

### Overview

#### HP EliteBook x360 1040 G8 Notebook PC



1. Internal Microphones
2. IR Camera LEDs
3. Webcam and IR Camera
4. Webcam LED
5. Glass Clickpad

#### Left

6. Nano Security lock slot (Lock sold separately)
7. WWAN SIM (Nano)
8. Audio Combo Jack
9. SuperSpeed USB Type-A 5Gbps signaling rate (Charging port)

### Overview



1. Power button

2. SuperSpeed USB Type-A 5Gbps signaling rate (Charging port)

3. HDMI 2.0 port (Cable not included)

#### Right

4. Thunderbolt™ 4 with USB4™ Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)<sup>1</sup>

5. Thunderbolt™ 4 with USB4™ Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)<sup>1</sup>

6. Battery LED

[1. SuperSpeed USB 20Gbps is not available with Thunderbolt™ 4.](#)

### Overview

#### AT A GLANCE

- An all metal CNC Aluminum chassis that is .6 inches (1.66 cm) thin (at front) and with a starting weight of 2.9 lbs. (1.31 Kg)
  - A 360° convertible notebook with 4 usage modes: Laptop mode, Tablet mode, Tent mode, and Media mode
  - Choice of 11th Generation Intel® Core™ i5, i7 Processors with integrated Intel® Iris® Xe Graphics supporting dual channel LP DDR4X memory up to 32 GB and solid state storage up to 2 TB
  - Intel® EVO configurations available
  - Touch display choices include 35.56 cm (14.0") diagonal IPS FHD displays and stunning UHD HDR-400 display. Optional Anti-glare screen available on FHD panels. Get added protection in open or public places with the optional HP Sure View Reflect integrated privacy screen
  - Ultimate connectivity with dual Thunderbolt™ 4<sup>2</sup> with USB4 support ports, dual USB 3.1 Gen1 charging ports, and HDMI 2.0. Stay connected where you need to with additional choices of 5G or 4G/LTE WWAN, WLAN and optional Thunderbolt™ Docking (Sold separately)
  - Featuring HP Quiet Keyboard with the HP Programmable key. The power button, HP Sure Shutter and the fingerprint sensor are also located on the keyboard
  - An optional HP Rechargeable Active Pen 31 with Magnetic Attach and 4096 Levels of pressure
  - Never forget your password with your choice of simple authentication methods, including the IR camera for face recognition and Touch Fingerprint Sensor for Windows Hello
  - Enterprise grade security with HP Sure Sense, HP Sure Start, HP Sure Shutter, HP Sure View Reflect (optional), HP Sure Run, HP Sure Recover with Embedded Reimaging, HP Sure Click, HP Tamper Lock and Touch Fingerprint sensor
  - HP Sure Shutter - industry's 1st camera with an electric shutter. The on/off button for this shutter is located on the function row of the keyboard.
  - Two choices for the system battery: a 54.5 Wh battery for lighter configurations and a 78.5 Wh battery for the longest battery life. Battery Life up to 14 hours 45 minutes (54 Wh battery) (MobileMark2018) and up to 22 hours (78 Wh battery) (MobileMark2018).
  - AI based HP Context Aware to maximize performance when working at a table, comfort when working from your lap, and responsiveness when working on the go.
  - HP Presence Aware automatically locks your system when you leave and seamlessly authenticates with Windows Hello
  - HP Dynamic Audio, a new AI-based audio experience, tunes output to speech, music, and movies all while suppressing background noise. (Planned to be available March 2021)
  - HP Sound Calibration to uniquely tune end user headphone audio. (Planned to be available March 2021)
  - Passed 19 MIL-STD 810H tests<sup>1</sup>
1. MIL-STD 810H is not intended to demonstrate fitness of U.S. Department of Defense contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Accidental damage requires an optional HP Accidental Damage Protection Care Pack.
  2. SuperSpeed USB 20Gbps is not available with Thunderbolt™ 4.

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

## Technical Specifications

### PRODUCT NAME

HP EliteBook x360 1040 G8 Notebook PC

### OPERATING SYSTEM

#### Preinstalled

Windows 10 Pro 64 – HP recommends Windows 10 Pro for business <sup>1</sup>  
Windows 10 Pro 64 (National Academic License) <sup>1,2</sup>  
Windows 10 Home 64 <sup>1</sup>  
Windows 10 Home Single Language 64 <sup>1</sup>  
Windows 10 Pro (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 10 is automatically updated, which is always enabled. ISP fees may apply, and additional requirements may apply over time for updates. See <http://www.windows.com/>.

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

NOTE: HP tested Windows 10, version 1809 on this platform. For testing information on newer versions of Windows 10, please see <https://support.hp.com/document/c05195282>.

### PROCESSORS

Intel® Core™ i7-1185G7 (3.0 GHz base frequency, up to 4.8 GHz frequency with Intel® Turbo Boost Technology, 12 MB L3 cache, 4 cores) supports Intel® vPro® Technology <sup>3,4,5,6</sup>.

Intel® Core™ i7-1165G7 (Up to 4.7 GHz with Intel® Turbo Boost Technology, 12 MB L3 cache, 4 cores) <sup>3,4,5,6</sup>

Intel® Core™ i5-1145G7 (2.6 GHz base frequency, up to 4.4 GHz frequency with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores) supports Intel® vPro® Technology <sup>3,4,5,6</sup>

Intel® Core™ i5-1135G7 (Up to 4.2 GHz with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores) <sup>3,4,5,6</sup>

#### Processor Family

11th Generation Intel® Core™ i7 processor (i7-1185G7 and 1165G7) <sup>6</sup>

11th Generation Intel® Core™ i5 processor (i5-1145G7 and 1135G7) <sup>6</sup>

3. Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.

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

5. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See <http://www.intel.com/technology/turboboost> for more information.

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

### Technical Specifications

#### CHIPSET

Chipset is integrated with processor

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#### GRAPHICS

##### Integrated

Intel® Iris® X<sup>e</sup> Graphics

##### Supports

Support HD decode DX12 HDMI 2.0 <sup>7</sup>

7. HDMI cable sold separately.

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#### DISPLAY

##### Touch

35.6 cm (14") diagonal FHD IPS Ultraslim 2.0mm eDP + PSR2 BrightView touch screen with 0.4mm Gorilla® Glass 5, 400 nits, 72% NTSC (1920 x 1080) <sup>9,10,11</sup>

35.6 cm (14") diagonal FHD IPS Ultraslim 2.0mm eDP + PSR2 Anti-Glare touch screen with 0.4mm Gorilla® Glass 5, 400 nits, 72% NTSC (1920 x 1080) <sup>9,10,11</sup>

35.6 cm (14") diagonal UHD HDR400 IPS Ultraslim 2.0mm eDP + PSR BrightView touch screen with 0.4mm Gorilla® Glass 5, 550 nits, 72% NTSC (3840 x 2160) <sup>9,10,11</sup>

HP Sure View Reflect Integrated Privacy Screen 35.6 cm (14") diagonal FHD IPS Ultraslim 2.0mm eDP + PSR BrightView touch screen with 0.4mm Gorilla® Glass 5, 1000 nits, 72% NTSC (1920 x 1080) <sup>9,10,11,12</sup>

HP Sure View Reflect Integrated Privacy Screen 35.6 cm (14") diagonal FHD IPS Ultraslim 2.0mm eDP + PSR Anti-Glare touch screen with 0.4mm Gorilla® Glass 5, 1000 nits, 72% NTSC (1920 x 1080) <sup>9,10,11,12</sup>

##### HDMI 2.0<sup>8</sup>

Supports resolutions up to 4K@60Hz

8. HDMI cable sold separately.

9. FHD/HD content required to view FHD/HD images.

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

11. Actual brightness will be lower with touchscreen or Sure View.

12. HP Sure View integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.

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### Technical Specifications

#### STORAGE AND DRIVES

##### Primary M.2 Storage

128 GB PCIe® Gen3x2 NVMe™ M.2 SSD TLC<sup>13</sup>

256 GB PCIe® Gen3x4 NVMe™ M.2 SSD TLC<sup>13</sup>

512 GB PCIe® Gen3x4 NVMe™ M.2 SSD TLC<sup>13</sup>

1 TB PCIe® Gen3x4 NVMe™ M.2 SSD TLC<sup>13</sup>

2 TB PCIe® Gen3x4 NVMe™ M.2 SSD TLC<sup>13</sup>

256 GB PCIe® NVMe™ Value M.2 SSD<sup>13</sup>

512 GB PCIe® NVMe™ Value M.2 SSD<sup>13</sup>

256 GB PCIe® Gen3x4 NVMe™ M.2 SED SS TLC OPAL 2<sup>13</sup>

512 GB PCIe® Gen 3x4 NVMe™ M.2 SED TLC OPAL2<sup>13</sup>

512 Intel® PCIe® NVMe™ QLC M.2 SSD with 32 GB Intel® Optane™ memory H10<sup>13,14</sup>

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

14. Intel® Optane™ H10 memory system acceleration does not replace or increase the DRAM in your system. Requires 8th Gen or higher Intel® Core™ processor, BIOS version with Intel® Optane™ supported, Windows 10 64-bit, and an Intel® Rapid Storage Technology (Intel® RST) driver.

