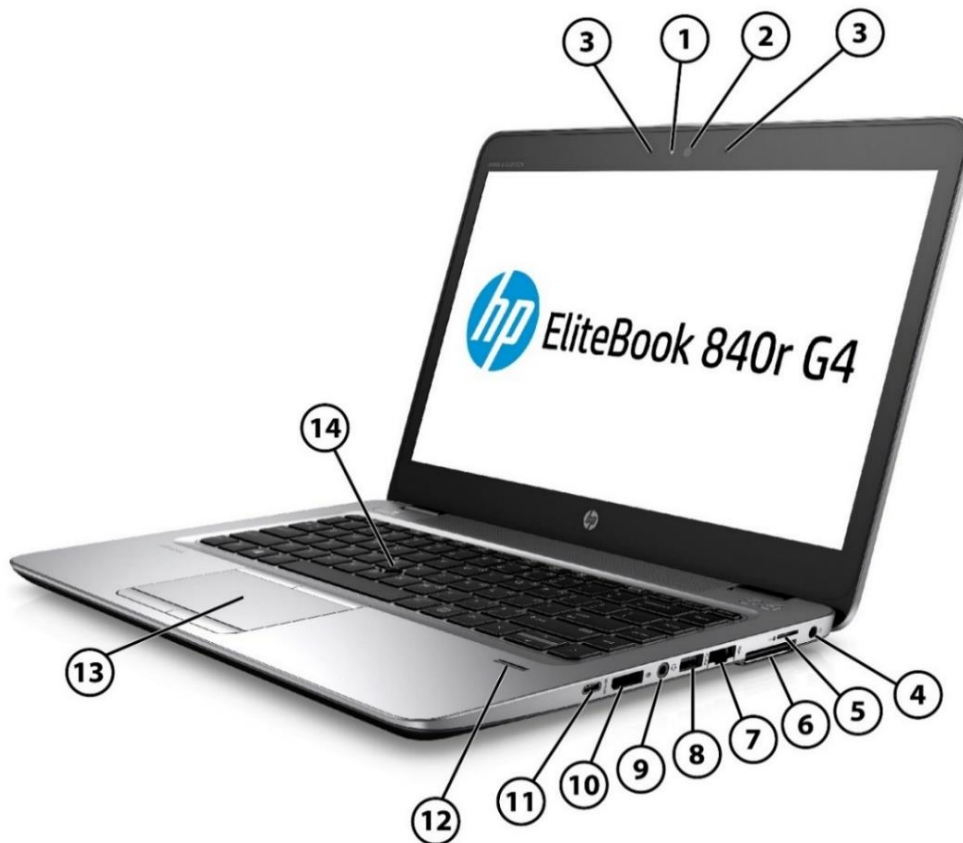


### Overview

#### HP EliteBook 840r G4

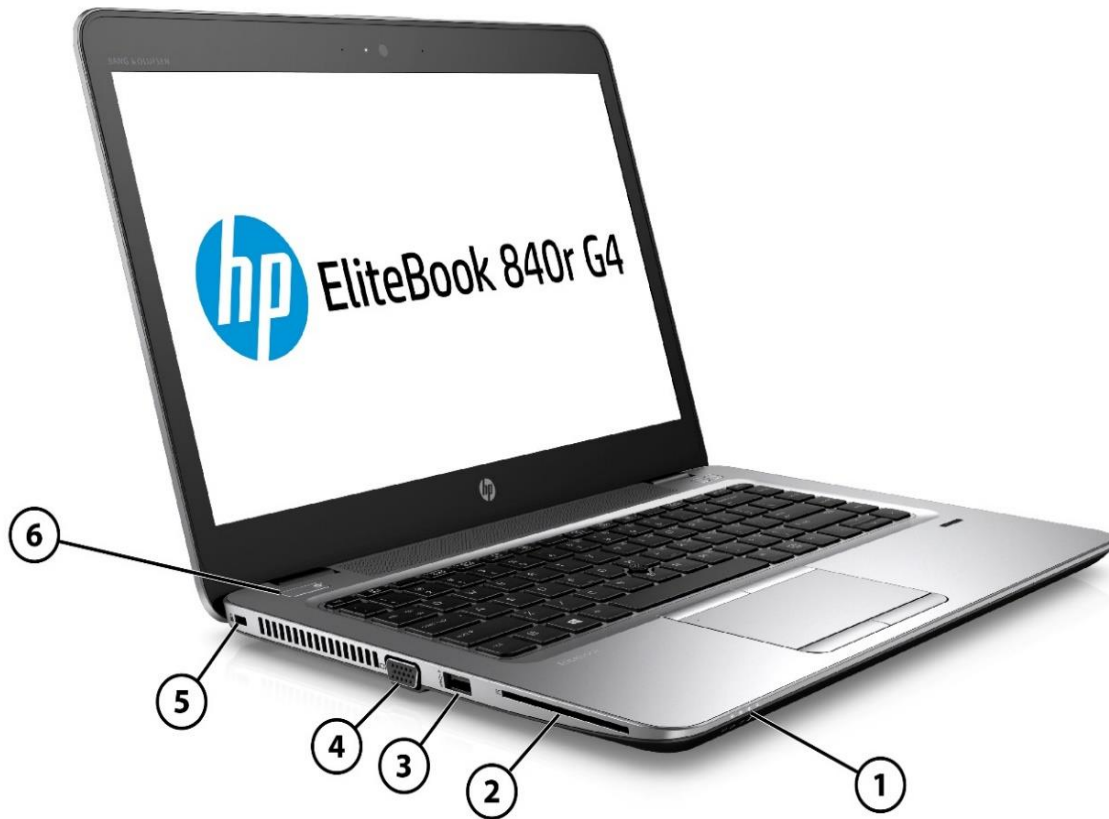


1. HD Camera LED (Select models only)
2. HD Camera (Select models only)
3. Internal microphones
4. Power connector
5. SIM card slot
6. Docking connector
7. Ethernet port

#### Left

8. USB 3.1 Gen 1 port
9. Audio combo jack
10. DisplayPort™ 1.2
11. USB Type-C™ port
12. Fingerprint reader (Select models only)
13. Touchpad
14. Pointstick

### Overview



#### Right

1. Indicator LEDs:  
Power Light,  
Wireless Light,  
AC Adapter/Battery Light,  
Storage Usage Light
2. Smartcard Reader
3. USB 3.1 Gen 1 charging port
4. VGA port
5. Security lock slot (Lock sold separately)
6. Power button

