

Overview

HP Pro x360 Fortis 11 inch G11 Notebook PC



Left

- | | |
|--|---|
| 1. Internal microphones (2) | 7. World-facing Webcam LED |
| 2. Webcam and HP Privacy Camera | 8. SuperSpeed USB Type-C® 5 Gbps signaling rate port |
| 3. Webcam LED | 9. SuperSpeed USB Type-A 5 Gbps signaling rate port (USB 3.2 Gen 1) |
| 4. Pen garage (Optional) | 10. HDMI port (Cable not included) |
| 5. Clickpad | 11. Ethernet (RJ-45) port |
| 6. World-facing 5 Megapixels Webcam (Optional) | 12. Power Connector |

Overview



Right

1. Power Button Key
2. Security lock slot (nano lock sold separately)
3. SuperSpeed USB Type-A 5 Gbps signaling rate port (USB 3.2 Gen 1)
4. Audio combo jack

Overview



1. HP Slim Rechargeable Pen (optional)

Overview

AT A GLANCE

- Windows 11 Pro, other Windows OS, or FreeDOS preinstalled
- Weight starting at 3.24 lbs (1.47 kgs)
- At 21.2 mm (0.84"), this flexible 360° hinge converts to laptop, tablet, tent, stand or book mode easily
- Undergoes 19 MIL-STD 810H tests¹, with rugged features such as co-molded rubber trim, spill- and pick-resistant keyboard, and Corning® Gorilla® Glass 3 touch screen
- Optional dual camera system for project-based learning
- Optional HP Slim Rechargeable Pen can be safely charged and housed on the keyboard in an optional spill-resistant Garage.
- Choice of Intel® N100 Qual Core and Intel® N200 processors.
- Choice of 29.5cm (11.6") diagonal HD IPS slim LED touch screen (1366 x 768), or 29.5 cm (11.6") diagonal HD SVA slim LED touch screen (1366 x 768) displays
- Up to 128 GB eMMC or 256 GB PCIe® NVMe™ M.2 Solid State Drive storage options
- Up to 16 GB total system memory
- Reliable connectivity with choice of Intel® Wi-Fi 6E AX211 and Bluetooth® 5.3 Combo WLAN or Realtek 8852CE Wi-Fi 6E and Bluetooth® 5.3 Combo WLAN for blended learning and collaboration beyond the classroom
- Supports wireless LAN and wireless WAN options for connectivity on the go
- Built-in ports include: Ethernet (RJ-45), USB 3.1 Gen 1, USB Type-C®, and HDMI 2.0b port for connecting to high resolution displays
- Enhanced security TPM 2.0 discrete chip
- Battery life up to 10 hours and 15 minutes

1. MIL-STD-810H testing is not intended to demonstrate fitness of U.S. Department of Defense (DoD) 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 Pro x360 Fortis 11 inch G11 Notebook PC

OPERATING SYSTEM

- Preinstalled** Windows 11 Pro ¹
- Windows 11 Pro Education ¹
- Windows 11 SE for Education ¹
- Windows 11 Home - HP recommends Windows 11 Pro for Business ¹
- Windows 11 Home Single Language - HP recommends Windows 11 Pro for Business ¹
- Windows 11 Pro (Windows 11 Enterprise available with a Volume Licensing Agreement) ¹
- Windows 10 Pro (available through downgrade rights from Windows 11 Pro) ^{1,2}
- 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 is automatically updated and enabled. High speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>

2. This system is preinstalled with Windows 10 Pro software and also comes with a license for Windows 11 Pro software and provision for recovery software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

PROCESSORS

Processor ^{3,4,5,6,7}	Cores	Number of E-cores	Threads	L3 Cache	Max Frequency	Base Frequency	Intel SIPP/vPro [®] Enterprise	Intel [®] Turbo Boost Technology 2.0
					E-cores	E-cores		
Intel [®] N200	4	4	4	6 MB	3.7 GHz	1 GHz	X	Yes
Intel [®] N100	4	4	4	6 MB	3.4GHz	0.8GHz	X	Yes

Processor Family

Intel[®] Processor N-series

3. Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.

4. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

5. 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>

6. Intel vPro[®] requires Windows 10 Pro 64 bit or higher, a vPro supported processor, vPro enabled chipset, vPro enabled

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wired LAN and/or Wi-Fi 6E WLAN and TPM 2.0. Some functionality requires additional 3rd party software in order to run. Features of vPro® Essentials and Enterprise vary. See <http://intel.com/vpro>
7. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See <http://www.intel.com/technology/turboboost> for more information.

