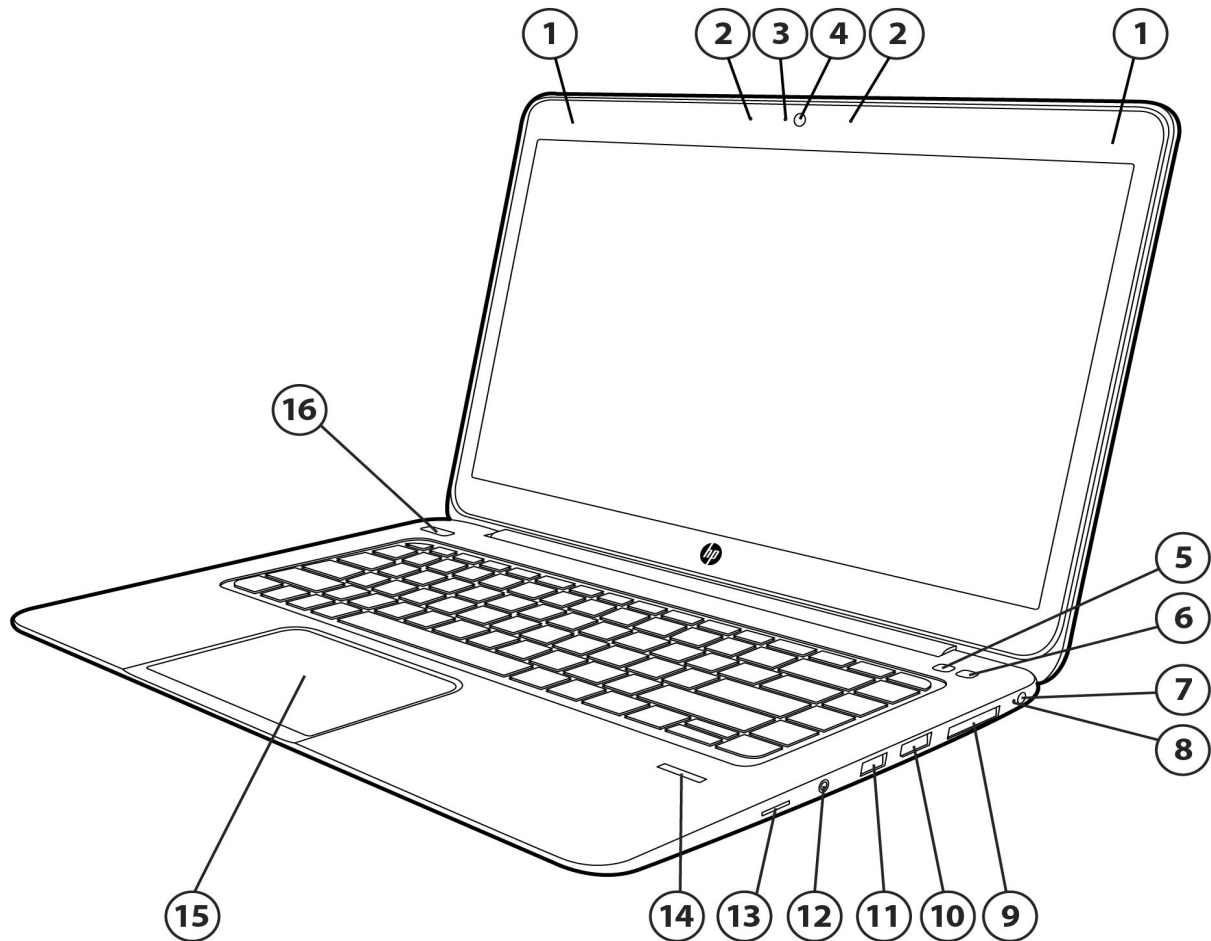
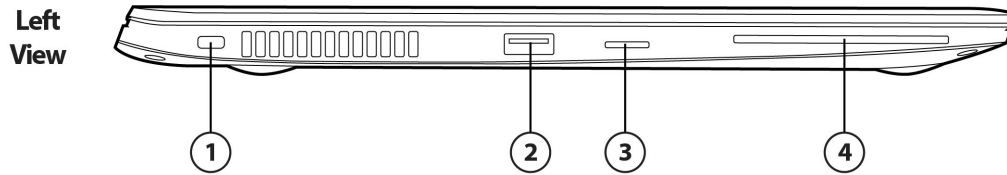


Overview



- | | |
|--|---|
| 1. WLAN antennas (2) | 9. Docking connector |
| 2. Dual-microphone array | 10. DisplayPort 1.2 |
| 3. Webcam light (only with optional webcam) | 11. USB 3.0 port |
| 4. Optional 720p HD webcam | 12. Headphone/microphone combo |
| 5. Wireless on/off button with LED indicator | 13. WWAN sim slot with plug (Plug is removable only for units with optional WWAN) |
| 6. Speaker mute button with LED indicator | 14. Fingerprint reader |
| 7. Power connector | 15. ForcePad™ |
| 8. Power LED indicator | 16. Power button |

