

### Overview

#### HP ProBook x360 11 G5 EE



#### Left

- |    |   |     |  |
|----|---|-----|--|
| 1. | Webcam LED                                  | 6.  | World-facing Webcam LED (Optional)             |
| 2. | 720p Webcam or optional HP Privacy Camera   | 7.  | Power Button                                   |
| 3. | Microphone                                  | 8.  | Headphone / Microphone Combo Jack              |
| 4. | ClickPad                                    | 9.  | USB 3.1 Gen 1 Port                             |
| 5. | World-facing 5 Megapixels Webcam (Optional) | 10. | Security Lock Slot (Nano lock sold separately) |

### Overview



#### Right

- |    |                                |    |                                     |
|----|--------------------------------|----|-------------------------------------|
| 1. | Power Connector                | 4. | USB 3.1 Gen 1 Port                  |
| 2. | Ethernet (RJ-45) Port          | 5. | USB Type-C™ (Data and Power in-out) |
| 3. | HDMI Port (Cable not included) |    |                                     |

### Overview

#### AT A GLANCE

- Starting at 3.16 lbs (1.44 kg) touch
- At 21 mm (0.83"), this flexible 360° hinge converts to laptop, tablet, tent, stand or book mode easily
- Designed to pass MIL-STD 810G testing<sup>1</sup> with rugged features such as co-molded rubber trim, spill- and pick-resistant keyboard, and Corning® Gorilla® Glass 3 touch screen
- Optional dual camera system for project-based learning
- New optional active HP Pro Pen is engineered for the classroom – durable tips require less replacing
- Pre-installed with Windows 10 Pro 64, Windows 10 Pro 64 (National Academic), Windows 10 Home 64, or Windows 10 Pro in S mode 64, FreeDOS<sup>2</sup>
- Powered by Intel® Celeron® N4000, Intel® Celeron® N4100 and Intel® Pentium® N4020, N4120 and Pentium N5000, N5030 processors
- Choice of 29.4cm (11.6") diagonal HD UWVA slim LED touch screen (1366 x 768) or 29.4 cm (11.6") diagonal HD SVA slim LED touch screen (1366 x 768) displays
- 64 GB eMMC, 128 GB SATA-3 TLC Solid State Drive or up to 256 GB SATA-3 Solid State Drive storage options
- Up to 8 GB system memory for enhanced memory management
- Reliable connectivity with choice of Intel® Dual Band Wireless-AC 9560 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 5.0 Combo WLAN or Intel® Dual Band Wireless-AX200 802.11a/b/g/n/ax (2x2) Wi-Fi 6 and Bluetooth® 5.0 Combo WLAN for learning and collaboration beyond the classroom
- Built-in ports include: Ethernet (RJ-45), 2 USB 3.1 Gen 1, USB Type-C™, and HDMI 1.4b port for connecting to high-resolution displays
- Enhanced security TPM 2.0 discrete chip
- Battery life Up to 16 hours and 45 minutes<sup>3</sup>

1. MIL STD 810H testing is pending and is not intended to demonstrate fitness for U.S. Department of Defense contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Damage under the MIL STD test conditions or any accidental damage requires an optional HP Accidental Damage Protection Care Pack.

2. FreeDOS planned to be available March 2020.

3. Recharges the battery up to 90% within 90 minutes when the system is off or in standby mode. Power adapter with a minimum capacity of 65 watts is required. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.

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



### Technical Specifications

#### PRODUCT NAME

HP ProBook x360 11 G5 EE

#### OPERATING SYSTEM

##### Preinstalled

Windows 10 Pro 64<sup>1</sup>  
Windows 10 Pro 64 (National Academic only)<sup>2</sup>  
Windows® 10 Home 64<sup>1</sup>  
Windows 10 Home Single Language 64<sup>1</sup>  
Windows 10 Pro in S mode 64<sup>3</sup>  
Windows 10 Pro in S mode 64 (National Academic only)<sup>2,3</sup>  
Windows 10 Pro (Windows 10 Enterprise available with a Volume Licensing Agreement)<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.windows.com>.

2. 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.

3. Windows 10 Pro in S mode 64 works exclusively with apps from the Windows store. Some accessories and apps compatible with Windows 10 may not work, and performance may vary. Certain default settings, features, and apps cannot be changed. Easily switch to Windows 10 Pro configuration (fee applies) Learn more at [Microsoft.com/Windows 10S](https://Microsoft.com/Windows10S).

