

### Overview

#### HP Elite mt645 G8 Mobile Thin Client



#### Left

- |  |   |
|--|---|
| 1. Internal Microphones (2)                    | 6. Clickpad   |
| 2. Webcam LED (Optional)                       | 7. Smartcard Reader (Optional)  |
| 3. HD TNR and IR Camera (Optional)             | 8. Audio Combo Jack   |
| 4. IR Camera LED (Optional)                    | 9. 2 SuperSpeed USB Type-C® 10Gbps signaling rate<br>(USB Power Delivery, DisplayPort™ 1.4) |
| 5. Camera Shutter (Only available with webcam) | 10. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1)                         |
|  | 11. HDMI 2.1 Port (Cable not included)  |

### Overview



#### Right

- |                            |  |
|----------------------------|--|
| 1. Power Button Key        | 4. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1) |
| 2. Nano Security Lock slot | 5. External SIM Card Slot (Optional)                               |
| 3. RJ45                    | 6. Touch Fingerprint Sensor (Select Models)                        |

### Overview

#### AT A GLANCE

- Choice of Windows 10 IoT Enterprise 2021 LTSC, HP ThinPro OS, HP Smart Zero OS, FreeDOS, IGEL OS
- Fast and upgradeable dual channel DDR4 SODIMM memory up to 16 GB
- Choice of AMD Ryzen™ 5 7535U and AMD Ryzen™ 3 PRO 7335U series mobile processors
- Choice of 35.56 cm (14") diagonal HD, Ultra-Wide Viewing Angle FHD, Touch\* or Non-Touch screen, and Privacy Panel option.
- Choice of solid state drives up to 256 GB
- Multi-layered security with HP SureStart Gen7, HP Sure View Gen4, Touch Fingerprint reader, and Tamper Lock, HP IR camera (Windows Only), Camera with Privacy Shutter.
- Supports wireless options for connectivity on the go including gigabit-speed Wi-Fi 6e and CAT16 4G/LTE WWAN.
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles
- Supports HP USB-C® Dock G5 and Thunderbolt Dock G4
- Optimize your video calls with an HD camera that adjusts to the lighting in your environment.
- 180°synchronized hinge allows the mobile thin client to lay completely flat, without lifting the keyboard, and includes everyone with visibility from multiple angles.

\* Touch only available with Windows 10 IoT

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

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Technical Specifications

PRODUCT NAME

HP Elite mt645 G8 Mobile Thin Client

OPERATING SYSTEM

- Preinstalled
- Windows 10 IoT<sup>1</sup>

HP ThinPro 8.1<sup>2</sup>

HP Smart Zero Core<sup>2</sup>

IGEL 11<sup>2</sup>

IGEL 12<sup>2v</sup>

FreeDOS

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. ISP fees may apply, and additional requirements may apply over time for updates. See <http://www.windows.com>.

2. Not all features are available with HP ThinPro, Smart Zero Core, IGEL

PROCESSORS

Name <sup>3,4,5,6</sup>	Cores	Threads	L3 Cache	Max Boost Frequency	Base Frequency
AMD Ryzen™ 5 7535U	6 cores	12	16 MB	4.55 GHz	2.90 GHz
AMD Ryzen™ 3 7335U	4 cores	8	8 MB	4.30 GHz	3.00 GHz

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 is not a measurement of clock speed.

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

5. Features and software that require a NPU may require software purchase, subscription or enablement by a software or platform provider, and third-party software may have specific configuration or compatibility requirements. Potential NPU inferencing performance varies by use, configuration, and other factors.

6. AMD Max Boost frequency performance varies depending on hardware, software and overall system configuration.

### Technical Specifications

#### CHIPSET

NPC300

#### GRAPHICS

##### Integrated

AMD Radeon™ Graphics

##### Supports

UMA: Support HDMI 2.1<sup>7</sup>

[7. HD content required to view HD images.](#)

#### DISPLAY

##### Non-Touch

35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, WLED, 300 nits, NTSC 45%<sup>8,9,10,11</sup>

35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, WLED + Low Blue Light, 400 nits, low power, sRGB 100%<sup>8,9,10</sup>

35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, WLED + Low Blue Light, 1000 nits, sRGB 100%, HP Sure View reflect integrated privacy screen<sup>8,9,10,11,12</sup>

##### Touch

35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, touch, UWVA, anti-glare, WLED, 300 nits, NTSC 45% [6,7,8,10]<sup>8,9,10,12</sup>

##### Display Size

14" diagonal

35.6 cm (14") diagonal

[8. HD content required to view HD images.](#)

[9. Sold separately or as an optional feature.](#)

[10. Resolutions are dependent upon monitor capability, and resolution and color depth settings.](#)

[11. CODEC H.265/HEVC \(High Efficiency Video Coding\) is disabled on this platform.](#)

[12. HP Sure View integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.](#)

[13. Actual brightness will be lower with touchscreen or HP Sure View.](#)

[14. WUXGA/FHD resolution content required to view WUXGA/FHD resolution images](#)

Technical Specifications

DOCKING (Sold Separately)

Docking station model #1	HP USB-C® Dock G5
Docking station model #2	HP Thunderbolt 120W G4 Dock

Docking station model	Total number of supported displays	Max. resolutions support	Dock Connector	Technical limitations
HP Thunderbolt Dock 120W G4	4	Quad 4K @60Hz Dual 8K single cable@30 for Thunderbolt hosts or USB-C hosts DisplayPort 1.4 with Display Stream Compression in High-Resolution Mode	2x HDMI 2.0, 2x DisplayPort 1.4, 1x Thunderbolt 4, 1x USB-C 3.2 Gen 2 DisplayPort	<p>Maximum resolution and display support is dependent on the maximum capability of the notebook.</p> <p>Thunderbolt Hosts: Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host. Maximum resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in high resolution mode @30Hz</p> <p>Non-Thunderbolt hosts: The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is (1) 5K dual cable (using both DP ports) + (1) 4K on USB-C DP port Non-Thunderbolt hosts support (3) displays with a maximum resolution of (2) 5K single cable + (1) 4K UHD @ 60 Hz in high resolution mode. In multi-function mode the maximum resolution for (3) displays is (2) 5K single cable @ 30Hz + (1) 4K UHD @ 30Hz.</p>
HP USB-C Dock G5	3	Multi-Function Mode: (2) 5k @ 30Hz and (1) 4k UHD @ 30Hz on any port High-Resolution Mode: (2) 5k @ 60Hz on DisplayPort ports and (1) 4k UHD @ 60Hz on HDMI port	1x HDMI 2.0, 2x DisplayPort 1.4	<p>Maximum resolution and display support is dependent on the maximum capability of the notebook.</p> <p>Highest resolution with dual displays is two 8K@ 60Hz host in High Resolution mode. Three maximum displays supported are two 5K@ 30 Hz on DP ports plus one 4K UHD@ 30 Hz on HDMI in Multi-function mode The highest resolution for a non-Thunderbolt host in Multi-function mode is a single 5K dual cable (using both DP ports) + (1) 4K on HDMI port.</p>

STORAGE AND DRIVES

**Primary M.2 Storage**  
256 GB PCIe® Gen4x4 NVMe™ SSD Value<sup>13</sup>

13. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30GB of disk is reserved for system recovery software.