Overview



1. Security lock
2. USB 3.0 charging port
3. Micro-SD card slot
4. Smart Card Reader

At A Glance

- Windows 8.1 versions, Windows 7 versions, or FreeDOS 2.0
- Magnesium display enclosure, magnesium-reinforced chassis, wear-resistant platinum-colored HP DuraFinish, HP DisplaySafe frame, HP DuraKeys, precision metal-alloy hinges, aluminum keyboard deck
- Ensured durability through MIL-SPEC 810G testing, plus an additional 115,000 hours of reliability testing through HP's Total Test Process
- Choice of 4th Generation Intel® Core™ i7 and i5 with Turbo Boost Technology
- Integrated Intel HD Graphics 4400
- 14.0-inch diagonal HD+, FHD* widescreen LED-backlit, or touchscreen display
- Choice of 256 GB SED Solid State Drive, 180 GB SED Solid State Drive (available Spring 2014), 180 GB Solid State Drive, or 128 GB Solid State Drive
- Built-in docking for a desktop-like experience
- DisplayPort 1.2 for high resolution support
- HD Audio with DTS Studio Sound™ optimized for high fidelity audio during video conferencing and web-based training
- 6-cell (42 WHr) HP Long Life battery for battery life up to 9 hours and 45 minutes
- ForcePad™ that enables multiple gestures and eliminates the need for repetitive motion and makes navigation easier
- Integrated Smart Card Reader and fingerprint reader for strong security authentication
- HP Premier Image with Microsoft Security Essentials and without trialware
- HP BIOSphere with HP Sure Start
- Flexible wireless connectivity options:
 - Optional integrated wireless mobile broadband 3G and 4G/LTE support
 - Integrated Intel® 802.11 a/b/g/n (2x2), Intel® 802.11 a/b/g/n (2x2) with Bluetooth® v4.0 Combo, or Intel® 802.11 a/b/g/n (2x2) AC with Bluetooth® v4.0 Combo
- Low halogen, ENERGY STAR qualified (with Microsoft OS) and EPEAT Gold registered in the U.S. (with Microsoft OS). EPEAT status varies by country- please see epeat.net.

NOTE: See important legal disclosures for all listed specs in their respective features sections.

Features

PRODUCT NAME

HP EliteBook Folio 1040 G1 Notebook PC

NOTE: Not all configurations qualify as an Ultrabook.

OPERATING SYSTEM

Preinstalled

Windows 8.1 Pro 64*
Windows 8.1 64*
Windows 7 Professional 32 (available through downgrade rights from Windows 8.1 Pro 64)**
Windows 7 Professional 64 (available through downgrade rights from Windows 8.1 Pro 64)**
Windows 7 Professional 32***
Windows 7 Professional 64***
Windows 7 Home Premium 32***
Windows 7 Home Premium 64***
FreeDOS 2.0

Supported

Windows 8 Enterprise*
Windows 7 Enterprise 32***
Windows 7 Enterprise 64***
Windows 7 Ultimate 32***
Windows 7 Ultimate 64***

Certified

SUSE Linux Enterprise Desktop

* Not all features are available in all editions of Windows 8.1. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8.1 functionality. See <http://www.microsoft.com> for details.

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

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

PROCESSOR

4th Generation Intel® Core™ i7-4600U with Intel HD Graphics 4400 (2.1 GHz, 4 MB cache, 2 cores)*

Up to 3.3 GHz with Intel Turbo Boost Technology

4th Generation Intel® Core™ i5-4300U with Intel HD Graphics 4400 (1.9 GHz, 3 MB cache, 2 cores)*

Up to 2.9 GHz with Intel Turbo Boost Technology

4th Generation Intel® Core™ i5-4200U with Intel HD Graphics 4400 (1.6 GHz, 3 MB cache, 2 cores)*†

Up to 2.6 GHz with Intel Turbo Boost Technology

† Not available with vPro

* 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.

NOTE: Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

Features

CHIPSET

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, an Intel Centrino® Advanced-N or Ultimate-N WLAN module and a preinstalled Windows operating system. It provides advances in remote manageability, security, energy efficient performance, and wireless connectivity. Intel Active Management Technology 9.0 (iAMT) offers built-in manageability and proactive security for networked notebook PCs, even when they are powered off* or when the operating system is inoperable. It can help identify threats before they reach the network, isolate infected systems, and update PCs regardless of their power state.