#### PROCESSORS

Intel® Pentium® Silver N5000 with Intel® UHD Graphics 605 (1.1 GHz base frequency, up to 2.7 GHz burst frequency, 4 MB cache, 4 cores)<sup>4,5,6</sup>

Intel® Celeron® N4100 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.4 GHz burst frequency, 4 MB cache, 4 cores)<sup>4,5,6</sup>

Intel® Celeron® N4000 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.6 GHz burst frequency, 4 MB cache, 2 cores)<sup>4,5,6</sup>

Intel® Pentium® Silver N5030 with Intel® UHD Graphics 605 (1.1 GHz base frequency, up to 3.1 GHz burst frequency, 4 MB cache, 4 cores)<sup>4,5,6</sup>

Intel® Celeron® N4020 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.8 GHz burst frequency, 4 MB cache, 2 cores)<sup>4,5,6</sup>

Intel® Celeron® N4120 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.6 GHz burst frequency, 4 MB cache, 4 cores)<sup>4,5,6</sup>

##### Processors Family

Intel® Celeron® processor (N4000, N4020, 4120)<sup>6</sup>

Intel® Pentium® Silver processor (N5000, N5030)<sup>6</sup>

4. 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



## Technical Specifications

and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.

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

6. 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>.

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## CHIPSET

Chipset is integrated with processor

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## GRAPHICS

### Integrated

Intel® UHD Graphics 605 (for Pentium Silver)<sup>7</sup>

Intel® UHD Graphics 600 (for Celeron)<sup>7</sup>

7. HD content required to view HD images

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## DISPLAY

### Internal

#### Non Touch

29.46 cm (11.6") diagonal HD SVA eDP WLED-backlit with HD camera, 220 nits, 45% NTSC (1366 x 768)<sup>7,8,9</sup>

#### Touch

29.46 cm (11.6") diagonal HD SVA eDP WLED-backlit touch screen with HD camera, 220 nits, 45% NTSC (1366 x 768)<sup>7,8,9</sup>

29.46 cm (11.6") diagonal HD IPS eDP WLED-backlit touch screen with HD camera, 220 nits, 50% NTSC (1366 x 768)<sup>7,8,9</sup>

### HDMI

Port supports resolutions up to 3840 x 2160 external resolution @30 Hz

7. HD content required to view HD images.

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

9. Sold separately or as an optional feature.

## Technical Specifications

### STORAGE AND DRIVES

#### Primary Storage M.2

128 GB SATA-3 TLC Solid State Drive<sup>10,11</sup>

256 GB SATA-3 TLC Solid State Drive<sup>10,11</sup>

#### eMMC Configurations

64 GB eMMC<sup>10</sup>

10. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.

11. Not available with eMMC storage.

### MEMORY

#### Standard

##### Maximum Memory

8 GB DDR4-2400 SDRAM<sup>12</sup>

#### Memory

4 GB DDR4-2400 SDRAM (on-board)<sup>12</sup>

8 GB DDR4-2400 SDRAM (on-board)<sup>12</sup>

12. 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

#### WLAN

Intel® Dual Band Wireless-AC 9560 802.11 a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 5 Combo, non-vPro™<sup>13</sup>

Intel® Dual Band Wireless-AX200 802.11 a/b/g/n/ax (2x2) Wi-Fi 6 and Bluetooth® 5 Combo, non-vPro™ \*

Realtek Dual Band Wireless- 8852AE 802.11 ax (2x2) Wi-Fi 6 and Bluetooth® 5.2 Combo, non-vPro™<sup>13</sup>

#### Miracast

Native Miracast Support<sup>14</sup>

#### Ethernet

Realtek RTL8111HSH-CG 10/100/1000 GbE NIC<sup>15</sup>

13. 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.

14. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.

15. 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



## Technical Specifications

and network infrastructure is required.

\*Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft 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 802.11ax devices.

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## AUDIO/MULTIMEDIA

### Audio

HP HD Audio

2 Integrated stereo speakers

### Speaker Power

2W/2ohm per speaker

### Camera

User-facing 720p HD camera<sup>7,16</sup>

Located on display

### Webcam

World-facing 5 MP secondary camera (Optional)<sup>7,9,16</sup>

7. HD content required to view HD images.

9. Sold separately or as an optional feature.

16. Internet access required.

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

### Keyboard

Full-sized chiclet keyboard, pick proof

### Pointing Device

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

Default on: 2-finger scroll, pinch

Support Windows 10 modern Trackpad gestures

### Function Keys

F1 - Blank

F2 - Blank

F3 - Sleep

F4 - Display Switching

F5 - Audio Mute/Unmute

F6 - Volume <down>

F7 - Volume <up>

F8 - Mic Mute/Unmute

F9 - Brightness <down>

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## Technical Specifications

F10 - Brightness <up>

F11 - Blank

F12 - Wireless On/Off

### Pen

Optional Passive Targus Slim Stylus\*

Optional Active HP Pro Pen

### Sensors

Combo Chip

Accelerometer

Magnetometer

Gyroscope

Hall Sensor

\*Optional Passive Targus Slim Stylus

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## SOFTWARE AND SECURITY

### BIOS

HP BIOSphere Gen5<sup>17</sup>

HP Drive Lock & Automatic Drive Lock<sup>18</sup>

BIOS Update via Network

Master Boot Record Security

Power On Authentication

Secure Erase<sup>19</sup>

Absolute Persistence Module<sup>20</sup>

Pre-boot Authentication

### Software

HP Connection Optimizer

HP School Pack

HP Interactive Light

HP Image Assistant

HP Hotkey Support

HP JumpStart

HP Support Assistant<sup>21</sup>

HP Noise Cancellation Software

Buy Office (sold separately)

