

Overview

HP Elite x2 1012 G2



- 1. Infrared camera
- 2. Infrared camera light
- 3. Audio-out/Audio-in combo jack
- 4. USB-A 3.0
- 5. Power LED
- 6. USB Type-C™ with Thunderbolt
- 7. Micro SIM Card Slot*
- 8. Kickstand
- 9. Application Launch Button (Default OneNote)
- 10. Clip
- 11. Select (Programmable Function Button)
- 12. Erase (Programmable Function Button)
- 13. Tip
- 14. Keyboard guide pins
- 15. Webcam light
- 16. Webcam
- 17. Microphones
- 18. Front-firing speakers

*only available on configurations with WWAN enabled

Overview



1. Power
2. Volume Up/Volume down
3. Micro SD Memory Card Slot
4. Security Cable Slot
5. Pen Lanyard Slots

Overview



- 1. Camera
- 2. Camera Flash

- 3. Fingerprint Sensor (optional)

Overview



HP Elite x2 1012 G2 Collaboration Keyboard

1. ClickPad

2. Pen Holder

3. Guide Pins

Collaboration Keys:

4. Present

5. Call answer/initiate

6. Call end

Collaboration Keys Detail



1. Present

2. Call answer/initiate

3. Call end

4. Delete



HP Elite x2 1012 G1 Advanced Keyboard

1. ClickPad/NFC Area

2. Smart card Slot

3. Guide Pins

Technical Specifications

At A Glance

- Designed for excellent mobility, this stylish and thin 2-in-1 design is built to the standards of Elite durability
- The quiet design and up to 10 hours and 15 minutes of battery life¹ lets you work, surf, and connect with colleagues
- Windows 10 versions
- 7th Generation Intel® Core™ (U-series) processors, some with vPro™ support²
- 12.3" diagonal ultra-slim LED-backlit better than QHD (2736 x 1824) Multi-Touch Display
- Solid State Drives up to 512GB including FIPS 140.2 (CIS only); OPAL 2 drives support up to 256GB PCIe NVMe drives support up to 1024GB
- Weight starting at 810g for Tablet
- Height starting at 8.05mm for Tablet
- Passed MIL-STD 810G testing:
 - MIL-STD is not intended to demonstrate fitness for U.S. Department of Defense contract requirements or for military use. MIL-STD test results are not a guarantee of future performance under these test conditions. Damage from drops requires separately purchase Accidental Damage Protection HP Care Pack.
- Audio by Bang & Olufsen
- Optional IR camera (mutually exclusive with WiGig)
- Dual microphone array with HP Advanced Noise Reduction Software
- Front and Back facing camera and webcam
- Supports a broad range of wireless broadband and Wi-Fi options for connectivity on the go
- Optimized security using industry standard technologies such as TPM2.0, optional integrated fingerprint reader and an optional smart card reader in the optional Advanced keyboard
- Passed EN 60601-1-2:2007 and IEC 60601-1-2:2014 tests
- ENERGY STAR® certified. EPEAT® Gold registered where applicable/supported. Registration may vary by country. See www.epeat.net for registration status by country.
- 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.

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

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.

Technical Specifications

PRODUCT NAME

HP Elite x2 1012 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
Web-only Support	Windows 10 Enterprise 64

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.

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>

PROCESSOR*

7th Generation Intel[®] Core[™] i3, i5 and i7 Processors:

Intel[®] Core[™] i3-7100U with Intel[®] HD Graphics 620
(2.4 GHz, 3 MB cache, 2 cores)

Intel[®] Core[™] i5-7200U with Intel[®] HD Graphics 620
(2.5 GHz, up to 3.1 GHz with Intel[®] Turbo Boost Technology**, 3 MB cache, 2 cores)

Intel[®] Core[™] i5-7300U with Intel[®] HD Graphics 620
(2.6 GHz, up to 3.5 GHz with Intel[®] Turbo Boost Technology**, 3 MB cache, 2 cores), vPro[™] Support

Intel[®] Core[™] i7-7600U with Intel[®] HD Graphics 620
(2.8 GHz, up to 3.9 GHz with Intel[®] Turbo Boost Technology**, 4 MB cache, 2 cores), vPro[™] Support

* Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology.. 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.

