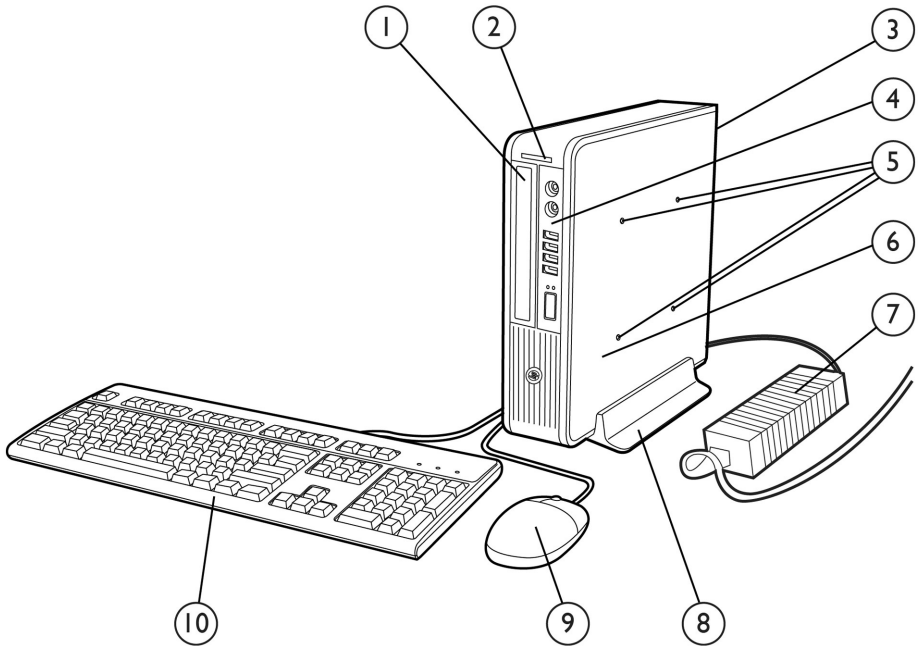
Overview

## HP SignagePlayer mp8200 and mp8200s




1. Optical DVD-ROM Drive
2. Secure Digital (SD) Card Reader
3. Rear I/O includes (6) USB 2.0 ports, DisplayPort v1.1a and VGA video interfaces, PS/2 mouse and keyboard ports, RJ-45 network interface, 3.5mm audio in/out jacks
4. Front I/O includes (4) USB 2.0 ports, audio out , and a microphone/headphone jack
5. 100mm VESA mounting holes
6. 2.5" internal hard disk drive bay
7. 135W 87% efficient external Power Adapter or
   180W 87% efficient external Power Adapter (when configured with discrete graphics)
8. HP USDT Tower Stand (optional)
9. HP Mouse (optional)
10. HP Keyboard (optional)

Overview

## At A Glance

- PC chassis and all internal components and modules are 100% free of brominated flame retardants (BFRs) and Polyvinyl Chloride (PVC).
- UEFI BIOS developed and engineered by HP for better security, manageability and software image stability
- Intel Q67 Express chipset supporting Intel 2nd generation Core processors, featuring Intel HD Graphics and with vPro Technology (available with select processors on Windows Embedded Standard 7)
- Intel 82579LM GbE integrated network connection
- DDR3 Synchronous Dynamic Random Access Memory (SDRAM)
- Integrated dual independent monitor support via VGA and digital DisplayPort v1.1a video interfaces (dual monitor support is not supported on the mp8200s using Scala Quickstart)
- Discrete graphics options available 87% efficient energy saving external power adapter standard with USDT models
- Guaranteed lengthy purchase lifecycles Created using industry leading Design for Environment standards
- Tool-less serviceability features for easier upgrades and repairs

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

## Operating Systems

**Preinstalled**

Genuine Windows Embedded Standard 2009[1]

Genuine Windows Embedded Standard 7[2]

[1] mp8200s model

[2] mp8200 model

## Value Added Software (included on mp8200s)

Scala Quickstart

## HP Business PC Services and Feature

HP Stable Platform Program

Intel Stable Platform Program

Business-to-Business Portals

HP Global Series Services

Factory Express Deployment and Lifecycle Services

Intel Core vPro Processors

Trusted Platform Module (TPM v1.2) *

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

## Service and Support

On-site warranty and service[1]: This limited warranty and service offering delivers parts, labor and on-site repair for terms up to 5 years. Response time is next business day[2] and includes free telephone support[3] 24 x 7. Global coverage[2] 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.

