

### Overview

### HP ProBook 645 G4



#### Right

- |                               |  |
|-------------------------------|--|
| 1. Webcam (Select models)     | 9. HDMI port (Cable not included)      |
| 2. Webcam LED (Select models) | 10. USB 3.1 Gen 1 port                 |
| 3. Internal microphones (2)   | 11. USB 3.1 Gen 1 charging port        |
| 4. Power connector            | 12. USB Type-C™ charging port          |
| 5. MicroSD card slot          | 13. HDD LED indicator                  |
| 6. Docking connector          | 14. Fingerprint reader (Select models) |
| 7. VGA port                   | 15. Clickpad                           |
| 8. Ethernet port              |  |

### Overview



#### Left

1. Smart Card Reader (Select models)
2. Audio combo jack
3. USB 3.1 Gen 1 port
4. Security lock slot (Lock sold separately)
5. Power button

### Overview

#### AT A GLANCE

- Windows 10 versions or FreeDOS 2.0
- Precision-crafted slim design with fingerprint resistant modern, fresh and comfortable natural silver finish
- Efficiently powerful, highly secure, and reliable AMD Ryzen™ PRO processor with Radeon™ Vega graphics designed for a highly responsive experience that helps secure your data, device, and identity
- HP Premium keyboard, spill resistant with optional backlit design
- Large Clickpad with gestures support
- Enhanced security features including TPM2.0, HP Privacy Camera, optional Smart Card Reader, optional Finger Print Reader, and HP Sure Start Gen4.
- LED-backlit display  
35.56 cm (14") diagonal HD and FHD or Touch FHD with camera and with WWAN
- HDMI port for connecting to high-resolution displays
- Optional HD webcam with dual-microphone array for video conferencing
- Three USB 3.1 Gen1 ports (1 charging) and one USB-C port (PD+DP, Gen1)
- Flexible wireless connectivity options
- Battery life up to 14.5 hours with fast charging technology
- Dual storage combines SSD fast boot up and app access with cost effective HDD mass storage
- Passed MIL-STD 810G testing<sup>1</sup>

1. MIL-STD-810G testing is conducted on select HP products. Testing is not intended to demonstrate fitness of U.S. Department of Defense (DoD) contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Accidental damage requires an optional HP Accidental Damage Protection Care Pack.

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

## Technical Specifications

### PRODUCT NAME

HP ProBook 645 G4

### OPERATING SYSTEM

<b>Preinstalled</b>	Windows 10 Pro 64 <sup>1</sup> Windows 10 Home 64 (National Academic only) <sup>1,2</sup> Windows 10 Home 64 <sup>1</sup> Windows 10 Home Single Language 64 <sup>1</sup> FreeDOS 2.0
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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.

### PROCESSORS

AMD Ryzen™ 3 PRO 2300U Mobile Processor with Radeon™ Vega Graphics  
(2 GHz base frequency, up to 3.4 GHz, 6 MB cache, 4 cores)<sup>3,4</sup>

AMD Ryzen™ 5 PRO 2500U Mobile Processor with Radeon™ Vega Graphics  
(2 GHz base frequency, up to 3.6 GHz, 6 MB cache, 4 cores)<sup>3,4</sup>

AMD Ryzen™ 7 PRO 2700U Mobile Processor with Radeon™ Vega Graphics  
(2.2 GHz base frequency, up to 3.8 GHz, 6 MB cache, 4 cores)<sup>3,4</sup>

#### Processor Family

AMD Ryzen™ 3 PRO APU processor

AMD Ryzen™ 5 PRO APU processor

AMD Ryzen™ 7 PRO APU processor

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

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

### CHIPSET

Chipset is integrated with processor

### Technical Specifications

#### GRAPHICS

##### Integrated

AMD Radeon™ Vega Graphics

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#### DISPLAY

##### Non-Touch HD

35.56 cm (14") diagonal HD SVA eDP anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB (1366 x 768)<sup>5,6</sup>

35.56 cm (14") diagonal HD SVA eDP anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB (1366 x 768) for camera<sup>5,6</sup>

35.56 cm (14") diagonal HD SVA eDP anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB (1366 x 768) for WWAN<sup>5,6</sup>

35.56 cm (14") diagonal HD SVA eDP anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB (1366 x 768) for camera and for WWAN<sup>5,6</sup>

##### Non-Touch FHD

35.56 cm (14") diagonal FHD IPS eDP anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB (1920 x 1080)<sup>5,6</sup>

35.56 cm (14") diagonal FHD IPS eDP anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB (1920 x 1080) for camera<sup>5,6</sup>

