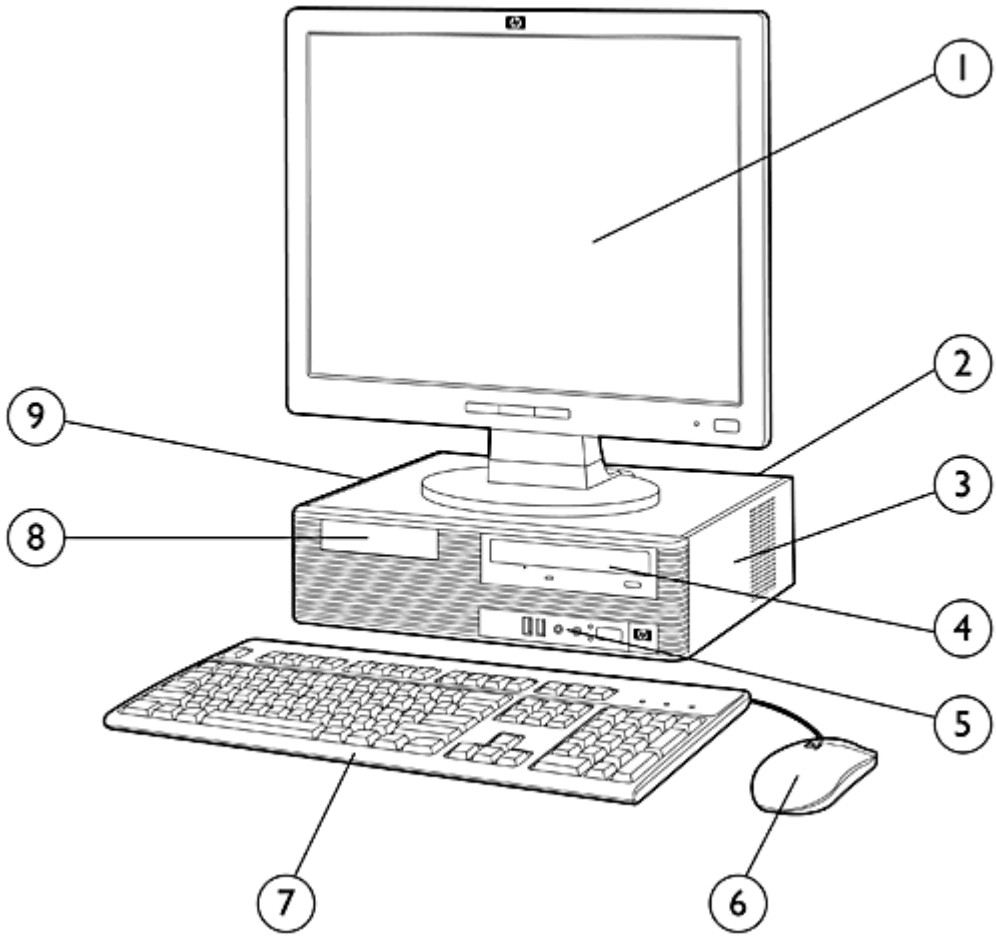
Overview

HP recommends
Windows Vista® Business

Small Form Factor



1. Monitor (sold separately)
2. 180-watt max power supply
3. (1) full-height PCI 2.3 slot, (2) PCIe x1 slots, (1) PCIe x16 slot
4. (1) external 5.25" drive bays for optional optical drives; (1) external 3.5" drive bay for optional media reader or diskette drive
5. (2) USB 2.0 ports, audio ports
6. PS/2 Scroll Mouse
7. HP Standard Keyboard
8. (1) internal 3.5" drive bays
9. (6) USB 2.0 ports, (1) serial port, (1) optional second serial port, (1) parallel port, (2) PS/2, (1) RJ-45, (1) VGA, (1) audio in – (1) audio out – (1) MIC

Overview

At A Glance

- Intel® Core™ 2 Duo processors, Intel Pentium® dual-core processors, Intel Celeron® processors
- Choice of operating systems:
  - Genuine Windows Vista Business 32
  - Genuine Windows Vista Business 64
  - Genuine Windows Vista Home Basic 32
  - Genuine Windows Vista Business 32 downgrade to Genuine Windows XP Professional 32
  - Genuine Windows Vista Ultimate
  - Genuine Windows XP Professional
  - Red Flag Linux (China Only)
  - FreeDOS (not available in China)
- Intel Q33 Express Chipset
- Intel I/O Controller Hub 9 (ICH9)
- Intel Graphics Media Accelerator 3100
- PCI Express I/O bus
- Serial ATA controller
- Broadcom NetLink BCM5786 GbE Network Connection
- Choice of hard drives and optical drives
- DDR2 SDRAM system memory
- Protected by HP Services. Terms and conditions vary by country. Certain restrictions and exclusions apply.

