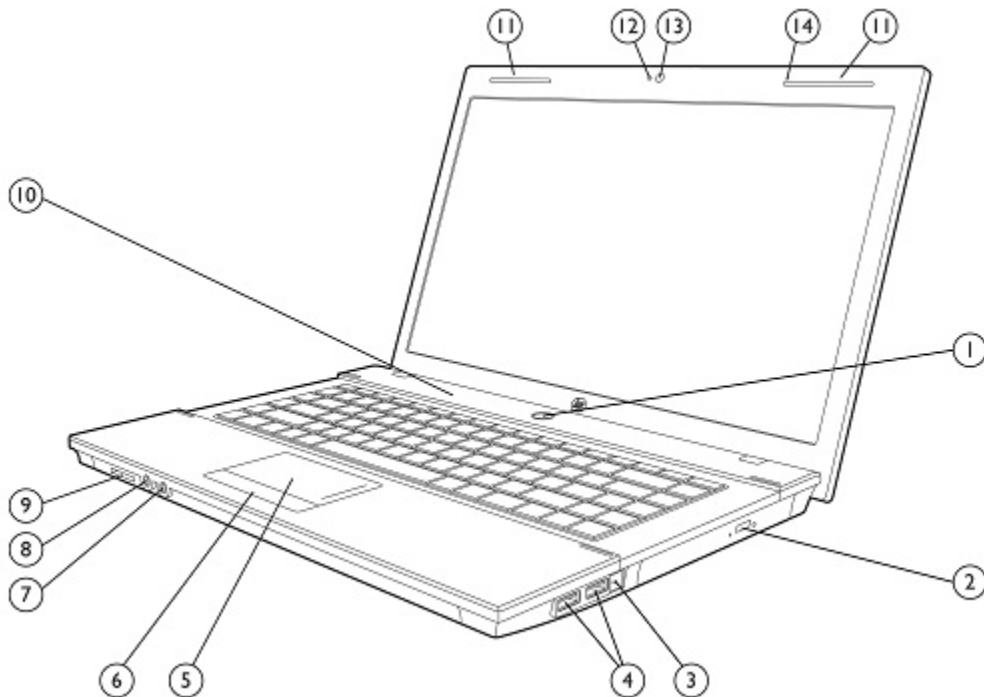
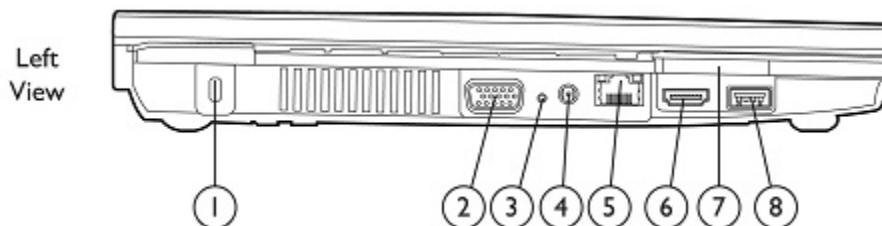


### Overview



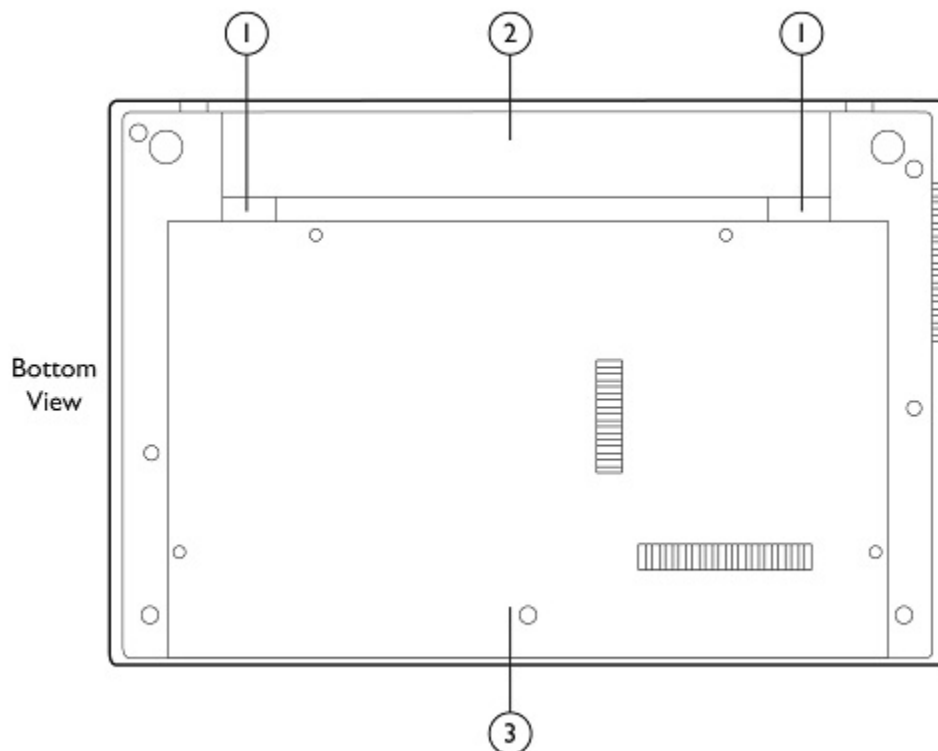
1. Power button with LED indicator
2. Optical drive\*
3. Optional RJ-11/modem port
4. Two USB 2.0 ports
5. Touchpad with scroll zone
6. Touchpad button
7. Stereo microphone in
8. Stereo headphone/line out
9. Secure Digital (SD) slot
10. Speaker
11. Dual-band wireless LAN antennas
12. Webcam LED (works with optional webcam)
13. Optional 2 MP webcam
14. Integrated microphone

\* [Select models only](#)



1. Kensington lock slot
2. VGA/external monitor connector
3. Battery charging LED indicator
4. Power connector
5. RJ-45/Ethernet port
6. HDMI port
7. ExpressCard/34 slot
8. USB 2.0 port

