## Overview

### HP EliteBook x360 1030 G3

1. IR Camera LEDs
2. Internal microphones
3. IR camera
4. FHD Camera
5. Webcam LED
6. HDMI port (Cable not included.)

**Left**

7. Nano Security lock slot (Lock sold separately.)
8. USB Type-C™ with Thunderbolt™
9. USB Type-C™ with Thunderbolt™
10. Volume up/down
11. Touch fingerprint sensor
12. Glass clickpad

## Overview

**Right**

1. WWAN SIM (Nano)
2. Power button
3. Audio combo jack
4. USB 3.1 Gen 1 charging port

## Overview

### AT A GLANCE

- All metal CNC Aluminum chassis that is .62 inches (1.58 cm) thin and with a starting weight of 2.76 lbs. (1.25 Kg)
- A 360° convertible notebook with 4 usage modes
- Choice of 8th Generation Intel® Core™ i5, i7 Processors with integrated Intel® HD 620 Graphics
- Display choices include 33.78 cm (13.3") diagonal IPS FHD touch screen or UHD touch screen. Brightness choices up to 700 Nits. Optional Anti-glare screen available. Get added protection in open or public places with the optional HP Sure View integrated privacy screen.
- Ultimate connectivity with 4G/LTE WWAN, WLAN, USB Type-C™, USB Type-A, HDMI and Thunderbolt™ Docking
- Innovative world-facing third mic improves inbound ambient noise cancellation
- Engage teams, clients, and vendors with the crystal-clear audio by Bang & Olufsen and the high-performance HP Premium Collaboration Keyboard
- The new optional HP Rechargeable Active Pen
- Never forget your password with your choice of simple authentication methods, including the IR camera for face recognition and Touch Fingerprint Sensor for Windows Hello
- Choice of solid state drives up to 2 TB
- DDR3 small m Memory up to 16 GB
- Up to 18 hours of battery life[1]
- Preinstalled with Windows 10 versions
- Pending MIL-STD 810g testing[2]

1. Windows 10 MM14 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See www.bapco.com for additional details.
2. MIL-STD-810G testing is pending and is conducted on select HP products. Testing is not intended to demonstrate fitness of U.S. Department of Defense (DoD) contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Accidental damage requires an optional HP Accidental Damage Protection Care Pack.

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

## PRODUCT NAME

HP EliteBook x360 1030 G3

## OPERATING SYSTEM

| | |
|---|---|
| **Preinstalled** | Windows 10 Pro 64[1]<br>Windows 10 Home 64[1] |

1. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com/.

## PROCESSORS

Intel® Core™ i5-8250U with Intel® UHD Graphics 620 (1.6 GHz base frequency, up to 3.4 GHz with Intel® Turbo Boost Technology, 6 MB cache, 4 cores)[2,3,4]
Intel® Core™ i5-8350U vPro™ processor with Intel® UHD Graphics 620 (1.7 GHz base frequency, up to 3.6 GHz with Intel® Turbo Boost Technology, 6 MB cache, 4 cores)[2,3,4]
Intel® Core™ i7-8550U with Intel® UHD graphics 620 (1.8 GHz base frequency, up to 4 GHz with Intel® Turbo Boost Technology, 8 MB cache, 4 cores)[2,3,4]
Intel® Core™ i7-8650U vPro™ processor with Intel® UHD graphics 620 (1.9 GHz base frequency, up to 3.9 GHz with Intel® Turbo Boost Technology, 8 MB cache, 4 cores)[2,3,4]

**Processor Family**
8th Generation Intel® Core™ i5 processor (i5-8350U, i5-8250U models)
8th Generation Intel® Core™ i7 processor (i7-8650U, i7-8550U models)

2. Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.
3. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
4. 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.

## CHIPSET

Chipset is integrated with processor.

## Features

### GRAPHICS

**Integrated**
Intel® UHD Graphics 620 [5]

[5] HD content required to view HD images.

### DISPLAY

**Touch**
33.8 cm (13.3") diagonal 4K IPS eDP + PSR BrightView LED-backlit touch screen, direct bonded with Corning® Gorilla® Glass 4, 500 cd/m², 100% sRGB (3840 x 2160)[6,7,8]

HP Sure View Integrated Privacy Screen 13.3" (13.3) diagonal FHD IPS eDP + PSR anti-glare LED-backlit touch screen, direct bonded with Corning® Gorilla® Glass 4, 700 cd/m², 100% sRGB (1920 x 1080)[6,7,8,9]

HP Sure View Integrated Privacy Screen 33.8 cm (13.3") diagonal FHD IPS eDP + PSR BrightView LED-backlit touch screen, direct bonded with Corning® Gorilla® Glass 4, 700 cd/m², 100% sRGB (1920 x 1080)[6,7,8,9]

33.8 cm (13.3") diagonal FHD IPS eDP + PSR anti-glare LED-backlit touch screen, direct bonded with Corning® Gorilla® Glass 4, 400 cd/m², 100% sRGB (1920 x 1080)[6,7,8]

33.8 cm (13.3") diagonal FHD IPS eDP + PSR BrightView LED-backlit touch screen, direct bonded with Corning® Gorilla® Glass 4, 400 cd/m², 100% sRGB (1920 x 1080)[6,7,8]

**Displays support**
Supports privacy filter
Supports narrow bezel
Direct Bonding 100% Attach

[6] HD content required to view HD images.
[7] Sold separately or as an optional feature.
[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.

## STORAGE AND DRIVES

**Primary M.2 Storage**
**M.2 (2280) Solid State Drive**
118 GB PCIe® Gen3x2 NVMe™ M.2 SS (Intel® Optane™)[10]
128 GB SATA-3 SS TLC[10]
256 GB PCIe® NVMe™ SS Value[10]
256 GB PCIe® Gen3x4 NVMe™ SS TLC[10]
256 GB SATA TLC SED OPAL 2[10]
360 GB PCIe® Gen3x4 NVMe™ SS TLC (Intel®)[10]
512 GB PCIe® Gen3x4 NVMe™ SS TLC[10]
512 GB PCIe® Gen3x4 NVMe™ SS TLC Opal 2[10]
1 TB PCIe® Gen3x4 NVMe™ SS TLC[10]
2 TB PCIe® Gen3x4 NVMe™ SS TLC[10]

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

## MEMORY

**Maximum Memory**
16 GB LPDDR3-2133 SDRAM[11]

**Memory**
8 GB LPDDR3-2133 SDRAM[11]
16 GB LPDDR3-2133 SDRAM[11]

**Memory Slots**
System runs at 2133
Memory soldered down (customer non-accessible)
Supports Dual Channel Memory

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

## NETWORKING/COMMUNICATIONS

**WLAN**
Intel® Dual Band Wireless-AC 8265 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo, vPro™[12]
Intel® Dual Band Wireless-AC 8265 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo, non-vPro™[12]

**WWAN**
HP lt4132 LTE/HSPA+ 4G Mobile Broadband Module[13]
Intel XMM 7360 LTE-Advanced (CAT9)[13]
Qualcomm Snapdragon X12 LTE-Advanced (CAT9)[13]

**NFC**
NXP NPC300 Near Field Communication Module

**Miracast**
Support for Miracast[14]

12. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.
13. WWAN is an optional feature and requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.
14. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.

