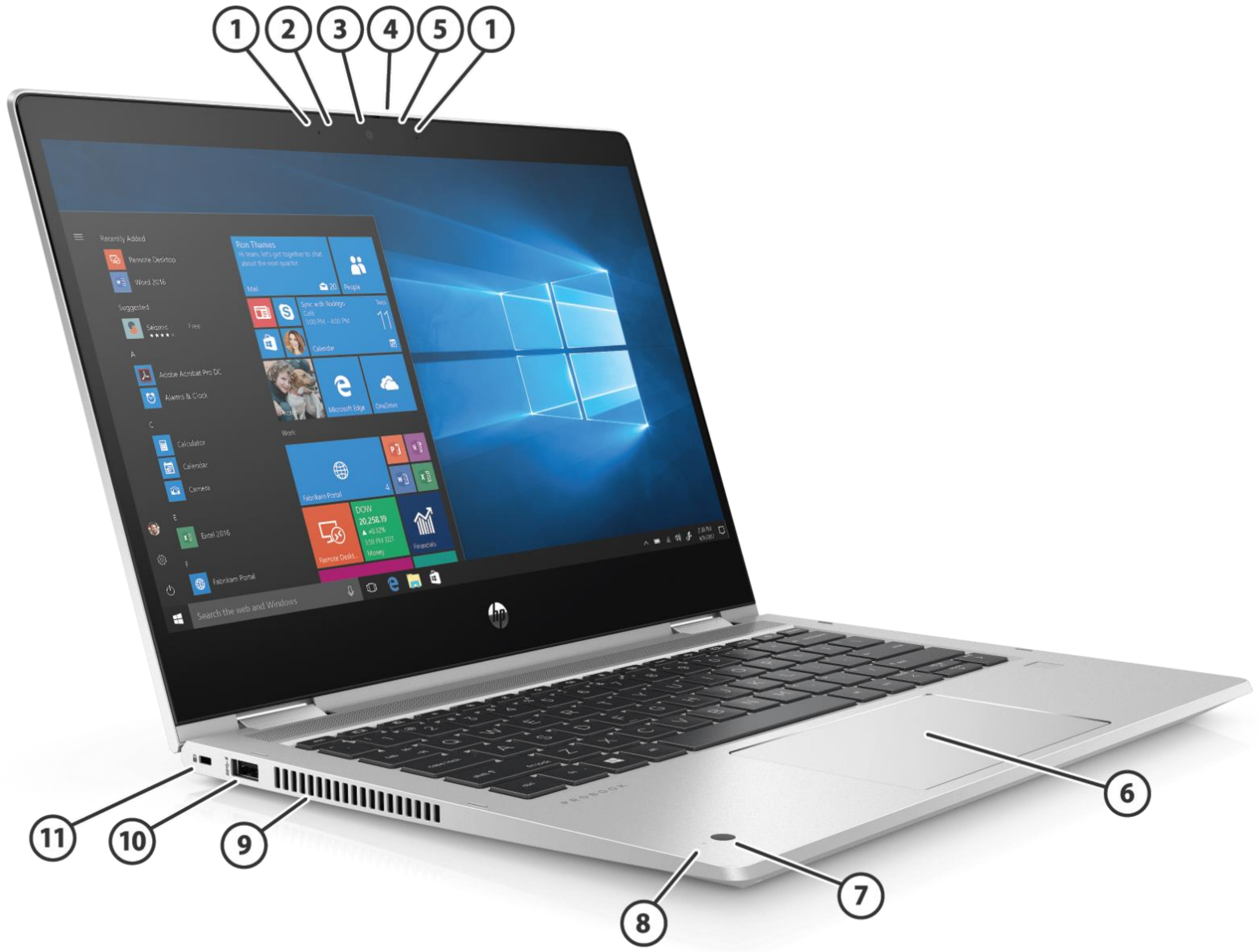
Overview

HP ProBook x360 435 G8 Notebook PC

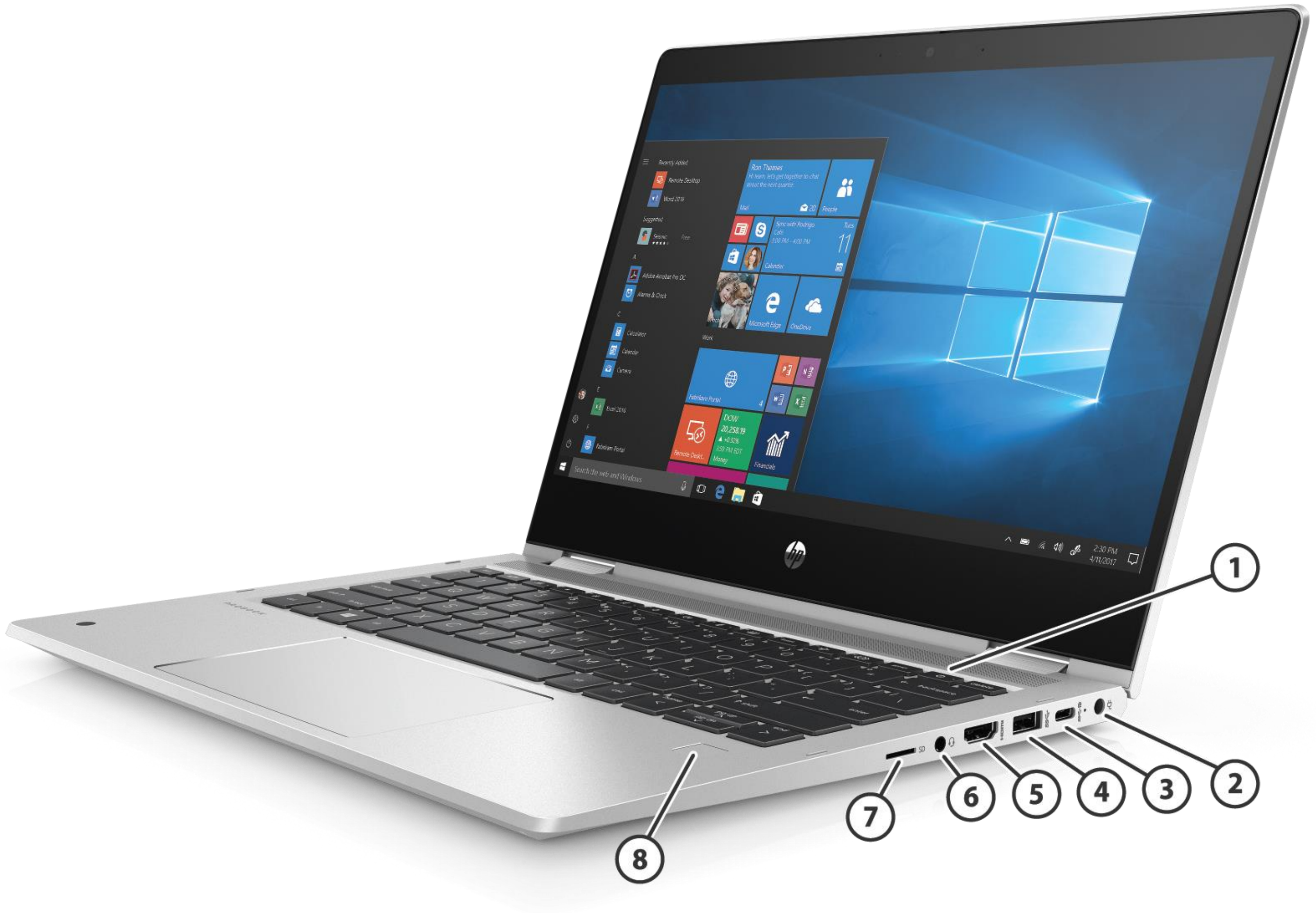


1. Internal Microphones
2. Webcam LED
3. Webcam and IR Camera (Optional)
4. HP Privacy Camera
5. IR Camera LED (Optional)
6. Clickpad

Left

7. World-facing Camera (Optional)
8. World-facing Camera LED (Optional)
9. Vents
10. SuperSpeed USB Type-A 5 Gbps signaling rate charging Port
11. Nano Security Lock Slot (Lock Sold Separately)

Overview



1. Power Button
2. Power Connector
3. SuperSpeed USB Type-C® 10Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)
4. SuperSpeed USB Type-A 5 Gbps signaling rate Port

Right

5. HDMI 1.4b Port (Cable not included)
6. Audio Combo Jack
7. MicroSD Card reader (Select Models)
8. Touch Fingerprint Sensor (Select models)

Overview

AT A GLANCE

- Preinstalled with Windows 10 versions or FreeDOS
- A stylish and professional convertible adapts with versatile use modes from traditional laptop to tablet, stand and tent that enables to create, present and collaborate
- Sleek and durable anodized aluminum top cover and keyboard deck
- Choice of AMD Ryzen™ 5000 series mobile processors
- Integrated AMD Radeon™ Graphics
- Display include your choice of 33.8 cm (13.3") diagonal IPS Wide Viewing Angle, FHD, touch screen with Corning® Gorilla® Glass 5
- Commercial-grade security features including HP Sure Start, HP Sure Sense, HP Client Security, HP Sure Click, Camera Privacy Shutter and optional HP Sure View
- Captures the world around with an optional world facing- camera in the keyboard[1]
- Supports wireless LAN options for connectivity on the go including gigabit data rate Wi-Fi® 6[1]
