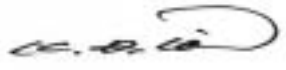


EMI Test Report

According to FCC Part 15 Subpart B

Project No.	LBE052834
Equipment under Test	
Applicant	Samsung Electronics Co., Ltd. 416 Maetan3- Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 443-742, Korea
FCC ID	A3LNP-P60
Product Name	Notebook PC
Model Name	Transport T2400, NP-P60, NP-X60
Manufacturer	Samsung Electronics
Date of Test	December 01, 2005 ~ December 05, 2005
Issued Date	December 07, 2005

	Name/Position	Signature
Tested by	Kyeong Dong, Kim Test Engineer	
Reviewed by	No Cheon, Park Manager of EMC Lab.	
Authorized by	Seung Kyu, Cha Chief of EMC Lab.	

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

3. FCC Registration Number : KR0004

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- 3.2 Radiated Emission

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- 4.2 EUT Photography

1. General Information

1.1 Basic Information related Product

Applicant	Samsung Electronics Co., Ltd.
Model name	Transport T2400
Applicant Address	416 Maetan3- Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
Contact Person	Kyeong Dong, Kim
Kind of product	Notebook PC
Variant list	NP-P60, NP-X60
Manufacturer	Samsung Electronics
New / Alternative / Permissive change Information	NEW

1.2 Detail Information related Product

Item	Specification	Remark
CPU	Intel Pentium-M Dual Core Yonah 2.16 GHz Cache 2MB, FSB 667MHz	-
Chipset	Intel Calistoga 945PM/GM, 667MHz FSB	-
Main Memory	Samsung, DDR 2 533MHz, 512MB(M470T6554BG0) * 2	-
Graphic controller	ATi Mobility Radeon X1400/X1600, M54/M56, Graphic memory 128MB/256MB	External Gfx
Inverter Board	DELTA	-
LCD DISPLAY	Samsung, LTN154P1-L03, 15.4", WSXGA+, 1680 x 1050 Pixels	-
HDD	Fujitsu, SATA type 40GB(MHV2040BH), 2.5".	-
MODEM	Agere systems, Athens(AM2) S/W Modem, 56KBPS, Fax/Data Azalia MDC, MIC No.:TE-A22/K012-04-0410	-
LAN	Intel 82573L(Vidalia), Gigabit	-
Wireless LAN	Intel, WM3945ABG KR, 802.11abg, 54Mbps, Mini-card MIC No.:INT-WM3945ABGKR	FCC ID: PD9WM3945ABG
Bluetooth	Broadcom, BCM92045NMD, USB 2.0 type, Bluetooth Ver 2.0 Foxconn Module, MIC No.:R-LARN-05-0240	FCC ID: QDS-BRCM1018
ADAPTER	Acbel, API5AD10, AD-9019S, 90W, 3 pin	-
Internal ODD	TEAC DW-224E, DVD-Combo	-
Input Devices	Keyboard, Travel length 2.6mm / Key Pitch 19.05mm Synaptics Touchpad, Finger Print	-
Battery	SDI / 6Cell(AA-PB2NC6B, 2600mA) LI-ION.	-
Ports	LAN, Modem, 1 X 1394, 3 USB, 1 CRT, TV-out, PCMCIA slot, DC IN, 1 MIC-IN, 1 HP-OUT, 1 LINE-IN, SIO port	-

Operating Frequency

2.16 GHz(CPU speed), 667 MHz(Host Clock), 533 MHz/667MHz(DDR2), 33 MHz(PCI Clock), 100 MHz (PCIE, SATA Clock), 14.318 MHz(Ref), 27 MHz (GFX Ref), 10 MHz (MICOM Ref)
59.6 MHz(WSXGA+ LCD Clock)

1.3 Operating Mode and Condition

The EUT exercise program used during radiated and conducted emissions testing was the Samsung Standardized Emission Test Program for Windows. During the certification test, the LCD panel was open and video signals were simultaneously active on the LCD panel, and the VGA port.

The system was configured for testing in a typical fashion that a customer would normally use, and was tested while in an automated non-attendant mode.

