

### Overview

#### HP ProBook x360 11 G1 EE Notebook PC

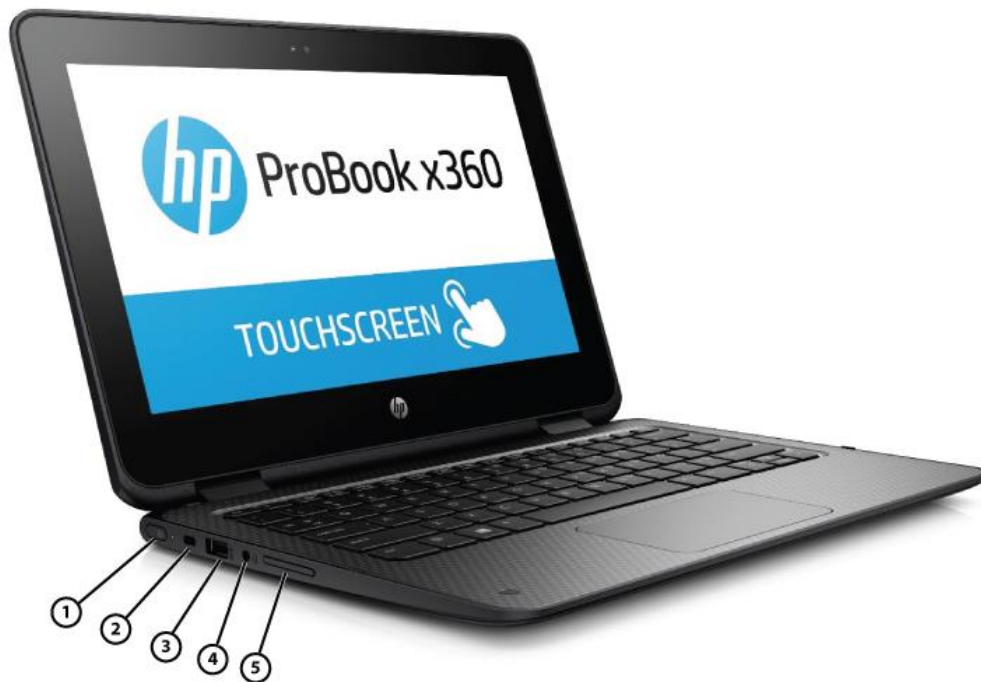


#### Front Right

- |    |                          |     |  |
|----|--------------------------|-----|--|
| 1. | WLAN antennas (2)        | 8.  | USB 3.1 Gen 1 port                             |
| 2. | Internal microphones (2) | 9.  | USB Type-C™ (Data only)                        |
| 3. | User-facing webcam LED   | 10. | Micro SD card reader                           |
| 4. | User-facing 720p webcam  | 11. | ClickPad                                       |
| 5. | Power connector          | 12. | World-facing 1080p webcam (select models only) |
| 6. | Ethernet (RJ-45) port    | 13. | World-facing webcam LED (select models only)   |
| 7. | HDMI v1.4b               |     |  |



### Overview

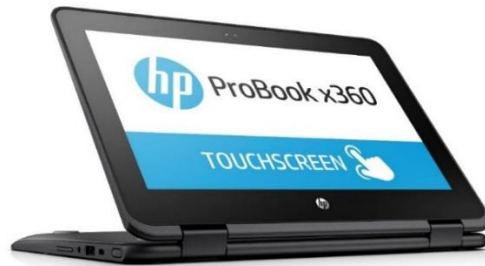


#### Front Left

- |    |                    |    |                                   |
|----|--------------------|----|-----------------------------------|
| 1. | Power button       | 4. | Headphone / Microphone Combo Jack |
| 2. | Security lock slot | 5. | Volume button                     |
| 3. | USB 3.1 Gen 1 Port |    |                                   |

