

## Informacije o proizvodu (EN)

HP laptop ProBook 455 G9 Win 11 (7K8Q4AA)



Tehnoteka je online destinacija za upoređivanje cena i karakteristika bele tehnike, potrošačke elektronike i IT uređaja kod trgovinskih lanaca i internet prodavnica u Srbiji. Naša stranica vam omogućava da istražite najnovije informacije, detaljne karakteristike i konkurentne cene proizvoda.

Posetite nas i uživajte u ekskluzivnom iskustvu pametne kupovine klikom na link:

<https://tehnoteka.rs/p/hp-laptop-probook-455-g9-win-11-7k8q4aa-akcija-cena/>

### Overview

#### HP ProBook 455 15.6" G9 Notebook PC



#### Left

- |                                   |                                                                    |
|-----------------------------------|--------------------------------------------------------------------|
| 1. Internal Microphones (2)       | 5. Clickpad                                                        |
| 2. Webcam LED (Optional)          | 6. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1) |
| 3. Camera Shutter                 | 7. Ethernet Port (RJ-45)                                           |
| 4. Combo Web/IR Camera (Optional) | 8. Nano Security Lock Slot (Lock sold separately)                  |

### Overview



#### Right

- |                                                                                        |                                             |
|----------------------------------------------------------------------------------------|---------------------------------------------|
| 1. Power Button Key                                                                    | 6. HDMI 2.0b Port (Cable not included)      |
| 2. Power Connector                                                                     | 7. Audio Combo Jack                         |
| 3. SuperSpeed USB Type-C® 10Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4) | 8. Nano SIM Slot (Select Models)            |
| 4. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1)                     | 9. Touch Fingerprint Sensor (select models) |
| 5. SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1)                     |                                             |

### Overview

#### AT A GLANCE

- Preinstalled with Windows 11 versions or FreeDOS
- Choice of AMD Barcelo™ 5000 series mobile processors, R7, R5 and R3
- Integrated AMD Radeon™ Vega graphics
- Fast and upgradeable dual channel DDR4 SODIMM memory up to 32 GB
- Choice of 39.62 cm (15.6") diagonal HD, Ultra Wide Viewing Angle FHD and FHD TOP Panel Option
- Features redesigned quiet and responsive HP Keyboard with the HP Programmable key and backlit options
- Choice of primary solid state drives up to 1TB, Optional 2nd SSD 128GB/256GB
- Multi-layered security with HP SureStart Gen6, HP Privacy Camera, HP Sure View Gen4, HP Sure Sense G2, HP Sure Click, and Touch Fingerprint reader, Tamper Lock, HP Wolf Security
- Supports wireless options for connectivity on the go including gigabit-speed up to Wi-Fi 6e and CAT9 4G/LTE WWAN (Optional)
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles
- Designed to support HP docking options including the HP Universal Dock G5
- Designed to pass 19 MIL-STD 810H tests
- Battery options 42.75 Wh and 51.3 Wh
- Battery life up to 19 hours and 30 minutes
- Optimize your video calls with an HD camera and temporal noise reduction that adjusts to the lighting in your environment.

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

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## Technical Specifications

### PRODUCT NAME

HP ProBook 455 15.6" G9 Notebook PC

### OPERATING SYSTEM

|                     |                                                                                                                          |
|---------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Preinstalled</b> | Windows 11 Pro <sup>1</sup>                                                                                              |
|                     | Windows 11 Pro Education <sup>1</sup>                                                                                    |
|                     | Windows 11 Home - HP recommends Windows 11 Pro for business <sup>1</sup>                                                 |
|                     | Windows 11 Home Single Language - HP recommends Windows 11 Pro for business <sup>1</sup>                                 |
|                     | Windows 11 Pro (Windows 11 Enterprise or Windows 10 Enterprise available with a Volume Licensing Agreement) <sup>1</sup> |
|                     | Windows 11 Pro (preinstalled with Windows 10 Pro Downgrade) <sup>1,2</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. Windows is automatically updated and enabled. High speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.

2. This system is preinstalled with Windows 10 Pro software and also comes with a license for Windows 11 Pro software and provision for recovery software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

### PROCESSORS

AMD Ryzen™ 7 5825U Mobile Processor with Radeon™ Graphics (2.0 GHz base clock, up to 4.5 GHz max boost clock, 16 MB L3 cache, 8 cores, 16 threads)<sup>3,4,5,6</sup>

AMD Ryzen™ 5 5625U Mobile Processor with Radeon™ Graphics (2.3 GHz base clock, up to 4.3 GHz max boost clock, 16 MB L3 cache, 6 cores, 12 threads)<sup>3,4,5,6</sup>

AMD Ryzen™ 3 5425U Mobile Processor with Radeon™ Graphics (2.7 GHz base clock, up to 4.1 GHz max boost clock, 8 MB L3 cache, 4 cores, 8 threads)<sup>3,4,5,6</sup>

#### Processor Family

AMD Barcelo™ 5000 Series Mobile Processors<sup>6</sup>

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

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

5. AMD Max Burst frequency performance varies depending on hardware, software and overall system configuration.

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

## Technical Specifications

### CHIPSET

Chipset is integrated with processor

### GRAPHICS

#### Integrated

AMD Radeon™ Graphics <sup>7</sup>

#### Supports

Support HD decode, DX12, HDMI 2.0b

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

### DISPLAY

#### Non-Touch

39.6 cm (15.6") diagonal FHD UWVA eDP w/o PSR anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD camera +WWAN (1920 x 1080) <sup>7,8</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP anti-glare, low power narrow bezel bent, 400 nits, 100% sRGB for HD Webcam (1920 x 1080) <sup>7,8</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP anti-glare, low power narrow bezel bent, 400 nits, 100% sRGB for HD Webcam +IR camera (1920 x 1080) <sup>7,8</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP w/o PSR anti-glare, narrow bezel bent, 250 nits, 45% NTSC (1920 x 1080) <sup>7,8</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD Webcam (1920 x 1080) <sup>7,8</sup>

39.6 cm (15.6") diagonal FHD UWVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD Webcam +IR camera (1920 x 1080) <sup>7,8</sup>

39.6 cm (15.6") diagonal HD SVA eDP w/o PSR anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD camera +WWAN (1366 x 768) <sup>7,8</sup>

39.6 cm (15.6") diagonal HD SVA eDP w/o PSR anti-glare, narrow bezel bent, 250 nits, 45% NTSC (1366 x 768) <sup>7,8</sup>

39.6 cm (15.6") diagonal HD SVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD Webcam (1366 x 768) <sup>7,8</sup>

39.6 cm (15.6") diagonal HD SVA eDP anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD Webcam +IR camera (1366 x 768) <sup>7,8</sup>

#### Touch

39.6 cm (15.6") diagonal FHD, touch, UWVA eDP w/o PSR anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD IR camera (1920 x 1080) <sup>7,8,10</sup>

39.6 cm (15.6") diagonal FHD, touch, UWVA eDP w/o PSR anti-glare, narrow bezel bent, 250 nits, 45% NTSC for HD IR camera +WWAN (1920 x 1080) <sup>7,8,10</sup>

#### HDMI

Support resolutions up to 4k 60Hz

#### Display Size

15.6"

39.6 cm (15.6") Diagonal

## Technical Specifications

7. HD content required to view HD images.
8. Resolutions are dependent upon monitor capability, and resolution and color depth settings.
9. HP Sure View integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
10. Actual brightness will be lower with touch or HP Sure View.

## DOCKING (Sold Separately)

|                                 |                              |
|---------------------------------|------------------------------|
| <b>Docking station model #1</b> | HP Thunderbolt Dock G2       |
| <b>Docking station model #2</b> | HP USB-C Dock G5             |
| <b>Docking station model #3</b> | HP USB-C/A Universal Dock G2 |

For additional aftermarket options and docking specs please see page 37.

## STORAGE AND DRIVES

### Primary Storage

- 128 GB PCIe® NVMe™ M.2 Value Solid State Drive <sup>11</sup>
- 256 GB PCIe® NVMe™ M.2 Value Solid State Drive <sup>11</sup>
- 512 GB PCIe® NVMe™ M.2 Value Solid State Drive <sup>11</sup>
- 1 TB PCIe® NVMe™ M.2 TLC Solid State Drive <sup>11</sup>

### Secondary M.2 Storage (Optional)

- 128 GB PCIe® NVMe™ M.2 Value Solid State Drive <sup>11</sup>
- 256 GB PCIe® NVMe™ M.2 Value Solid State Drive <sup>11</sup>

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

## MEMORY

### Maximum Memory

- 32 GB DDR4-3200 SDRAM <sup>12</sup>

### Memory

- 32 GB DDR4-3200 SDRAM (2 x 16 GB) <sup>12</sup>
- 16 GB DDR4-3200 SDRAM (1 x 16 GB) <sup>12</sup>
- 16 GB DDR4-3200 SDRAM (2 x 8 GB) <sup>12</sup>
- 12 GB DDR4- 3200 SDRAM (4 GB and 8 GB (1 x 8 GB)) <sup>12</sup>
- 8 GB DDR4-3200 SDRAM (1 x 8 GB) <sup>12</sup>
- 8 GB DDR4-3200 SDRAM (2 x 4 GB) <sup>12</sup>
- 4 GB DDR4-3200 SDRAM (1 x 4 GB) <sup>12</sup>

### Memory Slots

- 2 SODIMM

Both slots are accessible/upgradeable by IT or self-maintainers only



### Technical Specifications

DDR4 PC4 SODIMMS, system runs at 3200  
Supports Dual Channel Memory

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

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### NETWORKING/COMMUNICATIONS

#### WLAN

Realtek RTL8852BE 802.11ax 2x2 Wi-Fi® + Bluetooth® 5.3 Wireless Card<sup>13</sup>

Qualcomm® Fast Connect 6900 Wi-Fi 6E + Bluetooth® 5.2 (802.11ax 2x2, AMD AIM-T AME) Wireless Card<sup>13,14</sup>

#### WWAN

Intel® XMM™ 7560 R+ LTE-Advanced Pro Cat 16<sup>13,15</sup>

#### Miracast

Native Miracast Support

#### Ethernet

Realtek RTL8111HSH 10/100/1000 Integrated NIC<sup>16</sup>

#### Wake on WLAN

Support on S3 AC mode only

13. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs.

