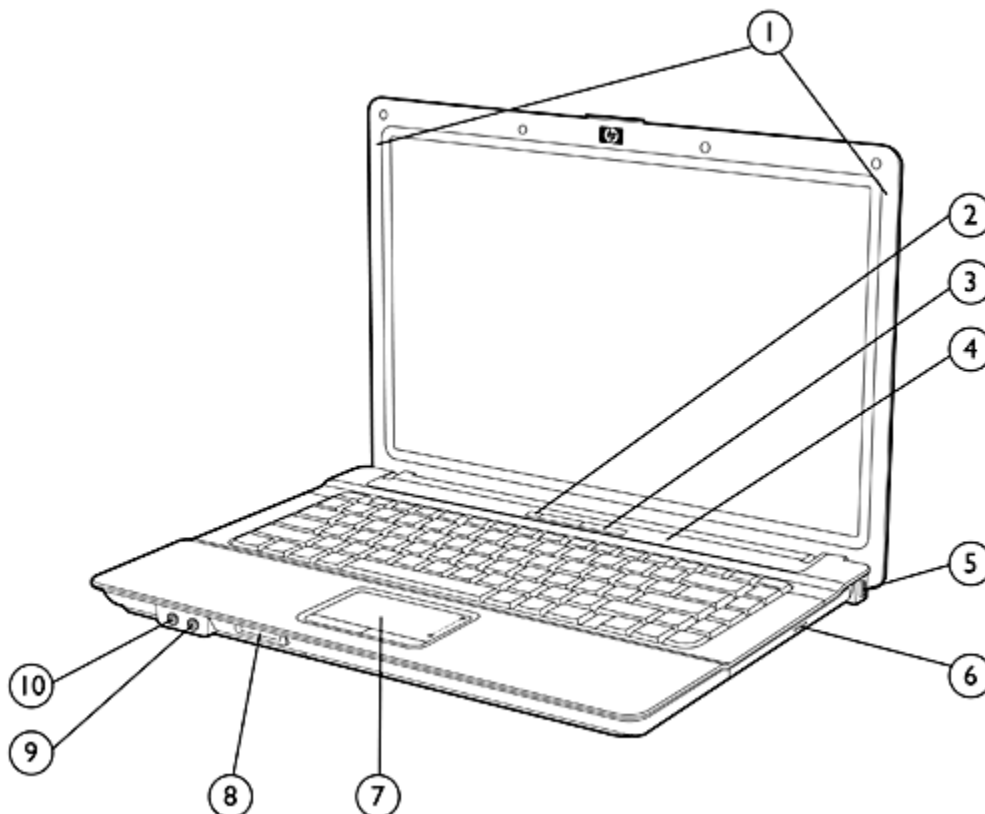
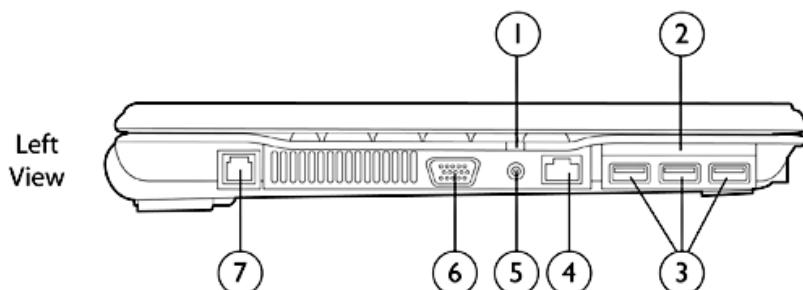


Overview

HP recommends Windows Vista® Business



- | | |
|-------------------------------------|------------------------------|
| 1. Dual-band Wireless LAN Antennas* | 6. Optical Drive |
| 2. Wireless On/Off Button with LED* | 7. Touchpad with Scroll Zone |
| 3. Power Button with LED | 8. Secure Digital (SD) slot |
| 4. Speaker | 9. Microphone Jack |
| 5. Kensington Lock Slot | 10. Headphone Jack |



- | | |
|-------------------------|-----------------------------------|
| 1. Battery Charging LED | 5. Power Connector |
| 2. ExpressCard/54 slot | 6. VGA/external monitor connector |
| 3. Three USB 2.0 ports | 7. RJ-11/modem port |
| 4. RJ-45/Ethernet port | |

