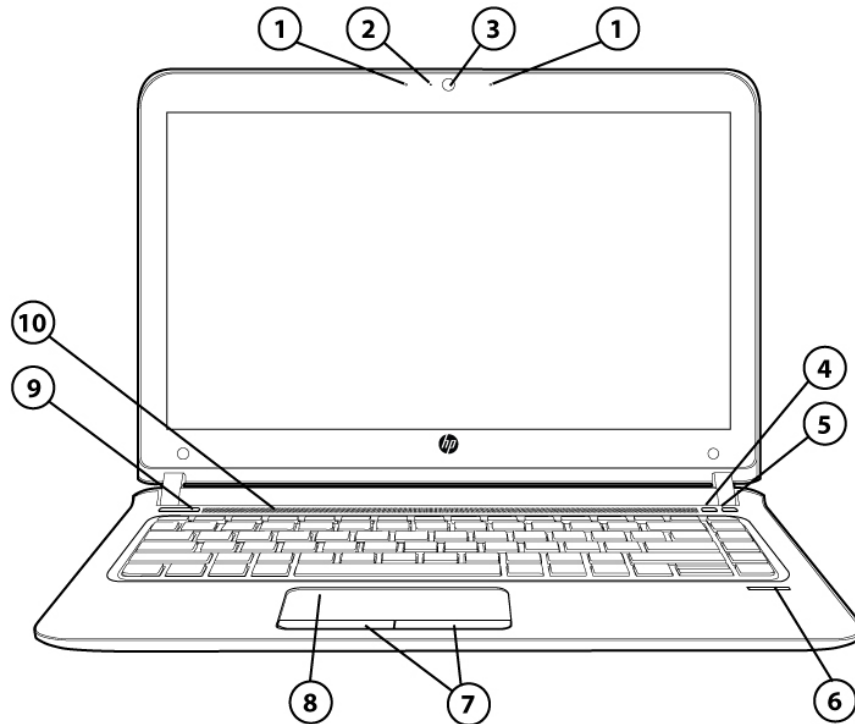


# QuickSpecs

## Overview

### HP ProBook 430 G3 Notebook PC



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

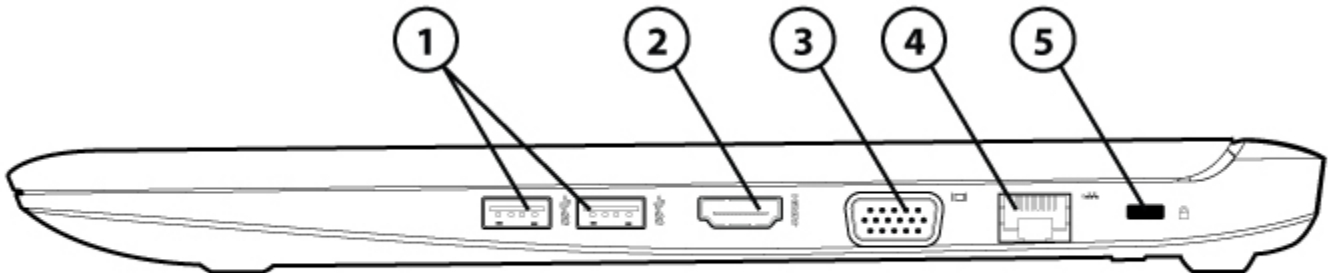
#### Front

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



# QuickSpecs

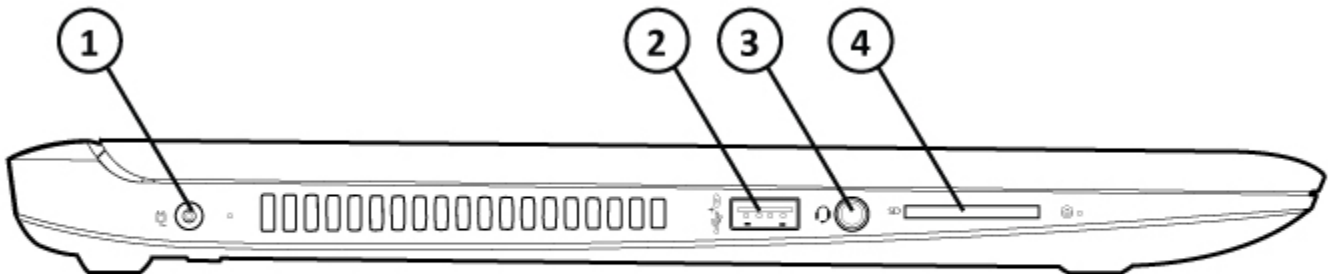
## Overview



- 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

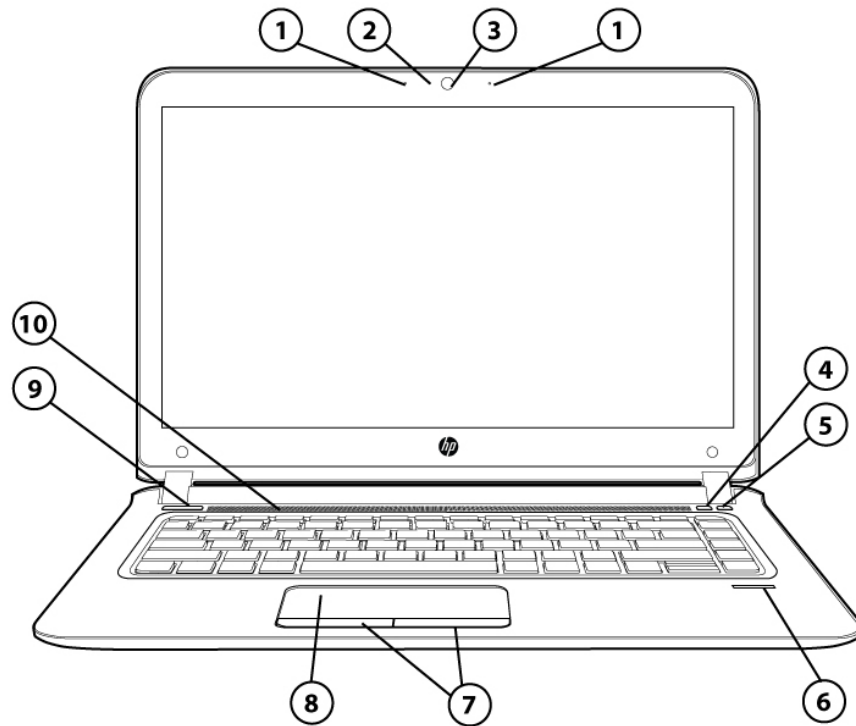
- 3. Headphone/Microphone combo jack
- 4. SD Card reader