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated

Intel® UHD Graphics⁸

Supports

Support HD decode, DX12, HDMI 2.0b⁸

8. HD content required to view HD images.

DISPLAY

Touch

29.5 cm (11.6") diagonal, HD (1366 x 768), slim, SVA, BrightView, touch, Corning® Gorilla® Glass 3, 250 nits, 45% NTSC, with HD camera^{8,9,10,11,12}

29.5 cm (11.6") diagonal, HD (1366 x 768), slim, IPS, BrightView, touch, Corning® Gorilla® Glass 3, 250 nits, 50% NTSC, with HD camera^{8,9,10,11,12}

Display Size

11.6" diagonal

29.5 cm (11.6") diagonal

8. HD content required to view HD images.

9. Sold separately or as an optional feature.

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

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

12. Touchscreen support 10 finger touches & SPT (Simultaneous Pen and Touch)

DOCKING (Sold Separately)

Docking station model #1

HP USB-C Dock G5

Docking station model #2

HP USB-C/A Universal Dock G2

Docking station model #3

HP USB-C G5 Essential Dock

For additional aftermarket options and docking specs please see page 35.

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STORAGE AND DRIVES

eMMC Configurations

64 GB eMMC

Primary Storage

128GB PCIe NVMe M.2 SSD ¹³

256 GB PCIe® NVMe™ M.2 SSD 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 and 11) is reserved for system recovery software.

MEMORY

Maximum Memory

16 GB DDR4-3200 MHz RAM (on-board) (1 x 16 GB)^{14,15}

Memory

16 GB DDR4-3200 MHz RAM (on-board) (1 x 16 GB) ^{14,15}

8 GB DDR4-3200 MHz RAM (on-board) (1 x 8 GB) ^{14,15}

4 GB DDR4-3200 MHz RAM (on-board) (1 x 4 GB)^{14,15}

Memory Slots

On-board DDR4 SODIMMS, system runs at 3200MHz ^{14,15}

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

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

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NETWORKING/COMMUNICATIONS

WLAN

Intel® Wi-Fi CERTIFIED 6E AX211 and Bluetooth® 5.3 combo, non-vPro ¹⁶
Realtek RTL8852CE 802.11ax (2x2) Wi-Fi 6E® with Bluetooth® 5.3 combo ¹⁶

WWAN

Intel® XMM™ 7560 LTE-Advanced Pro Cat 16 ¹⁷

Ethernet

Realtek RTL8111HSH 10/100/1000 Integrated NIC ¹⁸

16. Wi-Fi 6E requires a Wi-Fi 6E router, and Windows 11, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported.

17. WWAN module is an optional feature, requires factory configuration and requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.

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

AUDIO/MULTIMEDIA

Audio

2 Integrated stereo speakers
Integrated dual array microphone

Speaker Power

2W/4ohm per speaker

Camera

720p HD camera ^{8,19}
World-facing Wide Field of View 80° 5MP auto-focus secondary camera (Optional) ^{8,9,19}

8. HD content required to view HD images.

9. Sold separately or as an optional feature.

19. Internet access required.

Technical Specifications

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

Full-sized keyboard, spill and pick resistant keyboard

Pointing Device

Clickpad with multi-touch gesture support, taps enabled as default

Function Keys

F1 - Display Switching

F2 - Brightness Down

F3 - Brightness Up

F4 - Audio Mute/Unmute

F5 - Volume Down

F6 - Volume Up

F7 - Mic Mute/Unmute

F8 - Blank

F9 - Blank

F10 - Insert

F11 - Wireless On/Off

F12 - HP Programmable Key

Pen

Pen garage (optional)

HP Slim Rechargeable pen (optional)

Technical Specifications

SOFTWARE AND SECURITY

Preinstalled Software

Software

HP Easy Clean ²⁰
HP PC Hardware Diagnostics Windows
myHP
HP Smart Support ²¹
HP Services Scan ²²
HP Connection Optimizer
HP Hotkey Support
HP Support Assistant ²³ (download)
HP Notifications
Bulb Digital Portfolio (download) ²⁴
FluidMath (download)
HP Classroom Manager (download) ²⁵
HP Prime Graphing Calculator Pro (download) ²⁶
Kortext e-Library (download)
HP Privacy Settings
Buy Microsoft Office (Sold separately)

Manageability Features

HP Connect for Microsoft Endpoint Manager ²⁷
HP Image Assistant Gen5 (download)
HP Manageability Integration Kit (download) ²⁸
HP Client Management Script Library (download)
HP Patch Assistant (download) ²⁹
HP Driver Packs (download)
HP Client Catalog (download)

NOTE: To enhance brightness, level go to the Intel® Graphics Command Center app, click on System and turn off the Display Power Savings function.

Security Management

HP Wolf Security for Business ³⁰ includes:
HP Sure Sense ³¹
HP Sure Start Gen7 ³²

BIOS

HP BIOSphere Gen6 ³³
HP Secure Erase ³⁴
Absolute Persistence Module ³⁵
HP DriveLock & Automatic DriveLock
BIOS Update via Network
HP Wake on WLAN
TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)

Security

TPM

Model: Nuvoton NPCT760HABYX
Version: 7.2.3.1

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Revision: TPM 2.0
FIPS 140-2 Compliant: Yes

IPv6 Support

Yes

FirstNet Certified

Yes

The BIOS on this notebook implements ISO/IEC 19678:2015 guidelines (formerly NIST 800-147).