### Manageability Features

HP Driver Packs<sup>22</sup>

HP System Software Manager (SSM)

HP BIOS Config Utility (BCU)

HP Client Catalog

HP Manageability Integration Kit Gen3<sup>23</sup>





## Technical Specifications

### Client Security Software

HP Client Security Manager Gen5<sup>24</sup>

Windows Defender<sup>25</sup>

### Security Management

Pre-boot Authentication

TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)<sup>26</sup>

USB enable/disable (via BIOS)

Power-on password (via BIOS)

Setup password (via BIOS)

Support for chassis padlocks and cable lock devices

HP Sure Click<sup>27</sup>

17. HP BIOSphere Gen5 is available on select HP Pro and Elite PCs. See product specifications for details. Features may vary depending on the platform and configurations.

18. HP Drive Lock & Automatic Drive Lock is not supported on NVMe drives

19. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.

20. Absolute firmware module is shipped turned off and can only be activated with the purchase a license subscription and full activation of the software agent. License subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. Certain conditions apply. For full details visit: <https://www.absolute.com/about/legal/agreements/absolute/>.

21. HP Support Assistant requires Windows and Internet access.

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

23. HP Manageability Integration Kit can be downloaded from <http://www.hp.com/go/clientmanagement>.

24. HP Client Security Manager Gen5 requires Windows and is available on the select HP Pro and Elite PCs. See product specifications for details.

25. Windows Defender Opt in and internet connection required for updates.

26. Firmware TPM is version 2.0. Hardware TPM is v1.2, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT).

27. HP Sure Click is available on select HP platforms and supports Microsoft® Internet Explorer, Google Chrome, and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode.

Check <http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA7-0922ENW> for all compatible platforms as they become available.



## Technical Specifications

### POWER

#### Power Supply

HP Smart 45 W External AC power adapter<sup>28</sup>

HP Smart 65 W EM External AC power adapter<sup>28</sup>

HP Smart 45 W USB Type-C™ adapter<sup>28</sup>

#### Primary Battery

HP Long Life 3-cell, 48 Wh Li-ion (90% in 90 minutes)<sup>29,30</sup>

#### Power Cord

3-wire plug - 1 m

#### Battery life

Up to 16 hours and 45 minutes<sup>31</sup>

28. Availability may vary by country.

29. Battery is internal and not replaceable by customer. Serviceable by warranty.

30. 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.

31. Recharges the battery up to 90% within 90 minutes when the system is off or in standby mode. Power adapter with a minimum capacity of 65 watts is required. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.

### WEIGHTS & DIMENSIONS

#### Product Weight

Starting at 3.16 lb<sup>32</sup>

Starting at 1.44 kg<sup>32</sup>

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

11.8 x 8.8 x 0.83 in

30 x 20.53 x 2.12 cm

32. Weight will vary by configuration.

### PORTS/SLOTS

#### Ports

2 USB 3.1 Gen 1

1 USB Type-C™ (Data transfer, power delivery)

1 HDMI 1.4b<sup>33</sup>

1 AC power

1 RJ-45



## Technical Specifications

1 headphone/microphone combo jack

33. HDMI cable sold separately.

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## SERVICE AND SUPPORT

HP Services offers 1-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. 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>34</sup>

34. HP Services offers 1-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. 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>.

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### Technical Specifications

#### ENVIRONMENTAL & INDUSTRY

<b>Environmental Data</b>	<b>Eco-Label Certifications &amp; declarations</b>	<p>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:</p> <ul style="list-style-type: none"> <li>• IT ECO declaration</li> <li>• US ENERGY STAR®</li> <li>• EPEAT® Silver registered in the United States. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country.</li> <li>• TCO Certified 8.0</li> </ul>		
	<b>System Configuration</b>	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.		
	<b>Energy Consumption (in accordance with US ENERGY STAR® test method)</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>
	Normal Operation (Sort idle)	3.50 W	3.58 W	3.52 W
	Normal Operation (Long idle)	1.30 W	1.26 W	1.30 W
	Sleep	0.29 W	0.31 W	0.29 W
	Off	0.24 W	0.26 W	0.24 W
		<p>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.</p>		
	<b>Heat Dissipation*</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>
	Normal Operation (Short idle)	12 BTU/hr	12 BTU/hr	12 BTU/hr
	Normal Operation (Long idle)	4 BTU/hr	4 BTU/hr	4 BTU/hr
	Sleep	1 BTU/hr	1 BTU/hr	1 BTU/hr
	Off	1 BTU/hr	1 BTU/hr	1 BTU/hr

