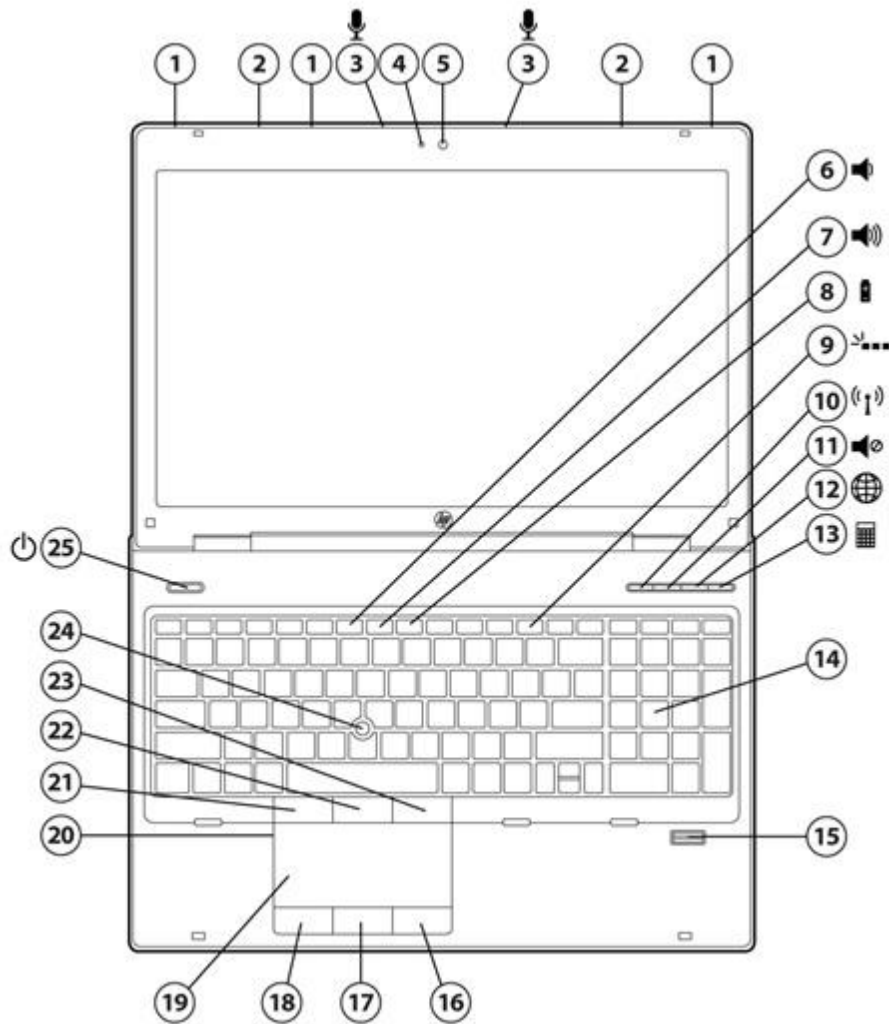


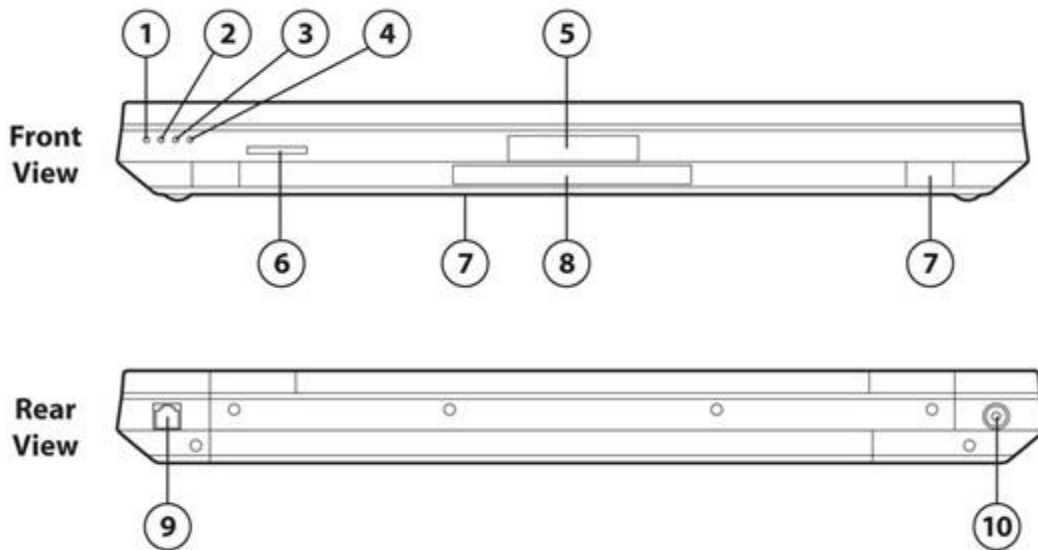
Overview

HP EliteBook 8570w Mobile Workstation

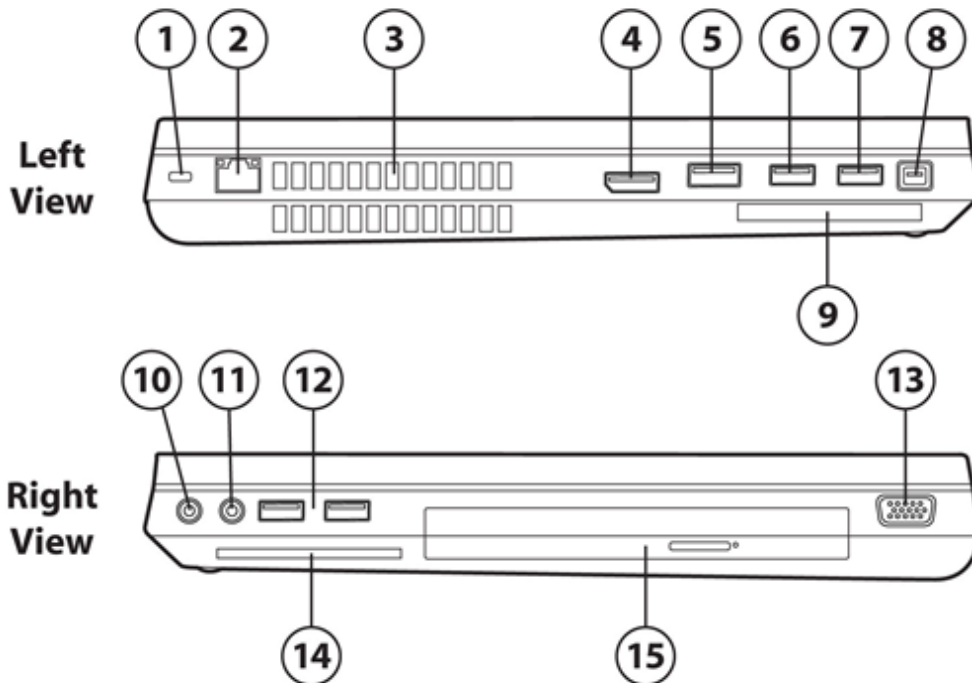


- | | |
|--|-------------------------------------|
| 1. WLAN antennas (3) | 14. Numeric keypad |
| 2. WWAN antennas (2) | 15. HP Fingerprint Sensor |
| 3. Dual-microphone array | 16. Right Touchpad button |
| 4. Webcam light (with webcam) | 17. Center Touchpad button |
