

HP EliteBook 630 13.3 inch G10 Notebook PC

Empowering the hybrid workforce

Simplify hybrid work with the cost-effective, highly secure, and easy to manage HP EliteBook 630. With the latest Intel® processor², this PC easily adapts for use at home, in the office, or when traveling.

Ready for demanding workloads

Drive performance with the latest Intel®² processor in the HP EliteBook 630. This globally available and easily serviceable PC features long battery life and two USB Type-A (USB 3.2 Gen 1) and one Thunderbolt™ 4 with USB4 Type-C® port.

Protected by HP Wolf Security

HP Wolf Security for Business creates a hardware-enforced, always-on, resilient defense. From the BIOS to the browser, above, in, and below the OS, these constantly evolving solutions help protect your PC from modern threats.³

Make connections that matter

Take presenting in a hybrid work environment to the next level with audio and video¹⁷ features that enhance your collaboration experience. Enjoy the crystal-clear audio performance delivered by HP Dynamic Voice Leveling⁶ and HP AI Noise Reduction.⁶



*Product image may differ from actual product

Sustainability in action

Outer box packaging 100% sustainably sourced

This PC contains at least 30-percent post-consumer recycled plastic in the bezel, at least 50-percent post-consumer recycled plastic in the keycaps⁶, and the outer box packaging is 100-percent sustainably sourced.⁷



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Featuring

Ready for demanding workloads

Drive performance with the latest Intel®² processor in the HP EliteBook 630. This globally available and easily serviceable PC features long battery life and two USB Type-A (USB 3.2 Gen 1) and one Thunderbolt™ 4 with USB4 Type-C® port.

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Easy battery management

Manage and monitor your battery's performance and condition and customize charging options with the easy-to-use HP Power Manager dashboard.

Dual sensors for image clarity

The HD camera with temporal noise reduction lowers the effects of visual noise and pixelation. Backlight Adjustment includes dual image sensors, that balance contrast, background, and foreground lighting so you can capture all the details.

Up to 64GB DDR4 memory

Work confidently even on larger files with the power of up to 64GB of DDR4 memory and up to 2TB of storage.

Crystal-clear speakers

HP Dynamic Voice Leveling automatically optimizes voice clarity within 3-meters of the PC. HP AI Noise Reduction uses noise-filtering technology to enhance audio conferencing experiences.

Keep visual hackers at bay

Instantly block prying eyes' ability to view your screen with optional HP Sure View Reflect that produces a copper reflective finish when the screen is viewed from the side making it appear unreadable.

Speed up the basics of IT management

Help speed up image creation and the management of hardware, BIOS, and security when managing devices through Microsoft Endpoint Manager with the HP Manageability Integration Kit.

Automatic recovery from firmware attacks

Firmware attacks can completely devastate your PC. Stay protected with HP Sure Start Gen7, the self-healing BIOS that automatically recovers itself from attacks or corruption.

Keep your PC's security protections in place

Stop unwanted changes to security settings and help limit the spread of malware with HP Sure Run Gen5 which identifies, quarantines, and provides reporting on attackers trying to kill processes.

Recovery simplified

HP Sure Recover Gen5 ensures fast, secure, and automated recovery of the OS over LAN or Wi-Fi® from advanced malware attacks. End users can now pause or retry if the connection is lost and it's corporate image ready for fleet deployments.

Browse confidently

Help protect your PC from websites and read-only Microsoft Office and PDF attachments with malware, ransomware, or viruses with hardware-enforced security from HP Sure Click.

Background Adjustment

Keep a consistent look across all your videoconferencing apps with Background Adjustment that has two ways to mask your background. Set Background Blur or choose an image once in myHP instead of adjusting settings in multiple apps.



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Technical specifications

Available Operating Systems	Windows 11 Pro ¹ Windows 11 Pro 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 or Windows 10 Enterprise available with a Volume Licensing Agreement) ¹ Windows 11 Pro (preinstalled with Windows 10 Pro Downgrade) ^{1,2} FreeDOS
Processor family ⁶	13th Generation Intel® Core™ i7 processor 13th Generation Intel® Core™ i5 processor 13th Generation Intel® Core™ i3 processor
Available Processors ^{3,4,5}	Intel® Core™ i7-1355U (1.2 GHz E-core base frequency, 1.7 GHz P-core base frequency, up to 3.7 GHz E-core Max Turbo frequency, up to 5.0 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-core, 12 threads) Intel® Core™ i5-1335U (0.9 GHz E-core base frequency, 1.3 GHz P-core base frequency, up to 3.4 GHz E-core Max Turbo frequency, up to 4.6 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-core, 12 threads) Intel® Core™ i7-1365U (1.3 GHz E-core base frequency, 1.8 GHz P-core base frequency, up to 3.9 GHz E-core Max Turbo frequency, up to 5.2 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-core, 12 threads) Intel® Core™ i5-1345U (1.2 GHz E-core base frequency, 1.6 GHz P-core base frequency, up to 3.5 GHz E-core Max Turbo frequency, up to 4.7 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-core, 12 threads) Intel® Core™ i3-1315U with Intel® UHD Graphics (0.9 GHz E-core base frequency, 1.2 GHz P-core base frequency, up to 3.3 GHz E-core Max Turbo frequency, up to 4.5 GHz P-core Max Turbo frequency, 10 MB L3 cache, 2 P-cores and 4 E-core, 8 threads)
Maximum memory	64 GB DDR4-3200 MHz RAM ⁷ Both slots are accessible/upgradeable by IT or self-maintainers only. Supports dual channel memory.
Memory slots	2 SODIMM
Internal storage	1 TB up to 2 TB PCIe® NVMe™ M.2 SSD TLC ⁸ up to 1 TB PCIe® NVMe™ M.2 SED SSD TLC ⁸ up to 512 GB PCIe® Gen4x4 NVMe™ M.2 SED SSD TLC ⁸ up to 512 GB PCIe® Gen4x4 NVMe™ M.2 SSD TLC ⁸ 256 GB up to 512 GB PCIe® NVMe™ M.2 SSD ⁸ up to 256 GB PCIe® NVMe™ M.2 SED SSD ⁸
Display size (diagonal, metric)	33.8 cm (13.3")
Display	33.8 cm (13.3") diagonal, FHD (1920 x 1080), IPS, anti-glare, 400 nits, low power, 72% NTSC; 33.8 cm (13.3") diagonal, FHD (1920 x 1080), IPS, narrow bezel, anti-glare, 250 nits, 45% NTSC; 33.8 cm (13.3") diagonal, HD (1366 x 768), narrow bezel, anti-glare, 250 nits, 45% NTSC; 33.8 cm (13.3") diagonal, FHD (1920 x 1080), touch, IPS, 250 nits, 45% NTSC; 33.8 cm (13.3") diagonal, FHD (1920 x 1080), IPS, narrow bezel, anti-glare, 1000 nits, 100% sRGB, HP Sure View integrated privacy screen with HP Eye Ease ^{13,15,16,17}
Available Graphics	Integrated: Intel® UHD Graphics; Intel® Iris® X® Graphics ^{12,13} (Support HD decode, DX12, HDMI 2.1.)
Audio	Dual stereo speakers, dual array microphones
Wireless technologies	(Compatible with Miracast-certified devices.)
Ports and connectors	1 Thunderbolt™ 4 with USB Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4); 2 USB Type-A 5Gbps signaling rate (1 power); 1 AC power; 1 HDMI 2.1; 1 stereo headphone/microphone combo jack; 1 RJ-45 ⁴² ; (HDMI cable sold separately.); Optional Ports: 1 Smartcard reader (optional) ¹⁸
Input devices	HP Premium Keyboard – spill resistant, optional backlit keyboard ¹⁴ ; Clickpad with multi-touch gesture support
Communications	Intel® I219-LM GbE LOM, vPro®; Intel® I219-LM GbE LOM, non-vPro® ¹¹ ; Intel® Wi-Fi 6E AX211 (2x2) and Bluetooth® 5.3 wireless card, vPro®; Intel® Wi-Fi 6E AX211 (2x2) and Bluetooth® 5.3 wireless card, non-vPro® ^{9,10} ; Near Field Communication (NFC) module
Camera	720p HD camera with temporal noise reduction; IR Camera (select models) ^{13,18}
Software	HP Connection Optimizer; HP Hotkey Support; HP Power Manager; myHP; HP Privacy Settings; HP Notifications; HP PC Hardware Diagnostics Windows; HP Services Scan; HP Smart Support (download) Buy Office (Sold separately) ^{20,21,38,57; 19}
Security management	Absolute persistence module; HP Secure Erase; HP Sure Click; HP Sure Sense; BIOS Update via Network; HP Sure Admin; HP BIOSphere Gen6; HP Client Security Manager Gen7; TPM 2.0 embedded security chip (Common Criteria EAL4+ and FIPS 140-2 Level 2 Certified); HP Sure Start Gen7; HP Wake on WLAN; HP Tamper Lock; HP Sure Run Gen5; HP Sure Recover Gen5; Secured-Core PC Enable ^{25,26,27,28,29,30,31,32,33,34}
Security Software Licenses	HP Wolf Pro Security Edition ⁵⁶
Fingerprint reader	Fingerprint sensor (select models)



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Management features	HP Client Management Script Library (download); HP Driver Packs (download); HP Client Catalog (download); HP Manageability Integration Kit Gen4 (download); HP Image Assistant Gen5 (download); HP Patch Assistant (download); HP Cloud Recovery; HP Connect for Microsoft Endpoint Manager ^{22,23,24}
Available Graphics	Integrated: Intel® UHD Graphics; Intel® Iris® X® Graphics ^{12,13} (Support HD decode, DX12, HDMI 2.1.)
Audio	Dual stereo speakers, dual array microphones
Wireless technologies	(Compatible with Miracast-certified devices.)
Ports and connectors	1 Thunderbolt™ 4 with USB Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4); 2 USB Type-A 5Gbps signaling rate (1 power); 1 AC power; 1 HDMI 2.1; 1 stereo headphone/microphone combo jack; 1 RJ-45 ⁴² ; (HDMI cable sold separately.); Optional Ports: 1 Smartcard reader (optional) ¹⁸
Input devices	HP Premium Keyboard - spill resistant, optional backlit keyboard ¹⁴ ; Clickpad with multi-touch gesture support
Communications	Intel® I219-LM GbE LOM, vPro®; Intel® I219-LM GbE LOM, non-vPro® ¹¹ ; Intel® Wi-Fi 6E AX211 (2x2) and Bluetooth® 5.3 wireless card, vPro®; Intel® Wi-Fi 6E AX211 (2x2) and Bluetooth® 5.3 wireless card, non-vPro® ^{9,10} ; Near Field Communication (NFC) module
Camera	720p HD camera with temporal noise reduction; IR Camera (select models) ^{13,18}
Software	HP Connection Optimizer; HP Hotkey Support; HP Power Manager; myHP; HP Privacy Settings; HP Notifications; HP PC Hardware Diagnostics Windows; HP Services Scan; HP Smart Support (download) Buy Office (Sold separately) ^{20,21,38,57; 19}
Security management	Absolute persistence module; HP Secure Erase; HP Sure Click; HP Sure Sense; BIOS Update via Network; HP Sure Admin; HP BIOSphere Gen6; HP Client Security Manager Gen7; TPM 2.0 embedded security chip (Common Criteria EAL4+ and FIPS 140-2 Level 2 Certified); HP Sure Start Gen7; HP Wake on WLAN; HP Tamper Lock; HP Sure Run Gen5; HP Sure Recover Gen5; Secured-Core PC Enable ^{25,26,27,28,29,30,31,32,33,34}
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Power	HP Smart 65 W External AC power adapter; HP Smart 65 W EM External AC power adapter; HP Smart 45 W External AC power adapter; HP Smart 45 W 2-prong External AC power adapter; HP Smart 65 W USB Type-C® adapter; HP Smart 45 W USB Type-C® adapter ³⁷
Battery type	HP Long Life 3-cell, 42.75 Wh polymer ³⁶
Dimensions	30.69 x 20.84 x 1.59 cm 6.9 x 48.3 x 30.5 cm (Package)
Weight	Starting at 1.22 kg (Weight will vary by configuration. Does not include power adapter.)
Ecolabels	CECP; IT ECO Declaration; EPEAT® Gold registered in the U.S.; SEPA; Taiwan Green Mark; Japan PC Green Label; TCO Certified ³⁹
Energy star certified (series fixed)	ENERGY STAR® certified
Certification and compliance	CCC; CECP; GS Mark
Sustainable impact specifications	Low Halogen; Bulk packaging available; Molded paper pulp cushion inside box is 100% sustainably sourced and recyclable; Outside box and corrugated cushions are 100% sustainably sourced and recyclable; 5% post-consumer recycled plastic; Ocean-bound plastic in speaker enclosure(s) ^{40,41,43,44,45}
Warranty	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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Footnotes

Key Selling Points Footnotes

- ² 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.
- ³ HP Wolf Security for Business requires Windows 10 Pro and higher, includes various HP security features and is available on HP Pro, Elite, Workstation, and RPOS products. See product details for included security features and OS requirements.
- ⁴ Requires the myHP application and Windows OS.
- ⁵ HP Power Manager requires Windows 10 and higher and is available from the Microsoft store.
- ⁷ 100% outer box packaging made from sustainably sourced certified and recycled fibers. Fiber cushions made from 100% recycled wood fiber and organic material. Any plastic cushions are made from >90% recycled plastic.
- ⁸ Sold separately or as an optional feature.
- ⁹ Sold separately or as an optional feature. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30GB (for Windows) of disk is reserved for system recovery software.
- ¹⁰ HP Sure View Reflect integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
- ¹¹ HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.
- ¹² HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 Pro and higher.
- ¹³ HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 Pro and higher.
- ¹⁴ HP Sure Recover Gen5 is available on select HP PCs and requires Windows 10 Pro and higher and an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. Network based recovery using Wi-Fi is only available on PCs with Intel Wi-Fi Module.
- ¹⁵ HP Sure Click requires Windows 10 and higher. See https://bit.ly/2PrLT6A_SureClick for complete details.
- ¹⁷ HP conferencing features require Windows and the latest myHP app, available over the air or for download via sofpaq on the HP Support website. Planned availability in spring 2023.

Technical Specifications Footnotes

- ² This computer is preinstalled with Windows [insert Product version/edition name] Home Single Language.
- ³ Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.
- ⁴ Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
- ⁵ Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See www.intel.com/technology/turboboost for more information.
- ⁶ In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on products configured with Intel and AMD 7th generation and forward processors or provide any Windows 8 or Windows 7 drivers on <http://www.support.hp.com>.
- ⁷ 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.
- ⁸ 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.
- ⁹ 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.
- ¹⁰ Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.
- ¹¹ 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.
- ¹² Intel® Iris™ X® Graphics capabilities require system to be configured with Intel® Core™ i5 or i7 processors and dual channel memory. Intel® Iris™ X® Graphics with Intel® Core™ i5 or i7 processors and single channel memory will only function as UHD graphics.
- ¹³ HD content required to view HD images.
- ¹⁴ Backlit keyboard is an optional feature.
- ¹⁵ Resolutions are dependent upon monitor capability, and resolution and color depth settings.
- ¹⁶ HP Sure View Reflect integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
- ¹⁷ Actual brightness will be lower with touchscreen or Sure View.
- ¹⁸ Sold separately or as an optional feature.
- ¹⁹ Microsoft Office sold separately and requires Internet access for activation.
- ²⁰ HP Support Assistant requires Windows and Internet access.
- ²¹ HP Services Scan is provided with Windows Update on select products 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. HP TechPulse is a telemetry and analytics platform that provides critical data around devices and applications. For full system requirements or to disable this feature, please visit <http://www.hpdaas.com/requirements>. Not applicable in China.
- ²² 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.
- ²³ HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.
- ²⁴ 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>.
- ²⁵ HP Sure Click requires Windows 10 Pro or higher or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.
- ²⁶ HP Sure Sense is available on select HP PCs with Windows 10 Pro, Windows 10 Enterprise, Windows 11 Pro, or Windows 11 Enterprise OS25. HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 and higher.
- ²⁷ HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 and higher.
- ²⁸ HP Sure Recover is available on HP Elite PCs with 8th generation Intel® or AMD processors and requires an open, wired network connection. You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Does not support platforms with Intel® Optane™.
- ²⁹ HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 and higher.
- ³⁰ HP Client Security Manager Gen7 requires Windows and is available on the select HP Elite and Pro PCs.
- ³¹ HP BIOSphere Gen6 features may vary depending on the platform and configuration.
- ³² 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™.
- ³³ 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/>
- ³⁴ Secured-Core PC Enable 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 is enabled from the factory.
- ³⁵ HP Fingerprint sensor is an optional feature that must be configured at purchase.
- 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 Availability may vary by country.
- ³⁸ HP Power Manager requires Windows 10 and higher and can be downloaded from the Microsoft Store.
- ³⁹ Based on US EPEAT® registration according to IEEE 16801-2018 EPEAT®. Status varies by country. Visit www.epeat.net for more information.
- ⁴⁰ External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.
- ⁴¹ Molded pulp cushions made from 100% recycled wood fiber and organic materials.
- ⁴² SuperSpeed USB 20Gbps is not available with Thunderbolt™ 4.
- ⁴³ Recycled plastic content percentage is based on the definition set in the IEEE 16801-2018 standard.
- ⁴⁴ 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.
- ⁴⁵ Percentage of ocean-bound plastic contained in each component varies by product.
- ⁵⁶ HP Wolf Pro Security Edition (including HP Sure Click Pro and HP Sure Sense Pro) is available preloaded on select SKUs and, depending on the HP product purchased, includes a paid 1-year or 3-year license. The HP Wolf Pro Security Edition software is licensed under the license terms of the HP Wolf Security Software - End-User license Agreement (EULA) that can be found at: https://support.hp.com/us-en/document/ish_3875769-3873014-16 as that EULA is modified by the following: "7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition (HP Sure Sense Pro and HP Sure Click Pro) is effective upon activation and will continue for either a twelve (12) month or thirty-six (36) month license term ("Initial Term"). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support."



Overview

HP EliteBook 640 14 inch G10 Notebook PC



Left

- | | |
|---|--|
| 1. Internal Microphones (2) | 7. Clickpad |
| 2. Webcam LED (Optional) | 8. Smartcard Reader (Optional) |
| 3. Camera Shutter (Only available with webcam) | 9. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1) |
| 4. 5MP IR, HD TNR, or HD TNR IR Camera (Optional) | 10. Ethernet Port (RJ-45) |
| 5. IR Camera LED (Optional) | 11. Nano Security Lock Slot (Lock sold separately) |
| 6. NFC Sensor | |

Overview



Right

- | | |
|---|--|
| 1. Power Button Key | 6. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1) |
| 2. Speakers | 7. HDMI 2.1 Port (Cable not included) |
| 3. Power Connector | 8. Audio Combo Jack |
| 4. Thunderbolt™ 4 with USB4™ Type-C® 40 Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)¹ | 9. External SIM Card Slot (Optional) |
| 5. SuperSpeed USB Type-C® 10Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4) | 10. Touch Fingerprint Sensor (Select Models) |
1. SuperSpeed USB 20Gbps is not available with Thunderbolt™ 4.

Overview

At a Glance

- Choice of 13th generation Intel® Core™ i7, i5 and i3 processors
- Preinstalled with Windows 11 versions or FreeDOS
- Optional NVIDIA® GeForce® RTX2050 discrete graphics with 4 GB DDR6 dedicated video memory
- Fast and upgradeable dual channel DDR4 SODIMM memory up to 64 GB
- Choice of 35.56 cm (14") diagonal HD, Ultra Wide Viewing Angle FHD, Touch or Non-Touch screen, and Privacy Panel option.
- Features quiet and responsive HP Keyboard with the HP Programmable key and backlit options
- Choice of solid state drives up to 2 TB
- Multi-layered security with HP SureStart Gen7, HP Privacy Camera, HP Sure View, HP Wolf Security (Includes HP Sure Sense and HP Sure Click), HP Secure Erase, Sure Run Gen5, Sure Recover Gen5, Touch Fingerprint reader, and Tamper Lock
- Supports wireless options for connectivity on the go including gigabit-speed Wi-Fi® 6e and CAT16 4G/LTE WWAN
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles
- Designed to support HP docking options
- Passed MIL-STD 810H tests¹
- Battery Life up to 14 hours
- Optimize your video calls with a 5MP+IR camera, HD+IR/HD camera and temporal noise reduction that adjusts to the lighting in your environment.
- 180° synchronized hinge allows the EliteBook to lay completely flat, without lifting the keyboard, and includes everyone with visibility from multiple angles.
- Can be wiped up to 1000 times with common household cleaning wipes²
- Synchronized hinge allows the EliteBook to ProBook to open to 177° +/- 3° without lifting the keyboard and offers visibility from multiple angles.