35.56 cm (14") diagonal FHD IPS eDP anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB (1920 x 1080) for WWAN<sup>5,6</sup>

35.56 cm (14") diagonal FHD IPS eDP anti-glare LED-backlit, 220 cd/m<sup>2</sup>, 45% sRGB (1920 x 1080) for camera and for WWAN<sup>5,6</sup>

##### Touch FHD

35.56 cm (14") diagonal FHD IPS eDP LED-backlit touch screen 220 cd/m<sup>2</sup>, 45% sRGB (1920 x 1080) for camera and for WWAN<sup>5,6</sup>

5. HD content required to view HD images.

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

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## Technical Specifications

### STORAGE AND DRIVES

#### Primary Storage

500 GB 7200 rpm<sup>7</sup>  
500 GB 7200 rpm Self Encrypting Drive (FIPS-140-2)<sup>7</sup>  
1 TB 7200 rpm<sup>7</sup>  
2 TB 5400 rpm<sup>7</sup>

#### Primary M.2 Storage

128 GB SATA-3 SS TLC<sup>7</sup>  
256 GB SATA-3 TLC OPAL2<sup>7</sup>  
256 GB PCIe NVMe SS Value<sup>7</sup>  
256 GB PCIe Gen3x4 NVMe SS TLC<sup>7</sup>  
360 GB Intel PCIe Gen3x4 NVMe SS TLC<sup>7</sup>  
512 GB SATA SS TLC (FIPS)<sup>7</sup>  
512 GB PCIe Gen3x4 NVMe SS TLC<sup>7</sup>  
1 TB PCIe Gen3x4 NVMe SS TLC<sup>7</sup>

7. 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.

### MEMORY

#### Maximum Memory

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

#### Memory

4 GB Total System Memory (4 GB x 1)<sup>8</sup>  
8 GB Total System Memory (4 GB x 2)<sup>8</sup>  
8 GB Total System Memory (8 GB x 1)<sup>8</sup>  
12 GB Total System Memory (8 GB + 4 GB)<sup>8</sup>  
16 GB Total System Memory (16 GB x 1)<sup>8</sup>  
16 GB Total System Memory (8 GB x 2)<sup>8</sup>  
32 GB Total System Memory (16 GB x 2)<sup>8</sup>

#### Memory Slots

2 SODIMM  
Both slots are customer accessible / upgradeable  
DDR4 PC4 SODIMMS - System supports run rate at 2400  
Supports Dual Channel Memory

8. 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.

### Technical Specifications

#### NETWORKING/COMMUNICATIONS

##### WLAN

Intel® Dual Band Wireless-AC 3168 802.11a/b/g/n/ac (1x1) Wi-Fi® and Bluetooth® 4.2 Combo, non-vPro™<sup>9</sup>

Intel® Dual Band Wireless-AC 8265 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo, non-vPro™<sup>9</sup>

Realtek 802.11ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo<sup>9</sup>

Realtek 802.11ac (1x1) Wi-Fi® and Bluetooth® 4.2 Combo<sup>9</sup>

##### WWAN

LTE CAT4: Huawei HP Lt4132, LTE/HSPA+ w/GPS M.2<sup>10</sup>

LTE CAT9: Fibocom Intel(R) XMM(TM) 7360 LTE-Advanced Lt4210 LTE/HSPA+ w/GPS<sup>10</sup>

##### NFC

NXP NPC300 Near Field Communication Module<sup>11</sup>

##### WPAN Bluetooth

Bluetooth® 4.2 supported via all supported WLAN modules<sup>9</sup>

##### Ethernet

Realtek RTL8111EPH-CG 10/100/1000 Ethernet NIC with DASH Support<sup>12</sup>

9. 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.

10. WWAN module requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.

11. Sold separately or as an optional feature.

12. The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

#### AUDIO/MULTIMEDIA

##### Audio

2 Integrated stereo speakers

Integrated dual array microphone

##### Webcam

720p HD HP Privacy Camera<sup>5,11,13</sup>

5. HD content required to view HD images.

11. Sold separately or as an optional feature.

13. Internet access required.

## Technical Specifications

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

#### Keyboard

HP Advanced Keyboard  
ClickPad, Spill-resistant with drain  
ClickPad, Spill-resistant with drain, DuraKeys & Backlit  
Dual Point, Spill-resistant with drain, DuraKeys & Backlit

#### Function Keys

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

#### Clickpad requirements:

On/off control by driver  
Taps enabled as default

#### Gestures:

(Win 10):

Disabled by default:

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

Win 10:

