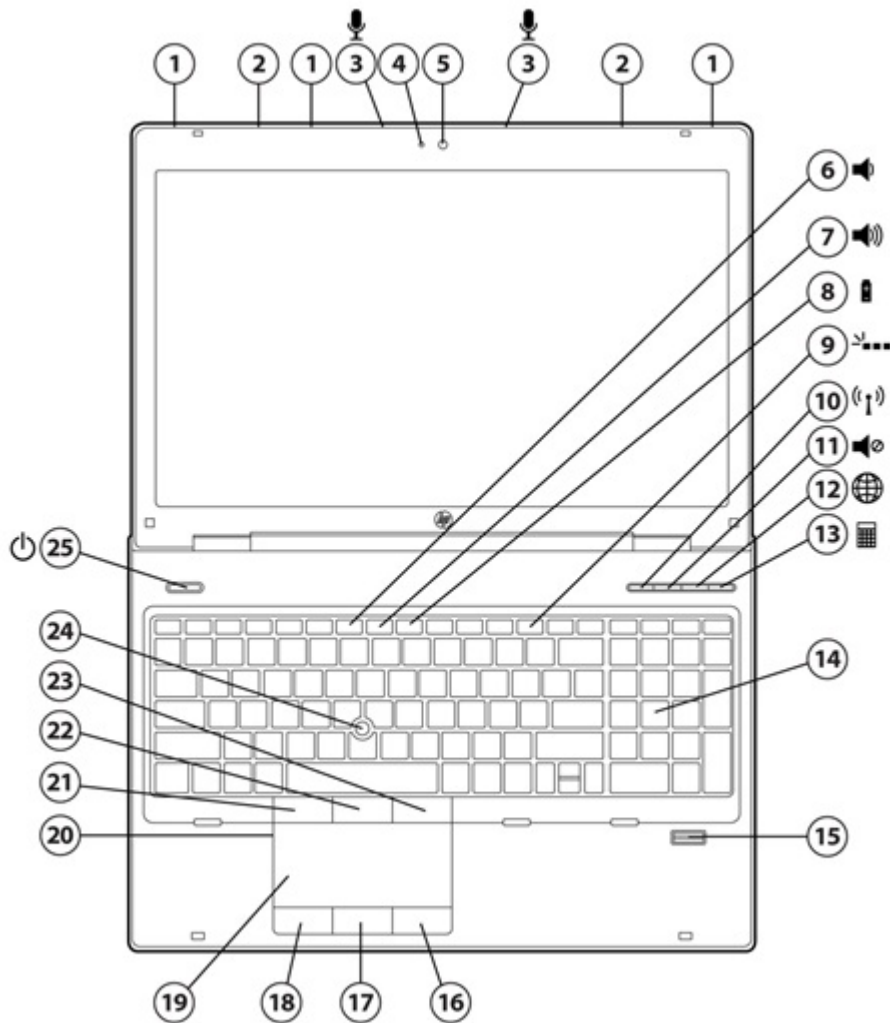
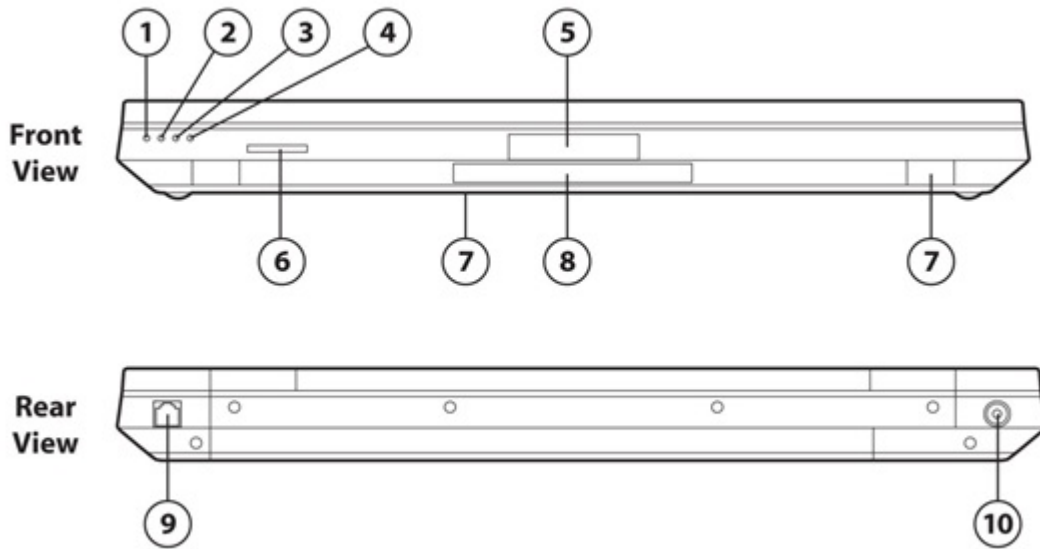


### Overview

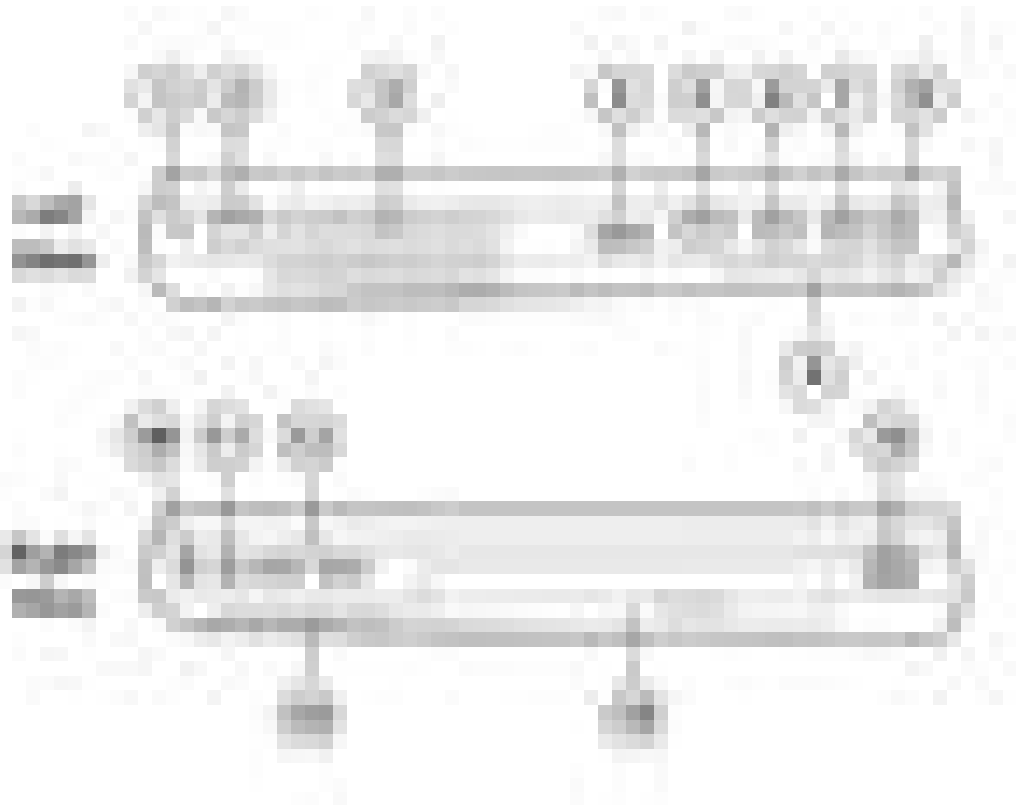


- |  |                                     |
|--|-------------------------------------|
| 1. WLAN antennas (3)                             | 14. Numeric keypad                  |
| 2. WWAN antennas (2)                             | 15. HP Fingerprint Sensor           |
| 3. Dual-microphone array                         | 16. Right Touchpad button           |
| 4. Webcam light (with webcam)                    | 17. Center Touchpad button          |
| 5. Optional 720p HD webcam                       | 18. Left Touchpad button            |
| 6. Volume down function key                      | 19. Touchpad with scroll zone       |
| 7. Volume up function key                        | 20. Touchpad on/off button with LED |
| 8. HP Power Assistant function key               | 21. Left Pointstick button          |
| 9. Optional backlit keyboard function key        | 22. Center Pointstick button        |
| 10. Wireless on/off button with LED indicator    | 23. Right Pointstick button         |
| 11. Volume mute button with LED indicator        | 24. Pointstick                      |
| 12. Web browser launch button with LED indicator | 25. Power button with LED indicator |
| 13. Calculator button with LED indicator         |                                     |

