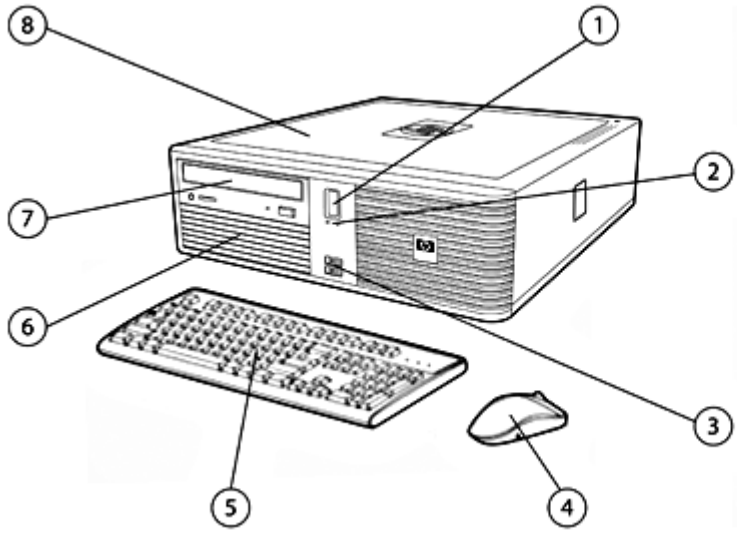
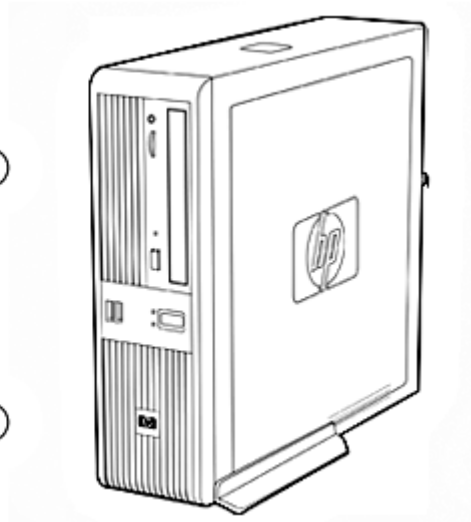
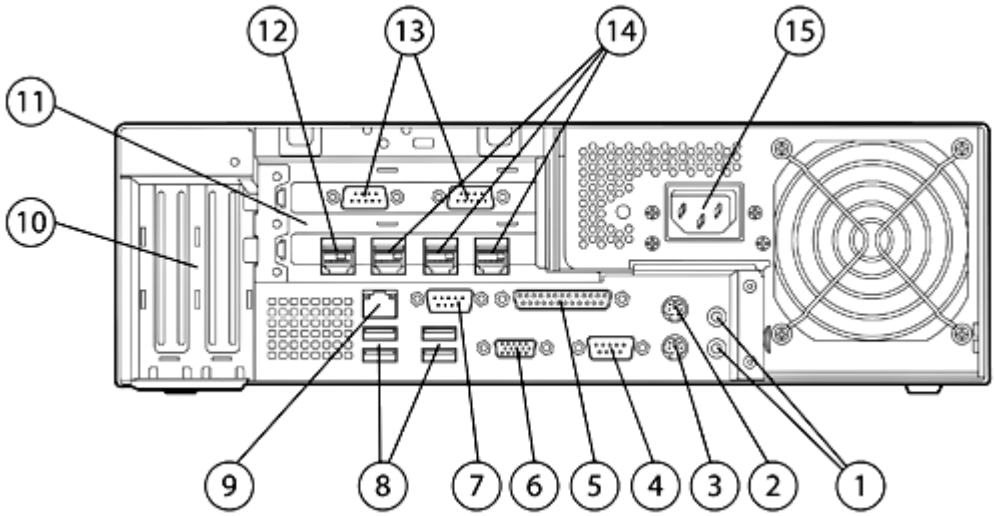
Overview





1. Recessed power button
2. Disk access and diagnostic LEDs
3. 2 USB 2.0 ports with rubber cover
4. HP 2-button scroll mouse
5. HP Keyboard
6. 3.5" internal hard drive
7. 5.25" external optical drive
8. 3.5" second internal hard drive



1. Line in and line out audio jacks
2. PS/2 mouse port
3. PS/2 keyboard port
4. RS232 serial COM1 port
5. Parallel port
6. VGA port
7. RS232 serial COM2 port
8. 4 USB 2.0 ports
9. RJ-45 LAN jack
10. 2 half-height slots: left ADD2/SDVO slot, right PCIe-x1
11. 2 full-height PCI slots
12. 1 USB 2.0, USB + PWR port: +24V (some models)
13. 2 RS232 serial COM3 and 4 ports (some models)
14. 3 USB 2.0, USB + PWR ports: +12V (some models)
15. 240W 80 PLUS® – Active PFC power supply

Overview

At A Glance

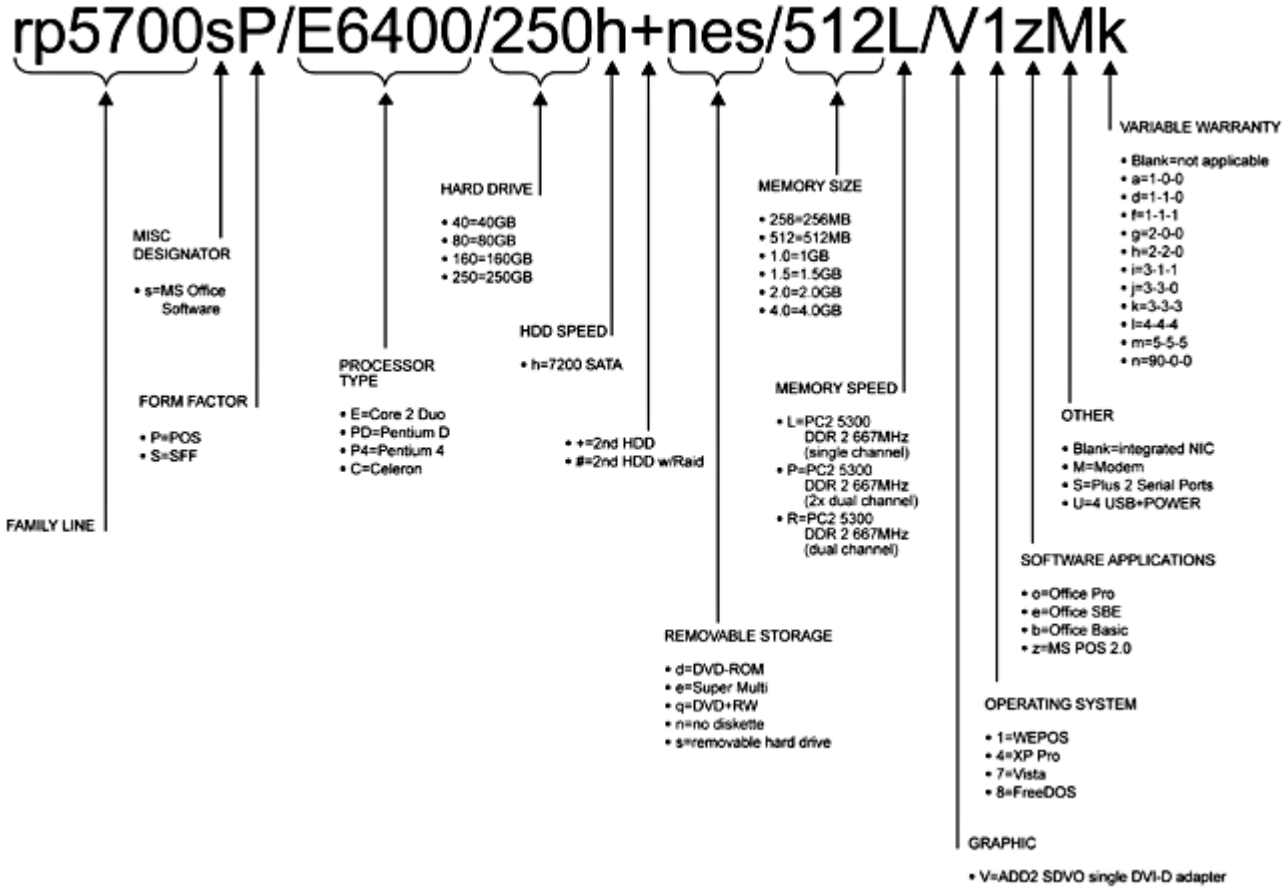
- Intel® Core™2 Duo processor, Intel Pentium® Dual-Core processor, or Intel Celeron® processor
- One of the following operating systems:
  - Genuine Windows 7 Professional 32-bit
  - Genuine Windows 7 Professional 64-bit
  - Genuine Windows Vista Business 32-bit
  - Genuine Microsoft Windows Embedded POSReady 2009
  - Genuine Windows Embedded for Point of Service (WEPOS)
  - FreeDOS
- Intel Q963 chipset with Intel GMA 3000 and support for dual independent displays
- Dual Channel DDR2 667 MHz system memory (800Mhz memory may be installed but will run at 667MHz)
- Integrated Broadcom 5755 NIC 10/100/1000 with integrated TPM support
- SMART III serial ATA 3.0Gb/s Hard Drives
- RAID level 0 & 1 support
- Manageability tools
- Protected by HP Services, including a 3-3-3, standard warranty. Terms and conditions vary by country. Certain restrictions and exclusions apply.