### Overview

#### Stand Mode



#### Tablet Mode



#### Tent Mode



### Overview

#### AT A GLANCE

- Starting at 2.98 lbs (1.35 kg) non-touch and 3.19 lbs (1.45 kg) touch
- Less than 20 mm (0.79"), this flexible 360° hinge converts to laptop, tablet, tent, or stand mode easily
- Passed 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 4 touch screen
- Optional dual camera system for project-based learning
- Optional HP Active Pen provides an authentic digital inking experience
- Pre-installed with Windows 10 Pro 64, Windows 10 Pro 64 (National Academic), Windows 10 Home 64, or Windows 10 S
- Powered by Intel® Celeron® N3350, Intel® Celeron® N3450 and Intel® Pentium® N4200 processors
- Choice of 29.4 cm (11.6") diagonal HD SVA anti-glare slim LED non-touch (1366 x 768) or 29.4 cm (11.6") diagonal HD SVA slim LED touch screen (1366 x 768) displays
- 64 GB eMMC or up to 256GB SATA-3 Solid State Drive storage options
- Up to 8 GB system memory for enhanced memory management
- Reliable connectivity with Intel® Dual Band Wireless-AC 7265 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo WLAN for learning and collaboration beyond the classroom
- Built-in ports include: Ethernet (RJ-45), 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 11 hours

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

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



### Features

#### PRODUCT NAME

HP ProBook x360 11 G1 EE Notebook PC

#### OPERATING SYSTEM

<b>Preinstalled</b>	Windows 10 Pro 64 <sup>1</sup> Windows 10 Home 64 <sup>1</sup> Windows 10 Pro (National Academic License) <sup>2</sup> Windows 10 S <sup>3</sup>
<b>Web supported</b>	Windows 10 Enterprise 64 <sup>1</sup>

**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>.

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 S is available in North America, UK and Australia and requires one of the following configurations: Intel® Celeron® N3340 (DC), 2GB memory, 64GB eMMC; Intel® Celeron® N3350 (DC), 4GB memory, 64GB eMMC; or Intel® Celeron® N3450 (QC), 4GB memory, 64GB eMMC. Supports Windows Store apps only.

#### PROCESSORS

Intel® Celeron® N3350 with Intel® HD Graphics 500 (1.1 GHz, up to 2.4 GHz, 2 MB cache, 2 cores)<sup>1, 2</sup>  
Intel® Pentium® N4200 with Intel® HD Graphics 505 (1.1 GHz, up to 2.5 GHz, 2 MB cache, 4 cores)<sup>1, 2</sup>  
Intel® Celeron® N3450 with Intel® HD Graphics 500 (1.1 GHz, up to 2.2 GHz, 2 MB cache, 4 cores)<sup>1</sup>

##### Processors Family

7th Generation Intel® Celeron® processor (N3350 model)  
7th Generation Intel® Pentium® processor (N4200 model)

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

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



### Features

2. 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 7<sup>th</sup> 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® HD<sup>1</sup> Graphics 500

Intel® HD<sup>1</sup> Graphics 505

1. HD content required to view HD images.

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

### DISPLAY

#### Internal

29.4 cm (11.6") diagonal HD SVA anti-glare slim LED non-touch with user-facing camera (1366 x 768)<sup>1</sup>

29.4 cm (11.6") diagonal HD SVA slim LED touch screen with user-facing camera (1366 x 768)<sup>1</sup>

#### External

Up to 32-bit per pixel color depth

#### HDMI<sup>2</sup>

HDMI v1.4b supporting: up to 3840 x 2160 @ 30 Hz

1. HD content required to view HD images.

2. HDMI cable sold separately.

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

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### STORAGE AND DRIVES

#### Primary Storage<sup>1</sup>

##### M.2 (NGFF) 2280 Solid State Drive

128 GB SATA-3 Value Solid State Drive<sup>2</sup>

128 GB SATA-3 SS TLC Solid State Drive<sup>2</sup>

256 GB SATA-3 Value Solid State Drive<sup>2</sup>

256 GB SATA-3 SS TLC Solid State Drive<sup>2</sup>



### Features

#### eMMC Configurations

64 GB<sup>3</sup>

257 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.