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

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

GRAPHICS

Integrated:
Intel® HD Graphics 4400

DISPLAY

Internal

14.0" diagonal eDP, slim, LED-backlit HD** 16:9 widescreen anti-glare SVA (1600 x 900)

14.0" diagonal eDP, slim, LED-backlit FHD* widescreen anti-glare UWVA (1920 x 1080), 300 nits

14.0" diagonal eDP, slim, LED-backlit FHD* widescreen Touch UWVA (1920 x 1080), 300 nits

External

Up to 32-bit per pixel color depth (250 nits)

DisplayPort

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

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

Features

STORAGE AND DRIVES

Primary Storage Bay

Solid State Drive

SATA 6 Gb/s 128 GB* Solid State

SATA 6 Gb/s 180 GB* Solid State

SATA 6 Gb/s 180 GB* SED Solid State (available Spring 2014)

SATA 6 Gb/s 256 GB* Solid State

* For hard drives and solid state drives, GB = 1 billion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 7) and up to 36 GB (for Windows 8.1) of system disk is reserved for the system recovery software.

NOTE: The EliteBook Folio is available in standard thin and light configurations for customers who value the ultra-thin design but prefer options such as a standalone HDD or require a self-encrypting hard drive. These configurations will not meet Intel's definition of an Ultrabook.

MEMORY

Standard

DDR3L SDRAM (1600 MHz, 1.3v)

One SODIMM slot

Standard memory 4096 MB soldered down

Maximum

8GB*

NOTE: Memory is not upgradeable by the end user.

*Maximum memory capacities assume Windows 64-bit operating systems or Linux. With Windows 32-bit operating systems, memory above 3 GB may not all be available due to system resource requirements.

NETWORKING/COMMUNICATIONS

Wireless

Support for a broad range of secure, integrated wireless LAN and wireless WAN options featuring support for the latest industry standards. Broadband Wireless (WWAN) requires a Windows operating system and is available in select countries. Wireless LAN and integrated Bluetooth are also available (both are factory configurable only) and can be combined with any of the supported wireless WAN options.

Broadband Wireless (WWAN)

HP lt4112 LTE/HSPA+ Mobile Broadband Module (EMEA only) *,**

HP hs3110 HSPA+ Mobile Broadband Module *

Integrated wireless LAN options

Intel® 802.11 a/b/g/n (2x2)***

Intel® 802.11 a/b/g/n (2x2) with Bluetooth® v4.0 Combo***

Intel® 802.11 a/b/g/n (2x2) AC with Bluetooth® v4.0 Combo***, ****

* WWAN modules are only available if preconfigured. WWAN connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors.

Features

** 4G LTE not available on all products, in all regions and requires Windows.

***Wireless access point and Internet service is required and is not included. 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.

Communications

Intel® 1218LM Gigabit Network connection (internal)*

Optional Near Field Communication with Secure Element**, ***

* 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.

** NFC ships enabled by default on Windows 8.1 and disabled by default on Windows 7.

*** Sold separately or as an option.

AUDIO/MULTIMEDIA

Audio

HD Audio with DTS Studio Sound

Integrated stereo speakers

Integrated dual-microphone array located in display

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

Headphone/Microphone combo port

Webcam

Optional* 720p HD** webcam

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

* Sold separately as an optional feature.

** HD content required to view HD images.

Features

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

The HP spill-resistant, backlit 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 the isolated inverted-T cursor control keys, editing keys, both left and right control and alt keys, 12 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

A pressure-sensing ForcePad™ that eliminates the need for repetitive motion and makes navigation easier

Buttons and Function Keys

Discrete buttons provide easy access to the following features: wireless on/off, and speaker mute. Function keys provide control of the following features: sleep mode, external display switching, volume down, volume up, microphone mute, backlit keyboard, and display brightness.

SOFTWARE AND SECURITY

Preinstalled Software with Windows Operating System

HP BIOSphere with HP Sure Start*
Buy Office
HP Connection Manager (Win 7)
HP Wireless HotSpot**
HP Mobile Connect (EMEA only)
HP PageLift
HP Recovery Manager
HP Support Assistant
HP ePrint***
Lync Optimized****

* HP Sure Start is only available on the EliteBook 800 series, Workstation ZBook series and HP EliteBook Folio 1040.

** The wireless hotspot application requires an active internet connection and separately purchased data plan. While HP wireless hotspot is active, on-device applications will continue to work and will use the same data plan as the wireless hotspot. Wireless hotspot data usage may incur additional charges. Check with your service provider for plan details. Requires Windows 8.

*** Requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see www.hp.com/go/eprintcenter). Requires optional broadband module. Broadband use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Separately purchased data plans or usage fees may apply. Print times and connection speeds may vary.

**** Lync software is sold separately. Requires internet access.

NOTE: 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 30 GB (for Windows 7) and up to 36 GB (for Windows 8.1) of system disk is reserved for the system recovery software.

