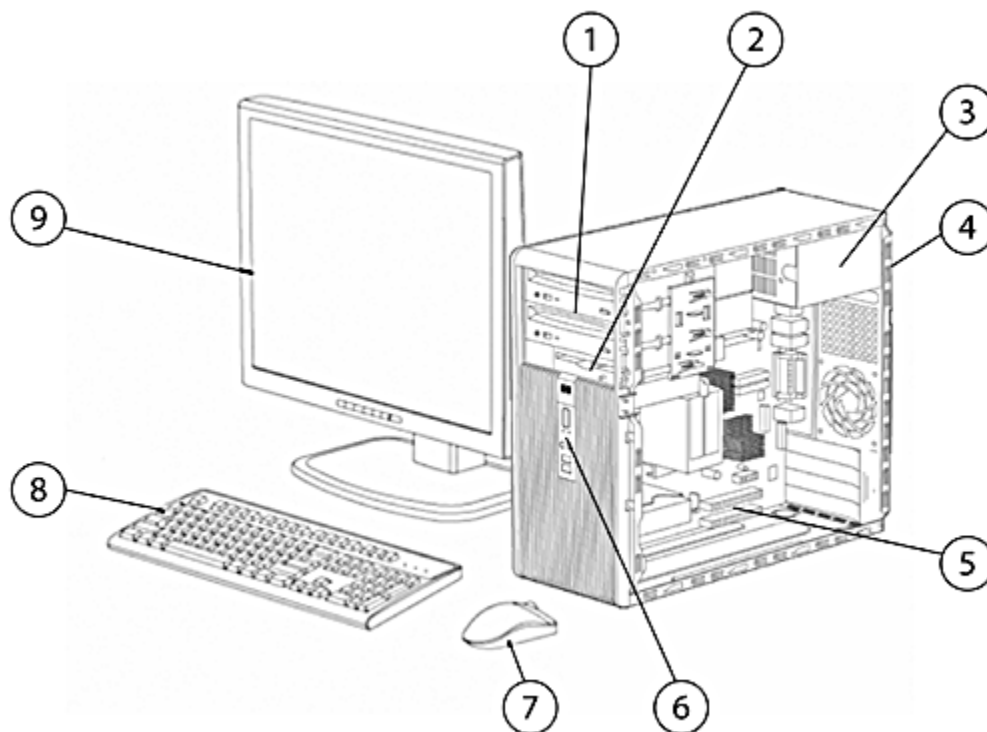


### Overview

**HP recommends  
Windows Vista® Business**

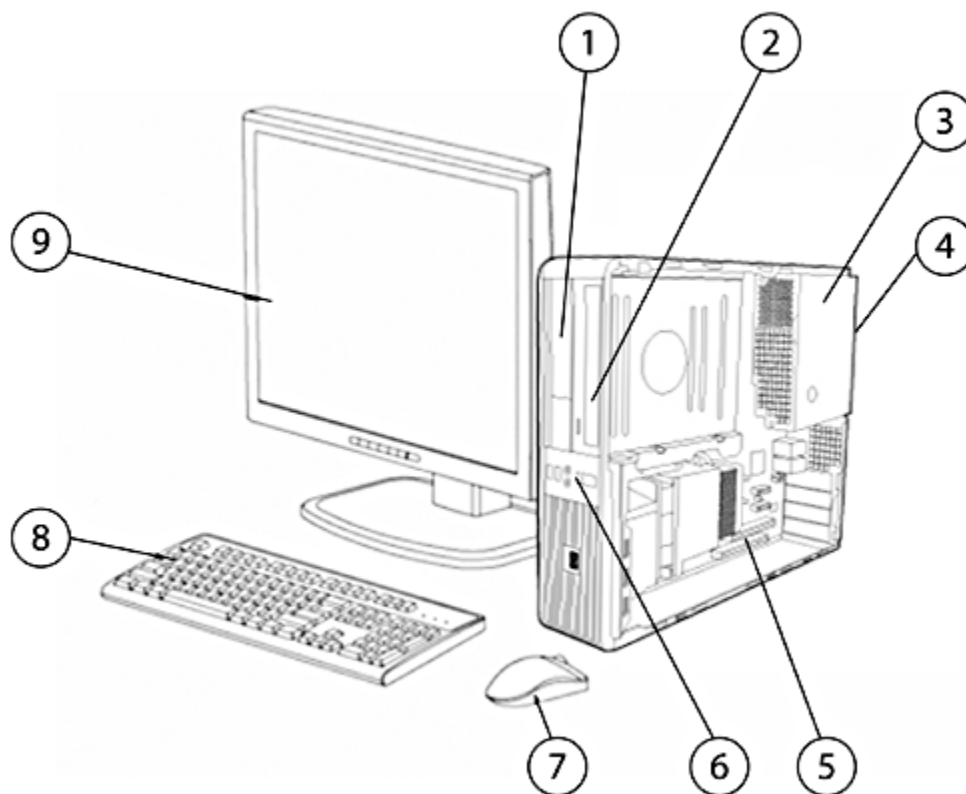
#### Microtower



1. (2) 5.25" external bays and (2) 3.5" internal bays
2. (1) 3.5" external bay for optional HP 16-in-1 Media Card Reader, diskette drive, or other 3.5" device
3. 300-watt power supply
4. Rear I/O: (6) USB 2.0, (1) standard serial port, (1) optional serial port, (1) optional parallel port, (2) PS/2, (1) RJ-45, (1) VGA, (1) DVI-D, (1) audio in, (1) audio out
5. (1) full-height PCI slot, (2) full-height PCIe x1 slots, (1) full-height PCIe x16 slot
6. Front I/O: (2) USB 2.0, headphone and microphone, Dual Color Diagnostic LEDs
7. 2-Button Scroll Mouse (PS/2), Optical Scroll Mouse (PS/2 or USB), or USB Laser Mouse
8. HP Standard Keyboard (PS/2 or USB) or HP USB Smartcard Keyboard
9. Monitor (sold separately)

### Overview

#### Small Form Factor



1. (1) 3.5" external bay for optional HP 16-in-1 Media Card Reader, diskette drive, or other 3.5" device; (1) 3.5" internal bay
2. (1) 5.25" external bay for optional optical drive, or other 5.25" device (bay tilts up for device removal and insertion)
3. 240-watt power supply
4. Rear I/O: (6) USB 2.0, (1) standard serial port, (1) optional serial port, (1) optional parallel port, (2) PS/2, (1) RJ-45, (1) VGA, (1) DVI-D, (1) audio in, (1) audio out
5. (1) low profile PCI slot, (2) low profile PCIe x1 slots, (1) low profile PCIe x16 slot
6. Front I/O: (2) USB 2.0, headphone and microphone, Dual Color Diagnostic LEDs
7. 2-Button Scroll Mouse (PS/2), Optical Scroll Mouse (PS/2 or USB), or USB Laser Mouse
8. HP Standard Keyboard (PS/2 or USB) or HP USB Smartcard Keyboard
9. Monitor (sold separately)

### Overview

#### At A Glance

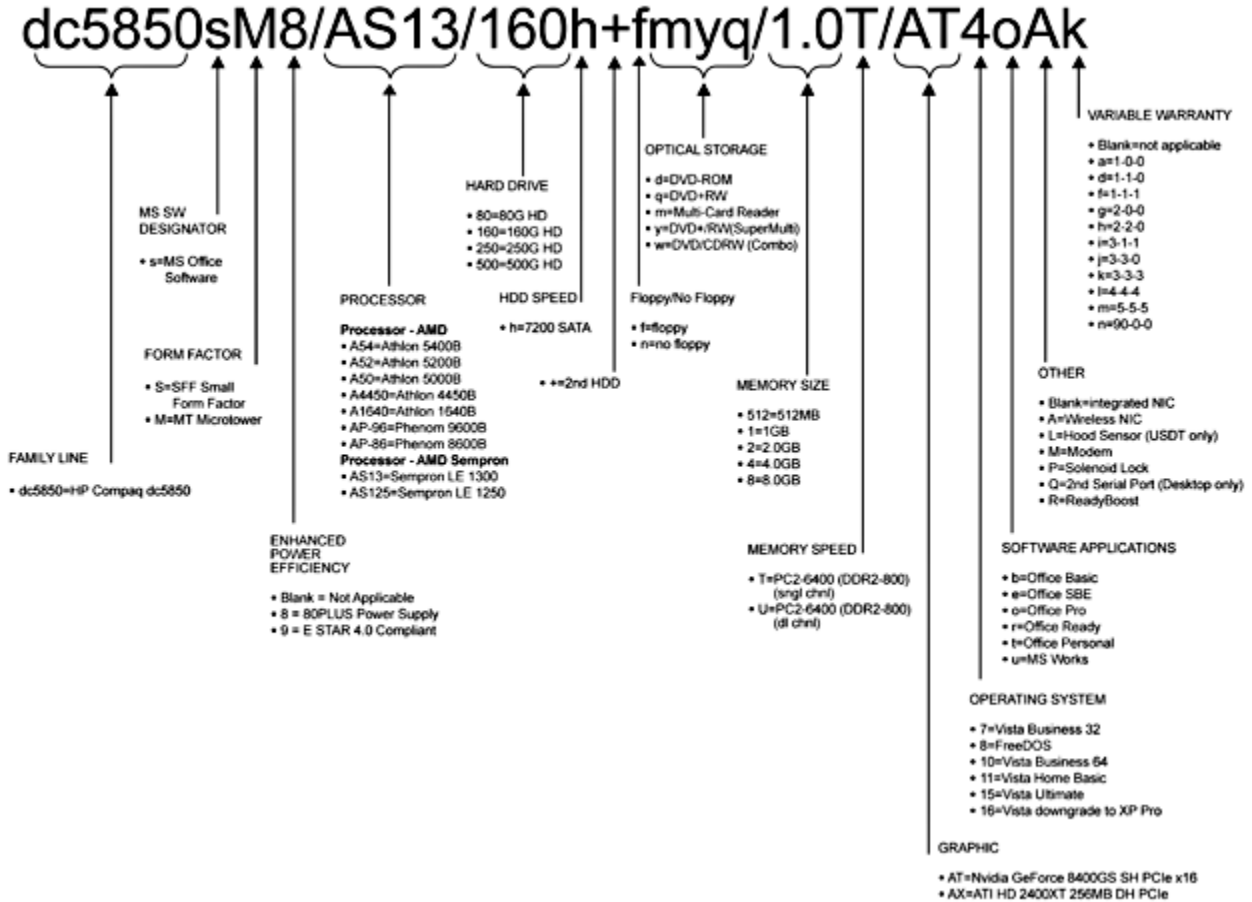
- The HP Compaq dc5850 offers a stable solution with mainstream features and flexibility that exceed basic business requirements
- AMD 780V chipset with integrated ATI Radeon 3100 graphics
- AMD Phenom™ Quad and Triple Core processors, AMD Athlon™ 64 X2 Dual Core processors, AMD Athlon 64 processors, and AMD Sempron™ processors
- Embedded TPM1.2 compliant security module\* (Vista Bit-Locker ready)
- Support for up to 500-GB SATA 3.0Gb/s Smart IV hard drives
- RAID 0/1 support
- Value-added software on select models
  - HP Total Care Advisor
  - HP Backup and Recovery Manager
  - HP Software Agent
  - Altiris Deployment Solution Agent
  - HP Insight Diagnostics software
  - Microsoft Office 2007
  - Verdiem Surveyor remote power management agent
  - Computrace for Desktops (select countries)
  - HP Power Manager
- Value-added software available for free download from the Web (<http://www.hp.com/go/easydeploy>)
- HP Client Automation – Starter Edition
- HP Client Manager for Altiris
- Altiris Out-of-Band Management Solution
- HP SoftPak Download Manager
- HP System Software Manager
- HP Client Catalog for Microsoft SMS
- Verdiem Surveyor remote power management agent
- Fully compatible software OS image across all models (Microtower, Small Form Factor)
- HP BIOS for security, manageability and software image stability
- Standard 3-years parts, 3-years labor, and 3-years on-site warranty services (terms and conditions vary by country; certain restrictions and exclusions apply)
- HP Insight Diagnostics software
- Selected configurations with global availability easily set up and ordered through HP.com Business to Business portals (<http://h10019.www1.hp.com/business-site/index.html>)
- Tailored HP Factory Express deployment and lifecycle services available (<http://h71028.www7.hp.com/enterprise/cache/97688-0-0-225-121.aspx>)