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#### MEMORY

##### Maximum Memory

32 GB LPDDR4X-4266 SDRAM

##### Memory

32 GB LPDDR4X-4266 SDRAM<sup>15</sup>

16 GB LPDDR4X-4266 SDRAM<sup>15</sup>

8 GB LPDDR4X-4266 SDRAM<sup>15</sup>

##### Memory Slots

Memory soldered down

LPDDR4X, System runs at: 4266

Supports Dual Channel Memory

15. All slots are non-accessible / non-upgradeable.

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## Technical Specifications

### NETWORKING/COMMUNICATIONS

#### WLAN

Intel® Dual Band Wireless-AX201 802.11a/b/g/n/ac/ax (2x2) Wi-Fi® 6 and Bluetooth® 5 Combo, vPro®<sup>16</sup>

Intel® Dual Band Wireless-AX201 802.11a/b/g/n/ac/ax (2x2) Wi-Fi® 6 and Bluetooth® 5 Combo, non-vPro®<sup>16</sup>

#### WWAN

Intel® XMM™ 7360 LTE-Advanced Cat 9<sup>18</sup>

Qualcomm® Snapdragon™ X55 5G Modem (5G + LTE CAT 20)<sup>19</sup>

#### NFC

NPC300 Near Field Communication Module<sup>20</sup>

#### Miracast

Native Miracast Support<sup>21</sup>

16. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices.

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. LTE not available on all products, in all regions.

19. 5G module is an optional feature that must be configured at purchase. AT&T and T-Mobile networks supported in the U.S. Module designed for 5G 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, requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. 5G not available on all products, in all regions. Backwards compatible to 4G LTE and 3G HSPA technologies. 5G module planned to be available in select countries, where carrier supported.

20. Sold separately or as an optional feature.

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

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### AUDIO/MULTIMEDIA

#### Audio

Audio by Bang & Olufsen

4 Premium stereo speakers

Microphones (Multi Array including two user facing and two world-facing microphones)

#### Camera

Hybrid 720p HD camera with integrated electronic privacy shutter, HP Sure Shutter<sup>22</sup>

Note: The on/off button for this shutter is located on the function row of the keyboard.

#### Sensors

Accelerometer

Magnetometer

Gyroscope

### Technical Specifications

Ambient light sensor  
Hall sensor

22. HD content required to view HD images.

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

#### Keyboard

HP Quiet Keyboard, spill resistant, Backlit keyboard and Durakeys

HP Quiet Keyboard, spill resistant, Backlit keyboard and Durakeys, privacy

#### Pointing Device

Glass ClickPad with multi-touch gesture support

#### Function Keys

F1 - Display Switching

F2 - Blank or Sure View

F3 - Brightness Down

F4 - Brightness up

F5 - Audio Mute

F6 - Volume Down

F7 - Volume Up

F8 - Mic Mute

F9 - Keyboard Backlight

F10 - Insert

F11 - Airplane Mode

F12 - Programmable Key

#### Non-Function Keys

HP Sure Shutter

Power Key

Delete Key

#### Hidden Function Keys

Fn+R = Break

Fn+S = Sys Rq

Fn+C = Scroll Lock

Fn+E = Insert

Fn+W = Pause

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### Technical Specifications

#### SOFTWARE AND SECURITY

##### Preinstalled Software

###### BIOS

HP BIOSphere Gen6 <sup>23</sup>  
HP Drive Lock & Automatic Drive Lock  
BIOS Update via Network  
HP Secure Erase <sup>24</sup>  
Absolute Persistence Module <sup>25</sup>  
HP LAN-Wireless Protection  
USB enable/disable (via BIOS)

###### Software

HP Connection Optimizer <sup>26</sup>  
HP Hotkey Support  
myHP  
HP Support Assistant <sup>27</sup>  
HP QuickDrop <sup>17</sup>  
HP Noise Cancellation Software  
Touchpoint Customizer for Commercial  
HP Notifications  
HP Privacy Settings  
HP Wireless Button Driver  
HP Power Manager  
HP PC Hardware Diagnostics Windows  
Buy Microsoft Office (sold separately)  
Microsoft Defender <sup>31</sup>  
Tile App <sup>32</sup>  
HP Smart Support <sup>53</sup>

###### Manageability Features

HP Driver Packs (download) <sup>28</sup>  
HP Manageability Integration Kit Gen4 (download) <sup>29</sup>  
HP Client Catalog (download)  
HP Client Management Script Library (download)  
HP Image Assistant (download)

###### Security Management

HP Client Security Manager Gen7 <sup>30</sup>  
HP Fingerprint Sensor  
HP Wolf Pro Security Edition <sup>33</sup>  
HP Sure Click <sup>34</sup>  
HP Sure Sense <sup>35</sup>  
HP Sure Start Gen6 <sup>36</sup>  
HP Sure Admin <sup>37</sup>  
HP Sure Recover Gen4 <sup>38</sup>  
HP Sure Run Gen4 <sup>39</sup>  
TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified) <sup>40</sup>

## Technical Specifications

17. HP Quick Drop requires Internet access and Windows 10 PC preinstalled with HP QuickDrop app and either an Android device (phone or tablet) running Android 7 or higher with the Android HP QuickDrop app, and /or an iOS device (phone or tablet) running iOS 12 or higher with the iOS HP QuickDrop app.
23. HP BIOSphere Gen6 is available on select HP Pro and Elite PCs. Features may vary depending on the platform and configurations.
24. HP Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.
25. 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/>
26. HP Connection Optimizer requires Windows 10.
27. HP Support Assistant requires Windows and Internet access.
28. HP Driver Packs not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.
29. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.
30. HP Client Security Manager Gen7 requires Windows and is available on the select HP Elite and Pro PCs.
31. Windows Defender Opt in and internet connection required for updates.
32. Some features require optional subscription to Tile Premium. Tile application for Windows 10 available for download from the Windows Store. Mobile phone app available for download from App Store and Google Play. Requires iOS 11 and greater or Android 6.0 and greater see <https://support.thetileapp.com/hc/en-us/articles/200424778> for more information. HP Tile will function as long as the PC has battery power.
33. HP Wolf Pro Security Edition (including HP Sure Click Pro and HP Sure Sense Pro) is available preloaded on select SKUs and, depending on the HP product purchased, includes a paid 1-year or 3-year license. The HP Wolf Pro Security Edition software is licensed under the license terms of the HP Wolf Security Software - End-User license Agreement (EULA) that can be found at: [https://support.hp.com/us-en/document/ish\\_3875769-3873014-16](https://support.hp.com/us-en/document/ish_3875769-3873014-16) as that EULA is modified by the following: "7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition (HP Sure Sense Pro and HP Sure Click Pro) is effective upon activation and will continue for either a twelve (12) month or thirty-six (36) month license term ("Initial Term"). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support.
34. HP Sure Click requires Windows 10 Pro or Enterprise. See [https://bit.ly/2PrLT6A\\_SureClick](https://bit.ly/2PrLT6A_SureClick) for complete details.
35. HP Sure Sense is available on select HP PCs and is not available with Windows10 Home.
36. HP Sure Start Gen6 is available on select HP PCs.
37. HP Sure Admin requires Windows 10, HP BIOS, HP Manageability Integration Kit from <http://www.hp.com/go/clientmanagement> and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store.
38. HP Sure Recover Gen4 is available on select HP PCs and requires an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data.
39. HP Sure Run Gen4 is available on select Windows 10 based HP Pro, Elite and Workstation PCs with select Intel® or AMD processors.
40. Firmware TPM is version 2.0.
53. HP Smart Support is available to commercial customers through your HP Service Representative and HP Factory Configuration Services; or it can be downloaded at: <http://www.hp.com/smart-support>. HP Smart Support automatically collects the telemetry necessary upon initial boot of the product to deliver device-level configuration data and health insights.