Support PTP with Miniport driver  
Settings enabled by default by MSFT:  
2 Finger Scrolling  
2 Finger Zoom (Pinch)  
OSD (enable/disable)  
3 finger tap - Cortana  
3 finger flick - App switch  
4 finger tap - Action Center



## Technical Specifications

### SOFTWARE AND SECURITY

#### Preinstalled Software

##### BIOS

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

##### Software

HP Native Miracast Support<sup>15</sup>  
HP LAN-Wireless Protection  
HP Velocity  
HP 3D DriveGuard  
HP ePrint + JetAdvantage<sup>20</sup>  
HP Hotkey Support - CMIT  
HP Recovery Manager  
HP Jumpstart  
HP Support Assistant<sup>21</sup>  
HP Noise Cancellation Software  
HP Host Based MAC Address Manager  
HP PhoneWise<sup>28</sup>  
Buy Office

#### 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 Gen2<sup>23</sup>  
Ivanti Management Suite

## Technical Specifications

### Client Security Software

HP Client Security Suite Gen4 including:<sup>25</sup>

HP Security Manager<sup>26</sup> (including Credential Manager, HP Password Manager, HP Spare Key)

Power On Authentication

HP Fingerprint Sensor<sup>29</sup>

HP Device Access Manager

Microsoft Defender<sup>27</sup>

### Security Management

Secure Erase<sup>18</sup>

TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)

SATA 0,1 port disablement (viaBIOS)

RAID configurations<sup>30</sup>

Serial, USB enable/disable (viaBIOS)

Power-on password (viaBIOS)

Setup password (viaBIOS)

Support for chassis padlocks and cable lock devices

Integrated hood sensor

HP Sure Click<sup>31</sup>

### Security

#### TPM

Model: TPM SLB9670 VQ2.0 FW7.63RS3 913310-002

Version: TPM 2.0

Revision: 1.16

FIPS 140-2 Compliant: No

#### Smartcard Reader

Model number: Alcor AU9560

FIPS 201 Compliant: Yes

#### IPv6 Certification

No

#### MD5 Hash

Please follow the instructions below to access MD5 Hash.

Log-on to <http://hp.com/support>, enter your product name, select software and drivers, select OS, select driver. After selecting the driver, click on “Associated files” and then click on “Download”. When opening the file, under “Purpose” you should see the appropriate “SOFTPAQ MD5:” Field

**Is the BIOS on this notebook ISO/IEC 19678:2015 (formerly NIST 800-147) compliant?:**

### Technical Specifications

Yes

UEFI version: 2.5

16. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming
17. HP BIOSphere Gen4 features may vary depending on the PC platform and configurations. Requires Intel® or AMD 8th generation processors.
18. Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88. Supported on Elite platforms with BIOS version F.03 or higher.
19. Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: <http://www.absolute.com/company/legal/agreements/computrace-agreement>. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.
20. HP ePrint Driver requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see <http://www.hp.com/go/eprintcenter>). Print times and connection speeds may vary.
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://www8.hp.com/us/en/ads/clientmanagement/overview.html>
24. Ivanti Management Suite subscription required.
25. HP Client Security Suite Gen 4 requires Windows and Intel® or AMD 8th generation processors.
26. HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. User may need to enable or allow the add-on / extension in the internet browser.
27. Microsoft Defender Opt in and internet connection required for updates.
28. HP PhoneWise Client is only available on select platforms. For supported platforms and HP PhoneWise system requirements see <http://www.hp.com/go/HPPhoneWise>.
29. HP Fingerprint Sensor sold separately or as an optional feature.
30. RAID configuration is optional and does require a second hard drive.
31. HP Sure Click is available on select HP platforms and supports Microsoft® Internet Explorer and Chromium™. 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 right angle 4.5 mm AC Adapter<sup>32</sup>

HP Smart 65 W right angle 4.5 mm AC Adapter<sup>32</sup>

HP Smart 45 W right angle 4.5 mm AC Adapter 2-prong (Japan only)<sup>32</sup>

45 W USB Type-C™ adapter<sup>32</sup>

65 W USB Type-C™ adapter<sup>32</sup>

##### Primary Battery

HP Long Life 3-cell, 48 Wh Li-ion<sup>33</sup>

HP Fast Charge Technology - 90% in 90minutes

##### Power Cord

3-wire plug (C5), 1.8m, Sticker, Conventional<sup>32</sup>

3-wire plug (C5), 1.0m, Sticker, Conventional<sup>32</sup>

2-wire plug (C5), 1.0m, Sticker, Conventional (Japan only)<sup>32</sup>

##### Battery Life

Up to 13 hours and 30 minutes (with SSD)<sup>34</sup>

32. Availability may vary by country.

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

34. Windows 10 MM14 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See <http://www.bapco.com> for additional details.

