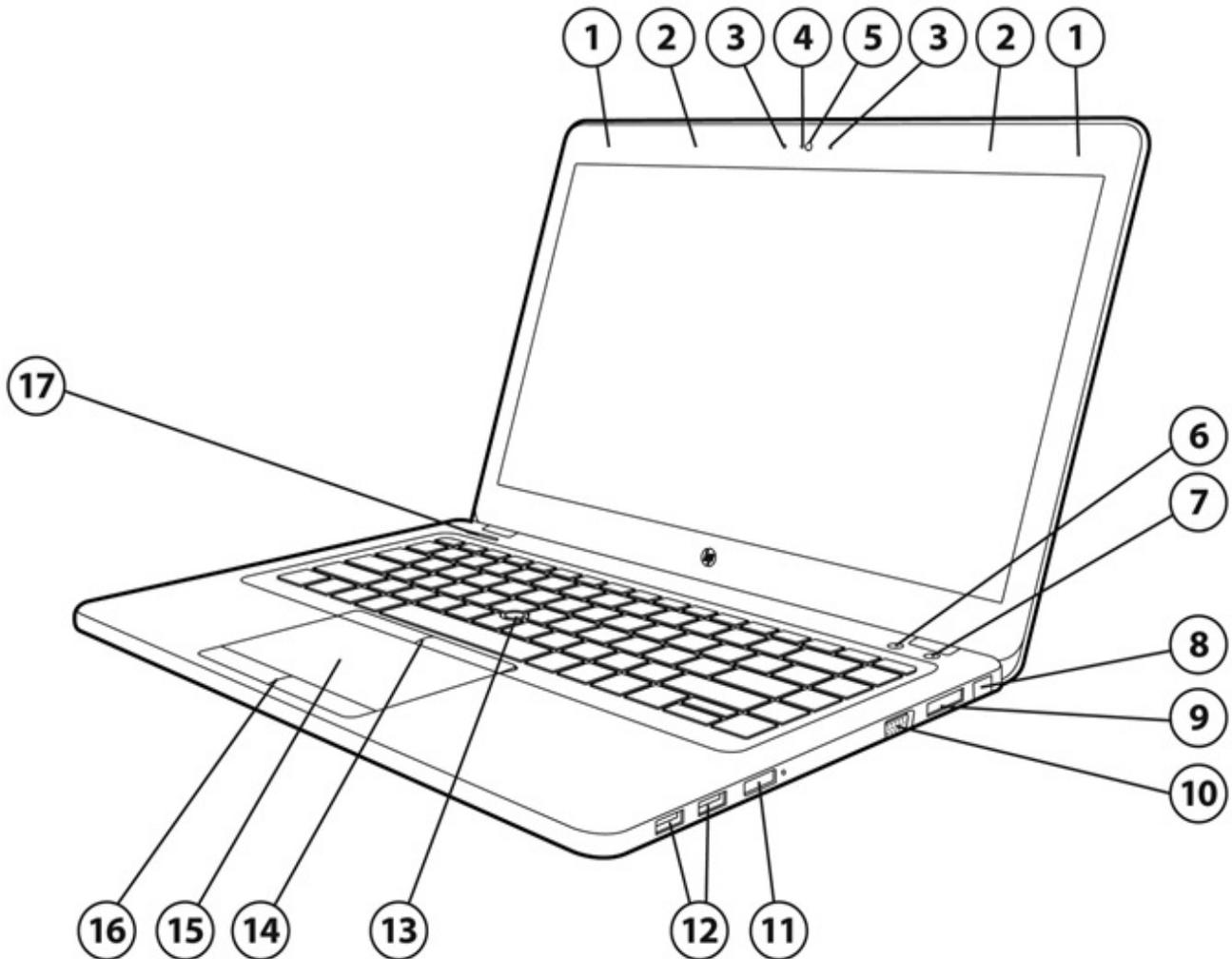
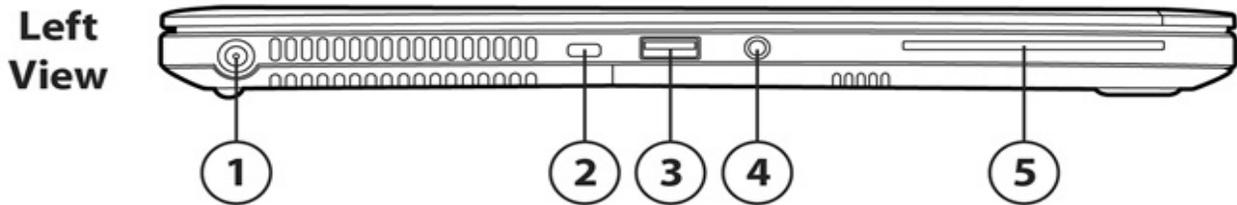


Overview



- | | |
|--|------------------------------------|
| 1. WLAN antennas (2) | 10. VGA/external monitor connector |
| 2. WWAN antennas (2) | 11. DisplayPort 1.1a |
| 3. Dual-microphone array | 12. (2) USB 3.0 ports |
| 4. Webcam light (only with optional webcam) | 13. Pointstick |
| 5. Optional 720p HD webcam | 14. Pointstick pick buttons |
| 6. Wireless on/off button with LED indicator | 15. Touchpad |
| 7. Volume mute button with LED indicator | 16. Touchpad pick buttons |
| 8. RJ-45/Ethernet port | 17. Power button |
| 9. Docking connector | |

