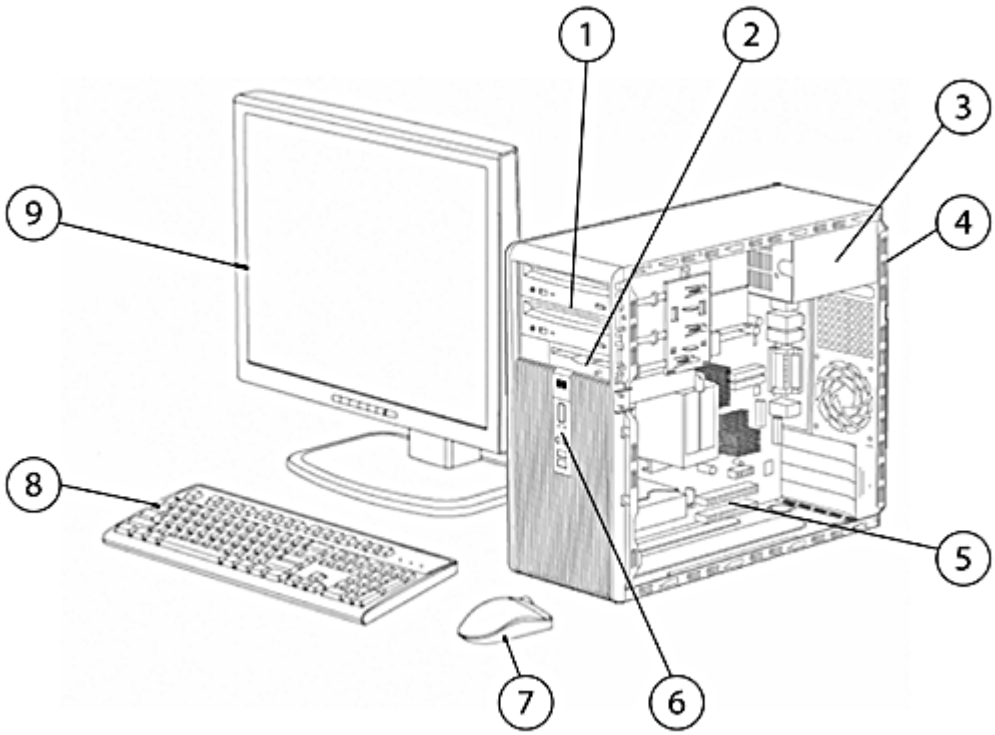
Overview

HP recommends
Windows Vista® Business

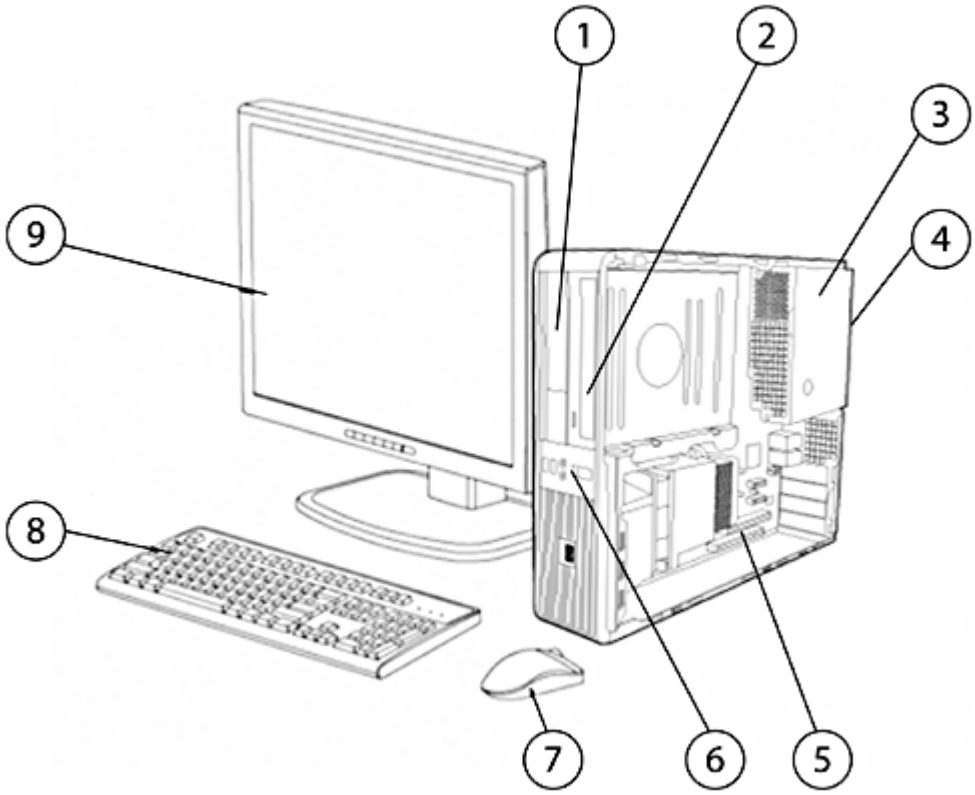
Microtower



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
   Optional: 85% efficient energy saving 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
   Optional: 85% efficient energy saving 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

