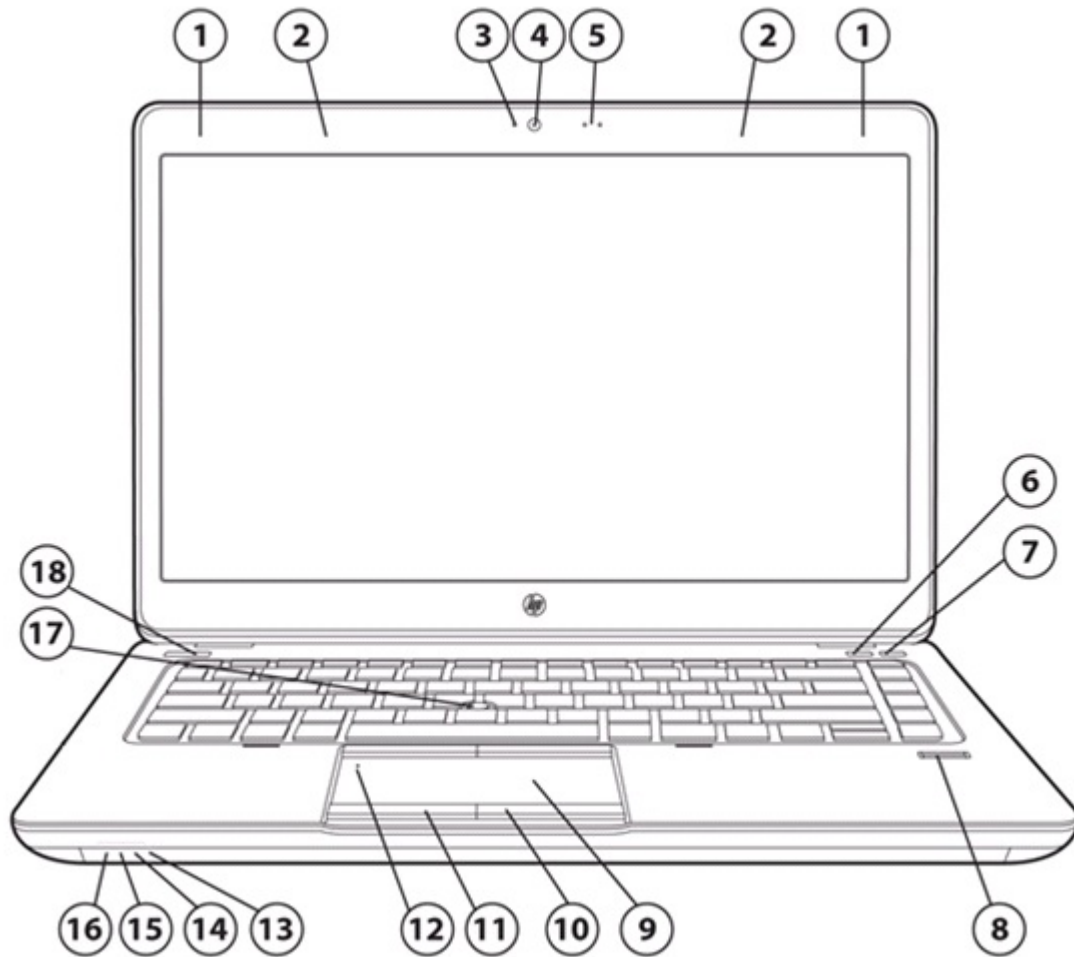


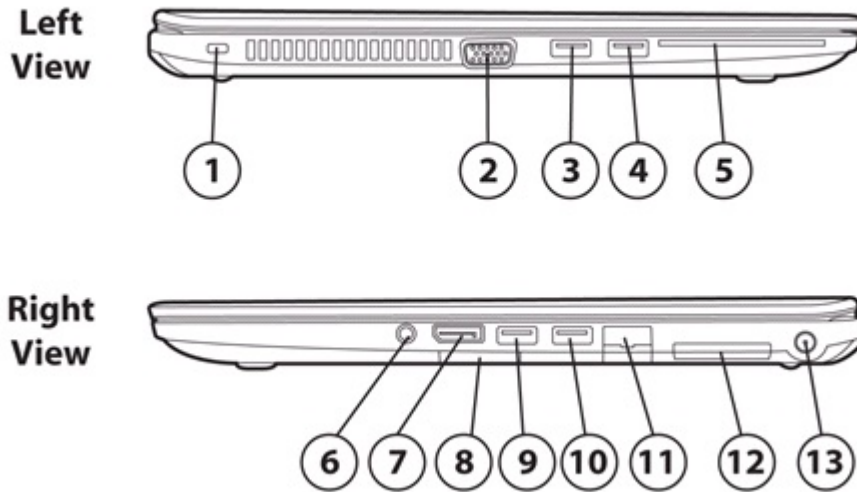
### Overview



**Front View**

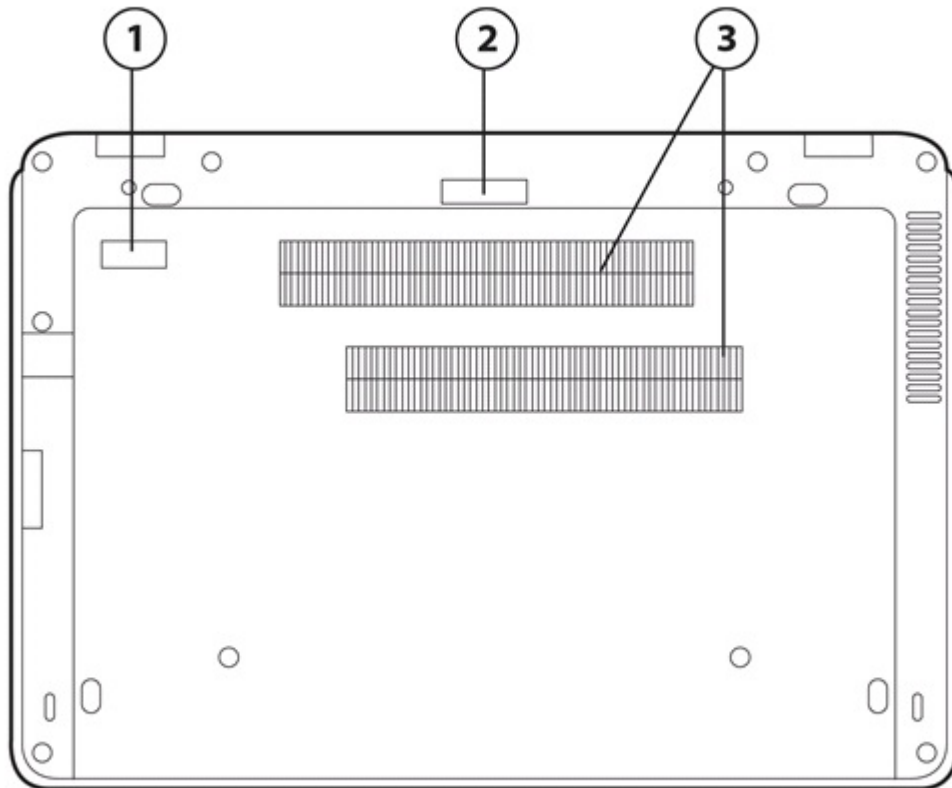
- |  |                                     |
|--|-------------------------------------|
| 1. WLAN antennas (2)                       | 10. Right Touchpad button           |
| 2. WWAN antennas (2)                       | 11. Left Touchpad button            |
| 3. Webcam light (with webcam)              | 12. Touchpad on/off button with LED |
| 4. Webcam                                  | 13. Hard drive light                |
| 5. Internal microphones (2)                | 14. AC adapter/Battery light        |
| 6. Wireless button                         | 15. Power light                     |
| 7. Volume mute button                      | 16. Wireless light                  |
| 8. Fingerprint reader (select models only) | 17. Pointstick                      |
| 9. Touchpad with scroll zone               | 18. Power button                    |

