Overview

HP Elite x2 G4

Left

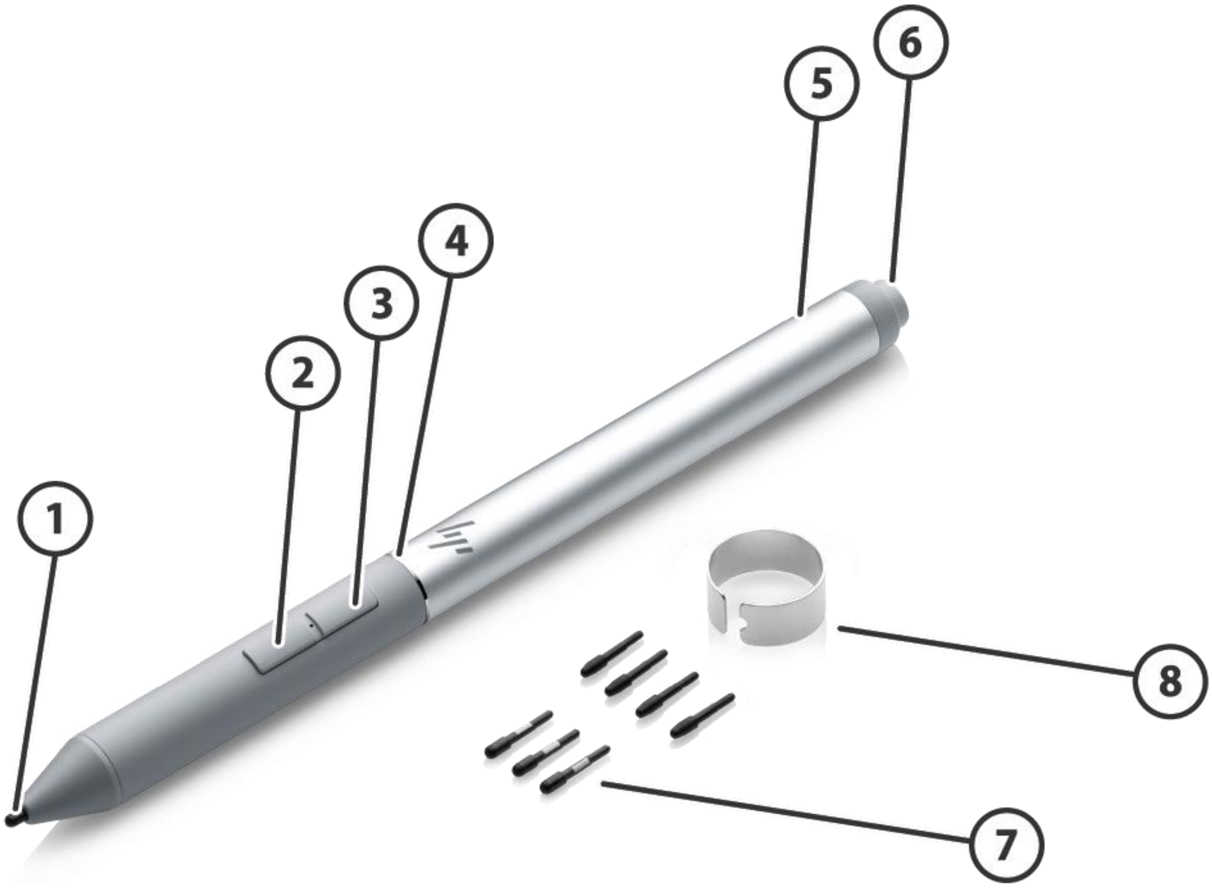
1. Audio-out/Audio-in Combo Jack
2. Speakers
3. Volume Up/Volume Down
4. Nano Security Lock Slot (Lock sold separately)
5. Magnetic Pen Attach Area
6. Glass Clickpad
7. Optional Collaboration Keyboard
8. IR Cam LED
9. Hybrid Webcam and IR Camera
10. Webcam LED

Overview

Right

1. Charging LED
2. USB Type-C™ charging port
3. USB Type-C™ with Thunderbolt™
4. USB Type-C™ with Thunderbolt™
5. Nano SIM Card Slot (Available on configurations with WWAN only)[1]
6. Kickstand
7. Optional Fingerprint Sensor (select models)
8. Power Button
9. Privacy Camera Shutter
10. Rear-Facing Webcam
11. World-Facing Microphone

1. All units have a SIM card slot and icon but units that do not support WWAN are shipped with a non-removable SIM slot plug.



HP Rechargeable Active Pen G3

1. Tip
2. Erase
3. Select
4. Diamond-Cut Ring
5. USB-C Charging Port (System AC adapter may be used to charge the pen)
6. Bluetooth Pairing / Application Launch
7. Spare Pen Tips (3 elastomer tips, 4 POM tips. POM tips are recommended for use with anti-glare panels)
8. Pen Tip Removal Tool

1. Sold separately or as an optional accessory

Overview

At a Glance

- Designed for full PC performance and pure tablet freedom in an exquisite, fully-optimized detachable design featuring authentic materials and thoughtful finishes
- 8th Generation Intel® Core™ (U-series) processors, some with vPro™ support[1]
- Up to 14 hours and 15 minutes of battery life[2]
- Windows 10 versions or FreeDOS
- Choice of displays:
  13" diagonal WUXGA+ 1000 nits Ultraslim 72% CG with HP Sure View (1920 x 1280)*
  13" diagonal 3kx2k 450 nits Ultraslim bent 72% CG (3000 x 2000)
  12.3" diagonal WUXGA+ 400 nits Ultraslim 72% CG (1920 x 1280)
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles[3]
- Weight starting at 830 g (1.83 lbs) for tablet
- Height starting at 8.8 mm (.35 inches) for tablet
- Supports up to gigabit speed LTE for a range of wireless broadband options for connectivity on the go
- Front and back-facing webcams
- Audio by Bang & Olufsen
- Three microphone array featuring a rear-facing microphone with HP Advanced Noise Reduction to improve inbound ambient noise cancellation
- Enterprise grade security with HP Sure Sense[6], HP SureStart Gen5, HP Privacy Camera, HP Sure View Gen3[5], HP Sure Run Gen2, HP Sure Recover Gen2, HP Sure Click, self-encrypting storage drives, a built-in IR camera and an optional Fingerprint Sensor[7] (select models)
- Pending 19 Mil-STD 810 g tests[4]
- Standard commercial 1 year limited warranty with extended service available with optional HP Care Packs

