

### Features

#### HP ZBook 8 G1i 16 Mobile Workstation



#### Left

1	ACS & ALS Sensor	9	LED Indicator
2	Microphone (2)	10	USB Type-C® 20Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)
3	IR Camera (optional)	11	USB Type-A 5Gbps signaling rate (Powered)
4	Webcam	12	RJ45 Ethernet port (standard)
5	Camera Shutter	13	Security lock slot (Integrated)
6	IR LEDs (optional)	14	Fingerprint reader / Power button
7	Webcam LED	15	Touchpad
8	Nano SIM card slot (Optional)		

### Features



#### Right

- |   |                                                                                                 |   |                              |
|---|-------------------------------------------------------------------------------------------------|---|------------------------------|
| 1 | HDMI 2.1                                                                                        | 4 | Power Indicator LED          |
| 2 | Thunderbolt™ 4 with USB Type-C® 40Gbps signaling rate<br>(USB Power Delivery, DisplayPort™ 2.1) | 5 | Headphone/mic combo jack     |
| 3 | Thunderbolt™ 4 with USB Type-C® 40Gbps signaling rate<br>(USB Power Delivery, DisplayPort™ 2.1) | 6 | Smart Card Reader (Optional) |

### Features

#### PRODUCT NAME

HP ZBook 8 G1i 16 Mobile Workstation

### OPERATING SYSTEM

#### Preinstalled OS

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

<sup>1</sup> 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>



### Features

#### PROCESSOR

Name <sup>1,2,3,4,5,7</sup>	Cores	Number of P-cores	Number of E-cores	Number Of LP E-core	Threads	Smart Cache	Max Turbo Frequency		Intel SIPP/vPro® Enterprise	NPU	NPU TOPs
							P-cores	E-cores			
Intel® Core™ Ultra9 processor 285H	16 cores	6	8	2	16	24 MB	5.40 GHz	4.5 GHz	X	Intel® AI Boost	13
Intel® Core™ Ultra7 processor 265H	16 cores	6	8	2	16	24 MB	5.30 GHz	4.50 GHz	X	Intel® AI Boost	13
Intel® Core™ Ultra7 processor 255H	16 cores	6	8	2	16	24 MB	5.10 GHz	4.40 GHz		Intel® AI Boost	13
Intel® Core™ Ultra5 processor 235H	14 cores	4	8	2	16	18 MB	5.00 GHz	4.40 GHz	X	Intel® AI Boost	13
Intel® Core™ Ultra5 processor 225H	14 cores	4	8	2	16	18 MB	4.90 GHz	4.30 GHz		Intel® AI Boost	13
Intel® Core™ Ultra7 processor 265U	12 cores	2	8	2	14	12 MB	5.30 GHz	4.20 GHz	X	Intel® AI Boost	12
Intel® Core™ Ultra7 processor 255U	12 cores	2	8	2	14	12 MB	5.20 GHz	4.20 GHz		Intel® AI Boost	12
Intel® Core™ Ultra5 processor 235U	12 cores	2	8	2	14	12 MB	4.90 GHz	4.10 GHz	X	Intel® AI Boost	12
Intel® Core™ Ultra5 processor 225U	12 cores	2	8	2	14	12 MB	4.80 GHz	3.80 GHz		Intel® AI Boost	12

<sup>1</sup> 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.

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

<sup>3</sup> 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>

<sup>4</sup> 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>.

<sup>5</sup> Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

<sup>7</sup> 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.



### Features

#### CHIPSET

Chipset is integrated with processor

### GRAPHICS

#### Integrated

Intel® Graphics (U Series Processors)

Intel® Arc™ 140T GPU (Ultra 7/9 H Series Processors)

Intel® Arc™ 130T GPU (Ultra 5 H Series Processors)

#### Discrete

NVIDIA RTX™ 500 Ada Laptop GPU (4 GB GDDR6 dedicated)

#### Supports

Support HDMI 2.1

### DISPLAY

#### Non-Touch

40.6 cm (16") diagonal, WUXGA (1920 x 1200), LCD, UWVA, Anti-Glare, Low Blue Light, 800 nits, sRGB 100%, HP Sure View 5 [6]

35.6 cm (14") diagonal, WQXGA (3840 x 2400), Bent, LCD, 120Hz, UWVA, anti-glare, WLED, 500 nits, DCI-P3 100%, HP DreamColor

