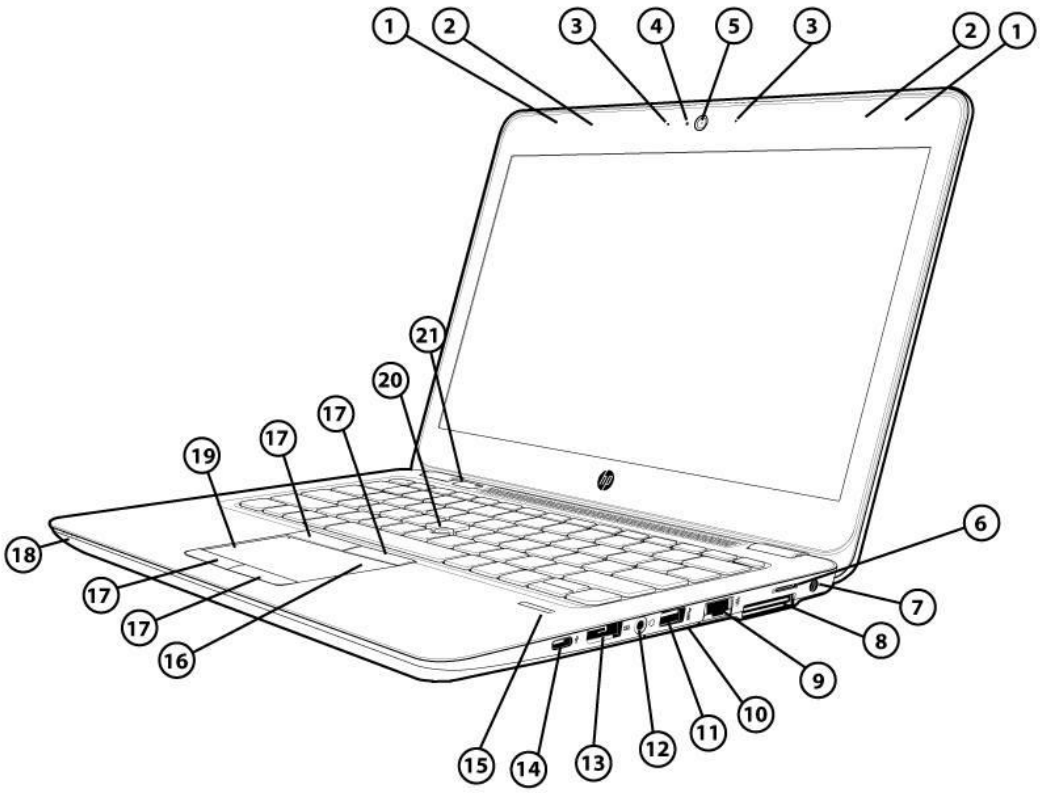
Overview

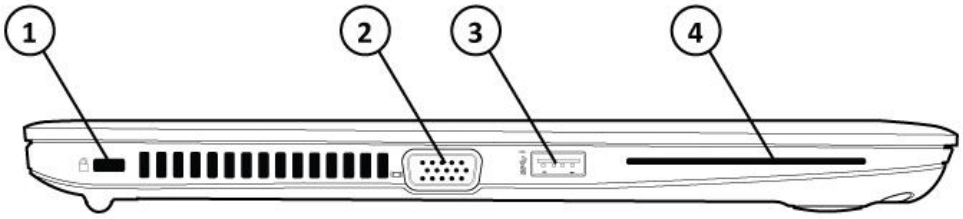
HP EliteBook 820 G3 Notebook PC



Front / Right

1. WLAN antennas (2)
2. WWAN antennas (2) (select models)
3. Internal microphones (2)
4. Webcam LED (select models)
5. Webcam (select models)
6. SIM card slot
7. Power connector
8. Docking connector
9. Ethernet port
10. SD Card Slot
11. USB 3.0 Port
12. Microphone/ headphones combo jack
13. Display Port
14. USB-C™ port
15. Fingerprint reader (select models)
16. Touchpad
17. Touchpad buttons (4)
18. Indicator LEDs: Wireless Light, Power Light, AC Adapter/Battery Light, Storage Usage Light
19. NFC (select models)
20. Pointstick
21. Power button

Overview

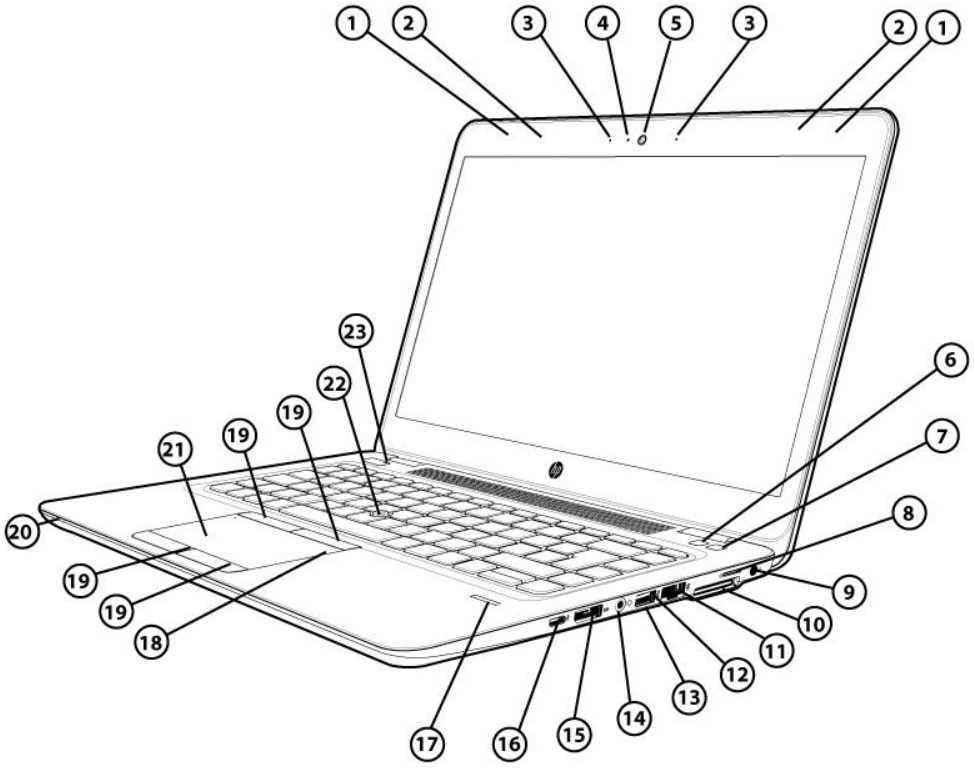


Left

1. Security lock slot
2. VGA port
3. USB 3.0 Charging port
4. Smart Card Reader

Overview

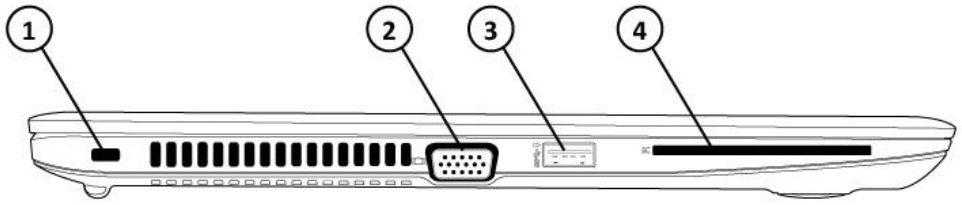
HP EliteBook 840 G3 Notebook PC



Front / Right

1. WLAN antennas (2)
2. WWAN antennas (2) (select models)
3. Internal microphones (2)
4. Webcam LED (select models)
5. Webcam (select models)
6. Wireless on/off button
7. Speaker mute button
8. SIM card slot
9. Power connector
10. Docking connector
11. Ethernet port
12. USB 3.0 port
13. SD card slot
14. Microphone/ headphones combo jack
15. Display Port
16. USB-C™ port
17. Fingerprint reader (select models)
18. Touchpad
19. Touchpad buttons (4)
20. Indicator LEDs: Wireless Light, Power Light, AC Adapter/Battery Light, Storage Usage Light
21. NFC (select models)
22. Pointstick
23. Power button