14. 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.

15. WWAN is an optional feature, requires factory configuration and separately purchased service contract. Check with service provider for coverage and availability in your area. 4G LTE not available on all products, in all regions.

16. 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.

### Technical Specifications

#### AUDIO/MULTIMEDIA

##### Audio

2 Integrated stereo speakers

Integrated microphone (Dual Array)

##### Speaker Power

2W/4ohm per speaker

##### Camera

720p HD camera with Temporal Noise Reduction <sup>7</sup>

720p HD camera+IR Camera <sup>7,17</sup>

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

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

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

##### Keyboard

HP Premium Keyboard, spill resistant and optional Durakeys and backlit

##### Pointing Device

Clickpad with multi-touch gesture support

##### Function Keys

F1 - Display Switching

F2 - Blank or SureView On/Off

F3 - Brightness Down

F4 - Brightness Up

F5 - Audio Mute

F6 - Volume Down

F7 - Volume Up

F8 - Mic Mute

F9 - Blank or Backlit Toggle

F10 - Insert

F11 - Airplane Mode

F12 - Programmable key

Print Screen

Power Button (with LED)

##### Hidden Function Keys

Fn+R - Break

Fn+S - Sys Rq

Fn+C - Scroll Lock

### Technical Specifications

#### SOFTWARE AND SECURITY

##### Software

HP Quick Drop <sup>18</sup>  
HP PC Hardware Diagnostics Windows  
HSA Fusion for Commercial  
HSA Telemetry for Commercial  
Touchpoint Customizer for Commercial  
myHP  
HP Smart Support <sup>19</sup>  
HP Connection Optimizer  
HP Mac Address Manager  
HP Hotkey Support  
HP Support Assistant <sup>20</sup>  
HP Notifications  
HP Power Manager  
HP Privacy Settings  
Buy Microsoft Office (Sold separately)

##### Manageability Features

HP Connect for Microsoft Endpoint Manager<sup>21</sup>  
HP Manageability Integration Kit Gen4 (download) <sup>22</sup>  
HP Driver Packs (download)  
HP Client Catalog (download)  
HP Client Management Script Library (download)  
HP Image Assistant (download)  
HP Patch Assistant (download) <sup>23</sup>

**NOTE:** To enhance brightness, level go to the Intel® Graphics Command Center app, click on System and turn off the Display Power Savings function.

##### Security Management

HP Wolf Security of Business<sup>24</sup> includes:  
HP Sure Click <sup>25</sup>  
HP Sure Sense <sup>26</sup>  
HP Sure Start Gen7<sup>27</sup>  
HP Tamper Lock  
HP Sure Admin<sup>28</sup>  
HP Client Security Manager Gen7 <sup>29</sup>

##### BIOS

HP BIOSphere Gen6 <sup>30</sup>  
HP Secure Erase <sup>31</sup>  
Absolute Persistence Module <sup>32</sup>  
HP DriveLock & Automatic DriveLock  
BIOS Update via Network  
HP Wake on WLAN  
TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)  
HP Fingerprint Sensor <sup>33</sup>

## Technical Specifications

### Security

#### TPM

Model: Nuvoton NPCT760HAAYX

Version: 7.2.3.0

Revision: TPM 2.0

FIPS 140-2 Compliant: Yes

### IPv6 Support

TBC

### FirstNet Certified

No

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

UEFI version: 2.7

Class: 3

18. HP Quick Drop requires Internet access and Windows 10 PC preinstalled with HP QuickDrop app and either an Android device (phone or tablet) running Android 7 or higher with the Android HP QuickDrop app, and /or an iOS device (phone or tablet) running iOS 12 or higher with the iOS HP QuickDrop app.

19. HP Smart Support automatically collects the telemetry necessary upon initial boot of the product to deliver device-level configuration data and health insights and is available preinstalled on select products, thru HP Factory Configuration Services; or it can be downloaded. For more information about how to enable HP Smart Support or for download, please visit <http://www.hp.com/smart-support>.

20. Requires Windows and Internet Access

21. HP Connect for Microsoft Endpoint Manager is available from the Azure Market Place for HP Pro, Elite, Z and Point-of-Sale PCs managed with Microsoft Endpoint Manager. Subscription to Microsoft Endpoint Manager required and sold separately. Network connection required.

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

23. HP Patch Assistant available on select HP PCs with the HP Manageability Kit that are managed through Microsoft System Center Configuration Manager. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

24. HP Wolf Security for Business requires Windows 10 or higher, includes various HP security features and is available on HP Pro, Elite, RPOS and Workstation products. See product details for included security features and OS requirement.

25. HP Sure Click requires Windows 10 Pro or higher or Enterprise. See [https://bit.ly/2PrLT6A\\_SureClick](https://bit.ly/2PrLT6A_SureClick) for complete details.

26. HP Sure Sense is available on select HP PCs with Windows 10 Pro, Windows 10 Enterprise, Windows 11 Pro, or Windows 11 Enterprise OS.

27. HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 and higher

28. HP Sure Admin requires Windows 10 or higher, HP BIOS, HP Manageability Integration Kit from <http://www.hp.com/go/clientmanagement> and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store.

29. HP Client Security Manager Gen7 requires Windows and is available on the select HP Elite and Pro PCs.

30. HP BIOSphere Gen6 features may vary depending on the platform and configuration.

31. 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™.

32. 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/>.



### Technical Specifications

33. HP Fingerprint sensor is an optional feature that must be configured at purchase. <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>

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#### POWER

##### Power Supply

HP Smart 65 W EM External AC power adapter <sup>34</sup>

HP Smart 65 W USB Type-C adapter <sup>34</sup>

HP Smart 45 W External AC power adapter <sup>34</sup>

HP Smart 45 W USB Type-C adapter <sup>34</sup>

##### Battery

HP Long Life 3-cell, 42.75 Wh Polymer <sup>35,36</sup>

HP Long Life 3-cell, 51.3 Wh Polymer <sup>35,36</sup>

Compliant with UL 1642 Standard

##### Power Cord

2-wire plug - 1m

3-wire plug - 1m

##### Battery life

Up to 19 hours and 30 minutes with 51whr battery (HP Long Life 3-Cell, 51 Whr Polymer, UMA graphic, AMD R7, 200 nits display, 8G memory, 256 GB SSD) <sup>37</sup>

Up to 16 hours and 15 minutes with 42whr battery (HP Long Life 3-Cell, 42 Whr Polymer, UMA graphic, AMD R7, 200 nits display, 8G memory, 256 GB SSD) <sup>37</sup>

34. Availability may vary by country.

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

36. Actual battery Watt-hours (Wh) will vary from design capacity. Battery capacity will naturally decrease with shelf life, time, usage, environment, temperature, system configuration, loaded apps, features, power management settings and other factors.

37. Windows 10 MM18 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

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### Technical Specifications

#### WEIGHTS & DIMENSIONS

**Product Weight****42.75Wh**Starting at 3.83 lb <sup>38</sup>Starting at 1.74 kg <sup>38</sup>**51.3 Wh**Starting at 3.96 lb <sup>38</sup>Starting at 1.79 kg <sup>38</sup>**Product Dimensions (W x D x H)**

14.15 x 9.21 x 0.78 in

35.94 x 23.39 x 1.99 cm

38. Weight will vary by configuration.

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#### PORTS/SLOTS

1 SuperSpeed USB Type-C® 10Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)

3 SuperSpeed USB Type-A 5Gbps signaling rate port (USB 3.2 Gen 1)

1 HDMI 2.0b <sup>39</sup>

1 RJ-45

1 Headphone/microphone combo jack

1 AC power

1 Nano SIM slot for WWAN (optional)

39. HDMI cable sold separately.

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### Technical Specifications

#### SERVICE AND SUPPORT

HP Services offers 1-year or 3-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year limited warranty as the platform. 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>40</sup>

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

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### Technical Specifications

#### SYSTEM UNIT

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

|                           |                             |
|---------------------------|-----------------------------|
| Nominal Operating Voltage | 19V                         |
| Average Operating Power   | 7.52W (Idle)                |
| Integrated graphics       | Yes (AMD Radeon™ Graphics)  |
| Discrete Graphics         | N/A                         |
| Max Operating Power       | Discrete < 65W<br>UMA < 45W |

