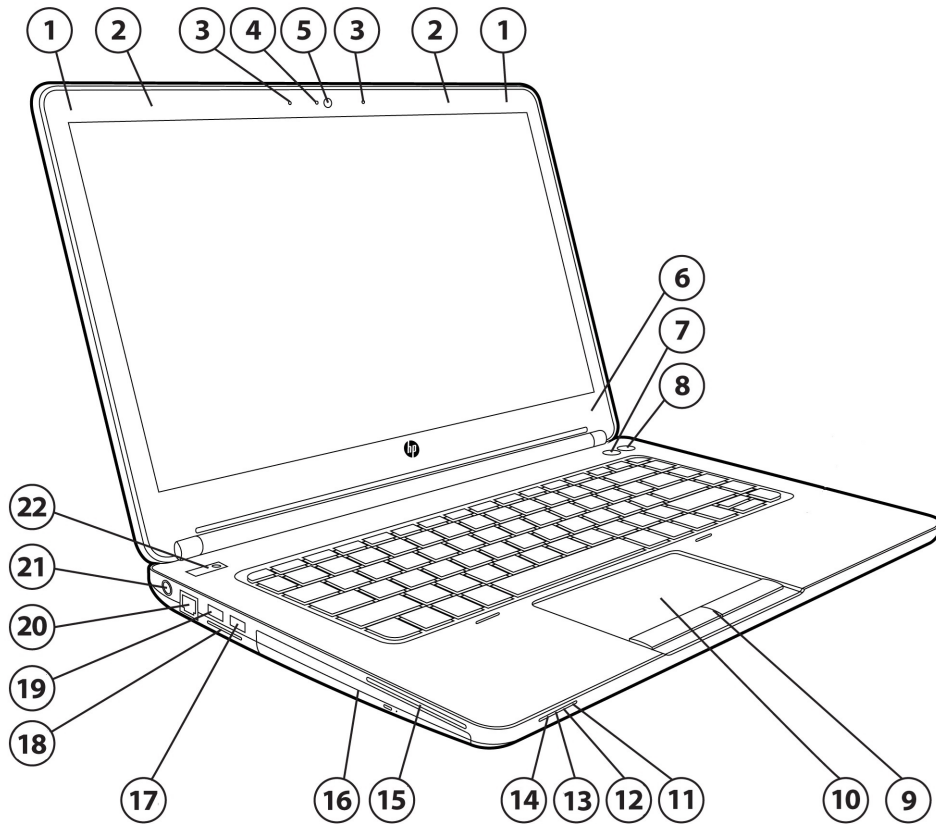


Overview

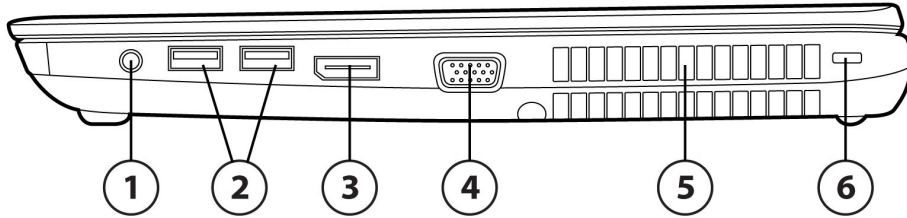


- | | |
|--------------------------------------|--|
| 1. WLAN antennas (2)* | 12. AC adapter/Battery light |
| 2. WWAN antennas (2)* | 13. Power light |
| 3. Internal microphone array (2)** | 14. Wireless light |
| 4. Webcam light (select models only) | 15. Smart Card Reader |
| 5. Webcam (select models only) | 16. Optical Drive (select models only) |
| 6. Internal display switch | 17. USB 2.0 port (1) |
| 7. Wireless button | 18. Secure Digital slot |
| 8. Volume mute button | 19. USB 2.0 charging port (1) |
| 9. Touchpad buttons | 20. RJ-45 (network) jack/lights |
| 10. Touchpad zone | 21. Power connector |
| 11. Hard drive light | 22. Power button |

