SAMSUNG ELECTRONICS

EMI TEST REPORT

According to FCC Part 15 Subpart B/Class B

Product : Notebook PC
Model No. : Transport GX3

FCC ID : A3LST10

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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.

Date of test : February 8, 2002 ~ February 9, 2002

Issued Date : February 14, 2002

Tested by: C. K. Park
Chun Kyu, PARK / Test Engineer

Reviewed by: Yang S. Kim
Yang Soo, KIM / Manager of EMC Lab.

Authorised by: K. B. Chung
Kyu Baek, CHUNG / Chief of EMC Lab.

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NVLAP Code: 200447

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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 Tel.: +81-(0)31-200-2135 Fax.: +81-(0)31-200-2189
Full Address	:	416 Maetan 3 Dong, Paldal-Ku, Suwon City, Kyungki Do, Korea, 442-742
Kind of Product	:	**Notebook PC**
FCC ID	:	**A3LST10**
Project Name	:	**Matrix III Plus**
Model & Variant Names	:	**Transport GX3** (Brand Name: Micronpc) **ST10** (Brand Name: Samsung) **Samsung T10** (Brand Name: Samsung)
Test Report Produced by	:	Chun Kyu, PARK / Test Engineer

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.

The system was pre-tested using the below additional components, and we found worst emission level for the components, were selected as the final components for the test.

Component	Brand and Model Name	Remark
CD-ROM	- Samsung, SN-124Q	
CD-ROM	- Samsung, SN-124P	
CD-ROM	- Teac, CD-233E	
CD-RW	- Matsushita, UJDA-330A	
DVD	- Toshiba, SD-C2502	
DVD_CDRW_Combo	- Toshiba, SD-R2102	Worst Case
DVD_CDRW_Combo	- Matsushita, UJDA-710	

And then the system was tested with the configuration of (A), (B), (C), (D) below
(A) CPU Pentium IV 1800MHz, LCD 15.0" without Docking Station(SMD-830E)
(B) CPU Pentium IV 1800MHz, LCD 15.0" with Docking Station
(C) CPU Pentium IV 1800MHz, LCD 14.1" without Docking Station
(D) CPU Pentium IV 1800MHz, LCD 14.1" with Docking Station
In each test mode, Finally we found worst case emission that is above (A) configuration with the Worst case components(in the above table). So, the DATA of the maximum(worst case) EUT operation was reported.

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

2) Operating Frequency :

1800MHz(CPU Speed), 100MHz(Host Clock), 133MHz(SDRAM Clock), 8M(Finger print)
33.3MHz(PCI Clock), 14.318MHz(Ref), 49.512MHz(Audio Clock), 25M(Network)
183MHz(Video Memory Clock), 12.288MHz(Audio Bit Clock), 24.576MHz(Audio C24)
10MHz(Micom Clock), 48MHz(USB Clock), 54MHz(15.0"LCD Clock), 66.6(Hub)
65MHz(14.1" LCD Clock)

3) Description of Testing operating mode

Operating Mode	Operating section of EUT
"H" Pattern display & Read / Write	LCD Screen
	external Monitor
	television
	floppy disk drive a:
	hard disk drive c: flash memory drive e: LPT1 to printer COM4 to modem
Audio Output	DVD (drive d:) playing, audio to headphone and digital speakers

4) Tested Resolution :

Tested Video mode	Resolutions	Refresh rates	Colors
LCD(15.0")	1400 X 1050	60Hz	32bits
LCD(14.1")	1024 X 768	60Hz	32bits
Ext. Monitor	1280 X 1024	85Hz	32bits
TV Monitor	640 X 480	60Hz	32bits

5) Manufacturer : SAMSUNG Electronics Co., Ltd.