** Intel[®] Turbo Boost technology requires a PC with a processor with Intel Turbo Boost capability. Intel Turbo Boost performance varies depending on hardware, software and overall system configuration. See <http://www.intel.com/technology/turboboost> for more information.

CHIPSET

Integrated with processor

Technical Specifications

GRAPHICS

Intel® HD Graphics 620

DISPLAY

Internal

Touch screen

12.3" diagonal BrightView LED-backlit better than QHD* UWVA eDP 1.3 Ultra-slim (2736 x 1824) Touch screen Chemically-strengthened Corning® Gorilla® Glass 4 top cover directly bonded to display

Refresh Rate

60 Hz

Brightness

450 nits (maximum)

Pixel Resolution

Format	2736 x 1824 (better than QHD)
Configuration	RGB Stripe

Interface

eDP 1.3

LCD Mode

IPS/FFS/VA

PPI

268 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)

* HD content required to view HD images.

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

STORAGE AND DRIVES

Internal Storage* - supports M.2 SSD 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 (FIPS 140.2 available via CIS only)
- 1024 GB 2280 PCIe-3x4 NVMe TLC

* For SSD's, GB=1 billion bytes. TB=1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) of system disk is reserved for system recovery software.

Expansion Storage

Micro SD Media Reader Slot - Supports microSD, microSDHC, microSDXC, supporting expansion up to 2TB

Technical Specifications

MEMORY

LPDDR3-1866 (Transfer rates up to 1866 MT/s)
Supports Dual Channel Memory
Soldered Down

Standard

4 GB Total System Memory
8 GB Total System Memory

Maximum

Up to 16 GB

NETWORKING/COMMUNICATIONS

Wireless

Support for a broad range of secure, integrated wireless LAN/Bluetooth and wireless WAN options featuring support for the latest industry standards. Broadband Wireless (WWAN) requires a Windows operating system and is available in select countries as a factory-only configurable feature only. Standalone GPS is also available (factory configurable only) and is supported via combo card. WiGig is also available with the optional LAN/Bluetooth/WiGig combo module for seamless, no wires docking*** (factory configurable only)

Wireless WAN (WWAN)*

HP It4132 LTE/HSPA+ 4G Mobile Broadband Module

HP It4120 Qualcomm® Snapdragon™ X5 LTE Mobile Broadband Module

HP hs3210 HSPA+ Mobile Broadband Module

Wireless LAN (WLAN)**

Intel® Dual Band Wireless-AC 8265 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo (vPro)

Intel® Dual Band Wireless-AC 8265 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo (non-vPro)

Intel® Tri Band Wireless-AC 18265 802.11a/b/g/n/ac (2x2) and Bluetooth® 4.2 + WiGig Combo***

Standalone GPS****

HP Graff GNSS Module

* WWAN is an optional feature and requires factory configuration. WWAN 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. 4G LTE not available on all products or in all countries.

**Wireless access point and Internet service is required and is not included. Availability of public wireless access points limited.

***The WiGig-compatible notebook or tablet must be positioned within 1.2 m (4 ft) and without obstruction in the line of sight of the wireless dock. HP Advanced Wireless Docking is compatible with the HP Elite x2 1012 G2 with an optional installed Intel Tri Band Wireless AC with WiGig Combo card available at the time of purchase. WiGig docking requires the additional purchase of the HP Advanced Wireless Docking Station. IR camera is not available when WiGig is selected.

****Standalone GPS is an optional feature and requires factory configuration. GPS and WWAN are mutually exclusive.

Technical Specifications

AUDIO/MULTIMEDIA

Audio

Audio by Bang & Olufsen
Dual speakers (front facing)
Dual microphone array with echo cancellation, noise suppression
Headphone line-out and microphone-in (combo)
HP Advanced Noise Reduction Software

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

IR Camera (mutually exclusive with WiGig)

Integrated VGA IR camera w/ IR LED emitters that meets Microsoft Hello face recognition certification for secure authentication.

* Internet access required.

