

Overview

HP EliteBook x360 1040 G7 Notebook PC



Left

- 1. **Webcam and IR Camera**
- 2. **IR Camera LEDs**
- 3. **Internal microphones**
- 4. **Glass Clickpad**
- 5. **Nano Security lock slot (Lock sold separately)**
- 6. **WWAN SIM (Nano)**
- 7. **Audio Combo Jack**
- 8. **USB 3.1 Gen 1 Charging Port**

Overview



Right

1. **Power button**
2. **USB 3.1 Gen 1 charging port**
3. **HDMI port (Cable not included)**
4. **USB Type-C® with Thunderbolt™**
5. **USB Type-C® with Thunderbolt™**

Overview

AT A GLANCE

- An updated all metal CNC Aluminum chassis that is .6 inches (1.66 cm) thin and with a starting weight of 2.88 lbs. (1.32 Kg)
- A 360° convertible notebook with 4 usage modes: Laptop mode, Tablet mode, Tent mode, and Media mode
- Choice of 10th Generation Intel® Core™ i5, i7 Processors (with up to 6 cores) with integrated Intel® UHD Premium Graphics
- Display choices include 35.56 cm (14.0") diagonal IPS FHD touch screen or UHD HDR-400 touch screen. Brightness choices up to 1000 Nits. Optional Anti-glare screen available on FHD panels. Get added protection in open or public places with the optional HP Sure View Reflect integrated privacy screen
- Connectivity with 4G/LTE WWAN, 5G/LTE WWAN, WiFi6 + Bluetooth®5, WLAN, USB Type-C®, USB Type-A, HDMI and optional Thunderbolt™ Docking¹
- Featuring redesigned quiet HP Keyboard with the HP Programmable key. The power button and the fingerprint sensor have been moved to the keyboard
- HP Sure Shutter - industry's 1st and only privacy camera with an electric shutter. The on/off button for this shutter is located on the function row of the keyboard
- An optional HP Rechargeable Active Pen 3¹ with Magnetic Attach and 4096 Levels of pressure
- 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
- Enterprise grade security with HP Sure Sense, HP SureStart Gen5, HP Privacy Camera, HP Sure View Reflect, HP Sure Run Gen2, HP Sure Recover Gen2 with Embedded Reimaging, HP Sure Click, and Touch Fingerprint sensor
- Track your PC and use it to find other Tile-enabled devices with optional Tile™²
- Two choices for the system battery: a 54.5 Whr battery for lighter configurations and a 78.5 Whr battery for the longest battery life
- Battery life up to xxx hours³ with the 78.5 Whr battery, and up to xxx hours with the 54 Whr battery
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles
- Choice of solid state drives up to 2 TB and LPDDR4 memory up to 32 GB
- Tested for 19 MIL-STD 810H tests⁴

1. Sold separately or as an optional feature.

2. Tile is an optional feature that must be configured at the factory and requires Windows 10. Some features require optional subscription to Tile Premium. Not available on models with WWAN M.2 module. Tile application for Windows 10 available for download from the Windows Store. Mobile phone app available for download from App Store and Google Play. Requires iOS 11 and greater or Android 6.0 and greater see <https://support.thetileapp.com/hc/en-us/articles/200424778> for more information. HP Tile will function as long as the PC has battery power.

3. 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.

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

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

Technical Specifications

PRODUCT NAME

HP EliteBook x360 1040 G7 Notebook PC

OPERATING SYSTEM

Preinstalled

Windows 10 Pro 64
Windows 10 Pro 64 (National Academic only)²
Windows 10 Home 64¹
Windows 10 Home Single Language 64¹
Windows® 10 Enterprise 64 (Web Support)¹
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 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com/>.

2. Some devices for academic use will automatically be updated to Windows 10 Pro Education with the Windows 10 Anniversary Update. Features vary; see <https://aka.ms/ProEducation> for Windows 10 Pro Education feature information.

NOTE: Your product does not support Windows 8 or Windows 7. 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>. A full list of HP products.

PROCESSORS

Intel® Core™ i7-10810U with Intel® UHD Graphics Premium (1.1 GHz base frequency, up to 4.7 GHz with Intel® Turbo Boost Technology, 12 MB L3 cache, 6 cores)^{3,4,5,6}
Intel® Core™ i7-10710U with Intel® UHD Graphics Premium (1.1 GHz base frequency, up to 4.7 GHz with Intel® Turbo Boost Technology, 12 MB L3 cache, 6 cores)^{3,4,5,6}
Intel® Core™ i7-10610U with Intel® UHD Graphics Premium (1.8 GHz base frequency, up to 4.3 GHz with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores)^{3,4,5,6}
Intel® Core™ i5-10310U with Intel® UHD Graphics Premium (1.7 GHz base frequency, up to 4.8 GHz with Intel® Turbo Boost Technology, 6 MB L3 cache, 4 cores)^{3,4,5,6}
Intel® Core™ i5-10210U with Intel® UHD Graphics Premium (1.6 GHz base frequency, up to 4.2 GHz with Intel® Turbo Boost Technology, 6 MB L3 cache, 4 cores)^{3,4,5,6}

Processor Family

10th Generation Intel® Core™ i7 processor (i7-10810U, i7-10710U, i7-10610U)
10th Generation Intel® Core™ i5 processor (i5-10310U, i5-10210U)

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

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

5. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See <http://www.intel.com/technology/turboboost> for more information.

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

Technical Specifications

CHIPSET

Chipset is integrated with processor.

GRAPHICS

Integrated

Intel® HD Graphics Premium⁷

Supports

Support HD decode, DX12, HDMI 1.4b⁸

7. HD content required to view HD images.

8. HDMI cable sold separately

DISPLAY

Touch

35.56 cm (14") diagonal FHD IPS Ultraslim 2.0mm eDP + PSR2 BrightView touch screen with 0.4mm Gorilla® Glass 5, 400 nits, 72% NTSC (1920 x 1080)^{7,9,10}

35.56 cm (14") diagonal FHD IPS Ultraslim 2.0mm eDP + PSR2 Anti-Glare touch screen with 0.4mm Gorilla® Glass 5, 400 nits, 72% NTSC (1920 x 1080)^{7,9,10}

35.56 cm (14") diagonal UHD HDR400 IPS Ultraslim 2.0mm eDP + PSR BrightView touch screen with 0.4mm Gorilla® Glass 5, 550 nits, 72% NTSC (3840 x 2160)^{7,9,10}

HP Sure View Reflect Integrated Privacy Screen 35.56 cm (14") diagonal FHD IPS Ultraslim 2.0mm eDP + PSR BrightView touch screen with 0.4mm Gorilla® Glass 5, 1000 nits, 72% NTSC (1920 x 1080)^{7,9,10,11}

HP Sure View Reflect Integrated Privacy Screen 35.56 cm (14") diagonal FHD IPS Ultraslim 2.0mm eDP + PSR Anti-Glare touch screen with 0.4mm Gorilla® Glass 5, 1000 nits, 72% NTSC (1920 x 1080)^{7,9,10,11}

