

### Overview

#### HP ProBook 455 G5 Notebook PC



#### Right

1. Microphones (2)
2. Webcam
3. Webcam light
4. Fingerprint reader
5. Clickpad
6. Hard drive LED
7. SD Card reader
8. Headphone/Microphone combo jack
9. USB 2.0 (power port)
10. Power button
11. Security lock slot (Lock sold separately.)

### Overview



#### Left

1. Power connector
2. Ethernet port (RJ-R45)
3. External VGA monitor port
4. HDMI port (Cable not included.)
5. USB 3.1 Gen 1 (2)
6. USB Type-C™ port

### Overview

#### AT A GLANCE

- Preinstalled with Windows 10 versions or FreeDOS 2.0
- Choice of 7th Generation AMD A10 or A9 APU with Radeon™ R5 Graphics
- 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.)
- Large Clickpad with gestures support
- Enhanced security features with preinstalled software and hardware options
- Optional HD webcam with dual-microphone array for video conferencing<sup>1</sup>
- HDMI port for connecting to high-resolution displays
- Choice of displays 39.6 cm (15.6") diagonal FHD IPS anti-glare flat LED backlit non-touch; 220 cd/m<sup>2</sup>; 45% sRGB (1920 x 1080)  
eDP HD Slim or 39.6 cm (15.6") diagonal HD SVA anti-glare LED-backlit non-touch; 220 cd/m<sup>2</sup>; 45% sRGB (1366 x 768)
- Flexible wireless connectivity options
- Battery life up to 9 hours and 45 minutes (SSD); up to 8 hours and 30 minutes (HDD)<sup>2</sup>
- HP 3-cell, 48 WHr Li-ion battery
- Designed to pass MIL-STD<sup>3</sup>
- Full size HP Premium Keyboard with numeric keypad, spill-resistant keyboard with a thin layer of mylar film to prevent minor spills

1. Sold separately or as an optional feature.

2. 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.

3. 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. Accidental damage requires an optional HP Accidental Damage Protection Care Pack.

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

### Features

#### PRODUCT NAME

HP ProBook 455 G5 Notebook PC

#### OPERATING SYSTEM

##### Preinstalled

Windows 10 Pro 64<sup>4</sup>  
Windows 10 Pro (National Academic only)<sup>4,5</sup>  
Windows 10 Home 64<sup>4</sup>  
Windows 10 Home Single Language 64<sup>4</sup>  
Windows 10 Home 64 (National Academic only)<sup>4</sup>  
FreeDOS 2.0

4. Sold separately or as an optional feature.

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

#### PROCESSORS

AMD A10-9620P APU with Radeon™ R5 Graphics (2.5 GHz base frequency, up to 3.4 GHz burst frequency, 2 MB cache, 4 cores)<sup>6,7</sup>  
AMD A9-9420 APU with Radeon™ R5 Graphics (3 GHz base frequency, up to 3.6 GHz burst frequency, 1 MB cache, 2 cores)<sup>6,7</sup>

##### Processor Family

7th Generation AMD A10 APU processor (9620P model)<sup>8</sup>

7th Generation AMD A9 APU processor (9420 model)<sup>8</sup>

6. 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. AMD's numbering is not a measurement of clock speed.

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

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

#### CHIPSET

Integrated with processor

#### GRAPHICS

##### Integrated

AMD Radeon™ R5<sup>9</sup>

##### Supports

Supports HD decode, DX12, HDMI 1.4b

9. HD content required to view HD images.

### Features

#### DISPLAY

**eDP FHD Slim**

39.6 cm (15.6") diagonal FHD IPS anti-glare flat LED backlit non-touch; 220 cd/m<sup>2</sup>; 45% sRGB (1920 x 1080)<sup>10,11</sup>

**eDP HD Slim**

39.6 cm (15.6") diagonal HD SVA anti-glare LED-backlit non-touch; 220 cd/m<sup>2</sup>; 45% sRGB (1366 x 768)<sup>10,11</sup>  
Up to 32-bit per pixel color depth