# 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

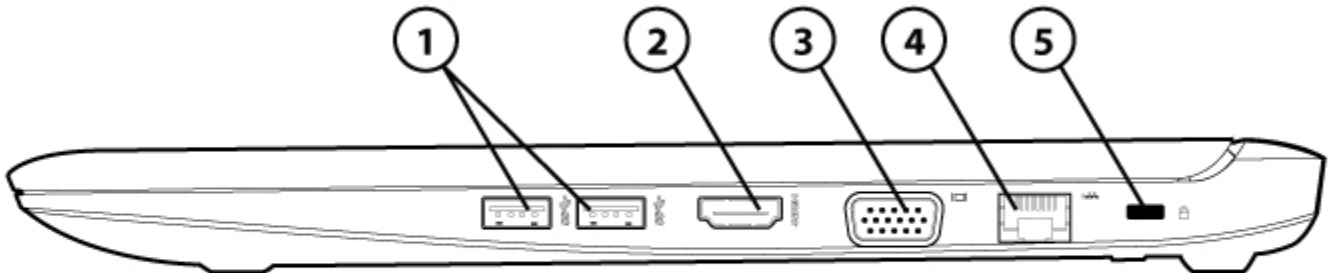
#### Front

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



# QuickSpecs

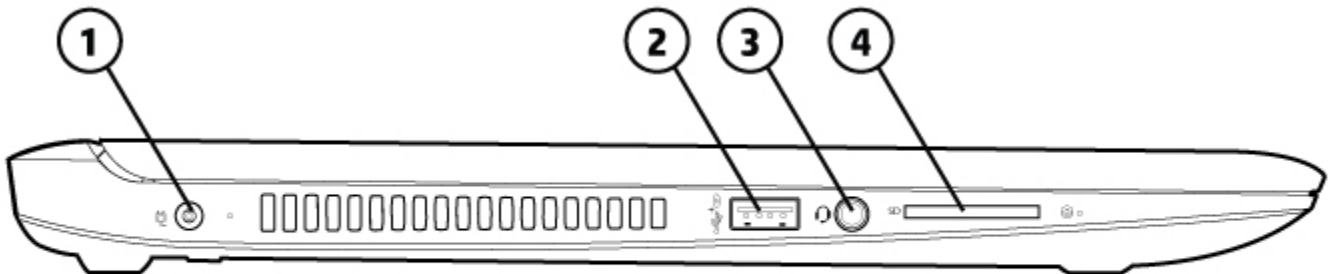
## Overview



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

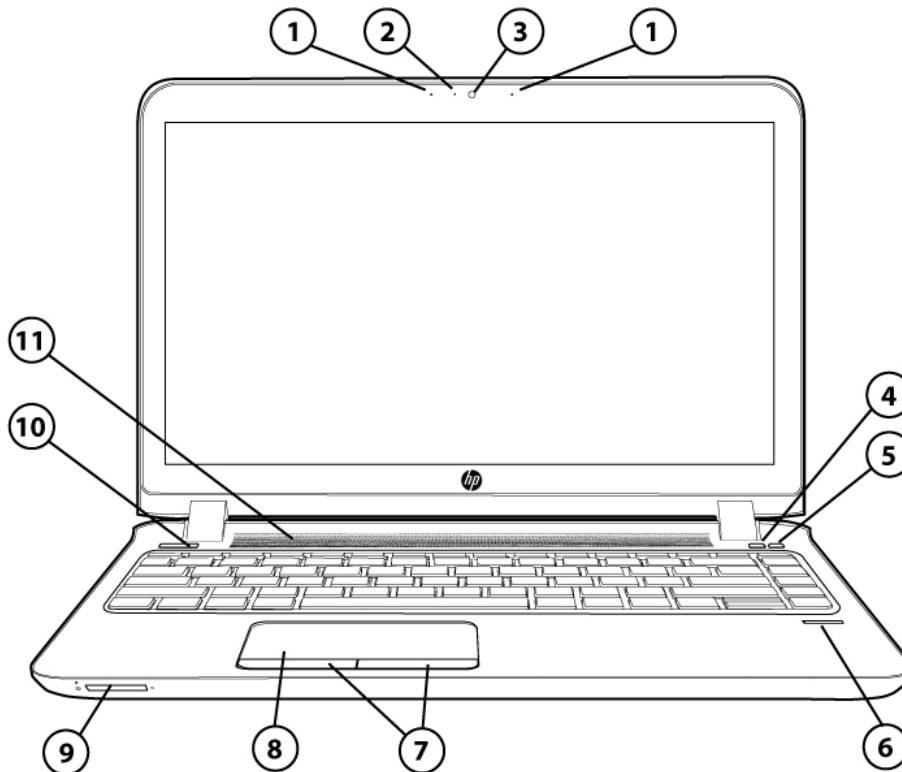
3. Headphone/Microphone combo jack
4. SD Card reader



# 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

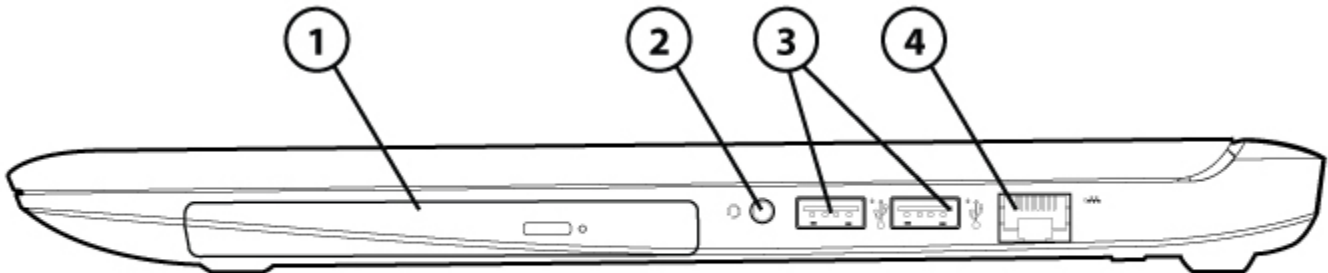
#### Front

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



# QuickSpecs

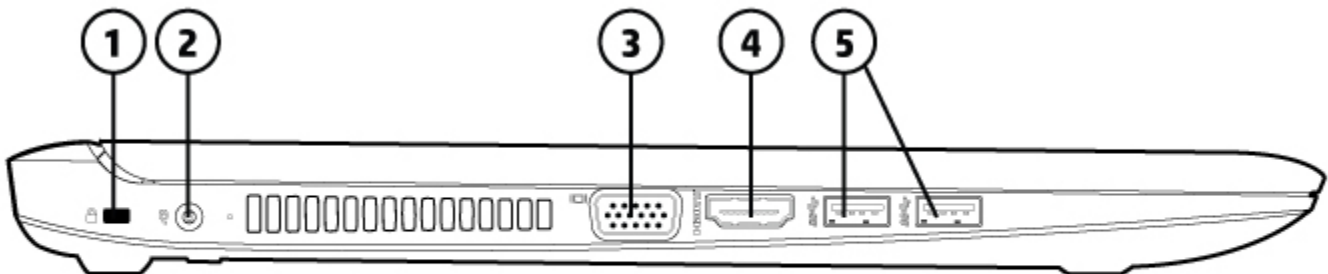
## Overview



- 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

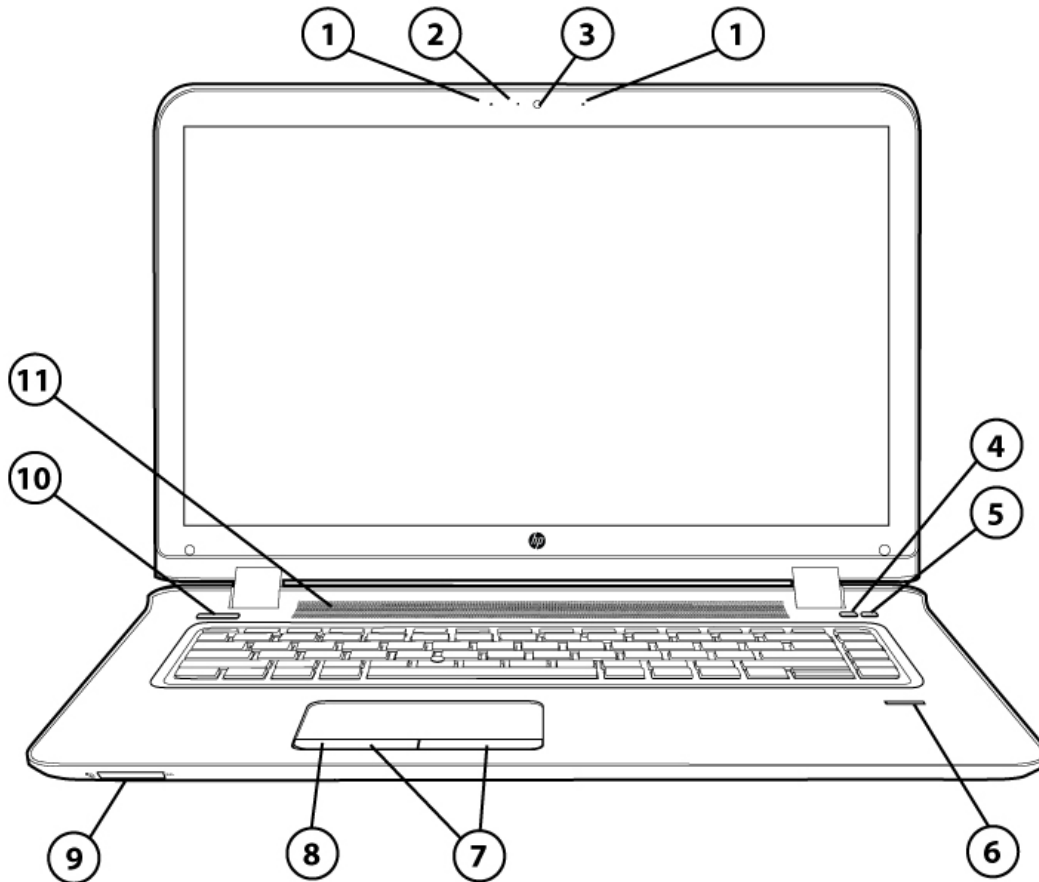
- 4. HDMI port
- 5. USB 3.0 ports (2)



# QuickSpecs

## Overview

### HP ProBook 470 G3 Notebook PC



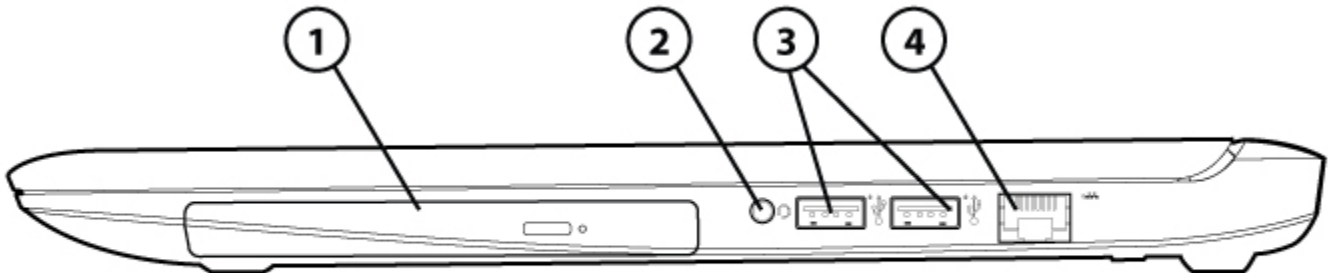
#### Front

- |                           |                          |
|---------------------------|--------------------------|
| 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

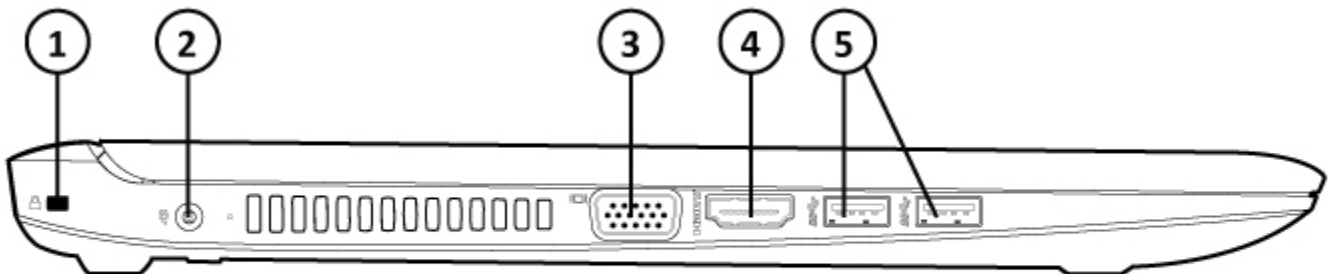
## Overview



- 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 life
  - 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 testing<sup>1</sup>

