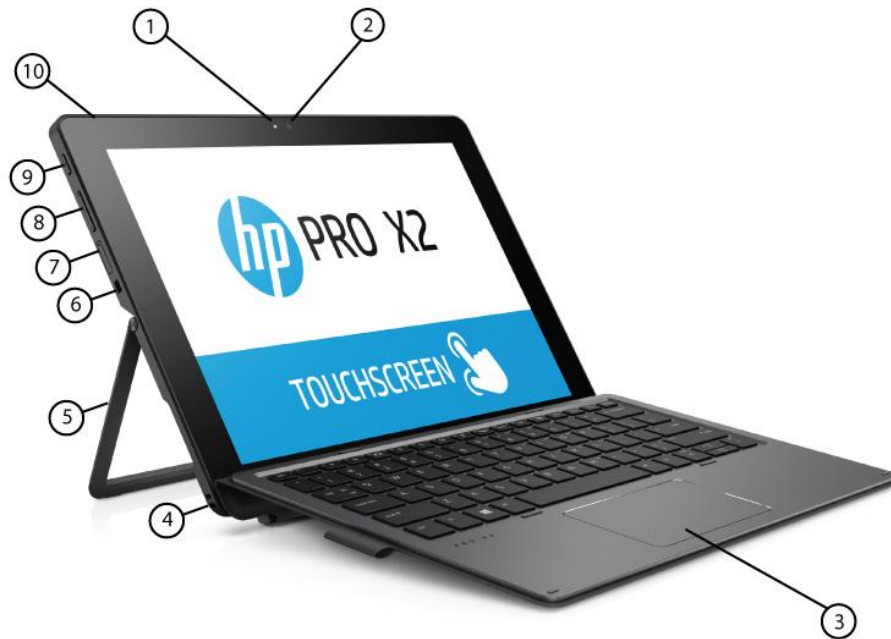


Overview

HP Pro x2 612 G2



Right View

- | | |
|----------------------------|------------------------------|
| 1. Front-facing camera LED | 6. Security cable slot |
| 2. Webcam | 7. Micro SD memory card slot |
| 3. Touchpad | 8. Volume controls |
| 4. Pen Lanyard Slots | 9. Power button |
| 5. Kickstand | 10. Smart card reader |

Overview



Left side view

1. Front-facing camera LED
2. Webcam
3. Audio-out/Audio-in combo jack
4. USB-A 3.0
5. Micro SIM Card Slot (only available on configurations with WWAN enabled)
6. Indicator LEDs: Battery Light
 - White: battery charge is greater than 90%
 - Amber: battery charge is from 0 to 90%
 - Off: battery is not charging
7. USB Type-C™ 3.1
8. Guide pins
9. Pogo pins

Overview



Top and Side

- | | |
|----------------------|--------------------------------|
| 1. Smart card reader | 5. Security cable slot |
| 2. Speakers (2) | 6. Micro SD memory card slot |
| 3. Power button | 7. Optional NFC |
| 4. Volume controls | 8. Optional fingerprint reader |

Overview



Dedicated Skype for Business keys

1. Present
2. Call answer / initiate
3. Call end

Overview

At A Glance

- The fanless design and up to 11 hours of battery life¹ lets you work, surf, and connect with colleagues
- Windows 10 versions
- 7th Generation Intel® Core™ (Y-series) processors, some with vPro™ ² support** or Intel® Pentium® processors
- Intel® HD Graphics 615
- 12" diagonal FHD BrightView WUXGA+ UWVA ultra-slim LED-backlit touch screen (1920 x1280) with direct bonded, Corning® Gorilla® Glass 4
- Up to 8 GB of memory and up to 512 GB storage
- Weight starting at 1.87 lbs for tablet
- Height starting at 9.1mm for tablet
- Designed to pass MIL-STD-810g testing³
- With integrated stereo speakers, front and rear facing web camera and integrated microphone
- Security features include TPM 2.0/1.2, integrated smart card reader, optional fingerprint reader, and optional NFC
- Wireless connectivity with WLAN and optional WWAN
- Protect your device and data using the latest HP security technology solutions: HP Sure Start, HP BIOSphere and HP Client Security
- Standard commercial 1 year limited warranty with extended service available with optional HP Care Packs
- New collaboration keyboard with dedicated collaboration keys, multitouch gestures enabled for clickpad and backlit keyboard

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.

2. vPro™ support not available on all configurations.

3. MIL STD 810G testing is not intended to demonstrate fitness for U.S. Department of Defense contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Damage under the MIL STD test conditions or any accidental damage requires an optional HP Accidental Damage Protection Care Pack.

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

Features

PRODUCT NAME

HP Pro x2 612 G2

OPERATING SYSTEM

Preinstalled Windows 10 Pro 64¹
Windows 10 Pro 64 (National Academic License)²
Windows 10 Home 64¹
Windows 10 Home Single Language 64¹
Windows 10 IoT 64 Enterprise LTSB for Retail¹

Web Supported Windows 10 Enterprise 64¹

Note: Your product does not support Windows 8 or Windows 7.

In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on products configured with Intel and AMD 7th generation and forward processors or provide any Windows 8 or Windows 7 drivers on <http://www.support.hp.com>.

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://www.windows.com>.
2. Some devices for academic use will automatically be updated to Windows 10 Pro Education with the Windows 10 Anniversary Update. Features vary; see <https://aka.ms/ProEducation> for Windows 10 Pro Education feature information.

