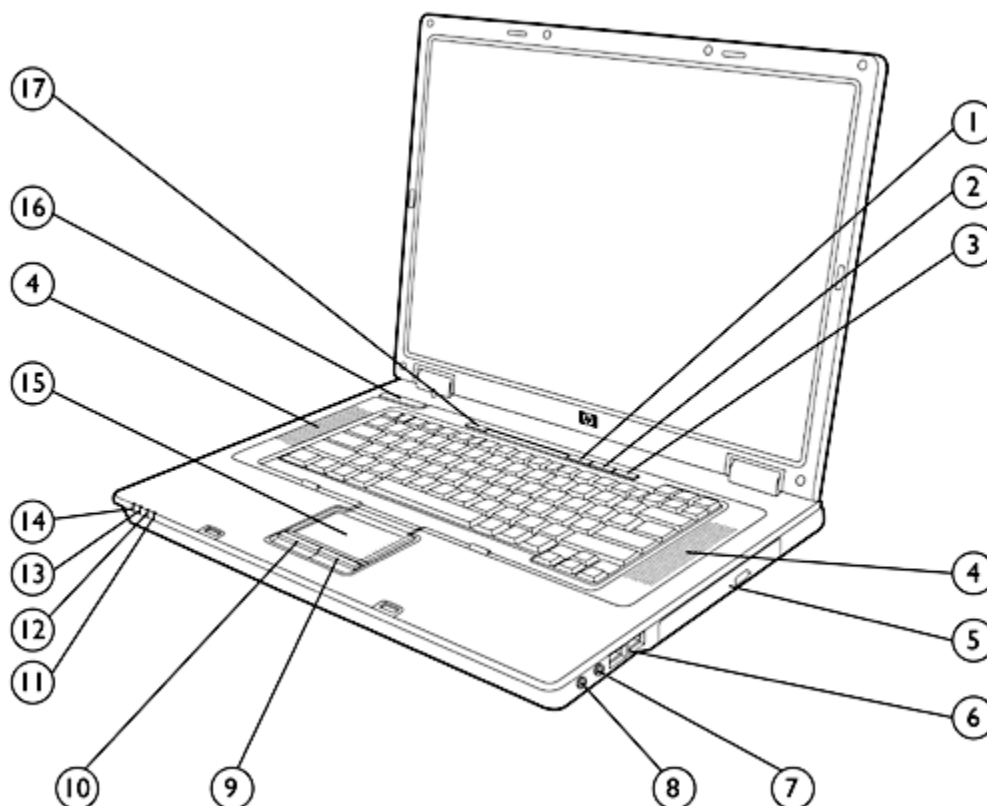


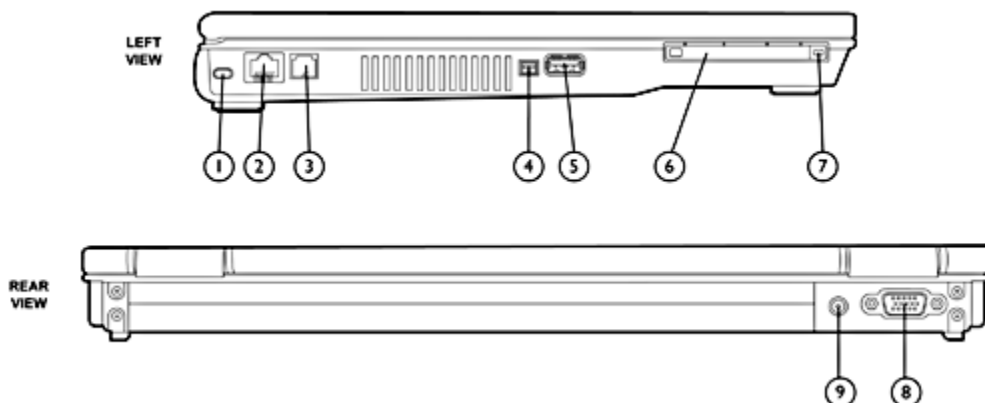
### Overview

HP recommends  
Windows Vista™ Business



- |                                |                                     |
|--------------------------------|-------------------------------------|
| 1. Volume Mute Button with LED | 10. Left Touchpad Button            |
| 2. Volume Down Button          | 11. Hard Drive Activity LED         |
| 3. Volume Up Button            | 12. Battery Charging LED            |
| 4. Stereo Speakers (2)         | 13. Power/Standby LED               |
| 5. Integrated Optical Drive    | 14. Wireless On/Off LED             |
| 6. 2 USB 2.0 Ports             | 15. Touchpad with scroll zone       |
| 7. Microphone Jack             | 16. Power Button with LED           |
| 8. Headphone Jack              | 17. Wireless On/Off Button with LED |
| 9. Right Touchpad Button       |                                     |