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles
- Undergoes MIL-STD 810H tests[2]

1. Sold separately or as an optional feature.
2. MIL STD 810H testing is not intended to demonstrate fitness for U.S. Department of Defense contract requirements or formilitary 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 x360 435 G8 Notebook PC

OPERATING SYSTEM

Preinstalled	Windows10 Pro 64 – HP recommends Windows 10 Pro[1] Windows10 Pro 64 (National Academic License)[2] Windows10 Home 64[1] Windows10 Home Single Language 64[1] Windows 10 Pro (Windows 10 Enterprise available with a Volume Licensing Agreement)[1] Windows10 Enterprise 64 (Web Support)[1] 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 with Radeon™ Graphics (2.6 GHz base clock, up to 4.0 GHz max boost clock, 8 MB L3 cache, 4 cores) [3,4,5,6]
AMD Ryzen™ 3 Pro 5450U with Radeon™ Graphics (2.6 GHz base clock, up to 4.0 GHz max boost clock, 8 MB L3 cache, 4 cores) [3,4,5,6] **Available April 2021**
AMD Ryzen™ 5 5600U with Radeon™ Graphics (2.3 GHz base clock, up to 4.2 GHz max boost clock, 16 MB L3 cache, 6 cores) [3,4,5,6]
AMD Ryzen™ 5 Pro 5650U with Radeon™ Graphics (2.3 GHz base clock, up to 4.2 GHz max boost clock, 16 MB L3 cache, 6 cores) [3,4,5,6] **Available April 2021**
AMD Ryzen™ 7 5800U with Radeon™ Graphics (1.9 GHz base clock, up to 4.4 GHz max boost clock, 16 MB L3 cache, 8 cores) [3,4,5,6]
AMD Ryzen™ 7 Pro 5850U with Radeon™ Graphics (1.9 GHz base clock, up to 4.4 GHz max boost clock, 16 MB L3 cache, 8 cores) [3,4,5,6] **Available April 2021**

Processor Family

AMD Ryzen™ 3 processor[6]
AMD Ryzen™ 5 processor[6]
AMD Ryzen™ 7 processor[6]

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.