Overview



1. Power connector
2. Security lock
3. USB 3.0 charging port
4. Headphone/Microphone combo port
5. Smart Card Reader

At A Glance

- Windows 8 Pro, Windows 7 versions or FreeDOS
- Magnesium display enclosure, magnesium-reinforced chassis, wear-resistant platinum-colored HP DuraFinish, HP DisplaySafe frame, HP DuraKeys, precision metal-alloy hinges, aluminum keyboard deck, and chemically strengthened glass touchpad
- Ensured durability through MIL-SPEC 810G testing, plus an additional 115,000 hours of reliability testing through HP's Total Test Process
- Choice of 3rd Generation Intel® Core. i7 and i5 with Turbo Boost Technology
- Integrated Intel® HD Graphics 4000
- 14.0-inch diagonal HD or HD+* widescreen LED-backlit display
- Choice of 7200 rpm user-removable hard drive (up to 500 GB) with HP 3D DriveGuard, 256 GB Self Encrypting Solid State Drive, 180 GB Solid State Drive, 128 GB Solid State Drive
- Optional 32 GB mSATA Flash Cache module support for Intel Smart Response Technology. (Available only with standard non-SED hard drive).
- Built-in docking for a desktop-like experience
- DisplayPort for high resolution support
- SRS PRO Audio. optimized for high fidelity audio during video conferencing and web-based training
- 4-cell (52 WHr) HP Long Life battery and 6-cell (60WHr) HP Long Life slice battery for extended battery life
- Glass touchpad with chemically etched surface and pointstick
- Integrated Smart Card Reader and fingerprint reader for strong security authentication
- HP Premier Image with Microsoft Security Essentials and without trialware
- Flexible wireless connectivity options:
 - Optional integrated wireless mobile broadband 3G support
 - Integrated Intel Centrino® 802.11 a/b/g/n 2x2 + BT Combo 4.0 HS or Atheros 802.11 a/b/g/n 2x2 + BT Combo 4.0 HS
- BFR/PVC-free*, 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.

* HD+ display will be available late 1Q 2013.

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

Features

OPERATING SYSTEM

Preinstalled	Windows 8 Pro 64* Windows 8 64* Windows 7 Professional 32 (available through downgrade rights from Windows 8 Pro 64)** Windows 7 Professional 64 (available through downgrade rights from Windows 8 Pro 64)** Windows 7 Professional 32*** Windows 7 Professional 64*** Windows 7 Home Premium 32*** Windows 7 Home Premium 64*** FreeDOS
Supported	Windows 8 Pro 32** Windows 7 Enterprise 32*** Windows 7 Enterprise 64*** Windows 7 Ultimate 32*** Windows 7 Ultimate 64*** Windows 7 Home Basic 64 Windows XP Professional 32 SUSE Linux SLED (for China only)
Certified	SUSE Linux Enterprise Desktop 11

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

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

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

PROCESSOR

- 3rd Generation Intel® Core™ i7-3687U (2.1 GHz, 4 MB L3 cache, 2 cores)*
Up to 3.30 GHz with Intel Turbo Boost Technology
- 3rd Generation Intel® Core™ i7-3667U (2.0 GHz, 4 MB L3 cache, 2 cores)*
Up to 3.20 GHz with Intel Turbo Boost Technology
- 3rd Generation Intel® Core™ i5-3437U (1.9 GHz, 3 MB L3 cache, 2 cores)*
Up to 2.90 GHz with Intel Turbo Boost Technology
- 3rd Generation Intel® Core™ i5-3427U (1.8 GHz, 3 MB L3 cache, 2 cores)*
Up to 2.80 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.

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

† Not available with vPro.

Features

CHIPSET

Mobile Intel QM77 Express

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

Intel Core i5 with vPro and Core i7 with vPro technology is a selectable feature that is available on units configured with select processors, an Intel Centrino® Advanced-N or Ultimate-N WLAN module and a preinstalled Windows operating system. It provides advances in remote manageability, security, energy efficient performance, and wireless connectivity. Intel Active Management Technology 8.0 (iAMT) offers built-in manageability and proactive security for networked notebook PCs, even when they are powered off* or when the operating system is inoperable. It can help identify threats before they reach the network, isolate infected systems, and update PCs regardless of their power state.

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

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

GRAPHICS

Integrated:
Intel HD Graphics 4000

DISPLAY

Internal

14.0" diagonal LED-backlit HD 16:9 widescreen anti-glare (1366 x 768)

External

Up to 32-bit per pixel color depth

DisplayPort

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

VGA

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

Internal

14.0" diagonal LED-backlit HD+ 16:9 widescreen anti-glare (1600 x 900) 3.0mm*

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

VGA

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

* HD+ display will be available late 1Q 2013.

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

Features

FLASH CACHE MODULE

Optional 32 GB mSATA Flash cache module support for Intel Smart Response Technology. (Available only with standard non-SED hard drive).

STORAGE AND DRIVES

Primary Storage Bay

Hard Drives

320/500GB 7200 rpm SMART SATA II

HP 3D DriveGuard (Windows only)

The hard drive is mounted directly to the notebook frame, reducing the transmission of shock to the hard drive.

