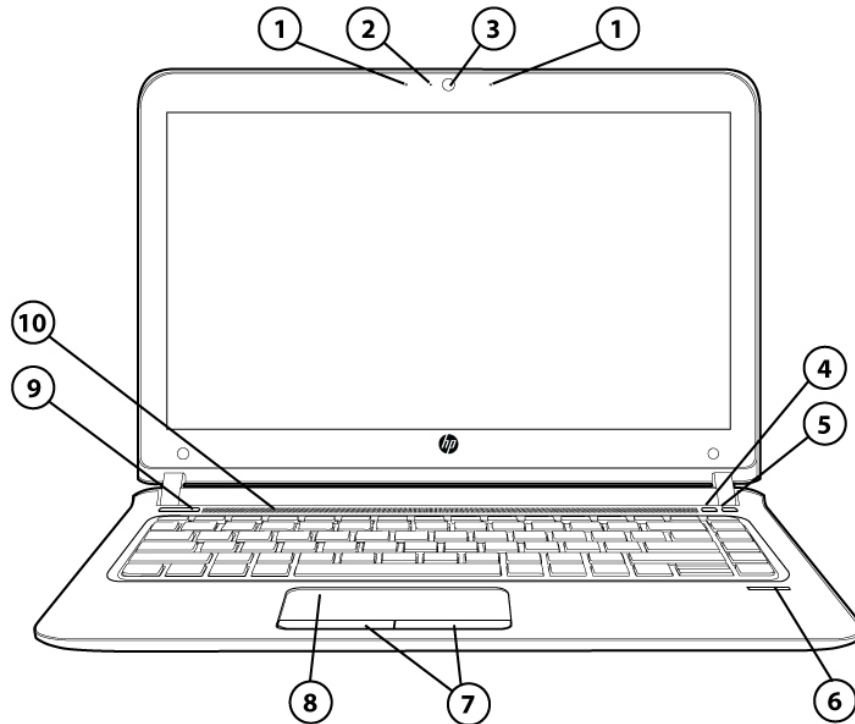


QuickSpecs

Overview

HP ProBook 430 G3 Notebook PC



- 1. Microphones (2)
- 2. Webcam light
- 3. Webcam
- 4. Wireless on/off button
- 5. Speaker mute button

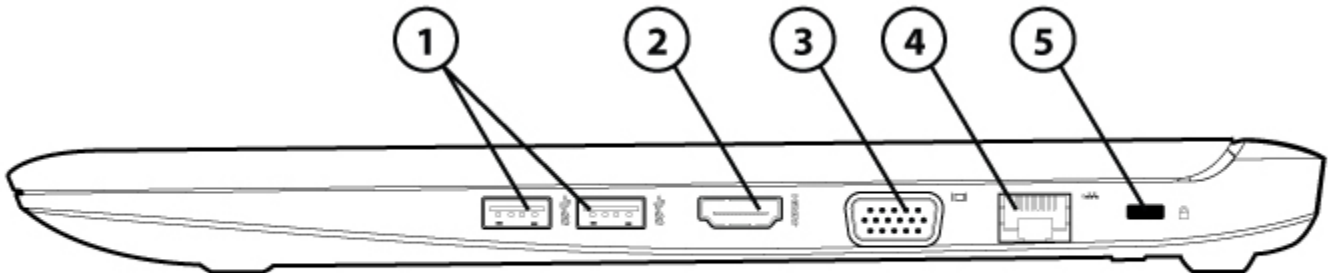
Front

- 6. Fingerprint reader
- 7. Touchpad pick buttons
- 8. Touchpad
- 9. Power button
- 10. Speaker array



QuickSpecs

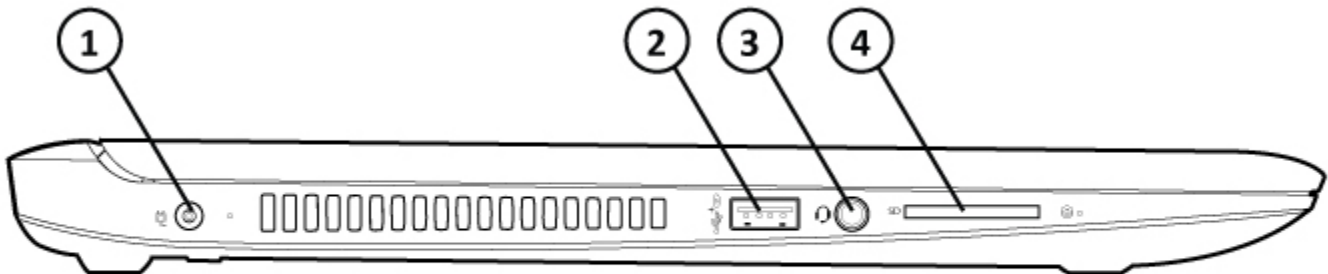
Overview



1. USB 3.0 ports (2)
2. HDMI port
3. External VGA monitor port

Right

4. Ethernet port (RJ-45)
5. Security lock slot



1. Power connector
2. USB 2.0 port (power port)

Left

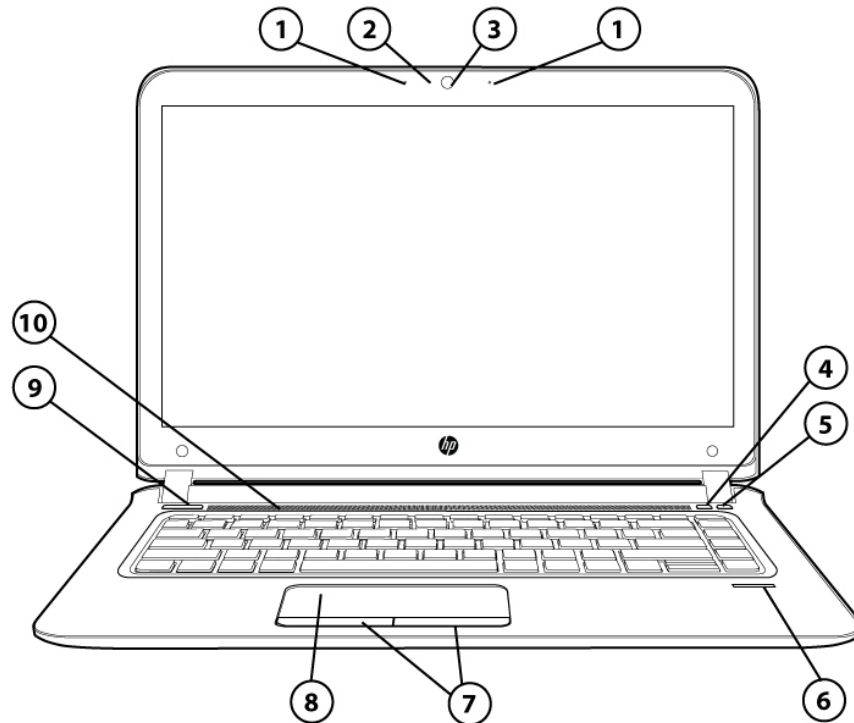
3. Headphone/Microphone combo jack
4. SD Card reader



QuickSpecs

Overview

HP ProBook 440 G3 Notebook PC



1. Microphones (2)
2. Webcam light
3. Webcam
4. Wireless on/off button
5. Speaker mute button

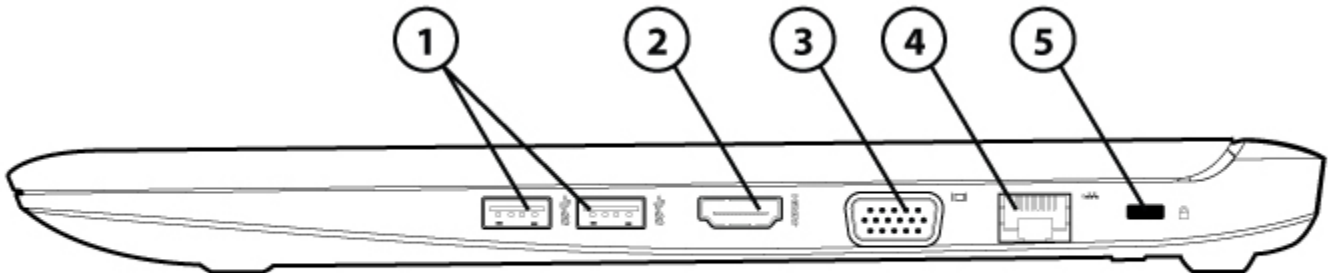
Front

6. Fingerprint reader
7. Touchpad pick buttons
8. Touchpad
9. Power button
10. Speaker array



QuickSpecs

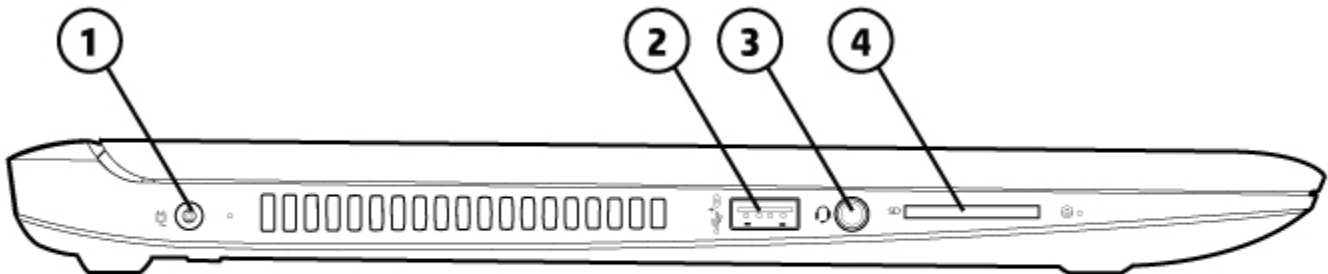
Overview



1. USB 3.0 ports (2)
2. HDMI port
3. External VGA monitor port

Right

4. Ethernet port (RJ-45)
5. Security lock slot



1. Power connector
2. USB 2.0 port (power port)

Left

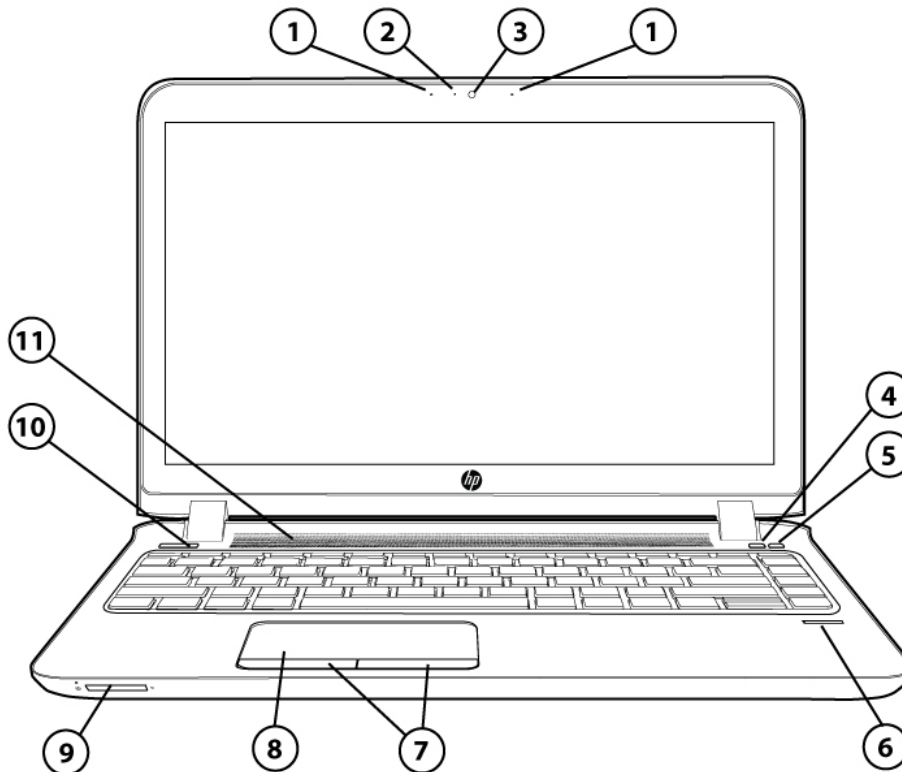
3. Headphone/Microphone combo jack
4. SD Card reader