**Display Size**

15.6"

39.6 cm (15.6")

10. HD content required to view HD images.

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

---

#### STORAGE AND DRIVES

**Primary Storage**

500 GB SATA (7200 rpm)<sup>12</sup>

1 TB SATA (5400 rpm)<sup>12</sup>

**Primary M.2 Storage**

128 GB M.2 SATA TLC SSD<sup>12</sup>

256 GB M.2 PCIe NVMe Value SSD<sup>12</sup>

12. For hard drives, GB = 1 billion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

---

#### MEMORY

**Maximum Memory**

16 GB DDR4-2400 SDRAM<sup>13</sup>

**Memory**

16 GB DDR4-2400 SDRAM (1 x 16 GB)<sup>13</sup>

16 GB DDR4-2400 SDRAM (2 x 8 GB)<sup>13</sup>

12 GB DDR4-2400 SDRAM (4 and 8 GB)<sup>13</sup>

8 GB DDR4-2400 SDRAM (1 x 8 GB)<sup>13</sup>

8 GB DDR4-2400 SDRAM (2 x 4 GB)<sup>13</sup>

4 GB DDR4-2400 SDRAM (1 x 4 GB)<sup>13</sup>

**Memory Slots**

2 SODIMM

Both slots are customer accessible / upgradeable

DDR4 PC4 SODIMMS (Transfer rates up to 1866 MT/s)

13. Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

---

### Features

#### NETWORKING/COMMUNICATIONS

**WLAN**

Realtek 802.11ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo<sup>14</sup>  
Realtek 802.11ac (1x1) Wi-Fi® and Bluetooth® 4.2 Combo<sup>14</sup>

**Ethernet**

Realtek RTL8111HSH Gigabit Ethernet

14. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.

---

#### AUDIO/MULTIMEDIA

**Audio**

2 Integrated stereo speakers  
Integrated dual array microphone

**Webcam**

HD webcam <sup>15,16</sup>

15. HD content required to view HD images.  
16. Internet access required.

---

### Features

#### KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

##### Keyboard

HP Premium Keyboard  
Backlit keyboard available as an option  
Full-sized island-style, spill resistant with numeric keypad

##### Pointing Device

Clickpad with multi-touch gesture support image sensor, taps enabled as default

##### Gestures

###### Enabled by default Win 10

2 Finger Scrolling  
2 Finger Zoom (Pinch)  
OSD (enable/disable)  
3 finger tap = Cortana  
3 finger flick = App switch  
4 finger tap = Action Center

###### Disabled by default Win 10

3 Finger Flick  
2 Finger Rotate  
Momentum Motion  
1 Finger Vertical Scroll

##### Function Keys

ESC: System Information  
F1 - Display Switching  
F2 - Blank  
F3 - Brightness Down  
F4 - Brightness Up  
F5 - Speaker Mute  
F6 - Volume Down  
F7 - Volume Up  
F8 - Mic Mute  
F9 - Backlight Toggle (for backlit keyboard) or Blank  
F10 - Blank  
F11 - Wifi Toggle  
F12 - Sleep

##### Hidden Functions

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

---

### Features

#### SOFTWARE AND SECURITY

##### Preinstalled Software

###### BIOS

- HP BIOSphere Gen4<sup>17</sup>
- HP DriveLock & Automatic DriveLock
- BIOS Update via Network
- Master Boot Record Security
- Power-on authentication
- Secure Erase<sup>18</sup>
- Absolute Persistence Module<sup>19</sup>
- Pre-boot Authentication
- HP Wireless Wakeup

###### Software

- HP Native Miracast Support<sup>20</sup>
- HP LAN-Wireless Protection
- HP Velocity v1.5
- HP 3D DriveGuard
- HP ePrint + JetAdvantage<sup>21</sup>
- HP Hotkey Support - CMIT
- HP Recovery Manager
- HP Jumpstart
- HP Support Assistant<sup>22</sup>
- HP Noise Cancellation Software
- HP WorkWise Gen2<sup>28</sup>
- HP PhoneWise<sup>29</sup>
- Buy Office

