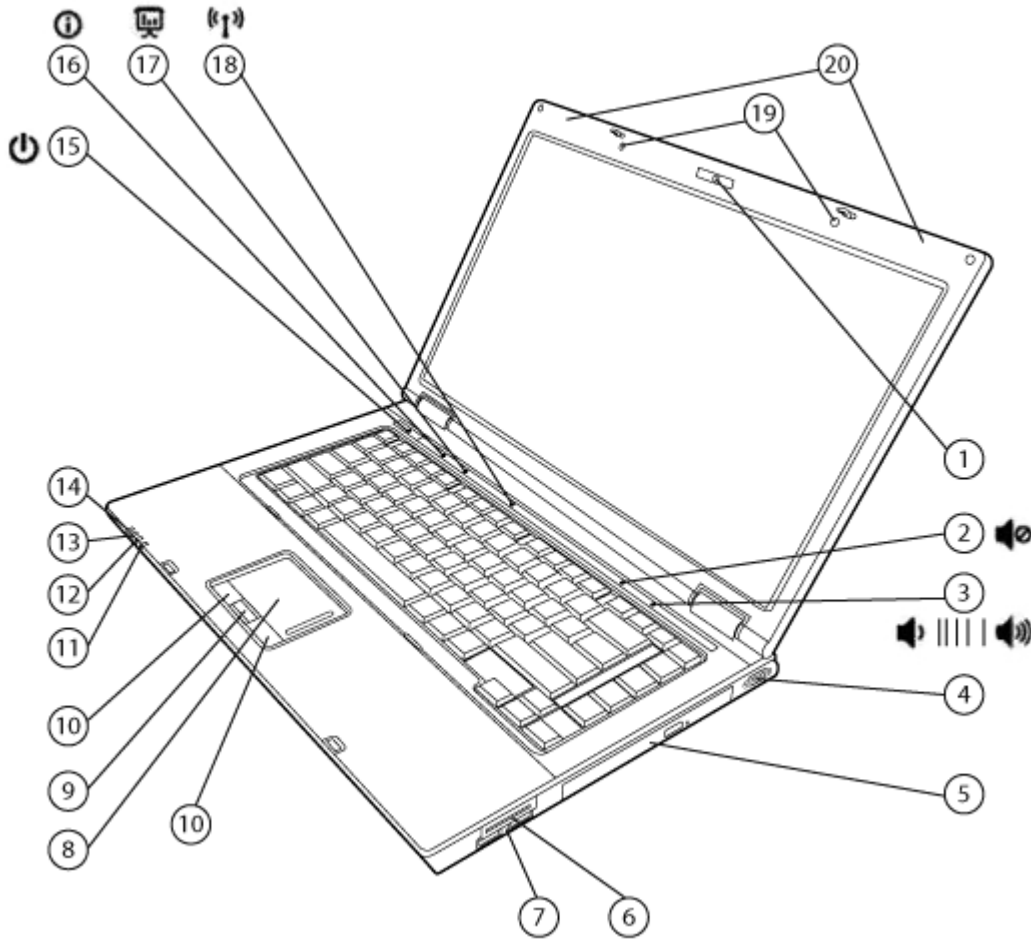


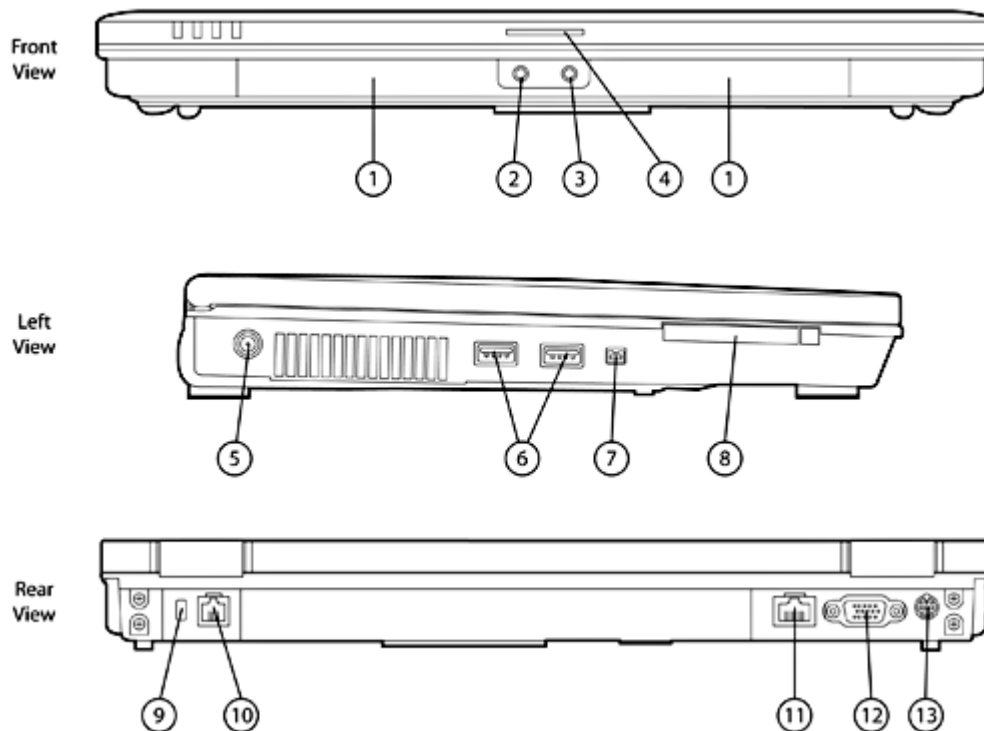
Overview

HP recommends Windows Vista® Business



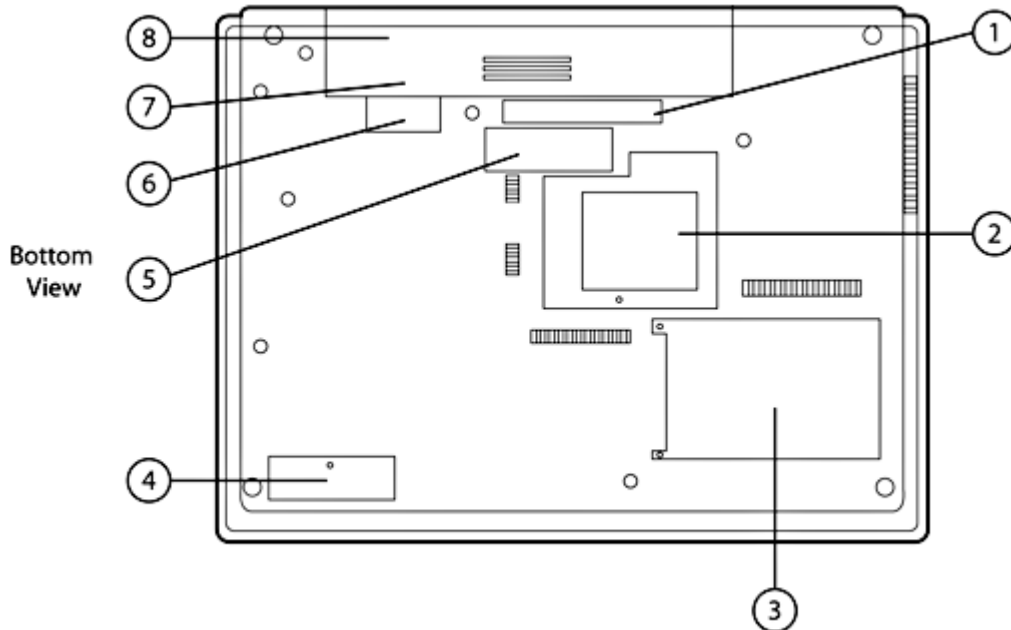
1. Optional VGA webcam
2. Volume mute button with LED indicator
3. Volume scroll zone with up/down LED indicators
4. Serial port
5. Optical drive/Upgrade Bay
6. Media Card Reader
7. (2) USB 2.0 ports
8. Touchpad with scroll zone
9. Optional HP Fingerprint Sensor
10. Touchpad buttons
11. Hard drive activity / HP 3D DriveGuard LED indicator
12. Battery charging LED indicator
13. Power/standby LED indicator
14. Wireless on/off LED indicator
15. Power button with LED indicator
16. HP Info Center/ HP QuickLook 2 button with LED indicator
17. HP Presentation button with LED indicator
18. Wireless on/off button with LED indicator
19. Integrated microphone (dual-microphone array with webcam)
20. WLAN and WWAN antennas (select models)