Overview

At A Glance

- Genuine Windows Vista Business 32, Genuine Windows Vista Home Basic 32, FreeDOS, or Red Flag Linux (PRC only)
- Thin, lightweight design starting at 5.5 lb/2.49 kg and 1.27-inch/32.3 mm thin at front
- Widescreen 15.4-inch diagonal display with optional BrightView
- Flexible wireless connectivity options:
 - Integrated 802.11 a/b/g/draft-n, a/b/g, or b/g wireless LAN module
 - Bluetooth®
- Intel® Core™2 Duo processor or Intel Celeron® processor
- Device Access Manager for HP ProtectTools
- Integrated optical drive
- Up to 160-GB 5400 rpm user-removable hard drive with HP DriveGuard protection
- Secure Digital (SD) slot
- Up to 4 GB of 533-MHz or 667-MHz DDR2 SDRAM, dual channel memory support
- Mobile Intel Graphics Media Accelerator X3100, with up to 384-MB shared system memory
- Intel 10/100 Ethernet Controller
- Touchpad with scroll zone

Standard Features

Processors	Intel Core 2 Duo Processor T7700 (2.40-GHz, 800-MHz FSB, 4-MB L2 cache)* Intel Core 2 Duo Processor T7500 (2.20-GHz, 800-MHz FSB, 4-MB L2 cache)* Intel Core 2 Duo Processor T7300 (2.00-GHz, 800-MHz FSB, 4-MB L2 cache)* Intel Core 2 Duo Processor T7100 (1.80-GHz, 800-MHz FSB, 2-MB L2 cache)* Intel Core 2 Duo Processor T5550 (1.83-GHz, 800-MHz FSB, 2-MB L2 cache)* Intel Core 2 Duo Processor T5470 (1.60-GHz, 800-MHz FSB, 2-MB L2 cache)* (select models) Intel Core 2 Duo Processor T5450 (1.66-GHz, 667-MHz FSB, 2-MB L2 cache)* (select models) Intel Celeron Processor 540 (1.86-GHz, 533-MHz FSB, 1-MB L2 cache)* * 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.	
Operating System	Preinstalled	Genuine Windows Vista Business 32* Genuine Windows Vista Home Basic 32* FreeDOS RedFlag Linux (PRC only) * 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 .
Chipset	Mobile Intel GM965 or GL960	
Graphics	Mobile Intel Graphics Media Accelerator X3100, up to 384-MB shared system memory Microsoft DirectX 9 capable	
Display	Internal	15.4-inch diagonal WXGA anti-glare (1280 x 800 resolution) 15.4-inch diagonal WXGA BrightView (1280 x 800 resolution)
	External	Up to 32-bit per pixel color depth VGA port supports resolutions up to 2048 x 1536 at 75 Hz, and lower resolutions at up to 100 Hz NOTE: Resolutions are dependent upon monitor capability, and resolution and color depth settings.
Memory	Standard	512-MB, 1024-MB, 2048-MB, or 4096-MB* 533-MHz or 667-MHz DDR2 SDRAM total memory; two SODIMM slots supporting dual channel memory
	Dual-channel	Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots. *with Mobile Intel GM965 chipset only 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.

Standard Features

Communications	Intel Fast Ethernet Integrated Controller (10/100 NIC) 56K V.92 modem* <i>* 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.</i>
Wireless Devices	Support for a broad range of secure, integrated wireless LAN options featuring support for the latest industry standards. Integrated Bluetooth is also available (factory configurable only) and can be combined with any of the supported wireless LAN options. All 802.11a/b/g integrated wireless LAN options Wi-Fi certified Cisco Compatible Extensions support (Version 4.0) with Microsoft Windows XP 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 Advanced Encryption Standard (AES) support WiFi certified for WPA2, WMM Dual antennas integrated in the display enclosure Intel Wireless WiFi Link 4965AGN* Integrated support for 802.11a, b, g, and draft-n Up to 243-mbps data rate Intel Wireless WiFi Link 4965AG* Integrated support for 802.11 a, b and g Up to 54-mbps data rate Intel PRO/Wireless 3945ABG Network Connection* Integrated support for 802.11 a, b and g Up to 54-mbps data rate Intel PRO/Wireless 3945BG Network Connection* Integrated support for 802.11 b and g Up to 54-mbps data rate Broadcom 4311AG 802.11a/b/g WiFi Adapter Integrated support for 802.11 a, b and g Up to 54-mbps data rate Broadcom 4311BG 802.11b/g WiFi Adapter Integrated support for 802.11 b and g Up to 54-mbps data rate HP Integrated Module with Bluetooth Wireless Technology Bluetooth Specification v2.0 compliant Works with a wide range of Bluetooth devices <i>* Requires Intel Core 2 Duo processor</i>
Keyboard	The 101/102-key compatible keyboard features an industry standard, 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, and 12 function keys. US and International key layouts are available. Other features include an integrated numeric keypad, hotkeys for instant access to power conservation, brightness, and other features, 19-mm x 19-mm key pitch (center-to-center spacing), 2.5-mm stroke, and comfort-dished keycaps.
Pointing device	Touchpad with scroll zone, two pick buttons