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

Technical Specifications

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+

OPTIONAL KEYBOARDS

Optional HP Elite x2 1012 G2 Collaboration Keyboard*

Kit contents	HP Elite x2 1012 G2 Collaboration Keyboard and documentation
Weight	.78 lb (353 g)

Optional HP Elite x2 1012 G1 Advanced Keyboard*

Kit contents	HP Elite x2 1012 G1 Advanced Keyboard and documentation
Key Features	Smart card reader FIPS-201 compliant. Security - Near Field Communications (NFC) Module

Weight	.992 lb (450 g)
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*Sold as an optional feature

Keyboard Features (common to both Collaboration and Advanced Keyboards)

- Backlit
- HP DuraKeys
- 1.3mm key travel
- 18.4mm pitch
- 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
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

Technical Specifications

Dedicated Skype for
Business keys:

Present
Call answer/initiate
Call end
Delete

Keyboard Features (Advanced Keyboard only)

Function Keys	F1 - Blank
	F2 - Blank
	F3 - Sleep
	F4 - Display Switching
	F5 - Speaker Mute
	F6 - Volume Down
	F7 - Volume Up
	F8 - Mic Mute
	F9 - Brightness Down
	F10 - Brightness Up
	F11 - Backlight Toggle
	F12 - Wireless On/Off

SOFTWARE AND SECURITY

Preinstalled Software with Windows Operating System

HP 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 Pro⁵
Native Miracast Support⁶
HP LAN-WLAN Protection
HP MAC Address Manager (select models only)
HP SureConnect
HP Velocity

HP Value Add Software

HP ePrint Driver + JetAdvantage⁷
HP Hotkey Support - CMIT
HP Jumpstart
HP Support Assistant

Technical Specifications

HP Noise Cancellation Software

Microsoft Products

Buy Office

Bing Search

Skype⁸

Manageability

HP Driver Packs⁹

HP SoftPaq Download Manager (SDM)

HP System Software Manager (SSM)⁹

HP BIOS Config Utility (BCU)⁹

HP Client Catalog⁹

HP MIK for Microsoft SCCM⁹

LANDESK Management¹⁰

Discover HP Touchpoint Manager¹¹

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

Client Security Software

HP Client Security

- 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 Defender¹²
- HP Workwise¹³

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

Security Hardware

TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified)

HP Fingerprint Reader (selectd models)

Integrated VGA IR camera with IR LED emitters that meets Microsoft Hello face recognition certification for secure authentication (select models)

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

1. BIOSphere Gen3 requires Intel® or AMD® 7th generation processors.
2. Available on HP Elite products equipped with Intel® 7th generation processors as well as the HP Pro x2 612 G2.
3. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88.
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.
5. HP Mobile Connect Pro is only available on preconfigured devices with WWAN. For geographic availability refer to www.hp.com/go/mobileconnect

Technical Specifications

6. 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>
7. Requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see www.hp.com/go/eprintcenter).
8. Skype is not offered in China.
9. Not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>
10. Subscription required.
11. 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 www.hp.com/touchpoint for availability information
12. Opt in and internet connection required for updates.
13. HP Workwise smartphone app is available as a free download on the App Store and Google Play. See requirements at www.hp.com/go/workwise

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

Tablet – Battery

4-cell Long Life Polymer 47Whr (3055mAh/cell)

- Voltage – 7.7 V
- Supports HP Fast Battery Charging*

Battery Life**

Windows 10 battery time:

Up to 10 hours and 15 minutes *

* Units enabled with 65w adapters or higher can support fast charging of the battery from 0-50% in 30 minutes while the system is off.

**Windows 10 MM14 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See www.bapco.com for additional details.

WEIGHTS & DIMENSIONS

Weight*

Tablet only

Starting at 1.77 lbs (803 g)

Tablet with Travel Keyboard

2.55 lbs (1156 g)

Tablet with Advanced Keyboard

2.94 lbs (1333 g)

Dimensions - (w x d x h)*



Technical Specifications

Tablet

11.8 x 8.4 x 0.3 in (300 x 213.85 x 8.05 mm)

Tablet with Travel Keyboard

11.8 x 8.63 x 0.53 in (300 x 219.3 x 13.55 mm)

Tablet with Advanced Keyboard

11.8 x 8.6 x 0.6 in (300 x 219.3 x 16.65 mm)

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

*Values are preliminary and may be updated before product launch.