Solid State Drive

SATA 6 Gb/s 128 GB Solid State

SATA 6 Gb/s 180 GB Solid State

SATA 6 Gb/s 256 GB Solid State Self-Encrypting Drive

mSATA module

256 GB mSATA module

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

DDR3 PC3-12800 SDRAM (1600 MHz)

Two SODIMM slots supporting dual-channel memory

Standard memory up to 8192 MB (2 GB, 4 GB, and 8 GB SODIMMs)

Maximum

Upgradeable to 16384 MB with optional 8192 MB SODIMMs in slots 1 and 2

Dual-channel

Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

NOTE: Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed. With Windows Starter 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements.

Features

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 hs2350 HSPA+ Mobile Broadband Module

HP un2430 EV-DO/HSPA Mobile Broadband Module

Integrated wireless LAN options

Intel Centrino Advanced-N 6205 802.11a/b/g/n (2x2)

Intel Centrino Advanced-N 6235 802.11a/b/g/n (2x2) + BT Combo 4.0 HS

Atheros 802.11 a/b/g/n (2x2) + BT Combo 4.0 HS

Broadcom 802.11 b/g/n (1x1) + BT Combo 4.0 HS

Communications

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

* The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

** Designed for downloads from 56K modem compliant sources. Maximum achievable download transmission rates currently do not reach 56 KB/s, and will vary with line conditions. Modem availability is subject to country regulatory approval.

AUDIO/MULTIMEDIA

Audio

SRS PRO Audio™

Integrated stereo speakers

Integrated dual-microphone array

Button for volume 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

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

Glass Touchpad (with chemically etched surface) with on/off button, two finger scrolling, pinch zoom, rotating and three-finger flick gestures, two pick buttons

Pointstick with two additional pointstick buttons (for a total of four)

Buttons and Function Keys

Discrete buttons provide easy access to the following features: wireless on/off, and volume 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 Wireless Hotspot (Windows 8 and web only)

HP Connection Manager (Windows 7 only)

HP Hotkey Support

HP ProtectTools for Central Management

HP ProtectTools Security Manager

HP Recovery Manager

HP Support Assistant

Adobe® Flash Player (Windows 7 only)

HP Premier Image

Cyberlink PowerDVD

Evernote

HP 3D DriveGuard

Microsoft Office 2010 60 days trial (Windows 8 only)

Microsoft Office Starter (Windows 7 only): reduced-functionality Word and Excel® only, with advertising. No PowerPoint® or Outlook®. Buy Office 2010 to use the full-featured software.*

Buy Microsoft Office to activate Office Software on this PC.

PDF Complete Corporate Edition

Supports UEFI specification 2.3

WinZip Basic (Windows 7 only)

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 16GB (for Windows 7) of system and up to 30 GB (for Windows 8) disk is reserved for system recovery software. Support in Windows Operating System only.

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

Security

Standard



Features

- HP Fingerprint Reader
- HP Client Security (Windows 8 only),
- Central Management for HP ProtectTools*
- Credential Manager for HP ProtectTools
- Device Access Manager w/ JITA
- Drive Encryption (will be web-only ready at Win8 GA date)
- Enhanced Pre-Boot Security
- Face Recognition
- File Sanitizer for HP ProtectTools (Windows 7 only)
- HP BIOS Protection
- HP ProtectTools
- HP Spare Key (requires initial user setup)
- Intel Rapid Start Technology* *
- Intel Smart Response Technology***
- Microsoft Defender
- Microsoft Security Essentials (included with Microsoft Defender for Windows 8)
- One Step Logon
- Smart Card Reader
- Security lock slot
- TPM Embedded Security Chip 1. 2

Optional

Computrace (requires a subscription)

Intel Anti-Theft Technology (requires a Computrace subscription)

NOTE: Computrace agent is shipped turned off, and must be activated by customers when they purchase a subscription.

Subscriptions can be purchased for terms ranging from one to five years. Service is limited, check with Absolute for availability outside the U.S.

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

Requires Microsoft Windows.

** Requires a compatible Intel® Core processor, Intel® Rapid Start software and BIOS update, and optional Solid State Drive (SSD) or mSATA flash cache module. Depending on system configuration, results may vary.

***Requires a compatible Intel® Core processor, enabled chipset, Intel® Rapid Storage technology software and non-SED HDD + optional mSATA SSD flash cache module. Intel® Smart Response Technology is only available on select 2012 HP systems. Depending on system configuration, results may vary.

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

Features

POWER

Power Supply

Models with integrated graphics with dual-core processor:
External 45W HP Smart AC Adapter
Power cord included is 6-foot (1.8 meter).
Total length including external AC adapter is 12 feet (3.66 meter).

Primary Battery

HP 4-cell Lithium-Ion Long Life Battery (52 WHr)

Slice Battery

HP 6-cell Lithium-Ion Long Life Battery (60 WHr)

Battery Life*

HP EliteBook Folio 9470m (Hard Drive)

4-cell (52 WHr) Primary	Up to 8 hours and 30 minutes
4-cell (52 WHr) Primary and 6-cell (60 WHr) Slice	Up to 19 hours

HP EliteBook Folio 9470m (Solid State Drive)

4-cell (52 WHr) Primary	Up to 9 hours and 30 minutes
4-cell (52 WHr) Primary and 6-cell (60 WHr) Slice	Up to 21 hours and 15 minutes

HP EliteBook Folio 9470m (mSATA module)

4-cell (52 WHr) Primary	Up to 10 hours
4-cell (52 WHr) Primary and 6-cell (60 WHr) Slice	Up to 21 hours and 45 minutes

System Standby Time

Deep sleep enabled: with main battery - 3 weeks 2 days

*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](http://www.bapco.com/products/mobilemark2007) for additional details.

