

Overview

HP EliteBook 745 G5



- 1. Power Connector
- 2. USB Type-C™
- 3. Docking Connector
- 4. Ethernet Port
- 5. HDMI Port (Cable not included)

Left

- 6. USB 3.1 Gen 1 Port
- 7. Audio Combo Jack
- 8. SIM Card Slot
- 9. Pointstick

Overview



Right

- | | |
|-------------------------|--|
| 1. Internal Microphones | 7. Indicator LEDs (Power, Wireless, and Storage usage light) |
| 2. Webcam | 8. Smartcard Reader (Select models) |
| 3. Internal Microphones | 9. USB 3.1 Gen 1 Charging Port |
| 4. Speaker Grill | 10. Vent |
| 5. Click Button | 11. Security Lock Slot (Lock sold separately) |
| 6. Clickpad | 12. Power Button |

Overview

AT A GLANCE

- Eye-catching ultraslim design, premium precision-crafted machined aluminum (CNC), seamless formed aluminum chassis for clean, crisp, premium look and feel
- AMD Ryzen PRO processor
- Designed to support all HP docking options including HP's traditional Ultraslim mechanical dock and the all-new Thunderbolt™ dock
- Featuring HP Collaboration Keyboard with Clickpad to manage most commonly used conferencing functions with a single keystroke
- Innovative world-facing third mic improves inbound ambient noise cancellation while 360 degree mic pick-up allows everyone to clearly hear and be heard
- Optional ultrabright displays with ambient light sensor
- Enterprise grade security with HP SureStart, HP Privacy Camera, HP Sure View, HP Sure Run, HP Sure Recover, SmartCard Reader and Fingerprint reader
- Choice of displays:
 - - 35.6cm (14.0") diagonal FHD IPS anti-glare LED-backlit, 220 cd/m², 67% sRGB
 - - 35.6cm (14.0") diagonal FHD IPS anti-glare LED-backlit, 400 cd/m², 100% sRGB
 - - 35.6cm (14.0") diagonal FHD IPS anti-glare LED-backlit non-touch, 700 cd/m², 100% sRGB with HP Sure View
 - - 35.6cm (14.0") diagonal FHD IPS LED-backlit Corning® Gorilla® Glass 3 touch, 220 cd/m², 67% sRGB
- Flexible wireless connectivity options
- Preinstalled with Windows 10 versions or FreeDOS 2.0
- Choice of solid state drives up to 512 GB and DDR4 memory up to 32 GB
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles¹
- Optional HD camera or Infra Red camera with multi-array microphone
- Battery life up to 11 hours and 45 minutes
- Passed MIL-STD testing²

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

2. MIL STD 810G testing is not intended to demonstrate fitness for Department of Defense contracts requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Damage under the MIL STD test conditions or any accidental damage requires an optional HP Accidental Damage Protection Care Pack.

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

Features

PRODUCT NAME

HP EliteBook 745 G5

OPERATING SYSTEM

| | |
|---------------------|--|
| Preinstalled | Windows 10 Pro 64 ¹ Windows 10 Pro 64 (National Academic only) ^{1,2} Windows 10 Home 64 ¹ Windows 10 Home Single Language 64 ¹ FreeDOS 2.0 |
|---------------------|--|

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

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

PROCESSORS

AMD Ryzen™ 7 PRO 2700U APU with Radeon™ Vega Graphics
(2.2 GHz base frequency, up to 3.8 GHz burst frequency, 6 MB cache, 4 cores)^{3,4,5}
AMD Ryzen™ 5 PRO 2500U APU with Radeon™ Vega Graphics
(2 GHz base frequency, up to 3.6 GHz burst frequency, 6 MB cache, 4 cores)^{3,4,5}
AMD Ryzen™ 3 PRO 2300U APU with Radeon™ Vega Graphics
(2 GHz base frequency, up to 3.4 GHz burst frequency, 6 MB cache, 4 cores)^{3,4,5}

Processor Family
AMD® Ryzen™ APU processor⁵

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

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated
AMD Radeon™ Vega Graphics

Features

DISPLAY

Non-Touch

- 35.6 cm (14") diagonal FHD IPS anti-glare LED-backlit, 220 cd/m², 67% sRGB (1920 x 1080)^{6,7,8}
- 35.6 cm (14") diagonal FHD IPS anti-glare LED-backlit, 220 cd/m², 67% sRGB with HD camera (1920 x 1080)^{6,7,8}
- 35.6 cm (14") diagonal FHD IPS anti-glare LED-backlit, 220 cd/m², 67% sRGB with HD IR webcam (1920 x 1080)^{6,7,8}
- 35.6 cm (14") diagonal FHD IPS anti-glare LED-backlit, 220 cd/m², 67% sRGB for WWAN (1920 x 1080)^{6,7,8}
- 35.6 cm (14") diagonal FHD IPS anti-glare LED-backlit, 220 cd/m², 67% sRGB with HD camera for WWAN (1920 x 1080)^{6,7,8}
- 35.6 cm (14") diagonal FHD IPS anti-glare LED-backlit, 220 cd/m², 67% sRGB with HD IR webcam for WWAN (1920 x 1080)^{6,7,8}
- 35.6 cm (14") diagonal FHD IPS anti-glare LED-backlit, 400 cd/m², 100% sRGB with Ambient Light Sensor and HD IR webcam for WWAN (1920 x 1080)^{6,7,8}
- HP Sure View Integrated Privacy Screen 35.6 cm (14") diagonal FHD IPS anti-glare LED-backlit, 700 cd/m², 100% sRGB with HD IR webcam for WWAN (1920 x 1080)^{6,7,8,9}

Touch

- 35.6 cm (14") diagonal FHD IPS LED-backlit touch screen with Corning® Gorilla® Glass 3, 220 cd/m², 67% sRGB with HD IR webcam (1920 x 1080)^{6,7,8}
- 35.6 cm (14") diagonal FHD IPS LED-backlit touch screen with Corning® Gorilla® Glass 3, 220 cd/m², 67% sRGB with HD IR webcam for WWAN (1920 x 1080)^{6,7,8}