Security

Standard

HP Trust Circles Standard (Available in Fall 2013)*
HP Client Security
TPM 1.2 Embedded Security Chip

Features

- Integrated Smart Card Reader
- HP Fingerprint Sensor (100%)
- Full Volume Encryption
- Security Lock Slot
- Microsoft Security Essentials

* HP Trust Circles Standard, when included, allows up to 5 Trust Circles with up to 5 contacts in each Trust Circle. Optional Trust Circles Professional required for unrestricted number of Trust Circles and members contacts. Trust Circles Reader is available to allow a contact to participate in an invited Trust Circle. Requires Windows.

For more information on HP security solutions refer to: <http://www.hp.com/go/security>

POWER

Power Supply

- 45W Smart AC Adapter
- 45W Slim Smart AC Adapter non-slim 2 prong (Japan only)
- 65W Smart EM AC Adapter
- 65W Slim Smart AC Adapter

Power cord included is either 3.2 feet or 6 feet (1.0 or 1.8 meter).
Total length including external AC adapter is TBD feet (TBD meter).

Primary Battery

HP 6-Cell (42Whr) polymer long life battery

Battery Life*

Up to 12 hours

System Standby Time

Up to TBD weeks

* Windows 7 testing conducted by HP consisting of full battery discharge while running a series of productivity scripts against the following applications (**which may or may not be included with your particular product**): Adobe® AcrobatReader 7.0, Adobe® Illustrator® CS2, Adobe® Photoshop® CS2, Apple® Quicktime 7.1, Intervideo® WinDVD® 8, Macromedia® Flash 8, Microsoft® Office® 2003 Pro, Microsoft® Project 2003, and Winzip® 10.0. Prior to testing, the system was fully charged, display brightness was set at 60 nits, wireless was turned off, and auto dim, suspend, hibernate and all other programs, utilities, and services not essential to running the computer system or battery life test were disabled. 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.

Power Conservation

- Hibernation
- Standby
- ACPI compliance

Features

ENVIRONMENTAL

US ENERGY STAR® qualified (with Microsoft OS)
Low Halogen (does not cover adapters and power cords)
IT ECO Declaration
EPEAT® Gold in the U.S. See www.epeat.net for registration status by country.

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 3.3 lbs (1.49 kg) (Weight will vary by configuration.)

Dimensions (w x d x h)

13.31 x 9.19 x 0.63 in

33.8 x 23.35 x 1.59 cm

NOTE: Weight varies by configuration and components. Weight includes 6-cell battery, mSATA solid state drive, and 4 GB memory. Weight varies by configuration and components.

PORTS/SLOTS

Ports

DisplayPort - One (v1.2)
Headphone/Microphone combo port - One
Power Connector - One
Docking Connector - One
USB 3.0 - One
USB 3.0 charging port - One

Digital Media Slots

Micro-SD card reader supports SD, SDHC, SDXC

SERVICE AND SUPPORT

Limited 3-year, 1-year and 90-day warranty options available, depending on country, 3-year limited warranty on HP Long Life Battery (only available with 3-year platform warranty). Optional* HP Care Pack Services** are extended service contracts which go beyond your standard warranties. For more details visit: <http://www.hp.com/go/cpc>.

*Sold separately or as an optional feature.

** Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. Consult the HP Customer Support Center for details.

<http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp>

NOTE: Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit: www.hp.com/go/cpc

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	18.5 V	
	Average Operating Power	Windows 7 (32-bit)	Windows 7 (64-bit)
		TBD W	TBD W
	Max Operating Power	< 65 W	
Temperature	Operating	32° to 95° F (0° to 35° C) (not 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 (Microsoft OS)*	
	EPEAT	Registered Gold in United States**	
	ICES	Yes	
	Australia / NZ A-Tick Compliance	Yes	
	CCC	Yes	
	Japan VCCI Compliance	Yes	
	KC	Yes	
	BSMI	Yes	
	CE Marking Compliance	Yes	
	BNCI or BELUS	Yes	
	CIT	Yes	
	GOST	Yes	
Saudi Arabian Compliance (ICCP)	Yes		
SABS	Yes		
UKRSERTCOMPUTER	Yes		

Technical Specifications

* Configurations of the HP EliteBook Folio 1040 G1 that are ENERGY STAR qualified are identified as HP EliteBook Folio 1040 G1 ENERGY STAR on HP websites and on www.energystar.gov.

**EPEAT® Gold in the U.S. See www.epeat.net for registration status by country.

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

DISPLAY

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 0.12 in (32.09 x 20.56 x 0.3 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 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)	
	Diagonal Size	14.0 in (35.6cm)	
	Touch enabled	Yes	
	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/VA	
	PPI	157 ppi	

Technical Specifications

Viewing Angle UWVA 85/85/85/85 (Left/Right/Down/Up)

14" diagonal LED-backlit TBD
FHD touchscreen UWVA
slim (1920 x 1080)

STORAGE AND DRIVES

Internal Storage

The EliteBook Folio is available in standard thin and light configurations for customers who value the ultra-thin design but prefer options such as a standalone HDD or require a self-encrypting hard drive. These configurations will not meet Intel's definition of an Ultrabook.