1. MIL-STD 810GH 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.

2. See wipe manufacturer's instructions for disinfecting and the HP cleaning guide for HP tested wipe solutions at <http://h20195.www.2.hp.com/v2/GetDocument.aspx?docname=4AA7-7610ENW>

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

Technical Specifications

PRODUCT NAME

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OPERATING SYSTEMS

Preinstalled

Windows 11 Pro ¹Windows 11 Pro Education ¹Windows 11 Home - HP recommends Windows 11 Pro for Business ¹Windows 11 Home Single Language – HP recommends Windows 11 Pro for Business ¹Windows 11 Pro (Windows 11 Enterprise or Windows 10 Enterprise available with a Volume Licensing Agreement ¹Windows 11 Pro (preinstalled with Windows 10 Pro Downgrade)^{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 P-cores	Number of E-cores	Threads	L3 Cache	Max Turbo Frequency		Base Frequency		Intel SIPP/vPro® Enterprise	Intel vPro® Essentials
						P-cores	E-cores	P-cores	E-cores		
Intel® Core™ i7-1370P	14	6	8	20	24 MB	5.2 GHz	3.9 GHz	1.9 GHz	1.4 GHz	X	
Intel® Core™ i7-1365U	10	2	8	12	12 MB	5.2 GHz	3.9 GHz	1.8 GHz	1.3 GHz	X	
Intel® Core™ i7-1355U	10	2	8	12	12 MB	5.0 GHz	3.7 GHz	1.7 GHz	1.2 GHz		
Intel® Core™ i5-1350P	12	4	8	16	12 MB	4.7 GHz	3.5 GHz	1.9 GHz	1.4 GHz	X	
Intel® Core™ i5-1345U	10	2	8	12	12 MB	4.7 GHz	3.5 GHz	1.6 GHz	1.2 GHz	X	
Intel® Core™ i5-1335U	10	2	8	12	12 MB	4.6 GHz	3.4 GHz	1.3 GHz	0.9 GHz		X
Intel® Core™ i3-1315U	6	2	4	8	10 MB	4.5 GHz	3.3 GHz	1.2 GHz	0.9 GHz		

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

Technical Specifications

workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.

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

5. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See www.intel.com/technology/turboboost for more information.

6. In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on products configured with Intel and AMD 7th generation and forward processors or provide any Windows 8 or Windows 7 drivers on <http://www.support.hp.com>

7. Intel vPro® requires Windows 10 Pro 64 bit or higher, a vPro supported processor, vPro enabled chipset, vPro enabled 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>

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated

Intel® Iris® X^e Graphics (Core i5 and Core i7) ⁸

Intel® UHD Graphics (Core i3)

Discrete

NVIDIA® GeForce® RTX2050 (4 GB DDR6 dedicated)

Supports

Supports CUDA, Optimus, PhysX, GPU Boost 2.0

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

Technical Specifications

DISPLAY

Non-Touch

- 35.6 cm (14") diagonal, FHD UWVA Low Blue Light IPS anti-glare, 1000 nits, sRGB 100% for 5MP + IR camera and HP Sure View Gen4 integrated privacy screen with HP Eye Ease (1920 x 1080) ^{9,10,11,12,13}
- 35.6 cm (14") diagonal, FHD UWVA eDP Low Blue Light IPS anti-glare, 400 nits, 100% for 5MP + IR camera (1920 x 1080) with HP Eye Ease ^{9,10,11}
- 35.6 cm (14") diagonal, FHD UWVA eDP 1.3+PSR Low Blue Light IPS anti-glare, low power, 400 nits, sRGB 100% for HD + IR camera and WWAN with HP Eye Ease (1920 x 1080) ^{9,10,11}
- 35.6 cm (14") diagonal, FHD UWVA Low Blue Light IPS anti-glare, 400 nits, 100% eDP for HD Webcam (1920 x 1080) with HP Eye Ease ^{9,10,11}
- 35.6 cm (14") diagonal FHD UWVA eDP anti-glare narrow bezel bent, 250 nits, 45% NTSC for HD + IR camera and WWAN (1920x1080) ^{9,10,11}
- 35.6 cm (14") diagonal FHD UWVA eDP anti-glare narrow bezel bent, 250 nits,45% NTSC for HD camera and WWAN (1920x1080) ^{9,10,11}
- 35.6 cm (14") diagonal FHD UWVA eDP anti-glare narrow bezel bent, 250 nits,45% NTSC for HD camera (1920 x 1080) ^{9,10,11}
- 35.6 cm (14") diagonal FHD UWVA eDP 1.2 w/o PSR anti-glare narrow bezel bent, 250 nits,45% NTSC (1920 x 1080) ^{9,10,11}
- 35.6 cm (14") diagonal, FHD , IPS anti-glare, micro-edge, 250 nits, 45% NTSC, no mic Narrow Bezel bent for WWAN (1920 x 1080) ^{9,10,11}
- 35.6 cm (14") diagonal, FHD UWVA eDP1.4 w/o PSR, anti-glare, micro-edge, 250 nits, 45% NTSC, no mic Narrow Bezel bent (1920 x 1080) ^{9,10,11}
- 35.6 cm (14") diagonal, HD SVA eDP 1.2 w/o PSR, Anti-Glare, 250 nits, 45% NTSC for HD Webcam Narrow Bezel bent (1366 x 768) ^{9,10,11}
- 35.6 cm (14") diagonal, HD SVA eDP 1.2 w/o PSR, Anti-Glare, 250 nits, 45% NTSC Narrow Bezel bent (1366x768) ^{9,10,11}

Touch

- 35.6 cm (14") diagonal FHD Anti-Glare UWVA eDP narrow bezel bent touch-on-panel screen, 250 nits, 45% NTSC for HD camera (1920 x 1080) ^{9,10,11,13}

Display Size (Diagonal)

- 14" diagonal
- 35.6 cm (14") diagonal

9. HD content required to view HD images.

10. Sold separately or as an optional feature.

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

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

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

DOCKING (Sold Separately)

Docking station model #1	HP Thunderbolt 120W G4 Dock
Docking station model #2	HP Thunderbolt 280W G4 Dock
Docking station model #3	HP USB-C Dock G5
Docking station model #4	HP USB-C/A Universal Dock G2
Docking station model #5	HP USB-C G5 Essential Dock

For additional aftermarket options and docking specs please see page 41.

Technical Specifications

STORAGE AND DRIVES

Primary Storage

2 TB PCIe® NVMe™ TLC 2280 Solid State Drive ¹⁴

1 TB PCIe® NVMe™ TLC 2280 Self Encrypted OPAL2 Solid State Drive ¹⁴

1 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC ^{14,52}

512 GB PCIe® NVMe™ TLC 2280 Self Encrypted OPAL2 Solid State Drive ¹⁴

512 GB PCIe® NVMe™ TLC Solid State Drive ¹⁴

512 GB PCIe® NVMe™ Value M.2 SSD ¹⁴

256 GB PCIe® NVMe™ Value 2280 Self Encrypted OPAL2 Solid State Drive ¹⁴

256 GB PCIe® NVMe™ Value M.2 SSD¹⁴

Secondary Storage

256 GB PCIe® NVMe™ Value 2230 2nd Solid State Drive ¹⁵

14. 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.

15. Secondary SSD slot (M.2 2230 form factor; Optional) is used for data storage only, not used for OS deployment, and is only available with non-WWAN base Unit AND Primary M.2 storage.

52. Available only to HK (Hong Kong), TW (Taiwan) and CN (China).

MEMORY

Maximum Memory

64 GB DDR4-3200 SDRAM ¹⁶

Memory

64 GB DDR4-3200 SDRAM (2x32GB) ¹⁶

32 GB DDR4-3200 SDRAM (2x16GB) ¹⁶

32 GB DDR4-3200 SDRAM (1x32GB) ¹⁶

16 GB DDR4-3200 SDRAM (2x8GB) ¹⁶

16 GB DDR4-3200 SDRAM (1x16GB) ¹⁶

8 GB DDR4-3200 SDRAM (1x8GB) ¹⁶

8 GB DDR4-3200 SDRAM (2x4GB) ¹⁶

Memory Slots

2 SODIMM

Slot is customer accessible / upgradeable

DDR4 PC4 SODIMMS (Raptor Lake runs at 3200)

Supports Dual Channel Memory

16. 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

Intel® AX211 Wi-Fi 6E +Bluetooth® 5.3 M.2 160MHz CNVi World-wide WLAN non-vPro® Wireless Card ¹⁷

Intel® AX211 Wi-Fi 6E +Bluetooth® 5.3 M.2 160MHz CNVi World-wide WLAN vPro® Wireless Card ¹⁷

WWAN

Intel® XMM™ 7560 R+ LTE-Advanced Pro ¹⁸

NFC

NFC Mirage module (NXP NPC300 I2C 10mmx17mm)

Miracast

Native Miracast Support ¹⁹

Ethernet

Intel® I219-LM 1 Gigabit Network Connection LOM (vPro) ²⁰

Intel® I219V 1 Gigabit Network Connection LOM (non-vPro) ²⁰

17. 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.

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

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

20. 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.

Technical Specifications

AUDIO/MULTIMEDIA

Audio

2 Integrated stereo speakers
Integrated microphone (Dual Array)

Speaker Power

2W/4ohm Per speaker

Webcam

720p HD camera with Temporal Noise Reduction ^{9,10}
720p HD camera+IR Camera with Temporal Noise Reduction ^{9,10}
5MP camera+IR with Temporal Noise Reduction ^{9,10}
5 MP + IR camera for face authentication with Windows Hello

[9. HD content required to view HD images.](#)

[10. Sold separately or as an optional feature.](#)

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Premium Keyboard, spill resistant with optional backlit function ²¹

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 - Wireless
F12 - Programmable key

Hidden Function Keys

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

[21. Backlit keyboard is an optional feature.](#)

Technical Specifications

SOFTWARE AND SECURITY

Preinstalled Software

HP Quick Drop ²²
HP PC Hardware Diagnostics Windows
myHP with Video Controls
HP Smart Support ²³
HP Services Scan ²⁴
HP Connection Optimizer
HP Hotkey Support
HP Support Assistant ²⁵
HP Notifications
HP Privacy Settings
HP Power Manager
Buy Microsoft Office (Sold separately)

Manageability Features

HP Connect ²⁶
HP Image Assistant Gen5 (download)
HP Manageability Integration Kit (download) ²⁷
HP Client Management Script Library (download)
HP Patch Assistant (download) ²⁸
HP Driver Packs (download)
HP Client Catalog (download)
HP Cloud Recovery

Security Management

HP Wolf Security for Business ²⁹ includes:
HP Sure Click ³⁰
HP Sure Sense ³¹
HP Sure Run ³²
HP Sure Recover ³³
HP Sure Start ³⁴
HP Tamper Lock
HP Sure Admin ³⁵

BIOS

HP BIOSphere Gen6 ³⁶
HP Secure Erase ³⁷
Absolute Persistence Module ³⁸
BIOS Update via Network
HP Wake on WLAN
Secured-Core PC Enable ³⁹
TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)
HP Fingerprint Sensor ⁴⁰

Security

TPM

Model: Nuvoton NPCT760HABYX



Technical Specifications

Version: 7.2.3.1
Revision: TPM 2.0
FIPS 140-2 Compliant: Yes

Smartcard Reader

Model number: Alcor AU9560
FIPS 201 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: 3

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

23. HP 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>.

24. HP Services Scan is provided with Windows Update on select products 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. 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 or to disable this feature, please visit <http://www.hpdaas.com/requirements>. Not applicable in China.

25. HP Support Assistant requires Windows and Internet access.

26. 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.

27. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

28. 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>.

29. 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..

30. HP Sure Click requires Windows 10 Pro or higher or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.

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 Run Gen5 is available on select HP PCs and requires Windows 10 and higher.

33. HP Sure Recover is available on select HP PCs and requires an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data.

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

35. HP Sure Admin requires Windows 10 or higher, 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

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



Technical Specifications

- 37. 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™.
 - 38. 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/>
 - 39. Secured-Core PC Enable 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 is enabled from the factory.
 - 40. HP Fingerprint sensor is an optional feature that must be configured at purchase.
-

Technical Specifications

POWER

Power Supply

AC Adapter 65 Watt nPFC Standard USB Type C® Straight 1.8m ⁴¹

AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm New EM⁴¹

AC Adapter 65 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m⁴¹

Battery

HP Long Life 3-cell, 51.3 Wh Polymer ^{42,43}

Compliant with UL 1642 Standard

Power Cord

3-wire plug - 1m ⁴¹

Battery Life

Up to 14 hours with 51whr battery (HP Long Life 3-Cell, 51 Whr Polymer, UMA graphic, Intel U15, Display set to 200 nits display (on a 400 nit display), 2*4G memory, 256 GB SSD) ⁴⁴

Up to 13 hours and 30 minutes with 51whr battery (HP Long Life 3-Cell, 51 Whr Polymer, UMA graphic, Intel P28, Display set to 200 nits display (on a 400 nit display), 2*4G memory, 256 GB SSD) ⁴⁴

Battery Weight

HP Long Life 3-cell - 51.3 Wh Polymer - .45 lb

HP Long Life 3-cell - 51.3 Wh Polymer - 203.56 g

41. Availability may vary by country.

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

43. 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.

44. 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.

WEIGHTS & DIMENSIONS

Product Weight

Starting at 3.13 lb ⁴⁵

Starting at 1.41 kg ⁴⁵

Product Dimensions (W x D x H)

12.67 x 8.42 x 0.78 in

32.19 x 21.39 x 1.99 cm

Packaging Dimensions (W x D x H) ⁴⁶

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

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

Technical Specifications

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

PORTS/SLOTS

- 1 Thunderbolt™ 4 with USB4™ Type-C® 40 Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)⁴⁷
- 1 SuperSpeed USB Type-C® 10Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)
- 2 SuperSpeed USB Type-A 5Gbps signaling rate Port (1 Powered port)
- 1 AC power
- 1 HDMI 2.1 ⁴⁸
- 1 Headphone/microphone combo jack
- 1 Nano SIM slot for WWAN (optional)
- 1 RJ-45
- 1 Smart Card Reader (optional)

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

48. HDMI cable sold separately

SERVICE AND SUPPORT

1-year and 3-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty. 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>.⁴⁹

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

Technical Specifications

SYSTEM UNIT**Stand-Alone Power Requirements
(AC Power)**

Nominal Operating Voltage	19V
Average Operating Power	3.81W
Integrated graphics	Yes
Discrete Graphics	Yes
Max Operating Power	Discrete < 65W UMA < 45W

Temperature

Operating	32° to 95° F (0° to 35° C) (No sustained direct exposure to sunlight) (System performance may be reduced above 32°C (89.6°F))
Non-operating	-4° to 140° F (-20° to 60° C)

Relative Humidity

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

Shock

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

Random Vibration

Operating	1.043 grams
Non-operating	3.5 grams

Altitude (unpressurized)

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

**Planned Industry Standard
Certifications**

Regulatory Model Number	HSN-Q33C-4
CSA/UL 62368-1	Yes
ENERGY STAR®	Yes ⁵⁰
EPEAT®	EPEAT® Gold in the United States ⁵¹
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
EAEU Compliance	Yes
Saudi Arabian Compliance	Yes
TCO	Yes
Low Blue Light	Yes
WW RoHS	Yes

Technical Specifications

50. Configurations of the HP EliteBook 640 14 inch G10 Notebook PC that are ENERGY STAR® qualified are identified as HP EliteBook 640 14 inch G10 Notebook PC ENERGY STAR on HP websites and on <http://www.energystar.gov>.

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

DISPLAYS

1. Actual brightness will be lower with touchscreen or HP 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 Touch on Panel NWBZ	Outline Dimensions (W x H x D)	316.170 x 186.400 (max)
	Active Area	309.370 x 174.020 mm (typ)
	Weight	305 g (max)
	Diagonal Size	14.0
	Surface Treatment	Anti-Glare On-cell
	Touch Enabled	Yes ¹
	Contrast Ratio	600:1 (typ)
	Refresh Rate	60 Hz
	Brightness	250 nits ¹
	Pixel Resolution - Format	1920 x 1080 (FHD)
	Backlight	LED
	Pixel Resolution	RGB
	Color Gamut Coverage	NTSC 45%
	Color Depth	6 (Hi FRC w/ condition to enable)
	Viewing Angle	UWVA 85/85/85/85
	Low Blue Light	No
	Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.30 (max)/ 2.80 (max)

14.0 in FHD (1920 x 1080) Anti-Glare UWVA Low Blue Light sRGB NB2X 400 eDP 1.4+PSR2 Low-Power 100 bent LCD Panel	Outline Dimensions (W x H x D)	315.100 x 184.900 (max)
	Active Area	309.370 x 174.020 mm (typ)
	Weight	230g (max)
	Diagonal Size	14.0
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	1200:1 (typ)
	Refresh Rate	60Hz
	Brightness	400 nits ¹
	Pixel Resolution - Format	1920 x 1080 (FHD)
	Backlight	WLED
	Pixel Resolution	RGB
	Color Gamut Coverage	sRGB 100%

Technical Specifications

Color Depth	8
Viewing Angle	UWVA 89/89/89/89
Low Blue Light	Yes
Power Consumption (W, EBL@ 150nits max/ 200nits max)	1.23 (max)/1.5 (max)

Panel LCD 14-in FHD (1920x1080) Anti-Glare WLED UWVA 45percent cg 250nits eDP 1.2 w/o PSR NWBZ bent	Outline Dimensions (W x H x D)	316.170 x 186.400 (max)
	Active Area	309.370 x 174.020 mm (typ)
	Weight	300 g (max)
	Diagonal Size	14.0
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	600:1 (typ)
	Refresh Rate	60Hz
	Brightness	250 nits ¹
	Pixel Resolution - Format	1920 x 1080 (FHD)
	Backlight	LED
	Pixel Resolution	RGB
	Color Gamut Coverage	NTSC 45%
	Color Depth	6 (Hi FRC w/ condition to enable)
	Viewing Angle	UWVA 85/85/85/85
	NEW - Low Blue Light	No
	NEW - Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.205 (max)/ 2.716 (max)

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)	316.110 x 186.370 (max)
	Active Area	309.400 x 173.950 mm (typ)
	Weight	300 g (max)
	Diagonal Size	14.0
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	300:1 (typ)
	Refresh Rate	60 Hz
	Brightness	250 nits ¹
	Pixel Resolution - Format	1366 x 768 (HD)
	Backlight	LED
	Pixel Resolution	RGB
	Color Gamut Coverage	NTSC 45%
	Color Depth	6

Technical Specifications

Viewing Angle	SVA 45/45/15/35
Low Blue Light	No
Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.52 (max) / 2.86 (max)

14.0 in FHD (1920 x 1080) Anti-Glare UWVA Low Blue Light sRGB NB2Y 1000 eDP 1.3+PSR 100 PrivacyG4 Plus bent LCD Panel	Outline Dimensions (W x H x D)	314.612 x 185.330 (max)
	Active Area	309.312 x 173.990 (typ)
	Weight	230 g (max)
	Diagonal Size	14.0
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	1500:1 (typ)
	Refresh Rate	60 Hz
	Brightness	1000 nits ¹
	Pixel Resolution - Format	1920 x1080 (FHD)
	Backlight	WLED
	Pixel Resolution	RGB
	Color Gamut Coverage	sRGB 100%
	Color Depth	8
	Viewing Angle	UWVA 85/85/85/85
	NEW - Low Blue Light	Yes
	NEW - Power Consumption (W, EBL@ 150nits max/ 200nits max)	NA

Technical Specifications

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 256GB 2230 PCIe NVMe Value	Form Factor	M.2 2230
	Capacity	256GB
	NAND Type	Value
	Interface	PCIe NVMe
	Minimum Sequential Read	2000 MB/s ± 10%
	Minimum Sequential Write	900 MB/s ± 10%
	Logical Blocks	500,118,192
	Features	Pyrite; TRIM; L1.2
SSD 256GB 2280 PCIe NVMe Value	Form Factor	M.2 2280
	Capacity	256GB
	NAND Type	Value
	Interface	PCIe NVMe
	Minimum Sequential Read	2000 MB/s ± 10%
	Minimum Sequential Write	900 MB/s ± 10%
	Logical Blocks	500,118,192
	Features	ATA Security; TRIM; L1.2
256GB PCIe 2280 NVMe Self Encrypted OPAL2 Value Solid State Drive	Form Factor	M.2 2280
	Capacity	256 GB
	NAND Type	Opal2 Value
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	2000 MB/s ± 10%
	Minimum Sequential Write	900 MB/s ± 10%
	Logical Blocks	500,118,192
	Features	Pyrite 2.0; TRIM; L1.2
SSD 512GB 2280 PCIe NVMe Value	Form Factor	M.2 2280
	Capacity	512GB
	NAND Type	Value
	Interface	PCIe NVMe
	Minimum Sequential Read	2200 MB/s ± 10%
	Minimum Sequential Write	1000 MB/s ± 10%
	Logical Blocks	1000215216
	Features	Pyrite 2.0, TRIM; L1.2
512GB PCIe-4x4 2280 NVME Self Encrypted	Form Factor	M.2 2280
	Capacity	512 GB
	NAND Type	Opal2 TLC