258 Not available with eMMC storage.

259 No HPRM.

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### MEMORY

#### Standard

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

Supports up to 8 GB max on-board (Not Customer Accessible)

#### Configurations

2 GB (256 MB x 16 x 4 pcs)

4 GB (256 MB x 16 x 8 pcs)

8 GB (256 MB x 16 x 2 x 8 pcs)

#### Maximum Memory

8 GB

### NETWORKING/COMMUNICATIONS

#### Wireless<sup>1</sup>

Intel® Dual Band Wireless-AC 7265 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo

#### Communications

Realtek RTL8111HSH Controller 10/100/1000 Ethernet

1. Wireless access point and Internet service is required and is not included. 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.

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### AUDIO/MULTIMEDIA

#### Audio

HP Audio

Two integrated stereo speaker

Headphone / microphone in combo jack



### Features

#### Webcam<sup>1</sup>

User Facing Camera  
1 MP HD Webcam @ 1280 x 720p<sup>2</sup>  
Located on display  
Dual digital mic

**NOTE:** Both webcams are fix focus.

World Facing Camera  
2 MP FHD Webcam @ 1920 x1080p<sup>2</sup>  
Located on keyboard deck (option only available with touch display configurations)

1. Internet access required.
  2. HD content required to view HD images.
- 

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

#### Keyboard

Full-sized keyboard  
Pick-resistant  
Spill-resistant

#### Function Keys

F1 - Blank  
F2 - ClickPad Enable/Disable  
F3 - Sleep  
F4 - Display Switching  
F5 - Audio Mute/Unmute  
F6 - Volume Down  
F7 - Volume Up  
F8 - Mic Mute/Unmute  
F9 - Brightness Down  
F10 - Brightness Up  
F11 - Blank  
F12 - Wireless On/Off

#### ClickPad

Multitouch gestures enabled  
Default on: 2-finger scroll, pinch  
Support Windows 10 modern Trackpad gestures  
Taps enabled as default

#### Pen

Optional HP Active Pen<sup>1</sup>

- 1.Sold separately or as an optional feature.
- 

### SOFTWARE AND SECURITY

#### BIOS

Secure Erase<sup>1</sup>





### Features

HP System Diagnostic (UEFI)

#### **Communication / Connectivity**

Native Miracast Support<sup>3</sup>

HP LAN-WLAN Protection

HP Wireless Wakeup

#### **HP Value Add Software**

HP ePrint Driver + JetAdvantage<sup>4,8</sup>

HP Hotkey Support – CMIT<sup>8</sup>

HP Jumpstart<sup>8</sup>

HP Support Assistant<sup>8</sup>

HP Noise Cancellation Software

#### **Microsoft Products**

Buy Office<sup>8</sup>

Bing Search

Skype<sup>5</sup>

#### **Manageability**

HP SoftPaq Download Manager (SDM)<sup>8</sup>

HP System Software Manager (SSM)<sup>6</sup>

LANDESK Management<sup>7</sup>

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

#### **HP School Pack**

- HP Adaptive Learning created by Fishtree<sup>8</sup>
- HP Simple Sign-on created by Classlink<sup>8</sup>
- HP Classroom Manager Student Edition<sup>2,8</sup>
- SparkVue<sup>8</sup>
- Codecademy<sup>8</sup>
- Corinth Classroom<sup>8</sup>
- HP Prime Graphing Calculator<sup>8</sup>
- Curriculum Matrix/CMX<sup>8</sup>
- Oxford University Press Advanced Learners English Dictionary<sup>8</sup>

#### **Security**

Lock slot (Lock sold separately)

Trusted Platform Module (TPM) 2.0

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

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



### Features

3. 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>
4. 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>).
5. Skype is not offered in China.
6. Not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>
7. Subscription required.
8. This application will not be initially available with Windows 10 S. All applications through the Windows Store will be compatible.