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

Standard and Configurable Components

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.



Standard and Configurable Components

Operating System – One of the following

Genuine Windows 7 Professional 32-bit*
Genuine Windows 7 Professional 64-bit*
Genuine Windows Vista Business 32-bit**
Genuine Microsoft Windows Embedded POSReady 2009***
Genuine Windows Embedded for Point of Service (WEPOS)
FreeDOS

* System may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details.
** Certain Windows Vista product features require advanced or additional hardware. See: http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx and: http://www.microsoft.com/windowsvista/getready/capable.mspx for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor.
*** DVD drive required to install Multilingual User Interface software

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Value-added Software (not included with FreeDOS) Not all software included with all models.

HP ProtectTools Security Software Suite**
HP Client Management Solutions (visit http://www.hp.com/go/easydeploy)
HP Backup and Recovery Manager
HP Insight Diagnostics
Computer Setup Utility
McAfee Total Protection Anti-Virus*
Corel WinDVD (supplied with DVD drive)
Microsoft Office Starter 2010+
Microsoft Office 2010++
Microsoft Office Home & Business 2010**
Microsoft Office Professional 2010**
Microsoft Office Personal 2010 (Japanese)***
Microsoft Internet Explorer
HP Client Automation Enterprise
Altiris Deployment Solution Agent
Roxio Creator Business (included with DVD R/W drive)

* 60 day trial period for McAfee Total Protection for Small Business software. Internet access required to receive updates. First update included. Subscription required for updates thereafter.
+ Includes Microsoft Word Starter 2010 and Microsoft Excel Starter 2010. This system is preloaded with reduced-functionality versions of Word and Excel that include advertising. It does not include PowerPoint or Outlook. Purchase an Office 2010 Product Key to activate the full-featured Office software on this system.
++ Office 2010 preloaded; purchase product key to activate. License-to-use not included and must be purchased separately.
** Sold separately.
*** Sold separately. Available in Japan only.

Value-added Services and Features

HP Stable Platform Program with Product Change Notification
Business-to-Business Portals
Factory Express Deployment and Lifecycle Services (sold separately)
TPM 1.2* Vista Bit-Locker Ready

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

Standard and Configurable Components

Service and Support	On-site Warranty and Service[NOTE 1]This three-year, limited warranty and service offering delivers three years of on-site, next business-day[NOTE 2] service for parts and labor and includes free telephone support[NOTE 3] 24 x 7. Global coverage[NOTE 2] ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. The rp5700 is available for sale in the Americas and EMEA only **NOTE 1**: Terms and conditions may vary by country. Certain restrictions and exclusions apply. **NOTE 2**: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country. **NOTE 3**: Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.	
Dimensions and Weight	**Chassis Dimensions** (HxWxD)	3.94 x 13.4 x 15 in (10 x 34 x 38 cm)
	System weight*	19.62 lb (8.9 kg) POS models, 18.64 lb (8.433 kg) PC models
	System volume	approximately 13 liters (13.74 quarts)
	Shipping weight*	27.3 lb (12.355 kg) POS models, 26.52 lb (11.998 kg) PC models
	Shipping box dimensions	23.38 x 19.68 x 9.00 inches (59.38 x 49.99 x 22.85 cm)
	Monitor weight supported	77 lb (35 kg) maximum
	* Configured with 2 hard drives, 1 optical drive, no diskette drive, USB and COM cards (POS models), and tower stand.	
Power Supply	240W 80 PLUS – Active PFC Power Supply. No line switching required.	
Ports	**USB**	6 USB 2.0 (2 front, 4 rear) Plus 4 additional USB+POWER on some models; 3 @ 12V, 1 @ 24V
	Serial	2 RS232 individually configurable to power 5V & 12 V. COM1 can be configured for 5V, 9V, and 12V Plus 2 additional RS232 on some models via PCI card. Individually configurable to power 5V and 12V
	Parallel	1
	PS/2	2
	Video	1
	Audio	2, line in and line out
	NIC	RJ-45
	Support for Multi-Monitor*	available via HP ADD2 SDVO DVI-D Adapter
	* The rp5700 supports normal (or non-reversed) layout (Advanced Digital Display 2) adapter cards inserted into the SDVO (Serial Digital Video Output) connector on the system board. This connector has the physical appearance of a PCIe- x16 connector; however, conventional PCIe cards are not supported in this connector.	
Chipset	Intel Q963 with ICH8-RAID	

Standard and Configurable Components

Processor and Speed*
One of the following

Intel Core2 Duo Processor E7400 (2.80-GHz, 3-MB L2 cache, 1066-MHz FSB)
Intel Pentium Dual-Core Processor E2160 (1.80-GHz, 1-MB L2 cache, 800-MHz FSB)
Intel Celeron Processor 440 (2-GHz, 512-KB L2 cache, 800-MHz FSB)

* Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

Memory

DDR2 SYNCH DRAM NON-ECC 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 rp5700 supports non-ECC DDR2 PC2-5300 (667-MHz) and PC2-6400 (800 MHz) memory.*

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

1-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (1 x 1 GB)
2-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (1 x 2 GB)
2-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (2 x 1 GB)
3-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (3 x 1 GB)
4-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (4 x 1 GB)
8-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (4 x 2 GB)

Maximum Memory

Supports up to 8 GB of DDR2 Synch DRAM.
Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.
* All supported memory modules run at system maximum of 667 MHz.
NOTE: Above 3-GB, all memory may not be available due to system resource requirements.