### Overview



- |   |                          |
|---|--------------------------|
| 1. Security cable slot                                  | 8. Memory card reader    |
| 2. External VGA monitor port                            | 9. USB 3.0 port          |
| 3. USB 3.0 charging port                                | 10. USB 3.0 port         |
| 4. USB 3.0 port   | 11. RJ-45 (network) jack |
| 5. Smart card reader                                    | 12. Docking port         |
| 6. Audio-out (headphone) jack/Audio-in(microphone) jack | 13. Power connector      |
| 7. DisplayPort  |                          |

### Overview



#### Bottom View

1. Secondary battery connector
2. Service door release lock
3. Vents (2)

### Overview

#### At A Glance

- Windows 8.1 versions, Windows 8 versions, Windows 7 versions, SuSE Linux, or FreeDOS
- All new, thinner and lighter form factor and industrial design for 2013. Durable HP Duracase with magnesium-reinforced chassis, HP DuraFinish with brushed aluminum on top cover and smooth aluminum around top, right, and left sides chassis with hematite /graphite color, HP DisplaySafe frame, latch-less design with precision aluminum-alloy hinges, optional backlight keyboard in full aluminum deck, chemically strengthened glass touchpad, and updated system functions indicators
- Designed to meet the military standard Mil-Std-810G for Drop (Method 516.6 Procedure IV), Functional Shock (Method 516.6 Procedure I), Vibration (Method 514.6 Procedure 1, Category 4), Vibration (Method 514.6 Procedure 1, Category 24), Dust (Method 510.5 Procedure I), Humidity (Method 507.5 Procedure II), Altitude (Method 500.5 Procedures I & II), High Temperature (Method 501.5 Procedures I and II), Low Temperature (Method 502.5 Procedure I and II), and Temperature Shock (Method 503.5 Procedure I)\*
- Workstation-caliber AMD® FirePro® discrete graphics: AMD FirePro M4100 (1 GB dedicated GDDR5)
- ISV certified to provide fast and reliable performance with workstation applications, including manipulation of 3D textures
- Choice of 4th 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 when configured with the optional flash cache module
- HP Performance Advisor for optimal configuration, compatibility and performance
- Up to two DDR3L-1600 1.35V SODIMMs for system memory up to 16 GB
- Supports multi-display via internal LED Panel, DisplayPort, VGA and new HP UltraSlim Docking Station v2 (sold separately)
- Supports DisplayPort 1.2 monitors
- DTS Studio Sound HD audio optimized for high fidelity audio with immersive surround sound with deep, rich bass and crystal clear dialog without distortion at high volume
- Choice of battery solutions: primary 3-cell (50 WHr) HP Long Life Battery, primary 3-cell (24 WHr) HP Long Life Battery, and optional secondary 6-cell (60 Whr) slice battery.
- 2 discrete buttons with LED indicator for convenient one touch access - Wireless On/Off, Volume Mute
- Widescreen 14-inch diagonal anti-glare LED-backlit display:  
HD (1366 x 768 eDP with standard viewing angle), HD+ (1600 x 900) eDP with standard viewing angle, HD+ (1600 x 900) touch-enabled eDP with standard viewing angle, FHD (1920x1080) eDP with PSR with ultrawide viewing angle
- Flexible wireless connectivity options:
  - Integrated Intel b/g/n (INDO only), Intel 2x2 a/b/g/n, Intel 2x2 a/b/g/n + Bluetooth, or Intel a/b/g/n AC 2x2 + Bluetooth
  - Optional integrated wireless 3G or 4G (LTE) mobile broadband module support
- Internal storage options include:
  - Choice of tool free capable, user-removable hard drive up to 1 TB with HP 3D DriveGuard protection
  - SATA 6 Gb/s 180/240/512 GB Solid State Drive or 256 GB SED Solid State Drive
  - 120 GB M.2 (NGFF) SSD\*\* (Planned to be available 4Q 2013)
  - 32GB M.2 (mSATA) flash cache for use with Intel SRT
- Security features including HP Client Security Manager, with central management
- Low halogen\*\*\*, ENERGY STAR qualified and EPEAT TBD registered in the U.S. EPEAT status varies by country- please see [epeat.net](http://epeat.net).
- HP BIOS self-healing technology including HP Sure Start to prevent, detect, and remedy known and unknown BIOS attacks.

\* MIL-STD-810G testing was not intended to demonstrate fitness for U.S. Department of Defense contracts or for military use. Test results are not a guarantee of future performance under these test conditions.

\*\*If 120 GB M.2 (NGFF) SSD is selected as primary storage, any of the HDD and SSD can be configured as secondary storage.

\*\*\* 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 8.1 Pro 64\*  
Windows 8.1 64\*  
Windows 8 Pro 64\*\*  
Windows 8 64\*\*  
Windows 7 Professional (available through downgrade rights from Windows 8 Pro)\*\*\*  
Windows 7 Professional 64\*\*\*\*  
Windows 7 Professional 32\*\*\*\*  
SUSE Linux Enterprise Desktop 11  
FreeDOS

\* Not all Windows 8.1 features may be available when updating to Windows 8.1 from Windows 8 PCs. Your system may require additional hardware, drivers, software, firmware, and/or a BIOS update. Upgrading between operating system editions, e.g. from Windows 8 (non Pro) to Windows 8.1 Pro and Media Center will incur additional fees. For complete update details, see <http://www.windows.com/everywhere>.

\*\* 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.

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#### PROCESSOR\*

4th Generation Intel® Core™ i7-4600U (2.1 GHz, 4 MB cache, 2 cores)\*

Up to 3.3 GHz with Intel Turbo Boost Technology

4th Generation Intel® Core™ i5-4300U (1.9 GHz, 3 MB cache, 2 cores)\*

Up to 2.9 GHz with Intel Turbo Boost Technology

4th Generation Intel® Core™ i5-4200U (1.6 GHz, 3 MB cache, 2 cores)\*

Up to 2.6 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.

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#### CHIPSET

Mobile Intel QM87 Express

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### 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, a qualified Intel Centrino® 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 9.0 (iAMT) offers built-in manageability and proactive security for networked mobile workstations, 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 mobile workstations 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

Intel HD 4400 Graphics

AMD FirePro M4100 (1 GB dedicated GDDR5)  
Microsoft DirectX 11.1 (Shader Model 5.0) and OpenGL 4.2 capable

AMD Dynamic Switchable Graphics supported

**NOTE:** The HP Zbook14 supports up to four independent displays when using the new HP 2013 UltraSlim Docking Station (sold separately) or the HP UltraSlim Docking station (sold separately); and three independent displays with no dock.

