

Overview

HP ZBook Power G7 Mobile Workstation



1. Ambient Light Sensor
2. Internal Microphones (optional)
3. Camera LEDs (optional)
4. RGB Camera Lens (optional)
5. IR Camera LED (optional)
6. Camera Cover (optional)
7. Speakers
8. Function Keys (changes with configured options)
9. Power button
10. HP Programmable Key

Right

11. Numeric Keypad
12. Fingerprint Sensor (optional)
13. Touchpad
14. Indicator LEDs: Power light, Wireless light, Storage usage light
15. Power connector
16. USB Type-C® with Thunderbolt™
17. USB 3.1 Gen 1
18. USB 3.1 Gen 1
19. Audio Combo Jack

Overview



Left

1. Security lock slot
2. RJ-45
3. USB 3.1 Gen 1 Charging Port
4. HDMI port
5. Smart Card Reader

Overview

At A Glance

- Work anywhere without compromising on performance or security with Windows 10 Pro¹ and HP's collaboration and connectivity technology.
- NVIDIA Quadro GPUs provide the interactive visual workspace you need to do great work wherever, whenever. With twice the CUDA cores as previous generations, NVIDIA Quadro GPUs deliver the performance professionals need to work from anywhere.
- Take multitasking to the next level with 10th gen Intel® Core™ i9 or Intel® Xeon® processors² built to handle multithreaded apps like Adobe Premiere Pro®, and with fast clock speeds to boost your speed on single threaded apps like Autodesk 3ds Max³.
- Strenuously tested to meet ISV certification and deliver superb performance and support with leading software providers, including Autodesk and Adobe®⁴.
- Have confidence with HP's most secure mobile workstations and defend against firmware and malware attacks with HP Sure Start⁵ and Sure Sense⁶.
- Built with the environment in mind, this ZBook includes recycled ocean-bound plastics⁷, plastic-free packaging, and ultra-efficient power consumption.
- Designed for ultimate durability, this ZBook undergoes brutal MIL-STD 810H⁸ tests to help ensure this PC keeps rolling through your workday.
- Plug in to greater connectivity at your desktop with the HP Thunderbolt™ Dock for lightning fast Thunderbolt™ 3⁹ transfers and the flexibility to run up to two external 4K displays^{10,11}.
- Work without limits in any location with up to 4TB¹² of local PCIe storage¹³.

¹Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>

²Multicore 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.

³Adobe Premiere Pro® and Autodesk 3ds Max sold separately.

⁴Adobe and Autodesk software sold separately.

⁵HP Sure Start Gen5 is available on select HP PCs with Intel processors.

⁶HP Sure Sense requires Windows 10.

⁷Speaker enclosure component made with 5% ocean bound plastic as of 2/3/2020.

⁸MIL STD testing is not intended to demonstrate fitness for 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.

⁹HP Thunderbolt™ Dock with Thunderbolt™ 3 sold separately.

¹⁰External displays sold separately.

¹¹Optional hybrid graphics is required to run up to two external 4K displays.

¹²For hard drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 35GB (for Windows 10) of system disk is reserved for system recovery software.

¹³Optional, configurable feature.

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

Features

OPERATING SYSTEM

Preinstalled OS	Windows 10 Pro 64 - HP recommends Windows 10 Pro for business. ¹ Windows 10 Pro for Workstations 64 ¹ Windows 10 Home 64 ¹ Windows 10 Home Single Language 64 ¹ Windows 10 China Government Editions ¹ FreeDOS 3.0
Web support OS	Windows 10 Enterprise 64 ¹
Supported Version	HP tested Windows 10, version 1809 on this platform. For testing information on newer versions of Windows 10, please see: https://support.hp.com/document/c05195282 .

¹ Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.

² For detailed Linux® OS/hardware support information, see: http://www.hp.com/linux_hardware_matrix

PROCESSOR

10th Generation Intel® Xeon® W-10855M vPro™ with Intel® UHD Graphics (2.8 GHz base frequency, up to 5.1 GHz with Intel® Turbo Boost Technology, 12 MB cache, 6 cores)^{1,2,3,4,5}

10th Generation Intel® Core™ i9-10885H vPro™ with Intel® UHD Graphics (2.4 GHz base frequency, up to 5.3 GHz with Intel® Turbo Boost Technology, 16 MB cache, 8 cores)^{1,2,3,4,5}

10th Generation Intel® Core™ i7-10850H vPro™ with Intel® UHD Graphics (2.7 GHz base frequency, up to 5.1 GHz with Intel® Turbo Boost Technology, 12 MB cache, 6 cores)^{1,2,3,4,5}

10th Generation Intel® Core™ i7 10750H with Intel® UHD Graphics (2.6 GHz base frequency, up to 5.0 GHz with Intel® Turbo Boost Technology, 12 MB cache, 6 cores)^{1,2,3,4,5}

10th Generation Intel® Core™ i5-10400H vPro™ with Intel® UHD Graphics (2.6 GHz base frequency, up to 4.6 GHz with Intel® Turbo Boost Technology, 8 MB cache, 4 cores)^{1,2,3,4,5}

10th Generation Intel® Core™ i5 10300H with Intel® UHD Graphics (2.5 GHz base frequency, up to 4.5 GHz with Intel® Turbo Boost Technology, 8 MB cache, 4 cores)^{1,2,3,4,5}

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 Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

³ Intel® Turbo Boost technology requires a PC with a processor with Intel Turbo Boost capability. Intel Turbo Boost performance varies depending on hardware, software and overall system configuration. See 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 For full Intel® vPro™ functionality, Windows 10 Pro 64 bit, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or WLAN card and TPM 2.0 are required. Some functionality requires additional 3rd party software in order to run. See <http://intel.com/vpro>