Standard Features and Configurable Components

Processor and Speed One of the following	**Intel Celeron Processors:** Intel Celeron 420 Processor (1.60-GHz, 512-KB L2 cache, 800-MHz FSB) Intel Celeron 430 Processor (1.80-GHz, 512-KB L2 cache, 800-MHz FSB) Intel Celeron 440 Processor (2.00-GHz, 512-KB L2 cache, 800-MHz FSB) Intel Celeron 450 Processor (2.2-GHz, 512K L2 cache, 800-MHz FSB) **Intel Celeron Dual-Core Processors** Intel Celeron Dual-Core E1200 Processor (1.6-GHz, 512K L2 cache, 800-MHz FSB) Intel Celeron Dual Core E1500 Processor (2.2-GHz, 512K L2 cache, 800-MHz FSB) **Intel Pentium dual-core Processors:** Intel Pentium dual-core E2140 Processor (1.6-GHz, 1-MB L2 cache, 800-MHz FSB) Intel Pentium dual-core E2160 Processor (1.8-GHz, 1-MB L2 cache, 800-MHz FSB) Intel Pentium dual-core E2200 Processor (2.2-GHz, 1-MB L2 cache, 800-MHz FSB) Intel Pentium dual-core E5200 processor (2.50 GHz, 2 MB L2 cache, 800 MHz FSB) Intel Pentium dual-core E5300 Processor (2.6-GHz, 2MB L2 cache, 800-MHz FSB) **Intel Core 2 Duo Processors:** Intel Core 2 Duo E4400 Processor (2.0-GHz, 2 MB L2 cache, 800-MHz FSB) Intel Core 2 Duo E4500 Processor (2.13-GHz, 2 MB L2 cache, 800-MHz FSB) Intel Core 2 Duo E4600 Processor (2.40-GHz, 2-MB L2 cache, 800-MHz FSB) Intel Core 2 Duo E6320 Processor (1.86-GHz, 4 MB L2 cache, 800-MHz FSB) Intel Core 2 Duo E6420 Processor (2.13-GHz, 4 MB L2 cache, 800-MHz FSB) Intel Core 2 Duo E6550 Processor (2.33-GHz, 4 MB L2 cache, 1333-MHz FSB) Intel Core 2 Duo E6750 Processor (2.66-GHz, 4 MB L2 cache, 1333-MHz FSB) Intel Core 2 Duo E6850 Processor (3.0-GHz, 4 MB L2 cache, 1333-MHz FSB) Intel Core 2 Duo E7300 Processor (2.66 GHz, 3 MB L2 cache, 1066 MHz FSB) Intel Core 2 Duo E7400 Processor (2.80-GHz, 3 MB L2 cache, 1066-Mhz FSB) Intel Core 2 Duo E8600 processor (3.33 GHz, 6 MB L2 cache, 1333 MHz FSB) **NOTE:** Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

Standard Features and Configurable Components

Operating Systems and Application Software (availability varies by region)

Genuine Windows Vista Business 32*
Genuine Windows Vista Business 64*
Genuine Windows Vista Home Basic 32*
Genuine Windows Vista Business 32 downgrade to Genuine Windows XP Professional 32*+
Genuine Windows Vista Ultimate*
Genuine Windows XP Professional SP3
Red Flag Linux (China Only)
Free DOS† (not available in China)

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

+ Windows Vista Business disk also included for future upgrade if desired. To qualify for this downgrade an end user must be a business (including governmental or educational institutions) and is expected to order annually at least 25 customer systems with the same custom image.

† The following features are not supported by Linux:

- HP Media Card Reader
- Intel PRO/1000 PT PCIe Gigabit NIC
- Intel VT-x
- Wireless A+G PCI Card
- Agere 2006 PCI 56K International SoftModem
- ATI Radeon HD 2400XT 256MB Dual Head graphics adapter (PCIe x16)
- NVIDIA GF 8400 GS 256MB single head graphics adapter
- NVIDIA GF 8400 GS 256MB dual head graphics adapter
- HP 2nd Serial Port
- HP FireWire / IEEE 1394 PCI Card

Microsoft Office 2007 Basic
Microsoft Office 2007 Small Business
Microsoft Office 2007 Professional
Microsoft Works 8.5
HP Backup and Recovery Manager
HP Power Manager 2.0

Roxio Easy Media Creator 9.1**
Intervideo WinDVD Player**
Symantec AntiVirus 10
Sun Java Runtime Environment
AOL Toolbar