### Overview



1. Battery release latches
2. Battery bay
3. Memory/WLAN/Hard drive compartment

### At A Glance

- Genuine Windows 7 versions, Genuine Windows Vista versions, Genuine Windows XP Professional available through downgrade rights from Windows 7 Professional, SUSE Linux, Red Flag Linux (PRC only), or FreeDOS\*
- Durable, stylish design with microfiber pattern in stone color
- Full-sized spill-resistant keyboard
- New keyboard function keys on HP 620 for play, rewind, and fast-forward of video and audio files
- HDMI port for connecting to high-resolution displays
- Optional integrated 2 MP webcam, integrated microphone
- Integrated 802.11 b/g/n or b/g wireless LAN module\*\*
- Bluetooth® 2.1\*\*
- Choice of 9-cell or 6-cell battery to customize weight and run-time to your needs
- Widescreen 15.6-inch or 14.0-inch diagonal LED-backlit HD display with 16:9 aspect ratio, BrightView optional
- Intel® Core™2 Duo processor, Intel Pentium® processor, or Intel Celeron® processor

\* Operating system options vary by country.

\*\* Select models only

### Standard Features (availability may vary by country)

#### Processors

Intel Core 2 Duo Processor T6570 (2.1 GHz, 2 MB L2 cache, 800 MHz FSB)\* †  
Intel Pentium Processor T4500 (2.3 GHz, 1 MB L2 cache, 800 MHz FSB)\*  
Intel Pentium Processor T4400 (2.2 GHz, 1 MB L2 cache, 800 MHz FSB)\*  
Intel Pentium Processor T4300 (2.1 GHz, 1 MB L2 cache, 800 MHz FSB)\*  
Intel Pentium Processor T4200 (2.0 GHz, 1 MB L2 cache, 800 MHz FSB)\*  
Intel Celeron Processor 900 (2.20 GHz, 1 MB L2 cache, 800 MHz FSB)\* ††  
Intel Celeron Processor T1600 (1.66 GHz, 1 MB L2 cache, 667 MHz FSB)\* ††

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

† Requires Mobile Intel GM45 or PM 45 Express Chipset.

†† Requires Mobile Intel GL40 or PM45 Express Chipset.

**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 XP Professional available through downgrade rights from Windows 7 Professional\*†  
Genuine Windows 7 Home Premium 32\*  
Genuine Windows 7 Home Basic 32\*  
Genuine Windows 7 Starter 32\*  
Genuine Windows Vista Home Basic 32\*\*  
SUSE Linux Enterprise Desktop 11  
Red Flag Linux (PRC only)  
FreeDOS

##### Supported

Genuine Windows 7 Home Premium 64\*  
Genuine Windows 7 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>.

† Windows XP Professional is preinstalled on this system and includes end user rights and media for Windows 7 Professional. You may only use one version at a time. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

#### Chipset

Models with integrated graphics:

Mobile Intel GL40 Express Chipset with ICH9M, 667 MHz front side bus  
or Mobile Intel GM45 Express Chipset with ICH9M, 1066 MHz front side bus

Models with discrete graphics:

Mobile Intel PM45 Express Chipset with ICH9M, 1066 MHz front side bus

### Standard Features (availability may vary by country)

#### Graphics

Models with Mobile Intel GL40 Express Chipset and Mobile Intel GM45 Express Chipset:  
Mobile Intel Graphics Media Accelerator 4500MHD

Models with Mobile Intel PM45 Express Chipset:  
ATI Mobility Radeon HD 4350 discrete graphics with 512 MB dedicated video memory and HyperMemory support

Microsoft DirectX 10.1 (discrete), 10 (integrated) capable

#### Display

##### Internal

HP 420:  
14.0-inch diagonal LED-backlit HD 16:9 widescreen antiglare (1366 x 768)  
14.0-inch diagonal LED-backlit HD 16:9 widescreen BrightView (1366 x 768)

HP 620:  
15.6-inch diagonal LED-backlit HD 16:9 widescreen anti-glare (1366 x 768 resolution)  
15.6-inch diagonal LED-backlit HD 16:9 widescreen BrightView (1366 x 768 resolution)

##### External

Up to 32-bit per pixel color depth  
**VGA port** supports resolutions up to 1600 x 1200 at 75 Hz, and lower resolutions at up to 100 Hz  
**HDMI 1.3** port supports direct connection to high-definition displays with up to 1920 x 1080 resolution and 7-channel audio with one convenient cable (not included).  
**NOTE:** Resolutions are dependent upon monitor capability, and resolution and color depth settings.

#### Memory

##### Standard

DDR3 SDRAM (1066 MHz/1333 MHz)\*  
Two SODIMM slots supporting dual-channel memory  
1024 MB and 2048 MB SODIMMs  
Standard memory up to 4096 MB

##### Maximum

Upgradeable to 8192 MB with optional 4096 MB SODIMMs in slots 1 and 2

##### Dual-channel

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

\* Maximum memory speed supported by the system is 1066 MHz.

**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 Windows Vista Business 64-bit 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

Realtek Ethernet Integrated Controller (10/100 NIC)

Optional 56K V.92 modem\*

\* 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.

### Standard Features (availability may vary by country)

#### 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.

<b>All 802.11 integrated wireless LAN options</b>	<p>Wi-Fi certified*</p> <p>Wired Equivalent Privacy (WEP) support up to 128-bit keys</p> <p>Wi-Fi Protected Access (WPA) and WPA2 support</p> <p>802.1x authentication support, including EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, and LEAP</p> <p>Advanced Encryption Standard (AES) support</p> <p>Dual antennas integrated in the display enclosure</p>
<b>Broadcom 4312G 802.11b/g WiFi Adapter</b>	<p>Integrated support for 802.11 b and g</p> <p>Cisco Compatible Extensions support</p> <p>Up to 54 mbps data rate</p>
<b>Realtek RTL8191SE 802.11b/g/n 1x1 WiFi Adapter</b>	<p>Integrated support for 802.11 b, g, and n</p> <p>Cisco Compatible Extensions support</p> <p>Up to 150 mbps data rate</p>
<b>HP Integrated Module with Bluetooth Wireless Technology</b>	<p>Bluetooth Specification v2.1 compliant</p> <p>Works with a wide range of Bluetooth devices</p>

\* In countries where 802.11n is not allowed, this capability is not enabled.