Technical Specifications

OPAL2 Three Layer Cell Solid State Drive	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	6400 MB/s ± 10%
	Minimum Sequential Write	3500 MB/s ± 10%
	Logical Blocks Features	1,000,215,216 Pyrite 2.0, TRIM; L1.2
512GB PCIe-4x4 2280 NVMe Self Encrypted OPAL2 Three Layer Cell Solid State Drive	Form Factor	M.2 2280
	Capacity	512 GB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	6400 MB/s ± 10%
	Minimum Sequential Write	3500 MB/s ± 10%
	Logical Blocks Features	1,000,215,216 Pyrite 2.0, TRIM; L1.2
1TB PCIe-4x4 2280 NVMe Self Encrypted OPAL2 Three Layer Cell Solid State Drive	Form Factor	M.2 2280
	Capacity	1 TB
	NAND Type	Opal2 TLC
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	6400 MB/s ± 10%
	Minimum Sequential Write	5000 MB/s ± 10%
	Logical Blocks	2,000,409,264
	Features	Pyrite 2.0, TRIM; L1.2
SSD 1 TB 2280 PCIe NVMe Value¹	Form Factor	M.2 2280
	Capacity	1TB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	3200 MB/s ± 10%
	Minimum Sequential Write	2700 MB/s ± 10%
	Logical Blocks	2,000,409,264
	Features	Pyrite 2.0; TRIM; L1.2
SSD 2TB 2280 PCIe-4x4 NVMe Three Layer Cell	Form Factor	M.2 2280
	Capacity	2 TB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	6400 MB/s ± 10%
	Minimum Sequential Write	5000 MB/s ± 10%
	Logical Blocks	4,000,797,360
	Features	Pyrite 2.0, TRIM; L1.2

1. Available only to HK (Hong Kong), TW (Taiwan) and CN (China).

Technical Specifications

NETWORKING/COMMUNICATIONS

Intel® AX211 Wi-Fi 6E + Bluetooth® 5.3 M.2 160MHz CNVi World-wide WLAN vPro Wireless Card¹	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
	Interoperability	Wi-Fi certified
	Frequency Band	•802.11b/g/n/ax 2.402 – 2.482 GHz •802.11a/n/ac/ax 4.9 – 4.95 GHz (Japan) 5.15 – 5.25 GHz 5.25 – 5.35 GHz 5.47 – 5.725 GHz 5.825 – 5.850 GHz 5.955 – 6.415 GHz 6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 GHz
	Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: max 300Mbps • 802.11ac : 1733Mbps • 802.11ax : max 2.4Gbps
	Modulation	Direct Sequence Spread Spectrum
	Security ²	OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • WPA3 certification • IEEE 802.11i • WAPI
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)

Technical Specifications

Roaming	IEEE 802.11 compliant roaming between access points
Output Power ³	• 802.11b : +17dBm minimum • 802.11g : +16dBm minimum • 802.11a : +17dBm minimum • 802.11n HT20(2.4GHz) : +14dBm minimum • 802.11n HT40(2.4GHz) : +13dBm minimum • 802.11n HT20(5GHz) : +14dBm minimum • 802.11n HT40(5GHz) : +13dBm minimum • 802.11ac VHT80(5GHz) : +10dBm minimum • 802.11ac VHT160(5GHz) : +10dBm minimum • 802.11ax HE40(2.4GHz) : +12dBm minimum • 802.11ax HE80(5GHz) : +10dBm minimum • 802.11ax HE160(5GHz) : +10dBm minimum
Power Consumption	• Transmit mode 2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity ⁴	• 802.11b, 1Mbps : -93.5dBm maximum • 802.11b, 11Mbps : -84dBm maximum • 802.11a/g, 6Mbps : -86dBm maximum • 802.11a/g, 54Mbps : -72dBm maximum • 802.11n, MCS07 : -67dBm maximum • 802.11n, MCS15 : -64dBm maximum • 802.11ac, MCS0(VHT80) : -84dBm maximum • 802.11ac, MCS9(VHT80) : -59dBm maximum • 802.11ac, MCS9(VHT160) : -58.5dBm maximum • 802.11ax, MCS11(HE40) : -57dBm maximum • 802.11ax, MCS11(HE80) : -54dBm maximum • 802.11ax, MCS11(HE160) : -53.5dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	1. Type 2230 : 2.8g 2. Type 1216: 1.3g
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)

Technical Specifications

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 Card

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	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

Technical Specifications

- Channel Selection Algo
- Limited High Duty Cycle Non-Connectable Advertising
- 2Mbps LE
- LE Long Range
- BT5.3
- Host to Controller Encryption Key Control Enhancements
- Compliance to the latest Errata Sectipn 12.3 of BT 5.3 specification

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. Check latest software/driver release for updates on supported security features.
3. 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.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Intel® AX211 Wi-Fi 6E + Bluetooth® 5.3 M.2 160MHz CNVi World-wide WLAN non-vPro Wireless Card ¹	Wireless LAN Standards	IEEE 802.11a
		IEEE 802.11b
		IEEE 802.11g
		IEEE 802.11n
		IEEE 802.11ac
		IEEE 802.11ax
		IEEE 802.11d
		IEEE 802.11e
		IEEE 802.11h
		IEEE 802.11i
		IEEE 802.11k
		IEEE 802.11r
		IEEE 802.11v
	Interoperability	Wi-Fi certified
		•802.11b/g/n/ax
	Frequency Band	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
	Data Rates	6.895 – 7.115 GHz
		• 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

Technical Specifications

	• 802.11n: max 300Mbps • 802.11ac : 1733Mbps • 802.11ax : max 2.4Gbps
Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
Security²	• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • WPA3 certification • IEEE 802.11i • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power³	• 802.11b : +17dBm minimum • 802.11g : +16dBm minimum • 802.11a : +17dBm minimum • 802.11n HT20(2.4GHz) : +14dBm minimum • 802.11n HT40(2.4GHz) : +13dBm minimum • 802.11n HT20(5GHz) : +14dBm minimum • 802.11n HT40(5GHz) : +13dBm minimum • 802.11ac VHT80(5GHz) : +10dBm minimum • 802.11ac VHT160(5GHz) : +10dBm minimum • 802.11ax HE40(2.4GHz) : +12dBm minimum • 802.11ax HE80(5GHz) : +10dBm minimum • 802.11ax HE160(5GHz) : +10dBm minimum
Power Consumption	• Transmit mode 2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity⁴	• 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

Technical Specifications

Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure	
	Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
Weight	1. Type 2230 : 2.8g 2. Type 1216: 1.3g	
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 Card

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)
Signaling Data Rate	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 Software Supported	BT4.1-ESR 5/6/7 Compliance
	LE Link Layer Ping
	LE Dual Mode
	LE Link Layer

Technical Specifications

LE Low Duty Cycle Directed Advertising
LE L2CAP Connection Oriented Channels
Train Nudging & Interlaced Scan
BT4.2 ESR08 Compliance
LE Secure Connection- Basic/Full
LE Privacy 1.2 –Link Layer Privacy
LE Privacy 1.2 –Extended Scanner Filter Policies
LE Data Packet Length Extension
FAX Profile (FAX)
Basic Imaging Profile (BIP)2
Headset Profile (HSP)
Hands Free Profile (HFP)
Advanced Audio Distribution Profile (A2DP)
BT5.2
ESR9/10 Compliance
LE Advertisement Extensions
Channel Selection Algo
Limited High Duty Cycle Non-Connectable Advertising
2Mbps LE
LE Long Range
BT5.3
Host to Controller Encryption Key Control Enhancements
Compliance to the latest Errata Section 12.3 of BT 5.3 specification

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. Check latest software/driver release for updates on supported security features.
3. 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.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Technical Specifications

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
	GPS	WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
	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 providers determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE is not available on all products, in all regions.

Technical Specifications

NFC Mirage module (NXP NPC300 I2C 10mmx17mm)	Dimensions (L x W x H)	Module 25 mm by 10 mm by 2.0 mm
	Chipset	NPC300
	System interface	I2C
	NFC RF standards	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 ISO/IEC 18092 ECMA-340 NFCIP-1 Target and Initiator ECMA-320 NFCIP-2
	NFC Forum Support	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2
	Reader (PCD-VCD) Mode	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 MIFARE 1K MIFARE 4K MIFARE DESFire FeliCa Jewel and Topaz cards
	Card Emulation (PICC-VICC) Mode	ISO/IEC 14443 A ISO/IEC 14443 B and B' MIFARE FeliCa
	Frequency	13.56 MHz
	NFC Modes Supported	Reader/Writer, Peer-to-Peer
	Raw RF Data Rates	106, 212, 424, 848 kbps
	Operating temperature	0°C to 70°C
	Storage temperature	-20°C to 125°C
	Humidity	10-90% operating 5-95% non-operating
	Supply Operating voltage	4.35 to 5.25 Volts
	I/O Voltage	1.8V or 3.3V
	Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)	
	Mode	Power Consumption, Typical
	Polling	7.3 mA
	Detected Test Tag Type 1	Total 283.8 mA Net Module 236.8 mA
	Detected Test Tag Type 2	Total 288.8 mA Net Module 241.8 mA
	Detected Test Tag Type 3	Total 287.7 mA Net Module 240.7 mA
	Detected Test Tag Type 4	Total 282.3 mA Net Module 235.3 mA
	Antenna	Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module.

Technical Specifications

Intel® I219-LM 1 Gigabit Network Connection LOM (vPro)	Connector	RJ-45
	System Interface	PCI(Intel proprietary) + 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 802.3 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(Hash Mode Only) 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
	Security & Manageability	Intel® vPro™ support with appropriate Intel® chipset components

Technical Specifications

Intel® I219v 1 Gigabit Network Connection LOM (non-vPro)	Connector	RJ-45
	System Interface	PCI (Intel proprietary) + 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 802.3 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 (Hash Mode Only) 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
	Security & Manageability	Intel® vPro™ support with appropriate Intel® chipset components

Technical Specifications

POWER

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

AC Adapter 65 Watt nPFC Standard USB Type C® Straight 1.8m	Dimensions (H x W x D)	3.543 x 2.008 x 1.122 in (9.0 x 5.1 x 2.85 cm)
	Weight	0.53 lb (240 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 : 88% 15V : 88% 20V : 89%
	Input frequency range	47 ~ 63 Hz
	Input AC current	Max. 1.6 A at 90 Vac
	Output	Output power 5V/15W 9V/27W 12V/60W 15V/60W 20V/65W
	DC output	5V/9V/12V/15V/20V
	Hold-up time	100% load 5ms at 115 Vac input
	Output current limit	<8.0A
Connector	USB TYPE C®	
	Environmental Design	Operating temperature 32°F to 95°F (0°to 35°C)
		Non-operating (storage) temperature -4°F to 185°F (-20°to 85°C)
		Altitude 0 to 16,400 ft (0 to 5000m)
EMI and Safety Certifications		Humidity 20% to 95%
		Storage Humidity 10% to 95%
		CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL 62368-1 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

AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm	Dimensions (H x W x D)	4.016 x 2.165 x 1.181 in (10.2 x 5.5 x 3 cm)
	Weight	0.58 lb (265 g) max (Not including power cord. Power cord varies by country.)
	Input	100 ~ 240VAC
	Input Efficiency	88.0 % at 115 Vac and 89.0 % at 230Vac
	Input frequency range	47 ~ 63 Hz

Technical Specifications

Output	Input AC current	Max. 1.7 A at 90 Vac
	Output power	65W
	DC output	19.5V
	Hold-up time	100% load 5ms at 115 Vac input/80% load 10ms at 115 Vac input
Connector	Output current limit	<11.0A
	4.5mm 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)
	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	

AC Adapter 65 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	Dimensions (H x W x D)	3.543 x 2.008 x 1.122 in (9.0 x 5.1 x 2.85 cm)
	Weight	0.55 lb (250 g) max (Not including power cord. Power cord varies by country.)
Input		100 ~ 240VAC
	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	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	4.5mm 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)
	Altitude	0 to 16,400 ft (0 to 5000m)
	Humidity	20% to 95%
	Storage Humidity	10% to 95%

Technical Specifications

**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 Slim USB-C
Straight AC Power
Adapter****Dimensions (H x W x D)**

97.00 x 53.05 x 21.00 mm

Weight

230g +/- 10g

Input

100~240VAC

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

Max. 1.6 A at 90 VAC

Output**Output power**

65 W

DC output

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

Hold-up time

5ms at 115 Vac input

Output current limit

<8.0A

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

5% to 95%

Storage Humidity

5% 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

Technical Specifications

RH 51Whr Long Life Polymer Fast Charge 3 cell Battery ¹	Weight	0.2025 kg (0.446 lb)
	Cells/Type	3cell Lithium-Ion Polymer cell / 566075
	Energy	Voltage 11.58V
		Amp-hour capacity 4.431Ah
		Watt-hour capacity¹ 51.3Wh
	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.

Technical Specifications

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	ALC 3247 has Embedded Class-D 2W Stereo Amplifier
Multi-streaming Capable	Playback multi-streaming can be enabled in the audio control panel to allow independent audio streams to be sent to/from the front and rear jacks or integrated speaker.
Sampling	Independent sampling rates for DAC's and ADC's; supports resolutions from 16 to 24-bit; 44.1 kHz;
Wavetable Syntheses	Internal SPK/Headphone/External MIC 24bit,48000Hz: Digital MIC
Analog Audio	Support 3.5mm Headset: CTIA only and Headphone-out
# of Channels on Line-Out	We do not support Line-Out
Internal Speaker	Yes

FINGERPRINT READER

Sensor vendor	ELAN 80ST
Sensor type	Capacitive
DPI resolution	508 DPI
Scan area	80x80 pixels
False Rejection Rate	<3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	2.7~3.6V
Operating Temperature	-20°C - +80°C
Current Consumption	35mA peak
Image	
Low Latency Wait For Finger	900uA
Capture Rate	Capture Rate: 50 frame/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	508 dpi / 4x4mm sensor area

Technical Specifications

ENVIRONMENTAL DATA

Eco-Label Certifications & declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: • IT ECO declaration • US ENERGY STAR® • US Federal Energy Management Program (FEMP) • EPEAT® Gold registered in the United States. See http://www.epeat.net for registration status in your country. • TCO 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	• Product Carbon Footprint (hp.com) • Ocean-bound plastic in speaker • 8.7% post-consumer recycled plastic • 50% recycled metal • 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	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.		
Energy Consumption (in accordance with US ENERGY STAR® test method)	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Sort idle)	5.06 W	5.04 W	5.29 W
Normal Operation (Long idle)	1.1 W	1.19 W	1.1 W
Sleep	1.1 W	1.19 W	1.1 W
Off	0.29 W	0.32 W	0.29 W
	NOTE: Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.		
Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	17.3 BTU/hr	17.2 BTU/hr	18.1 BTU/hr

Technical Specifications

Normal Operation (Long idle)	3.8 BTU/hr	4.1 BTU/hr	3.8 BTU/hr
Sleep	3.8 BTU/hr	4.1 BTU/hr	3.8 BTU/hr
Off	1.0 BTU/hr	1.1 BTU/hr	1.0 BTU/hr
	* NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.		
Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L _{WAd} , bels)	Sound Pressure (L _{pAm} , decibels)	
Typically Configured – Idle	2.6	14.6	
Fixed Disk – Random writes	2.8	16.3	
Optical Drive – Sequential reads	3.6	30.1	
Longevity and Upgrading	This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the		
	Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.		
Additional Information	• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC. • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. • This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986). • This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see www.epeat.net • Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043. • This product is 93.2% recycle-able when properly disposed of at end of life.		
Packaging Materials	External:	PAPER/Corrugated	230 g
		PAPER/Corrugated	51 g
		PAPER/Molded Pulp	61 g
	Internal:	PLASTIC/Polyethylene low density - LDPE	9 g
	The plastic packaging material contains at least 0.0% recycled content.		
	The corrugated paper packaging materials contains at least 57.0% recycled content.		
RoHS Compliance	HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam. We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.		

Technical Specifications

	We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve. To obtain a copy of the HP RoHS Compliance Statement, see HP RoHS position statement.
Material Usage	This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html): • Asbestos • Certain Azo Colorants • Certain Brominated Flame Retardants – may not be used as flame retardants in plastics • Cadmium • Chlorinated Hydrocarbons • Chlorinated Paraffins • Bis(2-Ethylhexyl) phthalate (DEHP) • Benzyl butyl phthalate (BBP) • Dibutyl phthalate (DBP) • Diisobutyl phthalate (DIBP) • Formaldehyde • Halogenated Diphenyl Methanes • Lead carbonates and sulfates • Lead and Lead compounds • Mercuric Oxide Batteries • Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user. • Ozone Depleting Substances • Polybrominated Biphenyls (PBBs) • Polybrominated Biphenyl Ethers (PBEBs) • 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)
Packaging Usage	HP follows these guidelines to decrease the environmental impact of product packaging: • Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

Technical Specifications

End-of-life Management and Recycling	HP offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.
HP, Inc. Corporate Environmental Information	For more information about HP's commitment to the environment: Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html ISO 14001 certificates: http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842 and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf
footnotes	• Percentage of ocean-bound plastic contained in each component varies by product • Recycled plastic content percentage is based on the definition set in the IEEE 1680.1 - 2018 standard. • External power supplies, WWAN modules, power cords, cables and peripherals excluded. • 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers. • Fiber cushions made from 100% recycled wood fiber and organic materials. • Plastic cushions are made from >90% recycled plastic. • Recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams.

COUNTRY OF ORIGIN

China

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

DOCKING (Sold Separately)

Docking station model #1	HP Thunderbolt 120W G4 Dock
Total number of supported displays (incl. the notebook display)	4
Max. resolutions supported	Quad 4K @60Hz Dual 8K single cable@30 for TB hosts or USB-C hosts DP 1.4 with DSC in high res mode
Dock Connectors	2xDP, 1xHDMI, 1xTB, 1xUSB-C Alt Mode
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. Thunderbolt Hosts: Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host. Maximum resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in high resolution mode @30Hz Non-Thunderbolt hosts: The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is (1) 5K dual cable (using both DP ports) +(1) 4K on USB-C DP port Non-Thunderbolt hosts support (3) displays with a maximum resolution of (2) 5K single cable + (1) 4K UHD @ 60 Hz in high resolution mode. In multi-function mode the maximum resolution for (3) displays is (2) 5K single cable @ 30Hz + (1) 4K UHD @ 30Hz.
Docking station model #2	HP Thunderbolt 280W G4 Dock
Total number of supported displays (incl. the notebook display)	4
Max. resolutions supported	Quad 4K @60Hz Dual 8K single cable@30 for TB hosts or USB-C hosts DP 1.4 with DSC in high res mode
Dock Connectors	2xDP, 1xHDMI, 1xTB, 1xUSB-C Alt Mode
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. Thunderbolt Hosts: Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host. Maximum resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in high resolution mode @30Hz Non-Thunderbolt hosts: The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is (1) 5K dual cable (using both DP ports) +(1) 4K on USB-C DP port Non-Thunderbolt hosts support (3) displays with a maximum resolution of (2) 5K single cable + (1) 4K UHD @ 60 Hz in high resolution mode. In multi-function mode the maximum resolution for (3) displays is (2) 5K single cable @ 30Hz + (1) 4K UHD @ 30Hz.
Docking station model #3	HP USB-C Dock G5

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

Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	Dual 5K@ 30Hz + (1) 4K UHD (multi-function mode)
Dock Connectors	1xHDMI, 2xDP
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. Highest resolution with dual displays is two 8K@ 60Hz host in High Resolution mode. Three maximum displays supported are two 5K@ 30 Hz on DP ports plus one 4K UHD@ 30 Hz on HDMI in Multi-function mode 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.
Docking station model #4	HP USB-C/A Universal Dock G2
Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	Dual 4K @ 60Hz Single 5K @ 60Hz
Dock Connectors	1xHDMI, 2xDP
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. The best resolution for dual or triple displays is 4K UHD@ 60Hz. 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.
Docking station model #5	HP USB-C G5 Essential Dock
Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	For hosts that support DisplayPort 1.4 with Display Stream Compression: 3x FHD @ 60 Hz 3x QHD @ 60 Hz 3x 4K @ 60 Hz For hosts that support DisplayPort 1.3/1.4: 3x FHD @ 60 Hz 3x QHD @ 60 Hz 2x 4K @ 60 Hz
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)

Type	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
Cases	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 14 Laptop Sleeve	2E6U9AA
	HP Renew Business 14.1 Laptop Bag	3E5F9AA
	HP Renew Business 14.1 Laptop Sleeve	3E2U7AA
	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 14.1 Laptop Sleeve	6B8Y3AA
	HP Renew Executive 16 Laptop Backpack	6B8Y1AA
	HP Renew Executive 16 Laptop Bag	6B8Y2AA
Docking	HP USB-C 120W G5 Dock	5TW10AA
	HP USB-C/A 120W G2 Universal Dock	5TW13AA
	HP Thunderbolt 120W G4 Dock	4J0A2AA
	HP Thunderbolt 280W G4 Dock	4J0G4AA
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
Keyboard/Combo	HP 125 WD USB Keyboard	266C9AA
	HP 320K WD USB Keyboard	9SR37AA
	HP 355 Compact Multi-Device BT Keyboard	692S9AA
	HP 455 Programmable Wireless Keyboard	4R177AA

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

	HP 975 USB+BT Dual-Mode Wireless Keyboard	3Z726AA
	HP 155 Wired Mouse and Keyboard Combo	5B8C0AA#ACJ
	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 435 Bluetooth 5.0 + Wireless 2.4GHz Multi-Device Wireless Mouse	3B4Q5AA
	HP 715 Rechargeable Multi-Device Bluetooth 5.0 + Wireless 2.4GHz Bluetooth Mouse	6E6F0AA
	HP 925 Ergonomic Vertical Bluetooth 5.0 + Wireless 2.4GHz Wireless Mouse	6H1A5AA
	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 45W USB-C LC AC Power Adapter	1MZ01AA
	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 65W USB-C LC AC Power Adapter	1P3K6AA
	HP 90W 4.5 mm Smart AC Power Adapter	H6Y90AA
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

Change Log

Date of change:	Version History:		Description of change:
March 30, 2023	V1 to V2	Added	Battery life and updated At a Glance section
April 24, 2023	V2 to V3	Updated	WWAN CAT in At a Glance section
May 18, 2023	V3 to V4	Updated	Storage and Drives section
June 5, 2023	V4 to V5	Updated	Storage and Drives section
June 27, 2023	V5 to V6	Updated	HP Sure Recover disclaimer
June 30, 2023	V6 to V7	Updated	Environmental Data
August 1, 2023	V7 to V8	Updated	Environmental Data
	V8 to V9		

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Overview

cHP EliteBook 645 14 inch G10 Notebook PC



Left

- | | |
|---|--|
| 1. Internal Microphones (2) | 7. Clickpad |
| 2. Webcam LED (Optional) | 8. Smartcard Reader (Optional) |
| 3. 5MP IR, HD TNR and HD TNR+IR Camera (Optional) | 9. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1) |
| 4. Camera Shutter (Only available with webcam) | 10. Ethernet Port (RJ-45) |
| 5. IR Camera LED (Optional) | 11. Nano Security Lock Slot (Lock sold separately) |
| 6. NFC Sensor | |

Overview



Right

- | | |
|--|--|
| 1. Power Button Key | 6. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1) |
| 2. Speakers | 7. HDMI 2.1 Port (Cable not included) |
| 3. Power Connector | 8. Audio Combo Jack |
| 4. SuperSpeed USB Type-C® 10Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4) | 9. External SIM Card Slot (Optional) |
| 5. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1) | 10. Touch Fingerprint Sensor (Select Models) |

Overview

At a Glance

- Choice of AMD Barcelo™ 7000 series mobile processors, R7, R5 and R3
- Preinstalled with Windows 11 Pro, other Windows OS or FreeDOS
- Fast and upgradeable dual channel DDR4 SODIMM memory up to 64 GB
- Choice of 35.56 cm (14") diagonal HD, Ultra-Wide Viewing Angle FHD, Touch or Non-Touch screen, and Privacy Panel option
- Features quiet and responsive HP Keyboard with the HP Programmable key and backlit options
- Choice of solid state drives up to 2 TB
- Multi-layered security with HP SureStart Gen7, HP Privacy Camera, HP Sure View, HP Sure Sense, HP Sure Click, HP Secure Erase, Sure Run Gen5, Sure Recover Gen5, Touch Fingerprint reader, and Tamper Lock
- Supports wireless options for connectivity on the go including gigabit-speed Wi-Fi 6E and CAT16 4G/LTE WWAN
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles
- Designed to support HP docking options
- Passed MIL-STD 810H tests ¹
- Battery life up to 16 hours 30 minutes with the optional 51.3Whr battery
- Optimize your video calls with a 5MP+IR camera, HD+IR/HD camera and temporal noise reduction that adjusts to the lighting in your environment.
- 180° synchronized hinge allows the EliteBook to lay completely flat, without lifting the keyboard, and includes everyone with visibility from multiple angles.
- Can be wiped up to 1000 times with common household cleaning wipes²
- Synchronized hinge allows the EliteBook to ProBook to open to 177° +/- 3° without lifting the keyboard and offers visibility from multiple angles.