### Overview

#### AT A GLANCE

- Stylish magnesium and aluminum chassis provides optimal durability with minimal weight
- Thin design but no adapters are needed with built-in VGA, drop-jaw RJ-45 Ethernet port, USB 3.1 Gen 1 Ports, USB TypeC™ (Alt Mode and Power Input), and full-size DisplayPort™ 1.2 for high resolution support
- Design allows memory, storage, wireless modules, and battery to be customer serviceable and upgradeable
- Choice of 8th Generation Intel® Core™ i5, i7 Processors and 7th generation Intel® Core™ i5 Processors
- Enterprise grade security with HP SureStart, HP Sure Run, HP Sure Recover, SmartCard Reader<sup>1</sup> and Fingerprint reader<sup>1</sup>
- Collaborate loud and clear with HP Audio Boost, Audio by Bang & Olufsen, HP Noise Cancellation software, and an optional 720p webcam
- Featuring HP Premium Keyboard with Pointstick
- Optional back-lit keyboard keeps you productive in all settings with HP DuraKeys to help protect keys from fading
- Choice of displays:
  - 35.6cm (14.0") diagonal HD anti-glare LED-backlit non-touch, 220 cd/m<sup>2</sup>, 45% sRGB
  - 35.6cm (14.0") diagonal FHD IPS anti-glare LED-backlit non-touch, 220 cd/m<sup>2</sup>, 45% sRGB
  - 35.6cm (14.0") diagonal FHD IPS LED-backlit Corning® Gorilla® Glass 4 touch, 220 cd/m<sup>2</sup>, 45% sRGB
- Easily dock with the optional HP UltraSlim Docking Station<sup>1</sup>
- Flexible wireless connectivity options
- Preinstalled with Windows 10 versions or FreeDOS 2.0
- Choice of solid state drives and hard drives up to 1 TB and DDR4 memory up to 32 GB
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles<sup>2</sup>

1. Sold separately or as an optional feature.

2. Recharges your battery up to 50% within 30 minutes when the system is off or in standby mode. Power adapter with a minimum capacity of 65 watts is required. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.

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

### Features

#### PRODUCT NAME

HP EliteBook 840r G4

#### OPERATING SYSTEM

<b>Preinstalled</b>	Windows 10 Home 64 <sup>1</sup> Windows 10 Pro 64 (National Academic only) <sup>1,2</sup> Windows 10 Home 64 <sup>1</sup> Windows 10 Home Single Language 64 <sup>1</sup> FreeDOS 2.0
---------------------	---

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

2. Some devices for academic use will automatically be updated to Windows 10 Pro Education with the Windows 10 Anniversary Update. Features vary; see <https://aka.ms/ProEducation> for Windows 10 Pro Education feature information.

#### PROCESSORS

Intel® Core™ i5-7200U with Intel® HD Graphics 620 (2.5 GHz base frequency, up to 3.1 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores)<sup>3,4,5</sup>

Intel® Core™ i5-7300U vPro™ processor with Intel® HD Graphics 620 (2.6 GHz base frequency, up to 3.5 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores)<sup>3,4,5</sup>

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)<sup>3,4,5</sup>

Intel® Core™ i5-8350U vPro™ processor with Intel® UHD Graphics 620 (1.7 GHz base frequency, up to 3.6 GHz with Intel® Turbo Boost Technology, 6 MB cache, 4 cores)<sup>3,4,5</sup>

Intel® Core™ i7-8550U with Intel® UHD graphics 620 (1.8 GHz base frequency, up to 4 GHz with Intel® Turbo Boost Technology, 8 MB cache, 4 cores)<sup>3,4,5</sup>

Intel® Core™ i7-8650U vPro™ processor with Intel® UHD graphics 620 (1.9 GHz base frequency, up to 4.2 GHz with Intel® Turbo Boost Technology, 8 MB cache, 4 cores)<sup>3,4,5</sup>

##### Processor Family

7th Generation Intel® Core™ i5 processor (i5-7300U, i5-7200U models)<sup>5</sup>

8th Generation Intel® Core™ i5 processor (i5-8350U, i5-8250U models)<sup>5</sup>

8th Generation Intel® Core™ i7 processor (i7-8650U, i7-8550U models)<sup>5</sup>

3. 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.

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

5. NOTE: 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>.

## Features

### CHIPSET

Chipset is integrated with processor

---

### GRAPHICS

#### Integrated

Intel® HD Graphics 620<sup>6</sup>

Intel® UHD Graphics 620<sup>6</sup>

6. HD content required to view HD images.

---

### DISPLAY

#### Non-Touch

35.6 cm (14") diagonal HD anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB (1366 x 768)<sup>6,7</sup>

35.6 cm (14") diagonal HD anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB with HD camera (1366 x 768)<sup>6,7</sup>

35.6 cm (14") diagonal FHD IPS anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB (1920 x 1080)<sup>6,7</sup>

35.6 cm (14") diagonal FHD IPS anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB with HD camera (1920 x 1080)<sup>6,7</sup>

#### Touch

35.6 cm (14") diagonal FHD IPS LED-backlit touch screen with Corning® Gorilla® Glass 4, 220 cd/m<sup>2</sup>, 45% sRGB with HD camera (1920 x 1080)<sup>6,7</sup>

6. HD content required to view HD images.

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

---

### STORAGE AND DRIVES

#### M.2 2280 Solid State Drives

128 GB SATA-3 SS TLC<sup>8</sup>

256 GB PCIe NVMe Value SS TLC<sup>8</sup>

256 GB PCIe Gen3x4 NVMe SS TLC<sup>8</sup>

256 GB SATA-3 SS TLC Opal 2<sup>8</sup>

360 GB PCIe Gen3x4 NVMe SS TLC (Intel®)<sup>8</sup>

512 GB PCIe Gen3x4 NVMe SS TLC<sup>8</sup>

512 GB PCIe Gen3x4 NVMe SS TLC Opal 2<sup>8</sup>

512 GB SATA-3 SS TLC FIPS-140-2<sup>8</sup>

1 TB PCIe Gen3x4 NVMe SS TLC<sup>8</sup>

#### SATA, 7mm 2.5" Hard Drives

500 GB 7200 rpm<sup>8</sup>

500 GB 7200 rpm SED FIPS-140-2<sup>8</sup>

1 TB 7200 rpm<sup>8</sup>

8. 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.