HDMI 2.0

Supports resolution up to 4k @ 60Hz

Displays support

| Docking station model | Total number of supported displays (incl. the notebook display) | Max. resolutions supported | Dock Connectors | Technical limitations |
|------------------------------|---|--|-------------------------------------|---|
| HP UltraSlim Docking Station | 4 | Dual 2.5K @ 60Hz | 2xDP, 1xVGA | Dual 2.5k only with both displays into DP |
| HP Thunderbolt Dock G2 | 4 | Dual 2560 x 1600 @ 60Hz Single 3840 x 2160 @ 60Hz | 2xDP, 1xVGA, 1xTB, 1xUSB-C alt-mode | |
| HP Elite USB-C Dock G4 | 4 | Dual 2K @ 60Hz Single 4K @ 60Hz (3840 x 1440) | 1xHDMI, 2xDP | |
| HP USB-C Universal Dock | 3 | Dual 4K @ 60Hz Single 5K @ 60Hz | 2xDP | |
| HP USB-C Travel Dock | 2 | Single 2K @ 60Hz | 1xHDMI, 1xVGA | Single external display Only HDMI or VGA at the time |
| HP USB-C Mini Dock | 2 | Single 4K @ 30Hz | 1xHDMI, 1xVGA | Single external display Only HDMI or VGA at the time |

- 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 is optional and must be configured at purchase.

Features

Features

STORAGE AND DRIVES

Primary M.2 Storage

128 GB SATA-3 SS TLC¹⁰

256GB PCIe NVMe SS¹⁰

256 GB PCIe Gen3x4 NVMe SS TLC¹⁰

256 GB SATA-3 SS TLC Opal 2¹⁰

360 GB PCIe Gen3x4 NVMe SS TLC (Intel)¹⁰

512 GB PCIe Gen3x4 NVMe SS TLC¹⁰

512 GB PCIe Gen3x4 NVMe SS TLC Opal 2¹⁰

512 GB SATA-3 SS TLC FIPS-140-2¹⁰

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

MEMORY

Maximum Memory

32 GB DDR4-2400 SDRAM¹¹

Memory

32 GB DDR4-2400 SDRAM (2 X 16 GB)¹¹

16 GB DDR4-2400 SDRAM (1 X 16 GB)¹¹

16 GB DDR4-2400 SDRAM (2 X 8 GB)¹¹

8 GB DDR4-2400 SDRAM (1 x 8 GB)¹¹

8 GB DDR4-2400 SDRAM (2 x 4 GB)¹¹

4 GB DDR4-2400 SDRAM (1 x 4 GB)¹¹

Memory Slots

2 SODIMM

Both slots are upgradeable

System runs at 2400

Supports Dual Channel Memory.

11. 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.

Features

NETWORKING/COMMUNICATIONS

WLAN

Intel® Dual Band Wireless-AC 8265 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo, non-vPro™¹²
Realtek RTL8822BE 802.11ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo, non-vPro™¹²

WWAN

HP lt4132 LTE/HSPA+ 4G Mobile Broadband¹³
Intel® XMM™ 7360 LTE-Advanced¹³

NFC

NXP NPC300 Near Field Communication Module

Miracast

Support for Miracast¹⁴

Ethernet

Realtek PCIe GbE Family Controller 10/100/1000¹⁵

12. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.
13. WWAN module is optional 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.
14. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming
15. The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

AUDIO/MULTIMEDIA

Audio

Audio by Bang & Olufsen
Integrated 3 Multi Array Microphone
2 Integrated Stereo Speakers (74dB)

Camera

HD camera^{16,17}
HD IR webcam^{16,17}

16. HD content required to view HD images.
17. Sold separately or as an optional feature.

Features

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Premium Collaboration Keyboard, spell resistant with drain
Backlit keyboard available as an option

Pointing Device

Clickpad with multi-touch gestures enabled, taps enabled as default
Microsoft Precision Touchpad Default Gestures Support

Function Keys

F1 - Display Switching
F2 - Blank or Privacy
F3 - Brightness Down
F4 - Brightness Up
F5 - Audio Mute
F6 - Volume Down
F7 - Volume Up
F8 - Mic Mute
F9 - Blank or Backlit Toggle
F10 - numlk
F11 - Wireless
F12 - Calendar
Share/Present
Call Answer
Call End

Hidden Functions

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

Features

SOFTWARE AND SECURITY

Preinstalled Software

BIOS

- HP BIOSphere Gen4¹⁷
- HP DriveLock & Automatic DriveLock
- BIOS Update via Network
- Master Boot Record Security
- Power On Authentication
- Secure Erase¹⁸
- Absolute Persistence Module¹⁹
- Pre-boot Authentication
- HP Wireless Wakeup

Software

- HP Native Miracast Support¹⁶
- HP LAN-Wireless Protection
- HP Velocity
- HP ePrint + JetAdvantage²⁰
- HP Hotkey Support - CMIT
- HP Recovery Manager
- HP Jumpstart
- HP Support Assistant²¹
- HP Noise Cancellation Software
- HP PhoneWise²⁸
- Buy Office

Manageability Features

- HP Driver Packs²²
- HP System Software Manager (SSM)
- HP BIOS Config Utility (BCU)
- HP Client Catalog
- HP Manageability Integration Kit Gen2²³
- Ivanti Management Suite²⁴
- HP Collaboration Keyboard

Client Security Software

- HP Client Security Suite Gen4 including:²⁵
- HP Security Manager²⁶ (including Credential Manager, HP Password Manager, HP Spare Key)
- Power On Authentication
- HP Fingerprint Sensor³⁰
- HP Device Access Manager
- HP Power On Authentication
- Microsoft Defender²⁷

Features

Security Management

HP BIOSphere Gen4¹⁷

HP DriveLock & Automatic DriveLock

BIOS Update via Network

Secure Erase¹⁸

Pre-boot Authentication

TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)

SATA 0,1 port disablement (viaBIOS)

RAID configurations³¹

Serial, USB enable/disable (viaBIOS)

Power-on password (viaBIOS)

Setup password (viaBIOS)

Support for chassis padlocks and cable lock devices

Integrated hood sensor

HP Sure Click³²

HP Sure Start Gen4²⁹

Security

TPM

Model: SLB9670

Version: 7.85

Revision: TPM 2.0

FIPS 140-2 Compliant: Yes

Smartcard Reader

Model number: Alcor AU9560

FIPS 201 Compliant: Yes

IPv6 Certification:

Yes / No

MD5 Hash: Please follow the instructions below to access MD5 Hash.

