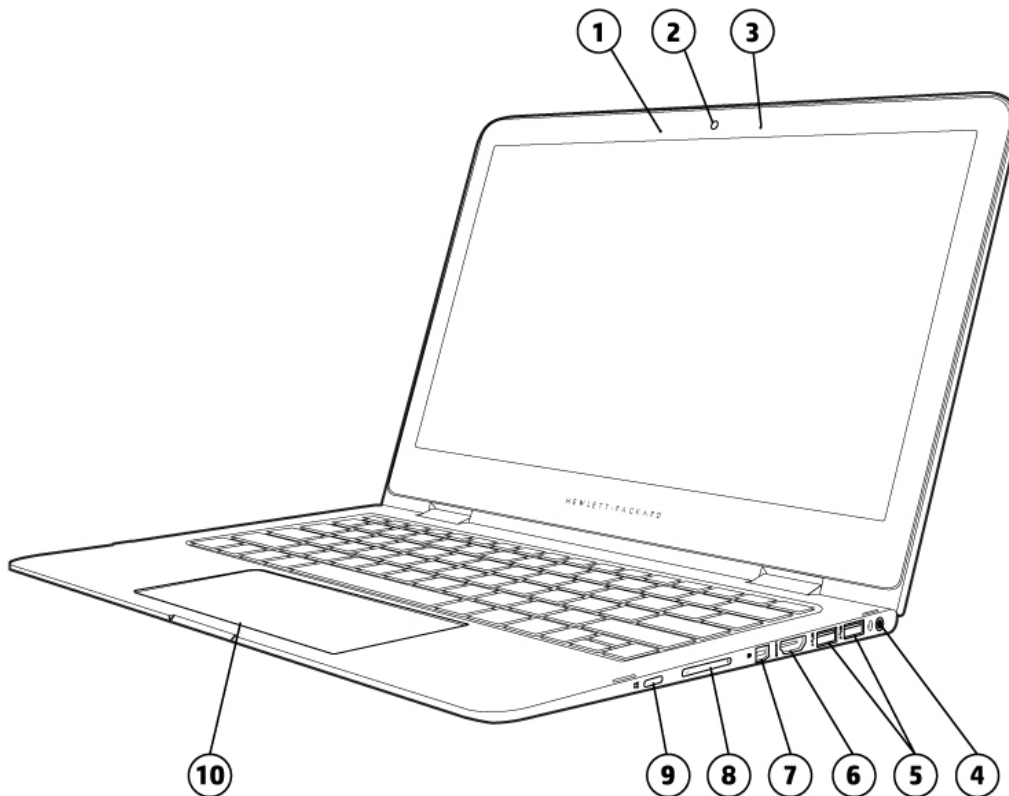


Overview

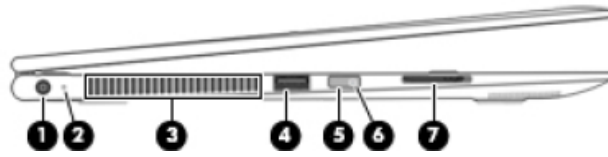
HP Spectre Pro x360 G2 Convertible PC



Front side RIGHT view

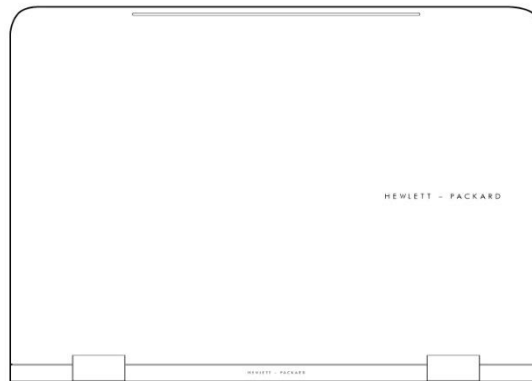
- | | |
|---|---------------------|
| 1. WLAN antennas | 6. HDMI Port |
| 2. Webcam LED | 7. Mini DisplayPort |
| 3. Dual-microphone array | 8. Volume button |
| 4. Audio-out (headphone)/Audio-in (microphone) jack | 9. Windows button |
| 5. USB 3.0 charging ports | 10. TouchPad |