###### Manageability Features

- HP Driver Packs<sup>23</sup>
- HP System Software Manager (SSM)
- HP BIOS Config Utility (BCU)
- HP Client Catalog
- HP Manageability Integration Kit Gen2<sup>24</sup>

###### Client Security Software

- HP Client Security Suite Gen4<sup>25</sup> including:
  - HP Security Manager (including Credential Manager, HP Password Manager, HP Spare Key)<sup>26</sup>
  - Power On Authentication
  - HP Fingerprint Sensor
  - HP Device Access Manager
  - HP Power On Authentication
- Microsoft Defender<sup>27</sup>

###### Security Management

### Features

- HP BIOSphere Gen4<sup>1</sup>
- HP DriveLock & Automatic DriveLock
- BIOS Update via Network
- Secure Erase<sup>2</sup>
- Pre-boot Authentication
- TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)
- SATA 0,1 port disablement (viaBIOS)
- Serial, USB enable/disable (viaBIOS)
- Power-on password (viaBIOS)
- Setup password (viaBIOS)
- Support for chassis padlocks and cable lock devices
- Integrated hood sensor

17. HP BIOSphere Gen4 requires Intel® 7th generation processors.

18. Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88. Supported on Elite platforms with BIOS version F.03 or higher.

19. Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: <http://www.absolute.com/company/legal/agreements/computrace-agreement>. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.

20. 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>.

21. HP ePrint Drive requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see <http://www.hp.com/go/eprintcenter>). Print times and connection speeds may vary.

22. HP Support Assistant requires Windows and Internet Access.

23. HP Driver Packs is not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.

24. HP Manageability Integration Kit Gen2: HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>

25. HP Client Security Suite Gen4: Requires Windows

26. HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. User may need to enable or allow the add-on / extension in the internet browser.

27. Microsoft Defender Opt in and internet connection required for updates.

28. HP WorkWise Gen2 smartphone app is available as a free download on the App Store and Google Play and is compatible with HP systems preinstalled with HP Workwise only. As of September 2017, HP WorkWise will no longer support iOS or iPhone® devices. See requirements at <http://www.hp.com/go/workwise>.

29. HP PhoneWise Client is only available on the HP EliteDesk 1000 AiO, HP EliteBook 1020 G3, HP EliteBook 1040 G3 platforms. For HP PhoneWise system requirements see <http://www.hp.com/go/HPPhoneWise>. HP PhoneWise not compatible with HP WorkWise at launch.

### Features

#### POWER

**Power Supply**

45 W HP Smart AC adapter<sup>30</sup>

45 W HP Smart AC adapter 2-prong (Japan only)<sup>30</sup>

65 W HP Smart AC adapter<sup>30</sup>

65 W EM Smart AC adapter<sup>30</sup>

**Primary Battery**

3-cell, 48 Wh Long Life Li-ion<sup>31</sup>

**Power Cord**

2-wire plug - 1 m (2-prong Japan only)<sup>30</sup>

3-wire plug - 1 m<sup>30</sup>

3-wire plug - 1.8 m<sup>30</sup>

**Battery Life**

Up to 9 hours and 45 minutes<sup>32</sup>

30. Availability may vary by country.

31. Battery is internal and not replaceable by customer. Serviceable by warranty. Fast charging 90% in 90 minutes

32. 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.

