Overview
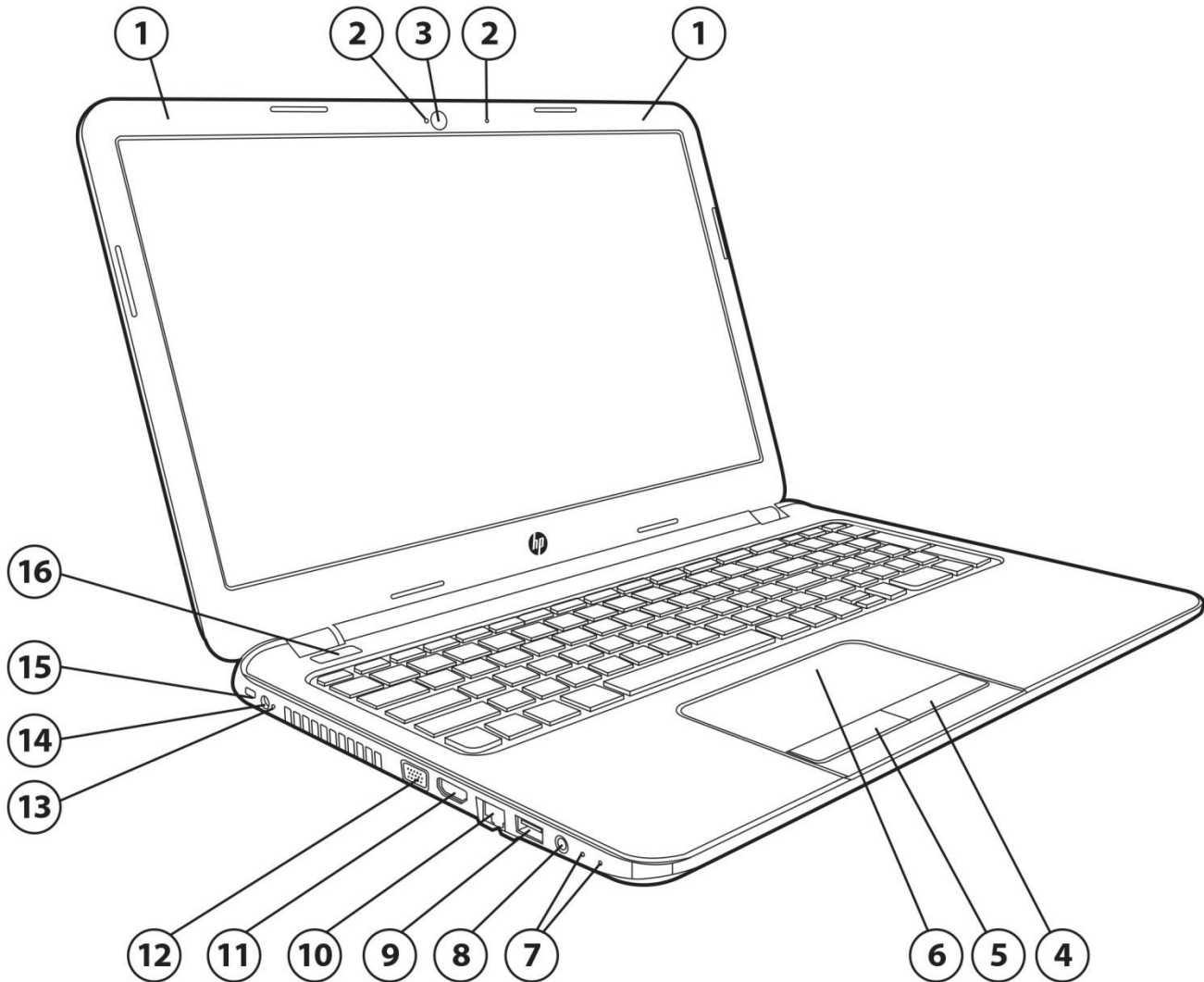
HP 250 G3 Notebook PC
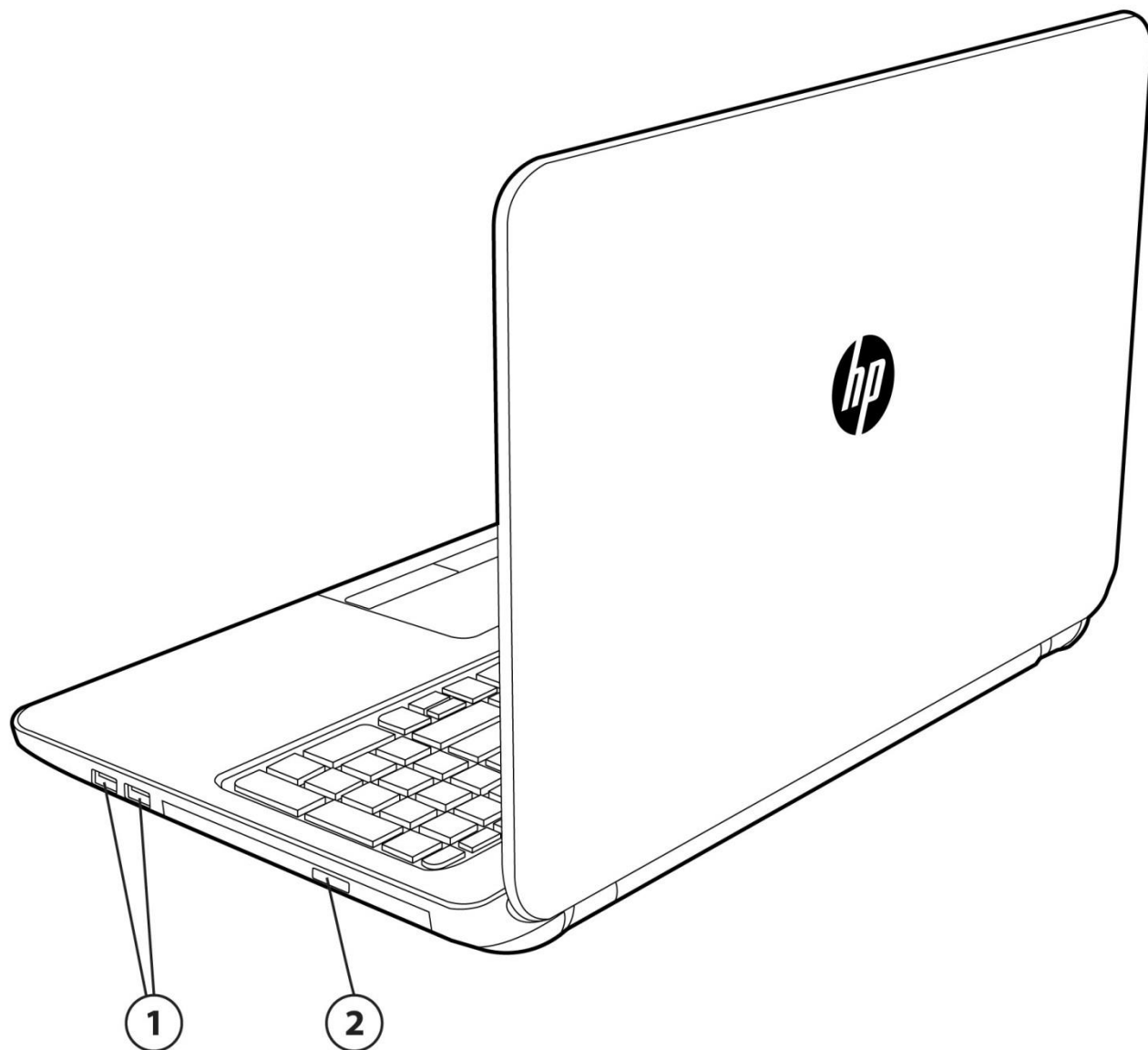