1. vPro™ support not available on all configurations
2. 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.
3. Recharges your battery up to 50% within 30 minutes when the system is off or in standby mode. Power adapter with a minimum capacity of 65 watts is required. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.
4. MIL-STD-810G testing is not intended to demonstrate fitness of U.S. Department of Defense (DoD) contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Accidental damage requires an optional HP Accidental Damage Protection Care Pack.
5. HP Sure View Gen3 integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
6. HP Sure Sense requires Windows 10. See product specifications for availability. On HP Elite x2 G4 units with WWAN shipping to China, HP Sure Sense is only available via Softpaq download.
7. HP Fingerprint Sensor is an optional feature and requires configuration at purchase.

*Touch-enabled display and Sure View privacy panel will lower actual brightness

Technical Specifications

PRODUCT NAME

HP Elite x2 G4

OPERATING SYSTEMS

Preinstalled	Windows 10 Pro 64[1] Windows 10 Pro 64 (National Academic only)[2] Windows 10 Home 64[1] Windows 10 Home Single Language 64[1] Windows 10 Pro (Windows 10 Enterprise available with a Volume Licensing Agreement)[1] FreeDOS

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.

PROCESSORS

Intel® Core™ i7-8665U vPro™ with Intel® UHD graphics 620 (1.9 GHz base frequency, up to 4.8 GHz with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores)[3,4,5,7]
Intel® Core™ i7-8565U with Intel® UHD Graphics 620 (1.8 GHz base frequency, up to 4.6 GHz with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores)[3,4,5,6]
Intel® Core™ i5-8365U vPro™ with Intel® UHD Graphics 620 (1.6 GHz base frequency, up to 4.1 GHz with Intel® Turbo Boost Technology, 6 MB L3 cache, 4 cores)[3,4,5,7]
Intel® Core™ i5-8265U with Intel® UHD Graphics 620 Graphics (1.6 GHz base frequency, up to 3.9 GHz with Intel® Turbo Boost Technology, 6 MB L3 cache, 4 cores)[3,4,5,6]

Processor Family
8th Generation Intel® Core™ i7 processor (i7-8665U, i7-8565U models)[5]
8th Generation Intel® Core™ i5 processor (i5-8365U, i5-8265U models)[5]

3. 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, branding and/or naming is not a measurement of higher performance.
4. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
5. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See http://www.intel.com/technology/turboboost for more information.
6. 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.
7. For full Intel® vPro™ functionality, Windows, a vPro supported processor, vPro enabled chipset, vPro enabled WLAN card and discrete TPM 2.0 are required. See http://Intel.com/vpro.

CHIPSET

Integrated with processor

GRAPHICS

Integrated
Intel® UHD graphics 620

Supports
Support HD decode, DX12, HDMI 1.4b[8]

[8] HD content required to view HD images.

DISPLAY

Touch
33.02 cm (13") diagonal 3kx2k IPS WLED-backlit Ultraslim bent touch screen with Corning® Gorilla® Glass 5 450 nits, 72% NTSC (3000x2000)[8,9,10]
33.02 (13") diagonal WUXGA+ IPS eDP + PSR WLED-backlit ultra slim bent touch screen with Corning® Gorilla® Glass 5 and HP Sure View integrated privacy screen, 1000 nits, 72% NTSC (1920 x 1280)[8,9,10]
33.02 (13") diagonal WUXGA+ IPS eDP + PSR WLED-backlit ultra slim bent touch screen with Corning® Gorilla® Glass 5 and HP Sure View integrated privacy screen, 650 nits, 72% NTSC (1920 x 1280)[8,9,10]
31.24 cm (12.3") diagonal WUXGA+ IPS eDP + PSR BrightView WLED-backlit Ultraslim touch screen with Corning® Gorilla® Glass 5, 400 nits, 72% NTSC (1920x1280)[8,9,10]
HP Sure View integrated privacy screen 33.02 cm (13") diagonal WUXGA+ IPS eDP + PSR WLED-backlit Ultraslim bent touch screen with Corning® Gorilla® Glass 5, 1000 cd/m^2, 72% CG (1920x1280)[8,9,10,11*]

[8] HD content required to view HD images.
[9] Sold separately or as an optional feature.
[10] Resolutions are dependent upon monitor capability, and resolution and color depth settings.
[11] HP Sure View Gen3 integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
*Touch-enabled display and Sure View privacy panel will lower actual brightness

Docking station model	Total number of supported displays (incl. the notebook) display)	Max. resolutions supported	Dock Connectors	Technical limitations
HP Thunderbolt Dock G2	3	Dual 4K @ 60Hz	2xDP, 1xVGA, 1xTB, 1xUSB-C alt-mode	Dual 4k (4096 x 2160) only with: • 1 DP + TB port or • USB-C alt mode + TB port Dual 4K (3840 x 2160) with any of the DP, TB or USB-C alt mode video ports