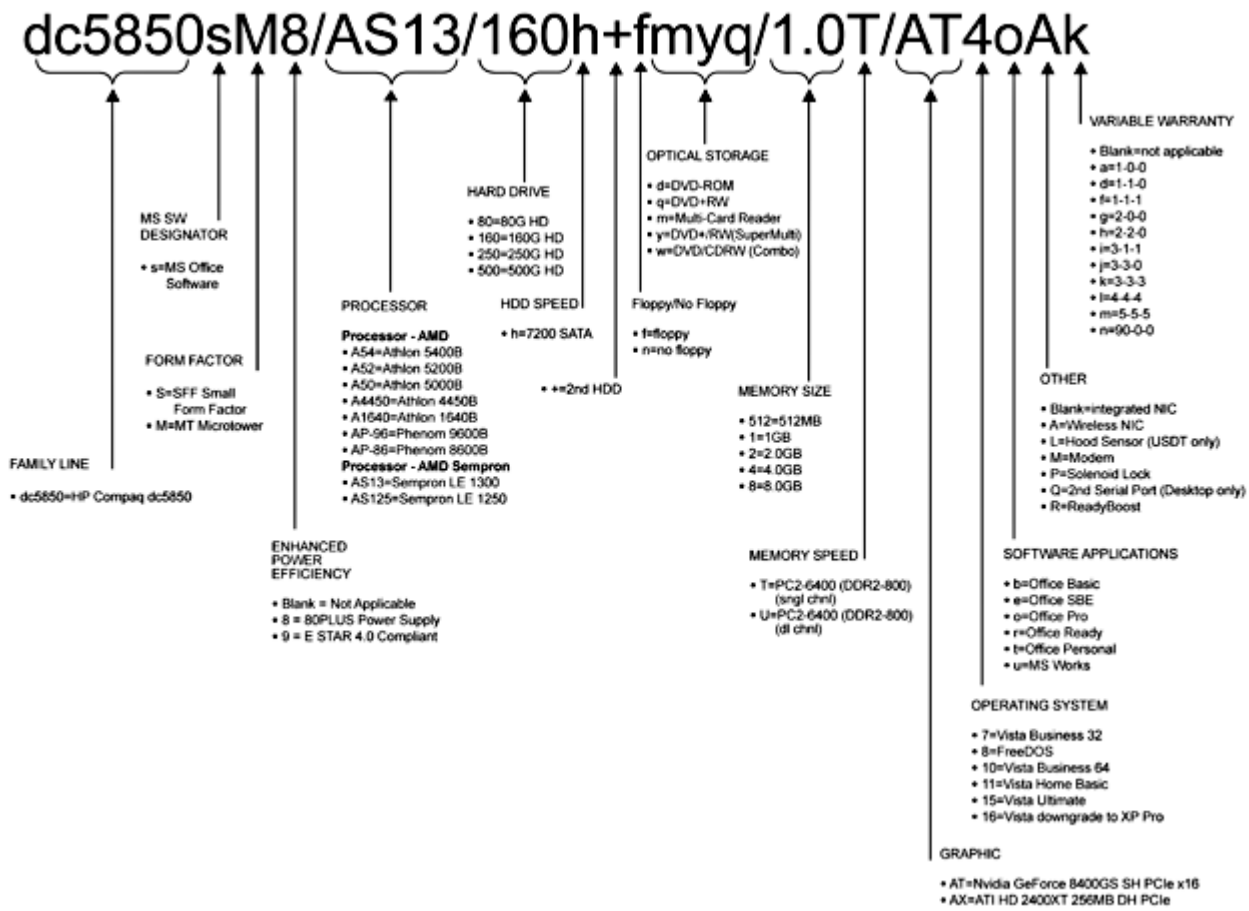
- The HP Compaq dc5850 offers a stable solution with mainstream features and flexibility that exceed basic business requirements
- AMD 780V chipset with integrated ATI Radeon 3100 graphics
- AMD Phenom™ Quad and Triple Core processors, AMD Athlon™ 64 X2 Dual Core processors, AMD Athlon 64 processors, 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 SoftPaq 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

Operating System – One of the following	**Preinstalled**	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
	Certified	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.

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

Value-added Software (available for free download from the Web http://www.hp.com/go/easydeploy)	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

Value-added Services and Features	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
Chassis Dimensions (H x W x D)	14.85 x 6.95 x 16.85 in (37.72 x 17.65 x 42.80 cm)	3.95 x 13.3 x 14.9 in (10.03 x 33.78 x 37.85 cm)
Optional Tower Stand Dimensions (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)
System weight*	20.42 lb (9.28 kg)	16.76 lb (7.62 kg)
System volume	1739 cu in	782.77 cu in
Shipping weight*	29.44 lb (13.38 kg)	25.08 lb (11.40 kg)
Maximum supported weight (desktop orientation)	77.1 lb (35 kg)	77.1 lb (35 kg)
Shipping box dimensions (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.

Power Supply	300W power supply – passive PFC	240W power supply - active PFC
Energy Efficient Power Supply	300W 85% efficient power supply – active PFC	240W 85% efficient power supply – active PFC
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	

Standard Features and Configurable Components

		MT	SFF
Chipset	AMD 780V chipset	X	X
Processor One of the following	**AMD Sempron Processors with HyperTransport™ Technology:**		
	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
	AMD Athlon Single-Core Processors with HyperTransport Technology:		
	AMD Athlon LE-1640B Processor (2.7-GHz, 512K L2 cache, HT bus 2.0)	X	X
	AMD Athlon Dual-Core Processors with HyperTransport Technology:		
	AMD Athlon X2 7750 Processor (2.7-GHz, 1MB L2 cache, 2 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Athlon X2 6000+ Processor (3.1-GHz, 1MB L2 cache, HT bus 3.0)	X	X
	AMD Athlon X2 5800+ Processor (3.0-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	AMD Athlon X2 5600B Processor (2.9-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	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 4850B Processor (2.5-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
	AMD Phenom Dual-Core Processors with HyperTransport Technology:		
	AMD Phenom II X2 550 Processor (3.1 GHz, 1 MB Dedicated L2 cache, 6 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom Triple-Core Processors with HyperTransport Technology:		
	AMD Phenom II X3 710 Processor, (2.6-GHz, 1.5 MB Dedicated L2 cache, 6 MB Shared L3 cache, HT bus 3.0)	X	X
	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
	AMD Phenom X3 8850B Processor (2.5-GHz, 1.5 MB Dedicated L2 cache, 2 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom Quad-Core Processors with HyperTransport Technology:		
	AMD Phenom II X4 805 Processor, (2.5-GHz, 2 MB Dedicated L2 cache, 4 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom II X4 810 Processor (2.6 GHz, 2 MB Dedicated L2 cache, 4 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom X4 9600B Processor (2.3-GHz, 2 MB Dedicated L2 cache, 2 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom X4 9850B processor (2.5 GHz, 2 MB Dedicated L2 cache, 2 MB Shared L3 cache, HT bus 3.0)	X	X

Standard Features and Configurable Components

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 16-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.

