Overview

HP ZBook Firefly 14" G11 A Mobile Workstation PC

Right

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)
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)
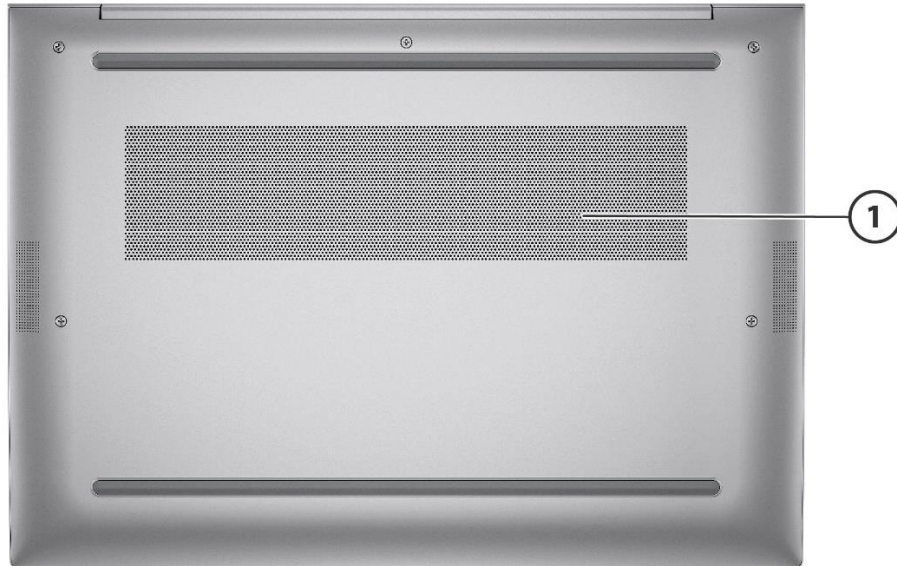
QuickSpecs

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.

QuickSpecs

Overview

Bottom

1. Fan Venting

QuickSpecs

Overview

At A Glance

- Premium ultraslim design with precision-crafted all-metal chassis for a premium look and feel
- Latest AMD® Ryzen PRO 8000 HS series processors
- Preinstalled with Windows 11 versions, FreeDOS, or Unbuntu Linux
- Integrated AMD Radeon Graphics w/ Pro Graphics driver
- 16:10 ratio screen reduces the need to scroll by showing more vertical content than 16:9
- 5MP camera (with 88 degree Field of View) with HP Auto Frame allows you to move around without losing viewers' attention during video calls
- DDR5 5600 memory and PCI Gen4 SSDs provide fast access to your work
- Choice of displays:
  - 35.6 cm (14") diagonal WUXGA IPS Anti-Glare LED-backlit, 300 nits, 45% NTSC
  - 35.6cm (14") diagonal WUXGA IPS Anti-Glare On-Cell LED-backlit touch, 300 nits, 45% NTSC
  - 35.6 cm (14") diagonal WUXGA IPS Anti-Glare LED-backlit non-touch 400 nits, 100% sRGB
  - 35.6cm (14") diagonal WUXGA IPS Anti-Glare LED-backlit non-touch, 1000 nits, 100% sRGB with HP Sure View Reflect
  - 35.6cm (14") diagonal WQXGA IPS Anti-Glare LED-backlit non-touch, 500 nits, 100% DCI-P3, DreamColor
- Premium keyboard layout to include easy use of discrete PgUp/Dn, End, and Home keys
- HP Wolf Security for Business creates a hardware-enforced, always-on, resilient defense.9
- Large Clickpad surface for easier, more intuitive input
- Connectivity with optional HP 5G/WWAN available world-wide, and Thunderbolt™ Docking (Dock sold separately)
- Undergoes MIL-STD 810H tests[1]
- 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

[1]MIL-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 Pro - HP recommends Windows 11 Pro for business[1]
Windows 11 Pro Education[1]
Windows 11 Home[1]
Windows 11 Home Single Language[1]
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[1,2,3,4,5,6]	Cores	Threads	L3 Cache	Max Boost Frequency	Base Frequency	Pro
AMD Ryzen™ 5 PRO 8640HS	6 cores	12	16 MB	4.90 GHz	3.50 GHz	X
AMD Ryzen™ 7 PRO 8840HS	8 cores	16	16 MB	5.10 GHz	3.30 GHz	X
AMD Ryzen™ 9 PRO 8945HS	8 cores	16	16 MB	5.20 GHz	4.00 GHz	X

[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.

