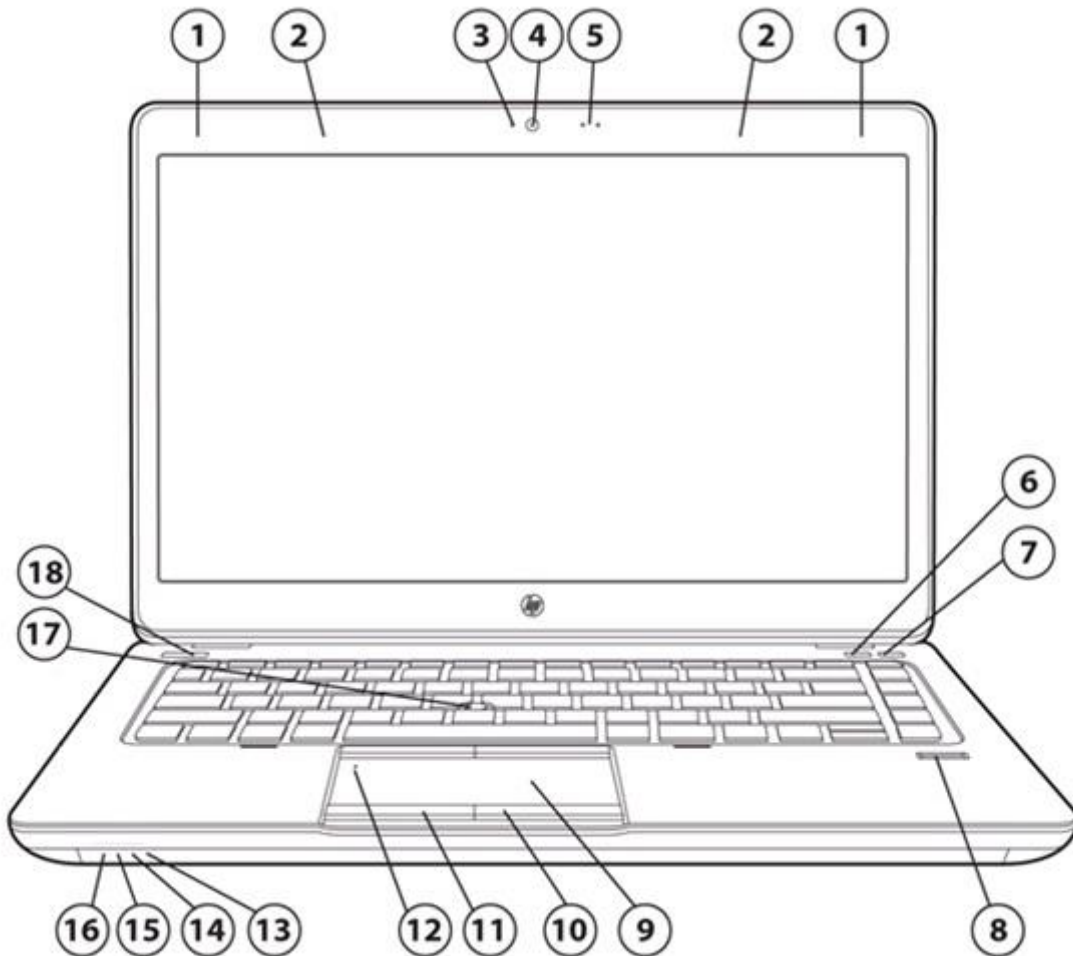


Overview

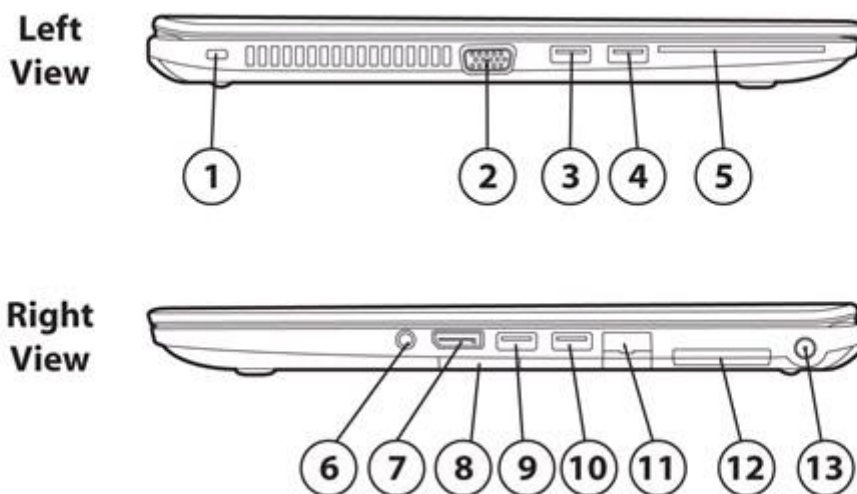
HP ZBook 14 Mobile Workstation



Front View

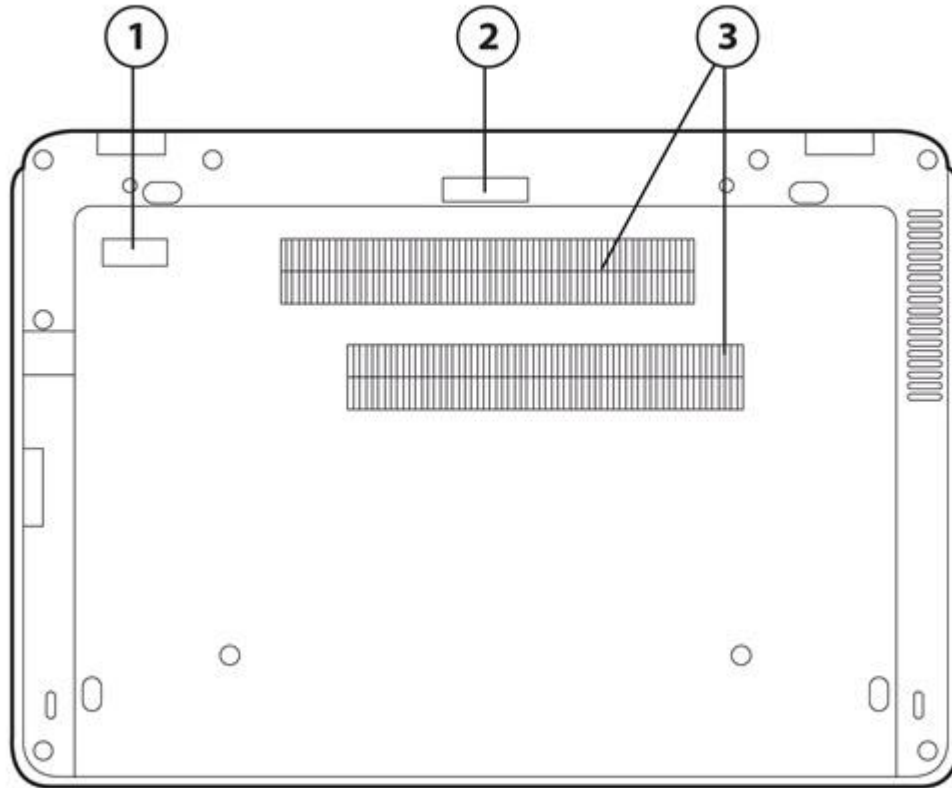
- | | |
|--|-------------------------------------|
| 1. WLAN antennas (2) | 10. Right Touchpad button |
| 2. WWAN antennas (2) | 11. Left Touchpad button |
| 3. Webcam light (with webcam) | 12. Touchpad on/off button with LED |
| 4. Webcam | 13. Hard drive light |
| 5. Internal microphones (2) | 14. 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)

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)

Overview

- 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.
- 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 features are available in all editions of Windows 8 and 8.1. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8 and 8.1 functionality. See <http://www.microsoft.com>

** 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*

4th Generation Intel® Core™ i7-4500U (1.8 GHz, 4 MB cache, 2 cores)*
Up to 3.0 GHz with Intel Turbo Boost Technology
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.