The program repetitively sends a screen of 'H' to the display, reads and writes to the hard drive, and writes to all serial, parallel ports and modem.

Music is played from the CD player to the Line-In jack and ported out to the earphones.

A hard drive from the remote PC was mapped to the EUT and a data file was read and written over the network connection to provide continuous activity. The EUT was connected to a remote PC through the Ethernet port with Unshielded Twisted Pair Ethernet cable and Modem port by using hyper terminal program. Ethernet testing was performed at 100 Mbps operation. Cables were attached to each of the available I/O Ports. Where applicable, peripherals were attached to the I/O cables.

1.4 Test System Details

This section provide details of the equipment under test(EUT)and the peripheral assemblies attached during radiated and conducted emission testing.

For the LCD panel the WSXGA+ resolution was set to its maximum value of 1680X1050

The AC adapter was connected to notebook PC. All external peripherals were connected to the I/O ports to the EUT.

1.5 Equipment Modifications

No equipment modifications were required.

1.6 Test Procedure

1.6.1 Conducted Emission

The EUT was placed on a platform nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The rear of tabletop was located 40 cm 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 bindle 30 cm to 40 cm long and were handed at a 40 cm 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.

Frequency Band [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
0.15 to 80	EMI Receiver	Quasi-Peak	9kHz	-
		Average	9kHz	-

1.6.2 Radiated Emission

EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm 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 30 cm to 40 cm long and were hanged 40 cm height to the ground plane.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane and the run table azimuth was varied to obtain the maximum signal strength

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 biconi-Log antenna.

Also, the EMI RECEIVER was scanned from 1000 to 12000 MHz using linearly polarization Double ridge horn antenna was used. The explanation of measuring instrument setup when Respective function is used in any frequency band is as following;

Frequency Band [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
30 to 1000	EMI Receiver	Quasi-Peak	120kHz	-
Above 1000	EMI Receiver	Peak	1MHz	1MHz

1.7 Test Configuration

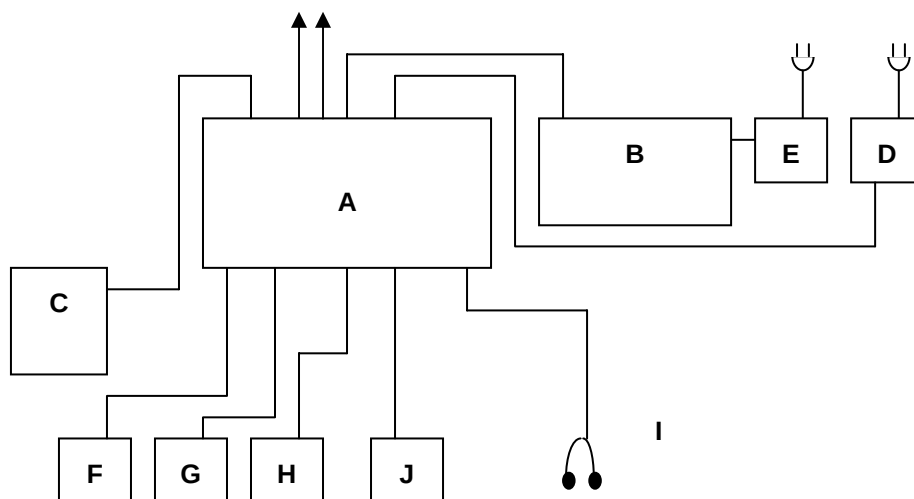
Used EUT and Peripherals

Seq	Device	Model Name	Serial #	Maker	Note
A	Note-PC	NP-P60	-	SEC	EUT
B	Monitor	CX712MPplus	-	SEC	DoC
C	Digital Cam.	DCR-PC115	1091827	SONY	-
D	AC adaptor	AD-9019S	ABJ6F5910039	Acbel	-
E	AC adaptor	PSCV360104A	C020381569	SEM	-
F	USB mouse	M-UV69a	HCA40801455	Logitech	DoC
G	USB mouse	M-UV69a	HCA40801463	Logitech	DoC
H	USB mouse	M-UV69a	HCA40801485	Logitech	DoC
I	Headset	-	-	Labtec	-
J	Serial mouse	-	1020764	Microsoft	FCC ID : C3KMS1