### Overview



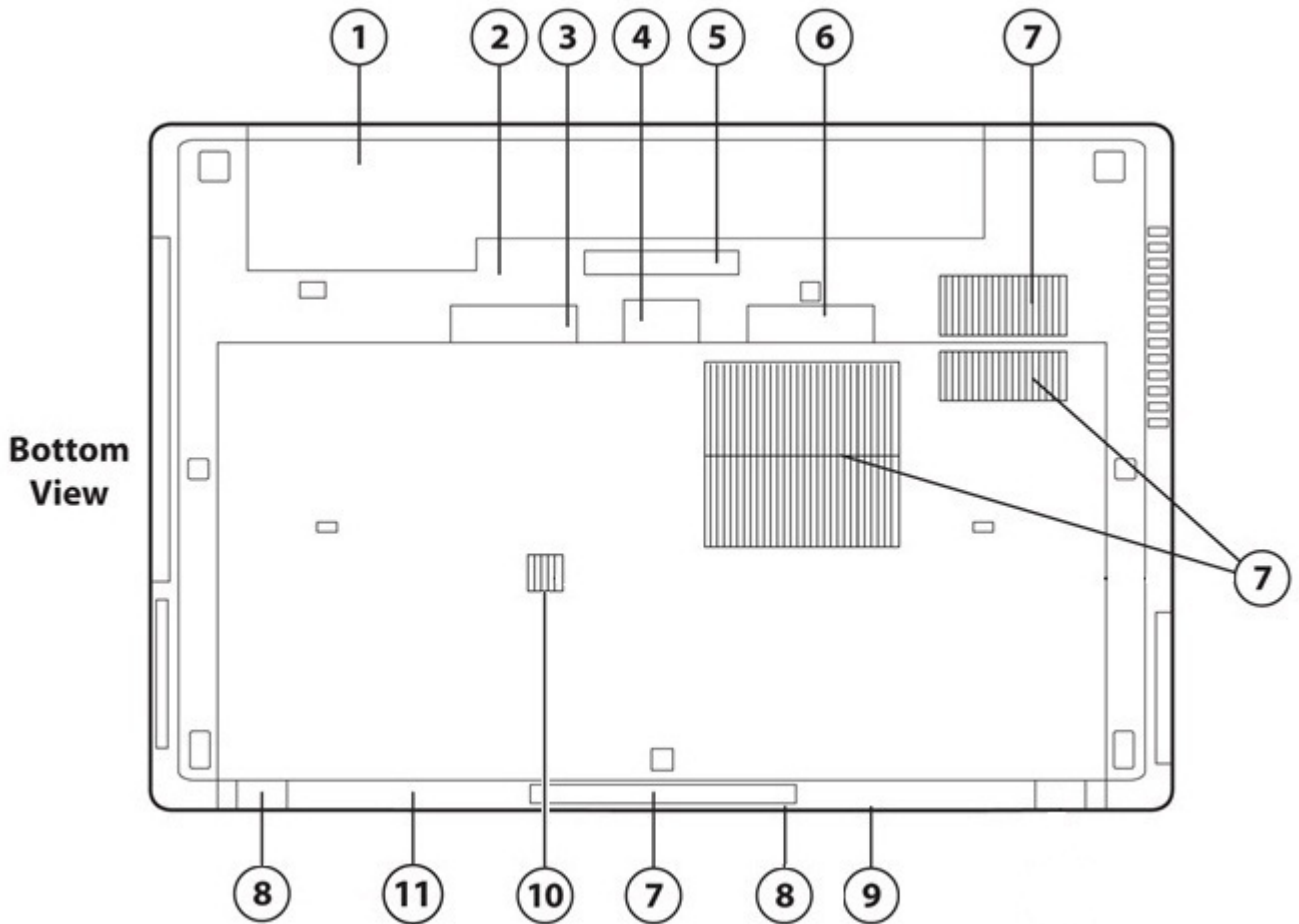
- |   |                            |
|---|----------------------------|
| 1. Wireless LED indicator                               | 6. Secure Digital/MMC slot |
| 2. Power/standby LED indicator                          | 7. Stereo speakers         |
| 3. Battery charging LED indicator                       | 8. Vent                    |
| 4. Hard drive activity / HP 3D DriveGuard LED indicator | 9. RJ-11/modem port        |
| 5. Display release latch                                | 10. Power connector        |



- |                             |                                    |
|-----------------------------|------------------------------------|
| 1. Security lock slot       | 9. ExpressCard/54 slot             |
| 2. RJ-45/Ethernet port      | 10. Stereo headphone/line out      |
| 3. Vents                    | 11. Stereo microphone/line in      |
| 4. DisplayPort              | 12. (2) USB 3.0 ports              |
| 5. eSATA/USB 2.0 combo port | 13. VGA/external monitor connector |
| 6. USB 2.0 port             | 14. Smart Card Reader              |

### Overview

- 7. USB 2.0 charging port
- 8. 1394a port
- 15. Upgrade Bay (optical drive, additional hard drive, or weight saver)



- 1. Battery bay
  - 2. SIM slot\* for WWAN (select models)
  - 3. Battery release latch
  - 4. Secondary battery connector
  - 5. Docking connector
  - 6. Bottom cover release latch
  - 7. Vents
  - 8. Stereo Speakers
  - 9. Bluetooth module compartment
  - 10. Spill-resistant keyboard drain hole
  - 11. Hard drive, memory, and wireless compartments under bottom cover
- \* SIM slot is accessed through battery bay.

### Overview

#### At A Glance

- Genuine Windows 7 versions or FreeDOS
- Chiseled design with enhanced HP DuraCase, magnesium-reinforced chassis, wear-resistant gunmetal color HP DuraFinish, radial spun finish, backlit HP logo, HP DisplaySafe frame, precision aluminum-alloy hinges, cast titanium-alloy display latches, keyboard in full aluminum deck, chemically strengthened glass touchpad, and laser-precision indicators
- Designed to meet the military standard Mil-Std-810G for vibration, dust, altitude, and high temperature operation\*
- Workstation-caliber discrete graphics: AMD FirePro™ M4000 (1GB GDDR5), NVIDIA Quadro K1000M (2GB DDR3), NVIDIA Quadro K2000M (2GB DDR3)
- ISV certified to provide fast and reliable performance with workstation applications, including manipulation of 3D textures
- Choice of 3rd generation Intel® Core™ i7 and i5 processors
- Intel Core i7 with vPro and Core i5 with vPro technology (optional)
- Intel Smart Response Technology support for higher system performance with a hard drive<sup>1</sup>
- HP Performance Advisor for optimal configuration, compatibility and performance
- Up to four SODIMMs on configurations with quad-core processor, for system memory up to 32 GB
- Supports multi-display when using an HP Advanced Docking Station (sold separately)
- DisplayPort for high resolution support
- SRS Premium Sound PRO optimized for high fidelity audio
- Choice of battery solutions: 8-cell (83 WHr) or 8-cell (75 WHr) HP Long Life Battery, combined with optional external batteries for extended life.
- Choice of two optional external batteries for extended battery life
- HP Power Assistant allows you to conserve power, stretch battery run-time, accurately monitor the energy usage of the PC and up to four select HP external monitors, and report workforce power consumption.
- 4 discrete buttons with LED indicator for convenient one touch access - Wireless On/Off, Volume Mute, Web browser, Calculator
- Widescreen 15.6-inch diagonal LED-backlit display:  
HD+ wide viewing angle, FHD wide viewing angle, or FHD ultra wide viewing angle with HP DreamColor
- Upgrade Bay for optical drive, optional second hard drive, or weight saver
- Flexible wireless connectivity options:
  - Optional integrated wireless mobile broadband module support
  - Integrated Intel Centrino® 802.11 a/b/g/n 2x2 or a/b/g/n 3x3, or Broadcom 802.11 a/b/g/n 2x2 wireless LAN module
  - Bluetooth® v4.0
- Choice of 7200 rpm user-removable hard drive up to 750 GB with HP 3D DriveGuard protection, or SATA 6 Gb/s 128/180 GB Solid State Drive or 256 GB SED Solid State Drive
- Security features including HP ProtectTools, with central management across HP and non-HP client PCs
- BFR/PVC-free\*\*, ENERGY STAR qualified and EPEAT TBD registered in the U.S. EPEAT status varies by country- please see [epeat.net](http://epeat.net).

\* 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.

\*\* Meeting the industry definition of 'BFR/PVC-free' per the iNEMI Position Statement on "Low Halogen" Electronics. Plastic parts incorporated into the chassis generally contain < 1000 ppm (0.1%) of bromine or chlorine. Printed circuit board and substrate laminates generally contain < 1500 ppm (0.15%) of total bromine and chlorine. Service parts after purchase may not be BFR/PVC-free. External accessories, including power supplies, power cords, and peripherals as well as the following customer-configurable internal components: ATT SIM card displays are not BFR/PVC-free.

### Features

#### OPERATING SYSTEM

<b>Preinstalled</b>	Genuine Windows 7 Professional 32* Genuine Windows 7 Professional 64* Genuine Windows 7 Home Premium 64* FreeDOS
<b>Supported</b>	Genuine Windows 7 Enterprise 32* Genuine Windows 7 Enterprise 64* Genuine Windows 7 Ultimate 32* Genuine Windows 7 Ultimate 64* Genuine Windows XP Professional 32 Genuine Windows XP Professional 64 SuSE Linux Enterprise Desktop 11 SP2 Red Hat Enterprise Linux 6.x
<b>Certified</b>	SuSE Linux Enterprise Desktop 11 Red Hat Enterprise Linux 6.x

\* Not all features are available in all editions of Windows 7. This system may require upgraded and/or separately purchased hardware to take full advantage of Windows 7 functionality. See <http://www.microsoft.com/windows/windows-7/> for details

#### PROCESSOR\*

- 3<sup>rd</sup> Generation Intel® Core™ i7-3820QM (2.7 GHz, 8 MB L3 cache, 4 cores)\*  
Up to 3.70 GHz with Intel Turbo Boost Technology
- 3<sup>rd</sup> Generation Intel® Core™ i7-3720QM (2.6 GHz, 6 MB L3 cache, 4 cores)\*  
Up to 3.60 GHz with Intel Turbo Boost Technology
- 3<sup>rd</sup> Generation Intel® Core™ i7-3610QM (2.3 GHz, 6 MB L3 cache, 4 cores) (no vPro support)\*  
Up to 3.30 GHz with Intel Turbo Boost Technology
- 3<sup>rd</sup> Generation Intel® Core™ i7-3520M (2.9 GHz, 4 MB L3 cache, 2 cores)\*  
Up to 3.60 GHz with Intel Turbo Boost Technology
- 3<sup>rd</sup> Generation Intel® Core™ i5-3360M (2.8 GHz, 3 MB L3 cache, 2 cores)\*  
Up to 3.50 GHz with Intel Turbo Boost Technology
- 3<sup>rd</sup> Generation Intel® Core™ i5-3320M (2.6 GHz, 3 MB L3 cache, 2 cores)\*  
Up to 3.30 GHz with Intel Turbo Boost Technology

\* Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. 64-bit computing on Intel® architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. Intel's numbering is not a measurement of higher performance.

#### CHIPSET

Mobile Intel QM77 Express

### Features

#### INTEL CORE I5 WITH VPRO/CORE I7 WITH VPRO TECHNOLOGY CAPABLE

Intel Core i5 with vPro and Core i7 with vPro technology is a selectable feature that is available on units configured with select processors, an Intel Centrino® Advanced-N or Ultimate-N WLAN module and a preinstalled Windows operating system. It provides advances in remote manageability, security, energy efficient performance, and wireless connectivity. Intel Active Management Technology 7.0 (iAMT) 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 network, isolate infected systems, and update PCs regardless of their power state.

\*Requires a Windows operating system, network hardware and software, connection with a power source, and a direct (non-VPN) corporate network connection which is either cable or wireless LAN.

**NOTE:** Some functionality of Intel Core i5 with vPro/Core i7 with vPro technology, such as Intel Active Management technology and Intel Virtualization technology, requires additional third-party software in order to run. Availability of future "virtual appliances" applications for Intel Core i5 with vPro/Core i7 with vPro technology is dependent on third-party software providers. Compatibility with future "virtual appliances" is yet to be determined.

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#### GRAPHICS

AMD FirePro™ M4000 with 1 GB dedicated GDDR5 video memory  
Microsoft DirectX 11 (Shader Model 5.0) and OpenGL 4.1/4.1+capable  
AMD Eyefinity Technology supports up to five independent displays\*  
when using an HP Advanced Docking station (sold separately)  
NVIDIA Quadro K1000M with 2 GB dedicated DDR3 video memory  
Microsoft DirectX 11 (Shader Model 5.0) and OpenGL 4.2 capable  
NVIDIA Quadro K2000M with 2 GB dedicated DDR3 video memory  
Microsoft DirectX 11 (Shader Model 5.0) and OpenGL 4.2 capable

**NOTE:** NVIDIA Quadro mobile professional graphics support up to four independent displays when using an HP Advanced Docking station (sold separately).