HDMI 1.4b

Supports resolutions up to 4K@60Hz

7. HD content required to view HD images.

9. Sold separately or as an optional feature.

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

11. HP Sure View integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.

Technical Specifications

STORAGE AND DRIVES

Primary M.2 Storage

128 GB M.2 SATA-3 SS TLC¹²
256 GB PCIe® NVMe™ M.2 SS Value¹²
256 GB PCIe® Gen3x4 NVMe™ M.2 SS TLC¹²
256 GB PCIe® TLC Opal 2¹²
256 GB PCIe® Gen3x2x2 SS QLC + 16 GB Intel Optane Memory
512 GB PCIe® Gen3x4 NVMe™ M.2 SS TLC¹²
512 GB PCIe® Gen3x4 NVMe™ M.2 SED SS TLC (OPAL 2) ¹²
512 GB PCIe® NVMe™ M.2 SS Value¹²
512 GB PCIe® Gen3x2x2 QLC + 32GB Intel Optane Memory¹²
1 TB PCIe® Gen3x4 NVMe™ M.2 SS TLC¹²
2 TB PCIe® Gen3x4 NVMe™ M.2 SS TLC¹²

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

MEMORY

Maximum Memory

32 GB LPDDR4-2933 SDRAM

Memory

32 GB LPDDR4-2933
16 GB LPDDR4-2933 SDRAM
8 GB LPDDR4-2933 SDRAM

Memory Slots

Memory soldered down
LPDDR4, System runs at: 2933
Supports Dual Channel Memory

NETWORKING/COMMUNICATIONS

WLAN

Intel® Dual Band Wireless-AX201 (2x2) Wi-Fi 6 and Bluetooth® 5 Combo, vPro™¹³
Intel® Dual Band Wireless-AX201 (2x2) Wi-Fi 6 and Bluetooth® 5 Combo, non-vPro™¹³

WWAN

Intel® XMM™ 7360 LTE-Advanced Cat 9¹⁴
Qualcomm® Snapdragon™ X55 5G Modem (5G + LTE CAT 20)

PC Locator

Built-in Tile® Module (select models)³⁷

NFC

NPC300 Near Field Communication module⁹

Miracast

Native Miracast Support¹⁵

Technical Specifications

9. Sold separately or as an optional feature.

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. The specifications for Wi-Fi 6 (802.11ax) are draft 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 802.11ax devices.

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

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

37. Tile is an optional feature that must be configured at the factory and requires Windows 10. Some features require optional subscription to Tile Premium. Not available on models with WWAN M.2 module. Tile application for Windows 10 available for download from the Windows Store. Mobile phone app available for download from App Store and Google Play. Requires iOS 11 and greater or Android 6.0 and greater see <https://support.thetileapp.com/hc/en-us/articles/200424778> for more information. HP Tile will function as long as the PC has battery power.

AUDIO/MULTIMEDIA

Audio

Audio by Bang & Olufsen

4 Premium Stereo Speakers

Microphones (Multi Array including two user facing and two world-facing microphones)

Camera

Hybrid 720p HD/IR camera with integrated privacy shutter⁷

Sensors

Accelerometer

Magnetometer

Gyroscope

Ambient light

Hall

Time of Flight

7. HD content required to view HD images.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Quiet Keyboard, spill resistant, Backlit keyboard and Durakeys

HP Quiet Keyboard, spill resistant, Backlit keyboard and Durakeys, privacy

Pointing Device

Glass ClickPad with multi-touch gesture support

Function Keys

F1 - Display Switching

F2 - Blank or Sure View

F3 - Brightness Down

F4 - Brightness up

F5 - Audio Mute

F6 - Volume Down

F7 - Volume Up

F8 - Mic Mute

F9 - Keyboard Backlight

Technical Specifications

F10 - Insert
F11 - Airplane Mode
F12 - Programmable Key

Hidden Function Keys

Fn+R = Break
Fn+S = Sys Rq
Fn+C = Scroll Lock
Fn+E - Insert
Fn+W - Pause

SOFTWARE AND SECURITY

Preinstalled Software

BIOS
HP BIOSphere Gen5¹⁶
HP Drive Lock & Automatic Drive Lock¹⁷
BIOS Update via Network
Master Boot Record Security
Power On Authentication
HP Secure Erase¹⁸
Absolute Persistence Module¹⁹
Pre-boot Authentication

Software

HP Connection Optimizer
HP Image Assistant
HP Hotkey Support
HP JumpStarts
HP Support Assistant²⁰
HP Noise Cancellation Software
Buy Office (Sold separately)
HP WorkWell
HP Presence Aware

Manageability Features

HP Driver Packs²¹
HP System Software Manager (SSM)
HP BIOS Config Utility (BCU)
HP Client Catalog
HP Manageability Integration Kit Gen4²²
Sure Recover Gen3 with embedded reimaging

Client Security Software

HP Client Security Manager Gen6²³

Technical Specifications

HP Fingerprint Sensor

HP Power On Authentication

Windows Defender²⁴

Security Management

Pre-boot Authentication

TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)²⁵

SATA 0,1 port disablement (via BIOS)

Serial, USB enable/disable (via BIOS)

Power-on password (via BIOS)

Setup password (via BIOS)

Support for chassis padlocks and cable lock devices

HP Sure Click²⁶

HP Sure Start Gen6²⁷

HP Sure Run Gen3²⁸

HP Sure Recover Gen3²⁹

HP Sure Sense³⁰

16. HP BIOSphere Gen5 is available on select HP Pro and Elite PCs. See product specifications for details. Features may vary depending on the platform and configurations.

17. HP Automatic Drive Lock is not supported on NVMe drives.

18. HP Secure Erase 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™.

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

20. HP Support Assistant requires Windows and Internet access.

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

22. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

23. HP Client Security Manager Gen6 requires Windows and is available on the select HP Pro and Elite PCs.

24. Windows Defender Opt in and internet connection required for updates.

25. Firmware TPM is version 2.0. Hardware TPM is v1.2, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT).re TPM is version 2.0. Hardware TPM is v1.2, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT).

26. 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, when Microsoft Office or Adobe Acrobat are installed.

27. HP Sure Start Gen6 is available on select HP PCs with Intel processors.

28. HP Sure Run Gen3 is available on select Windows 10 based HP Pro, Elite and Workstation PCs with select Intel® or AMD processors.

29. HP Sure Recover Gen3 is available on select HP PCs and requires an open network connection. Not available on platforms with multiple internal storage drives. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data.

30. HP Sure Sense requires Windows 10.

Technical Specifications

POWER

Power Supply

HP Smart 65 W USB Type-C® adapter³¹

Primary Battery

HP Long Life 4-cell, 54.5 Wh Li-ion polymer³²

HP Long Life 4-cell, 78.6 Wh Li-ion polymer³²

Power Cord

Premium 1m C5 power cord

Conventional 1m C5 power cord

Battery Life

Up to TBD hours with 54 Whr battery³³

Up to TBD hours with 78.5 Whr battery

31. Availability may vary by country.

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

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

WEIGHTS & DIMENSIONS

Weight

Product Weight

Starting at 2.9 lbs³⁴

Starting at 1.32 kg³⁴

Product Dimensions (w x d x h)

12.57 x 7.98 x 0.65 in

31.93 x 20.26 x 1.66 cm

34. Weight will vary by configuration. Starting weight configuration: FHD, 54Whr battery, 8GB of memory, 128GB SSD, WLAN + BT, No WWAN, No NFC, No Pen

PORTS/SLOTS

Ports

2 USB-C® (Thunderbolt, Supports Power Deliver 3.0, DisplayPort TM 1.2)

2 USB 3.1 Gen 1 (5Gbps signaling rate) Charging Ports

1 HDMI 1.4B⁸

1 External Nano SIM slot for WWAN

1 Headphone/Microphone combo

8. HDMI cable sold separately.

Technical Specifications

SERVICE AND SUPPORT

HP Care Services offers up to 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 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>.³⁵

