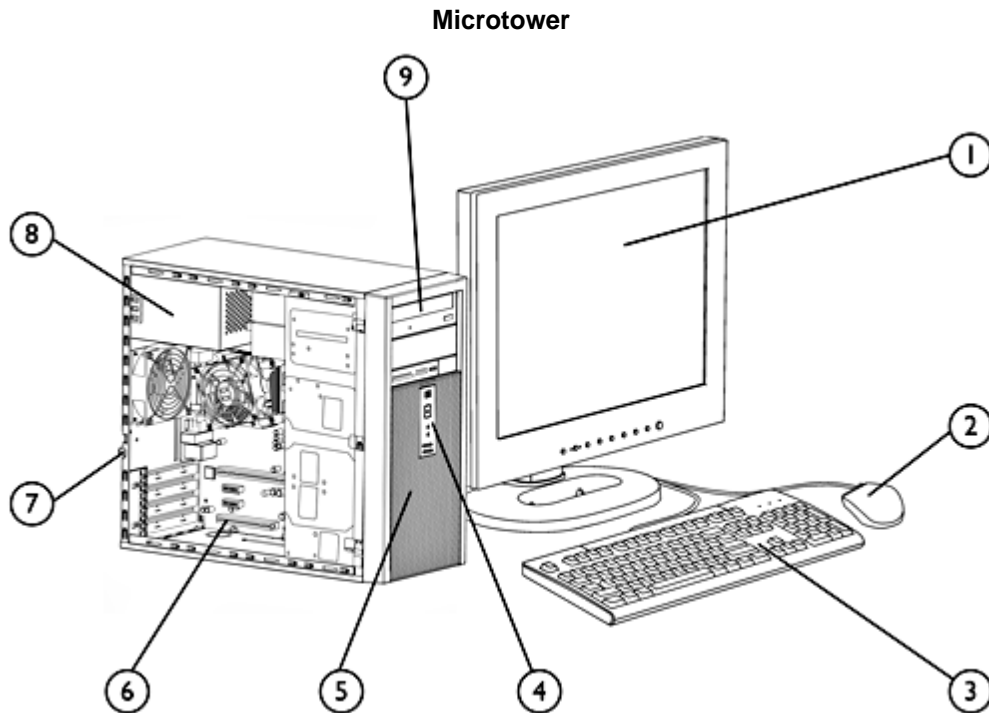


Overview

HP recommends Windows®
Vista™ Business



1. Monitor (sold separately)

2. PS/2 Scroll Mouse

3. HP Standard Keyboard

4. (2) USB 2.0 ports, audio ports

5. (2) internal 3.5" drive bays

6. (1) full-height PCI 2.3 slot, (2) PCIe x1 slots,
(1) PCIe x16 slot

7. (4) 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

8. 250-watt max power supply

9. (2) external 5.25" drive bays for optional optical drives; (1)
external 3.5" drive bay for optional media reader or
diskette drive

Overview

At A Glance

- Intel® Core™ 2 Duo processors, Intel Pentium® D processors, Intel Pentium 4 processors, or Intel Celeron® D processors
- Choice of operating systems:
 - Genuine Windows Vista Business 32
 - Genuine Windows Vista Home Basic 32
 - Genuine Windows XP Professional
 - Genuine Windows XP Home
 - Red Flag Linux (China Only)
 - FreeDOS
- Intel 946GZ Express Chipset
- Intel I/O Controller Hub 7 (ICH7)
- Intel Graphics Media Accelerator 3000
- PCI Express I/O bus
- Serial ATA controller
- Intel PRO/100 VE 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 D Processors

Intel Celeron D 331 Processor (2.66-GHz, 256-KB L2 cache, 533-MHz FSB)

Intel Celeron D 336 Processor (2.80-GHz, 256-KB L2 cache, 533-MHz FSB)

Intel Celeron D 347 Processor (3.06-GHz, 512-KB L2 cache, 533-MHz FSB)

Intel Celeron D 352 Processor (3.20-GHz, 512-KB L2 cache, 533-MHz FSB)

Intel Celeron D 356 Processor (3.33-GHz, 512-KB L2 cache, 533-MHz FSB)

Intel Celeron D 360 Processor (3.46-GHz, 512-KB L2 cache, 533-MHz FSB)

Intel Pentium 4 Processors

Intel Pentium 4 531 Processor (3.00-GHz, 1-MB L2 cache, 800-MHz FSB)

