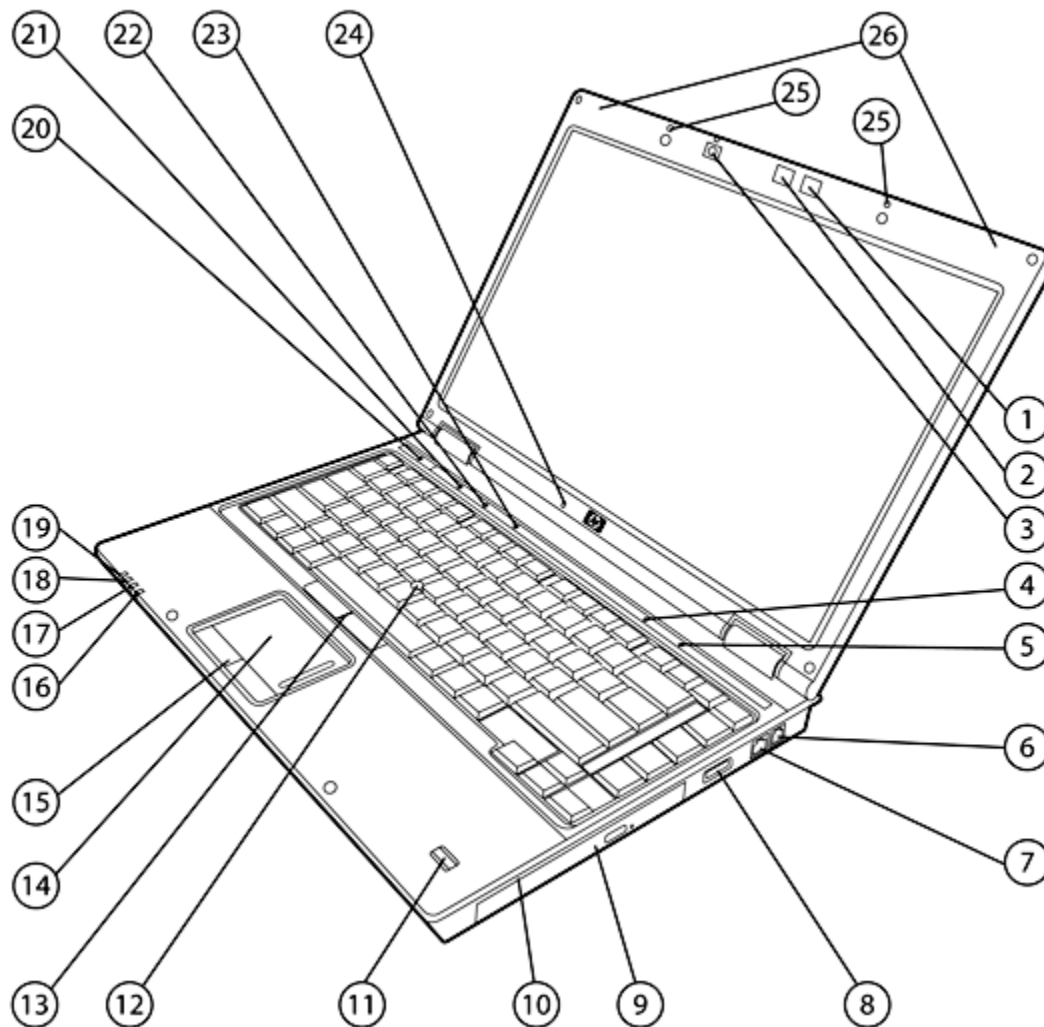
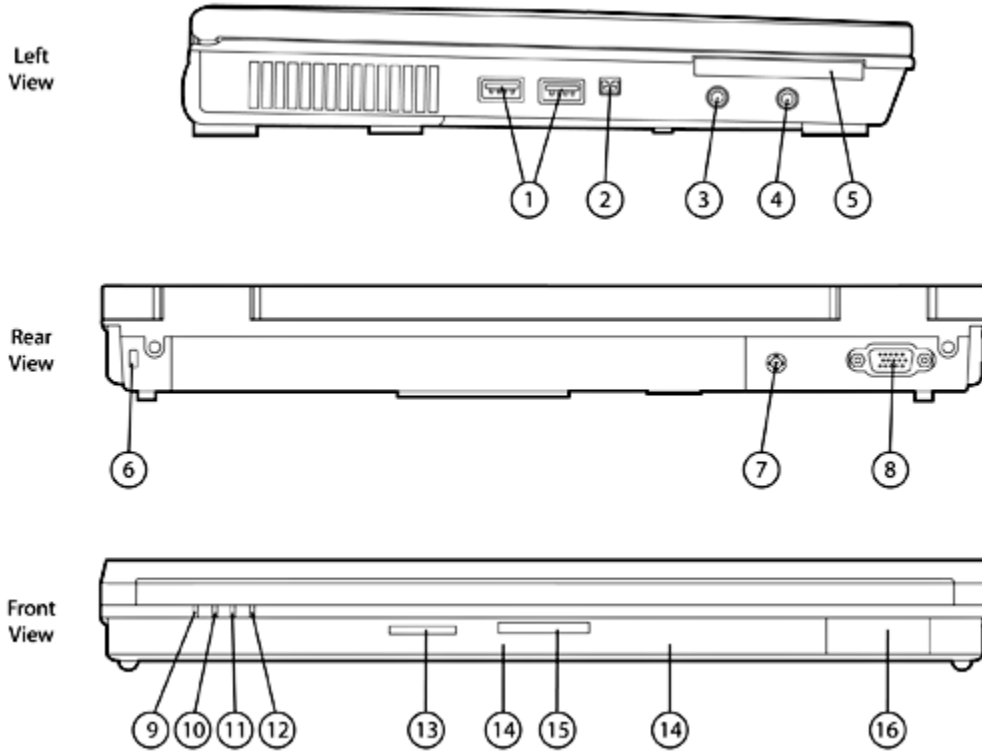


HP recommends Windows Vista® Business



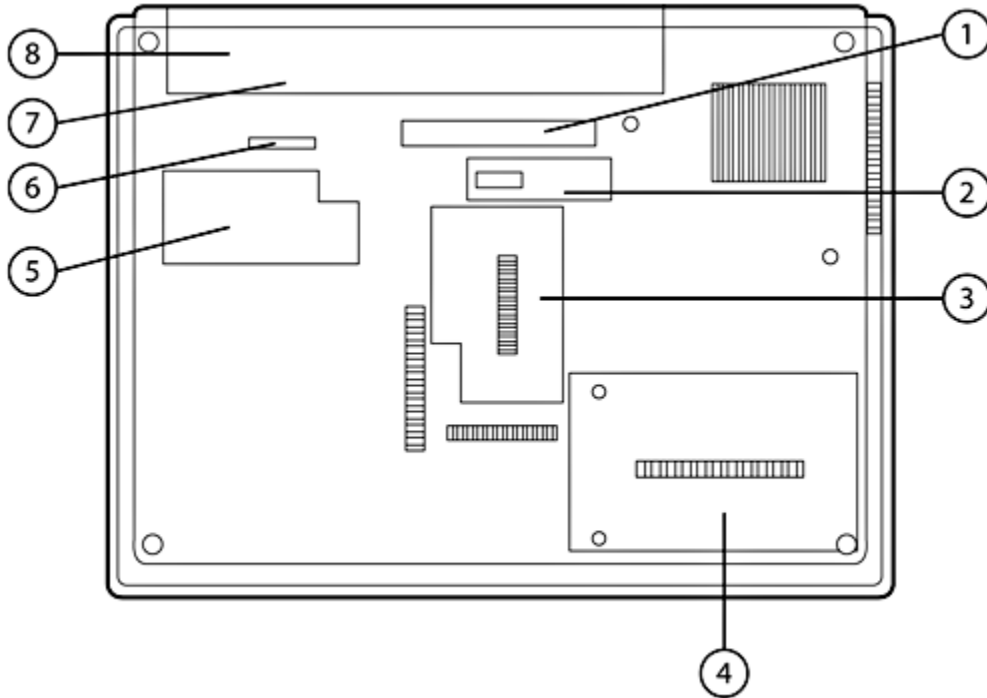
1. HP Nightlight on/off button
2. HP NightLight
3. Optional 2 MP Webcam
4. Volume mute button with LED indicator
5. Volume scroll zone with up/down LED indicators
6. RJ-11/modem port
7. RJ-45/Ethernet port
8. USB 2.0 port
9. Upgrade Bay (optical drive, second hard drive)
10. Integrated Smart Card Reader
11. HP Fingerprint Sensor
12. Pointstick
13. Pointstick buttons
14. Touchpad with scroll zone
15. Touchpad buttons
16. Hard drive activity / HP 3D DriveGuard LED indicator
17. Battery charging LED indicator
18. Power/standby LED indicator
19. Wireless on/off LED indicator
20. Power button with LED indicator
21. HP Info / HP QuickLook 2 button with LED indicator
22. Wireless on/off button with LED indicator
23. HP Presentation button with LED indicator
24. Ambient Light Sensor
25. Dual-microphone array
26. WLAN and WWAN antennas