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.

2. See wipe manufacturer's instructions for disinfecting and the HP cleaning guide for HP tested wipe solutions at <http://h20195.www.2.hp.com/v2/GetDocument.aspx?docname=4AA7-7610ENW>

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

Technical Specifications

PRODUCT NAME

HP EliteBook 645 14 inch G10 Notebook PC

OPERATING SYSTEMS

- Preinstalled
- Windows 11 Pro ¹
Windows 11 Pro 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 or Windows 10 Enterprise available with a Volume Licensing Agreement ¹
Windows 11 Pro (preinstalled with Windows 10 Pro Downgrade) ^{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}	Cores	Threads	L3 Cache	Max Boost Frequency ⁵	Base Frequency	Pro
AMD Ryzen™ 7 PRO-7730U	8	16	16MB	4.50GHz	2.00GHz	X
AMD Ryzen™ 7-7730U	8	16	16MB	4.50GHz	2.00GHz	
AMD Ryzen™ 5 PRO-7530U	6	12	16MB	4.50GHz	2.00GHz	X
AMD Ryzen™ 5-7530U	6	12	16MB	4.50GHz	2.00GHz	
AMD Ryzen™ 3-7330U	4	8	8MB	4.30GHz	2.30GHz	

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. AMD Max Boost frequency performance varies depending on hardware, software and overall system configuration.



Technical Specifications

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated

AMD Radeon™ Graphics

DISPLAY

Non-Touch

35.6 cm (14") diagonal FHD UWVA eDP anti-glare, IPS, micro-edge, Narrow Bezel Bent, 250 nits, 45% NTSC for HD + IR camera and WWAN (1920 x 1080) ^{6,7,8}

35.6 cm (14") diagonal FHD UWVA eDP anti-glare, IPS, Low Blue Light, 400 nits, 100% sRGB for 5MP + IR camera (1920x1080) with HP Eye Ease ^{6,7,8}

35.6 cm (14") diagonal, FHD UWVA eDP1.4 w/o PSR, anti-glare, Narrow Bezel Bent, 250 nits, 45%, no mic and WWAN (1920 x 1080) ^{6,7,8}

35.6 cm (14") diagonal, FHD UWVA eDP1.4 w/o PSR, anti-glare, Narrow Bezel Bent, 250 nits, 45%, no mic (1920 x 1080) ^{6,7,8}

35.6 cm (14") diagonal FHD UWVA eDP anti-glare, Low Power, Low Blue Light, 400 nits, 100% sRGB for HD + IR camera and WWAN (1920x1080) with HP Eye Ease ^{6,7,8}

35.6 cm (14") diagonal FHD UWVA anti-glare, IPS, Low Blue Light, 1000 nits, 100% sRGB for 5MP + IR camera, HP Sure View Gen4 integrated privacy screen with HP Eye Ease (1920x1080) ^{6,7,8,9,10}

35.6 cm (14") diagonal, FHD UWVA, IPS, micro edge, eDP1.2 w/o PSR, Anti-Glare, 250 nits, 45% NTSC Narrow Bezel bent (1920x1080) ^{6,7,8}

35.6 cm (14") diagonal, FHD UWVA, eDP, IPS, micro edge, Anti-Glare, 250 nits, 45% NTSC Narrow Bezel bent for HD camera (1920x1080) ^{6,7,8}

35.6 cm (14") diagonal, FHD UWVA, eDP, IPS, micro edge, Anti-Glare, Narrow Bezel bent, 250 nits, 45% NTSC for HD camera and WWAN (1920x1080) ^{6,7,8}

35.6 cm (14") diagonal, HD SVA eDP 1.2 w/o PSR, Anti-Glare, 250 nits, 45% NTSC Narrow Bezel bent (1366x768) ^{6,7,8}

35.6 cm (14") diagonal HD SVA eDP anti-glare narrow bezel bent, 250 nits, 45% NTSC for HD Camera (1366x768) ^{6,7,8,9}

Touch

35.6 cm (14") diagonal, FHD UWVA, eDP, IPS, micro edge, Anti-Glare, Narrow Bezel bent touch-on-panel screen 250 nits, 45% NTSC for HD camera (1920x1080) ^{6,7,8,10}

Display Size (Diagonal)

14" diagonal

35.6 cm (14") diagonal

6. HD content required to view HD images.

7. Sold separately or as an optional feature.

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

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

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

Technical Specifications

DOCKING (Sold Separately)

Docking station model #1	HP Thunderbolt 120W G4 Dock
Docking station model #2	HP Thunderbolt 280W G4 Dock
Docking station model #3	HP USB-C Dock G5
Docking station model #4	HP USB-C/A Universal Dock G2
Docking station model #5	HP USB-C G5 Essential Dock

[For additional aftermarket options and docking specs please see page 42.](#)

STORAGE AND DRIVES

Primary Storage

- 2 TB PCIe® Gen 4x4 NVMe™ TLC 2280 Solid State Drive ^{11,12}
- 1 TB PCIe® Gen 4x4 NVMe™ TLC 2280 Self Encrypted OPAL2 Solid State Drive ^{11,12}
- 1 TB PCIe® Gen 4x4 NVMe™ TLC 2280 Solid State Drive ^{11,12}
- 512 GB PCIe® NVMe™ M.2 SSD ¹¹
- 512 GB PCIe® Gen 4x4 NVMe™ TLC 2280 Self Encrypted OPAL2 Solid State Drive ^{11,12}
- 512 GB PCIe® Gen 4x4 NVMe™ TLC Solid State Drive ^{11,12}
- 256 GB PCIe® NVMe™ M.2 SSD ^{11,12}
- 256 GB PCIe® NVMe™ Value 2280 Self Encrypted OPAL2 Solid State Drive ¹¹

Primary M.2 Storage

- 256 GB PCIe® NVMe™ Value 2230 2nd Solid State Drive ^{11,13}

11. 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.

12. Only functions at the Gen3x4 capacity with AMD Ryzen Barcelo processor

13. Secondary SSD slot (M.2 2230 form factor; Optional) is used for data storage only, not used for OS deployment, and is only available with non-WWAN base Unit AND Primary M.2 storage.

MEMORY

Maximum Memory

- 64 GB DDR4-3200 SDRAM ¹⁴

Memory

- 64 GB DDR4-3200 SDRAM (2x32GB) ¹⁴
- 32 GB DDR4-3200 SDRAM (1 x 32 GB) ¹⁴
- 32 GB DDR4-3200 SDRAM (2 x 16 GB) ¹⁴
- 16 GB DDR4-3200 SDRAM (1 x 16 GB) ¹⁴
- 16 GB DDR4-3200 SDRAM (2 x 8 GB) ¹⁴
- 8 GB DDR4-3200 SDRAM (1 x 8 GB) ¹⁴
- 8 GB DDR4-3200 SDRAM (2 x 4 GB) ¹⁴

Memory Slots

- 2 SODIMM
- Both slots are customer accessible / upgradeable
- DDR4 PC4 SODIMMS (Barcelo runs at 3200)

Technical Specifications

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.

NETWORKING/COMMUNICATIONS

WLAN

Realtek RTL8852CE 802.11ax 2x2 Wi-Fi 6E + Bluetooth® 5.3 Wireless Card ¹⁵

Mediatek RZ616 Wi-Fi 6E + Bluetooth® 5.3 Wireless Card ¹⁵

WWAN

Intel® XMM 7560 R+ LTE-Advanced Pro WWAN (Cat 16) ¹⁶

NFC

NXP NPC300 Near Field Communication Module (NFC Mirage WNC XRAV-1)

MIRACAST

Native Miracast Support ¹⁷

Ethernet

Realtek RTL8111FPH 10/100/1000 Integrated NIC ¹⁸

Realtek RTL8111HSH 10/100/1000 Integrated NIC (Non-DASH) ¹⁸

15. 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.

16. Gigabit-class 4G LTE module is optional and must be configured at the factory. Module designed for up to 1 Gbps download speeds as carriers deploy 5 carrier aggregation and 100Mhz channel bandwidth, requires activation and separately purchased service contract. Backwards compatible to HSPA 3G technologies. Check with service provider for coverage and availability in your area. Connection, upload, and download speeds will vary due to network, location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.

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

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.

Technical Specifications

AUDIO/MULTIMEDIA

Audio

2 Integrated stereo speakers
Integrated microphone (Dual Array)

Speaker Power

2W/4ohm Per speaker

Webcam

720p HD camera with Temporal Noise Reduction ^{6,7}
720p HD camera+IR Camera with Temporal Noise Reduction ^{6,7,8}
5MP camera+IR with Temporal Noise Reduction ^{6,7}
5 MP + IR camera for face authentication with Windows Hello

6. HD content required to view HD images.
7. Sold separately or as an optional feature.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Premium Keyboard, spill resistant with optional backlit function ¹⁹

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 - Wireless
F12 - Programmable key

Hidden Function Keys

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

19. Backlit keyboard is an optional feature.

Technical Specifications

SOFTWARE AND SECURITY

Preinstalled Software

Software

HP Quick Drop 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
HP Notifications
HP Privacy Settings
HP Power Manager
Buy Microsoft Office (Sold separately)

Manageability Features

HP Connect ²⁴
HP Image Assistant Gen5 (download)
HP Manageability Integration Kit (download) ²⁵
HP Client Management Script Library (download)
HP Patch Assistant (download) ²⁶
HP Driver Packs (download)
HP Client Catalog (download)
HP Cloud Recovery

Security Management

HP Wolf Security for Business ²⁷ includes:
HP Sure Click ²⁸
HP Sure Sense ²⁹
HP Sure Run ³⁰
HP Sure Recover ³¹
HP Sure Start ³²
HP Tamper Lock
HP Sure Admin ³³

BIOS

HP BIOSphere Gen6 ³⁴
HP Secure Erase ³⁵
Absolute Persistence Module ³⁶
BIOS Update via Network
HP Wake on WLAN
Secured-Core PC Enable ³⁷
TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)
HP Fingerprint Sensor ³⁸

Security

TPM

Model: Nuvoton NPCT760HABYX
Version: 7.2.3.1



Technical Specifications

Revision: TPM 2.0
FIPS 140-2 Compliant: Yes

Smartcard Reader

Model number: Alcor AU9560
FIPS 201 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: 3

20. HP Quick Drop requires Internet access and Windows 10 or higher 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.

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>. 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. 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 or to disable this feature, please visit <http://www.hpdaas.com/requirements>.

22. HP Services Scan is provided with Windows Update on select products 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. 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 or to disable this feature, please visit <http://www.hpdaas.com/requirements>. Not applicable in China.

23. HP Support Assistance requires Windows and Internet Access

24. 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.

25. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

26. 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>.

27. 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

28. HP Sure Click requires Windows 10 Pro or higher or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.

29. HP Sure Sense is available on select HP PCs with Windows 10 Pro, Windows 10 Enterprise, Windows 11 Pro, or Windows 11 Enterprise OS25. HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 and higher.

30. HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 and higher.

31. HP Sure Recover is available on select HP PCs and requires an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data.

Technical Specifications

- 32. HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 and higher
 - 33. HP Sure Admin requires Windows 10 or higher, 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
 - 34. HP BIOSphere Gen6 features may vary depending on the platform and configuration.
 - 35. 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™.
 - 36. 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/>
 - 37. Secured-Core PC Enable 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 is enabled from the factory.
 - 38. HP Fingerprint sensor is an optional feature that must be configured at purchase.
-

Technical Specifications

POWER

Power Supply

AC Adapter 45 Watt nPFC Standard USB Type C® Straight 1.8m ³⁹

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m ³⁹

AC Adapter 45 Watt Smart nPFC Standard C8 for 2 prong Barrel 4.5mm Right Angle ³⁹

AC Adapter 65 Watt nPFC Standard USB Type C® Straight 1.8m³⁹

AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm ³⁹

AC Adapter 65 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m ³⁹

Battery

HP Long Life 3-cell, 42.75 Wh Polymer^{40,41}

HP Long Life 3-cell, 51.3 Wh Polymer ^{40,41}

Compliant with UL 1642 Standard

Power Cord

3-wire plug - 1m ³⁹

2-wire plug - 1m ³⁹

Battery Life

Up to 13 hours 30 minutes with 42.75Whr battery [HP Long Life 3-Cell, 42.75Whr Polymer, UMA graphics, AMD R7 PRO, display set to 200 nits (on a 400-nit display), 2*4G memory, 256G SSD] ⁴²

Up to 16 hours 30 minutes with 51.3Whr battery [HP Long Life 3-Cell, 51.3Whr Polymer, UMA graphics, AMD R7 PRO, display set to 200 nits (on a 400-nit display) (, 2*4G memory, 256G SSD)]⁴²

Battery Weight

HP Long Life 3-cell - 42.75 Wh Polymer - .40 lb

HP Long Life 3-cell - 51.3 Wh Polymer - .45 lb

HP Long Life 3-cell - 42.75 Wh Polymer - 181.83 g

HP Long Life 3-cell - 51.3 Wh Polymer - 203.56 g

³⁹. Availability may vary by country.

⁴⁰. Battery is internal and not replaceable by customer. Serviceable by warranty.

⁴¹. 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.

⁴². 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 3.1 lb ⁴³

Starting at 1.4 kg ⁴³

Product Dimensions (W x D x H)

12.67 x 8.42 x 0.78 in

32.19 x 21.39 x 1.99 cm

Packaging Dimensions (W x D x H) ⁴⁴

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

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

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

PORTS/SLOTS

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

3 SuperSpeed USB Type-A 5Gbps signaling rate Port (1 Powered port) (USB 3.2 Gen 1)

1 AC power

1 HDMI 2.1 ⁴⁵

1 Headphone/microphone combo jack

1 Nano SIM slot for WWAN (optional)

1 RJ-45

1 Smart Card Reader (optional)

45. HDMI cable sold separately

SERVICE AND SUPPORT

1-year and 3-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty. 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>. ⁴⁶

46. 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 www.hp.com/go/cpc. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

Technical Specifications

SYSTEM UNIT

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

Nominal Operating Voltage	19V
Average Operating Power	7.52W (Idle)
Integrated graphics	Yes (AMD Radeon™ Graphics)
Discrete Graphics	N/A
Max Operating Power	Discrete < 65W 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	1.043 grams
Non-operating	3.5 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-Q35C-4
CSA/UL 62368-1	Yes
ENERGY STAR®	Yes ⁴⁷
EPEAT®	EPEAT® Gold in the United States ⁴⁸
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
EAEU Compliance	Yes
Saudi Arabian Compliance	Yes
TCO	Yes
WW RoHS	Yes
Low Blue Light	Yes

47. Configurations of the HP EliteBook 645 14 inch G10 Notebook PC that are ENERGY STAR® qualified are identified as HP EliteBook 645 14 inch G10 Notebook PC ENERGY STAR on HP websites and on <http://www.energystar.gov>.

Technical Specifications

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

DISPLAYS

1. Actual brightness will be lower with touchscreen or HP 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 Touch on Panel NWBZ	Outline Dimensions (W x H x D)	316.170 x 186.400 (max)
	Active Area	309.370 x 174.020 mm (typ)
	Weight	305 g (max)
	Diagonal Size	14.0
	Surface Treatment	Anti-Glare On-cell
	Touch Enabled	Yes ¹
	Contrast Ratio	600:1 (typ)
	Refresh Rate	60 Hz
	Brightness	250 nits ¹
	Pixel Resolution - Format	1920 x 1080 (FHD)
	Backlight	LED
	Pixel Resolution	RGB
	Color Gamut Coverage	NTSC 45%
	Color Depth	6 (Hi FRC w/ condition to enable)
	Viewing Angle	UWVA 85/85/85/85
	Low Blue Light	No
	Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.30 (max)/ 2.80 (max)

14.0 in FHD (1920 x 1080) Anti-Glare UWVA Low Blue Light sRGB NB2X 400 eDP 1.4+PSR2 Low-Power 100 bent LCD Panel	Outline Dimensions (W x H x D)	315.100 x 184.900 (max)
	Active Area	309.370 x 174.020 mm (typ)
	Weight	230g (max)
	Diagonal Size	14.0
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	1200:1 (typ)
	Refresh Rate	60Hz
	Brightness	400 nits ¹
	Pixel Resolution - Format	1920 x 1080 (FHD)
	Backlight	WLED
	Pixel Resolution	RGB
	Color Gamut Coverage	sRGB 100%
	Color Depth	8
	Viewing Angle	UWVA 89/89/89/89

Technical Specifications

Low Blue Light	Yes
Power Consumption (W, EBL@ 150nits max/ 200nits max)	1.23 (max)/1.5 (max)

Panel LCD 14-in FHD (1920x1080) Anti-Glare WLED UWVA 45percent cg 250nits eDP 1.2 w/o PSR NWBZ bent	Outline Dimensions (W x H x D)	316.170 x 186.400 (max)
	Active Area	309.370 x 174.020 mm (typ)
	Weight	300 g (max)
	Diagonal Size	14.0
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	600:1 (typ)
	Refresh Rate	60Hz
	Brightness	250 nits ¹
	Pixel Resolution - Format	1920 x 1080 (FHD)
	Backlight	LED
	Pixel Resolution	RGB
	Color Gamut Coverage	NTSC 45%
	Color Depth	6 (Hi FRC w/ condition to enable)
	Viewing Angle	UWVA 85/85/85/85
	Low Blue Light	No
	Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.205 (max)/ 2.716 (max)

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)	316.110 x 186.370 (max)
	Active Area	309.400 x 173.950 mm (typ)
	Weight	300 g (max)
	Diagonal Size	14.0
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	300:1 (typ)
	Refresh Rate	60 Hz
	Brightness	250 nits ¹
	Pixel Resolution - Format	1366 x 768 (HD)
	Backlight	LED
	Pixel Resolution	RGB
	Color Gamut Coverage	NTSC 45%
	Color Depth	6
	Viewing Angle	SVA 45/45/15/35
	Low Blue Light	No