CHIPSET

Chipset is integrated with processor.

GRAPHICS

Integrated
AMD Radeon™ Graphics

Supports
Support HD decode, DX12, HDMI1.4b[7], via HDMI up to 4K 30Hz

7. HDMI cable sold separately.

DISPLAY

Touch

33.8 cm (13.3") diagonal FHD UWVA eDP BrightView WLED-backlit touch screen with Corning® Gorilla® Glass 5, 250 nits, 45% NTSC with HD camera (1920 x 1080) [8,9,10]
33.8 cm (13.3") diagonal FHD UWVA eDP BrightView WLED-backlit touch screen with Corning® Gorilla® Glass 5, 250 nits, 45% NTSC with HD + IR camera (1920 x 1080) [8,9,10]
33.8 cm (13.3") diagonal FHD UWVA eDP + PSR BrightView WLED-backlit touch screen with Corning® Gorilla® Glass 5, Low Power, 400 nits, 72% NTSC with HD camera (1920 x 1080) [8,9,10]
33.8 cm (13.3") diagonal FHD UWVA eDP + PSR BrightView WLED-backlit touch screen with Corning® Gorilla® Glass 5, Low Power, 400 nits, 72% NTSC with HD + IR camera (1920 x 1080) [8,9,10]
HP Sure View Integrated Privacy Screen 33.8 cm (13.3") diagonal FHD UWVA eDP + PSR BrightView WLED-backlit touch screen with Corning® Gorilla® Glass 5, 1000 nits, 72% NTSC with HD camera (1920 x 1080) [8,9,10,11]
HP Sure View Integrated Privacy Screen 33.8 cm (13.3") diagonal FHD UWVA eDP + PSR BrightView WLED-backlit touch screen with Corning® Gorilla® Glass 5, 1000 nits, 72% NTSC with HD + IR camera (1920 x 1080) [8,910,11]

8. FHD/HD content required to view FHD/HD images.
9. Resolutions are dependent upon monitor capability, and resolution and color depth settings.
10. Actual brightness will be lower with touchscreen or Sure View.
11. 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® Gen3x4 NVMe™ TLC Solid State Drive [12]
256 GB PCIe® NVMe™ Value Solid State Drive [12]
512 GB PCIe® NVMe™ Value Solid State Drive [12]
512 GB PCIe® Gen3x4 NVMe™ TLC Solid State Drive [12]
1 TB PCIe® Gen3x4 NVMe™ TLC Solid State Drive [12]

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

MEMORY

Maximum Memory
32 GB DDR4-3200 SDRAM [13]

Memory
32 GB DDR4 -3200 SDRAM (2 x 16GB) [13]
16 GB DDR4-3200 SDRAM (1 x 16 GB) [13]
16 GB DDR4-3200 SDRAM (2 x 8 GB) [13]
8 GB DDR4-3200 SDRAM (1 x 8 GB) [13]
8 GB DDR4-3200 SDRAM (2 x 4 GB) [13]
4 GB DDR4-3200 SDRAM (1 x 4 GB) [13]

Memory Slots
2 SODIMM
Both slots are customer accessible / upgradeable by IT or self-maintainers only.
DDR4 PC4 SODIMMS, system runs at 3200
Supports Dual Channel Memory

13. 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 [14]
Intel® Dual Band Wireless-AC 9260 802.11a/b/g/n/ac (2x2) Wi-Fi ®and Bluetooth® 5 Combo, non-vPro® [14]
Intel® AX200 Wi-Fi 6 (2x2) and Bluetooth® 5 Combo, non-vPro® [15]

Miracast
Native Miracast Support [16]

14. 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.
15. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 (802.11ax) is backwards compatible with prior 802.11 specs. Only available in countries where 802.11ax is supported.
16. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.

AUDIO/MULTIMEDIA

Audio
Integrated microphone (Dual Array)
2 Integrated stereo speakers

Speaker Power
2W/4ohm Per speaker

Camera
User-facing 720p HD camera [17,18]
User-facing 720p HD + IR camera [17,18]
World-facing 5MP auto-focus secondary camera [18]

Sensors
Combo Chip (Accelerometer + Gyro)
Magnetometer
Hall Sensor

17. 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 with DuraKeys and optional backlit [19]

Pointing Device

Clickpad with multi-touch gesture support

Function Keys

F1 - Display Switching
F2 - Blank or Privacy (with LED)
F3 - Brightness Down
F4 - Brightness Up
F5 - Audio Mute
F6 - Volume Down
F7 - Volume Up
F8 - Mic Mute
F9 - Blank or Keyboard Backlit Toggle
F10 - Insert
F11 - Airplane Mode
F12 - HP Programmable Key
Power Button

Hidden Function Keys

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

19. Backlit keyboard is an optional feature.

SOFTWARE AND SECURITY

Preinstalled Software
BIOS

HP BIOSphere Gen6[20]
BIOS Update via Network
HP Secure Erase[21]
Absolute Persistence Module[22]
HP Wake on WLAN