### MEMORY

### Features

#### Maximum Memory

32 GB DDR4-2400 SDRAM<sup>9</sup>

#### Memory

32 GB DDR4-2400 SDRAM (2 X 16 GB)<sup>9</sup>

16 GB DDR4-2400 SDRAM (1 X 16 GB)<sup>9</sup>

16 GB DDR4-2400 SDRAM (2 X 8 GB)<sup>9</sup>

8 GB DDR4-2400 SDRAM (1 x 8 GB)<sup>9</sup>

8 GB DDR4-2400 SDRAM (2 x 4 GB)<sup>9</sup>

4 GB DDR4-2400 SDRAM (1 x 4 GB)<sup>9</sup>

#### Memory Slots

2 SODIMM

Both slots are upgradeable

System runs at 2133 for Intel® 7th generation processors

System runs at 2400 for Intel® 8th generation processors

Supports Dual Channel Memory.

9. 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

#### WLAN

Intel® Dual Band Wireless-AC 8265 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo, vPro™<sup>10,11</sup>

Intel® Dual Band Wireless-AC 8265 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo, non-vPro™<sup>10,11</sup>

Realtek RTL8822BE 802.11ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo, non-vPro™<sup>10,11</sup>

#### WWAN

HP lt4132 LTE/HSPA+ w/GPS Mobile Broadband<sup>10,12</sup>

Intel® XMM™ 7360 LTE-Advanced<sup>10,12</sup>

#### NFC

NXP NPC300 Near Field Communication Module<sup>10</sup>

#### Miracast

Native Miracast Support<sup>13</sup>

#### Ethernet

Intel® I219-LM 10/100/1000 GbE, vPro™<sup>14</sup>

Intel® I219-V 10/100/1000 GbE, non-vPro™<sup>14</sup>

10. Sold separately or as an optional feature.

11. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. The specifications for the 802.11ac 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.

12. WWAN module is optional and requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.

13. 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>.

14. 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

### Features

and network infrastructure is required.<sup>19</sup> 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.

---

### AUDIO/MULTIMEDIA

#### Audio

Audio by Bang & Olufsen  
Integrated 2 Dual Array Microphones  
2 Integrated Stereo Speakers

#### Camera

Optional HD camera<sup>6</sup>  
[6. HD content required to view HD images.](#)

---

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

#### Keyboard

HP Premium Keyboard, spill resistant with drain  
Backlit keyboard available as an option<sup>10</sup>

#### Pointing Device

Glass Touchpad  
On/Off Button  
Taps enabled as default  
Gestures enabled by default

#### Function Keys

F1 - Sleep  
F2 - Blank  
F3 - Backlit Toggle  
F4 - Display Switching  
F5 - Brightness Down  
F6 - Brightness Up  
F7 - Blank  
F8 - Volume Down  
F9 - Volume Up  
F10 - Mic Mute  
F11 - Blank  
F12 - numlk

#### Hidden Functions

Fn+R = Break  
Fn+S = Sys Rq  
Fn+C = Scroll Lock

[10. Sold separately or as an optional feature.](#)

---

### Features

#### SOFTWARE AND SECURITY

##### Preinstalled Software

###### BIOS

- HP BIOSphere Gen4<sup>15</sup>
- HP Drive Lock & Automatic Drive Lock<sup>40</sup>
- BIOS Update via Network
- Master Boot Record Security
- Power On Authentication
- Absolute Persistence Module<sup>16</sup>
- Pre-boot Authentication
- HP Wireless Wakeup

###### Software

- HP Native Miracast Support<sup>13</sup>
- HP LAN-Wireless Protection
- HP Velocity
- HP 3D DriveGuard
- HP ePrint Driver + JetAdvantage<sup>17</sup>
- HP Hotkey Support - CMIT
- HP Recovery Manager
- HP Jumpstart
- HP Support Assistant<sup>18</sup>
- HP Noise Cancellation Software
- HP PhoneWise<sup>19</sup>
- Buy Office

###### Manageability Features

- HP Driver Packs<sup>20</sup>
- HP System Software Manager (SSM)
- HP BIOS Config Utility (BCU)
- HP Client Catalog
- HP Manageability Integration Kit Gen2<sup>21</sup>
- Ivanti Management Suite<sup>22</sup>

###### Client Security Software

- HP Client Security Suite Gen4<sup>23</sup> including:
  - HP Security Manager<sup>24</sup> (including Credential Manager, HP Password Manager, HP Spare Key)
  - HP Fingerprint Sensor<sup>25</sup>
  - HP Device Access Manager
  - HP Power On Authentication
  - Microsoft Defender<sup>26</sup>



### Features

#### Security Management

Secure Erase<sup>27</sup>

TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)

SATA 0,1 port disablement (viaBIOS)

RAID configurations<sup>28</sup>

Serial, USB enable/disable (viaBIOS)

Power-on password (viaBIOS)

Setup password (viaBIOS)

Support for chassis padlocks and cable lock devices

HP Sure Click<sup>29</sup>

HP Sure Start Gen430

HP Sure Run<sup>38</sup>

HP Sure Recover<sup>39</sup>

#### TPM

Model: Infineon SLB9670

Version: 7.62.3126.0

Revision: TPM 2.0

FIPS 140-2 Compliant: Yes (select models only)

#### Smartcard Reader

Model number: Alcor AU9560

FIPS 201 Compliant: Yes

#### IPv6 Certification:

Yes

**MD5 Hash:** Please follow the instructions below to access MD5 Hash.

Log-on to <http://hp.com/support>, enter your product name, select software and drivers, select OS, select driver. After selecting the driver, click on "Associated files" and then click on "Download". When opening the file, under "Purpose" you should see the appropriate "SOFTPAQ MD5:" Field

