

Overview

HP ProBook 445 G8 Notebook PC



Left

- | | |
|--|---|
| 1. Internal Microphones (2) | 6. Clickpad |
| 2. Webcam LED (Optional) | 7. SuperSpeed USB Type-A 5 Gbps signaling rate Power Port |
| 3. HD and IR Camera (Optional) | 8. Ethernet Port (RJ-45) |
| 4. Camera Shutter (Only available with webcam) | 9. 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 |
| 3. SuperSpeed USB Type-A 5 Gbps signaling rate Charging Port | 8. Touch Fingerprint Sensor (Select models) |
| 4. SuperSpeed USB Type-A 5 Gbps signaling rate Port | |
| 5. HDMI 1.4b Port (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, R7, R5 and R3
- 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 35.56 cm (14.0") diagonal HD, Ultra Wide Viewing Angle FHD, Touch or Non-Touch screen, 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 options including the HP Universal Dock G5
- Undergoes MIL-STD 810H tests ¹
- Battery Life up to 15 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 445 G8 Notebook PC

OPERATING SYSTEM

Preinstalled Windows 10 Pro 64 – HP recommends Windows 10 Pro for business ¹
Windows 10 Pro 64 (National Academic License) ²
Windows 10 Home 64 ¹
Windows 10 Home Single Language 64 ¹
Windows 10 Pro (Windows 10 Enterprise available with a Volume Licensing Agreement) ¹
Windows 10 Enterprise 64¹ (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)^{3,4,5,6}

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)^{3,4,5,6}

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)^{3,4,5,6}

Processor Family

AMD Cezanne™ 5000 Series Mobile Processors 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.

Technical Specifications

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>.

GRAPHICS

Integrated

AMD Radeon™ Graphics

Supports

Support HD decode, DX12, HDMI 1.4 ⁷

7. HDMI cable sold separately.

DISPLAY

Non-Touch

- 35.6 cm (14") diagonal HD SVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC (1366 x 768) ^{9,10}
- 35.6 cm (14") diagonal HD SVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD camera (1366 x 768) ^{9,10}
- 35.6 cm (14") diagonal HD SVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD+IR camera (1366 x 768) ^{9,10}
- 35.6 cm (14") diagonal FHD UWVA eDP+PSR anti-glare, low power narrow bezel bent, 400 nits, 100% sRGB for HD camera (1920 x 1080) ^{9,10}
- 35.6 cm (14") diagonal FHD UWVA eDP+PSR anti-glare, low power narrow bezel bent, 400 nits, 100% sRGB for HD+IR camera (1920 x 1080) ^{9,10}
- 35.6 cm (14") diagonal FHD UWVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC (1920 x 1080) ^{9,10}
- 35.6 cm (14") diagonal FHD UWVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD camera (1920 x 1080) ^{9,10}
- 35.6 cm (14") diagonal FHD UWVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD + IR camera (1920 x 1080) ^{9,10}
- 35.6 cm (14") 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) ^{9,10,11,12}
- 35.6 cm (14") 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) ^{9,10,11,12}

HDMI⁸

Supports resolution 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.

Technical Specifications

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.

STORAGE AND DRIVES

Primary M.2 Storage

- 128 GB PCIe® NVMe™ M.2 TLC Solid State Drive ¹³
- 256 GB PCIe® NVMe™ M.2 Value Solid State Drive ¹³
- 512 GB PCIe® NVMe™ M.2 Value Solid State Drive ¹³
- 1 TB PCIe® NVMe™ M.2 TLC Solid State Drive ¹³

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 ¹⁴

Memory

- 32 GB DDR4-3200 SDRAM (2 x 16 GB) ¹⁴
- 16 GB DDR4-3200 SDRAM (1 x 16 GB) ¹⁴
- 12 GB DDR4- 3200 SDRAM (1 x 4 GB + 1 x 8 GB) ¹⁴
- 8 GB DDR4-3200 SDRAM (1 x 8 GB) ¹⁴
- 8 GB DDR4-3200 SDRAM (2 x 4 GB) ¹⁴
- 4 GB DDR4-3200 SDRAM (1 x 4 GB) ¹⁴

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 802.11ac (2x2) WLAN and Bluetooth® 5 Combo ¹⁵

Intel® Dual Band Wireless-AC 9560 802.11a/b/g/n/ac (2x2) WLAN and Bluetooth® 5 Combo, non-vPro® ¹⁵

Intel® Dual Band Wi-Fi 6 AX201 802.11a/b/g/n/ac/ax (2x2) WLAN and Bluetooth® 5 Combo, non-vPro® ¹⁷

Ethernet

Realtek 10/100/1000 GbE NIC ¹⁶

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. 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.

