

Overview

HP ZBook Power 16 inch G11 Mobile Workstation PC



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

Right

8. Power Button Key
9. Nano Security Lock Slot (Lock sold separately)
10. RJ45
11. SuperSpeed USB Type-A 5Gbps signaling rate
12. Nano SIM Card Slot (Optional)
13. SD Reader
14. Touch Fingerprint Sensor (Select models)

Overview



Left

1. LED Indicator
2. Power connector
3. 2 Thunderbolt™ 4 with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 2.1)1
4. HDMI 2.0b Port (Cable not included)
5. SuperSpeed USB Type-A 5Gbps signaling rate
6. Audio Combo Jack
7. Smartcard Reader (Optional)

Overview

At A Glance

- Premium ultraslim design with precision-crafted all-metal chassis for a premium look and feel
- Intel® Core™ Ultra9 processor; Intel® Core™ Ultra7 processor; Intel® Core™ Ultra5 processor
- Preinstalled with Windows 11 versions or FreeDOS
- 5MP camera (with 88 degree Field of View) allows you to move around without losing viewers' attention during video calls
- DDR5 5600 memory with up to 64GB capacity and PCI Gen4 SSDs provide fast access to your work
- Choice of displays
 - 40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 300 nits, 45% NTSC;
 - 40.6 cm (16") diagonal, WUXGA (1920 x 1200), touch, IPS, anti-glare, 300 nits, 45% NTSC;
 - 40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 400 nits, 100% sRGB;
 - 40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 1000 nits, 100% sRGB, HP Sure View Reflect integrated privacy screen
 - 40.6 cm (16") diagonal, WQXGA (2560x1600), IPS, anti-glare, 400 nits, 100% sRGB, Low Blue light
- Premium keyboard layout to include easy use of discrete PgUp/Dn, End, and Home keys
- Optional NVIDIA RTX 500 Ada/1000 Ada/2000 Ada/3000 Ada pro graphics for improved performance for heavier graphics workloads.
- HP Wolf Security for Business creates a hardware-enforced, always-on, resilient defense.
- Larger Clickpad surface for easier, more intuitive input
- Connectivity with optional Intel® 4000 4G/WWAN available world-wide, and Thunderbolt™ Docking (Dock sold separately)
- Undergoes MIL-STD 810H tests
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles
- Designed to support all HP docking options

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 Ubuntu Linux 22.04 LTS
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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

Intel[®] Core™ Ultra5 125H (Up to 3.6 GHz E-core Max Turbo frequency, up to 4.5 GHz P-core Max Turbo frequency, 12 MB L3 cache, 4 P-cores and 8 E-cores, 18 threads);^{1,2,3,5,6}

Intel[®] Core™ Ultra5 135H (Up to 3.6 GHz E-core Max Turbo frequency, up to 4.6 GHz P-core Max Turbo frequency, 18 MB L3 cache, 4 P-cores and 8 E-cores, 18 threads), supports Intel[®] vPro[®] Technology;^{1,2,3,4,5,6}

Intel[®] Core™ Ultra7 155H (Up to 3.8 GHz E-core Max Turbo frequency, up to 4.8 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 22 threads);^{1,2,3,5,6}

Intel[®] Core™ Ultra7 165H (Up to 3.8 GHz E-core Max Turbo frequency, up to 5.0 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 22 threads), supports Intel[®] vPro[®] Technology;^{1,2,3,4,5,6}

Intel[®] Core™ Ultra9 185H (Up to 3.8 GHz E-core Max Turbo frequency, up to 5.1 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 22 threads), supports Intel[®] vPro[®] Technology;^{1,2,3,4,5,6}

¹ Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance. (AMD's numbering is not a measurement of clock speed. Qualcomm's numbering is not a measurement of clock speed.)

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.

Features

⁶Features 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® Iris® Xe Graphics ^{1,3}

Discrete^{1,2}

NVIDIA RTX™ 500 Ada(4GB)

NVIDIA RTX™ 1000 Ada (6 GB)

NVIDIA RTX™ 2000 Ada (8GB)

NVIDIA RTX™ 3000 Ada (8GB)

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.