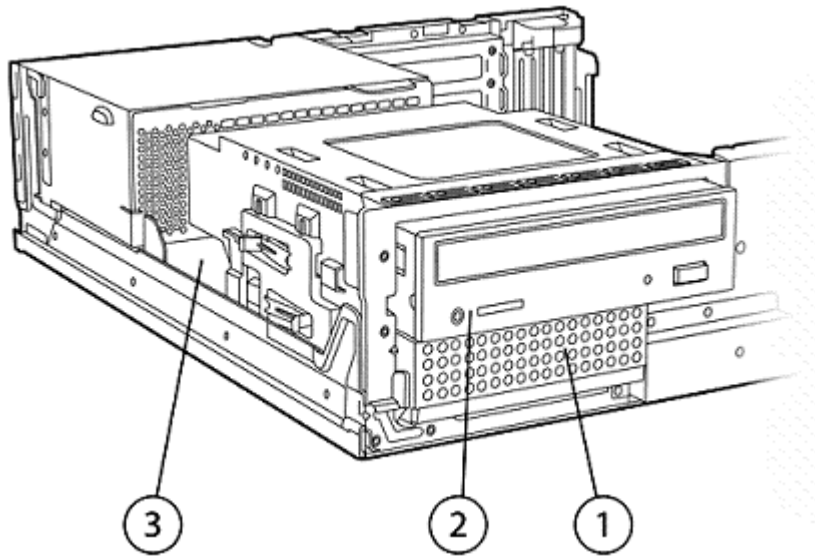
DIMM Size	Slot			
	Channel A		Channel B	
	1 (black)	**2** (white)	**3** (black)	**4** (white)
1 GB	1 GB			
2 GB	1 GB		1 GB	
2 GB	2 GB			
3 GB	1 GB		2 GB	
3 GB	2 GB		1 GB	
4 GB	1 GB	1 GB	1 GB	1 GB
8 GB	2 GB	2 GB	2 GB	2 GB

Slots

PCI 2 full-height, half-length PCI, 1 half-height PCIe-1x
SDVO/ADD2 1

Standard and Configurable Components

Storage	**Internal bays**	2 3.5-inch ATA hard drive
	External bay	1 5.25-inch optical drive
	Hard Drive Interfaces Supported	2 Serial ATA interfaces with RAID controller option. Supports RAID 0, 1, and 10.
	Hard Drive Controller Supported	SATA 3.0 Gb/s and 1.5 Gb/s
	Serial-ATA connectors	3
	Hard Drive – One of the following	160-GB, 250-GB, 500-GB, 1TB SATA 3.0 Gb/s, 7200 rpm 160-GB, 250-GB, 500-GB, 1TB SATA 3.0 Gb/s, 7200 rpm with RAID 1 80GB Solid State Drive 80GB Solid State Drive with RAID
	Removable Storage – One of the following	16X/48X SATA DVD-ROM 16X SATA SuperMulti Drive



Front View	Quantity Supported	Position	Controller
Diskette Drives	0	0	N/A
3.5-inch Serial ATA Hard Drive	3	1, 2*, 3	SATA
Optical Drive Bay or Carrier for Hard Drive	1	2	SATA

* Requires optional Hard Drive Carrier

Standard and Configurable Components

Security	TPM 1.2 Embedded Security Chip* integrated with Broadcom NIC HP ProtectTools Security Software Suite with BIOS Configuration (serial, parallel, USB enable/disable), Credential Manager, Smart Card Manager (sold separately) HP Desktop Security Lock Kit (lock and cable) (sold separately) Security cable with Kensington lock (sold separately) Wall Mount/Security Sleeve (sold separately) **Security loop hole diameter** 0.212 inch (0.538 cm) ***NOTE:** TPM module disabled where use is restricted by law; for example, Russia.	
NIC	Broadcom 5755 10/100/1000 NIC with TPM 1.2 support	
Communications	HP Wireless A+G PCI Adapter Card (optional) HP Wireless 802.11 b/g/n PCIe Card (optional) 2006 LSI PCIe x1 56K International SoftModem (optional) 2006 Agere PCI 56K International SoftModem (optional)	
Graphics	Integrated Intel Graphics Media Accelerator 3000. Support for dual display via optional HP ADD2 SDVO DVI-D Adapter	
Audio	Intel integrated high-definition audio with 2-channel Realtek ALC 262 codec and internal amplified chassis speaker	
Input/Output Devices	**Keyboard –** One of the following	PS/2 keyboard USB BG1650 keyboard (EMEA) USB keyboard No keyboard optional
	Mouse – One of the following	PS/2 scroll mouse USB scroll mouse Optical scroll mouse No mouse optional
Miscellaneous	Tower stand standard	

After-Market Options

Communications	HP Wireless 802.11 b/g/n PCIe Card	FH971AA
	Modem RJ11 Telecoms Adapter Kit	DC131C
	2006 Agere PCI 56K International SoftModem	EK694AA
	Broadcom NetXtreme Gigabit Ethernet Plus NIC	FS215AA
Graphics	HP ADD2 SDVO DVI-D Adapter	DY674A
	NVIDIA NVS 300 (512mb) PCIe x1 Card (includes DMS-59 to Dual-VGA cable, Low-Profile bracket)	BV457AA
	Single-DVI to Single-DVI Cable	DC198A
	DMS-59 to Dual-DVI cable	DL139A
	DMS-59 to Dual DisplayPort Cable Kit	XP612AA
	HP USB Graphics Adapter	NL571AA
Hard Drives	HP 160-GB SATA 3.0 Gb/s	PY277AA
	HP 250-GB SATA 3.0 Gb/s	PY278AA
	HP 500-GB SATA 3.0 Gb/s	PV943A
	HP 1.0-TB SATA 3.0 Gb/s	VU353AA
	HP 3.5-inch Removable SATA Hard Drive Carrier (inserts into optical drive bay for non-HP hard drive support)	DS710B
Solid State Drive	HP 80GB 2.5" Solid State Drive	BM848AA
Optical Drives	16X SATA SuperMulti Drive (Carbonite color)	GF343AA
	16X SATA SuperMulti Drive (HP Black color)	AR630AA
	16X/48X SATA DVD-ROM (Carbonite color)	AH047AA
	16X/48X SATA DVD-ROM (HP Black color)	AR629AA
Input/Output Devices	HP PS/2 Keyboard	DT527A
	HP USB BG1650 Keyboard (EMEA)	DT529A
	HP USB Keyboard	DT528A
	HP PS/2 2-Button Optical Scroll Mouse	EY703AA
	HP USB Smart Card Keyboard	ED707AA
	HP USB 2- Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	HP 2-port Powered Serial Port PCI Card	KH887AA
	HP 4-port Powered USB Port PCI Card	KH888AA

