Overview

HP ZBook X G1i 16 inch Mobile Workstation PC

Left

1	Internal Microphone (2)	8	Touch Fingerprint Sensor (Select models)
2	Webcam LED (Optional)	9	Power Button Key
3	Webcam	10	Nano Security Lock Slot (Lock sold separately)
4	Camera Shutter	11	RJ45 Ethernet port
5	IR Camera (Optional)	12	SuperSpeed USB Type-A 5Gbps signaling rate
6	IR Camera LEDs (Optional)	13	Nano SIM Card Slot (Optional)
7	Touchpad	14	SD Card Reader

Overview

Right

1	LED Indicator	5	SuperSpeed USB Type-A 5Gbps signaling rate
2	Power connector	6	Audio Combo Jack
3	2 Thunderbolt™ 4 with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 2.1)*	7	Smartcard Reader (Optional)
4	HDMI 2.1 Port (Cable not included)		

*Actual throughout may vary.

Overview

At A Glance

- Premium ultraslim design with precision-crafted all-metal chassis for a premium look and feel
- Intel® Core™ Ultra9 processor; Intel® Core™ Ultra7 processor; Intel® Core™ Ultra5 processor
- Preinstalled with Windows 11 versions or FreeDOS
- 5MP camera (with 88 degree Field of View) with HP Auto Frame allows you to move around without losing viewers' attention during video calls
- DDR5 5600 memory with up to 64GB capacity and PCI Gen4 SSDs provide fast access to your work
- Choice of displays
  - 40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 300 nits, 45% NTSC;
  - 40.6 cm (16") diagonal, WUXGA (1920 x 1200), touch, IPS, anti-glare, 300 nits, 45% NTSC;
  - 40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 400 nits, 100% sRGB;
  - 40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 800 nits, 100% sRGB, HP Sure View Reflect integrated privacy screen
  - 40.6 cm (16") diagonal, WQXGA(2560x1600), IPS, anti-glare, 400 nits, 100% sRGB, Low Blue light
  - 40.6 cm (16") diagonal, WQUXGA(3840x2400), IPS, anti-glare, 500 nits, 100% sRGB, HP Dreamcolor
- Premium keyboard layout to include easy use of discrete PgUp/Dn, End, and Home keys
- Optional NVIDIA RTX PRO 500/1000/2000 Blackwell pro graphics for improved performance for heavier graphics workloads.
- HP Wolf Security for Business creates a hardware-enforced, always-on, resilient defense.9
- Larger Clickpad surface for easier, more intuitive input
- Connectivity with optional HP KavalanR R15 5G/WWAN available world-wide, and Thunderbolt™ Docking (Dock sold separately)
- Undergoes MIL-STD 810H tests
- Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles3
- Designed to support all HP docking options

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

Features

PRODUCT NAME

HP ZBook X G1i 16 inch Mobile Workstation PC

OPERATING SYSTEM

Preinstalled OS

Windows 11 Pro[1]
Windows 11 Home - HP recommends Windows 11 Pro for business [1]
Windows 11 Home Single Language - HP recommends Windows 11 Pro for business [1]
Windows 11 Pro (Windows 11 Enterprise available with a Volume Licensing Agreement)[1]
FreeDOS
Ubuntu Linux 24.04

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

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 and the Windows 10 versions tested is available on the HP support website. https://support.hp.com/us-en/document/c05195282

PROCESSOR

Intel® Core™ Ultra 5 225H (Up to 4.9 GHz P-core Max Turbo frequency, 18 MB L3 cache, 4 P-cores ,8 E-Cores and 2 LP Cores , 14 threads);[1,2,4,5,6]

Intel® Core™ Ultra 5 235H (Up to 5 GHz P-core Max Turbo frequency, 18 MB L3 cache, 4 P-cores ,8 E-Cores and 2 LP Cores , 14 threads), supports Intel® vPro® Technology;[1,2,3,4,5,6]

Intel® Core™ Ultra 7 255H (Up to 5.1 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores, 8 E-cores and 2 LP Cores, 16 threads); [1,2,4,5,6]

Intel® Core™ Ultra 7 265H (Up to 5.3 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores, 8 E-cores and 2 LP Cores, 16 threads), supports Intel® vPro® Technology; [1,2,3,4,5,6]

Intel® Core™ Ultra 9 285H (Up to 5.4 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores 8 E-cores and 2 LP Cores, 16 threads), supports Intel® vPro® Technology; [1,2,3,4,5,6]

[1] Multicore is designed to improve performance of certain software products. Not all customers or software applications will

Features

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.

[2] Intel Turbo Boost performance varies depending on hardware, software and overall system configuration. See http://www.intel.com/technology/turboboost for more information.

[3] Intel vPro® requires Windows 10 Pro 64 bit or higher, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or Wi-Fi 6E WLAN and TPM 2.0. Some functionality requires additional 3rd party software in order to run. Features of vPro® Essentials and Enterprise vary. See http://intel.com/vpro

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

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

[6]Features and software that require a NPU may require software purchase, subscription or enablement by a software or platform provider, and third-party software may have specific configuration or compatibility requirements. Performance varies by use, configuration, and other factors.

GRAPHICS

Integrated
Intel® Arc Graphics

Discrete
NVIDIA RTX PRO 500 Blackwell (6GB)
NVIDIA RTX PRO 1000 Blackwell (8 GB)
NVIDIA RTX PRO 2000 Blackwell (8GB)

Supports
Support HD decode, DX12, HDMI 2.1

Features

DISPLAY

Non-Touch

40.6 cm (16") diagonal, 2.5K (2560x1600) low blue light, 400n, 120Hz refresh rat 2.5K (2560 x 1600), 120 Hz, UWVA, anti-glare, Low Blue Light, 400 nits, DCI-P3 100%
40.6 cm (16") diagonal, WQUXGA (3840 x 2400), 120 Hz, UWVA, 500 nits, 100% DCI-P3, HP DreamColor
40.6 cm (16") diagonal, WUXGA (1920 x 1200), 60 Hz, UWVA, 300 nits, 62.5% sRGB; 16" diagonal, WUXGA (1920 x 1200), UWVA, Low Blue Light, 800 nits, 100% sRGB, HP Sure View Reflect 5 integrated privacy screen
40.6 cm (16") diagonal, WUXGA (1920 x 1200), 60 Hz, UVWA, Low Blue Light, 400 nits, 100% sRGB

Touch

40.6 cm (16") diagonal, WUXGA (1920 x 1200), touch, 60 Hz, UWVA, 300 nits, 62.5% sRGB

DisplayPort™ 2.1

HDMI 2.1 Support resolution up to 4K @60 Hz

Displays support

Supports up to 4 displays, including the built-in screen.

Display Size

16"
40.64 cm (16")

[1]HD content required to view HD images.
[2]Sold separately or as an optional feature.
[3]Resolutions are dependent upon monitor capability, and resolution and color depth settings.
[4]HP Sure View 5 integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
[5]Actual brightness will be lower with touchscreen or Sure View.

Features

Docking (Sold Separately)

Docking station model #1	HP Thunderbolt 280W G4 Dock
Total number of supported displays (incl.the notebook) display)	4
Max.resolutions supported	Quad 4K @60Hz Dual 8K single cable@30 for TB hosts or USB-C hosts DP 1.4 with DSC in high res mode
Dock Connectors	2xDP, 1xVGA, 1xTB, 1xUSB-C alt-mode
Technicallimitations	Thunderbolt Hosts: Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host. Max resolution possible is dual 8K displays @ 60Hz running Thunderbolt host or running a non-Thunderbolt host in High Resolution mode @30Hz Non-Thunderbolt hosts: The highest resolution for dual displays running a non-Thunderbolt host in multi-function mode is (1) 5K dual cable (using both DP ports) +(1) 4K on USB-C DP port Non-Thunderbolt hosts support (3) displays with a max resolution of: (2) 5K single cable + (1) 4K UHD @ 60 Hz in high resolution mode. In multi-function mode the maximum resolution for (3) displays is (2) 5K single cable @ 30Hz + (1) 4K UHD @ 30Hz.