Front View

1.	WLAN antennas (select models only)	9.	USB 3.0 port
2.	Internal microphones	10.	RJ-45 (Ethernet)
3.	Webcam	11.	HDMI port
4.	Right TouchPad button	12.	VGA port
5.	Left TouchPad button	13.	AC adaptor LED
6.	Touchpad with scroll zone	14.	Power connector
7.	Duplicate power LED and Hard drive LED	15.	Security cable slot
8.	Headphone / Microphone-in combo jack	16.	Power button

Overview

Right/Rear View

1. USB 2.0 ports (2)
2. Optical drive door

Overview

AT A GLANCE

- Windows 8.1 versions, Windows 7 Pro 64 bit (available through downgrade rights from Windows 8.1 Pro), Ubuntu, FreeDOS 2.0
- Intel® HD Graphics Family with shared memory
- VISION Technology with Nvidia 820M Graphics with dedicated memory Durable, sophisticated design with textured-surfaced black licorice color.
- Full-sized keyboard with numeric keypad and action keys enabling functions directly
- VGA port and HDMI port (for connecting to high-resolution displays)
- Integrated webcam, integrated microphone
- Flexible wireless connectivity options
  - Optional 802.11 b/g/n wireless LAN module
  - Optional 802.11 b/g/n + Bluetooth® 4.0 Combo
- 15.6" diagonal LED-backlit HD anti-glare display, models with touchscreens are available

NOTE: See important legal disclosures for all listed specs in their respective features sections.

QuickSpecs

Features

PRODUCT NAMES

HP 250 G3 Notebook PC

OPERATING SYSTEM

Preinstalled

Windows 8.1 64*
Windows 7 Professional 64 (available through downgrade rights from Windows 8 Pro 64)
**
Ubuntu
FreeDOS 2.0

* Not all features are available in all editions of Windows 8.1. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8.1 functionality. See http://www.microsoft.com for details.

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

PROCESSORS

4th Generation Intel® Core™ i5-4210U (1.7 GHz, 3 MB L3 cache, 2 cores)*
4th Generation Intel® Core™ i3-4010U (1.7 GHz, 3 MB L3 cache, 2 cores)*
4th Generation Intel® Core™ i3-4005U (1.7 GHz, 3 MB L3 cache, 2 cores)*
3rd Generation Intel® Core™ i3-3217U (1.8 GHz, 3 MB L3 cache, 2 cores)*
Intel® Pentium® N3530 (2.58 GHz, 2 MB L2 cache, 4 cores)*
Intel® Pentium® N3520 (2.4 GHz, 2 MB L2 cache, 4 cores)*
Intel® Celeron® N2830 (2.42 GHz, 1 MB L2 cache, 2 cores)*
Intel® Celeron® N2815 (2.13 GHz, 1 MB L2 cache, 2 cores)*

* Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. 64-bit computing on Intel® architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. Intel's numbering is not a measurement of higher performance.