#### WEIGHTS & DIMENSIONS

##### Weight

Starting at 3.8 lb<sup>35</sup>

Starting at 1.73 kg<sup>35</sup>

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

13.4 x 9.5 x 0.83 in

34 x 24 x 2.095 cm

35. Weight will vary by configuration.

### Technical Specifications

#### PORTS/SLOTS

##### Ports

- 1 USB 3.1 Type-C™ (charging)
- 1 USB 3.1 Gen 1 (charging)
- 2 USB 3.1 Gen 1
- 1 HDMI 1.4<sup>36</sup>
- 1 RJ-45
- 1 VGA
- 1 headphone/microphone combo
- 1 AC power

##### Expansion Slots

- 1 docking connector
- 1 microSD (multi-format digital media reader)

36. HDMI cable sold separately.

#### SERVICE AND SUPPORT

HP Services offers 3 year and 1 year limited warranties and 90 day support options depending on country. Long Life batteries which will have same 1-year or 3-year limited warranty as the platform. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc><sup>37</sup>

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

### Technical Specifications

#### 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® 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>  <b>Energy Consumption (in accordance with US ENERGY STAR® test method)</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>		
Normal Operation (Short idle)		<b>115VAC, 60Hz</b> 9.76 W	<b>230VAC, 50Hz</b> 9.19 W	<b>100VAC, 60Hz</b> 9.22 W
Normal Operation (Long idle)		6.55 W	7.66 W	6.72 W
Sleep		0.91 W	0.95 W	0.92 W
Off		0.52 W	0.53 W	0.54 W
<b>Heat Dissipation*</b>		<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 60Hz</b>
Normal Operation (Short idle)		33 BTU/hr	31 BTU/hr	32 BTU/hr
Normal Operation (Long idle)		22 BTU/hr	26 BTU/hr	23 BTU/hr
Sleep		3 BTU/hr	3 BTU/hr	3 BTU/hr
Off		2 BTU/hr	2 BTU/hr	2 BTU/hr

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

### Technical Specifications

	*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)	
Typically Configured – Idle	3	22	
Fixed Disk – Random writes	3.9	34	
<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> <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> <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 94.4% recycle-able when properly disposed of at end of life.</li> </ul>		
<b>Packaging Materials</b>	<b>External:</b>	PAPER/Corrugated	225 g
		PAPER/Paper	40 g
	<b>Internal:</b>	PLASTIC/Polyethylene Expanded - EPE	31 g
		PLASTIC/Polyethylene low density – LDPE	7 g
	The plastic packaging material contains at least 50% recycled content.		
The corrugated paper packaging materials contains at least 75% recycled content.			

### Technical Specifications

	<p><b>Material Usage</b></p>	<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, 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>



### Technical Specifications

	<b>End-of-life Management and Recycling</b>	<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>
	<b>HP, Inc. Corporate Environmental Information</b>	<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></p> <p>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></p> <p>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>  <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</a></p>

### SERVICE AND SUPPORT

HP Services offers a 1-year limited warranties and 90 day 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 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>19</sup>

<sup>19</sup> .HP Care Packs are sold separately. Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit [www.hp.com/go/cpc](http://www.hp.com/go/cpc). HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

### Technical Specifications

#### DISPLAYS

<b>14" diagonal FHD UWVA anti-glare flat LED backlit non-touch; 220 cd/m<sup>2</sup>; 45% sRGB (1920 x 1080)</b>	<b>Outline Dimensions (W x H)</b>	320.9x205.6 (max)
	<b>Active Area</b>	309.31 x 173.99
	<b>Weight</b>	290 max.
	<b>Diagonal Size</b>	14 (inch)
	<b>Thickness</b>	3.0mm max
	<b>Interface</b>	eDP 1.2
	<b>Surface Treatment</b>	Anti-Glare (AG)
	<b>Touch Enabled</b>	None
	<b>Contrast Ratio</b>	600:1 (typ) - AG
	<b>Refresh Rate</b>	60Hz
	<b>Brightness</b>	220 nits
	<b>Pixel Resolution</b>	1920 x 1080 (FHD)
	<b>Format</b>	RGB
	<b>Backlight</b>	LED
	<b>Color Gamut Coverage</b>	45%
<b>Color Depth</b>	6 bits + Hi FRC	
<b>Viewing Angle</b>	UWVA 85/85/85/85	

