

### Overview

### HP ZBook Power G7 Mobile Workstation



1. Ambient Light Sensor
2. Internal Microphones (optional)
3. Camera LEDs (optional)
4. Camera (optional)
5. IR Camera (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 Pro<sup>1</sup> 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® processors<sup>2</sup> 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 Max<sup>3</sup>.
- Strenuously tested to meet ISV certification and deliver superb performance and support with leading software providers, including Autodesk and Adobe<sup>4</sup>.
- Have confidence with HP's most secure mobile workstations and defend against firmware and malware attacks with HP Sure Start<sup>5</sup> and Sure Sense<sup>6</sup>.
- Built with the environment in mind, this ZBook includes recycled ocean-bound plastics<sup>7</sup>, plastic-free packaging, and ultra-efficient power consumption.
- Designed for ultimate durability, this ZBook undergoes brutal MIL-STD 810H<sup>8</sup> 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™ 3<sup>9</sup> transfers and the flexibility to run up to two external 4K displays<sup>10,11</sup>.
- Work without limits in any location with up to 4TB<sup>12</sup> of local PCIe storage<sup>13</sup>.

<sup>1</sup>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>

<sup>2</sup>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.

<sup>3</sup>Adobe Premiere Pro® and Autodesk 3ds Max sold separately.

<sup>4</sup>Adobe and Autodesk software sold separately.

<sup>5</sup>HP Sure Start Gen6 is available on select HP PCs with Intel processors.

<sup>6</sup>HP Sure Sense requires Windows 10.

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

<sup>8</sup>MIL 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.

<sup>9</sup>HP Thunderbolt™ Dock with Thunderbolt™ 3 sold separately.

<sup>10</sup>External displays sold separately.

<sup>11</sup>Optional hybrid graphics is required to run up to two external 4K displays.

<sup>12</sup>For 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.

<sup>13</sup>Optional, configurable feature.

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

### Features

#### OPERATING SYSTEM

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

<sup>1</sup> 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>.

<sup>2</sup> For detailed Linux® OS/hardware support information, see: [http://www.hp.com/linux\\_hardware\\_matrix](http://www.hp.com/linux_hardware_matrix)

#### PROCESSOR

10<sup>th</sup> 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)<sup>1,2,3,4,5</sup>

10<sup>th</sup> 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)<sup>1,2,3,4,5</sup>

10<sup>th</sup> 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)<sup>1,2,3,4,5</sup>

10<sup>th</sup> 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)<sup>1,2,3,4,5</sup>

10<sup>th</sup> 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)<sup>1,2,3,4,5</sup>

10<sup>th</sup> 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)<sup>1,2,3,4,5</sup>

<sup>1</sup> 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.

<sup>2</sup> Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

<sup>3</sup> Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. Energy Efficient Turbo is a power management feature that can lower the maximum core ratio (frequency), if the CPU thinks it can achieve about the same performance as with the maximum turbo frequency. Energy Efficient Turbo feature is disabled in Comet Lake H in order to prioritize performance in DC mode. It can be changed in F10 BIOS settings. See [www.intel.com/technology/turboboost](http://www.intel.com/technology/turboboost) for more information.

<sup>4</sup> 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>.

<sup>5</sup> For full Intel® vPro® functionality, Windows, a vPro supported processor, vPro enabled Q370 chipset or higher and vPro enabled WLAN card are required. Some functionality, such as Intel Active management technology and Intel Virtualization technology, requires additional 3rd party software in order to run. Availability of future "virtual appliances" applications for Intel vPro technology is dependent on 3rd party software providers. Compatibility of this generation of Intel vPro technology-based hardware with future "virtual appliances" is yet to be determined.

### Features

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### Features

#### CHIPSET

Intel® Commet 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. <sup>1,2</sup>

<sup>1</sup> 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.