MEMORY

## Technical Specifications

### Memory

16GB DDR5-4800 (2 x 8 GB) MT/s RAM<sup>16</sup>  
16GB DDR5-4800 (1 x 16 GB) MT/s RAM<sup>16</sup>  
8GB DDR5-4800 (1 x 8 GB) MT/s RAM<sup>16</sup>

### Memory Slots

2 SODIMM  
System runs at 4800 MT/s  
Supports Dual Channel Memory<sup>16</sup>

16. 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

### Ethernet

Realtek RTL8111EPP 10/100/1000 Integrated NIC<sup>17</sup>  
Realtek RTL8111HSH 10/100/1000 Integrated NIC<sup>17</sup>

### WLAN

Realtek 8852CE Wi-Fi 6E Bluetooth® 5.3 Wireless Card WLAN<sup>18</sup>  
Mediatek RZ616 Wi-Fi 6E Bluetooth® 5.3 Wireless Card AIM-T WLAN<sup>18</sup>

### WWAN\*

HP 4G LTE-A Pro Cat16 WWAN eSIM<sup>19,21</sup>

### NFC

NFC Mirage WNC XRAV-1

### Miracast

Native Miracast Support<sup>20</sup>

17. 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.

18. Wi-Fi 6E requires a Wi-Fi 6E router, sold separately to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported.

19. Gigabit-class 4G LTE module is optional and must be configured at the factory. Module designed for up to 1 Gbps download speeds as carriers deploy 5 carrier aggregation and 100Mhz channel bandwidth, requires activation and separately purchased service contract. Backwards compatible to HSPA 3G technologies. Check with service provider for coverage and availability in your area. Connection, upload, and download speeds will vary due to network, location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.

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

21. WWAN module is an optional feature, requires factory configuration and 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.

## Technical Specifications

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### Technical Specifications

#### AUDIO/MULTIMEDIA

##### Audio

Audio by Poly Studio

2 Integrated stereo speakers

2 Integrated dual array microphones

##### Speaker Power

2W/4ohm Per speaker

##### Camera

5MP+Infrared camera<sup>8,9</sup>

FHD camera<sup>8,9</sup>

8. HD content required to view HD images.

9. Sold separately or as an optional feature.

10. Select product only (Privacy panel SKU).

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

##### Keyboard

HP Standard Keyboard, spill-resistant, backlit, Durakey keyboard<sup>21</sup>

HP Standard Keyboard, spill-resistant, Privacy, backlit, Durakey keyboard<sup>21</sup>

HP Standard Keyboard, spill-resistant keyboard.<sup>21</sup>

##### Pointing Device

Clickpad with multi-touch gesture support

Microsoft Precision Touchpad Default Gestures Support

##### Function Keys

ESC: System Information

F1 - Display Switching

F2 - Blank or SureView On/Off

F3 - Brightness Down

F4 - Brightness Up

F5 - Blank or Backlit Toggle

F6 - Audio Mute

F7 - Volume Down

F8 - Volume Up

F9 - Mic Mute

F10 - Play and Pause<sup>23</sup>

F11 - HPX key

F12 - Home key

End

Insert

Delete

Power Button (with LED)

Microsoft Copilot<sup>22, 23</sup>

##### Hidden Function Keys

Fn+R - Break, Fn+S - Sys Rq, Fn+C - Scroll Lock<sup>23</sup>

### Technical Specifications

21. Backlit keyboard is an optional feature.

22. Requires Windows 11 and an NPU. Timing of feature delivery and availability varies by market and device. Requires Microsoft account to log in. Where Copilot in Windows is not available, the Copilot key will lead to the Bing search engine. See <http://aka.ms/WindowsAIFeatures>

**NOTE:** for Copilot key, we haven't tested because we haven't got unit with build-in copilot key yet. The test result will be update later.

23. F10, Microsoft Copilot and Hidden Function Keys doesn't work on Linux local but may function with Win11 remote desktop when enabled by the virtualization protocol.

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### Technical Specifications

#### SOFTWARE AND SECURITY

##### Software

HP Auto Logon  
HP System Information  
TTWIN  
CyberLink Media Suite  
HP Connection Optimizer<sup>32</sup>  
Preinstall HEVC CODEC

##### HP Manageability Features

HP Device Manager  
HP Easy Shell<sup>36</sup>  
HP ThinUpdate  
HP USB Port Manager  
HP Write Filter Manager  
SUS Agent version 4.4.13.1445  
Microsoft System Center Configuration Manager

##### Security Management

Windows Hello Enhanced Sign-In Security (ESS)  
HP TPM Configuration Utility  
HP Platform Certificate  
HP Platform Certificate On Device Installation  
HP Sure Admin <sup>34</sup>  
HP Sure Start <sup>33</sup>  
HP Tamper Lock<sup>39</sup>

##### Security TPM

1st Source  
Model: NPCT760HABYX  
Version: 7.2.3.1  
FIPS 140-2 Compliant: Yes

2nd Source  
Model: Infineon SLB9672VU2.0  
TCG TPM 2.0  
Version: 15.23  
FIPS 140-2 Compliant: Yes

##### BIOS

Absolute Persistence Module <sup>37</sup>  
HP Fingerprint Sensor <sup>38</sup>  
Bluetooth Permanent Disable  
BT/WLAN Permanent Disable  
China CIO Customer - China TPM Hide  
HP LAN-Wireless Protection  
HP Protect and Trace Permanent Disable  
Microphone Permanent Disable  
Microsoft 3rd Party UEFI CA Enable  
NFC Permanent Disable

### Technical Specifications

Physical Presence Rollback  
Pre-Boot UEFI Wi-Fi support  
Signed 3rd Party Binaries  
SMBios  
TPM Hide  
UEFI Support  
Webcam Permanent Disable  
WOWLan

#### Smartcard Reader

Model number: AK9563  
FIPS 201 Compliant: Yes

32. HP Connection Optimizer requires Windows 10 and beyond version.
33. HP Sure Start is available on select HP PCs and requires Windows 10 and higher
34. HP Sure Admin requires HP G8 or newer platforms, Windows 10 or higher, HP BIOS, HP Manageability Kit or KMS Service from <http://www.hp.com/go/clientmanagement> and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store"35. 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™.
36. HP Easy Shell is currently available on Windows Embedded Standard 7E, Windows Embedded Standard 7P, Windows Embedded 8 Standard, Windows Embedded 8.1 Industry Pro, Windows 10 IOT Enterprise 2016 LTSC, and Windows 10 IoT Enterprise 2019.
37. 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/>
38. HP Fingerprint Reader is an optional feature that requires Windows 10 or 11 and must be configured at purchase.
39. HP Tamper Lock must be enabled by the customer or your administrator.

### Technical Specifications

#### POWER

##### Power Supply

HP Standard 65W USB Type-C® adapter<sup>41</sup>

HP Standard 65W USB Type-C® Halogen Free adapter<sup>41</sup>

##### Battery

HP Long Life 3 cell 56Whr Polymer<sup>42,43</sup>

HP Long Life 3 cell 48Whr Polymer<sup>42,43</sup>

##### Battery Recharge Time

Supports battery HP Fast Charge: approximately 50% in 30 minutes<sup>44</sup>

##### Power Cord

3-wire plug - 1m<sup>41</sup>

##### Battery Life<sup>45</sup>

Up to 14hours with 56Whr battery (Benchmark: MobileMark25)

41. Availability may vary by country.

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

43. For new batteries, actual battery Watt-hours (Wh) may differ from the design capacity and may have a full charge capacity that differs by up to 10, which is typical for lithium-ion batteries. Battery capacity naturally decreases over time and with use, depending on several factors such as battery health management settings, shelf life, temperature, environment, loaded apps, features, system configuration, and power settings.