Overview



Left view

- | | |
|-----------------------------|-----------------------|
| 1. Power Connector | 5. Power button |
| 2. AC adapter/battery light | 6. Power light |
| 3. Vent | 7. Memory Card reader |
| 4. USB 3.0 Port | |



Rear view

Overview

At A Glance

- Innovative x360 hinge - Unique geared hinges offer flexible positioning for work, entertainment, or sharing content
- 13.3-inch diagonal Touchscreen, Multitouch enabled and Active Stylus writing support
- Full-size island style keyboard with Dura-coat
- Touchpad w/ multi-touch gesture support image sensor
- A cool 15.9 mm thin design
- Weight starting at 3.17 lbs (1.44 kg)
- Windows 10 Pro 64
- 6th Generation Intel® Core™ i7 or i5 Processors with Intel® Turbo Boost and optional vPro Technology
- Integrated Intel® HD 520 Graphics
- Choice of Solid State Drives – MLC or TLC Solid State Drive, Self Encrypting Drive support, up to 512 GB
- Wireless connectivity:
 - Intel® 802.11a/b/g/n/ac (2x2) and Bluetooth® 4.0 Combo
 - Intel® 802.11a/b/g/n (2x2) and Bluetooth® 4.0 Combo
- HP Long Life 3-cell, 56 WHr Li-ion battery
- Battery life up to 13 hrs 18 mins
- Optimize your audio experience for remote collaboration with dual-microphone array, premium speakers, HP Noise Reduction Software, HP Clear Sound Amp, Audio by Bang & Olufsen
- Security includes TPM 2.0 Embedded Security Chip and Microsoft Bitlocker Defender
- Standard commercial 1 year warranty, upgrade available to 3 year with the purchase of optional HP Care Pack

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

Features

OPERATING SYSTEM- ADD NEW FOOTNOTES.

Preinstalled	Windows 10 Pro 64 ¹
Web-only Support	Windows 10 Pro 64 ¹ Windows 10 Home 64 ¹ Windows 10 Enterprise 64 ¹ Windows 8.1 64 ² Windows 8.1 Professional 64 ² Windows 8.1 Chinese Market 64 ² Windows 8.1 Emerging Markets 64 ² Windows 8.1 Multi-Language 64 ² Windows 8.1 Professional 64 ² Windows 7 Enterprise 64 ² Windows 7 Professional 64 ²

1. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://http://www.microsoft.com>.
2. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. See <http://http://www.microsoft.com>.

PROCESSOR

Intel® Core™ i7-6600U with Intel® HD Graphics 520 (Available with iAMT (vPro)
(2.6 GHz, up to 3.4 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)^{1,2}
Intel® Core™ i5-6300U with Intel® HD Graphics 520
(2.4 GHz, up to 3 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores)^{1,2}
Intel® Core™ i5-6200U with Intel® HD Graphics 520 (Available with iAMT (vPro) (Config with 8 GB only)
(2.3 GHz, up to 2.8 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores)^{1,2}

1. Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering is not a measurement of higher performance.
2. Intel® Turbo Boost technology requires a PC with a processor with Intel Turbo Boost capability. Intel Turbo Boost performance varies depending on hardware, software and overall system configuration. See www.intel.com/technology/turboboost for more information.
3. Not available with Intel iAMT. Does not support vPro.