CHIPSET

Intel chipset integrated with processor

GRAPHICS

Integrated:
Intel® HD Graphics (Intel® Pentium® or Intel® Celeron® processors)
Intel® HD Graphics 4000 (3rd Generation Intel® Core™ i3 processors)
Intel® HD Graphics 4400 (4th Generation Intel® Core™ i processors)

Features

Discrete:
Nvidia 820M Graphics with 1024MB of dedicated video memory (Switchable Graphics)

DISPLAY

Internal
15.6" diagonal HD* (1366 x 768) Anti-Glare LED-backlit SVA (Flat, 3.6 mm)
15.6" diagonal HD* WLED BrightView (1366 x 768) slim (3.2 mm) SVA (touch-enabled)
External
Up to 32-bit per pixel color depth
VGA
Port supports resolutions up to 2048 x 1536 external resolution @ 75Hz
HDMI*
1.4 port supports up to 1080p, 1920 x1080 at 60Hz and 1920 x1200 @ 60Hz DVI Mode

*HDMI cable sold separately.

NOTE: Resolutions are dependent upon monitor capability, and resolution and color depth settings.

STORAGE AND DRIVES

Primary Storage Bay
Hard Drives
320/500/750 GB/1 TB 5400 rpm SMART SATA II

NOTE: For hard drives, GB = 1 billion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 8.1) of system disk is reserved for the system recovery software.

OPTICAL DRIVES

Fixed Optical Drive
DVD+/-RW SuperMulti DL Drive*
Weight saver
* Double-layer discs can store more data than single layer discs. However, double-layer discs burned with this drive may not be compatible with many existing single-layer DVD drives and players. Note that DVD-RAM cannot read or write to 2.6 GB single-sided/5.2 GB double-sided – version 1.0 media. Don't copy copy-right protected materials.

MEMORY

Standard
DDR3L SDRAM (1600 MHz/1333 MHz)*
One SODIMM slot supporting single channel* SODIMMs
Standard memory up to 8192MB

Maximum
Upgradeable to 8192 MB with optional 8192 MB* SODIMM in slot 1

* Maximum memory speed supported is 1600 MHz, but it will be downgraded to 1333 MHz for systems running the E1-2100 and Pentium N3520 processors, and 1066 MHz for systems running the Celeron N2815 processor.

NOTE: Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory

Features

to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

*Maximum memory capacities assume Windows 64-bit operating systems or Linux.

NETWORKING/COMMUNICATIONS

Wireless
Optional Qualcomm 802.11b/g/n (1x1) wireless LAN module[1,2]
Optional Qualcomm 802.11 b/g/n (1x1) + Bluetooth® 4.0 Combo[1,2]
Optional Ralink 802.11 b/g/n (1x1) + Bluetooth™ 4.0 Combo[1,2]
Optional Realtek 802.11 b/g/n (1x1) wireless LAN module[1,2]

Communications
Realtek Ethernet (10/100 NIC)

1. Sold separately or as an optional feature.
2. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited.

AUDIO/MULTIMEDIA

Audio
High Definition Audio support
Integrated Stereo Speakers
Integrated microphone

Webcam
HD camera
Integrated Webcam*
- Supports videoconferencing and still image capture
- Improved quality for video streaming and still image capture
- Up to 30 frames/sec
- Fixed focus lens

* Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard
The 101/102-key compatible keyboard features a full-pitch key layout with desktop keyboard features, such as editing keys, both left and right control and alt keys, and function keys. US and International key layouts are available. Includes a separate numeric keypad (HP 250 G3 only).
Pointing Devices
Touchpad with 2-piece pick button with left and right click functions
Buttons and Function Keys
Multi-touch gestures supported

SOFTWARE AND SECURITY

Preinstalled Software with Windows Operating System

Features

UI Enhancements
HP Utility Center

Security and Protection
30-day McAfee LiveSafe Subscription*

Productivity
Buy Office

E-readers and Document Viewers
Kindle (not in EMEA)

ODD Playback and TV Tuners
CyberLink PowerDVD

Windows Essentials
MovieMaker
SkyDrive
Photo Gallery

Photos and Videos
CyberLink
CyberLink Media Suite
CyberLink Power2Go
CyberLink LabelPrint
SnapFish URL
Adobe® Shockwave Player
HP Connected Photo

Music – HP
RaRa Music (not in EMEA)

Movies
Netflix (NA and LA only)

Home AV Integration/Home Networking
Intel WiDi

Games – Microsoft
Solitaire Collection (not in EMEA)
Mahjong (not in EMEA)

Games – HP
HP Games (internet access required, games sold separately).
WildTangent Games for HP (internet access required, games sold separately).

Communication
Skype

Security
Security Lock slot (lock must be purchased separately)

Features

* Internet access required. First 30 days included. Subscription required for live updates afterwards.