Overview

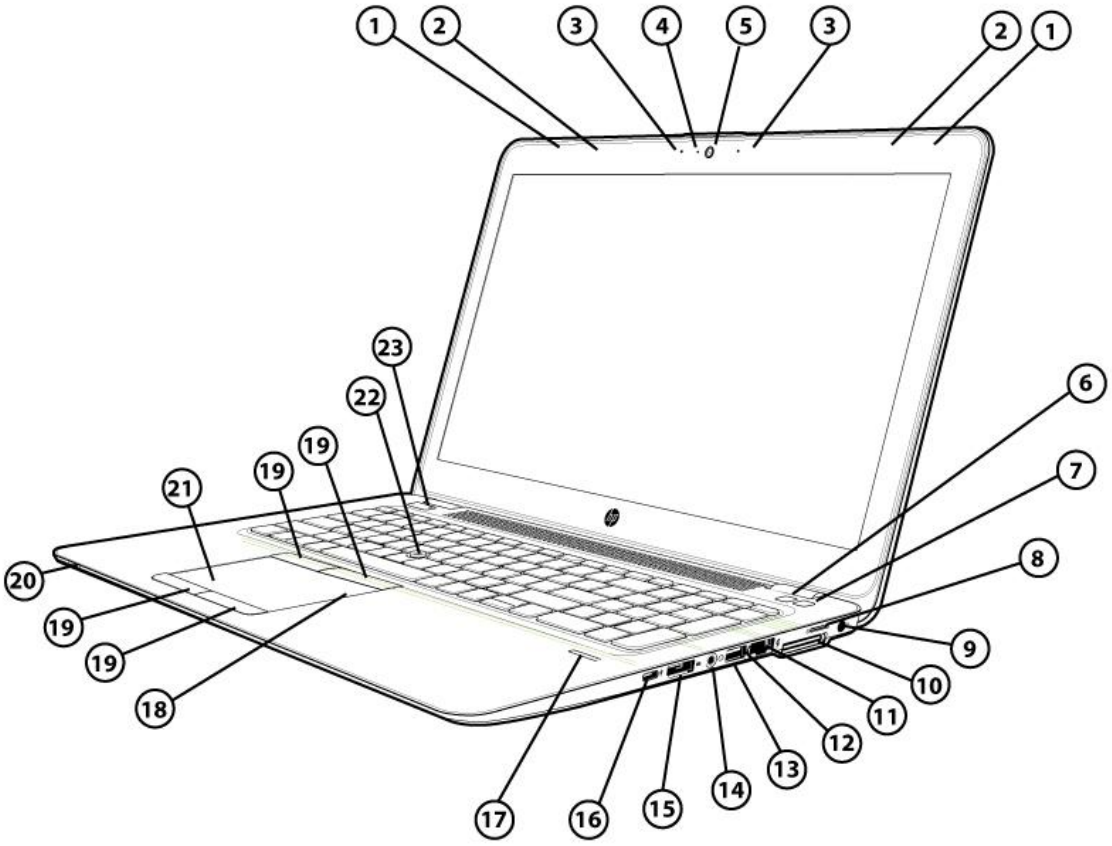


Left

1. Security lock slot
2. VGA port
3. USB 3.0 Charging port
4. Smart Card Reader

Overview

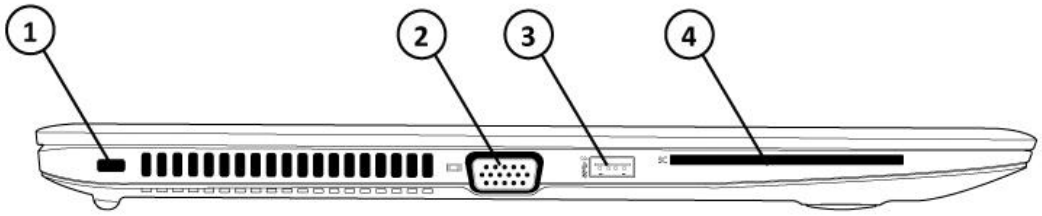
HP EliteBook 850 G3 Notebook PC



Front / Right

1. WLAN antennas (2)
2. WWAN antennas (2) (select models)
3. Internal microphones (2)
4. Webcam LED (select models)
5. Webcam (select models)
6. Wireless on/off button
7. Speaker mute button
8. SIM card slot
9. Power connector
10. Docking connector
11. Ethernet port
12. USB 3.0 port
13. SD card slot
14. Microphone/ headphones combo jack
15. Display Port
16. USB-C™ port
17. Fingerprint reader (select models)
18. Touchpad
19. Touchpad buttons (4)
20. Indicator LEDs: Wireless Light, Power Light, AC Adapter/Battery Light, Storage Usage Light
21. NFC (select models)
22. Pointstick
23. Power button

Overview



Left

1. Security lock slot
2. VGA port
3. USB 3.0 Charging port
4. Smart Card Reader

Overview

AT A GLANCE

- Stylish, lightweight magnesium and aluminum chassis starts at 18.9 mm thin
- No dongles are needed with built-in VGA, drop-jaw RJ-45 Ethernet port, USB 3.0, USB Type-C™, and full-size DisplayPort for high resolution support
- Customer serviceable and upgradeable with component accessible design
- Choice of 6th generation Intel® Core™ i7, i5 and i3 processors
- Integrated Intel® HD Graphics 520 or AMD Radeon™ R7 M365X discrete graphics (HP EliteBook 850 option only)
- Optimize your audio experience for remote collaboration with optional HD webcam, dual-microphone array, premium speakers, HP Noise Reduction Software, HP Clear Sound Amp, Audio by Bang & Olufsen
- Improved keyboard experience featuring HP Premium Keyboard with dual-point (10-key numeric keypad available on 850)
- Optional back-lit keyboard keeps you productive in all settings with HP DuraKeys to protect keys from fading
- Designed to pass MIL STD testing[1]
- Enhanced security features including TPM1.2/2.0[2], SmartCard Reader, HP Sure Start self-healing BIOS, HP Client Security, Self-Encrypting storage drives, and optional Fingerprint reader
- HP Touchpoint Manager manageability supported
- LED-backlit displays:
  - HP EliteBook 820: 12.5" diagonal HD, FHD Non-Touch or FHD Touch
  - HP EliteBook 840: 14.0" diagonal HD, FHD, QHD Non-Touch or FHD Touch
  - HP EliteBook 850: 15.6" diagonal HD, FHD, UHD Non-Touch or FHD Touch
- Flexible wireless connectivity options including mobile broadband
- Easily dock with the optional HP UltraSlim Docking Station
- Choice of hard drives up to 1 TB and solid state drives up to 512 GB
- DDR4 memory up to 16 GB
- Preinstall Windows 10, Windows 8.1, Windows 7, FreeDOS 2.0 or NeoKylin 64 versions

1. MIL STD 810G testing is pending and is not intended to demonstrate fitness for U.S. Department of Defense contract 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.

2. This product ships with TPM 1.2 with option to upgrade to TPM 2.0. Upgrade utility is expected to be available by the end of 2015 via HP Customer Support.

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

Features

PRODUCT NAMES

HP EliteBook 820 G3 Notebook PC
HP EliteBook 840 G3 Notebook PC
HP EliteBook 850 G3 Notebook PC

OPERATING SYSTEM

Preinstalled

Windows 10 Pro 64[1]
Windows 10 Home 64[1]
Windows 8.1 Pro 64[3]
Windows 8.1 64[3]
Windows 7 Professional 64 (available through downgrade rights from Windows 10 Pro)[2]
Windows 7 Professional 32 (available through downgrade rights from Windows 10 Pro)[2]
Windows 7 Professional 64[3]
Windows 7 Professional 32[3]
FreeDOS 2.0
NeoKylin Linux 64

Web Supported

Windows 10 Pro 64[1]
Windows 10 Home 64[1]
Windows 10 Enterprise 64[1]
Windows 8.1 Pro 64[1]
Windows 8.1 64[1]
Windows 8.1 Enterprise 64[1]
Windows 7 Professional 64[1]
Windows 7 Professional 32[1]
Windows 7 Enterprise 64[1]
Windows 7 Enterprise 32[1]

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.microsoft.com.
2. This system is preinstalled with Windows 7 Pro software and also comes with a license and media for Windows 10 Pro 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.
3. 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. See http://www.microsoft.com.

PROCESSOR

Intel® Core™ i7-6600U (2.6 GHz, up to 3.4 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)[1]
Intel® Core™ i7-6500U (2.5 GHz, up to 3.1 GHz with Intel®Turbo Boost Technology, 4 MB cache, 2 cores)[1,2]
Intel® Core™ i5-6300U (2.4 GHz, up to 3 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores) [1]
Intel® Core™ i5-6200U (2.3 GHz, up to 2.8 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores)[1,2]
Intel® Core™ i3-6100U (2.3 GHz, 3 MB cache, 2 cores) [1,2]

Features

1. 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 is not a
Measurement of higher performance.
2. Not available with Intel iAMT (*Not available with vPro)

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

CHIPSET

Chipset integrated with processor

INTEL® CORE I5 WITH VPRO/CORE I7 WITH VPRO TECHNOLOGY CAPABLE

Intel® Core i5 with vPro and Core i7 with vPro technology is a selectable feature that is available on units configured with select processors, an Intel Centrino® Advanced-N or Ultimate-N WLAN module and a preinstalled Windows operating system. It provides advances in remote manageability, security, energy efficient performance, and wireless connectivity. Intel® Active Management Technology (iAMT) offers built-in manageability and proactive security for networked notebook PCs, even when they are powered off* or when the operating system is inoperable. It can help identify threats before they reach the network, isolate infected systems, and update PCs regardless of their power state.

*Requires a Windows operating system, network hardware and software, connection with a power source, and a direct (non-VPN) corporate network connection which is either cable or wireless LAN.

