

### Overview

#### HP Elite Dragonfly G2 Notebook PC



#### Left

- |                           |  |
|---------------------------|--|
| 1. Internal Microphones   | 6. Glass Clickpad  |
| 2. IR Camera LEDs         | 7. WWAN SIM (Nano) <sup>1</sup>                                |
| 3. Webcam and IR Camera   | 8. Nano Security Lock Slot (Lock sold separately)              |
| 4. Privacy Camera Shutter | 9. Power Button  |
| 5. Webcam LED             | 10. SuperSpeed USB Type-A 5Gbps signaling rate (Charging port) |

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

### Overview



#### Right

1. HDMI 2.0 port (Cable not included)
2. Audio Combo Jack
3. Thunderbolt™ 4 with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)<sup>1</sup>
4. Thunderbolt™ 4 with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)<sup>1</sup>
5. Touch Fingerprint Sensor

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

### Overview

#### AT A GLANCE

- Precision Machined CNC Mg Unibody with Narrow borders, a chassis that is .63 inches (1.61 cm) thin and with a starting weight of 2.18 lbs. (<1 Kg)
- A 360° convertible notebook with 4 usage modes: Laptop mode, Tablet mode, Tent mode, and Media mode
- Integrated HP Privacy Camera, with HP Sure Shutter to protect from malicious surveillance
- Choice of 11th Generation Intel® Core™ i7, i5 and i3 processors
- Intel® EVO configurations available
- Intel® Core™ i5 and i7 feature integrated Intel® Iris® Xe Graphics
- Touch display choices include 33.78 cm (13.3") diagonal IPS FHD displays or stunning UHD HDR-400 display. Brightness choices up to 1000 Nits. Get added protection in open or public places with the optional HP Sure View Reflect integrated privacy screen
- Ultimate connectivity with dual Thunderbolt4 Type-C® with USB4 support ports, dual USB 3.1 Gen1 charging ports, and HDMI 2.0
- Stay connected where you need to with a choice of 5G or 4G/LTE WWAN, WLAN and optional Thunderbolt™ Docking (Sold separately)
- Never forget your password with your choice of simple authentication methods, including the IR camera for face recognition and Touch Fingerprint Sensor for Windows Hello
- LPDDR4X Memory up to 32 GB supports dual channel performance
- Up to 16 hours 30 minutes of battery life (56 Wh battery) and up to 11 hours of battery life (38 Wh battery)
- Preinstalled with Windows 10 versions or FreeDOS
- Passed 19 MIL-STD 810H tests <sup>1</sup>
- Instant on/instant off with Modern Connected Standby
- AI based HP Context Aware to maximize performance when working at a table, comfort when working from your lap, and responsiveness when working on the go
- HP Dynamic Audio, a new AI-based audio experience, tunes output to speech, music, and movies all while suppressing background noise (Planned to be available March 2021.)
- HP Sound Calibration to uniquely tune end user headphone audio (Planned to be available March 2021.)

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

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

## Technical Specifications

### PRODUCT NAME

HP Elite Dragonfly G2 Notebook PC

### OPERATING SYSTEM

#### Preinstalled

Windows 10 Pro 64 – HP recommends Windows 10 Pro for business <sup>1</sup>  
Windows 10 Pro 64 (National Academic License) <sup>2</sup>  
Windows 10 Home 64 <sup>1</sup>  
Windows 10 Home Single Language 64 <sup>1</sup>  
Windows 10 Pro (Windows 10 Enterprise available with a Volume Licensing Agreement) <sup>1</sup>  
Windows 10 Enterprise 64 (Web Support) <sup>1</sup>  
FreeDOS

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

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

#### Supported Versions

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

### PROCESSORS

Intel® Core™ i7-1185G7 (Up to 4.8 GHz frequency with Intel® Turbo Boost Technology, 12 MB L3 cache, 4 cores), supports Intel® vPro® Technology <sup>3,4,5,6</sup>  
Intel® Core™ i7-1165G7 (Up to 4.7 GHz with Intel® Turbo Boost Technology, 12 MB L3 cache, 4 cores) <sup>3,4,5,6</sup>  
Intel® Core™ i5-1145G7 (Up to 4.4 GHz frequency with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores), supports Intel® vPro® Technology <sup>3,4,5,6</sup>  
Intel® Core™ i5-1135G7 (Up to 4.2 GHz with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores) <sup>3,4,5,6</sup>  
Intel® Core™ i3-1115G4 with Intel® UHD Graphics (Up to 4.1 GHz with Intel® Turbo Boost Technology, 6 MB L3 cache, 2 cores) <sup>3,4,5,6</sup>

#### Processor Family

11th Generation Intel® Core™ i7 processor (i7-1185G7, i7-1165G7) <sup>6</sup>  
11th Generation Intel® Core™ i5 processor (i5-1145G7, i5-1135G7) <sup>6</sup>  
11th Generation Intel® Core™ i3 processor (i3-1115G4) <sup>6</sup>

### Technical Specifications

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 [www.intel.com/technology/turboboost](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>.

### CHIPSET

Chipset is integrated with processor

### GRAPHICS

#### Integrated

Intel® Iris® Xe Graphics<sup>7</sup>

Intel® UHD Graphics

#### Supports

Support HD Decode, DX12, HDMI 2.0<sup>8</sup>

7. Intel® Iris® Xe Graphics capabilities require system to be configured with Intel® Core™ i5 or i7 processors and dual channel memory. Intel® Iris® Xe Graphics with Intel® Core™ i5 or 7 processors and single channel memory will only function as UHD graphics.

8. HDMI cable sold separately.

### DISPLAY

#### Touch

33.8 cm (13.3") diagonal FHD bent, BrightView WLED UWVA eDP 1.4+PSR2, 400 nits, 72 NTSC, Touch, Low Power (1920x1080)<sup>9,10,11</sup>

33.8 cm (13.3") diagonal UHD bent, HDR-400, BrightView WLED UWVA eDP 1.4+PSR2, 550 nits, 95% sRGB, Touch, (3840x2160)<sup>9,10,11</sup>

33.8 cm (13.3") diagonal FHD bent, BrightView WLED UMA eDP 1.4+PSR, 1000 nits, 72% NTSC, Touch with HP Sure View Reflect integrated privacy screen (1920 x 1080)<sup>9,10,11,12</sup>

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

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

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

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

### Technical Specifications

#### STORAGE AND DRIVES

##### Primary M.2 Storage

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

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

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

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

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

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

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

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

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

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

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

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

#### MEMORY

##### Maximum Memory

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

##### Memory

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

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

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

##### Memory Slots

LPDDR4X, system runs at 4266

Supports Dual Channel Memory

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

### Technical Specifications

#### NETWORKING/COMMUNICATIONS

##### WLAN

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

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

##### WWAN

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

Qualcomm® Snapdragon™ X55 5G LTE Cat 20 <sup>19</sup>

##### Miracast

Native Miracast Support <sup>20</sup>

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

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

19. 5G module is an optional feature that must be configured at purchase. AT&T and T-Mobile networks supported in the U.S. Module designed for 5G networks as carriers deploy Evolved-Universal Terrestrial Radio Access New Radio Dual Connectivity (ENDC) with both 100MHz of 5G NR and LTE channel bandwidth, using 256QAM 4x4 as defined by 3GPP, requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. 5G not available on all products, in all regions. Backwards compatible to 4G LTE and 3G HSPA technologies. 5G module planned to be available in select countries, where carrier supported.