Intel Pentium 4 541 Processor (3.20-GHz, 1-MB L2 cache, 800-MHz FSB)

Intel Pentium 4 631 Processor (3.00-GHz, 2-MB L2 cache, 800-MHz FSB)

Intel Pentium 4 641 Processor (3.20-GHz, 2-MB L2 cache, 800-MHz FSB)

Intel Pentium 4 651 Processor (3.40-GHz, 2-MB L2 cache, 800-MHz FSB)

Intel Pentium D Processors

Intel Pentium D 915 Processor (2.80-GHz, 4-MB L2 cache, 800-MHz FSB)

Intel Pentium D 925 Processor (3.00-GHz, 4-MB L2 cache, 800-MHz FSB)

Intel Pentium D 935 Processor (3.20-GHz, 4-MB L2 cache, 800-MHz FSB)

Intel Pentium D 945 Processor (3.40-GHz, 4-MB L2 cache, 800-MHz FSB)

Intel Core 2 Duo Processors

Intel Core 2 Duo E4300 Processor (1.80-GHz, 2-MB L2 cache, 800-MHz FSB)

Intel Core 2 Duo E6300 Processor (1.86-GHz, 2-MB L2 cache, 1066-MHz FSB)

Intel Core 2 Duo E6400 Processor (2.13-GHz, 2-MB L2 cache, 1066-MHz FSB)

Intel Core 2 Duo E6600 Processor (2.40-GHz, 4-MB L2 cache, 1066-MHz FSB)

Intel Core 2 Duo E6700 Processor (2.66-GHz, 4-MB L2 cache, 1066-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.

Operating Systems and Application Software

(availability varies by region)

Genuine Windows Vista Business 32*

Genuine Windows Vista Home Basic 32*

Genuine Windows XP Professional SP2

Genuine Windows XP Home SP2

Red Flag Linux (China Only)

Free DOS

* **NOTE:** 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>.

Microsoft Office 2007 Basic

Microsoft Office 2007 Small Business

Microsoft Office 2007 Professional

Microsoft Works 8.5

Standard Features and Configurable Components

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

** Supporting software available with certain optical drive configurations

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)

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)

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

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 DVD+/-RW (DL/DF) LightScribe Drive

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

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

Standard Features and Configurable Components

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 (full height)
Intel PRO/100 VE Network Connection
Agere 56K PCI Modem

Graphics Intel Graphics Media Accelerator 3000
ATI Radeon X1300 (256MB SH) PCIe Graphics
ATI Radeon X1300 Pro (256MB DH) PCIe Graphics

Miscellaneous HP FireWire / IEEE 1394 PCI Card (full height)

System Details

Base Unit

- Micro ATX microtower chassis, including power supply and front bezel
- Five (5) drive bays and four expansion slots
- Microsoft operating system CD
- Active type heatsink
- 92 x 92 x 25 mm chassis fan
- System board with Intel 946GZ Express chipset, Intel I/O Controller Hub 7 (ICH7), Intel PRO/100 VE Network Connection, Intel GMA 3000 graphics, and Realtek audio, 1 full-height PCI 2.3 slot, 2 PCI Express x1 slots, 1 PCI Express x16 slot, 2 DDR2 DIMM memory slots
- (4) Serial ATA data connectors
- Product documentation on CD
- HP system restore CD
- Power cord

Slots	PCI	One (1) full-height PCI 2.3 slot on PCA Two (2) full-height PCI Express x1 slots on PCA One (1) full-height PCI Express x16 slot on PCA (for graphic cards)
	Memory Expansion	Two (2) DDR2 SDRAM DIMM slots (2 GB maximum memory support)

Bays	Internal	Two (2) 3.5"
	External	Two (2) 5.25" One (1) 3.5"

USB Support	EHCI high-speed USB 2.0 controller Two (2) front ports; Four (4) rear ports, Two (2) internal ports on motherboard
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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) RJ45 network port
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Weight & Dimensions	Chassis Dimensions	13.90 x 6.89 x 16.38 in (353 x 175 x 416 mm) (H x W x D)
	Packaged Dimensions	22.25 x 19.63 x 16.31 in (565.15 x 498.5 x 414.3 mm) (NA) 21.10 x 19.53 x 15.008 in (536.0 x 496.0 x 383.0 mm) (EMEA)
	System Weight	21.16 lb (9.6 kg)
	Shipping Weight	30.86 lb (14.0 kg)