40.6 cm (16") diagonal, 2.5K (2560 x 1600), LCD, 120Hz (VRR), UWVA, Anti-Glare, WLED+Low Blue Light, 400 nits, Adobe 100% + DCI-P3 100%

40.6 cm (16") diagonal, WUXGA (1920 x 1200), LCD, UWVA, Anti-Glare, WLED+Low Blue Light, 400 nits, Low Power, sRGB 100%

40.6 cm (16") diagonal, WUXGA (1920 x 1200), LCD, UWVA, Anti-Glare, WLED, 300 nits, sRGB 62.5%

#### Touch

40.6 cm (16") diagonal, WUXGA (1920 x 1200), LCD, Touch, UWVA, Anti-Glare, WLED, 300 nits, sRGB 62.5%

#### DisplayPort™ 1.4

HDMI 2.0 Support resolution up to 4K @60 Hz

#### Displays support

Supports dual display through the dock

#### Display Size

16.0"

40.6 cm

#### Docking (Sold Separately)



### Features

<b>Docking station model #1</b>	HP USB-C™ Dock G5
<b>Total number of supported displays (incl.the notebook)</b>	3
<b>Max.resolutions supported</b>	Multi-Function Mode: (2) 5k @ 30Hz and (1) 4k UHD @ 30Hz on any port High-Resolution Mode: (2) 5k @ 60Hz on DisplayPort ports and (1) 4k UHD @ 60Hz on HDMI port 1x HDMI 2.0, 2x DisplayPort 1.4 Maximum resolution and display support is dependent on the maximum capability of the notebook.
<b>Dock Connectors</b>	Highest resolution with dual displays is two 8K@ 60Hz host in High Resolution mode.
<b>Technicallimitations</b>	Three maximum displays supported are two 5K@ 30 Hz on DP ports plus one 4K UHD@ 30 Hz on HDMI in Multi-function mode The highest resolution for a non-Thunderbolt host in Multi-function mode is a single 5K dual cable (using both DP ports) + (1) 4K on HDMI port. HP Thunderbolt™ 120W G4 Dock
<b>Docking station model #2</b>	4
<b>Total number of supported displays (incl.the notebook)</b>	Quad 4K @60Hz
<b>display)</b>	Dual 8K single cable@30 for Thunderbolt hosts or USB-C hosts DisplayPort 1.4 with Display Stream Compression in High-Resolution Mode
<b>Max.resolutions supported</b>	2x HDMI 2.0, 2x DisplayPort 1.4, 1x Thunderbolt 4, 1x USB-C 3.2 Gen 2 DisplayPort Maximum resolution and display support is dependent on the maximum capability of the notebook.
<b>Dock Connectors</b>	Thunderbolt Hosts: Maximum of (4) displays with maximum resolution of 5K@ 30Hz running Thunderbolt host.
<b>Technicallimitations</b>	Maximum 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 maximum 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™ SSD Three Layer Cell [6]
- 1 TB PCIe® Gen4x4 NVMe™ SSD Three Layer Cell [6]
- 1 TB PCIe® NVMe™ SSD Value [6]
- 512 GB PCIe® Gen4x4 NVMe™ SSD Three Layer Cell [6]
- 512 GB PCIe® Gen4x4 NVMe™ Self Encrypted OPAL2 SSD Three Layer Cell [6]
- 512 GB PCIe® NVMe™ SSD Value [6]
- 256 GB PCIe® NVMe™ Self Encrypted OPAL2 SSD Value [6]
- 256 GB PCIe® NVMe™ SSD Value [6]

#### MEMORY

##### Maximum Memory

64GB DDR5-5600 MT/s (2 x 32 GB) Memory

64GB DDR5-5600 MT/s (2 x 32 GB) Memory

32GB DDR5-6400 MT/s (2 x 16 GB) Memory

32GB DDR5-5600 MT/s (1 x 32 GB) Memory

32GB DDR5-5600 MT/s (2 x 16 GB) Memory

16GB DDR5-6400 MT/s (1 x 16 GB) Memory

16GB DDR5-5600 MT/s (1 x 16 GB) Memory

16GB DDR5-5600 MT/s (2 x 8 GB) Memory

##### Memory Slots

2 SODIMM

System runs at up to 6400 MT/s

Supports Dual Channel Memory(optional).

