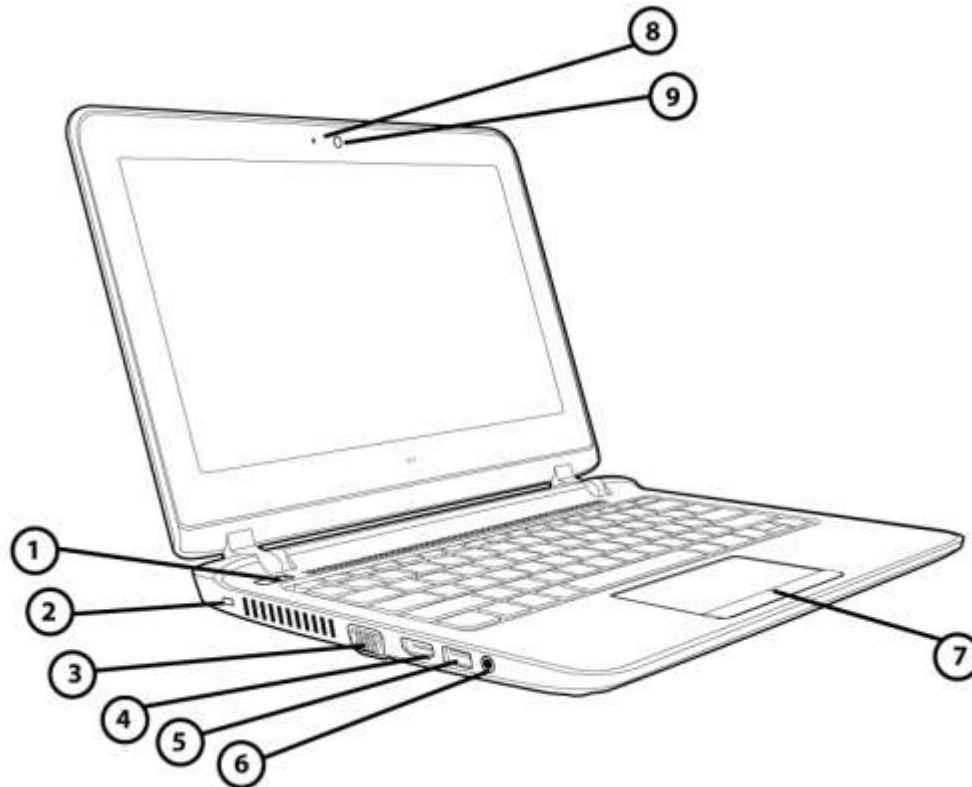


### Overview

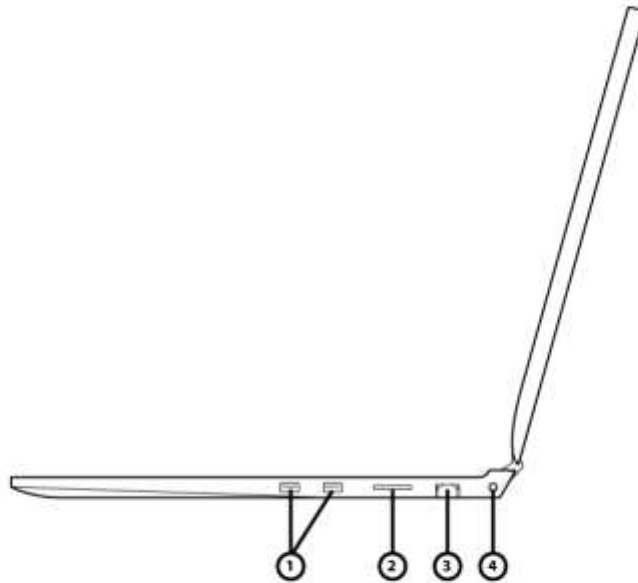
### HP ProBook 11 G2 Education Edition Notebook



#### Front, Left

- |                 |                              |
|-----------------|------------------------------|
| 1. Power Button | 6. 3.5mm Combo Headphone/Mic |
| 2. Lock Slot    | 7. Touchpad                  |
| 3. VGA Port     | 8. Webcam LED                |
| 4. HDMI Port    | 9. Webcam                    |
| 5. USB 3.0 Port |                              |