QuickSpecs

Overview

HP ProBook 450 G3 Notebook PC



1. Microphones (2)
2. Webcam light
3. Webcam
4. Wireless on/off button
5. Speaker mute button
6. Fingerprint reader

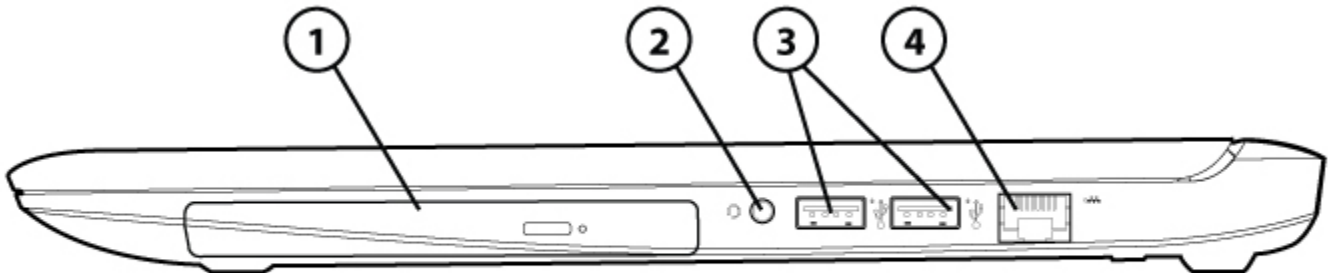
Front

7. Touchpad pick buttons
8. Touchpad
9. SD Card reader
10. Power button
11. Speaker array



QuickSpecs

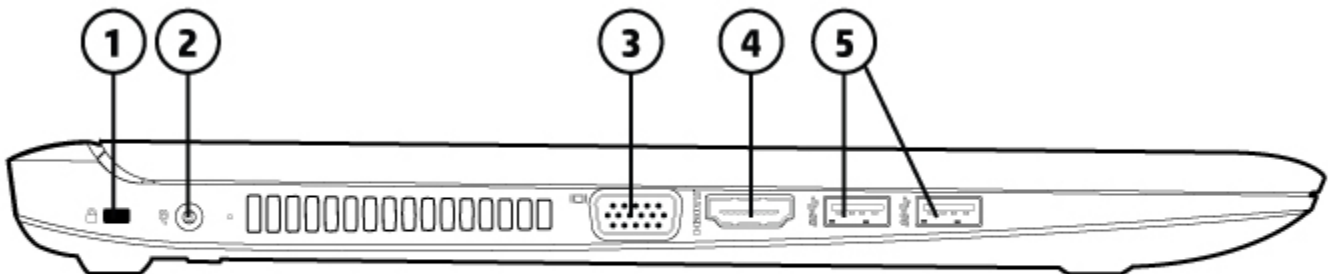
Overview



1. Optical drive
2. Headphone/Microphone combo jack
3. USB 2.0 ports (2)

Right

4. Ethernet port (RJ-45)



1. Security lock slot
2. Power connector
3. External VGA monitor port

Left

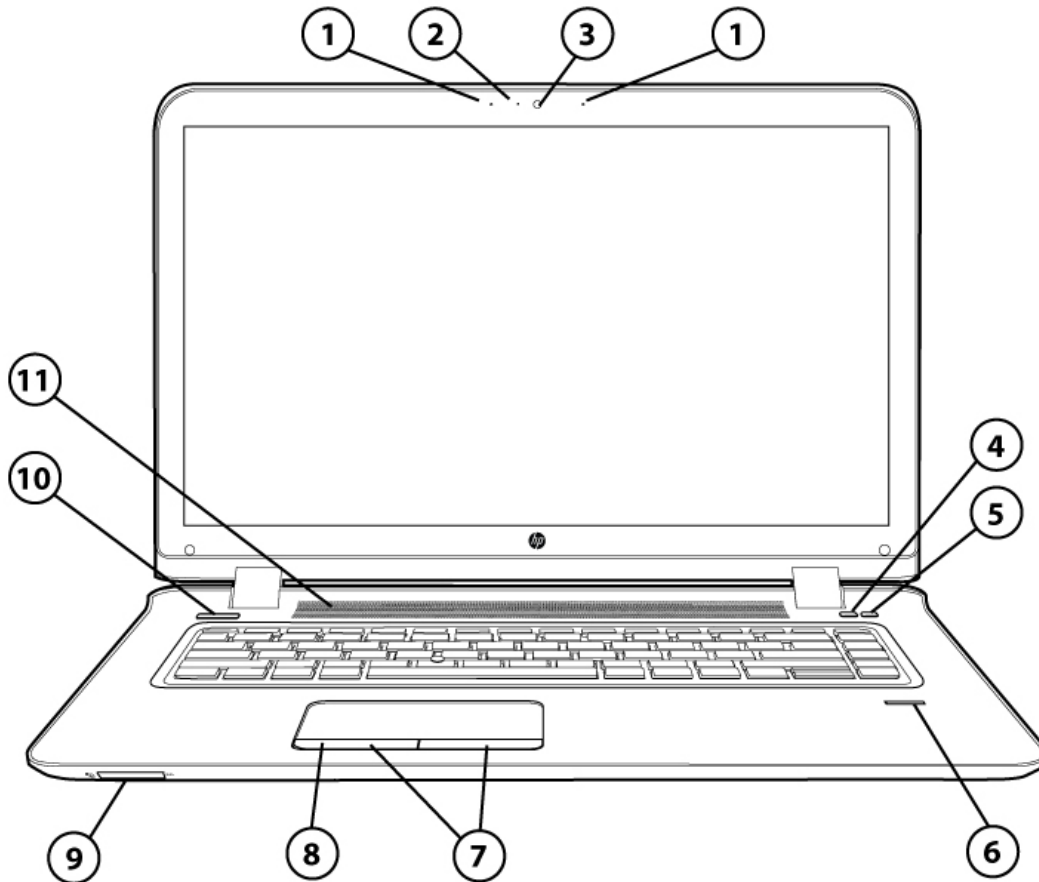
4. HDMI port
5. USB 3.0 ports (2)



QuickSpecs

Overview

HP ProBook 470 G3 Notebook PC



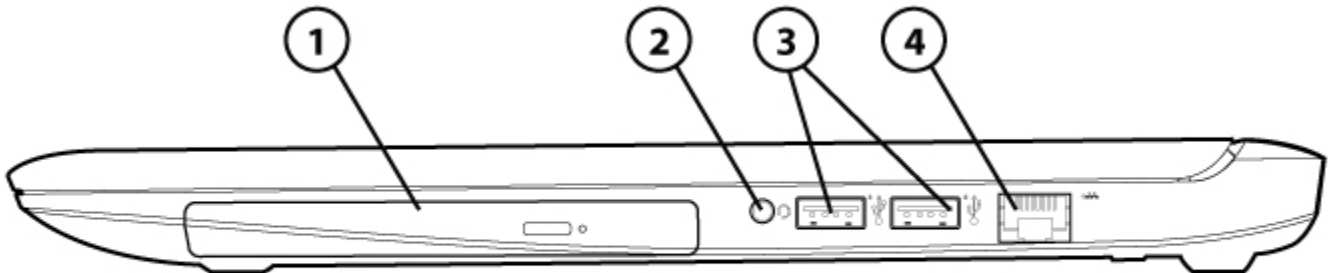
Front

- | | |
|---------------------------|--------------------------|
| 1. Microphones (2) | 7. Touchpad pick buttons |
| 2. Webcam light | 8. Touchpad |
| 3. Webcam | 9. SD card reader |
| 4. Wireless on/off button | 10. Power button |
| 5. Mute button | 11. Speaker array |
| 6. Fingerprint reader | |



QuickSpecs

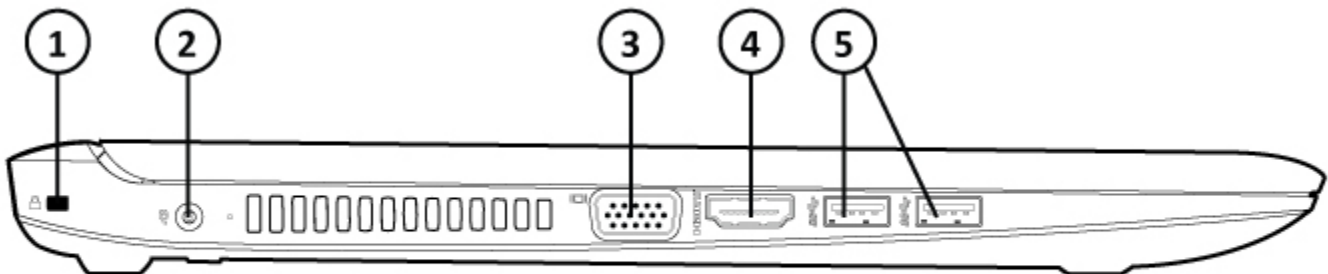
Overview



- 1. Optical drive
- 2. Headphone/Microphone combo jack

Right

- 3. USB 2.0 ports (2)
- 4. Ethernet port (RJ-45)



- 1. Security lock slot
- 2. Power connector
- 3. External VGA monitor port

Left

- 4. HDMI port
- 5. USB 3.0 ports (2)



QuickSpecs

Overview

AT A GLANCE

- Windows 10, Windows 8.1, Windows 7 editions or FreeDOS 2.0
- Choice of Intel® Core™ or Intel® Pentium® processors
- Full size HP Premium Keyboard, spill-resistant keyboard with a thin layer of Mylar film to prevent minor spills; full separate numeric keypad
- Separate launch buttons provide easy access to wireless on/off and speaker mute.
- Function keys provide control of features including: standby mode, display brightness, external display, microphone mute, volume down, volume up, and backlight toggle for backlit keyboard (select models only).
- Larger Touchpad with gestures support, on/off button with LED indicator
- Enhanced security features with preinstalled software and hardware options
- Optional HD webcam with dual-microphone array for video conferencing
- HDMI port for connecting to high-resolution displays
- HD audio with DTS Studio Sound™
- Choice of 13.3" diagonal, 14" diagonal, 15.6" diagonal or 17.3" diagonal flat screens or 13.3" diagonal, 14" diagonal, 15.6" diagonal Touch screens
- Flexible wireless connectivity options
- Battery
 - HP ProBook 430 G3 up to 14 hours and 15 minutes
 - HP ProBook 440 G3 up to 13 hours and 30 minutes
 - HP ProBook 450 G3 up to 13 hours and 15 minutes
 - HP ProBook 470 G3 up to 12 hours and 15 minutes
- Choice of HP 4-cell, 44 WHr Li-ion battery or optional HP 6-cell, Long Life 55 WHr Li-ion battery
- Passed MIL-STD testing¹

1. MIL STD 810G testing 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.

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



QuickSpecs

Technical Specifications

PRODUCT NAMES

HP ProBook 430 G3 Notebook PC
HP ProBook 440 G3 Notebook PC
HP ProBook 450 G3 Notebook PC
HP ProBook 470 G3 Notebook PC

OPERATING SYSTEMS

Preinstalled

- Windows 10 Pro 64¹
- Windows 10 Home 64¹
- Windows 8.1 Pro 64¹
- Windows 8.1 64¹
- 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 64¹
- Windows 7 Professional 32¹
- FreeDOS 2.0

Web only support

- Windows 10 Enterprise 64¹
- Windows 8.1 Enterprise 64¹
- Windows 7 Enterprise 64¹
- Windows 7 Enterprise 32¹

1. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers and/or software 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 Professional 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.