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

#### AUDIO/MULTIMEDIA

##### Audio

Audio by Bang & Olufsen

Microphone/Headphone Combo Audio Jack

##### Camera

720p HD+IR camera with integrated electronic privacy shutter, HP Sure Shutter <sup>21,22</sup>

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

##### Sensors

Accelerometer

Magnetometer

Gyroscope

Ambient light sensor

Hall sensor

21. HD content required to view HD images.

22. Sold separately or as an optional feature.

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

### Technical Specifications

**Keyboard**

HP Modernized Keyboard, spill resistant, Backlit  
Backlit, Spill-resistant, with HP Dura Keys

**Pointing Device**

Glass Clickpad  
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  
Backlit Toggle  
F10 - Insert  
F11 - Airplane Mode  
F12 - HP Command Center (Programmable Key)  
Num Lock  
HP Sure Shutter  
Print Screen  
Delete

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### SOFTWARE AND SECURITY

**Preinstalled Software****BIOS**

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

**Software**

HP Connection Optimizer <sup>26</sup>  
HP Hotkey Support  
myHP  
HP Support Assistant <sup>27</sup>  
HP QuickDrop<sup>17</sup>  
HP Noise Cancellation Software  
Touchpoint Customizer for Commercial  
HP Notifications  
HP Privacy Settings



### Technical Specifications

HP Wireless Button Driver  
 HP Power Manager  
 HP WorkWell  
 Tile App<sup>28</sup>  
 HP PC Hardware Diagnostics Windows  
 Buy Microsoft Office (sold separately)  
 Microsoft Defender<sup>29</sup>  
 HP Smart Support<sup>52</sup>

#### Manageability Features

HP Driver Packs (download)<sup>30</sup>  
 HP Manageability Integration Kit Gen4 (download)<sup>31</sup>  
 HP Client Catalog (download)  
 HP Client Management Script Library (download)  
 HP Image Assistant (download)

#### Security Management

HP Fingerprint Sensor  
 HP Pro Security Edition (Select models)<sup>32</sup>  
 HP Sure Click<sup>33</sup>  
 HP Sure Sense<sup>34</sup>  
 HP Sure Start Gen6<sup>35</sup>  
 HP Sure Admin<sup>36</sup>  
 HP Sure Recover Gen4<sup>37</sup>  
 HP Sure Run Gen4<sup>38</sup>  
 HP Client Security Manager Gen7<sup>39</sup>  
 Secured-core PC capable<sup>50</sup>  
 TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)

17. HP Quick Drop requires Internet access and Windows 10 PC preinstalled with HP QuickDrop app and either an Android device (phone or tablet) running Android 7 or higher with the Android HP QuickDrop app, and /or an iOS device (phone or tablet) running iOS 12 or higher with the iOS HP QuickDrop app.

23. HP BIOSphere Gen6 is available on select HP Pro and Elite PCs. Features may vary depending on the platform and configurations.

24. HP Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.

25. Absolute firmware module is shipped turned off and can only be activated with the purchase a license subscription and full activation of the software agent. License subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. Certain conditions apply. For full details visit:

<https://www.absolute.com/about/legal/agreements/absolute/>

26. HP Connection Optimizer requires Windows 10.

27. HP Support Assistant requires Windows and Internet access.

28. Some features require optional subscription to Tile Premium. Tile application for Windows 10 available for download from the Windows Store. Mobile phone app available for download from App Store and Google Play. Requires iOS 11 and greater or Android 6.0 and greater see <https://support.thetileapp.com/hc/en-us/articles/200424778> for more information. HP Tile will function as long as the PC has battery power.

29. Microsoft Defender Opt in and internet connection required for updates.

30. HP Driver Packs not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.

### Technical Specifications

31. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.
32. HP Pro Security Edition is available preloaded on select HP PCs and includes HP Sure Click Pro and HP Sure Sense Pro. 3-year license required. The HP Pro Security Edition software is licensed under the license terms of the HP End User License Agreement (EULA) that can be found at: [https://h30670.www3.hp.com/ecommerce/common/disclaimer.do#EN\\_US](https://h30670.www3.hp.com/ecommerce/common/disclaimer.do#EN_US) as modified by the following: “7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Pro Security Edition (HP Sure Sense Pro and HP Sure Click Pro) is effective upon activation and will continue for thirty-six (36) months thereafter (“Initial Term”). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support.” HP Pro Security Edition is optimized for the SMB environment and ships pre-configured - manageability is optional. The HP Pro Security Edition supports a limited tool set that can be used by the HP Manageability Integration Kit which can be downloaded from <http://www.hp.com/go/clientmanagement>.
33. HP Sure Click requires Windows 10 Pro or Enterprise. See [https://bit.ly/2PrLT6A\\_SureClick](https://bit.ly/2PrLT6A_SureClick) for complete details.
34. HP Sure Sense is available on select HP PCs and is not available with Windows 10 Home.
35. HP Sure Start Gen6 is available on select HP PCs and requires Windows 10.
36. HP Sure Admin requires Windows 10, HP BIOS, HP Manageability Integration Kit from <http://www.hp.com/go/clientmanagement> and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store.
37. HP Sure Recover Gen4 is available on select HP PCs and requires an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data.
38. HP Sure Run Gen4 is available on select Windows 10 based HP Pro, Elite and Workstation PCs with select Intel® or AMD processors.
39. HP Client Security Manager Gen7 requires Windows and is available on the select HP Elite and Pro PCs.
50. Requires an Intel® vPro®, AMD Ryzen™ Pro processor or Qualcomm® processor with SD850 or higher and requires 8 GB or more system memory. Secured-core PC functionality can be enabled from the factory.
52. HP Smart Support is available to commercial customers through your HP Service Representative and HP Factory Configuration Services; or it can be downloaded at: <http://www.hp.com/smart-support>. HP Smart Support automatically collects the telemetry necessary upon initial boot of the product to deliver device-level configuration data and health insights.
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### Technical Specifications

#### POWER

**Power Supply**

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

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

**Primary Battery**

HP Long Life 2-cell, 38Wh polymer <sup>41,42</sup>

HP Long Life 4-cell, 56Wh polymer <sup>41,42</sup>

HP Fast Charge Technology (50% in 30 minutes) <sup>43</sup>

**Battery Life<sup>44</sup>**

Up to 16 hours 30 minutes (56 Wh battery)

Up to 11 hours (38 Wh battery)

**Battery Weight**

0.57 lb /0.259 kg

40. Availability may vary by country.

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

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

43. Recharges the 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.

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

#### WEIGHTS & DIMENSIONS

**Product Weight <sup>45</sup>**

Starting at 2.18 lb

Starting at 0.98 kg

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

11.98 x 7.78 x 0.63 in

30.43 x 19.75 x 1.61 cm

45. Weight will vary by configuration.

### Technical Specifications

#### PORTS/SLOTS

##### Ports

- 2 Thunderbolt™ 4 with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)<sup>51</sup>
- 1 SuperSpeed USB Type-A 5Gbps signaling rate (Charging port)
- 1 Headphone/microphone combo jack
- 1 HDMI 2.0<sup>46</sup>

46. HDMI cable sold separately.

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

#### SERVICE AND SUPPORT

1-year or 3-year limited warranty and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty except for HP Long Life batteries which will follow the one or three year warranty of the platform. Refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>.<sup>47</sup>

47. 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.