## AUDIO/MULTIMEDIA

### Audio
Audio by Bang & Olufsen
Integrated 3 Multi Array Microphone
4 Premium Speakers with discrete amps (79Db)

### Camera
FHD Camera[6]
IR Camera[6]

[6] HD content required to view HD images.

## Features

## KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

**Keyboard**
Full size
HP Premium Colaboration Keyboard
Backlit
DuraKeys
Spill-resistant

**Pointing Device**
Clickpad (glass cover) with multi-touch gestures enabled, taps enabled as default
Microsoft Precision Touchpad Default Gestures Support

**Function Keys**
F1 - F1 - Display Switching
F2 - Sure View (blank if not supported)
F3 - Brightness Down
F4 - Brightness up
F5 - Audio Mute
F6 - Volume Down
F7 - Volume Up
F8 - Mic Mute
F9 - Kybd Backlight
F10 - NumLock
F11 - Wireless
F12 - Calendar
Share/Present
Pick Up/Accept/ Answer/Hold
Hang Up/Decline/ Reject
Delete

**Hidden Function Keys**
Fn+E - Insert
Fn+W - Pause

**Sensors**
Accelerometer
Magnetometer
Gyro
ALS (ambient light sensor)*
Hall Sensor

*ALS is disabled when Privacy Mode is turned on

## SOFTWARE AND SECURITY

### Preinstalled Software

**BIOS**

HP BIOSphere Gen4 [15]

HP Drive Lock & Automatic Drive Lock

BIOS Update via Network

Master Boot Record Security

Power On Authentication

Secure Erase [16]

Absolute Persistence Module [17]

Pre-boot Authentication

HP Wireless Wakeup

**Software**

HP Native Miracast Support [14]

HP LAN-Wireless Protection

HP ePrint Driver + JetAdvantage [18]

HP Hotkey Support - CMIT

HP Recovery Manager

HP Jumpstart

HP Support Assistant [19]

HP Noise Cancellation Software

HP PhoneWise [26]

Buy Office (Sold separately)

**Manageability Features**

HP Driver Packs [20]

HP System Software Manager (SSM)

HP BIOS Config Utility (BCU)

HP Client Catalog

HP Manageability Integration Kit Gen2 [21]

Ivanti Management Suite [22]

**Client Security Software**

HP Client Security Suite Gen4 [23] including:

HP Security Manager [24] (Including Credential Manager, HP Password Manager, HP Spare Key)

HP Fingerprint Sensor

HP Device Access Manager

HP Power On Authentication

Microsoft Defender [25]

# Features

**Security Management**

Secure Erase [16]

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

SATA 0,1 port disablement (viaBIOS)

RAID configurations [28]

Serial, USB enable/disable (viaBIOS)

Power-on password (viaBIOS)

Setup password (viaBIOS)

Support for chassis padlocks and cable lock devices

Integrated hood sensor

HP Sure Click [29]

HP Sure Start Gen4 [27]

HP Sure Run [30]

HP Sure Recover [31]

**Security**

**MD5 Hash:** Please follow the instructions below to access MD5 Hash.

WWAN: TBD

WLAN: TBD

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

Yes / No

UEFI version:

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

15. HP BIOSphere Gen4 requires Intel® or AMD® 8th Gen processors. Features may vary depending on the platform and configurations.

16. Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method.

17. Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: http://www.absolute.com/company/legal/agreements/ computrace-agreement. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.

18. HP ePrint Driver requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see www.hp.com/go/eprintcenter). Print times and connection speeds may vary.

19. HP Support Assistant requires Windows and Internet access.

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

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

22. Ivanti Management Suite subscription required.

23. HP Client Security Suite Gen 4 requires Windows and Intel® or AMD® 8th generation processors.

## Features

24. HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. User may need to enable or allow the add-on / extension in the internet browser.

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

26. HP PhoneWise Client may not be available with HP Workwise. For supported platforms and HP PhoneWise system requirements see www.hp.com/go/HPPhoneWise.

27. HP Sure Start Gen4 is available on HP EliteBook products equipped with Intel® 8th generation processors.

28. RAID configuration is optional and does require a second hard drive.

29. HP Sure Click is available on select HP platforms and supports Microsoft® Internet Explorer, Google Chrome, and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode. Check http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA7-0922ENW for all compatible platforms as they become available.

30. HP Sure Run is available on HP Elite products equipped with 8th generation Intel® or AMD® processors.

31. HP Sure Recover is available on HP Elite PCs with 8th generation Intel® or AMD processors and requires an open, wired network connection. Not available on platforms with multiple internal storage drives, Intel® Optane™. You must back up important files, data, photos, videos, etc. before use to avoid loss of data.

## Features

## POWER

**Power Supply**

65 W USB Type-C™ AC adapter

**Primary Battery**
HP Long Life 4-cell, 56.2 Wh Li-ion[33]
Supports battery fast charge

**Power Cord**
Power cord included is 1.0 m (+/- 0.1 m)

**Battery Life**
Up to 18 hours (With FHD panel)[34]
Up to 11 hours (With 4K panel)[34]

33. Battery is internal and not replaceable by customer. Serviceable by warranty.
34. Windows 10 MM14 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See www.bapco.com for additional details.

## WEIGHTS & DIMENSIONS

**Weight**
Starting at 2.76 lb[35]
Starting at 1.25 kg[35]

**Dimensions (w x d x h)**
12.04 x 8.07 x 0.62 in
30.58 x 20.5 x 1.58 cm

35. Weight will vary by configuration.

## PORTS/SLOTS

### Ports

2 Thunderbolt™ (USB Type-C™ connector)
1 USB 3.1 Gen 1 (Charging)
1 HDMI 1.4[36]
1 External Nano SIM slot for WWAN
1 Headphone/microphone combo

[36] HDMI cable sold separately.

## SERVICE AND SUPPORT

HP Services offers a 1-year limited warranty and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty. Long Life batteries will have same 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.[28]

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

# Technical Specifications

## ENVIRONMENTAL & INDUSTRY

**HP EliteBook x360 1030 G3 Notebook PC**

| | | | |
|---|---|---|---|
| **Eco-Label Certifications & declarations** | 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:<br>• IT ECO declaration<br>•US ENERGY STAR®<br>• EPEAT® Gold registered in the United States. See http://www.epeat.net for registration status in your country. Search keyword generator on HP's 3rd party option store for solar generator accessories at http://www.hp.com/go/options. | | |
| **System Configuration** | The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a Typically Configured Notebook. | | |
| **Energy Consumption (in accordance with US ENERGY STAR® test method)** | **115VAC, 60Hz** | **230VAC, 50Hz** | **100VAC, 60Hz** |
| Normal Operation (Short idle) | 6.09 W | 6.27 W | 6.12 W |
| Normal Operation (Long idle) | 3.16 W | 3.24 W | 3.13 W |
| Sleep | 0.82 W | 0.84W | 0.80 W |
| Off | 0.30 W | 0.34 W | 0.29 W |
| | **NOTE:** Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system. | | |
| **Heat Dissipation*** | **115VAC, 60Hz** | **230VAC, 50Hz** | **100VAC, 60Hz** |
| Normal Operation (Short idle) | 21 BTU/hr | 21 BTU/hr | 21 BTU/hr |
| Normal Operation (Long idle) | 11 BTU/hr | 11 BTU/hr | 11 BTU/hr |
| Sleep | 3 BTU/hr | 3 BTU/hr | 3 BTU/hr |
| Off | 1 BTU/hr | 1 BTU/hr | 1 BTU/hr |
| | **NOTE:** Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour. | | |