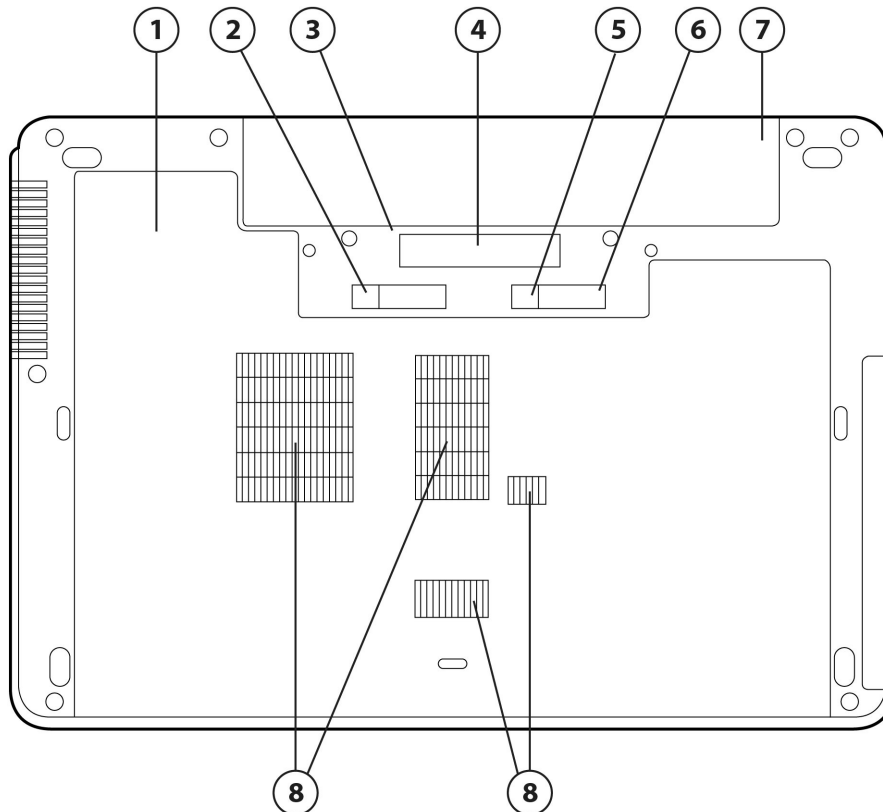
* The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

**Models without optional webcam have single integrated microphone on left side of display panel.

Overview



- 1. Combo stereo headphone/mic jack (1)
- 2. USB 2.0 ports (2)
- 3. DisplayPort 1.2
- 4. External VGA monitor port
- 5. Vents (2)
- 6. Security cable slot



- 1. Service cover
- 2. Battery release latch
- 3. SIM card slot
- 4. Docking connector
- 5. Service cover release lock
- 6. Service door release latch
- 7. Battery bay
- 8. Vents

Overview

At A Glance

- Windows Embedded Standard 7e (WES7E 32-bit)
- 14.0-inch diagonal LED-backlit HD anti-glare display (1366 x 768)
- Administrator control over read/write access to Solid State Drive and USB attached memory devices
- Weight starting at 4.59 lb (2.08 kg)
- 16GB Solid State Drive for reliability, durability, and increased battery life
- Choice of primary battery to optimize run-time or weight: 9-cell (100 WHr) or 6-cell (55 WHr)
- Easily hot dock with the optional HP docking station
- HP Device Manager to track, configure, upgrade, clone and manage hundreds or thousands of thin clients
- Improved Quality of Experience for End User using HP Velocity
 - HP Velocity intelligently reduces network packet loss and retransmissions providing a better experience for the end user
 - HP Velocity enables IT managers to monitor network activity and optimize end-user experience
 - Available only on HP thin clients
- VGA and DisplayPort v1.2 for dual external-monitor support, including high-definition displays
- Can support up to three monitors simultaneously when docked and if docking station has VGA and DisplayPort v.1.2
- Flexible wireless connectivity options:
 - HP Connection Manager allows full control over wireless connections, including 3G and 4G mobile broadband,
 - Integrated 3G/4G HP Mobile Broadband Modules
 - Integrated 802.11 a/b/g/n wireless LAN module
- Integrated Secure Digital slot (supports SD, SDHC, SDXC)
- Optional integrated DVD-ROM drive
- Optional webcam