44. Recharges your battery up to 50% within 30 minutes when the system is off or in standby mode. Power adapter minimum of 65 watts required for battery capacities 56Whr or less. Power adapter minimum of 100 watts required for battery capacities greater than 56Whr and less than 83Whr. Power adapter minimum of 120 watts required for battery capacities greater than 83Whr and less than 100Whr. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance. Upon initial startup, it is necessary to use an minimum 45 W adapter.

45. MM25 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.

### Technical Specifications

#### WEIGHTS & DIMENSIONS

##### Product Weight

Starting at 1.3980 kg (3.09- lb) with 56 Whr battery 56<sup>46</sup>

##### Product Dimensions (W x D x H)

318.6 mm (W) x 224.3 mm (D) x 10.9mm (front)/17mm (rear)

(12.54 in x 8.83 in x 0.43 in (front) / 0.67 in (rear))

Maximum height 19.9mm (Plastic); 20.9mm (Metal)

##### Pallet Dimensions (W x D x H)

12" to 15" boxes (305mm height): 1200mm x 1000mm x 1080mm 57

46. Weight will vary by configuration. Does not include power adapter.

47. Product packaging size varies based on options chosen. Please contact your HP representative for your packaging size details.

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#### PORTS/SLOTS

##### Left Side

1 HDMI 2.1<sup>48</sup>

1 Super Speed USB Type-A 5Gbps signaling rate Power charging

2 USB4™ Type-C® 40 Gbps signaling rate USB Power Delivery DisplayPort™ 1.4

2 USB4™ Type-C® 40 Gbps signaling rate USB Power Delivery DisplayPort™ 1.4

1 Power Indicator LED1 Power Indicator LED

Headphone/mic combo jack

Smart Card Reader (Optional)

##### Right side

1 Nano SIM card slot (Optional)

1 Super Speed USB Type-A 5Gbps signaling rate Data only

1 RJ45 Ethernet port

1 Security lock slot (Integrated)

48. HDMI cable sold separately.

49. USB 20Gbps speed is not available with Thunderbolt™ 4.

## Technical Specifications

### SERVICE AND SUPPORT

1-year warranty 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>49</sup>

49. 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.

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### CERTIFICATION AND COMPLIANCE

CSA/UL 62368-1  
ENERGY STAR®  
FCC/ICES/CISPR/VCCI  
CE MARKING  
GS Mark  
China CCC/SRRC  
Taiwan BSMI/NCC  
Korea KCC/KC/KES  
Ukraine NSoC/TEC  
EAEU Compliance  
Saudi Arabian Compliance  
TCO  
EPEAT® Gold in the U.S.<sup>1</sup>  
Low Blue Light  
WW RoHS

#### Sustainable Impact Specifications

Low Halogen<sup>2</sup> aligned with HP GSE

<sup>1</sup>Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. EPEAT® status varies by country. Visit [www.epeat.net](http://www.epeat.net) for more information.

<sup>2</sup>External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.

## Technical Specifications

## SYSTEM UNIT

<b>Nominal Operating Voltage</b>	20.0V
Average Operating Power	W
Max Operating Power	UMA 65W Discrete W
<b>Temperature</b>	
Operating	Operating: 0° to 35° C ( 32° to 95° F)No sustained direct exposure to sunlight, System performance may be reduced above 32°C (89.6°F)
Non-operating	Non-operating: -20° to 60° C ( -4° to 140° F)No sustained direct exposure to sunlight, System performance may be reduced above 32°C (89.6°F)
<b>Relative Humidity</b>	
Operating	Operating: 10% to 90 % (non-condensing)
Non-operating	Non-operating: 5% to 95 %, 38.7° C (101.6° F) maximum wet bulb temperature
<b>Shock</b>	
Operating	Operating: 40 G, 2 ms, half-sine
Non-operating	Non-operating: 240 G, 2 ms, half-sine
<b>Random Vibration</b>	
Operating	Operating: 1.043 grms
Non-operating	Non-operating: 3.500 grms
<b>Altitude (unpressurized)</b>	
Operating	Operating: 3048 m (10000 ft)
Non-operating	Non-Operating: 12192 m (40000 ft)
<b>Planned Industry Standard Certifications</b>	
<b>Regulatory Model Number</b>	HSN-Q39C-4
<b>CSA/UL 62368-1</b>	Yes
<b>ENERGY STAR®</b>	Yes
<b>FCC/ICES/CISPR/VCCI</b>	Yes
<b>CE MARKING</b>	Yes
<b>GS Mark</b>	Yes
	Related commodity should comply with ISO 9241 Standards.
<b>China CCC/SRRC/CEL</b>	Yes
<b>Taiwan BSMI/NCC</b>	Yes
<b>Korea KCC/KC/KES</b>	Yes
<b>Ukraine NSoC/TEC</b>	Yes
<b>EAEU Compliance</b>	Yes
<b>Saudi Arabian Compliance</b>	Yes
<b>TCO</b>	Yes
<b>EPEAT® Gold</b>	Yes
<b>Low Blue Light</b>	Yes
<b>WW RoHS</b>	Yes
<b>Regulatory Model Number</b>	HSN-Q39C-4
<b>CSA/UL 62368-1</b>	Yes
<b>ENERGY STAR®</b>	Yes
<b>FCC/ICES/CISPR/VCCI</b>	Yes



Technical Specifications

DISPLAYS

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

1. Actual brightness will be lower with touchscreen or HP Sure View.

<b>35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, WLED, 300 nits, NTSC 45%</b>	<b>Outline Dimensions (W x H)</b>	307.29x199.25(max)
	<b>Active Area</b>	301.59 X 188.50 (typ)
	<b>Weight</b>	300 (max)
	<b>Diagonal Size</b>	14
	<b>Surface Treatment</b>	Anti-Glare
	<b>Touch Enabled</b>	No
	<b>Contrast Ratio</b>	1000:1 (typ)
	<b>Refresh Rate</b>	60 (typ)
	<b>Brightness</b>	300 (typ)
	<b>Pixel Resolution - Format</b>	1920 x 1200 (WUXGA)
	<b>Backlight</b>	WLED
	<b>Pixel Resolution</b>	RGB
	<b>Color Gamut Coverage</b>	NTSC 45%
	<b>Color Depth</b>	6+2 FRC
	<b>Viewing Angle</b>	UWVA 89/89/89/89
	<b>Low Blue Light</b>	No
	<b>Power Consumption (W, EBL@ 150nits max/ 200nits max))</b>	2.20 (max) / 2.70 (max)