Features

CHIPSET

Intel® Comet Lake PCH-H, WM 490

INTEL® CORE™ I5 WITH VPRO/CORE I7 WITH VPRO/XEON® WITH VPRO TECHNOLOGY CAPABLE

Intel® Core™ i5 with vPro™, Core™ i7 with vPro™, Core™ i9 with vPro™ and Xeon® with vPro™ technology is a selectable feature that is available on units configured with select processors, a qualified Intel® WLAN module and a preinstalled Windows® operating system. It provides advances in remote manageability, security, energy efficient performance, and wireless connectivity. Intel® Active Management Technology (iAMT) offers built-in manageability and proactive security for networked mobile workstations, even when they are powered off* or when the operating system is inoperable. It can help identify threats before they reach the network, isolate infected systems, and update regardless of their power state. ^{1,2}

¹ Requires a Windows operating system, network hardware and software, connection with a power source, and a direct (non-VPN) corporate network connection which is either cable or wireless LAN.

² Some functionality of Intel® Core™ i5 with vPro™/Core™ i7 with vPro™/Core™ i9 with vPro™/Xeon® with vPro™ technology, such as Intel® Active Management technology and Intel® Virtualization technology, requires additional third-party software in order to run. Availability of future "virtual appliances" applications for Intel® Core™ i5 with vPro™/Core i7 with vPro™/Core™ i9 with vPro™/XEON® with vPro™ technology is dependent on third-party software providers. Compatibility with future "virtual appliances" is yet to be determined.

GRAPHICS

Integrated

Intel® UHD Graphics ^{1,2,3,4,5}

Discrete

NVIDIA Graphic options:

NVIDIA® Quadro® T2000 (4 GB GDDR6 dedicated) ^{1,2,3,4,5}

NVIDIA® Quadro® T1000 (4 GB GDDR6 dedicated) ^{1,2,3,4,5}

NVIDIA® Quadro® P620 (4 GB GDDR6 dedicated) ^{1,2,3,4,5}

¹ UHD content required to view UHD images.

² Support HD decode, DX11, DX12, HDMI 1.4, HDCP 2.3 via DP up to 4K @ 60Hz and via HDMI up to 4K @ 30Hz

³ HDMI cable Sold Separately

⁴ Shared video memory (UMA) uses part of the total system memory for video performance. System memory dedicated to video performance is not available for other use by other programs.

⁵ GPU configurations may be limited to specific panel options

Multi Display Support

With HP Thunderbolt™ Dock G2

HP ZBook Power configuration with hybrid graphics, supports a maximum of five independent displays provided DisplayPort™ is connected, Internal panel, one external display connected to the HDMI port and three external displays connected to the dock Type-C®, or VGA, and two DisplayPort™ ports

NOTE: If Thunderbolt™ only port on the dock is connected, then the three external displays will not function.

Features

Without HP Thunderbolt™ Dock G2

HP ZBook Power with hybrid graphics and without the use of the dock supports up to a maximum of three independent displays, Internal panel plus two external displays connected to the two following ports: HDMI 2.0, Thunderbolt™ 3

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

DISPLAY

Non-touch

- 15.6" diagonal FHD IPS eDP1.2 anti-glare bent WLED-backlit and ambient light sensor 250 nits 45% NTSC (1920 x 1080)^{1,2}
- 15.6" diagonal FHD Low Power IPS eDP1.4 + PSR2 anti-glare bent WLED-backlit and ambient light sensor 400 nits 100% sRGB (1920 x 1080)^{1,2}
- 15.6" diagonal UHD Low Power IPS eDP 1.4 + PSR2 +PSR anti-glare bent WLED-backlit and ambient light sensor 400 nits 100% sRGB (3840 x 2160)^{1,2}

Touch

- 15.6" diagonal FHD IPS eDP1.2 anti-glare bent WLED-backlit Touch On Cell screen with ambient light sensor 250 nits 45% NTSC (1920 x 1080)^{1,2}

¹ UHD content required to view UHD images.

² Resolutions are dependent upon monitor capability, and resolution and color depth settings.

Features

STORAGE AND DRIVES*

(2) M.2 Storage (NVMe™ PCIe SSD)

256 GB PCIe® NVMe™ M.2 SSD

512 GB PCIe® NVMe™ M.2 SSD

1 TB PCIe® NVMe™ M.2 SSD

2 TB PCIe® NVMe™ M.2 SSD

256 GB PCIe® NVMe™ M.2 SED SSD

512 GB PCIe® NVMe™ M.2 SED SSD

* 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.

DRIVE CONTROLLERS

M.2 Storage Bay (PCIe NVMe)

RAID:

PCIe Gen 3 x 4 lanes NVMe Solid State Drive

Not supported

MEMORY

Maximum Memory¹

64 GB DDR4-3200 non-ECC SDRAM²

32 GB DDR4-2666 ECC SDRAM²

2 DDR4 SODIMMs^{4,5}

Supports Single Channel Memory³

Slots are customer accessible / upgradeable

¹ 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.

² Transfer rates up to 2933 MT/s on nECC memory and 2666 MT/s on ECC memory.

³ Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory channels.

⁴ Intel® allows architectures designed with four DIMM slots to run at 2400 MT/s

⁵ Maximum memory capacities assume Windows 64-bit operating systems. With Windows 32-bit operating systems, memory above 3 GB may not all be available due to system resource requirements.