#### CERTIFICATION AND COMPLIANCE

ENERGY STAR® certified<sup>48</sup>  
EPEAT® 2019 Gold in the U.S.<sup>49</sup>  
TCO 8.0 Certified

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

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

### Technical Specifications

#### SYSTEM UNIT

<b>Stand-Alone Power Requirements</b> (AC Power)	<b>Nominal Operating Voltage</b>	20V, 3.25A
	<b>Integrated Graphics</b>	Intel UMA
	<b>Max Operating Power</b>	UMA
<b>Shock</b>	<b>Non-operating</b>	Comply SVTP
	<b>Operating</b>	Comply SVTP
<b>Random Vibration</b>	<b>Non-operating</b>	Comply SVTP
	<b>Operating</b>	Comply SVTP
<b>Altitude</b> (unpressurized)	<b>Non-operating</b>	Comply SVTP

## Technical Specifications

## DISPLAYS

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

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

**Panel LCD 13.3 inch FHD  
(1920x1080) BrightView WLED  
UWVA 72percent cg 400nits eDP  
1.4+PSR2 bent LP NWBZ**

<b>Outline Dimensions (W x H x D)</b>	299.06 x 176.54 mm (max) (FPC folding included)
<b>Active Area</b>	293.76 x 165.24 mm (typ.)
<b>Weight</b>	175 g (max)
<b>Diagonal Size</b>	13.3 inch
<b>Thickness</b>	2.0mm / 3.8mm (PCB) (max)
<b>Interface</b>	eDP 1.4
<b>Surface Treatment</b>	BrightView
<b>Touch Enabled</b>	Yes
<b>Contrast Ratio</b>	1500:1 (typ.)
<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	400nits <sup>1</sup>
<b>Pixel Resolution</b>	1920 x 1080 (FHD)
<b>Format</b>	RGB Stripe
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	72% NTSC (sRGB 100%) (typ.)
<b>Color Depth</b>	8 bit
<b>Viewing Angle</b>	UWVA 85/85/85/85

**Panel LCD 13.3 inch UHD  
(3840x2160) BrightView WLED  
UWVA HDR-400 sRGB 95percent  
cg 550nits eDP 1.4+PSR2 bent  
NWBZ**

<b>Outline Dimensions (W x H x D)</b>	299.06 x 176.54 mm (max) (FPC folding included)
<b>Active Area</b>	293.76 x 165.24 mm (typ.)
<b>Weight</b>	200 g (max)
<b>Diagonal Size</b>	13.3 inch
<b>Thickness</b>	2.0mm / 3.8mm (PCB) (max)
<b>Interface</b>	eDP 1.4
<b>Surface Treatment</b>	BrightView
<b>Touch Enabled</b>	Yes
<b>Contrast Ratio</b>	1400:1 (typ.) 1000:1 (HDR off) (min)
<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	550nits <sup>1</sup>
<b>Pixel Resolution</b>	3840 x 2160 (UHD)
<b>Format</b>	RGB Stripe
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	sRGB 95% (min)
<b>Color Depth</b>	8 bits + 2 FRC
<b>Viewing Angle</b>	UWVA 85/85/85/85

### Technical Specifications

<b>Panel LCD 13.3-in FHD (1920 x 1080) BrightView WLED UWVA 72% cg 1000nits eDP 1.4+PSR PrivacyG4</b>	<b>Outline Dimensions (W x H)</b>	299.06 x 176.54 mm (max)
	<b>Active Area</b>	293.76 x 165.24 mm (typ.)
	<b>Weight</b>	220 g (max)
	<b>Diagonal Size</b>	13.3 inch
	<b>Thickness</b>	3.9 mm (max)
	<b>Interface</b>	eDP 1.4 + PSR (4 lane)
	<b>Surface Treatment</b>	BrightView
	<b>Touch Enabled</b>	Yes
	<b>Contrast Ratio</b>	1500:1 (typ.)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	1000 nits <sup>1</sup>
	<b>Pixel Resolution</b>	1920 x 1080 (FHD)
	<b>Format of LCD Pixel Arrangement</b>	RGB
	<b>Backlight</b>	LED
	<b>Color Gamut Coverage</b>	72%
	<b>Color Depth</b>	8 bit
	<b>Viewing Angle</b>	UWVA 85/85/85/85

### Technical Specifications

#### STORAGE

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

<b>SSD 128GB 2280 PCIe-3x2 Three Layer Cell</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	128 GB
	<b>NAND Type</b>	TLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	Up To 2047 MB/s
	<b>Maximum Sequential Write</b>	Up To 1200 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>	TRIM; L1.2

<b>SSD 1TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	1 TB
	<b>NAND Type</b>	TLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	Up To 2800 MB/s
	<b>Maximum Sequential Write</b>	Up To 1600 MB/s
	<b>Logical Blocks</b>	2,000,409,264
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	ATA Security (Option); TRIM; L1.2



### Technical Specifications

<b>SSD 256GB 2280 M2 PCIe-3x4 SS NVMe TLC</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	256 GB
	<b>NAND Type</b>	TLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	2580 MB/s ~ 2600 MB/s
	<b>Maximum Sequential Write</b>	900 MB/s ~ 1000 MB/s
	<b>Logical Blocks</b>	500,118,192
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	ATA Security (Option); TRIM; L1.2
<b>SSD 256GB 2280 PCIe-3x4 NVMe Self Encrypted OPAL2 Three Layer Cell</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	256 GB
	<b>NAND Type</b>	TLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	Up To 3500 MB/s
	<b>Maximum Sequential Write</b>	Up To 2200 MB/s
	<b>Logical Blocks</b>	500,118,192
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	ATA Security; TCG OPAL 2.0; DIPM; TRIM; L1.2
<b>SSD 2TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided</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>Weight</b>	0.02 lb (10 g)
	<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>	ATA Security; TCG OPAL 2.0; DIPM; TRIM; DEVSLP

### Technical Specifications

#### SSD 512GB 2280 M2 PCIe-3x4 SS NVMe TLC

<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>	2800 MB/s ~ 2900 MB/s
<b>Maximum Sequential Write</b>	1000 MB/s ~ 1800 MB/s
<b>Logical Blocks</b>	1,000,215,215
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	ATA Security (Option); TRIM; L1.2

#### SSD 512GB 2280 PCIe- 3x4 NVMe Self Encrypted OPAL2 Three Layer Cell

<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>	2800 MB/s ~ 2900 MB/s
<b>Maximum Sequential Write</b>	1000 MB/s ~ 1800 MB/s
<b>Logical Blocks</b>	1,000,215,215
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	ATA Security (Option); TCG Opal 2.0; TRIM; L1.2

#### SSD 512GB 2280 PCIe NVMe Value

<b>Form Factor</b>	M.2 2280
<b>Capacity</b>	512GB
<b>NAND Type</b>	QLC/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
<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>	ATA Security; TRIM; L1.2

