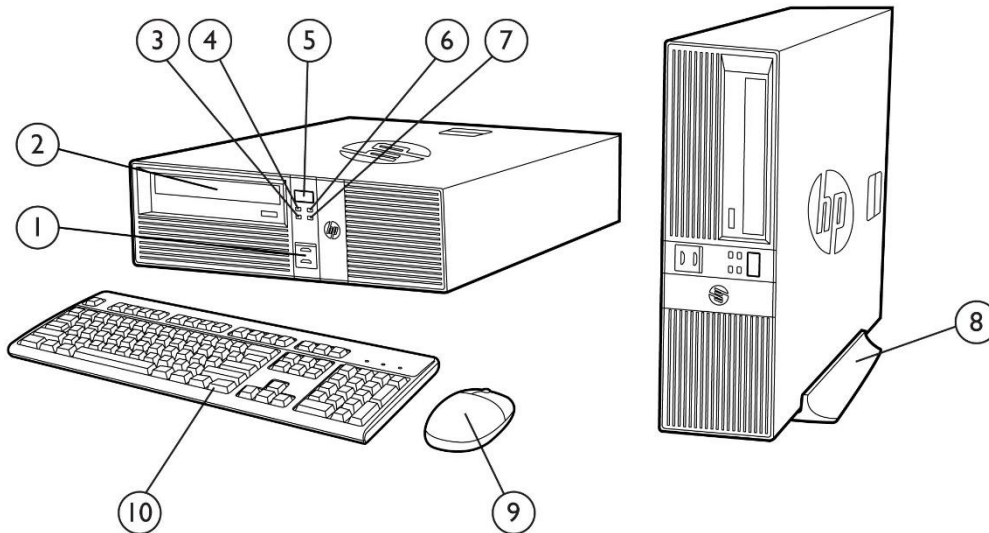
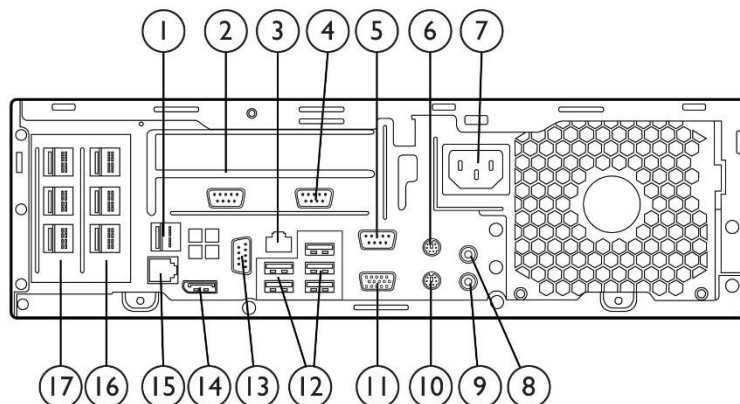


### Overview

### HP rp5800 Retail System



- |                                      |  |
|--------------------------------------|--|
| 1. 2 USB 2.0 ports with sliding door | 6. Hard Drive LED                              |
| 2. 5.25" external optical drive      | 7. NIC Link indicator LED                      |
| 3. NIC Activity indicator LED        | 8. Stand for vertical configuration (optional) |
| 4. Power/ Diagnostic LED             | 9. HP 2-button scroll mouse-(optional)         |
| 5. Power button                      | 10. HP Standard keyboard (optional)            |



- |   |                        |
|---|------------------------|
| 1. 24 Volt USB + PWR port   | 10. PS/2 keyboard port |
| 2. Two (2) Full-Height Slots*. Can be configured either as two (2) PCI or two (2) PCIe x1 Full-Height slots. Shown is optional 2 Port RS232 serial (power configurable) Card, COM4 port (left) and COM3 port (right port) |                        |
| 3. RJ-45 LAN jack   | 11. VGA port           |
| 4. RS232 serial COM3 (as described in item 2)   | 12. 5 USB 2.0 ports    |

### Overview

- |  |  |
|--|--|
| 5. RS232 serial (power configurable) COM1 port                     | 13. RS232 serial (power configurable) COM2 port  |
| 6. PS/2 mouse port   | 14. Display Port   |
| 7. 240W EPA – Active PFC power supply (no line switching required) | 15. RJ12 cash drawer port  |
| 8. Line in audio jack  | 16. One (1) PCIe x16 Slot* – shown is optional three (3) port<br>12 Volt USB +Power Card |
| 9. Line out audio jack   | 17. One (1) PCIe x1 Slot* (shown is optional three (3) port<br>12 Volt USB + Power Card  |

**\* NOTE:**A variety of cards are available to populate slots, dependant on riser choice and connectors utilized. For full details, please contact your HP sales representative for configuration choices.

### At A Glance

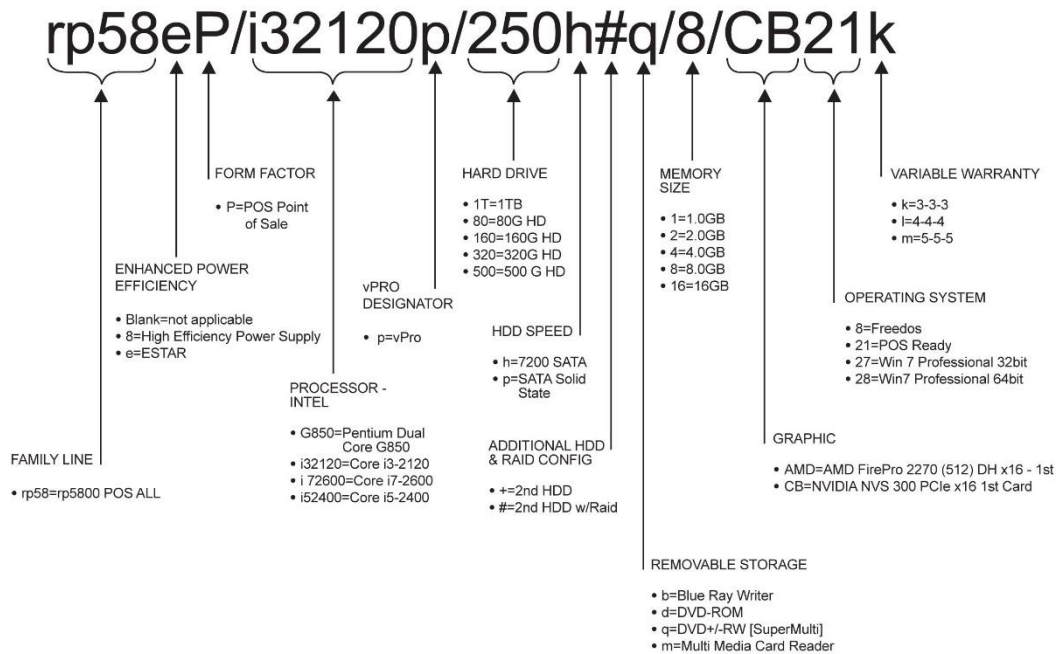
- BIOS developed and engineered by HP for better security, manageability and software image stability
- Intel Q67 Express chipset supporting Intel 2nd generation Core processors, featuring Intel HD Graphics and vPro Technology (available with select processors)
- One of the following operating systems:
  - Windows 7 Professional 32-bit or 64-bit
  - Windows Embedded POSReady 7 32-bit or 64-bit
  - Windows Embedded POSReady 2009
  - FreeDOS
- 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
- Discrete graphics options available
- 90% high efficiency energy saving power supply
- ENERGY STAR qualified models available (dependent upon the desired configuration)
- Can be configured with multiple hard disk drives in a RAID array
- Industry leading Design for Environment standards
- Protected by HP Services, including standard 3-3-3 warranty and 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
- 40C ambient thermals standard. Optional 50C thermal configuration available.
- Optional HP Rear Port/Cable Control Cover Available
- Point of Sale I/O ports including cash drawer port.
  - Configurable Full-Height expansion slots; must choose either a PCI Riser or PCIe Riser. The choice of riser will affect which cards can be utilized.
  - Either the PCI Riser or the PCIe Riser contain a Serial Port Connector, and if this connector is populated by a Serial Card then one of the riser bays is covered and cannot be used