Features

STORAGE AND DRIVES

Primary M.2 Storage

2 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
1 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
4 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
512 GB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
2TB PCIe® Gen4x4 NVMe™ SED TLC OPAL2
1TB PCIe® Gen4x4 NVMe™ SED TLC OPAL2
512 GB PCIe® Gen4x4 NVMe™ SED TLC OPAL2
1TB PCIe® Gen4x4 NVMe™ Value
512 GB PCIe® NVMe™ Value M.2 SSD

Secondary M.2 Storage

2 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
1 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
4 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
512 GB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
2TB PCIe® Gen4x4 NVMe™ SED TLC OPAL2
1TB PCIe® Gen4x4 NVMe™ SED TLC OPAL2
512 GB PCIe® Gen4x4 NVMe™ SED TLC OPAL2
1TB PCIe® Gen4x4 NVMe™ Value
Citadel 1TB PCIe-3x4 2280 NVMe SED OPAL2 FIPS 140-2 TLC M.2 2nd Solid State Drive
Citadel 2TB PCIe-3x4 2280 NVMe SED OPAL2 FIPS 140-2 TLC M.2 2nd Solid State Drive
Citadel 512GB PCIe-3x4 2280 NVMe SED OPAL2 FIPS 140-2 TLC M.2 2nd Solid State Drive

[1]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.

Features

MEMORY

Maximum Memory
64GB DDR5-5600

Memory
64GB DDR5-5600 (2x32GB)
32GB DDR5-5600 (2x16GB)
32GB DDR5-5600 (1x32GB)
16GB DDR5-5600 (2x8GB)
16GB DDR5-5600 (1x16GB)

Memory Slots
2 SODIMM
DDR5 SODIMM
Supports Dual Channel Memory

[1]The memory is accessible/upgradeable by IT or self-maintainers only.
[2]Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

Features

NETWORKING /COMMUNICATIONS

WLAN

Intel® Wi-Fi 7 BE201 and Bluetooth® 5.4 wireless card, vPro®; Intel® Wi-Fi 7 BE201 and Bluetooth® 5.4 wireless card, non-vPro®
Intel® Wi-Fi 6E AX211 and Bluetooth® 5.3 wireless card, vPro®; Intel® Wi-Fi 6E AX211 and Bluetooth® 5.3 wireless card, non-vPro®

WWAN

HP KavalanR R15 5G Solution;
LPWAN Qualcomm 9205 LTE-M

NFC

No Near Field Communication (NFC) module
NFC Mirage WNC XRAV-1

Miracast

Native Miracast Support

Ethernet

Intel® I219-LM GbE, vPro®;
Intel® I219-V GbE, non-vPro®

Features

AUDIO/MULTIMEDIA

Audio
Audio by Poly Studio
2 Integrated stereo speakers
Discrete Amplifiers
Integrated dual array microphone

Speaker Power
2W/4ohm Per speaker

Camera
FHD camera
5 MP+IR camera

Sensors
ALS (ambient light sensor)
Adaptive Color Sensor
Hall Sensor
HP Sure Platform
Motion AI LSM6DSL
Thermal Sensor
HP Tamper Lock
Fingerprint Sensor (optional)

[1]HD content required to view HD images.
[2]Sold separately or as an optional feature.
[3]Internet access required.

Features

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Premium Keyboard, spill resistant, Backlit keyboard and DuraKeys
HP Premium Keyboard, spill resistant, Backlit keyboard and DuraKeys Privacy

Pointing Device

Clickpad with multi-touch gesture support, taps enabled as default
Microsoft Precision Touchpad Default Gestures Support

Function Keys

ESC: System information
F1: Display switching
F2: Blank or Sure View on/off
F3: Brightness down
F4: Brightness up
F5: Blank or Backlight toggle
F6: Audio mute
F7: Volume down
F8: Volume up
F9: Microphone mute
F10: Play and pause
F11: HP Programmable key
F12: Print Screen
Power button (with LED)
Insert
Delete
Home
End
Microsoft Copilot

Hidden Keys

Fn + R: Break
Fn + S: System requests
Fn + C: Scroll lock

Backlit keyboard is an optional feature.

Features

SOFTWARE AND SECURITY

Software

Buy Microsoft Office (Sold Seperatley)
CoPilot in Windows with CoPilot Key [1]
Edge Customization
HP Connection Optimizer
HP Hotkey Support
HP Mac Address Manager
HP Notifications
HP PC Hardware Diagnostics UEFI
HP PC Hardware Diagnostics Windows
HP Privacy Settings
HP Services Scan [2]
HP Support Assistant [4]
myHP
HSA Fusion for Commercial
HSA Telemetry for Commercial
Poly Camera Pro
Poly Lens [5]
Ubuntu Data Science Stack

Manageability Features

HP Client Catalog (download) [6]
HP Client Management Script Library (download) [7]
HP Cloud Recovery [8]
HP Connect for Microsoft Endpoint Manager
HP Driver Packs (download) [9]
HP Image Assistant (download) [10]
HP Manageability Integration Kit (download) [11]
HP Power Manager with Battery Health Manager (download) [12]

Security Management

Secured-Core PC Enable
Windows Hello Enhanced Sign-In Security (ESS)
HP Wolf Security for Business which includes: [13]
HP Sure Admin [14]
HP Sure Click [15]
HP Sure Recover [16]
HP Sure Run [17]
HP Sure Sense [18]
HP Sure Start [19]
HP Tamper Lock

Features

BIOS

Absolute Persistence Module [20]
Audio Perminant Disable
HP BIOS Recovery
HP Fingerprint Sensor [21]
BIOS Update via Network
HP BIOSphere [22]
HP DriveLock & Automatic DriveLock
HP Secure Erase [23]
HP Wake on WLAN

1. Copilot key is available on select Windows 11 PCs. Where Microsoft Copilot is not available, the Copilot key will lead to the Bing search engine. Copilot key feature availability varies by market, see aka.ms/keysupport. Copilot is NOT available in China, Russia, Belarus, and embargoed regions Cuba, Iran, North Korea, Crimea.
2. HP Services Scan is preinstalled and/or provided thru Windows Update and checks for service entitlement on each hardware device and downloads the applicable software agent automatically. To disable this feature, please follow the instructions at http://www.hpdaas.com/requirements. The HP Insights agent is a telemetry and analytics platform that provides critical data around devices and applications and is not sold as a standalone service. HP follows stringent GDPR privacy regulations and is ISO27001, ISO27701, ISO27017 and SOC2 Type2 certified for Information Security. Internet access with connection to the HP Insights agent is required. For full system requirements, please visit http://www.hpdaas.com/requirements. Not available in China.
4. HP Support Assistant is available on Windows. For more information, please visit www.support.hp.com/help/hp-support-assistant.
5. Poly Lens Desktop requires a Windows OS.
6. HP Client Catalog not preinstalled, however available for download at (https://www.hp.com/us-en/solutions/client-management-solutions.html)
7. HP Client Management Script Library (https://www.hp.com/us-en/solutions/client-management-solutions.html#tab=manageability-tools).
8. HP Cloud Recovery is available for Z by HP, HP Elite and Pro desktops and laptops PCs with Intel® or AMD processors and requires an open, network connection. Note: You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Detail please refer to: https://support.hp.com/us-en/computer.
9. HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement.
10. HP Image Assistant not preinstalled, however available for download at (https://ftp.ext.hp.com/pub/caps-softpaq/cmit/HPIA.html),
11. HP Manageability Integration Kit not presintalled, however available for downloaded from https://www.hp.com/us-en/solutions/client-management-solutions.html#tab=manageability-tools.
12. HP Power Manager with Battery Health can be downloaded by entering your system information here: https://support.hp.com/in-en/document/ish_4449597-3519507-16.
13. HP Wolf Security for Business requires Windows 10 or 11 Pro or higher, includes various HP security features and is available on HP Pro, Elite, RPOS and Workstation products. See product details for included security features.
14. HP Sure Admin requires HP G8 or newer platforms, Windows 10 or higher, HP BIOS, HP Manageability Kit or KMS Service from http://www.hp.com/go/clientmanagement and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store.
15. HP Sure Click requires Windows 10 and higher. See https://bit.ly/2PrLT6A_SureClick for complete details.
16. HP Sure Recover is available on select HP PCs and requires Windows 10 or 11 and an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. HP Sure Recover Gen6 with Embedded Reimaging is an optional feature on select HP PCs which requires Windows 10 or 11 must be configured at purchase. You must back up

Features

important files, data, photos, videos, etc. before use to avoid loss of data.
17. HP Sure Run is available on select HP PCs and requires Windows 10 and higher.
18. HP Sure Sense requires Windows 10 and higher. See product specifications for availability. On units with WWAN shipping to China, HP Sure Sense is only available via Softpaq download.
19. HP Sure Start is available on select HP PCs and requires Windows 10 and higher.
20. Absolute Persistence 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/.
21. HP Fingerprint Reader is an optional feature that requires Windows 10 or 11 and must be configured at purchase.
22. HP BIOSphere features may vary depending on the platform and configuration.
23. HP Secure Erase implements the methods outlined in the National Institute of Standards and Technology Special Publication 800-88r "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.