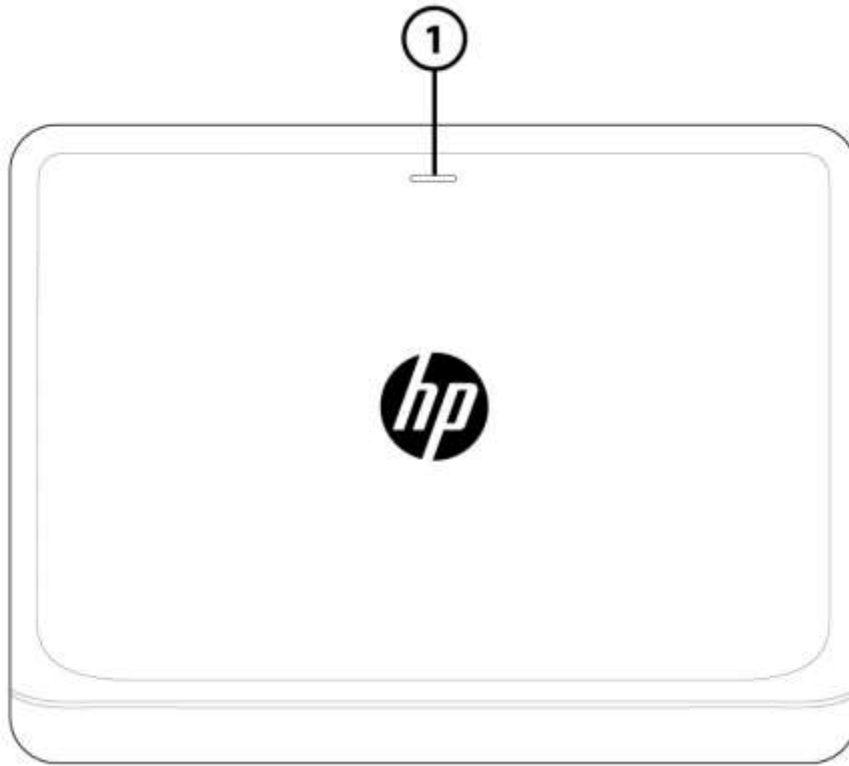
### Overview



#### Right side

1. 2 USB 3.0 Ports
2. SD Card Slot
3. RJ-45 Port (Ethernet)
4. AC Power Connector (4.5mm)

### Overview



**Closed view - top**

1. Network access indicator/LED light

### Overview

### At A Glance

- This light, durable notebook features a reinforced chassis design
- Weight starting at 3.48 lbs (1.58 kg) for Non Touch; 3.76 lbs (1.71 kg) for Touch
- Windows 10 versions, Windows 7 versions, or FreeDOS
- Choice of Intel® Core™ i3, Intel® Pentium®, or Intel® Celeron® Processors
- Battery life up to TBD
- Choose from a variety of 11.6" diagonal displays
  - 11.6" diagonal HD LED (3.6mm) SVA, 220 nits, (1366 x 768) Touch with Corning® Gorilla® Glass 3
  - 11.6" diagonal HD LED (3.6mm) SVA, 220 nits, (1366 x 768) Touch, with Corning® Gorilla® Glass 3 WWAN
  - 11.6" diagonal HD LED flat (3.6mm) SVA, 220 nits, Anti-glare (1366 x 768) Non-Touch
  - 11.6" diagonal HD LED flat (3.6mm) SVA, 220 nits, Anti-glare (1366 x 768), WWAN Non-Touch
- Full size island style spill resistant keyboard (tested to IP41 standard)
- Touchpad support multi gestures, Windows 8.1 modern TouchPad gestures and PS/2 interface
- Choice of up to 500 GB hard drives or up to 256 GB solid state drives
- Memory options up to 8 GB
- Integrated HP TrueVision HD Webcam
- Supports a broad range of wireless WLAN and an option WWAN for connectivity on the go.
- Choose between HP 3-cell battery (36 WHr) or HP 6-cell long life battery (64 WHr). One of the two is required.
- Integrated Intel® Graphics
- DTS Sound™ with integrated stereo speakers and single digital microphones
- HP Multi-Format Digital Media Card Reader

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

### Features

#### PRODUCT NAME

HP ProBook 11 G2 Education Edition Notebook

#### OPERATING SYSTEM

- Preinstalled** Windows 10 Home 64<sup>1</sup>  
Windows 10 Home Single Language 64<sup>1</sup>  
Windows 10 Pro (National Academic only)<sup>1</sup>  
Windows 7 Professional 64 (available through downgrade rights from Windows 10 Pro 64)<sup>2</sup>  
FreeDOS
- Web Support** Windows 10 Enterprise 64<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, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.microsoft.com>.
2. This system is preinstalled with Windows 7 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

#### PROCESSOR

Intel® Core™ i3-6100U with Intel HD Graphics 520 (2.3 GHz, 3 MB cache, 2 cores)<sup>1</sup>  
Intel® Pentium® 4405U with Intel HD Graphics 510 (2.1 GHz, 2 MB cache, 2 cores)<sup>1</sup>  
Intel® Celeron® 3855U with Intel HD Graphics 510 (1.6 GHz, 2 MB cache, 2 cores)<sup>1</sup>

1. Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering is not a measurement of higher performance.