35. HP Care Services 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

SYSTEM UNIT

| | | |
|--|--|---|
| <i>Stand-Alone Power Requirements (AC Power)</i> | <i>Nominal Operating Voltage</i> | AC 15V |
| | <i>Average Operating Power</i> | Win 10 |
| | <i>Integrated Graphics</i> | Yes |
| | <i>Max Operating Power</i> | UMA < 65W |
| <i>Temperature</i> | <i>Operating</i> | 32° to 95° F (0° to 35° C) (not writing optical) |
| | <i>Non-operating</i> | 41° to 95° F (5° to 35° C) (writing optical) |
| <i>Relative Humidity</i> | <i>Operating</i> | 32° to 95° F (0° to 35° C) (not writing optical) |
| | <i>Non-operating</i> | 5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature |
| <i>Shock</i> | <i>Operating</i> | 40 G, 2 ms, half-sine |
| | <i>Non-operating</i> | 200 G, 2 ms, half-sine |
| <i>Random Vibration</i> | <i>Operating</i> | 1.043 grms |
| | <i>Non-operating</i> | 3.5 grms |
| <i>Altitude (unpressurized)</i> | <i>Operating</i> | -50 to 10,000 ft (-15.24 to 3,048 m) |
| | <i>Non-operating</i> | -50 to 40,000 ft (-15.24 to 12,192 m) |
| <i>Planned Industry Standard Certifications</i> | <i>UL</i> | Yes |
| | <i>CSA</i> | Yes |
| | <i>FCC Compliance</i> | Yes |
| | <i>ENERGY STAR®</i> | Yes³⁷ |
| | <i>EPEAT 2020</i> | TBD³⁸ |
| | <i>ICES</i> | Yes |
| | <i>Australia</i> | Yes |
| | <i>NZ A-Tick Compliance</i> | Yes |
| | <i>CCC</i> | Yes |
| | <i>Japan VCCI Compliance</i> | Yes |
| | <i>KC</i> | Yes |
| | <i>BSMI</i> | Yes |
| | <i>CE Marking Compliance</i> | Yes |
| | <i>BNCI or BELUS</i> | Yes |
| | <i>CIT</i> | Yes |
| | <i>GOST</i> | Yes |
| | <i>Saudi Arabian Compliance (ICCP)</i> | Yes |
| | <i>SABS</i> | Yes |
| | <i>UKRSERTCOMPUTER</i> | Yes |

37. Configurations of the HP EliteBook x360 1040 G7 Notebook PC that are ENERGY STAR® certified are identified as HP EliteBook x360 1040 G7 Notebook PC ENERGY STAR® on HP websites and on <http://www.energystar.gov>.

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

Technical Specifications

DISPLAYS

| | | |
|--|--|----------------------------------|
| <i>Panel LCD 14 inch diagonal FHD (1920x1080) Anti-Glare WLED UWVA sRGB 100% NTSC 400nits eDP 1.4+PSR2 bent LP</i> | <i>Outline Dimensions (W x H x D)</i> | 313.67 X 184.17 mm (max) |
| | <i>Active Area</i> | 309.37 X 174.02 mm (typ.) |
| | <i>Weight</i> | 200 g max. |
| | <i>Diagonal Size</i> | 14.0 inch |
| | <i>Thickness</i> | 2.0mm / 3.8mm (PCB) max. |
| | <i>Interface</i> | eDP 1.4 |
| | <i>Surface Treatment</i> | Anti - Glare |
| | <i>Touch Enabled</i> | Yes |
| | <i>Contrast Ratio</i> | 1200:1 (typ.) |
| | <i>Refresh Rate</i> | 60 Hz |
| | <i>Brightness</i> | 400 nits |
| | <i>Pixel Resolution</i> | 1920 x 1080 (FHD) |
| | <i>Format of LCD Pixel Arrangement</i> | RGB Stripe |
| | <i>Backlight</i> | LED |
| | <i>Color Gamut Coverage</i> | sRGB 100% (NTSC 72%) |
| | <i>Color Depth</i> | 8 bits |
| | <i>Viewing Angle</i> | UWVA 85/85/85/85 |

Technical Specifications

| | | |
|--|--|------------------------------------|
| <i>Panel LCD 14 inch diagonal UHD (3840x2160) BrightView WLED UWVA HDR-400 sRGB 95% NTSC 550nits eDP 1.4+PSR2 bent</i> | <i>Outline Dimensions (W x H x D)</i> | 313.61 X 184.74 mm (max) |
| | <i>Active Area</i> | 309.31 X 173.98 mm (typ.) |
| | <i>Weight</i> | 220 g (max) |
| | <i>Diagonal Size</i> | 14.0 inch |
| | <i>Thickness</i> | 2.0 mm/3.8 mm (w/PCB) (max) |
| | <i>Interface</i> | eDP 1.4 |
| | <i>Surface Treatment</i> | BrightView |
| | <i>Touch Enabled</i> | Yes |
| | <i>Contrast Ratio</i> | 1400:1 (typ.) |
| | <i>Refresh Rate</i> | 60 Hz |
| | <i>Brightness</i> | 500 nits |
| | <i>Pixel Resolution</i> | 3840 x 2160 (UHD) |
| | <i>Format of LCD Pixel Arrangement</i> | RGB Stripe |
| | <i>Backlight</i> | LED |
| | <i>Color Gamut Coverage</i> | sRGB 95% |
| | <i>Color Depth</i> | 8 bits + 2FRC |
| | <i>Viewing Angle</i> | UWVA 85/85/85/85 |

| | | |
|---|--|-----------------------------------|
| <i>Panel LCD 14-in diagonal FHD (1920x1080) Anti-Glare WLED UWVA 72% NTSC 1000nits eDP 1.4+PSR PrivacyG4 NB2Y</i> | <i>Outline Dimensions (W x H x D)</i> | 314.612 x 185.33 mm (max.) |
| | <i>Active Area</i> | 309.312 x 173.99 mm |
| | <i>Weight</i> | 230 g (max) |
| | <i>Diagonal Size</i> | 14.0" |
| | <i>Thickness</i> | 3.9 mm (max.) |
| | <i>Interface</i> | eDP |
| | <i>Surface Treatment</i> | Anti – glare (AG) |
| | <i>Touch Enabled</i> | Yes |
| | <i>Contrast Ratio</i> | 1500:1 (typ.) |
| | <i>Refresh Rate</i> | 60 Hz |
| | <i>Brightness</i> | 1000 nits |
| | <i>Pixel Resolution</i> | 1920 x 1080 (FHD) |
| | <i>Format of LCD Pixel Arrangement</i> | RGB |

Technical Specifications

| | |
|-----------------------------|-------------------------|
| <i>Backlight</i> | LED |
| <i>Color Gamut Coverage</i> | 72% |
| <i>Color Depth</i> | 8 bits |
| <i>Viewing Angle</i> | 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.