128 GB* M.2 Solid State Drive	Drive Weight	Up to 10 grams		
	Capacity	128 GB		
	Height	0.091 in (2.3 mm)		
	Width	0.87 in (22 mm)		
	Interface	SATA 3 (6 Gb/s)		
	Performance	Maximum Sequential Read	Up to 500 MB/s	Maximum Sequential Write Up to 300 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		

180 GB* M.2 Solid State Drive	Drive Weight	Up to 10 grams		
	Capacity	180 GB		
	Height	0.091 in (2.3 mm)		
	Width	0.87 in (22 mm)		
	Interface	SATA Gen 3 (6 Gb/s)		
	Performance	Maximum Sequential Read	Up to 510 MB/s	Maximum Sequential Write Up to 470 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		
	Security Feature	TCG Opal 1 compliant		

Technical Specifications

256 GB* M.2 Solid State Drive	Drive Weight	Up to 10 grams		
	Capacity	256 GB		
	Height	0.091 in (2.3 mm)		
	Width	0.87 in (22 mm)		
	Interface	SATA Gen 3 (6 Gb/s)		
	Performance	Maximum Sequential Read	Maximum Sequential Write	
		Up to 510 MB/s	Up to 465 MB/s	
	Logical Blocks	500,118,192		
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]		
	Features	ATA Security; ATA-8, SATA 3.0; DIPM; TRIM		
Security Feature	TCG Opal 2 compliant			

180 GB* M.2 SED Solid State Drive (available Spring 2014)	Drive Weight	10 Grams		
	Capacity	180 GB		
	Height	0.091 in (2.3 mm)		
	Width	0.87 in (22 mm)		
	Interface	SATA 3 (6 Gb/s)		
	Performance	Maximum Sequential Read	Maximum Sequential Write	
		Up to 540 MB/s	Up to 490 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; TCG Opal 1.0		

SECURITY

HP Fingerprint Reader	Mobile Voltage Operation	3.0V-3.6V	
	Operating Temperature	14° - 167°F (-10° - 75°C)	
	Current Consumption	36 mA peak	
	Image		
	Low Latency Wait for Finger	950 uA	
	Capture Rate	3000. lines/sec	
	ESD Resistance	IEC 61000-4-2 4B (±15KV)	
	Detection Matrix	200*1 (plus another secondary line) 508 dpi 12*3 mm sensor area	

Technical Specifications

Smart Card Reader	Smart card standard	PC/SC 2.0 for Windows smart card standard
	Dimensions (L x W x H)	0.41x 0.08 x 0.32 in (10.5 x 2 x 8.2 mm)
	Smart Card support	ISO 7816 Class A and AB smart cards
	Smart Card Interface	Smart Card Interface with T = 0 and T = 1 support Support I2C memory card, SLE4418, SLE4428, SLE4432, SLE4442, SLE4436, SLE5536, SLE6636, AT88SC1608, AT45D041 card and AT45DB041 card via external EEPROM
	Operating systems	No driver is required for this device. Native support is provided by the operating system.
	Power	Normal Mode With card present, before being suspended: 40.9 mA Without card present, before being suspended: 33.16 mA After being suspended with smart card present: 380 µA After being suspended without smart card present: 380 µA Power Saving Mode With card present, before being suspended: 40.6 mA Without card present: 380 µA After being suspended with smart card present: 380 µA
	Features	<ul style="list-style-type: none">● Support single slot● Support T0, T1 protocol● Support I2C memory card, SLE4418, SLE4428, SLE4432, SLE4442, SLE4436,● SLE5536, SLE6636, AT88SC1608, AT45D041 card and AT45DB041 card via external EEPROM● Support ISO7816 Class A, B and C (5V/3V/1.8V) card● Implemented as an USB full speed device with bulk transfer endpoint, Mass● Storage endpoint● Built-in PLL for USB and Smart Card clocks requirement● Support EEPROM for USB descriptors customization (PID/VID/iManufacturer/iProduct/Serial Number), Direct Web Page Link, and accessing memory card module.● EEPROM programmable via USB interface● Support software update for memory card module● Support Direct Web Page Link via configuration in external EEPROM● Support short APDU and extended APDU● Compatible with Microsoft USB-CCID driver● Support remote wake up through inserting card/removing card● Support USB selective suspend● Support Power Saving Mode (Using one pin to select between Normal/PWR Saving Mode)● Support card power over current protection mechanism● Built in resonator.● Support USB LPM (Link Power Management) features. Embedded clock source.