DISPLAY

Non-touch

- 40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 300 nits, 45% NTSC; ^{1,3}
- 40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 400 nits, 100% sRGB; ^{1,3}
- 40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 1000 nits, 100% sRGB, HP Sure View Reflect integrated privacy screen^{1,3,4,5}
- 40.6 cm (16") diagonal, WQXGA(2560x1600), IPS, anti-glare, 400 nits, 100% sRGB, Low Blue light^{1,3}

Touch

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

DisplayPort™ 1.2

HDMI 2.1 Support resolution up to 4K @60 Hz²

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"

Features

40.64 cm (16")

¹HD content required to view HD images.

² HDMI cable sold separately.

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

⁴HP Sure View Reflect 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 280W 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	<p>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</p> <p>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.</p>

Features

STORAGE AND DRIVES*

Primary M.2 Storage

2 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
1 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
4 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
512 GB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
512 GB PCIe® Gen4x4 NVMe™ SED TLC OPAL2
512 GB PCIe® NVMe™ Value M.2 SSD

Secondary M.2 Storage

2 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
1 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
4 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
512 GB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
512 GB PCIe® Gen4x4 NVMe™ SED TLC OPAL2

* 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

Ethernet

Intel® I219LM(Vpro) GbE PCIe NIC
Intel® I219V (non-vPro) GbE PCIe NIC

WLAN

Intel® AX211 Wi-Fi6E+Bluetooth® 5.3 wireless card M.2 160MHz CNVi World-Wide WLAN vPro¹
Intel® AX211 Wi-Fi6E+Bluetooth® 5.3 wireless card M.2 160MHz CNVi World-Wide 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.

WWAN

HP 4000 4G LTE-Advanced Pro^{1,3}

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.

³ 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.

LPWAN

Qualcomm 9205 LTE-M (CAT-M1 fSVC) (no Internet)*

*LPWAN (Mobile Narrowband - MNB) cards support the HP Protect & Trace with Wolf Connect service, but do not support mobile broadband/Internet use.

Near Field Communication (NFC) module

NFC Mirage WNC XRAV-1¹

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 by Bang & Olufsen
2 Integrated stereo speakers
Integrated dual array microphone

Speaker Power

2W/4ohm per speaker

Camera¹

Features

HD camera
5MP+IR camera

Sensors

Ambient Light Sensor
Hall effect Sensor
HP Sure Platform
Motion AI LIS2DW12
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, Backlit keyboard and DuraKeys

HP Premium Keyboard, spill resistant, Non-Backlit keyboard and DuraKeys

HP Premium Keyboard, spill resistant, Backlit keyboard and DuraKeys Privacy

Pointing Devices

Clickpad with multi-touch gesture support, taps enabled as default

Microsoft Precision Touchpad Default Gestures Support

Function Keys

ESC: system information

F1 - Display Switching

F2 - Blank or SureView On/Off

F3 - Brightness Down

F4 - Brightness Up

F5 - Blank or Backlit Toggle

F6 - Audio Mute

F7 - Volume Down

F8 - Volume Up

F9 - Mic Mute

F10 - Play and Pause

F11 - My HP Key

F12 - Print Screen

home

end

Power Button (with LED)

delete

Hidden Keys

Fn+R - Break

Fn+S - Sys Rq

Fn+C - Scroll Lock

*Backlit keyboard is an optional feature.

SOFTWARE AND SECURITY

Software

Adobe Offer²⁰

Bing Search for IE11

Buy Microsoft Office (Sold separately)

HP Connection Optimizer¹⁰

HP Hotkey Support

HP Mac Address Manager

HP Notifications

HP PC Hardware Diagnostics UEFI

HP PC Hardware Diagnostics Windows

HP Privacy Settings

HP Services Scan

HP Smart Support¹⁸

HP Support Assistant¹

HSA Fusion for Commercial

Miro

myHP

Poly Lens¹⁹

Features

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)

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.

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 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>.

Features

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 or 11 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 HP Smart Support automatically collects the telemetry necessary upon initial boot of the product to deliver device-level configuration data and health insights and is available preinstalled on select products, thru HP Factory Configuration Services; or it can be downloaded. For more information about how to enable HP Smart Support or for download, please visit <http://www.hp.com/smart-support>.

¹⁹ Poly Lens Desktop requires a Windows OS.