| 5. Optional 720p HD webcam | 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



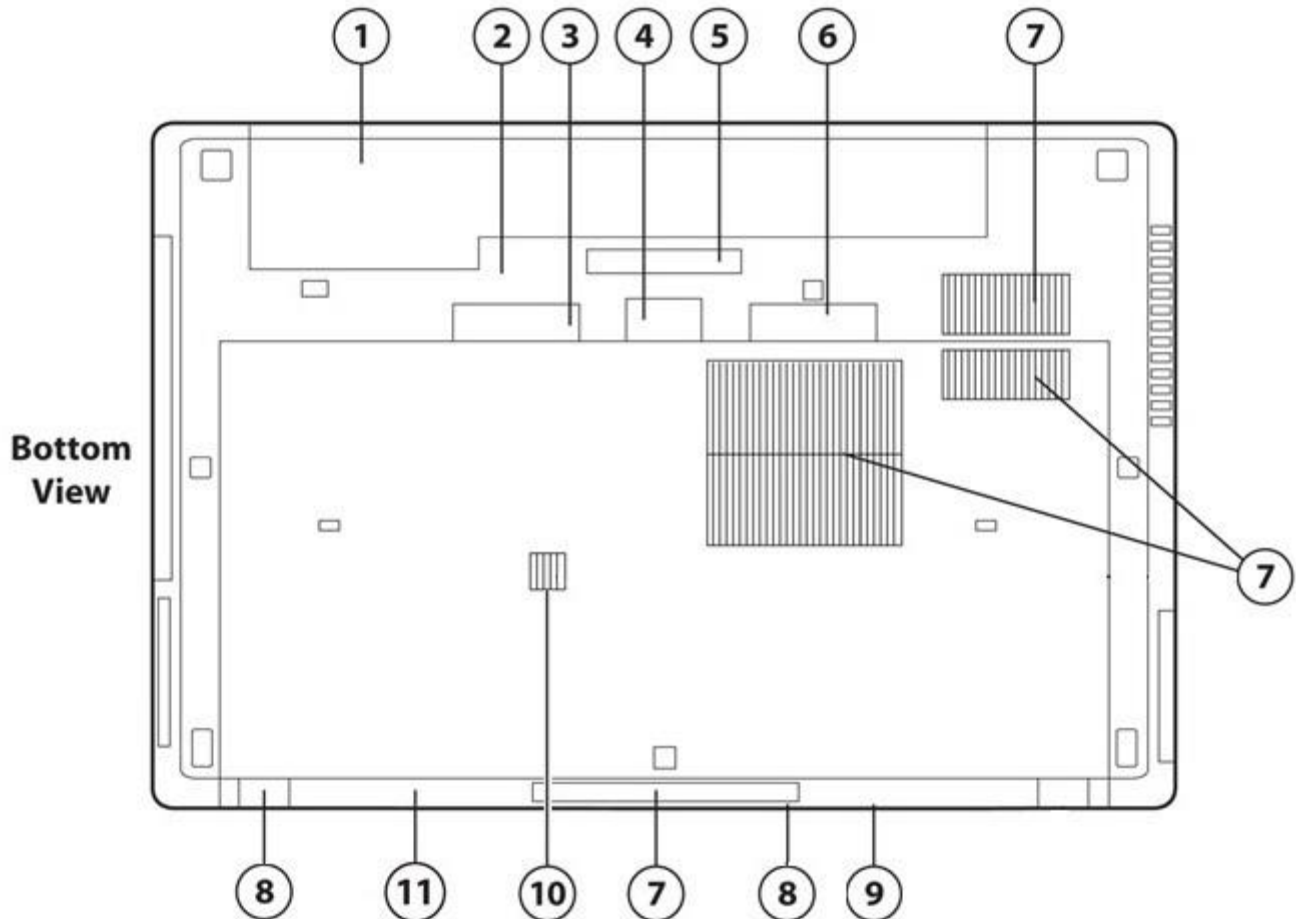
- 1. Wireless LED indicator
- 2. Power/standby LED indicator
- 3. Battery charging LED indicator
- 4. Hard drive activity / HP 3D DriveGuard LED indicator
- 5. Display release latch
- 6. Secure Digital slot
- 7. Stereo speakers
- 8. Vent
- 9. RJ-11/modem port
- 10. Power connector