6) Assemble Parts

Item	Specification	Remark
CPU	Intel Pentium4, 1800MHz Intel NetBurst micro architecture 400 MHz system bus 512KB advanced transfer cache	
Main Memory	Samsung, M470L3224BT0-CB0 direct DDR channel 64bit 256 MB memory	
Graphic Contoller	ATI, Mobility M7-D2 & D intergrated LVDS,TMDS,TV encoder,64bit DDR static and dynamic power management	
Flat Panel Dispay	SEC, LCD 15" TFT, LTN150P3-L01 Upto 1400x1050 Pixels; 16-bit 64k colors	Worst Case
	SEC, LCD 14.1" TFT, LTN141XF-L03 Upto 1024x768 Pixels	optional
FDD	Teac, FS05FG-5750A 3.5", 1.44MB, 3 mode support	
HDD	IBM, IC25N040ATCS04-0, 40GB, 4200RPM	
PCMCIA	Samsung, SCF-48M, 48MB	SN : CEB201ASM9947
DVD-COMBO	Toshiba, SD-R2102 CD 24X, DVD 8X, CDRW 4X Speed	
AC Adapter	ASTECH, AD-8019, 80-Watts, 2 pin	
MODEM	SEC, SFM-3100LW, 56KBPS	
LAN	10/100 Base-T Ethernet support	
Wireless LAN	Agere, MPCI3A-20, 01UT15473456, 016681/A	
Input Devices	Keyboard, 19mm pitch, 2.5mmH travel length Pointing Device, PS/2 Touchpad w/ 2 button Finger Print, ST Microelectronics, TCS1A	Korean, US, UK, Japan German, French
Battery	Samsung, SSB-T10CLS, Removable 9-cell Li-Ion	
Ports	2 USB, PIO, PS/2, RJ-11, RJ-45, DC IN, EXT. MONITOR, Mini-Dock Connector, TV-out, MIC-IN, LINE-IN,HEADPHONE-OUT, SPDIF, Card bus slot. Etc	

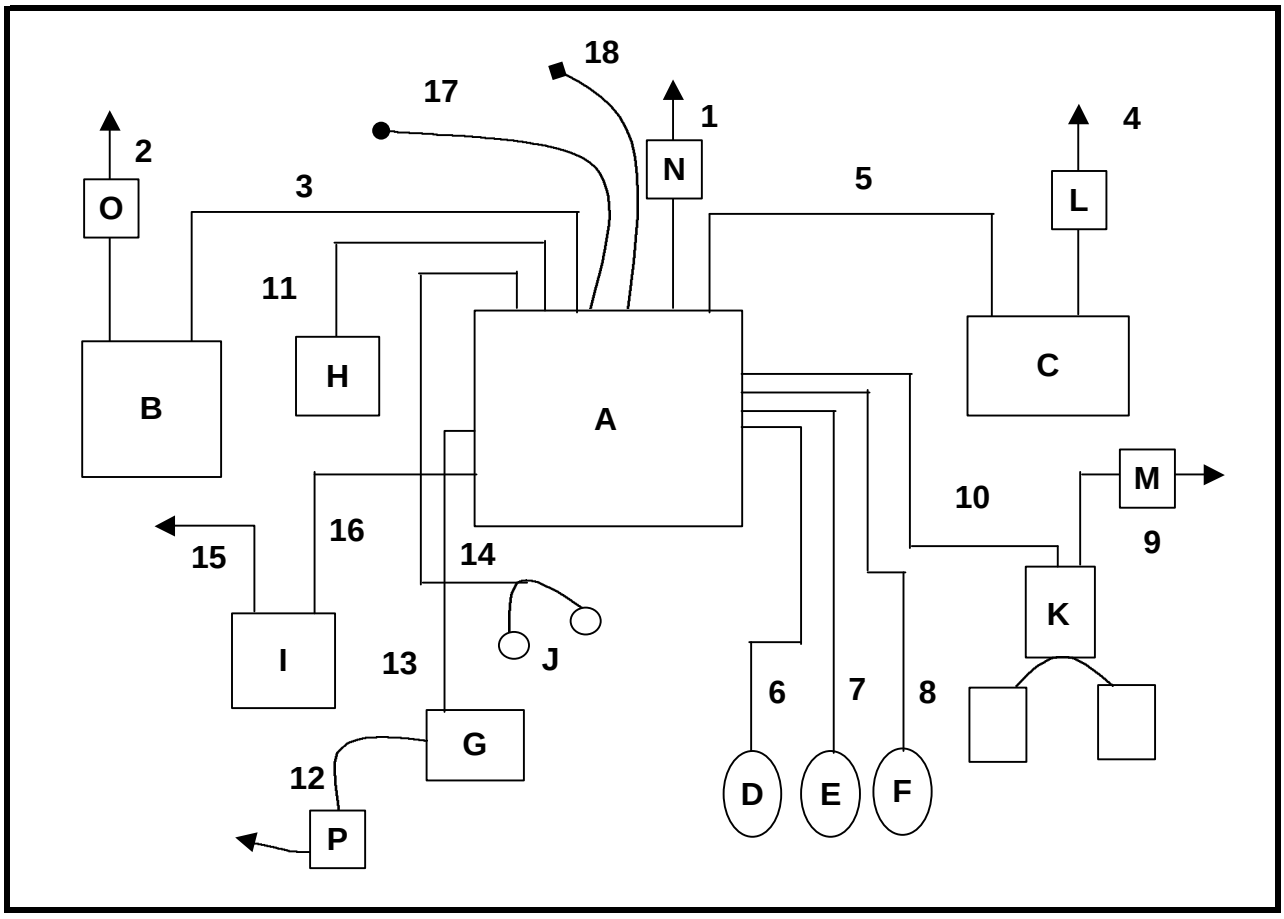
1.2 Configuration of EUT and peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	FCC ID
A	Notebook PC	Transport GX3	-	Samsung	A3LST10
B	External Monitor	TFT7010	147CK23DA272	COMPAQ	Doc
C	Printer	K10158	CLG001000275	CANON	Doc
D	USB Mouse	M-U48a	LZE01375334	LOGITECH	JNZ211360
E	USB Mouse	M-U48a	LZE94854007	LOGITECH	JNZ211360
F	PS/2 Mouse	NICHE MOUSE	K9137324	KEY SYSTEM	Doc
G	DVC	DCR-PC 110	1091817	SONY	Doc
H	Portable Cassette	MY-250	160KB00620	Samsung	-
I	CCTV	CCM-052C	54059495	COMMAX	Doc
J	Head Set	BA59-00228A	-	-	-
K	Digital speaker	BA-790	R0001479	BOSTON	-
L	Adapter(Printer)	AD-360U	PA9-0368-01K	CANON	-
M	Adapter(Speaker)	DK1201A5-2AN	-	BOSTON	-
N	Adapter(EUT)	AD-8019	B33738001L0BB	ASTEC	-
O	Adapter(Monitor)	PSCV420102A	C010503785	COMPAQ	-
P	Adapter(DVC)	AC-L10A	21121642	SONY	-