Software

HP Connection Optimizer[23]
HP Hotkey Support
HP Support Assistant[24]
HP Noise Cancellation Software
Buy Office (Sold separately)
Microsoft Defender[25]
HP Smart Support [45]

Technical Specifications

Manageability Features
HP Driver Packs (download)[26]
HP Client Catalog (download)
HP Manageability Integration Kit Gen4(download)[27]
HP Image Assistant (download)

Security Management
TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)
USB enable/disable (via BIOS)
Setup password (via BIOS)
Support for chassis padlocks and cable lock devices
HP Sure Click[28]
HP Sure Sense[29]
HP Sure Start Gen7 [30]
HP Sure View Gen3[31]
HP Sure Admin[32]
HP Wolf Pro Security Edition[33]
HP Fingerprint Sensor (Select models) [34]

20. HP BIOSphere Gen6 is available on select HP Pro and Elite PCs. Features may vary depending on the platform and configurations.
21. 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™.
22. 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/
23. HP Connection Optimizer requires Windows 10.
24. HP Support Assistant requires Windows and Internet access.
25. Windows 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://www8.hp.com/us/en/ads/clientmanagement/overview.html.
28. HP Sure Click requires Windows 10 Pro or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.
29.HP Sure Sense is available on select HP PCs and is not available with Windows10 Home.
30. HP Sure Start Gen6 is available on select HP PCs and requires Windows 10.
31. HP Sure View Gen3 integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
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 as that EULA is modified by the following: “7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition (HP Sure Sense Pro and HP Sure Click Pro) is effective upon activation and will continue for either a twelve (12) month or thirty-six (36) month license term (“Initial Term”). At the end of the Initial Term you may either (a) purchase a

renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support.

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

45. 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.

POWER

Power Supply
HP Smart 65 W External AC power adapter [35]
HP Smart 65 W EM External AC power adapter [35]
HP Smart 65 W USB Type-C adapter [35]
HP Smart 45 W External AC power adapter [35]
HP Smart 45 W USB Type-C adapter [35]

Power Cord
3-wire plug - 1m [35]
2-wire plug - 1m [35]

Primary Battery
HP Long Life 3-cell, 45 Wh Li-ion polymer [36,37]
Support HP Fast Charge (Up to 50% in 30 minutes with 65W AC Adapter)[38]

Battery life
Up to 17 hours [39]

35. Availability may vary by country.
36. Battery is internal and not replaceable by customer. Serviceable by warranty.
37. 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.
38. Supports HP Fast Charge with 65W AC Adapter. 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.
39. 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 for additional details.

Technical Specifications

WEIGHTS & DIMENSIONS

Weight
Starting at 3.19 lb (1.45 kg)[40]

Dimensions (w x d x h)
12.15 x 8.78 x 0.71 in
30.85 x 22.295 x 1.795 cm

[40] Weight will vary by configuration.

PORTS/SLOTS

Ports

1 SuperSpeed USB Type-C® 10Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)
2 SuperSpeed USB Type-A 5 Gbps signaling rate (1 charging port)
1 HDMI 1.4b[41]
1 Headphone/microphone combo jack
1 AC power

Expansion Slots
1 microSD
Supports SD, SDHC, SDXC

[41] HDMI cable sold separately.

Technical Specifications

SERVICE AND SUPPORT

1-year and 3-year limited warranties 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. [42]

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

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	**Nominal Operating Voltage**	19 V
	Average Operating Power	5.71 w
	Integrated Graphics	AMD
	Max Operating Power	UMA < 45W
Temperature	**Operating**	41° to 95° F (5° 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 10,000 ft (-15.24 to 3,048 m)
Planned Industry Standard Certifications	**UL**	Yes
	CSA	Yes
	FCC Compliance	Yes
	ENERGY STAR®	Yes, Select models[43]
	EPEAT®	Yes, Gold in U.S.[44]
	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
	EAC	Yes
	Saudi Arabian Compliance (ICCP)	Yes
	SABS	Yes
	UKRSERTCOMPUTER	Yes

43. Configurations of the HP ProBook x360 435 G7 G8 that are ENERGY STAR® qualified are identified as HP ProBook x360 435 G8 ENERGY STAR on HP websites and on http://www.energystar.gov.

44. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. EPEAT® status varies by country. Visit www.epeat.net for more information.

DISPLAYS

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

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

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

Technical Specifications

Panel LCD 13.3 inch diagonal FHD (1920 x 1080) Anti-Glare WLED UWVA 72% NTSC 400 nits eDP 1.4+PSR2 ultraslim	**Outline Dimensions (W x H x D)**	299.06 x 185.54 mm (max)
	Active Area	293.76 x 165.24 mm (typ.)
	Weight	170 g (max)
	Diagonal Size	13 inch
	Thickness	2.0 mm (max)
	Interface	eDP 1.4 + PSR2 (2 lane)
	Surface Treatment	BrightView Glass
	Touch Enabled	Yes
	Contrast Ratio	1200:1 (typ.)
	Refresh Rate	60 Hz
	Brightness[1]	400 nits
	Pixel Resolution	1920 x 1080 (FHD)
	Format of LCD Pixel Arrangement	RGB
	Backlight	LED
	Color Gamut Coverage	72% NTSC
	Color Depth	8 bits
	Viewing Angle	UWVA 85/85/85/85