System Details

Technology and Features	Memory Type	<ul style="list-style-type: none"> • PC2-5300 DDR2 SDRAM (667-MHz) non-ECC • 2 GB maximum system memory
	Hard Drive Interfaces Supported	<ul style="list-style-type: none"> • Serial ATA

Chassis	Front Panel	<ul style="list-style-type: none"> • Power button • Power On LED • HDD Activity LED
	Cooling Solutions Supported	<ul style="list-style-type: none"> • Power Supply Fan (variable speed) • Active heatsink (variable speed) • Chassis fan (variable speed)
	Slots Supported	Four (4) full-height expansion slots
	Front I/O	Two (2) USB 2.0 ports
	Rear I/O	Standard Micro ATX I/O connectors, including four (4) USB 2.0 ports
	Drive Bays	<ul style="list-style-type: none"> • Two (2) 5-1/4" external • One (1) 3-1/2" external • Two (2) 3-1/2" internal
	Internal Speaker	Standard
	Security	Padlock loop Kensington Lock Support
	Power Supply	250-watt ATX Power Supply – PFC/non-PFC with a 115v/230v line switch (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	<ul style="list-style-type: none"> • Operating: 50° to 95° F (10° to 35° C) • Non-operating: -22° to 140° F (-30° to 60° C)
Relative Humidity	<ul style="list-style-type: none"> • Operating: 10% to 90% (non-condensing at ambient) • Non-operating: 5% to 95% (non-condensing at ambient)
Maximum Altitude (unpressurized)	<ul style="list-style-type: none"> • Operating: 10,000 ft (3048 m) • Non-operating: 30,000 ft (9000 m)

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 | <ul style="list-style-type: none"> • Socket T; LGA775 industry standard Micro ATX form factor |
|------------------|--|



System Details

PWM	<ul style="list-style-type: none">• Support single Intel Core 2 Duo, Pentium D, Pentium 4 or Celeron D
Chipset	<ul style="list-style-type: none">• Intersil 6312 3 phase• Intel 946GZ Express• Intel I/O Controller Hub 7 (ICH7)
Super I/O	<ul style="list-style-type: none">• W83627DHG
Front Side Bus Frequency	<ul style="list-style-type: none">• 533/800 MHz
Memory	<ul style="list-style-type: none">• DDR2 SDRAM• 2 x DIMM slots
Clock Generator	<ul style="list-style-type: none">• CY505YC56DT
Integrated Graphics	<ul style="list-style-type: none">• Intel Graphics Media Accelerator (GMA) 3000
Audio	<ul style="list-style-type: none">• Realtek ALC888 HD Audio compatible codec with two channel audio 3D audio compliant with AC'97 rev. 2.3
LOM	<ul style="list-style-type: none">• Intel PRO/100 VE Network Connection
IDE	<ul style="list-style-type: none">• Support all PIO modes• 1 x IDE ports support up to 2 devices• Support Ultra ATA 33/66/100
Serial	<ul style="list-style-type: none">• Four Serial ATA interfaces
Expansion Slots	<ul style="list-style-type: none">• 1 x PCI 2.3 slot• 2 x PCI Express x1 slots• 1 x PCI Express x16 slot
BIOS	<ul style="list-style-type: none">• LPC EEPROM
Industrial Standard	<ul style="list-style-type: none">• PCI 2.3 compliant• USB 2.0
Rear Side I/O Ports	<ul style="list-style-type: none">• 1 x PS/2 keyboard port• 1 x PS/2 mouse port• 4 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	<ul style="list-style-type: none">• 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• 1 x header to support USB media reader• 1 x serial header to support optional second serial port
Board Size	<ul style="list-style-type: none">• Micro-ATX, PCB Size: 9.6 x 9.0 in (24.38 x 22.86 cm)• 4-layer PCB with green color

System Details

Additional Features

- Bootable without keyboard, mouse or monitor
- Keyboard/mouse/USB wake up
- Support S1, S3, S4 and S5
- ACPI status
- Hardware monitor capability
- CPU fan speed control

Network Interface

Hardware Highlights Features

Intel PRO/100 VE Network Connection

- PCI interfaces
- 10-Mbps and 100-Mbps operation

Hardware Highlights Features

Intel PRO/1000 PT Gigabit PCIe Adapter

- PCI Express interface
- 10-Mbps, 100-Mbps and 1000-Mbps operation

Wireless

Wireless A+G PCI Card (full height bracket)

