

### Overview

#### HP ProBook 455 G8 Notebook PC



#### Left

- |  |  |
|--|--|
| 1. Internal Microphones (2)                    | 5. Clickpad  |
| 2. Webcam LED (Optional)                       | 6. SuperSpeed USB Type-A 5Gbps signaling rate Port |
| 3. HD and IR Camera (Optional)                 | 7. Ethernet Port (RJ-45)                           |
| 4. Camera Shutter (Only available with webcam) | 8. Nano Security Lock Slot (Lock sold separately)  |
| 5. IR Camera LED (Optional)                    |  |

### Overview



#### Right

- |  |   |
|--|---|
| 1. Power Connector   | 6. Audio Combo Jack                         |
| 2. SuperSpeed USB Type-C® 10Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4) | 7. Micro SD Card Reader (Select Models)     |
| 3. SuperSpeed USB Type-A 5Gbps signaling rate Charging Port                            | 8. Touch Fingerprint Sensor (Select models) |
| 4. SuperSpeed USB Type-A 5Gbps signaling rate Port                                     |   |
| 5. HDMI Port 1.4b (Cable not included)   |   |

### Overview

#### AT A GLANCE

- A new compact design with lift-anywhere edge and configurable all metal chassis
- Choice of AMD Cezanne™ 5000 series mobile processors, R3, R5, R5 Pro, R7 and R7 Pro
- Preinstalled with Windows 10 versions or FreeDOS
- Integrated AMD Radeon™ Vega graphics
- Fast and upgradeable dual channel DDR4 SODIMM memory up to 32 GB
- Choice of 39.62 cm (15.6") diagonal HD, Ultra-Wide Viewing Angle FHD, and Privacy Panel option
- Features redesigned quiet and responsive HP Keyboard with the HP Programmable key and backlit options
- Choice of solid state drives up to 1 TB
- Multi-layered security with HP SureStart Gen6, HP Privacy Camera, HP Sure View Gen3, HP Sure Sense, HP Sure Click, and optional Touch Fingerprint sensor
- Supports wireless options for connectivity on the go including gigabit-speed Wi-Fi 6
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles
- Designed to support optional HP docking solutions including the HP Universal Dock G5
- Undergoes MIL-STD 810H tests <sup>1</sup>
- Battery Life 14 hours and 45 minutes

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 ProBook 455 G8 Notebook PC

#### OPERATING SYSTEM

**Preinstalled** Windows 10 Pro 64 – HP recommends Windows 10 Pro for business <sup>1</sup>  
Windows 10 Pro 64 (National Academic License) <sup>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<sup>1</sup> (Web support)  
FreeDOS

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

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

Note: HP tested Windows 10, version 1909 on this platform. For testing information on newer versions of Windows 10, please see <https://support.hp.com/document/c05195282>.

#### PROCESSORS

AMD Ryzen™ 3 5400U APU with AMD Radeon™ Graphics (2.6 GHz base clock, up to 4.0 GHz max boost clock, 8 MB L3 cache, 4 cores)<sup>3,4,5,6</sup>  
AMD Ryzen™ 5 5600U APU with AMD Radeon™ Graphics (2.3 GHz base clock, up to 4.2 GHz max boost clock, 16MB L3 cache, 6 cores)<sup>3,4,5,6</sup>  
AMD Ryzen™ 7 5800U APU with AMD Radeon™ Graphics (1.9 GHz base clock, up to 4.4 GHz max boost clock, 16 MB L3 cache, 8 cores)<sup>3,4,5,6</sup>  
AMD Ryzen™ 5 PRO 5650U APU with Radeon™ Graphics (2.3 GHz base clock, up to 4.2 GHz max boost clock, 16 MB L3 cache, 6cores)<sup>3,4,5,6</sup>  
AMD Ryzen™ 7 PRO 5850U APU with Radeon™ Graphics (1.9 GHz base clock, up to 4.4 GHz max boost clock, 16 MB L3 cache, 8cores)<sup>3,4,5,6</sup>

##### Processor Family

AMD Cezanne™ 5000 Series Mobile Processors <sup>6</sup>

### Technical Specifications

3. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
4. 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. AMD's numbering is not a measurement of clock speed.
5. AMD Max Burst frequency performance varies depending on hardware, software and overall system configuration.
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>.

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### GRAPHICS

#### Integrated

AMD Radeon™ Graphics

#### Supports

Supports HD decode, DX12, HDMI 1.4 <sup>7</sup>

7. HDMI cable not included.
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### Technical Specifications

#### DISPLAY

##### Non-Touch

39.6 cm (15.6") diagonal HD SVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC (1366 x 768) <sup>9,10</sup>

39.6 cm (15.6") diagonal HD SVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD camera (1366 x 768) <sup>9,10</sup>

39.6 cm (15.6") diagonal HD SVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD+IR camera (1366 x 768) <sup>9,10</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP+PSR anti-glare, low power narrow bezel bent, 400 nits, 100% sRGB for HD camera (1920 x 1080) <sup>9,10</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP+PSR anti-glare, low power narrow bezel bent, 400 nits, 100% sRGB for HD+IR camera (1920 x 1080) <sup>9,10</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC (1920 x 1080) <sup>9,10</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD camera (1920 x 1080) <sup>9,10</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD + IR camera (1920 x 1080) <sup>9,10</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP+PSR anti-glare, narrow bezel bent with HP Sure View Gen3 Integrated Privacy Screen, 1000 nits, 100% sRGB for HD camera (1920 x 1080) <sup>9,10,11,12</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP+PSR anti-glare, narrow bezel bent with HP Sure View Gen3 Integrated Privacy Screen, 1000 nits, 100% sRGB for HD+IR camera (1920 x 1080) <sup>9,10,11,12</sup>

