); 2) copy series of H characters to mass storage device. 3) print series of H characters to printer. Since the mouse and headphone are strictly input device, no data was transmitted to them during testing. They are, however, continuously scanned for data input activity.

3.4 Special Accessories

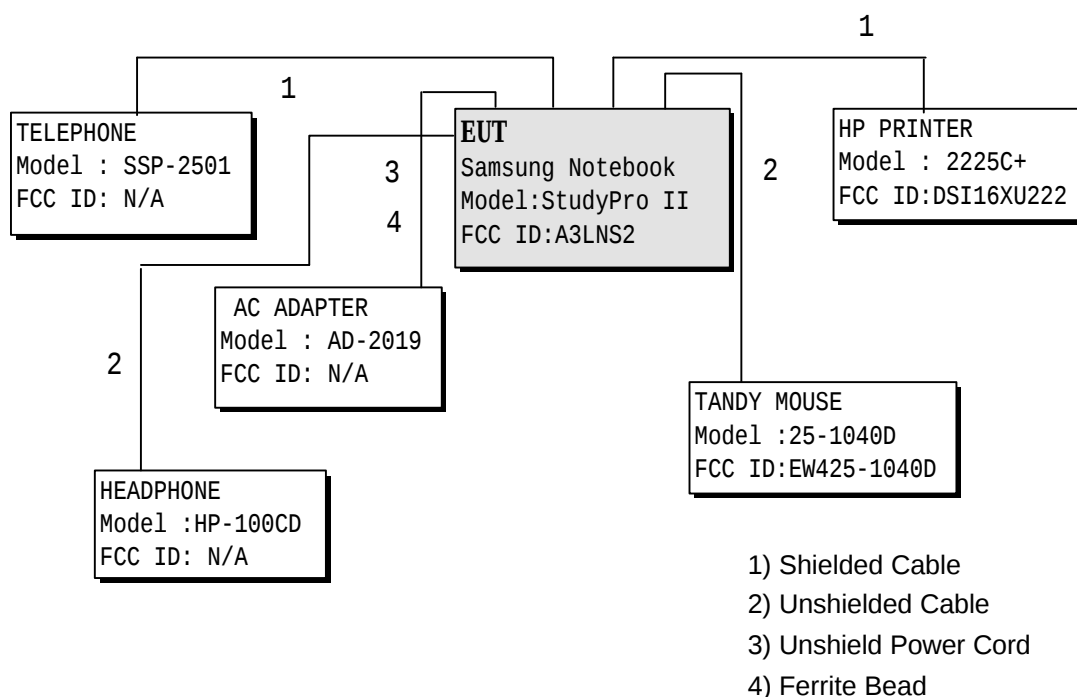
As shown in Figure 3.1, all interface cables used for compliance testing are unshielded as normally supplied by the manufacturer. The Samsung AC adapter cable has a ferrite bead on the line. The following is ferrite specification.



3.5 Equipment Modifications

No equipment modifications were performed during testing.

3.6 Test System configuration

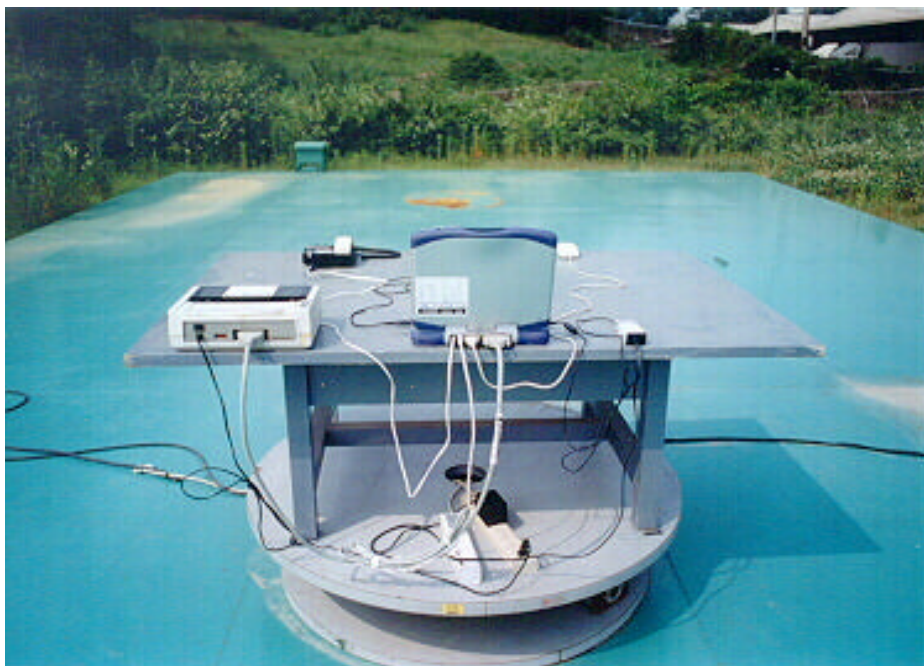


3.7 Photographs

Radiation(Front View)