<b>35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, touch, UWVA, anti-glare, WLED, 300 nits, NTSC 45%</b>	<b>Outline Dimensions (W x H)</b>	307.29x199.25(max)
	<b>Active Area</b>	301.59 X 188.50 (typ)
	<b>Weight</b>	305g (max)
	<b>Diagonal Size</b>	14
	<b>Surface Treatment</b>	Anti-Glare
	<b>Touch Enabled</b>	Yes
	<b>Contrast Ratio</b>	1000:1 (typ)
	<b>Refresh Rate</b>	60 (typ)
	<b>Brightness</b>	300 (typ)
	<b>Pixel Resolution - Format</b>	1920 x 1200 (WUXGA)
	<b>Backlight</b>	WLED
	<b>Pixel Resolution</b>	RGB
	<b>Color Gamut Coverage</b>	NTSC 45%
	<b>Color Depth</b>	6+2 FRC
	<b>Viewing Angle</b>	UWVA 89/89/89/89
	<b>Low Blue Light</b>	No
	<b>Power Consumption (W, EBL@ 150nits max/ 200nits max))</b>	2.15 (max)/2.65 (max)

Technical Specifications

<b>35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, WLED + Low Blue Light, 400 nits, low power, sRGB 100%</b>	<b>Outline Dimensions (W x H)</b>	307.590 x 199.550 (max)
	<b>Active Area</b>	301.590 x 188.500 (typ)
	<b>Weight</b>	210 (max)
	<b>Diagonal Size</b>	14
	<b>Surface Treatment</b>	Anti-Glare
	<b>Touch Enabled</b>	No
	<b>Contrast Ratio</b>	1000:1 (typ)
	<b>Refresh Rate</b>	60 (typ)
	<b>Brightness</b>	400 (typ)
	<b>Pixel Resolution - Format</b>	1920 x 1200 (WUXGA)
	<b>Backlight</b>	WLED
	<b>Pixel Resolution</b>	RGB
	<b>Color Gamut Coverage</b>	sRGB 100%
	<b>Color Depth</b>	8
	<b>Viewing Angle</b>	UWVA 89/89/89/89
	<b>Low Blue Light</b>	Yes
	<b>Power Consumption (W, EBL@ 150nits max/ 200nits max))</b>	1.29 (max) / 1.66 (max)
<hr/>		
<b>35.6 cm (14") diagonal, WUXGA (1920 x 1200), Bent, LCD, UWVA, anti-glare, WLED + Low Blue Light, 1000 nits, sRGB 100%, HP Sure View reflect integrated privacy screen</b>	<b>Outline Dimensions (W x H)</b>	307.600 x 199.550 (max)
	<b>Active Area</b>	301.680 x 188.500 (typ)
	<b>Weight</b>	238 (max)
	<b>Diagonal Size</b>	14
	<b>Surface Treatment</b>	Anti-Glare
	<b>Touch Enabled</b>	No
	<b>Contrast Ratio</b>	1500:1 (typ)
	<b>Refresh Rate</b>	60 (typ)
	<b>Brightness</b>	1000 (typ)
	<b>Pixel Resolution - Format</b>	1920 x1200 (WUXGA)
	<b>Backlight</b>	WLED
	<b>Pixel Resolution</b>	RGB
	<b>Color Gamut Coverage</b>	sRGB 100%
	<b>Color Depth</b>	8
	<b>Viewing Angle</b>	UWVA 85/85/85/85
	<b>Low Blue Light</b>	Yes
	<b>Power Consumption (W, EBL@ 150nits max/ 200nits max))</b>	N/A

## Technical Specifications

### STORAGE AND DRIVES

For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less.

256 GB PCIe® Gen4x4 NVMe™ SSD Value	Form Factor	M.2 2280
	Capacity	256 GB
	NAND Type	TLC
	Interface	PCIe NVMe Gen4X4
	Maximum Sequential Read	2000 MB/s ±20%
	Maximum Sequential Write	900 MB/s ±20%
	Logical Blocks	500,118,192
	Features	Pyrite 2.0; TRIM; L1.2

## Technical Specifications

## NETWORKING/COMMUNICATIONS

<b>Realtek RTL8852CE 802.11ax 2x2 Wi-Fi 6E + Bluetooth® 5.3 Wireless Card (802.11ax 2x2, supporting gigabit data rate)<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
	<b>Interoperability</b>	Wi-Fi certified
	<b>Frequency Band</b>	802.11b/g/n/ax • 2.402 – 2.482 GHz  802.11a/n/ac/ax • 5.15 – 5.25 GHz • 5.25 – 5.35 GHz • 5.47 – 5.725 GHz • 5.825 – 5.850 GHz • 5.955 – 6.415 GHz • 6.435 – 6.515 GHz • 6.535 – 6.875 GHz • 6.895 – 7.115 GHz
	<b>Data Rates</b>	• 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, (20MHz, 40MHz, ,80MHz & 160MHz) • 802.11ax: MCS0 ~ MCS11, (20MHz, 40MHz, ,80MHz & 160MHz)
	<b>Modulation</b>	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
	<b>Security<sup>3</sup></b>	• 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 (personal) certification • IEEE 802.11i • WAPI • EAP
	<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
	<b>Output Power<sup>2</sup></b>	• 802.11b : +17dBm minimum • 802.11g : +16dBm minimum • 802.11a : +17dBm minimum • 802.11n HT20(2.4GHz) : +14dBm minimum • 802.11n HT40(2.4GHz) : +13dBm minimum • 802.11n HT20(5GHz) : +14dBm minimum

## Technical Specifications

	<ul style="list-style-type: none"> <li>• 802.11n HT40(5GHz) : +13dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +10dBm minimum</li> <li>• 802.11ac VHT160(5GHz) : +10dBm minimum</li> <li>• 802.11ax HE40(2.4GHz) : +12dBm minimum</li> <li>• 802.11ax HE80(5GHz) : +10dBm minimum</li> <li>• 802.11ax HE160(5GHz) : +10dBm minimum</li> <li>• 802.11ax HE80(6GHz) : +10dBm minimum</li> <li>• 802.11ax HE160(6GHz) : +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(VHT80) : -84dBm maximum 802.11ac, MCS9(VHT80) : -59dBm maximum 802.11ac, MCS9(VHT160) : -58.5dBm maximum •802.11ax, MCS11(HE40): -57dBm maximum •802.11ax, MCS11(HE80): -54dBm maximum •802.11ax, MCS11(HE160): -53.5dBm maximum
<b>Antenna type</b>	High efficiency antenna with spatial diversity Two embedded tri-band 2.4/5/6 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
<b>Weight</b>	1. Type 2230 : 2.8g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	<b>Operating</b> Operating: 14° to 158° F (–10° to 70° C) <b>Non-operating</b> Non-operating: –40° to 176° F (–40° to 80° C)
<b>Humidity</b>	<b>Operating</b> Operating: 10% to 60% (non-condensing) <b>Non-operating</b> Non-operating: 5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b> Operating: 0 to 10,000 ft (3,048 m) <b>Non-operating</b> Non-operating: 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	N/A

**HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Card Technology**

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1/5.2/5.3 Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
<b>Data Rates and Throughput</b>	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps BLE : 1 Mbps data rate; throughput up to 0.2 Mbps Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels

### Technical Specifications

<b>Transmit Power</b>	Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5) The Bluetooth® component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.
<b>Power Consumption</b>	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
<b>Bluetooth Software Supported Link Topology</b>	Microsoft Windows Bluetooth® Software
<b>Power Management Certifications</b>	Microsoft Windows ACPI, and USB Bus Support FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407
<b>Power Management Certifications</b>	ETSI 300 328, ETSI 301 893, ETSI 303 687 Bluetooth® 4.1-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 Bluetooth 4.2 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) Bluetooth® 5.2 ESR9/10 Compliance LE Advertisement Extensions Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising 2Mbps LE LE Long Range Windows Bluetooth® profiles support Bluetooth® 5.3 Wireless Card Periodic Advertisement interval Encryption key size control enhancements

1. Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported. Wi-Fi 6E is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.
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

<b>MediaTek RZ616 Wi-Fi 6E + Bluetooth®5.3 Wireless Card (802.11ax 2x2, AMD AIM-T)<sup>1</sup></b>	<ul style="list-style-type: none"> <li>IEEE 802.11a</li> <li>IEEE 802.11b</li> <li>IEEE 802.11g</li> <li>IEEE 802.11n</li> <li>IEEE 802.11ac</li> <li>IEEE 802.11ax</li> <li>IEEE 802.11d</li> <li>IEEE 802.11e</li> <li>IEEE 802.11h</li> <li>IEEE 802.11i</li> <li>IEEE 802.11j</li> <li>IEEE 802.11k</li> <li>IEEE 802.11mc</li> <li>IEEE 802.11r</li> <li>IEEE 802.11v</li> <li>IEEE 802.11w</li> </ul>
<b>Interoperability</b> <b>Frequency Band</b>	<ul style="list-style-type: none"> <li>Wi-Fi certified</li> <li>802.11b/g/n/ax <ul style="list-style-type: none"> <li>• 2.402 – 2.482 GHz</li> </ul> </li> <li>802.11a/n/ac/ax <ul style="list-style-type: none"> <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> <li>• 5.925 – 7.125 GHz</li> </ul> </li> </ul>
<b>Data Rates</b>	<ul style="list-style-type: none"> <li>• 802.11b: 1, 2, 5.5, 11 Mbps</li> <li>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>• 802.11ac : MCS0 ~ MCS9, (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> <li>• 802.11ax : MCS0 ~ MCS11, (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> </ul>
<b>Modulation</b>	<ul style="list-style-type: none"> <li>Direct Sequence Spread Spectrum</li> <li>OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM</li> </ul>
<b>Security<sup>3</sup></b>	<ul style="list-style-type: none"> <li>• IEEE and WiFi certified 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>• WPA3 (personal) certification</li> <li>• IEEE 802.11i</li> <li>• WAPI</li> </ul>
<b>Network Architecture Models</b>	<ul style="list-style-type: none"> <li>Ad-hoc (Peer to Peer)</li> <li>Infrastructure (Access Point Required)</li> </ul>
<b>Roaming</b>	<ul style="list-style-type: none"> <li>IEEE 802.11 compliant roaming between access points</li> </ul>
<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"> <li>2.4GHz (MIMO, typical): <ul style="list-style-type: none"> <li>• 802.11b : +18dBm</li> <li>• 802.11g : +16.5dBm</li> <li>• 802.11n/ac/ax (HT20/VHT20/HE20) : +16dBm</li> <li>• 802.11n/ac/ax (HT40/VHT40/HE40) : +12.5dBm</li> </ul> </li> </ul>

### Technical Specifications

	5GHz (MIMO, typical):
	<ul style="list-style-type: none"> <li>• 802.11a : +13dBm</li> <li>• 802.11n/ac/ax (HT20/VHT20/HE20) : +13.5dBm</li> <li>• 802.11n/ac/ax (HT40/VHT40/HE40) : +12.5dBm</li> <li>• 802.11ac/ax (VHT80/HE80) : +11.5dBm</li> <li>• 802.11ax HE160 : +11.5dBm</li> </ul>
	6GHz LPI mode (MIMO, typical)::
	<ul style="list-style-type: none"> <li>• 802.11a : 0dBm</li> <li>• 802.11ax HE20 : +1dBm</li> <li>• 802.11ax HE40 : +4dBm</li> <li>• 802.11ax HE80 : +7dBm</li> <li>• 802.11ax HE160 : +7.5dBm</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>	2.4GHz (SISO): <ul style="list-style-type: none"> <li>• 802.11b, 11Mbps : -82dBm maximum</li> <li>• 802.11g, 54Mbps : -71 dBm maximum</li> <li>• 802.11n, MCS7 : -64dBm maximum</li> <li>• 802.11ac, MCS9 : -52dBm maximum</li> <li>• 802.11ax, MCS11(HT40): -49dBm maximum</li> </ul> 5GHz (SISO): <ul style="list-style-type: none"> <li>• 802.11a, 54Mbps : -71 dBm maximum</li> <li>• 802.11n, MCS07 : -64dBm maximum</li> <li>• 802.11ac, MCS9 : -52dBm maximum</li> <li>• 802.11ax, MCS11(HE80/HE160): -46dBm maximum</li> </ul> 6GHz (SISO): <ul style="list-style-type: none"> <li>• 802.11a, 54Mbps : -71 dBm maximum</li> <li>• 802.11n, MCS7 : -64dBm maximum</li> <li>• 802.11ac, MCS9 : -52dBm maximum</li> <li>• 802.11ax, MCS11(HE160): -46dBm maximum</li> </ul>
<b>Antenna type</b>	High efficiency antenna with spatial diversity Two embedded tri-band 2.4/5/6 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
<b>Weight</b>	1. Type 2230 : 2.8g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	<b>Operating</b> Operating: 14° to 158° F (–10° to 70° C) <b>Non-operating</b> Non-operating: –40° to 176° F (–40° to 80° C)
<b>Humidity</b>	<b>Operating</b> Operating: 10% to 60% (non-condensing) <b>Non-operating</b> Non-operating: 5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b> Operating: 0 to 10,000 ft (3,048 m) <b>Non-operating</b> Non-operating: 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	N/A



### Technical Specifications

#### HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Card Technology

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1/5.2/5.3 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 1.5 Bluetooth device with a maximum transmit power of + 14 dBm and 10 dBm for BR and EDR, respectively.
<b>Power Consumption</b>	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
<b>Bluetooth Software Supported Link Topology</b>	Microsoft Windows Bluetooth® Software
<b>Power Management Certifications</b>	Microsoft Windows ACPI, and USB Bus Support FCC (47 CFR) Part 15C, Section 15.247 & 15.407 ETS 300 328 Low Voltage Directive CE Mark
<b>Power Management Certifications</b>	Bluetooth® 4.1-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 Bluetooth 4.2 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) Bluetooth® 5.2 ESR9/10 Compliance LE Advertisement Extensions Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising 2Mbps LE LE Long Range Windows Bluetooth® profiles support Bluetooth® 5.3 Wireless Card Periodic Advertisement interval Encryption key size control enhancements

## Technical Specifications

1. Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported. Wi-Fi 6E is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.
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).