#### 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. International key layouts are available. Other features include 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, comfort-dished keycaps, and bright key legends for improved visibility in low light conditions.

New keyboard hotkeys for play, rewind, and fast-forward of video and audio files.

#### Pointing device

Touchpad with scroll zone, 1-piece pick button with left and right click functions

#### Expansion card slots

<b>ExpressCard/34 slot</b>	Supports ExpressCard/34 (34 mm x 75 mm x 5 mm)
<b>Secure Digital slot</b>	Supports SD (Secure Digital), and MMC (MultiMedia Card)

#### Storage

<b>Hard drives</b>	160/250/320/500 GB 7200 rpm SMART SATA II
	160/250/320/500 GB 5400 rpm SMART SATA II

**NOTE:** Up to 15 GB is reserved for the system recovery software.

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

<b>Fixed optical drives</b>	DVD ROM Drive
	DVD+/-RW SuperMulti DL LightScribe Drive

### Standard Features (availability may vary by country)

<b>Interfaces</b>	<b>ExpressCard/34 slot</b>	Supports ExpressCard/34
	<b>VGA</b>	One
	<b>HDMI</b>	One
	<b>Stereo microphone in</b>	One
	<b>Stereo headphone/line out</b>	One
	<b>Power connector</b>	One
	<b>RJ-11/modem (optional)</b>	One
	<b>RJ-45/Ethernet</b>	One
	<b>USB 2.0</b>	Three
	<b>LED status indicators</b>	Six

<b>Audio/Visual</b>	High Definition Audio support
	Integrated microphone Integrated mono speaker Stereo headphone/line out Stereo microphone in
	Optional 2 MP webcam <ul style="list-style-type: none"> <li>• Supports videoconferencing and still image capture</li> <li>• Improved quality for video streaming and still image capture (1600x1200 resolution)</li> <li>• Up to 30 frames/sec</li> <li>• Fixed focus lens</li> <li>• 16-bit true color (camera sensor up to UXGA resolution)</li> </ul>

<b>Software</b>	<b>Preinstalled Software with Windows Operating System</b>	HP Recovery Manager (available with Windows 7 or Vista only) HP Support Assistant (available with Windows 7 or Vista only) MS Office Ready 2007 HP Webcam Software (select models) HP Wireless Assistant Corel Home Office productivity suite 60-day trial Roxio Creator Business (select models) InterVideo WinDVD Player (select models) McAfee Total Protection*
		<a href="#">* 60 day trial period for McAfee Total Protection for Small Business software. Internet access required to receive updates. First update included. Subscription required for updates thereafter.</a>

**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 15 GB of the hard drive is reserved for the system recovery software.

### Standard Features (availability may vary by country)

<b>Security</b>	<b>Standard Features</b>	<ul style="list-style-type: none"> <li>HP Spare Key</li> <li>HP Disk Sanitizer</li> <li>Setup Password</li> <li>DriveLock</li> <li>Kensington Lock Slot</li> <li>Support for Computrace / LoJack for Laptops (must be purchased separately)</li> </ul>
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For more information on HP security solutions refer to: <http://www.hp.com/go/security>.

<b>Power Supply</b>	<p>Models with integrated graphics: External 65-watt AC adapter            Models with discrete graphics: External 90-watt AC adapter            6-foot (1.8-meter) power cord included            Total length including External AC adapter is 12 feet (3.66 meter).            Fast Charge*</p> <p>* Fast Charge recharges your battery up to 90% within 90 minutes when the system is off. HP Fast Charge does not apply to the HP 9-cell battery.</p>
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<b>Battery</b>	<ul style="list-style-type: none"> <li>HP 6-cell (47 WHr) Li-Ion battery</li> <li>HP 9-cell (93 WHr) Li-Ion battery</li> </ul>
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Battery Life	Integrated graphics		Discrete graphics
	Intel PM45 Chipset	Intel GM45 Chipset	Intel GL40 Chipset
<b>Primary 9-cell (93 WHr) battery</b>	Up to TBD hours	Up to TBD hours	Up to TBD hours
<b>Primary 6-cell (47 WHr) battery</b>	Up to TBD hours	Up to TBD hours	Up to TBD hours

**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 <http://www.bapco.com/products/mobilemark2007> for additional details.

<b>System Standby Time</b>	Up to TBD week
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<b>Power Conservation</b>	<ul style="list-style-type: none"> <li>Hibernation</li> <li>Standby</li> <li>ACPI compliance</li> </ul>
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<b>Service and Support</b>	<p>HP Services offers limited 1-year warranty options depending on country; 1-year limited warranty on primary battery. 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: <a href="http://www.hp.com/go/lookuptool">http://www.hp.com/go/lookuptool</a>. Additional HP Care Pack Services information by product is available at: <a href="http://www.hp.com/hps/carepack">http://www.hp.com/hps/carepack</a>.</p> <p><b>NOTE:</b> Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details. <a href="http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp">http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp</a></p>
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Options (availability may vary by country)