- 1. Security lock slot
- 2. RJ-45/Ethernet port
- 3. ExpressCard/54 slot
- 4. Stereo headphone/line out
- 5. FireWire port
- 6. USB port
- 7. FireWire port
- 8. FireWire port
- 9. ExpressCard/54 slot
- 10. Stereo headphone/line out
- 11. FireWire port
- 12. FireWire port
- 13. FireWire port
- 14. FireWire port
- 15. FireWire port

Overview

3. Vents
4. DisplayPort
5. eSATA/USB 2.0 combo port
6. USB 2.0 port
7. USB 2.0 charging port
8. 1394a port
11. Stereo microphone/line in
12. (2) USB 3.0 ports
13. VGA/external monitor connector
14. Smart Card Reader
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.

At A Glance

- Windows 8 versions, 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-

Overview

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 drive¹
- 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 Peak Power Manager (web download) and HP Power Assistant (Windows 7 only) allow 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
- Low halogen**, ENERGY STAR qualified and EPEAT Gold registered in the U.S. EPEATstatus varies by country- please see 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.

** External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.

Features

OPERATING SYSTEM

Preinstalled

- Windows 8 Pro 64*
- Windows 7 Professional (available through downgrade rights from Windows 8 Pro)**
- Windows 7 Professional 32*
- Windows 7 Professional 64*

Supported

- FreeDOS
- Windows 8 Pro 32*
- Windows 8 32*
- Windows 8 Enterprise 32*
- Windows 8 Enterprise 64*
- Windows 7 Enterprise 32***
- Windows 7 Enterprise 64***
- Windows XP Professional 32
- Windows XP Professional 64
- SuSE Linux Enterprise Desktop 11 SP2
- Red Hat Enterprise Linux 6.x

Certified

- SuSE Linux Enterprise Desktop 11
- Red Hat Enterprise Linux 6.x

* Not all features are available in all editions of Windows 8. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8 functionality. See <http://www.microsoft.com> for details.

** This system is preinstalled with Windows® 7 Pro software and also comes with a license and media for Windows 8 Pro software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

*** 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*

- 3rd Generation Intel® Core™ i7-3840QM (2.8 GHz, 8 MB L3 cache, 4 cores)*
Up to 3.80 GHz with Intel Turbo Boost Technology
- 3rd Generation Intel® Core™ i7-3820QM (2.7 GHz, 8 MB L3 cache, 4 cores)*
Up to 3.70 GHz with Intel Turbo Boost Technology
- 3rd Generation Intel® Core™ i7-3740QM (2.70 GHz, 6 MB L3 cache, 45W, 4 cores)*
Up to 3.70 GHz with Intel Turbo Boost Technology
- 3rd Generation Intel® Core™ i7-3720QM (2.6 GHz, 6 MB L3 cache, 4 cores)*
Up to 3.60 GHz with Intel Turbo Boost Technology
- 3rd Generation Intel® Core™ i7-3630QM (2.40 GHz, 6 MB L3 cache, 45W, 4 cores) (no vPro support)*
Up to 3.40 GHz with Intel Turbo Boost Technology
- 3rd 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
- 3rd Generation Intel® Core™ i7-3520M (2.9 GHz, 4 MB L3 cache, 2 cores)*
Up to 3.60 GHz with Intel Turbo Boost Technology
- 3rd Generation Intel® Core™ i5-3360M (2.8 GHz, 3 MB L3 cache, 2 cores)*
Up to 3.50 GHz with Intel Turbo Boost Technology
- 3rd 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

Features

depending on your hardware and software configurations. Intel's numbering is not a measurement of higher performance.

CHIPSET

Mobile Intel QM77 Express

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 8.0 (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.

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>

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

Features

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 36GB (for Windows 7) of system and up to 36GB (for Windows 8) disk is reserved for 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

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

Features

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) (Win 8 WWAN support will not be available at Win 8 introduction)

HP hs2350 HSPA+ Mobile Broadband Module

HP un2430 EV-DO/HSPA Mobile Broadband Module

HP lt2522 LTE/EV-DO Mobile Broadband Module - U.S. only*

HP lt2523 LTE/HSPA+ Mobile Broadband Module - U.S. only* (no Win 8 support)

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.

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

Features

- 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 (Windows 7 only), 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 Peak Power Manager (web download)*

HP Power Assistant (Windows 7 only)

HP Wireless Hotspot (Windows 8 only, web download)

HP Connection Manager (Windows 7 only)

HP GPS and Location (Select Models)

Adobe® Flash Player (Windows 7 only)

Buy Office

Microsoft Defender (now includes MS Security Essentials)

Microsoft Security Essentials (Windows 7 only)

PDF Complete Special Edition**

Corel WinDVD SD (DVD) Player, or HD (Blu-ray) Player (select Windows 7 models)

Roxio Secure Burn (select Windows 7 models)

Roxio MyDVD Business 2010 (select Windows 7 models)

HP Webcam Software (select models)

WinZip Basic (Windows 7 only)

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>

* HP Peak Power Manager replaces HP Power Assistant for both Win7 and Win8. HP Peak Power Manager will be available on

Features

[the web for download for existing product owners.](#)

** 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 36GB (for Windows 7) of system and up to 36GB (for Windows 8) disk is reserved for 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 Client Security Dashboard (Windows 8 only)

HP ProtectTools Security Manager (standard modules include)

- Credential Manager
- Computrace* Pro
- Device Access Manager
- Drive Encryption (will be web-only ready at Win8 GA date)
- Face Recognition (webcam configurations only)
- File Sanitizer (Windows 7 only)
- Privacy Manager (Windows 7 only)
- Embedded Security (Windows 7 only)

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**

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 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/>.