** Supporting software available with certain optical drive configurations

Standard Features and Configurable Components

Hard Drives	80-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm) 160-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm) 250-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm) 320-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm)
System Memory	256-MB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (1 x 256-MB) **NOTE:** 256-MB configurations not supported by Windows Vista 512-MB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (1 x 512-MB) 1-GB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (1 x 1-GB) 2-GB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (2 x 1-GB) 3-GB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (3 x 1-GB) 4-GB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (2 x 2-GB) 4-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (4 x 1-GB) 512-MB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (1 x 512-MB) 1-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (1 x 1-GB) 1-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (2 x 512MB) 2-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (1 x 2-GB) 2-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (2 x 1-GB) 4-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (2 x 2-GB) 4-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (4 x 1-GB) 8-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (4 x 2-GB) **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.
Storage – One or more of the following (see Storage section below)	**Diskette Drive** 1.44-MB Diskette Drive **Media Reader** HP 16-in-1 Media Reader and additional USB 2.0 port HP 22-in-1 Media Card Reader HP 22-in-1 Media Card Reader with 1394 port **Optical Drives (Serial ATA)** SATA CD-ROM drive (available in APJ only; not supported by Windows Vista) SATA DVD-ROM Drive SATA CD-RW/DVD-ROM Combo Drive (not supported by Windows Vista) SATA SuperMulti LightScribe DVD Writer Drive

Standard Features and Configurable Components

Input Devices	**Keyboard – One of the following** HP PS/2 Standard Keyboard HP USB Standard Keyboard **Mouse – One of the following** PS/2 2-Button Scroll Mouse PS/2 2-Button Optical Scroll Mouse USB 2-Button Optical Scroll Mouse
Audio	Realtek ALC888 High Definition audio codec 3D audio compliant with AC'97 Rev. 2.3 and HD Audio compatible Internal PC speaker
Communication	Intel PRO/1000 PT Gigabit PCIe Adapter (half height) Broadcom NetLink BCM5786 GbE Network Connection Agere 56K PCI Modem
Graphics	Intel Graphics Media Accelerator 3100 NVIDIA GeForce 8400 GS Dual Head graphics adapter (PCIe x1) NVIDIA GeForce 8400 GS Single Head graphics adapter (PCIe x16)* ATI Radeon HD 2400XT 256MB Dual Head graphics adapter (PCIe x16) ATI Radeon 3470 256MB Single Head graphics adapter (PCIe x16) HP ADD2 SDVO PCIe DVI-I/TV-Out Adapter HP DisplayPort To DVI-D Adapter * 1GB of system memory required. Graphics cards use part of the total system memory to enhance graphics performance.
Miscellaneous	HP FireWire / IEEE 1394 PCI Card (half height)

System Details

Base Unit

- Micro ATX Small Form Factor chassis, including power supply and front bezel
- Three (3) drive bays and four expansion slots
- Microsoft operating system CD
- Active type heatsink
- System board with Intel Q33 Express chipset, Intel I/O Controller Hub 9 (ICH9), Broadcom NetLink BCM5786 GbE Network Connection, Intel GMA graphics, and Realtek audio, 1 half-height PCI 2.3 slot, 2 PCI Express x1 slots, 1 PCI Express x16 slot, 4 DDR2 DIMM memory slots
- (4) Serial ATA data connectors
- Product documentation on CD
- HP system restore CD
- Power cord

Slots	**PCI**	One (1) half-height PCI 2.3 slot on PCA Two (2) half-height PCI Express x1 slots on PCA One (1) half-height PCI Express x16 slot on PCA (for graphic cards)
	Memory Expansion	Four (4) DDR2 SDRAM DIMM slots (8 GB maximum memory support) **NOTE:** Addressing memory above 4 GB requires a 64-bit operating system.
Bays	**Internal**	One (1) 3.5”
	External	One (1) 5.25” One (1) 3.5”
USB Support	EHCI high-speed USB 2.0 controller Two (2) front ports; Six (6) rear ports, Two (2) internal ports on motherboard	
Interfaces (Legacy)	One (1) parallel port One (1) serial port One (1) optional second serial port One (1) PS/2 keyboard port One (1) PS/2 mouse port One (1) analog VGA video port One (1) line in; one (1) line out; one (1) mic in One (1) RJ-45 network port	
Weight & Dimensions	**Chassis Dimensions** (H x W x D)	3.86 x 13.19 x 15.23 in (98 x 335 x 387 mm)
	Packaged Dimensions (L x W x H)	23.38 x 19.68 x 9.0 in (593.8 x 500.0 x 228.6 mm)
	System Weight	14.96 lb (6.79 kg)
	Shipping Weight	23.00 lb (10.43 kg)

System Details

Technology and Features	**Memory Type**	PC2-5300 DDR2 SDRAM (667-MHz) non-ECC or PC2-6400 DDR2 SDRAM (800MHz) non-ECC Up to 8-GB system memory standard **NOTE:** Addressing memory above 4 GB requires a 64-bit operating system.
	Hard Drive Interfaces Supported	Serial ATA
Chassis	**Front Panel**	Power button Power On LED HDD Activity LED
	Cooling Solutions Supported	Active heatsink (variable speed)
	Slots Supported	Four (4) half-height expansion slots
	Front I/O	Two (2) USB 2.0 ports
	Rear I/O	Standard Micro ATX I/O connectors, including six (6) USB 2.0 ports
	Drive Bays	One (1) 5-1/4” external One (1) 3-1/2” external One (1) 3-1/2” internal
	Internal Speaker	Standard
	Security	Padlock loop Kensington Lock Support
	Power Supply	180-watt ATX Power Supply – PFC (varies by country/region)

Unit Environment and Operating Conditions

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 4 in (10.2 cm) 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 (9000 m)

System Details

NOTE: Operating temperature is de-rated 1.0 deg C per 1000 ft (300 m) to 10,000 ft (3000 m) 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.