**NOTE:** All models and features may not be available in all countries

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

### Model Key and Example

**NOTE:** This diagram is an example that illustrates how to read the model number. It is not intended to give every available configuration choice specified in the body of this document and may include references to modules that are out of date and no longer available.



## Operating Systems

### Preinstalled

Windows 7 Professional Edition (32-bit or 64-bit)\*\*  
 Windows Embedded POSReady 7 (32-bit or 64-bit)  
 Windows Embedded POSReady 2009  
 FreeDOS

### Supported

Windows XP Professional Edition (32-bit)  
 Windows 7 Enterprise Edition\*\*

### Tested

Microsoft Windows Server 2003 R2 Standard (64-bit & 32-bit)  
 Microsoft Windows Server 2008 R2 Standard (64-bit)  
 Microsoft Windows Server 2012 R2 Standard (64-bit)

### Certified

Novell SUSE Linux Enterprise Desktop†

\*\* This system is preinstalled with Windows 7 Pro software and also comes with a license and media for Windows 8.1 Pro software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other

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

version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

† The following features are not supported by Novell SUSE Linux Enterprise Desktop:

- Intel Gigabit CT Desktop NIC
- Broadcom NetXtreme Gigabit Ethernet Plus
- HP ProtectTools
- HP Blu-ray Writer playback of commercial movies
- DisplayPort video interface
- HP 2nd serial port adapter
- Power Management features
- Systems configured with Linux do not qualify for ENERGY STAR

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

HP ProtectTools Security Suite	HP Vision Diagnostics
HP Software Management Agent	PDF Complete Corporate Edition
Computrace for Desktops agent	Microsoft Office 2013 Starter

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

HP Power Assistant v2.0  
Computer Setup Utility

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

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

HP SoftPaq Download Manager	HP Systems Software Manager
HP Client Catalog for Microsoft SMS	HP Client Automation Starter

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### Retail Solutions Services and Features

Intel® Stable Image Platform Program (SIPP)	Factory Express Deployment and Lifecycle Services
Intel® vPro™ Technology	Intel® Standard Manageability
HP Global Series Services	Trusted Platform Module (TPM) v1.2 <sup>1</sup>

<sup>1</sup> 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>: 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<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.

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

<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.

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## Chipset

Intel® Q67 Express

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## Processor

### Intel® Pentium® Dual-Core Processors

#### Intel® Pentium® Dual-Core G850 Processor

2.90 GHz, 3 MB cache, 2 cores

### Intel® 2<sup>nd</sup> Generation Core™ i3 Processors

#### Intel Core i3-2120 Processor

3.30 GHz, 3M cache, 2 cores/4 threads

### Intel® 2<sup>nd</sup> Generation Core™ i5 Processors

#### Intel Core i5-2400 Processor

3.10 GHz, 6M cache, 4 cores/4 threads

Intel Stable Image Platform Program (SIPP)

Supports Intel vPro Technology

### Intel® 2<sup>nd</sup> Generation Core™ i7 Processors

#### Intel Core i7-2600 Processor

3.40 GHz, 8M cache, 4 cores/8 threads

Intel Stable Image Platform Program (SIPP)

Supports Intel vPro Technology

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## Intel® vPro™ Technology

HP rp5800 Retail Systems 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 rp5800 Retail System, thus making this model the most stable, secure, and manageable platforms available to retailers 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

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

- 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 Retail System connects to the IT or service provider console for maintenance. Remote Retail Systems 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 Point of Sale/Desktop (WoDT)
- Enhanced KVM resolution

### 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 complete RAID systems and have both drives installed.
- 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.

### 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 rp5800 Retail System supports non-ECC DDR3 PC3-12800 (1600 MHz) and PC3-10600 (1333 MHz) memory.

**CAUTION:** You must shut down the Retail System and disconnect the power cord before adding or removing memory

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

modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the Retail System 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:

#### 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.

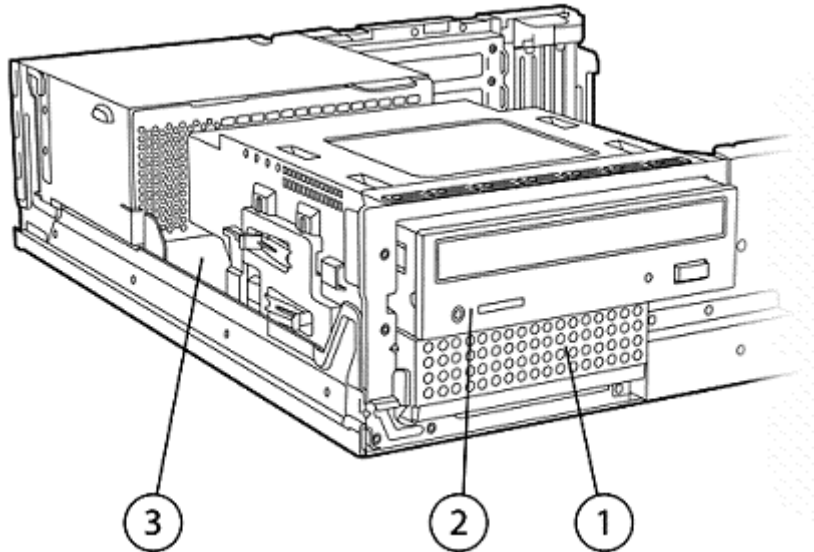
#### NOTE:

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)
1 GB	1 GB			
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

**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 POS System contains a single SO-DIMM, 16 MB of memory is pre-allocated for it at system startup. If the POS System 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.