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	*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>	Sound Power (L <sub>WAd</sub> , bels)	Sound Pressure (L <sub>pAm</sub> , decibels)
<b>Typically Configured – Idle</b>	2.5	15
<b>Fixed Disk – Random writes</b>	2.5	14
<b>Longevity and Upgrading</b>	<p>This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:</p> <ul style="list-style-type: none"> <li>• 3 USB ports</li> <li>• 1 PC card slot (type I/II)</li> <li>• 1 ExpressCard/54 slot</li> <li>• 1 IEEE 1394 Port</li> <li>• Optional expansion base docking station</li> <li>• 1 multi-bay II storage port</li> <li>• Interchangeable HDD</li> </ul> <p>Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.</p>	
<b>Batteries</b>	<p>This battery(s) in this product comply with EU Directive 2006/66/EC</p> <p>Batteries used in the product do not contain: Mercury greater the1ppm by weight Cadmium greater than 20ppm by weight</p> <p>Battery size: CR2032 (coin cell) Battery type: Lithium</p>	

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	<b>Additional Information</b>	<ul style="list-style-type: none"> <li>This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.</li> <li>This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.</li> <li>This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).</li> <li>This product is in compliance with the IEEE 1680.1 (EPEAT) standard at the &lt;Silver&gt; level, see <a href="http://www.epeat.net">www.epeat.net</a></li> <li>Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.</li> <li>This product contains 23% post-consumer recycled plastic (by wt.)</li> <li>This product is 96.1% recycle-able when properly disposed of at end of life.</li> </ul>	
	<b>Packaging Materials</b>	<b>External:</b>	PAPER/Corrugated 235 g
		<b>Internal:</b>	PLASTIC/Polypropylene - PP 3 g
			PLASTIC/Polyethylene Expanded - EPE 27 g
			PLASTIC/Polyethylene low density - LDPE 13 g
	<b>Material Usage</b>	<p>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 <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf</a>):</p> <ul style="list-style-type: none"> <li>Asbestos</li> <li>Certain Azo Colorants</li> <li>Certain Brominated Flame Retardants – may not be used as flame retardants in plastics</li> <li>Cadmium</li> <li>Chlorinated Hydrocarbons</li> <li>Chlorinated Paraffins</li> <li>Formaldehyde</li> <li>Halogenated Diphenyl Methanes</li> <li>Lead carbonates and sulfates</li> <li>Lead and Lead compounds</li> <li>Mercuric Oxide Batteries</li> <li>Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.</li> <li>Ozone Depleting Substances</li> <li>Polybrominated Biphenyls (PBBs)</li> <li>Polybrominated Biphenyl Ethers (PBBEs)</li> <li>Polybrominated Biphenyl Oxides (PBBOs)</li> <li>Polychlorinated Biphenyl (PCB)</li> <li>Polychlorinated Terphenyls (PCT)</li> <li>Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.</li> </ul>	



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		<ul style="list-style-type: none"> <li>• Radioactive Substances</li> <li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</li> </ul>
	<p><b>Packaging Usage</b></p>	<p>HP follows these guidelines to decrease the environmental impact of product packaging:</p> <ul style="list-style-type: none"> <li>• Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.</li> <li>• Eliminate the use of ozone-depleting substances (ODS) in packaging materials.</li> <li>• Design packaging materials for ease of disassembly.</li> <li>• Maximize the use of post-consumer recycled content materials in packaging materials.</li> <li>• Use readily recyclable packaging materials such as paper and corrugated materials.</li> <li>• Reduce size and weight of packages to improve transportation fuel efficiency.</li> <li>• Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.</li> </ul>
	<p><b>End-of-life Management and Recycling</b></p>	<p>HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <a href="http://www.hp.com/go/reuse-recycle">http://www.hp.com/go/reuse-recycle</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>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: <a href="http://www.hp.com/go/recyclers">http://www.hp.com/go/recyclers</a>. 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.</p>
	<p><b>HP, Inc. Corporate Environmental Information</b></p>	<p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report  <a href="http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html">http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html</a>          Eco-label certifications  <a href="http://www8.hp.com/us/en/hp-information/environment/ecolabels.html">http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</a>          ISO 14001 certificates:  <a href="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</a>          and  <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</a></p>

## Technical Specifications

### SYSTEM UNIT

#### Stand-Alone Power Requirements (AC Power)

Nominal Operating Voltage	19V
Average Operating Power	Win 10
Integrated graphics	Yes
Max Operating Power	UMA<45W

#### Temperature

Operating	32° to 95° F (0° to 35° C)
Non-operating	-4° to 140° F (-20° to 60° C)

#### Relative Humidity

Operating	10% to 90%, non-condensing
Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature

#### Shock

Operating	40 G, 2 ms, half-sine
Non-operating	240 G, 2 ms, half-sine

#### Random Vibration

Operating	0.75 grms
Non-operating	1.50 grms

#### Altitude (unpressurized)

Operating	-50 to 10,000 ft (-15.24 to 3,048 m)
Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)

#### Planned Industry Standard

#### Certifications

UL	Yes
CSA	Yes
FCC Compliance	Yes
ENERGY STAR®	Yes <sup>36</sup>
EPEAT® 2019	Yes, Silver in U.S. <sup>37</sup>
ICES	Yes
Australia	Yes
NZ A-Tick Compliance	Yes
CCC	Yes
Japan VCCI Compliance	Yes
KC	Yes
BSMI	Yes
CE Marking Compliance	Yes
BNCI or BELUS	Yes
CIT	Yes
GOST	Yes





### Technical Specifications

Saudi Arabian Compliance (ICCP)	Yes
SABS	Yes
UKRSERTCOMPUTER	Yes

36. Configurations of the HP ProBook x360 11 G5 EE is ENERGY STAR® qualified are identified as HP ProBook x360 11 G5 EE ENERGY STAR on HP websites and on <http://www.energystar.gov>.

37. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit <http://www.epeat.net> for more information.

### DISPLAYS

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

<b>Panel LCD 11.6 HD AG WLED SVA 45% NTSC 220 nits eDP Slim</b>	<b>Outline Dimensions (W x H x D)</b>	278.5 x 168.5 mm (max)
	<b>Active Area</b>	256.125 x 144 mm
	<b>Weight</b>	210 g max
	<b>Diagonal Size</b>	11.6 (inches)
	<b>Thickness</b>	3.0 mm (max)
	<b>Interface</b>	eDP1.2
	<b>Surface Treatment</b>	AntiGlare
	<b>Touch Enabled</b>	No
	<b>Contrast Ratio</b>	400:1 (typical)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	220 nit typical (panel only)
	<b>Pixel Resolution</b>	1366 x 768 (HD)
	<b>Format of LCD Pixel Arrangement</b>	RGB
	<b>Backlight</b>	LED
	<b>Color Gamut Coverage</b>	45% of NTSC
	<b>Color Depth</b>	6 bits
	<b>Viewing Angle</b>	SVA 40/40/15/30

<b>Panel LCD 11.6 HD AG WLED SVA 45% NTSC 220 nits eDP Slim</b>	<b>Outline Dimensions (W x H x D)</b>	278.5 x 168.5 mm (max)
	<b>Active Area</b>	256.125 x 144 mm
	<b>Weight</b>	210 g max
	<b>Diagonal Size</b>	11.6 (inches)



### Technical Specifications

<b>Thickness</b>	3.0 mm (max)
<b>Interface</b>	eDP1.2
<b>Surface Treatment</b>	BrightView Glass
<b>Touch Enabled</b>	Yes
<b>Contrast Ratio</b>	400:1 (typical)
<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	220 nit typical (panel only)
<b>Pixel Resolution</b>	1366 x 768 (HD)
<b>Format of LCD Pixel Arrangement</b>	RGB
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	45% of NTSC
<b>Color Depth</b>	6 bits
<b>Viewing Angle</b>	SVA 45/45/15/35

**Panel LCD 11.6 inch HD  
AG WLED UWVA 50%  
NTSC 220 nits eDP slim**

<b>Outline Dimensions (W x H x D)</b>	278.5 x 168.5 mm (max)
<b>Active Area</b>	256.125 x 144 mm
<b>Weight</b>	200 g max
<b>Diagonal Size</b>	11.6 (inches)
<b>Thickness</b>	3.2 mm max
<b>Interface</b>	eDP1.2
<b>Surface Treatment</b>	BrightView Glass
<b>Touch Enabled</b>	Yes
<b>Contrast Ratio</b>	800:1 (typical)
<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	220 nit typical (panel only)
<b>Pixel Resolution</b>	1366 x 768 (HD)
<b>Format of LCD Pixel Arrangement</b>	RGB
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	50% of NTSC
<b>Color Depth</b>	6 bits
<b>Viewing Angle</b>	UWVA 85/85/85/85



## Technical Specifications

### STORAGE AND DRIVES

<b>eMMC 64 GB M0-276 MMCv5.0</b>	<b>Drive Weight</b>	0.2	
	<b>Height</b>	1.4 mm	
	<b>Width</b>	11.5 x 13 mm	
	<b>Interface</b>	MMC potocal	
	<b>Seek Time</b>	<b>Sequential Read</b>	<b>Sequential Write</b>
		Up to 250 MB/s	Up to 70 MB/s
	<b>Logical Blocks</b>	32 GB(31,268,536,320 Bytes)/64 GB(62,537,072,640 Bytes)	
	<b>Operating Temperature</b>	0 to 70	
	<b>Security Features</b>	HS400	