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

HDMI 1.4 up to 4K 30Hz

8. HDMI cable not included.

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

128 GB PCIe® NVMe™ M.2 TLC Solid State Drive <sup>13</sup>

256 GB PCIe® NVMe™ M.2 Value Solid State Drive <sup>13</sup>

1 TB PCIe® NVMe™ M.2 TLC Solid State Drive <sup>13</sup>

512 GB PCIe® NVMe™ M.2 Value Solid State Drive <sup>13</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.

#### MEMORY

##### Maximum Memory

32 GB DDR4-3200 SDRAM <sup>14</sup>

##### Memory

32 GB DDR4-3200 SDRAM (2 x 16 GB) <sup>14</sup>

16 GB DDR4-3200 SDRAM (1 x 16 GB) <sup>14</sup>

12 GB DDR4-3200 SDRAM (1 x 4 GB + 1 x 8 GB) <sup>14</sup>

8 GB DDR4-3200 SDRAM (1 x 8 GB) <sup>14</sup>

8 GB DDR4-3200 SDRAM (2 x 4 GB) <sup>14</sup>

4 GB DDR4-3200 SDRAM (1 x 4 GB) <sup>14</sup>

##### Memory Slots

2 SODIMM

Both slots are accessible/upgradeable by IT or self-maintainers only.

DDR4 PC4 SODIMMS, system runs at 3200

Supports Dual Channel Memory

14. 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.

### Technical Specifications

#### NETWORKING/COMMUNICATIONS

##### WLAN

Realtek RTL8822CE 802.11ac (2x2) and Bluetooth® 5 Combo <sup>15</sup>

Intel® Dual Band Wireless-AC 9260 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 5 Combo, non-vPro® <sup>15</sup>

Intel® AX200 Wi-Fi 6 (2x2) and Bluetooth® 5 Combo, non-vPro® <sup>16</sup>

##### Ethernet

Realtek 10/100/1000 GbE NIC <sup>17</sup>

15. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 5 (802.11 ac) is backwards compatible with prior 802.11 specs.

16. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 (802.11 ax) is backwards compatible with prior 802.11 specs. Only available in countries where 802.11ax is supported.

17. The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

#### AUDIO/MULTIMEDIA

##### Audio

2 Integrated stereo speakers

Integrated microphone (Dual Array)

##### Speaker Power

2W/4ohm per speaker

##### Camera

720p HD camera <sup>9</sup>

720p HD camera+IR Camera <sup>9,18</sup>

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

18. Sold separately or as an optional feature.

### Technical Specifications

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

**Keyboard**

HP Premium Keyboard, spill resistant and optional Durakeys and backlit

**Pointing Device**

Clickpad with multi-touch gesture support

**Function Keys**

F1 - Display Switching

F2 - Blank or SureView On/Off

F3 - Brightness Down

F4 - Brightness Up

F5 - Audio Mute

F6 - Volume Down

F7 - Volume Up

F8 - Mic Mute

F9 - Blank or Backlit Toggle

F10 - Insert

F11 - Airplane Mode

F12 - Programmable key

Print Screen

Power Button (with LED)

**Hidden Function Keys**

Fn+R - Break

Fn+S - Sys Rq

Fn+C - Scroll Lock

### Technical Specifications

#### SOFTWARE AND SECURITY

##### BIOS

HP BIOSphere Gen5 <sup>19</sup>  
HP Drive Lock & Automatic Drive Lock  
BIOS Update via Network  
HP Secure Erase <sup>20</sup>  
Absolute Persistence Module <sup>21</sup>  
HP LAN-Wireless Protection  
USB enable/disable (via BIOS)

##### Software

HP Connection Optimizer <sup>22</sup>  
HP Hotkey Support  
myHP  
HP Support Assistant<sup>23</sup>  
HP QuickDrop<sup>24</sup>  
HP PC Hardware Diagnostics Windows  
HP Noise Cancellation Software  
Touchpoint Customizer for Commercial  
HP Notifications  
HP Privacy Settings  
HP Wireless Button Driver  
HP Power Manager  
Buy Microsoft Office (Sold separately)  
Microsoft Defender <sup>25</sup>  
Xerox® DocuShare® 30 day free trial offer<sup>43</sup>  
HP Smart Support <sup>44</sup>

##### Manageability Features

HP Driver Packs (download) <sup>26</sup>  
HP Manageability Integration Kit Gen4 (download) <sup>27</sup>  
HP Client Catalog (download)  
HP Client Management Script Library (download)  
HP Image Assistant (download)  
Ivanti Management Suite (download)

##### Security Management

HP Pro Security Edition (Select models)<sup>28</sup>  
HP Fingerprint Sensor (Select models) <sup>29</sup>  
HP Sure Click <sup>30</sup>  
HP Sure Sense <sup>31</sup>  
HP Sure Admin <sup>32</sup>  
HP Wolf Pro Security Edition <sup>33</sup>

### Technical Specifications

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

19. HP BIOSphere Gen6 requires Windows 10 and is available on select HP Pro and Elite PCs. Features may vary depending on the platform and configurations

20. 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™.

21. 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/>

22. HP Connection Optimizer requires Windows 10.

23. HP Support Assistant requires Windows and Internet access.

24. 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.

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

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

27. HP Manageability Integration Kit can be downloaded from <http://www.hp.com/go/clientmanagement>.

28. 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>.

29. HP Fingerprint sensor is an optional feature that must be configured at purchase.

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

31. HP Sure Sense is available on select HP PCs and is not available with Windows10 Home.

32. 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.

33. HP Wolf Pro Security Edition (including HP Sure Click Pro and HP Sure Sense Pro) is available preloaded on select SKUs and, depending on the HP product purchased, includes a paid 1-year or 3-year license. The HP Wolf Pro Security Edition software is licensed under the license terms of the HP Wolf Security Software - End-User license Agreement (EULA) that can be found at: [https://support.hp.com/us-en/document/ish\\_3875769-3873014-16](https://support.hp.com/us-en/document/ish_3875769-3873014-16) as that EULA is modified by the following: "7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition (HP Sure Sense Pro and HP Sure Click Pro) is effective upon activation and will continue for either a twelve (12) month or thirty-six (36) month license term ("Initial Term"). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using

### Technical Specifications

the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support.