### Technical Specifications

#### POWER

**Power Supply**

HP Smart 65 W USB Type-C® adapter <sup>41</sup>

HP Smart 65 W Slim USB Type-C® adapter <sup>41</sup>

**Primary Battery**

HP Long Life 4-cell, 54 Wh Li-ion polymer <sup>42,43</sup>

HP Long Life 4-cell, 78.5 Wh Li-ion polymer <sup>42,43</sup>

**Power Cord**

Premium 1m C5 power cord

Conventional 1m C5 power cord

**Battery life <sup>44</sup>**

Up to 14 hours 45 minutes (54 Wh battery) (MobileMark2018).

Up to 22 hours (78 Wh battery) (MobileMark2018)

41. Availability may vary by country.

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

43. 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.

44. Windows 10 MM18 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See [www.bapco.com](http://www.bapco.com) for additional details.

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#### WEIGHTS & DIMENSIONS

**Product Weight**

Starting at 2.9 lb (1.31 kg) <sup>45</sup>

**Product Dimensions (w x d x h)**

12.57 x 7.98 x 0.65 in

31.93 x 20.26 x 1.66 cm

45. Weight will vary by configuration.

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## Technical Specifications

### PORTS/SLOTS

#### Ports

- 2 Thunderbolt™ 4 with USB4™ Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)<sup>52</sup>
- 2 SuperSpeed USB Type-A 5Gbps signaling rate (Charging ports)
- 1 HDMI 2.0<sup>46</sup>
- 1 External Nano SIM Slot for WWAN <sup>47</sup>
- 1 Headphone/Microphone Combo

46. HDMI cable sold separately.

47. SIM slot is not user accessible without WWAN configuration.

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

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### SERVICE AND SUPPORT

1-year or 3-year limited warranty and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty except for HP Long Life batteries which will follow the one or three year warranty of the platform. Refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>.<sup>48</sup>

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

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### CERTIFICATION AND COMPLIANCE

- ENERGY STAR® <sup>49</sup>
- EPEAT® 2019 Gold in the U.S. <sup>50</sup>
- Low halogen <sup>51</sup>
- TCO 8.0 Certified

49. Configurations of the HP EliteBook x360 1040 G8 Notebook PC that are ENERGY STAR® qualified are identified as HP EliteBook x360 1040 G8 Notebook PC ENERGY STAR on HP websites and on <http://www.energystar.gov>.

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

51. External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.

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### Technical Specifications

#### SYSTEM UNIT

<b>Stand-Alone Power Requirements (AC Power)</b>	<b>Nominal Operating Voltage</b>	AC 15V
	<b>Average Operating Power</b>	
	<b>Integrated Graphics</b>	Yes
<b>Temperature</b>	<b>Discrete Graphics</b>	N/A
	<b>Max Operating Power</b>	UMA<65W
	<b>Operating</b>	32° to 95° F (0° to 35° C) (not writing optical)
<b>Relative Humidity</b>	<b>Non-operating</b>	41° to 95° F (5° to 35° C) (writing optical)
	<b>Operating</b>	32° to 95° F (0° to 35° C) (not writing optical)
	<b>Non-operating</b>	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
<b>Shock</b>	<b>Operating</b>	40 G, 2 ms, half-sine
	<b>Non-operating</b>	200 G, 2 ms, half-sine
	<b>Operating</b>	1.043 grms
<b>Random Vibration</b>	<b>Non-operating</b>	3.5 grms
	<b>Operating</b>	-50 to 10,000 ft (-15.24 to 3,048 m)
	<b>Non-operating</b>	-50 to 40,000 ft (-15.24 to 12,192 m)
<b>Planned Industry Standard Certifications</b>	<b>UL</b>	Yes
	<b>CSA</b>	Yes
	<b>FCC Compliance</b>	Yes
	<b>ENERGY STAR®</b>	Yes
	<b>EPEAT</b>	Yes
	<b>ICES</b>	Yes
	<b>Australia</b>	Yes
	<b>NZ A-Tick Compliance</b>	Yes
	<b>CCC</b>	Yes
	<b>Japan VCCI Compliance</b>	Yes
	<b>KC</b>	Yes
	<b>BSMI</b>	Yes
	<b>CE Marking Compliance</b>	Yes
	<b>BNCI or BELUS</b>	Yes
	<b>CIT</b>	Yes
	<b>GOST</b>	Yes
<b>Saudi Arabian Compliance (ICCP)</b>	Yes	
<b>SABS</b>	Yes	
<b>UKRSERTCOMPUTER</b>	Yes	

### Technical Specifications

#### DISPLAYS

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

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

<b>Panel LCD 14 inch FHD (1920.x.1080) Anti-Glare WLED UWVA sRGB 100% cg 400nits eDP 1.4+PSR2 bent LP</b>	<b>Outline Dimensions (W x H x D)</b>	313.67 X 184.17 mm (max)
	<b>Active Area</b>	309.37 X 174.02 mm (typ.)
	<b>Weight</b>	200 g (max)
	<b>Diagonal Size</b>	14.0 inch
	<b>Thickness</b>	2.0 mm/3.8 mm (w/PCB) (max)
	<b>Interface</b>	eDP 1.4
	<b>Surface Treatment</b>	Anti-Glare
	<b>Touch Enabled</b>	Yes
	<b>Contrast Ratio</b>	1200:1 (typ.)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	400 nits <sup>1</sup>
	<b>Pixel Resolution</b>	1920 x 1080 (FHD)
	<b>Format</b>	RGB Stripe
	<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	sRGB 100% (NTSC 72%)	
<b>Color Depth</b>	8 bits	
<b>Viewing Angle</b>	UWVA 85/85/85/85	

<b>Panel LCD 14 inch FHD (1920 x 1080) BrightView WLED UWVA sRGB 100% cg 400nits eDP 1.4+PSR2 bent LP</b>	<b>Outline Dimensions (W x H x D)</b>	313.67 X 184.17 mm (max)
	<b>Active Area</b>	309.37 X 174.02 mm (typ.)
	<b>Weight</b>	200 g (max)
	<b>Diagonal Size</b>	14.0 inch
	<b>Thickness</b>	2.0 mm/3.8 mm (w/PCB) (max)
	<b>Interface</b>	eDP 1.4
	<b>Surface Treatment</b>	BrightView
	<b>Touch Enabled</b>	Yes
	<b>Contrast Ratio</b>	1200:1 (typ.)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	400 nits <sup>1</sup>
	<b>Pixel Resolution</b>	1920 x 1080 (FHD)
	<b>Format of LCD Pixel Arrangement</b>	RGB Stripe
	<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	sRGB 100% (NTSC 72%)	
<b>Color Depth</b>	8 bits	