DIMM Size	Slot			
	Channel A		Channel B	
	4 (black)	**2** (white)	**3** (black)	**1** (white)
512-MB	512-MB			
1-GB	1-GB			
1-GB (dual-channel symmetric)	512-MB		512-MB	
2-GB (dual-channel symmetric)	1-GB		1-GB	
2-GB (dual-channel symmetric)	512-MB	512-MB	512-MB	512-MB
3-GB (dual-channel symmetric)	1-GB	512-MB	1-GB	512-MB
4-GB maximum (dual-channel symmetric)	1-GB	1-GB	1-GB	1-GB
8-GB maximum (dual-channel symmetric)	2-GB	2-GB	2-GB	2-GB
16-GB maximum (dual-channel symmetric)	4-GB	4-GB	4-GB	4-GB

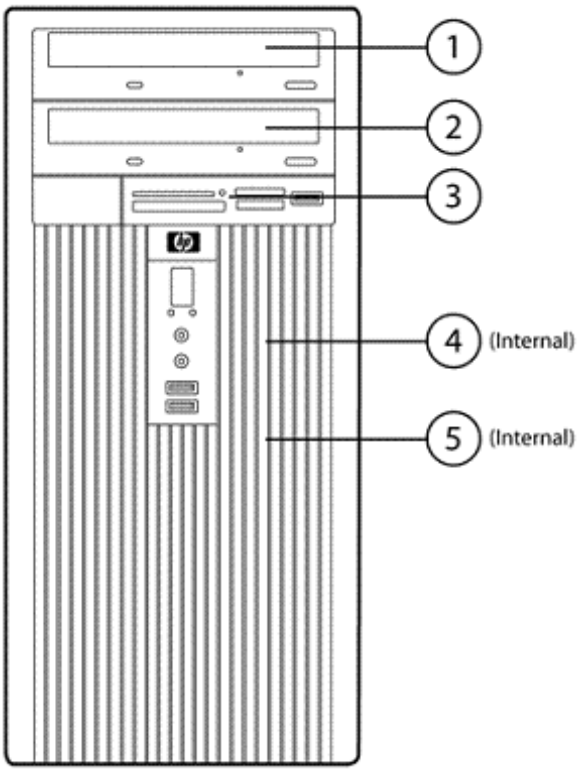
Standard Features and Configurable Components

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

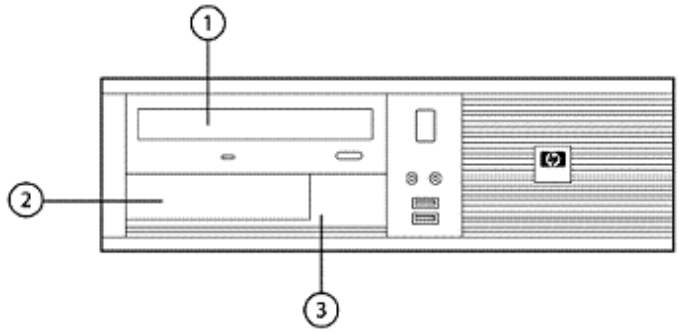
Expandability	**Microtower**	**Small Form Factor**
PCI slots	1 full-height	1 low-profile
Max power per slot	35W	35W
PCIe x1 slot	2	2
Max power per slot	10W	10W
PCIe x16 slot	1 full-height	1 low-profile
Max power per slot	60W	25W
External Bays		
3.5"	1	1
5.25"	2	1
IDE		
Internal 3.5" HDD Bays	2	1
Hard Drive Controller (SATA) **Supported**	SATA	SATA
Hard Drive Interfaces Supported	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
Hard Drive 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
	320-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	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, 320-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	
	2nd hard drive, 80-GB SATA 3.0-Gb/s Hard Drive (16MB Cache,10,000 RPM, NCQ, Smart III)	X	X
	2nd hard drive,160-GB SATA 3.0-Gb/s Hard Drive (16MB Cache, 10,000 RPM, NCQ, Smart III)	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[1]	X	X
	SATA CD-RW/DVD-ROM Combo Drive[1,2]	X	X
	SATA SuperMulti LightScribe DVD Writer Drive[1,2,3]	X	X
	HP SATA Blu-ray Writer	X	X
	NOTES: [1] For playing DVDs, InterVideo WinDVD 5 [2] For writing CDs, choice of Sonic/Roxio DigitalMedia Plus 7.2 (Windows XP only) or Easy Media Creator 9 [3] For writing CDs and DVDs, video editing and authoring DVDs, choice of Sonic/Roxio		

Standard Features and Configurable Components

	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
	HP 22-in-1 3.5” Media Card Reader	X	X
	HP 22-in-1 3.5” Media Card Reader with 1394	X	X
Security	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
	Optional USB Port Disable at factory (user configurable via BIOS)	X	X
	* TPM module disabled where use is restricted by law; for example, Russia.		
NIC	Integrated Broadcom Gigabit Ethernet (integrated on system board)	X	X
	Broadcom NetXtreme Gigabit Ethernet PCIe NIC Card	X	X
	Broadcom NetXtreme Plus Gigabit Ethernet PCIe NIC Card	X	X
Wireless	Wireless A+G PCI Card (full height bracket)	X	
	Wireless A+G PCI Card (low profile bracket)		X
	HP 802.11 b/g/n Wireless PCIe x1 card (full height bracket)	X	
	HP 802.11 b/g/n Wireless PCIe x1 card (low profile bracket)		X
Modem	2006 Agere PCI 56K International SoftModem (full height)	X	
	2006 Agere PCI 56K International SoftModem (low profile)		X
	LSI PCIe x1 Hi-Speed 56K International SoftModem	X	X
Graphics	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
	ATI Radeon HD 3470 256 SH PCIe x16 Graphics Card	X	X
	ATI Radeon HD 3650 (512MB DH) PCIe x16 Graphics Card	X	
	ATI Radeon HD 4550 Dual Head PCIe x16 Graphics Card	X	X
	HP DisplayPort to VGA Adapter	X	X

Standard Features and Configurable Components

Audio	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.		
Input Devices	**Keyboard** – One of the following		
	HP PS/2 Standard Keyboard	X	X
	HP USB Standard Keyboard	X	X
	HP USB PS2 Washable Keyboard	X	X
	Mouse – 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
Miscellaneous	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
Communications	**Wireless LAN**			
	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
	HP 802.11 b/g/n Wireless PCIe x1 card	X	X	FH971AA
	NICs			
	Broadcom NetXtreme Gigabit Ethernet PCIe NIC Card	X	X	EA833AA
	Intel PRO/1000 PT PCIe Gigabit NIC Card	X	X	EH352AA
	Modem			
	Agere 2006 PCI 56K International Modem	X	X	EK694AA
	LSI PCIe x1 Hi-Speed 56K International SoftModem	X	X	FH970AA
Graphics	**Single head solutions**			
	NVIDIA GeForce 8400 GS 256MB SH PCIe x16 Graphics Card*	X	X	GJ119AA
	ATI Radeon HD 3470 (256MB SH) PCIe x16 Graphics Card	X	X	FH972AA
	Multi head solutions			
	HP DMS59 DVI Dual-head Connector Cable	X	X	DY599A
	HP DVI to DVI Cable	X	X	DL139A
	HP DisplayPort to VGA Adapter	X	X	AS615AA
	ATI Radeon HD 3650 (512MB DH) PCIe x16 Graphics Card	X		KS505AA
	ATI Radeon HD 4550 Dual Head PCIe x16 Graphics Card	X	X	AT042AA
	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.			