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### DISPLAY

#### Internal

14" diagonal LED-backlit HD SVA eDP anti-glare (1366 x 768)  
14" diagonal LED-backlit HD+ SVA eDP anti-glare (1600 x 900)  
14" diagonal LED-backlit HD+ SVA eDP anti-glare + touch (1600 x 900)  
14" diagonal LED-backlit FHD UWVA IPS eDP anti-glare + PSR (1920 x 1080)

#### External

Up to 30-bit (2<sup>30</sup>) per pixel "Deep Color"  
(total of 1,073,741,824 color variations)

#### DisplayPort w/MST (Multi-stream Transport)

Supports resolutions up to QFHD 3840 x 2160, 24/30-bit color depth at 60 Hz, and WUXGA (1920 x 1200) monitors, 24/30-bit color depth at 120 Hz.

#### DisplayPort Features

- Multi-stream Transport (MST): Multi-stream Transport is a DP 1.2 feature that allows daisy chaining of DP 1.2 monitors (requires monitor with DP 1.2 MST capability), or the use of DP 1.2 hubs with MST to achieve a maximum of 5 active displays with optional HP 2013 UltraSlim Docking Station, 4 with HP UltraSlim Docking station, and 3 without a docking station.

### Features

**VGA**

Port supports resolutions up to 2048 x 1536 at 75 Hz, and lower resolutions at up to 100 Hz

**DVI-D (single link)**

DVI support requires a DP?DVI adapter (sold separately)

**NOTE:** Resolutions are dependent upon monitor capability, and resolution and color depth settings.

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### FLASH CACHE MODULE

Optional M.2 Flash cache module support for Intel Smart Response Technology. (Available only with standard non-SED hard drive. Cannot be combined with any solid state drive)

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### STORAGE AND DRIVES

**M.2 Storage Bay**

120GB M.2 Solid State Drive

**(NOTE:** cannot be combined with the M.2 Flash Cache Module)

**Primary Storage Bay****Hard Drives**

320/500/750 GB 7200 rpm SMART SATA II, SMART SATA III

1 TB 5400 rpm SMART SATA II, SMART SATA III

500 GB 7200 rpm SMART SATA II, SMART SATA III Self Encrypting Drive (Planned to be available in Oct. 2013)

500 GB 5400 rpm SMART SATA II, SMART SATA III I Self Encrypting Drive FIPS 140-2 compliant (Planned to be available in Oct. 2013)

**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**

120 GB M.2 (NGFF) Solid State Drive (Expected to be available in 4Q 2013)

180/240/512 GB SATA 6 Gb/sec

256 GB SATA 6 Gb/sec Self Encrypting Drive

**NOTE:** If 120 GB M.2 (NGFF) SSD is selected, any of the HDD and SSD can be configured as secondary storage.

**NOTE:** For hard drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 16 GB (for Windows 7) of system and up to 30 GB (for Windows 8) disk is reserved for system recovery software.

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### FLASH CACHE

32 GB M.2 (NGFF)

Optional 32 GB mSATA flash cache module (Available only with standard non-SED hard drive.)

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### Features

#### MEMORY

##### Standard

DDR3L 1.35V SDRAM (1600 MHz)  
Two SODIMM slots supporting dual-channel memory  
4 GB and 8 GB SODIMMs

##### Maximum

Upgradeable to 16384 MB with optional 8192 MB SODIMMs in both slots

##### 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.

#### 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.

##### Mobile Broadband options (Win 8 WWAN support will not be available at Win 8 introduction)

HP hs3110 HSPA+ Mobile Broadband Module\*

HP lt4111 LTE/EV-DO/HSPA+ Gobi4G Module

HP lt4112 LTE/HSPA+Gobi4G Module (EMEA)\*

##### All 802.11 integrated wireless LAN options

Intel b/g/n (INDO only)

Intel Dual Band Wireless-N 7260NB 802.11a/b/g/n (2x2) WiFi

Intel Dual Band Wireless-N 7260AN 802.11a/b/g/n (2x2) WiFi and Bluetooth 4.0 combo

Intel Dual Band Wireless-AC 7260 802.11ac (2x2) WiFi and Bluetooth 4.0 combo

##### Intel WiDi

Intel WiDi Software\*\*\*

##### Communications

Integrated Intel I218-LM Gigabit Network Connection (10/100/1000)\*\*

\* 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.

\*\* 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.

\*\*\* Integrated Intel Wi-Di feature is available on select configurations only and requires separately purchased projector, tv or computer monitor with an integrated or external Wi-Di receiver. External Wi-Di receivers connect to the projector, tv or computer monitor via a standard HDMI cable, also sold separately.

**NOTE:** WWAN is not available with DreamColor displays.



### Features

#### AUDIO/MULTIMEDIA

##### Audio

DTS Studio Sound HD audio (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  
Combo mic-in / stereo headphone-out jack

##### Webcam

720p HD webcam (select models)

- 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 rang
- 

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

##### Keyboard

Optional backlit keyboard with Function key control to toggle backlit brightness setting - off/full/half brightness  
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.

##### Pointing Devices

Touchpad with On/Off button, two-way scroll, gestures, two pick buttons  
Pointstick with two additional pointstick buttons  
Image sensor touchpad for enhanced performance and improved precision on scroll and gesture

##### Buttons and Function Keys

Separate launch buttons provide easy access to the following features: wireless on/off, volume mute. 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.

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#### SOFTWARE AND SECURITY

##### Preinstalled Software with Windows Operating System

###### Windows 8

##### Security

Absolute Data Protect  
Computrace\* (removed from UI on activation)

###### Windows 7

##### Security

Computrace\* (removed from UI on activation)  
Device Access Manager with Just In Time Authentication

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### Features

Device Access Manager with Just In Time Authentication  
DigitalPersona Fingerprint Driver  
Drive Encryption (FIPS 140-2)  
HP File Sanitizer (Activated via Wizard)  
HP Client Security (incl. Cred Mgr and Password Mgr)  
HP SpareKey  
HP Trust Circles Standard  
Microsoft Defender  
Privacy Manager (Web only)  
Validity Fingerprint Driver

#### BIOS Features

Absolute Persistence Module (for all Absolute products)  
HP Sure Start  
HP Automatic Drive Lock  
HP BIOS Protection (Follow NIST 800-147, 155 Guidelines)  
HP Disk Sanitizer (Not for SSD)  
HP DriveLock  
HP SpareKey  
Hybrid Boot  
Master Record Security (backup/restore)  
Measured Boot  
Power On Authentication  
Pre-Boot Security  
Secure Boot  
Secure Erase (SSD & HDD)  
Update via Network

#### MultiMedia

Cyberlink Power2Go  
Cyberlink PowerDVD

#### HP Value Add

Digital Energy Star Logo W8  
Getting Started with Windows 8  
HP 3D DriveGuard  
HP ePrint Driver  
HP Firmware & Driver Installer  
HP Hotkey Support  
HP Manageability  
HP PageLift App  
HP Performance Advisor  
HP Quick Start  
HP Registration App  
HP Remote Graphics  
HP Setup  
HP Software Setup  
HP Support Assistant