²⁰ Click on Adobe icon in the start menu to take advantage of a 30 day trial membership of select Adobe software. The software is tied to the device and is not transferrable. You may also choose to enter your payment details to auto-renew and continue to use the software beyond the 30 day trial. See Adobe for complete details.

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 Smart 150 W External AC power adapter²

Battery

HP Long Life 6-cell, 83 Wh Li-ion polymer^{3,4}

Power Cord

3-wire plug - 1m

Battery life

Up to TBD⁵

Discrete

TBD¹

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 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.

⁵ Recharges up to 50% within 30 minutes when the system is off or in standby mode when used with the power adapter provided with the notebook. 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 90% capacity, charging speed will return to normal. Charging time may vary +/-10% due to System tolerance.

Features

WEIGHTS & DIMENSIONS

Dimensions (w x d x h)

14.15 x 9.88 x 0.9 in

35.94 x 25.1 x 2.29 cm

Weights***Product Weight**

Starting at 4.68 lb

Starting at 2.122 kg

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

PORTS/SLOTS

2 Thunderbolt™ 4 with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 2.1) *

2 Super Speed USB Type-A 5Gbps signaling rate (1 charging)

1 HDMI 2.1**

1 Headphone/microphone combo jack

1 Nano Security Lock Slot (Lock sold separately)

1 Smartcard reader (Optional)

1 nano SIM card slot

1 SD card reader

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

**HDMI cable sold separately.

COMPATIBILITY

HP Wired USB-A Stereo Headset	428K6AA
HP Renew Business 17.3 Laptop Backpack	3E2U5AA
HP Universal USB-C Multiport Hub	50H55AA
HP Multi-Device 635 Black Wireless Mouse	1D0K2AA
HP 975 USB+ Bluetooth® Dual-Mode Wireless Keyboard	3Z726AA

SERVICE AND SUPPORT

1-year warranty and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty except for HP Long Life batteries which will follow the one or three year warranty of the platform. Refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at:

<http://www.hp.com/go/cpc>.

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

Features

ENERGY STAR® certified

EPEAT® registered where applicable. EPEAT® registration varies by country. See www.epeat.net for registration status by country.

EPEAT® Gold in the U.S.*

TCO 8.0 Certified

RCTA DO-160G

Medical EMC: IEC 60601-1-2:2014 EN60601-1-2: 2015

SEPA

GS Mark

Eyesafe Certification - Worldwide

Sustainable Impact Specifications

Recycled Aluminum and Magnesium, 75% PCR w/30% ITE plastics

*EPEAT® registered where applicable. EPEAT® registration varies by country. See www.epeat.net for registration status by country.

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	19V	
	Average Operating Power(idle)	6.927W	System in idle mode
	Integrated graphics	Yes	
	Discrete Graphics	Yes	
	Max Operating Power	150W	
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-Q41C	
	UL	Yes	
	CSA	Yes	
	FCC Compliance	Yes	
	ENERGY STAR®	Yes	
	EPEAT®	Yes, EPEAT® Gold in the U.S.	
	ICES	Yes	
	CCC	Yes	
	Japan VCCI Compliance	Yes	

Features

KC	Yes
BSMI	Yes
CE Marking Compliance	Yes
Saudi Arabian Compliance (ICCP)	Yes

¹Configurations of the HP ZBook Power 16 inch G11 Mobile Workstation PC that are ENERGY STAR® qualified are identified as HP ZBook Power 16 inch 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 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)	349.980 x 225.420 (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 (typ)		
	Brightness	1000 (typ)		
	Pixel Resolution	Pitch	1920 x1200 (WUXGA))	
		Format	RGB	
	Backlight	WLED		
	Color Gamut Coverage	sRGB 100%		
	Color Depth	8		
	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.