<b>NFC NXP NPC300*</b>	<b>Dimensions (L x W x H)</b>	17 x 10 x 2.0 mm
	<b>Chipset</b>	NPC300
	<b>System interface</b>	I2C
	<b>NFC RF standards</b>	ISO/IEC 14443 A
		ISO/IEC 14443 B
		ISO/IEC 15693
		ISO/IEC 18092
		ECMA-340 NFCIP-1 Target and Initiator
		ECMA-320 NFCIP-2
	<b>NFC Forum Support Reader (PCD-VCD) Mode(1)</b>	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2
		ISO/IEC 14443 A
		ISO/IEC 14443 B
		ISO/IEC 15693
		MIFARE 1K
		MIFARE 4K
		MIFARE DESFire
		FeliCa
		Jewel and Topaz cards
		ISO/IEC 14443 A
	<b>Card Emulation (PICC-VICC) Mode(1)</b>	ISO/IEC 14443 B and B'
		MIFARE
		FeliCa
	<b>Frequency</b>	13.56 MHz
	<b>NFC Modes Supported</b>	Reader/Writer, Peer-to-Peer
	<b>Raw RF Data Rates</b>	106, 212, 424, 848 kbps
	<b>Temperature</b>	Operating: 0 °C to 70 °C (32 °F to 158 °F)
		Storage: -20 °C to 125 °C (-4 °F to 257 °F)
	<b>Humidity</b>	10-90% operating
		5-95% non-operating
	<b>Supply Operating voltage</b>	4.35 to 5.25 Volts
	<b>I/O Voltage</b>	1.8V or 3.3V
	<b>Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)</b>	
	<b>Mode</b>	Power Consumption, Typical
	<b>Polling</b>	7.3 mA
	<b>Detected Test Tag Type 1</b>	Total 283.8 mA
		Net Module 236.8 mA

### Technical Specifications

<b>Detected Test Tag Type 2</b>	Total 288.8 mA Net Module 241.8 mA
<b>Detected Test Tag Type 3</b>	Total 287.7 mA Net Module 240.7 mA
<b>Detected Test Tag Type 4</b>	Total 282.3 mA Net Module 235.3 mA
<b>Antenna</b>	Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module.

<b>Realtek RTL8111HSH 10/100/1000 Integrated NIC</b>	<b>Connector</b> <b>System Interface</b> <b>Data rates supported</b>	RJ-45 PCIe + SMBus 10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s
	<b>IEEE Compliance</b>	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet)
	<b>Performance</b>	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling Jumbo Frame 9K
	<b>Power consumption</b>	Cable Disconnection: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
	<b>Power Management</b>	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
	<b>Management Interface</b> <b>IT Manageability</b>	Auto MDI/MDIX Crossover cable detection Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status

<b>HP 4G LTE-A Pro Cat16 WWAN eSIM<sup>1,*</sup></b>	<b>Technology/Operating bands</b>	WCDMA/HSPA+ operating bands: Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL) Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL) Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL) Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)
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### Technical Specifications

	<p>Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)</p> <p>LTE FDD/TDD operating bands:</p> <p>Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)</p> <p>Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)</p> <p>Band 3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL)</p> <p>Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)</p> <p>Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)</p> <p>Band 7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)</p> <p>Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)</p> <p>Band 12: 699 to 716 MHz (UL), 729 to 746 MHz (DL)</p> <p>Band 13: 777 to 787 MHz (UL), 746 to 756 MHz (DL)</p> <p>Band 14: 788 to 798 MHz (UL), 758 to 768 MHz (DL)</p> <p>Band 17: 704 to 716 MHz (UL), 734 to 746 MHz (DL)</p> <p>Band 18: 815 to 830 MHz (UL), 860 to 875 MHz (DL)</p> <p>Band 19: 830 to 845 MHz (UL), 875 to 890 MHz (DL)</p> <p>Band 20: 832 to 862 MHz (UL), 791 to 821 MHz (DL)</p> <p>Band 25: 1850 to 1915 MHz (UL), 1930 to 1995 MHz (DL)</p> <p>Band 26: 814 to 849 MHz (UL), 859 to 894 MHz (DL)</p> <p>Band 28: 703 to 748 MHz (UL), 758 to 803 MHz (DL)</p> <p>Band 29: 717 to 728 MHz (DL)</p> <p>Band 30: 2305 to 2315 MHz (UL) 2350 to 2360 MHz (DL)</p> <p>Band 32: 1452 to 1496 MHz (DL)</p> <p>Band 34: 2010 to 2025 MHz (UL/DL)</p> <p>Band 38: 2570 to 2620 MHz (UL/DL)</p> <p>Band 39: 1880 to 1920 MHz (UL/DL)</p> <p>Band 40: 2300 to 2400 MHz (UL/DL)</p> <p>Band 41: 2496 to 2690 MHz (UL/DL)</p> <p>Band 42: 3400 to 3600 MHz (UL/DL)</p> <p>Band 43: 3400 to 3800 MHz (UL/DL)</p> <p>Band 48: 3550 to 3700 MHz (UL/DL)</p> <p>Band 66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)</p> <p>Band 71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)</p>
<b>Wireless protocol standards</b>	<p>3GPP LTE Rel15</p> <p>LTE Specification, 100MHz 5 DLCA, 256 QAM, DL 1.0Gbps (CAT16)/ 40MHz 2 ULCA, 256 QAM, UL 211Mbps (CAT18)</p> <p>WCDMA 3GPP Release 8 UMTS Specification, DL UMTS: 384 kbps/UL 384 kbp, DL DC-HSPA+: 42 Mbps (CAT24)/UL 11.5 Mbps (CAT7)</p>
<b>GPS</b>	WCDMA R99,
<b>GPS bands</b>	<p>3GPP Release 5, 6, 7 and 8 UMTS Specification</p> <p>Standalone, A-GPS (MS-A, MS-B)</p> <p>GPS: L1 (1575.42MHz)</p> <p>GLONASS: L1 (1602MHz)</p> <p>BeidouB1(1561.098MHz)</p> <p>Galileo E1 (1575.42)</p> <p>QZSS(1575.42 MHz)</p>
<b>Maximum data rates</b>	<p>LTE: ue-CategoryDL 16, (DL : 1 Gbps )</p> <p>ue-CategoryUL 18 , (UL: 211Mbps)</p> <p>DC-HSPA+: 42 Mbps (Download), 11.5 Mbps (Upload)</p>
<b>Maximum output power</b>	<p>HPUE: Not supported</p> <p>LTE: 23 dBm in all band except (B30= 22dBm&amp; B48= 21dBm )</p> <p>UMTS: 23.5 dBm</p>
<b>Maximum power consumption</b>	<p>LTE: 1300 mA (peak); 1100 mA (average)</p> <p>HSPA+: 1,100 mA (peak); 800 mA (average)</p>
<b>Form Factor</b>	M.2, 3052-S3 Key B

## Technical Specifications

Weight	8 g
Dimensions (Length x Width x Thickness)	52 mm x 30 mm x 2.3 mm
eSIM	Support

1. Mobile Broadband is an optional feature. Connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products or in all countries.

