

Overview

HP ZBook Firefly 16" G11 Mobile Workstation PC



1. Ambient Light Sensor (Optional)
2. Internal Microphones (2)
3. Webcam LED (Optional)
4. Webcam
5. Camera Shutter
6. IR Camera (Optional)
7. IR Camera LEDs (Optional)

Right

8. Glass Clickpad
9. Power Button Key
10. Audio Combo Jack
11. SuperSpeed USB Type-A 5Gbps signaling rate (Charging)
12. Nano Security Lock Slot (Lock sold separately)
13. Nano SIM Card Slot (Optional)
14. Touch Fingerprint Sensor (Select models)

Overview

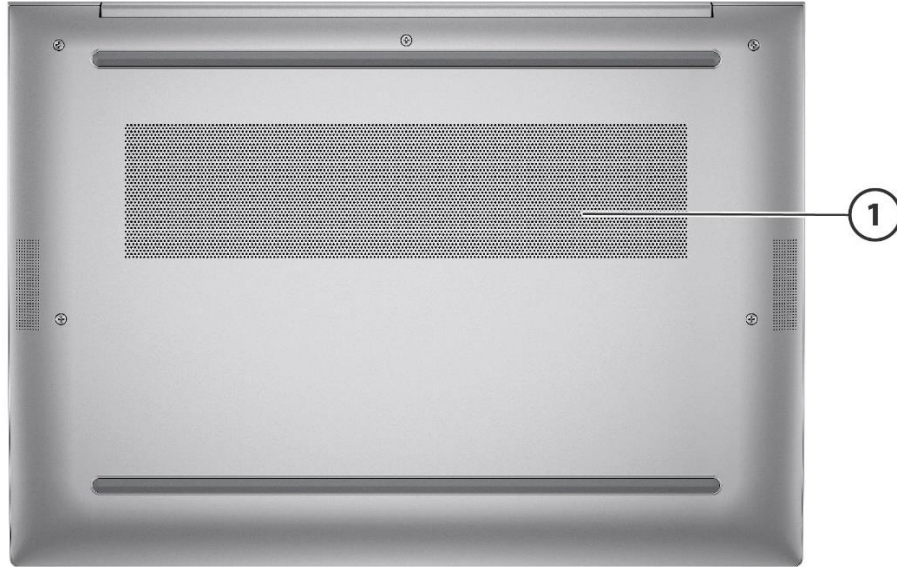


Left

1. HDMI 2.1 Port (Cable not included)
2. SuperSpeed USB Type-A 5Gbps signaling rate
3. Thunderbolt™ 4* with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)1
4. Thunderbolt™ 4* with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)1
5. LED Indicator
6. Smartcard Reader (Optional)

*SuperSpeed USB 20Gbps is not available with Thunderbolt™ 4.

Overview



Bottom

1. Fan Venting

Overview

At A Glance

- New premium ultraslim design with precision-crafted all-metal chassis for a premium look and feel
- Intel® Core™ Ultra5, Ultra7 U series and Intel Core Ultra5, Ultra7 H series Processors up to fourteen-core
- Preinstalled with Windows 11 versions or FreeDOS
- Now available paired with Intel Core Ultra5/Ultra7 H series processors and discrete graphics
- 16:10 ratio screen reduces the need to scroll by showing more vertical content than 16:9
- DDR5-5600 memory with up to 64GB capacity
- Choice of displays:
 - 40.6 cm (16") diagonal WUXGA IPS Anti-Glare LED-backlit non-touch, 300 nits, 45% NTSC
 - 40.6 cm (16") diagonal WUXGA IPS Anti-Glare On-Cell LED-backlit touch, 300 nits, 45% NTSC
 - 40.6 cm (16") diagonal WUXGA IPS Anti-Glare LED-backlit non-touch, 400 nits, 100% sRGB
 - 40.6 cm (16") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, + Low Blue Light, non-touch, 800 nits, sRGB 100%, HP Sure View 5 integrated privacy screen
- HP Auto Frame provides improved face tracking and more natural framing movement
- Optional NVIDIA RTX A500 pro graphics for improved performance for heavier graphics workloads.
- HP Wolf Security for Business creates a hardware-enforced, always-on, resilient defense.
- Connectivity with optional HP 5G/WWAN available world-wide, and Thunderbolt™ Docking (Dock sold separately)
- Undergoes MIL-STD 810H tests¹
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles
- Designed to support all HP docking options including the HP Universal Dock G5

¹MIL-STD 810H is not intended to demonstrate fitness of U.S. Department of Defense 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.

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

Features

OPERATING SYSTEM

Preinstalled OS

- Windows 11 Home 64 - HP recommends Windows 11 Pro for business¹
- Windows 11 Home Single Language 64 - HP recommends Windows 11 Pro for business¹
- Windows 11 Pro 64 (Windows 11 Enterprise or Windows 10 Enterprise available with a Volume Licensing Agreement)¹
- Windows 11 Pro¹
- Windows 11 Pro Education¹
- FreeDOS 3.0

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 is automatically updated and enabled. High speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.

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>. A full list of HP products and the Windows 10 versions tested is available on the HP support website. <https://support.hp.com/us-en/document/c05195282>

PROCESSOR

Name ^{1,2,3,4,5,7}	Cores	Number of P-cores	Number of E-cores	Number Of LP E-core	Threads	L3 Cache	Max Turbo Frequency		Intel SIPP/vPro® Enterprise
							P-cores	E-cores	
Intel® Core™ Ultra 7 processor 165H	16 cores	6	8	2	22	24 MB	5.00 GHz	3.80 GHz	X
Intel® Core™ Ultra 7 processor 155H	16 cores	6	8	2	22	24 MB	4.80 Ghz	3.80 GHz	
Intel® Core™ Ultra 5 processor 135H	14 cores	4	8	2	18	18 MB	4.60 GHz	3.60 GHz	X
Intel® Core™ Ultra 5 processor 125H	14 cores	4	8	2	18	18 MB	4.50 GHz	3.60 GHz	
Intel® Core™ Ultra 7 processor 165U	12 cores	2	8	2	14	12 MB	4.90 GHz	3.80 GHz	X
Intel® Core™ Ultra 7 processor 155U	12 cores	2	8	2	14	12 MB	4.80 GHz	3.80 GHz	
Intel® Core™ Ultra 5 processor 135U	12 cores	2	8	2	14	12 MB	4.40 Ghz	3.60 GHz	X
Intel® Core™ Ultra 5 processor 125U	12 cores	2	8	2	14	12 MB	4.30 Ghz	3.60 GHz	

Features

- ¹ Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.
- ² Intel Turbo Boost performance varies depending on hardware, software and overall system configuration. See <http://www.intel.com/technology/turboboost> for more information.
- ³ Intel vPro[®] requires Windows 10 Pro 64 bit or higher, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or Wi-Fi 6E WLAN and TPM 2.0. Some functionality requires additional 3rd party software in order to run. Features of vPro[®] Essentials and Enterprise vary. See <http://intel.com/vpro>
- ⁴ 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>.
- ⁵ Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
- ⁷ Features and software that require a NPU may require software purchase, subscription or enablement by a software or platform provider, and third party software may have specific configuration or compatibility requirements. Performance varies by use, configuration, and other factors.

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated

Intel[®] Arc™ GPU (H Series processors)

Intel[®] Graphics (U Series processors)

Discrete

NVIDIA RTX™ A500 Laptop GPU (4 GB GDDR6 dedicated)^{1,2}

Supports

Support HD decode, DX12, HDMI 2.1, HDCP 2.3

¹ Both UMA & Discrete configurations support 4 independent displays when on the HP Thunderbolt Dock G4 (120W) (sold separately) - Max. resolution = 2.5K @60Hz (DP1) & 2.5K @60Hz (DP2) & FHD (VGA) OR 4K @60Hz (one DP Port) & 4K @60Hz (Type-C output port using a Type C-to-DP adapter).

² HDMI cable Sold Separately

DISPLAY

Non-touch

- 40.6 cm (16") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, + Low Blue Light, 800 nits, sRGB 100%, HP Sure View 5 integrated privacy screen^{1,3,4,5}

Features

- 40.6 cm (16") diagonal, 2.8K (2880 x 1800), Bent, OLED, UWVA, BrightView, OLED + Low Blue Light, 400 nits, DCI-P3 100%^{1,3}
- 40.6 cm (16") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, WLED + Low Blue Light, 400 nits, low power, sRGB 100%^{1,3}
- 40.6 cm (16") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, WLED, 300 nits, NTSC 45%^{1,3}

Touch

- 40.6 cm (16") diagonal, WUXGA (1920 x 1200), Bent, LCD, touch, IPS, anti-glare, WLED, 300 nits, NTSC 45%^{1,3,4,5}

Displays support

Supports dual display through the dock

For more information, please reference the following ZBook docking whitepaper:

<https://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA5-2657ENW>

Display Size

16"

40.64 cm (16")

¹HD content required to view HD images.

³Resolutions are dependent upon monitor capability, and resolution and color depth settings.

⁴HP Sure View 5 integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.

⁵Actual brightness will be lower with touchscreen or Sure View.