[1] Terms and conditions may vary by country. Certain restrictions and exclusions apply

[2] 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

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

## Chipset

| | mp8200 | mp8200s |
|---|---|---|
| Intel Q67 Express | X | X |

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

| Processor | mp8200 | mp8200s |
|---|---|---|
| **Intel® 2nd Generation Core™ i3 Processors** | | |
| Intel Core i3-2100 Processor<br>3.10 GHz, 3M cache, 2 cores/4 threads | X | X |
| **Intel® 2nd Generation Core™ i5 Processors** | | |
| Intel Core i5-2400S Processor<br>2.50 GHz, 6M cache, 4 cores/4 threads<br>Intel Stable Image Platform Program (SIPP)<br>Supports Intel vPro Technology | X | X |

## Intel 2nd Generation Core vPro Processors

All HP SignagePlayer mp8200 Series models featuring this technology include processors that are part of the Intel 2011 Stable Image Platform Program (SIPP) designed to ensure the stability promise inherent in the value proposition of the HP SignagePlayer mp8200 Series, thus making these models the most stable, secure, and manageable platforms available to enterprises today.

**Intel Advanced Management Technology (AMT) v7.0** - An advanced set of remote management features and functionality which provides network administrators the latest and most effective tools to remotely discover, heal, and protect networked client systems regardless of the system's health or power state. AMT 7.0 includes the following advanced management functions:

- Power Management (on, off, reset)
- Hardware Inventory (includes BIOS and firmware revisions)
- Hardware Alerting
- Agent Presence
- System Defense Filters
- SOL/IDER
- Cisco NAC/SDN Support
- ME Wake-on-LAN
- DASH 1.1 compliance
- IPv6 Support
- Fast Call for Help - a client inside or outside the firewall may initiate a call for help via BIOS screen, periodic connections, or alert triggered connection
- Remote Scheduled Maintenance - pre-schedule when the PC connects to the IT or service provider console for maintenance. Remote PCs can get required patches, be inventoried, etc by connecting to their IT console or Service Provider when it's convenient
- Remote Alerts - automatically alert IT or service provider if issues arise
- Access Monitor - Provides oversight into Intel® AMT actions to support security requirements
- PC Alarm Clock
- Microsoft NAP Support
- Host Base set-up and configuration
- Management Engine (ME) firmware roll back
- Wireless AMT functionality on Desktop (WoDT)
- Enhanced KVM resolution

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

## System Memory Support

The HP SignagePlayer mp8200 Series supports the 2nd generation Intel® Core™ processor family. Based on a new PC micro-architecture, the processor is designed for a two-chip platform consisting of a processor and Platform Controller Hub (PCH). Unlike previous generations, the processor includes an integrated memory controller (IMC). The IMC supports DDR3 protocols with two independent, 64-bit wide channels each accessing one or two DIMMs.

- Two channels of non-ECC unbuffered DDR3 memory with a maximum of two UDIMMs or SODIMMs per channel
- Single-channel and dual-channel memory organization modes
- Data burst length of eight for all memory organization modes
- DDR3 memory data transfer rates of 1066 MT/s (PC3-8500) and 1333 MT/s (PC3-10600)
- 64-bit wide channels
- DDR3 I/O voltage of 1.5V
- Maximum memory bandwidth of 10.6 GB/s in single-channel mode or 21 GB/s in dual-channel mode assuming DDR3 1333 MT/s (PC3-10600)
- 2GB DDR3 DRAM technology is supported. Using 4 GB device technologies, the largest memory capacity possible is 32 GB, assuming dual channel mode with four x 8 GB dual ranked unbuffered DIMM memory configuration.

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.

## Memory Configurations:

Upgradeable to 4 GB. Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.

| Total Memory | Socket | |
|---|---|---|
| | Channel A (black) | Channel B (black) |
| 4 GB (dual channel) | 2 GB | 2 GB |

**NOTE:**
For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. The mp8200s hardware and BIOS supports up to 4GB however a maximum of 2GB is available to the operating system.

**NOTE:**
The Intel Q67 Express chipset includes a built-in Management Engine (ME), which allocates memory for manageability functions. Management Engine memory is shared with system memory. If the PC contains a single SO-DIMM, 16 MB of memory is pre-allocated for it at system startup. If the PC contains two SO-DIMMs, 32 MB of memory is pre-allocated. This memory is not made available to the operating system, just as pre-allocated video memory is not available.