17. 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. The specifications for Wi-Fi 6 are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax WLAN devices. Only available in countries where 802.11ax is supported.

AUDIO/MULTIMEDIA

Audio

2 Integrated stereo speakers

Integrated microphone (Dual Array)

Speaker Power

2W/4ohm per speaker

Camera

720p HD camera ⁹

720p HD camera+IR Camera ^{9,18}

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

18. Sold separately or as an optional feature.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Premium Keyboard, spill resistant and optional DuraKeys and backlit

Technical Specifications

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

SOFTWARE AND SECURITY

BIOS

HP BIOSphere Gen6 ¹⁹

HP Drive Lock & Automatic Drive Lock

BIOS Update via Network

HP Secure Erase ²⁰

Absolute Persistence Module ²¹

HP LAN-Wireless Protection

USB enable/disable (via BIOS)

Software

HP Connection Optimizer ²²

HP Hotkey Support

myHP

HP Support Assistant²³

HP QuickDrop²⁴

Technical Specifications

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
HP WorkWell
Buy Microsoft Office (Sold separately)
Microsoft Defender ²⁵

Manageability Features

HP Driver Packs (download) ²⁶
HP Manageability Integration Kit Gen4 (download) ²⁷
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)²⁸
HP Fingerprint Sensor (Select models) ²⁹
HP Sure Click ³⁰
HP Sure Sense ³¹
HP Sure Admin ³²
Secured-core PC Enable³³
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.

Technical Specifications

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 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 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. Requires an Intel® vPro® , AMD Ryzen™ Pro processor or Qualcomm® processor with SD850 or higher and requires 8 GB or more system memory. Secured-core PC functionality can be enabled from the factory.

POWER

Power Supply

- HP Smart 65 W External AC power adapter ³⁴
- HP Smart 65 W EM External AC power adapter ³⁴
- HP Smart 65 W USB Type-C adapter ³⁴
- HP Smart 45 W External AC power adapter ³⁴
- HP Smart 45 W USB Type-C adapter ³⁴

Power Cord

- 3-wire plug - 1m ³⁴

Technical Specifications

2-wire plug - 1m ³⁴

Primary Battery

HP Long Life 3-cell, 45 Wh Polymer ^{35,36}

Battery Life

Up to 15 hours and 45 minutes ³⁷

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 www.bapco.com for additional details.

Technical Specifications

WEIGHTS & DIMENSIONS

Product Weight

Starting at 3.03 lb ³⁸

Starting at 1.38 kg ³⁸

Product Dimensions (w x d x h)

32.19 x 21.39 x 1.99 cm

12.67 x 8.42 x 0.78 in

38. Weight will vary by configuration.

PORTS/SLOTS

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

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

1 HDMI 1.4b ³⁹

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.

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>. ⁴⁰

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

Technical Specifications

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	19V
Average Operating Power	7.52W (Idle)
Integrated graphics	Yes (AMD Radeon™ Graphics)
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 ⁴¹
EPEAT®	EPEAT® Gold in United States ⁴²
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 445 G8 that are ENERGY STAR® qualified are identified as HP ProBook 445 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 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 14 inch FHD (1920x1080) Anti-Glare WLED UWVA 45percent cg 250nits eDP 1.2 w/o PSR bent NWBZ	Outline Dimensions (W x H x D)	316.17 x 186.4 mm (max) (w/ PCB)
	Active Area	309.37 x 174.02 mm (typ.)
	Weight	300 g (max)
	Diagonal Size	14.0 inch
	Thickness	3.0 mm/ 5.0 mm (PCB) (max)
	Interface	eDP 1.2
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	600:1 (typ.)
	Refresh Rate	60 Hz
	Brightness	250 nits
	Pixel Resolution	1920 x 1080 (FHD)
	Format	RGB Stripe
	Backlight	LED
	Color Gamut Coverage	NTSC 45%
	Color Depth	6 bits (Hi FRC supportive w/ condition to enable)
	Viewing Angle	UWVA 85/85/85/85

