

### Overview

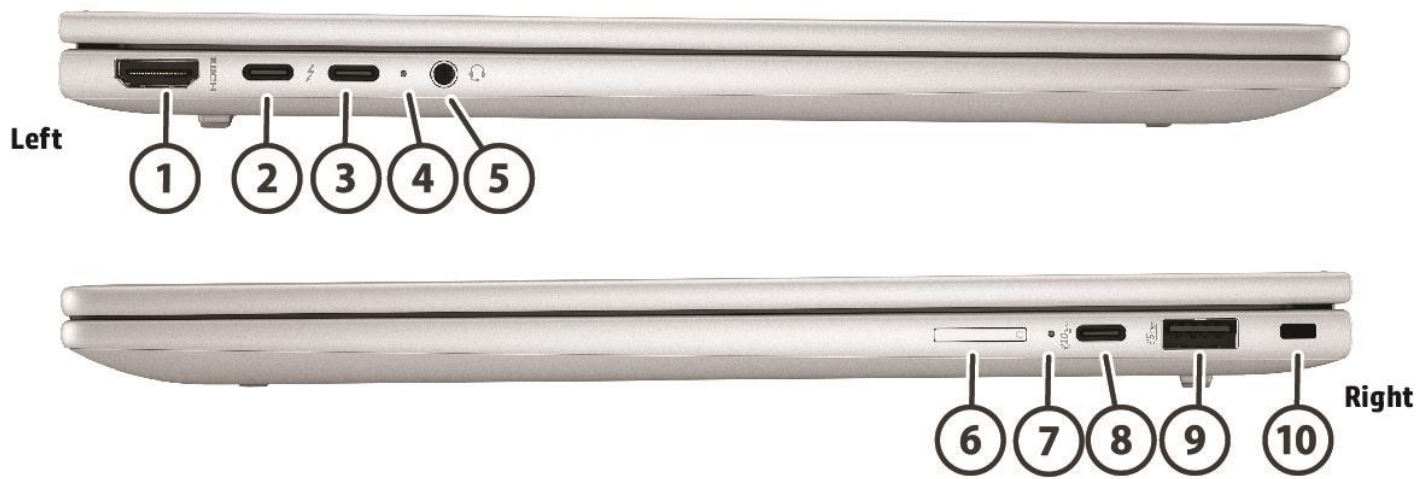
#### HP EliteBook 1040 14 inch G11 Notebook PC



**Front**

- |                   |             |
|-------------------|-------------|
| 1. Webcam LED     | 4. Touchpad |
| 2. Webcam         |             |
| 3. Camera Shutter |             |

### Overview



### Sides

- |   |  |
|---|--|
| 1. HDMI 2.1   | 6. Nano SIM card slot (Optional)   |
| 2. Thunderbolt™ 4 USB4™ Type-C® 40 Gbps USB Power Delivery DisplayPort™ 2.1 | 7. Power Indicator LED   |
| 3. Thunderbolt™ 4 USB4™ Type-C® 40 Gbps USB Power Delivery DisplayPort™ 2.1 | 8. Super Speed+ USB Type-C® 10Gbps signaling rate USB Power Delivery DisplayPort™ 1.4a |
| 4. Power Indicator LED  | 9. Super Speed USB Type-A 5Gbps signaling rate Power charging                          |
| 5. Headphone/mic combo jack   | 10. Security lock slot (Integrated)  |
1. SuperSpeed USB 20Gbps signaling rate is not available with Thunderbolt™ 4.

Technical Specifications

PRODUCT NAME

HP EliteBook 1040 14 inch G11 Notebook PC

OPERATING SYSTEMS

- Preinstalled
- 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 <sup>1</sup>

Windows 11 Pro Education <sup>1</sup>

Windows 11 Pro (Windows 11 Enterprise or Windows 10 Enterprise available with a Volume Licensing Agreement) <sup>1</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>.

PROCESSORS

Processor <sup>2,3,4,5,6</sup>	Cores	Number of P-cores	Number of E-cores	Number of LP E-core	Threads	L3 Cache	Max Turbo Frequency <sup>4</sup>		Intel SIPP/ vPro® Enterprise
							P-cores	E-cores	
Intel® Core™ Ultra 5 processor 135U	12 cores	2	8	2	12	12 MB	4.40 Ghz	3.60 GHz	X
Intel® Core™ Ultra 7 processor 165H	16 cores	6	8	2	22	24 MB	5.00 GHz	3.80 GHz	X
Intel® Core™ Ultra 7 processor 155H	16 cores	6	8	2	22	24 MB	4.80 Ghz	3.80 GHz	
Intel® Core™ Ultra 5 processor 125H	14 cores	4	8	2	18	18 MB	4.50 GHz	3.60 GHz	
Intel® Core™ Ultra 5 processor 135H	14 cores	4	8	2	18	18 MB	4.60 GHz	3.60 GHz	X

Processor Family

- Intel® Core™ Ultra 5 processor
- Intel® Core™ Ultra 7 processor

2. 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.

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

## Technical Specifications

4. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See [www.intel.com/technology/turboboost](http://www.intel.com/technology/turboboost) for more information.
5. Intel vPro® requires Windows 10 Pro 64 bit or higher, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or Wi-Fi 6E WLAN and TPM 2.0. Some functionality requires additional 3rd party software in order to run. Features of vPro® Essentials and Enterprise vary. See <http://intel.com/vpro>
6. Features and software that require a NPU may require software purchase, subscription or enablement by a software or platform provider, and third party software may have specific configuration or compatibility requirements. Performance varies by use, configuration, and other factors.

## GRAPHICS

### Integrated

Intel® ARC™ Graphics<sup>7</sup>  
Intel® Graphics

### Supports

UMA: Support DX12, HDMI 2.1 (4K/60Hz only), HDCP 2.3 <sup>8</sup>

7. Intel® Arc™ graphics only available on select Intel® Core™ Ultra H-series processor-powered systems with at least 16GB of system memory
8. HDMI cable sold separately

## DISPLAY

### Non-Touch

35.6 cm (14") diagonal, WUXGA (1920 x 1200), UWVA, Anti-Glare, WLED + Low Blue Light, 800 nits, sRGB 100%, Sure View 5 LCD Panel <sup>9,10,11,12,13</sup>  
35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent LCD, UWVA, Anti-Glare, WLED + Low Blue Light, 400 nits, low power, sRGB 100% <sup>9,10</sup>,  
35.6 cm (14") diagonal, 2.8K (2880 x 1800), Bent OLED, 120Hz (VRR), UWVA, BrightView, OLED+ Low Blue Light, 400 nits, DCI-P3 100%<sup>9,10</sup>

### Touch

35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent LCD, Touch, UWVA, Anti-Glare, WLED, 400 nits, sRGB 100% <sup>9,10</sup>  
35.6 cm (14") diagonal, WUXGA (1920 x 1200), Touch, UWVA, Anti-Glare, WLED + Low Blue Light, 800 nits, sRGB 100%, Sure View 5 LCD Panel <sup>11,12,13</sup>

### Display Size (Diagonal)

35.6 cm  
14"

### Screen to Body Ratio

89.80%

### Aspect Ratio

16.10

Technical Specifications

Max Hinge Open Angle  
177±3°

9. HD content required to view HD images.
10. Resolutions are dependent upon monitor capability, and resolution and color depth settings.
11. 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.
12. Actual brightness will be lower with touchscreen or HP Sure View.
13. Sure view 5 with touch availability starting from Summer/Fall, 2024.

DOCKING (Sold Separately)

Docking station model #1	HP Thunderbolt™ 120W G4 Dock
Docking station model #2	HP USB-C Dock G5
Docking station model #3	HP USB-C G5 Essential Dock
Docking station model #4	HP USB-C/A Universal Dock G2

For additional aftermarket options and docking specs please see page 42.

STORAGE AND DRIVES

- Primary Storage
- 2 TB PCIe® Gen4x4 NVMe™ SSD Three Layer Cell <sup>14</sup>
- 1 TB PCIe® Gen4x4 NVMe™ SSD Three Layer Cell <sup>14</sup>
- 1 TB PCIe® NVMe™ Value <sup>14</sup>
- 512 GB PCIe® Gen4x4 NVMe™ SSD Three Layer Cell <sup>14</sup>
- 512 GB PCIe® Gen4x4 NVMe™ Self Encrypted OPAL2 SSD Three Layer Cell <sup>14</sup>
- 512 GB PCIe® NVMe™ Value <sup>14</sup>
- 256 GB PCIe® NVMe™ Self Encrypted OPAL2 SSD Value <sup>14</sup>
- 256 GB PCIe® NVMe™ Value <sup>14</sup>

14. 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.

MEMORY

Maximum Memory  
64GB LPDDR5X-7467 MT/s RAM

- Memory
- 64GB LPDDR5X-7467 MT/s RAM
- 32GB LPDDR5X-7467 MT/s RAM
- 16GB LPDDR5X-7467 MT/s RAM

Memory Slots

## Technical Specifications

Memory soldered down.  
System runs at 7467 MT/s  
Supports Dual Channel Memory <sup>15</sup>  
Slot(s) are non-accessible / non-upgradeable.

