Overview

HP ZBook Fury G1i 18 inch Mobile Workstation PC

Left

1	ACS & ALS Sensor	9	Security lock slot (Integrated)
2	Microphone (2)	10	RJ45 Ethernet port (standard)
3	IR Camera (optional)	11	USB Type-A 5Gbps signaling rate (Powered)
4	Webcam	12	Thunderbolt™ 4 with USB Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 2.1)
5	Camera Shutter		
6	IR LEDS (optional)	13	Headphone/mic combo jack
7	Webcam LED	14	Smart Card Reader
8	Fingerprint reader / Power button	15	3-button Touchpad

Overview

Right

1	Power Indicator LED	5	USB Type-A 5Gbps signaling rate
2	Power connector	6	Headphone/mic combo jack
3	2 Thunderbolt™ 5 with USB Type-C® 80Gbps signaling rate (USB Power Delivery, DisplayPort™ 2.1)	7	Smart Card Reader
4	HDMI 2.1		

Features

PRODUCT NAME

HP ZBook Fury G1i 18 inch Mobile Workstation PC

OPERATING SYSTEM

Preinstalled OS

FreeDOS
Ubuntu Linux 24.04
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]

[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 9 Processor 285HX with Intel® Graphics and Intel® AI Boost (13 NPU TOPS), (2.1 GHz E-core base frequency, 2.8 GHz P-core base frequency, up to 4.6 GHz E-core Max Turbo frequency, up to 5.5 GHz P-core Max Turbo frequency, 36MB Cache, 8 P-cores and 16 E-cores, 24 threads), supports Intel vPro® Enterprise

Intel® Core™ Ultra 7 Processor 265HX with Intel® Graphics and Intel® AI Boost (13 NPU TOPS),(2.3 GHz E-core base frequency, 2.6 GHz P-core base frequency, up to 4.6 GHz E-core Max Turbo frequency, up to 5.3 GHz P-core Max Turbo frequency, 30MB Cache, 8 P-cores and 12 E-cores, 20 threads), supports Intel vPro® Enterprise

Intel® Core™ Ultra 7 Processor 255HX with Intel® Graphics and Intel® AI Boost (13 NPU TOPS), (1.8 GHz E-core base frequency, 2.4 GHz P-core base frequency, up to 4.5 GHz E-core Max Turbo frequency, up to 5.2 GHz P-core Max Turbo frequency, 30MB Cache, 8 P-cores and 12 E-cores, 20 threads)

Features

[1] 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.

[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.

CHIPSET

Intel® WM890

GRAPHICS

Integrated

Intel® Graphics

Discrete

NVIDIA RTX PRO 5000 Blackwell Generation Laptop GPU (24 GB GDDR7 dedicated);
NVIDIA RTX PRO 4000 Blackwell Generation Laptop GPU (16 GB GDDR7 dedicated);
NVIDIA RTX PRO 3000 Blackwell Generation Laptop GPU (12 GB GDDR7 dedicated);
NVIDIA RTX PRO 2000 Blackwell Generation Laptop GPU (8 GB GDDR7 dedicated);
NVIDIA RTX PRO 1000 Blackwell Generation Laptop GPU (8 GB GDDR7 dedicated);

Supports

RTX PRO 5000 / RTX PRO 4000 / RTX PRO 3000 Support Memory ECC
DP 2.1, HDMI 2.1b
Supports CUDA, Dynamic Boost

Features

DISPLAY

Non-Touch
45.7 cm (18") diagonal, WQXGA (2560 x 1600), anti-glare, UWVA, LED, 500 nits, eDP 1.4 + PSR2, 165Hz, flat LCD Panel, 100% DCI-P3
Displays support
Supports up to 4 displays through the HP Thunderbolt 280W G4 Dock

Display Size
18.0"
45.7 cm (18")

Features

STORAGE AND DRIVES

Primary M.2 Storage

4 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
2 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
2 TB PCIe® Gen4x4 NVMe™ SED SSD
1 TB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
1 TB PCIe® Gen4x4 NVMe™ SED SSD
512 GB PCIe® Gen4x4 NVMe™ M.2 SSD TLC
512 GB PCIe® Gen4x4 NVMe™ SED SSD
2 TB Citadel PCIe-3x4 NVMe™ M.2 2280 TLC SED OPAL2 FIPS SSD
1 TB Citadel PCIe-3x4 NVMe™ M.2 2280 TLC SED OPAL2 FIPS SSD
512GB Citadel PCIe-3x4 NVMe™ M.2 2280 TLC SED OPAL2 FIPS SSD