Used Cable Description

	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	Power	1.7	No	For EUT..
2	Power	1.7	No	For Monitor.
3	Monitor(RGB)	1.8	Yes	-
4	USB	1.8	Yes	-
5	RJ45	3.0	No	-
6	IEEE 1394	1.8	Yes	-
7	Serial	2.0	No	-

Block Diagram



1.8 Applied Standards

List

Product or Generic Standards	Basic Standards
FCC Part15 B	ANSI C63.4 : 2003

1.9 Test Facility

General Information

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

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 CISPR 16-4 and Lab. 34)

Samsung EMC Test Lab.

Conducted Emission : $\pm 3.3\text{dB}$

Radiated Emission Bi-Log Antenna : $\pm 4.3\text{dB}$

2. Summary of Test Results

Result : PASS

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

Section of the Product Standard		Applied Standard	Result
Electromagnetic Emission Test			
3.1	Conducted Emission	ANSI C63.4 : 2003	Complied
3.2	Radiated Emission	ANSI C63.4 : 2003	Complied

3.1 Conducted Emission

Test Information	
Test Engineer	Kyeong Dong, Kim
Test Date	December 05, 2005
Climate Condition	Ambient Temperature : 22.3 °C Relative Humidity : 42 %
	Atmospheric Pressure : 1 019 hPa
Test Place	Shielded Room #1

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
EMI TEST RECEIVER	ESCI	R&S	100136	2006-04-17	12
TWO-LINE V-NETWORK	ENV216	R&S	100116	2006-09-08	12
TWO-LINE V-NETWORK	ENV216	R&S	100117	2006-08-18	12

Measurement Results	Passed The Measured emissions of the EUT have found to be below the specified limits.
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Test Data & Graph

The Initial step in collecting conducted data was to perform a peak and average scan over the measurement range using a receiver

The find data represents worst-case emissions.

* QP : Quasi-peak, AV: Average

* Result = Meter Reading(QP or AV) + Total Loss(LISN Insertion loss + Cable loss)

* Margin = Limit – Result

1. TEST DATA & GRAPH

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Line	Margin (dB)	Limit (dBμV)
0.190500	42.8	N	11.2	54.0
0.482500	34.6	L1	11.7	46.3
0.501500	38.7	L1	7.3	46.0
0.565500	37.1	N	8.9	46.0
0.671500	33.4	L1	12.6	46.0
0.752500	33.7	L1	12.3	46.0
0.801500	35.3	L1	10.7	46.0
1.150500	32.7	L1	13.3	46.0
1.217500	33.6	N	12.4	46.0
1.291500	34.5	L1	11.5	46.0

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Line	Margin (dB)	Limit (dBμV)
0.505500	46.1	L1	9.9	56.0
0.645500	50.6	L1	5.4	56.0
0.867500	38.2	N	17.8	56.0
0.892500	40.8	N	15.2	56.0
0.917500	36.7	L1	19.3	56.0
0.952500	39.6	N	16.4	56.0
1.000500	36.8	L1	19.2	56.0
1.217500	41.9	N	14.1	56.0
1.272500	45.7	N	10.3	56.0
2.587500	43.8	N	12.2	56.0

SAMSUNG ELECTRONICS EMC Report

Hardware Setup: Voltage with 2-Line-LISN - [EMI conducted]