Power Conservation

Hibernation
Standby
ACPI compliance

Features

ENVIRONMENTAL

ENERGY STAR qualified (with Microsoft OS)

BFR/PVC-free (does not cover adapters and power cords)

IT ECO Declaration

EPEAT Gold where HP registers commercial notebook products. See <http://www.epeat.net> for registration status in your 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 3.56 lb (1.61 kg)

Dimensions (w x d x h)

13.3 x 9.09 x 0.75 in

33.8 x 23.1 x 1.895 cm

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

PORTS/SLOTS

Ports

VGA – One

DisplayPort – One (v1.1a)

Headphone/Microphone combo port – One

Power Connector – One

Secondary Battery Connector – One

Docking Connector – One

RJ-45 (Ethernet) – One

USB 3.0 – Two

USB 3.0 charging port – One

Digital Media Slots

1 SD/MultiMediaCard slot (supported media include: SD, SDHC, SDXC, MultiMediaCard, MultiMediaCard+)

SERVICE AND SUPPORT

HP Services offers limited 3 year and 1 year warranty options depending on country; 1-year limited warranty on primary battery; 3-year limited warranty on HP Long Life Battery (only available with 3-year 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	18.5 V	
	Average Operating Power	Windows 7 (32-bit)	Windows 7 (64-bit)
		6.06 W	6.18 W
	Max Operating Power	< 45 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 that are ENERGY STAR qualified are identified as HP EliteBook Folio 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

14.0-inch LED HD (1366 x 768) anti-glare	Dimensions (W x H)	12.74 x 7.56 in (32.4 x 19.2 cm)	
	Diagonal Size	14.0 in (35.6cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	400:1 (typical)	
	Refresh Rate	60 Hz	
	Brightness	200 nit (typical)	
	Pixel Resolution	Pitch	0.227 mm
		Format	1366 x 768
		Configuration	RGB Stripe
	Backlight	LED	
	PPI	112 ppi	
Viewing Angle	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)		

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.

Technical Specifications

500 GB 7200 rpm SATA Hard Drive	Drive Weight	0.21 lbs (95g)	
	Capacity	500 GB	
	Height	0.276 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 (typical reads, including settling)	Single Track	1.5 ms
		Average	11 ms
		Maximum	22 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

320 GB 7200 rpm SATA Hard Drive	Drive Weight	0.21 lbs (95g)	
	Capacity	320 GB	
	Height	0.276 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 (typical reads, including settling)	Single Track	1.5 ms
		Average	11 ms
		Maximum	22 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	625,142,448	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

Technical Specifications

SATA 6 Gb/s 256 GB, 2.5-inch SATA SED Solid State Drive	Drive Weight	73 Grams		
	Capacity	256 GB		
	Height	0.276 in (7 mm)		
	Width	2.76 in (70 mm)		
	Interface	SATA 3 (6 Gb/s)		
	Performance	Maximum Sequential Read	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 Read	Maximum Sequential Write	
		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		

SATA 6 Gb/s 128 GB, 2.5-inch Solid State Drive	Drive Weight	73 Grams		
	Capacity	128 GB		
	Height	0.276 in (7 mm)		
	Width	2.76 in (70 mm)		
	Interface	SATA 3 (6 Gb/s)		
	Performance	Maximum Sequential Read	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		

SECURITY

Technical Specifications

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

NETWORKING/COMMUNICATIONS

Intel® 82579LM Gigabit Network Connection	Ethernet Features	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023. Clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE(Energy Efficient Ethernet) Jumbo Frame 9K Auto MDI/MDIX Crossover cable detection
	Power Management	ACPI compliant - multiple power modes Energy Detect Low Power Mode(Green Ethernet)
	Performance Features	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload(ARP & NS) Large send offload and Giant send offload Receiving Side Scaling MACSec Offload (802.3ae) Intel vPro iSCSI Boot
	Manageability	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
	Interface	PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ. NOTE: Intel 82579 PCIe interface is not PCIe compliant. It operates at half of PCIe specification V1.1 (2.5GT/S) speed.

Technical Specifications

NIC Device Driver Name Intel 82579LM/82579V Ethernet Network Connection

**HP un2430
EV-DO/HSPA Mobile
Broadband Module**

Technology/Operating Bands GSM/GPRS/EDGE: 850MHz(Cell), 900MHz(EGSM), 1800MHz(DCS), 1900MHz (PCS)
UMTS/WCDMA with receive diversity: 2100MHz (UTRA FDD Band I), 1900MHz (UTRA FDD Band II), AWS (UTRA FDD Band IV), 900MHz(UTRA FDD Band VIII), 850MHz (UTRA FDD Band V)
1xEVDO/1xRTT with receive diversity: 850MHz (Band Class0-Cell), 1900MHz (Band Class1-PCS)

