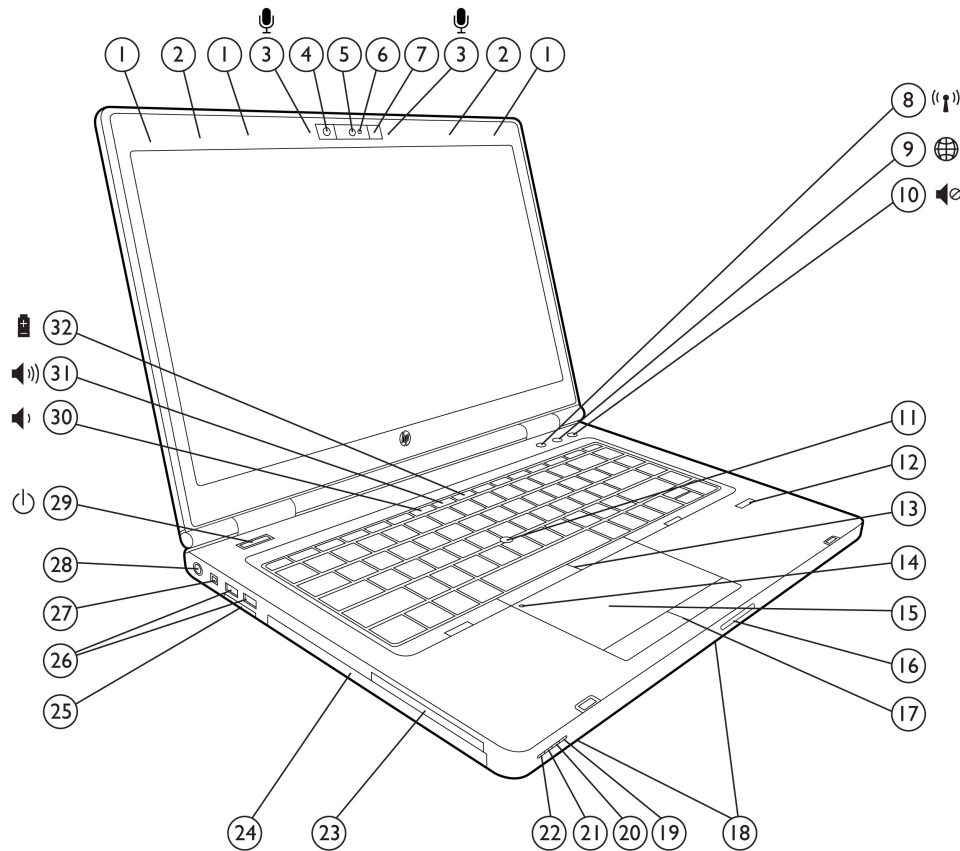


Overview

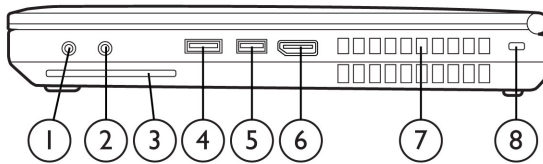


- | | |
|---|--|
| 1. WLAN antennas (3) | 17. Touchpad pick buttons |
| 2. WWAN antennas | 18. Stereo speakers (see bottom view) |
| 3. Dual-microphone array | 19. Hard drive activity / HP 3D DriveGuard LED indicator |
| 4. Optional 720p HD webcam | 20. Battery charging LED indicator |
| 5. Ambient Light Sensor | 21. Power/standby LED indicator |
| 6. HP Night Light on/off button | 22. Wireless on/off LED indicator |
| 7. HP Night Light | 23. ExpressCard/54 slot |
| 8. Wireless on/off button with LED indicator | 24. Upgrade Bay (optical drive or second hard drive) |
| 9. HP QuickWeb button with LED indicator | 25. Secure Digital/MMC slot |
| 10. Volume mute button with LED indicator | 26. (2) USB 3.0 ports |
| 11. Pointstick | 27. 1394a port |
| 12. HP Fingerprint Sensor | 28. Power connector |
| 13. Pointstick pick buttons | 29. Power button with LED indicator |
| 14. Touchpad on/off button with LED indicator | 30. Volume down function key |
| 15. Touchpad with scroll zone | 31. Volume up function key |
| 16. Display release latch | 32. HP Power Assistant function key |

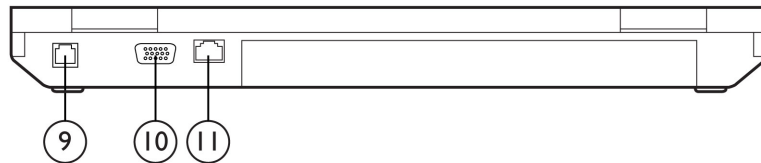


Overview

Right View

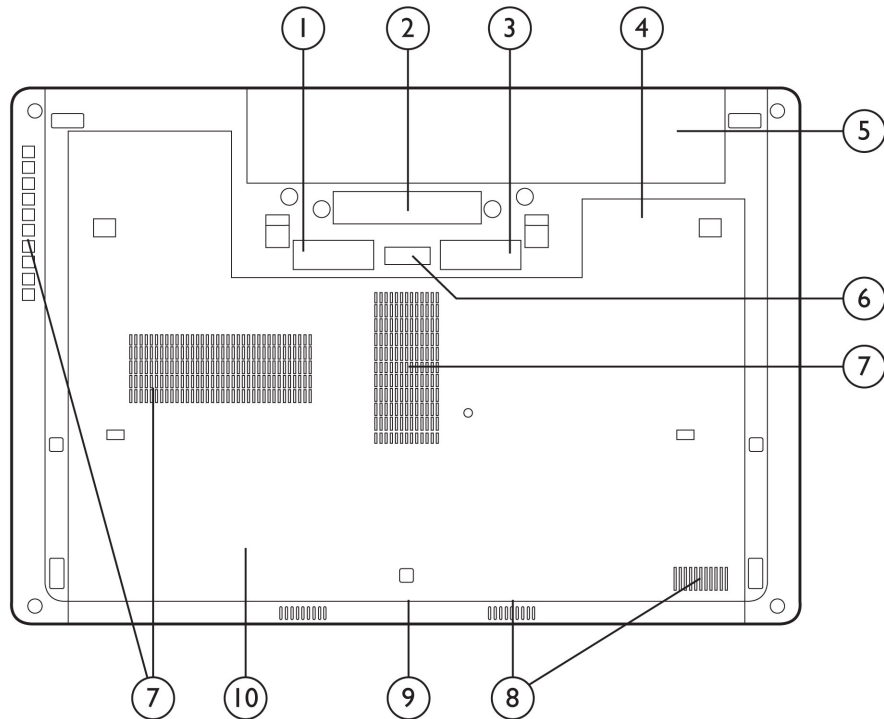


Rear View



- | | |
|---------------------------------|------------------------------------|
| 1. Stereo headphone/line out | 7. Vents |
| 2. Stereo microphone/line in | 8. Security lock slot |
| 3. Integrated Smart Card reader | 9. RJ-11/modem port |
| 4. eSATA/USB 2.0 combo port | 10. VGA/external monitor connector |
| 5. (1) USB 2.0 charging port | 11. RJ-45/Ethernet port |
| 6. DisplayPort | |

