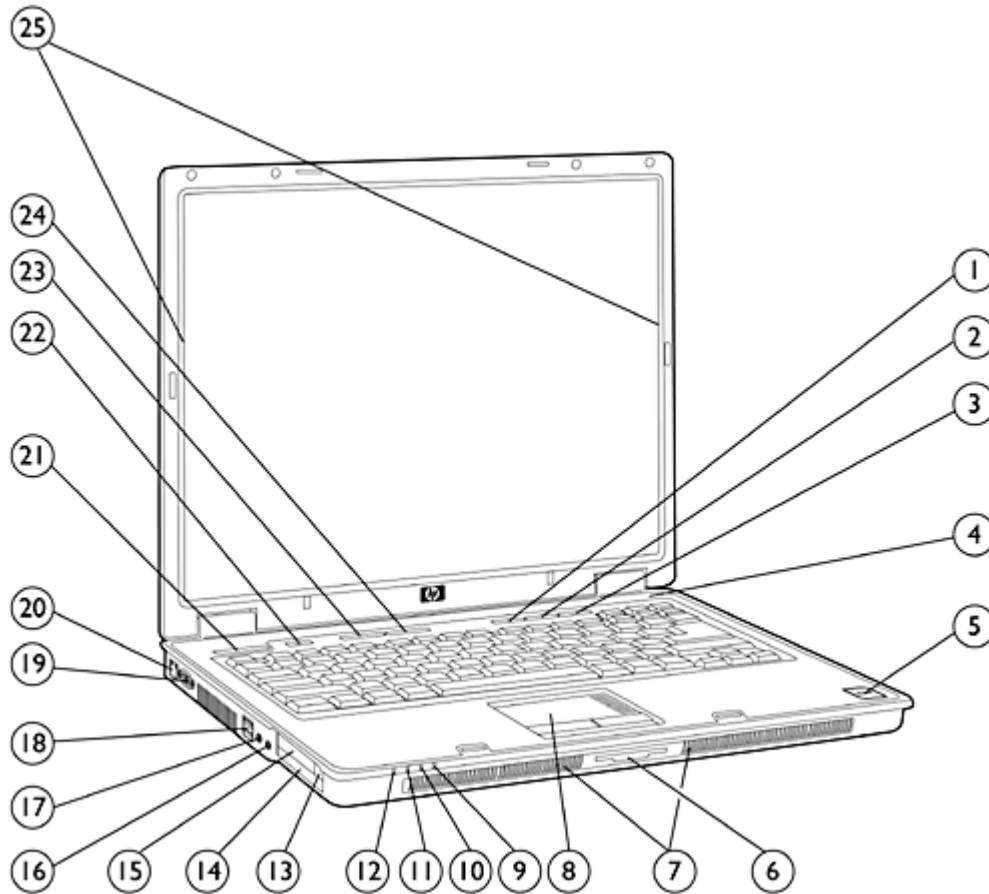


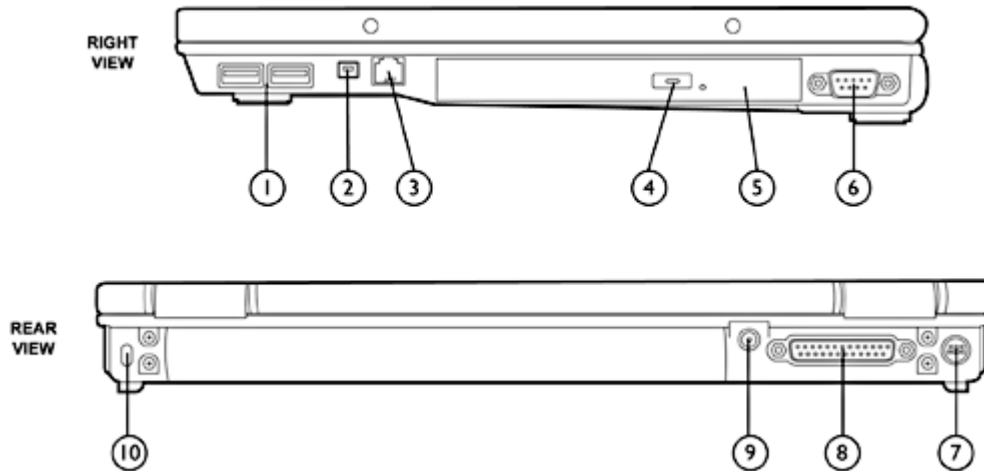
### Overview

HP recommends  
Windows Vista® Business



- |                                    |  |
|------------------------------------|--|
| 1. Volume Mute Button with LED     | 14. ExpressCard Slot                             |
| 2. Volume Down Button              | 15. PC Card Slot (or optional Smart Card Reader) |
| 3. Volume Up Button                | 16. Microphone Jack                              |
| 4. Integrated Microphone           | 17. Headphone Jack                               |
| 5. HP Biometric Fingerprint Sensor | 18. 2 USB 2.0 Ports                              |
| 6. 7-in-1 Media Reader             | 19. VGA/External Monitor Connector               |
| 7. Stereo Speakers                 | 20. RJ-45 Port (NIC)                             |
| 8. Touchpad with Scroll Zone       | 21. Power Button with LED                        |
| 9. Hard Drive Activity LED         | 22. HP Info Center Button                        |
| 10. Battery Charging LED           | 23. Wireless On/Off Button with LED              |
| 11. Power/Standby LED              | 24. Presentation Mode Button                     |
| 12. Wireless On/Off LED            | 25. Dual-band Wireless LAN Antennas              |
| 13. PC Card Eject Button           |  |

### Overview



- |                         |                          |
|-------------------------|--------------------------|
| 1. 2 USB 2.0 Ports      | 6. Serial Port           |
| 2. IEEE 1394a Port      | 7. S-Video TV Out        |
| 3. RJ-11 Port (Modem)   | 8. Parallel Port         |
| 4. Optical Drive Button | 9. DC Power Connector    |
| 5. Optical Drive        | 10. Kensington Lock Slot |

### At A Glance

- Genuine Windows Vista Business 32, Genuine Windows Vista Home Basic 32, Genuine Windows XP Professional, Genuine Windows XP Home Edition, or FreeDOS
- Intel® Core™ Duo Processors T2300e to T2500\*, Intel® Core™ 2 Duo Processors T5500 to T7200
- Intel Celeron M 410 to 440 processors
- Sleek industrial design starting at 2.7 kg and 30.3 mm thin at front
- Mobile Intel 945GM Express Chipset
- Up to 4GB\* of 533- or 667-MHz DDR2 SDRAM, dual channel memory support
- Up to 120-GB 5400 rpm, user-removable hard drive
- Intel Graphics Media Accelerator 950
- Optional integrated 802.11 a/b/g or 802.11 b/g wireless LAN module and Bluetooth®
- 7-in-1 Media Reader
- Broadcom NetLink Gigabit Ethernet PCI Controller
- Touchpad with scroll zone
- Biometric Fingerprint Sensor
- Protected by one-year or three-year (depending on country and/or model) standard parts and labor warranty - certain restrictions and exclusions apply

\* Intel's numbering system is not a measurement of higher performance.

\*\* Above 3-GB, all memory may not be available due to system resource requirements.