Features

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.

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)

Battery Life

Battery life up to 6 hours and 30 minutes***

System Standby Time

Up to 2 weeks

* HP Fast Charge recharges your battery up to 90% within 90 minutes when the system is off. HP Fast Charge does not apply

Features

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

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.

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.

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

Features

Digital Media Slots

ExpressCard/54 slot – One (Supports ExpressCard/54)

SD slot – One (Supports SD (Secure Digital), SDHC, SDXC)

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

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	19.5 V		
	Average Operating Power		Windows 7 (32-bit)	Windows 7 (64-bit)
		AMD Graphics	13.28 W	13.67 W
		NVIDIA Graphics	16.28 W	16.8 W
	Max Operating Power	< 120 W or < 150 W or < 200 W		
Temperature	Operating	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)		
	Non-operating	-4° to 140° F (-20° to 60° C)		
Relative Humidity	Operating	10% to 90%, non-condensing		
	Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature		
Shock	Operating	40 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)		
Planned Industry Standard Certifications	UL	Yes		
	CSA	Yes		
	FCC Compliance	Yes		
	ENERGY STAR®	Select models*		
	EPEAT	Gold**		
	ICES	Yes		
	Australia / NZ A-Tick Compliance	Yes		
	CCC	Yes		
	Japan VCCI Compliance	Yes		
	KC	Yes		
	BSMI	Yes		
	CE Marking Compliance	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.

** EPEAT registration varies by country. See 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

15.6-inch FHD WVA LED anti-glare	Dimensions (W x H)	13.54 x 7.59 in (34.4 x 19.4 cm)
	Diagonal Size	15.6 in (39.6 cm)

Technical Specifications

Surface Treatment	Anti-glare	
Contrast Ratio	300:1 (min)	
Refresh Rate	60 Hz	
Brightness	220 nit typical	
Pixel Resolution	Pitch	0.17925 mm x 0.17925 mm
	Format	1920x1080
	Configuration	RGB Stripe
Backlight	LED	
PPI	142	
Viewing Angle	±60° Horizontal, ±50° Vertical (minimum) 60/60/50/50 (Left/Right/Down/Up) (minimum)	

15.6-inch LED FHD UWVA (1920 x 1080) anti-glare DreamColor

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

17.3-inch FHD UWVA LED anti-glare Dreamcolor

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

Technical Specifications

STORAGE AND DRIVES

Internal Storage

750 GB 7200 rpm SATA Hard Drive	Drive Weight	0.22 lb (101 g)	
	Capacity	750 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) 300 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	1,465,149,168	
Operating Temperature	32° to 140° F (0° to 60° C) [case temp]		
Features	ATA Security		

500 GB 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115g)	
	Capacity	500 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) 300 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	976,773,168	
Operating Temperature	32° to 140° F (0° to 60° C) [case temp]		
Features	ATA Security		

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

Technical Specifications

320 GB 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115 g)		
	Capacity	320 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)	300 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	625,142,448		
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]		
	Features	ATA Security		

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

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

SATA 6 Gb/s 128 GB, 2.5-inch Solid State Drive	Drive Weight	73 Grams		
	Capacity	128 GB		
	Height	0.276 in (7 mm)		
	Width	2.76 in (70 mm)		
	Interface	SATA 3 (6 Gb/s)		
	Performance	Maximum Sequential Read	415 MB/s	Maximum Sequential Write 175 MB/s
		Logical Blocks	351,651,888	
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]		
Features	ATA Security; ATA-8, SATA 3.0; DIPM; TRIM			

Technical Specifications

Logical Blocks	250,069,680
Operating Temperature	32° to 158°F (0° to 70°C) [case temp]
Features	ATA Security; ATA-8; SATA 3.0 DIPM; TRIM

Optical Drives

DVD-ROM Drive

Access Times	Random	< 140 ms CD (typical) < 160 ms DVD (typical)
Max Data Transfer Rate	24X CD-ROM 8X-DVD	
Transfer Mode	UDMA Mode 5	
Interface	Gen 1 SATA	
Supported Media (read)	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	
Supported Media (write)	None	
Max Media Capacity (read)	8.5GB	
Transport	Tray Loading	

DVD+/-RW SuperMulti DL Drive

Access Times	Random	<140ms CD (typical) < 160 ms DVD (typical)
Max Data Transfer Rate	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	
Transfer Mode	UDMA Mode 5	
Interface	Gen 1 SATA	
Supported Media (read)	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	
Supported Media (write)	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, DVD+R DL, DVD-R DL	
Max Media Capacity (read)	8.5 GB	
Max Media Capacity (write)	8.5 GB	
Transport	Tray Loading	

Technical Specifications

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

Blu-ray R/RE DVD+/-RW SuperMulti DL Drive	Access Times	Random	<165 ms CD-ROM (typical) <185 ms DVD-ROM (typical) <205 ms BD-ROM (typical)
	Max Data Transfer Rate	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	
	Transfer Mode	UDMA Mode 5	