Technical Specifications

Panel LCD 13.3 inch diagonal FHD (1920 x 1080) BrightView WLED UWVA 72% NTSC 1000 nits eDP 1.4+PSR2 flat Privacy NWBZ	**Outline Dimensions (W x H x D)**	298.76 x 186.04 mm (typ.)
	Active Area	293.76 x 165.24 mm (typ.)
	Weight	255 g (max)
	Diagonal Size	13.3 inch
	Thickness	3.0 mm (max)
	Interface	eDP 1.4 + PSR2
	Surface Treatment	BrightView Glass
	Touch Enabled	Yes
	Contrast Ratio	2000:1 (typ.)
	Refresh Rate	60 Hz
	Brightness[1]	1000 nits
	Pixel Resolution	1920 x 1080(FHD)
	Format of LCD Pixel Arrangement	RGB
	Backlight	LED
	Color Gamut Coverage	72% NTSC
	Color Depth	8 bit
	Viewing Angle	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.

128 GB 2280 M2 PCIe NVMe TLC Solid State Drive	**Form Factor**	M.2 2280
	Capacity	128 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe
	Maximum Sequential Read	1300~2047MB/s
	Maximum Sequential Write	800~1200MB/s
	Logical Blocks	250,069,680
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security; DIPM; TRIM; DEVSLP

256 GB 2280 PCIe NVMe Value Solid State Drive	**Form Factor**	M.2 2280
	Capacity	256 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe
	Maximum Sequential Read	Around 1500 ~ 1700 MB/s
	Maximum Sequential Write	Around 780 ~ 1300 MB/s
	Logical Blocks	500118192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security; TRIM; L1.2

Technical Specifications

SSD 512 GB 2280 M2 PCIe-3x4 SS NVMe TLC	**Form Factor**	M.2 2280
	Capacity	512 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	Around 2700 ~ 3400 MB/s
	Maximum Sequential Write	Around 1390 ~ 2956 MB/s
	Logical Blocks	1000215215
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security; TRIM; L1.2

SSD 512 GB 2280 PCIe NVMe Value	**Form Factor**	M.2 2280
	Capacity	512 GB
	NAND Type	TLC/QLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe
	Maximum Sequential Read	Around 1500 ~ 1700 MB/s
	Maximum Sequential Write	Around 860 ~ 1500 MB/s
	Logical Blocks	1000215215
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security; TRIM; L1.2

Technical Specifications

SSD 1TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided	**Form Factor**	M.2 2280
	Capacity	1 TB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	3100 ~ 3500 MB/s
	Maximum Sequential Write	2770 ~ 3037 MB/s
	Logical Blocks	2000409264
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security; TRIM; L1.2

Technical Specifications

NETWORKING/COMMUNICATIONS

Realtek RTL8822CE 802.11ac 2x2 Wi-Fi® and Bluetooth® 5.0[1]	**Wireless LAN Standards**	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 866.7Mbps
	Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	Security[3]	•IEEE 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[2]	• 802.11b: +18.5dBm minimum • 802.11g: +17.5dBm minimum • 802.11a: +18.5dBm minimum • 802.11n HT20(2.4GHz): +15.5dBm minimum • 802.11n HT40(2.4GHz): +14.5dBm minimum • 802.11n HT20(5GHz): +15.5dBm minimum • 802.11n HT40(5GHz): +14.5dBm minimum • 802.11ac VHT80(5GHz): +11.5dBm minimum	
Power Consumption	•Transmit mode: 2.0 W •Receive mode: 1.6 W •Idle mode (PSP)180 mW (WLAN Associated) •Idle mode: 50 mW (WLAN unassociated) •Connected Standby/Modern Standby: 10mW •Radio disabled: 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[4]	802.11b, 1Mbps: -93.5dBm maximum 802.11b, 11Mbps: -84dBm maximum 802.11a/g, 6Mbps: -86dBm maximum 802.11a/g, 54Mbps: -72dBm maximum 802.11n, MCS07: -67dBm maximum 802.11n, MCS15: -64dBm maximum 802.11ac, MCS0: -84dBm maximum 802.11ac, MCS9: -59dBm maximum	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard with CNVi Interface	
Dimensions	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
Weight	1. Type 2230: 2.8 g 2. Type 126: 1.3 g	
Operating Voltage	3.3 v +/- 9%	
Temperature	**Operating**	14° to 158° F (–10° to 70° C)
	Non-operating	–40° to 176° F (–40° to 80° C)
Humidity	**Operating**	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	**Operating**	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)

LED Activity	LED Amber – Radio OFF LED OFF – Radio ON

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

Bluetooth Specification	4.0/4.1/4.2/5.0 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps signaling data rate[1] 2.17 Mbps BLE: 1 Mbps signaling data rate[1] 0.2 Mbps 1. Actual throughput may vary. Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2

Technical Specifications

Headset Profile (HSP)
Hands Free Profile (HFP)
Advanced Audio Distribution Profile (A2DP)

1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 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).