## Technical Specifications

<b>Viewing Angle</b>	UWVA 85/85/85/85
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<b>Panel LCD 14 inch UHD (3840 x 2160) BrightView WLED UWVA HDR-400 sRGB 95% cg 550nits eDP 1.4+PSR2 bent</b>	<b>Outline Dimensions (W x H x D)</b>	313.61 X 184.74 mm (max)
	<b>Active Area</b>	309.31 X 173.98 mm (typ.)
	<b>Weight</b>	200 g (max)
	<b>Diagonal Size</b>	14.0 inch
	<b>Thickness</b>	2.0 mm/3.8 mm (w/PCB) (max)
	<b>Interface</b>	eDP 1.4
	<b>Surface Treatment</b>	BrightView
	<b>Touch Enabled</b>	Yes
	<b>Contrast Ratio</b>	1400:1 (typ.)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	550 nits <sup>1</sup>
	<b>Pixel Resolution</b>	3840 x 2160 (UHD)
	<b>Format</b>	RGB Stripe
	<b>Backlight</b>	LED
	<b>Color Gamut Coverage</b>	sRGB 95%
<b>Color Depth</b>	8 bits+2FRC	
<b>Viewing Angle</b>	UWVA 85/85/85/85	

<b>Panel LCD 14-in FHD (1920 x 1080) Anti-Glare WLED UWVA 72% cg 1000nits eDP 1.4+PSR PrivacyG4 NB2Y</b>	<b>Outline Dimensions (W x H x D)</b>	314.612 x 185.33 mm (max.)
	<b>Active Area</b>	309.312 x 173.99 mm
	<b>Weight</b>	230 g (max.)
	<b>Diagonal Size</b>	14.0"
	<b>Thickness</b>	3.9 mm (max.)
	<b>Interface</b>	eDP
	<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>	1000 nits <sup>1</sup>
	<b>Pixel Resolution</b>	1920 x 1080 (FHD)

### Technical Specifications

<b>Format of LCD Pixel Arrangement</b>	RGB
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	72% of NTSC
<b>Color Depth</b>	8 bits
<b>Viewing Angle</b>	UWVA 85/85/85/85

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<b>Panel LCD 14-in FHD (1920 x 1080) BrightView WLED UWVA 72% cg 1000nits eDP 1.4+PSR PrivacyG4 NB2Y</b>	<b>Outline Dimensions (W x H x D)</b>	314.612 x 185.33 mm (max.)
	<b>Active Area</b>	309.312 x 173.99 mm
	<b>Weight</b>	230 g (max.)
	<b>Diagonal Size</b>	14.0"
	<b>Thickness</b>	3.9 mm (max.)
	<b>Interface</b>	eDP
	<b>Surface Treatment</b>	BrightView
	<b>Touch Enabled</b>	Yes
	<b>Contrast Ratio</b>	1500:1 (typ.)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	1000 nits <sup>1</sup>
	<b>Pixel Resolution</b>	1920 x 1080 (FHD)
	<b>Format</b>	RGB
	<b>Backlight</b>	LED
	<b>Color Gamut Coverage</b>	72%
	<b>Color Depth</b>	8 bits
	<b>Viewing Angle</b>	UWVA 85/85/85/85

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 Technical Specifications

## STORAGE

<b>SSD 128GB 2280 PCIe-3x2 Three Layer Cell</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	128 GB
	<b>NAND Type</b>	TLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	1300 ~ 2047 MB/s
	<b>Maximum Sequential Write</b>	630 ~ 800 MB/s
	<b>Logical Blocks</b>	250,069,680
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	ATA Security; DIPM; TRIM; DEVSLP	

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

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<b>SSD 1TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	1 TB
	<b>NAND Type</b>	TLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	3100 ~ 3500 MB/s
	<b>Maximum Sequential Write</b>	2770 ~ 3037 MB/s
	<b>Logical Blocks</b>	2,000,409,264
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	ATA Security; TRIM; L1.2	

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

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### Technical Specifications

<b>SSD 256GB 2280 M2 PCIe-3x4 SS NVMe TLC</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	256 GB
	<b>NAND Type</b>	TLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3x4
	<b>Maximum Sequential Read</b>	2800 ~ 3500 MB/s
	<b>Maximum Sequential Write</b>	1400 ~ 2200 MB/s
	<b>Logical Blocks</b>	500,118,192
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	ATA Security; TRIM; L1.2

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

<b>SSD 256GB 2280 PCIe NVMe Value</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	256 GB
	<b>NAND Type</b>	Value
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3
	<b>Maximum Sequential Read</b>	2100 ~ 2200 MB/s
	<b>Maximum Sequential Write</b>	900 ~ 1400 MB/s
	<b>Logical Blocks</b>	500,118,192
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	ATA Security (optional); TRIM; L1.2

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

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## Technical Specifications

<b>SSD 256GB 2280 PCIe-3x4 NVMe Self Encrypted OPAL2 Three Layer Cell</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	256 GB
	<b>NAND Type</b>	TLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	2800 ~ 3500 MB/s
	<b>Maximum Sequential Write</b>	1663 ~ 2200 MB/s
	<b>Logical Blocks</b>	500,118,192
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	ATA Security (Option); TCG Opal 2.0; TRIM; L1.2

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

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<b>SSD 512GB 2280 M2 PCIe-3x4 SS NVMe TLC</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	512 GB
	<b>NAND Type</b>	TLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	3100 ~ 3500 MB/s
	<b>Maximum Sequential Write</b>	2400 ~ 2956 MB/s
	<b>Logical Blocks</b>	1,000,215,215
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	ATA Security; TRIM; L1.2	

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

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### Technical Specifications

<b>SSD 512GB 2280 PCIe NVMe Value</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	512GB
	<b>NAND Type</b>	Value
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3
	<b>Maximum Sequential Read</b>	2200 ~ 2300 MB/s
	<b>Maximum Sequential Write</b>	1000 ~ 1600 MB/s
	<b>Logical Blocks</b>	1,000,215,215
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	ATA Security (optional); TRIM; L1.2

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

<b>SSD 512GB 2280 PCIe-3x4 NVMe Self Encrypted OPAL2 Three Layer</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	512 GB
	<b>NAND Type</b>	TLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	3100 ~ 3500 MB/s
	<b>Maximum Sequential Write</b>	2400 ~ 2956 MB/s
	<b>Logical Blocks</b>	1,000,215,215
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	ATA Security (Option); TCG Opal 2.0; TRIM; L1.2

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

### Technical Specifications

#### NETWORKING/COMMUNICATIONS

<b>Intel Wi-Fi<sup>1</sup> 6 AX201 + BT5 (802.11ax 2x2, supporting gigabit file transfer speeds<sup>5</sup>) (vPro<sup>®</sup>)</b>	<b>Wireless LAN Standards</b>	<ul style="list-style-type: none"> <li>IEEE 802.11a</li> <li>IEEE 802.11b</li> <li>IEEE 802.11g</li> <li>IEEE 802.11n</li> <li>IEEE 802.11ac</li> <li>IEEE 802.11ax</li> <li>IEEE 802.11d</li> <li>IEEE 802.11e</li> <li>IEEE 802.11h</li> <li>IEEE 802.11i</li> <li>IEEE 802.11k</li> <li>IEEE 802.11r</li> <li>IEEE 802.11v</li> </ul>
	<b>Interoperability</b>	Features Wi-Fi 6 technology
	<b>Frequency Band</b>	802.11b/g/n/ax <ul style="list-style-type: none"> <li>•2.402 – 2.482 GHz</li> </ul> 802.11a/n/ac/ax <ul style="list-style-type: none"> <li>•4.9 – 4.95 GHz (Japan)</li> <li>•5.15 – 5.25 GHz</li> <li>•5.25 – 5.35 GHz</li> <li>•5.47 – 5.725 GHz</li> <li>•5.825 – 5.850 GHz</li> </ul>
	<b>Data Rates</b>	<ul style="list-style-type: none"> <li>•802.11b: 1, 2, 5.5, 11 Mbps</li> <li>•802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>•802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> <li>• 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> </ul>
	<b>Modulation</b>	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
	<b>Security<sup>3</sup></b>	LTE: 23 dBm HSPA+: 23.5 dBm
	<b>Maximum power consumption</b>	<ul style="list-style-type: none"> <li>•IEEE compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>•AES-CCMP: 128 bit in hardware</li> <li>•802.1x authentication</li> <li>•WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>•WPA2 certification</li> <li>•WPA3 certification</li> <li>•IEEE 802.11i</li> </ul>