## Storage

### mp8200s and mp8200

**(waiting for image)**

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

**Storage Drive Support**

| | SDR | ODD | HDD | | |
|---|---|---|---|---|---|
| Quantity Supported | 0 | 1 | 1 | 0 | 1 |
| Position | 1 | 2 | 3 | | |

## Data Storage Drives

| | mp8200 | mp8200s |
|---|---|---|
| **250-GB Hard Disk Drives** | | |
| HP 250GB 7.2K rpm SATA 2.5" Hard Disk Drive | X | X |
| **320-GB Hard Disk Drives** | | |
| HP 320GB 7.2K rpm SATA 2.5" Hard Disk Drive | X | X |
| **Solid State Drives** | | |
| HP 160-GB SATA 3.0Gb/s Solid State Drive | X | X |
| **Optical Disc Drives** | | |
| HP Slim DVD-ROM Drive[1] | X | |

## Security Solutions and Capabilities

| | mp8200 | mp8200s |
|---|---|---|
| Trusted Platform Module (TPM) 1.2[1] | X | X |
| Stringent security (via BIOS)[2] | X | X |
| SATA port disablement (via BIOS) | X | X |
| Drive lock | X | X |
| Serial, parallel, USB enable/disable (via BIOS) | X | X |
| Removable media write/boot control | X | X |
| Power-On password (via BIOS) | X | X |
| Setup password (via BIOS) | X | X |
| HP Hood Sensor | X | |
| Support for chassis padlocks and cable lock devices | X | X |

[1] TPM module disabled where use is restricted by law; for example, Russia.

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

## Network Interface Connections

| | mp8200 | mp8200s |
|---|---|---|
| Intel 82579LM integrated GbE Network Connection | X | X |
| Intel Centrino Advanced-N 6205 Wireless NIC (mini PCI Express) | X | X |

**NOTE:** Either the integrated network connection or the Intel Centrino wireless NIC is required to support Intel vPro Technology features on the mp8200 model.

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

| Graphics | mp8200 | mp8200s |
|---|---|---|
| Intel HD Graphics 2000/3000 (integrated) | X | X |
| ATI Radeon HD 5450 Graphics (MXM) | X | X |
| HP DisplayPort Cable | X | X |
| HP DisplayPort to DVI-D Adapter | X | X |
| HP DisplayPort to HDMI Adapter | X | X |
| HP DisplayPort to VGA Adapter | X | X |

| Multi-Media | mp8200 | mp8200s |
|---|---|---|
| High Definition Audio with Realtek ALC261 codec (all ports are stereo) | X | X |
| Microphone/Headphone* and dedicated headphone front ports (3.5mm) | X | X |
| Line-out and Line-In rear Ports* (3.5mm) | X | X |
| Internal Speaker (standard) | X | X |

| Input/Output Devices | mp8200 | mp8200s |
|---|---|---|
| HP USB Standard Keyboard | X | X |

| Miscellaneous Devices and Configurations | mp8200 | mp8200s |
|---|---|---|
| HP USDT Tower Stand | X | X |

After-Market Options (availability may vary by country)

| Graphics | mp8200 | mp8200s | Part # |
|---|---|---|---|
| HP DisplayPort Cable Kit | X | X | VN567AA |
| HP DisplayPort To DVI-D Adapter | X | X | FH973AA |
| HP DisplayPort to HDMI Adapter | X | X | BP937AA |
| HP DisplayPort to VGA Adapter | X | X | AS615AA |

| Data Storage Drives and Accessories | mp8200 | mp8200s | Part # |
|---|---|---|---|
| HP 160-GB SATA 3.0Gb/s Solid State Drive | X | X | QV064AA*<br>*Not available in all regions. |

| Input Devices | mp8200 | mp8200s | Part Number |
|---|---|---|---|
| HP USB Standard Keyboard | X | X | DT528A |
| HP USB Optical Mouse | X | X | DC172AT |

| System Memory | mp8200 | mp8200s | Part Number |
|---|---|---|---|
| HP 1 GB SO-DIMM | X | X | VH639AA |
| HP 2 GB SO-DIMM | X | X | VH640AT |

| Multi-Media Devices | mp8200 | mp8200s | Part Number |
|---|---|---|---|
| HP Slim DVD-ROM Drive | X | | VP033AA |

| Security Devices | mp8200 | mp8200s | Part Number |
|---|---|---|---|
| HP Business PC Security Lock | X | X | PV606AA |
| HP USDT Rear Port Controller Cover | X | X | VN571AA |
| HP Keyed Lock Cable | X | X | BV411AA |

| Stands and Accessories | mp8200 | mp8200s | Part Number |
|---|---|---|---|
| HP USDT Tower Stand | X | X | VN568AA |