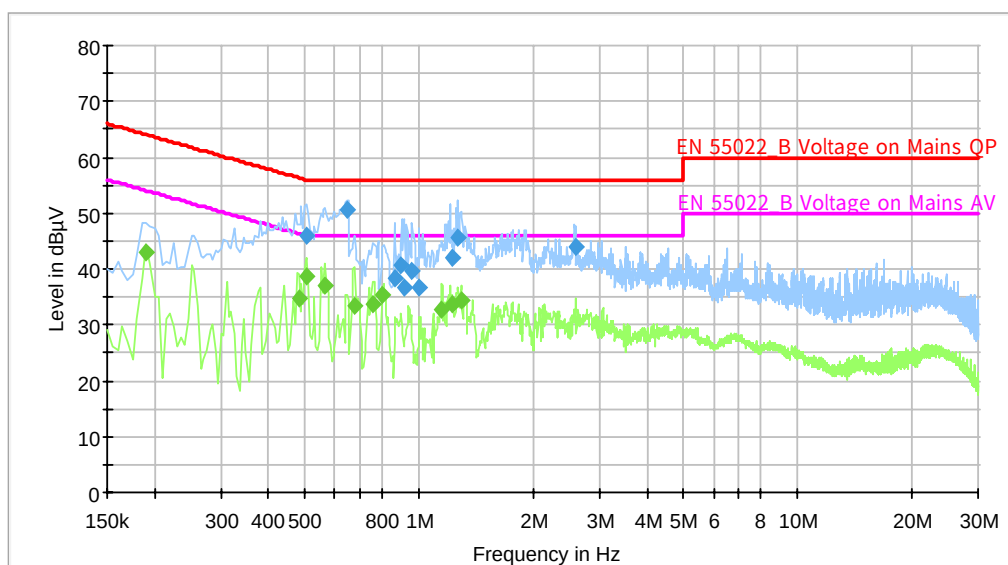
Subrange 1

Frequency Range: 150kHz - 30MHz
Receiver: ESCI 3
Transducer: ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55022_B_2-Line-LISN fin [EMI conducted]

Hardware Setup: Voltage with 2-Line-LISN
Level Unit: dB μ V

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	1s	ESCI 3



3.2 Radiated Emission

Test Information	
Test Engineer	Kyeong Dong, Kim
Test Date	December 01, 2005
Climate Condition	Ambient Temperature : 26.5 °C Relative Humidity : 37 %
	Atmospheric Pressure : 1 024 hPa
Test Place	10m Semi Anechoic Chamber #1

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
EMI Test Receiver	ESI-26	R&S	100289	2006-04-11	12
EMI Test Receiver	ESI-26	R&S	100291	2006-04-12	12
Ant. Mast	MA4000	inn-co	-	N/A	N/A
Ant. Mast	MA4000	inn-co	-	N/A	N/A
Mast Controller	CO2000	inn-co	-	N/A	N/A
Amplifier	310N	SONOMA	251674	2006-03-08	12
Amplifier	310N	SONOMA	251677	2006-03-08	12
Amplifier	NS4900	TOYO	-	N/A	N/A
Bi-log Antenna	CBL6141A	SCHAFFNER	4266	2006-05-24	12
Bi-log Antenna	CBL6141A	SCHAFFNER	4268	2006-05-24	12

Measurement Results	Passed No Operation errors were detected during or after the applied test.
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Test Data & Graph

The initial step in collecting radiated data was to perform a peak scan over the measurement range using a receiver. All modes of operation were investigated and the worst-case emission are reported. The minimum margin to the limit is as follows:

All other emission are non-significant.