43. Simply sign up and start using Xerox® DocuShare® Go. No credit card. No obligation. Data will become unavailable unless a subscription is entered before the end of the 30 day free trial period. See visit <http://www.xerox.com/docusharego> for details.

44. 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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### POWER

#### Power Supply

HP Smart 65 W External AC power adapter <sup>34</sup>

HP Smart 65 W EM External AC power adapter <sup>34</sup>

HP Smart 65 W USB Type-C adapter <sup>34</sup>

HP Smart 45 W External AC power adapter <sup>34</sup>

HP Smart 45 W USB Type-C adapter <sup>34</sup>

#### Power Cord

3-wire plug - 1m <sup>34</sup>

2-wire plug - 1m <sup>34</sup>

#### Primary Battery

HP Long Life 3-cell, 45 Wh Polymer <sup>35,36</sup>

#### Battery Life

Up to 14 hours and 45 minutes <sup>37</sup>

#### Battery Weight

0.42 lb

190 g

34. Availability may vary by country.

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

36. 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.

37. 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 <http://www.bapco.com> for additional details.

### Technical Specifications

#### WEIGHTS & DIMENSIONS

**Product Weight**

Starting at 3.83 lb <sup>38</sup>

Starting at 1.74 kg <sup>38</sup>

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

35.94 x 23.39 x 1.99 cm 14.15 x 9.21 x 0.78 in

[38. Weight will vary by configuration.](#)

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#### PORTS/SLOTS

1 SuperSpeed USB Type-C® 10Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)

3 SuperSpeed USB Type-A 5 Gbps signaling rate Port (1 Charging, 1 powered port)

1 HDMI 1.4b <sup>39</sup>

1 RJ-45

1 Headphone/microphone combo jack

1 AC power

**Expansion Slots**

1 micro SD

Supports SD, SDHC, SDXC

[39. HDMI cable sold separately.](#)

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### Technical Specifications

#### 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>40</sup>

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

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### Technical Specifications

#### SYSTEM UNIT

##### Stand-Alone Power Requirements (AC Power)

Nominal Operating Voltage	19V
Average Operating Power	8.1W (Idle)
Integrated graphics	Yes
Discrete Graphics	N/A
	Discrete < 65W
Max Operating Power	UMA < 45W

##### Temperature

Operating	32° to 95° F (0° to 35° C)
Non-operating	-4° to 140° F (-20° to 60° C)

##### Relative Humidity

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

##### Shock

Operating	40 G, 2 ms, half-sine
Non-operating	200 G, 2 ms, half-sine

##### Random Vibration

Operating	0.75 grms
Non-operating	1.50 grms

##### Altitude (unpressurized)

Operating	-50 to 10,000 ft (-15.24 to 3,048 m)
Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)

##### Planned Industry Standard Certifications

UL	Yes
CSA	Yes
FCC Compliance	Yes
ENERGY STAR®	Select models <sup>41</sup>
EPEAT	EPEAT 2019 Gold in United States <sup>42</sup>
ICES	Yes
Australia /	Yes
NZ A-Tick Compliance	Yes
CCC	Yes
Japan VCCI Compliance	Yes
KC	Yes
BSMI	Yes
CE Marking Compliance	Yes
BNCI or BELUS	Yes
CIT	Yes
GOST	Yes
Saudi Arabian Compliance (ICCP)	Yes
SABS	Yes

### Technical Specifications

41. Configurations of the HP ProBook 455 G8 that are ENERGY STAR® qualified are identified as HP ProBook 455 G8 ENERGY STAR on HP websites and on <http://www.energystar.gov>.

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

### DISPLAYS

1. Actual brightness will be lower with touchscreen or 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 15.6 inch FHD  
(1920x1080) Anti-Glare WLED  
UWVA 45percent cg 250nits eDP  
1.2 w/o PSR bent NWBZ**

<b>Outline Dimensions (W x H x D)</b>	350.96 x 205.54 mm (max)
<b>Active Area</b>	344.16 x 193.59 mm (typ.)
<b>Weight</b>	370 g (max)
<b>Diagonal Size</b>	15.6 inch
<b>Thickness</b>	3.0 mm/ 5.0 mm (w/PCB) (max)
<b>Interface</b>	eDP 1.2 (2 lane)
<b>Surface Treatment</b>	Anti-Glare
<b>Touch Enabled</b>	No
<b>Contrast Ratio</b>	600:1 (typ.)
<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	250 nits
<b>Pixel Resolution</b>	1920 x 1080 (FHD)
<b>Format</b>	RGB Stripe
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	NTSC 45%
<b>Color Depth</b>	6 bits (Hi FRC supportive w/ condition to enable)
<b>Viewing Angle</b>	UWVA 85/85/85/85

**Panel LCD 15.6 inch FHD  
(1920x1080) Anti-Glare WLED  
UWVA sRGB 100percent cg  
400nits eDP 1.4+PSR2 bent LP  
NWBZ**

<b>Outline Dimensions (W x H x D)</b>	349.46 x 204.79 mm (max)
<b>Active Area</b>	344.16 x 193.59 mm (typ.)
<b>Weight</b>	325 g (max)
<b>Diagonal Size</b>	15.6 inch
<b>Thickness</b>	2.6mm / 4.6mm (PCB) (max)
<b>Interface</b>	eDP 1.4
<b>Surface Treatment</b>	Anti-Glare
<b>Touch Enabled</b>	No
<b>Contrast Ratio</b>	1200:1 (typ.)
<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	400 nits
<b>Pixel Resolution</b>	1920 x 1080 (FHD)
<b>Format</b>	RGB Stripe

## Technical Specifications

<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	sRGB 100%
<b>Color Depth</b>	8 bit
<b>Viewing Angle</b>	UWVA 85/85/85/85