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



Front View	Quantity Supported	Position	Controller
3.5-inch SATA Hard Drive	3	1, 2*, 3	SATA
Optical Drive Bay or Carrier for Hard Drive	1	2	SATA

External HDD can be connected through optional external ESATA port. 3 Drive maximum

**NOTE:** When ESATA is installed, either the 2nd HDD (if applicable) or ODD (if applicable) cannot be used.

\* For CRU Removable storage in lieu of ODD

## Data Storage Drives

### 250-GB Hard Disk Drives

#### HP 250-GB SATA 3.0 Hard Disk Drive (3.5")

7,200 rpm, 8MB cache, 6.0 GB/s, NCQ, Smart IV

#### HP 250-GB SATA 3.0 Removable Hard Disk Drive (3.5")

7,200 rpm, 8MB cache, 6.0 GB/s, NCQ, Smart IV

### 500-GB Hard Disk Drives

#### HP 500-GB SATA 3.0 Hard Disk Drive (3.5")

7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

#### HP 500-GB SATA 3.0 Removable Hard Disk Drive (3.5")

7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

### 1-TB Hard Disk Drives

#### HP 1 TB SATA 3.0 Hard Disk Drive (3.5")

7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

### Solid State Drives (2.5" Drives use a 3.5" drive cage adapter)

HP 32-GB 2.5" SSD <sup>1</sup>

HP 64-GB 2.5" SSD



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

HP 120-GB 2.5" SSD

HP 128-GB 2.5" SSD

HP 160-GB 2.5" SSD

HP 256-GB 2.5" SSD

<sup>1</sup> 32 GB SATA SSD drive will be available to ship only with FreeDOS. This drive will no longer be available after November 30th, 2015.

#### Optical Disc Drives

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

HP SuperMulti DVD Writer Drive<sup>2</sup>

HP Blu-ray Writer Drive<sup>3</sup>

<sup>1</sup> For playing DVDs

<sup>2</sup> For writing CDs and DVDs, video editing and authoring DVDs, Roxio Business Creator 10

<sup>3</sup> For writing CDs and DVDs, video editing and authoring DVDs, Corel WinDVD 8

#### Media Card Readers

HP 22-n-1 Media Card Reader

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## 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

RAID configurations

HP ProtectTools Security Software Suite

Serial, parallel, USB enable/disable (via BIOS)

Optional USB Port Disable at factory (user configurable via BIOS)

Power Configurable Serial Ports (COM 1, 2, 3 and 4) via the HP BIOS

Removable media write/boot control

Power-On password (via BIOS)

Setup password (via BIOS)

HP Hood Sensor

TPM 1.2 Embedded Security Chip\* integrated with Broadcom NIC

HP ProtectTools Security Software Suite with BIOS Configuration (serial (all 4), parallel, USB enable / disable), Credential Manager, Smart Card Manager (sold separately)

Three (3) port 12 Volt USB + PWR Card (sold separately)

Two (2) port Power Configurable RS232 Serial Card COM 3 & 4 (sold separately)

Wall Mount (sold separately)

HP Desktop Security Lock Kit (lock and cable) (sold separately)

Security Cable with Kensington lock (sold separately)

HP Rear Port/Cable Control Cover (sold separately)

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

<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.

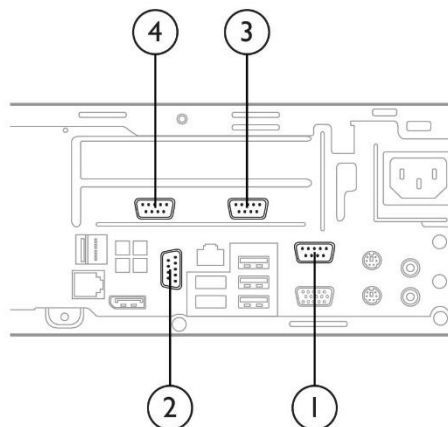
**NOTE:** TPM module disabled where use is restricted by law; for example, Russia.

## I/O Ports

<b>USB 2.0</b>	Front: Two (2), covered Rear: Five (5)
<b>USB 24V</b>	One (1) 24V powered USB
<b>Serial</b>	Two (2) RS-232 (power configurable) ports standard
<b>Parallel</b>	One port available as an option*
<b>eSATA</b>	One port available as an option*
<b>RS-232</b>	Two (2) RS-232 powered configurable ports optional (for a total of 4*)
<b>USB+PWR 12V</b>	Two (2) USB+PWR 12V cards optional (three (3) 12 Volt USB+ PWR per card) for a total of 6*
<b>PS/2</b>	One (1) color-coded support for keyboard (purple) One (1) color-coded support for mouse (green)
<b>RJ-11</b>	One (1) RJ-11 Cash Drawer port
<b>Video</b>	One (1) VGA One (1) DisplayPort v1.1a Provides integrated dual independent monitor support
<b>DVI output</b>	Available via optional DisplayPort to DVI Adapter
<b>Audio</b>	Rear: Line input (supports microphone or line input) and line out All ports are 3.5mm in diameter <b>NOTE:</b> See Audio/Visual section for information on re-taskable audio ports
<b>NIC</b>	One (1) Industry standard RJ-45 port accesses the integrated network interface controller

\*These options occupy slot openings so less slots will be available when the options are installed

### Serial Ports (Power Configurable in HP Bios) – detail



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

- 1 and 2:** Powered Configurable serial port expansion card installation that supplies two additional serial ports (COM3 and COM4)
- 3 and 4:** Two Power Configurable serial ports, COM1 and COM 2, are standard on the POS System.

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## Slots

<b>Full-Height</b>	Total of Two (2) Full-Height Slots, with a <i>Choice of either:</i>  1.) PCI - Two (2) each: 4.2" full height, 6.6" length, 25W max. power 2.) PCIe x1 - Two (2) each: 4.2" full height, 6.6" length, 10W max. power
<b>Half-Height</b>	Total of Two (2) Half-Height:  PCI Express x1 - One (1) each: 2.5" low profile, 6.6" length, 10W max. power PCI Express x16 - One (1) each: 2.5 low profile, 6.6" length, 25W max. power

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## Bays

<b>External</b>	1 each 5.25", 5.7" depth
<b>Internal HDD</b>	2 each 3.5"

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## Controllers

<b>Hard drive</b>	SATA Supports up to SATA 6.0 Gb/s
<b>SATA interfaces</b>	One (1) SATA 2.0 Two (2) SATA 3.0
<b>Host SATA</b>	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

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## Network Interface Connections

- Intel 82579LM (integrated) GbE Network Connection
- Intel PRO 1000 CT GbE NIC Card (PCIe x1) (optional)
- NOTE:** The integrated network connection is required to support Intel vPro Technology

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## Communications

- HP WLAN NIC 802.11 a/b/g/n x1 PCIe Card
- 2006 LSI PCIe x1 56K International SoftModem (optional)

---

## Graphics

- Intel HD Graphics (integrated)
- AMD FirePro 2270
- NVIDIA Quadro NVS 300 Graphics (PCIe x16)

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

- NVIDIA Quadro NVS 315 Graphics (PCIe x16)
- HP DisplayPort to DVI-D Adapter
- HP DisplayPort to HDMI Adapter
- HP DisplayPort to VGA Adapter

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### Multi-Media

- High Definition Audio (integrated) with Realtek ALC261 codec (all ports are stereo)
- Line-out and Line-In rear Ports (3.5mm)
- Internal Speaker (standard)

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### Input/Output Devices

- HP PS/2 Standard Keyboard
- HP USB Standard Keyboard
- HP PS/2 Optical Mouse
- HP USB Optical Mouse
- HP USB Laser Mouse

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### Miscellaneous Devices and Configurations

- HP FireWire (IEEE 1394) PCIe x1 Card
- HP Parallel Port Adapter
- HP eSATA Port Adapter
- HP Tower Stand
- HP Rear Port/Cable Control Cover
- rp5800 50C Thermal Kit
- rp5800 PCI Riser Assembly
- rp5800 PCIe Riser Assembly
- Three (3) port 12 Volt USB + Pwr Card
- Two (2) port RS232 Serial (power configurable) COM 3 & 4 port card

After-Market Options (availability may vary by region)

### Communication Devices

	<b>Part #</b>
Intel Gigabit CT Desktop NIC (PCIe x1)	FH969AA
Broadcom NetXtreme GbE Ethernet Plus NIC (PCIe x1)	FS215AA
HP Wireless 802.11 b/g/n NIC (PCIe x1)	FH971AA
Intel Ethernet I210-T1 GbE NIC	EOX95AA

**NOTE:**

The use of a discrete network interface connection card (wired or wireless) will disable the vPro Technology features.