[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.

CHIPSET

Features

Chipset is integrated with processor

GRAPHICS

Integrated

AMD Radeon™ Graphics[1,3,4]

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

[3] Intel® Iris® Xe Graphics capabilities require system to be configured with Intel® Core™ i5 or i7 processors and dual channel memory. Intel® Iris® Xe Graphics with Intel® Core™ i5 or 7 processors and single channel memory will only function as UHD graphics.

[4] AMD Radeon™ Graphics on this product comes standard with the AMD Pro Graphics driver.

DISPLAY

Non-touch

- 35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, WLED + Low Blue Light , 1000 nits, sRGB 100%, HP Sure View reflect integrated privacy screen[1,3,4,5]
- 35.6 cm (14") diagonal, WQXGA (2560 x 1600), Bent, LCD, 120Hz, UWVA, anti-glare, WLED, 500 nits, DCI-P3 100%, HP DreamColor[1,3]
- 35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, WLED + Low Blue Light , 400 nits, low power, sRGB 100%[1,3]
- 35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, WLED, 300 nits, NTSC 45%[1,3]

Touch

- 35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, touch, 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

14"
35.56 cm (14")

[1]HD content required to view HD images.
[3]Resolutions are dependent upon monitor capability, and resolution and color depth settings.
[4]HP Sure View Reflect integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
[5]Actual 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 MT/s (2 x 32 GB) RAM
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
System runs at 5600 MT/s

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.

QuickSpecs

Features

NETWORKING/COMMUNICATIONS

WLAN

Mediatek RZ616 Wi-Fi 6E Bluetooth® 5.3 wireless card AIM-T WLAN[1]

[1]Wi-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.

WWAN

HP 5G Sub-6 Cat 19 WWAN eSIM[1,2]
HP 4G LTE-A Pro Cat16 WWAN eSIM[1]

[1]WWAN 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.

[2]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.

LPWAN

Qualcomm® 9205 LTE-M (CAT-M1 fSVC)

Near Field Communication (NFC) module

NFC NXP NPC300[1]

[1]Sold 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

Speaker Power

1W/8ohm Per speaker

Camera[1]

5MP+Infrared camera
5MP camera

Features

Sensors
ALS (ambient light sensor)
ACS (Adaptive Color Sensor)
Hall effect Sensor
Thermal Sensor
HP Tamper Lock[2]
Fingerprint Sensor

[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

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
Power Button (with LED)
Hidden Keys
Fn+R - Break
Fn+S - Sys Rq
Fn+C - Scroll Lock

*Backlit keyboard is an optional feature.

SOFTWARE AND SECURITY

Software
Bing Search for IE11
Buy Microsoft Office (Sold separately)
HP Connection Optimizer[10]
HP Easy Clean[2]
HP Easy Clean Keyboard Driver[2]
HP Hotkey Support
HP Mac Address Manager
HP Notifications
HP PC Hardware Diagnostics UEFI
HP PC Hardware Diagnostics Windows
HP Power Manager
HP Privacy Settings
HP Services Scan[3]
HP Smart Support[3]
HP Support Assistant[1]
HSA Fusion for Commercial
Miro[4]
myHP
Battery Health Manager[16]

Features

Manageability Features
HP Client Catalog (download)
HP Client Management Script Library (download)
HP Cloud Recovery[28]
HP Connect for Microsoft Endpoint Manager[26]
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 Manager
HP Sure Admin[5]
HP Sure Click
HP Sure Recover Gen6[9]
HP Sure Run Gen5[11]
HP Sure Sense
HP Sure Start Gen7[13]
HP Tamper Lock
HP Wolf Security of Business[14]
Secured-Core PC Enable[15]
Windows Hello Enhanced Sign-In Security (ESS)
Wolf Pro Security[25]

Security- TPM
TCG TPM 2.0
BIOS
Absolute Persistence Module[7]
BIOS Update via Network
HP BIOSphere Gen6[6]
HP DriveLock & Automatic DriveLock
HP Fingerprint Sensor[32]
HP Secure Erase[17]
HP Wake on WLAN

