

### Overview

### HP ZBook x2 G4 Detachable Workstation



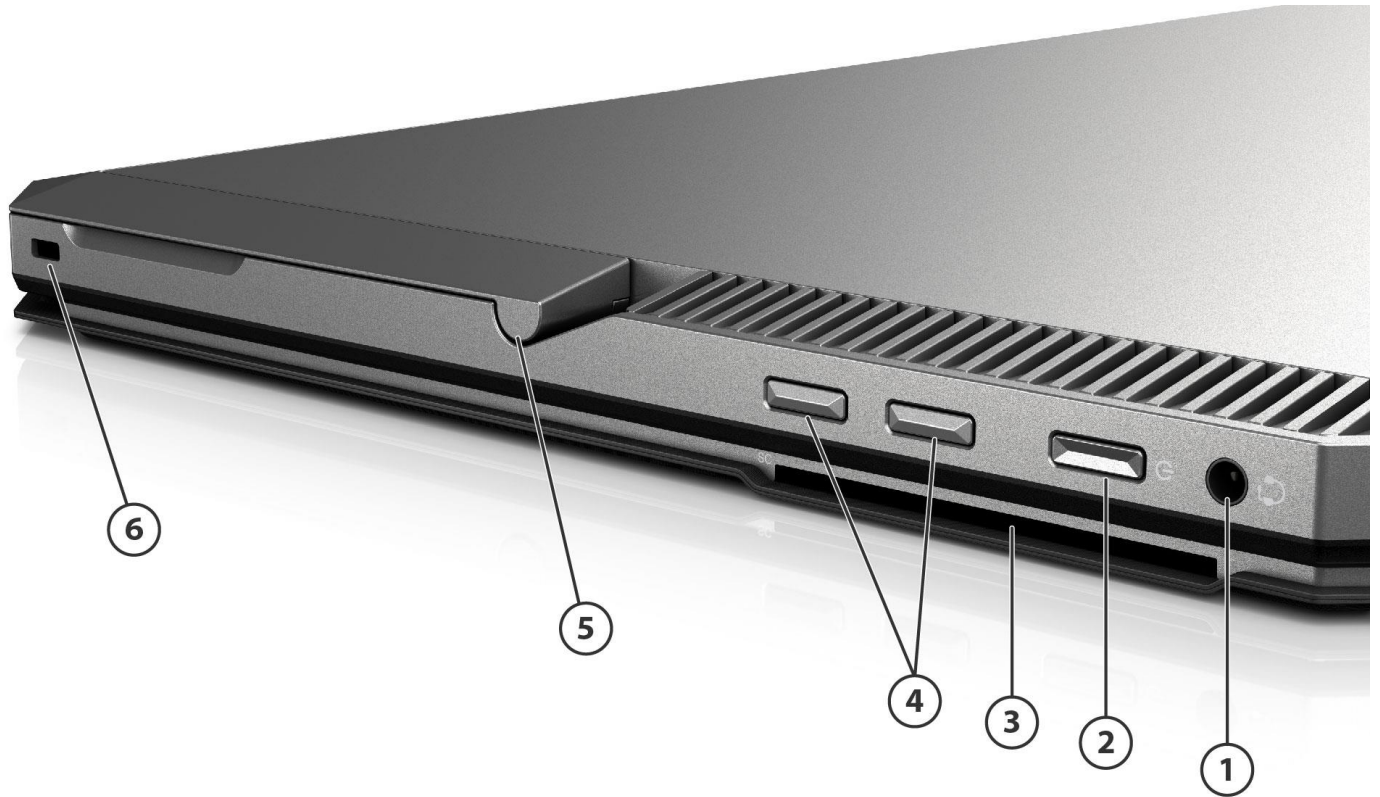
### Overview



### Front

- |                                    |                                    |
|------------------------------------|------------------------------------|
| 1. IR LED                          | 8. HP Quick Key – Mode Select      |
| 2. Microphones                     | 9. HP Quick Key                    |
| 3. RGB Camera                      | 10. HP Quick Key (Supports 1 Mode) |
| 4. IR Camera                       | 11. HP Quick Key (Supports 1 Mode) |
| 5. 3 Mode LEDs                     | 12. Large Clickpad                 |
| 6. HP Quick Key (Supports 3 Modes) |                                    |
| 7. HP Quick Key (Supports 3 Modes) |                                    |

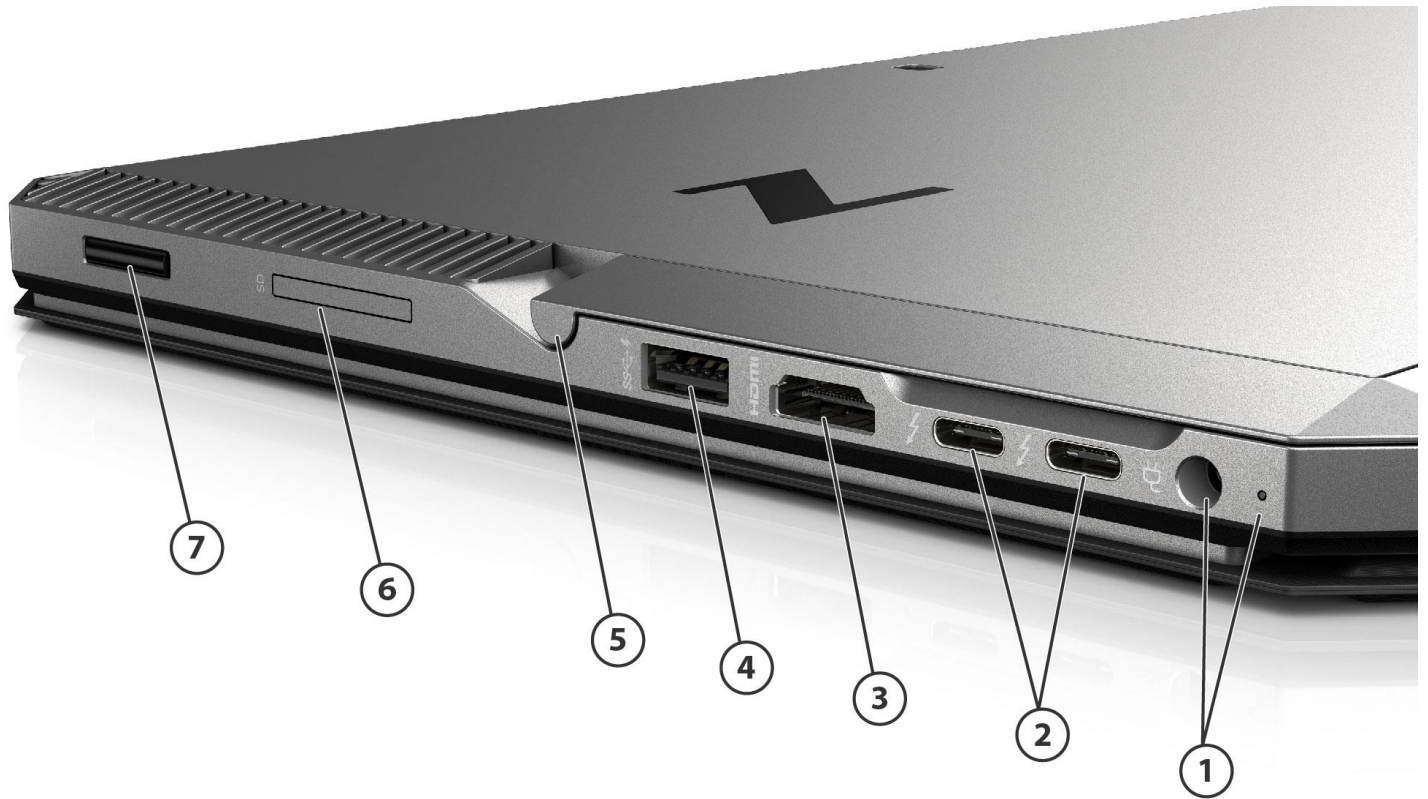
### Overview



#### Left

- |  |                         |
|--|-------------------------|
| 1. Combo headset                       | 4. (2) Volume Up/Down   |
| 2. Power                               | 5. Integrated Kickstand |
| 3. Smart card (on Detachable keyboard) | 6. Security lock slot   |