### POWER

#### Power Supply<sup>1</sup>

HP 45W Smart AC adapter  
HP 65W EM Smart AC adapter

#### Primary Battery

HP Long Life 3-cell, 41 Wh Prismatic battery

#### Power Cord

Power cord is 3.2 feet (1 meter)

#### Battery life<sup>2</sup>

Hardware details	UMA Graphics	Discrete Graphics
eMMC	Up to 11 hours	N/A
SSD	Up to 10 hours 30 mins	N/A

**NOTE:** Battery is internal and not replaceable by customer.

#### System Standby Time<sup>3</sup>

TBD

1. Availability may vary by country.
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 [www.bapco.com](http://www.bapco.com) for additional details.
3. Talk, standby, and usage times are approximate and depend on the network configuration, the usage pattern of an individual user, and the configuration of the handheld. Use of some internal wireless capabilities, backlight will significantly decrease battery run time



### Features

#### WEIGHTS & DIMENSIONS

**Weight****Non-Touch**

Starting at 2.98 lbs (1.35 kg)

**Touch**

Starting at 3.19 lbs (1.45 kg)

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

20.795 x 30.24 x 1.99 cm

8.14 x 11.88 x .78 in

**NOTE:** Weight varies by configuration and components.

#### PORTS/SLOTS

**Ports**

2 USB 3.1 Gen 1 Port

1 USB Type-C™ (Data transfer only)

1 HDMI 1.4b

1 AC power connector

1 RJ-45

1 headphone/microphone combo jack

**HP Multi-Format Digital Media Reader**

Support micro SD/SDHC/SDXC up to UHS-104

**NOTE:** All cables are sold separately.

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#### SERVICE AND SUPPORT

HP Services offers a 1-year limited warranties and 90 day software support 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 <sup>1,2</sup> 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>.

1. Sold separately or as an optional feature.
2. Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>.



### Features

#### SYSTEM UNIT

Temperature	Operating	41° to 95° F (5° 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%, non-condensing



### Technical Specifications

#### DISPLAYS

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

<b>29.4 cm (11.6") diagonal Outline Dimensions HD SVA anti-glare slim LED non-touch (1366 x 768)</b>	278.5 x 168.5 (mm) max
<b>Weight</b>	210 g max
<b>Diagonal Size</b>	11.6 (inch)
<b>Contrast Ratio</b>	300:1 (typical)
<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	220 nits
<b>Pixel Resolution</b>	<b>Format</b> 1366 x 768 (HD) <b>Configuration</b> RGB
<b>Interface</b>	eDP 1.2
<b>PPI</b>	135 ppi
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	45%
<b>Color depth</b>	6 bit
<b>Viewing Angle</b>	SVA 45/45/25/35

<b>29.4 cm (11.6") diagonal Outline Dimensions HD SVA slim LED touch screen (1366 x 768)</b>	278.5 x 168.5 (mm) max
<b>Active Area</b>	256.13 x 144.0 (mm)
<b>Weight</b>	360 g max
<b>Diagonal Size</b>	11.6 (inch)
<b>Contrast Ratio</b>	300:1 (typical)



### Technical Specifications

<b>Refresh Rate</b>	60 Hz
<b>Brightness</b>	220 nits
<b>Pixel Resolution</b>	<b>Format</b> 1366 x 768 (HD)
	<b>Configuration</b> RGB
<b>Interface</b>	eDP 1.2
<b>PPI</b>	135 ppi
<b>Backlight</b>	LED
<b>Color Gamut Coverage</b>	45%
<b>Color depth</b>	6 bit
<b>Viewing Angle</b>	SVA 45/45/25/35
<b>Pen Enabled</b>	Yes

