MPE TEST REPORT

Product : **Notebook Personal Computer**

Model(s): **W190**

(with WLAN a/b/g Module, INTEL, Model:WM3945ABG)
(with Bluetooth Module, BILLIONTON, Model:GUBTCR42M)

Brand: MTC; GETAC

Applicant: **MITAC Technology Corporation**

Address: **4F, No.1, R&D Road 2,**
Hsinchu Science-Based industrial Park,
Hsinchu 300
Taiwan

Test Performed by:

International Standards Laboratory
<Lung-Tan LAB>
*Site Registration No.
BSMI: SL2-IN-E-0013; TAF: 0997; NVLAP: 200234-0;
IC: IC4164-1; VCCI: R-1435, C-1440, T-299; NEMKO: ELA 113B
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Report No.: **ISL-08LR001MPE**
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Contents of Report

1. General

1.1. Certification of Accuracy of Test Data

Standards:	CFR 47 Part 15 Subpart B Class B CFR 47 Part 15 Subpart C (Section 15.247)
Test Procedure:	ANSI C63.4:2003
Equipment Tested:	Notebook Personal Computer
Model:	W190
Applied by:	MITAC Technology Corporation
Sample received Date:	2007/12/21
Final test Date :	2007/12/31
Test Result	PASS
Test Site:	Chamber 12, Conduction 02
Temperature	Refer to each site test data
Humidity:	Refer to each site test data
Test Engineer:	Jerry Chiou

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Approve & Signature

Roy Hsieh / Manager

Test results given in this report apply only to the specific sample(s) tested under stated test conditions.
This report shall not be reproduced other than in full without the explicit written consent of ISL. This report totally contains 12 pages, including 1 cover page, 1 contents page, and 10 pages for the test description.
This report must not be use to claim product endorsement by NVLAP or any agency of the U.S. Government.

This test data shown below is traceable to NIST or national or international standard.
International Standards Laboratory certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

1. Description of Equipment Under Test (EUT)

Description:	Notebook Personal Computer
Condition:	Pre-Production
Model:	W190
Brand:	MTC;GETAC
Wireless LAN Module:	Intel, Model: WM3945ABG (MOW1 Driver:V.11.1.1.1)
Bluetooth Module:	BILLIONTON(Model:GUBTCR42M)
Frequency Range of 802.11a:	5150 - 5250 MHz 5250 - 5350 MHz 5725 - 5850 MHz
Frequency Range of 802.11b/g:	2400 - 2483.5 MHz
Frequency Range of Bluetooth:	2400 - 2483.5 MHz
Support channel:	
802.11a	13 Channels
802.11b/g	11 Channels
Bluetooth	79 Channels
Modulation Skill:	
802.11a	OFDM (6 Mbps – 54 Mbps)
802.11b	DBPSK(1Mbps), DQPSK(2Mbps), CCK(5.5/11Mbps)
802.11g	OFDM (6M - 54Mbps)
Bluetooth	GFSK (1Mbps) DQPSK(2Mbps), 8DPSK(3Mbps)
Antennas Type:	
WLAN Main antenna:	PIFA (Model: W190 WLAN Antenna) Black made by JOINSOON ELECTRONICS MFG. CO., LTD
WLAN Aux antenna:	PIFA (P/N: W190 WLAN Antenna) Grey made by JOINSOON ELECTRONICS MFG. CO., LTD
Bluetooth antenna:	Chip Antenna(Model: RFANT5220), made by Walsin Technology Corporation.
Antenna Connected:	Connected to RF connector on the PCB of the Bluetooth or WLAN module .The user is not possible to change the antenna without disassembling the notebook computer.
Antenna peak Gain:	
WLAN Main antenna	0.04dBi(11b,11g), -0.1dBi(11a)
WLAN Aux antenna	-0.3 dBi (11b,11g), -0.54 dBi (11a)
Bluetooth antenna	2.66 dBi
Power Type of wireless module:	3.3V DC from Notebook PC
Power Type of Bluetooth module:	3.3V DC from Notebook PC

The channel and the operation frequency of 802.11a listed below:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	5180	02	5200
03	5220	04	5240
05	5260	06	5280
07	5300	08	5320
09	5745	10	5765
11	5785	12	5805
13	5825		