### Overview



#### Right

- |                             |                         |
|-----------------------------|-------------------------|
| 1. Power connector with LED | 5. Integrated Kickstand |
| 2. (2) Thunderbolt™ 3 Ports | 6. SD Card slot         |
| 3. HDMI 1.4                 | 7. Fingerprint reader   |
| 4. USB 3.0 (Charging) port  |                         |

### Overview

#### At A Glance

- Windows 10 editions, or FreeDOS
- Versatile performance workstation category and thin & light detachable industrial design
- Weights starting at 4.78 lb (2.17kg) (laptop mode) and 3.64 lb (1.65 kg) (Tablet mode)
- Height starting at 20.3 mm (Laptop mode) and 14.6 mm (Tablet mode)
- Designed to pass military MIL-STD-810G testing\*.
- Discrete Graphics: Workstation-caliber NVIDIA® Quadro® discrete graphics, NVIDIA® Quadro® M620 (with 2GB dedicated GDDR5 graphics memory); NVIDIA® Optimus®.
- Integrated Graphics:
  - Intel® Integrated graphics: Intel® UHD 620 graphics integrated on 8<sup>th</sup> gen Core™ i5 and i7 (available as a standalone option on Core i5)
  - Intel® Integrated graphics: Intel® HD 620 graphics integrated on 7<sup>th</sup> gen Core™ i7
- ISV certified to provide fast and reliable performance with workstation applications, including manipulation of 3D textures
- Choice of 8<sup>th</sup> generation Intel® Core™ i7 and i5 processors and 7<sup>th</sup> generation Intel® Core™ i7<sup>1</sup>
- Intel® Core™ i7 with vPro™ technology (optional)
- Memory: Up to two SODIMM channels, for system memory up to 32GB DDR4
- Displays supported: 14.0-inch diagonal 4K UHD UWVA display w/ multi-touch & anti-glare treatment; 14.0-inch diagonal 4K UHD HP DreamColor UWVA display w/ multi-touch and anti-glare treatment (10 bit supporting up to 1 billion colors)
- Supports multi-display, including up to three displays without the use of a docking solution, with hybrid graphics enabled. Supports up to five with HP ZBook Dock with Thunderbolt™ 3 (sold separately), with hybrid graphics enabled. Supports up to four with HP ZBook Dock with Thunderbolt™ 3 (sold separately), with HP DreamColor configurations.
- Bang and Olufsen audio optimized for high fidelity audio experience
- Full size premium backlight Bluetooth Keyboard with large clickpad with gestures support; 1.5mm of keyboard travel and 18.7mm pitch; integrated smart card reader
- Stay productive with 2 x Thunderbolt™ 3 ports at max supported bandwidth (PCIe Gen 3x4) One dedicated drive slots. (1) M.2 slot; Up to 2TB HP Z Turbo Drive G2<sup>2</sup>
- Professional high performance pen experience<sup>3</sup> with ergonomic pen design enabling precise creative control through low starting pressure, low latency, tilt support, 4,096 pressure sensitive levels and seamlessly works requiring no power source – (no battery or Bluetooth® pairing required). Creative professional design includes customizable button, dedicated pressure sensitive eraser and starter set of both POM & Felt Nibs for maximum expressiveness on anti-glare texturized screen surface. The creative experience is enhanced further by strategically located HP Quick Key buttons on both sides of the ZBook x2's industrial design for easy access to application specific functions that are user customizable to maximize overall workflow for a wide variety of professional applications including Adobe Photoshop, Lightroom, and Illustrator HP Create Control panel software enables full control & customization of all HP Quick Keys and Pen settings for both professional applications and Windows 10.
- Preinstalled with Adobe Creative Cloud Desktop Application for easy access to commonly used Adobe CC applications. Adobe Creative Cloud Suite (sold separately)
- Security features including an IR camera for face authentication with Windows Hello, TPM 2.0, HP SureStart Gen3, and hardware security options like Smart Card Reader integrated into the keyboard, Fingerprint Reader, Optional vPro™, Security lock slot
- 4-cell (70 WHr) HP Long Life Battery with HP Fast Charge Technology
- Wireless connectivity options:
  - Intel® Dual band wireless-AC 8265 802.11AC 2x2 WiFi + BT 4.2 Combo Adapter (vPro™)
- HP Performance Advisor for optimal configuration, compatibility and performance
- HP BIOS self-healing technology including HP Sure Start Gen 3 to prevent, detect, and remedy known and unknown BIOS attacks.
- Low halogen, ENERGY STAR® certified and EPEAT® TBD registered in the U.S. EPEAT® status varies by country- please see [epeat.net](http://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)

### Overview

\* MIL STD 810G testing is pending and 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. Damage under the MIL STD test conditions or any accidental damage requires an optional HP Accidental Damage Protection Care Pack.

**NOTE 1:** Intel® Core™ 8<sup>th</sup> gen is planned to be available in early 2018

**NOTE 2:** 2TB HP Z Turbo Drive G2 is planned to be available in early 2018

**NOTE 3:** HP Zbook x2 Pen sold separately, it is available as an After Market Option TBD

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

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### Features

#### OPERATING SYSTEM

**Preinstalled OS**      Windows® 10 Pro 64<sup>1</sup>  
Windows® 10 Home 64<sup>1</sup>  
Windows 10 Home Single Language 64<sup>1</sup>  
FreeDOS 2.0

**Supported OS**      Windows® 10 Enterprise 64\*

\* 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>

**NOTE: Your product does not support Windows 8 or Windows 7**

In accordance with Microsoft's support policy, HP does not support the Windows® 8 or Windows 7 operating system on products configured with Intel® and AMD 7th generation and forward processors or provide any Windows® 8 or Windows 7 drivers on <http://www.support.hp.com>

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#### PROCESSOR\*, \*\*

Intel® Core™ i7-8650U with Intel® UHD Graphics 620 (1.9 GHz base frequency, up to 4.2 GHz with Intel® Turbo Boost Technology 8 MB, 4 cores)

Intel® Core™ i7-8550U with Intel® UHD Graphics 620 (1.8 GHz base frequency, up to 4.0 GHz with Intel® Turbo Boost Technology, 8 MB cache, 4 cores)

Intel® Core™ i5-8250U with Intel® UHD Graphics 620 (1.6 GHz base frequency, up to 3.4 GHz with Intel® Turbo Boost Technology, 6 MB cache, 4 cores)

Intel® Core™ i7-7600U with Intel® HD Graphics 620 (2.8 GHz base frequency, up to 3.9 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)

Intel® Core™ i7-7500U with Intel® HD Graphics 620 (2.7 GHz base frequency, up to 3.5 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)

\*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.

\*\*HP ZBook x2 G4 detachable pc is planned to be available for shipment with the above Intel® 7th generation processors in December 2017 and Intel 8th Gen processors in early 2018.

Also note that the Intel® Turbo Boost is based on max GHz for a single core.

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### Features

#### CHIPSET

Non-applicable, processor specific

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#### INTEL® CORE™ I5/CORE I7 WITH vPro™ TECHNOLOGY CAPABLE

7<sup>th</sup> generation Intel® Core™ i5 with vPro™ and Core™ i7 with vPro™ technology is a selectable feature that is available on units configured with select processors, a qualified Intel® Centrino® 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 mobile workstations regardless of their power state.

\* 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.

**NOTE:** Some functionality of 7<sup>th</sup> generation Intel® Core™ i5 with vPro™/Core™ i7 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™ technology is dependent on third- party software providers. Compatibility with future "virtual appliances" is yet to be determined.