UEFI version: 2.7

Class: Class 3

20. HP Easy Clean requires Windows 10 RS3 and higher and will disable the keyboard, touchscreen, and clickpad only. Ports are not disabled. See user guide for cleaning instructions.

21. HP Smart Support requires HP TechPulse to be installed. For more information about how to enable or to download HP Smart Support, please visit <http://www.hp.com/smart-support>.

22. HP Services Scan is provided thru Windows Update and will check entitlement on each hardware device to determine if an HP TechPulse-enabled service has been purchased, and will download applicable software automatically. To disable this feature, please follow the instructions at <http://www.hpdaas.com/requirements>. HP TechPulse is a telemetry and analytics platform that provides critical data around devices and applications and is not sold as a standalone service. HP TechPulse follows stringent GDPR privacy regulations and is ISO27001, ISO27701, ISO27017 and SOC2 Type2 certified for Information Security. Internet access with connection to TechPulse portal is required. For full system requirements, please visit <http://www.hpdaas.com/requirements>. Not available in China.

23. HP Support Assistant requires Windows and Internet Access

24. Bulb Digital Portfolio includes full version 6 month trial. After 6 months, number of published pages is limited to 10 and storage to 2GB. To retain full functionality, subscription required prior to the end of the 6 month trial period.

25. HP Classroom Manager for Teachers is required and sold separately for control and device locking from the teacher's Windows desktop console; no locking and control functionality originates from HP Classroom Manager for Student. Control and device locking originate from the teacher's Windows desktop console.

26. HP Prime Graphing Calculator Pro included with HP School Pack and may be purchased separately for other devices from the Windows, Android, or Apple Store.

27. HP Connect for Microsoft Endpoint Manager is available from the Azure Market Place for HP Pro, Elite, Z and Point-of-Sale PCs managed with Microsoft Endpoint Manager. Subscription to Microsoft Endpoint Manager required and sold separately. Network connection required.

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

29. HP Patch Assistant available on select HP PCs with the HP Manageability Kit that are managed through Microsoft System Center Configuration Manager. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

30. HP Wolf Security for Business requires Windows 10 or higher, includes various HP security features and is available on HP Pro, Elite, RPOS and Workstation products. See product details for included security features and OS requirement.

31. HP Sure Sense is available on select HP PCs with Windows 10 Pro, Windows 10 Enterprise, Windows 11 Pro, or Windows 11 Enterprise OS.

32. HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 and higher

33. HP BIOSphere Gen6 features may vary depending on the platform and configuration.

34. 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™.

35. 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

Technical Specifications

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/>.

POWER

Power Supply

HP Smart 65 W EM External AC power adapter ³⁶

HP Smart 45 W External AC power adapter ³⁶

Smart 45 W USB Type-C® adapter ³⁶

Battery

HP Long Life 3-cell, 42 Wh Polymer ^{37,38}

Power Cord

2-wire plug - 1m

3-wire plug - 1m

Battery life

Up to 10 hours and 15 minutes with 42whr battery (HP Long Life 3-Cell, 42Whr Polymer, UMA graphic, Intel U9, display set to 200 nits, 16GB memory, 258GB SSD) ³⁹

Battery Weight

HP Long Life 3-cell - 42 Wh Polymer - .49 lb

HP Long Life 3-cell - 42 Wh Polymer - 225g

36. Availability may vary by country.

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

38. 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.

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

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WEIGHTS & DIMENSIONS

Product Weight

Starting at 3.24 lb ⁴⁰

Starting at 1.47 kg ⁴⁰

Product Dimensions (W x D x H)

11.7 x 8.02 x 0.84 in

29.7 x 20.37 x 2.12 cm

Packaging Dimensions (W x D x H) ⁴¹

12"-15" boxes (305mm height): 1200mm x 1000mm x 1080mm

40. Weight will vary by configuration. Does not include power adapter.

41. Product packaging size varies based on options chosen. Please contact your HP representative for your packaging size details.