Technical Specifications

POWER

HP Standard 65W USB Type-C® adapter	Weight	unit: 250g +/- 10g	
	Input	100-240Vac	
	Input	Input Efficiency	81.50% min at 115 Vac/ 230 Vac @5.00V 86.70% min at 115 Vac/ 230 Vac @9.00V 88.00% min at 115 Vac/ 230 Vac @12.00V 89.00% min at 115 Vac/ 230 Vac @15.00V 89.00% min at 115 Vac/ 230 Vac @20.00V
		Input frequency range	47 ~ 63 Hz
		Input AC current	Max. 1.6 A at 90 Vac
	Output	Output power	5V/15W 9V/27W 12V/60W 15V/65W 20V/65W
		DC output	5V/9V/12V/15V/20V
		Hold-up time	100% load 5ms at 115 Vac input
		Output current limit	<8.0A
	DC Cable Connector	USB type C	
HP Standard 65W USB Type-C® Halogen Free adapter	DC Cable Material	PVC	
	Connector	C6	
	Environmental Design	Operating temperature	32°Fto 95°F (0°to 35°C)
		Non-operating (storage) temperature	-4°Fto 185°F (-20°to 85°C)
		Altitude	0 to 16,400 ft (0 to 5,000m)
		Humidity	20% to 95
		Storage Humidity	10% to 95%
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL 62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC and CECP, CU(EAC), EAEU, KCC(Safety+EMC) and K-MEPS, NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia RCM, BIS, BSMI, UAE, UKCA DoC	

HP Standard 65W USB Type-C® Halogen Free adapter	Weight	unit: 250g +/- 10g	
	Input	100-240Vac	
	Input	Input Efficiency	81.50% min at 115 Vac/ 230 Vac @5.00V 86.70% min at 115 Vac/ 230 Vac @9.00V 88.00% min at 115 Vac/ 230 Vac @12.00V 89.00% min at 115 Vac/ 230 Vac @15.00V 89.00% min at 115 Vac/ 230 Vac @20.00V
		Input frequency range	47 ~ 63 Hz
		Input AC current	Max. 1.6 A at 90 Vac
	Output	Output power	5V/15W

### Technical Specifications

		9V/27W 12V/60W 15V/65W 20V/65W 5V/9V/12V/15V/20V 100% load 5ms at 115 Vac input <8.0A
<b>DC Cable Connector</b>	<b>DC output</b>	
<b>DC Cable Material</b>	<b>Hold-up time</b>	
<b>Connector</b>	<b>Output current limit</b>	
<b>Environmental Design</b>	USB type C	
	Halogen Free	
	C6	
	<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 5,000m)
	<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 - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL 62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC and CECP, CU(EAC), EAEU, KCC(Safety+EMC) and K-MEPS, NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia RCM, BIS, BSMI, UAE, UKCA DoC	

<b>HP Long Life 3 cell 56Whr* Polymer</b>	<b>Weight</b>	0.208kg +/- 10g (0.459 lb)
	<b>Cells/Type</b>	3cell Lithium-Ion Polymer cell / 586075
	<b>Energy</b>	
	<b>Voltage</b>	11.58V
	<b>Amp-hour capacity</b>	4.840Ah
	<b>Watt-hour capacity*</b>	56.04Wh
	<b>Temperature</b>	
	<b>Operating (Charging)</b>	32° to 113° F (0° to 45° C) (Charge Initial Temperature) 32° to 122° F (0° to 50° C) (Continuous Charging)
	<b>Operating (Discharging)</b>	14° to 140° F (-10° to 60° C)
	<b>Optional Travel Battery Available</b>	No

\*For new batteries, actual battery Watt-hours (Wh) may differ from the design capacity and may have a full charge capacity that differs by up to 10% from the design capacity, which is typical for lithium-ion batteries. Battery capacity decreases over time and with use, depending on several factors such as battery health management settings, shelf life, temperature, environment, loaded apps, features, system configuration, and power settings.

<b>HP Long Life 3 cell 48Whr* Polymer</b>	<b>Weight</b>	0.192kg +/- 10g (0.423 lb)
	<b>Cells/Type</b>	3cell Lithium-Ion Polymer cell / NCM 565875
	<b>Energy</b>	

## Technical Specifications

<b>Voltage</b>	11.58V
<b>Amp-hour capacity</b>	4.285Ah
<b>Watt-hour capacity*</b>	48.84Wh
<b>Temperature</b>	
<b>Operating (Charging)</b>	32° to 113° F (0° to 45° C) (Charge Initial Temperature) 32° to 122° F ( 0° to 50° C ) (Continuous Charging)
<b>Operating (Discharging)</b>	14° to 140° F (-10° to 60° C)
<b>Optional Travel Battery Available</b>	No

\*For new batteries, actual battery Watt-hours (Wh) may differ from the design capacity and may have a full charge capacity that differs by up to 10% from the design capacity, which is typical for lithium-ion batteries. Battery capacity decreases over time and with use, depending on several factors such as battery health management settings, shelf life, temperature, environment, loaded apps, features, system configuration, and power settings.



## Technical Specifications

## AUDIO

HD Stereo Codec	ALC3247
Audio I/O Ports	3.5mm Headset: CTIA only;Headphone-out
Internal Speaker Amplifier	
Multi-streaming Capable	Playback multi-streaming can be enabled in the audio control panel to allow independent audio streams to be sent to/from the front jacks or integrated speaker., Following MSFT Behavior
Sampling	DAC: Supports resolutions from 16-bit to 16-bit;48.0 kHz to 48.0 kHz ADC: Supports resolutions from 16-bit to 16-bit;48.0 kHz to 48.0 kHz
Wavetable Syntheses	Yes - Uses OS soft wavetable
Analog Audio	N/A
# of Channels on Line-Out	Yes
Internal Speaker	ALC3247

## FINGERPRINT READER

## 1st Source

Sensor vendor	ELAN
Sensor type	Capacitive
DPI resolution	508 DPI
Scan area	80 x 80 pixels
False Rejection Rate	< 3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	2.7 V ~ 3.6 V
Operating Temperature	-20°C ~ 80°C (-4°F ~ 176°F)
Current Consumption	
Image	35 mA max
Low Latency Wait For Finger	300 uA
Capture Rate	50 frames/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	508 dpi / 4.0 x 4.0 mm sensor area

## 2nd Source

Sensor vendor	SYNAPTICS
Sensor type	Capacitive
DPI resolution	363 DPI
Scan area	104 x 86 pixels
False Rejection Rate	< 3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	2.7 V ~ 3.6 V
Operating Temperature	0°C ~ 60°C (32°F ~ 140°F)

## Technical Specifications

Current Consumption	
Image	100 mA max
Low Latency Wait For	
Finger	260 uA
Capture Rate	50 frames/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	363 dpi / 7.4 x 6.0 mm sensor area

## Technical Specifications

## ENVIRONMENTAL DATA

<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>• US Federal Energy Management Program (FEMP)</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.</li> <li>• TCO Certified</li> <li>• China Energy Conservation Program (CECP)</li> <li>• China State Environmental Protection Administration (SEPA)</li> <li>• Taiwan Green Mark</li> <li>• Korea Eco-label</li> <li>• Japan PC Green label*</li> </ul>		
<b>Sustainable Impact Specifications</b>	<ul style="list-style-type: none"> <li>• <a href="#">Product Carbon Footprint</a></li> <li>• Ocean-bound plastic in Fan and Speaker<sup>1</sup></li> <li>• 25% post-consumer recycled plastic<sup>2</sup></li> <li>• 50% recycled metal<sup>7</sup></li> <li>• Low halogen<sup>6</sup></li> <li>• Outside Box and corrugated cushions are 100% sustainably sourced and recyclable<sup>4</sup></li> <li>• Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable.<sup>5</sup></li> <li>• Bulk packaging available</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)	5.18 W	5.30 W	5.16 W
Normal Operation (Long idle)	N/A	N/A	N/A
Sleep	1.28 W	1.28 W	1.29 W
Off	0.42 W	0.46 W	0.43 W
	<p><b>NOTE:</b> 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)	17.72 BTU/hr	18.12 BTU/hr	17.64 BTU/hr