\*TPM module disabled where use is restricted by law; for example, Russia.

### Configurable Components - Select Models (localized by Regions)

#### Model Key and Example

**NOTE:** This diagram is an example that illustrates how to read the model number. It is not intended to give every available configuration choice specified in the body of this document and may include references to modules that are out of date and no longer available.



### Standard Features and Configurable Components

<b>Operating System –</b> One of the following	<b>Preinstalled</b>	Genuine Windows Vista Business 32* Genuine Windows Vista Business 64* Genuine Windows Vista Home Basic 32* Genuine Windows Vista Ultimate 32* Genuine Windows Vista Business 32 downgrade to Genuine Windows XP Professional 32 FreeDOS
	<b>Certified</b>	Red Hat Enterprise Linux SUSE Linux Enterprise Desktop 10

\* 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>.

<b>Value-added Software</b> (on select models; not included with FreeDOS)	Altiris Deployment Solution Agent	HP Total Care Advisor
	HP Software Agent	Microsoft Office 2007 Basic
	Altiris Out-of-Band Management Solution	Microsoft Office 2007 Personal
	HP Insight Diagnostics (available via HP Backup and Recovery Manager)	Microsoft Office 2007 Professional
	Computer Setup Utility	Microsoft Office 2007 Small Business
	HP Backup and Recovery Manager	Microsoft Works 8.5
	HP Power Manager	Microsoft Internet Explorer with AOL Toolbar
	Sonic/Roxio DigitalMedia Plus 7.2 (select models) or	Computrace for Desktops (select countries)
	Easy Media Creator 9 (select models)	Verdiem Surveyor agent
		InterVideo WinDVD 5.0 (select models)

<b>Value-added Software</b> (available for free download from the Web <a href="http://www.hp.com/go/easydeploy">http://www.hp.com/go/easydeploy</a> )	HP Client Automation – Starter Edition	HP Client Catalog for Microsoft SMS
	HP Client Manager for Altiris	HP Systems Software Manager
	HP SoftPaq Download Manager	Verdiem Surveyor agent

<b>Value-added Services and Features</b>	HP Stable Platform Program	Factory Express Deployment and Lifecycle Services
	Business-to-Business Portals	TPM 1.2 Security chip*
	HP Global Series Services	

\* TPM module disabled where use is restricted by law; for example, Russia.

### Standard Features and Configurable Components

**Service and Support** On-site Warranty and Service [Note 1](#): This three-year (3-3-3), limited warranty and service offering delivers three years of parts, labor and on-site repair. Response time is next business-day [Note 2](#) and includes free telephone support [Note 3](#) 24 x 7. Global coverage [Note 2](#) ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. Some countries/regions do not offer one year onsite and labor. For HP Care Pack services see <http://www.hp.com/go/lookuptool>.

**NOTE 1:** Terms and conditions may vary by country. Certain restrictions and exclusions apply.

**NOTE 2:** On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

**NOTE 3:** Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

	Microtower	Small Form Factor
<b>Chassis Dimensions</b> (H x W x D)	14.85 x 6.95 x 16.85 in	3.95 x 13.3 x 14.9 in
<b>Optional Tower Stand Dimensions</b> (H x W x D)	N/A	1.05 x 6.95 x 7.83 in (26.75 x 176.46 x 198.87 mm)
<b>System weight*</b>	20.42 lb (9.28 kg)	16.76 lb (7.62 kg)
<b>System volume</b>	1739 cu in	782.77 cu in
<b>Shipping weight*</b>	29.44 lb (13.38 kg)	25.08 lb (11.40 kg)
<b>Maximum supported weight</b> (desktop orientation)	77.1 lb (35 kg)	77.1 lb (35 kg)
<b>Shipping box dimensions</b> (H x W x D)	12.0 x 19.76 x 23.62 in	9.72 x 19.68 x 22.67 in

\* Configured with 1 hard drive, 1 optical drive, no diskette drive, and no PCI card.

<b>Power Supply</b>	300W power supply – passive PFC	240W power supply - active PFC
<b>80 PLUS Power Supply</b>	300W 80 PLUS* power supply – active PFC	240W 80 PLUS* power supply – active PFC

\* This alternate 80% efficient power supply is a requirement for ENERGY STAR 4.0 compliance in conjunction with a select range of processors and modules.

Ports	
USB 2.0	8 (2 front, 6 rear)
Serial	1 standard with 2nd optional
Parallel	1 optional
PS/2	1 keyboard, 1 mouse
Video	VGA and DVID for integrated graphics
Support for Multi-Monitor	standard
Audio	Integrated High Definition audio with internal speaker Front – mic and headphone Rear – input (supports microphone or line input), line out
NIC (RJ-45)	Integrated Broadcom Gigabit Ethernet

		MT	SFF
<b>Chipset</b>	AMD 780V chipset	X	X



### Standard Features and Configurable Components

<b>Processor and Speed</b> One of the following	<b>AMD Sempron Processors with HyperTransport™ Technology:</b>		
	AMD Sempron LE-1300 Processor (2.3-GHz, 512K L2 cache, HT bus 1.0)	X	X
	AMD Sempron LE-1250 Processor (2.2-GHz, 512K L2 cache, HT bus 1.0)	X	X
	<b>AMD Athlon Single-Core Processors with HyperTransport Technology:</b>		
	AMD Athlon LE-1640B Processor (2.7-GHz, 512K L2 cache, HT bus 2.0)	X	X
	<b>AMD Athlon Dual-Core Processors with HyperTransport Technology:</b>		
	AMD Athlon X2 5400B Processor (2.8-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	AMD Athlon X2 5200B Processor (2.7-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	AMD Athlon X2 5000B Processor (2.6-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	AMD Athlon X2 4450B Processor (2.3-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	<b>AMD Phenom Triple-Core Processors with HyperTransport Technology:</b>		
	AMD Phenom X3 8600B Processor (2.3-GHz, 1.5 MB Dedicated L2 cache, 2 MB Shared L3 cache, HT bus 3.0)	X	X
	<b>AMD Phenom Quad-Core Processors with HyperTransport Technology:</b>		
	AMD Phenom X4 9600B Processor (2.3-GHz, 2 MB Dedicated L2 cache, 2 MB Shared L3 cache, HT bus 3.0)	X	X

### Memory

#### DDR2 SYNCH DRAM NON-ECC MEMORY

Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The AMD 780V chipset supports non-ECC DDR2 PC2-6400 (800-MHz) memory.

**CAUTION:** You must shut down the computer and disconnect the power cord before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged in to an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

**HP recommends dual-channel symmetric configurations for maximum performance.** For best performance, add the same amount of total memory to each channel and do not mix speeds. For dual-channel symmetric performance, the total amount of memory in each channel must be equal. If speeds are mixed, speed will default to the slowest DIMM.

### Microtower and Small Form Factor

#### Maximum Memory

Supports up to 8-GB of DDR2 SYNCH DRAM. *Slot 4 is black and must always be populated. Next populate slots 3, 2, and 1 in that order. Not all memory configurations possible are represented below.*

**NOTE:** For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

### Standard Features and Configurable Components

DIMM Size	Slot			
	Channel A		Channel B	
	4 (black)	2 (white)	3 (black)	1 (white)
<b>512-MB</b>	512-MB			
<b>1-GB</b>	1-GB			
<b>1-GB</b> (dual-channel symmetric)	512-MB		512-MB	
<b>2-GB</b> (dual-channel symmetric)	1-GB		1-GB	
<b>2-GB</b> (dual-channel symmetric)	512-MB	512-MB	512-MB	512-MB
<b>3-GB</b> (dual-channel symmetric)	1-GB	512-MB	1-GB	512-MB
<b>4-GB maximum</b> (dual-channel symmetric)	1-GB	1-GB	1-GB	1-GB
<b>8-GB maximum</b> (dual-channel symmetric)	2-GB	2-GB	2-GB	2-GB

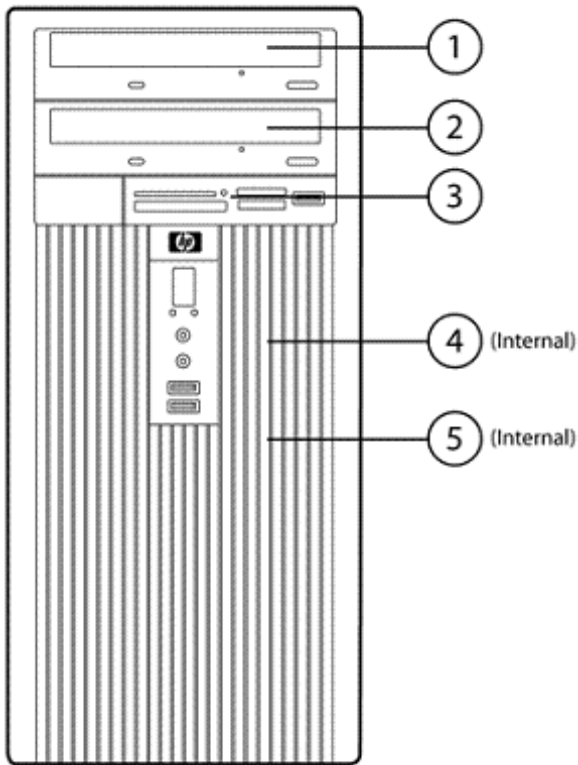
Memory Configurations	MT	SFF
512-MB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (1 x 512)	X	X
One of the following		
1-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (1 x 1GB)	X	X
1-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (2 x 512)	X	X
2-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (1 x 2GB)	X	X
2-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (2 x 1GB)	X	X
2-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 512)	X	X
3-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (3 x 1GB)	X	X
4-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 1GB)	X	X
4-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (2 x 2GB)	X	X
8-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 2GB)	X	X