#### CHIPSET

Chipset is integrated with processor

#### GRAPHICS

Intel® HD 520  
Intel® HD 510

**NOTE:** Integrated graphics depends on processor

#### DISPLAY

**Internal  
Touch**

11.6" diagonal HD LED (3.6mm) SVA, 220 nits, (1366 x 768) Touch with Corning® Gorilla® Glass 3<sup>1</sup> (with option of WWAN<sup>1</sup>)

**Non-Touch**

11.6" diagonal HD LED flat (3.6mm) SVA, 220 nits, Anti-glare (1366 x 768)<sup>1</sup>(with option of WWAN<sup>1</sup>)

### Features

1. HD content required to view HD images.

#### **HDMI v1.4 port on Unit**

Supporting up to 2560 x 1600 resolution

#### **VGA (Dsub 15 pin) supporting:**

2048 x 1536 external resolution @ 60 Hz

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

### STORAGE AND DRIVES

Supports single 2.5" 7.0 mm SATA Hard Drives

#### **Single Hard Drive <sup>1</sup>**

500 GB (5400 rpm)

#### **M.2 2280 Solid State Drives<sup>1</sup>**

128GB Solid State Drive

256 GB Solid State Drive

1. For hard drives and solid state drives, GB = 1 billion bytes. Actual formatted capacity is less. Up to 16 GB (for Windows 7) and up to 30 GB (for Windows 8 and 10) of system disk is reserved for the system recovery software.

### MEMORY

#### **Standard**

One SODIMM slots

Customer accessible / upgradeable

DDR4 PC4-17000 (2133) SODIMMS (Transfer rates up to 2133 MT/s)

#### **Supports**

4096 MB Total System Memory (4096 MB x 1)

8192 MB Total System Memory (8192 MB x 1)

#### **Maximum**

Supports up to 8 GB max system memory

**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.

### NETWORKING/COMMUNICATIONS

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

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

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

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

HP hs3110 HSPA+ Mobile Broadband

1. Wireless access point and Internet service is required and is not included. Availability of public wireless access points limited.

### Features

2. Sold separately or as an optional feature.

#### Communications

Integrated 10/100/1000 Gigabit Ethernet  
Supports PXE boot

### AUDIO/MULTIMEDIA

#### Audio

DTS Sound™  
Integrated dual stereo speakers  
Single digital microphone with echo cancellation/noise suppression

#### Webcam

Integrated HD webcam<sup>1,2</sup>

- HP TrueVision HD<sup>1</sup> camera
- Fixed (no tilt) + activity LED on LCD cover
- 1280 x 720 by 30 frames per second

1. HD content required to view HD images.
2. Wireless access point and Internet service is required and is not included. Availability of public wireless access points limited.

### KEYBOARDS/POINTING DEVICES

#### Keyboard

100% Full size island style keyboard  
Anti-peel protection on key caps  
Spill resistant keyboard (tested to IP41 standard)

#### Pointing Devices

Touchpad  
Taps enabled as default  
Support Multi Gestures - ability to turn on and off  
Support Windows 8.1 Modern TouchPad Gestures  
Support PS/2 interface

### SOFTWARE AND SECURITY

#### Preinstalled Software with Windows Operating System

##### Preinstalled Software

Bing Search for IE 11  
IE Home  
HP ePrint<sup>1</sup>  
Skype<sup>2</sup>  
HP PC Hardware Diagnostics UEFI  
HP Support Assistant  
Foxit Phantom PDF Express for HP  
Buy Office

##### HP School Pack includes the following:

HP Classroom Manager<sup>4</sup>

### Features

HP Adaptive Learning created by Fishtree  
Corinth Classroom  
SPARKvue by PASCO  
Oxford University Press Advanced Learner's Dictionary  
Edmin Curriculum Matrix  
Classlink Single Sign On  
Codecademy  
HP Touchpoint Manager  
HP Prime Graphing Calculator App