### Standard Features

#### Processors

Intel Core 2 Duo Processor T7200\* (2.00-GHz, 667-MHz FSB, 4-MB L2 cache)  
Intel Core 2 Duo Processor T5600\* (1.83-GHz, 667-MHz FSB, 2-MB L2 cache)  
Intel Core 2 Duo Processor T5500\* (1.66-GHz, 667-MHz FSB, 2-MB L2 cache)  
Intel Core Duo Processor T2500\* (2.00-GHz, 667-MHz FSB, 2-MB L2 cache)  
Intel Core Duo Processor T2400\* (1.83-GHz, 667-MHz FSB, 2-MB L2 cache)  
Intel Core Duo Processor T2300\* (1.66-GHz, 667-MHz FSB, 2-MB L2 cache)  
Intel Core Duo Processor T2300e\* (1.66-GHz, 667-MHz FSB, 2-MB L2 cache)  
Intel Celeron M Processor 440\* (1.86-GHz, 533-MHz FSB, 1-MB L2 cache)  
Intel Celeron M Processor 430\* (1.73-GHz, 533-MHz FSB, 1-MB L2 cache)  
Intel Celeron M Processor 420\* (1.66-GHz, 533-MHz FSB, 1-MB L2 cache)  
Intel Celeron M Processor 410\* (1.46-GHz, 533-MHz FSB, 1-MB L2 cache)

**NOTE:** Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

#### Operating System

##### Preinstalled

Genuine Windows Vista Business 32\*  
Genuine Windows Vista Home Basic 32\*  
Genuine Windows XP Professional SP2  
Genuine Windows XP Home Edition SP2  
FreeDOS

##### Supported

(select drivers available on  
<http://www.hp.com>)

Genuine Windows Vista Business 64\*†  
Genuine Windows Vista Enterprise\*†  
Genuine Windows 2000

† 64-bit versions for Intel Core 2 Duo models only

##### Certified

SuSE Linux Enterprise Desktop 10

\* Certain Windows Vista product features require advanced or additional hardware.

See <http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx> and <http://www.microsoft.com/windowsvista/getready/capable.mspx> for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit <http://www.windowsvista.com/upgradeadvisor>.

† At initial boot, either 32- or 64-bit can be selected. This is a one time selection and the other version will be deleted. The 64-bit version is for Intel Core 2 Duo models only.

#### Chipset

Mobile Intel 945GM Express Chipset with 667-MHz front side bus

#### Graphics

Intel Graphics Media Accelerator 950 with up to 224-MB shared system memory

### Standard Features

Display	Internal	15.0-inch XGA (1024 x 768 resolution) 15.0-inch SXGA+ wide viewing angle (1400 x 1050 resolution)
	External	Up to 32-bit per pixel color depth VGA port supports resolutions up to 2048 x 1536 at 75 Hz, and lower resolutions at up to 100 Hz <b>NOTE:</b> Resolutions are dependent upon monitor capability, and resolution and color depth settings.

Memory	Standard	256-MB, 512-MB, 1024-MB or 2048-MB 533-MHz or 667-MHz DDR2 SDRAM; two SODIMM slots supporting dual channel memory
	Maximum	Upgradeable to 4096-MB maximum (2048-MB SODIMM in slots 1 and 2)
	Dual-channel	Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

**NOTE:** Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed. Above 3-GB, all memory may not be available due to system resource requirements.

Communications	Integrated Broadcom NetLink Gigabit Ethernet PCI Controller (10/100/1000 NIC)* 56K V.92 modem** with digital line guard
----------------	--

\* The term "10/100/1000" or "Gigabit" Ethernet indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

\*\* Designed for downloads from 56K modem compliant sources. Maximum achievable download transmission rates currently do not reach 56 KB/s, and will vary with line conditions. Modem availability is subject to country regulatory approval.

Wireless Devices	Support for a broad range of secure, integrated wireless LAN options featuring support for the latest industry standards. Integrated Bluetooth is also an option (factory configurable only) and can be combined with any of the supported wireless LAN options.
------------------	--

All integrated wireless LAN options	Wi-Fi certified Cisco Compatible Extensions support (Version 3.0) Wired Equivalent Privacy (WEP) support up to 128-bit keys Wi-Fi Protected Access (WPA) and WPA2 support 802.1x authentication support, including EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, and LEAP Advanced Encryption Standard (AES) support WiFi certified for WPA2, WMM Dual antennas integrated in the display enclosure
Intel PRO/Wireless 3945ABG Network Connection	Intel Centrino mobile technology Integrated support for 802.11a, b and g Up to 54-mbps data rate
Intel PRO/Wireless 3945BG Network Connection	Intel Centrino mobile technology Integrated support for 802.11 b and g Up to 54-mbps data rate

### Standard Features

<b>Broadcom 4311AG WiFi Adapter</b>	Integrated support for 802.11a, b and g Up to 54-mbps data rate
<b>Broadcom 4311BG WiFi Adapter</b>	Integrated support for 802.11 b and g Up to 54-mbps data rate
<b>HP Integrated Module with Bluetooth 2.0 Wireless Technology</b>	Bluetooth Specification v2.0 compliant Works with a wide range of Bluetooth devices

\*\*\* Broadband Wireless Module (WWAN) is available in the US only on the nc6320 only and requires one of the Intel PRO/Wireless (WLAN) modules.

### Keyboard

The 101/102-key compatible keyboard features an industry standard, full-pitch key layout with desktop keyboard features, such as the isolated inverted-T cursor control keys, editing keys, both left and right control and alt keys, and 12 function keys. US and International key layouts are available. Other features include an integrated numeric keypad, hotkeys for instant access to power conservation, brightness, and other features, 19-mm x 19-mm key pitch (center-to-center spacing), 2.5-mm stroke, comfort-dished keycaps, and bright key legends for improved visibility in low light conditions.

### One-Touch Productivity Buttons

Provide one-touch access to the following features: HP Info Center, Wireless On/Off, Presentation Mode, Volume Up, Volume Down, and Volume Mute

### Pointing Device

Touchpad with scroll zone, two soft-touch buttons

### Expansion Card Slots

<b>One Type I/II PC Card slot</b>	Supports 32-bit CardBus and 16-bit PC Cards
<b>or</b>	
<b>Optional Integrated Smart Card Reader</b>	Compatible with ISO 7816 compliant Smart Cards PC/SC interface support
<b>Express Card slot</b>	Express Card/34 or ExpressCard/54

### Media Slots

**7-in-1 Media Reader** Supports SD (Secure Digital), MMC (MultiMedia Card), Memory Stick, Memory Stick Pro, Memory Stick Duo\*, Smart Media, xD-Picture card

\*NOTE: Memory Stick Duo Adapters are required and sold separately. Inserting a Memory Stick Duo Card directly into your notebook could damage the memory card and/or notebook.

### Storage

**Hard Drives** 40-, 60-, 80-, 100-, 120-GB 5400 rpm SMART SATA

NOTE: These hard drives are customer removable and will withstand multiple insertion/removal cycles. Up to 8 GB is reserved for the system recovery software.

**Fixed Optical Drives** DVD-ROM  
DVD/CD-RW Combo  
DVD+/-RW SuperMulti with Double Layer  
LightScribe DVD+/-RW with Double Layer

### Standard Features

<b>Interfaces</b>	<b>PC Card Slot</b>	One Type I/II or optional Smart Card Reader
	<b>Express Card Slot</b>	Express Card/34 or ExpressCard/54
	<b>External Monitor</b>	One – VGA
	<b>IEEE 1394a Port</b>	One
	<b>External Microphone</b>	One
	<b>Headphone/Line out</b>	One
	<b>Power Connector</b>	One
	<b>RJ-11 (Modem)</b>	One
	<b>RJ-45 (NIC)</b>	One
	<b>Serial Port</b>	One
	<b>S-Video TV Out</b>	One (Support for NTSC/PAL)
	<b>Parallel Port</b>	One
	<b>USB 2.0</b>	Four
	<b>Docking Connector</b>	One
	<b>Accessory Battery Connector</b>	One
	<b>LED Status Indicators</b>	Twelve