Expandability	Microtower	Small Form Factor
<b>PCI slots</b>	1 full-height	1 low-profile
<b>Max power per slot</b>	35W	35W
<b>PCIe x1 slot</b>	2	2
<b>Max power per slot</b>	10W	10W
<b>PCIe x16 slot</b>	1 full-height	1 low-profile
<b>Max power per slot</b>	60W	25W
<b>External Bays</b>		
3.5"	1	1
5.25"	2	1
<b>IDE</b>		
Internal 3.5" HDD Bays	2	1
<b>Hard Drive Controller (SATA) Supported</b>	SATA	SATA
<b>Hard Drive Interfaces Supported</b>	SATA 3.0Gb/s	SATA 3.0Gb/s

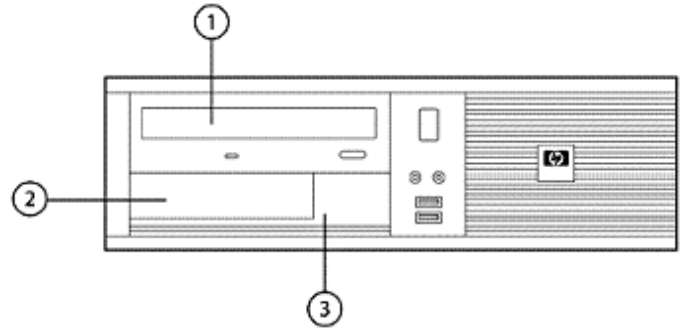


## Standard Features and Configurable Components

Microtower



Small Form Factor



Storage – Drive Support						
	Microtower			Small Form Factor		
	Media Card Reader or Diskette Drive (optional)	5.25" Serial ATA Devices	3.5" Serial ATA Devices	Media Card Reader or Diskette Drive (optional)	5.25" Serial ATA Devices	3.5" Serial ATA Devices
Quantity Supported	1	2	2	1	1	2
Position Supported	③	①, ②	③, ④, ⑤	②	①	②, ③
Controller	USB/Diskette	SATA	SATA	USB/Diskette	SATA	SATA

### Standard Features and Configurable Components

		MT	SFF
<b>Hard Drive</b> One or two of the following	80-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	160-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	250-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	500-GB SATA 3.0-Gb/s Hard Drive (16MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	80-GB SATA 3.0-Gb/s Hard Drive (16MB Cache, 10,000 RPM, NCQ, Smart III)	X	X
	160-GB SATA 3.0-Gb/s Hard Drive (16MB Cache, 10,000 RPM, NCQ, Smart III)	X	X
	3.5" Removable 80-GB SATA 3.0 Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	3.5" Removable 160-GB SATA 3.0 Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	3.5" Removable 250-GB SATA 3.0 Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	RAID 80-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)	X	X
	RAID 160-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)	X	X
	RAID 250-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)	X	X
	2nd hard drive, 80-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	2nd hard drive, 160-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	2nd hard drive, 250-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	2nd hard drive, 500-GB SATA 3.0-Gb/s Hard Drive (16MB Cache, 7200 RPM, NCQ, Smart IV)	X	X

**NOTE:** NCQ functionality requires a user set-up BIOS setting.

#### Removable Storage –

One or more of the following depending on form factor (see Storage – Drive Support section above)

#### Diskette Drives

1.44-MB Diskette Drive

X X

#### Media Reader

HP 16-in-1 Media Reader (USB connection on the system board)

X X

#### Optical Drives

SATA DVD-ROM Drive<sup>1</sup>

X X

SATA CD-RW/DVD-ROM Combo Drive<sup>1,2</sup>

X X

SATA SuperMulti LightScribe DVD Writer Drive<sup>1,2,3</sup>

X X

#### NOTES:

<sup>1</sup> For playing DVDs, InterVideo WinDVD 5

<sup>2</sup> For writing CDs, choice of Sonic/Roxio DigitalMedia Plus 7.2 (Windows XP only) or Easy Media Creator 9

<sup>3</sup> For writing CDs and DVDs, video editing and authoring DVDs, choice of Sonic/Roxio DigitalMedia Plus 7.2 (Windows XP only) or Easy Media Creator 9

#### Media Card Reader –

One of the following

HP 16-in-1 3.5" Media Card Reader

X X

### Standard Features and Configurable Components

<b>Security</b>	Integrated 1.2 TPM Embedded Security Chip*	X	X
	HP Desktop Security lock kit (lock and cable)	X	X
	Security cable with Kensington lock	X	X
	Optional HP ProtectTools security software suite	X	X
* TPM module disabled where use is restricted by law; for example, Russia.			
<b>NIC</b>	Integrated Broadcom Gigabit Ethernet (integrated on system board)	X	X
	Broadcom NetXtreme Gigabit Ethernet PCIe NIC Card	X	X
<b>Wireless</b>	Wireless A+G PCI Card (full height bracket)	X	
	Wireless A+G PCI Card (low profile bracket)		X
<b>Modem</b>	2006 Agere PCI 56K International SoftModem (full height)	X	
	2006 Agere PCI 56K International SoftModem (low profile)		X
<b>Graphics</b>	Integrated ATI Radeon 3100 Graphics (with DirectX 10 technology)	X	X
	NVIDIA GeForce 8400 GS 256MB SH PCIe x16 Graphics Card	X	X
	ATI Radeon HD 2400 XT 256MB DH PCIe x16 Graphics Card	X	X
<b>Audio</b>	Integrated High Definition audio with ADI1884 codec (all ports are stereo)	X	X
	Microphone and Headphone front ports	X	X
	Line-out and Line-In rear ports*	X	X
	Multistreaming capable*	X	X
	Internal Speaker	X	X
* Rear audio input port is re-taskable as Line-in or Microphone-in. External speakers must be powered externally. Multistreaming can be enabled in the ADI control panel to allow independent audio streams to be sent to/from the front and rear jacks. This allows for different audio applications to use separate audio ports on the system. For example, the front jacks could be used with a headset for a communications application while the rear jacks are being used with external speakers and a multimedia application.			
<b>Input Devices</b>	<b>Keyboard</b> – One of the following		
	HP PS/2 Standard Keyboard	X	X
	HP USB Standard Keyboard	X	X
	<b>Mouse</b> – One of the following		
	USB 2-Button Laser Mouse	X	X
	PS/2 2-Button Optical Scroll Mouse	X	X
USB 2-Button Optical Scroll Mouse	X	X	

### Standard Features and Configurable Components

<b>Miscellaneous</b>	HP FireWire / IEEE 1394 PCI Card (full height)	X	
	HP FireWire / IEEE 1394 PCI Card (low profile)		X
	2nd serial port adapter	X	
	2nd serial port adapter (low profile)		X
	Tower stand		X
	1-GB Flash Module for Vista ReadyBoost	X	X

After-Market Options (availability may vary by region)

		MT	SFF	After-Market Options Part Number
<b>Communications</b>	<b>Wireless LAN</b>			
	HP Wireless A+G PCI Card (North America only)	X	X	EA118AA
	HP Wireless A+G PCI Card (WW except North America)	X	X	PZ928AA
	HP BT450 USB Bluetooth Wireless Printer and PC Adapter	X	X	IPQ639A
	<b>NICs</b>			
	Broadcom NetXtreme Gigabit Ethernet PCIe NIC Card	X	X	EA833AA
	Intel PRO/1000 PT PCIe Gigabit NIC Card	X	X	EH352AA
	<b>Modem</b>			
Agere 2006 PCI 56K International Modem	X	X	EK694AA	
<b>Graphics</b>	<b>Single head solutions</b>			
	NVIDIA GeForce 8400 GS 256MB SH PCIe x16 Graphics Card*	X	X	GJ119AA
	<b>Multi head solutions</b>			
	HP DMS59 DVI Dual-head Connector Cable	X	X	DY599A
	HP DVI to DVI Cable	X	X	DL139A
	NVIDIA Quadro NVS 290 256MB DH PCIe x16 Graphics Card	X	X	KG748AA
	NVIDIA GeForce 8400 GS 256MB DH PCIe x1 Graphics Card*	X	X	GJ120AA
* 1GB of system memory required. Graphics cards use part of the total system memory to enhance graphics performance.				
<b>Hard Drives</b>	<b>Serial ATA Hard Drives</b>			
	HP 80-GB SATA (NCQ/Smart IV) 3.0-Gb/s Hard Drive	X	X	PY276AA
	HP 160-GB SATA (NCQ/Smart IV) 3.0-Gb/s Hard Drive	X	X	PY277AA
	HP 250-GB SATA (NCQ/Smart IV) 3.0-Gb/s Hard Drive	X	X	PY278AA
	HP 500-GB SATA (NCQ/Smart IV) 3.0-Gb/s Hard Drive	X	X	PV943A
	HP 80-GB SATA (NCQ/Smart III) 10,000 RPM 3.0-Gb/s Hard Drive	X	X	GD443AV
	HP 160-GB SATA (NCDQ/Smart III) 10,000 RPM 3.0-Gb/s Hard Drive	X	X	GD437AV
	HP Removable SATA Hard Drive Enclosure (Frame & Carrier)	X	X	RY102AA
HP Removable SATA Hard Drive Enclosure (Carrier Only)	X	X	RY103AA	
<b>Input/Output Devices</b>	HP PS/2 Standard Keyboard	X	X	DT527A
	HP USB Standard Keyboard	X	X	DT528A
	HP USB Smartcard Keyboard	X	X	ED707AA
	HP USB Gray Standard Keyboard	X	X	DT529A
	HP USB 2-Button Laser Mouse	X	X	GW405AA
	HP PS/2 2-Button Optical Scroll Mouse	X	X	EY703AA
	HP USB 2-Button Optical Scroll Mouse	X	X	DC172B