**Is the BIOS on this notebook ISO/IEC 19678:2015 (formerly NIST 800-147) compliant?:**

Yes

UEFI version: 2.5

### Features

13. 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>.
15. HP BIOSphere Gen4 features may vary depending on the PC platform and configurations requires 8th Gen Intel® processors.
16. 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.
17. HP ePrint Drive 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 [www.hp.com/go/eprintcenter](http://www.hp.com/go/eprintcenter)). Print times and connection speeds may vary.
18. HP Support Assistant requires Windows and Internet access.
19. HP PhoneWise Client is only available on select platforms. For supported platforms and HP PhoneWise system requirements see [www.hp.com/go/HPPhoneWise](http://www.hp.com/go/HPPhoneWise).
20. HP Driver Packs not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.
21. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>
22. Ivanti Management Suite subscription required.
23. HP Client Security Suite Gen 4 requires Windows and Intel® or AMD 8th generation processors.
24. HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. User may need to enable or allow the add-on / extension in the internet browser.
25. HP Fingerprint Sensor sold separately or as an optional feature.
26. Microsoft Defender Opt in and internet connection required for updates.
27. Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88. Supported on Elite platforms with BIOS version F.03 or higher.
28. RAID configuration is optional and does require a second hard drive.
29. HP Sure Click is available on select HP platforms and supports Microsoft® Internet Explorer and Chromium™. Check <http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA7-0922ENW> for all compatible platforms as they become available.
30. HP Sure Start Gen4 is available on HP Elite products equipped with 8th generation Intel® or AMD processors.
38. HP Sure Run is available on HP Elite products equipped with 8th generation Intel® or AMD® processors.
39. HP Sure Recover is available on HP Elite PCs with 8th generation Intel® or AMD processors and requires an open, wired network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data.
40. HP Drive Lock is not supported on NVMe drives.

### Features

#### POWER

##### Power Supply

- HP Smart 45 W External AC power adapter<sup>31</sup>
- HP Smart 45 W External AC power adapter, 2-prong (Japan only)<sup>31</sup>
- HP Smart 65 W External AC power adapter<sup>31,32</sup>
- HP Smart 65 W EM External AC power adapter<sup>31,32</sup>

##### Primary Battery

- HP Long Life 3-cell, 51 Wh Li-ion<sup>33</sup>

##### Power Cord

- 2-wire plug - 1.0m (Japan only)<sup>31</sup>
- 3-wire plug - 1.0m<sup>31</sup>
- 3-wire plug - 1.8m<sup>31</sup>

- 31. Availability may vary by country.
  - 32. Supports HP Fast Charging.
  - 33. Battery is internal and not replaceable by customer. Serviceable by warranty.
- 

#### WEIGHTS & DIMENSIONS

##### Weight

- Starting at 3.3 lb (non-touch); Starting at 3.64 lb (touch)<sup>34</sup>
- Starting at 1.5 kg (non-touch); Starting at 1.65 kg (touch)<sup>34</sup>

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

###### Non-touch

- 13.3 x 9.3 x 0.74 in
- 33.8 x 23.7 x 1.89 cm

###### Touch

- 13.3 x 9.3 x 0.8 in
- 33.8 x 23.7 x 2.02 cm

- 34. Weight will vary by configuration.
-

### Features

#### PORTS/SLOTS

##### Ports

- 1 USB 3.1 Type-C™ (Alt Mode and Power Input)
- 2 USB 3.1 Gen 1 (1 charging)
- 1 DisplayPort™ 1.2
- 1 VGA
- 1 RJ-45
- 1 Docking connector
- 1 Headphone/microphone combo
- 1 AC port
- SIM card slot
- Smartcard reader

##### Expansion Slots

- SD Media Card Reader Slot
- Supports SD, SDHC, SDXC

**Note:** Cables sold separately

#### ENVIRONMENTAL & INDUSTRY

<b>Environmental Data</b>	<b>Eco-Label Certifications &amp; declarations</b>	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: <ul style="list-style-type: none"> <li>• IT ECO declaration</li> <li>• US ENERGY STAR®</li> <li>• EPEAT<sup>®</sup> Gold registered in the United States. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country. Search keyword <i>generator</i> on HP's 3rd party option store for solar energy accessory at <a href="http://www.hp.com/go/options">http://www.hp.com/go/options</a></li> </ul>		
	<b>System Configuration</b>	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a "Typically Configured Notebook".		
	<b>Energy Consumption (in accordance with US ENERGY STAR® test method)</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 60Hz</b>
	Normal Operation (Short idle)	5.23 W	5.11 W	5.23 W
	Normal Operation (Long idle)	3.32 W	3.13 W	2.66 W
	Sleep	0.58 W	0.6 W	0.56 W
	Off	0.28 W	0.31 W	0.28 W

### Features

	<p>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.</p>		
<b>Heat Dissipation*</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 60Hz</b>
Normal Operation (Short idle)	18 BTU/hr	17 BTU/hr	18 BTU/hr
Normal Operation (Long idle)	11 BTU/hr	11 BTU/hr	9 BTU/hr
Sleep	2 BTU/hr	2 BTU/hr	2 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 BTU/hr
	<p>*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.</p>		
<b>Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)</b>	Sound Power (L <sub>WAd</sub> , bels)	Sound Pressure (L <sub>pAm</sub> , decibels)	
Typically Configured – Idle	3.1	25	
Fixed Disk – Random writes	3.7	31	
<b>Longevity and Upgrading</b>	<p>"This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:</p> <p>Spare parts are available throughout the warranty period and or for up to "5" years after the end of production.</p>		
<b>Batteries</b>	<p>"This battery(s) in this product comply with EU Directive 2006/66/EC</p> <p>Batteries used in the product do not contain:            Mercury greater the 1ppm by weight            Cadmium greater than 20ppm by weight</p> <p>Battery size: CR2032 (coin cell)            Battery type: Lithium</p> <p>Battery size: CR2032 (coin cell)</p>		

### Features

	Battery type: Lithium"		
<b>Additional Information</b>	<ul style="list-style-type: none"> <li>• "• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.</li> <li>• • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.</li> <li>• • This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).</li> <li>• • This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see <a href="http://www.epeat.net">www.epeat.net</a></li> <li>• • Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.</li> <li>• • This product contains 0% post-consumer recycled plastic (by wt.)</li> <li>• • This product is 94.4% recycle-able when properly disposed of at end of life."</li> </ul>		
<b>Packaging Materials</b>	<b>External:</b>	PAPER/Corrugated	357 g
	<b>Internal:</b>	PLASTIC/Polyethylene Expanded - EPE	56 g
		PLASTIC/Polyethylene low density – LDPE	15 g
		PLASTIC/Polypropylene - PP	4 g
	The plastic packaging material contains at least 50% recycled content.		
	The corrugated paper packaging materials contains at least 75% recycled content.		
<b>Material Usage</b>	<p>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 <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf</a>):</p> <ul style="list-style-type: none"> <li>• Asbestos</li> <li>• Certain Azo Colorants</li> <li>• Certain Brominated Flame Retardants – may not be used as flame retardants in plastics</li> <li>• Cadmium</li> <li>• Chlorinated Hydrocarbons</li> <li>• Chlorinated Paraffins</li> <li>• Formaldehyde</li> <li>• Halogenated Diphenyl Methanes</li> <li>• Lead carbonates and sulfates</li> <li>• Lead and Lead compounds</li> <li>• Mercuric Oxide Batteries</li> <li>• Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.</li> <li>• Ozone Depleting Substances</li> <li>• Polybrominated Biphenyls (PBBs)</li> <li>• Polybrominated Biphenyl Ethers (PBBEs)</li> <li>• Polybrominated Biphenyl Oxides (PBBOs)</li> <li>• Polychlorinated Biphenyl (PCB)</li> <li>• Polychlorinated Terphenyls (PCT)</li> <li>• Polyvinyl Chloride (PVC) – except for wires and cables, has been voluntarily removed from most applications.</li> <li>• Radioactive Substances</li> <li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</li> </ul>		