CHIPSET

Chipset integrated with processor

Features

GRAPHICS

Intel® HD Graphics 520¹

1. HD content required to view HD images.

DISPLAY

Touch Screen

13.3-inch diagonal FHD UWVA WLED BrightView (1920 x 1080) eDP 1.2¹

13.3-inch diagonal QHD UWVA WLED BrightView (2560 x 1440) eDP1.3+PSR¹

- Flush glass design
- Multitouch enabled and Active Stylus writing support

1. HD content required to view HD images.

External

Up to 32-bit per pixel color depth

HDMI

v1.4b Supporting up to 1920x1200 @ 60Hz

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

STORAGE AND DRIVES

Internal Storage Device

Solid State Drives

128 GB SSD 2280 DS TLC / SATA¹

180 GB SSD 2280 DS MLC / SATA¹

256 GB SSD 2280 DS TLC / SATA¹

512 GB SSD 2280 DS TLC / SATA¹

Self Encrypting Drive

256 GB SSD 2280 DS MLC / SATA-3 Self Encrypting Drive¹

1. For solid state drives, GB = 1 billion bytes. Actual formatted capacity is less.

Up to 16 GB (for Windows 7) and up to 30 GB (for Windows 8 and 10) of system disk is reserved for the system recovery software.

MEMORY

Standard

LPDDR3-1600 (Transfer rates up to 1600 MT/s)

Dual Channel Support

Memory soldered down

Supports

4096 MB (128Mx2x32 x 4PCs) - 1600 MT/s¹

8192 MB (256Mx4x16 x 4PCs) - 1600 MT/s¹

Features

Maximum

8 GB

1. Memory soldered down. Internal component upgrades to memory are not available after factory configuration.

NETWORKING/COMMUNICATIONS

Wireless LAN (WLAN)¹

Intel® 802.11a/b/g/n/ac (2x2) and Bluetooth® 4.0 Combo (Supports vPro)

Intel® 802.11a/b/g/n (2x2) and Bluetooth® 4.0 Combo (Supports vPro)

1. 802.11 wireless is an optional add-on feature and requires wireless access point and Internet service is required and is not included. Availability of public wireless access points limited.

Communications

Miracast support

Intel® WiDi Pro Support

AUDIO/MULTIMEDIA

Audio

Audio by Bang & Olufsen

HP Noise Reduction Software

Digital Microphones (Dual Array)

Dual Speakers

Webcam

HP TrueVision Full HD camera¹

Fixed (no tilt) + activity LED

1 Piece

USB 3.0

M-JPEG

Wide FOV(88 degree)

1920 x 1080 by 30 frames per second

Dual array Digital Microphones

With appropriate software - beam forming, echo cancellation, noise suppression

1. HD content required to view HD images.

KEYBOARDS/POINTING DEVICES/BUTTONS

Full-size island style keyboard

Backlit island-style Keyboard (Dura-coat, Silver color)

Pointing Device

Touchpad with image sensors

Multitouch gestures enabled

Support Win10 Modern Trackpad Gestures

Taps enabled as default

Chassis Buttons

Power

Features

Volume Up/Down
MS Start
LED Indicators

SOFTWARE AND SECURITY

Preinstalled Software with Windows Operating System

HP Value Add Software

HP Touchpoint Manager¹
HP Wireless Hotspot²
HP Support Assistant
HP ePrint³

Multimedia

Cyberlink PowerDVD/Power Media Player 12

Collaboration

Skype RTC Insertion⁴
mysms-Metro (Windows 8.1 only)

Third Party

Buy Office
Adobe® Shockwave Player
Foxit PhantomPDF Express for HP

Photos and Videos

Intel® Wireless Display (WiDi)⁵
Intel® WiDi Pro
Cyberlink Youcam (Windows 7 only)
HP PageLift

