

### Overview

### HP EliteBook 835 13 inch G10 Notebook PC



#### Left

- |                                    |   |
|------------------------------------|---|
| 1. Internal Microphones (2)        | 8. Glass Clickpad                                       |
| 2. Ambient Light Sensor (Optional) | 9. Smartcard Reader (Optional)                          |
| 3. Webcam                          | 10. LED Indicator                                       |
| 4. Camera Shutter                  | 11. USB4 Type-C® (USB Power Delivery, DisplayPort™ 1.4) |
| 5. IR Camera (Optional)            | 12. USB4 Type-C® (USB Power Delivery, DisplayPort™ 1.4) |
| 6. IR Camera LEDs (Optional)       | 13. SuperSpeed USB Type-A 5Gbps signaling rate          |
| 7. NFC Sensor                      | 14. HDMI 2.1 Port (Cable not included)                  |

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

### Overview



#### Right

- |  |   |
|--|---|
| 1. Power Button Key  | 4. Nano Security Lock Slot (Lock sold separately) |
| 2. Audio Combo Jack  | 5. SIM Card Slot (Optional)                       |
| 3. SuperSpeed USB Type-A 5Gbps signaling rate (Charging) (USB 3.2 Gen 1) | 6. Touch Fingerprint Sensor (Select models)       |

### Overview

#### At a Glance

- Premium ultraslim design with precision-crafted all-metal chassis for a premium look and feel
- Latest AMD® Ryzen PRO and non-PRO 7000 U and HS series processors
- Preinstalled with Windows 11 versions or FreeDOS
- New 16:10 ratio screen reduces the need to scroll by showing more vertical content than 16:9
- Optional ultrabright displays with HP Eye Ease, ambient light and ambient color sensors
- New 5MP camera4 with HP Auto Frame8 allows you around a little without losing viewers' attention during video calls
- New LPDDR5 6400 memory and PCI Gen4 SSDs provide fast access to your work.
- Choice of displays:
  - 33.8 cm (13.3") diagonal WUXGA IPS Anti-Glare LED-backlit non-touch, 250 nits, 45% NTSC
  - 33.8 cm (13.3") diagonal WUXGA IPS Anti-Glare On-Cell LED-backlit touch, 250 nits, 45% NTSC
  - 33.8 cm (13.3") diagonal WUXGA IPS Anti-Glare LED-backlit non-touch, 400 nits, 100% sRGB
  - 33.8 cm (13.3") diagonal WUXGA IPS Anti-Glare LED-backlit non-touch, 1000 nits, 100% sRGB with HP Sure View Reflect
- Redesigned keyboard layout to include easy use of discrete PgUp/Dn, End, and Home keys
- Choose from 38Whr or 51Whr battery options
- HP Wolf Security for Business creates a hardware-enforced, always-on, resilient defense.
- Larger Clickpad surface for easier, more intuitive input
- Connectivity with optional 4G LTE WWAN available, and USB-C Docking (Dock sold separately)
- Undergoes MIL-STD 810H tests<sup>1</sup>
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles
- Larger Clickpad surface for easier, more intuitive input
- Can be wiped up to 10,000 times with germicidal cleaning wipes<sup>2</sup>

1. MIL-STD 810H is not intended to demonstrate fitness of U.S. Department of Defense contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Accidental damage requires an optional HP Accidental Damage Protection Care Pack.

2. Approved germicidal wipes for use on Select HP Platforms

<https://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA7-9819ENW>

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

### Technical Specifications

#### PRODUCT NAME

HP EliteBook 835 13 inch G10 Notebook PC

#### OPERATING SYSTEMS

##### Preinstalled

Windows 11 Pro <sup>1</sup>  
 Windows 11 Pro Education <sup>1</sup>  
 Windows 11 Home - HP recommends Windows 11 Pro for Business<sup>1</sup>  
 Windows 11 Home Single Language – HP recommends Windows 11 Pro for Business <sup>1</sup>  
 Windows 11 Pro (Windows 11 Enterprise or Windows 10 Enterprise available with a Volume Licensing Agreement) <sup>1</sup>  
 Windows 11 Pro (preinstalled with Windows 10 Pro Downgrade) <sup>1,2</sup>  
 FreeDOS

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

2. This system is preinstalled with Windows 10 Pro software and also comes with a license for Windows 11 Pro software and provision for recovery software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

#### PROCESSORS

Processor <sup>3,4,5,6</sup>	Cores	Threads	L3 Cache	Max Boost Frequency <sup>5</sup>	Base Frequency	Pro
Next Generation AMD Ryzen™ Processors						

#### CHIPSET

Chipset is integrated with processor

## Technical Specifications

### GRAPHICS

#### Integrated

AMD Radeon™ Graphics<sup>7</sup>

#### Supports

Support HW decode, DX12, HDMI 2.1, HDCP 2.3

[7. HD content required to view HD images.](#)

### DISPLAY

#### Non-Touch

33.8 cm (13.3") diagonal WUXGA Bent, anti-glare UWVA, 250 nits, 45% NTSC for 5MP camera (1920 x 1200) <sup>7,8</sup>

33.8 cm (13.3") diagonal WUXGA Bent, anti-glare UWVA, 250 nits, 45% NTSC for 5MP+IR camera (1920 x 1200) <sup>7,8</sup>

33.8 cm (13.3") diagonal WUXGA Bent, anti-glare UWVA, 250 nits, 45% NTSC for WWAN (1920 x 1200) <sup>7,8</sup>

33.8 cm (13.3") diagonal WUXGA Bent, anti-glare UWVA, 250 nits, 45% NTSC for 5MP camera for WWAN (1920 x 1200) <sup>7,8</sup>

33.8 cm (13.3") diagonal WUXGA Bent, anti-glare UWVA, 250 nits, 45% NTSC for 5MP+IR camera for WWAN (1920 x 1200) <sup>7,8</sup>

33.8 cm (13.3") diagonal WUXGA Bent, anti-glare UWVA eDP1.2, micro-edge, 250 nits, 45% NTSC, Narrow Bezel (1920 x 1200) <sup>7,8</sup>

33.8 cm (13.3") diagonal WUXGA Bent, Low Blue Light, anti-glare UWVA eDP+PSR, 400 nits, 100% sRGB, Low Power, Ambient Light Sensor+Ambient Color Sensor for 5MP Camera (1920 x 1200) with HP Eye Ease <sup>7,8</sup>

33.8 cm (13.3") diagonal WUXGA Bent, Low Blue Light, anti-glare UWVA eDP+PSR, 400 nits, 100% sRGB, Low Power, Ambient Light Senso for 5MP+IR Camera (1920 x 1200) with HP Eye Ease <sup>7,8</sup>

33.8 cm (13.3") diagonal WUXGA Bent, Low Blue Light, anti-glare UWVA eDP+PSR, 400 nits, 100% sRGB, Low Power, Ambient Light Sensor for 5MP+IR Camera for WWAN (1920 x 1200) with HP Eye Ease <sup>7,8</sup>

33.8 cm (13.3") diagonal WUXGA Bent, Low Blue Light, anti-glare UWVA eDP+PSR, 1000 nits, 100% sRGB with HP Sure View Reflect integrated privacy screen, Ambient Light Sensor for 5MP camera (1920 x 1200) with HP Eye Ease <sup>7,8,9,10</sup>

33.8 cm (13.3") diagonal WUXGA Bent, Low Blue Light, anti-glare UWVA eDP+PSR, 1000 nits, 100% sRGB with HP Sure View Reflect integrated privacy screen, Ambient Light Sensor for 5MP+IR camera (1920 x 1200) with HP Eye Ease <sup>7,8,9,10</sup>

33.8 cm (13.3") diagonal WUXGA Bent, Low Blue Light, anti-glare UWVA eDP1.3+PSR, 1000 nits, 100% sRGB with HP Sure View Reflect integrated privacy screen, Ambient Light Sensor for 5MP+IR camera for WWAN (1920 x 1200) with HP Eye Ease <sup>7,8,9,10</sup>

#### Touch

33.8 cm (13.3") diagonal WUXGA Bent, anti-glare UWVA, 250 nits, 45% NTSC for 5MP+IR camera Touch on Panel (1920 x 1200) <sup>7,8,10</sup>

33.8 cm (13.3") diagonal WUXGA Bent, anti-glare UWVA, 250 nits, 45% NTSC for 5MP+IR camera for WWAN Touch on Panel (1920 x 1200) <sup>7,8,10</sup>

#### DisplayPort™ 1.2

Support HW decode, DX12, HDMI 2.1, HDCP 2.3 via HDMI/DP up to 4K@60Hz

#### Displays support

Supports 4 independent displays through the dock.