Features

DOCKING

Docking station model #1	HP Thunderbolt 120W G4 Dock
Total number of supported displays (incl.the notebook display)	4
Max.resolutions supported	Quad 4K @60Hz Dual 8K single cable@30 for TB hosts or USB-C hosts DP 1.4 with DSC in high res mode
Dock Connectors	2xDP, 1xVGA, 1xTB, 1xUSB-C alt-mode
Technical limitations	Thunderbolt Hosts: Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host. Max resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in High Resolution mode @30Hz Non-Thunderbolt hosts: The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is (1) 5K dual cable (using both DP ports) +(1) 4K on USB-C DP port Non-Thunderbolt hosts support (3) displays with a max resolution of: (2) 5K single cable + (1) 4K UHD @ 60 Hz in high resolution mode. In multi-function mode the maximum resolution for (3) displays is (2) 5K single cable @ 30Hz + (1) 4K UHD @ 30Hz.
Docking station model #2	HP USB-C Dock G5
Total number of supported displays (incl.the notebook display)	3
Max.resolutions supported	Dual 5K@ 30Hz + (1) 4K UHD (multi-function mode)
Dock Connectors	1xHDMI, 2xDP
Technical limitations	Highest resolution with dual displays is two 8K@ 60Hz host in High Resolution mode. Three maximum displays supported are two 5K@ 30 Hz on DP ports plus one 4K UHD@ 30 Hz on HDMI in multi-function mode The highest resolution for a non-Thunderbolt host in Multi-function mode is a single 5K dual cable (using both DP ports) + (1) 4K on HDMI port .
Docking station model #3	HP USB-C/A Universal Dock G2
Total number of supported displays (incl.the notebook display)	3
Max.resolutions supported	Triple 4K UHD@ 60Hz
Dock Connectors	1xHDMI, 2xDP
Technical limitations	The best resolution for dual or triple displays is 4K UHD@ 60Hz. For use with the USB-A adapter that comes in the box the maximum number of displays supported is (2) 4k x 60 Hz on the Type-A Gen 1 connection from the host

Features

STORAGE AND DRIVES*

PCIe® NVMe™ M.2 2280 Storage

2 TB PCIe® Gen4x4 NVMe™ SSD Three Layer Cell

1 TB PCIe® Gen4x4 NVMe™ SSD Three Layer Cell

1 TB PCIe® NVMe™ SSD Value

512 GB PCIe® Gen4x4 NVMe™ Seld Encrypted OPAL2 SSD Three Layer Cell

512 GB PCIe® Gen4x4 NVMe™ SSD Three Layer Cell

512 GB PCIe® NVMe™ SSD Value

256 GB PCIe® NVMe™ Seld Encrypted OPAL2 SSD Value

256 GB PCIe® NVMe™ SSD Value

* For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 35GB of disk is reserved for system recovery software.

MEMORY

Maximum Memory

64GB DDR5-5600

Memory

64GB DDR5-5600 (2x32GB)

32GB DDR5-5600 (2x16GB)

32GB DDR5-5600 (1x32GB)

16GB DDR5-5600 (2x8GB)

16GB DDR5-5600 (1x16GB)

8GB DDR5-5600 (1x8GB)

Memory Slots

2 SODIMM

DDR5 SODIMMS, system runs at 5600

Supports Dual Channel Memory

NOTE: 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.

Features

NETWORKING/COMMUNICATIONS

WLAN

Intel® AX211 Wi-Fi 6E Bluetooth® 5.3 wireless card vPro WLAN^{1,2}

Intel® AX211 Wi-Fi 6E Bluetooth® 5.3 wireless card WLAN¹

¹Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, and Windows 11 to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported.

² Intel vPro® requires Windows 10 Pro 64 bit or higher, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or Wi-Fi 6E WLAN and TPM 2.0. Some functionality requires additional 3rd party software in order to run. Features of vPro® Essentials and Enterprise vary. See <http://intel.com/vpro>

WWAN

HP 5G Sub-6 Cat 19 WWAN eSIM^{1,2}

HP 4G LTE-A Pro Cat 16 WWAN eSIM¹

¹WWAN module is an optional feature, requires factory configuration 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.

²5G module is optional and must be configured at the factory. Module designed for 5G NR NSA (non-standalone) networks as carriers deploy Evolved-Universal Terrestrial Radio Access New Radio Dual Connectivity (ENDC) with both 100Mhz of 5G NR and LTE channel bandwidth, using 256QAM 4x4 as defined by 3GPP. Module requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Data connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. Backwards compatible to 4G LTE and 3G HSPA technologies. 5G module planned to be available in select platforms and select countries, where carrier supported.

LPWAN

Qualcomm® 9205

Near Field Communication (NFC) module

NFC NXP NPC300¹

¹Sold separately or as an optional feature.

Miracast

Native Miracast Support

NOTE: Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.

AUDIO/MULTIMEDIA

Audio

Audio Tuning by Poly Studio

2 Integrated stereo speakers

Discrete Amplifiers

2 Integrated dual array microphone

3.5mm Headset: CTIA only; Headphone-out

Speaker Power

1W/8ohm Per speaker

Features

Camera¹

5MP+Infrared camera

5MP camera

Sensors

ALS (ambient light sensor)

ACS (Adaptive Color Sensor)

Hall effect Sensor

Thermal Sensor

HP Tamper Lock²

¹ Sold separately or as an optional feature.

² HP Tamper Lock must be enabled by the customer or your administrator.

Features

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard*

HP Premium Keyboard, spill-resistant, Privacy, Backlit, Durakey keyboard.

HP Premium Keyboard, spill-resistant, Backlit, Durakey keyboard.

HP Premium Keyboard, spill-resistant, Durakey keyboard.

Pointing Devices

Clickpad with multi-touch gesture support

Microsoft Precision Touchpad Default Gestures Support

Multi-touch gesture support

Function Keys

ESC: system information

F1 - Display Switching

F2 - Blank or Privacy

F3 - Brightness Down

F4 - Brightness Up

F5 - Audio Mute

F6 - Volume Down

F7 - Volume Up

F8 - Mic Mute

F9 - Blank or Backlit Toggle

F10 - Insert

F11 - Airplane Mode

F12 - HP Command Center

Print Screen

Power Button (with LED)

delete

home

end

pg up

pg dn

Microsoft Copilot key**

Hidden Keys

Fn+R - Break

Fn+S - Sys Rq

Fn+C - Scroll Lock

*Backlit keyboard is an optional feature.

**Requires Windows 11 and an NPU. Timing of feature delivery and availability varies by market and device. Requires Microsoft account to log in. Where Copilot in Windows is not available, the Copilot key will lead to the Bing search engine. See <http://aka.ms/WindowsAIFeatures>

SOFTWARE AND SECURITY

Software

Bing Search for IE11

Buy Microsoft Office (Sold separately)

HP Connection Optimizer¹⁰

HP Easy Clean²

HP Easy Clean Keyboard Driver²

HP Hotkey Support

HP Mac Address Manager

HP Notifications

HP PC Hardware Diagnostics UEFI

Features

HP PC Hardware Diagnostics Windows
HP Privacy Settings
HP Support Assistant¹
HSA Fusion for Commercial
HPX for CMIT
Battery Health Manager¹⁸

Manageability Features

HP Client Catalog (download)
HP Client Management Script Library (download)
HP Cloud Recovery²⁸
HP Connect for Microsoft Endpoint Manager²⁶
HP Driver Packs (download)
HP Image Assistant Gen5 (download)
HP Manageability Integration Kit (download)¹²
HP Patch Assistant (download)²⁷

Security Management

HP Client Security Manager³
HP Sure Admin⁴
HP Sure Click⁵
HP Sure Recover Gen6⁸
HP Sure Run Gen5⁹
HP Sure Sense¹¹
HP Sure Start Gen7¹³
HP Tamper Lock¹⁴
HP Wolf Security for Business¹⁵
Secured-Core PC Enable¹⁶
Windows Hello Enhanced Sign-In Security (ESS)
Wolf Pro Security²⁵

Security- TPM

TCG TPM 2.0

BIOS

Absolute Persistence Module⁷
BIOS Update via Network
HP BIOSphere Gen6⁶
HP DriveLock & Automatic DriveLock
HP Fingerprint Sensor³²
HP Secure Erase¹⁷
HP Wake on WLAN

¹ HP Support Assistant - Requires Windows and Internet Access.

² HP Easy Clean requires Windows 10 RS3 and higher and will disable the keyboard, touchscreen, and clickpad only. Ports are not disabled. See user guide for cleaning instructions.

³ HP Client Security Manager Gen7 requires Windows and is available on select HP Pro, Elite and ZBook PCs. See product specifications for details.

⁴ HP Sure Admin requires Windows 10, HP BIOS, HP Manageability Integration Kit from <http://www.hp.com/go/clientmanagement> and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store.

⁵ HP Sure Click requires Windows 10 Pro or higher or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.

⁶ HP BIOSphere Gen6 is available on select HP Pro, Elite and ZBook PCs. See product specifications for details. Features may vary depending on the platform and configurations.

⁷ 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

Features

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.

⁸ HP Sure Recover Gen6 with Embedded Reimaging is an optional feature which requires Windows 10 and higher must be configured at purchase. You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Network based recovery using Wi-Fi is only available on PCs with Intel Wi-Fi Module

⁹ HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 and higher.

¹⁰ HP Connection Optimizer requires Windows 10 and Windows 11.