| **Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)** | Sound Power<br>($L_{WAd}$, bels) | Sound Pressure<br>($L_{pAm}$, decibels) |
|---|---|---|
| Typically Configured – Idle | 2.6 | 15 |
| Fixed Disk – Random writes | 3.7 | 29 |

| | |
|---|---|
| Longevity and Upgrading | This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:<br><br>Spare parts are available throughout the warranty period and or for up to 5 years after the end of production. |
| Batteries | This battery(s) in this product comply with EU Directive 2006/66/EC<br><br>Batteries used in the product do not contain:<br>Mercury greater the1ppm by weight<br>Cadmium greater than 20ppm by weight<br><br>Battery size: CR2032 (coin cell)<br>Battery type: Lithium |
| **Additional Information** | • This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.<br>• This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.<br>• This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).<br>• This product is in compliance with the IEEE 1680 (EPEAT) standard at the <gold> level in the U.S. See http://www.epeat.net for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at http://www.hp.com/go/options<br>• Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.<br>• This product contains 0% post-consumer recycled plastic (by wt.)<br>• This product is 95.1% recycle-able when properly disposed of at end of life. |

| | | | |
|---|---|---|---|
| **Packaging Materials** | **External:** | PAPER/Corrugated | 341 g |
| | **Internal:** | PLASTIC/Polyethylene Expanded - EPE | 44 g |
| | | PLASTIC/Polyethylene low density – LDPE | 9 g |

| | |
|---|---|
| **Material Usage** | 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 http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf):<br>• Asbestos<br>• Certain Azo Colorants<br>• Certain Brominated Flame Retardants – may not be used as flame retardants in plastics<br>• Cadmium<br>• Chlorinated Hydrocarbons<br>• Chlorinated Paraffins<br>• Formaldehyde<br>• Halogenated Diphenyl Methanes<br>• Lead carbonates and sulfates<br>• Lead and Lead compounds<br>• Mercuric Oxide Batteries<br>• Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.<br>• Ozone Depleting Substances |

## Technical Specifications

| | |
|---|---|
| | • Polybrominated Biphenyls (PBBs)<br>• Polybrominated Biphenyl Ethers (PBBEs)<br>• Polybrominated Biphenyl Oxides (PBBOs)<br>• Polychlorinated Biphenyl (PCB)<br>• Polychlorinated Terphenyls (PCT)<br>• Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.<br>• Radioactive Substances<br>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO) |
| **Packaging Usage** | 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 http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf):<br>• Asbestos<br>• Certain Azo Colorants<br>• Certain Brominated Flame Retardants – may not be used as flame retardants in plastics<br>• Cadmium<br>• Chlorinated Hydrocarbons<br>• Chlorinated Paraffins<br>• Formaldehyde<br>• Halogenated Diphenyl Methanes<br>• Lead carbonates and sulfates<br>• Lead and Lead compounds<br>• Mercuric Oxide Batteries<br>• Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.<br>• Ozone Depleting Substances<br>• Polybrominated Biphenyls (PBBs)<br>• Polybrominated Biphenyl Ethers (PBBEs)<br>• Polybrominated Biphenyl Oxides (PBBOs)<br>• Polychlorinated Biphenyl (PCB)<br>• Polychlorinated Terphenyls (PCT)<br>• Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.<br>• Radioactive Substances<br>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO) |
| **End-of-life Management and Recycling** | HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.<br>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: http://www.hp.com/go/recyclers. 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.<br>Global Citizenship Report |

| | |
|---|---|
| | http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html<br>Eco-label certifications<br>http://www8.hp.com/us/en/hp-information/environment/ecolabels.html<br>ISO 14001 certificates:<br>http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf<br>and<br>http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf |

## DISPLAYS

| | | |
|---|---|---|
| **Panel LCD 13.3 inch FHD (1920x1080) BrightView WLED UWVA 72percent cg 400nits eDP 1.3+PSR ultraslim NB bent** | **Outline Dimensions (W x H x D)** | 299.76 x 177.24 max. (FPC folding included) |
| | **Active Area** | 293.76 x 165.24 |
| | **Weight** | 170g max. |
| | **Diagonal Size** | 13.3” |
| | **Thickness** | 2.0mm / 4.0mm (PCB) max. |
| | **Interface** | eDP 1.3 w/ PSR (2 lane) |
| | **Surface Treatment** | BV |
| | **Touch Enabled** | Yes |
| | **Contrast Ratio** | 800:1 |
| | **Refresh Rate** | 60Hz |
| | **Brightness** | 400nits typ. |
| | **Pixel Resolution** | 1920x1280 |
| | **Format** | RGB strip |
| | **Backlight** | LED |
| | **Color Gamut Coverage** | 72% |
| | **Color Depth** | 6 bits |
| | **Viewing Angle** | UWVA 85/85/85/85 |

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

## Technical Specifications

| | | |
|---|---|---|
| **Panel LCD 13.3 inch FHD (1920x1080) Anti-Glare WLED UWVA 72percent cg 700nits eDP 1.3+PSR ultraslim NB Privacy** | **Outline Dimensions (W x H x D)** | 300.56 x 178.39 mm (max.) |
| | **Active Area** | 293.86 x 165.34 mm (max.) |
| | **Weight** | 205g (max.) |
| | **Diagonal Size** | 13.3" |
| | **Thickness** | 2.0 mm / 3.9 mm (max.) |
| | **Interface** | eDP 1.4a |
| | **Surface Treatment** | Anti-Glare |
| | **Touch Enabled** | Yes |
| | **Contrast Ratio** | Sharing mode, 600:1 (typ.)<br>Privacy mode, 150:1 (typ.) |
| | **Refresh Rate** | 120Hz |
| | **Brightness** | Sharing mode, 700 nits (typ.)<br>Privacy mode, 320 nits (typ.) |
| | **Pixel Resolution** | 1920x1080 |
| | **Format** | RGB strip |
| | **Backlight** | LED |
| | **Color Gamut Coverage** | Sharing mode, 72%<br>Privacy mode, 60% |
| | **Color Depth** | 6 bits + Hi FRC |
| | **Viewing Angle** | Sharing mode, CR >10, L/R/U/D, 85/85/85/85 (typ.)<br>Privacy mode CR>2, L/R/U/D, 50/50/85/85 (typ.) |