NOTE: Some functionality of this technology, such as Intel® Active management technology and Intel Virtualization technology, requires additional 3rd party software in order to run. Availability of future "virtual appliances" applications for Intel vPro technology is dependent on 3rd party software providers. Microsoft Windows required.

GRAPHICS

Integrated
Intel® HD Graphics 520

Discrete
AMD Radeon™ R7 M365X
1GB GDDR5 dedicated
(HP EliteBook 850 only)

DISPLAY

HP EliteBook 820
Internal
Non-Touch
12.5" diagonal LED backlight HD[1] Slim eDP SVA Anti-glare (1366 x 768)
12.5" diagonal LED backlight HD[1] Slim eDP SVA Anti-glare (1366 x 768) with camera
12.5" diagonal LED backlight FHD UltraSlim eDP UWVA Anti-glare (1920 x 1080)
12.5" diagonal LED backlight FHD UltraSlim eDP UWVA Anti-glare (1920 x 1080) with camera

Features

Touch
12.5" diagonal LED backlight FHD UltraSlim eDP UWVA (1920 x 1080) Touch with camera[2]

HP EliteBook 840
Internal
Non-Touch
14.0" diagonal LED backlight HD[1] Slim eDP SVA Anti-glare (1366 x 768)
14.0" diagonal LED backlight HD[1] Slim eDP SVA Anti-glare (1366 x 768) with camera
14.0" diagonal LED backlight FHD Slim eDP SVA Anti-glare (1920 x 1080)
14.0" diagonal LED backlight FHD Slim eDP SVA Anti-glare (1920 x 1080) with camera
14.0" diagonal LED backlight QHD UltraSlim eDP + PSR UWVA Anti-glare (2560 x 1440)
14.0" diagonal LED backlight QHD UltraSlim eDP + PSR UWVA Anti-glare (2560 x 1440) camera
Touch
14.0" diagonal LED backlight FHD Slim eDP SVA (1920 x 1080) Touch with camera[2]

HP EliteBook 850
Internal
Non-Touch
15.6" diagonal LED backlight HD[1] Slim eDP SVA Anti-glare (1366 x 768)
15.6" diagonal LED backlight HD[1] Slim eDP SVA Anti-glare (1366 x 768) with camera
15.6" diagonal LED backlight FHD Slim eDP SVA Anti-glare (1920 x 1080)
15.6" diagonal LED backlight FHD Slim eDP SVA Anti-glare (1920 x 1080) with camera
15.6" diagonal LED backlight UHD Slim eDP UWVA Anti-glare (3840 x 2160)
15.6" diagonal LED backlight UHD Slim eDP UWVA Anti-glare (3840x 2160) with camera

Note: The HP EliteBook 850 G3 UHD panel is not compatible with WWAN.

Touch
15.6" diagonal LED backlight FHD Slim eDP SVA (1920 x 1080) Touch with camera[2]

VGA
Port supports resolutions up to 1920 x 1200 external resolution @60 Hz

DisplayPort
Supports resolutions up to 4096 x 2160 @ 60 Hz
Resolutions are dependent upon monitor capability, and resolution and color depth settings.

Number of Displays supported with Docking
Supports 3 independent displays if used with optional HP Ultraslim Docking Station.[3]

1. HD content required to view HD images.
2. Touch panel has chemically-strengthened Corning® Gorilla® Glass 3 top cover.
3. Sold separately or as an optional feature.
   NOTE: Resolutions are dependent upon monitor capability, and resolution and color depth settings.

STORAGE AND DRIVES

Primary Storage
SATA, 2.5" Hard Drives
500 GB 7200rpm Self Encrypting Drive (FIPS-140-2) (Opal 2)

Features

500 GB 7200rpm Hard Drive
500 GB 7200rpm Self-Encrypting Drive (Opal 2)
1 TB 5400rpm Hard Drive
500 GB Hybrid, 8 GB cache

Mini Card Solid State Drive
M.2 (NGFF) 2280 Solid State Drive
128 GB SATA-3 TLC Solid State Drive
180 GB SATA-3 MLC Solid State Drive
180 GB SATA-3 Self-Encrypting (Opal 2) MLC Solid State Drive
240 GB SATA-3 MLC Solid State Drive
256 GB SATA-3 TLC Solid State Drive
256 GB SATA-3 Self-Encrypting (Opal 2) MLC Solid State Drive
256 GB PCIe-3x4 NVMe Solid State Drive
512 GB SATA-3 TLC Solid State Drive

NOTE: For Solid State Drives or Hard Drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 16 GB (for Windows 7) and up to 30 GB (for Windows 8.1 and 10) is reserved for system recovery software.

HP 3D DriveGuard (Windows and Hard Drives only)
The hard drive is mounted directly to the notebook frame, reducing the transmission of shock to the hard drive

Dual Drive Configuration
System can be configured with a hard drive and M.2 SSD drive.[1]

1. Not available for the Hybrid Hard Drive and not supported on 820 G3.

MEMORY

Standard
DDR4 PC4-17000 (Transfer rates up to 2133 MT/s)
Two SODIMM slots supporting dual-channel memory
Both slots are customer accessible / upgradeable

Supports the following configurations
4096 MB Total System Memory (4096 MB x 1)
8192 MB Total System Memory (4096 MB x 2)
8192 MB Total System Memory (8192 MB x 1)
16384 MB Total System Memory (8192 MB x 2)

Maximum
Up to 16 GB

Dual-channel
Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

NOTE: Improved system performance when memory is added in pairs (dual channel).
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

Wireless
Support for a broad range of secure, integrated wireless LAN and wireless WAN options featuring support for the latest industry standards. Optional Broadband Wireless (WWAN) requires a Windows operating system and is available in select countries as a standard, factory configurable feature only. Integrated Bluetooth® is also available (factory configurable only) and can be combined with any of the supported wireless LAN and wireless WAN options.

Broadband Wireless (WWAN)
HP lt4120 Qualcomm® Snapdragon X5 LTE Mobile Broadband Module [1,3]
HP hs3110 HSPA+ Intel® Mobile Broadband Module[1,2]

Note: The HP EliteBook 850 G3 UHD panel is not compatible with WWAN.

Wireless LAN (WLAN) Via M.2 Minicard
Intel® Dual Band Wireless-AC 8260 802.11 a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 combo (vPro) [2]
Intel® Dual Band Wireless-AC 8260 802.11 a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 combo (non-vPro) [2]
Intel® Wireless-AC 3165 802.11 a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.0 combo (non-vPro) [2]

Near Field Communication (NFC)[1]
HP Module with NXP NFC Controller NPC100

Support for Miracast

1. Sold separately or as an optional feature.
2. Wireless access point and Internet service is required and is not included.
   Availability of public wireless access points limited.
3. WWAN module 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.

Communications
Intel® Ethernet Connection I219-V 10/100/1000 Ethernet (with Intel® i3-6100U, i5-6200U, and i7-6500U)
Intel® Ethernet Connection I219-LM 10/100/1000 Ethernet (with Intel® i5-6300U and i7-6600U)

NOTE: 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
HP Clear Sound Amp
HP Noise Reduction Software
Digital Microphones (Dual Array)
2 Premium Stereo Speakers

Webcam
Optional[1] 720p HD[2] webcam[3]

Features

1. Sold separately or as an optional feature.
2. HD content required to view HD images.
3. Internet access required.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Premium Keyboard

The HP spill-resistant keyboard with drain is designed using a thin layer of Mylar film under the keyboard and includes an all-metal keyboard deck for greater rigidity. The 820 has 79/80-key, 840 has 85-86-key, the 850 has 100/101-key compatible keyboard features a full-pitch key layout with desktop keyboard features, such as editing keys, both left and right control and alt keys, and function keys.
US and International key layouts are available. Backlit keyboard with HP DuraKeys available as an option.