Measurement detector function and bandwidth

- Detector function : CISPR quasi-peak
- Bandwidth : 120kHz

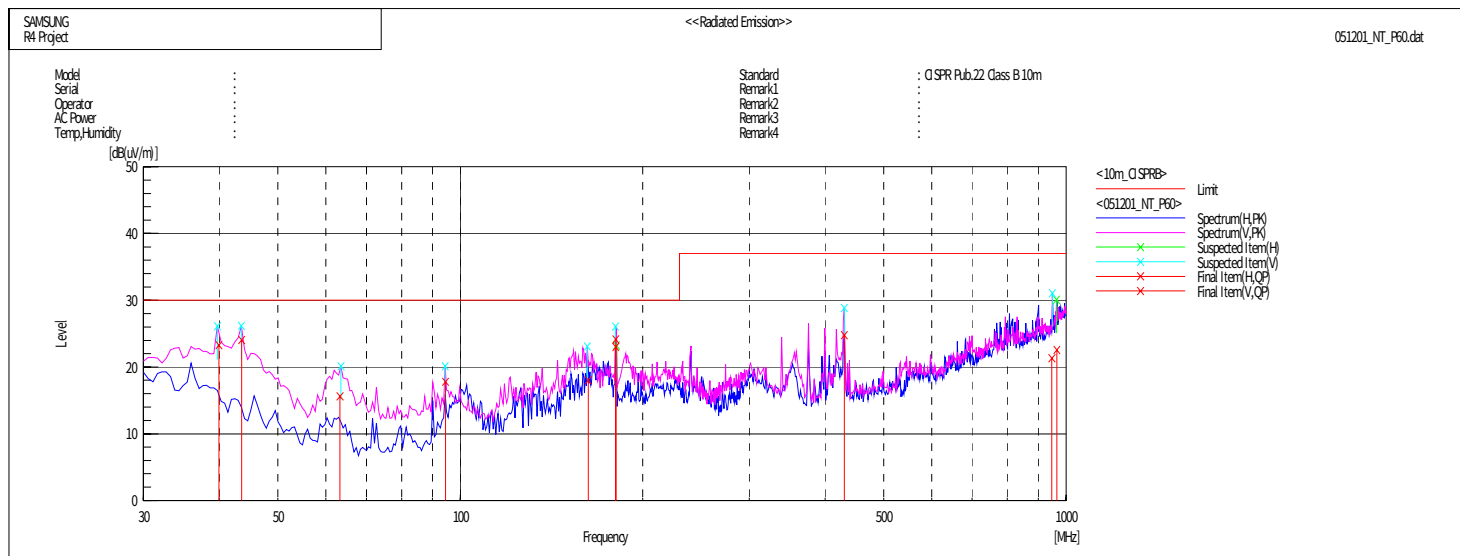
* Receiving Antenna Mode : Horizontal, Vertical

* Test distance : 10m (Semi-Anechoic Chamber)

* Result = Meter Reading + Total Loss(Antenna factor + Cable loss - Amp. Gain)

* Margin = Limit – Result

1. Under 1GHz



Final Result

No.	Frequency [MHz]	(P)	Reading OP [dB(uV)]	c.f [dB(1/m)]	Result OP [dB(uV/m)]	Limit [dB(uV/m)]	Margin OP [dB]	Height [cm]	Angle [deg]	System	Remark
1	39.948	V	34.9	-11.6	23.3	30.0	6.7	100.0	102.3	1	
2	43.578	V	37.5	-13.4	24.1	30.0	5.9	100.0	16.3	2	
3	63.317	V	37.6	-22.0	15.6	30.0	14.4	100.0	6.2	2	
4	94.511	V	38.1	-20.3	17.8	30.0	12.2	193.0	224.1	2	
5	162.687	V	35.9	-17.9	18.0	30.0	12.0	101.0	124.2	2	
6	180.543	V	43.6	-19.4	24.2	30.0	5.8	105.0	39.6	1	
7	180.543	H	42.4	-19.4	23.0	30.0	7.0	400.0	19.9	1	
8	430.272	V	36.2	-11.4	24.8	37.0	12.2	106.0	159.8	2	
9	947.304	V	22.5	-1.2	21.3	37.0	15.7	395.0	358.3	1	
10	966.017	H	22.8	-0.2	22.6	37.0	14.4	321.0	1.5	1	

2. Over 1GHz

* Measurement detector function and bandwidth

- Detector function : peak

- Bandwidth : 1MHz

* Receiving Antenna Mode : Horizontal, Vertical

* Test distance : 3m (Semi-Anechoic Chamber)

* Result = Meter Reading + Total Loss(Antenna factor + Cable loss-Amp. Gain)

* Margin = Limit – Result

No.	Frequency	(P)	Reading	c.f	Limit	Margin	Height	Angle	Remark
	[MHz]		[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB]	[cm]	[deg]	
1	1056.112	V	55.9	-13.5	54.0	11.6	200.0	41.7	
2	1056.112	H	56.8	-13.5	54.0	10.7	100.0	185.0	
3	1472.946	V	50.5	-11.9	54.0	15.4	200.0	148.9	
4	1496.994	V	50.9	-11.8	54.0	14.9	100.0	218.8	
5	1569.138	V	50.2	-11.1	54.0	14.9	200.0	360.0	
6	2242.485	V	46.1	-8.4	54.0	16.3	200.0	360.0	
7	2498.998	V	46.0	-7.9	54.0	15.9	200.0	360.0	
8	6683.367	V	38.1	3.5	54.0	12.4	200.0	324.7	