Power Supply

- ATX Power Supply – Passive PFC/non-PFC with a 115v/230v line switch
- 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
- 250 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) 35G'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 = 5.0 Bels,
Deskside Average LpAm = 39dBA

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 (full 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
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Hard Disk Drives	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
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Removable Storage Devices	Diskette Drive	
	HP 1.44-MB Internal Diskette Drive	AG295AA
	HP 1.44-MB USB Diskette Drive – External	DC141B
	16-in-1 Media Reader	EM718AA
	USB Drive Key	
	HP 1-GB Drive Key II Flash Drive	AG382AA
HP (APJ) 512-MB Drive Key II Flash Drive	ED516AA	
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Input Devices	Keyboards	
	HP PS/2 Standard Keyboard	DT527A
	HP USB Standard Keyboard	DT528A
	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
<hr/>		
Memory	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
	NOTE: The HP Compaq dx2300 Microtower memory frequency is clocked at 630 MHz.	
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Audio	HP Satellite Speakers	ZD929AA
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Graphics	ATI Radeon X1300 Pro (256MB DH) PCIe Graphics	AH050AT
	ATI Radeon X1300 (256MB SH) PCIe Graphics	AG392AA

After-Market Options

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 DVD+/-RW (DL/DF) LightScribe Drive	AH048AA

Security	HP Business PC Security Lock Kit	PV606AA
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Miscellaneous Accessories	HP FireWire / IEEE 1394 PCI Card	PA997A
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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 946GZ Express chipset supports non-ECC DDR2 memory up to PC2-5300 (667-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.

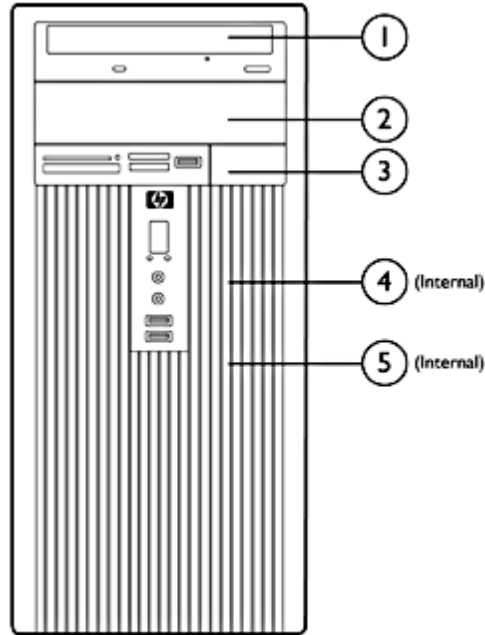
For best performance, add the same amount of total memory to each channel and do not mix speeds. For dual-channel symmetric performance, the total amount of memory in each channel must be equal. If speeds are mixed, speed will default to the slowest DIMM.

MAXIMUM MEMORY

Supports up to 2-GB of DDR2 SYNCH DRAM. Not all memory configurations possible are represented below.

DIMM Size	Slot 1	Slot 2
256-MB	256-MB	
512-MB	512-MB	
512-MB (dual-channel symmetric)	256-MB	256-MB
1-GB	1-GB	
1-GB (dual-channel symmetric)	512-MB	512-MB
2-GB (dual-channel symmetric)	1-GB	1-GB

Storage



HP Compaq dx2300 Microtower Business PC

	Maximum Quantity Supported	Position Supported	Controller
Drive Support			
Diskette Drives	1	3	SIO
Media Reader	1	3	Internal USB 2.0 port
CD-ROM Drives	2	1, 2	IDE ATAPI
DVD-ROM Drives	2	1, 2	IDE ATAPI
CD-RW/Combo Drives	2	1, 2	IDE ATAPI
DVD+/-RW Drives	2	1, 2	IDE ATAPI
3.5" Serial ATA Hard Drives	2	4, 5	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

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)
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	Atheros AR5414X chipset	
	system interface	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		

Technical Specifications - Communications

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	<p>108 Mbps (only with 200 ft (60.96 m) – Indoor Belkin 54G or above router that supports 108 Mbps speed)</p> <p>54 Mbps 200 ft (60.96 m) – Indoor</p> <p>11 Mbps 200 ft (60.96 m) – Indoor</p>
Certifications	Wi-Fi certified
Certifications for use by country	<p>North America: United States, Canada</p> <p>Europe: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom</p> <p>Australia</p> <p>New Zealand</p>