### Features

	<b>Packaging Usage</b>	<p>HP follows these guidelines to decrease the environmental impact of product packaging:</p> <ul style="list-style-type: none"> <li>• Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.</li> <li>• Eliminate the use of ozone-depleting substances (ODS) in packaging materials.</li> <li>• Design packaging materials for ease of disassembly.</li> <li>• Maximize the use of post-consumer recycled content materials in packaging materials.</li> <li>• Use readily recyclable packaging materials such as paper and corrugated materials.</li> <li>• Reduce size and weight of packages to improve transportation fuel efficiency.</li> <li>• Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.</li> </ul>
	<b>End-of-life Management and Recycling</b>	<p>Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <a href="http://www.hp.com/go/reuse-recycle">http://www.hp.com/go/reuse-recycle</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <a href="http://www.hp.com/go/recyclers">http://www.hp.com/go/recyclers</a>. 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.</p>
	<b>HP, Inc. Corporate Environmental Information</b>	<p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report  <a href="http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html">http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html</a></p> <p>Eco-label certifications  <a href="http://www8.hp.com/us/en/hp-information/environment/ecolabels.html">http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</a></p> <p>ISO 14001 certificates:  <a href="http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842">http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842</a>  <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</a></p>

### 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. 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>35</sup>

### Features

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

---



### Technical Specifications

#### DISPLAYS

**14" diagonal FHD UWVA anti-glare flat LED backlit non-touch; 220 cd/m<sup>2</sup>; 45% sRGB (1920 x 1080)**

<b>Outline Dimensions (W x H)</b>	320.9x205.6 (max)
<b>Active Area</b>	309.31 x 173.99
<b>Weight</b>	290 max.
<b>Diagonal Size</b>	14 (inch)
<b>Thickness</b>	3.0mm max
<b>Interface</b>	eDP 1.2
<b>Surface Treatment</b>	Anti-Glare (AG)
<b>Touch Enabled</b>	None
<b>Contrast Ratio</b>	600:1 (typ) - AG
<b>Refresh Rate</b>	60Hz
<b>Brightness</b>	220 nits
<b>Pixel Resolution</b>	1920 x 1080 (FHD)
<b>Format</b>	RGB
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	45%
<b>Color Depth</b>	6 bits + Hi FRC
<b>Viewing Angle</b>	UWVA 85/85/85/85

**14" diagonal FHD UWVA anti-glare flat LED backlit touch; 220 cd/m<sup>2</sup>; 45% sRGB (1920 x 1080)**

<b>Outline Dimensions (W x H)</b>	320.9x205.6 (max)
<b>Active Area</b>	309.31 x 173.99
<b>Weight</b>	290 max.
<b>Diagonal Size</b>	14 (inch)
<b>Thickness</b>	3.0mm max
<b>Interface</b>	eDP 1.2
<b>Surface Treatment</b>	BV
<b>Touch Enabled</b>	Yes
<b>Contrast Ratio</b>	600:1 (typ) - AG
<b>Refresh Rate</b>	60Hz
<b>Brightness</b>	220 nits
<b>Pixel Resolution</b>	1920 x 1080 (FHD)

### Technical Specifications

---

<b>Format</b>	RGB
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	45%
<b>Color Depth</b>	6 bits + Hi FRC
<b>Viewing Angle</b>	UWVA 85/85/85/85

---

**14" diagonal HD SVA anti-glare LED-backlit non-touch; 220 cd/m<sup>2</sup>; 45% sRGB (1366 x 768)**

<b>Outline Dimensions (W x H)</b>	320.9 x 205.6 (mm) max
<b>Active Area</b>	309.40 x 173.95 (mm)
<b>Weight</b>	290 g max
<b>Diagonal Size</b>	14 (inch)
<b>Thickness</b>	3.0 (mm) max
<b>Interface</b>	eDP 1.2
<b>Surface Treatment</b>	Anti-Glare (AG)
<b>Touch Enabled</b>	None
<b>Contrast Ratio</b>	300:1 (typical)
<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	220 nits
<b>Pixel Resolution</b>	1366 x 768 (HD)
<b>Format</b>	RGB
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	45%
<b>Color Depth</b>	6 bits + Hi FRC
<b>Viewing Angle</b>	SVA 40/40/15/30

---

### Technical Specifications

#### NETWORKING/COMMUNICATIONS

<b>Intel® 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo<sup>1</sup></b>	<b>Wireless LAN Standards</b>	<ul style="list-style-type: none"> <li>IEEE 802.11a</li> <li>IEEE 802.11b</li> <li>IEEE 802.11g</li> <li>IEEE 802.11n</li> <li>IEEE 802.11ac</li> </ul>
	<b>Interoperability</b>	Wi-Fi certified
	<b>Frequency Band</b>	802.11b/g/n <ul style="list-style-type: none"> <li>• 2.402 – 2.482 GHz</li> </ul> 802.11a/n <ul style="list-style-type: none"> <li>• 4.9 – 4.95 GHz (Japan)</li> <li>• 5.15 – 5.25 GHz</li> <li>• 5.25 – 5.35 GHz</li> <li>• 5.47 – 5.725 GHz</li> <li>• 5.825 – 5.850 GHz</li> </ul>
	<b>Data Rates</b>	<ul style="list-style-type: none"> <li>• 802.11b: 1, 2, 5.5, 11 Mbps</li> <li>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11a: 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, and 80MHz)</li> </ul>
	<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	<b>Security</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>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite</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</b>	<ul style="list-style-type: none"> <li>• 802.11b : +14dBm minimum</li> <li>• 802.11g : +12dBm minimum</li> <li>• 802.11a : +12dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +12dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +12dBm minimum</li> <li>• 802.11n HT20(5GHz) : +10dBm minimum</li> <li>• 802.11n HT40(5GHz) : +10dBm minimum</li> <li>• 802.11ac VHT80(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>