Overview



- | | |
|------------------------------|--|
| 1. Stereo speakers | 8. ExpressCard/54 slot or optional Smart Card Reader |
| 2. Stereo headphone/line out | 9. Kensington Lock slot |
| 3. Stereo microphone in | 10. RJ-11/modem port |
| 4. Display release latch | 11. RJ-45/Ethernet port |
| 5. Power connector | 12. VGA/external monitor connector |
| 6. (2) USB 2.0 ports | 13. S-Video TV out |
| 7. 1394a port | |

Overview



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

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
- Widescreen 15.4-inch diagonal display with wide-viewing angle, optional BrightView and HP Privacy Filter support
- AMD Turion™ X2 Ultra Dual-Core Mobile Processor, AMD Turion™ X2 Dual-Core Mobile Processor, AMD Athlon™ X2 Dual-Core Processor
- Thin, lightweight design starting at 5.93 lb/2.69 kg and 1.32 inch/33.6 mm thin at front
- Upgrade Bay for easy optical drive upgrade or optional second hard drive
- Flexible wireless connectivity options:
 - Integrated HP un2400 EV-DO/HSPA Mobile Broadband Module provides worldwide Gobi mobile Internet technology
 - Integrated 802.11 a/b/g/n draft 2.0 or b/g wireless LAN module
 - Bluetooth®
- Enhanced security features including HP ProtectTools, HP SpareKey, TPM 1.2;* optional Smart Card Reader and HP Fingerprint Sensor
- Optional integrated VGA webcam with dual-microphone array
- HP QuickLook 2 for instant access to e-mail, calendar, and contact information
- Up to 250 GB 5400 rpm or 160 GB 7200 rpm user-removable hard drive with HP 3D DriveGuard protection
- Enhanced reliability with magnesium alloy support structure and HP DuraFinish
- Touch-sensitive controls for HP Info Center / HP QuickLook, HP Presentation button, wireless on/off, mute, and volume up, volume down
- Media Card Reader
- Up to 8 GB of 800 MHz DDR2 SDRAM supported, dual-channel memory support

Overview

- ATI Radeon™ HD 3200 Graphics
- Broadcom NetLink Gigabit Ethernet Controller (10/100/1000 NIC)
- Touchpad with scroll zone

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

Standard Features

Processors	AMD Turion X2 Ultra Dual-Core Mobile Processor ZM-84 (2.3 GHz, 2 MB L2 cache) AMD Turion X2 Ultra Dual-Core Mobile Processor ZM-82 (2.2 GHz, 2 MB L2 cache) AMD Turion X2 Ultra Dual-Core Mobile Processor ZM-80 (2.1 GHz, 2 MB L2 cache) AMD Turion X2 Dual-Core Mobile Processor RM-72 (2.1 GHz, 1 MB L2 cache) AMD Turion X2 Dual-Core Mobile Processor RM-70 (2.0 GHz, 1 MB L2 cache) AMD Athlon 64 X2 Dual-Core Processor for Notebook PCs QL-62 (2.0 GHz, 1 MB L2 cache) AMD Athlon 64 X2 Dual-Core Processor for Notebook PCs QL-60 (1.9 GHz, 1 MB L2 cache) NOTE: Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
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Operating System	Preinstalled	Genuine Windows Vista Business 32* Genuine Windows Vista Home Basic 32* Genuine Windows Vista Business with downgrade to Windows XP Professional custom installed*† FreeDOS
	Supported	Genuine Windows Vista Business 64* Genuine Windows Vista Enterprise*
	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>.

† Windows Vista Business 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.

Chipset	AMD M780G
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Graphics	ATI Radeon HD 3200 Microsoft DirectX 10 capable
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Standard Features

Display	Internal	15.4-inch diagonal WXGA anti-glare (1280 x 800 resolution) 15.4-inch diagonal WXGA BrightView (1280 x 800 resolution) 15.4-inch diagonal WSXGA+ WVA anti-glare (1680 x 1050 resolution) HP Privacy Filter support
	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 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, or 4096 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. Full availability of 4 GB or more of memory requires Windows Vista Business 64-bit or Linux. With Windows 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements.