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 64<sup>1</sup>
- Windows 10 Home 64<sup>1</sup>
- Windows 8.1 Pro 64<sup>1</sup>
- Windows 8.1 64<sup>1</sup>
- Windows 7 Professional 64 (available through downgrade rights from Windows 10 Pro)<sup>2</sup>
- Windows 7 Professional 32 (available through downgrade rights from Windows 10 Pro)<sup>2</sup>
- Windows 7 Professional 64<sup>1</sup>
- Windows 7 Professional 32<sup>1</sup>
- FreeDOS 2.0

**Web only support**

- Windows 10 Enterprise 64<sup>1</sup>
- Windows 8.1 Enterprise 64<sup>1</sup>
- Windows 7 Enterprise 64<sup>1</sup>
- Windows 7 Enterprise 32<sup>1</sup>

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)<sup>1,2</sup>  
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)<sup>1,2</sup>  
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)<sup>1,2</sup>  
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)<sup>1,2</sup>  
Intel® Core™ i3-6100U with Intel® HD Graphics 520 (2.3 GHz, 3 MB cache, 2 cores)<sup>1,2</sup>  
Intel® Pentium® 4405U with Intel® HD Graphics 510 (2.1 GHz, 2 MB cache, 2 cores)<sup>1,2</sup>



# QuickSpecs

## Technical Specifications

### HP ProBook 440 G3

Intel® Core™ i3-6006U Intel® HD Graphics 520 (2.0GHz, 3MB L3 Cache, 2 core)<sup>1,2</sup>

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)<sup>1,2</sup>

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)<sup>1,2</sup>

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)<sup>1,2</sup>

Intel® Core™ i3-6100U with Intel® HD Graphics 520 (2.3 GHz, 3 MB cache, 2 cores)<sup>1,2</sup>

Intel® Pentium® 4405U with Intel® HD Graphics 510 (2.1 GHz, 2 MB cache, 2 cores)<sup>1,2</sup>

### 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)<sup>1,2</sup>

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)<sup>1,2</sup>

Intel® Core™ i3-6100U with Intel® HD Graphics 520 (2.3 GHz, 3 MB cache, 2 cores)<sup>1,2</sup>

Intel® Pentium® 4405U with Intel® HD Graphics 510 (2.1 GHz, 2 MB cache, 2 cores)<sup>1,2</sup>

### 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)<sup>1,2</sup>

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)<sup>1,2</sup>

Intel® Core™ i3-6100U with Intel® HD Graphics 520 (2.3 GHz, 3 MB cache, 2 cores)<sup>1,2</sup>

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 520<sup>1</sup>

Intel® HD Graphics 510<sup>1</sup>

**NOTE:** View processor section for details.

### Discrete<sup>2</sup>



# QuickSpecs

## Technical Specifications

### HP ProBook 440/450/470 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 HD<sup>1</sup> anti-glare LED-backlit (1366 x 768)

#### Touch

13.3" diagonal HD<sup>1</sup> 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 HD<sup>1</sup> anti-glare LED-backlit (1366 x 768)

14" diagonal full HD<sup>1</sup> anti-glare slim LED-backlit (1920 x 1080)

#### Touch

14" diagonal HD<sup>1</sup> 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 HD<sup>1</sup> anti-glare flat LED-backlit (1366 x 768)

15.6" diagonal full HD<sup>1</sup> anti-glare slim LED-backlit (1920 x 1080)

#### Touch

15.6" diagonal HD<sup>1</sup> 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+<sup>1</sup> 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 Hard Drive

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 Hard Drive

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

#### Solid State Drives



# QuickSpecs

## Technical Specifications

128/256 GB\* M2 Solid State 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

**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 Optional<sup>1</sup> External USB Drive CD/DVD R/RW

### **HP ProBook 450 and 470 G3**

#### **Fixed Optional<sup>1</sup> Optical Drive**

9.5mm SATA:

DVD-ROM<sup>1</sup>

DVD+/-RW SuperMulti DL Drive<sup>1,2</sup>

Blu-ray ROM DVD+/-RW SuperMulti DL Drive<sup>1,2</sup>

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

DDR3L PC3-12800 (Transfer rates up to 1600 MT/s)

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

Supports Dual Channel Memory

### **Standard**

2048 MB Total System Memory (2048 MB x 1)

4096 MB Total System Memory (4096 MB x 1)

6144 MB Total System Memory (4096 MB + 2048 MB) (Dual Channel)

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



# QuickSpecs

## Technical Specifications

### 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.

## NETWORKING/COMMUNICATIONS

### HP ProBook 430 G3

#### Broadband Wireless (WWAN)<sup>1,2</sup>

HP hs3110 HSPA+ Mobile Broadband

HP lt4110 LTE/HSPA+ 4G Mobile Broadband<sup>3</sup>

#### Wireless LAN (WLAN)<sup>1,2</sup>

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)<sup>1,2</sup>

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

#### Broadband Wireless (WWAN)<sup>1,2</sup>

HP hs3110 HSPA+ Mobile Broadband

HP lt4110 LTE/HSPA+ 4G Mobile Broadband<sup>3</sup>

#### Wireless LAN (WLAN)<sup>1</sup>

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)<sup>1,2</sup>

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



# QuickSpecs

## Technical Specifications

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)

**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

Optional<sup>1</sup> 720p HD<sup>2</sup> webcam<sup>3</sup>

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





# QuickSpecs

## Technical Specifications

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

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 BIOSphere<sup>1</sup>

HP DriveLock | HP Automatic DriveLock



# QuickSpecs

## Technical Specifications

HP BIOS Protection<sup>2</sup>  
Master Boot Record Security  
Power On Authentication  
Pre-Boot Security  
Secure Erase<sup>3</sup>  
Hybrid Boot (Windows 8.1 & later)  
Measure Boot (Windows 8.1 & later)  
Secure Boot (Windows 8.1 & later)  
Absolute Persistence Module<sup>4</sup>

### Multi Media

Cyberlink Power DVD, BD  
Cyberlink Power2Go (Secure Burn)  
Cyberlink YouCam BE (Windows 7 only)

### Communication

HP GPS and Location (Windows 7 only)<sup>5</sup>  
HP Connection Manager with support for HP Mobile Connect (Windows 7 only)<sup>6</sup>  
HP Mobile Connect (Windows 8.1 & later)<sup>6</sup>  
Native Miracast Support<sup>8</sup>

### HP Value Add Software

HP 3D DriveGuard  
HP ePrint Driver<sup>9</sup>  
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

### 3<sup>rd</sup> Party

Foxit PhantomPDF Express for HP

### Microsoft Products

Buy Office  
Bing Search  
Skype for Business certification<sup>10</sup>



# QuickSpecs

## Technical Specifications

### Manageability

HP Driver Packs<sup>11</sup>  
HP SoftPaq Download Manager (SDM)  
HP System Software Manager (SSM)<sup>11</sup>  
HP BIOS Config Utility (BCU)<sup>11</sup>  
HP Client Catalog<sup>11</sup>  
HP CIK for Microsoft SCCM<sup>11</sup>  
LANDESK Management<sup>12</sup>

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

### Client Security Software

Absolute Persistence Module  
HP Drive Encryption<sup>13</sup>  
HP Security Manager  
Microsoft Security Essentials<sup>14</sup>  
Microsoft Defender

### Security

Pre-boot Authentication  
Security lock slot (Lock sold separately.)  
Optional<sup>15</sup> Fingerprint Reader  
TPM 1.2/2.0<sup>16</sup>

**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. BIOS adheres to NIST SP800-147
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.



# QuickSpecs

## Technical Specifications

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 <http://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 <http://www.hp.com/go/eprintcenter>). Requires optional broadband module. Broadband use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Separately purchased data plans or usage fees may apply. Print times and connection speeds may vary.
10. Skype is not offered in China.
11. Not preinstalled, however available on manageability website.
12. Subscription required.
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.
16. This product ships with TPM 1.2 with option to upgrade to TPM 2.0. Upgrade utility is expected to be available by the second half of 2016 via HP Customer Support.

## 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
- Optional<sup>1</sup> HP 4-cell, Long Life 40 WHr Li-ion
- Optional<sup>1</sup> HP 6-cell, Long Life 55 WHr Li-ion
- (HP Fast Charge is available on 6-cell battery only.)

1. Sold separately as an optional feature.

### 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 <sup>1</sup>	N/A



# QuickSpecs

## Technical Specifications

	DDR3/Windows 8.1	6 cell (55Whr)	Up to 13 hrs <sup>1</sup>	N/A
	DDR4/Windows 10	4 cell (44Whr)	Up to 10 hrs 15mins <sup>1</sup>	N/A
	DDR4/Windows 10	6 cell (55Whr)	Up to 14 hrs 45 mins <sup>1</sup>	N/A
<b>HP Probook 440 G3</b>	DDR3/Windows 8.1	4 cell (44Whr)	Up to 9 hrs <sup>1</sup>	Up to 9 hrs <sup>1</sup>
	DDR3/Windows 8.1	6 cell (55Whr)	Up to 12 hrs 30 mins <sup>1</sup>	Up to 12 hrs 30 mins <sup>1</sup>
	DDR4/Windows 10	4 cell (44Whr)	Up to 9 hrs 30 mins <sup>1</sup>	Up to 9 hrs 30 mins <sup>1</sup>
	DDR4/Windows 10	6 cell (55Whr)	Up to 13 hrs 30 mins <sup>1</sup>	Up to 13 hrs 15 mins <sup>1</sup>
<b>HP Probook 450 G3</b>	DDR3/Windows 8.1	4 cell (44Whr)	Up to 8 hrs 30 mins <sup>1</sup>	Up to 8 hrs 30 mins <sup>1</sup>
	DDR3/Windows 8.1	6 cell (55Whr)	Up to 11 hrs 45 mins <sup>1</sup>	Up to 12 hrs <sup>1</sup>
	DDR4/Windows 10	4 cell (44Whr)	Up to 9 hrs 15 mins <sup>1</sup>	Up to 9 hrs 15 mins <sup>1</sup>
	DDR4/Windows 10	6 cell (55Whr)	Up to 13 hrs 15 mins <sup>1</sup>	Up to 13 hrs 15 mins <sup>1</sup>
<b>HP Probook 470 G3</b>	DDR3/Windows 8.1	4 cell (44Whr)	N/A	Up to 9 hrs <sup>1</sup>
	DDR3/Windows 8.1	6 cell (55Whr)	N/A	Up to 11 hrs 30 mins <sup>1</sup>
	DDR4/Windows 10	4 cell (44Whr)	N/A	Up to 9 hrs <sup>1</sup>
	DDR4/Windows 10	6 cell (55Whr)	N/A	Up to 12 hrs 15 mins <sup>1</sup>

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](http://www.bapco.com) for additional details.