**Panel LCD 15.6-in FHD  
(1920x1080) Anti-Glare WLED  
UWVA 72percent cg 1000nits eDP  
1.4+PSR2 PrivacyG3 NWBZ bent**

<b>Outline Dimensions (W x H x D)</b>	349.52x 205.39 mm (max)
<b>Active Area</b>	344.16 x 193.59 mm (typ.)
<b>Weight</b>	350 g (max)
<b>Diagonal Size</b>	15.6 inch
<b>Thickness</b>	2.6mm / 4.5mm Max. (PCB side)
<b>Interface</b>	eDP 1.4 + PSR (4 lane)
<b>Surface Treatment</b>	Anti-Glare
<b>Touch Enabled</b>	No
<b>Contrast Ratio</b>	2000:1 (typ.)
<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	1000 nits <sup>1</sup>
<b>Pixel Resolution</b>	1920 x 1080 (FHD)
<b>Format</b>	RGB
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	sRGB 100%
<b>Color Depth</b>	8 bits
<b>Viewing Angle</b>	UWVA 85/85/85/85

**Panel LCD 15.6-in HD (1366x768)  
Anti-Glare WLED SVA 45percent  
cg 250nits eDP 1.2 w/o PSR  
NWBZ bent**

<b>Outline Dimensions (W x H x D)</b>	350.96 x 205.54 (mm) max
<b>Active Area</b>	344.23 x 193.54 mm (typ.)
<b>Weight</b>	370 g max
<b>Diagonal Size</b>	15.6"
<b>Thickness</b>	3.2t (panel) / 5.0t (panel+PCB) max.
<b>Interface</b>	eDP 1.2 (1 lane)
<b>Surface Treatment</b>	Anti-Glare
<b>Touch Enabled</b>	No
<b>Contrast Ratio</b>	300:1 (typ)
<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	250nits
<b>Pixel Resolution</b>	1366 x 768 (HD)
<b>Format</b>	RGB
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	NTSC 45%
<b>Color Depth</b>	6 bits
<b>Viewing Angle</b>	SVA 45/45/15/35

## Technical Specifications

STORAGE<sup>1</sup>

1. 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
	<b>Maximum Sequential Read</b>	1400 ~ 2100 MB/s
	<b>Maximum Sequential Write</b>	800 ~ 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>	ATA Security; DIPM; TRIM; DEVSLP

<b>SSD 1TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	1 TB
	<b>NAND Type</b>	TLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Weight</b>	0.02 lb (10 g)
	<b>Interface</b>	PCIe NVMe Gen3x4
	<b>Maximum Sequential Read</b>	3100 ~ 3500 MB/s
	<b>Maximum Sequential Write</b>	2770 ~ 3037 MB/s
	<b>Logical Blocks</b>	2,000,409,264
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	ATA Security; TRIM; L1.2

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

## Technical Specifications

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

### Technical Specifications

#### NETWORKING

<b>Intel® Wi-Fi 6 AX200 + Bluetooth® 5 (802.11ax 2x2, supporting gigabit data rate) (non-vPro)<sup>1,5</sup></b>	<b>Wireless LAN Standards</b>	<ul style="list-style-type: none"> <li>IEEE 802.11a</li> <li>IEEE 802.11b</li> <li>IEEE 802.11g</li> <li>IEEE 802.11n</li> <li>IEEE 802.11ac</li> <li>IEEE 802.11ax</li> <li>IEEE 802.11d</li> <li>IEEE 802.11e</li> <li>IEEE 802.11h</li> <li>IEEE 802.11i</li> <li>IEEE 802.11k</li> <li>IEEE 802.11r</li> <li>IEEE 802.11v</li> </ul>
	<b>Interoperability</b>	Wifi Certified
	<b>Frequency Band</b>	<ul style="list-style-type: none"> <li>802.11b/g/n/ax</li> <li>• 2.402 – 2.482 GHz</li> <li>802.11a/n/ac/ax</li> <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: max 300mbps</li> <li>• 802.11ac : max 1733Mbps</li> <li>• 802.11ax : max 2.4Gbps</li> </ul>
	<b>Modulation</b>	<ul style="list-style-type: none"> <li>Direct Sequence Spread Spectrum</li> <li>OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM</li> </ul>
	<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>• WPA3 certification</li> <li>• IEEE 802.11i</li> <li>• WAPI</li> </ul>
	<b>Network Architecture Models</b>	<ul style="list-style-type: none"> <li>Ad-hoc (Peer to Peer)</li> <li>Infrastructure (Access Point Required)</li> </ul>
	<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: +17dBm minimum</li> <li>• 802.11g: +16dBm minimum</li> </ul>

### Technical Specifications

	<ul style="list-style-type: none"> <li>• 802.11a: +17dBm minimum</li> <li>• 802.11n HT20(2.4GHz): +14dBm minimum</li> <li>• 802.11n HT40(2.4GHz): +13dBm minimum</li> <li>• 802.11n HT20(5GHz): +14dBm minimum</li> <li>• 802.11n HT40(5GHz): +13dBm minimum</li> <li>• 802.11ac VHT80(5GHz): +10dBm minimum</li> <li>• 802.11ac VHT160(5GHz): +10dBm minimum</li> <li>• 802.11ax HE40(2.4GHz): +12dBm minimum</li> <li>• 802.11ax HE80(5GHz): +10dBm minimum</li> <li>• 802.11ax HE160(5GHz): +10dBm minimum</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode: 2.0 W</li> <li>• Receive mode 1.6 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode 50 mW (WLAN unassociated)</li> <li>• Connected Standby 10mW</li> <li>• Radio disabled 8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b, 1Mbps : -93.5dBm maximum</li> <li>• 802.11b, 11Mbps : -84dBm maximum</li> <li>• 802.11a/g, 6Mbps : -86dBm maximum</li> <li>• 802.11a/g, 54Mbps : -72dBm maximum</li> <li>• 802.11n, MCS07 : -67dBm maximum</li> <li>• 802.11n, MCS15 : -64dBm maximum</li> <li>• 802.11ac, MCS0(VHT80) : -84dBm maximum</li> <li>• 802.11ac, MCS9(VHT80) : -59dBm maximum</li> <li>• 802.11ac, MCS9(VHT160) : -58.5dBm maximum</li> <li>• 802.11ax, MCS11(HE40): -57dBm maximum</li> <li>• 802.11ax, MCS11(HE80): -54dBm maximum</li> <li>• 802.11ax, MCS11(HE160): -53.5dBm maximum</li> </ul>
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
<b>Form Factor</b>	PCI-Express M.2 MiniCard
<b>Dimensions</b>	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
<b>Weight</b>	1. Type 2230: 2.8g 2. Type 126: 1.3g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	Operating 14° to 158° F (–10° to 70° C) Non-operating –40° to 176° F (–40° to 80° C)
<b>Humidity</b>	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
<b>Altitude</b>	Operating 0 to 10,000 ft (3,048 m)

