Overview
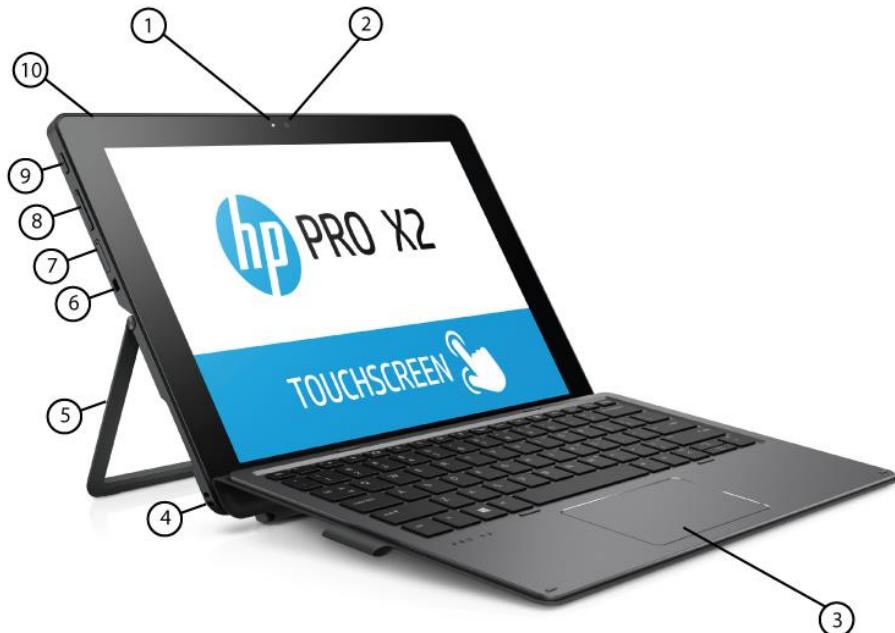
HP Pro x2 612 G2

Right View

1. Front-facing camera LED
2. Webcam
3. Touchpad
4. Pen Lanyard Slots
5. Kickstand

6. Security cable slot
7. Micro SD memory card slot
8. Volume controls
9. Power button
10. Smart card reader

Not all configuration components are available in all regions/countries.
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Page 1

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

Not all configuration components are available in all regions/countries.
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Page 2

Overview

Top and Side

1. Smart card reader
2. Speakers (2)
3. Power button
4. Volume controls

5. Security cable slot
6. Micro SD memory card slot
7. Optional NFC
8. Optional fingerprint reader

Not all configuration components are available in all regions/countries.
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Overview

Dedicated Skype for Business keys

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

Not all configuration components are available in all regions/countries.

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Overview

At A Glance

- The fanless design and up to 11 hours of battery life[1] 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 testing[3]
- 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 pad 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 keyboar0064

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.

Not all configuration components are available in all regions/countries.

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Features

PRODUCT NAME

HP Pro x2 612 G2

OPERATING SYSTEM

Preinstalled
Windows 10 Pro 64[1]
Windows 10 Pro 64 (National Academic License)[2]
Windows 10 Home 64[1]
Windows 10 Home Single Language 64[1]
Windows 10 IoT 64 Enterprise LTSB for Retail[1,3]

Web Supported
Windows 10 Enterprise 64[1]

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.

3. Available March 2017.

PROCESSOR

7th Generation Intel® Core™ M3, i5, i7 and Pentium Processors:

Intel® Pentium® 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™ i5-7Y57with 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)

Not all configuration components are available in all regions/countries.
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Features

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 615[1]

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 x1280) 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)

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

Not all configuration components are available in all regions/countries.
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Features

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
2 SODIMM memory slots
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 lt4132 LTE/HSPA+ 4G 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 NPC100[2]

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.
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

Not all configuration components are available in all regions/countries.
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Features

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
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.