¹¹ HP Sure Sense is available on select HP PCs with Windows 10 Pro, Windows 10 Enterprise, Windows 11 Pro, or Windows 11 Enterprise OS.

¹² HP Manageability Integration Kit can be downloaded from <https://ftp.ext.hp.com/pub/caps-softpaq/cmit/HPMIK.html>.

¹³ HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 and higher

¹⁴ HP Tamper Lock must be enabled by the customer or your administrator.

¹⁵ HP Wolf Security for Business requires Windows 10 Pro or higher, includes various HP security features and is available on HP Pro, Elite, RPOS and Workstation products. See product details for included security features and OS requirement.

¹⁶ Secured-core PC requires an Intel® vPro® or AMD Ryzen™ Pro processor. Requires 8 GB or more system memory. Secured-core PC functionality can be enabled from the factory.

¹⁷ 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™.

¹⁸ Depending on the version available for your device and the setting you select, HP Battery Health Manager (BHM) will use a proprietary set of algorithms to optimize battery health during the life of the battery. New Commercial Notebooks come equipped with BHM set to "Let HP Manage My Battery Health" as the default. This setting will reduce charge capacity over time to optimize battery health and mitigate factors that can accelerate battery degradation. As a result of this reduction, battery runtime will decrease over time as available charge capacity is reduced. HP may, at any time, update HP Battery Health Manager to improve available settings, functionality, and performance. Refurbished products may have customized default settings to optimize user experience. For additional information on updating or modifying HP Battery Health Manager settings, please go to HP.COM/SUPPORT/BATTERY.

²⁵ HP Wolf Pro Security Edition is available preloaded on select SKUs, and, depending on the HP product purchased, includes a license with a term length communicated to you at purchase and in your order confirmation email. The HP Wolf Pro Security Edition software is licensed under the license terms of the HP Wolf Security Software - End-User license Agreement (EULA) that can be found at: https://support.hp.com/us-en/document/ish_3875769-3873014-16 as that EULA is modified by the following: 7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition is effective upon 4 months after the date the HP Product was shipped by HP and will continue for the term communicated to you at purchase and in your order confirmation email ("Initial Term"). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support. Notwithstanding the foregoing, the license shall expire no later than one year after the fixed term of the subject license ends.

²⁶ HP Connect for Microsoft Endpoint Manager is available from the Azure Market Place for HP Pro, Elite, Z and Point-of-Sale PCs managed with Microsoft Endpoint Manager. Subscription to Microsoft Endpoint Manager required and sold separately. Network connection required.

²⁷ HP Patch Assistant available on select HP PCs with the HP Manageability Kit that are managed through Microsoft System Center Configuration Manager. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

²⁸ HP Cloud Recovery is available for Z by HP, 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>.

³² HP Fingerprint Reader is an optional feature that requires Windows 10 IoT and must be configured at purchase.

Features

POWER

Power Supply

HP Standard 65W USB Type-C® adapter²
HP Slim 65W USB Type-C® adapter²
HP Slim 100W USB Type-C® AC adapter^{2,5}

Battery

HP Long Life 3-cell, 56 Whr Polymer^{3,4}
HP Long Life 6-cell, 76 Wh Polymer^{3,4}

Power Cord

3-wire plug - 1m
2-wire plug - 1m

Battery life

UMA¹

Up to 19 hours and 15 minutes with 76whr battery (HP Long Life 3-Cell, 76 Whr Polymer, UMA graphic, Intel Ultra 7 U15 vPro, Display set to 250 nits display (on a 400-nit display), 2*8G LPDDR5 memory, 256 GB SSD)

Up to 17 hours and 15 minutes with 76whr battery (HP Long Life 3-Cell, 76 Whr Polymer, UMA graphic, Intel Ultra 7 H28 vPro, Display set to 250 nits display (on a 400-nit display), 2*8G LPDDR5 memory, 256 GB SSD)

Discrete¹

Up to 9 hours and 15 minutes with 56whr battery (HP Long Life 3-Cell, 76 Whr Polymer, NVIDIA RTX A500 graphics, Intel Ultra 7 H28 vPro, Display set to 250 nits display (on a 400-nit display), 2*8G LPDDR5 memory, 256 GB SSD)

Up to 13 hours and 15 minutes with 76whr battery (HP Long Life 3-Cell, 76 Whr Polymer, NVIDIA RTX A500 graphics, Intel Ultra 7 H28 vPro, Display set to 250 nits display (on a 400-nit display), 2*8G LPDDR5 memory, 256 GB SSD)

¹ MM25 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 Availability may vary by country.

³ Battery is internal and not replaceable by customer. Serviceable by warranty.

⁴ For new batteries, actual battery Watt-hours (Wh) may differ from the design capacity and may have a full charge capacity that differs by up to 10, which is typical for lithium-ion batteries. Battery capacity naturally decreases over time and with use, depending on several factors such as battery health management settings, shelf life, temperature, environment, loaded apps, features, system configuration, and power settings.

⁵ The 100w AC adapter is required when discrete graphics are used.

Features

WEIGHTS & DIMENSIONS

Dimensions (w x d x h)

14.12 x 9.88 x 0.76 in
35.87 x 25.1 x 1.92 cm

Weights***Product Weight- 56Whr**

Starting at 3.96 lb
Starting at 1.797 kg

*Weight will vary by configuration. Does not include power adapter.

PORTS/SLOTS

Left side

2 Thunderbolt™ 4 with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4) *
1 Super Speed USB Type-A 5Gbps Power charging
1 HDMI 2.1**
1 Smartcard reader

Right side

1 Super Speed USB Type-A 5Gbps Power charging
1 Nano SIM card slot
1 Security Lock Slot

*SuperSpeed USB 20Gbps is not available with Thunderbolt™ 4.

**HDMI cable sold separately.

SERVICE AND SUPPORT

1-year warranty and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty.. 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>.

¹HP 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.

Certification and Compliance

CSA/UL 62368-1
ENERGY STAR®
FCC/ICES/CISPR/VCCI
CE MARKING
GS Mark
China CCC/SRRC

Features

Taiwan BSMI/NCC
 Korea KCC/KC/KES
 Ukraine NSoC/TEC
 EAEU Compliance
 Saudi Arabian Compliance
 TCO
 EPEAT® registered*
 Low Blue Light
 WW RoHS

Sustainable Impact Specifications

Low Halogen** aligned with HP GSE

*Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. EPEAT® status varies by country. Visit www.epeat.net for more information

**External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	AC 20V
	Average Operating Power(idle)	
	Integrated graphics	Yes
	Discrete Graphics	N/A
Temperature	Max Operating Power	65W
	Operating	32° to 95° F (0° to 35° C)
	Non-operating	-4° to 140° F (-20° to 60° C)
Relative Humidity	Operating	10% to 90%, non-condensing
	Non-operating	5% to 95% (38.7° C (101.6° F) maximum wet bulb tempera-ture; non-condensing)
Shock	Operating	40 G, 2 ms, half-sine
	Non-operating	240 G, 2 ms, half-sine
Random Vibration	Operating	1.043 grms
	Non-operating	3.5 grms
Maximum Altitude (unpressurized)	Operating	10,000 ft (3,048 m)
	Non-operating	40,000 ft (12,192 m)
Planned Industry Standard Certifications	Regulatory Model Number	HSN-I45C-4
	CSA/UL 62368-1	Yes
	ENERGY STAR®¹	Yes
	FCC/ICES/CISPR/VCCI	Yes
	CE MARKING	Yes
	GS Mark	Yes
	China CCC/SRRC	Yes
	Taiwan BSMI/NCC	Yes
	Korea KCC/KC/KES	Yes
	Ukraine NSoC/TEC	Yes

Features

EAEU Compliance	Yes
Saudi Arabian Compliance	Yes
TCO	Yes
EPEAT®	EPEAT® Gold in the United States ²
Low Blue Light	Yes
WW RoHS	Yes
Saudi Arabian Compliance (ICCP)	Yes
SABS	Yes

¹Configurations of the HP ZBook Firefly 16" G11 Mobile Workstation PC that are ENERGY STAR® qualified are identified as HP ZBook Firefly 16" G11 Mobile Workstation PC ENERGY STAR on HP websites and on <http://www.energystar.gov>.

²Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit www.epeat.net for more information.