Features

OPERATING SYSTEM

Preinstalled Windows Embedded Standard 7e (WES7E 32-bit)

ACCELERATED PROCESSING UNIT

AMD Elite A4-5150M APU (2.7 GHz, 1 MB cache, 2 cores) with AMD Radeon™ HD 8350G Graphics*

AMD Elite A4-4300M APU (2.5 GHz, 1 MB cache, 2 cores) with AMD Radeon™ HD 7420G Graphics*

NOTE: AMD Radeon™ Dual Graphics requires an AMD "A" series APU plus an AMD Radeon™ discrete graphics configuration.

NOTE: With AMD Dynamic Switchable Graphics technology, full enablement of all discrete graphics video and display features may not be supported on all systems (e.g. OpenGL applications will run on the integrated GPU or the APU as the case may be).

NOTE: Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

*This system requires a separately purchased 64-bit operating system and 64-bit software products to take advantage of the 64-bit processing capabilities of AMD technology. (language in red only used if the OS is not x64) Multi-core processing available with AMD technology is designed to improve performance of this system. Given the wide range of software applications available, performance of a system including a 64-bit operating system and a dual-core processor will vary. AMD's numbering is not a measurement of clock speed.

FUSION CONTROLLER HUB (FCH)

AMD A76M FCH

GRAPHICS

Integrated graphics:

AMD A4-5150M Accelerated Processor with AMD Radeon™ HD 8350G Graphics

AMD A4-4300M Accelerated Processor with AMD Radeon™ HD 7420G Graphics

DISPLAY

Internal

14.0" diagonal LED-backlit HD 16:9 anti-glare (1366 x 768)

HP Privacy Filter support

External

Up to 32-bit per pixel color depth

DisplayPort v1.2

Supports resolutions up to 2560 x 1600, 30-bit color depth at 60 Hz, and full HD (1920 x 1080) monitors, 24-bit color depth at 120 Hz

VGA

Port supports resolutions up to 1920 x 1080 at 60Hz, and lower resolutions at up to 75 Hz

NOTE: Can support up to three monitors simultaneously when docked and if docking station has VGA and DisplayPort v.1.2

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

Features

STORAGE AND DRIVES

Solid State Drive

16 GB*

*For storage drives, GB = 1 billion bytes. Actual formatted capacity is less.

OPTICAL DRIVES (OPTIONAL)

Fixed 9.5 mm SATA optical drive

DVD-ROM Drive

MEMORY

Standard*

DDR3L PC3L-12800 (1600 MHz)

Two SODIMM slots supporting dual-channel memory

4 GB SODIMM

Maximum**

Upgradeable to 8192 MB with 4096 MB SODIMMs in slots 1 and 2

Dual-channel

Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

*Graphics chipset uses part of the total system memory (RAM) for graphics performance. System memory dedicated to graphics performance is not available for other use by other programs.

** Maximum memory capacities assume Windows 64-bit operating systems or Linux. With Windows 32-bit operating systems, memory above 3 GB may not all be available due to system resource requirements.

NOTE: Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

NETWORKING/COMMUNICATIONS

Wireless

Support for a broad range of secure, integrated wireless LAN and wireless WAN options featuring support for the latest industry standards. Broadband Wireless (WWAN) requires a Windows operating system and is available in select countries as a standard, factory configurable feature only.

Broadband Wireless (WWAN)*

HP It4111 LTE/EV-DO/HSPA+ Mobile Broadband Module (US, APJ) *,**

HP It4112 LTE/HSPA+ Mobile Broadband Module (EMEA) *,**

Wireless LAN (WLAN)

Broadcom 802.11 a/b/g/n WiFi Adapter (2x2)***

Atheros 802.11 b/g/n 1x1 (for Indonesia only)

Communications

Integrated Realtek RTL8151GH-CG 10/100/1000 Ethernet****

* Mobile broadband is an optional or add-on feature and is not available in all regions. Mobile broadband use requires separately

Features

purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors.