PROCESSORS

HP ProBook 430 G3

Intel® Core™ i3-6006U Intel® HD Graphics 520 (2.0GHz, 3MB L3 Cache, 2 core)^{1,2}

Intel® Core™ i7-6500U with Intel® HD Graphics 520 (2.5 GHz, up to 3.1 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)^{1,2}

Intel® Core™ i5-6300U with Intel® HD Graphics 520 (2.4 GHz, up to 3 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores)^{1,2}

Intel® Core™ i5-6200U with Intel® HD Graphics 520 (2.3 GHz, up to 2.8 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores)^{1,2}

Intel® Core™ i3-6100U with Intel® HD Graphics 520 (2.3 GHz, 3 MB cache, 2 cores)^{1,2}

Intel® Pentium® 4405U with Intel® HD Graphics 510 (2.1 GHz, 2 MB cache, 2 cores)^{1,2}



QuickSpecs

Technical Specifications

HP ProBook 440 G3

Intel® Core™ i3-6006U Intel® HD Graphics 520 (2.0GHz, 3MB L3 Cache, 2 core)^{1,2}

Intel® Core™ i7-6500U with Intel® HD Graphics 520 (2.5 GHz, up to 3.1 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)^{1,2}

Intel® Core™ i5-6300U with Intel® HD Graphics 520 (2.4 GHz, up to 3 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores)^{1,2}

Intel® Core™ i5-6200U with Intel® HD Graphics 520 (2.3 GHz, up to 2.8 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores)^{1,2}

Intel® Core™ i3-6100U with Intel® HD Graphics 520 (2.3 GHz, 3 MB cache, 2 cores)^{1,2}

Intel® Pentium® 4405U with Intel® HD Graphics 510 (2.1 GHz, 2 MB cache, 2 cores)^{1,2}

HP ProBook 450 G3

Intel® Core™ i7-6500U with Intel® HD Graphics 520 (2.5 GHz, up to 3.1 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)^{1,2}

Intel® Core™ i5-6200U with Intel® HD Graphics 520 (2.3 GHz, up to 2.8 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores)^{1,2}

Intel® Core™ i3-6100U with Intel® HD Graphics 520 (2.3 GHz, 3 MB cache, 2 cores)^{1,2}

Intel® Pentium® 4405U with Intel® HD Graphics 510 (2.1 GHz, 2 MB cache, 2 cores)^{1,2}

HP ProBook 470 G3

Intel® Core™ i7-6500U with Intel® HD Graphics 520 (2.5 GHz, up to 3.1 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)^{1,2}

Intel® Core™ i5-6200U with Intel® HD Graphics 520 (2.3 GHz, up to 2.8 GHz with Intel® Turbo Boost Technology, 3 MB cache, 2 cores)^{1,2}

1. 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. 64-bit computing on Intel® architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. Intel's numbering is not a measurement of higher performance.
2. HD content required to view HD images.

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

CHIPSET

Integrated with processor

GRAPHICS

Integrated

Intel® HD Graphics 520¹

Intel® HD Graphics 510¹

NOTE: View processor section for details.

Discrete²



QuickSpecs

Technical Specifications

HP ProBook 450/470 G3

AMD Radeon™ R7 M340 (1 or 2 GB DDR3 dedicated, switchable)

1. HD content required to view HD images.
2. AMD Dynamic Switchable Graphics technology requires either an AMD "A" series APU or an Intel processor, plus optional AMD Radeon™ discrete graphics configuration and is not available on FreeDOS and Linux OS. With AMD Dynamic Switchable Graphics technology, full enablement of all discrete graphics video and display features may not be supported on all systems (e.g. OpenGL applications will run on the integrated GPU or the APU as the case may be).

DISPLAYS

HP ProBook 430 G3

Internal

Non-Touch

13.3" diagonal HD¹ anti-glare LED-backlit (1366 x 768)

Touch

13.3" diagonal HD¹ LED-backlit touch screen (1366 x 768)

NOTE: Only available with Windows 10 or Windows 8.1.

External

Up to 32-bit per pixel color depth

VGA

Port supports resolutions up to 2048 x 1536 external resolution @60 Hz

HDMI

Supports direct connection to high-definition displays with up to 4096 x 2160 @24 Hz resolution and 7-channel audio with one convenient cable (Cable not included.)

HP ProBook 440 G3

Internal

Non-Touch

14" diagonal HD¹ anti-glare LED-backlit (1366 x 768)

14" diagonal full HD¹ anti-glare slim LED-backlit (1920 x 1080)

Touch

14" diagonal HD¹ LED-backlit touch screen (1366 x 768)

NOTE: Only available with Windows 10 or Windows 8.1.

External

Up to 32-bit per pixel color depth

VGA

Port supports resolutions up to 2048 x 1536 external resolution @60 Hz

HDMI

Supports direct connection to high-definition displays with up to 4096 x 2160 @24 Hz resolution and 7-channel audio with one convenient cable (Cable not included.)

HP ProBook 450 G3

Internal

Non-Touch

15.6" diagonal HD¹ anti-glare flat LED-backlit (1366 x 768)

15.6" diagonal full HD¹ anti-glare slim LED-backlit (1920 x 1080)

Touch

15.6" diagonal HD¹ flat LED-backlit touch screen (1366 x 768)



QuickSpecs

Technical Specifications

External

Up to 32-bit per pixel color depth

VGA

Port supports resolutions up to 2048 x 1536 external resolution @ 60 Hz

HDMI

Supports direct connection to high-definition displays with up to 4096 x 2160 @24 Hz resolution and 7-channel audio with one convenient cable (not included)

HP ProBook 470 G3

Internal

Non-Touch

17.3" diagonal HD+¹ SVA anti-glare flat LED backlit (1600 x 900)

17.3" diagonal FHD anti-glare flat LED backlit (1920 x 1080)

External

Up to 32-bit per pixel color depth

VGA

Port supports resolutions up to 2048x1536 external resolution @ 60 Hz

HDMI

Supports direct connection to high-definition displays with up to 4096 x 2160 @24 Hz resolution and 7-channel audio with one convenient cable (not included)

1. HD content required to view HD images.

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

STORAGE AND DRIVES

Primary Storage Bay

HP 3D DriveGuard (Windows only)

HP ProBook 430 and 440 G3

Hard Drives

Supports SATA, 7mm, 2.5" Hard Drives

500 GB - 5400 RPM Solid State Hard Drive (8 GB Cache)

500 GB - 7200 RPM Hard Drive

1 TB - 5400 RPM Hard Drive

Solid State Drives

128/256 GB* M2 Solid State Drive

HP ProBook 450 and 470 G3

Hard Drives

Supports SATA, 7mm/9.5mm, 2.5" Hard Drives

500 GB - 5400 RPM Solid State Hard Drive (8 GB Cache)

500 GB - 7200 RPM Hard Drive

1 TB - 5400 RPM Hard Drive

2 TB - 5400 RPM Hard Drive

HP 3D DriveGuard (Windows only)

The hard drive is mounted directly to the notebook frame, reducing the transmission of shock to the hard drive



QuickSpecs

Technical Specifications

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.

OPTICAL DRIVES

HP ProBook 430 and 440 G3

External

Support Optional¹ External USB Drive CD/DVD R/RW

HP ProBook 450 and 470 G3

Fixed Optional¹ Optical Drive

9.5mm SATA:

DVD+/-RW SuperMulti DL Drive^{1,2}

Blu-ray ROM DVD+/-RW SuperMulti DL Drive^{1,2}

Weight saver

1. Sold separately as an optional feature.
2. For Blu-ray drives, certain disc, digital connection, compatibility and/or performance issues may arise, and do not constitute defects in the product. Flawless playback on all systems is not guaranteed. In order for some Blu-ray titles to play, they may require an HDMI digital connection and your display may require HDCP support. HD-DVD disks cannot be played on this drive. Note that DVD-RAM cannot read or write to 2.6 GB Single Sided/5.2 GB Double Sided – Version 1.0 media. Actual speeds may vary. Don't copy copyright-protected materials. Double Layer discs can store more data than single layer discs; discs burned with this drive may not be compatible with many existing single-layer DVD drives and players.

MEMORY

Two SODIMM slots

Both slots are customer accessible / upgradeable

DDR4 PC4-2133 (Transfer rates up to 2133 MT/s)

Supports Dual Channel Memory

Standard

4096 MB Total System Memory (4096 MB x 1)

8192 MB Total System Memory (4096 MB x 2) (Dual Channel)

8192 MB Total System Memory (8192 MB x 1)

12288 MB Total System Memory (8192 MB + 4096 MB) (Dual Channel)

16384 MB Total System Memory (8192 MB x 2) (Dual Channel)

Maximum

Upgradeable to 16384 MB in slots 1 and 2

Dual-channel

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

NOTE: 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. With Windows Starter 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements.



QuickSpecs

Technical Specifications

NETWORKING/COMMUNICATIONS

HP ProBook 430 G3

Wireless LAN (WLAN)^{1,2}

Realtek 802.11b/g/n (1x1)

Realtek 802.11b/g/n (1x1) and Bluetooth® 4.0 Combo

Broadcom 802.11b/g/n (1x1) and Bluetooth® 4.0 Combo

Broadcom 802.11a/b/g/n (2x2) and Bluetooth® 4.0 Combo

Intel® Dual Band Wireless-AC 3165 802.11a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.0 Combo

Intel® Dual Band Wireless-AC 8260 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo

HP ProBook 440 G3

Wireless LAN (WLAN)^{1,2}

Realtek 802.11b/g/n (1x1)

Realtek 802.11b/g/n (1x1) and Bluetooth® 4.0 Combo

Broadcom 802.11b/g/n (1x1) and Bluetooth® 4.0 Combo

Broadcom 802.11a/b/g/n (2x2) and Bluetooth® 4.0 Combo

Intel® Dual Band Wireless-AC 3160 802.11a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.0 Combo

Intel® Dual Band Wireless-AC 3165 802.11a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.0 Combo

Intel® Dual Band Wireless-AC 8260 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo

HP ProBook 450 G3

Wireless LAN (WLAN)¹

Realtek 802.11b/g/n (1x1)

Realtek 802.11b/g/n (1x1) and Bluetooth® 4.0 Combo

Broadcom 802.11b/g/n (1x1) and Bluetooth® 4.0 Combo

Broadcom 802.11a/b/g/n (2x2) and Bluetooth® 4.0 Combo

Intel® Dual Band Wireless-AC 3165 802.11a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.0 Combo

Intel® Dual Band Wireless-AC 8260 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo

HP ProBook 470 G3

Wireless LAN (WLAN)^{1,2}

Realtek 802.11b/g/n (1x1)

Realtek 802.11b/g/n (1x1) and Bluetooth® 4.0 Combo

Broadcom 802.11b/g/n (1x1) and Bluetooth® 4.0 Combo

Broadcom 802.11a/b/g/n (2x2) and Bluetooth® 4.0 Combo

Intel® Dual Band Wireless-AC 3165 802.11a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.0 Combo

Intel® Dual Band Wireless-AC 8260 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo

1. Wireless access point and Internet service required and sold separately.

Availability of public wireless access points limited.