Security

MS BitLocker
Intel® Anti-Theft-p Ready support
HP SmartPass support
TPM 2.0

1. HP Touchpoint Manager supports Android™, iOS and Windows operating systems and PCs, notebooks, tablets and smartphones from various manufacturers. Not available in all countries see www.hp.com/touchpoint for availability information. Touchpoint Manager require purchase of a subscription. Out-of-band HP only Wipe, Lock, Unlock and reporting of BIOS boot error codes is planned to be available on select HP EliteBooks and tablets and requires Intel® vPro™ technology and functions in S3/Sleep, S4/Hibernate and S5/Soft Off power states.
2. The HP Wireless Hotspot application requires an active internet connection and separately purchased data plan. While HP wireless hotspot is active, on-device applications will continue to work and will use the same data plan as the wireless hotspot. Wireless hotspot data usage may incur additional charges. Check with your service provider for plan details. Requires Windows 8.1 or HP Connection Manager for Windows 7.
3. Requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see www.hp.com/go/businessmobileprinting).
4. Skype is not offered in China.
5. Integrated Intel Wi-Di feature is available on select configurations only and requires separately purchased projector, TV or computer monitor with an integrated or external Wi-Di receiver. External Wi-Di receivers connect to the projector, TV or computer monitor via a standard HDMI cable, also sold separately.
6. Requires Windows 7. Opt in and internet connection required for updates.

Features

7. Requires Windows 8. Opt in and internet connection required for updates.

POWER

Power Supply

HP 45W Smart AC Adapter

HP 45W Smart AC 2-prong Adapter (Japan only)

3.2 ft (1m) or 5.90 ft (1.8 m) length AC and DC power cord

Battery

HP Long Life 3-cell, 56 WHr Li-ion

Battery Life¹

FHD: Up to 13 hrs 18 mins

QHD: Up to 11 hrs 30 mins

1. Windows 10 MM14 battery life will vary depending on various 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.

WEIGHTS & DIMENSIONS

Weight

Starting at 3.17 lbs (1.44 kg)

(QHD Display + 3 cell battery + single mSATA)

Starting at 3.26 lbs (1.48 kg)

(FHD Display+ 3 cell battery + single mSATA)

Dimensions (w x d x h)

12.79 x 8.58 x .61 in

325 x 218 x 15.4 mm (Front)

NOTE: Height varies depending upon where on the notebook the measurement is made.

Weight varies by configuration and components.

PORTS/SLOTS

(3) USB 3.0 Ports (2 at left; 1 at right)

(1) mini DisplayPort 1.2

(1) HDMI (Cable not included)

(1) Headphone output & Microphone input combo jack

(1) AC power adapter plug

EXPANSION SLOTS

HP Multi-Format Digital Media Card Reader

Support SD/SDHC/SDXC

Features

Push-Push Insertion/Removal

INTERNAL CARD EXPANSION

One NGFF Slot (2230) for WLAN

One NGFF Slot (2280) for Solid State Drive

SERVICE AND SUPPORT

HP Services offers a 1-year limited warranty option depending on country. Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year limited warranty as the platform. On-site service and extended coverage is also available. HP Care Pack Services¹ are optional² extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>.

1. 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>

2. Sold separately or as an optional feature.

Technical Specifications

System Unit

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	19.5 V
	Average Operating Power	31.54 W
	Max Operating Power	45W
Temperature	Operating	32° to 95° F (0° to 35° C) 41° to 95° F (5° to 35° C)
	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)
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®	Yes
	EPEAT®	Gold for US; others for Silver
	ICES	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes
	Japan VCCI Compliance	Yes
	KC	No
	BSMI	No
	CE Marking Compliance	Yes
	BNCI or BELUS	Yes
	GOST	Yes
	Saudi Arabian Compliance (ICCP)	Yes
	SABS	Yes
	UKRSERTCOMPUTER	Yes

NOTE:
 Configurations of the HP Spectre Pro x360 G2 Convertible PC that are ENERGY STAR qualified are identified as HP Spectre Pro x360 G2Convertible PC 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>.