** 4G LTE not available on all products, or in all regions.

***802.11 a/b/g/n/ requires separately purchased wireless access point and internet service. Availability of public wireless access points limited.

****The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not denote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

AUDIO/MULTIMEDIA

Audio

Integrated stereo speakers

Integrated microphone (dual-microphone array when equipped with optional webcam)

Button for volume mute; function keys for volume up and down

Combo stereo headphone/mic jack

Webcam

Optional 720p HD webcam*

*Optional webcam sold separately or as an add on feature. Internet access required.

HD format (widescreen)

- Supports videoconferencing and still image capture
- High quality fixed focus lens
- Video capture at various resolutions up to 1280x720 resolution (720p) and up to 30fps
- M-JPEG compression supports higher frame rates for video capture and videoconferencing
- Improved low light sensitivity
- Improved dynamic range

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

The 101/102-key compatible keyboard features an industry standard, full-pitch key layout with desktop keyboard features, such as linear cursor control keys, editing keys, both left and right control and alt keys, and 12 function keys. U.S. and International key layouts are available. Other features include an integrated numeric keypad, brightness, and other features, 19 mm x 19 mm key pitch (center-to-center spacing), 2.0 mm stroke, and comfort-dished keycaps.

Pointing Devices

Touchpad with on/off button, two-way scroll, gestures, two pick buttons

Buttons and Function Keys

Discrete buttons provide easy access to the following features: wireless on/off, and volume mute. Function keys provide control of the following features: standby mode, external display, volume down, volume up, mic mute, and display brightness.

Features

SOFTWARE AND SECURITY

Preinstalled Software with Windows Embedded Standard 7 (WES7E 32-bit)

HP Device Manager
HP Velocity

Standard Security

Security lock slot
TPM 1.2
Integrated Smart Card reader
Preboot Authentication
Optional Security
HP Combo Lock*

* Optional feature sold separately or as an add-on feature. For more information on HP security solutions refer to: <http://www.hp.com/go/security>

POWER

Power Supply

External 65W HP Smart AC Adapter
Power cord included is 6-foot (1.8 meter)
Total length including external AC adapter is 12 feet (3.66 meter)

Primary Battery

HP 6-cell Lithium-Ion Battery (55 WHr)
HP 9-cell Lithium-Ion Battery (100 WHr) (optional)

Battery Life*

9-cell (100 WHr)	Up to 14 hours 39 minutes
6-cell (55 WHr)	Up to 8 hours 39 minutes

System Standby Time

Up to TBD weeks

*Battery life will vary depending on the 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 MobileMark07 battery benchmark <http://www.bapco.com/products/mobilemark2007> for additional details.

Power Conservation

Standby

Features

ENVIRONMENTAL

ENERGY STAR*

IT ECO Declaration

EPEAT<Gold registered in the United States. See <http://www.epeat.net> for registration status in your country.

Low Halogen**

*Configurations that are ENERGY STAR qualified are identified on HP websites and on www.energystar.gov.

** External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.

NOTE: 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.

WEIGHTS & DIMENSIONS

Weight

Starting at 4.59 lbs. (2.08 kg)

Dimensions (w x d x h)

13.39 x 9.33 x 0.99 in (at front) / 34 x 23.7 x 2.53 cm (at front)

NOTE: Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components.