## Technical Specifications

	<ul style="list-style-type: none"> <li>•WAPI</li> </ul>
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b: +18.5dBm minimum</li> <li>• 802.11g: +17.5dBm minimum</li> <li>• 802.11a: +18.5dBm minimum</li> <li>• 802.11n HT20(2.4GHz): +15.5dBm minimum</li> <li>• 802.11n HT40(2.4GHz): +14.5dBm minimum</li> <li>• 802.11n HT20(5GHz): +15.5dBm minimum</li> <li>• 802.11n HT40(5GHz): +14.5dBm minimum</li> <li>• 802.11ac VHT80(5GHz): +11.5dBm minimum</li> <li>• 802.11ac VHT160(5GHz): +11.5dBm minimum</li> <li>• 802.11ax HT40(2.4GHz): +10dBm minimum</li> <li>• 802.11ax VHT160(5GHz): +10dBm minimum"</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>•Transmit mode:2.0 W</li> <li>•Receive mode:1.6 W</li> <li>•Idle mode (PSP)180 mW (WLAN Associated)</li> <li>•Idle mode:50 mW (WLAN unassociated)</li> <li>•Connected Standby/Modern Standby: 10mW</li> <li>•Radio disabled:8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	<ul style="list-style-type: none"> <li>•802.11b, 1Mbps: -93.5dBm maximum</li> <li>•802.11b, 11Mbps: -84dBm maximum</li> <li>• 802.11a/g, 6Mbps: -86dBm maximum</li> <li>• 802.11a/g, 54Mbps: -72dBm maximum</li> <li>• 802.11n, MCS07: -67dBm maximum</li> <li>• 802.11n, MCS15: -64dBm maximum</li> <li>• 802.11ac, MCS0: -84dBm maximum</li> <li>• 802.11ac, MCS9: -59dBm maximum</li> <li>•802.11ax, MCS11(HT40): -59dBm maximum</li> <li>•802.11ax, MCS11(VHT160): -58.5dBm maximum</li> </ul>
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure  Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
<b>Form Factor</b>	PCI-Express M.2 MiniCard with CNVi Interface
<b>Dimensions</b>	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
<b>Weight</b>	1. Type 2230: 2.8g

### Technical Specifications

	2. Type 126: 1.3g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	Operating: 14° to 158° F (–10° to 70° C) Non-operating: –40° to 176° F (–40° to 80° C)
<b>Humidity</b>	Operating: 10% to 90% (non-condensing) Non-operating: 5% to 95% (non-condensing)
<b>Altitude</b>	Operating: 0 to 10,000 ft (3,048 m) Non-operating: 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON

### HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1 Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
<b>Data Rates and Throughput</b>	Legacy: 3 Mbps data rate <sup>1</sup> ; throughput up to 2.17 Mbps BLE: 1 Mbps data rate <sup>1</sup> ; throughput up to 0.2 Mbps  <a href="#">1. Actual throughput may vary.</a>
<b>Transmit Power</b>	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) The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.
<b>Power Consumption</b>	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Link Topology</b>	
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
<b>Power Management Certifications</b>	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
<b>Bluetooth Profiles Supported</b>	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer

### Technical Specifications

LE Low Duty Cycle Directed Advertising  
LE L2CAP Connection Oriented Channels  
Train Nudging & Interlaced Scan  
BT4.2 ESR08 Compliance  
LE Secure Connection- Basic/Full  
LE Privacy 1.2 –Link Layer Privacy  
LE Privacy 1.2 –Extended Scanner Filter Policies  
LE Data Packet Length Extension  
FAX Profile (FAX)  
Basic Imaging Profile (BIP)2  
Headset Profile (HSP)  
Hands Free Profile (HFP)  
Advanced Audio Distribution Profile (A2DP)

**Security & Manageability** Intel® vPro™ support with appropriate Intel® chipset components

1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices. Only available in countries where 802.11ax is supported.
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. Wi-Fi 5 or 6 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

<b>Intel Wi-Fi<sup>1</sup> 6 AX201 + BT5 (802.11ax 2x2, supporting gigabit file transfer speeds<sup>5</sup>) (non-vPro<sup>®</sup>)</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
	<b>Interoperability</b>	Features Wi-Fi 6 technology
	<b>Frequency Band</b>	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
	<b>Data Rates</b>	•802.11b: 1, 2, 5.5, 11 Mbps •802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps •802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps •802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) •802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz) • 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)
	<b>Modulation</b>	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM , 1024QAM
	<b>Security<sup>3</sup></b>	•IEEE compliant 64 /128 bit WEP encryption for a/b/g mode only •AES-CCMP: 128 bit in hardware •802.1x authentication •WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. •WPA2 certification •WPA3 certification •IEEE 802.11i •WAPI

## Technical Specifications

<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b : +18.5dBm minimum</li> <li>• 802.11g : +17.5dBm minimum</li> <li>• 802.11a : +18.5dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +14.5dBm minimum</li> <li>• 802.11n HT20(5GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(5GHz) : +14.5dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +11.5dBm minimum</li> <li>• 802.11ac VHT160(5GHz) : +11.5dBm minimum</li> <li>• 802.11ax HT40(2.4GHz) : +10dBm minimum</li> <li>• 802.11ax VHT160(5GHz) : +10dBm minimum</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode 2.0 W</li> <li>• Receive mode 1.6 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode 50 mW (WLAN unassociated)</li> <li>• Connected Standby 10mW</li> <li>• Radio disabled 8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b, 1Mbps: -93.5dBm maximum</li> <li>• 802.11b, 11Mbps: -84dBm maximum</li> <li>• 802.11a/g, 6Mbps: -86dBm maximum</li> <li>• 802.11a/g, 54Mbps: -72dBm maximum</li> <li>• 802.11n, MCS07: -67dBm maximum</li> <li>• 802.11n, MCS15: -64dBm maximum</li> <li>• 802.11ac, MCS0: -84dBm maximum</li> <li>• 802.11ac, MCS9: -59dBm maximum</li> <li>• 802.11ax, MCS11(HT40): -59dBm maximum</li> <li>• 802.11ax, MCS11(VHT160): -58.5dBm maximum</li> </ul>
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
<b>Form Factor</b>	PCI-Express M.2 Mini Card with CNVi Interface
<b>Dimensions</b>	<ol style="list-style-type: none"> <li>1. Type 2230: 2.3 x 22.0 x 30.0 mm</li> <li>2. Type 1216: 1.67 x 12.0 x 16.0 mm</li> </ol>
<b>Weight</b>	<ol style="list-style-type: none"> <li>1. Type 2230: 2.8g</li> <li>2. Type 126: 1.3g</li> </ol>

### Technical Specifications

<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	Operating: 14° to 158° F (–10° to 70° C) Non-operating: –40° to 176° F (–40° to 80° C)
<b>Humidity</b>	Operating: 10% to 90% (non-condensing) Non-operating: 5% to 95% (non-condensing)
<b>Altitude</b>	Operating: 0 to 10,000 ft (3,048 m) Non-operating: 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED Off – Radio ON

### HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1 Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
<b>Data Rates and Throughput</b>	Legacy: 3 Mbps data rate <sup>1</sup> ; throughput up to 2.17 Mbps BLE: 1 Mbps data rate <sup>1</sup> ; throughput up to 0.2 Mbps  <a href="#">1. Actual throughput may vary.</a>  Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
<b>Transmit Power</b>	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.
<b>Power Consumption</b>	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Link Topology</b>	
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
<b>Power Management Certifications</b>	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
<b>Bluetooth Profiles Supported</b>	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels

### Technical Specifications

Train Nudging & Interlaced Scan  
 BT4.2 ESR08 Compliance  
 LE Secure Connection- Basic/Full  
 LE Privacy 1.2 –Link Layer Privacy  
 LE Privacy 1.2 –Extended Scanner Filter Policies  
 LE Data Packet Length Extension  
 FAX Profile (FAX)  
 Basic Imaging Profile (BIP)2  
 Headset Profile (HSP)  
 Hands Free Profile (HFP)  
 Advanced Audio Distribution Profile (A2DP)

1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices. Only available in countries where 802.11ax is supported.
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. Wi-Fi 5 or 6 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