PORTS/SLOTS

Tablet

Ports

1 USB Type-C™, supporting USB 3.1 (supports Thunderbolt™ 3)

1 USB Type-A, supporting USB 3.0

1 Headphone /microphone combo

NOTE: For optimal performance, the HP x2 1012 G2 should charge from a USB Power Delivery, v2 compatible adapter or power source that offers 12V @ 3A.

Slots

1 Micro SIM drawer (optional)

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

1 Lock slot

Advanced Keyboard

Ports

Slots

1 Smart card reader

SENSORS

Accelerometer

Magnetometer

Gyro

ALS (Ambient Light Sensor)

Proximity (SAR for WWAN)

Hall Sensor

SERVICE AND SUPPORT

HP Services offers 3-year, 1-year and 90 day 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 are optional extended service contracts that go beyond

Technical Specifications

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>.

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.

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	15 V
	Nominal Operating Amperage	4.33A
	Average Operating Power	7.21 W (non-charging)
	Max Operating Power	65 W
Temperature	Operating	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)
	Non-operating	-4° to 140° F (-20° to 60° C)
Relative Humidity	Operating	10% to 90%, non-condensing
	Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
Shock	Operating	40 G, 2 ms, half-sine
	Non-operating	240 G, 2 ms, half-sine
Random Vibration	Operating	1.043 grms
	Non-operating	3.50 grms
Altitude (unpressurized)	Operating	-50 to 10,000 ft (-15.24 to 3,048 m)
	Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)

STORAGE AND DRIVES

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		
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)		

Technical Specifications

256GB 2280 M2 SATA-3 Self Encrypted OPAL2 TLC		TRIM; L1.2	
	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		0.02 lb (10 g)	
	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		0.02 lb (10 g)	
	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
	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		0.02 lb (10 g)	
	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		
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features			

Technical Specifications

	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
1024 GB 2280 PCIe-3x4 NVMe TLC	Drive Weight	0.02 lb (10 g)	
	Capacity	512 GB	
	Height	0.14 in (3.65 mm)	
	Width	0.87 in (22 mm)	
	Interface	PCIe NVMe Gen3X4	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		1500 MB/s	980 MB/s
		Logical Blocks	2,000,409,264
		Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
		Features	ATA Security (Option); TRIM; L1.2

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	36 mA peak
	Image	

Technical Specifications

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

WWAN Modules

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 is an optional feature and requires factory configuration. 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. 4G LTE not available on all products or in all countries.

Technical Specifications

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 is an optional feature and requires factory configuration. 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. 4G LTE not available on all products or in all countries.

HP lt4225 LTE/EV-DO Gobi™ 4G Mobile Broadband Module*

Technology/Operating bands	LTE: 1400 (Band 11), 800 (Band 18, Japan 800 lower) EV-DO: 800 (BC0), 2100 (BC6) MHz
Wireless protocol standards	3GPP Release 8 LTE Specification EVDO Release 0 and Release A
GPS	Standalone
GPS bands	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
Maximum data rates	LTE: 100 Mbps (Download), 50 Mbps (Upload) CDMA 1x: 153.6 kbps (Download), 153.6 kbps (Upload) EVDO Rev.A: 3.1 Mbps (Download), 1.8 Mbps (Upload)
Maximum output power	LTE: 23 dBm CDMA/EVDO: 24dBm
Maximum power consumption	LTE: 1,200 mA (peak); 900 mA (average) EVDO: 900mA (peak); 720mA (average)
Form Factor	M.2, 3042-S3 Key B
Weight	6 g
Dimensions (Length x Width x Thickness)	1.65 x 1.18 x 0.09 in (42 x 30 x 2.3 mm)

* Mobile Broadband is an optional feature and requires factory configuration. 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. 4G LTE not available on all products or in all countries.