POWER

Power Supply
External 45W Smart AC adapter (UMA)
External 65W Smart AC adapter (discrete)
External 65W EM Smart AC adapter (for China and India)

Primary Battery
3-cell, 31 WHr Li-ion
4-cell, 41 WHr Li-ion

Battery Life

	MM07*	MM12**
3-cell (31 WHr) battery		
4th generation Intel® Core™ i3 and i5 processors (integrated graphics)	Up to 6 hours 15 minutes	N/A
4th generation Intel® Core™ i3 and i5 processors (discrete graphics)	Up to 6 hours	N/A
3rd generation Intel® Core™ i3 processors (integrated graphics)	Up to 5 hours	Up to 3 hours 30 minutes
3rd generation Intel® Core™ i3 processors (integrated graphics)	Up to 4 hours 45 minutes	Up to 3 hours 15 minutes
Intel® Pentium™ and Celeron™ processors (integrated graphics)	Up to 6 hours 30 minutes	N/A
4-cell (41 WHr) battery		
4th generation Intel® Core™ i3 and i5 processors (integrated graphics)	Up to 8 hours 30minutes	N/A
4th generation Intel® Core™ i3 and i5 processors (discrete graphics)	Up to 8 hours 15 minutes	N/A
3rd generation Intel® Core™ i3 processors (integrated graphics)	Up to 6 hours 30 minutes	Up to 4 hours 45 minutes
3rd generation Intel® Core™ i3 processors (integrated graphics)	Up to 6 hours 15 minutes	Up to 4 hours 30 minutes
Intel® Pentium™ and Celeron™ processors (integrated graphics)	Up to 8 hours 45 minutes	N/A

System Standby Time
Up to TBD weeks***

* Windows 7 battery life will vary depending on numerous factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See www.bapco.com for additional details.
** Windows 8/mobilemark12 battery life will vary depending on the product model, configuration, loaded applications, features, wireless functionality and power management settings. The maximum capacity of the battery will decrease with time and usage. See www.bapco.com.

Features

***Standby life will vary depending on various factors including battery, Memory, CPU, EC and LAN chip. The maximum capacity of the battery will naturally decrease with time and usage.

Power Conservation
Hibernation*
Standby*
ACPI compliance*

* Only Linux will feature power conservation.

WEIGHTS & DIMENSIONS

Weight
Starting at < 4.83 lbs (2190 g) (Non-Touch) (Weight will vary by configuration)
Starting at < 5.25 lbs (2380 g) (Touch) (Weight will vary by configuration)

Dimensions (w x d x h)
Non-Touch
14.88 x 10.2 x 1.0 in
245.25 x 244 x 25.3 mm

Touch
14.88 x 10.2 x 1.0 in
378.0 x 259.0 x 25.6 mm

NOTE: Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components. Weight includes 3-cell battery, hard drive, 2 GB memory, and optical drive.

PORTS/SLOTS

Ports
VGA – One
HDMI* – One
Headphone / Microphone-in combo jack – One
Power Connector – One
RJ-45 (Ethernet) - One
USB 3.0 – One
USB 2.0 – Two

Digital Media Slots
Supports SD/SDHC/SDXC
Supports mini versions with adapter

* HDMI cable sold separately.

SERVICE AND SUPPORT

HP Services offers limited 1-year warranty options depending on country;
3-year options available With HP Care Pack Services**, depending on country, 1-year limited warranty on primary battery. On-

Features

site service and warranty upgrades are also available. Optional* HP Care Pack Services** are extended service contracts which go beyond your standard warranties. For more details visit: http://www.hp.com/go/lookuptool.

*Sold separately or as an optional feature.
** Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. Consult the HP Customer Support Center for details. http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp

NOTE: Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit www.hp.com/go/cpc

QuickSpecs

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	**Nominal Operating Voltage**	18.5/19.5V
	Average Operating Power	Integrated graphics: TBD W**
	Max Operating Power	< 65 W
Temperature	**Operating**	32° to 95° F (0° to 35° C) (not writing optical)
		41° to 95° F (5° to 35° C) (writing optical)
	Non-operating	-4° to 140° F (-20° to 60° C)
Relative Humidity	**Operating**	10% to 90%, non-condensing
	Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
Shock	**Operating**	40 G, 2 ms, half-sine
	Non-operating	200 G, 2 ms, half-sine
Random Vibration	**Operating**	0.75 grms
	Non-operating	1.50 grms
Altitude (unpressurized)	**Operating**	-50 to 10,000 ft (-15.24 to 3,048 m)
	Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)
Planned Industry Standard Certifications	**UL**	Yes
	CSA	Yes
	FCC Compliance	Yes
	ENERGY STAR®	Select models*
	EPEAT®	Registered Silver in United States**
	ICES	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes
	Japan VCCI Compliance	Yes
	KC	Yes
	BSMI	Yes
	CE Marking Compliance	Yes
	BNCI or BELUS	Yes
	CIT	Yes
	GOST	Yes
	Saudi Arabian Compliance (ICCP)	Yes
	SABS	Yes
	UKRSERTCOMPUTER	Yes

* Configurations of the HP 250 G3 Notebook PCs that are ENERGY STAR qualified are identified as HP 250 G3 ENERGY STAR on HP websites and on www.energystar.gov.
** EPEAT registration varies by country. See www.epeat.net for registration status by country.
EPEAT status listed above applies to U.S.

For accessibility information on HP products, please visit: http://www.hp.com/accessibility.