## NETWORKING/COMMUNICATIONS

### WLAN

Intel® BE200 Wi-Fi 7 Bluetooth® 5.4 wireless card vPro WW WLAN <sup>15,16</sup>  
Intel® BE200 Wi-Fi 7 Bluetooth® 5.4 wireless card non-vPro WW WLAN <sup>15,16</sup>  
Intel® AX211 Wi-Fi 6E Bluetooth® 5.3 wireless card vPro WLAN <sup>17</sup>  
Intel® AX211 Wi-Fi 6E Bluetooth® 5.3 wireless card WLAN <sup>17</sup>

### WWAN

HP 5000 5G Solution <sup>18,19</sup>  
HP 4000 4G LTE-Advanced Pro <sup>18</sup>

### LPWAN

Qualcomm 9205 LTE-M (CAT-M1 fSVC) (No Internet) <sup>20</sup>

### NFC

NFC Mirage WNC XRAV-1 (optional)

### Miracast

Native Miracast Support <sup>21</sup>

15. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 7 (802.11BE) functionality requires compatible Windows OS, select Intel® processor, and a Wi-Fi 7 router, sold separately. Wi-Fi 7 is backwards compatible with prior 802.11 specs. Available in countries where Wi-Fi 7 is supported. The specification for 802.11BE is a draft specification and is not final. If the final specification differs from the draft specification, it may affect the ability of the device to communicate with other 802.11BE devices.

16. Wi-Fi 7 availability starting from Summer/Fall, 2024

17. 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.

18. WWAN module is an optional feature, requires factory configuration 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.

19 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.

20. Cat M1 LPWAN (Mobile Narrowband) cards support select platforms with the HP Protect & Trace with Wolf Connect service, but do not support mobile broadband/Internet use.

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

### Technical Specifications

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#### AUDIO/MULTIMEDIA

##### Audio

Audio by Poly Studio

4 Integrated stereo speakers

Discrete Amplifiers

2 Integrated dual array microphones

##### Speaker Power

1W/8ohm Per speaker

##### Camera

5MP+Infrared camera

##### Sensors

Ambient Light Sensor

Adaptive Color Sensor

Fingerprint Sensor

Hall Effect Sensor

HP Tamper Lock <sup>22</sup>

HP Sure Platform

Motion AI LSM6DSOX

Thermal Sensor

Time of Flight Sensor

[22. HP Tamper Lock must be enabled by the customer or your administrator.](#)

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

##### Keyboard

HP Premium Keyboard, spill-resistant, Privacy, Backlit, Durakey keyboard.

HP Premium Keyboard, spill-resistant, Backlit, Durakey keyboard.

##### Pointing Device

Clickpad with multi-touch gesture support

Microsoft Precision Touchpad Default Gestures Support

##### Function Keys

ESC - System information

F1 - Display Switching

F2 - Blank or Privacy

F3 - Brightness Down

F4 - Brightness Up

F5 - Backlit Toggle

F6 - Audio Mute

F7 - Volume Down

F8 - Volume Up

## Technical Specifications

F9 - Mic Mute  
F10 - Play Pause  
F11 - MyHP  
F12 - HOME  
End  
Insert  
Delete  
Power Button (with LED) – integrated with Fingerprint sensor (optional)  
Microsoft Copilot <sup>23</sup>

### Hidden Function Keys

Fn+R – Break  
Fn+S - Sys Rq  
Fn+C - Scroll Lock

<sup>23</sup>. Requires Windows 11 and an NPU. Timing of feature delivery and availability varies by market and device. Requires Microsoft account to log in. Where Copilot in Windows is not available, the Copilot key will lead to the Bing search engine. See <http://aka.ms/WindowsAIFeatures>.

## SOFTWARE AND SECURITY

### Software

Adobe Offer <sup>24</sup>  
Bing Search for IE11  
Buy Microsoft Office (Sold separately)  
HP Connection Optimizer  
HP Easy Clean<sup>25</sup>  
HP Easy Clean Keyboard Driver  
HP Hotkey Support  
HP Mac Address Manager  
HP Notifications  
HP PC Hardware Diagnostics UEFI  
HP PC Hardware Diagnostics Windows  
HP Power Manager with Battery Health Manager<sup>26</sup>  
HP Privacy Settings  
HP Services Scan <sup>27</sup>  
HP Smart Support <sup>28</sup>  
HP Support Assistant <sup>29</sup>  
HSA Fusion for Commercial  
HSA Telemetry for Commercial  
Miro Offer <sup>30</sup>  
myHP <sup>31</sup>  
Poly Lens <sup>32</sup>

### Manageability Features

HP Client Catalog (download) <sup>33</sup>  
HP Client Management Script Library (download) <sup>34</sup>  
HP Cloud Recovery <sup>35</sup>  
HP Connect for Microsoft Endpoint Manager <sup>36</sup>  
HP Driver Packs (download) <sup>37</sup>





## Technical Specifications

HP Image Assistant (download) <sup>38</sup>

HP Manageability Integration Kit (download) <sup>39</sup>

HP Patch Assistant (download) <sup>40</sup>

### Security Management

Secured-Core PC Enable <sup>41</sup>

Windows Hello Enhanced Sign-In Security (ESS)

**HP Wolf Security for Business which includes:**<sup>42</sup>

HP Sure Admin <sup>43</sup>

HP Sure Click <sup>44</sup>

HP Sure Recover <sup>45</sup>

HP Sure Run <sup>46</sup>

HP Sure Sense

HP Sure Start <sup>47</sup>

HP Tamper Lock

### Security- TPM

Model: Nuvoton NPCT760HABYX

TCG TPM 2.0

Firmware Version: 7.2.3.1

FIPS 140-2 Compliant: Yes

Model: Infineon SLB9672VU2.0 FW15.23

TCG TPM 2.0

Firmware Version: 15.23

FIPS 140-2 Compliant: Yes

### BIOS

Absolute Persistence Module <sup>48</sup>

BIOS Update via Network

HP BIOSphere Gen6 <sup>49</sup>

HP DriveLock & Automatic DriveLock

HP Fingerprint Sensor <sup>50</sup>

HP Secure Erase <sup>51</sup>

HP Wake on WLAN

### IPv6 Support

Yes

### FirstNet Certified

Yes

**Does the BIOS implement the ISO/IEC 19678:2015 (formerly NIST 800-147) guidelines?:** Yes

**UEFI version:** 2.7

**Class:** 3

24. Click on Adobe icon in the start menu to take advantage of a 30 day trial membership of select Adobe software. The software is tied to the device and is not transferrable. You may also choose to enter your payment details to auto-renew and continue to use the software beyond the 30 day trial. See Adobe for complete details.

## Technical Specifications

25. 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.
26. HP Power Manager requires Windows 10 and higher and can be downloaded from the Microsoft Store. Depending on what version of HP Battery Health Manager (BHM) is available for your device, HP BHM may look at a number of factors to determine how to adjust battery charging over time to optimize battery health. HP BHM is preset to “Let HP Manage my Battery Charging” to allow the system to balance charging between battery health and battery duration. As Let HP Manage My Battery Charging adjusts charge capacity, the amount of run-time on battery will be reduced over time. HP may utilize BIOS updates to adjust BHM settings on select systems to optimize battery health and reduce exposure to those factors that can accelerate battery degradation. To update or change HP BHM settings and for complete details, see [https://support.hp.com/us-en/document/ish\\_4449597-3519507-16](https://support.hp.com/us-en/document/ish_4449597-3519507-16)
27. HP Services Scan is preinstalled and/or provided thru Windows Update and checks for service entitlement on each hardware device and downloads the applicable software agent automatically. To disable this feature, please follow the instructions at <http://www.hpdaas.com/requirements>. The HP Insights agent is a telemetry and analytics platform that provides critical data around devices and applications and is not sold as a standalone service. HP follows stringent GDPR privacy regulations and is ISO27001, ISO27701, ISO27017 and SOC2 Type2 certified for Information Security. Internet access with connection to the HP Insights agent is required. For full system requirements, please visit <http://www.hpdaas.com/requirements>. Not available in China.
28. HP Smart Support requires the HP agent to be installed. For more information about how to enable or to download HP Smart Support, please visit <http://www.hp.com/smart-support>. HP Services Scan is provided thru Windows Update and will check entitlement on each hardware device to determine if an HP agent-enabled service has been purchased, and will download applicable software automatically. The HP agent is a telemetry and analytics platform that provides critical data around devices and applications and is not sold as a standalone service. HP follows stringent GDPR privacy regulations and is ISO27001, ISO27701, ISO27017 and SOC2 Type2 certified for Information Security. Internet access is required. For full system requirements or to disable this feature, please visit <http://www.hpdaas.com/requirements>.
29. HP Support Assistant is available on Windows. For more information, please visit <http://www.support.hp.com/help/hp-support-assistant>
30. HP customers qualify for a 90 day trial of Miro, this offer ends September 2025. Complete terms and conditions are provided by Miro when accepting the offer.
31. MyHP requires Windows 10 or higher OS.
32. Poly Lens Desktop requires a Windows OS.
33. HP Client Catalog can be downloaded from <https://www.hp.com/us-en/solutions/client-management-solutions.html>
34. HP Client Management Script Library can be downloaded from <https://www.hp.com/us-en/solutions/client-management-solutions.html#tab=manageability-tools>
35. 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, network connection. **NOTE:** You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Detail please refer to: <https://support.hp.com/us-en/computer>.
36. 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.
37. HP Driver Packs can be downloaded from <https://www.hp.com/us-en/solutions/client-management-solutions/drivers-pack.html>
38. HP Image Assistant can be downloaded from <https://ftp.ext.hp.com/pub/caps-softpaq/cmit/HPIA.html>
39. HP Manageability Integration Kit can be downloaded from <https://www.hp.com/us-en/solutions/client-management-solutions.html#tab=manageability-tools>
40. 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>.
41. 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.