Technical Specifications

Power Consumption (W, EBL@ 150nits max/ 200nits max)		2.52 (max) / 2.86 (max)
14.0 in FHD (1920 x 1080) Anti-Glare UWVA Low Blue Light sRGB NB2Y 1000 eDP 1.3+PSR 100 PrivacyG4 Plus bent LCD Panel	Outline Dimensions (W x H x D)	314.612 x 185.330 (max)
	Active Area	309.312 x 173.990 (typ)
	Weight	230 g (max)
	Diagonal Size	14.0
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	1500:1 (typ)
	Refresh Rate	60 Hz
	Brightness	1000 nits ¹
	Pixel Resolution - Format	1920 x1080 (FHD)
	Backlight	WLED
	Pixel Resolution	RGB
	Color Gamut Coverage	sRGB 100%
	Color Depth	8
	Viewing Angle	UWVA 85/85/85/85
	Low Blue Light	Yes
Power Consumption (W, EBL@ 150nits max/ 200nits max)		NA

Technical Specifications

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 256GB 2230 PCIe NVMe Value	Form Factor	M.2 2230
	Capacity	256 GB
	NAND Type	Value
	Interface	PCIe NVMe
	Minimum Sequential Read	2000 MB/s $\pm$ 10%
	Minimum Sequential Write	900 MB/s $\pm$ 10%
	Logical Blocks	500118192
	Features	Pyrite; TRIM; L1.2

SSD 256GB 2280 PCIe NVMe Value	Form Factor	M.2 2280
	Capacity	256GB
	NAND Type	Value
	Interface	PCIe NVMe
	Minimum Sequential Read	2000 MB/s $\pm$ 10%
	Minimum Sequential Write	900 MB/s $\pm$ 10%
	Logical Blocks	500118192
	Features	ATA Security; TRIM; L1.2

256GB PCIe 2280 NVMe Self Encrypted OPAL2 Value Solid State Drive	Form Factor	M.2 2280
	Capacity	256 GB
	NAND Type	Opal2 Value
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	2000 MB/s $\pm$ 10%
	Minimum Sequential Write	900 MB/s $\pm$ 10%
	Logical Blocks	500,118,192
	Features	Pyrite 2.0; TRIM; L1.2

SSD 512GB 2280 PCIe NVMe Value	Form Factor	M.2 2280
	Capacity	512GB
	NAND Type	Value
	Interface	PCIe NVMe
	Minimum Sequential Read	2200 MB/s $\pm$ 10%
	Minimum Sequential Write	1000 MB/s $\pm$ 10%
	Logical Blocks	1000215216
	Features	Pyrite 2.0, TRIM; L1.2

Technical Specifications

512GB PCIe-4x4 2280 NVMe Self Encrypted OPAL2 Three Layer Cell Solid State Drive	Form Factor	M.2 2280
	Capacity	512 GB
	NAND Type	Opal2 TLC
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	6400 MB/s $\pm$ 10%
	Minimum Sequential Write	3500 MB/s $\pm$ 10%
	Logical Blocks	1,000,215,216
	Features	Pyrite 2.0, TRIM; L1.2

SSD 512GB 2280 PCIe-4x4 NVMe Three Layer Cell	Form Factor	M.2 2280
	Capacity	512 GB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	6400 MB/s $\pm$ 10%
	Minimum Sequential Write	3500 MB/s $\pm$ 10%
	Logical Blocks	1,000,215,216
	Features	Pyrite 2.0, TRIM; L1.2

1TB PCIe-4x4 2280 NVME Self Encrypted OPAL2 Three Layer Cell Solid State Drive	Form Factor	M.2 2280
	Capacity	1 TB
	NAND Type	Opal2 TLC
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	6400 MB/s $\pm$ 10%
	Minimum Sequential Write	5000 MB/s $\pm$ 10%
	Logical Blocks	2,000,409,264
	Features	Pyrite 2.0, TRIM; L1.2

SSD 1TB 2280 PCIe-4x4 NVMe Three Layer Cell	Form Factor	M.2 2280
	Capacity	1 TB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	6400 MB/s $\pm$ 10%
	Minimum Sequential Write	5000 MB/s $\pm$ 10%
	Logical Blocks	2,000,409,264
	Features	Pyrite 2.0, TRIM; L1.2

SSD 2TB 2280 PCIe-4x4 NVMe Three Layer Cell	Form Factor	M.2 2280
	Capacity	2 TB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	6400 MB/s $\pm$ 10%

Technical Specifications

Minimum Sequential Write	5000 MB/s $\pm$ 10%
Logical Blocks	4,000,797,360
Features	Pyrite 2.0, TRIM; L1.2

Technical Specifications

NETWORKING/COMMUNICATIONS

Realtek RTL8852CE 802.11ax 2x2 Wi-Fi 6E + Bluetooth® 5.3 Wireless Card (802.11ax 2x2, supporting gigabit data rate)¹	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
	Interoperability	Wi-Fi certified
	Frequency Band	• 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 5.955 – 6.415 GHz 6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 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, (20MHz, 40MHz, ,80MHz & 160MHz) • 802.11ax : MCS0 ~ MCS11, (20MHz, 40MHz, ,80MHz & 160MHz)
	Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
	Security ²	• 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
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power ³	• 802.11b : +17dBm minimum • 802.11g : +16dBm minimum • 802.11a : +17dBm minimum

Technical Specifications

	• 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 • 802.11ax HE80(6GHz) : +10dBm minimum • 802.11ax HE160(6GHz) : +10dBm minimum	
Power Consumption	• 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 Sensitivity ⁴	• 802.11b, 1Mbps : -93.5dBm maximum • 802.11b, 11Mbps : -84dBm maximum • 802.11a/g, 6Mbps : -86dBm maximum • 802.11a/g, 54Mbps : -72dBm maximum • 802.11n, MCS07 : -67dBm maximum • 802.11n, MCS15 : -64dBm maximum • 802.11ac, MCS0(VHT80) : -84dBm maximum • 802.11ac, MCS9(VHT80) : -59dBm maximum • 802.11ac, MCS9(VHT160) : -58.5dBm maximum • 802.11ax, MCS11(HE40): -57dBm maximum • 802.11ax, MCS11(HE80): -54dBm maximum • 802.11ax, MCS11(HE160): -53.5dBm maximum	
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
Weight	1. Type 2230 : 2.8g 2. Type 126: 1.3g	
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)

Technical Specifications

LED Activity N/A

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

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 + 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

Technical Specifications

- 2Mbps LE
- LE Long Range
- Windows BT profiles support
- BT5.3
- Periodic Advertisement interval
- Encryption key size control enhancements

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. Check latest software/driver release for updates on supported security features.
3. 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.
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).

Mediatek RZ616 Wi-Fi 6E Wireless LAN Standards
+ Bluetooth® 5.3 Wireless
Card(802.11ax 2x2,
supporting gigabit data
rate) ¹

- 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 802.11j
- IEEE 802.11k
- IEEE 802.11mc
- IEEE 802.11r
- IEEE 802.11v
- IEEE 802.11w

Interoperability
Frequency Band

- Wi-Fi certified
- 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
5.925 – 7.125 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, (20MHz, 40MHz, ,80MHz & 160MHz)



Technical Specifications

	• 802.11ax : MCS0 ~ MCS11, (20MHz, 40MHz, ,80MHz & 160MHz)
Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
Security²	• 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
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power³	2.4GHz (MIMO, typical): • 802.11b : +18dBm • 802.11g : +16.5dBm • 802.11n/ac/ax (HT20/VHT20/HE20) : +16dBm • 802.11n/ac/ax (HT40/VHT40/HE40) : +12.5dBm 5GHz (MIMO, typical): • 802.11a : +13dBm • 802.11n/ac/ax (HT20/VHT20/HE20) : +13.5dBm • 802.11n/ac/ax (HT40/VHT40/HE40) : +12.5dBm • 802.11ac/ax (VHT80/HE80) : +11.5dBm • 802.11ax HE160 : +11.5dBm 6GHz LPI mode (MIMO, typical):: • 802.11a : 0dBm • 802.11ax HE20 : +1dBm • 802.11ax HE40 : +4dBm • 802.11ax HE80 : +7dBm • 802.11ax HE160 : +7.5dBm
Power Consumption	• 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	2.4GHz (SISO): • 802.11b, 11Mbps : -82dBm maximum • 802.11g, 54Mbps : -71dBm maximum • 802.11n, MCS7 : -64dBm maximum • 802.11ac, MCS9 : -52dBm maximum • 802.11ax, MCS11(HT40): -49dBm maximum 5GHz (SISO):

Technical Specifications

- 802.11a, 54Mbps : -71 dBm maximum
- 802.11n, MCS07 : -64dBm maximum
- 802.11ac, MCS9 : -52dBm maximum
- 802.11ax, MCS11(HE80/HE160): -46dBm maximum

6GHz (SISO):

- 802.11a, 54Mbps : -71 dBm maximum
- 802.11n, MCS7 : -64dBm maximum
- 802.11ac, MCS9 : -52dBm maximum
- 802.11ax, MCS11(HE160): -46dBm maximum

Antenna type

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

Form Factor

PCI-Express M.2 MiniCard

Dimensions

1. Type 2230: 2.3 x 22.0 x 30.0 mm
2. Type 1216: 1.67 x 12.0 x 16.0 mm

Weight

1. Type 2230: 2.8g
2. Type 126: 1.3g

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 Card**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)

Signaling Data Rate

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 1.5 Bluetooth device with a maximum transmit power of + 14 dBm and 10 dBm for BR and EDR, respectively.

Power Consumption

Peak (Tx): 330 mW

Peak (Rx): 230 mW

Selective Suspend: 17 mW

Bluetooth Software

Microsoft Windows Bluetooth Software

Supported Link Topology

Technical Specifications

Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.407
Power Management	ETS 300 328
Certifications	Low Voltage Directive CE Mark
Bluetooth Software 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 BT5.3 Periodic Advertisement interval Encryption key size control enhancements

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. Check latest software/driver release for updates on supported security features.
3. 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.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Technical Specifications

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
	GPS GPS bands	WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification 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

NFC Mirage module (NXP NPC300 I2C 10mmx17mm)	Dimensions (L x W x H)	Module 25 mm by 10 mm by 2.0 mm
	Chipset	NPC300
	System interface	I2C
	NFC RF standards	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 ISO/IEC 18092 ECMA-340 NFCIP-1 Target and Initiator ECMA-320 NFCIP-2
	NFC Forum Support	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2
	Reader (PCD-VCD) Mode	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 MIFARE 1K MIFARE 4K MIFARE DESFire FeliCa Jewel and Topaz cards
	Card Emulation (PICC-VICC) Mode	ISO/IEC 14443 A ISO/IEC 14443 B and B' MIFARE FeliCa
	Frequency	13.56 MHz
	NFC Modes Supported	Reader/Writer, Peer-to-Peer
	Raw RF Data Rates	106, 212, 424, 848 kbps
	Operating temperature	0°C to 70°C
	Storage temperature	-20°C to 125°C
	Humidity	10-90% operating 5-95% non-operating
	Supply Operating voltage	4.35 to 5.25 Volts
	I/O Voltage	1.8V or 3.3V
	Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)	
	Mode	Power Consumption, Typical
	Polling	7.3 mA
	Detected Test Tag Type 1	Total 283.8 mA Net Module 236.8 mA
	Detected Test Tag Type 2	Total 288.8 mA Net Module 241.8 mA
	Detected Test Tag Type 3	Total 287.7 mA Net Module 240.7 mA
	Detected Test Tag Type 4	Total 282.3 mA Net Module 235.3 mA
	Antenna	Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module.

Technical Specifications

Realtek RTL8111FPH 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 802.3 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
	Security & Manageability	Support DASH 1.2 compliant

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 802.3 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)

Technical Specifications

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 IT Manageability	Auto MDI/MDIX Crossover cable detection 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

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

AC Adapter 45 Watt nPFC Standard USB Type C® Straight 1.8m	Dimensions (H x W x D)	3.701 x 1.693 x 1.071 in (9.4x4.3x2.72cm)
	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 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	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)
EMI and Safety Certifications	Humidity	20% to 95%
	Storage Humidity	10% to 95%
	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)	

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	Dimensions (H x W x D)	3.74 x 1.772 x 1.043 in (9.5x4.5x2.65cm)
	Weight	0.44 lb (200 g) max (Not including power cord. Power cord varies by country)
	Input	100 ~ 240VAC
	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

Technical Specifications

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°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 GEMS and RCM, BIS, BSMI, UAE, UKCA DoC	

AC Adapter 65 Watt nPFC Standard USB Type C® Straight 1.8m	Dimensions (H x W x D)	3.543 x 2.008 x 1.122 in (9.0x5.1x2.85cm)
	Weight	0.53 lb (240 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 : 88% 15V : 88% 20V : 89%
Output	Input frequency range	47 ~ 63 Hz
	Input AC current	Max. 1.6 A at 90 Vac
	Output power	5V/15W 9V/27W 12V/60W 15V/60W 20V/65W
	DC output	5V/9V/12V/15V/20V
	Hold-up time	100% load 5ms at 115 Vac input
	Output current limit	<8.0A
Connector	USB TYPE C®	
Environmental Design	Operating temperature	32°F to 95°F (0°to 35°C)

Technical Specifications

		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, UL 62368-1 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	
AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm	Dimensions (H x W x D)	4.016 x 2.165 x 1.181 in (10.2x5.5x3cm)		
	Weight	0.58 lb (265 g) max (Not including power cord. Power cord varies by country.)		
	Input	100 ~ 240VAC		
		Input Efficiency	88.0 % at 115 Vac and 89.0 % at 230Vac	
		Input frequency range	47 ~ 63 Hz	
	Output	Input AC current	Max. 1.7 A at 90 Vac	
		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	4.5mm 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)	
		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		

Technical Specifications

AC Adapter 65 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	Dimensions (H x W x D)	3.543 x 2.008 x 1.122 in (9.0x5.1x2.85cm)
	Weight	0.55 lb (250 g) max (Not including power cord. Power cord varies by country.)
	Input	100 ~ 240VAC
		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 100% load 5ms at 115 Vac input/80% load 10ms at 115 Vac input
	Connector	Output current limit <11.0A
Environmental Design		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%
EMI and Safety Certifications		Storage Humidity 10% to 95%
		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		

RH 42Whr Long Life Polymer Fast Charge 3 cell Battery ¹	Weight	0.18 kg (0.397 lb)
	Cells/Type	3cell Lithium-Ion Polymer cell / 545974
	Energy	Voltage 11.4V
		Amp-hour capacity 3.752Ah
		Watt-hour capacity¹ 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

Technical Specifications

RH 51Whr Long Life Polymer Fast Charge 3 cell Battery ¹	Weight	0.2025 kg (0.446 lb)
	Cells/Type	3cell Lithium-Ion Polymer cell / 566075
	Energy	Voltage 11.58V
		Amp-hour capacity 4.431Ah
		Watt-hour capacity¹ 51.3Wh
	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

Technical Specifications**AUDIO**

HD Stereo Codec	ALC3247-CG
Audio I/O Ports	Headset: CTIA only and Headphone-out
Internal Speaker Amplifier	ALC 3247 has Embedded Class-D 2W Stereo Amplifier
Multi-streaming Capable	Playback multi-streaming can be enabled in the audio control panel to allow independent audio. Following MSFT Behavior
Sampling	Streams to be sent to/from the front and rear jacks or integrated speaker.
Wavetable Syntheses	Independent sampling rates for DAC's and ADC's; supports resolutions from 16 to 24-bit; 44.1 kHz: External MIC/internal MIC 16bit,48000Hz: External SPK/Internal SPK
Analog Audio	Support 3.5mm Headset: CTIA only and Headphone-out
# of Channels on Line-Out	N/A
Internal Speaker	Yes

FINGERPRINT READER

Sensor vendor	ELAN 80ST
Sensor type	Capacitive
DPI resolution	508 DPI
Scan area	80x80 pixels
False Rejection Rate	<3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	2.7~3.6V
Operating Temperature	-20°C - +80°C
Current Consumption	35mA peak
Image	
Low Latency Wait For Finger	900uA
Capture Rate	Capture Rate: 50 frame/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	508 dpi / 4x4mm sensor area

Technical Specifications

ENVIRONMENTAL DATA

Eco-Label Certifications & declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: • IT ECO declaration • US ENERGY STAR® • US Federal Energy Management Program (FEMP) • EPEAT® Gold registered in the United States. See http://www.epeat.net for registration status in your country. • TCO 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	• Product Carbon Footprint (hp.com) • Ocean-bound plastic in Speaker • 5% post-consumer recycled plastic • 50% recycled metal • 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	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.		
Energy Consumption (in accordance with US ENERGY STAR® test method)	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Sort idle)	5.57 W	5.47 W	5.01 W
Normal Operation (Long idle)	0.95 W	1.31 W	1.23 W
Sleep	0.95 W	1.31 W	0.84 W
Off	0.3 W	0.3 W	0.28 W
	NOTE: Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.		
Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	19.0 BTU/hr	18.7 BTU/hr	17.1 BTU/hr
Normal Operation (Long idle)	3.2 BTU/hr	4.5 BTU/hr	4.2 BTU/hr
Sleep	3.2 BTU/hr	4.5 BTU/hr	2.9 BTU/hr
Off	1.0 BTU/hr	1.0 BTU/hr	1.0 BTU/hr
	*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.		

Technical Specifications

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L _{WAd} , bels)		Sound Pressure (L _{pAm} , decibels)
Typically Configured – Idle	2.6		14.3
Fixed Disk – Random writes	2.6		14.3
Optical Drive – Sequential reads	3.6		25.6
Longevity and Upgrading	This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.		
Additional Information	• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC. • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. • This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986). • This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see www.epeat.net • Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043. • This product is 93.3% recycle-able when properly disposed of at end of life.		
Packaging Materials	External:	PAPER/Corrugated	230 g
		PAPER/Paperboard	51 g
		PAPER/Molded Pulp	61 g
	Internal:	PLASTIC/Polyethylene low density-LDPE	9 g
	The plastic packaging material contains at least 0.0% recycled content.		
	The corrugated paper packaging materials contains at least 57.0% recycled content.		
RoHS Compliance	HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam. We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products. We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve. To obtain a copy of the HP RoHS Compliance Statement, see HP RoHS position statement.		
Material Usage	This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html): • Asbestos • Certain Azo Colorants • Certain Brominated Flame Retardants – may not be used as flame retardants in plastics • Cadmium		

Technical Specifications

	• 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)
Packaging Usage	HP follows these guidelines to decrease the environmental impact of product packaging: • Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.
End-of-life Management and Recycling	HP offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.
HP, Inc. Corporate Environmental Information	For more information about HP's commitment to the environment: Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html ISO 14001 certificates: http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842 and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf

Technical Specifications

footnotes	• Percentage of ocean-bound plastic contained in each component varies by product • Recycled plastic content percentage is based on the definition set in the IEEE 1680.1 - 2018 standard. • External power supplies, WWAN modules, power cords, cables and peripherals excluded. • 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers. • Fiber cushions made from 100% recycled wood fiber and organic materials. • Plastic cushions are made from >90% recycled plastic. • Recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams
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COUNTRY OF ORIGIN

China

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

DOCKING (Sold Separately)

Docking station model #1	HP Thunderbolt 120W G4 Dock
Total number of supported displays (incl. the notebook display)	4
Max. resolutions supported	Quad 4K @60Hz Dual 8K single cable@30 for TB hosts or USB-C hosts DP 1.4 with DSC in high res mode
Dock Connectors	2xDP, 1xHDMI, 1xTB, 1xUSB-C Alt Mode
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. Thunderbolt Hosts: Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host. Maximum resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in high resolution mode @30Hz Non-Thunderbolt hosts: The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is (1) 5K dual cable (using both DP ports) +(1) 4K on USB-C DP port Non-Thunderbolt hosts support (3) displays with a maximum resolution of (2) 5K single cable + (1) 4K UHD @ 60 Hz in high resolution mode. In multi-function mode the maximum resolution for (3) displays is (2) 5K single cable @ 30Hz + (1) 4K UHD @ 30Hz.

Docking station model #2	HP Thunderbolt 280W G4 Dock
Total number of supported displays (incl. the notebook display)	4
Max. resolutions supported	Quad 4K @60Hz Dual 8K single cable@30 for TB hosts or USB-C hosts DP 1.4 with DSC in high res mode
Dock Connectors	2xDP, 1xHDMI, 1xTB, 1xUSB-C Alt Mode
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. Thunderbolt Hosts: Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host. Maximum resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in high resolution mode @30Hz Non-Thunderbolt hosts: The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is (1) 5K dual cable (using both DP ports) +(1) 4K on USB-C DP port Non-Thunderbolt hosts support (3) displays with a maximum resolution of (2) 5K single cable + (1) 4K UHD @ 60 Hz in high resolution mode. In multi-function mode the maximum resolution for (3) displays is (2) 5K single cable @ 30Hz + (1) 4K UHD @ 30Hz.