### Overview



1. Kensington Lock Slot
2. RJ-45 Port (NIC)
3. RJ-11 Port (Modem)
4. IEEE 1394a Port
5. USB 2.0 Port
6. PC Card Slot
7. PC Card Eject Button
8. VGA/External Monitor Port
9. Power Connector

### At A Glance

- Genuine Windows Vista Business 32, Genuine Windows Vista Home Basic 32, Genuine Windows XP Professional, Genuine Windows XP Home Edition, FreeDOS
- Sleek light-weight design starting at 5.6 lb (2.54 kg) and 1.2 inch (30 mm) thin at front
- 15.4-inch wide screen display with BrightView option
- Intel® Core™ 2 Duo processors, Intel Core Duo processors, Intel Core Solo processors, or Intel Celeron® M processors
- Mobile Intel 945GM Express Chipset or Mobile Intel 940GML Express Chipset
- Up to 4GB of 533- or 667-MHz DDR2 SDRAM, dual channel memory support\*
- Intel Graphics Media Accelerator 950
- Up to 120-GB 5400 rpm, user-removable hard drive
- Optional LightScribe DVD+/-RW Drive with Double Layer
- Optional 802.11 a/b/g or 802.11 b/g wireless LAN modules and optional Bluetooth®
- IEEE 1394a Port
- Protected by a one-year standard parts and labor warranty – certain restrictions and exclusions apply.

\* Memory greater than 2 GB requires Mobile Intel 945GM Express Chipset. Above 3-GB, all memory may not be available due to system resource requirements. 667-MHz memory is supported at a maximum speed of 533 MHz by the 940GML Express Chipset.

### Standard Features

#### Processors

Intel Core 2 Duo Processor T7600 (2.33-GHz, 667-FSB, 4-MB L2 cache)\*  
 Intel Core 2 Duo Processor T7400 (2.16-GHz, 667-FSB, 4-MB L2 cache)\*  
 Intel Core 2 Duo Processor T7200 (2.0-GHz, 667-FSB, 4-MB L2 cache)\*  
 Intel Core 2 Duo Processor T5600 (1.83-GHz, 667-FSB, 2-MB L2 cache)\*  
 Intel Core 2 Duo Processor T5500 (1.66-GHz, 667-FSB, 2-MB L2 cache)\*  
 Intel Core Duo processor T2600\* (2.16-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 Core Duo Processor T2250\* (1.73-GHz, 533-MHz FSB, 2-MB L2 cache) (select countries only)  
 Intel Core Duo Processor T2050\* (1.60-GHz, 533-MHz FSB, 2-MB L2 cache) (select countries only)  
 Intel Core Solo Processor T1350\* (1.86-GHz, 533-MHz FSB, 2-MB L2 cache) (select countries only)  
 Intel Core Solo Processor T1300\* (1.66-GHz, 667-MHz FSB, 2-MB L2 cache)  
 Intel Celeron M Processor 450\* (2.0-GHz, 533-MHz FSB, 1-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\* (1.60-GHz, 533-MHz FSB, 1-MB L2 cache)  
 Intel Celeron M Processor 410\* (1.46-GHz, 533-MHz FSB, 1-MB L2 cache)

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

**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 32/64\*†  
 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>.

#### Chipset

Mobile Intel 945GM Express Chipset with 667-MHz front side bus  
 or  
 Mobile Intel 940GML Express Chipset with 533-MHz front side bus

### Standard Features

<b>Graphics</b>		Intel Graphics Media Accelerator 950 with up to 224-MB shared system memory Microsoft DirectX 9 capable
<b>Display</b>	<b>Internal</b>	15.4-inch WXGA display with 1280 x 800 resolution and 16M colors 15.4-inch WXGA BrightView display with 1280 x 800 resolution and 16M colors 15.4-inch WSXGA+ wide viewing angle display with 1680 x 1050 resolution and 16M colors
	<b>External</b>	Up to 32-bit per pixel color depth <b>VGA</b> 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.
<b>Memory</b>	<b>Standard</b>	256-MB, 512-MB, or 1024-MB 533-MHz or 667-MHz* DDR2 SDRAM SODIMMs; two SODIMM slots supporting dual channel memory
	<b>Maximum</b>	Supports up to 4096-MB maximum (2048-MB 667-MHz SODIMM in slots 1 and 2; requires Mobile Intel 945GM Express Chipset)
	<b>Dual-channel</b>	Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.
		* 667-MHz memory is supported at a maximum speed of 533 MHz by the Mobile Intel 940GML Express Chipset. <b>NOTE:</b> 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.
<b>Communications</b>		Integrated Broadcom 10/100 Ethernet PCI Controller 56K V.92 modem* with digital line guard * 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.
<b>Wireless Devices</b>		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 one of the supported wireless LAN options. <b>All integrated wireless LAN options</b> Wi-Fi certified Cisco Compatible Extensions support (Version 4.0) 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 <b>Intel PRO/Wireless 3945ABG Network Connection</b> Intel Centrino mobile technology Integrated support for 802.11a, b and g Up to 54-mbps data rate <b>Intel PRO/Wireless 3945BG Network Connection</b> Intel Centrino mobile technology Integrated support for 802.11b 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