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#### GRAPHICS

Intel® HD 620 Graphics\*

NVIDIA® Quadro® M620 with 2GB dedicated GDDR5 graphics memory<sup>1,2</sup>

Microsoft DirectX® 12 (Shader Model 5.0) and OpenGL® 4.4 capable

\* HD content required to view HD images

**NOTE 1:** NVIDIA® Optimus® Technology supported

**NOTE 2:** Supports up to 5 independent displays, These five displays are internal panel plus four external displays connected to the ZBook dock's Thunderbolt™ 3, VGA, and two DisplayPort™ 1.2 MST capability).

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#### DisplayPort™ 1.2 protocol features supported on Thunderbolt™ 3 ports:

- Legacy displays (HDMI, DVI, VGA) may be attached to Thunderbolt™ port with the use of a certified dongle.
- DisplayPort™ monitors capable of supporting DisplayPort™ 1.2 may be directly attached to the Thunderbolt™ port to achieve HBR2 with the use a dongle.
- Thunderbolt™ 3 enabled monitors may be directly attached to the Thunderbolt port to achieve HBR2 and MST.
- DisplayPort™ 1.2 MST feature ("daisy-chain" feature) is supported through Thunderbolt™ 3 port on Thunderbolt™ 3 enabled devices or DisplayPort™ 1.2 monitors (requires monitor with DisplayPort™ 1.2 MST capability) with the use of a dongle.
- Up to 2 streams (eight lanes) of DisplayPort™ 1.2 are supported over a single Thunderbolt™ 3 port. Up to (2) 4K displays 24/30-bit color depth at 60 Hz or (1) 5K display supported over a single Thunderbolt™ 3 port. (Requires Intel® certified Thunderbolt™ cable).



### Features

- DisplayPort™ 1.2 w/MST (Multi-stream Transport): Supports resolutions up to Full 4K, 24/30-bit color depth at 60 Hz, and WUXGA (1920 x1200) monitors, 24/30-bit color depth at 120 Hz.

\* Thunderbolt™ 3 is superset port supporting DisplayPort™ 1.2, USB 3.1 Gen 2, and PCIe Gen 3 devices over the new USB-C™ connector. Install all the latest drivers for your Thunderbolt™ device before connecting the device to the Thunderbolt™ port. Thunderbolt™ cable and Thunderbolt™ device (sold separately) must be compatible with Windows. To determine whether your device is Thunderbolt™ Certified for Windows, see <https://Thunderbolttechnology.net/products>.

### Multi-display Support

#### Without ZBook Dock with Thunderbolt™ 3:

HP ZBook x2 with hybrid graphics and without the use of the ZBook dock supports up to a maximum of three independent displays. These three displays are the internal panel plus two external displays connected to two of the three following ports: HDMI 1.4, Thunderbolt™ 3, Thunderbolt™ 3.

HP ZBook x2 with HP DreamColor configurations (discrete graphics only mode enabled) and without the use of the ZBook dock supports up to a maximum of three independent displays. These three displays are the internal panel plus two external displays connected to two of the three following ports: HDMI 1.4, Thunderbolt™ 3, Thunderbolt™ 3.

HP ZBook x2 configuration with Intel® integrated graphics and without the use of the ZBook dock supports up to a maximum of three independent displays. These three displays are the internal panel plus two external displays connected to two of the three following ports: HDMI, Thunderbolt™ 3, Thunderbolt™ 3.

#### With ZBook Dock with Thunderbolt™ 3:

The ZBook Dock with Thunderbolt™ 3 has a Thunderbolt™ 3 port, VGA port, and two DisplayPort™ 1.2 ports.

When used together with the HP ZBook x2 configuration with hybrid graphics, a maximum of 5 independent displays are supported. These five displays are internal panel plus four external displays connected to the ZBook dock's Thunderbolt™ 3, VGA, and two DisplayPort™ ports.

When used together with the HP ZBook x2 with HP DreamColor configurations (discrete graphics only mode enabled), a maximum of 4 independent displays are supported.

When used together with the HP ZBook x2 configuration with Intel® integrated graphics, a maximum of 3 independent displays are supported.

#### Without ZBook Dock with Thunderbolt™ 3 (using DP 1.2 MST)

Multi-stream Transport (MST) is a DP 1.2 feature that allows daisy chaining of DP 1.2 monitors (requires built in support of DP 1.2 MST in monitor), or the use of DP 1.2 hubs with MST to achieve 5 active displays without a docking station on configurations with hybrid graphics enabled.

\* HP ZBook Dock with Thunderbolt™ 3 sold separately.

### Features

#### DISPLAY

##### Touch

14.0-inch diagonal LED-backlit UHD Anti-glare UWVA Touch (3840 x 2160) – 10 bit (8+2 FRC) – Support for 1 billion colors  
14.0-inch diagonal LED-backlit UHD DreamColor Anti-glare UWVA Touch (3840 x 2160) – 10 bit (8+2 FRC) – Support for 1 billion colors

##### External

Up to 32-bit per pixel color depth

##### HDMI

HDMI 1.4

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

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#### STORAGE AND DRIVES

##### Primary Storage Bay

##### M.2 PCIe (NVMe) SSD TLC

256GB PCIe TLC Solid State Drive  
512GB PCIe TLC Opal 2 Solid State Drive  
1TB PCIe TLC Solid State Drive  
2TB PCIe TLC Solid State Drive

##### M.2 PCIe (NVMe) SSD MLC

256GB HP Z Turbo Drive MLC Solid State Drive  
512GB HP Z Turbo Drive MLC Solid State Drive

##### M.2 SATA SSD

512GB SATA-3 SS TLC SSD FIPS-140-2  
128 GB SATA SATA SSD

**NOTE:** For Solid State Drives or Hard 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.

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### Features

#### DRIVE CONTROLLERS

M.2 Storage Bay (SATA):	SATA-3 for SSD
HP Z Turbo Drive:	PCIe NVMe SSD
RAID:	Not supported

**NOTE:** Raid 0, 1 supported only on SATA drives.

#### MEMORY

##### Standard

32 GB DDR4 1.2V Non ECC SDRAM (Transfer rates up to 2133MT/s)  
Two SODIMM slots supporting dual-channel memory  
4 GB, 8GB and 16 GB SODIMMs

##### Maximum

Upgradeable to 32768 MB with optional 16384 MB SODIMMs in 2 slots

##### Dual-channel

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

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

**NOTE:** Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

#### NETWORKING/COMMUNICATIONS

##### Wireless

Secure, integrated wireless LAN options featuring support for the latest industry standards. Integrated Bluetooth® is also available (factory configurable only) and is combined with the supported wireless LAN feature.

##### 802.11 Wireless LAN\*

Intel® Dual Band Wireless-AC 8265 802.11 a/b/g/n/ac (2x2) WiFi + Bluetooth® 4.2 Combo Adaptor\* (vPro)

##### NFC Support

Assembly on Detachable keyboard  
Near Field Communications (NFC)  
Integrated NXP NFC Controller NPC100

\* Wireless cards are optional or add-on features and requires separately purchased wireless access point and internet service. Availability of public wireless access points limited. The specifications for the 802.11 ac 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 802.11ac WLAN devices.

#### AUDIO/MULTIMEDIA

### Features

#### Audio

Audio by Bang & Olufsen

Integrated stereo speakers (2)

Integrated dual-microphone array; located in the display

Two discrete buttons for volume up and down

Combo mic-in / stereo headphone-out jack

Intel® Smart Sound Technology (Windows 10)

#### Front Camera

720 HD webcam with IR (Near infrared imaging)

- Microsoft Hello Certification: Microsoft face authentication in Windows 10 is an enterprise-grade identity verification mechanism
- Microsoft Skype for Business<sup>1</sup> Certified
- HD format (widescreen 16:9)
- Supports videoconferencing and still image capture
- High quality fixed focus lens
- Video capture at various resolutions up to 1280x720 resolution (720p) and up to 30fps
- M-JPEG compression supports higher frame rates for video capture and videoconferencing
- Improved low light sensitivity
- Improved dynamic range

#### World Facing Camera

World Facing Camera (8MP USB3.0)

- Supports videoconferencing and still image capture
- High quality auto-focus lens
- Still capture at various resolutions up to 8MP (4:3)
- Video capture at various resolutions up to 1920x1080 (1080p) and up to 30fps
- M-JPEG compression supports higher frame rates for video capture and videoconferencing
- Improved low light sensitivity
- Improved dynamic range

\* HD content required to view HD images.