QuickSpecs

Technical Specifications

DISPLAYS

15.6" LED HD anti-glare (1366 x 768)	Active Area (w x h)	13.54 x 7.59 in (34.4 x 19.4 cm)	
	Diagonal Size	15.6 in (39.6cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	300:1 (min)	
	Refresh Rate	60 Hz	
	Brightness	200 nit (typical)	
	Pixel Resolution	Pitch	0.252 mm
		Format	1366 x 768
		Configuration	RGB Stripe
	Backlight	LED	
	PPI	101 ppi	
	Viewing Angle	±40° Horizontal, +10°/-30° Vertical (minimum)	
		40/40/30/10 (Left/Right/Down/Up) (minimum	

STORAGE AND DRIVES

Internal Storage

1 TB* 5400 rpm SATA Hard Drive	Drive Weight	0.254 lb (115 g)	
	Capacity	1 TB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum)	300 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	1,953,525,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

750 GB* 5400 rpm SATA Hard Drive	Drive Weight	0.22 lb (101 g)	
	Capacity	750 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum)	300 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	1,465,149,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

Technical Specifications

500 GB* 5400 rpm SATA Hard Drive			
	Drive Weight	0.22 lb (101 g)	
	Capacity	500 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	**Synchronous** (maximum)	150 MB/s (Drive Capability)
	Seek Time	**Single Track**	3 ms
	(typical reads, including	**Average**	13 ms
	settling)	**Maximum**	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

320 GB* 5400 rpm SATA Hard Drive			
	Drive Weight	0.22 lb (101 g)	
	Capacity	320 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	**Synchronous** (maximum)	150 MB/s (Drive Capability)
	Seek Time	**Single Track**	3 ms
	(typical reads, including	**Average**	13 ms
	settling)	**Maximum**	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	625,142,448	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

* For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 8.1) of system disk is reserved for the system recovery software.

Optical Drives

DVD+/-RW SuperMulti DL Drive			
	Access Times	Random	<140ms CD (typical)
			< 160 ms DVD (typical)
	Max Data Transfer Rate	24X CD-ROM	
		8X DVD	
		24X CD-R	
		24X CD-RW	
		8X DVD+R	
		8X DVD+RW	
		8X DVD-R	
		6X DVD-RW	
		5X DVD-RAM	
	Transfer Mode	UDMA Mode 5	
	Interface	Gen 1 SATA	
	Supported Media (read)	CD-DA, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	
	Supported Media (write)	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, DVD+R DL, DVD-R DL	

Technical Specifications

	Max Media Capacity (read)	8.5 GB
	Max Media Capacity (write)	8.5 GB
	Transport	Tray Loading

NETWORKING/COMMUNICATIONS

Networking
Integrated Realtek 10/100 NIC

	Ethernet Features	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)
		100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)
		Auto-Negotiation (Automatic Speed Selection)
		Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s
		IEEE 802.1p QoS (Quality of Service) Support
		IEEE 802.1q VLAN support
		IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable
	Power Management	ACPI compliant - multiple power modes
		Situation-sensitive features reduce power consumption
		Advanced link down power saving for reducing link down power consumption
	Performance Features	TCP/IP/UDP Checksum Offload (configurable)
		Large send offload and Giant send offload
		Receiving Side Scaling
	Manageability	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only)
		PXE 2.1 Remote Boot
		Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))
		Comprehensive diagnostic and configuration software suite
		Virtual Cable Doctor for Ethernet cable status
	Interface	PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ
	NIC Device Driver Name	Realtek PCIe FE Ethernet Family Controller

Communications
Qualcomm 802.11b/g/n WiFi Adapter*, **

	Wireless LAN Standards	IEEE 802.11b
		IEEE 802.11g
		IEEE 802.11n
	Interoperability	Wi-Fi certified
		Cisco Compatible Extensions Program compliant with Microsoft Windows 7, (details at: http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.402 - 2.482 GHz
	Data Rates	802.11b: 1, 2, 5.5, 11 Mbps
		802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
		802.11n150Mbps for MCS7

QuickSpecs

Technical Specifications

Frequency Support	20 MHz: 2.4 GHz bands
Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
Security[1]	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST. Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 5) with Microsoft Windows 7only.
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	13.5 dBm, minimum
Power Consumption	Idle associated: 250 mW avg (CLKREQ enabled) Idle unassociated: 100 mW avg Transmit/Receive channel: 2.0 /1.6 W
Power Management	ACPI compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	11b:-88dBm@11Mbps, 11g:-74 dBm@54Mbps, 11n:-70dBm@72.Mbps.
Antenna type	High efficiency dual antenna with spatial diversity, usually mounted in the display enclosure
Form Factor	PCI-Express Half-MiniCard
Weight	4 g
Dimensions	3.3 x 26.65 x 29.85 mm
Operating Voltage	3.3v +/- 9%
Temperature	Operating -10° to 70° C Non-operating -40° to 80° C
Humidity	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
Altitude	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
LED Activity	Amber LED on-Radio OFF; White LED on-Radio ON

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

NOTE: WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista and Windows 7.

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HP 250 G3 Notebook PC

Technical Specifications

* Wireless access point and internet service required. Availability of public wireless access points limited.