### 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: Wireless On/Off, Volume down, Volume up, and Volume Mute.

### Pointing Device

Touchpad with scroll zone and two soft-touch buttons

### Expansion Card Slots

**One Type I/II PC Card slot** Supports 32-bit CardBus and 16-bit PC Cards

### Storage

**Hard Drives** 40-, 60-, 80-, 100-, 120-GB 5400 rpm SMART SATA  
100-GB 7200 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.

**HP Mobile Data Protection System** Hard drive is mounted directly to the notebook frame, reducing the transmission of shock to the hard drive and protecting it during normal use from shock and vibration.

**Fixed Optical Drives** CD-ROM  
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
	<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>USB 2.0</b>	Three
	<b>Accessory Battery Connector</b>	One
<b>LED Status Indicators</b>	Nine	

<b>Audio</b>	<p>PremierSound audio/speaker subsystem            ADI1981HD High Definition CODEC            Integrated 16-bit Sound Blaster Pro compatible audio            24-bit DAC            Integrated stereo speakers            External volume up, volume down, and mute buttons            Stereo headphone/line out            Stereo microphone in</p>
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<b>Software</b>	<p><b>Preinstalled Software with Windows Vista or Windows XP</b></p> <ul style="list-style-type: none"> <li>Adobe Acrobat Reader</li> <li>HP Backup and Recovery Manager</li> <li>HP Help and Support Center</li> <li>HP Mobile Print Driver (Windows XP models)</li> <li>HP ProtectTools Security Manager:               <ul style="list-style-type: none"> <li>BIOS Configuration for HP ProtectTools</li> <li>Credential Manager for HP ProtectTools</li> </ul> </li> <li>HP Quick Launch Buttons</li> <li>HP Wireless Assistant</li> <li>Sonic Digital Media Plus (Windows XP models):               <ul style="list-style-type: none"> <li>RecordNow! (for optional DVD+/-RW and DVD/CDRW drives)</li> <li>MyDVD (DVD Authoring for optional DVD+/-RW drives)</li> </ul> </li> <li>Roxio Creator 9 (Window Vista models with optional DVD+/-RW or DVD/CDRW drives)</li> <li>Synaptics Touchpad Driver</li> <li>Symantec Norton Internet Security with complimentary 60-day live update</li> <li>Intervideo WinDVD - DVD Player (for optional DVD+/-RW, DVD/CDRW and DVD drives)</li> </ul> <p><b>Additional software available from the Web</b></p> <ul style="list-style-type: none"> <li>Smart Card Security for HP ProtectTools</li> <li>Device Access Manager for HP ProtectTools</li> </ul>
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<b>HP Backup and Recovery Manager</b>	<p>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 8 GB is reserved for the system recovery software. HP Backup and Recovery Manager can also create software recovery CDs or DVDs (requires optional hardware).</p>
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### Standard Features

**SMBIOS Version 2.4** System Management BIOS, previously known as DMI BIOS, is used to store system management information.

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**HP ProtectTools Security Manager** 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 or planned are:

- BIOS Configuration for HP ProtectTools
  - Credential Manager for HP ProtectTools
  - Device Access Manager for HP ProtectTools
- 

<b>Security</b>	<b>Standard Features</b>	HP ProtectTools Security Manager Configuration Control Hardware Memory Change Alert Ownership Tag Setup Password Power-On Password DriveLock HP Disk Sanitizer Kensington Lock Slot Support for Computrace / LoJack for Laptops (must be purchased separately)
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For more information on HP security solutions refer to <http://www.hp.com/go/security>.

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**Power Supply** External 65-watt AC adapter, 6-foot (1.8-meter) power cord included.  
Total length including External AC adapter is 12 feet (3.66 meter).  
HP Fast Charge Technology\*

\*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.