Technical Specifications

Panel LCD 14 inch FHD (1920x1080) Anti-Glare WLED UWVA 72percent cg 1000nits eDP 1.4+PSR2 bent Privacy NB2X Gen3	Outline Dimensions (W x H x D)	322.82 x 201.25mm (max.)
	Active Area	309.31 x 173.99
	Weight	280g max.
	Diagonal Size	14 (inch)
	Thickness	3mm max.
	Interface	eDP 1.3 + PSR (supportive @ 8bit)
	Surface Treatment	Anti-Glare (AG)
	Touch Enabled	No
	Contrast Ratio	1050:1 (typ.)
	Refresh Rate	60Hz
	Brightness	350nits ¹
	Pixel Resolution	3840 x 2160 (UHD)
	Format	RGB
	Backlight	LED
	Color Gamut Coverage	sRGB 100%
	Color Depth	8bits
	Viewing Angle	UWVA 85/85/85/85

Panel LCD 14 inch FHD (1920x1080) Anti-Glare WLED UWVA sRGB 100percent cg 400nits eDP 1.4+PSR2 bent LP NB2X	Outline Dimensions (W x H x D)	315.07 x 186.6 mm (max)
	Active Area	309.37 X 174.02 mm (typ.)
	Weight	200 g (max)
	Diagonal Size	14.0 inch
	Thickness	2.0 mm/4.0 mm (w/PCB) (max)
	Interface	eDP 1.4
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	1200:1 (typ.)
	Refresh Rate	60 Hz
	Brightness	400 nits
	Pixel Resolution	1920 x 1080 (FHD)
	Format	RGB Stripe
	Backlight	LED
	Color Gamut Coverage	sRGB 100% (NTSC 72%)
	Color Depth	6 bits
	Viewing Angle	UWVA 85/85/85/85

Technical Specifications

Panel LCD 14-in HD (1366x768) Anti-Glare WLED SVA 45percent cg 250nits eDP 1.2 w/o PSR NWBZ bent	Outline Dimensions (W x H x D)	316.1 x 186.37 (mm) max
	Active Area	309.4 x 173.95 (mm)
	Weight	300g Max
	Diagonal Size	14"
	Thickness	3.0t (panel) / 5.0t (panel+PCB) max.
	Interface	eDP 1.2 (1 lane)
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	300:1 (typ)
	Refresh Rate	60 Hz
	Brightness	250nits
	Pixel Resolution	1366 x 768 (HD)
	Format	RGB Stripe
	Backlight	LED
	Color Gamut Coverage	NTSC 45%
	Color Depth	6 bits
	Viewing Angle	SVA 45/45/15/35

Technical Specifications

STORAGE

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

SSD 128GB 2280 PCIe-3x2 Three Layer Cell	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	1400 ~ 2100 MB/s
	Maximum Sequential Write	800 ~ 1200 MB/s
	Logical Blocks	250,069,680
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security; DIPM; TRIM; DEVSLP

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	2,000,409,264
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security; TRIM; L1.2

Technical Specifications

SSD 256GB 2280 PCIe NVMe Value

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

SSD 512GB 2280 PCIe NVMe Value

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

Technical Specifications

NETWORKING

Intel® Wi-Fi 6 AX200 + Bluetooth® 5 (802.11ax 2x2, 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	Features Wi-Fi 6 technology
	Frequency Band	802.11b/g/n/ax •2.402 – 2.482 GHz 802.11a/n/ac/ax •4.9 – 4.95 GHz (Japan) •5.15 – 5.25 GHz •5.25 – 5.35 GHz •5.47 – 5.725 GHz •5.825 – 5.850 GHz
	Data Rates	•802.11b: 1, 2, 5.5, 11 Mbps •802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps •802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps •802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) •802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, 80MHz & 160MHz) •802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)
	Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM , 1024QAM
	Security³	•IEEE compliant 64 / 128-bit WEP encryption for a/b/g mode only •AES-CCMP: 128 bit in hardware •802.1x authentication •WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. •WPA2 certification •WPA3 certification •IEEE 802.11i •WAPI
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points