Communications	Integrated Broadcom NetLink Gigabit Ethernet Controller (10/100/1000 NIC)* 56K V.92 modem**
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* 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.

Standard Features

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 only. 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

Dual antennas integrated in the display enclosure

Broadcom 4322AGN

Integrated support for 802.11a, b, g, and n draft 2.0*

802.11a/b/g/draft-n Wi-Fi Adapter

Up to 300 mbps data rate

Broadcom 4312G

Integrated support for 802.11 b and g

802.11b/g

Up to 54 mbps data rate

WiFi Adapter

HP Integrated Module with Bluetooth Wireless Technology

Bluetooth Specification v2.0 compliant

Works with a wide range of Bluetooth devices

* 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.

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. U.S. 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.

Touch-sensitive controls

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

Pointing device

Touchpad with scroll zone, two pick buttons

Standard Features

Expansion card slots	ExpressCard/54 slot	Supports ExpressCard/54 and ExpressCard/34
	or	
	Optional Integrated Smart Card Reader (replaces ExpressCard/54 slot)	Compatible with ISO 7816 compliant Smart Cards PC/SC interface support
	Media Card Reader	Supports SD (Secure Digital), HC-SD (High Capacity Secure Digital), MMC (MultiMedia Card), HS-MMC (MultiMedia Card Plus), Sony Memory Stick, Sony Memory Stick Pro, Memory Stick Duo*, xD-Picture card Additionally, the following cards are supported via passive adapters (sold separately): Mini-Secure Digital (Mini-SD), Transflash (Micro-SD), Reduced size Multimedia card (RS-MMC), Reduced size Dual voltage Multimedia card, MMC Mobile Cards, MMC Micro Cards, Memory Stick Duo (MS Duo)*, Memory Stick Duo Pro (MS Duo Pro)*, Memory Stick M2 Micro
		* Memory Stick Duo Adapters are required and sold separately. Inserting a Memory Stick Duo Card directly into your notebook could damage the memory card and/or notebook.

Storage	Hard drives	120/160/250 GB 5400 rpm SMART SATA II 160 GB 7200 rpm SMART SATA II
		NOTE: These 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 to 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	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

Standard Features

Interfaces	ExpressCard/54 slot	One (or optional Smart Card Reader)
	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
	S-video TV out	One (Support for NTSC/PAL)
	USB 2.0	Four
	Serial port	One
	Docking connector	One
	Secondary battery connector	One

Audio/Visual

- High Definition Audio support w/24-bit DAC
- Integrated stereo speakers
- Integrated microphone (dual-microphone array when equipped with optional VGA webcam)
- Touch-sensitive controls for volume up, volume down, and mute
- Stereo headphone/line out
- Stereo microphone in
- Optional VGA webcam
 - Supports videoconferencing and still image capture
 - Large image sensor for excellent color matching and good low light sensitivity
 - Up to 30 frames/sec
 - Fixed focus lens
 - Video capture up to 640x480 pixels
 - 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 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 SE Intervideo WinDVD – DVD Player Roxio Creator Business (for optional DVD+/-RW and DVD/CDRW drives) McAfee Total Protection* Synaptics Touchpad Driver Microsoft Windows Live Messenger (select models) HP Webcam Software (with optional VGA webcam)
	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	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

HP ProtectTools Security Manager
Enhanced Pre-Boot Security
HP SpareKey
One-Step Logon
Configuration Control Hardware
Memory Change Alert
Ownership Tag
Setup Password
Power-On Password
TPM 1.2 Embedded Security Chip*
TPM Enhanced DriveLock*
HP Disk Sanitizer
HP 3D DriveGuard
Kensington Lock slot
Support for Computrace / LoJack for Laptops (must be purchased separately)

Optional Features

Smart Card Reader Compatible with ISO 7816 compliant Smart Cards
(replaces ExpressCard/54 slot) PC/SC interface support

HP Fingerprint Sensor Enhanced sensor scans the fingerprint to uniquely identify and authenticate a person.