Technical Specifications

Interface	Gen 1 SATA
Supported Media (read)	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
Supported Media (write)	CD-R, CD-RW, DVD+R, DVD+R DL, DVD+RW, DVD-R, DVD-R DL, DVD-RW, DVD-RAM, BD-R, BD-RE
Max Media Capacity (read)	50.0 GB
Max Media Capacity (write)	50.0 GB
Transport	Tray Loading

SECURITY

HP Fingerprint Sensor	Mobile Voltage 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

NETWORKING/COMMUNICATIONS

Intel® 82579LM Gigabit Network Connection	Ethernet Features	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 8023. 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
	Power Management	ACPI compliant - multiple power modes Energy Detect Low Power Mode(Green Ethernet)
	Performance Features	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload(ARP & NS) Large send offload and Giant send offload Receiving Side Scaling MACSec Offload (802.3ae)
	Manageability	Intel vPro iSCSI Boot Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft

Technical Specifications

		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 Virtual Cable Doctor for Ethernet cable status Interface PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ. NOTE: Intel 82579 PCIe interface is not PCIe compliant. It operates at half of PCIe specification V1.1 (2.5GT/S) speed.
	NIC Device Driver Name	Intel 82579LM/82579V Ethernet Network Connection
V.92 56K Data/Fax Modem	Form Factor	MDC 1.5 Daughtercard
	Power Management Support	APM Revision 1.2, ACPI
	Approvals/Certifications	UL, CSA, NEMKO, CCIB, Industry Canada, FCC Part 68, CTR21, FCC Part 15 Class B, Canadian ICES-003 Class B, C.I.S.P.R.22, Australian ACA, CE Mark, Other Countries
	Data Mode Capabilities	V.92 data V.8bis V.80 V44, V.42bis, MNP5 (Compression) V.42 (LAPM, MNP2-4) (Error Correction) Optional symbol rates: 2800, 3429 Asymmetric Symbol rates Synchronous primary channel data signaling rates: 3600, 31200 Automatic rate re-negotiation V.34 V.32bis V.32 V.23 V.22bis V.22 V.21 Bell 212A Bell 103J
	Fax Mode Capabilities	TIA/EIA-578-B (Class 1) T.30, T.4 (Group 3) V.17 V.29 V.27ter V.21 Channel 2 T.31
	Command Set	V.250 (Partial) TIA-602 Identification: +GMI, +GMM, +GMR Port control: +IPR, +ICF, +IFC, +ILRR Modulation: +MS, +MR, +MA Error control: +ES, +ER, +EB, +ESR, +ETBM Data compression: +DS, +DR V.251

Technical Specifications

HP un2430 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), 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)
	Wireless Protocol Standards	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
	Wireless Parametric Standards	Meets or exceeds TIA/EIA IS-98-D
	Maximum Data Rates	UMTS (HSPA) - 14.4 Mbps (Download), 5.76Mbps (Upload) CDMA (EVDO Release A) - 3.1 Mbps (Download), 1.8Mbps (Upload)
	GPS	Standalone GPS enabled gpsOneXTRATM™
	GPS Bands	L1 - 1575.42 MHz
	Maximum Output Power	GSM/GPRS/EDGE: 32dBm (+/-1) WCDMA: 24dBm (+0.7/-2.3) CDMA: 24dBm (+0.7/-2)
	Maximum Power Consumption	2750mA (peak); 1100mA (average)
	Power Consumption, Idle Not Connected	20 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, USB 2.0 interface
	Weight	11.5 g
	Dimensions (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 5 mm)
	Voltage, Operating	3.3v +/- 10%
	Temperature, Operating (from TIA/EIA/IS-98-D)	-22° to 158° F (-30° to 70° 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	95% 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

HP hs2350 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), 900MHz(UTRA FDD Band VIII), 850 MHz (UTRA FDD Band V)
--	-----------------------------------	---

Technical Specifications

Wireless Protocol Standards	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
Wireless Parametric Standards	Complies with 3GPP specifications
Maximum Data Rates	UMTS (HSPA) - 21 Mbps (Download), 5.76Mbps (Upload)
GPS	Standalone, A-GPS (Internet- and Network assisted)
GPS Bands	1575.42 MHz (± 1.023 MHz)
Maximum Output Power	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) UMTS UTRA FDD Bands +24 dBm +4 / -3 dBm (class 3)
Maximum Power Consumption	2000mA (peak); 600mA (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, USB 2.0 interface
Weight	< 12 g
Dimensions (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 5 mm)
Voltage, Operating	3.3v +/- 9%
Temperature, Operating	14° to 149° F (-10° to 65° C) (full RF performance) 14° to 167° F (-10° to 75° C) (reduced RF performance)
Temperature, Non-operating, 96 hours (from MIL-STD 202 Method 108)	-22° to 185° F (-30° 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

HP It2522 LTE/EV-DO Mobile Broadband Module

Technology/Operating Bands	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)
-----------------------------------	---