Technical Specifications

| Weights & Dimensions (configured with 1 HDD and 1 ODD) | mp8200 and mp8200s |
|---|---|
| Chassis (without stand) (H x W x D) | 2.6 x 9.9 x 10 in<br>66 x 252 x 254 mm |
| System Volume | 257.5 cu in<br>4.2 L |
| Tower Stand (H x W x D) | 1.1 x 4.9 x 6.7 in<br>27 x 125 x 170 mm |
| Packaging (H x W x D) | 8.6 x 15.7 x 19.7 in<br>218 x 398 x 500 mm |
| System Weight* | 6.8 lb<br>3.1 kg |
| Shipping Weight* | 14.4 lb<br>6.5 kg |
| Max Supported Weight (desktop orientation) | 77.0 lb<br>35.0 kg |

| I/O Ports | mp8200 and mp8200s |
|---|---|
| USB 2.0 | Front - four (4) ports<br>Rear - six (6) ports |
| PS/2 | color coded support for keyboard (purple) and mouse (green) |
| Video | VGA and DisplayPort v1.1a provide integrated dual independent monitor support |
| DVI output | available via optional DisplayPort to DVI Adapter |
| Audio | Front - microphone & headphone<br>Rear - line input (supports microphone or line input), line out<br>All ports are 3.5mm in diameter<br>**NOTE:** See Audio/Visual section for information on re-taskable audio ports. |
| NIC | Industry standard RJ-45 port accesses the integrated network interface controller |

| Slots | mp8200 and mp8200s |
|---|---|
| Mini PCI Express | 1 each |
| MXM | 1 each |

| Bays | mp8200 and mp8200s |
|---|---|
| Slim | 1 each |
| Internal HDD Bays | 1 each<br>2.5" drives |

Technical Specifications

| Controller | mp8200 and mp8200s |
|---|---|
| Hard Drive Controller | 1 each |
| 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.[1]<br>[1] The mp8200s model ships with the SATA controller in IDE mode |

## 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)*<br>Non-operating: -22° to 140° F(-30° to 60° C) |
| Relative Humidity | Operating: 10% to 90% (non-condensing at ambient)<br>Non-operating: 5% to 95% (non-condensing at ambient) |
| Maximum Altitude (unpressurized) | Operating: 10,000 ft (3048 m)<br>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 | mp8200 and mp8200s | |
|---|---|---|
| Standard Efficiency | N/A | |
| High Efficiency | Integrated graphics: | 135W active PFC 87% efficient |
| | Discrete graphics: | 180W active PFC 87% efficient |
| Operating Voltage Range | 90 - 264 VAC | |
| Rated Voltage Range | 100 - 240 VAC | |
| Rated Line Frequency | 50/60 Hz | |
| Operating Line Frequency Range | 47 - 63 Hz | |
| Rated Input Current | N/A | |
| Rated Input Current with Energy Efficient* Power Supply | 135W: 2.4A<br>180W: 2.9A | |

Technical Specifications

| | |
|---|---|
| Current Leakage (NFPA 99) | < 250 µA |
| Power Supply Fan | N/A |
| Power Cord Length | N/A |
| External Power Adapter | |
| Dimensions | 6.7 x 2.6 x 1.5 in |
| Total Cord Length | 12 ft 8 in |

## ROM BIOS Information

Key features of the HP BIOS include:

- Deployment and manageability - HP BIOS provides several technologies that help integrate the HP SignagePlayer 8200 Series into the enterprise, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages.
- Select models feature either Intel Standard Manageability or Intel Core vPro Processor Technology.
- Stability - HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- Support UEFI specification 2.1
- 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 Desktop computer 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 (DOSFlash), 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.
- HP BIOS uses PKI signing of the BIOS for trusted BIOS upgrades and recovery.

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 is S5 (when turned off). When S5 Max Power Savings feature is enabled power to slots is turned off along with WOL functionality.

Technical Specifications

## 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
- Intel Wired for Management support; industry wide initiative to make Intel architecture based PCs, servers and mobile computers more inherently manageable out-of-the-box and over the network
- Dual State Power Button; acts as both an on/off button and a suspend-to-sleep button

## Serviceability Features

- Dual colored power LED on front of computer to indicate either normal or fault condition
- Diagnostic LED Explanation Table:
  - Number of 1-second red LED blinks followed by a 2-second pause, then repeats:
    - 2 - processor thermal protection activated
    - 3 - processor not installed
    - 4 - power supply failure
    - 5 - memory error
    - 6 - video error
    - 7 - PCA failure (ROM detected failure prior to video)
    - 8 - invalid ROM, bootblock recovery mode
    - 9 - system not fetching code
    - 10 - system hang 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 | Description |
|---|---|
| Towerable Orientation | Product can be oriented as either a desktop or a tower |
| Drive Lock | 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. |
| Drive Protection System | DPS Access through F10 Setup during Boot<br><br>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<br><br>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<br><br>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 |
| SMART Technology (Self-Monitoring, Analysis and Reporting Technology)<br><br>SMART I - Drive Failure Prediction<br><br>SMART II - Off-Line Data Collection<br><br>SMART III - Off-Line Read Scanning with Defect Reallocation<br><br>SMART IV - End-to-End CRC for hard drives | Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted<br><br>Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count<br><br>By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure<br><br>IOEDC: I/O Error Detection Circuitry<br><br>Detects errors in Read/Write buffers on HDD cache RAM<br><br>Interface in F10 setup provides confirmation of SMART IV support. |