** Sold separately or as an optional add-on feature.

Qualcomm 802.11b/g/n Bluetooth 4.0 Combo Card*

Wireless LAN Standards	IEEE 802.11b
	IEEE 802.11g
	IEEE 802.11n
Interoperability	Wi-Fi certified
	Cisco Compatible Extensions Program compliant with Microsoft Windows7 (details at: http://www.hp.com/go/notebooks/WLAN)
Frequency Band	2.402 – 2.482 GHz
Data Rates	802.11b: 1, 2, 5.5, 11 Mbps
	802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	802.11n: 150Mbps for MCS7
Modulation	Direct Sequence Spread Spectrum
	DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
Security[1]	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST. WAPI
	Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 5) with Microsoft Windows Vista and XP only.
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
Network Architecture	Ad-hoc (Peer to Peer)
Models	Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power (for CCK)[2]	13.5dBm , minimum
Power Consumption	Idle associated: 250 mW
	Idle unassociated: 150 mW
	Transmit: 2.0 W (max)
	Receive: 2.0 W (max)
Power Management	ACPI compliant power management
	802.11 compliant power saving mode
Receiver Sensitivity[3]	11b:-88dBm@11Mbps,
	11g:-74 dBm@54Mbps,
	11n:-70dBm@72.Mbps.
Antenna type	High efficiency dual antenna with spatial diversity, mounted in the display enclosure
Form Factor	PCI-Express Half-MiniCard v1.2
Weight	6 g
Dimensions	3.3 x 26.65 x 29.85 mm
Operating Voltage	3.3v +/- 10%
Temperature	Operating	14° to 149° F (-10° to 65° C)
	Non-operating	-40° to 176° F (-40° to 80° C)

Technical Specifications

Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity		LED Off – Radio OFF; Solid LED On – RadioON

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

NOTE: WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista and Windows 7.

Bluetooth Specification	
V4.0 High Speed, V2.1+EDR, backwards compatible with V1.1, 1.2 and 2.0	
Number of Available Channels	79 (1 MHz) available channels
Data Rates and Throughput	3 Mbps data rate; throughput up to 2.17 Mbps
	Synchronous Connection Oriented links up to 3, 64 kbps, voice channels
	Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
Transmit Power	-6 dBm to 4 dBm (Bluetooth Class II)
Receiver Sensitivity	Better than -80 dBM at 0.1 % raw bit error rate
Power Consumption	Peak (Tx) 330 mW
	Peak (Rx) 230 mW
	Sleep <17 mW
Antenna	Internally integrated within module
Range	Up to 33 ft (10 m)
Electrical Interface	USB 2.0 compliant
	Microsoft Windows Plug and Play compliant
Bluetooth Software Supported	Broadcom Bluetooth for Windows
	Microsoft Windows Bluetooth Software
Link Topology	Point to Point, Multipoint Pico Nets up to 7 slaves
Security	Full support of Bluetooth Security Provisions
Power Management	Microsoft Windows ACPI, and USB Bus Support
	Self configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
Certifications	All necessary regulatory approvals for supported countries, including:
	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
	ETS 300 328, ETS 300 826
	Low Voltage Directive IEC950
	UL, CSA, and CE Mark
Bluetooth Profiles Supported	Generic Access Profile (GAP)
	Service Discovery Application Profile (SDAP)
	Serial Port Profile (SPP)
	Dial_Up Networking Profile (DUN)
	Generic Object Exchange Profile (GOEP)
	Object Push Profile (OPP)

Technical Specifications

File Transfer Profile (FTP)
Synchronization Profile (SYNC)
Hard Copy Cable Replacement (HCRP)
Personal Area Networking Profile (PAN)
Human Interface Device Profile (HID)
Generic Audio/Video Distribution Profile (GAVDP)
Advanced Audio/Video Distribution Profile (A2DP)
FAX Profile (FAX)
Basic Imaging Profile (BIP)
Headset Profile (HSP)
Hands Free Profile (HFP)
Basic Printing Profile (BPP)
VDP (Video Distribution Profile)
AVRCP (Audio Video Remote Control Profile)

* Wireless access point and internet service required. Availability of public wireless access points limited.
** Sold separately or as an optional add-on feature.

Ralink 802.11b/g/n Bluetooth 4.0 Combo Card*, **	Wireless LAN Standards	IEEE 802.11b IEEE 802.11g IEEE 802.11n
	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows7 (details at: http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.402 – 2.482 GHz
	Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: card will support rates for NSS=1 for RX and TX for 20 MHz channels. Short and long guard intervals shall be supported
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
	Security[1]	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST. WAPI Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 5) with Microsoft Windows Vista and XP only.
	Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
	Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power (for CCK)[2]	13.5dBm , minimum
	Power Consumption	Idle associated: 250 mW Idle unassociated: 150 mW Transmit: 2.0 W (max) Receive: 2.0 W (max)

Technical Specifications

Power Management	ACPI compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	72.2 Mbps: -70 dBm; 54 Mbps: -74 dBm; 11 Mbps: -88 dBm ; 1 Mbps: -95 dBm
Antenna type	High efficiency dual antenna with spatial diversity, mounted in the display enclosure
Form Factor	PCI-Express Half-MiniCard
Weight	6 g
Dimensions	3.3 x 26.65 x 29.85 mm
Operating Voltage	3.3v +/- 10%

Temperature	Operating	14° to 149° F (-10° to 65° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)

LED Activity	LED Off – Radio OFF; Solid LED On – RadioON

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

NOTE: WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista and Win7.