Security TPM
Model: Nuvoton NPCT760HABYX
TCG TPM 2.0
Version : 7.2.3.1
FIPS 140-2 Compliant: Yes

Model: Infineon SLB9672VU2.0 FW15.23
TCG TPM 2.0
Version: 15.23
FIPS 140-2 Compliant: Yes

Smartcard Reader
Model Number: Alcorlink AK9563
FIPS 201 Compliant: Yes

[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 Smart Support/ HP Services Scan is preinstalled and/or provided thru Windows Update and checks for service entitlement on each hardware device and downloads the HP Insights agent automatically. To disable this feature, please follow the instructions at

Features

http://www.hpdaas.com/requirements. The HP Insights agent is a telemetry and analytics platform that provides critical data around devices and applications and is not sold as a standalone service. Select HP Workforce Solutions require an HP Insights agent for Windows, Mac, & Android, available for download at https://admin.hp.com/software. For full system requirements and services that require the agent, please visit https://admin.hp.com/requirements. The agent collects telemetry and analytics around devices and applications that integrate into the Workforce Experience platform and is not sold as a standalone service. Internet access with connection to the Workforce Experience platform is required. HP follows stringent GDPR privacy regulations, and the platform is ISO27001, ISO27701, ISO27017 and SOC2 Type2 certified for Information Security. Not available in China.

[4]HP customers qualify for a 90 day trail of Miro, this offer ends September 2025. Complete terms and conditions are provided by Miro when accepting the offer.

[5]HP Sure Admin requires HP G8 or newer platforms, Windows 10 or higher, HP BIOS, HP Manageability Kit or KMS Service from http://www.hp.com/go/clientmanagement and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store.

[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 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 is available on select HP PCs and requires Windows 10 or 11 and an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. HP Sure Recover Gen6 with Embedded Reimaging is an optional feature on select HP PCs which requires Windows 10 or 11 must be configured at purchase. You must back up important files, data, photos, videos, etc. before use to avoid loss of data.

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

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

[13]HP Sure Start is available on select HP PCs and requires Windows 10 and higher.

[14] 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.

[15]Secured-Core PC Enable requires an Intel® vPro® , AMD Ryzen™ Pro processor or Qualcomm® processor with SD850 or higher and requires 8 GB or more system memory. Secured-core PC is enabled from the factory.

[16] 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 Manger 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.

[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™.

[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.

Features

[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® adapter[2]
HP Slim 65W USB Type-C® adapter[2]

Battery
HP Long Life 3-cell, 56 Whr Polymer[3,4]

Battery Recharge Time
Supports battery HP Fast Charge: approximately 50% in 30 minutes[5]

Power Cord
3-wire plug - 1m
2-wire plug - 1m

Battery life
UMA
Up to 15 hours and 45 minutes with 56whr battery (HP Long Life 3-Cell, 56 Whr Polymer, UMA graphic, AMD Ryzen 7 PRO, Display set to 250 nits display, 2*8G DDR5 memory, 256 GB SSD)[1]

[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] Recharges your battery up to 50% within 30 minutes when the system is off or in standby mode. Power adapter minimum of 65 watts required for battery capacities 56Whr or less. Power adapter minimum of 100 watts required for battery capacities greater than 56Whr and less than 83Whr. Power adapter minimum of 120 watts required for battery capacities greater than 83Whr and less than 100Whr. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance

Features

WEIGHTS & DIMENSIONS

Dimensions (w x d x h)
12.42 x 8.82 x 0.76 in
31.56 x 22.435 x 1.92 cm

Weights*
Product Weight- 56Whr
Starting at 3.12 lb
Starting at 1.414 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 signaling rate Power charging
1 HDMI 2.1**
1 Smart Card Reader (Integrated)

Right side
1 Super Speed USB Type-A® 5Gbps signaling rate Power charging
1 Headphone/microphone combo jack
1 Nano SIM card slot (Integrated)
1 Security lock slot (Integrated)

*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.

