

### Overview

#### HP EliteBook x360 830 G6 Notebook PC



#### Left

- |                                    |                                 |
|------------------------------------|---------------------------------|
| 1. HD and IR Camera (Optional)     | 7. Glass Clickpad               |
| 2. IR camera LEDs (Optional)       | 8. Smartcard reader (Optional)  |
| 3. Internal microphones            | 9. Volume Up/Down               |
| 4. Camera Shutter                  | 10. Vents                       |
| 5. HD Camera LED                   | 11. Power Button                |
| 6. Ambient light sensor (Optional) | 12. USB 3.1 Gen 1 charging port |

### Overview



#### Right

- |                                   |   |
|-----------------------------------|---|
| 1. Power connector                | 6. Audio Combo Jack                               |
| 2. USB 3.1 Gen 1                  | 7. Nano Security Lock Slot (Lock sold separately) |
| 3. HDMI port (Cable not included) | 8. SIM card tray <sup>1</sup>                     |
| 4. USB Type-C™ with Thunderbolt™  | 9. Touch fingerprint sensor (Optional)            |
| 5. USB Type-C™ with Thunderbolt™  |   |

1. All units have a SIM card tray but units that do not support WWAN are shipped with a non-removable SIM slot plug

### Overview

### At a Glance

- Eye catching, Aluminum x360 design with four usage modes that is 0.66 inches (1.69 cm) thin and with a starting weight of 2.97 lbs. (1.35 Kg)
- Choice of 8th Generation Intel® Core™ i3, i5, i7 Processors
- Optional ultrabright, ant-glare touch displays with ambient light sensor
- Choice of displays:
  - 33.8 cm (13.3") diagonal FHD IPS LED-backlit BrightView touch with Corning® Gorilla® Glass 5, 250 nits, 45% NTSC
  - 33.8 cm (13.3") diagonal FHD IPS LED-backlit BrightView touch with Corning® Gorilla® Glass 5, 400 nits, 72% NTSC
  - 33.8 cm (13.3") diagonal FHD IPS LED-backlit Anti-Glare glass touch with Corning® Gorilla® Glass 5, 400 nits, 72% NTSC
  - 33.8 cm (13.3") diagonal FHD IPS LED-backlit BrightView touch with Corning® Gorilla® Glass 5, 1000 nits, 72% NTSC with HP Sure View\*
  - 33.8 cm (13.3") diagonal FHD IPS LED-backlit Anti-Glare glass touch with Corning® Gorilla® Glass 5, 1000 nits, 72% NTSC with HP Sure View\*
- Enterprise grade security with HP Sure Sense, HP SureStart Gen5, HP Privacy Camera, HP Sure View Gen3<sup>1</sup>, HP Sure Run Gen2, HP Sure Recover Gen2<sup>2</sup>, HP Sure Click, SmartCard Reader<sup>2</sup> and Touch Fingerprint reader<sup>2</sup>
- New optional HP Rechargeable Active Pen<sup>2</sup>
- Ultimate connectivity with optional Wi-Fi 6<sup>2</sup>, CAT16 4G/LTE WWAN, and Thunderbolt™ Docking (Dock sold separately)
- Preinstalled with Windows 10 versions or FreeDOS 3.0
- Choice of solid state drives up to 2 TB and DDR4 memory up to 32 GB
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles<sup>3</sup>
- Featuring HP Collaboration Keyboard with Clickpad to manage most commonly used conferencing functions with a single keystroke
- Innovative world-facing third mic improves inbound ambient noise cancellation
- Battery life up to 21 hours<sup>5</sup>
- Passed MIL-STD 810G testing, plus an additional 120,000 hours of reliability testing through HP's Total Test Process<sup>4</sup>
- Instant on/instant off with Modern Connected Standby

1. HP Sure View G3 integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.

2. Sold separately or as an optional feature

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

4. MIL STD 810G 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.

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

\*Touch-enabled display and Sure View privacy panel will lower actual brightness.

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



# QuickSpecs

## Technical Specifications

### PRODUCT NAME

HP EliteBook x360 830 G6 Notebook PC

### OPERATING SYSTEMS

|                     |  |
|---------------------|--|
| <b>Preinstalled</b> | Windows 10 Pro 64 <sup>1</sup><br>Windows 10 Pro 64 (National Academic Only) <sup>2</sup><br>Windows 10 Home 64 <sup>1</sup><br>Windows 10 Home Single Language 64 <sup>1</sup><br>FreeDOS 3.0 |
|---------------------|--|

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

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

### PROCESSORS

Intel® Core™ i3-8145U with Intel® UHD Graphics 620 (2.1 GHz base frequency, up to 3.9 GHz with Intel® Turbo Boost Technology, 4 MB L3 cache, 2 cores)<sup>3,4,5,6</sup>  
 Intel® Core™ i5-8265U with Intel® UHD Graphics 620 (1.6 GHz base frequency, up to 3.9 GHz with Intel® Turbo Boost Technology, 6 MB L3 cache, 4 cores)<sup>3,4,5,6</sup>  
 Intel® Core™ i5-8365U vPro™ processor with Intel® UHD Graphics 620 (1.6 GHz base frequency, up to 4.1 GHz with Intel® Turbo Boost Technology, 6 MB L3 cache, 4 cores)<sup>3,4,5,6</sup>  
 Intel® Core™ i7-8565U with Intel® UHD Graphics 620 (1.8 GHz base frequency, up to 4.6 GHz with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores)<sup>3,4,5,6</sup>  
 Intel® Core™ i7-8665U vPro™ processor with Intel® UHD Graphics 620 (1.9 GHz base frequency, up to 4.8 GHz with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores)<sup>3,4,5,6</sup>

#### Processor Family

8th Generation Intel® Core™ i7 processor (i3-8145U)<sup>6</sup>  
 8th Generation Intel® Core™ i7 processor (i7-8665U and i7-8565U)<sup>6</sup>  
 8th Generation Intel® Core™ i5 processor (i5-8365U and i5-8265U)<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>.



# QuickSpecs

## Technical Specifications

### CHIPSET

Chipset is integrated with processor

### GRAPHICS

#### Integrated

Intel® UHD Graphics 620<sup>7</sup>

#### Supports

Support HD decode, DX12, HDMI 1.4b<sup>8</sup>, HDCP 2.2

7. HD content required to view HD images.

8. HDMI cable sold separately.

### DISPLAY

#### Touch

33.8 cm (13.3") diagonal FHD IPS BrightView LED-backlit touch screen with Corning® Gorilla® Glass 5, 250 nits, 45% NTSC with HD camera (1920 x 1080)<sup>7,9,10</sup>

33.8 cm (13.3") diagonal FHD IPS BrightView LED-backlit touch screen with Corning® Gorilla® Glass 5, 250 nits, 45% NTSC with HD camera for WWAN (1920 x 1080)<sup>7,9,10</sup>

33.8 cm (13.3") diagonal FHD IPS BrightView LED-backlit touch screen with Corning® Gorilla® Glass 5, 400 nits, 72% NTSC with Ambient Light Sensor and HD IR camera (1920 x 1080)<sup>7,9,10</sup>

33.8 cm (13.3") diagonal FHD IPS BrightView LED-backlit touch screen with Corning® Gorilla® Glass 5, 400 nits, 72% NTSC with Ambient Light Sensor and HD IR camera for WWAN (1920 x 1080)<sup>7,9,10</sup>

33.8 cm (13.3") diagonal FHD IPS Anti-Glare LED-backlit touch screen with Corning® Gorilla® Glass 5, 400 nits, 72% NTSC with Ambient Light Sensor and HD IR camera for WWAN (1920 x 1080)<sup>7,9,10</sup>

HP Sure View Integrated Privacy Screen 33.8 cm (13.3") diagonal FHD IPS BrightView LED-backlit touch screen with Corning® Gorilla® Glass 5, 1000 nits, 72% NTSC with Ambient Light Sensor and HD IR webcam (1920 x 1080)<sup>7,9,10,11\*</sup>

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#### HDMI 1.4b

Supports resolution up to 4k @ 30Hz

7. HD content required to view HD images.

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

10. Sold separately or as an optional feature.

11. HP Sure View G3 integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.

\*Touch-enabled display and Sure View privacy panel will lower actual brightness.



# QuickSpecs

## Technical Specifications

| Dockingstation model    | Total number of supported displays (Including the notebook display) | Max. resolutions supported                       | Dock Connectors                     | Technical limitations   |
|-------------------------|---|--|-------------------------------------|---|
| HP Thunderbolt Dock G2  | 3   | Dual 4K @ 60Hz                                   | 2xDP, 1xVGA, 1xTB, 1xUSB-C alt-mode | Dual 4k (4096 x 2160) only with: <ul style="list-style-type: none"> <li>• 1 DP + TB port or</li> <li>• USB-C alt mode + TB port</li> </ul> Dual 4K (3840 x 2160) with any of the DP, TB or USB-C alt mode video ports |
| HP Elite USB-C Dock G4  | 3   | Dual 2K @ 60Hz<br>Single 4K @ 60Hz (3840 x 1440) | 1xHDMI, 2xDP                        |   |
| HP USB-C Universal Dock | 3   | Dual 4K @ 60Hz<br>Single 5K @ 60Hz               | 2xDP                                |   |
| HP USB-C Travel Dock    | 2   | Single 2K @ 60Hz                                 | 1xHDMI, 1xVGA                       | Single external display<br>Only HDMI or VGA at the time   |
| HP USB-C Mini Dock      | 2   | Single 4K @ 30Hz                                 | 1xHDMI, 1xVGA                       | Single external display<br>Only HDMI or VGA at the time   |

## STORAGE AND DRIVES

### Primary M.2 Storage

128 GB SATA-3 SS TLC<sup>12</sup>

256 GB PCIe® NVMe™ SS Value<sup>12</sup>

256 GB PCIe® Gen3x4 NVMe™ SS TLC<sup>12</sup>

256 GB SATA-3 SED SS TLC<sup>12</sup>

256 GB Intel® PCIe® NVMe™ QLC M.2 SSD with 16 GB Intel® Optane™ memory H10<sup>12,13,14</sup>

512 GB PCIe® NVMe™ SS Value<sup>12</sup>

512 GB PCIe® Gen3x4 NVMe™ SS TLC<sup>12</sup>

512 GB PCIe® Gen3x4 NVMe™ SED SS TLC<sup>12</sup>

512 GB SATA-3 SS TLC (FIPS 140-2)<sup>12</sup>

512 GB Intel® PCIe® NVMe™ QLC M.2 SSD with 32 GB Intel® Optane™ memory H10(Planned to be available Q2 2019)<sup>12,13,14</sup>

1 TB PCIe® Gen3x4 NVMe™ SS TLC<sup>12</sup>

2 TB PCIe® Gen3x4 NVMe™ SS TLC<sup>12</sup>

12. 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.