<b>Intel® XMM™ 7360 LTE-Advanced<sup>1</sup></b>	<b>Technology/Operating bands</b>	FDD LTE: LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 1400 (Band 11), 700 (Band 12), 700 (Band 13) 700 (Band 17), 850 (Band 18), 850 (Band 19), 800 (Band 20), 1450 (Band 21), 850 (Band 26) 700 (Band 28) MHz, 700 (Band 29), 2300 (Band 30), 2100 (Band 66) MHz TDD LTE: 2600 (Band 38), 1900 (Band 39), 2300 (Band 40), 2500 (Band 41) MHz HSPA+: 2100 (Band 1), 1900 (Band 2), 1700 (Band 4), 850 (Band 5), 900 (Band 8) MHz
	<b>Wireless protocol standards</b>	3GPP Release 11 LTE Specification CAT.9, MAX 60MHz aggregation BW WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
	<b>GPS</b>	Standalone, A-GPS (MS-B and LTO)
	<b>GPS bands</b>	GPS 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 ± 2.046 MHz
	<b>Maximum data rates</b>	LTE: 450 Mbps (DL 3CA), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)

## Technical Specifications

	HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)
<b>Maximum output power</b>	LTE: 23 dBm HSPA+: 23.5 dBm
<b>Maximum power consumption</b>	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average)
<b>Form Factor</b>	M.2, 3042-S3 Key B
<b>Weight</b>	6 g
<b>Dimensions (Length x Width x Thickness)</b>	42 x 30 x 2.3 mm

1. 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. LTE not available on all products, in all regions.

**Qualcomm®  
Snapdragon™ X55 5G  
Modem (5G + LTE CAT  
20) <sup>1</sup>**

**Technology/Operating  
bands**

WCDMA/HSDPA/HSUPA/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 6: 830 to 840 MHz (UL), 875 to 885 MHz (DL)  
 Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)  
 Band 9: 1750 to 1785 MHz (UL), 1845 to 1880 MHz (DL)  
 Band 19: 830 to 845 MHz (UL), 875 to 890 MHz (DL)

LTE FDD/TDD operating bands:

Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)  
 Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)  
 Band 3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL)  
 Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)  
 Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)  
 Band 7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)  
 Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)  
 Band 12: 699 to 716 MHz (UL), 729 to 746 MHz (DL)  
 Band 13: 777 to 787 MHz (UL), 746 to 756 MHz (DL)  
 Band 14: 788 to 798 MHz (UL), 758 to 768 MHz (DL)  
 Band 17: 704 to 716 MHz (UL), 734 to 746 MHz (DL)  
 Band 18: 815 to 830 MHz (UL), 860 to 875 MHz (DL)  
 Band 19: 830 to 845 MHz (UL), 875 to 890 MHz (DL)  
 Band 20: 832 to 862 MHz (UL), 791 to 821 MHz (DL)  
 Band 25: 1850 to 1915 MHz (UL), 1930 to 1995 MHz (DL)  
 Band 26: 814 to 849 MHz (UL), 859 to 894 MHz (DL)  
 Band 28: 703 to 748 MHz (UL), 758 to 803 MHz (DL)

## Technical Specifications

Band 29: 717 to 728 MHz (DL)  
 Band 30: 2305 to 2315 MHz (UL) 2350 to 2360 MHz (DL)  
 Band 32: 1452 to 1496 MHz (DL)  
 Band 34: 2010 to 2025 MHz (UL/DL)  
 Band 38: 2570 to 2620 MHz (UL/DL)  
 Band 39: 1880 to 1920 MHz (UL/DL)  
 Band 40: 2300 to 2400 MHz (UL/DL)  
 Band 41: 2496 to 2690 MHz (UL/DL)  
 Band 42: 3400 to 3600 MHz (UL/DL)  
 Band 46: 5150 to 5925 MHz (DL)  
 Band 48: 3550 to 3700 MHz (UL/DL)  
 Band 66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)  
 Band 71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)  
 5G NR Sub 6GHz  
 n1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)  
 n2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)  
 n3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL)  
 n5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)  
 n7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)  
 n8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)  
 n12: 699 to 716 MHz (UL), 729 to 746 MHz (DL)  
 n20: 832 to 862 MHz (UL), 791 to 821 MHz (DL)  
 n28: 703 to 748 MHz (UL), 758 to 803 MHz (DL)  
 n41: 2496 to 2690 MHz (UL/DL)  
 n66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)  
 n71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)  
 n77: 3300 to 4200 MHz (UL/DL)  
 n78: 3300 to 3800 MHz (UL/DL)  
 n79: 4400 to 5000 MHz (UL/DL)

### Wireless protocol standards

5G NR Air Interface  
 | 3GPP Rel15 5G NR sub-6  
 LTE Rel14  
 20 layers and 2 Gbps downlink (DL) throughput – 4 × 4 MIMO across 5x CA  
 200 Mbps uplink (UL) throughput – 40 MHz ULCA and 256 QAM  
 WCDMA  
 R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification

### GPS

Standalone, A-GPS (MS-A, MS-B)

### GPS bands

GPS: L1 (1575.42MHz); L5 (1176MHz)  
 GLONASS: L1 (1602MHz)  
 BeidouB1(1561.098MHz)  
 Galileo E1 (1575.42); E5a (1176MHz)

### Maximum data rates

5G sub 6G : 3.8 Gbps  
 LTE: ue-CategoryDL 20, (DL : 2 Gbps )  
 ue-CategoryUL 13 , (UL: 150Mbps)  
 DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)  
 HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)

### Technical Specifications

<b>Maximum output power</b>	LTE: 23 dBm in all band except B41 LTE B41 HPUE = 26dBm HSPA+: 23.5 dBm
<b>Maximum power consumption</b>	5G Sub 6 : 2500 mA LTE: 1,300 mA (peak); 1100 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average)
<b>Form Factor</b>	M.2, 3042-S3 Key B
<b>Weight</b>	8 g
<b>Dimensions (Length x Width x Thickness)</b>	42 mm x 30 mm x 2.6 mm

1. 5G module is an optional feature that must be configured at purchase. AT&T and T-Mobile networks supported in the U.S. Module designed for 5G 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, requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. 5G not available on all products, in all regions. Backwards compatible to 4G LTE and 3G HSPA technologies. 5G module planned to be available in select countries, where carrier supported.

### Technical Specifications

<b>NXP NPC300 Near Field Communication Module</b>	<b>Dimensions (L x W x H)</b>	Module 17 mm by 10 mm by 2.0 mm
	<b>Chipset</b>	NPC300
	<b>System interface</b>	I2C
	<b>NFC RF standards</b>	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 ISO/IEC 18092 ECMA-340 NFCIP-1 Target and Initiator ECMA-320 NFCIP-2
	<b>NFC Forum Support</b>	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2
	<b>Reader (PCD-VCD) Mode(1)</b>	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 MIFARE 1K MIFARE 4K MIFARE DESFire FeliCa Jewel and Topaz cards
	<b>Card Emulation (PICC-VICC) Mode(1)</b>	ISO/IEC 14443 A ISO/IEC 14443 B and B' MIFARE FeliCa
	<b>Frequency</b>	13.56 MHz
	<b>NFC Modes Supported</b>	Reader/Writer, Peer-to-Peer
	<b>Raw RF Data Rates</b>	106, 212, 424, 848 kbps
	<b>Operating temperature</b>	-25°C to 80°C
	<b>Storage temperature</b>	-25°C to 125°C
	<b>Humidity</b>	10-90% operating 5-95% non-operating
	<b>Supply Operating voltage</b>	2.7 to 5.5 Volts
	<b>I/O Voltage</b>	1.8V or 3.3V
	<b>Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)</b>	
	<b>Mode</b>	Power Consumption, Typical (2)
	<b>Polling</b>	710.93 mW
	<b>Detected Test Tag Type 1</b>	152.09 mW
	<b>Detected Test Tag Type 2</b>	341.26 mW
	<b>Detected Test Tag Type 3</b>	383.76 mW



### Technical Specifications

**Detected Test Tag Type 4** 312.26 mW

**Antenna** Antenna connector, 0.3mm pitch, 7 connector FPC. Antenna matching is external to module.

1. With application or UICC support
  2. Actual Power Consumption is dependent on NFC antenna and matching circuit and on the particular polling sequence and period configured.
-