Docking station model #3	HP USB-C Dock G5
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Options and Accessories (Sold separately and availability may vary by country)

Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	Dual 5K@ 30Hz + (1) 4K UHD (multi-function mode)
Dock Connectors	1xHDMI, 2xDP
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. Highest resolution with dual displays is two 8K@ 60Hz host in High Resolution mode. Three maximum displays supported are two 5K@ 30 Hz on DP ports plus one 4K UHD@ 30 Hz on HDMI in Multi-function mode 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.
Docking station model #4	HP USB-C/A Universal Dock G2
Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	Dual 4K @ 60Hz Single 5K @ 60Hz
Dock Connectors	1xHDMI, 2xDP
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. The best resolution for dual or triple displays is 4K UHD@ 60Hz. 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.
Docking station model #5	HP USB-C G5 Essential Dock
Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	For hosts that support DisplayPort 1.4 with Display Stream Compression: 3x FHD @ 60 Hz 3x QHD @ 60 Hz 3x 4K @ 60 Hz For hosts that support DisplayPort 1.3/1.4: 3x FHD @ 60 Hz 3x QHD @ 60 Hz 2x 4K @ 60 Hz
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)

Type	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
Cases	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 14 Laptop Sleeve	2E6U9AA
	HP Renew Business 14.1 Laptop Bag	3E5F9AA
	HP Renew Business 14.1 Laptop Sleeve	3E2U7AA
	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 14.1 Laptop Sleeve	6B8Y3AA
	HP Renew Executive 16 Laptop Backpack	6B8Y1AA
	HP Renew Executive 16 Laptop Bag	6B8Y2AA
Docking	HP USB-C 120W G5 Dock	5TW10AA
	HP USB-C/A 120W G2 Universal Dock	5TW13AA
	HP Thunderbolt 120W G4 Dock	4J0A2AA
	HP Thunderbolt 280W G4 Dock	4J0G4AA
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
Keyboard/Combo	HP 125 WD USB Keyboard	266C9AA
	HP 320K WD USB Keyboard	9SR37AA
	HP 355 Compact Multi-Device BT Keyboard	692S9AA
	HP 455 Programmable Wireless Keyboard	4R177AA

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

	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 435 Bluetooth 5.0 + Wireless 2.4GHz Multi-Device Wireless Mouse	3B4Q5AA
	HP 715 Rechargeable Multi-Device Bluetooth 5.0 + Wireless 2.4GHz Bluetooth Mouse	6E6F0AA
	HP 925 Ergonomic Vertical Bluetooth 5.0 + Wireless 2.4GHz Wireless Mouse	6H1A5AA
	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 45W USB-C LC Dali AC Power Adapter	1MZ01AA
	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 65W USB-C LC AC Power Adapter	1P3K6AA
	HP 90W 4.5 mm Smart AC Power Adapter	H6Y90AA
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

Change Log

Date of change:	Version History:		Description of change:
March 2, 2023	V1 to V2	Added	Environmental Data
March 9, 2023	V2 to V3	Added	Battery life and Docking station
March 30, 2023	V3 to V4	Updated	At a Glance section
June 5, 2023	V4 to V5	Updated	Storage and Drives section
June 27, 2023	V5 to V6	Updated	HP Sure Recover disclaimer
August 1, 2023	V6 to V7	Updated	Environmental Data
October 3, 2023	V7 to V8	Updated	Frequency bands for Realtek 8852CE in Networking section
	V8 to V9		

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HP EliteBook 650 15.6 inch G10 Notebook PC

Empowering the hybrid workforce

Simplify hybrid work with the cost-effective, highly secure and easily managed HP EliteBook 650. The latest Intel® processor², a wide variety of configurable ports, and connectivity options allow easy adoption for use at home, in the office, or when traveling.



*Product image may differ from actual product

HP recommends Windows 11 Pro for business

Ready for demanding workloads

- Drive performance with the latest Intel®² processor in the HP EliteBook 650. This globally available and easily serviceable PC features long battery life and now has two USB Type-A (USB 3.2 Gen 1), one Thunderbolt™ 4 with USB4 Type-C® port, and 1 multifunction USB Type-C® port.

Protected by HP Wolf Security

- HP Wolf Security for Business creates a hardware-enforced, always-on, resilient defense. From the BIOS to the browser, above, in, and below the OS, these constantly evolving solutions help protect your PC from modern threats.³

Make connections that matter

- Take presenting in a hybrid work environment to the next level with audio and video¹⁷ features that enhance your collaboration experience. Enjoy the crystal-clear audio performance delivered by HP Dynamic Voice Leveling⁵ and HP AI Noise Reduction.⁵

Outer box packaging 100% sustainably sourced

- This PC contains at least 30-percent post-consumer recycled plastic in the bezel, at least 50-percent post-consumer recycled plastic in the keycaps⁸, and the outer box packaging is 100-percent sustainably sourced.⁹
- Manage and monitor your battery's performance and condition and customize charging options with the easy-to-use HP Power Manager dashboard.⁷
- The HD camera with temporal noise reduction lowers the effects of visual noise and pixelation. Backlight Adjustment includes dual image sensors, that balance contrast, background, and foreground lighting so you can capture all the details.⁶
- This PC contains at least 30-percent post-consumer recycled plastic in the bezel, at least 50-percent post-consumer recycled plastic in the keycaps, and the outer box packaging is 100-percent sustainably sourced.^{4,5}
- Move around a little without losing viewers' attention during video calls with optional HP Auto Frame.^{4,5}
- A creative powerhouse that inspires. Take on big projects utilizing multiple applications with the latest Intel® processor, NVIDIA® GeForce RTX™ 2050 graphics, up to 64GB DDR4 memory and up to 2TB of storage.^{2,10,11}
- Help speed up image creation and the management of hardware, BIOS, and security when managing devices through Microsoft Endpoint Manager with the HP Manageability Integration Kit.¹²
- HP Dynamic Voice Leveling automatically optimizes voice clarity within 3-meters of the PC. HP AI Noise Reduction uses noise-filtering technology to enhance audio conferencing experience even while wearing a mask.⁶
- Firmware attacks can completely devastate your PC. Stay protected with HP Sure Start Gen7, the self-healing BIOS that automatically recovers itself from attacks or corruption.¹³
- Stop unwanted changes to security settings and help limit the spread of malware with HP Sure Run Gen5 which identifies, quarantines, and provides reporting on attackers trying to kill processes.¹⁴
- HP Sure Recover Gen5 ensures fast, secure, and automated recovery of the OS over LAN or Wi-Fi® from advanced malware attacks. End users can now pause or retry if the connection is lost and it's corporate image ready for fleet deployments.¹⁵
- Help protect your PC from websites and read-only Microsoft Office and PDF attachments with malware, ransomware, or viruses with hardware-enforced security from HP Sure Click.¹⁶
- Keep a consistent look across all your videoconferencing apps with Background Adjustment that has two ways to mask your background. Set Background Blur or choose an image once in myHP instead of adjusting settings in multiple apps.⁶

HP EliteBook 650 15.6 inch G10 Notebook PC Specifications Table



*Product image may differ from actual product

Available Operating Systems	Windows 11 Pro ¹ Windows 11 Pro 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
Processor family	13th Generation Intel® Core™ i7 processor; 13th Generation Intel® Core™ i5 processor; 13th Generation Intel® Core™ i3 processor
Available Processors ^{3,4,5}	Intel® Core™ i7-1355U (1.2 GHz E-core base frequency, 1.7 GHz P-core base frequency, up to 3.7 GHz E-core Max Turbo frequency, up to 5.0 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-core, 12 threads); Intel® Core™ i5-1335U (0.9 GHz E-core base frequency, 1.3 GHz P-core base frequency, up to 3.4 GHz E-core Max Turbo frequency, up to 4.6 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-core, 12 threads); Intel® Core™ i7-1370P (1.4 GHz E-core base frequency, 1.9 GHz P-core base frequency, up to 3.9 GHz E-core Max Turbo frequency, up to 5.2 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-core, 20 threads); Intel® Core™ i7-1365U (1.3 GHz E-core base frequency, 1.8 GHz P-core base frequency, up to 3.9 GHz E-core Max Turbo frequency, up to 5.2 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-core, 12 threads); Intel® Core™ i5-1350P (1.4 GHz E-core base frequency, 1.9 GHz P-core base frequency, up to 3.5 GHz E-core Max Turbo frequency, up to 4.7 GHz P-core Max Turbo frequency, 12 MB L3 cache, 4 P-cores and 8 E-core, 16 threads); Intel® Core™ i5-1345U (1.2 GHz E-core base frequency, 1.6 GHz P-core base frequency, up to 3.5 GHz E-core Max Turbo frequency, up to 4.7 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-core, 12 threads); Intel® Core™ i3-1315U with Intel® UHD Graphics (0.9 GHz E-core base frequency, 1.2 GHz P-core base frequency, up to 3.3 GHz E-core Max Turbo frequency, up to 4.5 GHz P-core Max Turbo frequency, 10 MB L3 cache, 2 P-cores and 4 E-core, 8 threads)
Maximum memory	64 GB DDR4-3200 MHz RAM ⁷ Both slots are accessible/upgradeable by IT or self-maintainers only. Supports dual channel memory.
Memory slots	2 SODIMM
Internal storage	1 TB up to 2 TB PCIe® NVMe™ M.2 SSD TLC ⁸ up to 1 TB PCIe® NVMe™ M.2 SED SSD TLC ⁸ up to 512 GB PCIe® Gen4x4 NVMe™ M.2 SED SSD TLC ⁸ up to 512 GB PCIe® Gen4x4 NVMe™ M.2 SSD TLC ⁸ 256 GB up to 512 GB PCIe® NVMe™ M.2 SSD ⁸ up to 256 GB PCIe® NVMe™ M.2 SED SSD ⁸ up to 256 GB PCIe® NVMe™ Value M.2 SSD ^{8,41}
Display size (diagonal, metric)	39.6 cm (15.6")
Display	15.6" diagonal, FHD (1920 x 1080), micro-edge, anti-glare, 250 nits, 45% NTSC; 15.6" diagonal, HD (1366 x 768), micro-edge, anti-glare, 250 nits, 45% NTSC; 15.6" diagonal, FHD (1920 x 1080), touch, IPS, anti-glare, 250 nits, 45% NTSC; 15.6" diagonal, FHD (1920 x 1080), IPS, narrow bezel, anti-glare, 400 nits, 100% sRGB with HP Eye Ease ^{13,15,16,17} 39.6 cm (15.6") diagonal, FHD (1920 x 1080), touch, IPS, anti-glare, 250 nits, 45% NTSC; 39.6 cm (15.6") diagonal, FHD (1920 x 1080), micro-edge, anti-glare, 250 nits, 45% NTSC; 39.6 cm (15.6") diagonal, HD (1366 x 768), micro-edge, anti-glare, 250 nits, 45% NTSC; 39.6 cm (15.6") diagonal, FHD (1920 x 1080), IPS, narrow bezel, anti-glare, 400 nits, 100% sRGB with HP Eye Ease ^{13,15,16,17}
Available Graphics	Integrated: Intel® UHD Graphics; Intel® Iris® X® Graphics ^{12,13} Discrete: NVIDIA® GeForce RTX™ 2050 Laptop GPU (4 GB GDDR6 dedicated) ⁴² (Support CUDA, Optimus, PhysX, GPU Boost 2.0.)
Audio	Dual stereo speakers, dual array microphones
Wireless technologies	(Compatible with Miracast-certified devices.)
Ports and connectors	1 Thunderbolt™ 4 with USB Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4); 1 USB Type-C® 10Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4); 2 USB Type-A 5Gbps signaling rate (1 power); 1 AC power; 1 HDMI 2.1; 1 stereo headphone/microphone combo jack; 1 RJ-45 ; (HDMI cable sold separately.); Optional Ports: 1 Smartcard reader (optional); 1 External Nano SIM slot for WWAN ¹⁸
Input devices	HP Premium Keyboard – spill resistant, optional backlit keyboard ¹⁴ ; Clickpad with multi-touch gesture support;
Communications	Intel® i219-LM GbE LOM, vPro®; Intel® i219-LM GbE LOM, non-vPro® ¹¹ ; Intel® Wi-Fi 6E AX211 (2x2) and Bluetooth® 5.3 wireless card, vPro®; Intel® Wi-Fi 6E AX211 (2x2) and Bluetooth® 5.3 wireless card, non-vPro® ^{9,10} ; Intel® XMM™ 7560 LTE Advanced Pro; Qualcomm® 9205 LTE Cat-M1 ; Near Field Communication (NFC) module
Camera	720p HD camera with temporal noise reduction (select models); IR Camera (select models) ^{13,18}
Software	HP Connection Optimizer; HP Hotkey Support; HP Power Manager; myHP; HP Privacy Settings; HP Notifications; HP PC Hardware Diagnostics Windows; HP Services Scan; HP Smart Support (download); Buy Office (Sold separately) ^{20,21,36,37,19}
Security management	Absolute persistence module; HP Secure Erase; HP Sure Click; HP Sure Sense; BIOS Update via Network; HP Sure Admin; HP BIOSphere Gen6; HP Client Security Manager Gen7; TPM 2.0 embedded security chip (Common Criteria EAL4+ and FIPS 140-2 Level 2 Certified); HP Sure Start Gen7; HP Wake on WLAN; HP Tamper Lock; HP Sure Run Gen5; HP Sure Recover Gen5; Secured-Core PC Enable; ^{25,26,27,28,29,30,31,32,33,34}
Security Software Licenses	HP Wolf Pro Security Edition ²⁶
Management features	HP Client Management Script Library (download); HP Driver Packs (download); HP Client Catalog (download); HP Manageability Integration Kit Gen4 (download); HP Image Assistant Gen5 (download); HP Patch Assistant (download); HP Cloud Recovery; HP Connect for Microsoft Endpoint Manager ^{22,23,24}
Power	HP Smart 65 W External AC power adapter; HP Smart 65 W EM External AC power adapter; HP Smart 45 W External AC power adapter; HP Smart 45 W 2-prong External AC power adapter; HP Smart 65 W USB Type-C® adapter; HP Smart 45 W USB Type-C® adapter ³⁷
Battery type	HP Long Life 3-cell, 42.75 Wh polymer ³⁶
Dimensions	14.14 x 9.2 x 0.78 in; 35.94 x 23.39 x 1.99 cm
Weight	Starting at 3.94 lb; Starting at 1.78 kg. (Weight will vary by configuration. Does not include power adapter.)
Ecolabels	EPEAT® Gold registered in the U.S.; TCO Certified ³⁹
Energy star certified (Series fixed)	ENERGY STAR® certified
Certification and compliance	CCC; CECP; GS Mark
Sustainable impact specifications	Low Halogen ⁴⁰
Warranty	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 .

HP EliteBook 650 15.6 inch G10 Notebook PC

Messaging Footnotes

- ² 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.
- ³ HP Wolf Security for Business requires Windows 10 Pro and higher, includes various HP security features and is available on HP Pro, Elite, Workstation, and RPOS products. See product details for included security features and OS requirements.
- ⁴ Optional feature must be configured at time of purchase.
- ⁵ HP Auto Frame available only with optional SMP camera that must be configured at purchase. Requires the myHP application and Windows OS.
- ⁶ Requires the myHP application and Windows OS.
- ⁷ HP Power Manager requires Windows 10 and higher and is available from the Microsoft store.
- ⁸ Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.
- ⁹ 100% outer box packaging made from sustainably sourced certified and recycled fibers. Fiber cushions made from 100% recycled wood fiber and organic material. Any plastic cushions are made from >90% recycled plastic.
- ¹⁰ Sold separately or as an optional feature.
- ¹¹ Sold separately or as an optional feature. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30GB (for Windows) of disk is reserved for system recovery software.
- ¹² HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.
- ¹³ HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 Pro and higher.
- ¹⁴ HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 Pro and higher.
- ¹⁵ HP Sure Recover Gen5 is available on select HP PCs and requires Windows 10 Pro and higher and an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. Network based recovery using Wi-Fi is only available on PCs with Intel Wi-Fi Module.
- ¹⁶ HP Sure Click requires Windows 10 and higher. See https://bit.ly/2PrLT6A_SureClick for complete details.
- ¹⁷ HP conferencing features require Windows and the latest myHP app, available over the air or for download via sofpaq on the HP Support website. Planned availability in spring 2023.

Technical Specifications Footnotes

- 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 computer is preinstalled with Windows (Insert Product version/edition name) Home Single Language.
- ³ Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.
- ⁴ Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
- ⁵ Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See www.intel.com/technology/turboboost for more information.
- ⁶ In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on products configured with Intel and AMD 7th generation and forward processors or provide any Windows 8 or Windows 7 drivers on <http://www.support.hp.com>.
- ⁷ 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.
- ⁸ 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.
- ⁹ 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.
- ¹⁰ Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.
- ¹¹ 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.
- ¹² Intel® Iris® X* Graphics capabilities require system to be configured with Intel® Core™ i5 or i7 processors and dual channel memory. Intel® Iris® X* Graphics with Intel® Core™ i5 or 7 processors and single channel memory will only function as UHD graphics.
- ¹³ HD content required to view HD images.
- ¹⁴ Backlit keyboard is an optional feature.
- ¹⁵ Resolutions are dependent upon monitor capability, and resolution and color depth settings.
- ¹⁶ HP Sure View Reflect integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
- ¹⁷ Actual brightness will be lower with touchscreen or Sure View.
- ¹⁸ Sold separately or as an optional feature.
- ¹⁹ Microsoft Office sold separately and requires Internet access for activation.
- ²⁰ HP Support Assistant requires Windows and Internet access.
- ²¹ HP Services Scan is provided with Windows Update on select products 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. HP TechPulse is a telemetry and analytics platform that provides critical data around devices and applications. For full system requirements or to disable this feature, please visit <http://www.hpdaas.com/requirements>. Not applicable in China.
- ²² 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.
- ²³ HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.
- ²⁴ 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>.
- ²⁵ HP Sure Click requires Windows 10 Pro or higher or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.
- ²⁶ HP Sure Sense is available on select HP PCs with Windows 10 Pro, Windows 10 Enterprise, Windows 11 Pro, or Windows 11 Enterprise OS25. HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 and higher.
- ²⁷ HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 and higher.
- ²⁸ HP Sure Recover is available on HP Elite PCs with 8th generation Intel® or AMD processors and requires an open, wired network connection. You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Does not support platforms with Intel® Optane™.
- ²⁹ HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 and higher.
- ³⁰ HP Client Security Manager Gen7 requires Windows and is available on the select HP Elite and Pro PCs.
- ³¹ HP BIOSphere Gen6 features may vary depending on the platform and configuration.
- ³² 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™.
- ³³ 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/>
- ³⁴ Secured-Core PC Enable requires an Intel® vPro®, AMD Ryzen™ Pro processor or Qualcomm® processor with SDB50 or higher and requires 8 GB or more system memory. Secured-core PC is enabled from the factory.
- ³⁵ HP Fingerprint sensor is an optional feature that must be configured at purchase.
- 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 Availability may vary by country.
- ³⁸ HP Power Manager requires Windows 10 and higher and can be downloaded from the Microsoft Store.
- ³⁹ Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit www.epeat.net for more information.
- ⁴⁰ External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.
- ⁴¹ Secondary SSD slot (M.2 2230 form factor; Optional) is used for data storage only, not used for OS deployment, and is only available with non-WWAN base Unit AND Primary M.2 storage.
- ⁴² Integrated graphics depends on processor. NVIDIA® Optimus™ technology requires an Intel processor, plus an NVIDIA® GeForce® discrete graphics configuration and is available on Windows 10 Pro OS or higher. With NVIDIA® Optimus™ technology, full enablement of all discrete graphics video and display features may not be supported on all systems (e.g. OpenGL applications will run on the integrated GPU or the APU as the case may be).
- ⁴³ Windows 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.
- ⁴⁴ HP Wolf Pro Security Edition (including HP Sure Click Pro and HP Sure Sense Pro) is available preloaded on select SKUs and, depending on the HP product purchased, includes a paid 1-year or 3-year license. The HP Wolf Pro Security Edition software is licensed under the terms of the HP Wolf Security Software - End-User License Agreement (EULA) that can be found at: https://support.hp.com/us-en/document/ish_3875769-3873014-16 as that EULA is modified by the following: "7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition (HP Sure Sense Pro and HP Sure Click Pro) is effective upon activation and will continue for either a twelve (12) month or thirty-six (36) month license term ("Initial Term"). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support."
- ⁴⁵ 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>.

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#us-en#, July 2023

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Overview

HP EliteBook 655 15.6 inch G10 Notebook PC



- | | |
|--|---|
| 1. Internal Microphones (2) | 7. Clickpad |
| 2. Webcam LED (Optional) | 8. Smartcard Reader (Optional) |
| 3. 5MP IR, HD TNR and HD TNR+IR Camera (Optional) | 9. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1) |
| 4. Camera Shutter (Only available with webcam) | 10. Ethernet Port (RJ-45) |
| 5. IR Camera LED (Optional) | 11. Nano Security Lock Slot (Lock sold separately) |
| 6. NFC Sensor | |

Overview



Right

- | | |
|--|--|
| 1. Power Button Key | 6. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1) |
| 2. Speakers | 7. HDMI 2.1 Port (Cable not included) |
| 3. Power Connector | 8. Audio Combo Jack |
| 4. SuperSpeed USB Type-C® 10Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4) | 9. External SIM Card Slot (Optional) |
| 5. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1) | 10. Touch Fingerprint Sensor (Select Models) |

Overview

At a Glance

- Choice of AMD Barcelo™ 7000 series mobile processors, R7, R5 and R3
- Preinstalled with Windows 11 Pro, other Windows OS or FreeDOS
- Fast and upgradeable dual channel DDR4 SODIMM memory up to 64 GB
- Choice of 39.6 cm (15.6") diagonal HD, Ultra Wide Viewing Angle FHD, Touch or Non-Touch screen option
- Features quiet and responsive HP Keyboard with the HP Programmable key and backlit options
- Choice of solid state drives up to 2 TB
- Multi-layered security with HP SureStart Gen7, HP Privacy Camera, HP Sure Sense, HP Sure Click, HP Secure Erase, Sure Run Gen5, Sure Recover Gen5, Touch Fingerprint reader, and Tamper Lock
- Supports wireless options for connectivity on the go including gigabit-speed Wi-Fi 6E and CAT16 4G/LTE WWAN
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles
- Designed to support HP docking options
- Passed MIL-STD 810H tests ¹
- Battery Life up to 16 hours with the optional 51.3Whr battery
- Optimize your video calls with a 5MP+IR camera, HD+IR/HD camera and temporal noise reduction that adjusts to the lighting in your environment.
- 180° synchronized hinge allows the EliteBook to lay completely flat, without lifting the keyboard, and includes everyone with visibility from multiple angles.
- Can be wiped up to 1000 times with common household cleaning wipes²
- Synchronized hinge allows the EliteBook to ProBook to open to 177° +/- 3° without lifting the keyboard and offers visibility from multiple angles.