Technical Specifications

Mobile Operator	Verizon (US only)
Wireless Protocol Standards	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
Wireless Parametric Standards	Complies with 3GPP specifications Release 8 for LTE
Maximum Data Rates	EvDO (Revision A) - 3.1 Mbps (Download), 1.8 Mbps (Upload) WCDMA (DC-HSPA+) - 42Mbps (Download) LTE (Category 3) - 100 Mbps (Download), 50Mbps (Upload)
GPS	Standalone, Assisted, XTRA
GPS Bands	1575.42 MHz (± 1.023 MHz)
Maximum Output Power	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)
Maximum Power Consumption	2700mA (peak)
Power Consumption, Sleep Mode	10 mA
Power Management	USB selective suspend Integrated notebook wireless button
Antenna Type	Dual high efficiency 6 band antennae with spatial diversity, mounted in the display enclosure
Form Factor	PCI-Express MiniCard, USB 2.0 interface
Weight	< 10 g
Dimensions (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 4.5 mm)
Voltage, Operating	3.3v +/- 9%
Temperature, Operating	-4° to 149° F (-20° to 65° C)
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)
LED Activity	LED Off - Radio Off; Solid LED On - Radio On

HP It2523 LTE/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), 850 MHz (UTRA FDD Band V) LTE: AWS (Band IV) 700 MHz (AT&T, Band XVII)
Mobile Operator	AT&T (US only)
Wireless Protocol Standards	LTE: Power Class III as per 3GPP TS 36.101
Wireless Parametric Standards	Complies with 3GPP specifications Release 8 for LTE
Maximum Data Rates	WCDMA (DC-HSPA+) - 42Mbps (Download) LTE (Category 3) - 100 Mbps (Download), 50Mbps (Upload)

Technical Specifications

GPS	Standalone, Assisted, XTRA
GPS Bands	1575.42 MHz (± 1.023 MHz)
Maximum Output Power	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)
Maximum Power Consumption	2700mA (peak)
Power Consumption, Sleep Mode	10 mA
Power Management	USB selective suspend Integrated notebook wireless button
Antenna Type	Dual high efficiency 6 band antennae with spatial diversity, mounted in the display enclosure
Form Factor	PCI-Express MiniCard, USB 2.0 interface
Weight	< 10 g
Dimensions (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 4.5 mm)
Voltage, Operating	3.3v +/- 9%
Temperature, Operating	-4° to 149° F (-20° to 65° C)
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)
LED Activity	LED Off - Radio Off; Solid LED On - Radio On

Intel Centrino Advanced-N 6205 (2x2)	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n
	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 7, Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.4 GHz and 5GHz
	Antenna Structure	2 transmit; 2 receive (2x2)
	Data Rates	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
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
	Security¹	Authentication: WPA and WPA2, 802.1x (EAP_TLS, TTLS, PEAP, LEAP, EAP-FAST) Authentication Protocols: PAP, CHAP, TLS, GTC, MS-CHAP, MS-CHAPv2

Technical Specifications

	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.
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 2.4GHz band Access Points
Output Power (for CCK and OFDM) ²	17 dBm max
Power Consumption	Transmit: 2.3 Watts (max, with two spatial streams) Receive: 1 Watt (max with two spatial streams) Idle mode ³ : 35 mW (average) Radio off: 20 mW (max)
Power Management	ACPI compliant power management 802.11 compliant power saving mode
Receiver Sensitivity ⁴	54 Mbps: -76 dBm, 6 Mbps: -92 dBm
Antenna Connections	2 U.FL type connectors, 50 ohm nominal impedance
Form Factor	PCI-Express Half-MiniCard
Weight	0.0075 lb (3.4 g)
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)
Operating Voltage	3.3V +/- 9%
Temperature	Operating 32° to 176° F (0° to 80° C) Non-operating -40° to 176° F (-40° to 80° C)
Humidity	Operating 10% to 90% (non-condensing) Non-operating 5% to 90% (non-condensing)
Altitude	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. In Power Save Polling mode and on battery power.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.

Intel Centrino Ultimate-N Wireless LAN Standards 6300	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n
Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 7, Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)
Frequency Band	2.4 GHz and 5GHz

Technical Specifications

Antenna Structure	3 transmit; 3 receive (3x3)
Data Rates	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
Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
Security¹	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.
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 and OFDM) ²	17 dBm max
Power Consumption	Transmit: 1.4 Watts (average, with one spatial streams) Receive: 1.3 Watts (average with two receive chains) Idle mode ³ : 30 mW (average) Radio off: 20 mW (max)
Power Management	ACPI compliant power management 802.11 compliant power saving mode
Receiver Sensitivity⁴	54 Mbps: -76 dBm, 6 Mbps: -92 dBm
Antenna Connections	3 U.FL type connectors, 50 ohm nominal impedance
Form Factor	PCI-Express Half-MiniCard
Weight	0.0075 lb (3.4 g)
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)
Operating Voltage	3.3V +/- 9%
Temperature	Operating 32° to 176° F (0° to 80° C) Non-operating -40° to 176° F (-40° to 80° C)
Humidity	Operating 10% to 90% (non-condensing) Non-operating 5% to 90% (non-condensing)
Altitude	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON

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

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

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

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

Technical Specifications

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 suppliers. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.

Broadcom 43224AGN 802.11a/b/g/n (2x2)	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n*
	Interoperability	Wi-Fi certified (802.11abg only) Cisco Compatible Extensions Program compliant (802.11abg only) with Microsoft Windows 7, Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.4 GHz and 5 GHz
	Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 6, 6.5, 9, 12, 13, 13.5, 18, 19.5, 24, 26, 27, 36, 39, 40.5, 48, 52, 54, 58.5, 65, 78, 81, 104, 108, 117, 121.5, 130, 135, 162, 216, 243, 270, 300 Mbps
	Frequency Support	20 MHz: 2.4 GHz and 5 GHz bands 40 MHz: 2.4 GHz and 5 GHz bands
	Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, 16QAM, 64QAM, 256QAM, DBPSK, DQPSK and CCK
	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 7, 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 , nominal
	Output Power (for OFDM; power varies by data rate)²	15 dBm , nominal
	Power Consumption	Idle associated: 250 mW Idle unassociated: 150 mW Transmit/Receive 20 MHz channel: 2.0 W (max) Transmit/Receive 40 MHz channel: 2.0 W (max)
	Power Management	ACPI compliant power management 802.11 compliant power saving mode
	Receiver Sensitivity³	270 Mbps: -68dBm, , 54 Mbps: -75 dBm, 11 Mbps: -88 dBm , 1 Mbps: -96 dBm
	Antenna Connections	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure
	Form Factor	PCI-Express Half-MiniCard