### After-Market Options (availability may vary by region)

<b>Memory (DIMMs)</b>	<b>PC2-6400 (DDR2, 800 MHz) DIMMs Non-ECC</b>			
	HP 2-GB PC2-6400 (DDR2 800 MHz) DIMM	X	X	AH060AA
	HP 1-GB PC2-6400 (DDR2 800 MHz) DIMM	X	X	AH058AA
	HP 512-MB PC2-6400 (DDR2 800 MHz) DIMM	X	X	AH056AA
<b>Monitors</b>	<b>TFTs</b>			
	HP L1506 15 TFT Flat Panel Monitor – Analog only	X	X	PX848AA#xxx
	HP L1706 17 TFT Flat Panel Monitor – Analog only	X	X	PX849AA#xxx
	HP L1740 17 LCD Flat Panel Display – Analog/Digital	X	X	PL766AA#xxx
	HP L1745 17 TFT Flat Panel Display – Analog/Digital	X	X	GE178AA#xxx
	HP L1906 19 TFT Flat Panel Display – Analog only	X	X	PX850AA#xxx
	HP L1940T 19 TFT Flat Panel Display – Analog/Digital	X	X	EM869AA#xxx
	HP LP1965 19 TFT Flat Panel Display – Analog/Digital	X	X	RA373AA#xxx
	HP L2065 20 TFT Flat Panel Display – Analog/Digital	X	X	EF227A4#xxx
	HP LP3065 30" LCD Monitor – Digital	X	X	EZ320A4#xxx
	<b>Widescreen LCDs</b>			
	HP w19 19" Widescreen LCD Monitor – Analog/Digital	X	X	EM885AA#xxx
	HP LP2045 20" Widescreen LCD Monitor – Analog/Digital	X	X	RD125A#xxx
	HP LP2465 24" Widescreen LCD Monitor – Analog/Digital	X	X	EF224A4#xxx
	<b>CRTs</b>			
	HP s7540 17" (16.0 vis) CRT Monitor	X	X	PF997AA#xxx
<b>Multimedia</b>	HP USB Powered Speakers	X	X	RD628AA
<b>Optical Drives</b>	<b>DVD-ROM Drive</b>			
	HP SATA DVD-ROM Drive	X	X	AH047AA
	<b>DVD Writer</b>			
HP SATA SuperMulti LightScribe DVD Writer Drive	X	X	GF343AA	
<b>Removable Storage</b>	<b>Diskette and Digital Drives</b>			
	HP 1.44-MB External USB Diskette Drive	X	X	DC141B
	HP 1.44-MB Internal Diskette Drive	X	X	AH053AA
	<b>Multimedia</b>			
HP 16-in-1 Media Card Reader with PCI Card	X	X	EM718AA	

### After-Market Options (availability may vary by region)

<b>Security</b>	Kensington lock	X	X	PC766A	
	HP Business PC Security Lock	X	X	PV606AA	
	HP ProtectTools Client Security Software including HP ProtectTools Security Manager BIOS Configuration for HP ProtectTools Credential Manager for HP ProtectTools Device Access Manager for HP ProtectTools Drive Encryption for HP ProtectTools Embedded Security for HP ProtectTools Java Card Security for HP ProtectTools	X	X	KN740AA	
	HP 2007 Wall Mount/Security Sleeve		X	GF344AA	
	HP USB Biometric Fingerprint Reader	X	X	EM717AA	
	HP USB Smartcard Keyboard	X	X	ED707AA	
	<hr/>				
	<b>Manageability</b>	HP Client Configuration Manager, Premium Edition	X	X	T3488AA (use T3489AA for 1000 licenses)
		HP ProtectTools Client Security Software including: HP ProtectTools Security Manager BIOS Configuration for HP ProtectTools Credential Manager for HP ProtectTools Device Access Manager for HP ProtectTools Drive Encryption for HP ProtectTools Embedded Security for HP ProtectTools Java Card Security for HP ProtectTools	X	X	KN740AA
		Altiris Client Management Suite Level 1 Includes: Altiris Deployment Solution Altiris Inventory Solution Altiris Application Metering Solution Altiris Carbon Copy Solution Altiris Software Delivery Solution Altiris Application Management Solution Altiris Patch Management Solution	X	X	DR605A (use DR606A for 1000+ licenses)
<hr/>					
<b>Brackets/Stand</b>	HP 2007 SFF Tower Stand		X	GJ118AA	
<b>Miscellaneous Accessories</b>	HP 2nd Serial Port Adapter	X	X	PA716A	
	HP Parallel Port Adapter	X	X	KD061AA	
	Belken USB to Serial Adapter	X	X	EM449AA	
	HP FireWire / IEEE 1394 PCI Card	X	X	PA997A	

### Technical Specifications

Unit Environment and Operating Conditions	Microtower	Small Form Factor
<b>General Unit Operating Guidelines</b> <ul style="list-style-type: none"> <li>Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.</li> <li>Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow.</li> <li>Never restrict airflow into the computer by blocking any vents or air intakes.</li> <li>Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.</li> <li>Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.</li> <li>If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.</li> </ul>		
<b>Temperature Range</b>	Operating: 50° to 95° F (10° to 35° C)* Non-operating: -22° to 140° F (-30° to 60° C)	
<b>Relative Humidity</b>	Operating: 10% to 90% (non-condensing at ambient) Non-operating: 5% to 95% (non-condensing at ambient)	
<b>Maximum Altitude</b> (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)	
<b>*NOTE:</b> Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.		

	Microtower		Small Form Factor	
<b>Power Supply</b>	300-watt BTX power supply – Passive PFC 115v/230v line switch	300-watt 80 PLUS* BTX power supply – Active PFC	240-watt BTX power supply – Active PFC 115v/230v line switch	240-watt 80 PLUS* BTX power supply – Active PFC
Operating Voltage Range	90 to 132VAC, or 180 to 264VAC	90 to 264VAC	90 to 132VAC, or 180 to 264VAC	90 to 264VAC
Rated Voltage Range	100 to 127VAC, or 200 to 240VAC	100 to 240VAC	100 to 127VAC, or 200 to 240VAC	100 to 240VAC
Rated Line Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Operating Line Frequency Range	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Rated Input Current	8A/4A	5A/2.5A	6A/3A	3.5A/1.75
Heat Dissipation	Typical 315 btu/hr (79 kg-cal/hr) Maximum 1575 btu/hr (397 kg-cal/hr)	Typical 270 btu/hr (68 kg-cal/hr) Maximum 1280 btu/hr (322 kg-cal/hr)	Typical 315 btu/hr (79 kg-cal/hr) Maximum 1260 btu/hr (317 kg-cal/hr)	Typical 270 btu/hr (68 kg-cal/hr) Maximum 1025 btu/hr (258 kg-cal/hr)
Power Supply Fan	Variable speed fan	Variable speed fan	Variable speed fan	Variable speed fan
ENERGY STAR 4.0 Compliant		X		X
FEMP Standby Power Compliant (<2W in S5 – Power Off)**	X	X	X	X
Power Consumption in ES Mode – Suspend to RAM (S3) (Instantly Available PC)	<4W	<3W	<4W	<3W



### Technical Specifications

#### NOTES:

\* This 80% efficient power supply is a requirement for ENERGY STAR 4.0 compliance in conjunction with a select range of processors and modules.

\*\* Power consumption in the Off/Apparent Off mode is measured and reported with the network interface controller "Wake on LAN" feature disabled in F10 Setup (default is "enabled").

#### ROM BIOS Information

Key features of the HP BIOS in the dc5850 include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP Business desktop computer into the enterprise, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages.
- Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- Security – HP BIOS offers a robust and flexible set of security features to help the system administrator secure their systems from removal of sensitive data, and help prevent access by unauthorized users.
- Tracking and tracing capabilities in case of theft available in select countries (subscription sold separately).
- Thermal and power management – The HP BIOS provides and enables thermal and power management technologies to assist in operating the HP Business Desktop computer in any enterprise environment.
- Serviceability – HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery – HP BIOS provides numerous ways to upgrade HP Business Desktop computers, including BIOS updates from within DOS (Flashlite), BIOS updates from within Windows (HPQFlash, SSM), HP Client Manager, and fail-safe recovery. In addition, the HP Business Desktop BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS software and from the support website.

#### Additional HP BIOS Features

- Administrator password – Also known as the setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS version cannot be changed and changes cannot be made to BIOS settings using F10 setup or under the OS.
- Advanced Configuration and Power Interface (ACPI) – Represents a significant innovation in power and configuration management, allowing operating systems and applications to manage power based on activity and usage. Provides power conservation features under Windows XP.
- Ability to mute the internal speaker

#### Other Features

ACPI-Ready Hardware

#### Description

Advanced Configuration and Power Management Interface (ACPI).

- Allows the system to wake from a low power mode.
- Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.

SMBIOS Ver. 2.4

System Management BIOS, previously known as DMI BIOS, for system management information

Dual-State Power Button

Power button acts as both an on/off button and suspend-to-sleep button

### Technical Specifications

Serviceability Features of System		
Dual Color Power LED on Front of Computer (Indicates Normal Operations and Fault Conditions)		
Diagnostic LED Explanation Table	Number of 1-second red LED blinks followed by 2-second pause, then repeats: 2-processor thermal protection activated 3-processor not installed 4-power supply failure 5-memory error 6-video error 7-PCA failure (ROM detected failure prior to video) 8-invalid ROM, bootblock recover mode	
<ul style="list-style-type: none"> <li>System/Emergency ROM</li> </ul>	<ul style="list-style-type: none"> <li>Flash ROM</li> </ul>	<ul style="list-style-type: none"> <li>CMOS Battery Holder for easy Replacement</li> </ul>
<ul style="list-style-type: none"> <li>Flash Recovery with Video</li> </ul>	<ul style="list-style-type: none"> <li>5 Aux Power LED on System PCA</li> </ul>	<ul style="list-style-type: none"> <li>Processor ZIF Socket for easy Upgrade</li> </ul>
<ul style="list-style-type: none"> <li>Over-Temp Warning on Screen (Requires IM Agents)</li> </ul>	<ul style="list-style-type: none"> <li>Clear Password Jumper</li> </ul>	<ul style="list-style-type: none"> <li>DIMM Connectors for easy Upgrade</li> </ul>
<ul style="list-style-type: none"> <li>Restore CD</li> </ul>	<ul style="list-style-type: none"> <li>Clear CMOS Switch</li> </ul>	<ul style="list-style-type: none"> <li>NIC LEDs (integrated) (Green &amp; Amber)</li> </ul>

