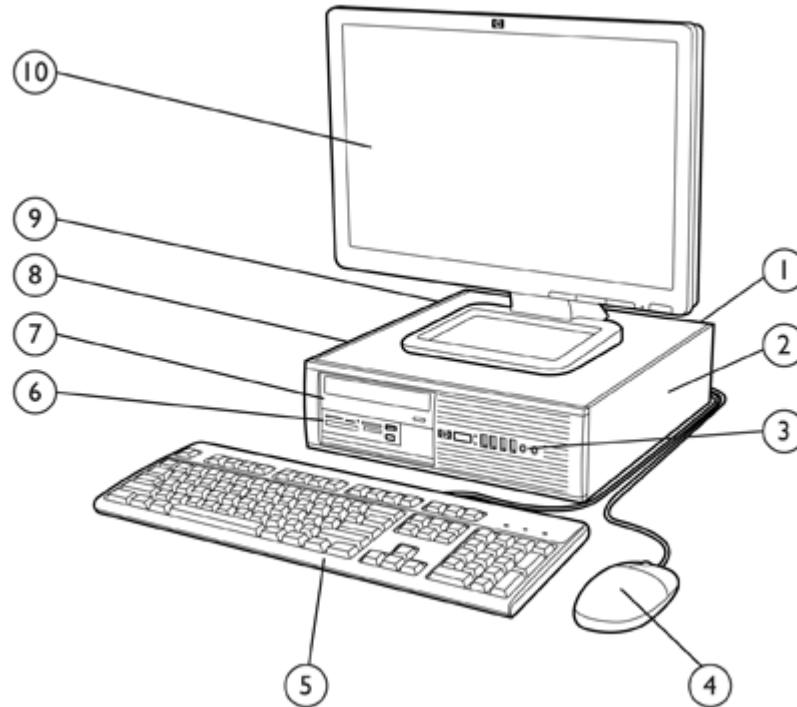


### Overview

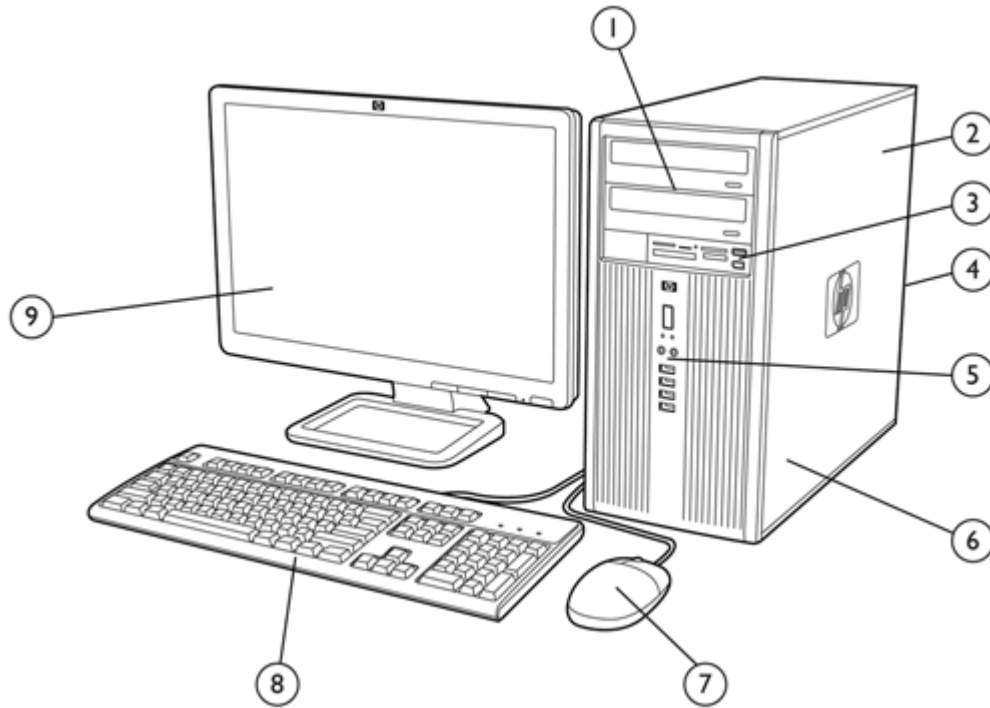
#### HP Compaq 6005 Pro Small Form Factor Business PC



- 1 Rear I/O includes (6) USB 2.0 ports, serial port, PS/2 mouse and keyboard ports, RJ-45 network interface, DisplayPort and VGA video interfaces, and audio in/out jacks
- 2 Low profile expansion slots include (1) PCI, (2) PCI Express x1 and (1) PCI Express x16 graphics
- 3 Front I/O includes (4) USB 2.0 ports, dedicated headphone output, and a microphone/headphone jack
- 4 HP Optical Mouse
- 5 HP Keyboard
- 6 3.5" external drive bay supporting a media card reader or a secondary hard disk drive
- 7 5.25" external drive bay supporting an optical disk drive
- 8 3.5" internal drive bay supporting primary hard disk drive
- 9 240W standard or 89% high efficiency Power Supply
- 10 HP Monitor (sold separately)

#### HP Compaq 6005 Pro Microtower Business PC

### Overview



- 1 (2) 5.25" external drive bays  
(2) 3.5" internal hard disk drive bays
- 2 320W standard or 89% high efficiency Power Supply
- 3 (1) 3.5" external bay
- 4 Rear I/O includes (6) USB 2.0 ports, serial port, PS/2 mouse and keyboard ports, RJ-45 network interface, DisplayPort and VGA video interfaces, and audio in/out jacks
- 5 Front I/O includes (4) USB 2.0 ports, dedicated headphone output, and a microphone/headphone jack
- 6 Full height expansion slots include (1) PCI, (2) PCI Express x1 and (1) PCI Express x16 graphics
- 7 HP Mouse
- 8 HP Keyboard
- 9 HP Monitor (sold separately)

### Overview

#### At A Glance

- Designed for long-term deployment within corporate, enterprise, public sector and mid-market commercial organizations
- Choice of two professional chassis form factors to accommodate any desired mix between expandability and size
- BIOS developed and engineered by HP for better security, manageability and software image stability
- AMD 785G chipset with integrated ATI Radeon HD 4200 graphics supporting DirectX 10.1
- Side Port Memory for increased power savings and increased graphics performance
- DDR3 Synchronous Dynamic Random Access Memory (SDRAM)
- Supports industry standard management protocols including DASH 1.1
- Integrated dual independent monitor support via both a VGA and DisplayPort video interface
- Standard efficiency or 89% high efficiency energy saving power supplies available on SFF and MT models
- 87% efficient energy saving external power adapter standard with USDT models
- ENERGY STAR qualified models available (dependent upon the desired configuration)
- Guaranteed lengthy purchase lifecycles and image stability
- Software image fully compatible across all models and form factors
- Created using industry leading Design for Environment standards
- Selected configurations with global availability easily set up and ordered through HP.com Business to Business portals (<http://h10019.www1.hp.com/business-site/index.html>)
- Tailored HP Factory Express deployment and lifecycle services available (<http://h71028.www7.hp.com/enterprise/cache/97688-0-0-225-121.aspx>)
- Protected by HP Services, including standard warranties up to 5-5-5 (terms and conditions vary by country; certain restrictions and exclusions apply)
- Tool-less serviceability features for easier upgrades and repairs

### Standard Features and Configurable Components (availability may vary by country)

#### Operating Systems

<b>Preinstalled</b>	Genuine Windows 7 Home Basic Edition (32-bit) <sup>2</sup> Genuine Windows 7 Home Premium Edition (32-bit or 64-bit) <sup>2</sup> Genuine Windows 7 Professional Edition (32-bit or 64-bit) <sup>2</sup>	
	Novell SUSE Linux Enterprise Desktop 11 <sup>3</sup> FreeDOS	
<b>Supported</b>	Genuine Windows 7 Enterprise Edition (32-bit) <sup>2</sup> Genuine Windows 7 Enterprise Edition (64-bit) <sup>2</sup> Genuine Windows Vista Business (32-bit) <sup>1</sup> Genuine Windows Vista Home Basic <sup>1</sup> Genuine Windows Vista Business 64 <sup>1</sup> Genuine Windows Vista Enterprise 32 <sup>1</sup> Genuine Windows Vista Enterprise 64 <sup>1</sup>	
	<b>Certified</b>	Novell SUSE Linux Enterprise Desktop 11 <sup>3</sup>

<sup>1</sup> Certain Windows Vista product features require advanced or additional hardware. See [www.microsoft.com/windowsvista/getready/hardwarereqs.mspx](http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx) and [www.microsoft.com/windowsvista/getready/capable.mspx](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: [www.windowsvista.com/upgradeadvisor](http://www.windowsvista.com/upgradeadvisor)

<sup>2</sup> System may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See <http://www.microsoft.com/windows/windows-7/> for details.

<sup>3</sup> The following modules or devices are not supported on Linux certified systems:

- HP 22-in-1 media card reader
- Trusted Platform Module (TPM) 1.2 Security Chip
- Intel Pro 1000 CT GbE NIC
- Broadcom NetXtreme GbE Ethernet Plus NIC
- HP 802.11b/g/n wireless NIC (SFF and MT)
- Intel WiFi Link 5100 a/b/g/n wireless NIC (USDT)
- LSI 56K Int'l SoftModem
- HP USB Smartcard keyboard
- HP Serial port adapter
- HP Parallel port adapter
- HP eSATA port adapter
- HP FireWire/IEEE 1394 I/O card

#### Value Added Software (included with all models; not included when configured with FreeDOS)

HP Software Management Agent  
Computrace for Desktops agent (optional)

HP Insight Diagnostics

PDF Complete Corporate Edition

### Standard Features and Configurable Components (availability may vary by country)

Microsoft Office 2010 preloaded (purchase of a Product Key required to activate a full Office 2010 suite)\*

\* Microsoft Office 2010 Preloaded includes reduced functionality versions of Word and Excel. Purchase of Product Key required to activate full Office 2010 suite available at participating resellers/retailers and <http://www.office.com>.

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### Value Added Software (included with select models; not included when configured with FreeDOS)

Computer Setup Utility

HP Total Care Advisor

McAfee Total Protection Anti-Virus\*

Corel WinDVD

Roxio Creator Business

Firefox HP Virtual Browser

HP Power Manager

\* 60 day trial period for McAfee Total Protection for Small Business software. Internet access required to receive updates. First update included. Subscription required for updates thereafter.

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### HP Client Management Solutions (available for free download from the Internet)

<http://www.hp.com/go/easydeploy>

HP Client Automation Starter\*

HP Client Catalog for Microsoft SMS

HP SoftPaq Download Manager

HP Systems Software Manager

\* Available from your HP Sales Representative or HP Channel Partner

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### Value Added Services and Features

HP Stable Platform Program

Factory Express Deployment and Lifecycle Services

HP Global Series Services

Trusted Platform Module (TPM) v1.2\*

Business-to-Business Portals

\* TPM module disabled where restricted by law, i.e. Russia.