PORTS/SLOTS

Ports

VGA - One

DisplayPort - One (v1.2)

Combo stereo headphone/mic jack - One

Power Connector - One

Docking Connector - One

RJ-45 (Ethernet) - One

USB 2.0 - Three

USB 2.0 charging - One

Digital Media Slots

1 Secure Digital slot (SD/SDHC/SDXC)

Features

SERVICE AND SUPPORT

HP Services offers limited 3-year warranty. 1-year limited warranty on primary battery. 1-year limited warranty on primary battery. On-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>

For details, visit: www.hp.com/go/cpc

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	19.52V
	Average Operating Power	14.05W
	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
	508 Compliance (test and document)	Yes
	ENERGY STAR®	Select models*
	EPEAT	Registered Gold in the United States**
	Low halogen (does not cover adapters and power cords)	Yes
	Acoustics Performance Summary (requires ISO 7779)	Yes
	Environmental Data Sheet (EDS)	Yes
	ISO 9241/9995 (keyboard ergonomics)	Yes
	IT ECO declaration	Yes
	CA AB 1125 Rechargeable Battery Recycling Act of 2006	Yes
	TAA (FAR 52.255-5)	Yes
	GS Mark (EMEA)	Yes
	China CECP & SEPA (China)	Yes

Technical Specifications

China Minimum Efficiency and Labeling Requirements	Yes
E-Standby (Korea)	Yes
Made in Japan	Yes (Only applies to Japan RCTO units)
Taiwan Green Mark (Taiwan)	Yes

* Configurations of the HP mt41 Mobile Thin Client that are ENERGY STAR qualified are identified as HP mt41 Mobile Thin Client 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>.

DISPLAY

14.0-inch LED HD (1366 x 768) anti-glare

Dimensions (W x H)	12.74 x 7.56 in (32.4 x 19.2 cm)
Diagonal Size	14.0 in (35.6cm)
Surface Treatment	Anti-glare
Contrast Ratio	400:1 (typical)
Refresh Rate	60 Hz
Brightness	200 nit (typical)
Pixel Resolution	Pitch 0.227 mm
	Format 1366 x 768
	Configuration RGB Stripe
Backlight	LED
PPI	112 ppi
Viewing Angle	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)

STORAGE AND DRIVES

Internal Storage

Technical Specifications

16-GB Solid State Drive (SSD)	Drive Weight	3.4 grams		
	Capacity	16 GB (unformatted)		
	Height	100.5 mm		
	Width	70 mm		
	Interface	SATA 6 GB/s		
	Performance	Maximum Sequential Read	Maximum Sequential Write	
		Up to 450 MB/s	Up to 350 MB/s	
	Logical Blocks	31,277,232		
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]		
	Features	ATA Command Set ACS-2 NCQ support up to queue depth = 32 Advanced Flash Management: nCache™ - Non Volatile Write Cache Support for TRIM Dynamic & Static Wear-leveling Bad Block Management Background Garbage Collection Support for Performance throttling and Power Classes		

Optical Drives

DVD-ROM Drive (optional)	Access Times	Random	< 140 ms CD (typical) < 160 ms DVD (typical)
	Max Data Transfer Rate	24X CD-ROM 8X-DVD	
	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)	None	
	Max Media Capacity (read)	8.5GB	
	Transport	Tray Loading	

NETWORKING/COMMUNICATIONS

Technical Specifications

<p>Integrated Realtek RTL8151GH-CG 10/100/1000 NIC</p>	<p>Ethernet Features</p> <p>Power Management Support</p> <p>Performance Features</p> <p>Manageability</p> <p>Interface</p> <p>NIC Device Driver Name</p>	<p>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) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40) 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) IEEE 802.3az EEE (Energy Efficient Ethernet) Jumbo Frame 9K Auto MDI/MDIX Crossover cable detection</p> <p>ACPI compliant - multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption</p> <p>TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling</p> <p>Wake-on-LAN from standby (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</p> <p>PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ</p> <p>Realtek PCIe GBE Ethernet Family Controller</p>
<p>HP It4111 LTE/EV-DO/HSPA+ 4G WWAN*</p>	<p>Technology/Operating bands</p> <p>Wireless protocol standards</p> <p>Wireless parametric standards</p> <p>Maximum data rates</p> <p>GPS</p>	<p>LTE FDD all bands with diversity: 1900 MHz (Band II)¹, 1700/2100MHz (Band IV (AWS), 850 MHz (Band V), 700MHz (Band XIII), 700MHz (Band XVII), 1900MHz G Block (Band XXV) WCDMA/HSDPA/HSUPA/HSPA+: all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II) , AWS 1700/2100MHz (Band IV), 850 MHz (Band V), 800 MHz (Band VIII) GSM/GPRS/EDGE: 1900 MHz, 1800 MHz , 850 MHz , 900 MHz CDMA: Cellular 800MHz (BC0), PCS 1900MHz (BC1)</p> <p>3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification EVDO Release 0 and Release A</p> <p>Complies with 3GPP specifications Release 8 for LTE</p> <p>LTE (Category 3): 100 Mbps (Download), 50Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload) EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)</p> <p>Standalone GPS, A-GPS, GPS XTRA</p>