Bottom View



- | | |
|--------------------------------------|---|
| 1. Battery release latch | 7. Vents |
| 2. Docking connector | 8. Speakers |
| 3. Bottom cover release latch | 9. Bluetooth module compartment |
| 4. SIM slot for WWAN (select models) | 10. Hard drive, memory, and wireless compartments |



Overview

5. Battery bay under bottom cover
6. Secondary battery connector

At A Glance

- Genuine Windows 7 versions or FreeDOS
- All new chiseled design with enhanced HP DuraCase, magnesium-reinforced chassis, wear-resistant gunmetal color HP DuraFinish, radial spun finish, backlit HP logo, HP DisplaySafe frame, precision aluminum-alloy hinges, cast titanium-alloy display latches, keyboard in full aluminum deck, chemically strengthened glass touchpad, and laser-precision indicators
- Designed to meet the military standard Mil-Std-810G for vibration, dust, altitude, and high and low temperature operation*
- AMD FirePro™ M3900 workstation-caliber graphics with 1 GB dedicated video memory
- ISV certified to provide fast and reliable performance with workstation applications, including manipulation of 3D textures
- Choice of 2nd generation Intel® Core™ i7 and i5 processors
- Intel Core i7 with vPro and Core i5 with vPro technology (optional)
- HP Performance Advisor for optimal configuration, compatibility and performance
- AMD Eyefinity Technology for advanced multi-monitor support
- DisplayPort for high resolution support
- SRS Premium Sound optimized for high fidelity audio
- Choice of primary battery to optimize run time or weight: 9-cell (100 WHr), 6-cell (62 WHr), or 6-cell (55 WHr) HP Long Life Battery
- Choice of two optional external batteries for extended battery life: HP ST09 Extended Life Battery or HP BB09 Ultra Extended Life Battery
- HP Power Assistant allows you to conserve power, stretch battery run-time, accurately monitor the energy usage of the PC and up to four select HP external monitors, and report workforce power consumption.
- HP QuickWeb for convenient online access without long boot-up times
- Widescreen LED-backlit display
 - 14.0-inch diagonal HD, or HD+ wide viewing angle,
- Upgrade Bay for optical drive or optional second hard drive
- Flexible wireless connectivity options:
 - Optional integrated HP hs2340 HSPA+ Mobile Broadband Module connects to both HSPA and HSPA+ (UMTS) networks and provides GPS functionality
 - Optional integrated HP un2430 EV-DO/HSPA Mobile Broadband Module (Gobi 3000) provides GPS functionality (available after product introduction)
 - Integrated Intel Centrino® 802.11 a/b/g/n 2x2 or a/b/g/n 3x3, Atheros 802.11 a/b/g/n 3x3, or Broadcom 802.11 a/b/g/n 2x2 wireless LAN module
 - Bluetooth® v2.1 +EDR
 - HP Connection Manager 4.0
- Choice of 7200 rpm user-removable hard drive up to 750 GB with HP 3D DriveGuard protection, or 128/160 GB Solid State Drive
- Security features including HP ProtectTools, with central management across HP and non-HP client PCs
- BFR/PVC-free**, ENERGY STAR qualified and EPEAT Gold registered in the U.S. EPEAT status varies by country- please see epeat.net.

* Testing was not intended to demonstrate fitness for DOD contracts requirements or for military use. Test results are not a guarantee of future performance under these test conditions.

** This notebook is brominated flame retardant and polyvinyl chloride-free (BFR/PVC-free) on notebooks that are non-WWAN; meeting the evolving definition of 'BFR/PVC-free' as set forth in the "iNEMI Position Statement on the 'Definition of Low-Halogen' Electronics (BFR/CFR/PVC-Free)". Plastic parts contain < 1000 ppm (0.1%) of bromine [if the Br source is from BFRs] and < 1000 ppm (0.1%) of chlorine [if the Cl source is from CFRs or PVC or PVC copolymers]. Power supply and power cords are not BFR/PVC-



Overview

free. Service parts after purchase may not be BFR/PVC-free.



Standard Features (availability may vary by country)

Processors

2nd Generation Intel Core i7 Processors

Intel Core i7-2820QM Processor (2.30 GHz, 8 MB L3 cache, 4 cores/8 threads, 45W)*

Up to 3.40 GHz with Intel Turbo Boost Technology

Intel Core i7-2720QM Processor (2.20 GHz, 6 MB L3 cache, 4 cores/8 threads, 45W)*

Up to 3.30 GHz with Intel Turbo Boost Technology

Intel Core i7-2630QM Processor (2.00 GHz, 6 MB L3 cache, 4 cores/8 threads, 45W)* †

Up to 2.90 GHz with Intel Turbo Boost Technology

Intel Core i7-2620M Processor (2.70 GHz, 4 MB L3 cache, 2 cores/4 threads, 35W)*

Up to 3.40 GHz with Intel Turbo Boost Technology

2nd Generation Intel Core i5 Processors

Intel Core i5-2540M Processor (2.60 GHz, 3 MB L3 cache, 2 cores/4 threads, 35W)*

Up to 3.30 GHz with Intel Turbo Boost Technology

Intel Core i5-2520M Processor (2.50 GHz, 3 MB L3 cache, 2 cores/4 threads, 35W)*

Up to 3.20 GHz with Intel Turbo Boost Technology

* Intel's numbering is not a measurement of higher performance.

† Not available with vPro.

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

Operating System

Preinstalled

Genuine Windows 7 Professional 32*

Genuine Windows 7 Professional 64*

Genuine Windows 7 Home Premium 64*

FreeDOS

Supported

Genuine Windows 7 Enterprise 32*

Genuine Windows 7 Enterprise 64*

Genuine Windows 7 Ultimate 32*

Genuine Windows 7 Ultimate 64*

Genuine Windows Vista Enterprise 32**

Genuine Windows Vista Enterprise 64**

Genuine Windows Vista Business 32**

Genuine Windows Vista Business 64**

Genuine Windows XP Professional 32

Genuine Windows XP Professional 64

Certified

SuSE Linux Enterprise Desktop 11

* System may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See <http://www.microsoft.com/windows/windows-7/> for details.