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

## Technical Specifications

| | | |
|---|---|---|
| **Panel LCD 13.3 inch UHD (3840x2160) BrightView WLED UWVA 72percent cg 500nits eDP 1.3+PSR ultraslim NB bent** | **Outline Dimensions (W x H x D)** | 299.26 x 177.51 (FPC folding included) |
| | **Active Area** | 293.76 x 165.24 mm |
| | **Weight** | 190g max. |
| | **Diagonal Size** | 13.3” |
| | **Thickness** | 2.0mm / 4.0mm (PCB) max. |
| | **Interface** | eDP 1.4a PSR (4 lane) |
| | **Surface Treatment** | BV |
| | **Touch Enabled** | Yes |
| | **Contrast Ratio** | 1400:1 |
| | **Refresh Rate** | 60Hz |
| | **Brightness** | 500nits typ. |
| | **Pixel Resolution** | 3840 x 2160 (UHD) |
| | **Format** | RGB strip |
| | **Backlight** | LED |
| | **Color Gamut Coverage** | 72% |
| | **Color Depth** | 8 bits |
| | **Viewing Angle** | UWVA 85/85/85/85 |

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

## Technical Specifications

### STORAGE

| | | |
|---|---|---|
| **SSD 128GB 2280 M2 SATA-3 TLC** | **Form Factor** | M.2 2280 |
| | **Capacity** | 128 GB |
| | **NAND Type** | TLC |
| | **Height** | 0.09 in (2.3 mm) |
| | **Width** | 0.87 in (22 mm) |
| | **Weight** | 0.02 lb (10 g) |
| | **Interface** | ATA-8, SATA 3.0 |
| | **Maximum Sequential Read** | Up To 520 MB/s |
| | **Maximum Sequential Write** | Up To 450 MB/s |
| | **Logical Blocks** | 250,069,680 |
| | **Operating Temperature** | 32° to 158°F (0° to 70°C) [ambient temp] |
| | **Features** | DIPM; TRIM; DEVSLP |

**NOTE**: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

| | | |
|---|---|---|
| **SSD 256 GB 2280 M2 PCIe-3x4 SS NVMe TLC** | **Form Factor** | M.2 2280 |
| | **Capacity** | 256 GB |
| | **NAND Type** | TLC |
| | **Height** | 0.09 in (2.3 mm) |
| | **Width** | 0.87 in (22 mm) |
| | **Weight** | 0.02 lb (<10 g) |
| | **Interface** | PCIe NVMe Gen3X4 |
| | **Maximum Sequential Read** | Up To 2600 MB/s |
| | **Maximum Sequential Write** | Up To 900 MB/s |
| | **Logical Blocks** | 500,118,192 |
| | **Operating Temperature** | 32° to 158°F (0° to 70°C) [ambient temp] |
| | **Features** | TRIM; L1.2 |

**NOTE**: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

| | | |
|---|---|---|
| **SSD 256 GB 2280 M2 SATA-3 Self Encrypted OPAL2 Three Layer Cell** | **Form Factor** | M.2 2280 |
| | **Capacity** | 256 GB |
| | **NAND Type** | TLC |
| | **Height** | 0.09 in (2.3 mm) |
| | **Width** | 0.87 in (22 mm) |

| | | |
|---|---|---|
| | **Weight** | 0.02 lb (<10 g) |
| | **Interface** | ATA-8, SATA 3.0 |
| | **Maximum Sequential Read** | 530 MB/s～ 560 MB/s |
| | **Maximum Sequential Write** | 500 MB/s～ 530 MB/s |
| | **Logical Blocks** | 500,118,192 |
| | **Operating Temperature** | 32° to 158°F (0° to 70°C) [ambient temp] |
| | **Features** | ATA Security; TCG Opal 2.0, DIPM; TRIM; DEVSLP |

**NOTE**: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

| | | |
|---|---|---|
| **SSD 256 GB 2280 PCIe NVMe Value** | **Form Factor** | M.2 2280 |
| | **Capacity** | 360 GB |
| | **NAND Type** | MLC |
| | **Height** | 0.09 in (2.3 mm) |
| | **Width** | 0.87 in (22 mm) |
| | **Weight** | 0.02 lb (10 g) |
| | **Interface** | PCIe NVMe Gen3X4 |
| | **Maximum Sequential Read** | Up To 1700 MB/s |
| | **Maximum Sequential Write** | Up To 600 MB/s |
| | **Logical Blocks** | 703,282,608 |
| | **Operating Temperature** | 32° to 158°F (0° to 70°C) [ambient temp] |
| | **Features** | TRIM; L1.2 |

**NOTE**: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

| | | |
|---|---|---|
| **SSD 360 GB 2280 PCIe-3x4 NVMe Three Layer Cell** | **Form Factor** | 0.02 lb (10 g) |
| | **Capacity** | 360 GB |
| | **NAND Type** | MLC |
| | **Height** | 0.09 in (2.3 mm) |
| | **Width** | 0.87 in (22 mm) |
| | **Weight** | 0.02 lb (10 g) |
| | **Interface** | PCIe NVMe Gen3X4 |
| | **Maximum Sequential Read** | Up To 1700 MB/s |
| | **Maximum Sequential Write** | Up To 600 MB/s |
| | **Logical Blocks** | 703,282,608 |

| | | |
|---|---|---|
| | **Operating Temperature** | 32° to 158°F (0° to 70°C) [ambient temp] |
| | **Features** | TRIM; L1.2 |

**NOTE**: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

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| | | |
|---|---|---|
| **SSD 512 GB 2280 M2 PCIe-3x4 SS NVMe TLC** | **Form Factor** | M.2 2280 |
| | **Capacity** | 512 GB |
| | **NAND Type** | TLC |
| | **Height** | 0.09 in (2.3 mm) |
| | **Width** | 0.87 in (22 mm) |
| | **Weight** | 0.02 lb (<10 g) |
| | **Interface** | PCIe NVMe Gen3X4 |
| | **Maximum Sequential Read** | 2800 MB/s～ 2900 MB/s |
| | **Maximum Sequential Write** | 1000 MB/s～ 1800 MB/s |
| | **Logical Blocks** | 1,000,215,215 |
| | **Operating Temperature** | 32° to 158°F (0° to 70°C) [ambient temp] |
| | **Features** | ATA Security,TRIM; L1.2 |

**NOTE**: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

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| | | |
|---|---|---|
| **SSD 512 GB 2280 M2 SATA-3 Three Layer Cell Federal Information Processing Standard** | **Form Factor** | M.2 2280 |
| | **Capacity** | 512 GB |
| | **NAND Type** | TLC |
| | **Height** | 0.09 in (2.3 mm) |
| | **Width** | 0.87 in (22 mm) |
| | **Weight** | 0.02 lb (10 g) |
| | **Interface** | ACS-3, SATA 3.2 |
| | **Maximum Sequential Read** | Up To 530 MB/s |
| | **Maximum Sequential Write** | Up To 400 MB/s |
| | **Logical Blocks** | 1,000,215,216 |
| | **Operating Temperature** | 32° to 158°F (0° to 70°C) [ambient temp] |
| | **Features** | TCG Opal 2.0; FIPS, DIPM; TRIM; DEVSLP |