4. Appendix

4.1 Test Photography



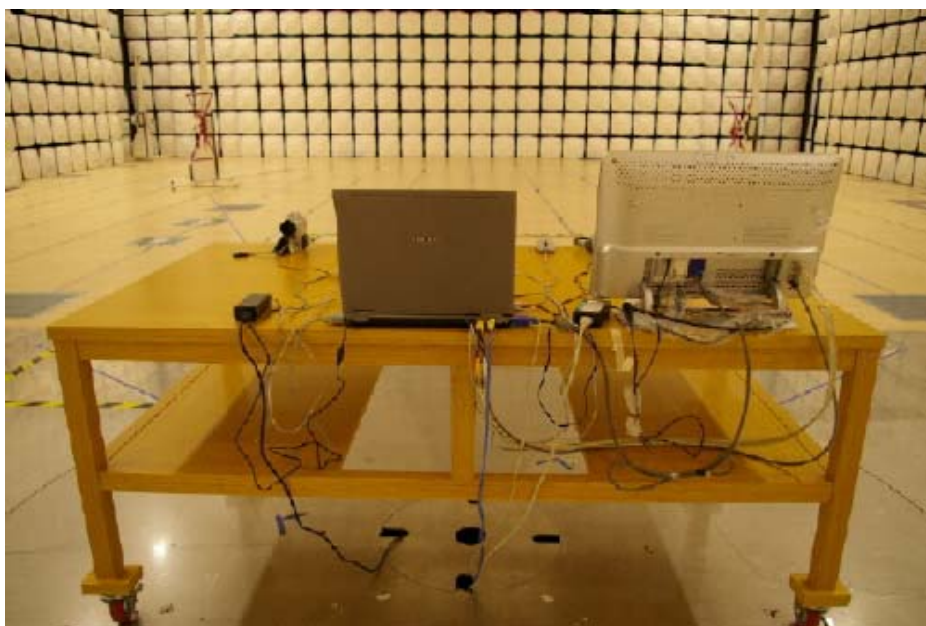
Picture 1. Conducted Emission (Front)



Picture 2. Conducted Emission (Rear)



Picture 3. Radiated Emission (Front)



Picture 4. Radiated Emission (Rear)

4.2 EUT Photography



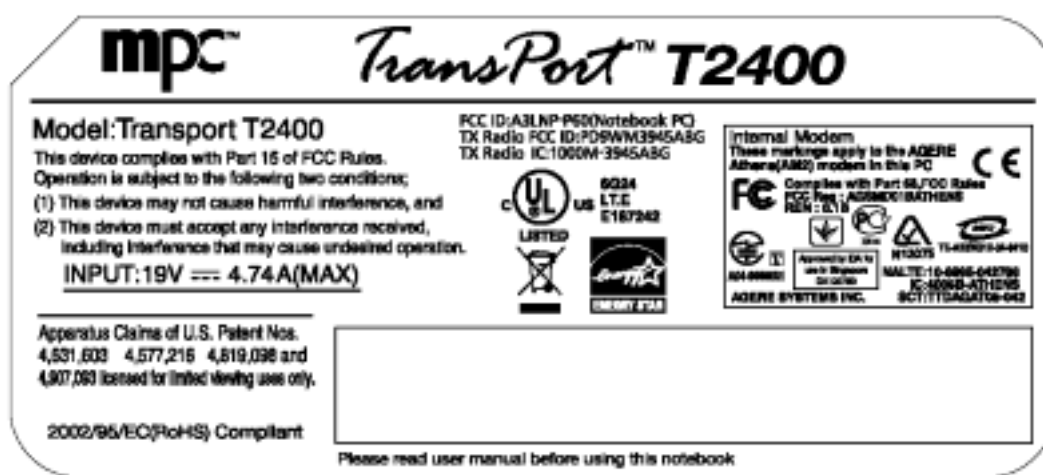
Picture 5. EUT (Front)



Picture 6. EUT (Rear)



Picture 7. ID Label Location



Picture 8. ID Label