Technical Specifications

Weight	0.013 lb (6 g)	
Dimensions	0.19 x 1.05 x 1.18 in (4.75 x 26.65 x 30 mm)	
Operating Voltage	3.3v +/- 10%	
Temperature	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 212° F (-40° to 100° C)
Humidity	Operating	0% to 95% (non-condensing)
	Non-operating	0% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON	

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

HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology	Bluetooth Specification	4.0+EDR Compliant	
	Dimensions	1.18 x 0.26 x 0.13 in (30 x 6.5 x 3.25 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	-1.5 dBm to 4 dBm (Bluetooth Class II)	
	Receiver Sensitivity	Better than -20 dBm at 0.1 % raw bit error rate	
	Power Consumption	Peak (Tx) 264 mW	
		Peak (Rx) 231 mW	
		Sleep <1 mW	
	Antenna	Internally integrated within module	
	Range	Up 33 ft (10 m)	
	Electrical Interface	USB 2.0 compliant	
	Bluetooth Software Supported	Microsoft Windows Plug and Play compliant	
Broadcom Bluetooth for Windows Microsoft Windows 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		

Technical Specifications

	UL, CSA, and CE Mark	
Temperature	Operating	-14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 212° F (-40° to 100° C)
Humidity	Operating	0% to 90%
	Non-operating	0% to 95%
Altitude	Operating	15,000 ft (4,572 m)
	Non-operating	40,000 ft (12,192 m)
Bluetooth Profiles Supported	Serial Port Profile (SPP) ¹	
	Service Discovery Application Profile (SDAP)	
	Dial-Up Networking (DUN) ^{1,2}	
	Generic Object Exchange Profile (GOEP) ^{1,2}	
	Object Push Profile (OPP) ^{1,2}	
	File Transfer Profile (FTP)	
	Synchronization Profile (SYNC)	
	Hard Copy Cable Replacement (HCRP) ^{1,2}	
	Personal Area Networking Profile (PAN) ^{1,2}	
	Human Interface Device Profile (HID) ^{1,2}	
	FAX Profile (FAX)	
	Basic Imaging Profile (BIP) ²	
	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

AUDIO/MULTIMEDIA

Audio **SRS Premium Sound™ PRO**

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

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

Technical Specifications

	ADC	16 or 20-bit
Internal Stereo Speaker	Power Rating	2 Watts
	Impedance	4 ohms

POWER

HP 200W Slim Smart AC Adapter	Dimensions	6.77 x 3.80 x 1.0 in (172 x 96 x 25.4 mm)		
	Weight	1.65 lb (748 g)		
	Input	Input	100 to 240 VAC	
		Input Efficiency	87% min at 115 VAC	
		Input frequency range	47 to 63 Hz	
	Output	Input AC current	2.9 A at 90 VAC, 1.45 A at 180 VAC	
		Output power	200W	
		DC output	19.5V	
	Connector	Hold-up time	5 msec at 115 VAC input	
		Output current limit	<16A, Over voltage protection- 29V max automatic shutdown	
		Environmental Design	3 pin/grounded, mates with interchangeable cords	
	EMI and Safety Certifications	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%		

HP 150W Slim Smart AC adapter	Dimensions	6.59 x 3.23 x 1.0 in (167.5 x 82 x 25.4 mm)		
	Weight	1.25 lb (565 g)		
	Input	Input	90 to 265 VAC	
		Input Efficiency	87% min at 115 VAC	
		Input frequency range	47 to 63 Hz	
	Output	Input AC current	<2.7 A at 90 VAC	
		Output power	150W	
		DC Output Voltage	19.50V +5.0%/-5.0%	
	Connector	Hold-up time	5 msec at 115 VAC input	
		Output current limit	<15A, Over voltage protection- 29V max automatic shutdown	
		Environmental Design	3 pin/grounded, mates with interchangeable cords	
	EMI and Safety Certifications	Operating temperature	41° to 95° F (5° to 35° C)	
		Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)	

Technical Specifications

	Altitude	0 to 10,000 ft (0 to 3,048 m)
	Humidity	10% to 95%
	Storage Humidity	10% to 95%
EMI and Safety Certifications	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 SII.	

HP 120W Slim Smart AC Adapter	Dimensions	5.83 x 2.97 x 1.0 in (148 x 75.5 x 25.4 mm)	
	Weight	1.03 lb (465 g)	
	Input	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
	Output	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
	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, UL, CSA or cUL, GS, Australian Electric Permit, C-tick, NOM, CCC, KC, GOST, SABS, S mark, BSMI, ISC, PSE, PSB and SII		

HP 8-cell Lithium-Ion Battery (83 WHr)	Dimensions (H x W x L)	0.8 x 2.1 x 10.6 in (2 x 5.3 x 27cm)	
	Weight (max)	0.99lb (0.442 kg)	
	Cells/Type	Lithium-Ion	
	Energy	Voltage	14.8V
		Amp-hour capacity	5.6Ah
		Watt-hour capacity	83Wh
	Temperature	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)
	Battery Re-Charge Time	System in OFF or Standby Mode	2.5 hours
		System ON	3 to 5 hours
Fuel Gauge LED	No		
Warranty	1 year		
Compatible with optional Travel Battery	Yes		