#### Display Size (Diagonal)

13.3"

### Technical Specifications

33.8 cm (13.3")

7. HD content required to view HD images.
8. Resolutions are dependent upon monitor capability, and resolution and color depth settings.
9. HP Sure View Reflect integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
10. Actual brightness will be lower with touchscreen or Sure View.

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### DOCKING (Sold Separately)

<b>Docking station model #1</b>	HP Thunderbolt 120W G4 Dock
<b>Docking station model #2</b>	HP Thunderbolt 280W G4 Dock
<b>Docking station model #3</b>	HP USB-C Dock G5
<b>Docking station model #4</b>	HP USB-C/A Universal Dock G2
<b>Docking station model #5</b>	HP USB-C G5 Essential Dock

For additional aftermarket options and docking specs please see page 40.

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### STORAGE AND DRIVES

#### Primary M.2 Storage

- 2 TB PCIe® 2280 NVMe™ TLC SSD <sup>11</sup>
- 1 TB PCIe® 2280 OPAL2 NVMe™ TLC SSD <sup>11</sup>
- 1 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC <sup>11,51</sup>
- 512 GB PCIe® 2280 OPAL2 NVMe TLC SSD <sup>11</sup>
- 512 GB PCIe® NVMe™ Value SSD <sup>11</sup>
- 512 GB PCIe® NVMe™ TLC SSD <sup>11</sup>
- 256 GB PCIe® 2280 OPAL2 NVMe Val SSD <sup>11</sup>
- 256 GB PCIe® NVMe™ TLC SSD <sup>11</sup>

11. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10 and 11) is reserved for system recovery software.

51. Available only to HK (Hong Kong), TW (Taiwan) and CN (China).

## Technical Specifications

### MEMORY

**Maximum Memory**64Gb LPDDR5-6400 <sup>12</sup>**Memory**32Gb LPDDR5-6400 <sup>12</sup>16Gb LPDDR5-6400 <sup>12</sup>

12. 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**Mediatek RZ616 Wi-Fi 6E Bluetooth® 5.3 AIM-T WLAN Wireless Card <sup>13</sup>Realtek 8852CE Wi-Fi 6E + Bluetooth® 5.3 M.2 2230 PCI-e+ USB WLAN Wireless Card <sup>13</sup>**WWAN**Intel® XMM 7560 R+ LTE-Advanced Pro WWA <sup>14</sup>Intel® 5000 5G Solution WWAN <sup>14,15</sup>**NFC**

NFC Mirage WNC XRAV-1

**Miracast**Native Miracast Support <sup>16</sup>

13. Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported.

14. WWAN module is optional, must be configured at the factory, requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.

15. Intel® 5G module is optional and must be configured at the factory. Module designed for 5G NR NSA (non-standalone) networks as carriers deploy Evolved-Universal Terrestrial Radio Access New Radio Dual Connectivity (ENDC) with both 100MHz of 5G NR and LTE channel bandwidth, using 256QAM 4x4 as defined by 3GPP. Module requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Data connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. Backwards compatible to 4G LTE and 3G HSPA technologies. 5G module planned to be available in select platforms and select countries, where carrier supported.

16. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.

### Technical Specifications

#### AUDIO/MULTIMEDIA

##### Audio

Audio by Bang & Olufsen

2 Integrated stereo speakers

Integrated dual array microphone

##### Speaker Power

2W/4ohm Per speaker

##### Camera

Dual Array Digital Microphone 5MP USB2 Wide-field of View Integrated Camera

Dual Array Digital Microphone 5MP USB2 Infrared Wide-field of View Integrated Camera

5 MP + IR camera for face authentication with Windows Hello

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

##### Keyboard

HP Premium Keyboard, spill resistant with optional Backlit keyboard <sup>17</sup>

##### Pointing Device

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

##### Function Keys

F1 - Display Switching

F2 - Blank or Privacy

F3 - Brightness Down

F4 - Brightness Up

F5 - Audio Mute

F6 - Volume Down

F7 - Volume Up

F8 - Mic Mute

F9 - Blank or Backlit Toggle

F10 - Insert

F11 - Airplane Mode

F12 - HP Command Center (Programmable Key)

Print Screen

Power Button (with LED)

##### Hidden Function Keys

Fn+R - Break

Fn+S - Sys Rq

Fn+C - Scroll Lock

[17. Backlit keyboard is an optional feature.](#)

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### Technical Specifications

#### SOFTWARE AND SECURITY

##### Preinstalled Software

###### Software

HP Easy Clean <sup>18</sup>

HP PC Hardware Diagnostics Windows

myHP

HP Smart Support <sup>19</sup>

HP Services Scan <sup>20</sup>

HP Connection Optimizer

HP Hotkey Support

HP Support Assistant <sup>21</sup>

HP Notifications

HP Privacy Settings

HP Power Manager<sup>22</sup>

Microsoft Office (Sold separately and requires Internet access for activation)

##### Manageability Features

HP Connect <sup>23</sup>

HP Image Assistant Gen5 (download)

HP Manageability Integration Kit (download) <sup>24</sup>

HP Client Management Script Library (download)

HP Patch Assistant (download) <sup>25</sup>

HP Driver Packs (download)

HP Client Catalog (download)

HP Cloud Recovery <sup>26</sup>

##### Security Management

HP Wolf Security for Business <sup>27</sup> includes:

HP Sure Click <sup>28</sup>

HP Sure Sense <sup>29</sup>

HP Sure Run <sup>30</sup>

HP Sure Recover <sup>31</sup>

HP Sure Start <sup>32</sup>

HP Tamper Lock<sup>33</sup>

HP Sure Admin <sup>34</sup>

##### BIOS

HP BIOSphere Gen6 <sup>35</sup>

HP Secure Erase <sup>36</sup>

Absolute Persistence Module <sup>37</sup>

BIOS Update via Network

HP Wake on WLAN

Secured-Core PC Enable <sup>38</sup>

TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)

HP Fingerprint Sensor <sup>39</sup>

##### Security

###### TPM

Model: Nuvoton NPCT760HABYX

## Technical Specifications

Version: 7.2.3.1

Revision: TPM 2.0

FIPS 140-2 Compliant: Yes

### Smartcard Reader

Model number: Alcor AU9560

FIPS 201 Compliant: Yes

### IPv6 Support

Yes

### FirstNet Certified

Yes

### The BIOS on this notebook implements ISO/IEC 19678:2015 guidelines (formerly NIST 800-147).

UEFI version: 2.7

Class: 3

18. HP Easy Clean requires Windows 10 RS3 and higher and will disable the keyboard, touchscreen, and clickpad only. Ports are not disabled. See user guide for cleaning instructions

19. HP Smart Support requires HP TechPulse to be installed. For more information about how to enable or to download HP Smart Support, please visit <http://www.hp.com/smart-support>.

20. HP Services Scan is provided with Windows Update on select products and will check entitlement on each hardware device to determine if an HP TechPulse-enabled service has been purchased, and will download applicable software automatically. HP TechPulse is a telemetry and analytics platform that provides critical data around devices and applications and is not sold as a standalone service. HP TechPulse follows stringent GDPR privacy regulations and is ISO27001, ISO27701, ISO27017 and SOC2 Type2 certified for Information Security. Internet access with connection to TechPulse portal is required. For full system requirements or to disable this feature, please visit <http://www.hpdaas.com/requirements>. Not applicable in China.

21. HP Support Assistance requires Windows and Internet Access

22. HP Power Manager requires Windows 10 and higher and can be downloaded from the Microsoft Store

23. HP Connect for Microsoft Endpoint Manager is available from the Azure Market Place for HP Pro, Elite, Z and Point-of-Sale PCs managed with Microsoft Endpoint Manager. Subscription to Microsoft Endpoint Manager required and sold separately. Network connection required.

24. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

25. HP Patch Assistant available on select HP PCs with the HP Manageability Kit that are managed through Microsoft System Center Configuration Manager. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

26. HP Cloud Recovery is available for Z by HP, HP Elite and Pro desktops and laptops PCs with Intel® or AMD processors and requires an open, wired network connection. **NOTE:** You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Details please refer to: <https://support.hp.com/us-en/document/c05115630>.

27. HP Wolf Security for Business requires Windows 10 or higher, includes various HP security features and is available on HP Pro, Elite, RPOS and Workstation products. See product details for included security features and OS requirement.

28. HP Sure Click requires Windows 10 Pro or higher or Enterprise. See [https://bit.ly/2PrLT6A\\_SureClick](https://bit.ly/2PrLT6A_SureClick) for complete details.