Radiation(Rear View)



Conduction(Front View)



Conduction(Side View)



4. CONDUCTED EMISSION DATA

The initial step in collecting conducted data was to perform a quasi-peak scan over the measurement range using a spectrum analyzer.

Sample Calculation

Frequency : 0.469 [MHz]
Meter Reading : 41.9 [dBuV] <--- Maximum Meter Reading
Factor of LISN : 0.1 [dB]

Then, Result is calculated as follows.

$$41.9 + 0.1 = 42.0 \text{ [dBuV]}$$

Test Data Sheet

Tested Frequency [MHz]	Meter Reading [A] [dBuV]	LISN Pol. [L,N]	Total Loss	Results	Limits [dBuV]	FCC Margin [dB]
			[B]	[A+B]		
			[dB]	[dBuV]		
0.469	41.9	N	0.1	42.0	48.0	6.0
0.481	40.8	L	0.1	40.9	48.0	7.1
0.603	38.4	N	0.1	38.5	48.0	9.5
2.244	41.5	L	0.1	41.6	48.0	6.4
2.251	42.9	N	0.1	43.0	48.0	5.0
14.556	36.3	L	0.1	36.4	48.0	11.6

[NOTE] LISN : "L": Live , "N": Neutral

5. RADIATED EMISSION DATA

The initial step in collecting radiated data was to perform a quasi-peak scan over the measurement range using a spectrum analyzer. All modes of operation were investigated and the worst-case emission are reported.
All other emission are non-significant.

Sample Calculation

Frequency : 47.8 [MHz]
Meter Reading : 20.4 [dBuV] <--- Maximum Meter Reading
Total of Loss : 11.7 [dB]

Then, Result is calculated as follows.

$$20.4 + 11.7 = 32.1 \text{ [dBuV]}$$

Test Data Sheet

Frequency Range [MHz]	Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Total Loss [B] [dB]	Results [A+B] [dBuV/m]	Limits [3m] [dBuV/m]
30 - 88	47.8	H	20.4	11.7	32.1	40.0
	53.5	H	20.5	11.18	31.7	
	58.6	H	21.4	9.6	31.0	
	65.4	H	10.9	9.3	20.2	
	72.9	H	21.9	9.15	31.1	
	86.2	V	20.4	9.5	29.9	
88 - 216	88.1	H	24.1	9.7	33.8	43.5
	112.9	H	23.6	9.6	33.2	
	139.1	V	23.7	9.8	33.5	
	159.6	H	20.0	10.4	30.4	
	178.5	V	24.3	11.2	35.5	
	192.5	H	16.2	11.8	28.0	
216 - 960	219.5	H	15.5	12.8	28.3	46.0
	259.5	V	24.5	14.6	39.1	
	299.2	H	19.3	16.6	35.9	
	320.3	V	24.1	16.7	40.8	
	339.9	V	20.9	16.9	37.8	
	359.5	V	20.5	17.3	37.8	
960 -	963.4	H	<6	27.6	-	54.0
	1214.3	H	<6	30.6	-	
	1689.1	H	<6	35.8	-	

[NOTE] "<" Means equal or less than

Receiving Antenna polarization : **Horizontal, Vertical**

6. LIST OF TEST INSTRUMENT.

Equipment	Model No.	Serial No.	Makers	Calibration and Interval
Spectrum analyzer	8566B	2607A2581	H.P	98/ 9/21, 12Months
Quasi-peak adapter	85650A	2521A00687	H.P	98/ 9/21, 12Months
RF Preselector	85685A	2602A00224	H.P	98/10/14, 12Months
Field strength meter	ESH3	882399/028	R & S	99/ 3/18, 12Months
Field strength meter	ESVP	880688/015	R & S	99/ 1/13, 12Months
L.I.S.N	3825/2R	1151	EMCO	98/ 8/14, 12Months
Biconilog antenna	3142	9712-1237	EMCO	98/12/17, 12Months
Double ridged waveguide	3115	4028	EMCO	98/10/11, 12Months