Features

POWER

Power Supply [16]
HP Smart 150 W External AC power adapter
HP Smart 120 W External AC power adapter

Battery
HP Long Life 6-cell, 83 Wh Li-ion polymer

Power Cord
3-wire plug - 1m

Battery life
UMA: Up to 19 hours 23 mins[5,1]
Discrete: Up to 12 hours 12 mins[5,1]

[1]Availability may vary by country.
[2]Battery is internal and serviceable by warranty.
[3]Windows 11 MM25 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See www.bapco.com for additional details.
[4]Testing conducted by HP using Google Chrome OS power_LoadTest. Battery life will vary and the maximum capacity of the battery will naturally decrease with time and usage and battery optimization activation. See http://www.chromium.org/chromium-os/testing/power-testing for test details.
[5]Recharges your 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.
[6]Recharges up to 90% within 90 minutes when the system is off or in standby mode when used with the power adapter provided with the notebook. After charging has reached 90% capacity, charging speed will return to normal. Charging time may vary +/-10% due to System tolerance.
[7]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.

Features

WEIGHT & DIMENSIONS

Weight[1]
Product Weight-
Starting at 4.5 lbs
Starting at 2.04 KG

Product Dimensions (w x d x h)
14.15 inches (W) x 9.88 inches (D) x (HF) 0.90 inches (HR)
359.40 mm (W) x 251 mm (D) x (HF) 22.9 mm (HR)

[1]Weight will vary by configuration. Does not include power adapter.

Features

PORTS/SLOTS

2 Thunderbolt™ 4 with USB4 Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 2.1)*
2 Super Speed USB Type-A 5Gbps signaling rate (1 charging)
1 HDMI 2.1
1 Headphone/microphone combo jack
1 Nano Security Lock Slot (Lock sold separately)
1 Smartcard reader (Optional)
1 nano SIM card slot
1 SD card reader

Expansion Slots
1 SD
1 multi-format digital media reader
Supports SD, SDHC, SDXC

*Actual throughout may vary.
[1]SuperSpeed USB 20Gbps is not available with Thunderbolt™ 4.
[2]HDMI cable sold separately.
[3]SIM slot is not user accessible without WWAN configuration.

Features

SERVICE AND SUPPORT

1-year warranty and 90 day software limited warranty options depending on country. HP Worldwide Limited Warranty for the battery is aligned with the warranty period of the HP Hardware Product. 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.

[1]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® certified
EPEAT® 2019 registered where applicable. EPEAT ® registration varies by country. See www.epeat.net for registration status by country.
EPEAT® 2025 Gold
TCO 10 Certified
RCTA DO-160G
Medical EMC: IEC 60601-1-2:2014 EN60601-1-2: 2015
SEPA
GS Mark
Eyesafe Certification – Worldwide

Sustainable Impact Specifications

Recycled Aluminum and Magnesium, 75% PCR w/30% ITE plastics

[1]Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit www.epeat.net for more information.
[2]External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.
[3]Percentage of ocean-bound plastic contained in each component varies by product.
[4]100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.
[5]Plastic cushions are made from >90% recycled plastic.
[6]Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.
[7]ITE Derived Closed Loop Plastic percentage is based on the definition set in the IEEE 1680.1-2018 standard.
[8]Molded pulp cushions made from 100% recycled wood fiber and organic materials.

Technical Specifications – System Unit

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	
Nominal Operating Voltage	19V
Average Operating Power	
Integrated graphics	Yes
Discrete Graphics	Yes
Max Operating Power	150W
Temperature	
Operating	32° to 95° F (0° to 35° C) (No sustained direct exposure to sunlight) (System performance may be reduced above 32°C (89.6°F))
Non-operating	-4° to 140° F (-20° to 60° C)
Relative Humidity	
Operating	10% to 90% (non-condensing)
Non-operating	5% to 95% (38.7° C (101.6° F) maximum wet bulb tempera-ture; non-condensing)
Shock	
Operating	40 G, 2 ms, half-sine
Non-operating	240 G, 2 ms, half-sine
Random Vibration	
Operating	1.043 grms
Non-operating	3.5 grms
Altitude (unpressurized)	
Operating	10,000 ft (3,048 m)
Non-operating	40,000 ft (12,192 m)
Planned Industry Standard Certifications	
Regulatory Model Number	HSN-Q40C
UL	Yes
CSA	Yes
FCC Compliance	Yes
ENERGY STAR®	Yes
EPEAT	Yes
ICES	Yes
Australia /	Yes
NZ A-Tick Compliance	Yes
CCC	Yes
Japan VCCI Compliance	Yes
KC	Yes
BSMI	Yes
CE Marking Compliance	Yes
BNCI or BELUS	
CIT	
GOST	

Technical Specifications – System Unit

Saudi Arabian Compliance (ICCP)	Yes
SABS	Yes
UKRSERTCOMPUTER	

Technical Specifications – Displays

DISPLAYS

Actual brightness will be lower with touchscreen or HP Sure View.
Availability may vary by country

16.0 in 2.5K (2560 x 1600)
Anti-Glare UWVA WLED+LBL
AD-100 400 eDP 1.4+PSR2
120Hz (VRR) bent LCD Panel

Outline Dimensions (W x H x D)	349.98 x 224.82 (max)
Active Area	344.6784x215.424 (typ)
Weight	280 (max)
Diagonal Size	16
Thickness	2.3 / 4.1 (max)
Interface	eDP1.4
Surface Treatment	Anti-Glare
Touch Enabled	No
Contrast Ratio	2000:1 (typ)
Refresh Rate	120 (typ)
Brightness	400 (typ)
Pixel Resolution - Format	2560 x 1600 (2.5K)
Backlight	WLED
Pixel Resolution	RGB
Color Gamut Coverage	Adobe RGB 100% + DCI-P3 100%
Color Depth	8
Viewing Angle	UWVA 89/89/89/89
Low Blue Light	Yes
Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.5 (max)/ 3.0 (max)

16.0 in WUXGGA (1920 x1200)
Anti-Glare UWVA LED sRGB
62.5 8bit 300 eDP 1.2 w.o PSR
60Hz bent LCD Panel

Outline Dimensions (W x H x D)	350.680 x 226.070 (max)
Active Area	344.6784 x 215.424 (typ)
Weight	390 (max)
Diagonal Size	16
Thickness	3.0 / 4.8 (max)
Interface	eDP 1.2
Surface Treatment	Anti-Glare
Touch Enabled	No
Contrast Ratio	1000:1(typ)

Technical Specifications – Displays

Refresh Rate	60 (typ)
Brightness	300 (typ)
Pixel Resolution - Format	1920 x 1200 (WUXGA)
Backlight	WLED
Pixel Resolution	RGB
Color Gamut Coverage	sRGB 62.5%
Color Depth	8
Viewing Angle	UWVVA 89/89/89/89
Low Blue Light	No
Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.7 (max) / 3.4 (max)

16.0 in WUXGA (1920 x 1200) Anti-Glare UWVA LED sRGB 62.5 8bit 300 TOP eDP 1.2 w/o PSR 60Hz bent LCD Panel

Outline Dimensions (W x H x D)	350.680 x 226.070 (max)
Active Area	344.680 x 215.420 (typ)
Weight	400 (max)
Diagonal Size	16
Thickness	3 / 4.8 (max)
Interface	eDP1.2
Surface Treatment	Anti-Glare
Touch Enabled	Yes
Contrast Ratio	1000 : 1(typ.)
Refresh Rate	60 (typ)
Brightness	300 (typ)
Pixel Resolution - Format	1920 x 1200 (WUXGA)
Backlight	WLED
Pixel Resolution	RGB
Color Gamut Coverage	sRGB 62.5%
Color Depth	8
Viewing Angle	UWVA 89/89/89/89
Low Blue Light	No
Power Consumption (W, EBL@ 150nits max/ 200nits max)	2.43 (max) / 3.03 (max)

16.0 in WUXGA (1920 x 1200) Anti-Glare UWVA Low Blue Light sRGB 100 800 eDP 1.4+PSR+IOL Sure View 5 bent LCD Panel

Technical Specifications – Displays

Outline Dimensions (W x H x D)	349.980 x224.82 (max)
Active Area	344.680 x215.420 (typ)
Weight	310 (max)
Diagonal Size	16
Thickness	2.3/4.1 (max)
Interface	eDP 1.4
Surface Treatment	Anti-Glare
Touch Enabled	No
Contrast Ratio	1500 : 1 (typ)
Refresh Rate	60 (typ)
Brightness	800 (typ)
Pixel Resolution - Format	1920 x 1200 (WUXGA)
Backlight	WLED
Pixel Resolution	RGB
Color Gamut Coverage	sRGB 100%
Color Depth	8
Viewing Angle	UWVA 89/89/89/89
Low Blue Light	Yes
Power Consumption (W, EBL@ 150nits max/ 200nits max)	1.93(max)/2.38(max)