#### **BIOS**

HP BIOSphere<sup>5</sup>  
HP DriveLock  
HP BIOS Protection<sup>6</sup>  
Master Boot Record Security  
Power On Authentication  
Pre-Boot Security  
Secure Erase<sup>7</sup>  
Absolute Persistence Module<sup>8</sup>

#### **Communication**

Intel® Wireless Display (WiDi) Software for Windows<sup>9</sup>

#### **Manageability**

HP SoftPaq Download Manager (SDM)  
HP System Software Manager (SSM)<sup>10</sup>  
HP BIOS Config Utility (BCU)<sup>10</sup>

#### **Security**

Trust Platform Module (TPM) 1.2/2.0 Embedded Security Chip<sup>3</sup>  
Security lock slot (Lock not included)  
MicrosoftDefender<sup>11</sup>  
Preboot Authentication

1. Requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see [www.hp.com/go/eprintcenter](http://www.hp.com/go/eprintcenter)).

2. Skype is not offered in China.

3. This product ships with TPM 1.2 with option to upgrade to TPM 2.0.

Upgrade utility is expected to be available by February of 2016 via HP Customer Support.

4. HP Classroom Manager for Teachers is required and sold separately for control and device locking from the teacher's Windows desktop console; no locking and control functionality originates from HP Classroom Manager for Student. Control and device locking originate from the teacher's Windows desktop console.

5. Available only on business PCs with HP BIOS.

6. May require a manual recovery step if all copies of BIOS are compromised or deleted.

7. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88.

8. 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



### Features

must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.

9. Integrated Intel Wi-Di feature is available on select configurations only and requires separately purchased projector, TV or computer monitor with an integrated or external Wi-Di receiver. External Wi-Di receivers connect to the projector, TV or computer monitor via a standard HDMI cable, also sold separately.

10. Not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.

11. Opt in and internet connection required for updates.

### POWER

#### Power Supply

HP 45W Smart AC Adapter

HP 65W EM Smart AC Adapter (China, Asia and India only)

3.2 ft/1.0m 3-prong power cord

#### Primary Battery

HP 3-cell battery (36 WHr)

Optional HP 6-cell Long Life battery (64 WHr)<sup>1</sup>

1. Sold separately or as an optional feature.

#### Battery Life

3 cell battery- Up to 9 hours 45 minutes (SSD, Intel® Core™i3-6100U)

6 cell battery- Up to 18 hours and 30 minutes (SSD, Intel® Core™ i3-6100U)

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 <http://www.bapco.com> for additional details.

#### System Standby Time

TBD

### WEIGHTS & DIMENSIONS

#### Weight

##### Non Touch

Starting at 3.48 lbs (1.58 kg)<sup>1</sup>

(3-cell battery, non-touch, with Solid State Drive and no WWAN)

##### Touch

Starting at 3.76 lbs (1.71 kg)<sup>1</sup>

(3-cell battery, touch, with Solid State Drive and no WWAN)

1. Weight varies by configuration and components.

#### Dimensions (w x d x h)

11.88 x 8.95 x 1 in (at front)

30.18 x 22.74 x 2.54 cm (at front)

### PORTS/JACKS/SLOTS

#### Ports/Jacks



### Features

- (3) USB 3.0 (Two on one side, third on the opposite side)
- (1) HDMI
- (1) headphone/microphone combo
- (1) AC power
- (1) RJ-45
- (1) VGA

**NOTE:** Cables are not included.

#### **HP Multi-Format Digital Media Card Reader**

Support SD/SDHC/SDXC  
Push-Push Insertion/Removal

#### **SIM Slot**

**Populated on WWAN configurations only** (tool-less user-accessible)

### SERVICE AND SUPPORT

HP Services offers a 1-year 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<sup>1</sup> are optional<sup>2</sup> 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>.

1. Service levels and response times for HP Care Services may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit [www.hp.com/go/cpc](http://www.hp.com/go/cpc)
2. Sold separately or as an optional feature.