<sup>2</sup> 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 <sup>1,2,3,4,5</sup>

##### Discrete

NVIDIA Graphic options:

NVIDIA® Quadro® T2000 with Max-Q Design (4 GB GDDR6 dedicated) <sup>1,2,3,4,5</sup>

NVIDIA® Quadro® T1000 with Max-Q Design (4 GB GDDR6 dedicated) <sup>1,2,3,4,5</sup>

NVIDIA® Quadro® P620 (4 GB GDDR5 dedicated) <sup>1,2,3,4,5</sup>

<sup>1</sup> UHD content required to view UHD images.

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

<sup>3</sup> HDMI cable Sold Separately

<sup>4</sup> 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.

<sup>5</sup> 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 three independent displays which can include any combination of the Internal panel and two external display connected to the HDMI port and/or external displays connected to the dock Type-C®, or VGA, or two DisplayPort™ ports.

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

### 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.

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### 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)<sup>1,2</sup>
- 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)<sup>1,2</sup>
- 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)<sup>1,2</sup>

#### 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)<sup>1,2</sup>

<sup>1</sup> UHD content required to view UHD images.

<sup>2</sup> Resolutions are dependent upon monitor capability, and resolution and color depth settings.

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### Features

#### STORAGE AND DRIVES<sup>1</sup>

**Max Storage**

4TB through two M.2 NVMe drives

**(up to 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

<sup>1</sup>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.

<sup>2</sup>Storage slots 1 and 2 both support a maximum of PCIe Gen 3 speeds.

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#### DRIVE CONTROLLERS

M.2 Storage Bay (PCIe NVMe)

PCIe Gen 3 x 4 lanes NVMe Solid State Drive

RAID:

Not supported

#### MEMORY

**Maximum Memory<sup>1</sup>**

64 GB DDR4-3200 non-ECC SDRAM<sup>2</sup>

32 GB DDR4-2666 ECC SDRAM<sup>2</sup>

2 DDR4 SODIMMS<sup>4,5</sup>

Supports Dual Channel Memory<sup>3</sup>

Slots are customer accessible / upgradeable

<sup>1</sup> 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.

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

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

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

<sup>5</sup>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™

<sup>1</sup>GbE - 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™ <sup>1</sup>

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

<sup>1</sup>Wireless 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

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#### AUDIO/MULTIMEDIA

##### Audio

HP Audio, dual stereo speakers, dual array digital microphone<sup>3</sup>, functions keys for volume up and down, combo microphone/headphone jack, HD audio

##### Camera<sup>1,2</sup>

720p HD webcam with IR

720p HD webcam

<sup>1</sup> HD content required to view HD images respectively.

<sup>2</sup> 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.

<sup>3</sup>Dual-microphone array when equipped with optional webcam and optional world facing microphone.

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### 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

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#### 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 Advisor<sup>8</sup>

HP Recovery Manager

HP Remote Graphics Software

HP Z Central Remote Boost<sup>2</sup>

HP Support Assistant <sup>1</sup>

Native Miracast support <sup>4</sup>

HP Connection Optimizer<sup>9</sup>

HP Cloud Recovery

myHP

##### Security Management

Absolute persistence module <sup>6</sup>

HP Admin

HP Device Access Manager

HP FingerPrint Sensor

HP Manageability Integration Kit Gen4<sup>11</sup>

HP Power On Authentication

Security lock slot<sup>12</sup>

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 Defender<sup>10</sup>

HP Client Security Manager Gen6<sup>17</sup>

HP BIOSphere Gen6 <sup>5</sup>

HP Sure Recover Gen3<sup>13</sup>

### Features

HP Sure Start Gen6<sup>15</sup>  
HP Secure Erase<sup>16</sup>  
HP Sure Sense<sup>18</sup>  
HP Security Manager  
HP Sure Click<sup>20</sup>  
HP Sure Run Gen3  
Smartcard Reader - Alcor AU9560 (FIPS 201 Compliant)

#### BIOS Version

ISO/IEC 19678: 2015 (formerly NIST 800-147) compliant  
UEFI version: 2.7

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

<sup>1</sup> HP Support Assistant - Requires Windows and Internet Access.

<sup>2</sup> 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](http://hp.com/ZCentralRemoteBoost).

<sup>4</sup> 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>.

<sup>5</sup> 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.

<sup>6</sup> 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.