Drive Encryption (FIPS 140-2)  
HP File Sanitizer (Activated via Wizard)  
HP Client Security (incl. Cred Mgr and Password Mgr)  
HP SpareKey  
HP Trust Circles Standard  
Microsoft Security Essentials  
Privacy Manager (Web only)  
Validity Fingerprint Driver

#### BIOS Features

Absolute Persistence Module (for all Absolute products)  
HP Sure Start  
HP Automatic Drive Lock  
HP BIOS Protection (Follow NIST 800-147, 155 Guidelines)  
HP Disk Sanitizer (Not for SSD)  
HP DriveLock  
HP SpareKey  
Hybrid Boot  
Master Record Security (backup/restore)  
Measured Boot  
Power On Authentication  
Pre-Boot Security  
Secure Boot  
Secure Erase (SSD & HDD)  
Update via Network

#### MultiMedia

Cyberlink Power2Go  
Cyberlink PowerDVD  
Cyberlink YouCam BE

#### HP Value Add

HP Ceement  
HP 3D DriveGuard  
HP ePrint Driver  
HP Hotkey Support  
HP Manageability  
HP PageLift Desktop App  
HP Performance Advisor  
HP Recovery Manager  
HP Remote Graphics  
HP Setup  
HP Software Setup  
HP Support Assistant  
HP Recovery Disc Creator (HPRDC)  
HP Wallpaper  
Internet Explorer 9

### Features

HP WallPaper  
Internet Explorer 9  
Internet Explorer 10  
IE Home  
System Default Settings for Win8  
UEFI System Diagnostics W8  
Wireless Button Driver  
Amazon Kindle App  
PDF Complete, Corporate Edition  
Box.Net (UK only)  
Box 50GB CMIT Cloud Offer  
BTB Host and ISP Stub  
BTB Host End Block  
Bing Search for IE10  
Netflix App  
Skype App  
Skype RTC Insertion (Windows 8.1)

Internet Explorer 10  
IE Home  
Wireless Button Driver  
Adobe Flash Player (Commercial)  
PDF Complete, Corporate Edition  
Box.Net (UK only)  
Box 50GB CMIT Cloud Offer  
BTB Host and ISP Stub  
BTB Host End Block  
Bing Search for IE9  
Bing Search for IE10  
Skype Desktop App

#### Microsoft Products

Buy Office  
Lync Optimized

#### Microsoft Products

Buy Office  
Lync Optimized

#### Additional Software Available from the Web

HP SoftPaq Download Manager  
HP Software System Manager  
HP Peak Power Manager

#### Workstation ISV Certifications

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

#### HP Remote Graphics Software

The remote desktop solution for serious workstation users and their most demanding applications.  
Download at: [www.hp.com/go/RGS](http://www.hp.com/go/RGS)

#### 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.  
Download at: [www.hp.com/go/performanceadvisor](http://www.hp.com/go/performanceadvisor)

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

#### Security



### Features

See Software section above.

#### Other Standard Security Features

Integrated Smart Card Reader  
HP Spare Key (requires initial user setup)  
One-Step Logon  
Common Criteria EAL4+ Augmented Certified Discrete TPM 1.2 Embedded Security Chip  
Security lock slot  
Support for Intel AT

#### Optional Security Features

HP Fingerprint Sensor (optional)  
Computrace\* 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.

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## HP CENTRAL MANAGEMENT

HP offers a variety of scalable hardware, software, and BIOS-based security features to help you defend your organization against viruses and other threats. These integrated security features safeguard what matters to you the most - your data, device and identity. Now, be confident your fleet of devices is protected in multiple layers of HP Client Security protection.

HP BIOS Protection keeps you up and running with enhanced protection against virus attacks and other threats. And if the BIOS is accidentally compromised, the auto recovery feature automatically restores it to its fully functional state.

HP Sure Start detects and negates a BIOS attack with automatic recovery of the BIOS even when the installation is accidentally compromised (i.e. power outage). When HP Sure Start heals the BIOS an event log is generated that an IT administrator can retrieve so the business is aware of a BIOS attack. Golden copy of BIOS is stored in protected nonvolatile memory providing redundant, hardware-based protection against a new generation of attacks. This helps to future-proof your technology and business.

An optional fingerprint reader and integrated Smart Card Reader help keep your identity secure. The security cable slot helps keep your notebook physically secure.

HP Drive Encryption+ with TPM enhanced security protects your data on your hard drive from unauthorized access. Authentication is required before Windows will even start.

Or you can even permanently destroy data on your hard drive in preparation for your system disposal or redeployment with Secure Erase.

This hardware-based solution encrypts and decrypts data as it is written or read from the hard drive and is supported by HP Drive Encryption+. You get faster encryption performance than that of software-based encryption solutions.

+ Requires Windows. Data is protected prior to Drive Encryption login. Turning the PC off or into hibernate logs out of Drive Encryption and prevents data access.

### Features

HP provides a separate management solution, targeted at the enterprise and the SMB:

- **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>

### POWER

#### Power Supply

External HP 65W Smart AC adapter  
(TBD mm)

Power cord included is 6-foot (1.8 meter).  
Total length including external AC adapter is 12 feet (3.66 meter).

#### Primary Battery

HP Long Life 3-cell Polymer Battery (24 WHr)  
HP Long Life 3-cell Polymer/Prismatic Battery (50 WHr)

#### Secondary Battery

HP 6-cell Slice (60 WHr)

#### Battery Life\*

Primary Battery	+HDD	+ 2.5" SSD
50 Whr, 3-cell	Up to 10 hours 52 minutes	Up to 12 hours 21 minutes
50Whr+Slice 60Whr	Up to 23 hours 59 minutes	Up to 26 hours 47 minutes

#### System Standby Time

Up to TBD weeks

\*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

Hibernation  
Standby  
ACPI compliance

### Features

#### ENVIRONMENTAL

US Energy Star®

IT ECO declaration

EPEAT TBD 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 3.51 lb (1.59 kg) without hard drive and with M.2 (NGFF) Solid State Drive

Starting at 3.94 lb (1.79 kg) with touchscreen, without hard drive and with M.2 (NGFF) Solid State Drive

Starting at 3.62 lb (1.64 kg) with 128 GB Solid State Drive

Starting at 3.64 lb (1.65 kg) with 180 GB Solid State Drive

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

13.35 (at front) x 9.33 x .83 in

33.9 (at front) x 23.7 x 2.1 cm

**NOTE:** Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components.

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#### PORTS/SLOTS

##### Ports

VGA - One

DisplayPort v1.2 - One

Stereo microphone in / headphone-out combo jack - One

Power Connector - One

Side Docking Connector - One

RJ-45 (Ethernet) - One

USB 3.0 - Three

USB 3.0 Charging Port - One

Security lock slot - One

Secondary Battery Connector - One

##### Digital Media Slots

SD UHS-II Flash Media slot - One (Supports next generation SD (Secure Digital), backward compatible to SDHC, SDXC, Integrated Smart Card Reader (Compatible with ISO 7816 compliant Smart Cards PC/SC interface support)

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### Features

#### **SERVICE AND SUPPORT**

HP Services offers limited 3-year, 1-year and 90-day warranty options depending on country. 1-year or 3-year limited warranty on primary battery (battery warranty is the same number of years as the platform warranty).