System Board	**Processor**	Socket T; LGA775 industry standard Micro ATX form factor
		Support single Intel Core 2 Duo, Pentium dual-core, or Celeron processors
	PWM	Intersil 6312 3 phase
	Chipset	Intel Q33 Express
		Intel I/O Controller Hub 9 (ICH9)
	Super I/O	W83627DHG
	Front Side Bus Frequency	533/800/1066/1333 MHz
	Memory	DDR2 SDRAM
		4 x DIMM slots
	Clock Generator	CY505YC56DT
	Integrated Graphics	Intel Graphics Media Accelerator (GMA) 3100
	Audio	Realtek ALC888 HD Audio compatible codec with two channel audio 3D audio compliant with AC'97 rev. 2.3
	LOM	Broadcom NetLink BCM5786 GbE Connection
	Expansion Slots	1 x PCI 2.3 slot
		2 x PCI Express x1 slots
		1 x PCI Express x16 slot
		Four Serial ATA interfaces
	BIOS	SPI FLASH ROM
	Industrial Standard	PCI 2.3 compliant
		USB 2.0
	Rear Side I/O Ports	1 x PS/2 keyboard port
		1 x PS/2 mouse port
		6 x USB 2.0 ports
		1 x RJ-45 10/100 port
		1 x serial port
		1 x optional second serial port
		1 x parallel port
		1 x DB 15-pin analog VGA port
		3 x audio ports
	On Board I/O Interfaces	1 x ATX power connector
		1 x +12V power connector
		1 x Floppy connector
		1 x Front panel connector, Switch, LED (ON/Flash/OFF)
		2 x Fan headers for CPU, chassis, with voltage/fan speed control
		1 x header to support 2 USB 2.0 ports at front side

System Details

		1 x header to support USB media reader
		1 x serial header to support optional second serial port
	Board Size	Micro-ATX, PCB Size: 9.6 x 9.0 in (24.38 x 22.86 cm)
		4-layer PCB with green color
	Additional Features	Bootable without keyboard, mouse or monitor
		Keyboard/mouse/USB wake up
		Support S3, S4 and S5
		ACPI status
		Hardware monitor capability
		CPU fan speed control
Network Interface		**Broadcom NetLink BCM 5786 GbE Network Connection**
	Hardware Highlights	PCI Express interface
	Features	10-Mbps, 100-Mbps and 1000-Mbps operation
		Intel PRO/1000 PT Gigabit PCIe Adapter
	Hardware Highlights	PCI Express interface
	Features	10-Mbps, 100-Mbps and 1000-Mbps operation
Wireless		Wireless A+G PCI Card (full height bracket)

Power Supply

- ATX Power Supply – Passive PFC
- Passive Power Factor Correction (PFC) – with line switch set to 230V – No PFC in 115V line switch position
- 90 to 140VAC, or 180 to 264VAC operating voltage range
- 100 to 127VAC, or 200 to 240VAC rated voltage range
- 50-60 Hz rated line frequency
- 47-63 Hz operating line frequency range
- 180 watt maximum rated power
- 80-mm power supply fan – variable speed for optimum acoustics

Power Conservation 'Energy Saver'

- APM 1.2 support
- Screen blanking
- Hard drive 'Idle' mode
- System Idle mode
- ~2 watt power consumption in ES mode – suspend to RAM (S3) (instantly available PC)
- Processor/Cache memory power-down (S3)

System Details

System Environmental Specs

- Values are subject to change without notification and are for reference only.
- Performance of system, options, and ancillary equipment will vary depending on the system configuration.
- Levels presented do not account for non-HP/Compaq installed hardware