<sup>8</sup> 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>

<sup>9</sup> HP Connection Optimizer requires Windows 10.

<sup>10</sup> Microsoft Defender Opt in and internet connection required for updates.

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

<sup>12</sup> Security lock slot is Lock sold separately.

<sup>13</sup> 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.

<sup>14</sup> 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™.

<sup>15</sup> HP Sure Start Gen6 is available on select HP PCs and requires Windows 10.

<sup>16</sup> 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™.

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

<sup>18</sup> HP Sure Sense requires Windows 10. See product specifications for availability.

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

<sup>20</sup> HP Sure Click requires Windows 10 Pro or Enterprise. See [https://bit.ly/2PrLT6A\\_SureClick](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 polymer<sup>1</sup>

120 W Slim Smart external AC power adapter<sup>2</sup>

150 W Slim Smart external AC power adapter<sup>3</sup>

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

<sup>1</sup> Measured with MobileMark 14

<sup>2</sup> 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.

<sup>3</sup> 120 W power adapter is configurable with Intel UMA graphics

<sup>4</sup> 150 W power adapter is configurable with NVIDIA Quadro P620 T1000 and T2000 configurations

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#### ENVIRONMENTAL

Targeting ENERGY STAR® certified and EPEAT® GOLD registered configurations available<sup>1</sup>

Low halogen<sup>2</sup>

<sup>1</sup> Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit [www.epeat.net](http://www.epeat.net) for more information.

<sup>2</sup> 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 2.28 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

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#### PORTS/SLOTS

1 smart card reader

**Left side**

1 RJ-45

1 USB 3.1 Gen 1 (charging)

1 HDMI<sup>1,3</sup>

**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

<sup>1</sup>HDMI port-cable not included.

<sup>3</sup>HDMI 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>.

<sup>1</sup>Sold 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

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

<sup>1</sup>Configurations 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>.

<sup>2</sup> 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](http://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**

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

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

<b>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)</b>	<b>Outline Dimensions (W x H)</b>	349.52 x 205.42 mm (max)		
	<b>Active Area</b>	344.22 x 193.62 mm (typ.)		
	<b>Weight</b>	320 g (max)		
	<b>Diagonal Size</b>	15.6"		
	<b>Thickness</b>	2.6mm / 4.6mm (PCB) (max)		
	<b>Interface</b>	eDP 1.4		
	<b>Panel Technology</b>	IPS		
	<b>Surface Treatment</b>	Anti-glare (AG)		
	<b>Touch Enabled</b>	No		
	<b>Contrast Ratio</b>	1200:1 (typ.)		
	<b>Refresh Rate</b>	60Hz		
	<b>Brightness</b>	1000nits		
	<b>Pixel Resolution</b>	<b>Format</b>	RGB	
	<b>Backlight</b>	LED		
	<b>PPI</b>	141		
	<b>Color Gamut Coverage</b>	100% sRGB		
<b>Color Depth</b>	8 bits			
<b>Viewing Angle</b>	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.

<b>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)</b>	<b>Outline Dimensions (W x H)</b>	350.96 x 205.74 mm (max)		
	<b>Active Area</b>	344.16 x 193.59 mm (typ.)		
	<b>Weight</b>	380 g (max)		
	<b>Diagonal Size</b>	15.6 inch		
	<b>Thickness</b>	3.2mm/ 5.2mm (PCB) (max)		
	<b>Interface</b>	eDP 1.2 (2 lane)		
	<b>Panel Technology</b>	IPS		
	<b>Surface Treatment</b>	Anti-Glare On-cell		
	<b>Touch Enabled</b>	Yes		
	<b>Contrast Ratio</b>	600:1 (typ.)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	250 nits		
	<b>Pixel Resolution</b>	<b>Format</b>	1920 x 1080 (FHD)	
	<b>Backlight</b>	<b>Configuration</b>	RGB Stripe	
	<b>PPI</b>	LED		
	<b>Color Gamut Coverage</b>	166		
<b>Color Depth</b>	NTSC 45%			
<b>Viewing Angle</b>	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