Technical Specifications

DISPLAYS

13.3-inch diagonal FHD UWVA WLED BrightView (1920 x 1080) eDP 1.2 Touch	Outline Dimensions (W x H x D)	305.65mm x 188.32mm x 2.85mm (Max; w/o bracket)	
	Active Area	293.86mm x 165.34mm	
	Weight	260g	
	Diagonal Size	13.3 inch	
	Touch enabled	Yes	
	Contrast Ratio	800 typ.	
	Refresh Rate	60Hz	
	Brightness	350nits typ. (w/o touch)	
	Pixel Resolution	Format	FHD
		Configuration	1920 x 1080
	Interface	eDP	
	LCD Mode	LED	
	PPI	166	
Viewing Angle	85/85/85/85		

13.3-inch diagonal QHD UWVA WLED BrightView (2560 x 1440) eDP1.3+PSR1 Touch	Outline Dimensions (W x H x D)	306.8mm x 189.2mm x 2.6mm (Max; w/o bracket)	
	Active Area	293.376mm x 165.024mm	
	Weight	235g	
	Diagonal Size	13.3 inch	
	Touch enabled	Yes	
	Contrast Ratio	700 typ.	
	Refresh Rate	60Hz	
	Brightness	340nits typ. (w/o touch)	
	Pixel Resolution	Format	QHD
		Configuration	2560 x 1440
	Interface	eDP	
	LCD Mode	LED	
	PPI	221	
Viewing Angle	85/85/85/85		

NETWORKING/COMMUNICATIONS

Intel® 802.11 2x2ac + Bluetooth 4.0 Combo

Wireless LAN Standards	IEEE 802.11a
	IEEE 802.11b
	IEEE 802.11g
	IEEE 802.11n
	IEEE 802.11ac

Technical Specifications

Interoperability	Wi-Fi certified
Frequency Band	802.11b/g/n <ul style="list-style-type: none">2.402 – 2.482 GHz Note: The FCC has declared as of January 1, 2015 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
	802.11a <ul style="list-style-type: none">4.9 – 4.95 GHz (Japan)5.15 – 5.25 GHz5.25 – 5.35 GHz5.47 – 5.725 GHz5.825 – 5.850 GHz Note: Indonesia only supports 5.725 - 5.825 GHz (CH149 - CH161)
Data Rates	<ul style="list-style-type: none">802.11b: 1, 2, 5.5, 11 Mbps802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum
Security¹	BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM <ul style="list-style-type: none">IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode onlyAES-CCMP: 128 bit in hardware802.1x authenticationWPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.WPA2 certificationIEEE 802.11iCisco Certified Extensions, all versions through CCX4 and CCX LiteWAPI
Network Architecture	Ad-hoc (Peer to Peer)
Models	Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power²	<ul style="list-style-type: none">802.11b : +16dBm minimum802.11g : +14dBm minimum802.11a : +14dBm minimum802.11n HT20(2.4GHz) : +13dBm minimum802.11n HT40(2.4GHz) : +13dBm minimum802.11n HT20(5GHz) : +12dBm minimum802.11n HT40(5GHz) : +12dBm minimum802.11ac 80MHz(5GHz) : +11dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 60 mW (WLAN unassociated)

Technical Specifications

Power Management	Radio disabled: 30 mW ACPI and PCI Express compliant power management
Receiver Sensitivity³	802.11 compliant power saving mode 802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm maximum 802.11a, 6Mbps : -86dBm maximum 802.11a, 54Mbps : -72dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm maximum 802.11ac, 1SS, MCS-0 : -86dBm maximum 802.11ac, 1SS, MCS-9 : -61dBm maximum 802.11ac, 2SS, MCS-0 : -83dBm maximum 802.11ac, 2SS, MCS-9 : -58dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm Or Type 1630 : 2.3 x 16.0 x 30.0 mm
Weight	Type 2230 : 2.8g Or Type 1630 : 2g
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 Amber – Radio OFF; LED White – Radio ON
	<ol style="list-style-type: none"> 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).

HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology

Bluetooth Specification	4.0+EDR Compliant
Frequency Band	2402 to 2480 MHz
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	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of +4 dBm for BR and EDR.