Log-on to <http://hp.com/support>, enter your product name, select software and drivers, select OS, select driver. After selecting the driver, click on "Associated files" and then click on "Download". When opening the file, under "Purpose" you should see the appropriate "SOFTPAQ MD5:" Field

Graphics (Intel Video Driver): TBD

WWAN: TBD

WLAN: TBD

Is the BIOS on this notebook ISO/IEC 19678:2015 (formerly NIST 800-147) compliant?:

Yes / No

UEFI version:

Features

16. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming
 17. HP BIOSphere Gen4 features may vary depending on the PC platform and configurations. Requires Intel® or AMD 8th generation processors.
 18. Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88. Supported on Elite platforms with BIOS version F.03 or higher.
 19. Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: <http://www.absolute.com/company/legal/agreements/computrace-agreement>. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.
 20. HP ePrint Drive requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see <http://www.hp.com/go/eprintcenter>). Print times and connection speeds may vary.
 21. HP Support Assistant requires Windows and Internet access.
 22. HP Driver Packs not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.
 23. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>
 24. Ivanti Management Suite subscription required.
 25. HP Client Security Suite Gen 4 requires Windows and Intel® or AMD 8th generation processors.
 26. HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. User may need to enable or allow the add-on / extension in the internet browser.
 27. Microsoft Defender Opt in and internet connection required for updates.
 28. HP PhoneWise Client is only available on select platforms. For supported platforms and HP PhoneWise system requirements see <http://www.hp.com/go/HPPhoneWise>.
 29. HP Sure Start Gen4 is available on HP Elite products equipped with 8th generation Intel® or AMD processors.
 30. HP Fingerprint Sensor sold separately or as an optional feature.
 31. RAID configuration is optional and does require a second hard drive.
 32. HP Sure Click is available on most HP PCs and supports Microsoft® Internet Explorer and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode, when Microsoft Office or Adobe Acrobat are installed.
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Features

POWER

Power Supply

HP Smart 45 W External AC power adapter³³
HP Smart 45 W External AC power adapter, 2-prong (Japan only)³³
HP Smart 65 W External AC power adapter³³
HP Smart 65 W EM External AC power adapter³³
45 W USB Type-C™ adapter³³
65 W USB Type-C™ adapter³³

Primary Battery

HP Long Life 3-cell, 50 Wh Li-ion^{34,35}

Power Cord

2-wire plug - 1.0m (Japan only)³³
3-wire plug - 1.0m³³
3-wire plug - 1.8m³³
Duckhead power cord - 1.0m³³
Duckhead power cord - 1.8m³³

Battery Life

Up to 11 hours and 45 minutes³⁶

33. Availability may vary by country.

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

35. Supports HP Fast Charging with 65W AC adapter.

36. Windows 10 MM14 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

Weight

Starting at 3.27 lb (non-touch); Starting at 3.56 lb (touch)³⁷
Starting at 1.48 kg (non-touch); Starting at 1.61 kg (touch)³⁷

Dimensions (w x d x h)

12.84 x 9.22 x 0.71 in
32.6 x 23.4 x 1.79 cm

37. Weight will vary by configuration.

Features

PORTS/SLOTS

Ports

- 1 USB Type-C™ (Alt Mode)
- 2 USB 3.1 Gen 1 (1 charging)
- 1 HDMI 2.0³⁸
- 1 RJ-45 / Ethernet
- 1 docking connector
- 1 headphone/microphone combo
- 1 AC power
- 1 SIM card slot³⁹
- 1 Smartcard reader³⁹

38. HDMI cable sold separately.

39. Sold separately or as an optional feature.

ENVIRONMENTAL & INDUSTRY

| | | | | |
|---------------------------|--|---|---------------------|---------------------|
| 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: <ul style="list-style-type: none"> • IT ECO declaration • US ENERGY STAR® • EPEAT[□] Gold registered in the United States. See http://www.epeat.net for registration status in your country. Search keyword <i>generator</i> on HP's 3rd party option store for solar energy accessory at http://www.hp.com/go/options | | |
| | 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, 60Hz |
| | Normal Operation (Short idle) | 7.98 W | 7.7 W | 7.04 W |
| | Normal Operation (Long idle) | 5.24 W | 5.1 W | 5.16 W |
| | Sleep | 0.82 W | 0.84 W | 0.82 W |
| | Off | 0.43 W | 0.44 W | 0.42 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 | | |

Features

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|--|---|--|---------------------|
| | 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, 60Hz |
| Normal Operation (Short idle) | 27 BTU/hr | 26 BTU/hr | 24 BTU/hr |
| Normal Operation (Long idle) | 18 BTU/hr | 17 BTU/hr | 18 BTU/hr |
| Sleep | 2 BTU/hr | 3 BTU/hr | 3 BTU/hr |
| Off | 2 BTU/hr | 2 BTU/hr | 2 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 | 2.5 | 15 | |
| Fixed Disk – Random writes | 2.5 | 15 | |
| Longevity and Upgrading | This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include: Spare parts are available throughout the warranty period and or for up to “5” years after the end of production. | | |
| Batteries | This battery(s) in this product comply with EU Directive 2006/66/EC Batteries used in the product do not contain: Mercury greater the 1ppm by weight Cadmium greater than 20ppm by weight Battery size: CR2032 (coin cell) Battery type: Lithium | | |