16.0 in WUXGA (1920 x 1200) Anti-Glare UWVA WLED+LBL sRGB NB2Y 400 eDP 1.4+PSR2 Low-Power 100 bent LCD Panel

Outline Dimensions (W x H x D)	350.680 x 226.470 (max)
Active Area	344.678 x 215.424 (typ)
Weight	330 (max)
Diagonal Size	16
Thickness	2.6 / 4.6 (max)
Interface	eDP1.4
Surface Treatment	Anti-Glare
Touch Enabled	No
Contrast Ratio	1000:1 (typ)
Refresh Rate	60 (typ)
Brightness	400 (typ)
Pixel Resolution - Format	1920 x 1200 (WUXGA)
Backlight	WLED
Pixel Resolution	RGB
Color Gamut Coverage	sRGB 100%
Color Depth	8
Viewing Angle	UWVA 89/89/89/89
Low Blue Light	Yes

Technical Specifications – Displays

Power Consumption (W, EBL@ 150nits max/ 200nits max)	1.60 (max)/ 1.95 (max)

16.0 in WQUXGA DRM (3840 x 2400) Anti-Glare UWVA LED DCI-P3 NB2Y 500 eDP1.4 w/o PSR 100 120Hz bent LCD Panel

Outline Dimensions (W x H x D)	349.980 x 225.420 (max)
Active Area	344.680 x 215.420 (typ)
Weight	300 (max)
Diagonal Size	16
Thickness	2.3 / 4.1 (max)
Interface	eDP1.4
Surface Treatment	Anti-Glare
Touch Enabled	No
Contrast Ratio	1200:1 (typ)
Refresh Rate	120 (typ)
Brightness	500 (typ)
Pixel Resolution - Format	3840 x 2400 (WQUXGA)
Backlight	WLED
Pixel Resolution	RGB
Color Gamut Coverage	DCI-P3 100%
Color Depth	8
Viewing Angle	UWVA 89/89/89/89
Low Blue Light	No
Power Consumption (W, EBL@ 150nits max/ 200nits max)	4.98 (max)/ 5.84 (max)

Technical Specifications – Storage

STORAGE

SSD 2TB 2280 PCIe-4x4 NVMe Three Layer Cell

Form Factor	M.2 2280
Capacity	2TB
NAND Type	TLC
Height	0.09 in (2.3 mm)
Width	0.87 in (22 mm)
Weight	0.02 lb (10 g)
Interface	PCIe NVMe Gen4X4
Maximum Sequential Read	6400 MB/s ±20%
Maximum Sequential Write	5000 MB/s ±20%
Logical Blocks	4000797360
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	Pyrite 2.0; TRIM; L1.2

SSD 1TB 2280 PCIe-4x4 NVMe Three Layer Cell

Form Factor	M.2 2280
Capacity	1TB
NAND Type	TLC
Height	0.09 in (2.3 mm)
Width	0.87 in (22 mm)
Weight	0.02 lb (10 g)
Interface	PCIe NVMe Gen4X4
Maximum Sequential Read	6400 MB/s ±20%
Maximum Sequential Write	5000 MB/s ±20%
Logical Blocks	2000409264
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	Pyrite 2.0; TRIM; L1.2

SSD 512GB 2280 PCIe-4x4 NVMe Three Layer Cell

Form Factor	M.2 2280
Capacity	512GB
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 Gen4X4
Maximum Sequential Read	6400 MB/s ±20%

Technical Specifications – Storage

	Maximum Sequential Write	3500 MB/s ±20%
	Logical Blocks	1000215215
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	Pyrite 2.0; TRIM; L1.2
SSD 512GB 2280 PCIe NVMe Value		
	Form Factor	M.2 2280
	Capacity	512 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 Gen4X4
	Maximum Sequential Read	3500 MB/s ±20%
	Maximum Sequential Write	1600 MB/s ±20%
	Logical Blocks	1000215215
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	Pyrite 2.0; TRIM; L1.2
SSD 1TB 2280 PCIe NVMe Value	**Form Factor**	M.2 2280
	Capacity	1TB
	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 Gen4X4
	Maximum Sequential Read	3500 MB/s ±20%
	Maximum Sequential Write	2700 MB/s ±20%
	Logical Blocks	2000409264
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	Pyrite 2.0; TRIM; L1.2
4TB PCIe-4x4 2280 NVMe Three Layer Cell double-sided M.2 Solid State Drive		
	Form Factor	M.2 2280
	Capacity	4TB
	NAND Type	TLC
	Height	0.14 in (3.65 mm)
	Width	0.87 in (22 mm)

Technical Specifications – Storage

Weight	15g
Interface	PCIe NVMe Gen4X4
Maximum Sequential Read	6400 MB/s ±20%
Maximum Sequential Write	5000 MB/s ±20%
Logical Blocks	8001573552
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	Pyrite 2.0; TRIM; L1.2

2TB PCIe-4x4 2280 NVME Self Encrypted OPAL2 Three Layer Cell Solid State Drive

Form Factor	M.2 2280
Capacity	2TB
NAND Type	TLC
Height	0.09 in (2.3 mm)
Width	0.87 in (22 mm)
Weight	0.02 lb (10 g)
Interface	PCIe NVMe Gen4X4
Maximum Sequential Read	6400 MB/s ±20%
Maximum Sequential Write	5000 MB/s ±20%
Logical Blocks	4000797360
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	Pyrite 2.0; TRIM; L1.2

1TB PCIe-4x4 2280 NVME Self Encrypted OPAL2 Three Layer Cell Solid State Drive

Form Factor	M.2 2280
Capacity	1TB
NAND Type	TLC
Height	0.09 in (2.3 mm)
Width	0.87 in (22 mm)
Weight	0.02 lb (10 g)
Interface	PCIe NVMe Gen4X4
Maximum Sequential Read	6400 MB/s ±20%
Maximum Sequential Write	5000 MB/s ±20%
Logical Blocks	2000409264
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	Pyrite 2.0; TRIM; L1.2

512GB PCIe-4x4 2280 NVME

Technical Specifications – Storage

Self Encrypted OPAL2 Three Layer Cell Solid State Drive

Form Factor	M.2 2280
Capacity	512GB
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 Gen4X4
Maximum Sequential Read	6400 MB/s ±20%
Maximum Sequential Write	3500 MB/s ±20%
Logical Blocks	1000215215
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	TCG Opal 2.0; TRIM; L1.2

Technical Specifications – Networking

NETWORKING / COMMUNICATION

Intel® BE201 Wi-Fi 7

Bluetooth® 5.4 vPro WW WLAN

[1]

Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11be IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
Interoperability	Wi-Fi certified
Frequency Band	802.11b/g/n/ax/be 2.402 – 2.482 GHz 802.11a/n/ac/ax/be 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 5.955 – 6.415 GHz 6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 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: max 300Mbps 802.11ac : 1733Mbps 802.11ax : max 2.4Gbps 802.11be : max 5.76Gbps
Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM, 4096QAM

Technical Specifications – Networking

Security[3]	IEEE and WiFi 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 Power[2]	802.11b, 1Mbps : +17dBm minimum 802.11g, 6Mpbs : +16dBm minimum 802.11a, 6Mbps : +17dBm minimum 802.11n, MCS7(HT20) : +14dBm minimum 802.11n, MCS7(HT40) : +13.5dBm minimu 802.11ac MCS9(VHT20) : 13.5dBm minimum 802.11ac MCS9(VHT40) : +13.5dBm minimum 802.11ac MCS9(VHT80) : +12.5dBm minimum 802.11ac MCS9(VHT160) : +10.5dBm minimum 802.11ax MCS11(HE20)(6GHz) : +11.5dBm minimum 802.11ax MCS11(HE40)(6GHz) : +7.5dBm minimum 802.11ax MCS11(HE80)(6GHz) : +7.5dBm minimum 802.11ax MCS11(HE160)(6GHz) : +7.5dBm minimum 802.11be MCS13(EHT20)(6GHz) : 11.5dBm 802.11be MCS13(EHT40)(6GHz) : 7.5dBm 802.11be MCS13(EHT80)(6GHz) : 7.5dBm 802.11be MCS13(EHT160)(6GHz) : 6.5dBm 802.11be MCS13(EHT320)(6GHz) : 4.5dBm
Power Consumption	Transmit mode 3.1 W Receive mode 1.8 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 Sensitivity[3]	802.11b, 1Mbps : -93.5dBm maximum

