

Overview

HP Elite Dragonfly G2 Notebook PC



Left

- | | |
|---------------------------|--|
| 1. Internal Microphones | 6. Glass Clickpad |
| 2. IR Camera LEDs | 7. WWAN SIM (Nano) ¹ |
| 3. Webcam and IR Camera | 8. Nano Security Lock Slot (Lock sold separately) |
| 4. Privacy Camera Shutter | 9. Power Button |
| 5. Webcam LED | 10. SuperSpeed USB Type-A 5Gbps signaling rate (Charging port) |

1. All units have a SIM card slot and icon but units that do not support WWAN are shipped with a non-removable SIM slot plug.

Overview



Right

1. HDMI 2.0 port (Cable not included)
2. Audio Combo Jack
3. Thunderbolt™ 4 with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)¹
4. Thunderbolt™ 4 with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)¹
5. Touch Fingerprint Sensor

1. SuperSpeed USB 20Gbps is not available with Thunderbolt™ 4.

Overview

AT A GLANCE

- Precision Machined CNC Mg Unibody with Narrow borders, a chassis that is .63 inches (1.61 cm) thin and with a starting weight of 2.18 lbs. (<1 Kg)
- A 360° convertible notebook with 4 usage modes: Laptop mode, Tablet mode, Tent mode, and Media mode
- Integrated HP Privacy Camera, with HP Sure Shutter to protect from malicious surveillance
- Choice of 11th Generation Intel® Core™ i7, i5 and i3 processors
- Intel® EVO configurations available
- Intel® Core™ i5 and i7 feature integrated Intel® Iris® Xe Graphics
- Touch display choices include 33.78 cm (13.3") diagonal IPS FHD displays or stunning UHD HDR-400 display. Brightness choices up to 1000 Nits. Get added protection in open or public places with the optional HP Sure View Reflect integrated privacy screen
- Ultimate connectivity with dual Thunderbolt4 Type-C® with USB4 support ports, dual USB 3.1 Gen1 charging ports, and HDMI 2.0
- Stay connected where you need to with a choice of 5G or 4G/LTE WWAN, WLAN and optional Thunderbolt™ Docking (Sold separately)
- 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
- LPDDR4X Memory up to 32 GB supports dual channel performance
- Up to 16 hours 30 minutes of battery life (56 Wh battery) and up to 11 hours of battery life (38 Wh battery)
- Preinstalled with Windows 10 versions or FreeDOS
- Passed 19 MIL-STD 810H tests ¹
- Instant on/instant off with Modern Connected Standby
- AI based HP Context Aware to maximize performance when working at a table, comfort when working from your lap, and responsiveness when working on the go
- HP Dynamic Audio, a new AI-based audio experience, tunes output to speech, music, and movies all while suppressing background noise (Planned to be available March 2021.)
- HP Sound Calibration to uniquely tune end user headphone audio (Planned to be available March 2021.)

1. 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 Elite Dragonfly G2 Notebook PC

OPERATING SYSTEM

Preinstalled

Windows 10 Pro 64 – HP recommends Windows 10 Pro for business ¹
Windows 10 Pro 64 (National Academic License) ²
Windows 10 Home 64 ¹
Windows 10 Home Single Language 64 ¹
Windows 10 Pro (Windows 10 Enterprise available with a Volume Licensing Agreement) ¹
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. 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/>.

Supported Versions

HP tested Windows 10, version 1809 on this platform. For testing information on newer versions of Windows 10, please see <https://support.hp.com/document/c05195282>

PROCESSORS

Intel® Core™ i7-1185G7 (3.0 GHz base frequency, up to 4.8 GHz frequency with Intel® Turbo Boost Technology, 12 MB L3 cache, 4 cores), supports Intel® vPro® Technology ^{3,4 5,6}

Intel® Core™ i7-1165G7 (2.8 GHz base frequency, up to 4.7 GHz with Intel® Turbo Boost Technology, 12 MB L3 cache, 4 cores) ^{3,4 5,6}

Intel® Core™ i5-1145G7 (2.6 GHz base frequency, up to 4.4 GHz frequency with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores), supports Intel® vPro® Technology ^{3,4 5,6}

Intel® Core™ i5-1135G7 (2.4 GHz base frequency, up to 4.2 GHz with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores) ^{3,4 5,6}

Intel® Core™ i3-1115G4 with Intel® UHD Graphics (3.0 GHz base frequency, up to 4.1 GHz with Intel® Turbo Boost Technology, 6 MB L3 cache, 2 cores) ^{3,4 5,6}

Processor Family

11th Generation Intel® Core™ i7 processor (i7-1185G7, i7-1165G7) ⁶

11th Generation Intel® Core™ i5 processor (i5-1145G7, i5-1135G7) ⁶

11th Generation Intel® Core™ i3 processor (i3-1115G4) ⁶

Technical Specifications

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 www.intel.com/technology/turboboost for more information.