The channel and the operation frequency of 802.11b and 802.11g listed below:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437		

The channels and the operation frequency of Bluetooth listed below:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
00	2402	01	2403
02	2404	03	2405
04	2406	05	2407
……			
75	2477	76	2478
77	2479	78	2480

CPU:	Genuine intel U7600 1.2GHz
Memory:	Hynix (Model:HY5PS12821C FP-Y5) 1GB
Power Supply Type:	DELTA(Model:ADP-90SB BB INPUT:100~240V ~ 1.5A 50-60HZ OUTPUT:19V~4.74A
Hard Disk Drive:	Toshiba(Model:4032GSX) 40G or Toshiba(Model:8032GSX) 80G or Toshiba(Model:1234GSX) 120G
LCD Panel:	Toshiba(Model:LTD121EC5S)
USB 2.0 Connector:	two
LAN Connector:	one
Modem Port:	one
Serial Port:	one
D-SUB Port:	one
Microphone Port:	one
Earphone Port:	one
PCMCIA Connector:	one
Docking Connector:	one
Battery:	GTK P/N:338911120050
Power cord:	Non-shielded, Detachable 3-pin

All types of device listed above have been tested. We present the worst case test data in the report. The test configuration is listed below:

For EMI **Configuration:**

Configuration	
CPU	Genuine intel U7600 1.2GHz
LCD	Toshiba(Model:LTD121EC5S)
Hard Disk Device	Toshiba(Model:1234GSX) 120G
Memory	Hynix (Model:HY5PS12821C FP-Y5)
Wireless LAN card	Intel(Model:WM3945ABG)
Battery	GTK P/N:338911120050
Bluetooth	BILLIONTON(Model:GUBTCR42M)
Power Supply Type	DELTA(Model:ADP-90SB BB

EMI Noise Source:

Crystal: 32.768KHz(X1) 25MHz(X2) 10MHz(X501) 14.318MHz(X502)

Clock Generator: U517

EMI Solution:

1. Add Gasket behind LCD Panel
2. Add Gasket behind Computer
3. Add shielded tape on LCD Signal cable
4. Add aluminum foil behind LCD Panel
5. Add Gasket on LCD Panel Right and Left
6. Add shielded tape behind Computer

2. Description of Support Equipment

2.1 Description of Support Equipment

Unit	Model Serial No.	Brand	Power Cord	FCC ID
24" LCD Monitor	2407WFPb S/N: N/A	DELL	Non-shielded Detachable	FCC DOC
Dell USB Mouse	MO56UC S/N: 511001742	DELL	NA	FCC DOC
Bluetooth test set	Mt8852B S/N: 6K00004613	Anritsu	Shielded Detachable	NA

2.1.1 Software for Controlling Support Unit

Test programs exercising various part of EUT were used. The programs were executed as follows:

A. Read and write to the disk drives.
B. The RF software makes the transmitter continuously sending RF signals
C. Link with the Bluetooth test set makes the transmitter continuously sending RF signals.(EDR mode)
D. Repeat the above steps.

	Filename	Issued Date
CRTU 3945ABG version 4.0.18.0000	CRTU.exe	2005/10/16

2.1.2 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cord	110V (~240V) to EUT SPS	1.8M	Nonshielded, Detachable	Plastic Head
AC Power Cord	110V (~240V) to BT test set SPS	1.8M	Shielded, Detachable	Plastic Head
Monitor D-SUB Data Cable	Monitor D-SUB Port to EUT VGA Port	1.8M	Shielded, Detachable(with core)	Metal Head
USB Mouse Cable	USB Mouse to Docking USB Port	1.7M	Shielded, Un-detachable	Metal Head

2.2 General Test Conditions

1. During the test, the EUT was set in continuously transmitting mode with a duty cycle of 98%.for 802.11b / 1Mbps.
2. The EUT was set in continuously transmitting mode with a duty cycle of 91%.for 802.11g / 6Mbps and 802.11a / 6Mbps.
3. The channel 1, 6, 11 of 802.11b/g of EUT were all tested.