HP Privacy Filter Narrows viewing area so that screen data is visible only to persons directly in front of the monitor

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

NOTE: 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
	Optional HP Extended Life Battery	8-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 (55 WHr) Primary
	Primary battery	Up to 4 hours and 15 minutes
	Primary battery and optional HP Extended Life Battery	Up to 8 hours and 45 minutes
	Primary battery and optional HP Ultra-Capacity Battery	Up to 11 hours and 45 minutes

NOTE: The listed battery life measurements were taken on models running Microsoft Windows Vista Business. 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 TBD week
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Power Conservation	ATI PowerPlay technology Hibernation Standby ACPI compliance
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Docking and Stands	HP 2008 120W Docking Station HP 2008 150W Docking Station HP 2008 150W Advanced Docking Station HP 2008 180W Advanced Docking Station HP Mobile Port Replicator HP Monitor Stand HP Adjustable Notebook Stand HP Dual Monitor Stand HP's shared docking solutions provide simple and convenient port replication and cable management. Features include Gigabit NIC pass through, modem pass through, legacy parallel and serial ports, S-video TV out, USB 2.0 ports, integrated security mechanism*, integrated MultiBay II and ExpressCard** slots. These docking solutions are compatible across multiple Business Notebook platforms enabling a lower total cost of ownership. * HP/Kensington Cable Lock required (purchased separately) ** HP Advanced Docking Station only
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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>.

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 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
	HP Primary SATA 120 GB 5400 rpm Hard Drive	RT080AA

MultiBay II Storage (9.5-mm)	HP MultiBay II DVD-ROM Drive	PA849A
	HP MultiBay II DVD+/-RW SuperMulti DL Drive	PA851A

NOTE: Requires HP Advanced Docking Station or HP External MultiBay II

Expansion Solutions	HP 2008 120W Docking Station	KP080AA#ABA
	HP 2008 150W Docking Station	KQ751AA#ABA
	HP 2008 150W Advanced Docking Station	KP081AA#ABA
	HP 2008 180W Advanced Docking Station	KQ752AA#ABA
	HP Mobile Port Replicator	AK155AA
	HP Monitor Stand	PA507A
	HP Adjustable Notebook Stand	PA508A
	HP Dual-Monitor Stand	AK084AA
	HP External MultiBay II	PA509A#ABA

Power	HP 1-Bay Battery Charging Station	RW635AA#ABA
	HP 5-Bay Battery Charging Station	RW636AA#ABA
	HP Battery Adapter Kit	KV829AA
	HP 90W Smart AC Adapter	ED495AA#ABA
	HP 90W Smart Combo Adapter	AJ652AA#ABA
	HP 6-Cell Li-Ion Primary Battery	KU531AA
	HP 12-Cell Ultra-Capacity Battery	EJ092AA
	HP 8-cell Extended Life Battery (2008 ID)	AJ359AA
	HP 90W Smart Auto Adapter	ED493AA
	HP 65W AC/Auto/Air Combo Smart Adapter	ED993AA#ABA

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

Security	HP ExpressCard Smart Card Reader with Java Card	AJ451AA
	HP ProtectTools Java Card - 10 units	EL348AA
	HP/Kensington MicroSaver Security Lock	PC766A
	HP 15.4" Display Privacy Filter	AJ358AA

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)
 - 3072 MB (2048 MB + 1024 MB)
 - 4096 MB (2048 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	2048 MB	Empty
2048 MB	1024 MB	1024 MB
3072 MBB	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. Full availability of 4 GB or more of memory requires Windows Vista Business 64-bit or Linux. With Windows 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not 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
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 II 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

Technical Specifications

System Unit	Dimensions (HxWxD)	1.32 in (at front) x 14.02 in x 10.46 in 33.6 mm (at front) x 356.0 mm x 265.4 mm
	Weight	Starting at 5.93 lb (2.69 kg)
	NOTE: Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components. Weight includes 6-cell battery, hard drive, and optical drive. Weight varies by configuration and components.	
	Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage 18.5 V Average Operating Power 22.5 W (Turion) 24.5 W (Athlon) Max Operating Power < 90 W
	Temperature	Operating 332° 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)
	Industry Standard Certifications	UL Yes CSA Yes FCC Compliance Yes ENERGY STAR® Yes* EPEAT Silver ICES Yes GS TBD 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