Bluetooth Specification

V4.0 High Speed, V2.1+EDR, backwards compatible with V1.1, 1.2 and 2.0

Number of Available Channels	79 (1 MHz) available channels
Data Rates and Throughput	3 Mbps data rate; throughput up to 2.17 Mbps Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
Transmit Power	-6 dBm to 4 dBm (Bluetooth Class II)
Receiver Sensitivity	Better than -80 dBM at 0.1 % raw bit error rate
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Sleep <17 mW
Antenna	Internally integrated within module
Range	Up to 33 ft (10 m)

Technical Specifications

Electrical Interface	USB 2.0 compliant Microsoft Windows Plug and Play compliant
Bluetooth Software Supported	Broadcom Bluetooth for Windows Microsoft Windows Bluetooth Software
Link Topology	Point to Point, Multipoint Pico Nets up to 7 slaves
Security	Full support of Bluetooth Security Provisions
Power Management	Microsoft Windows ACPI, and USB Bus Support Self configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
Certifications	All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249 ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	Generic Access Profile (GAP) Service Discovery Application Profile (SDAP) Serial Port Profile (SPP) Dial_Up Networking Profile (DUN) Generic Object Exchange Profile (GOEP) Object Push Profile (OPP) File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP) Personal Area Networking Profile (PAN) Human Interface Device Profile (HID) Generic Audio/Video Distribution Profile (GAVDP) Advanced Audio/Video Distribution Profile (A2DP) FAX Profile (FAX) Basic Imaging Profile (BIP) Headset Profile (HSP) Hands Free Profile (HFP) Basic Printing Profile (BPP) VDP (Video Distribution Profile) AVRCP (Audio Video Remote Control Profile)

* Wireless access point and internet service required. Availability of public wireless access points limited.
** Sold separately or as an optional add-on feature.

Realtek 802.11 b/g/n (1x1) *, **	**Wireless LAN Standards**	IEEE 802.11b IEEE 802.11g IEEE 802.11n
	Interoperability	Wi-Fi certified
	Frequency Band	2.402 - 2.482 GHz
	Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: card will support rates for NSS=1 for RX and TX for 20 MHz channels. Short and long guard interval will be supported.

QuickSpecs

Technical Specifications

Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM
Security[1]	IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only AES-CCMP: 128 bit in hardware 802.1x authentication types WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. WPA2 certification IEEE 802.11i Cisco Certified Extensions, all versions through V5 WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output[2]	13.5 dBm, nominal
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Associated to Access Point, Idle: 250 mW nominal Wireless Button Off: 100 mW nominal Radio disabled: 75 mW nominal
Power Management	ACPI compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps) 802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps) 802.11n:-70dBm (72.2 Mbps)
Antenna Connections	High efficiency antenna with spatial diversity, mounted in the display enclosure
Form Factor	PCI-Express Half-MiniCard
Dimensions	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)
Operating Voltage	3.3v +/- 9%
Temperature	Operating — 14° to 158° F (-10° to 70° C) Non-operating — -40° to 176° F (-40° to 80° C)
Humidity	Operating — 10% to 90% (non-condensing) Non-operating — 5% to 95% (non-condensing)
Altitude	Operating — 0 to 10,000 ft (3,048 m) Non-operating — 0 to 50,000 ft (15,240 m)
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

* Wireless access point and internet service required. Availability of public wireless access points limited.
** Sold separately or as an optional add-on feature.

QuickSpecs

Technical Specifications

AUDIO/MULTIMEDIA

Audio

Hardware	**Implementation**	Realtek ALC3201-GR High Definition audio
	Volume Controls	Up, down, and mute function keys
	Full Duplex	Yes
	Microphone In	Stereo
	Headphone/Line Out	Stereo
	Integrated Microphone	Yes

Audio Output Quality	**Frequency Response**	10 Hz ~ 22 KHz
	Signal to Noise Ratio	Typical 95 dB FSA (DAC)
	Total Harmonic Distortion	Typical -88 dB FS (DAC)
	Noise Floor	-110 dB
	Play/Record Sampling Rate(s)	Up to 192 KHz
	DAC	24 bits
	ADC	24 bits

Integrated Stereo Speakers	**Power Rating**	1.5 W
	Impedance	4 ohms

Multimedia

Integrated Webcam	Supports videoconferencing and still image capture
	Improved quality for video streaming and still image capture
	Up to 30 frames/sec
	Fixed focus lens

POWER

HP 45W Smart AC Adapter	**Dimensions**	3.78 x 1.95 x 0.88 in (9.6 x 4.95 x 2.24 cm)	
	Input	90 to 265 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.4 A at 90 VAC and maximum load
	Output	**Output power**	45W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<8A, Over voltage protection- 29V max automatic shutdown
	Connector	3 pin/grounded, mates with interchangeable cords	
	Environmental Design	**Operating temperature**	32° to 95° F (0° to 35° C)

Technical Specifications

	Non-operating (storage) temperature	–4° to 121° F (–20° to 85° C)	
	Altitude	0 to 16,405 ft (0 to 5,000 m)	
	Humidity	0% to 95%	
	Storage Humidity	0% to 95%	
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; Reliability - failure rate of less than 0.1% annually within the first three years of operation.	
HP 65W AC Adapter	**Dimensions**	4.21 x 1.85 x 1.18 in (10.7 x 4.7 x 3.0 cm)	
	Weight	0.62 lb (280 g)	
	Input	100 to 240 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC
	Output	Output power	65W
		DC output	18.5/19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection– 29V max automatic shutdown
	Connector	3 pin/grounded, mates with interchangeable cords	
	Environmental Design	Operating temperature	41° to 95° F (5° to 35° C)
		Non-operating (storage) temperature	–4° to 185° F (–20° to 85° C)
		Altitude	0 to 5,000 ft (0 to 1,524 m)
		Humidity	20% to 95%
		Storage Humidity	10% to 95%
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; MTBF - over 200,000 hours at 25°C ambient condition.	
HP 65W Slim Smart AC Adapter EM	**Dimensions** (H x W x D)	126.0 x 50.0 x 30.0 mm	
	Input	90 to 265 VAC	
		Input Efficiency	87% min at 115 VAC/230VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC and maximum load
	Output	Output power	65W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection– 29V max automatic shutdown