### System Standby Time

<b>4-cell (44 WHr) battery</b>	Up to 15 days
<b>6-cell (55 WHr) long life battery</b>	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.



# QuickSpecs

## Technical Specifications

### 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

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



# QuickSpecs

## Technical Specifications

### 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

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. Optional<sup>1</sup> HP Services<sup>2</sup> 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



# QuickSpecs

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

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## Technical Specifications

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

<b>Stand-Alone Power Requirements (AC Power)</b>	<b>Nominal Operating Voltage</b>	<b>Average Operating Power</b>	<b>19 V Win 7</b>	<b>Win8</b>	<b>Max</b>
	<b>ProBook 440</b>	Integrated graphics	6.78W	6.78W	38.88W
		Discrete graphics	4.49W	4.49W	31.87W
	<b>ProBook 450</b>	Integrated graphics	8.89W	8.89W	39.33W
		Discrete graphics	6.79W	6.79W	38.42W
	<b>ProBook 470</b>	Discrete graphics	5.71W	5.71W	23.56W
	<b>Max Operating Power</b>				
			Discrete < 90W		
			UMA < 65W		
<b>Temperature</b>	<b>Operating</b>		32° to 95° F (0° to 35° C) (not writing optical)		
			41° to 95° F (5° to 35° C) (writing optical)		
	<b>Non-operating</b>		-4° to 140° F (-20° to 60° C)		
<b>Relative Humidity</b>	<b>Operating</b>		10% to 90%, non-condensing		
	<b>Non-operating</b>		5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature		
<b>Shock</b>	<b>Operating</b>		40 G, 2 ms, half-sine		
	<b>Non-operating</b>		200 G, 2 ms, half-sine		
<b>Random Vibration</b>	<b>Operating</b>		0.75 grms		
	<b>Non-operating</b>		1.50 grms		
<b>Altitude (unpressurized)</b>	<b>Operating</b>		-50 to 10,000 ft (-15.24 to 3,048 m)		
	<b>Non-operating</b>		-50 to 40,000 ft (-15.24 to 12,192 m)		
<b>Planned Industry Standard Certifications</b>	<b>UL</b>		Yes		
	<b>CSA</b>		Yes		
	<b>FCC Compliance</b>		Yes		
	<b>ENERGY STAR 6.0®</b>		Select models*		
	<b>EPEAT</b>		Registered Gold in United States**		
	<b>ICES</b>		Yes		
	<b>Australia / NZ A-Tick Compliance</b>		Yes		
	<b>CCC</b>		Yes		
	<b>Japan VCCI Compliance</b>		Yes		
	<b>KC</b>		Yes		
	<b>BSMI</b>		Yes		
	<b>CE Marking Compliance</b>		Yes		
	<b>BNCI or BELUS</b>		Yes		
	<b>CIT</b>		Yes		
	<b>GOST</b>		Yes		
	<b>Saudi Arabian Compliance (ICCP)</b>		Yes		
	<b>SABS</b>		Yes		
	<b>UKRSERTCOMPUTER</b>		Yes		

\* Configurations of the HP ProBook 430 G3, HP ProBook 440 G3, HP ProBook 450 G3 and HP ProBook 470 G3 that are ENERGY STAR® qualified are identified as HP ProBook 430 G3 ENERGY STAR, HP ProBook 440 G3 ENERGY STAR, HP ProBook 450 G3 ENERGY STAR and HP ProBook 470 G3 ENERGY STAR on HP websites and on <http://www.energystar.gov>.

\*\* EPEAT® registration varies by country. See <http://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>.



# QuickSpecs

## Technical Specifications

### DISPLAYS

<b>13.3" diagonal HD1 anti-glare LED-backlit (1366 x 768)</b>	<b>Outline Dimensions (W x H x D)</b>	314.6 x 189.2 mm max. (w/ bracket & PCB) D(Flat): 3.6mm max. D(Slim): 3.0mm max.
	<b>Active Area</b>	293.42 x 164.97 mm
	<b>Weight</b>	Flat: 290g max. Slim: 260 max.
	<b>Diagonal Size</b>	13.3"
	<b>Surface Treatment</b>	Anti-glare
	<b>Contrast Ratio</b>	300:1 (typ)
	<b>Refresh Rate</b>	60Hz
	<b>Brightness</b>	220 nit typ
	<b>Pixel Resolution</b>	1366 x 768 (HD)
	<b>Interface</b>	eDP 1.2 (1 lane)
	<b>LCD Mode</b>	SVA
	<b>PPI</b>	118
	<b>Viewing Angle</b>	SVA 45/45/25/35
<b>14" diagonal FHD anti-glare flat LED backlit (1920 x 1080)</b>	<b>Outline Dimensions (W x H x D)</b>	320.9x205.6x3.0mm max (panel + PCBA)
	<b>Active Area</b>	309.14x173.89
	<b>Weight</b>	290g max. (To be updated w/ real measure data)
	<b>Diagonal Size</b>	14.0"
	<b>Surface Treatment</b>	Anti-glare
	<b>Contrast Ratio</b>	300:1 (typ) - AG
	<b>Refresh Rate</b>	60Hz
	<b>Brightness</b>	220 nit typ
	<b>Pixel Resolution</b>	1920 x 1080 (FHD)
	<b>Interface</b>	eDP 1.2 (2 lane)
	<b>LCD Mode</b>	SVA
	<b>PPI</b>	157
	<b>Viewing Angle</b>	SVA 45/45/25/35
<b>14" diagonal LED HD (1366 x 768) anti-glare</b>	<b>Dimensions (W x H)</b>	12.63 x 7.39 in (32.09 x 18.76 cm)
	<b>Weight</b>	320g max.
	<b>Diagonal Size</b>	14.0 in (35.6cm)
	<b>Surface Treatment</b>	Anti-glare
	<b>Contrast Ratio</b>	400:1 (typical)



# QuickSpecs

## Technical Specifications

<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	220 nit (typical)
<b>Pixel Resolution</b>	<b>Pitch</b> 0.227 mm
	<b>Format</b> 1366 x 768
	<b>Configuration</b> RGB Stripe
<b>Backlight</b>	LED
<b>PPI</b>	112 ppi
<b>Viewing Angle</b>	±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)**

<b>Outline Dimensions (W x H x D)</b>	360.0 x 224.3 x 3.8mm max.
<b>Active Area</b>	344.2 x 193.5
<b>Weight</b>	420 max.
<b>Diagonal Size</b>	15.6"
<b>Surface Treatment</b>	Anti-glare
<b>Contrast Ratio</b>	300:1 (typ) - AG
<b>Refresh Rate</b>	60Hz
<b>Brightness</b>	220 nit typ
<b>Pixel Resolution</b>	1366 x 768 (HD)
<b>Interface</b>	eDP 1.2 (1 lane)
<b>LCD Mode</b>	SVA
<b>PPI</b>	101
<b>Viewing Angle</b>	SVA 40/40/15/30

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

<b>Outline Dimensions (W x H x D)</b>	360.0 x 224.3 x 3.2mm max.
<b>Active Area</b>	344.16 x 193.59
<b>Weight</b>	370g max.
<b>Diagonal Size</b>	15.6"
<b>Surface Treatment</b>	Anti-glare
<b>Contrast Ratio</b>	300:1 (typ) - AG
<b>Refresh Rate</b>	60Hz
<b>Brightness</b>	220 nit typ
<b>Pixel Resolution</b>	1920 x 1080 (FHD)



# QuickSpecs

## Technical Specifications

<b>Interface</b>	eDP 1.2 (2 lane)
<b>LCD Mode</b>	SVA
<b>PPI</b>	142
<b>Viewing Angle</b>	SVA 45/45/25/35

<b>17.3" diagonal HD+1 SVA anti-glare flat LED backlit (1600 x 900)</b>	<b>Outline Dimensions (W x H x D)</b>	398.6 x 251 x 4.0 (max.) mm
	<b>Active Area</b>	382.08 x 214.92 mm
	<b>Weight</b>	550g max.
	<b>Diagonal Size</b>	17.3"
	<b>Surface Treatment</b>	Anti-glare
	<b>Contrast Ratio</b>	300:1 (typ)
	<b>Refresh Rate</b>	60Hz
	<b>Brightness</b>	220 nit typ
	<b>Pixel Resolution</b>	1600 x 900 (HD+)

<b>Interface</b>	eDP1.3 w/o PSR (2-lane)
<b>LCD Mode</b>	SVA
<b>PPI</b>	106
<b>Viewing Angle</b>	40/40/15/30 (typ)