Technical Specifications

SABS Yes

UKRSERTCOMPUTER Yes

* When configured with AMD Turion processor

NOTE: 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			
<hr/>				
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			
<hr/>				
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

Displays

15.4-inch WSXGA+ wide-viewing angle, anti-glare	Dimensions (W x H)	13.0 x 8.1 in (33.1 x 20.7 cm)		
	Diagonal Size	15.4 in (39.1 cm)		
	Surface Treatment	Anti-glare		
	Number of Colors	Up to 16M		
	Contrast Ratio	300:1 (typical)		
	Refresh Rate	60 Hz		
	Brightness	200 nit (typical)		
	Pixel Resolution	Pitch	0.197 mm	
		Format	1680 x 1050	
		Configuration	RGB stripe	
	Backlight	CCFL		
	PPI	129		
	Viewing Angle	±60° Horizontal, ±50° Vertical (minimum) or ±70° Horizontal, ±60° Vertical (typical)		
<hr/>				
15.4-inch WXGA anti-glare	Active Area (W x H)	13.0 x 8.1 in (33.1 x 20.7 cm)		
	Diagonal Size	15.4 in (39.1 cm)		
	Surface Treatment	Anti-glare		
	Number of Colors	Up to 16M		
	Contrast Ratio	300:1 (typical)		
	Refresh Rate	60 Hz		
	Brightness	200 nit (typical)		
	Pixel Resolution	Pitch	0.259 mm	
		Format	1280 x 800	
		Configuration	RGB stripe	
	Backlight	CCFL		
	PPI	98		
	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

15.4-inch WXGA BrightView	Active Area (W x H)	13.0 x 8.1 in (33.1 x 20.7 cm)		
	Diagonal Size	15.4 in (39.1 cm)		
	Surface Treatment	BrightView		
	Number of Colors	Up to 16M		
	Contrast Ratio	300:1 (typical)		
	Refresh Rate	60 Hz		
	Brightness	200 nit (typical)		
	Pixel Resolution	Pitch	0.259 mm	
		Format	1280 x 800	
		Configuration	RGB stripe	
	Backlight	CCFL		
	PPI	98		
	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

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 (typical reads, including settling)	Single Track	1.5 ms	
		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		

Technical Specifications

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 (typical reads, including settling)	Single Track	3 ms
		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	

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 (typical reads, including settling)	Single Track	3 ms
		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	

Technical Specifications

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 (typical reads, including settling)	Single Track	3 ms
		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	

Removable Storage Drives

DVD-ROM Drive	Access Times	Random	<116 ms CD (typical) <125 ms DVD (typical)
	Max Data Transfer Rate	24X CD-ROM	Up to 3,600 KB/s
		8X-DVD	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	

Technical Specifications

DVD/CD-RW Combo Drive	Access Times	Random	<110 ms CD (typical) <130 ms DVD (typical)
	Max Data Transfer Rate	24X CD-ROM	Up to 3,600 KB/s
		8X DVD	Up to 10,800 KB/s
		24X CD-R	Up to 3,600 KB/s
		24X CD-RW	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		

DVD+/-RW SuperMulti DL LightScribe Drive	Access Times	Random	<175 ms CD (typical) <230 ms DVD (typical)
	Max Data Transfer Rate	24X CD-ROM	Up to 3,600 KB/s
		8X DVD	Up to 10,800 KB/s
		24X CD-R	Up to 3,600 KB/s
		16X CD-RW	Up to 2,400 KB/s
		8X DVD+R	Up to 10,800 KB/s
		4X DVD+RW	Up to 5,400 KB/s
		8X DVD-R	Up to 10,800 KB/s
		4X DVD-RW	Up to 5,400 KB/s
		2.4X DVD+R(9)	Up to 2,700 KB/s
5X DVD-RAM		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		

Technical Specifications

Max Media Capacity (write)	8.5 GB
Transport	Tray Loading

Security

HP Fingerprint Sensor (optional)	Mobile Voltage Operation	3.0V–3.6V Single Supply
	Operating Temperature	32° – 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 Capture	Up 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 when equipped with optional webcam	