\* AMD Eyefinity Technology requires AMD discrete graphics configuration. Total number of screens supported varies by model. HP EliteBook 8570w supports up to five screens.

**Note:** To use AMD's Eyefinity multi-head solution with HP's Advanced Docking Station, it is recommended to use an HP Performance DisplayPort display when connecting more than 2 displays. DVI displays can be substituted when used in conjunction with an approved active DP to DVI dongle. Approved dongles are listed at <http://support.amd.com/us/eyefinity/Pages/eyefinity-dongles.aspx>

### Features

## DISPLAY

### Internal

15.6" diagonal LED-backlit HD+ WVA anti-glare (1600 x 900)

15.6" diagonal LED-backlit FHD WVA anti-glare (1920 x 1080)

15.6" diagonal LED-backlit FHD UWVA anti-glare DreamColor (1920 x 1080)

HP Privacy Filter support

### External

Up to 32-bit per pixel color depth

### DisplayPort

Supports resolutions up to 2560 x 1600, 30-bit color depth at 60 Hz, and full HD (1920 x 1080) monitors, 24-bit color depth at 120 Hz

### 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.

## FLASH CACHE MODULE

Optional 24 GB mSATA Flash cache module support for Intel Smart Response Technology. (Available only with standard non-SED hard drive.)

## STORAGE AND DRIVES

### Primary Storage Bay

#### Hard Drives

320/500/750 GB 7200 rpm SMART SATA II

500 GB 7200 rpm SMART SATA II Self Encrypting Drive

HP 3D DriveGuard (Windows only)

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.

#### Solid State Drive

128/180 GB SATA 6 Gb/sec

256 GB SATA 6 Gb/sec Self Encrypting Drive

**NOTE:** Up to 19 GB is reserved for the system recovery software.

## OPTICAL DRIVES

### Fixed 12.7 mm SATA optical drive

Blu-ray R/RE DVD+/-RW SuperMulti DL Drive

Blu-ray ROM DVD+/-RW SuperMulti DL Drive

DVD+/-RW SuperMulti DL Drive

DVD-ROM Drive

### Second/Third hard drive

500 GB 7200 rpm SMART SATA II Hard Drive

256 GB SATA 6 Gb/sec Self Encrypting Drive

RAID 0 and 1 supported

### Weight saver

### Features

#### MEMORY

##### Standard

DDR3 PC3-12800 SDRAM (1600 MHz)

Two SODIMM slots (Dual-core processor) or four SODIMM slots (Quad-core processor) supporting dual-channel memory

2 GB, 4 GB, and 8 GB SODIMMs

##### Maximum

Upgradeable to 16384 MB with optional 8192 MB SODIMMs in both slots (Dual-core processor)

Upgradeable to 32768 MB with optional 8192 MB SODIMMs in all 4 slots (Quad-core processor)

##### 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. With Windows Starter 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.

#### NETWORKING/COMMUNICATIONS

##### Wireless

Support for a broad range of secure, integrated wireless LAN and wireless WAN options featuring support for the latest industry standards. Broadband Wireless (WWAN) requires a Windows operating system 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.

##### Broadband Wireless (WWAN)

HP hs2350 HSPA+ Mobile Broadband Module

HP un2430 EV-DO/HSPA Mobile Broadband Module

HP It2522 LTE/EV-DO Mobile Broadband Module (not available at product introduction) - U.S. only\*

HP It2523 LTE/HSPA+ Mobile Broadband Module (not available at product introduction) - U.S. only\*

##### Integrated wireless LAN options

Intel Centrino Ultimate-N 6300 (3x3)

Intel Centrino Advanced-N 6205 (2x2)

Broadcom 43224AGN 802.11a/b/g/n (2x2) WiFi Adapter

HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology

##### Communications

Integrated Intel 82579LM Gigabit\*\* Network Connection (vPro configurations)

56K V.92 modem\*\*\*

\* Wireless use requires separately purchased service contract. Check with your local vendor for coverage area and availability in your area. Connection and speeds will vary due to location, environment, network conditions, and other factors. 4G compatibility with HSPA+ and LTE. 4G LTE is only available in the United States. LTE is expected to be available in June 2012.

\*\* The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility 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.

### Features

#### AUDIO/MULTIMEDIA

##### Audio

SRS Premium Sound™ PRO (Windows OS only)

Integrated stereo speakers

Integrated microphone (dual-microphone array when equipped with optional webcam)

Button for volume mute; function keys for volume up and down

Stereo headphone/line out

Stereo microphone/line in

##### Webcam

Optional 720p HD webcam

- HD format (widescreen)
- Supports videoconferencing and still image capture
- High quality fixed focus lens
- Video capture at various resolutions up to 1280x720 resolution (720p) and up to 30fps
- M-JPEG compression supports higher frame rates for video capture and videoconferencing
- Improved low light sensitivity
- Improved dynamic range

#### KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

##### Keyboard

The HP spill-resistant keyboard is designed using a thin layer of Mylar film under the keyboard and a drain system that funnels fluid through a hole in the bottom of the notebook. This minimizes the risk of damage to sensitive components underneath. The 101/102-key compatible keyboard features a full-pitch key layout with desktop keyboard features, such as editing keys, both left and right control and alt keys, function keys, and 19.05 x 19.05 mm key pitch (center-to-center spacing). U.S. and International key layouts are available. Other features include hot keys for instant access to power conservation and brightness.

##### Optional Backlit Keyboard (select countries)

Function key to toggle backlit settings - Off/Full brightness/Half brightness

##### Pointing Devices

Touchpad with on/off button, two-way scroll, gestures, three pick buttons

Pointstick with three additional pointstick buttons

Image sensor touchpad

##### Buttons and Function Keys

Separate launch buttons provide easy access to the following features: wireless on/off, volume mute, Web browser, Calculator. Function keys provide control of the following features: standby mode, external display, volume down, volume up, HP Power Assistant, and display brightness.

#### SOFTWARE AND SECURITY

##### Preinstalled Software with Windows Operating System

HP Recovery Manager

HP Performance Advisor

HP Support Assistant

HP ProtectTools Security Manager

HP ProtectTools for Central Management

HP Hotkey Support

HP Power Assistant

HP Connection Manager

HP GPS and Location (Select Models)

Adobe® Flash Player

Microsoft® Office Starter: reduced-functionality Word and Excel® only, with advertising. No PowerPoint® or Outlook®. Buy Office 2010 to use the full-featured software. \*

Microsoft Security Essentials

PDF Complete Special Edition\*\*

### Features

Corel WinDVD SD (DVD) Player, or HD (Blu-ray) Player (select models)  
Roxio Secure Burn (select models)  
Roxio MyDVD Business 2010 (select models)  
HP Webcam Software (select models)  
WinZip Basic

#### Additional Software Available from the Web

HP SoftPaq Download Manager

#### Workstation ISV Certifications

See the latest list of certifications at <http://www.hp.com/united-states/campaigns/workstations/partnerships.html>

\* Includes reduced functionality versions of Word and Excel. Purchase of Product Key required to activate full Office 2010 suite available at participating resellers/retailers and <http://www.office.com>

\*\* PDF Complete Special Edition 60 day trial; purchase license afterwards for full functionality.

#### HP Performance Advisor

HP Performance Advisor enables optimal configuration of HP Mobile Workstations delivering stability and best performance. HP Performance Advisor will guide your system setup allowing a "custom" configuration that best matches the workstation to user requirements.

#### HP Recovery Manager

Models shipped with Windows 7 include 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 19 GB of the hard drive is reserved for the system recovery software.

#### Planned Workstation ISV Certifications

See the latest list of certifications at

<http://www.hp.com/united-states/campaigns/workstations/partnerships.html>

#### Security

##### Standard

HP ProtectTools Security Manager (standard modules include)

- Credential Manager
- Computrace\* Pro
- Device Access Manager
- Drive Encryption
- Face Recognition (webcam configurations only)
- File Sanitizer
- Privacy Manager
- Embedded Security

HP Fingerprint Sensor

Integrated Smart Card Reader

Enhanced Pre-Boot Security (Multiuser / Multifactor)

HP Spare Key (requires initial user setup)

One-Step Logon

TPM 1.2 Embedded Security Chip\*\*

HP Disk Sanitizer

Security lock slot

Support for Intel AT\*\*\*

##### Optional

HP Privacy Filter – Narrows viewing area so that screen data is visible only to persons directly in front of the monitor.  
Computrace\* Pro for HP ProtectTools with GPS Tracking - Subscription based security solution providing the ability to track, initiate physical recovery, conduct asset management, and perform remote data delete by utilizing GPS technology. GPS functionality requires HP Mobile Broadband Module.

\* The Computrace agent is shipped turned off, and must be activated by customers when they purchase a

### Features

subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S.

\*\* 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/products/security>.

\*\*\* Intel AT security requires a separately purchased Absolute Computrace service subscription and must be activated and configured. Check with Absolute for availability in your country. Intel and HP assume no liability for lost or stolen data and/or systems or any other damages resulting therefrom. See <http://www.intel.com/technology/anti-theft/>.

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## HP PROTECTTOOLS SECURITY MANAGER WITH CENTRAL MANAGEMENT

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. The ProtectTools modules are available on the hard drive (also downloadable from the web) and can be configured in Software Setup.

HP ProtectTools is centrally manageable with the capability to manage notebooks from a single point. HP ProtectTools is management ready out of the box, in partnership with Digital Persona. Features address requirements that customers expect from a centrally managed security solution such as user provisioning, credential reset, and credential revocation.

HP ProtectTools provides two separate management solutions, targeted at the enterprise and the SMB:

- Digital Persona Pro AD: Designed for the enterprise customer. Integrates with Active Directory and gives IT Managers the ability to provision users, create login policies based on passwords, biometrics or smartcards. Management features also include remote credential recovery in case the user forgets the password, loses the smartcard or cannot use the fingerprint reader for any reason. In addition, advanced auditing capabilities are also built in. Digital Persona Pro AD is available now.
- Digital Persona Pro Workgroup: Designed for the small business customer. Provides features similar to the Active Directory version, but for workgroups. Workgroup activation is built into HP ProtectTools, and activation of up to 5 seats is completely free.