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### Service and Support

On-site warranty and service<sup>1</sup>: three year (3/3/3) limited warranty and service offering delivers three years of parts, labor and on-site repair. Response time is next business day<sup>2</sup> and includes free telephone support<sup>3</sup> 24 x 7. Global coverage<sup>2</sup> ensures any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. Some countries/regions do not offer one year onsite and labor.

<sup>1</sup> Terms and conditions may vary by country. Certain restrictions and exclusions apply

<sup>2</sup> On-site services 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

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

Standard Features and Configurable Components (availability may vary by country)

### Chipset

AMD 785G chipset

### Processor

SFF/MT

#### AMD Athlon II X2 Processors

AMD Athlon II X2 220 Processor  
2.8 GHz, 1-MB L2 cache

X

AMD Athlon II X2 B28 Processor  
3.4 GHz, 2 MB L2 cache

AMD Athlon II X2 B30 Processor  
3.6 GHz, 2 MB L2 cache

#### AMD Phenom II X2 Processors

AMD Phenom II X2 B57 Processor  
3.2 GHz, 1-MB L2 cache, 6-MB shared cache

X

AMD Phenom II X2 B59 Processor  
3.4 GHz, 1 MB L2 cache, 6 MB shared cache

X

AMD Phenom II X2 B60 Processor  
3.5 GHz, 1 MB L2 cache, 6 MB shared cache

X

#### AMD Phenom II X3 Processors

AMD Phenom II X3 B75 Processor  
3.0-GHz, 1.5-MB L2 cache, 6-MB shared cache

X

AMD Phenom II X3 B77 Processor  
3.2-GHz, 1.5-MB L2 cache, 6-MB shared cache

X

#### AMD Phenom II X4 Processors

AMD Phenom II X4 B95 Processor  
3.0-GHz, 2-MB L2 cache, 6-MB shared cache

X

AMD Phenom II X4 B97 Processor  
3.2-GHz, 2-MB L2 cache, 6-MB shared cache

X

AMD Phenome II X4 B99 Processor  
3.3-GHz, 2-MB L2 cache, 6-MB shared cache

X

### Standard Features and Configurable Components (availability may vary by country)

#### Redundant Array of Independent Drives (RAID)

Flexible implementation:

- DriveLock is supported while in RAID mode. Users can manage the DriveLock password from within F10 Setup. Locked drives will be displayed as such in the RAID option ROM interface.
- Hard drive information can be viewed within F10 Setup while in RAID mode. Previously, the hard drives will not appear in Drive Configuration when switching to RAID mode.
- DPS Self Test can be executed on physical hard drives while in RAID mode.
- The RAID Setup Utility (accessed through CTRL-I) can be protected by the F10 Setup password.

#### NOTE:

RAID 1 is the only RAID configuration offered via factory configurations. The pre-configured systems:

- are only available on the CMT and SFF form factors. are complete RAID systems and have both drives installed. If the CMT is configured with three hard disk drives, the third drive is would be unpartitioned and not part of the RAID array
- have the necessary Option ROM configuration.
- are pre-loaded and pre-installed with all required Intel software.
- include a preinstalled operating system that is mirrored mode out of the box.

Please refer to the HP White Paper titled "Advanced Host Controller Interface (AHCI) and Redundant Array of Independent Disks (RAID) on HP Compaq PCs" at: <http://www.hp.com> for more information and instructions.

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#### DDR3 Synchronous DRAM NON-ECC System Memory

Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The HP Compaq 6005 Pro Series PC supports non-ECC DDR3 PC3-10600 (1333 MHz) and PC3-8500 (1066 MHz) memory.

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

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### Standard Features and Configurable Components (availability may vary by country)

#### Memory Configurations:

#### Ultra Slim Desktop

##### Maximum Memory

Supports up to 8 GB of DDR3 SDRAM using SO-DIMM modules. Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.

**NOTE:**

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

Total Memory	Slot	
	Channel A (black)	Channel B (white)
2 GB (dual channel)	1 GB	1 GB
4 GB (dual channel)	2 GB	2 GB
8 GB (dual channel)	4 GB	4 GB

#### Memory Configurations:

#### Small Form Factor Microtower

##### Maximum Memory

Supports up to 16 GB of DDR3 SDRAM using DIMM modules. Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.

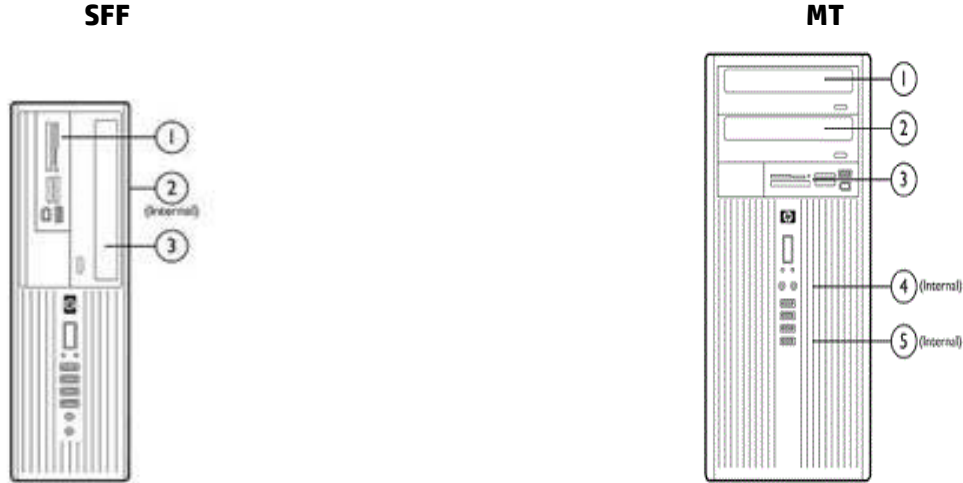
**NOTE:**

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

Total Memory	Slot			
	Channel A		Channel B	
	1 (black)	2 (white)	3 (white)	4 (white)
2 GB (dual channel symmetric)	1 GB		1 GB	
4 GB (dual channel symmetric)	1 GB	1 GB	1 GB	1 GB
8 GB (dual channel symmetric)	2 GB	2 GB	2 GB	2 GB
16 GB (dual channel symmetric)	4 GB	4 GB	4 GB	4 GB



Standard Features and Configurable Components (availability may vary by country)



Storage Drive Support						
	SFF			MT		
	MCR	ODD	HDD	MCR	ODD	HDD
Quantity Supported	1	1	2	1	2	3
Position	1	3	1,2	3	1,2	4,5

## Data Storage Drives

SFF/MT

### 80-GB Hard Disk Drives

HP 80-GB 2.5" Hard Disk Drive  
10,000 rpm, 16MB cache, 3.0 GB/s, NCQ, Smart III

X

### 160-GB Hard Disk Drives

HP 160-GB 2.5" Hard Disk Drive  
10,000 rpm, 16MB cache, 3.0 GB/s, NCQ, Smart III

X

### 250-GB Hard Disk Drives

HP 250-GB 3.5" Hard Disk Drive  
7,200 rpm, 8MB cache, 3.0 GB/s, NCQ, Smart IV

X

HP 250-GB Removable Hard Disk Drive  
7,200 rpm, 8MB cache, 3.0 GB/s, NCQ, Smart IV

X

### 320-GB Hard Disk Drive

HP 320-GB 3.5" Self Encrypting Hard Disk Drive  
7,200 rpm, 8MB cache, 3.0 GB/s, NCQ, Smart IV

X

### 500-GB Hard Disk Drives

### Standard Features and Configurable Components (availability may vary by country)

500-GB 3.5" Hard Disk Drive X  
7,200 rpm, 16MB cache, 3.0 GB/s, NCQ, Smart IV

500-GB Removable Hard Disk Drive X  
7,200 rpm, 16MB cache, 3.0 GB/s, NCQ, Smart IV

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#### 1-TB Hard Disk Drives

1 TB 3.5" Hard Disk Drive X  
7,200 rpm, 16MB cache, 3.0 GB/s, NCQ, Smart IV

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#### Self-Encrypting Solid State Drive

256 GB SATA 3.5" SED Solid State Drive X

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#### Self-Encrypting Drive

320 GB SATA 3.5" Self-Encrypting Drive X  
7,200 rpm

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#### Solid State Drives

80 GB 3.5" Solid State Drive X

120 GB 3.5" Solid State Drive X

128 GB 3.5" Solid State Drive X

160-GB 3.5" Solid State Drive X

256 GB 3.5" Solid State Drive X

RapidDrive X

#### NOTE:

RapidDrive is an optional productivity solution available only on the HP Compaq 6005 Pro SFF & MT models. It links the Solid State Drive (SSD) and Hard Drive together to form one virtual drive that combines the advantages of both technologies. Pre-installed applications reside on the SSD for reduced access time, yet the usual limitations of SSD storage are eliminated by linking it with a large hard drive.

#### Optical Disc Drives

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

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

Blu-Ray Writer Drive X

<sup>1</sup>For playing DVDs, Corel WinDVD 8

<sup>2</sup> For writing CDs, choice of Sonic/Roxio Easy Media Creator 9 or Roxio Business Creator 10

<sup>3</sup> For writing CDs and DVDs, video editing and authoring DVDs, choice of Sonic/Roxio Easy Media Creator 9 or Roxio Business Creator 10

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#### Media Card Readers

Media Card Reader (22-in-1) X

Standard Features and Configurable Components (availability may vary by country)

### Security Solutions and Capabilities

Trusted Platform Module (TPM) 1.2<sup>1</sup>  
 Stringent Security (via BIOS) <sup>2</sup>  
 SATA Port Disablement (via BIOS)  
 Drive Lock  
 Serial, Parallel, USB enable/disable (via BIOS)  
 Optional USB Port Disable at factory (user configurable via BIOS)  
 Removable Media Write/Boot Control  
 Power-On Password (via BIOS)  
 Setup Password (via BIOS)  
 HP Solenoid Hood Lock / Sensor (SFF & MT models only)  
 Support for chassis padlocks and cable lock devices

<sup>1</sup>TPM module disabled where use is restricted by law; for example, Russia.

<sup>2</sup>This setting is defaulted to disable, but when enabled, the PW jumper will not clear the BIOS pre-boot authentication passwords.