Features

NETWORKING/COMMUNICATIONS

LAN

Intel® I219-LM GbE, vPro™

Intel® I219-V GbE, non-vPro™

¹GbE - The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

WLAN

Intel® Wi-Fi 6 AX201 (2x2) and Bluetooth® 5 combo, vPro™ ¹

Intel® Wi-Fi 6 AX201 (2x2) and Bluetooth® 5 combo, non-vPro™ ¹

¹Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. The specifications for Wi-Fi 6 (802.11ax WLAN) are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax WLAN devices. Only available in countries where 802.11ax is supported.

Optional Near Field Communication (NFC) module

AUDIO/MULTIMEDIA

Audio

HP Audio, dual stereo speakers, dual array digital microphone³, functions keys for volume up and down, combo microphone/headphone jack, HD audio

Camera^{1,2}

720p HD webcam with IR

720p HD webcam

¹ HD content required to view HD images respectively.

² Windows Hello face authentication utilizes a camera specially configured for near infrared (IR) imaging to authenticate and unlock Windows devices as well as unlock your Microsoft Passport.

³Dual-microphone array when equipped with optional webcam and optional world facing microphone.

Features

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Premium Quiet Keyboard, full-size, spill-resistant, backlit, with Programmable Key, with sperate numeric keypad, clickpad with glass surface, multi-touch gestures and taps enabled

Pointing Devices

Clickpad with multi-touch gestures enabled, taps enabled as default;
Microsoft Precision Touchpad Default Gestures Support

SOFTWARE AND SECURITY

Workstation ISV Certifications

See the latest list of certifications at: <http://www.hp.com/go/isv>

HP ZCENTRAL REMOTE BOOST SOFTWARE

The remote desktop solution for serious workstation users and their most demanding applications. Download at:
<http://www.hp.com/go/RGS>

HP Performance Advisor

HP Performance Advisor enables optimal configuration of HP Mobile Workstations delivering stability and best performance. HP Performance Advisor will guide your system setup allowing a "custom" configuration that best matches the workstation to user requirements. Download at: <http://www.hp.com/go/performanceadvisor>

Software

Bing search for IE11

Buy Office

HP Hotkey Support

HP Image Assistant

HP Noise Cancellation Software

HP Performance Advisor⁸

HP Recovery Manager

HP Remote Graphics Software

HP Z Central Remote Boost²

HP Support Assistant¹

Native Miracast support⁴

HP Connection Optimizer⁹

HP Cloud Recovery

myHP

Security Management

Absolute persistence module⁶

HP Admin

HP Device Access Manager

HP FingerPrint Sensor

HP Manageability Integration Kit Gen4¹¹

HP Power On Authentication

Security lock slot¹²

Trusted Platform Module TPM 2.0 Embedded Security Chip with Windows 10 (Common Criteria EAL4+ Certified)(FIPS 140-2 Level 2 Certified)

Master Boot Record security

Pre-boot authentication

Microsoft Defender¹⁰

HP Client Security Manager Gen6¹⁷

HP BIOSphere Gen6⁵

HP Sure Recover Gen3¹³

Features

HP Sure Start Gen6¹⁵
HP Secure Erase¹⁶
HP Sure Sense¹⁸
HP Security Manager
HP Sure Click²⁰
HP Sure Run Gen3
Smartcard Reader - Alcor AU9560 (FIPS 201 Compliant)

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

¹ HP Support Assistant - Requires Windows and Internet Access.

² HP Z Central Remote Boost Software does not come preinstalled on Z Workstations but can be downloaded and run on all Z desktop and laptops without license purchase. With non-Z sender devices, purchase of perpetual individual license or perpetual floating license per simultaneously executing versions and purchase of ZCentral Remote Boost Software Support is required. RGS requires Windows, RHEL (7 or 8), UBUNTU 18.04 LTS, or HP ThinPro 7 operating systems. MacOS (10.13 or newer) operating system is only supported on the receiver side. Requires network access. The software is available for download at hp.com/ZCentralRemoteBoost.

⁴ Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming media players that also support Miracast. You can use Miracast to share what you're doing on your PC and present a slide show. For more information: <http://windows.microsoft.com/en-us/windows-8/project-wireless-screen-miracast>.

⁵ HP BIOSphere Gen6 is available on select HP Pro and Elite PCs. See product specifications for details. Features may vary depending on the platform and configurations.

⁶ 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 Performance Advisor Software - HP Performance Advisor is ready and waiting to help you get the most out of your HP Workstation from day one—and every day after. Learn more or download at: <https://www8.hp.com/us/en/workstations/performance-advisor.html>

⁹ HP Connection Optimizer requires Windows 10.

¹⁰ Microsoft Defender Opt in and internet connection required for updates.

¹¹ HP Manageability Integration Kit can be downloaded from <http://www.hp.com/go/clientmanagement>.

¹² Security lock slot is Lock sold separately.

¹³ HP Sure Recover Gen3 is available on select HP PCs and requires an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data.

¹⁴ HP Sure Recover with Embedded Reimaging Gen2 is an optional feature which must be configured at purchase. See product specifications for availability. You must back up important files, data, photos, videos, etc. before use to avoid loss of data. HP Sure Recover with Embedded Reimaging (Gen1) does not support platforms with Intel® Optane™.

¹⁵ HP Sure Start Gen6 is available on select HP PCs and requires Windows 10.

¹⁶ 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™.

¹⁷ HP Client Security Manager Gen6 requires Windows and is available on the select HP Elite and Pro PCs.

¹⁸ HP Sure Sense requires Windows 10. See product specifications for availability.

¹⁹ Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited.