Technical Specifications – Displays

DISPLAYS

16 in 2.8K (2880 x 1800) BrightView UWVA OLED+LBL DCI-P3 NBZ2 400 eDP 1.4+PSR 100 48H-120Hz (VRR) bent OLED Panel	Outline Dimensions (W x H)	348.078 x 224.19 (max)		
	Active Area	344.448 x 215.280 (typ)		
	Weight	220 (max)		
	Diagonal Size	16		
	Thickness	1.070 / 3.052 (max)		
	Interface	eDP1.4		
	Surface Treatment	Bright View		
	Touch enabled	No		
	Contrast Ratio	100,000:1 (typ)		
	Refresh Rate	120 (typ)		
	Brightness	400 (typ)		
	Pixel Resolution	Pitch	2880 x 1800 (WQUXGA)	
		Format	RGB	
	Backlight	OLED		
	Color Gamut Coverage	DCI-P3 100%		
	Color Depth	8 bits + 2FRC		
	Viewing Angle	UWVA 89/89/89/89		
	Low Blue Light	Yes		
	Power Consumption (W, EBL@ 150nits max/ 200nits max)	N/A (max)/ 7.5 (max)		

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

16.0 in WUXGA (1920 x 1200) Anti-Glare UWVA Low Blue Light sRGB 100 800 eDP 1.4+PSR+IOL Sure View 5 bent LCD Panel	Outline Dimensions (W x H)	349.980 x 224.80 (max)		
	Active Area	344.680 x 215.420 (typ)		
	Weight	310 (max)		
	Diagonal Size	16		
	Surface Treatment	Anti-Glare		
	Touch Enabled	No		
	Contrast Ratio	1500:1(typ)		
	Refresh Rate	60 Hz		
	Brightness	800 nits		
	Pixel Resolution	Pitch	1920 x 1200 (WUXGA)	
		Format	RGB	
	Backlight	WLED		
	Color Gamut Coverage	sRGB 100%		
	Color Depth	8 bits		
	Viewing Angle	UWVA 89/89/89/89		
Low Blue Light	Yes			

Technical Specifications – Displays

Power Consumption (W, EBL@ 150nits max/ 200nits max) 1.93(max)/2.38(max)

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

16 in WUXGA (1920 x 1200) Anti-Glare UWVA WLED+LBL sRGB NB2Y 400 eDP 1.4+PSR2 Low-Power 100 bent LCD Panel

Outline Dimensions (W x H) 350.680 x 226.470 (max)
Active Area 344.678 x 215.424 (typ)
Weight 330 (max)
Diagonal Size 16
Thickness 2.6 / 4.6 (max)
Interface eDP1.4
Surface Treatment Anti-Glare
Touch enabled No
Contrast Ratio 1000:1 (typ)
Refresh Rate 60 (typ)
Brightness 400 (typ)
Pixel Resolution **Pitch** 1920 x 1200 (WUXGA)
Format RGB
Backlight WLED
Color Gamut Coverage sRGB 100%
Color Depth 8 bits
Viewing Angle UWVA 89/89/89/89
Low Blue Light Yes
Power Consumption (W, EBL@ 150nits max/ 200nits max) 1.60 (max)/ 1.95 (max)

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

16 in WUXGA (1920 x 1200) Anti-Glare UWVA LED NTSC 45 NB2X 300 eDP 1.2 w/o PSR bent LCD Panel

Outline Dimensions (W x H) 350.680 x 226.470 (max)
Active Area 344.6784x215.424 (typ)
Weight 390 (max)
Diagonal Size 16
Thickness 3.0 / 5.0 (max)
Interface eDP 1.2
Surface Treatment Anti-Glare
Touch Enabled No
Contrast Ratio 1000:1(typ)
Refresh Rate 60 (typ)
Brightness 300 (typ)
Pixel Resolution **Pitch** 1920 x 1200 (WUXGA)
Format RGB

Technical Specifications – Displays

Backlight	WLED
Color Gamut Coverage	NTSC 45%
Color Depth	6 bits + 2FRC
Viewing Angle	UWVA 89/89/89/89
Low Blue Light	No
Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.7 (max)/3.4 (max)

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

16 in WUXGA (1920 x 1200) Anti-Glare UWVA LED NTSC 45 NB2X 300 TOP eDP 1.2 w/o PSR bent LCD Panel

Outline Dimensions (W x H)	350.680 x 226.470 (max)	
Active Area	344.6784x215.424 (typ)	
Weight	390 (max)	
Diagonal Size	16	
Thickness	3.0 / 5.0 (max)	
Interface	eDP 1.2	
Surface Treatment	Anti-Glare	
Touch Enabled	Yes	
Contrast Ratio	1000:1 (typ)	
Refresh Rate	60 (typ)	
Brightness	300 (typ)	
Pixel Resolution	Pitch	1920 x 1280 (WUXGA)
	Format	RGB
Backlight	WLED	
Color Gamut Coverage	NTSC 45%	
Color Depth	6 bits + 2FRC	
Viewing Angle	UWVA 89/89/89/89	
Low Blue Light	No	
Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.7 (max)/3.24 (max)	

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

Technical Specifications – Storage

STORAGE AND DRIVES

SSD 512GB 2280 PCIe-4x4 NVMe Three Layer Cell

Form Factor	M.2 2280				
Capacity	512GB				
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 Gen4X4				
Performance	<table> <tr> <td>Minimum Sequential Read</td> <td>Minimum Sequential Write</td> </tr> <tr> <td>6400 MB/s ±20%</td> <td>3500 MB/s ±20%</td> </tr> </table>	Minimum Sequential Read	Minimum Sequential Write	6400 MB/s ±20%	3500 MB/s ±20%
Minimum Sequential Read	Minimum Sequential Write				
6400 MB/s ±20%	3500 MB/s ±20%				
Logical Blocks	1,000,215,215				
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]				
Features	Pyrite 2.0; TRIM; L1.2				

NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 35 GB (for Windows 11) is reserved for system recovery software.

SSD 1TB 2280 PCIe-4x4 NVMe Three Layer Cell

Form Factor	M.2 2280				
Capacity	1TB				
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 Gen4X4				
Performance	<table> <tr> <td>Minimum Sequential Read</td> <td>Minimum Sequential Write</td> </tr> <tr> <td>6400 MB/s ±20%</td> <td>5000 MB/s ±20%</td> </tr> </table>	Minimum Sequential Read	Minimum Sequential Write	6400 MB/s ±20%	5000 MB/s ±20%
Minimum Sequential Read	Minimum Sequential Write				
6400 MB/s ±20%	5000 MB/s ±20%				
Logical Blocks	2,000,409,264				
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]				
Features	Pyrite 2.0; TRIM; L1.2				

NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 35 GB (for Windows 11) is reserved for system recovery software.

SSD 2TB 2280 PCIe-4x4 NVMe Three Layer Cell

Form Factor	M.2 2280				
Capacity	2TB				
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 Gen4X4				
Performance	<table> <tr> <td>Minimum Sequential Read</td> <td>Minimum Sequential Write</td> </tr> <tr> <td>6400 MB/s ±20%</td> <td>5000 MB/s ±20%</td> </tr> </table>	Minimum Sequential Read	Minimum Sequential Write	6400 MB/s ±20%	5000 MB/s ±20%
Minimum Sequential Read	Minimum Sequential Write				
6400 MB/s ±20%	5000 MB/s ±20%				
Logical Blocks	4,000,797,360				
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]				
Features	Pyrite 2.0; TRIM; L1.2				

Technical Specifications – Storage

NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 35 GB (for Windows 11) is reserved for system recovery software.

256GB PCIe 2280 NVMe Self Encrypted OPAL2 Value Solid State Drive

Form Factor	M.2 2280
Capacity	256GB
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 Gen4X4
Performance	Minimum Sequential Read Minimum Sequential Write
	2000 MB/s ±20% 900 MB/s ±20%
Logical Blocks	500,118,192
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	TCG Opal 2.0; TRIM; L1.2

NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 35 GB (for Windows 11) is reserved for system recovery software.

512GB PCIe-4x4 2280 NVMe Self Encrypted OPAL2 Three Layer Cell Solid State Drive

Form Factor	M.2 2280
Capacity	512GB
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 Gen4X4
Performance	Minimum Sequential Read Minimum Sequential Write
	6400 MB/s ±20% 3500 MB/s ±20%
Logical Blocks	1,000,215,215
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	TCG Opal 2.0; TRIM; L1.2

NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 35 GB (for Windows 11) is reserved for system recovery software.

SSD 1TB 2280 PCIe NVMe Value

Form Factor	M.2 2280
Capacity	1TB
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 Gen4X4
Performance	Minimum Sequential Read Minimum Sequential Write
	2200 MB/s ±20% 1600 MB/s ±20%
Logical Blocks	2,000,409,264
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	Pyrite 2.0; TRIM; L1.2

Technical Specifications – Storage

NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 35 GB (for Windows 11) is reserved for system recovery software.

SSD 256GB 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 Gen4X4	
	Performance	Minimum Sequential Read	Minimum Sequential Write
		2000 MB/s ±20%	900 MB/s ±20%
	Logical Blocks	500,118,192	
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]		
Features	Pyrite 2.0; TRIM; L1.2		

NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 35 GB (for Windows 11) is reserved for system recovery software.

SSD 512GB 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 Gen4X4	
	Performance	Minimum Sequential Read	Minimum Sequential Write
		2200 MB/s ±20%	1000 MB/s ±20%
	Logical Blocks	1,000,215,215	
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]		
Features	Pyrite 2.0; TRIM; L1.2		

NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 35 GB (for Windows 11) is reserved for system recovery software.