### Communication Devices

	SFF/MT
Broadcom NetXtreme BCM-5761 GbE network interface (integrated)	X
Broadcom NetXtreme GbE Ethernet Plus NIC PCIe x1 Card	X
HP 802.11 b/g/n Wireless NIC PCIe x1 Card	X
LSI Hi-Speed 56K International Soft Modem (PCIe x1 Card)	X

### Graphics

	SFF/MT
Integrated ATI Radeon HD 4200 Graphics; featuring a Side Port memory interface for 128-MB of dedicated frame buffer DDR3 memory with a device width of x16 for the integrated graphics engine	X
Nvidia NVS 300 Graphics Card	X
Nvidia GeForce 310 DP Graphics Card	X
Nvidia Quadro NVS 290 Graphics Card	X
ATI Radeon HD 4550 Graphics Card	X
ATI Radeon HD 4650 Graphics Card	MT models only
AMD Radeon HD 6350 (512 MB)	X
AMD Radeon HD 6450 (1 GB)	MT models only
AMD Radeon HD 7450 (1 GB)	X
HP DisplayPort to DVI-D Adapter	X
HP DisplayPort to VGA Adapter	X
HP DisplayPort Cable	X

### Standard Features and Configurable Components (availability may vary by country)

#### Multi-Media

High Definition Audio with Realtek ALC261 codec (all ports are stereo)

Microphone/Headphone\* and dedicated headphone front ports

Line-out and Line-In rear Ports\*

Multi-streaming capable\*

Internal Speaker (standard)

HP Thin USB Powered Speakers

HP TV Tuner PCIe x1 Card

X

\*The front microphone port is re-taskable as a Line-in, Microphone-in or Headphone-in port. Rear audio input ports are re-taskable as a Line-in or Microphone-in port. External speakers must be powered externally. Multi-streaming can be enabled in the Realtek control panel to allow independent audio streams to be sent to/from the front and rear jacks. This allows for different audio applications to use separate audio ports on the system. For example, the front jacks could be used with a headset for a communications application while the rear jacks are being used with external speakers and a multimedia application.

#### Input/Output Devices

PS/2 Standard Keyboard

USB Standard Keyboard

USB CCID SmartCard Keyboard

USB Mini Keyboard

USB and PS/2 Washable Keyboard

PS/2 Optical Mouse

USB Optical Mouse

USB Laser Mouse

USB and PS/2 Washable Mouse

#### Miscellaneous Devices

SFF/MT

HP FireWire (IEEE 1394) Card

X

HP Serial Port Adapter (RS-232 compatible)

X

HP Parallel Port Adapter

X

HP eSATA Port Adapter

X

HP SFF Tower Stand

SFF only

After-Market Options (availability may vary by region)

### Communication Devices

	SFF/MT	Part Number
HP Wireless 802.11 b/g/n NIC Card	X	FH971AA
Broadcom NetXtreme GbE Ethernet Plus NIC Card	X	FS215AA
LSI Hi-Speed 56K Int'l Soft Modem Card	X	FH970AA
RJ11 Modem Adapter Kit	X	DC131C

### Graphics Solutions

	SFF/MT	Part Number
ATI Radeon HD 4550 Graphics Card	X	SG764AT
ATI Radeon HD 4650 Graphics Card	MT models only	VN566AT
Nvidia Quadro NVS 290 Graphics Card (PCIe x16)	X	KG748AA
Nvidia GeForce 310 DP Graphics Card	X	VG885AA
DMS59 DVI Dual-head Connector Cable	X	DL139A
HP DVI to DVI Cable	X	DC198A
HP DisplayPort To DVI-D Adapter	X	FH973AT
HP DisplayPort To DL DVI-D Adapter	X	NR078AA
HP DisplayPort to VGA Adapter	X	AS615AA
HP DisplayPort to HDMI Adapter	X	BP937AA
HP DisplayPort Cable	X	VN567AA
HP USB Graphics Adapter	X	NL571AT

### Storage Drives

	SFF/MT	Part Number
HP 250GB Hard Disk Drive	X	PY278AA
HP 320GB Hard Disk Drive	X	FH963AA
HP 500GB Hard Disk Drive	X	KW347AA
HP eSATA Adapter	X	FH966AA
HP Removable SATA Hard Drive Enclosure (frame & carrier)	X	RY102AA
HP Removable SATA Hard Drive Enclosure (carrier only)	X	RY103AA

After-Market Options (availability may vary by region)

### Input Devices

	SFF/MT	Part Number
HP PS/2 Standard Keyboard	X	DT527A
HP USB Standard Keyboard	X	DT528A
HP USB SmartCard Keyboard	X	ED707AA
HP USB Keyboard and Mouse Kit	X	RC465AA
<hr/>		
HP USB Washable Keyboard	X	VF097AA
HP USB and PS/2 Washable Mouse	X	BM866AA
HP USB and PS/2 Washable Keyboard and Mouse Kit	X	BU207AA
<hr/>		
HP PS/2 Optical Mouse	X	EY703AA
HP USB Optical Mouse	X	DC172AT
HP USB Laser Mouse	X	GW405AT
HP USB Travel Mouse	X	RH304AA
<hr/>		
HP 2.4GHz Wireless Keyboard and Mouse	X	NB896AA

### System Memory

	SFF/MT	Part Number
HP 2 GB DIMM	X	AT024AA
HP 4 GB DIMM	X	VH638AA

### Multimedia Devices

	SFF/MT	Part Number
HP Thin USB Powered Speakers	X	KK912AA
HP DVD-ROM Drive	X	AR629AA
HP SuperMulti LightScribe DVD Writer Drive	X	AR630AA
HP Blu-ray Writer Drive	X	AR482AA

### Removable Media Storage

	SFF/MT	Part Number
HP USB External Diskette Drive	X	DC141B
HP Media Card Reader (22-in-1)	X	AR941AA

After-Market Options (availability may vary by region)

### Security Devices

	SFF/MT	Part Number
HP/Kensington MicroSaver Cable Lock	X	PC766A
HP Business PC Security Lock	X	PV606AA
HP SFF Wall Mount/Security Sleeve	SFF models only	VN570AA

### Security Devices

	SFF/MT	Part Number
HP Client Automation - Standard Edition (single seat)	X	T3488AA
HP Client Automation - Standard Edition (10 seats)	X	TA599AA
HP Client Automation - Standard Edition (100 seats)	X	TA600AA
HP Client Automation - Standard Edition (500 seats)	X	TA601AA
HP Client Automation - Standard Edition (1,000 seats)	X	T3489AA

### Stands and Accessories

	SFF/MT	Part Number
HP SFF Tower Stand	SFF models only	VN569AA
HP Serial Port Adapter (RS-232 compatible)	X	PA716A
HP Parallel Port Adapter	X	KD061AA
HP FireWire IEEE 1394 Card	X	PA997A

### Monitors

	Part Number
HP Compaq LE1711 17-inch LCD Monitor	EM886AA
HP Compaq LE1911 19-inch LCD Monitor	EM887AA
HP Compaq LE2002x 20-inch LED Backlit LCD Monitor	LL763AA
HP Compaq LE2002xi 20-inch LCD Monitor with IWC Stand	QC841AA
HP Compaq LE2002xm 20-inch LED Backlit LCD Monitor	A2U63AA
HP Compaq LE2202x 21.5-inch LED Backlit LCD Monitor	LL649AA
HP Compaq L2206tm 21.5-inch LED Backlit Touch Monitor	B0L55AA
HP L2401x 24-inch LED Backlit Monitor	B6R21AA

### Technical Specifications

#### Weights & Dimensions

(configured with 1 HDD and 1 ODD)

#### SFF

#### MT

Chassis (H x W x D)	4.0 x 13.3 x 14.9 in 100 x 338 x 379 mm	14.9 x 7.0 x 17.0 in 377 x 177 x 431 mm
System Volume	782.77 cu in 12.8 L	1739 cu in 28.5 liter
Tower Stand (H x W x D)	1.1 x 7.0 x 7.9 in 29 x 178 x 200 mm	N/A
Packaging (H x W x D)	9.0 x 19.7 x 23.4 in 229 x 500 x 594 mm	19.7 x 12.2 x 23.6 in 500 x 310 x 600 mm
System Weight*	16.7 lb 7.6 kg	20.5 lb 9.3 kg
Shipping Weight*	17.9 lb 8.1 kg	28.8 lb 13.1 kg
Max Supported Weight (desktop orientation)	77.0 lb 35.0 kg	N/A

#### I/O Ports

#### SFF/MT

USB 2.0	Front - four (4) ports Rear - six (6) ports
Serial	one RS-232 compatible port standard second port available as an option
Parallel	one port available as an option
eSATA	one port available as an option
PS/2	color coded support for keyboard (purple) and mouse (green)
Video	VGA and DisplayPort provide integrated dual independent monitor support
DVI output	available via optional DisplayPort to DVI Adapter
Audio	Front - microphone & headphone Rear - line input (supports microphone or line input), line out <b>NOTE:</b> <a href="#">See Audio/Visual section for information on re-taskable audio ports.</a>
NIC	Industry standard RJ-45 port accesses the integrated network interface controller



### Technical Specifications

Slots	SFF	MT
Mini PCI Express	N/A	N/A
MXM	N/A	N/A
5-volt PCI	1 each 2.5" low profile 6.6" length 25W max. power	1 each 4.2" full height 6.6" length 25W max. power
PCI Express x1	2 each 2.5" low profile 6.6" length 25W max. power	2 each 4.2" full height 6.6" length 25W max. power
PCI Express x16	1 each 2.5" low profile 6.6" length 25W max. power	1 each 4.2" full height 6.6" length 75W max. power

Bays	SFF	MT
3.5" external	1 bay available for Media Card Reader unless used for a secondary hard drive	
5.25" external	1 each 8.19" depth	2 each 8.19" depth
Slim	N/A	N/A
Secure Digital (SD) Reader	N/A	N/A
Internal HDD Bays	1 each 3.5" drives	2 each 3.5" drives

Controller	SFF	MT
Hard Drive Controller	Serial ATA Supports SATA 1.5-GB/s and 3.0-GB/s	
Host SATA Controller	Advanced Host Controller Interface (AHCI) Revision 1.2. The specification includes a description of the hardware/software interface between system software and the host controller hardware.	
SATA Interfaces	(3) SATA (1) eSATA	

### Technical Specifications

#### 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 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow.
- Never restrict airflow into the computer by blocking any vents or air intakes.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

Temperature Range	Operating: 50° to 95° F (10° to 35° C)* Non-operating: -22° to 140° F(-30° to 60° C)
Relative Humidity	Operating: 10% to 90% (non-condensing at ambient) Non-operating: 5% to 95% (non-condensing at ambient)
Maximum Altitude (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)

\* Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.

#### Power Supply

#### SFF

#### MT

Standard Efficiency	240W active PFC	320W active PFC
High Efficiency*	240W active PFC 87/89/85% efficient at 20/50/100% load	320W active PFC 87/89/85% efficient at 20/50/100% load
Operating Voltage Range	90 - 264 VAC	90 - 264 VAC
Rated Voltage Range	100 - 240 VAC	100 - 240 VAC
Rated Line Frequency	50/60 Hz	50/60 Hz
Operating Line Frequency Range	47 - 63 Hz	47 - 63 Hz
Rated Input Current	4A	5.5A
Rated Input Current with Energy Efficient*	4A	5.5A
Power Supply		
Current Leakage (NFPA 99)	< 275 µA	< 450 µA
Power Supply Fan	92mm variable speed	92mm variable speed
External Power Adapter		
Dimensions	N/A	N/A
Total Cord Length	N/A	N/A

\* High efficiency power supply is a requirement for ENERGY STAR qualification in conjunction with a select range of processors and modules

### Technical Specifications

#### ROM BIOS Information

Key features of the HP BIOS include:

- Deployment and manageability - HP BIOS provides several technologies that help integrate the HP Compaq 6005 Pro Series PC into the enterprise, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages.
- Stability - HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- Computrace agent - For tracking and tracing services, available in select countries, separate software and purchase of a subscription is required.
- Thermal and power management - The HP BIOS provides and enables thermal and power management technologies so component temperatures are managed for high reliability and to assist in operating the HP business PC in any enterprise environment.
- Acoustic performance - Industry leading acoustic emissions across the range of operating conditions.
- Serviceability - HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery - HP BIOS provides numerous ways to upgrade HP Business Desktop computers, including BIOS updates from within DOS (Flashbin), BIOS updates from within Windows (HPQFlash), HP Client Manager, and fail-safe recovery. In addition, the HP Business Desktop BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS software and from the support website.