<b>17.3" diagonal FHD anti-glare flat LED backlit (1920 x 1080)</b>	<b>Outline Dimensions (W x H x D)</b>	400 x 233.3 x 4.0 (max.) mm
	<b>Active Area</b>	381.888 x 214.812
	<b>Weight</b>	550g max.
	<b>Diagonal Size</b>	17.3"
	<b>Surface Treatment</b>	Anti-glare
	<b>Contrast Ratio</b>	600:1 (typ)
	<b>Refresh Rate</b>	60Hz
	<b>Brightness</b>	300 nit typ
	<b>Pixel Resolution</b>	1920 x 1080 (FHD)

<b>Interface</b>	eDP1.3 w/o PSR (2-lane)
<b>LCD Mode</b>	UWVA
<b>PPI</b>	128
<b>Viewing Angle</b>	85/85/85/85 (typ)



# QuickSpecs

## Technical Specifications

### STORAGE AND DRIVES

<b>500 GB* 5400 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	0.22 lb (101 g)
	<b>Capacity</b>	500 GB
	<b>Height</b>	0.276 in (7 mm)
	<b>Width</b>	2.75 in (70 mm)
	<b>Interface</b>	ATA-8, SATA 3.0, 6.0 Gb/s, NCQ
	<b>Transfer Rate</b>	<b>Synchronous</b> (maximum) 300 MB/s (Drive Capability)
	<b>Seek Time</b>	<b>Single Track</b> 3 ms
	(typical reads, including settling)	<b>Average</b> 13 ms
		<b>Maximum</b> 24 ms
	<b>Rotational Speed</b>	5400 rpm
	<b>Logical Blocks</b>	976,773,168
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]
<b>Features</b>	ATA Security	

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

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



# QuickSpecs

## Technical Specifications

<b>Seek Time</b> (typical reads, including settling)	<b>Maximum</b>	22 ms
<b>Rotational Speed</b>	7200 rpm	
<b>Logical Blocks</b>	976,773,168	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]	
<b>Features</b>	ATA Security	

<b>1 TB* 5400 rpm SATA Hard Drive</b>	<b>Drive Weight</b>	117g	
	<b>Capacity</b>	1TB	
	<b>Height</b>	9.5mm	
	<b>Width</b>	70.1mm	
	<b>Interface</b>	ATA-8, SATA 3.0	
	<b>Transfer Rate</b>	Synchronous 600MB/s (maximum)	
	<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	2ms
		<b>Average</b>	12ms
		<b>Maximum</b>	22ms
		<b>Rotational Speed</b>	5400rpm

**Logical Blocks** 1,953,525,168

**Operating Temperature** 0-60°C

**Features** ATA Security, S.M.A.R.T., NCQ, Ultra DMA

<b>2 TB* - 5400 RPM Hard Drive</b>	<b>Drive Weight</b>	130g	
	<b>Capacity</b>	2TB	
	<b>Height</b>	9.5mm	
	<b>Width</b>	70.1mm	
	<b>Interface</b>	ATA-8, SATA 3.0	
	<b>Transfer Rate</b>	<b>Synchronous</b> (maximum)	600MB/s
	<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	2ms
		<b>Average</b>	12ms
		<b>Maximum</b>	22ms
		<b>Rotational Speed</b>	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

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



# QuickSpecs

## Technical Specifications

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

### SSD 256GB 2280 M2 SATA-3

<b>Drive Weight</b>	0.022 lb (10 g)		
<b>Capacity</b>	256 GB		
<b>Height</b>	0.14 in (3.58 mm)		
<b>Width</b>	0.87 in (22 mm)		
<b>Interface</b>	ATA-8, SATA 3.0		
<b>Performance</b>	<b>Maximum Sequential Read</b>	<b>Maximum Sequential Write</b>	
	Up to 520 MB/s	Up to 270 MB/s	
<b>Logical Blocks</b>	250069680		
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]		
<b>Features</b>	DIPM; TRIM; DEVSLP		
<b>Security Features</b>	ATA Security		

## OPTICAL DRIVES

<b>DVD+/-RW SuperMulti DL Drive</b>	<b>Access Times</b>	Random	<140ms CD (typical) < 160 ms DVD (typical)
	<b>Weight</b>	170g max.	
	<b>Max Data Transfer Rate</b>	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

	<b>Transfer Mode</b>	UDMA Mode 5	
	<b>Interface</b>	Gen 1 SATA	
	<b>Supported Media (read)</b>	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	
	<b>Supported Media (write)</b>	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, DVD+R DL, DVD-R DL	
	<b>Max Media Capacity (read)</b>	8.5 GB	
	<b>Max Media Capacity (write)</b>	8.5 GB	
	<b>Transport</b>	Tray Loading	
<b>Blu-ray ROM DVD+/-RW SuperMulti DL Drive*</b>	<b>Access Times</b>	Random	<190 ms CD-ROM (typical) < 180ms DVD-ROM (typical) <230 ms BD-ROM (typical)
	<b>Weight</b>	170g max.	
	<b>Max Data Transfer Rate</b>	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	
	<b>Transfer Mode</b>	UDMA Mode 5	
	<b>Interface</b>	Gen 1 SATA	
	<b>Supported Media (read)</b>	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	
	<b>Supported Media (write)</b>	CD-R, CD-RW, DVD+R, DVD+R DL, DVD+RW, DVD-R, DVD-R DL, DVD-RW, DVD-RAM	
	<b>Max Media Capacity (read)</b>	50.0 GB	
	<b>Max Media Capacity (write)</b>	8.5GB	
	<b>Transport</b>	Tray Loading	





# QuickSpecs

## Technical Specifications

<b>DVD-ROM Drive</b>	<b>Access Times</b>	Random	< 140 ms CD (typical) < 160 ms DVD (typical)
	<b>Max Data Transfer Rate</b>	24X CD-ROM 8X-DVD	
	<b>Transfer Mode</b>	UDMA Mode 5	
	<b>Interface</b>	Gen 1 SATA	
	<b>Supported Media (read)</b>	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	
	<b>Supported Media (write)</b>	None	
	<b>Max Media Capacity (read)</b>	8.5GB	
	<b>Transport</b>	Tray Loading	

## SECURITY

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

## NETWORKING/COMMUNICATIONS

### WWAN

	<b>HP hs3110HSPA+ Mobile Broadband Module*</b>
<b>Technology/Operating bands</b>	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
<b>Wireless protocol standards</b>	E-GPRS: Class B, Multi-slot class 33, coding schemes CS1 - CS4 and MSC1 - MSC9. UMTS/WCDMA: Release 99 and Release 7
<b>GPS</b>	Standalone, A-GPS
<b>GPS bands</b>	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
<b>Maximum data rates</b>	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)
<b>Maximum output power</b>	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
<b>Maximum power consumption</b>	2500 mA (peak); 600 mA (average)
<b>Form Factor</b>	M.2, 3042-S3 Key B
<b>Weight</b>	6 g
<b>Dimensions</b> (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*
<b>Technology/Operating bands</b>	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
<b>Wireless protocol standards</b>	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification EVDO Release 0 and Release A
<b>GPS</b>	Standalone GPS, A-GPS, GPS XTRA
<b>GPS bands</b>	1575.42 MHz (± 1.023 MHz), GLONASS 1596-1607MHz
<b>Maximum data rates</b>	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)
<b>Maximum output power</b>	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
<b>Maximum power consumption</b>	LTE: 1,200 mA (peak); 900 mA (average) WCDMA: 1,100 mA (peak); 800 mA (average) EGPRS: 2,500 mA (peak); 700 mA (average)
<b>Form Factor</b>	M.2, 3042-S3 Key B



# QuickSpecs

## Technical Specifications

<b>Weight</b>	6 g
<b>Dimensions</b> (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. 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	<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac Wi-Fi certified 802.11b/g/n <ul style="list-style-type: none"> <li>• 2.402 – 2.482 GHz</li> </ul>
	<b>Interoperability</b>	802.11a/n <ul style="list-style-type: none"> <li>• 4.9 – 4.95 GHz (Japan)</li> <li>• 5.15 – 5.25 GHz</li> <li>• 5.25 – 5.35 GHz</li> <li>• 5.47 – 5.725 GHz</li> <li>• 5.825 – 5.850 GHz</li> <li>• 2.402 – 2.482 GHz</li> </ul>
	<b>Frequency Band</b>	
	<b>Data Rates</b>	<ul style="list-style-type: none"> <li>• 802.11b: 1, 2, 5.5, 11 Mbps</li> <li>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>• 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)</li> </ul>
	<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	<b>Security<sup>1</sup></b>	<ul style="list-style-type: none"> <li>• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>• AES-CCMP: 128 bit in hardware</li> <li>• 802.1x authentication</li> <li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>• WPA2 certification</li> <li>• IEEE 802.11i</li> <li>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>• WAPI</li> </ul>



# QuickSpecs

## Technical Specifications

<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer)
<b>Roaming</b>	Infrastructure (Access Point Required)
<b>Output Power<sup>2</sup></b>	IEEE 802.11 compliant roaming between access points <ul style="list-style-type: none"> <li>• 2.4G: +13.5dBm minimum</li> <li>• 5G: +12dBm minimum</li> <li>• Maximum output power must be able to achieve modular regulatory certification with notebooks that have antennas &gt;20cm from the user and peak gain of +3dBi at 2.4GHz and +4dBi at 5GHz</li> </ul>
<b>Power Consumption</b>	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
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>3</sup></b>	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)
<b>Antenna type</b>	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
<b>Form Factor</b>	PCI-Express Half-MiniCard
<b>Dimensions</b>	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)
<b>Weight</b>	3.1g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
<b>Altitude</b>	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON
	<ol style="list-style-type: none"> <li>1. Check latest software/driver release for updates on supported security features.</li> <li>2. Maximum output power may vary by country according to local regulations.</li> <li>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).</li> </ol>
<b>Bluetooth Specification</b>	V4.0 High Speed, V2.1+EDR, backwards compatible with V1.1, 1.2 and 2.0
<b>Number of Available Channels</b>	79 (1 MHz) available channels



# QuickSpecs

## Technical Specifications

<b>Data Rates and Throughput</b>	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
<b>Transmit Power</b>	-6 dBm to 4 dBm (Bluetooth Class II)
<b>Receiver Sensitivity</b>	Better than -80 dBm at 0.1 % raw bit error rate
<b>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Sleep 17 mW
<b>Antenna</b>	Internally integrated within module
<b>Range</b>	Up to 33 ft (10 m)
<b>Electrical Interface</b>	USB 2.0 compliant Microsoft Windows Plug and Play compliant
<b>Bluetooth Software Supported</b>	Broadcom Bluetooth for Windows Microsoft Windows Bluetooth Software
<b>Link Topology</b>	Point to Point, Multipoint Pico Nets up to 7 slaves
<b>Security</b>	Full support of Bluetooth Security Provisions
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
<b>Certifications</b>	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
<b>Bluetooth Profiles Supported</b>	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) Hands Free Profile (HFP) Basic Printing Profile (BPP) VDP (Video Distribution Profile) AVRCP (Audio Video Remote Control Profile)



# QuickSpecs

## Technical Specifications

Intel® Dual Band  
 Wireless-AC 3165  
 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  
 Wi-Fi certified  
 802.11b/g/n

**Interoperability  
 Frequency Band**

- 2.402 – 2.482 GHz

Note:

The FCC has declared as of January 1, 2015 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.