After-Market Options

POS Model Options	HP Heavy Duty Cash Drawer	FK182AA
	HP Flip-Top Cash Drawer	BW867AA
	HP USB Barcode Scanner	EY022AA
	HP Imaging Barcode Scanner	BW868AA
	HP POS Pole Display	FK225AA
	HP USB Mini MSR with Brackets	FK186AA
	HP POS Keyboard	FK221AA
	HP POS MSR Keyboard	FK218AA
	HP USB Single Station Thermal Receipt Printer	FK224AA
	HP USB Multifunction Thermal Receipt Printer with MICR	FK184AA
	HP Serial USB Thermal Receipt Printer	BM476AA
Memory (DIMMs)	1-GB DDR2 Synch DRAM PC2-6400 (800-MHz)* Non-ECC	BZ722AA**
	2-GB DDR2 Synch DRAM PC2-6400 (800-MHz)* Non-ECC	BZ723AA***
	* All supported memory modules run at system maximum of 667 MHz. ** Desktop PC memory AH058AA also compatible *** Desktop PC memory AH060AA also compatible	
Monitors	HP LP2065 20-inch TFT Flat Panel Display – Analog/Digital	EF227A4
	HP L5006tm 15-inch LCD Touchscreen Monitor	RB146AA
	HP L5009tm 15-inch LCD Touchscreen Monitor	VK202AA
Security	Kensington Security Lock Kit	PC766A
	HP Business PC Security Lock Kit	PV606AA
	HP Chassis Security Kit	AR639AA
Software	HP ProtectTools (1 user)	RG984AA

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 front side and power supply side of the computer 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 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.	
Temperature Range	Operating: 50° to 104 F (10° to 40° C)* Non-operating: -22° to 140° F(-30° to 60° C)
Relative Humidity	Operating: 20% to 85% (non-condensing at ambient) Non-operating: 5% to 90% (non-condensing at ambient)
Maximum Altitude (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)
*__NOTE:__ 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	240-watt – 80 PLUS* power supply – Active PFC *This alternate 80% efficient power supply is a requirement for 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	5 A @ 90 VAC (3.5 A @ 90 VAC with 80% efficient power supply*)
Heat Dissipation	Standard power supply: Typical 340 btu/hr (86 kg-cal/hr) Maximum 1260 btu/hr (397 kg-cal/hr) 80% efficient power supply: Typical 273 btu/hr (69 kg-cal/hr) Maximum 1024 btu/hr (258 kg-cal/hr)
Power Supply Fan	80 mm variable speed fan
ENERGY STAR Compliant	Yes
FEMP Standby Power Compliant (<2W in S5 – Power Off)**	Yes
Power Consumption in ES Mode – Suspend to RAM (S3) (Instantly Available PC)	< 3 W
Processor/Cache Memory Power - Down (S3)	< 3 W
Optical Drive Spins Down When Not In Use	Yes

Technical Specifications

NOTES:
* This 80% efficient power supply is a requirement for ENERGY STAR compliance in conjunction with a select range of processors and modules.
** Power consumption in the Off/Apparent Off mode is measured and reported with the network interface controller "Wake on LAN" feature disabled in F10 Setup (default is "enabled").

ROM BIOS Information
Key features of the HP BIOS in the rp5700 include: • Deployment and manageability – HP BIOS provides several technologies that help integrate the HP Business desktop computer into the enterprise, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages. • Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification. • Security – HP BIOS offers a robust and flexible set of security features to help the system administrator secure their systems from removal of sensitive data, and help prevent access by unauthorized users, subversion of OS security policies, removal of hardware, flash of rogue BIOS images, and attacks on BIOS settings. • Thermal and power management – The HP BIOS provides and enables thermal and power management technologies to assist in operating the HP Business Desktop computer in any enterprise environment. • 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 (Flashlite), BIOS updates from within Windows (HPQFlash, SSM), HP Client Manager, and fail-safe recovery. In addition, the HP Business Desktop BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS software and from the support website. Additional HP BIOS Features • 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. Provides power conservation features under Windows XP. • Ability to disable the internal speaker

Other Features	**Description**
ACPI-Ready Hardware	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.
SMBIOS Ver. 2.4	System Management BIOS, previously known as DMI BIOS, for system management information
Wired for Management Support	Intel-driven, industry-wide initiative to make Intel architecture-based PCs, servers and mobile computers more inherently manageable right out of the box and over the network
Dual-State Power Button	Power button acts as both an on/off button and suspend-to-sleep button

Technical Specifications

Serviceability Features of System		
Dual Color Power LED on Front of Computer (Indicates Normal Operations and Fault Conditions)		
Diagnostic LED Explanation Table	Number of 1-second red LED blinks followed by 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 recover mode	
• System/Emergency ROM	• Flash ROM	• CMOS Battery Holder for easy Replacement
• Flash Recovery with Video	• 3.3V 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
• Restore CD	• Clear CMOS Jumper	• NIC LEDs (integrated) (Green & Amber)

Serviceability Features of Chassis		
• Dual Color Power LED – To indicate normal operations and fault conditions	• Color coordinated cables and connectors	• Tool-less removal of hood power supply, slot cover, hard drive and optical drive
• Front power switch	• System memory can be upgraded without removing any internal components	

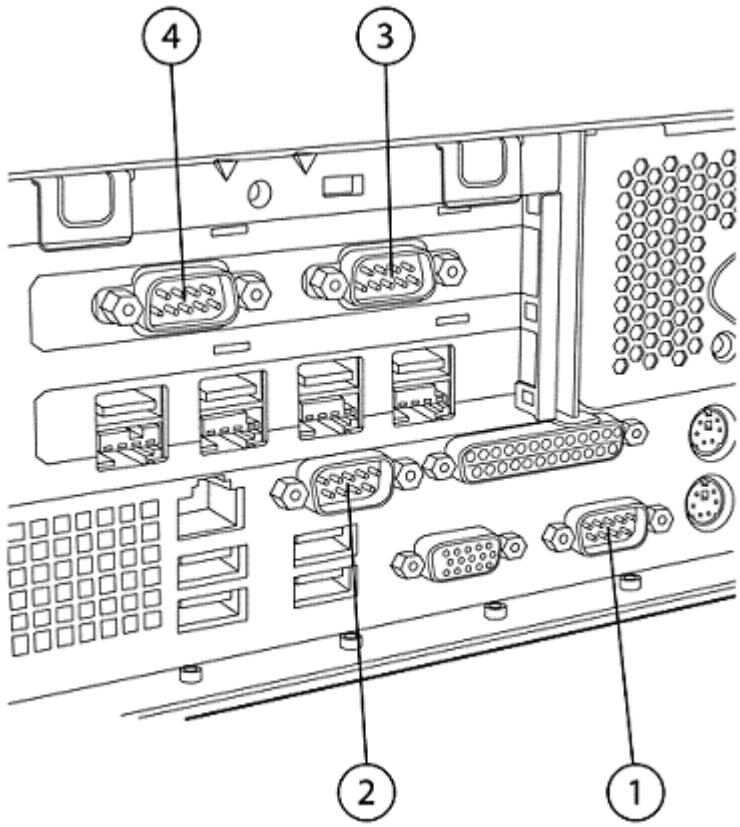
Feature	**Description**
ASF 2.0 support (Alert Standard Format)	Industry-standard specification for network alerting and remote control in operating system-absent environments
Towerable	Product can be oriented as a tower (in addition to desktop orientation)
Drive Self Tests (DPS)	• Drive Protection System • A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user. • Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced. • The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures.
DPS Access through F10 Setup during Boot	
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 • Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count • By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure
SMART I – Drive Failure Prediction	
SMART II – Off-Line Data Collection	
SMART III – Off-Line Read Scanning with Defect Reallocation	