1.3 Used Cable Description

No.	Item	Length[m]	Shielded (Y/N)	Remark
1	Power Cable for EUT	3.52	N	AC Mains
2	Power Cable for Monitor	1.82	N	
3	Monitor Cable	1.85	Y	
4	Power Cable for Printer	1.85	N	
5	Printer Cable	1.6	Y	
6	USB Mouse Cable	1.8	Y	
7	USB Mouse Cable	1.8	Y	
8	PS/2 Mouse Cable	1.8	Y	
9	Power Cable for Speaker	1.5	N	
10	Digital Speaker Cable	2.4	N	
11	Audio Device Cable	1.9	N	
12	Power Cable for Camcorder	1.5	N	
13	DVC Cable	1.7	N	
14	Head Set Cable	2.7	N	
15	Power Cable for CCTV	0.5	N	
16	CCTV Cable	1.5	N	
17	LAN Cable	5	N	
18	Modem Cable	2	N	

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 #1(Registration Number:98856) and Shielded Room.

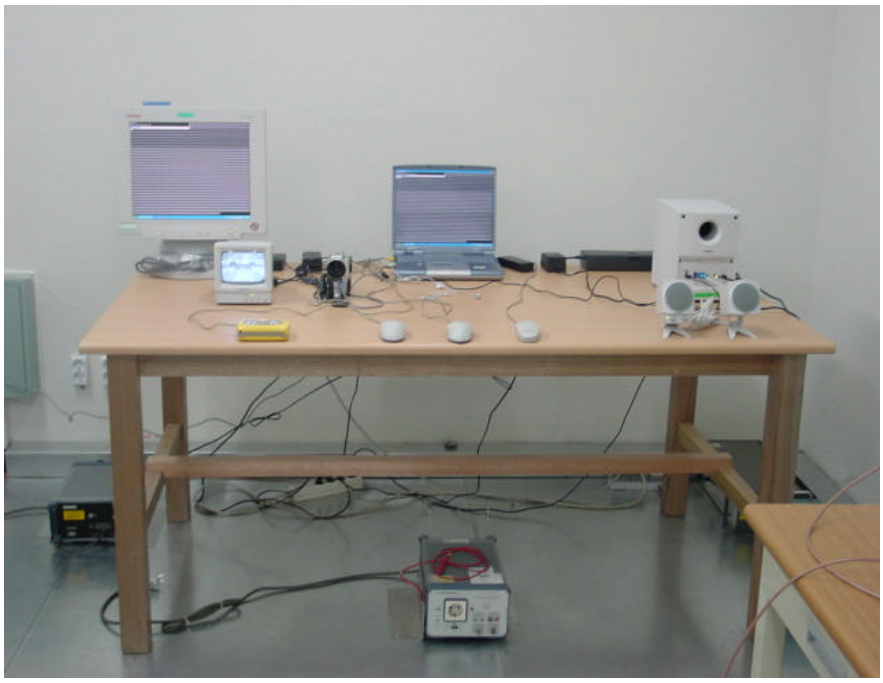
This test facility has been filed in FCC under the criteria in ANSI C63.4-1992.