Features

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|--|-------------------------------|---|---|-------|
| | Additional Information | <ul style="list-style-type: none"> This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC. This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986). This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see www.epeat.net Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043. This product contains 0% post-consumer recycled plastic (by wt.) This product is 94.4% recycle-able when properly disposed of at end of life. | | |
| | Packaging Materials | External: | PAPER/Corrugated | 357 g |
| | | Internal: | PLASTIC/Polyethylene Expanded - EPE | 66 g |
| | | | PLASTIC/Polyethylene low density – LDPE | 15 g |
| | | | PLASTIC/Polypropylene - PP | 4 g |
| | | The plastic packaging material contains at least 50% recycled content. | | |
| | | The corrugated paper packaging materials contains at least 75% recycled content. | | |
| | 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/pdf/gse.pdf): <ul style="list-style-type: none"> Asbestos Certain Azo Colorants Certain Brominated Flame Retardants – may not be used as flame retardants in plastics Cadmium Chlorinated Hydrocarbons Chlorinated Paraffins 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, has been voluntarily removed from most applications. Radioactive Substances Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO) | | |

Features

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| | <p>Packaging Usage</p> | <p>HP follows these guidelines to decrease the environmental impact of product packaging:</p> <ul style="list-style-type: none"> • Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards. |
| | <p>End-of-life Management and Recycling</p> | <p>Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.</p> |
| | <p>HP, Inc. Corporate Environmental Information</p> | <p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html</p> <p>Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</p> <p>ISO 14001 certificates: http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842 http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</p> |

Features

SERVICE AND SUPPORT

HP Services offers 3-year and 1-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year limited warranty as the platform. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>⁴⁰

40. HP Care Packs are sold separately. Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit 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 | Win 10 |
| | Integrated Graphics | 15W |
| | Max Operating Power | UMA < 45W |
| Temperature | Operating | 32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical) |
| | 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 | Half sine wave shock: 40G, 2ms duration |
| | Non-operating | Half sine wave shock: 240G, 2ms duration |
| Random Vibration | Operating | Nominal 1.043 grms |
| | Non-operating | Nominal 3.5 grms |
| Altitude (unpressurized) | Operating | -50 to 10,000 ft (-15.24 to 3,048 m) |
| | Non-operating | -50 to 40,000 ft (-15.24 to 12,192 m) |
| Planned Industry Standard Certifications | UL | Yes |
| | CSA | Yes |
| | FCC Compliance | Yes |
| | ENERGY STAR® | Yes |
| | EPEAT® | Yes |
| | Australia / NZ A-Tick Compliance | Yes |
| | CCC | Yes |
| | Japan VCCI Compliance | Yes |
| | KC | Yes |
| | BSMI | Yes |
| | CE Marking Compliance | Yes |
| | GOST | Yes |
| | Saudi Arabian Compliance (ICCP) | TRSE owned |
| | UKRSERTCOMPUTER | |

Technical Specifications

DISPLAYS*

Panel LCD 14 inch FHD (1920x1080) Anti-Glare WLED UWVA 72% cg 700nits eDP 1.3+PSR ultraslim Privacy

| | |
|-----------------------------------|--|
| Outline Dimensions (W x H) | 315.41x 196.14 max. |
| Active Area | 309.312 x 173.988 |
| Weight | <225g max. |
| Diagonal Size | 14.0" |
| Thickness | 3.0mm max. |
| Interface | eDP 1.4 |
| Surface Treatment | AG |
| Touch Enabled | No |
| Contrast Ratio | Privacy mode 150:1 (typ.) – Privacy, 110:1 (min.)- Privacy |
| Refresh Rate | 120Hz |
| Brightness | Privacy mode 350nits |
| Pixel Resolution | 1920 x 1080 (FHD) |
| Format | RGB |
| Backlight | LED |
| Color Gamut Coverage | 72% |
| Color Depth | 6 bits + Hi FRC |
| Viewing Angle | Privacy mode CR>2: UWVA 50/50/85/85 |

Panel LCD 14 inch FHD (1920x1080) Anti-Glare WLED UWVA 72% cg 400nits eDP 1.3 + PSR slim NB

| | |
|-----------------------------------|-------------------------------|
| Outline Dimensions (W x H) | 316.11 x 197.98 max. |
| Active Area | 309.31 x 173.99 |
| Weight | <285g max. |
| Diagonal Size | 14.0" |
| Thickness | 3.0mm max. |
| Interface | eDP 1.3 + PSR (2 lane) |
| Surface Treatment | AG |
| Touch Enabled | No |
| Contrast Ratio | 600:1 (typical) |
| Refresh Rate | 60Hz |
| Brightness | 400 nits typical (Panel Only) |
| Pixel Resolution | 1920 x 1080 (FHD) |
| Format | RGB |
| Backlight | LED |
| Color Gamut Coverage | 72% |
| Color Depth | 6 bits + Hi FRC |
| Viewing Angle | UWVA 85/85/85/85 |

Technical Specifications

Panel LCD 14 inch FHD (1920x1080) Anti-Glare WLED UWVA 45% cg 220nits eDP slim NB

| | |
|-----------------------------------|-------------------------------|
| Outline Dimensions (W x H) | 316.112 x 197.98 max. |
| Active Area | 309.312 x 173.988 |
| Weight | <280g max. |
| Diagonal Size | 14.0" |
| Thickness | 3.0mm max. |
| Interface | eDP 1.2 |
| Surface Treatment | AG |
| Touch Enabled | No |
| Contrast Ratio | 600:1 (typical) |
| Refresh Rate | 60Hz |
| Brightness | 220 nits typical (Panel Only) |
| Pixel Resolution | 1920 x 1080 (FHD) |
| Format | RGB |
| Backlight | LED |
| Color Gamut Coverage | 45% |
| Color Depth | 6 bits + Hi FRC |
| Viewing Angle | UWVA 85/85/85/85 |

Panel LCD 14 inch FHD (1920x1080) WLED UWVA 45% cg 220nits eDP slim NB Touch

| | |
|-----------------------------------|-------------------------------|
| Outline Dimensions (W x H) | 316.112 x 197.98 max. |
| Active Area | 309.312 x 173.988 |
| Weight | <413g max. |
| Diagonal Size | 14.0" |
| Thickness | 3.2mm max. |
| Interface | eDP 1.2 |
| Surface Treatment | BV |
| Touch Enabled | Yes |
| Contrast Ratio | 600:1 (typical) |
| Refresh Rate | 60Hz |
| Brightness | 220 nits typical (Panel Only) |
| Pixel Resolution | 1920 x 1080 (FHD) |
| Format | RGB |
| Backlight | LED |
| Color Gamut Coverage | 45% |
| Color Depth | 6 bits + Hi FRC |
| Viewing Angle | UWVA 85/85/85/85 |