2. Sold separately or as an optional feature.

3. 4G LTE not available on all products, and in all regions.

Communications

Realtek Ethernet (10/100/1000)



QuickSpecs

Technical Specifications

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

HD audio with DTS Studio Sound™

Two stereo speakers

Integrated microphone (dual-microphone array when equipped with optional webcam)

Headphone/microphone combo jack

Webcam

Optional¹ 720p HD² webcam³

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

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

HP Premium Keyboard

The HP spill-resistant keyboard is designed using a thin layer of Mylar film under the keyboard. The 101/102-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.

Includes a separate numeric keypad (HP ProBook 450 and 470 only.)

Backlit keyboard available as an option.

Buttons and Function Keys

Separate launch buttons provide easy access to wireless on/off and speaker mute. Function keys provide control of features including: standby mode, display brightness, external display, microphone mute, volume down, volume up, and backlight toggle for backlit keyboard (select models only).

Function Keys

ESC: system information

F1 - Sleep

F2 - Blank

F3 - Backlight Toggle (for backlit keyboard) or Blank

F4 - Display Switching

F5 - Brightness Down

F6 - Brightness Up

F7 - Blank

F8 - Volume Down

F9 - Volume Up

F10 - Mic Mute



QuickSpecs

Technical Specifications

F11 - Blank

F12 - NumLock (430/440); Blank (450/470)

Hidden Functions

o Fn+R --> Break

o Fn+S --> Sys Rq

o Fn+C --> Scroll Lock

Pointing Devices

Touchpad with gestures support, on/off button with LED indicator, two-way scroll, two pick buttons

Touchpad

On/off button (on board)

Taps enabled as default

Gestures

Enabled by default

2 Finger Scrolling

2 Finger Zoom (Pinch)

OSD (enable/disable)

Win8 2 Finger tap = right click

Win8 Edge Swipes

Disabled by default

3 Finger Flick

2 Finger Rotate

Momentum Motion

1 Finger Vertical Scroll

SOFTWARE AND SECURITY

Preinstalled Software

BIOS

HP BIOSphere¹

HP DriveLock | HP Automatic DriveLock

HP BIOS Protection²

Master Boot Record Security

Power On Authentication

Pre-Boot Security

Secure Erase³

Hybrid Boot (Windows 8.1 & later)

Measure Boot (Windows 8.1 & later)

Secure Boot (Windows 8.1 & later)

Absolute Persistence Module⁴

Multi Media

Cyberlink Power DVD, BD



QuickSpecs

Technical Specifications

Cyberlink Power2Go (Secure Burn)
Cyberlink YouCam BE (Windows 7 only)

Communication

HP GPS and Location (Windows 7 only)⁵
HP Connection Manager with support for HP Mobile Connect (Windows 7 only)⁶
HP Mobile Connect (Windows 8.1 & later)⁶
Native Miracast Support⁸

HP Value Add Software

HP 3D DriveGuard
HP ePrint Driver⁹
HP Hotkey
HP Recovery Manager
HP Recovery Disc Creator
HP Unified Recovery Manager (Windows 8.1 and 10 only)
HP Registration App (Windows 8.1 & later)
HP Support Assistant
HP Noise Reduction Software

3rd Party

Foxit PhantomPDF Express for HP
HP Caller Dashboard Built by Thug Labs

Microsoft Products

Buy Office
Bing Search
Skype for Business certification¹⁰

Manageability

HP Driver Packs¹¹
HP SoftPaq Download Manager (SDM)
HP System Software Manager (SSM)¹¹
HP BIOS Config Utility (BCU)¹¹
HP Client Catalog¹¹
HP CIK for Microsoft SCCM¹¹
LANDESK Management¹²

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

Client Security Software



QuickSpecs

Technical Specifications

Absolute Persistence Module
HP Drive Encryption¹³
HP Security Manager
Microsoft Security Essentials¹⁴
Microsoft Defender

Security

Pre-boot Authentication
Security lock slot (Lock sold separately.)
Optional¹⁵ Fingerprint Reader
TPM

NOTE: The Absolute Persistence agent is shipped turned off, and must be activated by customers when they purchase a subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S.

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 is only available on preconfigured devices with WWAN. For geographic availability refer to www.hp.com/go/mobileconnect
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 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 on manageability website.
12. Subscription required.



QuickSpecs

Technical Specifications

- 13. Data is protected prior to Drive Encryption login. Turning the PC off or into hibernate logs out of Drive Encryption and prevents data access.
- 14. Opt in and internet connection required for updates.
- 15. Sold separately as an optional feature.

POWER

Power Supply

HP ProBook 430 /440 /450 G3

- 45 W Smart AC adapter
- 45 W Smart AC adapter 2-prong (Japan only)
- 65 W EM Smart AC adapter (China and India only)

HP ProBook 470 G3

- 65 W Smart AC adapter
- 65 W EM Smart AC adapter (PRC and India only)

Battery

- HP 4-cell, 44 WHr Li-ion
- Optional¹ HP 4-cell, Long Life 40 WHr Li-ion
(HP Fast Charge is available on 6-cell battery only.)

- 1. Sold separately as an optional feature.

Battery Time

Battery Life

Platform	Memory/OS	Battery	UMA Graphics	Discrete Graphics
HP Probook 430 G3	DDR3/Windows 8.1	4 cell (44Whr)	Up to 9 hrs 30 mins ¹	N/A
	DDR3/Windows 8.1	6 cell (55Whr)	Up to 13 hrs ¹	N/A
	DDR4/Windows 10	4 cell (44Whr)	Up to 10 hrs 15mins ¹	N/A
	DDR4/Windows 10	6 cell (55Whr)	Up to 14 hrs 45 mins ¹	N/A
HP Probook 440 G3	DDR3/Windows 8.1	4 cell (44Whr)	Up to 9 hrs ¹	Up to 9 hrs ¹
	DDR3/Windows 8.1	6 cell (55Whr)	Up to 12 hrs 30 mins ¹	Up to 12 hrs 30 mins ¹
	DDR4/Windows 10	4 cell (44Whr)	Up to 9 hrs 30 mins ¹	Up to 9 hrs 30 mins ¹
	DDR4/Windows 10	6 cell (55Whr)	Up to 13 hrs 30 mins ¹	Up to 13 hrs 15 mins ¹



QuickSpecs

Technical Specifications

HP Probook 450 G3	DDR3/Windows 8.1	4 cell (44Whr)	Up to 8 hrs 30 mins ¹	Up to 8 hrs 30 mins ¹
	DDR3/Windows 8.1	6 cell (55Whr)	Up to 11 hrs 45 mins ¹	Up to 12 hrs ¹
	DDR4/Windows 10	4 cell (44Whr)	Up to 9 hrs 15 mins ¹	Up to 9 hrs 15 mins ¹
	DDR4/Windows 10	6 cell (55Whr)	Up to 13 hrs 15 mins ¹	Up to 13 hrs 15 mins ¹
HP Probook 470 G3	DDR3/Windows 8.1	4 cell (44Whr)	N/A	Up to 9 hrs ¹
	DDR3/Windows 8.1	6 cell (55Whr)	N/A	Up to 11 hrs 30 mins ¹
	DDR4/Windows 10	4 cell (44Whr)	N/A	Up to 9 hrs ¹
	DDR4/Windows 10	6 cell (55Whr)	N/A	Up to 12 hrs 15 mins ¹

1. Windows 8.1 and 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.

System Standby Time

4-cell (44 WHr) battery	Up to 15 days
6-cell (55 WHr) long life battery	Up to 16 days

NOTE: Standby time will vary depending on various factors including battery, Memory, CPU, EC and LAN chip. The maximum capacity of the battery will naturally decrease with time and usage.

Power Conservation

Supports enhanced Intel SpeedStep technology (allows Battery Optimized Mode, Maximum Performance Mode, or Automatic mode)
 AMD PowerPlay technology (discrete models)
 Hibernation
 Standby
 ACPI compliance

WEIGHTS & DIMENSIONS

HP ProBook 430 G3

Weight

Starting at 3.31 lbs (1.5 kg)

Dimensions

Non-Touch



QuickSpecs

Technical Specifications

12.83 x 9.19 x 0.78 to 0.83 in (front to rear)
32.6 x 23.35 x 1.99 to 2.09 cm (front to rear)

Touch

12.83 x 9.2 x 0.84 to 0.88 in (front to rear)
32.6 x 23.37 x 2.14 to 2.24 cm (front to rear)

HP ProBook 440 G3

Weight

Starting at 3.69 lbs (1.68 kg)

Dimensions

Non-Touch

13.35 x 9.61 x 0.78 to 0.83 in (front to rear)
33.92 x 24.4 x 1.99 to 2.09 cm (front to rear)

Touch

13.35 x 9.61 x 0.85 to 0.89 in (front to rear)
33.92 x 24.42 x 2.15 to 2.25 cm (front to rear)

HP ProBook 450 G3

Weight

Starting at 4.56 lbs (2.07 kg)

Dimensions

Non-Touch

14.88 x 10.41 x 0.94 to 0.98 in
37.8 x 26.43 x 2.38 to 2.48 cm (front to rear)

Touch

14.88 x 10.42 x 1 to 1.04 in (front to rear)
37.8 x 26.46 x 2.55 to 2.65 cm (front to rear)

HP ProBook 470 G3

Weight

Starting at 5.75 lbs (2.61 kg)

Dimensions

Non-Touch

16.41 x 11.44 x 0.98 to 1.02 in (front to rear)
41.68 x 29.05 x 2.5 to 2.6 cm (front to rear)

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

PORTS/SLOTS

Ports

430/440

2 USB 3.0
1 USB 2.0 (power port)
1 HDMI



QuickSpecs

Technical Specifications

1 headphone/microphone combo
1 AC power
1 RJ-45
1 VGA

450/470

2 USB 3.0
2 USB 2.0
1 HDMI
1 headphone/microphone combo
1 AC power
1 RJ-45
1 VGA

NOTE: All cables are not included and sold separately.

Digital Media Slots

Multi Media Reader Slot
Supports SD, SDHC, SDXC

SERVICE AND SUPPORT

HP Services offers 3 year, 1 year and 90 day limited warranty options depending on country. 1 year limited warranty on primary battery. On-site service and optional extended service contracts are also available. Optional¹ HP Services² are extended service contracts which go beyond your standard limited warranties. For more details visit:

<http://www.hp.com/go/lookuptool>.