Technical Specifications

GPS bands	1575.42 MHz (\pm 1.023 MHz), GLONASS 1596-1607MHz
Maximum output power	LTE: +23 dBm (\pm - 1 dBm) WCDMA: +23 dBm (\pm - 1 dBm) GSM850/900, GMSK: +32dBm (\pm - 1dBm) GSM850/900, 8PSK: +27dBm (\pm - 1dBm) DCS1800 / PCS 1900, GMSK: +29dBm (\pm - 1dBm) DCS1800 / PCS 1900, 8PSK: +26dBm (\pm - 1dBm) CDMA: +24dBm (\pm - 1dBm)
Maximum power consumption	LTE: 1,200 mA (peak); <900 mA (average) WCDMA: 1,100 mA (peak); <800 mA (average) EGPRS: 2,500 mA (peak); <700 mA (average)
Power consumption, sleep mode	2 mA
Power management	USB selective suspend, Integrated notebook wireless button
Antenna type	Dual high efficiency multi-band antennae with spatial diversity
Form Factor	M.2, 3042-S3 Key B
Weight	6 g
Dimensions (Length x Width x Thickness)	42 mm x 30 mm x 2.3 mm
Voltage, Operating	3.135 V to 4.4 V (3.3 V +1.1V/-0.165V)
Temperature, operating (from TIA/EIA/IS-98-D)	-13° to 140° F (-25° to 60° C)
Temperature, non-operating, 96 hours (from MIL-STD 202 Method 108)	-40° to 185° F (-40° to 85° C)
Humidity, non-operating	95% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
LED activity	LED Off - Radio Off; Solid LED On - Radio On

¹ 1900 MHz (Band II) and 850 MHz (Band V) not supported at launch but support planned in a future firmware update.

* 4G LTE not available on all products, in all regions. WWAN use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors.

HP It4112 LTE/HSPA+ Gobi 4G Module*

Technology/Operating bands	LTE FDD all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II), 1800 MHz (Band III), 850 MHz (Band V), 2600 MHz (Band VII), 900 MHz (Band VIII), 700 MHz (Band XX, DD800) WCDMA/HSDPA/HSUPA/HSPA+ all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II), 800 MHz (Band V), 900 MHz (Band VIII) GSM/GPRS/EDGE: 1900 MHz (Band II), 1800 MHz (Band III), 850 MHz (Band V), 900 MHz (Band VIII)
Wireless protocol standards	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification
Wireless parametric standards	Complies with 3GPP specifications Release 8 for LTE