### Technical Specifications

#### SSD 256GB 2280 PCIe NVMe Value

<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
<b>Maximum Sequential Read</b>	Up To 1700 MB/s
<b>Maximum Sequential Write</b>	Up to 1300 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

#### 512GB 2280 PCIe-3x2x2 NVMe+SSD 32GB 3D Xpoint

<b>Form Factor</b>	M.2 2280
<b>Capacity</b>	512 GB
<b>NAND Type</b>	QLC+3D Xpoint
<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 Gen3X2X2
<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>	ATA Security, TRIM; L1.2

### Technical Specifications

#### NETWORKING/COMMUNICATIONS

**Intel® Wi-Fi 61 AX20<sup>1</sup> and Wireless LAN Standards Bluetooth® 5.0 802.11ax (2x2) supporting gigabit data rate<sup>5</sup> (vPro®)**

IEEE 802.11a  
IEEE 802.11b  
IEEE 802.11g  
IEEE 802.11n  
IEEE 802.11ac  
IEEE 802.11ax  
IEEE 802.11d  
IEEE 802.11e  
IEEE 802.11h  
IEEE 802.11i  
IEEE 802.11k  
IEEE 802.11r  
IEEE 802.11v

#### Interoperability

Features Wi-Fi 6 technology

#### Frequency Band

802.11b/g/n/ax  
• 2.402 – 2.482 GHz  
802.11a/n/ac/ax  
• 4.9 – 4.95 GHz (Japan)  
• 5.15 – 5.25 GHz  
• 5.25 – 5.35 GHz  
• 5.47 – 5.725 GHz  
• 5.825 – 5.850 GHz

#### Data Rates

• 802.11b: 1, 2, 5.5, 11 Mbps  
• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps  
• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps  
• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)  
• 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)  
• 802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)

#### Modulation

Direct Sequence Spread Spectrum  
OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM  
, 1024QAM

#### Security<sup>3</sup>

• IEEE compliant 64 / 128 bit WEP encryption for a/b/g mode only  
• AES-CCMP: 128 bit in hardware  
• 802.1x authentication  
• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.  
• WPA2 certification  
• WPA3 certification

### Technical Specifications

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

### Technical Specifications

<b>Weight</b>	2. Type 1216: 1.67 x 12.0 x 16.0 mm	
	1. Type 2230: 2.8g	
	2. Type 126: 1.3g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	<b>Operating</b>	14° to 158° F (–10° to 70° C)
	<b>Non-operating</b>	–40° to 176° F (–40° to 80° C)
<b>Humidity</b>	<b>Operating</b>	10% to 90% (non-condensing)
	<b>Non-operating</b>	5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b>	0 to 10,000 ft (3,048 m)
	<b>Non-operating</b>	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON	

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

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

### Technical Specifications

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

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

1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices. Only available in countries where 802.11ax is supported.
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. Wi-Fi 5 or 6 is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

<b>Intel® Wi-Fi 6<sup>1</sup> AX201 and Wireless LAN Standards Bluetooth® 5.0 802.11ax (2x2), supporting gigabit data rate<sup>5</sup> (non-vPro®)</b>	IEEE 802.11a
	IEEE 802.11b
	IEEE 802.11g
	IEEE 802.11n
	IEEE 802.11ac
	IEEE 802.11ax
	IEEE 802.11d
	IEEE 802.11e
	IEEE 802.11h
	IEEE 802.11i
	IEEE 802.11k
	IEEE 802.11r
	IEEE 802.11v

**Interoperability** Features Wi-Fi 6 technology

### Technical Specifications

<b>Frequency Band</b>	<p>802.11b/g/n/ax</p> <ul style="list-style-type: none"> <li>• 2.402 – 2.482 GHz</li> </ul> <p>802.11a/n/ac/ax</p> <ul style="list-style-type: none"> <li>• 4.9 – 4.95 GHz (Japan)</li> <li>• 5.15 – 5.25 GHz</li> <li>• 5.25 – 5.35 GHz</li> <li>• 5.47 – 5.725 GHz</li> <li>• 5.825 – 5.850 GHz</li> </ul>
<b>Data Rates</b>	<ul style="list-style-type: none"> <li>• 802.11b: 1, 2, 5.5, 11 Mbps</li> <li>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>• 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> <li>• 802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> </ul>
<b>Modulation</b>	<p>Direct Sequence Spread Spectrum</p> <p>OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM</p>
<b>Security<sup>3</sup></b>	<ul style="list-style-type: none"> <li>• IEEE compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>• AES-CCMP: 128 bit in hardware</li> <li>• 802.1x authentication</li> <li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>• WPA2 certification</li> <li>• WPA3 certification</li> <li>• IEEE 802.11i</li> <li>• WAPI</li> </ul>
<b>Network Architecture Models</b>	<p>Ad-hoc (Peer to Peer)</p> <p>Infrastructure (Access Point Required)</p>
<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> </ul>



### Technical Specifications

	<ul style="list-style-type: none"> <li>•Receive mode 1.6 W</li> <li>•Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>•Idle mode50 mW (WLAN unassociated)</li> <li>•Connected Standby 10mW</li> <li>•Radio disabled 8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	<ul style="list-style-type: none"> <li>•802.11b, 1Mbps : -93.5dBm maximum</li> <li>•802.11b, 11Mbps : -84dBm maximum</li> <li>•802.11a/g, 6Mbps : -86dBm maximum</li> <li>•802.11a/g, 54Mbps : -72dBm maximum</li> <li>•802.11n, MCS07 : -67dBm maximum</li> <li>•802.11n, MCS15 : -64dBm maximum</li> <li>•802.11ac, MCS0 : -84dBm maximum</li> <li>•802.11ac, MCS9 : -59dBm maximum</li> <li>•802.11ax, MCS11(HT40): -59dBm maximum</li> <li>•802.11ax, MCS11(VHT160): -58.5dBm maximum</li> </ul>
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
<b>Form Factor</b>	PCI-Express M.2 MiniCard with CNVi Interface
<b>Dimensions</b>	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
<b>Weight</b>	1. Type 2230: 2.8g 2. Type 126: 1.3g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	<b>Operating</b> 14° to 158° F (–10° to 70° C) <b>Non-operating</b> –40° to 176° F (–40° to 80° C)
<b>Humidity</b>	<b>Operating</b> 10% to 90% (non-condensing) <b>Non-operating</b> 5% to 95% (non-condensing)"
<b>Altitude</b>	<b>Operating</b> 0 to 10,000 ft (3,048 m) <b>Non-operating</b> 0 to 50,000 ft (15,240 m)"
<b>LED Activity</b>	LED Amber – Radio OFF; LED Off – Radio ON

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

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1 Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)