<b>Memory</b>	HP 1 GB (DDR3 1333 MHz) SODIMM	AT911AA
	HP 2 GB (DDR3 1333 MHz) SODIMM	AT912AA
	HP 4 GB (DDR3 1333 MHz) SODIMM	AT913AA
	* Memory speed is processor dependent.	
<b>Other Storage</b>	HP 250 GB USB Pocket Media Hard Drive	FE477AA
	HP External USB CD/DVD R/RW Drive	FS943AA
<b>Expansion</b>	HP Essential USB 2.0 Port Replicator	AQ731AA#xxx
	HP USB 2.0 Docking Station	FQ834AA#xxx
	HP Basic Adjustable Stand	AL549AA
<b>Modem</b>	HP External USB Modem	GS023AA
<b>Power</b>	65W Smart AC Adapter	ED494AA#xxx
	90W Smart AC Adapter	ED495AA#xxx
	90W Smart Combo Adapter	AJ652AA#xxx
	Primary 6-cell Battery pack	TBD
<b>Carrying Cases</b>	HP Basic Carrying Case	AJ078AA
	HP Basic Backpack	AM863AA
	HP Basic Messenger	AP355AA
	HP Basic Messenger (Bulk 240 pieces)	BC055AA
	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
HP Professional Series Slip Case	AT890AA	
<b>Security</b>	HP Compaq Notebook Combo Lock	AY475AA
	HP Privacy Filter For 13.3 in	AU649AA
	HP Privacy Filter For 14.0 in	AU100AA
	HP Privacy Filter For 15.6 in	AU103AA

*Options (availability may vary by country)*

<b>Input/Output Devices</b>	HP Bluetooth Stereo Headphones	AR084AA
	HP Mobile Audio Speakers	FS944AA
	HP PS/2 Keyboard & Optical Mouse Bundle	RC464AA#xxx
	HP USB Keyboard & Mouse Bundle	RC465AA#xxx
	HP Wireless Optical Mouse	AR085AA
	HP USB-P/S2 Optical Mouse	DC369A
	HP Mobile Productivity Bundle	AQ729AA
	HP Special Edition Optical Mouse	AU094AA#xxx
	HP USB Optical Travel mouse	RH304AA
	HP Promo USB Graphics Adapter	NL571AT
	HP Digital Premium Stereo Headset	KJ270AA
	HP Premium Autofocus Webcam	KQ245AA
	HP Migration Cable for Windows 7	AY493AA
	HP Notebook Multi-Purpose Cleaning Kit	BL528AA#ABA
	HP Notebook Projection Companion	AX325AA
	HP Mobile Productivity Bundle	AQ729AA

### Technical Specifications

<b>System Unit</b>	<b>Dimensions (HxWxD)</b>	HP 420: 1.06 (at front) x 13.23 x 8.98 in 27 (at front) x 336 x 228 mm
		HP 620: 1.09 (at front) x 14.64 x 9.83 in 27.5 (at front) x 371.8 x 249.6 mm
	<b>Weight</b>	HP 420: Starting at 5.0 lb (2.26 kg)
		HP 620: Starting at 5.5 lb (2.49 kg)
<p><b>NOTE:</b> Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components. Weight includes 6-cell battery, hard drive, 1 GB memory, and optical drive. Weight varies by configuration and components.</p>		
<b>Stand-Alone Power Requirements (AC Power)</b>	Nominal Operating Voltage	18.5 V
	Average Operating Power	Models with integrated graphics: 18 W Models with discrete graphics: 21 W
	Max Operating Power	< 65 W or < 90 W
<b>Temperature</b>	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)
<b>Relative Humidity</b>	Operating	10% to 90%, non-condensing
	Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
<b>Shock</b>	Operating	125 G, 2 ms, half-sine
	Non-operating	200 G, 2 ms, half-sine
<b>Random Vibration</b>	Operating	0.75 grms
	Non-operating	1.50 grms
<b>Altitude (unpressurized)</b>	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)
<b>Industry Standard Certifications</b>	UL	Yes
	CSA	Yes
	FCC Compliance	Yes
	ENERGY STAR®	Select models*
	EPEAT	Registered TBD in United States**
	ICES	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes
	Japan VCCI Compliance	Yes
	KCC	Yes
	BSMI	Yes
	CE Marking Compliance	Yes
	BNCI or BELUS	Yes
CIT	Yes	
GOST	Yes	

### Technical Specifications

Saudi Arabian Compliance (ICCP)	Yes
SABS	Yes
UKRSERTCOMPUTER	Yes

\* Configurations of the HP 420 and HP 620 that are ENERGY STAR qualified are identified as HP 420 ENERGY STAR and HP 620 ENERGY STAR on HP websites and on [www.energystar.gov](http://www.energystar.gov).

\*\* EPEAT registration varies by country. See [www.epeat.net](http://www.epeat.net) for registration status by country. EPEAT status listed above applies to U.S.

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

<b>HP 90W AC Adapter</b>	<b>Dimensions</b>	5.00 x 1.97 x 1.1 in (12.7 x 5.0 x 2.9 cm)	
	<b>Weight</b>	0.82 lb (370 g)	
	<b>Input</b>	100 to 240 VAC	
		Input Efficiency	83% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.5 A at 90 VAC, 0.75 A at 180 VAC PFC Version
	<b>Output</b>	Output power	90W
		DC output	19.0V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	<b>Connector</b>	3 pin/grounded, mates with interchangeable cords	
	<b>Environmental Design</b>	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%	
<b>EMI and Safety Certifications</b>	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.		

### Technical Specifications

<b>HP 65W AC Adapter</b>	<b>Dimensions</b>	4.17 x 1.85 x 1.1 in (10.6 x 4.7 x 2.8 cm)	
	<b>Weight</b>	0.62 lb (280 g)	
	<b>Input</b>	100 to 240 VAC	
		Input Efficiency	83% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC, 0.85 A at 180 VAC
	<b>Output</b>	Output power	65W
		DC output	18.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	<b>Connector</b>	3 pin/grounded, mates with interchangeable cords	
	<b>Environmental Design</b>	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%	
<b>EMI and Safety Certifications</b>	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.		