Receiver Sensitivity

Modulation	0.01% BER	0.001% BER
GFSK	-80 dBm	-70 dBm
$\pi/4$ -DQPSK	-80 dBm	-70 dBm
8DPSK	-80 dBm	-70 dBm

Technical Specifications

Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Range	Up to 33 ft (10 m)
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Link Topology	Point to Point, Multipoint Pico Nets up to 7 slaves
Electrical Interface	Full support of Bluetooth Security Provisions
Bluetooth Software Supported	Microsoft Windows ACPI, and USB Bus Support
Security	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
Power Management	ETS 300 328, ETS 300 826
Power Management	Low Voltage Directive IEC950
Certifications	UL, CSA, and CE Mark
Security	Serial Port Profile (SPP) ¹
Certifications	Service Discovery Application Profile (SDAP)
Bluetooth Profiles Supported	Dial-Up Networking (DUN) ^{1,2}
Power Management	Generic Object Exchange Profile (GOEP) ^{1,2}
Certifications	Object Push Profile (OPP) ^{1,2}
Bluetooth Profiles Supported	File Transfer Profile (FTP)
Power Management	Synchronization Profile (SYNC)
Certifications	Hard Copy Cable Replacement (HCRP) ^{1,2}
Bluetooth Profiles Supported	Personal Area Networking Profile (PAN) ^{1,2}
	Human Interface Device Profile (HID) ^{1,2}
	FAX Profile (FAX)
	Basic Imaging Profile (BIP) ²
	Headset Profile (HSP)
	Hands Free Profile (HFP)
	Advanced Audio Distribution Profile (A2DP)

Intel® 802.11 2x2 a/b/g/n + Bluetooth 4.0 Combo

Wireless LAN Standards	IEEE 802.11b IEEE 802.11g IEEE 802.11n
Interoperability	Wi-Fi certified
Frequency Band	802.11b/g/n <ul style="list-style-type: none"> • 2.402 – 2.482 GHz
	Note: The FCC has declared as of January 1, 2015 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.

Technical Specifications

Antenna Structure	2 transmit; 2 receive (2x2)
Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)
Modulation	Direct Sequence Spread Spectrum CCK, BPSK, QPSK, 16-QAM, 64-QAM
Security¹	<ul style="list-style-type: none"> • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between band Access Points
Output Power²	<ul style="list-style-type: none"> • 802.11b : +16dBm minimum • 802.11g : +14dBm minimum • 802.11n HT20(2.4GHz) : +13dBm minimum • 802.11n HT40(2.4GHz) : +13dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 60 mW (WLAN unassociated) Radio disabled: 30 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity⁴	802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm maximum 802.11a, 6Mbps : -86dBm maximum 802.11a, 54Mbps : -72dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm Or Type 1630 : 2.3 x 16.0 x 30.0 mm
Weight	Type 2230 : 2.8g Or Type 1630 : 2g

Technical Specifications

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 Amber - Radio OFF; LED White - 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. In Power Save Polling mode and on battery power.
4. 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).
5. 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.

HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology

Bluetooth Specification	4.0+EDR Compliant
Frequency Band	2402 to 2480 MHz
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	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of +4 dBm for BR and EDR.

Receiver Sensitivity	Modulation	0.01% BER	0.001% BER
	GFSK	-80 dBm	-70 dBm
	$\pi/4$ -DQPSK	-80 dBm	-70 dBm
	8DPSK	-80 dBm	-70 dBm

Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Range	Up to 33 ft (10 m)
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported Link Topology	Microsoft Windows Bluetooth Software
Electrical Interface Bluetooth Software Supported Security	Point to Point, Multipoint Pico Nets up to 7 slaves Full support of Bluetooth Security Provisions
Power Management Certifications	Microsoft Windows ACPI, and USB Bus Support Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
Security Certifications	All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Bluetooth Profiles Supported	
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950
Certifications	UL, CSA, and CE Mark
Bluetooth Profiles Supported	Serial Port Profile (SPP) ¹ Service Discovery Application Profile (SDAP)