---

#### WEIGHTS & DIMENSIONS

**Weight**

Starting at 4.64 lb<sup>33</sup>

Starting at 2.02 kg<sup>33</sup>

**Dimensions (w x d x h)**

14.8 x 10.4 x 0.82 in

37.6 x 26.3 x 2.09 cm

33. Weight will vary by configuration.

---

### Features

#### PORTS/SLOTS

##### Ports

- 1 USB 3.1 Type-C™ Gen 1 (Power Delivery, DisplayPort™)
- 2 USB 3.0
- 1 USB 2.0(power port)
- 1 HDMI 1.4b<sup>34</sup>
- 1 VGA
- 1 RJ-45
- 1 AC power
- 1 headphone/microphone combo jack

##### Expansion Slots

- 1 multi-format digital media reader
- Supports SD, SDHC, SDXC

34. HDMI cable sold separately.

---

#### SERVICE AND SUPPORT

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. 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>.<sup>35</sup>

35. HP Care Packs are sold separately. Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit <http://www.hp.com/go/cpc>. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

---

### Technical Specifications

#### SYSTEM UNIT

<b>Stand-Alone Power Requirements</b> (AC Power)	<b>Nominal Operating Voltage</b>	19V
	<b>Average Operating Power</b>	Win 10
	<b>Max Operating Power</b>	UMA < 45W
<b>Temperature</b>	<b>Operating</b>	32° to 95° F (0° to 35° C)
	<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</b> (unpressurized)	<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®</b>	Select models <sup>36</sup>
	<b>EPEAT®</b>	Registered Gold in United States <sup>37</sup>
	<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	

36. EPEAT® registered where applicable. EPEAT registration varies by country. See <http://www.epeat.net> for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at <http://www.hp.com/go/options>.

37. Configurations of the HP ProBook 455 G4 is ENERGY STAR® qualified are identified as HP ProBook 455 G4 ENERGY STAR on HP websites and on <http://www.energystar.gov>.

### Technical Specifications

#### DISPLAYS

<b>15.6" diagonal FHD UWVA anti-glare eDP slim LED backlit non-touch; 220 nits; 45% sRGB (1920 x 1080)</b>	<b>Outline Dimensions (W x H)</b>	360.0 x 224.3mm max
	<b>Active Area</b>	344.16 x 193.59
	<b>Weight</b>	360g max.
	<b>Diagonal Size</b>	15.6 (inch)
	<b>Thickness</b>	3.2mm max
	<b>Interface</b>	eDP 1.2
	<b>LCD Mode</b>	IPS
	<b>PPI</b>	
	<b>Surface Treatment</b>	Anti-Glare (AG)
	<b>Touch Enabled</b>	None
	<b>Contrast Ratio</b>	600:1 (typical)
	<b>Refresh Rate</b>	60Hz
	<b>Brightness</b>	220 nits
	<b>Pixel Resolution</b>	1920 x 1080 (FHD)
	<b>Format</b>	RGB
	<b>Backlight</b>	LED
	<b>Color Gamut Coverage</b>	45%
<b>Color Depth</b>	6 bits + FRC	
<b>Viewing Angle</b>	UWVA 85/85/85/85	

<b>15.6" diagonal HD SVA anti-glare eDP slim LED-backlit non-touch; 220 nits; 45% sRGB (1366 x 768)</b>	<b>Outline Dimensions (W x H)</b>	360 x 224.3 (mm) max
	<b>Active Area</b>	344.2 x 193.5 (mm)
	<b>Weight</b>	370 g max
	<b>Diagonal Size</b>	15.6 (inch)
	<b>Thickness</b>	3.2 (mm) max
	<b>Interface</b>	eDP 1.2
	<b>LCD Mode</b>	TN
	<b>PPI</b>	
	<b>Surface Treatment</b>	Anti-Glare (AG)
	<b>Touch Enabled</b>	None
	<b>Contrast Ratio</b>	300:1 (typical)
	<b>Refresh Rate</b>	60 Hz

### Technical Specifications

<b>Brightness</b>	220 nits
<b>Pixel Resolution</b>	1366 x 768 (HD)
<b>Format</b>	RGB
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	45%
<b>Color Depth</b>	6 bits + Hi FRC
<b>Viewing Angle</b>	SVA 45/45/25/35