### Technical Specifications

<b>Signaling Data Rate</b>	<p>Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps</p> <p>BLE: 1 Mbps data rate; throughput up to 0.2 Mbps</p> <p>Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels</p> <p>Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)</p>
<b>Transmit Power</b>	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.
<b>Power Consumption</b>	<p>Peak (Tx): 330 mW</p> <p>Peak (Rx): 230 mW</p> <p>Selective Suspend: 17 mW</p>
<b>Bluetooth Software Supported</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>	<p>ETS 300 328, ETS 300 826</p> <p>Low Voltage Directive IEC950</p> <p>UL, CSA, and CE Mark</p>
<b>Bluetooth Profiles Supported</b>	<p>BT4.1-ESR 5/6/7 Compliance</p> <p>LE Link Layer Ping</p> <p>LE Dual Mode</p> <p>LE Link Layer</p> <p>LE Low Duty Cycle Directed Advertising</p> <p>LE L2CAP Connection Oriented Channels</p> <p>Train Nudging &amp; Interlaced Scan</p> <p>BT4.2 ESR08 Compliance</p> <p>LE Secure Connection- Basic/Full</p> <p>LE Privacy 1.2 –Link Layer Privacy</p> <p>LE Privacy 1.2 –Extended Scanner Filter Policies</p> <p>LE Data Packet Length Extension</p> <p>FAX Profile (FAX)</p> <p>Basic Imaging Profile (BIP)2</p> <p>Headset Profile (HSP)</p> <p>Hands Free Profile (HFP)</p> <p>Advanced Audio Distribution Profile (A2DP)</p>

1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices. Only available in countries where 802.11ax is supported.
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel

### Technical Specifications

- 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. Wi-Fi 5 or 6 is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

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

**Technology/Operating  
bands**

WCDMA/HSDPA/HSUPA/HSPA+ operating bands:  
 Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)  
 Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)  
 Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)  
 Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)  
 Band 6: 830 to 840 MHz (UL), 875 to 885 MHz (DL)  
 Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)  
 Band 9: 1750 to 1785 MHz (UL), 1845 to 1880 MHz (DL)  
 Band 19: 830 to 845 MHz (UL), 875 to 890 MHz (DL)  
 LTE FDD/TDD operating bands:  
 Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)  
 Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)  
 Band 3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL)  
 Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)  
 Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)  
 Band 7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)  
 Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)  
 Band 12: 699 to 716 MHz (UL), 729 to 746 MHz (DL)  
 Band 13: 777 to 787 MHz (UL), 746 to 756 MHz (DL)  
 Band 14: 788 to 798 MHz (UL), 758 to 768 MHz (DL)  
 Band 17: 704 to 716 MHz (UL), 734 to 746 MHz (DL)  
 Band 18: 815 to 830 MHz (UL), 860 to 875 MHz (DL)  
 Band 19: 830 to 845 MHz (UL), 875 to 890 MHz (DL)  
 Band 20: 832 to 862 MHz (UL), 791 to 821 MHz (DL)  
 Band 25: 1850 to 1915 MHz (UL), 1930 to 1995 MHz (DL)  
 Band 26: 814 to 849 MHz (UL), 859 to 894 MHz (DL)  
 Band 28: 703 to 748 MHz (UL), 758 to 803 MHz (DL)  
 Band 29: 717 to 728 MHz (DL)  
 Band 30: 2305 to 2315 MHz (UL), 2350 to 2360 MHz (DL)  
 Band 32: 1452 to 1496 MHz (DL)  
 Band 34: 2010 to 2025 MHz (UL/DL)  
 Band 38: 2570 to 2620 MHz (UL/DL)  
 Band 39: 1880 to 1920 MHz (UL/DL)  
 Band 40: 2300 to 2400 MHz (UL/DL)  
 Band 41: 2496 to 2690 MHz (UL/DL)  
 Band 42: 3400 to 3600 MHz (UL/DL)  
 Band 46: 5150 to 5925 MHz (DL)  
 Band 48: 3550 to 3700 MHz (UL/DL)  
 Band 66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)  
 Band 71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)  
 5G NR Sub 6GHz

### Technical Specifications

	<p>n1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)</p> <p>n2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)</p> <p>n3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL)</p> <p>n5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)</p> <p>n7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)</p> <p>n8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)</p> <p>n12: 699 to 716 MHz (UL), 729 to 746 MHz (DL)</p> <p>n20: 832 to 862 MHz (UL), 791 to 821 MHz (DL)</p> <p>n28: 703 to 748 MHz (UL), 758 to 803 MHz (DL)</p> <p>n41: 2496 to 2690 MHz (UL/DL)</p> <p>n66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)</p> <p>n71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)</p> <p>n77: 3300 to 4200 MHz (UL/DL)</p> <p>n78: 3300 to 3800 MHz (UL/DL)</p> <p>n79: 4400 to 5000 MHz (UL/DL)</p>
<b>Wireless protocol standards</b>	<p>5G NR Air Interface</p> <p>l 3GPP Rel15 5G NR sub-6</p> <p>LTE Rel14</p> <p>20 layers and 2 Gbps downlink (DL) throughput – 4 × 4 MIMO across 5x CA</p> <p>200 Mbps uplink (UL) throughput – 40 MHz ULCA and 256 QAM</p> <p>WCDMA</p> <p>R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification</p>
<b>GPS</b>	<p>Standalone, A-GPS (MS-A, MS-B)</p>
<b>GPS bands</b>	<p>GPS: L1 (1575.42MHz); L5 (1176MHz)</p> <p>GLONASS: L1 (1602MHz)</p> <p>BeidouB1(1561.098MHz)</p> <p>Galileo E1 (1575.42); E5a (1176MHz)</p>
<b>Maximum data rates</b>	<p>5G sub 6G : 3.8 Gbps</p> <p>LTE: ue-CategoryDL 20, (DL : 2 Gbps )</p> <p>ue-CategoryUL 13 , (UL: 150Mbps)</p> <p>DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)</p> <p>HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)</p>
<b>Maximum output power</b>	<p>LTE: 23 dBm in all band except B41</p> <p>LTE B41 HPUE = 26dBm</p> <p>HSPA+: 23.5 dBm</p>
<b>Maximum power consumption</b>	<p>5G Sub 6 : 2500 mA</p> <p>LTE: 1,300 mA (peak); 1100 mA (average)</p> <p>HSPA+: 1,100 mA (peak); 800 mA (average)</p>
<b>Form Factor</b>	<p>M.2, 3042-S3 Key B</p>
<b>Weight</b>	<p>8 g</p>
<b>Dimensions (Length x Width x Thickness)</b>	<p>42 mm × 30 mm × 2.6 mm</p>

## Technical Specifications

1. 5G module is an optional feature that must be configured at purchase. AT&T and T-Mobile networks supported in the U.S. Module designed for 5G networks as carriers deploy Evolved-Universal Terrestrial Radio Access New Radio Dual Connectivity (ENDC) with both 100MHz of 5G NR and LTE channel bandwidth, using 256QAM 4x4 as defined by 3GPP, requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. 5G not available on all products, in all regions. Backwards compatible to 4G LTE and 3G HSPA technologies. 5G module planned to be available in select countries, where carrier supported.