---

<b>Audio</b>	ADI High Definition CODEC Integrated 16-bit Sound Blaster Pro compatible audio Integrated stereo speakers Integrated microphone External volume up, volume down, and mute buttons Stereo headphone/line out Stereo microphone in
--------------	--

---

<b>Software</b>	<b>Preinstalled Software with Windows Vista or Windows XP</b> Adobe Acrobat Reader* HP Backup and Recovery Manager HP Help and Support Center* HP Mobile Print Driver* (Windows XP models) HP ProtectTools Security Manager*: BIOS Configuration for HP ProtectTools Embedded Security for HP ProtectTools Credential Manager for HP ProtectTools HP Quick Launch Buttons HP Wireless Assistant Sonic Digital Media Plus* (Windows XP models): RecordNow! (for optional DVD+/-RW and DVD/CDRW drives) MyDVD (DVD Authoring for optional DVD+/-RW drives) Roxio Creator 9 (Windows Vista models with optional DVD+/-RW or DVD/CDRW drives) Synaptics Touchpad Driver Symantec Norton Internet Security* with complimentary 60-day live update Intervideo WinDVD* – DVD Player (for optional DVD+/-RW, DVD/CDRW and DVD drives)
-----------------	--

### Standard Features

<b>Additional software available from the Web</b>	HP Client Manager Software (nc6320) HP OpenView Radia Management Solutions (nc6320) SmartCard Security for HP ProtectTools Device Access Manager for HP ProtectTools
---	---

**\*NOTE:** On nc6320, software marked with an asterisk is loaded on the hard drive and can be installed by running the Software Setup utility. On nx6320, all software in above list is preinstalled.

---

<b>HP Backup and Recovery Manager</b>	Each unit is shipped with HP Backup and Recovery Manager. HP Backup and Recovery Manager can provide data and system file protection for HP business PCs to enable fast recovery if the system becomes corrupted or if important information is accidentally deleted. HP Backup and Recovery Manager can perform scheduled or manual backups of the entire drive or individual files and folders. Up to 8GB of the hard drive is reserved for the system recovery software. HP Backup and Recovery Manager can also create software recovery CDs or DVDs (requires optional hardware).
---------------------------------------	--

---

<b>HP OpenView Radia Management Solutions</b>	HP OpenView Radia Management Solutions automate the management of software such as operating systems, software, software updates, content, and configuration settings to ensure that each computer is maintained in the correct configuration.
---	--

---

<b>HP Client Management Interface</b>	HP Client Management Interface is based on industry standards that include Microsoft Windows Management Interface (MS WMI), Web Based Enterprise Management (WBEM), System Management BIOS (SMBIOS), and Advanced Configuration and Power Interface (ACPI). HP CMI is a foundation technology utilized in HP Client Management Solutions.
---------------------------------------	---

---

<b>SMBIOS Version 2.4</b>	System Management BIOS, previously known as DMI BIOS, is used to store system management information.
---------------------------	---

---

<b>HP ProtectTools Security Manager</b>	HP ProtectTools Security Manager is the security platform for business notebooks and desktops. The HP ProtectTools Security Manager is an extensible client security console that delivers enhanced security capabilities through add-on software modules. Modules currently available are:
---	---

- Smart Card Security for HP ProtectTools
- BIOS Configuration for HP ProtectTools
- Embedded Security for HP ProtectTools
- Credential Manager for HP ProtectTools
- Device Access Manager for HP ProtectTools

### Standard Features

<b>Security</b>	<b>Standard Features</b>	<ul style="list-style-type: none"> <li>HP ProtectTools Security Manager</li> <li>Configuration Control Hardware</li> <li>Memory Change Alert</li> <li>Ownership Tag</li> <li>Setup Password</li> <li>Power-On Password</li> <li>DriveLock</li> <li>TPM Enhanced DriveLock</li> <li>HP Disk Sanitizer</li> <li>Enabled for PC Smart Card options</li> <li>Kensington Lock Slot</li> <li>Support for Computrace / LoJack for Laptops (must be purchased separately)</li> </ul>				
	<b>Optional Features</b>	<table border="0"> <tr> <td style="vertical-align: top;"><b>Smart Card Reader</b> (replaces Type I/II PC Card slot)</td> <td style="vertical-align: top;">Compatible with ISO 7816 compliant Smart Cards PC/SC interface support</td> </tr> <tr> <td style="vertical-align: top;"><b>Biometric Fingerprint Sensor</b></td> <td style="vertical-align: top;">Biometric sensor for fingerprint authentication (standard in all regions other than Asia Pacific/Japan)</td> </tr> </table>	<b>Smart Card Reader</b> (replaces Type I/II PC Card slot)	Compatible with ISO 7816 compliant Smart Cards PC/SC interface support	<b>Biometric Fingerprint Sensor</b>	Biometric sensor for fingerprint authentication (standard in all regions other than Asia Pacific/Japan)
<b>Smart Card Reader</b> (replaces Type I/II PC Card slot)	Compatible with ISO 7816 compliant Smart Cards PC/SC interface support					
<b>Biometric Fingerprint Sensor</b>	Biometric sensor for fingerprint authentication (standard in all regions other than Asia Pacific/Japan)					

For more information on HP security solutions refer to <http://www.hp.com/go/security>.

<b>Power Supply</b>	<ul style="list-style-type: none"> <li>External 65-watt Smart AC adapter, 6-foot (1.8-meter) power cord included.</li> <li>Total length including External AC adapter is 12 feet (3.66 meter).</li> <li>HP Fast Charge Technology*</li> </ul>
---------------------	---

\*Fast Charge Technology recharges your battery up to 90% within 90 minutes when the system is off. Fast Charge Technology does not apply to 12-cell Ultra-Capacity batteries.

<b>Battery</b>	<b>Primary Battery</b>	52Wh 6-cell high capacity Lithium-Ion
	<b>Optional HP 8-Cell Extended Life Battery</b>	52Wh 8-cell high capacity Lithium-Ion
	<b>Optional HP 12-Cell Ultra-Capacity Battery</b>	95Wh 12-cell high capacity Lithium-Ion

<b>Battery Life</b>	<b>Primary Battery</b>	Up to 4 hours and 45 minutes
	<b>Primary Battery and optional HP 8-Cell Extended Life Battery</b>	Up to 9 hours and 45 minutes
	<b>Primary Battery and optional HP 12-Cell Ultra-Capacity Battery</b>	Up to 14 hours and 45 minutes

**NOTE:** Battery life will vary depending on the product configuration, product model, applications loaded on the product, power management settings of the product, and the product features used by the customer. As with all batteries, the maximum capacity of this battery will decrease with time and usage.

<b>System Standby Time</b>	Up to 1 week
----------------------------	--------------



### Standard Features

<b>Power Conservation</b>	Supports enhanced Intel SpeedStep technology with Intel Core Duo processors (allows Battery Optimized Mode, Maximum Performance Mode, or Automatic mode) Intel Display Power Saving technology Hibernation Standby ACPI compliance
---------------------------	--

---

<b>Docking</b>	HP Basic Docking Station HP Advanced Docking Station HP 3-in-1 NAS Docking Station HP Adjustable Notebook Stand HP Monitor Stand
----------------	--

HP's shared docking solutions provide simple and convenient port replication and cable management. Features include Gigabit NIC pass through, modem pass through, legacy parallel and serial ports, S-video TV out, USB 2.0 ports, integrated security mechanism\*, integrated MultiBay II and ExpressCard\*\* slots. These docking solutions are compatible across multiple Business Notebook platforms enabling a lower total cost of ownership.

The 3-in-1 NAS Docking Station includes all the features of the HP Advanced Docking Station plus an automatic backup feature that backup the content of the Notebook to an integrated 160-GB Hard drive. Additionally, the NAS technology allow to share the 3-in-1 NAS Docking Station across a workgroup, enabling a shared network drive. The additional 2 USB network ports provide the possibility of share all the devices connected, such as scanners or printers.