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 dc @ 3.3 A		
	<b>Average Operating Power</b>		<b>Windows 7 (32-bit)</b>	<b>Windows 7 (64-bit)</b>
		AMD FirePro Graphics	16.28 W	16.8 W
	<b>Max Operating Power</b>	< 65 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>KCC</b>	Yes		
	<b>BSMI</b>	Yes		
	<b>CE Marking Compliance</b>	Yes		

\* Configurations of the HP ZBook 14 that are ENERGY STAR qualified are identified as HP ZBook 14 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>14" diagonal LED-backlit HD anti-glare SVA flat (1366 x 768)</b>	<b>Outline Dimensions</b> (W x H x D)	12.6 x 8.09 x 0.14 in (32.09 x 20.56 x 0.36 cm)	
	<b>Active Area</b>	12.18 x 6.85 in (30.94 x 17.395 cm)	
	<b>Weight</b>	0.71 lb (320g) (max)	
	<b>Diagonal Size</b>	14.0 in (35.6cm)	
	<b>Surface Treatment</b>	Anti-glare	
	<b>Contrast Ratio</b>	300:1 (min)	
	<b>Refresh Rate</b>	60 Hz	
	<b>Brightness</b>	200 nit (typical)	
	<b>Pixel Resolution</b>	<b>Format</b>	1366 x 768 (HD)
		<b>Configuration</b>	RGB Stripe
	<b>Interface</b>	eDP 1.2 (1 lane)	
	<b>LCD Mode</b>	TN	
	<b>PPI</b>	125 ppi	
	<b>Viewing Angle</b>	SVA 40/40/15/30 (Left/Right/Down/Up)	

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<b>14" diagonal LED-backlit HD+ anti-glare SVA flat (1600 x 900)</b>	<b>Outline Dimensions</b> (W x H x D)	12.6 x 8.09 x 0.14 in (32.09 x 20.56 x 0.36 cm)	
	<b>Active Area</b>	12.19 x 6.86 in (30.96 x 17.415 cm)	
	<b>Weight</b>	0.72 lb (325 g) (max)	
	<b>Diagonal Size</b>	14.0 in (35.6cm)	
	<b>Surface Treatment</b>	Anti-glare	
	<b>Contrast Ratio</b>	300:1 (min)	
	<b>Refresh Rate</b>	60 Hz	
	<b>Brightness</b>	250 nit (typical)	
	<b>Pixel Resolution</b>	<b>Format</b>	1600 x 900 (HD+)
		<b>Configuration</b>	RGB Stripe
	<b>Interface</b>	eDP 1.2 (1 lane)	
	<b>LCD Mode</b>	TN	
	<b>PPI</b>	131 ppi	
	<b>Viewing Angle</b>	SVA 40/40/15/30 (Left/Right/Down/Up)	

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### Technical Specifications

<b>14" diagonal LED-backlit HD+ anti-glare SVA flat + touch (1600 x 900)</b>	<b>Outline Dimensions</b> (W x H x D)	12.6 x 8.09 x 0.14 in (32.09 x 20.56 x 0.36 cm)	
	<b>Active Area</b>	12.19 x 6.86 in (30.96 x 17.415 cm)	
	<b>Weight</b>	0.72 lb (325 g) (max)	
	<b>Diagonal Size</b>	14.0 in (35.6cm)	
	<b>Touch enabled</b>	Yes	
	<b>Surface Treatment</b>	Anti-glare	
	<b>Contrast Ratio</b>	300:1 (min)	
	<b>Refresh Rate</b>	60 Hz	
	<b>Brightness</b>	250 nit (typical)	
	<b>Pixel Resolution</b>	<b>Format</b>	1600 x 900 (HD+)
		<b>Configuration</b>	RGB Stripe
	<b>Interface</b>	eDP 1.2 (1 lane)	
	<b>LCD Mode</b>	TN	
	<b>PPI</b>	131 ppi	
<b>Viewing Angle</b>	SVA 40/40/15/30 (Left/Right/Down/Up)		

<b>14" diagonal LED-backlit FHD anti-glare UWVA slim (1920 x 1080)</b>	<b>Outline Dimensions</b> (W x H x D)	12.6 x 8.09 x 0.12 in (32.09 x 20.56 x 0.3 cm)	
	<b>Active Area</b>	12.18 x 6.85 in (30.93 x 17.4 cm)	
	<b>Weight</b>	0.75 lb (340 g) (max)	
	<b>Diagonal Size</b>	14.0 in (35.6cm)	
	<b>Surface Treatment</b>	Anti-glare	
	<b>Contrast Ratio</b>	600:1 (min)	
	<b>Refresh Rate</b>	60 Hz	
	<b>Brightness</b>	300 nit (typical)	
	<b>Pixel Resolution</b>	<b>Format</b>	1920 x 1080 (FHD)
		<b>Configuration</b>	RGB Stripe
	<b>Interface</b>	eDP 1.3+PSR (2 lane)	
	<b>LCD Mode</b>	IPS/FFS/AHVA	
	<b>PPI</b>	157 ppi	
	<b>Viewing Angle</b>	UWVA 85/85/85/85 (Left/Right/Down/Up)	

### STORAGE AND DRIVES

#### Internal Storage

### Technical Specifications

<b>1 TB 5400 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.25 lbs (115g)	
	<b>Capacity</b>	1 TB	
	<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> (maximum) 300 MB/s (Drive Capability)	
	<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	4 ms
		<b>Average</b>	14 ms
		<b>Maximum</b>	24 ms
	<b>Cache</b>	16 MB	
	<b>Rotational Speed</b>	5400 rpm	
	<b>Logical Blocks</b>	1,953,525,168	
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]	
<b>Features</b>	ATA Security		

<b>500 GB 5400 rpm SATA FIPS* Hard Drive</b> (Planned to be available in Oct. 2013)	<b>Drive Weight</b>	0.25 lbs (95g)	
	<b>Capacity</b>	500 GB	
	<b>Height</b>	0.28 in (7 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> (maximum) 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>Cache</b>	16 MB	
	<b>Rotational Speed</b>	5400 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, TCG Opal SSC 2.0 and FIPS 140-2-level2		

\* FIPS-certified, hardware-based AES-256 encryption image.

### Technical Specifications

<b>750 GB 7200 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.25 lbs (115g)	
	<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> (maximum) 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>Cache</b>	16 MB	
	<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		

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<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</b> (maximum) 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>Cache</b>	16 MB	
	<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		

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### Technical Specifications

**500 GB 7200 rpm SMART  
SATA II Self Encrypting  
Drive** (Planned to be  
available in Oct. 2013)

<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</b> (maximum) 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>Cache</b>	16 MB
<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

**320 GB 7200 rpm SATA  
Hard Drive**

<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</b> (maximum) 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>Cache</b>	16 MB
<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 512 GB, 2.5-inch Solid State Drive</b>	<b>Drive Weight</b>	73 Grams	
	<b>Capacity</b>	512 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>
		460 MB/s	260 MB/s
	<b>Logical Blocks</b>	1,000,215,216	
<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 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 Gen 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		

### Technical Specifications

<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 Gen 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			