Features

MEMORY

Maximum Memory
128 GB DDR5-5600 MT/s ECC;
192 GB DDR5-5600 MT/s non-ECC
256 GB DDR5-6400 MT/s non-ECC*

Memory
16GB (1x16GB) DDR5 5600 SODIMM Memory
32GB (1x32GB) DDR5 5600 SODIMM Memory
32GB (2x16GB) DDR5 5600 SODIMM Memory
64GB (2x32GB) DDR5 5600 SODIMM Memory
64GB (4x16GB) DDR5 5600 SODIMM Memory
128GB (4x32GB) DDR5 5600 SODIMM Memory
192GB (3x64GB) DDR5 6400 CSODIMM Memory
32GB (1x32GB) DDR5 5600 SODIMM ECC Memory
32GB (2x16GB) DDR5 5600 SODIMM ECC Memory
64GB (2x32GB) DDR5 5600 SODIMM ECC Memory
128GB (4x32GB) DDR5 5600 SODIMM ECC Memory

Memory Slots
4 SODIMM
2 DIMMs per channel; support up to 4000 MT/s
DDR5 SODIMMS, system runs at 4000 MT/s
Supports Dual Channel Memory

*256 GB DDR5-6400 MT/s non-ECC will be available 2nd Half 2025
NOTE: 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 BE200 (2x2) and Bluetooth® 5.4 WLAN, vPro®[1,2]
Intel® Wi-Fi 7 BE200 (2x2) and Bluetooth® 5.4 WLAN, non-vPro®[1,2]

WWAN
HP R15 5G Solution WWAN[3]

WLPWAN
Qualcomm 9205 LTE-M (CAT-M1 fSVC)[4]

NFC
WNC XRAV-1 NFC

Ethernet
Intel I226-LM 2.5GbE Ethernet Controller
Intel I226-V 2.5GbE Ethernet Controller

[1]Wi-Fi 7: Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 7 (802.11BE) functionality requires compatible Windows 11 OS, compatible processor, and separately purchased Wi-Fi 7 router to support backwards compatibility with prior 802.11 specs. Available in countries where Wi-Fi 7 is supported. The specification for 802.11BE is a draft specification and is not final. If the final specification differs from the draft specification, it may affect the ability of the device to communicate with other 802.11BE devices.

[2]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

[3]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.

[4]LPWAN (also called Mobile Narrowband) support HP Protect & Trace with Wolf Connect service through the subscription term, but do not support mobile broadband use.

Features

AUDIO/MULTIMEDIA

Audio
Audio by Poly Studio,
4 integrated stereo speakers; discrete amplifiers
2 integrated dual array digital microphones

Speaker Power
(1W/8 ohm per speaker),

Camera
5MP Camera; IR Camera (optional)

Features

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Premium Quiet Keyboard – spill-resistant, full-size, backlit keyboard and DuraKeys
HP Lumen RGB Z Keyboard – Full-size, per-key RGB backlit keyboard

Pointing Device

Clickpad with multi-touch gesture support, taps enabled as default

Function Keys

ESC: system information
F1 - Display Switching
F2 - Night Mode / Sure View LED: On = White; Off = Not illuminated
F3 - Brightness Down
F4 - Brightness Up
F5 - Audio Mute LED: On = Amber; Off = not illuminated
F6 - Volume Down
F7 - Volume Up
F8 - Mic Mute On = Amber; Off = not illuminated
F9 - Keyboard Backlight
F10 - Insert
F11 - Airplane Mode
F12 - Command center
> Print Screen
> Power On/Off On = White; Off = not illuminated
> Delete
> Fn key lock
> Microsoft Copilot[1]

Hidden Keys

home
end
Fn+R = Break
Fn+S = Sys Rq
Fn+C = Scroll Lock
Fn+W = Pause

[1]Copilot in Windows requires Windows 11. Some features require an NPU. Timing of feature delivery and availability varies by market and device. Requires Microsoft account to log in. Where Microsoft in Windows is not available, the Copilot key will lead to the Bing search engine. Use of Recall requires customer authentication using Windows Hello Enhanced Sign in Security (ESS) which requires a fingerprint reader or facial recognition camera and may not be supported on all platforms. See http://aka.ms/WindowsAIFeatures