Technical Specifications

HP lt4226 LTE/HSPA+ Gobi 4G Module*

Technology/Operating bands	LTE: 2100 (Band 1), 800 (Band 19, Japan 800 upper), 1450 (Band 21) HSPA+: 2100 (Band 1), 800 (Band 6), 800 (Band 19) MHz
Wireless protocol standards	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification
GPS	Standalone
GPS bands	1575.42 MHz \pm 1.023 MHz, GLONASS 1596-1607MHz
Maximum data rates	LTE: 100 Mbps (Download), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload)
Maximum output power	LTE: 23 dBm HSPA+: 23.5 dBm
Maximum power consumption	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average)
Form Factor	M.2, 3042-S3 Key B
Weight	6 g
Dimensions (Length x Width x Thickness)	1.65 x 1.18 x 0.09 in (42 x 30 x 2.3 mm)

HP hs3210 WW HSPA+ w/o GPS

Technology/Operating bands	LTE: 2100 (Band 1), 800 (Band 19, Japan 800 upper), 1450 (Band 21) HSPA+: 2100 (Band 1), 800 (Band 6), 800 (Band 19) MHz
Wireless protocol standards	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification
GPS	Standalone, A-GPS
GPS bands	1575.42 MHz \pm 1.023 MHz, GLONASS 1596-1607MHz
Maximum data rates	LTE: 100 Mbps (Download), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload)
Maximum output power	LTE: 23 dBm HSPA+: 23.5 dBm
Maximum power consumption	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average)
Form Factor	M.2, 3042-S3 Key B
Weight	6 g
Dimensions (Length x Width x Thickness)	1.65 x 1.18 x 0.09 in (42 x 30 x 2.3 mm)

*Mobile Broadband is an optional feature and requires factory configuration. 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. 4G LTE not available on all products or in all countries.

HP GPS

Technology	Standalone GPS, GLONASS
Operating bands	GPS L1 1575.42 MHz \pm 1.023 MHz, GLONASS 1596-1607MHz

Technical Specifications

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

WLAN MODULES

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

Form Factor	Combo Module, M.2 2230-S3-A
Dimensions	22.00±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)
Frequency Band	Note: IP protocol is not supported 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 support only bands 2 and 3, 59-64 GHz
Antenna Structure (Remote Front End Module, R-FEM)	Note: Not all countries allow unlicensed operation at these frequencies Active, extended coverage multiple antenna array of 24 elements Almost full spherical RF coverage by having <ul style="list-style-type: none"> • Front 6 elements- horizontal + 7 elements- vertical • North 3 Patch • West 2 Dipole + 2 Patch • East 4 Dipole Device side supports one R-FEM3 Dock side supports one or two R-FEMs
Data Rates (RAW)	MCS Rate, Mbit/s Modulation
	0 27.5 $\pi/2$ -BPSK
	1 385.0 $\pi/2$ -BPSK
	2 770.0 $\pi/2$ -BPSK
	3 962.5 $\pi/2$ -BPSK
	4 1155.0 $\pi/2$ -BPSK
	5 1251.25 $\pi/2$ -BPSK
	6 1540.0 $\pi/2$ -QPSK

Technical Specifications

	7	1925.0	$\pi/2$ -QPSK
	8	2310.0	$\pi/2$ -QPSK
	9	2502.5	$\pi/2$ -QPSK
	10	3080.0	$\pi/16$ QAM
	11	3850.0	$\pi/16$ QAM
	12	4620.0	$\pi/16$ QAM
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 <ul style="list-style-type: none"> DP (Display port) v1.2a – HBR (1, 2, 4 lanes) Dock device side <ul style="list-style-type: none"> DP v1.2 – HBR (1, 2, 4 lanes) HDMI v1.4a (through external Hub or cable adapter) DP++ compatible
	DP Resolution and Frame Rate Support		<p>Note: DP v1.2 is backward compatible with DP v1.1a</p> <p>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 rates will be supported</p> <ul style="list-style-type: none"> 640x480p60 1280x720p60 1920x1080p60 1920x1200p60 2560x1440p60 2560x1600p60 <p>Note: resolution and refresh rate may change in situations where there is a bad link or strict limits on TDP</p>
	HDMI Resolution and Frame Rate Support		<p>HDMI supports the following resolution and frame rates –</p> <ul style="list-style-type: none"> 640x480p60 1280x720p60 1920x1080p60