**NOTE**: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

| | | |
|---|---|---|
| **SSD 512 GB 2280 PCIe-3x4 NVMe Self Encrypted OPAL2 Three Layer Cell** | **Drive Weight** | 0.02 lb (10 g) |
| | **Capacity** | 512 GB |
| | **Height** | 0.09 in (2.3 mm) |
| | **Width** | 0.87 in (22 mm) |
| | **Weight** | 0.02 lb (10 g) |
| | **Interface** | PCIe NVMe Gen3X4 |
| | **Maximum Sequential Read** | Up To 2900 MB/s |
| | **Maximum Sequential Write** | Up To 1400 MB/s |
| | **Logical Blocks** | 1,000,215,215 |
| | **Operating Temperature** | 32° to 158°F (0° to 70°C) [ambient temp] |
| | **Features** | TCG Opal2, TRIM; L1.2 |

**NOTE**: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

| | | |
|---|---|---|
| **SSD 1TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided** | **Form Factor** | 0.02 lb (10 g) |
| | **Capacity** | 1TB |
| | **NAND Type** | TLC |
| | **Height** | 0.09 in (2.3 mm) |
| | **Width** | 0.87 in (22 mm) |
| | **Weight** | 0.02 lb (10 g) |
| | **Interface** | PCIe NVMe Gen3X4 |
| | **Maximum Sequential Read** | Up To 2900 MB/s |
| | **Maximum Sequential Write** | Up To 2000 MB/s |
| | **Logical Blocks** | 2,000,409,263 |
| | **Operating Temperature** | 32° to 158°F (0° to 70°C) [ambient temp] |
| | **Features** | TRIM; L1.2 |

**NOTE**: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

| | | |
|---|---|---|
| **SSD 2TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided** | **Form Factor** | M.2 2280 |
| | **Capacity** | 2TB |
| | **NAND Type** | TLC |
| | **Height** | 0.09 in (2.3 mm) |
| | **Width** | 0.87 in (22 mm) |
| | **Weight** | 0.02 lb (10 g) |
| | **Interface** | PCIe NVMe Gen3X4 |
| | **Maximum Sequential Read** | Up To 2900 MB/s |
| | **Maximum Sequential Write** | Up To 2100 MB/s |
| | **Logical Blocks** | 3,907,029,168 |
| | **Operating Temperature** | 32° to 158°F (0° to 70°C) [ambient temp] |
| | **Features** | ATA Security, DIPM; TRIM; DEVSLP |

**NOTE**: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

## Technical Specifications

## NETWORKING/COMMUNICATIONS

| | | |
|---|---|---|
| **Intel 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo[1] Vpro** | **Wireless LAN Standards** | IEEE 802.11a<br>IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11n<br>IEEE 802.11ac |
| | **Interoperability** | Wi-Fi certified |
| | **Frequency Band** | **802.11b/g/n**<br>• 2.402 – 2.482 GHz<br>**802.11a/n**<br>• 4.9 – 4.95 GHz (Japan)<br>• 5.15 – 5.25 GHz<br>• 5.25 – 5.35 GHz<br>• 5.47 – 5.725 GHz<br>• 5.825 – 5.850 GHz |
| | **Data Rates** | • 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, and 80MHz) |
| | **Modulation** | Direct Sequence Spread SpectrumBPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM |
| | **Security[3]** | • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only<br>• 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<br>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite<br>• WAPI |
| | **Network Architecture Models** | Ad-hoc (Peer to Peer)<br>Infrastructure (Access Point Required) |
| | **Roaming** | IEEE 802.11 compliant roaming between access points |
| | **Output Power[2]** | • 802.11b : +14dBm minimum<br>• 802.11g : +12dBm minimum<br>• 802.11a : +12dBm minimum<br>• 802.11n HT20(2.4GHz) : +12dBm minimum<br>• 802.11n HT40(2.4GHz) : +12dBm minimum<br>• 802.11n HT20(5GHz) : +10dBm minimum<br>• 802.11n HT40(5GHz) : +10dBm minimum<br>• 802.11ac VHT80(5GHz) : +10dBm minimum |
| | **Power Consumption** | • Transmit mode 2.0 W<br>• Receive mode 1.6 W<br>• Idle mode (PSP) 180 mW (WLAN Associated)<br>• Idle mode 50 mW (WLAN unassociated) |

| | | |
|---|---|---|
| | • Connected Standby 10mW<br>• Radio disabled 8 mW | |
| **Power Management** | ACPI and PCI Express compliant power management 802.11 compliant power saving mode | |
| **Receiver Sensitivity** [3] | 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 | |
| **Antenna type** | High efficiency antenna with spatial diversity, mounted in the display enclosure<br><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** | Type 2230 : 2.3 x 22.0 x 30.0 mm | |
| **Weight** | Type 2230 : 2.8g | |
| **Operating Voltage** | 3.3v +/- 9% | |
| **Temperature** | Operating | 14° to 158° F (–10° to 70° C) |
| | Non-operating | –40° to 176° F (–40° to 80° C) |
| **Humidity** | Operating | 10% to 90% (non-condensing) |
| | Non-operating | 5% to 95% (non-condensing) |
| **Altitude** | Operating | 0 to 10,000 ft (3,048 m) |
| | Non-operating | 0 to 50,000 ft (15,240 m) |
| **LED Activity** | LED Amber – Radio OFF; LED White – Radio ON | |

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

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

| | |
|---|---|
| **Bluetooth Specification** | 4.0/4.1/4.2 Compliant |
| **Frequency Band** | 2402 to 2480 MHz |
| **Number of Available Channels** | Legacy : 0~79 (1 MHz/CH)BLE : 0~39 (2 MHz/CH) |
| **Data Rates and Throughput** | Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps<br><br>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. |
| | **Power Consumption** | Peak (Tx) 330 mWPeak (Rx) 230 mWSelective Suspend 17 mW |
| | **Electrical Interface** | USB 2.0 compliant |
| | **Bluetooth Software Supported** | Microsoft Windows Bluetooth Software |
| | **Link Topology** | |
| | **Power Management** | Microsoft Windows ACPI, and USB Bus Support |
| | **Certifications** | FCC (47 CFR) Part 15C, Section 15.247 & 15.249 |
| | **Power Management Certifications** | ETS 300 328, ETS 300 826Low Voltage Directive IEC950UL, CSA, and CE Mark |
| | **Bluetooth Profiles Supported** | BT4.1-ESR 5/6/7 Compliance<br>LE Link Layer Ping<br>LE Dual Mode<br>LE Link Layer<br>LE Low Duty Cycle Directed Advertising<br>LE L2CAP Connection Oriented Channels<br>Train Nudging & Interlaced Scan<br>BT4.2 ESR08 Compliance<br>LE Secure Connection- Basic/Full<br>LE Privacy 1.2 –Link Layer Privacy<br>LE Privacy 1.2 –Extended Scanner Filter Policies<br>LE Data Packet Length Extension<br>FAX Profile (FAX)<br>Basic Imaging Profile (BIP)2<br>Headset Profile (HSP)<br>Hands Free Profile (HFP)<br>Advanced Audio Distribution Profile (A2DP) |
| | **Security & Manageability** | Intel® vPro™ support with appropriate Intel® chipset components |
| **Intel 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo[1] Non-Vpro** | **Wireless LAN Standards** | IEEE 802.11a<br>IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11n<br>IEEE 802.11ac |
| | **Interoperability** | Wi-Fi certified |
| | **Frequency Band** | **802.11b/g/n**<br>• 2.402 – 2.482 GHz<br>**802.11a/n**<br>• 4.9 – 4.95 GHz (Japan) |