** Certain Windows Vista product features require advanced or additional hardware. See: <http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx> and <http://www.microsoft.com/windowsvista/getready/capable.mspx> for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: <http://www.windowsvista.com/upgradeadvisor>.



Standard Features (availability may vary by country)

Chipset Mobile Intel QM67 Express Chipset

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 7.0 (iAMT) offers built-in manageability and proactive security for networked notebook PCs, even when they are powered off* or when the operating system is inoperable. It can help identify threats before they reach the network, isolate infected systems, and update PCs regardless of their power state.

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

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

Graphics

AMD FirePro™ M3900 with 1 GB dedicated DDR3 video memory
Microsoft DirectX 11 (Shader Model 5.0) and OpenGL 4.0 capable
AMD Eyefinity Technology supports up to four independent displays
when using an HP Advanced Docking station

Display

Internal
14.0-inch diagonal LED-backlit HD anti-glare (1366 x 768 resolution)
14.0-inch diagonal LED-backlit HD+ anti-glare (1600 x 900 resolution)
HP Privacy Filter support

External
Up to 32-bit per pixel color depth
DisplayPort supports resolutions up to 2560 x 1600, 30-bit color depth at 60 Hz, and full HD (1920 x 1080) monitors, 24-bit color depth at 120 Hz
VGA port supports resolutions up to 2048 x 1536 at 75 Hz, and lower resolutions at up to 100 Hz
DVI-D (single link) video signal available through DVI port in optional HP Docking Station (sold separately)
supports resolutions up to 1600 x 1200 at both full and reduced blanking, and 1920 x 1200 at reduced blanking
NOTE: Resolutions are dependent upon monitor capability, and resolution and color depth settings.



Standard Features (availability may vary by country)

Memory	Standard	DDR3 PC3-10600 SDRAM (1333 MHz) Two SODIMM slots supporting dual-channel memory 2 GB, 4 GB, and 8 GB SODIMMs
	Maximum	Upgradeable to 16 GB with 8 GB 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. Full availability of 4 GB or more of memory requires a Windows 64-bit operating system or Linux. With Windows 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements.

Communications	Integrated Intel 82579LM Gigabit* Network Connection (vPro configurations) 56K V.92 modem**	
	* 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.	

Wireless Devices	Support for a broad range of secure, integrated wireless LAN and wireless WAN options featuring support for the latest industry standards. Broadband Wireless (WWAN) requires a Windows operating system and is available in select countries as a standard, factory configurable feature only. Integrated Bluetooth is also available (factory configurable only) and can be combined with any of the supported wireless LAN and wireless WAN options.	
	Mobile Broadband options	Two 850/900/1575/1700/1800/1900/2100 MHz antennas integrated in the top of the display panel support current and future WWAN technologies. NOTE: Separately purchased mobile network operator service is required.
	HP hs2340 HSPA+ Mobile Broadband Module	Integrated mobile broadband module that provides connectivity to both HSPA and HSPA+ (UMTS) networks. It also provides standalone, Internet and network assisted GPS functionality for various mapping applications and security applications such as Computrace Pro for HP ProtectTools.
	HP un2430 EV-DO/HSPA Mobile Broadband Module (not available at product introduction)	Integrated mobile broadband module with Gobi global mobile Internet technology that provides connectivity to both CDMA (EVDO) and UMTS (HSPA) networks. It also provides GPS functionality for various mapping applications and security applications such as Computrace LoJack Pro Premium for HP ProtectTools.
All 802.11 integrated wireless LAN options		Wi-Fi Certified* Cisco Compatible Extensions support Wired Equivalent Privacy (WEP) support up to 128-bit keys Wi-Fi Protected Access (WPA) and WPA2 support 802.1x authentication support, including EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, and LEAP



Standard Features (availability may vary by country)

	Advanced Encryption Standard (AES) support
	Dual antennas integrated in the display enclosure
Intel Centrino Ultimate-N 6300 (3x3)	Integrated support for 802.11a, b, g, and n* 3 transmit, 3 receive antennas Up to 450 mbps data rate
Intel Centrino Advanced-N 6205 (2x2)	Integrated support for 802.11a, b, g, and n* 2 transmit, 2 receive antennas Up to 300 mbps data rate
Atheros HB112AGN 802.11a/b/g/n (3x3) WiFi Adapter	Integrated support for 802.11a, b, g, and n* 3 transmit, 3 receive antennas
Broadcom 43224AGN 802.11a/b/g/n (2x2) WiFi Adapter	Integrated support for 802.11 a, b, g, and n Up to 300 mbps data rate
HP Integrated Module with Bluetooth 2.1 +EDR Wireless Technology	Bluetooth Specification v2.1 +EDR compliant Works with a wide range of Bluetooth devices

Keyboard

The HP spill-resistant keyboard is designed using a thin layer of Mylar film under the keyboard and a drain system that funnels fluid through a hole in the bottom of the notebook. This minimizes the risk of damage to sensitive components underneath. The 101/102-key compatible keyboard features a full-pitch key layout with desktop keyboard features, such as editing keys, both left and right control and alt keys, function keys, and 19.05 x 19.05 mm key pitch (center-to-center spacing). U.S. and International key layouts are available. Other features include hot keys for instant access to power conservation and brightness.

Launch Buttons and Function Keys

Separate launch buttons provide easy access to the following features: wireless on/off, HP QuickWeb, and volume mute. Function keys provide control of the following features: standby mode, external display, volume down, volume up, HP Power Assistant, and display brightness.