Technical Specifications - Audio

High Definition Audio	**Type**	Integrated
	High Definition Stereo Codec	Yes – Realtek ALC262 codec
	Audio Jacks	Line-In (64-K ohm Input Impedance) Line-Out * (200 ohms Output Impedance, expects at least a 10-K ohm load)
	NOTE: *Internal speaker amplifier is for internal speaker only. External speakers need to be powered externally.	
	Sampling	8 kHz – 192 kHz
	Wavetable Syntheses (software)	Yes - Uses OS soft wavetable
	Analog Audio	Yes
	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	1.5 W
	Internal Speaker	Yes
	External Speaker Jack (Line-Out)	Yes

Serial Ports

All serial (COM) ports can be custom configured in either standard mode or powered mode. By repositioning the jumpers (provided) on the system board and on the COM port PCI add-in card (some models), each COM power can achieve power on pin 1 or pin 9. The illustration and table below indicate the COM port assignments and voltage supported for each COM port.

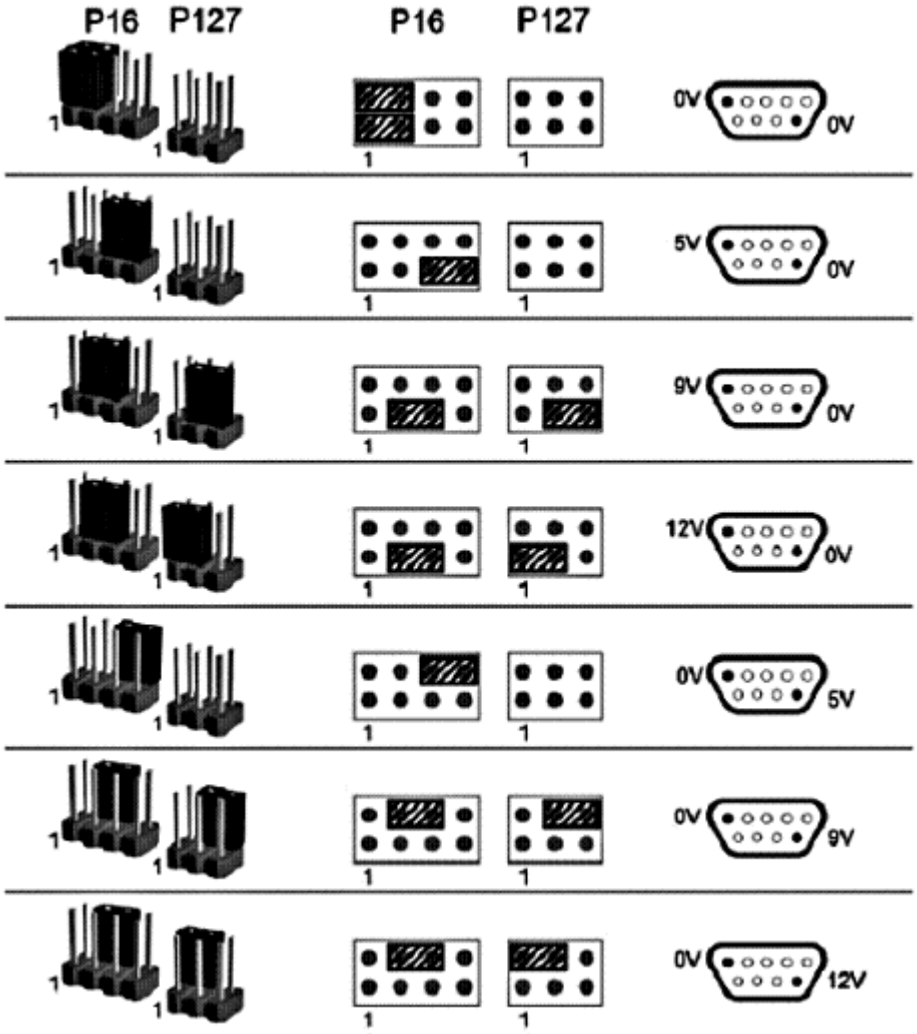


COM port assignment	Description	Standard Mode	+5V	+9V	+12V
1	COM1 (yellow)	Yes	Yes	Yes	Yes
2	COM2	Yes	Yes	No	Yes
3	COM3 (some models)	Yes	Yes	No	Yes
4	COM4 (some models)	Yes	Yes	No	Yes

The following illustrations show how to position the jumpers on the system board and on the COM port PCI add-in card (available on some models) to achieve power on pin 1 or pin 9.

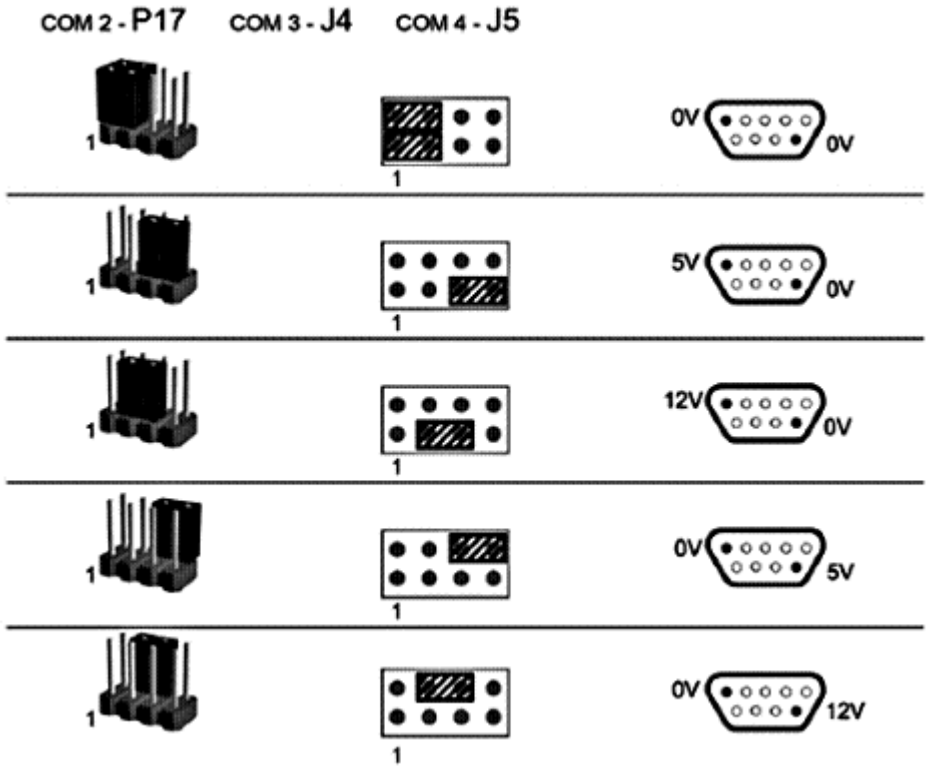
P16 and P127 are located on the system board behind the COM1 port.