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

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated

Intel® Iris® Xe Graphics⁷

Intel® UHD Graphics

Supports

Support HD Decode, DX12, HDMI 2.0⁸

7. Intel® Iris® Xe Graphics capabilities require system to be configured with Intel® Core™ i5 or i7 processors and dual channel memory. Intel® Iris® Xe Graphics with Intel® Core™ i5 or 7 processors and single channel memory will only function as UHD graphics.

8. HDMI cable sold separately.

DISPLAY

Touch

33.8 cm (13.3") diagonal FHD bent, BrightView WLED UWVA eDP 1.4+PSR2, 400 nits, 72 NTSC, Touch, Low Power (1920x1080)^{9,10,11}

33.8 cm (13.3") diagonal UHD bent, HDR-400, BrightView WLED UWVA eDP 1.4+PSR2, 550 nits, 95% sRGB, Touch, (3840x2160)^{9,10,11}

33.8 cm (13.3") diagonal FHD bent, BrightView WLED UMA eDP 1.4+PSR, 1000 nits, 72% NTSC, Touch with HP Sure View Reflect integrated privacy screen (1920 x 1080)^{9,10,11,12}

9. FHD/HD content required to view FHD/HD images.

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

11. Actual brightness will be lower with touchscreen or Sure View.

Technical Specifications

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

STORAGE AND DRIVES

Primary M.2 Storage

2 TB PCIe® Gen3x4 NVMe™ M.2 SSD TLC ¹³

1 TB PCIe® Gen3x4 NVMe™ M.2 SSD TLC ¹³

512 GB PCIe® Gen3x4 NVMe™ M.2 SSD TLC ¹³

256 GB PCIe® Gen3x4 NVMe™ M.2 SSD TLC ¹³

128 GB PCIe® Gen3x4 NVMe™ M.2 SSD TLC ¹³

512 GB PCIe® NVMe™ Value M.2 SSD ¹³

256 GB PCIe® NVMe™ Value M.2 SSD ¹³

512 GB PCIe® Gen3x4 NVMe™ M.2 SED SSD TLC ¹³

256 GB PCIe® Gen3x4 NVMe™ M.2 SED SSD TLC ¹³

512 GB Intel® PCIe® NVMe™ QLC M.2 SSD with 32 GB Intel® Optane™ memory H10 ^{13,14}

13. 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.

14. Intel® Optane™ H10 memory system acceleration does not replace or increase the DRAM in your system. Requires 8th Gen or higher Intel® Core™ processor, BIOS version with Intel® Optane™ supported, Windows 10 64-bit, and an Intel® Rapid Storage Technology (Intel® RST) driver.

MEMORY

Maximum Memory

32 GB LPDDR4X-4266 SDRAM ¹⁵

Memory

32 GB LPDDR4X-4266 SDRAM ¹⁵

16 GB LPDDR4X-4266 SDRAM ¹⁵

8 GB LPDDR4X-4266 SDRAM ¹⁵

Memory Slots

LPDDR4X, system runs at 4266

Supports Dual Channel Memory

15. All slots are non-accessible / non-upgradeable.

Technical Specifications

NETWORKING/COMMUNICATIONS

WLAN

Intel® Dual Band Wi-Fi® 6 AX201 802.11a/b/g/n/ac/ax (2x2) WLAN and Bluetooth® 5 Combo, vPro® ¹⁶

Intel® Dual Band Wi-Fi® 6 AX201 802.11a/b/g/n/ac/ax (2x2) WLAN and Bluetooth® 5 Combo, non-vPro® ¹⁶

WWAN

Intel® XMM™ 7360 LTE-Advanced Cat 9 ¹⁸

Qualcomm® Snapdragon™ X55 5G LTE Cat 20 ¹⁹

Miracast

Native Miracast Support ²⁰

16. 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.

18. 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. LTE not available on all products, in all regions.

19. 5G module is an optional feature that must be configured at purchase. AT&T and T-Mobile networks supported in the U.S. Module designed for 5G networks as carriers deploy Evolved-Universal Terrestrial Radio Access New Radio Dual Connectivity (ENDC) with both 100Mhz of 5G NR and LTE channel bandwidth, using 256QAM 4x4 as defined by 3GPP, requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. 5G not available on all products, in all regions. Backwards compatible to 4G LTE and 3G HSPA technologies. 5G module planned to be available in select countries, where carrier supported.

20. 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

Microphone/Headphone Combo Audio Jack

Camera

720p HD+IR camera with integrated electronic privacy shutter, HP Sure Shutter ^{21,22}

Note: The on/off button for this shutter is located on the function row of the keyboard.