### Technical Specifications

<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode	
<b>Receiver Sensitivity</b>	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum	
<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 Half-MiniCard	
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm	
<b>Weight</b>	Type 2230 : 2.8g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	<b>Operating</b>	14° to 158° F (-10° to 70° C)
	<b>Non-operating</b>	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	<b>Operating</b>	10% to 90% (non-condensing)
	<b>Non-operating</b>	5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b>	0 to 10,000 ft (3,048 m)
	<b>Non-operating</b>	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	<b>LED Amber</b> – Radio OFF; <b>LED White</b> – Radio ON	

### HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology

<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>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW

### Technical Specifications

<b>Electrical Interface</b>	USB 2.0 compliant
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Power Management Certifications</b>	Microsoft Windows ACPI, and USB Bus Support 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)

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac 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

<b>HP It4132 LTE/HSPA+ 4G Mobile Broadband Module (Macan)<sup>1</sup></b>	<b>Technology/Operating bands</b>	LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3) MHz, 850 (Band 5), 2600 (Band 7), 900 (Band 8) MHz, 800 (Band 20), 700 (Band 28) MHz. HSPA+: 2100 (Band 1), 1900 (Band 2), 850 (Band 5), 900 (Band 8) MHz E-GPRS: 1900 (Band 2), 1800 (Band 3), 850 (Band 5), 900 (Band 8) MHz
	<b>Wireless protocol standards</b>	3GPP Release 10 LTE Specification CAT.4, 20MHz BW WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification E-GPRS: Class B, Multi-slot class 12, coding schemes CS1 - CS4 and MSC1 - MSC9
	<b>GPS</b>	Standalone, A-GPS (MS-B and LTO)
	<b>GPS bands</b>	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
	<b>Maximum data rates</b>	LTE: 150 Mbps (Download), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)

### Technical Specifications

	EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)
<b>Maximum output power</b>	LTE: 23 dBm HSPA+: 23.5 dBm E-GPRS 1900/1800: 26 dBm E-GPRS 900/850: 27 dBm GPRS 1900/1800: 29.5 dBm GPRS 900/850: 32.5 dBm
<b>Maximum power consumption</b>	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average) E-GPRS: 2,600 mA (peak); 500 mA (average)
<b>Form Factor</b>	M.2, 3042-S3 Key B
<b>Weight</b>	6 g
<b>Dimensions (Length x Width x Thickness)</b>	42 x 30 x 2.3 mm

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac 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

<b>Intel® XMM™ 7360 LTE-Advanced<sup>1</sup></b>	<b>Technology/Operating bands</b>	LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700/2100 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 17 lower), 800 (Band 20), 700 (Band 28). HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz
	<b>Wireless protocol standards</b>	3GPP Release 10 LTE Specification CAT.4, 20MHz BW WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification 1xEVDO Release 0, A and B. E-GPRS: Class B, Multi-slot class 12, coding schemes CS1 - CS4 and MSC1 - MSC9
	<b>GPS</b>	Standalone, A-GPS (MS-A, MS-B and XTRA)
	<b>GPS bands</b>	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
	<b>Maximum data rates</b>	LTE: 150 Mbps (Download), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload) CDMA 1xRTT: 153.6 kbps (Download), 153.6 kbps (Upload) EVDO Rel.A: 3.1 Mbps (Download), 1.8 Mbps (Upload) EVDO Rel.B: 14.7 Mbps (Download), 5.4Mbps (Upload) EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)

### Technical Specifications

<b>Maximum output power</b>	LTE: 23 dBm HSPA+: 23.5 dBm 1xRTT/EVDO: 24dBm E-GPRS 1900/1800: 26 dBm E-GPRS 900/850: 27 dBm GPRS 1900/1800: 29.5 dBm GPRS 900/850: 32.5 dBm
<b>Maximum power consumption</b>	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average) 1xRTT/EVDO: 1,000 mA (peak); 700 mA (average) E-GPRS: 2,800 mA (peak); 500 mA (average)
<b>Form Factor</b>	M.2, 3042-S3 Key B
<b>Weight</b>	6 g
<b>Dimensions (Length x Width x Thickness)</b>	42 x 30 x 2.3 mm

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac 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

#### Realtek 802.11b/g/n (2x2) WiFi and Bluetooth® 4.2 Combo<sup>1</sup>

<b>Wireless LAN Standards</b>	IEEE 802.11b IEEE 802.11g IEEE 802.11n
<b>Interoperability</b>	Wi-Fi certified
<b>Frequency Band</b>	802.11b/g/n <sup>2</sup> • 2.402 – 2.482 GHz
<b>Data Rates</b>	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 07, (20MHz)
<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
<b>Security<sup>3</sup></b>	• 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 • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required) GPRS 900/850: 32.5 dBm
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power</b>	• 802.11b : +16dBm minimum

### Technical Specifications

	<ul style="list-style-type: none"> <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>
<b>Power Consumption</b>	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 60 mW (WLAN unassociated) Radio disabled: 30 mW
<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm maximum 802.11a, 6Mbps : -86dBm maximum 802.11a, 54Mbps : -72dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm maximum
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded 2.4 GHz antennas are provided to the card to support WLAN and Bluetooth communications (Support Dual antenna or Single antenna, depend on platform requirement)
<b>Form Factor</b>	PCI-Express Half-MiniCard
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm Or Type 1630 : 2.3 x 16.0 x 30.0 mm
<b>Weight</b>	Type 2230 : 2.8g Or Type 1630 : 2g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	<b>Operating</b> 14° to 158° F (-10° to 70° C) <b>Non-operating</b> -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	<b>Operating</b> 10% to 90% (non-condensing) <b>Non-operating</b> 5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b> 0 to 10,000 ft (3,048 m) <b>Non-operating</b> 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	<b>LED Amber</b> – Radio OFF; <b>LED White</b> – Radio ON



### Technical Specifications

#### HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology

<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.