The memory is accessible/upgradeable by IT or self-maintainers only

#### NETWORKING /COMMUNICATIONS

##### WLAN

Intel® BE201 Wi-Fi 7 Bluetooth® 5.4 vPro® WW WLAN

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

Intel® AX211 Wi-Fi 6E Bluetooth® 5.3 vPro® WW WLAN

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



### Features

#### WWAN

HP 5G Sub-6 CAT19

HP 4G CAT19

#### LPWAN

Qualcomm 9205 LTE-M (CAT-M1 fSVC) [12]

#### NFC

NFC Mirage WNC XRAV-1

#### Miracast

Native Miracast Support

#### Ethernet

Intel® I219-LM (vPro®) GbE PCIe NIC

### AUDIO/MULTIMEDIA

Audio by Poly Studio

2 Integrated stereo speakers

Discrete Amplifiers

2 Integrated dual array microphone

#### Speaker Power

1W / 8 ohm per speaker

#### Camera

5MP + Infrared camera

5MP camera

Webcam

#### Sensors

Ambient Light Sensor

Color Sensor with Ambient Light Sensing

Fingerprint Sensor (optional)

Hall Effect Sensor

HP Sure Platform

HP Tamper Lock [14]

Motion Sensor (select models)

Thermal Sensor



### Features

#### KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

HP Premium NB Keyboard, spill-resistant, backlit, Durakey keyboard.

HP Premium NB Keyboard, spill-resistant, Privacy, backlit, Durakey, keyboard.

##### Pointing Device

Clickpad

Microsoft Precision Touchpad Default Gestures Support

Multi-touch gesture support

##### Function Keys

ESC - System information

F1 - Display Switching

F2 - Blank or Privacy

F3 - Brightness Down

F4 - Brightness Up

F5 - Blank or Keyboard Backlight

F6 - Audio Mute

F7 - Volume Down

F8 - Volume Up

F9 - Mic Mute

F10 - Play and Pause

F11 - Programmable Key

F12 - HOME

Power Button (with LED)

Insert

Delete

End

Page up

Page down

Microsoft Copilot [15]

##### Hidden Keys

Fn+R - Break, Fn+S - Sys Rq, Fn+C - Scroll Lock



### Features

#### SOFTWARE AND SECURITY

##### Application Software

Buy Microsoft Office (Sold separately)

HP Connection Optimizer

Edge Customization

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 [15]

HP Smart Support [16]

HP Support Assistant [17]

myHP

HSA Fusion for Commercial

HSA Telemetry for Commercial

Poly Lens [18]

Poly Camera Pro

Ubuntu Data Science Stack

##### Manageability Features

HP Client Catalog ([download](#)) [19]

HP Client Management Script Library ([download](#)) [20]

HP Cloud Recovery [21]

HP Connect for Microsoft Endpoint Manager

HP Driver Packs ([download](#)) [22]

HP Image Assistant ([download](#)) [23]

HP Manageability Integration Kit ([download](#)) [24]

HP Power Manager with Battery Health Manager ([download](#)) [25]

##### Security Management

Secured-Core PC Enable [26]

Windows Hello Enhanced Sign-In Security (ESS)

HP Wolf Security for Business which includes: [27]

HP Tamper Lock

HP Sure Admin [28]

HP Sure Click [29]

HP Sure Recover [30]

HP Sure Run [31]

HP Sure Sense [32]



### Features

HP Sure Start [33]

### BIOS

Absolute Persistence Module [34]

Audio Permanent Disable

HP BIOS Recovery

HP Fingerprint Sensor [35]

BIOS Update via Network

HP BIOSphere Gen6 [36]

HP DriveLock & Automatic DriveLock

HP Secure Erase [37]

HP Wake on WLAN

15. 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.

16. 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>.

17. HP Support Assistant is available on Windows. For more information, please visit <https://support.hp.com/us-en/help/hp-support-assistant>. 18. Poly Lens Desktop requires a Windows OS.

19. HP Client Catalog not preinstalled, however available for download at (<https://www.hp.com/us-en/solutions/client-management-solutions.html>).

20. HP Client Management Script Library (<https://www.hp.com/us-en/solutions/client-management-solutions.html#tab=manageability-tools>).

21. 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>.