### STORAGE AND DRIVES

<b>128 GB SATA-3 Solid State Drive</b>	<b>Drive Weight</b>	10 grams	
	<b>Capacity</b>	128 GB	
	<b>Height</b>	0.091 in (2.3 mm)	
	<b>Width</b>	0.87 in (22 mm)	
	<b>Interface</b>	ATA-8, SATA 3.0	
	<b>Performance</b>	<b>Sequential Read</b> <b>Sequential Write</b>	
		Between 520 MB/s and 535 MB/s	Between 185 MB/s and 515 MB/s
	<b>Logical Blocks</b>	250,069,680	
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [case temp]	
	<b>Features</b>	ATA Security; ATA-8; SATA 3.0; DIPM; TRIM; DVESLP	



### Technical Specifications

<b>128 GB SATA-3 Solid State Drive TLC</b>	<b>Drive Weight</b>	10 grams		
	<b>Capacity</b>	128 GB		
	<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>Performance</b>	<b>Sequential Read</b>	<b>Sequential Write</b>	
		Between 520 MB/s and 530 MB/s	Between 380 MB/s and 500 MB/s	
	<b>Logical Blocks</b>	250,069,680		
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [case temp]		
	<b>Features</b>	ATA Security; ATA-8; SATA 3.0; DIPM; TRIM; DVESLP		
<b>256 GB SATA-3 Solid State Drive</b>	<b>Drive Weight</b>	10 grams		
	<b>Capacity</b>	256 GB		
	<b>Height</b>	0.091 in (2.3 mm)		
	<b>Width</b>	0.87 in (22 mm)		
	<b>Interface</b>	500118192		
	<b>Performance</b>	<b>Sequential Read</b>	<b>Sequential Write</b>	
		Between 520 MB/s and 535 MB/s	Between 330 MB/s and 515 MB/s	
	<b>Logical Blocks</b>	250,069,680		
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [case temp]		
	<b>Features</b>	ATA Security; ATA-8; SATA 3.0; DIPM; TRIM; DVESLP		
<b>256 GB SATA-3 Solid State Drive TLC</b>	<b>Drive Weight</b>	10 grams		
	<b>Capacity</b>	256 GB		
	<b>Height</b>	0.09 in (2.3 mm)		
	<b>Width</b>	0.87 in (22 mm)		



### Technical Specifications

<b>Interface</b>	ATA-8, SATA 3.0	
<b>Performance</b>	<b>Sequential Read</b>	<b>Sequential Write</b>
	Up to 515 MB/s	Up to 490 MB/s
<b>Logical Blocks</b>	500,118,192	
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [case temp]	
<b>Features</b>	ATA Security; ATA-8; SATA 3.0; DIPM; TRIM; DVESLP	

### 64 GB embedded Multi Media Card

<b>Drive Weight</b>	Up to 2g
<b>Capacity</b>	64 GB
<b>Height</b>	1.4mm
<b>Package Size</b>	12x16 mm
<b>Interface</b>	MMC protocol v4.51
<b>Performance</b>	Sequential Read : 100MB/s (min.) Sequential Write: 40MB/s (min.)
<b>Features</b>	Embedded Multi Media Card v4.51 compliant, TRIM, Secure Erase, CMD5 support, Partition management, Enhanced Write Protection, HS200 support

## NETWORKING/COMMUNICATIONS

### Intel® Dual Band Wireless-AC 7265 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo

<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g
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### Technical Specifications

	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> <p>Note:</p> <p>The FCC has declared as of January 1, 2015 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.</p>
	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> <p>Note: Indonesia no support this band)</p>
<b>Data Rates</b>	<ul style="list-style-type: none"> <li>• 802.11b: 1, 2, 5.5, 11 Mbps</li> <li>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>• 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)</li> </ul>
<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
<b>Security<sup>1</sup></b>	<ul style="list-style-type: none"> <li>• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>• AES-CCMP: 128 bit in hardware</li> <li>• 802.1x authentication</li> <li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>• WPA2 certification</li> <li>• IEEE 802.11i</li> <li>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>• WAPI</li> </ul>
<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