Ambient Air Temperature	**Operating**	50° to 95°F (10° to 35°C) at sea level with an altitude de-rating of 1.0°C per every 1000 ft (300 m) above sea level to a maximum of 8000 ft (2500 m), no direct sustained sunlight. Maximum rate of change is 77°F/Hr (25°C/Hr). The upper limit may be limited by the type and number of options installed.
	Storage	-22° to 140°F (-30° to 60°C) – Maximum rate of change: 410°F/Hr (210°C/Hr).
Humidity	**Operating**	10% to 90% relative humidity (Rh), 86°F (30°C) maximum wet bulb temperature, non-condensing
	Storage	10% to 95% relative humidity (Rh), 101.66°F (38.7°C) maximum wet bulb temperature, non-condensing
Altitude	**Operating**	0 to 10,000 feet (0 to 3048 meters) – This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1,000 ft/min (304.8 m/min).
	Non-Operating	0 to 30,000 feet (0 to 9,144 meters) – Maximum allowable altitude change rate is 1200 ft/min (365.76 m/min).
Shock	Listed are the levels of shock the product can withstand with NO damage being incurred. The values represent peak input acceleration during an 2~3 ms half-sine shock pulse, 11 ms trapezoidal shock pulse.	
	Non-Operating	35G's (Half-sine Shock) 40G's (Trapezoidal Shock)
Vibration	Listed are the levels of vibration the product can withstand with NO damage being incurred. The values represent a flat random vibration input acceleration profile across the given frequency range.	
	Operating	Random vibration at 5Hz@0.00025G^2/Hz, 10Hz@0.01G^2/Hz, 100Hz@0.01G^2/Hz, 300Hz@0.00001G^2/Hz 5Hz to 300Hz, (0.25G's nominal).
	Non-Operating	Random vibration at 0.008G^2/Hz, 10Hz to 500Hz, (2 Grms nominal).

System Details

Acoustic Noise	Listed are the declared A-WEIGHTED SOUND POWER LEVELS (LWAd) and declared average desktop seated operator position A-WEIGHTED SOUND PRESSURE LEVELS (LpAm) when the product is operating in a 73.4°F (23°C) ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). **IDLE** (Fixed disk drive spinning) LWAd = 4.3 Bels, Desktop Average LpAm = 32 dBA **FIXED DISK** (Random write) LWAd = 4.8 Bels, Desktop Average LpAm = 37dBA **CD-ROM** (Sequential Reads) LWAd = 5.2 Bels, Deskside Average LpAm = 41dBA
Service and Support	On-site Warranty[Note 1]: One-year (1-1-1) limited warranty delivers one year of on-site, next business-day[Note 2] service for parts and labor 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. One-year onsite and labor are not available in all countries. **NOTE 1**: Terms and conditions may vary by country. Certain restrictions and exclusions apply. Other warranty variations may be offered in your region. **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 Compaq and third-party HP-qualified hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

After-Market Options

Communications	**NICs**	
	Intel PRO/1000 PT Gigabit PCIe Adapter (half height)	EH352AA
	Wireless LAN	
	HP Wireless A+G PCI Card (North America only)	EA118AA
	HP Wireless A+G PCI Card (WW except North America)	PZ928AA
	Modems	
	Agere 2006 PCI High-Speed 56K International SoftModem	EK694AA
Hard Disk Drives	HP 320-GB SATA 3.0-Gb/s Hard Drive	FH963AA
	HP 250-GB SATA 3.0-Gb/s Hard Drive	PY278AA
	HP 160-GB SATA 3.0-Gb/s Hard Drive	PY277AA
	HP 80-GB SATA 3.0-Gb/s Hard Drive	PY276AA
Removable Storage Devices	**Diskette Drive**	
	HP 1.44-MB Internal Diskette Drive	AG295AA
	HP 1.44-MB USB Diskette Drive – External	DC141B
	HP 16-in-1 Media Reader	EM718AA
	HP 22-in-1 Media Card Reader	FX273AA
	HP 22-in-1 Media Card Reader with 1394 port	KN518AA
	USB Drive Key	
	HP 1-GB Drive Key II Flash Drive	AG382AA
	HP (APJ) 512-MB Drive Key II Flash Drive	ED516AA
Input Devices	**Keyboards**	
	HP PS/2 Standard Keyboard	DT527A
	HP USB Standard Keyboard	DT528A
	HP USB Smart Card Keyboard (no reader functionality)	ED707AA
	Mice	
	HP PS/2 2-Button Scroll Mouse	DD440B
	HP PS/2 2-Button Optical Scroll Mouse	EY703AA
	HP USB 2-Button Optical Scroll Mouse	DC172B