### STORAGE

#### 500 GB 7200 rpm SATA Hard Drive

<b>Drive Weight</b>	0.21 lbs (94 g)
<b>Rotation Speed</b>	5400 rpm
<b>Cache Buffer</b>	Up to 32 MB
<b>Height</b>	0.28 in (7.2 mm)
<b>Width</b>	2.75 in (69.85 mm)
<b>Interface</b>	ATA-8, SATA 3.0
<b>Transfer Rate</b>	600 MB/s
<b>Seek Time</b>	<b>Single Track</b> 2 ms <b>Average</b> 13 ms <b>Maximum</b> 18 ~ 22 ms
<b>Logical Blocks</b>	1,953,525,168
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [top cover temp]
<b>Security Features</b>	ATA Security
<b>Features</b>	S.M.A.R.T., NCQ, Ultra DMA

#### 1 TB 5400 rpm SATA Hard Drive

<b>Drive Weight</b>	0.21 lbs (94 g)
<b>Rotation Speed</b>	5400 rpm
<b>Cache Buffer</b>	Up to 32 MB
<b>Height</b>	0.28 in (7.2 mm)
<b>Width</b>	2.75 in (69.85 mm)
<b>Interface</b>	ATA-8, SATA 3.0
<b>Transfer Rate</b>	600 MB/s
<b>Seek Time</b>	<b>Single Track</b> 2 ms <b>Average</b> 13 ms <b>Maximum</b> 18 ~ 22 ms
<b>Logical Blocks</b>	1,953,525,168

### Technical Specifications

<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [top cover temp]
<b>Security Features</b>	ATA Security
<b>Features</b>	S.M.A.R.T., NCQ, Ultra DMA

#### 128 GB 2280 M2 SATA-3 TLC Solid State Drive

<b>Form Factor</b>	M.2 2280
<b>Capacity</b>	128 GB
<b>NAND Type</b>	TLC
<b>Height</b>	0.09 in (2.3 mm)
<b>Width</b>	0.87 in (22 mm)
<b>Weight</b>	0.02 lb (10 g)
<b>Interface</b>	ATA-8, SATA 3.0
<b>Maximum Sequential Read</b>	Up To 520 MB/s
<b>Maximum Sequential Write</b>	Up To 450 MB/s
<b>Logical Blocks</b>	250,069,680
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	DIPM; TRIM; DEVSLP

#### 256 GB 2280 PCIe NVMe Value Solid State Drive

<b>Form Factor</b>	M.2 2280
<b>Capacity</b>	256 GB
<b>NAND Type</b>	TLC
<b>Height</b>	0.09 in (2.3 mm)
<b>Width</b>	0.87 in (22 mm)
<b>Weight</b>	0.02 lb (10 g)
<b>Interface</b>	PCIe NVMe Gen3X4
<b>Maximum Sequential Read</b>	Up To 1700 MB/s
<b>Maximum Sequential Write</b>	Up To 600 MB/s
<b>Logical Blocks</b>	500,118,192
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	M.2 2280

### Technical Specifications

#### NETWORKING/COMMUNICATIONS

<b>Realtek 802.11 b/g/n (1x1) with Bluetooth® v4.2 combo *</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
	<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> 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>
	<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</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 •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</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</b>	<ul style="list-style-type: none"> <li>• 802.11b : +14dBm minimum</li> <li>• 802.11g : +12dBm minimum</li> <li>• 802.11a : +12dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +12dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +12dBm minimum</li> <li>• 802.11n HT20(5GHz) : +10dBm minimum</li> <li>• 802.11n HT40(5GHz) : +10dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +10dBm minimum</li> </ul>
	<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode 2.0 W</li> <li>• Receive mode 1.6 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode 50 mW (WLAN unassociated)</li> <li>• Connected Standby 10mW</li> <li>• Radio disabled 8 mW</li> </ul>
	<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode

### Technical Specifications

<b>Receiver Sensitivity</b>	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum	
<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>	Type 2230 : 2.3 x 22.0 x 30.0 mm	
<b>Weight</b>	Type 2230 : 2.8g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	<b>Operating</b>	14° to 158° F (-10° to 70° C)
	<b>Non-operating</b>	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	<b>Operating</b>	10% to 90% (non-condensing)
	<b>Non-operating</b>	5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b>	0 to 10,000 ft (3,048 m)
	<b>Non-operating</b>	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	<b>Amber</b> – Radio OFF; <b>White</b> – Radio ON	

### Technical Specifications

#### 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 Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
<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>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
<b>Electrical Interface</b>	USB 2.0 compliant
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
<b>Power Management Certifications</b>	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
<b>Bluetooth Profiles Supported</b>	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP)  Advanced Audio Distribution Profile (A2DP)

### Technical Specifications

<b>Intel® 802.11a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.2 Combo</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
	<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> 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>
	<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</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. •WPA2 certification</li> <li>• IEEE 802.11i •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</b>	<ul style="list-style-type: none"> <li>• 802.11b : +14dBm minimum</li> <li>• 802.11g : +12dBm minimum</li> <li>• 802.11a : +12dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +12dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +12dBm minimum</li> <li>• 802.11n HT20(5GHz) : +10dBm minimum</li> <li>• 802.11n HT40(5GHz) : +10dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +10dBm minimum</li> </ul>
	<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode 2.0 W</li> <li>• Receive mode 1.6 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode 50 mW (WLAN unassociated)</li> <li>• Connected Standby 10mW</li> <li>• Radio disabled 8 mW</li> </ul>
	<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode

### Technical Specifications

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

### Technical Specifications

#### 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 Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
<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>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
<b>Electrical Interface</b>	USB 2.0 compliant
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
<b>Power Management Certifications</b>	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
<b>Bluetooth Profiles Supported</b>	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

### Technical Specifications

#### POWER

<b>HP 45W Smart AC adapter</b>	<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>	<b>Input Voltage</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
		<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>Connector</b>	4.5mm Barrel Type, 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>Safety Certifications</b>	<b>Storage Humidity</b>	10% to 95%	
	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE.		
	MTBF - over 200,000 hours at 25°C ambient condition.		

<b>HP 45W Smart AC adapter</b>	<b>Dimensions</b>	102x55x30mm		
	<b>Weight</b>	270g +/- 10g		
	<b>Input</b>	<b>Input Efficiency</b>	87% min at 115V/230V	
		<b>Input frequency range</b>	47 to 63 Hz	
		<b>Input AC current</b>	1.7 A at 90 VAC and maximum load	
		<b>DC output</b>	65W(19.5V/3.33A)	
	<b>Output</b>	<b>Hold-up time</b>	5 msec at 115 VAC input	
		<b>Output current limit</b>	<11A, Over voltage protection- 29V max automatic shutdown	
		<b>Connector</b>	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords	
		<b>Environmental Design</b>	<b>Operating temperature</b>	0° to 35° C
	<b>Non-operating (storage) temperature</b>		-20° to 85° C	
	<b>Altitude</b>		0 to 5,000 m	
	<b>Humidity</b>		0% to 95%	
	<b>Safety Certifications</b>	<b>Storage Humidity</b>	0% to 95%	
CE Mark - 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;				
Reliability - failure rate of less than 0.1% annually within the first three years of operation.				

### Technical Specifications

<b>HP 3-cell, Long Life 48 WHr Li-ion</b>	<b>Dimensions (H x W x L)</b>	7.0. x180.48x88.95mm (0.273 x 7.09 x 3.49 inch)
	<b>Weight</b>	0.22 kg (0.48lb)
	<b>Cells/Type</b>	3cell Lithium-Ion
	<b>Voltage</b>	11.4V/ 10.95V
<b>Energy</b>	<b>Amp-hour capacity</b>	4.212Ah /4.385Ah
	<b>Watt-hour capacity</b>	48Wh
<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>Fuel Gauge LED</b>		N/A
<b>Warranty</b>		3 years
<b>Optional Travel Battery Available</b>		No