STORAGE

| | | |
|--|---|---|
| <i>SSD 128 GB 2280 M2 SATA-3 TLC</i> | <i>Form Factor</i> | M.2 2280 |
| | <i>Capacity</i> | 128 GB |
| | <i>NAND Type</i> | TLC |
| | <i>Height</i> | 0.09 in (2.3 mm) |
| | <i>Width</i> | 0.87 in (22 mm) |
| | <i>Weight</i> | 0.02 lb (10 g) |
| | <i>Interface</i> | ATA-8, SATA 3.0 |
| | <i>Maximum Sequential Read</i> | 550 MB/s ~ 560 MB/s |
| | <i>Maximum Sequential Write</i> | 380 MB/s ~ 530 MB/s |
| | <i>Logical Blocks</i> | 250,069,680 |
| | <i>Operating Temperature</i> | 32° to 158°F (0° to 70°C) [ambient temp] |
| <i>Features</i> | ATA Security; DIPM; TRIM; DEVSLP | |

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

| | | |
|--|--|---|
| <i>SSD 1 TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided</i> | <i>Form Factor</i> | M.2 2280 |
| | <i>Capacity</i> | 1 TB |
| | <i>NAND Type</i> | TLC |
| | <i>Height</i> | 0.09 in (2.3 mm) |
| | <i>Width</i> | 0.87 in (22 mm) |
| | <i>Weight</i> | 0.02 lb (10 g) |
| | <i>Interface</i> | PCIe NVMe Gen3X4 |
| | <i>Maximum Sequential Read</i> | 3100 ~ 3500 MB/s |
| | <i>Maximum Sequential Write</i> | 2770 ~ 3037 MB/s |
| | <i>Logical Blocks</i> | 2,000,409,264 |
| | <i>Operating Temperature</i> | 32° to 158°F (0° to 70°C) [ambient temp] |
| <i>Features</i> | ATA Security (Option); TRIM; L1.2 | |

Technical Specifications

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

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 | 2800 MB/s ~ 3500 MB/s |
| Maximum Sequential Write | 1400 MB/s ~ 2200 MB/s |
| Logical Blocks | 500,118,192 |
| Operating Temperature | 32° to 158°F (0° to 70°C) [ambient temp] |
| Features | ATA Security; TRIM; L1.2 |

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

SSD 256 GB 2280 PCIe
NVMe Value

| | |
|--------------------------|---|
| Form Factor | M.2 2280 |
| Capacity | 256 GB |
| NAND Type | Value |
| Height | 0.09 in (2.3 mm) |
| Width | 0.87 in (22 mm) |
| Weight | 0.02 lb (10 g) |
| Interface | PCIe NVMe Gen3 |
| Maximum Sequential Read | 2100 MB/s ~ 2200 MB/s |
| Maximum Sequential Write | 900 MB/s ~ 1400 MB/s |
| Logical Blocks | 500,118,192 |
| Operating Temperature | 32° to 158°F (0° to 70°C) [ambient temp] |
| Features | ATA Security (optional); TRIM; L1.2 |

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

Technical Specifications

| | | |
|--|---------------------------------|---|
| <i>SSD 256 GB 2280 PCIe-3x2x2 NVMe+SSD 16 GB 3D Xpoint</i> | <i>Form Factor</i> | M.2 2280 |
| | <i>Capacity</i> | 256 GB |
| | <i>NAND Type</i> | QLC + 3D XPoint |
| | <i>Height</i> | 0.09 in (2.3 mm) |
| | <i>Width</i> | 0.87 in (22 mm) |
| | <i>Weight</i> | 0.02 lb (10 g) |
| | <i>Interface</i> | PCIe NVMe Gen3X2X2 |
| | <i>Maximum Sequential Read</i> | Up To 1450 MB/s |
| | <i>Maximum Sequential Write</i> | Up To 500 MB/s |
| | <i>Logical Blocks</i> | 500, 118, 192 |
| | <i>Operating Temperature</i> | 32° to 158°F (0° to 70°C) [ambient temp] |
| | <i>Features</i> | ATA Security; TRIM; L1.2 |

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

| | | |
|--|---------------------------------|--|
| <i>SSD 256 GB 2280 PCIe-3x4 NVMe Self Encrypted OPAL2 Three Layer Cell</i> | <i>Form Factor</i> | M.2 2280 |
| | <i>Capacity</i> | 256 GB |
| | <i>NAND Type</i> | TLC |
| | <i>Height</i> | 0.09 in (2.3 mm) |
| | <i>Width</i> | 0.87 in (22 mm) |
| | <i>Weight</i> | 0.02 lb (10 g) |
| | <i>Interface</i> | PCIe NVMe Gen3X4 |
| | <i>Maximum Sequential Read</i> | 2800 MB/s ~ 3500 MB/s |
| | <i>Maximum Sequential Write</i> | 1663 MB/s ~ 2200 MB/s |
| | <i>Logical Blocks</i> | 500, 118, 192 |
| | <i>Operating Temperature</i> | 32° to 158°F (0° to 70°C) [ambient temp] |
| | <i>Features</i> | ATA Security (Option); TCG Opal 2.0; TRIM; L1.2 |

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

Technical Specifications

| | | |
|--|---------------------------------|---|
| <i>SSD 512 GB 2280 M2 PCIe-3x4 SS NVMe TLC</i> | <i>Form Factor</i> | M.2 2280 |
| | <i>Capacity</i> | 512 GB |
| | <i>NAND Type</i> | TLC |
| | <i>Height</i> | 0.09 in (2.3 mm) |
| | <i>Width</i> | 0.87 in (22 mm) |
| | <i>Weight</i> | 0.02 lb (10 g) |
| | <i>Interface</i> | PCIe NVMe Gen3X4 |
| | <i>Maximum Sequential Read</i> | 3100 MB/s ~ 3500 MB/s |
| | <i>Maximum Sequential Write</i> | 2400 MB/s ~ 2956 MB/s |
| | <i>Logical Blocks</i> | 1,000, 215, 215 |
| | <i>Operating Temperature</i> | 32° to 158°F (0° to 70°C) [ambient temp] |
| | <i>Features</i> | ATA Security; TRIM; L1.2 |

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

| | | |
|--|---------------------------------|---|
| <i>SSD 512 GB 2280 PCIe NVMe Value</i> | <i>Form Factor</i> | M.2 2280 |
| | <i>Capacity</i> | 512 GB |
| | <i>NAND Type</i> | Value |
| | <i>Height</i> | 0.09 in (2.3 mm) |
| | <i>Width</i> | 0.87 in (22 mm) |
| | <i>Weight</i> | 0.02 lb (10 g) |
| | <i>Interface</i> | PCIe NVMe Gen3 |
| | <i>Maximum Sequential Read</i> | 2200 MB/s ~ 2300 MB/s |
| | <i>Maximum Sequential Write</i> | 1000 MB/s ~ 1600 MB/s |
| | <i>Logical Blocks</i> | 1,000, 215, 215 |
| | <i>Operating Temperature</i> | 32° to 158°F (0° to 70°C) [ambient temp] |
| | <i>Features</i> | ATA Security (optional); TRIM; L1.2 |

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

Technical Specifications

| | | |
|--|---------------------------------|---|
| <i>SSD 512 GB 2280 PCIe-3x2x2 NVMe+SSD 32 GB 3D Xpoint</i> | <i>Form Factor</i> | M.2 2280 |
| | <i>Capacity</i> | 512 GB |
| | <i>NAND Type</i> | QLC + 3D XPoint |
| | <i>Height</i> | 0.09 in (2.3 mm) |
| | <i>Width</i> | 0.87 in (22 mm) |
| | <i>Weight</i> | 0.02 lb (10 g) |
| | <i>Interface</i> | PCIe NVMe Gen3X2X2 |
| | <i>Maximum Sequential Read</i> | Up To 2400 MB/s |
| | <i>Maximum Sequential Write</i> | Up to 1300 MB/s |
| | <i>Logical Blocks</i> | 1,000, 215, 215 |
| | <i>Operating Temperature</i> | 32° to 158°F (0° to 70°C) [ambient temp] |
| | <i>Features</i> | ATA Security, TRIM; L1.2 |