For more information on Central Management for HP ProtectTools, refer to: <http://www.hp.com/products/security>

**NOTE:** In order to deploy and receive updated policies, the client needs to be connected to the network server and requires separately purchased DigitalPersona Pro software. System access may not prevent users from logging into the system on the first attempt if policy updates haven't yet been received and applied. Requires Microsoft Windows.

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## POWER

### Power Supply

External HP 120W Slim Smart AC adapter  
(148.0 x 75.5 x 25.4mm)

External HP 150W Slim Smart AC adapter  
(167.0 x 82.0 x 25.4mm)

External HP 200W Slim Smart AC adapter  
(172 x 96 x 25.4mm)

Power cord included is 6-foot (1.8 meter).

Total length including external AC adapter is 12 feet (3.66 meter).

HP Fast Charge\*

### Primary Battery

HP 8-cell Lithium-Ion Battery (83 WHR)

HP Long Life 8-cell Lithium-Ion Battery (75 WHr) \*\*

Secondary Battery

HP BB09 Ultra Extended Life Notebook Battery (9-cell/100 WHr)

HP ST09 Extended Life Notebook Battery (9-cell/73 WHr)

### Features

#### Battery Life

Battery life up to TBD hours\*\*\*

#### System Standby Time

Up to 1 week

\* HP Fast Charge recharges your battery up to 90% within 90 minutes when the system is off. HP Fast Charge does not apply to the 9-cell primary battery, HP ST09 Extended Life Notebook Battery, or HP BB09 Ultra Extended Life Notebook Battery.

\*\* Available with 3-year warranty only

\*\*\*Battery life will vary depending on the product model, configuration, loaded applications, features, use, wireless functionality and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See MobileMark07 battery benchmark <http://www.bapco.com/products/mobilemark2007> for additional details.

#### Power Conservation

AMD PowerPlay technology

NVIDIA PowerMizer technology

Hibernation

Standby

ACPI compliance

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## ENVIRONMENTAL

US Energy Star ®

IT ECO declaration

EPEAT Gold where HP registers commercial desktop products. See <http://www.epeat.net> for registration status in your country US Federal Energy Management Program (FEMP)

**NOTE:** 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.

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## WEIGHTS & DIMENSIONS

#### Weight

Starting at 6.69 lb (3.0 kg) with SSD and weight saver (no optical drive)

Starting at 6.94 lb (3.1 kg) with hard drive and DVD-R/W drive

#### Dimensions (w x d x h)

.36 in (at front)/1.51 in (at rear) x 15.0 in x 10.1 in

34.5 mm (at front)/38.4 mm (at rear) x 382.0 mm x 257.5 mm

Height with DreamColor display: 1.44 in / 36.5 mm at front

1.59 in / 40.4 mm at rear

**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, 1 GB memory, and no optical drive. Weight varies by configuration and components.

### Features

#### PORTS/SLOTS

##### Ports

VGA – One  
DisplayPort v1.2 – One  
Stereo microphone in – One  
Stereo headphone/line out – One  
Power Connector – One  
Secondary Battery Connector – One  
Docking Connector – One  
RJ-45 (Ethernet) – One  
RJ-11 (Modem) – One  
1394a – One  
USB 3.0 – Two  
USB 2.0 – Two (one with USB charging port)  
eSATA/USB 2.0 combo port – One  
Security lock slot

##### Digital Media Slots

ExpressCard/54 slot – One (Supports ExpressCard/54)  
SD/MMC slot – One (Supports SD (Secure Digital), SDHC, SDXC, MMC (MultiMedia Card), MMC+)  
Integrated Smart Card Reader (Compatible with ISO 7816 compliant Smart Cards PC/SC interface support)

#### SERVICE AND SUPPORT

HP Services offers limited 3-year, 1-year and 90-day warranty options depending on country. 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>

### Technical Specifications

#### SYSTEM UNIT

<b>Stand-Alone Power Requirements (AC Power)</b>	<b>Nominal Operating Voltage</b>	19.5 V		
	<b>Average Operating Power</b>	AMD Graphics	<b>Windows 7 (32-bit)</b>	<b>Windows 7 (64-bit)</b>
		NVIDIA Graphics	13.28 W	13.67 W
			16.28 W	16.8 W
	<b>Max Operating Power</b>	< 120 W or < 150 W or < 200 W		
<b>Temperature</b>	<b>Operating</b>	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)		
	<b>Non-operating</b>	-4° to 140° F (-20° to 60° C)		
<b>Relative Humidity</b>	<b>Operating</b>	10% to 90%, non-condensing		
	<b>Non-operating</b>	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature		
<b>Shock</b>	<b>Operating</b>	40 G, 2 ms, half-sine		
	<b>Non-operating</b>	200 G, 2 ms, half-sine		
<b>Random Vibration</b>	<b>Operating</b>	0.75 grms		
	<b>Non-operating</b>	1.50 grms		
<b>Altitude (unpressurized)</b>	<b>Operating</b>	-50 to 10,000 ft (-15.24 to 3,048 m)		
	<b>Non-operating</b>	-50 to 40,000 ft (-15.24 to 12,192 m)		
<b>Planned Industry Standard Certifications</b>	<b>UL</b>	Yes		
	<b>CSA</b>	Yes		
	<b>FCC Compliance</b>	Yes		
	<b>ENERGY STAR®</b>	Select models*		
	<b>EPEAT</b>	Gold target**		
	<b>ICES</b>	Yes		
	<b>Australia / NZ A-Tick Compliance</b>	Yes		
	<b>CCC</b>	Yes		
	<b>Japan VCCI Compliance</b>	Yes		
	<b>KC</b>	Yes		
	<b>BSMI</b>	Yes		
	<b>CE Marking Compliance</b>	Yes		

\* Configurations of the HP EliteBook 8570w that are ENERGY STAR qualified are identified as HP EliteBook 8570w ENERGY STAR on HP websites and on [www.energystar.gov](http://www.energystar.gov).

\*\* EPEAT registration varies by country. See [www.epeat.net](http://www.epeat.net) for registration status by country. EPEAT status listed above applies to U.S.

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

#### DISPLAY



### Technical Specifications

<b>15.6-inch FHD WVA LED anti-glare</b>	<b>Dimensions (W x H)</b>	13.54 x 7.59 in (34.4 x 19.4 cm)		
	<b>Diagonal Size</b>	15.6 in (39.6 cm)		
	<b>Surface Treatment</b>	Anti-glare		
	<b>Contrast Ratio</b>	300:1 (min)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	220 nit typical		
	<b>Pixel Resolution</b>	<b>Pitch</b>	0.17925 mm x 0.17925 mm	
		<b>Format</b>	1920x1080	
		<b>Configuration</b>	RGB Stripe	
	<b>Backlight</b>	LED		
	<b>PPI</b>	142		
	<b>Viewing Angle</b>	±60° Horizontal, ±50° Vertical (minimum) 60/60/50/50 (Left/Right/Down/Up) (minimum)		
	<hr/>			
<b>15.6-inch LED FHD UWVA (1920 x 1080) anti-glare DreamColor</b>	<b>Dimensions (W x H)</b>	13.54 x 7.59 in (34.4 x 19.4 cm)		
	<b>Diagonal Size</b>	15.6 in (39.6 cm)		
	<b>Surface Treatment</b>	Anti-glare		
	<b>Contrast Ratio</b>	800:1 (min)		
	<b>Refresh Rate</b>	48 Hz, 50 Hz and 60		
	<b>Brightness</b>	210 nits (typical)		
	<b>Pixel Resolution</b>	<b>Pitch</b>	0.179 mm x 0.179 mm	
		<b>Format</b>	1920x1080	
		<b>Configuration</b>	RGB Stripe	
	<b>Backlight</b>	LED		
	<b>PPI</b>	142		
	<b>Viewing Angle</b>	±89° Horizontal, ±89° Vertical (typical)		
	<b>Technology Type</b>	30-bit In-Plane Switching (IPS)		
	<b>Color Depth</b>	10-bits/color		
	<b>Display Colors</b>	Over 1 billion colors (native mode)		
	<b>Color Gamut Coverage</b>		<b>CIE1931 (x,y)</b>	<b>CIE 1976 (u',v')</b>
	<b>NTSC</b>	109%	129%	
	<b>AdobeRGB</b>	114%	127%	
	<b>sRGB</b>	154%	148%	

### Technical Specifications

17.3-inch FHD UWVA LED anti-glare Dreamcolor	<b>Dimensions (W x H)</b>	13.54 x 7.59 in (34.4 x 19.4 cm)		
	<b>Diagonal Size</b>	15.6 in (39.6 cm)		
	<b>Surface Treatment</b>	Anti-glare		
	<b>Contrast Ratio</b>	300:1 (typical)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	200 nit (typical)		
	<b>Pixel Resolution</b>	<b>Pitch</b>	0.215 mm	
		<b>Format</b>	1600 x 900	
		<b>Configuration</b>	RGB Stripe	
	<b>Backlight</b>	LED		
<b>PPI</b>	118 ppi			
<b>Viewing Angle</b>	±60° Horizontal, ± 50° Vertical (minimum) or ±70° Horizontal, ±60° Vertical (typical)			

### STORAGE AND DRIVES

#### Internal Storage

750 GB 7200 rpm SATA Hard Drive	<b>Drive Weight</b>	0.22 lb (101 g)		
	<b>Capacity</b>	750 GB		
	<b>Height</b>	0.37 in (9.5 mm)		
	<b>Width</b>	2.75 in (70 mm)		
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ		
	<b>Transfer Rate</b>	<b>Synchronous</b>	300 MB/s (Drive Capability)	
		(maximum)		
		<b>Seek Time</b>	<b>Single Track</b>	1.5 ms
	(typical reads, including settling)	<b>Average</b>	11 ms	
		<b>Maximum</b>	22 ms	
	<b>Rotational Speed</b>	7200 rpm		
	<b>Logical Blocks</b>	1,465,149,168		
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]		
<b>Features</b>	ATA Security			

### Technical Specifications

<b>500 GB 7200 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.25 lbs (115g)		
	<b>Capacity</b>	500 GB		
	<b>Height</b>	0.37 in (9.5 mm)		
	<b>Width</b>	2.75 in (70 mm)		
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ		
	<b>Transfer Rate</b>	<b>Synchronous (maximum)</b>	300 MB/s (Drive Capability)	
	<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	1.5 ms	
		<b>Average</b>	11 ms	
		<b>Maximum</b>	22 ms	
	<b>Rotational Speed</b>	7200 rpm		
	<b>Logical Blocks</b>	976,773,168		
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]		
	<b>Features</b>	ATA Security		