Technical Specifications - Communications



P17 and J4 are located on the optional COM port card

Technical Specifications - Communications



Integrated Broadcom 5755 Gigabit Ethernet	**Connector**	RJ-45
	Controller	Broadcom 5755 PCI-Express LAN Controller
	Memory	Integrated 96Kb frame buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI-E
	Data path width	Single channel, PCI-E
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	1.33 watts @ +3.3V AUX supply with 5V tolerance
	Boot ROM support	Yes
	Network transfer mode	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver)
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps

Technical Specifications - Communications

	Environmental	**Operating temperature**	32° to 131°F (0° to 55° C)
		Operating humidity	85% at 131° F (55° C)
	Management capabilities	ASF 2.0, ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility	
	Alerting	ASF 2.0	
LSI PCIe x1 Hi-Speed 56K International SoftModem	**Data Transmission**	Technology speeds: 56,000 Kbps maximum downstream data, controllerless **NOTE:** 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.	
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/ 16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300	
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103	
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s	
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2	
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5	
	Power Management	PCI Bus Power Management Interface Specification (PCI-PM) Revision 1.2, Appendix A. D0, D3hot, and D3cold. Wake on Ring state when in D3cold. If the power management event (PME) feature is enabled in D3cold, a modem can wake the system via WAKE# (WAKEN) or beacon. Meets PCI Express 1.1 standard.	
	Upgradeability	Driver upgradeable for future enhancements	
	Video	ITU-T V.80 video ready interface	
	Other	TIA/EIA 602 standard AT command set	
		Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface	
		Optional ring wakeup signal	
	Operating Temperature	32° to 158° F (0° to 70° C)	
	Operating Humidity	20% to 90%, non-condensing	
	Power	Requires a 3.3-V auxiliary power rail on PCI express bus	
		Uses only one PCI express load (i.e., one grant/request pair), one shared IRQ, one electrical load	
	Chipset	LSI SV92EX - Integrated PCI interface with 3.3-V tolerant buffers and CardBus support	
	Dimensions (L X H)	Complies with PCI express low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets	
	Connection	Single RJ-11 connector	
	Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support	
	Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark	

Technical Specifications - Communications

	EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
	Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
	Other	The SV92EX device is packaged in a 32-pin micro leadless chip carrier (MLCC). The SV92EX is fully compliant with the PCI Express revision 1.1 specification. WHQL approved; ASPM compliant.

HP Wireless 802.11b/g/n PCIe	**Dimensions (LxH)**	3.3 x 4.7 inches (8.5 x 12 cm)		
	Weight	0.08 pounds (40 g)		
	Controller	Ralink RT2790		
	System interface	PCIExpress x1		
	Network standard	802.11 b/g/n		
	Frequency band	2.400 - 2.497 GHz		
	Operating temperature	14° to 149°F, operating (-10° to 65°C, operating)		
	Storage temperature	-40° to 176°F, non-operating (-40° to 80°C, non-operating)		
	Humidity	10-90% operating 5-95% non-operating		
	Operating voltage	3.3V +/- 9% 12V +/- 8%		
	Power consumption	Platform/WLAN Mode	Power Consumption	
		Maximum Power Consumption	10 Watts	
		Transmit Only	4 Watts maximum averaged power over 1 second	
		Transmit Packet or Active Scanning	1000 mA peak current for 100 microseconds or longer	
		Receive Only Mode or Idle without IEEE PSP mode enabled	3 Watts maximum averaged over 1 second	
		Idle, with IEEE PSP mode enabled	1.0 Watts maximum averaged over 1 second	
		Transmit Disabled (turned off in software)	50 mW maximum, averaged over 1 second	
		Platform in S3 or S4 (power removed from Low Profile PCI Express Card)	5 mW maximum, averaged over 1 second	
	Output power (approximately)	**802.11b modes**	**802.11g modes**	**EWC modes**
		+19 dBm +/- 1.0 dB maximum	+17 dBm +/- 1.0 dB maximum	+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	
	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	

Technical Specifications - Communications

	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
2006 Agere PCI 56K International SoftModem	**Data Transmission**	Technology speeds: 56,000 Kbps maximum downstream data, controllerless **NOTE:** 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
	Power Management	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
	Upgradeability	Driver upgradeable for future enhancements
	Video	ITU-T V.80 video ready interface
	Other	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
	Operating Temperature	32° to 158° F (0° to 70° C)
	Operating Humidity	20% to 90%, non-condensing
	Power	Requires a 3.3-V auxiliary power rail on PCI bus Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
	Chipset	Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support
	Dimensions (L X H)	Complies with PCI low profile specifications–6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
	Connection	Single RJ-11 connector

Technical Specifications - Communications

Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
Other	Bare PCB material compliant to 94V-0 or better (marked as such) PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

Technical Specifications - Graphics

Integrated Graphics Media Accelerator 3000

Graphic Controller	Integrated GMA 3000
Bus type	Integrated
RAMDAC	Single 400 MHz integrated
Memory	UMA with DVMT 4.0 support for frame buffer sizes 8-256 MB
Controller clock speed	667 MHz
Overlay planes	One 16-bit video overlay plane
Maximum Color Depth	32 bpp
Maximum vertical refresh rate	85 Hz
Multi-display Support	One VGA and one DVI-D in conjunction with an ADD2 card, clone and extended desktop modes are enabled by the addition of the HP ADD2 DVI-D Adapter
Graphics/Video API Support	DirectX 9.0c, WGF 1.0, DirectX VA 2.0, Shader Model 3.0, OpenGL 1.5

Resolutions Supported[1]

Resolution	Maximum Refresh Rate (Hz)	
	Analog Monitor	Digital Monitor
640 x 480	85	60
800 x 600	85	60
1024 x 768	85	60
1280 x 1024	85	60
1600 x 1200	85	60
1920 x 1080	85	60-R[2]
1920 x 1200	85	60-R[2]
1920 x 1440	60	N/A

NOTES:

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

[2] -R denotes reduced blanking timings (some digital monitors may not support reduced blanking timings). Other resolutions and refresh rates may be selectable but are not recommended.

Technical Specifications - Graphics

ADD2 SDVO DVI-D Adapter

Form Factor	Low-profile card (full-height (ATX) and low-profile brackets included in kit)
Dual head support	Yes
Host Interface Connector	• Mechanically compliant with PCI-e standard • Complies with the Intel ADD2 and Intel Serial Digital Video Output (SDVO) specifications
Dot Clock	165 MHz maximum
Display Modes	Supports display modes that require up to 165-MHz bandwidth on the link, as shown in the following table.