#### Additional HP BIOS Features

- Power-On password - Helps prevent an unauthorized user from powering on the system.
- Administrator password - Also known as the setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS version cannot be changed and changes cannot be made to BIOS settings using F10 setup or under the OS.
- Advanced Configuration and Power Interface (ACPI) - Represents a significant innovation in power and configuration management, allowing operating systems and applications to manage power based on activity and usage. HP Elite models use ACPI to provide power conservation features.

S5 Max Power Savings setting supports EU Lot6 requirement and allows the computer to power down below 1W in S5 (when turned off). When S5 Max Power Savings feature is enabled power to slots is turned off along with WOL functionality.

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#### Other Features

- Advanced Configuration and Power Management Interface (ACPI). Allows the system to wake from a low power mode. Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.
  - System Management BIOS v2.6
  - Dual State Power Button; acts as both an on/off button and a suspend-to-sleep button
-

### Technical Specifications

#### Serviceability Features

- Dual colored power LED on front of computer to indicate either normal or fault condition
- Diagnostic LED Explanation Table:

# of 1 second blinks followed by a 2 second pause; then repeats	Event Description
2	processor thermal protection activated
3	processor not installed
4	power supply failure
5	memory error
6	video error
7	PCA failure (ROM detected failure prior to video)
8	invalid ROM, bootblock recovery mode
9	System not fetching code
10	System hand while loading an option ROM

- System/Emergency ROM
- Flash ROM
- CMOS Battery Holder for easy replacement
- Flash Recovery with Video Configuration Record Software
- 5 Aux Power LED on System PCA
- Processor ZIF Socket for easy Upgrade
- Over-Temp Warning on Screen (Requires IM Agents)
- Clear Password Jumper
- DIMM Connectors for easy Upgrade
- Clear CMOS Button
- NIC LEDs (integrated) (Green & Amber)
- Dual Color Power and HD LED - To Indicate Normal Operations and Fault Conditions
- Color coordinated cables and connectors
- Tool-less Hood Removal
- Front power switch
- System memory can be upgraded without removing the system board or any internal components
- Tool-less Hard Drive, CD & Diskette Removal
- Green Pull Tabs, and Quick Release Latches for easy Identification

### Technical Specifications

#### Additional Features

DASH 1.1 support (Desktop and Mobile Architecture for System Hardware)  
ASF 2.0 support (Alert Standard Format)  
  
TXT (Trusted Execution Technology) and VT-d (Virtualized devices)

Computrace  
Towerable Orientation  
Drive Lock

Drive Protection System

SMART Technology (Self-Monitoring, Analysis and Reporting Technology)

SMART I - Drive Failure Prediction

SMART II - Off-Line Data Collection

SMART III - Off-Line Read Scanning with Defect Reallocation

SMART IV - End-to-End CRC for hard drives

#### Description

A standards initiative for representing out-of-band management capability for computer systems. It is a secure, web-services based successor to ASF.

Industry-standard specification for network alerting in operating system-absent environments

TXT allows for secure management (via TPM) and measured launch of VMM, as well as teardown of secrets in unexpected reset case. TXT support provided in select Intel processors

VT-d is a chipset technology that virtualizes directed I/O

Together, TXT and VT-d may be used to support verified launch of a known trusted VMM that also may protect VMs from accessing each other's memory.

Computrace agent support standard

Small Form Factor models can be oriented as either a desktop or a tower

Implementation of the industry standard ATA Security feature set. When enabled, it prevents software access to user data on the drive until one or two user-defined passwords are provided.

DPS Access through F10 Setup during Boot

A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user

Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced

The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures

Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted

Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count

By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure

IOEDC: I/O Error Detection Circuitry

Detects errors in Read/Write buffers on HDD cache RAM

Interface in F10 setup provides confirmation of SMART IV support.

### Technical Specifications - Audio

#### High Definition Audio

<b>Type</b>	Integrated
<b>HD Stereo Codec</b>	Realtek 2-channel ALC261 codec
<b>Audio I/O Ports</b>	Front microphone-In (150-K ohm Input Impedance) Rear Line-In/Microphone input (150-K ohm Input Impedance, function is configurable by audio driver) Rear Line-Out* (190 ohms Output Impedance, expects at least a 10-K ohm load) Front Headphone-Out (0.5 Ohm Output Impedance, expects at least a 32 ohm load) Front Microphone/Headphone jack is re-task able to provide Microphone input, line-in or Headphone output to support connecting two headphones to the front of the system. When configured as a second front headphone output, both front headphone outputs are always driven with the same signal. All ports are 3.5mm in diameter
<b>Internal Speaker Amplifier</b>	For the internal speaker only. External speakers must be powered externally. Rear Line-in audio port is re-taskable as either Line-in or Microphone-In.
<b>Multi-streaming Capable</b>	Multi-streaming can be enabled in the Realtek control panel to allow independent audio streams to be sent to/from the front and rear jacks.
<b>Sampling</b>	8 kHz - 192 kHz
<b>Wavetable Syntheses (software)</b>	Yes - Uses OS soft wavetable
<b>Analog Audio</b>	Yes
<b># of Channels on Line-Out (mono/stereo)</b>	Stereo (Left & Right channels)
<b>Internal Audio Speaker Power Rating</b>	1.5 W
<b>Internal Speaker</b>	Yes
<b>External Speaker Jack (Line-Out)</b>	Yes

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### Technical Specifications - Audio

#### HP Thin USB Powered Speakers

<b>On/Off/Volume Controls</b>	Right side of right speaker
<b>Power LED</b>	Front of right speaker (green)
<b>Frequency Response</b>	F0 to 20kHz
<b>Watts</b>	2/3 watt (normal/maximum)
<b>Dimensions/Speaker (H x W x D)</b>	5.72 x 3.74 x 0.96 in 14.52 x 9.50 x 2.45 cm
<b>Net Weight</b>	0.68 lbs 0.31kg
<b>Color</b>	Black
<b>Environmental (all conditions non-condensing)</b>	<b>Operating Temperature:</b> 14° to 104° F -10° to 40° C <b>Relative Humidity</b> 40% to 90%
<b>Speaker Cable Length</b>	<b>Input Cord:</b> 5.91 ft 1800mm <b>L-channel Cord:</b> 3.28 ft 1000mm <b>USB Cord:</b> 5.91 ft 1800mm

### Technical Specifications - Communications

#### **Broadcom NetXtreme BCM 5761 GbE integrated network interface**

<b>Connector</b>	RJ-45
<b>Controller</b>	Broadcom 5761 PCI-Express LAN Controller
<b>Memory</b>	8 MB NVRAM serial Flash
<b>Data rates supported</b>	10/100/1000 Mbps
<b>Compliance</b>	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB, 802.3u, and 802.3x
<b>Bus architecture</b>	PCI-Express
<b>Data path width</b>	Single Channel PCI-Express
<b>Data transfer mode</b>	Bus-master DMA
<b>Hardware certifications</b>	FCC class B, Canada and US NRTL Mark, C-Tick for Australia, BSMI for Taiwan, VCCI for Japan, MIC for Korea, GOST for Russia, UL listed (E212044), European Union Notice (CE 0682)
<b>Power requirement</b>	1.8W @ 3.3V
<b>Boot ROM support</b>	Yes
<b>Network Transfer Mode</b>	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver) 10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps
<b>Network Transfer Rate</b>	100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps (actual rate limited by PCI Bus)
<b>Environmental</b>	Operating temperature 32° to 131°F (0° to 55° C) Operating humidity 131° F (55° C) with 5% to 95% non-condensing humidity
<b>Dimensions</b>	2.75 in x 4.13 in (7 cm x 10.5 cm), low profile compatible
<b>OS driver support</b>	Windows Vista 32-bit SP1, Windows Vista x64 SP1, Windows XP 32 bit professional
<b>Management</b>	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility, ASF2.0, DASH 1.0 and DASH 1.1 profiles



### Technical Specifications - Communications

#### Broadcom NetXtreme GbE Ethernet Plus Network Interface Controller

<b>Connector</b>	RJ-45
<b>Controller</b>	Broadcom 5761 PCI-Express LAN Controller
<b>Memory</b>	8 MB NVRAM serial Flash
<b>Data rates supported</b>	10/100/1000 Mbps
<b>Compliance</b>	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB, 802.3u, and 802.3x
<b>Bus architecture</b>	PCI-Express
<b>Data path width</b>	Single Channel PCI-Express
<b>Data transfer mode</b>	Bus-master DMA
<b>Hardware certifications</b>	FCC class B, Canada and US NRTL Mark, C-Tick for Australia, BSMI for Taiwan, VCCI for Japan, MIC for Korea, GOST for Russia, UL listed (E212044), European Union Notice (CE 0682)
<b>Power requirement</b>	1.8W @ 3.3V
<b>Boot ROM support</b>	Yes
<b>Network Transfer Mode</b>	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver) 10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps
<b>Network Transfer Rate</b>	100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
<b>Environmental</b>	Operating temperature 32° to 131°F (0° to 55° C) Operating humidity 131° F (55° C) with 5% to 95% non-condensing humidity
<b>Dimensions</b>	2.75 in x 4.13 in (7 cm x 10.5 cm), low profile compatible
<b>OS driver support</b>	Windows Vista 32-bit SP1, Windows Vista x64 SP1, Windows XP 32 bit professional
<b>Management</b>	ACPI, WOL and DMI 2.0, PXE 2.1, WfM 2.0, Broadcom mgmt utility, ASF2.0, DASH 1.0 and DASH 1.1 profiles

#### HP Wireless Network Connection 802.11 b/g/n

<b>Dimensions (L x H)</b>	3.3 x 4.7 in 8.5 x 12 cm
<b>Weight</b>	0.08 lbs (40 g)
<b>Controller</b>	Ralink RT2790
<b>System interface</b>	PCIe x1
<b>Network standard</b>	802.11 b/g/n
<b>Frequency band</b>	2.400 - 2.497 GHz
<b>Operating temperature</b>	14° to 149°F, operating (-10° to 65°C, operating)
<b>Storage temperature</b>	-40° to 176°F, non-operating (-40° to 80°C, non-operating)
<b>Humidity</b>	10-90% operating 5-95% non-operating