\* HP/Kensington Cable Lock required (purchased separately)

\*\* HP Advanced Docking Station only

---

<b>Service and Support</b>	HP Services includes a one-year or three-year (depending on country and/or model) standard parts and labor warranty, pick-up or carry-in, and toll-free 7 x 24 hardware technical phone support. On-site service and warranty upgrades are also available.
----------------------------	--

**NOTE:** Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details. <http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp>.

### Options

<b>Memory</b>	256-MB 533-MHz DDR2 SDRAM	PE830A
	512-MB 533-MHz DDR2 SDRAM	PE831A
	1024-MB 533-MHz DDR2 SDRAM	PE832A
	512-MB 667-MHz DDR2 SDRAM	EM993AA
	1024-MB 667-MHz DDR2 SDRAM	EM994AA
	2048-MB 667-MHz DDR2 SDRAM	EM995AA

<b>MultiBay II Storage (9.5-mm)</b> <b>NOTE:</b> Requires HP Advanced Docking Station or HP External MultiBay II	8X DVD-ROM MultiBay II Drive	PA849A
	24X Combo DVD/CD-RW MultiBay II Drive	PA850A
	2X DVD+/-RW Dual Format MultiBay II Drive	PA851A
	80-GB 5400 rpm MultiBay II Hard Drive	PH357A

<b>Other Storage</b>	80-GB 5400 rpm Primary SATA Hard Drive	ET354AA
	HP SuperMulti (DL) DVD+/-RW LightScribe Drive	ET353AA
	HP USB Digital Drive + 128-MB Secure Digital Card	DL702A
	HP USB Digital Drive + 256-MB Secure Digital Card	DL702AA
	HP USB Diskette Drive	DC361B

<b>Communications</b>	Intel PRO/Wireless 3945ABG 802.11 a/b/g WLAN option kit	EX150AA#xxx
-----------------------	---	-------------

<b>Expansion Solutions</b>	HP Docking Station	EN488AA#xxx
	HP Advanced Docking Station	EN489AA#xxx
	HP 3-in-1 NAS Docking Station	EM537AA#xxx
	HP Monitor Stand	PA507A
	HP Adjustable Notebook Stand	PA508A
	HP External MultiBay II (9.5-mm)	PA509A#xxx
	HP 4-port USB 2.0 Hub	DG954A

<b>Power</b>	HP 2-bay Battery Charging Station	DT533A#xxx
	65W Smart AC Adapter	ED494AA#xxx
	90W Smart AC Adapter	ED495AA#xxx
	65W Air/Auto/AC Combo Adapter	ED993AA#xxx
	Primary 6-cell Battery Pack	PB994A
	HP 8-cell Extended Life Battery	PB993A
	HP 12-cell Ultra-Capacity Battery	EJ092AA

### Options

<b>Carrying Cases</b>	HP Entry Value Case	DL617A
	HP Top Load Nylon	DC915A
	HP Executive Leather case	PA847A
	HP Sport Backpack	DG102A
<hr/>		
<b>Security</b>	HP PCMCIA Smart Card Reader	DC350B
	HP/Kensington Cable Lock	PC766A
<hr/>		
<b>Input/Output Devices</b>	PS2 Keyboard	DT527A#xxx
	USB Keyboard	DT528A#xxx
	USB/PS2 Optical Mouse	DC369A
	HP USB Optical Travel Mouse	F2100A

### Memory

Support for up to 4096 MB\* of 533- or 667-MHz DDR2 SDRAM  
 Two DIMM slots  
 DIMM sizes supported: 256 MB, 512 MB, 1024 MB, and 2048 MB

- Standard Memory**
- 256 MB (256 MB x 1)
  - 512 MB (512 MB x 1 or 256 MB x 2)
  - 768 MB (512 MB + 256 MB)
  - 1024 MB (1024 MB x 1 or 512 MB x 2)
  - 1536 MB (1024 MB + 512 MB)
  - 2048 MB (1024 MB x 2)
  - 4096 MB (2048 MB x 2)

**Optional Memory Upgrades** Support for up to 4096 MB\* of memory is available (with the installation of optional DDR2 SDRAM memory kits). Both memory slots are user accessible. Please refer to the Hardware and Software Guide for installation procedures. Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

Up to	Slot 1	Slot 2
768 MB	512 MB	256 MB
1024 MB	1024 MB	Empty
1024 MB	512 MB	512 MB
1280 MB	1024 MB	256 MB
1536 MB	1024 MB	512 MB
2048 MB	1024 MB	1024 MB
2048 MB (1024 MB x 2)	2048 MB (1024 MB x 2)	2048 MB (1024 MB x 2)

**NOTE:** This chart does not represent all possible memory configurations. Due to the non-industry standard nature of some third-party memory modules, we strongly recommend using only HP branded memory modules to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

<b>Memory Upgrades</b>	256-MB 533-MHz DDR2 SDRAM	PE830A
	512-MB 533-MHz DDR2 SDRAM	PE831A
	1024-MB 533-MHz DDR2 SDRAM	PE832A
	512-MB 667-MHz DDR2 SDRAM	EM993AA
	1024-MB 667-MHz DDR2 SDRAM	EM994AA
	2048-MB 667-MHz DDR2 SDRAM	EM995AA

\* Above 3-GB, all memory may not be available due to system resource requirements.

## Storage

### Removable Media Drive Support

---

	Quantity Supported	Drive Bay
LightScribe DVD+/-RW Drive with Double Layer Drive	One	Fixed optical drive bay
DVD+/-RW SuperMulti Drive with Double Layer	One	Fixed optical drive bay
DVD/CD-RW Combo Drive	One	Fixed optical drive bay
DVD-ROM Drive	One	Fixed optical drive bay

---

### Hard Drive Support

---

	Quantity Supported	Drive Bay
<b>Primary Hard Drives</b>		
120-GB 5400 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
100-GB 5400 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
80-GB 5400 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
60-GB 5400 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
40-GB 5400 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay

### Technical Specifications

<b>System Unit</b>	<b>Dimensions (HxWxD)</b>	30.3 (at front) x 328.6 x 247.3 mm
	<b>Weight</b>	with 15.0-inch display 2.7 kg
	<b>NOTE:</b> Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components. Weight includes 6-cell battery, 60-GB hard drive, 256-MB memory, and CD-ROM drive. Weight varies by configuration and components.	
	<b>Stand-Alone Power Requirements</b>	Normal Operating Voltage 18.5 V Average Operating Power 12.5 W Max Operating Power < 65 W
	<b>Temperature</b>	Operating 0° to 35° C (not writing optical) 5° to 35° C (writing optical) Non-operating -20° to 60° C
	<b>Relative Humidity</b>	Operating 10% to 90%, non-condensing Non-operating 5% to 95%, 38.7° C maximum wet bulb temperature
	<b>Shock</b>	Operating 125 G, 2 ms, half-sine Non-operating 200 G, 2 ms, half-sine
	<b>Random Vibration</b>	Operating 0.75 grms Non-operating 1.50 grms
	<b>Altitude (unpressurized)</b>	Operating -15.24 to 3,048 m Non-operating -15.24 to 12,192 m
	<b>Industry Standard Certifications</b>	UL Yes CSA Yes FCC Compliance Yes Energy Star Compliant Yes ICES Yes GS Yes Australia / NZ A-Tick Compliance Yes CCC Yes Japan VCCI Compliance Yes MIC Yes BSMI Yes CE Marking Compliance Yes BNCI or BELUS Yes CIT Yes GOST Yes Saudi Arabian Compliance (ICCP) Yes SABS Yes UKRSERTCOMPUTER Yes