##### Temperature

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

##### Relative Humidity

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

##### Shock

|               |                        |
|---------------|------------------------|
| Operating     | 40 G, 2 ms, half-sine  |
| Non-operating | 200 G, 2 ms, half-sine |

##### Random Vibration

|               |            |
|---------------|------------|
| Operating     | 1.043 grms |
| Non-operating | 3.5 grms   |

##### Altitude (unpressurized)

|               |                                    |
|---------------|------------------------------------|
| Operating     | -50 to 10,000 ft (-15 to 3,048 m)  |
| Non-operating | -50 to 40,000 ft (-15 to 12,192 m) |

##### Planned Industry Standard Certifications

|                                 |                                                     |
|---------------------------------|-----------------------------------------------------|
| Regulatory Model Number         | HSN-Q34C-5                                          |
| UL                              | Yes                                                 |
| CSA                             | Yes                                                 |
| FCC Compliance                  | Yes                                                 |
| ENERGY STAR®                    | Yes <sup>41</sup>                                   |
| EPEAT®                          | EPEAT® 2019 Gold in the United States <sup>42</sup> |
| ICES                            | Yes                                                 |
| Australia /                     | Yes                                                 |
| NZ A-Tick Compliance            | Yes                                                 |
| CCC                             | Yes                                                 |
| Japan VCCI Compliance           | Yes                                                 |
| KC                              | Yes                                                 |
| BSMI                            | Yes                                                 |
| CE Marking Compliance           | Yes                                                 |
| BNCI or BELUS                   | Yes                                                 |
| CIT                             | Yes                                                 |
| EAC                             | Yes                                                 |
| Saudi Arabian Compliance (ICCP) | Yes                                                 |

## Technical Specifications

|                 |     |
|-----------------|-----|
| SABS            | Yes |
| UKRSERTCOMPUTER | Yes |

41. Configurations of the HP ProBook 455 G9 that are ENERGY STAR® certified are identified as HP ProBook 455 G9 ENERGY STAR on HP websites and on <http://www.energystar.gov>.

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

## DISPLAYS

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

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

|                                                                                                                                                 |                                                                 |                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------|
| <b>Panel LCD 15.6 inch FHD<br/>(1920 x 1080) Anti-Glare WLED<br/>UWVA 45percent cg 250nits eDP<br/>1.2 w/o PSR bent Touch on Panel<br/>NWBZ</b> | <b>Outline Dimensions (W x H)</b>                               | 350.960 x 205.740 (max) |
|                                                                                                                                                 | <b>Active Area</b>                                              | 344.160 x 193.590 (typ) |
|                                                                                                                                                 | <b>Weight</b>                                                   | 380 g (max)             |
|                                                                                                                                                 | <b>Diagonal Size</b>                                            | 15.6                    |
|                                                                                                                                                 | <b>Thickness</b>                                                | 3.2 / 5.2 (max)         |
|                                                                                                                                                 | <b>Interface</b>                                                | eDP 1.2                 |
|                                                                                                                                                 | <b>Surface Treatment</b>                                        | Anti-Glare On-cell      |
|                                                                                                                                                 | <b>Touch Enabled</b>                                            | Yes <sup>1</sup>        |
|                                                                                                                                                 | <b>Contrast Ratio</b>                                           | 600:1 (typ)             |
|                                                                                                                                                 | <b>Refresh Rate</b>                                             | 60 Hz                   |
|                                                                                                                                                 | <b>Brightness</b>                                               | 250 Nits <sup>1</sup>   |
|                                                                                                                                                 | <b>Pixel Resolution - Format</b>                                | 1920 x 1080 (FHD)       |
|                                                                                                                                                 | <b>Backlight</b>                                                | WLED                    |
|                                                                                                                                                 | <b>Pixel Resolution</b>                                         | RGB                     |
|                                                                                                                                                 | <b>Color Gamut Coverage</b>                                     | NTSC 45%                |
|                                                                                                                                                 | <b>Color Depth</b>                                              | 6                       |
|                                                                                                                                                 | <b>Viewing Angle</b>                                            | UWVA 85/85/85/85        |
|                                                                                                                                                 | <b>Low Blue Light</b>                                           | No                      |
|                                                                                                                                                 | <b>Power Consumption (W, EBL@<br/>150nits max/ 200nits max)</b> | 2.54 (Max) / 3.12 (Max) |

|                                                                                                                          |                                   |                         |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------|
| <b>15.6 inch FHD (1920 x 1080)<br/>Anti-Glare WLED UWVA sRGB<br/>100percent cg 400nits eDP<br/>1.4+PSR2 bent LP NWBZ</b> | <b>Outline Dimensions (W x H)</b> | 349.460 x 204.790 (max) |
|                                                                                                                          | <b>Active Area</b>                | 344.160 x 193.590 (typ) |
|                                                                                                                          | <b>Weight</b>                     | 325 g (max)             |
|                                                                                                                          | <b>Diagonal Size</b>              | 15.6                    |
|                                                                                                                          | <b>Thickness</b>                  | 2.6 / 4.6 (max)         |
|                                                                                                                          | <b>Interface</b>                  | eDP 1.4                 |
|                                                                                                                          | <b>Surface Treatment</b>          | Anti-Glare              |
|                                                                                                                          | <b>Touch Enabled</b>              | No                      |
|                                                                                                                          | <b>Contrast Ratio</b>             | 1200:1 (typ)            |
|                                                                                                                          | <b>Refresh Rate</b>               | 60 Hz                   |

### Technical Specifications

|                                                             |                         |
|-------------------------------------------------------------|-------------------------|
| <b>Brightness</b>                                           | 400 Nits                |
| <b>Pixel Resolution - Format</b>                            | 1920 x 1080 (FHD)       |
| <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>                                       | No                      |
| <b>Power Consumption (W, EBL@ 150nits max/ 200nits max)</b> | 1.13 (Max) / 1.37 (Max) |

**15.6 inch FHD (1920 x 1080)  
Anti-Glare WLED UWVA  
45percent cg 250nits eDP 1.2  
w/o PSR bent NWBZ**

|                                                             |                                   |
|-------------------------------------------------------------|-----------------------------------|
| <b>Outline Dimensions (W x H)</b>                           | 350.960 x 205.540 (max)           |
| <b>Active Area</b>                                          | 344.160 x 193.590 (typ)           |
| <b>Weight</b>                                               | 370 g (max)                       |
| <b>Diagonal Size</b>                                        | 15.6                              |
| <b>Thickness</b>                                            | 3.0 / 5.0 (max)                   |
| <b>Interface</b>                                            | eDP 1.2                           |
| <b>Surface Treatment</b>                                    | Anti-Glare                        |
| <b>Touch Enabled</b>                                        | No                                |
| <b>Contrast Ratio</b>                                       | 600:1 (typ)                       |
| <b>Refresh Rate</b>                                         | 60 Hz                             |
| <b>Brightness</b>                                           | 250 nits                          |
| <b>Pixel Resolution - Format</b>                            | 1920 x 1080 (FHD)                 |
| <b>Backlight</b>                                            | WLED                              |
| <b>Pixel Resolution</b>                                     | RGB                               |
| <b>Color Gamut Coverage</b>                                 | NTSC 45%                          |
| <b>Color Depth</b>                                          | 6 (Hi FRC w/ condition to enable) |
| <b>Viewing Angle</b>                                        | UWVA 85/85/85/85                  |
| <b>Low Blue Light</b>                                       | No                                |
| <b>Power Consumption (W, EBL@ 150nits max/ 200nits max)</b> | 2.62 (Max) / 3.27 (Max)           |

**15.6-in HD (1366 x 768)  
Anti-Glare WLED SVA 45percent  
cg 250nits eDP 1.2 w/o PSR  
NWBZ bent**

|                                   |                         |
|-----------------------------------|-------------------------|
| <b>Outline Dimensions (W x H)</b> | 350.960 x 205.540 (max) |
| <b>Active Area</b>                | 344.230 x 193.540 (typ) |
| <b>Weight</b>                     | 370 g (max)             |
| <b>Diagonal Size</b>              | 15.6                    |
| <b>Thickness</b>                  | 3.2 / 5.0 (max)         |
| <b>Interface</b>                  | eDP 1.2                 |
| <b>Surface Treatment</b>          | Anti-Glare              |
| <b>Touch Enabled</b>              | No                      |
| <b>Contrast Ratio</b>             | 300:1 (typ)             |
| <b>Refresh Rate</b>               | 60 Hz                   |

## Technical Specifications

|                                                      |                         |
|------------------------------------------------------|-------------------------|
| Brightness                                           | 250 nits                |
| Pixel Resolution - Format                            | 1366 x 768 (HD)         |
| Backlight                                            | WLED                    |
| Pixel Resolution                                     | RGB                     |
| Color Gamut Coverage                                 | NTSC 45%                |
| Color Depth                                          | 6                       |
| Viewing Angle                                        | SVA 45/45/15/35         |
| Low Blue Light                                       | No                      |
| Power Consumption (W, EBL@ 150nits max/ 200nits max) | 2.49 (Max) / 2.78 (Max) |