3. RF Exposure Measurement [Section 15.247(b)(4) & 1.1307(b)]

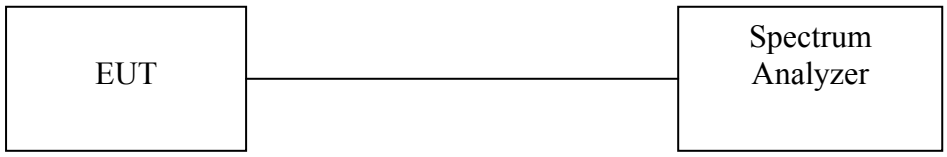
3.1 Applied Standards

FCC PART 1.1307, 1.1310, 2.1091, 2.1093 RF EXPOSURE

3.2 Test Procedure

The Transmitter output of EUT was connected to the Spectrum Analyzer

3.3 Test Setup



3.4 Calculation for Maximum Permissible Exposure (MPE)

From FCC 1.1310 Table 1B, the maximum permissible RF exposure for an uncontrolled environment is 1 mW/cm2 .The actual power density for the EUT with the antenna is calculated as shown below.

$$S = (P \times G)/(4 \times \pi \times d^2)$$

where:
S = power density
P = transmitter conducted power in (W)
G = antenna numeric gain
d = distance to radiation center (m)

<<DATA>>

Bluetooth

Antenna Manufacturer	Antenna Type	Gain (dBi)	Numeric Gain	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (cm)	Power Density (W/m2)	Power Density (mW/cm2)
Walsin Technology Corporation.Model: RFANT5220	Chip Antenna	2.66	1.8450154	2402	2.9	1.949845	20	0.007157	0.0007157
				2441	3.65	2.317395	20	0.0085061	0.00085061
				2480	3.23	2.103778	20	0.007722	0.0007722

802.11a

Antenna Manufacturer	Antenna Type	Gain (dBi)	Numeric Gain	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (cm)	Power Density (W/m2)	Power Density (mW/cm2)
JOINSOON ELECTRONICS MFG. CO., LTD Model: W190 WLAN Antenna	PIFA in Metal	-0.1	0.98	5180	7.55	5.69	20	0.0111	0.00111
				5200	7.59	5.74	20	0.0112	0.00112
				5240	8.04	6.37	20	0.0124	0.00124
				5260	11.4	13.80	20	0.0268	0.00268
				5280	11.32	13.55	20	0.0263	0.00263
				5320	11.78	15.07	20	0.0293	0.00293
				5745	12.46	17.62	20	0.0343	0.00343
				5785	12.71	18.66	20	0.0363	0.00363
				5825	13.14	20.61	20	0.0401	0.00401

802.11b

Antenna Manufacturer	Antenna Type	Gain (dBi)	Numeric Gain	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (cm)	Power Density (W/m2)	Power Density (mW/cm2)
JOINSOON ELECTRONICS MFG. CO., LTD Model: W190 WLAN Antenna	PIFA in Metal	0.04	1.01	2412	14.43	27.73	20	0.0557	0.00557
				2437	14.49	28.12	20	0.0565	0.00565
				2462	13.92	24.66	20	0.0495	0.00495

802.11g

Antenna Manufacturer	Antenna Type	Gain (dBi)	Numeric Gain	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (cm)	Power Density (W/m2)	Power Density (mW/cm2)
JOINSOON ELECTRONICS MFG. CO., LTD Model: W190 WLAN Antenna	PIFA in Metal	0.04	1.01	2412	14.18	26.18	20	0.0526	0.00526
				2437	13.93	24.72	20	0.0496	0.00496
				2462	13.53	22.54	20	0.0453	0.00453

WARNING:
It is the responsibility of the installer to ensure that the EUT is a WLAN module and a specified antenna inside. Only the specified antennas listed above may be used. The use of any other antenna is expressly forbidden in accordance with FCC rules CFR 47 part 15.204.

NOTICE:
FCC Radiation Exposure Statement
This equipment complies with FCC radiation exposure limits for an uncontrolled environment when installed as directed. This equipment should be installed and operated with the specified antenna listed in this report.

4. Appendix : Test Equipment

4.1 Test Equipment List

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Radiation	Spectrum Analyzer 19	R&S	FSP40	100116	09/12/2007	09/12/2008
Radiation	Spectrum Analyzer 14	Advantest	R3182	140600028	12/06/2007	12/06/2008

Note: Calibration traceable to NIST or national or international standards.