29. HP Sure Sense is available on select HP PCs with Windows 10 Pro, Windows 10 Enterprise, Windows 11 Pro, or Windows 11 Enterprise OS

30. HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 and higher.

### Technical Specifications

31. HP Sure Recover Gen5 with Embedded Reimaging is an optional feature which requires Windows 10 and higher must be configured at purchase. You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Network based recovery using Wi-Fi is only available on PCs with Intel Wi-Fi Module
  32. HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 and higher
  33. HP Tamper Lock must be enabled by the customer or your administrator
  34. HP Sure Admin requires Windows 10 or higher, HP BIOS, HP Manageability Integration Kit from <http://www.hp.com/go/clientmanagement> and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store
  35. HP BIOSphere Gen6 features may vary depending on the platform and configuration.
  36. HP Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.
  37. Absolute firmware module is shipped turned off and can only be activated with the purchase a license subscription and full activation of the software agent. License subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. Certain conditions apply. For full details visit: <https://www.absolute.com/about/legal/agreements/absolute/>
  38. Secured-Core PC Enable requires an Intel® vPro®, AMD Ryzen™ Pro processor or Qualcomm® processor with SD850 or higher and requires 8 GB or more system memory. Secured-core PC is enabled from the factory.
  39. HP Fingerprint sensor is an optional feature that must be configured at purchase.
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### Technical Specifications

#### POWER

##### Power Supply

HP Smart 65 W USB Type-C® adapter <sup>40</sup>

##### Battery

HP Long Life 3-cell, 38 Wh Polymer <sup>41,42</sup>

HP Long Life 3-cell, 51 Wh Polymer <sup>41,42</sup>

##### Power Cord

3-wire plug - 1m <sup>40</sup>

2-wire plug - 1m<sup>40</sup>

##### Battery Life

Up to XX <sup>43</sup>

40. Availability may vary by country.

41. Battery is internal and not replaceable by customer. Serviceable by warranty.

42. Actual battery Watt-hours (Wh) will vary from design capacity. Battery capacity will naturally decrease with shelf life, time, usage, environment, temperature, system configuration, loaded apps, features, power management settings and other factors.

43. MM18 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See [www.bapco.com](http://www.bapco.com) for additional details.

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#### WEIGHTS & DIMENSIONS

##### Product Weight <sup>44</sup>

Starting at 2.93lb

Starting at 1.33kg

##### Product Dimensions (W x D x H)

11.81 x 8.46 x 0.76 in

30.01 x 21.48 x 1.92 cm

##### Packaging Dimensions (W x D x H) <sup>45</sup>

12"-15" boxes (305mm height): 1200mm x 1000mm x 1080mm

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

45. Product packaging size varies based on options chosen. Please contact your HP representative for your packaging size details.

### Technical Specifications

#### PORTS/SLOTS

- 2 USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)<sup>46</sup>
- 2 Super Speed USB Type-A 5Gbps signaling rate (1 charging)
- 1 HDMI 2.1<sup>47</sup>
- 1 Headphone/microphone combo jack

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

47. HDMI cable sold separately.

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#### SERVICE AND SUPPORT

1-year warranty and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty. Refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>.<sup>48</sup>

48. 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.

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### Technical Specifications

#### SYSTEM UNIT

**Stand-Alone Power Requirements** Type-C Adapter

**(AC Power)**

Nominal Operating Voltage AC 20V

Average Operating Power

Integrated graphics Yes

Discrete Graphics N/A

Max Operating Power 65W

**Temperature**

Operating 32° to 95° F (0° to 35° C)  
(No sustained direct exposure to sunlight)  
(System performance may be reduced above 32°C (89.6°F))

Non-operating -4° to 140° F (-20° to 60° C)

**Relative Humidity**

Operating 10% to 90% (non-condensing)

Non-operating 5% to 95%  
(38.7° C (101.6° F) maximum wet bulb tempera-ture; non-condensing)

**Shock**

Operating 40 G, 2 ms, half-sine

Non-operating 200 G, 2 ms, half-sine

**Random Vibration**

Operating 1.043 grams

Non-operating 3.5 grams

**Altitude (unpressurized)**

Operating 10,000 ft (3,048 m)

Non-operating 40,000 ft (12,192 m)

**Planned Industry Standard**

**Certifications**

Regulatory Model Number HSN-I49C

CSA/UL 62368-1 Yes

ENERGY STAR® Yes <sup>49</sup>

EPEAT® EPEAT® Gold in the United States <sup>50</sup>

FCC/ICES/CISPR/VCCI Yes

CE MARKING Yes

64Gb LPPDR GS Mark Yes

Related commodity should comply with ISO 9241 Standards.

China CCC/SRRC Yes

Taiwan BSMI/NCC Yes

Korea KCC/KC/KES Yes

Ukraine NSoC/TEC Yes

EAEU Compliance Yes

Saudi Arabian Compliance Yes

TCO Yes

Low Blue Light Yes

WW RoHS Yes



### Technical Specifications

49. Configurations of the HP EliteBook 835 13 inch G10 Notebook PC that are ENERGY STAR® qualified are identified as HP EliteBook 835 13 inch G10 Notebook PC ENERGY STAR on HP websites and on <http://www.energystar.gov>.

50. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. EPEAT® status varies by country. Visit <http://www.epeat.net> for more information.

#### DISPLAYS

1. Actual brightness will be lower with touchscreen or HP Sure View.

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

<b>13.3 in WUXGA (1920 x 1200) Anti-Glare UWVA LED NTSC NB2X 250 eDP 1.2 w/o PSR 45 bent LCD Panel</b>	<b>Outline Dimensions (W x H x D)</b>	292.040 x 189.830 (max)
	<b>Active Area</b>	286.040 x 178.780 (typ)
	<b>Weight</b>	280g (max)
	<b>Diagonal Size</b>	13.3
	<b>Surface Treatment</b>	Anti-Glare
	<b>Touch Enabled</b>	No
	<b>Contrast Ratio</b>	1000:1 (typ)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	250 nits <sup>1</sup>
	<b>Pixel Resolution - Format</b>	1920 x 1200 (WUXGA)
	<b>Backlight</b>	WLED
	<b>Pixel Resolution</b>	RGB
	<b>Color Gamut Coverage</b>	NTSC 45%
	<b>Color Depth</b>	8
	<b>Viewing Angle</b>	UWVA 89/89/89/89
<b>Low Blue Light</b>	No	
<b>Power Consumption (W, EBL@ 150nits max/ 200nits max)</b>	2.26 (max) / 2.78 (max)	

<b>13.3 in WUXGA (1920 x 1200) Anti-Glare UWVA LED NTSC NB2X 250 TOP eDP 1.2 w/o PSR 45 bent LCD Panel</b>	<b>Outline Dimensions (W x H x D)</b>	292.040 x 189.830 (max)
	<b>Active Area</b>	286.040 x 178.780 (typ)
	<b>Weight</b>	280g (max)
	<b>Diagonal Size</b>	13.3
	<b>Surface Treatment</b>	Anti-Glare
	<b>Touch Enabled</b>	Yes <sup>1</sup>
	<b>Contrast Ratio</b>	800:1 (typ)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	250 nits <sup>1</sup>
	<b>Pixel Resolution - Format</b>	1920 x 1200 (WUXGA)
	<b>Backlight</b>	WLED

## Technical Specifications

<b>Pixel Resolution</b>	RGB
<b>Color Gamut Coverage</b>	NTSC 45%
<b>Color Depth</b>	8
<b>Viewing Angle</b>	UWVA 89/89/89/89
<b>Low Blue Light</b>	No
<b>Power Consumption (W, EBL@ 150nits max/ 200nits max)</b>	2.39 (max) / 2.94 (max)

<b>13.3 in WUXGA (1920 x 1200) Anti-Glare UWVA WLED+LBL sRGB NB2X 400 eDP 1.4+PSR2 Low-Power 100 bent LCD Panel</b>	<b>Outline Dimensions (W x H x D)</b>	292.040 x 189.830 (max)
	<b>Active Area</b>	286.040 x 178.780 (typ)
	<b>Weight</b>	185g (max)
	<b>Diagonal Size</b>	13.3
	<b>Surface Treatment</b>	Anti-Glare
	<b>Touch Enabled</b>	No
	<b>Contrast Ratio</b>	1200:1(typ)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	400 nits <sup>1</sup>
	<b>Pixel Resolution - Format</b>	1920 x 1200 (WUXGA)
	<b>Backlight</b>	WLED
	<b>Pixel Resolution</b>	RGB
	<b>Color Gamut Coverage</b>	sRGB 100%
	<b>Color Depth</b>	8
	<b>Viewing Angle</b>	UWVA 89/89/89/89
	<b>Low Blue Light</b>	Yes
<b>Power Consumption (W, EBL@ 150nits max/ 200nits max)</b>	1.21 (max) / 1.45 (max)	

<b>13.3 in WUXGA (1920 x 1200) Anti-Glare UWVA WLED+LBL sRGB NB2Y 1000 eDP 1.3+PSR 100 PrivacyG4 Plus bent LCD Panel</b>	<b>Outline Dimensions (W x H x D)</b>	291.380 x 188.640 (max)
	<b>Active Area</b>	286.080 x 178.800 (typ)
	<b>Weight</b>	210g (max)
	<b>Diagonal Size</b>	13.3
	<b>Surface Treatment</b>	Anti-Glare
	<b>Touch Enabled</b>	No
	<b>Contrast Ratio</b>	1500:1 (typ)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	1000 nits <sup>1</sup>
	<b>Pixel Resolution - Format</b>	1920 x 1200 (WUXGA)
	<b>Backlight</b>	WLED
	<b>Pixel Resolution</b>	RGB



### Technical Specifications

<b>Color Gamut Coverage</b>	sRGB 100%
<b>Color Depth</b>	8
<b>Viewing Angle</b>	UWVA 85/85/85/85
<b>Low Blue Light</b>	Yes
<b>Power Consumption (W, EBL@ 150nits max/ 200nits max)</b>	N/A

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## Technical Specifications

**STORAGE AND DRIVES**

For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10 and 11) is reserved for system recovery software.