Serviceability Features of Chassis		
<ul style="list-style-type: none"> <li>Dual Color Power and HD LED - To Indicate Normal Operations and Fault Conditions</li> </ul>	<ul style="list-style-type: none"> <li>Color coordinated cables and connectors</li> </ul>	<ul style="list-style-type: none"> <li>Tool-less Hood Removal (thumbscrews for Microtower, spring-latch for Small Form Factor)</li> </ul>
<ul style="list-style-type: none"> <li>Front power switch</li> </ul>	<ul style="list-style-type: none"> <li>System memory can be upgraded upgraded on Microtower without removing any internal components</li> </ul>	<ul style="list-style-type: none"> <li>Tool-less Hard Drive, CD &amp; Diskette Removal</li> </ul>
Feature	Description	
ASF 2.0 support (Alert Standard Format)	Industry-standard specification for network alerting and remote control in operating system-absent environments	
Towerable	Product can be oriented as a tower (in addition to desktop orientation)	
Drive Self Tests (DPS)	<ul style="list-style-type: none"> <li>Drive Protection System</li> <li>A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user.</li> <li>Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced.</li> <li>The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures.</li> </ul>	
DPS Access through F10 Setup during Boot		
SMART IV Technology* (Self-Monitoring, Analysis and Reporting Technology)	<p>Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted</p> <ul style="list-style-type: none"> <li>Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count</li> <li>By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure</li> </ul>	

### Technical Specifications - Audio

<b>High Definition Audio</b>	<b>Type</b>	Integrated
	<b>High Definition Stereo Codec</b>	Yes – 4-channel ADI 1884 codec
	<b>Audio Jacks</b>	Front microphone-In (150-K ohm Input Impedance) Rear Line-In/Microphone input* (150-K ohm Input Impedance, function is configurable by audio driver) Rear Line-Out ** (190 ohms Output Impedance, expects at least a 10-K ohm load) Front Headphone-Out (0.5 Ohm Output Impedance, expects at least a 32 ohm load)
	<b>Multistreaming Capable</b>	Multistreaming can be enabled in the ADI control panel to allow independent audio streams to be sent to/from the front and rear jacks.
	<b>Sampling</b>	8 kHz – 192 kHz
	<b>Wavetable Syntheses (software)</b>	Yes – Uses OS soft wavetable
	<b>Analog Audio</b>	Yes
	<b>Number of Channels on Line-Out (mono/stereo)</b>	Stereo (Left & Right channels)
	<b>Internal Audio Speaker Power Rating</b>	1.5 W**
	<b>Internal Speaker</b>	Yes; ability to mute internal speaker through F10 Setup
	<b>External Speaker Jack (Line-Out)</b>	Yes**

\*Rear Line in audio port is re-taskable as Line-in or Microphone-in.

\*\*Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally.

### Technical Specifications - Communications

<b>Integrated Broadcom 5754 Gigabit Ethernet</b>	<b>Connector</b>	RJ-45
	<b>Controller</b>	Broadcom 5754 PCI-Express LAN Controller
	<b>Memory</b>	48KB receive and 8KB transmit on chip buffer memory
	<b>Data rates supported</b>	10/100/1000 Mbps
	<b>Compliance</b>	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	<b>Bus architecture</b>	PCI-E
	<b>Data path width</b>	Single channel, PCI-E
	<b>Data transfer mode</b>	Bus-master DMA
	<b>Hardware certifications</b>	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	<b>Power requirement</b>	1.33 watts @ +3.3V AUX supply with 5V tolerance
	<b>Boot ROM support</b>	Yes
	<b>Network transfer mode</b>	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver)
	<b>Network transfer rate</b>	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
	<b>Environmental</b>	<b>Operating temperature</b> 32° to 131°F (0° to 55° C) <b>Operating humidity</b> 85% at 131° F (55° C)
	<b>Management capabilities</b>	ASF 2.0, ACPI, WOL, PXE 2.1, Broadcom mgmt utility
	<b>Alerting</b>	ASF 2.0

<b>HP Wireless A+G PCI</b>	<b>Dimensions</b>	4.99 x 2.54 x 0.71 in (126.8 x 64.4 x 18.0 mm)
	<b>Weight</b>	0.268 lb (65 g)
	<b>Controller</b>	Atheros AR5414X chipset
	<b>system interface</b>	PCI Spec 2.2
	<b>Network standard</b>	IEEE 802.11a/b/g
	<b>Frequency band</b>	5.1500 to 5.8500 GHz 2.4000 to 2.4835 GHz 2.4465 to 2.4835 GHz (Europe, Middle East, Asia and Asia Pacific - excluding Japan) 2.4000 to 2.4697 GHz (Japan)
	<b>Operating temperature</b>	32° to 140° F (0° to 60° C), operating
	<b>Storage temperature</b>	-4° to 176° F (-20° to 80° C), non-operating
	<b>Humidity</b>	10% to 85% non-condensing
	<b>Operating voltage</b>	5V ± 5%
	<b>Power consumption</b>	Tx/Rx peak 560/250mA @ 3.3V (max.)
	<b>Output power</b> (approximately)	15 dBm ±2dB
	<b>Receive sensitivity</b>	-90dBm at 11 Mbps (typical)
	<b>Data transfer rate</b>	Standard rates of 1, 2, 5.5, 11, 6, 9, 12, 18, 24, 48, 54 and Super AG Mode108-Mbps

### Technical Specifications - Communications

<b>Spreading</b>	DSSS (Direct Sequence Spread Spectrum)
<b>Security</b>	64(40h) bit, 128(104h) bit, WPA, IEEE802.1X, AES-OCB, AES-CCM, Microsoft PEAP, TKIP, WEP.
<b>Antenna</b>	External 5dBi antenna
<b>Throughput</b>	108 Mbps (only with Belkin 54G or 200 ft (60.96 m) – Indoor above router that supports 108 Mbps speed)
	54 Mbps 200 ft (60.96 m) – Indoor
	11 Mbps 200 ft (60.96 m) – Indoor
<b>Certifications</b>	Wi-Fi certified
<b>Certifications for use by country</b>	North America: United States, Canada Europe: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom Australia New Zealand

### 2006 Agere PCI 56K International SoftModem

<b>Data Transmission</b>	Technology speeds: 56,000 Kbps maximum downstream data, controllerless
	<b>NOTE:</b> 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
<b>Data Speeds</b>	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
<b>Data Standards</b>	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis, V.32bis, Bell 212A, and Bell 103
<b>Fax Speeds</b>	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
<b>Fax Mode Capabilities</b>	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
<b>Error Correction and Data Compression</b>	V.44, 42bis, V.42 and MNP2-5
<b>Power Management</b>	ACPI; PPML 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
<b>Upgradeability</b>	Driver upgradeable for future enhancements
<b>Video</b>	ITU-T V.80 video ready interface
<b>Other</b>	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
<b>Operating Humidity</b>	20% to 90%, non-condensing
<b>Power</b>	Requires a 3.3-V auxiliary power rail on PCI bus Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
<b>Chipset</b>	Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support
<b>Dimensions (L X H)</b>	Complies with PCI low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
<b>Connection</b>	Single RJ-11 connector

### Technical Specifications - Communications

<b>Other Features</b>	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
<b>Safety</b>	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark)
<b>EMC</b>	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
<b>Telecom</b>	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
<b>Health</b>	Bare PCB material compliant to 94V-0 or better (marked as such)
<b>Other</b>	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

### Technical Specifications - Graphics

<b>Integrated AMD DX10 graphics</b>	<b>Bus Type</b>	PCIe x16
	<b>Memory</b>	Variable and User selectable in BIOS settings
	<b>Controller Clock Speed</b>	400MHz
	<b>Overlay Planes</b>	1
	<b>Maximum Color Depth</b>	32 bpp
	<b>Maximum Vertical Refresh Rate</b>	85Hz
	<b>Multi-display Support</b>	Yes
	<b>Graphics/Video API Support</b>	DX10, OpenGL 2.0
	<b>Integrated DVI-D connector</b>	Compliant with DDWG (Digital Display Working Group) and VESA specifications for a single-link digital DVI (DVI-D) connector.
	<b>Display Devices Supported</b>	HP L1530 HP L1740 HP L1755 HP L1940 HP L1955 HP L2035 HP L2335

<b>Resolutions Supported</b>	<b>Resolution</b>	<b>Maximum Refresh Rate (Hz)</b>	
		<b>Analog Connection</b>	<b>Digital Connection</b>
	640x480	85	60
	800x600	85	60
	1024x768	85	60
	1280x720	85	60
	1280x1024	85	60
	1440x900	75	60
	1600x1200	85	60
	1680x1050	75	60
	1920x1080	85	60-R
	1920x1200	85	60-R
	1920x1440	85	N/A
	2048x1536	75	N/A

**NOTE:** 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections

### Technical Specifications - Graphics

<b>NVIDIA GeForce 8400 GS (256 MB SH) PCIe x16 Graphics Controller</b>	<b>Bus type</b>	PCI Express (x16 lanes)		
	<b>Maximum vertical refresh rate</b>	85 Hz		
	<b>Display support</b>	Integrated 400 MHz RAMDAC		
	<b>Display max resolution</b>	2048 x 1536 (analog), 2560 x 1600 (digital)		
	<b>Input/Output connectors</b>	DVI-I (DVI port supports dual-link and HDCP) TV-out (4 pin S-video)		
	<b>Board display options</b>	DVI-I + TV DVI-I supports analog CRT or flat panel or digital flat panel (using DVI-A, DVI-D or DVI-I connector) DVI-I supports analog CRT or flat panel (with VGA connector and DVI-I to VGA dongle) TV connector is a 4-pin mini-DIN S-video connector		
	<b>Board configuration</b>	<b>Specification</b>	<b>Description</b>	
		Graphics Chip	NVIDIA P413-260	
		Core clock	460 MHz	
		Memory clock	200 MHz	
	Frame buffer	256 MB DDR2		
<b>Languages supported</b>	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish			
<b>System memory</b>	1GB of system memory required			
<b>Core power</b>	25 W (Max board power)			

#### NVIDIA GeForce 8400 GS (256 MB SH) PCIe x16 Graphics Controller display resolutions and refresh rates

**NOTE:** Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP.

Analog Resolution	Maximum Refresh Rate
640 x 480	85 Hz
800 x 600	85 Hz
1024 x 768	85 Hz
1280 x 1024	85 Hz
1600 x 1200	85 Hz
1920 x 1080	85 Hz
1920 x 1200	85 Hz
1920 x 1440	85 Hz
2048 x 1536	85 Hz
Digital Resolution	Maximum Refresh Rate
640 x 480	60 Hz
800 x 600	60 Hz
1024 x 768	60 Hz
1280 x 1024	60 Hz
1600 x 1200	60 Hz
1920 x 1200*	60 Hz
1920 x 1440**	60 Hz
2560 x 1600**	60 Hz