<b>500 GB 7200 rpm SMART SATA II Self Encrypting Drive</b>	<b>Drive Weight</b>	0.25 lbs (115g)		
	<b>Capacity</b>	500 GB		
	<b>Height</b>	0.37 in (9.5 mm)		
	<b>Width</b>	2.50 in (63.5 mm)		
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s		
	<b>Transfer Rate</b>	<b>Synchronous (maximum)</b>	300 MB/s (Drive Capability)	
	<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	1 ms	
		<b>Average</b>	12 ms	
		<b>Maximum</b>	20 ms	
	<b>Rotational Speed</b>	7200 rpm		
	<b>Logical Blocks</b>	976,773,168		
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]		
	<b>Features</b>	ATA Security		

<b>320 GB 7200 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.25 lbs (115 g)		
	<b>Capacity</b>	320 GB		
	<b>Height</b>	0.37 in (9.5 mm)		
	<b>Width</b>	2.75 in (70 mm)		
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ		
	<b>Transfer Rate</b>	<b>Synchronous (maximum)</b>	300 MB/s (Drive Capability)	
	<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	1.5 ms	
		<b>Average</b>	11 ms	
		<b>Maximum</b>	22 ms	
	<b>Rotational Speed</b>	7200 rpm		
	<b>Logical Blocks</b>	625,142,448		
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]		
	<b>Features</b>	ATA Security		

### Technical Specifications

<b>SATA 6 Gb/s 256 GB, 2.5-inch SATA SED Solid State Drive</b>	<b>Drive Weight</b>	73 Grams		
	<b>Capacity</b>	256 GB		
	<b>Height</b>	0.276 in (7 mm)		
	<b>Width</b>	2.76 in (70 mm)		
	<b>Interface</b>	SATA 3 (6 Gb/s)		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		Up to 460 MB/s	Up to 260 MB/s	
	<b>Logical Blocks</b>	500,118,192		
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [case temp]		
	<b>Features</b>	ATA Security; ATA-8 compliant; SATA 3.0; DIPM; TRIM		

<b>SATA 6 Gb/s 180 GB, 2.5-inch Solid State Drive</b>	<b>Drive Weight</b>	78 Grams		
	<b>Capacity</b>	180 GB		
	<b>Height</b>	0.276 in (7 mm)		
	<b>Width</b>	2.76 in (70 mm)		
	<b>Interface</b>	SATA Gen 3 (6 Gb/s)		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		550 MB/s	520 MB/s	
	<b>Logical Blocks</b>	351,651,888		
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [case temp]		
	<b>Features</b>	ATA Security; ATA-8, SATA 3.0; DIPM; TRIM		

<b>SATA 6 Gb/s 128 GB, 2.5-inch Solid State Drive</b>	<b>Drive Weight</b>	73 Grams		
	<b>Capacity</b>	128 GB		
	<b>Height</b>	0.276 in (7 mm)		
	<b>Width</b>	2.76 in (70 mm)		
	<b>Interface</b>	SATA 3 (6 Gb/s)		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		415 MB/s	175 MB/s	
	<b>Logical Blocks</b>	250,069,680		
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [case temp]		
	<b>Features</b>	ATA Security; ATA-8; SATA 3.0 DIPM; TRIM		

### Optical Drives

### Technical Specifications

<b>DVD-ROM Drive</b>	<b>Access Times</b>	Random	< 140 ms CD (typical) < 160 ms DVD (typical)
	<b>Max Data Transfer Rate</b>	24X CD-ROM 8X-DVD	
	<b>Transfer Mode</b>	UDMA Mode 5	
	<b>Interface</b>	Gen 1 SATA	
	<b>Supported Media (read)</b>	CD-DA, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	
	<b>Supported Media (write)</b>	None	
	<b>Max Media Capacity (read)</b>	8.5GB	
	<b>Transport</b>	Tray Loading	

<b>DVD+/-RW SuperMulti DL Drive</b>	<b>Access Times</b>	Random	<140ms CD (typical) < 160 ms DVD (typical)
	<b>Max Data Transfer Rate</b>	24X CD-ROM 8X DVD 24X CD-R 24X CD-RW 8X DVD+R 8X DVD+RW 8X DVD-R 6X DVD-RW 6X - DVD+R Dual Layer 6X - DVD-R Dual Layer 5X DVD-RAM	
	<b>Transfer Mode</b>	UDMA Mode 5	
	<b>Interface</b>	Gen 1 SATA	
	<b>Supported Media (read)</b>	CD-DA, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	
	<b>Supported Media (write)</b>	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, DVD+R DL, DVD-R DL	
	<b>Max Media Capacity (read)</b>	8.5 GB	
	<b>Max Media Capacity (write)</b>	8.5 GB	
	<b>Transport</b>	Tray Loading	

### Technical Specifications

<b>Blu-ray ROM DVD+/-RW Access Times</b> <b>SuperMulti DL Drive</b>	Random	<190 ms CD-ROM (typical)
		< 180ms DVD-ROM (typical)
		<230 ms BD-ROM (typical)
<b>Max Data Transfer Rate</b>	24X CD-ROM	
	8X DVD-ROM	
	24X CD-R	
	16X CD-RW	
	8X DVD+R	
	8X DVD+RW	
	8X DVD-R	
	6X DVD-RW	
	4X - DVD+R Dual Layer	
	4X - DVD-R Dual Layer	
	5X DVD-RAM	
	6X BD-ROM	
<b>Transfer Mode</b>	UDMA Mode 5	
<b>Interface</b>	Gen 1 SATA	
<b>Supported Media (read)</b>	CD-DA, , 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	
<b>Supported Media (write)</b>	CD-R, CD-RW, DVD+R, DVD+R DL, DVD+RW, DVD-R, DVD-R DL, DVD-RW, DVD-RAM	
<b>Max Media Capacity (read)</b>	50.0 GB	
<b>Max Media Capacity (write)</b>	8.5GB	
<b>Transport</b>	Tray Loading	

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<b>Blu-ray R/RE DVD+/-RW SuperMulti DL Drive</b>	<b>Access Times</b>	Random	<165 ms CD-ROM (typical)
			<185 ms DVD-ROM (typical)
			<205 ms BD-ROM (typical)
<b>Max Data Transfer Rate</b>	24X CD-ROM		
	8X DVD-ROM		
	24X CD-R		
	16X CD-RW		
	8X DVD+R		
	8X DVD+RW		
	8X DVD-R		
	6X DVD+R Dual Layer		
	6X DVD-R Dual Layer		
	5X DVD-RAM		
	6X BD-ROM		
	6X BD-R		
	2X BD-RE		
<b>Transfer Mode</b>	UDMA Mode 5		
<b>Interface</b>	Gen 1 SATA		

### Technical Specifications

<b>Supported Media (read)</b>	CD-DA, , 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
<b>Supported Media (write)</b>	CD-R, CD-RW, DVD+R, DVD+R DL, DVD+RW, DVD-R, DVD-R DL, DVD-RW, DVD-RAM, BD-R, BD-RE
<b>Max Media Capacity (read)</b>	50.0 GB
<b>Max Media Capacity (write)</b>	50.0 GB
<b>Transport</b>	Tray Loading

## SECURITY

<b>HP Fingerprint Sensor</b>	<b>Mobile Voltage Operation</b>	3.0V-3.6V Single Supply
	<b>Operating Temperature</b>	32° - 158°F (0° - 70°C)
	<b>Current Consumption @ 3.3V</b>	Less than 70 mA peak imaging and scrolling Less than 25 mA hardware finger detection Advanced Power Management
	<b>High-Rate Image Capture</b>	Up to 240 image frames /sec
	<b>ESD Resistance</b>	IEC 61000-4-2 Level 4 (±15KV)
	<b>Detection Matrix</b>	192 x 16 Pixels 9.7 mm x 0.81 mm 500 ppi High-Resolution Images

## NETWORKING/COMMUNICATIONS

<b>Intel® 82579LM Gigabit Ethernet Features Network Connection</b>	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 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 802.3ab; IEEE 802.3 Clauses 40) 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 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE(Energy Efficient Ethernet) Jumbo Frame 9K Auto MDI/MDIX Crossover cable detection
<b>Power Management</b>	ACPI compliant - multiple power modes Energy Detect Low Power Mode(Green Ethernet)
<b>Performance Features</b>	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload( ARP & NS)

### Technical Specifications

	<p>Large send offload and Giant send offload</p> <p>Receiving Side Scaling</p> <p>MACSec Offload (802.3ae)</p> <p>Intel vPro</p> <p>iSCSI Boot</p>
<b>Manageability</b>	<p>Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only)</p> <p>PXE 2.1 Remote Boot</p> <p>Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))</p> <p>Comprehensive diagnostic and configuration software suite</p> <p>Virtual Cable Doctor for Ethernet cable status</p>
<b>Interface</b>	<p>PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ.</p> <p><b>NOTE:</b> Intel 82579 PCIe interface is not PCIe compliant. It operates at half of PCIe specification V1.1 (2.5GT/S) speed.</p>
<b>NIC Device Driver Name</b>	Intel 82579LM/82579V Ethernet Network Connection

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

<b>Form Factor</b>	MDC 1.5 Daughtercard
<b>Power Management Support</b>	APM Revision 1.2, ACPI
<b>Approvals/Certifications</b>	UL, CSA, NEMKO, CCIB, Industry Canada, FCC Part 68, CTR21, FCC Part 15 Class B, Canadian ICES-003 Class B, C.I.S.P.R.22, Australian ACA, CE Mark, Other Countries
<b>Data Mode Capabilities</b>	<p>V.92 data</p> <p>V.8bis</p> <p>V.80</p> <p>V44, V.42bis, MNP5 (Compression)</p> <p>V.42 (LAPM, MNP2-4) (Error Correction)</p> <p><b>Optional symbol rates:</b></p> <p>2800, 3429</p> <p>Asymmetric Symbol rates</p> <p><b>Synchronous primary channel data signaling rates:</b></p> <p>3600, 31200</p> <p>Automatic rate re-negotiation</p> <p>V.34</p> <p>V.32bis</p> <p>V.32</p> <p>V.23</p> <p>V.22bis</p> <p>V.22</p> <p>V.21</p> <p>Bell 212A</p> <p>Bell 103J</p>
<b>Fax Mode Capabilities</b>	<p>TIA/EIA-578-B (Class 1)</p> <p>T.30, T.4 (Group 3)</p> <p>V.17</p> <p>V.29</p> <p>V.27ter</p> <p>V.21 Channel 2</p> <p>T.31</p>
<b>Command Set</b>	<p>V.250 (Partial)</p> <p>TIA-602</p> <p>Identification: +GMI, +GMM, +GMR</p>

### Technical Specifications

Port control: +IPR, +ICF, +IFC, +ILRR  
 Modulation: +MS, +MR, +MA  
 Error control: +ES, +ER, +EB, +ESR, +ETBM  
 Data compression: +DS, +DR  
 V.251