Technical Specifications – Networking

	802.11b, 11Mbps : -85dBm maximum 802.11a/g, 6Mbps : -90.5dBm maximum 802.11a/g, 54Mbps : -72.5dBm maximum 802.11n, MCS0(HT20) : -90dBm maximum 802.11n, MCS7(HT20) : -71.5dBm maximum 802.11n, MCS0(HT40) : -88.5dBm maximum 802.11n, MCS7(HT40) : -68.5dBm maximum 802.11ac, MCS9(VHT20) : -88.5dBm maximum 802.11ac, MCS9(VHT40) : -65.5dBm maximum 802.11ac, MCS9(VHT80) : -60.5dBm maximum 802.11ac, MCS9(VHT160) : -58.5dBm maximum 802.11ax, MCS11(HE20)(6GHz) : -59.5dBm maximum 802.11ax, MCS11(HE40)(6GHz) : -56.5dBm maximum 802.11ax, MCS11(HE80)(6GHz) : -53.5dBm maximum 802.11ax, MCS11(HE160)(6GHz) : -51.5dBm maximum 802.11be, MCS13(EHT20)(6GHz) : -55.5dBm maximum 802.11be, MCS13(EHT40)(6GHz) : -53.5dBm maximum 802.11be, MCS13(EHT80)(6GHz) : -51.5dBm maximum 802.11be, MCS13(EHT160)(6GHz) : -48.5dBm maximum 802.11be, MCS13(EHT320)(6GHz) : -45.5dBm maximum
Antenna type	High efficiency antenna with spatial diversity Two embedded tri-band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
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
Subtitle	HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2/5.3/5.4 Wireless Technology
Bluetooth Specification	4.0/4.1/4.2/5.0/5.1/5.2/5.3/5.4 Compliant

Technical Specifications – Networking

Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps 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 I Bluetooth device with a maximum transmit power of +15.5 dBm for BR and +13dBm for EDR.
Power Consumption	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
Bluetooth Software Supported **Link Topology**	1. Microsoft Windows Bluetooth Software 2. Linux/Chrome OS Bluetooth Software.
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Certifications	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407 ETSI 300 328, ETSI 301 893, ETSI 303 687
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) BT5.2 ESR9/10 Compliance LE Advertisement Extensions

Technical Specifications – Networking

	Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising 2Mbps LE LE Long Range BT5.3 Host to Controller Encryption Key Control Enahancements Compliance to the latest Errata Sectipn 12.3 of BT 5.3 specification

1.Wi-Fi 7 requires a Wi-Fi 7 router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 7 is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 7 is supported. Wi-Fi 7 is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

2. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Intel® BE201 Wi-Fi 7
Bluetooth® 5.4 non-vPro WW
WLAN [1]

Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11be IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
Interoperability	Wi-Fi certified
Frequency Band	802.11b/g/n/ax/be 2.402 – 2.482 GHz 802.11a/n/ac/ax/be 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 5.955 – 6.415 GHz 6.435 – 6.515 GHz 6.535 – 6.875 GHz

Technical Specifications – Networking

	6.895 – 7.115 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: max 300Mbps 802.11ac : 1733Mbps 802.11ax : max 2.4Gbps 802.11be : max 5.76Gbps
Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM, 4096QAM
Security[3]	IEEE and WiFi 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 Power[2]	802.11b, 1Mbps : +17dBm minimum 802.11g, 6Mpbs : +16dBm minimum 802.11a, 6Mbps : +17dBm minimum 802.11n, MCS7(HT20) : +14dBm minimum 802.11n, MCS7(HT40) : +13.5dBm minimu 802.11ac MCS9(VHT20) : 13.5dBm minimum 802.11ac MCS9(VHT40) : +13.5dBm minimum 802.11ac MCS9(VHT80) : +12.5dBm minimum 802.11ac MCS9(VHT160) : +10.5dBm minimum 802.11ax MCS11(HE20)(6GHz) : +11.5dBm minimum 802.11ax MCS11(HE40)(6GHz) : +7.5dBm minimum 802.11ax MCS11(HE80)(6GHz) : +7.5dBm minimum 802.11ax MCS11(HE160)(6GHz) : +7.5dBm minimum 802.11be MCS13(EHT20)(6GHz) : 11.5dBm 802.11be MCS13(EHT40)(6GHz) : 7.5dBm 802.11be MCS13(EHT80)(6GHz) : 7.5dBm 802.11be MCS13(EHT160)(6GHz) : 6.5dBm

Technical Specifications – Networking

	802.11be MCS13(EHT320)(6GHz) : 4.5dBm
Power Consumption	Transmit mode 3.1 W Receive mode 1.8 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 Sensitivity[3]	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -85dBm maximum 802.11a/g, 6Mbps : -90.5dBm maximum 802.11a/g, 54Mbps : -72.5dBm maximum 802.11n, MCS0(HT20) : -90dBm maximum 802.11n, MCS7(HT20) : -71.5dBm maximum 802.11n, MCS0(HT40) : -88.5dBm maximum 802.11n, MCS7(HT40) : -68.5dBm maximum 802.11ac, MCS9(VHT20) : -88.5dBm maximum 802.11ac, MCS9(VHT40) : -65.5dBm maximum 802.11ac, MCS9(VHT80) : -60.5dBm maximum 802.11ac, MCS9(VHT160) : -58.5dBm maximum 802.11ax, MCS11(HE20)(6GHz) : -59.5dBm maximum 802.11ax, MCS11(HE40)(6GHz) : -56.5dBm maximum 802.11ax, MCS11(HE80)(6GHz) : -53.5dBm maximum 802.11ax, MCS11(HE160)(6GHz) : -51.5dBm maximum 802.11be, MCS13(EHT20)(6GHz) : -55.5dBm maximum 802.11be, MCS13(EHT40)(6GHz) : -53.5dBm maximum 802.11be, MCS13(EHT80)(6GHz) : -51.5dBm maximum 802.11be, MCS13(EHT160)(6GHz) : -48.5dBm maximum 802.11be, MCS13(EHT320)(6GHz) : -45.5dBm maximum
Antenna type	High efficiency antenna with spatial diversity Two embedded tri-band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
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

Technical Specifications – Networking

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
Subtitle	HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2/5.3/5.4 Wireless Technology
Bluetooth Specification	4.0/4.1/4.2/5.0/5.1/5.2/5.3/5.4 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps 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 I Bluetooth device with a maximum transmit power of +15.5 dBm for BR and +13dBm for EDR.
Power Consumption	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
Bluetooth Software Supported **Link Topology**	1. Microsoft Windows Bluetooth Software 2. Linux/Chrome OS Bluetooth Software.
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Certifications	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407 ETSI 300 328, ETSI 301 893, ETSI 303 687
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)
BT5.2
ESR9/10 Compliance
LE Advertisement Extensions
Channel Selection Algo
Limited High Duty Cycle Non-Connectable Advertising
2Mbps LE
LE Long Range
BT5.3
Host to Controller Encryption Key Control Enahancements
Compliance to the latest Errata Sectipn 12.3 of BT 5.3 specification

1.Wi-Fi 7 requires a Wi-Fi 7 router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 7 is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 7 is supported. Wi-Fi 7 is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

2. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Intel® AX211 Wi-Fi 6E
Bluetooth® 5.3 vPro WLAN [1]

Wireless LAN Standards	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	Wi-Fi certified
Frequency Band	802.11b/g/n/ax
	2.402 – 2.482 GHz

Technical Specifications – Networking

	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 5.955 – 6.415 GHz 6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 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: max 300Mbps 802.11ac : 1733Mbps 802.11ax : max 2.4Gbps
Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM , 1024QAM
Security	IEEE and WiFi 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 Power	802.11b : +17dBm minimum 802.11g : +16dBm minimum 802.11a : +17dBm minimum 802.11n HT20(2.4GHz) : +14dBm minimum 802.11n HT40(2.4GHz) : +13dBm minimum 802.11n HT20(5GHz) : +14dBm minimum 802.11n HT40(5GHz) : +13dBm minimum 802.11ac VHT80(5GHz) : +10dBm minimum 802.11ac VHT160(5GHz) : +10dBm minimum

Technical Specifications – Networking

	802.11ax HE40(2.4GHz) : +12dBm minimum 802.11ax HE80(5GHz) : +10dBm minimum 802.11ax HE160(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 10mW Radio disabled 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[2]	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0(VHT80) : -84dBm maximum 802.11ac, MCS9(VHT80) : -59dBm maximum 802.11ac, MCS9(VHT160) : -58.5dBm maximum 802.11ax, MCS11(HE40): -57dBm maximum 802.11ax, MCS11(HE80): -54dBm maximum 802.11ax, MCS11(HE160): -53.5dBm maximum
Antenna type	High efficiency antenna with spatial diversity Two embedded tri-band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
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)