Sensors

Accelerometer

Magnetometer

Gyroscope

Ambient light sensor

Hall sensor

21. HD content required to view HD images.

Technical Specifications

22. Sold separately or as an optional feature.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Modernized Keyboard, spill resistant, Backlit
Backlit, Spill-resistant, with HP Dura Keys

Pointing Device

Glass Clickpad
Microsoft Precision Touchpad Default Gestures Support

Function Keys

F1 - Display Switching
F2 - Blank or Privacy
F3 - Brightness Down
F4 - Brightness Up
F5 - Audio Mute
F6 - Volume Down
F7 - Volume Up
F8 - Mic Mute
Backlit Toggle
F10 - Insert
F11 - Airplane Mode
F12 - HP Command Center (Programmable Key)
Num Lock
HP Sure Shutter
Print Screen
Delete

SOFTWARE AND SECURITY

Preinstalled Software

BIOS

HP BIOSphere Gen6 ²³
HP Drive Lock & Automatic Drive Lock
BIOS Update via Network
HP Secure Erase ²⁴
Absolute Persistence Module ²⁵
HP LAN-Wireless Protection
USB enable/disable (via BIOS)

Software

HP Connection Optimizer ²⁶
HP Hotkey Support
myHP

Technical Specifications

HP Support Assistant ²⁷
HP QuickDrop¹⁷
HP Noise Cancellation Software
Touchpoint Customizer for Commercial
HP Notifications
HP Privacy Settings
HP Wireless Button Driver
HP Power Manager
HP WorkWell
Tile App²⁸
HP PC Hardware Diagnostics Windows
Buy Microsoft Office (sold separately)
Microsoft Defender ²⁹

Manageability Features

HP Driver Packs (download) ³⁰
HP Manageability Integration Kit Gen4 (download) ³¹
HP Client Catalog (download)
HP Client Management Script Library (download)
HP Image Assistant (download)

Security Management

HP Fingerprint Sensor
HP Pro Security Edition (Select models) ³²
HP Sure Click ³³
HP Sure Sense ³⁴
HP Sure Start Gen6 ³⁵
HP Sure Admin ³⁶
HP Sure Recover Gen4 ³⁷
HP Sure Run Gen4 ³⁸
HP Client Security Manager Gen7 ³⁹
Secured-core PC capable ⁵⁰
TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)

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

23. HP BIOSphere Gen6 is available on select HP Pro and Elite PCs. Features may vary depending on the platform and configurations.

24. 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™.

25. Absolute firmware module is shipped turned off and can only be activated with the purchase a license subscription and full activation of the software agent. License subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. Certain conditions apply. For full details visit:

<https://www.absolute.com/about/legal/agreements/absolute/>

26. HP Connection Optimizer requires Windows 10.

27. HP Support Assistant requires Windows and Internet access.

28. Some features require optional subscription to Tile Premium. Tile application for Windows 10 available for download

Technical Specifications

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.

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

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

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

32. HP Pro Security Edition is available preloaded on select HP PCs and includes HP Sure Click Pro and HP Sure Sense Pro. 3-year license required. The HP Pro Security Edition software is licensed under the license terms of the HP End User License Agreement (EULA) that can be found at:

https://h30670.www3.hp.com/ecommerce/common/disclaimer.do#EN_US as modified by the following: “7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Pro Security Edition (HP Sure Sense Pro and HP Sure Click Pro) is effective upon activation and will continue for thirty-six (36) months thereafter (“Initial Term”). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support.” HP Pro Security Edition is optimized for the SMB environment and ships pre-configured - manageability is optional. The HP Pro Security Edition supports a limited tool set that can be used by the HP Manageability Integration Kit which can be downloaded from <http://www.hp.com/go/clientmanagement>.

33. HP Sure Click requires Windows 10 Pro or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.

34. HP Sure Sense is available on select HP PCs and is not available with Windows 10 Home.

35. HP Sure Start Gen6 is available on select HP PCs and requires Windows 10.

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

37. HP Sure Recover Gen4 is available on select HP PCs and requires an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data.

38. HP Sure Run Gen4 is available on select Windows 10 based HP Pro, Elite and Workstation PCs with select Intel® or AMD processors.

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

50. Requires an Intel® vPro®, AMD Ryzen™ Pro processor or Qualcomm® processor with SD850 or higher and requires 8 GB or more system memory. Secured-core PC functionality can be enabled from the factory.

POWER

Power Supply

HP Smart 65 W USB Type-C adapter ⁴⁰

HP Smart 65 W Slim USB Type-C adapter⁴⁰

Primary Battery

HP Long Life 2-cell, 38Wh polymer ^{41,42}

HP Long Life 4-cell, 56Wh polymer ^{41,42}

HP Fast Charge Technology (50% in 30 minutes) ⁴³

Battery Life⁴⁴

Up to 16 hours 30 minutes (56 Wh battery)

Up to 11 hours (38 Wh battery)

Technical Specifications

Battery Weight

0.57 lb / 0.259 kg

40. Availability may vary by country.

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

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

43. Recharges the battery up to 50% within 30 minutes when the system is off or in standby mode. Power adapter with a minimum capacity of 65 watts is required. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.