Technical Specifications

Dial-Up Networking (DUN)^{1,2}
 Generic Object Exchange Profile (GOEP)^{1,2}
 Object Push Profile (OPP)^{1,2}
 File Transfer Profile (FTP)
 Synchronization Profile (SYNC)
 Hard Copy Cable Replacement (HCRP)^{1,2}
 Personal Area Networking Profile (PAN)^{1,2}
 Human Interface Device Profile (HID)^{1,2}
 FAX Profile (FAX)
 Basic Imaging Profile (BIP)²
 Headset Profile (HSP)
 Hands Free Profile (HFP)
 Advanced Audio Distribution Profile (A2DP)

AUDIO/MULTIMEDIA

Hardware	Implementation	I2S /HD Audio
	Function Key Volume Controls	up, down and mute function keys
	Full Duplex	yes
	Microphone In	stereo (combo jack)
	Headphone/Line Out	stereo (combo jack)
	Integrated Microphone	yes
Audio Output Quality	Frequency Response	20~22kHz
	Signal to Noise Ratio	102 dB FSA (DAC)
	Total Harmonic Distortion	-88 dB FSA (DAC)
	Noise Floor	
	Play/Record Sampling Rate(s)	support 44.1k/48k/96k/192kHz sample rate
		DAC
	ADC	24bits
Internal Stereo Speaker	Power Rating	2W
	Impedance	4 ohm

POWER

HP 45W Smart AC Adapter

Technical Specifications

Dimensions	3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm)	
Weight	0.386 lb (175g) max	
	90 to 265 VAC	
Input	Input Efficiency	87.74% at 115Vac and 88.4% at 230Vac
	Input frequency range	47 to 63 Hz
	Input AC current	1.4 A at 90 VAC
	Output power	45W
	DC output	19.5V
Output	Hold-up time	5 msec at 115 VAC input
	Output current limit	<8.0A
	Over voltage protection	< 29V max automatic shutdown
	Over short protection	Auto-recovery and no damage
Connector	3 pin/grounded, mates with interchangeable cords	
	Operating temperature	32° to 95° F (0° to 35° C)
	Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)
Environmental Design	Altitude	0 to 16,400 ft (0 to 5,000 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 EM Smart AC Adapter

Dimensions	4.98 x 1.97 x 1.18 in (12.65 x 5.0 x 3.0 cm)	
Weight	0.62 lb (290g) max	
	90 to 265 VAC	
Input	Input Efficiency	87% min at 115 VAC
	Input frequency range	47 to 63 Hz
	Input AC current	1.7 A at 90 VAC
	Output power	65W
	DC output	19.5V
Output	Hold-up time	5 msec at 115 VAC input
	Output current limit	<11.0A
	Over voltage protection	< 29V max automatic shutdown
	Over short protection	Auto-recovery and no damage
Connector	3 pin/grounded, mates with interchangeable cords	
	Operating temperature	32° to 95° F (0° to 35° C)
Environmental Design	Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)

Technical Specifications

	Altitude	0 to 16,400 ft (0 to 5,000 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 Long Life 3-cell, 56 WHr Li-ion

Dimensions (H x W x L)	5.60*146.80*291.80
Weight	230g
Cells/Type	3-cells/Lithium-Ion Polymer
	11.4v
Energy	4.96Ah
	56Wh
	Operating (Charging) 32° to 113° F (0° to 45° C)
Temperature	Operating (Discharging) 14° to 122° F (-10° to 60° C)
	Non-operating -4° to 122° F (-20° to 60° C)
Battery	
Re-Charge Time	<3 hours
Fuel Gauge LED	No
Warranty	1000 cycles