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

| | | |
|---|---------------------------------|--|
| <i>SSD 512 GB 2280 PCIe-3x4 NVMe Self Encrypted OPAL2 Three Layer</i> | <i>Form Factor</i> | M.2 2280 |
| | <i>Capacity</i> | 512 GB |
| | <i>NAND Type</i> | TLC |
| | <i>Height</i> | 0.09 in (2.3 mm) |
| | <i>Width</i> | 0.87 in (22 mm) |
| | <i>Weight</i> | 0.02 lb (10 g) |
| | <i>Interface</i> | PCIe NVMe Gen3X4 |
| | <i>Maximum Sequential Read</i> | 3100 ~ 3500 MB/s |
| | <i>Maximum Sequential Write</i> | 2400 ~ 2956 MB/s |
| | <i>Logical Blocks</i> | 1,000, 215, 215 |
| | <i>Operating Temperature</i> | 32° to 158°F (0° to 70°C) [ambient temp] |
| | <i>Features</i> | ATA Security (Option); TCG Opal 2.0; TRIM; L1.2 |

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

Technical Specifications

NETWORKING/COMMUNICATIONS

Intel® Wi-Fi 6¹ AX201 and Wireless LAN Standards
Bluetooth® 5.0 802.11ax
(2 x 2), non-vPro,
supporting gigabit file
transfer speeds non-vPro

IEEE 802.11a
IEEE 802.11b
IEEE 802.11g
IEEE 802.11n
IEEE 802.11ac
IEEE 802.11ax
IEEE 802.11d
IEEE 802.11e
IEEE 802.11h
IEEE 802.11i
IEEE 802.11k
IEEE 802.11r
IEEE 802.11v

Interoperability
Frequency Band

Wi-Fi CERTIFIED™
•802.11b/g/n/ax
2.402 – 2.482 GHz
•802.11a/n/ac/ax
4.9 – 4.95 GHz (Japan)
5.15 – 5.25 GHz
5.25 – 5.35 GHz
5.47 – 5.725 GHz
5.825 – 5.850 GHz

Data Rates

•802.11b: 1, 2, 5.5, 11 Mbps
•802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
•802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
•802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)
•802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)
•802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)

Modulation

Direct Sequence Spread Spectrum
OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM

Security³

•IEEE compliant 64 / 128 bit WEP encryption for a/b/g mode only
•AES-CCMP: 128 bit in hardware
•802.1x authentication
•WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.
•WPA2 certification
•IEEE 802.11i
•WAPI

Network Architecture
Models

Ad-hoc (Peer to Peer)
Infrastructure (Access Point Required)

Roaming

IEEE 802.11 compliant roaming between access points

Output Power²

•802.11b: +18.5dBm minimum
•802.11g: +17.5dBm minimum
•802.11a: +18.5dBm minimum

Technical Specifications

| | |
|---|--|
| | <ul style="list-style-type: none"> • 802.11n HT20(2.4GHz): +15.5dBm minimum • 802.11n HT40(2.4GHz): +14.5dBm minimum • 802.11n HT20(5GHz): +15.5dBm minimum • 802.11n HT40(5GHz): +14.5dBm minimum • 802.11ac VHT80(5GHz): +11.5dBm minimum • 802.11ac VHT160(5GHz): +11.5dBm minimum • 802.11ax HT40(2.4GHz): +10dBm minimum • 802.11ax VHT160(5GHz): +10dBm minimum |
| <i>Power Consumption</i> | <ul style="list-style-type: none"> • Transmit mode 2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode: 50 mW (WLAN unassociated) • Connected Standby: 10 mW • Radio disabled: 8 mW |
| <i>Power Management</i> | <p>ACPI and PCI Express compliant power management</p> <p>802.11 compliant power saving mode</p> |
| <i>Receiver Sensitivity³</i> | <ul style="list-style-type: none"> • 802.11b, 1Mbps: -93.5dBm maximum • 802.11b, 11Mbps: -84dBm maximum • 802.11a/g, 6Mbps: -86dBm maximum • 802.11a/g, 54Mbps: -72dBm maximum • 802.11n, MCS07: -67dBm maximum • 802.11n, MCS15: -64dBm maximum • 802.11ac, MCS0: -84dBm maximum • 802.11ac, MCS9: -59dBm maximum • 802.11ax, MCS11(HT40): -59dBm maximum • 802.11ax, MCS11(VHT160): -58.5dBm maximum |
| <i>Antenna type</i> | <p>High efficiency antenna with spatial diversity, mounted in the display enclosure</p> <p>Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications</p> |
| <i>Form Factor</i> | <p>PCI-Express M.2 MiniCard with CNVi Interface</p> |
| <i>Dimensions</i> | <p>Type 2230: 2.3 x 22.0 x 30.0 mm</p> <p>Type 1216: 1.67 x 12.0 x 16.0 mm</p> |
| <i>Weight</i> | <p>Type 2230: 2.8 g</p> <p>Type 1216: 1.3 g</p> |
| <i>Operating Voltage</i> | <p>3.3 v +/- 9%</p> |
| <i>Temperature</i> | <p>Operating: 14° to 158° F (-10° to 70° C)</p> <p>Non-operating: -40° to 176° F (-40° to 80° C)</p> |
| <i>Humidity</i> | <p>Operating: 10% to 90% (non-condensing)</p> <p>Non-operating: 5% to 95% (non-condensing)</p> |
| <i>Altitude</i> | <p>Operating: 0 to 10,000 ft (3,048 m)</p> <p>Non-operating: 0 to 50,000 ft (15,240 m)</p> |
| <i>LED Activity</i> | <p>LED Amber – Radio OFF</p> <p>LED OFF – Radio ON</p> |

HP Integrated Module with Bluetooth® 4.0/4.1/4.2/5.0/5.1 Wireless Technology

Bluetooth® Specification 4.0/4.1/4.2/5.0/5.1 Compliant

Technical Specifications

| | |
|-------------------------------------|---|
| <i>Frequency Band</i> | 2402 to 2480 MHz |
| <i>Number of Available Channels</i> | Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH) |
| <i>Signaling Data Rate</i> | Legacy: 3 Mbps signaling data rate 2.17 Mbps BLE: 1 Mbps signaling data rate 0.2 Mbps 1. Actual throughput may vary. |
| | Legacy: Synchronous Connection Oriented links, 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) |
| <i>Transmit Power</i> | The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 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 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft 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 802.11ax devices. Only available in countries where 802.11ax is supported.**
- 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).**

| | | |
|--|-------------------------------|---|
| <i>Intel® Wi-Fi 6 AX201 and Bluetooth® 5.0 802.11ax (2 x 2) vPro, supporting gigabit file transfer speeds vPro</i> | <i>Wireless LAN Standards</i> | IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v |
| | <i>Interoperability</i> | Wi-Fi CERTIFIED™ |
| | <i>Frequency Band</i> | •802.11b/g/n/ax 2.402 – 2.482 GHz •802.11a/n/ac/ax 4.9 – 4.95 GHz (Japan) 5.15 – 5.25 GHz 5.25 – 5.35 GHz 5.47 – 5.725 GHz 5.825 – 5.850 GHz |
| | <i>Data Rates</i> | •802.11b: 1, 2, 5.5, 11 Mbps |