### Technical Specifications

- 42. HP Wolf Security for Business requires Windows 10 or 11 Pro 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.
  - 43. HP Sure Admin requires HP G8 or newer platforms, Windows 10 or higher, HP BIOS, HP Manageability Kit or KMS Service from <http://www.hp.com/go/clientmanagement> and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store.
  - 44. HP Sure Click requires Windows 10 or 11 Pro or higher. See [https://bit.ly/2PrLT6A\\_SureClick](https://bit.ly/2PrLT6A_SureClick) for complete details.
  - 45. HP Sure Recover is available on select HP PCs and requires Windows 10 or 11 and an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. Network based recovery using Wi-Fi is only available on select PCs.
  - 46. HP Sure Run is available on select HP PCs and requires Windows 10 and higher.
  - 47. HP Sure Start is available on select HP PCs and requires Windows 10 and higher.
  - 48. 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/>
  - 49. HP BIOSphere Gen6 features may vary depending on the platform and configuration.
  - 50. HP Fingerprint Reader is an optional feature that requires Windows 10 or 11 and must be configured at purchase.
  - 51. HP Secure Erase implements the methods outlined in the National Institute of Standards and Technology Special Publication 800-88r "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.
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## Technical Specifications

### POWER

#### Power Supply

HP 100W Slim USB Type-C® adapter <sup>52</sup>

HP Standard 65W USB Type-C® adapter <sup>52</sup>

HP Slim 65W USB Type-C® adapter <sup>52</sup>

#### Battery

HP Long Life 6 cell, 68Whr Polymer <sup>53,54</sup>

HP Long Life 3 cell, 56Whr Polymer <sup>53,54</sup>

#### Battery Recharge Time

Supports battery HP Fast Charge: approximately 50% in 30 minutes <sup>55</sup>

#### Power Cord

3-wire plug - 1m <sup>52</sup>

#### Battery life

Up to 20hrs with 68Whr battery (Intel U15, UMA graphic, brightness set to 250nits on a 400nits display, 2\*8GB LPDDR5x, 256GB SSD, 68Whr Polymer) <sup>56</sup>

Up to 19hrs15mins with 68Whr battery (Intel H28, UMA graphic, brightness set to 250nits on a 400nits display, 2\*8GB LPDDR5x, 256GB SSD, 68Whr Polymer) <sup>56</sup>

Up to 16hrs 40mins with 56Whr battery (Intel U15, UMA graphic, brightness set to 250nits on a 400nits display, 2\*8GB LPDDR5x, 256GB SSD, 56Whr Polymer) <sup>56</sup>

Up to 15hrs 15mins with 56Whr battery (Intel H28, UMA graphic, brightness set to 250nits on a 400nits display, 2\*8GB LPDDR5x, 256GB SSD, 56Whr Polymer) <sup>56</sup>

52. Availability may vary by country.

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

54. 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.

55. Recharges your battery up to 50% within 30 minutes when the system is off or in standby mode. Power adapter minimum of 65 watts required for battery capacities 56Whr or less. Power adapter minimum of 100 watts required for battery capacities greater than 56Whr and less than 83Whr. Power adapter minimum of 120 watts required for battery capacities greater than 83Whr and less than 100Whr. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.

56. Mobile Mark 25 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.

## Technical Specifications

### WEIGHTS & DIMENSIONS

#### Product Weight

Starting at 1.18 kg (2.6 lb) with 56.00 Wh battery  
Weight will vary by configuration. Does not include power adapter.

#### Product Dimensions (W x D x H) <sup>57</sup>

313.9 mm (W) x 219.9 mm (D) x 10.5 mm (front)/14.9 mm (rear)  
12.36 in (W) x 8.66 in (D) x 0.41 in (front)/0.59 in (rear)  
Maximum height 17.55 mm. (0.69 in)

#### Pallet Dimensions (W x D x H) <sup>58</sup>

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

57. Front height measurement is near the front edge where the chassis bottom cover taper begins. Back height measurement is near the back edge where the chassis bottom cover taper ends.

58. Product packaging size varies based on options chosen. Please contact your HP representative for your packaging size details. For detailed packaging information, access the [HP Commercial Notebooks Packaging Guide](#).

### PORTS/SLOTS

#### Left side

2 Thunderbolt™ 4 USB4™ Type-C® 40 Gbps USB Power Delivery DisplayPort™ 2.1  
1 HDMI 2.1  
1 Headphone/mic combo jack

#### Right side

1 Super Speed+ USB Type-C® 10Gbps USB signaling rate Power Delivery DisplayPort™ 1.4a  
1 Super Speed USB Type-A 5Gbps signaling rate Power charging  
1 Nano SIM card slot (Integrated) optional  
1 Security lock slot (Integrated)

## 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® 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>• <a href="#">Product Carbon Footprint</a></li> <li>• Ocean-bound plastic in SPEAKER,CPU</li> <li>• 48.2% post-consumer recycled plastic</li> <li>• 80% 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>	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, 50Hz</b>
Normal Operation (Short idle)	5.12 W	4.75 W	4.71 W
Normal Operation (Long idle)	0.95 W	0.67 W	0.68 W
Sleep	0.79 W	0.67 W	0.62 W
Off	0.31 W	0.30 W	0.30 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)	17.46 BTU/hr	16.20 BTU/hr	16.06 BTU/hr
Normal Operation (Long idle)	3.24 BTU/hr	2.28 BTU/hr	2.32 BTU/hr
Sleep	2.69 BTU/hr	2.28 BTU/hr	2.11 BTU/hr
Off	1.06 BTU/hr	1.02 BTU/hr	1.02 BTU/hr
	<p><b>*NOTE:</b> 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>	<b>Sound Power (L<sub>WAd</sub>, bels)</b>	<b>Sound Pressure (L<sub>pAm</sub>, decibels)</b>	
Typically Configured – Idle	2.6	13.3	
Fixed Disk – Random writes	2.6	19.1	

## Technical Specifications

Optical Drive – Sequential reads	3.0		19.5
<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</p> <p>Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.</p>		
<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 93.2% recycle-able when properly disposed of at end of life.</li> </ul>		
<b>Packaging Materials</b>	<b>External:</b>	PAPER/Corrugated	304 g
		PAPER/Molded pulp	114 g
	<b>Internal:</b>	PAPER/PAPER	3 g
		PLASTIC/Polyethylene low density-LDPE	22g
	The plastic packaging material contains at least 0% recycled content.		
	The corrugated paper packaging materials contains at least 57.9% 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>		
<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="https://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c05998906">https://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c05998906</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> </ul>		

## Technical Specifications

	<ul style="list-style-type: none"> <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 (TBT0)</li> </ul>
<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>HP offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <a href="https://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c05403198">https://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c05403198</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="#">HP Product Disassembly Instruction Website</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>Sustainable Impact Report  <a href="https://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c06040843">https://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c06040843</a></p> <p>Eco-label certifications  <a href="https://www.hp.com/us-en/sustainable-impact/document-reports.html#filters_documents_reports==document_type-type_energy_star,type_epeat,type_tcoISO">https://www.hp.com/us-en/sustainable-impact/document-reports.html#filters_documents_reports==document_type-type_energy_star,type_epeat,type_tcoISO</a></p> <p>ISO 14001 certificates:  <a href="https://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c04777932">https://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c04777932</a></p>



Technical Specifications

footnotes	<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>• Disclaimer: 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>
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### Technical Specifications

#### 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>59</sup>

59. 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

## (AC Power)

Nominal Operating Voltage	20.0V
Max Operating Power	100W

## Temperature

Operating	0° to 35° C (32° to 95° F) No sustained direct exposure to sunlight, System performance may be reduced above 32°C (89.6°F)
Non-operating	-20° to 60° C (-4° to 140° F) No sustained direct exposure to sunlight, System performance may be reduced above 32°C (89.6°F)

## Relative Humidity

Operating	10% to 90 % (non-condensing)
Non-operating	5% to 95 %, 38.7° C (101.6° F) maximum wet bulb temperature

## Shock

Operating	40 G, 2 ms, half-sine
Non-operating	240 G, 2 ms, half-sine

## Random Vibration

Operating	1.043 grams
Non-operating	3.500 grams

## Altitude (unpressurized)

Operating	3048 m (10000 ft)
Non-operating	12192 m (40000 ft)

## Planned Industry Standard

## Certifications

Regulatory Model Number	HSN-I60C
CSA/UL 62368-1	Yes
ENERGY STAR®	Yes <sup>59</sup>
EPEAT®	EPEAT® Gold in the United States <sup>60</sup>
FCC/ICES/CISPR/VCCI	Yes
CE MARKING	Yes
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
WW RoHS	Yes
Low Blue Light	Yes
MIL-STD 810H Testing	Yes <sup>61</sup>

59. Configurations of the HP EliteBook 1040 14 inch G11 Notebook PC that are ENERGY STAR® qualified are identified as HP EliteBook 1040 14 inch G11 Notebook PC ENERGY STAR on HP websites and on <http://www.energystar.gov>.

## Technical Specifications

60. 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.