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 Smart Support [3]
HP Support Assistant [4]
HSA Fusion for Commercial
HSA Telemetry for Commercial
myHP[5]
Poly Camera Pro
Poly Lens[6]

Manageability Features

HP Client Catalog (download) [7]
HP Client Management Script Library (download) [8]
HP Cloud Recovery [9]
HP Connect for Microsoft Endpoint Manager[10]
HP Driver Packs (download) [11]
HP Image Assistant (download) [12]
HP Manageability Integration Kit (download) [13]
HP Power Manager with Battery Health Manager (download) [14]

Security Management

Secured-Core PC Enable[15]
Windows Hello Enhanced Sign-In Security (ESS)
HP Wolf Security for Business which includes: [16]
HP Sure Admin [17]
HP Sure Click [18]
HP Sure Recover [19]
HP Sure Run [20]
HP Sure Sense [21]
HP Sure Start [22]
HP Tamper Lock[23]

Features

BIOS

Absolute Persistence Module [24]
Audio Permanent Disable
BIOS Update via Network
HP BIOS Recovery
HP BIOSphere [25]
HP DriveLock & Automatic DriveLock
HP Fingerprint Sensor [26]
HP Secure Erase [27]
HP Wake on WLAN

1. Copilot+ in Windows requires Windows 11. Some features require an NPU. Timing of feature delivery and availability varies by market and device. Requires Microsoft account to log in. Where Microsoft in Windows is not available, the Copilot key will lead to the Bing search engine. See aka.ms/copilotpluspcs.
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.
3. HP Smart Support requires the HP Insights agent to be installed. For more information about how to enable or to download HP Smart Support, please visit http://www.hp.com/smart-support. HP Services Scan is preinstalled and/or provided thru Windows Update and will check entitlement on each hardware device to determine if an HP Insights agent-enabled service has been purchased, and will download applicable software automatically. 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 is required. For full system requirements or to disable this feature, please visit https://www.hpdaas.com/requirements.
4. HP Support Assistant is available on Windows. For more information, please visit www.support.hp.com/help/hp-support-assistant.
5. MyHP requires Windows 10 or higher OS.
6. Poly Lens Desktop requires a Windows OS.
7. HP Client Catalog not preinstalled, however available for download at (https://www.hp.com/us-en/solutions/client-management-solutions.html)
8. HP Client Management Script Library (https://www.hp.com/us-en/solutions/client-management-solutions.html#tab=manageability-tools).
9. 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.
10. HP Connect for Microsoft Endpoint Manager is available from the Azure Market Place for HP Pro, Elite, Z and Point-of-Sale PCs managed with Microsoft Endpoint Manager. Subscription to Microsoft Endpoint Manager required and sold separately. Network connection required.
11. HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement.
12. HP Image Assistant not preinstalled, however available for download at (https://ftp.ext.hp.com/pub/caps-softpaq/cmit/HPIA.html),
13. HP Manageability Integration Kit not presintalled, however available for downloaded from https://www.hp.com/us-

Features

en/solutions/client-management-solutions.html#tab=manageability-tools.

14. 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.

15. Secured-Core PC Enable 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 is enabled from the factory.

16. 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.

17. 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.

18. HP Sure Click requires Windows 10 and higher. See https://bit.ly/2PrLT6A_SureClick for complete details.

19. 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 important files, data, photos, videos, etc. before use to avoid loss of data.

20. HP Sure Run is available on select HP PCs and requires Windows 10 and higher.

21. 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.

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

23. HP Tamper Lock must be enabled by the customer or your administrator.

24. 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/.

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

26. HP Fingerprint Reader is an optional feature that requires Windows 10 or 11 and must be configured at purchase.

27. 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 200W Slim 4.5 mm PFC Right Angle Smart (3-pin) AC Power Adapter;
HP 280W Slim 4.5 mm PFC Right Angle Smart (3-pin) AC Power Adapter;
HP 330W Slim 4.5 mm PFC Right Angle Smart (3-pin) AC Power Adapter;
Not Included AC Adapter

Battery
HP 99 Wh Long Life Polymer Fast Charge 8 cell Battery

Power Cord
C13 1.83m Paper Sticker Flange Premium CWP Black Straight Halogen Free Power Cord
C13 1.83m Paper Sticker Flange Premium CWP Black Straight Power Cord
Not Included Power Cord

Battery life
TBD

Features

WEIGHT & DIMENSIONS

Weight[1]
Starting at 7.78 lb
(Weight varies by configuration and components.)
Starting at 3.52 kg;
(Weight varies by configuration and components.)