²⁰ HP Sure Click requires Windows 10 Pro or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.

Features

POWER

Power Supply

Up to 15 hours 15 minutes

HP Long Life 6-cell, 83 Wh Li-ion polymer¹

120 W Slim Smart external AC power adapter²

150 W Slim Smart external AC power adapter³

Supports battery fast charge: approximately 50% in 30 minutes (defined under system hibernation and off mode)

¹ Measured with MobileMark 14

² Battery is internal and not replaceable by customer. Serviceable by warranty. Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year.

³ 120 W power adapter is configurable with Intel UMA graphics

⁴ 150 W power adapter is configurable with NVIDIA Quadro P620 T1000 and T2000 configurations

ENVIRONMENTAL

Targeting ENERGY STAR® certified and EPEAT® GOLD registered configurations available¹

Low halogen²

¹ Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit www.epeat.net for more information.

² External power supplies, power cords, cables and peripherals are not low halogen. Service parts obtained after purchase may not be low halogen.

Features

WEIGHTS & DIMENSIONS

Dimensions (w x d x h)

35.94 x 23.39 x 2.86 cm

14.15 x 9.21 x 0.9 in

Weights

Starting at 1.9kg (4.16 lb)

Weight varies by configuration and components.

A deck: Anodized Aluminum

B deck: PC-ABS with Talc

C deck: Anodized Aluminum

D deck: Anodized Aluminum

Metal Alloy Hinges

PORTS/SLOTS

1 smart card reader

Left side

1 RJ-45

1 USB 3.1 Gen 1 (charging)

1 HDMI¹

Right side

1 power connector

1 USB Type-C® (Thunderbolt™ 3, pass through support DisplayPort™ 1.2, USB 3.1 Gen 2, with BC 1.2)

2 USB 3.1 Gen 1

1 HDMI 2.0³

¹HDMI port-cable not included.

³HDMI 2.0 with discrete, 1.4 with UMA.

SERVICE AND SUPPORT

HP Services offers 3-year and 1-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year limited warranty as the platform. Refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>.

¹Sold separately or as an optional feature. 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. 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. Consult your local HP Customer Support Center for details.

Technical Specifications – System Unit

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	19.5V		
	Average Operating Power(idle)	WIN10	System in idle mode + max panel brightness	Adapter Safety test condition
Temperature	Discrete Graphics	N19MQ3: 80W N19EQ1 : maxQ 80W N19EQ3: maxQ 80W		
	Max Operating Power	<150W		
	Operating	5°C to 35°C		
Relative Humidity	Non-operating	-20°C to 60°C		
	Operating	10% to 90%, non-condensing		
Shock	Non-operating	5% to 95%		
	Operating	40 G, 2 ms, half-sine		
Random Vibration	Non-operating	240 G, 2 ms, half-sine		
	Operating	Nominal 1.043 grms		
Maximum Altitude (unpressurized)	Non-operating	Nominal 3.50 grms		
	Operating	-50 to 10,000 ft (-15.24 to 3,048 m)		
Planned Industry Standard Certifications	Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)		
	UL	Yes		
	CSA	Yes		
	FCC Compliance	Yes		
	ENERGY STAR®	Yes		
	EPEAT®	Yes ²		
	ICES	Yes		
	Australia / NZ A-Tick Compliance	Yes		
	CCC	Yes		
	Japan VCCI Compliance	Yes		
	KCC	Yes		
	BSMI	Yes		
	CE Marking Compliance	Yes		
	MIL STD 810H	Yes		
	BNCI or BELUS	Yes		
	GOST	Yes		
Saudi Arabian Compliance (ICCP)	Yes			
UKRSERTCOMPUTER	Yes			

¹Configurations of the HP ZBook Power G7 Mobile Workstation that are ENERGY STAR® qualified are identified as HP ZBook Power G7 Mobile Workstation ENERGY STAR on HP websites and on <http://www.energystar.gov>.

² EPEAT® registered where applicable. EPEAT registration varies by country. See <http://www.epeat.net> for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at www.hp.com/go/options.

Technical Specifications – Displays

DISPLAYS

15.6" diagonal FHD IPS eDP anti-glare bent WLED-backlit and ambient light sensor 250 nits 45% NTSC (1920 x 1080) NWBZ

Outline Dimensions (W x H)	350.96 x 205.54 mm (max)	
Active Area	344.16 x 193.59 mm (typ.)	
Weight	370 g (max)	
Diagonal Size	15.6 inch	
Thickness	3.0 mm/ 5.0 mm (w/PCB) (max)	
Interface	eDP 1.2 (2 lane)	
Panel Technology	IPS	
Surface Treatment	Anti-Glare	
Touch Enabled	No	
Contrast Ratio	600:1 (typ.)	
Refresh Rate	60 hz	
Brightness	250 nits	
Pixel Resolution	Format	1920 x 1080 (FHD)
	Configuration	RGB Stripe
Backlight	LED	
PPI	166	
Color Gamut Coverage	NTSC 45%	
Color Depth	6 bits (Hi FRC supportive w/ condition to enable)	
Viewing Angle	UWVA 85/85/85/85	

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

15.6" diagonal FHD Low Power IPS eDP1.2 anti-glare bent WLED-backlit and ambient light sensor 400 nits 100% sRGB (1920 x 1080)