Pointing device

Touchpad with on/off button, two-way scroll, gestures, two pick buttons
Pointstick with two additional pointstick buttons

Expansion card slots

ExpressCard/54 slot	Supports ExpressCard/54
Integrated Smart Card Reader	Compatible with ISO 7816 compliant Smart Cards PC/SC interface support
Secure Digital/MMC slot	Supports SD (Secure Digital), SDHC, SDXC, MMC (MultiMedia Card), and MMC+



Standard Features (availability may vary by country)

Internal Storage	Hard drives	250/320/500/750 GB 7200 rpm SMART SATA II 320 GB 7200 rpm SMART SATA II Self Encrypting Drive
	NOTE: These hard drives are customer removable and will withstand multiple insertion/removal cycles. Up to 10 GB is reserved for the system recovery software.	
	HP 3D DriveGuard (Windows only)	The hard drive is mounted directly to the notebook frame, reducing the transmission of shock to the hard drive. Uses three-axis digital motion detection with intelligent sensitivity to help protect the hard drive during normal use from shock and vibration. The digital accelerometer temporarily halts all data transfer and parks the hard drive when abrupt motion is detected.
	Solid State Drive	128/160 GB
Upgrade Bay	Fixed 12.7 mm SATA optical drive	Blu-ray R/RE DVD+/-RW SuperMulti DL Drive DVD+/-RW SuperMulti DL Drive
	Second hard drive	500 GB 7200 rpm SMART SATA II Hard Drive
Interfaces	ExpressCard/54 slot	One
	External monitor	Two - (1) DisplayPort, (1) VGA
	1394a	One
	Stereo microphone in	One
	Stereo headphone/line out	One
	Power connector	One
	RJ-11/modem	One
	RJ-45/Ethernet	One
	USB 3.0	Two
	USB 2.0	One (charging port)
	eSATA/USB 2.0 combo	One
	Docking connector	One
	Secondary battery connector	One



Standard Features (availability may vary by country)

Audio/Visual

SRS Premium Sound™

Integrated stereo speakers

Integrated microphone (dual-microphone array when equipped with optional webcam)

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

Stereo headphone/line out

Stereo microphone/line in

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

Software

Preinstalled software with Windows operating system

HP Recovery Manager

HP Performance Advisor

HP Support Assistant

HP ProtectTools Security Manager

HP ProtectTools for Central Management

HP Hotkey Support

HP QuickWeb

HP Power Assistant

HP Connection Manager 4.0

HP DayStarter

Microsoft Office 2010 preloaded (purchase of a Product

Key required to activate a full Office 2010 suite)*

Norton Internet Security 2011**

PDF Complete Special Edition***

Intervideo WinDVD – DVD Player (select models)

Roxio Burn Secure (select models)

Roxio MyDVD 10 SE (select models)

HP Webcam Software (select models)

Skype

Additional software

available from the web

HP SoftPaq Download Manager

HP Client Manager Software

HP Client Configuration Management Agent

* Microsoft Office 2010 Preloaded 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>.

** Norton Internet Security 2011 includes 60 days of complimentary live updates; subscription required for live updates thereafter. Internet access required to receive updates.

*** PDF Complete Special Edition 60 day trial; purchase license afterwards for full functionality.

Planned Workstation ISV
Certifications

MCAD
(Mechanical)

Autodesk AutoCAD
Autodesk AutoCAD Mechanical



Standard Features (availability may vary by country)

CAD/Architectural
Engineering and
Construction)

Autodesk AutoCAD Electrical
Autodesk Inventor
Autodesk AutoCAD Architecture
Autodesk AutoCAD Plant3D
Autodesk AutoCAD P&ID
Autodesk AutoCAD Structural Detailing
Autodesk Alias Automotive
Autodesk Alias Design
Autodesk Alias Surface
Autodesk AutoCAD MEP
Autodesk AutoCAD Raster Design
Autodesk Showcase
Autodesk Moldflow
Aveva PDMS & Marine
Bentley InRoads XM
Bentley Microstation
Bentley Navigator
PTC Creo Elements Direct
Dassault Systemes CATIA V5, V6
DS Solidworks
ICEM Surf
MSC Software MSC.Patran
MSC Software SimXpert
PTC Pro/ENGINEER Wildfire (Creo Elements Pro & Creo 1.0)
SensAble
Siemens PLMS NX
Siemens PLMS NX I-deas
Siemens PLMS Solid Edge
Siemens PLMS TeamCenter Visualization
Siemens Tecnomatix
HSMWorks

DCC
(Digital Content Creation)

Adobe Premiere
Adobe After effects
Adobe Encore
Adobe Photoshop
Autodesk 3DS MAX
Autodesk MotionBuilder
Autodesk Mudbox
Autodesk Maya
Autodesk SoftImage
Avid Media Composer
Avid Pro Tools

GIS
(Geographic Information
Systems) /
Oil and Gas

ESRI ArcGIS
Paradigm GoCAD, SKUA
Schlumberger Petrel
SeismicMicro Technology Kingdom
Dynamic Graphics Inc. EarthVision, CoVis4D
Landmark Decision Space Desktop
Roxar RMS
Transform TerraSuite



Standard Features (availability may vary by country)

	Headwave Headwave2
	ffA SVI Pro
	Autodesk AutoCAD Map 3D
GIS	Landmark Decision Space Desktop
(Geographic Information Systems) /	Paradigm EPOS, GOCAD, SKUA
Oil and Gas	Schlumberger GeoFrame
(Linux if available)	Dynamic Graphics Inc. EarthVision
	Roxar RMS
	Transform TerraSuite
	Headwave Headwave2
AEC	Autodesk Navisworks Manage
	Autodesk Navisworks Simulate
	Autodesk Navisworks Review
	Autodesk Revit Architecture
	Autodesk Revit MEP
	Autodesk Revit Structure
	Autodesk AutoCAD Civil 3D

NOTE: This is a tentative list, and some certifications may only be completed on specific graphics solutions.

HP Performance Advisor HP Performance Advisor enables optimal configuration of HP Mobile Workstations delivering stability and best performance. HP Performance Advisor will guide your system setup allowing a "custom" configuration that best matches the workstation to user requirements.

HP Recovery Manager Models shipped with Windows 7 or Windows Vista include HP Recovery Manager. HP Recovery Manager enables fast recovery of the factory preinstalled image if the system becomes corrupted or if important system files are accidentally deleted. Up to 20 GB of the hard drive is reserved for the system recovery software.

Security	Standard Features	HP ProtectTools Security Manager (standard modules include)
		• Credential Manager • Computrace* Pro • Device Access Manager • Drive Encryption • Face Recognition (webcam configurations only) • File Sanitizer • Privacy Manager • Embedded Security
		HP Fingerprint Sensor Integrated Smart Card Reader Enhanced Pre-Boot Security (Multiuser / Multifactor) HP SpareKey One-Step Logon TPM 1.2 Embedded Security Chip** HP Disk Sanitizer



Standard Features (availability may vary by country)

Optional Features	Security lock slot	
	Support for Intel AT***	
	HP Privacy Filter	Narrows viewing area so that screen data is visible only to persons directly in front of the monitor.
	Computrace* Pro for HP ProtectTools with GPS Tracking	Subscription based security solution providing the ability to track, initiate physical recovery, conduct asset management, and perform remote data delete by utilizing GPS technology. GPS functionality requires HP Mobile Broadband Module.