HP Elite USB-C Dock G4	3	Dual 2K @ 60Hz Single 4K @ 60Hz (3840 x 1440)	1xHDMI, 2xDP	
HP USB-C Universal Dock	3	Dual 4K @ 60Hz Single 5K @ 60Hz	2xDP	
HP USB-C Travel Dock	2	Single 2K @ 60Hz	1xHDMI, 1xVGA	Single external display Only HDMI or VGA at the time
HP USB-C Mini Dock	2	Single 4K @ 30Hz	1xHDMI, 1xVGA	Single external display Only HDMI or VGA at the time

STORAGE AND DRIVES

Primary M.2 Storage
2 TB PCIe® Gen3x4 NVMe™ SS TLC[12]
1 TB PCIe® Gen3x4 NVMe™ SS TLC[12]
512 GB Intel® PCIe® NVMe™ QLC M.2 SSD with 32 GB Intel® Optane™ memory H10[12,13,14]
512 GB PCIe® Gen3x4 NVMe™ SS TLC Opal 2[12]
512 GB PCIe® Gen3x4 NVMe™ SS TLC[12]
512 GB PCIe® NVMe™ SS Value[12]
256 GB SATA-3 SED TLC Opal 2[12]
256 GB PCIe® Gen3x4 NVMe™ SS TLC[12]
256 GB PCIe® NVMe™ SS Value[12]
256 GB Intel® PCIe® NVMe™ QLC M.2 SSD with 16 GB Intel® Optane™ memory H10[12,13,14]
128 GB SATA-3 SS TLC[12]

12. 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.
13. Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system. Requires 8th Gen or higher Intel® Core™ processor, BIOS version with Intel® Optane™ supported, Windows 10 64-bit, and an Intel® Rapid Storage Technology (Intel® RST) driver.
14. Intel® Optane™ memory H10 only for Intel® PCIe® NVMe™ QLC M.2 SSD.

MEMORY

Maximum Memory
16 GB LPDDR3-2133 SDRAM[15]

Memory
16 GB LPDDR3-2133 SDRAM (2 X 8 GB)[15]
8 GB LPDDR3-2133 SDRAM (2 x 4 GB)[15]

Memory Slots
Memory soldered down
Supports Dual Channel Memory

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

NETWORKING/COMMUNICATIONS

WLAN
Intel® Wi-Fi 6 AX200 + BT5 (802.11ax 2x2, vPro*, supporting gigabit file transfer speeds)™[16,17]
Intel® Wi-Fi 6 AX200 + BT5 (802.11ax 2x2, non-vPro, supporting gigabit file transfer speeds)™[16,17]

WWAN
Intel® XMM™ 7360 LTE-Advanced Cat 9[18]
Intel® XMM™ 7560 LTE-Advanced Pro Cat 16[19]

Miracast
Native Miracast Support[20]

Standalone GPS
HP Graff GNSS Module[21]

HP Connection Optimizer
Support HP Connection Optimizer

16. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft 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 802.11ax devices. Only available in countries where 802.11ax is supported. Wi-Fi® supporting gigabit speeds is achievable when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 160 MHz channels.
17. Dynamic Regulatory Solution will auto-change AC WLAN to abgn by passive scan when entering Indonesia.
18. WWAN module is optional, must be configured at the factory and requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.
19. Gigabit class Category 16 4G LTE module is optional and must be configured at the factory. Module designed for up to 1 Gbps download speeds as carriers deploy 5 carrier aggregation and 100Mhz channel bandwidth, requires activation and separately purchased service contract. Backwards compatible to HSPA 3G technologies. Check with service provider for coverage and availability in your area. Connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.
20. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.
21. Standalone GPS is an optional feature and requires factory configuration. GPS and WWAN are mutually exclusive.
* For full Intel® vPro™ functionality, Windows, a vPro supported processor, vPro enabled chipset, vPro enabled WLAN card and discrete TPM 2.0 are required. See http://Intel.com/vpro.

AUDIO/MULTIMEDIA

Audio
Audio by Bang & Olufsen
2 Premium stereo speakers (74 dB)
Maximum System Acoustic level: 35 dBA.
SSD Random Seeks Sound Pressure level is 19 dBA (fan off).
Integrated 3 Multi Array Microphone including world-facing 3 rd mic for noise suppression Audio Solution Codec Realtek ALC3292 + Discrete amp NXP9892

Camera

Technical Specifications

User facing FHD + IR camera – Front[8]
Integrated 8MP – Back

Webcam
IR Webcam LED Indicator

[8] HD content required to view HD images.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard
HP Elite x2 G4 Collaboration Keyboard

Pointing Device
Touchpad with multi-touch gesture enabled

Function Keys
Esc Key
F1 - Display Switching
F2 - Privacy
F3 - Brightness Down
F4 - Brightness Up
F5 - Audio Mute
F6 - Volume Down
F7 - Volume Up
F8 - Mic Mute
F9 - Backlit Toggle
F10 - numlk
F11 - Wireless
F12 - Calendar
Share/Present
Call Answer
Call End
Delete
FN Key Lock

Hidden Function Keys
Fn+R - Break
Fn+S - Sys Rq
Fn+C - Scroll Lock
Fn+E - Insert
Fn+W - Pause

Clickpad Requirements:
Microsoft Precision Touchpad Default Gestures Support
FW PTP with Filter Driver

SOFTWARE AND SECURITY

Preinstalled Software

BIOS

HP BIOSphere Gen5[22]

Technical Specifications

HP Drive Lock & Automatic Drive Lock[23]
BIOS Update via Network
Master Boot Record Security
Power On Authentication
Secure Erase[24]
Absolute Persistence Module[25]
Pre-boot Authentication

Software
HP Native Miracast Support[26]
HP Connection Optimizer
HP Image Assistant
HP Hotkey Support
HP JumpStart
HP Support Assistant[27]
HP Noise Cancellation Software
Buy Office (Sold separately)

Manageability Features
HP Driver Packs[28]
HP System Software Manager (SSM)
HP BIOS Config Utility (BCU)
HP Client Catalog
HP Manageability Integration Kit Gen3[29]
HP Cloud Recovery[30]