Standard Features

Expansion card slots	ExpressCard/54 slot	Supports ExpressCard/54 and ExpressCard/34
	Secure Digital slot	Supports SD (Secure Digital), MMC (MultiMedia Card)
Storage	Hard drives	80/120/160-GB 5400 rpm SMART SATA
	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 DriveGuard	The hard drive is mounted directly to the notebook frame, reducing the transmission of shock to the hard drive.
	Fixed optical drives	DVD/CD-RW Combo Drive DVD+/-RW SuperMulti DL Drive DVD+/-RW SuperMulti DL LightScribe Drive
Interfaces	ExpressCard/54	Supports ExpressCard/54 and ExpressCard/34
	External monitor	One – VGA
	Stereo microphone in	One
	Stereo headphone/line out	One
	Power connector	One
	RJ-11/modem	One
	RJ-45/Ethernet	One
	USB 2.0	Three
	LED status indicators	Six
Audio	High Definition Audio support	
	Integrated mono speaker	
	Stereo headphone/line out	
	Stereo microphone in	
Software	Preinstalled software with Windows Vista	PDF Complete HP Backup and Recovery Manager HP Help and Support Center HP Universal Print Driver HP ProtectTools Security Manager: Device Access Manager for HP ProtectTools HP Wireless Assistant Microsoft Office Ready with 60-day Office Professional 2007 Trial Edition (select models) Roxio Creator 9 (for optional DVD+/-RW and DVD/CDRW drives) Synaptics Touchpad Driver Symantec Norton Internet Security with complimentary 60-day live update Intervideo WinDVD – DVD Player
	Additional software available from the web	HP Client Manager Java Card Security for HP ProtectTools

Standard Features

HP Backup and Recovery Manager	Each unit is shipped with HP Backup and Recovery Manager. HP Backup and Recovery Manager can provide data and system file protection for HP business PCs to enable fast recovery if the system becomes corrupted or if important information is accidentally deleted. HP Backup and Recovery Manager can perform scheduled or manual backups of the entire drive or individual files and folders. Up to 10 GB of the hard drive is reserved for the system recovery software. HP Backup and Recovery Manager can also create software recovery CDs or DVDs (requires optional hardware).	
SMBIOS Version 2.4	System Management BIOS, previously known as DMI BIOS, is used to store system management information.	
Security	Standard Features	Device Access Manager for HP ProtectTools Configuration Control Hardware Memory Change Alert Ownership Tag Setup Password Power-On Password HP DriveGuard Kensington Lock Slot Support for Computrace / LoJack for Laptops (must be purchased separately) For more information on HP security solutions refer to http://www.hp.com/go/security .
Power Supply	External 65-watt AC adapter, 6-foot (1.8-meter) power cord included. Total length including external AC adapter is 12 feet (3.66 meter).	
Battery	Primary battery	6-cell (47 WHr) Lithium-Ion battery
Battery Life	Primary battery	TBD NOTE: The listed battery life measurements were taken on models running Microsoft Windows Vista. Battery life will vary depending on the product configuration, product model, applications loaded on the product, power management settings of the product, and the product features used by the customer. As with all batteries, the maximum capacity of this battery will decrease with time and usage.
System Standby Time	Up to 1 week	
Power Conservation	Supports enhanced Intel SpeedStep technology with Intel Core 2 Duo processors (allows Battery Optimized Mode, Maximum Performance Mode, or Automatic mode) Intel Display Power Saving technology Hibernation Standby ACPI compliance	
Service and Support	HP Services offers limited 1-year warranty. On-site service and warranty upgrades are also available. For HP Care Pack services see http://www.hp.com/go/lookuptool . NOTE: Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details. http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp .	

Options

Memory	HP 512-MB (DDR2 667 MHz) SODIMM	EM993AA
	HP 1-GB (DDR2 667 MHz) SODIMM	EM994AA
	HP 2-GB (DDR2 667 MHz) SODIMM	EM995AA
<hr/>		
Other Storage	HP Notebooks USB Diskette Drive	DC361B
<hr/>		
Power	HP 65W Smart AC Adapter	ED494AA#xxx
	HP 65W AC/Auto/Air Combo Smart Adapter	ED993AA#xxx
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Carrying Cases	HP Value Nylon Case	RR314AA
	HP Universal Nylon Case	RR315AA
	HP Executive Leather Case	RR316AA
	HP Deluxe Nylon Backpack	RR317AA
	HP Deluxe Roller Case	GD405AA
<hr/>		
Security	HP/Kensington MicroSaver Security Lock	PC766A
<hr/>		
Input/Output Devices	HP PS/2 Keyboard & Mouse Bundle	RC464AA#xxx
	HP USB Optical Travel Mouse	RH304AA

Memory

Up to 4096 MB* of 533-MHz or 667-MHz DDR2 SDRAM
Two DIMM slots
DIMM sizes supported: 512 MB, 1024 MB, and 2048 MB