PORTS/SLOTS

2 Super Speed USB Type-A 5Gbps signaling rate (USB 3.2 Gen 1)

1 SuperSpeed USB Type-C[®] 5 Gbps signaling rate port (USB Power Delivery, Alt-mode DisplayPort™ 1.2)

1 RJ-45

1 HDMI 2.0b ⁴²

1 AC power

1 headphone/microphone combo jack

Expansion Slots

1 internal on-board Nano SIM slot for WWAN (optional) ⁴³

42. HDMI cable sold separately.

43. SIM slot is not user accessible without WWAN configuration.

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SERVICE AND SUPPORT

HP Services offers 1-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty. 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> ⁴⁴

44. 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. 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>

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SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)

Nominal Operating Voltage	19V
Average Operating Power	11.7W
Integrated graphics	Intel UHD Graphics
Discrete Graphics	N/A
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-operating	5% to 95%

Shock

Operating	40 G, 2 ms, half-sine
Non-operating	240 G, 2 ms, half-sine

Random Vibration

Operating	0.75 grams
Non-operating	1.50 grams

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

Regulatory Model Number	HSN-I57C
CSA/UL 62368-1	Yes
FCC/ICES/CISPR/VCCI	Yes
ENERGY STAR®	Yes ⁴⁵
EPEAT®	Registered Gold in United States ⁴⁶
FCC/ICES/CISPR/VCCI	Yes
CE MARKING	Yes
GS Mark	Yes
Related commodity should comply with ISO 9241 Standards.	
China CCC/SRRC	Yes
Taiwan BSMI/NCC	Yes
Korea KCC/KC/KES	Yes
Ukraine NSoC/TEC	Yes
TCO	Yes
WW RoHS	Yes
Low Blue Light	No

45. Configurations of the HP Pro x360 Fortis 11 inch G11 that are ENERGY STAR® certified are identified HP Pro x360 Fortis 11 inch G11 ENERGY STAR on HP websites and on <http://www.energystar.gov>.

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

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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 HP Sure View. Touchscreen support 10 finger touches & SPT (Simultaneous Pen and Touch)

11.6 in HD (1366x768) Anti-Glare SVA NTSC 250 eDP 45 flat LCD Panel	Outline Dimensions (W x H)	268.5 x 168.5 max. (w/ PCB)
	Active Area	256.125 x 144.0 mm
	Weight	210g max.
	Diagonal Size	11.6 inch
	Surface Treatment	Anti-Glare
	Touch Enabled	Yes ¹
	Contrast Ratio	400:1 (typ)
	Refresh Rate	60Hz
	Brightness	250nits
	Pixel Resolution - Format	1366 x 768 (HD)
	Backlight	WLED
	Pixel Resolution	RGB
	Color Gamut Coverage	45%NTSC
	Color Depth	6bits
	Viewing Angle	40/40/15/30
	Low Blue Light	No
Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.08W (max)/NA	

11.6 in HD (1366x768) Anti-Glare UWVA NTSC 250 eDP 50 flat LCD Panel	Outline Dimensions (W x H)	278.5 x 168.5 max (w/ PCB)
	Active Area	256.125 x 144.0
	Weight	200g max.
	Diagonal Size	11.6 inch
	Surface Treatment	Anti-Glare
	Touch Enabled	Yes ¹
	Contrast Ratio	600:1 (typ)
	Refresh Rate	60Hz
	Brightness	250nits
	Pixel Resolution - Format	1366 x 768 (HD)
	Backlight	WLED
	Pixel Resolution	RGB
	Color Gamut Coverage	50%NTSC
	Color Depth	6bits
	Viewing Angle	85/85/85/85
	Low Blue Light	No
Power Consumption (W, EBL@ 150nits max/ 200nits max)	1.94W (max)/NA	

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STORAGE AND DRIVES

For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10 and 11) is reserved for system recovery software.

SSD 128GB 2230 PCIe NVMe Value	Form Factor	M.2 2230
	Capacity	128 GB
	NAND Type	2230 Value
	Interface	PCIe NVMe Gen4X4
	Maximum Sequential Read	2000 MB/s \pm 20%
	Maximum Sequential Write	600 MB/s \pm 20%
	Logical Blocks	250,069,680
	Features	Pyritec2.0; TRIM; L1.2

SSD 256GB 2230 PCIe NVMe Value	Form Factor	M.2 2230
	Capacity	256GB
	NAND Type	2230 Value
	Interface	PCIe NVMe Gen3X4 or Gen4X4
	Maximum Sequential Read	2000 MB/s \pm 20%
	Maximum Sequential Write	900 MB/s \pm 20%
	Logical Blocks	500,118,192
	Features	Pyritec, Pyritec2.0; TRIM; L1.2

Technical Specifications

NETWORKING/COMMUNICATIONS

<p>Intel® AX211 Wi-Fi 6E +Bluetooth® 5.3 M.2 160MHz CNVi World-wide WLAN non-vPro¹</p>	<p>Wireless LAN Standards</p>	<p>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</p>
	<p>Interoperability</p>	<p>Wi-Fi certified</p>
	<p>Frequency Band</p>	<ul style="list-style-type: none"> • 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 5.955 – 6.415 GHz 6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 GHz
	<p>Data Rates</p>	<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: max 300Mbps • 802.11ac : 1733Mbps • 802.11ax : max 2.4Gbps
	<p>Modulation</p>	<p>Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM</p>
	<p>Security³</p>	<ul style="list-style-type: none"> • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • WPA3 certification • IEEE 802.11i • WAPI
	<p>Network Architecture</p>	<p>Ad-hoc (Peer to Peer)</p>
	<p>Models</p>	<p>Infrastructure (Access Point Required)</p>
	<p>Roaming</p>	<p>IEEE 802.11 compliant roaming between access points</p>
	<p>Output Power²</p>	<ul style="list-style-type: none"> • 802.11b : +17dBm minimum • 802.11g : +16dBm minimum