**802.11a/n**

- 4.9 – 4.95 GHz (Japan)
- 5.15 – 5.25 GHz
- 5.25 – 5.35 GHz
- 5.47 – 5.725 GHz
- 5.825 – 5.850 GHz

Note:

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

**Data Rates**

- 802.11b: 1, 2, 5.5, 11 Mbps
- 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
- 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
- 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)
- 802.11ac: MCS0 ~ MCS7, (1SS) (20MHz, 40MHz, and 80MHz)

**Modulation**

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

**Security<sup>1</sup>**

- 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  
 Roaming**

Ad-hoc (Peer to Peer)  
 Infrastructure (Access Point Required)  
 IEEE 802.11 compliant roaming between access points

Not all configuration components are available in all regions/countries.  
 c04685350 – DA 15285 – World Wide – Version 15 – October 19, 2016



# QuickSpecs

## Technical Specifications

<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b : +16dBm minimum</li> <li>• 802.11g : +14dBm minimum</li> <li>• 802.11a : +14dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +13dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +13dBm minimum</li> <li>• 802.11n HT20(5GHz) : +12dBm minimum</li> <li>• 802.11n HT40(5GHz) : +12dBm minimum</li> <li>• 802.11ac 80MHz(5GHz) : +11dBm minimum</li> </ul>
<b>Power Consumption</b>	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
<b>Power Management</b>	ACPI and PCI Express compliant power management
<b>Receiver Sensitivity<sup>3</sup></b>	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
<b>Antenna type</b>	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
<b>Form Factor</b>	PCI-Express M.2 MiniCard
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm Or Type 1630 : 2.3 x 16.0 x 30.0 mm
<b>Weight</b>	Type 2230 : 2.8g Or Type 1630 : 2g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
<b>Altitude</b>	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	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.



# QuickSpecs

## Technical Specifications

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 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)

**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: 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)<sup>1</sup>

Service Discovery Application Profile (SDAP)

Dial-Up Networking (DUN)<sup>1,2</sup>

Generic Object Exchange Profile (GOEP)<sup>1,2</sup>

Object Push Profile (OPP)<sup>1,2</sup>

File Transfer Profile (FTP)

Synchronization Profile (SYNC)

Hard Copy Cable Replacement (HCRP)<sup>1,2</sup>

Personal Area Networking Profile (PAN)<sup>1,2</sup>

Human Interface Device Profile (HID)<sup>1,2</sup>

FAX Profile (FAX)

Basic Imaging Profile (BIP)<sup>2</sup>

**Certifications**

**Bluetooth Profiles Supported**





# QuickSpecs

## Technical Specifications

	Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)
<b>Realtek 802.11 b/g/n (1x1)</b>	
<b>Wireless LAN Standards</b>	IEEE 802.11b IEEE 802.11g  IEEE 802.11n
<b>Interoperability</b>	Wi-Fi certified
<b>Frequency Band</b>	802.11b/g/n <ul style="list-style-type: none"> <li>• 2.402 – 2.482 GHz</li> </ul> <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>
<b>Data Rates</b>	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)
<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM,
<b>Security<sup>1</sup></b>	<ul style="list-style-type: none"> <li>• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>• AES-CCMP: 128 bit in hardware</li> <li>• 802.1x authentication</li> <li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>• WPA2 certification</li> <li>• IEEE 802.11i</li> <li>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>• WAPI</li> </ul>
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b : +16dBm minimum</li> </ul>



# QuickSpecs

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

## Technical Specifications

	<ul style="list-style-type: none"><li>• 802.11g : +14dBm minimum</li><li>• 802.11a : +14dBm minimum</li><li>• 802.11n HT20(2.4GHz) : +13dBm minimum</li><li>• 802.11n HT40(2.4GHz) : +13dBm minimum</li><li>• 802.11n HT20(5GHz) : +12dBm minimum</li><li>• 802.11n HT40(5GHz) : +12dBm minimum</li></ul>
<b>Power Consumption</b>	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
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>3</sup></b>	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
<b>Antenna type</b>	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)
<b>Form Factor</b>	PCI-Express M.2 MiniCard
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm



# QuickSpecs

## Technical Specifications

	Or Type 1630 : 2.3 x 16.0 x 30.0 mm
<b>Weight</b>	Type 2230 : 2.8g
	Or Type 1630 : 2g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	Operating Non-operating
<b>Humidity</b>	Operating Non-operating
<b>Altitude</b>	Operating Non-operating
<b>LED Activity</b>	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

<b>Wireless LAN Standards</b>	IEEE 802.11b IEEE 802.11g  IEEE 802.11n
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<b>Interoperability</b>	Wi-Fi certified
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<b>Frequency Band</b>	802.11b/g/n
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- 2.402 – 2.482 GHz

**Note:**

The FCC has declared as of September 1, 2014 products that u  
passive scanning on channel 12/13 and are capable of



# QuickSpecs

## Technical Specifications

	transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
<b>Data Rates</b>	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)
<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM,
<b>Security<sup>1</sup></b>	<ul style="list-style-type: none"> <li>• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>• AES-CCMP: 128 bit in hardware</li> <li>• 802.1x authentication</li> <li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>• WPA2 certification</li> <li>• IEEE 802.11i</li> <li>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>• WAPI</li> </ul>
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b : +16dBm minimum</li> <li>• 802.11g : +14dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +13dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +13dBm minimum</li> <li>• 802.11n HT20(5GHz) : +12dBm minimum</li> <li>• 802.11n HT40(5GHz) : +12dBm minimum</li> </ul>
<b>Power Consumption</b>	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
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>3</sup></b>	802.11b, 1Mbps : -94dBm maximum  802.11b, 11Mbps : -86dBm maximum  802.11g, 6Mbps : -88dBm maximum  802.11g, 54Mbps : -74dBm maximum



# QuickSpecs

## Technical Specifications

	802.11n, MCS07 : -69dBm maximum	
	802.11n, MCS15 : -66dBm maximum	
<b>Antenna type</b>	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)	
<b>Form Factor</b>	PCI-Express M.2 MiniCard	
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm	
	Or	
	Type 1630 : 2.3 x 16.0 x 30.0 mm	
<b>Weight</b>	Type 2230 : 2.8g	
	Or	
	Type 1630 : 2g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	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).



# QuickSpecs

## Technical Specifications

### HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology

<b>Bluetooth Specification</b>	4.0+EDR Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	79 (1 MHz) available channels
<b>Data Rates and Throughput</b>	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
<b>Transmit Power</b>	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

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

<b>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
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<b>Range</b>	Up to 33 ft (10 m)
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<b>Electrical Interface</b>	USB 2.0 compliant
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<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
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### Link Topology

<b>Electrical Interface</b>	Point to Point, Multipoint Pico Nets up to 7 slaves
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<b>Bluetooth Software Supported</b>	Full support of Bluetooth Security Provisions
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### Security



# QuickSpecs

## Technical Specifications

<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Power Management</b>	Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
<b>Certifications</b>	
<b>Security</b>	All necessary regulatory approvals for supported countries, including:
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
<b>Bluetooth Profiles Supported</b>	
<b>Power Management</b>	ETS 300 328, ETS 300 826
<b>Certifications</b>	Low Voltage Directive IEC950
	UL, CSA, and CE Mark
<b>Certifications</b>	Serial Port Profile (SPP) <sup>1</sup> Service Discovery Application Profile (SDAP) Dial-Up Networking (DUN) <sup>1,2</sup> Generic Object Exchange Profile (GOEP) <sup>1,2</sup> Object Push Profile (OPP) <sup>1,2</sup> File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP) <sup>1,2</sup> Personal Area Networking Profile (PAN) <sup>1,2</sup> Human Interface Device Profile (HID) <sup>1,2</sup> FAX Profile (FAX) Basic Imaging Profile (BIP) <sup>2</sup> Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)
<b>Bluetooth Profiles Supported</b>	

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

<b>Wireless LAN Standards</b>	IEEE 802.11b IEEE 802.11g  IEEE 802.11n
<b>Interoperability</b>	Wi-Fi certified



# QuickSpecs

## Technical Specifications

<b>Frequency Band</b>	802.11b/g/n <ul style="list-style-type: none"> <li>2.402 – 2.482 GHz</li> </ul> <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>
<b>Data Rates</b>	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)
<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM,
<b>Security<sup>1</sup></b>	<ul style="list-style-type: none"> <li>IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>AES-CCMP: 128 bit in hardware</li> <li>802.1x authentication</li> <li>WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>WPA2 certification</li> <li>IEEE 802.11i</li> <li>Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>WAPI</li> </ul>
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"> <li>802.11b : +16dBm minimum</li> <li>802.11g : +14dBm minimum</li> <li>802.11n HT20(2.4GHz) : +13dBm minimum</li> <li>802.11n HT40(2.4GHz) : +13dBm minimum</li> <li>802.11n HT20(5GHz) : +12dBm minimum</li> <li>802.11n HT40(5GHz) : +12dBm minimum</li> </ul>
<b>Power Consumption</b>	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
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>3</sup></b>	802.11b, 1Mbps : -94dBm maximum





# QuickSpecs

## Technical Specifications

	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	
<b>Antenna type</b>	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)	
<b>Form Factor</b>	PCI-Express M.2 MiniCard	
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm	
	Or	
	Type 1630 : 2.3 x 16.0 x 30.0 mm	
<b>Weight</b>	Type 2230 : 2.8g	
	Or	
	Type 1630 : 2g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	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.