Overview



- | | |
|---|--|
| 1. (2) USB 2.0 ports | 9. Wireless on/off LED indicator |
| 2. 1394a port | 10. Power/standby LED indicator |
| 3. Stereo microphone in | 11. Battery charging LED indicator |
| 4. Stereo headphone/line out | 12. Hard drive activity / HP 3D DriveGuard LED |
| 5. ExpressCard/54 slot | 13. Secure Digital (SD) slot |
| 6. Kensington Lock slot | 14. Integrated stereo speakers |
| 7. Power connector | 15. Display release latch |
| 8. VGA connector (external monitor/projector) | 16. Bluetooth module compartment |

Overview



Bottom View

- | | |
|--------------------------------|---|
| 1. Docking connector | 5. WWAN module compartment |
| 2. Secondary battery connector | 6. Battery release latch |
| 3. Memory module compartment | 7. SIM slot for WWAN (select models) – inside battery bay |
| 4. Hard drive bay | 8. Battery bay |

NOTE: WLAN module connector is located under the keyboard (not shown)

Overview

At A Glance

- Genuine Windows Vista Business 32, Genuine Windows Vista Home Basic 32, Genuine Windows Vista Business with downgrade to Windows XP Professional custom installed, or FreeDOS
- Business Rugged – designed to meet the military standard Mil-Std-810F for drop, shock, vibration, sand and dust, humidity, altitude, and high and low temperature operation*
- ATI Mobility Radeon™ HD 3450 graphics with 128 or 256 MB dedicated memory or Mobile Intel GMA 4500MHD graphics
- Flexible wireless connectivity options:
 - Integrated HP un2400 EV-DO/HSDPA Mobile Broadband Module provides worldwide Gobi mobile Internet technology
 - Integrated 802.11 a/b/g/n draft 2.0, a/b/g, or b/g wireless LAN module
 - Bluetooth® 2.0
- Intel® Centrino® 2 with vPro™ technology capable, with Intel Core™2 Duo processors
- Optional HP Illumi-Lite LED 14.1-inch diagonal widescreen display with Ambient Light Sensor and optional HP Privacy Filter
- Upgrade Bay for easy optical drive upgrade or optional second hard drive for RAID 1 Mirroring or RAID 0 Striping
- Enhanced security features including integrated Smart Card Reader, HP ProtectTools, HP SpareKey, HP Fingerprint Sensor, TPM 1.2 Embedded Security Chip**
- Optional 2 MP Webcam with Business Card Reader Software, HP Night Light
- HP QuickLook 2 for instant access to email, calendar, and contact information
- Enhanced reliability with HP DuraCase, HP DuraKeys and HP DuraFinish
- Up to 8 GB of 800 MHz DDR2 SDRAM supported, dual channel memory support
- Up to 160 GB 7200 rpm or 250 GB 5400 rpm user-removable hard drive with HP 3D DriveGuard protection
- Integrated Intel Gigabit Network Connection (10/100/1000 NIC)
- Enhanced dual pointing devices (touchpad with scroll zone and pointstick)
- ExpressCard/54 slot, Secure Digital (SD) slot
- Designed for common image for corporate environments

* Testing was not intended to demonstrate fitness for DOD contracts requirements or for military use. Test results are not a guarantee of future performance under these test conditions.

** TPM module disabled where not permitted by law (for example, Russia and China).

Standard Features

Processors	<p>Intel Core 2 Duo Processor T9600 (2.80 GHz, 6 MB L2 cache, 1066 MHz FSB)*</p> <p>Intel Core 2 Duo Processor T9400 (2.53 GHz, 6 MB L2 cache, 1066 MHz FSB)*</p> <p>Intel Core 2 Duo Processor P8600 (2.40 GHz, 3 MB L2 cache, 1066 MHz FSB)*</p> <p>Intel Core 2 Duo Processor P8400 (2.26 GHz, 3 MB L2 cache, 1066 MHz FSB)*</p> <p>* Intel's numbering is not a measurement of higher performance.</p> <p>NOTE: Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.</p>	
<hr/>		
Operating System	<p>Preinstalled</p> <p>Supported</p> <p>Certified</p>	<p>Genuine Windows Vista Business 32*</p> <p>Genuine Windows Vista Home Basic 32*</p> <p>Genuine Windows Vista Business with downgrade to Windows XP Professional custom installed*†</p> <p>FreeDOS</p> <p>Genuine Windows Vista Business 64*</p> <p>Genuine Windows Vista Enterprise*</p> <p>SuSE Linux Enterprise Desktop 10</p> <p>* Certain Windows Vista product features require advanced or additional hardware. See: http://www.microsoft.com/windowsvista/getready/hardwarereqs.msp# and: http://www.microsoft.com/windowsvista/getready/capable.msp# 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.</p> <p>† Windows Vista Business disk may be included for future upgrade if desired. To qualify for this downgrade an end user must be a business (including governmental or educational institutions) and is expected to order annually at least 25 customer systems with the same custom image.</p>
<hr/>		
Chipset	<p>Mobile Intel PM45 Express Chipset with ICHM9-Enhanced, 1066 MHz front side bus (models with discrete graphics)</p> <p>or</p> <p>Mobile Intel GM45 Express Chipset with ICHM9-Enhanced, 1066 MHz front side bus (models with integrated graphics)</p>	
<hr/>		
Intel Centrino 2 with vPro technology capable	<p>Intel Centrino 2 with vPro technology is a selectable feature that is available on units configured with an Intel WiFi Link 5300 or 5100. It provides advances in remote manageability, security, energy efficient performance, and wireless connectivity. Intel Active Management Technology (AMT) offers built-in manageability and proactive security for networked notebook PCs, even when they are powered off* or when the operating system is inoperable. It can help identify threats before they reach the operating system, isolate infected systems, and update PCs regardless of their power state.</p> <p>NOTE: Some functionality of Intel Centrino 2 with vPro technology, such as Intel Active Management technology and Intel Virtualization technology, requires additional 3rd party software in order to run. Availability of future "virtual appliances" applications for Intel Centrino 2 with vPro technology is dependant on 3rd party software providers. Compatibility with future "virtual appliances" is yet to be determined.</p>	

Standard Features

Business Rugged

Meets the military standard Mil-Std-810F* for:

- Drop: Method 516.5 Proc. IV (26 drops from 30")
- Shock: Method 515.5 Proc. I (Functional)
- Vibration: Method 514.5, Proc I, Cat. 20 & 24
- High Temperature: Method 501.4, Proc I & II (140°F/60°C operational)
- Low Temperature: Method 502.4, Proc I & II (-20°F/-29°C operational)
- Sand and Dust: Method 510.4, Proc. I (Blowing Dust)
- Humidity: Method 507.4 (95% relative humidity)
- Altitude: Method 500.4 Low Pressure, Proc. I & II (15,000 feet operational)

* Testing was not intended to demonstrate fitness for DOD contracts requirements or for military use. Test results are not a guarantee of future performance under these test conditions.

Graphics

Models with discrete graphics:

ATI Mobility Radeon HD 3450 with 128 MB or 256 MB dedicated video memory
Microsoft DirectX 10.1 (Shader 4.1) and OpenGL 2.1 capable

Models with integrated graphics:

Mobile Intel Graphics Media Accelerator 4500MHD
Microsoft DirectX 10 (Shader 4.0) and OpenGL 2.0 capable

Display

Internal

14.1-inch diagonal WXGA anti-glare (1280 x 800 resolution)
14.1-inch diagonal Illumi-Lite LED WXGA anti-glare (1280 x 800 resolution)
14.1-inch diagonal WXGA+ anti-glare (1440 x 900 resolution)
Ambient Light Sensor
Optional HP Privacy Filter

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
DVI-D (single link) video signal available through DVI port in optional HP Docking Station (sold separately); supports resolutions up to 1600 x 1200 at both full and reduced blanking, and 1920 x 1200 at reduced blanking
Supports 2 external displays (optional HP Docking Station required)
NOTE: Resolutions are dependent upon monitor capability, and resolution and color depth settings.