ENVIRONMENTAL

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: <ul style="list-style-type: none"> • IT ECO declaration • US ENERGY STAR® • EPEAT® Gold registered in the United States. See http://www.epeat.net for registration status in your country.
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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".
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Energy Consumption (in accordance with US ENERGY STAR® test method)

	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
Normal Operation (Sort idle)	8.42 W	8.52 W	8.44 W
Normal Operation (Long idle)	4.11 W	4.16 W	4.11 W

Technical Specifications

Sleep	0.82 W	0.81 W	0.82 W
Off	0.45 W	0.46 W	0.45 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
Normal Operation (Short idle)	29 BTU/hr	29 BTU/hr	29 BTU/hr
Normal Operation (Long idle)	14 BTU/hr	14 BTU/hr	14 BTU/hr
Sleep	3 BTU/hr	3 BTU/hr	3 BTU/hr
Off	2 BTU/hr	2 BTU/hr	2 BTU/hr

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

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L_{WAd}, bels)	Sound Pressure (L_{pAm}, decibels)
Typically Configured – Idle	1.9	20
Fixed Disk – Random writes	1.9	20

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

- 3 USB ports
- 1 PC card slot (type I/II)
- 1 ExpressCard/54 slot
- 1 IEEE 1394 Port
- 2 SODIMM memory slots
- Optional expansion base docking station
- 1 multi-bay II storage port
- Interchangeable HDD

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

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

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

Battery size: CR2032 (coin cell)
 Battery type: Lithium

Technical Specifications

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 98 % recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	380 g
	PAPER/Cardboard & misc	882 g
Internal:	PLASTIC/EPE (Expanded Polyethylene)	28 g
	PLASTIC/Polyethylene low density	7 g

The plastic packaging material contains at least 0 % recycled content.

The corrugated paper packaging materials contains at least 80 % 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>):

- 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)

Technical Specifications

Packaging Usage

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

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

End-of-life Management and Recycling

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

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/recyclers>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Hewlett-Packard Corporate Environmental Information

For more information about HP's commitment to the environment:

Global Citizenship Report

<http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html>

Eco-label certifications

<http://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

China

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

Type	Description	Part #
Cases	HP Slim Ultrabook Messenger (up to 15.6" x .88"/22/5mm)	F3W14AA
	HP Slim Ultrabook Top Load (up to 15.6" x .88"/22/5mm)	F3W15AA
	HP Slim Ultrabook Backpack (up to 15.6" x .88"/22/5mm)	F3W16AA
Docking	HP 3005pr USB Port Replicator	H1L08AA#xxx
	HP 3001pr USB 3 Port Replicator	F3S42AA
	HP Display and Notebook Stand II	E8G00AA#xxx
	HP Dual Hinge II Notebook Stand	E8F99AA#xxx
Input/Output	HP Touch To Pair Mouse	H6E52AA
	HP Stylish Wireless KB/Mouse	H4B79AA
	HP 2.4GHz Keyboard and Mouse	G1K29AA
	HDMI to VGA Adapter	H4F02AA
	HP HDMI to DVI Adapter	F5A28AA
	HP USB to Gigabit RJ45 Adapter	N7P47AA
Memory	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 65W Smart AC Adapter (4.5mm)	H6Y89AA#xxx
	HP 90W Smart AC Adapter (4.5mm)	H6Y90AA#xxx
Security	HP USB Smart Card Reader	F6V67AA
Storage – External Storage	HP External USB Optical Drive	F2B56AA
Monitors	HP EliteDisplay E232	M1N98AA
	HP EliteDisplay S270c	K1M38AA
	HP EliteDisplay E272q	M1P04AA

Summary of Changes

Date of change	Version History		Description of change
January 21, 2016	Version 1 to 2	Updated	Processors page 4
February 26, 2016	Version 2 to 3	Added	Environmental section
March 16, 2016	Version 3 to 4	Updated	Software section
April 15, 2016	Version 4 to 5	Added	Battery life
June 13, 2016	Version 5 to 6	Removed	Cable lock

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