Technical Specifications

| | |
|---|---|
| | <ul style="list-style-type: none">•802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps•802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps•802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)•802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)•802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, 80MHz & 160MHz) |
| <i>Modulation</i> | Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM |
| <i>Security³</i> | <ul style="list-style-type: none">•IEEE compliant 64 / 128 bit WEP encryption for a/b/g mode only•AES-CCMP: 128 bit in hardware•802.1x authentication•WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.•WPA2 certification•IEEE 802.11i•WAPI |
| <i>Network Architecture Models</i> | Ad-hoc (Peer to Peer) Infrastructure (Access Point Required) |
| <i>Roaming</i> | IEEE 802.11 compliant roaming between access points |
| <i>Output Power²</i> | <ul style="list-style-type: none">•802.11b: +18.5dBm minimum•802.11g: +17.5dBm minimum•802.11a: +18.5dBm minimum•802.11n HT20(2.4GHz): +15.5dBm minimum•802.11n HT40(2.4GHz): +14.5dBm minimum•802.11n HT20(5GHz): +15.5dBm minimum•802.11n HT40(5GHz): +14.5dBm minimum•802.11ac VHT80(5GHz): +11.5dBm minimum•802.11ac VHT160(5GHz): +11.5dBm minimum•802.11ax HT40(2.4GHz): +10dBm minimum•802.11ax VHT160(5GHz): +10dBm minimum |
| <i>Power Consumption</i> | <ul style="list-style-type: none">•Transmit mode: 2.0 W•Receive mode: 1.6 W•Idle mode (PSP) 180 mW (WLAN Associated)•Idle mode: 50 mW (WLAN unassociated)•Connected Standby: 10 mW•Radio disabled: 8 mW |
| <i>Power Management</i> | ACPI and PCI Express compliant power management 802.11 compliant power saving mode |
| <i>Receiver Sensitivity³</i> | <ul style="list-style-type: none">•802.11b, 1Mbps: -93.5dBm maximum•802.11b, 11Mbps: -84dBm maximum•802.11a/g, 6Mbps: -86dBm maximum•802.11a/g, 54Mbps: -72dBm maximum•802.11n, MCS07: -67dBm maximum•802.11n, MCS15: -64dBm maximum•802.11ac, MCS0: -84dBm maximum•802.11ac, MCS9: -59dBm maximum•802.11ax, MCS11(HT40): -59dBm maximum |

Technical Specifications

| | |
|--------------------------|--|
| <i>Antenna type</i> | <p>•802.11ax, MCS11(VHT160): -58.5dBm maximum</p> <p>High efficiency antenna with spatial diversity, mounted in the display enclosure</p> <p>Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications</p> |
| <i>Form Factor</i> | PCI-Express M.2 MiniCard with CNVi Interface |
| <i>Dimensions</i> | <p>Type 2230: 2.3 x 22.0 x 30.0 mm</p> <p>Type 1216: 1.67 x 12.0 x 16.0 mm</p> |
| <i>Weight</i> | <p>Type 2230: 2.8 g</p> <p>Type 126: 1.3 g</p> |
| <i>Operating Voltage</i> | 3.3 v +/- 9% |
| <i>Temperature</i> | <p>Operating: 14° to 158° F (-10° to 70° C)</p> <p>Non-operating: -40° to 176° F (-40° to 80° C)</p> |
| <i>Humidity</i> | <p>Operating: 10% to 90% (non-condensing)</p> <p>Non-operating: 5% to 95% (non-condensing)</p> |
| <i>Altitude</i> | <p>Operating: 0 to 10,000 ft (3,048 m)</p> <p>Non-operating: 0 to 50,000 ft (15,240 m)</p> |
| <i>LED Activity</i> | <p>LED Amber – Radio OFF</p> <p>LED White – Radio ON</p> |

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology

| | |
|-------------------------------------|---|
| <i>Bluetooth Specification</i> | 4.0/4.1/4.2/5.0/5.1 Compliant |
| <i>Frequency Band</i> | 2402 to 2480 MHz |
| <i>Number of Available Channels</i> | <p>Legacy: 0~79 (1 MHz/CH)</p> <p>BLE: 0~39 (2 MHz/CH)</p> |
| <i>Signaling Data Rate</i> | <p>Legacy: 3 Mbps signaling data rate 2.17 Mbps</p> <p>BLE: 1 Mbps signaling data rate 0.2 Mbps</p> <p>1. Actual throughput may vary.</p> |
| <i>Transmit Power</i> | <p>Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels</p> <p>Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)</p> <p>The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.</p> |

- 1. 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. The specifications for Wi-Fi 6 (802.11ax) are draft 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 802.11ax devices. Only available in countries where 802.11ax is supported.**
- 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

| | | |
|---|---|---|
| Intel® XMM™ 7360 LTE-Advanced CAT9 ¹ | Technology/Operating bands | <p>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).</p> <p>TDD LTE: 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41).</p> <p>HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz</p> |
| | Wireless protocol standards | 3GPP Release 11 LTE Specification CAT.9, DL 60MHz BW throughput up to 450Mbps; UL 20MHz throughput up to 50Mbps |
| | GPS | WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification 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) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload) |
| | Maximum output power | LTE: 23 dBm 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 | 5.8 g |
| | Dimensions (Length x Width x Thickness) | 42 x 30 x 2.3 mm |

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

Technical Specifications

Qualcomm® Snapdragon™ Technology/Operating
X55 5G Modem bands

WCDMA/HSDPA/HSUPA/HSPA+ operating bands:

Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)
Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)
Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)
Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)
Band 6: 830 to 840 MHz (UL), 875 to 885 MHz (DL)
Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)
Band 9: 1750 to 1785 MHz (UL), 1845 to 1880 MHz (DL)
Band 19: 830 to 845 MHz (UL), 875 to 890 MHz (DL)

LTE FDD/TDD operating bands:

Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)
Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)
Band 3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL)
Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL)
Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)
Band 7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)
Band 8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)
Band 12: 699 to 716 MHz (UL), 729 to 746 MHz (DL)
Band 13: 777 to 787 MHz (UL), 746 to 756 MHz (DL)
Band 14: 788 to 798 MHz (UL), 758 to 768 MHz (DL)
Band 17: 704 to 716 MHz (UL), 734 to 746 MHz (DL)
Band 18: 815 to 830 MHz (UL), 860 to 875 MHz (DL)
Band 19: 830 to 845 MHz (UL), 875 to 890 MHz (DL)
Band 20: 832 to 862 MHz (UL), 791 to 821 MHz (DL)
Band 25: 1850 to 1915 MHz (UL), 1930 to 1995 MHz (DL)
Band 26: 814 to 849 MHz (UL), 859 to 894 MHz (DL)
Band 28: 703 to 748 MHz (UL), 758 to 803 MHz (DL)
Band 29: 717 to 728 MHz (DL)
Band 30: 2305 to 2315 MHz (UL) 2350 to 2360 MHz (DL)
Band 32: 1452 to 1496 MHz (DL)
Band 34: 2010 to 2025 MHz (UL/DL)
Band 38: 2570 to 2620 MHz (UL/DL)
Band 39: 1880 to 1920 MHz (UL/DL)
Band 40: 2300 to 2400 MHz (UL/DL)
Band 41: 2496 to 2690 MHz (UL/DL)
Band 42: 3400 to 3600 MHz (UL/DL)
Band 46: 5150 to 5925 MHz (DL)
Band 48: 3550 to 3700 MHz (UL/DL)
Band 66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)
Band 71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)