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		
	Surface Treatment	Anti-Glare		
	Touch Enabled	No		
	Contrast Ratio	1000:1 (typ)		
	Refresh Rate	60 (typ)		
	Brightness	400 (typ)		
	Pixel Resolution	Pitch	1920 x1200 (WUXGA))	
		Format	RGB	
	Backlight	WLED		
	Color Gamut Coverage	sRGB 100%		
	Color Depth	8		
	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)		

Technical Specifications – Displays

*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	
Surface Treatment	Anti-Glare	
Touch Enabled	No	
Contrast Ratio	1000:1 (typ)	
Refresh Rate	60 (typ)	
Brightness	300 (typ)	
Pixel Resolution	Pitch	1920 x1200 (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)/3.4 (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	
Surface Treatment	Anti-Glare	
Touch Enabled	Yes	
Contrast Ratio	1000:1 (typ)	
Refresh Rate	60 (typ)	
Brightness	300 (typ)	
Pixel Resolution	Pitch	1920 x1200 (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)/3.4 (max)	

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

Technical Specifications – Displays

16 in WQXGA (2560 x 1600) Anti-Glare UWVA Low Blue Light sRGB 100 400 eDP 1.4+PSR2 120Hz (VRR) bent LCD Panel"	Outline Dimensions (W x H)	349.978 x 224.824 (max)
	Active Area	309.312 x 173.988 (typ)
	Weight	320 (max)
	Diagonal Size	16
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	1200:1 (typ)
	Refresh Rate	60 (typ)
	Brightness	400 (typ)
	Pixel Resolution	Pitch 2560 x 1600(WQXGA)
		Format RGB
	Backlight	WLED
	Color Gamut Coverage	sRGB 100%
	Color Depth	6 bits + 2FRC
	Viewing Angle	UWVA 85/85/85/85
	Low Blue Light	Yes
Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.9W max @ 150nits/3.3W 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	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) 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) 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) 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) 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) 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) 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) 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) is reserved for system recovery software.

Technical Specifications – Networking

NETWORKING/COMMUNICATION

Intel® I219-LM 1 Gigabit Network Connection LOM (vPro)	Connector	RJ-45
	System Interface	PCI(Intel proprietary) + SMBus
	Data Rates Supported	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 802.3 clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s
	IEEE Compliance	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet)
	Performance	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling(Hash Mode Only) Jumbo Frame 9K
	Power consumption	Cable Disconnection: 25mW 100Mbps Full Run: 450mW 1000bps Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
	Power Management	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
	Management Interface	Auto MDI/MDIX Crossover cable detection
	IT Manageability	Wake-on-LAN from modern standby or sleep state (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
	Security & Manageability	Intel® vPro® support with appropriate Intel® chipset components

Intel® I219v 1 Gigabit Network Connection LOM (non-vPro)	Connector	RJ-45
	System Interface	PCI(Intel proprietary) + SMBus
	Data Rates Supported	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 802.3 clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s
	IEEE Compliance	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet)

Technical Specifications – Networking

	IEEE 802.3i 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3ab 1000BASE-T IEEE 802.3bz 2.5GBASE-T
Performance	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling(Hash Mode Only) Jumbo Frame 9K
Power consumption	Cable Disconnection: 25mW 100Mbps Full Run: 450mW 1000bps Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
Power Management	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
Management Interface	Auto MDI/MDIX Crossover cable detection
IT Manageability	Wake-on-LAN from modern standby or sleep state (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
Security & Manageability	Intel® non-vPro® support with appropriate Intel® chipset components

Intel AX211 Wi-Fi 6E + Bluetooth® 5.3 wireless card M.2 160MHz CNVi World-Wide WLAN vPro

Wireless LAN Standards

IEEE 802.11a
IEEE 802.11b
IEEE 802.11g
IEEE 802.11n
IEEE 802.11ac
IEEE 802.11ax
IEEE 802.11d
IEEE 802.11e
IEEE 802.11h
IEEE 802.11i
IEEE 802.11k
IEEE 802.11r
IEEE 802.11v

Interoperability

Frequency Band

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

Technical Specifications – Networking

Data Rates	<ul style="list-style-type: none">• 6.535 – 6.875 GHz• 6.895 – 7.115 GHz• 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
Security¹	OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM <ul style="list-style-type: none">• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only• AES-CCMP: 128 bit in hardware• 802.1x authentication• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.• WPA2 certification• 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
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 2.3 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