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

Technical Specifications - Communications

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 3000	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 slot, the internal graphics can be enabled or disabled using the system's BIOS setup utility. If an external graphics card is installed in the PCI Express™ slot, the internal graphics cannot be enabled).
	RAMDAC	Integrated, 400 MHz
	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
	Controller Clock Speed	400 MHz
	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 DVI-D display via the optional DVI ADD2 card. Dual independent displays and dual synchronous (Twin or Clone mode) displays are supported.
	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
	1920 x 1080	85	60
	1920 x 1200	85	60
	1920 x 1440	85	60
	2048 x 1536	85	60

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.

Technical Specifications - Graphics

**ATI Radeon X1300
(256MB SH) PCIe
Graphics Card
(256 MB)**

Bus type	PCI Express (x16 lanes)
Maximum vertical refresh rate	85 Hz
Display support	Integrated 400 MHz RAMDAC
Display max resolution	2048 x 1536
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	RV515
	Core clock	450 MHz
	Memory clock	250 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)

Option kit contents

- ATI RADEON X1300 PCIe graphics card with full height bracket attached
- Low profile bracket
- DVI-to-VGA Adapter
- Software CD with graphics drivers
- 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

EMC Immunity:
CISPR 24:1997/EN 55024:1998 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement.

Safety:
UL 60950 (USA) & EN 60950 (EU): Safety of Information Technology Equipment, Including Electrical Business Equipment. All boards meet UL PCB flammability requirements.

Technical Specifications - Graphics

ATI Radeon X1300 Pro (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	2048 x 1536
	Board Display Options	Supports 2 displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual DVI monitor kit #DL139A. Support TV connection via 7 pin mini Din S-video connector
Board Configuration	Specification	Description
128 MB Frame Buffer	Graphics Chip	RV516
	Core clock	600 MHz
	Memory clock	400 MHz
	Frame buffer	256 MB DDR2 (128 bits 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	25 W (Max board power)	
Option kit contents	<ul style="list-style-type: none"> • ATI Radeon X1300 Pro (256MB DH) PCIe Graphics Card with full height bracket attached • DMS-59 Dual VGA • NOTE: The Optional DMS-59 DVI cable can be ordered with HP Option Kit #DL139A • 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: <ul style="list-style-type: none"> 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.	
	Safety: UL 60950 (USA) & EN 60950 (EU): Safety of Information Technology Equipment, Including Electrical Business Equipment. All boards meet UL PCB flammability requirements.	

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
	Environmental	Acoustics	43-dBA maximum sound pressure level
		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		
Regulatory Approvals	PC98-99	Mechanically compliant		
		UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick		

Technical Specifications - Hard Drives

Serial ATA Hard Drives 80 GB (7200 rpm)

Capacity	80,026,361,856 bytes
Height	1 in (2.6 cm)
Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)
Interface	Serial ATA
Synchronous Transfer Rate (Maximum)	1.5 Gb/s
Buffer	8 MB
Seek Time (typical reads, includes controller overhead, including settling)	Single Track 1.0 ms Average 8.5 ms Full-Stroke 18 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 (2.6 cm)
Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)
Interface	Serial ATA
Synchronous Transfer Rate (Maximum)	1.5 Gb/s
Buffer	8 MB
Seek Time (typical reads, includes controller overhead, including settling)	Single Track 1.0 ms Average 8.5 ms Full-Stroke 18 ms
Rotational Speed	7,200 rpm
Logical Blocks	312,581,808
Operating Temperature	32° to 140° F (0° to 60° C)