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

## 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>14.0 in WUXGA (1920 x 1200) Anti-Glare UWVA LED sRGB 100 NB2Y 400 TOP eDP 1.4+PSR bent LCD Panel</b>	<b>Outline Dimensions (W x H)</b>	306.590x197.600(max)
	<b>Active Area</b>	301.59 X 188.50 (typ)
	<b>Weight</b>	220(max)
	<b>Diagonal Size</b>	14
	<b>Surface Treatment</b>	Anti-Glare
	<b>Touch Enabled</b>	Yes
	<b>Contrast Ratio</b>	1500: 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>	No
	<b>Power Consumption (W, EBL@ 150nits max/ 200nits max))</b>	1.35(max)/1.66(max)

<b>14.0 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)</b>	307.590 x 199.550 (max)
	<b>Active Area</b>	301.590 x 188.500 (typ)
	<b>Weight</b>	210 (max)
	<b>Diagonal Size</b>	14
	<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>	400 nits <sup>1</sup>
	<b>Pixel Resolution - Format</b>	1920 x 1200 (WUXGA)
	<b>Backlight</b>	WLED

Technical Specifications

Pixel Resolution	RGB
Color Gamut Coverage	sRGB 100%
Color Depth	8
Viewing Angle	UWVA 89/89/89/89
Low Blue Light	Yes
Power Consumption (W, EBL@ 150nits max/ 200nits max))	1.29 (max) / 1.66 (max)

<b>14.0 in WUXGA (1920 x 1200) Anti-Glare UWVA Low Blue Light sRGB 100 TOP 800 eDP 1.4+PSR +IOL Sure View 5 bent LCD Panel</b>	<b>Outline Dimensions (W x H)</b>	306.890 x 197.900 (max)
	<b>Active Area</b>	301.590 x 188.500 (typ)
	<b>Weight</b>	260 (max)
	<b>Diagonal Size</b>	14
	<b>Surface Treatment</b>	Anti-Glare
	<b>Touch Enabled</b>	Yes
	<b>Contrast Ratio</b>	1500:1(typ)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	800 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>	1.60 (max) / 1.97 (max)

<b>14.0 in WUXGA (1920 x 1200) Anti-Glare UWVA Low Blue Light sRGB 100 800 eDP 1.4+PSR +IOL Sure View 5 bent LCD Panel</b>	<b>Outline Dimensions (W x H)</b>	306.890 x 197.900 (max)
	<b>Active Area</b>	301.590 x 188.500 (typ)
	<b>Weight</b>	260 (max)
	<b>Diagonal Size</b>	14
	<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>	800 nits <sup>1</sup>
	<b>Pixel Resolution - Format</b>	1920 x 1200 (WUXGA)
	<b>Backlight</b>	WLED
	<b>Pixel Resolution</b>	RGB

Technical Specifications

Color Gamut Coverage	sRGB 100%
Color Depth	8
Viewing Angle	UWVA 89/89/89/89
Low Blue Light	Yes
Power Consumption (W, EBL@ 150nits max/ 200nits max))	1.48 (max) / 1.8 (max)

<b>14.0 in 2.8K (2880 x 1800) BrightView UWVA OLED+LBL DCI-P3 100 NBZ2 400 eDP 1.4+PSR 120Hz (VRR) bent OLED Panel</b>	<b>Outline Dimensions (W x H)</b>	305.450x197.850(max)
	<b>Active Area</b>	301.824x188.640 (typ)
	<b>Weight</b>	165(max)
	<b>Diagonal Size</b>	14
	<b>Surface Treatment</b>	Bright View
	<b>Touch Enabled</b>	No
	<b>Contrast Ratio</b>	100,000:1(typ)
	<b>Refresh Rate</b>	48~120Hz
	<b>Brightness</b>	400 nits <sup>1</sup>
	<b>Pixel Resolution - Format</b>	2880 x 1800 (UWVA)
	<b>Backlight</b>	OLED
	<b>Pixel Resolution</b>	RGB
	<b>Color Gamut Coverage</b>	DCI-P3 100%
	<b>Color Depth</b>	8 bit + FRC 2 bit
	<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>	4.42(max)/4.09(max)

## 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 ±20%
	<b>Maximum Sequential Write</b>	3500 MB/s ±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</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 ±20%
	<b>Maximum Sequential Write</b>	5000 MB/s ±20%
	<b>Logical Blocks</b>	2,000,409,264
	<b>Features</b>	Pyrite 2.0; TRIM; L1.2

<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 ±20%
	<b>Maximum Sequential Write</b>	5000 MB/s ±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 ±20%
	<b>Maximum Sequential Write</b>	900 MB/s ±20%
	<b>Logical Blocks</b>	500,118,192
	<b>Features</b>	TCG Opal 2.0; TRIM; L1.2

Technical Specifications

512GB PCIe-4x4 2280 NVME Self Encrypted OPAL2 Three Layer Cell Solid State Drive	Form Factor	M.2 2280
	Capacity	512GB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Maximum Sequential Read	6400 MB/s ±20%
	Maximum Sequential Write	3500 MB/s ±20%
	Logical Blocks	1,000,215,215
	Features	TCG Opal 2.0; TRIM; L1.2
SSD 256GB 2280 PCIe NVMe Value	Form Factor	M.2 2280
	Capacity	256 GB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Maximum Sequential Read	2000 MB/s ±20%
	Maximum Sequential Write	900 MB/s ±20%
	Logical Blocks	500,118,192
	Features	Pyrite 2.0; TRIM; L1.2
SSD 512GB 2280 PCIe NVMe Value	Form Factor	M.2 2280
	Capacity	512 GB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Maximum Sequential Read	2200 MB/s ±20%
	Maximum Sequential Write	1000 MB/s ±20%
	Logical Blocks	1,000,215,215
	Features	Pyrite 2.0; TRIM; L1.2
SSD 1TB 2280 PCIe NVMe Value	Form Factor	M.2 2280
	Capacity	1TB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Maximum Sequential Read	2200 MB/s ±20%
	Maximum Sequential Write	1600 MB/s ±20%
	Logical Blocks	2,000,409,264
	Features	Pyrite 2.0; TRIM; L1.2



Technical Specifications

NETWORKING/COMMUNICATIONS

Intel® AX211 Wi-Fi 6E Bluetooth® 5.3 Wireless Card vPro® WLAN <sup>1</sup>	Wireless LAN Standards	IEEE 802.11a IEEE 802.11ac IEEE 802.11ax IEEE 802.11b IEEE 802.11d IEEE 802.11e IEEE 802.11g IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11n IEEE 802.11r IEEE 802.11v
	Interoperability	Wi-Fi certified
	Frequency Band	<ul style="list-style-type: none"><li>• 802.11b/g/n/ax 2.402 – 2.482 GHz</li><li>• 802.11a/n/ac/ax 4.9 – 4.95 GHz (Japan) 5.15 – 5.25 GHz 5.25 – 5.35 GHz 5.47 – 5.725 GHz 5.825 – 5.850 GHz 5.955 – 6.415 GHz 6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 GHz</li></ul>
	Data Rates	<ul style="list-style-type: none"><li>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li><li>• 802.11ac: MCS0 ~ MCS9, (20MHz, 40MHz, 80MHz, 160MHz)</li><li>• 802.11ax: MCS0 ~ MCS11, (20MHz, 40MHz, 80MHz, 160MHz)</li><li>• 802.11b: 1, 2, 5.5, 11 Mbps</li><li>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li><li>• 802.11n: MCS 0 ~ MCS 15, (20MHz, 40MHz)</li></ul>
	Modulation	Direct Sequence Spread Spectrum 1024QAM, 16-QAM, 256-QAM, 4096QAM, 64-QAM, BPSK, CCK, OFDM, QPSK
	Security <sup>2</sup>	<ul style="list-style-type: none"><li>• 802.1x authentication</li><li>• AES-CCMP: 128 bit in hardware</li><li>• IEEE 802.11i</li><li>• IEEE and WiFi certified 64 / 128 bit WEP encryption for a/b/g mode only</li><li>• WAPI</li><li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li><li>• WPA2 certification</li><li>• WPA3 (personal) certification</li></ul>
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power <sup>3</sup>	<ul style="list-style-type: none"><li>• 802.11b: +17dBm minimum</li></ul>

Technical Specifications

	<ul style="list-style-type: none"><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><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></ul>
Power Consumption	<ul style="list-style-type: none"><li>• Transmit mode: 2.3 W</li><li>• Receive mode: 1.6 W</li><li>• Idle mode (PSP): 180 mW (WLAN Associated)</li><li>• Idle mode: 50 mW (WLAN unassociated)</li><li>• Connected Standby/Modern Standby: 10 mW</li><li>• Radio disabled: 8 mW</li></ul>
Power Management	ACPI and PCI Express compliant power management
Receiver Sensitivity <sup>4</sup>	<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>
Antenna type	High efficiency antenna with spatial diversity Two embedded tri-band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth® communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	30.00 x 22.00 x 2.30 mm (1.18 x 0.87 x 0.09 inch)
Weight	1. Type 2230: 2.8 g 2. Type 1216: g
Operating Voltage	3.3v +/- 9%
HP Integrated Module with Bluetooth® 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Card Technology	
Bluetooth® Specification	0
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	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

## Technical Specifications

	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 Link Topology</b>	Microsoft Windows Bluetooth® Software
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407; ETSI 300 328, ETSI 301 893, ETSI 303 687
<b>Bluetooth® Software Supported</b>	2Mbps LE Advanced Audio Distribution Profile (A2DP) Basic Imaging Profile (BIP) Bluetooth® 4.1-ESR 5/6/7 Compliance Bluetooth® 4.2 ESR08 Compliance Bluetooth® 5.2 Bluetooth® 5.3 wireless card Channel Selection Algo Encryption key size control enhancements ESR9/10 Compliance FAX Profile (FAX) Hands Free Profile (HFP) Headset Profile (HSP) LE Advertisement Extensions LE Data Packet Length Extension LE Dual Mode LE L2CAP Connection Oriented Channels LE Link Layer LE Link Layer Ping LE Long Range LE Low Duty Cycle Directed Advertising LE Privacy 1.2 –Extended Scanner Filter Policies LE Privacy 1.2 –Link Layer Privacy LE Secure Connection- Basic/Full Limited High Duty Cycle Non-Connectable Advertising Periodic Advertisement interval Train Nudging & Interlaced Scan Windows Bluetooth® profiles support

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.

Technical Specifications

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).