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<b>Battery</b>	<b>Primary Battery</b>	8-cell (69Wh) high capacity Lithium-Ion 6-cell (43Wh) high capacity Lithium-Ion
	<b>Optional 8-Cell Extended Life Battery</b>	8-cell (52Wh) high capacity Lithium-Ion
	<b>Optional HP 12-Cell Ultra-Capacity Battery</b>	12-cell (95Wh) high capacity Lithium-Ion

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### Standard Features

#### Battery Life

##### Primary Battery

Primary Battery and optional HP 8-Cell Extended Life Battery

Primary Battery and optional HP 12-Cell Ultra-Capacity Battery

##### 8-cell (69Wh) Primary

Up to 5 hours and 45 minutes

Up to 9 hours and 45 minutes

Up to 13 hours and 30 minutes

##### 6-cell (43Wh) Primary

Up to 3 hours and 30 minutes

Up to 7 hours and 30 minutes

Up to 12 hours

**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.

#### System Standby Time

Up to 1 week

#### Power Conservation

Supports enhanced Intel SpeedStep technology (allows Battery Optimized Mode, Maximum Performance Mode, or Automatic mode)

Hibernation

Standby

ACPI compliance

#### Service and Support

HP Services includes a one-year standard parts and labor warranty, pick-up or carry-in, and toll-free 7 x 24 hardware technical phone support (depending on model). 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
	1-GB 533-MHz DDR2 SDRAM	PE832A
	512-MB 667-MHz DDR2 SDRAM*	EM993AA
	1-GB 667-MHz DDR2 SDRAM*	EM994AA
	2-GB 667-MHz DDR2 SDRAM*	EM995AA

\* 667-MHz memory is supported at a maximum speed of 533 MHz by the Mobile Intel 940GML Express Chipset.

<b>MultiBay II Storage</b> (9.5-mm) <b>NOTE:</b> Requires HP External MultiBay II	DVD-ROM MultiBay II Drive	PA849A
	Combo DVD/CD-RW MultiBay II Drive	PA850A
	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
	DVD+/-RW Double Layer Drive with LightScribe Upgrade	ET353AA
	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
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<b>Expansion Solutions</b>	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
	HP 10-bay Battery Charging Station	DT534A#ABA
	Battery Adapter kit #1	PK402A
	65W Smart AC Adapter	ED494AA#xxx
	90W Smart AC Adapter	ED495AA#xxx
	90W Smart Auto Adapter	ED493AA
	65W Air/Auto/AC Combo Adapter	ED993AA#xxx
	Primary 8-cell Battery Pack	PB992A
	HP 8-cell Extended Life Battery	PB993A
HP 12-cell Ultra-Capacity Battery	EJ092AA	

<b>Carrying Cases</b>	HP Entry Value Case	DL617A
	HP Top Load Nylon Case	DC915A
	HP Executive Leather Case	PA847A
	HP Sport Backpack	DG102A

### Options

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<b>Security</b>	HP PCMCIA Smart Card Reader	DC350B
	HP/Kensington Cable Lock	PC766A

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<b>Input/Output Devices</b>	USB/PS2 Keyboard	DC852A#xxx
	USB/PS2 Optical Mouse	DC369A
	HP USB Optical Travel Mouse	F2100A

### Memory

Supports up to 4096 MB\* of 533-MHz 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)
  - 1024 MB (1024 MB x 1 or 512 MB x 2)
  - 2048 MB (1024 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
4096 MB*	2048 MB	2048 MB

**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

\* Memory greater than 2 GB requires Mobile Intel 945GM Express Chipset. Above 3-GB, all memory may not be available due to system resource requirements.

\*\* 667-MHz memory is supported at a maximum speed of 533 MHz by the Mobile Intel 940GML Express Chipset.

## Storage

### Removable Media Drive Support

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	Quantity Supported	Drive Bay
LightScribe DVD+/-RW Drive with Double Layer	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