### Technical Specifications

<b>14" diagonal FHD UWVA anti-glare flat LED backlit touch; 220 cd/m<sup>2</sup>; 45% sRGB (1920 x 1080)</b>	<b>Outline Dimensions (W x H)</b>	320.9x205.6 (max)
	<b>Active Area</b>	309.31 x 173.99
	<b>Weight</b>	290 max.
	<b>Diagonal Size</b>	14 (inch)
	<b>Thickness</b>	3.0mm max
	<b>Interface</b>	eDP 1.2
	<b>Surface Treatment</b>	BV
	<b>Touch Enabled</b>	Yes
	<b>Contrast Ratio</b>	600:1 (typ) - AG
	<b>Refresh Rate</b>	60Hz
	<b>Brightness</b>	220 nits
	<b>Pixel Resolution</b>	1920 x 1080 (FHD)
	<b>Format</b>	RGB
	<b>Backlight</b>	LED
	<b>Color Gamut Coverage</b>	45%
	<b>Color Depth</b>	6 bits + Hi FRC
	<b>Viewing Angle</b>	UWVA 85/85/85/85

### Technical Specifications

<b>14" diagonal HD SVA anti-glare LED-backlit non-touch; 220 cd/m<sup>2</sup>; 45% sRGB (1366 x 768)</b>	<b>Outline Dimensions (W x H)</b>	320.9 x 205.6 (mm) max
	<b>Active Area</b>	309.40 x 173.95 (mm)
	<b>Weight</b>	290 g max
	<b>Diagonal Size</b>	14 (inch)
	<b>Thickness</b>	3.0 (mm) max
	<b>Interface</b>	eDP 1.2
	<b>Surface Treatment</b>	Anti-Glare (AG)
	<b>Touch Enabled</b>	None
	<b>Contrast Ratio</b>	300:1 (typical)
	<b>Refresh Rate</b>	60 Hz
	<b>Brightness</b>	220 nits
	<b>Pixel Resolution</b>	1366 x 768 (HD)
	<b>Format</b>	RGB
	<b>Backlight</b>	LED
	<b>Color Gamut Coverage</b>	45%
	<b>Color Depth</b>	6 bits + Hi FRC
<b>Viewing Angle</b>	SVA 40/40/15/30	

### Technical Specifications

#### STORAGE

<b>HDD 500 GB 7200RPM 7mm SATA</b>	<b>Drive Weight</b>	0.21 lbs (95 g)
	<b>Rotation speed</b>	7200RPM
	<b>Cache Buffer</b>	Up to 32MB
	<b>Height</b>	0.28 in (7 mm)
	<b>Width</b>	2.75 in (69.85 mm)
	<b>Interface</b>	ATA-8, SATA 3.0
	<b>Transfer Rate</b>	600 MB/s
	<b>Seek Time</b>	Single Track: 2 ~ 1.5 ms; Average: 11 ~ 13 ms; Maximum: 18 ~ 22 ms
	<b>Logical Blocks</b>	976773168
	<b>Operating Temperature</b>	32° to 140°F (0° to 60°C) [ambient temp]
	<b>Security Features</b>	ATA Security
	<b>Features</b>	S.M.A.R.T., NCQ, Ultra DMA

<b>HDD 500 GB 7200RPM 7mm FIPS SATA Opal2</b>	<b>Drive Weight</b>	0.21 lbs (95 g)
	<b>Rotation speed</b>	7200 rpm
	<b>Cache Buffer</b>	Up to 32MB
	<b>Height</b>	0.28 in (7 mm)
	<b>Width</b>	2.75 in (69.85 mm)
	<b>Interface</b>	ATA-8, SATA 3.0
	<b>Transfer Rate</b>	600 MB/s
	<b>Seek Time</b>	Single Track: 2 ~ 1.5 ms; Average: 11 ~ 13 ms; Maximum: 18 ~ 22 ms
	<b>Logical Blocks</b>	976,773,168
	<b>Operating Temperature</b>	32° to 140°F (0° to 60°C) [ambient temp]
	<b>Security Features</b>	ATA Security; TCG Opal 2.x, FIPS
	<b>Features</b>	S.M.A.R.T., NCQ, Ultra DMA

### Technical Specifications

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<b>HDD 1 TB 7200RPM 7mm SATA Drive Weight</b>	90g
<b>2.5in</b>	
<b>Rotation speed</b>	7200rpm
<b>Cache Buffer</b>	128MB
<b>Height</b>	7.2mm Max.
<b>Width</b>	69.85mm
<b>Interface</b>	ATA-8, SATA 3.0
<b>Transfer Rate</b>	600 MB/s
<b>Seek Time</b>	Single Track: 1.5 ms; Average: 13 ms; Maximum: 32 ms
<b>Logical Blocks</b>	1,953,525,168
<b>Operating Temperature</b>	0~60°C
<b>Security Features</b>	ATA Security
<b>Features</b>	S.M.A.R.T., NCQ, Ultra DMA, TRIM