Technical Specifications - Audio

## High Definition Audio

| | |
|---|---|
| **Type** | Integrated |
| **HD Stereo Codec** | Realtek 2-channel ALC261 codec |
| **Audio I/O Ports** | Front microphone-In (150-K ohm Input Impedance)<br>Rear Line-In/Microphone input (150-K ohm Input Impedance, function is configurable by audio driver)<br>Rear Line-Out* (190 ohms Output Impedance, expects at least a 10-K ohm load)<br>Front Headphone-Out (0.5 Ohm Output Impedance, expects at least a 32 ohm load)<br>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.<br>All ports are 3.5 mm |
| **Internal Speaker Amplifier** | 1.5W amplifier 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. |
| **Multi-streaming Capable** | 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. |
| **Sampling** | 8 kHz - 192 kHz |
| **Wavetable Syntheses** | Yes - Uses OS soft wavetable |
| **Analog Audio** | Yes |
| **# of Channels on Line-Out** | Stereo (Left & Right channels) |
| **Internal Speaker** | Yes |
| **External Speaker Jack** | Yes |

## Intel 82579LM GbE Network Connection (integrated)

| | |
|---|---|
| **Connector** | RJ-45 |
| **System Interface** | Integrated on PCA |
| **Controller** | Intel 82579LM GbE platform LAN connect networking controller |
| **Memory** | 24 KB FIFO packet buffer memory |
| **Data rates supported** | 10/100/1000 Mbps |
| **IEEE Compliance** | 802.1P<br>802.1Q<br>802.2<br>802.3<br>802.3ab<br>802.3az<br>802.3u |
| **Bus architecture** | PCI Express and SMBus |
| **Data transfer mode** | PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx low power state) |
| **Power requirement** | Requires 3.3V and 1.05V or just 3.3V with integrated regulators<br>Power consumption 0.697 Watts |
| **Boot ROM support** | Yes |
| **Network transfer mode** | Full-duplex<br>Half-duplex (not supported for the 1000BASE-T transceiver) |
| **Network transfer rate** | 10BASE-T (half-duplex) 10 Mbps<br>10BASE-T (full-duplex) 20 Mbps<br>100BASE-TX (half-duplex) 100 Mbps<br>100BASE-TX (full-duplex) 200 Mbps<br>1000BASE-T (full-duplex) 2000 Mbps |
| **Environmental** | Operating Temperature: 0° to 85° C<br>Operating Humidity: 60% RH |
| **Management** | WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, Advanced cable diagnostic. |
| **Alerting** | ASF 2.0 support; AMT 7.0 support |

## Intel Centrino Advance-N 6205 Wireless Network Interface Connection

| | |
|---|---|
| **Wireless LAN Standards** | IEEE 802.11a<br>IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11n |
| **Interoperability** | Supports Intel Core vPro Processor Technologies<br>Cisco Compatible Extensions Program compliant (802.11a/b/g only) with Microsoft Windows XP, Windows Vista and Windows 7 |
| **Frequency Band** | 2.4 GHz and 5 GHz |

## Technical Specifications - Communications

| | |
|---|---|
| **Antenna Structure** | 2 transmit; 2 receive (2x2) |
| **Data Rates** | 802.11b: 1, 2, 5.5, 6, 9, 11 Mbps<br>802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>802.11n: ranging from 6 Mbps to 300 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n specification |
| **Modulation** | Direct Sequence Spread Spectrum<br>DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM |
| **Security** | Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES (support for key sizes of 128, 192, and 256 bits), 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST.<br>Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows Vista and XP only. |
| **Sub-channels** | Multinational support with frequency bands and channels compliant to local regulations. |
| **Media Access Protocol** | CSMA/CA (Collision Avoidance) with ACK |
| **Network Architecture Models** | Ad-hoc (Peer to Peer)<br>Infrastructure (Access Point Required) |
| **Roaming** | IEEE 802.11 compliant roaming between access points |
| **Output Power** (for CCK) | 15 dBm |
| **Output Power** (for OFDM; power varies by data rate) | 15 dBm |
| **Power Consumption** | Transmit: 2.3 Watts (average, with one spatial streams)<br>Receive: 1.9 Watts (average with two receive chains)<br>Idle mode: 30mW - 40mW (average)<br>Radio off: 20 mW (max) |
| **Power Management** | ACPI compliant power management<br>802.11 compliant power saving mode |
| **Antenna Connections** | 3 U.FL type connectors, 50 ohm nominal impedance |
| **Range** | 802.11 a - Typical (@6 Mbps): 600 feet - Outdoor Open Area; 150 feet - Indoor, Office environment<br>802.11 b - Typical (@1 Mbps): 1200 feet - Outdoor Open Area; 300 feet - Indoor, Office environment<br>802.11 g - Typical (@1 Mbps): 1200 feet - Outdoor Open Area; 300 feet - Indoor, Office environment |
| **Form Factor** | MiniPCI-Express |
| **Weight** | 0.013 lb (4.0 g) |
| **Dimensions** | 1.1 x 1.2 in (26.8 x 30.0 mm) |
| **Operating Voltage** | 3.3V +/- 9%, 1.5V +/- 5% |
| **Temperature** | Operating: 32° to 176° F (0° to 80° C)<br>Non-operating: -40° to 176° F (-40° to 80° C) |
| **Humidity** | Operating: 10% to 90% (non-condensing)<br>Non-operating: 5% to 90% (non-condensing) |