- Standard Memory
- 512 MB (512 MB x 1)
 - 1024 MB (1024 MB x 1 or 512 MB x 2)
 - 2048 MB (2048 MB x 1 or 1024 MB x 2)

Optional Memory Upgrades

Both memory slots are user accessible. Please refer to the Hardware and Software Guide for installation procedures. Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

Up to	Slot 1	Slot 2
1024 MB	1024 MB	Empty
1024 MB	512 MB	512 MB
1536 MB	1024 MB	512 MB
2048 MB	1024 MB	1024 MB
4096 MB*	2048 MB	2048 MB

NOTE: This chart does not represent all possible memory configurations. Due to the non-industry standard nature of some third-party memory modules, we strongly recommend using only HP branded memory modules to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

*with Mobile Intel GM965 chipset only

Memory Upgrades	HP 512-MB (DDR2 667 MHz) SODIMM	EM993AA
	HP 1024-MB (DDR2 667 MHz) SODIMM	EM994AA
	HP 2048-MB (DDR2 667 MHz) SODIMM	EM995AA

Storage

Removable Media Drive Support

	Quantity Supported	Drive Bay
DVD/CD-RW Combo Drive	One	Fixed optical drive bay
DVD+/-RW SuperMulti DL Drive	One	Fixed optical drive bay
DVD+/-RW SuperMulti DL LightScribe Drive	One	Fixed optical drive bay

Hard Drive Support

	Quantity Supported	Drive Bay
Primary Hard Drives		
160-GB 5400 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
120-GB 5400 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
80-GB 5400 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay

Technical Specifications

System Unit	Dimensions (HxWxD)	1.27 in (at front) x 14.1 in x 10.5 in 32.3 mm (at front) x 358 mm x 266.8 mm)
	Weight	Starting at 5.5 lb (2.49 kg)
	NOTE: Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components. Weight includes 6-cell battery, 80-GB hard drive, and optical drive. Weight varies by configuration and components.	
Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	18.5 V
	Average Operating Power	12.5 W
	Max Operating Power	< 65 W
Temperature	Operating	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)
	Non-operating	–4° to 140° F (–20° to 60° C)
Relative Humidity	Operating	10% to 90%, non-condensing
	Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
Shock	Operating	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)
Industry Standard Certifications	UL	Yes
	CSA	Yes
	FCC Compliance	Yes
	ENERGY STAR® 4.0	Yes
	ICES	Yes
	GS*	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes
	Japan VCCI Compliance	Yes
	MIC	Yes
	BSMI	Yes
	CE Marking Compliance	Yes
	BNCI or BELUS	Yes
	CIT	Yes
	GOST	Yes
	Saudi Arabian Compliance (ICCP)	Yes
	SABS	Yes
	UKRSERTCOMPUTER	Yes

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

* This device is not intended for use at visual display workplace in compliance with BildscharbV. If this product is used in an Office Environment where the VDU Directive 90/270/EEC is applicable (Bildschirmarbeitsverordnung), an external monitor and external keyboard are recommended to avoid potential reflections.



Technical Specifications

HP 65W AC Adapter	Dimensions	4.17 x 1.85 x 1.1 in (10.6 x 4.7 x 2.8 cm)	
	Weight	0.62 lb (280 g)	
	Input	100 to 240 VAC	
		Input Efficiency	83% min at 115 VAC
	Output	Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC, 0.85 A at 180 VAC
		Output power 65W	65W
		DC output	18.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	Connector	3 pin/grounded, mates with interchangeable cords	
	Environmental Design	Operating temperature	32° to 104° F (0° to 40° C)
		Non-operating (storage) temperature	−4° to 149° F (−20° to 65° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
		Humidity	20% to 80%
		Storage Humidity	10% to 90%
	EMI and Safety Certifications	CE Mark – full compliance with LVD and EMC directives; Worldwide safety standards – IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals – C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; MTBF – over 200,000 hours at 25°C ambient condition.	

6-Cell (47WHr) Lithium-Ion battery	Dimensions (H x W x L)	0.8 x 2.1 x 8.0 in (2.0 x 5.3 x 20.3 cm)	
	Weight	0.715 lb (0.325 kg)	
	Cells/Type	6-cell Lithium-Ion	
	Energy	Watt-hour Capacity	47Wh
	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)

Technical Specifications

15.4-inch WXGA anti-glare	Active Area (W x H)	13.0 x 8.1 in (33.1 x 20.7 cm)	
	Diagonal Size	15.4 in (39.1 cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	300:1 (typical)	
	Refresh Rate	60 Hz	
	Brightness	200 nit (typical)	
	Pixel Resolution	Pitch	0.259 mm
		Format	1280x800
		Configuration	RGB Stripe
	Backlight	CCFL	
PPI		98	
Viewing Angle		±30° Horizontal, ±10° Vertical (minimum)	