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

Technical Specifications

STORAGE¹

| | | |
|--------------------------------------|---------------------------------|--|
| SSD 128 GB 2280 M2 SATA-3 TLC | Drive Weight | 0.02 lb (10 g) |
| | Capacity | 128 GB |
| | Height | 0.09 in (2.3 mm) |
| | Width | 0.87 in (22 mm) |
| | Interface | ATA-8, SATA 3.0 |
| | Maximum Sequential Read | Up To 520 MB/s |
| | Maximum Sequential Write | Up To 450 MB/s |
| | Logical Blocks | 250,069,680 |
| | Operating Temperature | 32° to 158°F (0° to 70°C) [ambient temp] |
| | Features | DIPM; TRIM; DEVSLP |

| | | |
|--|---------------------------------|--|
| SSD 256 GB 2280 M2 PCIe-3x4 SS NVMe TLC | Drive Weight | 0.02 lb (10 g) |
| | Capacity | 256 GB |
| | Height | 0.09 in (2.3 mm) |
| | Width | 0.87 in (22 mm) |
| | Interface | PCIe NVMe Gen3X4 |
| | Maximum Sequential Read | Up To 2600 MB/s |
| | Maximum Sequential Write | Up To 900 MB/s |
| | Logical Blocks | 500,118,192 |
| | Operating Temperature | 32° to 158°F (0° to 70°C) [ambient temp] |
| | Features | TRIM; L1.2 |

| | | |
|---|---------------------------------|--|
| SSD 256 GB 2280 M2 SATA-3 Self Encrypted OPAL2 TLC | Drive Weight | 0.02 lb (10 g) |
| | Capacity | 256 GB |
| | Height | 0.09 in (2.3 mm) |
| | Width | 0.87 in (22 mm) |
| | Interface | ATA-8, SATA 3.0 |
| | Maximum Sequential Read | Up To 530 MB/s |
| | Maximum Sequential Write | Up To 515 MB/s |
| | Logical Blocks | 500,118,192 |
| | Operating Temperature | 32° to 158°F (0° to 70°C) [ambient temp] |
| | Features | DIPM; TRIM; DEVSLP |

Technical Specifications

| | | |
|--|---------------------------------|--|
| 256 GB 2280 PCIe NVMe Value Solid State Drive | Drive Weight | 0.02 lb (10 g) |
| | Capacity | 256 GB |
| | Height | 0.09 in (2.3 mm) |
| | Width | 0.87 in (22 mm) |
| | Interface | PCIe NVMe Gen3X4 |
| | Maximum Sequential Read | Up To 1700 MB/s |
| | Maximum Sequential Write | Up To 600 MB/s |
| | Logical Blocks | 500,118,192 |
| | Operating Temperature | 32° to 158°F (0° to 70°C) [ambient temp] |
| | Features | TRIM; L1.2 |

| | | |
|--|---------------------------------|--|
| SSD 360 GB 2280 PCIe-3x4 NVMe TLC | Drive Weight | 0.02 lb (10 g) |
| | Capacity | 360 GB |
| | Height | 0.09 in (2.3 mm) |
| | Width | 0.87 in (22 mm) |
| | Interface | PCIe NVMe Gen3X4 |
| | Maximum Sequential Read | Up To 1700 MB/s |
| | Maximum Sequential Write | Up To 600 MB/s |
| | Logical Blocks | 703,282,608 |
| | Operating Temperature | 32° to 158°F (0° to 70°C) [ambient temp] |
| | Features | TRIM; L1.2 |

| | | |
|--|---------------------------------|--|
| SSD 512 GB 2280 M2 PCIe-3x4 SS NVMe TLC | Drive Weight | 0.02 lb (10 g) |
| | Capacity | 512 GB |
| | Height | 0.09 in (2.3 mm) |
| | Width | 0.87 in (22 mm) |
| | Interface | PCIe NVMe Gen3X4 |
| | Maximum Sequential Read | Up To 2600 MB/s |
| | Maximum Sequential Write | Up To 1400 MB/s |
| | Logical Blocks | 1,000,215,216 |
| | Operating Temperature | 32° to 158°F (0° to 70°C) [ambient temp] |
| | Features | TRIM; L1.2 |

Technical Specifications

| | | |
|---|---------------------------------|--|
| SSD 512 GB 2280 M2 SATA-3 TLC FIPS | Drive Weight | 0.02 lb (10 g) |
| | Capacity | 512 GB |
| | Height | 0.09 in (2.3 mm) |
| | Width | 0.87 in (22 mm) |
| | Interface | ACS-3, SATA 3.2 |
| | Maximum Sequential Read | Up To 530 MB/s |
| | Maximum Sequential Write | Up To 400 MB/s |
| | Logical Blocks | 1,000,215,216 |
| | Operating Temperature | 32° to 158°F (0° to 70°C) [ambient temp] |
| | Features | DIPM; TRIM; DEVSLP |

| | | |
|---|---------------------------------|--|
| SSD 512 GB 2280 PCIe-3x4 NVMe Self Encrypted OPAL2 TLC | Drive Weight | 0.02 lb (10 g) |
| | Capacity | 512 GB |
| | Height | 0.09 in (2.3 mm) |
| | Width | 0.87 in (22 mm) |
| | Interface | PCIe NVMe Gen3X4 |
| | Maximum Sequential Read | Up To 2900 MB/s |
| | Maximum Sequential Write | Up To 1400 MB/s |
| | Logical Blocks | 1,000,215,215 |
| | Operating Temperature | 32° to 158°F (0° to 70°C) [ambient temp] |
| | Features | TRIM; L1.2 |