### Graphics Solutions

	<b>Part #</b>
AMD FirePro 2270	D4S24AA
NVIDIA NVS 300 (512MB) PCIe x16	BV456AA
NVIDIA NVS 315 (1GB) PCIe x16	E1U66AA

HP DMS-59 to Dual DVI Adapter	DL139A
HP DMS-59 to Dual DisplayPort Adapter	XP688AA
HP DisplayPort Cable Kit	VN567AA
HP DisplayPort To Dual Link DVI-D Adapter	NR078AA
HP DisplayPort To DVI-D Adapter	FH973AA
HP DisplayPort to HDMI Adapter	BP937AA
HP DisplayPort to VGA Adapter	AS615AA

### Hard Disk Storage Drives

	<b>Part #</b>
HP 500GB SATA (6.0Gb/s) Hard Disk Drive	QK554AA
HP 1TB SATA (6.0Gb/s) Hard Disk Drive	QK555AA
HP 128-GB Solid State Drive	QV063AA
HP eSATA Adapter	FH966AA
HP Removable SATA Hard Drive Enclosure (frame & carrier)	RY102AA
HP Removable SATA Hard Drive Enclosure (carrier only)	RY103AA

### Input / Output Devices

	<b>Part #</b>
HP PS/2 Standard Keyboard	DT527A
HP USB Standard Keyboard	DT528A

### After-Market Options (availability may vary by region)

HP 2-port Powered Serial Port Card	QP906AA
HP 3-port 12 Volt Powered USB Port Card	QP905AA
HP USB and PS/2 Washable Keyboard and Mouse Kit	BU207AA
HP PS/2 Mouse	QY775AA
HP USB Mouse	QY777AA
HP rp5800 PCI Riser Assembly	QP907AA
HP rp5800 PCIe x1 Riser Assembly	QP908AA

### System Memory

	Part #
HP 2 GB DDR3-1600 MHz DIMM	B4U35AA
HP 4 GB DDR3-1600 MHz DIMM	B4U36AA
HP 8 GB DDR3-1600 MHz DIMM	B4U37AA

### Multimedia Devices

	Part #
HP DVD-ROM Drive	AR629AA
HP SuperMulti Drive	QS208AA
HP Blu-ray Writer Drive	B4F70AA

### Removable Media Storage

	Part #
HP 22-n-1 Media Card Reader	AR941AA

### Security Devices

	Part #
HP Chassis Security Kit	AR639AA
HP Business PC Security Lock	PV606AA
HP Wall Mount/Security Sleeve	VN570AA

### Accessories

	Part #
HP rp5800 Trim Bezel – with ODD Opening	QP910AA
HP Integrated Work Center Stand	GN783AA
HP Tower Stand	VN569AA
HP Parallel Port Adapter	KD061AA
HP FireWire (IEEE 1394) Card	PA997A

### After-Market Options (availability may vary by region)

HP SuperSpeed USB 3.0 Card	BM867AA
HP Rear Port / Cable Control Cover	QP909AA

### Retail Solutions Specific Accessories

	Part #
HP Standard Duty Cash Drawer	QT457AA
HP Heavy Duty Cash Drawer	FK182AA
HP Till with Locking Cover	QT458AA
HP Flip-Top Cash Drawer	BW867AA
HP Flip-Top Till with Locking Cover	BZ335AA
HP Imaging Barcode Scanner	BW868AA
HP Linear Barcode Scanner	QY405AA
HP Presentation Barcode Scanner	QY439AA
HP 2D Value Wireless Scanner AMO kit	K3L28AA
HP LCD Pole Display	F7A93AA
HP POS Pole Display	FK225AA
HP Graphical Pole Display	QZ704AA
HP Mini MSR with Brackets	FK186AA
HP POS Keyboard without MSR	FK221AA
HP POS Keyboard with MSR	FK218AA
HP Powered USB Thermal Receipt Printer	FK224AA
HP Serial/USB Thermal Receipt Printer	BM476AA
HP Hybrid Printer with MICR	FK184AA
HP USB Y Cable (for Serial USB Receipt Printer)	BM477AA
HP Cable Pack for Dual Cash Drawers	QT538AA
HP L5006tm 15-inch LCD (SAW) Touchscreen Monitor	RB146AA
HP L5009tm 15-inch LCD (APR) Touchscreen Monitor	VK202AA
HP L1506x 15-inch LED Monitor (Non-Touchscreen)	LL543AA
HP L6010 10.4-inch Monitor (Non-Touchscreen)	A1X76AA
HP Dual Position Stand for L6010	A1X79AA
HP L6015tm 15-inch (PCAP) Touchscreen Monitor	A1X78AA
HP L6017tm 17-inch (PCAP) Touchscreen Monitor	A1X77AA
HP Height Adjusting Stand for L6015/17tm	A1X81AA
HP Retail Integrated Fingerprint Reader	QZ672AA
HP Retail Integrated Webcam	QZ673AA
HP Retail Integrated Dual-Head MSR	QZ700AA
HP rp5800 Terminal Enclosure Assembly	QQ971AA
HP rp5800 Integration Tray Assembly	QQ972AA
HP Display Pole Mount Assembly	QQ973AA

### After-Market Options (availability may vary by region)

HP Optional Display Arm Assembly

QQ974AA



### Technical Specifications

#### Weights & Dimensions

(configured with 1 HDD & 1 ODD)

Chassis (H x W x D)	3.95 x 13.3 x 14.9 in 100 x 338 x 379 mm
System Volume	782.77 cu in 13.0 L
Tower Stand (H x W x D)	1.1 x 7.0 x 7.9 in 29 x 178 x 200 mm
Packaging (H x W x D)	9.0 x 19.7 x 23.4 in 229 x 500 x 594 mm
System Weight*	15.08 lb 6.84 kg
Shipping Weight*	16.28 lb 7.34 kg
Max Supported Weight (desktop orientation)	77.0 lb 35.0 kg

#### Unit Environment and Operating Conditions

##### General Unit Operating Guidelines

- Keep the POS System 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 front side and power supply side of the POS System to permit the required airflow.
- If within an enclosure, the front side should be 100% open. The clearance between the system and the cabinet must be at least 10 mm (0.4 inch) on the sides and top and at least 50-mm (2-inch) clearance in the rear with power supply venting area 100% open per the above bullet.
- Never restrict airflow into the POS System by blocking any vents or air intakes.
- Do not stack POS Systems on top of each other or place POS Systems 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 POS System. Lint, dust and other foreign matter can block the vents and limit the airflow.