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.

2. See wipe manufacturer's instructions for disinfecting and the HP cleaning guide for HP tested wipe solutions at <http://h20195.www.2.hp.com/v2/GetDocument.aspx?docname=4AA7-7610ENW>

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

Technical Specifications

PRODUCT NAME

HP EliteBook 655 15.6 inch G10 Notebook PC

OPERATING SYSTEMS

Preinstalled	Windows 11 Pro ¹ Windows 11 Pro 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 or Windows 10 Enterprise available with a Volume Licensing Agreement ¹ Windows 11 Pro (preinstalled with Windows 10 Pro Downgrade) ^{1,2} FreeDOS
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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}	Cores	Threads	L3 Cache	Max Boost Frequency ⁵	Base Frequency	Pro
AMD Ryzen™ 7 PRO-7730	8	16	16MB	4.50GHz	2.00GHz	X
AMD Ryzen™ 7-7730U	8	16	16MB	4.50GHz	2.00GHz	
AMD Ryzen™ 5 PRO-7530U	6	12	16MB	4.50GHz	2.0GHz	X
AMD Ryzen™ 5-7530U	6	12	16MB	4.50GHz	2.00GHz	
AMD Ryzen™ 3-7330U	4	8	8MB	4.30GHz	2.30GHz	

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. AMD's numbering is not a measurement of clock speed.

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

5. AMD Max Boost frequency performance varies depending on hardware, software and overall system configuration.

Technical Specifications

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated

AMD Radeon™ Graphics

DISPLAY

Non-Touch

39.6 cm (15.6") diagonal, FHD, UWVA eDP IPS, anti-glare, micro-edge, narrow bezel bent, 250 nits, 45% for HD + IR camera and WWAN (1920 x 1080) ^{6,7}

39.6 cm (15.6") diagonal, FHD, UWVA, Low Blue Light IPS anti-glare, Low Power, 400 nits, 100% for 5MP+IR camera (1920 x 1080) with HP Eye Ease ^{6,7}

39.6 cm (15.6") diagonal, FHD, Low Blue Light IPS anti-glare, micro-edge, 400 nits, sRGB 100% eDP 1.4+PSR2 for HD + IR camera and WWAN with HP Eye Ease (1920 x 1080) ^{6,7}

39.6 cm (15.6") diagonal, FHD, UWVA eDP 1.2 w/o PSR, IPS, anti-glare, micro-edge, narrow bezel bent, 250 nits, 45% (1920 x 1080) ^{6,7}

39.6 cm (15.6") diagonal, FHD, UWVA eDP, IPS, anti-glare, micro-edge, narrow bezel bent, 250 nits, 45% for HD camera (1920 x 1080) ^{6,7}

39.6 cm (15.6") diagonal, FHD, UWVA eDP IPS, anti-glare, micro-edge, narrow bezel bent, 250 nits, 45% for HD camera and WWAN (1920 x 1080) ^{6,7}

39.6 cm (15.6") diagonal, HD, SVA eDP 1.2 w/o PSR, anti-glare, micro-edge, narrow bezel bent, 250 nits, 45% (1366 x 768) ^{6,7}

39.6 cm (15.6") diagonal, HD, SVA eDP, anti-glare, micro-edge, narrow bezel bent, 250 nits, 45% for HD camera (1366 x 768) ^{6,7}

Touch

39.6 cm (15.6") diagonal FHD UWVA eDP anti-glare narrow bezel bent touch-on-panel screen, 250 nits, 45% NTSC for HD (1920 x 1080) ^{6,7,8,9}

Display Size (Diagonal)

15.6" diagonal

39.6 cm (15.6") diagonal

6. HD content required to view HD images.

7. Sold separately or as an optional feature.

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

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

Technical Specifications

DOCKING (Sold Separately)

Docking station model #1	HP Thunderbolt 120W G4 Dock
Docking station model #2	HP Thunderbolt 280W G4 Dock
Docking station model #3	HP USB-C Dock G5
Docking station model #4	HP USB-C/A Universal Dock G2
Docking station model #5	HP USB-C G5 Essential Dock

[For additional aftermarket options and docking specs please see page 43.](#)

STORAGE AND DRIVES

Primary Storage

2 TB PCIe® Gen 4x4 NVMe™ TLC 2280 Solid State Drive ^{10,11}
1 TB PCIe® Gen 4x4 NVMe™ TLC 2280 Self Encrypted OPAL2 Solid State Drive ^{10,11}
1 TB PCIe® Gen 4x4 NVMe™ TLC 2280 Solid State Drive ^{10,11}
512 GB PCIe® NVMe™ M.2 SSD ¹⁰
512 GB PCIe® Gen 4x4 NVMe™ TLC 2280 Self Encrypted OPAL2 Solid State Drive ^{10,11}
512 GB PCIe® Gen 4x4 NVMe™ TLC Solid State Drive ^{10,11}
256 GB PCIe® NVMe™ M.2 SSD ¹⁰
256 GB PCIe® NVMe™ Value 2280 Self Encrypted OPAL2 Solid State Drive ^{10,11}

Primary M.2 Storage

256 GB PCIe® NVMe™ Value 2230 2nd Solid State Drive ^{10,12}

10. 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.

11. Only functions at the Gen3x4 capacity with AMD Ryzen Barcelo processor

12. Secondary SSD slot (M.2 2230 form factor; Optional) is used for data storage only, not used for OS deployment, and is only available with non-WWAN base Unit AND Primary M.2 storage.

MEMORY

Maximum Memory

64 GB DDR4-3200 SDRAM ¹³

Memory

64 GB DDR4-3200 SDRAM (2x32GB) ¹³
32 GB DDR4-3200 SDRAM (1 x 32 GB) ¹³
32 GB DDR4-3200 SDRAM (2 x 16 GB) ¹³
16 GB DDR4-3200 SDRAM (1 x 16 GB) ¹³
16 GB DDR4-3200 SDRAM (2 x 8 GB) ¹³
8 GB DDR4-3200 SDRAM (1 x 8 GB) ¹³
8 GB DDR4-3200 SDRAM (2 x 4 GB) ¹³

Memory Slots

2 SODIMM

Both slots are customer accessible / upgradeable

DDR4 PC4 SODIMMS (Barcelo runs at 3200)



Technical Specifications

Supports Dual Channel Memory

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

NETWORKING/COMMUNICATIONS

WLAN

Realtek RTL8852CE 802.11ax 2x2 Wi-Fi 6E + Bluetooth® 5.3 Wireless Card ¹⁴

Mediatek RZ616 Wi-Fi 6E + Bluetooth® 5.3 Wireless Card ¹⁴

WWAN

Intel® XMM 7560 R+ LTE-Advanced Pro WWAN (Cat 16) ¹⁵

NFC

NXP NPC300 Near Field Communication Module (NFC Mirage WNC XRAV-1)

MIRACAST

Native Miracast Support ¹⁶

Ethernet

Realtek RTL8111FPH 10/100/1000 Integrated NIC ¹⁷

Realtek RTL8111HSH 10/100/1000 Integrated NIC (Non-DASH) ¹⁷

14. 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.

15. Gigabit-class 4G LTE module is optional and must be configured at the factory. Module designed for up to 1 Gbps download speeds as carriers deploy 5 carrier aggregation and 100Mhz channel bandwidth, requires activation and separately purchased service contract. Backwards compatible to HSPA 3G technologies. Check with service provider for coverage and availability in your area. Connection, upload, and download speeds will vary due to network, location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.

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

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

Technical Specifications

AUDIO/MULTIMEDIA

Audio

2 Integrated stereo speakers
Integrated microphone (Dual Array)

Speaker Power

2W/4ohm Per speaker

Webcam

720p HD camera with Temporal Noise Reduction ^{7,8}
720p HD camera+IR Camera with Temporal Noise Reduction ^{7,8}
5MP camera+IR with Temporal Noise Reduction ^{7,8}
5 MP + IR camera for face authentication with Windows Hello

6. HD content required to view HD images.
7. Sold separately or as an optional feature.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Premium Keyboard, spill resistant with optional backlit function ¹⁸

Pointing Device

Clickpad with multi-touch gesture support

Function Keys

F1 - Display Switching
F2 - Blank
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 - Wireless
F12 - Programmable key

Hidden Function Keys

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

18. Backlit keyboard is an optional feature.

Technical Specifications

SOFTWARE AND SECURITY

Preinstalled Software

Software

HP Quick Drop ¹⁹
HP PC Hardware Diagnostics Windows
myHP
HP Smart Support (download)²⁰
HP Services Scan ²¹
HP Connection Optimizer
HP Hotkey Support
HP Support Assistant ²²
HP Notifications
HP Privacy Settings
HP Power Manager
Buy Microsoft Office (Sold separately)

Manageability Features

HP Connect ²³
HP Image Assistant Gen5 (download)
HP Manageability Integration Kit (download)²⁴
HP Client Management Script Library (download)
HP Patch Assistant (download)²⁵
HP Driver Packs (download)
HP Client Catalog (download)
HP Cloud Recovery

Security Management

HP Wolf Security for Business ²⁶ includes:
HP Sure Click²⁷
HP Sure Sense ²⁸
HP Sure Run ²⁹
HP Sure Recover ³⁰
HP Sure Start ³¹
HP Tamper Lock
HP Sure Admin ³²

BIOS

HP BIOSphere Gen6 ³³
HP Secure Erase ³⁴
Absolute Persistence Module ³⁵
BIOS Update via Network
HP Wake on WLAN
Secured-Core PC Enable ³⁶
TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)
HP Fingerprint Sensor ³⁷

Security

TPM

Model: Nuvoton NPCT760HABYX
Version: 7.2.3.1



Technical Specifications

Revision: TPM 2.0
FIPS 140-2 Compliant: Yes

Smartcard Reader

Model number: Alcor AU9560
FIPS 201 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: 3

19. HP Quick Drop requires Internet access and Windows 10 or higher 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.

20. 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>. 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. 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 or to disable this feature, please visit <http://www.hpdaas.com/requirements>.

21. HP Services Scan is provided with Windows Update on select products 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. 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 or to disable this feature, please visit <http://www.hpdaas.com/requirements>. Not applicable in China.

22. HP Support Assistance requires Windows and Internet Access

23. 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.

24. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

25. 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>.

26. 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.

27. HP Sure Click requires Windows 10 Pro or higher or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.

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

29. HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 and higher.

30. HP Sure Recover is available on select HP PCs and requires an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data.

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

Technical Specifications

- 32. HP Sure Admin requires Windows 10 or higher, HP BIOS, HP Manageability Integration Kit from <http://www.hp.com/go/clientmanagement> and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store
 - 33. HP BIOSphere Gen6 features may vary depending on the platform and configuration.
 - 34. 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™.
 - 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 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/>
 - 36. Secured-Core PC Enable 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 is enabled from the factory.
 - 37. HP Fingerprint sensor is an optional feature that must be configured at purchase.
-

Technical Specifications

POWER

Power Supply

AC Adapter 45 Watt nPFC Standard USB Type C® Straight 1.8m ³⁸

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m ³⁸

AC Adapter 45 Watt Smart nPFC Standard C8 for 2 prong Barrel 4.5mm Right Angle ³⁸⁹

AC Adapter 65 Watt nPFC Standard USB Type C® Straight 1.8m ³⁸

AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm ³⁸

AC Adapter 65 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m ³⁸

Battery

HP Long Life 3-cell, 42.75 Wh Polymer ^{39,40}

HP Long Life 3-cell, 51.3 Wh Polymer ^{39,40}

Compliant with UL 1642 Standard

Power Cord

3-wire plug - 1m ³⁸

2-wire plug - 1m ³⁸

Battery Life

Up to 13 hours 15 minutes with 42.75Whr battery [HP Long Life 3-Cell, 42.75Whr Polymer, UMA graphics, AMD R7 PRO, display set to 200 nits (on a 250-nit display), 2*4G memory, 256G SSD] ⁴¹

Up to 16 hours with 51.3Whr battery [HP Long Life 3-Cell, 42.75Whr Polymer, UMA graphics, AMD R7 PRO, display set to 200 nits (on a 250-nit display), 2*4G memory, 256G SSD] ⁴¹

Battery Weight

HP Long Life 3-cell - 42.75 Wh Polymer - .40 lb

HP Long Life 3-cell - 51.3 Wh Polymer - .45 lb

HP Long Life 3-cell - 42.75 Wh Polymer - 181.83 g

HP Long Life 3-cell - 51.3 Wh Polymer - 203.56 g

38. Availability may vary by country.

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

40. 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.

41. 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 3.9 lb ⁴²

Starting at 1.77 kg⁴²

Product Dimensions (W x D x H)

14.14 x 9.2 x 0.78 in

35.94 x 23.39 x 1.99 cm

Packaging Dimensions (W x D x H) ⁴³

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

16"-17" boxes (345mm height): 1200mm x 1000mm x 1200mm

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

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

PORTS/SLOTS

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

3 SuperSpeed USB Type-A 5Gbps signaling rate Port (1 Powered port) (USB 3.2 Gen 1)

1 AC power

1 HDMI 2.1 ⁴⁴

1 Headphone/microphone combo jack

1 Nano SIM slot for WWAN (optional)

1 RJ-45

1 Smart Card Reader (optional)

44. HDMI cable sold separately

Technical Specifications

SERVICE AND SUPPORT

1-year and 3-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty. 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>.⁴⁵

45. 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 www.hp.com/go/cpc. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

Technical Specifications

SYSTEM UNIT

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

Nominal Operating Voltage	19V
Average Operating Power	7.52W (Idle)
Integrated graphics	Yes (AMD Radeon™ Graphics)
Discrete Graphics	N/A
Max Operating Power	Discrete < 65W 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	1.043 grams
Non-operating	3.5 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-Q35C-5
CSA/UL 62368-1	Yes
ENERGY STAR®	Yes ⁴⁶
EPEAT®	EPEAT® Gold in the United States ⁴⁷
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
EAEU Compliance	Yes
Saudi Arabian Compliance	Yes
TCO	Yes
WW RoHS	Yes
Low Blue Light	Yes

46. Configurations of the HP EliteBook 655 15.6 inch G10 Notebook PC that are ENERGY STAR® qualified are identified as HP EliteBook 655 15.6 inch G10 Notebook PC ENERGY STAR on HP websites and on <http://www.energystar.gov>.

Technical Specifications

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

DISPLAYS

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

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

Panel LCD 15.6 inch FHD (1920x1080) Anti-Glare WLED UWVA 45percent cg 250nits eDP 1.2 w/o PSR bent Touch on Panel NWBZ	Outline Dimensions (W x H x D)	350.960 x 205.740 (max)
	Active Area	344.160 x 193.590 mm (typ)
	Weight	380 g (max)
	Diagonal Size	15.6
	Surface Treatment	Anti-Glare On-cell
	Touch Enabled	Yes ¹
	Contrast Ratio	600:1 (typ)
	Refresh Rate	60 Hz
	Brightness	250 nits ¹
	Pixel Resolution - Format	1920 x 1080 (FHD)
	Backlight	LED
	Pixel Resolution	RGB
	Color Gamut Coverage	NTSC 45%
	Color Depth	6
	Viewing Angle	UWVA 85/85/85/85
	Low Blue Light	No
	Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.54 (Max) / 3.12 (Max)

15.6 in FHD (1920 x 1080) Anti-Glare UWVA Low Blue Light sRGB NB2X 400 eDP 1.4+PSR2 Low-Power 100 bent LCD Panel	Outline Dimensions (W x H x D)	349.460 x 204.790 (max)
	Active Area	344.160 x 193.590 mm (typ)
	Weight	310 g (max)
	Diagonal Size	15.6 (inch)
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	1200:1 (typ)
	Refresh Rate	60 Hz
	Brightness	400 nits ¹
	Pixel Resolution - Format	1920 x 1080 (FHD)
	Backlight	WLED
	Pixel Resolution	RGB
	Color Gamut Coverage	sRGB 100%
	Color Depth	8

Technical Specifications

Viewing Angle	UWVA 89/89/89/89
Low Blue Light	Yes
Power Consumption (W, EBL@ 150nits max/ 200nits max)	1.27 (max) / 1.5 (max)

15.6 inch FHD (1920x1080)	Outline Dimensions (W x H x D)	350.960 x 205.540 (max)
Anti-Glare WLED UWVA	Active Area	344.160 x 193.590 mm (typ)
45percent cg 250nits eDP	Weight	370 g (max)
1.2 w/o PSR bent NWBZ	Diagonal Size	15.6
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	600:1 (typ)
	Refresh Rate	60 Hz
	Brightness	250 nits ¹
	Pixel Resolution - Format	1920 x 1080 (FHD)
	Backlight	LED
	Pixel Resolution	RGB
	Color Gamut Coverage	NTSC 45%
	Color Depth	6 (Hi FRC w/ condition to enable)
	Viewing Angle	UWVA 85/85/85/85
	Low Blue Light	No
	Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.62 (Max) / 3.27 (Max)

15.6-in HD (1366x768)	Outline Dimensions (W x H x D)	350.960 x 205.540 (max)
Anti-Glare WLED SVA	Active Area	344.230 x 193.540 mm (typ)
45percent cg 250nits eDP	Weight	370 g (max)
1.2 w/o PSR NWBZ bent	Diagonal Size	15.6
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	300:1 (typ)
	Refresh Rate	60 Hz
	Brightness	250 nits ¹
	Pixel Resolution - Format	1366 x 768 (HD)
	Backlight	LED
	Pixel Resolution	RGB
	Color Gamut Coverage	NTSC 45%
	Color Depth	6
	Viewing Angle	SVA 45/45/15/35

Technical Specifications

Low Blue Light	No
Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.49 (Max) / 2.78 (Max)

Technical Specifications

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 256GB 2230 PCIe NVMe Value	Form Factor	M.2 2230
	Capacity	256 GB
	NAND Type	Value
	Interface	PCIe NVMe
	Minimum Sequential Read	2000 MB/s $\pm$ 10%
	Minimum Sequential Write	900 MB/s $\pm$ 10%
	Logical Blocks	500118192
	Features	Pyrite; TRIM; L1.2

SSD 256GB 2280 PCIe NVMe Value	Form Factor	M.2 2280
	Capacity	256GB
	NAND Type	Value
	Interface	PCIe NVMe
	Minimum Sequential Read	2000 MB/s $\pm$ 10%
	Minimum Sequential Write	900 MB/s $\pm$ 10%
	Logical Blocks	500118192
	Features	ATA Security; TRIM; L1.2

256GB PCIe 2280 NVMe Self Encrypted OPAL2 Value Solid State Drive	Form Factor	M.2 2280
	Capacity	256 GB
	NAND Type	Opal2 Value
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	2000 MB/s $\pm$ 10%
	Minimum Sequential Write	900 MB/s $\pm$ 10%
	Logical Blocks	500,118,192
	Features	Pyrite 2.0; TRIM; L1.2

SSD 512GB 2280 PCIe NVMe Value	Form Factor	M.2 2280
	Capacity	512GB
	NAND Type	Value
	Minimum Sequential Read	2200 MB/s $\pm$ 10%
	Minimum Sequential Write	1000 MB/s $\pm$ 10%
	Logical Blocks	1000215216
	Features	Pyrite 2.0, TRIM; L1.2

Technical Specifications

**512GB PCIe-4x4 2280
NVMe Self Encrypted
OPAL2 Three Layer Cell
Solid State Drive**

Form Factor	M.2 2280
Capacity	512 GB
NAND Type	Opal2 TLC
Interface	PCIe NVMe Gen4X4
Minimum Sequential Read	6400 MB/s $\pm$ 10%
Minimum Sequential Write	3500 MB/s $\pm$ 10%
Logical Blocks	1,000,215,216
Features	Pyrite 2.0, TRIM; L1.2

**SSD 512GB 2280 PCIe-4x4
NVMe Three Layer Cell**

Form Factor	M.2 2280
Capacity	512 GB
NAND Type	TLC
Interface	PCIe NVMe Gen4X4
Minimum Sequential Read	6400 MB/s $\pm$ 10%
Minimum Sequential Write	3500 MB/s $\pm$ 10%
Logical Blocks	1,000,215,216
Features	Pyrite 2.0, TRIM; L1.2

**1TB PCIe-4x4 2280 NVME
Self Encrypted OPAL2
Three Layer Cell Solid
State Drive**

Form Factor	M.2 2280
Capacity	1 TB
NAND Type	Opal2 TLC
Interface	PCIe NVMe Gen4X4
Minimum Sequential Read	6400 MB/s $\pm$ 10%
Minimum Sequential Write	5000 MB/s $\pm$ 10%
Logical Blocks	2,000,409,264
Features	Pyrite 2.0, TRIM; L1.2

**SSD 1TB 2280 PCIe-4x4
NVMe Three Layer Cell**

Form Factor	M.2 2280
Capacity	1 TB
NAND Type	TLC
Interface	PCIe NVMe Gen4X4
Minimum Sequential Read	6400 MB/s $\pm$ 10%
Minimum Sequential Write	5000 MB/s $\pm$ 10%
Logical Blocks	2,000,409,264
Features	Pyrite 2.0, TRIM; L1.2

Technical Specifications

SSD 2TB 2280 PCIe-4x4 NVMe Three Layer Cell	Form Factor	M.2 2280
	Capacity	2 TB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Minimum Sequential Read	6400 MB/s ± 10%
	Minimum Sequential Write	5000 MB/s ± 10%
	Logical Blocks	4,000,797,360
	Features	Pyrite 2.0, TRIM; L1.2

Technical Specifications

NETWORKING/COMMUNICATIONS

Realtek RTL8852CE 802.11ax 2x2 Wi-Fi 6E + Bluetooth® 5.3 Wireless Card (802.11ax 2x2, supporting gigabit data rate)¹	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
	Interoperability	Wi-Fi certified
	Frequency Band	• 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 5.955 – 6.415 GHz 6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 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, (20MHz, 40MHz, ,80MHz & 160MHz) • 802.11ax : MCS0 ~ MCS11, (20MHz, 40MHz, ,80MHz & 160MHz)
	Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
	Security ²	• 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
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power ³	• 802.11b : +17dBm minimum • 802.11g : +16dBm minimum • 802.11a : +17dBm minimum

Technical Specifications

	• 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 • 802.11ax HE80(6GHz) : +10dBm minimum • 802.11ax HE160(6GHz) : +10dBm minimum	
Power Consumption	• 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 Sensitivity ⁴	• 802.11b, 1Mbps : -93.5dBm maximum • 802.11b, 11Mbps : -84dBm maximum • 802.11a/g, 6Mbps : -86dBm maximum • 802.11a/g, 54Mbps : -72dBm maximum • 802.11n, MCS07 : -67dBm maximum • 802.11n, MCS15 : -64dBm maximum • 802.11ac, MCS0(VHT80) : -84dBm maximum • 802.11ac, MCS9(VHT80) : -59dBm maximum • 802.11ac, MCS9(VHT160) : -58.5dBm maximum • 802.11ax, MCS11(HE40): -57dBm maximum • 802.11ax, MCS11(HE80): -54dBm maximum • 802.11ax, MCS11(HE160): -53.5dBm maximum	
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
Weight	1. Type 2230 : 2.8g 2. Type 126: 1.3g	
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)

Technical Specifications

LED Activity N/A

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

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 + 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

Technical Specifications

- 2Mbps LE
- LE Long Range
- Windows BT profiles support
- BT5.3
- Periodic Advertisement interval
- Encryption key size control enhancements

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. Check latest software/driver release for updates on supported security features.
3. 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.
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).