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### Hard Drive Support

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	Quantity Supported	Drive Bay
<b>Primary Hard Drives</b>		
100-GB 7200 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
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>	1.2 in (at front) x 14.1 in x 10.2 in 30 mm (at front) x 357 mm x 260 mm
	<b>Weight</b>	5.6 lb (2.54 kg)
	<b>NOTE:</b> Height varies depending upon where on the notebook the measurement is made. Weight includes 6-cell battery, 60-GB hard drive, 512-MB memory, 802.11 wireless communications module. Weight varies by configuration and components.	
<b>Stand-Alone Power Requirements</b>	Normal Operating Voltage	19 V
	Average Operating Power	25 W
	Max Operating Power	< 65 W
<b>Temperature</b>	Operating	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)
	Non-operating	-4° to 140° F (-20° to 60° C)
<b>Relative Humidity</b>	Operating	10% to 90%, non-condensing
	Non-operating	5% to 95%, 101.6° F (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</b> (unpressurized)	Operating	-50 to 10,000 ft (-15.24 to 3,048 m)
	Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)
<b>Industry Standard Certifications</b>	Blue Angel	No
	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>	4.17 x 1.85 x 1.1 in (10.6 x 4.7 x 2.8 cm)	
	<b>Weight</b>	0.62 lb (280 g)	
	<b>Input</b>	100 to 240 VAC	
		Input Efficiency	83% min at 115 VAC
	<b>Output</b>	Input frequency range	47 to 63 Hz
		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	32° to 104° F (0° to 40° C)
		Non-operating (storage) temperature	-4° to 149° F (-20° to 65° C)
		Altitude	0 to 10,000 ft (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 – IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals – C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, 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>	1.3 x 6.0 x 10.6 in (3.33 x 15.25 x 26.88 cm)	
	<b>Weight</b>	1.77 lb (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)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (-10° to 60° C)
		Non-operating	-4° to 140° F (-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>	1.0 x 3.9 x 8.7 in (2.5 x 10.0 x 22.0 cm)		
	<b>Weight</b>	1.00 lb (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)	32° to 113° F (0° to 45° C)	
		Operating (Discharging)	14° to 140° F (-10° to 60° C)	
		Non-operating	-4° to 140° F (-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>69Wh Primary 8-Cell Battery</b>	<b>Dimensions (H x W x L)</b>	0.8 x 1.9 x 10.6 in (2.0 x 4.8 x 27.0 cm)		
	<b>Weight</b>	0.980 lb (0.445 kg)		
	<b>Cells/Type</b>	8-cell Lithium-Ion		
	<b>Energy</b>	Voltage	14.4V	
		Watt-hour Capacity	69Wh	
		Amp-hour Capacity	4.8Ah	
	<b>Temperature</b>	Operating (Charging)	32° to 113° F (0° to 45° C)	
		Operating (Discharging)	14° to 140° F (-10° to 60° C)	
		Non-operating	-4° to 140° F (-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

<b>43Wh Primary 6-Cell Battery</b>	<b>Dimensions (H x W x L)</b>	0.8 x 1.9 x 10.6 in (2.0 x 4.8 x 27.0 cm)		
	<b>Weight</b>	0.74 lb (0.336 kg)		
	<b>Cells/Type</b>	6-cell Lithium-Ion		
	<b>Energy</b>	<b>Voltage</b>	10.8V	
		<b>Watt-hour Capacity</b>	43Wh	
		<b>Amp-hour Capacity</b>	4.0Ah	
	<b>Temperature</b>	<b>Operating (Charging)</b>	32° to 113° F (0° to 45° C)	
		<b>Operating (Discharging)</b>	14° to 140° F (-10° to 60° C)	
		<b>Non-operating</b>	-4° to 140° F (-20° to 60° C)	
	<b>Battery Re-Charge Time</b>	<b>System in OFF Mode or Standby</b>	2.5 hours	
<b>System ON</b>		3 to 5 hours (depending on system power consumption)		
<b>HP Fast Charge Technology</b>		Charges the battery up to 90% within 1.5 hours when system is OFF		

<b>15.4-inch Color TFT WSXGA+ Wide Viewing Angle Display</b>	<b>Active Area (W x H)</b>	13.0 x 8.1 in (33.1 x 20.7 cm)		
	<b>Diagonal Size</b>	15.4 in (39.1 cm)		
	<b>Surface Treatment</b>	Anti-glare		
	<b>Number of Colors</b>	Up to 16M		
	<b>Contrast Ratio</b>	300:1 (typical)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	170 nit (typical)		
	<b>Pixel Resolution</b>	<b>Pitch</b>	0.197 mm	
		<b>Format</b>	1680 x 1050	
		<b>Configuration</b>	RGB stripe	
	<b>Backlight</b>	CCFL		
	<b>PPI</b>	129		
<b>Viewing Angle</b>	±65° Horizontal, ± 50° Vertical (typical)			

<b>15.4-inch Color TFT WXGA Display</b>	<b>Active Area (W x H)</b>	13.0 x 8.1 in (33.1 x 20.7 cm)		
	<b>Diagonal Size</b>	15.4 in (39.1 cm)		
	<b>Surface Treatment</b>	Anti-glare		
	<b>Number of Colors</b>	Up to 16M		
	<b>Contrast Ratio</b>	300:1 (typical)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	170 nit (typical)		
	<b>Pixel Resolution</b>	<b>Pitch</b>	0.259 mm	
		<b>Format</b>	1280 x 800	
		<b>Configuration</b>	RGB stripe	
	<b>Backlight</b>	CCFL		
	<b>PPI</b>	98		
<b>Viewing Angle</b>	±45° Horizontal, ±25° Vertical (typical)			