PROCESSOR

Intel® Pentium® Gold 4410Y with Intel Graphics 615
(1.5 GHz, 2 MB cache, 2 cores)

Intel® Core™ M3-7Y30 with Intel Graphics 615
(1 GHz, up to 2.6 GHz, 4 MB cache, 2 cores)

Intel® Core™ i5-7Y54 with Intel Graphics 615
(1.2 GHz, up to 3.3 GHz, 4 MB cache, 2 cores)

Intel® Core™ i5-7Y57 with Intel Graphics 615, vPro™ Support
(1.2 GHz, up to 3.2 GHz, 4 MB cache, 2 cores)

Intel® Core™ i7-7Y75 with Intel Graphics 615, vPro™ Support
(1.3 GHz, up to 3.6 GHz, 4 MB cache, 2 cores)

Processors Family

7th Generation Intel® Pentium® processor (4410Y model)
7th Generation Intel® Core™ M3 processor (7Y30 model)
7th Generation Intel® Core™ i5 processor (i5-7Y54, i5-7Y57 models)
7th Generation Intel® Core™ i7 processor (i7-7Y75 model)

Features

NOTE: In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on products configured with Intel and AMD 7th generation and forward processors or provide any Windows 8 or Windows 7 drivers on <http://www.support.hp.com>.

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

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.

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated

Intel® HD Graphics 615¹

Discrete

Intel® UMA Graphics (GT2)

With shared video memory

1. HD content required to view HD images.

DISPLAY

Internal

30.48 cm (12") diagonal FHD BrightView WUXGA+ UWVA ultra-slim LED-backlit (1920 x 1280) touch screen chemically-strengthened Corning® Gorilla® Glass 4 top cover directly bonded to display

1. HD content required to view HD images.

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

Refresh Rate	60 Hz
Brightness	340 nits (typical)
Pixel Resolution	Format 1920 x 1280 (WUXGA+)
	Configuration RGB Stripe
Interface	eDP 1.3
LCD Mode	IPS/FFS/VA
PPI	192 ppi
Viewing Angle	UWVA 85/85/85/85 (Left/Right/Down/Up)

External

24-bit + 8 bit alpha channel (standard)

Up to 30-bit per pixel color depth (Wide Color Gamut)

Features

STORAGE

Supports M.2 Solid State Drive SS 2280
128 GB SATA-3 SS VALUE SSD
256GB 2280 M2 PCIe-3x4 SS NVMe TLC
256GB 2280 M2 SATA-3 Self Encrypted OPAL2 TLC
256GB 2280 PCIe NVMe Value
360GB 2280 PCIe-3x4 NVMe TLC
512GB 2280 M2 PCIe-3x4 SS NVMe TLC
512GB 2280 PCIe NVMe Value
512GB 2280 M2 SATA-3 Three Layer Cell Federal Information Processing Standard

1. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.

MEMORY

LPDDR3 1866 (Transfer rates up to 1866 MT/s)
Supports Dual Channel Memory
Memory Soldered Down
Non-accessible
Not upgradeable

Configurations

4 GB
8 GB

Memory Maximum

Up to 8 GB

NETWORKING/COMMUNICATIONS

Broadband Wireless (WWAN)^{1,2,3}

HP hs3210 HSPA+ Mobile Broadband Module
HP lt4120 Qualcomm® Snapdragon™ X5 LTE Mobile Broadband Module

Wireless LAN (WLAN)

Intel® Dual Band Wireless-AC 8260 802.11 a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 combo (vPro)
Intel® Dual Band Wireless-AC 8260 802.11 a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 combo (non-vPro)

Optional GPS

HP Graff GNSS Module ²

Near Field Communications (NFC)

HP Module with NXP NFC Controller NPC100²

Support for Miracast (Windows 10) ⁴

1. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.

Features

2. Sold separately or as an optional feature.
3. Mobile Broadband requires separately purchased service contract and factory configuration. 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, and in all regions.
4. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming media players that also support Miracast. You can use Miracast to share what you're doing on your PC and present a slide show. For more information: <http://windows.microsoft.com/en-us/windows-8/project-wireless-screen-miracast>

AUDIO/MULTIMEDIA

Audio on Tablet

Integrated stereo speakers (DTS)
Integrated dual-microphone array

Camera – Front

Integrated 5 MP (1080p)

- 1080p format for video
- 5 MP for still capture
- Supports videoconferencing* and still image capture
- High quality fixed focus lens
- Video capture at various resolutions up to 1920x1080 resolution (1080p) and up to 30 fps
- M-JPEG compression supports higher frame rates for video capture and videoconferencing*
- Improved low light sensitivity
- Improved dynamic range

Camera – Back

Integrated 8 MP with flash (1080p)

- 1080p format for video
- 8 MP for still capture
- Supports videoconferencing* and still image capture
- High quality auto focus lens
- Video capture at various resolutions up to 1920x1080 resolution (1080p) and up to 30fps
- M-JPEG compression supports higher frame rates for video capture and videoconferencing*
- Improved low light sensitivity
- Improved dynamic range

Sensors on Tablet

Accelerometer Magnetometer, Gyro (Combo chip)
Proximity (SAR for WWAN)
Ambient light sensor

*Internet access required.