Technical Specifications

STORAGE AND DRIVES

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

|                                |                          |                                          |
|--------------------------------|--------------------------|------------------------------------------|
| SSD 128GB 2230 PCIe NVMe Value | Form Factor              | M.2 2230                                 |
|                                | Capacity                 | 128GB                                    |
|                                | NAND Type                | TLC                                      |
|                                | Height                   | 0.09 in (2.3 mm)                         |
|                                | Width                    | 0.87 in (22 mm)                          |
|                                | Weight                   | 0.01 lb (5 g)                            |
|                                | Interface                | PCIe NVMe Gen3                           |
|                                | Maximum Sequential Read  | Up to 2100 MB/s                          |
|                                | Maximum Sequential Write | Up to 1200 MB/s                          |
|                                | Logical Blocks           | 250069680                                |
|                                | Operating Temperature    | 32° to 158°F (0° to 70°C) [ambient temp] |
|                                | Features                 | Pyrite; TRIM; L1.2                       |

|                                |                          |                                          |
|--------------------------------|--------------------------|------------------------------------------|
| SSD 256GB 2230 PCIe NVMe Value | Form Factor              | M.2 2230                                 |
|                                | Capacity                 | 256 GB                                   |
|                                | NAND Type                | TLC                                      |
|                                | Height                   | 0.09 in (2.3 mm)                         |
|                                | Width                    | 0.87 in (22 mm)                          |
|                                | Interface                | PCIe NVMe Gen3                           |
|                                | Maximum Sequential Read  | up to 2500 MB/s                          |
|                                | Maximum Sequential Write | up to 1300 MB/s                          |
|                                | Logical Blocks           | 500118192                                |
|                                | Operating Temperature    | 32° to 158°F (0° to 70°C) [ambient temp] |
|                                | Features                 | Pyrite; TRIM; L1.2                       |

|                                |                          |                                          |
|--------------------------------|--------------------------|------------------------------------------|
| SSD 256GB 2280 PCIe NVMe Value | Form Factor              | M.2 2280                                 |
|                                | Capacity                 | 256GB                                    |
|                                | NAND Type                | Value                                    |
|                                | Height                   | 0.09 in (2.3 mm)                         |
|                                | Width                    | 0.87 in (22 mm)                          |
|                                | Interface                | PCIe NVMe Gen3                           |
|                                | Maximum Sequential Read  | Up to 2900 MB/s                          |
|                                | Maximum Sequential Write | Up to 1400 MB/s                          |
|                                | Logical Blocks           | 500118192                                |
|                                | Operating Temperature    | 32° to 158°F (0° to 70°C) [ambient temp] |
|                                | Features                 | ATA Security; TRIM; L1.2                 |

Technical Specifications

|                                                |                          |                                          |
|------------------------------------------------|--------------------------|------------------------------------------|
| SSD 512GB 2280 PCIe NVMe Value                 | Form Factor              | M.2 2280                                 |
|                                                | Capacity                 | 512GB                                    |
|                                                | NAND Type                | Value                                    |
|                                                | Height                   | 0.09 in (2.3 mm)                         |
|                                                | Width                    | 0.87 in (22 mm)                          |
|                                                | Interface                | PCIe NVMe Gen3                           |
|                                                | Maximum Sequential Read  | Up to 3500 MB/s                          |
|                                                | Maximum Sequential Write | up to 3000 MB/s                          |
|                                                | Logical Blocks           | 1000215216                               |
|                                                | Operating Temperature    | 32° to 158°F (0° to 70°C) [ambient temp] |
|                                                | Features                 | TRIM; L1.2                               |
|                                                |                          |                                          |
| SSD 1TB 2280 PCIe-4x4 NVMe<br>Three Layer Cell | Form Factor              | M.2 2280                                 |
|                                                | Capacity                 | 1TB                                      |
|                                                | NAND Type                | 3D TLC                                   |
|                                                | Height                   | 0.09 in (2.3 mm)                         |
|                                                | Width                    | 0.87 in (22 mm)                          |
|                                                | Interface                | PCIe NVMe Gen3                           |
|                                                | Maximum Sequential Read  | Up to 7,100 MB/s                         |
|                                                | Maximum Sequential Write | Up to 5,200 MB/s                         |
|                                                | Logical Blocks           | 2000409264                               |
|                                                | Operating Temperature    | 32° to 158°F (0° to 70°C) [ambient temp] |
|                                                | Features                 | Pyrite 2.0; TRIM; L1.2                   |

### Technical Specifications

#### NETWORKING/COMMUNICATIONS

|                                                                                                                                                                                                        |                                    |                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Qualcomm® Fast Connect</b><br><b>6900 Wi-Fi 6E + BT5.2</b><br><b>Wireless Card (802.11ax</b><br><b>2x2, AMD AIM-T AME,</b><br><b>supporting gigabit file</b><br><b>transfer speeds)<sup>1</sup></b> | <b>Wireless LAN Standards</b>      | IEEE 802.11a<br>IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11n<br>IEEE 802.11ac<br>IEEE 802.11ax<br>IEEE 802.11d<br>IEEE 802.11e<br>IEEE 802.11h<br>IEEE 802.11i<br>IEEE 802.11k<br>IEEE 802.11r<br>IEEE 802.11u<br>IEEE 802.11v<br>IEEE 802.11w                                                                                       |
|                                                                                                                                                                                                        | <b>Interoperability</b>            | Wi-Fi certified                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                        | <b>Frequency Band</b>              | •802.11b/g/n/ax<br>2.402 – 2.482 GHz<br>•802.11a/n/ac/ax<br>5.15 – 5.25 GHz<br>5.25 – 5.35 GHz<br>5.47 – 5.725 GHz<br>5.825 – 5.850 GHz<br>5.925 – 7.125 GHz"                                                                                                                                                                        |
|                                                                                                                                                                                                        | <b>Data Rates</b>                  | • 802.11b: 1, 2, 5.5, 11 Mbps<br>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)<br>• 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)<br>• 802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz) |
|                                                                                                                                                                                                        | <b>Modulation</b>                  | Direct Sequence Spread Spectrum<br>OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 024QAM, 4096QAM                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                        | <b>Security<sup>3</sup></b>        | •AES-CCMP: 128 bit in hardware<br>•802.1x authentication<br>•WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.<br>•WPA2 certification<br>•IEEE 802.11i                                                                                                                                                                            |
|                                                                                                                                                                                                        | <b>Network Architecture Models</b> | Wi-Fi Direct in Win10 for peer-to-peer connection.<br>Infrastructure (Access Point Required)                                                                                                                                                                                                                                         |
|                                                                                                                                                                                                        | <b>Roaming</b>                     | IEEE 802.11 compliant roaming between access points                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                        | <b>Output Power<sup>2</sup></b>    | 2.4GHz (MIMO, typical):<br>• 802.11b: +18dBm<br>• 802.11g: +16.5dBm<br>• 802.11n/ac/ax (HT20/VHT20/HE20): +16dBm                                                                                                                                                                                                                     |

### Technical Specifications

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | <ul style="list-style-type: none"> <li>• 802.11n/ac/ax (HT40/VHT40/HE40): +12.5dBm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                         | 5GHz (MIMO, typical):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                         | <ul style="list-style-type: none"> <li>• 802.11a: +13dBm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                         | <ul style="list-style-type: none"> <li>• 802.11n/ac/ax (HT20/VHT20/HE20): +13.5dBm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                         | <ul style="list-style-type: none"> <li>• 802.11n/ac/ax (HT40/VHT40/HE40): +12.5dBm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                         | <ul style="list-style-type: none"> <li>• 802.11ac/ax (VHT80/HE80): +11.5dBm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                         | <ul style="list-style-type: none"> <li>• 802.11ax HE160: +11.5dBm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                         | 6GHz LPI mode (MIMO, typical):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                         | <ul style="list-style-type: none"> <li>• 802.11a: 0dBm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                         | <ul style="list-style-type: none"> <li>• 802.11ax HE20: +1dBm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                         | <ul style="list-style-type: none"> <li>• 802.11ax HE40: +4dBm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                         | <ul style="list-style-type: none"> <li>• 802.11ax HE80: +7dBm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                         | <ul style="list-style-type: none"> <li>• 802.11ax HE160: +7.5dBm "</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Power Consumption</b>                | <ul style="list-style-type: none"> <li>• Transmit mode: 3.0 W</li> <li>• Receive mode: 2.0 W</li> <li>• Idle mode (WLAN associated): 300mW</li> <li>• Idle mode (WLAN unassociated): 100mW</li> <li>• Modern Connected Standby: 10mW</li> <li>• Radio disabled: 8 mW</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Power Management</b>                 | ACPI and PCI Express compliant power management<br>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: -71dBm 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: -71dBm 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: -71dBm 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, mounted in the display enclosure.<br>Two embedded dual 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>                       | Type 2230: 2.3 x 22.0 x 30.0 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Weight</b>                           | Type 2230: 3g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Operating Voltage</b>                | 3.3 +/- 0.165v                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Temperature</b>                      | <b>Operating</b> -10° to 60° C<br><b>Non-operating</b> -40° to 85° C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

### Technical Specifications

|                     |                      |                             |
|---------------------|----------------------|-----------------------------|
| <b>Humidity</b>     | <b>Operating</b>     | 10% to 60% (non-condensing) |
|                     | <b>Non-operating</b> | 5% to 95% (non-condensing)  |
| <b>Altitude</b>     | <b>Operating</b>     | 0 to 10,000 ft (3,048 m)    |
|                     | <b>Non-operating</b> | 0 to 50,000 ft (15,240 m)   |
| <b>LED Activity</b> | N/A                  |                             |