Technical Specifications

Output Power²	<ul style="list-style-type: none"> • 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 • 802.11ac VHT160(5GHz): +11.5dBm minimum • 802.11ax HT40(2.4GHz): +10dBm minimum • 802.11ax VHT160(5GHz): +10dBm minimum 				
Power Consumption	<ul style="list-style-type: none"> • 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 10mW • Radio disabled 8 mW 				
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode				
Receiver Sensitivity⁴	<ul style="list-style-type: none"> • 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 • 802.11ax, MCS11(HT40): -59dBm maximum • 802.11ax, MCS11(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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Type 2230: 2.8g 2. Type 126: 1.3g 				
Operating Voltage	3.3v +/- 9%				
Temperature	<table> <tr> <td>Operating</td> <td>14° to 158° F (-10° to 70° C)</td> </tr> <tr> <td>Non-operating</td> <td>-40° to 176° F (-40° to 80° C)</td> </tr> </table>	Operating	14° to 158° F (-10° to 70° C)	Non-operating	-40° to 176° F (-40° to 80° C)
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Altitude	<table> <tr> <td>Operating</td> <td>0 to 10,000 ft (3,048 m)</td> </tr> <tr> <td>Non-operating</td> <td>0 to 50,000 ft (15,240 m)</td> </tr> </table>	Operating	0 to 10,000 ft (3,048 m)	Non-operating	0 to 50,000 ft (15,240 m)
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 4.0/4.1/4.2/5.0/5.1 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)
Data Rates and Throughput	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 + 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. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices. Only available in countries where 802.11ax is supported.
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. Wi-Fi 5 or 6 is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

Intel® 9260 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 5.0 Combo¹ (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

Technical Specifications

Interoperability	Wi-Fi CERTIFIED modules
Frequency Band	<p>802.11b/g/n</p> <ul style="list-style-type: none"> •2.402 – 2.482 GHz <p>802.11a/n/ac</p> <ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •802.11b: 1, 2, 5.5, 11 Mbps •802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps •802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps •802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) •802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)
Modulation	<p>Direct Sequence Spread Spectrum</p> <p>BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</p>
Security³	<ul style="list-style-type: none"> •IEEE compliant 64 / 128-bit WEP encryption for a/b/g mode only •AES-CCMP: 128 bit in hardware •802.1x authentication •WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. •WPA2 certification •WPA3 certification •IEEE 802.11i •WAPI
Network Architecture Models	<p>Ad-hoc (Peer to Peer)</p> <p>Infrastructure (Access Point Required)</p>
Roaming	IEEE 802.11 compliant roaming between access points
Output Power²	<ul style="list-style-type: none"> • 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 • 802.11ac VHT160(5GHz): +11.5dBm minimum
Power Consumption	<ul style="list-style-type: none"> •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 10mW •Radio disabled 8 mW

Technical Specifications

Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode				
Receiver Sensitivity⁴	<ul style="list-style-type: none"> •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				
Dimensions	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 1. Type 2230: 2.8g 2. Type 126: 1.3g 				
Operating Voltage	3.3v +/- 9%				
Temperature	<table> <tr> <td>Operating</td> <td>14° to 158° F (-10° to 70° C)</td> </tr> <tr> <td>Non-operating</td> <td>-40° to 176° F (-40° to 80° C)</td> </tr> </table>	Operating	14° to 158° F (-10° to 70° C)	Non-operating	-40° to 176° F (-40° to 80° C)
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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
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Data Rates and Throughput	<p>Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps</p> <p>BLE: 1 Mbps data rate; throughput up to 0.2 Mbps</p> <p>Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels</p> <p>Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)</p>
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

Technical Specifications

- 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).

Realtek RTL8822CE
802.11ac 2x2 Wi-Fi® +
Bluetooth® 5¹

Wireless LAN Standards

- IEEE 802.11a
- IEEE 802.11b
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- 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 modules

Frequency Band

- 802.11b/g/n
 - 2.402 – 2.482 GHz
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Direct Sequence Spread Spectrum
 BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM

Security³

- IEEE and Wi-Fi certified 64 / 128-bit WEP encryption for a/b/g mode only
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- 802.1x authentication
- WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.
- WPA2 certification
- WPA3 certification
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Technical Specifications

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Technical Specifications

Realtek RTK8111HSH 10/100/1000 Integrated NIC

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

Technical Specifications

POWER

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	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	
	Connector	4.5mm Barrel Type
	Environmental Design	
	Operating temperature	32oF to 95oF (0° to 35°C)
	Non-operating (storage) temperature	-4oF to 185oF (-20° to 85°C)
	Non-operating (storage) temperature	
	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.

Technical Specifications

AC Adapter 45 Watt nPFC Standard USB type C Straight 1.8m		
Dimensions		94.0mm * 40.0mm * 26.5mm
Weight		192.5g +/-10%
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 ~ 63Hz
Input AC current		Max. 1.4 A at 90 Vac
Output		
		5V/15W
		9V/27W
		12V/36W
Output power		15V/45W
DC output		5V/9V/12V/15V
Hold-up time		5ms at 115 Vac input
Output current limit		
Connector		USB Type-C™
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.