Client Security Software
HP Client Security Suite Manager[31]
HP Fingerprint Sensor (select models)[32]
HP Power On Authentication
Windows Defender[33]

Security Management
Pre-boot Authentication
TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)[34]
SATA 0,1 port disablement (via BIOS)
Serial, USB enable/disable (via BIOS)
Power-on password (via BIOS)
Setup password (via BIOS)
Support for chassis padlocks and cable lock devices
HP Sure Click[35]
HP Sure Start Gen5[36]
HP Sure Run Gen2[37]

Technical Specifications

HP Sure Recover Gen2[38]

HP Sure Sense[39]

Security

TPM

Model: Infineon SLB9670

Version: 7.85

Revision: TPM 2.0

FIPS 140-2 Compliant: Yes

Is the BIOS on this notebook ISO/IEC 19678:2015 (formerly NIST 800-147) compliant?:

Yes

UEFI version: 2.6

22. HP BIOSphere Gen5 is available on select HP Pro and Elite PCs. See product specifications for details. Features may vary depending on the platform and configurations.
23. HP Drive Lock & Automatic Drive Lock is not supported on NVMe drives
24. HP Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.
25. 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.
26. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.
27. HP Support Assistant requires Windows and Internet access.
28. HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement.
29. HP Manageability Integration Kit can be downloaded from http://www.hp.com/go/clientmanagement.
30. HP Cloud Recovery is available for HP Elite and Pro desktops and laptops PCs with Intel® or AMD processors and requires an open, wired network connection. Note: You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Detail please refer to: https://support.hp.com/us-en/document/c05115630
31. HP Client Security Manager Gen5 requires Windows and is available on the select HP Pro and Elite PCs. See product specifications for details.
32. HP Fingerprint Sensor is an optional feature and requires configuration at purchase.
33. Windows Defender Opt in and internet connection required for updates.
34. Firmware TPM is version 2.0. Hardware TPM is v1.2, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT).re TPM is version 2.0. Hardware TPM is v1.2, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT).
35. HP Sure Click is available on select HP platforms and supports Microsoft Internet Explorer, Google Chrome™, and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode, when Microsoft Office or Adobe Acrobat are installed.
36. HP Sure Start Gen5 is available on select HP PCs with Intel processors. See product specifications for availability.
37. HP Sure Run Gen2: See product specifications for availability.
38. HP Sure Recover Gen2: See product specifications for availability. Requires an open, wired network connection. Not available on platforms with multiple internal storage drives. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. HP Sure Recover (Gen1) does not support platforms with Intel® Optane™.
39. HP Sure Sense requires Windows 10. See product specifications for availability. On HP Elite x2 G4 units with WWAN shipping to China, HP Sure Sense is only available via Softpaq download.

Technical Specifications

POWER

Power Supply
HP Smart 65 W USB Type-C™ adapter[40]
HP Smart 65 W USB Type-C™ slim adapter[40]

Primary Battery
HP Long Life 2-cell, 47 Wh Li-ion polymer[41]
Supports HP Fast Charging (Up to 50% in 30 mins)[42]

Battery life
Up to 14 hours and 15 minutes[43]

Power Cord
Duckhead
Duckhead Power Cord Length: AC = 1m

[40] Availability may vary by country.
[41] Battery is internal and not replaceable by customer. Serviceable by warranty.
[42] Recharges the battery up to 50% within 30 minutes when the system is off or in standby mode. Power adapter with a minimum capacity of 65 watts is required. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.
[43] 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 http://www.bapco.com for additional details.

WEIGHTS & DIMENSIONS

Weight	
Tablet (Imperial)	Starting at 1.83 lbs[44]
Tablet (Metric)	Starting at 0.83 kg[44]
Collaboration Travel Keyboard (Imperial)	Starting at .81 lbs[44]
Collaboration Travel Keyboard (Metric)	Starting at .37 kg[44]
Tablet and Collaboration Travel Keyboard (Imperial)	Starting at 2.58 lb[44]
Tablet and Collaboration Travel Keyboard (Metric)	Starting at 1.17 kg[44]

Product Dimensions (w x d x h)	
Dimensions tablet (imperial)	11.39 x 8.51 x 0.35 in
Dimensions tablet (metric)	28.93 x 21.58 x 0.88 cm
Dimensions tablet and Collaboration Travel Keyboard(imperial)	11.39 x 8.79 x 0.56 in
Dimensions tablet and Collaboration Travel Keyboard (metric)	28.93 x 22.32 x1.42 cm

[44] Weight will vary by configuration.

PORTS/SLOTS

Technical Specifications

Ports
2 USB 3.1 Type-C™ with Thunderbolt support
1 USB 3.1 Type-C™ Gen 1 (Power delivery, DisplayPort™ 1.2)
1 Headphone/Microphone Combo
Nano Security Lock Slot (Lock sold separately)

Expansion Slots
1 Nano SIM

Sensors
Accelerometer
Magnetometer
Gyro
E-compass
ALS (ambient light sensor)
Hall Sensor

SERVICE AND SUPPORT

HP Services offers 1-year or 3 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. Refer to http://www.hp.com/support/batterywarranty/ for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services 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.[45]

[45] 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 http://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.