CHIPSET

Chipset is integrated with processor

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

Features

"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

Intel HD 4400 Graphics

AMD FirePro M4100 (1 GB dedicated GDDR5)

Microsoft DirectX 11.1 (Shader Model 5.0) and OpenGL 4.2 capable

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.

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 (2³⁰) 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 UltralSlim Docking Station, 4 with HP UltraSlim Docking station, and 3 without a docking station.

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.

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)

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

Features

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.

FLASH CACHE

32 GB M.2 (NGFF)

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

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

Features

Intel Dual Band Wireless-AC 7260 802.11 ac (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.

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

Features

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

Windows 8

Security

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

Windows 7

Security

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

Features

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
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)

Microsoft Products

Buy Office

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
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

Additional Software Available from the Web

HP SoftPak 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

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

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

Features

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

Security

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.

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.

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

Features

- **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

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.

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

Features

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.

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)

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

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	19.5 V dc @ 3.3 A		
	Average Operating Power		Windows 7 (32-bit)	Windows 7 (64-bit)
		AMD FirePro Graphics	16.28 W	16.8 W
	Max Operating Power	< 65 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 target**		
	ICES	Yes		
	Australia / NZ A-Tick Compliance	Yes		
	CCC	Yes		
	Japan VCCI Compliance	Yes		
	KCC	Yes		
	BSMI	Yes		
	CE Marking Compliance	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.

** 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

14" diagonal LED-backlit HD anti-glare SVA flat (1366 x 768)	Outline Dimensions (W x H x D)	12.6 x 8.09 x 0.14 in (32.09 x 20.56 x 0.36 cm)
	Active Area	12.18 x 6.85 in (30.94 x 17.395 cm)
	Weight	0.71 lb (320g) (max)
	Diagonal Size	14.0 in (35.6cm)
	Surface Treatment	Anti-glare
	Contrast Ratio	300:1 (min)

Technical Specifications

Refresh Rate	60 Hz
Brightness	200 nit (typical)
Pixel Resolution	Format 1366 x 768 (HD)
	Configuration RGB Stripe
Interface	eDP 1.2 (1 lane)
LCD Mode	TN
PPI	125 ppi
Viewing Angle	SVA 40/40/15/30 (Left/Right/Down/Up)

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

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

14" diagonal LED-backlit FHD anti-glare UWVA slim (1920 x 1080)	Outline Dimensions (W x H x D)	12.6 x 8.09 x 0.12 in (32.09 x 20.56 x 0.3 cm)
	Active Area	12.18 x 6.85 in (30.93 x 17.4 cm)
	Weight	0.75 lb (340 g) (max)

Technical Specifications

Diagonal Size	14.0 in (35.6cm)	
Surface Treatment	Anti-glare	
Contrast Ratio	600:1 (min)	
Refresh Rate	60 Hz	
Brightness	300 nit (typical)	
Pixel Resolution	Format	1920 x 1080 (FHD)
	Configuration	RGB Stripe
Interface	eDP 1.3+PSR (2 lane)	
LCD Mode	IPS/FFS/AHVA	
PPI	157 ppi	
Viewing Angle	UWVA 85/85/85/85 (Left/Right/Down/Up)	

STORAGE AND DRIVES

Internal Storage

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

500 GB 5400 rpm SATA FIPS* Hard Drive (Planned to be available in Oct. 2013)	Drive Weight	0.25 lbs (95g)		
	Capacity	500 GB		
	Height	0.28 in (7 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	Single Track	1.5 ms	
	(typical reads, including settling)	Average	11 ms	
		Maximum	22 ms	
	Cache	16 MB		
	Rotational Speed	5400 rpm		
	Logical Blocks	976,773,168		
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]		
Features	ATA Security, TCG Opal SSC 2.0 and FIPS 140-2-level2			