<b>Temperature Range</b>	Operating: 32° to 104° F (0° to 40° C)* Non-operating: -22° to 149° F (-30° to 65° C)
<b>Relative Humidity</b>	Operating: 10% to 90% (non-condensing at ambient) Non-operating: 0% to 95% (non-condensing at ambient)
<b>Maximum Altitude</b> (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.

**NOTE:** An optional thermal configuration is available to support 50C ambient temperatures. This is a factory configurable configuration only.

<b>Power Supply</b>	240-watt – EPA90 power supply – Active PFC
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### Technical Specifications

	*This power supply meets ENERGY STAR compliance in conjunction with a select range of processors and modules.
Operating Voltage Range	90 to 264 VAC
Rated Voltage Range	100 to 240VAC
Rated Line Frequency	50/60 Hz
Operating Line Frequency Range	47 – 63 Hz
Rated Input Current	4A Efficiency 87/90/87% at 20/50/100% load
Power Supply Fan	80 mm variable speed fan
ENERGY STAR Compliant	ENERGY STAR compliant
Power Cord Length	6.0ft (1.8 3m)
Current Leakage (NFPA99)	< 275 $\mu$ A

### ROM BIOS Information

Key features of the HP BIOS include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP rp5800 Retail System into retail, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages.
- Select models feature either Intel Standard Manageability or vPro Technology.
- 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 rp5800 Retail System in any retail 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 the HP rp5800 Retail Systems, including BIOS updates from within DOS (Flashbin), BIOS updates from within Windows (HPQFlash), HP Client Manager, and fail-safe recovery. In addition, the HP rp5800 Retail System 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 rp5800 Retail Systems use ACPI to provide power conservation features.
- S5 Max Power Savings setting supports EU Lot6 requirement and allows the HP rp5800 Retail System 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.

### Technical Specifications

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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
  - Intel Wired for Management support; industry wide initiative to make Intel architecture based Retail Systems, 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 the HP rp5800 Retail System to indicate either normal or fault condition
- Indicator Lights on front of system:

Power / Diagnostic LED	Hard Drive LED
NIC Activity LED	NIC Link LED

- 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
- NIC Link and activity LED's on front bezel
- 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) - Rear
- Color coordinated cables and connectors
- Tool-less Hood Removal
- Front power button
- System memory can be upgraded without removing the system board or any internal components

### Technical Specifications

- Tool-less Hard Drive, Optical Drive Removal

**NOTE:** thumb screw release mechanism is used with the Ultra-slim Desktop chassis cover.

### Additional Features

	Description
Intel® Standard Manageability	<ul style="list-style-type: none"> <li>• Requires the utilization of the integrated network connection</li> <li>• Delivered with processors that are not part of the Intel Stable Intel Platform Program (SIPP)</li> <li>• Intel Advanced Management Technology (AMT) v3.2</li> <li>• Basic Retail SYSTEM management capabilities such as asset inventory, HW alerting, SOL/IDE-R, remote configuration, agent presence and system defense.</li> <li>• DASH 1.1 compliance. Support for profile updates.</li> <li>• Host VPN support for local management VPN tunneling</li> </ul>
DASH 1.1 support (Desktop and Mobile Architecture for System Hardware)	<p>Intel Standard Manageability includes features of Intel Active Management Technology (Intel AMT). Intel AMT requires the Retail system to have an Intel AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. For more information, see <a href="http://www.intel.com/technology/platform-technology/intel-amt/">http://www.intel.com/technology/platform-technology/intel-amt/</a>.</p>
ASF 2.0 support (Alert Standard Format)	<p>A standards initiative for representing out-of-band management capability for Retail Systems. It is a secure, web-services based successor to ASF.</p>
TXT (Trusted Execution Technology) and VT-d (Virtualized devices)	<p>Industry-standard specification for network alerting in operating system-absent environments</p>
Computrace	<p>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</p>
Towerable Orientation	<p>VT-d is a chipset technology that virtualizes directed I/O</p>
Drive Protection System	<p>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.</p>
	<p>Computrace agent support standard</p>
	<p>The chassis can be oriented as either a desktop or a tower.</p>
	<p>DPS Access through F10 Setup during Boot</p>
	<p>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</p>
	<p>Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the Retail System's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced</p>
	<p>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</p>

### Technical Specifications

SMART Technology (Self-Monitoring, Analysis and Reporting Technology)	Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted
SMART I – Drive Failure Prediction	Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count
SMART II – Off-Line Data Collection	By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure
SMART III – Off-Line Read Scanning with Defect Reallocation	IOEDC: I/O Error Detection Circuitry Detects errors in Read/Write buffers on HDD cache RAM
SMART IV – End-to-End CRC for hard drives	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>	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) Line-in and Line-out, both on rear. All ports are 3.5mm in diameter
<b>Internal Speaker Amplifier</b>	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.
<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</b> (software)	Yes – Uses OS soft wavetable
<b>Analog Audio</b>	Yes
<b># of Channels on Line-Out</b> (mono/stereo)	Stereo (Left & Right channels)
<b>Internal Speaker</b>	Yes
<b>External Speaker Jack</b> (Line-Out)	Yes

### Technical Specifications - Communications

#### Intel 82579LM GbE Network Connection (integrated)

<b>Connector</b>	RJ-45	
<b>System Interface</b>	Integrated on PCA	
<b>Controller</b>	Intel 82579LM gigabit platform LAN connect networking controller	
<b>Memory</b>	24 KB FIFO packet buffer memory	
<b>Data rates supported</b>	10/100/1000 Mbps	
<b>Compliance</b>	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3 ab and 802.3u compliant	
<b>Bus architecture</b>	GLCI, LCI interface. Intel specific MAC to PHY interface	
<b>Data transfer mode</b>	At gigabit GLCI (Intel proprietary 802.3 series-based interface) is for Data, LCI (parallel bus) for MDIO, at 10/100 LCI for both data and MDIO, GLCI is idle.	
<b>Data rates supported</b>	10/100/1000 Mbps	
<b>Compliance</b>	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3ab and 802.3u compliant	
<b>Bus architecture</b>	GLCI, LCI interface. Intel specific MAC to PHY interface	
<b>Data transfer mode</b>	At gigabit GLCI (Intel proprietary 802.3 series-based interface) is for Data, LCI (parallel bus) for MDIO, at 10/100 LCI for both data and MDIO, GLCI is idle.	
<b>Power requirement</b>	Requires 3.3V, 1.9/1.8V and 1.0V or just 3.3V with integrated regulators Power consumption 1.3 Watts for 82567 whole LOM	
<b>ACBS</b>	Intel Auto Connect Battery Saving feature	
<b>Boot ROM support</b>	Yes	
<b>Network transfer mode</b>	Full-duplex Half-duplex (not supported for the 1000BASE-T transceiver)	
<b>Network transfer rate</b>	10BASE-T (half-duplex)	10 Mbps
	10BASE-T (full-duplex)	20 Mbps
	100BASE-TX (half-duplex)	100 Mbps
	100BASE-TX (full-duplex)	200 Mbps
	1000BASE-T (full-duplex)	2000 Mbps
<b>Environmental</b>	Operating Temperature:	32° to 131°F (0° to 55° C) To 70° C for external regulator
	Operating Humidity:	85% at 131° F (55° C)
<b>Management</b>	WOL, auto MDI crossover, PXE, Multi-port teaming, RSS, Advanced cable diagnostic.	
<b>Alerting</b>	ASF 2.0 support, AMT 3.0 support	