Memory

Standard

800 MHz DDR2 SDRAM; two slots supporting dual channel memory
1024 MB, 2048 MB, 4096 MB, or 8192 MB

Maximum

Upgradeable to 8192 MB with 4096 MB SODIMMs 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. Availability of 4 GB or more of memory requires Windows Vista Business 64-bit or Linux. With Windows 32-bit operating systems, memory above 3 GB may not all be available due to system resource requirements.

Standard Features

Communications Integrated Intel Gigabit Network Connection (10/100/1000 NIC)*
56K V.92 modem**

* 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 and wireless WAN options featuring support for the latest industry standards. Wireless LAN is factory configurable or available as an option to be added later. Broadband Wireless (WWAN) requires Windows Vista Business or Windows XP Professional and is available in select countries as a standard, factory configurable feature or as an option to be added later. Integrated Bluetooth is also available (factory configurable only) and can be combined with any of the supported wireless LAN and wireless WAN options.

HP un2400 EV-DO/HSPA Mobile Broadband Module Integrated WWAN module with Gobi global mobile Internet technology that provides worldwide connection to both CDMA (EVDO) and UMTS (HSPA) wireless networks.

NOTE: Separately purchased mobile network operator service is required.
Two 850/900/1800/1900/2100 MHz antennas integrated in the top of the display panel support current and future WWAN technologies.

All 802.11 integrated wireless LAN options Wi-Fi CERTIFIED*
Cisco Compatible Extensions support
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
Three antennas integrated in the display enclosure

Intel WiFi Link 5300 Integrated support for 802.11 a, b, g, and n draft 2.0*
Up to 450 mbps data rate

Intel WiFi Link 5100 Integrated support for 802.11 a, b, g, and n draft 2.0*
Up to 300 mbps data rate

Broadcom 4322AGN 802.11 a/b/g/draft-n Wi-Fi Adapter Integrated support for 802.11 a, b, g, and n draft 2.0*
Up to 300 mbps data rate

Broadcom 4312G 802.11 b/g Wi-Fi Adapter Integrated support for 802.11 b and g
Up to 54 mbps data rate

HP Integrated Module Bluetooth Specification v2.0 compliant with Bluetooth WirelessWorks with a wide range of Bluetooth devices
Technology

* The specifications for 802.11 n draft 2.0 are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11 n WLAN devices. In countries where n draft 2.0 is not allowed, this capability is not enabled (Intel 802.11 a/b/g only).

Standard Features

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 x 19 mm key pitch (center-to-center spacing), 2.5 mm stroke, and comfort-dished keycaps.

HP DuraKeys is a clear coating applied over the notebook keyboard that helps protect the finish and the printed characters on the keys. HP DuraFinish helps protect the finish on the keyboard deck, graphics, and icons from normal wear and tear.

HP Night Light shines directly on the keyboard for low-light conditions.

Touch-sensitive controls Touch-sensitive controls provide easy access to the following features: HP Info Center, HP QuickLook 2, wireless on/off, HP Presentation button, external volume up, volume down, and mute

Pointing device

Enhanced dual pointing devices:
Touchpad with scroll zone, two pick buttons
and
Pointstick, two pick buttons

Expansion card slots

ExpressCard/54 slot	Supports ExpressCard/54 and ExpressCard/34
Integrated Smart Card Reader	Compatible with ISO 7816 compliant Smart Cards PC/SC interface support
Secure Digital slot	Supports SD (Secure Digital), MMC (MultiMedia Card)

Storage

Internal Storage Device 120/160/250 GB 5400 rpm SMART SATA II Hard Drive
160 GB 7200 rpm SMART SATA II Hard Drive
80 GB Solid State Drive

NOTE: Hard drives are customer removable and will withstand multiple insertion/removal cycles. Up to 10 GB is reserved for the system recovery software.

HP 3D DriveGuard The hard drive is mounted directly to the notebook frame, reducing the transmission of shock away from the hard drive. Uses three-axis digital motion detection with intelligent sensitivity to help protect the hard drive during normal use from shock and vibration. The digital accelerometer temporarily halts all data transfer and parks the hard drive when abrupt motion is detected.

Upgrade Bay	Fixed 12.7 mm SATA optical drive	Blu-ray R/RE DVD+/-RW SuperMulti DL Drive DVD+/-RW SuperMulti DL LightScribe Drive DVD/CD-RW Combo Drive DVD-ROM Drive
	or	

Second hard drive*	250 GB 5400 rpm SMART SATA II Hard Drive 160 GB 7200 rpm SMART SATA II Hard Drive
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* For RAID configurations, both hard drive capacities must be equal.

Standard Features

Interfaces	ExpressCard/54 slot	One
	Smart Card Reader	One
	External monitor	One (VGA)
	1394a	One
	Stereo microphone in	One
	Stereo headphone/line out	One
	Power connector	One
	RJ-11/modem	One
	RJ-45/Ethernet	One
	USB 2.0	Three
	Docking connector	One
	Secondary battery connector	One
	LED status indicators	Fifteen

Audio/Visual

High Definition Audio support w/24-bit DAC
Integrated stereo speakers
Integrated dual-microphone array
Touch-sensitive controls for volume up, volume down, and mute
Stereo headphone/line out
Stereo microphone in

Optional 2 MP Webcam with Business Card Reader Software

- Supports videoconferencing and still image capture
- Large image sensor for excellent color matching and good low light sensitivity
- Up to 30 frames/sec
- AutoMacro focus lens
- Video capture at VGA, 1.3 Mpixel, and 2 Mpixel resolutions
- 16-bit true color (camera sensors output YCrCb format among others)

Standard Features

Software	Preinstalled software with Windows Vista or Windows XP	HP Recovery Manager (Vista only) HP Help and Support Center HP QuickLook 2 HP Universal Print Driver HP ProtectTools Security Manager: BIOS Configuration for HP ProtectTools Credential Manager for HP ProtectTools Device Access Manager for HP ProtectTools Drive Encryption for HP ProtectTools Embedded Security for HP ProtectTools HP Quick Launch Buttons HP Wireless Assistant Microsoft Office Ready with 60-day Office Professional 2007 Trial Edition (select models) PDF Complete Special Edition Intervideo WinDVD – DVD Player Roxio Creator Business (for optional DVD+/-RW and DVD/CD-RW drives) McAfee Total Protection* Synaptics Touchpad Driver Microsoft Windows Live Messenger (select models) HP Webcam Software (select models)
	Additional software available from the web	HP SoftPaq Download Manager HP Client Manager Software HP Client Management Solutions Java Card Security for HP ProtectTools

* 60 day trial period for McAfee Total Protection for Small Business software. Internet access required to receive updates. First update included. Subscription required for updates thereafter.

HP Recovery Manager (Vista only)	Each unit is shipped with HP Recovery Manager. HP Recovery Manager enables fast recovery of the factory preinstalled image if the system becomes corrupted or if important system files are accidentally deleted. Up to 10 GB of the hard drive is reserved for the system recovery software.
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SMBIOS Version 2.4	System Management BIOS, previously known as DMI BIOS, is used to store system management information.
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Standard Features

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 are:

- BIOS Configuration for HP ProtectTools
- Credential Manager for HP ProtectTools
- Device Access Manager for HP ProtectTools
- Drive Encryption for HP ProtectTools
- File Sanitizer for HP ProtectTools
- Set-up Wizard for HP ProtectTools
- Privacy Manager for HP ProtectTools (Chat & Sign)
- Embedded Security for HP ProtectTools
- Java Card Security for HP ProtectTools

Security	Standard Features	<p>HP ProtectTools Security Manager</p> <p>Enhanced Pre-Boot Security</p> <p>HP SpareKey</p> <p>One-Step Logon</p> <p>HP Fingerprint Sensor</p> <p>Integrated Smart Card Reader</p> <p>Configuration Control Hardware</p> <p>Memory Change Alert</p> <p>Ownership Tag</p> <p>Setup Password</p> <p>Power-On Password</p> <p>TPM 1.2 Embedded Security Chip*</p> <p>TPM Enhanced DriveLock*</p> <p>HP Disk Sanitizer</p> <p>HP 3D DriveGuard</p> <p>Kensington Lock Slot</p> <p>Support for Computrace / LoJack for Laptops (must be purchased separately)</p>
	Optional Features	<p>HP Privacy Filter Narrows viewing area so that screen data is visible only to persons directly in front of the monitor</p>

* TPM module disabled where use is restricted by law; for example, Russia and China.
 For more information on HP security solutions refer to: <http://www.hp.com/go/security>.