## Technical Specifications

Normal Operation (Long idle)	N/A	N/A	N/A
Sleep	4.37 BTU/hr	4.37 BTU/hr	4.41 BTU/hr
Off	1.43 BTU/hr	1.60 BTU/hr	1.47 BTU/hr
	*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.		
Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L <sub>Wad</sub> , bels)	Sound Pressure (L <sub>pAm</sub> , decibels)	
Typically Configured – Idle	2.6	14.8	
Fixed Disk – Random writes	3.7	29.1	
Optical Drive – Sequential reads	3.7	29.2	
Longevity and Upgrading	This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the spare parts are available throughout the warranty period and or for up to “5” years after the end of production.		
Additional Information	<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 is 93.4% recycle-able when properly disposed of at end of life.</li></ul>		
Packaging Materials	External:	PAPER/Corrugated	281 g
		PAPER/Molded Pulp	140 g
	Internal:	PLASTIC/Polyethylene low density - LDPE	16 g
	The plastic packaging material contains at least 0.0% recycled content.		
	The corrugated paper packaging materials contains at least 54.5% recycled content.		
RoHS Compliance	<p>HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.</p> <p>We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.</p> <p>We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve.</p> <p>To obtain a copy of the HP RoHS Compliance Statement, see <a href="#">HP RoHS position statement</a>.</p>		

### Technical Specifications

<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/supplychain/gen_specifications.html">http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html</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>• Bis(2-Ethylhexyl) phthalate (DEHP)</li> <li>• Benzyl butyl phthalate (BBP)</li> <li>• Dibutyl phthalate (DBP)</li> <li>• Diisobutyl phthalate (DIBP)</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> <li>• Radioactive Substances</li> <li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</li> </ul>
<b>Packaging Usage</b>	<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>
<b>End-of-life Management and Recycling</b>	<p>HP 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</p>

### Technical Specifications

	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.
<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>  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>
<b>footnotes</b>	<ol style="list-style-type: none"> <li>1. Percentage of ocean-bound plastic contained in each component varies by product</li> <li>2. Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.</li> <li>3. External power supplies, WWAN modules, power cords, cables and peripherals excluded.</li> <li>4. 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.</li> <li>5. Fiber cushions made from 100% recycled wood fiber and organic materials.</li> <li>6. External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.</li> <li>7. Disclaimer: recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams.</li> </ol>

### COUNTRY OF ORIGIN

China

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

Category	Description	Part Number
<b>AC Adapter</b>	HP 45W USB-C LC Dali AC Power Adapter	1M201AA
	HP 65W GaN USB-C Laptop Charger	600Q8AA, 600Q8UT
	HP 65W GaN USB-C LC Laptop Charger	9Y3X5AA, 9Y3X5UT
	HP 65W USB-C Laptop Charger - New AMO	671R3AA, 671R3UT
	HP 65W USB-C LC AC Power Adapter	1P3K6AA, 1P3K6UT
	HP 100W+10W USB-C+USB-A Slim Straight Kenting AC Power Adapter	8B3Y2AA, 8B3Y2UT
<b>Adapters</b>	HP HDMI to VGA Adapter	H4F02AA, H4F02UT
	HP USB 3.0 to Gigabit RJ45 Adapter G2	4Z7Z7AA, 4Z7Z7UT
	HP USB-C to DisplayPort Adapter	N9K78AA, N9K78UT
	HP USB-C to DisplayPort Adapter G2	8Y8Y1AA
	HP USB-C to HDMI 2.0 Adapter	1WC36AA
	HP USB-C to RJ45 Adapter G2	4Z527AA, 4Z527UT
	HP USB-C to USB 3.0 Adapter	N2Z63AA, N2Z63UT
	HP USB-C to VGA Adapter	N9K76AA, N9K76UT
<b>Bags and Cases</b>	HP Campus Blue Backpack	7K0E5AA
	HP Campus Green Backpack	7K0E4AA
	HP Campus XL Marble Stone Backpack	7K0E2AA
	HP Campus XL Tie Dye Backpack	7K0E3AA
	HP Renew Business 14.1 Laptop Bag	3E5F9AA, 3E5F9UT
	HP Renew Business 14.1 Laptop Sleeve	3E2U7AA, 3E2U7UT
	HP Renew Executive 14.1 Laptop Sleeve	6B8Y3AA
<b>Docking Stations</b>	HP Thunderbolt 120W G4 Dock	4J0A2AA, 4J0A2ET
	HP USB-C Dock G5	5TW10AA, 5TW10ET
<b>Hub</b>	HP 4K USB-C Multiport Hub	6G842AA, 6G843UT
	HP Universal USB-C Hub and Laptop Charger Combo	9H0H9AA
	HP Universal USB-C Multiport Hub	50H55AA, 50H55UT
	HP USB-C to USB-A Hub	Z6A00AA, Z6A00UT
	HP USB-C Travel Hub G3	86S97AA, 86T46UT
<b>Keyboard</b>	HP 405 Wired Backlit USB-C Keyboard	7N7C1AA, 7N7C1UT
	HP 455 Wireless Programmable USB Keyboard	4R177AA, 4R177UT
	HP 475 Dual-Mode Keyboard	7N7B9AA, 7N7B9UT
	HP 655 Wireless Keyboard and Mouse Combo	4R009AA
	HP 965 Ergonomic Wireless Keyboard	7E756AA
	HP 975 WL Dual-Mode USB+BT Keyboard	3Z726AA, 3Z726UT
<b>Mouse</b>	HP 125 USB-A Wired Mouse	265A9AA, 265A9UT
	HP 128 USB Laser Wired Mouse	265D9AA, 265D9UT
	HP 320M USB-A Wired Mous	9VA80AA
	HP 425 Programmable Bluetooth Wireless Mouse	7M1D5AA

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

	HP 435 Bluetooth 5.0 + Wireless 2.4GHz Multi-Device Wireless Mouse	3B4Q5AA, 3B4Q5UT
	HP 515 Ultra-Fast Rechargeable Wireless Mouse	9C2F7AA
	HP 715 Rechargeable Multi-Device Bluetooth 5.0 + Wireless 2.4GHz Bluetooth Mouse	6E6F0AA
	HP 925 Ergonomic Vertical Bluetooth 5.0 + Wireless 2.4GHz Wireless Mouse	6H1A5AA
	HP Creator USB-A+Bluetooth 935 Wireless Mouse Black	1D0K8AA, 1D0K8UT
	HP USB-A Premium Wireless Mouse	1JR31AA, 1JR31UT
	HP USB-A+Bluetooth Multi-Device 635 Wireless Mouse Black	1D0K2AA, 1D0K2UT
Security Hardware	HP Combination Nano Cable Lock	63B28AA
	HP Essential Combination Nano Cable Lock	63B31AA
	HP Nano Keyed Cable Lock	1AJ39AA, 1AJ39UT
	HP Nano Master Keyed Cable Lock	1AJ40AA
	HP SureKey Standard/Nano/Wedge Cable Lock	6UW42AA, 6UW42UT
Storage - ODD	HP USB DVD-Writer EXT ODD	F2B56AA, F2B56UT



## Summary of Changes

Date of change	Version History		Description of change
	From v1 to v2		

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