44. Windows 10 MM18 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See www.bapco.com for additional details.

WEIGHTS & DIMENSIONS

Product Weight ⁴⁵

Starting at 2.18 lb

Starting at 0.98 kg

Product Dimensions (w x d x h)

11.98 x 7.78 x 0.63 in

30.43 x 19.75 x 1.61 cm

45. Weight will vary by configuration.

PORTS/SLOTS

Ports

2 Thunderbolt™ 4 with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)⁵¹

1 SuperSpeed USB Type-A 5Gbps signaling rate (Charging port)

1 Headphone/microphone combo jack

1 HDMI 2.0⁴⁶

46. HDMI cable sold separately.

51. SuperSpeed USB 20Gbps is not available with Thunderbolt™ 4

Technical Specifications

SERVICE AND SUPPORT

1-year or 3-year limited warranty and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty except for HP Long Life batteries which will follow the one or three year warranty of 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>.⁴⁷

47. 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.

CERTIFICATION AND COMPLIANCE

ENERGY STAR® certified⁴⁸
EPEAT® 2019 Gold in the U.S.⁴⁹
TCO 8.0 Certified

48. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. EPEAT® status varies by country. Visit www.epeat.net for more information.

49. Configurations of the HP EliteBook x360 1040 G8 Notebook PC that are ENERGY STAR® qualified are identified as HP EliteBook x360 1040 G8 Notebook PC ENERGY STAR on HP websites and on <http://www.energystar.gov>.

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	20V, 3.25A
	Integrated Graphics	Intel UMA
	Max Operating Power	UMA
Shock	Non-operating	Comply SVTP
	Operating	Comply SVTP
Random Vibration	Non-operating	Comply SVTP
	Operating	Comply SVTP
Altitude (unpressurized)	Non-operating	Comply SVTP

Technical Specifications

DISPLAYS

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

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

**Panel LCD 13.3 inch FHD
(1920x1080) BrightView WLED
UWVA 72percent cg 400nits eDP
1.4+PSR2 bent LP NWBZ**

Outline Dimensions (W x H x D)	299.06 x 176.54 mm (max) (FPC folding included)
Active Area	293.76 x 165.24 mm (typ.)
Weight	175 g (max)
Diagonal Size	13.3 inch
Thickness	2.0mm / 3.8mm (PCB) (max)
Interface	eDP 1.4
Surface Treatment	BrightView
Touch Enabled	Yes
Contrast Ratio	1500:1 (typ.)
Refresh Rate	60 Hz
Brightness	400nits ¹
Pixel Resolution	1920 x 1080 (FHD)
Format	RGB Stripe
Backlight	LED
Color Gamut Coverage	72% NTSC (sRGB 100%) (typ.)
Color Depth	8 bit
Viewing Angle	UWVA 85/85/85/85

**Panel LCD 13.3 inch UHD
(3840x2160) BrightView WLED
UWVA HDR-400 sRGB 95percent
cg 550nits eDP 1.4+PSR2 bent
NWBZ**

Outline Dimensions (W x H x D)	299.06 x 176.54 mm (max) (FPC folding included)
Active Area	293.76 x 165.24 mm (typ.)
Weight	200 g (max)
Diagonal Size	13.3 inch
Thickness	2.0mm / 3.8mm (PCB) (max)
Interface	eDP 1.4
Surface Treatment	BrightView
Touch Enabled	Yes
Contrast Ratio	1400:1 (typ.) 1000:1 (HDR off) (min)
Refresh Rate	60 Hz
Brightness	550nits ¹
Pixel Resolution	3840 x 2160 (UHD)
Format	RGB Stripe
Backlight	LED
Color Gamut Coverage	sRGB 95% (min)
Color Depth	8 bits + 2 FRC
Viewing Angle	UWVA 85/85/85/85

Technical Specifications

Panel LCD 13.3-in FHD (1920 x 1080) BrightView WLED UWVA 72% cg 1000nits eDP 1.4+PSR PrivacyG4	Outline Dimensions (W x H)	299.06 x 176.54 mm (max)
	Active Area	293.76 x 165.24 mm (typ.)
	Weight	220 g (max)
	Diagonal Size	13.3 inch
	Thickness	3.9 mm (max)
	Interface	eDP 1.4 + PSR (4 lane)
	Surface Treatment	BrightView
	Touch Enabled	Yes
	Contrast Ratio	1500:1 (typ.)
	Refresh Rate	60 Hz
	Brightness	1000 nits ¹
	Pixel Resolution	1920 x 1080 (FHD)
	Format of LCD Pixel Arrangement	RGB
	Backlight	LED
	Color Gamut Coverage	72%
	Color Depth	8 bit
	Viewing Angle	UWVA 85/85/85/85

Technical Specifications

STORAGE

NOTE: 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.