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

Technical Specifications

NETWORKING/COMMUNICATIONS

| | | |
|---|--|---|
| Realtek 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo¹ | Wireless LAN Standards | IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac |
| | Interoperability | Wi-Fi certified |
| | Frequency Band | 802.11b/g/n <ul style="list-style-type: none"> • 2.402 – 2.482 GHz 802.11a/n <ul style="list-style-type: none"> • 4.9 – 4.95 GHz (Japan) • 5.15 – 5.25 GHz • 5.25 – 5.35 GHz • 5.47 – 5.725 GHz • 5.825 – 5.850 GHz |
| | Data Rates | <ul style="list-style-type: none"> • 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz) |
| | Modulation | Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM |
| | Security³ | <ul style="list-style-type: none"> • IEEE and Wi-Fi® 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 • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI |
| | Network Architecture Models | Ad-hoc (Peer to Peer) Infrastructure (Access Point Required) |
| | Roaming | IEEE 802.11 compliant roaming between access points |
| | Output Power² | <ul style="list-style-type: none"> • 802.11b : +14dBm minimum • 802.11g : +12dBm minimum • 802.11a : +12dBm minimum • 802.11n HT20(2.4GHz) : +12dBm minimum • 802.11n HT40(2.4GHz) : +12dBm minimum • 802.11n HT20(5GHz) : +10dBm minimum • 802.11n HT40(5GHz) : +10dBm minimum • 802.11ac VHT80(5GHz) : +10dBm minimum |
| | Power Consumption | <ul style="list-style-type: none"> • Transmit mode 2.0 W • Receive mode 1.6 W |

Technical Specifications

| | |
|---|--|
| | <ul style="list-style-type: none"> • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW |
| Power Management | ACPI 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 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum |
| Antenna type | High efficiency antenna with spatial diversity, mounted in the display enclosure |
| | Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications |
| Form Factor | PCI-Express Half-MiniCard |
| Dimensions | Type 2230 : 2.3 x 22.0 x 30.0 mm |
| Weight | Type 2230 : 2.8g |
| Operating Voltage | 3.3v +/- 9% |
| Temperature | Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 176° F (-40° to 80° C) |
| Humidity | Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing) |
| Altitude | Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m) |
| LED Activity | LED Amber – Radio OFF; LED White – Radio ON |

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

| | |
|-------------------------------------|--|
| Bluetooth Specification | 4.0/4.1/4.2 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) |

Technical Specifications

| | |
|--|--|
| 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 |
| Electrical Interface | USB 2.0 compliant |
| Bluetooth Software Supported | Microsoft Windows Bluetooth Software |
| Power Management | Microsoft Windows ACPI, and USB Bus Support |
| Certifications | FCC (47 CFR) Part 15C, Section 15.247 & 15.249 |
| Power Management Certifications | ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark |
| Bluetooth Profiles Supported | BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP) |

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Technical Specifications

| | | |
|---|---|---|
| <p>Intel Windstorm Peak 2 8265 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo¹ Non-vPro</p> | <p>Wireless LAN Standards</p> | <p>IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac</p> |
| | <p>Frequency Band</p> | <p>802.11b/g/n • 2.402 – 2.482 GHz 802.11a/n • 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</p> |
| | <p>Data Rates</p> | <ul style="list-style-type: none"> • 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz) |
| | <p>Modulation</p> | <p>Direct Sequence Spread SpectrumBPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</p> |
| | <p>Security³</p> | <ul style="list-style-type: none"> • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI |
| | <p>Network Architecture Models</p> | <p>Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)</p> |
| | <p>Roaming</p> | <p>IEEE 802.11 compliant roaming between access points</p> |
| | <p>Output Power²</p> | <ul style="list-style-type: none"> • 802.11b : +14dBm minimum • 802.11g : +12dBm minimum • 802.11a : +12dBm minimum • 802.11n HT20(2.4GHz) : +12dBm minimum • 802.11n HT40(2.4GHz) : +12dBm minimum • 802.11n HT20(5GHz) : +10dBm minimum • 802.11n HT40(5GHz) : +10dBm minimum • 802.11ac VHT80(5GHz) : +10dBm minimum |
| | <p>Power Consumption</p> | <ul style="list-style-type: none"> • Transmit mode 2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW |

Technical Specifications

| | | |
|---|--|--------------------------------|
| Power Management | ACPI and PCI Express compliant power management 802.11 compliant power saving mode | |
| Receiver Sensitivity³ | 802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum | |
| Antenna type | High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications | |
| Form Factor | PCI-Express M.2 MiniCard | |
| Dimensions | Type 2230 : 2.3 x 22.0 x 30.0 mm | |
| Weight | Type 2230 : 2.8g | |
| Operating Voltage | 3.3v +/- 9% | |
| Temperature | Operating | 14° to 158° F (-10° to 70° C) |
| | Non-operating | -40° to 176° F (-40° to 80° C) |
| Humidity | Operating | 10% to 90% (non-condensing) |
| | Non-operating | 5% to 95% (non-condensing) |
| Altitude | Operating | 0 to 10,000 ft (3,048 m) |
| | Non-operating | 0 to 50,000 ft (15,240 m) |
| LED Activity | LED Amber – Radio OFF; LED White – Radio ON | |

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

| | |
|-------------------------------------|--|
| Bluetooth Specification | 4.0/4.1/4.2 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. |

Technical Specifications

| | |
|--|--|
| Power Consumption | Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW |
| Electrical Interface | USB 2.0 compliant |
| Bluetooth Software Supported | Microsoft Windows Bluetooth Software |
| Power Management | Microsoft Windows ACPI, and USB Bus Support |
| Certifications | FCC (47 CFR) Part 15C, Section 15.247 & 15.249 |
| Power Management Certifications | ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark |
| Bluetooth Profiles Supported | BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP) |

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Technical Specifications

| | | |
|--|--|---|
| HP It4132 LTE/HSPA+ 4G Mobile Broadband⁵ | Technology/Operating bands | LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3) MHz, 850 (Band 5), 2600 (Band 7), 900 (Band 8) MHz, 800 (Band 20), 700 (Band 28) MHz. HSPA+: 2100 (Band 1), 1900 (Band 2), 850 (Band 5), 900 (Band 8) MHz E-GPRS: 1900 (Band 2), 1800 (Band 3), 850 (Band 5), 900 (Band 8) MHz |
| | Wireless protocol standards | 3GPP Release 10 LTE Specification CAT.4, 20MHz BW WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification E-GPRS: Class B, Multi-slot class 12, coding schemes CS1 - CS4 and MSC1 - MSC9 |
| | GPS | Standalone, A-GPS (MS-B and LTO) |
| | GPS bands | 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz |
| | Maximum data rates | LTE: 150 Mbps (Download), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload) EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload) |
| | Maximum output power | LTE: 23 dBm HSPA+: 23.5 dBm E-GPRS 1900/1800: 26 dBm E-GPRS 900/850: 27 dBm GPRS 1900/1800: 29.5 dBm GPRS 900/850: 32.5 dBm |
| | Maximum power consumption | LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average) E-GPRS: 2,600 mA (peak); 500 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 |