13. Intel® Optane™ 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.

14. Intel® Optane™ memory H10 only for Intel® PCIe® NVMe™ QLC M.2 SSD.





# QuickSpecs

## Technical Specifications

### MEMORY

#### Maximum Memory

32 GB DDR4-2400 SDRAM<sup>15</sup>

#### Memory

32 GB DDR4-2400 SDRAM (2 x 16 GB)<sup>15</sup>

16 GB DDR4-2400 SDRAM (1 x 16 GB)<sup>15</sup>

16 GB DDR4-2400 SDRAM (2 x 8 GB)<sup>15</sup>

8 GB DDR4-2400 SDRAM (1 x 8 GB)<sup>15</sup>

8 GB DDR4-2400 SDRAM (2 x 4 GB)<sup>15</sup>

4 GB DDR4-2400 SDRAM (1 x 4 GB)<sup>15</sup>

#### Memory Slots

2 SODIMM

Both slots are upgradeable

System runs at 2400 for Intel® 8th Generation processors

Supports Dual Channel Memory

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

### NETWORKING/COMMUNICATIONS

#### WLAN

Intel® Wireless-AC 9560 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 5 Combo, vPro™<sup>10,16</sup>

Intel® Wireless-AC 9560 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 5 Combo, non-vPro™<sup>10,16</sup>

Intel® Wi-Fi 6 AX200 802.11a/b/g/n/ac/ax (2x2) and Bluetooth® 5 Combo, vPro™<sup>10,20</sup>

Intel® Wi-Fi 6 AX200 802.11a/b/g/n/ac/ax (2x2) Bluetooth® 5 Combo, non-vPro™<sup>10,20</sup>

#### WWAN

Intel® XMM™ 7262 LTE-Advanced Cat 6<sup>17</sup>

Intel® XMM™ 7360 LTE-Advanced Cat 9<sup>17</sup>

Intel® XMM™ 7560 LTE-Advanced Pro Cat 16<sup>19</sup>

#### NFC

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

#### Miracast

Native Miracast Support<sup>18</sup>

10. Sold separately or as an optional feature.

16. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited.

17. 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.

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

19. Gigabit class Category 16 4G LTE module is optional and must be configured at the factory. Module designed for up to 1 Gbps download speeds as carriers deploy 5 carrier aggregation and 100Mhz channel bandwidth, requires activation and separately purchased service contract. Backwards compatible to HSPA 3G technologies. Check with service provider for coverage and



# QuickSpecs

## Technical Specifications

availability in your area. Connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.

20. 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.

## AUDIO/MULTIMEDIA

### Audio

Audio by Bang & Olufsen

Integrated 3 Multi Array Microphone

2 Integrated Stereo Speakers (74 Db)

### Camera

HD camera<sup>7</sup>

HD IR camera<sup>7</sup>

7. HD content required to view HD images.

## KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

### Keyboard

HP Premium Collaboration Keyboard, backlit and spill resistant with drain

### Pointing Device

Clickpad with multi-touch gestures enabled, taps enabled as default

Microsoft Precision Touchpad Default Gestures Support

### Function Keys

F1 - Display Switching

F2 - Blank or Privacy

F3 - Brightness Down

F4 - Brightness Up

F5 - Audio Mute

F6 - Volume Down

F7 - Volume Up

F8 - Mic Mute

F9 - Backlit Toggle

F10 - numlk

F11 - Wireless

F12 - Calendar

Share/Present

Call Answer

Call End

### Hidden Function Keys

Fn+R - Break

Fn+S - Sys Rq





# QuickSpecs

## Technical Specifications

Fn+C - Scroll Lock  
 Fn+E - Insert  
 Fn+W - Pause

## SOFTWARE AND SECURITY

### Preinstalled Software

#### BIOS

HP BIOSphere Gen5<sup>21</sup>  
 HP Drive Lock & Automatic Drive Lock<sup>22</sup>  
 BIOS Update via Network  
 Master Boot Record Security  
 Power On Authentication  
 Secure Erase<sup>23</sup>  
 Absolute Persistence Module<sup>24</sup>  
 Pre-boot Authentication

#### Software

HP Native Miracast Support<sup>25</sup>  
 HP Connection Optimizer  
 HP Image Assistant  
 HP Hotkey Support  
 HP JumpStart  
 HP Support Assistant<sup>26</sup>  
 HP Noise Cancellation Software  
 Buy Office (Sold separately)

#### Manageability Features

HP Driver Packs<sup>27</sup>  
 HP System Software Manager (SSM)  
 HP BIOS Config Utility (BCU)  
 HP Client Catalog  
 HP Manageability Integration Kit Gen3<sup>28</sup>  
 HP Cloud Recovery<sup>29</sup>

#### Client Security Software

HP Client Security Manager Gen5<sup>30</sup>  
 HP Fingerprint Sensor<sup>31</sup>  
 HP Power On Authentication  
 Windows Defender<sup>32</sup>

#### Security Management

Pre-boot Authentication  
 TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)  
 SATA 0,1 port disablement (via BIOS)  
 Serial, USB enable/disable (via BIOS)  
 Power-on password (via BIOS)  
 Setup password (via BIOS)  
 Support for chassis padlocks and cable lock devices  
 HP Sure Click<sup>33</sup>  
 HP Sure Start Gen5<sup>34</sup>  
 HP Sure Run Gen2<sup>35</sup>  
 HP Sure Recover Gen2<sup>36</sup>



# QuickSpecs

## Technical Specifications

HP Sure Sense<sup>37</sup>

### TPM

Model: Infineon SLB9670

Version: 7.85

Revision: TPM 2.0

FIPS 140-2 Compliant: Yes

### Smartcard Reader

Model number: Alcor AU9560

FIPS 201 Compliant: Yes

### IPv6 Compliance

Yes

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

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

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

Yes

UEFI version: 2.6

21. HP BIOSphere Gen5 is available on select HP Pro and Elite PCs. See product specifications for details. Features may vary depending on the platform and configurations.
- 22 HP Automatic Drive Lock is not supported on NVMe drives
23. 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™.
24. Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: <http://www.absolute.com/company/legal/agreements/> computrace-agreement. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.
25. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.
26. HP Support Assistant requires Windows and Internet access.
27. HP Driver Packs not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.
28. HP Manageability Integration Kit can be downloaded from <http://www.hp.com/go/clientmanagement>.
29. HP Cloud Recovery is available for HP Elite and Pro desktops and laptops PCs with Intel® or AMD processors and requires an open, wired network connection. Note: You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Detail please refer to: <https://support.hp.com/us-en/document/c05115630>
30. HP Client Security Manager Gen5 requires Windows and is available on the select HP Pro and Elite PCs. See product specifications for details.
31. HP Fingerprint Sensor sold separately or as an optional feature.
32. Windows Defender Opt in and internet connection required for updates.



# QuickSpecs

## Technical Specifications

33. HP Sure Click is available on select HP platforms and supports Microsoft Internet Explorer, Google Chrome™, and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode, when Microsoft Office or Adobe Acrobat are installed.
34. HP Sure Start Gen5 is available on select HP PCs with Intel processors. See product specifications for availability.
35. HP Sure Run Gen2: See product specifications for availability.
36. HP Sure Recover Gen2: See product specifications for availability. Requires an open, wired network connection. Not available on platforms with multiple internal storage drives. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. HP Sure Recover (Gen1) does not support platforms with Intel® Optane™.
37. HP Sure Sense requires Windows 10. See product specifications for availability.

## POWER

### Power Supply

- HP Smart 45 W External AC power adapter<sup>38</sup>
- HP Smart 45 W External AC power adapter, 2-prong (Japan only)<sup>38</sup>
- HP Smart 65 W External AC power adapter<sup>38</sup>
- HP Smart 65 W EM External AC power adapter<sup>38</sup>
- HP 45 W USB Type-C™ adapter<sup>38</sup>
- HP 65 W USB Type-C™ adapter<sup>38</sup>

### Primary Battery

- HP Long Life 4-cell, 53 Wh Li-ion<sup>39</sup>

### Battery Life

- Up to 21 hours (Intel® 8th Generation CPU and 4-cell 53 WHr battery)<sup>40</sup>

### Power Cord

- 2-wire plug - 1m3
- 3-wire plug - 1m
- 3-wire plug - 1.8m
- Duckhead power cord - 1 m
- Duckhead power cord - 1.8 m

38. Availability may vary by country.

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

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

## WEIGHTS & DIMENSIONS

### Product Weight

- Starting weight
- 2.97 lbs<sup>35</sup> 1.35 kgs<sup>41</sup>

**NOTE:** Starting weight configuration includes FHD 400 nits BrightView Touch, 53 Wh battery, 4 GB, 128 GB SSD, HD + IR camera, No FPS, with WWAN Antenna, No NFC, and No Pen



# QuickSpecs

## Technical Specifications

### Mainstream weight

3.13 lbs<sup>35</sup> 1.42 kg<sup>41</sup>

NOTE: Mainstream weight configuration includes FHD 250 nits BrightView Touch, 53 Wh battery, 4 GB, 128 GB SSD, HD Camera, No FPS, with WWAN Antenna, No NFC and No Pen

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

12.07 x 8.47 x 0.66 in

30.66 x 21.52 x 1.69 cm

41. Weight will vary by configuration.

## PORTS/SLOTS

2 USB 3.1 Type-C™ with Thunderbolt™ support

2 USB 3.1 Gen 1 (1 Charging)

1 HDMI 1.4b<sup>8</sup>

1 External Nano SIM tray (Optional)<sup>10</sup>

1 Headphone/microphone combo

1 Smartcard reader (Optional)<sup>10</sup>

1 AC power

Nano Security Lock Slot (Lock sold separately)

### Sensors

Accelerometer

Magnetometer

Gyro

ALS (ambient light sensor)

Hall Sensor

8. HDMI cable sold separately

10. Sold separately or as an optional feature.

## SERVICE AND SUPPORT

HP offers 3-year and 1-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year limited warranty as the platform. 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>42</sup>

42. 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.