<b>128 GB 2280 M2 SATA-3 TLC Solid State Drive</b>	<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>Seek Time</b>	<b>Sequential Read</b>	<b>Sequential Write</b>
		Up To 520 MB/s	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		

<b>256 GB 2280 M2 SATA-3 TLC Solid State Drive</b>	<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>Interface</b>	ATA-8, SATA 3.0	
	<b>Seek Time</b>	<b>Sequential Read</b>	<b>Sequential Write</b>
		Up To 540 MB/s	Up To 515 MB/s
	<b>Logical Blocks</b>	500,118,192	



## Technical Specifications

<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	DIPM; TRIM; DEVSLP

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## Technical Specifications

### NETWORKING/COMMUNICATIONS

<p><b>Intel® 9560 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 5.0 Combo<sup>1</sup> non-vPro</b></p>	<p><b>Wireless LAN Standards</b></p>	<p>IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v</p>
	<p><b>Interoperability Frequency Band</b></p>	<p>Wi-Fi® certified</p> <ul style="list-style-type: none"> <li>•802.11b/g/n 2.402 – 2.482 GHz</li> <li>•802.11a/n/ac 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</li> </ul>
	<p><b>Data Rates</b></p>	<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, 80MHz &amp; 160MHz)</li> </ul>
	<p><b>Modulation</b></p>	<p>Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</p>
	<p><b>Security<sup>3</sup></b></p>	<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>•WAPI</li> </ul>
	<p><b>Network Architecture Models</b></p>	<p>Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)</p>



### Technical Specifications

<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 : +18.5dBm minimum</li> <li>• 802.11g : +17.5dBm minimum</li> <li>• 802.11a : +18.5dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +14.5dBm minimum</li> <li>• 802.11n HT20(5GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(5GHz) : +14.5dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +11.5dBm minimum</li> <li>• 802.11ac VHT160(5GHz) : +11.5dBm 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 and PCI Express compliant power management 802.11 compliant power saving mode	
<b>Receiver Sensitivity<sup>3</sup></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	
<b>Form Factor</b>	Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications	
<b>Dimensions</b>	PCI-Express M.2 MiniCard with CNVi Interface	
<b>Weight</b>	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
<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)



## Technical Specifications

<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 4.0/4.1/4.2/5.0 Wireless Technology

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0 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>Signaling Data Rate</b>	Legacy: 3 Mbps signaling data rate <sup>1</sup> 2.17 Mbps BLE: 1 Mbps signaling data rate <sup>1</sup> 0.2 Mbps 1. Actual throughput may vary.
	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>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Link Topology</b>	
<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



## Technical Specifications

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)

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## Technical Specifications

**Intel® Wi-Fi 6 AX200 + Bluetooth 5 (802.11ax 2x2, non-vPro, supporting gigabit file transfer speeds) non-vPro**

### Wireless LAN Standards

IEEE 802.11a  
IEEE 802.11b  
IEEE 802.11g  
IEEE 802.11n  
IEEE 802.11ac  
IEEE 802.11ax  
IEEE 802.11d  
IEEE 802.11e  
IEEE 802.11h  
IEEE 802.11i  
IEEE 802.11k  
IEEE 802.11r  
IEEE 802.11v

### Interoperability

Wi-Fi® certified

### Frequency Band

- 802.11b/g/n/ax  
2.402 – 2.482 GHz
- 802.11a/n/ac/ax  
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

### Data Rates

- 802.11b: 1, 2, 5.5, 11 Mbps
- 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
- 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
- 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)
- 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)
- 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)

### Modulation

Direct Sequence Spread Spectrum  
OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM

### Security<sup>3</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
- WAPI



### Technical Specifications

<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 : +18.5dBm minimum</li> <li>• 802.11g : +17.5dBm minimum</li> <li>• 802.11a : +18.5dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +14.5dBm minimum</li> <li>• 802.11n HT20(5GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(5GHz) : +14.5dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +11.5dBm minimum</li> <li>• 802.11ac VHT160(5GHz) : +11.5dBm minimum</li> <li>• 802.11ax HT40(2.4GHz) : +10dBm minimum</li> <li>• 802.11ax VHT160(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/Modern Standby: 10mW</li> <li>• Radio disabled: 8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>3</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b, 1Mbps : -93.5dBm maximum</li> <li>• 802.11b, 11Mbps : -84dBm maximum</li> <li>• 802.11a/g, 6Mbps : -86dBm maximum</li> <li>• 802.11a/g, 54Mbps : -72dBm maximum</li> <li>• 802.11n, MCS07 : -67dBm maximum</li> <li>• 802.11n, MCS15 : -64dBm maximum</li> <li>• 802.11ac, MCS0 : -84dBm maximum</li> <li>• 802.11ac, MCS9 : -59dBm maximum</li> <li>• 802.11ax, MCS11(HT40): -59dBm maximum</li> <li>• 802.11ax, MCS11(VHT160): -58.5dBm maximum</li> </ul>
<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>	<ol style="list-style-type: none"> <li>1. Type 2230 : 2.3 x 22.0 x 30.0 mm</li> <li>2. Type 1216: 1.67 x 12.0 x 16.0 mm</li> </ol>