Mediatek RZ616 Wi-Fi 6E + Bluetooth® 5.3 Wireless Card (802.11ax 2x2, supporting gigabit data rate) ¹	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 802.11j
		IEEE 802.11k
		IEEE 802.11mc
		IEEE 802.11r
		IEEE 802.11v
		IEEE 802.11w
	Interoperability	Wi-Fi certified
	Frequency Band	•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
		5.925 – 7.125 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, (20MHz, 40MHz, ,80MHz & 160MHz)

Technical Specifications

Modulation	• 802.11ax : MCS0 ~ MCS11, (20MHz, 40MHz, ,80MHz & 160MHz) Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
Security²	• 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
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power³	2.4GHz (MIMO, typical): • 802.11b : +18dBm • 802.11g : +16.5dBm • 802.11n/ac/ax (HT20/VHT20/HE20) : +16dBm • 802.11n/ac/ax (HT40/VHT40/HE40) : +12.5dBm 5GHz (MIMO, typical): • 802.11a : +13dBm • 802.11n/ac/ax (HT20/VHT20/HE20) : +13.5dBm • 802.11n/ac/ax (HT40/VHT40/HE40) : +12.5dBm • 802.11ac/ax (VHT80/HE80) : +11.5dBm • 802.11ax HE160 : +11.5dBm 6GHz LPI mode (MIMO, typical):: • 802.11a : 0dBm • 802.11ax HE20 : +1 dBm • 802.11ax HE40 : +4dBm • 802.11ax HE80 : +7dBm • 802.11ax HE160 : +7.5dBm
Power Consumption	• 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	2.4GHz (SISO): • 802.11b, 11Mbps : -82dBm maximum • 802.11g, 54Mbps : -71 dBm maximum • 802.11n, MCS7 : -64dBm maximum • 802.11ac, MCS9 : -52dBm maximum • 802.11ax, MCS11 (HT40): -49dBm maximum 5GHz (SISO):

Technical Specifications

- 802.11a, 54Mbps : -71 dBm maximum
 - 802.11n, MCS07 : -64dBm maximum
 - 802.11ac, MCS9 : -52dBm maximum
 - 802.11ax, MCS11(HE80/HE160): -46dBm maximum
- 6GHz (SISO):

- 802.11a, 54Mbps : -71 dBm maximum
- 802.11n, MCS7 : -64dBm maximum
- 802.11ac, MCS9 : -52dBm maximum
- 802.11ax, MCS11(HE160): -46dBm maximum

Antenna type

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

Form Factor

PCI-Express M.2 MiniCard

Dimensions

1. Type 2230: 2.3 x 22.0 x 30.0 mm
2. Type 1216: 1.67 x 12.0 x 16.0 mm

Weight

1. Type 2230: 2.8g
2. Type 126: 1.3g

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 Card**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)

Signaling Data Rate

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 1.5 Bluetooth device with a maximum transmit power of + 14 dBm and 10 dBm for BR and EDR, respectively.

Power Consumption

Peak (Tx): 330 mW
 Peak (Rx): 230 mW
 Selective Suspend: 17 mW

Bluetooth Software

Microsoft Windows Bluetooth Software

Supported Link Topology

Technical Specifications

Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.407
Power Management	ETS 300 328
Certifications	Low Voltage Directive CE Mark
Bluetooth Software 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 BT5.3 Periodic Advertisement interval Encryption key size control enhancements

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. Check latest software/driver release for updates on supported security features.
3. 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.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Technical Specifications

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
	GPS GPS bands	WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification 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) embedded eSIM	42 x 30 x 2.3 mm 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

NFC Mirage module (NXP NPC300 I2C 10 mm x 17 mm)	Dimensions (L x W x H)	Module 25 mm by 10 mm by 2.0 mm
	Chipset	NPC300
	System interface	I2C
	NFC RF standards	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 ISO/IEC 18092 ECMA-340 NFCIP-1 Target and Initiator ECMA-320 NFCIP-2
	NFC Forum Support	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2
	Reader (PCD-VCD) Mode	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 MIFARE 1K MIFARE 4K MIFARE DESFire FeliCa Jewel and Topaz cards
	Card Emulation (PICC-VICC) Mode	ISO/IEC 14443 A ISO/IEC 14443 B and B' MIFARE FeliCa
	Frequency	13.56 MHz
	NFC Modes Supported	Reader/Writer, Peer-to-Peer
	Raw RF Data Rates	106, 212, 424, 848 kbps
	Operating temperature	0°C to 70°C
	Storage temperature	-20°C to 125°C
	Humidity	10-90% operating 5-95% non-operating
	Supply Operating voltage	4.35 to 5.25 Volts
	I/O Voltage	1.8V or 3.3V
	Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)	
	Mode	Power Consumption, Typical
	Polling	7.3 mA
	Detected Test Tag Type 1	Total 283.8 mA Net Module 236.8 mA
	Detected Test Tag Type 2	Total 288.8 mA Net Module 241.8 mA
	Detected Test Tag Type 3	Total 287.7 mA Net Module 240.7 mA
	Detected Test Tag Type 4	Total 282.3 mA Net Module 235.3 mA
	Antenna	Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module.

Technical Specifications

Realtek RTL8111FPH 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 802.3 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
	Security & Manageability	Support DASH 1.2 compliant

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 802.3 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)

Technical Specifications

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 IT Manageability	Auto MDI/MDIX Crossover cable detection 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

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

AC Adapter 45 Watt nPFC Standard USB type C Straight 1.8m	Dimensions (H x W x D)	3.701 x 1.693 x 1.071 in (9.4x4.3x2.72cm)
	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		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%
EMI and Safety Certifications	Storage Humidity	10% to 95%
		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)

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	Dimensions (H x W x D)	3.74 x 1.772 x 1.043 in (9.5x4.5x2.65cm)
	Weight	0.44 lb (200 g) max (Not including power cord. Power cord varies by country)
	Input	100 ~ 240VAC
	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



Technical Specifications

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
Connector	Output current limit	<8.0A
	4.5mm Barrel Type	
	Environmental Design	
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 GEMS and RCM, BIS, BSMI, UAE, UKCA DoC	

AC Adapter 65 Watt nPFC Standard USB type C Straight 1.8m	Dimensions (H x W x D)	3.543 x 2.008 x 1.122 in (9.0x5.1x2.85cm)
	Weight	0.53 lb (240 g) max (Not including power cord. Power cord varies by country.)
	Input	100 ~ 240VAC
Output	Input Efficiency	Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec: 5V : 81.5% 9V : 86.7% 12V : 88% 15V : 88% 20V : 89%
	Input frequency range	47 ~ 63 Hz
	Input AC current	Max. 1.6 A at 90 Vac
	Output power	5V/15W 9V/27W 12V/60W 15V/60W 20V/65W
	DC output	5V/9V/12V/15V/20V
Connector	Hold-up time	100% load 5ms at 115 Vac input
	Output current limit	<8.0A
	USB TYPE C	
Environmental Design	Operating temperature	32°F to 95°F (0°to 35°C)

Technical Specifications

	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, UL 62368-1 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
AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm	Dimensions (H x W x D)	4.016 x 2.165 x 1.181 in (10.2x5.5x3cm)
	Weight	0.58 lb (265 g) max (Not including power cord. Power cord varies by country.)
	Input	100 ~ 240VAC
		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 100% load 5ms at 115 Vac input/80% load 10ms at 115 Vac input
		Output current limit <11.0A
	Connector	4.5mm 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)
		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

Technical Specifications

AC Adapter 65 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	Dimensions (H x W x D)	3.543 x 2.008 x 1.122 in (9.0x5.1x2.85cm)
	Weight	0.55 lb (250 g) max (Not including power cord. Power cord varies by country.)
	Input	100 ~ 240VAC
		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 100% load 5ms at 115 Vac input/80% load 10ms at 115 Vac input
	Connector	Output current limit <11.0A
Environmental Design		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%
EMI and Safety Certifications		Storage Humidity 10% to 95%
		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		

RH 42Whr Long Life Polymer Fast Charge 3 cell Battery ¹	Weight	0.18 kg (0.397 lb)
	Cells/Type	3cell Lithium-Ion Polymer cell / 545974
	Energy	Voltage 11.4V
		Amp-hour capacity 3.752Ah
		Watt-hour capacity¹ 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

Technical Specifications

RH 51Whr Long Life Polymer Fast Charge 3 cell Battery ¹	Weight	0.2025 kg (0.446 lb)
	Cells/Type	3cell Lithium-Ion Polymer cell / 566075
	Energy	Voltage 11.58V
		Amp-hour capacity 4.431Ah
		Watt-hour capacity¹ 51.3Wh
	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

Technical Specifications

AUDIO

HD Stereo Codec	ALC3247-CG
Audio I/O Ports	Headset: CTIA only and Headphone-out
Internal Speaker Amplifier	ALC 3247 has Embedded Class-D 2W Stereo Amplifier
Multi-streaming Capable	Playback multi-streaming can be enabled in the audio control panel to allow independent audio. Following MSFT Behavior
Sampling	Streams to be sent to/from the front and rear jacks or integrated speaker.
Wavetable Syntheses	Independent sampling rates for DAC's and ADC's; supports resolutions from 16 to 24-bit; 44.1 kHz: External MIC/internal MIC 16bit,48000Hz: External SPK/Internal SPK
Analog Audio	Support 3.5mm Headset: CTIA only and Headphone-out
# of Channels on Line-Out	N/A
Internal Speaker	Yes

FINGERPRINT READER

Sensor vendor	ELAN 80ST
Sensor type	Capacitive
DPI resolution	508 DPI
Scan area	80x80 pixels
False Rejection Rate	<3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	2.7~3.6V
Operating Temperature	-20°C - +80°C
Current Consumption	35mA peak
Image	
Low Latency Wait For Finger	900uA
Capture Rate	Capture Rate: 50 frame/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	508 dpi / 4x4mm sensor area

Technical Specifications

ENVIRONMENTAL DATA

Eco-Label Certifications & declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: • IT ECO declaration • US ENERGY STAR® • US Federal Energy Management Program (FEMP) • EPEAT[®] Gold registered in the United States. See http://www.epeat.net for registration status in your country. • TCO 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	• Product Carbon Footprint • Ocean-bound plastic in Speaker • 5% post-consumer recycled plastic • 50% recycled metal • 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	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.		
Energy Consumption (in accordance with US ENERGY STAR® test method)	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Sort idle)	4.44 W	4.58 W	4.39 W
Normal Operation (Long idle)	1.49 W	1.12 W	1.47 W
Sleep	1.49 W	1.12 W	1.47 W
Off	0.31 W	0.35 W	0.30 W
	NOTE: Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.		
Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	15.2 BTU/hr	15.7 BTU/hr	15.0 BTU/hr
Normal Operation (Long idle)	5.1 BTU/hr	3.8 BTU/hr	5.0 BTU/hr

Technical Specifications

Sleep	5.1 BTU/hr	3.8 BTU/hr	5.0 BTU/hr
Off	1.1 BTU/hr	1.2 BTU/hr	1.0 BTU/hr
	* NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.		
Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L_{WAd}, bels)	Sound Pressure (L_{pAm}, decibels)	
Typically Configured – Idle	2.6	14.3	
Fixed Disk – Random writes	2.6	19.1	
Optical Drive – Sequential reads	3.7	28.8	
Longevity and Upgrading	This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the		
	Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.		
Additional Information	• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC. • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. • This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986). • This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see www.epeat.net • Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043. • This product is 93.5% recycle-able when properly disposed of at end of life.		
Packaging Materials	External:	PAPER/Corrugated	245 g
		PAPER/Paperboard	50 g
		PAPER/Molded Pulp	96 g
	Internal:	PLASTIC/Polyethylene low density -LDPE	10 g
	The plastic packaging material contains at least 0.0% recycled content.		
	The corrugated paper packaging materials contains at least 61.0% recycled content.		
RoHS Compliance	HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam. We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products. We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the		

Technical Specifications

	scope of the commitment to include further restricted substances as regulations continue to evolve. To obtain a copy of the HP RoHS Compliance Statement, see HP RoHS position statement.
Material Usage	This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html): • Asbestos • Certain Azo Colorants • Certain Brominated Flame Retardants – may not be used as flame retardants in plastics • Cadmium • Chlorinated Hydrocarbons • Chlorinated Paraffins • Bis(2-Ethylhexyl) phthalate (DEHP) • Benzyl butyl phthalate (BBP) • Dibutyl phthalate (DBP) • Diisobutyl phthalate (DIBP) • Formaldehyde • Halogenated Diphenyl Methanes • Lead carbonates and sulfates • Lead and Lead compounds • Mercuric Oxide Batteries • Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user. • Ozone Depleting Substances • Polybrominated Biphenyls (PBBs) • Polybrominated Biphenyl Ethers (PBBEs) • Polybrominated Biphenyl Oxides (PBBOs) • Polychlorinated Biphenyl (PCB) • Polychlorinated Terphenyls (PCT) • Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications. • Radioactive Substances • Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)
Packaging Usage	HP follows these guidelines to decrease the environmental impact of product packaging: • Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

Technical Specifications

End-of-life Management and Recycling	HP offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.
HP, Inc. Corporate Environmental Information	For more information about HP's commitment to the environment: Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html ISO 14001 certificates: http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842 and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf
footnotes	• Percentage of ocean-bound plastic contained in each component varies by product • Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard. • External power supplies, WWAN modules, power cords, cables and peripherals excluded. • 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers. • Fiber cushions made from 100% recycled wood fiber and organic materials. • Plastic cushions are made from >90% recycled plastic. • Disclaimer: recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams.

COUNTRY OF ORIGIN

China

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

DOCKING (Sold Separately)

Docking station model #1	HP Thunderbolt 120W G4 Dock
Total number of supported displays (incl. the notebook display)	4
Max. resolutions supported	Quad 4K @60Hz Dual 8K single cable@30 for TB hosts or USB-C hosts DP 1.4 with DSC in high res mode
Dock Connectors	2xDP, 1xHDMI, 1xTB, 1xUSB-C Alt Mode
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. Thunderbolt Hosts: Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host. Maximum resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in high resolution mode @30Hz Non-Thunderbolt hosts: The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is (1) 5K dual cable (using both DP ports) +(1) 4K on USB-C DP port Non-Thunderbolt hosts support (3) displays with a maximum resolution of (2) 5K single cable + (1) 4K UHD @ 60 Hz in high resolution mode. In multi-function mode the maximum resolution for (3) displays is (2) 5K single cable @ 30Hz + (1) 4K UHD @ 30Hz.

Docking station model #2	HP Thunderbolt 280W G4 Dock
Total number of supported displays (incl. the notebook display)	4
Max. resolutions supported	Quad 4K @60Hz Dual 8K single cable@30 for TB hosts or USB-C hosts DP 1.4 with DSC in high res mode
Dock Connectors	2xDP, 1xHDMI, 1xTB, 1xUSB-C Alt Mode
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. Thunderbolt Hosts: Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host. Maximum resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in high resolution mode @30Hz Non-Thunderbolt hosts: The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is (1) 5K dual cable (using both DP ports) +(1) 4K on USB-C DP port Non-Thunderbolt hosts support (3) displays with a maximum resolution of (2) 5K single cable + (1) 4K UHD @ 60 Hz in high resolution mode. In multi-function mode the maximum resolution for (3) displays is (2) 5K single cable @ 30Hz + (1) 4K UHD @ 30Hz.

Docking station model #3	HP USB-C Dock G5
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Options and Accessories (Sold separately and availability may vary by country)

Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	Dual 5K@ 30Hz + (1) 4K UHD (multi-function mode)
Dock Connectors	1xHDMI, 2xDP
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. Highest resolution with dual displays is two 8K@ 60Hz host in High Resolution mode. Three maximum displays supported are two 5K@ 30 Hz on DP ports plus one 4K UHD@ 30 Hz on HDMI in Multi-function mode 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.
Docking station model #4	HP USB-C/A Universal Dock G2
Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	Dual 4K @ 60Hz Single 5K @ 60Hz
Dock Connectors	1xHDMI, 2xDP
Technical limitations	Maximum resolution and display support is dependent on the maximum capability of the notebook. The best resolution for dual or triple displays is 4K UHD@ 60Hz. 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.
Docking station model #5	HP USB-C G5 Essential Dock
Total number of supported displays (incl. the notebook display)	3
Max. resolutions supported	For hosts that support DisplayPort 1.4 with Display Stream Compression: 3x FHD @ 60 Hz 3x QHD @ 60 Hz 3x 4K @ 60 Hz For hosts that support DisplayPort 1.3/1.4: 3x FHD @ 60 Hz 3x QHD @ 60 Hz 2x 4K @ 60 Hz
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)

Type	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
Cases	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 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
Docking	HP USB-C 120W G5 Dock	5TW10AA
	HP USB-C/A 120W G2 Universal Dock	5TW13AA
	HP Thunderbolt 120W G4 Dock	4J0A2AA
	HP Thunderbolt 280W G4 Dock	4J0G4AA
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
Keyboard/Combo	HP 125 WD USB Keyboard	266C9AA
	HP 320K WD USB Keyboard	9SR37AA
	HP 355 Compact Multi-Device BT Keyboard	692S9AA
	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 Wired Mouse and Keyboard Combo	286J4AA
	HP 235 Wireless Mouse and Keyboard Combo	1Y4D0AA

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

	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 435 Bluetooth 5.0 + Wireless 2.4GHz Multi-Device Wireless Mouse	3B4Q5AA
	HP 715 Rechargeable Multi-Device Bluetooth 5.0 + Wireless 2.4GHz Bluetooth Mouse	6E6F0AA
	HP 925 Ergonomic Vertical Bluetooth 5.0 + Wireless 2.4GHz Wireless Mouse	6H1A5AA
	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 45W USB-C LC Dali AC Power Adapter	1MZ01AA
	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 65W USB-C LC AC Power Adapter	1P3K6AA
	HP 90W 4.5 mm Smart AC Power Adapter	H6Y90AA
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

Change Log

Date of change:	Version History:		Description of change:
March 9, 2023	V1 to V2	Added	Battery life and Docking station
March 30, 2023	V2 to V3	Updated	At a Glance section
June 5, 2023	V3 to V4	Updated	Storage and Drives section
August 24, 2023	V4 to V5	Updated	Environmental Data
October 3, 2023	V5 to V6	Updated	Frequency bands for Realtek 8852CE in Networking section
	V6 to V7		

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