### Technical Specifications

<b>15.4-inch Color TFT WXGA BrightView Display</b>	<b>Active Area (W x H)</b>	13.0 x 8.1 in (33.1 x 20.7 cm)		
	<b>Diagonal Size</b>	15.4 in (39.1 cm)		
	<b>Surface Treatment</b>	BrightView		
	<b>Number of Colors</b>	Up to 16M		
	<b>Contrast Ratio</b>	300:1 (typical)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	170 nit (typical)		
	<b>Pixel Resolution</b>	<b>Pitch</b>	0.259 mm	
		<b>Format</b>	1280 x 800	
		<b>Configuration</b>	RGB stripe	
	<b>Backlight</b>	CCFL		
	<b>PPI</b>	98		
	<b>Viewing Angle</b>	±45° Horizontal, ±25° Vertical (typical)		

### Hard Drives

<b>100-GB 7200 rpm SATA</b>	<b>Drive Weight</b>	0.25 lb (113 g)		
	<b>Capacity</b>	100 GB		
	<b>Height</b>	0.37 in (9.5 mm)		
	<b>Width</b>	2.75 in (70 mm)		
	<b>Interface</b>	ATA-7 / SATA 1.0a		
	<b>Transfer Rate</b>	Synchronous (maximum) 100 MB/s (Drive Capability)		
	<b>Seek Time</b>	<b>Single Track</b>	1 ms	
	(typical reads, including settling)	<b>Average</b>	10 ms	
		<b>Maximum</b>	18 ms	
	<b>Rotational Speed</b>	7200 rpm		
	<b>Logical Blocks</b>	195,371,568		
	<b>Operating Temperature</b>	41° to 140° F (5° to 60° C) [case temp]		
	<b>Features</b>	ATA Security		

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

### Technical Specifications

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<b>100-GB 5400 rpm SATA</b>	<b>Drive Weight</b>	0.22 lb (101 g)
	<b>Capacity</b>	100 GB
	<b>Height</b>	0.37 in (9.5 mm)
	<b>Width</b>	2.75 in (70 mm)
	<b>Interface</b>	ATA-7 / SATA 1.0a
	<b>Transfer Rate</b>	Synchronous (maximum) 100 MB/s (Drive Capability)
	<b>Seek Time</b>	Single Track 3 ms
	(typical reads, including settling)	Average 13 ms
		Maximum 24 ms
	<b>Rotational Speed</b>	5400 rpm
	<b>Logical Blocks</b>	195,371,568
	<b>Operating Temperature</b>	41° to 140° F (5° to 60° C) [case temp]
	<b>Features</b>	ATA Security

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<b>80-GB 5400 rpm SATA</b>	<b>Drive Weight</b>	0.22 lb (101 g)
	<b>Capacity</b>	80 GB
	<b>Height</b>	0.37 in (9.5 mm)
	<b>Width</b>	2.75 in (70 mm)
	<b>Interface</b>	ATA-7 / SATA 1.0a
	<b>Transfer Rate</b>	Synchronous (maximum) 100 MB/s (Drive Capability)
	<b>Seek Time</b>	Single Track 3 ms
	(typical reads, including settling)	Average 13 ms
		Maximum 24 ms
	<b>Rotational Speed</b>	5400 rpm
	<b>Logical Blocks</b>	156,301,488
	<b>Operating Temperature</b>	41° to 140° F (5° to 60° C) [case temp]
	<b>Features</b>	ATA Security

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<b>60-GB 5400 rpm SATA</b>	<b>Drive Weight</b>	0.22 lb (101 g)
	<b>Capacity</b>	60 GB
	<b>Height</b>	0.37 in (9.5 mm)
	<b>Width</b>	2.75 in (70 mm)
	<b>Interface</b>	ATA-7 / SATA 1.0a
	<b>Transfer Rate</b>	Synchronous (maximum) 100 MB/s (Drive Capability)
	<b>Seek Time</b>	Single Track 3 ms
	(typical reads, including settling)	Average 13 ms
		Maximum 24 ms
	<b>Rotational Speed</b>	5400 rpm
	<b>Logical Blocks</b>	117,231,408
	<b>Operating Temperature</b>	41° to 140° F (5° to 60° C) [case temp]
	<b>Features</b>	ATA Security

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### Technical Specifications

<b>40-GB 5400 rpm SATA Drive</b>	<b>Drive Weight</b>	0.22 lb (101 g)
	<b>Capacity</b>	40 GB
	<b>Height</b>	0.37 in (9.5 mm)
	<b>Width</b>	2.75 in (70 mm)
	<b>Interface</b>	ATA-7 / SATA 1.0a
	<b>Transfer Rate</b>	Synchronous (maximum) 100 MB/s (Drive Capability)
	<b>Seek Time</b>	Single Track 3 ms
	(typical reads, including settling)	Average 13 ms
		Maximum 24 ms
	<b>Rotational Speed</b>	5400 rpm
	<b>Logical Blocks</b>	78,165,360
	<b>Operating Temperature</b>	41° to 140° F (5° to 60° C) [case temp]
	<b>Features</b>	ATA Security