Technical Specifications

NETWORKING/COMMUNICATIONS

Intel I218LM Gigabit Network Connection (internal)	System Interface	Integrated on PCA
	Controller	Intel I218LM GbE platform LAN connect networking controller
	Memory	24 KB FIFO packet buffer memory
	Data rates supported	10/100/1000 Mbps
	IEEE Compliance	802.1P 802.1Q 802.2 802.3 802.3ab 802.3az 802.3u
	Bus architecture	PCI Express and SMBus
	Data transfer mode	PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx low power state)
	Power requirement	Requires 3.3V and 0.9V or just 3.3V with integrated regulators Power consumption 0.733 Watts
	Boot ROM support	Yes
	Network transfer mode	Full-duplex Half-duplex (not supported for the 1000BASE-T transceiver)
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
	Environmental	Operating Temperature: 0° to 85° C Operating Humidity: 60% RH
	Management	WOL, auto MDI crossover, PXE, Multi-port teaming, RSS, Advanced cable diagnostic.
	Alerting	ASF 2.0 support; iAMT 9.0 support

Technical Specifications

Optional Near Field Communications (NFC)*, **

NFC Specifications

ISO/IEC 14443A, ISO/IEC 14443B PCD 106 kbps to 848 kbps
 ISO/IEC 14443A, ISO/IEC 14443B PICC 106 kbps to 424 kbps
 ISO/IEC 15693/ICODE reader
 NFC-IP1 and NFC-IP2 protocols, 106 kbps to 424 kbps
 MIFARE reader encryption mechanism
 NFC Forum Types 1-4 card reader

Supported Host Interfaces

I2C
 Automatic wakeup from Standby via host control interface

Dimensions

0.18 x 0.18 x 0.04 in (4.5 x 4.5 x 0.9 mm)

Frequency Band

13.56 MHz ISO Band

RF Output Voltage

3.3 V max
 150 mA max (@3.0V output)

Power Consumption

1.5 W (max)

Antenna

Built-in

Antenna Range

Up to 0.79 in (2 cm)

Secure Element Interfaces

SWP/HCI according to ETSI/SCP standardization
 ISO/IEC 28361 (ECMA 373) NFC-WI. Data rate restricted to 106kbps

Embedded Secure Element (eSE)

P5CN145 SmartMX Secure Dual Interface PKI Smart Card Controller

eSE Memory

144 kB EEPROM
 264 kB User ROM
 7.5 kB RAM (5 kB standard, 2.5 kB FameXE RAM)

Operating Temperature

-13 to 185 oF (-25 to +85oC)

* NFC ships enabled by default on Windows 8.1 and disabled by default on Windows 7.

** Sold separately or as an option.

HP hs3110/3114 HSPA+ Mobile Broadband Module*

Technology/Operating Bands

Modes: WCDMA/HSDPA/HSUPA/HSPA+/AWS/GSM/EDGE/GPRS
 Penta-band WCDMA/HSDPA/HSUPA/HSPA+/AWS: 850/900/1900/2100/AWS MHz
 GSM/GPRS/EDGE: 850/900/1800/1900 MHz

Wireless Protocol Standards

GSM/GPRS/EDGE: Class B, Multi-slot class 33, coding schemes CS1 - CS4 and MSC1 - MSC9.
 UMTS/WCDMA: Release 99 and Release 7
 Advanced Receiver Type 3i

GPS

GPS Standalone, A-GPS: L1 (Internet- and Network assisted)

Wireless parametric standards

Complies with 3GPP specifications

Maximum data rates

GPRS/EDGE: Multi-slot Class 33, Class B
 WCDMA PS: UL (384 kbps) / DL (384 kbps)
 UL/DL HSPA: UL (5.76 Mbps)/ DL (7.2 Mbps)
 UL/DL HSPA+: UL (5.76 Mbps)/ DL (21Mbps)

Technical Specifications

Maximum output power	WCDMA/HSPA/HSPA+ 2100/1900/900/850/AWS MHz: +24dBm (Power Class 3) GPRS 1900/1800 MHz: +30dBm (Power Class 1) GPRS 900/850 MHz: +33dBm (Power Class 4) EDGE 1900/1800 MHz: +26dBm (Power Class E2) EDGE 900/850 MHz: +27dBm (Power Class E2)
Maximum power consumption	2500mA (peak); 600mA (average)
Power consumption, sleep mode	3.6 mA
Power management	USB selective suspend, Connected Standby Integrated notebook wireless button
Antenna type	Dual high efficiency 5 band antennae with spatial diversity, mounted in the display enclosure
Form Factor	M.2 Socket 2, USB 2.0 interface high speed
Weight	<6 g
Dimensions (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (42 x 30 x 2.3 mm)
SIM card supply voltage	1.8 V/3.0 V UICC (SIM/UICC/USIM)
Voltage, Operating	3.135V~4.4V (3.3 V recommended)
Temperature, Operating	14° to 131° F (-10° to 55° C) (Normal operation) -4° to 158° F (-20° to 70° C) (Extended operation)
Temperature, storage	-40° to 185° F (-40° to 85° C)
Humidity	LED Off - Radio Off; Solid LED On - Radio On
Configuration utilities	HP Connection Manager
LED Activity	LED Off - Radio Off; Solid LED On - Radio On

* Mobile Broadband is an optional feature sold separately or as an add on feature. Connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors.