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

Technical Specifications

750 GB 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115g)	
	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
	Cache	16 MB	
	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
	Cache	16 MB	
	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 (Planned to be available in Oct. 2013)	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
	Cache	16 MB	
	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	
	Cache	16 MB		
	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 512 GB, 2.5-inch Solid State Drive	Drive Weight	73 Grams		
	Capacity	512 GB		
	Height	0.276 in (7 mm)		
	Width	2.76 in (70 mm)		
	Interface	SATA Gen 3 (6 Gb/s)		
	Performance	Maximum Sequential Read	Maximum Sequential Write	
		460 MB/s	260 MB/s	
		Logical Blocks	1,000,215,216	
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 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 Gen 3 (6 Gb/s)		
	Performance	Maximum Sequential Read	Maximum Sequential Write	
		Up to 460 MB/s	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	Maximum Sequential Write

Technical Specifications

		Read		
		550 MB/s	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		
<hr/>				
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 Gen 3 (6 Gb/s)		
	Performance	Maximum Sequential Read	Maximum Sequential Write	
		415 MB/s	175 MB/s	
	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		
<hr/>				
SATA 6Gb/s 120 GB, 2242 M.2 Solid State Drive (Expected to be available in 4Q 2013)	Drive Weight	Up to 10 Grams		
	Capacity	120 GB		
	Height	0.138 in (3.5mm)		
	Width	0.866 in (22 mm)		
	Interface	M.2 SATA Gen3 (6 Gb/s)		
	Performance	Maximum Sequential Read	Maximum Sequential Write	
		Up to 540 MB/s	Up to 480 MB/s	
	Logical Blocks	234,441,648		
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]		
	Features	ATA Security; ATA-8, SATA 3.0; DIPM; TRIM		
<hr/>				
SATA 6Gb/s 32 GB, 2242 M.2 Solid State Drive	Drive Weight	Up to 10 Grams		
	Capacity	32 GB		
	Height	0.138 in (3.5mm)		
	Width	0.866 in (22 mm)		
	Interface	M.2 SATA Gen3 (6 Gb/s)		
	Performance	Maximum Sequential Read	Maximum Sequential Write	
		Up to 380 MB/s	Up to 70 MB/s	
	Logical Blocks	62,533,296		
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]		
	Features	ATA Security; ATA-8, SATA 3.0; DIPM; TRIM		

SECURITY

HP Fingerprint Sensor	Voltage	3.0-3.6V
	Operating temperature	14° - 167°F (-10° - 75°C)

Technical Specifications

Current consumption image	36mA
Low latency wait for finger	950 uA
Capture rate	3000 lines/sec
ESD Resistance	IEC 6100-4-2 4B (+/-15KV)
Detection Matrix	200*1 (plus another secondary line); 508 dpi, sensor area 12*3 mm

NETWORKING/COMMUNICATIONS

Intel® I218-LM Gigabit Network Connection	Ethernet Features	<p>10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)</p> <p>100 10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)</p> <p>100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)</p> <p>1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 802.3. Clauses 40)</p> <p>Auto-Negotiation (Automatic Speed Selection)</p> <p>Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s</p> <p>IEEE 802.1p QoS (Quality of Service) Support</p> <p>IEEE 802.1q VLAN support</p> <p>IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)</p> <p>IEEE 802.3az EEE(Energy Efficient Ethernet)</p> <p>Jumbo Frame 9K</p> <p>Auto MDI/MDIX Crossover cable detection</p>
	Power Management	ACPI compliant - multiple power modes
	Performance Features	<p>Energy Detect Low Power Mode(Green Ethernet)</p> <p>TCP/IP/UDP Checksum Offload (configurable)</p> <p>Protocol Offload(ARP & NS)</p> <p>Large send offload and Giant send offload</p> <p>Receiving Side Scaling</p> <p>MACSec Offload (802.3ae)</p> <p>Intel vPro</p> <p>iSCSI Boot</p>
	Manageability	<p>Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only)</p> <p>PXE 2.1 Remote Boot</p> <p>Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))</p> <p>Comprehensive diagnostic and configuration software suite</p> <p>Virtual Cable Doctor for Ethernet cable status</p>
	Interface	<p>PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ.</p> <p>NOTE: Intel 82579 PCIe interface is not PCIe compliant. It operates at half of PCIe specification V1.1 (2.5GT/S) speed.</p>
	NIC Device Driver Name	Intel 82579LM/82579V Ethernet Network Connection