Pointing Devices

Glass Touchpad
On/Off button
Taps enabled as default
Gestures enabled by default - 2 Finger Scrolling, 2 Finger Zoom (Pinch)

Buttons and Function Keys

HP EliteBook 820

F1 - Sleep
F2 - Blank
F3 – Keyboard Backlit toggle
F4 - Display switching
F5 - Brightness Down
F6 - Brightness Up
F7 – Speaker Mute
F8 - Volume Down
F9 - Volume Up
F10 - Mic Mute
F11 - Wireless
F12 - Num Lock

HP EliteBook 840

F1 - Sleep
F2 - Blank
F3 - Keyboard Backlit toggle
F4 - Display switching
F5 - Brightness Down
F6 - Brightness Up
F7 - Blank
F8 - Volume down
F9 - Volume up
F10 - Mic mute
F11 - Blank
F12 – Num Lock

Features

HP EliteBook 850

F1 - Sleep
F2 - Blank
F3 - Backlit toggle
F4 - Display switching
F5 - Brightness Down
F6 - Brightness Up
F7 - Blank
F8 - Volume down
F9 - Volume up
F10 - Mic mute
F11 - Blank
F12 – Blank

Hidden Function Keys

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

SOFTWARE AND SECURITY

Preinstalled Software
BIOS

HP BIOSphere[1]
HP Sure Start
HP DriveLock | HP Automatic DriveLock
HP BIOS Protection[2]
BIOS Update via Network
Master Boot Record Security
Power On Authentication
Pre-Boot Security
Secure Erase[3]
Hybrid Boot
Measure Boot
HP SpareKey
Pre-boot Authentication

Multi Media

Cyberlink Power DVD, BD
Cyberlink YouCam BE (Windows 7 only)

Communication

HP GPS and Location (Windows 7 only)[5]
HP Connection Manager with support for HP Mobile Connect Pro (Windows 7 only)[6]
HP Mobile Connect Pro (Windows 8.1 and Windows 10 only)[6]
Intel® Wireless Display (WiDi) Software for Windows[7]
Native Miracast Support[8]

Features

HP Value Add Software

HP 3D DriveGuard (requires Windows)
HP ePrint Driver[9]
HP Hotkey Support
HP Recovery Manager
HP Recovery Disc Creator
HP Registration App (Windows 8.1 only)
HP Support Assistant
HP Noise Reduction Software

3rd Party

Foxit PhantomPDF Express for HP

Microsoft Products

Buy Office
Bing Search
Skype[10]

Manageability

HP Driver Packs[11]
HP SoftPaq Download Manager (SDM)
HP System Software Manager (SSM)[11]
HP BIOS Config Utility (BCU)[11]
HP Client Catalog[11]
HP CIK for Microsoft SCCM[11]
HP Image Assistant[11]
LANDESK Management[12]

For more information on HP Client Management Solutions refer to: http://www.hp.com/go/clientmanagement.

Client Security Software

HP Client Security

- HP Security Manager (including Credential Manager and Password Manager)
- HP Drive Lock
- HP Fingerprint Sensor
- HP Password Manager
- Absolute Persistence Module[4]
- Power On Authentication

Microsoft Security Essentials[13]
Microsoft Defender

Features

Security

Trusted Platform Module (TPM) 1.2 (Infineon SLB9670). Common Criteria EAL4+ Certified.
Upgradable to TPM 2.0. Convertible to FIPS 140-2 Certified mode. (TPM 2.0 is not available for Win 7 32-bit.)[14]
HP Fingerprint Reader (On select models)

For more information on HP Client Security Software Suite, refer to http://www.hp.com/go/clientsecurity.

1. Available only on business PCs with HP BIOS.
2. May require a manual recovery step if all copies of BIOS are compromised or deleted
3. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88.
4. 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.
5. GPS access requires an unobstructed path to multiple satellites. Performance may be affected if/when used inside of buildings, bridges or heavily congested metropolitan areas. Requires separately purchased GPS navigation software available from multiple GPS applications.
6. HP Mobile Connect Pro is only available on preconfigured devices with WWAN. For geographic availability refer to http://www.hp.com/go/mobileconnect
7. Integrated Intel Wi-Di feature is available on select configurations only and requires separately purchased projector, TV or computer monitor with an integrated or external Wi-Di receiver. External Wi-Di receivers connect to the projector, TV or computer monitor via a standard HDMI cable, also sold separately.
8. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming media players that also support Miracast. You can use Miracast to share what you're doing on your PC and present a slide show. For more information: http://windows.microsoft.com/en-us/windows-8/project-wireless-screen-miracast
9. 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). Requires optional broadband module. Broadband use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Separately purchased data plans or usage fees may apply. Print times and connection speeds may vary.
10. Skype is not offered in China.
11. Not preinstalled, however available for download in December 2015 at http://www.hp.com/go/clientmanagement
12. Subscription required.
13. Opt in and internet connection required for updates.
14. This product ships with TPM 1.2 with option to upgrade to TPM 2.0. Upgrade utility is expected to be available by the end of 2015 via HP Customer Support.

POWER

HP 45W Smart AC Adapter (Not available for Asia, China and India)
HP 45W 2-prong DC jack AC Adapter (Japan only)
HP 65W Smart AC Adapter (Not available for Asia, China and India; for 840 & 850 only)
HP 65W Smart AC Adapter EM (Asia, China and India only)

Power cord is configurable; either 3.2 feet or 6 feet (1.0 or 1.8 meter)
Total length including external AC adapter is 9.2 feet or 12 feet (2.86 or 3.66 meter)

Features

Primary Battery
HP EliteBook 820
HP 3-cell Long Life Li-Ion (44 WHr)

HP EliteBook 840 and HP EliteBook 850
HP 3-cell Long Life Li-Ion (46 WHr)

Battery Life
HP EliteBook 820
Up to 12 hours and 30 minutes[1]

HP EliteBook 840
Up to 13 hours and 30 minutes[1]

HP EliteBook 850
Up to 12 hours and 30 minutes[1]
1. Disclaimer: 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.

Power Conservation
Hibernation
Standby
ACPI compliance

WEIGHTS & DIMENSIONS

HP EliteBook 820
Weight[1]
Starting at 2.78 lbs (1.26 kg)
(3-cell battery (44WHr), UMA, no FPR, 1 SODIMM, WLAN, M.2 SSD, no camera, no WWAN, Non-Touch panel)
Starting at 3.08 lbs (1.39 kg)
(3-cell battery (44WHr), UMA, no FPR, 1 SODIMM, WLAN, M.2 SSD, no camera, no WWAN, FHD Touch)

Dimensions[2] (w x d x h)
Non-Touch
12.2 x 8.6 x 0.74 in
31 x 21.89 x 1.89 cm
Touch
12.2 x 8.6 x 0.80 in
31 x 21.89 x 2.02 cm

HP EliteBook 840
Weight[1]
Starting at 3.41 lbs (1.54 kg)
(3-cell battery (46WHr), UMA, no FPR, 1 SODIMM, WLAN, M.2 SSD, no camera, no WWAN, Non-Touch panel)
Starting at 3.76 lbs (1.70 kg)
(3-cell battery (46WHr), UMA, no FPR, 1 SODIMM, WLAN, M.2 SSD, no camera, no WWAN, FHD Touch)

Features

Dimensions[2] (w x d x h)
Non-Touch
13.3 x 9.3 x 0.74 in
33.8 x 23.7 x 1.89 cm
Touch
13.3 x 9.3 x 0.80 in
33.8 x 23.7 x 2.02 cm

HP EliteBook 850
Weight[1]
Starting at 4.15 lbs (1.88 kg)
(3-cell battery (46WHr), UMA, no FPR, 1 SODIMM, WLAN, M.2 SSD, no camera, no WWAN, Non-Touch panel)
Starting at 4.54 lbs (2.06 kg)
(3-cell battery (46WHr), UMA, no FPR, 1 SODIMM, WLAN, M.2 SSD, no camera, no WWAN, FHD Touch)

Dimensions[2] (w x d x h)
Non-Touch
15.09 x 10.10 x 0.76 in
38.33 x 25.77 x 1.94 cm
Touch
15.09 x 10.10 x 0.82 in
38.33 x 25.77 x 2.08 cm

1. Weight varies by configuration and components.
2. Height varies depending upon where on the notebook the measurement is made.

PORTS/SLOTS

Ports
(1) USB 3.0 Charging Port
(1) USB 3.0 Port
(1) USB Basic Type-C
DisplayPort
VGA
RJ-45 / Ethernet
Docking connector
Headphone/Microphone Combo
AC Port

NOTE: Cables are not included.

Slots
External SIM slot
SD Media Card Reader Slot Supports SD, SDHC, SDXC

Features

SERVICE AND SUPPORT

Limited 3-year, 1-year or 90-day limited warranty options available, 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.Optional1 HP Care Pack Services[2] are extended service contracts which go beyond your standard limited warranties.

1. Sold separately or as an optional feature.
2. 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. Consult the HP Customer Support Center for details. http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp

Features

SYSTEM UNIT

TBD

DISPLAYS

12.5" diagonal LED backlight HD Slim eDP SVA Anti-glare (1366 x 768)	**Outline Dimensions** (W x H x D)	291.0 x181.9mm(max) X 3.0(max) mm	
	Active Area	276.615mm x 155.52mm	
	Weight	250g max.	
	Diagonal Size	12.5”	
	Surface Treatment	AG	
	Contrast Ratio	300:1 (typ) - AG	
	Refresh Rate	60Hz	
	Response time	16ms typ.	
	Pixel Per Inch (PPI)	125	
	Brightness	220nits	
	Pixel Resolution	**Format**	1366 x 768 (HD)
		Configuration	RGB Stripe
	Interface	eDP 1.2 (1 lane)	
	LCD Mode	TN	
	Viewing Angle	SVA 40/40/15/30	