\* 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.

1. Skype is not offered in China.

### Features

#### KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

##### Full size Bluetooth Keyboard

The ZBook x2 Bluetooth® keyboard delivers a best in class typing experience using a stiffened anodized aluminum deck and keys uniquely designed for ideal contouring, separation, and size. Class leading 1.5 mm of keyboard travel. The addition of patterned polyurethane material nicely contrasts the smooth aluminum for a feel of comfort and a tailored appeal. This helps reduce the risk of damage to sensitive components underneath.

Backlit keyboard supports backlit brightness settings - off/full/half brightness

The 85-key compatible keyboard features a full-pitch key layout with desktop keyboard features, such as editing keys, both left and right control and alt keys, function keys, and 18.7 x 18.4 mm key pitch (center-to-center spacing).

U.S. and International key layouts are available. For North America, a US/Euro Spanish Keyboard option now available. Other features include hot keys for instant access to power conservation and brightness.

##### Pointing Devices

Extra large clickpad with On/Off button, two-way scroll, gestures, two integrated buttons within chemically etched clickpad surface

Image sensor clickpad for enhanced performance and improved precision on scroll and gesture.

##### Buttons and Function Keys

Power button

Volume control buttons

HP Quick Keys located on left and right side of the device

Function keys provide control of the following features: standby mode, external display, volume down, volume up, and display brightness.

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#### SOFTWARE AND SECURITY

##### Preinstalled Software with Windows® Operating System

##### BIOS

HP BIOSphere Gen3<sup>1</sup>

HP Sure Start Gen3<sup>2</sup>

HP DriveLock | HP Automatic DriveLock

BIOS Update via Network

Master Boot Record Security

Power On Authentication

Secure Erase<sup>3</sup>

Absolute Persistence Module<sup>4</sup>

Pre-boot Authentication

##### Communication / Connectivity

HP Mobile Connect Pro<sup>5</sup>

Native Miracast Support<sup>6</sup>

HP LAN-WLAN Protection

HP MAC Address Manager (select models only)

### Features

HP Wireless Wakeup (select models only)

HP SureConnect

### Adobe Productivity Software

Adobe Creative Cloud Desktop Manager Application

Adobe Creative Cloud Suite

### HP Value Add Software

HP ePrint Driver + JetAdvantage<sup>7</sup>

HP Hotkey Support

HP Recovery Manager

HP Jumpstart

HP Support Assistant<sup>12</sup>

HP Noise Cancellation Software

HP Performance Advisor

HP Remote Graphics Software

HP Velocity

### Microsoft Products

Buy Office

Bing Search

Skype<sup>8</sup>

### Manageability

HP Driver Packs<sup>9</sup>

HP SoftPaq Download Manager (SDM)

HP System Software Manager (SSM)<sup>9</sup>

HP BIOS Config Utility (BCU)<sup>9</sup>

HP Client Catalog<sup>9</sup>

HP Manageability Integration Kit for Microsoft SCCM<sup>10</sup>

HP Image Assistant

LANDESK Management<sup>11</sup>

For more information on HP Client Management Solutions refer to: <http://www.hp.com/go/clientmanagement>.

### Client Security Software

HP Client Security Suite Gen3<sup>13</sup>

HP Security Manager (including Credential Manager and Password Manager)

HP Fingerprint Sensor

Power On Authentication

Device Access Manager

Microsoft Defender<sup>14</sup>

HP WorkWise<sup>15</sup>

### Standard

For Windows 10, Trusted Platform Module (TPM) 2.0 (Infineon SLB9670). Common Criteria EAL4+ Certified.

### Features

#### HP Fingerprint Reader

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

1. Requires Intel® 7th generation processors
2. Available on HP Elite products equipped with Intel® 7th generation processors.
3. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88.
4. 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.
5. HP Mobile Connect Pro is only available on preconfigured devices with WWAN. For geographic availability refer to <http://www.hp.com/go/mobileconnect>
6. 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>
7. Requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see <http://www.hp.com/go/eprintcenter>). Requires optional broadband module. Broadband use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Separately purchased data plans or usage fees may apply. Print times and connection speeds may vary.
8. Skype is not offered in China.
9. Not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>
10. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>
11. Subscription required.
12. Requires Windows and Internet Access
13. Requires Windows and Intel® 7th generation processors.
14. Opt in and internet connection required for updates
15. HP WorkWise smartphone app is available as a free download on the App Store and Google Play. As of September 2017, HP WorkWise will no longer support iOS or iPhone® devices.

#### Workstation ISV Certifications

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

#### 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>

#### Security

See Software section above.

#### Other Standard Security Features

Smart Card Reader integrated into keyboard

One-Step Logon

Security lock slot

Support for Intel® AT

#### Optional Security Features

### Features

HP Fingerprint Sensor (optional)

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### HP CENTRAL MANAGEMENT

HP offers a variety of scalable hardware, software, and BIOS-based security features to help you defend your organization against viruses and other threats. These integrated security features safeguard what matters to you the most - your data, device and identity. Now, be confident your fleet of devices is protected in multiple layers of HP Client Security protection.

HP BIOS Protection keeps you up and running with enhanced protection against virus attacks and other threats. And if the BIOS is accidentally compromised, the auto recovery feature automatically restores it to its fully functional state.

HP Sure Start detects and negates a BIOS attack with automatic recovery of the BIOS even when the installation is accidentally compromised (i.e. power outage). When HP Sure Start heals the BIOS an event log is generated that an IT administrator can retrieve so the business is aware of a BIOS attack. Golden copy of BIOS is stored in protected nonvolatile memory providing redundant, hardware-based protection against a new generation of attacks. This helps to future-proof your technology and business.

An optional fingerprint reader to help keep your identity secure. The security cable slot helps keep your notebook physically secure.

You can even permanently destroy data on your hard drive in preparation for your system disposal or redeployment with Secure Erase.

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### Features

#### POWER

##### Power Supply

HP 65W Smart AC Adapter (Configurations with Intel® HD graphics only; Does not support HP Fast Charge)

HP 65W EM Smart AC Adapter

HP 90W Smart AC Adapter (Supports HP Fast Charge)

##### Primary Battery

HP 4-cell Long Life Polymer Battery (70 WHr)

##### Battery Life

Battery life up to 10 hours \* (Hybrid Graphics configurations and Intel® HD graphics configurations)

##### System Standby Time

Up to **TBD** weeks\*\*

\* Windows 10 MM14 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See <http://www.bapco.com> for additional details.

\*\* Standby life will vary depending on various factors including battery, Memory, CPU, EC and LAN chip. The maximum capacity of the battery will naturally decrease with time and usage.

##### Power Conservation

NVIDIA® Optimus®

Hibernation

Standby

ACPI compliance

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#### ENVIRONMENTAL

US ENERGY STAR®

IT ECO declaration

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

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

**NOTE:** 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.

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### Features

#### WEIGHTS & DIMENSIONS

##### Weight

Starting at 4.78 lbs (2.17 kg) (laptop mode) and 3.64 lbs (1.65 kg) (Tablet mode)

##### Dimensions (w x d x h)

20.3 x 364.5 x 227 mm (h x w x d) – Mobile workstation laptop mode

0.80 x 14.35 x 8.94 in (h x w x d) – Mobile workstation laptop mode

14.6 x 364.5 x 227 mm (h x w x d) – detachable workstation tablet mode

0.57 x 14.35 x 8.94 in (h x w x d) – detachable workstation tablet mode

**NOTE:** Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components. Weight includes 4 cell 70Whr battery, without hard drive and with 256 GB Z Turbo Drive (PCIe SSD).