# QuickSpecs

## Technical Specifications

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

<b>Bluetooth Specification</b>	4.0+EDR Compliant												
<b>Frequency Band</b>	2402 to 2480 MHz												
<b>Number of Available Channels</b>	79 (1 MHz) available channels												
<b>Data Rates and Throughput</b>	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												
<b>Transmit Power</b>	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of +4 dBm for BR and EDR.												
<b>Receiver Sensitivity</b>	<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><math>\pi/4</math>-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											
<b>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW												
<b>Range</b>	Up to 33 ft (10 m)												
<b>Electrical Interface</b>	USB 2.0 compliant												
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software												
<b>Link Topology</b>													
<b>Electrical Interface</b>	Point to Point, Multipoint Pico Nets up to 7 slaves												
<b>Bluetooth Software Supported</b>	Full support of Bluetooth Security Provisions												



# QuickSpecs

## Technical Specifications

**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)<sup>1</sup>  
 Service Discovery Application Profile (SDAP)  
 Dial-Up Networking (DUN)<sup>1,2</sup>  
 Generic Object Exchange Profile (GOEP)<sup>1,2</sup>  
 Object Push Profile (OPP)<sup>1,2</sup>  
 File Transfer Profile (FTP)  
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 FAX Profile (FAX)  
 Basic Imaging Profile (BIP)<sup>2</sup>  
 Headset Profile (HSP)  
 Hands Free Profile (HFP)  
 Advanced Audio Distribution Profile (A2DP)

**Bluetooth Profiles Supported**

**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



# QuickSpecs

## Technical Specifications

### Frequency Band

#### 802.11b/g/n

- 2.402 – 2.482 GHz

#### Note:

The FCC has declared as of January 1, 2015 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.

#### 802.11a

- 4.9 – 4.95 GHz (Japan)
- 5.15 – 5.25 GHz
- 5.25 – 5.35 GHz
- 5.47 – 5.725 GHz
- 5.825 – 5.850 GHz

#### Note:

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

### Antenna Structure

2 transmit; 2 receive (2x2)

### Data Rates

802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

802.11b: 1, 2, 5.5, 11 Mbps

802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)

### Modulation

Direct Sequence Spread Spectrum

CCK, BPSK, QPSK, 16-QAM, 64-QAM

### Security<sup>1</sup>

- 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

### Sub-channels

Multinational support with frequency bands and channels compliant to local regulations.

### Network Architecture

Ad-hoc (Peer to Peer)

### Models

Infrastructure (Access Point Required)

### Roaming

IEEE 802.11 compliant roaming between band Access Points

### Output Power<sup>2</sup>

- 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



# QuickSpecs

## Technical Specifications

<b>Power Consumption</b>	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
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>3</sup></b>	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
<b>Antenna type</b>	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
<b>Form Factor</b>	PCI-Express M.2 MiniCard
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm Or Type 1630 : 2.3 x 16.0 x 30.0 mm
<b>Weight</b>	Type 2230 : 2.8g Or Type 1630 : 2g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
<b>Altitude</b>	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	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

<b>Bluetooth Specification</b>	4.0+EDR Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	79 (1 MHz) available channels
<b>Data Rates and Throughput</b>	3 Mbps data rate; throughput up to 2.17 Mbps Synchronous Connection Oriented links up to 3, 64 kbps, voice channel:



# QuickSpecs

## Technical Specifications

<b>Transmit Power</b>	Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric												
<b>Receiver Sensitivity</b>	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of +4 dBm for BR and EDR. <table border="1" data-bbox="756 495 1411 625"> <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><math>\pi/4</math>-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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<b>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW												
<b>Range</b>	Up to 33 ft (10 m)												
<b>Electrical Interface</b>	USB 2.0 compliant												
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software												
<b>Link Topology</b>	Point to Point, Multipoint Pico Nets up to 7 slaves												
<b>Electrical Interface</b>	Full support of Bluetooth Security Provisions												
<b>Bluetooth Software Supported</b>	Microsoft Windows ACPI, and USB Bus Support												
<b>Security</b>	Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff												
<b>Certifications</b>	All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249												
<b>Bluetooth Profiles Supported</b>	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark Serial Port Profile (SPP) <sup>1</sup> Service Discovery Application Profile (SDAP) Dial-Up Networking (DUN) <sup>1,2</sup> Generic Object Exchange Profile (GOEP) <sup>1,2</sup> Object Push Profile (OPP) <sup>1,2</sup> File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP) <sup>1,2</sup> Personal Area Networking Profile (PAN) <sup>1,2</sup> Human Interface Device Profile (HID) <sup>1,2</sup> FAX Profile (FAX) Basic Imaging Profile (BIP) <sup>2</sup> Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)												
<b>Certifications</b>													
<b>Bluetooth Profiles Supported</b>													



# QuickSpecs

## Technical Specifications

<b>Realtek Ethernet (10/100/1000)</b>	<b>Ethernet Features</b>	<p>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</p>
	<b>Power Management</b>	<p>ACPI compliant - multiple power modes          Situation-sensitive features reduce power consumption          Advanced link down power saving for reducing link down power consumption</p>
	<b>Performance Features</b>	<p>TCP/IP/UDP Checksum Offload (configurable)          Protocol Offload (ARP &amp; NS)          Large send offload and Giant send offload          Receiving Side Scaling</p>
	<b>Manageability</b>	<p>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</p>
	<b>Interface</b>	<p>PCI Express 1.1 to fully support ASPM L0s/L1 and CLKREQ</p>
	<b>NIC Device Driver Name</b>	<p>Realtek PCIe GBE Ethernet Family Controller</p>

## AUDIO/MULTIMEDIA

### DTS STUDIO SOUND™

<b>Hardware</b>	<b>Implementation</b>	Conexant
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# QuickSpecs

## Technical Specifications

	<b>Function Controls</b>	<b>Key</b>	<b>Volume</b>	Volume up, volume down, and mute
	<b>Full Duplex</b>			Yes
	<b>Microphone In</b>			Stereo
	<b>Headphone/Line Out</b>			Stereo
	<b>Integrated Microphone</b>			Yes, dual digital microphone array
<b>Audio Output Quality</b>	<b>Frequency Response</b>			20Hz – 20kHz
	<b>Signal to Noise Ratio</b>			106 dB (DAC), 102dB (ADC)
	<b>Total Distortion</b>	<b>Harmonic</b>		91dB THD+n on Line Out/HP (0.003%)
	<b>Play Sampling Rate(s)</b>			Up to 192kHz
	<b>Record Sampling Rate(s)</b>			Up to 96Khz
	<b>DAC</b>			16, 20 or 24-bit
	<b>ADC</b>			16, 20 or 24-bit
<b>Integrated Speakers</b>	<b>Stereo Power Rating</b>			2 Watts
	<b>Impedance</b>			4 Ohms

## POWER

### HP 45W Smart AC Adapter

<b>Dimensions</b>	3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm)
<b>Weight</b>	0.386 lb (175g) max
<b>Input</b>	90 to 265 VAC
	<b>Input Efficiency</b> 87.74% at 115Vac and 88.4% at 230Vac
	<b>Input frequency range</b> 47 to 63 Hz
	<b>Input AC current</b> 1.4 A at 90 VAC
<b>Output</b>	<b>Output power</b> 45W





# QuickSpecs

## Technical Specifications

	<b>DC output</b>	19.5V
	<b>Hold-up time</b>	5 msec at 115 VAC input
	<b>Output current limit</b>	<8.0A
	<b>Over voltage protection</b>	< 29V max automatic shutdown
	<b>Over short protection</b>	Auto-recovery and no damage
<b>Connector</b>		3 pin/grounded, mates with interchangeable cords
<b>Environmental Design</b>	<b>Operating temperature</b>	32° to 95° F (0° to 35° C)
	<b>Non-operating (storage) temperature</b>	-4° to 185° F (-20° to 85° C)
	<b>Altitude</b>	0 to 16,400 ft (0 to 5,000 m)
	<b>Humidity</b>	20% to 95%
	<b>Storage Humidity</b>	10% to 95%
<b>EMI and Safety Certifications</b>		*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.
<b>HP 65W EM Smart AC Adapter (PRC, India only)</b>	<b>Dimensions</b>	4.98 x 1.97 x 1.18 in (12.65 x 5.0 x 3.0 cm)
	<b>Weight</b>	0.62 lb (290g) max
	<b>Input</b>	90 to 265 VAC
	<b>Input Efficiency</b>	87% min at 115 VAC
	<b>Input frequency range</b>	47 to 63 Hz
	<b>Input AC current</b>	1.7 A at 90 VAC
<b>Output</b>	<b>Output power</b>	65W
	<b>DC output</b>	19.5V
	<b>Hold-up time</b>	5 msec at 115 VAC input
	<b>Output current limit</b>	<11.0A
	<b>Over voltage protection</b>	< 29V max automatic shutdown
	<b>Over short protection</b>	Auto-recovery and no damage
<b>Connector</b>		3 pin/grounded, mates with interchangeable cords
<b>Environmental Design</b>	<b>Operating temperature</b>	32° to 95° F (0° to 35° C)
	<b>Non-operating (storage) temperature</b>	-4° to 185° F (-20° to 85° C)
	<b>Altitude</b>	0 to 16,400 ft (0 to 5,000 m)
	<b>Humidity</b>	20% to 95%
	<b>Storage Humidity</b>	10% to 95%
<b>EMI and Safety Certifications</b>		*CE Mark - full compliance with LVD and EMC directives * Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN,



# QuickSpecs

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

## Technical Specifications

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.