After-Market Options (availability may vary by region)

Hard Drives	**Serial ATA Hard Drives**			
	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 320-GB SATA (NCQ/Smart IV) 3.0-Gb/s Hard Drive	X	X	NB505AV
	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
Input/Output Devices	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 PS2 Washable Keyboard	X	X	VF097AA#XXX
	HP 2.4 GHz Wireless Keyboard and Mouse	X	X	NB896AA#xxx
	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
Memory (DIMMs)	**PC2-6400 (DDR2, 800 MHz) DIMMs Non-ECC**			
	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
Monitors	All HP monitors are supported that accept a graphics output provided by this PC. The LP3065 monitor can be supported by installing a graphics card that supports a dual-link DVI-D output.			
Multimedia	HP USB Powered Speakers	X	X	RD628AA

After-Market Options (availability may vary by region)

Optical Drives	**DVD-ROM Drive**			
	HP SATA DVD-ROM Drive	X	X	AH047AA
	DVD Writer			
	HP SATA SuperMulti LightScribe DVD Writer Drive	X	X	GF343AA
	Blu-ray Writer			
	HP SATA Blu-ray Writer (carbonite)	X	X	AR481AA
	HP SATA Blu-ray Writer (black)	X	X	AR482AA
Removable Storage	**Diskette and Digital Drives**			
	HP 1.44-MB External USB Diskette Drive	X	X	DC141B
	HP 1.44-MB Internal Diskette Drive	X	X	AH053AA
	Multimedia			
	HP 16-in-1 Media Card Reader with PCI Card	X	X	EM718AA
Security	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 Smartcard Keyboard	X	X	ED707AA
Manageability	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	X	X	DR605A (use DR606A for 1000+ licenses)

After-Market Options (availability may vary by region)

	Altiris Software Delivery Solution Altiris Application Management Solution Altiris Patch Management Solution			
Brackets/Stands	HP 2007 SFF Tower Stand		X	GJ118AA
Miscellaneous Accessories	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
General Unit Operating Guidelines • 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. • Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow. • Never restrict airflow into the computer by blocking any vents or air intakes. • 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. • 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. • 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.		
Temperature Range	Operating: 50° to 95° F (10° to 35° C)* Non-operating: -22° to 140° F(-30° to 60° C)	
Relative Humidity	Operating: 10% to 90% (non-condensing at ambient) Non-operating: 5% to 95% (non-condensing at ambient)	
Maximum Altitude (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)	
*__NOTE:__ 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	
Power Supply	300-watt BTX power supply – Passive PFC 115v/230v line switch	300-watt 85% efficient* BTX power supply – Active PFC	240-watt BTX power supply – Active PFC 115v/230v line switch	240-watt 85% efficient* 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 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

NOTES:
* Energy efficient power supply is a requirement for ENERGY STAR qualification 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	Description
ACPI-Ready Hardware	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. 2.6	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	
• System/Emergency ROM	• Flash ROM	• CMOS Battery Holder for easy Replacement
• Flash Recovery with Video	• 5 Aux Power LED on System PCA	• Processor ZIF Socket for easy Upgrade
• Over-Temp Warning on Screen (Requires IM Agents)	• Clear Password Jumper	• DIMM Connectors for easy Upgrade
• Restore CD	• Clear CMOS Switch	• NIC LEDs (integrated) (Green & Amber)

Serviceability Features of Chassis		
• Dual Color Power and HD LED - To Indicate Normal Operations and Fault Conditions	• Color coordinated cables and connectors	• Tool-less Hood Removal (thumbscrews for Microtower, spring-latch for Small Form Factor)
• Front power switch	• System memory can be upgraded upgraded on Microtower without removing any internal components	• Tool-less Hard Drive, CD & Diskette Removal
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)	• Drive Protection System • 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. • 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. • 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.	
DPS Access through F10 Setup during Boot		
SMART IV Technology* (Self-Monitoring, Analysis and Reporting Technology)	Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted • Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count • By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure	

Technical Specifications - Audio

High Definition Audio	**Type**	Integrated
	High Definition Stereo Codec	Yes – 4-channel ADI 1884 codec
	Audio Jacks	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)
	Multistreaming Capable	Multistreaming can be enabled in the ADI control panel to allow independent audio streams to be sent to/from the front and rear jacks.
	Sampling	8 kHz – 192 kHz
	Wavetable Syntheses (software)	Yes – Uses OS soft wavetable
	Analog Audio	Yes
	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	1.5 W**
	Internal Speaker	Yes; ability to mute internal speaker through F10 Setup
	External Speaker Jack (Line-Out)	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

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

HP Wireless A+G PCI	**Dimensions**	4.99 x 2.54 x 0.71 in (126.8 x 64.4 x 18.0 mm)
	Weight	0.268 lb (65 g)
	Controller system interface	Atheros AR5414X chipset PCI Spec 2.2
	Network standard	IEEE 802.11a/b/g
	Frequency band	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)
	Operating temperature	32° to 140° F (0° to 60° C), operating
	Storage temperature	-4° to 176° F (-20° to 80° C), non-operating
	Humidity	10% to 85% non-condensing
	Operating voltage	5V ± 5%

Technical Specifications - Communications

	Power consumption	Tx/Rx peak 560/250mA @ 3.3V (max.)
	Output power (approximately)	15 dBM ±2dB
	Receive sensitivity	-90dBm at 11 Mbps (typical)
	Data transfer rate	Standard rates of 1, 2, 5.5, 11, 6, 9, 12, 18, 24, 48, 54 and Super AG Mode108-Mbps
	Spreading	DSSS (Direct Sequence Spread Spectrum)
	Security	64(40h) bit, 128(104h) bit, WPA, IEEE802.1X, AES-OCB, AES-CCM, Microsoft PEAP,TKIP, WEP.
	Antenna	External 5dBi antenna
	Throughput	108 Mbps (only with Belkin 54G or above router that supports 108 Mbps speed) — 200 ft (60.96 m) – Indoor
		54 Mbps — 200 ft (60.96 m) – Indoor
		11 Mbps — 200 ft (60.96 m) – Indoor
	Certifications	Wi-Fi certified
	Certifications for use by country	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