<b>SATA 6Gb/s 120 GB, 2242 M.2 Solid State Drive</b> (Expected to be available in 4Q 2013)	<b>Drive Weight</b>	Up to 10 Grams		
	<b>Capacity</b>	120 GB		
	<b>Height</b>	0.138 in (3.5mm)		
	<b>Width</b>	0.866 in (22 mm)		
	<b>Interface</b>	M.2 SATA Gen3 (6 Gb/s)		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		Up to 540 MB/s	Up to 480 MB/s	
	<b>Logical Blocks</b>	234,441,648		
<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 6Gb/s 32 GB, 2242 M.2 Solid State Drive</b>	<b>Drive Weight</b>	Up to 10 Grams		
	<b>Capacity</b>	32 GB		
	<b>Height</b>	0.138 in (3.5mm)		
	<b>Width</b>	0.866 in (22 mm)		
	<b>Interface</b>	M.2 SATA Gen3 (6 Gb/s)		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		Up to 380 MB/s	Up to 70 MB/s	
	<b>Logical Blocks</b>	62,533,296		
<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			

### SECURITY

### Technical Specifications

<b>HP Fingerprint Sensor</b>	<b>Voltage</b>	3.0-3.6V
	<b>Operating temperature</b>	14° - 167°F (-10° - 75°C)
	<b>Current consumption image</b>	36mA
	<b>Low latency wait for finger</b>	950 uA
	<b>Capture rate</b>	3000 lines/sec
	<b>ESD Resistance</b>	IEC 6100-4-2 4B (+/-15KV)
	<b>Detection Matrix</b>	200*1 (plus another secondary line); 508 dpi, sensor area 12*3 mm

### NETWORKING/COMMUNICATIONS

<b>Intel® I218-LM Gigabit Network Connection</b>	<b>Ethernet Features</b>	<p>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</p>
	<b>Power Management</b>	<p>ACPI compliant - multiple power modes            Energy Detect Low Power Mode(Green Ethernet)</p>
	<b>Performance Features</b>	<p>TCP/IP/UDP Checksum Offload (configurable)            Protocol Offload( ARP &amp; NS)            Large send offload and Giant send offload            Receiving Side Scaling            MACSec Offload (802.3ae)            Intel vPro            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)            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</p>
	<b>Interface</b>	<p>PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ.  <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



### Technical Specifications

<b>HP hs3110 HSPA+ Mobile Broadband Module*</b>	<b>Technology/Operating Bands</b>	<p>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)</p>
	<b>Mobile Operator</b>	Verizon (US only)
	<b>Wireless Protocol Standards</b>	<p>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</p>
	<b>Wireless Parametric Standards</b>	Complies with 3GPP specifications Release 8 for LTE
	<b>Maximum Data Rates</b>	<p>EvDO (Revision A) - 3.1 Mbps (Download), 1.8 Mbps (Upload)            WCDMA (DC-HSPA+) - 42Mbps (Download)            LTE (Category 3) - 100 Mbps (Download ), 50Mbps (Upload)</p>
	<b>GPS</b>	Standalone, Assisted, XTRA
	<b>GPS Bands</b>	1575.42 MHz (± 1.023 MHz)
	<b>Maximum Output Power</b>	<p>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)</p>
	<b>Maximum Power Consumption</b>	2700mA (peak)
	<b>Power Consumption, Sleep Mode</b>	10 mA
	<b>Power Management</b>	<p>USB selective suspend            Integrated notebook wireless button</p>
	<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 5 mm)
	<b>Voltage, Operating</b>	3.3v +/- 9%
	<b>Temperature, Operating</b> (from TIA/EIA/IS-98-D)	-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)

### Technical Specifications

**LED Activity** LED Off - Radio Off;  
Solid LED On - Radio On

\* Not available with Dreamcolor

#### HP It4111 LTE/EV-DO/HSPA+ Mobile Broadband Module\*

<b>Technology/Operating Bands</b>	LTE FDD all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II), 1800 MHz (Band III), 850 MHz (Band V), 2600 MHz (Band VII), 900 MHz (Band VIII), 700 MHz (Band XX, DD800) WCDMA/HSDPA/HSUPA/HSPA+ all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II), 800 MHz (Band V), 900 MHz (Band VIII) GSM/GPRS/EDGE: 1900 MHz (Band II), 1800 MHz (Band III), 850 MHz (Band V), 900 MHz (Band VIII)
<b>Wireless Protocol Standards</b>	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification
<b>Wireless Parametric Standards</b>	Complies with 3GPP specifications Release 8 for LTE
<b>Maximum Data Rates</b>	LTE (Category 3): 100 Mbps (Download), 50Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload) EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)
<b>GPS</b>	Standalone
<b>GPS Bands</b>	1575.42 MHz ( $\pm 1.023$ MHz), GLONASS 1596-1607MHz
<b>Maximum Output Power</b>	LTE: +23 dBm ( $\pm 2$ dBm) WCDMA: +23.5 dBm ( $\pm 1$ dBm) GPRS Band II, III: +29.5 dBm ( $\pm 1$ dBm) GPRS Band V, VIII: +32.5 dBm ( $\pm 1$ dBm) EGPRS Band II, III: +26.5 dBm ( $\pm 1.5$ dBm) EGPRS Band V, VIII: +27.5 dBm ( $\pm 1.5$ dBm)
<b>Maximum Power Consumption</b>	LTE: 1,200 mA (peak); <900 mA (average) WCDMA: 1,100 mA (peak); <800 mA (average) EGPRS: 2,800 mA (peak); <700 mA (average)
<b>Power Consumption, Sleep Mode</b>	3 mA
<b>Power Management</b>	USB selective suspend, Integrated notebook wireless button
<b>Antenna Type</b>	Dual high efficiency multi-band antennae with spatial diversity
<b>Form Factor</b>	M.2, USB 2.0 interface
<b>Weight</b>	6 g
<b>Dimensions</b> (Length x Width x Thickness)	42 mm x 30 mm x 2.3 mm
<b>Voltage, Operating</b>	3.135 V to 4.4 V (3.3 V +1.1V/-0.165V)
<b>Temperature, operating</b> (from TIA/EIA/IS-98-D)	14° to 131° F (-10° to 55° C)
<b>Temperature, non-operating, 96 hours</b> (from MIL-STD 202 Method 108)	-40° to 185° F (-40° to 85° C)