Intel® AX211 Wi-Fi 6E Bluetooth® 5.3 Wireless Card WLAN <sup>1</sup>	Wireless LAN Standards	IEEE 802.11a IEEE 802.11ac IEEE 802.11ax IEEE 802.11b IEEE 802.11d IEEE 802.11e IEEE 802.11g IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11n IEEE 802.11r IEEE 802.11v
	Interoperability	Wi-Fi certified
	Frequency Band	<ul style="list-style-type: none"><li>• 802.11b/g/n/ax 2.402 – 2.482 GHz</li><li>• 802.11a/n/ac/ax 4.9 – 4.95 GHz (Japan) 5.15 – 5.25 GHz 5.25 – 5.35 GHz 5.47 – 5.725 GHz 5.825 – 5.850 GHz 5.955 – 6.415 GHz 6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 GHz</li></ul>
	Data Rates	<ul style="list-style-type: none"><li>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li><li>• 802.11ac: MCS0 ~ MCS9, (20MHz, 40MHz, 80MHz, 160MHz)</li><li>• 802.11ax: MCS0 ~ MCS11, (20MHz, 40MHz, 80MHz, 160MHz)</li><li>• 802.11b: 1, 2, 5.5, 11 Mbps</li><li>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li><li>• 802.11n: MCS 0 ~ MCS 15, (20MHz, 40MHz)</li></ul>
	Modulation	Direct Sequence Spread Spectrum 1024QAM, 16-QAM, 256-QAM, 64-QAM, BPSK, CCK, Direct Sequence Spread Spectrum, OFDM, QPSK
	Security <sup>2</sup>	<ul style="list-style-type: none"><li>• 802.1x authentication</li><li>• AES-CCMP: 128 bit in hardware</li><li>• IEEE 802.11i</li><li>• IEEE and WiFi certified 64 / 128 bit WEP encryption for a/b/g mode only</li><li>• WAPI</li><li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li><li>• WPA2 certification</li><li>• WPA3 (personal) certification</li></ul>
	Network Architecture	Ad-hoc (Peer to Peer)

Technical Specifications

Models	Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power <sup>3</sup>	<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><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></ul>
Power Consumption	<ul style="list-style-type: none"><li>• Transmit mode: 2.3 W</li><li>• Receive mode: 1.6 W</li><li>• Idle mode (PSP): 180 mW (WLAN Associated)</li><li>• Idle mode: 50 mW (WLAN unassociated)</li><li>• Connected Standby/Modern Standby: 10 mW</li><li>• Radio disabled: 8 mW</li></ul>
Power Management	ACPI and PCI Express compliant power management
Receiver Sensitivity <sup>4</sup>	<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>
Antenna type	High efficiency antenna with spatial diversity Two embedded tri-band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth® communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	30.00 x 22.00 x 2.30 mm (1.18 x 0.87 x 0.09 inch)
Weight	Type 2230: 2.8g
Operating Voltage	3.3v +/- 9%
HP Integrated Module with Bluetooth® 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Card Technology	
Bluetooth® Specification	0
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps

## Technical Specifications

	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 Link Topology</b>	Microsoft Windows Bluetooth® Software
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407; ETSI 300 328, ETSI 301 893, ETSI 303 687
<b>Bluetooth® Software Supported</b>	2Mbps LE Advanced Audio Distribution Profile (A2DP) Basic Imaging Profile (BIP) Bluetooth® 4.1-ESR 5/6/7 Compliance Bluetooth® 4.2 ESR08 Compliance Bluetooth® 5.2 Bluetooth® 5.3 wireless card Channel Selection Algo Encryption key size control enhancements ESR9/10 Compliance FAX Profile (FAX) Hands Free Profile (HFP) Headset Profile (HSP) LE Advertisement Extensions LE Data Packet Length Extension LE Dual Mode LE L2CAP Connection Oriented Channels LE Link Layer LE Link Layer Ping LE Long Range LE Low Duty Cycle Directed Advertising LE Privacy 1.2 –Extended Scanner Filter Policies LE Privacy 1.2 –Link Layer Privacy LE Secure Connection- Basic/Full Limited High Duty Cycle Non-Connectable Advertising Periodic Advertisement interval Train Nudging & Interlaced Scan Windows Bluetooth® profiles support

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.

Technical Specifications

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).

Intel® BE200 Wi-Fi 7 Bluetooth® 5.4 wireless card non-vPro® WW WLAN¹	Wireless LAN Standards	IEEE 802.11a IEEE 802.11ac IEEE 802.11ax IEEE 802.11b IEEE 802.11be IEEE 802.11d IEEE 802.11e IEEE 802.11g IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11n IEEE 802.11r IEEE 802.11v
	Interoperability	Wi-Fi certified
	Frequency Band	• 802.11b/g/n/ax 2.402 – 2.482 GHz • 802.11a/n/ac/ax 4.9 – 4.95 GHz (Japan) 5.15 – 5.25 GHz 5.25 – 5.35 GHz 5.47 – 5.725 GHz 5.825 – 5.850 GHz 5.955 – 6.415 GHz 6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 GHz
	Data Rates	• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11ac: MCS0 ~ MCS9, (20MHz, 40MHz, 80MHz, 160MHz) • 802.11ax: MCS0 ~ MCS11, (20MHz, 40MHz, 80MHz, 160MHz) • 802.11b: 1, 2, 5.5, 11 Mbps • 802.11be: MCS0~13, (20MHz, 40MHz, ,80MHz, 160MHz, 320MHz) • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, 40MHz)
	Modulation	Direct Sequence Spread Spectrum 1024QAM, 16-QAM, 256-QAM, 4096QAM, 64-QAM, BPSK, CCK, Direct Sequence Spread Spectrum, OFDM, QPSK
	Security²	• 802.1x authentication • AES-CCMP: 128 bit in hardware • IEEE 802.11i • IEEE and WiFi certified 64 / 128 bit WEP encryption for a/b/g mode only

### Technical Specifications

	<ul style="list-style-type: none"> <li>• WAPI</li> <li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>• WPA2 certification</li> <li>• WPA3 (personal) certification</li> </ul>
<b>Network Architecture</b>	Ad-hoc (Peer to Peer)
<b>Models</b>	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, 1Mbps: +17dBm minimum</li> <li>• 802.11g, 6Mbps: +16dBm minimum</li> <li>• 802.11a, 6Mbps: +17dBm minimum</li> <li>• 802.11n, MCS7(HT20): +14dBm minimum</li> <li>• 802.11n, MCS7(HT40): +13.5dBm minimum</li> <li>• 802.11ac MCS9(VHT20): 13.5dBm minimum</li> <li>• 802.11ac MCS9(VHT40): +13.5dBm minimum</li> <li>• 802.11ac MCS9(VHT80): +12.5dBm minimum</li> <li>• 802.11ac MCS9(VHT160): +10.5dBm minimum</li> <li>• 802.11ax MCS11(HE20) (6GHz): +11.5dBm minimum</li> <li>• 802.11ax MCS11(HE40) (6GHz): +7.5dBm minimum</li> <li>• 802.11ax MCS11(HE80) (6GHz): +7.5dBm minimum</li> <li>• 802.11ax MCS11(HE160) (6GHz): +7.5dBm minimum</li> <li>• 802.11be MCS13(EHT20) (6GHz): 11.5dBm</li> <li>• 802.11be MCS13(EHT40) (6GHz): 7.5dBm</li> <li>• 802.11be MCS13(EHT80) (6GHz): 7.5dBm</li> <li>• 802.11be MCS13(EHT160) (6GHz): 6.5dBm</li> <li>• 802.11be MCS13(EHT320) (6GHz): 4.5dBm</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode: 3.4 W</li> <li>• Receive mode: 1.8 W</li> <li>• Idle mode (PSP): 180 mW (WLAN Associated)</li> <li>• Idle mode: 50 mW (WLAN unassociated)</li> <li>• Connected Standby/Modern Standby: 10 mW</li> <li>• Radio disabled: 8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management
<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: -85dBm maximum</li> <li>• 802.11a/g, 6Mbps: -90.5dBm maximum</li> <li>• 802.11a/g, 54Mbps: -72.5dBm maximum</li> <li>• 802.11n, MCS0(HT20): -90dBm maximum</li> <li>• 802.11n, MCS7(HT20): -71.5dBm maximum</li> <li>• 802.11n, MCS0(HT40): -88.5dBm maximum</li> <li>• 802.11n, MCS7(HT40): -68.5dBm maximum</li> <li>• 802.11ac, MCS9(VHT20): -88.5dBm maximum</li> <li>• 802.11ac, MCS9(VHT40): -65.5dBm maximum</li> <li>• 802.11ac, MCS9(VHT80): -60.5dBm maximum</li> <li>• 802.11ac, MCS9(VHT160): -58.5dBm maximum</li> <li>• 802.11ax, MCS11(HE20) (6GHz): -59.5dBm maximum</li> <li>• 802.11ax, MCS11(HE40) (6GHz): -56.5dBm maximum</li> <li>• 802.11ax, MCS11(HE80) (6GHz): -53.5dBm maximum</li> <li>• 802.11ax, MCS11(HE160) (6GHz): -51.5dBm maximum</li> </ul>



## Technical Specifications

- 802.11be, MCS13(EHT20) (6GHz): -55.5dBm maximum
- 802.11be, MCS13(EHT40) (6GHz): -53.5dBm maximum
- 802.11be, MCS13(EHT80) (6GHz): -51.5dBm maximum
- 802.11be, MCS13(EHT160) (6GHz): -48.5dBm maximum
- 802.11be, MCS13(EHT320) (6GHz): -45.5dBm maximum

**Antenna type**

High efficiency antenna with spatial diversity  
Two embedded tri-band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth® communications

**Form Factor**

PCI-Express M.2 MiniCard

**Dimensions**

30.00 x 22.00 x 2.30 mm (1.18 x 0.87 x 0.09 inch)

**Weight**

1. Type 2230: 3.1 g
2. Type 1216: 0.8 g

**Operating Voltage**

3.3 v +/- 5 %

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

0

**Frequency Band**

2402 to 2480 MHz

**Number of Available Channels**

Legacy: 0~79 (1 MHz/CH)  
BLE: 0~39 (2 MHz/CH)

**Signaling Data Rate**

Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps  
BLE: 1 Mbps data rate; throughput up to 0.2 Mbps  
Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels  
Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)

**Transmit Power**

The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of + 4 dBm for BR and EDR.