\* Reduced blanking timings used when connected to a single-link DVI monitor

\*\* Requires a dual-link DVI capable monitor



### Technical Specifications - Graphics

<b>ATI Radeon HD 2400XT (256MB DH) PCIe Graphics Card</b>	<b>Bus type</b>	PCI Express (x16 lanes)										
	<b>Maximum vertical refresh rate</b>	85 Hz										
	<b>Display support</b>	Integrated 400 MHz RAMDAC										
	<b>Display max resolution</b>	2560 x 1600 digital, 2048 x 1536 analog										
	<b>Board display options</b>	Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual DVI cable kit part number: DL139A. 4-pin mini-DIN S-video connector for TV output										
	<b>Board configuration</b>	<table border="0"> <thead> <tr> <th style="text-align: left;">Specification</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr> <td>Graphics Chip</td> <td>RV610</td> </tr> <tr> <td>Core clock</td> <td>650 MHz</td> </tr> <tr> <td>Memory clock</td> <td>500 MHz</td> </tr> <tr> <td>Frame buffer</td> <td>256 MB DDR2, 128 bit wide</td> </tr> </tbody> </table>	Specification	Description	Graphics Chip	RV610	Core clock	650 MHz	Memory clock	500 MHz	Frame buffer	256 MB DDR2, 128 bit wide
Specification	Description											
Graphics Chip	RV610											
Core clock	650 MHz											
Memory clock	500 MHz											
Frame buffer	256 MB DDR2, 128 bit wide											
	<b>Languages supported</b>	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish										
	<b>System memory</b>	1GB of system memory required										
	<b>Core power</b>	21 W										
	<b>Compliance standards</b>	EMC Emissions: a) FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use b) CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment c) Canadian Standard ICES-003 is equivalent to CISPR22 d) Taiwanese Standard BSMI e) Japanese VCCI f) Australian C-Tick g) Korean (MIC) EMC Immunity: CISPR 24:1997/EN 55024:1998 – Information Technology Equipment - Immunity Characteristics – Limits and Methods of Measurement.										

**ATI Radeon HD 2400XT (256MB DH) PCIe Graphics Card display resolutions and refresh rates**

**NOTE:** Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP.

### Technical Specifications - Graphics

<b>Analog Resolution</b>	<b>Maximum Refresh Rate</b>
640 x 480	85 Hz
800 x 600	85 Hz
1024 x 768	85 Hz
1280 x 1024	85 Hz
1600 x 1024	85 Hz
1600 x 1200	85 Hz
1920 x 1080	85 Hz
1920 x 1200	75 Hz
1920 x 1440	85 Hz
2048 x 1536	75 Hz
<b>Digital Resolution</b>	<b>Maximum Refresh Rate</b>
640 x 480	60 Hz
800 x 600	60 Hz
1024 x 768	60 Hz
1280 x 768	60 Hz
1280 x 1024	60 Hz
1600 x 1024	60 Hz
1600 x 1200	60 Hz
1920 x 1200	60 Hz
1920 x 1440	60 Hz
2560 x 1600	60 Hz

### Technical Specifications - Hard Drives

<b>7200 RPM Serial ATA Hard Drives</b>	<b>500-GB</b>	<b>Capacity</b>	500,107,862,016 bytes	
		<b>Height</b>	1 in (2.54 cm)	
		<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		<b>Interface</b>	Serial ATA (3.0 Gb/s)	
		<b>Synchronous Transfer Rate (Maximum)</b>	Up to 3 Gb/s	
		<b>Buffer</b>	16 MB	
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	2.0 ms
			<b>Average</b>	11 ms
			<b>Full-Stroke</b>	21 ms
		<b>Rotational Speed</b>	7,200 rpm	
		<b>Logical Blocks</b>	976,773,168	
		<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	
		<b>250-GB</b>	<b>Capacity</b>	250,059,350,016 bytes
		<b>Height</b>	1 in (2.54 cm)	
		<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		<b>Interface</b>	Serial ATA (3.0 Gb/s)	
		<b>Synchronous Transfer Rate (Maximum)</b>	Up to 3 Gb/s	
		<b>Buffer</b>	8 MB	
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	2.0 ms
			<b>Average</b>	11 ms
			<b>Full-Stroke</b>	21 ms
		<b>Rotational Speed</b>	7,200 rpm	
		<b>Logical Blocks</b>	488,397,168	
		<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	
	<b>160-GB</b>	<b>Capacity</b>	160,041,885,696 bytes	
		<b>Height</b>	1 in (2.54 cm)	
		<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		<b>Interface</b>	Serial ATA (3.0 Gb/s)	
		<b>Synchronous Transfer Rate (Maximum)</b>	Up to 3 Gb/s	
		<b>Buffer</b>	8 MB	
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	2.0 ms
			<b>Average</b>	11 ms
			<b>Full-Stroke</b>	21 ms
		<b>Rotational Speed</b>	7,200 rpm	
		<b>Logical Blocks</b>	312,581,808	
		<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	
	<b>80-GB</b>	<b>Capacity</b>	80,026,361,856 bytes	
		<b>Height</b>	1 in (2.54 cm)	

### Technical Specifications - Hard Drives

<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>	Serial ATA (3.0 Gb/s)	
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 3 Gb/s	
<b>Buffer</b>	8 MB	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	2.0 ms
	<b>Average</b>	11 ms
	<b>Full-Stroke</b>	21 ms
<b>Rotational Speed</b>	7,200 rpm	
<b>Logical Blocks</b>	156,301,488	
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	

#### 10,000 RPM Serial ATA 160-GB Hard Drives

<b>Capacity</b>	160,041,885,696 bytes	
<b>Height</b>	1 in (2.54 cm)	
<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>	Serial ATA (1.5 Gb/s), Native Command Queuing enabled	
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 1.5 Gb/s	
<b>Cache</b>	16 Mbytes	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.3 ms
	<b>Average</b>	4.6 ms
	<b>Full-Stroke</b>	10.2 ms
<b>Rotational Speed</b>	10,000 RPM	
<b>Logical Blocks</b>	312,581,808	
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	

#### 80-GB

<b>Capacity</b>	80,026,361,856 bytes	
<b>Height</b>	1 in (2.54 cm)	
<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>	Serial ATA (1.5 Gb/s), Native Command Queuing enabled	
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 1.5 Gb/s	
<b>Cache</b>	16 Mbytes	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.3 ms
	<b>Average</b>	4.6 ms
	<b>Full-Stroke</b>	10.2 ms
<b>Rotational Speed</b>	10,000 RPM	
<b>Logical Blocks</b>	156,301,488	
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	

### Technical Specifications - Input/Output Devices

<b>PS/2 Standard Keyboard</b>	<b>Physical characteristics</b>	<b>Keys</b>	104, 105, 106, 107, 109 layout (depending upon country)
		<b>Dimensions (L x W x H)</b>	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		<b>Weight</b>	2 lb (0.9 kg) minimum
	<b>Electrical</b>	<b>Operating voltage</b>	+ 5VDC ± 5%
		<b>Power consumption</b>	50-mA maximum (with three LEDs ON)
		<b>System interface</b>	PS/2 6-pin mini din connector
		<b>ESD</b>	CE level 4, 15-kV air discharge
		<b>EMI – RFI</b>	Conforms to FCC rules for a Class B computing device
	<b>Mechanical</b>	<b>Microsoft PC 99 – 2001</b>	Functionally compliant
		<b>Languages</b>	38 available
		<b>Keycaps</b>	Low-profile design
		<b>Switch actuation</b>	55-g nominal peak force with tactile feedback
		<b>Switch life</b>	20 million keystrokes (using Hasco modified tester)
		<b>Switch type</b>	Contamination-resistant switch membrane
		<b>Key-leveling mechanisms</b>	For all double-wide and greater-length keys
		<b>Cable length</b>	6 ft (1.8 m)
		<b>Microsoft PC 99 – 2001</b>	Mechanically compliant
	<b>Environmental</b>	<b>Acoustics</b>	43-dBA maximum sound pressure level
		<b>Operating temperature</b>	50° to 122° F (10° to 50° C)
		<b>Non-operating temperature</b>	-22° to 140° F (-30° to 60° C)
		<b>Operating humidity</b>	10% to 90% (non-condensing at ambient)
		<b>Non-operating humidity</b>	20% to 80% (non-condensing at ambient)
		<b>Operating shock</b>	40 g, six surfaces
		<b>Non-operating shock</b>	80 g, six surfaces
		<b>Operating vibration</b>	2-g peak acceleration
		<b>Non-operating vibration</b>	4-g peak acceleration
		<b>Drop (out of box)</b>	26 in (66 cm) on carpet, six-drop sequence
		<b>Drop (in box)</b>	42 in (107 cm) on concrete, 16-drop sequence
	<b>Approvals</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	<b>Ergonomic compliance</b>	ANSI HFS 100, ISO 9241-4, and TUVGS	

### Technical Specifications - Input/Output Devices

<b>HP USB 2-Button Laser Mouse</b>	<b>Scroll Wheel</b>	24	
	<b>Maximum Rotation Speed</b>	48 rats/sec	
	<b>Switch Type</b>	wheel	
	<b>Switch Life</b>	Button – 3,000,000 Wheel – 1,000,000 times Tilt switch – 500,000 times	
	<b>Environmental</b>	<b>Operating Temperature</b>	32° to 104° F (0° to 40° C)
		<b>Non-operating Temperature</b>	-4° to 140° F (-20° to 60° C)
		<b>Operating Humidity</b>	10% to 90% (non-condensing at ambient)
		<b>Non-operating Humidity</b>	20% to 80% (non-condensing at ambient)
		<b>Operating Shock</b>	40 g, six surfaces
		<b>Non-operating Shock</b>	80 g, six surfaces
<b>Operating Vibration</b>		2-g peak acceleration	
<b>Electrical</b>	<b>Non-operating Vibration</b>	4-g peak acceleration	
	<b>Operating Voltage</b>	+ 5VDC ± 5%	
	<b>Power Consumption</b>		
	<b>MTBF</b>	> 150,000 hrs	
	<b>ESD</b>	IEC-61000-4-2 criteria B, Contact discharge: +/- 4kV, Air discharge: +/- 8kV	
	<b>EMI-RFI</b>	FCC Class B	
	<b>PC98</b>	PC 99 Compliant	
<b>Mechanical</b>	<b>Resolution</b>	800dpi	
	<b>Tracking Speed</b>	25 cm/sec	
	<b>Acceleration</b>	0.5mm	
	<b>Switch Actuation</b>	0.6N (60gf)	
	<b>Switch Life</b>	Button – 3,000,000 Wheel – 1,000,000 times Tilt switch – 500,000 times	
	<b>Cable Length</b>	1850mm	
	<b>PC98-99</b>	PC99 compliant	
<b>Regulatory Approvals</b>	UL60950-1, UL 94, UL 746 (A-E), UL 796 TUV/GS: EN 60950-1, EN 60825-1 FCC Class B, UL 1950, cUL, TUV GS, CE, C-tick, VCCI, BSMI, RRL		