# QuickSpecs

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## Technical Specifications



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### SYSTEM UNIT

|  |  |  |
|--|--|--|
| <b>Stand-Alone Power Requirements (AC Power)</b> | <b>Nominal Operating Voltage</b>       | AC 19V   |
|  | <b>Average Operating Power</b>         | Win10  |
|  | <b>Integrated Graphics</b>             | Yes  |
|  | <b>Max Operating Power</b>             | UMA < 65W  |
| <b>Temperature</b>                               | <b>Operating</b>                       | 32° to 95° F (0° to 35° C)                                 |
|  | <b>Non-operating</b>                   | -4° to 140° F (-20° to 60° C)                              |
| <b>Relative Humidity</b>                         | <b>Operating</b>                       | 10% to 90%, non-condensing                                 |
|  | <b>Non-operating</b>                   | 5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature |
| <b>Shock</b>                                     | <b>Operating</b>                       | 40 G, 2 ms, half-sine                                      |
|  | <b>Non-operating</b>                   | 200 G, 2 ms, half-sine                                     |
| <b>Random Vibration</b>                          | <b>Operating</b>                       | 0.75 grms  |
|  | <b>Non-operating</b>                   | 1.50 grms  |
| <b>Altitude (unpressurized)</b>                  | <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 <sup>43</sup>  |
|  | <b>EPEAT® 2019</b>                     | Yes, Silver in U.S. <sup>44</sup>                          |
|  | <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  |

43. Configurations of the HP EliteBook x360 830 G6 that are ENERGY STAR® certified are identified as HP EliteBook x360 830 G6 ENERGY STAR® on HP websites and on <http://www.energystar.gov>.

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





# QuickSpecs

## Technical Specifications

### ENVIRONMENTAL & INDUSTRY

|  |  |  |                     |                     |
|--|--|--|---------------------|---------------------|
| <b>Environmental Data</b>  | <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® 2019 Silver registered in the United States. Based on EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country.</li> <li>• TCO Certified Edge</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>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 (Sort idle)   | 4.26   | 4.42                | 4.3                 |
|  | Normal Operation (Long idle)   | 2.66   | 2.77                | 2.69                |
|  | Sleep  | 0.88   | 0.92                | 0.9                 |
|  | Off  | 0.36   | 0.37                | 0.36                |
|  | <p>Note:<br/>Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.</p> |  |                     |                     |
|  | <b>Heat Dissipation*</b>   | <b>115VAC, 60Hz</b>  | <b>230VAC, 50Hz</b> | <b>100VAC, 60Hz</b> |
|  | Normal Operation (Short idle)  | 14   | 15                  | 15                  |
|  | Normal Operation (Long idle)   | 9  | 9                   | 9                   |
|  | Sleep  | 3  | 3                   | 3                   |
|  | Off  | 1  | 1                   | 1                   |
| <p>*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.</p> |  |  |                     |                     |



# QuickSpecs

## Technical Specifications

|  |  |   |     |
|--|--|---|-----|
| <b>Declared Noise Emissions<br/>(in accordance with ISO 7779 and ISO 9296)</b> | Sound Power<br>(L <sub>WAd</sub> , bels)   | Sound Pressure<br>(L <sub>pAm</sub> , decibels) |     |
| Typically Configured – Idle  | 2.5  | 15  |     |
| Fixed Disk – Random writes   | 2.6  | 15  |     |
| <b>Longevity and Upgrading</b>   | This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include: <ul style="list-style-type: none"><li>• 3 USB ports</li><li>• 1 PC card slot (type I/II)</li><li>• 1 ExpressCard/54 slot</li><li>• 1 IEEE 1394 Port</li><li>• 2 SODIMM memory slots</li><li>• Optional expansion base docking station</li><li>• 1 multi-bay II storage port</li><li>• Interchangeable HDD</li></ul><br>Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.  |   |     |
| <b>Batteries</b>   | This battery(s) in this product comply with EU Directive 2006/66/EC<br><br>Batteries used in the product do not contain:<br>Mercury greater the 1ppm by weight<br>Cadmium greater than 20ppm by weight<br><br>Battery size: CR2032 (coin cell)<br>Battery type: Lithium  |   |     |
| <b>Additional Information</b>  | <ul style="list-style-type: none"><li>• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.</li><li>• This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.</li><li>• This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).</li><li>• This product is in compliance with the IEEE 1680.1 (EPEAT) standard at the Silver level, see <a href="http://www.epeat.net">http://www.epeat.net</a></li><li>• Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.</li><li>• This product contains 5.69% post-consumer recycled plastic (by wt.)</li><li>• This product is 96.4% recycle-able when properly disposed of at end of life.</li></ul> |   |     |
| <b>Packaging Materials</b>   | <b>External:</b>   | PAPER/Corrugated                                | 264 |
|  | <b>Internal:</b>   | PLASTIC/EPE (Expanded Polyethylene)             | 47  |
|  |  | PLASTIC/Polypropylene - PP                      | 3   |
|  |  | PLASTIC/Polyethylene low density - LDPE         | 14  |



# QuickSpecs

## Technical Specifications

|  |                        |  |
|--|------------------------|--|
|  | <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 (PBEBs)</li> <li>• Polybrominated Biphenyl Oxides (PBBOs)</li> <li>• Polychlorinated Biphenyl (PCB)</li> <li>• Polychlorinated Terphenyls (PCT)</li> <li>• Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.</li> <li>• Radioactive Substances</li> <li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</li> </ul> |
|  | <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>  |



# QuickSpecs

## Technical Specifications

|  |   |  |
|--|---|--|
|  | <b>End-of-life Management and Recycling</b>         | <p>Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <a href="http://www.hp.com/go/reuse-recycle">http://www.hp.com/go/reuse-recycle</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <a href="http://www.hp.com/go/recyclers">http://www.hp.com/go/recyclers</a>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.</p> |
|  | <b>HP, Inc. Corporate Environmental Information</b> | <p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report<br/> <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<br/> <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:<br/> <a href="http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842">http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842</a><br/> and<br/> <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</a></p>   |

## DISPLAYS

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

|  |  |                          |
|--|--|--------------------------|
| <b>Panel LCD 13.3 inch diagonal FHD WLED BrightView UWVA 72 percent cg 400 nits eDP 1.4+PSR2 ultraslim</b> | <b>Outline Dimensions (W x H x D)</b>  | 299.06 x 185.54 (max.)   |
|  | <b>Active Area</b>                     | 293.76 x 165.24          |
|  | <b>Weight</b>                          | 170 g max. (panel only)  |
|  | <b>Diagonal Size</b>                   | 13.3"                    |
|  | <b>Thickness</b>                       | 2.0 mm                   |
|  | <b>Interface</b>                       | eDP 1.4 w/ PSR2 (2 lane) |
|  | <b>Surface Treatment</b>               | BrightView Glass         |
|  | <b>Touch Enabled</b>                   | Yes                      |
|  | <b>Contrast Ratio</b>                  | 1500:1 (typical)         |
|  | <b>Refresh Rate</b>                    | 60 Hz                    |
|  | <b>Brightness</b>                      | 400 nits typ.            |
|  | <b>Pixel Resolution</b>                | 1920 x 1080 (FHD)        |
|  | <b>Format of LCD Pixel Arrangement</b> | RGB                      |
|  | <b>Backlight</b>                       | WLED                     |
|  | <b>Color Gamut Coverage</b>            | 72% of NTSC              |
|  | <b>Color Depth</b>                     | 8 bit                    |
|  | <b>Viewing Angle</b>                   | UWVA 85/85/85/85         |



# QuickSpecs

## Technical Specifications

|  |  |                          |
|--|--|--------------------------|
| <b>Panel LCD 13.3 inch diagonal FHD WLED</b><br><b>Anti-glare UWVA 72 percent cg 400 nits eDP 1.4+PSR2 ultraslim</b> | <b>Outline Dimensions (W x H x D)</b>  | 299.06 x 185.54 (max.)   |
|  | <b>Active Area</b>                     | 293.76 x 165.24          |
|  | <b>Weight</b>                          | 170 g max. (panel only)  |
|  | <b>Diagonal Size</b>                   | 13.3"                    |
|  | <b>Thickness</b>                       | 2.0 mm                   |
|  | <b>Interface</b>                       | eDP 1.4 w/ PSR2 (2 lane) |
|  | <b>Surface Treatment</b>               | Anti-glare Glass         |
|  | <b>Touch Enabled</b>                   | Yes                      |
|  | <b>Contrast Ratio</b>                  | 1500:1 (typical)         |
|  | <b>Refresh Rate</b>                    | 60 Hz                    |
|  | <b>Brightness</b>                      | 400 nits typ.            |
|  | <b>Pixel Resolution</b>                | 1920 x 1080 (FHD)        |
|  | <b>Format of LCD Pixel Arrangement</b> | RGB                      |
|  | <b>Backlight</b>                       | WLED                     |
|  | <b>Color Gamut Coverage</b>            | 72% of NTSC              |
|  | <b>Color Depth</b>                     | 8 bit                    |
|  | <b>Viewing Angle</b>                   | UWVA 85/85/85/85         |

|  |  |   |
|--|--|---|
| <b>Panel LCD 13.3 inch diagonal FHD WLED</b><br><b>BrightView UWVA 45 percent cg 250 nits eDP slim</b> | <b>Outline Dimensions (W x H x D)</b>  | 300.56 x 187.77 max. (w/ PCB & w/o bracket) |
|  | <b>Active Area</b>                     | 293.76 x 165.24 typ.                        |
|  | <b>Weight</b>                          | <260 max. (panel only)                      |
|  | <b>Diagonal Size</b>                   | 13.3"                                       |
|  | <b>Thickness</b>                       | 3.0 mm max.                                 |
|  | <b>Interface</b>                       | eDP 1.2 (2 lane)                            |
|  | <b>Surface Treatment</b>               | BrightView Glass                            |
|  | <b>Touch Enabled</b>                   | Yes   |
|  | <b>Contrast Ratio</b>                  | 600:1 (typ)                                 |
|  | <b>Refresh Rate</b>                    | 60 Hz                                       |
|  | <b>Brightness</b>                      | 250 nit typ                                 |
|  | <b>Pixel Resolution</b>                | 1920 x 1080 (FHD)                           |
|  | <b>Format of LCD Pixel Arrangement</b> | RGB   |
|  | <b>Backlight</b>                       | WLED  |
|  | <b>Color Gamut Coverage</b>            | 45% of NTSC                                 |
|  | <b>Color Depth</b>                     | 6 bit                                       |
|  | <b>Viewing Angle</b>                   | UWVA 85/85/85/85                            |