* The Computrace agent is shipped turned off, and must be activated by customers when they purchase a subscription with terms ranging from one to five years.

** TPM module disabled where use is restricted by law, for example, Russia and China.

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

*** Intel AT security requires a separately purchased Absolute Computrace service subscription and must be activated and configured. Check with Absolute for availability in your country. Intel and HP assume no liability for lost or stolen data and/or systems or any other damages resulting therefrom. See <http://www.intel.com/technology/anti-theft/>

HP ProtectTools Security Manager with Central Management

HP ProtectTools Security Manager is the security platform for business notebooks and desktops. The HP ProtectTools Security Manager is an extensible client security console that delivers enhanced security capabilities through add-on software modules. The ProtectTools modules are available on the hard drive (also downloadable from the web) and can be configured in Software Setup.

HP ProtectTools is centrally manageable with the capability to manage notebooks from a single point. HP ProtectTools is management ready out of the box, in partnership with Digital Persona. Features address requirements that customers expect from a centrally managed security solution such as user provisioning, credential reset, and credential revocation.

HP ProtectTools provides two separate management solutions, targeted at the enterprise and the SMB:

- Digital Persona Pro AD: Designed for the enterprise customer. Integrates with Active Directory and gives IT Managers the ability to provision users, create login policies based on passwords, biometrics or smartcards. Management features also include remote credential recovery in case the user forgets the password, loses the smartcard or cannot use the fingerprint reader for any reason. In addition, advanced auditing capabilities are also built in. Digital Persona Pro AD is available now.
- Digital Persona Pro Workgroup: Designed for the small business customer. Provides features similar to the Active Directory version, but for workgroups. Workgroup activation is built into HP ProtectTools, and activation of up to 5 seats is completely free.

For more information on Central Management for HP ProtectTools, refer to: <http://www.hp.com/products/security>.



Standard Features (availability may vary by country)

Power Supply

External 90-watt Smart AC adapter
Power cord included is 6-foot (1.8 meter).
Total length including external AC adapter is 12 feet (3.66 meter).
HP Fast Charge*

*HP Fast Charge recharges your battery up to 90% within 90 minutes when the system is off. HP Fast Charge does not apply to the 9-cell primary battery, HP ST09 Extended Life Notebook Battery, or HP BB09 Ultra Extended Life Notebook Battery.

Battery

Primary battery

HP 9-cell (100 WHr) Li-Ion battery
HP 6-cell (62 WHr) Li-Ion battery
HP Long Life 6-cell (55 WHr) Li-Ion battery

Secondary battery Options

HP BB09 Ultra Extended Life Notebook Battery (9-cell 100 WHr)
HP ST09 Extended Life Notebook Battery (9-cell 73 WHr)

Battery Life

9-cell (100 WHr)

Up to TBD hours and TBD minutes

with optional
HP ST09 Extended Life
Notebook Battery

Up to TBD hours and TBD minutes

with optional
HP BB09 Ultra Extended
Life Notebook Battery

Up to TBD hours and TBD minutes

6-cell (62 WHr)

Up to TBD hours and TBD minutes

* Configurations with integrated graphics.

NOTE: 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 www.bapco.com/products/mobilemark2007 for additional details.

System Standby Time

Up to 1 week

Power Conservation

AMD PowerPlay technology
Hibernation
Standby
ACPI compliance

Docking and Stands

HP 90W Docking Station
HP 120W Advanced Docking Station
HP USB 2.0 Docking Station
HP Essential USB 2.0 Port Replicator
HP LAN and USB Travel Hub

NOTE: Some HP Docking stations may not support every feature of some HP Notebook models. Please refer to the individual docking station documentation for specific information about supported features.



Standard Features (availability may vary by country)

Service and Support

HP Services offers limited 3-year warranty options depending on country. On-site service and warranty upgrades are also available. HP Care Pack Services extend service contracts beyond the standard warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/lookuptool>. Additional HP Care Pack Services information by product is available at: <http://www.hp.com/hps/carepack>.

NOTE: Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details. <http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp>.



QuickSpecs

HP EliteBook 8460w Mobile Workstation

Options (availability may vary by country)

Memory	HP 1 GB (DDR3 1333 MHz) SODIMM	AT911AA#xxx
	HP 2 GB (DDR3 1333 MHz) SODIMM	AT912AA#xxx
	HP 4 GB (DDR3 1333 MHz) SODIMM	AT913AA#xxx
	HP 8 GB (DDR3 1333 MHz) SODIMM	QP013AA#xxx
Storage	HP 250 GB Pocket Media Drive	FE477AA
	HP Mobile USB DVD	XQ543AA
	HP Mobile USB DVDRW	BU516AA
	HP Mobile Blu-ray USB DVDRW	XQ546AA
	HP Upgrade Bay SATA 500 GB 7200 rpm Hard Drive	LX733AA#xxx
	HP Primary SATA 500 GB 7200 rpm Hard Drive	AU098AA#xxx
	HP Upgrade Bay DL DVD+/-RW	LZ835AA
Expansion Solutions	HP 90W Docking Station	VB041AA#xxx
	HP 120W Advanced Docking Station	NZ222AA#xxx
	HP USB 2.0 Docking Station	AY052AA#xxx
	HP Essential USB 2.0 Port Replicator	AQ731AA#xxx
	HP LAN and USB Travel Hub	BM868AA#xxx
	HP Display & Notebook Stand	AW662AA#xxx
	HP Adjustable Display Stand	AW663AA#xxx
Power	HP Adjustable Dual Display Stand	AW664AA#xxx
	HP ST09 Extended Life Notebook Battery	QK639AA
	HP BB09 Ultra Extended Life Notebook Battery	QK640AA
	HP CC06XL Long Life Notebook Battery	QK642AA
	HP CC09 Notebook Battery	QK643AA
	HP 90W Smart AC Adapter	ED495AA#xxx
	HP 90W Smart AC/Auto/Air Combo Adapter	AJ652AA#xxx
	HP 90W Smart Auto/Truck Adapter	ED493AA
Carrying Cases	HP 65W Slim Adapter	AX727AA#xxx
	HP 90W Slim Adapter	BT796AA#xxx
	HP Basic Carrying Case	AJ078AA
	HP Business Nylon Case	BP848AA
	HP Professional Slim Top Load Case	AY530AA



Options (availability may vary by country)