12.5" diagonal LED backlight FHD UltraSlim eDP UWVA Anti-glare (1920 x 1080)	**Outline Dimensions** (W x H x D)	291.0 x 181.4 (max) x 2.85 (max) mm	
	Active Area	276.48 typ. (W) x 155.52 typ. (H)	
	Weight	230 max	
	Diagonal Size	12.5”	
	Surface Treatment	AG	
	Contrast Ratio	600:1 (typ) - AG	
	Refresh Rate	60Hz	
	Response time	25ms typ.	
	Pixel Per Inch (PPI)	176	
	Brightness	300nits	
	Pixel Resolution	**Format**	1920 x 1080 (FHD)
		Configuration	RGB Stripe
	Interface	eDP 1.3 (2 lane)	
	LCD Mode	IPS/FFS/VA	
	Viewing Angle	UWVA 85/85/85/85	

Features

12.5" diagonal LED backlight FHD UltraSlim eDP UWVA (1920 x 1080) Touch with camera	**Outline Dimensions** (W x H x D)	291.0 x 181.4 (max) x 2.85 (max) mm	
	Active Area	276.48 typ. (W) x 155.52 typ. (H)	
	Weight	230g max	
	Diagonal Size	12.5”	
	Touch Enabled	Yes	
	TSP Type	Capacitive	
	Surface Treatment	AG	
	Contrast Ratio	600:1 (typ) - AG	
	Refresh Rate	60Hz	
	Response time	25ms typ.	
	Pixel Per Inch (PPI)	176	
	Brightness	300nits	
	Pixel Resolution	**Format**	1920 x 1080 (FHD)
		Configuration	RGB Stripe
	Interface	eDP 1.3 (2 lane)	
	LCD Mode	IPS/FFS/VA	
	Viewing Angle	UWVA 85/85/85/85	
14.0" diagonal LED backlight HD Slim eDP SVA Anti-glare (1366 x 768)	**Outline Dimensions** (W x H x D)	320.9 x 205.6 (max) x 3.0mm max	
	Active Area	309.4 x 173.95	
	Weight	<290 max.	
	Diagonal Size	14.0”	
	Surface Treatment	AG	
	Contrast Ratio	300:1 (typ) - AG	
	Refresh Rate	60Hz	
	Response time	16ms typ.	
	Pixel Per Inch (PPI)	112	
	Brightness	220nits	
	Pixel Resolution	**Format**	1366 x 768 (HD)
		Configuration	RGB Stripe
	Interface	eDP 1.2 (1 lane)	
	LCD Mode	TN	
	Viewing Angle	SVA 40/40/15/30	

Features

14.0" diagonal LED backlight FHD Slim eDP SVA Anti-glare (1920 x 1080)	**Outline Dimensions** (W x H x D)	320.9 x 205.6 (max) x 3.0(max) mm	
	Active Area	308.851x173.73	
	Weight	<270 max	
	Diagonal Size	14”	
	Surface Treatment	AG	
	Contrast Ratio	300:1 (typ) - AG	
	Refresh Rate	60Hz	
	Response time	16ms typ.	
	Pixel Per Inch (PPI)	157	
	Brightness	300nits	
	Pixel Resolution	**Format**	1920 x 1080 (FHD)
		Configuration	RGB Stripe
	Interface	eDP 1.2 (2 lane)	
	LCD Mode	TN	
	Viewing Angle	SVA 40/40/15/30	

14.0" diagonal LED backlight QHD UltraSlim eDP UWVA Anti-glare (2560 x 1440)	**Outline Dimensions (W x H x D)**	320.4± 0.5 x 198.6±0.5 mm typ. (w/PCB)	
	Active Area	309.504 mmx 174.096mm	
	Weight	270g max	
	Diagonal Size	14.0”	
	Surface Treatment	Anti-Glare	
	Contrast Ratio	600:1 (typ.)	
	Refresh Rate	60Hz	
	Response time	25ms typ.	
	Pixel Per Inch (PPI)	210	
	Brightness	340 nits typ	
	Pixel Resolution	**Format**	2560x1440
		Configuration	RGB
	Interface	eDP 1.3 + PSR	
	LCD Mode	IPS	
	Viewing Angle	UWVA 85/85/85/85	

Features

14.0" diagonal LED backlight FHD Slim eDP SVA (1920 x 1080) Touch with camera	**Outline Dimensions** (W x H x D)	320.9 x 205.6 (max) x 3.0(max) mm	
	Active Area	308.851x173.73	
	Weight	270g max	
	Diagonal Size	14”	
	Surface Treatment	AG	
	Touch Enabled	Yes	
	TSP Type	Capacitive	
	Contrast Ratio	300:1 (typ) - AG	
	Refresh Rate	TBD	
	Response time	16ms typ.	
	Pixel Per Inch (PPI)	157	
	Brightness	300nits	
	Pixel Resolution	**Format**	1920 x 1080 (FHD)
		Configuration	RGB Stripe
	Interface	eDP 1.2 (2 lane)	
	LCD Mode	TN	
	Viewing Angle	SVA 40/40/15/30	

15.6" diagonal LED backlight HD Slim eDP SVA Anti-glare (1366 x 768)	**Outline Dimensions** (W x H x D)	360.0 x 224.3 x 3.2mm max	
	Active Area	344.2 x 193.5	
	Weight	370g max	
	Diagonal Size	15.6”	
	Surface Treatment	AG	
	Contrast Ratio	300:1 (typ) - AG	
	Refresh Rate	60Hz	
	Response time	16ms typ.	
	Pixel Per Inch (PPI)	101	
	Brightness	220 nit typ	
	Pixel Resolution	**Format**	1366 x 768 (HD)
		Configuration	RGB Stripe
	Interface	eDP 1.2 (1 lane)	
	LCD Mode	TN	
	Viewing Angle	SVA 40/40/15/30	

Features

15.6" diagonal LED backlight FHD Slim eDP SVA Anti-glare (1920 x 1080)	**Outline Dimensions** (W x H x D)	360.0 x 224.3 x 3.2 mm max	
	Active Area	344.16 x 193.59 mm	
	Weight	360 max.	
	Diagonal Size	15.6”	
	Surface Treatment	AG	
	Contrast Ratio	400:1 (typ)	
	Refresh Rate	60Hz	
	Response time	16ms typ.	
	Pixel Per Inch (PPI)	142	
	Brightness	300nits	
	Pixel Resolution	**Format**	1920 x 1080 (FHD)
		Configuration	RGB Stripe
	Interface	eDP 1.2 (2 lane)	
	LCD Mode	TN	
	Viewing Angle	SVA 45/45/25/35	

15.6" diagonal LED backlight UHD Slim eDP UWVA Anti-glare (3840 x 2160)	**Dimensions (W x H)**	13.62 x 7.59 in (3.6 x 19.4 cm)	
	Diagonal Size	15.6 in (39.6 cm)	
	Weight	345 g (max)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	1000:1 (typ)	
	Refresh Rate	60 Hz	
	Brightness	340 nit typical	
	Pixel Resolution	**Pitch**	0.090 x 0.090 mm
		Format	3840x2160
		Configuration	RGB Stripe
	Backlight	LED	
	PPI	282	
	Viewing Angle	80° Horizontal, ±80° Vertical (minimum) 80/80/80/80 (Left/Right/Down/Up) (min)	

Features

15.6" diagonal LED backlight FHD Slim eDP SVA (1920 x 1080) Touch with Camera	**Outline Dimensions** (W x H x D)	360.0 x 224.3 x 3.2 mm max	
	Active Area	344.16 x 193.59 mm	
	Weight	360 max.	
	Diagonal Size	15.6”	
	Surface Treatment	AG/BV	
	Contrast Ratio	500:1 (typ) - BV, 400:1 (typ) - AG	
	Touch Enabled	Yes	
	TSP Type	Capacitive	
	Refresh Rate	60Hz	
	Response time	16ms typ.	
	Pixel Per Inch (PPI)	142	
	Brightness	300nits	
	Pixel Resolution	**Format**	1920 x 1080 (FHD)
		Configuration	RGB Stripe
	Interface	eDP 1.2 (2 lane)	
	LCD Mode	TN	
	Viewing Angle	SVA 45/45/25/35	

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

STORAGE AND DRIVES

500 GB 7200rpm Self Encrypting Drive (FIPS-140-2) (Opal 2)	**Drive Weight**	0.21 lbs (95 g)	
	Capacity	500 GB	
	Height	0.28 in (7 mm)	
	Width	2.75 in (69.85 mm)	
	Interface	ATA-8, SATA 3.0	
	Transfer Rate	**Synchronous** (maximum)	600 MB/s
	Seek Time (typical reads, including settling)	**Single Track**	1.5 ms
		Average	12ms
		Maximum	18mm-22ms
	Cache	32GB	
	Rotational Speed	7200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [top cover temp]	
	Features	ATA Security; TCG Opal 2.x, FIPS, S.M.A.R.T., NCQ, Ultra DMA ,	