# QuickSpecs

## Technical Specifications

|  |  |                           |
|--|--|---------------------------|
| <b>Panel LCD 13.3 inch<br/>diagonal FHD WLED<br/>BrightView UWVA<br/>72 percent cg 1000 nits<br/>eDP 1.4+PSR2 flat Privacy</b> | <b>Outline Dimensions (W x H x D)</b>  | 298.76 x 186.04 mm (typ.) |
|  | <b>Active Area</b>                     | 293.76 x 165.24 mm (typ.) |
|  | <b>Weight</b>                          | 255 g (max)               |
|  | <b>Diagonal Size</b>                   | 13.3 inch                 |
|  | <b>Thickness</b>                       | 3.0 mm (max)              |
|  | <b>Interface</b>                       | eDP 1.4                   |
|  | <b>Surface Treatment</b>               | BrightView Glass          |
|  | <b>Touch Enabled</b>                   | YES                       |
|  | <b>Contrast Ratio</b>                  | 2000:1 (typ.)             |
|  | <b>Refresh Rate</b>                    | 60 Hz                     |
|  | <b>Brightness*</b>                     | 1000 nits                 |
|  | <b>Pixel Resolution</b>                | 1920 x 1080(FHD)          |
|  | <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 bit                     |
|  | <b>Viewing Angle</b>                   | UWVA 85/85/85/85          |

\*Touch-enabled display and Sure View privacy panel will lower actual brightness.

|   |  |                           |
|---|--|---------------------------|
| <b>Panel LCD 13.3 inch<br/>diagonal FHD WLED Anti-<br/>Glare UWVA 72 percent cg<br/>1000 nits eDP 1.4+PSR2<br/>flat Privacy</b> | <b>Outline Dimensions (W x H x D)</b>  | 298.76 x 186.04 mm (typ.) |
|   | <b>Active Area</b>                     | 293.76 x 165.24 mm (typ.) |
|   | <b>Weight</b>                          | 255 g (max)               |
|   | <b>Diagonal Size</b>                   | 13.3 inch                 |
|   | <b>Thickness</b>                       | 3.0 mm (max)              |
|   | <b>Interface</b>                       | eDP 1.4                   |
|   | <b>Surface Treatment</b>               | Anti-glare Glass          |
|   | <b>Touch Enabled</b>                   | YES                       |
|   | <b>Contrast Ratio</b>                  | 2000:1 (typ.)             |
|   | <b>Refresh Rate</b>                    | 60 Hz                     |
|   | <b>Brightness</b>                      | 1000 nits                 |
|   | <b>Pixel Resolution</b>                | 1920 x 1080(FHD)          |
|   | <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 bit                     |
|   | <b>Viewing Angle</b>                   | UWVA 85/85/85/85          |

\*Touch-enabled display and Sure View privacy panel will lower actual brightness.





# QuickSpecs

## Technical Specifications

### STORAGE AND DRIVES

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.

#### SSD 128 GB 2280 M2 SATA-3 TLC

|                                 |  |
|---------------------------------|--|
| <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>                | ATA-8, SATA 3.0                          |
| <b>Maximum Sequential Read</b>  | Up To 520 MB/s                           |
| <b>Maximum Sequential Write</b> | Up To 450 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>                 | DIPM; TRIM; DEVSLP                       |

#### SSD 256 GB 2280 M2 PCIe-3x4 SS NVMe TLC

|                                 |  |
|---------------------------------|--|
| <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>Interface</b>                | PCIe NVMe Gen3X4                         |
| <b>Maximum Sequential Read</b>  | Up To 3167 MB/s                          |
| <b>Maximum Sequential Write</b> | Up To 1663 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                 |

#### SSD 256 GB 2280 M2 SATA-3 Self Encrypted OPAL2 TLC

|                                 |  |
|---------------------------------|--|
| <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>Interface</b>                | ATA-8, SATA 3.0                          |
| <b>Maximum Sequential Read</b>  | Up To 530 MB/s                           |
| <b>Maximum Sequential Write</b> | Up To 515 MB/s                           |
| <b>Logical Blocks</b>           | 500,118,192                              |
| <b>Operating Temperature</b>    | 32° to 158°F (0° to 70°C) [ambient temp] |



# QuickSpecs

## Technical Specifications

|  | Features                        | DIPM; TRIM; DEVSLP                       |
|--|---------------------------------|--|
| <b>256 GB 2280 PCIe NVMe Value Solid State Drive</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>  | Up To 1700 MB/s                          |
|  | <b>Maximum Sequential Write</b> | Up To 600 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>                 | TRIM; L1.2                               |
| <b>SSD 512 GB 2280 M2 PCIe-3x4 SS NVMe TLC</b>       | <b>Form Factor</b>              | M.2 2280                                 |
|  | <b>Capacity</b>                 | 512 GB                                   |
|  | <b>NAND Type</b>                | MLC                                      |
|  | <b>Height</b>                   | 0.09 in (2.3 mm)                         |
|  | <b>Width</b>                    | 0.87 in (22 mm)                          |
|  | <b>Interface</b>                | PCIe NVMe Gen3X4                         |
|  | <b>Maximum Sequential Read</b>  | Up To 2600 MB/s                          |
|  | <b>Maximum Sequential Write</b> | Up To 1400 MB/s                          |
|  | <b>Logical Blocks</b>           | 1,000,215,216                            |
|  | <b>Operating Temperature</b>    | 32° to 158°F (0° to 70°C) [ambient temp] |
| <b>SSD 512 GB 2280 M2 SATA-3 TLC FIPS</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>Interface</b>                | ACS-3, SATA 3.2                          |
|  | <b>Maximum Sequential Read</b>  | Up To 530 MB/s                           |
|  | <b>Maximum Sequential Write</b> | Up To 400 MB/s                           |
|  | <b>Logical Blocks</b>           | 1,000,215,216                            |
|  | <b>Operating Temperature</b>    | 32° to 158°F (0° to 70°C) [ambient temp] |
|  | <b>Features</b>                 | DIPM; TRIM; DEVSLP                       |



# QuickSpecs

## Technical Specifications

|   |                                 |  |
|---|---------------------------------|--|
| <b>SSD 512 GB 2280 PCIe-3x4 NVMe Self Encrypted OPAL2 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>  | Up To 2900 MB/s                          |
|   | <b>Maximum Sequential Write</b> | Up To 1400 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>                 | TRIM; L1.2                               |
| <b>SSD 1 TB 2280 PCIe-3x4 NVMe TLC SS</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>Interface</b>                | PCIe NVMe Gen3X4                         |
|   | <b>Maximum Sequential Read</b>  | Up to 3480 MB/s                          |
|   | <b>Maximum Sequential Write</b> | Up to 2800 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>                 | TRIM; L1.2                               |
| <b>SSD 2 TB 2280 PCIe-3x4 NVMe TLC SS</b>                     | <b>Form Factor</b>              | M.2 2280                                 |
|   | <b>Capacity</b>                 | 2 TB                                     |
|   | <b>NAND Type</b>                | TLC                                      |
|   | <b>Height</b>                   | 0.09 in (2.3 mm)                         |
|   | <b>Width</b>                    | 0.87 in (22 mm)                          |
|   | <b>Interface</b>                | PCIe NVMe Gen3X4                         |
|   | <b>Maximum Sequential Read</b>  | Up to 3000 MB/s                          |
|   | <b>Maximum Sequential Write</b> | Up to 2100 MB/s                          |
|   | <b>Logical Blocks</b>           | 3,907,029,168                            |
|   | <b>Operating Temperature</b>    | 32° to 158°F (0° to 70°C) [ambient temp] |
|   | <b>Features</b>                 | TRIM; L1.2                               |
| <b>SSD 512 GB 2280 PCIe NVMe Value</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)                         |



# QuickSpecs

## Technical Specifications

|  |                                 |  |
|--|---------------------------------|--|
|  | <b>Width</b>                    | 0.87 in (22 mm)                          |
|  | <b>Interface</b>                | PCIe NVMe Gen3X4                         |
|  | <b>Maximum Sequential Read</b>  | Up to 1700 MB/s                          |
|  | <b>Maximum Sequential Write</b> | Up to 1500 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>                 | TRIM; L1.2                               |
| <b>SSD 512 GB PCIe<br/>NVMe + 32 GB Optane</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>Interface</b>                | PCIe NVMe Gen3X4                         |
|  | <b>Maximum Sequential Read</b>  | Up to 2400 MB/s                          |
|  | <b>Maximum Sequential Write</b> | Up to 1300 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>                 | TRIM; L1.2                               |