Wireless Protocol Standards GSM/GPRS/EDGE: Class A, Multi-slot class 10 operation, coding schemes CS1 - CS4 and MSC1 - MSC9.
UMTS/WCDMA: Release 99 and Release 6
CDMA: 1xEVDO Release 0 and Release A, IS-95A, IS-95B, IS-856, IS-2000

Wireless Parametric Standards Meets or exceeds TIA/EIA IS-98-D

Maximum Data Rates UMTS (HSPA) - 14.4 Mbps (Download), 5.76Mbps (Upload)
CDMA (EVDO Release A) - 3.1 Mbps (Download), 1.8Mbps (Upload)

GPS Standalone GPS enabled
gpsOneXTRATM™

GPS Bands L1 - 1575.42 MHz

Maximum Output Power GSM/GPRS/EDGE: 32dBm (+/-1)
WCDMA: 24dBm (+0.7/-2.3)
CDMA: 24dBm (+0.7/-2)

Maximum Power Consumption 2750mA (peak); 1100mA (average)

Power Consumption, Idle Not Connected 20 mA

Power Management USB selective suspend
Integrated notebook wireless button

Antenna Type Dual high efficiency 5 band antennae with spatial diversity, mounted in the display enclosure

Form Factor PCI-Express MiniCard, USB 2.0 interface

Weight 11.5 g

Dimensions (Length x Width x Thickness) 2.01 x 1.18 x 0.18 in (51 x 30 x 5 mm)

Voltage, Operating 3.3v +/- 10%

Temperature, Operating (from TIA/EIA/IS-98-D) -22° to 158° F (-30° to 70° C) (full RF performance)
-22° to 167° F (-30° to 75° C) (reduced RF performance)

Temperature, Non-operating, 96 hours (from MIL-STD 202 Method 108) -40° to 185° F (-40° to 85° C)

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

Configuration Utilities HP Connection Manager

Technical Specifications

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

HP hs2350 HSPA+ Mobile Broadband Module	Technology/Operating Bands	GSM/GPRS/EDGE: 850MHz(Cell), 900MHz(EGSM), 1800MHz(DCS), 1900MHz (PCS) UMTS/WCDMA with receive diversity: 2100MHz (UTRA FDD Band I), 1900MHz (UTRA FDD Band II), 900MHz(UTRA FDD Band VIII), 850 MHz (UTRA FDD Band V)
	Wireless Protocol Standards	GSM/GPRS/EDGE: Class B, Multi-slot class 10 operation, coding schemes CS1 - CS4 and MSC1 - MSC9. UMTS/WCDMA: Release 99 and Release 7 Advanced Receiver Type 3i
	Wireless Parametric Standards	Complies with 3GPP specifications
	Maximum Data Rates	UMTS (HSPA) - 21 Mbps (Download), 5.76Mbps (Upload)
	GPS	Standalone, A-GPS (Internet- and Network assisted)
	GPS Bands	1575.42 MHz (± 1.023 MHz)
	Maximum Output Power	GSM/EDGE GSM850 & GSM900 bands GPRS: +33 dBm ± 2 dBm (class 4) EGPRS: +27 dBm ± 3 dBm (class E2) DCS1800 & PCS1900 bands GPRS: +30 dBm ± 2 dBm (class 1) EGPRS: +26 dBm +4 / -3 dBm (class E2)
	Maximum Power Consumption	UMTS UTRA FDD Bands +24 dBm +4 / -3 dBm (class 3) 2000mA (peak); 600mA (average)
	Power Consumption, Sleep Mode	5 mA
	Power Management	USB selective suspend Integrated notebook wireless button
	Antenna Type	Dual high efficiency 5 band antennae with spatial diversity, mounted in the display enclosure
	Form Factor	PCI-Express MiniCard, USB 2.0 interface
	Weight	< 12 g
	Dimensions (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 5 mm)
	Voltage, Operating	3.3v +/- 9%
	Temperature, Operating	14° to 149° F (-10° to 65° C) (full RF performance) 14° to 167° F (-10° to 75° C) (reduced RF performance)

Technical Specifications

Temperature, Non-operating, 96 hours (from MIL-STD 202 Method 108)	-22° to 185° F (-30° to 85° C)
Humidity, Non-operating	85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
Configuration Utilities	HP Connection Manager
LED Activity	LED Off - Radio Off; Solid LED On - Radio On

Intel Centrino Advanced-N Wireless LAN Standards 6205 (2x2)	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n
Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 7, Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)
Frequency Band	2.4 GHz and 5GHz
Antenna Structure	2 transmit; 2 receive (2x2)
Data Rates	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 66 possible data rates, ranging from 6 Mbps to 300 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n specification
Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
Security¹	Authentication: WPA and WPA2, 802.1x (EAP_TLS, TTLS, PEAP, LEAP, EAP-FAST) Authentication Protocols: PAP, CHAP, TLS, GTC, MS-CHAP, MS-CHAPv2 Encryption: 64 and 128-bit WEP, AES-CCMP, CKIP, TKIP Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows Vista and XP only.
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between 2.4GHz band Access Points
Output Power (for CCK and OFDM) ²	17 dBm max