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	<ul style="list-style-type: none"> • 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	<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	High efficiency antenna with spatial diversity, mounted in the display enclosure
Antenna type	Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications <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(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
Form Factor	PCI-Express M.2 MiniCard
Dimensions	Type 2230: 2.3 x 22.0 x 30.0 mm
Weight	Type 2230: 2.8g
Operating Voltage	3.3v +/- 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 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Technology



Technical Specifications

Bluetooth Specification	4.0/4.1/4.2/5.0/5.1/5.2/5.3 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.
Power Consumption	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
Bluetooth Software Supported Link Topology	Microsoft Windows Bluetooth Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP) BT5.2 ESR9/10 Compliance LE Advertisement Extensions Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising 2Mbps LE LE Long Range

Technical Specifications

1. Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported. Wi-Fi 6E 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.
 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).
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Technical Specifications

<p>Realtek RTL8852CE 802.11ax 2x2 Wi-Fi 6E + Bluetooth® 5.3 (802.11ax 2x2, supporting gigabit data rate)¹</p>	<p>Wireless LAN Standards</p>	<p>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</p>
	<p>Interoperability</p>	<p>Wi-Fi certified</p>
	<p>Frequency Band</p>	<ul style="list-style-type: none"> •802.11b/g/n/ax 2.402 – 2.482 GHz •802.11a/n/ac/ax 5.15 – 5.25 GHz 5.25 – 5.35 GHz 5.47 – 5.725 GHz 5.825 – 5.850 GHz
	<p>Data Rates</p>	<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, (20MHz, 40MHz, ,80MHz & 160MHz) • 802.11ax : MCS0 ~ MCS11, (20MHz, 40MHz, ,80MHz & 160MHz)
	<p>Modulation</p>	<p>Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM</p>
	<p>Security³</p>	<ul style="list-style-type: none"> • IEEE and WiFi certified 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 (personal) certification • IEEE 802.11i • WAPI • EAP
	<p>Network Architecture Models</p>	<p>Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)</p>
	<p>Roaming</p>	<p>IEEE 802.11 compliant roaming between access points</p>
	<p>Output Power²</p>	<ul style="list-style-type: none"> • 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

Technical Specifications

	<ul style="list-style-type: none"> • 802.11ax HE40(2.4GHz) : +12dBm minimum • 802.11ax HE80(5GHz) : +10dBm minimum • 802.11ax HE160(5GHz) : +10dBm minimum • 802.11ax HE80(6GHz) : +10dBm minimum • 802.11ax HE160(6GHz) : +10dBm minimum
Power Consumption	<ul style="list-style-type: none"> • Transmit mode :2.5 W • Receive mode :2 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 Sensitivity⁴	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Antenna type	<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(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
Form Factor	PCI-Express M.2 MiniCard
Dimensions	Type 2230: 2.3 x 22.0 x 30.0 mm
Weight	Type 2230: 2.8g
Operating Voltage	3.3v +/- 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 60% (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	N/A

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2/5.0/5.1/5.2/5.3 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	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps

Technical Specifications

Throughput	BLE: 1 Mbps data rate; throughput up to 0.2 Mbps Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.
Power Consumption	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Link Topology	
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.407
Power Management Certifications	ETS 300 328 Low Voltage Directive CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP) BT5.2 ESR9/10 Compliance LE Advertisement Extensions Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising 2Mbps LE LE Long Range Windows BT profiles support

1. Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported. Wi-Fi 6E is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

Technical Specifications

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).
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Technical Specifications

Intel® XMM™ 7560 R+ LTE-Advanced Pro ¹	Technology/Operating bands	FDD LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700/2100 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 14 upper), 700 (Band 17 lower), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1900 (Band 25), 850 (Band 26), 700 (Band 28), 700 (Band 29 RX only), 2300 (Band 30), 1700/2100 (Band 66), 600 (band 71). TDD LTE: 2100 (Band 34), 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41), 3500 (Band 42), 3700 (Band 43), 3700 (band 48), 5200 (Band 46 RX only) MHz; HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz
	Wireless protocol standards	3GPP Release 12 LTE Specification DL-CAT.16, DL 100MHz BW throughput up to 978Mbps; UL-CAT.13 40MHz throughput up to 150Mbps WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
	GPS GPS bands	Standalone GPS/Beidou/Glonass, A-GPS (MS-A, MS-B) 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz
	Maximum data rates	LTE: 978 Mbps (Download), 150 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)
	Maximum output power	LTE: 23 dBm in all band except B41 LTE B41 HPUE = 26dBm HSPA+: 23.5 dBm
	Maximum power consumption	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average)
	Form Factor	M.2, 3042-S3 Key B
	Weight	6 g
	Dimensions (Length x Width x Thickness)	42 x 30 x 2.3 mm
	embedded eSIM	Support

1. Mobile Broadband is an optional feature. Connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products or in all countries.