Not all configuration components are available in all regions/countries.
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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 Keyboard[1]

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)

Not all configuration components are available in all regions/countries.
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Features

Keyboard Features (Collaboration Keyboard only)

F1 – Display Switching
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 Gen3
HP SureStart Gen3[10]
HP DriveLock | HP Automatic DriveLock
BIOS Update via Network
Master Boot Record Security
Power On Authentication
Secure Erase[1]
Absolute Persistence Module[2]
Pre-boot Authentication

Communication / Connectivity

HP Mobile Connect Pro (Windows 10 only)[3]
Native Miracast Support[4]
HP LAN-WLAN Protection
HP MAC Address Manager
HP Wireless Wakeup
HP SureConnect
HP Workwise
HP Velocity

HP Value Add Software

HP ePrint Driver + JetAdvantage[5]

Not all configuration components are available in all regions/countries.
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Features

HP Hotkey Support - CMIT

HP Recovery Manager

HP Jumpstart

HP Support Assistant

HP Noise Cancellation Software

HP Notifications

Microsoft Products

Buy Office

Bing Search

Skype[6]

Manageability

HP Driver Packs[7]

HP SoftPaq Download Manager (SDM)

HP System Software Manager (SSM)[7]

HP BIOS Config Utility (BCU)[7]

HP Client Catalog[7]

HP MIK for Microsoft SCCM[7]

LANDESK Management[8]

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

Client Security Software

HP Client Security Suite Gen3[10]

- 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 Defender[11]

Security Hardware

Trusted Platform Module (TPM) 2.0 (Infineon SLB9670). Common Criteria EAL4+ Certified.
Downgradable to TPM 1.2. Convertible to FIPS 140-2 Certified mode. [12]
HP Fingerprint Reader (On select models)

1. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88.
2. 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

Not all configuration components are available in all regions/countries.
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Features

Software.

3. HP Mobile Connect Pro is only available on preconfigured devices with WWAN. For geographic availability refer to http://www.hp.com/go/mobileconnect

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

5. 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.

6. Skype is not offered in China.

7. Not preinstalled, however available for download at http://www.hp.com/go/clientmanagement

8. Subscription required.

9. Sure Start Gen 3 is available on HP Elite products equipped with Intel® 7th generation processors.

10. HP Client Security Suite Gen3 requires Windows and Intel® or AMD 7th generation processors.

11. Microsoft Defender requires Windows 10.

12. This product ships with TPM 2.0 with option to downgrade to TPM 1.2. Upgrade utility is available via HP Customer Support

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-ion[2]
Supports battery fast charge (65W adapter only).

Power cord

Duckhead Power Cord (3.28 feet /1.0 m)

Battery life[1]

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-

Not all configuration components are available in all regions/countries.
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Features

WEIGHTS & DIMENSIONS

Weight[1]

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 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.

Not all configuration components are available in all regions/countries.
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Features

DISPLAY

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

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

Outline Dimensions (W x H x D)	267.7 x 184.4 (mm) max
Active Area	253.44 x 168.96 (mm)
Weight	200 g max
Diagonal Size	12.0 (inch)
Surface Treatment	Bright-View (BV)
Touch enabled	Yes
Contrast Ratio	800:1 (typical)
Refresh Rate	60 Hz
Brightness	340 nits
Pixel Resolution	**Format** 1920 x 1280 (WUXGA+)
	Configuration RGB
Interface	eDP 1.3 + PSR
LCD Mode	LED
PPI	192
Viewing Angle	UWVA 85/85/85/85

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	
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	

Not all configuration components are available in all regions/countries.
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Features

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	

360GB 2280 PCIe-3x4 NVMe TLC	**Drive Weight**	0.02 lb (10 g)	
	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

Not all configuration components are available in all regions/countries.

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Features

	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	

Not all configuration components are available in all regions/countries.

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Features

SECURITY

HP Fingerprint Reader	**Mobile Voltage Operation**	3.0V-3.6V
	Operating Temperature	14° – 167°F (-10° – 75°C)
(Optional – available on the Tablet)	**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.

HP lt4132 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,

Not all configuration components are available in all regions/countries.
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	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 lt4120 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
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)

Not all configuration components are available in all regions/countries.

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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.

WLAN MODULES

Intel® Tri Band Wireless-N 18265 802.11 ac 2x2 WiFi + BT 4.2 +WiGig combo adaptor

Form Factor	Combo Module, M.2 3030-S3–A
Dimensions	30.00±0.15mm by 30.00±0.15mm by 2.38mm max.
Weight	4 grams
Operating Voltage	3.3 Volts
Wireless LAN Standards	IEEE 802.11ad
Interoperability	Wi-Fi certified MAC and Physical Layer
	WiFi Alliance/WiGig Alliance Protocol Adaption Layers (PALs) (Not yet ratified)
	Wireless Display Extension (WDE)
	Wireless Serial Extension (WSE)
	Note: IP protocol is not supported
Frequency Band	802.11ad
	57 – 66 GHz
	Note: There are 4 bands (1, 2, 3, 4) but only 2 (bands 2 and 3) are supported in most of the countries on the planet. HP will

Not all configuration components are available in all regions/countries.