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<b>HDD 2 TB 5400RPM 7mm SATA Drive Weight</b>	90g
<b>2.5in</b>	
<b>Rotation speed</b>	7200rpm
<b>Cache Buffer</b>	128MB
<b>Height</b>	7.2mm Max.
<b>Width</b>	69.85mm
<b>Interface</b>	ATA-8, SATA 3.0
<b>Transfer Rate</b>	600 MB/s
<b>Seek Time</b>	Single Track: 1.5 ms; Average: 13 ms; Maximum: 32 ms
<b>Logical Blocks</b>	1,953,525,168
<b>Operating Temperature</b>	0~60°C
<b>Security Features</b>	ATA Security
<b>Features</b>	S.M.A.R.T., NCQ, Ultra DMA, TRIM

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 Technical Specifications

<b>SSD 128 GB 2280 M2 SATA-3 TLC</b>	<b>Drive Weight</b>	0.02 lb (10 g)
	<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>Interface</b>	ATA-8, SATA 3.0
	<b>Maximum Sequential Read</b>	Up To 520 MB/s
	<b>Maximum Sequential Write</b>	Up To 450 MB/s
	<b>Logical Blocks</b>	250,069,680
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	DIPM; TRIM; DEVSLP	

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<b>SSD 256 GB 2280 M2 PCIe-3x4 SS NVMe TLC</b>	<b>Drive Weight</b>	0.02 lb (10 g)
	<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>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	Up To 2600 MB/s
	<b>Maximum Sequential Write</b>	Up To 900 MB/s
	<b>Logical Blocks</b>	500,118,192
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	TRIM; L1.2	

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<b>SSD 256 GB 2280 M2 SATA-3 Self Encrypted OPAL2 TLC</b>	<b>Drive Weight</b>	0.02 lb (10 g)
	<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>Maximum Sequential Read</b>	Up To 530 MB/s
	<b>Maximum Sequential Write</b>	Up To 515 MB/s
	<b>Logical Blocks</b>	500,118,192
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	DIPM; TRIM; DEVSLP	

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 Technical Specifications

<b>256 GB 2280 PCIe NVMe Value Solid State Drive</b>	<b>Drive Weight</b>	0.02 lb (10 g)
	<b>Capacity</b>	256 GB
	<b>NAND Type</b>	MLC
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	Up To 1700 MB/s
	<b>Maximum Sequential Write</b>	Up To 600 MB/s
	<b>Logical Blocks</b>	703,282,608
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	TRIM; L1.2	

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<b>SSD 512 GB 2280 M2 PCIe-3x4 SS NVMe TLC</b>	<b>Drive Weight</b>	0.02 lb (10 g)
	<b>Capacity</b>	512 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>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	Up To 2600 MB/s
	<b>Maximum Sequential Write</b>	Up To 1400 MB/s
	<b>Logical Blocks</b>	1,000,215,216
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	TRIM; L1.2	

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<b>SSD 512 GB 2280 M2 SATA-3 TLC FIPS</b>	<b>Drive Weight</b>	0.02 lb (10 g)
	<b>Capacity</b>	512GB
	<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>	ACS-3, SATA 3.2
	<b>Maximum Sequential Read</b>	Up To 530 MB/s
	<b>Maximum Sequential Write</b>	Up To 400 MB/s
	<b>Logical Blocks</b>	1,000,215,216
	<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

<b>SSD 1 TB 2280 PCIe-3x4 NVMe TLC SS</b>	<b>Drive Weight</b>	0.02 lb (10 g)
	<b>Capacity</b>	1 TB
	<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>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	2900
	<b>Maximum Sequential Write</b>	2000
	<b>Logical Blocks</b>	2,000,409,263
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	TRIM; L1.2	

<b>SSD 16 GB 2280 PCIe-3x2 NVMe 3D Xpoint</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	16 GB
	<b>NAND Type</b>	Xpoint
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	1400
	<b>Maximum Sequential Write</b>	300
	<b>Logical Blocks</b>	28,181,188
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	L1.2	

<b>SSD 360 GB 2280 PCIe-3x4 NVMe Three Layer Cell</b>	<b>Form Factor</b>	M.2 2280
	<b>Capacity</b>	360 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>	PCIe NVMe Gen3X4
	<b>Maximum Sequential Read</b>	1700
	<b>Maximum Sequential Write</b>	600
	<b>Logical Blocks</b>	703,282,608
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	TRIM; L1.2	