[1]HP Care Packs are sold separately. Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit 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	AC 20V	
	Average Operating Power(idle)		System in idle mode
	Integrated graphics	Yes	

Features

	Discrete Graphics	N/A
	Max Operating Power	65W
Temperature	**Operating**	32° to 95° F (0° to 35° C) (No sustained direct exposure to sunlight) (System performance may be reduced above 32°C (89.6°F))
	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-I49C-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
	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

[1]Configurations of the HP ZBook Firefly 14" G11 A Mobile Workstation PC that are ENERGY STAR® qualified are identified as HP ZBook Firefly 14" G11 A Mobile Workstation PC ENERGY STAR on HP websites and on http://www.energystar.gov.
[2] Based 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

14 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)	307.29 x 199.25 (max)		
Active Area	301.59 X 188.50 (typ)		
Weight	300 (max)		
Diagonal Size	14		
Thickness	3.0 / 4.8 (max)		
Interface	eDP 1.2		
Surface Treatment	Anti-Glare		
Touch enabled	No		
Contrast Ratio	1000:1(typ)		
Refresh Rate	60 Hz		
Brightness	300 nits		
Pixel Resolution	**Pitch**	1920 x 1200 (WUXGA)	
	Format	RGB	
Backlight	WLED		
Color Gamut Coverage	NTSC 45%		
Color Depth	6+2 FRC		
Viewing Angle	UWVA 89/89/89/89		
Low Blue Light	No		
Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.20 (max) / 2.70 (max)		

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

14 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)	307.29 x 199.25 (max)		
Active Area	301.59 x 188.50 (typ)		
Weight	305g (max)		
Diagonal Size	14		
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 Hz		
Brightness	300 nits		
Pixel Resolution	**Pitch**	1920 x 1200 (WUXGA)	
	Format	RGB	
Backlight	WLED		
Color Gamut Coverage	NTSC 45%		
Color Depth	6+2 FRC		
Viewing Angle	UWVA 89/89/89/89		
Low Blue Light	No		

Technical Specifications – Displays

Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.15 (max)/2.65 (max)	

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

14 in WUXGA (1920 x 1200) Anti-Glare UWVA WLED+LBL sRGB NB2X 400 eDP 1.4+PSR2 Low-Power 100 bent LCD Panel		
Outline Dimensions (W x H)	307.590 x 199.550 (max)	
Active Area	301.590 X 188.500 (typ)	
Weight	210 (max)	
Diagonal Size	14	
Thickness	2.0 / 3.8 (max)	
Interface	eDP 1.4	
Surface Treatment	Anti-Glare	
Touch enabled	No	
Contrast Ratio	1000:1(typ)	
Refresh Rate	60 Hz	
Brightness	400 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	
Power Consumption (W, EBL@ 150nits max/ 200nits max)	1.29 (max) / 1.66 (max)	

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

14 in WUXGA (1920 x 1200) Anti-Glare UWVA WLED+LBL sRGB NB2Y 1000 eDP 1.3+PSR 100 PrivacyG4 Plus bent LCD Panel		
Outline Dimensions (W x H)	307.600 x 199.550 (typ)	
Active Area	301.680 x 188.500 (typ)	
Weight	238 (max)	
Diagonal Size	14	
Thickness	2.2 / 3.9 (max)	
Interface	eDP 1.3	
Surface Treatment	Anti-Glare	
Touch Enabled	No	
Contrast Ratio	1500:1(typ)	
Refresh Rate	60 Hz	
Brightness	1000 nits	
Pixel Resolution	**Pitch**	1920 x 1200 (WUXGA)
	Format	RGB

Technical Specifications – Displays

	Backlight	WLED	
	Color Gamut Coverage	sRGB 100%	
	Color Depth	8 bits	
	Viewing Angle	UWVA 85/85/85/85	
	Low Blue Light	Yes	
	Power Consumption (W, EBL@ 150nits max/ 200nits max)	N/A	