Technical Specifications

	<ul style="list-style-type: none"> • 1920x1200p60 • 2560x1440p60 • 2560x1600p60
	<p>Note: resolution and refresh rate may change in situations where there is a bad link or strict limits on TDP</p>
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)	<p>The following dual display mode via MST is supported</p> <ul style="list-style-type: none"> • 2 x (1280x720) • 2 x (1920x1080) • 2 x (1920x1200) <p>1920x1080 plus 1920x1200</p>
Audio Pass-Through Support	<p>Support for all relevant Audio formats in Pass-Through mode as defined in the WDE specification. LPCM (uncompressed and un compounded), 2-8 channels, 32KHz – 192KHz, up to 24 bits per sample (dependent on the number of channels)</p>
Independent Digital Audio Out Interface (Sink)	<p>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)</p> <ul style="list-style-type: none"> • 4 x I2S Interfaces • Multiplexed with • S/PDIF Interface
Selection of Independent Audio Out Interface	<p>Selection of output interface (I2S or SPDIF) and on-board audio device capabilities is configurable on a system basis through module Flash Configuration.</p> <p>AUX (DP) / DDC (HDMI) channel is supported.</p>
AUX/DDC Channel Interface	<p>Note: FAUX – fast AUX (~7000Mb) is not required.</p>
Chosen resolution, frame rate, color space, audio capabilities	<p>WDE will inform the host graphics of the best resolution , frame rate, color space and audio capabilities based on</p> <ul style="list-style-type: none"> • Native/Supported monitor resolutions • Module Core Capabilities • Power consumption considerations

Technical Specifications

Wireless Serial Extension (WSE) for support of USB data flow over wireless link	Hot Plug	<ul style="list-style-type: none"> Link status(physical layer rate and other services) 																
	WGA WSE support	Plug and Play through hot plug detection is not supported 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. 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 4 th Tier will only support non Hub devices.																
	Supported USB peripherals over WSE	<table border="0"> <thead> <tr> <th>Device Class</th> <th>Comment</th> </tr> </thead> <tbody> <tr> <td>HID</td> <td>Supported</td> </tr> <tr> <td>Printer</td> <td>Supported</td> </tr> <tr> <td>Communication Device Class (CDC)</td> <td>Supported</td> </tr> <tr> <td>Mass Storage Class (MSC)</td> <td>Supported</td> </tr> <tr> <td>Hub</td> <td>Supported</td> </tr> <tr> <td>Audio Class</td> <td>Supported</td> </tr> <tr> <td>USB Video Class (UVC)</td> <td>Supported</td> </tr> </tbody> </table>	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
	Device Class	Comment																
HID	Supported																	
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* 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 (non-vPro™)

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

Technical Specifications

Interoperability Frequency Band	<p>IEEE 802.11n IEEE 802.11ac Wi-Fi certified 802.11b/g/n</p> <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> <p>802.11a/n</p> <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	<p>BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</p> <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 Roaming	<p>Ad-hoc (Peer to Peer) Infrastructure (Access Point Required) IEEE 802.11 compliant roaming between access points</p>
Output Power²	<ul style="list-style-type: none"> • 802.11b : +16dBm minimum • 802.11g : +14dBm minimum • 802.11a : +14dBm minimum

Technical Specifications

	<ul style="list-style-type: none"> • 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 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).

Technical Specifications

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
$\pi/4$ -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

Point to Point, Multipoint Pico Nets up to 7 slaves

Bluetooth Software Supported Security

Full support of Bluetooth Security Provisions

Power Management Certifications

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

Technical Specifications

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	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 <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> <p>802.11a/n</p> <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 BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security¹	<ul style="list-style-type: none"> • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.

Technical Specifications

	<ul style="list-style-type: none"> • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture	Ad-hoc (Peer to Peer)
Models	Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power²	<ul style="list-style-type: none"> • 802.11b : +16dBm 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 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
Weight	Type 1630 : 2.3 x 16.0 x 30.0 mm Type 2230 : 2.8g Or
Operating Voltage	Type 1630 : 2g 3.3v +/- 9%

Technical Specifications

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).

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
$\pi/4$ -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

Microsoft Windows Bluetooth Software

Link Topology

Point to Point, Multipoint Pico Nets up to 7 slaves

Electrical Interface

Bluetooth Software Supported

Security

Full support of Bluetooth Security Provisions

Power Management

Microsoft Windows ACPI, and USB Bus Support

Certifications

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

FCC (47 CFR) Part 15C, Section 15.247 & 15.249

Bluetooth Profiles Supported

Technical Specifications

Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Certifications 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 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.