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac 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
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

#### Near Field Communications Controller (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

<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>	2.97 to 5.5 Volts
<b>I/O Voltage</b>	1.8V or 3.3V

#### Power Consumption

(Booster enable, VBAT= 3.3V, VCC\_BOOST = 5V)

<b>Mode</b>	Power Consumption, Typical
<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

#### STORAGE

---

<b>HDD 500 GB 7200RPM 7mm SATA</b>	Drive Weight	0.21 lbs (95 g)
	Rotation speed	7200 RPM
	Cache Buffer	Up to 32 MB
	Height	0.28 in (7 mm)
	Width	2.75 in (69.85 mm)
	Interface	ATA-8, SATA 3.0
	Transfer Rate	600 MB/s
	Seek Time	Single Track: 2 ~ 1.5 ms; Average: 11 ~ 13 ms; Maximum: 18 ~ 22 ms
	Logical Blocks	976,773,168
	Operating Temperature	32° to 140°F (0° to 60°C) [ambient temp]
	Security Features	ATA Security
	Features	S.M.A.R.T., NCQ, Ultra DMA

---

<b>HDD 500 GB 7200RPM 7mm FIPS SATA Opal2</b>	Drive Weight	0.21 lbs (95 g)
	Rotation speed	7200 RPM
	Cache Buffer	Up to 32 MB
	Height	0.28 in (7 mm)
	Width	2.75 in (69.85 mm)
	Interface	ATA-8, SATA 3.0
	Transfer Rate	600 MB/s
	Seek Time	Single Track: 2 ~ 1.5 ms; Average: 11 ~ 13 ms; Maximum: 18 ~ 22 ms
	Logical Blocks	976,773,168
	Operating Temperature	32° to 140°F (0° to 60°C) [ambient temp]
	Security Features	ATA Security; TCG Opal 2.x, FIPS
	Features	S.M.A.R.T., NCQ, Ultra DMA

---

### Technical Specifications

<b>HDD 1 TB 7200RPM 7mm SATA 2.5in</b>	Drive Weight	90g
	Rotation speed	7200rpm
	Cache Buffer	128 MB
	Height	7.2mm Max.
	Width	69.85mm
	Interface	ATA-8, SATA 3.0
	Transfer Rate	600 MB/s
	Seek Time	Single Track: 1.5 ms; Average: 13 ms; Maximum: 32 ms
	Logical Blocks	1,953,525,168
	Operating Temperature	0~60°C
	Security Features	ATA Security
	Features	S.M.A.R.T., NCQ, Ultra DMA, TRIM

---

### Technical Specifications

#### POWER

<b>AC Adapter 65 Watt nPFC USB Type C™</b>	<b>Dimensions</b>	74x74x28.5mm
	<b>Weight</b>	unit: 245g +/- 10g
<b>Output</b>	<b>Input</b>	<b>Input Efficiency</b>
		81.5% min at 115 Vac/ 230Vac @ 5V/3A
		86.7% min at 115 Vac/ 230Vac @ 9V/3A
		88% min at 115 Vac/ 230Vac @ 10V/5A
		88% min at 115 Vac/ 230Vac @ 12V/5A
		89% min at 115 Vac/ 230Vac @ 15V/4.33A
		89% min at 115 Vac/ 230Vac @ 20V/3.25A
		<b>Input frequency range</b>
		47 ~ 63 Hz
		<b>Input AC current</b>
	1.7 A at 90 VAC and maximum load	
<b>Environmental Design</b>	<b>Output power</b>	65W
	<b>DC output</b>	5V/9V/10V/12V/15V/20V
	<b>Hold-up time</b>	5ms at 115 Vac input
	<b>Output current limit</b>	<8.0A
	<b>Operating temperature</b>	32°F to 95°F (0° to 35°C)
	<b>Non-operating (storage) temperature</b>	-4°F to 185°F (-20° to 85°C)
<b>EMI and Safety Certifications</b>	<b>Altitude</b>	0 to 16,400 ft (0 to 5000m)
	<b>Humidity</b>	5% to 95%
	<b>Storage Humidity</b>	5% to 95%
	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.		

<b>AC Adapter 45 Watt nPFC USB Type C™</b>	<b>Dimensions</b>	62.0x62.0x28.5mm
	<b>Weight</b>	unit: 220g +/- 10g
<b>Output</b>	<b>Input</b>	<b>Input Efficiency</b>
		Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec:5V :
		81.5%9V : 86.7%10V : 87.5%12V : 87.8%15V :
		87.8%20V : 87.8%
		<b>Input frequency range</b>
		47 ~ 63Hz
		<b>Input AC current</b>
		Max. 1.4 A at 90 Vac
		<b>Output power</b>
		5V/15W
<b>Connector</b>		9V/27W
		10V/37.5W
		12V/45W
		15V/45W
		20V/45W
		<b>DC output</b>
<b>Environmental Design</b>		5V / 9V / 10V /12V / 15V / 20V
		<b>Hold-up time</b>
		5ms at 115 Vac input
		<b>Output current limit</b>
	<5.0A	
	<b>USB Type-C™</b>	
	<b>Operating temperature</b>	
	32°F to 95°F (0° to 35°C)	
	<b>Non-operating (storage) temperature</b>	
	-4°F to 185°F (-20° to 85°C)	

### Technical Specifications

	<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>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 45W Smart AC adapter</b>	<b>Dimensions</b>	3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm)
	<b>Weight</b>	0.386 lb (175g) max
	<b>Input</b>	<b>Input Efficiency</b> 87.74% at 115Vac and 88.4% at 230Vac <b>Input frequency range</b> 47 ~ 63Hz <b>Input AC current</b> Max. 1.4 A at 90 Vac
	<b>Output</b>	<b>Output power</b> 45W <b>DC output</b> 19.5V <b>Hold-up time</b> 5 msec at 115 VAC input <b>Output current limit</b> <8.0A
	<b>Connector</b>	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords
	<b>Environmental Design</b>	<b>Operating temperature</b> 32° to 95° F (0° to 35° C) <b>Non-operating (storage) temperature</b> -4° to 185° F (-20° to 85° C) <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>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 65W Smart AC adapter</b>	<b>Dimensions</b>	107.0x47.0x30.0mm
	<b>Weight</b>	unit: 250g +/- 10g
	<b>Input</b>	<b>Input Efficiency</b> 88.0 % at 115 Vac and 89.0 % at 230Vac <b>Input frequency range</b> 47 ~ 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 current limit</b> <11.0A
	<b>Connector</b>	4.5mm Barrel Type
	<b>Environmental Design</b>	<b>Operating temperature</b> 32°F to 95°F (0°to 35°C) <b>Non-operating (storage) temperature</b> -4°F to 185°F (-20° to 85°C) <b>Altitude</b> 0 to 16,400 ft (0 to 5000m) <b>Humidity</b> 20% to 95% <b>Storage Humidity</b> 10% to 95%