## Technical Specifications - Communications

| | |
|---|---|
| **Altitude** | Operating: 0 to 10,000 ft (3,048 m) |
| | Non-operating: 0 to 50,000 ft (15,240 m) |

## Intel HD Graphics

| | |
|---|---|
| **3D/2D Controller** | Microsoft DirectX 10.1 based with support for Pixel Shader 4.1 |
| **VGA Controller** | Integrated |
| **DisplayPort** | v1.1a; integrated, multimode capable; supports HDCP and audio over DisplayPort |
| **Bus Type** | PCI Express™ x16 |
| **RAMDAC** | Integrated, 350 MHz |
| **Memory** | Graphics memory is shared with system memory. Graphics memory usage varies depending on the amount of system memory installed, BIOS settings, operating system, and system load. 32 MB is pre-allocated for graphics use at system boot time. Additional memory can be allocated at boot time by the BIOS for PAVP (Protected Audio Video Playback) support for playback of protected video content.<br><br>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. |
| **HW Video Decode** | Hardware Accelerated decode for MPEG2 encrypted video; support for PAVP |
| **Maximum Color Depth** | 32 bits/pixel |
| **Multi-display Support** | Integrated dual independent monitor support facilitated via one VGA port and one DisplayPort v1.1a integrated on the back plane of the system board and presented as part of the rear I/O set of interfaces. Support for DVI, HDMI, dual link DVI or second VGA monitor provided by optional HP DisplayPort adapters. (see complete listing of available optional adapters elsewhere in this QuickSpec).<br><br>The system can support greater than two monitors with the addition of an optional discrete graphics card. Both integrated graphics and discrete graphics can be utilized simultaneously. |
| **Graphics/Video API Support** | DirectX 10.1 support in hardware<br>OpenGL 3.0 support in hardware |
| **Resolutions Supported** | **Display Resolutions and Refresh Rates**<br>**NOTE:** other resolutions may be available but are not recommended as they may not have been tested and qualified by HP |

| Resolution | Analog | Digital |
|---|---|---|
| 640x480 | 85 | 60 |
| 800x600 | 85 | 60 |
| 1024x768 | 85 | 60 |
| 1280x720 | 85 | 60 |
| 1280x1024 | 85 | 60 |
| 1440x900 | 75 | 60 |
| 1600x1200 | 85 | 60 |
| 1680x1050 | 75 | 60 |
| 1920x1080 | 85 | 60-R |
| 1920x1200 | 85 | 60-R |
| 1920x1440 | 85 | N/A |
| 2048x1536 | 75 | N/A |
| 2560x1600 | N/A | 60* |

Technical Specifications - Graphics

* Only supported when using a DisplayPort connection
**NOTE:** other resolutions may be available but are not recommended as the 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

## AMD Radeon HD 5450 Graphics Card

| | |
|---|---|
| **Form Factor** | MXM 3.0 A |
| **Engine Clock** | 650 MHz |
| **Memory Type** | DDR3 |
| **Memory Data Rate** | 800 MHz |
| **Memory Size** (width) | 512 MB (64 bit) |
| **3D API support** | DX11, SM 5 |
| **LVDS support** | Yes |
| **DisplayPort** | 1.1a |
| **HDCP support** | yes |
| **HDMI support** | 1.3 compatible |
| **BD support** | • Full rate playback @ max. resolution of display<br>• Full sub-video support w/o frame drops<br>• Full BDJ or iHD support w/o frame drops |
| **Total Power Consumption** | 25W |

## HP DisplayPort to DVI-D Adapter

| | |
|---|---|
| **Connectors** | DisplayPort and DVI-D single link connector |
| **Adapter length** | 7.5 in (19.0 cm) |
| **Adapter weight** | .10 lbs (.05 kg) |

## HP DisplayPort to VGA Adapter

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

Technical Specifications - Graphics

| | Resolution | Max refresh rate |
|---|---|---|
| **Resolutions Supported** | **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.