Power Supply External 90-watt Smart 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*

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

Standard Features

Battery	Primary battery	6-cell (55 WHr) Li-Ion battery 4-cell (37 WHr) Li-Ion battery
	Optional HP Extended Life Battery	6-cell (52 WHr) high capacity Li-Ion battery
	Optional HP Ultra-Capacity Battery	12-cell (95 WHr) high capacity Li-Ion battery

Battery Life		6-cell Primary with integrated graphics and CCFL display	6-cell Primary with integrated graphics and Illumi-Light LED display and Intel 80 GB Solid State Drive
	Primary battery	Up to 6 hours and 15 minutes	Up to 8 hours and 45 minutes
	Primary battery and optional HP Extended Life Battery	Up to 13 hours	Up to 17 hours and 30 minutes
	Primary battery and optional HP Ultra-Capacity Battery	Up to 17 hours and 15 minutes	Up to 24 hours

NOTE: The listed battery life measurements were taken on models running Microsoft Windows XP Professional. 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
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Power Conservation	Supports enhanced Intel SpeedStep technology with Intel Core 2 Duo (allows Battery Optimized Mode, Maximum Performance Mode, or Automatic mode)
	Intel Display Power Saving technology (models with integrated graphics)
	ATI PowerPlay technology (models with discrete graphics)
	Hibernation
	Standby
	ACPI compliance

Docking and Stands	HP Advanced Docking Station
	HP Docking Station
	HP Standard Monitor Stand
	HP Adjustable Notebook Stand
	HP External MultiBay II
	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, 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.
	* HP/Kensington Cable Lock required (purchased separately)
	** HP Advanced Docking Station only

Standard Features

Service and Support HP Services offers limited 3-year, 1-year and 90-day warranty options depending on country; 1-year limited warranty on primary battery. On-site service and warranty upgrades are also available. HP Care Pack Services extend service contracts beyond the standard warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/lookuptool>. Additional HP Care Pack Services information by product is available at: <http://www.hp.com/hps/carepack>.

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

Select Model(s) HP's Global Product Offer includes Global Series Preconfigured (GS-P) and Configurable (GS-C) products. GPO delivers globally consistent products, services, and solutions with End-of-Life (EOL) transition management. These products reduce IT complexity, lower management costs, increase productivity, and simplify product transitions.

6930p FL488AW#xxx Global SKU (see exceptions below)	Processor	Intel Core 2 Duo Processor P8600 (2.40 GHz, 3 MB L2 cache, 1066 MHz FSB)
FL489AW#xxx (for Latin America, Australia, New Zealand)	Operating System	Genuine Windows Vista Business 32 with Office Ready
NOTE: Components may vary based on local regulatory requirements	System Memory	2048 MB 800 MHz DDR2 (1 DIMM)
	Hard Drive	160 GB 5400 rpm SMART SATA II
	Upgrade Bay	DVD+/-RW SuperMulti DL LightScribe Drive
	Display	14.1-inch diagonal WXGA anti-glare
	Graphics	Mobile Intel GMA 4500MHD
	Webcam	No
	Audio	ADI High Definition CODEC Stereo headphone/line out and microphone in Integrated microphone
	Communications	Integrated Intel Gigabit Network Connection (10/100/1000 NIC) 56K V.92 modem
	Integrated Wireless	Intel WiFi Link 5300 (802.11 a/b/g/n draft 2.0)
	Integrated Security	Drive Encryption for HP ProtectTools HP Fingerprint Sensor TPM 1.2*
Pointing Device	Dual pointing devices (Touchpad and Pointstick)	
Battery	6-cell (55 WHr) Li-Ion	
Power	External 90W adapter	
Warranty	3/3/0 or 3/3/3 depending on country	

* TPM module disabled where use is restricted by law; for example, Russia and China.

Standard Features

6930p FL490AW#xxx Global SKU (see exceptions below)	Processor	Intel Core 2 Duo Processor T9400 (2.53 GHz, 6 MB L2 cache, 1066 MHz FSB)
	Intel Centrino 2 with vPro enabled technology	Enabled
FL491AW#xxx (for Latin America, Australia, New Zealand)	Operating System	Genuine Windows Vista Business 32 with Office Ready
	System Memory	2048 MB 800 MHz DDR2 (1 DIMM)
	Hard Drive	250 GB 5400 rpm SMART SATA II
	Upgrade Bay	DVD+/-RW SuperMulti DL LightScribe Drive
	Display	14.1-inch diagonal WXGA anti-glare
	Graphics	Mobile Intel GMA 4500MHD
	Webcam	2 MP Webcam
	Audio	ADI High Definition CODEC Stereo headphone/line out and microphone in Integrated microphone
	Communications	Integrated Intel Gigabit Network Connection (10/100/1000 NIC) 56K V.92 modem
	Integrated Wireless	Intel WiFi Link 5300 (802.11 a/b/g/n draft 2.0)
	Integrated Security	Drive Encryption for HP ProtectTools HP Fingerprint Sensor TPM 1.2*
	Pointing Device	Dual pointing devices (Touchpad and Pointstick)
	Battery	6-cell (55 WHr) Li-Ion
	Power	External 90W adapter
	Warranty	3/3/0 or 3/3/3 depending on country

* TPM module disabled where use is restricted by law; for example, Russia and China.

6930p FL492AW#xxx Global SKU (see exceptions below)	Processor	Intel Core 2 Duo Processor P8600 (2.40 GHz, 3 MB L2 cache, 1066 MHz FSB)
	Intel Centrino 2 with vPro enabled technology	Enabled
FL493AW#xxx (for Latin America, Australia, New Zealand)	Operating System	Genuine Windows Vista Business 32 with Office Ready
	System Memory	2048 MB 800 MHz DDR2 (1 DIMM)
	Hard Drive	160 GB 5400 rpm SMART SATA II
	Upgrade Bay	DVD+/-RW SuperMulti DL LightScribe Drive
	Display	14.1-inch diagonal WXGA anti-glare
	Graphics	ATI Mobility Radeon HD 3450 with 128 MB
	Webcam	No
	Audio	ADI High Definition CODEC Stereo headphone/line out and microphone in Integrated microphone
	Communications	Integrated Intel Gigabit Network Connection (10/100/1000 NIC) 56K V.92 modem
	Integrated Wireless	Intel WiFi Link 5300 (802.11 a/b/g/n draft 2.0)

Standard Features

Integrated Security	Drive Encryption for HP ProtectTools HP Fingerprint Sensor TPM 1.2*
Pointing Device	Dual pointing devices (Touchpad and Pointstick)
Battery	6-cell (55 WHr) Li-Ion
Power	External 90W adapter
Warranty	3/3/0 or 3/3/3 depending on country

* TPM module disabled where use is restricted by law; for example, Russia and China.

6930p FL494AW#xxx Global SKU (see exceptions below)	Processor	Intel Core 2 Duo Processor T9400 (2.53 GHz, 6 MB L2 cache, 1066 MHz FSB)
FL495AW#xxx (for Latin America, Australia, New Zealand)	Operating System	Genuine Windows Vista Business 32 with Office Ready
NOTE: Components may vary based on local regulatory requirements	System Memory	2048 MB 800 MHz DDR2 (1 DIMM)
	Hard Drive	160 GB 7200 rpm SMART SATA II
	Upgrade Bay	DVD+/-RW SuperMulti DL LightScribe Drive
	Display	14.1-inch diagonal WXGA anti-glare
	Graphics	ATI Mobility Radeon HD 3450 with 256 MB
	Webcam	2 MP Webcam
	Audio	ADI High Definition CODEC Stereo headphone/line out and microphone in Integrated microphone
	Communications	Integrated Intel Gigabit Network Connection (10/100/1000 NIC) 56K V.92 modem
	Integrated Wireless	Intel WiFi Link 5300 (802.11 a/b/g/n draft 2.0)
	Integrated Security	Drive Encryption for HP ProtectTools HP Fingerprint Sensor TPM 1.2*
Pointing Device	Dual pointing devices (Touchpad and Pointstick)	
Battery	6-cell (55 WHr) Li-Ion	
Power	External 90W adapter	
Warranty	3/3/0 or 3/3/3 depending on country	

* TPM module disabled where use is restricted by law; for example, Russia and China.