### Technical Specifications

<b>LED Activity</b>	Non-operating	0 to 50,000 ft (15,240 m)
	LED Amber – Radio OFF; LED OFF – Radio ON	

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

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1 Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
<b>Data Rates and Throughput</b>	Legacy: 3 Mbps data rate; 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.

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. Only available in countries where 802.11ax is supported.
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. Wi-Fi 5 or 6 is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

### Technical Specifications

**Intel® Thunder Peak 9260 Wireless LAN Standards**  
**802.11a/b/g/n/ac (2x2)**  
**WiFi® and Bluetooth® 5.0**  
**Combo <sup>1</sup> (Non-vPro)**

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

#### Interoperability

Wi-Fi certified

#### Frequency Band

802.11b/g/n  
 • 2.402 – 2.482 GHz  
 802.11a/n/ac  
 • 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: max 300Mbps  
 • 802.11ac : max 1733Mbps

#### Modulation

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

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

• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only  
 • AES-CCMP: 128 bit in hardware  
 • 802.1x authentication  
 • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.  
 • WPA2 certification  
 • WPA3 certification  
 • IEEE 802.11i  
 • WAPI

#### Network Architecture Models

Ad-hoc (Peer to Peer)  
 Infrastructure (Access Point Required)

#### Roaming

IEEE 802.11 compliant roaming between access points

#### Output Power<sup>2</sup>

• 802.11b: +17dBm minimum  
 • 802.11g: +16dBm minimum  
 • 802.11a: +17dBm minimum  
 • 802.11n HT20(2.4GHz): +14dBm minimum  
 • 802.11n HT40(2.4GHz): +13dBm minimum

### Technical Specifications

	<ul style="list-style-type: none"> <li>• 802.11n HT20(5GHz): +14dBm minimum</li> <li>• 802.11n HT40(5GHz): +13dBm minimum</li> <li>• 802.11ac VHT80(5GHz): +10dBm minimum</li> <li>• 802.11ac VHT160(5GHz): +10dBm minimum</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode: 2.0 W</li> <li>• Receive mode 1.6 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode 50 mW (WLAN unassociated)</li> <li>• Connected Standby 10mW</li> <li>• Radio disabled 8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b, 1Mbps: -93.5dBm maximum</li> <li>• 802.11b, 11Mbps -84dBm maximum</li> <li>• 802.11a/g, 6Mbps: -86dBm maximum</li> <li>• 802.11a/g, 54Mbps: -72dBm maximum</li> <li>• 802.11n, MCS07: -67dBm maximum</li> <li>• 802.11n, MCS15: -64dBm maximum</li> <li>• 802.11ac, MCS0(VHT80): -84dBm maximum</li> <li>• 802.11ac, MCS9(VHT80): -59dBm maximum</li> <li>• 802.11ac, MCS9(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
<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>	Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
<b>Altitude</b>	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED OFF – Radio ON

#### HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 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)

## Technical Specifications

**Data Rates and Throughput**

BLE: 0~39 (2 MHz/CH)  
Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps  
BLE: 1 Mbps data rate; throughput up to 0.2 Mbps  
Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels  
Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)

**Transmit Power**

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

- 1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 5 (802.11 ac) is backwards compatible with prior 802.11 specs.
- 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).

### Technical Specifications

<b>Realtek RTL8822CE 802.11ac 2x2 Wi-Fi® + Bluetooth® 5<sup>1</sup></b>	<b>Wireless LAN Standards</b>	<ul style="list-style-type: none"> <li>IEEE 802.11a</li> <li>IEEE 802.11b</li> <li>IEEE 802.11g</li> <li>IEEE 802.11n</li> <li>IEEE 802.11ac</li> <li>IEEE 802.11d</li> <li>IEEE 802.11e</li> <li>IEEE 802.11h</li> <li>IEEE 802.11i</li> <li>IEEE 802.11k</li> <li>IEEE 802.11r</li> <li>IEEE 802.11v</li> </ul>
	<b>Interoperability</b>	Wi-Fi certified modules
	<b>Frequency Band</b>	<ul style="list-style-type: none"> <li>802.11b/g/n</li> <li>•2.402 – 2.482 GHz</li> <li>802.11a/n/ac</li> <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: max 300Mbps</li> <li>•802.11ac : max 866.7Mbps</li> </ul>
	<b>Modulation</b>	<ul style="list-style-type: none"> <li>Direct Sequence Spread Spectrum</li> <li>BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</li> </ul>
	<b>Security<sup>3</sup></b>	<ul style="list-style-type: none"> <li>•IEEE and Wi-Fi certified 64 / 128-bit WEP encryption for a/b/g mode only</li> <li>•AES-CCMP: 128 bit in hardware</li> <li>•802.1x authentication</li> <li>•WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>•WPA2 certification</li> <li>•WPA3 certification</li> <li>•IEEE 802.11i</li> <li>•WAPI</li> </ul>
	<b>Network Architecture Models</b>	<ul style="list-style-type: none"> <li>Ad-hoc (Peer to Peer)</li> <li>Infrastructure (Access Point Required)</li> </ul>
	<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> </ul>