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. 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. 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>.



QuickSpecs

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	Average Operating Power	19 V Win 7	Win8	Max
	ProBook 440	Integrated graphics	6.78W	6.78W	38.88W
		Discrete graphics	4.49W	4.49W	31.87W
	ProBook 450	Integrated graphics	8.89W	8.89W	39.33W
		Discrete graphics	6.79W	6.79W	38.42W
	ProBook 470	Discrete graphics	5.71W	5.71W	23.56W
	Max Operating Power				
			Discrete < 90W		
			UMA < 65W		
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		40 G, 2 ms, half-sine		
	Non-operating		200 G, 2 ms, half-sine		
Random Vibration	Operating		0.75 grms		
	Non-operating		1.50 grms		
Altitude (unpressurized)	Operating		-50 to 10,000 ft (-15.24 to 3,048 m)		
	Non-operating		-50 to 40,000 ft (-15.24 to 12,192 m)		
Planned Industry Standard Certifications	UL		Yes		
	CSA		Yes		
	FCC Compliance		Yes		
	EPEAT		Registered Gold in United States**		
	ICES		Yes		
	Australia / NZ A-Tick Compliance		Yes		
	CCC		Yes		
	Japan VCCI Compliance		Yes		
	KC		Yes		
	BSMI		Yes		
	CE Marking Compliance		Yes		
	BNCI or BELUS		Yes		
	CIT		Yes		
	GOST		Yes		
	Saudi Arabian Compliance (ICCP)		Yes		
	SABS		Yes		
	UKRSERTCOMPUTER		Yes		

** EPEAT® registration varies by country. See www.epeat.net for registration status by country. EPEAT status listed above applies to U.S. For accessibility information on HP products, please visit: <http://www.hp.com/accessibility>.

DISPLAYS



QuickSpecs

Technical Specifications

13.3" diagonal HD1 anti-glare LED-backlit (1366 x 768) Touch	Outline Dimensions (W x H x D)	314.6 x 189.2 mm max. (w/ bracket & PCB) D(Flat): 3.6mm max. D(Slim): 3.0mm max.
	Active Area	293.42 x 164.97 mm
	Weight	Flat: 290g max. Slim: 260 max.
	Diagonal Size	13.3"
	Surface Treatment	Anti-glare
	Contrast Ratio	300:1 (typ)
	Refresh Rate	60Hz
	Brightness	220 nit typ
	Pixel Resolution	1366 x 768 (HD)
	Interface	eDP 1.2 (1 lane)
	LCD Mode	SVA
	PPI	118
	Viewing Angle	SVA 45/45/25/35
	14" diagonal FHD anti-glare flat LED backlit (1920 x 1080)	Outline Dimensions (W x H x D)
Active Area		309.14x173.89
Weight		290g max. (To be updated w/ real measure data)
Diagonal Size		14.0"
Surface Treatment		Anti-glare
Contrast Ratio		300:1 (typ) - AG
Refresh Rate		60Hz
Brightness		220 nit typ
Pixel Resolution		1920 x 1080 (FHD)
Interface		eDP 1.2 (2 lane)
LCD Mode		SVA
PPI		157
Viewing Angle		SVA 45/45/25/35
14" diagonal LED HD (1366 x 768) anti-glare		Dimensions (W x H)
	Weight	320g max.
	Diagonal Size	14.0 in (35.6cm)
	Surface Treatment	Anti-glare
	Refresh Rate	60 Hz



QuickSpecs

Technical Specifications

	Brightness	220 nit (typical)	
	Pixel Resolution	Pitch	0.227 mm
		Format	1366 x 768
		Configuration	RGB Stripe
	Backlight	LED	
	PPI	112 ppi	
	Viewing Angle	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)	
14" diagonal LED HD (1366 x 768) anti-glare Touch	Dimensions (W x H)	12.63 x 7.39 in (32.09 x 18.76 cm)	
	Active Area	309.4 x 173.95 (mm)	
	Weight	320g max.	
	Diagonal Size	14.0 in (35.6cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	400:1 (typical)	
	Refresh Rate	60 Hz	
	Brightness	220 nit (typical)	
	Pixel Resolution	Pitch	0.227 mm
		Format	1366 x 768
		Configuration	RGB Stripe
		Backlight	LED
		PPI	112 ppi
	Viewing Angle	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)	
15.6" diagonal HD SVA anti-glare flat LED backlit (1366 x 768) Touch	Outline Dimensions (W x H x D)	360.0 x 224.3 x 3.8mm max.	
	Active Area	344.2 x 193.5	
	Weight	420 max.	
	Diagonal Size	15.6"	
	Surface Treatment	Anti-glare	
	Contrast Ratio	300:1 (typ) - AG	
	Refresh Rate	60Hz	
	Brightness	220 nit typ	
	Pixel Resolution	1366 x 768 (HD)	
	Interface	eDP 1.2 (1 lane)	
	LCD Mode	SVA	



QuickSpecs

Technical Specifications

	PPI	101
	Viewing Angle	SVA 40/40/15/30
15.6" diagonal FHD anti-glare flat LED backlit (1920 x 1080)	Outline Dimensions (W x H x D)	360.0 x 224.3 x 3.2mm max.
	Active Area	344.16 x 193.59
	Weight	370g max.
	Diagonal Size	15.6"
	Surface Treatment	Anti-glare
	Contrast Ratio	300:1 (typ) - AG
	Refresh Rate	60Hz
	Brightness	220 nit typ
	Pixel Resolution	1920 x 1080 (FHD)
	Interface	eDP 1.2 (2 lane)
	LCD Mode	SVA
	PPI	142
	Viewing Angle	SVA 45/45/25/35
17.3" diagonal HD+1 SVA anti-glare flat LED backlit (1600 x 900)	Outline Dimensions (W x H x D)	398.6 x 251 x 4.0 (max.) mm
	Active Area	382.08 x 214.92 mm
	Weight	550g max.
	Diagonal Size	17.3"
	Surface Treatment	Anti-glare
	Contrast Ratio	300:1 (typ)
	Refresh Rate	60Hz
	Brightness	220 nit typ
	Pixel Resolution	1600 x 900 (HD+)
	Interface	eDP1.3 w/o PSR (2-lane)
	LCD Mode	SVA
	PPI	106
	Viewing Angle	40/40/15/30 (typ)
	Outline Dimensions (W x H x D)	400 x 233.3 x 4.0 (max.) mm



QuickSpecs

Technical Specifications

17.3" diagonal FHD anti-glare flat LED backlit (1920 x 1080)	Active Area	381.888 x 214.812
	Weight	550g max.
	Diagonal Size	17.3"
	Surface Treatment	Anti-glare
	Contrast Ratio	600:1 (typ)
	Refresh Rate	60Hz
	Brightness	300 nit typ
	Pixel Resolution	1920 x 1080 (FHD)
	Interface	eDP1.3 w/o PSR (2-lane)
	LCD Mode	UWVA
PPI	128	
Viewing Angle	85/85/85/85 (typ)	

STORAGE AND DRIVES

500 GB* 5400 rpm SMART SATA II Hybrid HDD/SSHD	Drive Weight	0.209 lb (95 g)
	Capacity	500 GB
	Height	0.276 in (7 mm)
	Width	2.76 in (70.1 mm)
	Interface	ATA-8, SATA 3.0, 6.0 Gb/s, NCQ
	Transfer Rate	Synchronous (maximum) 600 MB/s (Drive Capability)
	Seek Time	Single Track 2 ms
	(typical reads, including settling)	Average 12 ms
		Maximum NIL ms
	Rotational Speed	5400 rpm
	Logical Blocks	976,773,168
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]
	Features	ATA Security

500 GB* 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115g)
	Capacity	500 GB
	Height	0.276 in (7 mm)
	Width	2.75 in (70 mm)
	Interface	ATA-8, SATA 3.0, 6.0 Gb/s, NCQ
	Transfer Rate	Synchronous (maximum) 300 MB/s (Drive Capability)
	Single Track 1.5 ms	
	Average 11 ms	



QuickSpecs

Technical Specifications

	Seek Time (typical reads, including settling)	Maximum	22 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	
1 TB* 5400 rpm SATA Hard Drive	Drive Weight	117g	
	Capacity	1TB	
	Height	9.5mm	
	Width	70.1mm	
	Interface	ATA-8, SATA 3.0	
	Transfer Rate	Synchronous 600MB/s (maximum)	
	Seek Time (typical reads, including settling)	Single Track	2ms
		Average	12ms
		Maximum	22ms
		Rotational Speed	5400rpm
	Logical Blocks	1,953,525,168	
	Operating Temperature	0-60°C	
	Features	ATA Security, S.M.A.R.T., NCQ, Ultra DMA	
2 TB* - 5400 RPM Hard Drive	Drive Weight	130g	
	Capacity	2TB	
	Height	9.5mm	
	Width	70.1mm	
	Interface	ATA-8, SATA 3.0	
	Transfer Rate	Synchronous (maximum)	600MB/s
	Seek Time (typical reads, including settling)	Single Track	2ms
		Average	12ms
		Maximum	22ms
		Rotational Speed	5400rpm
	Logical Blocks	3,907,029,168	
	Operating Temperature	0-60°C	
	Features	ATA Security, S.M.A.R.T., NCQ, Ultra DMA	

SOLID STATE DRIVES

SSD 128GB 2280 M2 SATA-3	Drive Weight	0.022 lb (10 g)
	Capacity	128 GB
	Height	0.14 in (3.7 mm)



QuickSpecs

Technical Specifications

Width	0.87 in (22 mm)	
Interface	ATA-8, SATA 3.0	
Performance	Maximum Sequential Read	Maximum Sequential Write
	Up to 520 MB/s	Up to 140 MB/s
Logical Blocks	250069680	
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	DIPM; TRIM; DEVSLP	
Security Features	ATA Security	

SSD 256GB 2280 M2 SATA-3

Drive Weight	0.022 lb (10 g)	
Capacity	256 GB	
Height	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 520 MB/s	Up to 270 MB/s
Logical Blocks	250069680	
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	DIPM; TRIM; DEVSLP	
Security Features	ATA Security	

OPTICAL DRIVES

DVD+/-RW SuperMulti DL Drive	Access Times	Random	<140ms CD (typical) < 160 ms DVD (typical)
	Weight	170g max.	
	Max Data Transfer Rate	24X CD-ROM 8X DVD 24X CD-R 24X CD-RW 8X DVD+R 8X DVD+RW 8X DVD-R 6X DVD-RW 6X - DVD+R Dual Layer 6X - DVD-R Dual Layer 5X DVD-RAM	