**Power Consumption**

Peak (Tx): 330 mW  
Peak (Rx): 230 mW  
Selective Suspend: 17 mW

**Bluetooth® Software Supported Link Topology**

Microsoft Windows Bluetooth® Software

**Power Management**

Microsoft Windows ACPI, and USB Bus Support

**Certifications**

FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407; ETSI 300 328, ETSI 301 893, ETSI 303 687

**Bluetooth® Software Supported**

2Mbps LE  
Advanced Audio Distribution Profile (A2DP)  
Basic Imaging Profile (BIP)  
Bluetooth® 4.1-ESR 5/6/7 Compliance  
Bluetooth® 4.2 ESR08 Compliance  
Bluetooth® 5.2  
Bluetooth® 5.3 wireless card  
Channel Selection Algo  
Encryption key size control enhancements  
ESR9/10 Compliance  
FAX Profile (FAX)  
Hands Free Profile (HFP)

Technical Specifications

- Headset Profile (HSP)
- LE Advertisement Extensions
- LE Data Packet Length Extension
- LE Dual Mode
- LE L2CAP Connection Oriented Channels
- LE Link Layer
- LE Link Layer Ping
- LE Long Range
- LE Low Duty Cycle Directed Advertising
- LE Privacy 1.2 –Extended Scanner Filter Policies
- LE Privacy 1.2 –Link Layer Privacy
- LE Secure Connection- Basic/Full
- Limited High Duty Cycle Non-Connectable Advertising
- Train Nudging & Interlaced Scan
- Windows Bluetooth® profiles support

1. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 7 (802.11BE) functionality requires compatible Windows OS, select Intel® processor, and a Wi-Fi 7 router, sold separately. Wi-Fi 7 is backwards compatible with prior 802.11 specs. Available in countries where Wi-Fi 7 is supported. The specification for 802.11BE is a draft specification and is not final. If the final specification differs from the draft specification, it may affect the ability of the device to communicate with other 802.11BE devices.
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).

<b>Intel® BE200 Wi-Fi 7 Bluetooth® 5.4 wireless card vPro ® WW WLAN <sup>1</sup></b>	<b>Wireless LAN Standards</b>	IEEE 802.11a
		IEEE 802.11ac
		IEEE 802.11ax
		IEEE 802.11b
		IEEE 802.11be
		IEEE 802.11d
		IEEE 802.11e
		IEEE 802.11g
		IEEE 802.11h
		IEEE 802.11i
		IEEE 802.11k
		IEEE 802.11n
		IEEE 802.11r
IEEE 802.11v		
<b>Interoperability Frequency Band</b>	Wi-Fi certified	
	• 802.11b/g/n/ax 2.402 – 2.482 GHz	
	• 802.11a/n/ac/ax 4.9 – 4.95 GHz (Japan) 5.15 – 5.25 GHz	

### Technical Specifications

	5.25 – 5.35 GHz
	5.47 – 5.725 GHz
	5.825 – 5.850 GHz
	5.955 – 6.415 GHz
	6.435 – 6.515 GHz
	6.535 – 6.875 GHz
	6.895 – 7.115 GHz
<b>Data Rates</b>	<ul style="list-style-type: none"> <li>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11ac: MCS0 ~ MCS9, (20MHz, 40MHz, 80MHz, 160MHz)</li> <li>• 802.11ax: MCS0 ~ MCS11, (20MHz, 40MHz, 80MHz, 160MHz)</li> <li>• 802.11b: 1, 2, 5.5, 11 Mbps</li> <li>• 802.11be: MCS0~13, (20MHz, 40MHz, 80MHz, 160MHz, 320MHz)</li> <li>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11n: MCS 0 ~ MCS 15, (20MHz, 40MHz)</li> </ul>
<b>Modulation</b>	Direct Sequence Spread Spectrum 1024QAM, 16-QAM, 256-QAM, 4096QAM, 64-QAM, BPSK, CCK, Direct Sequence Spread Spectrum, OFDM, QPSK
<b>Security<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• 802.1x authentication</li> <li>• AES-CCMP: 128 bit in hardware</li> <li>• IEEE 802.11i</li> <li>• IEEE and WiFi certified 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>• WAPI</li> <li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>• WPA2 certification</li> <li>• WPA3 (personal) certification</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, 1Mbps: +17dBm minimum</li> <li>• 802.11g, 6Mbps: +16dBm minimum</li> <li>• 802.11a, 6Mbps: +17dBm minimum</li> <li>• 802.11n, MCS7(HT20): +14dBm minimum</li> <li>• 802.11n, MCS7(HT40): +13.5dBm minimum</li> <li>• 802.11ac MCS9(VHT20): 13.5dBm minimum</li> <li>• 802.11ac MCS9(VHT40): +13.5dBm minimum</li> <li>• 802.11ac MCS9(VHT80): +12.5dBm minimum</li> <li>• 802.11ac MCS9(VHT160): +10.5dBm minimum</li> <li>• 802.11ax MCS11(HE20) (6GHz): +11.5dBm minimum</li> <li>• 802.11ax MCS11(HE40) (6GHz): +7.5dBm minimum</li> <li>• 802.11ax MCS11(HE80) (6GHz): +7.5dBm minimum</li> <li>• 802.11ax MCS11(HE160) (6GHz): +7.5dBm minimum</li> <li>• 802.11be MCS13(EHT20) (6GHz): 11.5dBm</li> <li>• 802.11be MCS13(EHT40) (6GHz): 7.5dBm</li> <li>• 802.11be MCS13(EHT80) (6GHz): 7.5dBm</li> <li>• 802.11be MCS13(EHT160) (6GHz): 6.5dBm</li> <li>• 802.11be MCS13(EHT320) (6GHz): 4.5dBm</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode: 3.4 W</li> <li>• Receive mode: 1.8 W</li> </ul>

Technical Specifications

	<ul style="list-style-type: none"><li>• Idle mode (PSP): 180 mW (WLAN Associated)</li><li>• Idle mode: 50 mW (WLAN unassociated)</li><li>• Connected Standby/Modern Standby: 10 mW</li><li>• Radio disabled: 8 mW</li></ul>
Power Management	ACPI and PCI Express compliant power management
Receiver Sensitivity <sup>4</sup>	<ul style="list-style-type: none"><li>•802.11b, 1Mbps: -93.5dBm maximum</li><li>•802.11b, 11Mbps: -85dBm maximum</li><li>• 802.11a/g, 6Mbps: -90.5dBm maximum</li><li>• 802.11a/g, 54Mbps: -72.5dBm maximum</li><li>• 802.11n, MCS0(HT20): -90dBm maximum</li><li>• 802.11n, MCS7(HT20): -71.5dBm maximum</li><li>• 802.11n, MCS0(HT40): -88.5dBm maximum</li><li>• 802.11n, MCS7(HT40): -68.5dBm maximum</li><li>• 802.11ac, MCS9(VHT20): -88.5dBm maximum</li><li>• 802.11ac, MCS9(VHT40): -65.5dBm maximum</li><li>• 802.11ac, MCS9(VHT80): -60.5dBm maximum</li><li>• 802.11ac, MCS9(VHT160): -58.5dBm maximum</li><li>• 802.11ax, MCS11(HE20) (6GHz): -59.5dBm maximum</li><li>• 802.11ax, MCS11(HE40) (6GHz): -56.5dBm maximum</li><li>• 802.11ax, MCS11(HE80) (6GHz): -53.5dBm maximum</li><li>• 802.11ax, MCS11(HE160) (6GHz): -51.5dBm maximum</li><li>• 802.11be, MCS13(EHT20) (6GHz): -55.5dBm maximum</li><li>• 802.11be, MCS13(EHT40) (6GHz): -53.5dBm maximum</li><li>• 802.11be, MCS13(EHT80) (6GHz): -51.5dBm maximum</li><li>• 802.11be, MCS13(EHT160) (6GHz): -48.5dBm maximum</li><li>• 802.11be, MCS13(EHT320) (6GHz): -45.5dBm maximum</li></ul>
Antenna type	High efficiency antenna with spatial diversity Two embedded tri-band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth® communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	30.00 x 22.00 x 2.30 mm (1.18 x 0.87 x 0.09 inch)
Weight	1. Type 2230: 3.1 g 2. Type 1216: 0.8 g
Operating Voltage	3.3v +/- 5%
HP Integrated Module with Bluetooth® 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Card Technology	
Bluetooth® Specification	0
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps BLE: 1 Mbps data rate; throughput up to 0.2 Mbps Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of + 4 dBm for BR and EDR.

## Technical Specifications

<b>Power Consumption</b>	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
<b>Bluetooth® Software Supported Link Topology</b>	Microsoft Windows Bluetooth® Software
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407; ETSI 300 328, ETSI 301 893, ETSI 303 687
<b>Bluetooth® Software Supported</b>	2Mbps LE Advanced Audio Distribution Profile (A2DP) Basic Imaging Profile (BIP) Bluetooth® 4.1-ESR 5/6/7 Compliance Bluetooth® 4.2 ESR08 Compliance Bluetooth® 5.2 Bluetooth® 5.3 wireless card Channel Selection Algo Encryption key size control enhancements ESR9/10 Compliance FAX Profile (FAX) Hands Free Profile (HFP) Headset Profile (HSP) LE Advertisement Extensions LE Data Packet Length Extension LE Dual Mode LE L2CAP Connection Oriented Channels LE Link Layer LE Link Layer Ping LE Long Range LE Low Duty Cycle Directed Advertising LE Privacy 1.2 –Extended Scanner Filter Policies LE Privacy 1.2 –Link Layer Privacy LE Secure Connection- Basic/Full Limited High Duty Cycle Non-Connectable Advertising Train Nudging & Interlaced Scan Windows Bluetooth® profiles support

1. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 7 (802.11BE) functionality requires compatible Windows OS, select Intel® processor, and a Wi-Fi 7 router, sold separately. Wi-Fi 7 is backwards compatible with prior 802.11 specs. Available in countries where Wi-Fi 7 is supported. The specification for 802.11BE is a draft specification and is not final. If the final specification differs from the draft specification, it may affect the ability of the device to communicate with other 802.11BE devices.