Product Dimensions (w x d x h)
15.88 x 11.41 x 1.10 in
(Dimensions vary by configuration)
40.3 x 28.9 x 2.7 cm
(Dimensions vary by configuration)

Features

PORTS/SLOTS

Left Side

1 power connector
2 Thunderbolt™ 5 with USB Type-C® 80 Gbps signaling rate (USB Power Delivery, DisplayPort™ 2.1)
1 HDMI 2.1
SD 7.0 Media Card Reader

Right side:

1 Thunderbolt™ 4 with USB Type-C® 40 Gbps signaling rate (USB Power Delivery, DisplayPort™ 2.1)
1 USB Type-A 10Gbps signaling rate
1 headphone/microphone combo
1 RJ-45
1 nano security lock slot
1 smart card reader

Expansion Slots

SD 7.0 Media Card Reader

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.

Certification and Compliance
ENERGY STAR® certified
EPEAT® registered configurations available
Low halogen

Sustainable Impact Specifications
40% post-consumer recycled plastic
Bulk packaging available
External power supply 90% efficiency;
Molded paper pulp cushion inside box is 100% sustainably sourced and recyclable;
Outside box and corrugated cushions are 100% sustainably sourced and recyclable

Technical Specifications – System Unit

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	
Nominal Operating Voltage	19.5V
Average Operating Power	
Integrated graphics	CPU < 55W
Discrete Graphics	NVIDIA RTX PRO 5000 Blackwell 135W NVIDIA RTX PRO 4000 Blackwell 135W NVIDIA RTX PRO 3000 Blackwell 115W NVIDIA RTX PRO 2000 Blackwell 60W NVIDIA RTX PRO 1000 Blackwell 60W
Max Operating Power	<330W
Temperature	
Operating	32° to 95° F (0° to 35° C), System performance may be reduced above 32°C (89.6°F). No sustained direct exposure to sunlight.
Non-operating	-4-140°F (-20 - 60°C)
Relative Humidity	
Operating	10% to 90%, non-condensing
Non-operating	5% to 95%; 38.7C (101.6F) maximum wet bulb tempera-ture; non-condensing.
Shock	
Operating	40 G, 2 ms, half-sine
Non-operating	240G, 2ms, half sine
Random Vibration	
Operating	0.079 ~ 1.043 grams
Non-operating	3.5 grams
Altitude (unpressurized)	
Operating	3048m (10,000ft)
Non-operating	12192m (40,000ft)
Planned Industry Standard Certifications	
Regulatory Model Number	HSN-I64C-8
UL	Yes
CSA	Yes
FCC Compliance	Yes
ENERGY STAR®	Yes
EPEAT	Gold
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	No

Technical Specifications – System Unit

CIT	
EAC	Yes
SASO	Yes
SABS	Yes
UKRSERTCOMPUTER	

Technical Specifications – Displays

DISPLAYS

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

18.0 in WQXGA (2560 x 1600)
Anti-Glare UWVA LED DCI-P3
100 500 eDP 1.4+PSR2
165Hzflat LCD Panel

Outline Dimensions (W x H)	394.56 x 264.80 (max)
Active Area	387.76 x 242.35 (typ)
Weight	560 (max)
Diagonal Size	18
Thickness	3.32/3.5 (max)
Interface	eDP 1.4
Surface Treatment	Anti-Glare
Touch Enabled	No
Contrast Ratio	1200:1 (typ)
Refresh Rate	165Hz (typ)
Brightness	500 (typ)
Pixel Resolution - Format	2560 x 1600 (WQXGA)
Backlight	WLED
Pixel Resolution	RGB
Color Gamut Coverage	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)	4.18 (max)/4.97(max)

Technical Specifications – Storage

STORAGE

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

Form Factor	M.2 2280
Capacity	512GB
NAND Type	TLC
Weight	10 g (0.02 lb)
Interface	PCIe NVMe Gen4X4
Sequential Read	6400 MB/s ±20%
Sequential Write	3500 MB/s ±20%
Logical Blocks	1000215215
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
Weight	10 g (0.02 lb)
Interface	PCIe NVMe Gen4X4
Sequential Read	6400 MB/s ±20%
Sequential Write	5000 MB/s ±20%
Logical Blocks	2000409264
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
Weight	10 g (0.02 lb)
Interface	PCIe NVMe Gen4X4
Sequential Read	6400 MB/s ±20%
Sequential Write	5000 MB/s ±20%
Logical Blocks	2000409264
Features	Pyrite 2.0; TRIM; L1.2