### Removable Storage Drives – Fixed Bay

<b>CD-ROM Drive</b>	<b>Access Times</b>	Random	<110 ms CD
	<b>Max Data Transfer Rate</b>	24X CD-ROM	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	
	<b>Supported Media (write)</b>	None	
	<b>Max Media Capacity (read)</b>	700 MB	
	<b>Transport</b>	Tray Loading	

<b>DVD-ROM Drive</b>	<b>Access Times</b>	Random	<116 ms CD
			<125 ms DVD
	<b>Max Data Transfer Rate</b>	24X CD-ROM	3,600 KB/s
		8X-DVD	10,800 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>	None	
<b>Max Media Capacity (read)</b>	4.7 GB		
<b>Transport</b>	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

<b>DVD+/-RW SuperMulti 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
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		

### PremierSound Audio

<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

<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

### Technical Specifications

<b>Internal Speakers</b>	<b>Power Rating</b>	2 Watts
	<b>Impedance</b>	4 Ohms

### Communications

<b>Integrated Broadcom 10/100 Ethernet PCI Controller (BCM4401)</b>	<b>Ethernet Features</b>	10 Mbit/s operation (10BASE-T; IEEE 802.3j; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s 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
	<b>Manageability</b>	Wake-on-LAN from standby and hibernation (configurable; Magic Packet and Microsoft Wake-Up Frame) PXE 2.1 Remote Boot Statistics Gathering (RMON, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite
	<b>Interface</b>	32-bit PCI, 33-MHz
	<b>NIC Device Driver Name</b>	Broadcom 440X 10/100 Integrated Controller
	<b>Drivers Available</b>	Microsoft Windows XP Microsoft Windows 2000

<b>V.92 56K Data/Fax Modem</b>	<b>Form Factor</b>	MDC 1.5 Daughtercard
	<b>Power Management Support</b>	APM Revision 1.2, ACPI
	<b>Approvals/Certifications</b>	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
	<b>Data Mode Capabilities</b>	V.92 data V.8bis V.80 V.44, 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





### Technical Specifications

	V.21 Bell 212A Bell 103J
<b>Fax Mode Capabilities</b>	TIA/EIA-578-B (Class 1) T.30, T.4 (Group 3) V.17 V.29 V.27ter V.21 Channel 2
<b>Command Set</b>	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

<b>Broadcom 4311BG 802.11b/g WiFi Adapter</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</b> (for CKK) <sup>2</sup>	17.5 dBm
	<b>Output Power</b> (for OFDM; power varies by data rate) <sup>2</sup>	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

### 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)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
<b>Form Factor</b>	PCI-Express MiniCard	
<b>Weight</b>	0.026 lb (12 g)	
<b>Dimensions</b>	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
<b>Operating Voltage</b>	3.3v +/- 10%	
<b>Temperature</b>	Operating	32° to 176° F (0° to 80° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (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>	

#### Broadcom 4311AG 802.11a/b/g WiFi Adapter

<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

### Technical Specifications

<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</b> (for CKK) <sup>2</sup>	17.5 dBm						
<b>Output Power</b> (for OFDM; power varies by data rate) <sup>2</sup>	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</b> <sup>4</sup>	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>	<table><tr><td>802.11 a – Typical (@6 Mbps)</td><td>600 feet – Outdoor Open Area 150 feet – Indoor, Office environment</td></tr><tr><td>802.11 b – Typical (@1 Mbps)</td><td>1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment</td></tr><tr><td>802.11 g – Typical (@1 Mbps)</td><td>1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment</td></tr></table>	802.11 a – Typical (@6 Mbps)	600 feet – Outdoor Open Area 150 feet – Indoor, Office environment	802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
802.11 a – Typical (@6 Mbps)	600 feet – Outdoor Open Area 150 feet – Indoor, Office environment						
802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment						
802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment						
<b>Form Factor</b>	PCI-Express MiniCard						
<b>Weight</b>	0.026 lb (12 g)						
<b>Dimensions</b>	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)						
<b>Operating Voltage</b>	3.3v +/- 10%						
<b>Temperature</b>	Operating 32° to 176° F (0° to 80° C) Non-operating -40° to 176° F (-40° to 80° C)						
<b>Humidity</b>	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)						
<b>Altitude</b>	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)						
<b>Configuration Utility</b> <sup>5</sup>	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
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### 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 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 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</b> (for CCK) <sup>2</sup>	15 dBm	
<b>Output Power</b> (for OFDM; power varies by data rate) <sup>2</sup>	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)	600 feet – Outdoor Open Area 150 feet – Indoor, Office environment
	802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
<b>Form Factor</b>	PCI-Express MiniCard	
<b>Weight</b>	0.013 lb (6 g)	
<b>Dimensions</b>	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
<b>Operating Voltage</b>	3.3v +/- 10%	
<b>Temperature</b>	Operating	32° to 176° F (0° to 80° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)