Technical Specifications – Networking

NETWORKING/COMMUNICATION

Intel® AX211 Wi-Fi 6E **Wireless LAN Standards**
+Bluetooth® 5.3 wireless
card M.2 160MHz CNVi
World-wide WLAN vPro®
1

Interoperability
Frequency Band

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

Wi-Fi certified

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

- 5.955 – 6.415 GHz

- 6.435 – 6.515 GHz

- 6.535 – 6.875 GHz

- 6.895 – 7.115 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: max 300Mbps

- 802.11ac : 1733Mbps

- 802.11ax : max 2.4Gbps

Modulation

Direct Sequence Spread Spectrum

OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM

Security¹

- 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

- WPA3 certification

- IEEE 802.11i

- WAPI

Network Architecture Models

Ad-hoc (Peer to Peer)

Infrastructure (Access Point Required)

Roaming

IEEE 802.11 compliant roaming between access points

Technical Specifications – Networking

Output Power²	<ul style="list-style-type: none">• 802.11b : +17dBm minimum• 802.11g : +16dBm minimum• 802.11a : +17dBm minimum• 802.11n HT20(2.4GHz) : +14dBm minimum• 802.11n HT40(2.4GHz) : +13dBm minimum• 802.11n HT20(5GHz) : +14dBm minimum• 802.11n HT40(5GHz) : +13dBm minimum• 802.11ac VHT80(5GHz) : +10dBm minimum• 802.11ac VHT160(5GHz) : +10dBm minimum• 802.11ax HE40(2.4GHz) : +12dBm minimum• 802.11ax HE80(5GHz) : +10dBm minimum• 802.11ax HE160(5GHz) : +10dBm minimum
Power Consumption	<ul style="list-style-type: none">• 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 Sensitivity³	<ul style="list-style-type: none">• 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(VHT80) : -84dBm maximum• 802.11ac, MCS9(VHT80) : -59dBm maximum• 802.11ac, MCS9(VHT160) : -58.5dBm maximum• 802.11ax, MCS11(HE40) : -57dBm maximum• 802.11ax, MCS11(HE80) : -54dBm maximum• 802.11ax, MCS11(HE160) : -53.5dBm 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 1216: 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 Off – Radio ON

Technical Specifications – Networking

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Technology

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 + 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
Link Topology	
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407
Power Management Certifications	ETSI 300 328, ETSI 301 893, ETSI 303 687 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	Bluetooth® 4.1-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 Bluetooth® 4.2 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) Bluetooth® 5.2 ESR9/10 Compliance LE Advertisement Extensions Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising 2Mbps LE LE Long Range Bluetooth® 5.3 Host to Controller Encryption Key Control Enhancements Compliance to the latest Errata Section 12.3 of Bluetooth® 5.3 wireless card specification

Technical Specifications – Networking

1. Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported. Wi-Fi 6E is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.
2. Check latest software/driver release for updates on supported security features.
3. 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.
4. 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).

Intel® AX211 Wi-Fi 6E + Bluetooth® 5.3 wireless card M.2 160MHz CNVi World-wide WLAN nonvPro® Wireless Card	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 • 5.955 – 6.415 GHz • 6.435 – 6.515 GHz • 6.535 – 6.875 GHz • 6.895 – 7.115 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: max 300Mbps • 802.11ac : 1733Mbps • 802.11ax : max 2.4Gbps
	Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM , 1024QAM
	Security¹	• 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 – Networking

Network Architecture Models	<ul style="list-style-type: none">• WPA2 certification• WPA3 certification• IEEE 802.11i• WAPI Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power²	<ul style="list-style-type: none">• 802.11b : +17dBm minimum• 802.11g : +16dBm minimum• 802.11a : +17dBm minimum• 802.11n HT20(2.4GHz) : +14dBm minimum• 802.11n HT40(2.4GHz) : +13dBm minimum• 802.11n HT20(5GHz) : +14dBm minimum• 802.11n HT40(5GHz) : +13dBm minimum• 802.11ac VHT80(5GHz) : +10dBm minimum• 802.11ac VHT160(5GHz) : +10dBm minimum• 802.11ax HE40(2.4GHz) : +12dBm minimum• 802.11ax HE80(5GHz) : +10dBm minimum• 802.11ax HE160(5GHz) : +10dBm minimum
Power Consumption	<ul style="list-style-type: none">• 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 Sensitivity³	<ul style="list-style-type: none">• 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(VHT80) : -84dBm maximum• 802.11ac, MCS9(VHT80) : -59dBm maximum• 802.11ac, MCS9(VHT160) : -58.5dBm maximum• 802.11ax, MCS11(HE40) : -57dBm maximum• 802.11ax, MCS11(HE80) : -54dBm maximum• 802.11ax, MCS11(HE160) : -53.5dBm 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 1216: 1.3g
Operating Voltage	3.3v +/- 9%

Technical Specifications – Networking

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	
HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Technology		
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 + 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	
Link Topology		
Power Management	Microsoft Windows ACPI, and USB Bus Support	
Certifications	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407	
Power Management Certifications	ETSI 300 328, ETSI 301 893, ETSI 303 687 Low Voltage Directive IEC950 UL, CSA, and CE Mark	
Bluetooth Profiles Supported	Bluetooth® 4.1-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 Bluetooth® 4.2 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) Bluetooth® 5.2	

Technical Specifications – Networking

ESR9/10 Compliance
LE Advertisement Extensions
Channel Selection Algo
Limited High Duty Cycle Non-Connectable Advertising
2Mbps LE
LE Long Range
Bluetooth® 5.3
Host to Controller Encryption Key Control Enhancements
Compliance to the latest Errata Section 12.3 of Bluetooth® 5.3 wireless card specification

1. Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported. Wi-Fi 6E is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.
2. Check latest software/driver release for updates on supported security features.
3. 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.
4. 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 5G Sub-6 Cat 19 WWAN eSIM

Technology/Operating bands*

WCDMA/HSPA+ operating bands:

Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)

Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)

Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)

Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)

Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)

LTE FDD/TDD operating bands:

Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)

Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)

Band 3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL)

Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)

Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)

Band 7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)

Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)

Band 12: 699 to 716 MHz (UL), 729 to 746 MHz (DL)

Band 13: 777 to 787 MHz (UL), 746 to 756 MHz (DL)

Band 14: 788 to 798 MHz (UL), 758 to 768 MHz (DL)

Band 17: 704 to 716 MHz (UL), 734 to 746 MHz (DL)

Band 18: 815 to 830 MHz (UL), 860 to 875 MHz (DL)

Band 19: 830 to 845 MHz (UL), 875 to 890 MHz (DL)

Band 20: 832 to 862 MHz (UL), 791 to 821 MHz (DL)

Band 25: 1850 to 1915 MHz (UL), 1930 to 1995 MHz (DL)

Band 26: 814 to 849 MHz (UL), 859 to 894 MHz (DL)

Band 28: 703 to 748 MHz (UL), 758 to 803 MHz (DL)

Band 29: 717 to 728 MHz (DL)

Band 30: 2305 to 2315 MHz (UL) 2350 to 2360 MHz (DL)

Band 32: 1452 to 1496 MHz (DL)

Band 34: 2010 to 2025 MHz (UL/DL)

Band 38: 2570 to 2620 MHz (UL/DL)

Band 39: 1880 to 1920 MHz (UL/DL)

Technical Specifications – Networking

Band 40: 2300 to 2400 MHz (UL/DL)
Band 41: 2496 to 2690 MHz (UL/DL)
Band 42: 3400 to 3600 MHz (UL/DL)
Band 43: 3400 to 3800 MHz (UL/DL)
Band 46: 5150 to 5925 MHz (DL)
Band 48: 3550 to 3700 MHz (UL/DL)
Band 66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)
Band 71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)
5G NR Sub 6GHz
n1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)
n2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)
n3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL)
n5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)
n7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)
n8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)
n20: 832 to 862 MHz (UL), 791 to 821 MHz (DL)
n25: 1850 to 1915 MHz (UL), 1930 to 1995 MHz (DL)
n28: 703 to 748 MHz (UL), 758 to 803 MHz (DL)
n30: 2305 to 2315 MHz (UL) 2350 to 2360 MHz (DL)
n38: 2570 to 2620 MHz (UL/DL)
n40: 2300 to 2400 MHz (UL/DL)
n41: 2496 to 2690 MHz (UL/DL)
n48: 3550 to 3700 MHz (UL/DL)
n66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)
n71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)
n77: 3300 to 4200 MHz (UL/DL)
n78: 3300 to 3800 MHz (UL/DL)
n79: 4400 to 5000 MHz (UL/DL)

Wireless protocol standards

NR Sub6G rel15
200MHz 2 DLCA, 256 QAM
200MHz 2 ULCA, 256 QAM
15KHz/30KHz SCS for FDD/TDD
LTE Rel15
100MHz 5 DLCA, 256 QAM
40MHz 2 ULCA, 256 QAM
UMTS Rel8

GPS

GPS bands

GPS only support L1 C/A
GPS: L1 (1575.42MHz)
GLONASS: L1 (1602MHz)
BeidouB1(1561.098MHz)
Galileo E1 (1575.42)
QZSS(1575.42 MHz)

Maximum data rates

Sub-6 SA Peak
DL 4.67Gbps/UL 1.25Gbps
Sub-6 NSA Peak
DL 3.74Gbps/UL 835Mbps
LTE Peak
DL 1.6Gbps (CAT19)/UL 211Mbps (CAT18)
UMTS/HSPA+
DL DC-HSPA+: 42 Mbps (CAT24)/UL 11.5 Mbps (CAT7)

Maximum output power

NR :
23 dBm in all band except (n30 = 22dBm & n48=21dBm & n77=25dBm & n41/n77/n78 = 26dBm)
LTE:

Technical Specifications – Networking

	23 dBm in all band except (B30 = 22dBm & B48=21dBm & B41=26dBm)
	UMTS: 23.5 dBm
Maximum power consumption	3500 mA (peak); 1674mA (average)
Form Factor	M.2, 3052-S3 Key B
Weight	8.7g
Dimensions (Length x Width x Thickness)	52 mm x 30 mm x 2.3 mm
embedded eSIM	Support

*5G module is optional and must be configured at the factory. Module designed for 5G NR NSA (non-standalone) networks as carriers deploy Evolved-Universal Terrestrial Radio Access New Radio Dual Connectivity (ENDC) with both 100MHz of 5G NR and LTE channel bandwidth, using 256QAM 4x4 as defined by 3GPP. Module requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Data connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. Backwards compatible to 4G LTE and 3G HSPA technologies. 5G module planned to be available in select platforms and select countries, where carrier supported.