Features

500 GB 7200rpm Hard Drive	**Drive Weight**	0.20 lbs (92 g)-0.21 lbs (95 g)	
	Capacity	500 GB	
	Height	0.28 in (7 mm)	
	Width	2.75 in (69.85 mm)	
	Interface	ATA-8, SATA 3.0	
	Transfer Rate	**Synchronous** (maximum)	600 MB/s
	Seek Time (typical reads, including settling)	**Single Track**	1.5ms-2.0ms
		Average	11ms-13ms
		Maximum	18ms-22ms
	Cache	32GB	
	Rotational Speed	7200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	
500 GB 7200rpm Self-Encrypting Drive (Opal 2)	**Drive Weight**	0.21 lbs (95 g)	
	Capacity	500GB	
	Height	0.28 in (7 mm)	
	Width	2.75 in (69.85 mm)	
	Interface	ATA-8, SATA 3.0	
	Transfer Rate	**Synchronous** (maximum)	600 MB/s
	Seek Time (typical reads, including settling)	**Single Track**	1.5ms
		Average	12ms
		Maximum	18ms- 22ms
	Cache	32GB	
	Rotational Speed	7200rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [top cover temp]	
	Features	ATA Security; TCG Opal 2.x, S.M.A.R.T., NCQ, Ultra DMA	
1 TB 5400rpm Hard Drive	**Drive Weight**	0.21 lbs (94 g)- 0.21 lbs (99 g)	
	Capacity	1TB	
	Height	0.28 in (7.2 mm)	
	Width	2.75 in (69.85 mm)	
	Interface	ATA-8, SATA 3.0	
	Transfer Rate	**Synchronous** (maximum)	600 MB/s
	Seek Time (typical reads, including settling)	**Single Track**	2ms
		Average	12ms-13ms
		Maximum	18ms-23ms
	Cache	Up to 32GB	

Features

	Rotational Speed	5400rpm	
	Logical Blocks	1,953,525,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	S.M.A.R.T., NCQ, Ultra DMA	
500 GB Hybrid, 8 GB cache	**Drive Weight**	0.21 lb (95 g)	
	Capacity	500 GB	
	Height	0.276 in (7 mm)	
	Width	2.76 in (70.1 mm)	
	Interface	ATA-8, SATA 2.6, 6.0 Gb/s, NCQ	
	Transfer Rate	**Synchronous** (maximum)	600 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	**Single Track**	2 ms
		Average	12 ms
		Maximum	NIL ms
	Cache	64GB	
	Rotational Speed	5400 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	
128 GB M2 2280 SATA-3 TLC Solid State Drive	**Drive Weight**	0.019 lb (8.5 g)-0.022 lb (10 g)	
	Capacity	128 GB	
	Height	0.09 in (2.23 mm)- 0.14 in (3.58 mm)	
	Width	0.87 in (22 mm)	
	Interface	ATA-8, SATA 3.0	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 540 MB/s	Up to 300 MB/s
	Logical Blocks	250,069,680	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security, DIPM; TRIM; DEVSLP	
180 GB M2 2280 SATA-3 MLC Solid State Drive	**Drive Weight**	0.022 lb (<10 g)	
	Capacity	180 GB	
	Height	0.09 in (2.23 mm)	
	Width	0.87 in (22 mm)	
	Interface	ATA-8, SATA 3.0	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 540 MB/s (Compressible Performance)	UP to 490 MB/s (Compressible Performance)

Features

	Logical Blocks	351,651,888	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security, DIPM; TRIM; DEVSLP	
180 GB M2 2280 SATA-3 Self-Encrypting Drive (Opal 2) MLC Solid State Drive	**Drive Weight**	0.022 lb (<10 g)	
	Capacity	180GB	
	Height	0.09 in (2.23 mm)	
	Width	0.87 in (22 mm)	
	Interface	ATA-8, SATA 3.0	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 540 MB/s (Compressible Performance)	UP to 490 MB/s (Compressible Performance)
	Logical Blocks	351,651,888	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security, TCG OPAL 2.x, DIPM; TRIM; DEVSLP	
240 GB SATA-3 MLC Solid State Drive	**Drive Weight**	0.02 lb (10 g)	
	Capacity	240 GB	
	Height	0.14 in (3.58 mm)	
	Width	0.87 in (22 mm)	
	Interface	ACS-3, SATA 3.2	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 540 MB/s	UP to 490 MB/s
	Logical Blocks	468,862,128	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security, DIPM; TRIM; DEVSLP	
256 GB 2280 SATA-3 TLC Solid State Drive	**Drive Weight**	0.019 lb (8.5 g)- 0.022 lb (10 g)	
	Capacity	256GB	
	Height	0.09 in (2.3 mm)- 0.14 in (3.58 mm)	
	Width	0.87 in (22 mm)	
	Interface	ATA-8, SATA 3.0	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 540 MB/s	Up to 455 MB/s
	Logical Blocks	500,118,192	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security, DIPM; TRIM; DEVSLP	

Features

256 GB M2 2280 SATA-3 Self-Encrypting Drive (Opal 2) MLC Solid State Drive	**Drive Weight**	0.02 lb (10 g)	
	Capacity	256 GB	
	Height	0.14 in (3.58 mm)- 0.09 in (2.23 mm)	
	Width	0.87 in (22 mm)	
	Interface	ATA-8, SATA 3.0	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 540 MB/s	UP to 460 MB/s
	Logical Blocks	500,118,192	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security; TCG Opal 2.0, DIPM; TRIM; DEVSLP	
256 GB PCIe-3x4 NVMe 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	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 2,260 MB/s	UP to 1,260 MB/s
	Logical Blocks	500,118,192	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security, TRIM; L1.2	
512 GB M2 2280 TLC Solid State Drive	**Drive Weight**	0.019 lb (8.5 g)- 0.02 lb (10 g)	
	Capacity	512 GB	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	ATA-8, SATA 3.0	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 540 MB/s	UP to 500 MB/s
	Logical Blocks	1,000,215,216	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security, DIPM; TRIM; DEVSLP	

SECURITY

Features

HP Fingerprint Reader (optional)	**Mobile Voltage Operation**	3.0V-3.6V
	Operating Temperature	14° – 167°F (-10° – 75°C)
	Current Consumption Image	36 mA peak
	Low Latency Wait for Finger	950 uA
	Capture Rate	59000 lines/sec
	ESD Resistance	IEC 61000-4-2 4B (±15KV)
	Detection Matrix	200*1 (plus another secondary line) 508 dpi 10*1 mm sensor area

Smart Card Reader			
	Smart card standard	PC/SC 2.0 for Windows smart card standard	
	Dimensions (L x W x H)	0.41x 0.08 x 0.32 in (10.5 x 2 x 8.2 mm)	
	Smart Card support	ISO 7816 Class A and AB smart cards	
	Smart Card Interface	Smart Card Interface with T = 0 and T = 1 support Support I2C memory card, SLE4418, SLE4428, SLE4432, SLE4442, SLE4436, SLE5536, SLE6636, AT88SC1608, AT45D041 card and AT45DB041 card via external EEPROM	
	Operating systems	No driver is required for this device. Native support is provided by the operating system.	
	Power	**Normal Mode**	With card present, before being suspended: 40.9 mA Without card present, before being suspended: 33.16 mA After being suspended with smart card present: 380 µA After being suspended without smart card present: 380 µA
		Power Saving Mode	With card present, before being suspended: 40.6 mA Without card present: 380 µA After being suspended with smart card present: 380 µA

Features

Features	• Support single slot • Support T0, T1 protocol • Support I2C memory card, SLE4418, SLE4428, SLE4432, SLE4442, SLE4436, • SLE5536, SLE6636, AT88SC1608, AT45D041 card and AT45DB041 card via external EEPROM • Support ISO7816 Class A, B and C (5V/3V/1.8V) card • Implemented as an USB full speed device with bulk transfer endpoint, Mass • Storage endpoint • Built-in PLL for USB and Smart Card clocks requirement • Support EEPROM for USB descriptors customization (PID/VID/ iManufacturer/iProduct/Serial Number), Direct Web Page Link, and accessing memory card module. • EEPROM programmable via USB interface • Support software update for memory card module • Support Direct Web Page Link via configuration in external EEPROM • Support short APDU and extended APDU • Compatible with Microsoft USB-CCID driver • Support remote wake up through inserting card/removing card • Support USB selective suspend • Support Power Saving Mode (Using one pin to select between Normal/PWR Saving Mode) • Support card power over current protection mechanism • Built in resonator. • Support USB LPM (Link Power Management) features. • Embedded clock source.

NETWORKING/COMMUNICATIONS

	HP hs3110 HSPA+ Intel® Mobile Broadband Module*
Technology/Operating bands	HSPA+: 2100 (Band1), 1900 (Band 2), 1700 (Band 4), 850 (Band 5), 900 (Band 8) MHz E-GPRS: 1900 (Band 2), 1800 (Band 3), 850 MHz (Band 5), 900 (Band 8) MHz
Wireless protocol standards	WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification E-GPRS: Class B, Multi-slot class 33, coding schemes CS1 - CS4 and MSC1 - MSC9
GPS	Standalone, A-GPS

Features

GPS bands	1575.42 MHz ± 1.023 MHz
Maximum data rates	HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload) E-GPRS: 296 kbps (Download), 236.8 kbps (Upload) GPRS: 107 kbps (Download), 85.6 kbps (Upload)
Maximum output power	HSPA+: 24 dBm E-GPRS 1800/1900: 26 dBm E-GPRS 850/900: 27 dBm GPRS 1800/1900: 30 dBm GPRS 850/900: 33 dBm
Maximum output power	HSPA+: 24 dBm E-GPRS 1800/1900: 26 dBm E-GPRS 850/900: 27 dBm GPRS 1800/1900: 30 dBm GPRS 850/900: 33 dBm
Maximum power consumption	HSPA+: 1,100 mA (peak); 800 mA (average) E-GPRS: 2,800 mA (peak); 700 mA (average)
Form Factor	M.2, 3042-S3 Key B
Weight	6 g
Dimensions (Length x Width x Thickness)	1.65 x 1.18 x 0.09 in (42 x 30 x 2.3 mm)

* 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.