Technical Specifications

Realtek RTL8111HSH 10/100/1000 Integrated NIC	Connector	RJ-45
	System Interface	PCIe + SMBus
	Data rates supported	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
	IEEE Compliance	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet)
	Performance	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling Jumbo Frame 9K
	Power consumption	Cable Disconnection: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
	Power Management	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
	Management Interface	Auto MDI/MDIX Crossover cable detection
	IT 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.

Technical Specifications

POWER

HP 45W Smart AC adapter	Weight	0.44 lb (200 g) max (Not including power cord. Power cord varies by country.)
	Input	100 ~ 240VAC
	Input Efficiency	87.74% at 115Vac and 88.4% at 230Vac
	Input frequency range	47 to 63 Hz
	Input AC current	Max. 1.4 A at 90 VAC
	Output	
	Output power	45W
	DC output	19.5V
	Hold-up time	100% load 5ms at 115 Vac input/80% load 10ms at 115 Vac input
	Output current limit	<8.0A
	Connector	4.5mm Barrel Type,
	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 5,000 m)
	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 IEC62368-1 : 2018, EN62368-1:2014+A11, UL62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC and CECP, CU(EAC), EAEU, KCC(Safety+EMC) and K-MEPS, NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia GEMS and RCM, BIS, BSMI, UAE, UKCA DoC

HP 65W EM Smart AC adapter	Weight	0.58 lb (265 g) max (Not including power cord. Power cord varies by country.)
	Input	100 ~ 240VAC
	Input Efficiency	88 % at 115 Vac and 89 % at 230Vac
	Input frequency range	47 to 63 Hz
	Input AC current	Max. 1.7 A at 90 Vac
	Output	
	Output power	65W
	DC output	19.5V
	Hold-up time	100% load 5ms at 115 Vac input/80% load 10ms at 115 Vac input
	Output current limit	< 11.0A
	Connector	4.5/7.4mm Barrel Type
	Environmental Design	
	Operating temperature	32 ° F to 95 ° F (0 ° to 35 ° C)
	Non-operating (storage) temperature	-4 ° F to 185 ° F (-20 ° to 85 ° C)

Technical Specifications

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 IEC62368-1 : 2018, EN62368-1:2014+A11, UL62368-1 Agency approvals - C-UL-US, TUV/GS, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC and CECP, BIS, UKCA DoC

HP 45W USB type C Straight 1.8m AC Adapter	Weight	0.44 lb (200 g) max (Not including power cord. Power cord varies by country.)
	Input	100 ~ 240VAC
	Input Efficiency	Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec: 5V : 81.5% 9V : 86.7% 12V : 87.4% 15V : 87.8%
	Input frequency range	47 ~ 63Hz
	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	100% load 5ms at 115 Vac input
	Output current limit	<5.0A
	Connector	
	Connector	USB Type-C
	Environmental Design	
	Operating temperature	32 ° F to 95 ° F (0 ° to 35 ° C)
	Non-operating (storage) temperature	-4 ° F to 185 ° F (-20 ° to 85 ° C)
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 IEC62368-1 : 2018, EN62368-1:2014+A11, UL62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC and CECP, CU(EAC), EAEU, KCC(Safety+EMC) and K-MEPS, NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia RCM, BIS, BSMI, UAE, UKCA DoC, USB-IF, Ukraine (CoC+DoC+RoHS+ECO)	

Technical Specifications

AN 42Whr¹ Long Life Polymer Fast Charge² 3 cell Battery	Cells/Type	3cell Lithium-Ion Polymer cell / 545974
	Energy	
	Voltage	11.4V
	Amp-hour capacity	3.752Ah
	Watt-hour capacity	42.75Wh
	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

1. 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.

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

AUDIO

HD Stereo Codec	Realtek ALC3247
Audio I/O Ports	Headset connector supports a CTIA style headset and is re-taskable as a Microphone-in or Headphone-out port
Internal Speaker Amplifier	Codec internal Amplifier
Multi-streaming Capable	Support multi-streaming
Sampling	Streams to be sent to/from headset or integrated speaker.
Wavetable Syntheses	N/A
Analog Audio	N/A
# of Channels on Line-Out	N/A
Internal Speaker	Yes