1TB PCIe-5x4 2280 NVMe Solid State Drive

Technical Specifications – Storage

Form Factor	M.2 2280
Capacity	1TB
NAND Type	TLC
Weight	10 g (0.02 lb)
Interface	PCIe NVMe Gen5X4
Sequential Read	13000 MB/s ±20%
Sequential Write	9000 MB/s ±20%
Logical Blocks	
Features	Pyrite 2.0; TRIM; L1.2

2TB PCIe-4x4 2280 NVMe Three Layer Cell Solid State Drive

Form Factor	M.2 2280
Capacity	2TB
NAND Type	TLC
Weight	10 g (0.02 lb)
Interface	PCIe NVMe Gen4X4
Sequential Read	6400 MB/s ±20%
Sequential Write	5000 MB/s ±20%
Logical Blocks	4000797360
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
Weight	10 g (0.02 lb)
Interface	PCIe NVMe Gen4X4
Sequential Read	6400 MB/s ±20%
Sequential Write	5000 MB/s ±20%
Logical Blocks	4000797360
Features	Pyrite 2.0; TRIM; L1.2

2TB PCIe-5x4 2280 NVMe Solid State Drive

Form Factor	M.2 2280
Capacity	2TB
NAND Type	TLC

Technical Specifications – Storage

Weight	10 g (0.02 lb)
Interface	PCIe NVMe Gen5X4
Sequential Read	13500 MB/s ±20%
Sequential Write	10000 MB/s ±20%
Logical Blocks	
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
Weight	15 g
Interface	PCIe NVMe Gen4X4
Sequential Read	6400 MB/s ±20%
Sequential Write	5000 MB/s ±20%
Logical Blocks	8001573552
Features	Pyrite 2.0; TRIM; L1.2

Technical Specifications – Networking

NETWORKING / COMMUNICATION

Intel BE200 Wi-Fi 7 +BT 5.4 M.2 320MHz PCIe World-wide WLAN vPro [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
Security[3]	IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only

Technical Specifications – Networking

	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
	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

Technical Specifications – Networking

	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
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)

Technical Specifications – Networking

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	1. Microsoft Windows Bluetooth Software
Link Topology	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

Technical Specifications – Networking

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. Check latest software/driver release for updates on supported security features.
3. 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.
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 BE200 Wi-Fi 7 +BT 5.4 M.2 320MHz PCIe World-wide WLAN non-vPro [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

Technical Specifications – Networking

	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 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

Technical Specifications – Networking

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
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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 4.0/4.1/4.2/5.0/5.1/5.2/5.3/5.4 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

Technical Specifications – Networking

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	1. Microsoft Windows Bluetooth Software
Link Topology	2. Linux/Chrome OS Bluetooth Software.
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
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Technical Specifications – Networking

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

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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).

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)

Technical Specifications – Networking

	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)

Technical Specifications – Networking

Maximum data rates	Sub-6 SA Peak DL 4.67Gbps/UL 1.25Gbps Sub-6 NSA Peak 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	l 3GPP TS 51.010-1 V10.5.0: Mobile Station (MS) conformance specification; Part 1: Conformance specification l 3GPP TS 36.521-1 V14.3.0: User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Conformance testing l 3GPP TS 21.111 V10.0.0: USIM and IC card requirements l 3GPP TS 51.011 V4.15.0: Specification of the Subscriber Identity

Technical Specifications – Networking

		Module -Mobile Equipment (SIM-ME) interface l 3GPP TS 31.102 V10.11.0: Characteristics of the Universal Subscriber Identity Module (USIM) application l 3GPP TS 31.11 V10.16.0: Universal Subscriber Identity Module (USIM) Application Toolkit (USAT) l 3GPP TS 36.124 V10.3.0: Electro Magnetic Compatibility (EMC) requirements for mobile terminals and ancillary equipment l 3GPP TS 27.007 V10.0.8: AT command set for User Equipment (UE) l 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