SSD 128GB 2280 PCIe-3x2 Three Layer Cell	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	PCIe NVMe Gen3X2
	Maximum Sequential Read	Up To 2047 MB/s
	Maximum Sequential Write	Up To 1200 MB/s
	Logical Blocks	250,069,680
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	TRIM; L1.2

SSD 1TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided	Form Factor	M.2 2280
	Capacity	1 TB
	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 2800 MB/s
	Maximum Sequential Write	Up To 1600 MB/s
	Logical Blocks	2,000,409,264
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security (Option); TRIM; L1.2

Technical Specifications

SSD 256GB 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	2580 MB/s ~ 2600 MB/s
	Maximum Sequential Write	900 MB/s ~ 1000 MB/s
	Logical Blocks	500,118,192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security (Option); TRIM; L1.2
SSD 256GB 2280 PCIe-3x4 NVMe 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	PCIe NVMe Gen3X4
	Maximum Sequential Read	Up To 3500 MB/s
	Maximum Sequential Write	Up To 2200 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; L1.2
SSD 2TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided	Form Factor	M.2 2280
	Capacity	2 TB
	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 3000 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; TCG OPAL 2.0; DIPM; TRIM; DEVSLP

Technical Specifications

SSD 512GB 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 (Option); TRIM; L1.2

SSD 512GB 2280 PCIe- 3x4 NVMe Self Encrypted OPAL2 Three Layer Cell

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 (Option); TCG Opal 2.0; TRIM; L1.2

SSD 512GB 2280 PCIe NVMe Value

Form Factor	M.2 2280
Capacity	512GB
NAND Type	QLC/TLC
Height	0.09 in (2.3 mm)
Width	0.87 in (22 mm)
Weight	0.02 lb (10 g)
Interface	PCIe NVMe
Maximum Sequential Read	Up To 1700 MB/s
Maximum Sequential Write	Up To 1500 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

Technical Specifications

SSD 256GB 2280 PCIe NVMe Value

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
Maximum Sequential Read	Up To 1700 MB/s
Maximum Sequential Write	Up to 1300 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

512GB 2280 PCIe-3x2x2 NVMe+SSD 32GB 3D Xpoint

Form Factor	M.2 2280
Capacity	512 GB
NAND Type	QLC+3D Xpoint
Height	0.09 in (2.3 mm)
Width	0.87 in (22 mm)
Weight	0.02 lb (10 g)
Interface	PCIe NVMe Gen3X2X2
Maximum Sequential Read	Up To 2400 MB/s
Maximum Sequential Write	Up To 1300 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

Technical Specifications

NETWORKING/COMMUNICATIONS

Intel® Wi-Fi 61 AX20¹ and Wireless LAN Standards Bluetooth® 5.0 802.11ax (2x2) supporting gigabit data rate⁵ (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

Features Wi-Fi 6 technology

Frequency Band

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
, 1024QAM

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
• WPA3 certification

Technical Specifications

	•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 • 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"
Power Consumption	•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/Modern Standby: 10mW •Radio disabled: 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity⁴	•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
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure 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 with CNVi Interface
Dimensions	1. Type 2230: 2.3 x 22.0 x 30.0 mm

Technical Specifications

Weight	2. Type 1216: 1.67 x 12.0 x 16.0 mm
	1. Type 2230: 2.8g 2. Type 126: 1.3g
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

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
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH)
	BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE: 1 Mbps data rate; throughput up to 0.2 Mbps
	Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels
	Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.
Power Consumption	Peak (Tx): 330 mW
	Peak (Rx): 230 mW
	Selective Suspend: 17 mW
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
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 300 826
	Low Voltage Directive IEC950
	UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance
	LE Link Layer Ping
	LE Dual Mode
	LE Link Layer

Technical Specifications

LE Low Duty Cycle Directed Advertising
 LE L2CAP Connection Oriented Channels
 Train Nudging & Interlaced Scan
 BT4.2 ESR08 Compliance
 LE Secure Connection- Basic/Full
 LE Privacy 1.2 –Link Layer Privacy
 LE Privacy 1.2 –Extended Scanner Filter Policies
 LE Data Packet Length Extension
 FAX Profile (FAX)
 Basic Imaging Profile (BIP)2
 Headset Profile (HSP)
 Hands Free Profile (HFP)
 Advanced Audio Distribution Profile (A2DP)

Security & Manageability Intel® vPro™ support with appropriate Intel® chipset components

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).
5. Wi-Fi 5 or 6 is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

Intel® Wi-Fi 6¹ AX201 and Wireless LAN Standards Bluetooth® 5.0 802.11ax (2x2), supporting gigabit data rate⁵ (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 Features Wi-Fi 6 technology

Technical Specifications

Frequency Band	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, 1024QAM
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 • WPA3 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 • 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"

Technical Specifications

Power Consumption	• 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 10mW • Radio disabled 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity⁴	• 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	
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure 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 with CNVi Interface	
Dimensions	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
Weight	1. Type 2230: 2.8g 2. Type 1216: 1.3g	
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 Off – Radio ON	

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
Frequency Band	2402 to 2480 MHz

Technical Specifications

Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps BLE: 1 Mbps data rate; throughput up to 0.2 Mbps Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.
Power Consumption	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
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 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

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

Technical Specifications

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).