Intel® Wi-Fi 6 AX200 and Bluetooth® 5.0 (802.11ax 2 x 2, supporting gigabit data rate) non-vPro[1,5]	**Wireless LAN Standards**	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	Wi-Fi certified
	Frequency Band	•802.11b/g/n/ax 2.402 – 2.482 GHz •802.11a/n/ac/ax 4.9 – 4.95 GHz (Japan) 5.15 – 5.25 GHz 5.25 – 5.35 GHz 5.47 – 5.725 GHz 5.825 – 5.850 GHz
	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 : 1733Mbps •802.11ax : max 2.4Gbps
	Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
	Security[3]	•IEEE 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

Technical Specifications

Output Power[2]	• 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 • 802.11n HT20(5GHz) : +14dBm minimum • 802.11n HT40(5GHz) : +13dBm minimum • 802.11ac VHT80(5GHz) : +10dBm minimum • 802.11ac VHT160(5GHz) : +10dBm minimum • 802.11ax HE40(2.4GHz) : +12dBm minimum • 802.11ax HE80(5GHz) : +10dBm minimum • 802.11ax HE160(5GHz) : +10dBm minimum
Power Consumption	•Transmit mode: 2.0 W •Receive mode: 1.6 W •Idle mode (PSP)180 mW (WLAN Associated) •Idle mode: 50 mW (WLAN unassociated) •Connected Standby/Modern Standby: 10mW •Radio disabled: 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[4]	802.11b, 1Mbps: -93.5dBm maximum 802.11b, 11Mbps: -84dBm maximum 802.11a/g, 6Mbps: -86dBm maximum 802.11a/g, 54Mbps: -72dBm maximum 802.11n, MCS07: -67dBm maximum 802.11n, MCS15: -64dBm maximum 802.11ac, MCS0(VHT80) : -84dBm maximum 802.11ac, MCS9(VHT80) : -59dBm maximum 802.11ac, MCS9(VHT160): -58.5dBm maximum 802.11ax, MCS11(HE40): -57dBm maximum 802.11ax, MCS11(HE80): -54dBm maximum 802.11ax, MCS11(HE160): -53.5dBm maximum
Antenna type	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
Form Factor	PCI-Express M.2 MiniCard
Dimensions	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	1. Type 2230: 2.8 g 2. Type 126: 1.3 g

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

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

Technical Specifications

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)
BT5.1
ESR9/10 Compliance
LE Advertisement Extensions
Channel Selection Algo
Limited High Duty Cycle Non-Connectable Advertising
2Mbps LE
LE Long Range

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.

Intel® 9260 802.11a/b/g/n/ac (2 x 2) Wi-Fi® and Bluetooth® 5 Combo[1] (Non-vPro)	**Wireless LAN Standards**	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[3]	•IEEE 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[2]	• 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 • 802.11n HT20(5GHz): +14dBm minimum • 802.11n HT40(5GHz): +13dBm minimum • 802.11ac VHT80(5GHz): +10dBm minimum • 802.11ac VHT160(5GHz): +10dBm minimum	
Power Consumption	•Transmit mode: 2.0 W •Receive mode: 1.6 W •Idle mode (PSP)180 mW (WLAN Associated) •Idle mode: 50 mW (WLAN unassociated) •Connected Standby/Modern Standby: 10mW •Radio disabled: 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[4]	802.11b, 1Mbps: -93.5dBm maximum 802.11b, 11Mbps: -84dBm maximum 802.11a/g, 6Mbps: -86dBm maximum 802.11a/g, 54Mbps: -72dBm maximum 802.11ac, MCS0(VHT80): -84dBm maximum 802.11ac, MCS9(VHT80): -59dBm maximum 802.11ac, MCS9(VHT160): -58.5dBm maximum	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
Weight	1. Type 2230: 2.8 g 2. Type 126: 1.3 g	
Operating Voltage	3.3 v +/- 9%	
Temperature	**Operating**	14° to 158° F (–10° to 70° C)
	Non-operating	–40° to 176° F (–40° to 80° C)
Humidity	**Operating**	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	**Operating**	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)

Technical Specifications

LED Activity	LED Amber – Radio OFF LED OFF – Radio ON

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

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Signaling Data Rate	Legacy: 3 Mbps signaling data rate[1] 2.17 Mbps BLE: 1 Mbps signaling data rate[1] 0.2 Mbps 1. Actual throughput may vary. Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
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Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX)

Basic Imaging Profile (BIP)2
Headset Profile (HSP)
Hands Free Profile (HFP)
Advanced Audio Distribution Profile (A2DP)

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

POWER

HP 45 W USB type C Straight 1.8 m AC Adapter	**Dimensions**	94.0 mm x 40.0 mm x 26.5 mm	
	Weight	192.5 g +/- 10 g (Not including power cord. Power cord varies by country)	
	Input	**Input Efficiency**	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%
		Input frequency range	47 ~ 63 Hz
		Input AC current	Max. 1.4 A at 90 VAC
	Output	**Output power**	5V/15W 9V/27W 12V/36W 15V/45W
		DC output	5V / 9V / 12V / 15V
		Hold-up time	5ms at 115 Vac input
		Output current limit	< 5.0A
	Connector	USB Type-C™	
	Environmental Design	**Operating temperature**	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° 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	CE Mark - full compliance with LVD and EMC directives. Worldwide safety standards - IEC60950-1 and/or IEC62368-1, EN60950-1 and/or EN62368-1, UL60950-1 and/or UL62368-1 , Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, NOM-001 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

HP 45 W Smart AC adapter	**Dimensions**	3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm)	
	Weight	0.386 lb (175g) max (Not including power cord. Power cord varies by country)	
	Input	90 to 265 VAC	
		Input Efficiency	87.74% at 115Vac and 88.4% at 230Vac
		Input frequency range	47 ~ 63 Hz
		Input AC current	1.4 A at 90 VAC
	Output	**Output power**	45 W
		DC output	19.5 V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<8.0A