After-Market Options

Memory	HP 2-GB PC2-5300 (DDR2 667-MHz) DIMM	PX977AA
	HP 1-GB PC2-5300 (DDR2 667-MHz) DIMM	PX976AA
	HP 512-MB PC2-5300 (DDR2 667-MHz) DIMM	PX975AA
	HP 256-MB PC2-5300 (DDR2 667-MHz) DIMM	PX974AA
	HP 1-GB PC2-6400 (DDR2 800-MHz) DIMM	AH058AA
	HP 512-MB PC2-6400 (DDR2 800-MHz) DIMM	AH056AA
	HP 256-MB PC2-6400 (DDR2 800-MHz) DIMM	AH054AA
Audio	HP Satellite Speakers	ZD929AA
Graphics	NVIDIA GeForce 8400 GS 256MB DH PCIe x1 Card	GJ120AA
	NVIDIA GeForce 8400 GS 256MB SH PCIe x16 Card*	GJ119AA
	ATI Radeon 3470 256MB SH PCIe x16	FH972AA
	HP DisplayPort To DVI-D Adapter	FH973AA
	* 1GB of system memory required. Graphics cards use part of the total system memory to enhance graphics performance.	
Optical Drives	HP SATA CD-ROM Drive (available in Asia Pacific and Japan only)	AH045AA
	HP SATA CD-RW/DVD-ROM Combo Drive	AH046AA
	HP SATA DVD-ROM Drive	AH047AA
	HP SATA SuperMulti LightScribe DVD Writer Drive	GF343AA
Security	HP Business PC Security Lock Kit	PV606AA
Miscellaneous Accessories	HP FireWire / IEEE 1394 PCI Card	PA997A

After-Market Options

Monitors	**CRTs**	
	HP s7540 17" (16.0" vis) CRT Monitor	PF997AA#XXX
	HP v7650 17" (16.0" vis) Flat-face CRT Monitor	PF996AA#XXX
	TFTs	
	HP L1506 15" TFT Flat Panel Monitor – Analog only	PX848AA#XXX
	HP L1706 17" TFT Flat Panel Monitor – Analog only	PX849AA#XXX
	HP L1740 17" TFT Flat Panel Display – Analog/Digital	PL766AA#XXX
	HP L1755 17" TFT Flat Panel Display – Analog/Digital	PL777AA#XXX
	HP L1906 19" TFT Flat Panel Display – Analog only	PX850AA#XXX
	HP L1940T 19" TFT Flat Panel Display – Analog/Digital	EM869AA#XXX
	HP L1955 19" TFT Flat Panel Display – Analog/Digital	PD974AA#XXX
	HP L2065 20" TFT Flat Panel Display – Analog/Digital	EF227A4#XXX
	HP LP2465 24" TFT Widescreen Flat Panel Display – Analog/Digital	EF224A4#XXX
	GSA Monitors	
	HP L717g 17" GSA Flat Panel Monitor	EE191AA#ABA
	HP L919g 19" GSA Flat Panel Monitor	EE192AA#ABA
	Options	
	HP Flat Panel Speaker Bar	EE418AA
	HP CRT Monitor Multimedia Base	PM552AA

Memory

DDR SYNCH DRAM NON-ECC MEMORY

The Intel Q33 Express chipset supports non-ECC DDR2 memory up to PC2-6400 (800-MHz). 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.

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.

STANDARD MEMORY

256-MB, 512-MB, 1-GB, or 2-GB DDR2 SYNCH DRAM

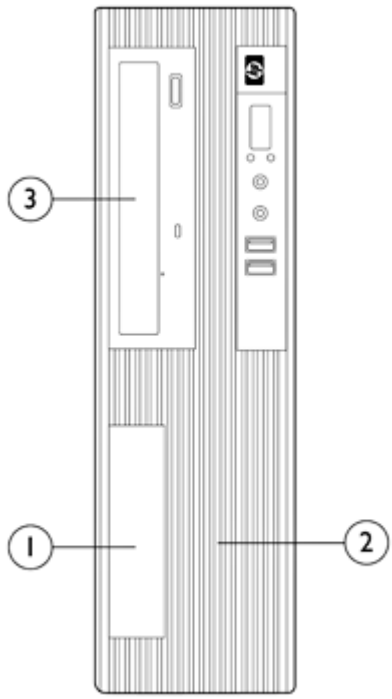
OPTIONAL MEMORY UPGRADES

Supports up to 8-GB of DDR2 SYNCH DRAM. Not all memory configurations possible are represented below.

NOTE: Addressing memory above 4 GB requires a 64-bit operating system.

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

Storage



HP Compaq dx7400 Small Form Factor Business PC

	Maximum Quantity Supported	Position Supported	Controller
Drive Support			
Diskette Drives	1	1	SIO
Media Reader	1	1	Internal USB 2.0 port
CD-ROM Drives	1	3	SATA
DVD-ROM Drives	1	3	SATA
CD-RW/Combo Drives	1	3	SATA
DVD+/-RW Drives	1	3	SATA
3.5” Serial ATA Hard Drives	1	2	SATA

Technical Specifications - Audio

Integrated Realtek ALC888 Audio	**Type**	Integrated
	HD Audio compatible codec	Yes
	Sampling	Supports 48/96 KHz
	Audio Jacks	Mic-In
		Line-In
		Line-Out / Headphone Out
	Power Support	Digital: 3.3V
		Analog: 5V
	Other	Meets performance requirements for audio on PC99/2001 systems High-performance DACs with 97dB SNR(A-Weighting) ADCs with 90dB NR(A-Weighting)