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#### PORTS/SLOTS

##### Ports

##### Left side:

- (1) Stereo microphone in / headphone-out combo jack
- (1) Security lock slot

##### Right side:

- (1) Power Connector
- (2) Thunderbolt™ 3 (supporting DP 1.2, USB 3.1 Gen2, PCIe Gen 3 devices)
- (1) HDMI 1.4
- (1) USB 3.0 (Charging)

##### Thunderbolt™ 3

Thunderbolt™ 3 ports supports DisplayPort™ 1.2, USB 3.1 Gen 2, and PCIe Gen 3 devices over the new USB-C port connector. The port is compatible with existing DisplayPort™ displays, devices, and cables. Install all the latest drivers for your Thunderbolt™ device before connecting the device to the Thunderbolt™ port. Thunderbolt™ cable and Thunderbolt™ device (sold separately) must be compatible with Windows®. To determine whether your device is Thunderbolt™ Certified for Windows®, see <https://Thunderbolttechnology.net/products>.

##### Digital Media Slots

- (1) Integrated SD flash media slot (RT5237S)- supports SD, SDHC, SDX
-

### Features

#### **SERVICE AND SUPPORT**

Limited 3-year, 1-year or 90-day limited warranty options available, depending on country. Long Life batteries which will have same 1-year or 3-year limited warranty as the platform. 24/7 operation will not void the HP warranty. Optional<sup>1</sup> HP Care Pack Services<sup>2</sup> are extended service contracts which go beyond your standard limited warranties.

1. Sold separately or as an optional feature.
  2. HP Care Packs are sold separately. Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. Consult the HP Customer Support Center for details. For details, visit [www.hp.com/go/cpc](http://www.hp.com/go/cpc). HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.
-

### Technical Specifications – Displays

#### SYSTEM UNIT

<b>Stand-Alone Power Requirements</b> (AC Power)	<b>Nominal Operating Voltage</b>	19.5 V dc @ 3.3 A		
	<b>Average Operating Power</b>		<b>Windows® 10 (32-bit)</b>	<b>Windows® 10 (64-bit)</b>
		NVIDIA® Quadro® Graphics	16.28 W	16.8 W
	<b>Max Operating Power</b>	< 65 W		
<b>Temperature</b>	<b>Operating</b>	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)		
	<b>Non-operating</b>	-4° to 140° F (-20° to 60° C)		
<b>Relative Humidity</b>	<b>Operating</b>	10% to 90%, non-condensing		
	<b>Non-operating</b>	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature		
<b>Shock</b>	<b>Operating</b>	40 G, 2 ms, half-sine		
	<b>Non-operating</b>	200 G, 2 ms, half-sine		
<b>Random Vibration</b>	<b>Operating</b>	0.75 grms		
	<b>Non-operating</b>	1.50 grms		
<b>Altitude</b> (unpressurized)	<b>Operating</b>	-50 to 10,000 ft. (-15.24 to 3,048 m)		
	<b>Non-operating</b>	-50 to 15,000 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>	Select models*		
	<b>EPEAT®</b>	Gold**		
	<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***</b>	Planned		

\* Configurations of the HP ZBook x2 G4 that are ENERGY STAR® certified are identified as HP ZBook x2 G4 ENERGY STAR® on HP websites and on <http://www.energystar.gov>.

\*\* EPEAT registration varies by country. See <http://www.epeat.net> for registration status by country. EPEAT status listed above applies to U.S. Search keyword generator on HP's 3rd party option store for solar generator accessories at <http://www.hp.com/go/options>

\*\*\* MIL STD 810G testing is pending and 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. Damage under the MIL STD test conditions or any accidental damage requires an optional HP Accidental Damage Protection Care Pack.

For accessibility information on HP products, please visit: <http://www.hp.com/accessibility>.

### Technical Specifications – Displays

#### DISPLAYS\*

<b>14.0-inch 4K UHD UWVA IPS LED w/ multi-touch and anti-glare (3840 x 2160)</b>	<b>Active Area (W x H)</b>	13.54 x 7.59 in (34.4 x 19.4 cm)		
	<b>Dimensions (W x H)</b>	15.6 in (39.6 cm)		
	<b>Weight</b>	380 g (max)		
	<b>Surface Treatment</b>	Anti-glare		
	<b>Contrast Ratio</b>	400:1 (typical)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	270 nit typical		
	<b>Pixel Resolution</b>	<b>Format</b>	1920 x 1080 (FHD)	
		<b>Configuration</b>	RGB Stripe	
	<b>Backlight</b>	LED		
	<b>PPI</b>	141		
<b>Viewing Angle</b>	85/85/85/85 (Left/Right/Down/Up) (typical)			

<b>14.0-inch 4K UHD HP DreamColor UWVA IPS LED w/ multi-touch and anti-glare (3840 x 2160)</b>	<b>Dimensions (W x H)</b>	13.62 x 7.59 in (34.6 x 19.4 cm)		
	<b>Diagonal Size</b>	15.6 in (39.6 cm)		
	<b>Weight</b>	345 g (max)		
	<b>Surface Treatment</b>	Anti-glare		
	<b>Contrast Ratio</b>	1000:1 (typ)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	270 nit typical		
	<b>Pixel Resolution</b>	<b>Format</b>	3840x2160	
		<b>Configuration</b>	RGB Stripe	
	<b>Backlight</b>	LED		
	<b>PPI</b>	282		
<b>Viewing Angle</b>	85/85/85/85 (Left/Right/Down/Up) (typical)			

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

### Technical Specifications – Storage and Drives

#### STORAGE AND DRIVES

##### Internal Storage

**128 GB M2 2280 SATA-3  
TLC Solid State Drive**

<b>Drive Weight</b>	0.019 lb (8.5 g)-0.022 lb (10 g)	
<b>Capacity</b>	128 GB	
<b>Height</b>	0.09 in (2.23 mm)- 0.14 in (3.58 mm)	
<b>Width</b>	0.87 in (22 mm)	
<b>Interface</b>	ATA-8, SATA 3.0	
<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>
	Up to 540 MB/s	Up to 300 MB/s
<b>Logical Blocks</b>	250,069,680	
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]	
<b>Features</b>	ATA Security, DIPM; TRIM; DEVSLP	

### System Technical Specifications

<b>HP Z Turbo Drive 512 GB, M.2 NVMe MLC Solid State Drive</b>	<b>Drive Weight</b>	0.022 lb. (10 g)		
	<b>Capacity</b>	512 GB		
	<b>Height</b>	0.14 in (3.7 mm)		
	<b>Width</b>	0.87 in (22 mm)		
	<b>Generation</b>	NVMe		
	<b>NAND Type</b>	MLC		
	<b>Form-Factor (I/O)</b>	M.2 2280		
	<b>Interface</b>	PCIe GEN3X4		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		Up to 2260MB/s	Up to 1600MB/s	
	<b>Logical Blocks</b>	1,000,215,216		
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]			
<b>Features</b>	ATA Security; TRIM; L1.2			

<b>HP Z Turbo Drive 256 GB, M.2 NVMe MLC Solid State Drive</b>	<b>Drive Weight</b>	0.022 lb. (<10 g)		
	<b>Capacity</b>	256 GB		
	<b>Height</b>	0.09 in (2.3 mm)		
	<b>Width</b>	0.87 in (22.1 mm)		
	<b>Generation</b>	NVMe		
	<b>NAND Type</b>	MLC		
	<b>Form-Factor (I/O)</b>	M.2 2280		
	<b>Interface</b>	PCIe GEN3X4		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		Up to 2260MB/s	Up to 1260 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>HP Z Turbo Drive 256 GB, M.2 NVMe TLC Solid State Drive</b>	<b>Drive Weight</b>	0.022 lb (<10 g)		
	<b>Capacity</b>	256 GB		
	<b>Height</b>	0.09 in (2.3 mm)		
	<b>Width</b>	0.87 in (22 mm)		
	<b>Generation</b>	NVMe		
	<b>NAND Type</b>	TLC		
	<b>Form-Factor (I/O)</b>	M.2 2280		
	<b>Interface</b>	PCIe GEN3X4		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		Up to 2600MB/s	Up to 900 MB/s	
	<b>Logical Blocks</b>	500,118,192		
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]			