	Connector	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords	
	Environmental Design	**Operating temperature**	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° 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	CE Mark - full compliance with LVD and EMC directives. Worldwide safety standards - IEC60950-1 and/or IEC62368-1, EN60950-1 and/or EN62368-1, UL60950-1 and/or UL62368-1 , Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, NOM-001 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5 mm Right Angle 1.8 m 2prong	**Dimensions**	95.0 x 40.0 x 26.5 mm	
	Weight	200 g +/- 10 g (Not including power cord. Power cord varies by country)	
	Input	**Input Efficiency**	87.74% at 115Vac and 88.4% at 230Vac
		Input frequency range	47 ~ 63 Hz
		Input AC current	1.4 A at 90 VAC
	Output	**Output power**	45 W
		DC output	19.5 V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<8.0A
	Connector	C6	
	Environmental Design	**Operating temperature**	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° 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	CE Mark - full compliance with LVD and EMC directives. Worldwide safety standards - IEC60950-1 and/or IEC62368-1, EN60950-1 and/or EN62368-1, UL60950-1 and/or UL62368-1 , Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, NOM-001 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

Technical Specifications

AC Adapter 65 Watt nPFC Standard USB Type-C Straight 1.8 m	**Dimensions**	90.0 x 51 x 28.5 mm	
	Weight	250 g +/- 10 g (Not including power cord. Power cord varies by country)	
	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**	65 W
		DC output	5V/9V/12V/15V/20V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<8.0A MAXIMUM
	Connector	USB Type-C™	
	Environmental Design	**Operating temperature**	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° 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	CE Mark - full compliance with LVD and EMC directives. Worldwide safety standards - IEC60950-1 and/or IEC62368-1, EN60950-1 and/or EN62368-1, UL60950-1 and/or UL62368-1 , Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, NOM-001 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

AC Adapter 65 Watt Smart nPFC EM Barrel 4.5 mm New EM	**Dimensions**	102 x 55 x 30 mm	
	Weight	250 g +/- 10 g (Not including power cord. Power cord varies by country)	
	Input	**Input Efficiency**	88.0 % at 115 Vac and 89.0 % at 230Vac
		Input frequency range	47 ~ 63 Hz
		Input AC current	1.7 A at 90 Vac
	Output	**Output power**	65 W
		DC output	19.5 V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<11.0 A
	Connector	C6	
	Environmental Design	**Operating temperature**	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° 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	CE Mark - full compliance with LVD and EMC directives. Worldwide safety standards - IEC60950-1 and/or IEC62368-1, EN60950-1 and/or EN62368-1, UL60950-1 and/or UL62368-1 , Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, NOM-001 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

AC Adapter 65 Watt Smart nPFC Standard Barrel 4.5 mm Right Angle 1.8 m	**Dimensions**	90.0 x 51 x 28.5 mm	
	Weight	230 g +/- 10 g (Not including power cord. Power cord varies by country)	
	Input	**Input Efficiency**	88.0 % at 115 Vac and 89.0 % at 230Vac
		Input frequency range	47 ~ 63 Hz
		Input AC current	1.7 A at 90 Vac
	Output	**Output power**	65 W
		DC output	19.5 V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<11.0 A
	Connector	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords	
	Environmental Design	**Operating temperature**	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° 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	CE Mark - full compliance with LVD and EMC directives. Worldwide safety standards - IEC60950-1 and/or IEC62368-1, EN60950-1 and/or EN62368-1, UL60950-1 and/or UL62368-1 , Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, NOM-001 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

Technical Specifications

Battery SX 3 Cell 45 Wh Long Life -PL Fast Charge	**Dimensions** (H x W x L)	184.62 x 85.25 x 6.15 mm	
	Weight	0.195 kg Max	
	Cells/Type	3cell Lithium-Ion Polymer cell	
	Energy	**Voltage**	13.2V / 11.55V (13.2V / 11.4V)
		Amp-hour capacity	3.9 Ah / 3.75 Ah (3.95 Ah / 3.79 Ah)
		Watt-hour capacity	45 Wh
	Temperature	**Operating (Charging)**	32˚ to 113˚ F (0˚ to 45˚ C)
		Operating (Discharging)	14˚ to 122˚ F (-10˚ to 60˚ C)
	Optional Travel Battery Available	No	
	Warranty	Based on system offering	

Technical Specifications

ENVIRONMENTAL DATA

Eco-Label Certifications & declarations	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: • IT ECO declaration • US ENERGY STAR® • US Federal Energy Management Program (FEMP) • EPEAT® Gold registered in the United States. See http://www.epeat.net for registration status in your country. • TCO 8.0 • China Energy Conservation Program (CECP) • China State Environmental Protection Administration (SEPA) • Taiwan Green Mark • Korea Eco-label • Japan PC Green label*		
Sustainable Impact Specifications	• 35% post-consumer recycled plastic • External Power Supply 90% Efficiency • Low halogen • Outside Box and corrugated cushions are 100% sustainably sourced and recyclable • Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable • Recycled Plastic cushions • Bulk packaging available		
System Configuration	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.		
Energy Consumption (in accordance with US ENERGY STAR® test method)	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 50Hz**
Normal Operation (Sort idle)	5.68 W	5.85 W	5.73 W
Normal Operation (Long idle)	0.81 W	0.83 W	0.79 W
Sleep	0.81 W	0.83 W	0.79 W
Off	0.22 W	0.25 W	0.22 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)	19 BTU/hr	20 BTU/hr	20 BTU/hr
Normal Operation (Long idle)	3 BTU/hr	3 BTU/hr	3 BTU/hr
Sleep	3 BTU/hr	3 BTU/hr	3 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_{WAd}, bels)	Sound Pressure (L_{pAm}, decibels)
Typically Configured – Idle	2.6	15.4
Fixed Disk – Random writes	2.6	15.4
Optical Drive – Sequential reads	4.1	20.7

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.
Additional Information	• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC. • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. • This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986). • This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see www.epeat.net • Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043. • This product is 94.1% recycle-able when properly disposed of at end of life.