HP 4G LTE-A Pro Cat16 WWAN eSIM

Technology/Operating bands*	WCDMA/HSPA+ operating bands: Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL) Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL) Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL) Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL) Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL) LTE FDD/TDD operating bands: Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL) Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL) Band 3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL) Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL) Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL) Band 7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL) Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL) Band 12: 699 to 716 MHz (UL), 729 to 746 MHz (DL) Band 13: 777 to 787 MHz (UL), 746 to 756 MHz (DL) Band 14: 788 to 798 MHz (UL), 758 to 768 MHz (DL) Band 17: 704 to 716 MHz (UL), 734 to 746 MHz (DL) Band 18: 815 to 830 MHz (UL), 860 to 875 MHz (DL) Band 19: 830 to 845 MHz (UL), 875 to 890 MHz (DL) Band 20: 832 to 862 MHz (UL), 791 to 821 MHz (DL) Band 25: 1850 to 1915 MHz (UL), 1930 to 1995 MHz (DL) Band 26: 814 to 849 MHz (UL), 859 to 894 MHz (DL) Band 28: 703 to 748 MHz (UL), 758 to 803 MHz (DL) Band 29: 717 to 728 MHz (DL) Band 30: 2305 to 2315 MHz (UL) 2350 to 2360 MHz (DL) Band 32: 1452 to 1496 MHz (DL) Band 34: 2010 to 2025 MHz (UL/DL) Band 38: 2570 to 2620 MHz (UL/DL) Band 39: 1880 to 1920 MHz (UL/DL) Band 40: 2300 to 2400 MHz (UL/DL)
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Technical Specifications – Networking

	Band 41: 2496 to 2690 MHz (UL/DL) Band 42: 3400 to 3600 MHz (UL/DL) Band 43: 3400 to 3800 MHz (UL/DL) Band 48: 3550 to 3700 MHz (UL/DL) Band 66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL) Band 71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)
Wireless protocol standards	3GPP LTE Rel15 LTE Specification, 100MHz 5 DLCA, 256 QAM, DL 1.0Gbps (CAT16)/ 40MHz 2 ULCA, 256 QAM, UL 211Mbps (CAT18) WCDMA 3GPP Release 8 UMTS Specification, DL UMTS: 384 kbps/UL 384 kbp, DL DC-HSPA+: 42 Mbps (CAT24)/UL 11.5 Mbps (CAT7) WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
GPS	Standalone, A-GPS (MS-A, MS-B)
GPS Bands	GPS: L1 (1575.42MHz) GLONASS: L1 (1602MHz) BeidouB1(1561.098MHz) Galileo E1 (1575.42) QZSS(1575.42 MHz)
Maximum Data Rates	LTE: ue-CategoryDL 16, (DL : 1 Gbps) ue-CategoryUL 18 , (UL: 211Mbps) DC-HSPA+: 42 Mbps (Download), 11.5 Mbps (Upload)
Maximum Output Power	HPUE: Not supported LTE: 23 dBm in all band except (B30= 22dBm& B48= 21dBm) UMTS: 23.5 dBm
Maximum Power Consumption	LTE: 1300 mA (peak); 1100 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average)
Form Factor	M.2, 3052-S3 Key B
Weight	8 g
Dimensions (Length x Width x Thickness)	52 mm × 30 mm × 2.3 mm
eSIM	Support

*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.

NFC NXP NPC300

Dimensions (L x W x H)	17 x 10 x 2.0 mm
Chipset	NPC300
System interface	I2C
NFC RF standards	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 ISO/IEC 18092 ECMA-340 NFCIP-1 Target and Initiator ECMA-320 NFCIP-2
NFC Forum Support	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2

Technical Specifications – Networking

Reader (PCD-VCD Mode(1))	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 MIFARE 1K MIFARE 4K MIFARE DESFire FeliCa Jewel and Topaz cards
Card Emulation (PICC-VICC) Mode(1)	ISO/IEC 14443 A ISO/IEC 14443 B and B' MIFARE FeliCa
Frequency	13.56 MHz
NFC Modes Supported	Reader/Writer, Peer-to-Peer
Raw RF Data Rates	106, 212, 424, 848 kbps
Operating temperature	0°C to 70°C
Storage temperature	-20°C to 125°C
Humidity	10-90% operating 5-95% non-operating
Supply Operating voltage	4.35 to 5.25 Volts
I/O Voltage	1.8V or 3.3V
Power Consumption	Booster enable, VCC_BOOST = 5V) Mode Power Consumption, Typical
	VBAT= 3.3V, Polling 7.3 mA
	Detected Test Tag Type 1 Total 283.8 mA Net Module 236.8 mA
	Detected Test Tag Type 2 Total 288.8 mA Net Module 241.8 mA
	Detected Test Tag Type 3 Total 287.7 mA Net Module 240.7 mA
	Detected Test Tag Type 4 Total 282.3 mA Net Module 235.3 mA

Qualcomm® 9205

Technology/Operating bands*

FDD LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 14 upper), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1900 (Band 25), 850 (Band 26), 800 (Band 27), 700 (Band 28), 1700/2100 (Band 66), 700 (band 85) MHz.
GSM/GPRS/EGPRS: 850, 900, 1800, 1900MHz.

Wireless protocol standards

- 3GPP TS 51.010-1 V10.5.0: Mobile Station (MS) conformance specification; Part 1: Conformance specification
- 3GPP TS 36.521-1 V14.3.0: User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Conformance testing
- 3GPP TS 21.111 V10.0.0: USIM and IC card requirements
- 3GPP TS 51.011 V4.15.0: Specification of the Subscriber Identity Module -Mobile Equipment (SIM-ME) interface
- 3GPP TS 31.102 V10.11.0: Characteristics of the Universal Subscriber Identity Module (USIM) application

Technical Specifications – Networking

	<ul style="list-style-type: none">• 3GPP TS 31.11 V10.16.0: Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)• 3GPP TS 36.124 V10.3.0: Electro Magnetic Compatibility (EMC) requirements for mobile terminals and ancillary equipment• 3GPP TS 27.007 V10.0.8: AT command set for User Equipment (UE)• 3GPP TS 27.005 V10.0.1: Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)
GPS	Standalone GPS/Beidou/Glonass, 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 FDD: 375 Kbps (Download), 1119 Kbps (Upload) GSM: - GPRS: 107 Kbps (Download), 85.6 Kbps (Upload) - EGPRS: 296 Kbps (Download), 236.8 Kbps (Upload)
Maximum Output Power	LTE: 21.5 dBm in all band GSM:34dBm
Maximum Power Consumption	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average)
Form Factor	M.2, 2242-S3 Key
Weight	5.5 g
Dimensions (Length x Width x Thickness)	22 x 42 x 2.3 mm
eSIM	Support

1. LPWAN (also called Mobile Narrowband) does not support mobile broadband use.

AUDIO

HD Stereo Codec	Realtek ALC3315
Audio I/O Ports	Headset: CTIA only and Headphone-out
Internal Speaker Amplifier	Cirrus Logic High-Efficiency Boosted Class D Amplifier
Multi-streaming Capable	Playback multi-streaming can be enabled in the audio control panel to allow independent audio. Following MSFT Behaviour
Sampling	DAC:48kHz ADC:48kHz
Wavetable Syntheses	N/A
Analog Audio	Support 3.5mm Headset: CTIA only and Headphone-out
# of Channels on Line-Out	N/A
Internal Speaker	Yes

FINGERPRINT READER

Sensor vendor	Synaptics
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Technical Specifications – Networking

Sensor type	Capacitive
DPI resolution	363 DPI
Scan area	104 x 86 pixels
False Rejection Rate	FRR= \leq 3%
False Acceptance Rate	FAR 1/100K
Mobile Voltage Operation	3.0V to 3.6V
Operating Temperature	0~60C
Current Consumption Image	100mA max
Low Latency Wait For Finger	260uA
Capture Rate	50 Frames/ sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	363 dpi / 7.4x6mm sensor area

Sensor vendor	Elan
Sensor type	Capacitive
DPI resolution	508 DPI
Scan area	80 x 80 pixels
False Rejection Rate	FRR= \leq 3%
False Acceptance Rate	FAR 1/100K
Mobile Voltage Operation	2.7V to 3.6V
Operating Temperature	-20~80C
Current Consumption Image	35mA max
Low Latency Wait For Finger	300uA
Capture Rate	50 Frames/ sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	508 dpi / 4.0x1.0mm sensor area