<b>256GB PCIe NVMe TLC M.2 2280 Solid State Drive</b>	<b>Form Factor</b>	M.2 2280		
	<b>Drive Weight</b>	0.02 lb (10 g)		
	<b>Capacity</b>	256GB		
	<b>NAND Type</b>	TLC		
	<b>Height</b>	0.09 in (2.3 mm)		
	<b>Width</b>	0.87 in (22 mm)		
	<b>Interface</b>	PCIe NVMe Gen3X4		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		3500 MB/s	2200 MB/s	
	<b>Logical Blocks</b>	500,118,192		
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]		
<b>Features</b>	ATA Security; TRIM; L1.2			
	<b>Note:</b> 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.			
<b>256GB PCIe NVMe TLC M.2 2280 SED Opal 2 Solid State Drive</b>	<b>Form Factor</b>	M.2 2280		
	<b>Drive Weight</b>	0.02 lb (10 g)		
	<b>Capacity</b>	256 GB		
	<b>NAND Type</b>	TLC		
	<b>Height</b>	0.09 in (2.3 mm)		
	<b>Width</b>	0.87 in (22 mm)		
	<b>Interface</b>	PCIe NVMe Gen3X4		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		3500 MB/s	2200 MB/s	
	<b>Logical Blocks</b>	500,118,192		
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]		
<b>Features</b>	ATA Security (Option); TCG Opal 2.0; TRIM; L1.2			
	<b>Note:</b> 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.			
<b>512GB PCIe NVMe TLC M.2 2280 Solid State Drive</b>	<b>Form Factor</b>	M.2 2280		
	<b>Drive Weight</b>	0.02 lb (10 g)		
	<b>Capacity</b>	512GB		
	<b>NAND Type</b>	TLC		
	<b>Height</b>	0.09 in (2.3 mm)		
	<b>Width</b>	0.87 in (22 mm)		
	<b>Interface</b>	PCIe NVMe Gen3X4		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		3500 MB/s	2956 MB/s	
	<b>Logical Blocks</b>	1,000,215,215		
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]		
<b>Features</b>	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.

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

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

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

<b>Intel i219LM 10/100/1000 Integrated NIC</b>	<b>Connector</b>	RJ-45
	<b>System Interface</b>	PCI(Intel proprietary) + SMBus
	<b>Data Rates Supported</b>	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
	<b>IEEE Compliance</b>	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)
	<b>Performance</b>	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling Jumbo Frame 9K
	<b>Power consumption</b>	Cable Disconnection: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
	<b>Power Management</b>	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
	<b>Management Interface IT Manageability</b>	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
	<b>Security &amp; Manageability</b>	Intel® vPro™ support with appropriate Intel® chipset components

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<b>Intel i219v 10/100/1000 Integrated NIC</b>	<b>Connector</b>	RJ-45
	<b>System Interface</b>	PCI(Intel proprietary) + SMBus
	<b>Data Rates Supported</b>	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
	<b>IEEE Compliance</b>	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support