#### Intel Gigabit CT Desktop Network Interface Controller (AM0)

<b>Connector</b>	RJ-45
<b>System Interface</b>	PCI Express x1
<b>Controller</b>	Intel WG82574L Gigabit Ethernet Controller
<b>Memory</b>	Integrated Dual 48K configurable transmit receive FIFO Buffers
<b>Data rates supported</b>	10/100/1000 Mbps
<b>Compliance</b>	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control

### Technical Specifications - Communications

<b>Bus architecture</b>	PCI Express 1.0a	
<b>Data path width</b>	X1, 250 MB/s, Bi-directional interface	
<b>Data transfer mode</b>	Bus-master DMA	
<b>Hardware certifications</b>	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union	
<b>Power requirement</b>	Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T	
<b>Boot ROM support</b>	Yes	
<b>Network Transfer Rate</b>	10BASE-T (half-duplex)	10 Mbps
	10BASE-T (full-duplex)	20 Mbps
	100BASE-TX (half-duplex)	100 Mbps
	100BASE-TX (full-duplex)	200 Mbps
	1000BASE-T (full-duplex)	2000 Mbps (actual rate limited by PCI Bus)
<b>Environmental</b>	Operating Temperature:	32° to 131°F (0° to 55° C)
	Operating Humidity:	85% at 131° F (55° C)
<b>Dimensions</b>	4.75 x 2.25 x 0.8 in (12.1 x 5.7 x 2.0 cm)	
<b>Management</b>	WOL, PXE, DMI, WFM 2.0	

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

<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>	PCI Express 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
<b>Operating voltage</b>	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



### Technical Specifications - Communications

<b>Output Power</b> (approximate)	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
	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)

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

Data Transfer Rate	Data Rate (MCS)	Minimum Throughput
	1 Mbps (802.11 b)	700 kbps
	2 Mbps (802.11 b)	1.4 Mbps
	5.5 Mbps (802.11 b)	3.5 Mbps
	11 Mbps (802.11 b)	5.9 Mbps
	12 Mbps (802.11 g)	6 Mbps
	18 Mbps (802.11 g)	9 Mbps
	24 Mbps (802.11 g)	12 Mbps
	36 Mbps (802.11 g)	18 Mbps
	48 Mbps (802.11 g)	21 Mbps
	54 Mbps (802.11 g)	22.5 Mbps
	6.5 Mbps (20 MHz EWC)	4.5 Mbps
	13 Mbps (20 MHz EWC)	9 Mbps
	19.5 Mbps (20 MHz EWC)	13.5 Mbps
	26 Mbps (20 MHz EWC)	18 Mbps
	39 Mbps (20 MHz EWC)	27 Mbps
	52 Mbps (20 MHz EWC)	36 Mbps
	58.5 Mbps (20 MHz EWC)	40 Mbps

### Technical Specifications - Communications

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 - Graphics

#### Intel HD Graphics (integrated)

<b>3D/2D Controller</b>	Microsoft DirectX 10.1 based with support for Pixel Shader 4.1
<b>VGA Controller</b>	Integrated
<b>DisplayPort</b>	v1.1a; integrated, multimode capable; supports HDCP and audio over DisplayPort
<b>Bus Type</b>	PCI Express x16
<b>RAMDAC</b>	Integrated, 350 MHz
<b>Memory</b>	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.

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.

<b>HW Video Decode</b>	Hardware Accelerated decode for MPEG2 encrypted video; support for PAVP
<b>Maximum Color Depth</b>	32 bits/pixel
<b>Maximum Vertical Refresh Rate</b>	85 Hz at up to 1920x1440, 75 Hz at 2048x1536. Varies with mode and configuration. See table below.
<b>Multi-display Support</b>	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.  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.
<b>Graphics/Video API Support</b>	Microsoft DirectX 10.1, OpenGL 3.0

Resolutions Supported	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	60*

\* Only supported when using a DisplayPort connection

### Technical Specifications - Graphics

**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 NVS 300 PCIe Graphics Card

<b>Form Factor</b>	Dimensions Low-profile, 2.586 x 5.7 in (6.57 x 14.48 cm)
<b>Graphics Controller</b>	Nvidia GT218 GPU
<b>Bus Type</b>	PCIe x16
<b>Memory</b>	512 MB DDR3
<b>Connectors</b>	DMS-59 Connector
<b>Board Display Options</b>	Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual single-link DVI-I connectors cable kit part number: DL139A
<b>Multi-monitor support</b>	Dual analog or digital (Single Link DVI) monitors (DVI support requires optional DVI cable kit DL139A)
<b>Supported Graphics APIs</b>	OpenGL 3.3 support in hardware for optimal performance with OpenGL applications DirectX 10.1 support in hardware for optimal performance in DX10 applications

Resolution	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
2048x1536	85	N/A
1920x1440	75	N/A

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

#### NVIDIA NVS 315 PCIe Graphics Card

<b>Form Factor</b>	Low Profile: 2.713 x 6.15 in
<b>Graphics Controller</b>	NVIDIA® NVS 315
<b>Bus Type</b>	PCIe x16
<b>Memory</b>	512 MB DDR3
<b>Connectors</b>	DMS-59 Connector

### Technical Specifications - Graphics

**Display Max. Resolution** Up to 2048 x 1536 VGA; 1920 x 1200 DVI; 2560 x 1600 DisplayPort

**Display Output** Up to 2 displays in the following configurations

- Dual DVI:
  - Drives two DVI displays using optional HP DMS59 DVI Dual-head Connector Cable DL139A
- Dual DisplayPort:
  - Drives two DisplayPort using optional HP DMS-59 to Dual DisplayPort kit XP688AA
- Dual VGA:
  - Drives two analog using the included HP DMS-59 to Dual VGA Cable

**Supported 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	Analog Connection	Digital Connection
640x480	85	60
720x480	85	60
720x576	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x768	85	60
1280x1024	85	60
1440x900	75	60
1600x1024	85	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1440	N/A	60*
2560x1600	N/A	60*

\* Display Port Only

### AMD FirePro 2270 512MB Graphics Card

**Form Factor** Low Profile, Half Length, 2.3" x 6.6"  
**Graphics Controller** AMD FirePro™ 2270 Professional Graphics  
**Bus Type** PCI Express™ x16 Generation 2.0  
**Memory** 512MB DDR3

### Technical Specifications - Graphics

<b>Connectors</b>	DMS-59 connector to support breakout cables for dual DisplayPort, DVI and VGA output. DMS-59 to VGA adapter included. (Dual Display Port and Dual DVI adapters sold separately)
<b>Maximum Resolution</b>	Digital 2560x1600 (DisplayPort) Analog 1920x1200 (DVI 60 Hz/ VGA 75Hz)
<b>RAMDAC</b>	400 MHz DAC, 10-bit per channel
<b>Display Output</b>	Power two 30" high resolution displays
<b>Supported Graphics APIs</b>	DirectX 11 and OpenGL 4.0

### 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)

### 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>Max. 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: <http://www.hp.com>.