### Technical Specifications

#### POWER

<b>AC Adapter 65 Watt nPFC USB Type C™</b>	<b>Dimensions</b>	74x74x28.5mm
	<b>Weight</b>	unit: 245g +/- 10g
<b>Output</b>	<b>Input</b>	<b>Input Efficiency</b>
		81.5% min at 115 Vac/ 230Vac @ 5V/3A
		86.7% min at 115 Vac/ 230Vac @ 9V/3A
		88% min at 115 Vac/ 230Vac @ 10V/5A
		88% min at 115 Vac/ 230Vac @ 12V/5A
		89% min at 115 Vac/ 230Vac @ 15V/4.33A
		89% min at 115 Vac/ 230Vac @ 20V/3.25A
		<b>Input frequency range</b>
		47 ~ 63 Hz
		<b>Input AC current</b>
	1.7 A at 90 VAC and maximum load	
<b>Connector</b>	<b>Output power</b>	65W
	<b>DC output</b>	5V/9V/10V/12V/15V/20V
	<b>Hold-up time</b>	5ms at 115 Vac input
	<b>Output current limit</b>	<8.0A
<b>Environmental Design</b>	Duck head / duck head power cord, without Smart ID DC connector	
	<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>	5% to 95%
<b>EMI and Safety Certifications</b>	<b>Storage Humidity</b>	5% 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 100,000 hours at 25°C ambient condition.

### Technical Specifications

<b>AC Adapter 45 Watt nPFC USB Type C™</b>		62.0x62.0x28.5mm
<b>Weight</b>		unit: 220g +/- 10g
<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%10V : 87.5%12V : 87.8%15V : 87.8%20V : 87.8%
	<b>Input frequency range</b>	47 ~ 63Hz
	<b>Input AC current</b>	Max. 1.4 A at 90 Vac
<b>Output</b>	<b>Output power</b>	5V/15W 9V/27W 10V/37.5W 12V/45W 15V/45W 20V/45W
	<b>DC output</b>	5V / 9V / 10V /12V / 15V / 20V
	<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%
	<b>Storage Humidity</b>	10% to 95%
<b>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.	

### Technical Specifications

<b>HP 45W Smart AC adapter</b>	<b>Dimensions</b>	3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm)	
	<b>Weight</b>	0.386 lb (175g) max	
	<b>Input</b>		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>Output</b>	<b>Input AC current</b>	1.4 A at 90 VAC
		<b>Output power</b>	45W
		<b>DC output</b>	19.5V
		<b>Hold-up time</b>	5 msec at 115 VAC input
		<b>Output current limit</b>	<8.0A
	<b>Connector</b>	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords	
	<b>Environmental Design</b>	<b>Operating temperature</b>	32° to 95° F (0° to 35° C)
		<b>Non-operating (storage) temperature</b>	-4° to 185° F (-20° to 85° C)
<b>Altitude</b>		0 to 16,400 ft (0 to 5,000 m)	
<b>Humidity</b>		20% to 95%	
<b>Storage Humidity</b>		10% to 95%	
<b>EMI and Safety Certifications</b>	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.		

<b>HP 65W Smart AC adapter</b>	<b>Dimensions</b>	107.0x47.0x30.0mm	
	<b>Weight</b>	unit: 250g +/- 10g	
	<b>Input</b>		88.0 % at 115 Vac and 89.0 % at 230Vac
		<b>Input Efficiency</b>	88.0 % at 115 Vac and 89.0 % at 230Vac
		<b>Input frequency range</b>	47 ~ 63 Hz
	<b>Output</b>	<b>Input AC current</b>	Max. 1.7 A at 90 Vac
		<b>Output power</b>	65W
		<b>DC output</b>	19.5V
		<b>Hold-up time</b>	5ms at 115 Vac input
		<b>Output current limit</b>	<11.0A
	<b>Connector</b>	4.5mm Barrel Type	
	<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%	
<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.		

### Technical Specifications

<b>HP 65W EM Smart AC adapter</b>	<b>Dimensions</b>	102x55x30mm	
	<b>Weight</b>	270g +/- 10g	
	<b>Input</b>	<b>Input Efficiency</b>	87% min at 115V/230V
		<b>Input frequency range</b>	47 to 63 Hz
		<b>Input AC current</b>	1.7 A at 90 VAC and maximum load
	<b>Output</b>	<b>Output power</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
	<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 65W Watt Smart Travel Adapter</b>	<b>Dimensions</b>	120.0x57.6x16.7mm	
	<b>Weight</b>	unit: 250g +/- 10g	
	<b>Input</b>	<b>Input Efficiency</b>	88.0 % at 115 Vac and 89.0 % at 230Vac
		<b>Input frequency range</b>	47 ~ 63 Hz
		<b>Input AC current</b>	Max. 1.7 A at 90 Vac
	<b>Output</b>	<b>Output power</b>	65W
		<b>DC output</b>	19.5V/5V
		<b>Hold-up time</b>	5ms at 115 Vac input
		<b>Output current limit</b>	<11.0A
		<b>Connector</b>	4.5mm/7.4mm tips
	<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%
<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.		