QuickSpecs

Technical Specifications

	Transfer Mode	UDMA Mode 5	
	Interface	Gen 1 SATA	
	Supported Media (read)	CD-DA, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	
	Supported Media (write)	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, DVD+R DL, DVD-R DL	
	Max Media Capacity (read)	8.5 GB	
	Max Media Capacity (write)	8.5 GB	
	Transport	Tray Loading	
Blu-ray ROM DVD+/-RW SuperMulti DL Drive*	Access Times	Random	<190 ms CD-ROM (typical) < 180ms DVD-ROM (typical) <230 ms BD-ROM (typical)
	Weight	170g max.	
	Max Data Transfer Rate	24X CD-ROM 8X DVD-ROM 24X CD-R 16X CD-RW 8X DVD+R 8X DVD+RW 8X DVD-R 6X DVD-RW 4X - DVD+R Dual Layer 4X - DVD-R Dual Layer 5X DVD-RAM 6X BD-ROM	
	Transfer Mode	UDMA Mode 5	
	Interface	Gen 1 SATA	
	Supported Media (read)	CD-DA, , CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW. DVD-RAM, BD-ROM, BD-R, BD-RE	
	Supported Media (write)	CD-R, CD-RW, DVD+R, DVD+R DL, DVD+RW, DVD-R, DVD-R DL, DVD-RW, DVD-RAM	
	Max Media Capacity (read)	50.0 GB	
	Max Media Capacity (write)	8.5GB	
	Transport	Tray Loading	



QuickSpecs

Technical Specifications

DVD-ROM Drive	Access Times	Random	< 140 ms CD (typical) < 160 ms DVD (typical)
	Max Data Transfer Rate	24X CD-ROM 8X-DVD	
	Transfer Mode	UDMA Mode 5	
	Interface	Gen 1 SATA	
	Supported Media (read)	CD-DA, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	
	Supported Media (write)	None	
	Max Media Capacity (read)	8.5GB	
	Transport	Tray Loading	

SECURITY

HP Synaptics VFM 495 Fingerprint Reader (optional)	Mobile Voltage Operation	3.0V-3.6V Single Supply
	Operating Temperature	32° – 158°F (0° – 70°C)
	Current Consumption @ 3.3V	Less than 70 mA peak imaging and scrolling Less than 25 mA hardware finger detection Advanced Power Management
	High-Rate Image Capture	Up to 240 image frames /sec
	ESD Resistance	IEC 61000-4-2 Level 4 (±15KV)
	Detection Matrix	200 pixel wide fingerprinting image 16.5 mm x 3 mm sensor area 508 dpi resolution, 256 levels of grayscale

NETWORKING/COMMUNICATIONS

WWAN

	HP hs3110HSPA+ Mobile Broadband Module*
Technology/Operating bands	HSPA+: 2100 (Band 1), 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	E-GPRS: Class B, Multi-slot class 33, coding schemes CS1 - CS4 and MSC1 - MSC9. UMTS/WCDMA: Release 99 and Release 7
GPS	Standalone, A-GPS
GPS bands	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
Maximum data rates	HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload) HSPA: 7.2 Mbps (Download), 5.76 Mbps (Upload) WCDMA PS: 384 kbps (Download), 384 kbps (Upload) WCDMA CS: 64 kbps (Download), 64 kbps (Upload)



QuickSpecs

Technical Specifications

	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 power consumption	2500 mA (peak); 600 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 lt4110 LTE/HSPA+ 4G Mobile Broadband*
Technology/Operating bands	LTE: 1900 (Band 2) , 1700/2100 (Band 4), 850 (Band 5), 700 (Band 13), 700 (Band 17), 1900 (Band 25) MHz HSPA+: 2100 (Band 1), 1900 (Band 2) , AWS 1700/2100 (Band 4), 850 (Band 5), 800 (Band 8) MHz E-GPRS: 1900 (Band 2), 1800 (Band 3) , 850 (Band 5) , 900 (Band 8) MHz EV-DO: 800 (BC0), 1900 (BC1) MHz
Wireless protocol standards	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification EVDO Release 0 and Release A
GPS	Standalone GPS, A-GPS, GPS XTRA
GPS bands	1575.42 MHz (± 1.023 MHz), GLONASS 1596-1607MHz
Maximum data rates	LTE (Category 3): 100 Mbps (Download), 50Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21.6 Mbps (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 WCDMA: +23 dBm GSM 850/900, GMSK: +32dBm GSM 850/900, 8PSK: +27dBm DCS1800 / PCS 1900, GMSK: +29dBm DCS1800 / PCS 1900, 8PSK: +26dBm CDMA: +24dBm



QuickSpecs

Technical Specifications

Maximum power consumption LTE: 1,200 mA (peak); 900 mA (average)
WCDMA: 1,100 mA (peak); 800 mA (average)
EGPRS: 2,500 mA (peak); 700 mA (average)

Form Factor M.2, 3042-S3 Key B

Weight 6 g

Dimensions 1.65 x 1.18 x 0.09 in (42 x 30 x 2.3 mm)
(Length x Width x Thickness)

* 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.

WLAN

Intel® Dual Band Wireless-AC 8260 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo – TBD

Intel® Dual Band
Wireless-AC 3160
802.11a/b/g/n/ac (1x1)
WiFi and Bluetooth®
4.0 Combo

Wireless LAN Standards

IEEE 802.11a
IEEE 802.11b
IEEE 802.11g
IEEE 802.11n
IEEE 802.11ac

Interoperability Frequency Band

Wi-Fi certified
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
- 2.402 – 2.482 GHz

Data Rates

- 802.11b: 1, 2, 5.5, 11 Mbps
- 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
- 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
- 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)
- 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)

Modulation

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

Security¹

- 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.



QuickSpecs

Technical Specifications

	<ul style="list-style-type: none"> • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer)
Roaming	Infrastructure (Access Point Required)
Output Power²	IEEE 802.11 compliant roaming between access points <ul style="list-style-type: none"> • 2.4G: +13.5dBm minimum • 5G: +12dBm minimum • Maximum output power must be able to achieve modular regulatory certification with notebooks that have antennas >20cm from the user and peak gain of +3dBi at 2.4GHz and +4dBi at 5GHz
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio disabled: 75 mW
Power Management	ACPI and PCI Express compliant power management
Receiver Sensitivity³	802.11 compliant power saving mode 802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps) 802.11a/g:-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 (72.2 Mbps), -66 dBm (300 Mbps) 802.11ac: -83 dBm (65Mbps), -79 dBm (195Mbps), -73 dBm (390Mbps), -66 dBm (650Mbps), -60 dBm (867Mbps)
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	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)
Weight	3.1g
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

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



QuickSpecs

Technical Specifications

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).

Bluetooth Specification

V4.0 High Speed, V2.1+EDR, backwards compatible with V1.1, 1.2 and 2.0

Number of Available Channels 79 (1 MHz) available channels

Data Rates and Throughput 3 Mbps data rate; throughput up to 2.17 Mbps

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 -6 dBm to 4 dBm (Bluetooth Class II)

Receiver Sensitivity Better than -80 dBm at 0.1 % raw bit error rate

Power Consumption Peak (Tx) 330 mW

Peak (Rx) 230 mW

Sleep 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

Full support of Bluetooth Security Provisions

Security 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

Bluetooth Profiles Supported Generic Access Profile (GAP)

Service Discovery Application Profile (SDAP)

Serial Port Profile (SPP)

Dial_Up Networking Profile (DUN)

Generic Object Exchange Profile (GOEP)

Object Push Profile (OPP)

File Transfer Profile (FTP)

Synchronization Profile (SYNC)

Hard Copy Cable Replacement (HCRP)

Personal Area Networking Profile (PAN)

Human Interface Device Profile (HID)

Generic Audio/Video Distribution Profile (GAVDP)

Advanced Audio/Video Distribution Profile (A2DP)

FAX Profile (FAX)

Basic Imaging Profile (BIP)

Headset Profile (HSP)



QuickSpecs

Technical Specifications

Hands Free Profile (HFP)
 Basic Printing Profile (BPP)
 VDP (Video Distribution Profile)
 AVRCP (Audio Video Remote Control Profile)

Intel® Dual Band
 Wireless-AC 3165
 802.11a/b/g/n/ac (1x1)
 WiFi and Bluetooth®
 4.0 Combo

Wireless LAN Standards

Interoperability Frequency Band

IEEE 802.11a
 IEEE 802.11b
 IEEE 802.11g
 IEEE 802.11n
 IEEE 802.11ac
 Wi-Fi certified
 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

Security¹

- 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.



QuickSpecs

Technical Specifications

	<ul style="list-style-type: none"> • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer)
Roaming	Infrastructure (Access Point Required)
Output Power²	IEEE 802.11 compliant roaming between access points <ul style="list-style-type: none"> • 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
Receiver Sensitivity³	802.11 compliant power saving mode 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%



QuickSpecs

Technical Specifications

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	
	4. Check latest software/driver release for updates on supported security features.	
	5. Maximum output power may vary by country according to local regulations.	
	6. 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	4.0+EDR Compliant														
Frequency Band	2402 to 2480 MHz														
Number of Available Channels	79 (1 MHz) available channels														
Data Rates and Throughput	3 Mbps data rate; throughput up to 2.17 Mbps 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 EDF														
Receiver Sensitivity	<table border="1"> <thead> <tr> <th>Modulation</th> <th>0.01% BER</th> <th>0.001% BER</th> </tr> </thead> <tbody> <tr> <td>GFSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td>$\pi/4$-DQPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td>8DPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> </tbody> </table>			Modulation	0.01% BER	0.001% BER	GFSK	-80 dBm	-70 dBm	$\pi/4$ -DQPSK	-80 dBm	-70 dBm	8DPSK	-80 dBm	-70 dBm
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8DPSK	-80 dBm	-70 dBm													
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW														
Range	Up to 33 ft (10 m)														
Electrical Interface	USB 2.0 compliant														
Bluetooth Software Supported	Microsoft Windows Bluetooth Software														
Link Topology															
Electrical Interface	Point to Point, Multipoint Pico Nets up to 7 slaves														
Bluetooth Software Supported	Full support of Bluetooth Security Provisions														
Security															
Power Management	Microsoft Windows ACPI, and USB Bus Support														
Power Management	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:														
Security	FCC (47 CFR) Part 15C, Section 15.247 & 15.249														
Certifications															
Bluetooth Profiles Supported															
Power Management	ETS 300 328, ETS 300 826														
Certifications	Low Voltage Directive IEC950														
Certifications	UL, CSA, and CE Mark														



QuickSpecs

Technical Specifications

Bluetooth Profiles Supported	<ul style="list-style-type: none"> 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)
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Realtek 802.11 b/g/n (1x1)

Wireless LAN Standards	<ul style="list-style-type: none"> IEEE 802.11b IEEE 802.11g IEEE 802.11n
Interoperability	Wi-Fi certified
Frequency Band	<p>802.11b/g/n</p> <ul style="list-style-type: none"> • 2.402 – 2.482 GHz <p>Note: 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.</p>
Data Rates	<p>802.11b: 1, 2, 5.5, 11 Mbps</p> <p>802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</p> <p>802.11n: MCS 0 ~ MCS 07, (20MHz)</p>
Modulation	<p>Direct Sequence Spread Spectrum</p> <p>BPSK, QPSK, CCK, 16-QAM, 64-QAM,</p>
Security¹	<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



QuickSpecs

Technical Specifications

	<ul style="list-style-type: none"> • 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 : +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 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 Sensitivity³	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



QuickSpecs

Technical Specifications

Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded 2.4 GHz antennas are provided to the card to support WLAN and Bluetooth communications (Support Dual antenna or Single antenna, depend on platform requirement)
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 Non-operating
Humidity	Operating Non-operating
Altitude	Operating Non-operating
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).