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.

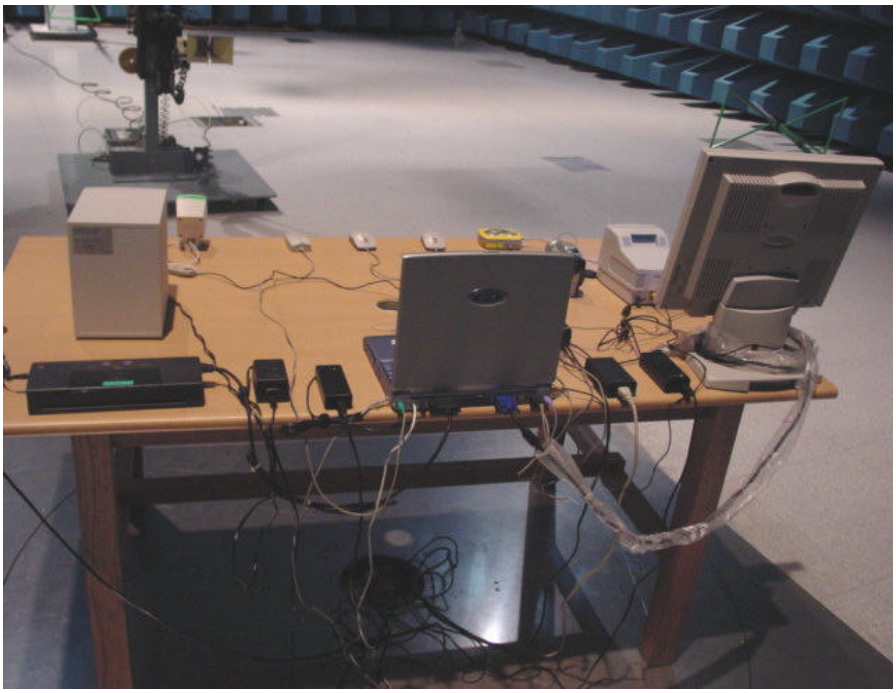
1)Conduction(Front View)



2)Conduction(Rear View)

3) Radiation(Front View)

4) Radiation(Rear View)



2.2 Operation Environment

	Conduction	Radiation
Temperature [C] :	23C	23C
Humidity [%] :	63C	63C
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 450kHz 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 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	Average	1MHz	-

3. Conducted Emission Test Data

O Test Data Sheet

Frequency	Meter Reading [a]	LISN Pol.	Total Loss [b]	Results [a+b]	Limits	Margin (Limit - Result)
[MHz]	[dBuV]	[L,N]	[dB]	[dBuV]	[dBuV]	[dB]
0.498	33.5	N	0.1	33.6	**48.0**	14.4
0.540	30.4	L	0.1	30.5	**48.0**	17.5
0.918	23.5	N	0.1	23.6	**48.0**	24.4
1.776	23.2	N	0.1	23.3	**48.0**	24.7
3.300	34.0	L	0.1	34.1	**48.0**	13.9
3.408	30.2	N	0.1	30.3	**48.0**	17.7
4.494	31.2	L	0.1	31.3	**48.0**	16.7
4.866	27.6	N	0.1	27.7	**48.0**	20.3
5.604	24.6	L	0.1	24.7	**48.0**	23.3
9.516	24.3	L	0.2	24.5	**48.0**	23.5
15.732	20.1	N	0.9	21.0	**48.0**	27.0
24.492	20.1	N	1.7	21.8	**48.0**	26.2
29.202	22.5	L	1.5	24.0	**48.0**	24.0

* Results = Meter Reading(QP) + Total Loss(LISN Insertion loss + Cable loss)
* Measurement detector function and bandwidth
  Detector function : CISPR quasi-peak
  Bandwidth : 10kHz