### Technical Specifications - Communications

**Operating voltage** 3.3V +/- 9%  
12V +/- 8%

<b>Power Consumption</b>	<b>Platform/WLAN Mode</b>	<b>Power Consumption</b>
	Maximum Power Consumption:	10 Watts
	Transmit Only	4 Watts maximum averaged power over 1 second
	Transmit Packet or Active Scanning	1000 mA peak current for 100 microseconds or longer
	Receive Only Mode or Idle without IEEE PSP mode enabled	3 Watts maximum averaged over 1 second
	Idle, with IEEE PSP mode enabled	1.0 Watts maximum averaged over 1 second
	Transmit Disabled (turned off in software)	50 mW maximum, averaged over 1 second
	Platform in S3 or S4 (power removed from Low Profile PCI Express Card)	5 mW maximum, averaged over 1 second
<b>Output Power (approximate)</b>	802.11b mode	+19 dBm +/- 1.0 dB maximum
	802.11g mode	+17 dBm +/- 1.0 dB maximum
	EWC mode	+17 dBm +/- 1.0 dB maximum (total power in all transmit chains)

<b>Receive Sensitivity</b>	<b>Mode</b>	<b>Data Rate</b>	<b>Sensitivity</b>
	802.11b	1 Mbps	-94 dBm
	802.11b	11 Mbps	-85 dBm
	802.11g	6 Mbps	-91 dBm
	802.11g	18 Mbps	-85 dBm
	802.11g	48 Mbps	-75 dBm
	802.11g	54 Mbps	-72 dBm
	EWC (2.4 GHz)	6.5 Mbps	-87 dBm
	EWC (2.4 GHz)	54 Mbps	-82 dBm
	EWC (2.4 GHz)	81 Mbps	-78 dBm
	EWC (2.4 GHz)	162 Mbps	-74 dBm
	EWC (2.4 GHz)	270 Mbps	-68 dBm
	EWC (2.4 GHz)	300 Mbps	-64 dBm

<b>Data Transfer Rate</b>	<b>Data Rate (MCS)</b>	<b>Minimum Throughput</b>
	1 Mbps (802.11 b)	700 kbps
	2 Mbps (802.11 b)	1.4 Mbps
	5.5 Mbps (802.11 b)	3.5 Mbps
	11 Mbps (802.11 b)	5.9 Mbps
	12 Mbps (802.11 g)	6 Mbps
	18 Mbps (802.11 g)	9 Mbps
	24 Mbps (802.11 g)	12 Mbps
	36 Mbps (802.11 g)	18 Mbps
	48 Mbps (802.11 g)	21 Mbps

### Technical Specifications - Communications

54 Mbps (802.11 g)	22.5 Mbps
6.5 Mbps (20 MHz EWC)	4.5 Mbps
13 Mbps (20 MHz EWC)	9 Mbps
19.5 Mbps (20 MHz EWC)	13.5 Mbps
26 Mbps (20 MHz EWC)	18 Mbps
39 Mbps (20 MHz EWC)	27 Mbps
52 Mbps (20 MHz EWC)	36 Mbps
58.5 Mbps (20 MHz EWC)	40 Mbps
65 Mbps (20 MHz EWC)	45 Mbps
78 Mbps (20 MHz EWC)	54 Mbps
104 Mbps (20 MHz EWC)	72 Mbps
117 Mbps (20 MHz EWC)	81 Mbps
130 Mbps (20 MHz EWC)	91 Mbps
13.5 Mbps (40 MHz EWC)	8 Mbps
27 Mbps (40 MHz EWC)	16 Mbps
40.5 Mbps (40 MHz EWC)	24 Mbps
54 Mbps (40 MHz EWC)	32 Mbps
81 Mbps (40 MHz EWC)	48 Mbps
108 Mbps (40 MHz EWC)	64 Mbps
121.5 Mbps (40 MHz EWC)	72 Mbps
135 Mbps (40 MHz EWC)	81 Mbps

#### Security

IEEE and WiFi compliant 64 / 128 bit WEP encryption

AES: CCM

802.1x authentication

WPA: 802.1x. WPA-PSK and TKIP

WPA2 certification

IEEE 802.11i

Cisco Certified Extensions, all versions through V5

#### Antenna

HP part number 497792-001

#### Certifications

Wi-Fi certified

#### Certifications for use by country

United States, Canada, Peru, Taiwan

### Technical Specifications - Communications

#### LSI 56K International SoftModem

<b>Data Transmission</b>	Technology speeds: 56,000 Kbps maximum downstream data, controllerless <b>NOTE:</b> 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
<b>Data Speeds</b>	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/ 16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
<b>Data Standards</b>	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
<b>Fax Speeds</b>	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
<b>Fax Mode Capabilities</b>	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
<b>Error Correction and Data Compression</b>	V.44, 42bis, V.42 and MNP2-5
<b>Power Management</b>	PCI Bus Power Management Interface Specification (PCI-PM) Revision 1.2, Appendix A. D0, D3hot, and D3cold. Wake on Ring state when in D3cold. If the power management event (PME) feature is enabled in D3cold, a modem can wake the system via WAKE# (WAKEN) or beacon. Meets PCI Express 1.1 standard.
<b>Upgradeability</b>	Driver upgradeable for future enhancements
<b>Video</b>	ITU-T V.80 video ready interface
<b>Other</b>	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
<b>Operating Humidity</b>	20% to 90%, non-condensing
<b>Power</b>	Requires a 3.3-V auxiliary power rail on PCI express bus Uses only one PCI express load (i.e., one grant/request pair), one shared IRQ, one electrical load
<b>Chipset</b>	LSI SV92EX - Integrated PCI interface with 3.3-V tolerant buffers and CardBus support
<b>Dimensions (L X H)</b>	Complies with PCI express low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
<b>Connection</b>	Single RJ-11 connector
<b>Other Features</b>	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
<b>Safety</b>	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark)
<b>EMC</b>	FCC Part 15, IC E5003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
<b>Telecom</b>	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
<b>Other</b>	The SV92EX device is packaged in a 32-pin micro leadless chip carrier (MLCC). The SV92EX is fully compliant with the PCI Express revision 1.1 specification. WHQL approved; ASPM compliant.

### Technical Specifications - Graphics

#### ATI HD 4200 Integrated Graphics

<b>Memory</b>	Variable and user selectable in BIOS
<b>Controller Clock Speed</b>	500-MHz
<b>Maximum Color Depth</b>	32-bpp
<b>Multi-display Support</b>	Yes
<b>Graphics/Video API Support</b>	DX10, OpenGL 2.0
<b>Output Connectors</b>	(1) VGA; (1) DisplayPort
<b>VGA DAC Frequency</b>	400-MHz
<b>Resolutions Supported</b>	

Resolution	Maximum Refresh Rate	
	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
1920x1200	85	60
1920x1440	85	60
2048x1536	75	60
2560x1600	N/A	60

**NOTE:**

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

**NOTE:**

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

#### NVIDIA Quadro NVS 290 Graphics Card

<b>Bus Type</b>	PCI Express x16; low profile	PCI Express x1, low profile
<b>Graphics Controller</b>	Integrated Quadro 290 2D GPU	
<b>Memory</b>	256 MB 400MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage	
<b>Connector</b>	Single high-density DMS-59 Flex Connector	
<b>Dimensions</b>	Low-profile, 2.586 x 6.6 in (6.57 x 16.76 cm)	
<b>Multi-Monitor support</b>	Dual monitor support	
<b>RAMDAC</b>	Integrated dual 400MHz	
<b>Maximum Pixel Clock</b>	350-MHz	

### Technical Specifications - Graphics

<b>Overlay planes</b>	One 16-bit video overlay plane	One 1-bit video overlay plane
	Full screen, full frame video playback of HDTV and DVD content	
	DVD ready motion compensation for MPEG-2	
	Independent hardware color controls for video overlay	
<b>High Definition Video Processor (HDVP)</b>	Hardware color space conversion (YUV 4:2:2 and 4:2:0)	
	IDCT motion compensation	
	5-tap horizontal by 3-tap vertical filtering	
	8:1 up/down scaling	

#### Specification

#### Description

<b>Board Configuration</b>	Description	G86-825
	Core Clock	460-MHz
	Memory Clock	400-MHz
	Frame Buffer	256-MB DDR2, 64-bit wide
<b>Display resolution support</b>	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link).	
	NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft Windows	
<b>Color planes</b>	32-bit color buffer	
<b>DVI support</b>	DMS-59 (to dual DVI-SL)	
<b>Supported graphics APIs</b>	OpenGL 2.1 & DX10 Support; Shader Model 4.0	

#### Maximum Refresh Rate

Resolutions Supported	Resolution	Maximum Refresh Rate	
		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:

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

#### NOTE:

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

### Technical Specifications - Graphics

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#### NVIDIA NVS 310 Graphics Card

##### Introduction

The NVIDIA® NVS™ 310 Graphics Card is a PCI Express low profile form factor graphics add-in card targeted as an active low cost graphics solution for the corporate business and enterprise markets.

The NVIDIA® NVS 310 graphics card is an ideal solution for customers requiring a small form factor graphics add-in card for either standard or small form factor PC designs.

##### Performance and Features

The NVIDIA® NVS 310 Graphics Card offers 512 MB of ultrafast DDR3 memory and is capable of supporting up to 2 displays.

- DisplayPort connector supports multimode technology to support connection to DVI-D, VGA and HDMI monitors with optional adapters in kits [NR078AA](#), [FH973AT](#), [BP937AA](#), [AS615AA](#).
- For a DisplayPort to DisplayPort connections use the optional DisplayPort Cable Kit VN567AA.