### Technical Specifications – Networking

<b>Performance</b>	<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 &amp; NS)</p> <p>Large send offload and Giant send offload</p> <p>Receiving Side Scaling</p> <p>Jumbo Frame 9K</p>
<b>Power consumption</b>	<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>
<b>Power Management</b>	<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>
<b>Management Interface IT Manageability</b>	<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"><li>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li><li>• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li><li>• 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li><li>• 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li></ul>
<b>Modulation</b>	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
<b>Security<sup>1</sup></b>	<ul style="list-style-type: none"><li>• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li><li>• AES-CCMP: 128 bit in hardware</li><li>• 802.1x authentication</li><li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li><li>• WPA2 certification</li><li>• IEEE 802.11i</li><li>• WAPI</li></ul>
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"><li>• 802.11b : +18.5dBm minimum</li><li>• 802.11g : +17.5dBm minimum</li><li>• 802.11a : +18.5dBm minimum</li><li>• 802.11n HT20(2.4GHz) : +15.5dBm minimum</li><li>• 802.11n HT40(2.4GHz) : +14.5dBm minimum</li><li>• 802.11n HT20(5GHz) : +15.5dBm minimum</li><li>• 802.11n HT40(5GHz) : +14.5dBm minimum</li><li>• 802.11ac VHT80(5GHz) : +11.5dBm minimum</li><li>• 802.11ac VHT160(5GHz) : +11.5dBm minimum</li><li>• 802.11ax HT40(2.4GHz) : +10dBm minimum</li><li>• 802.11ax VHT160(5GHz) : +10dBm minimum</li></ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"><li>• Transmit mode 2.0 W</li><li>• Receive mode 1.6 W</li><li>• Idle mode (PSP) 180 mW (WLAN Associated)</li><li>• Idle mode 50 mW (WLAN unassociated)</li><li>• Connected Standby 10mW</li><li>• Radio disabled 8 mW</li></ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>3</sup></b>	<ul style="list-style-type: none"><li>• 802.11b, 1Mbps : -93.5dBm maximum</li><li>• 802.11b, 11Mbps : -84dBm maximum</li><li>• 802.11a/g, 6Mbps : -86dBm maximum</li><li>• 802.11a/g, 54Mbps : -72dBm maximum</li><li>• 802.11n, MCS07 : -67dBm maximum</li><li>• 802.11n, MCS15 : -64dBm maximum</li><li>• 802.11ac, MCS0 : -84dBm maximum</li><li>• 802.11ac, MCS9 : -59dBm maximum</li><li>• 802.11ax, MCS11(HT40): -59dBm maximum</li><li>• 802.11ax, MCS11(VHT160): -58.5dBm maximum</li></ul>
<b>Antenna Type</b>	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

<b>Form Factor</b>	PCI-Express M.2 MiniCard with CNVi Interface	
<b>Dimensions</b>	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
<b>Weight</b>	1. Type 2230 : 2.8g 2. Type 1216: 1.3g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio Off; LED Off – Radio ON	
<b>HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology</b>		
<b>Frequency Band</b>	2402 to 2480 MHz	
<b>Number of Available Channels</b>	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)	
<b>Data Rates and Throughput</b>	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)	
<b>Transmit Power</b>	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.	
<b>Power Consumption</b>	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW	
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software	
<b>Link Topology</b>		
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support	
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.249	
<b>Power Management Certifications</b>	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark	
<b>Bluetooth Profiles Supported</b>	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)<sup>2</sup>  
 Headset Profile (HSP)  
 Hands Free Profile (HFP)  
 Advanced Audio Distribution Profile (A2DP)