Features

ACTIVE PEN

HP Active Pen with Bluetooth® App Launch

Pen Technology	Wacom AES
Digitizer	N/A, shared with touch
Dimensions	147.4 x 9.5 mm
Weight	17.5 g
Power	AAAA battery and 319 coin cell x2
System Requirements	Windows 10
Tip Diameter	1 mm
Pen Tips	Three extra elastomer pen tips for replacement
Pressure Sensitivity (Y/N)	Yes (2048 levels)
Buttons (Y/N)	Yes, 3
Resolution	2540 ppi
Report rate	133hz
Hover Capability (Y/N)	Yes
Hover Height (mm)	10mm+
Palm Rejection (Y/N)	Yes
Tilt Angle (Y/N)	>60 degrees from vertical
Battery Life Based on Continuous Usage	7.5 month+

KEYBOARD

Optional HP Pro x2 612 G2 Collaboration Keyboard¹

Kit Contents: HP Pro x2 612 G2 Collaboration Keyboard and documentation

Weight: 2.65 lbs (1203g)

1. Sold separately or as an optional feature.

Keyboard Features

- Backlit
- HP DuraKeys
- ClickPad™ (91 x 51 mm) with image sensor, multi-touch gestures enabled, on/off function and LED indicator
- 165° max opening angle
- Docking connector to tablet
- Wipeable back cover
- Full size 81/82-key island-style backlit keyboard with full row of function keys and LED indicators

ClickPad

Glass with chemical etched surface
Supports 2-way scroll
Taps enabled as default
Gestures enabled by default - 2 Finger Scrolling, 2 Finger Zoom (Pinch)

Keyboard Features (Collaboration Keyboard only)

F1 – Display Switching



Features

F2 - Blank
F3 - Brightness Down
F4 - Brightness Up
F5 - Speaker Mute
F6 - Volume Down
F7 - Volume Up
F8 - Mic Mute
F9 - Backlight Toggle
F10 - Number Lock
F11 - Wireless On/Off F12
- Calendar

Dedicated Skype keys:

Present
Call answer/initiate
Call end
Delete

SOFTWARE AND SECURITY

BIOS

HP BIOSphere Gen3¹
HP Sure Start Gen3²
HP DriveLock | HP Automatic DriveLock
BIOS Update via Network
Master Boot Record Security
Power On Authentication
Secure Erase³
Absolute Persistence Module⁴
Pre-boot Authentication

Communication / Connectivity

HP Mobile Connect Pro⁶
Native Miracast Support⁷
HP LAN-WLAN Protection
HP MAC Address Manager (select models only)
HP Wireless Wakeup (Intel platforms only)
HP SureConnect
HP Velocity

HP Value Add Software

HP ePrint Driver + JetAdvantage⁸
HP Hotkey Support - CMIT
HP Jumpstart

Features

HP Support Assistant⁹
HP Noise Cancellation Software

Microsoft Products

Buy Office
Bing Search
Skype¹⁰

Manageability

HP Driver Packs¹¹
HP SoftPaq Download Manager (SDM)
HP System Software Manager (SSM)¹¹
HP BIOS Config Utility (BCU)¹¹
HP Client Catalog¹¹
HP MIK for Microsoft SCCM¹² -
HP Image Assistant
LANDESK Management¹³
Discover HP Touchpoint Manager¹⁴

For more information on HP Client Management Solutions refer to: <http://www.hp.com/go/clientmanagement>.

Client Security Software

HP Client Security Suite Gen3¹⁵

- HP Security Manager (including Credential Manager and Password Manager)
- HP Drive Lock
- HP Fingerprint Sensor
- HP Password Manager
- Absolute Persistence Module
- Power On Authentication

Microsoft Defender¹⁶
HP WorkWise¹⁷

Standard

For Windows 10, Trusted Platform Module (TPM) 2.0 (Infineon SLB9670). Common Criteria EAL4+ Certified.

HP Fingerprint Reader (On select models)

For more information on HP Client Security Software Suite, refer to <http://www.hp.com/go/clientsecurity>.

¹ Requires Intel® 7th generation processors.

² Available on HP Elite products equipped with Intel® 7th generation processors.

³ For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88. Supported on Elite platforms with BIOS version F.03 or higher

Features

- 4 Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: <http://www.absolute.com/company/legal/agreements/computrace-agreement>. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.
- 6 HP Mobile Connect Pro is only available on preconfigured devices with WWAN. For geographic availability refer to <http://www.hp.com/go/mobileconnect>
- 7 Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming media players that also support Miracast. You can use Miracast to share what you're doing on your PC and present a slide show. For more information: <http://windows.microsoft.com/en-us/windows-8/project-wireless-screen-miracast>
- 8 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 <http://www.hp.com/go/eprintcenter>). Requires optional broadband module. Broadband use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Separately purchased data plans or usage fees may apply. Print times and connection speeds may vary.
- 9 Requires Windows and Internet Access
- 10 Skype is not offered in China.
- 11 Not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>
- 12 HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>
- 13 Subscription required
- 14 HP Touchpoint Manager requires purchase of a subscription and supports Android™, iOS and Windows 7 or higher operating systems and PCs, notebooks, tablets and smartphones from various manufacturers. Not available in all countries see <http://www.hp.com/touchpoint> for availability information
- 15 Requires Windows and Intel® 7th generation processors.
- 16 Opt in and internet connection required for updates.
- 17 HP WorkWise smartphone app will soon be available as a free download on the App Store and Google Play.

POWER

Power Supply

- HP 45 W USB Type-C™ AC adapter
- HP 65 W USB Type-C™ AC adapter
 - USB Type-C™ DC integrated cord (1.8m)
 - AC Power cord (1m)
 - AC Adapter Weight: 245g +/- 10g

Primary Battery

4-cell, long life 41 Wh Li-ion²
Supports battery fast charge (65W adapter only).