POWER

AC Adapter 65 Watt nPFC Standard USB type C Straight 1.8m	Dimensions	3.543 x 2.008 x 1.122 in (9.0x5.1x2.85cm)
	Weight	240g \pm 10g
	Input	Input Efficiency
		81.50% min at 115 Vac/ 230 Vac @5.00V
		86.70% min at 115 Vac/ 230 Vac @9.00V
		88.00% min at 115 Vac/ 230 Vac @12.00V
		89.00% min at 115 Vac/ 230 Vac @15.00V
		89.00% min at 115 Vac/ 230 Vac @20.00V
		Input frequency range
		47 ~ 63 Hz
		Input AC current
		Max. 1.6 A at 90 Vac
	Output	Output power
		5V/15W
		9V/27W
		12V/60W
		15V/65W
		20V/65W

Technical Specifications – Networking

		DC output	5V/9V/12V/15V/20V
		Hold-up time	100% load 5ms at 115 Vac input
		Output current limit	<8.0A
		AC Inlet Type	C6
		DC Cable Connector	USB type C
		DC Cable Material	PVC
	Connector	C6	
	Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° 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 - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL 62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC and CECP, CU(EAC), EAEU, KCC(Safety+EMC) and K-MEPS, NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia RCM, BIS, BSMI, UAE, UKCA DoC	
HP 65W Slim USB-C Straight AC Power Adapter	Dimensions	3.819 x 2.106 x 0.827 in (9.7x5.35x2.1cm)	
	Weight	220g ± 10g	
	Input	Input Efficiency	81.50% min at 115 Vac/ 230 Vac @5.00V 86.70% min at 115 Vac/ 230 Vac @9.00V 88.00% min at 115 Vac/ 230 Vac @12.00V 89.00% min at 115 Vac/ 230 Vac @15.00V 89.00% min at 115 Vac/ 230 Vac @20.00V
		Input frequency range	47-63Hz
		Input AC current	Max. 1.6 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	100% load 5ms at 115 Vac input
		Output current limit	< 8.0A
		AC Inlet Type	C6
		DC Cable Connector	USB type C
		DC Cable Material	PVC
	Connector	C6	
	Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)
		Altitude	0 to 16,400 ft (0 to 5000m)

Technical Specifications – Networking

		Humidity	20% to 95%
		Storage Humidity	10% to 95%
	EMI and Safety Certifications	<p>CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL 62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC and CECP, CU(EAC), EAEU, KCC(Safety+EMC) and K-MEPS, NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia RCM, BIS, BSMI, UAE, UKCA DoC</p>	
HP 100W Slim USB-C Straight AC Power Adapter	Dimensions	5.354 x 2.362 x 0.866 in (13.6x6.0x2.2cm)	
	Weight	380g ± 10g	
	Input	Input Efficiency	81.50% min at 115 Vac/ 230 Vac @5.00V 86.70% min at 115 Vac/ 230 Vac @9.00V 88.00% min at 115 Vac/ 230 Vac @12.00V 89.00% min at 115 Vac/ 230 Vac @15.00V 89.00% min at 115 Vac/ 230 Vac @20.00V
		Input frequency range	47-63Hz
		Input AC current	Max. 1.6 A at 90 Vac
	Output	Output power	5V/15W 9V/27W 12V/60W 15V/75W 20V/100W
		DC output	5V/9V/12V/15V/20V
		Hold-up time	100% load 5ms at 115 Vac input/80% load 10ms at 115 Vac input
		Output current limit	5V/9V/12V/15V<125% max current, 20V<135% max current
		AC Inlet Type	C6
		DC Cable Connector	USB type C
		DC Cable Material	PVC
	Connector	C6	
	Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° 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	<p>CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950-1, IEC 62368-1:2014 and IEC62368-1 : 2018, EN62368-1:2020+A11, UL 62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, CU(EAC), KCC(Safety+EMC), NOM-001 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia RCM, BIS, BSMI, UAE, UKCA DoC, Ukraine(CoC+DoC+RoHS+ECO)</p>	
	Dimensions (H x W x L)	251.8*70.3*6.82mm (9.91*2.77*0.27 inch)	

Technical Specifications – Networking

HP 3-cell Long Life Li-Ion (56 WHr)	Weight	0.205kg +/- 10g(0.474 lb)	
	Cells/Type	3cell Lithium-Ion Polymer cell / 586075	
	Energy	Voltage	11.58V
		Amp-hour capacity	4.84Ah
		Watt-hour capacity	56.04Wh
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (-10° to 60° C)
	Fuel Gauge LED	NA	
	Warranty	Follow product spec	
	Optional Travel Battery Available	No	

*Actual battery Watt-hours (Wh) will vary from design capacity. Battery capacity will naturally decrease with shelf life, time, usage, environment, temperature, system configuration, loaded apps, features, power management settings and other factors.

HP 6-cell Long Life Li-Ion (76WHr)	Dimensions (H x W x L)	303.2*90.1*6.82mm(11.94*3.55*0.27 inch)	
	Weight	0.357kg +/- 10g(0.787 lb)	
	Cells/Type	6cell Lithium-Ion Polymer cell / 564975	
	Energy	Voltage	11.58V
		Amp-hour capacity	6.565Ah
		Watt-hour capacity	76Wh
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (-10° to 60° C)
	Fuel Gauge LED	NA	
	Warranty	Follow product spec	
Optional Travel Battery Available	No		

*Actual battery Watt-hours (Wh) will vary from design capacity. Battery capacity will naturally decrease with shelf life, time, usage, environment, temperature, system configuration, loaded apps, features, power management settings and other factors.

Technical Specifications – Environmental

ENVIRONMENTAL DATA

Eco-Label Certifications & declarations

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- IT ECO declaration
- US ENERGY STAR®
- US Federal Energy Management Program (FEMP)
- EPEAT[®] Gold registered in the United States. See <http://www.epeat.net> for registration status in your country.
- TCO Certified
- China Energy Conservation Program (CECP)
- China State Environmental Protection Administration (SEPA)
- Taiwan Green Mark
- Korea Eco-label
- Japan PC Green label*

Sustainable Impact Specifications

- Product Carbon Footprint (hp.com)
- Ocean-bound plastic in Speaker
- 60% post-consumer recycled plastic
- 65% recycled metal
- Low halogen
- Outside Box and corrugated cushions are 100% sustainably sourced and recyclable
- Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable
- Bulk packaging available

System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.

Energy Consumption (in accordance with US ENERGY STAR® test method)

	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	4.61 W	4.45 W	4.40 W
Normal Operation (Long idle)	1.96 W	2.79 W	2.68 W
Sleep	1.10 W	1.15 W	1.17 W
Off	0.37 W	0.39 W	0.38 W

NOTE:

Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Heat Dissipation*

	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	16 BTU/hr	15 BTU/hr	15 BTU/hr
Normal Operation (Long idle)	7 BTU/hr	10 BTU/hr	9 BTU/hr
Sleep	4 BTU/hr	4 BTU/hr	4 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 BTU/hr

Technical Specifications – Environmental

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

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

	Sound Power (L _{Wad} , bels)	Sound Pressure (L _{pAm} , decibels)
Typically Configured – Idle	2.8	16.8
Fixed Disk – Random writes	3.1	21.1
Optical Drive – Sequential reads	3.9	29.8

Longevity and Upgrading

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

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

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2011/65/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product is 94.6% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	358 g
	PAPER/Molded Pulp	162 g
	PAPER/Paper	4 g
Internal:	PLASTIC/Polyethylene low density - LDPE	13 g

The plastic packaging material contains at least 0.0% recycled content.

The corrugated paper packaging materials contains at least 51.8% recycled content.

RoHS Compliance

HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.

We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.

We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve.

To obtain a copy of the HP RoHS Compliance Statement, see [HP RoHS position statement](#).

Technical Specifications – Environmental

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Bis(2-Ethylhexyl) phthalate (DEHP)
- Benzyl butyl phthalate (BBP)
- Dibutyl phthalate (DBP)
- Diisobutyl phthalate (DIBP)
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging Usage

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

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

End-of-life Management and Recycling

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

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/recyclers>.

Technical Specifications – Environmental

These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

HP Inc. Corporate Environmental Information

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

Global Citizenship Report

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

Eco-label certifications

<http://www8.hp.com/us/en/hp-information/environment/ecolabels.html>

ISO 14001 certificates:

<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842>

and

<http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf>

Footnotes

- Percentage of ocean-bound plastic contained in each component varies by product
- Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.
- External power supplies, WWAN modules, power cords, cables and peripherals excluded.
- 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.
- Fiber cushions made from 100% recycled wood fiber and organic materials.
- Disclaimer: recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams.