5. 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

| | | |
|--|--|--|
| Intel® XMM™ 7360 LTE-Advanced⁶ | 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), 1400 (Band 11), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 17 lower), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1400 (Band 21), 850 (Band 26), 700 (Band 28), 700 (Band 29 RX only), 2300 (Band 30), 2100 (Band 66). TDD LTE: 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41). HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz |
| | Wireless protocol standards | 3GPP Release 11 LTE Specification CAT.9, DL 60MHz BW throughput up to 450Mbps; UL 20MHz throughput up to 50Mbps WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification |
| | GPS | Standalone, A-GPS (MS-A, MS-B and XTRA) |
| | GPS bands | 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz |
| | Maximum data rates | LTE: 450 Mbps (Download), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload) |
| | Maximum output power | LTE: 23 dBm 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 | 5.8 g |
| | Dimensions (Length x Width x Thickness) | 42 x 30 x 2.3 mm |

6. 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

POWER

| | | |
|---|--|--|
| AC Adapter 65 Watt nPFC USB type C | Dimensions | 74x74x28.5mm |
| | Weight | unit: 245g +/- 10g |
| Output | Input | Input Efficiency |
| | | 81.5% min at 115 Vac/ 230Vac @ 5V/3A |
| | | 86.7% min at 115 Vac/ 230Vac @ 9V/3A |
| | | 88% min at 115 Vac/ 230Vac @ 10V/5A |
| | | 88% min at 115 Vac/ 230Vac @ 12V/5A |
| | | 89% min at 115 Vac/ 230Vac @ 15V/4.33A |
| | | 89% min at 115 Vac/ 230Vac @ 20V/3.25A |
| | | Input frequency range |
| | | 47 ~ 63 Hz |
| | | Input AC current |
| | 1.7 A at 90 VAC and maximum load | |
| Connector | Output power | 65W |
| | DC output | 5V/9V/10V/12V/15V/20V |
| | Hold-up time | 5ms at 115 Vac input |
| | Output current limit | <8.0A |
| Environmental Design | Duck head / duck head power cord, without Smart ID DC connector | |
| | 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% |
| EMI and Safety Certifications | Storage Humidity | 5% to 95% |
| | CE Mark - full compliance with LVD and EMC directives | |
| | Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. | |
| | | MTBF - over 100,000 hours at 25°C ambient condition. |

Technical Specifications

| | | | |
|--|---|---|--|
| AC Adapter 45 Watt nPFC USB type C™ | Dimensions | 62.0x62.0x28.5mm | |
| | Weight | unit: 220g +/- 10g | |
| Output | Input | Input Efficiency Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec:5V : 81.5%9V : 86.7%10V : 87.5%12V : 87.8%15V : 87.8%20V : 87.8% | |
| | Connector | Input frequency range | 47 ~ 63Hz |
| | | Input AC current | Max. 1.4 A at 90 Vac |
| | Environmental Design | Output power | 5V/15W 9V/27W 10V/37.5W 12V/45W 15V/45W 20V/45W |
| | | DC output | 5V / 9V / 10V /12V / 15V / 20V |
| | | Hold-up time | 5ms at 115 Vac input |
| | | Output current limit | <5.0A |
| | | USB Type-C™ | |
| | Safety Certifications | 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% | |
| | CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition. | | |

Technical Specifications

| | | | | |
|--------------------------------|--|---|--|--|
| HP 45W Smart AC adapter | Dimensions | 3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm) | | |
| | Weight | 0.386 lb (175g) max | | |
| | Input | Input Efficiency | 87.74% at 115Vac and 88.4% at 230Vac | |
| | | Input frequency range | 47 ~ 63Hz | |
| | | Input AC current | 1.4 A at 90 Vac | |
| | Output | Output power | 45W | |
| | | DC output | 19.5V | |
| | | Hold-up time | 5 msec at 115 VAC input | |
| | | Output current limit | <8.0A | |
| | Connector | 4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords | | |
| | Environmental Design | Operating temperature | 32° to 95° F (0° to 35° C) | |
| | | Non-operating (storage) temperature | -4° to 185° F (-20° to 85° C) | |
| | | Altitude | 0 to 16,400 ft (0 to 5000m) | |
| | | Humidity | 20% to 95% | |
| Safety Certifications | Storage Humidity | 10% to 95% | | |
| | CE Mark - full compliance with LVD and EMC directives | | | |
| | Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition. | | | |
| HP 65W Smart AC adapter | Dimensions | 107.0x47.0x30.0mm | | |
| | Weight | unit: 250g +/- 10g | | |
| | Input | Input Efficiency | 88.0 % at 115 Vac and 89.0 % at 230Vac | |
| | | Input frequency range | 47 ~ 63 Hz | |
| | | Input AC current | Max. 1.7 A at 90 Vac | |
| | Output | Output power | 65W | |
| | | DC output | 19.5V | |
| | | Hold-up time | 5ms at 115 Vac input | |
| | | Output current limit | <11.0A | |
| | Connector | 4.5mm Barrel Type | | |
| | 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% | |
| Safety Certifications | Storage Humidity | 10% to 95% | | |
| | CE Mark - full compliance with LVD and EMC directives | | | |
| | Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition. | | | |