Realtek 802.11 b/g/n (1x1) + Bluetooth® Combo

Wireless LAN Standards	IEEE 802.11b IEEE 802.11g
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QuickSpecs

Technical Specifications

	IEEE 802.11n
Interoperability	Wi-Fi certified
Frequency Band	802.11b/g/n <ul style="list-style-type: none"> • 2.402 – 2.482 GHz <p>Note: 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.</p>
Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 07, (20MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM,
Security¹	<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
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 : +16dBm minimum • 802.11g : +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 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 60 mW (WLAN unassociated)



QuickSpecs

Technical Specifications

	Radio disabled: 30 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity³	802.11b, 1Mbps : -94dBm maximum	
	802.11b, 11Mbps : -86dBm maximum	
	802.11g, 6Mbps : -88dBm maximum	
	802.11g, 54Mbps : -74dBm 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 antennas for 2.4GHz are provided to the card to support WLAN and Bluetooth communications. (Support Dual antenna or Single antenna, depend on platform requirement)	
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)



QuickSpecs

Technical Specifications

Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)

LED Activity LED Amber – Radio OFF; LED 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 4.0+EDR Compliant

Frequency Band 2402 to 2480 MHz

Number of Available Channels 79 (1 MHz) available channels

Data Rates and Throughput 3 Mbps data rate; throughput up to 2.17 Mbps

Synchronous Connection Oriented links up to 3, 64 kbps, voice channel:

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

Modulation	0.01% BER	0.001% BER
GFSK	-80 dBm	-70 dBm
$\pi/4$ -DQPSK	-80 dBm	-70 dBm
8DPSK	-80 dBm	-70 dBm

Power Consumption Peak (Tx) 330 mW
 Peak (Rx) 230 mW
 Selective Suspend 17 mW

Range Up to 33 ft (10 m)



QuickSpecs

Technical Specifications

Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Link Topology	
Electrical Interface	Point to Point, Multipoint Pico Nets up to 7 slaves
Bluetooth Software Supported	Full support of Bluetooth Security Provisions
Security	
Power Management	Microsoft Windows ACPI, and USB Bus Support
Power Management	Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
Certifications	
Security	All necessary regulatory approvals for supported countries, including:
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Bluetooth Profiles Supported	
Power Management	ETS 300 328, ETS 300 826
Certifications	Low Voltage Directive IEC950
	UL, CSA, and CE Mark
	Serial Port Profile (SPP) ¹
	Service Discovery Application Profile (SDAP)
	Dial-Up Networking (DUN) ^{1,2}
	Generic Object Exchange Profile (GOEP) ^{1,2}
Certifications	Object Push Profile (OPP) ^{1,2}
	File Transfer Profile (FTP)
Bluetooth Profiles Supported	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)



QuickSpecs

Technical Specifications

Broadcom 802.11 b/g/n (1x1) + Bluetooth® Combo

Wireless LAN Standards	IEEE 802.11b IEEE 802.11g IEEE 802.11n
Interoperability	Wi-Fi certified
Frequency Band	802.11b/g/n <ul style="list-style-type: none"> • 2.402 – 2.482 GHz <p>Note: The FCC has declared as of September 1, 2014 products that u passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 o otherwise disable those channels.</p>
Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 07, (20MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM,
Security¹	<ul style="list-style-type: none"> • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a 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 • 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 : +16dBm minimum • 802.11g : +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



QuickSpecs

Technical Specifications

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 Sensitivity³	802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm 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 antennas for 2.4GHz are provided to the card to support WLAN and Bluetooth communications. (Support Dual antenna or Single antenna, depend on platform requirement)
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%



QuickSpecs

Technical Specifications

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	

1. Check latest software/driver release for updates on supported security features.
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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	4.0+EDR Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	79 (1 MHz) available channels
Data Rates and Throughput	3 Mbps data rate; throughput up to 2.17 Mbps
	Synchronous Connection Oriented links up to 3, 64 kbps, voice channel:
	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

Modulation	0.01% BER	0.001% BER
GFSK	-80 dBm	-70 dBm
$\pi/4$ -DQPSK	-80 dBm	-70 dBm
8DPSK	-80 dBm	-70 dBm



QuickSpecs

Technical Specifications

Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Range	Up to 33 ft (10 m)
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Link Topology	
Electrical Interface	Point to Point, Multipoint Pico Nets up to 7 slaves
Bluetooth Software Supported	Full support of Bluetooth Security Provisions
Security	
Power Management	Microsoft Windows ACPI, and USB Bus Support
Power Management	Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
Certifications	
Security	All necessary regulatory approvals for supported countries, including:
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Bluetooth Profiles Supported	
Power Management	ETS 300 328, ETS 300 826
Certifications	Low Voltage Directive IEC950 UL, CSA, and CE Mark
Certifications	Serial Port Profile (SPP) ¹ Service Discovery Application Profile (SDAP) Dial-Up Networking (DUN) ^{1,2}
Bluetooth Profiles Supported	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}



QuickSpecs

Technical Specifications

FAX Profile (FAX)
 Basic Imaging Profile (BIP)²
 Headset Profile (HSP)
 Hands Free Profile (HFP)
 Advanced Audio Distribution Profile (A2DP)

Broadcom 802.11a/b/g/n (2x2) and Bluetooth® 4.0 Combo

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 <ul style="list-style-type: none"> • 2.402 – 2.482 GHz <p>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.</p> <p>802.11a</p> <ul style="list-style-type: none"> • 4.9 – 4.95 GHz (Japan) • 5.15 – 5.25 GHz • 5.25 – 5.35 GHz • 5.47 – 5.725 GHz • 5.825 – 5.850 GHz <p>Note: Indonesia only supports 5.725 - 5.825 GHz (CH149 - CH161)</p>
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
Security¹	<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.



QuickSpecs

Technical Specifications

	<ul style="list-style-type: none"> • 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 Power²	<ul style="list-style-type: none"> • 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 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 Sensitivity³	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)



QuickSpecs

Technical Specifications

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													
	<ol style="list-style-type: none"> 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	4.0+EDR Compliant													
Frequency Band	2402 to 2480 MHz													
Number of Available Channels	79 (1 MHz) available channels													
Data Rates and Throughput	3 Mbps data rate; throughput up to 2.17 Mbps Synchronous Connection Oriented links up to 3, 64 kbps, voice channel: 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	<table border="1"> <thead> <tr> <th>Modulation</th> <th>0.01% BER</th> <th>0.001% BER</th> </tr> </thead> <tbody> <tr> <td>GFSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td>$\pi/4$-DQPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td>8DPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> </tbody> </table>		Modulation	0.01% BER	0.001% BER	GFSK	-80 dBm	-70 dBm	$\pi/4$ -DQPSK	-80 dBm	-70 dBm	8DPSK	-80 dBm	-70 dBm
Modulation	0.01% BER	0.001% BER												
GFSK	-80 dBm	-70 dBm												
$\pi/4$ -DQPSK	-80 dBm	-70 dBm												
8DPSK	-80 dBm	-70 dBm												
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW													
Range	Up to 33 ft (10 m)													
Electrical Interface	USB 2.0 compliant													
Bluetooth Software Supported Link Topology	Microsoft Windows Bluetooth Software													
Electrical Interface Bluetooth Software Supported Security	Point to Point, Multipoint Pico Nets up to 7 slaves Full support of Bluetooth Security Provisions													
Power Management	Microsoft Windows ACPI, and USB Bus Support													
Power Management Certifications	Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff													
Security Certifications	All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249													
Bluetooth Profiles Supported														
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark													
Certifications	Serial Port Profile (SPP) ¹ Service Discovery Application Profile (SDAP) Dial-Up Networking (DUN) ^{1,2}													
Bluetooth Profiles Supported														



QuickSpecs

Technical Specifications

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)

**Realtek Ethernet
(10/100/1000)**

Ethernet Features

10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)
 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)
 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40)
 Auto-Negotiation (Automatic Speed Selection)
 Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s
 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
 Situation-sensitive features reduce power consumption
 Advanced link down power saving for reducing link down power consumption

Performance Features

TCP/IP/UDP Checksum Offload (configurable)
 Protocol Offload (ARP & NS)
 Large send offload and Giant send offload
 Receiving Side Scaling

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 to fully support ASPM L0s/L1 and CLKREQ

NIC Device Driver Name

Realtek PCIe GBE Ethernet Family Controller



QuickSpecs

Technical Specifications

AUDIO/MULTIMEDIA

DTS STUDIO SOUND™

Hardware	Implementation	Conexant
	Function Key Controls	Volume up, volume down, and mute
	Full Duplex	Yes
	Microphone In	Stereo
	Headphone/Line Out	Stereo
	Integrated Microphone	Yes, dual digital microphone array
Audio Output Quality	Frequency Response	20Hz – 20kHz
	Signal to Noise Ratio	106 dB (DAC), 102dB (ADC)
	Total Harmonic Distortion	91dB THD+n on Line Out/HP (0.003%)
	Play Sampling Rate(s)	Up to 192kHz
	Record Sampling Rate(s)	Up to 96Khz
	DAC	16, 20 or 24-bit
	ADC	16, 20 or 24-bit
	Power Rating	2 Watts



QuickSpecs

Technical Specifications

Integrated Speakers **Stereo Impedance** 4 Ohms

POWER

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	90 to 265 VAC	
	Output	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 power	45W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<8.0A
		Over voltage protection	< 29V max automatic shutdown
		Over short protection	Auto-recovery and no damage
		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%	
EMI and 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 EM Smart AC Adapter (PRC, India only)	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	
	Output	Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC
		Output power	65W
		DC output	19.5V



QuickSpecs

Technical Specifications

	Hold-up time	5 msec at 115 VAC input
	Output current limit	<11.0A
	Over voltage protection	< 29V max automatic shutdown
	Over short protection	Auto-recovery and no damage
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	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
	Over voltage protection	< 29V max automatic shutdown
	Over short protection	Auto-recovery and no damage
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.



QuickSpecs

Technical Specifications

Battery 430/440 G3

HP 4-cell, Long Life 44 WHr Li-ion

Dimensions (H x W x L)	34.96x277.2x21.63 mm (1.38x10.91x0.85 inch)	
Weight	0.32 kg (0.72lb)	
Cells/Type	4cell Lithium-Ion	
Energy	Voltage	14.8V
	Amp-hour capacity	3.0Ah
	Watt-hour capacity	44Wh
Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
	Operating (Discharging)	14° to 122° F (-10° to 60° C)
	Non-operating	-4° to 122° F (-20° to 60° C)
Battery Re-Charge Time	System in OFF or Standby Mode	<3 hours
Fuel Gauge LED	No	
Warranty	1 year	
Optional Travel Battery Available	No	

HP 6-cell, Long Life 55 WHr Li-ion.	Dimensions (H x W x L)	35.31x49.59x277.2	
	Weight	340g	
	Cells/Type	Cylindrical ICR18650 C4	
	Energy	10.68V	Voltage
		5.15Ah	Amp-hour capacity
		55Wh	Watt-hour capacity
	Temperature	32° to 113° F (0° to 45° C)	Operating (Charging)
		14 to 140° F (-10° to 60° C)	Operating (Discharging)
		-4° to 140° F (-20° to 60° C)	Non-operating
	Battery Re-Charge Time	3 hours	System in OFF or Standby Mode
		3 to 5 hours	System ON
	Fuel Gauge LED	NA	



QuickSpecs

Technical Specifications

Warranty	3years or 1000 cycles*
Optional Travel Battery Available	NA

*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>.