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

23. HP Image Assistant not preinstalled, however available for download at (<https://ftp.ext.hp.com/pub/caps-softpaq/cmit/HPIA.html>),

24. HP Manageability Integration Kit not preinstalled, however available for downloaded from <https://www.hp.com/us-en/solutions/client-management-solutions.html#tab=manageability-tools>.

25. 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](https://support.hp.com/in-en/document/ish_4449597-3519507-16).

26. 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.

27. HP Wolf Security for Business requires Windows 10 or 11 Pro or higher, includes various HP security features and is available on HP Pro,



### Features

Elite, RPOS and Workstation products. See product details for included security features.

28. 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.

29. HP Sure Click requires Windows 10 and higher. See [https://bit.ly/2PrLT6A\\_SureClick](https://bit.ly/2PrLT6A_SureClick) for complete details.

30. 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.

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

32. 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.

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

34. 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/>.

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

36. HP BIOSphere Gen6 features may vary depending on the platform and configuration.

37. 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

HP 140W Slim USB Type-C® AC power adapter  
HP 100W Slim USB Type-C® AC power adapter  
HP 65W Standard USB Type-C® AC power adapter  
HP 65W Slim USB Type-C® AC power adapter  
HP 65W Standard USB Type-C® Halogen Free AC power adapter

#### Battery

HP Long Life 3 cell, 62Whr Polymer  
HP Long Life 8 cell, 77Whr Polymer

#### Power Cord

3-wired plug- 1.0m

#### Battery life

TBD

### WEIGHT & DIMENSIONS

#### Weight

##### Product Weight- 62Whr

Starting at 1.72 kg  
Starting at 3.79 lb

##### Product Weight- 77Whr

TBD

#### Product Dimensions (w x d x h)

14.13 x 9.84 x .76 in  
35.9 x 25.0 x 1.92 cm



### Features

#### PORTS/SLOTS

##### Left Side

- 2 x Thunderbolt™ 4 with USB Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 2.1) [40]
- 1 x HDMI 2.1
- 1 x headphone/mic combo jack
- 1 x Smart Card Reader (Optional)

##### Right Side

- 1 x USB Type-C® 20Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4)
- 1 x USB Type-A 5Gbps signaling rate (Powered)
- 1 x RJ45 Ethernet port (Optional)
- 1 x Nano SIM card slot (Optional)
- 1 x Security lock slot (Integrated)

### SERVICE AND SUPPORT

1-year warranty and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty except for HP Long Life batteries which will follow the one or three year warranty of the platform. Refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>. [53]

### Certification and Compliance

- CSA/UL 62368-1
- ENERGY STAR®
- FCC/ICES/CISPR/VCCI
- CE MARKING
- GS Mark
- China CCC/SRRC
- Taiwan BSMI/NCC
- Korea KCC/KC/KES
- Ukraine NSoC/TEC
- EAEU Compliance
- Saudi Arabian Compliance
- TCO
- EPEAT® Gold<sup>1</sup>
- Low Blue Light

<sup>1</sup>EPEAT® registered where applicable. EPEAT® registration varies by country. See [www.epeat.net](http://www.epeat.net) for registration status by country.



### Technical Specifications – System Unit

#### SYSTEM UNIT

##### Stand-Alone Power Requirements (AC Power)

**Nominal Operating Voltage** 20.0V

##### Average Operating Power

##### Integrated graphics

Intel® Graphics / Intel® Arc™ Pro Graphics

##### Discrete Graphics

NVIDIA® RTX 500 Ada

##### Max Operating Power

Discrete < 140W

UMA < 100W

#### Temperature

##### Operating

0° to 35° C ( 32° to 95° F)

System performance may be reduced above 32°C (89.6°F)

##### Non-operating

-20° to 60° C ( -4° to 140° F)

System performance may be reduced above 32°C (89.6°F)

#### Relative Humidity

##### Operating

10% to 90 % (non-condensing)

##### Non-operating

5% to 95 %, 38.7° C (101.6° F) maximum wet bulb temperature

#### Shock

##### Operating

40 G, 2 ms, half-sine

##### Non-operating

240 G, 2 ms, half-sine

#### Random Vibration

##### Operating

1.043 grms

##### Non-operating

3.500 grms

#### Altitude (unpressurized)

##### Operating

3048 m (10000 ft)

##### Non-operating

12192 m (40000 ft)