Technical Specifications – Networking

Antenna Type	<ul style="list-style-type: none"> • 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 <p>High efficiency antenna with spatial diversity, mounted in the display enclosure</p> <p>Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications</p>				
Form Factor	PCI-Express M.2 MiniCard				
Dimensions	1. Type 2230 : 2.3 x 22.0 x 30.0 mm				
Weight	1. Type 2230 : 2.3g				
Operating Voltage	3.3v +/- 5%				
Temperature	<table> <tbody> <tr> <td>Operating</td> <td>14° to 158° F (-10° to 70° C)</td> </tr> <tr> <td>Non-operating</td> <td>-40° to 176° F (-40° to 80° C)</td> </tr> </tbody> </table>	Operating	14° to 158° F (-10° to 70° C)	Non-operating	-40° to 176° F (-40° to 80° C)
Operating	14° to 158° F (-10° to 70° C)				
Non-operating	-40° to 176° F (-40° to 80° C)				
Humidity	<table> <tbody> <tr> <td>Operating</td> <td>10% to 90% (non-condensing)</td> </tr> <tr> <td>Non-operating</td> <td>5% to 95% (non-condensing)</td> </tr> </tbody> </table>	Operating	10% to 90% (non-condensing)	Non-operating	5% to 95% (non-condensing)
Operating	10% to 90% (non-condensing)				
Non-operating	5% to 95% (non-condensing)				
Altitude	<table> <tbody> <tr> <td>Operating</td> <td>0 to 10,000 ft (3,048 m)</td> </tr> <tr> <td>Non-operating</td> <td>0 to 50,000 ft (15,240 m)</td> </tr> </tbody> </table>	Operating	0 to 10,000 ft (3,048 m)	Non-operating	0 to 50,000 ft (15,240 m)
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				
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	1. Microsoft Windows Bluetooth Software 2. Linux/Chrome OS Bluetooth Software.				
Link Topology					
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode				
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	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				

Technical Specifications – Networking

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

* 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.

[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 non-
 vPro**

Wireless LAN Standards

IEEE 802.11a
 IEEE 802.11b
 IEEE 802.11g
 IEEE 802.11n
 IEEE 802.11ac
 IEEE 802.11ax
 IEEE 802.11d
 IEEE 802.11e
 IEEE 802.11h
 IEEE 802.11i
 IEEE 802.11k
 IEEE 802.11r
 IEEE 802.11v

Interoperability

Wi-Fi certified

Frequency Band

802.11b/g/n/ax
 • 2.402 – 2.482 GHz
 802.11a/n/ac/ax
 • 4.9 – 4.95 GHz (Japan)
 • 5.15 – 5.25 GHz

Technical Specifications – Networking

	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 802.11b: 1, 2, 5.5, 11 Mbps• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps• 802.11n: 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	<ul style="list-style-type: none">• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only• AES-CCMP: 128 bit in hardware• 802.1x authentication• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.• WPA2 certification• 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
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 2.3 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

Technical Specifications – Networking

	<ul style="list-style-type: none"> • 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 2.4/5/6 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
Weight	1. Type 2230 : 2.3g
Operating Voltage	3.3v +/- 5%
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 OFF – 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	1. Microsoft Windows Bluetooth Software 2. Linux/Chrome OS Bluetooth Software.
Link Topology	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
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	Bluetooth® 4.1-ESR 5/6/7 Compliance

Technical Specifications – Networking

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

* 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.

[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 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)

Technical Specifications – Networking

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)
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)

GPS

GPS bands

WCDMA R99,
3GPP Release 5, 6, 7 and 8 UMTS Specification
Standalone, A-GPS (MS-A, MS-B)
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 x 30 mm x 2.3 mm

Technical Specifications – Networking

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.

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 l 3GPP TS 51.010-1 V10.5.0: Mobile Station (MS) conformance specification; Part 1: Conformance specification
l 3GPP TS 36.521-1 V14.3.0: User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Conformance testing
l 3GPP TS 21.111 V10.0.0: USIM and IC card requirements
l 3GPP TS 51.011 V4.15.0: Specification of the Subscriber Identity Module -Mobile Equipment (SIM-ME) interface
l 3GPP TS 31.102 V10.11.0: Characteristics of the Universal Subscriber Identity Module (USIM) application
l 3GPP TS 31.11 V10.16.0: Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)
l 3GPP TS 36.124 V10.3.0: Electro Magnetic Compatibility (EMC) requirements for mobile terminals and ancillary equipment
l 3GPP TS 27.007 V10.0.8: AT command set for User Equipment (UE)
l 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 B

Weight 5.5 g

Dimensions
(Length x Width x Thickness) 22 x 42 x 2.3 mm

embedded eSIM Support

Technical Specifications – Networking

*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 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	
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,	VBAT= 3.3V, Polling 7.3 mA Detected Test Tag Type 1 Total 283.8 mA Net Module 236.8 mA

Technical Specifications – Networking

	Typical	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.		