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

Technical Specifications – Data Storage

## Introduction:

HP Serial Advanced Technology Attachment (SATA) Hard Drives maximize the performance of HP Business PCs by providing the technologies to meet your increasing storage demands with high-capacity drives offering superior reliability and performance.

SATA provides faster data transfer speeds, better system cooling airflow, more bandwidth, more headroom for speed increases in future generations and better data integrity. A next-generation technology, the SATA interface connects hard drives to the PC platform enabling easy aggregation of multiple hard drives into a single PC. This offers you the additional benefits of dedicated bandwidth, the ability to more easily identify device failures and scalability. The HP SignagePlayer mp8200 Elite Series supports the latest SATA 6.0Gb/s specification.

**HP Drive Lock**

HP Serial ATA Hard Drives offer enhanced security via a new Drive Lock. When enabled, this ATA security feature set prevents software access to user data on the drive until one or two user-defined passwords are provided.

**SMART IV Technology**

Self Monitoring Analysis and Reporting Technology (SMART) hard drive technology allows hard drives to monitor their own health and to raise flags if imminent failures are predicted. If the drive determines that a failure is imminent, the SMART hard drive technology enables the intelligent manageability or management software to generate a fault alert. While the current versions of SMART hard drives do a good job monitoring the data on the hard drive media, the ever increasing emphasis on reliability and quality has promoted HP to implement SMART IV technology which constantly checks that the data flow from host interface to media and media to host interface is not compromised. This is accomplished by inserting a 2 byte parity code into every 512 byte block in the data path of the hard drive's Cache RAM. This unique parity checking performed by HP's SMART IV technology hard drives, allows for more complete error detection coverage encompassing the entire data path between the host and the hard drive.

Smart IV is also known as IOEDC: I/O Error Detection Code.

**Native Command Queuing**

NCQ or Native Command Queuing is a SATA protocol extension that allows the hard drive to have several write or read commands outstanding at the same time. In contrast, normal non-queued operation requires each command to be completed before the next command is issued by the host system. Queuing allows the drive to complete the commands in the order that allows for best overall throughput. It also involves an advanced method of transferring data to or from the host, called First Party Direct Memory Access (FPDMA), which allows the hard drive and the host controller to manage the data transfers for multiple outstanding commands, without involving the host processor. NCQ can contribute to better performance but the results are dependent on many factors, including the access patterns of the various applications and operating system functions that are initiating drive accesses. Enabling NCQ features in the hard drive requires AHCI support from the host system BIOS, controller, and driver. AHCI support is typically implemented in RAID configurations.

**NOTE:** GB = 1 billion bytes. Actual available capacity is less.

Technical Specifications – Data Storage

## HP 160-GB Solid State Drive

| | | |
|---|---|---|
| **Unformatted Capacity** | 160 GB | |
| **Architecture** | Multi Level Cell (MLC) NAND Flash with wear leveling 10 channel controller | |
| **Interface** | Serial ATA 2.0 (3.0 Gb/s) | |
| **Dimensions** (W x H x D) | 2.74 x 0.37 x 4 in (6.98 x 0.95 x 10.2 cm) | |
| **Weight** | 0.18 lb (80 g) | |
| **Bandwidth Performance** | Sustained Sequential Read: | Up to 250 MB/s |
| | Sustained Sequential Write: | Up to 70 MB/s |
| | Random Read: | Up to 35K IOPs |
| | Random Write: | Up to 6.6K IOPs |
| **Latency** | Read: | 65-ms |
| | Write: | 85-ms |
| **Power** | DC power requirement: | 5 VDC 5%-100 mV ripple p-p |
| | Total power consumption: | 0.15W (active); 0.075W (idle) |
| **Useful Drive Life** | 35TB written, up to 20GB/day for 5 years | |
| **Environmental** (all conditions, non-condensing) | Operating Temperature: | 32° to 158° F (0° to 70° C) |
| | Relative Humidity: | 5% to 95% |
| | Maximum Wet Bulb Temperature (operating): | 84° F (29° C) |
| | Shock: | 1,500 G/0.5-ms |