Technical Specifications

ENVIRONMENTAL DATA

Eco-Label Certifications & declarations	<p>This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:</p> <ul style="list-style-type: none"> • 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 Certified • China Energy Conservation Program (CECP) • China State Environmental Protection Administration (SEPA) • Taiwan Green Mark • Korea Eco-label • Japan PC Green label* 		
Sustainable Impact Specifications	<ul style="list-style-type: none"> • Ocean-bound plastic in CPU Fan and Speaker • 20% post-consumer recycled plastic • 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 • Bulk packaging available 		
System Configuration	<p>The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.</p>		
Energy Consumption (in accordance with US ENERGY STAR® test method)	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Sort idle)	3.91 W	4.04 W	4.13 W
Normal Operation (Long idle)	0.54 W	0.63 W	0.59 W
Sleep	0.54 W	0.63 W	0.59 W
Off	0.3 W	0.33 W	0.29 W
	<p>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.</p>		
Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	13.4 BTU/hr	13.8 BTU/hr	14.1 BTU/hr
Normal Operation (Long idle)	1.8 BTU/hr	2.2 BTU/hr	2.0 BTU/hr
Sleep	1.8 BTU/hr	2.2 BTU/hr	2.0 BTU/hr
Off	1.0 BTU/hr	1.1 BTU/hr	1.0 BTU/hr

Technical Specifications

	<p>*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.</p>		
Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L _{WAd} , bels)	Sound Pressure (L _{pAm} , decibels)	
Typically Configured – Idle	1.3	15.6	
Fixed Disk – Random writes	1.3	14.2	
Optical Drive – Sequential reads	1.3	14.3	
Longevity and Upgrading	<p>This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the</p>		
	<p>Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.</p>		
Additional Information	<ul style="list-style-type: none"> • 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 96.7% recycle-able when properly disposed of at end of life. 		
Packaging Materials	External:	PAPER/Corrugated	191 g
		PAPER/Corrugated	44 g
		PAPER/Molded Pulp	42 g
		PAPER/Paper	2 g
	Internal:	PLASTIC/Polyethylene low density - LDPE	13 g
		The plastic packaging material contains at least 0.0% recycled content.	
		The corrugated paper packaging materials contains at least 53.6% recycled content.	
RoHS Compliance	<p>HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.</p> <p>We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.</p>		

Technical Specifications

	<p>We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve. To obtain a copy of the HP RoHS Compliance Statement, see HP RoHS position statement.</p>
<p>Material Usage</p>	<p>This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):</p> <ul style="list-style-type: none"> • 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)
<p>Packaging Usage</p>	<p>HP follows these guidelines to decrease the environmental impact of product packaging:</p> <ul style="list-style-type: none"> • 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.

Technical Specifications

End-of-life Management and Recycling	<p>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.</p> <p>The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: 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.</p>
HP, Inc. Corporate Environmental Information	<p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html</p> <p>Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</p> <p>ISO 14001 certificates: http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842 and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</p>
footnotes	<ul style="list-style-type: none"> • 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)

DOCKING (Sold Separately)

Docking station model #1	HP USB-C Dock G5
Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	Dual 5K@ 30Hz + 4K UHD (multi-function mode)
Dock Connectors	1xHDMI, 2xDP
Technical limitations	<p>Maximum resolution and display support is dependent on the maximum capability of the notebook.</p> <p>Highest resolution with dual displays is two 8K@ 60Hz host in High Resolution mode.</p> <p>Three maximum displays supported are two 5K@ 30 Hz on DP ports plus one 4K UHD@ 30 Hz on HDMI in Multi-function mode</p> <p>The highest resolution for a non-Thunderbolt host in Multi-function mode is a single 5K dual cable (using both DP ports) + (1) 4K on HDMI port.</p>
Docking station model #2	HP USB-C/A Universal Dock G2
Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	Triple 4K UHD@ 60Hz
Dock Connectors	1xHDMI, 2xDP
Technical limitations	<p>Maximum resolution and display support is dependent on the maximum capability of the notebook.</p> <p>The best resolution for dual or triple displays is 4K UHD@ 60Hz.</p> <p>For use with the USB-A adapter that comes in the box the maximum number of displays supported is (2) 4k x 60 Hz on the Type-A Gen 1 connection from the host.</p>
Docking station model #3	HP USB-C G5 Essential Dock
Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	<p>For hosts that support DisplayPort 1.4 with Display Stream Compression:</p> <p>3x FHD @ 60 Hz</p> <p>3x QHD @ 60 Hz</p> <p>3x 4K @ 60 Hz</p> <p>For hosts that support DisplayPort 1.3/1.4:</p> <p>3x FHD @ 60 Hz</p> <p>3x QHD @ 60 Hz</p> <p>2x 4K @ 60 Hz</p>
Dock Connectors	1 x HDMI, 2 x DP
Technical limitations	Video resolution depends on the capability of the host machine. This dock provides up to 65W of power delivery to the host machine.