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support only bands 2 and 3, 59-64 GHz

Note: Not all countries allow unlicensed operation at these frequencies

Antenna Structure (Remote Front End Module, R-FEM)	Active, Beam Steering Array of 10 x 2 Elements, 8 x 2 Active Elements Azimuth 8 active elements Elevation 2 active elements Vertical tilt of 20 to 30 degrees off of broadside Horizontal beam steering ±65°, -6dB from peak gain Vertical beam steering +80° -50°, -6dB from peak gain Azimuth beam width ~20°, -6dB from peak gain Elevation beam width ~80°, -6dB from peak gain Omni (no beam forming) beam width ~110°, -6dB from peak gain Vertical Polarization Device side supports one R-FEM Dock side supports one or two R-FEMs

Data Rates (RAW)

MCS	Rate, Mbit/s	Modulation
0	27.5	π/2-BPSK
1	385.0	π/2-BPSK
2	770.0	π/2-BPSK
3	962.5	π/2-BPSK
4	1155.0	π/2-BPSK
5	1251.25	π/2-BPSK
6	1540.0	π/2-QPSK
7	1925.0	π/2-QPSK
8	2310.0	π/2-QPSK
9	2502.5	π/2-QPSK
10	3080.0	π/-16QAM
11	3850.0	π/-16QAM
12	4620.0	π/-16QAM

Network Architecture Models	Ad-hoc (Peer to Peer)	
Wireless Display Extension (WDE)	WGA WDE support	AV PAL (WDE) as defined by WiGig alliance
	AVC/MPEG support - encoder	WDE supports generation of MPEG-PS / MPEG-PES packets as described in the WDE standard WDE supports AVC (H264) encoder, intra only, 4:4:4 Chroma subsampling. Different visually lossless and lossy scenarios are supported by configuration
	AVC/MPEG support – decoder	H.264 CAVLC 4:4:4 I-only sub sampling is supported
	Type of Interface	Client device side • DP (Display port) v1.2a – HBR (1, 2, 4 lanes) Dock device side • DP v1.2 – HBR (1, 2, 4 lanes)

Features

	• HDMI v1.4a (through external Hub or cable adapter) • DP++ compatible
DP Resolution and Frame Rate Support	**Note**: DP v1.2 is backward compatible with DP v1.1a DP will support the following resolutions 640x480, 1280x720, 1920x1080, 1920x1200, 2560x1440, 2560x1600 and frame rates – 24, 25, 30, 50 and 60 Hz All resolutions are in progressive mode (no interlaced supported) Specifically, the following resolutions and frame rats will be supported • 640x480p60 • 1280x720p60 • 1920x1080p60 • 1920x1200p60 • 2560x1440p60 • 2560x1600p60 **Note:** resolution and refresh rate may change in situations where there is a bad link or strict limits on TDP
HDMI Resolution and Frame Rate Support	HDMI supports the following resolution and frame rates – • 640x480p60 • 1280x720p60 • 1920x1080p60 • 1920x1200p60 • 2560x1440p60 • 2560x1600p60 **Note:** resolution and refresh rate may change in situations where there is a bad link or strict limits on TDP
Color space support	YCbCr and RGB
DP & HDMI Color Depth Support	The following color depths are supported 8 bits per color
Dual display mode	The Output interface (Display Port Multi-Stream Transport, DP MST) has the ability to support dual display mode – splitting the video stream is based on external HW (with monitors that can support it, a daisy chain approach can be used to support dual display mode)
Multiple Display Stream Support (MST)	The following dual display mode via MST is supported • 2 x (1280x720) • 2 x (1920x1080)

Not all configuration components are available in all regions/countries.