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

14 in WQXGA DRM (2560 x 1600) Anti-Glare UWVA LED DCI-P3 NB2X 500 eDP 1.4+PSR2 100 120Hz bent LCD Panel	**Outline Dimensions (W x H)**	307.594 x 199.546 (max)	
	Active Area	301.594 x 188.496 (typ)	
	Weight	230 (max)	
	Diagonal Size	14	
	Thickness	2.0 / 3.8 (max)	
	Interface	eDP 1.4	
	Surface Treatment	Anti-Glare	
	Touch Enabled	No	
	Contrast Ratio	1200:1 (typ)	
	Refresh Rate	120 Hz	
	Brightness	500 nits	
	Pixel Resolution	**Pitch**	2560 x1600 (WQXGA)
		Format	RGB
	Backlight	WLED	
	Color Gamut Coverage	DCI-P3 100%	
	Color Depth	8 bits	
	Viewing Angle	UWVA 89/89/89/89	
	Low Blue Light	No	
	Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.88 (max) / 3.44 (max)	

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

QuickSpecs

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	**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	**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	**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.

NETWORKING/COMMUNICATION

Mediatek RZ616 Wi-Fi 6E Bluetooth® 5.3 wireless card AIM-T WLAN [1]	**Wireless LAN Standards**	IEEE 802.11a IEEE 802.11ac IEEE 802.11ax IEEE 802.11b IEEE 802.11d IEEE 802.11e IEEE 802.11g IEEE 802.11h IEEE 802.11i IEEE 802.11j IEEE 802.11k IEEE 802.11mc IEEE 802.11n IEEE 802.11r IEEE 802.11v IEEE 802.11w
	Interoperability	Wi-Fi certified

	Frequency Band	• 802.11b/g/n/ax
		  2.402 – 2.482 GHz
		• 802.11a/n/ac/ax
		  5.15 – 5.25 GHz
		  5.25 – 5.35 GHz
		  5.47 – 5.725 GHz
		  5.825 – 5.850 GHz
		  5.925 – 7.125 GHz

	Data Rates	• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11ac : MCS0 ~ MCS9, (20MHz, 40MHz, 80MHz, 160MHz) • 802.11ax : MCS0 ~ MCS11, (20MHz, 40MHz, 80MHz, 160MHz) • 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, 40MHz)
	Modulation	Direct Sequence Spread Spectrum 1024QAM, 16-QAM, 256-QAM, 64-QAM, BPSK, CCK, Direct Sequence Spread Spectrum, OFDM, QPSK
	Security[1]	• 802.1x authentication • AES-CCMP: 128 bit in hardware • IEEE 802.11i • IEEE and WiFi certified 64 / 128 bit WEP encryption for a/b/g mode only • WAPI • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • WPA3 (personal) certification
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)

Technical Specifications – Networking

Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	2.4GHz (MIMO, typical):

2.4GHz (MIMO, typical):
- 802.11b : +18dBm
- 802.11g : +16.5dBm
- 802.11n/ac/ax (HT20/VHT20/HE20) : +16dBm
- 802.11n/ac/ax (HT40/VHT40/HE40) : +12.5dBm

5GHz (MIMO, typical):
- 802.11a : +13dBm
- 802.11n/ac/ax (HT20/VHT20/HE20) : +13.5dBm
- 802.11n/ac/ax (HT40/VHT40/HE40) : +12.5dBm
- 802.11ac/ax (VHT80/HE80) : +11.5dBm
- 802.11ax HE160 : +11.5dBm

6GHz LPI mode (MIMO, typical):
- 802.11a : 0dBm
- 802.11ax HE20 : +1dBm
- 802.11ax HE40 : +4dBm
- 802.11ax HE80 : +7dBm

- 802.11ax HE160 : +7.5dBm

Power Consumption
Transmit mode : 2.5 W
Receive mode : 2.0 W
Idle mode (PSP) : 180 mW (WLAN Associated)
Idle mode: 50 mW (WLAN unassociated)
Connected Standby/Modern Standby : 10 mW
Radio disabled : 8 mW

Power Management
ACPI and PCI Express compliant power management

Receiver Sensitivity[3]
2.4GHz (SISO):
- 802.11b, 11Mbps : -82dBm maximum
- 802.11g, 54Mbps : -71dBm maximum
- 802.11n, MCS7 : -64dBm maximum
- 802.11ac, MCS9 : -52dBm maximum
- 802.11ax, MCS11(HT40): -49dBm maximum

5GHz (SISO):
- 802.11a, 54Mbps : -71dBm maximum
- 802.11n, MCS07 : -64dBm maximum
- 802.11ac, MCS9 : -52dBm maximum
- 802.11ax, MCS11(HE80/HE160): -46dBm maximum