### Displays

<b>15.6-inch LED HD (1366 x 768) anti-glare</b>	<b>Dimensions (W x H)</b>	13.54 x 7.59 in (34.4 x 19.4 cm)		
	<b>Diagonal Size</b>	15.6 in (39.6cm)		
	<b>Surface Treatment</b>	Anti-glare		
	<b>Contrast Ratio</b>	400:1 (min)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	210 nit (typical)		
	<b>Pixel Resolution</b>	<b>Pitch</b>	0.252 mm	
		<b>Format</b>	1366 x 768	
		<b>Configuration</b>	RGB Stripe	
	<b>Backlight</b>	LED		
	<b>PPI</b>	101 ppi		
<b>Viewing Angle</b>	±30° Horizontal, ±10° Vertical (minimum)			
	30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)			

### Technical Specifications

<b>15.6-inch LED HD (1366 x 768) BrightView</b>	<b>Dimensions (W x H)</b>	13.54 x 7.59 in (34.4 x 19.4 cm)		
	<b>Diagonal Size</b>	15.6 in (39.6cm)		
	<b>Surface Treatment</b>	BrightView (glossy)		
	<b>Contrast Ratio</b>	500:1 (typical)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	200 nit (typical)		
	<b>Pixel Resolution</b>	<b>Pitch</b>	0.252 mm	
		<b>Format</b>	1366 x 768	
		<b>Configuration</b>	RGB Stripe	
	<b>Backlight</b>	LED		
	<b>PPI</b>	101 ppi		
<b>Viewing Angle</b>	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)			

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

<b>14.0-inch LED HD (1366 x 768) BrightView</b>	<b>Active Area (W x H)</b>	12.16 x 6.85 in (30.9 x 17.4 cm)		
	<b>Diagonal Size</b>	14.0 in (35.6cm)		
	<b>Surface Treatment</b>	BrightView (glossy)		
	<b>Contrast Ratio</b>	500:1 (typical)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	200 nit (typical)		
	<b>Pixel Resolution</b>	<b>Pitch</b>	0.227 mm	
		<b>Format</b>	1366 x 768	
		<b>Configuration</b>	RGB Stripe	
	<b>Backlight</b>	LED		
	<b>PPI</b>	112 ppi		
<b>Viewing Angle</b>	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)			

### Technical Specifications

#### Internal Storage

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<b>500 GB 7200 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.25 lbs (115g)	
	<b>Capacity</b>	500 GB	
	<b>Height</b>	0.37 in (9.5 mm)	
	<b>Width</b>	2.75 in (70 mm)	
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	<b>Transfer Rate</b>	<b>Synchronous</b> 150 MB/s (Drive Capability) (maximum)	
	<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	1.5ms
		<b>Average</b>	11ms
		<b>Maximum</b>	22ms
	<b>Rotational Speed</b>	7200 rpm	
	<b>Logical Blocks</b>	976,773,168	
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]	
<b>Features</b>	ATA Security		

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<b>320 GB 7200 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.25 lbs (115g)	
	<b>Capacity</b>	250 GB	
	<b>Height</b>	0.37 in (9.5 mm)	
	<b>Width</b>	2.75 in (70 mm)	
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	<b>Transfer Rate</b>	<b>Synchronous</b> 150 MB/s (Drive Capability) (maximum)	
	<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	1.5ms
		<b>Average</b>	11ms
		<b>Maximum</b>	22ms
	<b>Rotational Speed</b>	7200 rpm	
	<b>Logical Blocks</b>	625,142,448	
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]	
<b>Features</b>	ATA Security		

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### Technical Specifications

<b>250 GB 7200 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.25 lbs (115g)		
	<b>Capacity</b>	250 GB		
	<b>Height</b>	0.37 in (9.5 mm)		
	<b>Width</b>	2.75 in (70 mm)		
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ		
	<b>Transfer Rate</b>	<b>Synchronous</b>	150 MB/s (Drive Capability)	
		(maximum)		
	<b>Seek Time</b>	<b>Single Track</b>	1.5ms	
	(typical reads, including settling)	<b>Average</b>	11ms	
		<b>Maximum</b>	22ms	
	<b>Rotational Speed</b>	7200 rpm		
	<b>Logical Blocks</b>	488,397,168		
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]		
<b>Features</b>	ATA Security			

<b>160 GB 7200 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.25 lb (115 g)		
	<b>Capacity</b>	160 GB		
	<b>Height</b>	0.37 in (9.5 mm)		
	<b>Width</b>	2.75 in (70 mm)		
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ		
	<b>Transfer Rate</b>	<b>Synchronous</b>	150 MB/s (Drive Capability)	
		(maximum)		
	<b>Seek Time</b>	<b>Single Track</b>	1.5 ms	
	(typical reads, including settling)	<b>Average</b>	11 ms	
		<b>Maximum</b>	22 ms	
	<b>Rotational Speed</b>	7200 rpm		
	<b>Logical Blocks</b>	312,581,808		
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]		
<b>Features</b>	ATA Security			

<b>500 GB 5400 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.22 lb (101 g)		
	<b>Capacity</b>	500 GB		
	<b>Height</b>	0.37 in (9.5 mm)		
	<b>Width</b>	2.75 in (70 mm)		
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ		
	<b>Transfer Rate</b>	<b>Synchronous</b>	150 MB/s (Drive Capability)	
		(maximum)		
	<b>Seek Time</b>	<b>Single Track</b>	3 ms	
	(typical reads, including settling)	<b>Average</b>	13 ms	
		<b>Maximum</b>	24 ms	
	<b>Rotational Speed</b>	5400 rpm		
	<b>Logical Blocks</b>	976,773,168		
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]		
<b>Features</b>	ATA Security			

### Technical Specifications

<b>320 GB 5400 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.22 lb (101 g)		
	<b>Capacity</b>	320 GB		
	<b>Height</b>	0.37 in (9.5 mm)		
	<b>Width</b>	2.75 in (70 mm)		
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ		
	<b>Transfer Rate</b>	<b>Synchronous</b>	150 MB/s (Drive Capability)	
		(maximum)		
	<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	3 ms	
		<b>Average</b>	13 ms	
		<b>Maximum</b>	24 ms	
	<b>Rotational Speed</b>	5400 rpm		
	<b>Logical Blocks</b>	625,142,448		
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]		
<b>Features</b>	ATA Security			