Outline Dimensions (W x H)	349.46 x 204.79 mm (max)	
Active Area	344.16 x 193.59 mm (typ.)	
Weight	325 g (max)	
Diagonal Size	15.6 inch	
Thickness	2.6mm / 4.6mm (PCB) (max)	
Interface	eDP 1.4	
Panel Technology	IPS	
Surface Treatment	Anti-Glare	
Touch Enabled	No	
Contrast Ratio	1200:1 (typ.)	
Refresh Rate	60 Hz	
Brightness	400 nits	
Pixel Resolution	Format	1920 x 1080 (FHD)
	Configuration	RGB Stripe
Backlight	LED	
PPI	142	
Color Gamut Coverage	sRGB 100%	
Color Depth	8 bit	
Viewing Angle	UWVA 85/85/85/85	

Technical Specifications – Displays

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

15.6" diagonal UHD Low Power IPS eDP1.3 +PSR anti-glare bent WLED-backlit and ambient light sensor 400 nits 100% sRGB (3840 x 2160)	Outline Dimensions (W x H)	349.52 x 205.42 mm (max)		
	Active Area	344.22 x 193.62 mm (typ.)		
	Weight	320 g (max)		
	Diagonal Size	15.6"		
	Thickness	2.6mm / 4.6mm (PCB) (max)		
	Interface	eDP 1.4		
	Panel Technology	IPS		
	Surface Treatment	Anti-glare (AG)		
	Touch Enabled	No		
	Contrast Ratio	1200:1 (typ.)		
	Refresh Rate	60Hz		
	Brightness	1000nits		
	Pixel Resolution	Format	RGB	
	Backlight	LED		
	PPI	141		
	Color Gamut Coverage	100% sRGB		
Color Depth	8 bits			
Viewing Angle	UWVA 85/85/85/85			

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

15.6" diagonal FHD IPS eDP anti-glare bent WLED-backlit Touch On Cell screen with Corning® Gorilla® Glass 5 with ambient light sensor 250 nits 45% NTSC (1920 x 1080)	Outline Dimensions (W x H)	350.96 x 205.74 mm (max)		
	Active Area	344.16 x 193.59 mm (typ.)		
	Weight	380 g (max)		
	Diagonal Size	15.6 inch		
	Thickness	3.2mm/ 5.2mm (PCB) (max)		
	Interface	eDP 1.2 (2 lane)		
	Panel Technology	IPS		
	Surface Treatment	Anti-Glare On-cell		
	Touch Enabled	Yes		
	Contrast Ratio	600:1 (typ.)		
	Refresh Rate	60 Hz		
	Brightness	250 nits		
	Pixel Resolution	Format	1920 x 1080 (FHD)	
	Backlight	Configuration	RGB Stripe	
	PPI	LED		
	Color Gamut Coverage	166		
Color Depth	NTSC 45%			
Viewing Angle	6 bits			
	UWVA 85/85/85/85			

NOTE: 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

256GB PCIe NVMe TLC M.2 2280 Solid State Drive	Form Factor	M.2 2280	
	Drive Weight	0.02 lb (10 g)	
	Capacity	256GB	
	NAND Type	TLC	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	PCIe NVMe Gen3X4	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		3500 MB/s	2200 MB/s
	Logical Blocks	500,118,192	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	ATA Security; TRIM; L1.2		
	Note: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.		
256GB PCIe NVMe TLC M.2 2280 SED Opal 2 Solid State Drive	Form Factor	M.2 2280	
	Drive Weight	0.02 lb (10 g)	
	Capacity	256 GB	
	NAND Type	TLC	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	PCIe NVMe Gen3X4	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		3500 MB/s	2200 MB/s
	Logical Blocks	500,118,192	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	ATA Security (Option); 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 30 GB (for Windows 10) is reserved for system recovery software.		
512GB PCIe NVMe TLC M.2 2280 Solid State Drive	Form Factor	M.2 2280	
	Drive Weight	0.02 lb (10 g)	
	Capacity	512GB	
	NAND Type	TLC	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	PCIe NVMe Gen3X4	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		3500 MB/s	2956 MB/s
	Logical Blocks	1,000,215,215	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	ATA Security; TRIM; L1.2		

Technical Specifications – Storage

Note: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.

512TB PCIe NVMe TLC M.2 2280 SED Opal 2 Solid State Drive	Form Factor	M.2 2280	
	Drive Weight	0.02 lb (10 g)	
	Capacity	512GB	
	NAND Type	TLC	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	PCIe NVMe Gen3X4	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		3500 MB/s	2956 MB/s
	Logical Blocks	1,000,215,215	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	ATA Security (Option); TCG Opal 2.0; TRIM; L1.2		

Note: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.

1TB PCIe NVMe TLC M.2 2280 Solid State Drive	Form Factor	M.2 2280	
	Drive Weight	0.02 lb (10 g)	
	Capacity	1TB	
	NAND Type	TLC	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	PCIe NVMe Gen3X4	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		3500 MB/s	3037 MB/s
	Logical Blocks	2,000,409,264	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	ATA Security; TRIM; L1.2		

Note: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.

2TB PCIe NVMe TLC M.2 2280 Solid State Drive	Form Factor	M.2 2280	
	Drive Weight	0.02 lb (10 g)	
	Capacity	2TB	
	NAND Type	TLC	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	PCIe NVMe Gen3X2	
	Performance	Maximum Sequential Read	Maximum Sequential Write
		3500 MB/s	3000MB/s
	Logical Blocks	3,907,029,168	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	ATA Security (Option);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 30 GB (for Windows 10) is reserved for system recovery software.