Technical Specifications

Power Consumption	Transmit: 2.3 Watts (max, with two spatial streams) Receive: 1 Watt (max with two spatial streams) Idle mode ³ : 35 mW (average) Radio off: 20 mW (max)	
Power Management	ACPI compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity⁴	54 Mbps: -76 dBm, 6 Mbps: -92 dBm	
Antenna Connections	2 U.FL type connectors, 50 ohm nominal impedance	
Form Factor	PCI-Express Half-MiniCard	
Weight	0.0075 lb (3.4 g)	
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)	
Operating Voltage	3.3V +/- 9%	
Temperature	Operating	32° to 176° F (0° to 80° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 90% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON	

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

Intel Centrino Advanced - N 6235 802.11a/g/n (2x2) Bluetooth v4.0 combo	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n
	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 7, Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.4 GHz and 5 GHz
	Data Rates	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 66 possible data rates, ranging from 6 Mbps to 300 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n specification
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
	Security¹	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES,

Technical Specifications

	802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST.
Sub-channels	Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 5) with Microsoft Windows 7, Windows Vista and XP only.
Media Access Protocol	Multinational support with frequency bands and channels compliant to local regulations.
Network Architecture Models	CSMA/CA (Collision Avoidance) with ACK Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power²	13.5 dBm , nominal
Power Consumption	Idle associated: 250 mW Idle unassociated: 100 mW Radio disabled: 75mW Transmit: 2.0 W (max) Receive: 1.6 W (max)
Power Management	ACPI compliant power management 802.11 compliant power saving mode
Receiver Sensitivity³	54 Mbps: -71 dBm, 11 Mbps: -85 dBm , 1 Mbps: -95 dBm
Antenna Connections	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure
Form Factor	PCI-Express Half-MiniCard 1.2
Weight	0.013 lb (6 g)
Dimensions	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)
Operating Voltage	3.3v +/- 10%
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)
Configuration Utility⁴	Microsoft Windows XP Choice of Configuration Utility: <ul style="list-style-type: none">● Microsoft Windows XP Wireless Network Connection Manager● Broadcom Wireless Configuration Utility (required for Cisco Compatible Extensions support) Microsoft Windows Vista <ul style="list-style-type: none">● Microsoft Windows Vista Wireless Network Connection Manager● Broadcom IHV extensions for Windows Vista available to support Cisco Compatible Extensions. Microsoft Windows 7

Technical Specifications

- Microsoft Windows 7 Wireless Network Connection Manager
- Broadcom IHV extensions for Windows 7 available to support Cisco Compatible Extensions.

LED Activity LED Off - Radio OFF; Solid LED On - Radio ON

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

Bluetooth 4.0 Wireless Technology

Bluetooth Specification	2.1+EDR, 3.0+HS, 4.0 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	Max 4 dBm (Bluetooth Class II)	
Receiver Sensitivity	Better than -80 dBm at 0.1 % raw bit error rate	
Power Consumption	Average 230mW Sleep <1 mW	
Antenna	Internally integrated within module	
Range	Up 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	
Temperature	Operating	-4° to 158° F (-20° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)

Technical Specifications

Humidity	Operating	10% to 90%
	Non-operating	5% to 95%
Altitude	Operating	15,000 ft (4,572 m)
	Non-operating	40,000 ft (12,192 m)
Bluetooth Profiles Supported	Serial Port Profile (SPP) ¹	
	Service Discovery Application Profile (SDAP)	
	Dial-Up Networking (DUN) ^{1,2}	
	Generic Object Exchange Profile (GOEP) ^{1,2}	
	Object Push Profile (OPP) ^{1,2}	
	File Transfer Profile (FTP)	
	Synchronization Profile (SYNC)	
	Hard Copy Cable Replacement (HCRP) ^{1,2}	
	Personal Area Networking Profile (PAN) ^{1,2}	
	Human Interface Device Profile (HID) ^{1,2,3}	
	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

Atheros 802.11 a/b/g/n (2x2) Bluetooth v4.0 combo	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: 2.4 GHz and 5 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
	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 DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM

Technical Specifications

Security¹	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST. Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 5) with Microsoft Windows 7, Windows Vista and XP only.
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power²	13.5 dBm , nominal
Power Consumption	Idle associated: 250 mW Idle unassociated: 100 mW Radio disabled: 75mW Transmit: 2.0 W (max) Receive: 1.6 W (max)
Power Management	ACPI compliant power management 802.11 compliant power saving mode
Receiver Sensitivity³	300 Mbps: -66 dBm, 54 Mbps: -74 dBm, 11 Mbps: -88 dBm , 1 Mbps: -95 dBm
Antenna Type	Two embedded, high efficiency dual band antennae with spatial diversity, mounted in the display enclosure
Form Factor	PCI-Express Half-MiniCard 1.2
Weight	0.013 lb (6 g)
Dimensions	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)
Operating Voltage	3.3v +/- 10%
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)
Configuration Utility⁴	Microsoft Windows XP Choice of Configuration Utility: <ul style="list-style-type: none">● Microsoft Windows XP Wireless Network Connection Manager● Broadcom Wireless Configuration Utility (required for Cisco Compatible Extensions support) Microsoft Windows Vista <ul style="list-style-type: none">● Microsoft Windows Vista Wireless Network Connection Manager● Broadcom IHV extensions for Windows Vista available to support Cisco Compatible Extensions. Microsoft Windows 7

Technical Specifications

- Microsoft Windows 7 Wireless Network Connection Manager
- Broadcom IHV extensions for Windows 7 available to support Cisco Compatible Extensions.