HP Long Life 8-cell	Dimensions (H x W x L)	0.8 x 2.1 x 10.6 in (2 x 5.3 x 27cm)
----------------------------	-------------------------------	--------------------------------------

Technical Specifications

Lithium-Ion Battery (75 WHr)	Weight (max)	0.99lb (0.442 kg)	
	Cells/Type	8-cell; Lithium-Ion	
	Energy	Voltage	14.4V
		Amp-hour capacity	5.1Ah
		Watt-hour capacity	75Wh
	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 or Standby Mode	2.5 hours
		System ON	3 to 5 hours
	Fuel Gauge LED	No	
Warranty	3 year		
Compatible with optional Travel Battery	Yes		

Optional HP BB09 Ultra Extended Life Notebook Battery (secondary battery)	Dimensions (H x W x L)	1.2 x 5.9 x 11.4 in (3x15x29cm)	
	Weight (max)	1.5lb, (.682kg)	
	Cells/Type	Lithium-Ion	
	Energy	Voltage	11.25V
		Amp-hour capacity	8.85Ah
		Watt-hour capacity	100Wh
	Temperature	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)
	Battery Re-Charge Time	System in OFF or Standby Mode	3.5 to 5 hours
		System ON	4 to 7 hours
Fuel Gauge LED	Yes		
Warranty	1 year		
Compatible with optional Travel Battery	No		

Optional HP ST09 Extended Life Notebook Battery ("Travel Battery") (secondary battery)	Dimensions (H x W x L)	1.2 x 6.1 x 12 in (3x15.5x30.5cm)	
	Weight (max)	1.2lb, (.550kg)	
	Cells/Type	Lithium-Ion Polymer	
	Energy	Voltage	11.1V
		Amp-hour capacity	6.6Ah
		Watt-hour capacity	73Wh
	Temperature	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)
	Battery Re-Charge Time	System in OFF or Standby Mode	3.5 to 5 hours
		System ON	4 to 7 hours
Fuel Gauge LED	Yes		

Technical Specifications

Warranty	1 year
Compatible with optional Travel Battery	Yes

ENVIRONMENTAL

Environmental Data

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

US Energy Star®
 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)

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

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	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
Heat Dissipation*	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

Technical Specifications

Additional information

6-cell high capacity Lithium-Ion battery (optional 8 cell available)

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

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

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

This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see 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.

Technical Specifications

- 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
- 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/cm²/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/qcreport/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>

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

Type	Description	Part #
Memory	HP 2 GB (DDR3 1333 MHz) SODIMM	AT912AA#xxx
	HP 4 GB (DDR3 1333 MHz) SODIMM	AT913AA#xxx
	HP 8 GB (DDR3 1333 MHz) SODIMM	QP013AA#xxx
	HP 2 GB PC3-12800 (DDR3 1600 MHz) SODIMM	H2P63AA#xxx
	HP 4 GB PC3-12800 (DDR3 1600 MHz) SODIMM	H2P64AA#xxx
	HP 8 GB PC3-12800 (DDR3 1600 MHz) SODIMM	H2P65AA#xxx
	NOTE: 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. Due to system limitations, DDR3-1600 MHz memory will only be supported at DDR3-1333 MHz.	
Cases	HP Business Nylon Carrying Case	BP848AA
	HP Business Nylon Backpack	BP849AA
	HP Deluxe 4 Wheel Roller	XW576AA
Docking	HP Display and Notebook Stand	AW662AA
	HP Dual Hinge Notebook Stand	AW661AA
	HP 230W Docking Station	A7E34AA
	HP 120W Advanced Docking Station	A7E36AA
	HP 230W Advanced Docking Station	A7E38AA
Input/Output - Mice	HP 2.4 GHz Wireless Optical Mobile Mouse	LX732AA
	HP Wireless Mobile Mouse	H2L63AA
	HP USB Essential Keyboard/Mouse	H2S75AA
Adapters	HP 90W Slim Adapter	BT796AA
	HP 90W Smart Auto Adapter	ED493AA
Storage - External Storage	HP Mobile USB DVDRW	A2U57AA
	HP 2011 BNB Notebook Upgrade Bay 500 GB Hard Drive	LX733AA
	HP 2011 BNB Notebook Upgrade Bay DL DVD+/-RW	LZ835AA
Batteries	HP ST09 Extended Life Notebook Battery	QK639AA
	HP BB09 Ultra Extended Life Notebook Battery	QK640AA
Health and Education	HP 20-Notebook Managed Charging Cart	QL489AA
	HP 20-Notebook Charging Cart	QL488AA
	HP 30-Notebook Managed Charging Cart	QL490AA
	HP Pocket Whiteboard	A0X37AA
Security	HP Docking Station Cable Lock	AU656AA

Summary of Changes

Date of change:	Version History:		Description of change:
November 1, 2014	From v15 to v16	Removed	Windows 7 Home Premium 64, Windows 7 Ultimate 32, Windows 7 Ultimate 64

Copyright © 2013 Hewlett-Packard Development Company, L.P.

All rights reserved. All trademarks are the property of their respective owners. Intel, Core, Celeron, and vPro are registered trademarks or trademarks of Intel Corporation in the U.S. and/or other countries. Adobe is a trademark of Adobe Systems Incorporated. Bluetooth is a registered trademark of Bluetooth SIG, Inc., in the U.S. and other countries. All other product names mentioned herein may be trademarks of their respective companies.

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