POWER

HP 45 W USB Type-C™ AC adapter	Dimensions	62.0x62.0x28.5mm
	Weight	unit: 220g +/- 10g
	Input	<p>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%</p> <p>Input frequency range 47 ~ 63 Hz</p> <p>Input AC current Max. 1.4 A at 90 Vac</p>
	Output	<p>Output power 5V/15W 9V/27W 10V/37.5W 12V/45W 15V/45W 20V/45W</p> <p>DC output 5V/9V/10V/12V/15V/20V</p> <p>Hold-up time 5ms at 115 Vac input</p>

Technical Specifications

		<p>Output current limit <5.0A</p>
	Connector	USB Type-C
	Environmental Design	<p>Operating temperature 32oFto 95oF (0oto 35oC)</p> <p>Non-operating (storage) temperature -4oFto 185oF (-20oto 85oC)</p> <p>Altitude 0 to 16,400 ft (0 to 5000m)</p> <p>Humidity 20% to 95%</p> <p>Storage Humidity 10% to 95%</p>
	EMI and Safety Certifications	<p>*CE Mark - full compliance with LVD and EMC directives</p> <p>* 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.</p> <p>* MTBF - over 200,000 hours at 25°C ambient condition.</p>
HP 65 W USB Type-C™ AC adapter	Dimensions	74x74x28.5mm
	Weight	unit: 245g +/- 10g
	Input	<p>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</p> <p>Input frequency range 47 ~ 63 Hz</p> <p>Input AC current 1.7 A at 90 VAC and maximum load</p>
	Output	<p>Output power 65W</p> <p>DC output 5V/9V/10V/12V/15V/20V</p> <p>Hold-up time 5ms at 115 Vac input</p> <p>Output current limit <8.0A</p>
	Connector	USB Type C
	Environmental Design	<p>Operating temperature 32oFto 95oF (0oto 35oC)</p> <p>Non-operating (storage) temperature -4oFto 185oF (-20oto 85oC)</p>

Technical Specifications

EMI and Safety Certifications

Altitude

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

Humidity

5% to 95%

Storage Humidity

5% to 95%

*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.

HP 4-cell Polymer Battery (47 WHr)

Dimensions (H x W x L) 4.46 x 265.6 x 81.15 mm
0.18 x 10.45 x 3.2 inch

Weight 0.195 kg/0.88 lb
Cells/Type Li-ion/Polymer cell

Energy Voltage : 7.7V
Amp-hour capacity: 6.11Ah
Watt-hour capacity: 47 WHr

Watt-hour capacity

Temperature

Operating (Charging)	32° to 113° F (0° to 45° C)
Operating (Discharging)	14° to 140° F (-10° to 60° C)
Non-operating	-4° to 140° F (-20° to 60° C)

Battery recharge time System in OFF or Standby Mode <3 hours

Fuel Gauge LED No

Optional travel battery available No

COUNTRY OF ORIGIN

China

Technical Specifications

CLEANING

The following cleaning solutions, if used as instructed in the user guide, will not harm the surface of the HP Elite x2 1012 G2 Collaboration Keyboard:

- Alcohol-free glass-cleaning fluid
- Solution of mild soap and water
- Dry microfiber cleaning cloth or a chamois (static-free cloth without oil)
- Static-free cloth wipes

Please refer to the user guide that came with your product for detailed instructions about how to clean your HP Elite x2 1012 G2 using these solutions.

The following cleaning solutions, if used as instructed in the user guide, will not harm the surface of HP Elite x2 1012 Travel Keyboard and the HP Elite x2 1012 Advanced Keyboard:

Surface side of the keyboards:

- Alcohol-free glass-cleaning fluid
- Solution of mild soap and water
- Dry microfiber cleaning cloth or a chamois (static-free cloth without oil)
- Static-free cloth wipes

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 1012 G2 Protective Case	1HM07AA
Docking	HP Advanced Wireless Docking Station (requires WiGig)	F7M97AA
	HP Elite 90W Thunderbolt 3 Dock	1DT93AA
	HP Elite USB-C Desk Dock G2	Z9R42AA
	HP Elite USB-C Docking Station	X7W54AA
	HP USB-C Travel HUB	Z9G82AA
Input Devices	HP Elite x2 1012 G2 Collaboration Keyboard	1FV39A
	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 Type-C to Gigabit Ethernet 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