6GHz (SISO):
- 802.11a, 54Mbps : -71dBm maximum
- 802.11n, MCS7 : -64dBm maximum
- 802.11ac, MCS9 : -52dBm maximum
- 802.11ax, MCS11(HE160): -46dBm maximum

Antenna Type
High efficiency antenna with spatial diversity, mounted in the display enclosure

Technical Specifications – Networking

	Two embedded dual band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	30.00 x 22.00 x 2.30 mm (1.18 x 0.87 x 0.09 inch)	
Weight	Type 2230: 2.8g	
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 Non-operating	0 to 10,000 ft (3,048 m)
		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 + 4 dBm for BR and EDR.
Power Consumption	Peak (Tx): 330 mW
	Peak (Rx): 230 mW
	Selective Suspend: 17 mW
Bluetooth Software Supported Link Topology	Microsoft Windows Bluetooth Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407; ETSI 300 328, ETSI 301 893, ETSI 303 687
Bluetooth Profiles Supported	2Mbps LE
	Advanced Audio Distribution Profile (A2DP)
	Basic Imaging Profile (BIP)
	Bluetooth® 4.1-ESR 5/6/7 Compliance
	Bluetooth® 4.2 ESR08 Compliance
	Bluetooth® 5.2
	Bluetooth® 5.3
	Channel Selection Algo
	Encryption key size control enhancements
	ESR9/10 Compliance
	FAX Profile (FAX)
	Hands Free Profile (HFP)
	Headset Profile (HSP)
	LE Advertisement Extensions
	LE Data Packet Length Extension

Technical Specifications – Networking

LE Dual Mode
LE L2CAP Connection Oriented Channels
LE Link Layer
LE Link Layer Ping
LE Long Range
LE Low Duty Cycle Directed Advertising
LE Privacy 1.2 –Extended Scanner Filter Policies
LE Privacy 1.2 –Link Layer Privacy
LE Secure Connection- Basic/Full
Limited High Duty Cycle Non-Connectable Advertising
Periodic Advertisement interval
Train Nudging & Interlaced Scan
Windows Bluetooth® profiles support

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 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 2: 1850 to 1910 MHz (UL), 1930 to 1990 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 3: 1710 to 1785 MHz (UL), 1805 to 1880 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 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)
	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 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)
	Band 66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)
	Band 7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)
	Band 71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)
	Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)
	5GNR Sub 6GHZ:
	n1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)
	n2: 1850 to 1910 MHz (UL), 1930 to 1990 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)
	n3: 1710 to 1785 MHz (UL), 1805 to 1880 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)
	n5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)
	n66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)
	n7: 2500 to 2570 MHz (UL), 2620 to 2690 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)
	n8: 880 to 915 MHz (UL), 925 to 960 MHz (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 only support L1 C/A
GPS bands	GPS L1 (1575.42MHz), GLONASS L1 (1602MHz), Beidou B1 (1561.098MHz), Galileo E1 (1575.42MHz), QZSS (1575.42MHz)
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 : 23 dBm in all band except (B30 = 22dBm & B48=21dBm & B41=26dBm) UMTS : 23.5 dBm

Technical Specifications – Networking

Maximum power consumption	3500 mA (peak); 1674mA (average)
Form Factor	M.2, 3052-S3 Key B
Weight	8.7 g (0.307 oz)
Dimensions (Length x Width x Thickness)	52.00 x 30.00 x 2.30 mm (2.05 x 1.18 x 0.09 inch)
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 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 2: 1850 to 1910 MHz (UL), 1930 to 1990 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 3: 1710 to 1785 MHz (UL), 1805 to 1880 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 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)
	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 48: 3550 to 3700 MHz (UL/DL)
	Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)
	Band 66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)
	Band 7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)
	Band 71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)

Technical Specifications – Networking

	Band 8: 880 to 915 MHz (UL), 925 to 960 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), Beidou B1 (1561.098MHz), Galileo E1 (1575.42MHz), QZSS (1575.42MHz)
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	8.0 g (0.282 oz)
Dimensions (Length x Width x Thickness)	52.00 x 30.00 x 2.30 mm (2.05 x 1.18 x 0.09 inch)
embedded 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.