### Technical Specifications

**Humidity, Non-operating** 95% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)

**LED Activity** LED Off - Radio Off; Solid LED On - Radio On

\* Not available with Dreamcolor

<b>HP It4112 LTE/HSPA+ Mobile Broadband Module*</b>	<b>Technology/Operating Bands</b>	LTE FDD all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II), 1800 MHz (Band III), 850 MHz (Band V), 2600 MHz (Band VII), 900 MHz (Band VIII), 700 MHz (Band XX, DD800) WCDMA/HSDPA/HSUPA/HSPA+ all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II), 800 MHz (Band V), 900 MHz (Band VIII) GSM/GPRS/EDGE: 1900 MHz (Band II), 1800 MHz (Band III), 850 MHz (Band V), 900 MHz (Band VIII)
	<b>Wireless Protocol Standards</b>	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification
	<b>Wireless Parametric Standards</b>	Complies with 3GPP specifications Release 8 for LTE
	<b>Maximum Data Rates</b>	LTE (Category 3): 100 Mbps (Download), 50Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload) EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)
	<b>GPS</b>	Standalone
	<b>GPS Bands</b>	1575.42 MHz (± 1.023 MHz), GLONASS 1596-1607MHz
	<b>Maximum Output Power</b>	LTE: +23 dBm (+/- 2 dBm) WCDMA: +23.5 dBm (+/- 1 dBm) GPRS Band II, III: +29.5 dBm (+/- 1 dBm) GPRS Band V, VIII: +32.5 dBm (+/- 1 dBm) EGPRS Band II, III: +26.5 dBm (+/-1.5 dBm) EGPRS Band V, VIII: +27.5 dBm (+/-1.5 dBm)
	<b>Maximum Power Consumption</b>	LTE: 1,200 mA (peak); <900 mA (average) WCDMA: 1,100 mA (peak); <800 mA (average) EGPRS: 2,800 mA (peak); <700 mA (average)
	<b>Power Consumption, Sleep Mode</b>	3 mA
	<b>Power Management</b>	USB selective suspend, Integrated notebook wireless button
	<b>Antenna Type</b>	Dual high efficiency multi-band antennae with spatial diversity
	<b>Form Factor</b>	M.2, USB 2.0 interface
	<b>Weight</b>	6 g
	<b>Dimensions</b> (Length x Width x Thickness)	42 mm × 30 mm × 2.3 mm
	<b>Voltage, Operating</b>	3.135 V to 4.4 V (3.3 V +1.1V/-0.165V)
	<b>Temperature, operating</b> (from TIA/EIA/IS-98-D)	14° to 131° F (-10° to 55° C)

### Technical Specifications

<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>	95% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
<b>LED Activity</b>	LED Off - Radio Off; Solid LED On - Radio On

\* Not available with Dreamcolor.

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<b>Intel Dual Band Wireless-N 7260AN 802.11 a/b/g/n (2x2) WiFi + Bluetooth 4.0 Combo Adaptor*</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>	802.11b/g/n 2.402 - 2.482 GHz 802.11a/n 4.9 - 4.95 GHz (Japan) 5.15 - 5.25 GHz 5.25 - 5.35 GHz 5.47 - 5.725 GHz 5.825 - 5.850 GHz
	<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: card will support rates for NSS=1 and NSS=2 for RX and TX for 20 and 40 MHz channels. Short and long guard interval shall be supported.
	<b>Modulation</b>	Direct Sequence Spread Spectrum CCK, BPSK, QPSK, 16-QAM, 64-QAM
	<b>Security<sup>1</sup></b>	<ul style="list-style-type: none"><li>• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li><li>• AES-CCMP: 128 bit in hardware</li><li>• 802.1x authentication</li><li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li><li>• WPA2 certification</li><li>• IEEE 802.11i</li><li>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li><li>• WAPI</li></ul>
	<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.
	<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between band Access Points
	<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"><li>• 2.4G: +13.5dBm minimum</li><li>• 5G: +12dBm minimum</li></ul>

### Technical Specifications

<b>Power Consumption</b>	Transmit: 2.0 Watts Receive: 1.6 Watts Idle mode <sup>3</sup> : 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio off: 75 mW
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps)  802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps)  802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps)  802.11n:-69 dBm (150 Mbps), -66 dBm (300 Mbps)
<b>Antenna Connections</b>	2 U.FL type connectors (output impedance of 50 ± 2 ohms)
<b>Form Factor</b>	PCI-Express Half-MiniCard
<b>Dimensions</b>	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)
<b>Weight</b>	3.1g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
<b>Altitude</b>	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
<b>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.

#### HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology

<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

### Technical Specifications

<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
<b>Range</b>	Up to 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>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

\* Wireless access point and internet service required. Availability of public wireless access points limited.

### Technical Specifications

<b>Intel Dual Band Wireless-AC 7260 802.11 ac (2x2) WiFi + BT 4.0 combo Adapter*</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
	<b>Interoperability</b>	Wi-Fi certified
	<b>Frequency Band</b>	802.11b/g/n <ul style="list-style-type: none"> <li>● 2.402 - 2.482 GHz</li> </ul> 802.11a/n <ul style="list-style-type: none"> <li>● 4.9 - 4.95 GHz (Japan)</li> <li>● 5.15 - 5.25 GHz</li> <li>● 5.25 - 5.35 GHz</li> <li>● 5.47 - 5.725 GHz</li> <li>● 5.825 - 5.850 GHz</li> <li>● 2.402 - 2.482 GHz</li> </ul>
	<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
	<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	<b>Security<sup>1</sup></b>	<ul style="list-style-type: none"> <li>● IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>● AES-CCMP: 128 bit in hardware</li> <li>● 802.1x authentication</li> <li>● WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>● WPA2 certification</li> <li>● IEEE 802.11i</li> <li>● Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>● WAPI</li> </ul>
	<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<sup>2</sup></b>	<ul style="list-style-type: none"> <li>● 2.4G: +13.5dBm minimum</li> <li>● 5G: +12dBm minimum</li> <li>● Maximum output power must be able to achieve modular regulatory certification with notebooks that have antennas &gt;20cm from the user and peak gain of +3dBi at 2.4GHz and +4dBi at 5GHz</li> </ul>
	<b>Power Consumption</b>	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio disabled: 75 mW
	<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode

### Technical Specifications

<b>Receiver Sensitivity<sup>3</sup></b>	802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps)
	802.11a/g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps)
	802.11n:-69 dBm (72.2 Mbps), -66 dBm (300 Mbps)
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
<b>Form Factor</b>	PCI-Express Half-MiniCard
<b>Dimensions</b>	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)
<b>Weight</b>	3.1g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
<b>Altitude</b>	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Off - Radio OFF; Solid LED On - Radio ON
	<ol style="list-style-type: none"> <li>1. Check latest software/driver release for updates on supported security features.</li> <li>2. Maximum output power may vary by country according to local regulations.</li> <li>3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).</li> </ol>
<b>Bluetooth Specification</b>	
<b>Bluetooth Specification</b>	V4.0 High Speed, V2.1+EDR, backwards compatible with V1.1, 1.2 and 2.0
<b>Number of Available Channels</b>	79 (1 MHz) available channels
<b>Data Rates and Throughput</b>	3 Mbps data rate; throughput up to 2.17 Mbps Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
<b>Transmit Power</b>	-6 dBm to 4 dBm (Bluetooth Class II)
<b>Receiver Sensitivity</b>	Better than -80 dBm at 0.1 % raw bit error rate
<b>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Sleep <17 mW
<b>Antenna</b>	Internally integrated within module
<b>Range</b>	Up to 33 ft (10 m)
<b>Electrical Interface</b>	USB 2.0 compliant Microsoft Windows Plug and Play compliant



### Technical Specifications

<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>Bluetooth Profiles Supported</b>	Generic Access Profile (GAP) Service Discovery Application Profile (SDAP) Serial Port Profile (SPP) Dial_Up Networking Profile (DUN) Generic Object Exchange Profile (GOEP) Object Push Profile (OPP) File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP) Personal Area Networking Profile (PAN) Human Interface Device Profile (HID) Generic Audio/Video Distribution Profile (GAVDP) Advanced Audio/Video Distribution Profile (A2DP) FAX Profile (FAX) Basic Imaging Profile (BIP) Headset Profile (HSP) Hands Free Profile (HFP) Basic Printing Profile (BPP) VDP (Video Distribution Profile) AVRCP (Audio Video Remote Control Profile)