### Technical Specifications

	<ul style="list-style-type: none"> <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> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode: 2.0 W</li> <li>• Receive mode 1.6 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode 50 mW (WLAN unassociated)</li> <li>• Connected Standby/Modern Standby: 10mW</li> <li>• Radio disabled 8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b, 1Mbps: -93.5dBm maximum</li> <li>• 802.11b, 11Mbps: -84dBm maximum</li> <li>• 802.11a/g, 6Mbps: -86dBm maximum</li> <li>• 802.11a/g, 54Mbps: -72dBm maximum</li> <li>• 802.11n, MCS07: -67dBm maximum</li> <li>• 802.11n, MCS15: -64dBm maximum</li> <li>• 802.11ac, MCS0: -84dBm maximum</li> <li>• 802.11ac, MCS9: -59dBm maximum</li> </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
<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>	Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
<b>Altitude</b>	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED OFF – Radio ON

#### HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 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) BLE: 0~39 (2 MHz/CH)
<b>Data Rates and</b>	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps

Technical Specifications

Throughput	BLE: 1 Mbps data rate; throughput up to 0.2 Mbps Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.

- 1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 5 (802.11 ac) is backwards compatible with prior 802.11 specs.
- 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).

### Technical Specifications

#### Realtek RTK8111HSH 10/100/1000 Integrated NIC

<b>Ethernet Features</b>	<p>10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)</p> <p>100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)</p> <p>1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40)</p> <p>Auto-Negotiation (Automatic Speed Selection)</p> <p>Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s</p>
<b>Power Management</b>	<p>ACPI compliant – multiple power modes</p> <p>Situation-sensitive features reduce power consumption</p> <p>Advanced link down power saving for reducing link down power consumption</p>
<b>Performance Features</b>	<p>TCP/IP/UDP Checksum Offload (configurable)</p> <p>Protocol Offload (ARP &amp; NS)</p> <p>Large send offload and Giant send offload</p> <p>Receiving Side Scaling</p> <p>Jumbo Frame 9K</p>
<b>Manageability</b>	<p>Wake-on-LAN from modern standby or sleep state (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only)</p> <p>PXE 2.1 Remote Boot</p> <p>Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))</p> <p>Comprehensive diagnostic and configuration software suite</p> <p>Virtual Cable Doctor for Ethernet cable status</p>
<b>Interface</b>	Auto MDI/MDIX Crossover cable detection
<b>NIC Device Driver Name</b>	Realtek PCIe GBE Ethernet Family Controller

### Technical Specifications

#### POWER

**AC Adapter 45 Watt Smart  
nPFC Standard Barrel 4.5mm  
Right Angle 1.0m**

<b>Dimensions</b>	95x45x26.8mm
<b>Weight</b>	unit: 200g +/- 10g
<b>Input</b>	
<b>Input Efficiency</b>	87.74 % at 115 Vac and 88.4 % at 230Vac
<b>Input frequency range</b>	47 ~ 63 Hz
<b>Input AC current</b>	Max. 1.4 A at 90 Vac
<b>Output</b>	
<b>Output power</b>	45W
<b>DC output</b>	19.5V
<b>Hold-up time</b>	5ms at 115 Vac input
<b>Output current limit</b>	<8.0A
<b>Connector</b>	
<b>Connector</b>	4.5mm Barrel Type
<b>Environmental Design</b>	
<b>Operating temperature</b>	32oF to 95oF (0oto 35oC)
<b>Non-operating (storage) temperature</b>	-4oF to 185oF (-20oto 85oC)
<b>Non-operating (storage) temperature</b>	
<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>	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 200,000 hours at 25°C ambient condition.

### Technical Specifications

<b>AC Adapter 45 Watt nPFC</b>	<b>Dimensions</b>	94.0mm * 40.0mm * 26.5mm
<b>Standard USB type C</b>	<b>Weight</b>	192.5g +/-10%
<b>Straight 1.0m</b>	<b>Input</b>	
	<b>Input Efficiency</b>	Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec: 5V: 81.5% 9V: 86.7% 12V: 87.41% 15V: 87.8% 47 ~ 63Hz
	<b>Input frequency range</b>	Max. 1.4 A at 90 Vac
	<b>Input AC current</b>	
	<b>Output</b>	5V/15W 9V/27W 12V/36W 15V/45W
	<b>Output power</b>	5V/9V/12V/15V
	<b>DC output</b>	5ms at 115 Vac input
	<b>Hold-up time</b>	
	<b>Output current limit</b>	
	<b>Connector</b>	USB Type-C
	<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</b>	Eg:
	<b>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.

### Technical Specifications

**AC Adapter 45 Watt Smart  
nPFC Standard Barrel  
4.5mm Right Angle 1.0m  
2prong**

**Dimensions**

95x45x26.8mm

**Weight**

unit: 200g +/- 10g

**Input**

**Input Efficiency**

87.74 % at 115 Vac and 88.4 % at 230Vac

**Input frequency range**

47 ~ 63 Hz

**Input AC current**

Max. 1.4 A at 90 Vac

**Output**

**Output power**

45W

**DC output**

19.5V

**Hold-up time**

5ms at 115 Vac input

**Output current limit**

<8.0A

**Connector**

4.5mm Barrel Type

**Operating temperature**

32°F to 95°F (0° to 35°C)

**Non-operating (storage)  
temperature**

-4°F to 185°F (-20° to 85°C)

**Altitude**

0 to 16,400 ft (0 to 5000m)

**Humidity**

20% to 95%

**Storage Humidity**

10% to 95%

**EMI and Safety  
Certifications**

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 200,000 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**

**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**

**Output power**

65W

**DC output**

5V/9V/12V/15V/20V

**Hold-up time**

5ms at 115 Vac input

**Output current limit**

8.0A Max.

**Connector**

USB Type C

### Technical Specifications

<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>	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 200,000 hours at 25°C ambient condition.

#### AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm New EM

<b>Dimensions</b>	102 x 55 x 30mm
<b>Weight</b>	unit: 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>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>	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 200,000 hours at 25°C ambient condition.

### Technical Specifications

<b>AC Adapter 65 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.0m</b>	<b>Dimensions</b>	90 x 51 x 28.5mm
	<b>Weight</b>	unit: 230g +/- 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>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>	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 200,000 hours at 25°C ambient condition.

<b>Battery RH 3 Cell Wh 45 Long Life -PL Fast Charge</b>	<b>Dimensions (H x W x L)</b>	6.2 x 68.7 x 249.6mm
	<b>Weight</b>	190g
	<b>Cells/Type</b>	3cell Lithium-Ion Polymer cell/ 545974
	<b>Energy</b>	
	<b>Voltage</b>	11.4V
	<b>Amp-hour capacity</b>	3.950Ah
	<b>Watt-hour capacity</b>	45Wh
	<b>Temperature</b>	
	<b>Operating (Charging)</b>	32° to 113° F (0° to 45° C)
	<b>Operating (Discharging)</b>	14° to 122° F (-10° to 60° C)
	<b>Fuel Gauge LED</b>	NA
	<b>Warranty</b>	Based on system offering
	<b>Optional Travel Battery Available</b>	No

### Technical Specifications

#### FINGERPRINT READER

Model: Elan efsa80ST (module P1515B)

Mobile Voltage Operation: 2.7V to 3.6V

Operating Temperature: -4°F – 175°F (-20° ~ +80°C)

Current Consumption Image: 50mA peak

Low Latency Wait For Finger: 900uA

Capture Rate: 30 frame/sec

ESD Resistance: +15KV

Detection Matrix: 80\*80 pixels/ 508 dpi / 4\*4mm sensor area

FRR (False Reject Rate) / FAR (False Acceptance Rate): FRR: <3% , FAR: 1/100K

#### ENVIRONMENTAL DATA

<b>Eco-Label Certifications &amp; declarations</b>	<p>This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:</p> <ul style="list-style-type: none"> <li>• IT ECO declaration</li> <li>• US ENERGY STAR®</li> <li>• US Federal Energy Management Program (FEMP)</li> <li>• EPEAT<sup>®</sup> Gold registered in the United States. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country.</li> <li>• TCO 8.0</li> <li>• China Energy Conservation Program (CECP)</li> <li>• China State Environmental Protection Administration (SEPA)</li> <li>• Taiwan Green Mark</li> <li>• Korea Eco-label</li> <li>• Japan PC Green label*</li> </ul>		
<b>Sustainable Impact Specifications</b>	<ul style="list-style-type: none"> <li>• Ocean-bound plastic in (part(s))</li> <li>• 12.9% post-consumer recycled plastic</li> <li>• External Power Supply 90% Efficiency</li> <li>• Low halogen</li> <li>• Outside Box and corrugated cushions are 100% sustainably sourced and recyclable</li> <li>• Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable</li> <li>• Recycled Plastic cushions</li> <li>• Bulk packaging available</li> </ul>		
<b>System Configuration</b>	<p>The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.</p>		
<b>Energy Consumption (in accordance with US ENERGY STAR® test method)</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>
Normal Operation (Sort idle)	5.33 W	5.24 W	5.28 W

### Technical Specifications

Normal Operation (Long idle)	0.74 W	0.79 W	0.73 W
Sleep	0.74 W	0.79 W	0.73 W
Off	0.29 W	0.36 W	0.29 W
	Note: 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.		
Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	17 BTU/hr	17 BTU/hr	17 BTU/hr
Normal Operation (Long idle)	2 BTU/hr	2 BTU/hr	2 BTU/hr
Sleep	2 BTU/hr	2 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.		
Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L <sub>WAd</sub> , bels)	Sound Pressure (L <sub>pAm</sub> , decibels)	
Typically Configured – Idle	2.2	22.1	
Fixed Disk – Random writes	2.8	27.7	
Optical Drive – Sequential reads	2.2	22.1	
Longevity and Upgrading	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.		

### Technical Specifications

<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 12.9% recycle-able when properly disposed of at end of life.</li> </ul>		
<b>Packaging Materials</b>	<b>External:</b>	PAPER/Corrugated	245 g
		PAPER/Corrugated	50
	<b>Internal:</b>	PAPER/Molded pulp	192 g
		PLASTIC/Polyethylene low density	10 g
	The plastic packaging material contains at least 0% recycled content.		
	The corrugated paper packaging materials contains at least 51.4% recycled content.		
<b>RoHS Compliance</b>	<p>HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.</p> <p>We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.</p> <p>We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve. To obtain a copy of the HP RoHS Compliance Statement, see <a href="#">HP RoHS position statement</a>.</p>		
<b>Material Usage</b>	<p>This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html">http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html</a>):</p> <ul style="list-style-type: none"> <li>Asbestos</li> <li>Certain Azo Colorants</li> <li>Certain Brominated Flame Retardants – may not be used as flame retardants in plastics</li> <li>Cadmium</li> <li>Chlorinated Hydrocarbons</li> <li>Chlorinated Paraffins</li> <li>Bis(2-Ethylhexyl) phthalate (DEHP)</li> <li>Benzyl butyl phthalate (BBP)</li> <li>Dibutyl phthalate (DBP)</li> <li>Diisobutyl phthalate (DIBP)</li> <li>Formaldehyde</li> <li>Halogenated Diphenyl Methanes</li> <li>Lead carbonates and sulfates</li> <li>Lead and Lead compounds</li> </ul>		

### Technical Specifications

	<ul style="list-style-type: none"> <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>
<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>

## Technical Specifications

footnotes	<ul style="list-style-type: none"><li>Percentage of ocean-bound plastic contained in each component varies by product</li><li>Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.</li><li>External power supplies, WWAN modules, power cords, cables and peripherals excluded.</li><li>100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.</li><li>Fiber cushions made from 100% recycled wood fiber and organic materials.</li><li>Plastic cushions are made from &gt;90% recycled plastic.</li></ul>
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## COUNTRY OF ORIGIN