Power cord

Duckhead Power Cord (3.28 feet /1.0 m)

Features

Battery life¹

Windows 10 battery time:

Up to 10 hours *

* Units enabled with 65w adapters or higher can support fast charging of the battery from 0-45% in 30 minutes while the system is off.

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.
2. 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.

WEIGHTS & DIMENSIONS

Weight¹

Tablet only

Starting at 1.87 lbs (850 g)

Tablet with Collaboration Keyboard

2.65 lbs (1203 g)

1. Weight will vary by configuration.

Dimensions - (w x d x h)

Tablet

11.81 x 8.65 x 0.36 in (300 x 219.3 x 9.1 mm)

Tablet with Collaboration Keyboard

11.81 x 8.65 x 0.57 in (300 x 219.3 x 14.6 mm)

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

PORTS/SLOTS

Tablet

Ports

1 USB Type-C™ (docking, charging, and USB 3.1)

1 USB A 3.0

1 headphone/microphone combo

Slots

1 Micro SIM drawer (optional)

1 Micro SD Media Reader drawer - supports microSD, microSDHC, microSDXC

SERVICE AND SUPPORT

HP Services offers 3-year and 1-year limited warranties and 90 day software limited warranty options 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 Services ¹ are

Features

optional 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. HP Care Packs are sold separately. 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. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

Features

DISPLAY

Note: All specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.

<p>12.0" diagonal LED-backlit BV UWVA eDP 1.3 Ultra-slim (1920 x 1280 – Full HD*) Chemically-strengthened Corning® Gorilla® Glass 4 top cover directly bonded to display</p>	<p>Outline Dimensions (W x H x D) Active Area Weight Diagonal Size Surface Treatment Touch enabled Contrast Ratio Refresh Rate Brightness Pixel Resolution</p>	<p>267.7 x 184.4 (mm) max 253.44 x 168.96 (mm) 200 g max 12.0 (inch) Bright-View (BV) Yes 800:1 (typical) 60 Hz 340 nits</p> <p>Format 1920 x 1280 (WUXGA+)</p> <p>Configuration RGB</p> <p>Interface eDP 1.3 + PSR</p> <p>LCD Mode LED</p> <p>PPI 192</p> <p>Viewing Angle UWVA 85/85/85/85</p>
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ENVIRONMENTAL & INDUSTRY

Environmental Data HP Pro x2 612 G2

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: <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. Search keyword <i>generator</i> on HP's 3rd party option store for solar energy accessory at http://www.hp.com/go/options. 		
	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, 50Hz
	Normal Operation (Short idle)	7.88 W	6.23 W	8.02 W
	Normal Operation (Long idle)	4.67 W	4.87 W	4.99 W
	Sleep	0.31 W	0.35 W	0.30 W
	Off	0.25 W	0.26 W	0.24 W

Features

	<p>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.</p>		
Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	27 BTU/hr	21 BTU/hr	27 BTU/hr
Normal Operation (Long idle)	16 BTU/hr	17 BTU/hr	17 BTU/hr
Sleep	1 BTU/hr	1 BTU/hr	1 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 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	2.6	16	
Fixed Disk – Random writes	2.6	15	
Longevity and Upgrading	<p>This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:</p> <ul style="list-style-type: none"> • 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?? <p>Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.</p>		
Batteries	<p>This battery(s) in this product comply with EU Directive 2006/66/EC</p> <p>Batteries used in the product do not contain: Mercury greater the 1ppm by weight Cadmium greater than 20ppm by weight</p> <p>Battery size: CR2032 (coin cell) Battery type: Lithium</p>		

Features

	Additional Information	<ul style="list-style-type: none"> 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 91% recycle-able when properly disposed of at end of life. 		
	Packaging Materials	External:	PAPER/Corrugated	328 g
		Internal:	PLASTIC/Polyethylene Expanded - EPE	45 g
			PLASTIC/Polyethylene low density – LDPE	14 g
		The plastic packaging material contains at least 50% recycled content.		
		The corrugated paper packaging materials contains at least 70% 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): <ul style="list-style-type: none"> 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, has been voluntarily removed from most applications. Radioactive Substances Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO) 		

Features

	Packaging Usage	<p>HP follows these guidelines to decrease the environmental impact of product packaging:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p>
	HP, Inc. Corporate Environmental Information	<p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html</p> <p>Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</p> <p>ISO 14001 certificates: http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842 and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</p>

STORAGE

**128 GB SATA-3 SS
VALUE SSD**

Drive Weight	0.02 lb (10 g)
Capacity	128 GB
Height	0.09 in (2.3 mm)
Width	0.87 in (22 mm)
Interface	ATA-8, SATA 3.0



Features

Performance	Maximum Sequential Read	Maximum Sequential Write
	535 MB/s	515 MB/s
Logical Blocks	250,069,680	
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	ATA Security; DIPM; TRIM; DEVSLP	

256GB 2280 M2 PCIe-3x4 SS NVMe TLC

Drive Weight	0.02 lb (10 g)	
Capacity	256 GB	
Height	0.09 in (2.3 mm)	
Width	0.87 in (22 mm)	
Interface	PCIe NVMe Gen3X4	
Performance	Maximum Sequential Read	Maximum Sequential Write
	2600 MB/s	900 MB/s
Logical Blocks	500,118,192	
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	ATA Security (Option) TRIM; L1.2	