HP Wireless 802.11 b/g/n PCIe x1 Card	**Dimensions** (L x H)	3.3 x 4.7 inches (8.5 x 12 cm)	
	Weight	0.08 pounds (40 g)	
	Controller	Ralink RT2790	
	System interface	PCIExpress x1	
	Network standard	802.11 b/g/n	
	Frequency band	2.400 – 2.497 GHz	
	Operating temperature	14° to 149°F, operating (–10° to 65°C, operating)	
	Storage temperature	–40° to 176°F, non-operating (–40° to 80°C, non-operating)	
	Humidity	10–90% operating 5–95% non-operating	
	Operating voltage	3.3V +/- 9% 12V +/- 8%	
	Power consumption	**Platform/WLAN Mode**	Power Consumption
		Maximum Power Consumption	10 Watts
		Transmit Only	4 Watts maximum averaged power over 1 second
		Transmit Packet or Active Scanning	1000 mA peak current for 100 microseconds or longer

	Receive Only Mode or Idle without IEEE PSP mode enabled	3 Watts maximum averaged over 1 second	
	Idle, with IEEE PSP mode enabled	1.0 Watts maximum averaged over 1 second	
	Transmit Disabled (turned off in software)	50 mW maximum, averaged over 1 second	
	Platform in S3 or S4 (power removed from Low Profile PCI Express Card)	5 mW maximum, averaged over 1 second	
Output power (approximately)	**802.11b modes**	**802.11g modes**	**EWC modes**
	+19 dBm +/- 1.0 dB maximum	+17 dBm +/- 1.0 dB maximum	+17 dBm +/- 1.0 dB maximum (total power in all transmit chains)
Receive sensitivity	**Mode**	**Data rate**	**Sensitivity**
	802.11b	1 Mbps	-94 dBm
	802.11b	11 Mbps	-85 dBm
	802.11g	6 Mbps	-91 dBm
	802.11g	18 Mbps	-85 dBm
	802.11g	48 Mbps	-75 dBm
	802.11g	54 Mbps	-72 dBm
	EWC (2.4 GHz)	6.5 Mbps	-87 dBm
	EWC (2.4 GHz)	54 Mbps	-82 dBm
	EWC (2.4 GHz)	81 Mbps	-78 dBm
	EWC (2.4 GHz)	162 Mbps	-74 dBm
	EWC (2.4 GHz)	270 Mbps	-68 dBm
	EWC (2.4 GHz)	300 Mbps	-64 dBm
Data transfer rate	**Data Rate** (MCS)	**Minimum Throughput**	
	1 Mbps (802.11 b)	700 kbps	
	2 Mbps (802.11 b)	1.4 Mbps	
	5.5 Mbps (802.11 b)	3.5 Mbps	
	11 Mbps (802.11 b)	5.9 Mbps	
	12 Mbps (802.11 g)	6 Mbps	
	18 Mbps (802.11 g)	9 Mbps	
	24 Mbps (802.11 g)	12 Mbps	
	36 Mbps (802.11 g)	18 Mbps	
	48 Mbps (802.11 g)	21 Mbps	
	54 Mbps (802.11 g)	22.5 Mbps	
	6.5 Mbps (20 MHz EWC)	4.5 Mbps	
	13 Mbps (20 MHz EWC)	9 Mbps	
	19.5 Mbps (20 MHz EWC)	13.5 Mbps	
	26 Mbps (20 MHz EWC)	18 Mbps	

	39 Mbps (20 MHz EWC)	27 Mbps
	52 Mbps (20 MHz EWC)	36 Mbps
	58.5 Mbps (20 MHz EWC)	40 Mbps
	65 Mbps (20 MHz EWC)	45 Mbps
	78 Mbps (20 MHz EWC)	54 Mbps
	104 Mbps (20 MHz EWC)	72 Mbps
	117 Mbps (20 MHz EWC)	81 Mbps
	130 Mbps (20 MHz EWC)	91 Mbps
	13.5 Mbps (40 MHz EWC)	8 Mbps
	27 Mbps (40 MHz EWC)	16 Mbps
	40.5 Mbps (40 MHz EWC)	24 Mbps
	54 Mbps (40 MHz EWC)	32 Mbps
	81 Mbps (40 MHz EWC)	48 Mbps
	108 Mbps (40 MHz EWC)	64 Mbps
	121.5 Mbps (40 MHz EWC)	72 Mbps
	135 Mbps (40 MHz EWC)	81 Mbps
Security	• IEEE and WiFi compliant 64 / 128 bit WEP encryption • AES: CCM • 802.1x authentication • WPA: 802.1x. WPA-PSK and TKIP • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through V5	
Antenna	HP part number 497792-001	
Certifications	Wi-Fi certified	
Certifications for use by country	United States, Canada, Peru, Taiwan	
OS support	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. Red Hat Linux 7.2, Linux 7.3 and Red Hat Enterprise Linux 3 * Certain Windows Vista product features require advanced or additional hardware. 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. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.	
Option kit contents	PCIe x1 card with full height bracket, rf antenna, separate low profile bracket, software CD and warranty.	

Technical Specifications - Communications

2006 Agere PCI 56K International SoftModem	**Data Transmission**	Technology speeds: 56,000 Kbps maximum downstream data, controllerless **NOTE:** 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.
	Data Speeds	(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
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
	Power Management	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
	Upgradeability	Driver upgradeable for future enhancements
	Video	ITU-T V.80 video ready interface
	Other	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
	Operating Temperature	32° to 158° F (0° to 70° C)
	Operating Humidity	20% to 90%, non-condensing
	Power	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
	Chipset	Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support
	Dimensions (L X H)	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
	Connection	Single RJ-11 connector
	Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
	Safety	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
	EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
	Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
	Health	Bare PCB material compliant to 94V-0 or better (marked as such)
	Other	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

Technical Specifications - Communications

LSI PCIe x1 56K International SoftModem	**Data Transmission**	Technology speeds: 56,000 Kbps maximum downstream data, controllerless **NOTE:** 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.
	Data Speeds	(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
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
	Power Management	PCI Bus Power Management Interface Specification (PCI-PM) Revision 1.2, Appendix A. D0, D3hot, and D3cold. Wake on Ring state when in D3cold. If the power management event (PME) feature is enabled in D3cold, a modem can wake the system via WAKE# (WAKEN) or beacon. Meets PCI Express 1.1 standard.
	Upgradeability	Driver upgradeable for future enhancements
	Video	ITU-T V.80 video ready interface
	Other	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
	Operating Temperature	32° to 158° F (0° to 70° C)
	Operating Humidity	20% to 90%, non-condensing
	Power	Requires a 3.3-V auxiliary power rail on PCI express bus Uses only one PCI express load (i.e., one grant/request pair), one shared IRQ, one electrical load
	Chipset	LSI SV92EX – Integrated PCI interface with 3.3-V tolerant buffers and CardBus support
	Dimensions (L X H)	Complies with PCI express low profile specifications-—6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
	Connection	Single RJ-11 connector
	Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
	Safety	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
	EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
	Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
	Other	The SV92EX device is packaged in a 32-pin micro leadless chip carrier (MLCC). The SV92EX is fully compliant with the PCI Express revision 1.1 specification. WHQL approved; ASPM compliant.