Resolutions Supported

Resolutions	60-Hz LCD	60-Hz	75-Hz	85-Hz
Blanking	5% reduced	GTF	GTF	GTF
640 x 480 VGA	Yes	Yes	Yes	Yes
800 x 600 SVGA	Yes	Yes	Yes	Yes
1024 x 768 XGA	Yes	Yes	Yes	Yes
1280 x 1024 SXGA	Yes	Yes	No	No
1600 x 1200 UXGA	Yes	Yes	No	No
1920 x 1200	Yes	No	No	No

Color Depth	All modes support 8-bpp, 16-bpp, and 24-bpp color depths (up to 16.7 million colors)

NVIDIA NVS 300 PCIe x1 Graphics Cards

Bus type	PCIe x1; Low profile
Graphics Controller	Nvidia GT218 GPU
Memory	512 MB DDR3
Connector	Single high-density DMS-59 Flex Connector
Dimensions	Low-profile, 2.586 x 5.7 in (6.57 x 14.48 cm)
Multi-monitor support	Dual analog (VGA) or digital (Single Link DVI or DisplayPort) monitors (DVI support requires optional DVI cable kit DL139A;DisplayPort support requires DMS-59 to Dual DisplayPort Cable Kit required
RAMDAC	Dual 400 MHz (integrated)
Maximum pixel clock	400 MHz
Overlay planes	One 16-bit Video overlay plane
Video Acceleration	DirectX 10.1; OpenGL 3.3, CUDA, DirectCompute
High-defintion Video Processor (HDVP)	Full screen, full frame video playback of HDTV, Blu-Ray and DVD content Inbuilt video decoder for multiple video formats including MPEG2, VC-1, WMV9, H.264, and MVC Capable of decoding dual Video Streams at HD (1080p) resolutions Hardware color-space conversion (YUV 4:2:2 and 4:2:0) High-Quality in-built Filtering/Scaling Stereo & HD Audio (LPCM 7.1) support for HDMI outputs (HDMI via optional DVI-HDMI dongles) with the DMS-59 to DisplayPort Adapter

Board configuration

Specification	Description
GPU	GT218
Core clock	520 MHz
Memory clock	790 MHz

Technical Specifications - Graphics

Frame buffer 512MB DDR3, 64-bit wide

Resolutions supported

Resolution	Maximum Refresh Rate (Hz)	
	Analog Monitor	Digital Monitor
640 x 480	85	60
800 x 600	85	60
1024 x 768	85	60
1280 x 720	85	60
1280 x 1024	85	60
1440 x 900	75	60
1600 x 1200	85	60
1680 x 1050	75	60
1920 x 1080	85	60-R*
1920 x 1200	85	60-R*
1920 x 1440	85	N/A
2048 x 1536	75	N/A

Technical Specifications - Hard Drives

Serial ATA 3.0-Gb/s Hard Drives (7200 rpm)	**1 TB**	**Capacity**	1,000,204,886,016 byte	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s	
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
		Buffer	32 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2.0 ms
			Average	11 ms
			Full-Stroke	21 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	1,953,525,168	
		Operating Temperature	41° to 131°F (5° to 55°C)	
	500 GB	**Capacity**	500,107,862,016 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
		Buffer	16 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2.0 ms
			Average	11 ms
			Full-Stroke	21 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	976,773,168	
		Operating Temperature	41° to 131° F (5° to 55° C)	
	250 GB	**Capacity**	250,059,350,016 bytes	
		Height	1 in (2.6 cm)	
		Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
		Buffer	8 MB	

Technical Specifications - Hard Drives

	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	1.0 ms
		Average	8.5 ms
		Full-Stroke	18 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	488,397,168	
	Operating Temperature	41° to 131°F (5° to 55°C)	
160-GB	**Capacity**	163,928,604,672 bytes	
	Height	1 in (2.54 cm)	
	Width	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
	Interface	Serial ATA (3.0 Gb/s)	
	Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.9 ms
		Average	9.3 ms
		Full-Stroke	18 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	320,173,056	
	Operating Temperature	41° to 131°F (5° to 55°C)	

Technical Specifications - Solid State Drives

2.5" Solid State Drives	**80-GB**	**Unformatted Capacity***	80 GB	
		Architecture	Multi Level Cell (MLC) NAND Flash with wear leveling 10 channel controller	
		Interface type	SATA 3Gb/sec	
		Dimensions-external (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 (4KB)	up to 35K IOPs
			Random Write (4KB)	up to 6.6K IOPs
		Latency	**Read**	65 ms
			Write	85 ms
		Power	**Total power consumption**	0.15 Watt (Active); 0.075 Watt (Idle)
		Useful drive life	**5 years**	35TB written, up to 20GB/day for 5 years
		Environmental (all conditions, non-condensing)	**Temperature** (operating)	32° to 158° F (0° to 70° C)
			Relative Humidity (operating)	5% to 95%
			Maximum Wet Bulb Temperature (operating)	84° F (29° C)
			Shock (operating)	1,500 G/0.5 msec

Technical Specifications - Input/Output Devices

USB Keyboard	**Physical characteristics**	**Keys**	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	**Operating voltage**	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		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
		Acoustics	43-dBA maximum sound pressure level
	Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
		Non-operating temperature	–22° to 140° F (–30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

Technical Specifications - Input/Output Devices

PS/2 Keyboard	**Physical characteristics**	**Keys**	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	**Operating voltage**	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		System interface	PS/2 6-pin mini din 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
		Acoustics	43-dBA maximum sound pressure level
	Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
		Non-operating temperature	–22° to 140° F (–30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

Technical Specifications - Input/Output Devices

USB Standard BG1650 Keyboard (gray)	**Physical characteristics**	**Keys**	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	**Operating voltage**	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		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
		Acoustics	43-dBA maximum sound pressure level
	Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
		Non-operating temperature	–22° to 140° F (–30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC, BG Prufzert Mark	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

HP PS/2 Scroll Mouse	**Dimensions**	1.5 x 2.5 x 4.6 in (3.8 x 6.3 x 11.6 cm)	
	Weight	4.44 oz (126 g)	
	Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
		Non-operating temperature	–22° to 140° F (–30° to 60° C)

Technical Specifications - Input/Output Devices

	Operating humidity	10% to 90% (non-condensing at ambient)
	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, 6 surfaces
	Non-operating shock	80 g, 6 surfaces
	Operating vibration	2 g peak acceleration
	Non-operating vibration	4 g peak acceleration
	Drop (out-of-box)	26 in (66 cm) on carpet, 6-drop sequence
	Drop (out-of-box)	1 m on asphalt tile over concrete, 6-drop sequence
Electrical	**Operating voltage**	5 VDC ± 10%
	Power consumption	15 mA
	System consumption	PS/2 mini-din connector
	ESD	CE level 4, 15 kV air discharge
	EMI-RFI	Conforms to FCC rules for a Class B computing device
	Microsoft PC99 – 2001	Functionally compliant
Mechanical	**Resolution**	400 ± 20% DPI
	Tracking speed	10 in/s (25.4 cm/s) maximum
	Acceleration	100 in/s/s (2.54 m/s/s)
	Switch actuation	65 g nominal peak force
	Switch life	1,000,000 operations (using Hasco modified tester)
	Switch type	Low force micro-switches
	Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s
	Cable length	6 ft (1.8 m)
	Microsoft PC99 – 2001	Mechanically compliant
Scroll wheel	**Width**	8 mm
	Diameter	0.99 in (25.2 mm)
	Maximum rotation speed	30 mm/s
	Switch type	Light force micro-switch
	Switch life	1 million operations
	Mechanical life	Minimum 200,000 revolutions
Regulatory approvals	**Compliant**	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