5G NR Sub 6GHz

n1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL)
n2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL)
n3: 1710 to 1785 MHz (UL), 1805 to 1880 MHz (DL)
n5: 824 to 849 MHz (UL), 869 to 894 MHz (DL)
n7: 2500 to 2570 MHz (UL), 2620 to 2690 MHz (DL)
n8: 880 to 915 MHz (UL), 925 to 960 MHz (DL)

Technical Specifications

n12: 699 to 716 MHz (UL), 729 to 746 MHz (DL)
 n20: 832 to 862 MHz (UL), 791 to 821 MHz (DL)
 n28: 703 to 748 MHz (UL), 758 to 803 MHz (DL)
 n41: 2496 to 2690 MHz (UL/DL)
 n66: 1710 to 1800 MHz (UL), 2110 to 2200 MHz (DL)
 n71: 663 to 698 MHz (UL), 617 to 652 MHz (DL)
 n77: 3300 to 4200 MHz (UL/DL)
 n78: 3300 to 3800 MHz (UL/DL)
 n79: 4400 to 5000 MHz (UL/DL)

Wireless protocol standards

5G NR Air Interface
3GPP Rel15 5G NR sub-6

LTE Rel14
20 layers and 2 Gbps downlink (DL) throughput – 4 × 4 MIMO across 5x CA
200 Mbps uplink (UL) throughput – 40 MHz ULCA and 256 QAM

GPS bands

WCDMA
R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
Standalone, A-GPS (MS-A, MS-B)
GPS: L1 (1575.42MHz); L5 (1176MHz)
GLONASS: L1 (1602MHz)
BeidouB1(1561.098MHz)
Galileo E1 (1575.42); E5a (1176MHz)

Maximum data rates

5G sub 6G: TBD
LTE: ue-CategoryDL 20, (DL: 2 Gbps)
ue-CategoryUL 13, (UL: 150Mbps)
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

5G Sub 6: TBD
LTE: 1,300 mA (peak); 1100 mA (average)
LTE HPUE: TBD
HSPA+: 1,100 mA (peak); 800 mA (average)

Form Factor

M.2, 3042-S3 Key B

Weight

8 g

Dimensions (Length x Width x Thickness)

42 mm x 30 mm x 2.6 mm

Built-in Tile module

Bluetooth Specification

Bluetooth Core Specification v5.0
Bluetooth® 5, IEEE 802.15.4-2006

Technical Specifications

| | | |
|--|--|--|
| | <i>Frequency Band</i> | 2400 to 2483.5 MHz |
| | <i>Number of Available Channels</i> | TBD |
| | <i>Data Rate</i> | BLE: 1 Mbps data rate |
| | <i>Transmit Power</i> | Max TX power: 8dBm |
| | <i>Power Consumption</i> | <0.1mW at idle mode (ready to be found) |
| | <i>Bluetooth Profiles Supported</i> | TBD |
| | <i>Form Factor</i> | PCI-Express M.2 MiniCard |
| | <i>Dimensions</i> | Type 3042: 30 x 42 x 2.3 mm |
| | <i>Weight</i> | 4.0 g |
| | <i>Operating Voltage</i> | DC 3.135V ~ 3.6V, Typical 3.3V |
| | <i>Temperature</i> | Operating: -10°C ~ +55°C Non-operating: - 40°C ~ +85°C |
| <i>Near Field Communications Controller (optional)</i> | <i>Dimensions (L x W x H)</i> | Module 25 mm by 10 mm by 2.0 mm |
| | <i>Chipset</i> | NPC100 |
| | <i>System interface</i> | I2C |
| | <i>NFC RF standards</i> | ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 ISO/IEC 18092 ECMA-340 NFCIP-1 Target and Initiator ECMA-320 NFCIP-2 |
| | <i>NFC Forum Support</i> | Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2 |
| | <i>Reader (PCD-VCD) Mode (1)</i> | ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 MIFARE 1K MIFARE 4K MIFARE DESFire FeliCa Jewel and Topaz cards |
| | <i>Card Emulation (PICC-VICC) Mode (1)</i> | ISO/IEC 14443 A ISO/IEC 14443 B and B' MIFARE FeliCa |
| | <i>Frequency</i> | 13.56 MHz |

Technical Specifications

| | |
|---------------------------------|---|
| <i>NFC Modes Supported</i> | Reader/Writer, Peer-to-Peer |
| <i>Raw RF Data Rates</i> | 106, 212, 424, 848 kbps |
| <i>Operating temperature</i> | 0°C to 70°C |
| <i>Storage temperature</i> | -20°C to 125°C |
| <i>Humidity</i> | 10-90% operating 5-95% non-operating |
| <i>Supply Operating voltage</i> | 4.35 to 5.25 Volts |
| <i>I/O Voltage</i> | 1.8V or 3.3V |
| <i>Mode</i> | Power Consumption, Typical |
| <i>Polling</i> | 7.3 mA |
| <i>Detected Test Tag Type 1</i> | Total 283.8 mA Net Module 236.8 mA |
| <i>Detected Test Tag Type 2</i> | Total 288.8 mA Net Module 241.8 mA |
| <i>Detected Test Tag Type 3</i> | Total 287.7 mA Net Module 240.7 mA |
| <i>Antenna</i> | Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module. |

POWER

| | | |
|----------------------------------|-----------------------------|--|
| <i>AC Adapter 65 Watt nPFC</i> | <i>Dimensions</i> | 88.0 x 53.5 x 21.0 mm |
| <i>Slim USB type C® Straight</i> | <i>Weight</i> | Unit: 220 g +/- 10 g |
| <i>1.8 m</i> | | Not including power cord. Power cord varies by country |
| | <i>Input</i> | <i>Input Efficiency</i> |
| | | 81.5% min at 115 Vac/ 230Vac @ 5V/3A 86.7% min at 115 Vac/ 230Vac @ 9V/3A 88% min at 115 Vac/ 230Vac @ 12V/5A 89% min at 115 Vac/ 230Vac @ 15V/4.33A 89% min at 115 Vac/ 230Vac @ 20V/3.25A |
| | | <i>Input frequency range</i> |
| | | 47 ~ 63 Hz |
| | | <i>Input AC current</i> |
| | | Max. 1.6 A at 90 VAC |
| | <i>Output</i> | <i>Output power</i> |
| | | 65 W |
| | | <i>DC output</i> |
| | | 5V / 9V / 12V / 15V / 20V |
| | | <i>Hold-up time</i> |
| | | 5ms at 115 Vac input |
| | | <i>Output current limit</i> |
| | | < 8.0 A |
| | <i>Connector</i> | USB Type-C® |
| | <i>Environmental Design</i> | <i>Operating temperature</i> |
| | | 32° to 95° F (0° to 35° C) |
| | | <i>Non-operating (storage) temperature</i> |
| | | -4° to 185° F (-20° to 85° C) |
| | | <i>Altitude</i> |
| | | 0 to 16,400 ft (0 to 5000m) |
| | | <i>Humidity</i> |
| | | 5% to 95% |