<b>250 GB 5400 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.22 lb (101 g)		
	<b>Capacity</b>	250 GB		
	<b>Height</b>	0.37 in (9.5 mm)		
	<b>Width</b>	2.75 in (70 mm)		
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ		
	<b>Transfer Rate</b>	<b>Synchronous</b>	150 MB/s (Drive Capability)	
		(maximum)		
	<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	3 ms	
		<b>Average</b>	13ms	
		<b>Maximum</b>	24 ms	
	<b>Rotational Speed</b>	5400 rpm		
	<b>Logical Blocks</b>	488,397,168		
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]		
<b>Features</b>	ATA Security			

<b>160 GB 5400 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.22 lb (101 g)		
	<b>Capacity</b>	160 GB		
	<b>Height</b>	0.37 in (9.5 mm)		
	<b>Width</b>	2.75 in (70 mm)		
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ		
	<b>Transfer Rate</b>	<b>Synchronous</b>	150 MB/s (Drive Capability)	
		(maximum)		
	<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	3 ms	
		<b>Average</b>	13ms	
		<b>Maximum</b>	24 ms	
	<b>Rotational Speed</b>	5400 rpm		
	<b>Logical Blocks</b>	312,581,808		
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]		
<b>Features</b>	ATA Security			

### Technical Specifications

#### Optical Drives

<b>DVD-ROM Drive</b>	<b>Access Times</b>	Random	< 140 ms CD (typical) < 160 ms DVD (typical)
	<b>Max Data Transfer Rate</b>	24X CD-ROM	Up to 3,600 KB/s
		8X-DVD	Up to 10,800 KB/s
	<b>Transfer Mode</b>	UDMA Mode 5	
	<b>Interface</b>	Gen 1 SATA	
	<b>Supported Media (read)</b>	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	
	<b>Supported Media (write)</b>	None	
	<b>Max Media Capacity (read)</b>	8.5GB	
<b>Transport</b>	Tray Loading		

<b>DVD+/-RW SuperMulti DL LightScribe Drive</b>	<b>Access Times</b>	Random	< 150ms CD (typical) < 160 ms DVD (typical)
	<b>Max Data Transfer Rate</b>	24X CD-ROM	Up to 3,600 KB/s
		8X DVD	Up to 10,800 KB/s
		24X CD-R	Up to 3,600 KB/s
		16X CD-RW	Up to 2,400 KB/s
		8X DVD+R	Up to 10,800 KB/s
		8X DVD+RW	Up to 10,800 KB/s
		8X DVD-R	Up to 10,800 KB/s
		6X DVD-RW	Up to 8100KB/s
		4X - DVD+R Dual Layer	Up to 5,400 KB/s
		4X - DVD-R Dual Layer	Up to 5,400 KB/s
		5X DVD-RAM	Up to 6,750 KB/s
	<b>Transfer Mode</b>	UDMA Mode 5	
	<b>Interface</b>	Gen 1 SATA	
	<b>Supported Media (read)</b>	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	
<b>Supported Media (write)</b>	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, LightScribe		
<b>Max Media Capacity (read)</b>	8.5 GB		
<b>Max Media Capacity (write)</b>	8.5 GB		
<b>Transport</b>	Tray Loading		

### Technical Specifications

#### Security

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

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#### Audio

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<b>Hardware</b>	<b>Implementation</b>	IDT 92HD88 High Definition audio
	<b>Volume Controls</b>	Up, down, and mute function keys
	<b>Full Duplex</b>	Yes
	<b>Microphone In</b>	Stereo
	<b>Headphone/Line Out</b>	Stereo
	<b>Integrated Microphone</b>	Yes

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<b>Audio Output Quality</b>	<b>Frequency Response</b>	10 Hz ~ 30 KHz
	<b>Signal to Noise Ratio</b>	>95 db
	<b>Total Harmonic Distortion</b>	>83 dBr
	<b>Noise Floor</b>	-110 dB
	<b>Play/Record Sampling Rate(s)</b>	Up to 192 KHz
	<b>DAC</b>	24 bits
	<b>ADC</b>	24 bits

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<b>Internal Mono Speaker</b>	<b>Power Rating</b>	2 W
	<b>Impedance</b>	8 ohms

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#### Communications

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### Technical Specifications

<b>Integrated Realtek RTL8153EH 10/100 NIC</b>	<b>Ethernet Features</b>	<p>10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)</p> <p>100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)</p> <p>Auto-Negotiation (Automatic Speed Selection)</p> <p>Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s</p> <p>IEEE 802.1p QoS (Quality of Service) Support</p> <p>IEEE 802.1q VLAN support</p> <p>IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)</p>
	<b>Power Management</b>	<p>ACPI compliant - multiple power modes</p> <p>Situation-sensitive features reduce power consumption</p> <p>Advanced link down power saving for reducing link down power consumption</p>
	<b>Performance Features</b>	<p>TCP/IP/UDP Checksum Offload (configurable)</p> <p>Large send offload and Giant send offload</p> <p>Receiving Side Scaling</p>
	<b>Manageability</b>	<p>Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only)</p> <p>PXE 2.1 Remote Boot</p> <p>Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))</p> <p>Comprehensive diagnostic and configuration software suite</p> <p>Virtual Cable Doctor for Ethernet cable status</p>
	<b>Interface</b>	<p>PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ</p>
	<b>NIC Device Driver Name</b>	<p>Realtek PCIe FE Ethernet Family Controller</p>