### Technical Specifications

<b>HP 65W Smart AC Adapter</b>	<b>Dimensions</b>	10.6 x 4.7 x 2.8 cm	
	<b>Weight</b>	280 g	
	<b>Input</b>	Input	100 to 240 VAC
		Input Efficiency	83% min at 115 VAC
		Input frequency range	47 to 63 Hz
	<b>Output</b>	Input AC current	1.7 A at 90 VAC, 0.85 A at 180 VAC
		Output power 65W	65W
		DC output	18.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	<b>Connector</b>	3 pin/grounded, mates with interchangeable cords	
	<b>Environmental Design</b>	Operating temperature	0° to 40° C
		Non-operating (storage) temperature	-20° to 65° C
		Altitude	0 to 3,048 m
Humidity		20% to 80%	
<b>EMI and Safety Certifications</b>	Storage Humidity	10% to 90%	
	CE Mark – full compliance with LVD and EMC directives; Worldwide safety standards – IEC950, EN60950, UL1950, Class2, SELV; Agency approvals – C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCIB, NOM-1 NYCE; MTBF – over 200,000 hours at 25°C ambient condition.		
	<b>Option Kit Contents</b>	65W AC Adapter, power cable, warranty booklet	

---

<b>Optional HP 12-Cell Ultra-Capacity Battery</b>	<b>Dimensions (H x W x L)</b>	3.33 x 15.25 x 26.88 cm	
	<b>Weight</b>	0.803 kg	
	<b>Cells/Type</b>	12-cell Lithium-Ion	
	<b>Energy</b>	Voltage	14.8V
		Watt-hour Capacity	95Wh
		Amp-hour Capacity	6.45Ah
	<b>Temperature</b>	Operating (Charging)	0° to 45° C
		Operating (Discharging)	-10° to 60° C
		Non-operating	-20° to 60° C
	<b>Battery Re-Charge Time</b>	Smart Adapter	3 to 4 hours
System ON		4 to 5 hours (depending on system power consumption)	
<b>Fuel Gauge</b>	When pressed, LEDs light indicating level of charge remaining on battery		

---

### Technical Specifications

<b>Optional HP 8-Cell Extended Life Battery</b>	<b>Dimensions (H x W x L)</b>	2.5 x 10.0 x 22.0 cm		
	<b>Weight</b>	0.455 kg		
	<b>Cells/Type</b>	8-cell Lithium-Ion		
	<b>Energy</b>	Voltage	14.4V	
		Watt-hour Capacity	52Wh	
		Amp-hour Capacity	3.6Ah	
	<b>Temperature</b>	Operating (Charging)	0° to 45° C	
		Operating (Discharging)	-10° to 60° C	
		Non-operating	-20° to 60° C	
	<b>Battery Re-Charge Time</b>	System in OFF mode or Standby	3 hours	
System ON		3 to 5 hours (depending on system power consumption)		
HP Fast Charge Technology		Charges the battery up to 90% within 90 minutes when system is OFF		
<b>Fuel Gauge</b>	When pressed, LEDs light indicating level of charge remaining on battery			

---

<b>52Wh Primary 6-Cell Battery</b>	<b>Dimensions (H x W x L)</b>	2.0 x 5.3 x 20.3 cm		
	<b>Weight</b>	0.335 kg		
	<b>Cells/Type</b>	6-cell Lithium-Ion		
	<b>Energy</b>	Voltage	10.8V	
		Watt-hour Capacity	52Wh	
		Amp-hour Capacity	4.8Ah	
	<b>Temperature</b>	Operating (Charging)	0° to 45° C	
		Operating (Discharging)	-10° to 60° C	
		Non-operating	-20° to 60° C	
	<b>Battery Re-Charge Time</b>	System in OFF Mode or Standby	2.5 hours	
System ON		3 to 5 hours (depending on system power consumption)		
HP Fast Charge Technology		Charges the battery up to 90% within 1.5 hours when system is OFF		

---



### Technical Specifications

15.0-Inch Color TFT SXGA+ Wide Viewing Angle Display	Active Area (W x H)	30.4 x 22.8 cm	
	Diagonal Size	38.0 cm	
	Surface Treatment	Anti-glare	
	Contrast Ratio	300:1 (typical)	
	Refresh Rate	60 Hz	
	Brightness	170 nit (typical)	
	Pixel Resolution	Pitch	0.217 mm
		Format	1400 x 1050
		Configuration	RGB Stripe
	Backlight	CCFL	
	PPI	117	
Viewing Angle	±60° Horizontal, +40°/-45° Vertical (typical)		

---

15.0-Inch Color TFT XGA Display	Active Area (W x H)	12.0 x 9.0 in (30.4 x 22.8 cm)	
	Diagonal Size	15.0 in (38.0 cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	300:1 (typical)	
	Refresh Rate	60 Hz	
	Brightness	150 nit (typical)	
	Pixel Resolution	Pitch	0.296 mm
		Format	1024 x 768
		Configuration	RGB Stripe
	Backlight	CCFL	
	PPI	86	
Viewing Angle	±45° Horizontal, ±25° Vertical (typical)		

---

### Hard Drives

---

### Technical Specifications

---

120-GB 5400 rpm SATA	Drive Weight	0.22 lb (101 g)	
	Capacity	120 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	234,441,648	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

---

100-GB 5400 rpm SATA	Drive Weight	101 g	
	Capacity	100 GB	
	Height	9.5 mm	
	Width	70 mm	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	195,371,568	
	Operating Temperature	5° to 60° C [case temp]	
	Features	ATA Security	

---

### Technical Specifications

---

80-GB 5400 rpm SATA	Drive Weight	101 g	
	Capacity	80 GB	
	Height	9.5 mm	
	Width	70 mm	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	156,301,488	
	Operating Temperature	5° to 60° C [case temp]	
	Features	ATA Security	

---

60-GB 5400 rpm SATA	Drive Weight	101 g	
	Capacity	60 GB	
	Height	9.5 mm	
	Width	70 mm	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	117,231,408	
	Operating Temperature	5° to 60° C [case temp]	
	Features	ATA Security	

---

### Technical Specifications

40-GB 5400 rpm SATA	Drive Weight	101 g	
	Capacity	40 GB	
	Height	9.5 mm	
	Width	70 mm	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	78,165,360	
	Operating Temperature	5° to 60° C [case temp]	
	Features	ATA Security	

### Removable Storage Drives – Fixed Bay

DVD-ROM Drive	Access Times	Random	<116 ms CD <125 ms DVD
		Max Data Transfer Rate	24X CD-ROM 3,600 KB/s 8X-DVD 10,800 KB/s
	Transfer Mode	Multiword DMA Mode 2	
	Interface	EIDE	
	Supported Media (read)	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW	
	Supported Media (write)	None	
	Max Media Capacity (read)	4.7 GB	
	Transport	Tray Loading	

### Technical Specifications

<b>DVD/CD-RW Combo Drive</b>	<b>Access Times</b>	Random	<110 ms CD <130 ms DVD
	<b>Max Data Transfer Rate</b>	24X CD-ROM	3,600 KB/s
		8X DVD	10,800 KB/s
		24X CD-R	3,600 KB/s
		24X CD-RW	3,600 KB/s
	<b>Transfer Mode</b>	Multiword DMA Mode 2	
	<b>Interface</b>	EIDE	
	<b>Supported Media (read)</b>	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW	
	<b>Supported Media (write)</b>	CD-R, CD-RW	
	<b>Max Media Capacity (read)</b>	8.5 GB	
<b>Max Media Capacity (write)</b>	700 MB		
<b>Transport</b>	Tray loading		