256GB 2280 M2 SATA-3 Self Encrypted OPAL2 TLC

Drive Weight	0.02 lb (10 g)	
Capacity	256 GB	
Height	0.09 in (2.3 mm)	
Width	0.87 in (22 mm)	
Interface	ATA-8, SATA 3.0	
Performance	Maximum Sequential Read	Maximum Sequential Write
	530 MB/s	515 MB/s
Logical Blocks	500,118,192	
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	ATA Security; TCG Opal 2.0 DIPM; TRIM; DEVSLP	

256GB 2280 PCIe NVMe Value

Drive Weight	0.02 lb (10 g)	
Capacity	256 GB	
Height	0.09 in (2.3 mm)	
Width	0.87 in (22 mm)	
Interface	PCIe NVMe Gen3X4	
Performance	Maximum Sequential Read	Maximum Sequential Write
	1700 MB/s	600 MB/s
Logical Blocks	500,118,192	
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	ATA Security; TCG Opal 2.0 ; FIPS; TRIM; L1.2	
Drive Weight	0.02 lb (10 g)	

Features

360GB 2280 PCIe-3x4 NVMe TLC	Capacity	360GB	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	PCIe NVMe Gen3X4	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		1700 MB/s	600 MB/s
	Logical Blocks	703,282,608	
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]		
Features	ATA Security (Option); TRIM; L1.2		

512GB 2280 M2 PCIe-3x4 SS NVMe TLC	Drive Weight	0.02 lb (10 g)	
	Capacity	512 GB	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	PCIe NVMe Gen3X4	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		2600 MB/s	1400 MB/s
Logical Blocks	1,000,215,216		
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]		
Features	ATA Security; TRIM; L1.2		

512GB 2280 PCIe NVMe Value	Drive Weight	0.02 lb (10 g)	
	Capacity	512 GB	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	PCIe NVMe Gen3X4	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		1700 MB/s	600 MB/s
Logical Blocks	1,000,215,216		
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]		
Features	ATA Security; TCG Opal 2.0 ; FIPS; TRIM; L1.2		

512GB 2280 M2 SATA-3 Three Layer Cell Federal Information Processing Standard	Drive Weight	0.02 lb (10 g)	
	Capacity	512 GB	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	PCIe NVMe Gen3X4	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		530 MB/s	500 MB/s
Logical Blocks	1,000,215,216		
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]		
Features	ATA Security; TCG Opal 2.0 ; FIPS; TRIM; L1.2		

Features

SECURITY

HP Fingerprint Reader (Optional – available on the Tablet)	Mobile Voltage Operation	3.0V-3.6V
	Operating Temperature	14° – 167°F (-10° – 75°C)
	Current Consumption Image	36 mA peak
	Low Latency Wait for Finger	950 uA
	Capture Rate	30 cm/sec
	ESD Resistance	IEC 61000-4-2 4B (±15KV)
	Detection Matrix	200*1 (plus another secondary line) 508 dpi 10 mm sensor area

NETWORKING/COMMUNICATIONS

HP hs3210 HSPA+ Mobile Broadband Module*

Technology/Operating bands	HSPA+: 2100 (Band1), 1900 (Band 2), 850 (Band 5), 900 (Band 8) MHz E-GPRS: 1900 (Band 2), 1800 (Band 3), 850 MHz (Band 5), 900 (Band 8) MHz
Wireless protocol standards	WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification E-GPRS: Class B, Multi-slot class 33, coding schemes CS1 - CS4 and MSC1 - MSC9
Maximum data rates	HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload) E-GPRS: 296 kbps (Download), 236.8 kbps (Upload) GPRS: 107 kbps (Download), 85.6 kbps (Upload)
Maximum output power	HSPA+: 24 dBm E-GPRS 1800/1900: 26 dBm E-GPRS 850/900: 27 dBm GPRS 1800/1900: 30 dBm GPRS 850/900: 33 dBm
Maximum power consumption	HSPA+: 1,100 mA (peak); 800 mA (average) E-GPRS: 2,800 mA (peak); 700 mA (average)
Form Factor	M.2, 2242-S3 Key B
Weight	6 g
Dimensions (Length x Width x Thickness)	1.65 x 8.66 x 0.09 in (42 x 22 x 2.38 mm)

*Mobile Broadband requires separately purchased service contract and factory configuration. 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, and in all regions.

Features

HP It4132 LTE/HSPA+ 4G Mobile Broadband Module*

Technology/Operating bands	LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3) MHz, 850 (Band 5), 2600 (Band 7), 900 (Band 8) MHz, 800 (Band 20), 700 (Band 28) MHz. HSPA+: 2100 (Band 1), 1900 (Band 2), 850 (Band 5), 900 (Band 8) MHz E-GPRS: 1900 (Band 2), 1800 (Band 3), 850 (Band 5), 900 (Band 8) MHz
Wireless protocol standards	3GPP Release 10 LTE Specification CAT.4, 20MHz BW WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification E-GPRS: Class B, Multi-slot class 12, coding schemes CS1 - CS4 and MSC1 - MSC9
GPS	Standalone, A-GPS (MS-B and LTO)
GPS bands	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
Maximum data rates	LTE: 150 Mbps (Download), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload) EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)
Maximum output power	LTE: 23 dBm HSPA+: 23.5 dBm E-GPRS 1900/1800: 26 dBm E-GPRS 900/850: 27 dBm GPRS 1900/1800: 29.5 dBm GPRS 900/850: 32.5 dBm
Maximum power consumption	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average) E-GPRS: 2,600 mA (peak); 500 mA (average)
Form Factor	M.2, 3042-S3 Key B
Weight	6 g
Dimensions (Length x Width x Thickness)	42 x 30 x 2.3 mm

* Mobile Broadband requires separately purchased service contract and factory configuration.
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, and in all regions.