Options

Memory	HP 1 GB (DDR2 800 MHz) SODIMM	KT292AA
	HP 2 GB (DDR2 800 MHz) SODIMM	KT293AA
	HP 4 GB (DDR2 800 MHz) SODIMM	KT294AA
Storage	HP Notebooks USB Diskette Drive	DC361B
	HP Primary SATA 120 GB 5400 rpm Hard Drive	RT080AA
	HP Primary SATA 120 GB 7200 rpm Hard Drive	AH920AA
	HP Primary SATA 250 GB 5400 rpm Hard Drive	AK072AA
	HP Upgrade Bay SATA 250 GB 5400 rpm Hard Drive	AK868AA
	HP Upgrade Bay SATA DVD+/-RW SuperMulti DL LightScribe Drive	AK869AA
MultiBay II Storage (9.5-mm) <i>NOTE: Requires HP Advanced Docking Station or HP External MultiBay II</i>	HP MultiBay II DVD-ROM Drive	PA849A
	HP MultiBay II DVD+/-RW SuperMulti DL Drive	PA851A
Expansion Solutions	HP 2008 120W Docking Station	KP080AA#xxx
	HP 2008 150W Docking Station	KQ751AA#xxx
	HP 2008 150W Advanced Docking Station	KP081AA#xxx
	HP 2008 180W Advanced Docking Station	KQ752AA#xxx
	HP External MultiBay II	PA509A#xxx
	HP Standard Monitor Stand	PA507A
	HP Adjustable Notebook Stand	PA508A
Communications	Intel WiFi Link 5300	KM591AA#xxx
	HP un2400 EVDO/HSUPA Mobile Broadband Module	FN556AA
Power	HP 1-Bay Battery Charging Station	RW635AA#xxx
	HP 5-Bay Battery Charging Station	RW636AA#ABA
	HP Battery Adapter Kit	RW637AA
	HP 90W Smart AC Adapter	ED495AA#xxx
	HP 90W Smart Auto Adapter	ED493AA
	HP 6700b/6500b Series 6-cell Primary Battery	KU531AA
	HP Extended Life Battery	AJ359AA
	HP 8-cell Extended Life Battery	PB993A
HP 12-cell Ultra-Capacity Battery	EJ092AA	

Options

Carrying Cases	HP Basic Carrying Case	AJ078AA
	HP Value Nylon Case	RR314AA
	HP Universal Nylon Case	RR315AA
	HP Executive Leather Case	RR316AA
	HP Deluxe Nylon Backpack	RR317AA
	HP Deluxe Roller Case	GD405AA
<hr/>		
Security	HP ExpressCard Smart Card Reader with Java Card	AJ451AA
	HP ProtectTools Java Card – 10 units	EL348AA
	HP/Kensington MicroSaver Security Lock	PC766A
	HP Privacy Filter	AJ357AA
<hr/>		
Input/Output Devices	HP PS/2 Keyboard & Mouse Bundle	RC464AA#xxx
	HP USB Keyboard & Mouse Bundle	RC465AA#xxx
	HP USB/PS2 Optical 2-Button Scroll Mouse	DC369A
	HP USB Optical Travel Mouse	RH304AA

Memory

800-MHz DDR2 SDRAM

Two DIMM slots supporting dual channel memory

DIMM sizes supported: 1024 MB, 2048 MB, and 4096 MB

Standard Memory

- 1024 MB (1024 MB x 1)
- 2048 MB (2048 MB x 1 or 1024 MB x 2)
- 4096 MB (4096 MB x 1 or 2048 MB x 2)
- 8192 MB (4096 MB x 2)

Optional Memory Upgrades

Support for up to 8192 MB of memory 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
1024 MB	1024 MB	Empty
2048 MB	1024 MB	1024 MB
3072 MB	2048 MB	1024 MB
4096 MB	2048 MB	2048 MB
8192 MB	4096 MB	4096 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. Availability of 4 GB or more of memory requires Windows Vista Business 64-bit or Linux. With Windows 32-bit operating systems, memory above 3 GB may not all be available due to system resource requirements.

Memory Upgrades	HP 1 GB (DDR2 800 MHz) SODIMM	KT292AA
	HP 2 GB (DDR2 800 MHz) SODIMM	KT293AA
	HP 4 GB (DDR2 800 MHz) SODIMM	KT294AA

Storage

Upgrade Bay Drive Support

	Quantity Supported	Drive Bay
Blu-ray R/RE DVD+/-RW SuperMulti DL Drive	One	Upgrade Bay
DVD+/-RW SuperMulti DL LightScribe Drive	One	Upgrade Bay
DVD/CD-RW Combo Drive	One	Upgrade Bay
DVD-ROM Drive	One	Upgrade Bay
250 GB 5400 rpm SMART SATA Hard Drive	One	Upgrade Bay
160 GB 7200 rpm SMART SATA Hard Drive	One	Upgrade Bay

Internal Storage Device

	Quantity Supported	Drive Bay
Hard Drives		
250 GB 5400 rpm SMART SATA II Hard Drive	One	Dedicated hard drive bay
160 GB 5400 rpm SMART SATA II Hard Drive	One	Dedicated hard drive bay
120 GB 5400 rpm SMART SATA II Hard Drive	One	Dedicated hard drive bay
160 GB 7200 rpm SMART SATA II Hard Drive	One	Dedicated hard drive bay
Solid State Drive		
80 GB Solid State Drive	One	Dedicated hard drive bay

Technical Specifications

System Unit	Dimensions (HxWxD)	1.23 in (at front) x 13.03 in x 9.57 in 31.3 mm (at front) x 331.0 mm x 243.0 mm
	Weight	with Upgrade Bay weight-saver and 4-cell battery Starting at 4.7 lb (2.1 kg) with Upgrade Bay optical drive and 6-cell battery Starting at 5.1 lb (2.3 kg)

NOTE: Height varies depending upon where on the notebook the measurement is made. Starting weight includes integrated graphics, hard drive, one memory DIMM, 802.11 wireless communications module. Weight varies by configuration and components.

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	18.5 V
	Average Operating Power	18 W (integrated graphics) 19.5 W (discrete graphics)
	Max Operating Power	< 90 W
Temperature*	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)
Relative Humidity*	Operating	10% to 90%, non-condensing
	Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
Shock	Operating	125 G, 2 ms, half-sine
	Non-operating	200 G, 2 ms, half-sine
Random Vibration*	Operating	0.75 grms
	Non-operating	1.50 grms
Altitude* (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)

* These ranges represent the recommended operating conditions. Although this notebook meets the military standard MIL-STD 810F for vibration, dust, humidity, altitude, and high temperature, HP does not guarantee future performance under those extreme conditions.

Industry Standard Certifications	UL	Yes
	CSA	Yes
	FCC Compliance	Yes
	ENERGY STAR®	Yes
	EPEAT	Gold with Illumi-Lite LED display Silver without Illumi-Lite LED display
	ICES	Yes
	GS	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes
	Japan VCCI Compliance	Yes
	MIC	Yes
	BSMI	Yes
	CE Marking Compliance	Yes

Technical Specifications

BNCI or BELUS	Yes
CIT	Yes
GOST	Yes
Saudi Arabian Compliance (ICCP)	Yes
SABS	Yes
UKRSERTCOMPUTER	Yes

For accessibility information on HP products, please visit: <http://www.hp.com/accessibility>.

HP 90W Smart AC Adapter	Dimensions	5.00 x 1.97 x 1.1 in (12.7 x 5.0 x 2.9 cm)	
	Weight	0.82 lb (370 g)	
	Input	100 to 240 VAC	
		Input Efficiency	83% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.5 A at 90 VAC, 0.75 A at 180 VAC PFC Version
			2.4 A at 90 VAC, 1.2 A at 180 VAC NON PFC Version
		Output	Output power 65W 90W
			DC output 19.0V
			Hold-up time 5 msec at 115 VAC input
			Output current limit <11A, Over voltage protection- 29V max automatic shutdown
		Connector	3 pin/grounded, mates with interchangeable cords
		Environmental Design	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%	
		Storage Humidity 10% to 90%	
EMI and Safety Certifications		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.	