HP hs3110 HSPA+ Mobile Broadband Module*	Technology/Operating Bands	<p>CDMA/1xRTT/EvDO: 800MHz (Cell), 1900MHz (PCS)</p> <p>GSM/GPRS/EDGE: 850MHz (Cell), 900MHz (EGSM), 1800MHz (DCS), 1900MHz (PCS)</p> <p>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)</p> <p>LTE: 700 MHz (Verizon, Band XIII)</p>
	Mobile Operator	Verizon (US only)

Technical Specifications

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 5 mm)
Voltage, Operating	3.3v +/- 9%
Temperature, Operating (from TIA/EIA/IS-98-D)	-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

* Not available with Dreamcolor

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

Technology/Operating Bands	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)
Wireless Protocol Standards	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification
Wireless Parametric Standards	Complies with 3GPP specifications Release 8 for LTE

Technical Specifications

Maximum Data Rates	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)
GPS	Standalone
GPS Bands	1575.42 MHz (± 1.023 MHz), GLONASS 1596-1607MHz
Maximum Output Power	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)
Maximum Power Consumption	LTE: 1,200 mA (peak); <900 mA (average) WCDMA: 1,100 mA (peak); <800 mA (average) EGPRS: 2,800 mA (peak); <700 mA (average)
Power Consumption, Sleep Mode	3 mA
Power Management	USB selective suspend, Integrated notebook wireless button
Antenna Type	Dual high efficiency multi-band antennae with spatial diversity
Form Factor	M.2, USB 2.0 interface
Weight	6 g
Dimensions (Length x Width x Thickness)	42 mm × 30 mm × 2.3 mm
Voltage, Operating	3.135 V to 4.4 V (3.3 V +1.1V/-0.165V)
Temperature, operating (from TIA/EIA/IS-98-D)	14° to 131° F (-10° to 55° C)
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)
LED Activity	LED Off - Radio Off; Solid LED On - Radio On

* Not available with Dreamcolor

HP It4112 LTE/HSPA+ Mobile Broadband Module*

Technology/Operating Bands	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)
Wireless Protocol Standards	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification
Wireless Parametric Standards	Complies with 3GPP specifications Release 8 for LTE
Maximum Data Rates	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)

Technical Specifications

GPS	Standalone
GPS Bands	1575.42 MHz (\pm 1.023 MHz), GLONASS 1596-1607MHz
Maximum Output Power	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)
Maximum Power Consumption	LTE: 1,200 mA (peak); <900 mA (average) WCDMA: 1,100 mA (peak); <800 mA (average) EGPRS: 2,800 mA (peak); <700 mA (average)
Power Consumption, Sleep Mode	3 mA
Power Management	USB selective suspend, Integrated notebook wireless button
Antenna Type	Dual high efficiency multi-band antennae with spatial diversity
Form Factor	M.2, USB 2.0 interface
Weight	6 g
Dimensions (Length x Width x Thickness)	42 mm x 30 mm x 2.3 mm
Voltage, Operating	3.135 V to 4.4 V (3.3 V +1.1V/-0.165V)
Temperature, operating (from TIA/EIA/IS-98-D)	14° to 131° F (-10° to 55° C)
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)
LED Activity	LED Off - Radio Off; Solid LED On - Radio On
* Not available with Dreamcolor.	

Intel Dual Band Wireless-N 7260AN 802.11 a/b/g/n (2x2) WiFi + Bluetooth 4.0 Combo Adaptor*	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	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
	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: 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.
	Modulation	Direct Sequence Spread Spectrum