Technical Specifications - Communications

Broadcom NetLink BCM5786 Gigabit Network Controller	**Connector**	RJ-45
	Controller	Broadcom NetLink BCM 5786 Gigabit Ethernet Controller
	Memory	Large 48kb receive and 8kb transmit on chip buffer
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.3 compliant, 802.3x flow control
	Bus architecture	PCI Express 1.1
	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	Aux 3.3V, 1.234 Watts in 1000base-T and 0.641 Watts in 100Base-T
	Boot ROM support	Yes
	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 (actual rate limited by PCI Bus)
	Environmental	**Operating temperature** 32° to 120°F (0° to 48.89° C)
		Operating humidity 85% at 120°F (48.89° C)
	Dimensions	68Pin QFN (10mm x 10mm x 0.85mm)
	Management capabilities	WOL, PXE
Intel PRO/1000 PT PCIe Gigabit NIC	**Connector**	RJ-45
	Controller	Intel 82572EI Gigabit Ethernet Controller
	Memory	Integrated Dual 48K configurable transmit receive FIFO Buffers
	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 Express 1.0a
	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	Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T
	Boot ROM support	Yes
	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 (actual rate limited by PCI Bus)

Technical Specifications - Communications

	Environmental	**Operating temperature**	32° to 131°F (0° to 55° C)
		Operating humidity	85% at 131° F (55° C)
	Dimensions	6.4 x 2.6 x 0.8 in (16.3 x 6.6 x 1.9 cm)	
	Management capabilities	ASF, WOL, PXE, DMI, WFM 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%	
	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	

Agere 56K PCI Modem	**Data Transmission**	56,000 Kbps maximum downstream data **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	14,400/12,000/9,600/7,200/4,800/2,400/300 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 - Graphics

Integrated Graphics Media Accelerator 3100	**3D/2D Controller**	Microsoft DirectX® 9 based with support for Pixel Shader 2.0, 4:1 anisotropic filtering, Gaussian texture filtering, shadow maps, volumetric textures, double-sided stencil buffers, and 4 pixel pipes.
	VGA Controller	Integrated
	Bus Type	PCI Express™ x16 (If an external graphics card is installed in a PCI or PCIe x1 slot, the internal graphics can be enabled or disabled using the system's BIOS setup utility. If a graphics card other than an SDVO/ADD2 card is installed in the PCI Express™ X16 slot, the internal graphics cannot be enabled).
	RAMDAC	Integrated, 350 MHz (2048x1536@75 Hz)
	Memory	Graphics memory is shared with system memory. Graphics memory usage varies depending on the amount of system memory installed and system load. 8 MB is pre-allocated for graphics use at system boot time. Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (DVMT), to provide an optimal balance between graphics and system memory use. **System memory equal or greater than 512 MB** 8 MB pre-allocated + 248 MB DVMT = max frame buffer of 256 MB
	Overlay Planes	Single overlay support with 5x3 filtering
	Maximum Color Depth	32 bits/pixel
	Maximum Vertical Refresh Rate	85 Hz at up to 1920x1440, 85 Hz at 2048x1536. Varies with mode and configuration. See table below.
	Multi-display Support	Support for one CRT via the motherboard's VGA connector. Support for an additional display can be accomplished with the addition of SDVO/ADD2 option installed in PCIe x16 slot.
	Graphics/Video API Support	Microsoft DirectX®9, DirectXVA®, VMR9, GDI/GDI+; OpenGL® 1.4.

Resolutions Supported[1]

Resolution	**Maximum Refresh Rate** (Hz)	
	Analog Monitor	**Digital Monitor**
640 x 480	85	60
800 x 600	85	60
1024 x 768	85	60
1280 x 1024	85	60
1600 x 1200	85	60
1680 x 1050	85	60
1920 x 1080	85	60
1920 x 1200	85	60
1920 x 1440	85	N/A
2048 x 1536	75	N/A

[1] Modes listed are supported with a single active display. The supported mode list for multiple active displays is a subset of this list. Not all modes will support video playback and some supported modes may use software MC (motion compensation) rather than hardware MC. Not all modes will support 3D acceleration depending on the system configuration (e.g., resolution selected, size of frame buffer, number of installed memory modules, etc.).
NOTE: Other resolutions and refresh rates may be selectable but are not recommended.

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 GeForce 8400 GS 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
	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

NVIDIA GeForce 8400 GS (256 MB DH) PCIe x1 Graphics Controller	**Bus type**	PCI Express (x1 lane)
	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	DMS59 (DMS-59 port supports Dual VGA or Dual DVII connections) TV-out (4 pin S-video)
	Board display options	DMS59 + TV DMS59 supports either 2 VGA displays with the included cable or 2 DVII displays with optional HP DMS59 DVI Dual-head Connector Cable kit #DL139A TV connector is a 4-pin mini-DIN S-video connector
	Board configuration	**Specification** / **Description**
		Graphics Chip / NVIDIA GeForce 8400 GS
		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
	Core power	25 W (Max board power)

NVIDIA GeForce 8400 GS (256 MB SH) PCIe x1 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	N/A

Technical Specifications - Graphics

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 display options	TV connector is a 4-pin mini-DIN S-video connector
	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
	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.