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	**Nominal Operating Voltage**	19 V
	Average Operating Power	Win 10
	Integrated Graphics	6.78W
	Discrete Graphics	N/A
	Max Operating Power	UMA < 65W
Temperature	**Operating**	32° to 95° F (0° to 35° C) (not writing optical)
	Non-operating	41° to 95° F (5° to 35° C) (writing optical)
Relative Humidity	**Operating**	10% to 90%, non-condensing
	Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
Shock	**Operating**	40 G, 2 ms, half-sine
	Non-operating	200 G, 2 ms, half-sine
Random Vibration	**Operating**	0.75 grms
	Non-operating	1.50 grms
Altitude (unpressurized)	**Operating**	-50 to 10,000 ft (-15.24 to 3,048 m)

Technical Specifications

	Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)
Planned Industry Standard Certifications	**UL**	Yes
	CSA	Yes
	FCC Compliance	Yes
	ENERGY STAR®	Yes[46]
	EPEAT® 2019	Yes, Gold in U.S.[47]
	ICES	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes
	Japan VCCI Compliance	Yes
	KC	Yes
	BSMI	Yes
	CE Marking Compliance	Yes
	BNCI or BELUS	Yes
	CIT	Yes
	GOST	Yes
	Saudi Arabian Compliance (ICCP)	Yes
	SABS	Yes
	UKRSERTCOMPUTER	Yes

[46] Configurations of the HP Elite x2 G4 that are ENERGY STAR® certified are identified as HP Elite x2 G4 ENERGY STAR® on HP websites and on http://www.energystar.gov.

[47] Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit http://www.epeat.net for more information.

DISPLAYS

Panel LCD 12.3 inch diagonal WUXGA+ (1920 x 1280) BrightView WLED UWVA 72% NTSC 400 nits eDP 1.4+PSR Ultraslim	**Outline Dimensions (W x H x D)**	265.56 x 185.06 mm (max)
	Active Area	259.2 x 172.8 mm (typ.)
	Weight	161 g (max)
	Diagonal Size	12.3 inch
	Thickness	1.96 mm (panel side) / 4.59 mm (max)
	Interface	eDP 1.4a + PSR (2 lane)
	Surface Treatment	Bright-View (BV)
	Touch Enabled	Yes
	Contrast Ratio	1200:1 (typ.)
	Refresh Rate	60Hz
	Brightness	400 nits
	Pixel Resolution	1920 x 1280 (WUXGA+)
	Format	RGB
	Backlight	LED
	Color Gamut Coverage	72% of NTSC
	Color Depth	6bits
	Viewing Angle	UWVA 85/85/85/85

13" diagonal 3kx2k IPS LED-backlit touch screen with Corning® Gorilla® Glass 4 Low Power Ultra Slim bent 450 nits 72% NTSC (3000 x 2000)	**Outline Dimensions (W x H x D)**	279.3 x 193.0 mm (max)
	Active Area	274.5 x 183 mm (max)
	Weight	160 g (max)
	Diagonal Size	13.0”
	Thickness	1.8 (panel side)/3.9 (PCBA side) mm(max)
	Interface	eDP
	Surface Treatment	Glare
	Touch Enabled	Yes
	Contrast Ratio	1800 (typ.)
	Refresh Rate	60Hz
	Brightness	450 nits typical (Panel Only)
	Pixel Resolution	3000 x 2000
	Format	RGB stripe
	Backlight	LED
	Color Gamut Coverage	72% of NTSC
	Color Depth	6 bits
	Viewing Angle	85/85/85/85

Panel LCD 13 inch diagonal FHD (1920 x 1080) BrightView WLED UWVA 72% NTSC 1000 nits eDP 1.4+PSR2 bent Privacy NWBZ	**Outline Dimensions (W x H x D)**	277.748 x 193.2 mm (max)
	Active Area	272.448 x 191.632 mm (typ.)
	Weight	190 g (max)
	Diagonal Size	13.0 inch
	Thickness	3.9 mm (max)
	Interface	eDP 1.4 + PSR2 (4 lane)
	Touch Enabled	Yes
	Contrast Ratio	2000:1 (typ.)
	Refresh Rate	60 Hz
	Brightness*	1000 nits
	Pixel Resolution	1920 x 1080 (FHD)
	Format	RGB
	Backlight	LED
	Color Gamut Coverage	72% of NTSC
	Color Depth	8 bits
	Viewing Angle	UWVA 85/85/85/85

Panel LCD 13 inch FHD (1920 x 1080) BrightView	**Outline Dimensions (W x H)**	277.748 x 193.2 mm (max)
	Active Area	272.448 x 181.632 mm (typ.)

Technical Specifications

WLED UWVA 72% NTSC 1000 nits eDP 1.4+PSR2 bent Privacy NWBZ	**Weight**	190 g (max)
	Diagonal Size	13.0 inch
	Thickness	3.9 mm (max)
	Interface	eDP 1.4
	Surface Treatment	BrightView (BV)
	Touch Enabled	Yes
	Contrast Ratio	2000:1 (typ.)
	Refresh Rate	60 Hz
	Brightness	1000 nits
	Pixel Resolution	1920 x 1080 (FHD)
	Format of LCD Pixel Arrangement	RGB
	Backlight	LED
	Color Gamut Coverage	Sharing mode 72% of NTSC
	Color Depth	Privacy mode, 60% of NTSC
	Viewing Angle	8 bits

13" diagonal WUXGA+ IPS LED-backlit touch screen with Corning® Gorilla® Glass 4 and privacy screen, CWLED UWVA (1920 x 1280)	**Outline Dimensions (W x H x D)**	279.3 x 193.2 mm (max.)
	Active Area	272.449 x 181.632 mm (max.)
	Weight	220g (max.)
	Diagonal Size	13.0"
	Thickness	3.9 mm(max.)
	Interface	eDP 1.3
	Surface Treatment	BrightView (BV)
	Touch Enabled	Yes
	Contrast Ratio	Sharing mode, 600:1 (typ.)
	Refresh Rate	Privacy mode, 150:1 (typ.)
	Brightness	120Hz
	Pixel Resolution	Sharing mode, 700 nits (typ.)
	Format of LCD Pixel Arrangement	Privacy mode, 320 nits (typ.)
	Backlight	1920x1280
	Color Gamut Coverage	RGB
	Color Depth	LED
	Viewing Angle	Sharing mode, CR >10, L/R/U/D, 85/85/85/85 (typ.) Privacy mode CR>2, L/R/U/D, 50/50/85/85 (typ.)