### Technical Specifications

<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"><li>• 802.11b : +16dBm minimum</li><li>• 802.11g : +14dBm minimum</li><li>• 802.11a : +14dBm minimum</li><li>• 802.11n HT20(2.4GHz) : +14dBm minimum</li><li>• 802.11n HT40(2.4GHz) : +12dBm minimum</li><li>• 802.11n HT20(5GHz) : +14dBm minimum</li><li>• 802.11n HT40(5GHz) : +12dBm minimum</li></ul>
<b>Power Consumption</b>	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connect Standby: 10 mW (WLAN+BT) Radio disabled: 5 mW
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>3</sup></b>	802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm maximum 802.11a, 6Mbps : -88dBm maximum 802.11a, 54Mbps : -74dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm maximum 802.11ac, 1SS, MCS-0 : -86dBm maximum 802.11ac, 1SS, MCS-9 : -61dBm maximum 802.11ac, 2SS, MCS-0 : -83dBm maximum 802.11ac, 2SS, MCS-9 : -58dBm maximum
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure  Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications



### Technical Specifications

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

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

### HP Integrated Module with Bluetooth 4.0/4.1/4.2 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)



### Technical Specifications

**Transmit Power**

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

**Receiver Sensitivity**

**Legacy**

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

**Power Consumption**

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

**Range**

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

**Electrical Interface**

USB 2.0 compliant

**Bluetooth Software Supported**

Microsoft Windows Bluetooth Software

**Link Topology**

**Electrical Interface**

Point to Point, Multipoint Pico Nets up to 7 slaves

**Bluetooth Software Supported**

Full support of Bluetooth Security Provisions

**Security**

**Power Management**

Microsoft Windows ACPI, and USB Bus Support

**Certifications**

Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff

**Security**

All necessary regulatory approvals for supported countries, including:

**Certifications**

FCC (47 CFR) Part 15C, Section 15.247 & 15.249

**Bluetooth Profiles Supported**

**Power Management**

ETS 300 328, ETS 300 826

**Certifications**

Low Voltage Directive IEC950

**Certifications**

UL, CSA, and CE Mark



### Technical Specifications

#### Bluetooth Profiles Supported

Serial Port Profile (SPP)<sup>1,2</sup>  
Service Discovery Application Profile (SDAP)  
Dial-Up Networking (DUN)<sup>1,1</sup>  
Generic Object Exchange Profile (GOEP)<sup>1,2</sup>  
Object Push Profile (OPP)<sup>1,2</sup>  
Hard Copy Cable Replacement (HCRP)<sup>1,2</sup>  
Personal Area Networking Profile (PAN)<sup>1,0</sup>  
Human Interface Device Profile (HID)<sup>1,0</sup>  
Hands Free Profile (HFP)<sup>1,5/1,6</sup>  
Advanced Audio Distribution Profile (A2DP)<sup>1,3</sup>  
  
Audio Video Remote Control Profile (AVRCP)<sup>1,3/1,4</sup>

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

V4.1: ESR5/6/7 compliant

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

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## AUDIO/MULTIMEDIA

### Hardware

### Implementation

Function Key Volume Controls

Full Duplex

Microphone In

Headphone/Line Out

Integrated Microphone

### Audio Output Quality

Frequency Response

Signal to Noise Ratio

Total Harmonic Distortion

Noise Floor



### Technical Specifications

	<b>Play/Record Sampling Rate(s)</b>
	<b>DAC</b>
	<b>ADC</b>
<b>Integrated Stereo Speakers</b>	<b>Power Rating</b>
	<b>Impedance</b>

### POWER

<b>HP 45 Watt Smart AC adapter</b>	<b>Dimensions (H x W x D)</b>	95x40x26.5mm
	<b>Weight</b>	200g +/- 10g
	<b>Input</b>	
	Input Efficiency	87.74 % at 115 Vac and 88.4 % at 230Vac
	Input frequency range	47 ~ 63 Hz
	Input AC current	Max. 1.4 A at 90 Vac
	<b>Output</b>	
	Output power	45W
	DC output	19.5V
	Hold-up time	5ms at 115 Vac input
	Output current protection	<8.0A
	<b>Connector</b>	C6 (3pin/with grounded, with Smart ID DC connector)
	<b>Environmental Design</b>	
	<b>Operating temperature</b>	32oF to 95oF (0oto 35oC)
	<b>Non-operating (storage) temperature</b>	-4oF to 185oF (-20oto 85oC)
	<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



### Technical Specifications

\* Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE.