### System Technical Specifications

	<b>Features</b>	ATA Security, TRIM; L1.2		
<b>HP Z Turbo Drive 512 GB, M.2 NVMe TLC Opal 2 Solid State Drive</b>	<b>Drive Weight</b>	0.022 lb (<10 g)		
	<b>Capacity</b>	512 GB		
	<b>Height</b>	0.09 in (2.3 mm)		
	<b>Width</b>	0.87 in (22 mm)		
	<b>Generation</b>	NVMe		
	<b>NAND Type</b>	TLC		
	<b>Form-Factor (I/O)</b>	M.2 2280		
	<b>Interface</b>	PCIe GEN3X4		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		Up to 1800MB/s	Up to 980 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>HP Z Turbo Drive 1TB, M.2 NVMe TLC Solid State Drive</b>	<b>Drive Weight</b>	0.022 lb (<10 g)		
	<b>Capacity</b>	1TB		
	<b>Height</b>	0.14 in (3.7 mm)		
	<b>Width</b>	0.87 in (22 mm)		
	<b>Generation</b>	NVMe		
	<b>NAND Type</b>	TLC		
	<b>Form-Factor (I/O)</b>	M.2 2280		
	<b>Interface</b>	PCIe GEN3X4		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		Up to 2400MB/s	Up to 1500MB/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, L1.2		
<b>512 GB, M.2 SATA FIPS-140-2 Solid State Drive</b>	<b>Drive Weight</b>	0.022 lb (<10 g)		
	<b>Capacity</b>	512 GB		
	<b>Height</b>	0.09 in (2.3 mm)		
	<b>Width</b>	0.87 in (22 mm)		
	<b>Generation</b>	SM951 NVMe		
	<b>NAND Type</b>	MLC		
	<b>Form-Factor (I/O)</b>	M.2 2280		
	<b>Interface</b>	PCIe GEN3X4		
	<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
		Up to 2260MB/s	Up to 1260 MB/s	
	<b>Logical Blocks</b>	500,118,192		



### System Technical Specifications

<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	ATA Security, TRIM; L1.2

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

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### Technical Specifications – Networking

#### NETWORKING

<p><b>Intel® Dual Band Wireless-AC 8265 802.11 AC/a/b/g/n (2x2) WiFi + Bluetooth® 4.2 Combo Adaptor* (vPro)</b></p>	<p><b>Wireless LAN Standards</b></p>	<p>IEEE 802.11a          IEEE 802.11b          IEEE 802.11g          IEEE 802.11n          IEEE 802.11n</p>
	<p><b>Interoperability</b></p>	<p>Wi-Fi certified</p>
	<p><b>Frequency Band</b></p>	<p>802.11b/g/n      2.402 - 2.482 GHz  <span style="color: blue;"><b>Note:</b> The FCC has declared as of January 1, 2015 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels</span></p> <p>802.11a      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  <span style="color: blue;"><b>Note:</b> Indonesia only supports 5.725 - 5.825 GHz (CH149 - CH161)</span></p>
	<p><b>Data Rates</b></p>	<ul style="list-style-type: none"> <li>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11b: 1, 2, 5.5, 11 Mbps</li> <li>• 802.11g: 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, and 80MHz)</li> </ul>
	<p><b>Modulation</b></p>	<p>Direct Sequence Spread Spectrum          CCK, BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM</p>
	<p><b>Security<sup>1</sup></b></p>	<ul style="list-style-type: none"> <li>• IEEE and Wi-Fi 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>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>• WAPI</li> </ul>
	<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 band Access Points</p>
	<p><b>Output Power<sup>2</sup></b></p>	<ul style="list-style-type: none"> <li>• 802.11b : +16dBm minimum</li> <li>• 802.11g : +14dBm minimum</li> <li>• 802.11a : +14dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +13dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +13dBm minimum</li> <li>• 802.11n HT20(5GHz) : +12dBm minimum</li> <li>• 802.11n HT40(5GHz) : +12dBm minimum</li> </ul>

### Technical Specifications – Networking

<b>Power Consumption</b>	<p>Transmit: 2.0 Watts (max)          Receive: 1.6 Watts (max)          Idle mode (PSP): 180 mW (WLAN Associated)          Idle mode: 50 mW (WLAN unassociated)          Connect Standby: 10mW (WLAN + BT)          Radio disabled: 5 mW</p>				
<b>Power Management</b>	<p>ACPI and PCI Express compliant power management          802.11 compliant power saving mode</p>				
<b>Receiver Sensitivity<sup>3</sup></b>	<p>802.11b, 1Mbps : -94dBm maximum          802.11b, 11Mbps : -86dBm maximum          802.11g, 6Mbps : -88dBm maximum          802.11g, 54Mbps : -74dBm maximum          802.11a, 6Mbps : -88dBm maximum          802.11a, 54Mbps : -74dBm maximum          802.11n, MCS07 : -69dBm maximum          802.11n, MCS15 : -66dBm maximum          802.11ac, 1SS, MCS-0 : -86dBm maximum          802.11ac, 1SS, MCS-9 : -61dBm maximum          802.11ac, 2SS, MCS-0 : -83dBm maximum          802.11ac, 2SS, MCS-9 : -58dBm maximum</p>				
<b>Antenna Type</b>	<p>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 and Bluetooth communications</p>				
<b>Form Factor</b>	<p>PCI-Express M.2 MiniCard</p>				
<b>Dimensions</b>	<p>Type 2230 : 2.3 x 22.0 x 30.0 mm          Or          Type 1630 : 2.3 x 16.0 x 30.0 mm</p>				
<b>Weight</b>	<p>Type 2230 : 2.8g          Or          Type 1630 : 2g</p>				
<b>Operating Voltage</b>	<p>3.3v +/- 9%</p>				
<b>Temperature</b>	<table border="0"> <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> </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"> <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> </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"> <tr> <td>Operating</td> <td>0 to 10,000 ft (3,048 m)</td> </tr> <tr> <td>Non-operating</td> <td>0 to 50,000 ft (15,240 m)</td> </tr> </table>	Operating	0 to 10,000 ft (3,048 m)	Non-operating	0 to 50,000 ft (15,240 m)
Operating	0 to 10,000 ft (3,048 m)				
Non-operating	0 to 50,000 ft (15,240 m)				
<b>LED Activity</b>	<p>LED Amber – Radio OFF; LED White – Radio ON</p>				