Security	HP Notebook Combo Lock	AY475AA#xxx
	HP Keyed Cable Lock	BV411AA
	HP 14.0-inch Display Privacy Filter	AU100AA#xxx
Input/Output Devices	HP USB Optical Travel Mouse	RH304AA
	HP USB/PS2 Optical 2-Button Scroll Mouse	DC369A
	HP USB Keyboard & Mouse Bundle	RC465AA#xxx
	HP Notebook Projection Companion	AX325AA#xxx



Technical Specifications

System Unit	Dimensions (HxWxD)	1.25 in (at front) x 13.31 in x 9.11 in 31.8 mm (at front) x 338 mm x 231.3 mm
	Weight	Starting at 4.90 lb (2.22 kg) with hard drive (no optical drive)
	NOTE: Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components. Weight includes 6-cell battery and WLAN.	
Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	18.5 V
	Average Operating Power	TBD W
	Max Operating Power	< 90 W
Temperature	Operating	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)
	Non-operating	−4° to 140° F (−20° to 60° C)
Relative Humidity	Operating	10% to 90%, non-condensing
	Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
Shock	Operating	125 G, 2 ms, half-sine
	Non-operating	200 G, 2 ms, half-sine
Random Vibration	Operating	0.75 grms
	Non-operating	1.50 grms
Altitude (unpressurized)	Operating	−50 to 10,000 ft (−15.24 to 3,048 m)
	Non-operating	−50 to 40,000 ft (−15.24 to 12,192 m)
Planned Industry Standard Certifications	UL	Yes
	CSA	Yes
	FCC Compliance	Yes
	ENERGY STAR®	Select models*
	EPEAT	Gold**
	ICES	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes
	Japan VCCI Compliance	Yes
	KCC	Yes
	BSMI	Yes
	CE Marking Compliance	Yes

* Configurations of the HP EliteBook 8460w that are ENERGY STAR qualified are identified as HP EliteBook 8460w ENERGY STAR on HP websites and on www.energystar.gov.

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

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



Technical Specifications

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

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

Integrated Stereo Speakers	Power Rating	2 Watts
	Impedance	4 Ohms

Power



Technical Specifications

HP 90W Smart AC Adapter	Dimensions	5.00 x 1.97 x 1.1 in (12.7 x 5.0 x 2.9 cm)	
	Weight	0.82 lb (370 g)	
	Input	100 to 240 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
	Output	Input AC current	1.5 A at 90 VAC, 0.75 A at 180 VAC PFC Version
			2.4 A at 90 VAC, 1.2 A at 180 VAC NON PFC Version
		Output power	90W
	Connector	DC output	19.0V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
		3 pin/grounded, mates with interchangeable cords	
	Environmental Design	Operating temperature	32° to 104° F (0° to 40° C)
		Non-operating (storage) temperature	-4° to 149° F (-20° to 65° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
		Humidity	20% to 80%
	EMI and Safety Certifications	Storage Humidity	10% to 90%
		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.	

Optional HP BB09 Ultra Extended Life Notebook Battery	Dimensions (H x W x L)	1.2 x 5.9 x 11.4 in (3x15x29cm)	
	Weight (max)	1.5lb, (.682kg)	
	Cells/Type	Lithium-Ion	
	Energy	Voltage	11.25V
		Amp-hour capacity	8.85Ah
		Watt-hour capacity	100Wh
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 122° F (-10° to 50° C)
		Non-operating	-4° to 122° F (-20° to 50° C)
	Battery Re-Charge Time	System in OFF or Standby Mode	3.5 to 5 hours
		System ON	4 to 7 hours
	Fuel Gauge LED	Yes	
	Warranty	1 year	



Technical Specifications

Optional Travel Battery Available NA

Optional HP ST09 Extended Life Notebook Battery	Dimensions (H x W x L)	1.2 x 6.1 x 12 in (3x15.5x30.5cm)	
	Weight (max)	1.2lb, (.550kg)	
	Cells/Type	Lithium-Ion Polymer	
	Energy	Voltage	11.1V
		Amp-hour capacity	6.6Ah
		Watt-hour capacity	73Wh
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 122° F (-10° to 50° C)
		Non-operating	-4° to 122° F (-20° to 50° C)
	Battery Re-Charge Time	System in OFF or Standby Mode	3.5 to 5 hours
		System ON	4 to 7 hours
	Fuel Gauge LED	Yes	
	Warranty	1 year	
Optional Travel Battery Available	NA		

Optional HP 6-cell (55 WHr) Long Life Battery	Dimensions (H x W x L)	0.8 x 1.8 x 8.0in (2.0 x 4.7 x 20.5cm)		
	Weight (max)	.72lb, (.323kg)		
	Cells/Type	Lithium-Ion		
	Energy	Voltage	10.8V	
		Amp-hour capacity	5.1Ah	
		Watt-hour capacity	55Wh	
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)	
		Operating (Discharging)	14° to 122° F (-10° to 50° C)	
		Non-operating	-4° to 122° F (-20° to 50° C)	
	Battery Re-Charge Time	System in OFF or Standby Mode	2.5 hours	
		System ON	3 to 5 hours	
	Fuel Gauge LED	No		
	Warranty	3 years		
Optional Travel Battery Available	Yes			



Technical Specifications

HP 9-cell (100 WHr) Lithium-Ion Primary battery	Dimensions (H x W x L)	0.8 x 2.4 x 8.1 in (2 x 6.6 x 20.5cm)
	Weight (max)	1.1lb, (.488kg)
	Cells/Type	Lithium-Ion
	Energy	Voltage 11.25V
		Amp-hour capacity 8.85Ah
		Watt-hour capacity 100Wh
	Temperature	Operating (Charging) 32° to 113° F (0° to 45° C)
		Operating (Discharging) 14° to 122° F (-10° to 50° C)
		Non-operating -4° to 122° F (-20° to 50° C)
	Battery Re-Charge Time	System in OFF or Standby Mode 3.5 to 5 hours
		System ON 4 to 7 hours
	Fuel Gauge LED	No
	Warranty	1 year
	Optional Travel Battery Available	Yes

6-Cell (62 WHr) Lithium- on battery	Dimensions (HxWxL)	0.8 x 2.0 x 8.3 in (2.0 x 5.1 x 21.1 cm)
	Weight	0.72 lb (0.325 kg)
	Cells/Type	6-cell Lithium-Ion
	Energy	Watt-hour Capacity 62Wh
	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 Mode or Standby 2.5 hours
		System ON 3 to 5 hours (depending on system power consumption)

Internal Storage



Technical Specifications

750 GB 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115g)	
	Capacity	750 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum)	300 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	1.5 ms
		Average	11 ms
		Maximum	22 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	1,465,149,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