5. Wi-Fi 5 or 6 is designed to support gigabit data rate when transferring files between two devices connected to the same router.

Requires a wireless router, sold separately, that supports 80MHz and higher channels.

**Qualcomm®
Snapdragon™
X55 5G
Modem (5G +
LTE CAT 20) ¹**

**Technology/Operating
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)

Technical Specifications

	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) 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 WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
GPS	Standalone, A-GPS (MS-A, MS-B)
GPS bands	GPS: L1 (1575.42MHz); L5 (1176MHz) GLONASS: L1 (1602MHz) BeidouB1(1561.098MHz) Galileo E1 (1575.42); E5a (1176MHz)
Maximum data rates	5G sub 6G : 3.8 Gbps 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 : 2500 mA LTE: 1,300 mA (peak); 1100 mA (average) 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 × 30 mm × 2.6 mm

Technical Specifications

1. 5G module is an optional feature that must be configured at purchase. AT&T and T-Mobile networks supported in the U.S. Module designed for 5G networks as carriers deploy Evolved-Universal Terrestrial Radio Access New Radio Dual Connectivity (ENDC) with both 100MHz of 5G NR and LTE channel bandwidth, using 256QAM 4x4 as defined by 3GPP, requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. 5G not available on all products, in all regions. Backwards compatible to 4G LTE and 3G HSPA technologies. 5G module planned to be available in select countries, where carrier supported.

Intel® XMM™ 7360 LTE-Advanced¹	Technology/Operating bands	FDD LTE: LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 1400 (Band 11), 700 (Band 12), 700 (Band 13) 700 (Band 17), 850 (Band 18), 850 (Band 19), 800 (Band 20), 1450 (Band 21), 850 (Band 26) 700 (Band 28) MHz, 700 (Band 29), 2300 (Band 30), 2100 (Band 66) MHz TDD LTE: 2600 (Band 38), 1900 (Band 39), 2300 (Band 40), 2500 (Band 41) MHz HSPA+: 2100 (Band 1), 1900 (Band 2), 1700 (Band 4), 850 (Band 5), 900 (Band 8) MHz
	Wireless protocol standards	3GPP Release 11 LTE Specification CAT.9, MAX 60MHz aggregation BW WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification
	GPS	Standalone, A-GPS (MS-B and LTO)
	GPS bands	GPS 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 ± 2.046 MHz
	Maximum data rates	LTE: 450 Mbps (DL 3CA), 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	6 g
	Dimensions (Length x Width x Thickness)	42 x 30 x 2.3 mm

1. 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. LTE not available on all products, in all regions.

Technical Specifications

POWER

AC Adapter 65 Watt nPFC Slim USB type C Straight 1.0m	Dimensions	88x53.5x21mm
	Weight	unit: 220g +/- 10g
	Input	100 to 240 VAC
	Input Efficiency	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
	Input frequency range	47 ~ 63 Hz
	Input AC current	1.6 A at 90 VAC and maximum load
	Output power	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°F to 95°F (0° to 35°C)
	Non-operating (storage) temperature	-4°F to 185°F (-20° to 85°C)
EMI and Safety Certifications	Altitude	0 to 16,400 ft (0 to 5000m)
	Humidity	5% to 95%
	Storage Humidity	5% to 95%
	Eg:	
*CE Mark - full compliance with LVD and EMC directives		
* Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE.		
* MTBF - over 100,000 hours at 25°C ambient condition.		

AC Adapter 65 Watt nPFC Standard USB type C Straight 1.0m	Dimensions	90.0x51x28.5mm
	Weight	unit: 250g +/- 10g
	Input	100 to 240 VAC
	Input Efficiency	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
	Input frequency range	47 ~ 63 Hz
	Input AC current	1.6 A at 90 VAC and maximum load
	Output power	65 W
	DC output	5V/9V/12V/15V/20V
	Hold-up time	5ms at 115 Vac input
	Output current limit	8.0A Max.

Technical Specifications

Connector	USB TYPE C
Environmental Design	Operating temperature 32°F to 95°F (0° to 35°C)
	Non-operating (storage) temperature -4°F 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%
Safety Certifications	- 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.