<b>Intel® XMM™ 7360 LTE-Advanced<sup>1</sup></b>	<b>Technology/Operating bands</b>	FDD LTE: LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 1400 (Band 11), 700 (Band 12), 700 (Band 13) 700 (Band 17), 850 (Band 18), 850 (Band 19), 800 (Band 20), 1450 (Band 21), 850 (Band 26) 700 (Band 28) MHz, 700 (Band 29), 2300 (Band 30), 2100 (Band 66) MHz TDD LTE: 2600 (Band 38), 1900 (Band 39), 2300 (Band 40), 2500 (Band 41) MHz HSPA+: 2100 (Band 1), 1900 (Band 2), 1700 (Band 4), 850 (Band 5), 900 (Band 8) MHz
	<b>Wireless protocol standards</b>	3GPP Release 11 LTE Specification CAT.9, MAX 60MHz aggregation BW WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
	<b>GPS</b>	Standalone, A-GPS (MS-B and LTO)
	<b>GPS bands</b>	GPS 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 ± 2.046 MHz
	<b>Maximum data rates</b>	LTE: 450 Mbps (DL 3CA), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)
	<b>Maximum output power</b>	LTE: 23 dBm HSPA+: 23.5 dBm
	<b>Maximum power consumption</b>	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average)
	<b>Form Factor</b>	M.2, 3042-S3 Key B
	<b>Weight</b>	6 g
	<b>Dimensions (Length x Width x Thickness)</b>	42 x 30 x 2.3 mm

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

### Technical Specifications

#### POWER

AC Adapter 65 Watt nPFC Slim USB type C Straight 1.0m	Dimensions	88x53.5x21mm
	Weight	unit: 220g +/- 10g
	Input	100 to 240 VAC
	Input Efficiency	81.5% min at 115 Vac/ 230Vac @ 5V/3A 86.7% min at 115 Vac/ 230Vac @ 9V/3A 88% min at 115 Vac/ 230Vac @ 12V/5A 89% min at 115 Vac/ 230Vac @ 15V/4.33A 89% min at 115 Vac/ 230Vac @ 20V/3.25A
	Input frequency range	47 ~ 63 Hz
	Input AC current	1.6 A at 90 VAC and maximum load
	Output power	65W
	DC output	5V/9V/12V/15V/20V
	Hold-up time	5ms at 115 Vac input
	Output current limit	<8.0A
Connector	USB Type-C	
	Environmental Design	
	Operating temperature	32°F to 95°F (0° to 35°C)
	Non-operating (storage) temperature	-4°F to 185°F (-20° to 85°C)
EMI and Safety Certifications	Altitude	0 to 16,400 ft (0 to 5000m)
	Humidity	5% to 95%
	Storage Humidity	5% to 95%
	Eg:	
*CE Mark - full compliance with LVD and EMC directives		
* Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE.		
* MTBF - over 100,000 hours at 25°C ambient condition.		

AC Adapter 65 Watt nPFC Standard USB type C Straight 1.0m	Dimensions	90.0x51x28.5mm
	Weight	unit: 250g +/- 10g
	Input	100 to 240 VAC
	Input Efficiency	81.5% min at 115 Vac/ 230Vac @ 5V/3A 86.7% min at 115 Vac/ 230Vac @ 9V/3A 88% min at 115 Vac/ 230Vac @ 12V/5A 89% min at 115 Vac/ 230Vac @ 15V/4.33A 89% min at 115 Vac/ 230Vac @ 20V/3.25A
	Input frequency range	47 ~ 63 Hz
	Input AC current	1.6 A at 90 VAC and maximum load
	Output power	65 W
	DC output	5V/9V/12V/15V/20V
	Hold-up time	5ms at 115 Vac input
	Output current limit	8.0A Max.

### Technical Specifications

<b>Connector</b>	USB TYPE C
<b>Environmental Design</b>	<b>Operating temperature</b> 32°F to 95°F (0° to 35°C)
	<b>Non-operating (storage) temperature</b> -4°F to 185°F (-20° to 85°C)
	<b>Altitude</b> 0 to 16,400 ft (0 to 5000m)
	<b>Humidity</b> 20% to 95%
	<b>Storage Humidity</b> 10% to 95%
<b>Safety Certifications</b>	- CE Mark - full compliance with LVD and EMC directives
	- Worldwide safety standards - IEC60950, EN60950, UL60950, UL62368, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE.
	- MTBF - over 200,000 hours at 25°C ambient condition.

<b>HP 4-cell Long Life Li-Ion(56Wh)</b>	<b>Dimensions (H x W x L)</b>	5.25x85.00x274.00 mm
	<b>Weight</b>	0.259 kg
	<b>Cells/Type</b>	4cell Lithium-Ion Polymer cell / 446872
	<b>Energy</b>	<b>Voltage</b> 8.8V/7.7V
		<b>Amp-hour capacity</b> 7.3Ah/7.0Ah
		<b>Watt-hour capacity</b> 56 Wh
		<b>Operating (Charging)</b> 32° to 113° F (0° to 45° C)
	<b>Temperature</b>	<b>Operating (Discharging)</b> 14° to 122° F (-10° to 60° C)
	<b>Optional Travel</b>	No
	<b>Battery Available</b>	

<b>HP 2-cell Long Life Li-Ion(38Wh)</b>	<b>Dimensions (H x W x L)</b>	5.20*79.40*274.00
	<b>Weight</b>	0.16 kg
	<b>Cells/Type</b>	2cell Lithium-Ion Polymer cell / 4453C2
	<b>Energy</b>	<b>Voltage</b> 8.8V/7.7V
		<b>Amp-hour capacity</b> 4.93Ah/4.68Ah
		<b>Watt-hour capacity</b> 38 Wh
		<b>Operating (Charging)</b> 32° to 113° F (0° to 45° C)
	<b>Temperature</b>	<b>Operating (Discharging)</b> 14° to 122° F (-10° to 60° C)
	<b>Optional Travel Battery Available</b>	No

### Technical Specifications

#### FINGERPRINT READER

<b>Model:</b>	Model: Synaptics Validity VFS7552 touch sensor
<b>Mobile Voltage Operation:</b>	Mobile Voltage Operation: 3.0V to 3.6V
<b>Operating Temperature:</b>	Operating Temperature: 14° – 167°F (-10°-75°C)
<b>Current Consumption Image:</b>	Current Consumption Image: 36mA peak
<b>Low Latency Wait For Finger:</b>	Low Latency Wait For Finger: 950 uA
<b>Capture Rate:</b>	Capture Rate: 30 cm/sec
<b>ESD Resistance:</b>	ESD Resistance: IEC 61000-4-2 4B (+15KV)
<b>Detection Matrix:</b>	Detection Matrix: 200*1 (Plus another secondary line) / 508 dpi / 10mm sensor area
<b>FRR (False Reject Rate) / FAR (False Acceptance Rate):</b>	FRR (False Reject Rate) / FAR (False Acceptance Rate): FRR ~ 1% @ 1:50K FAR