<p><b>Intel Wi-Fi 6 AX201 + BT5 (802.11ax 2x2, vPro, supporting gigabit file transfer speeds) vPro</b></p>	<p><b>Wireless LAN Standards</b></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><b>Interoperability</b></p>	<p>Wi-Fi certified</p>
	<p><b>Frequency Band</b></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><b>Data Rates</b></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 &amp; 160MHz)          • 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz &amp; 160MHz)</p>
	<p><b>Modulation</b></p>	<p>Direct Sequence Spread Spectrum          OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM</p>
	<p><b>Security<sup>1</sup></b></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><b>Network Architecture Models</b></p>	<p>Ad-hoc (Peer to Peer)          Infrastructure (Access Point Required)</p>
	<p><b>Roaming</b></p>	<p>IEEE 802.11 compliant roaming between access points</p>
	<p><b>Output Power<sup>2</sup></b></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"> <li>• 802.11n HT20(2.4GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +14.5dBm minimum</li> <li>• 802.11n HT20(5GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(5GHz) : +14.5dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +11.5dBm minimum</li> <li>• 802.11ac VHT160(5GHz) : +11.5dBm minimum</li> <li>• 802.11ax HT40(2.4GHz) : +10dBm minimum</li> <li>• 802.11ax VHT160(5GHz) : +10dBm minimum</li> </ul>				
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode :2.0 W</li> <li>• Receive mode :1.6 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode :50 mW (WLAN unassociated)</li> <li>• Connected Standby/Modern Standby: 10mW</li> <li>• Radio disabled: 8 mW</li> </ul>				
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode				
<b>Receiver Sensitivity<sup>3</sup></b>	<ul style="list-style-type: none"> <li>•802.11b, 1Mbps : -93.5dBm maximum</li> <li>•802.11b, 11Mbps : -84dBm maximum</li> <li>• 802.11a/g, 6Mbps : -86dBm maximum</li> <li>• 802.11a/g, 54Mbps : -72dBm maximum</li> <li>• 802.11n, MCS07 : -67dBm maximum</li> <li>• 802.11n, MCS15 : -64dBm maximum</li> <li>• 802.11ac, MCS0 : -84dBm maximum</li> <li>• 802.11ac, MCS9 : -59dBm maximum</li> <li>•802.11ax, MCS11(HT40): -59dBm maximum</li> <li>•802.11ax, MCS11(VHT160): -58.5dBm maximum</li> </ul>				
<b>Antenna Type</b>	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				
<b>Form Factor</b>	PCI-Express M.2 MiniCard with CNVi Interface				
<b>Dimensions</b>	<ol style="list-style-type: none"> <li>1. Type 2230 : 2.3 x 22.0 x 30.0 mm</li> <li>2. Type 1216: 1.67 x 12.0 x 16.0 mm</li> </ol>				
<b>Weight</b>	<ol style="list-style-type: none"> <li>1. Type 2230 : 2.8g</li> <li>2. Type 126: 1.3g</li> </ol>				
<b>Operating Voltage</b>	3.3v +/- 9%				
<b>Temperature</b>	<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)				
<b>Humidity</b>	<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)				
<b>Altitude</b>	<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)				
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON				
<b>HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology</b>					
<b>Frequency Band</b>	2402 to 2480 MHz				
<b>Number of Available Channels</b>	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)				
<b>Data Rates and Throughput</b>	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)
<b>Transmit Power</b>	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.
<b>Power Consumption</b>	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
<b>Bluetooth Software Supported Link Topology</b>	Microsoft Windows Bluetooth Software
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
<b>Power Management Certifications</b>	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
<b>Bluetooth Profiles Supported</b>	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)
<b>Security &amp; Manageability</b>	Intel® vPro™ support with appropriate Intel® chipset components

### NFC (Near Field Communication) module (optional)

<b>Dimensions (L x W x H)</b>	Module 25 mm by 10 mm by 2.0 mm
<b>Chipset</b>	NPC100
<b>System interface</b>	I2C
<b>NFC RF standards</b>	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
<b>NFC Forum Support</b>	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2

### Technical Specifications – Networking

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

### Technical Specifications – Power

#### POWER

<b>120 Watt Slim Smart AC Adapter</b>	<b>Dimensions</b>	138x68.5x25.4mm	
	<b>Weight</b>	unit: 350g +/- 10g	
	<b>Input</b>	<b>Input Efficiency</b>	88% at 115 Vac and 89% at 230Vac
		<b>Input frequency range</b>	47 ~ 63 Hz
		<b>Input AC current</b>	1.7 A at 90 Vac and Maximum Load
	<b>Output</b>	<b>Output power</b>	120W
		<b>DC output</b>	19.5V
		<b>Hold-up time</b>	5ms at 115 Vac input
		<b>Output current limit</b>	<18.0A
	<b>Connector</b>	C5	
	<b>Environmental Design</b>	<b>Operating temperature</b>	32oFto 95oF (0oto 35oC)
		<b>Non-operating (storage) temperature</b>	-4oFto 185oF (-20oto 85oC)
		<b>Altitude</b>	0 to 16,400 ft (0 to 5000m)
		<b>Humidity</b>	5% to 95%
<b>Storage Humidity</b>		5% to 95%	
<b>EMI and Safety Certifications</b>	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