### Technical Specifications

	<b>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 65W EM Smart AC adapter</b>	<b>Dimensions</b>	102x55x30mm	
	<b>Weight</b>	270g +/- 10g	
	<b>Input</b>	<b>Input Efficiency</b>	87% min at 115V/230V
		<b>Input frequency range</b>	47 to 63 Hz
		<b>Input AC current</b>	1.7 A at 90 VAC and maximum load
	<b>Output</b>	<b>DC output</b>	65W(19.5V/3.33A)
		<b>Hold-up time</b>	5 msec at 115 VAC input
		<b>Output current limit</b>	<11A, Over voltage protection- 29V max automatic shutdown
	<b>Connector</b>	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords	
	<b>Environmental Design</b>	<b>Operating temperature</b>	0° to 35° C
<b>Non-operating (storage) temperature</b>		-20° to 85° C	
<b>Altitude</b>		0 to 5,000 m	
<b>Humidity</b>		0% to 95%	
<b>Storage Humidity</b>		0% to 95%	
	<b>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 3-cell Long Life Li-Ion (51 WHr)</b>	<b>Dimensions (H x W x L)</b>	6.8mm x 102.8mm x 198mm	
	<b>Weight</b>	235g	
	<b>Cells/Type</b>	3cell Lithium-Ion Polymer cell / 506480	
		<b>Voltage</b>	11.55V
	<b>Energy</b>	<b>Amp-hour capacity</b>	4420mAh
		<b>Watt-hour capacity</b>	51Wh
		<b>Operating (Charging)</b>	0~45 C
	<b>Temperature</b>	<b>Operating (Discharging)</b>	-10~60 C
		<b>Fuel Gauge LED</b>	N/A
	<b>Warranty</b>	1000 cycles >65% (at 23° C)	
<b>Optional Travel Battery Available</b>	No		

### COUNTRY OF ORIGIN

China

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

Category	Description	Part #
<b>Cases</b>	HP Exec Midnight 15.6" Backpack	1KM16AA
	HP Exec Midnight 15.6" Top Load	1KM15AA
<b>Docking</b>	HP Thunderbolt Dock 120W G2	2UK37AA
	HP USB-C Universal Dock	1MK33AA
	HP UltraSlim Docking Station	D9Y32AA
	HP USB-C Dock G4	3FF69AA
	HP USB-C Mini Dock	1PM64AA
<b>Input/Output</b>	HP Slim Wireless Keyboard and Mouse	T6L04AA
	HP Slim USB Keyboard and Mouse	T6T83AA
	HP Wireless (Link-5) Keyboard	T6U20AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP Ultra Mobile Wireless Mouse	H6F25AA
	HP Slim Bluetooth Mouse	F3J92AA
	HP Wireless Premium Mouse	1JR31AA
	HP USB Premium Mouse	1JR32AA
	HP Elite Presenter Mouse	2CE30AA
	HP USB-C to USB-A Hub	Z6A00AA
	HP DisplayPort to DVI Adapter	F7W96AA
	HP DisplayPort to VGA	F7W97AA
	HP DisplayPort to HDMI 1.4 Adapter	F3W43AA
	HP USB-C to HDMI 2.0	1WC36AA
	HP Stereo 3.5mm Headset	T1A66AA
HP Stereo USB Headset	T1A67AA	
<b>Power</b>	HP 65W Slim AC Adapter	H6Y82AA
	HP 90W Slim AC Adapter	H6Y83AA
	HP 90W Slim Combo AC Adapter w/ USB	H6Y84AA
	HP 45W USB-C Power Adapter	1HE07AA
	HP 65W USB-C Power Adapter	1HE08AA
	HP Notebook Power Bank	N9F71AA
	HP USB-C Notebook Power Bank	1TZ86AA
	HP TA03XL Rechargeable Battery	1FN06AA
<b>Storage</b>	HP USB External DVDRW Drive	F2B56AA
	HP 500GB 7200rpm HDD	F3B97AA
	HP 256GB M2 PCIe NVME SSD TLC (2280)	1FU87AA
	HP 512GB M2 PCIe NVME SSD TLC (2280)	1FU88AA



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

<b>Memory</b>	HP 4GB 2400MHz DDR4 Memory	Z4Y84AA
	HP 8GB 2400MHz DDR4 Memory	Z4Y85AA
	HP 16GB 2400MHz DDR4 Memory	Z4Y86AA
<b>Security</b>	HP Docking Station Cable Lock	AU656AA
	HP Combination Lock	TOY15AA
	HP Keyed Cable lock	TOY14AA
	HP Keyed Cable Lock 10mm	T1A62AA
	HP Dual Head Keyed Cable Lock	T1A64AA
	HP 14.1 Privacy Filter	V8Z57AA
<b>UCC</b>	HP USB Collaboration Keyboard	Z9N38AA
	HP Wireless Collaboration Keyboard	Z9N39AA
	HP UC Speaker Phone	K7V16AA
	HP UC Wired Headset	K7V17AA
	HP UC Wireless Mono Headset	W3K08AA
	HP UC Wireless Duo Headset	W3K09AA

---

### Summary of Changes

Date of change:	Version History:		Description of change:
May 8, 2018	V1 to V2	Added	Environmental tab
July 23, 2018	V2 to V3	Update	Software section

Copyright © 2018 HP Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products are set forth in the express limited warranty statements accompanying such products. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Bluetooth is a trademark of its proprietor and used by HP Inc. under license. Intel, Core, Thunderbolt and Intel vPro are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries. USB Type-C™ and USB-C™ are trademarks of USB Implementers Forum. SD, SDHC and SDXC are registered trademarks of SD-3C in the United States, other countries or both. DisplayPort™ and the DisplayPort™ logo are trademarks owned by the Video Electronics Standards Association (VESA®) in the United States and other countries. ENERGY STAR is a registered trademark of the U.S. Environmental Protection Agency. All other trademarks are the property of their respective owners.