### Technical Specifications

<b>Battery CD 3 Cell WHr 48 Long Life -PR+PL Fast Charge</b>	<b>Dimensions (H x W x L)</b>	8.05. x185.15x95 mm
	<b>Weight</b>	0.26 kg
	<b>Cells/Type</b>	3cell Lithium-Ion Polymer cell / 606072 3cell Lithium-Ion Prismatic cell / 606080
	<b>Energy</b>	<b>Voltage</b> 11.4V <b>Amp-hour capacity</b> 4.212Ah /4.0Ah <b>Watt-hour capacity</b> 50Wh
	<b>Temperature</b>	<b>Operating (Charging)</b> 32° to 113° F (0° to 45° C) <b>Operating (Discharging)</b> 14° to 122° F (-10° to 60° C)
	<b>Fuel Gauge LED</b>	N/A
	<b>Warranty</b>	3 years <sup>6</sup>
	<b>Optional Travel Battery Available</b>	No

### COUNTRY OF ORIGIN

China

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

Type	Description	Part #
<b>Cases</b>	HP 15.6 Business Top Load	2SC66AA
	HP Slim Top Load	F3W15AA
	HP Slim Backpack	F3W16AA
<b>Docking</b>	HP 2013 UltraSlim Docking Station	D9Y32AA
	HP USB-C Dock G4	3FF69AA
	HP USB-C Universal Dock	1MK33AA
<b>Input/Output</b>	HP Slim USB Keyboard and Mouse	T6T83AA
	HP Slim Wireless Keyboard and Mouse	T6L04AA
	HP Ultra Mobile Wireless Mouse	H6F25AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP Wireless Premium Mouse	1JR31AA
	HP Slim Bluetooth Mouse	F3J92AA
	HP USB Premium Mouse	1JR32AA
	HP USB Travel Mouse	G1K28AA
	HP Elite Presenter Mouse	2CE30AA
	HP HDMI to DVI Adapter	F5A28AA
	HP HDMI to VGA	H4F02AA
	HP USB-C to DP	N9K78AA
	HP USB-C to USB-A Hub	Z6A00AA
	HP USB-C to VGA	N9K76AA
	HP Stereo 3.5mm Headset	T1A66AA
HP Stereo USB Headset	T1A67AA	
<b>Power</b>	HP 45W Smart AC Adapter	H6Y88AA
	HP 65W Smart AC Adapter	H6Y89AA
	HP 45W USB-C Power Adapter	1HE07AA
	HP 65W USB-C Power Adapter	1HE08AA
	HP USB-C Notebook Power Bank	2NA10AA
<b>Storage</b>	HP External USB Optical Drive	F2B56AA
	HP 128GB TLC M.2 SATA-3	2JB95AA
	HP 256GB TLC PCIe 3x4 NVMe M.2 SSD	1FU87AA
	HP 512GB TLC PCIe 3x4 NVMe M.2 SSD	1FU88AA
<b>Security</b>	HP Docking Station Cable Lock	AU656AA#XXX
	HP 14.0" Notebook Privacy Filter	J6E65AA
	HP Keyed Cable Lock 10mm	T1A62AA

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

<b>Memory</b>	HP 4GB DDR4 Memory	Z4Y84AA
	HP 8GB DDR4 Memory	Z4Y85AA
	HP 16GB DDR4 Memory	Z4Y86AA
<b>UCC</b>	HP Wireless Collaboration Keyboard	Z9N39AA
	HP USB Collaboration Keyboard	Z9N38AA
	HP UC Speaker Phone	K7V16AA
	HP UC Wireless Mono Headset	W3K08AA
	HP UC Wireless Duo Headset	W3K09AA
<b>Displays</b>	HP ProDisplay P223 21.5-inch Monitor	X7R61AA
	HP ProDisplay P240va 23.8-inch Monitor	N3H14AA
	HP EliteDisplay E243 23.8-inch Monitor	1FH47AA

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### Summary of Changes

Date of change:	Version History:	Update	Description of change:
March 30, 2018	V1 to V2		Processor and at a glance section updated

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