### Technical Specifications

#### POWER

<b>AC Adapter 65 Watt nPFC Slim USB type C Straight 1.0 m</b>	<b>Dimensions</b>	88 x 53.5 x 21mm	
	<b>Weight</b>	unit: 220g +/- 10g	
	<b>Input</b>	100 to 240 VAC	
	<b>Output</b>	<b>Input Efficiency</b>	81.5% min at 115 Vac/ 230Vac @ 5V/3A 86.7% min at 115 Vac/ 230Vac @ 9V/3A 88% min at 115 Vac/ 230Vac @ 12V/5A 89% min at 115 Vac/ 230Vac @ 15V/4.33A 89% min at 115 Vac/ 230Vac @ 20V/3.25A
		<b>Input frequency range</b>	47 ~ 63 Hz
		<b>Input AC current</b>	1.6 A at 90 VAC and maximum load
		<b>Output power</b>	65W
		<b>DC output</b>	5V/9V/12V/15V/20V
		<b>Hold-up time</b>	5ms at 115 Vac input
		<b>Output current limit</b>	< 8.0A
	<b>Connector</b>	USB Type C	
	<b>Environmental Design</b>	<b>Operating temperature</b>	32oFto 95oF (0oto 35oC)
		<b>Non-operating (storage) temperature</b>	-4oFto 185oF (-20oto 85oC)
<b>Altitude</b>		0 to 16,400 ft (0 to 5000m)	
<b>Humidity</b>		5% to 95%	
<b>Storage Humidity</b>		5% to 95%	
<b>EMI and Safety Certifications</b>	Eg: *CE Mark - full compliance with LVD and EMC directives * Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. * MTBF - over 100,000 hours at 25°C ambient condition.		

<b>AC Adapter 65 Watt nPFC Standard USB type C Straight 1.0 m</b>	<b>Dimensions</b>	90.0 x 51 x 28.5mm	
	<b>Weight</b>	unit: 250g +/- 10g	
	<b>Input</b>	100 to 240 VAC	
	<b>Output</b>	<b>Input Efficiency</b>	81.5% min at 115 Vac/ 230Vac @ 5V/3A 86.7% min at 115 Vac/ 230Vac @ 9V/3A 88% min at 115 Vac/ 230Vac @ 12V/5A 89% min at 115 Vac/ 230Vac @ 15V/4.33A 89% min at 115 Vac/ 230Vac @ 20V/3.25A
		<b>Input frequency range</b>	47 ~ 63 Hz
		<b>Input AC current</b>	1.6 A at 90 VAC and maximum load
		<b>Output power</b>	65W
		<b>DC output</b>	5V/9V/12V/15V/20V
		<b>Hold-up time</b>	5ms at 115 Vac input
		<b>Output current limit</b>	8.0A Max.
	<b>Connector</b>	USB TYPE C	

### Technical Specifications

<b>Environmental Design</b>	<b>Operating temperature</b>	32°F to 95°F (0° to 35°C)
	<b>Non-operating (storage) temperature</b>	-4°F to 185°F (-20° to 85°C)
	<b>Altitude</b>	0 to 16,400 ft (0 to 5000m)
	<b>Humidity</b>	20% to 95%
	<b>Storage Humidity</b>	10% to 95%
<b>EMI and Safety Certifications</b>	<ul style="list-style-type: none"> <li>- CE Mark - full compliance with LVD and EMC directives</li> <li>- Worldwide safety standards - IEC60950, EN60950, UL60950, UL62368, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE.</li> <li>- MTBF - over 200,000 hours at 25°C ambient condition.</li> </ul>	

<b>Battery HK 4 Cell Wh 54 Long Life -PL</b>	<b>Dimensions (H x W x L)</b>	5.85mm*89.7mm*268.2mm		
	<b>Weight</b>	221g±10g		
	<b>Cells/Type</b>	4-cell; Polymer		
	<b>Energy</b>	<b>Voltage</b>	7.7V	
		<b>Amp-hour capacity</b>	7.013Ah	
		<b>Watt-hour capacity</b>	54Wh	
		<b>Operating (Charging)</b>	0~45°C	
		<b>Operating (Discharging)</b>	-10°C~60°C	
	<b>Temperature</b>	<b>Fuel Gauge LED</b>	No	
	<b>Optional Travel Battery Available</b>	N/a		

<b>Battery HK 4 Cell WH 78 Long Life -PL</b>	<b>Dimensions (H x W x L)</b>	6.49mm*94.6mm*281.6mm		
	<b>Weight</b>	295g±10g		
	<b>Cells/Type</b>	4-cell; Polymer		
	<b>Energy</b>	<b>Voltage</b>	7.72V	
		<b>Amp-hour capacity</b>	10.18Ah	
		<b>Watt-hour capacity</b>	78.5Wh	
		<b>Operating (Charging)</b>	0~45°C	
		<b>Operating (Discharging)</b>	-10°C~60°C	
	<b>Temperature</b>	<b>Fuel Gauge LED</b>	No	
	<b>Optional Travel Battery Available</b>	N/A		

### Technical Specifications

#### **FINGERPRINT READER**

Model:  
Synaptics Validity VFS7604 touch sensor  
Mobile Voltage Operation:  
3.0V to 3.6V  
Operating Temperature:  
0~60°C  
Current Consumption Image:  
100mA Max  
Low Latency Wait For Finger:  
260 uA  
Capture Rate:  
Image transmitter output frequency 9.6MHz  
ESD Resistance:  
IEC 61000-4-2 4B (+/-15KV)  
Detection Matrix:  
363 dpi / 7.4x6mm sensor area  
FRR (False Reject Rate) / FAR (False Acceptance Rate):  
FRR <1% @ 1:50K FAR

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### Technical Specifications

#### ENVIRONMENTAL DATA

<b>Eco-Label Certifications &amp; declarations</b>	<p>This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:</p> <ul style="list-style-type: none"> <li>• IT ECO declaration</li> <li>• US ENERGY STAR®</li> <li>• US Federal Energy Management Program (FEMP)</li> <li>• EPEAT<sup>®</sup> Gold registered in the United States. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country.</li> <li>• TCO 8.0</li> <li>• China Energy Conservation Program (CECP)</li> <li>• China State Environmental Protection Administration (SEPA)</li> <li>• Taiwan Green Mark</li> <li>• Korea Eco-label</li> <li>• Japan PC Green label*</li> </ul>		
<b>Sustainable Impact Specifications</b>	<ul style="list-style-type: none"> <li>• Ocean-bound plastic in (part(s))<sup>1</sup></li> <li>• 24.71% post-consumer recycled plastic<sup>2</sup></li> <li>• External Power Supply 90% Efficiency</li> <li>• Low halogen<sup>3</sup></li> <li>• Outside Box and corrugated cushions are 100% sustainably sourced and recyclable<sup>4</sup></li> <li>• Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable<sup>5</sup></li> <li>• Recycled Plastic cushions<sup>6</sup></li> <li>• Bulk packaging available</li> </ul> <p>1. Percentage of ocean-bound plastic contained in each component varies by product                  2. Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.                  3. External power supplies, WWAN modules, power cords, cables and peripherals excluded.                  4. 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.                  5. Fiber cushions made from 100% recycled wood fiber and organic materials.                  6. Plastic cushions are made from &gt;90% recycled plastic.</p>		
<b>System Configuration</b>	<p>The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.</p>		
<b>Energy Consumption (in accordance with US ENERGY STAR® test method)</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>
Normal Operation (Sort idle)	8.47 W	8.56 W	8.50 W
Normal Operation (Long idle)	0.82 W	0.81 W	0.78 W
Sleep	0.82 W	0.81 W	0.78 W