HP It4112 LTE/HSPA+ Gobi 4G 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), 800 MHz (Band XX, DD800) WCDMA/HSDPA/HSUPA/HSPA+ all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II), 850 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

* 4G LTE not available on all products, in all regions and requires Windows. WWAN use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors.

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

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>)

Technical Specifications

Frequency Band	802.11b/g/n 802.11a/n	2.402 - 2.482 GHz 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	<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>	

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.
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 CCK, BPSK, QPSK, 16-QAM, 64-QAM
	Security ¹ <ul style="list-style-type: none">• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode

Technical Specifications

	<ul style="list-style-type: none">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) 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 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 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	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}

Technical Specifications

File Transfer Profile (FTP)
Synchronization Profile (SYNC)
Hard Copy Cable Replacement (HCRP)^{1,2}
Personal Area Networking Profile (PAN)^{1,2}
Human Interface Device Profile (HID)^{1,2}
FAX Profile (FAX)
Basic Imaging Profile (BIP)²
Headset Profile (HSP)
Hands Free Profile (HFP)
Advanced Audio Distribution Profile (A2DP)

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

2. indicates the profile is part of Windows Vista

* 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

- 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
- 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

- 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

Technical Specifications

Network Architecture Models	Network Architecture Models	
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 ● 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 Connections	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. 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	

Technical Specifications

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 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)

Technical Specifications

* 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

AUDIO/MULTIMEDIA - DTS SOUND+

Hardware	Implementation	IDT 92HD91
	Function Key Volume Controls	Volume up, volume down, and mute
	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 45W Slim Smart AC Adapter	Dimensions	3.78 x 1.95 x 0.88 in (9.6 x 4.95 x 2.24 cm)	
	Input	90 to 265 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
	Output	Input AC current	1.4 A at 90 VAC and maximum load
		Output power	45W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<8A, Over voltage protection- 29V max automatic shutdown
	Connector	3 pin/grounded, mates with interchangeable cords	
	Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° to 121° F (-20° to 85° C)
		Altitude	0 to 16,405 ft (0 to 5,000 m)
		Humidity	0% to 95%
	Storage Humidity	0% to 95%	
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; Reliability - failure rate of less than 0.1% annually within the first three years of operation.		

HP 45W Slim Smart AC Adapter non-slim	Dimensions (H x W x D)	95.0 x 40.0 x 26.5mm	
	Input	90 to 265 VAC	
		Input Efficiency	88% min at 115 VAC / 89% min at 230VAC
		Input frequency range	47 to 63 Hz
	Output	Input AC current	1.4 A at 90 VAC and maximum load
		Output power	45W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<8A, Over voltage protection- 29V max automatic shutdown
	Connector	3 pin/grounded, mates with 4.5mm barrel type Smart ID DC connector	
	Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° to 121° F (-20° to 85° C)
		Altitude	0 to 16,405 ft (0 to 5,000 m)
		Humidity	0% to 95%

Technical Specifications

	EMI and Safety Certifications	Storage Humidity	0% to 95%
		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; Reliability - failure rate of less than 0.1% annually within the first three years of operation.	
HP 45W Slim Smart AC Adapter non-slim 2 prong	Dimensions (H x W x D)	95.0 x 40.0 x 26.5mm	
	Input	90 to 265 VAC	
		Input Efficiency	88% min at 115 VAC / 89% min at 230VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.4 A at 90 VAC and maximum load
	Output	Output power	45W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<8A, Over voltage protection- 29V max automatic shutdown
	Connector	2 pin/non-grounded, mates with 4.5mm barrel type Smart ID DC connector	
	Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° to 121° F (-20° to 85° C)
		Altitude	0 to 16,405 ft (0 to 5,000 m)
		Humidity	0% to 95%
		Storage Humidity	0% to 95%
	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; Reliability - failure rate of less than 0.1% annually within the first three years of operation.	

Technical Specifications

HP 65W EM Smart AC Adapter	Dimensions	126.0 x 50.0 x 30.0 mm	
	Weight	300 g	
	Input		90 to 265 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
		Output power	65W
		DC output	19.5V
		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 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
		Humidity	20% to 95%
EMI and Safety Certifications	Storage Humidity	10% to 95%	
	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.		

HP 65W Smart Travel AC Adapter	Dimensions	120.0 x 57.6 x 16.7 mm	
	Weight	250 g	
	Input		90 to 265 VAC
		Input Efficiency	88% min at 115 VAC / 89% min at 230VAC
		Input frequency range	47 to 63 Hz
	Output	Input AC current	1.7 A at 90 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)

Technical Specifications

	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.	