**NOTE:**

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

### Technical Specifications - Data Storage Drives

#### Introduction:

HP Serial Advanced Technology Attachment (SATA) Hard Drives maximize the performance of HP Retail Systems 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 Retail System platform enabling easy aggregation of multiple hard drives into a single Retail System. This offers you the additional benefits of dedicated bandwidth, the ability to more easily identify device failures and scalability. The HP rp5800 Retail System 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.

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## HP Solid State Drives

**Unformatted Capacities**      128-GB and 256-GB

### Technical Specifications - Data Storage Drives

<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</b> (all conditions, non-condensing)	<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

**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 250-GB Hard Disk Drive (3.5")

<b>Capacity</b>	250,059,350,016 bytes	
<b>Rotational Speed</b>	7,200 rpm	
<b>Interface</b>	Serial ATA (SATA) 3.0	
<b>Synchronous Transfer Rate</b> (maximum)	Up to 6 GB/s	
<b>Buffer Size</b>	8 MB	
<b>Logical Blocks</b>	488,397,168	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track:</b>	1.0 ms
	<b>Average:</b>	8.5 ms
	<b>Full-Stroke:</b>	18 ms
<b>Height</b> (nominal)	1 in/2.54 cm	
<b>Width</b> (nominal)	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)	

### HP 500-GB Hard Disk Drive (3.5")

<b>Capacity</b>	500,107,862,016 bytes
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### Technical Specifications - Data Storage Drives

<b>Rotational Speed</b>	7,200 rpm
<b>Interface</b>	Serial ATA (SATA) 3.0
<b>Synchronous Transfer Rate</b> (maximum)	Up to 6 GB/s
<b>Buffer Size</b>	16 MB
<b>Logical Blocks</b>	976,773,168
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track:</b> 2.0 ms <b>Average:</b> 11 ms <b>Full-Stroke:</b> 21 ms
<b>Height</b> (nominal)	1 in/2.54 cm
<b>Width</b> (nominal)	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

### HP 1-TB Hard Disk Drive (3.5")

<b>Capacity</b>	1,000,xxxxx bytes
<b>Rotational Speed</b>	7,200 rpm
<b>Interface</b>	Serial ATA (SATA) 3.0
<b>Synchronous Transfer Rate</b> (maximum)	Up to 6 GB/s
<b>Buffer Size</b>	16 MB
<b>Logical Blocks</b>	976,773,168
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track:</b> 2.0 ms <b>Average:</b> 11 ms <b>Full-Stroke:</b> 21 ms
<b>Height</b> (nominal)	1 in/2.54 cm
<b>Width</b> (nominal)	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 – Optical Drives and Storage

#### HP Blu-ray Writer Drive

<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>	128 GB QL, 100 GB TL, 50 GB DL or 25 GB standard
<b>Dimensions</b> (W x H x D)	5.9 x 1.7 x 7.5 in 15.0 x 4.4 x 19.0 cm
<b>Weight</b> (max)	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, 6x PCAV
<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, 8x PCAV
<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, 8x PCAV
<b>DVD+RW</b>	2.4x, 4x, 6x CLV, 8x ZCLV	Not supported
<b>DVD-RAM</b>	2x, 3x, 5x CLV	
<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>	8x CAV	8x CAV
<b>BD-R</b>	8x CAV	8x CAV
<b>BD-RE (SL/DL)</b>	6x CAV	6x CAV
<b>DVD-ROM</b>	16x CAV	8x CAV
<b>DVD-R</b>	16x CAV	8x CAV
<b>DVD-RW</b>	10x CAV	Not support
<b>DVD+R</b>	16x CAV	8x CAV
<b>DVD+RW</b>	10x CAV	Not support
<b>BDMV (AACs Compliant Disc)</b>	8x CAV	
<b>DVD-RAM</b>	2x, 3x, 5x CLV	

### Technical Specifications – Optical Drives and Storage

	<b>DVD-Video</b> (CSS Compliant Disc)	8x CAV
	<b>CD-R/RW/ROM</b>	40x / 40x / 40x CAV
	<b>CD-DA</b> (DAE)	32x CAV
	<b>80 mm CD</b>	11.5x CAV
<b>Sustained Transfer rate</b>	<b>BD-ROM</b>	35.977 MB/s (8x) max.
	<b>DVD-ROM</b>	22.16 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	
<b>Access times</b> (typical reads, including setting)	<b>Random</b>	DVD: < 140 ms (typical), CD: < 125 ms (typical)
	<b>Full Stroke</b>	DVD: < 250 ms (seek), CD: < 210 ms (seek)
<b>Power</b>	<b>Source</b>	SATA DC power receptacle
	<b>DC Power Requirement</b>	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
	<b>DC Current</b>	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</b> (operating)	41° to 122° F (5° to 50° C)
	<b>Relative Humidity</b> (operating)	10% to 90%
	<b>Maximum Wet Bulb Temperature</b> (operating)	86° F (30° C)

### HP SuperMulti DVD Writer Drive

<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>	8.5 GB DL or 4.7 GB standard	
<b>Dimensions</b> (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
<b>Weight</b> (max)	2.6 lb (1.2 kg)	
<b>Write speeds</b>	<b>DVD-RAM</b>	Up to 5X
	<b>DVD+R</b>	Up to 16X

### Technical Specifications – Optical Drives and Storage

	<b>DVD+RW</b>	Up to 8X
	<b>DVD+R DL</b>	Up to 8X
	<b>DVD-R DL</b>	Up to 8X
	<b>DVD-R</b>	Up to 16X
	<b>DVD-RW</b>	Up to 6X
	<b>CD-R</b>	Up to 40X
	<b>CD-RW</b>	Up to 24X
<b>Read speeds</b>	<b>DVD-RAM</b>	Up to 12X
	<b>DVD+RW, DVD-RW, DVD+R DL, DVD-R DL</b>	Up to 8X
	<b>DVD-ROM DL</b>	Up to 8X
	<b>DVD-ROM, DVD+R, DVD-R</b>	Up to 16X
	<b>CD-ROM, CD-R</b>	Up to 40X
	<b>CD-RW</b>	Up to 32X
<b>Access time</b> (typical reads, including settling)	<b>Random</b>	DVD: < 140 ms (typical), CD: < 125 ms (typical)
	<b>Full Stroke</b>	DVD: < 250 ms (seek), CD: < 210 ms (seek)
<b>Power</b>	<b>Source</b>	SATA DC power receptacle
	<b>DC Power Requirement</b>	5 VDC $\pm$ 5%-100 mV ripple p-p 12 VDC $\pm$ 5%-200 mV ripple p-p
	<b>DC Current</b>	5 VDC (< 1000 mA typical, 1600 mA maximum) 12 VDC (< 600 mA typical, 1400 mA maximum)
<b>Environmental conditions</b> (operating - non-condensing)	<b>Temperature</b>	41° to 122° F (5° to 50° C)
	<b>Relative Humidity</b>	10% to 90%
	<b>Maximum Wet Bulb Temperature</b>	86° F (30° C)

### HP DVD-ROM Drive

<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>	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)