**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.

NFC NXP NPC300

Dimensions (L x W x H)	17.00 x 10.00 x 2.00 mm (0.67 x 0.39 x 0.08 inch)
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		
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	Operating: 0 °C to 70 °C (32 °F to 158 °F) Storage: -20 °C to 125 °C (-4 °F to 257 °F)		
Humidity	Operating: 10% - 90% (non-condensing) Non-Operating: 5% - 95% (non-condensing)		
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
Antenna	Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module.		

Qualcomm® 9205

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

GSM/GPRS/EGPRS: 1800, 1900, 850, 900 MHz |
| **Wireless protocol standards** | 3GPP TS 21.111 V10.0.0: USIM and IC card requirements 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) 3GPP TS 27.007 V10.0.8: AT command set for User Equipment (UE) 3GPP TS 31.102 V10.11.0: Characteristics of the Universal Subscriber Identity Module (USIM) application 3GPP TS 31.11 V10.16.0: Universal Subscriber Identity Module (USIM) Application Toolkit (USAT) |

Technical Specifications – Networking

	3GPP TS 36.124 V10.3.0: Electro Magnetic Compatibility (EMC) requirements for mobile terminals and ancillary equipment 3GPP TS 36.521-1 V14.3.0: User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Conformance testing 3GPP TS 51.010-1 V10.5.0: Mobile Station (MS) conformance specification; Part 1: Conformance specification 3GPP TS 51.011 V4.15.0: Specification of the Subscriber Identity Module -Mobile Equipment (SIM-ME) interface
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: 375.00 Kbps (Download), 1119.00 Kbps (Upload) GPRS: 107.00 Kbps (Download), 85.60 Kbps (Upload) EGPRS: 296.00 Kbps (Download), 236.80 Kbps (Upload)
Maximum Output Power	LTE (all bands except B41): 21.5 dBm GSM: 34.0 dBm
Maximum Power Consumption	LTE: 147 mA(peak), 18 mA(average)
Form Factor	M.2
Weight	4 g
Dimensions (Length x Width x Thickness)	22.00 x 42.00 x 2.30 mm (0.87 x 1.65 x 0.09 inch)
embedded eSIM	Support

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

AUDIO

HD Stereo Codec	Realtek ALC3315
Audio I/O Ports	3.5mm Headset: CTIA only;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 streams to be sent to/from the front jacks or integrated speaker., Following MSFT Behavior
Sampling	DAC: Supports resolutions from -bit to -bit;48.0 kHZ to 48.0 kHz ADC: Supports resolutions from -bit to -bit;48.0 kHZ to 48.0 kHz
Wavetable Syntheses	N/A
# of Channels on Line-Out	N/A
Internal Speaker	Yes

FINGERPRINT READER

Fingerprint Reader 1st Source

Sensor vendor	SYNAPTICS

Technical Specifications – Networking

Sensor type	Capacitive
DPI resolution	363 DPI
Scan area	104 x 86 pixels
False Rejection Rate	< 3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	2.7 V ~ 3.6 V
Operating Temperature	0°C ~ 60°C (32°F ~ 140°F)
Current Consumption Image	100 mA max
Low Latency Wait For Finger	260 uA
Capture Rate	50 frames/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	363 dpi / 7.4 x 6.0 mm sensor area
Fingerprint Reader 2st Source	
Sensor vendor	ELAN
Sensor type	Capacitive
DPI resolution	508 DPI
Scan area	80 x 80 pixels
False Rejection Rate	< 3%
False Acceptance Rate	< 3.000%
Mobile Voltage Operation	2.7 V ~ 3.6 V
Operating Temperature	–20°C ~ 80°C (-4°F ~ 176°F)
Current Consumption Image	35 mA max
Low Latency Wait For Finger	300 uA
Capture Rate	50 frames/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	508 dpi / 4.0 x 4.0 mm 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 ± 10g	
	Input	**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	47 ~ 63 Hz
		Input AC current	Max. 1.6 A at 90 Vac
	Output	**Output power**	5V/15W 9V/27W

Technical Specifications – Networking

			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)
		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**	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	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	

Technical Specifications – Networking

	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 3-cell Long Life Li-Ion (56 WHr)	**Dimensions (H x W x L)**	251.8*70.3*6.82mm (9.91*2.77*0.27 inch)	
	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.

