

EMI TEST REPORT

According to FCC Part 15 Subpart B/Class B

Product : Notebook PC

Model No. : 200STM

FCC ID : A3LSQ10R

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All tests necessary to show compliance to the requirements were and these results met the specifications requirement.

Date of test : August 30, 2002

Issued Date : September 05, 2002

Tested by:

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Reviewed by:

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NVLAP Code: 200447

Table of Contents

1. General Information

- 1.1 Product Description
- 1.2 Configuration of EUT and peripherals
- 1.3 Used Cable Description
- 1.4 System Block Diagram of Test Configuration
- 1.5 Test Facility

2. System Test Configuration

- 2.1 Configuration of Radiated and Conducted Interference Measurement
- 2.2 Operation Environment
- 2.3 Test Procedure

3. Conducted Emission Test Data

4. Radiated Emission Test Data

5. Label Configuration and Location

6. Test Equipment Used

Distribution

This test report has been made available as follows:

CS Management Center, EMC Laboratory	1 original
Computer Division	1 copy

1. General Information

Applicant : Samsung Electronics Co., Ltd.
CS Management Center EMC Test Laboratory
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Full Address : 416 Maetan 3 Dong, Paldal-Ku,
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Kind of Product : **Notebook PC**

FCC ID : **A3LSQ10R**

Project Name : **Storm / Gemini**

Model & Variant Names : **200STM** (Brand Name: Gateway)
Gateway 200 (Brand Name: Gateway)
Samsung Q10 (Brand Name: SAMSUNG)

Test Report Produced by : Tae Young Jang / Test Eng.

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.

2) Operating Frequency :

1000MHz(CPU CORE CLOCK), 165MHz(DV01_CLK), 133MHz(HOST CLOCK)
66MHz(GB CLOCK), 48MHz(DREF CLK), 65MHz(LCD CLOCK), 33MHz(PCI CLOCK)
133MHz(MEMORY CLOCK), 14.318(REF CLOCK), 25MHz(LOM LO)
24.576MHz(R5C511 LO), 14.318MHz(REF LO), 42.152MHz(ESS1988 LO)

3) Description of Testing operating mode

Operating Mode	Operating section of EUT
"H" Pattern display & Read / Write	LCD Screen
	Ext. CRT Monitor
	Hard disk drive(drive C), DVD Combo(Drive D)
	Floppy disk drive(drive A)
	Network (drive N)
	Flash Memory(drive P)
	COM2 to Internal Modem
	COM4 to Speedup USB Modem
File Reading & Audio Output	LPT1 to Printer
	Audio out to Speaker, digital speaker
	DVD Combo(drive E) Play out to speaker

4) Tested Resolution :

Tested Video mode	Resolutions	Refresh rates	Colors
LCD(12.1")	1024 X 768	60Hz	32bits
Ext. Monitor	1024 X 768	85Hz	32bits