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

HP 5000 5G Solution<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 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 2: 1850 to 1910 MHz (UL), 1930 to 1990 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 3: 1710 to 1785 MHz (UL), 1805 to 1880 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 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (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 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)

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

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

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

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

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)

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

n38: 2570 to 2620 MHz (UL/DL)

n40: 2300 to 2400 MHz (UL/DL)

n41: 2496 to 2690 MHz (UL/DL)

n48: 3550 to 3700 MHz (UL/DL)

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

Technical Specifications

	n66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL) n7: 2500 to 2570 MHz (UL), 2620 to 2690 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) n8: 880 to 915 MHz (UL), 925 to 960 MHz (DL) 3GPP Rel15 5G NR sub-6
Wireless protocol standards	
GPS	Standalone/A-GPS (MS-A, MS-B)
GPS bands	GPS L1 (1575.42MHz), GLONASS L1 (1602MHz), Beidou B1 (1561.098MHz), Galileo E1 (1575.42MHz), QZSS (1575.42MHz)
Maximum data rates	SA 5G/NR sub-6 Peak: 4.67 Gbps (Download), 1.25 Gbps (Upload)
Maximum output power	LTE (all bands except B41): 23.0 dBm LTE B41 HPUE: 26.0 dBm
Maximum power consumption	5G Sub 6: 3,500 mA
Form Factor	M.2
Weight	8.7 g (0.307 oz)
Dimensions (Length x Width x Thickness)	52.00 x 30.00 x 2.30 mm (2.05 x 1.18 x 0.09 inch)
embedded eSIM	Support

1. 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.

HP 4000 4G LTE-Advanced Pro <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 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 2: 1850 to 1910 MHz (UL), 1930 to 1990 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)
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Technical Specifications

	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 3: 1710 to 1785 MHz (UL), 1805 to 1880 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 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (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 48: 3550 to 3700 MHz (UL/DL)
	Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)
	Band 66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)
	Band 7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)
	Band 71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)
	Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)
<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>	DC-HSPA+: 42.00 Mbps(Download), 11.50 Mbps(Upload)
<b>Maximum output power</b>	HSPA+: 23.5 dBm LTE (all bands except B41): 23.0 dBm
<b>Maximum power consumption</b>	LTE: 1,300 mA (peak); 1,100 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average)
<b>Form Factor</b>	M.2; 3052-S3 Key B
<b>Weight</b>	8.0 g (0.282 oz)
	52.00 x 30.00 x 2.30 mm (2.05 x 1.18 x 0.09 inch)
<b>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.

<b>NFC Mirage WNC XRAV-1</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



## Technical Specifications

	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>	Type 1, Type 2, Type 3 / Type 4, NFCIP-1 / 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
<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>	Operating: 0 °C to 70 °C (32 °F to 158 °F) Storage: -20 °C to 125 °C (-4 °F to 257 °F)
<b>Storage temperature</b>	Operating: 10% - 90% (non-condensing) Non-Operating: 5% - 95% (non-condensing)
<b>Humidity</b>	Operating: 10% - 90% (non-condensing) Non-Operating: 5% - 95% (non-condensing)
<b>Supply Operating voltage</b>	4.35 to 5.25 Volts
<b>I/O Voltage</b>	1.8V or 3.3V
<b>Power Consumption</b> <b>(Booster enable, 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

<b>Qualcomm 9205 LTE-M<sup>1</sup> (no Internet)*</b>	<b>Technology/Operating bands</b>	FDD LTE: 1700/2100 (Band 4), 1700/2100 (Band 66), 1800 (Band 3), 1900 (Band 2), 1900 (Band 25), 2100 (Band 1), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 14 upper), 700 (Band 28), 700 (band 85), 800 (Band 20), 800 (Band 27), 850 (Band 18 lower), 850 (Band 19 upper), 850 (Band 26), 850 (Band 5), 900 (Band 8) MHz GSM/GPRS/EGPRS: 1800, 1900, 850, 900 MHz
	<b>Wireless protocol standards</b>	<ul style="list-style-type: none"> <li>• 3GPP TS 21.111 V10.0.0: USIM and IC card requirements</li> <li>• 3GPP TS 27.005 V10.0.1: Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)</li> <li>• 3GPP TS 27.007 V10.0.8: AT command set for User Equipment (UE)</li> <li>• 3GPP TS 31.102 V10.11.0: Characteristics of the Universal Subscriber Identity Module (USIM) application</li> <li>• 3GPP TS 31.11 V10.16.0: Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)</li> <li>• 3GPP TS 36.124 V10.3.0: Electro Magnetic Compatibility (EMC) requirements for mobile terminals and ancillary equipment</li> <li>• 3GPP TS 36.521-1 V14.3.0: User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Conformance testing</li> <li>• 3GPP TS 51.010-1 V10.5.0: Mobile Station (MS) conformance specification; Part 1: Conformance specification</li> <li>• 3GPP TS 51.011 V4.15.0: Specification of the Subscriber Identity Module -Mobile Equipment (SIM-ME) interface</li> </ul>
	<b>GPS</b>	Standalone GPS/Beidou/GLONASS
	<b>GPS bands</b>	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz
	<b>Maximum data rates</b>	LTE FDD: 375.00 Kbps(Download), 1119.00 Kbps(Upload) GPRS: 107.00 Kbps(Download), 85.60 Kbps(Upload) EGPRS: 296.00 Kbps(Download), 236.80 Kbps(Upload)
	<b>Maximum output power</b>	LTE (all bands except B41): 21.5 dBm GSM: 34.0 dBm
	<b>Maximum power consumption</b>	LTE: 147 mA(peak), 60 mA(average)
	<b>Weight</b>	4.0 g (0.141 oz)
	<b>Dimensions (Length x Width x Thickness)</b>	22.00 x 42.00 x 2.30 mm (0.87 x 1.65 x 0.09 inch)
	<b>eSIM</b>	Support

1.LPWAN (also called Mobile Narrowband) supports HP Protect & Trace with Wolf Connect service through the subscription term, but does not support mobile broadband use.

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

AC Adapter 65 Watt nPFC Standard USB type C Straight 1.8m	Weight	240g ± 10g	
		Input	100-240Vac
			Input Efficiency
			Input frequency range
			Input AC current
Output	Output	Output power	81.50% min at 115 Vac/ 230 Vac @5.00V
			86.70% min at 115 Vac/ 230 Vac @9.00V
			88.00% min at 115 Vac/ 230 Vac @12.00V
			89.00% min at 115 Vac/ 230 Vac @15.00V
			89.00% min at 115 Vac/ 230 Vac @20.00V
			47-63Hz
			Max. 1.6 A at 90 Vac
			5V/15W
			9V/27W
			12V/60W
Connector	Connector	DC output	15V/65W
			20V/65W
			5V/9V/12V/15V/20V
			Hold-up time
			100% load 5ms at 115 Vac input
			Output current limit
			< 8.0A
			AC Inlet Type
			C6
			DC Cable Connector
Environmental Design	Environmental Design	DC Cable Material	USB type C
			PVC
			C6
			Operating temperature
			32°F to 95°F (0° to 35°C)
			Non-operating (storage) temperature
			-4°F to 185°F (-20° to 85°C)
			Altitude
EMI and Safety Certifications	EMI and Safety Certifications	Humidity	0 to 16,400 ft (0 to 5000m)
			20% to 95%
			Storage Humidity
			10% to 95%
			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

HP 65W Slim USB-C Straight AC Power Adapter	Weight	220g ± 10g	
	Input	100-240Vac	
	Output	Input Efficiency	81.50% min at 115 Vac/ 230 Vac @5.00V 86.70% min at 115 Vac/ 230 Vac @9.00V 88.00% min at 115 Vac/ 230 Vac @12.00V 89.00% min at 115 Vac/ 230 Vac @15.00V 89.00% min at 115 Vac/ 230 Vac @20.00V
		Input frequency range	47-63Hz
		Input AC current	Max. 1.6 A at 90 Vac
		Output power	5V/15W 9V/27W 12V/60W 15V/65W 20V/65W
		DC output	5V/9V/12V/15V/20V
		Hold-up time	100% load 5ms at 115 Vac input
		Output current limit	< 8.0A
		AC Inlet Type	C6
		DC Cable Connector	USB type C
Connector	Environmental Design	DC Cable Material	PVC
		C6	
		Operating temperature	32°F to 95°F (0° to 35°C)
		Non-operating (storage) temperature	-4°F to 185°F (-20° to 85°C)
		Altitude	0 to 16,400 ft (0 to 5000m)
EMI and Safety Certifications		Humidity	20% to 95%
		Storage Humidity	10% to 95%
		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

HP 100W Slim USB-C Straight AC Power Adapter	Weight	380g ± 10g
	Input	100-240Vac
	Output	<b>Input Efficiency</b>
		81.50% min at 115 Vac/ 230 Vac @5.00V
		86.70% min at 115 Vac/ 230 Vac @9.00V
		88.00% min at 115 Vac/ 230 Vac @12.00V
		89.00% min at 115 Vac/ 230 Vac @15.00V
		89.00% min at 115 Vac/ 230 Vac @20.00V
		<b>Input frequency range</b>
		47-63Hz
		<b>Input AC current</b>
		Max. 1.6 A at 90 Vac
	Connector	<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/80% load 10ms at 115 Vac input
	Environmental Design	<b>Output current limit</b>
		5V/9V/12V/15V<125% max current, 20V<135% max current
		<b>AC Inlet Type</b>
		C6
		<b>DC Cable Connector</b>
		USB type C
		<b>DC Cable Material</b>
		PVC
		<b>Connector</b>
		C6
EMI and Safety Certifications		<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>CE Mark - full compliance with LVD and EMC directives</b>
		Worldwide safety standards - IEC60950-1, IEC 62368-1:2014 and IEC62368-1: 2018, EN62368-1:2020+A11, UL 62368-1
		Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, CU(EAC), KCC(Safety+EMC), NOM-001 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia RCM, BIS, BSMI, UAE, UKCA DoC, Ukraine(CoC+DoC+RoHS+ECO)