*Touch-enabled display and Sure View privacy panel will lower actual brightness

STORAGE AND DRIVES

Form Factor	M.2 2280

SSD 128 GB 2280 M2 SATA-3 TLC	**Capacity**	128 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	ATA-8, SATA 3.0
	Maximum Sequential Read	540 MB/s～ 560 MB/s
	Maximum Sequential Write	500 MB/s～ 530 MB/s
	Logical Blocks	250,069,680
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	DIPM; TRIM; DEVSLP

SSD 1 TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided	**Form Factor**	M.2 2280
	Capacity	1 TB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	Up To 2800 MB/s
	Maximum Sequential Write	Up To 1600 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

SSD 256 GB 2280 M2 PCIe-3x4 SS NVMe TLC	**Form Factor**	M.2 2280
	Capacity	256 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	2580 MB/s～ 2600 MB/s
	Maximum Sequential Write	900 MB/s～ 1000 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

SSD 256 GB 2280 M2 SATA-3 Self Encrypted OPAL2 Three Layer Cell	**Form Factor**	M.2 2280
	Capacity	256 GB
	NAND Type	TLC

	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	ATA-8, SATA 3.0
	Maximum Sequential Read	530 MB/s～ 560 MB/s
	Maximum Sequential Write	500 MB/s～ 530 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

SSD 2 TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided	**Form Factor**	M.2 2280
	Capacity	2 TB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	Up To 3000 MB/s
	Maximum Sequential Write	Up To 2100 MB/s
	Logical Blocks	3,907,029,168
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security; TCG OPAL 2.0; DIPM; TRIM; DEVSLP

SSD 512 GB 2280 M2 PCIe-3x4 SS NVMe TLC	**Form Factor**	M.2 2280
	Capacity	512 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	2800 MB/s～ 2900 MB/s
	Maximum Sequential Write	1000 MB/s～ 1800 MB/s
	Logical Blocks	1,000,215,215
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security (Option); TRIM; L1.2

SSD 512 GB 2280 PCIe-3x4 NVMe Self Encrypted OPAL2 Three Layer Cell	**Form Factor**	M.2 2280
	Capacity	512 GB
	NAND Type	TLC

	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	2800 MB/s～ 2900 MB/s
	Maximum Sequential Write	1000 MB/s～ 1800 MB/s
	Logical Blocks	1,000,215,215
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security (Option); TCG Opal 2.0; TRIM; L1.2

SSD 512 GB 2280 PCIe NVMe Value	**Form Factor**	M.2 2280
	Capacity	512 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	Up To 1700 MB/s
	Maximum Sequential Write	Up To 1500 MB/s
	Logical Blocks	1,000,215,215
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security; TRIM; L1.2

SSD 256 GB 2280 PCIe NVMe Value	**Form Factor**	M.2 2280
	Capacity	256 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	Up To 1700 MB/s
	Maximum Sequential Write	Up to 1300 MB/s
	Logical Blocks	500,118,192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security, TRIM; L1.2

512 GB 2280 PCIe-3x2x2 NVMe+SSD 32 GB 3D Xpoint	**Form Factor**	M.2 2280
	Capacity	512 GB
	NAND Type	TLC

Technical Specifications

Height	0.09 in (2.3 mm)
Width	0.87 in (22 mm)
Weight	0.02 lb (10 g)
Interface	PCIe NVMe Gen3X4
Maximum Sequential Read	Up To 2400 MB/s
Maximum Sequential Write	Up To 1300 MB/s
Logical Blocks	1,000,215,215
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	ATA Security, TRIM; L1.2

Technical Specifications

NETWORKING/COMMUNICATIONS

Intel® 22260 802.11a/b/g/n/ac/ax (2x2) Wi-Fi 6* and Bluetooth® 5.1 Combo vPro	**Wireless LAN Standards**	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
	Interoperability	Wi-Fi® certified
	Frequency Band	•802.11b/g/n/ax 2.402 – 2.482 GHz •802.11a/n/ac/ax 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
	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, 80MHz & 160MHz) • 802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)
	Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM , 1024QAM
	Security[2]	•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[1]	• 802.11b: +18.5dBm minimum • 802.11g: +17.5dBm minimum • 802.11a: +18.5dBm minimum • 802.11n HT20(2.4GHz): +15.5dBm minimum • 802.11n HT40(2.4GHz): +14.5dBm minimum • 802.11n HT20(5GHz): +15.5dBm minimum • 802.11n HT40(5GHz): +14.5dBm minimum • 802.11ac VHT80(5GHz): +11.5dBm minimum

	• 802.11ac VHT160(5GHz): +11.5dBm minimum • 802.11ax HT40(2.4GHz): +10dBm minimum • 802.11ax VHT160(5GHz): +10dBm minimum
Power Consumption	•Transmit mode 2.0 W •Receive mode 1.6 W •Idle mode (PSP) 180 mW (WLAN Associated) •Idle mode 50 mW (WLAN unassociated) •Connected Standby 10mW •Radio disabled 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	•802.11b, 1Mbps: -93.5dBm maximum •802.11b, 11Mbps: -84dBm maximum • 802.11a/g, 6Mbps: -86dBm maximum • 802.11a/g, 54Mbps: -72dBm maximum • 802.11n, MCS07: -67dBm maximum • 802.11n, MCS15: -64dBm maximum • 802.11ac, MCS0: -84dBm maximum • 802.11ac, MCS9: -59dBm maximum •802.11ax, MCS11(HT40): -59dBm maximum •802.11ax, MCS11(VHT160): -58.5dBm 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	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	1. Type 2230: 2.8 g 2. Type 126: 1.3 g
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. The FCC has declared as of September 1, 2014 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.
2. Check latest software/driver release for updates on supported security features.
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).

*Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft 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 802.11ax devices. Only available in countries where 802.11ax is supported.

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2/5.0/5.1 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps signaling data rate[1] 2.17 Mbps BLE: 1 Mbps signaling data rate[1] 0.2 Mbps 1. Actual throughput may vary. 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 + 9.5 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	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
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)
Security & Manageability	Intel® vPro™ support with appropriate Intel® chipset components

For full Intel® vPro™ functionality, Windows, a vPro supported processor, vPro enabled chipset, vPro enabled WLAN card and discrete TPM 2.0 are required. See http://Intel.com/vpro.

Technical Specifications

Intel® 22260 802.11a/b/g/n/ac/ax (2 x 2) Wi-Fi 6* and Bluetooth® 5.1 Combo	**Wireless LAN Standards**	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
	Interoperability	Wi-Fi® certified
	Frequency Band	•802.11b/g/n/ax 2.402 – 2.482 GHz •802.11a/n/ac/ax 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
	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, 80MHz & 160MHz) • 802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)
	Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM , 1024QAM
	Security[2]	•IEEE and Wi-Fi 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[1]	• 802.11b: +18.5dBm minimum • 802.11g: +17.5dBm minimum • 802.11a: +18.5dBm minimum • 802.11n HT20(2.4GHz): +15.5dBm minimum • 802.11n HT40(2.4GHz): +14.5dBm minimum • 802.11n HT20(5GHz): +15.5dBm minimum • 802.11n HT40(5GHz): +14.5dBm minimum • 802.11ac VHT80(5GHz): +11.5dBm minimum

	• 802.11ac VHT160(5GHz): +11.5dBm minimum • 802.11ax HT40(2.4GHz): +10dBm minimum • 802.11ax VHT160(5GHz): +10dBm minimum	
Power Consumption	•Transmit mode 2.0 W •Receive mode 1.6 W •Idle mode (PSP)180 mW (WLAN Associated) •Idle mode 50 mW (WLAN unassociated) •Connected Standby 10mW •Radio disabled 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[3]	•802.11b, 1Mbps: -93.5dBm maximum •802.11b, 11Mbps: -84dBm maximum • 802.11a/g, 6Mbps: -86dBm maximum • 802.11a/g, 54Mbps: -72dBm maximum • 802.11n, MCS07: -67dBm maximum • 802.11n, MCS15: -64dBm maximum • 802.11ac, MCS0: -84dBm maximum • 802.11ac, MCS9: -59dBm maximum •802.11ax, MCS11(HT40): -59dBm maximum •802.11ax, MCS11(VHT160): -58.5dBm 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	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
Weight	1. Type 2230: 2.8g 2. Type 126: 1.3g	
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. The FCC has declared as of September 1, 2014 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.
2. Check latest software/driver release for updates on supported security features.
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).

*Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft 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 802.11ax devices. Only available in countries where 802.11ax is supported.

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2/5.0/5.1 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps signaling data rate[1] 2.17 Mbps BLE: 1 Mbps signaling data rate[1] 0.2 Mbps 1. Actual throughput may vary. 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 + 9.5 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	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
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

Intel® XMM™ 7360 LTE-Advanced CAT9[1]	**Technology/Operating bands**	FDD LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700/2100 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 1400 (Band 11), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 17 lower), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1400 (Band 21), 850 (Band 26), 700 (Band 28), 700 (Band 29 RX only), 2300 (Band 30), 1700/2100 (Band 66).

		TDD LTE: 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41). HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz
	Wireless protocol standards	3GPP Release 11 LTE Specification CAT.9, DL 60MHz BW throughput up to 450Mbps; UL 20MHz throughput up to 50Mbps WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
	GPS	Standalone, A-GPS (MS-A, MS-B)
	GPS bands	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz
	Maximum data rates	LTE: 450 Mbps (Download), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (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	5.8 g
	Dimensions (Length x Width x Thickness)	42 x 30 x 2.3 mm

1. 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. 4G LTE not available on all products or in all countries.

Intel® XMM™ 7560 LTE-Advanced Pro DL CAT16[1]	**Technology/Operating bands**	FDD 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 14 upper), 700 (Band 17 lower), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1900 (Band 25), 850 (Band 26), 700 (Band 28), 700 (Band 29 RX only), 2300 (Band 30), 1700/2100 (Band 66). TDD LTE: 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41), 3500 (Band 42), 5200 (Band 46 RX only) HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz
	Wireless protocol standards	3GPP Release 12 LTE Specification DL-CAT.16, DL 100MHz BW throughput up to 978Mbps; UL-CAT.7 20MHz throughput up to 75Mbps WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
	GPS	Standalone, A-GPS (MS-A, MS-B)
	GPS bands	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz
	Maximum data rates	LTE: 978 Mbps (Download), 75 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)
	Maximum output power	LTE: 23 dBm in all band except B41 LTE B41 HPUE = 26dBm 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)	42 x 30 x 2.3 mm

1. 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. 4G LTE not available on all products or in all countries.