<b>HP un2430 EV-DO/HSPA Mobile Broadband Module</b>	<b>Technology/Operating Bands</b>	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), AWS (UTRA FDD Band IV), 900MHz(UTRA FDD Band VIII), 850MHz (UTRA FDD Band V) 1xEVDO/1xRTT with receive diversity: 850MHz (Band Class0-Cell), 1900MHz (Band Class1-PCS)
	<b>Wireless Protocol Standards</b>	GSM/GPRS/EDGE: Class A, Multi-slot class 10 operation, coding schemes CS1 - CS4 and MSC1 - MSC9. UMTS/WCDMA: Release 99 and Release 6 CDMA: 1xEVDO Release 0 and Release A, IS-95A, IS-95B, IS-856, IS-2000
	<b>Wireless Parametric Standards</b>	Meets or exceeds TIA/EIA IS-98-D
	<b>Maximum Data Rates</b>	UMTS (HSPA) - 14.4 Mbps (Download ), 5.76Mbps (Upload) CDMA (EVDO Release A) - 3.1 Mbps (Download), 1.8Mbps (Upload)
	<b>GPS</b>	Standalone GPS enabled gpsOneXTRATM™
	<b>GPS Bands</b>	L1 - 1575.42 MHz
	<b>Maximum Output Power</b>	GSM/GPRS/EDGE: 32dBm (+/-1) WCDMA: 24dBm (+0.7/-2.3) CDMA: 24dBm (+0.7/-2)
	<b>Maximum Power Consumption</b>	2750mA (peak); 1100mA (average)
	<b>Power Consumption, Idle Not Connected</b>	20 mA
	<b>Power Management</b>	USB selective suspend Integrated notebook wireless button
	<b>Antenna Type</b>	Dual high efficiency 5 band antennae with spatial diversity, mounted in the display enclosure
	<b>Form Factor</b>	PCI-Express MiniCard, USB 2.0 interface
	<b>Weight</b>	11.5 g
	<b>Dimensions (Length x Width x Thickness)</b>	2.01 x 1.18 x 0.18 in (51 x 30 x 5 mm)
	<b>Voltage, Operating</b>	3.3v +/- 10%
	<b>Temperature, Operating (from TIA/EIA/IS-98-D)</b>	-22° to 158° F (-30° to 70° C) (full RF performance) -22° to 167° F (-30° to 75° C) (reduced RF performance)
	<b>Temperature, Non-operating, 96 hours (from MIL-STD 202 Method 108)</b>	-40° to 185° F (-40° to 85° C)
	<b>Humidity, Non-operating</b>	95% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
	<b>Configuration Utilities</b>	HP Connection Manager

### Technical Specifications

<b>LED Activity</b>	LED Off - Radio Off; Solid LED On - Radio On
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<b>HP hs2350 HSPA+ Mobile Broadband Module</b>	<b>Technology/Operating Bands</b>	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), 900MHz(UTRA FDD Band VIII), 850 MHz (UTRA FDD Band V)
	<b>Wireless Protocol Standards</b>	GSM/GPRS/EDGE: Class B, Multi-slot class 10 operation, coding schemes CS1 - CS4 and MSC1 - MSC9. UMTS/WCDMA: Release 99 and Release 7 Advanced Receiver Type 3i
	<b>Wireless Parametric Standards</b>	Complies with 3GPP specifications
	<b>Maximum Data Rates</b>	UMTS (HSPA) - 21 Mbps (Download ), 5.76Mbps (Upload)
	<b>GPS</b>	Standalone, A-GPS (Internet- and Network assisted)
	<b>GPS Bands</b>	1575.42 MHz (± 1.023 MHz)
	<b>Maximum Output Power</b>	GSM/EDGE GSM850 & GSM900 bands GPRS: +33 dBm ± 2 dBm (class 4) EGPRS: +27 dBm ± 3 dBm (class E2)
		DCS1800 & PCS1900 bands GPRS: +30 dBm ± 2 dBm (class 1) EGPRS: +26 dBm +4 / -3 dBm (class E2)
	<b>Maximum Power Consumption</b>	UMTS UTRA FDD Bands +24 dBm +4 / -3 dBm (class 3) 2000mA (peak); 600mA (average)
	<b>Power Consumption, Sleep Mode</b>	5 mA
	<b>Power Management</b>	USB selective suspend Integrated notebook wireless button
	<b>Antenna Type</b>	Dual high efficiency 5 band antennae with spatial diversity, mounted in the display enclosure
	<b>Form Factor</b>	PCI-Express MiniCard, USB 2.0 interface
	<b>Weight</b>	< 12 g
	<b>Dimensions</b> (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 5 mm)
	<b>Voltage, Operating</b>	3.3v +/- 9%
	<b>Temperature, Operating</b>	14° to 149° F (-10° to 65° C) (full RF performance)
		14° to 167° F (-10° to 75° C) (reduced RF performance)
	<b>Temperature, Non-operating, 96 hours</b> (from MIL-STD 202 Method 108)	-22° to 185° F (-30° to 85° C)
	<b>Humidity, Non-operating</b>	85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
<b>Configuration Utilities</b>	HP Connection Manager	

### Technical Specifications

<b>LED Activity</b>	LED Off - Radio Off; Solid LED On - Radio On
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<b>HP It2522 LTE/EV-DO Mobile Broadband Module</b>	<b>Technology/Operating Bands</b>	CDMA/1xRTT/EvDO: 800MHz (Cell), 1900MHz (PCS) 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), 900MHz (UTRA FDD Band VIII), 850 MHz (UTRA FDD Band V) LTE: 700 MHz (Verizon, Band XIII)
	<b>Mobile Operator</b>	Verizon (US only)
	<b>Wireless Protocol Standards</b>	GSM/GPRS/EDGE: Class B, Multi-slot class 10 operation, coding schemes CS1 - CS4 and MSC1 - MSC9. CDMA: 1xEVDO Release 0 and Release A, IS-95A, IS-95B, IS-856, IS-2000 UMTS/WCDMA: Release 99 and Release 7 LTE: Power Class III as per 3GPP TS 36.101
	<b>Wireless Parametric Standards</b>	Complies with 3GPP specifications Release 8 for LTE
	<b>Maximum Data Rates</b>	EvDO (Revision A) - 3.1 Mbps (Download), 1.8 Mbps (Upload) WCDMA (DC-HSPA+) - 42Mbps (Download) LTE (Category 3) - 100 Mbps (Download ), 50Mbps (Upload)
	<b>GPS</b>	Standalone, Assisted, XTRA
	<b>GPS Bands</b>	1575.42 MHz (± 1.023 MHz)
	<b>Maximum Output Power</b>	GSM/GPRS/EDGE: 32dBm (+/-1) WCDMA: 24dBm (+0.7/-2.3) LTE: +23 dBm (+2.7 dBm/-1.7 dBm) 1xRTT/EvDO: +24 dBm (+0.5 dBm/-1.5 dBm)
	<b>Maximum Power Consumption</b>	2700mA (peak)
	<b>Power Consumption, Sleep Mode</b>	10 mA
	<b>Power Management</b>	USB selective suspend Integrated notebook wireless button
	<b>Antenna Type</b>	Dual high efficiency 6 band antennae with spatial diversity, mounted in the display enclosure
	<b>Form Factor</b>	PCI-Express MiniCard, USB 2.0 interface
	<b>Weight</b>	< 10 g
	<b>Dimensions</b> (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 4.5 mm)
	<b>Voltage, Operating</b>	3.3v +/- 9%
	<b>Temperature, Operating</b>	-4° to 149° F (-20° to 65° C)
	<b>Temperature, Non-operating, 96 hours</b> (from MIL-STD 202 Method 108)	-40° to 185° F (-40° to 85° C)
	<b>Humidity, Non-operating</b>	85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
	<b>LED Activity</b>	LED Off - Radio Off; Solid LED On - Radio On

### Technical Specifications

<b>HP It2523 LTE/HSPA+ Mobile Broadband Module</b>	<b>Technology/Operating Bands</b>	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), 850 MHz (UTRA FDD Band V) LTE: AWS (Band IV) 700 MHz (AT&T, Band XVII)
	<b>Mobile Operator</b>	AT&T (US only)
	<b>Wireless Protocol Standards</b>	LTE: Power Class III as per 3GPP TS 36.101
	<b>Wireless Parametric Standards</b>	Complies with 3GPP specifications Release 8 for LTE
	<b>Maximum Data Rates</b>	WCDMA (DC-HSPA+) - 42Mbps (Download) LTE (Category 3) - 100 Mbps (Download ), 50Mbps (Upload)
	<b>GPS</b>	Standalone, Assisted, XTRA
	<b>GPS Bands</b>	1575.42 MHz (± 1.023 MHz)
	<b>Maximum Output Power</b>	GSM/GPRS/EDGE: 32dBm (+/-1) WCDMA: 24dBm (+0.7/-2.3) LTE: +23 dBm (+2.7 dBm/-1.7 dBm) 1xRTT/EvDO: +24 dBm (+0.5 dBm/-1.5 dBm)
	<b>Maximum Power Consumption</b>	2700mA (peak)
	<b>Power Consumption, Sleep Mode</b>	10 mA
	<b>Power Management</b>	USB selective suspend Integrated notebook wireless button
	<b>Antenna Type</b>	Dual high efficiency 6 band antennae with spatial diversity, mounted in the display enclosure
	<b>Form Factor</b>	PCI-Express MiniCard, USB 2.0 interface
	<b>Weight</b>	< 10 g
	<b>Dimensions (Length x Width x Thickness)</b>	2.01 x 1.18 x 0.18 in (51 x 30 x 4.5 mm)
	<b>Voltage, Operating</b>	3.3v +/- 9%
	<b>Temperature, Operating</b>	-4° to 149° F (-20° to 65° C)
	<b>Temperature, Non-operating, 96 hours</b> (from MIL-STD 202 Method 108)	-40° to 185° F (-40° to 85° C)
	<b>Humidity, Non-operating</b>	85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
	<b>LED Activity</b>	LED Off - Radio Off; Solid LED On - Radio On

<b>Intel Centrino Advanced-N 6205 (2x2)</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n
	<b>Interoperability</b>	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 7, Windows Vista and XP (details at: <a href="http://www.hp.com/go/notebooks/WLAN">http://www.hp.com/go/notebooks/WLAN</a> )
	<b>Frequency Band</b>	2.4 GHz and 5GHz