| | |
|---|---|
| | • 5.15 – 5.25 GHz<br>• 5.25 – 5.35 GHz<br>• 5.47 – 5.725 GHz<br>• 5.825 – 5.850 GHz |
| **Data Rates** | • 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, and 80MHz) |
| **Modulation** | Direct Sequence Spread SpectrumBPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM |
| **Security**[3] | • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only<br>• 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<br>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite<br>• WAPI |
| **Network Architecture Models** | Ad-hoc (Peer to Peer)<br>Infrastructure (Access Point Required) |
| **Roaming** | IEEE 802.11 compliant roaming between access points |
| **Output Power**[2] | • 802.11b : +14dBm minimum<br>• 802.11g : +12dBm minimum<br>• 802.11a : +12dBm minimum<br>• 802.11n HT20(2.4GHz) : +12dBm minimum<br>• 802.11n HT40(2.4GHz) : +12dBm minimum<br>• 802.11n HT20(5GHz) : +10dBm minimum<br>• 802.11n HT40(5GHz) : +10dBm minimum<br>• 802.11ac VHT80(5GHz) : +10dBm minimum |
| **Power Consumption** | • Transmit mode 2.0 W<br>• Receive mode 1.6 W<br>• Idle mode (PSP) 180 mW (WLAN Associated)<br>• Idle mode 50 mW (WLAN unassociated)<br>• Connected Standby 10mW<br>• Radio disabled 8 mW |
| **Power Management** | ACPI and PCI Express compliant power management 802.11 compliant power saving mode |
| **Receiver Sensitivity** [3] | 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 |

## Technical Specifications

| | | |
|---|---|---|
| **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** | Type 2230 : 2.3 x 22.0 x 30.0 mm | |
| **Weight** | Type 2230 : 2.8g | |
| **Operating Voltage** | 3.3v +/- 9% | |
| **Temperature** | Operating | 14° to 158° F (–10° to 70° C) |
| | Non-operating | –40° to 176° F (–40° to 80° C) |
| **Humidity** | Operating | 10% to 90% (non-condensing) |
| | Non-operating | 5% to 95% (non-condensing) |
| **Altitude** | Operating | 0 to 10,000 ft (3,048 m) |
| | Non-operating | 0 to 50,000 ft (15,240 m) |
| **LED Activity** | LED Amber – Radio OFF; LED White – Radio ON | |

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

**HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology**

| | |
|---|---|
| **Bluetooth Specification** | 4.0/4.1/4.2 Compliant |
| **Frequency Band** | 2402 to 2480 MHz |
| **Number of Available Channels** | Legacy : 0~79 (1 MHz/CH)BLE : 0~39 (2 MHz/CH) |
| **Data Rates and Throughput** | Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps<br>BLE: 1 Mbps data rate; throughput up to 0.2 Mbps<br>Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels<br>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. |
| **Power Consumption** | Peak (Tx) 330 mWPeak (Rx) 230 mWSelective Suspend 17 mW |
| **Electrical Interface** | USB 2.0 compliant |
| **Bluetooth Software Supported** | Microsoft Windows Bluetooth Software |
| **Link Topology** | |

| | | |
|---|---|---|
| | **Power Management** | Microsoft Windows ACPI, and USB Bus Support |
| | **Certifications** | FCC (47 CFR) Part 15C, Section 15.247 & 15.249 |
| | **Power Management Certifications** | ETS 300 328, ETS 300 826Low Voltage Directive IEC950UL, CSA, and CE Mark |
| | **Bluetooth Profiles Supported** | BT4.1-ESR 5/6/7 Compliance<br>LE Link Layer Ping<br>LE Dual Mode<br>LE Link Layer<br>LE Low Duty Cycle Directed Advertising<br>LE L2CAP Connection Oriented Channels<br>Train Nudging & Interlaced Scan<br>BT4.2 ESR08 Compliance<br>LE Secure Connection- Basic/Full<br>LE Privacy 1.2 –Link Layer Privacy<br>LE Privacy 1.2 –Extended Scanner Filter Policies<br>LE Data Packet Length Extension<br>FAX Profile (FAX)<br>Basic Imaging Profile (BIP)2<br>Headset Profile (HSP)<br>Hands Free Profile (HFP)<br>Advanced Audio Distribution Profile (A2DP) |
| **HP lt4132 LTE/HSPA+ 4G Mobile Broadband Module[1]** | **Technology/Operating bands** | LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3) MHz,<br>850 (Band 5), 2600 (Band 7), 900 (Band 8) MHz,<br>800 (Band 20), 700 (Band 28) MHz.<br>HSPA+: 2100 (Band 1), 1900 (Band 2), 850 (Band 5), 900 (Band 8) MHz<br>E-GPRS: 1900 (Band 2), 1800 (Band 3), 850 (Band 5), 900 (Band 8) MHz |
| | **Wireless protocol standards** | 3GPP Release 10 LTE Specification CAT.4, 20MHz BW<br>WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification<br>E-GPRS: Class B, Multi-slot class 12, coding schemes CS1 - CS4 and MSC1 - MSC9 |
| | **GPS** | Standalone, A-GPS (MS-B and LTO) |
| | **GPS bands** | 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz |
| | **Maximum data rates** | LTE: 150 Mbps (Download), 50 Mbps (Upload)<br>DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)<br>HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)<br>EDGE: 236.8 kbps (Download), 236.8 kbps (Upload)<br>GPRS: 85.6 kbps(Download), 85.6 kbps (Upload) |
| | **Maximum output power** | LTE: 23 dBm<br>HSPA+: 23.5 dBm<br>E-GPRS 1900/1800: 26 dBm<br>E-GPRS 900/850: 27 dBm |

| | |
|---|---|
| | GPRS 1900/1800: 29.5 dBm<br>GPRS 900/850: 32.5 dBm |
| **Maximum power consumption** | LTE: 1,200 mA (peak); 900 mA (average)<br>HSPA+: 1,100 mA (peak); 800 mA (average)<br>E-GPRS: 2,600 mA (peak); 500 mA (average) |
| **Form Factor** | M.2, 3042-S3 Key B |
| **Weight** | 6 g |
| **Dimensions (Length x Width x Thickness)** | 42 x 30 x 2.3 mm |

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.