HP Graff GNSS Module	**Technology**	Standalone GPS, GLONASS
	Dimensions (L x W x H)	42 x 30 x 2.3 mm
	System interface	USB 2.0
	GPS bands	GPS L1 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
	Power Consumption	Active mode (continuous): 67 mA (peak); 26 mA (average)
	Form Factor	M.2, 3042-S3 Key B
	Weight	4.3 g

POWER

AC Adapter 65 Watt nPFC Slim USB type C Straight 1.8m	**Dimensions (H x W x D)**	88.0 x 53.5 x 21.0 mm	
	Weight	220 g +/- 10 g	
	Input	100 to 240 VAC	
		Input Efficiency	Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec: 5V: 81.5% 9V: 86.7% 12V: 88.0% 15V: 89.0% 20V: 89.0%
		Input frequency range	48 ~ 63 Hz
		Input AC current	Max. 1.7 A at 90 VAC
	Output	**Output power**	5V/15W 9V/27W 12V/60W 15V/65W 20V/65W
		DC output	5V / 9V / 12V / 15V / 20V
		Hold-up time	5 ms at 115 Vac input
		Output current limit	<8.0A
	Connector	USB Type-C	

	Environmental Design	**Operating temperature**	32°F to 95°F (0° to 35°C)
		Non-operating (storage) temperature	-4°F to 185°F (-20° to 85°C)
		Altitude	0 to 16,400 ft (0 to 5000m)
		Humidity	20% to 95%
		Storage Humidity	10% to 95%
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

AC Adapter 65 Watt nPFC USB type C Straight 1.8 m C6NS (Hades+)	**Dimensions (H x W x D)**	74 x 74 x 28.5 mm	
	Weight	245 g +/- 10 g	
	Input	100 to 240 VAC	
		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 power	65W
		DC output	5V/9V/10V/12V/15V/20V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<8.0A
	Connector	Non-Standard C6	
	Environmental Design	**Operating temperature**	32°F to 95°F (0° to 35°C)
		Non-operating (storage) temperature	-4°F to 185°F (-20° to 85°C)
		Altitude	0 to 16,400 ft (0 to 5000m)
		Humidity	5% to 95%
		Storage Humidity	5% to 95%
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 100,000 hours at 25°C ambient condition.	

Technical Specifications

Battery MR 2 Cell WHr 47 Long Life -PL Fast Charge	**Dimensions** (H x W x L)	5.11 x 84.00 x 238.14 mm	
	Weight	0.190 kg	
	Cells/Type	4cell Lithium-Ion Polymer cell / 4473A9	
	Energy	**Voltage**	7.7 V
		Amp-hour capacity	6.15 Ah
		Watt-hour capacity	47 Wh
	Temperature	**Operating (Charging)**	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 122° F (-10° to 60° C)
	Fuel Gauge LED	NA	
	Warranty	3-year	
	Optional Travel Battery Available	No	

Country of Origin

China

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

Type	Description	Part Number
Docking	HP Thunderbolt Dock 120W G2	2UK37AA
	HP Thunderbolt Dock w/Combo Cable G2	3TR87AA
	HP Thunderbolt Dock w/Audio Module	3YE87AA
	HP Audio Module	3AQ21AA
	HP Thunderbolt Dock 120W Cable	3XB94AA
	HP Thunderbolt Dock Combo Cable	3XB96AA
	HP Thunderbolt Dock	1DT93AA
	HP USB-C Dock G4	3FF69AA
	HP USB-C Universal Dock	1MK33AA
	HP USB-C Universal Dock Non Flash	3DV65AA
	HP USB-C Mini Dock	1PM64AA
	HP USB-C Dock G5	5TW10AA
	HP USB-C/A Universal Dock G2	5TW13AA
Input/Output	HP Slim Wireless Keyboard and Mouse	T6L04AA
	HP Slim USB Keyboard and Mouse	T6T83AA
	HP Wireless (Link-5) Keyboard	T6U20AA
	HP USB Essential Keyboard and Mouse	H6L29AA
	HP Conferencing Keyboard	K8P74AA
	HP Elite x2 G4 Collaboration Keyboard	7CS01AA
	HP USB Collaboration Keyboard	Z9N38AA
	HP Wireless Collaboration Keyboard	Z9N39AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP X4000b Bluetooth Mouse	H3T50AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP USB Travel Mouse	G1K28AA
	HP Ultra Mobile Wireless Mouse	H6F25AA
	HP Slim Bluetooth Mouse	F3J92AA
	HP Wireless Premium Mouse	1JR31AA
	HP USB Premium Mouse	1JR32AA
	HP Elite Presenter Mouse	2CE30AA
	HP Rechargeable Active Pen G3	6SG43AA
	HP USB-C to USB-A Hub	Z6A00AA
	HP USB 3.0 PN	N2Z63AA
	HP USB-C to HDMI	1WC36AA
	HP USB-C to DP	N9K78AA
	HP USB-C to VGA	N9K76AA
	HP RJ45 Adapter PN	V7W66AA
Power	HP 65W USB-C Power Adapter	1HE08AA
	HP 65W USB-C Slim Power Adapter	3PN48AA
	HP USB-C Notebook Power Bank	2NA10AA

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

Security	HP Nano Keyed Cable Lock	1AJ39AA
	HP Nano Dual-Head Keyed Cable Lock	1AJ41AA
UCC	HP UC Speaker Phone	4VW02AA
	HP Stereo 3.5mm Headset	T1A66AA
	HP Stereo USB Headset	T1A67AA
	HP UC Wireless Mono Headset	W3K08AA
	HP UC Wireless Duo Headset	W3K09AA

Change Log

Date of change:	Version History:		Description of change:
August 1, 2019	From V1 to V2	Updated	Sure Sense disclaimer
August 7, 2019	From V2 to V3	Updated	Displays section
September 9, 2019	From V3 to V4	Added	Intel® Optane™ and disclaimer for 1000 nit Sure View panel
October 4, 2019	From V4 to V5	Updated	Ports, Battery and Weight Sections
November 6, 2019	From V5 to V6	Updated	Keyboard
November 13, 2019	From V6 to V7	Updated	Security Section
January 6, 2020	From V7 to V8	Updated	Collaboration Keyboard weight
February 21, 2020	From V8 to V9	Added	Two panels in display section
February 27, 2020	From V9 t oV10	Updated	Copyright and footnote for fingerprint sensor
March 4, 2020	From V10 to V11	Removed	Power Bank, Accessories Section