\* Wireless access point and internet service required. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices

<b>Intel Dual Band Wireless-N 7260NB 802.11 a/b/g/n (2x2) WiFi Adapter*</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>	802.11b/g/n                      2.402 - 2.482 GHz

### Technical Specifications

	802.11a/n	4.9 - 4.95 GHz (Japan) 5.15 - 5.25 GHz 5.25 - 5.35 GHz 5.47 - 5.725 GHz 5.825 - 5.850 GHz
<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: card will support rates for NSS=1 and NSS=2 for RX and TX for 20 and 40 MHz channels. Short and long guard interval shall be supported.	
<b>Modulation</b>	Direct Sequence Spread Spectrum CCK, BPSK, QPSK, 16-QAM, 64-QAM	
<b>Security<sup>1</sup></b>	<ul style="list-style-type: none"><li>• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li><li>• AES-CCMP: 128 bit in hardware</li><li>• 802.1x authentication</li><li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li><li>• WPA2 certification</li><li>• IEEE 802.11i</li><li>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li><li>• WAPI</li></ul>	
<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.	
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)	
<b>Roaming</b>	IEEE 802.11 compliant roaming between band Access Points	
<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"><li>• 2.4G: +13.5dBm minimum</li><li>• 5G: +12dBm minimum</li></ul>	
<b>Power Consumption</b>	Transmit: 2.0 Watts Receive: 1.6 Watts Idle mode <sup>3</sup> : 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio off: 75 mW	
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
<b>Receiver Sensitivity<sup>4</sup></b>	802.11g: -90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps)  802.11b: -95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps)  802.11g: -90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps)  802.11n: -69 dBm (150 Mbps), -66 dBm (300 Mbps)	

### Technical Specifications

<b>Antenna Connections</b>	2 U.FL type connectors (output impedance of 50 ± 2 ohms)	
<b>Form Factor</b>	PCI-Express Half-MiniCard	
<b>Dimensions</b>	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)	
<b>Weight</b>	3.1g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber - 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.
- \* Wireless access point and internet service required. Availability of public wireless access points limited.

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### AUDIO/MULTIMEDIA - DTS SOUND+

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<b>Hardware</b>	<b>Implementation</b>	IDT 92HD91
	<b>Function Key</b>	Volume up, volume down, and mute
	<b>Volume Controls</b>	
	<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 when equipped with optional webcam

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### Technical Specifications

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

### POWER

<b>HP 65W Smart AC Adapter</b>	<b>Dimensions</b>	4.17 x 1.85 x 1.1 in (10.6 x 4.7 x 2.8 cm)		
	<b>Weight</b>	0.62 lb (280 g)		
	<b>Input</b>	<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>	1.7 A at 90 VAC, 0.85 A at 180 VAC	
		<b>Output power</b>	65W	
		<b>DC output</b>	18.5V	
		<b>Hold-up time</b>	5 msec at 115 VAC input	
		<b>Output current limit</b>	<11A, 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>EMI and Safety Certifications</b>	<b>Storage Humidity</b>	10% to 90%	
<b>CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; MTBF - over 200,000 hours at 25°C ambient condition.</b>				

### Technical Specifications

#### 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:

- IT ECO declaration
- US ENERGY STAR®
- EPEAT <Gold> registered in the United States. See <http://www.epeat.net> for registration status in your country.

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

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	5.51 W	5.15 W	5.36 W
Sleep (Energy Star low power mode)	0.85 W	0.88 W	0.85 W
Off	0.36 W	0.36 W	0.35 W

**NOTE:**

Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	19 BTU/hr	18 BTU/hr	18 BTU/hr
Sleep	3 BTU/hr	3 BTU/hr	3 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 BTU/hr

\* 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)
Typically Configured - Idle	3.3	26
Fixed Disk - Random writes	4	33

**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 1ppm by weight  
 Cadmium greater than 20ppm by weight

Battery size: CR2032 (coin cell)  
 Battery type: Lithium  
 Battery size: 6-cell high capacity Lithium-Ion battery (optional 8 cell available)

### Technical Specifications

#### Additional information

##### Battery type:

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/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](http://www.epeat.net)
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product contains 9.3% post-consumer recycled plastic (by wt.)
- This product is 98.1% recycle-able when properly disposed of at end of life.

##### Packaging Materials

- External:
  - PAPER/Corrugated 539.5 g
- Internal:
  - PLASTIC/EPE (Expanded Polyethylene) 49.5 g
  - PLASTIC/Polyethylene low density 26 g
- The PAPER/Corrugated packaging material is made from 80 % recycled content.
- The corrugated paper packaging materials contains at least 60% recycled content.

#### Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at <http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf>):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants - may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel - finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) - except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

#### Packaging Usage

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

### Technical Specifications

- 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.

### 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>

Eco-label certifications

<http://www8.hp.com/us/en/hp-information/environment/ecolabels.html>

ISO 14001 certificates:

[http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC\\_GBU\\_Product\\_Design\\_ISO\\_14K\\_Certificate.pdf](http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf)

and

<http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf>

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

Type	Description	Part #
<b>Memory</b>	HP 4 GB DDR3L-1600 1.35V SODIMM	H6Y75AA#xxx
	HP 8 GB DDR3L-1600 1.35V SODIMM	H6Y77AA#xxx
<b>Cases</b>	HP Business Top Load Case (fits up to 15.6")	H5M92AA
	HP Business Backpack (fits up to 17.3")	H5M90AA
	HP Essential Top Load Case (up to 15.6")	H2W17AA#xxx
	HP Professional Leather Case (up to 17.3")	H4J94AA
	HP Business 4 Wheel Roller Case (fits up to 17.3")	H5M93AA
<b>Docking</b>	HP Adjustable Dual Monitor Stand	AW664AA#xxx
	HP Adjustable Display Stand	AW663AA#xxx
	HP UltraSlim Docking Station	D9Y32AA#xxx
<b>Input/Output - Mice</b>	HP Wireless Mobile Mouse	H2L63AA
	HP Stylish USB KB/Mouse	H4B80AA#xxx
<b>Adapters</b>	HP 90W Slim AC Adapter	H6Y83AA#xxx
	HP 65W Slim AC Adapter	H6Y82AA#xxx
	HP 90W Slim Combo Adapter w/USB Adapter	H6Y84AA#xxx
<b>Storage - External Storage</b>	HP External USB Optical Drive (expected availability 10/1/13)	F2B56AA#xxx
<b>Batteries</b>	HP C006XL Notebook Battery	E7U23AA
	HP CM03XL Notebook Battery	E7U24AA
<b>Health and Education</b>	HP 20-Notebook Managed Charging Cart	QL489AA#xxx
	HP 20-Notebook Charging Cart	QL488AA#xxx
	HP 30-Notebook Managed Charging Cart	QL490AA#xxx
	HP 30-Notebook Charging Cart	H4F31AA#xxx
<b>Security</b>	HP Docking Station Cable Lock	AU656AA#xxx
	HP UltraSlim Keyed Cable Lock	H4D73AA
<b>Wireless</b>	HP hs3110 HSPA+ Mobile Module	E5M76AA
	HP lt4112 LTE/HSPA+ 4G Mobile Module (EMEA, APJ only)	E5M74AA



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

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