### Technical Specifications – Optical Drives and Storage

<b>Dimensions</b> (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
<b>Weight</b> (max)	2.6 lb (1.2 kg)		
<b>Read speeds</b>	<b>DVD+R/-R/+RW/-RW/+R DL /-R DL</b>	Up to 8X	
	<b>DVD-ROM</b>	Up to 16X	
	<b>DVD-RAM</b>	Up to 5X	
	<b>CD-ROM, CD-R</b>	Up to 40X	
	<b>CD-RW</b>	Up to 32X	
	<b>Removable Storage - Media Compatibility - DVD-ROM</b>	<b>Media</b>	<b>Read</b>
<b>CD-ROM</b>		Yes	No
<b>CD-R</b>		Yes	No
<b>CD-RW</b>		Yes	No
<b>DVD-ROM</b>		Yes	No
<b>DVD-ROM DL</b>		Yes	No
<b>DVD-RAM</b>		Yes	No
<b>DVD+R</b>		Yes	No
<b>DVD+R DL</b>		Yes	No
<b>DVD+RW</b>		Yes	No
<b>DVD-R</b>		Yes	No
<b>DVD-RW</b>		Yes	No
<b>DVD-R DL</b>		Yes	No
<b>Access times</b> (typical reads, including setting)		<b>Random</b>	DVD: < 140 ms (typical), CD: < 125 ms (typical)
	<b>Full Stroke</b>	DVD: < 250 ms (seek), CD: < 210 ms (seek)	
	<b>Cache Buffer</b>	2 MB (minimum)	
	<b>Data Transfer Modes</b>	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)	
<b>Power</b>	<b>Source</b>	SATA DC power receptacle	
	<b>DC Power Requirement</b>	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p	
	<b>DC Current</b>	5 VDC - <1000 mA typical, < 1600 mA maximum 12 VDC - < 600 mA typical, < 1400 mA maximum	
	<b>Temperature</b>	41° to 122° F (5° to 50° C)	
	<b>Relative Humidity</b>	10% to 90%	

### Technical Specifications – Optical Drives and Storage

<b>Environmental</b> (all conditions non-condensing)	<b>Maximum Wet Bulb Temperature</b>	86° F (30° C)
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### HP 22-n-1 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.

**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

### Technical Specifications – Optical Drives and Storage

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 - 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</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
<b>Electrical</b>	<b>Operating voltage</b>	+ 5VDC ± 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>	38 available
	<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)
<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
<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>	<b>Keyboard</b>	Installation Guide
	<b>Warranty Card</b>	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)
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### Technical Specifications - Input/Output Devices

<b>Electrical</b>	<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>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>	38 available
		<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>Environmental</b>		<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>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>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		

### HP USB & PS2 Washable 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>	USB Type A plug connector

### Technical Specifications - Input/Output Devices

<b>Mechanical</b>	<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>Keycaps</b>	Stepped -profile design
	<b>Switch actuation</b>	55-g nominal peak force with tactile feedback
	<b>Switch life</b>	20 million keystrokes
	<b>Switch type</b>	Contamination-resistant switch membrane
	<b>Key-leveling mechanisms</b>	For all double-wide and greater-length keys
<b>Environmental</b>	<b>Cable length</b>	7 ft 2.2 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>	-4° to 149° F -20° to 65° C
	<b>Operating humidity</b>	10% to 95% (non-condensing at ambient)
	<b>Non-operating humidity</b>	0% to 95% (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 (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	
<b>Approvals</b>	UL, cUL, FCC, CE, TUV GS, VCCI, BSMI, C-Tick, KCC, USB-IF, WHQL, EN/IEC 60601-1, IP66/NEMA4X	
<b>Ergonomic compliance</b>	ANSI HFS 100, ISO 9241-4, and TUVGS	

### 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
	<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

### Technical Specifications - Input/Output Devices

<b>Electrical</b>	<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</b> (out of box)	80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face
	<b>Operating voltage</b>	5 VDC $\pm$ 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 $\pm$ 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>
<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
<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</b> (H x L x W)	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
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### Technical Specifications - Input/Output Devices

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

### Technical Specifications - Environmental Data

#### Eco-Label Certifications & declarations

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US ENERGY STAR<sup>®</sup>
- IT ECO declaration
- EPEAT Gold registered in the United States. See <http://www.epeat.net> for registration status in your country.

Energy Consumption	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
Normal Operation	31.41 W	36.57 W	33.26 W
Normal Operation (Long idle)	30.46 W	36.18 W	32.98 W
Sleep	2.58 W	2.79 W	2.58 W
Off	0.77 W	0.94 W	0.76 W

**NOTE:** Energy efficiency data listed is for an ENERGY STAR<sup>®</sup> compliant product if offered within the model family. HP computers marked with the ENERGY STAR<sup>®</sup> Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR<sup>®</sup> specifications for computers. If a model family does not offer ENERGY STAR<sup>®</sup> compliant configurations, then energy efficiency data listed is for a typically configured model.

Heat Dissipation*	115VAC, 60Hz	230VAC, 60Hz	100VAC, 60Hz
Normal Operation (Short idle)	107 BTU/hr	125 BTU/hr	114 BTU/hr
Normal Operation (Long idle)	104 BTU/hr	124 BTU/hr	113 BTU/hr
Sleep	9 BTU/hr	10 BTU/hr	9 BTU/hr
Off	3 BTU/hr	4 BTU/hr	3 BTU/hr

**\*NOTE:** 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 (L <sub>WAd</sub> , bels)	Sound Pressure (L <sub>pAm</sub> , decibels)
Typically Configured – Idle	3.7	28
Fixed Disk – Random writes	3.8	29

**Longevity and Upgrading** This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:

- 6 USB ports
- 2 memory slots
- 1 Mini PCIe half-length slot
- 1 MXM 3.0 Type A - 35W slot
- 1 mSATA slot
- 1 2.5" internal bay supporting up to Two 2.5" hard drives (HDD/SSD/SED/SSHD)
- 1 5.25" external supporting optical drive

### Technical Specifications - Environmental Data

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

#### Batteries

This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:

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

Battery size: CR2032 (coin cell)

Battery type: Lithium

#### Additional formation

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/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)
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product contains 5% post-consumer recycled plastic (by wt.)
- This product is 93.7% recycle-able when properly disposed of at end of life.

#### Packaging Materials

<b>External:</b>	PAPER/Corrugated	1966 g
<b>Internal:</b>	Polyethylene low density Foam	154 g

The plastic packaging material contains at least 60.42 % recycled content.

The corrugated paper packaging materials contains at least 38.38 % recycled content.

#### 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)

### Technical Specifications - Environmental Data

- 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<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 Usage

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>

### Summary of Changes

Date of change:	Version History:		Description of change:
	From v1 to v2		
May 20, 2014	From v13 to v14,	Changed	ENERGY STAR wording, Pubnumber
April 8, 2015	From v14 to v15	Changed	Callouts naming in front view, Overview section
April 17, 2015	From v15 to v16	Changed	Change to Indicator lights in Serviceability Features section
July 15, 2015	From v16 to v17	Changed	Bios feature in At a Glance section
October 8, 2015	From v17 to v18	Added	32GB SSD availability note; HP PCIe x1 Parallel Port Card in AMO section
December 14, 2015	From v18 to v19	Added	Windows 10 IoT Enterprise for Retail 64-bit, Windows 10 Pro 64-bit to Overview and Operative Systems
June 22, 2016	From v19 to v20	Removed	All instances of Win 10



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