Technical Specifications - Graphics

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

Resolutions Supported

Resolution	**Maximum Refresh Rate** (Hz)	
	Analog Connection	**Digital Connection**
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

NVIDIA GeForce 8400 GS (256 MB SH) PCIe x16 Graphics Controller	**Bus type**	PCI Express (x16 lanes)
	Maximum vertical refresh rate	85 Hz
	Display support	Integrated 400 MHz RAMDAC
	Display max resolution	2048 x 1536 (analog), 2560 x 1600 (digital)
	Input/Output connectors	DVI-I (DVI port supports dual-link and HDCP) TV-out (4 pin S-video)
	Board display options	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
	Board configuration	**Specification** / **Description**
		Graphics Chip / NVIDIA P413-260
		Core clock / 460 MHz
		Memory clock / 200 MHz
		Frame buffer / 256 MB DDR2
	Languages supported	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
	System memory	1GB of system memory required
	Core power	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.

Resolution	**Maximum Refresh Rate** (Hz)	
	Analog Connection	**Digital Connection**
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
2560x1600	N/A	60*

Technical Specifications - Graphics

* Only supported when using a dual-link DVI or DP connection
NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections

ATI Radeon HD 2400XT (256MB DH) PCIe Graphics Card	**Bus type**	PCI Express (x16 lanes)
	Maximum vertical refresh rate	85 Hz
	Display support	Integrated 400 MHz RAMDAC
	Display max resolution	2560 x 1600 digital, 2048 x 1536 analog
	Board display options	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
	Board configuration	**Specification** / **Description**
		Graphics Chip / RV610
		Core clock / 650 MHz
		Memory clock / 500 MHz
		Frame buffer / 256 MB DDR2, 128 bit wide
	Languages supported	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
	System memory	1GB of system memory required
	Core power	21 W
	Compliance standards	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

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
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
2560x1600	N/A	N/A

ATI Radeon HD 3470 (256MB SH) PCIe x16 Graphics Card

Bus type	PCI Express (x16 lanes)	
Maximum vertical refresh rate	85 Hz	
Display support	Integrated 400 MHz RAMDAC	
Display max resolution	2560 x 1600 digital, 2048 x 1536 analog	
Board display options	Supports two displays via the DisplayPort and DVI connectors	
Board configuration	**Specification**	**Description**
	Graphics Chip	RV620
	Core clock	750 MHz
	Memory clock	500 MHz
Frame buffer	256 MB DDR2, 64 bit wide	
Languages supported	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	
Operating systems support	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows XP Professional or Windows XP Home 32*.	
	* Certain Windows Vista product features require advanced or additional hardware. 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. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.	
	Linux x86 and x86_64 distributions using XFree86 or X.Org**.	
	** Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website:	

http://www.hp.com/wwsolutions/linux/products/clients/ for support information.

Core power	22 W (max)
Dimensions (H x D)	2.71 in x 6.60 in (68.90 mm x 167.65 mm)
Weight	0.30 lb (134.3 g)
Option kit contents	• ATI Radeon HD 3470 (256MB SH) PCIe x16 Graphics Card with full height bracket attached • DVI to VGA adapter • Software CD with graphics drivers • Low profile bracket to convert the card for using in a low profile chassis • Warranty documentation
Compliance standards	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 3470 (256MB SH) PCIe x16 Graphics Card display resolutions and refresh rates

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

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
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
2560x1600	N/A	60*

* Only supported when using a dual-link DVI or DP connection

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

ATI Radeon HD **Input/Output** DMS-59

Technical Specifications - Graphics

4550 DH PCIe x16 Graphics Card	**connectors**	S-video connector	
	Board display options	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	
	Board configuration	**Specification**	**Description**
		Graphics Chip	RV710
		Core clock	600 MHz
		Memory clock	800 MHz
		Frame buffer	256 MB DDR2, 64 bit wide
	Bus type	PCI Express (x16 lanes)	
	Maximum vertical refresh rate	85 Hz	
	Display support	Integrated 400 MHz RAMDAC	
	Display max resolution	1900 x 1200 digital, 2048 x 1536 analog	

ATI Radeon HD 4550 DH PCIe x16 Graphics Card display resolutions and refresh rates

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

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
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
2560x1600	N/A	N/A

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

Languages supported	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
Operating systems support	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows XP Professional or Windows XP Home 32*. * Certain Windows Vista product features require advanced or additional hardware. 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. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements. Linux x86 and x86_64 distributions using XFree86 or X.Org**.

	** Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website: http://www.hp.com/wwsolutions/linux/products/clients/ for support information.
Core power	21 W
Option kit contents	• ATI Radeon HD 4550 DH PCIe x16 Graphics Card with full height bracket attached • DMS 59 to dual VGA Y cable • Software CD with graphics drivers • Low profile bracket to convert the card for using in a low profile chassis • Warranty documentation
Compliance standards	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 (KCC) EMC Immunity: CISPR 24:1997/EN 55024:1998 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement.

HP DisplayPort to VGA Adapter	**Connectors**	DisplayPort and VGA connector
	Adapter length	8 in (20 cm)
	Adapter weight	.1 lbs (.06 kg)
	Option kit contents	HP DisplayPort to VGA Adapter, documentation
	Maximum vertical refresh rate	85 Hz
	Display support	162 MHz RAMDAC
	Display max resolution	1600x1200

HP DisplayPort to VGA adapter 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. Using the HP DisplayPort to VGA Adapter may require an update to the graphics driver installed on your system. To install the most up-to-date graphics driver go to: www.hp.com.

Resolution	Max refresh rate
640x480	85
800x600	85
1024x768	85
1280x720	85
1280x1024	85
1440x900	75
1600x1200	60
1680x1050	60
1920x1080	60-R
1920x1200	60-R

NOTE: 60-R denotes reduced blanking timings are used. Not all monitors support reduced blanking timing.