Technical Specifications – Networking

NETWORKING/COMMUNICATION

Intel i219LM 10/100/1000 Integrated NIC	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 8023 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 Jumbo Frame 9K
	Power consumption	Cable Disconnection: 25mW 100Mbps Full Run: 450mW 1000bp 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 IT Manageability	Auto MDI/MDIX Crossover cable detection Wake-on-LAN from standby and hibernation (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 10/100/1000 Integrated NIC	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 8023 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

Technical Specifications – Networking

Performance	<p>IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)</p> <p>IEEE 802.3az EEE (Energy Efficient Ethernet)</p> <p>TCP/IP/UDP Checksum Offload (configurable)</p> <p>Protocol Offload (ARP & NS)</p> <p>Large send offload and Giant send offload</p> <p>Receiving Side Scaling</p> <p>Jumbo Frame 9K</p>
Power consumption	<p>Cable Disconnection: 25mW</p> <p>100Mbps Full Run: 450mW</p> <p>1000bp Full Run: 1000mW</p> <p>WoL Enable(S3/S4/S5): 50mW</p> <p>WoL Disable(S3/S4/S5): 25mW</p>
Power Management	<p>ACPI compliant – multiple power modes</p> <p>Situation-sensitive features reduce power consumption</p> <p>Advanced link down power saving for reducing link down power consumption</p>
Management Interface IT Manageability	<p>Auto MDI/MDIX Crossover cable detection</p> <p>Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only)</p> <p>PXE 2.1 Remote Boot</p> <p>Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))</p> <p>Comprehensive diagnostic and configuration software suite</p> <p>Virtual Cable Doctor for Ethernet cable status</p>

**Intel Wi-Fi 6 AX201 +
BT5 (802.11ax 2x2, non-
vPro, supporting gigabit
file transfer speeds)
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

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

Data Rates

- 802.11b: 1, 2, 5.5, 11 Mbps
- 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

Technical Specifications – Networking

	<ul style="list-style-type: none">• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)• 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)• 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)
Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
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• 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 : +18.5dBm minimum• 802.11g : +17.5dBm minimum• 802.11a : +18.5dBm minimum• 802.11n HT20(2.4GHz) : +15.5dBm minimum• 802.11n HT40(2.4GHz) : +14.5dBm minimum• 802.11n HT20(5GHz) : +15.5dBm minimum• 802.11n HT40(5GHz) : +14.5dBm minimum• 802.11ac VHT80(5GHz) : +11.5dBm minimum• 802.11ac VHT160(5GHz) : +11.5dBm minimum• 802.11ax HT40(2.4GHz) : +10dBm minimum• 802.11ax VHT160(5GHz) : +10dBm minimum
Power Consumption	<ul style="list-style-type: none">• Transmit mode 2.0 W• Receive mode 1.6 W• Idle mode (PSP) 180 mW (WLAN Associated)• Idle mode 50 mW (WLAN unassociated)• Connected Standby 10mW• Radio disabled 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity³	<ul style="list-style-type: none">• 802.11b, 1Mbps : -93.5dBm maximum• 802.11b, 11Mbps : -84dBm maximum• 802.11a/g, 6Mbps : -86dBm maximum• 802.11a/g, 54Mbps : -72dBm maximum• 802.11n, MCS07 : -67dBm maximum• 802.11n, MCS15 : -64dBm maximum• 802.11ac, MCS0 : -84dBm maximum• 802.11ac, MCS9 : -59dBm maximum• 802.11ax, MCS11(HT40): -59dBm maximum• 802.11ax, MCS11(VHT160): -58.5dBm maximum
Antenna Type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications

Technical Specifications – Networking

Form Factor	PCI-Express M.2 MiniCard with CNVi Interface	
Dimensions	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
Weight	1. Type 2230 : 2.8g 2. Type 1216: 1.3g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio Off; LED Off – Radio ON	
HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology		
Frequency Band	2402 to 2480 MHz	
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)	
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps BLE : 1 Mbps data rate; throughput up to 0.2 Mbps Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)	
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.	
Power Consumption	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW	
Bluetooth Software Supported	Microsoft Windows Bluetooth Software	
Link Topology		
Power Management	Microsoft Windows ACPI, and USB Bus Support	
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249	
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark	
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX)	

Technical Specifications – Networking

Basic Imaging Profile (BIP)²
 Headset Profile (HSP)
 Hands Free Profile (HFP)
 Advanced Audio Distribution Profile (A2DP)

<p>Intel Wi-Fi 6 AX201 + BT5 (802.11ax 2x2, vPro, supporting gigabit file transfer speeds) vPro</p>	<p>Wireless LAN Standards</p>	<p>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</p>
	<p>Interoperability</p>	<p>Wi-Fi certified</p>
	<p>Frequency Band</p>	<p>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</p>
	<p>Data Rates</p>	<p>• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz) • 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)</p>
	<p>Modulation</p>	<p>Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM</p>
	<p>Security¹</p>	<p>• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • WAPI</p>
	<p>Network Architecture Models</p>	<p>Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)</p>
	<p>Roaming</p>	<p>IEEE 802.11 compliant roaming between access points</p>
	<p>Output Power²</p>	<p>• 802.11b : +18.5dBm minimum • 802.11g : +17.5dBm minimum • 802.11a : +18.5dBm minimum</p>