# QuickSpecs

## Technical Specifications

### NETWORKING/COMMUNICATIONS

|  |  |  |
|--|--|--|
| <b>Intel® Wireless-AC 9560</b><br><b>802.11a/b/g/n/ac (2 x 2)</b><br><b>Wi-Fi® and Bluetooth® 5.0</b><br><b>Combo<sup>1</sup>, vPro™<sup>10,14</sup></b> | <b>Wireless LAN Standards</b>                    | IEEE 802.11a<br>IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11n<br>IEEE 802.11ac  |
|  | <b>Interoperability</b><br><b>Frequency Band</b> | Wi-Fi® certified<br>• 802.11b/g/n<br>2.402 – 2.482 GHz   |
|  | <b>Data Rates</b>                                | • 802.11a/n<br>4.9 – 4.95 GHz (Japan)<br>5.15 – 5.25 GHz<br>5.25 – 5.35 GHz<br>5.47 – 5.725 GHz<br>5.825 – 5.850 GHz   |
|  |  | • 802.11b: 1, 2, 5.5, 11 Mbps<br>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)<br>• 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)  |
|  | <b>Modulation</b>                                | Direct Sequence Spread Spectrum<br>BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM  |
|  | <b>Security<sup>3</sup></b>                      | • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only<br>• AES-CCMP: 128 bit in hardware<br>• 802.1x authentication<br>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.<br>• WPA2 certification<br>• IEEE 802.11i<br>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite<br>• WAPI                                  |
|  | <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>2</sup></b>                  | • 802.11b: +18.5dBm minimum<br>• 802.11g: +17.5dBm minimum<br>• 802.11a: +18.5dBm minimum<br>• 802.11n HT20(2.4GHz): +15.5dBm minimum<br>• 802.11n HT40(2.4GHz): +14.5dBm minimum<br>• 802.11n HT20(5GHz): +15.5dBm minimum<br>• 802.11n HT40(5GHz): +14.5dBm minimum<br>• 802.11ac VHT80(5GHz): +11.5dBm minimum<br>• 802.11ac VHT160(5GHz): +11.5dBm minimum |
|  | <b>Power Consumption</b>                         | • Transmit mode 2.0 W<br>• Receive mode 1.6 W<br>• Idle mode (PSP) 180 mW (WLAN Associated)<br>• Idle mode 50 mW (WLAN unassociated)<br>• Connected Standby 10mW   |



# QuickSpecs

## Technical Specifications

|  |  |
|--|--|
|  | •Radio disabled 8 mW   |
| <b>Power Management</b>                  | ACPI and PCI Express compliant power management<br>802.11 compliant power saving mode  |
| <b>Receiver Sensitivity</b> <sup>3</sup> | 802.11b, 1Mbps: -93.5dBm maximum<br>802.11b, 11Mbps: -84dBm maximum<br>802.11a/g, 6Mbps: -86dBm maximum<br>802.11a/g, 54Mbps: -72dBm maximum<br>802.11n, MCS07: -67dBm maximum<br>802.11n, MCS15: -64dBm maximum<br>802.11ac, MCS0: -84dBm maximum<br>802.11ac, MCS9: -59dBm maximum |
| <b>Antenna type</b>                      | High efficiency antenna with spatial diversity, mounted in the display enclosure<br>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   |
| <b>Dimensions</b>                        | Type 2230: 2.3 x 22.0 x 30.0 mm  |
| <b>Weight</b>                            | Type 2230: 2.8g  |
| <b>Operating Voltage</b>                 | 3.3v +/- 9%  |
| <b>Temperature</b>                       | Operating 14° to 158° F (-10° to 70° C)<br>Non-operating -40° to 176° F (-40° to 80° C)  |
| <b>Humidity</b>                          | Operating 10% to 90% (non-condensing)<br>Non-operating 5% to 95% (non-condensing)  |
| <b>Altitude</b>                          | Operating 0 to 10,000 ft (3,048 m)<br>Non-operating 0 to 50,000 ft (15,240 m)  |
| <b>LED Activity</b>                      | LED Amber – Radio OFF; LED White – Radio ON  |

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

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

|                                     |  |
|-------------------------------------|--|
| <b>Bluetooth Specification</b>      | 4.0/4.1/4.2 Compliant  |
| <b>Frequency Band</b>               | 2402 to 2480 MHz   |
| <b>Number of Available Channels</b> | Legacy: 0~79 (1 MHz/CH)<br>BLE: 0~39 (2 MHz/CH)  |
| <b>Signaling Data Rate</b>          | Legacy: 3 Mbps signaling data rate <sup>1</sup> 2.17 Mbps<br>BLE: 1 Mbps signaling data rate <sup>1</sup> 0.2 Mbps<br><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 + 4 dBm for BR and EDR.  |





# QuickSpecs

## Technical Specifications

|  |  |
|--|--|
| <b>Power Consumption</b>               | Peak (Tx) 330 mW<br>Peak (Rx) 230 mW<br>Selective Suspend 17 mW  |
| <b>Electrical Interface</b>            | USB 2.0 compliant  |
| <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<br>Low Voltage Directive IEC950<br>UL, CSA, and CE Mark   |
| <b>Bluetooth Profiles Supported</b>    | BT4.1-ESR 5/6/7 Compliance<br>LE Link Layer Ping<br>LE Dual Mode<br>LE Link Layer<br>LE Low Duty Cycle Directed Advertising<br>LE L2CAP Connection Oriented Channels<br>Train Nudging & Interlaced Scan<br>BT4.2 ESR08 Compliance<br>LE Secure Connection- Basic/Full<br>LE Privacy 1.2 –Link Layer Privacy<br>LE Privacy 1.2 –Extended Scanner Filter Policies<br>LE Data Packet Length Extension<br>FAX Profile (FAX)<br>Basic Imaging Profile (BIP)2<br>Headset Profile (HSP)<br>Hands Free Profile (HFP)<br>Advanced Audio Distribution Profile (A2DP) |
| <b>Security &amp; Manageability</b>    | Intel® vPro™ support with appropriate Intel® chipset components  |

10. Sold separately or as an optional feature.

14. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited.

**Intel® Wireless-AC 9560  
802.11a/b/g/n/ac (2 x 2)  
Wi-Fi® and Bluetooth® 5.0  
Combo<sup>1</sup>, non-vPro™<sup>10,14</sup>**

|                               |  |
|-------------------------------|--|
| <b>Wireless LAN Standards</b> | IEEE 802.11a<br>IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11n<br>IEEE 802.11ac  |
| <b>Interoperability</b>       | Wi-Fi® certified   |
| <b>Frequency Band</b>         | • 802.11b/g/n<br>2.402 – 2.482 GHz<br><br>• 802.11a/n<br>4.9 – 4.95 GHz (Japan)<br>5.15 – 5.25 GHz<br>5.25 – 5.35 GHz<br>5.47 – 5.725 GHz<br>5.825 – 5.850 GHz |



# QuickSpecs

## Technical Specifications

|   |  |
|---|--|
| <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> </ul>   |
| <b>Modulation</b>                       | Direct Sequence Spread Spectrum<br>BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM  |
| <b>Security<sup>3</sup></b>             | <ul style="list-style-type: none"> <li>• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>• AES-CCMP: 128 bit in hardware</li> <li>• 802.1x authentication</li> <li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>• WPA2 certification</li> <li>• IEEE 802.11i</li> <li>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>• WAPI</li> </ul>  |
| <b>Network Architecture Models</b>      | Ad-hoc (Peer to Peer)<br>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> </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<br>802.11 compliant power saving mode  |
| <b>Receiver Sensitivity<sup>3</sup></b> | 802.11b, 1Mbps: -93.5dBm maximum<br>802.11b, 11Mbps: -84dBm maximum<br>802.11a/g, 6Mbps: -86dBm maximum<br>802.11a/g, 54Mbps: -72dBm maximum<br>802.11n, MCS07: -67dBm maximum<br>802.11n, MCS15: -64dBm maximum<br>802.11ac, MCS0: -84dBm maximum<br>802.11ac, MCS9: -59dBm maximum   |
| <b>Antenna type</b>                     | High efficiency antenna with spatial diversity, mounted in the display enclosure<br>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   |



# QuickSpecs

## Technical Specifications

|                          |   |
|--------------------------|---|
| <b>Dimensions</b>        | Type 2230: 2.3 x 22.0 x 30.0 mm   |
| <b>Weight</b>            | Type 2230: 2.8g   |
| <b>Operating Voltage</b> | 3.3v +/- 9%   |
| <b>Temperature</b>       | Operating 14° to 158° F (–10° to 70° C)<br>Non-operating –40° to 176° F (–40° to 80° C) |
| <b>Humidity</b>          | Operating 10% to 90% (non-condensing)<br>Non-operating 5% to 95% (non-condensing)       |
| <b>Altitude</b>          | Operating 0 to 10,000 ft (3,048 m)<br>Non-operating 0 to 50,000 ft (15,240 m)           |
| <b>LED Activity</b>      | LED Amber – Radio OFF; LED White – Radio ON   |

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

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

|   |   |
|---|---|
| <b>Bluetooth Specification</b>                    | 4.0/4.1/4.2/5.0 Compliant   |
| <b>Frequency Band</b>                             | 2402 to 2480 MHz  |
| <b>Number of Available Channels</b>               | Legacy: 0~79 (1 MHz/CH)<br>BLE: 0~39 (2 MHz/CH)   |
| <b>Signaling Data Rate</b>                        | Legacy: 3 Mbps signaling data rate <sup>1</sup> 2.17 Mbps<br>BLE: 1 Mbps signaling data rate <sup>1</sup> 0.2 Mbps<br>1. Actual throughput may vary.  |
|   | 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<br>Peak (Rx) 230 mW<br>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, Section 15.247 & 15.249  |
| <b>Power Management Certifications</b>            | ETS 300 328, ETS 300 826<br>Low Voltage Directive IEC950<br>UL, CSA, and CE Mark  |
| <b>Bluetooth Profiles Supported</b>               | BT4.1-ESR 5/6/7 Compliance<br>LE Link Layer Ping<br>LE Dual Mode<br>LE Link Layer<br>LE Low Duty Cycle Directed Advertising<br>LE L2CAP Connection Oriented Channels<br>Train Nudging & Interlaced Scan |