	HP lt4120 Qualcomm® Snapdragon™ X5 LTE Mobile Broadband Module
Technology/Operating bands	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 17 lower),

Features

	800 (Band 20), 700 (Band 28). HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz EV-DO: 850 (BC0), 1900 (BC1) MHz (Only work with Verizon network) 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 1xEVDO Release 0, A and B. E-GPRS: Class B, Multi-slot class 12, coding schemes CS1 - CS4 and MSC1 - MSC9
GPS	Standalone, A-GPS (MS-A, MS-B and XTRA)
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) CDMA 1xRTT: 153.6 kbps (Download), 153.6 kbps (Upload) EVDO Rel.A: 3.1 Mbps (Download), 1.8 Mbps (Upload) EVDO Rel.B: 14.7 Mbps (Download), 5.4Mbps (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 1xRTT/EVDO: 24dBm E-GPRS 1900/1800: 26 dBm

Features

	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) 1xRTT/EVDO: 1,000 mA (peak); 700 mA (average) E-GPRS: 2,800 mA (peak); 500 mA (average)
Dimensions (Length x Width x Thickness)	42 x 30 x 2.3 mm

* 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.

Intel® Dual Band Wireless-N 8260AC 802.11 a/b/g/n (2x2) WiFi + Bluetooth 4.2 Combo Adaptor* (vPro)	**Wireless LAN Standards**	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n	
	Interoperability	Wi-Fi certified	
	Frequency Band	802.11b/g/n	2.402 - 2.482 GHz Note: The FCC has declared as of January 1, 2015 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
		802.11a	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 **Note:** Indonesia only supports 5.725 - 5.825 GHz

(CH149 - CH161)

Antenna Structure	2 transmit; 2 receive (2x2)
Data Rates	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)
Modulation	Direct Sequence Spread Spectrum CCK, BPSK, QPSK, 16-QAM, 64-QAM
Security[1]	• 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
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between band Access Points
Output Power[2]	• 802.11b : +16dBm minimum • 802.11g : +14dBm minimum • 802.11a : +14dBm minimum • 802.11n HT20(2.4GHz) : +13dBm minimum • 802.11n HT40(2.4GHz) : +13dBm minimum • 802.11n HT20(5GHz) : +12dBm minimum • 802.11n HT40(5GHz) : +12dBm minimum
Power Consumption	Transmit: 2.0 Watts (max) Receive: 1.6 Watts (max) Idle mode[3] (PSP): 180 mW (WLAN Associated) Idle mode: 60 mW (WLAN unassociated) Radio off: 30 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode

Features

Receiver Sensitivity[4]	802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm maximum 802.11a, 6Mbps : -86dBm maximum 802.11a, 54Mbps : -72dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm 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 and Bluetooth communications	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm Or Type 1630 : 2.3 x 16.0 x 30.0 mm	
Weight	Type 2230 : 2.8g Or Type 1630 : 2g	
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 Off - Radio OFF; Solid LED On - Radio ON	

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. In Power Save Polling mode and on battery power.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b

(CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.

Intel® Dual Band Wireless-N 8260AC 802.11 a/b/g/n (2x2) WiFi + Bluetooth 4.2 Combo Adaptor* (non-vPro)	**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 2.402 - 2.482 GHz Note: The FCC has declared as of January 1, 2015 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 802.11a • 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 Note: Indonesia only supports 5.725 - 5.825 GHz (CH149 - CH161)
	Antenna Structure	2 transmit; 2 receive (2x2)
	Data Rates	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: card will support rates for NSS=1 and NSS=2 for RX and TX for 20 and 40 MHz channels. Short and long guard interval shall be supported.

Features

	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
Security[1]	• 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 Power[2]	• 802.11b : +16dBm minimum • 802.11g : +14dBm minimum • 802.11a : +14dBm minimum • 802.11n HT20(2.4GHz) : +13dBm minimum • 802.11n HT40(2.4GHz) : +13dBm minimum • 802.11n HT20(5GHz) : +12dBm minimum • 802.11n HT40(5GHz) : +12dBm minimum • 802.11ac 80MHz(5GHz) : +11dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 60 mW (WLAN unassociated) Radio disabled: 30 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps) 802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps) 802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74

	dBm (54 Mbps)	
	802.11n:-69 dBm (150 Mbps), -66 dBm (300 Mbps)	
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	0.134 x 1.06 x 1.18 in (3.4 x 26.8 x 30 mm)	
Weight	3.1g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating Non-operating	14° to 158° F (-10° to 70° C) -40° to 176° F (-40° to 80° C)
Humidity	Operating Non-operating	10% to 90% (non-condensing) 5% to 95% (non-condensing)
Altitude	Operating Non-operating	0 to 10,000 ft. (3,048 m) 0 to 50,000 ft. (15,240 m)
LED Activity	LED Amber - Radio OFF; LED White - Radio ON	

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. 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).

HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology

Bluetooth Specification	4.2+EDR Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	79 (1 MHz) available channels
Data Rates and	3 Mbps data rate; throughput up to 2.17 Mbps

Features

Throughput	Synchronous Connection Oriented links up to 3, 64 kbps, voice channels
	Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
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
Receiver Sensitivity	Better than -20 dBM at 0.1 % raw bit error rate
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Antenna	Internally integrated within module
Range	Up to 33 ft. (10 m)
Electrical Interface	USB 2.0 compliant
	Microsoft Windows Plug and Play compliant
Bluetooth Software Supported	Broadcom Bluetooth for Windows
	Microsoft Windows Bluetooth Software
Link Topology	Point to Point, Multipoint Pico Nets up to 7 slaves
Security	Full support of Bluetooth Security Provisions
Power Management	Microsoft Windows ACPI, and USB Bus Support
	Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
Certifications	All necessary regulatory approvals for supported countries, including:
	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
	ETS 300 328, ETS 300 826
	Low Voltage Directive IEC950
	UL, CSA, and CE Mark

Features

	Bluetooth Profiles Supported	Serial Port Profile (SPP)[1] Service Discovery Application Profile (SDAP) Dial-Up Networking (DUN)[1,2] Generic Object Exchange Profile (GOEP)[1,2] Object Push Profile (OPP)[1,2] File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP)[1,2] Personal Area Networking Profile (PAN)[1,2] Human Interface Device Profile (HID)[1,2] FAX Profile (FAX) Basic Imaging Profile (BIP)[2] Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

1. Indicates the profile is supported by Microsoft Windows XP SP2
2. Indicates the profile is part of Windows Vista

* Wireless access point and internet service required. Availability of public wireless access points limited.

Intel Dual Band Wireless-AC 3160 802.11 ac (1x1) WiFi and Bluetooth 4.0 Combo Adapter (non-vPro)	**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 • 2.402 – 2.482 GHz Note: The FCC has declared as of January 1, 2015 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. 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

Note: Indonesia only supports 5.725 - 5.825 GHz (CH149 - CH161)

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 ~ MCS7, (1SS) (20MHz, 40MHz, and 80MHz)

Modulation

Direct Sequence Spread Spectrum
BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM

Security[1]

- 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

Ad-hoc (Peer to Peer)

Models

Infrastructure (Access Point Required)

Roaming

IEEE 802.11 compliant roaming between access points

Output Power[2]

- 802.11b : +16dBm minimum
- 802.11g : +14dBm minimum
- 802.11a : +14dBm minimum
- 802.11n HT20(2.4GHz) : +13dBm minimum
- 802.11n HT40(2.4GHz) : +13dBm minimum
- 802.11n HT20(5GHz) : +12dBm minimum
- 802.11n HT40(5GHz) : +12dBm minimum
- 802.11ac 80MHz(5GHz) : +11dBm minimum

Power Consumption

Transmit: 2.0 W (max)

Receive: 1.6 W (max)

Idle mode (PSP): 180 mW (WLAN Associated)

Idle mode: 60 mW (WLAN unassociated)

Radio disabled: 30 mW

Features

Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm maximum 802.11a, 6Mbps : -86dBm maximum 802.11a, 54Mbps : -72dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm maximum 802.11ac, 1SS, MCS-0 : -86dBm maximum 802.11ac, 1SS, MCS-9 : -61dBm maximum 802.11ac, 2SS, MCS-0 : -83dBm maximum 802.11ac, 2SS, MCS-9 : -58dBm 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 Or Type 1630 : 2.3 x 16.0 x 30.0 mm
Weight	Type 2230 : 2.8g Or Type 1630 : 2g
Operating Voltage	3.3v +/- 9%

Features

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)

Near Field Communications Controller

Dimensions (L x W x H)	Module 25 mm by 10 mm by 2.0 mm
Chipset	NPC100
System interface	I^2C
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(1)	ISO/IEC 14443 A
	ISO/IEC 14443 B
	ISO/IEC 15693
	MIFARE 1K
	MIFARE 4K
	MIFARE DESFire
	FeliCa
	Jewel and Topaz cards

Features

Card Emulation (PICC-VICC) Mode(1)	ISO/IEC 14443 A ISO/IEC 14443 B and B' MIFARE FeliCa	
Frequency	13.56 MHz	
NFC Modes Supported	Reader/Writer, Peer-to-Peer, Card Emulation	
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	2.97 to 5.5 Volts	
I/O Voltage	1.8V or 3.3V	
Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)	**Mode**	**Power Consumption, Typical[2]**
	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.	