<b>SSD 512GB 2280 PCIe-4x4 NVMe Three Layer Cell</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	512GB
	<b>NAND Type</b>	TLC
	<b>Interface</b>	PCIe NVMe Gen4X4
	<b>Maximum Sequential Read</b>	6400 MB/s $\pm$ 20%
	<b>Maximum Sequential Write</b>	3500 MB/s $\pm$ 20%
	<b>Logical Blocks</b>	1,000,215,215
	<b>Features</b>	Pyrite 2.0; TRIM; L1.2

<b>SSD 1TB 2280 PCIe-4x4 NVMe Three Layer Cell <sup>1</sup></b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	1TB
	<b>NAND Type</b>	TLC
	<b>Interface</b>	PCIe NVMe Gen4X4
	<b>Maximum Sequential Read</b>	3200 MB/s $\pm$ 20%
	<b>Maximum Sequential Write</b>	2700 MB/s $\pm$ 20%
	<b>Logical Blocks</b>	2,000,409,264
	<b>Features</b>	Pyrite 2.0; TRIM; L1.2

1. Available only to HK (Hong Kong), TW (Taiwan) and CN (China).

<b>SSD 2TB 2280 PCIe-4x4 NVMe Three Layer Cell</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	2TB
	<b>NAND Type</b>	TLC
	<b>Interface</b>	PCIe NVMe Gen4X4
	<b>Maximum Sequential Read</b>	6400 MB/s $\pm$ 20%
	<b>Maximum Sequential Write</b>	5000 MB/s $\pm$ 20%
	<b>Logical Blocks</b>	4,000,797,360
	<b>Features</b>	Pyrite 2.0; TRIM; L1.2

<b>256GB PCIe 2280 NVMe Self Encrypted OPAL2 Value Solid State Drive</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	256GB
	<b>NAND Type</b>	TLC
	<b>Interface</b>	PCIe NVMe Gen4X4
	<b>Maximum Sequential Read</b>	2000 MB/s $\pm$ 20%
	<b>Maximum Sequential Write</b>	900 MB/s $\pm$ 20%
	<b>Logical Blocks</b>	500,118,192
	<b>Features</b>	TCG Opal 2.0; TRIM; L1.2

## Technical Specifications

<b>512GB PCIe-4x4 2280 NVMe Self Encrypted OPAL2 Three Layer Cell Solid State Drive</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	512GB
	<b>NAND Type</b>	TLC
	<b>Interface</b>	PCIe NVMe Gen4X4
	<b>Maximum Sequential Read</b>	6400 MB/s $\pm$ 20%
	<b>Maximum Sequential Write</b>	3500 MB/s $\pm$ 20%
	<b>Logical Blocks</b>	1,000,215,215
	<b>Features</b>	TCG Opal 2.0; TRIM; L1.2

<b>1TB PCIe-4x4 2280 NVMe Self Encrypted OPAL2 Three Layer Cell Solid State Drive</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	1TB
	<b>NAND Type</b>	TLC
	<b>Interface</b>	PCIe NVMe Gen4X4
	<b>Maximum Sequential Read</b>	6400 MB/s $\pm$ 20%
	<b>Maximum Sequential Write</b>	5000 MB/s $\pm$ 20%
	<b>Logical Blocks</b>	2,000,409,264
	<b>Features</b>	TCG Opal 2.0; TRIM; L1.2

<b>SSD 256GB 2280 PCIe NVMe Value</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	256 GB
	<b>NAND Type</b>	TLC
	<b>Interface</b>	PCIe NVMe Gen4X4
	<b>Maximum Sequential Read</b>	2000 MB/s $\pm$ 20%
	<b>Maximum Sequential Write</b>	900 MB/s $\pm$ 20%
	<b>Logical Blocks</b>	500,118,192
	<b>Features</b>	Pyrite 2.0; TRIM; L1.2

<b>SSD 512GB 2280 PCIe NVMe Value</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	512 GB
	<b>NAND Type</b>	TLC
	<b>Interface</b>	PCIe NVMe Gen4X4
	<b>Maximum Sequential Read</b>	2200 MB/s $\pm$ 20%
	<b>Maximum Sequential Write</b>	1000 MB/s $\pm$ 20%
	<b>Logical Blocks</b>	1,000,215,215
	<b>Features</b>	Pyrite 2.0; TRIM; L1.2

### Technical Specifications

#### NETWORKING/COMMUNICATIONS

<b>Realtek RTL8852CE 802.11ax 2x2 Wi-Fi 6E + Bluetooth® 5.3 Wireless Card<sup>1</sup> (802.11ax 2x2, supporting gigabit data rate)</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k
	<b>Interoperability</b>	Wi-Fi certified
	<b>Frequency Band</b>	<ul style="list-style-type: none"> <li>•802.11b/g/n/ax 2.402 – 2.482 GHz</li> <li>•802.11a/n/ac/ax 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, (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> <li>• 802.11ax : MCS0 ~ MCS11, (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> </ul>
	<b>Modulation</b>	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
	<b>Security<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• IEEE and WiFi certified 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>• WPA3 (personal) certification</li> <li>• IEEE 802.11i</li> <li>• WAPI</li> <li>• EAP</li> </ul>
	<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
	<b>Output Power<sup>3</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b : +17dBm minimum</li> <li>• 802.11g : +16dBm minimum</li> <li>• 802.11a : +17dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +14dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +13dBm minimum</li> <li>• 802.11n HT20(5GHz) : +14dBm minimum</li> <li>• 802.11n HT40(5GHz) : +13dBm minimum</li> </ul>

### Technical Specifications

	<ul style="list-style-type: none"> <li>• 802.11ac VHT80(5GHz) : +10dBm minimum</li> <li>• 802.11ac VHT160(5GHz) : +10dBm minimum</li> <li>• 802.11ax HE40(2.4GHz) : +12dBm minimum</li> <li>• 802.11ax HE80(5GHz) : +10dBm minimum</li> <li>• 802.11ax HE160(5GHz) : +10dBm minimum</li> <li>• 802.11ax HE80(6GHz) : +10dBm minimum</li> <li>• 802.11ax HE160(6GHz) : +10dBm minimum</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode :2.5 W</li> <li>• Receive mode :2 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode :50 mW (WLAN unassociated)</li> <li>• Connected Standby/Modern Standby: 10mW</li> <li>• Radio disabled: 8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	<ul style="list-style-type: none"> <li>•802.11b, 1Mbps : -93.5dBm maximum</li> <li>•802.11b, 11Mbps : -84dBm maximum</li> <li>•802.11a/g, 6Mbps : -86dBm maximum</li> <li>•802.11a/g, 54Mbps : -72dBm maximum</li> <li>•802.11n, MCS07 : -67dBm maximum</li> <li>•802.11n, MCS15 : -64dBm maximum</li> <li>•802.11ac, MCS0(VHT80) : -84dBm maximum</li> <li>•802.11ac, MCS9(VHT80) : -59dBm maximum</li> <li>•802.11ac, MCS9(VHT160) : -58.5dBm maximum</li> <li>•802.11ax, MCS11(HE40): -57dBm maximum</li> <li>•802.11ax, MCS11(HE80): -54dBm maximum</li> <li>•802.11ax, MCS11(HE160): -53.5dBm maximum</li> </ul>
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
<b>Form Factor</b>	PCI-Express M.2 MiniCard
<b>Dimensions</b>	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
<b>Weight</b>	1. Type 2230 : 2.8g 2. Type 1216: 1.3g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	<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 60% (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>	N/A

#### HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Card

**Bluetooth Specification** 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Compliant

## Technical Specifications

<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
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Link Topology</b>	
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.407
<b>Power Management</b>	ETS 300 328 Low Voltage Directive
<b>Certifications</b>	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) BT5.2 ESR9/10 Compliance LE Advertisement Extensions Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising 2Mbps LE LE Long Range Windows BT profiles support

### Technical Specifications

BT5.3

Periodic Advertisement interval

Encryption key size control enhancements

1. Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported. Wi-Fi 6E is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.
  2. Check latest software/driver release for updates on supported security features.
  3. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
  4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
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### Technical Specifications

<p><b>Mediatek RZ616 Wi-Fi 6E + Bluetooth® 5.3 Wireless Card<sup>1</sup> (802.11ax 2x2, supporting gigabit data rate)</b></p>	<p><b>Wireless LAN Standards</b></p> <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> <li>IEEE 802.11ax</li> <li>IEEE 802.11d</li> <li>IEEE 802.11e</li> <li>IEEE 802.11h</li> <li>IEEE 802.11i</li> <li>IEEE 802.11j</li> <li>IEEE 802.11k</li> <li>IEEE 802.11mc</li> <li>IEEE 802.11r</li> <li>IEEE 802.11v</li> <li>IEEE 802.11w</li> </ul>
<p><b>Interoperability</b></p>	<p>Wi-Fi certified</p>
<p><b>Frequency Band</b></p>	<ul style="list-style-type: none"> <li>•802.11b/g/n/ax 2.402 – 2.482 GHz</li> <li>•802.11a/n/ac/ax 5.15 – 5.25 GHz 5.25 – 5.35 GHz 5.47 – 5.725 GHz 5.825 – 5.850 GHz 5.925 – 7.125 GHz</li> </ul>
<p><b>Data Rates</b></p>	<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, (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> <li>• 802.11ax : MCS0 ~ MCS11, (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> </ul>
<p><b>Modulation</b></p>	<p>Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM</p>
<p><b>Security<sup>2</sup></b></p>	<ul style="list-style-type: none"> <li>• IEEE and WiFi certified 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>• WPA3 (personal) certification</li> <li>• IEEE 802.11i</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 access points</p>
<p><b>Output Power<sup>3</sup></b></p>	<p>2.4GHz (MIMO, typical):</p> <ul style="list-style-type: none"> <li>• 802.11b : +18dBm</li> <li>• 802.11g : +16.5dBm</li> <li>• 802.11n/ac/ax (HT20/VHT20/HE20) : +16dBm</li> </ul>



### Technical Specifications

	<ul style="list-style-type: none"> <li>• 802.11n/ac/ax (HT40/VHT40/HE40) : +12.5dBm</li> </ul>
	<p>5GHz (MIMO, typical):</p> <ul style="list-style-type: none"> <li>• 802.11a : +13dBm</li> <li>• 802.11n/ac/ax (HT20/VHT20/HE20) : +13.5dBm</li> <li>• 802.11n/ac/ax (HT40/VHT40/HE40) : +12.5dBm</li> <li>• 802.11ac/ax (VHT80/HE80) : +11.5dBm</li> <li>• 802.11ax HE160 : +11.5dBm</li> </ul>
	<p>6GHz LPI mode (MIMO, typical):</p> <ul style="list-style-type: none"> <li>• 802.11a : 0dBm</li> <li>• 802.11ax HE20 : +1dBm</li> <li>• 802.11ax HE40 : +4dBm</li> <li>• 802.11ax HE80 : +7dBm</li> <li>• 802.11ax HE160 : +7.5dBm</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode :2.5 W</li> <li>• Receive mode :2 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode :50 mW (WLAN unassociated)</li> <li>• Connected Standby/Modern Standby: 10mW</li> <li>• Radio disabled: 8 mW</li> </ul>
<b>Power Management</b>	<p>ACPI and PCI Express compliant power management 802.11 compliant power saving mode</p>
<b>Receiver Sensitivity <sup>4</sup></b>	<p>2.4GHz (SISO):</p> <ul style="list-style-type: none"> <li>•802.11b, 11Mbps : -82dBm maximum</li> <li>• 802.11g, 54Mbps : -71 dBm maximum</li> <li>• 802.11n, MCS7 : -64dBm maximum</li> <li>• 802.11ac, MCS9 : -52dBm maximum</li> <li>•802.11ax, MCS11(HT40): -49dBm maximum</li> </ul> <p>5GHz (SISO):</p> <ul style="list-style-type: none"> <li>• 802.11a, 54Mbps : -71 dBm maximum</li> <li>• 802.11n, MCS07 : -64dBm maximum</li> <li>• 802.11ac, MCS9 : -52dBm maximum</li> <li>•802.11ax, MCS11(HE80/HE160): -46dBm maximum</li> </ul> <p>6GHz (SISO):</p> <ul style="list-style-type: none"> <li>• 802.11a, 54Mbps : -71 dBm maximum</li> <li>• 802.11n, MCS7 : -64dBm maximum</li> <li>• 802.11ac, MCS9 : -52dBm maximum</li> <li>•802.11ax, MCS11(HE160): -46dBm maximum</li> </ul>
<b>Antenna type</b>	<p>High efficiency antenna with spatial diversity, mounted in the display enclosure</p> <p>Two embedded dual band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications</p>
<b>Form Factor</b>	<p>PCI-Express M.2 MiniCard</p>
<b>Dimensions</b>	<p>1. Type 2230 : 2.3 x 22.0 x 30.0 mm</p> <p>2. Type 1216: 1.67 x 12.0 x 16.0 mm</p>

## Technical Specifications

<b>Weight</b>	1. Type 2230 : 2.8g 2. Type 1216: 1.3g
<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 60% (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>	N/A

**HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Card**

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1/5.2/5.3 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 1.5 Bluetooth device with a maximum transmit power of + 14 dBm and 10 dBm for BR and EDR, respectively.
<b>Power Consumption</b>	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Link Topology</b>	
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.407
<b>Power Management</b>	ETS 300 328 Low Voltage Directive
<b>Certifications</b>	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

### Technical Specifications

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)  
BT5.2  
ESR9/10 Compliance  
LE Advertisement Extensions  
Channel Selection Algo  
Limited High Duty Cycle Non-Connectable Advertising  
2Mbps LE  
LE Long Range  
Windows BT profiles support  
BT5.3  
Periodic Advertisement interval  
Encryption key size control enhancements

1. Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported. Wi-Fi 6E is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.
2. Check latest software/driver release for updates on supported security features.
3. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

## Technical Specifications

Intel® 5G Solution 5000<sup>1</sup>

## Technology/Operating bands

## WCDMA/HSPA+ operating bands:

Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)

Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)

Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)

Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)

Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)

## LTE FDD/TDD operating bands:

Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)

Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)

Band 3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL)

Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)

Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)

Band 7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)

Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)

Band 12: 699 to 716 MHz (UL), 729 to 746 MHz (DL)

Band 13: 777 to 787 MHz (UL), 746 to 756 MHz (DL)

Band 14: 788 to 798 MHz (UL), 758 to 768 MHz (DL)

Band 17: 704 to 716 MHz (UL), 734 to 746 MHz (DL)

Band 18: 815 to 830 MHz (UL), 860 to 875 MHz (DL)

Band 19: 830 to 845 MHz (UL), 875 to 890 MHz (DL)

Band 20: 832 to 862 MHz (UL), 791 to 821 MHz (DL)

Band 25: 1850 to 1915 MHz (UL), 1930 to 1995 MHz (DL)

Band 26: 814 to 849 MHz (UL), 859 to 894 MHz (DL)

Band 28: 703 to 748 MHz (UL), 758 to 803 MHz (DL)

Band 29: 717 to 728 MHz (DL)

Band 30: 2305 to 2315 MHz (UL) 2350 to 2360 MHz (DL)

Band 32: 1452 to 1496 MHz (DL)

Band 34: 2010 to 2025 MHz (UL/DL)

Band 38: 2570 to 2620 MHz (UL/DL)

Band 39: 1880 to 1920 MHz (UL/DL)

Band 40: 2300 to 2400 MHz (UL/DL)

Band 41: 2496 to 2690 MHz (UL/DL)

Band 42: 3400 to 3600 MHz (UL/DL)

Band 43: 3400 to 3800 MHz (UL/DL)

Band 46: 5150 to 5925 MHz (DL)

Band 48: 3550 to 3700 MHz (UL/DL)

Band 66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)

Band 71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)

## 5G NR Sub 6GHz

n1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)

n2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)

n3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL)

n5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)

n7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)

n8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)

n20: 832 to 862 MHz (UL), 791 to 821 MHz (DL)

n25: 1850 to 1915 MHz (UL), 1930 to 1995 MHz (DL)

n28: 703 to 748 MHz (UL), 758 to 803 MHz (DL)

n38: 2570 to 2620 MHz (UL/DL)