Technical Specifications - Hard Drives

7200 RPM Serial ATA Hard Drives	**500-GB**	**Capacity**	500,107,862,016 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
		Buffer	16 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2.0 ms
			Average	11 ms
			Full-Stroke	21 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	976,773,168	
		Operating Temperature	41° to 131° F (5° to 55° C)	
	320-GB	**Capacity**	320,072,933,376 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
		Buffer	16 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2.0 ms
			Average	11 ms
			Full-Stroke	21 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	625,142,448	
		Operating Temperature	41° to 131° F (5° to 55° C)	
	250-GB	**Capacity**	250,059,350,016 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2.0 ms
			Average	11 ms
			Full-Stroke	21 ms

Technical Specifications - Hard Drives

	Rotational Speed	7,200 rpm	
	Logical Blocks	488,397,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
160-GB	**Capacity**	160,041,885,696 bytes	
	Height	1 in (2.54 cm)	
	Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
	Interface	Serial ATA (3.0 Gb/s)	
	Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2.0 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	312,581,808	
	Operating Temperature	41° to 131° F (5° to 55° C)	
80-GB	**Capacity**	80,026,361,856 bytes	
	Height	1 in (2.54 cm)	
	Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
	Interface	Serial ATA (3.0 Gb/s)	
	Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2.0 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	156,301,488	
	Operating Temperature	41° to 131° F (5° to 55° C)	

Technical Specifications - Hard Drives

10,000 RPM Serial ATA Hard Drives	**160-GB**	**Capacity**	160,041,885,696 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (1.5 Gb/s), Native Command Queuing enabled	
		Synchronous Transfer Rate (Maximum)	Up to 1.5 Gb/s	
		Cache	16 Mbytes	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.3 ms
			Average	4.6 ms
			Full-Stroke	10.2 ms
		Rotational Speed	10,000 RPM	
		Logical Blocks	312,581,808	
		Operating Temperature	41° to 131° F (5° to 55° C)	
	80-GB	**Capacity**	80,026,361,856 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (1.5 Gb/s), Native Command Queuing enabled	
		Synchronous Transfer Rate (Maximum)	Up to 1.5 Gb/s	
		Cache	16 Mbytes	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.3 ms
			Average	4.6 ms
			Full-Stroke	10.2 ms
		Rotational Speed	10,000 RPM	
		Logical Blocks	156,301,488	
		Operating Temperature	41° to 131° F (5° to 55° C)	

Technical Specifications - Input/Output Devices

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

Technical Specifications - Input/Output Devices

HP USB PS2 Washable Keyboard	**Physical characteristics**	Keys	104 (US) Layout, 105 (EU) layout -- depending upon country
		Dimensions (L x W x H)	17.67x 6.62 x 1.38 in (449 x 168 x 35 mm)
		Weight	1.7 lb (0.77 kg) minimum
	Electrical	Operating voltage	+ 5VDC ±5%
		Power consumption	50-mA maximum (with three LEDs ON)
		System interface	USB Type A plug connector
		ESD	CE level 4, 15-kV air discharge
		EMI - RFI	Conforms to FCC rules for a Class B computing device
		Microsoft® PC 99 - 2001	Functionally compliant
	Mechanical	Keycaps	Stepped -profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	7 ft (2.2 m)
		Microsoft PC 99 - 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	-4° to 149° F (-20° to 65° C)
		Operating humidity	10% to 95% (non-condensing at ambient)
		Non-operating humidity	0% to 95% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals	UL, cUL, FCC, CE, TUV GS, VCCI, BSMI, C-Tick, KCC, USB-IF, WHQL, EN/IEC 60601-1, IP66/NEMA4X	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

Technical Specifications - Input/Output Devices

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

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

Technical Specifications - Input/Output Devices

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

Technical Specifications - Optical Storage

HP 16x SATA Blu-ray Writer	**Form Factor**	5.25-inch, half-height, tray-load		
	Orientation	Either horizontal or vertical		
	Interface type	SATA/ATAPI		
	Disc capacity	50 GB DL or 25 GB standard		
	Dimensions (W x H x D)	5.9 x 1.7 x 7.5 in (15.0 x 4.4 x 19.0 cm)		
	Weight (max)	2.0 lb (907g)		
			Single-layer	**Double-layer**
	Write speed	**BD-R**	2x, 4x CLV, 6x CAV	2x, 4x CLV
		BD-RE	2.3x	2x CLV
		DVD-R	2x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV	2x, 4x CLV
		DVD-RW	1x, 2x, 4x, 6x CLV	Not supported
		DVD+R	2.4x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV	2.4x, 4x CLV
		DVD+RW	2.4x, 4x, 6x CLV, 8x ZCLV	Not supported
		DVD-RAM	2x, 3x CLV, 3-5x PCAV	
		CD-R	8x,16x CLV, 24x, 32x PCAV, 40x CAV	
		CD-RW	4x, 10x, 16x CLV, 24x ZCLV	
			Single-layer	**Double-layer**
	Read speeds	**BD-ROM**	6x CAV	4.8x CAV
		BD-R	6x CAV	4.8x CAV
		BD-RE (SL/DL)	4.8x CAV	4.8x CAV
		DVD-ROM	16x CAV	8x CAV
		DVD-R	12x CAV	8x CAV
		DVD-RW	10x CAV	Not support
		DVD+R	12x CAV	8x CAV
		DVD+RW	10x CAV	Not support
		BDMV (AACS Compliant Disc)	4.8x CAV	
		DVD-RAM	2x, 3x CLV, 3x-5x PCAV	
		DVD-Video (CSS Compliant Disc)	8x CAV	
		CD-R/RW/ROM	40x / 40x / 40x CAV	
		CD-DA (DAE)	32x CAV	
		80 mm CD	16x CAV	
	Sustained Transfer rate	**BD-ROM**	215.79 Mbits/s (6x) max.	
		DVD-ROM	16.62 Mbytes/s (16x) max.	
		CD-ROM	6,000 KB/s (40x) max.	

Technical Specifications - Optical Storage

Burst Transfer rate		1.5Gbps bits/s (10b side) 1.2Gbps bits/s (8b side)
Multimedia MPC-3 compliant		Yes
Access times (typical reads, including setting)	**Random**	DVD: < 140 ms (typical), CD: < 125 ms (typical)
	Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)
Power	**Source**	SATA DC power receptacle
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
	DC Current	5 VDC -1000 mA typical, 1600 mA maximum 12 VDC -600 mA typical, 1400 mA maximum
Environmental (all conditions non-condensing)	**Temperature** (operating)	41° to 122° F (5° to 50° C)
	Relative Humidity (operating)	10% to 90%
	Maximum Wet Bulb Temperature (operating)	86° F (30° C)
Operating systems supported		Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. No driver is required for this device. Native support is provided by the operating system. * Certain Windows Vista product features require advanced or additional hardware. 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. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.
Option kit contents		HP 16x SATA Blu-ray Writer drive, the appropriate SATA cable for the drive, LightScribe software, Roxio Creator Business HD version 9, Corel WinDVD BD Software, installation guide, and DVD+R media.