Technical Specifications

Security¹	<p>CCK, BPSK, QPSK, 16-QAM, 64-QAM</p> <ul style="list-style-type: none"> • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between band Access Points
Output Power²	<ul style="list-style-type: none"> • 2.4G: +13.5dBm minimum • 5G: +12dBm minimum
Power Consumption	<p>Transmit: 2.0 Watts Receive: 1.6 Watts Idle mode³: 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio off: 75 mW</p>
Power Management	<p>ACPI and PCI Express compliant power management 802.11 compliant power saving mode</p>
Receiver Sensitivity⁴	<p>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)</p> <p>802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps)</p> <p>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)</p> <p>802.11n:-69 dBm (150 Mbps), -66 dBm (300 Mbps)</p>
Antenna Connections	2 U.FL type connectors (output impedance of 50 ± 2 ohms)
Form Factor	PCI-Express Half-MiniCard
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)
Weight	3.1g
Operating Voltage	3.3v +/- 9%
Temperature	<p>Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)</p>
Humidity	<p>Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)</p>
Altitude	<p>Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)</p>
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON

Technical Specifications

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

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 to 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 UL, CSA, and CE Mark
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)

Technical Specifications

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

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

Intel Dual Band Wireless-AC 7260 802.11 ac (2x2) WiFi + BT 4.0 combo Adapter*	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
	Interoperability	Wi-Fi certified
	Frequency Band	802.11b/g/n <ul style="list-style-type: none"> • 2.402 - 2.482 GHz 802.11a/n <ul style="list-style-type: none"> • 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 • 2.402 - 2.482 GHz
	Data Rates	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)
	Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	Security¹	<ul style="list-style-type: none"> • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power²	<ul style="list-style-type: none"> • 2.4G: +13.5dBm minimum • 5G: +12dBm minimum

Technical Specifications

- Maximum output power must be able to achieve modular regulatory certification with notebooks that have antennas >20cm from the user and peak gain of +3dBi at 2.4GHz and +4dBi at 5GHz

Power Consumption	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	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity³	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)	
Antenna type	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	
Form Factor	PCI-Express Half-MiniCard	
Dimensions	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)	
Weight	3.1g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
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 (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).	
Bluetooth Specification	V4.0 High Speed, V2.1+EDR, backwards compatible with V1.1, 1.2 and 2.0	
Number of Available Channels	79 (1 MHz) available channels	
Data Rates and Throughput	3 Mbps data rate; throughput up to 2.17 Mbps Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric	
Transmit Power	-6 dBm to 4 dBm (Bluetooth Class II)	
Receiver Sensitivity	Better than -80 dBm at 0.1 % raw bit error rate	
Power Consumption	Peak (Tx) 330 mW	

Technical Specifications

	Peak (Rx) 230 mW Sleep <17 mW
Antenna	Internally integrated within module
Range	Up to 33 ft (10 m)
Electrical Interface	USB 2.0 compliant
	Microsoft Windows Plug and Play compliant
Bluetooth Software Supported	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 UL, CSA, and CE Mark
Bluetooth Profiles Supported	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
Intel Dual Band Wireless- N 7260NB 802.11 a/b/g/n (2x2) WiFi Adapter*	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:

Technical Specifications

	http://www.hp.com/go/notebooks/WLAN	
Frequency Band	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
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: 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.	
Modulation	Direct Sequence Spread Spectrum CCK, BPSK, QPSK, 16-QAM, 64-QAM	
Security¹	<ul style="list-style-type: none"> • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI 	
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.	
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)	
Roaming	IEEE 802.11 compliant roaming between band Access Points	
Output Power²	<ul style="list-style-type: none"> • 2.4G: +13.5dBm minimum • 5G: +12dBm minimum 	
Power Consumption	Transmit: 2.0 Watts Receive: 1.6 Watts Idle mode ³ : 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio off: 75 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity⁴	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)	

Technical Specifications

	802.11n:-69 dBm (150 Mbps), -66 dBm (300 Mbps)
Antenna Connections	2 U.FL type connectors (output impedance of 50 ± 2 ohms)
Form Factor	PCI-Express Half-MiniCard
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)
Weight	3.1g
Operating Voltage	3.3v +/- 9%
Temperature	Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
Humidity	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
Altitude	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
LED Activity	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.