Technical Specifications

Optional HP Ultra-Capacity Battery	Dimensions (H x W x L)	1.3 x 6.0 x 10.6 in (3.33 x 15.25 x 26.88 cm)	
	Weight	1.77 lb (0.803 kg)	
	Cells/Type	12-cell Li-Ion	
	Energy	Watt-hour Capacity	95 WHr
	Temperature	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)
	Battery Re-Charge Time	Smart Adapter	3 to 4 hours
		System ON	4 to 5 hours (depending on system power consumption)
	Fuel Gauge	When pressed, LEDs light indicating level of charge remaining on battery	
Optional HP Extended Life Battery	Dimensions (H x W x L)	1.0 x 3.9 x 8.7 in (2.5 x 10.0 x 22.0 cm)	
	Weight	1.00 lb (0.455 kg)	
	Cells/Type	8-cell Li-Ion	
	Energy	Watt-hour Capacity	52 WHr
	Temperature	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)
	Battery Re-Charge Time	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
Fuel Gauge	When pressed, LEDs light indicating level of charge remaining on battery		
6-Cell (55 WHr) Li-Ion battery	Dimensions (H x W x L)	0.8 x 2.1 x 8.0 in (2.0 x 5.3 x 20.3 cm)	
	Weight	0.737 lb (0.335 kg)	
	Cells/Type	6-cell Li-Ion	
	Energy	Watt-hour Capacity	55 WHr
	Temperature	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)
	Battery Re-Charge Time	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 90 minutes when system is OFF

Technical Specifications

4-Cell (37 WHr) Li-Ion battery	Dimensions (H x W x L)	0.8 x 2.1 x 8.0 in (2.0 x 5.3 x 20.3 cm)		
	Weight	0.55 lb (0.249 kg)		
	Cells/Type	4-cell Li-Ion		
	Energy	Watt-hour Capacity	37 WHr	
	Temperature	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)	
	Battery Re-Charge Time	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 90 minutes when system is OFF	

Displays

14.1-inch Illumi-Lite WXGA anti-glare	Active Area (W x H)	11.9 x 7.5 in (30.3 x 19.0 cm)		
	Diagonal Size	14.1 in (35.7 cm)		
	Surface Treatment	Anti-glare		
	Contrast Ratio	400:1 (typical)		
	Refresh Rate	60 Hz		
	Brightness	200 nit (typical)		
	Pixel Resolution	Pitch	0.237 mm	
		Format	1280 x 800	
		Configuration	RGB Stripe	
	Backlight	LED		
	PPI	107		
	Viewing Angle	±30° Horizontal, ±10° Vertical (minimum)		
		30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)		

Technical Specifications

14.1-inch WXGA anti-glare	Active Area (W x H)	11.9 x 7.5 in (30.3 x 19.0 cm)	
	Diagonal Size	14.1 in (35.7 cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	300:1 (typical)	
	Refresh Rate	60 Hz	
	Brightness	200 nit (typical)	
	Pixel Resolution	Pitch	0.237 mm
		Format	1280 x 800
		Configuration	RGB Stripe
	Backlight	CCFL	
	PPI	107	
Viewing Angle	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)		

14.1-inch WXGA+ anti-glare	Active Area (W x H)	11.9 x 7.5 in (30.3 x 19.0 cm)	
	Diagonal Size	14.1 in (35.7 cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	300:1 (typical)	
	Refresh Rate	60 Hz	
	Brightness	200 nit (typical)	
	Pixel Resolution	Pitch	0.210 mm
		Format	1440 x 900
		Configuration	RGB Stripe
	Backlight	CCFL	
	PPI	121	
Viewing Angle	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)		

Hard Drives

Technical Specifications

160 GB 7200 rpm SATA Hard Drive	Drive Weight	0.25 lb (115 g)	
	Capacity	160 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum) 100 MB/s (Drive Capability)	
	Seek Time	Single Track	1.5 ms
	(typical reads, including settling)	Average	11 ms
		Maximum	22 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	312,581,808	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

250 GB 5400 rpm SATA Hard Drive	Drive Weight	0.22 lb (101 g)	
	Capacity	250 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum) 100 MB/s (Drive Capability)	
	Seek Time	Single Track	3 ms
	(typical reads, including settling)	Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	488,397,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

Technical Specifications

160 GB 5400 rpm SATA Hard Drive	Drive Weight	0.22 lb (101 g)	
	Capacity	160 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum) 100 MB/s (Drive Capability)	
	Seek Time	Single Track	3 ms
	(typical reads, including settling)	Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	312,581,808	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

120 GB 5400 rpm SATA Hard Drive	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-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum) 100 MB/s (Drive Capability)	
	Seek Time	Single Track	3 ms
	(typical reads, including settling)	Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	234,441,648	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

80 GB 2.5" SATA Solid State Drive	Weight	0.19 lbs (86 g)	
	Capacity	80 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 2.6	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		250 MB/s	70 MB/s
	Logical Blocks	156,301,488	
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]	
	Features	ATA Security	

Removable Storage Drives

Technical Specifications

DVD-ROM Drive	Access Times	Random	<116 ms CD (typical) <125 ms DVD (typical)
	Max Data Transfer Rate	24X CD-ROM 8X-DVD	Up to 3,600 KB/s Up to 10,800 KB/s
	Transfer Mode	UDMA Mode 5	
	Interface	Gen 1 SATA	
	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, DVD-RAM	
	Supported Media (write)	None	
	Max Media Capacity (read)	4.7 GB	
	Transport	Tray Loading	

DVD/CD-RW Combo Drive	Access Times	Random	<110 ms CD (typical) <130 ms DVD (typical)
	Max Data Transfer Rate	24X CD-ROM 8X DVD 24X CD-R 24X CD-RW	Up to 3,600 KB/s Up to 10,800 KB/s Up to 3,600 KB/s Up to 3,600 KB/s
	Transfer Mode	UDMA Mode 5	
	Interface	Gen 1 SATA	
	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)	CD-R, CD-RW	
	Max Media Capacity (read)	8.5 GB	
	Max Media Capacity (write)	700 MB	
	Transport	Tray loading	

Technical Specifications

DVD+/-RW SuperMulti DL LightScribe Drive	Access Times	Random	<175 ms CD (typical) <230 ms DVD (typical)
	Max Data Transfer Rate	24X CD-ROM 8X DVD 24X CD-R 16X CD-RW 8X DVD+R 4X DVD+RW 8X DVD-R 4X DVD-RW 2.4X DVD+R(9) 5X DVD-RAM	Up to 3,600 KB/s Up to 10,800 KB/s Up to 3,600 KB/s Up to 2,400 KB/s Up to 10,800 KB/s Up to 5,400 KB/s Up to 10,800 KB/s Up to 5,400 KB/s Up to 2,700 KB/s Up to 6,750 KB/s
	Transfer Mode	UDMA Mode 5	
	Interface	Gen 1 SATA	
	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, DVD-RAM	
	Supported Media (write)	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, LightScribe	
	Max Media Capacity (read)	8.5 GB	
	Max Media Capacity (write)	8.5 GB	
	Transport	Tray Loading	

Blu-ray R/RE DVD+/-RW SuperMulti DL Drive	Access Times	Random	<140 ms CD-ROM (typical) <160 ms DVD-ROM (typical) <300 ms BD-ROM (typical)
	Max Data Transfer Rate	24X CD-ROM 8X DVD-ROM 8X CD-R 8X CD-RW 8X DVD+R 4X DVD+RW 8X DVD-R 4X DVD-RW 2.4X DVD+R(9) 5X DVD-RAM 1X BD-ROM 1X BD-R 1X BD-RE	Up to 3,600 KB/s Up to 10,800 KB/s Up to 1,200 KB/s Up to 1,200 KB/s Up to 10,800 KB/s Up to 5,400 KB/s Up to 10,800 KB/s Up to 5,400 KB/s Up to 2,700 KB/s Up to 6,750 KB/s Up to 4,500 KB/s Up to 4,500 KB/s Up to 4,500 KB/s
	Transfer Mode	UDMA Mode 5	
	Interface	Gen 1 SATA	

Technical Specifications

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. DVD-RAM, BD-ROM, BD-R, BD-RE
Supported Media (write)	CD-R, CD-RW, DVD+R, DVD+R(9), DVD+RW, DVD-R, DVD-R(9), DVD-RW, DVD-RAM, BD-R, BD-RE
Max Media Capacity (read)	50.0 GB
Max Media Capacity (write)	50.0 GB
Transport	Tray Loading

Security

HP Fingerprint Sensor	Mobile Voltage Operati3.0V–3.6V Single Supply
	Operating Temperature32° – 158°F (0° – 70°C)
	Current Consumption @3.3V Less than 70 mA peak imaging and scrolling Less than 25 mA hardware finger detection Advanced Power Management
	High-Rate Image CaptureUp to 240 image frames /sec
	ESD Resistance IEC 61000-4-2 Level 4 (±15KV)
	Detection Matrix 192 x 16 Pixels 9.7 mm x 0.81 mm 500 ppi High-Resolution Images

Audio

Hardware	Implementation	ADI1981HD High Definition CODEC
	Touch-Sensitive Volume Controls	Volume up, volume down, and mute
	Full Duplex	Yes
	Microphone In	Stereo
	Headphone/Line Out	Stereo
	Integrated Microphone	Yes, dual-microphone array