# QuickSpecs

## Technical Specifications

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)

10. Sold separately or as an optional feature.  
14. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited.

|  |                        |  |
|--|------------------------|--|
| Intel® Wi-Fi 6 AX200<br>802.11a/b/g/n/ac/ax<br>(2 x 2) and Bluetooth® 5.0<br>Combo <sup>1</sup> , vPro™ <sup>10,18</sup> | Wireless LAN Standards | IEEE 802.11a<br>IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11n<br>IEEE 802.11ac<br>IEEE 802.11ax<br>IEEE 802.11d<br>IEEE 802.11e<br>IEEE 802.11h<br>IEEE 802.11i<br>IEEE 802.11k<br>IEEE 802.11r<br>IEEE 802.11v   |
|  | Interoperability       | Wi-Fi® certified   |
|  | Frequency Band         | • 802.11b/g/n/ax<br>2.402 – 2.482 GHz<br>• 802.11a/n/ac/ax<br>4.9 – 4.95 GHz (Japan)<br>5.15 – 5.25 GHz<br>5.25 – 5.35 GHz<br>5.47 – 5.725 GHz<br>5.825 – 5.850 GHz  |
|  | Data Rates             | • 802.11b: 1, 2, 5.5, 11 Mbps<br>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)<br>• 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)<br>• 802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz) |
|  | Modulation             | Direct Sequence Spread Spectrum<br>OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM   |
|  | Security <sup>3</sup>  | • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only<br>• AES-CCMP: 128 bit in hardware<br>• 802.1x authentication<br>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.<br>• WPA2 certification  |



# QuickSpecs

## Technical Specifications

|   |  |
|---|--|
|   | <ul style="list-style-type: none"> <li>• IEEE 802.11i</li> <li>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>• WAPI</li> </ul>   |
| <b>Network Architecture Models</b>      | Ad-hoc (Peer to Peer)  |
| <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<br>802.11 compliant power saving mode  |
| <b>Receiver Sensitivity<sup>3</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<br>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   |
| <b>Dimensions</b>                       | 1. Type 2230: 2.3 x 22.0 x 30.0 mm<br>2. Type 1216: 1.67 x 12.0 x 16.0 mm  |
| <b>Weight</b>                           | 1. Type 2230: 2.8g<br>2. Type 126: 1.3g  |
| <b>Operating voltage</b>                | 3.3v +/- 9%  |
| <b>Temperature</b>                      | Operating: 14° to 158° F (-10° to 70° C)<br>Non-operating: -40° to 176° F (-40° to 80° C)  |
| <b>Humidity</b>                         | Operating: 10% to 90% (non-condensing)<br>Non-operating: 5% to 95% (non-condensing)  |
| <b>Altitude</b>                         | Operating: 0 to 10,000 ft (3,048 m)<br>Non-operating: 0 to 50,000 ft (15,240 m)  |



# QuickSpecs

## Technical Specifications

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

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

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

**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 signaling data rate<sup>1</sup> 2.17 Mbps  
BLE: 1 Mbps signaling data rate<sup>1</sup> 0.2 Mbps  
[1. Actual throughput may vary.](#)

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 + 9.5 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, Section 15.247 & 15.249

**Power Management Certifications** ETS 300 328, ETS 300 826  
Low Voltage Directive IEC950  
UL, CSA, and CE Mark

**Bluetooth Profiles Supported** BT4.1-ESR 5/6/7 Compliance  
LE Link Layer Ping  
LE Dual Mode  
LE Link Layer  
LE Low Duty Cycle Directed Advertising  
LE L2CAP Connection Oriented Channels  
Train Nudging & Interlaced Scan  
BT4.2 ESR08 Compliance  
LE Secure Connection- Basic/Full  
LE Privacy 1.2 –Link Layer Privacy  
LE Privacy 1.2 –Extended Scanner Filter Policies  
LE Data Packet Length Extension  
FAX Profile (FAX)  
Basic Imaging Profile (BIP)2  
Headset Profile (HSP)  
Hands Free Profile (HFP)  
Advanced Audio Distribution Profile (A2DP)

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

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





# QuickSpecs

## Technical Specifications

18. 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.

**Intel® Wi-Fi 6 AX200  
802.11a/b/g/n/ac/ax  
(2 x 2) Bluetooth® 5  
Combo<sup>1</sup>, non-vPro™<sup>10,18</sup>**

|                                    |  |
|------------------------------------|--|
| <b>Wireless LAN Standards</b>      | IEEE 802.11a<br>IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11n<br>IEEE 802.11ac<br>IEEE 802.11ax<br>IEEE 802.11d<br>IEEE 802.11e<br>IEEE 802.11h<br>IEEE 802.11i<br>IEEE 802.11k<br>IEEE 802.11r<br>IEEE 802.11v   |
| <b>Interoperability</b>            | Wi-Fi certified  |
| <b>Frequency Band</b>              | <ul style="list-style-type: none"> <li>• 802.11b/g/n/ax<br/>2.402 – 2.482 GHz</li> <li>• 802.11a/n/ac/ax<br/>4.9 – 4.95 GHz (Japan)<br/>5.15 – 5.25 GHz<br/>5.25 – 5.35 GHz<br/>5.47 – 5.725 GHz<br/>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<br>OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM   |
| <b>Security<sup>3</sup></b>        | <ul style="list-style-type: none"> <li>• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>• AES-CCMP: 128 bit in hardware</li> <li>• 802.1x authentication</li> <li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>• WPA2 certification</li> <li>• IEEE 802.11i</li> <li>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>• WAPI</li> </ul>    |
| <b>Network Architecture Models</b> | Ad-hoc (Peer to Peer)<br>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> </ul>  |



# QuickSpecs

## Technical Specifications

|  |  |
|--|--|
|  | <ul style="list-style-type: none"> <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<br>802.11 compliant power saving mode  |
| <b>Receiver Sensitivity<sup>3</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<br>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   |
| <b>Dimensions</b>  | 1. Type 2230: 2.3 x 22.0 x 30.0 mm<br>2. Type 1216: 1.67 x 12.0 x 16.0 mm  |
| <b>Weight</b>  | 1. Type 2230: 2.8g<br>2. Type 126: 1.3g  |
| <b>Operating Voltage</b>   | 3.3v +/- 9%  |
| <b>Temperature</b>   | Operating: 14° to 158° F (-10° to 70° C)<br>Non-operating: -40° to 176° F (-40° to 80° C)  |
| <b>Humidity</b>  | Operating: 10% to 90% (non-condensing)<br>Non-operating: 5% to 95% (non-condensing)  |
| <b>Altitude</b>  | Operating: 0 to 10,000 ft (3,048 m)<br>Non-operating: 0 to 50,000 ft (15,240 m)  |
| <b>HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology</b> |  |
| <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)<br>BLE: 0~39 (2 MHz/CH)  |
| <b>Signaling Data Rate</b>   | Legacy: 3 Mbps signaling data rate <sup>1</sup> 2.17 Mbps<br>BLE: 1 Mbps signaling data rate <sup>1</sup> 0.2 Mbps   |



# QuickSpecs

## Technical Specifications

1. Actual throughput may vary.

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 + 9.5 dBm for BR and EDR.

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

**Bluetooth Software Supported** Microsoft Windows Bluetooth Software

**Link Topology**

**Power Management** Microsoft Windows ACPI, and USB Bus Support

**Certifications** FCC (47 CFR) Part 15C, Section 15.247 & 15.249

**Power Management Certifications** ETS 300 328, ETS 300 826  
Low Voltage Directive IEC950  
UL, CSA, and CE Mark

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

10. Sold separately or as an optional feature.

18. 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.

Intel® XMM™ 7360 LTE-Advanced Cat 9<sup>15</sup>



**Technology/Operating bands**

FDD LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700/2100 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 1400

# QuickSpecs

## Technical Specifications

|  |   |
|--|---|
|  | (Band 11), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 17 lower), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1400 (Band 21), 850 (Band 26), 700 (Band 28), 700 (Band 29 RX only), 2300 (Band 30), 1700/2100 (Band 66).<br>TDD LTE: 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41).<br>HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz |
| <b>Wireless protocol standards</b>             | 3GPP Release 11 LTE Specification CAT.9, DL 60MHz BW throughput up to 450Mbps; UL 20MHz throughput up to 50Mbps<br>WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification   |
| <b>GPS</b>                                     | Standalone, A-GPS (MS-A, MS-B)  |
| <b>GPS bands</b>                               | 1575.42 MHz $\pm$ 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz  |
| <b>Maximum data rates</b>                      | LTE: 450 Mbps (Download), 50 Mbps (Upload)<br>DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)<br>HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)  |
| <b>Maximum output power</b>                    | LTE: 23 dBm<br>HSPA+: 23.5 dBm  |
| <b>Maximum power consumption</b>               | LTE: 1,200 mA (peak); 900 mA (average)<br>HSPA+: 1,100 mA (peak); 800 mA (average)  |
| <b>Form Factor</b>                             | M.2, 3042-S3 Key B  |
| <b>Weight</b>                                  | 5.8 g   |
| <b>Dimensions (Length x Width x Thickness)</b> | 42 x 30 x 2.3 mm  |

15. 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.