Packaging Materials	**Externa:**	PAPER/Corrugated	256g
	Internal:	PAPER/Molded pulp	171 g
		PLASTIC/Polyethylene low density	14 g

		PLASTIC/polypropylene	3
	The plastic packaging material contains at least 0% recycled content.		
	The corrugated paper packaging materials contains at least 61.7% recycled content.		
RoHS Compliance	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. 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. 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 HP RoHS position statement.		
Material Usage	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 http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html): • Asbestos • Certain Azo Colorants • Certain Brominated Flame Retardants – may not be used as flame retardants in plastics • Cadmium • Chlorinated Hydrocarbons • Chlorinated Paraffins • Bis(2-Ethylhexyl) phthalate (DEHP) • Benzyl butyl phthalate (BBP) • Dibutyl phthalate (DBP) • Diisobutyl phthalate (DIBP) • Formaldehyde • Halogenated Diphenyl Methanes • Lead carbonates and sulfates • Lead and Lead compounds • Mercuric Oxide Batteries • Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user. • Ozone Depleting Substances • Polybrominated Biphenyls (PBBs) • Polybrominated Biphenyl Ethers (PBBEs) • Polybrominated Biphenyl Oxides (PBBOs) • Polychlorinated Biphenyl (PCB) • Polychlorinated Terphenyls (PCT) • Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications. • Radioactive Substances • Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)		

Technical Specifications

Packaging Usage	HP follows these guidelines to decrease the environmental impact of product packaging: • Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.
End-of-life Management and Recycling	HP offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. 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: http://www.hp.com/go/recyclers. 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.
HP, Inc. Corporate Environmental Information	For more information about HP's commitment to the environment: Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html ISO 14001 certificates: http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842 and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf
footnotes	• Percentage of ocean-bound plastic contained in each component varies by product • Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard. • External power supplies, WWAN modules, power cords, cables and peripherals excluded. • 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers. • Fiber cushions made from 100% recycled wood fiber and organic materials. • Plastic cushions are made from >90% recycled plastic.

COUNTRY OF ORIGIN

China

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

Type	Description	Part #
Cases	HP Essential Top Load Case	H2W17AA
	HP Essential Backpack (up to 15.6")	H1D24AA
Docking	HP USB-C Mini Dock	1PM64AA
	HP Thunderbolt Dock 120W G2	2UK37AA
	HP TB Dock G2 w/ Combo Cable	3TR87AA
	HP TB Dock 120W G2 w/Audio	3YE87AA
	HP TB Dock 120W G2 cable	3XB94AA
	HP TB Dock G2 combo cable	3XB96AA
	HP TB Dock 120W G2 Cable	3XB94AA
	HP TB Dock G2 Combo Cable	3XB96AA
	HP TB Dock G2 Audio Module	3AQ21AA
	HP USB-C/A Universal Dock G2	5TW13AA
	HP USB-C Dock G5	5TW10AA
Input/Output	HP Comfort Grip Wireless Mouse	H2L63AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP USB Travel Mouse	G1K28AA
	HP Ultra Mobile Wireless Mouse	H6F25AA
	HP USB Fingerprint Mouse	4TS44AA
	HP USB-C to DP	N9K78AA
	HP USB-C to USB-A Hub	Z6A00AA
	HP Elite USB-C Multi Port Hub	4WX89AA
	HP Pro Pen	8JU62AA
	HP USB-C to RJ45 Adapter	V7W66AA
Power	HP 45W Smart AC Adapter 4.5mm	H6Y88AA
	HP 65W Smart AC Adapter 4.5mm	H6Y89AA
	HP 45W LC USB-C Power Adapter	1MZ01AA
	HP 65W LC USB-C Power Adapter	TBD
	USB-C NB Power Bank	1TZ86AA
	HP Essential Power Bank	3TB55AA
Storage	HP External USB Optical Drive	F2B56AA
Memory	HP 4GB DDR4 3200 Memory	286H5AA
	HP 8GB DDR4 3200 Memory	286H8AA
	HP 16GB DDR4 3200 Memory	286J1AA

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

Security	HP Sure Key Cable Lock	6UW42AA
	HP Nano Keyed Cable Lock	1AJ39AA

Summary of Changes

Date of change:	Version History:	Update:	Description of change:
February 10, 2021	V1 to V2		Processor specs and Environmental Data
March 9, 2021	V2 to V3	Removed	USB-C to RJ45 Adapter
March 17, 2021	V3 to V4	Updated	Environmental Data
March 19, 2021	V4 to V5	Updated	Processor section
April 20, 2021	V5 to V6	Updated	Memory Section and Input/ Output Section Updated
May 6, 2021	V6 to V7	Updated	TPM 2.0/Added HP Smart Support
May 27, 2021	V7 to V8	Updated	HP Pro Security Edition to HP Wolf Pro Security Edition
June 17, 2021	V8 to V9	Add	Select Models for Micro SD Card Reader in Overview section
July 19, 2021	V9 to V10	Updated	Networking WLAN; Power section and At a Glance section