<b>Form Factor (H x L)</b>	Low Profile: 2.713 × 6.15 in
<b>Bus Type</b>	PCI Express x16, 2.0 compliant
<b>Graphics Controller</b>	NVIDIA® NVS 310
<b>Memory Size</b>	512 MB DDR3
<b>Memory Clock</b>	875MHz
<b>Memory Bandwidth</b>	14 GB/s
<b>Connectors</b>	2 × DisplayPort 1.2
<b>Maximum Resolution</b>	Up to 2560 × 1600 (digital display) per display.
<b>Display Output</b>	Up to 2 displays in the following configurations DisplayPort output: <ul style="list-style-type: none"><li>• Drives two DisplayPort enabled digital display at resolutions up to 2560 × 1600 at 60 Hz with reduced blanking, when connected natively using the 2 DisplayPort connectors on the NVS 310 graphics card</li><li>• Supports 2 monitors up to resolution of 1920 × 1200 at 60 Hz with reduced blanking using DisplayPort 1.2 multi stream topology technology.</li></ul> DVI-D output: <ul style="list-style-type: none"><li>• Drives two digital display at resolutions up to 1920 × 1200 at 60 Hz with reduced blanking using DisplayPort to DVI-D single-link cable adaptors</li><li>• Drives two digital display at resolutions up to 2560 × 1600 at 60 Hz with reduced blanking using DisplayPort to DVI-D dual-link cable adaptors</li></ul> HDMI output: <ul style="list-style-type: none"><li>• NVS 310 is capable of driving two high definition (HD) panels up to resolutions of 1920 × 1080P at 60 Hz using DisplayPort to HDMI cable adaptors</li></ul> VGA display output: <ul style="list-style-type: none"><li>• Drives two analog display at resolutions up to 1920 × 1200 at 60 Hz using DisplayPort to VGA cable adaptors</li></ul>

### Technical Specifications - Graphics

**Max. Power** 19.5 W

#### 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 Rates (Hz) by Connection			
	DisplayPort to VGA	DisplayPort to DVI-D	DisplayPort to HDMI	DisplayPort
640 x 480	85	60	60	60
800 x 600	85	60	60	60
1024 x 768	85	60	60	60
1280 x 720	85	60	60	60
1280 x 1024	85	60	60	60
1440 x 900	75	60	60	60
1600 x 1200	60	60	60	60
1680 x 1050	60	60	60	60
1920 x 1080	60-R	60-R	60	60
1920 x 1200	60-R	60-R		60
1920 x 1440				60
2048 x 1536				60
2560 x 1600				60

**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 4550 Graphics Card

**Bus type** PCI Express (x16 lanes)

**Maximum vertical refresh rate** 85 Hz

**Display support** Integrated 400 MHz RAMDAC

**Display max resolution** 1900 x 1200 digital, 2048 x 1536 analog

**Board display options** Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual DVI cable kit part number: DL139A. 4-pin mini-DIN S-video connector for TV output

Board Configuration	Specification	Description
Graphics Chip:	RV710	
Core clock:	600MHz	
Memory clock:	800 MHz	
Frame buffer:	512 MB DDR3, 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

#### Compliance

**Standards Supported Resolutions** FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use

#### EMC Emissions

#### EMC Immunity



### Technical Specifications - Graphics

CISPR22: 1997/EN 55022:1998 - Class B - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment

Canadian Standard ICES-003 is equivalent to CISPR22

Taiwanese Standard BSMI

Japanese VCCI

Australian C-Tick

Korean (MIC)

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

Resolution	Maximum Refresh Rate	
	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:**

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

**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 4650 Graphics Card

**Bus type** PCI Express x16

**Maximum vertical refresh rate** 85 Hz

**Display support** Integrated 400 MHz RAMDAC

**Display max resolution** 2560 x 1600 digital, 2048 x 1536 analog

**Resolutions Supported**

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60

### Technical Specifications - Graphics

1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	60*

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

**NOTE:**

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

**NOTE:**

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

**Board display options** Supports two displays via included two DisplayPort and one Dual Link DVI-I connectors.

**Board Configuration**

**Specification**

**Description**

Graphics Chip:	RV635
Core clock:	725 MHz
Memory clock:	500 MHz
Frame buffer:	1 GB DDR3, 128 bit wide

**Core power** 56 W

**Compliance Standards**

**EMC Emissions**

**EMC Immunity**

FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use

CISPR 24:1997/EN 55024:1998 - Information Technology Equipment - Immunity Characteristics - Limits and

CISPR22: 1997/EN 55022:1998 - Class B - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment

Canadian Standard ICES-003 is equivalent to CISPR22

Taiwanese Standard BSMI

Japanese VCCI

Australian C-Tick

Korean (MIC)

Methods of Measurement

### Technical Specifications - Graphics

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#### HP DisplayPort to DVI-D Adapter

<b>Connectors</b>	DisplayPort and DVI-D single link connector
<b>Adapter length</b>	7.5 in (19.0 cm)
<b>Adapter weight</b>	.10 lbs (.05 kg)

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#### HP DisplayPort to VGA Adapter

<b>Connectors</b>	DisplayPort and VGA connector
<b>Adapter length</b>	8 in (20 cm)
<b>Adapter weight</b>	.1 lbs (.06 kg)
<b>Maximum vertical refresh rate</b>	85 Hz
<b>Display support</b>	162 MHz RAMDAC
<b>Display max resolution</b>	1600x1200

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

**Note:**

Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP. Using the HP DisplayPort to VGA Adapter may require an update to the graphics driver installed on your system. To install the most up-to-date graphics driver go to: [www.hp.com](http://www.hp.com).

**Note:**

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

### Technical Specifications – Hard Disk Data Storage

#### 250-GB 3.5" Hard Disk Drive

<b>Capacity</b>	250,059,350,016 bytes	
<b>Rotational Speed</b>	7,200 rpm	
<b>Interface</b>	Serial ATA (SATA)	
	Up to 3 GB/s	
<b>Buffer Size</b>	8 MB	
<b>Logical Blocks</b>	488,397,168	
<b>Seek Time (typical reads, includes controller overhead, including settling)</b>	<b>Single Track</b>	1.0 ms
	<b>Average</b>	8.5 ms
	<b>Full-Stroke</b>	18 ms
<b>Height (nominal)</b>	1 in/2.54 cm	
<b>Width (nominal)</b>	Media diameter: 3.5 in/8.89 cm	
	Physical size: 4 in/10.2 cm	
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	

#### 500-GB 3.5" Hard Disk Drive

<b>Capacity</b>	500,107,862,016 bytes	
<b>Rotational Speed</b>	7,200 rpm	
<b>Interface</b>	Serial ATA (SATA)	
<b>Synchronous Transfer Rate (maximum)</b>	Up to 3 GB/s	
<b>Buffer Size</b>	16 MB	
<b>Logical Blocks</b>	976,773,168	
<b>Seek Time (typical reads, includes controller overhead, including settling)</b>	<b>Single Track</b>	2.0 ms
	<b>Average</b>	11 ms
	<b>Full-Stroke</b>	21 ms
<b>Height (nominal)</b>	1 in/2.54 cm	
<b>Width (nominal)</b>	Media diameter: 3.5 in/8.89 cm	
	Physical size: 4 in/10.2 cm	
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	

### Technical Specifications – Hard Disk Data Storage

#### 160-GB 10,000 rpm Hard Disk Drive

<b>Capacity</b>	160,041,885,696 bytes	
<b>Rotational Speed</b>	10,000 rpm	
<b>Interface</b>	Serial ATA (SATA)	
<b>Synchronous Transfer Rate (maximum)</b>	Up to 3 GB/s	
<b>Buffer Size</b>	16 MB	
<b>Logical Blocks</b>	312,581,808	
<b>Seek Time (typical reads, includes controller overhead, including settling)</b>	<b>Single Track</b>	0.3 ms
	<b>Average</b>	4.6 ms
	<b>Full-Stroke</b>	10.2 ms
<b>Height (nominal)</b>	1 in/2.54 cm	
<b>Width (nominal)</b>	Media diameter: 3.5 in/8.89 cm	
	Physical size: 4 in/10.2 cm	
<b>Operating Temperature</b>	41° to 131° F 5° to 55° C	

#### 80-GB 2.5" Solid State Drive

<b>Unformatted Capacity</b>	80-GB	
<b>Architecture</b>	Multi Level Cell (MLC) NAND Flash with wear leveling 10 channel controller	
<b>Interface</b>	Serial ATA (SATA)	
<b>Dimensions (W x H x D)</b>	2.74 x 0.37 x 4 in/6.98 x 0.95 x 10.2 cm	
<b>Weight</b>	0.18 lb/80 g	
<b>Bandwidth Performance</b>	<b>Sustained Sequential Read</b>	Up to 250 MB/s
	<b>Sustained Sequential Write</b>	Up to 70 MB/s
	<b>Random Read</b>	Up to 35K IOPs
	<b>Random Write</b>	Up to 6.6K IOPs
<b>Latency</b>	<b>Read</b>	65-ms
	<b>Write</b>	85-ms
<b>Power</b>	<b>DC power requirement</b>	5 VDC 5%-100 mV ripple p-p
	<b>Total power consumption</b>	0.15W (active); 0.075W (idle)
<b>Useful Drive Life</b>	35TB written, up to 20GB/day for 5 years	
<b>Environmental (all conditions, non-condensing)</b>	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Relative Humidity</b>	5% to 95%
	<b>Maximum Wet Bulb Temperature (operating)</b>	84° F (29° C)
	<b>Shock</b>	1,500 G/0.5-ms

### Technical Specifications – Hard Disk Data Storage

**NOTE:**  
For solid state disk drives, GB means 1 billion bytes. 16GB is the unformatted capacity of this drive before a portion of the drive is reserved for flash management features. Actual capacity varies by content and will be less than 15.8GB.

### Technical Specifications - Input/Output Devices

#### HP USB Standard Keyboard

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

### Technical Specifications - Input/Output Devices

	<b>Drop (in box)</b>	42 in (107 cm) on concrete, 16-drop sequence
<b>Approvals</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
<b>Ergonomic compliance</b>	ANSI HFS 100, ISO 9241-4, and TUVGS	
<b>Kit contents</b>	Keyboard	Installation Guide
	Warranty Card	Safety and Comfort Guide

### HP PS/2 Standard Keyboard

<b>Physical Characteristics</b>	<b>Keys</b>	104, 105, 106, 107, 109 layout (depending upon country)
	<b>Dimensions</b> (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
	<b>Weight</b>	2 lb (0.9 kg) minimum
<b>Electrical</b>	<b>Operating voltage</b>	+ 5VDC $\pm$ 5%
	<b>Power consumption</b>	50-mA maximum (with three LEDs ON)
	<b>System interface</b>	PS/2 6-pin mini din connector
	<b>ESD</b>	CE level 4, 15-kV air discharge
	<b>EMI - RFI</b>	Conforms to FCC rules for a Class B computing device
	<b>Microsoft PC 99 - 2001</b>	Functionally compliant
	<b>Mechanical</b>	<b>Languages</b>
<b>Keycaps</b>		Low-profile design
<b>Switch actuation</b>		55-g nominal peak force with tactile feedback
<b>Switch life</b>		20 million keystrokes (using Hasco modified tester)
<b>Switch type</b>		Contamination-resistant switch membrane
<b>Key-leveling mechanisms</b>		For all double-wide and greater-length keys
<b>Cable length</b>		6 ft 1.8 m
<b>Microsoft PC 99 - 2001</b>		Mechanically compliant
<b>Acoustics</b>		43-dBA maximum sound pressure level
<b>Environmental</b>		<b>Operating temperature</b>
	<b>Non-operating temperature</b>	-22° to 140° F (-30° to 60° C)
	<b>Operating humidity</b>	10% to 90% (non-condensing at ambient)
	<b>Non-operating humidity</b>	20% to 80% (non-condensing at ambient)



### Technical Specifications - Input/Output Devices

<b>Operating shock</b>	40 g, six surfaces
<b>Non-operating shock</b>	80 g, six surfaces
<b>Operating vibration</b>	2-g peak acceleration
<b>Non-operating vibration</b>	4-g peak acceleration
<b>Drop (out of box)</b>	26 in (66 cm) on carpet, six-drop sequence
<b>Drop (in box)</b>	42 in (107 cm) on concrete, 16-drop sequence