### Technical Specifications

Off	0.30 W	0.32 W	0.29 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)	27 BTU/hr	27 BTU/hr	27 BTU/hr
Normal Operation (Long idle)	3 BTU/hr	3 BTU/hr	2 BTU/hr
Sleep	3 BTU/hr	3 BTU/hr	2 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 BTU/hr
	<p>*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.</p>		
<b>Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)</b>	Sound Power (L <sub>WAd</sub> , bels)	Sound Pressure (L <sub>pAm</sub> , decibels)	
Typically Configured – Idle	2.6	14.4	
Fixed Disk – Random writes	2.9	14.4	
Optical Drive – Sequential reads	3.1	29.1	
<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 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 24.7% recycle-able when properly disposed of at end of life.</li> </ul>		

### Technical Specifications

<b>Packaging Materials</b>	<b>External:</b>	PAPER/Corrugated	222 g
	<b>Internal:</b>	PLASTIC/polypropylene	3 g
		PLASTIC/Polyethylene low density	8 g
		PAPER/paperboard	51 g
		PAPER/Molded pulp	154 g
	The plastic packaging material contains at least 0% recycled content.		
	The corrugated paper packaging materials contains at least 59% 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. 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="http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html">http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html</a>)</p> <ul style="list-style-type: none"> <li>• Asbestos</li> <li>• Certain Azo Colorants</li> <li>• Certain Brominated Flame Retardants – may not be used as flame retardants in plastics</li> <li>• Cadmium</li> <li>• Chlorinated Hydrocarbons</li> <li>• Chlorinated Paraffins</li> <li>• Bis(2-Ethylhexyl) phthalate (DEHP)</li> <li>• Benzyl butyl phthalate (BBP)</li> <li>• Dibutyl phthalate (DBP)</li> <li>• Diisobutyl phthalate (DIBP)</li> <li>• Formaldehyde</li> <li>• Halogenated Diphenyl Methanes</li> <li>• Lead carbonates and sulfates</li> <li>• Lead and Lead compounds</li> <li>• Mercuric Oxide Batteries</li> <li>• Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.</li> <li>• Ozone Depleting Substances</li> <li>• Polybrominated Biphenyls (PBBs)</li> <li>• Polybrominated Biphenyl Ethers (PBBEs)</li> <li>• Polybrominated Biphenyl Oxides (PBBOs)</li> <li>• Polychlorinated Biphenyl (PCB)</li> <li>• Polychlorinated Terphenyls (PCT)</li> <li>• Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been</li> </ul>		

### Technical Specifications

	<p>voluntarily removed from most applications.</p> <ul style="list-style-type: none"> <li>• Radioactive Substances</li> <li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</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="http://www.hp.com/go/reuse-recycle">http://www.hp.com/go/reuse-recycle</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <a href="http://www.hp.com/go/recyclers">http://www.hp.com/go/recyclers</a>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.</p>
<b>HP, Inc. Corporate Environmental Information</b>	<p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report  <a href="http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html">http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html</a></p> <p>Eco-label certifications  <a href="http://www8.hp.com/us/en/hp-information/environment/ecolabels.html">http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</a></p> <p>ISO 14001 certificates:  <a href="http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842">http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842</a>          and  <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</a></p>

### COUNTRY OF ORIGIN

China



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

Type	Description	Part #
<b>Cases</b>	HP Business Slim 14.1 Top Load	2SC65AA, 2SC65UT, 2SC65ET
	HP Executive 15.6 Backpack	6KD07AA, 6KD07UT, 6KD07ET
	HP Executive Slim 14.1 Top Load	6KD04AA, 6KD04UT, 6KD04ET
<b>Docking</b>	HP Thunderbolt 120W Dock G2	6HP48AA, 2UK37AA, 2UK37ET
	HP Thunderbolt 120W Dock w/Audio G2	3YE87AA, 2UK37UT, 3YE87ET
	HP Thunderbolt 230W Dock w/Combo Cable G2	3TR87AA, 3TR87UT, 3TR87ET
	HP USB-C 120W G5 Dock	26D32AA, 5TW10AA, 5TW10UT, 5TW10ET
	HP USB-C Mini Dock	2SR85AA, 1PM64AA, 1PM64UT, 1PM64ET
	HP USB-C/A 120W Universal Dock G2	5TW13AA, 5TW13UT, 5TW13ET
<b>Input/Output</b>	HP HDMI to VGA Adapter	H4F02AA, H4F02UT, H4F02ET
	HP TB Dock 120W G2 Cable	3XB94AA, 3XB94UT, 3XB94ET
	HP TB Dock 230W G2 Combo Cable	3XB96AA, 3XB96UT, 3XB96ET
	HP USB-C to DisplayPort Adapter	N9K78AA, N9K78UT
	HP USB-C to HDMI 2.0 Adapter	2PC54AA, 1WC36UT, 1WC36AA
	HP USB-C to RJ45 Adapter	V8Y76AA, V7W66AA, V7W66UT
	HP USB to Gig RJ45 Adapter	N7P47AA
	HP USB-C to USB-A Hub	Z8W90AA, Z6A00AA, Z6A00UT, Z6A00ET
	HP USB Collaboration Keyboard	Z9N38AA, Z9N38UT
	HP Wireless USB Premium Keyboard	Z9N41AA, Z9N41AT
	HP WL BT Collaboration Keyboard	Z9N39AA, Z9N39UT
	HP WL USB Keyboard	T6U20AA, T6U20UT
	HP Slim Wireless Keyboard and Mouse	T6L04AA, T6L04UT
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA, 9SR36UT, 9SR36ET
	HP Wireless Rechargeable 950MK Mouse and Keyboard	3M165AA
	HP 235 WL Mouse and Keyboard Combo	1Y4D0AA
	HP 125 Wired Keyboard	266C9AA
	HP 320M Wired Mouse	9VA80AA, 9VA80UT, 9VA80ET
	HP Comfort Grip Wireless USB Mouse	H2L63AA, H2L63UT
	HP Presenter Bluetooth Mouse	2CE30AA, 2CE30UT, 2CE30ET
	HP Travel Bluetooth Mouse	6SP30AA, 6SP30UT, 6SP30ET
	HP Travel USB Mouse	G1K28AA, G1K28ET
	HP UltraMobile Wireless Mouse	H6F25AA, H6F25UT
	HP Active RECHBL Pen G3	6SG43AA, 6SG43UT

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

<b>Power</b>	HP 65W USB-C AC Power Adapter	1HE08AA, 1HE08UT
	HP 65W USB-C LC AC Power Adapter	1P3K6AA, 1P3K6UT
	HP 65W USB-C Slim Travel AC Power Adapter	X7W50AA, 3PN48AA, 3PN48UT
	HP USB Power Bank	N9F71AA, N9F71UT
	HP USB-C Essential Power Bank	3TB55AA, 3TB55UT
<b>Storage</b>	HP USB DVD-Writer EXT ODD	Y3T76AA, F2B56AA, F2B56UT, F2B56ET
<b>Security</b>	HP Dual Head Nano Cable Lock	1AJ41AA, 1AJ41UT
	HP Nano Cable Lock	1AJ39AA, 1AJ39UT
	HP SureKey Standard/Nano/Wedge Cable Lock	6UW42AA, 6UW42UT
<b>UCC</b>	HP BT UC WL Duo Headset	W3K09AA#ABB, W3K09AA#UUF
	HP Wired Thunderbolt Audio Module	3AQ21AA, 3AQ21UT, 3AQ21ET
	HP Wired USB-A Stereo Headset	T1A67AA
	HP Wireless BT UC WL Mono Headset	W3K08AA#ABB, W3K08AA#UU

### Summary of Changes

<b>Date of change:</b>	<b>Version History:</b>		<b>Description of change:</b>
January 27, 2021	V1 to V2	Update	USB ports to new industry standards, WPA3 certification
February 10, 2021	V2 to V3	Added	Environmental Data
February 17, 2021	V3 to V4	Update	Environmental Data
March 2, 2021	V4 to V5	Update	Battery Life
March 15, 2021	V5 to V6	Update	Battery Life
April 19, 2021	V6 to V7	Updated	Input/ Output Section Updated
May 6, 2021	V7 to V8	Removed	Processors base frequency/Added HP Smart Support
May 27, 2021	V8 to V9	Updated	HP Pro Security Edition to HP Wolf Pro Security Edition
June 11, 2021	V9 to V10	Removed	HP WorkWell from Software and Security section

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