Technical Specifications

| | | | |
|--|--------------------------------------|--|---|
| | <i>EMI and Safety Certifications</i> | <i>Storage Humidity</i> | 5% to 95% |
| | | 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, CCC, NOM-1 NYCE | |
| | | MTBF- over 200,000 hours at 25°C ambient condition. | |
| <hr/> | | | |
| <i>AC Adapter 65 Watt nPFC Standard USB type C® Straight 1.8 m</i> | <i>Dimensions</i> | 90.0 x 51 x 28.5 mm | |
| | <i>Weight</i> | Unit: 250 g +/- 10 g | |
| | <i>Input</i> | Not including power cord. Power cord varies by country | |
| | | <i>Input Efficiency</i> | 81.5% min at 115 Vac/ 230Vac @ 5V/3A |
| | | | 86.7% min at 115 Vac/ 230Vac @ 9V/3A |
| | | | 88% min at 115 Vac/ 230Vac @ 10V/5A |
| | | | 88% min at 115 Vac/ 230Vac @ 12V/5A |
| | | | 89% min at 115 Vac/ 230Vac @ 15V/4.33A |
| | | | 89% min at 115 Vac/ 230Vac @ 20V/3.25A |
| | | <i>Input frequency range</i> | 47 ~ 63 Hz |
| | <i>Output</i> | <i>Input AC current</i> | 1.6 A at 90 VAC and maximum load |
| | | <i>Output power</i> | 65 W |
| | | <i>DC output</i> | 5V/9V/12V/15V/20V |
| | | <i>Hold-up time</i> | 5ms at 115 Vac input |
| | <i>Connector</i> | <i>Output current limit</i> | 8.0 A Max. |
| | <i>Environmental Design</i> | USB Type-C® | |
| | | <i>Operating temperature</i> | 32° to 95° F (0° to 35° C) |
| | | <i>Non-operating (storage) temperature</i> | -4° to 185° F (-20° to 85° C) |
| | | <i>Altitude</i> | 0 to 16,400 ft (0 to 5000m) |
| | | <i>Humidity</i> | 20% to 95% |
| | | <i>Storage Humidity</i> | 10% to 95% |
| | <i>EMI and Safety Certifications</i> | CE Mark- full compliance with LVD and EMC directives | |
| | | Worldwide safety standards -IEC60950, EN60950, UL60950, UL62368, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE | |
| | | MTBF- over 200,000 hours at 25°C ambient condition. | |
| <hr/> | | | |
| <i>Battery HK 4 Cell WHr 54 Long Life -PL Fast Charge</i> | <i>Dimensions (H x W x L)</i> | 5.85 x 89.7 x 268.2 mm | |
| | <i>Weight</i> | 221g ± 10g | |
| | <i>Cells/Type</i> | 4-cell; Polymer | |
| | <i>Energy</i> | <i>Voltage</i> | 7.7V |
| | | <i>Amp-hour capacity</i> | 7.013Ah |
| | | <i>Watt-hour capacity</i> | 54Wh |
| | <i>Temperature</i> | <i>Operating (Charging)</i> | 0° to 45° C |
| | | <i>Operating (Discharging)</i> | -10° to 60° C |
| | <i>Fuel Gauge LED</i> | No | |

Technical Specifications

| | | |
|---|-------------------------------|---|
| <i>Battery HK 4 Cell WHr 78.5 Long Life -PL Fast Charge</i> | <i>Dimensions (H x W x L)</i> | 6.49mm x 94.6mm x 281.6mm |
| | <i>Weight</i> | 295 g ± 10 g |
| | <i>Cells/Type</i> | 4-cell; Polymer |
| | <i>Energy</i> | <i>Voltage</i> 7.72 V |
| | | <i>Amp-hour capacity</i> 10.18 Ah |
| | | <i>Watt-hour capacity</i> 78.5 Wh |
| | <i>Temperature</i> | <i>Operating (Charging)</i> 0° to 45° C |
| | | <i>Operating (Discharging)</i> -10° to 60° C |
| | <i>Fuel Gauge LED</i> | No |

Technical Specifications

COUNTRY OF ORIGIN

China

Summary of Changes

| <i>Type</i> | <i>Description</i> | <i>Part #</i> |
|---------------------|--|----------------|
| <i>Cases</i> | HP Executive 14.1 Slim Topload | 6KD04AA |
| | HP Executive 15.6 Top Load | 6KD06AA |
| | HP Executive 15.6 Backpack | 6KD07AA |
| | HP Recycle Series Top Load | 5KN29AA |
| <i>Docking</i> | HP Thunderbolt Dock 120W G2 (Hook) | 2UK37AA |
| | HP Thunderbolt Dock w/Audio Module | 3YE87AA |
| | HP Audio Module (Hook base dock required) | 3AQ21AA |
| | HP Thunderbolt Dock 120W Cable | 3XB94AA |
| | HP Thunderbolt Dock Combo Cable | 3XB96AA |
| | HP USB-C® Mini Dock | 1PM64AA |
| | HP USB-C® Dock G5 | 5TW10AA |
| | HP USB-C®/A Universal Dock G2 | 5TW13AA |
| | HP EliteDisplay E223d Docking monitor | 5VT82AA |
| | HP EliteDisplay E273d Docking monitor | 5WN63AA |
| <i>Input/Output</i> | HP Wireless (Link-5) Keyboard | T6U20AA |
| | HP USB Collaboration Keyboard | Z9N38AA |
| | HP Wireless Collaboration Keyboard | Z9N39AA |
| | HP USB Essential Keyboard and Mouse | H6L29AA |
| | HP Slim Wireless Keyboard and Mouse | T6L04AA |
| | HP Comfort Grip Wireless Mouse | H2L63AA |
| | HP X4000b Bluetooth Mouse | H3T50AA |
| | HP 3-button USB Laser Mouse | H4B81AA |
| | HP Ultra Mobile Wireless Mouse | H6F25AA |
| | HP USB Travel Mouse | G1K28AA |
| | HP Wireless Premium Mouse | 1JR31AA |
| | HP USB Premium Mouse | 1JR32AA |
| | HP Essential USB Mouse | 2TX37AA |
| | HP Elite Presenter Mouse | 2CE30AA |
| | HP Bluetooth Travel Mouse | 6SP30AA |
| | HP UC Speaker Phone | 4VW02AA |
| | HP Stereo USB Headset | T1A67AA |
| | HP UC Wireless Mono Headset | W3K08AA |
| | HP UC Wireless Duo Headset | W3K09AA |
| | HP Rechargeable Active Pen G3 | 6SG43AA |
| | HP USB-C® to USB-A Hub | Z6A00AA |
| | HP USB-C® to DP | N9K78AA |
| | HP USB-C® to VGA | N9K76AA |
| | HP USB-C® to RJ45 Adapter | V7W66AA |
| | HP HDMI to VGA | H4F02AA |
| | HP USB 3.0 to Gigabit Adapter | N7P47AA |
| | HP Elite USB-C® Hub | 4WX89AA |

Summary of Changes

| | | |
|-----------------|---|----------------|
| | HP USB-C® Travel Hub G2 | 7PJ38AA |
| | HP USB-C® to 4.5mm Adapter | 4ST73AA |
| <i>Power</i> | HP 65W USB-C® Power Adapter | 1HE08AA |
| | HP 65W USB-C® Slim Power Adapter | 3PN48AA |
| | HP 65W USB-C® Auto Adapter | 5TQ76AA |
| <i>Storage</i> | HP External USB DVDRW Drive | F2B56AA |
| <i>Security</i> | HP Nano Keyed Cable Lock | 1AJ39AA |
| | HP Nano Dual-Head Keyed Cable Lock | 1AJ41AA |
| | HP Sure Key Cable Lock | 6UW42AA |

Summary of Changes

| <i>Date of change:</i> | <i>Version History:</i> | | <i>Description of change:</i> |
|------------------------|-------------------------|--|-------------------------------|
| | v1 to v2 | | |
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