#### ENVIRONMENTAL DATA

<b>Eco-Label Certifications &amp; declarations</b>	<p>This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:</p> <ul style="list-style-type: none"> <li>• IT ECO declaration</li> <li>• US ENERGY STAR®</li> <li>• US Federal Energy Management Program (FEMP)</li> <li>• EPEAT® Gold registered in the United States. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country.</li> <li>• TCO 8.0</li> <li>• China Energy Conservation Program (CECP)</li> <li>• China State Environmental Protection Administration (SEPA)</li> <li>• Taiwan Green Mark</li> <li>• Korea Eco-label</li> <li>• Japan PC Green label*</li> </ul>
<b>Sustainable Impact Specifications</b>	<ul style="list-style-type: none"> <li>• Ocean-Bound Plastic in speaker enclosure and bezel<sup>1</sup></li> <li>• 10% post-consumer recycled plastic<sup>2</sup></li> <li>• Low halogen<sup>3</sup></li> <li>• Outside Box and corrugated cushions are 100% sustainably sourced and recyclable<sup>4</sup></li> <li>• Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable<sup>5</sup></li> <li>• Bulk packaging available</li> </ul> <p>1. Percentage of ocean-bound plastic contained in each component varies by product</p> <p>2. Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.</p> <p>3. External power supplies, WWAN modules, power cords, cables and peripherals excluded.</p> <p>4. 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.</p> <p>5. Fiber cushions made from 100% recycled wood fiber and organic materials.</p>



### Technical Specifications

<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)	5.07 W	5.26 W	4.92 W
Normal Operation (Long idle)	0.73 W	0.82 W	0.78 W
Sleep	0.73 W	0.82 W	0.78 W
Off	0.30 W	0.32 W	0.29 W
	<p><b>NOTE:</b> Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.</p>		
<b>Heat Dissipation*</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>
Normal Operation (Short idle)	16 BTU/hr	16 BTU/hr	16 BTU/hr
Normal Operation (Long idle)	3 BTU/hr	3 BTU/hr	2 BTU/hr
Sleep	3 BTU/hr	3 BTU/hr	2 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 BTU/hr
	*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.		
<b>Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)</b>	<b>Sound Power (L<sub>WAd</sub>, bels)</b>	<b>Sound Pressure (L<sub>pAm</sub>, decibels)</b>	
Typically Configured – Idle	2.7	13.8	
Fixed Disk – Random writes	3.0	19.8	
Optical Drive – Sequential reads	3.4	22.7	

### Technical Specifications

<b>Longevity and Upgrading</b>	This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.		
<b>Additional Information</b>	<ul style="list-style-type: none"> <li>This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.</li> <li>This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.</li> <li>This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).</li> <li>This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see <a href="http://www.epeat.net">www.epeat.net</a></li> <li>Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.</li> <li>This product is 11.07% recycle-able when properly disposed of at end of life.</li> </ul>		
<b>Packaging Materials</b>	<b>External:</b>	PAPER/Corrugated	215 g
		PAPER/Corrugated	49 g
	<b>Internal:</b>	PLASTIC/polypropylene	3 g
		PLASTIC/Polyethylene low density	111 g
		PAPER/Molded pulp	102 g
		PAPER/Molded pulp	154 g
	The plastic packaging material contains at least 0% recycled content.		
	The corrugated paper packaging materials contains at least 64% recycled content.		
<b>RoHS Compliance</b>	<p>HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.</p> <p>We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.</p> <p>We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve.</p> <p>To obtain a copy of the HP RoHS Compliance Statement, see <a href="#">HP RoHS position statement</a>.</p>		
<b>Material Usage</b>	<p>This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at:</p> <p><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> </ul>		

### Technical Specifications

	<ul style="list-style-type: none"> <li>• Chlorinated Hydrocarbons</li> <li>• Chlorinated Paraffins</li> <li>• Bis(2-Ethylhexyl) phthalate (DEHP)</li> <li>• Benzyl butyl phthalate (BBP)</li> <li>• Dibutyl phthalate (DBP)</li> <li>• Diisobutyl phthalate (DIBP)</li> <li>• Formaldehyde</li> <li>• Halogenated Diphenyl Methanes</li> <li>• Lead carbonates and sulfates</li> <li>• Lead and Lead compounds</li> <li>• Mercuric Oxide Batteries</li> <li>• Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.</li> <li>• Ozone Depleting Substances</li> <li>• Polybrominated Biphenyls (PBBs)</li> <li>• Polybrominated Biphenyl Ethers (PBBEs)</li> <li>• Polybrominated Biphenyl Oxides (PBBOs)</li> <li>• Polychlorinated Biphenyl (PCB)</li> <li>• Polychlorinated Terphenyls (PCT)</li> <li>• Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.</li> <li>• Radioactive Substances</li> <li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</li> </ul>
<b>Packaging Usage</b>	<p>HP follows these guidelines to decrease the environmental impact of product packaging:</p> <ul style="list-style-type: none"> <li>• Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.</li> <li>• Eliminate the use of ozone-depleting substances (ODS) in packaging materials.</li> <li>• Design packaging materials for ease of disassembly.</li> <li>• Maximize the use of post-consumer recycled content materials in packaging materials.</li> <li>• Use readily recyclable packaging materials such as paper and corrugated materials.</li> <li>• Reduce size and weight of packages to improve transportation fuel efficiency.</li> <li>• Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.</li> </ul>
<b>End-of-life Management and Recycling</b>	<p>HP offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <a href="http://www.hp.com/go/reuse-recycle">http://www.hp.com/go/reuse-recycle</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <a href="http://www.hp.com/go/recyclers">http://www.hp.com/go/recyclers</a>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.</p>

## Technical Specifications

<b>HP, Inc. Corporate Environmental Information</b>	<p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report <a href="http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html">http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html</a></p> <p>Eco-label certifications <a href="http://www8.hp.com/us/en/hp-information/environment/ecolabels.html">http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</a></p> <p>ISO 14001 certificates: <a href="http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842">http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842</a> and <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</a></p>
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## COUNTRY OF ORIGIN

China

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

Type	Description	Part Number
Audio	HP Wired Thunderbolt Audio Module	3AQ21AA,3AQ21UT,3AQ21ET
	HP Wired USB-A UC SPK Phone	4VW02AA
Case	HP Business 13.3 Sleeve	2UW00AA,2UW00UT,2UW00ET
	HP Business 14.1 Sleeve	2UW01A6
	HP Business 14.1 Sleeve	2UW01AA,2UW01UT,2UW01ET
	HP Business 15.6 Case	2SC66A6
	HP Business 15.6 Top Load	2SC66AA,2SC66UT,2SC66ET
	HP Business 17.3 Backpack	2SC67A6
	HP Business 17.3 Backpack	2SC67AA,2SC67UT,2SC67ET
	HP Business Slim 14.1 Top Load	2SC65A6
	HP Business Slim 14.1 Top Load	2SC65AA,2SC65UT,2SC65ET
	HP Business Slim 17.3 Top Load	2UW02A6
	HP Business Slim 17.3 Top Load	2UW02AA,2UW02UT,2UW02ET
	HP Executive 14.1 Tote	6KD10AA,6KD10UT,6KD10ET
	HP Executive 15.6 Backpack	6KD07AA,6KD07UT,6KD07ET
	HP Executive 15.6 Top Load	6KD06AA,6KD06UT,6KD06ET
	HP Executive 17.3 Backpack	6KD05AA,6KD05UT,6KD05A9,6KD05ET
	HP Executive 17.3 Top Load	6KD08AA,6KD08UT,6KD08ET
	HP Executive Convertible 14.1 Tote	5KN27AA
	HP Executive Leather 15.6 Top Load	6KD09AA,6KD09UT,6KD09ET
	HP Executive Slim 14.1 Top Load	6KD04AA,6KD04UT,6KD04ET
	HP Prelude G2 15.6 Backpack	1E7D6A6
	HP Prelude G2 15.6 Backpack	2Z8P3AA,1E7D6AA
	HP Prelude G2 15.6 Top Load	1E7D7A6
	HP Prelude G2 15.6 Top Load	2Z8P4AA,1E7D7AA
	HP Prelude Pro Recycled 15.6 Backpack	1X644A6
	HP Prelude Pro Recycled 15.6 Backpack	1X644AA,1X644UT,1X644ET
	HP Prelude Pro Recycled 15.6 Top Load	1X645A6
	HP Prelude Pro Recycled 15.6 Top Load	1X645AA,1X645UT,1X645ET
	HP Renew Business 14.1 Laptop Bag AMO	3E5F9A6
	HP Renew Business 14.1 Laptop Bag	3E5F9AA,3E5F9UT,3E5F9ET
	HP Renew Business 14.1 Laptop Sleeve	3E2U7AA,3E2U7UT,3E2U7ET
	HP Renew Business 14.1 Sleeve	3E2U7A6
	HP Renew Business 15.6 Laptop Bag	3E5F8A6
	HP Renew Business 15.6 Laptop Bag	3E5F8AA,3E5F8UT,3E5F8ET
	HP Renew Business 17.3 Laptop Backpack	3E2U5A6
	HP Renew Business 17.3 Laptop Backpack	3E2U5AA,3E2U5UT,3E2U5ET