### Technical Specifications

#### NETWORKING/ COMMUNICATIONS

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

<b>Wireless LAN Standards</b>	<ul style="list-style-type: none"> <li>IEEE 802.11a</li> <li>IEEE 802.11b</li> <li>IEEE 802.11g</li> <li>IEEE 802.11n</li> <li>IEEE 802.11ac</li> </ul>
<b>Interoperability Frequency Band</b>	<ul style="list-style-type: none"> <li>Wi-Fi certified 802.11b/g/n                             <ul style="list-style-type: none"> <li>• 2.402 – 2.482 GHz</li> </ul> </li> <li>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.</li> <li>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> </ul> </li> <li>Note: Indonesia no support this band)</li> </ul>
<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>	<p>Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</p>
<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>	<p>Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)</p>
<b>Roaming</b>	<p>IEEE 802.11 compliant roaming between access points</p>
<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> </ul>

### Technical Specifications

- 802.11n HT20(2.4GHz) : +14dBm minimum
- 802.11n HT40(2.4GHz) : +12dBm minimum
- 802.11n HT20(5GHz) : +14dBm minimum
- 802.11n HT40(5GHz) : +12dBm minimum

<b>Power Consumption</b>	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connect Standby: 10 mW (WLAN+BT) Radio disabled: 5 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 : -88dBm maximum 802.11a, 54Mbps : -74dBm 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
	<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>

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

<b>Bluetooth Specification</b>	4.0/4.1/4.2 Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)

### Technical Specifications

#### Data Rates and Throughput

Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps  
 BLE : 1 Mbps data rate; throughput up to 0.2 Mbps  
 Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels  
 Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)

#### Transmit Power

The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.

#### Receiver Sensitivity Legacy

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

Legacy Up to 33 ft (10 m)  
 BLE Up to 99 ft (30 m)

#### Electrical Interface

USB 2.0 compliant

#### Bluetooth Software Supported Link Topology

Microsoft Windows Bluetooth Software

#### Electrical Interface Bluetooth Software Supported Security

Point to Point, Multipoint Pico Nets up to 7 slaves  
 Full support of Bluetooth Security Provisions

#### Power Management Certifications

Microsoft Windows ACPI, and USB Bus Support  
 Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff

#### Security Certifications Bluetooth Profiles Supported

All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249

#### Power Management Certifications

ETS 300 328, ETS 300 826  
 Low Voltage Directive IEC950  
 UL, CSA, and CE Mark  
 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>  
 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>  
 Hands Free Profile (HFP)  
 Advanced Audio Distribution Profile (A2DP)  
 Audio Video Remote Control Profile (AVRCP)

#### Certifications Bluetooth Profiles Supported

#### Bluetooth V4.1/V4.2 support feature

V4.1: ESR5/6/7 compliant

V4.2: ESR8 compliant, LE Secure Connection – Basic.

### Technical Specifications

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

<b>Wireless LAN Standards</b>	<ul style="list-style-type: none"> <li>IEEE 802.11a</li> <li>IEEE 802.11b</li> <li>IEEE 802.11g</li> <li>IEEE 802.11n</li> <li>IEEE 802.11ac</li> </ul>
<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> 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 <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> </ul> Note: Indonesia only supports 5.725 - 5.825 GHz (CH149 - CH161)
<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 ~ MCS7, (1SS) (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>
<b>Network Architecture</b>	Ad-hoc (Peer to Peer)
<b>Models</b>	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>802.11a : +14dBm minimum</li> <li>802.11n HT20(2.4GHz) : +14dBm minimum</li> <li>802.11n HT40(2.4GHz) : +12dBm minimum</li> <li>802.11n HT20(5GHz) : +14dBm minimum</li> </ul>

### Technical Specifications

	<ul style="list-style-type: none"> <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: 50 mW (WLAN unassociated) Connect Standby: 10 mW (WLAN+BT) Radio disabled: 5 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 : -88dBm maximum 802.11a, 54Mbps : -74dBm 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. 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 4.0/4.1/4.2 Wireless Technology

<b>Bluetooth Specification</b>	4.0/4.1/4.2 Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
<b>Data Rates and Throughput</b>	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps BLE : 1 Mbps data rate; throughput up to 0.2 Mbps Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels

### Technical Specifications

**Transmit Power**

Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)

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 Legacy**

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**

Legacy Up to 33 ft (10 m)  
BLE Up to 99 ft (30 m)

**Electrical Interface Bluetooth Software Supported Link Topology**

USB 2.0 compliant  
Microsoft Windows Bluetooth Software

**Electrical Interface Bluetooth Software Supported Security**

Point to Point, Multipoint Pico Nets up to 7 slaves  
Full support of Bluetooth Security Provisions

**Power Management Certifications**

Microsoft Windows ACPI, and USB Bus Support  
Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff

**Security Certifications Bluetooth Profiles Supported**

All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249

**Power Management Certifications**

ETS 300 328, ETS 300 826  
Low Voltage Directive IEC950  
UL, CSA, and CE Mark  
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>  
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>  
Hands Free Profile (HFP)  
Advanced Audio Distribution Profile (A2DP)  
Audio Video Remote Control Profile (AVRCP)

**Certifications Bluetooth Profiles Supported**

**Bluetooth V4.1/V4.2 support feature**

V4.1: ESR5/6/7 compliant

V4.2: ESR8 compliant, LE Secure Connection – Basic.