| | | |
|---|---|---|
| **HP lt4210 4G Module[1]** | **Technology/Operating bands** | 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 17 lower), 800 (Band 20), 700 (Band 28).<br>HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz |
| | **Wireless protocol standards** | 3GPP Release 10 LTE Specification CAT.4, 20MHz BW, WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification 1xEVDO Release 0, A and B.<br>E-GPRS: Class B, Multi-slot class 12, coding schemes CS1 - CS4 and MSC1 - MSC9 |
| | **GPS** | Standalone, A-GPS (MS-A, MS-B and XTRA) |
| | **GPS bands** | 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz |
| | **Maximum data rates** | LTE: 150 Mbps (Download), 50 Mbps (Upload)<br>DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)<br>HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)<br>CDMA 1xRTT: 153.6 kbps (Download), 153.6 kbps (Upload)<br>EVDO Rel.A: 3.1 Mbps (Download), 1.8 Mbps (Upload)<br>EVDO Rel.B: 14.7 Mbps (Download), 5.4Mbps (Upload)<br>EDGE: 236.8 kbps (Download), 236.8 kbps (Upload)<br>GPRS: 85.6 kbps(Download), 85.6 kbps (Upload) |
| | **Maximum output power** | LTE: 23 dBm<br>HSPA+: 23.5 dBm<br>1xRTT/EVDO: 24dBm<br>E-GPRS 1900/1800: 26 dBm<br>E-GPRS 900/850: 27 dBm<br>GPRS 1900/1800: 29.5 dBm |

| | | |
|---|---|---|
| | | GPRS 900/850: 32.5 dBm |
| | **Maximum power consumption** | LTE: 1,200 mA (peak); 900 mA (average)<br>HSPA+: 1,100 mA (peak); 800 mA (average)<br>1xRTT/EVDO: 1,000 mA (peak); 700 mA (average)<br>E-GPRS: 2,800 mA (peak); 500 mA (average) |
| | **Form Factor** | M.2, 3042-S3 Key B |
| | **Weight** | 6.2 g |
| | **Dimensions (Length x Width x Thickness)** | 42 30 x 2.3 mm |

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.

| | | |
|---|---|---|
| **Intel® XMM™ 7360 LTE-Advanced CAT9[1]** | **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), 1400 (Band 11), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 17 lower), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1400 (Band 21), 850 (Band 26), 700 (Band 28), 700 (Band 29 RX only), 2300 (Band 30), 1700/2100 (Band 66).<br>TDD LTE: 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41).<br>HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz |
| | **Wireless protocol standards** | 3GPP Release 11 LTE Specification CAT.9, DL 60MHz BW throughput up to 450Mbps; UL 20MHz throughput up to 50Mbps WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification |
| | **GPS** | Standalone, A-GPS (MS-A, MS-B) |
| | **GPS bands** | 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz |

| | |
|---|---|
| **Maximum data rates** | LTE: 450 Mbps (Download), 50 Mbps (Upload)<br>DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)<br>HSPA+: 21Mbps (Download), 5.76 Mbps (Upload) |
| **Maximum output power** | LTE: 23 dBm<br>HSPA+: 23.5 dBm |
| **Maximum power consumption** | LTE: 1,200 mA (peak); 900 mA (average)<br>HSPA+: 1,100 mA (peak); 800 mA (average) |
| **Form Factor** | M.2, 3042-S3 Key B |
| **Weight** | 5.8g |
| **Dimensions (Length x Width x Thickness)** | 30 x 2.3 mm |

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.

| | | |
|---|---|---|
| **Near Field Communications Controller (optional)** | **Dimensions (L x W x H)** | Module 17 mm by 10 mm by 2.0 mm |
| | **Chipset** | NPC300 |
| | **System interface** | I2C |
| | **NFC RF standards** | ISO/IEC 14443 A<br>ISO/IEC 14443 B<br>ISO/IEC 15693<br>ISO/IEC 18092<br>ECMA-340 NFCIP-1 Target and Initiator<br>ECMA-320 NFCIP-2 |
| | **NFC Forum Support** | Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2 |
| | **Reader (PCD-VCD) Mode (1)** | ISO/IEC 14443 A<br>ISO/IEC 14443 B<br>ISO/IEC 15693<br>MIFARE 1K<br>MIFARE 4K<br>MIFARE DESFire<br>FeliCa<br>Jewel and Topaz cards |

| | | |
|---|---|---|
| | **Card Emulation (PICC-VICC) Mode (1)** | ISO/IEC 14443 A<br>ISO/IEC 14443 B and B’<br>MIFARE<br>FeliCa |
| | **Frequency** | 13.56 MHz |
| | **NFC Modes Supported** | Reader/Writer, Peer-to-Peer |
| | **Raw RF Data Rates** | 106, 212, 424, 848 kbps |
| | **Operating temperature** | 0°C to 70°C |
| | **Storage temperature** | -20°C to 125°C |
| | **Humidity** | 10-90% operating |
| | **Supply Operating voltage** | 2.97 to 5.5 Volts |
| | **I/O Voltage** | 1.8V or 3.3V |
| **Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)** | **Mode** | Power Consumption, Typical |
| | **Polling** | 7.3 mA |
| | **Detected Test Tag Type 1** | 32.9 mA |
| | **Detected Test Tag Type 2** | 70.7 mA |
| | **Detected Test Tag Type 3** | 79.2 mA |
| | **Detected Test Tag Type 4** | 64.9 mA |
| | **Antenna** | Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module. |

## Technical Specifications

### POWER

| | | | |
|---|---|---|---|
| **AC Adapter 65 Watt nPFC Slim USB type C Straight 1.8m (MissPiggy)** | **Dimensions** | 88.0x53.5x21.0mm | |
| | **Weight** | 220g +/- 10g | |
| | **Input** | 100 to 240 VAC | |
| | | **Input Efficiency** | Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec:<br>5V : 81.5%<br>9V : 86.7%<br>12V : 88.0%<br>15V : 89.0%<br>20V : 89.0% |
| | | **Input frequency range** | 48 ~ 63 Hz |
| | | **Input AC current** | Max. 1.7 A at 90 VAC |
| | **Output** | **Output power** | 5V/15W<br>9V/27W<br>12V/60W<br>15V/65W<br>20V/65W |
| | | **DC output** | 5V / 9V / 12V / 15V / 20V |
| | | **Hold-up time** | 5ms at 115 Vac input |
| | | **Output current limit** | < 8.0A |
| | **Connector** | USB Type-C | |
| | **Environmental Design** | **Operating temperature** | 32° to 95° F (0° to 35° C) |
| | | **Non-operating (storage) temperature** | -4° to 185° F (-20° to 85° C) |
| | | **Altitude** | 0 to 16,400 ft (0 to 5000m) |
| | | **Humidity** | 20% to 95% |
| | | **Storage Humidity** | 10% to 95% |
| | **EMI and Safety Certifications** | CE Mark- full compliance with LVD and EMC directives; Worldwide safety standards- IEC950, EN60950, UL1950, Class 1, SELV; Agency approvals- C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCIB, NOM-1 NYCE; MTBF- over 200,000 hours at 25°C ambient condition. | |

## Technical Specifications

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|---|---|---|---|
| **Battery ME 4 Cell WHr 50 Long Life -PL Fast Charge** | **Dimensions** (H x W x L) | 4.0 x 96.62 x231.8 mm (0.157 x3.804 x9.126 inch) | |
| | **Weight** | 0.188kg (0.415 lb) | |
| | **Cells/Type** | 4cell Lithium-Ion Polymer cell / 385784 | |
| | **Energy** | **Voltage** | 8.8V/7.7V |
| | | **Amp-hour capacity** | 6.175Ah(min.)/6.5Ah(typ.) |
| | | **Watt-hour capacity** | 47.5Wh(min.)/50Wh(typ.) |
| | **Temperature** | **Operating (Charging)** | 32˚ to 113˚ F (0˚ to 45˚ C) |
| | | **Operating (Discharging)** | 14˚ to 122˚ F (-10˚ to 60˚ C) |
| | **Fuel Gauge LED** | No | |
| | **Optional Travel Battery Available** | No | |