#### Planned Industry Standard Certifications

##### Regulatory Model Number

HSN-I62C-6



### 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

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

##### 16.0 in WUXGA (1920 x 1200)

Anti-Glare UWVA LED sRGB

62.5 8bit 300 eDP 1.2 w/o PSR

60Hz bent LCD Panel

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



### Technical Specifications – Displays

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

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

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

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

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



### Technical Specifications – Storage

#### STORAGE

##### SSD 2TB 2280 PCIe-4x4 NVMe

###### Three Layer Cell

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

##### SSD 1TB 2280 PCIe-4x4 NVMe

###### Three Layer Cell

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

##### SSD 512GB 2280 PCIe-4x4

###### NVMe Three Layer Cell

<b>Form Factor</b>	M.2 2280
<b>Capacity</b>	512GB
<b>NAND Type</b>	TLC
<b>Height</b>	0.09 in (2.3 mm)
<b>Width</b>	0.87 in (22 mm)
<b>Weight</b>	0.02 lb (10 g)
<b>Interface</b>	PCIe NVMe Gen4X4
<b>Maximum Sequential Read</b>	6400 MB/s ±20%



### Technical Specifications – Storage

<b>Maximum Sequential Write</b>	3500 MB/s ±20%
<b>Logical Blocks</b>	1000215215
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	Pyrite 2.0; TRIM; L1.2

#### 512GB PCIe-4x4 2280 NVME

**Self Encrypted OPAL2 Three  
Layer Cell Solid State Drive**

<b>Form Factor</b>	M.2 2280
<b>Capacity</b>	512GB
<b>NAND Type</b>	TLC
<b>Height</b>	0.09 in (2.3 mm)
<b>Width</b>	0.87 in (22 mm)
<b>Weight</b>	0.02 lb (10 g)
<b>Interface</b>	PCIe NVMe Gen4X4
<b>Maximum Sequential Read</b>	6400 MB/s ±20%
<b>Maximum Sequential Write</b>	3500 MB/s ±20%
<b>Logical Blocks</b>	1000215215
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	TCG Opal 2.0; TRIM; L1.2

#### SSD 1TB 2280 PCIe NVMe Value

<b>Form Factor</b>	M.2 2280
<b>Capacity</b>	1TB
<b>NAND Type</b>	Value
<b>Height</b>	0.09 in (2.3 mm)
<b>Width</b>	0.87 in (22 mm)
<b>Weight</b>	0.02 lb (10 g)
<b>Interface</b>	PCIe NVMe Gen4X4
<b>Maximum Sequential Read</b>	3500 MB/s ±20%
<b>Maximum Sequential Write</b>	2700 MB/s ±20%
<b>Logical Blocks</b>	2000409264
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	Pyrite 2.0; TRIM; L1.2

#### SSD 512GB 2280 PCIe NVMe

**Value**

<b>Form Factor</b>	M.2 2280
<b>Capacity</b>	512 GB
<b>NAND Type</b>	Value
<b>Height</b>	0.09 in (2.3 mm)
<b>Width</b>	0.87 in (22 mm)



### Technical Specifications – Storage

<b>Weight</b>	0.02 lb (10 g)
<b>Interface</b>	PCIe NVMe Gen4X4
<b>Maximum Sequential Read</b>	3500 MB/s ±20%
<b>Maximum Sequential Write</b>	1600 MB/s ±20%
<b>Logical Blocks</b>	1000215215
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	Pyrite 2.0; TRIM; L1.2

### SSD 256GB 2280 PCIe NVMe

#### Value

<b>Form Factor</b>	M.2 2280
<b>Capacity</b>	256 GB
<b>NAND Type</b>	Value
<b>Height</b>	0.09 in (2.3 mm)
<b>Width</b>	0.87 in (22 mm)
<b>Weight</b>	0.02 lb (10 g)
<b>Interface</b>	PCIe NVMe Gen4X4
<b>Maximum Sequential Read</b>	3100 MB/s ±20%
<b>Maximum Sequential Write</b>	1200 MB/s ±20%
<b>Logical Blocks</b>	500118192
<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
<b>Features</b>	Pyrite 2.0; TRIM; L1.2