### Technical Specifications

<b>Antenna Structure</b>	2 transmit; 2 receive (2x2)
<b>Data Rates</b>	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 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 specification
<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
<b>Security<sup>1</sup></b>	Authentication: WPA and WPA2, 802.1x (EAP_TLS, TTLS, PEAP, LEAP, EAP-FAST)  Authentication Protocols: PAP, CHAP, TLS, GTC, MS-CHAP, MS-CHAPv2  Encryption: 64 and 128-bit WEP, AES-CCMP, CKIP, TKIP  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.
<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.
<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between 2.4GHz band Access Points
<b>Output Power</b> (for CCK and OFDM) <sup>2</sup>	17 dBm max
<b>Power Consumption</b>	Transmit: 2.3 Watts (max, with two spatial streams) Receive: 1 Watt (max with two spatial streams) Idle mode <sup>3</sup> : 35 mW (average) Radio off: 20 mW (max)
<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	54 Mbps: -76 dBm, 6 Mbps: -92 dBm
<b>Antenna Connections</b>	2 U.FL type connectors, 50 ohm nominal impedance
<b>Form Factor</b>	PCI-Express Half-MiniCard
<b>Weight</b>	0.0075 lb (3.4 g)
<b>Dimensions</b>	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)
<b>Operating Voltage</b>	3.3V +/- 9%
<b>Temperature</b>	Operating 32° to 176° F (0° to 80° C) Non-operating -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating 10% to 90% (non-condensing) Non-operating 5% to 90% (non-condensing)
<b>Altitude</b>	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Off - Radio OFF; Solid LED On - Radio ON

1. [Check latest software/driver release for updates on supported security features.](#)

2. [Maximum output power may vary by country according to local regulations.](#)

3. [In Power Save Polling mode and on battery power.](#)

4. [Receiver sensitivity is measured at a packet error rate of 8% for 802.11b \(CCK modulation\) and](#)

### Technical Specifications

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.

<b>Intel Centrino Ultimate-N 6300</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n
	<b>Interoperability</b>	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 7, Windows Vista and XP (details at: <a href="http://www.hp.com/go/notebooks/WLAN">http://www.hp.com/go/notebooks/WLAN</a> )
	<b>Frequency Band</b>	2.4 GHz and 5GHz
	<b>Antenna Structure</b>	3 transmit; 3 receive (3x3)
	<b>Data Rates</b>	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: many 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 specification
	<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
	<b>Security<sup>1</sup></b>	Authentication: WPA and WPA2, 802.1x (EAP_TLS, TTLS, PEAP, LEAP, EAP-FAST)  Authentication Protocols: PAP, CHAP, TLS, GTC, MS-CHAP, MS-CHAPv2  Encryption: 64 and 128-bit WEP, AES-CCMP, CKIP, TKIP  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.
	<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.
	<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK
	<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between Access Points
	<b>Output Power</b> (for CCK and OFDM) <sup>2</sup>	17 dBm max
	<b>Power Consumption</b>	Transmit: 1.4 Watts (average, with one spatial streams) Receive: 1.3 Watts (average with two receive chains) Idle mode <sup>3</sup> : 30 mW (average) Radio off: 20 mW (max)
	<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode
	<b>Receiver Sensitivity<sup>4</sup></b>	54 Mbps: -76 dBm, 6 Mbps: -92 dBm
	<b>Antenna Connections</b>	3 U.FL type connectors, 50 ohm nominal impedance

### Technical Specifications

<b>Form Factor</b>	PCI-Express Half-MiniCard	
<b>Weight</b>	0.0075 lb (3.4 g)	
<b>Dimensions</b>	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)	
<b>Operating Voltage</b>	3.3V +/- 9%	
<b>Temperature</b>	Operating	32° to 176° F (0° to 80° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 90% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Off - Radio OFF; Solid LED On - Radio ON	

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. In Power Save Polling mode 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.

<b>Broadcom 43224AGN 802.11a/b/g/n (2x2)</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n*
	<b>Interoperability</b>	Wi-Fi certified (802.11abg only) Cisco Compatible Extensions Program compliant (802.11abg only) with Microsoft Windows 7, Vista and XP (details at: <a href="http://www.hp.com/go/notebooks/WLAN">http://www.hp.com/go/notebooks/WLAN</a> )
	<b>Frequency Band</b>	2.4 GHz and 5 GHz
	<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 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
	<b>Frequency Support</b>	20 MHz: 2.4 GHz and 5 GHz bands 40 MHz: 2.4 GHz and 5 GHz bands
	<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, 16QAM, 64QAM, 256QAM, DBPSK, DQPSK and CCK
	<b>Security<sup>1</sup></b>	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST.  Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows 7, Vista and XP only.
	<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.
	<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK
	<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between access points

### Technical Specifications

<b>Output Power</b> (for CCK) <sup>2</sup>	17 dBm , nominal
<b>Output Power</b> (for OFDM; power varies by data rate) <sup>2</sup>	15 dBm , nominal
<b>Power Consumption</b>	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)
<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity</b> <sup>3</sup>	270 Mbps: -68dBm , , 54 Mbps: -75 dBm, 11 Mbps: -88 dBm , 1 Mbps: -96 dBm
<b>Antenna Connections</b>	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure
<b>Form Factor</b>	PCI-Express Half-MiniCard
<b>Weight</b>	0.013 lb (6 g)
<b>Dimensions</b>	0.19 x 1.05 x 1.18 in (4.75 x 26.65 x 30 mm)
<b>Operating Voltage</b>	3.3v +/- 10%
<b>Temperature</b>	Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 212° F (-40° to 100° C)
<b>Humidity</b>	Operating 0% to 95% (non-condensing) Non-operating 0% to 95% (non-condensing)
<b>Altitude</b>	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Off - Radio OFF; Solid LED On - Radio ON

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. 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.

<b>HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology</b>	<b>Bluetooth Specification</b> 4.0+EDR Compliant
	<b>Dimensions</b> 1.18 x 0.26 x 0.13 in (30 x 6.5 x 3.25 mm)
	<b>Frequency Band</b> 2402 to 2480 MHz
	<b>Number of Available Channels</b> 79 (1 MHz) available channels
	<b>Data Rates and Throughput</b> 3 Mbps data rate; throughput up to 2.17 Mbps Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
	<b>Transmit Power</b> -1.5 dBm to 4 dBm (Bluetooth Class II)
	<b>Receiver Sensitivity</b> Better than -20 dBM at 0.1 % raw bit error rate
	<b>Power Consumption</b> Peak (Tx) 264 mW Peak (Rx) 231 mW Sleep <1 mW
	<b>Antenna</b> Internally integrated within module

### Technical Specifications

<b>Range</b>	Up 33 ft (10 m)
<b>Electrical Interface</b>	USB 2.0 compliant Microsoft Windows Plug and Play compliant
<b>Bluetooth Software Supported</b>	Broadcom Bluetooth for Windows Microsoft Windows Bluetooth Software
<b>Link Topology</b>	Point to Point, Multipoint Pico Nets up to 7 slaves
<b>Security</b>	Full support of Bluetooth Security Provisions
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support Self configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
<b>Certifications</b>	All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249 ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
<b>Temperature</b>	Operating -14° to 158° F (-10° to 70° C) Non-operating -40° to 212° F (-40° to 100° C)
<b>Humidity</b>	Operating 0% to 90% Non-operating 0% to 95%
<b>Altitude</b>	Operating 15,000 ft (4,572 m) Non-operating 40,000 ft (12,192 m)
<b>Bluetooth Profiles Supported</b>	Serial Port Profile (SPP) <sup>1</sup> Service Discovery Application Profile (SDAP) Dial-Up Networking (DUN) <sup>1,2</sup> Generic Object Exchange Profile (GOEP) <sup>1,2</sup> Object Push Profile (OPP) <sup>1,2</sup> File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP) <sup>1,2</sup> Personal Area Networking Profile (PAN) <sup>1,2</sup> Human Interface Device Profile (HID) <sup>1,2</sup> FAX Profile (FAX) Basic Imaging Profile (BIP) <sup>2</sup> Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

1. indicates the profile is supported by Microsoft Windows XP SP2

2. indicates the profile is part of Windows Vista

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## AUDIO/MULTIMEDIA

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### Audio

**SRS Premium Sound™ PRO**

### Technical Specifications

<b>Hardware</b>	<b>Implementation</b>	IDT 92HD80 High Definition CODEC
	<b>Function Key</b>	Volume up, volume down
	<b>Volume Controls</b>	
	<b>Mute Button</b>	Volume mute button with LED indicator
	<b>Full Duplex</b>	Yes
	<b>Microphone In</b>	Stereo
	<b>Headphone/Line Out</b>	Stereo
	<b>Integrated Microphone</b>	Yes, dual digital microphone array

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

<b>Internal Stereo Speaker</b>	<b>Power Rating</b>	2 Watts
	<b>Impedance</b>	4 ohms

## POWER

<b>HP 200W Slim Smart AC Adapter</b>	<b>Dimensions</b>	6.69 x 3.35 x 1.38 in (17.0 x 8.5 x 3.5 cm)		
	<b>Weight</b>	2.03 lb (920 g)		
	<b>Input</b>	<b>Input</b>	100 to 240 VAC	
		<b>Input Efficiency</b>	87% min at 115 VAC	
		<b>Input frequency range</b>	47 to 63 Hz	
	<b>Output</b>	<b>Input AC current</b>	2.9 A at 90 VAC, 1.45 A at 180 VAC	
		<b>Output power</b>	200W	
		<b>DC output</b>	19.5V	
		<b>Hold-up time</b>	5 msec at 115 VAC input	
		<b>Output current limit</b>	<16A, Over voltage protection- 29V max automatic shutdown	
		<b>Connector</b>	3 pin/grounded, mates with interchangeable cords	
		<b>Environmental Design</b>	<b>Operating temperature</b>	32° to 104° F (0° to 40° C)
	<b>Non-operating (storage) temperature</b>		-4° to 149° F (-20° to 65° C)	
	<b>Altitude</b>		0 to 10,000 ft (0 to 3,048 m)	
	<b>Humidity</b>		20% to 80%	
<b>Storage Humidity</b>	10% to 90%			