LED Activity LED Off - Radio OFF; Solid LED On - Radio ON

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

Bluetooth 4.0 Wireless Technology

Bluetooth Specification	2.1+EDR, 3.0+HS, 4.0 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	Max 4 dBm (Bluetooth Class II)	
Receiver Sensitivity	Better than -80 dBm at 0.1 % raw bit error rate	
Power Consumption	Average 230mW Sleep <1 mW	
Antenna	Internally integrated within module	
Range	Up 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	
Temperature	Operating	-4° to 158° F (-20° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)

Technical Specifications

Humidity	Operating	10% to 90%
	Non-operating	5% to 95%
Altitude	Operating	15,000 ft (4,572 m)
	Non-operating	40,000 ft (12,192 m)
Bluetooth Profiles Supported	Serial Port Profile (SPP) ¹	
	Service Discovery Application Profile (SDAP)	
	Dial-Up Networking (DUN) ^{1,2}	
	Generic Object Exchange Profile (GOEP) ^{1,2}	
	Object Push Profile (OPP) ^{1,2}	
	File Transfer Profile (FTP)	
	Synchronization Profile (SYNC)	
	Hard Copy Cable Replacement (HCRP) ^{1,2}	
	Personal Area Networking Profile (PAN) ^{1,2}	
	Human Interface Device Profile (HID) ^{1,2,3}	
	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

Broadcom 802.11 b/g/n (1x1) Bluetooth v4.0 combo	Wireless LAN Standards	IEEE 802.11b IEEE 802.11g IEEE 802.11n
	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 7, Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.4 GHz and 5 GHz
	Data Rates	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 for RX and TX for 20 MHz channels. Short and long guard interval shall be supported.
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
	Security¹	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, WAPI, 802.1x authentication types EAP-TLS, EAP-PEAPv0, EAP-PEAPv1, EAP-PEAPv2, EAP-FAST, EAP-SIM, LEAP. Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 5) with Microsoft Windows 7, Windows Vista and XP only.
	Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.

Technical Specifications

Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power²	13.5 dBm , nominal
Power Consumption	Idle associated: 250 mW Idle unassociated: 100 mW Radio disabled: 75mW Transmit: 2.0 W (max) Receive: 1.6 W (max)
Power Management	ACPI compliant power management 802.11 compliant power saving mode
Receiver Sensitivity³	72.2 Mbps: -70 dBm 54 Mbps: -74 dBm, 11 Mbps: -88 dBm , 1 Mbps: -95 dBm
Antenna Type	Two embedded single band, 2.4 antennae with spatial diversity, mounted in the display enclosure
Form Factor	PCI-Express Half-MiniCard 1.2
Weight	0.013 lb (6 g)
Dimensions	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)
Operating Voltage	3.3v +/- 10%
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)
Configuration Utility⁴	Microsoft Windows XP Choice of Configuration Utility: <ul style="list-style-type: none">● Microsoft Windows XP Wireless Network Connection Manager● Broadcom Wireless Configuration Utility (required for Cisco Compatible Extensions support) Microsoft Windows Vista <ul style="list-style-type: none">● Microsoft Windows Vista Wireless Network Connection Manager● Broadcom IHV extensions for Windows Vista available to support Cisco Compatible Extensions. Microsoft Windows 7 <ul style="list-style-type: none">● Microsoft Windows 7 Wireless Network Connection Manager● Broadcom IHV extensions for Windows 7 available to support Cisco Compatible Extensions.
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON

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

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

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

Technical Specifications

error rate of 10% for 802.11a/g (OFDM modulation).

4. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.

Bluetooth 4.0 Wireless Technology

Bluetooth Specification	2.1+EDR, 3.0+HS, 4.0 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	Max 4 dBm (Bluetooth Class II)	
Receiver Sensitivity	Better than -80 dBm at 0.1 % raw bit error rate	
Power Consumption	Average 230mW Sleep <1 mW	
Antenna	Internally integrated within module	
Range	Up 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	
Temperature	Operating	-4° to 158° F (-20° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90%
	Non-operating	5% to 95%
Altitude	Operating	15,000 ft (4,572 m)
	Non-operating	40,000 ft (12,192 m)
Bluetooth Profiles Supported	Serial Port Profile (SPP) ¹ Service Discovery Application Profile (SDAP) Dial-Up Networking (DUN) ^{1,2}	

Technical Specifications

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)^{1,2,3}
FAX Profile (FAX)
Basic Imaging Profile (BIP)²
Headset Profile (HSP)
Hands Free Profile (HFP)
Advanced Audio Distribution Profile (A2DP)

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

2. indicates the profile is part of Windows Vista

AUDIO/MULTIMEDIA

Audio

Hardware	Implementation	IDT 92HD87 High Definition CODEC
	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

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

Internal Stereo Speaker	Power Rating	2 Watts
	Impedance	4 ohms

Technical Specifications

POWER

HP 45W 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 4-cell Lithium-Ion Long Life Battery (52 WHr)	Dimensions (h x w x l)	0.31 x 5.25 x 8.15in (0.8 x 13.3 x 20.7cm)		
	Weight	0.74 lb (0.335kg)		
	Cells/Type	4-cell Lithium-Ion		
	Energy	Voltage	14.8V	
		Amp-hour capacity	3.515Ah	
		Watt-hour capacity	52Wh	
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)	
		Operating (Discharging)	14° to 122° F (-10° to 50° C)	
		Non-operating	-4° to 122° F (-20° to 50° C)	
	Battery Re-Charge Time	System in OFF or Standby Mode	2.5 hours	
		System ON	3 to 5 hours	
	Fuel Gauge LED	No		