Technical Specifications – Networking

	Non-operating: 0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED OFF – Radio ON
Subtitle	Integrated Bluetooth® specifications
Bluetooth Specification	4.0/4.1/4.2/5.0/5.1/5.2/5.3 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps 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 **Link Topology**	1. Microsoft Windows Bluetooth Software 2. Linux/Chrome OS Bluetooth Software.
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Certifications	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407 ETSI 300 328, ETSI 301 893, ETSI 303 687
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)

Technical Specifications – Networking

	Advanced Audio Distribution Profile (A2DP) BT5.2 ESR9/10 Compliance LE Advertisement Extensions Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising 2Mbps LE LE Long Range BT5.3 Host to Controller Encryption Key Control Enahancements Compliance to the latest Errata Sectipn 12.3 of BT 5.3 specification

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

4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Intel® AX211 Wi-Fi 6E
Bluetooth® 5.3 WW WLAN [1]

Wireless LAN Standards	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	Wi-Fi certified
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 5.955 – 6.415 GHz

Technical Specifications – Networking

	6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 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: max 300Mbps 802.11ac : 1733Mbps 802.11ax : max 2.4Gbps
Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM , 1024QAM
Security	IEEE and WiFi 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 Power	802.11b : +17dBm minimum 802.11g : +16dBm minimum 802.11a : +17dBm minimum 802.11n HT20(2.4GHz) : +14dBm minimum 802.11n HT40(2.4GHz) : +13dBm minimum 802.11n HT20(5GHz) : +14dBm minimum 802.11n HT40(5GHz) : +13dBm minimum 802.11ac VHT80(5GHz) : +10dBm minimum 802.11ac VHT160(5GHz) : +10dBm minimum 802.11ax HE40(2.4GHz) : +12dBm minimum 802.11ax HE80(5GHz) : +10dBm minimum 802.11ax HE160(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

Technical Specifications – Networking

	(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 Sensitivity[4]	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0(VHT80) : -84dBm maximum 802.11ac, MCS9(VHT80) : -59dBm maximum 802.11ac, MCS9(VHT160) : -58.5dBm maximum 802.11ax, MCS11(HE40): -57dBm maximum 802.11ax, MCS11(HE80): -54dBm maximum 802.11ax, MCS11(HE160): -53.5dBm maximum
Antenna type	High efficiency antenna with spatial diversity Two embedded tri-band 2.4/5/6 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
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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
Subtitle	HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1/5.2/5.3 Wireless Technology
Bluetooth Specification	4.0/4.1/4.2/5.0/5.1/5.2/5.3 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH)

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	BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps BLE : 1 Mbps data rate; throughput up to 0.2 Mbps Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.
Power Consumption	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
Bluetooth Software Supported **Link Topology**	1. Microsoft Windows Bluetooth Software 2. Linux/Chrome OS Bluetooth Software.
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Certifications	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407 ETSI 300 328, ETSI 301 893, ETSI 303 687
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) BT5.2 ESR9/10 Compliance LE Advertisement Extensions Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising

2Mbps LE
LE Long Range
BT5.3
Host to Controller Encryption Key Control Enahancements
Compliance to the latest Errata Sectipn 12.3 of BT 5.3 specification

1.Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported. Wi-Fi 6E is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.
2. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

HP 5G Sub-6 Cat 19

Technology/Operating bands	WCDMA/HSPA+ operating bands: Band 1: 1920 to 1980 MHz (UL), 2110 to 2170 MHz (DL) Band 2: 1850 to 1910 MHz (UL), 1930 to 1990 MHz (DL) Band 4: 1710 to 1755 MHz (UL), 2110 to 2155 MHz (DL) Band 5: 824 to 849 MHz (UL), 869 to 894 MHz (DL) Band 8: 880 to 915 MHz (UL), 925 to 960 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 43: 3400 to 3800 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) 5GNR 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) n20: 832 to 862 MHz (UL), 791 to 821 MHz (DL) n25: 1850 to 1915 MHz (UL), 1930 to 1995 MHz (DL) n28: 703 to 748 MHz (UL), 758 to 803 MHz (DL) n30: 2305 to 2315 MHz (UL) 2350 to 2360 MHz (DL) n38: 2570 to 2620 MHz (UL/DL) n40: 2300 to 2400 MHz (UL/DL) n41: 2496 to 2690 MHz (UL/DL) n48: 3550 to 3700 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	NR Sub6G rel15 200MHz 2 DLCA, 256 QAM 200MHz 2 ULCA, 256 QAM 15KHz/30KHz SCS for FDD/TDD LTE Rel15 100MHz 5 DLCA, 256 QAM 40MHz 2 ULCA, 256 QAM UMTS Rel8
GPS	GPS only support L1 C/A
GPS bands	GPS: L1 (1575.42MHz) GLONASS: L1 (1602MHz) BeidouB1(1561.098MHz) Galileo E1 (1575.42) QZSS(1575.42 MHz)
Maximum data rates	Sub-6 SA Peak DL 4.67Gbps/UL 1.25Gbps Sub-6 NSA Peak

Technical Specifications – Networking

	DL 3.74Gbps/UL 835Mbps LTE Peak DL 1.6Gbps (CAT19)/UL 211Mbps (CAT18) UMTS/HSPA+ DL DC-HSPA+: 42 Mbps (CAT24)/UL 11.5 Mbps (CAT7)
Maximum output power	NR : 23 dBm in all band except (n30 = 22dBm & n48=21dBm & n77=25dBm & n41/n77/n78 = 26dBm) LTE: 23 dBm in all band except (B30 = 22dBm & B48=21dBm & B41=26dBm) UMTS: 23.5 dBm
Maximum power consumption	3500 mA (peak); 1674mA (average)
Form Factor	M.2, 3052-S3 Key B
Weight	8.7g
Dimensions (Length x Width x Thickness)	52 mm × 30 mm × 2.3 mm
embedded eSIM	Support

1. 5G module is optional and must be configured at the factory. Module designed for 5G NR NSA (non-standalone) 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. Module requires activation and separately purchased service contract. Check with service provider for coverage and availability in your area. Data connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. Backwards compatible to 4G LTE and 3G HSPA technologies. 5G module planned to be available in select platforms and select countries, where carrier supported.

Qualcomm 9205

Technology/Operating bands	FDD LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 14 upper), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1900 (Band 25), 850 (Band 26), 800 (Band 27), 700 (Band 28), 1700/2100 (Band 66), 700 (band 85) MHz. GSM/GPRS/EGPRS: 850, 900, 1800, 1900MHz.
Wireless protocol standards	3GPP TS 51.010-1 V10.5.0: Mobile Station (MS) conformance specification; Part 1: Conformance specification 3GPP TS 36.521-1 V14.3.0: User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Conformance testing 3GPP TS 21.111 V10.0.0: USIM and IC card requirements 3GPP TS 51.011 V4.15.0: Specification of the Subscriber Identity Module -Mobile Equipment (SIM-ME) interface 3GPP TS 31.102 V10.11.0: Characteristics of the Universal

Technical Specifications – Networking

		Subscriber Identity Module (USIM) application 3GPP TS 31.11 V10.16.0: Universal Subscriber Identity Module (USIM) Application Toolkit (USAT) 3GPP TS 36.124 V10.3.0: Electro Magnetic Compatibility (EMC) requirements for mobile terminals and ancillary equipment 3GPP TS 27.007 V10.0.8: AT command set for User Equipment (UE) 3GPP TS 27.005 V10.0.1: Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)
	GPS	Standalone GPS/Beidou/Glonass, A-GPS(XTRA)
	GPS bands	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz
	Maximum data rates	LTE FDD: 375 Kbps (Download), 1119 Kbps (Upload) GSM: - GPRS: 107 Kbps (Download), 85.6 Kbps (Upload) - EGPRS: 296 Kbps (Download), 236.8 Kbps (Upload)
	Maximum output power	LTE: 21.5 dBm in all band GSM:34dBm
	Maximum power consumption	LTE: 147 mA(peak), 18 mA(average)
	Form Factor	M.2,
	Weight	4 g
	Dimensions (Length x Width x Thickness)	22 x 42 x 2.3 mm
	embedded eSIM	Support
NFC NXP NPC300	**Dimensions (L x W x H)**	17 x 10 x 2.0 mm
	Chipset	NPC300
	System interface	I2C
	NFC RF standards	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
	NFC Forum Support	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2
	Reader (PCD-VCD) Mode(1)	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 MIFARE 1K MIFARE 4K MIFARE DESFire FeliCa

Technical Specifications – Networking

	Jewel and Topaz cards
Card Emulation (PICC-VICC)	ISO/IEC 14443 A
Mode(1)	ISO/IEC 14443 B and B’
	MIFARE
	FeliCa
Frequency	13.56 MHz
NFC Modes Supported	Reader/Writer, Peer-to-Peer
Raw RF Data Rates	106, 212, 424, 848 kbps
Operating temperature	Operating: 0 °C to 70 °C (32 °F to 158 °F)
	Storage: -20 °C to 125 °C (-4 °F to 257 °F)
Storage temperature	10-90% operating
	5-95% non-operating
Humidity	4.35 to 5.25 Volts
Supply Operating voltage	1.8V or 3.3V
I/O Voltage	(Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)
Power Consumption	(Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)
Mode	Power Consumption, Typical
Polling	7.3 mA
Detected Test Tag Type 1	Total 283.8 mA
	Net Module 236.8 mA
Detected Test Tag Type 2	Total 288.8 mA
	Net Module 241.8 mA
Detected Test Tag Type 3	Total 287.7 mA
	Net Module 240.7 mA
Detected Test Tag Type 4	Total 282.3 mA
	Net Module 235.3 mA
Antenna	Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module.