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<b>V.92 56K Data/Fax Modem</b>	<b>Form Factor</b>	<p>MDC 1.5 Daughtercard</p>
	<b>Power Management Support</b>	<p>APM Revision 1.2, ACPI</p>
	<b>Approvals/ Certifications</b>	<p>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</p>
	<b>Data Mode Capabilities</b>	<p>V.92 data</p> <p>V.8bis</p> <p>V.80</p> <p>V44, V.42bis, MNP5 (Compression)</p> <p>V.42 (LAPM, MNP2-4) (Error Correction)</p> <p><b>Optional symbol rates:</b></p> <p>2800, 3429</p> <p>Asymmetric Symbol rates</p> <p><b>Synchronous primary channel data signaling rates:</b></p> <p>3600, 31200</p> <p>Automatic rate re-negotiation</p> <p>V.34</p> <p>V.32bis</p> <p>V.32</p> <p>V.23</p> <p>V.22bis</p> <p>V.22</p> <p>V.21</p> <p>Bell 212A</p>

### Technical Specifications

	Bell 103J
<b>Fax Mode Capabilities</b>	TIA/EIA-578-B (Class 1) T.30, T.4 (Group 3) V.17 V.29 V.27ter V.21 Channel 2
<b>Command Set</b>	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

### HP un2420 EV-DO/HSPA Mobile Broadband Module

<b>Technology/Operating Bands</b>	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), 850MHz (UTRA FDD Band V) 1xEVDO/1xRTT with receive diversity: 850MHz (Band Class0-Cell), 1900MHz (Band Class1-PCS)
<b>Wireless Protocol Standards</b>	GSM/GPRS/EDGE: Class B, Multi-slot 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-2000
<b>Wireless Parametric Standards</b>	Meets or exceeds TIA/EIA IS-98-D
<b>Maximum Data Rates</b>	UMTS (HSPA) – 7.2 Mbps (Download ), 2.0 Mbps (Upload) CDMA (EVDO Release A) – 3.1 Mbps (Download), 1.8 Mbps (Upload)
<b>GPS</b>	Standalone GPS enabled
<b>GPS Bands</b>	L1 – 1575.42 MHz
<b>Maximum Output Power</b>	GSM/GPRS/EDGE: 32dBm (+/-1) WCDMA: 24dBm (+/-1) CDMA: 24dBm (+/-1)
<b>Maximum Power Consumption</b>	2500mA (peak); 1000mA (average)
<b>Power Consumption, Sleep Mode</b>	5 mA
<b>Power Management</b>	USB selective suspend Integrated notebook wireless button
<b>Antenna Type</b>	Dual high efficiency 5 band antennae with spatial diversity, mounted in the display enclosure
<b>Form Factor</b>	PCI-Express MiniCard, USB 2.0 interface
<b>Weight</b>	11.5 g
<b>Dimensions</b> (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 5 mm)
<b>Voltage, Operating Temperature, Operating</b> (from TIA/EIA/IS-98-D)	3.3v +/- 10% –22° to 140° F (–30° to 60° C) (full RF performance) –22° to 167° F (–30° to 75° C) (reduced RF performance)

### Technical Specifications

<b>Temperature, Non-operating, 96 hours</b> (from MIL-STD 202 Method 108)	-40° to 185° F (-40° to 85° C)
<b>Humidity, Non-operating</b>	85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
<b>Configuration Utilities</b>	HP Connection Manager
<b>LED Activity</b>	LED Off – Radio Off; Solid LED On – Radio On

<b>Broadcom 4312G 802.11b/g WiFi Adapter</b>	<b>Wireless LAN Standards</b>	IEEE 802.11b IEEE 802.11g
	<b>Interoperability</b>	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows Vista and XP (details at: <a href="http://www.hp.com/go/notebooks/WLAN">http://www.hp.com/go/notebooks/WLAN</a> )
	<b>Frequency Band</b>	2.4 GHz
	<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	<b>Security<sup>1</sup></b>	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.
	<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.
	<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK
	<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
	<b>Output Power</b> (for CCK) <sup>2</sup>	17 dBm , nominal
	<b>Output Power</b> (for OFDM; power varies by data rate) <sup>2</sup>	15 dBm , nominal
	<b>Power Consumption</b>	Idle associated: 250 mW Idle unassociated: 150 mW Transmit: 2.0 W (max) Receive: 2.0 W (max)
	<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode
	<b>Receiver Sensitivity<sup>3</sup></b>	54 Mbps: -71 dBm, 11 Mbps: -85 dBm , 1 Mbps: -95 dBm
	<b>Antenna type</b>	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure
	<b>Form Factor</b>	PCI-Express Half-MiniCard
	<b>Weight</b>	0.013 lb (6 g)

### Technical Specifications

<b>Dimensions</b>	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)	
<b>Operating Voltage</b>	3.3v +/- 10%	
<b>Temperature</b>	Operating	14° to 149° F (-10° to 65° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Off - Radio OFF; Solid LED On - Radio ON	
	<ol style="list-style-type: none"> <li>1. Check latest software/driver release for updates on supported security features.</li> <li>2. Maximum output power may vary by country according to local regulations.</li> <li>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).</li> <li>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.</li> </ol>	

<b>Realtek RTL8191SE 802.11b/g/n 1x1 WiFi Adapter</b>	<b>Wireless LAN Standards</b>	IEEE 802.11b IEEE 802.11g IEEE 802.11n
	<b>Interoperability</b>	Wi-Fi certified
	<b>Frequency Band</b>	2.4 GHz
	<b>Data Rates</b>	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 150 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n specification
	<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	<b>Security<sup>1</sup></b>	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.
	<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.
	<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK
	<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
	<b>Output Power (for CCK)<sup>2</sup></b>	17 dBm, nominal
	<b>Output Power (for OFDM; power varies by data rate)<sup>2</sup></b>	15 dBm, nominal
	<b>Power Consumption</b>	Transmit: 1.5 W (max) Receive: 1.0 W (max) Associated to Access Point, Idle: 152 mW nominal Wireless Button Off: 33 mW nominal
	<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode

### Technical Specifications

<b>Receiver Sensitivity<sup>3</sup></b>	54 Mbps: -73 dBm, 11 Mbps: -82 dBm , 1 Mbps: -93 dBm, MCS7_HT20: -69dBm , MCS7_HT40: -67dBm	
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure	
<b>Form Factor</b>	PCI-Express Half-MiniCard	
<b>Weight</b>	0.007 lb (3 g)	
<b>Dimensions</b>	0.14 x 1.06 x 1.18 in (3.5 x 26.8 x 30 mm)	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	Operating	14° to 149° F (-10° to 65° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Off - Radio OFF; Solid LED On - Radio ON	
	<ol style="list-style-type: none"> <li>1. Check latest software/driver release for updates on supported security features.</li> <li>2. Maximum output power may vary by country according to local regulations.</li> <li>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/n (OFDM modulation).</li> </ol>	

<b>HP Integrated Module with Bluetooth 2.1 Wireless Technology</b>	<b>Bluetooth Specification</b>	2.1 Compliant
	<b>Dimensions</b>	1.18 x 0.26 x 0.13 in (30 x 6.5 x 3.25 mm)
	<b>Frequency Band</b>	2402 to 2480 MHz
	<b>Number of Available Channels</b>	79 (1 MHz) available channels
	<b>Data Rates and Throughput</b>	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
	<b>Transmit Power</b>	-6 dBm to 4 dBm (Bluetooth Class II)
	<b>Receiver Sensitivity</b>	Better than -80 dBm at 0.1 % raw bit error rate
	<b>Power Consumption</b>	Peak (Tx) 264 mW Peak (Rx) 231 mW Sleep <1 mW
	<b>Antenna</b>	Internally integrated within module
	<b>Range</b>	Up 33 ft (10 m)
	<b>Electrical Interface</b>	USB 2.0 compliant Microsoft Windows Plug and Play compliant
	<b>Bluetooth Software Supported</b>	Broadcom Bluetooth for Windows Microsoft Windows Bluetooth Software
	<b>Link Topology</b>	Point to Point, Multipoint Pico Nets up to 7 slaves
	<b>Security</b>	Full support of Bluetooth Security Provisions
	<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support Self configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff

### Technical Specifications

<b>Certifications</b>	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		
<b>Temperature</b>	Operating	-4° to 158° F (-20° to 70° C)	
	Non-operating	-40° to 176° F (-40° to 80° C)	
<b>Humidity</b>	Operating	10% to 90%	
	Non-operating	5% to 95%	
<b>Altitude</b>	Operating	15,000 ft (4,572 m)	
	Non-operating	40,000 ft (12,192 m)	
<b>Bluetooth Profiles Supported</b>	Serial Port Profile (SPP) <sup>1</sup> Service Discovery Application Profile (SDAP) Dial-Up Networking (DUN) <sup>1,2</sup> Generic Object Exchange Profile (GOEP) <sup>1,2</sup> Object Push Profile (OPP) <sup>1,2</sup> File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP) <sup>1,2</sup> Personal Area Networking Profile (PAN) <sup>1,2</sup> Human Interface Device Profile (HID) <sup>1,2,3</sup> FAX Profile (FAX) Basic Imaging Profile (BIP) <sup>2</sup> 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 where HP registers commercial desktop products. See <http://www.epeat.net> for registration status in your country.

#### HP 420 Notebook PC and HP 620 Notebook PC

<b>Energy Consumption</b>	115 VAC	230 VAC	100 VAC
Normal Operation	11.87 W	11.95 W	11.68 W
Sleep (Energy Star low power mode)	0.702 W	0.792 W	0.674 W
Off	0.522 W	0.594 W	0.492 W
<b>Heat Dissipation*</b>	115 VAC	230 VAC	100 VAC
Normal Operation	41 BTU/hr	41 BTU/hr	40 BTU/hr
Sleep	2 BTU/hr	3 BTU/hr	2 BTU/hr
Off	2 BTU/hr	2 BTU/hr	2 BTU/hr



### Technical Specifications

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

#### HP 420 Notebook PC

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

System Fan Off	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.4	27
Fixed Disk (random writes)	3.9	32

System fan is usually off except when charging the battery

#### HP 620 Notebook PC

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

System Fan Off	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.2	25.1
Fixed Disk (random writes)	3.4	31.6

System fan is usually off except when charging the battery

#### HP 420 Notebook PC

##### Batteries

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

Batteries used in the product do not contain:

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

The battery type and chemistry used in the product is:

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

##### Additional information:

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

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

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

This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see [www.epeat.net](http://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% recycle-able when properly disposed

### Technical Specifications

of at end of life.

#### Packaging Materials

- External:
  - Corrugated carton 360 g
  - Cardboard & misc 365 g
- Internal:
  - Polyethylene low density Foam 15 g
  - EPE - Expanded Polyethylene 90 g
- The Corrugated carton packaging material is made from 70~80% recycled content.
- The Cardboard & misc packaging material is made from 70~80% recycled content.
- The Polyethylene low density Foam packaging material is made from 0% recycled content.
- The EPE - Expanded Polyethylene packaging material is made from 70~80% 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.
- 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.

#### HP 620 Notebook PC

##### Batteries

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

Batteries used in the product do not contain:

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

The battery type and chemistry used in the product is:

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

##### Additional information:

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

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

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

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

### Technical Specifications

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

#### Packaging Materials

- External:
  - Corrugated carton 635 g
  - Corrugated 140 g
- Internal:
  - Polyethylene low density 15 g
  - EPS (Expanded Polystyrene) 50 g
- The Corrugated carton packaging material is made from 80% recycled content.
- The Corrugated packaging material is made from 80% recycled content.
- The Polyethylene low density packaging material is made from 100% recycled content.
- The EPS (Expanded Polystyrene) packaging material is made from 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.

#### HP 420 Notebook PC and HP 620 Notebook PC

##### 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](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

### Technical Specifications

- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel - finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

#### End-of-life Management and Recycling

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

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

#### Hewlett-Packard Corporate Environmental Information

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

Global Citizenship Report  
<http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html>  
Environment website  
<http://www.hp.com/environment>  
Eco-label certifications  
<http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html>  
ISO 14001 certificates:  
<http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html>

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