15.4-inch WXGA BrightView	Active Area (W x H)	13.0 x 8.1 in (33.1 x 20.7 cm)	
	Diagonal Size	15.4 in (39.1 cm)	
	Surface Treatment	BrightView	
	Contrast Ratio	300:1 (typical)	
	Refresh Rate	60 Hz	
	Brightness	200 nit (typical)	
	Pixel Resolution	Pitch	0.259 mm
		Format	1280x800
		Configuration	RGB Stripe
	Backlight	CCFL	
PPI		98	
Viewing Angle		±30° Horizontal, ±10° Vertical (minimum)	

Hard Drives

160-GB 5400 rpm SATA	Drive Weight	0.22 lb (101 g)	
	Capacity	160 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	312,581,808	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

Technical Specifications

120-GB 5400 rpm SATA	Drive Weight	0.22 lb (101 g)	
	Capacity	120 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	234,441,648	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

80-GB 5400 rpm SATA	Drive Weight	0.22 lb (101 g)	
	Capacity	80 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	156,301,488	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

Removable Storage Drives

Technical Specifications

DVD/CD-RW Combo Drive	Access Times	Random	<110 ms CD <130 ms DVD
	Max Data Transfer Rate	24X CD-ROM	3,600 KB/s
		8X DVD	10,800 KB/s
		24X CD-R	3,600 KB/s
		24X CD-RW	3,600 KB/s
	Transfer Mode	Multiword DMA Mode 2	
	Interface	EIDE	
	Supported Media (read)	CD-DA, CD+(E)G, CD-MIDI, 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	
	Supported Media (write)	CD-R, CD-RW	
	Max Media Capacity (read)	8.5 GB	
DVD+/-RW SuperMulti DL Drive	Max Media Capacity (write)	700 MB	
	Transport	Tray loading	
	Access Times	Random	<175 ms CD <230 ms DVD
	Max Data Transfer Rate	24X CD-ROM	3,600 KB/s
		8X DVD	10,800 KB/s
		24X CD-R	3,600 KB/s
		16X CD-RW	2,400 KB/s
		8X DVD+R	10,800 KB/s
		4X DVD+RW	5,400 KB/s
		8X DVD-R	10,800 KB/s
		4X DVD-RW	5,400 KB/s
		2.4X DVD+R(9)	2,700 KB/s
		5X DVD-RAM	6,750 KB/s
	Transfer Mode	Multiword DMA Mode	
	Interface	EIDE	
	Supported Media (read)	CD-DA, CD+(E)G, CD-MIDI, 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	
	Max Media Capacity (read)	8.5 GB	
	Max Media Capacity (write)	8.5 GB	
	Transport	Tray Loading	

Technical Specifications

DVD+/-RW SuperMulti DL LightScribe Drive	Access Times	Random	<175 ms CD <230 ms DVD
	Max Data Transfer Rate	24X CD-ROM	3,600 KB/s
		8X DVD	10,800 KB/s
		24X CD-R	3,600 KB/s
		16X CD-RW	2,400 KB/s
		8X DVD+R	10,800 KB/s
		4X DVD+RW	5,400 KB/s
		8X DVD-R	10,800 KB/s
		4X DVD-RW	5,400 KB/s
		2.4X DVD+R(9)	2,700 KB/s
		5X DVD-RAM	6,750 KB/s
Transfer Mode	Multiword DMA Mode		
Interface	EIDE		
Supported Media (read)	CD-DA, CD+(E)G, CD-MIDI, 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, LightScribe		
Max Media Capacity (read)	8.5 GB		
Max Media Capacity (write)	8.5 GB		
Transport	Tray Loading		

Audio

Hardware	Implementation	ADI1981HD High Definition CODEC
	Full Duplex	Yes
	Sound Blaster Pro compatible	Yes
	Microphone In	Stereo
	Headphone/Line Out	Stereo

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

Technical Specifications

Integrated Mono Speaker	Power Rating	2 Watts
	Impedance	4 Ohms

Communications

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
	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 V.251

Intel PRO/Wireless 3945ABG Network Connection	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g
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Technical Specifications

Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 2000 and XP (details at http://www.hp.com/go/notebooks/WLAN)							
Frequency Band	2.4 GHz							
Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps							
Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM							
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, EAP-SIM. Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4).							
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 CKK) ²	15 dBm							
Output Power (for OFDM; power varies by data rate) ²	15 dBm							
Power Consumption	Transmit: 1.8 Watts (max) Receive: 1.4 Watts (max) Idle mode ³ : 150 mW (nominal) Sleep mode: 30 mW (max)							
Power Management	ACPI compliant power management 802.11 compliant power saving mode							
Receiver Sensitivity⁴	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm							
Antenna Connections	2 U.FL type connectors, 50 ohm nominal impedance							
Range	<table><tr><td>802.11 a – Typical (@6 Mbps)</td><td>600 feet – Outdoor Open Area 150 feet – Indoor, Office environment</td></tr><tr><td>802.11 b – Typical (@1 Mbps)</td><td>1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment</td></tr><tr><td>802.11 g – Typical (@1 Mbps)</td><td>1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment</td></tr></table>		802.11 a – Typical (@6 Mbps)	600 feet – Outdoor Open Area 150 feet – Indoor, Office environment	802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
802.11 a – Typical (@6 Mbps)	600 feet – Outdoor Open Area 150 feet – Indoor, Office environment							
802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment							
802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment							
Form Factor	PCI-Express MiniCard							
Weight	0.013 lb (6 g)							
Dimensions	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)							
Operating Voltage	3.3V +/- 9%, 1.5V +/- 5%							
Temperature	<table><tr><td>Operating</td><td>32° to 176° F (0° to 80° C)</td></tr><tr><td>Non-operating</td><td>–40° to 176° F (–40° to 80° C)</td></tr></table>		Operating	32° to 176° F (0° to 80° C)	Non-operating	–40° to 176° F (–40° to 80° C)		
Operating	32° to 176° F (0° to 80° C)							
Non-operating	–40° to 176° F (–40° to 80° C)							
Humidity	<table><tr><td>Operating</td><td>10% to 90% (non-condensing)</td></tr><tr><td>Non-operating</td><td>5% to 95% (non-condensing)</td></tr></table>		Operating	10% to 90% (non-condensing)	Non-operating	5% to 95% (non-condensing)		
Operating	10% to 90% (non-condensing)							
Non-operating	5% to 95% (non-condensing)							
Altitude	<table><tr><td>Operating</td><td>0 to 10,000 ft (3,048 m)</td></tr><tr><td>Non-operating</td><td>0 to 50,000 ft (15,240 m)</td></tr></table>		Operating	0 to 10,000 ft (3,048 m)	Non-operating	0 to 50,000 ft (15,240 m)		
Operating	0 to 10,000 ft (3,048 m)							
Non-operating	0 to 50,000 ft (15,240 m)							

Technical Specifications

Configuration Utility ⁵	Microsoft Windows 2000 or XP Choice of Configuration Utility:
	<ul style="list-style-type: none">• Microsoft Windows XP Wireless Network Connection Manager• Intel PROSet for Microsoft Windows 2000 or XP (required for Cisco Compatible Extensions support)
	Microsoft Windows Vista <ul style="list-style-type: none">• Microsoft Windows Vista Wireless Network Connection Manager
LED Activity	LED Off – Radio OFF; Solid LED On – Radio ON
	<ol style="list-style-type: none">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.4. 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).5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows 2000 or XP. WLAN may also be compatible with certain third-party software supplicants.

Intel PRO/Wireless 3945BG Network Connection	Wireless LAN Standards	IEEE 802.11b IEEE 802.11g
	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 2000 and XP (details at http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.4 GHz
	Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	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, EAP-SIM. Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4).
	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 CKK) ²	15 dBm
	Output Power (for OFDM; power varies by data rate) ²	15 dBm
	Power Consumption	Transmit: 1.8 Watts (max) Receive: 1.4 Watts (max) Idle mode ³ : 150 mW (nominal) Sleep mode: 30 mW (max)

Technical Specifications

Power Management	ACPI compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity⁴	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm	
Antenna Connections	2 U.FL type connectors, 50 ohm nominal impedance	
Range	802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
Form Factor	PCI-Express MiniCard	
Weight	0.013 lb (6 g)	
Dimensions	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
Operating Voltage	3.3V +/- 9%, 1.5V +/- 5%	
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 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
Configuration Utility⁵	Microsoft Windows 2000 or XP Choice of Configuration Utility: <ul style="list-style-type: none">• Microsoft Windows XP Wireless Network Connection Manager• Intel PROSet for Microsoft Windows 2000 or XP (required for Cisco Compatible Extensions support) Microsoft Windows Vista <ul style="list-style-type: none">• Microsoft Windows Vista Wireless Network Connection Manager	
LED Activity	LED Off – Radio OFF; Solid LED On – Radio ON	
<ol style="list-style-type: none">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.4. 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).5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows 2000 or XP. WLAN may also be compatible with certain third-party software supplicants.		