### Technical Specifications

	<b>EMI and Safety Certifications</b>	CE Mark- full compliance with LVD and EMC directives; Worldwide safety standards- IEC950, EN60950, UL1950, Class 1, SELV; Agency approvals- C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCIB, NOM-1 NYCE; MTBF- over 200,000 hours at 25°C ambient condition.	
<b>HP 150W Slim Smart AC adapter</b>	<b>Dimensions</b>	6.65 x 2.76 x 1.57 in (16.9 x 7.0 x 4.0 cm)	
	<b>Weight</b>	1.610 lb (0.73 kg)	
	<b>Input</b>	90 to 265 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	<2.7 A at 90 VAC
	<b>Output</b>	Output power	150W
		DC Output Voltage	19.50V +5.0%/-5.0%
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<15A, Over voltage protection- 29V max automatic shutdown
	<b>Connector</b>	3 pin/grounded, mates with interchangeable cords	
	<b>Environmental Design</b>	Operating temperature	41° to 95° F (5° to 35° C)
		Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)
	Altitude	0 to 10,000 ft (0 to 3,048 m)	
	Humidity	10% to 95%	
	Storage Humidity	10% to 95%	
	<b>EMI and Safety Certifications</b>	Worldwide safety and EMC approvals including CE, UL, CSA or cUL, GS, Australian Electric Permit, C-tick, NOM, CCC, KC, GOST, SABS, S mark, BSMI, ISC, PSE, PSB and SIL.	
<b>HP 120W Slim Smart AC Adapter</b>	<b>Dimensions</b>	4.72 x 2.28 x 0.67 in (148 x 75.5 x 25.4 mm)	
	<b>Input</b>	90 to 265 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	<2.2 A at 90 VAC
	<b>Output</b>	Output power	120W
		DC Output Voltage	19.50V +5.0%/-5.0%
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<16A, Over voltage protection- 29V max automatic shutdown
	<b>Connector</b>	3 pin/grounded, mates with interchangeable cords	
	<b>Environmental Design</b>	Operating temperature	32° to 104° F (0° to 40° C)
		Non-operating (storage) temperature	-4° to 149° F (-20° to 65° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
	Humidity	20% to 80%	
	Storage Humidity	10% to 90%	

### Technical Specifications

<b>EMI and Safety Certifications</b>	CE, UL, CSA or cUL, GS, Australian Electric Permit, C-tick, NOM, CCC, KC, GOST, SABS, S mark, BSMI, ISC, PSE, PSB and SII
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<b>HP 8-cell Lithium-Ion Battery (83 WHr)</b>	<b>Dimensions (H x W x L)</b>	0.8 x 2.1 x 10.6 in (2 x 5.3 x 27cm)		
	<b>Weight (max)</b>	0.99lb (0.442 kg)		
	<b>Cells/Type</b>	Lithium-Ion		
	<b>Energy</b>	Voltage	14.8V	
		Amp-hour capacity	5.6Ah	
		Watt-hour capacity	83Wh	
	<b>Temperature</b>	Operating (Charging)	32° to 113° F (0° to 45° C)	
		Operating (Discharging)	14° to 122° F (-10° to 50° C)	
		Non-operating	-4° to 122° F (-20° to 50° C)	
	<b>Battery Re-Charge Time</b>	System in OFF or Standby Mode	2.5 hours	
		System ON	3 to 5 hours	
<b>Fuel Gauge LED</b>	No			
<b>Warranty</b>	1 year			
<b>Compatible with optional Travel Battery</b>	Yes			

<b>HP Long Life 8-cell Lithium-Ion Battery (75 WHr)</b>	<b>Dimensions (H x W x L)</b>	0.8 x 2.1 x 10.6 in (2 x 5.3 x 27cm)		
	<b>Weight (max)</b>	0.99lb (0.442 kg)		
	<b>Cells/Type</b>	8-cell; Lithium-Ion		
	<b>Energy</b>	Voltage	14.4V	
		Amp-hour capacity	5.1Ah	
		Watt-hour capacity	75Wh	
	<b>Temperature</b>	Operating (Charging)	32° to 113° F (0° to 45° C)	
		Operating (Discharging)	14° to 140° F (-10° to 60° C)	
		Non-operating	-4° to 140° F (-20° to 60° C)	
	<b>Battery Re-Charge Time</b>	System in OFF or Standby Mode	2.5 hours	
		System ON	3 to 5 hours	
<b>Fuel Gauge LED</b>	No			
<b>Warranty</b>	3 year			
<b>Compatible with optional Travel Battery</b>	Yes			

### Technical Specifications

<b>Optional HP BB09 Ultra Extended Life Notebook Battery (secondary battery)</b>	<b>Dimensions (H x W x L)</b>	1.2 x 5.9 x 11.4 in (3x15x29cm)
	<b>Weight (max)</b>	1.5lb, (.682kg)
	<b>Cells/Type</b>	Lithium-Ion
	<b>Energy</b>	<b>Voltage</b> 11.25V
		<b>Amp-hour capacity</b> 8.85Ah
		<b>Watt-hour capacity</b> 100Wh
	<b>Temperature</b>	<b>Operating (Charging)</b> 32° to 113° F (0° to 45° C)
		<b>Operating (Discharging)</b> 14° to 122° F (-10° to 50° C)
		<b>Non-operating</b> -4° to 122° F (-20° to 50° C)
	<b>Battery Re-Charge Time</b>	<b>System in OFF or Standby Mode</b> 3.5 to 5 hours
		<b>System ON</b> 4 to 7 hours
	<b>Fuel Gauge LED</b>	Yes
	<b>Warranty</b>	1 year
	<b>Compatible with optional Travel Battery</b>	No

<b>Optional HP ST09 Extended Life Notebook Battery ("Travel Battery") (secondary battery)</b>	<b>Dimensions (H x W x L)</b>	1.2 x 6.1 x 12 in (3x15.5x30.5cm)
	<b>Weight (max)</b>	1.2lb, (.550kg)
	<b>Cells/Type</b>	Lithium-Ion Polymer
	<b>Energy</b>	<b>Voltage</b> 11.1V
		<b>Amp-hour capacity</b> 6.6Ah
		<b>Watt-hour capacity</b> 73Wh
	<b>Temperature</b>	<b>Operating (Charging)</b> 32° to 113° F (0° to 45° C)
		<b>Operating (Discharging)</b> 14° to 122° F (-10° to 50° C)
		<b>Non-operating</b> -4° to 122° F (-20° to 50° C)
	<b>Battery Re-Charge Time</b>	<b>System in OFF or Standby Mode</b> 3.5 to 5 hours
		<b>System ON</b> 4 to 7 hours
	<b>Fuel Gauge LED</b>	Yes
	<b>Warranty</b>	1 year
	<b>Compatible with optional Travel Battery</b>	Yes

### ENVIRONMENTAL

### Technical Specifications

#### Environmental Data

<b>Eco-Label Certifications</b>	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:		
	US Energy Star® IT ECO declaration EPEAT Gold where HP registers commercial desktop products. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country US Federal Energy Management Program (FEMP)		
<b>System Configuration</b>	The configuration used for the Energy Consumption and Declared Noise Emissions data is based on a "Typically Configured Notebook"		
<b>Energy Consumption</b>	115 VAC	230 VAC	100 VAC
Normal Operation	18.31 W	18.33 W	18.37 W
Sleep (Energy Star low power mode)	1.38 W	1.42 W	1.37 W
Off	0.77 W	0.82 W	0.77 W
<b>Heat Dissipation*</b>	115 VAC	230 VAC	100 VAC
Normal Operation	63 BTU/hr	63 BTU/hr	63 BTU/hr
Sleep	5 BTU/hr	5 BTU/hr	5 BTU/hr
Off	3 BTU/hr	3 BTU/hr	3 BTU/hr

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

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

System Fan Off	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.3	27
Fixed Disk (random writes)	4.0	33

System fan is usually off except when charging the battery

**Batteries** This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight

The battery type and chemistry used in the product is:

CR2032 (coin cell), Li-ion  
 6-cell high capacity Lithium-Ion battery (optional 8 cell available)

#### 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).

### Technical Specifications

This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see [www.epeat.net](http://www.epeat.net)

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

This product contains 0% post-consumer recycled plastic (by wt.)

This product is greater than 92.4% recycle-able when properly disposed of at end of life.

#### Packaging Materials

- External:
- PAPER/Corrugated 374 g
- Internal:
- PLASTIC/Polyethylene low density 30 g
- PLASTIC/EPE-Expanded Polyethylene 28 g
- OTHER/OTHER 20 g
- PLASTIC/Polypropylene 15 g
  
- The PAPER/Corrugated packaging material is made from 74% recycled content.
- The PLASTIC/Polyethylene low density packaging material is made from 0% recycled content
- The PLASTIC/EPE-Expanded Polyethylene packaging material is made from 0% recycled content
- The OTHER/OTHER packaging material is made from 0% recycled content.
- The PLASTIC/Polypropylene packaging material is made from 0% 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.

### Technical Specifications

#### MATERIAL USAGE

This product does not contain any of the following substances in excess of regulatory limits (for reference of these limits please refer to the HP General Specification of the Environment

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

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- 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)
- Nickel finishes that release greater than 0.5 µgrams/cm<sup>2</sup>/week, measured according to EN 1811:1998, are not used on any product surface designed to be frequently handled or touched by users.

#### 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>

*Options and Accessories (sold separately and availability may vary by country)*

Type	Description	Part #
<b>Cases</b>	HP Business Nylon Carrying Case	BP848AA
	HP Business Nylon Backpack	BP849AA
	HP Deluxe 4 Wheel Roller	XW576AA
<b>Docking</b>	HP Display and Notebook Stand	AW662AA
	HP Dual Hinge Notebook Stand	AW661AA
	HP 90W Docking Station	A7E32AA
	HP 230W Docking Station	A7E34AA
	HP 120W Advanced Docking Station	A7E36AA
	HP 230W Advanced Docking Station	A7E38AA
<b>Input/Output - Mice</b>	HP 2.4 GHz Wireless Optical Mobile Mouse	LX732AA
	HP Wireless Mobile Mouse	H2L63AA
	HP USB Essential Keyboard/Mouse	H2S75AA
<b>Adapters</b>	HP 90W Slim Adapter	BT796AA
	HP 90W Smart AC/Auto/Air Combo Adapter	ED493AA
<b>Storage - External Storage</b>	HP Mobile USB DVDRW	A2U57AA
	HP Upgrade Bay 500 GB 7200rpm Primary SATA Hard Drive	AU097AA
	HP 2011 BNB Notebook Upgrade Bay 500 GB Hard Drive	LX733AA
	HP 2011 BNB Notebook Upgrade Bay DL DVD+/-RW	LZ835AA
<b>Batteries</b>	HP ST09 Extended Life Notebook Battery	QK639AA
	HP BB09 Ultra Extended Life Notebook Battery	QK640AA
<b>Health and Education</b>	HP 20-Notebook Managed Charging Cart	QL489AA
	HP 20-Notebook Charging Cart	QL488AA
	HP 30-Notebook Managed Charging Cart	QL490AA
	HP Pocket Whiteboard	A0X37AA
<b>Security</b>	HP Docking Station Cable Lock	AU656AA

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