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 3m [dBuV/m]	Margin (Limit-Result) [dB]
30 - 88	39.984	V	17.4	14.2	100	85	31.6	**40.0**	8.4
	46.318	H	18.0	11.2	358	79	29.2	**40.0**	10.8
	64.530	V	18.3	6.8	176	78	25.1	**40.0**	14.9
	84.401	H	17.4	9.9	400	30	27.3	**40.0**	12.7
88 - 216	90.403	H	20.9	11.1	300	345	32.0	**43.5**	11.5
	96.440	V	16.6	12.2	100	330	28.8	**43.5**	14.7
	135.173	V	16.9	13.2	100	360	30.1	**43.5**	13.4
	156.651	H	16.1	12.1	196	334	28.2	**43.5**	15.3
	184.282	V	22.9	11.5	100	360	34.4	**43.5**	9.1
216 - 960	272.349	V	20.6	15.9	100	257	36.5	**46.0**	9.5
	294.910	H	21.6	16.3	100	71	37.9	**46.0**	8.1
	741.801	V	13.1	25.6	151	79	38.7	**46.0**	7.3
	916.309	V	13.5	27.2	146	192	40.7	**46.0**	5.3
960 - 9000	1548	H	12.5	33.1	100	360	45.6	**54.0**	8.4
	5052	H	4.5	45.7	100	360	50.2	**54.0**	3.8
	5052	V	4.5	45.7	100	360	50.2	**54.0**	3.8
	1402	V	12.4	32.2	100	360	44.6	**54.0**	9.4
	2398	V	12.7	36.8	100	360	49.5	**54.0**	4.5

** "<" Means equal or less then 5dB*

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

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

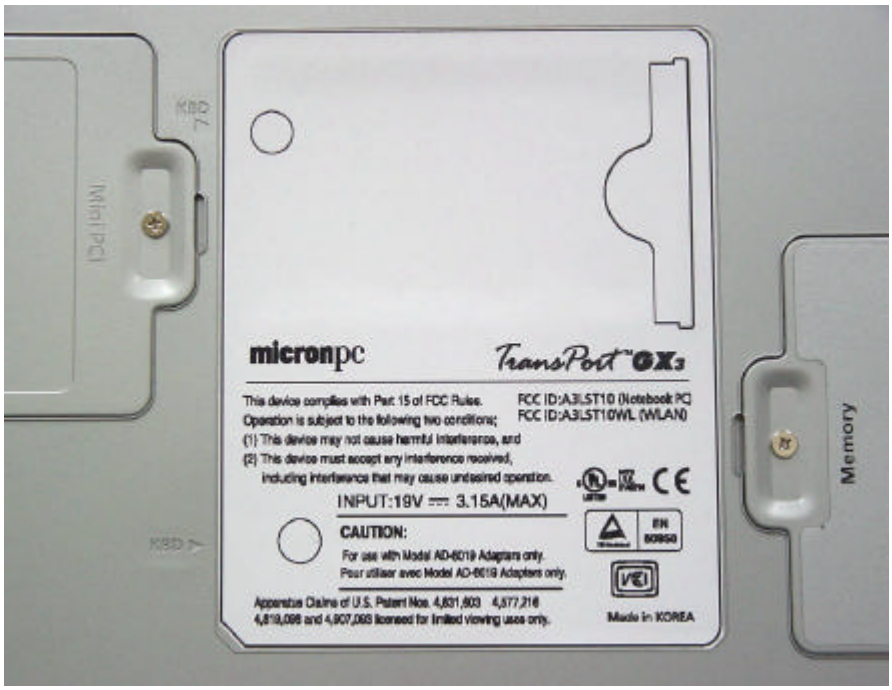
* Measurement detector function and bandwidth

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

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

5. FCC Label Configuration and Location

5.1 Label Configulation



5.2 Location of Label

6. Test Equipment Used

Equipment	Model No.	Serial No.	Makers	Calibration Last calibration and Interval
Spectrum analyzer	8566B	3340A21744	H.P	01/ 03/ 20, 12Months
	Firmware versions : Rev.29.9.86			
Quasi-peak adapter	85650A	2521A00687	H.P	01/ 10/ 10, 12Months
RF Preselector	85685A	2602A00224	H.P	01/ 10/ 10, 12Months
Field strength meter	ESCS30	839809/022	R & S	01/ 06/ 18, 12Months
	Firmware versions : Main 1.08, OTP 02.01, GRA 02.03			
Field strength meter	ESI 26	832692/002	R & S	01/ 06/ 18, 12Months
	Firmware versions : BIOS 3.3, Analyzer 2.09.2			
L.I.S.N	3825-2	9208-1981	EMCO	01/ 03/ 23, 12Months
Double Ridged Guide Antenna	3115	9505-4441	EMCO	01/ 06/ 03, 12Months
Bi-Log Antenna	CBL6112B	2767	SCHAFFNER	01/ 01/ 02, 12Months