HP 4-cell Long Life Li-Ion(56Wh)	Dimensions (H x W x L)	5.25x85.00x274.00 mm
	Weight	0.259 kg
	Cells/Type	4cell Lithium-Ion Polymer cell / 446872
	Energy	Voltage 8.8V/7.7V
		Amp-hour capacity 7.3Ah/7.0Ah
		Watt-hour capacity 56 Wh
		Operating (Charging) 32° to 113° F (0° to 45° C)
	Temperature	Operating (Discharging) 14° to 122° F (-10° to 60° C)
	Optional Travel	No
	Battery Available	

HP 2-cell Long Life Li-Ion(38Wh)	Dimensions (H x W x L)	5.20*79.40*274.00
	Weight	0.16 kg
	Cells/Type	2cell Lithium-Ion Polymer cell / 4453C2
	Energy	Voltage 8.8V/7.7V
		Amp-hour capacity 4.93Ah/4.68Ah
		Watt-hour capacity 38 Wh
		Operating (Charging) 32° to 113° F (0° to 45° C)
	Temperature	Operating (Discharging) 14° to 122° F (-10° to 60° C)
	Optional Travel Battery Available	No

Technical Specifications

ENVIRONMENTAL DATA

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: • IT ECO declaration • US ENERGY STAR® • US Federal Energy Management Program (FEMP) • EPEAT[®] Gold registered in the United States. See http://www.epeat.net for registration status in your country. • TCO 8.0 • China Energy Conservation Program (CECP) • China State Environmental Protection Administration (SEPA) • Taiwan Green Mark • Korea Eco-label • Japan PC Green label*		
Sustainable Impact Specifications	• Ocean-bound plastic in (part(s))¹ • 11.7% post-consumer recycled plastic² • External Power Supply 90% Efficiency • Low halogen³ • Outside Box and corrugated cushions are 100% sustainably sourced and recyclable⁴ • Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable⁵ • Recycled Plastic cushions⁶ • Bulk packaging available 1. Percentage of ocean-bound plastic contained in each component varies by product 2. Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard. 3. External power supplies, WWAN modules, power cords, cables and peripherals excluded. 4. 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers. 5. Fiber cushions made from 100% recycled wood fiber and organic materials. 6. Plastic cushions are made from >90% recycled plastic.		
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, 50Hz
Normal Operation (Sort idle)	5.07 W	5.26 W	4.92 W
Normal Operation (Long idle)	0.73 W	0.82 W	0.78 W

Technical Specifications

Sleep	0.73 W	0.82 W	0.78 W
Off	0.30 W	0.32 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, 50Hz
Normal Operation (Short idle)	16 BTU/hr	16 BTU/hr	16 BTU/hr
Normal Operation (Long idle)	3 BTU/hr	3 BTU/hr	2 BTU/hr
Sleep	3 BTU/hr	3 BTU/hr	2 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 (L _{WAd} , bels)	Sound Pressure (L _{pAm} , decibels)	
Typically Configured – Idle	2.7	13.8	
Fixed Disk – Random writes	3.0	19.8	
Optical Drive – Sequential reads	3.4	22.7	
Longevity and Upgrading	This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.		

Technical Specifications

Additional Information	- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC. - This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. - This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986). - This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see www.epeat.net - Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043. - This product is 11.07% recycle-able when properly disposed of at end of life.		
Packaging Materials	External:	PAPER/Corrugated	215 g
		PAPER/Corrugated	49 g
	Internal:	PLASTIC/polypropylene	3 g
		PLASTIC/Polyethylene low density	111 g
		PAPER/Molded pulp	102 g
		PAPER/Molded pulp	154 g
	The plastic packaging material contains at least 0% recycled content.		
	The corrugated paper packaging materials contains at least 64% recycled content.		
RoHS Compliance	HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam. We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products. We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve. To obtain a copy of the HP RoHS Compliance Statement, see HP RoHS position statement.		
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/supplychain/gen_specifications.html) - Asbestos - Certain Azo Colorants - Certain Brominated Flame Retardants – may not be used as flame retardants in plastics - Cadmium - Chlorinated Hydrocarbons - Chlorinated Paraffins - Bis(2-Ethylhexyl) phthalate (DEHP) - Benzyl butyl phthalate (BBP)		

Technical Specifications

	• Dibutyl phthalate (DBP) • Diisobutyl phthalate (DIBP) • Formaldehyde • Halogenated Diphenyl Methanes • Lead carbonates and sulfates • Lead and Lead compounds • Mercuric Oxide Batteries • Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user. • Ozone Depleting Substances • Polybrominated Biphenyls (PBBs) • Polybrominated Biphenyl Ethers (PBBEs) • Polybrominated Biphenyl Oxides (PBBOs) • Polychlorinated Biphenyl (PCB) • Polychlorinated Terphenyls (PCT) • Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications. • Radioactive Substances • Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)
Packaging Usage	HP follows these guidelines to decrease the environmental impact of product packaging: • Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.
End-of-life Management and Recycling	HP 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. 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.