Intel® I219-LM 1 Gigabit Network Connection LOM (vPro)

Connector	RJ-45
System Interface	PCI(Intel proprietary) + SMBus
Data rates supported	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)
	100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)
	1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40)
	Auto-Negotiation (Automatic Speed Selection)
	Full Duplex Operation at all Speeds, Half Duplex operation at 10

Technical Specifications – Networking

	and 100 Mbit/s
IEEE Compliance	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet)
Performance	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling(Hash Mode Only) Jumbo Frame 9K
Power consumption	Cable Disconnetion: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
Power Management	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
Management Interface	Auto MDI/MDIX Crossover cable detection
IT Manageability	Wake-on-LAN from modern standby or sleep state (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
Security & Manageability	Intel® vPro™ support with appropriate Intel® chipset components

Intel® I219v 1 Gigabit Network Connection LOM (non-vPro)

Connector	RJ-45
System Interface	PCI(Intel proprietary) + SMBus
Data rates supported	1. 10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 2. 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 3. 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 802.3 clauses 40) 4. Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10,

Technical Specifications – Networking

	100 & 1000 Mbit/s
IEEE Compliance	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet) IEEE 802.3i 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3ab 1000BAE-T IEEE 802.3bz 2.5GBASE-T
Performance	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling(Hash Mode only) Jumbo Frame 9K
Power consumption	Cable Disconnetion: 25mW 100Mbps Full Run: 450mW 1000bps Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
Power Management	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
Management Interface	Auto MDI/MDIX Crossover cable detection
IT Manageability	Wake-on-LAN from modern standby or sleep state (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
Security & Manageability	Intel® non-vPro™ support with appropriate Intel® chipset components

Technical Specifications – Power

POWER

Power supply availability may vary by country.

AC Adapter 150 Watt Smart PFC Slim Barrel 4.5mm - Vesta II

Dimensions	
Weight	0.716 lb (325 g) max (Not including power cord. Power cord varies by country.)
Input	100-240Vac
Input Efficiency	88% at 115 Vac and 89% at 230Vac
Input frequency range	47-63Hz
Input AC current	Max. 2.7 A at 90 Vac
Output	
Output power	150W
DC output	19.5V
Hold-up time	100% load 5ms at 115 Vac input
Output current limit	< 16.0A
AC Inlet Type	C6
DC Cable Connector	4.5mm Barrel Type
DC Cable Material	PVC
Environmental Design	
Operating temperature	32oF to 95oF (0oto 35oC)
Non-operating (storage) temperature	-4o F to 185oF (-20oto 85oC)
Altitude	0 to 16,400 ft (0 to 5000m)
Humidity	20% to 95%
Storage Humidity	10% to 95%
EMI and Safety Certifications	*CE Mark - full compliance with LVD and EMC directives *Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL62368-1 *Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC and CECP, CU(EAC), EAEU, KCC(Safety+EMC), NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia GEMS and RCM, BIS, BSMI, UAE, UKCA DoC

AC Adapter 120 Watt Smart PFC Slim Barrel 4.5mm Right Angle - Delphin

Dimensions	
Weight	350g(+/-10g) (Not including power cord. Power cord varies by country.)

Technical Specifications – Power

Input	100-240Vac
Input Efficiency	88 % at 115 Vac and 89 % at 230Vac
Input frequency range	47-63 Hz
Input AC current	Max. 1.7 A at 90 Vac
Output	
Output power	120W
DC output	19.5V
Hold-up time	100% load 5ms at 115 Vac input/80% load 10ms at 115 Vac input
Output current limit	< 18.0A
AC Inlet Type	C6
DC Cable Connector	4.5mm Barrel Type
DC Cable Material	PVC
Environmental Design	
Operating temperature	32oF to 95oF (0oto 35oC)
Non-operating (storage) temperature	-4oF to 185oF (-20oto 85oC)
Altitude	0 to 16,400 ft (0 to 5000m)
Humidity	20% to 95%
Storage Humidity	10% to 95%
EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC and CECP, CU(EAC), EAEU, KCC(Safety+EMC) and K-MEPS, NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia GEMS and RCM, BIS, BSMI, UAE, UKCA DoC

Battery MB 6 Cell WHr 83 Long Life -PL Fast Charge

Dimensions (H x W x L)	
Weight	0.305kg +/-0.010kg (0.67lb +/-0.02lb)
Cells/Type	6 cell Lithium-Ion polymer cell/ 685257
Energy	
Voltage	11.58V
Amp-hour capacity	7.17Ah
Watt-hour capacity	83Wh
Temperature	
Operating (Charging)	32˚ to 113˚ F (0˚ to 45˚ C) (Charge Initial Temperature) 32˚ to 122˚ F (0˚ to 50˚ C) (Continuous Charging)
Operating (Discharging)	14˚ to 140˚ F (-10˚ to 60˚ C)
Optional Travel Battery Available	No

Technical Specifications – Audio

AUDIO

HD Stereo Codec	Realtek ALC3247
Audio I/O Ports	3.5mm Headset: CTIA only, Headphone-out,
Internal Speaker Amplifier	None
Multi-streaming Capable	Playback multi-streaming can be enabled in the audio control panel to allow independent audio streams to be sent to/from the front jacks or integrated speaker., Following Microsoft behavior.
Sampling	DAC: 16bit/24bit, 48000Hz ADC: 16bit/24bit, 44100Hz/48000Hz
Wavetable Syntheses	
Analog Audio	3.5mm Headset: CTIA only, Headphone-out,
# of Channels on Line-Out	None
Internal Speaker	YES

Technical Specifications – Fingerprint Reader

FINGERPRINT READER

Sensor vendor	ELAN 80SW
Sensor type	Capacitive
DPI resolution	508 DPI
Scan area	80x80 pixels
False Rejection Rate	<3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	2.7~3.6V
Operating Temperature	-20°C - +80°C
Current Consumption Image	35mA peak
Low Latency Wait For Finger	300uA
Capture Rate	Capture Rate: 50 frame/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	508 dpi / 4x4mm sensor area
Footnotes	

Technical Specifications – Environmental

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 Certified
- China Energy Conservation Program (CECP)
- China State Environmental Protection Administration (SEPA)
- Taiwan Green Mark
- Korea Eco-label
- Japan PC Green label*

Sustainable Impact Specifications

- Product Carbon Footprint
- At least 50% ocean bound plastic in the system fan and 30% in speaker[1]
- At least 30% post-consumer recycled plastic[2]
- At least 50% recycled metal[3]
- Low Halogen[4]
- 100% of HP paper-based packaging is from recycled or certified sustainable sources[5]
- Bulk packaging available

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 (Short idle)	6.63 W	6.79 W	6.60 W
Normal Operation (Long idle)	N/A	N/A	N/A
Sleep	2.59 W	2.65 W	2.35 W
Off	0.25 W	0.30 W	0.25 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.

Technical Specifications – Environmental

Heat Dissipation*	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 50Hz**
Normal Operation (Short idle)	23 BTU/hr	23 BTU/hr	23 BTU/hr
Normal Operation (Long idle)	N/A	N/A	N/A
Sleep	8.9 BTU/hr	9 BTU/hr	8 BTU/hr
Off	0.9 BTU/hr	1 BTU/hr	0.9 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	2.6	14.1
Fixed Disk – Random writes	2.7	14.7
Optical Drive – Sequential reads	3.1	20.9

Longevity and Upgrading

This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the

Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.