5) Assemble Parts

Item	Specification	Remark
CPU	Intel Pentium IV 1000MHz uFCPGA2, Cache 512KB	Intel Mobile Pentium IV 1000Mhz 495 pin, BGA2
Main Chipset (RAM)	Intel 830M -133 MHz CPU/Memory Bus -128MB On Board/ Maximum 640MB With 1 SODIMM Slot	Main Board Rev. 1.5 RAM:256MB
Graphic Controller	Intel, Integrated In the 830M 8MB Video Buffer (UMA), DVMT	Intel 82830M-GMCH-M
Video Display	Samsung, LTN121XF-L01 12.1" XGA TFT LCD	
FDD	Samsung, SFD-321S/PC5	
HDD	Toshiba, MK4021GAS, 40GB, 2.5"	
Swap Device	Toshiba, DVD_CD-RW Combo Drive, SD-R2212	
Cardbus & IEEE1394 Cont.	Ricoh R5C551 CSP 208pin, 1 CardBus, 2 IEEE1394 Port	
Network(LAN)	3Com, 920-STT06	
(WLAN)	Intel, Trilogy-3 Wireless LAN Card, M3AWEB	FCC ID:J3OM3AWEB56GA
Communication Device	PCTEL, SENS PT56ADW MDC modem Yisotel, Speedup USB Modem, YM-4032K	
External Media Unit (SEM-Q10E)	Toshiba, DVD_CD-RW Combo Drive, SD-R2212	(IEEE 1394)
AC Adapter	Samsung, 42W , AD-4212B, 100V~240V Free Voltage	50Hz/60Hz
Battery	Toshiba, Removable 8-cell Li-Ion Smart, 26W	
Slice dock	IEEE1394 Signal for IDE Slot on Slice Dock -Fully Support Hot Dock/Undock -Left Bay: CD-ROM, DVD-ROM, CD-R/W, Combo Drive, 2nd HDD support -Right Bay: FDD -Ports : SIO, PIO, 2 USB, PS/2, NETWORK, DC IN, SPDIF, IEEE1394, CRT	MD-200STM, SSD-Q10E

1.2 Configuration of EUT and peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	FCC ID
A	Notebook PC	200STM	-	Samsung	A3LSQ10R
B	USB Mouse	M-U48a	LZP12500084	LOGITECH	JNZ211360
C	USB Mouse	M-U48a	LZE94654007	LOGITECH	JNZ211360
D	USB Mouse	M-U48a	LZE94654021	LOGITECH	JNZ211360
E	USB Mouse	M-U48a	LZO10703970	LOGITECH	JNZ211360
F	PS/2 Mouse	M-S34	LZA70957404	LOGITECH	DZL211029
G	Searial Mouse	M-M35	LZA71452614	LOGITECH	DOC
H	Printer	LQ-580H	CG2Y014532	EPSON	DOC
I	Ear phone	-	-	-	-
J	Digital Speaker	BA790	RO0001478	Boston	DOC
K	Digital Camcorder	DCR-PC110	1983343	Sony	-
L	Ext. Media Unit	SEM-Q10E	-	Samsung	DOC
M	Monitor	M17D-AN	N106H4JT100839	Samsung	DOC

1.3 Used Cable Description

No.	Item	Length[m]	Shielded (Y/N)	Remark
1	Power cable for EUT	3.52	N	
2	USB Mouse cable	1.5	N	
3	PS/2 Mouse cable	1.8	N	
4	Serial Mouse cable	1.82	N	
5	Printer cable	1.6	Y	
6	Power cable for printer	1.85	N	
7	Head Set cable	2	N	
8	Digital speaker cable 1	2.35	N	
9	Digital speaker cable 2	2.5	N	
10	Digital camcorder cable	1.8	N	
11	Ext. Media Unit cable	0.2	N	
12	Power cable for DVD-COMBO	1.85	N	
13	Monitor cable	1.85	Y	
14	Power cable for monitor	1.82	N	

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)