**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.

## HP 160-GB 7.2K SATA 3.0Gb/s 2.5" Hard Disk Drive

| | | |
|---|---|---|
| **Capacity** | 160,041,885,696 bytes | |
| **Rotational Speed** | 7,200 rpm | |
| **Interface** | Serial ATA 2.0 (3.0 Gb/s) | |
| **Buffer Size** | 16 MB | |
| **Logical Blocks** | 312,581,808 | |
| **Seek Time** (typical reads, includes controller overhead, including settling) | Single Track: | 2.0 ms |
| | Average: | 12 ms |
| | Full-Stroke: | 22 ms |
| **Height** (nominal) | 0.374 in/9.5 mm | |
| **Width** (nominal) | Media diameter: 2.5 in/63.5 mm | |
| | Physical size: 2.75 in/70 mm | |
| **Operating Temperature** | 41° to 131° F (5° to 55° C) | |

Technical Specifications - Removable Storage

## HP 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) |
| **Electrical** | Operating voltage | + 5VDC ± 5% |
| | Power consumption | 50-mA maximum (with three LEDs ON) |
| | System interface | USB Type A plug connector |
| | ESD | CE level 4, 15-kV air discharge |
| | EMI - RFI | Conforms to FCC rules for a Class B computing device |
| | Microsoft® PC 99 - 2001 | Functionally compliant |
| **Mechanical** | 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 | |
| **Kit contents** | Keyboard | Installation Guide |
| | Warranty Card | Safety and Comfort Guide |

Technical Specifications - Removable Storage

## HP Slim DVD-ROM Drive

| | | |
|---|---|---|
| **AMO Part Number** | VP033AA | |
| **Height** | 12.7mm | |
| **Orientation** | Either horizontal or vertical | |
| **Interface type** | SATA/ATAPI | |
| **Dimensions** (W x H x D) | 5.0 x 0.5 x 5.0 in (128 x 13.6 x 129 mm) | |
| **Weight** (max) | 0.42 lb (190 g) | |
| **Read speeds** | DVD+R/-R/+RW/ -RW/+R DL /-R DL | Up to 4X |
| | DVD-ROM | Up to 8X |
| | CD-ROM, CD-R | Up to 24X |
| | CD-RW | Up to 24X |
| **Access time** (typical reads, including settling) | Random DVD | DVD: < 140 ms (typical), CD: < 125 ms (typical) |
| | Random CD | DVD: < 250 ms (seek), CD: < 210 ms (seek) |
| | Data Transfer Modes | ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s) |
| **Power** | Source | Four-pin, DC power receptacle |
| | DC Power Requirement | 5 VDC ± 5%-100 mV ripple p-p |
| | DC Current | 5 VDC - <1000 mA typical, < 1600 mA maximum |
| | Total Drive Power (standby mode) | < 2.5 Watt |
| **Audio output** | Line-Out | 0.7 VRMS |
| | Signal-to-Noise Ratio | 74 dB |
| | Channel Separation | 65 dB |
| **Environmental** (all conditions non-condensing) | Temperature | 41° to 122° F (5° to 50° C) |
| | Relative Humidity | 5% to 85% |
| | Maximum Wet Bulb Temperature (operating) | 86° F (30° C) |

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:

- IT ECO declaration

## mp8200 and mp8200s models

| **Energy Consumption** (typically configured) | 115 VAC | 230 VAC | 100 VAC |
|---|---|---|---|
| **Normal Operation** | 18.95 W | 20.01 W | 18.66 W |
| **Sleep State** | 2.09 W | 2.182 W | 2.099 W |
| **Off** | 1.128 W | 1.228 W | 1.127 W |

| **Heat Dissipation*** | 115 VAC | 230 VAC | 100 VAC |
|---|---|---|---|
| **Normal Operation** | 65 BTU/hr | 68 BTU/hr | 64 BTU/hr |
| **Sleep State** | 7 BTU/hr | 7 BTU/hr | 7 BTU/hr |
| **Off** | 4 BTU/hr | 4 BTU/hr | 4 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** | 3.7 | 28 |
| **Fixed Disk** (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** Lithium

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

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

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

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

This product contains 0.03% post-consumer recycled plastic (by wt.)

This product is 92.2% recyclable when properly disposed of at end of life.

## Technical Specifications - Eco Data

| | | |
|---|---|---|
| **Packaging Materials** | External | Corrugated Carton - 1526.2 g |
| | Internal | Polyethylene low density foam - 177 g |

The corrugated packaging material contains at least 49.42 % recycled content.

The Polyethylene low density Foam packaging material contains at least 60.42% 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):

- 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)
- Nickel finishes that release greater than 0.5 micro-grams/cm^2/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.

## Technical Specifications - Eco Data

| | |
|---|---|
| | 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.<br><br>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:<br>Global Citizenship Report<br>http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html<br>Eco-label certifications<br>http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html<br>ISO 14001 certificates:<br>http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html |