HP It4120 Qualcomm® Snapdragon™ X5 LTE Mobile Broadband Module *

Technology/Operating bands	LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700/2100 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 17 lower), 800 (Band 20), 700 (Band 28). HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz EV-DO: 850 (BC0), 1900 (BC1) MHz (Only work with Verizon network) E-GPRS: 1900 (Band 2), 1800 (Band 3), 850 (Band 5), 900 (Band 8) MHz
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Features

Wireless protocol standards	3GPP Release 10 LTE Specification CAT.4, 20MHz BW WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification 1xEVDO Release 0, A and B. E-GPRS: Class B, Multi-slot class 12, coding schemes CS1 - CS4 and MSC1 - MSC9
GPS	Standalone, A-GPS (MS-A, MS-B and XTRA)
GPS bands	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
Maximum data rates	LTE: 150 Mbps (Download), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload) CDMA 1xRTT: 153.6 kbps (Download), 153.6 kbps (Upload) EVDO Rel.A: 3.1 Mbps (Download), 1.8 Mbps (Upload) EVDO Rel.B: 14.7 Mbps (Download), 5.4Mbps (Upload) EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)
Maximum output power	LTE: 23 dBm HSPA+: 23.5 dBm 1xRTT/EVDO: 24dBm E-GPRS 1900/1800: 26 dBm E-GPRS 900/850: 27 dBm GPRS 1900/1800: 29.5 dBm GPRS 900/850: 32.5 dBm
Maximum power consumption	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average) 1xRTT/EVDO: 1,000 mA (peak); 700 mA (average) E-GPRS: 2,800 mA (peak); 500 mA (average)
Form Factor	M.2, 3042-S3 Key B
Weight	6.2 g
Dimensions (Length x Width x Thickness)	42 x 30 x 2.3 mm

* Mobile Broadband requires separately purchased service contract and factory configuration.
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, and in all regions.

Intel® Dual band wireless-AC 8265 802.11AC 2x2 WiFi + BT 4.2 Combo Adaptor (non-vPro)

Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability Frequency Band	Wi-Fi certified 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.

Features

	802.11a/n
	<ul style="list-style-type: none"> • 4.9 – 4.95 GHz (Japan) • 5.15 – 5.25 GHz • 5.25 – 5.35 GHz • 5.47 – 5.725 GHz • 5.825 – 5.850 GHz <p>Note: Indonesia no support this band)</p>
Data Rates	<ul style="list-style-type: none"> • 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: 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 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
Network Architecture Models	Ad-hoc (Peer to Peer)
Roaming	Infrastructure (Access Point Required)
Output Power²	IEEE 802.11 compliant roaming between access points <ul style="list-style-type: none"> • 802.11b : +16dBm minimum • 802.11g : +14dBm minimum • 802.11a : +14dBm minimum • 802.11n HT20(2.4GHz) : +14dBm minimum • 802.11n HT40(2.4GHz) : +12dBm minimum • 802.11n HT20(5GHz) : +14dBm minimum • 802.11n HT40(5GHz) : +12dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max)

Features

	Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connect Standby: 10 mW (WLAN+BT) Radio disabled: 5 mW
Power Management	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 : -88dBm maximum 802.11a, 54Mbps : -74dBm 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 4.0/4.1/4.2 Wireless Technology	
Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz

Features

Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)												
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps BLE : 1 Mbps data rate; throughput up to 0.2 Mbps Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)												
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 Legacy	<table border="1"> <thead> <tr> <th>Modulation</th> <th>0.01% BER</th> <th>0.001% BER</th> </tr> </thead> <tbody> <tr> <td>GFSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td>$\pi/4$-DQPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td>8DPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> </tbody> </table>	Modulation	0.01% BER	0.001% BER	GFSK	-80 dBm	-70 dBm	$\pi/4$ -DQPSK	-80 dBm	-70 dBm	8DPSK	-80 dBm	-70 dBm
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	Legacy Up to 33 ft (10 m) BLE Up to 99 ft (30 m)												
Electrical Interface Bluetooth Software Supported Link Topology	USB 2.0 compliant Microsoft Windows Bluetooth Software												
Electrical Interface Bluetooth Software Supported Security	Point to Point, Multipoint Pico Nets up to 7 slaves												
Power Management Certifications	Full support of Bluetooth Security Provisions Microsoft Windows ACPI, and USB Bus Support Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff												
Security	All necessary regulatory approvals for supported countries, including:												
Certifications Bluetooth Profiles Supported	FCC (47 CFR) Part 15C, Section 15.247 & 15.249												
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950												
Certifications	UL, CSA, and CE Mark												

Features

Bluetooth Profiles Supported	<ul style="list-style-type: none"> Serial Port Profile (SPP)¹ Service Discovery Application Profile (SDAP) Dial-Up Networking (DUN)^{1,2} Generic Object Exchange Profile (GOEP)^{1,2} Object Push Profile (OPP)^{1,2} Hard Copy Cable Replacement (HCRP)^{1,2} Personal Area Networking Profile (PAN)^{1,2} Human Interface Device Profile (HID)^{1,2} Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP) Audio Video Remote Control Profile (AVRCP)
Bluetooth V4.1/V4.2 support feature	V4.1: ESR5/6/7 compliant

V4.2: ESR8 compliant, LE Secure Connection – Basic.