Intel Wireless WiFi Link4965AGN	Wireless LAN Standards	IEEE 802.11a
		IEEE 802.11b
		IEEE 802.11g
		IEEE 802.11n (draft 1.02)
Interoperability	Wi-Fi certified (802.11abg only)	
	Cisco Compatible Extensions Program compliant (802.11abg only) with Microsoft Windows 2000 and XP (details at http://www.hp.com/go/notebooks/WLAN) Tested with wireless access points from several major manufacturers (details at http://www.hp.com/go/notebooks/WLAN/draft-n)	
Frequency Band	2.4 GHz and 5 GHz	

Technical Specifications

Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n (draft): 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 (draft) 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 (support for key sizes of 128, 192, and 256 bits), 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 2000 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 CKK) ²	15 dBm	
Output Power (for OFDM; power varies by data rate) ²	15 dBm	
Power Consumption	Transmit: 2.3 Watts (average, with two spatial streams) Receive: 1.9 Watts (average with three receive chains) Idle mode ³ : 30 mW (average) Radio off: 20 mW (max)	
Power Management	ACPI compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity ⁴	300 Mbps: -68 dBm, 54 Mbps: -74 dBm, 6 Mbps: -90 dBm	
Antenna Connections	3 U.FL type connectors, 50 ohm nominal impedance	
Range	802.11 a – Typical 600 feet – Outdoor Open Area 	

Technical Specifications

Configuration Utility ⁵	Microsoft Windows 2000 or XP Choice of Configuration Utility:
	<ul style="list-style-type: none">• Microsoft Windows XP Wireless Network Connection Manager• Intel PROSet for Microsoft Windows 2000 or XP (required for Cisco Compatible Extensions support)
	Microsoft Windows Vista
LED Activity	<ul style="list-style-type: none">• Microsoft Windows Vista Wireless Network Connection Manager
	LED Off – Radio OFF; Solid LED On – Radio ON
<ol style="list-style-type: none">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 (CKK 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 2000 or XP. WLAN may also be compatible with certain third-party software supplicants.	

Intel Wireless WiFi Link4965AG	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g
	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 2000 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
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	Security ¹	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES (support for key sizes of 128, 192, and 256 bits), 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 2000 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 CKK) ²	15 dBm
	Output Power (for OFDM; power varies by data rate) ²	15 dBm

Power Consumption	Transmit: 1.6 Watts (average) Receive: 1.1 Watts (average) Idle mode ³ : 30 mW (average) Radio off: 20 mW (max)	
Power Management	ACPI compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity⁴	54 Mbps: -74 dBm, 6 Mbps: -90 dBm	
Antenna Connections	2 U.FL type connectors, 50 ohm nominal impedance	
Range	802.11 a – Typical (@6 Mbps)	600 feet – Outdoor Open Area 150 feet – Indoor, Office environment
	802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
Form Factor	PCI-Express MiniCard	
Weight	0.013 lb (6 g)	
Dimensions	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
Operating Voltage	3.3V +/- 9%, 1.5V +/- 5%	
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)
Configuration Utility⁵	Microsoft Windows 2000 or XP Choice of Configuration Utility: <ul style="list-style-type: none">• Microsoft Windows XP Wireless Network Connection Manager• Intel PROSet for Microsoft Windows 2000 or XP (required for Cisco Compatible Extensions support) Microsoft Windows Vista <ul style="list-style-type: none">• Microsoft Windows Vista Wireless Network Connection Manager	
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 \(CKK modulation\) 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 2000 or XP. WLAN may also be compatible with certain third-party software supplicants.](#)

Broadcom 4311AG 802.11a/b/g WiFi Adapter	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g
	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 2000 and XP (details at http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.4 GHz and 5 GHz

Technical Specifications

Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps							
Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM							
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 4).							
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) ²	17.5 dBm							
Output Power (for OFDM; power varies by data rate) ²	15 dBm							
Power Consumption	Transmit: 2.0 W (max) Receive: 1.5 W (max) Idle mode ³ : 390 mW (nominal) Sleep mode: 20 mW (max)							
Power Management	ACPI compliant power management 802.11 compliant power saving mode							
Receiver Sensitivity⁴	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm							
Antenna type	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure							
Range	<table><tr><td>802.11 a – Typical (@6 Mbps)</td><td>600 feet – Outdoor Open Area 150 feet – Indoor, Office environment</td></tr><tr><td>802.11 b – Typical (@1 Mbps)</td><td>1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment</td></tr><tr><td>802.11 g – Typical (@1 Mbps)</td><td>1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment</td></tr></table>		802.11 a – Typical (@6 Mbps)	600 feet – Outdoor Open Area 150 feet – Indoor, Office environment	802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
802.11 a – Typical (@6 Mbps)	600 feet – Outdoor Open Area 150 feet – Indoor, Office environment							
802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment							
802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment							
Form Factor	PCI-Express MiniCard							
Weight	0.026 lb (12 g)							
Dimensions	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)							
Operating Voltage	3.3v +/- 10%							
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 95% (non-condensing)							
Altitude	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)							

Technical Specifications

Configuration Utility⁵	Microsoft Windows 2000 or 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
LED Activity	LED Off – Radio OFF; Solid LED On – Radio ON <ol style="list-style-type: none">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.4. 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).5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows 2000 or XP. WLAN may also be compatible with certain third-party software supplicants.