Technical Specifications

Maximum data rates	LTE (Category 3): 100 Mbps (Download), 50Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload) EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)
GPS	Standalone
GPS bands	1575.42 MHz (± 1.023 MHz), GLONASS 1596-1607MHz
Maximum output power	LTE: +23 dBm (+/- 2 dBm) WCDMA: +23.5 dBm (+/- 1 dBm) GPRS Band II, III: +29.5 dBm (+/- 1 dBm) GPRS Band V, VIII: +32.5 dBm (+/- 1 dBm) EGPRS Band II, III: +26.5 dBm (+/-1.5 dBm) EGPRS Band V, VIII: +27.5 dBm (+/-1.5 dBm)
Maximum power consumption	LTE: 1,200 mA (peak); <900 mA (average) WCDMA: 1,100 mA (peak); <800 mA (average) EGPRS: 2,800 mA (peak); <700 mA (average)
Power consumption, sleep mode	3 mA
Power management	USB selective suspend, Integrated notebook wireless button
Antenna type	Dual high efficiency multi-band antennae with spatial diversity
Form Factor	M.2, USB 2.0 interface
Weight	6 g
Dimensions (Length x Width x Thickness)	42 mm × 30 mm × 2.3 mm
Voltage, Operating	3.135 V to 4.4 V (3.3 V +1.1V/-0.165V)
Temperature, operating (from TIA/EIA/IS-98-D)	14° to 131° F (-10° to 55° C)
Temperature, non-operating, 96 hours (from MIL-STD 202 Method 108)	-40° to 185° F (-40° to 85° C)
Humidity, non-operating	95% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
LED activity	LED Off - Radio Off; Solid LED On - Radio On

* 4G LTE not available on all products, in all regions. WWAN use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors.

Broadcom 802.11 a/b/g/n WiFi Adapter (2x2)	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n
	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows 7, Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.4 GHz and 5 GHz

Technical Specifications

Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 6, 6.5, 9, 12, 13, 13.5, 18, 19.5, 24, 26, 27, 36, 39, 40.5, 48, 52, 54, 58.5, 65, 78, 81, 104, 108, 117, 121.5, 130, 135, 162, 216, 243, 270, 300 Mbps
Frequency Support	20 MHz: 2.4 GHz and 5 GHz bands 40 MHz: 2.4 GHz and 5 GHz bands
Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
Security¹	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 4) with Microsoft Windows Vista and XP only.
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power (for CCK)²	17 dBm , nominal
Output Power (for OFDM; power varies by data rate)²	15 dBm , nominal
Power Consumption	Idle associated: 250 mW Idle unassociated: 150 mW Transmit/Receive 20 MHz channel: 2.0 W (max) Transmit/Receive 40 MHz channel: 2.0 W (max)
Power Management	ACPI compliant power management 802.11 compliant power saving mode
Receiver Sensitivity³	270 Mbps: -61dBm, 54 Mbps: -72 dBm, 11 Mbps: -85 dBm , 1 Mbps: -92 dBm
Antenna Connections	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure
Form Factor	PCI-Express Half-MiniCard
Weight	0.013 lb (6 g)
Dimensions	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 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 - Radio ON

Technical Specifications

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).
4. 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.

AUDIO/MULTIMEDIA

Audio	HD Audio with DTS Sound+	
Hardware	Implementation	IDT 92HD87 High Definition CODEC
	Function Key Volume Controls	Volume up, volume down
	Mute Key	Yes
	Full Duplex	Yes
	Microphone In	Stereo
	Headphone/Line Out	Stereo
	Integrated Microphone	Yes, dual digital microphone array when equipped with optional webcam
	Audio Output Quality	Frequency Response
	Signal to Noise Ratio	>85 dB
	Total Harmonic Distortion	0.01%
	Noise Floor	-110 dB
	Play/Record Sampling Rate(s)	8 kHz - 48kHz
	DAC	16, 20 or 24-bit
	ADC	16 or 20-bit
Integrated Stereo Speakers	Power Rating	2 Watts
	Impedance	4 ohms

POWER

Technical Specifications

HP 65W Smart AC Adapter	Dimensions	4.17 x 1.85 x 1.1 in (10.6 x 4.7 x 2.8 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
	Output	Input AC current	1.7 A at 90 VAC, 0.85 A at 180 VAC
		Output power	65W
		DC output	18.5V
		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	32° to 104° F (0° to 40° C)
		Non-operating (storage) temperature	-4° to 149° F (-20° to 65° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
		Humidity	20% to 80%
Storage Humidity		10% to 90%	
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 9-cell (100 WHr) Lithium-Ion Primary battery (optional)	Dimensions (H x W x L)	0.8 x 2.4 x 8.1in (2 x 6.6 x 20.5cm)	
	Weight	1.1lb, (.488kg)	
	Cells/Type	Lithium-Ion	
	Energy	Voltage	11.25V
		Amp-hour capacity	8.85Ah
		Watt-hour capacity	100Wh
	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	3.5 to 5 hours
		System ON	4 to 7 hours
	Fuel Gauge LED	No	
Warranty	1 year		
Optional Travel Battery Available	Yes		