Technical Specifications – Networking

	MIFARE DESFire
	FeliCa
	Jewel and Topaz cards
Card Emulation (PICC-VICC) Mode(1)	ISO/IEC 14443 A
	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 temperature	Storage: -20 °C to 125 °C (-4 °F to 257 °F)
Humidity	10-90% operating
	5-95% non-operating
Supply Operating voltage	4.35 to 5.25 Volts
I/O Voltage	1.8V or 3.3V
Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)	(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® I226-LM 2.5 Gigabit Network Connection LOM (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)

Technical Specifications – Networking

	4. 2.5 Gbit/s operation(2.5GBASE-T; IEEE 802.3bz Clause 126) 5. Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 & 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) 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 Disconnection: 25mW 100Mbps Full Run: 450mW 1000Mbp Full Run: 1000mW 2500Mbp Full Run: 4500mW 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® I226V 2.5 Gigabit Network Connection LOM (non-vPro)

Connector	RJ-45
System Interface	PCI(Intel proprietary) + SMBus

Technical Specifications – Networking

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. 2.5 Gbit/s operation(2.5GBASE-T; IEEE 802.3bz Clause 126) 5. Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10& 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) 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 Disconnection: 25mW 100Mbps Full Run: 450mW 1000Mbp Full Run: 1000mW 2500Mbp Full Run: 4500mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW

Technical Specifications – Networking

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.

HP 200W Slim 4.5 mm PFC Right Angle Smart (3-pin) AC Power Adapter Eris+

Dimensions	6.496 x 3.11 x 1.0 in (16.5x7.9x2.54cm)
Weight	530g(+/-10g) (Not including power cord. Power cord varies by country.)
Input Voltage	100-240Vac
Input Efficiency	88 % at 115 Vac and 89 % at 230Vac
Input frequency range	47-63 Hz
Input AC current	Max. 3.0 A at 90 Vac
Output	
Output power	200W
DC output	19.5V
Hold-up time	100% load 5ms at 115 Vac input
Output Over Current Protection	< 21.0A
Connector	C14
Connector	4.5mm Barrel Type
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), NOM-001 and 029 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia GEMS and RCM, BIS, BSMI, UAE, UKCA DoC

HP 280W Standard 4.5 mm Right Angle Smart (3-pin) AC Power Adapter Bowser+

Dimensions	7.087 x 3.465 x 1.0 in (18.0x8.8x2.54cm)
Weight	730g(+/-10g) (Not including power cord. Power cord varies by country.)

Technical Specifications – Power

Input Voltage	100-240Vac
Input Efficiency	89 % at 115Vac/230Vac
Input frequency range	47-63 Hz
Input AC current	Max. 4.0 A at 90 Vac
Output	
Output power	280W
DC output	20.0V
Hold-up time	100% load 10ms at 115 Vac input
Output Over Current Protection	< 28.0A
Connector	C14
Connector	4.5mm Barrel Type
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, IEC 62368-1:2014 and IEC62368-1 : 2018, EN62368-1:2020+A11, UL62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, CU(EAC), KCC(Safety+EMC), NOM-001 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia RCM, BIS, BSMI, UAE, UKCA DoC

HP 330W Standard 4.5 mm PFC Straight Smart (3-pin) AC Power Adapter Luigi

Dimensions	7.87 x 3.54 x 1.0 in (20.0x9.0x2.54cm)
Weight	770g(+/-10g) max (Not including power cord. Power cord varies by country.)
Input Voltage	100-240Vac
Input Efficiency	89 % at 115Vac/230Vac
Input frequency range	47-63 Hz
Input AC current	Max. 4.2 A at 90 Vac
Output	330W
Output power	20.0V
DC output	
Hold-up time	100% load 10ms at 115 Vac input
Output Over Current Protection	< 25.0A
Connector	C14