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

Integrated Stereo Speakers	Power Rating	2 Watts
	Impedance	4 Ohms

Technical Specifications

Communications

<p>Integrated Broadcom NetLink Gigabit Ethernet (10/100/1000 NIC) BCM5787M</p>	<p>Ethernet Features</p>	<p>10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3z and 802.3ab; IEEE 802.3 clauses 34-42) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s IEEE 802.1p QoS (Quality of Service) Support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)</p>
	<p>Power Management</p>	<p>ACPI compliant -- multiple power modes Situation-sensitive features reduce power consumption</p>
	<p>Performance Features</p>	<p>TCP/IP/UDP Checksum Offload (configurable)</p>
	<p>Manageability</p>	<p>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</p>
	<p>Interface</p>	<p>PCI Express x1</p>
	<p>NIC Device Driver Name</p>	<p>Broadcom NetLink Gigabit Ethernet</p>

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

Technical Specifications

	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

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)

Technical Specifications

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

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
	Security¹	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 Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power (for CCK)²	17 dBm
	Output Power (for OFDM; power varies by data rate)²	15 dBm
	Power Consumption	Idle associated: 250 mW Idle unassociated: 150 mW Transmit: 2.0 W (max) Receive: 2.0 W (max)

Technical Specifications

Power Management	ACPI compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity³	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 Utility⁴	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.	

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)
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Technical Specifications

Interoperability	<p>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)</p>	
Frequency Band	2.4 GHz and 5 GHz	
Data Rates	<p>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</p>	
Frequency Support	<p>20 MHz: 2.4 GHz and 5 GHz bands 40 MHz: 2.4 GHz and 5 GHz band</p>	
Modulation	<p>Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM</p>	
Security¹	<p>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.</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 Models	<p>Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)</p>	
Roaming	IEEE 802.11 compliant roaming between access points	
Output Power (for CCK)²	17 dBm	
Output Power (for OFDM; power varies by data rate)²	15 dBm	
Power Consumption	<p>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)</p>	
Power Management	<p>ACPI compliant power management 802.11 compliant power saving mode</p>	
Receiver Sensitivity³	<p>270 Mbps: -66dBm, 162 Mbps: -72 dBm, 54 Mbps: -72 dBm, 11 Mbps: -85 dBm , 1 Mbps: -94 dBm</p>	
Antenna type	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure	
Range	<p>802.11 a – Typical (@6 Mbps)</p> <p>802.11 b – Typical (@1 Mbps)</p>	<p>600 feet – Outdoor Open Area 150 feet – Indoor, Office environment</p> <p>1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment</p>

Technical Specifications

	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 Utility⁴	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. 	

HP Integrated Module with Bluetooth Wireless Technology

Bluetooth Specification	2.0 Compliant
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

Technical Specifications

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)* 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)

Technical Specifications

* 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
- IT ECO declaration
- EPEAT – SILVER

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	13.44 W	13.55 W	13.20 W
Sleep (Energy Star low power mode)	1.61 W	1.61 W	1.58 W
Off	0.511 W	0.541 W	0.512 W

Heat Dissipation*

	115 VAC	230 VAC	100 VAC
Normal Operation	46 BTU/hr	46 BTU/hr	45 BTU/hr
Sleep	6 BTU/hr	6 BTU/hr	5 BTU/hr
Off	2 BTU/hr	2 BTU/hr	2 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.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

System Fan Off

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	4.4	27
Fixed Disk (random writes)	4.4	28

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

Technical Specifications

Additional information:

The battery type and chemistry used in the product is:
CR2032 (coin cell), Hg
High capacity Lithium-Ion battery

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 SILVER level, 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 96.7% recycle-able when properly disposed of at end of life.

Packaging Materials

- External:
 - CANON bags 15 g
 - EPE-Expanded Polyethylene 80 g
- Internal:
 - Corrugated Carton & Cardboard & misc. 685 g
- The Corrugated Carton Cardboard & misc. material is made from 100% recycled content.
- The CANON bag packaging materials contains 100% recycled content.
- The Expanded Polyethylene packaging materials contains 100% 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.

Technical Specifications

- 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 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>

Technical Specifications

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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