Technical Specifications – Networking

	<ul style="list-style-type: none"> • 802.11n HT20(2.4GHz) : +15.5dBm minimum • 802.11n HT40(2.4GHz) : +14.5dBm minimum • 802.11n HT20(5GHz) : +15.5dBm minimum • 802.11n HT40(5GHz) : +14.5dBm minimum • 802.11ac VHT80(5GHz) : +11.5dBm minimum • 802.11ac VHT160(5GHz) : +11.5dBm minimum • 802.11ax HT40(2.4GHz) : +10dBm minimum • 802.11ax VHT160(5GHz) : +10dBm minimum 				
Power Consumption	<ul style="list-style-type: none"> • Transmit mode :2.0 W • Receive mode :1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode :50 mW (WLAN unassociated) • Connected Standby/Modern 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 : -84dBm maximum • 802.11ac, MCS9 : -59dBm maximum •802.11ax, MCS11(HT40): -59dBm maximum •802.11ax, MCS11(VHT160): -58.5dBm maximum 				
Antenna Type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications				
Form Factor	PCI-Express M.2 MiniCard with CNVi Interface				
Dimensions	<ol style="list-style-type: none"> 1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm 				
Weight	<ol style="list-style-type: none"> 1. Type 2230 : 2.8g 2. Type 126: 1.3g 				
Operating Voltage	3.3v +/- 9%				
Temperature	<table border="0"> <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 border="0"> <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 border="0"> <tbody> <tr> <td>Operating Non-operating</td> <td>0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)</td> </tr> </tbody> </table>	Operating Non-operating	0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)		
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 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				

Technical Specifications – Networking

	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 Link Topology	Microsoft Windows Bluetooth Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)
Security & Manageability	Intel® vPro™ support with appropriate Intel® chipset components

Near Field Communications Controller (optional)

Dimensions (L x W x H)	Module 25 mm by 10 mm by 2.0 mm
Chipset	NPC100
System interface	I2C
NFC RF standards	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 ISO/IEC 18092 ECMA-340 NFCIP-1 Target and Initiator ECMA-320 NFCIP-2
NFC Forum Support	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2

Technical Specifications – Networking

Reader (PCD-VCD) Mode(1)	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 MIFARE 1K MIFARE 4K MIFARE DESFire FeliCa Jewel and Topaz cards
Card Emulation (PICC-VICC) Mode(1)	ISO/IEC 14443 A ISO/IEC 14443 B and B' MIFARE FeliCa
Frequency	13.56 MHz
NFC Modes Supported	Reader/Writer, Peer-to-Peer
Raw RF Data Rates	106, 212, 424, 848 kbps
Operating temperature	0°C to 70°C
Storage temperature	-20°C to 125°C
Humidity	10-90% operating 5-95% non-operating
Supply Operating voltage	4.35 to 5.25 Volts
I/O Voltage	1.8V or 3.3V
Power Consumption	Booster enable, VCC_BOOST = 5V) Mode Power Consumption, Typical
	VBAT= 3.3V, Polling 7.3 mA Detected Test Tag Type 1 Total 283.8 mA Net Module 236.8 mA Detected Test Tag Type 2 Total 288.8 mA Net Module 241.8 mA Detected Test Tag Type 3 Total 287.7 mA Net Module 240.7 mA Detected Test Tag Type 4 Total 282.3 mA Net Module 235.3 mA
Antenna	Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module.

Technical Specifications – Power

POWER

120 Watt Slim Smart AC Adapter	Dimensions	138x68.5x25.4mm	
	Weight	unit: 350g +/- 10g	
	Input	Input Efficiency	88% at 115 Vac and 89% at 230Vac
		Input frequency range	47 ~ 63 Hz
		Input AC current	1.7 A at 90 Vac and Maximum Load
	Output	Output power	120W
		DC output	19.5V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<18.0A
	Connector	C6	
	Environmental Design	Operating temperature	32oFto 95oF (0oto 35oC)
		Non-operating (storage) temperature	-4oFto 185oF (-20oto 85oC)
		Altitude	0 to 16,400 ft (0 to 5000m)
		Humidity	5% to 95%
		Storage Humidity	5% to 95%
	EMI and Safety Certifications	Eg: *CE Mark - full compliance with LVD and EMC directives * Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. * MTBF - over 100,000 hours at 25°C ambient condition.	

NOTE: Can only be configured with Intel UMA Graphics option

150 Watt Slim Smart AC Adapter	Dimensions	138x66x22mm	
	Weight	unit: 325g +/- 10g	
	Input	Input Efficiency	88% at 115 Vac and 89% at 230Vac
		Input frequency range	47 ~ 63 Hz
		Input AC current	2.7 A at 90 Vac and Maximum Load
	Output	Output power	150W
		DC output	19.5V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<16.0A
	Connector	C6	
	Environmental Design	Operating temperature	32oFto 95oF (0oto 35oC)

Technical Specifications – Power

Non-operating (storage) temperature	-40F to 185oF (-20oto 85oC)
Altitude	0 to 16,400 ft (0 to 5000m)
Humidity	5% to 95%
Storage Humidity	5% to 95%

EMI and Safety Certifications Eg:

- *CE Mark - full compliance with LVD and EMC directives
- * Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE.
- * MTBF - over 100,000 hours at 25°C ambient condition.

NOTE: Can only be configured with Quadro T1000 and T2000 Graphics option

Technical Specifications – Power

HP Long Life 6-cell Polymer (83Wh) Battery	Dimensions (H x W x L)	8.7 x 316.1 x 70.2mm (0.342 x 12.44 x 2.763 inch)	
	Weight	0.31kg (0.683lb)	
	Cells/Type	6-cell; Polymer	
	Energy	Voltage	11.58V
		Amp-hour capacity	7.170Ah
		Watt-hour capacity	83Wh
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 122° F (-10° to 60° C)
	Fuel Gauge LED	NA	
	Warranty	Refer to http://www.hp.com/support/batterywarranty/ for battery warranty information.	
Optional Travel Battery Available	N/A		

NOTE: Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year limited warranty as the platform.