Technical Specifications

**HP 6-cell (55 WHr)
Lithium-Ion Primary
battery**

Dimensions (H x W x L)	0.8 x 1.8 x 8.0in (2.0 x 4.7 x 20.5cm)
Weight	.70lb, (.313kg)
Cells/Type	Lithium-Ion
Energy	Voltage 10.8V
	Amp-hour capacity 5.1Ah
	Watt-hour capacity 55Wh
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
Optional Travel Battery Available	Yes

Environmental Data

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

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

System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a "Typically Configured Notebook".

Energy Consumption (in accordance with US ENERGY STAR® test method)

	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
Normal Operation	8.38 W	8.61 W	8.45 W
Sleep	1.28 W	1.33 W	1.28 W
Off	0.46 W	0.49 W	0.46 W

NOTE:

Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
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Technical Specifications

Normal Operation	29 BTU/hr	29 BTU/hr	29 BTU/hr
Sleep	4 BTU/hr	5 BTU/hr	4 BTU/hr
Off	2 BTU/hr	2 BTU/hr	2 BTU/hr

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

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

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Typically Configured - Idle	3.4	27
Fixed Disk - Random writes	3.4	27

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

Batteries used in the product do not contain:
Mercury greater than 1ppm by weight
Cadmium greater than 20ppm by weight

Battery size: CR2032 (coin cell)

Battery type: Lithium

Battery size: 6-cell high capacity Lithium-Ion battery (optional 8 cell available)

Battery type:

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive - 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the <gold> level, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product contains 0% post-consumer recycled plastic (by wt.)
- This product is 95.8% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	482.6 g
Internal:	PLASTIC/EPE (Expanded Polyethylene)	28 g
	PLASTIC/Polyethylene low density	30.4 g

The PAPER/Corrugated packaging material contains at least 70% recycled content.

The PLASTIC/EPE (Expanded Polyethylene) packaging materials contains at least 50% recycled content.

The PLASTIC/Polyethylene low density packaging materials contains at least 50% 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/pdf/gse.pdf>):

Technical Specifications

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants - may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel - finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- 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)

Packaging

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling

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

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/recyclers>. These instructions may be used by recyclers

Technical Specifications

**Hewlett-Packard
Corporate
Environmental
Information**

and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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://www8.hp.com/us/en/hp-information/environment/ecolabels.html>

ISO 14001 certificates:

http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf

and

<http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf>

COUNTRY OF ORIGIN

TAA skus – Juarez, Mexico

All other SKU's – China

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

Type	Description	Part #
Docking	HP 90W Docking Station	A7E32AA#XXX
	HP Display and Notebook Stand	AW662AA
Input/Output	DisplayPort to HDMI Cable	F3W43AA
Power	90W Smart AC/Auto/Air Combo Adapter	AJ652AA#XXX
	90W Smart Auto/Truck Adapter	ED493AA
	HP 65W Slim Adapter	AX727AA#XXX
	90W Slim Adapter	BT796AA#XXX
	HP 65W Smart AC Adapter	ED494AA#XXX
	HP 65W Smart AC Adapter	H6Y89AA#XXX
	HP 90W Smart AC Adapter	H6Y90AA#XXX
	HP CA06 Notebook Battery	718676#XXX
HP CA09 9-cell Battery	718678#XXX	
Security	HP Notebook Combo Lock	AY475AA#XXX
	HP Keyed Cable Lock	BV411AA
	HP UltraSlim Keyed Cable Lock	H4D73AA
	HP Docking Station Cable Lock	AU656AA#XXX

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