**Approvals** UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

**Ergonomic compliance** ANSI HFS 100, ISO 9241-4, and TUVGS

### HP USB SmartCard Keyboard

<b>Physical Characteristics</b>	<b>Keys</b>	104, 105, 106, 107, 109 layout (depending upon country)
	<b>Form factor</b>	USB basic Smart Card keyboard
	<b>Colors</b>	Carbonite/Silver
	<b>Dimensions (H x W x D)</b>	18.2 x 6.3 x 1.3 in 46.3 x 16.1 x 3.3 cm
<b>Electrical</b>	<b>Weight</b>	2 lb (0.9 kg) minimum
	<b>Operating voltage</b>	+ 5VDC $\pm$ 5%
	<b>Power consumption</b>	100-mA maximum (with four LEDs ON)
	<b>System interface</b>	USB Type A plug connector
	<b>ESD</b>	CE level 4, 15-kV air discharge
	<b>EMI - RFI</b>	Conforms to FCC rules for a Class B computing device
	<b>Microsoft PC 99 - 2001</b>	Functionally compliant
<b>Mechanical</b>	<b>Languages</b>	30+ available
	<b>Keycaps</b>	Standard design
	<b>Switch actuation</b>	55 g nominal peak force with tactile feedback
	<b>Switch life</b>	20 million keystrokes (using Hasco modified tester)
	<b>Switch type</b>	Contamination-resistant membrane
	<b>Key-leveling mechanisms</b>	For all double-wide and greater-length keys
<b>Environmental</b>	<b>Cable length</b>	6 ft (1.8 m)
	<b>Microsoft PC 99 - 2001</b>	Mechanically compliant
	<b>Acoustics</b>	43-dBA maximum sound pressure level
	<b>Operating temperature</b>	50° to 122° F (10° to 50° C)
	<b>Non-operating temperature</b>	-22° to 140° F (-30° to 60° C)
	<b>Operating humidity</b>	10% to 90% (non-condensing at ambient)

### Technical Specifications - Input/Output Devices

	<b>Non-operating humidity</b>	20% to 80% (non-condensing at ambient)		
	<b>Operating shock</b>	40 g, six surfaces		
	<b>Non-operating shock</b>	80 g, six surfaces		
	<b>Operating vibration</b>	2-g peak acceleration		
	<b>Non-operating vibration</b>	4-g peak acceleration		
	<b>Drop</b> (out of box)	26 in (66 cm) on carpet, six-drop sequence		
	<b>Drop</b> (in box)	42 in (107 cm) on concrete, 16-drop sequence		
<b>SmartCard Function</b>	<b>Support</b>	All ISO 7816 smart cards		
	<b>Interface</b>	Reads from and writes to all ISO7816-1, 2, 3, 4 memory and microprocessor smart cards (T=0, T=1)		
	<b>Chipset</b>	SCM STCIII		
	<b>Standard APIs supported</b>	PC/SC, EMV2000, CT-API		
	<b>Power</b>	USB Port		
		Short circuit detection (protects smart card and reader)		
		Power supply compliant with ISO7816 and EMV (5V, 60 mA)		
		Supports 3-V and 5-V cards		
		<b>Power consumption</b>	250-mA maximum draw (50 mA for the keyboard with three LEDs ON and 200-mA maximum startup current using a high-current, 60-mA smart card)	
		<b>Communication</b>	From card	Programmable from 9,600 baud to 115,200 baud
		From computer	Up to 38,400 baud	
	<b>Landing mechanism</b>	Contact device	Friction contact	
		Card insertions rating	Up to 100,000 insertion cycles	
	<b>Interface modes</b>	USB communications through USB port SCM protocol Automatic card insertion/removal detection		
	<b>Reader performance interface</b>	USB connection		
	<b>Electro-magnetic standards</b>	Europe	89/336/CEE guideline	
		USA	USAFCC part 15	

### HP PS/2 Optical Mouse

<b>Dimensions</b> (H x L x W)	1.56 x 2.44 x 4.61 in
	3.95 x 6.21 x 11.7 cm
<b>Weight</b>	4.44 oz
	126 g
<b>Environmental</b>	<b>Operating temperature</b>
	-32° to 104°F
	0° to 40° C

### Technical Specifications - Input/Output Devices

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

### Technical Specifications - Input/Output Devices

	<b>Mechanical life</b>	Minimum 200,000 revolutions
<b>Regulatory Approvals</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	

#### HP USB Optical Mouse

<b>Dimensions (H x L x W)</b>	1.5 x 4.5 x 2.5 in 3.8 x 11.6 x 6.3 cm
<b>Weight</b>	0.27 lb 0.12 kg
<b>Cable length</b>	72.8 in 185 cm
<b>System requirements</b>	Microsoft Windows 95, 98, 2000, Me, XP and Vista Available USB port

#### HP USB Laser Mouse

<b>Scroll Wheel</b>	24																
<b>Maximum Rotation Speed</b>	48 rats/sec																
<b>Switch Type</b>	Wheel																
<b>Switch Life</b>	Button – 3,000,000 Wheel – 1,000,000 times Tilt switch – 500,000 times																
<b>Environmental</b>	<table> <tr> <td><b>Operating Temperature</b></td> <td>32° to 104° F 0° to 40° C</td> </tr> <tr> <td><b>Non-operating Temperature</b></td> <td>-4° to 140° F -20° to 60° C</td> </tr> <tr> <td><b>Operating Humidity</b></td> <td>10% to 90% (non-condensing at ambient)</td> </tr> <tr> <td><b>Non-operating Humidity</b></td> <td>20% to 80% (non-condensing at ambient)</td> </tr> <tr> <td><b>Operating Shock</b></td> <td>40 g, six surfaces</td> </tr> <tr> <td><b>Non-operating Shock</b></td> <td>80 g, six surfaces</td> </tr> <tr> <td><b>Operating Vibration</b></td> <td>2-g peak acceleration</td> </tr> <tr> <td><b>Non-operating Vibration</b></td> <td>4-g peak acceleration</td> </tr> </table>	<b>Operating Temperature</b>	32° to 104° F 0° to 40° C	<b>Non-operating Temperature</b>	-4° to 140° F -20° to 60° C	<b>Operating Humidity</b>	10% to 90% (non-condensing at ambient)	<b>Non-operating Humidity</b>	20% to 80% (non-condensing at ambient)	<b>Operating Shock</b>	40 g, six surfaces	<b>Non-operating Shock</b>	80 g, six surfaces	<b>Operating Vibration</b>	2-g peak acceleration	<b>Non-operating Vibration</b>	4-g peak acceleration
<b>Operating Temperature</b>	32° to 104° F 0° to 40° C																
<b>Non-operating Temperature</b>	-4° to 140° F -20° to 60° C																
<b>Operating Humidity</b>	10% to 90% (non-condensing at ambient)																
<b>Non-operating Humidity</b>	20% to 80% (non-condensing at ambient)																
<b>Operating Shock</b>	40 g, six surfaces																
<b>Non-operating Shock</b>	80 g, six surfaces																
<b>Operating Vibration</b>	2-g peak acceleration																
<b>Non-operating Vibration</b>	4-g peak acceleration																
<b>Electrical</b>	<b>Operating Voltage</b> + 5VDC ± 5%																

### Technical Specifications - Input/Output Devices

#### Power Consumption

**MTBF** > 150,000 hrs

**ESD** IEC-61000-4-2 criteria B, Contact discharge: +/- 4kV, Air discharge: +/- 8kV

**EMI-RFI** FCC Class B

**PC98** PC 99 Compliant

#### Mechanical

**Resolution** 800dpi

**Tracking Speed** 25 cm/sec

**Acceleration** 0.5mm

**Switch Actuation** 0.6N (60gf)

**Switch Life** Button - 3,000,000

Wheel - 1,000,000 times

Tilt switch - 500,000 times

**Cable Length** 1850mm

**PC98-99** PC99 compliant

#### Regulatory Approvals

Regulatory Approvals UL60950-1, UL 94, UL 746 (A-E), UL 796  
TUV/GS: EN 60950-1, EN 60825-1  
FCC Class B, UL 1950, cUL, TUV GS, CE, C-tick, VCCI, BSMI, RRL

### Technical Specifications - Optical Storage

#### HP Blu-ray Writer Drive

<b>AMO Part Number</b>	AR482AA		
<b>Height</b>	5.25-inch, half-height, tray-load		
<b>Orientation</b>	Either horizontal or vertical		
<b>Interface type</b>	SATA/ATAPI		
<b>Disc capacity</b>	50 GB DL or 25 GB standard		
<b>Dimensions (W x H x D)</b>	5.9 x 1.7 x 7.5 in 15.0 x 4.4 x 19.0 cm		
<b>Weight (max)</b>	2.0 lb 907g		
<b>Write Speeds</b>		<b>Single-layer</b>	<b>Double-layer</b>
	<b>BD-R</b>	2x, 4x CLV, 6x CAV	2x, 4x CLV
	<b>BD-RE</b>	2.3x	2x CLV
	<b>DVD-R</b>	2x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV	2x, 4x CLV
	<b>DVD-RW</b>	1x, 2x, 4x, 6x CLV	Not supported
	<b>DVD+R</b>	2.4x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV	2.4x, 4x CLV
	<b>DVD+RW</b>	2.4x, 4x, 6x CLV, 8x ZCLV	Not supported
	<b>DVD-RAM</b>	2x, 3x CLV, 3-5x PCAV	
	<b>CD-R</b>	8x, 16x CLV, 24x, 32x PCAV, 40x CAV	
	<b>CD-RW</b>	4x, 10x, 16x CLV, 24x ZCLV	
<b>Read Speeds</b>		<b>Single-layer</b>	<b>Double-layer</b>
	<b>BD-ROM</b>	6x CAV	4.8x CAV
	<b>BD-R</b>	6x CAV	4.8x CAV
	<b>BD-RE (SL/DL)</b>	4.8x CAV	4.8x CAV
	<b>DVD-ROM</b>	16x CAV	8x CAV
	<b>DVD-R</b>	12x CAV	8x CAV
	<b>DVD-RW</b>	10x CAV	Not support
	<b>DVD+R</b>	12x CAV	8x CAV
	<b>DVD+RW</b>	10x CAV	Not support
	<b>BDMV (AACs Compliant Disc)</b>	4.8x CAV	
	<b>DVD-RAM</b>	2x, 3x CLV, 3x-5x PCAV	
	<b>DVD-Video (CSS Compliant Disc)</b>	8x CAV	
	<b>CD-R/RW/ROM</b>	40x / 40x / 40x CAV	
	<b>CD-DA (DAE)</b>	32x CAV	
	<b>80 mm CD</b>	16x CAV	
<b>Sustained Transfer rate</b>	<b>BD-ROM</b>	26.97 MB/s (6x) max.	
	<b>DVD-ROM</b>	16.62 MB/s (16x) max.	
	<b>CD-ROM</b>	6,000 KB/s (40x) max.	
<b>Buffer Transfer Rates</b>	1.5Gbps bits/s (10b side)		
	1.2Gbps bits/s (8b side)		
<b>Multimedia MPC-3 compliant</b>	Yes		