## Technical Specifications

	n40: 2300 to 2400 MHz (UL/DL) n41: 2496 to 2690 MHz (UL/DL) n48: 3550 to 3700 MHz (UL/DL) n66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL) n71: 663 to 698 MHz (UL), 617 to 652 MHz (DL) n77: 3300 to 4200 MHz (UL/DL) n78: 3300 to 3800 MHz (UL/DL) n79: 4400 to 5000 MHz (UL/DL)
<b>Wireless protocol standards</b>	5G NR Air Interface 3GPP Rel15 5G NR sub-6 LTE Rel14 20 layers and 2 Gbps downlink (DL) throughput – 4 × 4 MIMO across 5x CA 200 Mbps/uplink (UL) throughput – 40 MHz ULCA and 256 QAM WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
<b>GPS</b>	Standalone, A-GPS (MS-A, MS-B)
<b>GPS bands</b>	GPS: L1 (1575.42MHz) GLONASS: L1 (1602MHz) BeidouB1(1561.098MHz) Galileo E1 (1575.42) QZSS(1575.42 MHz)
<b>Maximum data rates</b>	SA 5G/NR sub-6 Peak: DL4.67Gbps/ UL 1.25Gbps 5G NSA sub 6G : DL: 3.8 Gbps/UL 700Mbps LTE: ue-CategoryDL 19, (DL : 1.6 Gbps ) ue-CategoryUL 18 , (UL: 211Mbps) DC-HSPA+: 42 Mbps (Download), 11.5 Mbps (Upload)
<b>Maximum output power</b>	LTE: 23 dBm in all band except B41 LTE B41 HPUE = 26dBm NR: 23 dBm in all band except n41, n77, n78 and n79 LTE n41, n77, n78 and n79 HPUE = 26dBm HSPA+: 23.5 dBm
<b>Maximum power consumption</b>	5G Sub 6 : 2500 mA LTE: 1,300 mA (peak); 1100 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average)
<b>Form Factor</b>	M.2, 3052-S3 Key B
<b>Weight</b>	8 g
<b>Dimensions (Length x Width x Thickness)</b>	52 mm × 30 mm × 2.3 mm
<b>embedded eSIM</b>	Support

1. Intel® 5G module is optional and must be configured at the factory. Module designed for 5G SA (standalone), and 5G NR NSA (non-standalone) networks as carriers deploy Evolved-Universal ng 256QAM 4x4 as defined by 3GPP. Module requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Data connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. Backwards compatible to 4G LTE and 3G HSPA technologies. 5G module planned to be available in select platforms and select countries, where carrier supported.

## Technical Specifications

<b>Intel® XMM™ 7560 R+ LTE-Advanced Pro<sup>1</sup></b>	<b>Technology/Operating bands</b>	FDD 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 14 upper), 700 (Band 17 lower), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1900 (Band 25), 850 (Band 26), 700 (Band 28), 700 (Band 29 RX only), 2300 (Band 30), 1700/2100 (Band 66), 600 (band 71). TDD LTE: 2100 (Band 34), 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41), 3500 (Band 42), 3700 (Band 43), 3700 (band 48), 5200 (Band 46 RX only) MHz; 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 12 LTE Specification DL-CAT.16, DL 100MHz BW throughput up to 978Mbps; UL-CAT.13 40MHz throughput up to 150Mbps WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
	<b>GPS</b>	Standalone GPS/Beidou/Glonass, A-GPS (MS-A, MS-B)
	<b>GPS bands</b>	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz
	<b>Maximum data rates</b>	LTE: 978 Mbps (Download), 150 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)
	<b>Maximum output power</b>	LTE: 23 dBm in all band except B41 LTE B41 HPUE = 26dBm HSPA+: 23.5 dBm
	<b>Maximum power consumption</b>	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 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
	<b>embedded eSIM</b>	Support

1. Mobile Broadband is an optional feature. Connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products or in all countries.

## Technical Specifications

<b>NFC NXP NPC300</b>	<b>Dimensions (L x W x H)</b>	17 x 10 x 2.0 mm
	<b>Chipset</b>	NPC300
	<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
	<b>Reader (PCD-VCD) Mode</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</b>	ISO/IEC 14443 A ISO/IEC 14443 B and B' MIFARE FeliCa
	<b>Frequency</b>	13.56 MHz
	<b>NFC Modes Supported</b>	Reader/Writer, Peer-to-Peer
	<b>Raw RF Data Rates</b>	106, 212, 424, 848 kbps
	<b>Operating temperature</b>	0°C to 70°C
	<b>Storage temperature</b>	-20°C to 125°C
	<b>Humidity</b>	10-90% operating 5-95% non-operating
	<b>Supply Operating voltage</b>	4.35 to 5.25 Volts
	<b>I/O Voltage</b>	1.8V or 3.3V
	<b>Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)</b>	
	<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

#### POWER

1. Actual battery Watt-hours (Wh) will vary from design capacity. Battery capacity will naturally decrease with shelf life, time, usage, environment, temperature, system configuration, loaded apps, features, power management settings and other factors

<b>AC Adapter 65 Watt nPFC Standard USB Type C® Straight 1.8m</b>	<b>Dimensions (H x W x D)</b>	3.543 x 2.008 x 1.122 in (9.0x5.1x2.85cm)
	<b>Weight</b>	0.53 lb (240 g) max (Not including power cord. Power cord varies by country.)
	<b>Input</b>	100-240Vac
	<b>Input Efficiency</b>	Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec: 5V : 81.5% 9V : 86.7% 12V : 88.0% 15V : 89.0% 20V : 89.0%
	<b>Input frequency range</b>	47-63Hz
	<b>Input AC current</b>	Max. 1.6 A at 90 Vac
<b>Output</b>	<b>Output power</b>	5V/15W 9V/27W 12V/60W 15V/65W 20V/65W
	<b>DC output</b>	5V/9V/12V/15V/20V
	<b>Hold-up time</b>	100% load 5ms at 115 Vac input
	<b>Output current limit</b>	< 8.0A
<b>Connector</b>		USB Type-C®
<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%
<b>EMI and Safety Certifications</b>		CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL 62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC and CECP, CU(EAC), EAEU, KCC(Safety+EMC) and K-MEPS, NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia RCM, BIS, BSMI, UAE, UKCA DoC



### Technical Specifications

<b>HP 65W Slim USB-C Straight AC Power Adapter</b>	<b>Dimensions (H x W x D)</b>	3.819 x 2.106 x 0.827 in (9.7x5.35x2.1 cm)	
	<b>Weight</b>	0.49 lb (220 g) max (Not including power cord. Power cord varies by country.)	
	<b>Input</b>	100-240Vac	
	<b>Output</b>	<b>Input Efficiency</b>	Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec: 5V : 81.5% 9V : 86.7% 12V : 88.0% 15V : 89.0% 20V : 89.0%
		<b>Input frequency range</b>	47-63Hz
		<b>Input AC current</b>	Max. 1.6 A at 90 Vac
		<b>Output power</b>	5V/15W 9V/27W 12V/60W 15V/65W 20V/65W
		<b>DC output</b>	5V/9V/12V/15V/20V
		<b>Hold-up time</b>	100% load 5ms at 115 Vac input
		<b>Output current limit</b>	< 8.0A
	<b>Connector</b>	USB TYPE C®	
	<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%	
<b>EMI and Safety Certifications</b>	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL 62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC and CECP, CU(EAC), EAEU, KCC(Safety+EMC) and K-MEPS, NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia RCM, BIS, BSMI, UAE, UKCA DoC		

### Technical Specifications

<b>HP 3-cell Long Life Li-Ion (WP 38Wh)<sup>1</sup></b>	<b>Weight</b>	0.184kg +/- 10g(0.406lb)
	<b>Cells/Type</b>	3cell Lithium-Ion Polymer cell / 564975
<b>Energy</b>	<b>Voltage</b>	11.58V
	<b>Amp-hour capacity</b>	3.283Ah
	<b>Watt-hour capacity<sup>1</sup></b>	38Wh
<b>Temperature</b>	<b>Operating (Charging)</b>	32° to 113° F (0° to 45° C)
	<b>Operating (Discharging)</b>	14° to 140° F (-10° to 60° C)
	<b>Optional Travel Battery Available</b>	No

1. Actual battery Watt-hours (Wh) will vary from design capacity. Battery capacity will naturally decrease with shelf life, time, usage, environment, temperature, system configuration, loaded apps, features, power management settings and other factors