### Technical Specifications – Networking

<b>HP Integrated Module with Bluetooth® 4.0/4.1/4.2 Wireless Technology</b>	<b>Bluetooth® Specification</b>	4.0/4.1/4.2 Compliant												
	<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 +4 dBm for BR and EDR												
	<b>Receiver Sensitivity</b>	<table border="1"> <thead> <tr> <th>Modulation</th> <th>0.01% BER</th> <th>0.001% BER</th> </tr> </thead> <tbody> <tr> <td>GFSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td>π/4-DQPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td>8DPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> </tbody> </table>	Modulation	0.01% BER	0.001% BER	GFSK	-80 dBm	-70 dBm	π/4-DQPSK	-80 dBm	-70 dBm	8DPSK	-80 dBm	-70 dBm
	Modulation	0.01% BER	0.001% BER											
	GFSK	-80 dBm	-70 dBm											
	π/4-DQPSK	-80 dBm	-70 dBm											
	8DPSK	-80 dBm	-70 dBm											
<b>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW													
<b>Antenna</b>	Internally integrated within module													
<b>Range</b>	Legacy Up to 33 ft (10 m) BLE Up to 99 ft (30 m)													
<b>Electrical Interface</b>	USB 2.0 compliant													
<b>Bluetooth® Software Supported</b>	Microsoft Windows Bluetooth Software													
<b>Link Topology</b>	Point to Point, Multipoint Pico Nets up to 7 slaves													
<b>Security</b>	Full support of Bluetooth Security Provisions													
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support													
<b>Certifications</b>	Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff													
<b>Security</b>	All necessary regulatory approvals for supported countries, including: 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>Certifications</b>	Serial Port Profile (SPP)1													
<b>Bluetooth® Profiles Supported</b>	Service Discovery Application Profile (SDAP) Dial-Up Networking (DUN)1,2 Generic Object Exchange Profile (GOEP)1,2 Object Push Profile (OPP)1,2 Hard Copy Cable Replacement (HCRP)1,2 Personal Area Networking Profile (PAN)1,2 Human Interface Device Profile (HID)1,2 Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP) Audio Video Remote Control Profile (AVRCP)													

### Technical Specifications – Networking

**Bluetooth® V4.1/V4.2 support feature** V4.1: ESR5/6/7 compliant  
V4.2: ESR8 compliant, LE Secure Connection – Basic.

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.

<b>NXP NPC100 Near Field Communication (NFC) Module</b>	<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>	I <sup>2</sup> C	
	<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 Reader (PCD-VCD) Mode<sup>1</sup></b>	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2 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<sup>1</sup></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>	2.97 to 5.5 Volts	
<b>I/O Voltage</b>	1.8V or 3.3V		
<b>Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)</b>	<b>Mode</b> Polling  Detected Test Tag Type 1	<b>Power Consumption, Typical<sup>2</sup></b> 7.3 mA  Total 283.8 mA Net Module 236.8 mA	

### Technical Specifications – Networking

	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
<b>Antenna</b>	Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module.	
<b>Notes</b>	<ol style="list-style-type: none"><li>1. With application or UICC support</li><li>2. Actual Power Consumption is dependent on NFC antenna and matching circuit and on the particular polling sequence and period configured.</li></ol>	

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### Technical Specifications – Security

#### SECURITY

<b>HP Fingerprint Reader</b>	<b>Mobile Voltage Operation</b>	3.0V-3.6V Single Supply
	<b>Operating Temperature</b>	14° - 167°F (-10° - 75°C)
	<b>Current consumption image</b>	36mA
	<b>Low latency wait for finger</b>	950 uA
	<b>Capture rate</b>	3000 lines/sec
	<b>ESD Resistance</b>	IEC 6100-4-2 4B (+/-15KV)
	<b>Detection Matrix</b>	200*1 (plus another secondary line); 508 dpi, sensor area 12*3 mm

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### Technical Specifications – Audio/Multimedia

#### AUDIO/MULTIMEDIA – BANG & OLUFSEN

<b>Hardware</b>	<b>Implementation</b>	Conexant CX7700
	<b>Function Key</b>	Volume up, volume down, and mute
	<b>Volume Controls</b>	
	<b>Full Duplex</b>	Yes
	<b>Microphone In</b>	Stereo
	<b>Headphone/Line Out</b>	Stereo
	<b>Integrated Microphone</b>	Yes, dual digital microphone array when equipped with optional webcam

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<b>Audio Output Quality</b>	<b>Frequency Response</b>	20 Hz - 20 kHz
	<b>Signal to Noise Ratio</b>	106dB (DAC), 102dB (ADC)
	<b>Total Harmonic Distortion</b>	91dB THD+n on LineOut/HP (0.003%)
	<b>Noise Floor</b>	-110 dB
	<b>Play Sampling Rate(s)</b>	Up to 192kHz
	<b>Record Sampling Rate(s)</b>	Up to 96kHz
	<b>DAC</b>	16, 20 or 24-bit
	<b>ADC</b>	16,20 or 24-bit

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<b>Integrated Stereo Speakers</b>	<b>Power Rating</b>	2 Watts
	<b>Impedance</b>	4 Ohms

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### Technical Specifications – HP Pen technology

#### HP PEN TECHNOLOGY

HP ZBook x2 Pen	Key Features		
	<b>Precision</b>		The pen has a 1.6mm tip size (0.063inch), ensuring pinpoint accuracy.
	<b>Stylus Ergonomic design</b>		Ergonomic stylus design for professional users. Well balanced weight distribution and customized latex-free silicone rubber for comfortable grip.
	<b>One Control Button</b>		One customized side button for users to customize desired application specific function.
	<b>Battery free</b>		pen leverages battery-less technology
	<b>Pressure sensitivity</b>		4096 levels pressure sensitivity to make sure stylus can capture any tiny stroke difference.
	<b>Hovering capability</b>		The on-screen pen cursor can be controlled by hovering the pen above the screen's surface – no physical contact is necessary.
	<b>Report Rate</b>		200 Hz pen report rate to minimize inking latency or lag.
	<b>Tail Eraser</b>		Intuitive tail eraser design for users to eraser items with another option.
	<b>Tilt function</b>		Enable tilt stroke support capability for better usability and stylus control.
	<b>Palm rejection</b>		Users can rest the underside of their hand on the screen surface without registering any unintended inputs.
	<b>Replacement kit</b>		Different writing feel pen tips (POM & Felt pen tips) are offered for users to choose their preferable inking experience.
	<b>Physical specifications</b>	<b>Pen Technology</b>	Wacom Electro-Magnetic Resonance (EMR)
		<b>Dimension</b>	163.04mm x 11mm
		<b>Weight</b>	12.3gram
		<b>Power</b>	Battery-free
		<b>System Requirement</b>	Win10
		<b>Tip Diameter</b>	1.6mm
		<b>Pressure Sensitivity</b>	4096 pressure level
		<b>Pen Resolution</b>	2540 ppi
		<b>Hover Capability (Y/N)</b>	Yes
		<b>Hover Height (mm)</b>	10mm+
		<b>Report Rate</b>	200 Hz
		<b>Tilt Support (Y/N)</b>	Yes
		<b>Tail Eraser (Y/N)</b>	Yes
		<b>Palm Rejection (Y/N)</b>	Yes
		<b>Pen Tips</b>	10 standard, 4 POM tips and 6 Felt tips for different inking experience
	<b>Environmental conditions</b>	<b>Operating temperature</b>	5° to 40° C (41° F – 104° F)
		<b>Operating humidity</b>	30 - 80 %
		<b>Storage temperature</b>	-10 to 55°C (14° F – 131° F)
		<b>Storage humidity</b>	30 - 80 %

### Technical Specifications – Power

#### POWER

<b>HP 65W EM Smart AC Adapter</b>	<b>Dimensions</b>	127.0x51.0x30.0mm	
	<b>Weight</b>	unit: 350g +/- 10g	
	<b>Input</b>	90 to 265 VAC	
		<b>Input Efficiency</b>	88.0 % at 115 Vac and 89.0 % at 230Vac
		<b>Input frequency range</b>	47 to 63 Hz
		<b>Input AC current</b>	Max. 1.7 A at 90 Vac
	<b>Output</b>	<b>Output power</b>	65W
		<b>DC output</b>	19.5V
		<b>Hold-up time</b>	5ms at 115 Vac input
		<b>Output Over Current Protection</b>	<11.0A
	<b>AC Connector (Ac Inlet)</b>	C6 (3pin/with grounded, with Smart ID DC connector)	
	<b>AC Connector (Ac Inlet)</b>	<b>Operating temperature</b>	32F to 104F (0 to 40C)
	<b>Environmental Design</b>	<b>Non-operating (storage) temperature</b>	-4F to 185F (-20 o 85C)
		<b>Altitude</b>	0 to 16,400 ft (0 to 5000m)
	<b>Humidity</b>	20% to 95%	
	<b>Storage Humidity</b>	10% to 95%	
<b>EMI and Safety Certifications</b>	<p>*CE Mark - full compliance with LVD and EMC directives</p> <p>* 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.</p> <p>* MTBF - over 200,000 hours at 25°C ambient condition.</p>		