<b>LightScribe DVD+/-RW Drive with Double Layer</b>	<b>Access Times</b>	Random	<175 ms CD <230 ms DVD
	<b>Max Data Transfer Rate</b>	24X CD-ROM	3,600 KB/s
		8X DVD	10,800 KB/s
		24X CD-R	3,600 KB/s
		16X CD-RW	2,400 KB/s
		8X DVD+R	10,800 KB/s
		4X DVD+RW	5,400 KB/s
		8X DVD-R	10,800 KB/s
		4X DVD-RW	5,400 KB/s
		2.4X DVD+R(9)	2,700 KB/s
<b>Transfer Mode</b>	Multiword DMA Mode 2		
<b>Interface</b>	EIDE		
<b>Supported Media (read)</b>	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW		
<b>Supported Media (write)</b>	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, LightScribe		
<b>Max Media Capacity (read)</b>	8.5 GB		
<b>Max Media Capacity (write)</b>	8.5 GB		
<b>Transport</b>	Tray Loading		

### Technical Specifications

DVD+/-RW SuperMulti Drive with Double Layer	<b>Access Times</b>	Random	<175 ms CD <230 ms DVD
	<b>Max Data Transfer Rate</b>	24X CD-ROM	3,600 KB/s
		8X DVD	10,800 KB/s
		24X CD-R	3,600 KB/s
		16X CD-RW	2,400 KB/s
		8X DVD+R	10,800 KB/s
		4X DVD+RW	5,400 KB/s
		8X DVD-R	10,800 KB/s
		4X DVD-RW	5,400 KB/s
		2.4X DVD+R(9)	2,700 KB/s
	5X DVD-RAM	6,750 KB/s	
	<b>Transfer Mode</b>	Multiword DMA Mode	
	<b>Interface</b>	EIDE	
<b>Supported Media (read)</b>	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM		
<b>Supported Media (write)</b>	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM		
<b>Max Media Capacity (read)</b>	8.5 GB		
<b>Max Media Capacity (write)</b>	8.5 GB		
<b>Transport</b>	Tray Loading		

HP Biometric Fingerprint Sensor	<b>Mobile Voltage Operation</b>	3.0V–3.6V Single Supply
	<b>Operating Temperature</b>	0° – 70°C
	<b>Current Consumption @ 3.3V</b>	Less than 70 mA peak imaging and scrolling Less than 25 mA hardware finger detection Advanced Power Management
	<b>High-Rate Image Capture</b>	Up to 240 image frames /sec
	<b>ESD Resistance</b>	IEC 61000-4-2 Level 4 (±15KV)
	<b>Detection Matrix</b>	192 x 16 Pixels
		9.7mm x 0.81mm 500 ppi High-Resolution Images

### Audio

### Technical Specifications

<b>Hardware</b>	<b>Implementation</b>	ADI1981HD High Definition CODEC
	<b>Volume Controls</b>	Up, down, and mute buttons
	<b>Full Duplex</b>	Yes
	<b>Sound Blaster Pro compatible</b>	Yes
	<b>Microphone Jack</b>	Stereo or mono
	<b>Headphone/Line Out Jack</b>	Stereo
<hr/>		
<b>Audio Output Quality</b>	<b>Frequency Response</b>	20 Hz – 20 kHz
	<b>Signal to Noise Ratio</b>	>85 dB
	<b>Total Harmonic Distortion</b>	0.01%
	<b>Noise Floor</b>	-110 dB
	<b>Play/Record Sampling Rate(s)</b>	8 kHz – 48kHz
	<b>DAC</b>	16, 20 or 24-bit
	<b>ADC</b>	16 or 20-bit
<hr/>		
<b>Internal Speakers</b>	<b>Power Rating</b>	2 Watts
	<b>Impedance</b>	4 Ohms
<hr/>		
<b>Communications</b>		
<hr/>		
<b>Integrated Broadcom NetLink Gigabit Ethernet PCI Controller (BCM5788M)</b>	<b>Ethernet Features</b>	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3z and 802.3ab; IEEE 802.3 clauses 34-42) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s IEEE 802.1p QoS (Quality of Service) Support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)
	<b>Power Management</b>	ACPI compliant -- multiple power modes Situation-sensitive features reduce power consumption NIC Battery Saving Mode (enabled by default)
	<b>Performance Features</b>	TCP/IP/UDP Checksum Offload (configurable)
	<b>Manageability</b>	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite
	<b>Interface</b>	32-bit PCI, 33-MHz
	<hr/>	

## Technical Specifications

NIC Device Driver Name	Broadcom NetLink Gigabit Ethernet
Drivers Available	Microsoft Windows XP Microsoft Windows 2000

### V.92 56K Data/Fax Modem

Form Factor	MDC 1.5 Daughtercard
Power Management Support	APM Revision 1.2, ACPI
Approvals/Certifications	UL, CSA, NEMKO, CCIB, Industry Canada, FCC Part 68, CTR21, FCC Part 15 Class B, Canadian ICES-003 Class B, C.I.S.P.R.22, Australian ACA, CE Mark, Other Countries
Data Mode Capabilities	V.92 data V.8bis V.80 V44, V.42bis, MNP5 (Compression) V.42 (LAPM, MNP2-4) (Error Correction) <b>Optional symbol rates:</b> 2800, 3429 Asymmetric Symbol rates <b>Synchronous primary channel data signaling rates:</b> 3600, 31200 Automatic rate re-negotiation V.34 V.32bis V.32 V.23 V.22bis V.22 V.21 Bell 212A Bell 103J
Fax Mode Capabilities	TIA/EIA-578-B (Class 1) T.30, T.4 (Group 3) V.17 V.29 V.27ter V.21 Channel 2
Command Set	V.250 (Partial) TIA-602 Identification: +GMI, +GMM, +GMR Port control: +IPR, +ICF, +IFC, +ILRR Modulation: +MS, +MR, +MA Error control: +ES, +ER, +EB, +ESR, +ETBM Data compression: +DS, +DR V.251

Broadcom 4311BG  
802.11b/g WiFi Adapter

Wireless LAN Standards IEEE 802.11b  
IEEE 802.11g





### Technical Specifications

<b>Interoperability</b>	Wi-Fi certified Cisco Compatible Extensions Program compliant (details at <a href="http://www.hp.com/go/notebooks/WLAN">www.hp.com/go/notebooks/WLAN</a> )	
<b>Frequency Band</b>	2.4 GHz	
<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps	
<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM	
<b>Security<sup>1</sup></b>	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST, EAP-SIM.  Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4).	
<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.	
<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK	
<b>Network Architecture</b>	Ad-hoc (Peer to Peer)	
<b>Models</b>	Infrastructure (Access Point Required)	
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points	
<b>Output Power (for CCK)<sup>2</sup></b>	17.5 dBm	
<b>Output Power (for OFDM; 15 dBm power varies by data rate)<sup>2</sup></b>	15 dBm	
<b>Power Consumption</b>	Transmit: 2.0 W (max) Receive: 1.5 W (max) Idle mode <sup>3</sup> : 390 mW (nominal) Sleep mode: 20 mW (max)	
<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode	
<b>Receiver Sensitivity<sup>4</sup></b>	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm	
<b>Antenna type</b>	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure	
<b>Range</b>	802.11 b – Typical (@1 Mbps)	365.76 m – Outdoor Open Area 91.44 m – Indoor, Office environment
	802.11 g – Typical (@1 Mbps)	365.76 m – Outdoor Open Area 91.44 m – Indoor, Office environment
<b>Form Factor</b>	PCI-Express MiniCard	
<b>Weight</b>	12 g	
<b>Dimensions</b>	4.75 x 29.85 x 50.8 mm	
<b>Operating Voltage</b>	3.3v +/- 10%	
<b>Temperature</b>	Operating	0° to 80° C
	Non-operating	-40° to 80° C
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)