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

	HP Renew Business 17.3 Laptop Bag	3E2U6AA,3E2U6UT
<b>Docks</b>	HP USB-C/A 120W G2 Universal Dock	5TW13AA, 5TW13ET, 5TW13UT
	HP Thunderbolt 120W G2 Dock	6HP48AA, 2UK37AA, 2UK37ET
	HP Thunderbolt 120W G2 Dock w/Audio	3YE87AA, 3YE87ET
	HP Thunderbolt 230W G2 Dock	2UK38AA, 2UK38UT, 2UK38ET
	HP Thunderbolt 230W G2 Dock w/Combo Cable	3TR87AA, 3TR87UT, 3TR87ET
	HP USB-C 120W G5 Dock	26D32AA, 5TW10XX
	HP USB-C Mini Dock	1PM64AA,1PM64UT, 1PM64ET
	HP USB-C Travel Dock G2	7PJ38AA,7PJ38UT,7PJ38ET
<b>Input/Output</b>	HP WL USB Agnes Keyboard	T6U20AA, T6U20UT
	HP Collaboration WL Wanda Bluetooth Keyboard	Z9N39AA, Z9N39UT
	HP Wired Desktop 320K Keyboard	9SR37AA, 9SR37UT, 9SR37ET
	HP 125 WD USB Keyboard	266C9AA, 266C9UT, 266C9ET
	HP Wireless Rechargeable 950MK Mouse and Keyboard	3M165AA, 3M165UT
	HP USB Essential Keyboard/Mouse	H6L29AA
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA, 9SR36UT, 9SR36ET
	HP Slim Wireless Keyboard and Mouse	T6L04AA, T6L04UT
	HP Wired Desktop 320M Mouse	9VA80AA, 9VA80UT, 9VA80ET
	HP Wired Mouse	265A9AA, 265A9UT, 265A9ET
	HP LSR Wired Mouse	265D9AA, 265D9UT, 265D9ET
	HP USB 320M Wired Mouse	9VA80AA,9VA80UT,9VA80ET
	HP Comfort Grip USB Wireless Mouse	H2L63AA, H2L63UT
	HP Bluetooth Fingerprint Reader USB Mouse	4TS44AA,4TS44UT,4TS44ET
	HP Bluetooth Travel Bluetooth Mouse	6SP30AA,6SP30UT,6SP30ET
	HP Creator USB-A+Bluetooth 935 Wireless Mouse Black	1D0K8AA, 1D0K8ET, 1D0K8UT
	HP Presenter Bluetooth 4.2 Bluetooth Mouse	2CE30AA,2CE30UT,2CE30ET
	HP UltraMobile USB-A Wireless Mouse	H6F25AA, H6F25UT
	HP USB-A Fingerprint Reader USB Mouse	4TS44AA, 4TS44UT, 4TS44ET
	HP USB-A Laser 3 Button USB Mouse	H4B81AA, H4B81ET
	HP USB Premium USB Mouse	1JR32AA,1JR32UT
	HP USB Premium Wireless Mouse	1JR31AA,1JR31UT
	HP USB Travel USB Mouse	G1K28AA, G1K28ET
	HP Multi-Device 635 Black Wireless Mouse	1D0K2AA
	HP USB-A+Bluetooth Travel Bluetooth Mouse	6SP30AA, 6SP30UT, 6SP30ET
	HP HDMI to DVI Adapter	F5A28AA
	HP HDMI to VGA Adapter	H4F02AA, H4F02UT, H4F02ET
	HP USB 3.0 to Gigabit Adapter	N7P47AA
	HP USB-C to 4.5mm Adapter	4ST73AA

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

	HP USB-C to HDMI 2.0 Adapter	2PC54AA, 1WC36UT, 1WC36AA
	HP USB-C to RJ45 Adapter	V8Y76AA, V7W66AA, V7W66UT
	HP USB-C to USB-A Adapter	N2Z63AA, N2Z63UT
	HP 4.5 mm and USB-C Dock Adapter G2	6LX61AA
	HP USB-C to USB-A Hub Jake	Z8W90AA, Z6A00XX
	HP USB-C to USB-C Cable Blight	5AR72AA
	HP USB-C to VGA Adapter	P7Z54AA, N9K76AA, N9K76UT
<b>Power</b>	HP 45W USB-C G2 Zeus AC Power Adapter	1HE07AA, 1HE07UT
	HP 45W USB-C LC Dali AC Power Adapter	1MZ01AA
	HP 65W USB-C Auto Chevy AC Power Adapter	5TQ76AA, 5TQ76UT, 5TQ76ET
	HP 65W USB-C Hades AC Power Adapter	X7W50AA, 1HE08XX
	HP 65W USB-C LC AC Power Adapter	1P3K6AA
	HP 90W USB-C Gaia AC Power Adapter	2LN85AA
	HP USB Power Bank	N9F71AA, N9F71UT
	HP USB-C Essential Power Bank	3TB55AA, 3TB55UT
<b>Storage</b>	HP USB DVD-Writer EXT ODD	Y3T76AA, F2B56AA, F2B56UT, F2B56ET
<b>Security</b>	HP Nano Cable Lock	1AJ39AA, 1AJ39UT
	HP Sure Key Cable Lock	6UW42AA

### Summary of Changes

Date of change:	Version History:		Description of change:
January 22, 2021	V1 to V2		At a Glance section update, WPA3 certification
February 10, 2021	V2 to V3	Add	Environmental Data
February 17, 2021	V3 to V4	Update	Environmental Data
March 2, 2021	V4 to V5	Update	Battery Life
March 5, 2021	V5 to V6	Update	USB ports
March 11, 2021	V6 to V7	Update	Environmental Data
April 16, 2021	V7 to V8	Update	Options and Accessories
April 20, 2021	V8 to V9	Add	Fingerprint Reader
May 6, 2021	V9 to V10	Add	HP Smart Support

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