### Technical Specifications - Input/Output Devices

<b>HP PS/2 Optical Scroll Mouse</b>	<b>Dimensions (H x L x W)</b>	3.95 x 6.21 x 11.7 cm (1.56 x 2.44 x 4.61 in)	
	<b>Weight</b>	4.44 oz (126 g)	
<b>Environmental</b>	<b>Operating temperature</b>	32° to 104°F (0° to 40° C)	
	<b>Non-operating temperature</b>	-4° to 140°F (-20° to 60° C)	
	<b>Operating humidity</b>	10% to 90% (non condensing at ambient)	
	<b>Non-operating humidity</b>	10% to 90% non condensing	
	<b>Operating shock</b>	40 g, 6 surfaces	
	<b>Non-operating shock</b>	80 g, 6 surfaces	
	<b>Operating vibration</b>	2 g peak acceleration	
	<b>Non-operating vibration</b>	4 g peak acceleration	
	<b>Drop (out of box)</b>	80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face	
	<b>Electrical</b>	<b>Operating voltage</b>	5 VDC ± 10%
		<b>Power consumption</b>	100mA
		<b>System consumption</b>	PS/2 mini-din connector
		<b>ESD</b>	CE level 4, 15 kV air discharge
<b>EMI-RFI</b>		Conforms to FCC rules for a Class B computing device	
<b>Mechanical</b>	<b>Microsoft PC99 – 2001</b>	Functionally compliant	
	<b>Resolution</b>	400 ± 20% DPI	
	<b>Tracking speed</b>	10 in/s (25.4 cm/s) maximum	
	<b>Acceleration</b>	100 in/s/s (2.54 m/s/s)	
	<b>Switch actuation</b>	61 g nominal peak force	
	<b>Switch life</b>	3,000,000 operations (using Hasco modified tester)	
	<b>Switch type</b>	Low force micro-switches	
	<b>Tracking mechanism life</b>	155 mi (250 km) at average speed of 10 in/s	
	<b>Cable length</b>	6 ft (1.8 m)	
	<b>Microsoft PC99 – 2001</b>	Mechanically compliant	
<b>Scroll wheel</b>	<b>Width</b>	8 mm	
	<b>Diameter</b>	1.01 in (25.6 mm)	
	<b>Maximum rotation speed</b>	48 rats/sec	
	<b>Switch type</b>	Light force micro-switch	
	<b>Switch life</b>	1 million operations	
<b>Regulatory approvals</b>	<b>Mechanical life</b>	Minimum 200,000 revolutions	
	<b>Compliant</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	

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<b>HP USB Optical Scroll Mouse</b>	<b>Dimensions (H x L x W)</b>	1.5 x 4.5 x 2.5 in (3.8 x 11.6 x 6.3 cm)
	<b>Weight</b>	0.27 lb (0.12 kg)
	<b>Cable length</b>	72.8 in (185 cm)

### Technical Specifications - Optical Storage

<b>HP SATA SuperMulti LightScribe DVD Writer Drive</b>	<b>Height</b>	5.25-inch, half-height, tray-load																		
	<b>Orientation</b>	Either horizontal or vertical																		
	<b>Interface type</b>	SATA/ATAPI																		
	<b>Disc capacity</b>	8.5 GB DL or 4.7 GB standard																		
	<b>Dimensions (W x H x D)</b>	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)																		
	<b>Weight (max)</b>	2.6 lb (1.2 kg)																		
	<b>Write speeds</b>	<table border="0"> <tr><td><b>DVD-RAM</b></td><td>Up to 12X</td></tr> <tr><td><b>DVD+R</b></td><td>Up to 16X</td></tr> <tr><td><b>DVD+RW</b></td><td>Up to 8X</td></tr> <tr><td><b>DVD+R DL</b></td><td>Up to 8X</td></tr> <tr><td><b>DVD-R DL</b></td><td>Up to 8X</td></tr> <tr><td><b>DVD-R</b></td><td>Up to 16X</td></tr> <tr><td><b>DVD-RW</b></td><td>Up to 6X</td></tr> <tr><td><b>CD-R</b></td><td>Up to 48X</td></tr> <tr><td><b>CD-RW</b></td><td>Up to 32X</td></tr> </table>	<b>DVD-RAM</b>	Up to 12X	<b>DVD+R</b>	Up to 16X	<b>DVD+RW</b>	Up to 8X	<b>DVD+R DL</b>	Up to 8X	<b>DVD-R DL</b>	Up to 8X	<b>DVD-R</b>	Up to 16X	<b>DVD-RW</b>	Up to 6X	<b>CD-R</b>	Up to 48X	<b>CD-RW</b>	Up to 32X
<b>DVD-RAM</b>	Up to 12X																			
<b>DVD+R</b>	Up to 16X																			
<b>DVD+RW</b>	Up to 8X																			
<b>DVD+R DL</b>	Up to 8X																			
<b>DVD-R DL</b>	Up to 8X																			
<b>DVD-R</b>	Up to 16X																			
<b>DVD-RW</b>	Up to 6X																			
<b>CD-R</b>	Up to 48X																			
<b>CD-RW</b>	Up to 32X																			
	<b>Read speeds</b>	<table border="0"> <tr><td><b>DVD-RAM</b></td><td>Up to 12X</td></tr> <tr><td><b>DVD+RW, DVD-RW, DVD+R DL, DVD-R DL</b></td><td>Up to 8X</td></tr> <tr><td><b>DVD-ROM DL</b></td><td>Up to 8X</td></tr> <tr><td><b>DVD-ROM, DVD+R, DVD-R</b></td><td>Up to 16X</td></tr> <tr><td><b>CD-ROM, CD-R</b></td><td>Up to 48X</td></tr> <tr><td><b>CD-RW</b></td><td>Up to 32X</td></tr> </table>	<b>DVD-RAM</b>	Up to 12X	<b>DVD+RW, DVD-RW, DVD+R DL, DVD-R DL</b>	Up to 8X	<b>DVD-ROM DL</b>	Up to 8X	<b>DVD-ROM, DVD+R, DVD-R</b>	Up to 16X	<b>CD-ROM, CD-R</b>	Up to 48X	<b>CD-RW</b>	Up to 32X						
<b>DVD-RAM</b>	Up to 12X																			
<b>DVD+RW, DVD-RW, DVD+R DL, DVD-R DL</b>	Up to 8X																			
<b>DVD-ROM DL</b>	Up to 8X																			
<b>DVD-ROM, DVD+R, DVD-R</b>	Up to 16X																			
<b>CD-ROM, CD-R</b>	Up to 48X																			
<b>CD-RW</b>	Up to 32X																			
	<b>Access time</b> (typical reads, including settling)	<table border="0"> <tr><td><b>Random</b></td><td>DVD: &lt; 140 ms (typical), CD: &lt; 125 ms (typical)</td></tr> <tr><td><b>Full Stroke</b></td><td>DVD: &lt; 250 ms (seek), CD: &lt; 210 ms (seek)</td></tr> </table>	<b>Random</b>	DVD: < 140 ms (typical), CD: < 125 ms (typical)	<b>Full Stroke</b>	DVD: < 250 ms (seek), CD: < 210 ms (seek)														
<b>Random</b>	DVD: < 140 ms (typical), CD: < 125 ms (typical)																			
<b>Full Stroke</b>	DVD: < 250 ms (seek), CD: < 210 ms (seek)																			
	<b>Power</b>	<table border="0"> <tr><td><b>Source</b></td><td>SATA DC power receptacle</td></tr> <tr><td><b>DC Power Requirement</b></td><td>5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p</td></tr> <tr><td><b>DC Current</b></td><td>5 VDC (&lt; 1000 mA typical, 1600 mA maximum) 12 VDC (&lt; 600 mA typical, 1400 mA maximum)</td></tr> </table>	<b>Source</b>	SATA DC power receptacle	<b>DC Power Requirement</b>	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p	<b>DC Current</b>	5 VDC (< 1000 mA typical, 1600 mA maximum) 12 VDC (< 600 mA typical, 1400 mA maximum)												
<b>Source</b>	SATA DC power receptacle																			
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	<b>Environmental conditions</b> (operating – non-condensing)	<table border="0"> <tr><td><b>Temperature</b></td><td>41° to 122° F (5° to 50° C)</td></tr> <tr><td><b>Relative Humidity</b></td><td>10% to 90%</td></tr> <tr><td><b>Maximum Wet Bulb Temperature</b></td><td>86° F (30° C)</td></tr> </table>	<b>Temperature</b>	41° to 122° F (5° to 50° C)	<b>Relative Humidity</b>	10% to 90%	<b>Maximum Wet Bulb Temperature</b>	86° F (30° C)												
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<b>Relative Humidity</b>	10% to 90%																			
<b>Maximum Wet Bulb Temperature</b>	86° F (30° C)																			



### Technical Specifications - Optical Storage

<b>SATA CD-RW/DVD-ROM Combo Drive</b>	<b>Height</b>	5.25-inch, half-height, tray-load		
	<b>Orientation</b>	Either horizontal or vertical		
	<b>Interface type</b>	SATA/ATAPI		
	<b>Disc capacity</b>	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)		
	<b>Dimensions (W x H x D)</b>	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
	<b>Weight (max)</b>	2.6 lb (1.2 kg)		
	<b>Write speeds</b>	<b>CD-R</b>	Up to 48X	
		<b>CD-RW</b>	Up to 32X	
	<b>Read speeds</b>	<b>DVD+R/-R/+RW/-RW/+R DL /-R DL</b>	Up to 8X	
		<b>DVD-ROM</b>	Up to 16X	
		<b>CD-ROM, CD-R</b>	Up to 48X	
		<b>CD-RW</b>	Up to 32X	
		<b>Access time</b> (typical reads, including settling)	<b>Random</b>	DVD: < 140 ms (typical), CD: < 125 ms (typical)
	<b>Full Stroke</b>		DVD: < 250 ms (typical), CD: < 210 ms (typical)	
	<b>Power</b>	<b>Source</b>	SATA DC power receptacle	
		<b>DC Power Requirement</b>	5 VDC ± 5%-100 mV ripple p-p	
			12 VDC ± 5%-200 mV ripple p-p	
		<b>DC Current</b>	5 VDC (< 1000 mA typical, < 1600 mA maximum)	
	12 VDC (< 600 mA typical, < 1400 mA maximum)			
<b>Environmental</b> (all conditions non-condensing)	<b>Temperature</b>	41° to 122° F (5° to 50° C)		
	<b>Relative Humidity</b>	10% to 90%		
	<b>Maximum Wet Bulb Temperature</b>	86° F (30° C)		