Additional Information

- 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 93.5% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	417 g
	PAPER/Molded Pulp	125 g
Internal:	PLASTIC/Polyethylene low density – LDPE	10 g

The plastic packaging material contains at least 0.0% recycled content.

The corrugated paper packaging materials contains at least 50% 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

Technical Specifications – Environmental

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 https://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c05998906):

- 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)
- 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)

Technical Specifications – Environmental

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: https://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c05403198 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: HP Product Disassembly Instruction Website. 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.

HP Inc. Corporate Environmental Information

For more information about HP's commitment to the environment:

- Sustainable Impact Report
  - https://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c06040843
- Eco-label certifications
  - https://www.hp.com/us-en/sustainable-impact/document-reports.html#filters_documents_reports-=document_type-type_energy_star,type_epeat,type_tcoISO
- ISO 14001 certificates
  - https://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c04777932

Footnotes

1. Percentage of ocean-bound plastic contained in each component varies by product. Ocean Bound plastic is expressed as a percentage of the total weight plastic. Ocean Bound plastic is based on the definition set by the UL2809 standard.
2. Recycled plastic is expressed as a percentage of the total weight plastic. Post-consumer recycled is based on the definition set in the EPEAT standard for computers, IEEE 1680.1-2018 standard.
3. Recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams.
4. External power supplies, WWAN modules, power cords, cables and peripherals excluded. Service parts obtained after purchase may not be Low Halogen.
5. HP paper and fiber-based packaging for PCs, displays, home and office print, and supplies is reported by suppliers as recycled or certified, with a minimum of 97% by volume verified by HP. Packaging is the box that comes with the product and all paper-based materials inside the box. Packaging for personal systems accessories and spare

Technical Specifications – Environmental

parts is not included. Plastic cushions are made from >90% recycled plastic.

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

OPTIONS

Category	Description	Part Number
Audio/Video		
Cases	HP Renew Business 17.3 Laptop Bag	3E2U6AA
	HP Renew Executive 16 Laptop Backpack	6B8Y1AA
	HP Renew Executive 16 Laptop Bag	6B8Y2AA
	HP Campus XL Marble Stone Backpack	7K0E2AA
	HP Campus XL Tie Dye Backpack	7K0E3AA
	HP Convertible Laptop Stand	9C2H2AA
	HP Everyday 16 Odyssey Gray Laptop Bag	A08KKAA
	HP Travel Plus 30 Liter 17 Laptop Backpack	A2CE0AA
	HP Travel Plus 22 Liter 16 Laptop Bag	A2CE1AA
Docking	HP Thunderbolt 280W G4 Dock w/Combo Cable	4J0G4AA
	HP Thunderbolt 280W G4 Dock w/Combo Cable	4J0G4ET
	HP Thunderbolt 280W TAA G4 Dock w/Combo Cable	4J0J9AA
	HP Thunderbolt 4 Ultra 280W G6 Dock	AW5M5UT
	HP Thunderbolt 4 Ultra 280W TAA G6 Dock	AW5N3AA
Hub	HP USB-C to USB-A Hub	Z6A00AA
	HP Portable USB-C Hub	B8SU8UT
Adapter	HP HDMI to VGA Adapter	H4F02AA
	HP USB-C to USB 3.0 Adapter	N2Z63AA
	HP USB-C to VGA Adapter	N9K76AA
	HP USB-C to HDMI 2.0 Adapter	1WC36AA
	HP USB-C to RJ45 Adapter G2	4Z527AA
	HP USB 3.0 to Gig RJ45 Adapter G2	4Z7Z7AA
	HP USB-C to DisplayPort Adapter G2	8Y8Y1AA
Keyboard/Combo	HP 320K Wired Keyboard	9SR37AA
	HP 975 USB+BT Dual-Mode Wireless Keyboard	3Z726AA
	HP 455 Programmable Wireless Keyboard	4R177AA
	HP 355 Compact Multi-Device Keyboard	692S9AA
	HP 965 BLK Ergonomic Wireless Keyboard	7E756AA
	HP 475 Dual-Mode Wireless Keyboard	7N7B9AA
	HP 405 Multi-Device Backlit Wired Keyboard	7N7C1AA
	HP 435 Programmable Bluetooth Wireless Keypad	7N7C3AA
	HP 225 Wireless Keyboard	805T1AA
	HP 485 Comfort Wired Keyboard	8T6M2AA
	HP 725 Multi-Device Rechargeable Wireless Keyboard	9T5B2AA
	HP 125 G2 USB Wired Keyboard	AY2Y7AA
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA
	HP 235 Wireless Mouse and Keyboard Combo	1Y4D0AA
	HP 225 Wired Mouse and Keyboard Combo	286J4AA
	HP 225 Antimicrobial Wired Mouse and Keyboard Combo	286K3AA
	HP 655 Wireless Keyboard and Mouse Combo	4R009AA
	HP 655 Wireless Keyboard and Mouse Combo White	860P8AA

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

	HP 225 Wired Mouse and Keyboard Combo Cashmere White	86J24AA
	HP 225 Wired Mouse and Keyboard Combo G2	AX2Y7AA
	HP 225 Wired Mouse and Keyboard Combo G2 Cashmere White	AW5S6AA
Mouse	HP Wired 320M Mouse	9VA80AA
	HP Travel USB Mouse	G1K28AA
	HP Multi-Device 635 Black Wireless Mouse	1D0K2AA
	HP Creator 935 Black Wireless Mouse	1D0K8AA
	HP 235 Slim Wireless Mouse	4E407AA
	HP 128 LSR Wired Mouse	265D9AA
	HP 125 Wired Mouse	265A9AA
	HP 435 Multi-Device Wireless Mouse	3B4Q5AA
	HP 155 Wired Mouse	5B8B7AA
	HP 715 Rechargeable Multi-Device Bluetooth Mouse	6E6F0AA
	HP 925 Ergonomic Vertical Wireless Mouse	6H1A5AA
	HP 285 Silent Wireless Mouse	6G4E6AA
	HP 425 Programmable Wireless Mouse	7M1D5AA
	HP 105 Black Wired Mouse	822M9AA
	HP 245 Black Bluetooth Mouse	81S67AA
	HP 695 Qi-Charging Wireless Mouse	8F1Y4AA
	HP 255 Dual Wireless Mouse	8R3U1AA
	HP 515 Ultra-Fast Rechargeable Wireless Mouse	9C2F7AA
	HP 705 Rechargeable Wireless Mouse	AZ7B1AA
	HP 405 Quiet Black Wireless Mouse	AZ7B3AA
Power	HP 230W Smart AC Adapter	AQ9X8AA
Commodity	HP USB External DVDRW Drive	F2B56AA
Security	HP Nano Keyed Cable Lock	1AJ39AA
	HP Nano Master Keyed Cable Lock	1AJ40AA
	HP Sure Key Cable Lock	6UW42AA
	HP Nano Combination Cable Lock	63B28AA
	HP Essential Nano Combination Cable Lock	63B31AA
Monitor	HP Series 7 Pro 34 inch WQHD Conferencing Monitor - 734pm	8K157AA
	HP Series 7 Pro 27 inch QHD Thunderbolt 4 Monitor - 727pu	8J9E6AA
	HP Series 7 Pro 37.5 inch WQHD+ Thunderbolt 4 Monitor - 738pu	8K167AA
	HP Series 7 Pro 27 inch 4K Thunderbolt 4 Monitor - 727pk	8J9G2AA
	HP Series 7 Pro 27 inch 4K Conferencing Monitor - 727pm	8K135AA
	HP Series 7 Pro 24 inch WUXGA USB-C Monitor - 724pu	8Y2F7AA
	HP Series 7 Pro 31.5 inch 4K Thunderbolt 4 Monitor - 732pk	8Y2K9AA
	HP Series 7 Pro 39.7 inch 5K2K Conferencing Monitor - 740pm	8Y2R2AA
Memory	HP 8GB DDR5 5600 Memory	AL0M5AA
	HP 16GB DDR5 5600 Memory	AL0M6AA
	HP 32GB DDR5 5600 Memory	AL0M7AA

CHANGELOG

Date of change	Version History		Description of change
May 27, 2025	From v1 to v2	Changed	Format
June 2, 2025	From v2 to v3	Changed	Format
June 9, 2025	From v3 to v4	Changed	ENVIRONMENTAL DATA section
June 27, 2025	From v4 to v5	Changed	MEMORY section
August 1, 2025	From v5 to v6	Changed	OPTIONS, DISPLAY sections
August 5, 2025	From v6 to v7	Changed	STORAGE, POWER sections
August 18, 2025	From v7 to v8	Changed	AUDIO/MULTIMEDIA section
September 22, 2025	From v8 to v9	Changed	OPTIONS section