### Technical Specifications

- Configuration Utility<sup>5</sup>** Choice of Configuration Utility:
- Microsoft Windows XP Wireless Network Connection Manager
  - Intel PROSet (required for Cisco Compatible Extensions support)
- LED Activity** LED Off – Radio OFF; Solid LED On – Radio ON
1. Check latest software/driver release for updates on supported security features.
  2. Maximum output power may vary by country according to local regulations.
  3. In Power Save Polling mode.
  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).
  5. WLAN supplier's client utility is required for Cisco Compatible Extensions support. WLAN may also be compatible with certain third-party software supplicants.

<b>Intel PRO/Wireless 3945BG 802.11b/g Network Connection</b>	<b>Wireless LAN Standards Interoperability</b>	IEEE 802.11b IEEE 802.11g 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</b> (for CKK) <sup>2</sup>	15 dBm
	<b>Output Power</b> (for OFDM; power varies by data rate) <sup>2</sup>	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 b – Typical                      1200 feet – Outdoor Open Area (@1 Mbps)                                      300 feet – Indoor, Office environment

### Technical Specifications

	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
<b>Form Factor</b>	PCI-Express MiniCard	
<b>Weight</b>	0.013 lb (6 g)	
<b>Dimensions</b>	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
<b>Operating Voltage</b>	3.3v +/- 10%	
<b>Temperature</b>	Operating	32° to 176° F (0° to 80° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (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>	

### HP Integrated Module with Bluetooth Wireless Technology

<b>Bluetooth Specification</b>	2.0 Compliant
<b>Dimensions</b>	1.02 x 0.55 x 0.22 in (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>	Up 33 ft (10 m)
<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



### Technical Specifications

<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 -4° to 158° F (-20° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating 10% to 90% Non-operating 5% to 95%
<b>Altitude</b>	Operating 15,000 ft (4,572 m) Non-operating 40,000 ft (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

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<b>Environmental Data</b>	<b>Eco-Label Certifications</b>	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: <ul style="list-style-type: none"><li>● US Energy Star</li><li>● US Federal Energy Management Program (FEMP)</li><li>● Taiwan Green Mark</li><li>● China Energy Conservation Program</li><li>● IT ECO declaration</li></ul>
	<b>System Configuration</b>	The configuration used for the Energy Consumption and Declared Noise Emissions data is based on a "Typically Configured Notebook."



### Technical Specifications

	115 VAC	230 VAC	100 VAC
<b>Energy Consumption</b>			
Normal Operation	23 W	23.5 W	23 W
Sleep (Energy Star low power mode)	1.72 W	1.88 W	1.73 W
Off	1.90 W	1.98 W	1.90 W
<b>Heat Dissipation*</b>	<b>115 VAC</b>	<b>230 VAC</b>	<b>100 VAC</b>
Normal Operation	78.5 BTU/hr	80.2 BTU/hr	78.5 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.

<b>Declared Noise Emissions</b> (in accordance with ISO 7779 and ISO 9296)	<b>Sound Power</b> (LWAd, bels)	<b>Sound Pressure</b> (LpAm, decibels)
Idle	3.0	28.0
Fixed Disk (random writes)	3.9	33.8
Optical Drive (sequential reads)		34.0
System fan is usually off except when charging the battery		
System Fan On		29.0
Idle		34.0
Fixed Disk (random writes)		42.0

#### 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

#### Additional Information

This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.

This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.

Keyboard complies with ISO standard: ISO 9995, EN 29241-4, and

### Technical Specifications

ISO/IEC 15412

Input devices of this product comply with ISO 9241, part 9.

Plastics parts weighing over 0.055 pounds (25 grams) used in the product are marked per ISO 11469 and ISO1043.

This product contains 0% recycled materials (by wt.)

This product is greater than 85% recycle-able when properly disposed of at end of life.

#### Packaging

##### Packaging Materials

- External:
  - Corrugated Paper 920 g
- Internal:
  - EPE Foam 266 g
  - LDPE Bag 14 g
  - Corrugated/Paper 210 g
- The plastic packaging material is made from 0% recycled content.
- The corrugated paper packaging materials contains at least 80% recycled content.

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

#### Material Usage

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

([http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen\\_specifications.html](http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html)):

- Asbestos
- Certain Azo Colorants
- 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.

### Technical Specifications

- 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>

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