## COUNTRY OF ORIGIN

China

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

| Type | Description | Part # |
|---|---|---|
| **Cases** | HP Slim Ultrabook Top Load | F3W15AA#xxx |
| | HP Exec Midnight 15.6" Backpack | 1KM16AA#xxx |
| **Docking** | HP Thunderbolt Dock 120W G2 | 2UK37AA#xxx |
| | HP TB Dock G2 w/ Combo Cable | 3TR87AA#xxx |
| | HP TB Dock 120W G2 w/ Audio | 3YE87AA#xxx |
| | HP Thunderbolt Dock Audio Module | 3AQ21AA |
| | HP TB Dock 120W G2 cable | 3XB94AA |
| | HP TB Dock G2 combo cable | 3XB96AA |
| | HP USB-C Universal Dock | 1MK33AA#xxx |
| | HP USB-C Universal Dock w/4.5mm Adapter | 2UF95AA |
| | HP USB-C Universal Dock NF | 3DV65AA |
| | HP USB-C Dock G4 | 3FF69AA#xxx |
| | HP USB-C Mini Dock | 1PM64AA#xxx |
| | HP USB Travel Dock | T0K30AA#xxx |
| | HP Elite 90W Thunderbolt 3 Dock | 1DT93AA#xxx |
| | HP Hot Desk Stand (up to 32" monitor) | W3Z73AA#xxx |
| | HP Hot Desk Stand Monitor Arm (for use with W3Z73AA; supports two 24" monitors) | W3Z74AA#xxx |
| **Input/Output** | HP Slim Wireless Keyboard and Mouse | T6L04AA#xxx |
| | HP Slim USB Keyboard and Mouse | T6T83AA#xxx |
| | HP Wireless (Link-5) Keyboard | T6U20AA#xxx |
| | HP USB Essential Keyboard and Mouse | H6L29AA#xxx |
| | HP Conferencing Keyboard | K8P74AA#xxx |
| | HP USB Collaboration Keyboard | Z9N38AA#xxx |
| | HP Wireless Collaboration Keyboard | Z9N39AA#xxx |
| | HP Comfort Grip Wireless Mouse | H2L63AA#xxx |
| | HP X4000b Bluetooth Mouse | H3T50AA#xxx |
| | HP 3-Button USB Laser Mouse | H4B81AA#xxx |
| | HP USB Travel Mouse | G1K28AA#xxx |
| | HP Ultra Mobile Wireless Mouse | H6F25AA#xxx |
| | HP Slim Bluetooth Mouse | F3J92AA#xxx |
| | HP Wireless Premium Mouse | 1JR31AA#xxx |
| | HP USB Premium Mouse | 1JR32AA#xxx |
| | HP Elite Presenter Mouse | 2CE30AA#xxx |
| | HP Stereo 3.5mm Headset | T1A66AA#xxx |
| | HP Stereo USB Headset | T1A67AA#xxx |
| | HP USB-C to USB 3.0 Adapter | N2Z63AAA#xxx |
| | HP USB-C to USB-A Hub | Z6A00AA#xxx |
| | HP USB-C to DP | N9K78AA#xxx |
| | HP USB-C to VGA | N9K76AA#xxx |
| | HP USB-C to RJ45 Adapter | V7W66AA |

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

| | | |
|---|---|---|
| | HP HDMI to DVI | F5A28AA#xxx |
| | HP HDMI to VGA | H4F02AA#xxx |
| | HP USB 3.0 to Gigabit Adapter | N7P47AA#xxx |
| | HP Active Pen G2 | TBD |
| | HP USB-C to USB-A Hub | Z6A00AA#xxx |
| **Power** | HP 65W USB-C Power Adapter | 1HE08AA#xxx |
| | HP 65W USB-C Slim Power Adapter | 3PN48AA |
| | HP USB-C Notebook Power Bank | 1TZ86AA#xxx |
| **Memory** | HP 4 GB DDR4-2666 SODIMM | TBD |
| | HP 8 GB DDR4-2666 SODIMM | TBD |
| | HP 16 GB DDR4-2666 SODIMM | TBD |
| **Storage** | HP USB External DVDRW Drive | F2B56AA#xxx |
| **Security** | HP Nano Keyed Cable Lock | 1AJ39AA |
| | HP Nano Dual-Head Keyed Cable Lock | 1AJ41AA |
| **UCC** | HP UC Speaker Phone | K7V16AA#xxx |
| | HP UC Wired Headset | K7V17AA#xxx |
| | HP UC Wireless Mono Headset | W3K08AA#xxx |
| | HP UC Wireless Duo Headset | W3K09AA#xxx |
| **Displays** | HP EliteDisplay E243 23.8-inch Monitor | 1FH47AA |
| | HP EliteDisplay E273q 27-inch QHD Monitor | 1FH52AA |
| | HP EliteDisplay E273m 27-inch Collaboration Monitor | 1FH51AA |
| | HP EliteDisplay S240n 23.8-inch Monitor | W9A88AA |
| | HP EliteDisplay S270n 27-inch 4K Monitor | 2PD37AA |

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

| **Docking station model** | **Total number of supported displays (incl. the notebook display)** | **Max.resolutions supported** | **Dock Connectors** | **Technical limitations** |
|---|---|---|---|---|
| HP UltraSlim Docking Station | 3 | Dual 2.5K @ 60Hz | 2xDP, 1xVGA | Dual 2.5k only with both displays into DP |
| HP Elite 120W TB3 Dock | 3 | Dual 4K @ 60Hz | "2xDP, 1xVGA, 1xTB, | Dual 4k only with one display in to DP and + TB port or USB-C alt mode + TB port |
| HP Elite USB-C Dock G4 | 3 | "Dual 2K @ 60Hz | 1xUSB-C alt-mode" | |
| HP USB-C Universal Dock | 3 | Single 4K @ 60Hz (3840 x 1440)" | 1xHDMI, 2xDP | |
| HP USB-C Travel Dock | 2 | Dual 4K @ 60Hz | 2xDP | Single external display<br>Only HDMI or VGA at the time |
| HP USB-C Mini Dock | 2 | Single 5K @ 60Hz | 1xHDMI, 1xVGA | Single external display<br>Only HDMI or VGA at the time |

## Summary of Changes

| Date of change: | Version History: | | Description of change: |
|---|---|---|---|
| June 12, 2018 | v1 to v2 | Update | Touch enabled displays section |
| June 28, 2018 | v2 to v3 | Added | Environmental tab |
| July 5, 2018 | v3 to v4 | Update | Sensors section footnote |
| July 11, 2018 | v4 to v5 | Update | Warranty |
| August 6, 2018 | v5 to v6 | Removed | Software Velocity |
| August 23, 2018 | V6 to v7 | Update | WWAN section |
| August 31, 2018 | V7 to v8 | Added | Networking section |
| September 6, 2018 | V8 to v9 | Update | Networking section and Audio sections |
| | | | |