### Technical Specifications - Optical Storage

<b>Access times</b> (typical reads, including setting)	<b>Random Full Stroke</b>	DVD: < 140 ms (typical), CD: < 125 ms (typical) DVD: < 250 ms (seek), CD: < 210 ms (seek)
<b>Power</b>	<b>Source DC Power Requirement DC Current</b>	SATA DC power receptacle 5 VDC -1000 mA typical, 1600 mA maximum 12 VDC -600 mA typical, 1400 mA maximum 5 VDC -1000 mA typical, 1600 mA maximum 12 VDC -600 mA typical, 1400 mA maximum
<b>Environmental</b> (all conditions non-condensing)	<b>Temperature (operating) Relative Humidity (operating) Maximum Wet Bulb Temperature (operating)</b>	41° to 122° F (5° to 50° C) 10% to 90% 86° F (30° C)

### HP SuperMulti Drive

<b>AMO Part Number</b>	AR630AT		
<b>Height</b>	5.25-inch, half-height, tray-load		
<b>Orientation</b>	Either horizontal or vertical		
<b>Interface type</b>	Serial ATA		
<b>Dimensions (W x H x D)</b>	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
<b>Weight</b>	2.6 lb (1.2 kg)		
<b>Performance</b>	CD Media Read Access	Random Full Stroke	< 120 ms typical < 200 ms typical
	DVD Media Read Access	Random Full Stroke	< 130 ms typical < 240 ms typical
	CD Media Read Transfer	CD-ROM, CD-R Read CD-RW Read Digital/Analog Audio Playback Digital Audio Extraction (CD-ROM, CD-R)	Up to 6000 KB/s (40X) Up to 4800 KB/s (32X) Up to 2400 KB/s (16X) Up to 6000 KB/s (40X)
	DVD Media Read Transfer	Digital Audio Extraction (CD-RW) Video CD Playback DVD-ROM SL Read DVD-ROM DL Read DVD Video Playback DVD Video SL (other than playback) DVD Video DL (other than playback) DVD-R DVD+R	Up to 4800 KB/s (32X) Up to 2400 KB/s (16X) Up to 21600 KB/s (16X) Up to 10800 KB/s (8X) Up to 10800 KB/s (8X) Up to 21600 KB/s (16X) Up to 10800 KB/s (8X) Up to 21600 KB/s (16X) Up to 21600 KB/s (16X)

### Technical Specifications - Optical Storage

	DVD-RW	Up to 10800 KB/s (8X)
	DVD-R DL	Up to 10800 KB/s (8X)
	DVD+RW	Up to 10800 KB/s (8X)
CD Media Write Transfer	CD-R Write	UP to 6000 KB/s (40X)
	CD-RW	600 KB/s (4X)
	CD-RW (High speed)	1500 KB/s (10X)
	CD-RW (Ultra speed)	Up to 3600 KB/s (24X)
	CD-RW (Ultra speed+)	Up to 4800 KB/s (32X)
DVD Media Write Transfer	DVD+R	Up to 21600 KB/s (16X)
	DVD+R DL (v1.2)	Up to 16200 KB/s (12X)
	DVD+R DL (v1.1)	Up to 10800 KB/s (8X)
	DVD+RW (Volume 2 v1.0)	Up to 10800 KB/s (8X)
	DVD+RW (Volume 1 v1.3)	Up to 5400 KB/s (4X)
	DVD-R (v2.1 rev. 6.0)	Up to 21600 KB/s (16X)
	DVD-R (v2.1 rev. 4.0)	Up to 10800 KB/s (8X)
	DVD-R DL (v3.0 rev. 5.0)	Up to 16200 KB/s (12X)
	DVD-R DL (v3.0 rev. 3.0)	Up to 10800 KB/s (8X)
	DVD-RW (v1.2 rev. 3.0)	8100 KB/s (6X)
	DVD-RW (v1.2 rev. 2.0)	Up to 5400 KB/s (4X)
	DVD-RAM (v2.2 rev. 5.0)	Up to 16200 KB/s (12X)
	DVD-RAM (v2.2 rev. 2.0)	Up to 6750 KB/s (5X)

### Media Compatibility

	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

### Power Supply

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 (max.)



### Technical Specifications - Optical Storage

12 VDC	1200 mA (typical)
	2000 mA (max.)
Total Drive Power (Standby Mode)	< 2.5W

#### Rear Panel

SATA Power Connector, 15-pin  
SATA Data Connector, 7-pin  
Markings to identify each connector

#### Environmental (all conditions non-condensing)

Temperature (operating)	41° to 122° F (5° to 50° C)
Temperature (storage)	-22° F to 140° F (-30° C to 60° C)
Relative Humidity	10% to 90%
Maximum Wet Bulb Temperature	86° F (30° C)
Altitude	0 to 10,171 ft. (0 to 3,100 meters)

### HP DVD-ROM Drive

#### AMO Part Number

AR629AA

#### Height

5.25-inch, half-height, tray-load

#### Orientation

Either horizontal or vertical

#### Interface type

Serial ATA

#### 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

2.6 lb (1.2 kg)

#### Performance

CD Media Read Access	Random	< 120 ms typical	
	Full Stroke	< 200 ms typical	
DVD Media Read Access	Random	< 130 ms typical	
	Full Stroke	< 240 ms typical	
CD Media Read Transfer	CD-ROM, CD-R Read	Up to 6000 KB/s (40X)	
	CD-RW Read	Up to 4800 KB/s (32X)	
	Digital/Analog Audio Playback	Up to 2400 KB/s (16X)	
	Digital Audio Extraction (CD-ROM, CD-R)	Up to 6000 KB/s (40X)	
	Digital Audio Extraction (CD-RW)	Up to 4800 KB/s (32X)	
	Video CD Playback	Up to 2400 KB/s (16X)	
	DVD Media Read Transfer	DVD-ROM SL Read	Up to 21600 KB/s (16X)
		DVD-ROM DL Read	Up to 10800 KB/s (8X)
		DVD Video Playback	Up to 10800 KB/s (8X)
		DVD Video SL (other than playback)	Up to 21600 KB/s (16X)

### Technical Specifications - Optical Storage

		DVD Video DL (other than playback)	Up to 10800 KB/s (8X)
		DVD-R	Up to 21600 KB/s (16X)
		DVD+R	Up to 21600 KB/s (16X)
		DVD-RW	Up to 10800 KB/s (8X)
		DVD-R DL	Up to 10800 KB/s (8X)
		DVD+RW	Up to 10800 KB/s (8X)
<b>Media Compatibility</b>	<b>Media</b>	<b>Read</b>	<b>Write</b>
	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
<b>Power Supply</b>	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 (max.)
		12 VDC	1200 mA (typical) 2000 mA (max.)
		Total Drive Power (Standby Mode)	< 2.5W
<b>Rear Panel</b>	SATA Power Connector, 15-pin		
	SATA Data Connector, 7-pin		
	Markings to identify each connector		
<b>Environmental conditions</b> (all conditions non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)	
	Temperature (storage)	-22° F to 140° F (-30° C to 60° C)	
	Relative Humidity	10% to 90%	
	Maximum Wet Bulb Temperature	86° F (30° C)	
	Altitude	0 to 10,171 ft. (0 to 3,100 meters)	

### Technical Specifications - Removable Storage

#### HP 22-n-1 plus 1394 Media Card Reader

**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

### 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  
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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### Technical Specifications - Eco 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®
- IT ECO declaration
- EPEAT Gold where HP registers commercial desktop products. See <http://www.epeat.net> for registration status in your country

#### Small Form Factor

	115 VAC	230 VAC	100 VAC
<b>Energy Consumption</b> (typically configured)			
<b>Normal Operation</b>	27.4159W	27.1680W	27.7080W
<b>Sleep State</b> (Energy Star low power mode)	2.5527W	2.7644W	2.5316W
<b>Off</b>	0.7149W	0.8667W	0.7003W
<b>Heat Dissipation</b> (typically configured)*			
<b>Normal Operation</b>	94 BTU/hr	93 BTU/hr	95 BTU/hr
<b>Sleep</b>	9 BTU/hr	9 BTU/hr	9 BTU/hr
<b>Off</b>	2 BTU/hr	3 BTU/hr	2 BTU/hr

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

#### Declared Noise Emissions

(in accordance with ISO 7779 and ISO 9296)

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
<b>Idle</b>	3.8	27
<b>Fixed Disk</b> (random writes)	3.9	28

#### Battery

The battery(s) in this product complies with EU Directive 2006/66/EC, and does not contain:

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

#### Battery Size

CR2032 (coin cell)

#### Battery type

Li-Ion

#### Additional Information

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

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

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

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

### Technical Specifications - Eco Data

Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.

This product contains 0% post consumer recycled plastic (by wt.)

This product is 91.5% recyclable when properly disposed of at end of life.

#### Packaging Materials

External	Corrugated 1835g Contains at least 30% recycled content
Internal	EPE low density solid: 150g EPE low density foam: 20g Contains 100% recycled content

### Microtower

<b>Energy Consumption</b> (typically configured)	115 VAC	230 VAC	100 VAC
<b>Normal Operation</b>	31.3720W	32.1179W	31.8169W
<b>Sleep State</b> (Energy Star low power mode)	2.4746W	2.6361W	2.4347W
<b>Off</b>	0.7153W	0.8560W	0.6980W
<b>Heat Dissipation*</b>	115 VAC	230 VAC	100 VAC
<b>Normal Operation</b>	107 BTU/hr	110 BTU/hr	109 BTU/hr
<b>Sleep</b>	8 BTU/hr	9 BTU/hr	8 BTU/hr
<b>Off</b>	2 BTU/hr	3 BTU/hr	2 BTU/hr

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

### Declared Noise Emissions

(in accordance with ISO 7779 and ISO 9296)

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.8	28
Fixed Disk (random writes)	3.8	29

#### Battery

The battery(s) in this product complies with EU Directive 2006/66/EC, and does not contain:

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

#### Battery Size

CR2032 (coin cell)

#### Battery type

Li-Ion

#### Additional Information

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

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

### Technical Specifications - Eco Data

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

This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see:

[www.epeat.net](http://www.epeat.net)

Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.

This product contains 0% post consumer recycled plastic (by wt.)

This product is 91.4% recyclable when properly disposed of at end of life.

#### Packaging Materials

External	Corrugated 1835g Contains at least 30% recycled content
Internal	EPE low density solid: 150g EPE low density foam: 20g Contains 100% recycled content

### All Models

#### Reduction in Hazardous Substances (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](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
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) - except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

### Technical Specifications - Eco Data

Nickel finishes that release greater than 0.5 micro-grams/cm<sup>2</sup>/week, measured according to EN 1811:1998, are not used on any product surface designed to be frequently handled or touched by users.

#### 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/go/reuse-recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

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

#### Hewlett-Packard Corporate Environmental Information

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

Global Citizenship Report

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

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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