## Technical Specifications

<b>Weight</b>	1. Type 2230: 2.8 g 2. Type 126: 1.3 g
<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 OFF – 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 4.0/4.1/4.2/5.0/5.1 Wireless Technology

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1 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>Signaling Data Rate</b>	Legacy: 3 Mbps signaling data rate <sup>1</sup> 2.17 Mbps BLE: 1 Mbps signaling data rate <sup>1</sup> 0.2 Mbps 1. Actual throughput may vary.
	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 + 9.5 dBm for BR and EDR.
<b>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Link Topology</b>	
<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



## Technical Specifications

	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)

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## Technical Specifications

<b>Realtek Dual Band Wireless- 8852AE 802.11ax (2x2) Wi-Fi 6 and Bluetooth® 5.2 Combo, non-vPro™<sup>1</sup></b>	<b>Wireless LAN Standards</b>	IEEE 802.11a		
		IEEE 802.11b		
		IEEE 802.11g		
		IEEE 802.11n		
		IEEE 802.11ac		
		IEEE 802.11ax		
		IEEE 802.11d		
		IEEE 802.11e		
		IEEE 802.11h		
		IEEE 802.11i		
		IEEE 802.11k		
		IEEE 802.11r		
		IEEE 802.11v		
<b>Interoperability Frequency Band</b>	<b>Data Rates</b>	Wi-Fi certified modules		
		802.11b/g/n/ax		
		• 2.402 – 2.482 GHz		
		802.11a/n/ac/ax		
		• 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		
		• 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: max 300Mbps		
• 802.11ac : max 866.7Mbps				
• 802.11ax : max 1201Mbps				
<b>Modulation</b>	<b>Security<sup>3</sup></b>	Direct Sequence Spread Spectrum		
		BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM		
		• IEEE and WiFi certified 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		
		• WPA3 certification		
		• IEEE 802.11i		
		• WAPI		
		<b>Network Architecture Models Roaming</b>	<b>Network Architecture Models Roaming</b>	Ad-hoc (Peer to Peer)
				Infrastructure (Access Point Required)
				IEEE 802.11 compliant roaming between access points



## Technical Specifications

<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b : +18.5dBm minimum</li> <li>• 802.11g : +17.5dBm minimum</li> <li>• 802.11a : +18.5dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +14.5dBm minimum</li> <li>• 802.11n HT20(5GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(5GHz) : +14.5dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +11.5dBm minimum</li> <li>• 802.11ax HE40(2.4GHz) : +10dBm minimum</li> <li>• 802.11ax HE80(5GHz) : +10dBm minimum</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode :2.5 W</li> <li>• Receive mode :2 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode :50 mW (WLAN unassociated)</li> <li>• Connected Standby/Modern Standby: 10mW</li> <li>• Radio disabled: 8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></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 802.11ax, MCS11(HE40): -57dBm maximum 802.11ax, MCS11(HE80): -54dBm 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>	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
<b>Weight</b>	1. Type 2230 : 2.8g 2. Type 1216: 1.3g
<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)



## Technical Specifications

<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	

### HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2 Wireless Technology

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1 Compliant/5.2 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.

1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 5 (802.11 ac) is backwards compatible with prior 802.11 specs.
2. 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.
3. Check latest software/driver release for updates on supported security features.
4. 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).

### Technical Specifications

#### POWER

##### HP 45 W Smart AC adapter

<b>Dimensions (H x W x D)</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 (175 g) max <a href="#">Not including power cord. Power cord varies by country</a>
<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> 45 W <b>DC output</b> 19.5 V <b>Hold-up time</b> 5ms at 115 VAC input <b>Output current protection</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 5000m) <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.

##### HP 65 W EM Smart AC adapter

<b>Dimensions</b>	102 x 55 x 30 mm
<b>Weight</b>	270 g +/- 10 g <a href="#">Not including power cord. Power cord varies by country</a>
<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>Output</b>	<b>DC output</b> 65W(19.5V/3.33A) <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





### Technical Specifications

<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>Storage Humidity</b>	0% to 95%
	<b>EMI and Safety Certifications</b>	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.