AUDIO

HD Stereo Codec	Realtek ALC3247
Audio I/O Ports	Headset connector supports a CTIA
Internal Speaker Amplifier	2W class D mono amplifier for the internal speaker only
Multi-streaming Capable	YES
Sampling	"SPK/Headphone: 16bit,48000Hz
Wavetable Syntheses	Intel MIC:16 bit/24 bit. 44100hz/48000hz.
Analog Audio	Headset mic: 16 bit/24 bit. 44100hz/48000hz."
# of Channels on Line-Out	NO
Internal Speaker	YES

FINGERPRINT READER

Sensor vendor	ELAN 80SW
Sensor type	Capacitive
DPI resolution	508 DPI
Scan area	80x80 pixels
False Rejection Rate	<3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	2.7~3.6V
Operating Temperature	-20°C - +80°C
Current Consumption	35mA peak
Image	
Low Latency Wait For Finger	300uA
Capture Rate	Capture Rate: 50 frame/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	508 dpi / 4x4mm sensor area

POWER

AC Adapter 150 Watt Smart PFC Slim Barrel 4.5mm	Weight	0.716 lb (325 g) max (Not including power cord. Power cord varies by country.)	
	Input	Input Efficiency	88% at 115 Vac and 89% at 230Vac
		Input frequency range	47 ~ 63 Hz

Technical Specifications – Networking

	Input AC current	Max. 2.7 A at 90 Vac
Output	Output power	150W
	DC output	19.5V
	Hold-up time	100% load 5ms at 115 Vac input
	Output current limit	< 16.0A
	AC Inlet Type	C6
Connector	DC Cable Connector	4.5mm Barrel Type
	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</p> <p>*Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL62368-1</p> <p>*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), NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia GEMS and RCM, BIS, BSMI, UAE, UKCA DoC"</p>	
Battery MB 6 Cell WHr 83 Long Life -PL Fast Charge**	Weight	0.305kg +/-0.010kg (0.67lb +/-0.02lb)
	Cells/Type	6 cell Lithium-Ion polymer cell/ 685257
Energy	Voltage	11.58V
	Amp-hour capacity	7.17Ah
	Watt-hour capacity	83Wh
Temperature	Operating (Charging)	32° to 113° F (0° to 45° C) (Charge Initial Temperature) 32° to 122° F (0° to 50° C) (Continuous Charging)
	Operating (Discharging)	14° to 140° F (-10° to 60° C)
	Optional Travel Battery Available	No
<p>*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.</p> <p>**Recharges up to 50% within 30 minutes when the system is off or in standby mode when used with the power adapter provided with the notebook. 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 90% capacity, charging speed will return to normal. Charging time may vary +/-10% due to System tolerance.</p>		

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, 60Hz
Normal Operation (Short idle)	6.36W	6.53W	6.61W
Normal Operation (Long idle)	1.25W	1.15W	1.11W
Sleep	1.25W	1.15W	1.11W
Off	0.29W	0.31W	0.29W

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)	22 BTU/hr	22 BTU/hr	23 BTU/hr
Normal Operation (Long idle)	4 BTU/hr	4 BTU/hr	4 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)

Typically Configured – Idle
Fixed Disk – Random writes

Sound Power
(L_{WAd} , bels)

2.5
2.9

Sound Pressure
(L_{pAm} , decibels)

15
21

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 95.1% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	41g
Internal:	PAPER/Paperboard	220g
	PAPER/Molded Pulp	163g
	PLASTIC/Polypropylene - PP	4g
	PLASTIC/Polyethylene low density -LDPE	14g

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](#).

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.

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:
	From v1 to v2		