<b>SATA DVD-ROM Drive</b>	<b>Height</b>	5.25-inch, half-height, tray-load			
	<b>Orientation</b>	Either horizontal or vertical			
	<b>Interface type</b>	SATA/ATAPI			
	<b>Disc capacity</b>	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)			
	<b>Dimensions (W x H x D)</b>	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)			
	<b>Weight (max)</b>	2.6 lb (1.2 kg)			
	<b>Read speeds</b>	<b>DVD+R/-R/+RW/-RW/+R DL /-R DL</b>	Up to 8X		
		<b>DVD-ROM</b>	Up to 16X		
		<b>DVD-RAM</b>	Up to 4X		
		<b>CD-ROM, CD-R</b>	Up to 48X		
		<b>CD-RW</b>	Up to 32X		
	<b>Removable Storage – Media Compatibility – DVD-ROM</b>	<b>Media</b>	<b>Read</b>	<b>Write</b>	
		<b>CD-ROM</b>	Yes	No	
		<b>CD-R</b>	Yes	No	
		<b>CD-RW</b>	Yes	No	

### Technical Specifications - Optical Storage

	<b>DVD-ROM</b>	Yes	No
	<b>DVD-ROM DL</b>	Yes	No
	<b>DVD-RAM</b>	Yes	No
	<b>DVD+R</b>	Yes	No
	<b>DVD+R DL</b>	Yes	No
	<b>DVD+RW</b>	Yes	No
	<b>DVD-R</b>	Yes	No
	<b>DVD-RW</b>	Yes	No
	<b>DVD-R DL</b>	Yes	No
<b>Access times</b> (typical reads, including setting)	<b>Random</b>	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
	<b>Full Stroke</b>	DVD: < 250 ms (seek), CD: < 210 ms (seek)	
	<b>Cache Buffer</b>	2 MB (minimum)	
	<b>Data Transfer Modes</b>	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)	
<b>Power</b>	<b>Source</b>	SATA DC power receptacle	
	<b>DC Power Requirement</b>	5 VDC $\pm$ 5%-100 mV ripple p-p 12 VDC $\pm$ 5%-200 mV ripple p-p	
	<b>DC Current</b>	5 VDC – <1000 mA typical, < 1600 mA maximum 12 VDC –< 600 mA typical, < 1400 mA maximum	
<b>Environmental</b> (all conditions non-condensing)	<b>Temperature</b>	41° to 122° F (5° to 50° C)	
	<b>Relative Humidity</b>	10% to 90%	
	<b>Maximum Wet Bulb Temperature</b>	86° F (30° C)	

### Technical Specifications - Removable Storage

<b>HP 16-in-1 Media Card Reader</b>	<b>USB Interface</b> <b>Advance protocol support</b>	USB 2.0 High-speed device Supports hardware ECC (Error Correction Code) function <ul style="list-style-type: none"><li>• Supports hardware CRC (Cyclic Redundancy Check) function</li><li>• Supports MS 4-bit parallel transfer mode</li><li>• Supports MS-PRO 4-bit parallel transfer mode</li><li>• Supports SD 4-bit parallel transfer mode</li><li>• Supports high-speed 50-MHz SD 4-bit card (version 1.1)</li><li>• Support high-speed 52-MHz MMC 8-bit card</li></ul>
	<b>Supported media type with card adapter</b>	<ul style="list-style-type: none"><li>• MicroSD (T-Flash)</li><li>• Memory Stick Micro</li></ul>
	<b>Mechanical</b>	
	<b>Environmental</b>	<b>Operational Environmental Extremes</b> Test Parameters/Conditions – Power applied, unit operating on system $\pm 5\%$ nominal supply voltage. 10°C 10% R.H. $\geq$ 24 hours 10°C 90% R.H. $\geq$ 24 hours 20°C 90% R.H. $\geq$ 24 hours 30°C 90% R.H. $\geq$ 24 hours 40°C 90% R.H. $\geq$ 24 hours 50°C 90% R.H. $\geq$ 24 hours 50°C 10% R.H. $\geq$ 24 hours
		<b>Storage Environmental Extremes</b> Test Parameters/Conditions 60°C @ 80% R.H. for 96 hours -30°C @ 20% R.H. for 48 hours No power applied Delta °C < 1.0°C/min Delta % R.H. < 1.5% R.H./min
	<b>Approvals</b>	USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.2 FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T

### Technical Specifications - Environmental Data

#### Eco-Label Certifications and declarations

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®
- US Federal Energy Management Program (FEMP)
- Taiwan Green Mark
- China Energy Conservation Program
- IT ECO declaration
- EPEAT™ Rated – GOLD
- Korea Eco-label
- Japan PC Green label\*

\* This product conforms to the examination standards (2003 version) under JEITA's 'PC Green Label System.'

#### Small Form Factor

##### System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Small Form Factor Desktop model is based on a typically configured product.

##### Energy Consumption

	<b>AC Input Voltage at 115 VAC +/- 5 VAC, 60 Hz +/- 3 Hz</b>	<b>AC Input Voltage at 230 VAC +/- 5 VAC, 50 Hz +/- 3 Hz</b>	<b>AC Input Voltage at 100 VAC +/- 5 VAC, 50 Hz +/- 3 Hz</b>
Normal Operation On-Idle (ENERGY STAR Idle (S0))	58.845 W	57.922 W	59.386 W
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Enabled)	3.5388 W	3.796 W	3.5329 W
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Disabled)	3.5041 W	3.7921 W	3.5187 W
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Enabled)	1.9653 W	2.2104 W	1.916 W
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Disabled)	1.0306 W	1.2865 W	1.0084 W

##### Heat Dissipation\*

	<b>AC Input Voltage at 115 VAC +/- 5 VAC, 60 Hz +/- 3 Hz</b>	<b>AC Input Voltage at 230 VAC +/- 5 VAC, 50 Hz +/- 3 Hz</b>	<b>AC Input Voltage at 100 VAC +/- 5 VAC, 50 Hz +/- 3 Hz</b>
Normal Operation On-Idle (ENERGY STAR Idle (S0))	200.779 BTU/hr	197.629 BTU/hr	202.625 BTU/hr
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Enabled)	12.074 BTU/hr	12.951 BTU/hr	12.054 BTU/hr
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Disabled)	11.955 BTU/hr	12.938 BTU/hr	12.005 BTU/hr
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Enabled)	6.705 BTU/hr	7.541 BTU/hr	6.537 BTU/hr

### Technical Specifications - Environmental Data

ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Disabled)	3.516 BTU/hr	4.389 BTU/hr	3.44 BTU/hr
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\* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

#### Declared Noise

##### Emissions

(in accordance with  
ISO 7779 and ISO 9296)

	<b>Sound Power</b> (LWAd, bels)	<b>Sound Pressure</b> (LpAm, decibels)
System Fan Off		
Idle	3.9	29
Fixed Disk (random writes)	3.9	29

#### Batteries

This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 2000ppm by weight.

Battery size: CR2032 (coin cell)

Battery type: Lithium

#### Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- 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 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% recycled materials (by wt.)
- This product is 93% recyclable when properly disposed of at end of life.

<b>Packaging Materials</b>		
Corrugated Paper		1915 g
EPE Foam		135 g
LDPE Bag		25 g

- The EPE foam packaging material is made from 30 to 60% industrial recycled content.
- The corrugated paper packaging materials contain at least 80% post consumer recycled content.

### Technical Specifications - Environmental Data

#### Minitower

**System Configuration** The configuration used for the Energy Consumption and Declared Noise Emissions data for the Minitower Desktop model is based on a typically configured product.

Energy Consumption	AC Input Voltage at 115 VAC	AC Input Voltage at 230 VAC	AC Input Voltage at 100 VAC
	+/- 5 VAC, 60 Hz +/- 3 Hz	+/- 5 VAC, 50 Hz +/- 3 Hz	+/- 5 VAC, 50 Hz +/- 3 Hz
Normal Operation On-Idle (ENERGY STAR Idle (S0))	61.772 W	58.107 W	59.222 W
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Enabled)	2.6393 W	3.0205 W	2.678 W
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Disabled)	2.6475 W	3.0336 W	2.7218 W
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Enabled)	1.2281 W	1.5847 W	1.3381 W
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Disabled)	0.7837 W	1.1556 W	0.8801 W
Heat Dissipation*	AC Input Voltage at 115 VAC	AC Input Voltage at 230 VAC	AC Input Voltage at 100 VAC
	+/- 5 VAC, 60 Hz +/- 3 Hz	+/- 5 VAC, 50 Hz +/- 3 Hz	+/- 5 VAC, 50 Hz +/- 3 Hz
Normal Operation On-Idle (ENERGY STAR Idle (S0))	210.766 BTU/hr	198.261 BTU/hr	202.065 BTU/hr
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Enabled)	9.005 BTU/hr	10.305 BTU/hr	9.137 BTU/hr
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Disabled)	9.033 BTU/hr	10.35 BTU/hr	9.286 BTU/hr
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Enabled)	4.19 BTU/hr	5.406 BTU/hr	4.565 BTU/hr
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Disabled)	2.673 BTU/hr	3.942 BTU/hr	3.002 BTU/hr

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

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

#### Declared Noise

##### Emissions

(in accordance with ISO 7779 and ISO 9296)

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.8	28
Fixed Disk (random writes)	4.2	30



### Technical Specifications - Environmental Data

#### Batteries

This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product **do not** contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 2000ppm by weight.

Battery size: CR2032 (coin cell)

Battery type: Lithium

#### 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% recycled materials (by wt.)
- This product is 93% recyclable when properly disposed of at end of life.

<b>Packaging Materials</b>	Corrugated Paper	1700 g
	EPE Foam	138 g
	LDPE Bag	50 g

- The EPE foam packaging material is made from 30 to 60% industrial recycled content.
- The corrugated paper packaging materials contains at least 80% post consumer recycled content.

#### Small Form Factor, Minitower

##### RoHS Compliance

Hewlett-Packard is committed to compliance with all applicable environmental laws and regulations, including the European Union Restriction of Hazardous Substances (RoHS) Directive. HP's goal is to exceed compliance obligations by meeting the requirements of the RoHS Directive on a worldwide basis. By July 1, 2006, RoHS substances were virtually eliminated (virtually = to levels below legal limits) for all HP electronic products subject to the RoHS Directive, except where it is widely recognized that there is no technically feasible alternative (as indicated by an exemption under the EU RoHS Directive).

##### Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at:

[http://www.hp.com/hpinfo/globalcitizenship/environment/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
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- 



### Technical Specifications - Environmental Data

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

#### Packaging

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.

#### 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/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>

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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