China

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

Category	Description	Part Number
<b>Cases</b>	HP Prelude Pro Recycle Backpack	1X644AA
	HP Prelude Pro Recycle Top Load	1X645AA
	HP Business 15.6 Top Load	2SC66AA
	HP Business 17.3 Backpack	2SC67AA
	HP Business Slim 17.3 Top Load	2UW02AA
	HP Executive 15.6 Backpack	6KD07AA
	HP Executive 15.6 Top Load	6KD06AA
	HP Executive 17.3 Backpack	6KD05AA
	HP Executive 17.3 Top Load	6KD08AA
	HP Executive Leather 15.6 Top Load	6KD09AA
	HP Executive Slim 14.1 Top Load	6KD04AA
	HP Prelude G2 15.6 Backpack	1E7D6AA
	HP Prelude G2 15.6 Top Load	1E7D7AA
	HP Renew Business 15.6 Laptop Bag	3E5F8AA
	HP Renew Business 17.3 Laptop Backpack	3E2U5AA
	HP Renew Business 17.3 Laptop Bag	3E2U6AA
<b>Docking</b>	HP Thunderbolt 120W Dock G2	2UK37AA
	HP Thunderbolt 120W Dock w/Audio G2	3YE87AA
	HP Thunderbolt 230W Dock w/Combo Cable G2	3TR87AA
	HP USB-C 120W G5 Dock	5TW10AA
	HP USB-C Mini Dock	1PM64AA
	HP USB-C/A 120W Universal Dock G2	5TW13AA
	HP USB-C Travel Dock G2	7PJ38AA
	HP Wired Thunderbolt Audio Module	3AQ21AA
<b>Input/Output</b>	HP USB-C Travel Dock	4WX89AA
	HP USB-C to HDMI 2.0 Adapter	2PC54AA#ABB
	HP USB-C to RJ45 Adapter	V8Y76AA#ABB, V7W66AA
	HP USB-C to USB 3.0 Adapter	N2Z63AA
	HP 320M Wired Mouse	9VA80AA
	HP Travel Bluetooth Mouse	6SP30AA
	HP Travel USB Mouse	G1K28AA
	HP Wireless Keyboard	T6U20AA
	HP Slim Wireless Keyboard and Mouse	T6L04AA
	HP Wireless USB Premium Keyboard	Z9N41AA
	HP Wireless Rechargeable 950MK Mouse and Keyboard	3M165AA
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA
	HP 235 WL Mouse and Keyboard Combo	1Y4D0AA
	HP 125 Wired Keyboard	266C9AA
	HP 225 Wired Mouse and Keyboard Combo	286J4AA

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

	HP HDMI to VGA Adapter	H4F02AA
	HP 125 USB-A Wired Mouse	265A9AA
	HP 128 USB Laser Wired Mouse	265D9AA
	HP 235 Wireless 2.4GHz Slim Wireless Mouse	4E407AA
	HP 435 Bluetooth 5.0 + Wireless 2.4GHz Multi-Device Wireless Mouse	3B4Q5AA
	HP Creator USB-A+Bluetooth 935 Wireless Mouse	1D0K8AA
	HP USB-A+Bluetooth Multi-Device 635 Wireless Mouse Black	1D0K2AA
<b>Power</b>	HP 45W 4.5 mm LC Smart Japan Only AC Power Adapter	L6F60AA#ABJ
	HP 45W 4.5 mm Smart AC Power Adapter	H6Y88AA#ABA
	HP 45W USB-C LC AC Power Adapter	1MZ01AA#ABA
	HP 65W 4.5 mm Smart AC Power Adapter	H6Y89AA#ABA
	HP 65W 4.5 mm w Dongle 7.4 mm Slim AC Power Adapter	H6Y82AA#ABA
	HP 65W USB-C LC AC Power Adapter	1P3K6AA#ABA
	HP 65W USB-C Slim Travel AC Power Adapter	X7W50AA#ABA
	HP 65W USB-C Auto AC Power Adapter	5TQ76AA
<b>Power bank</b>	HP USB-C Essential Power Bank	3TB55AA
<b>Storage</b>	HP USB DVD-Writer EXT ODD	Y3T76AA
<b>Memory</b>	HP 4GB DDR4 3200 Memory	286H5AA
	HP 8GB DDR4 3200 Memory	286H8AA
	HP 16GB DDR4 3200 Memory	286J1AA
<b>Security</b>	HP Nano Cable Lock	1AJ39AA
	HP SureKey Standard/Nano/Wedge Cable Lock	6UW42AA
	HP Nano Master Keyed Cable Lock	1AJ40AA
	HP Notebook 15.6" Privacy Filter	J7H71AA
<b>UCC</b>	HP Stereo 3.5mm Headset	T1A66AA
	HP Wired USB-A Stereo Headset	T1A67AA

### Summary of Changes

Date of change:	Version History:	Updated	Description of change:
February 2, 2021	V1 to V2	Update	Battery Life
February 9, 2021	V2 to V3	Added	Environmental Data
February 16, 2021	V3 to V4	Update	Wireless Section
February 18, 2021	V4 to V5	Update	Networking and Environmental section
February 25, 2021	V5 to V6	Update	Xerox DocuShare offer value
April 20, 2021	V6 to V7	Updated	Memory Section and Input/ Output Section Updated
May 6, 2021	V7 to V8	Add	HP Smart Support
May 14, 2021	V8 to V9	Add	AMDR5 Pro/R7 Pro Processors
May 25, 2021	V9 to V10	Update	Micro SD Card Reader
June 11, 2021	V10 to V11	Remove	HP WorkWell from Software and Security section
July 15, 2021	V11 to V12	Update	At a Glance section and Networking WLAN section
July 30, 2021	V12 to V13	Update	At a Glance section, added HP Wolf Pro and Accessories

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