\* MTBF - over 200,000 hours at 25°C ambient condition.

#### HP 65W EM Smart AC Adapter

<b>Dimensions (H x W x D)</b>	127.0x51.0x30.0mm	
<b>Weight</b>	350g +/- 10g	
<b>Input</b>		
	Input Efficiency	88.0 % at 115 Vac and 89.0 % at 230Vac
	Input frequency range	47 ~ 63 Hz
	Input AC current	Max. 1.7 A at 90 Vac
<b>Output</b>		
	Output power	65W
	DC output	19.5V
	Hold-up time	5ms at 115 Vac input
	Output current protection	<11.0A
<b>Connector</b>	C6 (3pin/with grounded, with Smart ID DC connector)	
<b>Environmental Design</b>		
	<b>Operating temperature</b>	32oF to 95oF (0to 35oC)
	<b>Non-operating (storage) temperature</b>	-4oF to 185oF (-20to 85oC)
	<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>	<p>*CE Mark - full compliance with LVD and EMC directives</p> <p>* 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.</p> <p>* MTBF - over 200,000 hours at 25°C ambient condition.</p>	



### Technical Specifications

#### HP 3-cell Li-ion Prismatic Battery (41 WHr)

<b>Cells/Type</b>	3-cell Prismatic
<b>Watt-hour capacity</b>	41WHr
<b>Temperature</b>	<b>Operating (Charging)</b> 32° to 113° F (0° to 45° C)
	<b>Operating (Discharging)</b> 14° to 140° F (-10° to 60° C)
	<b>Non-operating</b> -4° to 140° F (-20° to 60° C)
<b>Warranty</b>	Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year limited warranty as the platform

### ENVIRONMENTAL

<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<sup>®</sup> Gold registered in the United States. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country. Search keyword <i>generator</i> on HP's 3rd party option store for solar energy accessory at <a href="http://www.hp.com/go/options">http://www.hp.com/go/options</a>.</li> </ul>		
<b>System Configuration</b>	<p>The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a "Typically Configured Notebook".</p>		
<b>Energy Consumption (in accordance with US</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>





### Technical Specifications

<b>ENERGY STAR® test method)</b>			
Normal Operation (Short idle)	3.79 W	4.77 W	3.73 W
Normal Operation (Long idle)	2.29 W	2.76 W	2.24 W
Sleep	0.29 W	0.38 W	0.29 W
Off	0.24 W	0.32 W	0.24 W
	<p>Note:</p> <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)	13 BTU/hr	16 BTU/hr	13 BTU/hr
Normal Operation (Long idle)	8 BTU/hr	9 BTU/hr	8 BTU/hr
Sleep	1 BTU/hr	1 BTU/hr	1 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 BTU/hr
	<p>*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.</p>		
<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)	
Typically Configured – Idle	2.6	15	
Fixed Disk – Random writes	2.6	15	
<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> </ul>		



### Technical Specifications

	<ul style="list-style-type: none"> <li>• 1 PC card slot (type I/II)</li> <li>• 1 ExpressCard/54 slot</li> <li>• 1 IEEE 1394 Port</li> <li>• 2 SODIMM memory slots</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 the 1ppm by weight Cadmium greater than 20ppm by weight</p> <p>Battery size: CR2032 (coin cell) Battery type: Lithium</p>
<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 (EPEAT) standard at the gold 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 0% post-consumer recycled plastic (by wt.)</li> <li>• This product is 98.5% recycle-able when properly disposed of at end of life.</li> </ul>
<b>Packaging Materials</b>	<b>External:</b> PAPER/Corrugated 318 g
	<b>Internal:</b> PLASTIC/Polyethylene Expanded - EPE 25 g
	PLASTIC/Polyethylene low density – LDPE 18 g
	PLASTIC/Polypropylene - PP 3 g
	The plastic packaging material contains at least 50% recycled content.
	The corrugated paper packaging materials contains at least 75% recycled content.
<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> </ul>