<b>HP 65W Smart AC Adapter</b>	<b>Dimensions</b>	107.0x47.0x30.0mm	
	<b>Weight</b>	unit: 250g +/- 10g	
	<b>Input</b>	90 to 265 VAC	
		<b>Input Efficiency</b>	88% min at 115 VAC
		<b>Input frequency range</b>	47 to 63 Hz
		<b>Input AC current</b>	2.9 A at 90 VAC, 1.45 A at 180 VAC
	<b>Output</b>	<b>Output power</b>	200W
		<b>DC output</b>	19.5V
		<b>Hold-up time</b>	5 msec at 115 VAC input
		<b>Output current limit</b>	<16A, Over voltage protection- 29V max automatic shutdown
	<b>AC Connector (Ac Inlet)</b>	C6 (3pin/with grounded, with Smart ID DC connector)	
	<b>AC Connector (Ac Inlet)</b>	<b>Operating temperature</b>	32° to 104° F (0° to 40° C)
	<b>Environmental Design</b>		

### Technical Specifications – Power

<b>EMI and Safety Certifications</b>	<b>Non-operating (storage) temperature</b>	-4° to 149° F (-20° to 65° C)	
	<b>Altitude</b>	0 to 10,000 ft (0 to 3,048 m)	
	<b>Humidity</b>	20% to 80%	
	<b>Storage Humidity</b>	10% to 90%	
		*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 200,000 hours at 25°C ambient condition.	

<b>HP 90W Smart AC Adapter</b>	<b>Dimensions</b>	107.0x47.0x30.0mm	
	<b>Weight</b>	unit: 250g +/- 10g	
	<b>Input</b>		90 to 265 VAC
		<b>Input Efficiency</b>	88% min at 115 VAC
		<b>Input frequency range</b>	47 to 63 Hz
		<b>Input AC current</b>	2.9 A at 90 VAC, 1.45 A at 180 VAC
	<b>Output</b>	<b>Output power</b>	200W
		<b>DC output</b>	19.5V
		<b>Hold-up time</b>	5 msec at 115 VAC input
		<b>Output current limit</b>	<16A, Over voltage protection- 29V max automatic shutdown
	<b>AC Connector (Ac Inlet)</b>	C6 (3pin/with grounded, with Smart ID DC connector)	
	<b>AC Connector (Ac Inlet) Environmental Design</b>	<b>Operating temperature</b>	32° to 104° F (0° to 40° C)
		<b>Non-operating (storage) temperature</b>	-4° to 149° F (-20° to 65° C)
		<b>Altitude</b>	0 to 10,000 ft (0 to 3,048 m)
<b>Humidity</b>		20% to 80%	
<b>Storage Humidity</b>		10% to 90%	
<b>EMI and Safety Certifications</b>		*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 200,000 hours at 25°C ambient condition.		

<b>HP Long Life 4-cell Polymer Battery (70 WHr)</b>	<b>Dimensions (H x W x L)</b>	0.29 x 3.35 x 10.2 in (0.74cm x 8.5cm x 25.8cm)
	<b>Weight (max)</b>	315g

### Technical Specifications – Power

<b>Cells/Type</b>	4-cell; Prismatic	
<b>Energy</b>	Voltage	15.2V
	Amp-hour capacity	4.21Ah
	Watt-hour capacity	64Wh
<b>Temperature</b>	Operating (Charging)	32° to 113° F (0° to 45° C)
	Operating (Discharging)	14° to 140° F (-10° to 60° C)
	Non-operating	-4° to 140° F (-20° to 60° C)
<b>Battery Re-Charge Time</b>	System in OFF or Standby Mode	3 hours
	System ON	3 to 5 hours
<b>Fuel Gauge LED</b>	No	
<b>Warranty*</b>	3 year	

\* 3-year platform warranty is required for a 3-year Long Life Battery warranty.

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

Type	Description	Part #
<b>Cases</b>	HP ZBook x2 Case	Y7B68AA
	HP Executive 15.6 Black Top Load	P6N18AA
	HP Business Case (up to 15.6")	H5M92AA
<b>Docking</b>	HP ZBook 150W Thunderbolt 3 Dock	P5Q58AA
	HP USB-C™ Travel Dock	TOK29AA
	HP USB Travel Dock	TOK30AA
	HP 3005pr USB 3.0 Port Replicator w/ USB-C™ Adapter	Y4H06AA
	HP Display and Notebook Stand II	E8G00AA#xxx
	HP USB-C™ Elite Dock	X7W54AA
	HP USB-C™ Universal Dock	1MK33AA
	HP Elite USB-C™ Dock	Z9R42AA
	HP USB-C™ Mini Dock	1PM64AA
<b>Pen</b>	HP ZBook x2 Pen	TBD
	HP ZBook x2 Nib Set	TBD
<b>Input/Output - Mice</b>	HP Comfort Grip Mouse	H2L63AA
	HP 3-Button Laser Mouse	H4B81AA#xxx
	HP Ultra Mobile Wireless Mouse	H6F25AA#xxx
	HP X4000 Bluetooth Mouse	H3T50AA#xxx
	HP Slim Bluetooth Mouse	F3J92AA#xxx
	HP Ultrathin Wireless Mouse	L9V78AA
	HP USB Travel Mouse	G1K28AA#xxx
	HP Slim Wireless Keyboard and Mouse	T6L04AA#xxx
	HP USB Essential Keyboard and Mouse	H6L29AA#xxx
	HP Slim USB Keyboard and Mouse	T6T83AA
	HP Wireless (Link-5) Keyboard	T6U20AA#xxx
<b>Power Adapters</b>	HP 65W Slim A/C Adapter w/USB	H6Y82AA
	HP 90W Slim A/C Adapter w/USB	H6Y83AA
	HP 90W Slim Auto Combo AC Adapter w/USB	H6Y84AA
	HP 65W Smart AC Adapter	H6Y89AA
	HP 90W Smart AC Adapter	H6Y90AA
<b>Adapters</b>	HP USB-C™ to VGA Adapter	N9K76AA
	HP USB-C™ to USB 3.0	N2Z63AA
	HP USB-C™ to USB Hub	Z6A00AA
	HP USB-C™ to DisplayPort™ Adapter	N9K78AA

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

	HP USB-C™ to DisplayPort™ Adapter	N9K78AA
	HP HDMI to DVI adapter	F5A28AA
	DisplayPort™ to DVI Adapter	F7W96AA
	DisplayPort™ to VGA	F7W97AA
	DisplayPort™ to HDMI 1.4 Adapter	F3W43AA
<b>Wireless</b>		TBD
<b>Collaboration</b>	HP UC Conferencing Keyboard	K8P74AA#xxx
	HP UC Speaker Phone	K7V16AA
	HP UC Wired Headset	K7V17AA
	HP UC Mono Wireless Headset	W3K08AA
	HP UC Duo Wireless Headset	W3K09AA
	HP Stereo 3.5mm Headset	T1A66AA
	HP Stereo USB Headset	T1A67AA
<b>Storage - External Storage</b>	HP External USB DVDRW Drive	F2B56AA
<b>Security</b>	HP Dual Head Cable Lock (Non-Master key)	T1A64AA
	HP Dual Head Cable Lock (Master Key)	T1A65AA
	HP 15.6" Notebook PC Privacy Filter (non-touch)	J7H71AA
	HP Docking Station Cable Lock	AU656AA#XXX
	HP Essential Combination Lock	TOY16AA
	HP Combination Lock	TOY15AA
	HP Keyed Cable Lock	TOY14AA
	HP 15'6 Privacy Filter (touch panel)	V8Z58AA#xxx

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

### Summary of Changes

Date of change:	Version History:		Description of change:
	From v1 to v2	Added	

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