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		• 2 x (1920x1200) 1920x1080 plus 1920x1200
	Audio Pass-Through Support	Support for all relevant Audio formats in Support for all relevant Audio formats in Pass-Through mode as defined in the WDE specification. LPCM (uncompressed and uncompounded), 2-8 channels, 32KHz – 192KHz, up to 24 bits per sample (dependent on the number of channels)
	Independent Digital Audio Out Interface (Sink)	Support for an independent digital Audio Out sink interface, operational upon insertion of an audio peripheral, and not dependent on monitor state (On/Off/Powered-Off) • 4 x I2S Interfaces • Multiplexed with • S/PDIF Interface
	Selection of Independent Audio Out Interface	Selection of output interface (I²S or SPDIF) and on-board audio device capabilities is configurable on a system basis through module Flash Configuration.
	AUX/DDC Channel Interface	AUX (DP) / DDC (HDMI) channel is supported. **Note:** FAUX – fast AUX (~7000Mb) is not required.
	Chosen resolution, frame rate, color space, audio capabilities	WDE will inform the host graphics of the best resolution , frame rate, color space and audio capabilities based on • Native/Supported monitor resolutions • Module Core Capabilities • Power consumption considerations • Link status(physical layer rate and other services)
	Hot Plug	Plug and Play through hot plug detection is not supported
Wireless Serial Extension (WSE) for support of USB data flow over wireless link	WGA WSE support	USB PAL (WSE) version 1.2 (June 2013)
	WSE Supported USB Ports	Single USB 2.0/3.0 Root Port
	USB Hub	Supports direct connection to an external USB Hub device. Any USB devices on the Dock device should be connected to the external USB Hub.
	Port Powering	Module does not support USB device powering. Any Dock device must be self-powered or powered from an external USB Hub in the Dock Device.

Not all configuration components are available in all regions/countries.

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		The module is capable of managing the powering requirements of USB devices connected to the Dock USB Hub external to the module.
	WSE Supported Devices	USB devices listed in 'Supported USB Peripherals over USB' below are supported, separately and simultaneously. It supports control, interrupt, bulk and isochronous flows based on the supported device capabilities.
	Number of USB devices supported on Dock device	At least 12 USB devices
	Number of USB Hub Tiers supported	Maximum number of Hub Tiers connected to the external Hub in the Dock device is 3. A 4th Tier will only support non Hub devices.
	Supported USB peripherals over WSE	**Device Class** **Comment**

Device Class	Comment
HID	Supported
Printer	Supported
Communication Device Class (CDC)	Supported
Mass Storage Class (MSC)	Supported
Hub	Supported
Audio Class	Supported
USB Video Class (UVC)	Supported

* Wireless access point and Iternet 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 (non-vPro)

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

- 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/n

- 4.9 – 4.95 GHz (Japan)

Not all configuration components are available in all regions/countries.

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- 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)

Data Rates	- 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 BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[1]	- IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only - AES-CCMP: 128 bit in hardware - 802.1x authentication - 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) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	- 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

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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 802.11 compliant power saving mode
Receiver Sensitivity[3]	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	

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).

Not all configuration components are available in all regions/countries.

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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, 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

Modulation	0.01% BER	0.001% BER
GFSK	-80 dBm	-70 dBm
π/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
	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	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

Not all configuration components are available in all regions/countries.
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Bluetooth Profiles Supported	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 Iternet 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	IEEE 802.11a
	IEEE 802.11b
	IEEE 802.11g
	IEEE 802.11n
	IEEE 802.11ac
Interoperability	Wi-Fi certified
Frequency Band	802.11b/g/n

- 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/n

- 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)

Data Rates	

- 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,

Not all configuration components are available in all regions/countries.

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	and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[1]	• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • 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) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 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 802.11 compliant power saving mode
Receiver Sensitivity[3]	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

Not all configuration components are available in all regions/countries.
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	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	

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).

Not all configuration components are available in all regions/countries.
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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, 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	Modulation	0.01% BER	0.001% BER
Legacy	GFSK	-80 dBm	-70 dBm
	π/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
	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	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
	UL, CSA, and CE Mark
	Serial Port Profile (SPP)[1]
	Service Discovery Application Profile (SDAP)
	Dial-Up Networking (DUN)[1,2]
Certifications **Bluetooth Profiles Supported**	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

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

Features

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 (Length x Width x Thickness)	42 x 30 x 2.3 mm

* 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
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

Not all configuration components are available in all regions/countries.
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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

	Mode	Power Consumption, Typical[2]
Power Consumption **(Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)**	Polling	7.3 mA
	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

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

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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** 32oFto 95oF (0oto 35oC)
		Non-operating (storage) temperature -4oFto 185oF (-20oto 85oC)
		Altitude 0 to 16,400 ft (0 to 5000m)
		Humidity 5% to 95%
		Storage Humidity 5% to 95%
	EMI and Safety	*CE Mark - full compliance with LVD and EMC directives

Features

	Certifications	* 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-Lon/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

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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

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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	Update	MIL STD disclaimer updated. Battery life message updated. Footnotes of Software and Security section were updated (HP BIOS).

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