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 • 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)	3.73 W	3.53 W	3.69 W
Normal Operation (Long idle)	0.66 W	0.62 W	0.67 W
Sleep	0.66 W	0.62 W	0.67 W
Off	0.31 W	0.33 W	0.30 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)	12.72 BTU/hr	12.04 BTU/hr	12.58 BTU/hr
Normal Operation (Long idle)	2.25 BTU/hr	2.11 BTU/hr	2.28 BTU/hr
Sleep	2.25 BTU/hr	2.11 BTU/hr	2.28 BTU/hr
Off	1.06 BTU/hr	1.13 BTU/hr	1.02 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	2.7	14
Fixed Disk – Random writes	3.2	20.1
Optical Drive – Sequential reads	3.7	25.3

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 93.6% recycle-able when properly disposed of at end of life.

Packaging Materials	**External:**	PAPER/Corrugated	269 g
		PAPER/Molded Pulp	3 g
		PAPER/Paper	108 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 59.1% 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.

QuickSpecs

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.
- Plastic cushions are made from >90% recycled plastic.
- 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 Prelude 15.6 Backpack (Bulk Qty.15)	1E7D6A6
	HP Prelude Pro Recycle Backpack	1X644AA
	HP Prelude Pro Recycle Top Load	1X645AA
	HP Prelude 15.6 Top Load	1E7D7AA
	HP Prelude 15.6 Top Load	2Z8P4AA
	HP Prelude 15.6 Top Load	50P31AA
	HP Prelude 15.6 Backpack	1E7D6AA
	HP Prelude 15.6 Backpack	2Z8P3AA
	HP Prelude 15.6 Backpack	50P32AA
	HP Prelude Pro Recycled 15.6 Backpack (Bulk Qty.12)	1X644A6
	HP Prelude Pro Recycled 15.6 Top Load (Bulk Qty.12)	1X645A6
	HP Renew Business 17.3 Laptop Backpack	3E2U5AA
	HP Renew Business 17.3 Laptop Bag	3E2U6AA
	HP Renew Business 15.6 Laptop Bag	3E5F8AA
	HP Renew Business 14.1 Laptop Bag	3E5F9AA
	HP Renew Business 14.1 Laptop Sleeve	3E2U7AA
	HP Renew Business 17.3 Laptop Backpack (Bulk Qty. 6)	3E2U5A6
	HP Renew Business 15.6 Laptop Bag (Bulk Qty.12)	3E5F8A6
	HP Renew Business 14.1 Laptop Bag (Bulk Qty.12)	3E5F9A6
	HP Renew Business 14.1 Sleeve (Bulk Qty. 24)	3E2U7A6
	HP Renew Executive 16 Laptop Backpack	6B8Y1AA
	HP Renew Executive 16 Laptop Bag	6B8Y2AA
	HP Renew Executive 14.1 Laptop Sleeve	6B8Y3AA
	HP Travel 25 Liter 15.6 Iron Gray Laptop Backpack	6B8U4AA
	HP Travel 25 Liter 15.6 Iron Gray Laptop Backpack	6H2D8AA
	HP Travel 18 Liter 15.6 Iron Gray Laptop Backpack	6B8U6AA
	HP Travel 18 Liter 15.6 Iron Gray Laptop Backpack	6H2D9AA
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	4J0A2AA
	HP Thunderbolt 280W G4 Dock w/Combo Cable	4J0G4AA
	HP USB-C G5 Essential Dock	72C71AA

QuickSpecs

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

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
	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

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

	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 Keyed Cable Lock	1AJ39UT
	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

Date of change:	Version History:		Description of change:
April 24, 2024	From v1 to v2	Changed	WEIGHTS & DIMENSIONS section
May 22, 2024	From v2 to v3	Changed	HDMI support
July 18, 2024	From v3 to v4	Changed	At A Glance, DISPLAY, SOFTWARE AND SECURITY sections
July 18, 2024	From v4 to v5	Changed	POWER section
August 15, 2024	From v5 to v6	Changed	POWER section
October 8, 2024	From v6 to v7	Changed	GRAPHICS section