Technical Specifications

**AC Adapter 45 Watt
Smart nPFC Standard
Barrel 4.5mm Right
Angle 1.8m 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.

Technical Specifications

AC Adapter 65 Watt nPFC Standard USB type C®Straight 1.8m	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™
	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%
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Technical Specifications

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

Dimensions	102 x 55 x 30mm
Weight	unit: 250g +/- 10g
Input	
Input Efficiency	88.0 % at 115 Vac and 89.0 % at 230Vac
Input frequency range	47 ~ 63 Hz
Input AC current	Max. 1.7 A at 90 Vac
Output	
Output power	65W
DC output	19.5V
Hold-up time	5ms at 115 Vac input
Output current limit	<11.0A
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.

Technical Specifications

AC Adapter 65 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	Dimensions	90 x 51 x 28.5mm
	Weight	unit: 230g +/- 10g
	Input	
	Input Efficiency	88.0 % at 115 Vac and 89.0 % at 230Vac
	Input frequency range	47 ~ 63 Hz
	Input AC current	Max. 1.7 A at 90 Vac
	Output	
	Output power	65W
	DC output	19.5V
	Hold-up time	5ms at 115 Vac input
	Output current limit	<11.0A
	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.	

Battery RH 3 Cell 45Wh Long Life -PL Fast Charge	Dimensions (H x W x L)	6.2 x 68.7 x 249.6mm
	Weight	190g
	Cells/Type	3cell Lithium-Ion Polymer cell/ 545974
	Energy	
	Voltage	11.4V
	Amp-hour capacity	3.950Ah
	Watt-hour capacity	45Wh
	Temperature	
	Operating (Charging)	32° to 113° F (0° to 45° C)
	Operating (Discharging)	14° to 122° F (-10° to 60° C)
	Fuel Gauge LED	NA
	Warranty	Based on system offering
	Optional Travel Battery Available	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

Sustainable Impact Specifications

- Low halogen¹
- Ocean-Bound Plastic in speaker enclosure²
- Outside Box and corrugated cushions are 100% sustainably sourced and recyclable³

1. External power supplies, WWAN modules, power cords, cables and peripherals excluded.

2. Percentage of ocean-bound plastic contained in each component varies by product

3. 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.

COUNTRY OF ORIGIN

China

Summary of Changes

Category	Description	Part Number	
Cases	HP Prelude Pro Recycle Backpack	1X644AA	
	HP Prelude Pro Recycle Top Load	1X645AA	
Docking	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 - New AMO	7PJ38AA	
	HP Wired Thunderbolt Audio Module	3AQ21AA	
	HP USB-C Travel Dock	4WX89AA	
	Input/Output	HP USB-C to HDMI 2.0 Adapter	2PC54AA#ABB
HP USB-C to RJ45 Adapter		V8Y76AA#ABB	
HP USB-C to USB 3.0 Adapter		N2Z63AA	
HP 320M Wired Mouse - New AMO		9VA80AA	
HP Travel Bluetooth Mouse - New AMO		6SP30AA	
HP Travel USB Mouse - New AMO		G1K28AA	
HP Wireless (Link-5) 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	
Power		HP 45W 4.5 mm LC Smart Japan Only AC Power Adapter - New AMO	L6F60AA#ABJ
		HP 45W 4.5 mm Smart AC Power Adapter - New AMO	H6Y88AA#ABA
	HP 45W USB-C LC AC Power Adapter - New AMO	1MZ01AA#ABA	
	HP 65W 4.5 mm Smart AC Power Adapter - New AMO	H6Y89AA#ABA	
	HP 65W 4.5 mm wDongle 7.4 mm Slim AC Power Adapter - New AMO	H6Y82AA#ABA	
	HP 65W USB-C LC AC Power Adapter - New AMO	1P3K6AA#ABA	
	HP 65W USB-C Slim Travel AC Power Adapter - New AMO	X7W50AA#ABA	
Storage	HP USB DVD-Writer EXT ODD - New AMO	Y3T76AA	
Security	HP Nano Cable Lock	1AJ39AA	
	HP SureKey Standard/Nano/Wedge Cable Lock	6UW42AA	
UCC	HP Stereo 3.5mm Headset (Mindy)	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
	V3 to V4		

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