### Intel® XMM™ 7262 LTE-Advanced Cat 6<sup>15</sup>

|                                    |   |
|------------------------------------|---|
| <b>Technology/Operating bands</b>  | FDD LTE: 2100 (Band 1), 1800 (Band 3), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 800 (Band 20), 700 (Band 28),<br>HSPA+: 2100 (Band 1), 850 (Band 5), 900 (Band 8)         |
| <b>Wireless protocol standards</b> | 3GPP Release 11 LTE Specification CAT.6, DL 40MHz BW throughput up to 300Mbps; UL 20MHz throughput up to 50Mbps<br>WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification |
| <b>GPS</b>                         | Standalone, A-GPS (MS-A, MS-B and XTRA)   |
| <b>GPS bands</b>                   | 1575.42 MHz $\pm$ 1.023 MHz, GLONASS 1596-1607MHz   |
| <b>Maximum data rates</b>          | LTE: 300 Mbps (Download), 50 Mbps (Upload)<br>DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)<br>UMT: 384 kbps (Download), 384 kbps (Upload)                               |
| <b>Maximum output power</b>        | LTE: 23 dBm<br>HSPA+: 23.5 dBm  |
| <b>Maximum power consumption</b>   | LTE: 1,200 mA (peak); 900 mA (average)<br>HSPA+: 1,100 mA (peak); 800 mA (average)  |
| <b>Form Factor</b>                 | M.2, 3042-S3 Key B  |



# QuickSpecs

## Technical Specifications

|  |                  |
|--|------------------|
| <b>Weight</b>  | 6 g              |
| <b>Dimensions<br/>(Length x Width x<br/>Thickness)</b> | 42 x 30 x 2.3 mm |

15. 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.

### Intel® XMM™ 7560 LTE-Advanced Pro Cat 16<sup>17</sup>

|  |  |
|--|--|
| <b>Technology/Operating bands</b>                      | FDD LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700/2100 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 14 upper), 700 (Band 17 lower), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1900 (Band 25), 850 (Band 26), 700 (Band 28), 700 (Band 29 RX only), 2300 (Band 30), 1700/2100 (Band 66).<br>TDD LTE: 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41), 3500 (Band 42), 5200 (Band 46 RX only)<br>HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MH |
| <b>Wireless protocol standards</b>                     | 3GPP Release 12 LTE Specification DL-CAT.16, DL 100MHz BW throughput up to 978Mbps; UL-CAT.13 40MHz throughput up to 150Mbps<br>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: 978 Mbps (Download), 150 Mbps (Upload)<br>DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)<br>HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)  |
| <b>Maximum output power</b>                            | LTE: 23 dBm in all bands except B41<br>LTE B41 HPUE: 26dBm<br>HSPA+: 23.5 dBm  |
| <b>Maximum power consumption</b>                       | LTE: 1,200 mA (peak); 900 mA (average)<br>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<br/>(Length x Width x<br/>Thickness)</b> | 42 x 30 x 2.3 mm   |

17. Gigabit class Category 16 4G LTE module is optional and must be configured at the factory. Module designed for up to 1 Gbps download speeds as carriers deploy 5 carrier aggregation and 100Mhz channel bandwidth, requires activation and separately purchased service contract. Backwards compatible to HSPA 3G technologies. Check with service provider for coverage and availability in your area. Connection, upload and download speeds will vary due



# QuickSpecs

## Technical Specifications

to network, location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.

|   |  |  |
|---|--|--|
| <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<br>ISO/IEC 14443 B<br>ISO/IEC 15693<br>ISO/IEC 18092<br>ECMA-340 NFCIP-1 Target and Initiator<br>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<sup>1</sup></b>           | ISO/IEC 14443 A<br>ISO/IEC 14443 B<br>ISO/IEC 15693<br>MIFARE 1K<br>MIFARE 4K<br>MIFARE DESFire<br>FeliCa<br>Jewel and Topaz cards |
|   | <b>Card Emulation (PICC-VICC) Mode<sup>1</sup></b> | ISO/IEC 14443 A<br>ISO/IEC 14443 B and B'<br>MIFARE<br>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>                         | -20°C to 125°C   |
|   | <b>Humidity</b>                                    | 10-90% operating<br>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   |

10. Sold separately or as an optional feature.

|   |                                 |  |
|---|---------------------------------|--|
| <b>Power Consumption<br/>(Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)</b> | <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  |
|   | <b>Detected Test Tag Type 4</b> | 312.26 mW  |
|   | <b>Antenna</b>                  | Antenna connector, 0.3mm pitch, 7 connector FPC. Antenna matching is external to module. |



# QuickSpecs

## Technical Specifications

### POWER

|                                    |                                      |  |  |
|------------------------------------|--------------------------------------|--|--|
| <b>HP 65W<br/>Smart AC adapter</b> | <b>Dimensions (H x W x D)</b>        | 107.0 x 47.0 x 30.0mm  |  |
|                                    | <b>Weight</b>                        | 250g +/- 10g   |  |
|                                    | <b>Input</b>                         | <b>Input Efficiency</b>  | 88.0 % at 115 Vac and 89.0 % at 230Vac |
|                                    |                                      | <b>Input frequency range</b>   | 47 ~ 63 Hz                             |
|                                    |                                      | <b>Input AC current</b>  | Max. 1.7 A at 90 Vac                   |
|                                    | <b>Output</b>                        | <b>Output power</b>  | 65W                                    |
|                                    |                                      | <b>DC output</b>   | 19.5V                                  |
|                                    |                                      | <b>Hold-up time</b>  | 5ms at 115 Vac input                   |
|                                    |                                      | <b>Output current limit</b>  | <11.0A                                 |
|                                    | <b>Connector</b>                     | 4.5mm Barrel Type  |  |
|                                    | <b>Environmental Design</b>          | <b>Operating temperature</b>   | 32°F to 95°F (0° to 35°C)              |
|                                    |                                      | <b>Non-operating (storage) temperature</b>   | -4°F to 185°F (-20° to 85°C)           |
|                                    |                                      | <b>Altitude</b>  | 0 to 16,400 ft (0 to 5000m)            |
|                                    |                                      | <b>Humidity</b>  | 20% to 95%                             |
|                                    |                                      | <b>Storage Humidity</b>  | 10% to 95%                             |
|                                    | <b>EMI and Safety Certifications</b> | CE Mark - full compliance with LVD and EMC directives  |  |
|                                    |                                      | Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. |  |
|                                    |                                      | MTBF - over 200,000 hours at 25°C ambient condition.   |  |

|                            |                        |   |   |  |
|----------------------------|------------------------|---|---|--|
| HP 45W<br>Smart AC adapter | Dimensions (H x W x D) | 3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm) |   |  |
|                            | Weight                 | 0.386 lb (175g) max                         |   |  |
|                            | Input                  | 90 to 265 VAC                               |   |  |
|                            |                        | Input Efficiency                            | 87.74% at 115Vac and 88.4% at 230Vac                                |  |
|                            |                        | Input frequency range                       | 47 to 63 Hz   |  |
|                            | Output                 | Input AC current                            | 1.4 A at 90 VAC   |  |
|                            |                        | Output power                                | 45W   |  |
|                            |                        | DC output                                   | 19.5V   |  |
|                            |                        | Hold-up time                                | 5 msec at 115 VAC input   |  |
|                            |                        | Output current limit                        | <8.0A   |  |
|                            |                        | Connector                                   | 4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords |  |
|                            | Environmental Design   | Operating temperature                       | 32° to 95°F (0° to 35°C)  |  |



# QuickSpecs

## Technical Specifications

|                                      |   |                             |
|--------------------------------------|---|-----------------------------|
| <b>EMI and Safety Certifications</b> | <b>Non-operating (storage) temperature</b>  | -4° to 185°F (-20° to 85°C) |
|                                      | <b>Altitude</b>   | 0 to 16,400 ft (0 to 5000m) |
|                                      | <b>Humidity</b>   | 20% to 95%                  |
|                                      | <b>Storage Humidity</b>   | 10% to 95%                  |
|                                      | CE Mark - full compliance with LVD and EMC directives<br>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.<br>MTBF - over 200,000 hours at 25°C ambient condition. |                             |

|                                   |                                      |   |
|-----------------------------------|--------------------------------------|---|
| <b>HP 65W EM Smart AC adapter</b> | <b>Dimensions (H x W x D)</b>        | 102 x 55 x 30mm   |
|                                   | <b>Weight</b>                        | 270g +/- 10g  |
|                                   | <b>Input</b>                         | <b>Input Efficiency</b> 87% min at 115V/230V  |
|                                   |                                      | <b>Input frequency range</b> 47 to 63 Hz  |
|                                   |                                      | <b>Input AC current</b> 1.7 A at 90 VAC and maximum load  |
|                                   | <b>Output</b>                        | <b>DC output</b> 65W(19.5V/3.33A)   |
|                                   |                                      | <b>Hold-up time</b> 5 msec at 115 VAC input   |
|                                   |                                      | <b>Output current limit</b> <11A, Over voltage protection- 29V max automatic shutdown   |
|                                   | <b>Connector</b>                     | 4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords   |
|                                   | <b>Environmental Design</b>          | <b>Operating temperature</b> 0° to 35° C  |
|                                   |                                      | <b>Non-operating (storage) temperature</b> -20° to 85° C  |
|                                   |                                      | <b>Altitude</b> 0 to 5,000 m  |
|                                   |                                      | <b>Humidity</b> 0% to 95%   |
|                                   |                                      | <b>Storage Humidity</b> 0% to 95%   |
|                                   | <b>EMI and Safety Certifications</b> | CE Mark - 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; Reliability - failure rate of less than 0.1% annually within the first three years of operation. |