### Technical Specifications – Networking

#### NETWORKING / COMMUNICATION

<b>Intel® AX211 Wi-Fi 6E</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11ac IEEE 802.11ax IEEE 802.11b IEEE 802.11d IEEE 802.11e IEEE 802.11g IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11n IEEE 802.11r IEEE 802.11v
<b>Bluetooth® 5.3 vPro® WLAN [1]</b>	<b>Interoperability</b>	Wi-Fi certified
	<b>Frequency Band</b>	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 6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 GHz
	<b>Data Rates</b>	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	<b>Modulation</b>	Direct Sequence Spread Spectrum 1024QAM, 16-QAM, 256-QAM, 64-QAM, BPSK, CCK, Direct Sequence Spread Spectrum, OFDM, QPSK
	<b>Security</b>	802.1x authentication AES-CCMP: 128 bit in hardware IEEE 802.11i IEEE and WiFi certified 64 / 128 bit WEP encryption for a/b/g mode only WAPI WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. WPA2 certification WPA3 (personal) certification



### Technical Specifications – Networking

<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power</b>	<ul style="list-style-type: none"><li>• 802.11b : +17dBm minimum</li><li>• 802.11g : +16dBm minimum</li><li>• 802.11a : +17dBm minimum</li><li>• 802.11n HT20(2.4GHz) : +14dBm minimum</li><li>• 802.11n HT40(2.4GHz) : +13dBm minimum</li><li>• 802.11n HT20(5GHz) : +14dBm minimum</li><li>• 802.11n HT40(5GHz) : +13dBm minimum</li><li>• 802.11ac VHT80(5GHz) : +10dBm minimum</li><li>• 802.11ac VHT160(5GHz) : +10dBm minimum</li><li>• 802.11ax HE40(2.4GHz) : +12dBm minimum</li><li>• 802.11ax HE80(5GHz) : +10dBm minimum</li><li>• 802.11ax HE160(5GHz) : +10dBm minimum</li></ul>
<b>Power Consumption</b>	Transmit mode : 2.0 W Receive mode : 1.6 W Idle mode (PSP) : 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connected Standby/Modern Standby : 10 mW Radio disabled : 8 mW
<b>Power Management</b>	ACPI and PCI Express compliant power management
<b>Receiver Sensitivity[2]</b>	<ul style="list-style-type: none"><li>• 802.11b, 1Mbps : -93.5dBm maximum</li><li>• 802.11b, 11Mbps : -84dBm maximum</li><li>• 802.11a/g, 6Mbps : -86dBm maximum</li><li>• 802.11a/g, 54Mbps : -72dBm maximum</li><li>• 802.11n, MCS07 : -67dBm maximum</li><li>• 802.11n, MCS15 : -64dBm maximum</li><li>• 802.11ac, MCS0(VHT80) : -84dBm maximum</li><li>• 802.11ac, MCS9(VHT80) : -59dBm maximum</li><li>• 802.11ac, MCS9(VHT160) : -58.5dBm maximum</li><li>• 802.11ax, MCS11(HE40): -57dBm maximum</li><li>• 802.11ax, MCS11(HE80): -54dBm maximum</li><li>• 802.11ax, MCS11(HE160): -53.5dBm maximum</li></ul>
<b>Antenna type</b>	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
<b>Form Factor</b>	PCI-Express M.2 MiniCard
<b>Dimensions</b>	2.30 x 22.00 x 30.00 mm (0.09 x 0.87 x 1.18 inch)
<b>Weight</b>	1. Type 2230: 2.8 g 2. Type 1216: g
<b>Operating Voltage</b>	3.3 v +/- 9 %
<b>Subtitle</b>	Integrated Bluetooth specifications



### Technical Specifications – Networking

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1/5.2/5.3 Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
<b>Data Rates and Throughput</b>	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)
<b>Transmit Power</b>	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.
<b>Power Consumption</b>	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Link Topology</b>	
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407; ETSI 300 328, ETSI 301 893, ETSI 303 687
<b>Bluetooth Profiles Supported</b>	2Mbps LE Advanced Audio Distribution Profile (A2DP) Basic Imaging Profile (BIP) Bluetooth 4.1 -ESR 5/6/7 Compliance Bluetooth 4.2 ESR08 Compliance Bluetooth 5.2 Bluetooth 5.3 wireless card Channel Selection Algo ESR9/10 Compliance FAX Profile (FAX) Hands Free Profile (HFP) Headset Profile (HSP) LE Advertisement Extensions LE Data Packet Length Extension LE Dual Mode LE L2CAP Connection Oriented Channels LE Link Layer LE Link Layer Ping LE Long Range LE Low Duty Cycle Directed Advertising LE Privacy 1.2 –Extended Scanner Filter Policies LE Privacy 1.2 –Link Layer Privacy LE Secure Connection- Basic/Full



### Technical Specifications – Networking

- Limited High Duty Cycle Non-Connectable Advertising  
Train Nudging & Interlaced Scan
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.
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).