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

|                                     |                                                                                                                                                          |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Bluetooth Specification</b>      | 4.0/4.1/4.2/5.0/5.1/5.2 Compliant                                                                                                                        |
| <b>Frequency Band</b>               | 2402 to 2480 MHz                                                                                                                                         |
| <b>Number of Available Channels</b> | Legacy: 0~79 (1 MHz/CH)                                                                                                                                  |
|                                     | BLE: 0~39 (2 MHz/CH)                                                                                                                                     |
| <b>Data Rates and Throughput</b>    | Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps                                                                                                     |
|                                     | BLE: 1 Mbps data rate; throughput up to 0.2 Mbps                                                                                                         |
|                                     | Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels                                                                           |
|                                     | Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)                                       |
| <b>Transmit Power</b>               | The Bluetooth component shall operate as a Class 1.5 Bluetooth device with a maximum transmit power of + 14 dBm and 10 dBm for BR and EDR, respectively. |

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>Realtek RTL8852BE<br/>802.11ax 2x2 Wi-Fi +<br/>BT5.3 Wireless Card<br/>(802.11ax 2x2,<br/>supporting gigabit data<br/>rate) <sup>1</sup></b> | <b>Wireless LAN Standards</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 802.11k</li> <li>IEEE 802.11r</li> <li>IEEE 802.11v</li> </ul>                          |
|                                                                                                                                                 | <b>Interoperability</b>            | Wi-Fi certified modules                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                 | <b>Frequency Band</b>              | <ul style="list-style-type: none"> <li>•802.11b/g/n/ax<br/>2.402 – 2.482 GHz</li> <li>•802.11a/n/ac/ax<br/>4.9 – 4.95 GHz (Japan)</li> <li>5.15 – 5.25 GHz</li> <li>5.25 – 5.35 GHz</li> <li>5.47 – 5.725 GHz</li> <li>5.825 – 5.850 GHz</li> </ul>                                                                                                               |
|                                                                                                                                                 | <b>Data Rates</b>                  | <ul style="list-style-type: none"> <li>•802.11b: 1, 2, 5.5, 11 Mbps</li> <li>•802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11n: max 300Mbps</li> <li>•802.11ac: max 866.7Mbps</li> <li>• 802.11ax: max 1201Mbps</li> </ul>                                                                       |
|                                                                                                                                                 | <b>Modulation</b>                  | <ul style="list-style-type: none"> <li>Direct Sequence Spread Spectrum</li> <li>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 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>                     | IEEE 802.11 compliant roaming between access points                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                 | <b>Output Power<sup>2</sup></b>    | <ul style="list-style-type: none"> <li>• 802.11b : +18.5dBm minimum</li> <li>• 802.11g : +17.5dBm minimum</li> <li>• 802.11a : +18.5dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +14.5dBm minimum</li> <li>• 802.11n HT20(5GHz) : +15.5dBm minimum</li> </ul>                                                 |

Technical Specifications

|                                                                               |                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                               | <ul style="list-style-type: none"><li>• 802.11n HT40(5GHz) : +14.5dBm minimum</li><li>• 802.11ac VHT80(5GHz) : +11.5dBm minimum</li><li>• 802.11ax HE40(2.4GHz) : +10dBm minimum</li><li>• 802.11ax HE80(5GHz) : +10dBm minimum</li></ul>                                                                                                                                |
| Power Consumption                                                             | <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>                                                                                           |
| Power Management                                                              | ACPI and PCI Express compliant power management<br>802.11 compliant power saving mode                                                                                                                                                                                                                                                                                    |
| Receiver Sensitivity <sup>4</sup>                                             | 802.11b, 1Mbps: -93.5dBm maximum<br>802.11b, 11Mbps: -84dBm maximum<br>802.11a/g, 6Mbps: -86dBm maximum<br>802.11a/g, 54Mbps: -72dBm maximum<br>802.11n, MCS07: -67dBm maximum<br>802.11n, MCS15: -64dBm maximum<br>802.11ac, MCS0: -84dBm maximum<br>802.11ac, MCS9: -59dBm maximum<br>•802.11ax, MCS11(HE40): -57dBm maximum<br>•802.11ax, MCS11(HE80): -54dBm maximum |
| Antenna type                                                                  | High efficiency antenna with spatial diversity, mounted in the display enclosure.<br>Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications                                                                                                                                                 |
| Form Factor                                                                   | PCI-Express M.2 MiniCard                                                                                                                                                                                                                                                                                                                                                 |
| Dimensions                                                                    | 1. Type 2230: 2.3 x 22.0 x 30.0 mm<br>2. Type 1216: 1.67 x 12.0 x 16.0 mm                                                                                                                                                                                                                                                                                                |
| Weight                                                                        | 1. Type 2230: 2.8g<br>2. Type 126: 1.3g                                                                                                                                                                                                                                                                                                                                  |
| Operating Voltage                                                             | 3.3v +/- 9%                                                                                                                                                                                                                                                                                                                                                              |
| Temperature                                                                   | <b>Operating</b> 14° to 158° F (–10° to 70° C)<br><b>Non-operating</b> –40° to 176° F (–40° to 80° C)                                                                                                                                                                                                                                                                    |
| Humidity                                                                      | <b>Operating</b> 10% to 90% (non-condensing)<br><b>Non-operating</b> 5% to 95% (non-condensing)                                                                                                                                                                                                                                                                          |
| Altitude                                                                      | <b>Operating</b> 0 to 10,000 ft (3,048 m)<br><b>Non-operating</b> 0 to 50,000 ft (15,240 m)                                                                                                                                                                                                                                                                              |
| LED Activity                                                                  | LED Amber – Radio OFF;<br>LED Off – Radio ON                                                                                                                                                                                                                                                                                                                             |
| HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Card |                                                                                                                                                                                                                                                                                                                                                                          |
| Bluetooth Specification                                                       | 4.0/4.1/4.2/5.0/5.1 Compliant/5.2/5.3 Compliant                                                                                                                                                                                                                                                                                                                          |
| Frequency Band                                                                | 2402 to 2480 MHz                                                                                                                                                                                                                                                                                                                                                         |
| Number of Available Channels                                                  | Legacy: 0~79 (1 MHz/CH)<br>BLE: 0~39 (2 MHz/CH)                                                                                                                                                                                                                                                                                                                          |

## Technical Specifications

**Data Rates and Throughput**

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)

**Transmit Power**

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

1. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 (802.11ax) is backwards compatible with prior 802.11 specs. Wi-Fi 6™ 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).

**Intel® XMM™ 7560 R+  
LTE-Advanced Pro<sup>1</sup>****Technology/Operating bands**

FDD LTE:  
 2100 (Band 1), 1900 (Band 2), 1800 (Band 3),  
 1700/2100 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 14 upper), 700 (Band 17 lower), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1900 (Band 25), 850 (Band 26), 700 (Band 28), 700 (Band 29 RX only), 2300 (Band 30), 1700/2100 (Band 66), 600 (band 71).  
 TDD LTE:  
 2100 (Band 34), 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41), 3500 (Band 42), 3700 (Band 43), 3700 (band 48), 5200 (Band 46 RX only) MHz;  
 HSPA+:  
 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz  
**Wireless protocol standards**  
 3GPP Release 12 LTE Specification DL-CAT.16, DL 100MHz BW throughput up to 978Mbps; UL-CAT.13 40MHz throughput up to 150Mbps  
 WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification  
**GPS**  
**GPS bands**  
 Standalone GPS/Beidou/Glonass, A-GPS (MS-A, MS-B)  
 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz  
**Maximum data rates**  
 LTE: 978 Mbps (Download), 150 Mbps (Upload)  
 DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)  
 HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)  
**Maximum output power**  
 LTE: 23 dBm in all band except B41  
 LTE B41 HPUE = 26dBm  
 HSPA+: 23.5 dBm  
**Maximum power consumption**  
 LTE: 1,200 mA (peak); 900 mA (average)  
 HSPA+: 1,100 mA (peak); 800 mA (average)  
**Form Factor**  
 M.2, 3042-S3 Key B  
**Weight**  
 6 g

Technical Specifications

|                                                        |                  |
|--------------------------------------------------------|------------------|
| <b>Dimensions<br/>(Length x Width x<br/>Thickness)</b> | 42 x 30 x 2.3 mm |
| <b>eSIM</b>                                            | 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.

|                                                              |                               |                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Realtek RTL8111HSH<br/>10/100/1000 Integrated<br/>NIC</b> | <b>Ethernet Features</b>      | 10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)<br>100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)<br>1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40)<br>Auto-Negotiation (Automatic Speed Selection)<br>Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s       |
|                                                              | <b>Power Management</b>       | ACPI compliant – multiple power modes<br>Situation-sensitive features reduce power consumption<br>Advanced link down power saving for reducing link down power consumption                                                                                                                                                                                           |
|                                                              | <b>Performance Features</b>   | TCP/IP/UDP Checksum Offload (configurable)<br>Protocol Offload (ARP & NS)<br>Large send offload and Giant send offload<br>Receiving Side Scaling<br>Jumbo Frame 9K                                                                                                                                                                                                   |
|                                                              | <b>Manageability</b>          | Wake-on-LAN from modern standby or sleep state (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only)<br>PXE 2.1 Remote Boot<br>Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))<br>Comprehensive diagnostic and configuration software suite<br>Virtual Cable Doctor for Ethernet cable status |
|                                                              | <b>Interface</b>              | PCIe + SMBus                                                                                                                                                                                                                                                                                                                                                         |
|                                                              | <b>NIC Device Driver Name</b> | Realtek PCIe GBE Ethernet Family Controller                                                                                                                                                                                                                                                                                                                          |