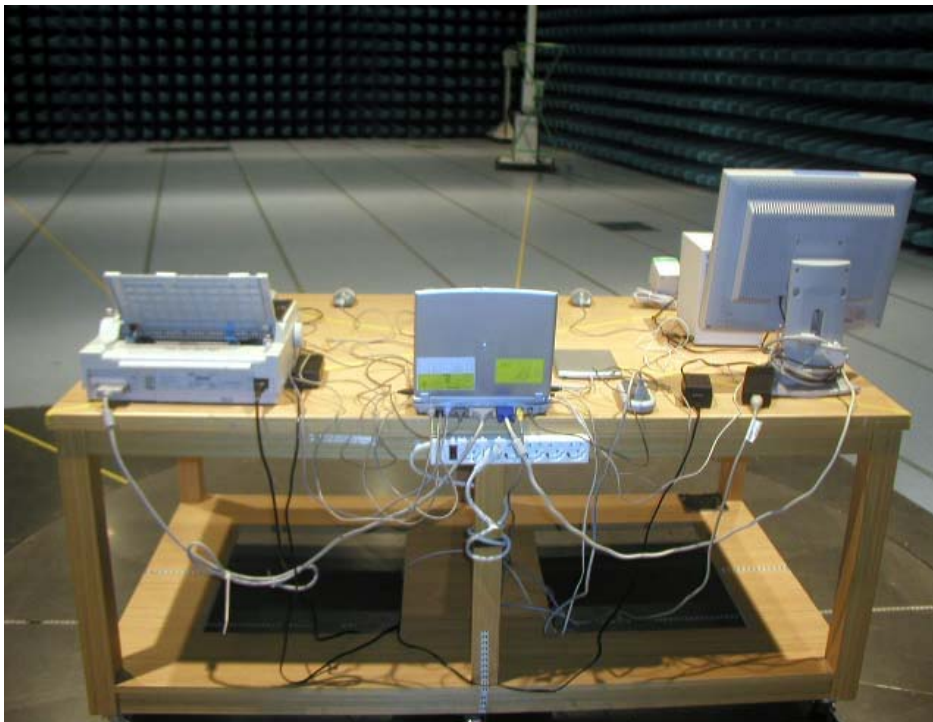
2)Conduction(Rear View)



3) Radiation(Front View)



4) Radiation(Rear View)



2.2 Operation Environment

	Conduction	Radiation
Temperature [C] :	22	23.5
Humidity [%]	48	52
Power supply	: AC120V/60Hz	AC120V/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 9kHz, 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 2000 MHz using biconiLog antenna.

Also, the EMI TEST RECEIVER was scanned from 1000 to 18000MHz using linearly polarized double ridge horn antennas were used.

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.

The explanation of measuring instrument setup when respective function is used in any frequency band is as following:

Frequency Band [MHz]	Instrument	Detector fuction	resolution Bandwidth	Video Bandwidth
30 to 1000	Spectrum analyzer	Peak	1MHz	1MHz
	EMI Test receiver	Quasi-Peak	120kHz	-
Above 1000	EMI Test receiver	Peak	1MHz	-

3. Conducted Emission Test Data

O Test Data Sheet

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	20.4	-	0.6	21.0	-	66.0	56.0	45.0	35.0
0.193	21.2	-	0.6	21.8	-	63.9	53.9	42.1	32.1
0.240	17.4	-	0.6	18.0	-	62.1	52.1	44.1	34.1
0.291	16.3	-	0.5	16.8	-	60.5	50.5	43.7	33.7
0.338	14.4	-	0.5	14.9	-	59.3	49.3	44.3	34.3
0.388	13.0	-	0.5	13.5	-	58.1	48.1	44.6	34.6
0.517	14.0	-	0.6	14.6	-	56.0	46.0	41.4	31.4
0.595	12.1	-	0.6	12.7	-	56.0	46.0	43.3	33.3
1.935	12.9	-	0.6	13.5	-	56.0	46.0	42.5	32.5
3.045	13.0	-	0.6	13.6	-	56.0	46.0	42.4	32.4
4.009	16.3	-	0.8	17.1	-	56.0	46.0	38.9	28.9
4.209	18.3	-	0.8	19.2	-	56.0	46.0	36.8	26.8
16.228	32.5	-	1.5	34.0	-	60.0	50.0	26.0	16.0
17.693	39.0	-	1.4	40.4	-	60.0	50.0	19.6	9.6
19.709	42.1	-	6.1	48.3	-	60.0	50.0	11.8	1.8
20.255	40.9	-	1.7	42.5	-	60.0	50.0	17.5	7.5
21.662	36.3	-	1.7	38.0	-	60.0	50.0	22.0	12.0
27.158	30.9	-	2.1	33.0	-	60.0	50.0	27.0	17.0

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

* Measurement detector function and bandwidth

Detector function : CISPR quasi-peak

Bandwidth : 9kHz

*Because the QP Result value exceed not Average limit, the Average value is not measured.