<b>Intel® AX211 Wi-Fi 6E</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a
<b>Bluetooth® 5.3 WW WLAN [1]</b>		IEEE 802.11ac
		IEEE 802.11ax
		IEEE 802.11b
		IEEE 802.11d
		IEEE 802.11e
		IEEE 802.11g
		IEEE 802.11h
		IEEE 802.11i
		IEEE 802.11k
		IEEE 802.11n
		IEEE 802.11r
		IEEE 802.11v
	<b>Interoperability</b>	Wi-Fi certified
	<b>Frequency Band</b>	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
		6.435 – 6.515 GHz
		6.535 – 6.875 GHz
		6.895 – 7.115 GHz
<b>Data Rates</b>		802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
		802.11b: 1, 2, 5.5, 11 Mbps
		802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
<b>Modulation</b>		Direct Sequence Spread Spectrum
		1024QAM, 16-QAM, 256-QAM, 64-QAM, BPSK, CCK, Direct
		Sequence Spread Spectrum, OFDM, QPSK
<b>Security</b>		802.1x authentication
		AES-CCMP: 128 bit in hardware



### Technical Specifications – Networking

	IEEE 802.11i IEEE and WiFi certified 64 / 128 bit WEP encryption for a/b/g mode only WAPI WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. WPA2 certification WPA3 (personal) certification <b>Network Architecture Models</b> Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power</b>	<ul style="list-style-type: none"><li>• 802.11b : +17dBm minimum</li><li>• 802.11g : +16dBm minimum</li><li>• 802.11a : +17dBm minimum</li><li>• 802.11n HT20(2.4GHz) : +14dBm minimum</li><li>• 802.11n HT40(2.4GHz) : +13dBm minimum</li><li>• 802.11n HT20(5GHz) : +14dBm minimum</li><li>• 802.11n HT40(5GHz) : +13dBm minimum</li><li>• 802.11ac VHT80(5GHz) : +10dBm minimum</li><li>• 802.11ac VHT160(5GHz) : +10dBm minimum</li><li>• 802.11ax HE40(2.4GHz) : +12dBm minimum</li><li>• 802.11ax HE80(5GHz) : +10dBm minimum</li><li>• 802.11ax HE160(5GHz) : +10dBm minimum</li></ul>
<b>Power Consumption</b>	Transmit mode : 2.0 W Receive mode : 1.6 W Idle mode (PSP) : 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connected Standby/Modern Standby : 10 mW Radio disabled : 8 mW
<b>Power Management</b> <b>Receiver Sensitivity[2]</b>	ACPI and PCI Express compliant power management <ul style="list-style-type: none"><li>• 802.11b, 1Mbps : -93.5dBm maximum</li><li>• 802.11b, 11Mbps : -84dBm maximum</li><li>• 802.11a/g, 6Mbps : -86dBm maximum</li><li>• 802.11a/g, 54Mbps : -72dBm maximum</li><li>• 802.11n, MCS07 : -67dBm maximum</li><li>• 802.11n, MCS15 : -64dBm maximum</li><li>• 802.11ac, MCS0(VHT80) : -84dBm maximum</li><li>• 802.11ac, MCS9(VHT80) : -59dBm maximum</li><li>• 802.11ac, MCS9(VHT160) : -58.5dBm maximum</li><li>• 802.11ax, MCS11(HE40): -57dBm maximum</li><li>• 802.11ax, MCS11(HE80): -54dBm maximum</li><li>• 802.11ax, MCS11(HE160): -53.5dBm maximum</li></ul>
<b>Antenna type</b>	High efficiency antenna with spatial diversity Two embedded tri-band 2.4/5/6 GHz antennas are provided to the