Technical Specifications - Hard Drives

250 GB	Capacity	250,059,350,016 bytes	
	Height	1 in (2.6 cm)	
	Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)	
	Interface	Serial ATA	
	Synchronous Transfer Rate (Maximum)	1.5 Gb/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.8 ms
		Average	<9.0 ms
		Full-Stroke	=17 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	488,397,168	
	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
	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 \pm 5%-100 mV ripple p-p 12 VDC \pm 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 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 \pm 5%-100 mV ripple p-p 12 VDC \pm 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	<table border="0"> <tr> <td>DVD+R</td> <td>Up to 16X</td> </tr> <tr> <td>DVD+RW</td> <td>Up to 8X</td> </tr> <tr> <td>DVD+R DL</td> <td>Up to 8X</td> </tr> <tr> <td>DVD-R DL</td> <td>Up to 4X</td> </tr> <tr> <td>DVD-R</td> <td>Up to 16X</td> </tr> <tr> <td>DVD-RW</td> <td>Up to 6X</td> </tr> <tr> <td>CD-R</td> <td>Up to 48X</td> </tr> <tr> <td>CD-RW</td> <td>Up to 32X</td> </tr> </table>	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
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DVD-R DL	Up to 4X																	
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CD-R	Up to 48X																	
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	Access times (typical reads, including setting)	<table border="0"> <tr> <td>Random</td> <td>DVD: < 130 ms (typical), CD: < 120 ms (typical)</td> </tr> <tr> <td>Full Stroke</td> <td>DVD: < 240 ms (seek), CD: < 200 ms (seek)</td> </tr> </table>	Random	DVD: < 130 ms (typical), CD: < 120 ms (typical)	Full Stroke	DVD: < 240 ms (seek), CD: < 200 ms (seek)												
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	Environmental (all conditions non-condensing)	<table border="0"> <tr> <td>Temperature</td> <td>41° to 122° F (5° to 50° C)</td> </tr> <tr> <td>Relative Humidity</td> <td>10% to 90%</td> </tr> <tr> <td>Maximum Wet Bulb Temperature</td> <td>86° F (30° C)</td> </tr> </table>	Temperature	41° to 122° F (5° to 50° C)	Relative Humidity	10% to 90%	Maximum Wet Bulb Temperature	86° F (30° C)										
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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			
<hr/>				
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	<ul style="list-style-type: none"> • 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 MMC 8-bit card (version 4.x) 		
	Supported media types	<ul style="list-style-type: none"> • 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), xD-Picture Card (xD) • Supports Secure Digital Card (SD), Secure Digital ROM Card (SD ROM), miniSD, MultiMediaCard (MMC), Secure MultiMediaCard (Secure MMC), ROM Type MultiMediaCard (MMC ROM), Reduced Size MultiMediaCard (RS MMC), MultiMediaCard 4.0 (MMC Plus), Reduced Size MultiMediaCard 4.0 (MMC 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	
		Height (3.5")	25.4 cm	
		Length (5.25")	171.6 cm	
		Width (5.25")	148.9 cm	
		Height (5.25")	42.7 cm	

Technical Specifications - Removable Storage

Environmental

Operational environmental extremes

Test Parameters/Conditions - Power applied, unit operating on system $\pm 5\%$ 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

Technical Specifications - Environmental Data

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:

- US Energy Star*
- US Federal Energy Management Program (FEMP)
- Taiwan Green Mark
- China Energy Conservation Program
- IT ECO declaration
- EPEAT
- Korea Ecolabel

* Compliant with Energy Star 3.0; not compliant with Energy Star 4.0 when those requirements take effect

Longevity and Upgrading

This product is designed to be upgraded, possibly extending its useful life by several years. Spare parts are available throughout the warranty period and for up to 15 months after the end of production. Upgradeability features contained in the product include:

- 6 external USB ports
- 2 internal USB ports
- 2 external 5.25" drive bays
- 2 internal 3.5" drive bays
- 1 external 3.5" drive bay
- 1 empty standard PCI slot
- 2 empty standard PCIe x1 slots
- 1 empty standard PCIe x16 slot
- 2 memory slots
- 1 Serial port
- 1 Optional second serial port
- 1 Parallel port

Spare parts are available throughout the warranty period and for up to 5 years after the end of production.

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 4000ppm by weight.

Battery size: CR2032 (coin cell)

Battery type: Lithium

Technical Specifications - Environmental Data

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 Silver level, see <http://www.epeat.net>
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 0% recycled materials (by wt.)
- This product is >90% recyclable when properly disposed of at end of life.

Packaging Materials

- Corrugated Paper – TBD g
- EPE Foam – TBD g
- LDPE Bag –TBD g

The EPE foam packaging material is made from 30–60% recycled content.

The corrugated paper packaging materials contains at least 80% recycled content.

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 will be 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
- 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.

Technical Specifications - Environmental Data

- 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.

Hewlett-Packard Corporate Environmental Information

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

Global Citizenship Report

<http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html>

Eco-label certifications

<http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html>

ISO 14001 certificates:

<http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html>

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