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®
- EPEAT® Gold registered in the United States. See <http://www.epeat.net> for registration status in your country.

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)	TBD	TBD	TBD
Normal Operation (Long idle)	TBD	TBD	TBD
Sleep	TBD	TBD	TBD
Off	TBD	TBD	TBD

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, 60Hz
Normal Operation (Short idle)	TBD	TBD	TBD
Normal Operation (Long idle)	TBD	TBD	TBD
Sleep	TBD	TBD	TBD
Off	TBD	TBD	TBD

***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	TBD	TBD
Fixed Disk – Random writes	TBD	TBD

Longevity and Upgrading

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

- AC Adapter
- Memory
- Storage Slots (M.2 SSD)

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

Technical Specifications – Environmental

Batteries

This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:

- Mercury greater than 1ppm by weight
- Cadmium greater than 20ppm by weight

Battery description: CR2032 (coin cell)

Battery type: Lithium

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 contains 7.8% post-consumer recycled plastic (by wt.)
- This product is 96.1% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Cardboard & misc	TBD
Internal:	PLASTIC/EPE (Expanded Polyethylene)	TBD
	PLASTIC/Polyethylene low density	TBD
	PLASTIC/Polypropylene	TBD

The plastic packaging material contains at least 50% recycled content.

The corrugated paper packaging materials contains at least 70% recycled content.

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/pdf/gse.pdf>):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- 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)

Technical Specifications – Environmental

- Polyvinyl Chloride (PVC) – except for wires and cables, 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 HP web site at: <http://www.hp.com/go/recyclers>. 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>

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

Type	Description	Part #
Displays	HP Z32 31.5" 4k UHD Display	1AA81A8#XXX
	HP Z38c 37.5" Curved Display	Z4W65A8#ABA
Cases	HP Business Backpack (up to 17.3")	2SC67AA
	HP Business Slim Top Load (up to 17.3")	2UW02AA
	HP Exec 17.3 Midnight Backpack	1KM17AA
Docking Accessories	HP Adjustable Dual Monitor Stand	AW664AA
	HP Adjustable Display Stand	AW663AA
	HP Display and Notebook Stand II	E8G00AA
	HP Monitor Stand	M9X76AA
	HP Dual Hinge II Notebook Stand	E8F99AA
	HP Hot Desk Stand (up to 32" monitor)	W3Z73AA
	HP Hot Desk Stand Monitor Arm (for use with W3Z73AA; supports two 24" monitors)	W3Z74AA
	HP TB Audio Module (comp with Hook dock)	3AQ21AA
	HP TB Dock G2 Combo Cable (this is 230W) comp with Hook dock	3XB96AA
Docking station	HP USB Travel Dock	TOK30AA
	HP USB-C Mini Dock - power not supported on mWKS	1PM64AA
	HP USB-C Universal Dock - power not supported on mWKS or USB-data only ports	1MK33AA
	HP USB-C Universal Dock Non-Flash with Power Splitter - power not supported on mWKS or USB-data only ports - NEW	3DV65AA
	HP USB-C Dock G4 - Power Not Supported on Mobile Workstations	3FF69AA
	HP TB Dock G2 w/ Combo Cable (this is 230W)	3TR87AA
	HP USB-C/A Universal Dock G2 Power Not Supported on Mobile Workstations	5TW13AA
	HP USB-C Dock G5 Power Not Supported on Mobile Workstations	5TW10AA
Input/Output - Mice	HP Comfort Grip Wireless Mouse (See Link 5 Tab)	H2L63AA
	HP 3-button USB Laser Mouse	H4B81AA
	HP Slim Bluetooth Mouse	F3J92AA
	HP USB Travel Mouse	G1K28AA
	HP Wireless Premium Mouse (See Link 5 Tab)	1JR31AA
	HP Elite Presenter Mouse	2CE30AA
Input/Output - Keyboard	HP Slim USB Keyboard and Mouse	T6T83AA
	HP Slim Wireless Keyboard and Mouse	T6L04AA
Input/Output - Adapter	HP USB-C to USB-A Hub	Z6A00AA
	HDMI to VGA Adapter	H4F02AA
	HP HDMI to DVI Adapter	F5A28AA
	HP USB-C to USB 3.0 Adapter	N2Z63AA
	HP USB-C to DisplayPort Adapter	N9K78AA

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

	HP USB-C to VGA Adapter	N9K76AA
Collaboration	HP UC Wired Headset	K7V17AA
Memory	HP 8GB 2666Mhz DDR4	4VN06AA
	HP 16GB 2666Mhz DDR4	4VN07AA
	HP 8GB 2666MHz DDR4 ECC	4UY11AA
	HP 16GB 2666MHz DDR4 ECC	4UY12AA
Power - A/C Adapter	HP 200W Smart AC Adapter (4.5mm)	TBD
	HP 200W Smart AC Adapter (4.5mm)	TBD
Adapter Dongle	HP 7.4mm to 4.5mm DC Dongle	K0Q39AA
Security	HP Essential Combination Lock (Herb)	T0Y16AA
	HP Keyed Cable Lock 10mm (Wolv II)	T1A62AA
	HP Dual Head Keyed Cable Lock (Sumo)	T1A64AA
Storage - External	HP External USB DVDRW Drive	F2B56AA
Storage - SS M2	HP 256GB PCIe 3x4 NVMe SSD (2280)	V3K66AA
	HP 512GB PCIe 3x4 NVMe DS SSD (2280)	V3K67AA

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Date of change:	Version History:		Description of change:
September 23, 2020	From v1 to v2	Changed	Format