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

Type	Description	Part #
Audio/Video	HP USB G2 Stereo Headset	428H5AA
	HP USB G2 Stereo Headset	428K6AA
	HP 3.5mm G2 Stereo Headset	428H6AA
	HP 3.5mm G2 Stereo Headset	428K7AA
	HP 365 BT Speaker	567D3AA
	HP 325 FHD USB-A Webcam	53X27AA
	HP 965 4K Streaming Webcam	695J5AA
	HP 625 FHD Webcam	6Y7L1AA
Cases	HP Renew Business 17.3 Laptop Backpack	3E2U5AA
	HP Renew Business 17.3 Laptop Bag	3E2U6AA
	HP Renew Executive 16 Laptop Backpack	6B8Y1AA
	HP Renew Executive 16 Laptop Bag	6B8Y2AA
Docking station	HP USB-C Dock G5	26D32AA
	HP USB-C Dock G5	5TW10AA
	HP USB-C/A Universal Dock G2	5TW13AA
	HP Thunderbolt 120W G4 Dock	4JOA2AA
	HP Thunderbolt 280W G4 Dock w/Combo Cable	4JOG4AA
	HP USB-C G5 Essential Dock	72C71AA
Dongle	HP HDMI to VGA Adapter	H4F02AA
	HP USB-C to USB 3.0 Adapter	N2Z63AA
	HP USB-C to DisplayPort Adapter	N9K78AA
	HP USB-C to VGA Adapter	N9K76AA
	HP USB-C to VGA Adapter	P7Z54AA
	HP USB-C to HDMI 2.0 Adapter	1WC36AA
	HP USB-C to HDMI 2.0 Adapter	2PC54AA
	HP USB-C to RJ45 Adapter G2	4Z527AA
	HP USB-C to RJ45 Adapter G2	4Z534AA
	HP USB 3.0 to Gig RJ45 Adapter G2	4Z7Z7AA
	HP USB-C to DisplayPort Adapter G2	8Y8Y1AA
Hub	HP USB-C Travel Hub G2	7PJ38AA
	HP USB-C to USB-A Hub	Z6A00AA
	HP Universal USB-C Multiport Hub	50H55AA
	HP Universal USB-C Multiport Hub	50H98AA
	HP 4K USB-C Multiport Hub	6G842AA
	HP 4K USB-C Multiport Hub	6G843AA
	HP Universal USB-C Hub and Laptop Charger Combo	9H0H9AA
Keyboard/Combo	HP 320K Wired Keyboard	9SR37AA
	HP 975 USB+BT Dual-Mode Wireless Keyboard	3Z726AA

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

	HP 455 Programmable Wireless Keyboard	4R177AA
	HP 965 BLK Ergonomic Wireless Keyboard	7E756AA
	HP 475 Dual-Mode Wireless Keyboard	7N7B9AA
	HP 405 Multi-Device Backlit Wired Keyboard	7N7C1AA
	HP 435 Programmable Bluetooth Wireless Keypad	7N7C3AA
	HP Wireless Rechargeable 950MK Mouse and Keyboard	3M165AA
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA
	HP 655 Wireless Keyboard and Mouse Combo	4R009AA
Mouse	HP Wired 320M Mouse	9VA80AA
	HP Premium Wireless Mouse	1JR31AA
	HP Travel Bluetooth Mouse	6SP30AA
	HP Multi-Device 635 Black Wireless Mouse	1D0K2AA
	HP Creator 935 Black Wireless Mouse	1D0K8AA
	HP 235 Slim Wireless Mouse	4E407AA
	HP 435 Multi-Device Wireless Mouse	3B4Q5AA
	HP 715 Rechargeable Multi-Device Bluetooth Mouse	6E6F0AA
	HP 925 Ergonomic Vertical Wireless Mouse	6H1A5AA
Power	HP 65W USB-C LC Power Adapter	1P3K6AA
	HP 65W USB-C LC Power Adapter	944V0AA
	HP 65W Gallium Nitride USB-C Laptop Charger	600Q7AA
	HP 65W Gallium Nitride USB-C Laptop Charger	600Q8AA
	HP 65W USB-C Laptop Charger	671R2AA
	HP 65W USB-C Laptop Charger	671R3AA
	HP 110W USB-C Laptop Charger	8B3Y2AA
Commodity	HP 2TB PCIe-4x4 NVMe TLC M.2 Solid State Drive	6D8L6AA
	HP USB External DVDRW Drive	F2B56AA
	HP USB External DVDRW Drive	Y3T76AA
Security	HP Nano Keyed Cable Lock	1AJ39AA
	HP Nano Master Keyed Cable Lock	1AJ40AA
	HP Sure Key Cable Lock	6UW42AA
	HP Nano Combination Cable Lock	63B28AA
	HP Essential Nano Combination Cable Lock	63B31AA
Monitor	HP Z27k G3 4K USB-C Display	1B9T0A7
	HP Z27k G3 4K USB-C Display	1B9T0AA
	HP Z27k G3 4K USB-C Display	1B9T0AT
	HP Z27u G3 QHD USB-C Display	1B9X2A7
	HP Z27u G3 QHD USB-C Display	1B9X2AA
	HP Z27u G3 QHD USB-C Display	1B9X2AT
	HP Z34c G3 WQHD Curved Display	30A19A7

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

HP Z34c G3 WQHD Curved Display	30A19AA
HP Z34c G3 WQHD Curved Display	30A19AT
HP Z34c G3 WQHD Curved Display	30A19E9
HP Z24q G3 QHD Display	4Q8N4A7
HP Z24q G3 QHD Display	4Q8N4AA
HP Z24q G3 QHD Display	4Q8N4AT
HP Z24q G3 QHD Display	4Q8N4E9
HP Z24m G3 QHD Conferencing Display	4Q8N9A7
HP Z24m G3 QHD Conferencing Display	4Q8N9AA
HP Z24m G3 QHD Conferencing Display	4Q8N9AT
HP Z24m G3 QHD Conferencing Display	4Q8N9E9
HP Series 7 Pro 34 inch WQHD Conferencing Monitor - 734pm	8K157A5
HP Series 7 Pro 34 inch WQHD Conferencing Monitor - 734pm	8K157AA
HP Series 7 Pro 34 inch WQHD Conferencing Monitor - 734pm	8K157AT
HP Series 7 Pro 34 inch WQHD Conferencing Monitor - 734pm	8K157E9
HP Series 7 Pro 27 inch QHD Thunderbolt 4 Monitor - 727pu	8J9E6A5
HP Series 7 Pro 27 inch QHD Thunderbolt 4 Monitor - 727pu	8J9E6AA
HP Series 7 Pro 27 inch QHD Thunderbolt 4 Monitor - 727pu	8J9E6AT
HP Series 7 Pro 27 inch QHD Thunderbolt 4 Monitor - 727pu	8J9E6E9
HP Series 7 Pro 37.5 inch WQHD+ Thunderbolt 4 Monitor - 738pu	8K167A5
HP Series 7 Pro 37.5 inch WQHD+ Thunderbolt 4 Monitor - 738pu	8K167AA
HP Series 7 Pro 37.5 inch WQHD+ Thunderbolt 4 Monitor - 738pu	8K167AT
HP Series 7 Pro 37.5 inch WQHD+ Thunderbolt 4 Monitor - 738pu	8K167E9
HP Series 7 Pro 27 inch 4K Thunderbolt 4 Monitor - 727pk	8J9G2A5
HP Series 7 Pro 27 inch 4K Thunderbolt 4 Monitor - 727pk	8J9G2AA
HP Series 7 Pro 27 inch 4K Thunderbolt 4 Monitor - 727pk	8J9G2AT
HP Series 7 Pro 27 inch 4K Thunderbolt 4 Monitor - 727pk	8J9G2E9
HP Series 7 Pro 27 inch 4K Conferencing Monitor - 727pm	8K135A5
HP Series 7 Pro 27 inch 4K Conferencing Monitor - 727pm	8K135AA
HP Series 7 Pro 27 inch 4K Conferencing Monitor - 727pm	8K135AT
HP Series 7 Pro 27 inch 4K Conferencing Monitor - 727pm	8K135E9
HP Series 7 Pro 24 inch WUXGA USB-C Monitor - 724pu	8Y2F7A5
HP Series 7 Pro 24 inch WUXGA USB-C Monitor - 724pu	8Y2F7AA
HP Series 7 Pro 24 inch WUXGA USB-C Monitor - 724pu	8Y2F7AT
HP Series 7 Pro 24 inch WUXGA USB-C Monitor - 724pu	8Y2F7E9
HP Series 7 Pro 31.5 inch 4K Thunderbolt 4 Monitor - 732pk	8Y2K9A5
HP Series 7 Pro 31.5 inch 4K Thunderbolt 4 Monitor - 732pk	8Y2K9AA
HP Series 7 Pro 31.5 inch 4K Thunderbolt 4 Monitor - 732pk	8Y2K9AT
HP Series 7 Pro 31.5 inch 4K Thunderbolt 4 Monitor - 732pk	8Y2K9E9
HP Series 7 Pro 39.7 inch 5K2K Conferencing Monitor - 740pm	8Y2R2A5
HP Series 7 Pro 39.7 inch 5K2K Conferencing Monitor - 740pm	8Y2R2AA
HP Series 7 Pro 39.7 inch 5K2K Conferencing Monitor - 740pm	8Y2R2AT
HP Series 7 Pro 39.7 inch 5K2K Conferencing Monitor - 740pm	8Y2R2E9

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Date of change:	Version History:		Description of change:
March 12, 2024	From v1 to v2	Changed	At A Glance, POWER sections
March 25, 2024	From v2 to v3	Changed	Page 1 Right image
April 8, 2024	From v3 to v4	Changed	Format
April 24, 2024	From v4 to v5	Changed	WEIGHTS & DIMENSIONS, PORTS/SLOTS, POWER sections
May 22, 2024	From v5 to v6	Changed	HDMI support
July 18, 2024	From v6 to v7	Changed	At A Glance, DISPLAY, SOFTWARE AND SECURITY sections