### Technical Specifications

<b>Altitude</b>	Operating	3,048 m
	Non-operating	15,240 m
<b>Configuration Utility<sup>5</sup></b>	Choice of Configuration Utility:	
	<ul style="list-style-type: none"> <li>• Microsoft Windows XP Wireless Network Connection Manager</li> <li>• Broadcom Wireless Configuration Utility (required for Cisco Compatible Extensions support)</li> </ul>	
<b>LED Activity</b>	LED Off – Radio OFF; Solid LED On – Radio ON	
	<ol style="list-style-type: none"> <li>1. Check latest software/driver release for updates on supported security features.</li> <li>2. Maximum output power may vary by country according to local regulations.</li> <li>3. In Power Save Polling mode.</li> <li>4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).</li> <li>5. WLAN supplier's client utility is required for Cisco Compatible Extensions support. WLAN may also be compatible with certain third-party software supplicants.</li> </ol>	

---

<b>Broadcom 4311AG 802.11a/b/g WiFi Adapter</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g
	<b>Interoperability</b>	Wi-Fi certified Cisco Compatible Extensions Program compliant (details at <a href="http://www.hp.com/go/notebooks/WLAN">www.hp.com/go/notebooks/WLAN</a> )
	<b>Frequency Band</b>	2.4 GHz and 5 GHz
	<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	<b>Security<sup>1</sup></b>	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST, EAP-SIM.  Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4).
	<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.
	<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK
	<b>Network Architecture</b>	Ad-hoc (Peer to Peer)
	<b>Models</b>	Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
	<b>Output Power (for CCK)<sup>2</sup></b>	17.5 dBm
	<b>Output Power (for OFDM; 15 dBm power varies by data rate)<sup>2</sup></b>	15 dBm

### Technical Specifications

<b>Power Consumption</b>	Transmit: 2.0 W (max) Receive: 1.5 W (max) Idle mode <sup>3</sup> : 390 mW (nominal) Sleep mode: 20 mW (max)
<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm
<b>Antenna type</b>	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure
<b>Range</b>	802.11 a – Typical                      600 feet – Outdoor Open Area (@6 Mbps)                                150 feet – Indoor, Office environment 802.11 b – Typical                      1200 feet – Outdoor Open Area (@1 Mbps)                                300 feet – Indoor, Office environment 802.11 g – Typical                      1200 feet – Outdoor Open Area (@1 Mbps)                                300 feet – Indoor, Office environment
<b>Form Factor</b>	PCI-Express MiniCard
<b>Weight</b>	12 g
<b>Dimensions</b>	4.75 x 29.85 x 50.8 mm
<b>Operating Voltage</b>	3.3v +/- 10%
<b>Temperature</b>	Operating                                0° to 80° C Non-operating                           -40° to 80° C
<b>Humidity</b>	Operating                                10% to 90% (non-condensing) Non-operating                           5% to 95% (non-condensing)
<b>Altitude</b>	Operating                                3,048 m Non-operating                           15,240 m
<b>Configuration Utility<sup>5</sup></b>	Choice of Configuration Utility: <ul style="list-style-type: none"><li>● Microsoft Windows XP Wireless Network Connection Manager</li><li>● Broadcom Wireless Configuration Utility (required for Cisco Compatible Extensions support)</li></ul>
<b>LED Activity</b>	LED Off – Radio OFF; Solid LED On – Radio ON <ol style="list-style-type: none"><li>1. Check latest software/driver release for updates on supported security features.</li><li>2. Maximum output power may vary by country according to local regulations.</li><li>3. In Power Save Polling mode.</li><li>4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).</li><li>5. WLAN supplier's client utility is required for Cisco Compatible Extensions support. WLAN may also be compatible with certain third-party software supplicants.</li></ol>

Intel PRO/Wireless  
3945ABG 802.11a/b/g  
Network Connection

<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g
<b>Interoperability</b>	Wi-Fi certified Cisco Compatible Extensions Program compliant (details at <a href="http://www.hp.com/go/notebooks/WLAN">www.hp.com/go/notebooks/WLAN</a> )
<b>Frequency Band</b>	2.4 GHz and 5 GHz

### Technical Specifications

<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps	
<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM	
<b>Security<sup>1</sup></b>	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST, EAP-SIM.  Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4).	
<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.	
<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK	
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)	
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points	
<b>Output Power (for CCK)<sup>2</sup></b>	15 dBm	
<b>Output Power (for OFDM; power varies by data rate)<sup>2</sup></b>	15 dBm	
<b>Power Consumption</b>	Transmit: 1.8 Watts (max) Receive: 1.4 Watts (max) Idle mode <sup>3</sup> : 150 mW (nominal) Sleep mode: 30 mW (max)	
<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode	
<b>Receiver Sensitivity<sup>4</sup></b>	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm	
<b>Antenna type</b>	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure	
<b>Range</b>	802.11 a – Typical (@6 Mbps)	182.88 m – Outdoor Open Area 45.72 m – Indoor, Office environment
	802.11 b – Typical (@1 Mbps)	365.76 m – Outdoor Open Area 91.44 m – Indoor, Office environment
	802.11 g – Typical (@1 Mbps)	365.76 m – Outdoor Open Area 91.44 m – Indoor, Office environment
<b>Form Factor</b>	PCI-Express MiniCard	
<b>Weight</b>	6 g	
<b>Dimensions</b>	4.75 x 29.85 x 50.8 mm	
<b>Operating Voltage</b>	3.3v +/- 10%	
<b>Temperature</b>	Operating	0° to 80° C
	Non-operating	-40° to 80° C
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	3,048 m
	Non-operating	15,240 m

### Technical Specifications

<b>Configuration Utility<sup>5</sup></b>	Choice of Configuration Utility: <ul style="list-style-type: none"> <li>• Microsoft Windows XP Wireless Network Connection Manager</li> <li>• Intel PROSet (required for Cisco Compatible Extensions support)</li> </ul>
<b>LED Activity</b>	LED Off – Radio OFF; Solid LED On – Radio ON
	<ol style="list-style-type: none"> <li>1. Check latest software/driver release for updates on supported security features.</li> <li>2. Maximum output power may vary by country according to local regulations.</li> <li>3. In Power Save Polling mode.</li> <li>4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).</li> <li>5. WLAN supplier's client utility is required for Cisco Compatible Extensions support. WLAN may also be compatible with certain third-party software suppliers.</li> </ol>

<b>Intel PRO/Wireless 3945BG 802.11b/g Network Connection</b>	<b>Wireless LAN Standards</b>	IEEE 802.11b IEEE 802.11g
	<b>Interoperability</b>	Wi-Fi certified Cisco Compatible Extensions Program compliant (details at <a href="http://www.hp.com/go/notebooks/WLAN">www.hp.com/go/notebooks/WLAN</a> )
	<b>Frequency Band</b>	2.4 GHz
	<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	<b>Security<sup>1</sup></b>	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST, EAP-SIM.  Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4).
	<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.
	<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK
	<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
	<b>Output Power (for CCK)<sup>2</sup></b>	15 dBm
	<b>Output Power (for OFDM; power varies by data rate)<sup>2</sup></b>	15 dBm
	<b>Power Consumption</b>	Transmit: 1.8 Watts (max) Receive: 1.4 Watts (max) Idle mode <sup>3</sup> : 150 mW (nominal) Sleep mode: 30 mW (max)
<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode	
<b>Receiver Sensitivity<sup>4</sup></b>	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm	