Technical Specifications

Audio Output Quality	Frequency Response	20 Hz – 20 kHz
	Signal to Noise Ratio	>85 dB
	Total Harmonic Distortion	<0.01%
	Noise Floor	-110 dB
	Play/Record Sampling Rate(s)	8 kHz – 48kHz
	DAC	16, 20 or 24-bit
	ADC	16 or 20-bit

Communications

Integrated Intel Gigabit Ethernet Features	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)
Network Connection (10/100/1000 NIC)	100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)
82567LM	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)
Power Management	ACPI compliant – multiple power modes
	Situation-sensitive features reduce power consumption
Performance Features	TCP/IP/UDP Checksum Offload (configurable)
Manageability	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
	Intel Advanced Management Technology (iAMT)
Interface	PCI Express x1
NIC Device Driver Name	Intel 82567 Gigabit Network Connection

Technical Specifications

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) Optional symbol rates: 2800, 3429 Asymmetric Symbol rates Synchronous primary channel data signaling rates: 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

Technical Specifications

HP un2400 EV-DO/HSPA Mobile Broadband Module	Technology/Operating Bands	GSM/GPRS/EDGE: 850MHz(Cell), 900MHz(EGSM), 1800MHz(DCS), 1900MHz (PCS) UMTS/WCDMA with receive diversity: 2100MHz (UTRA FDD Band I), 1900MHz (UTRA FDD Band II), 850MHz (UTRA FDD Band V) 1xEVDO/1xRTT with receive diversity: 850MHz (Band Class0-Cell), 1900MHz (Band Class1-PCS)
	Wireless Protocol Standards	GSM/GPRS/EDGE: Class B, Multi-slot operation, coding schemes CS1 – CS4 and MSC1 – MSC9. UMTS/WCDMA: Release 99 and Release 5 CDMA: 1xEVDO Release 0 and Release A, IS-95A, IS-95B, IS-2000
	Wireless Parametric Standards	Meets or exceeds TIA/EIA IS-98-D
	Maximum Data Rates	UMTS (HSPA) – 7.2 Mbps (Download), 2.0Mbps (Upload) CDMA (EVDO Release A) – 3.1 Mbps (Download), 1.8Mbps (Upload)
	Maximum Output Power	GSM/GPRS/EDGE: 32dBm (+/-1) WCDMA: 24dBm (+/-1) CDMA: 24dBm (+/-1)
	Maximum Power Consumption	2500mA (peak); 1000mA (average)
	Power Consumption, Sleep Mode	5 mA
	Power Management	USB selective suspend Integrated notebook wireless button
	Antenna Type	Dual high efficiency 5 band antennae with spatial diversity, mounted in the display enclosure
	Form Factor	PCI-Express MiniCard
	Weight	11.5 g
	Dimensions (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 4.5 mm)
	Voltage, Operating	3.3v +/- 10%
	Temperature, Operating (from TIA/EIA/IS-98-D)	22° to 140° F (–30° to 60° C) (full RF performance) –22° to 167° F (–30° to 75° C) (reduced RF performance)
	Temperature, Non-operating, 96 hours (from MIL-STD 202 Method 108)	–40° to 185° F (–40° to 85° C)
	Humidity, Non-operating	85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
	Configuration Utilities	HP Connection Manager
	LED Activity	LED Off – Radio Off; Solid LED On – Radio On
Intel WiFi Link 5300	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n draft 2.0*

Technical Specifications

* The specifications for 802.11n draft 2.0 are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11n WLAN devices. In countries where n draft 2.0 is not allowed, this capability is not enabled.

Interoperability	<p>Wi-Fi certified (802.11abg only)</p> <p>Cisco Compatible Extensions Program compliant (802.11abg only) with Microsoft Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)</p> <p>Tested with wireless access points from several major manufacturers (details at: http://www.hp.com/go/notebooks/WLAN/draftn)</p>
Frequency Band	2.4 GHz and 5 GHz
Antenna Structure	3 transmit; 3 receive (3x3)
Data Rates	<p>802.11b: 1, 2, 5.5, 11 Mbps</p> <p>802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</p> <p>802.11n (draft): 66 possible data rates, ranging from 6 Mbps to 450 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n (draft) specification</p>
Modulation	<p>Direct Sequence Spread Spectrum</p> <p>DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM</p>
Security ¹	<p>Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES (support for key sizes of 128, 192, and 256 bits), 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST.</p> <p>Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows Vista and XP only.</p>
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
Network Architecture	Ad-hoc (Peer to Peer)
Models	Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power (for CCK) ²	15 dBm
Output Power (for OFDM) ²	5 dBm
	power varies by data rate) ²
Power Consumption	<p>Transmit: 2.3 Watts (average, with three spatial streams)</p> <p>Receive: 1.9 Watts (average with three receive chains)</p> <p>Idle mode³: 30 mW (average)</p> <p>Radio off: 20 mW (max)</p>
Power Management	<p>ACPI compliant power management</p> <p>802.11 compliant power saving mode</p>
Receiver Sensitivity ⁴	300 Mbps: -68 dBm, 54 Mbps: -74 dBm, 6 Mbps: -90 dBm
Antenna Connections	3 U.FL type connectors, 50 ohm nominal impedance
Range	<p>802.11 a – Typical 600 feet – Outdoor Open Area</p> <p>(@6 Mbps) 150 feet – Indoor, Office environment</p>

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	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
Form Factor	PCI-Express MiniCard	
Weight	0.013 lb (6 g)	
Dimensions	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
Operating Voltage	3.3V +/- 9%, 1.5V +/- 5%	
Temperature	Operating	32° to 176° F (0° to 80° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 90% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
Configuration Utility ⁵	Microsoft Windows XP Choice of Configuration Utility:	
		<ul style="list-style-type: none"> • Microsoft Windows XP Wireless Network Connection Manager • Intel PROSet for Microsoft Windows XP (required for Cisco Compatible Extensions support)
	Microsoft Windows Vista	
		<ul style="list-style-type: none"> • Microsoft Windows Vista Wireless Network Connection Manager. • Intel IHV extensions for Windows Vista available to support Cisco Compatible Extensions.
LED Activity	LED Off – Radio OFF; Solid LED On – Radio ON	
	<ol style="list-style-type: none"> 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 and on battery power. 4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK 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 with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista. 	

Intel WiFi Link 5100	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n draft 2.0*
		* The specifications for 802.11n draft 2.0 are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11n WLAN devices. In countries where n draft 2.0 is not allowed, this capability is not enabled.
	Interoperability	Wi-Fi certified (802.11abg only) Cisco Compatible Extensions Program compliant (802.11abg only) with Microsoft Windows Vista and XP (details at:

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	http://www.hp.com/go/notebooks/WLAN Tested with wireless access points from several major manufacturers (details at: http://www.hp.com/go/notebooks/WLAN/draft-n)							
Frequency Band	2.4 GHz and 5 GHz							
Antenna Structure	1 transmit; 2 receive (1x2)							
Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n (draft): 66 possible data rates, ranging from 6 Mbps to 300 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n (draft) specification							
Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM							
Security ¹	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES (support for key sizes of 128, 192, and 256 bits), 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST. Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows Vista and XP only.							
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.							
Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK							
Network Architecture	Ad-hoc (Peer to Peer)							
Models	Infrastructure (Access Point Required)							
Roaming	IEEE 802.11 compliant roaming between access points							
Output Power (for CCK) ²	15 dBm							
Output Power (for OFDM) ²	5 dBm							
	power varies by data rate) ²							
Power Consumption	Transmit: 2.3 Watts (average, with one spatial streams) Receive: 1.9 Watts (average with two receive chains) Idle mode ³ : 30 mW (average) Radio off: 20 mW (max)							
Power Management	ACPI compliant power management 802.11 compliant power saving mode							
Receiver Sensitivity ⁴	300 Mbps: -68 dBm, 54 Mbps: -74 dBm, 6 Mbps: -90 dBm							
Antenna Connections	3 U.FL type connectors, 50 ohm nominal impedance							
Range	<table border="0"> <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							
Form Factor	PCI-Express MiniCard							
Weight	0.013 lb (6 g)							
Dimensions	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)							

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Operating Voltage	3.3V +/- 9%, 1.5V +/- 5%	
Temperature	Operating	32° to 176° F (0° to 80° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 90% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
Configuration Utility ⁵	Microsoft Windows XP Choice of Configuration Utility:	
	<ul style="list-style-type: none"> • Microsoft Windows XP Wireless Network Connection Manager • Intel PROSet for Microsoft Windows XP (required for Cisco Compatible Extensions support) 	
	Microsoft Windows Vista	
	<ul style="list-style-type: none"> • Microsoft Windows Vista Wireless Network Connection Manager. • Intel IHV extensions for Windows Vista available to support Cisco Compatible Extensions. 	
LED Activity	LED Off – Radio OFF; Solid LED On – Radio ON	
	<ol style="list-style-type: none"> 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 and on battery power. 4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK 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 with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista. 	