QuickSpecs

Technical Specifications

	Connector	3 pin/grounded, mates with 7.4mm barrel type Smart ID DC connector	
	Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° to 121° F (-20° to 85° C)
		Altitude	0 to 16,405 ft (0 to 5,000 m)
		Humidity	0% to 95%
		Storage Humidity	0% to 95%
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; Reliability - failure rate of less than 0.1% annually within the first three years of operation.	

4-Cell (41 WHr) Lithium-Ion battery	Cells/Type	4-cell Lithium-Ion	
	Energy Temperature	Watt-hour capacity	41 WHr
		Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (-10° to 60° C)
		Non-operating	-4° to 140° F (-20° to 60° C)
	Battery Re-Charge Time	System in OFF or Standby Mode	2.5 hours
		System ON	3 to 5 hours (depending on system power consumption)

HP 3-cell (31 WHr) Lithium-Ion Primary battery	Dimensions (H x W x L)	0.8 x 1.2 x 8.1 in (2 x 3 x 20.5cm)	
	Weight (max)	0.37lb, (0.166kg)	
	Cells/Type	Lithium-Ion	
	Energy	Voltage	11.1V
		Amp-hour capacity	2.8Ah
		Watt-hour capacity	31Wh
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 122° F(-10° to 50° C)
		Non-operating	-4° to 122° F (-20° to 50° C)
	Battery Re-Charge Time	System in OFF or Standby Mode	2.5 hours
		System ON	3 to 5 hours
	Fuel Gauge LED	No	
	Warranty	1 year	

Technical Specifications

COUNTRY OF ORIGIN

China

Options and Accessories (sold separately and availability may vary by country)

Type	Description	Part #
Carrying Cases	HP Business Nylon Backpack (up to 17.3")	BP849AA
	HP Business Nylon Case(up to 15.6")	BP848AA
	HP Essential Top Load Case (up to 15.6")	H2W17AA#xxx
	HP Essential Backpack (up to 15.6")	H1D24AA
	HP Essential Messenger Case (up to 17.3")	H1D25AA
Docking	HP USB 3.0 Port Replicator	H1L08AA#xxx
	HP Universal Port Replicator	E6D70AA#xxx
	HP 3001pr USB 3 Port Replicator	F3S42AA
	HP Dual Hinge Notebook Stand	AW661AA#xxx
	HP Dual Hinge II Notebook Stand	E8F99AA#xxx
Input/Output	HP Touch To Pair Mouse	H6E52AA
	HP Stylish Wireless KB/Mouse	H4B79AA
	HP USB Optical Travel mouse	RH304AA
	HDMI to VGA Adapter	H4F02AA
	HP HDMI to DVI Adapter	F5A28AA
Memory	HP 2GB DDR3 1600 PC3-12800 SODIMM	H2P63AA#xxx
	HP 4GB DDR3 1600 PC3-12800 SODIMM	H2P64AA#xxx
	HP 2GB DDR3L-1600 1.35V SODIMM	H6Y73AA#XXX
	HP 4GB DDR3L-1600 1.35V SODIMM	H6Y75AA#XXX
	HP 8GB DDR3L-1600 1.35V SODIMM	H6Y77AA#XXX
Adapters	HP 45W Smart AC Adapter (4.5mm) (PL MP only)	H6Y88AA#xxx
	HP 65W Smart AC Adapter (4.5mm)	H6Y89AA#xxx
	HP 65W Slim AC Adapter	H6Y82AA#xxx
	HP 90W Slim AC Adapter	H6Y83AA#xxx
	HP 90W Slim Combo Adapter w/ USB	H6Y84AA#xxx
Battery Chargers	HP Notebook Battery Charger (Single Battery Charger)	QL816AA#xxx
Security	HP Notebook Combo Lock	AY475AA#XXX
	HP Keyed Cable Lock	BV411AA
	HP UltraSlim Keyed Cable Lock	H4D73AA
	HP USB Smart Card Reader	F6V67AA
Storage	HP External USB Optical Drive	F2B56AA
Monitors	HP EliteDisplay E271i 27-inch IPS LED Monitor	D7Z72AA/A8/AS/AT
	HP EliteDisplay E231 23-inch LED Monitor	C9V75AA/A8/AS/AT
	HP EliteDisplay E201 20-inch LED Monitor	C9V73AA/A8/AS/AT
	HP ProDisplay P221 21.5" LED Monitor	C9E49AA/A8/AS/AT
	HP ProDisplay P201 20" LED Monitor	C9F26AA/A8/AS/AT

Options and Accessories (sold separately and availability may vary by country)

Options and Accessories (sold separately and availability may vary by country)

Summary of Changes

Date of change:	Version History:		Description of change:
June 13, 2014	From v2 to v3	Changed	Updated battery, display