Technical Specifications

| | | | |
|---|---|---|---|
| HP 65W EM Smart AC adapter | Dimensions | 102x55x30mm | |
| | Weight | 270g +/- 10g | |
| | Input | Input Efficiency | 87% min at 115V/230V |
| | | Input frequency range | 47 to 63 Hz |
| | Output | Input AC current | 1.7 A at 90 VAC and maximum load |
| | | DC output | 65W(19.5V/3.33A) |
| | | Hold-up time | 5 msec at 115 VAC input |
| | | Output current limit | <11A, Over voltage protection- 29V max automatic shutdown |
| | Connector | 4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords | |
| | Environmental Design | Operating temperature | 0° to 35° C |
| | | Non-operating (storage) temperature | -20° to 85° C |
| | | Altitude | 0 to 5,000 m |
| | | Humidity | 0% to 95% |
| Storage Humidity | | 0% to 95% | |
| Safety Certifications | CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition. | | |
| Battery TT 3 Cell WHr 56 Long Life -PL | Dimensions (H x W x L) | L 281.7mm x W 79.65mm x H 7.15mm | |
| | Weight | 193 +/- 10g | |
| | Cells/Type | 3cell Lithium-Ion Polymer cell / P604883A1 | |
| | Energy | Voltage | 11.55V/ |
| | | Amp-hour capacity | 4.113Ah/ 4.330Ah |
| | | Watt-hour capacity | 50 Wh |
| | Temperature | Operating (Charging) | 0° to 50° C |
| | | Operating (Discharging) | -10° to 60° C |
| | Fuel Gauge LED | N/A | |
| | Warranty | 3 years | |
| Optional Travel Battery Available | No | | |

COUNTRY OF ORIGIN

China

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

| Type | Description | Part # |
|---------------------|--------------------------------------|---------|
| Cases | HP Slim Top Load | F3W16AA |
| | HP Slim Backpack | F3W15AA |
| | HP 15.6 Business Top Load | 2SC66AA |
| Docking | HP UltraSlim Docking Station | D9Y32AA |
| | HP USB-C Universal Dock | 1MK33AA |
| | HP USB-C Dock G4 | 3FF69AA |
| | HP Thunderbolt Dock G2 | 2UK37AA |
| | HP USB-C Mini Dock | 1PM64AA |
| Input/Output | HP Slim Wireless Keyboard and Mouse | T6L04AA |
| | HP Slim USB Keyboard and Mouse | T6T83AA |
| | HP Wireless (Link-5) Keyboard | T6U20AA |
| | HP Comfort Grip Wireless Mouse | H2L63AA |
| | HP Ultra Mobile Wireless Mouse | H6F25AA |
| | HP Wireless Premium Mouse | 1JR31AA |
| | HP USB Premium Mouse | 1JR32AA |
| | HP Elite Presenter Mouse | 2CE30AA |
| | HP USB Travel Mouse | G1K28AA |
| | HP Stereo 3.5mm Headset | T1A66AA |
| | HP Stereo USB Headset | T1A67AA |
| | HP USB-C to USB-A Hub | Z6A00AA |
| | HP USB-C to DP | N9K78AA |
| | HP USB-C to VGA | N9K76AA |
| | HP HDMI to DVI | F5A28AA |
| HP HDMI to VGA | H4F02AA | |
| Power | HP 65W Slim AC Adapter | H6Y82AA |
| | HP 90W Slim AC Adapter | H6Y83AA |
| | HP 45W USB-C Power Adapter | 1HE07AA |
| | HP 65W USB-C Power Adapter | 1HE08AA |
| | HP USB-C Notebook Power Bank | 2NA10AA |
| Memory | HP 4GB 2400MHz DDR4 Memory | Z4Y84AA |
| | HP 8GB 2400MHz DDR4 Memory | Z4Y85AA |
| | HP 16GB 2400MHz DDR4 Memory | Z4Y86AA |
| Storage | HP USB External DVDRW Drive | F2B56AA |
| | HP 128GB TLC M.2 SATA-3 SSD | 2JB95AA |
| | HP 256GB M2 PCIe NVME SSD TLC (2280) | 1FU87AA |
| | HP 512GB M2 PCIe NVME SSD TLC (2280) | 1FU88AA |

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

| | | |
|-----------------|---|---------|
| Security | HP Docking Station Cable Lock | AU656AA |
| | HP Keyed Cable Lock | T0Y14AA |
| | HP Keyed Cable Lock 10mm | T1A62AA |
| | HP Dual Head Keyed Cable Lock | T1A64AA |
| UCC | HP USB Collaboration Keyboard | Z9N38AA |
| | HP Wireless Collaboration Keyboard | Z9N39AA |
| | HP UC Speaker Phone | K7V16AA |
| | HP UC Wireless Mono Headset | W3K08AA |
| | HP UC Wireless Duo Headset | W3K09AA |
| Displays | HP EliteDisplay E243 23.8-inch Monitor | 1FH47AA |
| | HP EliteDisplay E243i 23.8-inch Monitor | 1FH49AA |
| | HP EliteDisplay E273 27-inch Monitor | 1FH50AA |
| | HP EliteDisplay E273m 27-inch Monitor | 1FH51AA |

Summary of Changes

| Date of change: | Version History: | | Description of change: |
|-------------------|------------------|---------|---|
| February 28, 2018 | V1 to V2 | Update | 256 GB 2280 PCIe NVMe Value Solid State Drive features specs added Panel LCD 14 inch FHD (1920x1080) Anti-Glare WLED UWVA 72% cg 700nits eDP 1.3+PSR ultraslim Privacy added to DISPLAYS |
| May 7, 2018 | V2 to V3 | Update | Display support matrix moved to Display Support section |
| May 8, 2018 | V3 to V4 | Added | Environmental tab |
| May 16, 2018 | V4 to V5 | Update | Battery life |
| May 17, 2018 | V5 to V6 | Update | Processors |
| May 23, 2018 | V6 to V7 | Update | Images changed |
| June 4, 2018 | V7 to V8 | Update | Display section |
| July 4, 2018 | V8 to V9 | Update | At a glance, Memory, Display |
| July 23, 2018 | V9 to V10 | Update | Battery life |
| August 8, 2018 | V10 to V11 | Update | Battery life, Storage and HP Sure Click |
| August 29, 2018 | V11 to V12 | Updated | Networking section |
| December 5, 2018 | V12 to V13 | Updated | Display Support Section |
| December 12, 2018 | V13 to V14 | Removed | Phonewise Software |

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