Technical Specifications - Optical Storage

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

Technical Specifications - Optical Storage

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

SATA DVD-ROM Drive	**Height**	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	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)	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Read speeds	**DVD+R/-R/+RW/ -RW/+R DL /-R DL**	Up to 8X
		DVD-ROM	Up to 16X
		DVD-RAM	Up to 4X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X

Technical Specifications - Optical Storage

Removable Storage – Media Compatibility – DVD-ROM	**Media**	**Read**	**Write**
	CD-ROM	Yes	No
	CD-R	Yes	No
	CD-RW	Yes	No
	DVD-ROM	Yes	No
	DVD-ROM DL	Yes	No
	DVD-RAM	Yes	No
	DVD+R	Yes	No
	DVD+R DL	Yes	No
	DVD+RW	Yes	No
	DVD-R	Yes	No
	DVD-RW	Yes	No
	DVD-R DL	Yes	No
Access times (typical reads, including setting)	**Random**	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
	Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)	
	Cache Buffer	2 MB (minimum)	
	Data Transfer Modes	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)	
Power	**Source**	SATA DC power receptacle	
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p	
	DC Current	5 VDC – <1000 mA typical, < 1600 mA maximum 12 VDC –< 600 mA typical, < 1400 mA maximum	
Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)	
	Relative Humidity	10% to 90%	
	Maximum Wet Bulb Temperature	86° F (30° C)	

Technical Specifications - Removable Storage

HP 16-in-1 Media Card Reader	**USB Interface**	USB 2.0 High-speed device	
	Advance protocol support	Supports hardware ECC (Error Correction Code) function • Supports hardware CRC (Cyclic Redundancy Check) function • Supports MS 4-bit parallel transfer mode • Supports MS-PRO 4-bit parallel transfer mode • Supports SD 4-bit parallel transfer mode • Supports high-speed 50-MHz SD 4-bit card (version 1.1) • Support high-speed 52-MHz MultiMediaCard 8-bit card	
	Supported media type with card adapter	• MicroSD (T-Flash) • Memory Stick Micro	
	Mechanical		
	Environmental	**Operational Environmental Extremes**	Test Parameters/Conditions – Power applied, unit operating on system ±5% nominal supply voltage. 10°C 10% R.H. = 24 hours 10°C 90% R.H. = 24 hours 20°C 90% R.H. = 24 hours 30°C 90% R.H. = 24 hours 40°C 90% R.H. = 24 hours 50°C 90% R.H. = 24 hours 50°C 10% R.H. = 24 hours
		Storage Environmental Extremes	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
	Approvals	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	
HP 22-in-1 Media Card Reader (with 1394 port)	**USB Interface**	USB 2.0 High-speed interface **NOTE:** Requires the USB cable to be connected to the internal USB 2.0 port or a USB 2.0 PCI card.	
	1394 Interface	Two IEEE-1394a external ports; 1 IEEE-1394a internal port (connects to the pass through cable on the media card reader)	
	Advance protocol support	• Supports hardware ECC (Error Correction Code) function • Supports hardware CRC (Cyclic Redundancy Check) function • Supports MS 4-bit parallel transfer mode • Supports MS-PRO 4-bit parallel transfer mode • Supports MS PRO-HG Duo 4-bit parallel transfer mode • Supports SD 4-bit parallel transfer mode • Supports high-speed 50Mhz SD 4-bit card (version 2.0) • Supports high-speed 52Mhz MultiMediaCard 8-bit card (version 4.2) • Supports CF v4.0 with PIO mode 6 and Ultra DMA mode	

Technical Specifications - Removable Storage

Supported media type	• CompactFlash Type I • CompactFlash Type II • Microdrive • MultiMediaCard • Reduced Size MultiMediaCard (RS MultiMediaCard) • MultiMediaCard 4.2 (MultiMediaCard Plus, including MultiMediaCard Plus HC) • Reduced Size MultiMediaCard 4.2 (MultiMediaCard Mobile, including MultiMediaCard Mobile HC) • Secure Digital Card (SD) • Secure Digital High Capacity (SDHC) • miniSD • miniSD High Capacity • Micro SD (T-Flash) • Micro SD HC • Memory Stick • Memory Stick Select • Memory Stick Duo (MS Duo) • Memory Stick PRO (MS PRO) • Memory Stick PRO Duo (MS PRO Duo) • Memory Stick PRO-HG Duo • MagicGate Memory Stick (MG) • MagicGate Memory Stick Duo • Picture Card	
Supported media type with card adapter	• Memory Stick Micro (M2) • MultiMedia Card Micro	
Environmental	**Operational Environmental Extremes**	Test Parameters/Conditions - Power applied, unit operating on system ±5% nominal supply voltage. 10°C 10% R.H. = 24 hours 10°C 90% R.H. = 24 hours 20°C 90% R.H. = 24 hours 30°C 90% R.H. = 24 hours 40°C 90% R.H. = 24 hours 50°C 90% R.H. = 24 hours 50°C 10% R.H. = 24 hours
	Storage Environmental Extremes	Test Parameters/Conditions 140°F (60°C) @ 80% R.H. for 96 hours -22°F (-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
Approvals	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. 1.3 FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T	

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	**AC Input Voltage at 115 VAC +/- 5 VAC, 60 Hz +/- 3 Hz**	**AC Input Voltage at 230 VAC +/- 5 VAC, 50 Hz +/- 3 Hz**	**AC Input Voltage at 100 VAC +/- 5 VAC, 50 Hz +/- 3 Hz**
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*	**AC Input Voltage at 115 VAC +/- 5 VAC, 60 Hz +/- 3 Hz**	**AC Input Voltage at 230 VAC +/- 5 VAC, 50 Hz +/- 3 Hz**	**AC Input Voltage at 100 VAC +/- 5 VAC, 50 Hz +/- 3 Hz**
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

* 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)
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
- 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.

Packaging Materials		
	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 +/- 5 VAC, 60 Hz +/- 3 Hz**	**AC Input Voltage at 230 VAC +/- 5 VAC, 50 Hz +/- 3 Hz**	**AC Input Voltage at 100 VAC +/- 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 +/- 5 VAC, 60 Hz +/- 3 Hz**	**AC Input Voltage at 230 VAC +/- 5 VAC, 50 Hz +/- 3 Hz**	**AC Input Voltage at 100 VAC +/- 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
- 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.

Packaging Materials

	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):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde

Technical Specifications - Environmental Data

- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- 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