<b>HP 3-cell Long Life Li-Ion (WQ 38Wh)<sup>1</sup></b>	<b>Weight</b>	0.178kg +/- 10g(0.392lb)
	<b>Cells/Type</b>	3cell Lithium-Ion Polymer cell / 604975
<b>Energy</b>	<b>Voltage</b>	11.55V
	<b>Amp-hour capacity</b>	3.291Ah
	<b>Watt-hour capacity<sup>1</sup></b>	38Wh
<b>Temperature</b>	<b>Operating (Charging)</b>	32° to 113° F (0° to 45° C)
	<b>Operating (Discharging)</b>	14° to 140° F (-10° to 60° C)
	<b>Optional Travel Battery Available</b>	No

1. Actual battery Watt-hours (Wh) will vary from design capacity. Battery capacity will naturally decrease with shelf life, time, usage, environment, temperature, system configuration, loaded apps, features, power management settings and other factors

<b>HP 3-cell Long Life Li-Ion (51 Wh)<sup>1</sup></b>	<b>Weight</b>	0.229kg +/- 10g(0.505 lb)
	<b>Cells/Type</b>	3cell Lithium-Ion Polymer cell / 566075
<b>Energy</b>	<b>Voltage</b>	11.58V
	<b>Amp-hour capacity</b>	4.431Ah
	<b>Watt-hour capacity<sup>1</sup></b>	51.3Wh
<b>Temperature</b>	<b>Operating (Charging)</b>	32° to 113° F (0° to 45° C)
	<b>Operating (Discharging)</b>	14° to 140° F (-10° to 60° C)
	<b>Optional Travel Battery Available</b>	No

1. Actual battery Watt-hours (Wh) will vary from design capacity. Battery capacity will naturally decrease with shelf life, time, usage, environment, temperature, system configuration, loaded apps, features, power management settings and other factors

## Technical Specifications

### AUDIO

<b>HD Stereo Codec</b>	Realtek ALC3315
<b>Audio I/O Ports</b>	Headset: CTIA only and Headphone-out
<b>Internal Speaker Amplifier</b>	Cirrus Logic High-Efficiency Boosted Class D Amplifier
<b>Multi-streaming Capable</b>	Playback multi-streaming can be enabled in the audio control panel to allow independent audio. Following MSFT Behaviour
<b>Sampling</b>	DAC:48kHz ADC:48kHz
<b>Wavetable Syntheses</b>	
<b>Analog Audio</b>	Support 3.5mm Headset: CTIA only and Headphone-out
<b># of Channels on Line-Out</b>	
<b>Internal Speaker</b>	Yes

### FINGERPRINT READER

<b>Sensor vendor</b>	Main source : Synaptics FS7605 2nd source : ELAN 805W
<b>Sensor type</b>	Capacitive
<b>DPI resolution</b>	Main source : 363 DPI 2nd source : 508 DPI
<b>Scan area</b>	Main source : 104 x 86 pixels 2nd source : 80x80 pixels
<b>False Rejection Rate</b>	FRR= $\leq$ 3%
<b>False Acceptance Rate</b>	Main source : FAR 1/100K 2nd source : < 0.001%
<b>Mobile Voltage Operation</b>	Main source : 3.0V to 3.6V 2nd source : 2.7V~3.6V
<b>Operating Temperature</b>	Main source : 0°C~60°C 2nd source : -20°C - +80°C
<b>Current Consumption</b>	Main source : 100mA max 2nd source : 35mA peak
<b>Image</b>	Main source : 260uA 2nd source : 300uA
<b>Low Latency Wait For Finger</b>	Main source : 260uA 2nd source : 300uA
<b>Capture Rate</b>	Main source : Image transmitter output frequency 9.6MHz 2nd source : 50 frame/sec
<b>ESD Resistance</b>	IEC 61000-4-2 4B (+15KV)
<b>Detection Matrix</b>	Main source : 363 dpi / 7.4x6mm sensor area 2nd source : 508 dpi / 4x4mm sensor area

### Technical Specifications

#### ENVIRONMENTAL DATA

<b>Eco-Label Certifications &amp; declarations</b>	<p>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:</p> <ul style="list-style-type: none"> <li>• IT ECO declaration</li> <li>• US ENERGY STAR®</li> <li>• US Federal Energy Management Program (FEMP)</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.</li> <li>• TCO Certified</li> <li>• China Energy Conservation Program (CECP)</li> <li>• China State Environmental Protection Administration (SEPA)</li> <li>• Taiwan Green Mark</li> <li>• Korea Eco-label</li> <li>• Japan PC Green label*</li> </ul>		
<b>Sustainable Impact Specifications</b>	<ul style="list-style-type: none"> <li>• Ocean-bound plastic in CPU Fan, Speaker</li> <li>• 60% post-consumer recycled plastic</li> <li>• 65% recycled metal</li> <li>• Low halogen</li> <li>• Outside Box and corrugated cushions are 100% sustainably sourced and recyclable</li> <li>• Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable</li> <li>• Bulk packaging available</li> </ul>		
<b>System Configuration</b>	<p>The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.</p>		
<b>Energy Consumption (in accordance with US ENERGY STAR® test method)</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>
Normal Operation (Short idle)	17.5 W	17.8 W	18.2 W
Normal Operation (Long idle)	4.5 W	4.4 W	4.4 W
Sleep	4.5 W	4.4 W	4.4 W
Off	1.4 W	1.5 W	1.6 W
	<p><b>NOTE:</b> 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, 50Hz</b>
Normal Operation (Short idle)	17.5 BTU/hr	17.8 BTU/hr	18.2 BTU/hr
Normal Operation (Long idle)	4.5 BTU/hr	4.4 BTU/hr	4.4 BTU/hr
Sleep	4.5 BTU/hr	4.4 BTU/hr	4.4 BTU/hr



### Technical Specifications

Off	1.4 BTU/hr	1.5 BTU/hr	1.6 BTU/hr
	*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.		
<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	2.6	14.6	
Fixed Disk – Random writes	2.8	21.6	
Optical Drive – Sequential reads	3.2	24.7	
<b>Longevity and Upgrading</b>	This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the spare parts are available throughout the warranty period and or for up to “5” years after the end of production.		
<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 is 93.4% recycle-able when properly disposed of at end of life.</li> </ul>		
<b>Packaging Materials</b>	<b>External:</b>	PAPER/Corrugated	1106g
		PAPER/Molded pulp	666g
	<b>Internal:</b>	PLASTIC/Polyethylene low density-LDPE	40g
	The plastic packaging material contains at least 0.0% recycled content.		
	The corrugated paper packaging materials contains at least 35.0% recycled content.		
<b>RoHS Compliance</b>	<p>HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.</p> <p>We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.</p> <p>We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve.</p> <p>To obtain a copy of the HP RoHS Compliance Statement, see <a href="#">HP RoHS position statement</a>.</p>		

### Technical Specifications

<p><b>Material Usage</b></p>	<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/supplychain/gen_specifications.html">http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html</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>• Bis(2-Ethylhexyl) phthalate (DEHP)</li> <li>• Benzyl butyl phthalate (BBP)</li> <li>• Dibutyl phthalate (DBP)</li> <li>• Diisobutyl phthalate (DIBP)</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, and certain retail packaging 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>
<p><b>Packaging Usage</b></p>	<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>

### Technical Specifications

<b>End-of-life Management and Recycling</b>	<p>HP 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>  and  <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</a></p>
<b>Footnotes</b>	<ul style="list-style-type: none"> <li>• Percentage of ocean-bound plastic contained in each component varies by product</li> <li>• Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.</li> <li>• External power supplies, WWAN modules, power cords, cables and peripherals excluded.</li> <li>• 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.</li> <li>• Fiber cushions made from 100% recycled wood fiber and organic materials.</li> <li>• Plastic cushions are made from &gt;90% recycled plastic.</li> <li>• Recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams</li> </ul>

### COUNTRY OF ORIGIN

China

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

#### DOCKING (Sold Separately)

<b>Docking station model #1</b>	HP Thunderbolt 120W G4 Dock
<b>Total number of supported displays (incl. the notebook display)</b>	4
<b>Max. resolutions supported</b>	Quad 4K @60Hz Dual 8K single cable@30 for TB hosts or USB-C hosts DP 1.4 with DSC in high res mode
<b>Dock Connectors</b>	2xDP, 1xHDMI, 1xTB, 1xUSB-C Alt Mode
<b>Technical limitations</b>	Maximum resolution and display support is dependent on the maximum capability of the notebook.

#### Thunderbolt Hosts:

Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host.

Maximum resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in high resolution mode @30Hz

#### Non-Thunderbolt hosts:

The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is

(1) 5K dual cable (using both DP ports) +(1) 4K on USB-C DP port

Non-Thunderbolt hosts support (3) displays with a maximum resolution of (2) 5K single cable + (1) 4K UHD @ 60 Hz in high resolution mode. In multi-function mode the maximum resolution for (3) displays is (2) 5K single cable @ 30Hz + (1) 4K UHD @ 30Hz.