Technical Specifications

HP, Inc. Corporate Environmental Information	For more information about HP's commitment to the environment: Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html ISO 14001 certificates: http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842 and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf
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COUNTRY OF ORIGIN

China

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

Type	Description	Part #
Cases	HP Business Slim 14.1 Top Load	2SC65AA,2SC65UT,2SC65ET
	HP Executive 15.6 Backpack	6KD07AA,6KD07UT,6KD07ET
	HP Executive Slim 14.1 Top Load	6KD04AA,6KD04UT,6KD04ET
Docking	HP Thunderbolt 120W Dock G2	6HP48AA,2UK37AA,2UK37ET
	HP Thunderbolt 120W Dock w/Audio G2	3YE87AA,2UK37UT,3YE87ET
	HP Thunderbolt 230W Dock w/Combo Cable G2	3TR87AA,3TR87UT,3TR87ET
	HP USB-C 120W G5 Dock	26D32AA,5TW10AA,5TW10UT,5TW10ET
	HP USB-C Mini Dock	2SR85AA,1PM64AA,1PM64UT,1PM64ET
	HP USB-C/A 120W Universal Dock G2	5TW13AA,5TW13UT,5TW13ET
Input/Output	HP HDMI to VGA Adapter	H4F02AA, H4F02UT, H4F02ET
	HP TB Dock 120W G2 Cable	3XB94AA, 3XB94UT, 3XB94ET
	HP TB Dock 230W G2 Combo Cable	3XB96AA, 3XB96UT, 3XB96ET
	HP USB to Gigabit RJ45 Adapter	N7P47AA, N7P47UT
	HP USB-C to DisplayPort Adapter	N9K78AA, N9K78UT
	HP USB-C to RJ45 Adapter	V8Y76AA, V7W66AA, V7W66UT
	HP USB-C to USB-A Hub	Z8W90AA, Z6A00AA, Z6A00UT, Z6A00ET
	HP USB-C to VGA Adapter	P7Z54AA, N9K76AA, N9K76UT
	HP Wireless USB Premium Keyboard	Z9N41AA, Z9N41AT
	HP WL USB Keyboard	T6U20AA, T6U20UT
	HP Slim Wireless Keyboard and Mouse	T6L04AA, T6L04UT
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA, 9SR36UT, 9SR36ET
	HP Wireless Rechargeable 950MK Mouse and Keyboard	3M165AA
	HP 320M Wired Mouse	9VA80AA, 9VA80UT, 9VA80ET
	HP Comfort Grip Wireless USB Mouse	H2L63AA, H2L63UT
	HP Premium USB Mouse	1JR32AA, 1JR32UT
	HP Premium Wireless Mouse	1JR31AA, 1JR31UT
	HP Presenter Bluetooth Mouse	2CE30AA, 2CE30UT, 2CE30ET
	HP Travel Bluetooth Mouse	6SP30AA, 6SP30UT, 6SP30ET
	HP Travel USB Mouse	G1K28AA, G1K28ET
	HP Ultra Mobile Wireless Mouse	H6F25AA, H6F25UT
	HP X4000 Bluetooth Wireless 2.4 GHz Mouse	H3T50AA, H3T50UT
	HP Rechargeable Active Pen G3	6SG43AA
Power	HP 65W USB-C AC Power Adapter	1HE08AA, 1HE08UT

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

HP 65W USB-C LC AC Power Adapter	1P3K6AA, 1P3K6UT
HP 65W USB-C Slim Travel AC Power Adapter	X7W50AA, 3PN48AA, 3PN48UT
HP USB Power Bank	N9F71AA, N9F71UT
HP USB-C Essential Power Bank	3TB55AA, 3TB55UT

Storage

HP USB DVD-Writer EXT ODD	Y3T76AA, F2B56AA, F2B56UT, F2B56ET
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Security

HP Nano Cable Lock	1AJ39AA, 1AJ39UT
HP SureKey Standard/Nano/Wedge Cable Lock	6UW42AA, 6UW42UT

UCC

HP BT UC WL Duo Headset	W3K09AA#ABB, W3K09AA#UUF
HP Wired Thunderbolt Audio Module	3AQ21AA, 3AQ21UT, 3AQ21ET
HP Wired USB-A Stereo Headset	T1A67AA
HP Wireless BT UC WL Mono Headset	W3K08AA#ABB, W3K08AA#UUF

Summary of Changes

Date of change:	Version History:		Description of change:
January 22, 2021	V1 to V2		At a Glance section update, WPA3 certification
February 10, 2021	V2 to V3	Add	Environmental Data
February 17, 2021	V3 to V4	Update	Environmental Data
March 2, 2021	V4 to V5	Update	Battery Life
March 5, 2021	V5 to V6	Update	USB ports
	V6 to V7		

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