### Technical Specifications

	<ul style="list-style-type: none"> <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, has been voluntarily removed from most applications.</li> <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>Hewlett-Packard 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>



### Technical Specifications

<b>HP, Inc. Corporate Environmental Information</b>	For more information about HP's commitment to the environment:  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://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842">http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842</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>
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### COUNTRY OF ORIGIN

China

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

Type	Description	Part Number
<b>Carrying Cases</b>	HP Essential Top Load Case (up to 15.6")	H2W17AA#xxx
	HP Essential Backpack (up to 15.6")	H1D24AA
	HP Slim Top Load	F3W15AA
	HP Slim Backpack	F3W16AA
	HP ProBook x360 Protective Case	1JS00AA
<b>Docking</b>	HP USBC Travel Dock	T0K29AA
	HP Elite USBC Dock	X7W54AA#xxx
	HP 3005pr USB3 Port Replicator	Y4H06AA
<b>Input/Output</b>	HP Slim USB Keyboard & Mouse Bundle	T6T83AA#xxx
	HP 3-Button Laser Mouse	H4B81AA#xxx
	HP 2.4GHz Wireless Mouse	L0Z84AA#xxx
	HP Slim Wireless keyboard and mouse	T6L04AA#xxx
	HP HDMI to VGA Adapter	H4F02AA
	HP Stereo USB Headset	T1A67AA
	HP Stereo 3.5mm Headset	T1A66AA
	HP Active Pen	1FH00AA#xxx
	<b>Power</b>	HP 45W Smart AC Adapter 4.5mm
65W Smart AC Adapter		H6Y89AA#xxx
HP Notebook Powerbank		N9F71AA#xxx
<b>Storage</b>	HP External USB Optical Drive	F2B56AA
<b>Security</b>	HP Keyed Cable Lock 10mm	T1A62AA



### Summary of Changes

<b>Date of change:</b>	<b>Version History:</b>		<b>Description of change:</b>
November 30, 2016	V1 to V2	Launched	Quickspecs launched
December 19, 2016	V2 to V3	Update	Environmental section updated
December 21, 2016	V3 to V4	Update	Environmental section updated
January 20, 2017	V4 to V5	Update	Disclaimer added to Processors Section
January 26, 2017	V5 to V6	Update	Options and Accessories Section updated HP Active Pen, 1FH00AA#xxx
February 2, 2017	V6 to V7	Update	At a Glance Section updated (MIL STD 810G references)
March 9, 2017	V7 to V8	Update	Updated Note in Operating System and Processor sections
March 21, 2017	V8 to V9	Update	Displays Section updated (Weight updated)
April 4, 2017	V9 to V10	Update	Battery Warranty updated
April 4, 2017	V10 to V11	Added	Processors Family added
April 6, 2017	V11 to V12	Added	Storage and Drives updated (added 128/256GB TLC SSD)
April 12, 2017	V12 to v13	Update	Battery section updated
April 19, 2017	V13 to V14	Update	Dimensions updated
July 10, 2017	V14 to v15	Update	At a Glance section updated (Windows 10 S); Operating System section updated (Windows 10 S); Software and Security section updated (Windows 10 S); Options and Accessories section updated (Windows 10 S); System Unit section added.
October 2, 2017	V15 to V16	Update	Touchpoint removed
November 8, 2017	V16 to V17	Update	Options and Accessories Section updated
November 15, 2017	V17 to V18	Update	Options and Accessories Section updated
November 28, 2017	V18 to V19	Update	Environmental data added

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