---

### COUNTRY OF ORIGIN

China

---

### 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	H1D24AA
	HP Essential Messenger Case	H1D25AA
<b>Docking</b>	HP 3005pr USB3 Port Replicator	Y4H06AA
	HP Thunderbolt Dock 120W G2	TBD
	HP USB-C Travel Dock	TOK29AA
	HP USB Travel Dock	TOK30AA
	HP Elite USB-C Docking Station	X7W54AA
	HP Elite USB-C Dock	Z9R42AA
	HP Elite USB-C Dock G3	2DW60AA
	HP USB-C Mini Dock	1PM64AA
	HP USB-C Universal Dock	1MK33AA
HP Thunderbolt 120W 1m cable	3AQ23AA	
<b>Input/Output</b>	HP Slim USB Keyboard and Mouse	T6T83AA
	HP Slim Wireless Keyboard and Mouse	T6L04AA
	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 HDMI to DVI Adapter	F5A28AA
	HP USB-C to DP	N9K78AA
	HP USB-C to USB-A Hub	Z6A00AA
	HP Stereo 3.5mm Headset	T1A66AA
	HP Stereo USB Headset	T1A67AA
HP Essential USB Mouse	2TX37AA	
<b>Power</b>	HP 45W Smart AC Adapter 4.5mm	H6Y88AA
	HP 65W Smart AC Adapter	H6Y89AA
	HP 65W Slim AC Adapter	H6Y82AA
	HP 45W USB-C Power Adapter	1HE07AA
	HP 65W USB-C Power Adapter	1HE08AA
	HP Power Bank	N9F71AA
	HP USB-C Notebook Power Bank	2NA10AA
	HP Notebook Power Bank	N9F71AA
<b>Storage</b>	HP External USB Optical Drive	F2B56AA
	HP 500GB 7200rpm HDD	F3B97AA
	HP External Portable USB3.0 HDD	K6A93AA
	HP 256GB Value 2280 M.2 SATA3 SSD	1DE47AA
	HP 512GB TLC PCI-e 3x4 NVMe M.2 SSD	1FU88AA

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

<b>Security</b>	HP Essential Combination Lock	T0Y16AA
	HP Combination Lock	T0Y15AA
	HP Keyed Cable lock	T0Y14AA
	HP Keyed Cable Lock 10mm	T1A62AA
<b>UCC</b>	HP Conferencing Keyboard	K8P74AA
	HP USB Collaboration Keyboard	Z9N38AA
	HP Wireless Collaboration Keyboard	Z9N39AA
	HP UC Wireless Mono Headset	W3K08AA
	HP UC Wireless Duo Headset	W3K09AA
	HP UC Speaker Phone	K7V16AA
	HP UC Wired Headset	K7V17AA
<b>Displays</b>	HP EliteDisplay S140u USB Portable Monitor	G8R65AA
	HP ProDisplay P240VA 23.8-inch Monitor	N3H14AA
	HP ProDisplay P232 23-inch Monitor	K7X31AA
	HP ProDisplay P223 21.5-inch Monitor	X7R61AA
	HP EliteDisplay E230t 23-inch Touch Monitor	W2Z50AA
	HP EliteDisplay E240c 23.8-inch Collaboration Monitor	M1P00A8

---

### Summary of Changes

Date of change:	Version History:		Description of change:
January 4, 2018	V1 to V2	Update	Ports section rearranged
January 17, 2018	V2 to V3	Update	Footnote number 3 on At a Glance section updated
January 18, 2018	V3 to V4	Update	“Fast charging 90% in 90 minutes” added to footnote n. 31 in Power section

©Copyright 2018 HP Development Company, L.P. The information contained herein is subject to change without notice. The only warranties are contained in the limited warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein. Bluetooth is a trademark of its proprietor used by HP Inc. under license. ENERGY STAR is a registered trademark of the U.S. Environmental Protection Agency. USB Type-C and USB-C are trademarks of USB Implementers Forum. AMD and Radeon are a trademark of Advanced Micro Devices, Inc. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.