Features

Intel® I219-V Gigabit Network Connection	**Ethernet Features**	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023. Clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s IEEE 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) Jumbo Frame 9K Auto MDI/MDIX Crossover cable detection
	Power Management	ACPI compliant - multiple power modes Energy Detect Low Power Mode(Green Ethernet)
	Performance Features	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload(ARP & NS) Large send offload and Giant send offload Receiving Side Scaling MACSec Offload (802.3ae) Intel Non-vPro iSCSI Boot
	Manageability	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
	Interface	PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ. **NOTE:** Intel 82579 PCIe interface is not PCIe compliant. It operates at half of PCIe specification V1.1 (2.5GT/S)

		speed.
	NIC Device Driver Name	Intel 82579LM/82579V Ethernet Network Connection
Intel® I219-LM Gigabit Network Connection	**Ethernet Features**	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023. Clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s IEEE 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) Jumbo Frame 9K Auto MDI/MDIX Crossover cable detection
	Power Management	ACPI compliant - multiple power modes Energy Detect Low Power Mode(Green Ethernet)
	Performance Features	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload(ARP & NS) Large send offload and Giant send offload Receiving Side Scaling MACSec Offload (802.3ae) Intel vPro iSCSI Boot
	Manageability	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
	Interface	PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ. **NOTE:** Intel 82579 PCIe interface is not PCIe compliant. It operates

		at half of PCIe specification V1.1 (2.5GT/S) speed.
	NIC Device Driver Name	Intel 82579LM/82579V Ethernet Network Connection

AUDIO/MULTIMEDIA

Hardware	**Implementation**	CX7501
	Function Key Volume Controls	Volume up, volume down, and mute
	Full Duplex	Yes
	Line in/Line out	Yes via dock
	Headphone/Microphone In	Yes combo jack
	Integrated Microphone	Yes, dual digital microphone array
Audio Output Quality	**Frequency Response**	20 Hz – 20 kHz
	Signal to Noise Ratio	>85 dB
	Total Harmonic Distortion	0.01%
	Noise Floor	–110 dB
	Play/Record Sampling Rate(s)	8 kHz – 48kHz
	DAC	16, 20 or 24-bit
	ADC	16 or 20-bit
Integrated Stereo Speakers	**Power Rating**	2 Watts
	Impedance	4 Ohms

POWER

HP 45W Smart AC Adapter	**Dimensions** (H x W x D)	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	90 to 265 VAC	
		Input Efficiency	87.74% at 115Vac and 88.4% at 230Vac
		Input frequency range	47 to 63 Hz
		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	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 5,000 m)
		Humidity	20% to 95%
		Storage Humidity	10% to 95%
	EMI and Safety Certifications	*CE Mark - full compliance with LVD and EMC directives * Worldwide safety standards - IEC60950, 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 EM	**Dimensions**	4.98 x 1.97 x 1.18 in (12.65 x 5.0 x 3.0 cm)	
	Weight	0.62 lb (290g) max	
	Input	90 to 265 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC
	Output	**Output power**	65W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11.0A
	Connector	3 pin/grounded, mates with interchangeable cords	
	Environmental Design	**Operating temperature**	32° to 95° F (0° to 35° C)
		Non-operating (storage)	-4° to 185° F (-20° to 85° C)

Features

		temperature	
		Altitude	0 to 16,400 ft (0 to 5,000 m)
		Humidity	20% to 95%
		Storage Humidity	10% to 95%
	EMI and Safety Certifications	*CE Mark - full compliance with LVD and EMC directives * Worldwide safety standards - IEC60950, 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 3-cell Long Life Li-Ion (44.5 WHr) – HP EliteBook 820 G3	**Dimensions** (H x W x L)	8.30 mm x127.5 mm x 160.25 mm	
	Weight	213g (ATL), 211.1g (SDI)	
	Cells/Type	ATL 505295, SDI 505295	
	Energy	**Voltage**	11.4V
		Amp-hour capacity	3910mAh
		Watt-hour capacity	44.5Wh
	Temperature	**Operating (Charging)**	0~45 C
		Operating (Discharging)	-10~60 C
		Non-operating	5~40 C
	Fuel Gauge LED	NA	
	Warranty	1000 cycles >65% (at 23˚C)	
	Optional Travel Battery Available	No	

HP 3-cell Long Life Li-Ion (46.5 WHr) – HP EliteBook 840 & 850 G3	**Dimensions** (H x W x L)	6.8mm x 102.8mm x 198mm	
	Weight	216.3g (ATL), 217.8g (COS)	
	Cells/Type	ATL 506480, COSLIGHT 506480	
	Energy	**Voltage**	11.4V
		Amp-hour capacity	4080mAh
		Watt-hour capacity	46.5Wh
	Temperature	**Operating (Charging)**	0~45 C
		Operating (Discharging)	-10~60 C
		Non-operating	5~40 C
	Fuel Gauge LED	NA	
	Warranty	1000 cycles >65% (at 23˚C)	
	Optional Travel Battery Available	No	

ENVIRONMENTAL

Features
TBD

Country of Origin
China

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

Type	Description	Part #
Batteries	HP Notebook Power Bank	N9F71AA
	HP SN03XL Rechargeable Battery (820 G3)	T7B33AA
	HP CS03XL Rechargeable Battery (840, 850 G3)	T7B32AA
Cases	HP Essential Top Load Case (up to 15.6")	H2W17AA
	HP Business Backpack (up to 17.3")	H5M90AA
	HP Business Case (up to 15.6")	H5M92AA
Docking	HP 3005pr USB 3.0 Port Replicator	H1L08AA
	HP UltraSlim Docking Station	D9Y32AA
	HP Display and Notebook Stand II	E8G00AA
	HP Adjustable Dual Display Stand	AW664AA
Input/Output Devices	HP 2.4 GHz Keyboard and Mouse	G1K29AA
	HP Slim Wireless Keyboard and Mouse	T6L04AA
	HP Wireless (Link-5) Keyboard	T6U20AA

Features

	HP Touch to Pair Mouse	H6E52AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP USB Travel Mouse	G1K28AA
	HP Slim Bluetooth Mouse	F3J92AA
	HP Ultrathin Wireless Mouse SE	L9V77AA
	HP UC Wired Headset	K7V17AA
	HP UC Speaker Phone	K7V16AA
	HP Conferencing Keyboard	K8P74AA
Adapters	HP Wireless Display Adapter	J1V25AA
	HP USB-C to USB 3.0 Adapter	N2Z63AAA
	HP USB-C to RJ45/USB 3/USB-C	N2Z64AA
	HP DisplayPort to HDMI 1.4 Adapter	F3W43AA
	HP DisplayPort to VGA	F7W97AA
Memory	HP 4GB 2133MHz DDR4 Memory	T7B76AA
	HP 8GB 2133MHz DDR4 Memory	T7B77AA
Power Adapters	HP 65W Slim AC Adapter	H6Y82AA#xxx
	HP 45W Smart AC Adapter	H6Y88AA#xxx
	HP 65W Smart AC Adapter	H6Y89AA#xxx
	HP 90W Slim Combo AC Adapter w/USB	H6Y84AA#xxx
External Drives	HP USB External DVDRW Drive	F2B56AA
Security	HP Docking Station Cable Lock	AU656AA
	HP UltraSlim Keyed Cable Lock	H4D73AA
	HP 12.5" Notebook PC Privacy Filter (non-touch screens)	J6E64AA
	HP 14.1" Notebook PC Privacy Filter (non-touch screens)	J6E65AA
	HP 15.6” Notebook PC Privacy Filter (non-touch screens)	J7H71AA
Displays	HP EliteDisplay E240 23.8-inch Monitor	M1N99AA
	HP EliteDisplay E272Q 27-inch QHD Monitor	M1P04AA
	HP EliteDisplay E240c 23.8-inch Video Conferencing Monitor	M1P00AA
	HP EliteDisplay S140u 14-inch USB Portable Monitor	G8R65AA

Date of change:	**Version History:**		**Description of change:**
	Version 1 to 2		

Features

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