Broadcom 4312G 802.11b/g WiFi Adapter	Wireless LAN Standards	IEEE 802.11b IEEE 802.11g
	Interoperability	Wi-Fi certified (802.11abg only) Cisco Compatible Extensions Program compliant (802.11abg only) with Microsoft Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN) Tested with wireless access points from several major manufacturers (details at: http://www.hp.com/go/notebooks/WLAN/draft-n)
	Frequency Band	2.4 GHz
	Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	Security ¹	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.
		Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program

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	Version 4) with Microsoft Windows Vista and XP only.	
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.	
Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK	
Network Architecture	Ad-hoc (Peer to Peer)	
Models	Infrastructure (Access Point Required)	
Roaming	IEEE 802.11 compliant roaming between access points	
Output Power (for CCK) ²	17 dBm	
Output Power (for OFDM)	5 dBm	
	power varies by data rate) ²	
Power Consumption	Idle associated: 250 mW Idle unassociated: 150 mW Transmit: 2.0 W (max) Receive: 2.0 W (max)	
Power Management	ACPI compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity ³	54 Mbps: -71 dBm, 11 Mbps: -85 dBm , 1 Mbps: -95 dBm	
Antenna type	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure	
Range	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
Form Factor	PCI-Express MiniCard	
Weight	0.026 lb (12 g)	
Dimensions	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
Operating Voltage	3.3v +/- 10%	
Temperature	Operating	14° to 149° F (-10° to 65° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
Configuration Utility ⁴	Microsoft Windows XP Choice of Configuration Utility: <ul style="list-style-type: none"> • Microsoft Windows XP Wireless Network Connection Manager • Broadcom Wireless Configuration Utility (required for Cisco Compatible Extensions support) Microsoft Windows Vista <ul style="list-style-type: none"> • Microsoft Windows Vista Wireless Network Connection Manager • Broadcom IHV extensions for Windows Vista available to support Cisco Compatible Extensions. 	
LED Activity	LED Off – Radio OFF; Solid LED On – Radio ON	

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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. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
4. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.

Broadcom 4322AGN 802.11a/b/g/draft-n WiFi Adapter	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n (draft 2.0)
	Interoperability	Wi-Fi certified (802.11abg only) Cisco Compatible Extensions Program compliant (802.11abg only) with Microsoft Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN) Tested with wireless access points from several major manufacturers (details at: http://www.hp.com/go/notebooks/WLAN/draft-n)
	Frequency Band	2.4 GHz and 5 GHz
	Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n (draft): 6, 6.5, 9, 12, 13, 13.5, 18, 19.5, 24, 26, 27, 36, 39, 40.5, 48, 52, 54, 58.5, 65, 78, 81, 104, 108, 117, 121.5, 130, 135, 162, 216, 243, 270, 300 Mbps
	Frequency Support	20 MHz: 2.4 GHz and 5 GHz bands 40 MHz: 2.4 GHz and 5 GHz band
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
	Security ¹	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. Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows Vista and XP only.
	Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
	Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
	Network Architecture	Ad-hoc (Peer to Peer)
	Models	Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power (for CCK) ²	17 dBm
	Output Power (for OFDM) ²	5 dBm
	power varies by data rate) ²	

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Power Consumption	Idle associated: 250 mW Idle unassociated: 150 mW Transmit/Receive 20 MHz channel: 2.0 W (max) Transmit/Receive 40 MHz channel: 2.0 W (max)	
Power Management	ACPI compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity ³	270 Mbps: -66dBm, 162 Mbps: -72 dBm, 54 Mbps: -72 dBm, 11 Mbps: -85 dBm , 1 Mbps: -94 dBm	
Antenna type	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure	
Range	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
Form Factor	PCI-Express MiniCard	
Weight	0.026 lb (12 g)	
Dimensions	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
Operating Voltage	3.3v +/- 10%	
Temperature	Operating	14° to 149° F (-10° to 65° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
Configuration Utility ⁴	Microsoft Windows XP Choice of Configuration Utility: <ul style="list-style-type: none"> • Microsoft Windows XP Wireless Network Connection Manager • Broadcom Wireless Configuration Utility (required for Cisco Compatible Extensions support) Microsoft Windows Vista <ul style="list-style-type: none"> • Microsoft Windows Vista Wireless Network Connection Manager • Broadcom IHV extensions for Windows Vista available to support Cisco Compatible Extensions. 	
LED Activity	LED Off – Radio OFF; Solid LED On – Radio ON	
	<ol style="list-style-type: none"> 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. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation). 4. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista. 	

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HP Integrated Module with Bluetooth Technology	Bluetooth Specification 2.0 Compliant
Wireless Dimensions	1.02 x 0.55 x 0.22 in (26 x 14 x 5.7 mm)
Frequency Band	2402 to 2480 MHz
Number of Available Channels	79 (1 MHz) available channels
Data Rates and Throughput	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
Transmit Power	-6 dBm to 4 dBm (Bluetooth Class II)
Receiver Sensitivity	Better than -80 dBm at 0.1 % raw bit error rate
Power Consumption	Peak (Tx) 264 mW Peak (Rx) 231 mW Sleep <1 mW
Antenna	Internally integrated within module
Range	Up 33 ft (10 m)
Electrical Interface	USB 2.0 compliant Microsoft Windows Plug and Play compliant
OS Support	Microsoft Windows XP Professional and Home Microsoft Windows 2000
Bluetooth Software Supported	Broadcom Bluetooth for Windows Microsoft Windows XP Bluetooth Software
Link Topology	Point to Point, Multipoint Pico Nets up to 7 slaves
Security	Full support of Bluetooth Security Provisions
Power Management	Microsoft Windows ACPI, and USB Bus Support Self configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
Certifications	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
Temperature	Operating -4° to 158° F (-20° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
Humidity	Operating 10% to 90% Non-operating 5% to 95%
Altitude	Operating 15,000 ft (4,572 m) Non-operating 40,000 ft (12,192 m)
Bluetooth Profiles Supported	(with Bluetooth for Windows 4.0 software) Serial Port Profile (SPP)* Dial-Up Networking (DUN)* Generic Object Exchange Profile (GOEP) Object Push Profile (OPP)*

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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

Eco 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
- Taiwan Green Mark
- China Energy Conservation Program
- IT ECO declaration
- EPEAT – Gold with Illumi-Lite LED display
Silver without Illumi-Lite LED display
- Korea ECO label

System Configuration The configuration used for the Energy Consumption and Declared Noise Emissions data for the Convertible Mini tower Desktop model is based on a "Typically Configured Notebook"

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	10.614 W	11.826 W	10.792 W
Sleep (Energy Star low power mode)	1.8621 W	1.9193 W	1.8764 W
Off	0.8042 W	0.8435 W	0.8106 W
Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	36 BTU/hr	40 BTU/hr	36 BTU/hr
Sleep	6 BTU/hr	6 BTU/hr	6 BTU/hr
Off	3 BTU/hr	3 BTU/hr	3 BTU/hr

* 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.

Technical Specifications

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
System Fan Off		
Idle	2.8	31.3
Fixed Disk (random writes)	3.7	30.5

NOTE: System fan is usually off except when charging the battery

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.

The battery type and chemistry used in the product is:

Battery type – CR2032 (coin cell)

Battery Chemistry – Lithium, Li Ion

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.

This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).

This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level with Illumi-Lite LED display and Silver level without Illumi-Lite LED display, see www.epeat.net

Keyboard complies with ISO standard: ISO 9995, EN 29241-4, and ISO/IEC 15412

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

Plastics parts weighing over 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 95.4% recycle-able when properly disposed of at end of life.

Packaging Materials

Technical Specifications

- External:
 - Corrugated Carton – 0.81 lb (182 g)
- Internal:
 - EPE-Expanded Polyethylene – 0.15 lb (33 g)
 - Corrugated Carton – 0.03 lb (488 g)
- The EPE foam packaging material is made from 100% 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):

- 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.
- 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

Technical Specifications

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 Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to:

<http://www.hp.com/go/reuse-recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/recyclers>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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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