### Technical Specifications

<b>Antenna type</b>	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure	
<b>Range</b>	802.11 b – Typical (@1 Mbps)	365.76 m – Outdoor Open Area 91.44 m – Indoor, Office environment
	802.11 g – Typical (@1 Mbps)	365.76 m – Outdoor Open Area 91.44 mt – Indoor, Office environment
<b>Form Factor</b>	PCI-Express MiniCard	
<b>Weight</b>	6 g	
<b>Dimensions</b>	4.75 x 29.85 x 50.8 mm	
<b>Operating Voltage</b>	3.3v +/- 10%	
<b>Temperature</b>	Operating	0° to 80° C
	Non-operating	-40° to 80° C
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	3,048 m
	Non-operating	15,240 m
<b>Configuration Utility<sup>5</sup></b>	Choice of Configuration Utility: <ul style="list-style-type: none"> <li>• Microsoft Windows XP Wireless Network Connection Manager</li> <li>• Intel PROSet (required for Cisco Compatible Extensions support)</li> </ul>	
<b>LED Activity</b>	LED Off – Radio OFF; Solid LED On – Radio ON	
	<ol style="list-style-type: none"> <li>1. Check latest software/driver release for updates on supported security features.</li> <li>2. Maximum output power may vary by country according to local regulations.</li> <li>3. In Power Save Polling mode.</li> <li>4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).</li> <li>5. WLAN supplier's client utility is required for Cisco Compatible Extensions support. WLAN may also be compatible with certain third-party software supplicants.</li> </ol>	

---

<b>HP Integrated Module with Bluetooth Wireless Technology</b>	<b>Bluetooth Specification</b>	2.0 Compliant
	<b>Dimensions</b>	26 x 14 x 5.7 mm
	<b>Frequency Band</b>	2402 to 2480 MHz
	<b>Number of Available Channels</b>	79 (1 MHz) available channels
	<b>Data Rates and Throughput</b>	3 Mbps data rate; throughput up to 2.17 Mbps Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
	<b>Transmit Power</b>	-6 dBm to 4 dBm (Bluetooth Class II)
	<b>Receiver Sensitivity</b>	Better than -80 dBm at 0.1 % raw bit error rate
	<b>Power Consumption</b>	Peak (Tx) 264 mW Peak (Rx) 231 mW Sleep < 1 mW
	<b>Antenna</b>	Internally integrated within module
	<b>Range</b>	10 m

### Technical Specifications

<b>Electrical Interface</b>	USB 2.0 compliant Microsoft Windows Plug and Play compliant
<b>OS Support</b>	Microsoft Windows XP Professional and Home Microsoft Windows 2000
<b>Bluetooth Software Supported</b>	Broadcom Bluetooth for Windows Microsoft Windows XP Bluetooth Software
<b>Link Topology</b>	Point to Point, Multipoint Pico Nets up to 7 slaves
<b>Security</b>	Full support of Bluetooth Security Provisions
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support Self configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
<b>Certifications</b>	All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249 ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
<b>Temperature</b>	Operating -20° to 70° C Non-operating -40° to 80° C
<b>Humidity</b>	Operating 10% to 90% Non-operating 5% to 95%
<b>Altitude</b>	Operating 4,572 m Non-operating 12,192 m
<b>Bluetooth Profiles Supported</b>	(with Bluetooth for Windows 4.0 software) Serial Port Profile (SPP)* Dial-Up Networking (DUN)* Generic Object Exchange Profile (GOEP) Object Push Profile (OPP)* File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP)* Personal Area Networking Profile (PAN)* Human Interface Device Profile (HID)* FAX Profile (FAX) Basic Imaging Profile (BIP) Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

\* indicates the profile is also supported by Microsoft Windows XP SP2

### Technical Specifications

**Environmental Data**      **Eco-Label Certifications**      This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US Energy Star
- US Federal Energy Management Program (FEMP)
- Taiwan Green Mark
- China Energy Conservation Program
- IT ECO declaration

**System Configuration**      The configuration used for the Energy Consumption and Declared Noise Emissions data is based on a "Typically Configured Notebook."

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	23.0 W	23.5 W	23.0 W
Sleep (Energy Star low power mode)	1.72 W	1.88 W	1.73 W
Off	1.90 W	1.90 W	1.98 W
Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	78 BTU/hr	80 BTU/hr	78 BTU/hr
Sleep	5.9 BTU/hr	6.4 BTU/hr	5.9 BTU/hr
Off	6.5 BTU/hr	6.8 BTU/hr	6.5 BTU/hr

**\*NOTE:** Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.2	23
Fixed Disk (random writes)	3.8	24

**Batteries**      This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater than 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 4000 ppm by weight.

Battery type and chemistry used in the product:

- Primary battery
- 6-cell high capacity Lithium-Ion battery pack

- Real Time Clock battery
- CR2032 (coin cell), Lithium



### Technical Specifications

<b>Additional Information</b>	<p>This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.</p> <p>This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.</p> <p>Keyboard complies with ISO standard: ISO 9995, EN 29241-4, and ISO/IEC 15412</p> <p>Input devices of this product comply with ISO 9241, part 9.</p> <p>Plastics parts weighing over 0.055 pounds (25 grams) used in the product are marked per ISO 11469 and ISO1043.</p> <p>This product contains 0% recycled materials (by wt.)</p> <p>This product is greater than 85% recycle-able when properly disposed of at end of life.</p>
<b>Packaging</b>	<p>Packaging Materials</p> <ul style="list-style-type: none"><li>● External:<ul style="list-style-type: none"><li>○ Corrugated Paper – 2.03 lb (920 g)</li></ul></li><li>● Internal:<ul style="list-style-type: none"><li>○ Corrugated Paper – 1.84 lb (835 g)</li><li>○ EPE Foam – 0.12 lb (55 g)</li><li>○ LDPE Bag – 0.01 lb (5 g)</li></ul></li><li>● The corrugated paper packaging materials contains at least 80% recycled content.</li></ul> <p>HP follows these guidelines to decrease the environmental impact of product packaging:</p> <ul style="list-style-type: none"><li>● Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.</li><li>● Eliminate the use of ozone-depleting substances (ODS) in packaging materials.</li><li>● Design packaging materials for ease of disassembly.</li><li>● Maximize the use of post-consumer recycled content materials in packaging materials.</li><li>● Use readily recyclable packaging materials such as paper and corrugated materials.</li><li>● Reduce size and weight of packages to improve transportation fuel efficiency.</li><li>● Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.</li></ul>
<b>Material Usage</b>	<p>This product does not contain any of the following substances in excess of regulatory limits (for reference of these limits please refer to the HP General Specification of the Environment (<a href="http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html">http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html</a>):</p> <ul style="list-style-type: none"><li>● Asbestos</li><li>● Certain Azo Colorants</li></ul>

### Technical Specifications

- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

#### End-of-life Management and Recycling

HP offers our customers several other options for handling their aging computers while also minimizing the impact on the environment-including product trade-in and leasing services-in addition to recycling services. Please go to: <http://www.hp.com/recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

#### Hewlett-Packard Corporate Environmental Information

For more information about HP's commitment to the environment:

Global Citizenship Report

<http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html>

Environment website

<http://www.hp.com/environment>

Eco-label certifications

<http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html>

ISO 14001 certificates:

<http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html>

## *Technical Specifications*

Copyright © 2007 Hewlett-Packard Development Company, L.P.

All rights reserved. Microsoft, Windows, Windows Vista, and Windows XP are registered trademarks or trademarks of Microsoft Corporation in the U.S. and/or other countries. Core Duo, Centrino, and SpeedStep are registered trademarks or trademarks of Intel Corporation in the U.S. and/or other countries. Bluetooth is a registered trademark of Bluetooth SIG, Inc., in the U.S. and other countries. All other product names mentioned herein may be trademarks of their respective companies.

The information contained herein is subject to change without notice and is provided "as is" without warranty of any kind. The warranties for HP products are set forth in the express limited warranty statements accompanying such products. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.