Technical Specifications

HP 3-cell Long Life Li-Ion (56WHr) <sup>1</sup>	Weight	0.205kg +/- 10g (0.474 lb)	
	Cells/Type	3cell Lithium-Ion Polymer cell / 586075	
	Energy	Voltage	11.58V
		Amp-hour capacity	4.84Ah
		Watt-hour capacity <sup>1</sup>	56.04Wh
		Operating (Charging)	32° to 113° F (0° to 45° C)
	Temperature	Operating (Discharging)	14° to 140° F (-10° to 60° C)
		Optional Travel Battery Available	No

HP 6-cell Long Life Li-Ion (68WHr) <sup>1</sup>	Weight	0.255kg +/- 10g(0.562 lb)	
	Cells/Type	6cell Lithium-Ion Polymer cell /594461	
	Energy	Voltage	11.58V
		Amp-hour capacity	5.88Ah
		Watt-hour capacity <sup>1</sup>	68Wh
		Operating (Charging)	32° to 113° F (0° to 45° C)
	Temperature	Operating (Discharging)	14° to 140° F (-10° to 60° C)
		Optional Travel Battery Available	No

Technical Specifications

AUDIO

HD Stereo Codec	Realtek ALC3315
Audio I/O Ports	3.5mm Headset: CTIA only; Headphone-out
Internal Speaker Amplifier	Cirrus Logic High-Efficiency Boosted Class D Amplifier
Multi-streaming Capable	Playback multi-streaming can be enabled in the audio control panel to allow independent audio streams to be sent to/from the front jacks or integrated speaker., Following MSFT Behavior
Sampling	DAC: Supports resolutions from 16-bit to 24-bit;48.0 kHz to 48.0 kHz ADC: Supports resolutions from 16-bit to 24-bit;44.1 kHz to 48.0 kHz
Internal Speaker	Yes

FINGERPRINT READER

Sensor vendor	SYNAPTICS
Sensor type	Capacitive
DPI resolution	363 DPI
Scan area	104 x 86 pixels
False Rejection Rate	< 3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	2.7 V ~ 3.6 V
Operating Temperature	5°C ~ 60°C (41°F ~ 140°F)
Current Consumption	100 mA max
Image	
Low Latency Wait For Finger	260 uA
Capture Rate	50 frames/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	363 dpi / 7.4 x 6.0 mm sensor area

Sensor vendor	ELAN
Sensor type	Capacitive
DPI resolution	508 DPI
Scan area	80 x 80 pixels
False Rejection Rate	< 3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	2.7 V ~ 3.6 V
Operating Temperature	-20°C ~ 80°C (-4°F ~ 176°F)
Current Consumption	35 mA max
Image	
Low Latency Wait For Finger	300 uA
Capture Rate	50 frames/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	508 dpi / 4.0 x 4.0 mm sensor area

### 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 Thunderbolt hosts or USB-C hosts DisplayPort 1.4 with Display Stream Compression in High-Resolution Mode.
<b>Dock Connectors</b>	2 x HDMI 2.0, 1 x USB-C Alt Mode, 1 x Thunderbolt 4, 2 x DisplayPort 1.4
<b>Technical limitations</b>	<b>Maximum resolution and display support is dependent on the maximum capability of the notebook.</b>  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: <b>The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is</b> (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 USB-C Dock G5
<b>Total number of supported displays (incl. the notebook display)</b>	3
<b>Max. resolutions supported</b>	Multi-Function Mode: (2) 5k @ 30Hz and (1) 4k UHD @ 30Hz on any port. High-Resolution Mode: (2) 5k @ 60Hz on DisplayPort ports and (1) 4k UHD @ 60Hz on HDMI port.
<b>Dock Connectors</b>	1x HDMI 2.0, 2x DisplayPort 1.4
<b>Technical limitations</b>	<b>Maximum resolution and display support is dependent on the maximum capability of the notebook.</b>  <b>Highest resolution with dual displays is two 8K@ 60Hz host in High Resolution mode.</b> Three maximum displays supported are two 5K@ 30 Hz on DP ports plus one 4K UHD@ 30 Hz on HDMI in Multi-function mode. 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.
<b>Docking station model #3</b>	HP USB-C G5 Essential Dock
<b>Total number of supported displays (incl. the notebook display)</b>	3
<b>Max. resolutions supported</b>	Multi-Function Mode: (2) 5k @ 30Hz and (1) 4k UHD @ 30Hz on any port High-Resolution Mode: (2) 5k @ 60Hz on DisplayPort ports and (1) 4k UHD @ 60Hz on HDMI port



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

<b>Dock Connectors</b>	1x HDMI 2.0, 2x DisplayPort 1.4
<b>Technical limitations</b>	<b>Maximum resolution and display support is dependent on the maximum capability of the notebook.</b>  <b>Highest resolution with dual displays is two 8K@ 60Hz host in High Resolution mode.</b> Three maximum displays supported are two 5K@ 30 Hz on DP ports plus one 4K UHD@ 30 Hz on HDMI in Multi-function mode. 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.
<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>	Multi-Function Mode: (3) 4K DCI @ 30Hz on any port High-Resolution Mode: (3) 4K DCI @ 30Hz on any port
<b>Dock Connectors</b>	1x HDMI 2.0, 2x DisplayPort 1.2
<b>Technical limitations</b>	<b>Maximum resolution and display support is dependent on the maximum capability of the notebook.</b>  <b>The best resolution for dual or triple displays is 4K UHD@ 60Hz.</b> 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.

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

Type	Description	Part Number
<b>Adapter</b>	HP HDMI to VGA Adapter	H4F02AA
	HP USB 3.0 to Gigabit RJ45 Adapter G2	4Z7Z7AA
	HP USB-C to DisplayPort Adapter	N9K78AA
	HP USB-C to DisplayPort Adapter G2	8Y8Y1AA
	HP USB-C to HDMI 2.0 Adapter	1WC36AA
	HP USB-C to RJ45 Adapter G2	4Z527AA
	HP USB-C to USB 3.0 Adapter	N2Z63AA
	HP USB-C to VGA Adapter	N9K76AA
<b>Cases</b>	HP Prelude 15.6 Backpack	1E7D6AA
	HP Prelude 15.6 Top Load	1E7D7AA
	HP Prelude Pro Recycled 15.6 Backpack	1X644AA
	HP Prelude Pro Recycled 15.6 Top Load	1X645AA
	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 Travel 15.6 iron gray Laptop Backpack	6H2D8AA
<b>Commodity</b>	HP USB DVD-Writer External ODD	F2B56AA
	HP Combination Nano Cable Lock	63B28AA
	HP Essential Combination Nano Cable Lock	63B31AA
	HP Nano Keyed Cable Lock	1AJ39AA
	HP Nano Master Keyed Cable Lock	1AJ40AA
	HP SureKey Standard/Nano/Wedge Cable Lock	6UW42AA
<b>Docking</b>	HP Thunderbolt™ 120W G4 Dock	4J0A2AA
	HP Thunderbolt™ 280W G4 Dock w/Combo Cable	4J0G4AA
	HP USB-C™ 120W G5 Dock	5TW10AA
	HP USB-C™ G2 Travel Dock	7PJ38AA
	HP USB-C™ G5 Essential Dock	72C71AA
	HP USB-C™/A 120W G2 Universal Dock	5TW13AA
<b>Hub</b>	HP 4K USB-C Multiport Hub	6G843AA
	HP Universal USB-C Hub and Laptop Charger Combo	9H0H9AA

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

	HP Universal USB-C Multiport Hub	50H55AA
	HP USB-C to USB-A Hub	Z6A00AA
	HP USB-C Travel Hub G3	86S97AA
<b>Keyboard/Combo</b>	HP 655 Wireless Keyboard and Mouse Combo	4R009AA
	HP Wireless Rechargeable 950MK Mouse and Keyboard	3M165AA
	HP 965 black Ergonomic Wireless Keyboard	7E756AA
	HP 975 Dual-Mode USB+ Bluetooth® Wireless Keyboard	3Z726AA
<b>Mouse</b>	HP 435 Multi-Device Wireless Mouse	3B4Q5AA
	HP 715 Rechargeable Multi-Device Bluetooth® Mouse	6E6F0AA
	HP 925 Ergonomic Vertical Wireless Mouse	6H1A5AA
	HP Creator Black 935 Wireless Mouse	1D0K8AA
	HP Multi-Device Black 635 Wireless Mouse	1D0K2AA
<b>Power</b>	HP 110W USB-C Laptop Charger	8B3Y2AA
	HP 65W USB-C Laptop Charger	600Q8AA
<b>Video</b>	HP USB-A 325 Webcam	53X27AA
	HP Streaming 965 Webcam	695J5AA
	HP 625 Webcam	6Y7L1AA

Change Log

Date of change:	Version History:		Description of change:
May 20, 2024	V1 to V2	Updated	Environmental Section
May 22, 2024	V2 to V3	Updated	Battery Life
June 10, 2024	V3 to V4	Added	System unit Section
June 11, 2024	V4 to V5	Added	Display Section
June 20, 2024	V5 to V6	Added	Display Section
July 9, 2024	V6 to V7	Added	Display Section
July 15, 2024	V7 to V8	Updated	Weight and Dimensions Section
September 20, 2024	V8 to V9	Updated	Display Section
January 22, 2025	V9 to V10	Updated	Memory Section

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