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

Category	Description	Part Number
Audio	HP Wired USB-A Stereo Headset	428K6AA
	HP Wired 3.5mm Stereo Headset	428K7AA
	HP 365 BT Speaker	567D3AA#ACJ
Video	HP 325 FHD USB-A Webcam	53X27AA
	HP 965 4K USB-A STR Webcam	695J5AA
	HP 625 FHD Webcam	6Y7L1AA
Cases	HP Always On 11.6 Black Case	1D3D0AA
	HP Mobility 11.6 Laptop Case	4U9G8AA
	HP Mobility 14 Laptop Case	4U9G9AA
	HP Prelude G2 15.6 Backpack	1E7D6AA
	HP Prelude G2 15.6 Top Load	1E7D7AA
	HP Prelude Pro Recycled 15.6 Backpack	1X644AA
	HP Prelude Pro Recycled 15.6 Top Load	1X645AA
	HP Renew Business 14.1 Laptop Sleeve	3E2U7AA
	HP Renew Business 14.1 Laptop Bag	3E5F9AA
	HP Renew Business 15.6 Laptop Bag	3E5F8AA
	HP Renew Business 17.3 Laptop Backpack	3E2U5AA
	HP Renew Business 17.3 Laptop Bag	3E2U6AA
	HP Renew Executive 16 Laptop Backpack	6B8Y1AA
	HP Renew Executive 16 Laptop Bag	6B8Y2AA
HP Reversible 11.6	7ZE81AA	
Docking	HP USB-C 120W G5 Dock	5TW10AA
	HP USB-C/A 120W G2 Universal Dock	5TW13AA
Digital Pen	HP Slim RECHBL Pen	630W7AA
Pen Accessory	HP Rechargeable Slim Pen Charger	4X491AA
Hub	HP 4K USB-C Multiport Hub	6G842AA
	HP Universal USB-C Multiport Hub	50H55AA
	HP USB-C Travel Dock G2	7PJ38AA
	HP USB-C to USB-A Hub	Z6A00AA
Adapter	HP USB-C to RJ45 Adapter G2	4Z527AA
	HP USB 3.0 to Gigabit RJ45 Adapter G2	4Z7Z7AA
	HP HDMI to VGA Adapter	H4F02AA
	HP USB-C to DisplayPort Adapter	N9K78AA
	HP USB-C to HDMI 2.0 Adapter	1WC36AA
	HP USB-C to USB 3.0 Adapter	N2Z63AA
	HP USB-C to VGA Adapter	N9K76AA

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

Keyboard/Combo	HP 125 WD USB Keyboard	266C9AA
	HP 320K WD USB Keyboard	9SR37AA
	HP 455 Programmable Wireless Keyboard	4R177AA
	HP 975 USB+BT Dual-Mode Wireless Keyboard	3Z726AA
	HP 155 Wired Mouse and Keyboard Combo	5B8C0AA#ACJ
	HP 225 Antimicrobial Wired Mouse and Keyboard Combo	286K3AA#AB2
	HP 225 Wired Mouse and Keyboard Combo	286J4AA
	HP 235 Wireless Mouse and Keyboard Combo	1Y4D0AA
	HP 655 Wireless Keyboard and Mouse Combo	4R009AA
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA
HP Wireless Rechargeable 950MK Mouse and Keyboard	3M165AA	
Mouse	HP 125 USB-A Wired Mouse	265A9AA
	HP 128 USB Laser Wired Mouse	265D9AA
	HP 155 USB-A Wired Mouse	5B8B7AA#ACJ
	HP 235 Wireless 2.4GHz Slim Wireless Mouse	4E407AA
	HP 320M USB-A Wired Mouse	9VA80AA
	HP Creator USB-A+Bluetooth 935 Wireless Mouse Black	1D0K8AA
	HP USB Premium Wireless Mouse	1JR31AA
	HP USB-A+Bluetooth Multi-Device 635 Wireless Mouse Black	1D0K2AA
	HP USB-A+Bluetooth Travel Bluetooth Mouse	6SP30AA
Power	HP 65W 4.5 mm Smart AC Power Adapter	H6Y89AA
	HP 65W GaN USB-C Laptop Charger	600Q7AA
	HP 65W USB-C Laptop Charger	671R3AA
	HP 90W 4.5 mm Smart AC Power Adapter	H6Y90AA
	HP 65W USB-C LC AC Power Adapter	1P3K6AA
Commodity	HP USB DVD-Writer EXT ODD	F2B56AA
	HP Nano Keyed Cable Lock	1AJ39AA
	HP Nano Master Keyed Cable Lock	1AJ40AA
	HP SureKey Standard/Nano/Wedge Cable Lock	6UW42AA
	HP Combination Nano Cable Lock	63B28AA
	HP Essential Combination Nano Cable Lock	63B31AA

Summary of Changes

Date of change:	Version History:	Updated	Description of change:
March 9, 2023	V1 to V2	Added	Docking station
March 14, 2023	V2 to V3	Updated	Battery Life
March 21, 2023	V3 to V4	Update	At a Glance section
	V4 to V5		

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