500 GB 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115g)	
	Capacity	500 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum)	300 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	1.5 ms
		Average	11 ms
		Maximum	22 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	



Technical Specifications

320 GB 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115 g)	
	Capacity	320 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum)	300 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	1.5 ms
		Average	11 ms
		Maximum	22 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	625,142,448	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

250 GB 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115g)	
	Capacity	250 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum)	300 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	1.5 ms
		Average	11 ms
		Maximum	22 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	488,397,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

160 GB 2.5-inch SATA Solid State Drive	Drive Weight	78 Grams	
	Capacity	160 GB	
	Height	0.276 in (7 mm)	
	Width	2.76 in (70 mm)	
	Interface	SATA Gen 2	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		250 MB/s	100 MB/s
	Logical Blocks	312,581,808	
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]	
	Features	ATA Security; ATA-7; SATA 2.6; DIPM; TRIM	



Technical Specifications

128 GB 2.5-inch SATA Solid State Drive	Drive Weight	75 Grams	
	Capacity	128 GB	
	Height	0.276 in (7 mm)	
	Width	2.76 in (70 mm)	
	Interface	SATA Gen 2	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		250 MB/s	140 MB/s
	Logical Blocks	250,069,680	
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]	
	Features	ATA Security; ATA-7; SATA 2.6; DIPM; TRIM	

Optical Drives

DVD+/-RW SuperMulti DL Drive	Access Times	Random	< 140ms CD (typical) < 160 ms DVD (typical)
	Max Data Transfer Rate	24X CD-ROM 8X DVD 24X CD-R 24X CD-RW 8X DVD+R 8X DVD+RW 8X DVD-R 6X DVD-RW 6X - DVD+R Dual Layer 6X - DVD-R Dual Layer 5X DVD-RAM	
	Transfer Mode	UDMA Mode 5	
	Interface	Gen 1 SATA	
	Supported Media (read)	CD-DA, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	
	Supported Media (write)	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, DVD+R DL, DVD-R DL	
	Max Media Capacity (read)	8.5 GB	
	Max Media Capacity (write)	8.5 GB	
	Transport	Tray Loading	



Technical Specifications

Blu-ray R/RE DVD+/-RW SuperMulti DL Drive	Access Times	Random	<165 ms CD-ROM (typical)
			<185 ms DVD-ROM (typical)
			<205 ms BD-ROM (typical)
Max Data Transfer Rate			24X CD-ROM
			8X DVD-ROM
			24X CD-R
			16X CD-RW
			8X DVD+R
			8X DVD+RW
			8X DVD-R
			6X DVD-RW
			6X DVD+R Dual Layer
			6X DVD-R Dual Layer
			5X DVD-RAM
			6X BD-ROM
			6X BD-R
			2X BD-RE
Transfer Mode			UDMA Mode 5
Interface			Gen 1 SATA
Supported Media (read)			CD-DA, , CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW. DVD-RAM, BD-ROM, BD-R, BD-RE
Supported Media (write)			CD-R, CD-RW, DVD+R, DVD+R DL, DVD+RW, DVD-R, DVD-R DL, DVD-RW, DVD-RAM, BD-R, BD-RE
Max Media Capacity (read)			50.0 GB
Max Media Capacity (write)			50.0 GB
Transport			Tray Loading

Security



Technical Specifications

HP Fingerprint Sensor (optional)	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

Communications

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



Technical Specifications

Interface	Virtual Cable Doctor for Ethernet cable status
	PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ. NOTE: Intel 82579 PCIe interface is not PCIe compliant. It operates at half of PCIe specification V1.1 (2.5GT/S) speed.
NIC Device Driver Name	Intel 82579LM/82579V Ethernet Network Connection

V.92 56K Data/Fax Modem	Form Factor	MDC 1.5 Daughtercard
	Power Management Support	APM Revision 1.2, ACPI
	Approvals/Certifications	UL, CSA, NEMKO, CCIB, Industry Canada, FCC Part 68, CTR21, FCC Part 15 Class B, Canadian ICES-003 Class B, C.I.S.P.R.22, Australian ACA, CE Mark, Other Countries
	Data Mode Capabilities	V.92 data V.8bis V.80 V.44, V.42bis, MNP5 (Compression) V.42 (LAPM, MNP2-4) (Error Correction) Optional symbol rates: 2800, 3429 Asymmetric Symbol rates Synchronous primary channel data signaling rates: 3600, 31200 Automatic rate re-negotiation V.34 V.32bis V.32 V.23 V.22bis V.22 V.21 Bell 212A Bell 103J
	Fax Mode Capabilities	TIA/EIA-578-B (Class 1) T.30, T.4 (Group 3) V.17 V.29 V.27ter V.21 Channel 2 T.31
	Command Set	V.250 (Partial) TIA-602 Identification: +GMI, +GMM, +GMR Port control: +IPR, +ICF, +IFC, +ILRR Modulation: +MS, +MR, +MA Error control: +ES, +ER, +EB, +ESR, +ETBM Data compression: +DS, +DR



Technical Specifications

V.251

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 hs2340 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)

UMTS
UTRA FDD Bands
+24 dBm +4 / -3 dBm (class 3)

Maximum Power Consumption

2000mA (peak); 600mA (average)

Power Consumption, Sleep Mode

5 mA

Power Management

USB selective suspend
Integrated notebook wireless button

Antenna Type

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

Form Factor

PCI-Express MiniCard, USB 2.0 interface

Weight

< 12 g

Dimensions (Length x Width x Thickness)

2.01 x 1.18 x 0.18 in (51 x 30 x 5 mm)

Voltage, Operating

3.3v +/- 9%

Temperature, Operating

14° to 149° F (-10° to 65° C) (full RF performance)
14° to 167° F (-10° to 75° C) (reduced RF performance)



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 6205	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n* * In countries where 802.11n is not allowed, this capability is not enabled.
	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft 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 Sensitivity ⁴	54 Mbps: -76 dBm, 6 Mbps: -92 dBm
Antenna Connections	2 U.FL type connectors, 50 ohm nominal impedance
Form Factor	PCI-Express Half-MiniCard
Weight	0.0075 lb (3.4 g)
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)
Operating Voltage	3.3V +/- 9%
Temperature	Operating 32° to 176° F (0° to 80° C) Non-operating -40° to 176° F (-40° to 80° C)
Humidity	Operating 10% to 90% (non-condensing) Non-operating 5% to 90% (non-condensing)
Altitude	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON
1. Check latest software/driver release for updates on supported security features. 2. Maximum output power may vary by country according to local regulations. 3. In Power Save Polling mode and on battery power. 4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation). 5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.	