* Wireless access point and Internet service required. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.

Intel® Dual band wireless-AC 8265 802.11AC 2x2 WiFi + BT 4.2 Combo Adaptor (VPro)

Wireless LAN Standards	<ul style="list-style-type: none"> IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability Frequency Band	<ul style="list-style-type: none"> Wi-Fi certified 802.11b/g/n <ul style="list-style-type: none"> • 2.402 – 2.482 GHz <p>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.</p>
Data Rates	<ul style="list-style-type: none"> 802.11a/n <ul style="list-style-type: none"> • 4.9 – 4.95 GHz (Japan) • 5.15 – 5.25 GHz • 5.25 – 5.35 GHz • 5.47 – 5.725 GHz • 5.825 – 5.850 GHz Note: Indonesia no support this band)
	<ul style="list-style-type: none"> • 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

Features

	<ul style="list-style-type: none"> • 802.11n: 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 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
Network Architecture Models	Ad-hoc (Peer to Peer)
Roaming	Infrastructure (Access Point Required)
Output Power²	IEEE 802.11 compliant roaming between access points <ul style="list-style-type: none"> • 802.11b : +16dBm minimum • 802.11g : +14dBm minimum • 802.11a : +14dBm minimum • 802.11n HT20(2.4GHz) : +14dBm minimum • 802.11n HT40(2.4GHz) : +12dBm minimum • 802.11n HT20(5GHz) : +14dBm minimum • 802.11n HT40(5GHz) : +12dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connect Standby: 10 mW (WLAN+BT) Radio disabled: 5 mW
Power Management	ACPI and PCI Express compliant power management
Receiver Sensitivity³	802.11 compliant power saving mode <ul style="list-style-type: none"> 802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm maximum 802.11a, 6Mbps : -88dBm maximum 802.11a, 54Mbps : -74dBm 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

Features

Antenna type	802.11ac, 2SS, MCS-9 : -58dBm maximum 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"> 4. Check latest software/driver release for updates on supported security features. 5. Maximum output power may vary by country according to local regulations. 6. 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). 	

Features

HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps BLE : 1 Mbps data rate; throughput up to 0.2 Mbps Legacy : Synchronous Connection Oriented links up to 3, 64 kbps channels Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth with a maximum transmit power of + 4 dBm for BR and EDR.

Receiver Sensitivity Legacy

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

Legacy Up to 33 ft (10 m)
BLE Up to 99 ft (30 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

Power Management Certifications

Full support of Bluetooth Security Provisions
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

Bluetooth Profiles Supported

Power Management Certifications

ETS 300 328, ETS 300 826
Low Voltage Directive IEC950
UL, CSA, and CE Mark
Serial Port Profile (SPP)¹
Service Discovery Application Profile (SDAP)
Dial-Up Networking (DUN)^{1,2}
Generic Object Exchange Profile (GOEP)^{1,2}
Object Push Profile (OPP)^{1,2}
Hard Copy Cable Replacement (HCRP)^{1,2}
Personal Area Networking Profile (PAN)^{1,2}
Human Interface Device Profile (HID)^{1,2}
Hands Free Profile (HFP)
Advanced Audio Distribution Profile (A2DP)
Audio Video Remote Control Profile (AVRCP)

Certifications

Bluetooth Profiles Supported

Features

Bluetooth V4.1/V4.2 support feature

V4.1: ESR5/6/7 compliant

V4.2: ESR8 compliant, LE Secure Connection – Basic.

* Wireless access point and Internet service required. Availability of public wireless access points limit specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.

HP Graff GNSS Module

- Technology** Standalone GPS, GLONASS
- Operating bands** GPS L1 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
- Maximum power consumption** Active mode (continuous): 67 mA (peak); 26 mA (average)
- Form Factor** M.2, 3042-S3 Key B
- Weight** 4.3 g
- Dimensions** 42 x 30 x 2.3 mm
(Length x Width x Thickness)

* Mobile Broadband is an optional feature. Connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors.

Near Field Communications (NFC)

HP Module with NXP NFC Controller NPC100
 Marketing name: NXP NPC100 Near Field Communication Module
 Supports Windows 8, Proximity Events
 Support Windows 7, PC/SC
 NFC Forum Compliant

Near Field Communications Controller	
Dimensions (L x W x H)	Module 25 mm by 10 mm by 2.0 mm
Chipset	NPC100
System interface	I ² C

Features

NFC RF standards	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 ISO/IEC 18092 ECMA-340 NFCIP-1 Target and Initiator ECMA-320 NFCIP-2	
NFC Forum Support	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2	
Reader (PCD-VCD) Mode(1)	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 MIFARE 1K MIFARE 4K MIFARE DESFire FeliCa Jewel and Topaz cards	
Card Emulation (PICC-VICC) Mode⁽¹⁾	ISO/IEC 14443 A ISO/IEC 14443 B and B' MIFARE FeliCa	
Frequency	13.56 MHz	
NFC Modes Supported	Reader/Writer, Peer-to-Peer	
Raw RF Data Rates	106, 212, 424, 848 kbps	
Operating temperature	0°C to 70°C	
Storage temperature	-20°C to 125°C	
Humidity	10-90% operating 5-95% non-operating	
Supply Operating voltage	2.97 to 5.5 Volts	
I/O Voltage	1.8V or 3.3V	
Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)	Mode	Power Consumption, Typical⁽²⁾
	Polling	7.3 mA

Features

	Detected Test Tag Type 1	Total 283.8 mA Net Module 236.8 mA
	Detected Test Tag Type 2	Total 288.8 mA Net Module 241.8 mA
	Detected Test Tag Type 3	Total 287.7 mA Net Module 240.7 mA
	Detected Test Tag Type 4	Total 282.3 mA Net Module 235.3 mA
Antenna	Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module.	