<b>Docking station model #2</b>	HP Thunderbolt 280W G4 Dock
<b>Total number of supported displays (incl. the notebook display)</b>	4
<b>Max. resolutions supported</b>	Quad 4K @60Hz Dual 8K single cable@30 for TB hosts or USB-C hosts DP 1.4 with DSC in high res mode
<b>Dock Connectors</b>	2xDP, 1xHDMI, 1xTB, 1xUSB-C Alt Mode
<b>Technical limitations</b>	Maximum resolution and display support is dependent on the maximum capability of the notebook.

#### Thunderbolt Hosts:

Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host.

Maximum resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in high resolution mode @30Hz

#### Non-Thunderbolt hosts:

The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is

(1) 5K dual cable (using both DP ports) +(1) 4K on USB-C DP port

Non-Thunderbolt hosts support (3) displays with a maximum resolution of (2) 5K single cable + (1) 4K UHD @ 60 Hz in high resolution mode. In multi-function mode the maximum resolution for (3) displays is (2) 5K single cable @ 30Hz + (1) 4K UHD @ 30Hz.



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

<b>Docking station model #3</b>	HP USB-C Dock G5
<b>Total number of supported displays (incl. the notebook display)</b>	3
<b>Max. resolutions supported</b>	Dual 5K@ 30Hz + (1) 4K UHD (multi-function mode)
<b>Dock Connectors</b>	1xHDMI, 2xDP
<b>Technical limitations</b>	<p>Maximum resolution and display support is dependent on the maximum capability of the notebook.</p> <p>Highest resolution with dual displays is two 8K@ 60Hz host in High Resolution mode.</p> <p>Three maximum displays supported are two 5K@ 30 Hz on DP ports plus one 4K UHD@ 30 Hz on HDMI in Multi-function mode</p> <p>The highest resolution for a non-Thunderbolt host in Multi-function mode is a single 5K dual cable (using both DP ports) + (1) 4K on HDMI port.</p>
<b>Docking station model #4</b>	HP USB-C/A Universal Dock G2
<b>Total number of supported displays (incl. the notebook display)</b>	3
<b>Max. resolutions supported</b>	Dual 4K @ 60Hz Single 5K @ 60Hz
<b>Dock Connectors</b>	1xHDMI, 2xDP
<b>Technical limitations</b>	<p>Maximum resolution and display support is dependent on the maximum capability of the notebook.</p> <p>The best resolution for dual or triple displays is 4K UHD@ 60Hz.</p> <p>For use with the USB-A adapter that comes in the box the maximum number of displays supported is (2) 4k x 60 Hz on the Type-A Gen 1 connection from the host.</p>
<b>Docking station model #5</b>	HP USB-C G5 Essential Dock
<b>Total number of supported displays (incl. the notebook display)</b>	3
<b>Max. resolutions supported</b>	<p>For hosts that support DisplayPort 1.4 with Display Stream Compression:</p> <p>3x FHD @ 60 Hz 3x QHD @ 60 Hz 3x 4K @ 60 Hz</p> <p>For hosts that support DisplayPort 1.3/1.4:</p> <p>3x FHD @ 60 Hz 3x QHD @ 60 Hz 2x 4K @ 60 Hz</p>
<b>Dock Connectors</b>	1 x HDMI, 2 x DP
<b>Technical limitations</b>	Video resolution depends on the capability of the host machine. This dock provides up to 65W of power delivery to the host machine.

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

Type	Description	Part Number
<b>Audio</b>	HP Wired USB-A Stereo Headset	428K6AA
	HP Wired 3.5mm Stereo Headset	428K7AA
	HP 365 BT Speaker	567D3AA#ACJ
<b>Video</b>	HP 325 FHD USB-A Webcam	53X27AA
	HP 965 4K USB-A STR Webcam	695J5AA
<b>Docking</b>	HP Thunderbolt 120W G4 Dock	4J0A2AA
	HP Thunderbolt 280W Dock	4J0G4AA
	HP USB-C G5 Dock	5TW10AA
	HP USB-C/A Universal G2 Dock	5TW13AA
<b>Cases</b>	HP Prelude G2 15.6 Backpack	1E7D6AA
	HP Prelude G2 15.6 Top Load	1E7D7AA
	HP Prelude Pro Recycled 15.6 Backpack	1X644AA
	HP Prelude Pro Recycled 15.6 Top Load	1X645AA
	HP Renew 14 Laptop Sleeve	2E6U9AA
	HP Renew Business 14.1 Laptop Bag	3E5F9AA
	HP Renew Business 14.1 Laptop Sleeve	3E2U7AA
	HP Renew Business 15.6 Laptop Bag	3E5F8AA
	HP Renew Business 17.3 Laptop Backpack	3E2U5AA
	HP Renew Business 17.3 Laptop Bag	3E2U6AA
	HP Renew Executive 14.1 Laptop Sleeve	6B8Y3AA
	HP Renew Executive 16 Laptop Backpack	6B8Y1AA
	HP Renew Executive 16 Laptop Bag	6B8Y2AA
	HP Reversible 13.3 Sleeve	7ZE82AA
	HP Travel 18L 15.6 Iron Gray Laptop Backpack	6H2D9AA
HP Travel 25L 15.6 Iron Gray Laptop Backpack	6H2D8AA	
<b>Hub</b>	HP 4K USB-C Multiport Hub	6G842AA
	HP Universal USB-C Multiport Hub	50H55AA
	HP USB-C Travel Dock G2	7PJ38AA
	HP USB-C to USB-A Hub	Z6A00AA
<b>Adapter</b>	HP USB-C to RJ45 Adapter G2	4Z527AA
	HP USB 3.0 to Gigabit RJ45 Adapter G2	4Z7Z7AA
	HP HDMI to VGA Adapter	H4F02AA
	HP USB-C to DisplayPort Adapter	N9K78AA
	HP USB-C to HDMI 2.0 Adapter	1WC36AA

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

	HP USB-C to USB 3.0 Adapter	N2Z63AA
	HP USB-C to VGA Adapter	N9K76AA
<b>Keyboard/Combo</b>	HP 125 WD USB Keyboard	266C9AA
	HP 320K WD USB Keyboard	9SR37AA
	HP 355 Compact Multi-Device BT Keyboard	692S9AA
	HP 455 Programmable Wireless Keyboard	4R177AA
	HP 975 USB+BT Dual-Mode Wireless Keyboard	3Z726AA
	HP 155 Wired Mouse and Keyboard Combo	5B8C0AA#ACJ
	HP 225 Antimicrobial Wired Mouse and Keyboard Combo	286K3AA#AB2
	HP 225 Wired Mouse and Keyboard Combo	286J4AA
	HP 235 Wireless Mouse and Keyboard Combo	1Y4D0AA
	HP 655 Wireless Keyboard and Mouse Combo	4R009AA
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA
	HP Wireless Rechargeable 950MK Mouse and Keyboard	3M165AA
<b>Mouse</b>	HP 125 USB-A Wired Mouse	265A9AA
	HP 128 USB Laser Wired Mouse	265D9AA
	HP 155 USB-A Wired Mouse	5B8B7AA#ACJ
	HP 235 Wireless 2.4GHz Slim Wireless Mouse	4E407AA
	HP 320M USB-A Wired Mouse	9VA80AA
	HP 435 Bluetooth 5.0 + Wireless 2.4GHz Multi-Device Wireless Mouse	3B4Q5AA
	HP 715 Rechargeable Multi-Device Bluetooth 5.0 + Wireless 2.4GHz Bluetooth Mouse	6E6F0AA
	HP 925 Ergonomic Vertical Bluetooth 5.0 + Wireless 2.4GHz Wireless Mouse	6H1A5AA
	HP Creator USB-A+Bluetooth 935 Wireless Mouse Black	1D0K8AA
	HP USB Premium Wireless Mouse	1JR31AA
	HP USB-A+Bluetooth Multi-Device 635 Wireless Mouse Black	1D0K2AA
	HP USB-A+Bluetooth Travel Bluetooth Mouse	6SP30AA
<b>Power</b>	HP 65W GaN USB-C Laptop Charger	600Q7AA
	HP 65W USB-C Laptop Charger	671R3AA
	HP 65W USB-C LC AC Power Adapter	1P3K6AA
<b>Commodity</b>	HP USB DVD-Writer EXT ODD	F2B56AA
	HP Nano Keyed Cable Lock	1AJ39AA
	HP Nano Master Keyed Cable Lock	1AJ40AA
	HP SureKey Standard/Nano/Wedge Cable Lock	6UW42AA
	HP Combination Nano Cable Lock	63B28AA
	HP Essential Combination Nano Cable Lock	63B31AA

### Change Log

Date of change:	Version History:		Description of change:
	V1 to V2		

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