### 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)



# QuickSpecs

## Technical Specifications

<b>Battery Re-Charge Time</b>	<b>Non-operating System in OFF or Standby Mode</b>	-4° to 122° F (-20° to 60° C) <3 hours
<b>Fuel Gauge LED</b>	No	
<b>Warranty</b>	1 year	
<b>Optional Travel Battery Available</b>	No	

<b>HP 6-cell, Long Life 55 WHr Li-ion.</b>	<b>Dimensions (H x W x L)</b>	35.31x49.59x277.2	
	<b>Weight</b>	340g	
	<b>Cells/Type</b>	Cylindrical ICR18650 C4	
	<b>Energy</b>	10.68V	<b>Voltage</b>
		5.15Ah	<b>Amp-hour capacity</b>
		55Wh	<b>Watt-hour capacity</b>
	<b>Temperature</b>	32° to 113° F (0° to 45° C)	<b>Operating (Charging)</b>
		14 to 140° F (-10° to 60° C)	<b>Operating (Discharging)</b>
		-4° to 140° F (-20° to 60° C)	<b>Non-operating</b>
	<b>Battery Re-Charge Time</b>	3 hours	<b>System in OFF or Standby Mode</b>
		3 to 5 hours	<b>System ON</b>
	<b>Fuel Gauge LED</b>	NA	
	<b>Warranty</b>	3years or 1000 cycles*	
	<b>Optional Travel Battery Available</b>	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



# QuickSpecs

## Technical Specifications

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

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

<b>HP 6-cell, Long Life 55 WHr Li-ion</b>	<b>Dimensions (H x W x L)</b>	45.59x275.8x33.89	
	<b>Weight</b>	330g	
	<b>Cells/Type</b>	Cylindrical ICR18650 C4	
	<b>Energy</b>	10.68V	<b>Voltage</b>
		5.15Ah	<b>Amp-hour capacity</b>
		55Wh	<b>Watt-hour capacity</b>
	<b>Temperature</b>	32° to 113° F (0° to 45° C)	<b>Operating (Charging)</b>
		14 to 140° F (-10° to 60° C)	<b>Operating (Discharging)</b>
		-4° to 140° F (-20° to 60° C)	<b>Non-operating</b>
	<b>Battery Re-Charge Time</b>	3 hours	<b>System in OFF or Standby Mode</b>
		3 to 5 hours	<b>System ON</b>



# QuickSpecs

## Technical Specifications

<b>Fuel Gauge LED</b>	NA
<b>Warranty</b>	3years or 1000 cycles*
<b>Optional Travel Battery Available</b>	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>.

### ENVIRONMENTAL

TBD

### Country of Origin

China

## ENVIRONMENTAL

### 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
- US ENERGY STAR®
- 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 Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.

**Energy Consumption (in accordance with US ENERGY STAR® test method)**

**115VAC, 60Hz**

**230VAC, 50Hz**

**100VAC, 60Hz**



# QuickSpecs

## Technical Specifications

Normal Operation (Short idle)	6.66 W	7.03 W	6.94 W
Normal Operation (Long idle)	3.72 W	3.92 W	3.84 W
Sleep	0.64 W	0.69 W	0.64 W
Off	0.32 W	0.37 W	0.32 W

**Note:**

Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 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 <sub>WAd</sub> , bels)	Sound Pressure (L <sub>pAm</sub> , decibels)
	Typically Configured – Idle	2.9
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



# QuickSpecs

## Technical Specifications

- 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:

### 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](http://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

<b>External:</b>	PAPER/Corrugated	337.2 g
<b>Internal:</b>	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

Not all configuration components are available in all regions/countries.  
 c04685350 – DA 15285 – World Wide – Version 15 – October 19, 2016



# QuickSpecs

## Technical Specifications

- 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)

### 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/gcreport/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](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
- US ENERGY STAR®
- 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 Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a "Typically Configured Notebook".

#### Energy Consumption (in accordance with US ENERGY STAR® test method)

	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
Normal Operation (Short idle)	6.25 W	6.50 W	6.24 W
Normal Operation (Long idle)	4.18 W	4.21 W	4.10 W
Sleep	0.90 W	0.93 W	0.87 W
Off	0.35 W	0.40 W	0.35 W

#### NOTE:

Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.



# QuickSpecs

## Technical Specifications

### 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
- US ENERGY STAR®
- 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 Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.

#### Energy Consumption (in accordance with US ENERGY STAR® test method)

	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 60Hz</b>
Normal Operation (Short idle)	5.58 W	5.86 W	5.64 W
Normal Operation (Long idle)	3.51 W	3.67 W	3.37 W
Sleep	0.82 W	0.86 W	0.82 W
Off	0.39 W	0.42 W	0.39 W

**Note:**

Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

#### Heat Dissipation\*

	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 60Hz</b>
Normal Operation (Short idle)	19 BTU/hr	20 BTU/hr	19 BTU/hr
Normal Operation (Long idle)	12 BTU/hr	13 BTU/hr	12 BTU/hr
Sleep	3 BTU/hr	3 BTU/hr	3 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.



# QuickSpecs

## Technical Specifications

**Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)**

Sound Power  
 ( $L_{WAd}$ , bels)

Sound Pressure  
 ( $L_{pAm}$ , decibels)

Typically Configured – Idle

2.8

18

Fixed Disk – Random writes

2.7

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](http://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

<b>External:</b>	PAPER/Corrugated	378 g
<b>Internal:</b>	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/gse.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:

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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](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
- US ENERGY STAR®
- 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 Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a "Typically Configured Notebook".

### Energy Consumption (in accordance

**115VAC, 60Hz**

**230VAC, 50Hz**

**100VAC, 60Hz**



Not all configuration components are available in all regions/countries.  
c04685350 – DA 15285 – World Wide – Version 15 – October 19, 2016

# QuickSpecs

## Technical Specifications

**with US ENERGY STAR® test method)**

Normal Operation (Short idle)	7.58 W	7.82 W	7.70 W
Normal Operation (Long idle)	6.58 W	6.76 W	6.49 W
Sleep	0.69 W	0.75 W	0.69 W
Off	0.39 W	0.45 W	0.39 W

**Note:**

Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

<b>Heat Dissipation*</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 60Hz</b>
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)**

	<b>Sound Power (L<sub>WA</sub>d, bels)</b>	<b>Sound Pressure (L<sub>pAm</sub>, decibels)</b>
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



# QuickSpecs

## Technical Specifications

- 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:

### 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](http://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

<b>External:</b>	PAPER/Corrugate d	423 g
<b>Internal:</b>	PLASTIC/EPE (Expanded Polyethylene)	23 g
	PLASTIC/Polyethy lene 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



# QuickSpecs

## Technical Specifications

<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
- 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/gcreport/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](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 #
<b>Cases</b>	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
<b>Docking</b>	HP 3001pr USB 3 Port Replicator	F3S42AA
	HP 3005pr USB 3.0 Port Replicator	H1L08AA
<b>Input/Output – Mice</b>	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
	<b>Power</b>	HP 45W Smart AC Adapter 4.5mm
HP 65W Smart AC Adapter		H6Y89AA
HP 65W Slim AC Adapter		H6Y82AA
HP Power Bank		N9F71AA
<b>Storage</b>	HP External USB Optical Drive	F2B56AA
	HP 500GB 7200rpm HDD	F3B97AA
<b>Security</b>	HP External Portable USB3.0 HDD	K6A93AA
	HP UltraSlim Keyed Cable Lock	H4D73AA
	HP USB Smart Card Reader	F6V67AA
<b>Displays</b>	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

<b>Date of change:</b>	<b>Version History:</b>		<b>Description of change:</b>
September 30, 2015	Version 1 to 2	Added	Environmental information pages 60 to 71
October 28, 2015	Version 2 to 3	Updated	3 <sup>rd</sup> Party software list
December 9, 2015	Version 2 to 3	Added	SSD list to Storage section at the top
January 20, 2016	Version 3 to 4	Added	BIOS adheres to NIST SP800-147 to footnote 2 on Software Bios section
February 1, 2016	Version 4 to 5	Added	Passed MIL-STD testing and footnote
February 3, 2016	Vesion 5 to 6	Updated	Battery times
March 29, 2016	Version 6 to 7	Added	440 G3 HDD Battery times
March 31, 2016	Version 7 to 8	Changed	TPM upgrade footnote
April 11, 2016	Version 8 to 9	Updated	Battery life page 9 and 21
April 25, 2016	Version 9 to 10	Added	New optional battery and memory units.
May 11, 2016	Version 10 to 11	Added	SSD to 450 and 470 G3.
May 26, 2016	Version 11 to 12	Changed	SATA interfaces to HDDs to 3.0, 6.0 Gb/s
July 14, 2016	Version 12 to 13	Added	Note to 6-cell battery warranty.
July 27, 2016	Version 13 to 14	Added Removed	HP 440 G3 Environmental data WiDi
October 19, 2016	Version 14 to 15	Added	Added processor information to 430 & 440 G3 Processors specs. Skype for Business certification information added to the Software section.

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