# QuickSpecs

## Technical Specifications

|  |                               |                              |  |  |
|--|-------------------------------|------------------------------|--|--|
| <b>AC Adapter</b><br><b>45 Watt nPFC USB</b><br><b>type C™</b> | <b>Dimensions (H x W x D)</b> | 62.0 x 62.0 x 28.5 mm        |  |  |
|  | <b>Weight</b>                 | unit: 220g +/- 10g           |  |  |
|  | <b>Input</b>                  | <b>Input Efficiency</b>      | Average Efficiency of 25%, 50%, 75%, 100%<br>load condition with 115Vac/230Vac Spec:5V :<br>81.5%9V : 86.7%10V : 87.5%12V : 87.8%15V :<br>87.8%20V : 87.8% |  |
|  |                               | <b>Input frequency range</b> | 47 ~ 63Hz  |  |
|  |                               | <b>Input AC current</b>      | Max. 1.4 A at 90 Vac   |  |
|  |                               | <b>Output</b>                | <b>Output Power</b>  | 5V/15W<br>9V/27W<br>10V/37.5W<br>12V/45W<br>15V/45W<br>20V/45W |
|  | <b>DC output</b>              |                              | 5V / 9V / 10V /12V / 15V / 20V   |  |
|  | <b>Hold-up time</b>           |                              | 5ms at 115 Vac input   |  |
|  | <b>Output current limit</b>   |                              | <5.0A  |  |
|  | <b>Connector</b>              |                              | USB Type-C™  |  |
|  | <b>Environmental Design</b>   |                              | <b>Operating temperature</b>   | 32°F to 95°F (0° to 35°C)                                      |
| <b>Non-operating (storage) temperature</b>                     |                               | -4°F to 185°F (-20° to 85°C) |  |  |
| <b>Altitude</b>  |                               | 0 to 16,400 ft (0 to 5000m)  |  |  |

|  |                               |   |  |                       |
|--|-------------------------------|---|--|-----------------------|
| <b>AC Adapter</b><br><b>65 Watt nPFC USB</b><br><b>type C™</b> | <b>Dimensions (H x W x D)</b> | 74 x 74 x 28.5 mm   |  |                       |
|  | <b>Weight</b>                 | unit: 245g +/- 10g  |  |                       |
|  | <b>Input</b>                  | <b>Input Efficiency</b>   | 81.5% min at 115 Vac/ 230Vac @ 5V/3A<br>86.7% min at 115 Vac/ 230Vac @ 9V/3A<br>88% min at 115 Vac/ 230Vac @ 10V/5A<br>88% min at 115 Vac/ 230Vac @ 12V/5A<br>89% min at 115 Vac/ 230Vac @ 15V/4.33A<br>89% min at 115 Vac/ 230Vac @ 20V/3.25A |                       |
|  |                               | <b>Input frequency range</b>                                    | 47 ~ 63 Hz   |                       |
|  |                               | <b>Input AC current</b>   | 1.7 A at 90 VAC and maximum load   |                       |
|  |                               | <b>Output</b>   | <b>Output Power</b>  | 65W                   |
|  |                               |   | <b>DC output</b>   | 5V/9V/10V/12V/15V/20V |
|  |                               |   | <b>Hold-up time</b>  | 5ms at 115 Vac input  |
|  | <b>Output current limit</b>   |   | <8.0A  |                       |
|  | <b>Connector</b>              | Duck head / duck head power cord, without Smart ID DC connector |  |                       |
|  | <b>Environmental Design</b>   | <b>Operating temperature</b>                                    | 32°F to 95°F (0° to 35°C)  |                       |



# QuickSpecs

## Technical Specifications

|                                      |   |                              |
|--------------------------------------|---|------------------------------|
| <b>EMI and Safety Certifications</b> | <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>   | 5% to 95%                    |
|                                      | <b>Storage Humidity</b>   | 5% to 95%                    |
|                                      | CE Mark - full compliance with LVD and EMC directives<br>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.<br>MTBF - over 100,000 hours at 25°C ambient condition. |                              |

|   |                               |  |
|---|-------------------------------|--|
| <b>HP 4 Cell WHr<br/>53 Long Life -PL Fast Charge</b> | <b>Dimensions (H x W x D)</b> | 5.58 mm * 80.62 mm * 269.2 mm                              |
|   | <b>Weight</b>                 | 243g   |
|   | <b>Cells/Type</b>             | 3-cell; Polymer  |
|   | <b>Energy</b>                 | <b>Voltage</b> 7.7V  |
|   |                               | <b>Amp-hour capacity</b> 6.9Ah                             |
|   |                               | <b>Watt-hour capacity</b> 53.2Wh                           |
|   | <b>Temperature</b>            | <b>Operating (Charging)</b> 0°C ~ 45°C                     |
|   |                               | <b>Operating (Discharging)</b> 14° to 122°F (-10° to 60°C) |
|   |                               | <b>Optional Travel Battery Available</b> No                |

## Country of Origin

China



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

| Type                | Description                         | Part Number |
|---------------------|-------------------------------------|-------------|
| <b>Cases</b>        | HP Essential Top Load Case          | H2W17AA     |
|                     | HP Basic Backpack                   | H1D24AA     |
|                     | HP Slim Top Load                    | F3W15AA     |
| <b>Docking</b>      | HP Thunderbolt Dock 120W G2         | 2UK37AA     |
|                     | HP Thunderbolt Dock 120W G2 TAA     | 2UK37AA     |
|                     | HP Elite 90W Thunderbolt 3 Dock     | 1DT93AA     |
|                     | HP USB-C Dock G4                    | 3FF69AA     |
|                     | HP USB-C Mini Dock                  | 1PM64AA     |
|                     | HP USB-C Travel Dock                | TOK29AA     |
|                     | HP USB Travel Dock                  | TOK30AA     |
|                     | HP USB-C Universal Dock             | 1MK33AA     |
|                     | HP Adjustable Dual Display Stand    | AW664AA     |
| <b>Input/Output</b> | HP Slim Wireless Keyboard and Mouse | T6L04AA     |
|                     | HP Slim USB Keyboard and Mouse      | T6T83AA     |
|                     | HP Wireless (Link-5) Keyboard       | T6U20AA     |
|                     | HP USB Essential Keyboard and Mouse | H6L29AA     |
|                     | HP Conferencing Keyboard            | K8P74AA     |
|                     | HP USB Collaboration Keyboard       | Z9N38AA     |
|                     | HP Wireless Collaboration Keyboard  | Z9N39AA     |
|                     | HP Comfort Grip Wireless Mouse      | H2L63AA     |
|                     | HP X4000b Bluetooth Mouse           | H3T50AA     |
|                     | HP 3-Button USB Laser Mouse         | H4B81AA     |
|                     | HP USB Travel Mouse                 | G1K28AA     |
|                     | HP Ultra Mobile Wireless Mouse      | H6F25AA     |
|                     | HP Slim Bluetooth Mouse to AMO      | F3J92AA     |
|                     | HP Wireless Premium Mouse           | 1JR31AA     |
|                     | HP USB Premium Mouse                | 1JR32AA     |
|                     | HP Essential USB Mouse              | 2TX37AA     |
|                     | HP Elite Presenter Mouse            | 2CE30AA     |
|                     | HP USB-C to USB 3.0 Adapter         | N2Z63AAA    |
|                     | HP USB-C to USB-A Hub               | Z6A00AA     |
|                     | HP USB-C to HDMI 2.0                | 1WC36AA     |
|                     | HP USB-C to VGA                     | N9K76AA     |
|                     | HP HDMI to DVI                      | F5A28AA     |
|                     | HP USB-C to RJ45                    | V7W66AA     |
|                     | HP USB to RJ45                      | N7P47AA     |
|                     | HP HDMI to VGA                      | H4F02AA     |
| <b>Power</b>        | HP 65W Slim AC Adapter              | H6Y82AA     |
|                     | HP 90W Slim AC Adapter              | H6Y83AA     |



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

|                 |   |         |
|-----------------|---|---------|
|                 | HP 90W Slim Combo AC Adapter w/ USB             | H6Y84AA |
|                 | HP 45W Smart AC Adapter                         | H6Y88AA |
|                 | HP 65W Smart AC Adapter                         | H6Y89AA |
|                 | HP 90W Smart AC Adapter                         | H6Y90AA |
|                 | HP 45W 2-prong 4.5 mm DC jack AC Adapter        | L6F60AA |
|                 | HP 45W USB-C Power Adapter                      | 1HE07AA |
|                 | HP 65W USB-C Power Adapter                      | 1HE08AA |
|                 | 65W USB-C Slim Power Adapter                    | 3PN48AA |
|                 | HP Notebook Power Bank                          | N9F71AA |
|                 | HP USB-C Notebook Power Bank                    | 1TZ86AA |
| <b>UCC</b>      | HP Stereo 3.5mm Headset                         | T1A66AA |
|                 | HP Stereo USB Headset                           | T1A67AA |
|                 | HP UC Wireless Mono Headset                     | W3K08AA |
|                 | HP UC Wireless Duo Headset                      | W3K09AA |
| <b>Storage</b>  | HP USB External DVDRW Drive                     | F2B56AA |
|                 | HP 256GB M2 PCIe NVME SSD TLC (2280)            | 1FU87AA |
|                 | HP 512GB M2 PCIe NVME SSD TLC (2280)            | 1FU88AA |
| <b>Security</b> | HP Nano Keyed Cable Lock                        | 1AJ39AA |
|                 | HP Nano Dual-Head Keyed Cable Lock              | 1AJ41AA |
| <b>Other</b>    | HP TB Dock Audio Module                         | 3AQ21AA |
|                 | HP Thunderbolt 120W 1m cable                    | 3AQ23AA |
|                 | HP Thunderbolt 1m combo cable                   | 3A25AA  |
|                 | HP Rechargeable Active Pen                      | 4KL69AA |
| <b>Displays</b> | HP EliteDisplay E243d 23.8-inch Docking Monitor | 1TJ76AA |
|                 | HP EliteDisplay E243 23.8-inch Monitor          | 1FH47AA |
|                 | HP EliteDisplay E273q 27-inch Monitor           | 1FH52AA |



### Change Log

| Date of change:   | Version History: |         | Description of change:                                     |
|-------------------|------------------|---------|--|
| June 10, 2019     | From V1 to V2    | Added   | HP Cloud Recovery  |
| June 20, 2019     | From V2 to V3    | Added   | Environmental tab  |
| July 2, 2019      | From V3 to V4    | Updated | Color Gamut  |
| September 9, 2019 | From V4 to V5    | Updated | Intel® Optane™ and disclaimer for 1000 nit Sure View panel |
| November 6, 2019  | From V5 to V6    | Updated | Processors section   |
| January 21, 2020  | From V6 to V7    | Added   | Modern Connected Standby                                   |

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