### Technical Specifications

#### POWER

|                                                                          |                                                |                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AC Adapter 45 Watt<br/>nPFC Standard USB<br/>type C Straight 1.8m</b> | <b>Dimensions</b>                              | 94.0 mm x 40.0 mm x 26.5 mm                                                                                                                                                                                                                                                                                                                                                 |
|                                                                          | <b>Weight</b>                                  | 192.5g +/-10%                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Input</b>                                   | 100-240 VAC                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                          | <b>Input Efficiency</b>                        | Average Efficiency of 25%, 50%, 75%, 100% load condition with<br>115Vac/230Vac Spec:<br>5V: 81.5%<br>9V: 86.7%<br>12V: 87.41%<br>15V: 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<br>9V/27W<br>12V/36W<br>15V/45W                                                                                                                                                                                                                                                                                                                                      |
|                                                                          | <b>DC output</b>                               | 5V/9V/12V/15V                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Hold-up time</b>                            | 5ms at 115 Vac input                                                                                                                                                                                                                                                                                                                                                        |
|                                                                          | <b>Output current limit</b>                    | <5.0A                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                          | <b>Connector</b>                               | USB Type-C                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Environmental Design</b>                    |                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Operating temperature</b>                   | 32° to 95° F (0° to 35° C)                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Non-operating (storage)<br/>temperature</b> | -4° to 185° F (-20° to 85° C)                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Altitude</b>                                | 0 to 16,400 ft (0 to 5000m)                                                                                                                                                                                                                                                                                                                                                 |
|                                                                          | <b>Humidity</b>                                | 20% to 95%                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Storage Humidity</b>                        | 10% to 95%                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>EMI and Safety</b>                          | Eg.                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                          | <b>Certifications</b>                          | *CE Mark - full compliance with LVD and EMC directives<br>*Worldwide safety standards - IEC60950-1 and/or IEC62368-1,<br>EN60950-1 and/or EN62368-1, UL60950-1 and/or UL62368-1,<br>Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN,<br>EN55022 Class B, FCC Class B, CISPR32 Class B, CCC, NOM-001 NYCE.<br>*MTBF - over 200,000 hours at 25°C ambient condition. |

|                                                                                         |                              |                                         |
|-----------------------------------------------------------------------------------------|------------------------------|-----------------------------------------|
| <b>AC Adapter 45 Watt<br/>Smart nPFC Standard<br/>Barrel 4.5mm Right<br/>Angle 1.8m</b> | <b>Dimensions</b>            | 95 x 45 x 26.5 mm                       |
|                                                                                         | <b>Weight</b>                | unit: 200g +/- 10g                      |
|                                                                                         | <b>Input</b>                 | 100-240 VAC                             |
|                                                                                         | <b>Input Efficiency</b>      | 87.74 % at 115 Vac and 88.4 % at 230Vac |
|                                                                                         | <b>Input frequency range</b> | 47 ~ 63 Hz                              |
|                                                                                         | <b>Input AC current</b>      | Max. 1.4 A at 90 Vac                    |
|                                                                                         | <b>Output</b>                |                                         |
|                                                                                         | <b>Output power</b>          | 45W                                     |
|                                                                                         | <b>DC output</b>             | 19.5V                                   |

### Technical Specifications

|                                            |                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Hold-up time</b>                        | 5ms at 115 Vac input                                                                                                                                                                                                                                                                                                                                                    |
| <b>Output current limit</b>                | <8.0A                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Connector</b>                           | 4.5mm Barrel Type                                                                                                                                                                                                                                                                                                                                                       |
| <b>Environmental Design</b>                |                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Operating temperature</b>               | 32° to 95° F (0° to 35° C)                                                                                                                                                                                                                                                                                                                                              |
| <b>Non-operating (storage) temperature</b> | -4° to 185° F (-20° to 85° C)                                                                                                                                                                                                                                                                                                                                           |
| <b>Altitude</b>                            | 0 to 16,400 ft (0 to 5000m)                                                                                                                                                                                                                                                                                                                                             |
| <b>Humidity</b>                            | 20% to 95%                                                                                                                                                                                                                                                                                                                                                              |
| <b>Storage Humidity</b>                    | 10% to 95%                                                                                                                                                                                                                                                                                                                                                              |
| <b>EMI and Safety</b>                      | Eg:                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Certifications</b>                      | *CE Mark - full compliance with LVD and EMC directives<br>* Worldwide safety standards - IEC60950-1 and/or IEC62368-1, EN60950-1 and/or EN62368-1, UL60950-1 and/or UL62368-1, Class1, SELV;<br>Agency approvals - C-UL-US, NORDICS, DENAN, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, NOM-001 NYCE.<br>* MTBF - over 200,000 hours at 25°C ambient condition. |

|                                                                          |                                            |                                                                                                                                                 |
|--------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AC Adapter 65 Watt<br/>nPFC Standard USB<br/>type C Straight 1.8m</b> | <b>Dimensions</b>                          | 90.0 x 51 x 28.5mm                                                                                                                              |
|                                                                          | <b>Weight</b>                              | unit: 250g +/- 10g                                                                                                                              |
|                                                                          | <b>Input</b>                               | 100-240 VAC                                                                                                                                     |
|                                                                          | <b>Input Efficiency</b>                    | Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec:<br>5V: 81.5%<br>9V: 86.7%<br>12V: 88%<br>15V: 88%<br>20V: 89% |
|                                                                          | <b>Input frequency range</b>               | 47 ~ 63Hz                                                                                                                                       |
|                                                                          | <b>Input AC current</b>                    | 1.6 A at 90 VAC and maximum load                                                                                                                |
|                                                                          | <b>Output</b>                              |                                                                                                                                                 |
|                                                                          | <b>Output power</b>                        | 5V/15W<br>9V/27W<br>12V/60W<br>15V/60W<br>20V/65W                                                                                               |
|                                                                          | <b>DC output</b>                           | 5V/9V/12V/15V/20V                                                                                                                               |
|                                                                          | <b>Hold-up time</b>                        | 5ms at 115 Vac input                                                                                                                            |
|                                                                          | <b>Output current limit</b>                | <8.0A                                                                                                                                           |
|                                                                          | <b>Connector</b>                           | USB Type-C                                                                                                                                      |
|                                                                          | <b>Environmental Design</b>                |                                                                                                                                                 |
|                                                                          | <b>Operating temperature</b>               | 32° to 95° F (0° to 35° C)                                                                                                                      |
|                                                                          | <b>Non-operating (storage) temperature</b> | -4° to 185° F (-20° to 85° C)                                                                                                                   |
|                                                                          | <b>Altitude</b>                            | 0 to 16,400 ft (0 to 5000m)                                                                                                                     |

### Technical Specifications

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Humidity</b>                      | 20% to 95%                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Storage Humidity</b>              | 10% to 95%                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>EMI and Safety Certifications</b> | <p>Eg:</p> <p>*CE Mark - full compliance with LVD and EMC directives</p> <p>* Worldwide safety standards - IEC60950-1 and/or IEC62368-1, EN60950-1 and/or EN62368-1, UL60950-1 and/or UL62368-1 , Class1, SELV;</p> <p>Agency approvals - C-UL-US, NORDICS, DENAN, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, NOM-001 NYCE.</p> <p>* MTBF - over 200,000 hours at 25°C ambient condition.</p> |

#### AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm New EM

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dimensions</b>                          | 102 x 55 x 30mm                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Weight</b>                              | unit: 250g +/- 10g                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Input</b>                               | 100-240 VAC                                                                                                                                                                                                                                                                                                                                                                                            |
| <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                                                                                                                                                                                                                                                                                                                                                                                                  |
| <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>       | <p>Eg:</p> <p>*CE Mark - full compliance with LVD and EMC directives</p> <p>* Worldwide safety standards - IEC60950-1 and/or IEC62368-1, EN60950-1 and/or EN62368-1, UL60950-1 and/or UL62368-1 , Class1, SELV;</p> <p>Agency approvals - C-UL-US, NORDICS, DENAN, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, NOM-001 NYCE.</p> <p>* MTBF - over 200,000 hours at 25°C ambient condition.</p> |