4. Radiated Emission Test Data

Frequency Range [MHz]	Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Total Loss [B] [dB]	Antenna Height [Cm]	Turn table Degree [Deg]	Results [A+B] [dBuV/m]	Limits at 10m [dBuV/m]	Margin (Limit-Result) [dB]
30 - 230	30.050	V	6.0	18.8	225	78	24.8	30.0	5.2
	49.100	V	15.0	9.3	112	314	24.3		5.7
	70.710	V	13.3	6.8	225	105	20.1		9.9
	90.140	V	11.4	10.2	175	300	21.6		8.4
	189.620	V	13.6	10.5	100	359	24.1		5.9
	209.400	V	11.6	10.8	104	359	22.4		7.6
230 - 1000	364.490	H	9.4	17.9	244	225	27.3	37.0	9.7
	397.440	V	7.2	18.9	102	187	26.1		10.9
	662.330	H	6.0	23.2	399	210	29.2		7.8
	786.380	H	7.4	24.5	400	158	31.9		5.1
	835.540	V	7.1	24.9	187	182	32.0		5.0
	933.850	H	8.5	25.2	100	30	33.7		3.3

Frequency Range [MHz]	Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Total Loss [B] [dB]	Antenna Height [Cm]	Turn table Degree [Deg]	Results [A+B] [dBuV/m]	Limits at 3m [dBuV/m]	Margin (Limit-Result) [dB]
1000 ~ 5000	1000	H	54.9	-13.0	120	120	41.9	74.00	32.07
	1200	H	59.0	-12.6	120	60	46.4	74.00	27.59
	1514	H	56.1	-12.1	120	60	44.0	74.00	29.99
	1665	H	55.2	-11.1	120	60	44.0	74.00	29.96
	2122	H	51.2	-8.4	120	30	42.8	74.00	31.25

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

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

if the frequency range exceeds 1000MHz, The total Loss is sumed Antenna factor, Cable loss and 40dB Preamp.

* 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: 3m(Peak)

5. FCC Label Configuration and Location

5.1 Label Configuration



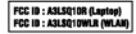
**MODEL NO :
200STM**

This device complies with Part 15 of 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.

INPUT : 12V ---3.2A(MAX)

This class B digital apparatus meets all requirements of the
Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la classe B respecte toutes les
exigences du Règlement sur le matériel brouilleur du Canada.
Canadian Certification Number(RSS-210) : 649E11909
Apparatus Claims of U.S. Patent Nos. 4,631,603 4,577,216
4,819,098 and 4,907,093 licensed for limited viewing uses only.






For use with AD-4212.
Pour utiliser avec model
AD-4212.
Made in Korea



SAMSUNG Q 10

This device complies with Part 15 of 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.

INPUT : 12V ---3.2A(MAX)

Internal Modem
Complies with Part 68, FCC Rules
FCC Reg: 52X MUA, 36273-FB-E
REN: 0,19
Made in TAIWAN

CE 0336

FCC ID : A3LSQ10R (Laptop)
FCC ID : A3LSQ10WLR (WLAN)





Rev 1.1
BA68-20076A Made in Korea

5.2 Location of Label



6. Test Equipment Used

Equipment	Model No.	Serial No.	Makers	Last calibration Date
Field strength meter	ESCS30	830986/004	R & S	2002-02-15
	Firmware versions : Main 2.22, OTP 02.01, GRA 02.36			
Test Receiver	ESI26	100010	R&S	2002-05-04
L.I.S.N	ESH2-Z5	831886/006	R & S	2001-11-20
L.I.S.N	3810/2	2251	EMCO	2002-05-07
Bi-Log Antenna	CBL2804	361324/003	R & S	2002-01-13
Horn Antenna	HF906	100028	EMCO	2002-07-26