<b>HP 45 W USB type C Straight 1.8 m AC Adapter</b>	<b>Dimensions</b>	94.0mm x 40.0mm x 26.5 mm		
	<b>Weight</b>	192.5 g +/-10%		
	<b>Input</b>	<b>Input Efficiency</b>	Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec:	
			5V: 81.5%	
			9V: 86.7%	
			12V: 87.41%	
			15V: 87.8%	
			<b>Input frequency range</b> 47 ~ 63Hz	
	<b>Output</b>	<b>Input AC current</b>	Max. 1.4 A at 90 Vac	
		<b>Output power</b>	5V/15W	
			9V/27W	
			12V/36W	
15V/45W				
<b>DC output</b>		5V/9V/12V/15V		
<b>Hold-up time</b>	5ms at 115 Vac input			
<b>Output current limit</b>	<5.0A			
<b>Connector</b>	USB Type-C			
<b>Environmental Design</b>	<b>Operating temperature</b>	32°F to 95° F (0° to 35° C)		
	<b>Non-operating (storage) temperature</b>	4°F to 185° F (-20° to 85° C)		
	<b>Altitude</b>	0 to 16,400 ft (0 to 5000m)		
	<b>Humidity</b>	20% to 95%		



### Technical Specifications

#### EMI and Safety Certifications

#### Storage Humidity

10% to 95%

CE Mark - full compliance with LVD and EMC directives  
Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV;  
Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class  
B, CISPR22 Class B, CCC, NOM-1 NYCE.  
MTBF - over 200,000 hours at 25°C ambient condition.

#### HP 3-cell Long Life Li- Ion (48 WHr)

#### Dimensions (H x W x L)

7.3 x 94 x 184.47 mm (0.287 x 3.7 x 7.263 inch)

#### Weight

0.215 kg

#### Cells/Type

3cell Lithium-Ion Prismatic cell / 596080

3cell Lithium-Ion Polymer cell / 606072

#### Voltage

11.4 V

#### Amp-hour capacity

4.212Ah

#### Watt-hour capacity

48Wh

#### Operating (Charging)

32° to 113° F (0° to 45° C)

#### Operating (Discharging)

14° to 122° F (-10° to 60° C)

#### Optional Travel Battery Available

No

### COUNTRY OF ORIGIN

China



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

Type	Description	Part Number
<b>Cases</b>	HP Essential Top Load Case (up to 15.6")	H2W17AA
	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
	HP Black 11.6 Always On Case	2MY57AA
	HP Slim Ultrabook Messenger	F3W14AA
<b>Docking</b>	HP USB-C/A universal Dock G2	5TW13AA
<b>Input/Output</b>	HP Comfort Grip Wireless Mouse	H2L63AA
	HP Slim USB Keyboard & Mouse Bundle	T6T83AA
	HP 3-Button Laser Mouse	H4B81AA
	HP USB Premium Mouse	1JR32AA
	HP Wireless Premium Mouse	1JR31AA
	HP Essential USB Mouse	2TX37AA
	HP USB Travel Mouse	G1K28AA
	HP Slim Bluetooth Mouse	F3J92AA
	HP Slim Wireless keyboard and mouse	T6L04AA
	HP USB-C to USB 3.0 Adapter	N2Z63AA
	HP USB-C to 3 and 4.5mm Adapter	N2Z65AA
	HP HDMI to VGA Adapter	H4F02AA
	HP USB-C to RJ45 Adapter	V7W66AA
	HP Pro Pen with Spare Tips	TBD
HP Pro Pen Nib Set	TBD	
<b>Power</b>	HP 45W Smart AC Adapter (4.5mm)	H6Y88AA
	HP 65W Smart AC Adapter (4.5mm)	H6Y89AA
	HP 45W LC USB-C Power Adapter	1MZ01AA
	HP Notebook Powerbank	N9F71AA
	HP USB-C ESSENTIAL POWER BANK	3TB55AA
	HP USB-C Notebook Power Bank	2NA10AA
<b>Storage</b>	HP External USB Optical Drive	F2B56AA
<b>Security</b>	HP Nano Keyed Cable Lock	1AJ39AA
<b>UCC</b>	HP Stereo USB Headset	T1A67AA
	HP Stereo 3.5mm Headset	T1A66AA



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

\*Supported using the USB connection for video and data. Power is not supported and must be provided directly to the Notebook with the power adapter that comes with the unit

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## Summary of Changes

<b>Date of change:</b>	<b>Version History:</b>		<b>Description of change:</b>
February 28, 2020	V1 to V2	Added	Environmental Section
May 13, 2020	V2 to V3	Updated	Military Standards information and removed old docking stations.
June 25, 2020	V3 to V4	Updated	HDMI port
July 07, 2020	V4 to V5	Updated	Accessories section
September 17, 2020	V5 to V6	Removed	HP USB-C/A universal Dock G2
March 4, 2021	V6 to V7	Added	Speaker Power Section
April 20, 2021	V7 to V8	Updated	Input/ Output Section Updated
July 19, 2021	V8 to V9	Added	Display Section Updated
August 9, 2021	V9 to V10	Added	WLAN in Networking/Communications section

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