Broadcom 4311BG 802.11b/g WiFi Adapter	Wireless LAN Standards	IEEE 802.11b IEEE 802.11g
	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 2000 and XP (details at http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.4 GHz
	Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	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 4).
	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 CKK) ²	17.5 dBm
	Output Power (for OFDM; power varies by data rate) ²	15 dBm
	Power Consumption	Transmit: 2.0 W (max) Receive: 1.5 W (max) Idle mode ³ : 390 mW (nominal) Sleep mode: 20 mW (max)

Technical Specifications

Power Management	ACPI compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity ⁴	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm	
Antenna type	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure	
Range	802.11 b – Typical	1200 feet – Outdoor Open Area
	(@1 Mbps)	300 feet – Indoor, Office environment
	802.11 g – Typical	1200 feet – Outdoor Open Area
	(@1 Mbps)	300 feet – Indoor, Office environment
Form Factor	PCI-Express MiniCard	
Weight	0.026 lb (12 g)	
Dimensions	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
Operating Voltage	3.3v +/- 10%	
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 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
Configuration Utility ⁵	Microsoft Windows 2000 or 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	
LED Activity	LED Off – Radio OFF; Solid LED On – Radio ON <ol style="list-style-type: none">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.4. 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).5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows 2000 or XP. WLAN may also be compatible with certain third-party software supplicants.	

HP Integrated Module with Bluetooth Wireless Technology	Bluetooth Specification	2.0 Compliant
	Dimensions	1.02 x 0.55 x 0.22 in (26 x 14 x 5.7 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	-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



Technical Specifications

	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
OS Support	Genuine Windows Vista
	Genuine Windows XP
	Genuine Windows 2000
Bluetooth Software Supported	Broadcom Bluetooth for Windows
	Microsoft Windows XP 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	(with Bluetooth for Windows 4.0 software) Serial Port Profile (SPP)* Dial-Up Networking (DUN)* Generic Object Exchange Profile (GOEP) Object Push Profile (OPP)* File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP)* Personal Area Networking Profile (PAN)* Human Interface Device Profile (HID)* FAX Profile (FAX) Basic Imaging Profile (BIP) Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

* indicates the profile is also supported by Microsoft Windows XP SP2

Technical Specifications

Environmental Data	Eco-Label Certifications	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:		
		<ul style="list-style-type: none">ENERGY STAR 4.0US Federal Energy Management Program (FEMP)ECO declarationTaiwan Green MarkChina Energy Certification Program (CECP)Korean Eco LabelEPEAT Silver Rating		
	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	18.6 W	18.9 W	18.8 W
	Sleep (Energy Star low power mode)	1 W	1.1 W	0.99 W
	Off	0.9 W	1.01 W	0.9 W
	Heat Dissipation*	115 VAC	230 VAC	100 VAC
	Normal Operation	63.463 BTU/hr	64.486 BTU/hr	64.145 BTU/hr
	Sleep	3.412 BTU/hr	3.753 BTU/hr	3.377 BTU/hr
	Off	3.07 BTU/hr	3.446 BTU/hr	3.07 BTU/hr
		<p>* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.</p> <p>This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.</p>		
	Declared Noise Emissions	Sound Power	Sound Pressure	
	(in accordance with ISO 7779 and ISO 9296)	(LWAd, bels)	(LpAm, decibels)	
	Idle	3.4	27.3	
	Operating mode (HDD)	3.4	27.4	
	Batteries	This product complies with ISO standards:		
		<ul style="list-style-type: none">EU Directive 91/ 157/ EECEU Directive 93/ 86/ EECEU Directive 98/ 101/ EEC		
		Batteries used in the product do not contain:		
		<ul style="list-style-type: none">Mercury greater the 5ppm by weightCadmium greater than 10ppm by weightLead greater than 4000 ppm by weight.		
		The battery type and chemistry used in the product is: CR2032 (coin cell), Lithium 6 cell rechargeable Lithium-Ion battery		
	Additional information:	This product is in compliance with the EU 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.		
		Keyboard complies with ISO standard: ISO 9995, EN 29241-4, and		

Technical Specifications

ISO/IEC 15412

Input devices of this product comply with ISO 9241, part 9.

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

This product contains 0% recycled materials (by wt.)

This product is greater than 96% recyclable when properly disposed of at end of life.

Packaging Materials

- External:
 - Corrugated / Paper – 2.25 lb (1019 g)
- Internal:
 - EPE Foam – 0.15 lb (70 g)
 - LDPE Bag – 0.043 lb (19.44 g)
- The corrugated paper packaging materials contains at least 40% 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
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)

Technical Specifications

- 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)

End-of-life Management and Recycling

HP offers our customers several other options for handling their aging computers while also minimizing the impact on the environment—including product trade-in and leasing services—in addition to recycling services.

Please go to: <http://www.hp.com/recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

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>

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