Technical Specifications – Power

	Connector	4.5mm Barrel Type
	Environmental Design	
	Operating temperature	32oF to 95oF (0oto 35oC)
	Non-operating (storage) temperature	-4oF to 185oF (-20oto 85oC)
	Non-operating (storage) temperature	
	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, IEC 62368-1:2014 and IEC62368-1 : 2018, EN62368-1:2020+A11, UL62368-1 Agency approvals - C-UL-US, TUV/GS, TUV/PSE, EN55032 Class B, FCC Class B, CISPR32 Class B, CCC, CU(EAC), KCC(Safety+EMC), NOM-001 NYCE, NRcan, NRCS, ISC, SEC, PSB, Argentina S-mark, Australia RCM, BIS, BSMI, UAE, UKCA DoC
GE 99Whr Long Life Polymer Fast Charge 8 cell Battery		
	Weight	0.41kg +/- 10g(0.90 lb)
	Cells/Type	8 cell Lithium-Ion Polymer cell /574269
	Energy	
	Voltage	15.56V
	Amp-hour capacity	6.37Ah
	Watt-hour capacity	99.1Wh
	Temperature	
	Operating (Charging)	0˚ to 45˚ C (32˚ to 113˚ F)
	Operating (Discharging)	-10˚ to 65˚ C (14˚ to 149˚ F)
	Fuel Gauge LED	
	Warranty	
	Optional Travel Battery Available	

Technical Specifications – Audio

AUDIO

HD Stereo Codec	Realtek ALC3315
Audio I/O Ports	Support 3.5mm Headset : CTIA only and Headphone-out
Internal Speaker Amplifier	Texas Instruments digital input Class-D smart audio amplifiers
Multi-streaming Capable	Playback multi-streaming can be enabled in the audio control panel to allow independent audio. Following MSFT Behaviour
Sampling	DAC:48kHz 16bits~24bits ADC:44.1k~48kHz 16bits~24bits
Analog Audio	Support 3.5mm Headset : CTIA only and Headphone-out
Internal Speaker	Yes

Technical Specifications – Fingerprint Reader

FINGERPRINT READER

Sensor vendor	Synaptics FS7614
Sensor type	Capacitive
DPI resolution	363 DPI
Scan area	104 x 86 pixels
False Rejection Rate	<3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	3.0V to 3.6V
Operating Temperature	0°~60°C
Current Consumption Image	100mA max
Low Latency Wait For Finger	260uA
Capture Rate	Image transmitter output frequency 9.6MHz
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	363 dpi / 7.4x6mm sensor area
Footnotes	

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

Type	Description	Part#
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
Input/Output	HP USB-C to USB-C 100W Cable	5AR72AA
Keyboard/Mouse	HP 320K Wired Keyboard	9SR37AA
	HP 975 USB+BT Dual-Mode Wireless Keyboard	3Z726AA
	HP 455 Programmable Wireless Keyboard	4R177AA
	HP 455 Programmable USB Wireless Keyboard (Bulk Qty.12)	4R177A6
	HP 965 BLK Ergonomic Wireless Keyboard	7E756AA
	HP 475 Dual-Mode Wireless Keyboard	7N7B9AA
	HP 475 Dual-Mode Wireless Keyboard	7N7B9UT
	HP 405 Multi-Device Backlit Wired Keyboard	7N7C1AA
	HP 405 Multi-Device Backlit Wired Keyboard	7N7C1UT
	HP 435 Programmable Bluetooth Wireless Keypad	7N7C3AA
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA
	HP 655 Wireless Keyboard and Mouse Combo	4R009AA
	HP 655 Wireless Keyboard and Mouse Combo (Blk Qty.10)	4R009A6
	HP Wired 320M Mouse	9VA80AA
	HP Multi-Device 635 Black Wireless Mouse	1D0K2AA
	HP Creator 935 Black Wireless Mouse	1D0K8AA
	HP 235 Slim Wireless Mouse	4E407AA
	HP 235 Slim Wireless Mouse	4E407UT
	HP 435 Multi-Device Wireless Mouse	3B4Q5UT
	HP 715 Rechargeable Multi-Device Bluetooth Mouse	6E6F0AA
	HP 925 Ergonomic Vertical Wireless Mouse	6H1A5AA
	HP 695 Qi-Charging Wireless Mouse	8F1Y4AA

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

	HP Tilt Ergonomic Mouse 725M	BH0Z5AA
Hub	HP USB-C to USB-A Hub	Z6A00AA
	HP Portable USB-C Hub	B8SU8UT
	HP Portable USB-C Hub	B8SV8AA
Audio	HP USB G2 Stereo Headset	428H5AA
	HP USB G2 Stereo Headset	428K6AA
	HP USB G2 Stereo Headset	428K6PT
Power	HP 330W Smart AC Adapter	BF7A6AA
	HP 330W Smart AC Adapter	BF7C7AA
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

Date of change	Version History		Description of change
	From v1 to v2		