### Technical Specifications

|                                                                                         |                                            |                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AC Adapter 65 Watt<br/>Smart nPFC Standard<br/>Barrel 4.5mm Right<br/>Angle 1.8m</b> | <b>Dimensions</b>                          | 90 x 51 x 28.5mm                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                         | <b>Weight</b>                              | 230g +/-10%                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                         | <b>Input</b>                               | 100-240 VACvvvvv                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                         | <b>Input Efficiency</b>                    | 88.0 % at 115 Vac and 89.0 % at 230 Vac                                                                                                                                                                                                                                                                                                                                 |
|                                                                                         | <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                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                         | <b>Hold-up time</b>                        | 5 ms 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</b>                      | Eg:                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                         | <b>Certifications</b>                      | *CE Mark - full compliance with LVD and EMC directives<br>* Worldwide safety standards - IEC60950-1 and/or IEC62368-1, EN60950-1 and/or EN62368-1, UL60950-1 and/or UL62368-1, Class1, SELV;<br>Agency approvals - C-UL-US, NORDICS, DENAN, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, NOM-001 NYCE.<br>* MTBF - over 200,000 hours at 25°C ambient condition. |

|                                                                      |                                          |                                                      |
|----------------------------------------------------------------------|------------------------------------------|------------------------------------------------------|
| <b>RH 42Whr Long Life<br/>Polymer Fast Charge 3<br/>cell Battery</b> | <b>Dimensions (H x W x L)</b>            | 6.2 x 76.25 x 249.50 mm (0.244 x 3.002 x 9.823 inch) |
|                                                                      | <b>Weight</b>                            | 0.18 kg (0.397 lb)                                   |
|                                                                      | <b>Cells/Type</b>                        | 3cell Lithium-Ion Polymer cell / 545974              |
|                                                                      | <b>Energy</b>                            |                                                      |
|                                                                      | <b>Voltage</b>                           | 11.4V                                                |
|                                                                      | <b>Amp-hour capacity</b>                 | 3.752Ah                                              |
|                                                                      | <b>Watt-hour capacity</b>                | 42.75Wh                                              |
|                                                                      | <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>                    | NA                                                   |
|                                                                      | <b>Warranty</b>                          |                                                      |
|                                                                      | <b>Optional Travel Battery Available</b> | No                                                   |

### Technical Specifications

|                                                                      |                                          |                                                    |
|----------------------------------------------------------------------|------------------------------------------|----------------------------------------------------|
| <b>RH 51Whr Long Life<br/>Polymer Fast Charge 3<br/>cell Battery</b> | <b>Dimensions (H x W x L)</b>            | 6.50 x 67.80 x 254.00 mm (0.256 x 2.669 x 10 inch) |
|                                                                      | <b>Weight</b>                            | 0.2025 kg (0.446 lb)                               |
|                                                                      | <b>Cells/Type</b>                        | 3cell Lithium-Ion Polymer cell / 566075            |
|                                                                      | <b>Energy</b>                            |                                                    |
|                                                                      | <b>Voltage</b>                           | 11.58V                                             |
|                                                                      | <b>Amp-hour capacity</b>                 | 4.431Ah                                            |
|                                                                      | <b>Watt-hour capacity</b>                | 51.3Wh                                             |
|                                                                      | <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>                    | NA                                                 |
|                                                                      | <b>Warranty</b>                          |                                                    |
|                                                                      | <b>Optional Travel Battery Available</b> | No                                                 |

## Technical Specifications

## AUDIO

|                                   |                                                                                                                           |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>HD Stereo Codec</b>            | ALC3247-CG                                                                                                                |
| <b>Audio I/O Ports</b>            | Headset: CTIA only and Headphone-out                                                                                      |
| <b>Internal Speaker Amplifier</b> | ALC 3247 has Embedded Class-D 2W Stereo Amplifier                                                                         |
| <b>Multi-streaming Capable</b>    | Playback multi-streaming can be enabled in the audio control panel to allow independent audio.<br>Following MSFT Behavior |
| <b>Sampling</b>                   | DAC: 48kHz<br>ADC: 44.1k/48kHz                                                                                            |
| <b>Wavetable Syntheses</b>        | N/A                                                                                                                       |
| <b>Analog Audio</b>               | Support 3.5mm Headset: CTIA only and Headphone-out                                                                        |
| <b># of Channels on Line-Out</b>  | N/A                                                                                                                       |
| <b>Internal Speaker</b>           | Yes                                                                                                                       |

## FINGERPRINT READER

|                                    |                                           |
|------------------------------------|-------------------------------------------|
| <b>Sensor vendor</b>               | Model: Elan efsa80ST (module P1515E)      |
| <b>Sensor type</b>                 | Capacitive                                |
| <b>DPI resolution</b>              | 508 dpi                                   |
| <b>Scan area</b>                   | 80*80 pixels                              |
| <b>False Rejection Rate</b>        | FRR: $\leq 3\%$                           |
| <b>False Acceptance Rate</b>       | FAR: 1:100K                               |
| <b>Mobile Voltage Operation</b>    | Mobile Voltage Operation: 2.7V to 3.6V    |
| <b>Operating Temperature</b>       | -4°F – 175°F (-20° ~ +80°C)               |
| <b>Current Consumption</b>         | 50mA peak                                 |
| <b>Image</b>                       |                                           |
| <b>Low Latency Wait For Finger</b> | 900uA                                     |
| <b>Capture Rate</b>                | 30 frame/sec                              |
| <b>ESD Resistance</b>              | +15KV                                     |
| <b>Detection Matrix</b>            | 80*80 pixels/ 508 dpi / 4*4mm sensor area |

## Technical Specifications

## ENVIRONMENTAL DATA

|                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                            |                     |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>Eco-Label Certifications &amp; declarations</b>                         | 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: <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 Specifications</b>                                          | <b>Impact</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>• Ocean-bound plastic in Speaker</li><li>• 15% post-consumer recycled plastic</li><li>• Low halogen</li><li>• Outside Box and corrugated cushions are 100% sustainably sourced and recyclable</li><li>• Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable</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)                                               | 4.04 W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4.34 W                                                                                                                                                                                                                                                                                                                                                                     | 4.37 W              |
| Normal Operation (Long idle)                                               | 0.86 W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.02 W                                                                                                                                                                                                                                                                                                                                                                     | 0.70 W              |
| Sleep                                                                      | 0.86 W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.02 W                                                                                                                                                                                                                                                                                                                                                                     | 0.70 W              |
| Off                                                                        | 0.30 W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.32 W                                                                                                                                                                                                                                                                                                                                                                     | 0.30 W              |
|                                                                            | <b>NOTE:</b><br>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.                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                            |                     |
| <b>Heat Dissipation*</b>                                                   | <b>115VAC, 60Hz</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>230VAC, 50Hz</b>                                                                                                                                                                                                                                                                                                                                                        | <b>100VAC, 50Hz</b> |
| Normal Operation (Short idle)                                              | 13.8 BTU/hr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 14.8 BTU/hr                                                                                                                                                                                                                                                                                                                                                                | 14.9 BTU/hr         |
| Normal Operation (Long idle)                                               | 2.9 BTU/hr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3.5 BTU/hr                                                                                                                                                                                                                                                                                                                                                                 | 2.4 BTU/hr          |
| Sleep                                                                      | 2.9 BTU/hr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3.5 BTU/hr                                                                                                                                                                                                                                                                                                                                                                 | 2.4 BTU/hr          |
| Off                                                                        | 1 BTU/hr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.1 BTU/hr                                                                                                                                                                                                                                                                                                                                                                 | 1 BTU/hr            |

### Technical Specifications

|                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                                                       |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------|
|                                                                               | <p><b>*NOTE:</b> Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                         |                                                       |
| <b>Declared Noise Emissions</b><br>(in accordance with ISO 7779 and ISO 9296) | <p>Sound Power<br/>(L<sub>WAd</sub>, bels)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         | <p>Sound Pressure<br/>(L<sub>pAm</sub>, decibels)</p> |
| Typically Configured – Idle                                                   | 2.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         | 13.3                                                  |
| Fixed Disk – Random writes                                                    | 3.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         | 27                                                    |
| Optical Drive – Sequential reads                                              | 2.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         | 20                                                    |
| <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 spare parts are available throughout the warranty period and or for up to “5” years after the end of production.</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 is 93.4% recycle-able when properly disposed of at end of life.</li> </ul>                                                                                                                                                                                                                                                                                                                                                         |                                         |                                                       |
| <b>Packaging Materials</b>                                                    | <b>External:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PAPER/Corrugated                        | 245 g                                                 |
|                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | PAPER/Paperboard                        | 50 g                                                  |
|                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | PAPER/Molded Pulp                       | 192 g                                                 |
|                                                                               | <b>Internal:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PLASTIC/Polyethylene low density - LDPE | 10 g                                                  |
|                                                                               | The plastic packaging material contains at least 0.0% recycled content.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                         |                                                       |
|                                                                               | The corrugated paper packaging materials contains at least 61% recycled content.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                         |                                                       |
| <b>RoHS Compliance</b>                                                        | <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="#">Error! Hyperlink reference not valid. HP RoHS position statement.</a></p> |                                         |                                                       |

### Technical Specifications

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|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

### Technical Specifications

|                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 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<br/> <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<br/> <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:<br/> <a href="http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842">http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842</a><br/> and<br/> <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>                                    | <ul style="list-style-type: none"> <li>• Percentage of ocean-bound plastic contained in each component varies by product</li> <li>• Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.</li> <li>• External power supplies, WWAN modules, power cords, cables and peripherals excluded.</li> <li>• 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.</li> <li>• Fiber cushions made from 100% recycled wood fiber and organic materials.</li> </ul>                                                                                                                                                                                                                                                                                            |