450/470 G3

HP 4-cell, Long Life 44 WHr Li-ion

Dimensions (H x W x L)	33.40*275.80*20.60 mm (1.32x10.86x0.81 inch)
Weight	0.3 kg (0.66lb)
Cells/Type	4cell Lithium-Ion
Energy	Voltage 14.8V
	Amp-hour capacity 3.0Ah
	Watt-hour capacity 44Wh
Temperature	Operating (Charging) 32° to 113° F (0° to 45° C)
	Operating (Discharging) 14° to 122° F (-10° to 60° C)
	Non-operating -4° to 122° F (-20° to 60° C)
Battery Re-Charge Time	System in OFF or Standby Mode <3 hours
Fuel Gauge LED	No
Warranty	1 year
Optional Travel Battery Available	No

Dimensions (H x W x L) 45.59x275.8x33.89



QuickSpecs

Technical Specifications

Weight	330g	
Cells/Type	Cylindrical ICR18650 C4	
Energy	10.68V	Voltage
HP 6-cell, Long Life 55 WHr Li-ion	5.15Ah	Amp-hour capacity
	55Wh	Watt-hour capacity
Temperature	32° to 113° F (0° to 45° C)	Operating (Charging)
	14 to 140° F (-10° to 60° C)	Operating (Discharging)
	-4° to 140° F (-20° to 60° C)	Non-operating
Battery Re-Charge Time	3 hours	System in OFF or Standby Mode
	3 to 5 hours	System ON
Fuel Gauge LED	NA	
Warranty	3years or 1000 cycles*	
Optional Travel Battery Available	NO	

*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>.

Country of Origin

China

ENVIRONMENTAL



QuickSpecs

Technical Specifications

HP ProBook 430 G3 Notebook PC

**Eco-Label
Certifications
& declarations**

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- IT ECO declaration
- EPEAT (Gold) registered in the United States. See <http://www.epeat.net> for registration status in your country.
-

**System
Configuration**

The configuration used for the Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.

Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
Normal Operation (Short idle)	23 BTU/hr	24 BTU/hr	24 BTU/hr
Normal Operation (Long idle)	13 BTU/hr	13 BTU/hr	13 BTU/hr
Sleep	2 BTU/hr	2 BTU/hr	2 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 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	2.9	22
Fixed Disk – Random writes	3.0	21

**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:

- 3 USB ports
- 1 PC card slot (type I/II)
- 1 ExpressCard/54 slot
- 1 IEEE 1394 Port
- 2 SODIMM memory slots
- Optional expansion base docking station
- 1 multi-bay II storage port
- Interchangeable HDD??



QuickSpecs

Technical Specifications

<edit list of features as required>

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 than 1ppm by weight
- Cadmium greater than 20ppm by weight

Battery size: CR2032 (coin cell)

Battery type: Lithium

Battery size: 6-cell high capacity Lithium-Ion battery (optional 8 cell available)

Battery type:

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the <gold> level, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product contains 0% post-consumer recycled plastic (by wt.)
- This product is 95.6% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	337.2 g
Internal:	PLASTIC/EPE (Expanded Polyethylene)	22 g
	PLASTIC/Polyethylene low density	20 g

The PAPER/Corrugated packaging material is made from 80 % recycled content.

The PLASTIC/EPE (Expanded Polyethylene) packaging materials contains at least 0% recycled content.

The PLASTIC/Polyethylene low density packaging materials contains at least 0% 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>):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins



QuickSpecs

Technical Specifications

- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging Usage

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling

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.

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.



QuickSpecs

Technical Specifications

**Hewlett-Packard
Corporate
Environmental
Information**

For more information about HP's commitment to the environment:

Global Citizenship Report

<http://www.hp.com/hpinfo/globalcitizenship/qcreport/index.html>

Eco-label certifications

<http://www8.hp.com/us/en/hp-information/environment/ecolabels.html>

ISO 14001 certificates:

http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf

and

<http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf>

HP ProBook 440 G3 Notebook PC

**Eco-Label
Certifications &
declarations**

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- IT ECO declaration
- EPEAT (Gold) registered in the United States. See <http://www.epeat.net> for registration status in your country.
-

System Configuration

The configuration used for the Declared Noise Emissions data for the Notebook model is based on a "Typically Configured Notebook".

HP ProBook 450 G3 Notebook PC

**Eco-Label
Certifications &
declarations**

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- IT ECO declaration
- EPEAT (Gold) registered in the United States. See <http://www.epeat.net> for registration status in your country.
-

**System
Configuration**

The configuration used for the Declared Noise Emissions data for the Notebook model is based on a "Typically Configured Notebook".

**Heat
Dissipation***

Normal
Operation
(Short idle)
Normal
Operation
(Long idle)
Sleep

115VAC, 60Hz

19 BTU/hr

12 BTU/hr

3 BTU/hr

230VAC, 50Hz

20 BTU/hr

13 BTU/hr

3 BTU/hr

100VAC, 60Hz

19 BTU/hr

12 BTU/hr

3 BTU/hr



QuickSpecs

Technical Specifications

Off	1 BTU/hr	1 BTU/hr	1 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)

Typically Configured – Idle
Fixed Disk – Random writes

Sound Power (L_{WAd}, bels)

2.8

2.7

Sound Pressure (L_{pAm}, decibels)

18

19

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:

- 3 USB ports
- 1 PC card slot (type I/II)
- 1 ExpressCard/54 slot
- 1 IEEE 1394 Port
- 2 SODIMM memory slots
- Optional expansion base docking station
- 1 multi-bay II storage port
- Interchangeable HDD??

<edit list of features as required>

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
Battery size: 6-cell high capacity Lithium-Ion battery (optional 8 cell available)
Battery type:



QuickSpecs

Technical Specifications

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the <gold> level, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product contains 0% post-consumer recycled plastic (by wt.)
- This product is 90.1% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	378 g
Internal:	PLASTIC/EPE (Expanded Polyethylene)	25.7 g
	PLASTIC/Polyethylene low density	20 g

The PAPER/Corrugated packaging material is made from 80 % recycled content.

The PLASTIC/EPE (Expanded Polyethylene) packaging materials contains at least 0% recycled content.

The PLASTIC/Polyethylene low density packaging materials contains at least 0% 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/qse.pdf>):

- 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, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)



QuickSpecs

Technical Specifications

Packaging Usage

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling

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.

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.

Hewlett-Packard Corporate Environmental Information

For more information about HP's commitment to the environment:

Global Citizenship Report

<http://www.hp.com/hpinfo/globalcitizenship/qcreport/index.html>

Eco-label certifications

<http://www8.hp.com/us/en/hp-information/environment/ecolabels.html>

ISO 14001 certificates:

http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf

and

<http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf>

HP ProBook 470 G3 Notebook PC

Eco-Label Certifications & declarations

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- IT ECO declaration
- EPEAT (Gold) registered in the United States. See <http://www.epeat.net> for registration status in your country.
-

System Configuration

The configuration used for the Declared Noise Emissions data for the Notebook model is based on a "Typically Configured Notebook".



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Technical Specifications

Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
Normal Operation (Short idle)	26 BTU/hr	27 BTU/hr	26 BTU/hr
Normal Operation (Long idle)	23 BTU/hr	23 BTU/hr	22 BTU/hr
Sleep	2 BTU/hr	3 BTU/hr	2 BTU/hr
Off	1 BTU/hr	2 BTU/hr	1 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_{WA}d, bels)	Sound Pressure (L_{pAm}, decibels)
Typically Configured – Idle	3.2	24
Fixed Disk – Random writes	3.0	24

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:

- 3 USB ports
- 1 PC card slot (type I/II)
- 1 ExpressCard/54 slot
- 1 IEEE 1394 Port
- 2 SODIMM memory slots
- Optional expansion base docking station
- 1 multi-bay II storage port
- Interchangeable HDD??

<edit list of features as required>

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



QuickSpecs

Technical Specifications

Batteries used in the product do not contain:
 Mercury greater than 1ppm by weight
 Cadmium greater than 20ppm by weight

Battery size: CR2032 (coin cell)
 Battery type: Lithium
 Battery size: 6-cell high capacity Lithium-Ion battery (optional 8 cell available)
 Battery type:

Additional Information

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- 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 90.1% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugate	423 g
	d	
Internal:	PLASTIC/EPE	23 g
	(Expanded Polyethylene)	
	PLASTIC/Polyethylene low density	20 g

The PAPER/Corrugated packaging material is made from 80 % recycled content.
 The PLASTIC/EPE (Expanded Polyethylene) packaging materials contains at least 0% recycled content.
 The PLASTIC/Polyethylene low density packaging materials contains at least 0% 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/qse.pdf>:

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- Lead and Lead compounds
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Technical Specifications

- Ozone Depleting Substances
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- Polybrominated Biphenyl Ethers (PBBEs)
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- Polychlorinated Biphenyl (PCB)
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ISO 14001 certificates:

http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf

and

<http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf>



QuickSpecs

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

Type	Description	Part #
Cases	HP Essential Top Load Case	H2W17AA
	HP Essential Backpack (up to 15.6")	H1D24AA
	HP Essential Messenger Case (up to 17.3")	H1D25AA
	HP Business Backpack (up to 17.3")	H5M90AA
	HP Business Case(up to 15.6")	H5M92AA
Docking	HP 3001pr USB 3 Port Replicator	F3S42AA
	HP 3005pr USB 3.0 Port Replicator	H1L08AA
Input/Output – Mice	HP Adjustable Display Stand	AW663AA
	HP Stylish USB Keyboard and Mouse	H4B80AA
	HP Stylish Wireless Keyboard and Mouse	H4B79AA
	HP 2.4 GHz Keyboard and Mouse	G1K29AA
	HP Ultra Mobile Wireless Mouse	H6F25AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP USB Travel Mouse	G1K28AA
	HP Ultrathin Wireless Mouse	L9V78AA
	HP Conferencing Keyboard	K8P74AA
	HP Speaker Phone	K7V16AA
	HP Wired Headset	K7V17AA
	HP HDMI to DVI Adapter	F5A28AA
	HP Wireless Display Adapter	J1V25AA
	Power	HP 45W Smart AC Adapter 4.5mm
HP 65W Smart AC Adapter		H6Y89AA
HP 65W Slim AC Adapter		H6Y82AA
HP Power Bank		N9F71AA
Storage	HP External USB Optical Drive	F2B56AA
	HP 500GB 7200rpm HDD	F3B97AA
Security	HP External Portable USB3.0 HDD	K6A93AA
	HP UltraSlim Keyed Cable Lock	H4D73AA
	HP USB Smart Card Reader	F6V67AA
Displays	HP 14.0" NB Privacy Filter	J6E65AA
	HP ProDisplay P242va 24-inch Monitor	K7X32AA
	HP EliteDisplay E222 21.5-inch Monitor	M1N96AA
	HP EliteDisplay E240 23.8-inch Monitor	M1N99AA
	HP EliteDisplay E240c 23.8-inch Monitor	M1P00AA
	HP EliteDisplay S270c 27-inch Curved Display	K1M38AA



QuickSpecs

Summary of Changes

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