### Technical Specifications

#### HP hs3110 HSPA+ Intel® Mobile Broadband Module\*

<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>	WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification E-GPRS: Class B, Multi-slot class 33, coding schemes CS1 - CS4 and MSC1 - MSC9
<b>GPS</b>	Standalone, A-GPS
<b>GPS bands</b>	1575.42 MHz ± 1.023 MHz
<b>Maximum data rates</b>	HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload)  E-GPRS: 296 kbps (Download), 236.8 kbps (Upload) GPRS: 107 kbps (Download), 85.6 kbps (Upload)
<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>	HSPA+: 1,100 mA (peak); 800 mA (average) E-GPRS: 2,800 mA (peak); 700 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.

### ENVIRONMENTAL

#### 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)	5.97 W	6.13 W	6.01 W
Normal Operation (Long idle)	3.04 W	3.66 W	3.12 W
Sleep	0.46 W	0.49 W	0.39 W

### Technical Specifications

Off	0.27 W	0.40 W	0.28 W
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**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)	20 BTU/hr	21 BTU/hr	21 BTU/hr
Normal Operation (Long idle)	10 BTU/hr	13 BTU/hr	11 BTU/hr
Sleep	2 BTU/hr	2 BTU/hr	1 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.

<b>Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)</b>	<b>Sound Power (L<sub>WAd</sub>, bels)</b>	<b>Sound Pressure (L<sub>pAm</sub>, decibels)</b>
Typically Configured – Idle	2.8	20
Fixed Disk – Random writes	2.8	20

**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

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:

### 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 98.2% recycle-able when properly disposed of at end of life.

#### Packaging Materials

<b>External:</b>	PAPER/Corrugated	392.4 g
<b>Internal:</b>	PLASTIC/EPE (Expanded Polyethylene)	46.9 g
	PLASTIC/Polyethylene low density	12.1 g
	PLASTIC/Plast. Other	1.8

The plastic packaging material contains at least 30% recycled content.

The corrugated paper packaging materials contains at least 30% 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)

### Technical Specifications

#### Packaging Usage

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

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

#### End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <http://www.hp.com/go/reuse-recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/recyclers>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

#### Hewlett-Packard Corporate Environmental Information

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

Global Citizenship Report

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

Eco-label certifications

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

ISO 14001 certificates:

<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842>

and

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

### COUNTRY OF ORIGIN

China

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

### Cases

HP Essential Top Load Case (up to 15.6")	H2W17AA#xxx
HP Essential Backpack (up to 15.6")	H1D24AA
HP Slim Ultrabook Top Load (up to 15.6" x .88"/22/5mm)	F3W15AA
HP Slim Ultrabook Backpack (up to 15.6" x .88"/22/5mm)	F3W16AA

### Docking

HP 3001pr USB 3 Port Replicator	F3S42AA
HP USB 3.0 Port Replicator (Spin)	H1L08AA#xxx

### Input/Output

HP Touch To Pair Mouse	H6E52AA
HP Stylish Wireless KB/Mouse	H4B79AA
HP Ultrathin Wireless Mouse SE	L9V77AA
HP Ultrathin Wireless Mouse	L9V78AA
HP 2.4 GHz Keyboard and Mouse	G1K29AA#xxx
HP Stylish USB KB/Mouse	H4B80AA
HP X4000b Bluetooth Mouse	H3T50AA#xxx
HP HDMI to DVI Adapter	F5A28AA
HP Wireless Display Adapter	J1V25AA#xxx

### Power

HP 45W Smart AC Adapter (4.5mm)	H6Y88AA#xxx
HP DB06XL Notebook Battery	M0A68AA

### Storage

HP External USB Optical Drive	F2B56AA
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### Security

HP USB Smart Card Reader	F6V67AA
HP UltraSlim Keyed Cable Lock	H4D73AA

### Displays

HP ProDisplay P222va	K7X30A
HP ProDisplay P202	K7X27A
HP ProDisplay P232	K7X31A

### Summary of Changes

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