### COUNTRY OF ORIGIN

China

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

#### DOCKING (Sold Separately)

|                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Docking station model #1</b>                                        | HP Thunderbolt Dock G2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Total number of supported displays (incl. the notebook display)</b> | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Max. resolutions supported</b>                                      | Dual 4K @30Hz or dual 4K UHD @ 60Hz is supported <sup>9</sup><br>Single 8K@ 60Hz for Thunderbolt hosts or USB-C hosts DP 1.4 with DSC in high-res mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Dock Connectors</b>                                                 | 2xDP, 1xVGA, 1xTB, 1xUSB-C alt-mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Technical limitations</b>                                           | Thunderbolt Hosts:<br>Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host.<br>Maximum resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in high resolution mode @30Hz<br>Non-Thunderbolt hosts:<br>The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is<br>(1) 5K dual cable (using both DP ports) +(1) 4K on USB-C DP port<br>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. |
| <b>Docking station model #2</b>                                        | HP USB-C Dock G5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Total number of supported displays (incl. the notebook display)</b> | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Max. resolutions supported</b>                                      | Dual 5K@ 30Hz + 1 4K UHD (multi-function mode) 5120 x 2880 <sup>9</sup><br>Highest resolution with dual displays is two 8K@ 60Hz host in High Resolution mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Dock Connectors</b>                                                 | 1xHDMI, 2xDP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Technical limitations</b>                                           | The highest resolution for running a non-Thunderbolt host in Multi-function mode is a single 5K dual cable (using both DP ports) + one 4K on HDMI port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Docking station model #3</b>                                        | HP USB-C/A Universal Dock G2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Total number of supported displays (incl. the notebook display)</b> | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Max. resolutions supported</b>                                      | Triple 4K UHD@ 60Hz 3840 x 2160 <sup>9</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Dock Connectors</b>                                                 | 1xHDMI, 2xDP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Technical limitations</b>                                           | The best resolution for dual or triple displays is 4K UHD@ 60Hz.<br>For use with the USB-A adapter that comes in the box the maximum number of displays supported is (2) 4k x 60 Hz on the Type-A Gen 1 connection from the host                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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

| Category              | Description                               | Part Number |
|-----------------------|-------------------------------------------|-------------|
| <b>Audio/Video</b>    | HP Wired USB-A Stereo Headset             | 428K6AA     |
|                       | HP Wired 3.5mm Stereo Headset             | 428K7AA     |
| <b>Cases</b>          | HP Business Slim 17.3 Top Load            | 2UW02AA     |
|                       | HP Executive 15.6 Backpack                | 6KD07AA     |
|                       | HP Executive 15.6 Top Load                | 6KD06AA     |
|                       | HP Executive 17.3 Backpack                | 6KD05AA     |
|                       | HP Executive 17.3 Top Load                | 6KD08AA     |
|                       | HP Executive Leather 15.6 Top Load        | 6KD09AA     |
|                       | HP Prelude G2 15.6 Backpack               | 1E7D6AA     |
|                       | HP Prelude G2 15.6 Top Load               | 1E7D7AA     |
|                       | HP Prelude Pro Recycled 15.6 Backpack     | 1X644AA     |
|                       | HP Prelude Pro Recycled 15.6 Top Load     | 1X645AA     |
|                       | HP Renew Business 17.3 Laptop Backpack    | 3E2U5AA     |
|                       | HP Renew Business 17.3 Laptop Bag         | 3E2U6AA     |
|                       | HP Renew Business 15.6 Laptop Bag         | 3E5F8AA     |
| <b>Docking</b>        | HP Thunderbolt 120W G2 Dock               | 2UK37AA     |
|                       | HP Thunderbolt 120W G2 Dock w/Audio       | 3YE87AA     |
|                       | HP Thunderbolt 120W G4 Dock               | 4J0A2AA     |
|                       | HP Thunderbolt 230W G2 Dock w/Combo Cable | 3TR87AA     |
|                       | HP Thunderbolt 280W G4 Dock w/Combo Cable | 4J0G4AA     |
|                       | HP USB-C/A 120W G2 Universal Dock         | 5TW13AA     |
|                       | HP USB-C Dock G5                          | 5TW10AA     |
| <b>Hub</b>            | HP USB-C Mini Dock                        | 1PM64AA     |
|                       | HP Universal USB-C Multiport Hub          | 50H55AA     |
|                       | HP USB-C Travel Dock G2                   | 7PJ38AA     |
|                       | HP USB-C to USB-A Hub                     | Z6A00AA     |
| <b>Adapter</b>        | HP HDMI to DVI Adapter                    | F5A28AA     |
|                       | HP HDMI to VGA Adapter                    | H4F02AA     |
|                       | HP USB-C to DisplayPort Adapter           | N9K78AA     |
|                       | HP USB-C to HDMI 2.0 Adapter              | 1WC36AA     |
|                       | HP USB-C to USB 3.0 Adapter               | N2Z63AA     |
|                       | HP USB-C to VGA Adapter                   | N9K76AA     |
| <b>Keyboard/Combo</b> | HP 975 USB+BT Dual-Mode Wireless Keyboard | 3Z726AA     |
|                       | HP 455 Programmable Wireless Keyboard     | 4R177AA     |
|                       | HP 125 WD USB Keyboard                    | 266C9AA     |
|                       | HP 320K WD USB Keyboard                   | 9SR37AA     |
|                       | HP 655 Wireless Keyboard and Mouse Combo  | 4R009AA     |
|                       | HP 225 Wired Mouse and Keyboard Combo     | 286J4AA     |

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

|                  |                                                           |             |
|------------------|-----------------------------------------------------------|-------------|
|                  | HP 235 Wireless Mouse and Keyboard Combo                  | 1Y4D0AA     |
|                  | HP Slim Wireless Keyboard and Mouse                       | T6L04AA     |
|                  | HP Wired Desktop 320MK Mouse and Keyboard                 | 9SR36AA     |
|                  | HP Wireless Rechargeable 950MK Mouse and Keyboard         | 3M165AA     |
| <b>Mouse</b>     | HP USB Premium Wireless Mouse                             | 1JR31AA     |
|                  | HP 435 Multi-Device Wireless Mouse                        | 3B4Q5AA     |
|                  | HP 125 USB-A Wired Mouse                                  | 265A9AA     |
|                  | HP 128 USB Laser Wired Mouse                              | 265D9AA     |
|                  | HP 320M USB-A Wired Mouse                                 | 9VA80AA     |
|                  | HP Creator USB-A+Bluetooth 935 Wireless Mouse Black       | 1D0K8AA     |
|                  | HP USB-A+Bluetooth Multi-Device 635 Wireless Mouse Black  | 1D0K2AA     |
|                  | HP USB-A+Bluetooth Travel Bluetooth Mouse                 | 6SP30AA     |
| <b>Power</b>     | HP 65W USB-C Auto Chevy AC Power Adapter                  | 5TQ76AA     |
|                  | HP 45W 4.5 mm Smart AC Power Adapter                      | H6Y88AA     |
|                  | HP 45W USB-C G2 Zeus AC Power Adapter                     | 1HE07AA     |
|                  | HP 45W USB-C LC Dali AC Power Adapter                     | 1MZ01AA     |
|                  | HP 65W 4.5 mm LC Smart non-EM India Only AC Power Adapter | 3FF84AA#ACJ |
|                  | HP 65W 4.5 mm Smart AC Power Adapter                      | H6Y89AA     |
|                  | HP 65W 4.5 mm wDongle 7.4 mm Slim AC Power Adapter        | H6Y82AA     |
|                  | HP 65W USB-C Hades AC Power Adapter                       | 1HE08AA     |
|                  | HP 65W USB-C LC AC Power Adapter                          | 1P3K6AA     |
| <b>Commodity</b> | HP USB DVD-Writer EXT ODD                                 | F2B56AA     |
|                  | HP Nano Keyed Cable Lock                                  | 1AJ39AA     |
|                  | HP Nano Master Keyed Cable Lock                           | 1AJ40AA     |
|                  | HP SureKey Standard/Nano/Wedge Cable Lock                 | 6UW42AA     |

### Summary of Changes

| Date of change:   | Version History: | Updated | Description of change:                                       |
|-------------------|------------------|---------|--------------------------------------------------------------|
| January 25, 2022  | V1 to V2         | Added   | TPM and IPv6 Compliance in Security section and Battery Life |
| February 11, 2022 | V2 to V3         | Removed | Tile App from Software and Security section                  |
| February 15, 2022 | V3 to V4         | Updated | Display Port in Ports and Slots section                      |
| February 22, 2022 | V4 to V5         | Updated | WWAN Module and Battery Life section                         |
| February 28, 2022 | V5 to V6         | Removed | HP 955 4K Webcam from Accessories; add Wake on WLAN          |
| March 14, 2022    | V6 to V7         | Added   | Battery Compliance in Power section                          |
| April 11, 2022    | V7 to V8         | Added   | Reference for USB ports                                      |
| June 15, 2022     | V8 to V9         | Added   | Added note in Manageability Feature                          |
| July 19, 2022     | V9 to V10        | Added   | Input value in Power section                                 |
| October 20, 2022  | V10 to V11       | Updated | Bluetooth version                                            |
| December 8, 2022  | V11 to V12       | Updated | Windows OS                                                   |
| January 12, 2023  | V12 to V13       | Added   | HP Client Security Manager in Software and Security section  |
| January 20, 2023  | V13 to V14       | Updated | Operating System                                             |
| March 2, 2023     | V14 to V15       | Updated | Networking and communications section                        |
|                   | V15 to V16       |         |                                                              |
|                   |                  |         |                                                              |
|                   |                  |         |                                                              |

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