Intel Centrino Ultimate-N Wireless LAN Standards 6300

IEEE 802.11a
IEEE 802.11b
IEEE 802.11g
IEEE 802.11n*
* In countries where 802.11n is not allowed, this capability is not enabled.

Interoperability	Wi-Fi certified (802.11bgn only) Cisco Compatible Extensions Program compliant (802.11bgn only) with Microsoft Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)
Frequency Band	2.4 GHz and 5GHz
Antenna Structure	3 transmit; 3 receive (3x3)



Technical Specifications

Data Rates	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: many possible data rates, ranging from 6 Mbps to 450 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n specification
Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
Security¹	Authentication: WPA and WPA2, 802.1x (EAP_TLS, TTLS, PEAP, LEAP, EAP-FAST) Authentication Protocols: PAP, CHAP, TLS, GTC, MS-CHAP, MS-CHAPv2 Encryption: 64 and 128-bit WEP, AES-CCMP, CKIP, TKIP Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows Vista and XP only.
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between Access Points
Output Power (for CCK and OFDM) ²	17 dBm max
Power Consumption	Transmit: 2.4 Watts (max, with three spatial streams) Receive: 1.4 Watts (max with three 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	3 U.FL type connectors, 50 ohm nominal impedance
Form Factor	PCI-Express Half-MiniCard
Weight	0.0075 lb (3.4 g)
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)
Operating Voltage	3.3V +/- 9%
Temperature	Operating 32° to 176° F (0° to 80° C) Non-operating -40° to 176° F (-40° to 80° C)
Humidity	Operating 10% to 90% (non-condensing) Non-operating 5% to 90% (non-condensing)
Altitude	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON



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.

Atheros HB112AGN 802.11a/b/g/n 3x3 WiFi Adapter	Wireless LAN Standards	IEEE802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n
	Interoperability	Wi-Fi certified
	Frequency Band	2.4 GHz and 5GHz
	Data Rates	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: many possible data rates, ranging from 6 Mbps to 450 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n specification
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
	Security ¹	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.
	Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
	Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power (for CCK and OFDM) ²	17 dBm, nominal
	Output Power (for OFDM; power varies by data rate) ²	15 dBm, nominal
	Power Consumption	Transmit: 2.0 W (max) Receive: 1.5 W (max) Associated to Access Point, Idle: 300 mW nominal Wireless Button Off: 75 mW nominal
	Power Management	ACPI compliant power management 802.11 compliant power saving mode
	Receiver Sensitivity ³	54 Mbps: -75 dBm, 11 Mbps: -88 dBm , 1 Mbps: -93 dBm



Technical Specifications

Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure	
Form Factor	PCI-Express Half-MiniCard	
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 +/- 9%	
Temperature	Operating	14° to 149° F (-10° to 65° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON	
1. Check latest software/driver release for updates on supported security features. 2. Maximum output power may vary by country according to local regulations. 3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).		

Broadcom 43224AGN 802.11a/b/g/n WiFi Adapter

Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n*
Interoperability	Wi-Fi certified (802.11abg only) Cisco Compatible Extensions Program compliant (802.11abg only) with Microsoft Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)
Frequency Band	2.4 GHz and 5 GHz
Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 6, 6.5, 9, 12, 13, 13.5, 18, 19.5, 24, 26, 27, 36, 39, 40.5, 48, 52, 54, 58.5, 65, 78, 81, 104, 108, 117, 121.5, 130, 135, 162, 216, 243, 270, 300 Mbps
Frequency Support	20 MHz: 2.4 GHz and 5 GHz bands 40 MHz: 2.4 GHz and 5 GHz bands
Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
Security ¹	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST. Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows 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	Ad-hoc (Peer to Peer)	
Models	Infrastructure (Access Point Required)	
Roaming	IEEE 802.11 compliant roaming between access points	
Output Power (for CCK) ²	17 dBm , nominal	
Output Power (for OFDM; power varies by data rate) ²	15 dBm , nominal	
Power Consumption	Idle associated: 250 mW Idle unassociated: 150 mW Transmit/Receive 20 MHz channel: 2.0 W (max) Transmit/Receive 40 MHz channel: 2.0 W (max)	
Power Management	ACPI compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity ³	270 Mbps: -61dBm , 54 Mbps: -72 dBm, 11 Mbps: -85 dBm , 1 Mbps: -92 dBm	
Antenna type	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure	
Form Factor	PCI-Express Half-MiniCard	
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 149° F (-10° to 65° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON	
1. Check latest software/driver release for updates on supported security features. 2. Maximum output power may vary by country according to local regulations. 3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (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.		

HP Integrated Module with Bluetooth 2.1+EDR Wireless Technology

Bluetooth Specification	2.1+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



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) 264 mW Peak (Rx) 231 mW Sleep <1 mW
Antenna	Internally integrated within module
Range	Up 33 ft (10 m)
Electrical Interface	USB 2.0 compliant 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} 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}



Technical Specifications

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

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

System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for these models are based on a "Typically Configured Notebook"

Energy Consumption

	115 VAC	230 VAC	100 VAC
Normal Operation	10.84 W	11.10 W	10.85 W
Sleep (Energy Star low power mode)	0.90 W	0.99 W	0.89 W
Off	0.57 W	0.65 W	0.57 W

Heat Dissipation*

	115 VAC	230 VAC	100 VAC
Normal Operation	37 BTU/hr	38 BTU/hr	37 BTU/hr
Sleep	3 BTU/hr	3 BTU/hr	3 BTU/hr
Off	2 BTU/hr	2 BTU/hr	2 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)
Idle	3.3	26.7
Fixed Disk (random writes)	3.4	30.2

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:



Technical Specifications

Additional information

- 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)

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 95.1% recycle-able when properly disposed of at end of life.

Packaging Materials

- External:
 - Corrugated Paper – 500 g
 - CANON bags-several layers – 5 g
- Internal:
 - Polyethylene – 15 g
 - Molded Pulp – 180 g
- The Corrugated Paper packaging material is made from 80% recycled content.
- The CANON bags-several layers packaging material is made from 80% recycled content.
- The Polypropylene packaging material is made from 80% recycled content.
- The Molded Pulp packaging material is made from 80% 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.



Technical Specifications

- 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)
- 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 micro-grams/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



Technical Specifications

Hewlett-Packard Corporate Environmental Information

Packard web site at: <http://www.hp.com/go/recyclers>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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

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>

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