Technical Specifications

Optional Travel Battery Available No

HP 6-cell Lithium-Ion Long Life Slice Battery (60 WHr)	Dimensions (h x w x l)	0.28 x 12.6 x 8.39in (0.7 x 32 x 21.3 cm)		
	Weight	1.72 lb (0.78 kg)		
	Cells/Type	6-cell Lithium-Ion		
	Energy	Voltage	11.4V	
		Amp-hour capacity	2.0Ah	
		Watt-hour capacity	60Wh	
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)	
		Operating (Discharging)	14° to 122° F (-10° to 50° C)	
		Non-operating	-4° to 122° F (-20° to 50° C)	
	Battery Re-Charge Time	System in OFF or Standby Mode	3.5 to 5 hours	
System ON		4 to 7 hours		
Fuel Gauge LED	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:

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

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

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	5.12 W	5.24 W	5.13 W
	0.64 W	0.65 W	0.65 W
	0.34 W	0.36 W	0.35 W
Sleep (Energy Star low power mode)			
Off			

Heat Dissipation* **115 VAC** **230 VAC** **100 VAC**

Technical Specifications

Normal Operation	17 BTU/hr 2 BTU/hr 1 BTU/hr	18 BTU/hr 2 BTU/hr 1 BTU/hr	17 BTU/hr 2 BTU/hr 1 BTU/hr
Sleep			
Off			

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

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

System Fan Off	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	2.7 3.2	26.4 32.8

Fixed Disk
(random writes)

System fan is usually off except when charging the battery

Batteries

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

Batteries used in the product do not contain:

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

The battery type and chemistry used in the product is:

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

Additional information

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

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

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

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

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

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

This product is greater than 97.4% recycle-able when properly disposed of at end of life.

Technical Specifications

Packaging Materials

- External:
 - PAPER/Corrugated 509 g
- Internal:
 - PLASTIC/Polyethylene low density 66 g
- The PAPER/Corrugated packaging material is made from 70% recycled content.
- The PLASTIC/Polyethylene low density packaging material is made from 50% recycled content.

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

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

MATERIAL USAGE

This product does not contain any of the following substances in excess of regulatory limits (for reference of these limits please refer to the HP General Specification of the Environment (http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants - may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)

Technical Specifications

- Polyvinyl Chloride (PVC) - except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)
- Nickel finishes that release greater than 0.5 µgrams/cm²/week, measured according to EN 1811:1998, are not used on any product surface designed to be frequently handled or touched by users.

END-OF-LIFE MANAGEMENT AND RECYCLING

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <http://www.hp.com/go/reuse-recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/recyclers>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

HEWLETT-PACKARD CORPORATE ENVIRONMENTAL INFORMATION

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

Global Citizenship Report

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

Environment website

<http://www.hp.com/environment>

Eco-label certifications

<http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html>

ISO 14001 certificates:

<http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html>

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

Type	Description	Part #
Cases	HP Business Slim Top Load (up to 14.1" x .75" thick)	H2T13AA
	HP Business Nylon Case (up to 15.6")	BP848AA
	HP Business Nylon Backpack (up to 17.3")	BP848ET
	HP Professional Series Carrying Case (up to 15.6")	H4J90AA
	HP Professional Series Slim Top Load (up to 17.3")	H4J91AA
	HP Professional Series Backpack (up to 15.6")	H4J93AA
	HP Professional Leather Case (up to 17.3")	H4J94AA
	HP Deluxe 4 Wheel Roller	XW576AA
Docking	HP UltraSlim Side Docking Station	B9C87AA#xxx
	HP 2005pr USB 2.0 Port Replicator	H1L07AA#xxx
	HP 3005pr USB 3.0 Port Replicator	H1L08AA#xxx
Workspace Enhancement Stands	HP Display and Notebook Stand	AW662AA
	HP Dual Hinge Notebook Stand	AW661AA
	HP Adjustable Dual Display Stand	AW664AA
Input/Output – Mice	HP Comfort Grip Wireless Mouse	H2L63AA
	HP X4000b Bluetooth® Mouse	H3T50AA
	HP 3-button USB Laser Mouse	H4B81AA
Adapters	HP 90W Slim Adapter	BT796AA#xxx
	HP 65W Slim Adapter	AX727AA#xxx
	HP 90W Smart AC/Auto/Air Combo Adapter	AJ652AA#xxx
Storage - External Storage	HP Mobile USB DVDRW	A2U57AA
Batteries	HP BT04 Long Life Battery	H4Q47AA
	HP BA06 Long Life Battery Slice	H4Q48AA
Security	HP UltraSlim Keyed Cable Lock	H4D73AA
	HP Docking Station Cable Lock	AU656AA
Health and Education	HP 20-Notebook Managed Charging Cart	QL489AA
	HP 30-Notebook Managed Charging Cart	QL490AA
	HP Pocket Whiteboard	A0X37AA

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

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