Technical Specifications - Graphics

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 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.

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	2560x1600 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*

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

Technical Specifications - Input Devices

HP PS/2 or USB 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)
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
		MicrosoftPC 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 Devices

HP 2-Button Scroll Mouse (PS/2)	**Scroll Wheel**	8 mm	
	Maximum Rotation Speed	30 mm/s	
	Switch Type	Light force micro-switch	
	Switch Life	1 million operations	
	Mechanical Life	Minimum 200,000 revolutions	
	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, 6 surfaces
		Non-operating Shock	80 g, 6 surfaces
		Operating Vibration	2 g peak acceleration
		Non-operating Vibration	4 g peak acceleration
	Electrical	**Operating Voltage**	+ 5VDC ± 10%
		Power Consumption	15mA
		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
		PC98	Functionally compliant
	Mechanical	**Resolution**	400 ± 20% DPI
		Tracking Speed	10 in/s maximum
		Acceleration	100 in/s
		Switch Actuation	85 g nominal peak force
		Switch Life	1,000,000 operations (using Hasco modified tester)
		Cable Length	2 m
		PC98-99	Mechanically compliant
	Regulatory Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick	

Technical Specifications - Hard Drives

Serial ATA Hard Drives (7200 rpm)	**80 GB**	**Capacity**	80,026,361,856 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.9 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	32° to 140° F (0° to 60° C)	
	160 GB	**Capacity**	160,041,885,696 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.9 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	32° to 140° F (0° to 60° C)	
	250 GB	**Capacity**	250,059,350,016 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.9 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	

Technical Specifications - Hard Drives

	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	488,397,168	
	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 (8.9 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	625,142,448	
	Operating Temperature	41° to 131° F (5° to 55° C)	

Technical Specifications - Optical Storage

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	
	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	

Technical Specifications - Optical Storage

	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 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 times (typical reads, including setting)	**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)

Technical Specifications - Optical Storage

SATA DVD+/-RW LightScribe 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	**DVD+R**	Up to 16X
		DVD+RW	Up to 8X
		DVD+R DL	Up to 8X
		DVD-R DL	Up to 4X
		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 4X
		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 times (typical reads, including setting)	**Random**	DVD: < 130 ms (typical), CD: < 120 ms (typical)
		Full Stroke	DVD: < 240 ms (seek), CD: < 200 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**	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 1.44-MB Diskette Drive	**Size**	3.5 in (8.89 cm)	
	LED Indicators (front panel)	Green	
	Read/Write Capacity per Diskette (high/low)	1.44 MB/720 KB	
	Drive Height	One-third	
	Drive Rotation	300 rpm	
	Transfer Rate (high/low)	500/250 KB/s	
	Bytes/Sector	512	
	Sectors/Track (high/low)	18/9	
	Tracks/Side (high/low)	80/80	
	Access Times	**Track-to-Track** (high/low)	3/6 ms
		Average (high/low)	94/173 ms
		Settling Time	15 ms
		Latency Average	100 ms
	Cylinders (high/low)	80/80	
	Read/Write Heads	Two	

HP 16-in-1 Media Card Reader	**USB interface**	USB 2.0 High-speed device via PCI card or pass -through via internal USB port of system board
	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 (version 4.x)
	Supported media types	• Supports CompactFlash Card Type I (CF I), CompactFlash Card Type II (CF II),MicroDrive (MD) • Supports 3.3V SmartMedia Card (SM), SmartMedia ROM (SM ROM), Picture Card • Supports Secure Digital Card (SD), Secure Digital ROM Card (SD ROM), miniSD, MultiMediaCard, Secure MultiMediaCard (Secure MultiMediaCard), ROM Type MultiMediaCard (MultiMediaCard ROM), Reduced Size MultiMediaCard (RS MultiMediaCard), MultiMediaCard 4.0 (MultiMediaCard Plus), Reduced Size MultiMediaCard 4.0 (MultiMediaCard Mobile) • Support Memory Stick (MS), Memory Stick ROM (MS ROM), MagicGate Memory Stick (MG), Memory Stick Select, Memory Stick Duo (MS Duo), Memory Stick PRO (MS-PRO), Memory Stick PRO Duo (MS PRO Duo)
	Mechanical	**Length** (3.5") 124.7 cm
		Width (3.5") 101.6 cm

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		Height (3.5")	25.4 cm
		Length (5.25")	171.6 cm
		Width (5.25")	148.9 cm
		Height (5.25")	42.7 cm
	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
	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) • MultiMediaCard 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

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Eco-Label Certifications & 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:
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