<b>150 Watt Slim Smart AC Adapter</b>	<b>Dimensions</b>	138x66x22mm	
	<b>Weight</b>	unit: 325g +/- 10g	
	<b>Input</b>	<b>Input Efficiency</b>	88% at 115 Vac and 89% at 230Vac
		<b>Input frequency range</b>	47 ~ 63 Hz
		<b>Input AC current</b>	2.7 A at 90 Vac and Maximum Load
	<b>Output</b>	<b>Output power</b>	150W
		<b>DC output</b>	19.5V
		<b>Hold-up time</b>	5ms at 115 Vac input
		<b>Output current limit</b>	<16.0A
	<b>Connector</b>	C5	
	<b>Environmental Design</b>	<b>Operating temperature</b>	32oFto 95oF (0oto 35oC)

### Technical Specifications – Power

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

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

Battery description: 6 Cell HP Long Life Polymer 83Wh

#### 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](http://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

<b>External:</b>	PAPER/Cardboard & misc	TBD
<b>Internal:</b>	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)

### Technical Specifications – Environmental

- Polychlorinated Terphenyls (PCT)
- 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 #
<b>Displays</b>	HP Z32 31.5" 4k UHD Display	1AA81A8#XXX
	HP Z38c 37.5" Curved Display	Z4W65A8#ABA
<b>Cases</b>	HP Business Backpack (up to 17.3")	2SC67AA
	HP Essential Top Load Case (up to 15.6")	H2W17AA
	HP Essential Backpack (up to 15.6")	H1D24AA
	HP Business Case(up to 15.6")	2SC66AA
	HP Executive 15.6 Midnight Top Load	1KM15AA
	HP Exec 15.6 Midnight Backpack	1KM16AA
	HP Executive 15.6 Black Leather Top Load	1LG83AA
	HP Business Slim Top Load (up to 17.3")	2UW02AA
HP Exec 17.3 Midnight Backpack	1KM17AA	
<b>Docking Accessories</b>	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	
<b>Docking station</b>	HP USB Travel Dock	T0K30AA
	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
HP Thunderbolt Dock 230W G2	2UK38AA	
<b>Input/Output - Mice</b>	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
<b>Input/Output - Keyboard</b>	HP Slim USB Keyboard and Mouse	T6T83AA

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

	HP Slim Wireless Keyboard and Mouse	T6L04AA
<b>Input/Output - Adapter</b>	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
	HP USB-C to VGA Adapter	N9K76AA
<b>Collaboration</b>	HP UC Wired Headset	K7V17AA
<b>Memory</b>	HP 8GB 2666Mhz DDR4	4VN06AA
	HP 16GB 2666Mhz DDR4	4VN07AA
	HP 8GB 2666MHz DDR4 ECC	4UY11AA
	HP 16GB 2666MHz DDR4 ECC	4UY12AA
<b>Power - A/C Adapter</b>	HP 200W Smart AC Adapter (4.5mm)	TBD
	HP 200W Smart AC Adapter (4.5mm)	TBD
<b>Adapter Dongle</b>	HP 7.4mm to 4.5mm DC Dongle	K0Q39AA
<b>Security</b>	HP Essential Combination Lock	T0Y16AA
	HP Keyed Cable Lock 10mm	T1A62AA
	HP Dual Head Keyed Cable Lock	T1A64AA
<b>Storage - External</b>	HP External USB DVDRW Drive	F2B56AA
<b>Storage - SS M2</b>	HP 256GB PCIe 3x4 NVMe SSD (2280)	V3K66AA
	HP 512GB PCIe 3x4 NVMe DS SSD (2280)	V3K67AA

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<b>Date of change:</b>	<b>Version History:</b>		<b>Description of change:</b>
September 23, 2020	From v1 to v2	Changed	Format
September 30, 2020	From v2 to v3	Changed	At A Glance, GRAPHICS, STORAGE AND DRIVES, SOFTWARE AND SECURITY, NETWORKING/COMMUNICATION, ENVIRONMENTAL DATA and Options and Accessories sections
October 20, 2020	From v3 to v4	Changed	Format
December 11, 2020	From v4 to v5	Changed	Format
December 16, 2020	From v5 to v6	Added	BIOS Version in Software and Security section
January 8, 2021	From v6 to v7	Changed	PORTS/SLOTS section
January 14, 2021	From v7 to v8	Changed	Multi Display Support section
February 3, 2021	From v8 to v9	Changed	STORAGE AND DRIVES section