Technical Specifications - Input/Output Devices

USB Scroll Mouse	**Environmental**	**Operating temperature**	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, 6 surfaces
		Non-operating shock	80 g, 6 surfaces
		Operating vibration	2 g peak acceleration
		Non-operating vibration	4 g peak acceleration
		Drop (out-of-box)	26 in (66 cm) on carpet, 6-drop sequence
			1 m on asphalt tile over concrete, 6-drop sequence
	Electrical	**Operating voltage**	5 VDC ± 10%
		Power consumption	15 mA
		System consumption	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 PC99 – 2001	Functionally compliant
	Mechanical	**Resolution**	400 ± 20% DPI
		Tracking speed	10 in/s maximum
		Acceleration	100 in/s
		Switch actuation	65 g nominal peak force
		Switch life	1,000,000 operations (using Hasco modified tester)
		Switch type	Low force micro-switches
		Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s
		Cable length	6 ft (1.8 m)
		Microsoft PC99 – 2001	Mechanically compliant
	Scroll wheel	**Width**	8 mm
		Diameter	0.99 in (25.2 mm)
		Maximum rotation speed	30 mm/s
		Switch type	Light force micro-switch
		Switch life	1 million operations
		Mechanical life	Minimum 200,000 revolutions
	Regulatory approvals	**Compliant**	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

Technical Specifications - Input/Output Devices

USB Optical Scroll Mouse	**Dimensions** (H x L x W)	1.5 x 4.5 x 2.5 in (3.8 x 11.6 x 6.3 cm)
	Weight	0.27 lb (0.12 kg)
	Cable length	72.8 in (185 cm)

Technical Specifications - Optical Storage

SATA DVD+/-RW SuperMulti Drive	**Height**	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	8.5 GB DL or 4.7 GB standard	
	Dimensions (HxWxD)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (maximum)	2.6 lb (1.2 kg)	
	Write speeds	**DVD+R**	Up to 16X
		DVD+RW	Up to 8X
		DVD+R DL	Up to 8X
		DVD-R DL	Up to 4X
		DVD-R	Up to 16X
		DVD-RW	Up to 6X
		CD-R	Up to 48X
		CD-RW	Up to 32X
	Read speeds	**DVD-RAM**	Up to 4X
		DVD+RW, DVD-RW, DVD+R DL, DVD-R DL	Up to 8X
		DVD-ROM, DVD+R, DVD-R	Up to 16X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Access time (typical reads, including settling)	**Random**	DVD: < 130 ms (typical), CD: < 120 ms (typical)
		Full Stroke	DVD: < 240 ms (seek), CD: < 200 ms (seek)
	Power	**Source**	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
			12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum)
			12 VDC (< 600 mA typical, < 1400 mA maximum)
	Environmental conditions (operating - non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
		Relative humidity	10% to 90%
		Maximum wet bulb temperature	86° F (30° C)

Technical Specifications - Optical Storage

SATA DVD-ROM Drive	**Height**	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Read speeds	**DVD+R/-R/+RW/ -RW/+R DL /-R DL**	Up to 8X
		DVD-ROM	Up to 16X
		DVD-RAM	Up to 4X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Removable Storage – Media Compatibility – DVD-ROM	**Media** (READ ONLY – drive is not write capable) CD-ROM CD-R CD-RW DVD-ROM DVD-ROM DL DVD-RAM DVD+R DVD+R DL DVD+RW DVD-R DVD-RW DVD-R DL	
	Access times (typical reads, including setting)	**Random**	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)
		Cache Buffer	2 MB (minimum)
		Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)
	Power	**Source**	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
			12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum)
			12 VDC (< 600 mA typical, < 1400 mA maximum)
	Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)

Technical Specifications - Environmental Data

Eco-Label Certifications and 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:

- Eup Lot 6 Compliant
- US Federal Energy Management Program (FEMP)
- IT ECO declaration
- Select U.S. configurations of the rp5700 Point of Sale System and rp5700 Business Desktop PC are in compliance with the IEEE 1680 (EPEAT) standard at the GOLD level (see http://www.epeat.net)
- Korea Eco-label
- Japan PC Green label**
- CECP Certification (China Energy Conservation Program)

* This product conforms to the examination standards (2003 version) under JEITA's 'PC Green Label System.'

Energy Consumption (in accordance with ENERGY STAR test method)

This product complies with the European Union Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment (EUP LOT 6).

	115 VAC, 60 Hz	230 VAC, 50 Hz	100 VAC, 60 Hz
Normal Operation	62.9 W	61.8 W	63.1 W
Sleep (ENERGY low power mode)	3.1 W	3.4 W	3 W
Off	0.654 W	0.889 W	0.654 W

Heat Dissipation*

	115 VAC, 60 Hz	230 VAC, 50 Hz	100 VAC, 60 Hz
Normal Operation	214.614 BTU/hr	210.861 BTU/hr	215.297 BTU/hr
Sleep	10.577 BTU/hr	11.6 BTU/hr	10.236 BTU/hr
Off	3.616 BTU/hr	4.606 BTU/hr	3.548 BTU/hr

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

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

System Fan Off	Sound Power (L_{Wad}, bels)	Sound Pressure (L_{pAm}, decibels)
Idle	3.61	28.2 dB(A)
Fixed Disk (random writes)	3.8	30.2 dB(A)
Optical Drive (sequential reads)	4.9	44.3 dB(A)

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 include:

- Higher endurance capacitors for longer life.
- Higher temperature rated capacitors for longer life and reliability
- Improved gold plating on connectors, ports, and add-in cards for longer life and reliability
- Over current protection using polyfuses for USB, serial, PS/2, and video ports for improved reliability and hardware protection
- On-board thermal sensors for improved reliability and thermal protection
- More stringent thermal and humidity testing inside a special cabinet to simulate a thermally harsh

Technical Specifications - Environmental Data

POS environment

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

Batteries

This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater the 5 ppm by weight
- Cadmium greater than 10 ppm by weight
- Lead greater than 15 ppm by weight.

Battery size: CR2032 (coin cell)
Battery type: Lithium/Manganese Dioxide

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- The rp5700 Point of Sale System and rp5700 Business Desktop PC is in compliance with the IEEE 1680 (EPEAT) standard at the Silver level (see http://www.epeat.net)
- Select U.S. configurations of the rp5700 Point of Sale System and rp5700 Business Desktop PC are in compliance with the IEEE 1680 (EPEAT) standard at the GOLD level (see http://www.epeat.net)
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- The rp5700 Point of Sale System and rp5700 Business Desktop PC contains an average of 10% post-consumer recycled plastic.
- This product is >91% recyclable when properly disposed of at end of life.

Packaging Materials	**Corrugated Paper**	1407 g
	EPE Foam	290 g
	LDPE Bag	63.5 g
	HIPS Cushion	127.01 g

- The EPE foam packaging material is made from no post consumer recycled content.
- The corrugated paper packaging materials contain at least 25% post consumer 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):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde

Technical Specifications - Environmental Data

- 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.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

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

Technical Specifications - Environmental Data

Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit http://www.windowsvista.com/systemrequirements.