HP 6-cell (42 WHr) Polymer Primary battery	Dimensions (L x W x H)	13.3 x 4.94 x 0.31 in (33.79 x 12.545 x 0.785 cm)		
	Weight (max)	0.225kg		
	Cells/Type	6-cell Polymer		
	Energy	Voltage	11.1V	
		Amp-hour capacity	3.86Ah	
		Watt-hour capacity	42Wh	
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)	
		Operating (Discharging)	14° to 140° F (-10° to 60° C)	
		Non-operating	-4° to 140° F (-20° to 60° C)	
	Battery Re-Charge Time	System in OFF or Standby Mode	This depends on system setting	
		System ON	This depends on system setting	
	Fuel Gauge LED	No		
	Optional Travel Battery Available	No		

ENVIRONMENTAL

Environmental Data

Eco-Label Certifications	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:		
	<ul style="list-style-type: none"> ● 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 Commercial Notebook model is based on a "Typically Configured Notebook"		
Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	3.40 W	3.26 W	3.32 W
Sleep	0.92 W	0.94 W	0.93 W
Off	0.38 W	0.45 W	0.38 W

NOTE:

Energy efficiency data listed is for an ENERGY STAR® compliant product if

Technical Specifications

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	12 BTU/hr	11 BTU/hr	11 BTU/hr
Sleep	3 BTU/hr	3 BTU/hr	3 BTU/hr
Off	1 BTU/hr	2 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	2.8	25
Fixed Disk - Random writes	2.8	25

Batteries

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

Batteries used in the product do not contain:

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

Battery size: CR2025 (coin cell)

Battery type: Lithium

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 2.6 % post-consumer recycled plastic (by wt.)
- This product is 97.2 % recycle-able when properly disposed of at end of life.

Packaging Materials

- External:
 - PAPER/Cardboard & misc - 295 g
 - PAPER/Corrugated - 14 g

Technical Specifications

- Internal:
 - PLASTIC/Polyethylene low density - 65 g
 - PLASTIC/EPE-Expanded Polyethylene- 2 g
 - PLASTIC/PET - 1 g
 - OTHER/OTHER - 24 g
- The PAPER/Cardboard & misc packaging material is made from 80 % recycled content.
- The PAPER/Corrugated packaging material is made from 80 % recycled content.
- The PLASTIC/Polyethylene low density packaging materials contains at least 65% recycled content.
- The PLASTIC/EPE-Expanded Polyethylene packaging materials contains at least 65% recycled content.
- The PLASTIC/PET packaging materials contains at least 65% recycled content.
- The OTHER/OTHER materials contains at least 65% 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:

- 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

Technical Specifications

	<ul style="list-style-type: none">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	<p>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.</p> <p>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.</p>
Hewlett-Packard Corporate Environmental Information	<p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html</p> <p>Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</p> <p>ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf</p> <p>and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</p>

COUNTRY OF ORIGIN

China

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

Type	Description	Part #
Cases	HP Slim Ultrabook Messenger	F3W14AA
	HP Slim Ultrabook Top Load Case (15.6")	F3W15AA
	HP Slim Ultrabook Backpack	F3W16AA
	HP 4 Wheel Roller	H5M93AA
Docking	HP Display and Notebook II Stand	E8G00AA
	HP Dual Hinge Notebook II Stand	E8F99AA
	HP Adjustable Dual Display Stand	AW664AA
	HP UltraSlim Side Docking Station	D9Y32AA
	HP 2005pr USB 2.0 Port Replicator	H1L07AA#xxx
	HP 3005pr USB 3.0 Port Replicator	H1L08AA#xxx
Input/Output - Mice	HP Slim Bluetooth Mouse	F3J9AA
	HP Wireless Mobile Mouse	H2L63AA
	HP Touch To Pair Mouse	H6E52AA
	HP Stylish USB Keyboard and Mouse	H4B80AA
Adapters	HP Smart 65W Travel AC Adapter	AU155AA#xxx
	HP 65W Slim Adapter	AX727AA#xxx
	HP 90W Smart AC/Auto/Air Combo Adapter	AJ652AA#xxx
	HP EliteFolio RJ45/VGA Adapter	F3W44AA
	HP DisplayPort to HDMI Adapter	BP937AA
Storage - External Storage	HP External USB DVD/RW Drive	F2B56AA
Health and Education	HP 20-Notebook Managed Charging Cart	QL489AA
	HP 20-Notebook Charging Cart	QL488AA
	HP 30-Notebook Managed Charging Cart	QL490AA
Security	HP UltraSlim Keyed Cable Lock	H4D73AA
Monitors	HP EliteDisplay E231 23-inch LED Monitor	C9V75AA/A8/AS/AT
	HP LA1956x 19-inch LED Monitor	A9S75AA/A8/AS/AT
	HP LA2405x 24-inch LED Monitor	A9P21AA/A8/AT
	HP ProDisplay P221 21.5" LED Monitor	C9E49AA/A8/AS/AT
	HP ProDisplay P201 20" LED Monitor	C9F26AA/A8/AS/AT

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

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