(1) With application or UICC support

(2) Actual Power Consumption is dependent on NFC antenna and matching circuit and on the particular polling sequence and period configured.

POWER

HP 45 W USB Type-C™ AC adapter

Dimensions
Weight
Input

62.0x62.0x28.5mm
unit: 220g +/- 10g

Input Efficiency

Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec:

5V : 81.5%
9V : 86.7%
10V : 87.5%
12V : 87.8%
15V : 87.8%
20V : 87.8%

Input frequency range

47 ~ 63Hz

Input AC current

Max. 1.4 A at 90 Vac

Output

Output power

5V/15W
9V/27W
10V/37.5W
12V/45W
15V/45W
20V/45W

DC output

5V / 9V / 10V / 12V / 15V / 20V

Hold-up time

5ms at 115 Vac input

Features

	Output current limit <5.0A
Connector	USB Type-C
Environmental Design	Operating temperature 32oF to 95oF (0oto 35oC) Non-operating (storage) temperature -4oF to 185oF (-20oto 85oC) Altitude 0 to 16,400 ft (0 to 5000m) 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 65 W USB Type-C™ AC adapter	Dimensions	74x74x28.5mm
	Weight	unit: 245g +/- 10g
	Input	Input Efficiency 81.5% min at 115 Vac/ 230Vac @ 5V/3A 86.7% min at 115 Vac/ 230Vac @ 9V/3A 88% min at 115 Vac/ 230Vac @ 10V/5A 88% min at 115 Vac/ 230Vac @ 12V/5A 89% min at 115 Vac/ 230Vac @ 15V/4.33A 89% min at 115 Vac/ 230Vac @ 20V/3.25A Input frequency range 47 ~ 63 Hz Input AC current 1.7 A at 90 VAC and maximum load
	Output	Output power 65W DC output 5V/9V/10V/12V/15V/20V Hold-up time 5ms at 115 Vac input Output current limit <8.0A
	Connector	USB Type C
	Environmental Design	Operating temperature

Features

32°F to 95°F (0°C to 35°C)

Non-operating (storage) temperature

-4°F to 185°F (-20°C to 85°C)

Altitude

0 to 16,400 ft (0 to 5000m)

Humidity

5% to 95%

Storage Humidity

5% 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 100,000 hours at 25°C ambient condition.

4-cell, long life 41 Wh Li-ion

Dimensions (H x W x L)

3.4mm*91.1mm*264.58mm

Weight

170g

Cells/Type

Li-Ion/polymer cell

Energy

Voltage 7.7V

Amp-hour capacity 2700mAh

Watt-hour Capacity 41.58Wh

Temperature

Operating (Charging) 0~45°C

Operating (Discharging) -10~60°C

Battery Re-Charge Time

System in OFF mode or Standby 3Hr

Fuel Gauge LED

N/A

Optional Travel Battery Available

N/A

COUNTRY OF ORIGIN

China

ENVIRONMENTAL

TBD

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

Category	Description	Part number
Cases	HP Elite Top Load Colombian Leather Case	T9H72AA
	HP Elite Top Load Herringbone Nylon Case	T9H73AA
	HP Elite x2 612 G2 Rugged Case	Z7T26AA
Docking	HP Elite USB-C™ Dock	Z9R42AA
	HP Elite USB-C™ Docking Station	X7W54AA
	HP USB-C™ Travel Hub	Z9G82AA
Input Devices	HP Pro x2 612 Collaboration Keyboard	1FV38AA
	HP Active Pen with Bluetooth App Launch Button	T4Z24AA
	HP USB Type-C™ to VGA Adapter	N9K76AA
	HP USB Type-C™ to HDMI Adapter	N9K77AA
	HP USB Type-C™ to DisplayPort Adapter	N9K78AA
	HP USB-C™ to RJ45 Adapter	V8Y76AA
Power	HP 45W USB-C™ Auto Adapter	Z3Q87AA
Security	HP Nano Keyed Cable Lock	1AJ39AA
	HP Nano Master Keyed Cable Lock	1AJ40AA
	HP Nano Dual Head Keyed Cable Lock	1AJ41AA

Summary of Changes

Date of change:	Version History:		Description of change:
January 18, 2017	Version 1 to 2	Update	Options and Accessories section updated
January 23, 2017	Version 2 to 3	Update	Options and Accessories section updated (HP USB-C™ to RJ45 Adapter V8Y76AA)
January 24, 2017	Version 3 to 4	Update	PORTS/SLOTS Section updated (Thunderbolt™ support removed)
January 30, 2017	Version 4 to 5	Update	Multiple updates
February 6, 2017	Version 5 to 6	Update	MIL STD disclaimer updated. Battery life message updated. Footnotes of Software and Security section were updated (HP BIOS).
February 25, 2017	Version 6	Update	At a Glance and Software section updated
March 9, 2017	Version 6 to 7	Update	Features section updated (Removed NOTE in Operating System)
April 4, 2017	Version 7 to 8	Update	Processors Family added
September 21, 2017	Version 8 to 9	Update	Processor name updated
April 30, 2018	Version 9 to 10	Update	Environmental tab

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