AUDIO/MULTIMEDIA - DTS SOUND+

Hardware	Implementation	IDT 92HD91
	Function Key	Volume up, volume down, and mute
	Volume Controls	
	Full Duplex	Yes
	Microphone In	Stereo
	Headphone/Line Out	Stereo
	Integrated Microphone	Yes, dual digital microphone array when equipped with optional webcam

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

Integrated Stereo Speakers	Power Rating	2 Watts
	Impedance	4 Ohms

POWER

Technical Specifications

HP 65W Smart AC Adapter	Dimensions	4.17 x 1.85 x 1.1 in (10.6 x 4.7 x 2.8 cm)	
	Weight	0.62 lb (280 g)	
	Input	100 to 240 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
	Output	Input AC current	1.7 A at 90 VAC, 0.85 A at 180 VAC
		Output power	65W
		DC output	18.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	Connector	3 pin/grounded, mates with interchangeable cords	
	Environmental Design	Operating temperature	32° to 104° F (0° to 40° C)
		Non-operating (storage) temperature	-4° to 149° F (-20° to 65° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
		Humidity	20% to 80%
Storage Humidity		10% to 90%	
EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; MTBF - over 200,000 hours at 25°C ambient condition.		

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
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Technical Specifications

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 than 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)

Battery type:

Additional information

- 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
- 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

Technical Specifications

- 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:

- 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.

For more information about HP's commitment to the environment:

Hewlett-Packard Corporate Environmental Information

Global Citizenship Report

<http://www.hp.com/hpinfo/globalcitizenship/qcreport/index.html>

Eco-label certifications

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

Technical Specifications

ISO 14001 certificates:

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 #
Memory	HP 4 GB DDR3L-1600 1.35V SODIMM	H6Y75AA#xxx
	HP 8 GB DDR3L-1600 1.35V SODIMM	H6Y77AA#xxx
Cases	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
Docking	HP Adjustable Dual Monitor Stand	AW664AA#xxx
	HP Adjustable Display Stand	AW663AA#xxx
	HP Ultrastim Docking Station	D9Y32AA#xxx
Input/Output - Mice	HP Wireless Mobile Mouse	H2L63AA
	HP Stylish USB KB/Mouse	H4B80AA#xxx
Adapters	HP 90W Slim AC Adapter	H6Y83AA#xxx
	HP 65W Slim AC Adapter	H6Y82AA#xxx
	HP 90W Slim Combo Adapter w/USB Adapter	H6Y84AA#xxx
Storage - External Storage	HP External USB Optical Drive (expected availability 10/1/13)	F2B56AA#xxx
	HP 2013 MWS Upgrade Bay DVD	G1Y57AA
	HP 2013 MWS Upgrade Bay 750GB HDD	G1Y56AA
	HP External USB Optical Drive	F2B56AA
	HP 500GB 7200rpm HDD*	F3B97AA
	HP 750GB 7200rpm HDD*	H2P67AA
	HP 128GB Solid State Drive*	F4P50AA
	HP 180GB Solid State Drive*	H4T75AA
	HP 512GB Solid State Drive*	J2V75AA
	HP MWS HDD/SDD Bracket Only	J2D73AA
	* If you are not replacing an existing drive in your system, separate HP MWS HDD/SDD Bracket (J2D73AA) required for installation of this drive.	
Batteries	HP C006XL Notebook Battery	E7U23AA
	HP CM03XL Notebook Battery	E7U24AA
Health and Education	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
Security	HP Docking Station Cable Lock	AU656AA#xxx
	HP UltraSlim Keyed Cable Lock	H4D73AA

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

Wireless

HP hs3110 HSPA+ Mobile Module

E5M76AA

HP lt4112 LTE/HSPA+ 4G Mobile Module (EMEA, APJ only)

E5M74AA

Summary of Changes

Date of change:	Version History:		Description of change:
May 22, 2014	V6 to v7	Changed	Graphics and Networking/Communications and Display were revised. Environmental Data.
August 26, 2014	From v7 to v8	Added	Processors option added
Sept 17, 2014	From v8 to v9	Removed	Supported AMD Dynamic Switchable Graphics
November 20, 2014	From v9 to v10	Added	External storage for Options and Accessories
		Changed	Chipset component

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