### Technical Specifications – Networking

<b>Form Factor</b>	PCI-Express M.2 MiniCard
<b>Dimensions</b>	2.30 x 22.00 x 30.00 mm (0.09 x 0.87 x 1.18 inch)
<b>Weight</b>	1. Type 2230: 2.8 g 2. Type 1216: g
<b>Operating Voltage</b>	3.3 v +/- 9 %
<b>Subtitle</b>	Integrated Bluetooth specifications
<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1/5.2/5.3 Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
<b>Data Rates and Throughput</b>	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)
<b>Transmit Power</b>	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.
<b>Power Consumption</b>	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Link Topology</b>	
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407; ETSI 300 328, ETSI 301 893, ETSI 303 687
<b>Bluetooth Profiles Supported</b>	2Mbps LE Advanced Audio Distribution Profile (A2DP) Basic Imaging Profile (BIP) Bluetooth 4.1 -ESR 5/6/7 Compliance Bluetooth 4.2 ESR08 Compliance Bluetooth 5.2 Bluetooth 5.3 wireless card Channel Selection Algo Encryption key size control enhancements ESR9/10 Compliance FAX Profile (FAX) Hands Free Profile (HFP) Headset Profile (HSP) LE Advertisement Extensions LE Data Packet Length Extension



### Technical Specifications – Networking

LE Dual Mode  
LE L2CAP Connection Oriented Channels  
LE Link Layer  
LE Link Layer Ping  
LE Long Range  
LE Low Duty Cycle Directed Advertising  
LE Privacy 1.2 –Extended Scanner Filter Policies  
LE Privacy 1.2 –Link Layer Privacy  
LE Secure Connection- Basic/Full  
Limited High Duty Cycle Non-Connectable Advertising  
Periodic Advertisement interval  
Train Nudging & Interlaced Scan  
Windows Bluetooth profiles support

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.
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).

<b>Intel® BE201 Wi-Fi 7</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a
<b>Bluetooth® 5.4 non-vPro® WW</b>		IEEE 802.11ac
<b>WLAN [1]</b>		IEEE 802.11ax
		IEEE 802.11b
		IEEE 802.11be
		IEEE 802.11d
		IEEE 802.11e
		IEEE 802.11g
		IEEE 802.11h
		IEEE 802.11i
		IEEE 802.11k
		IEEE 802.11n
		IEEE 802.11r
		IEEE 802.11v
<b>Interoperability</b>		Wi-Fi certified
<b>Frequency Band</b>		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



### Technical Specifications – Networking

	5.955 – 6.415 GHz 6.435 – 6.515 GHz 6.535 – 6.875 GHz 6.895 – 7.115 GHz
<b>Data Rates</b>	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11ac : MCS0 ~ MCS9, (20MHz, 40MHz, 80MHz, 160MHz) 802.11ax : MCS0 ~ MCS11, (20MHz, 40MHz, 80MHz, 160MHz) 802.11b: 1, 2, 5.5, 11 Mbps 802.11be : MCS0~13, (20MHz, 40MHz, ,80MHz, 160MHz, 320MHz) 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 15, (20MHz, 40MHz)
<b>Modulation</b>	Direct Sequence Spread Spectrum 1024QAM, 16-QAM, 256-QAM, 4096QAM, 64-QAM, BPSK, CCK, Direct Sequence Spread Spectrum, OFDM, QPSK
<b>Security[3]</b>	802.1x authentication AES-CCMP: 128 bit in hardware IEEE 802.11i IEEE and WiFi certified 64 / 128 bit WEP encryption for a/b/g mode only WAPI WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. WPA2 certification WPA3 (personal) certification
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power[2]</b>	<ul style="list-style-type: none"><li>• 802.11b, 1Mbps : +17dBm minimum</li><li>• 802.11g, 6Mbps : +16dBm minimum</li><li>• 802.11a, 6Mbps : +17dBm minimum</li><li>• 802.11n, MCS7(HT20) : +14dBm minimum</li><li>• 802.11n, MCS7(HT40) : +13.5dBm minimum</li><li>• 802.11ac MCS9(VHT20) : 13.5dBm minimum</li><li>• 802.11ac MCS9(VHT40) : +13.5dBm minimum</li><li>• 802.11ac MCS9(VHT80) : +12.5dBm minimum</li><li>• 802.11ac MCS9(VHT160) : +10.5dBm minimum</li><li>• 802.11ax MCS11(HE20)(6GHz) : +11.5dBm minimum</li><li>• 802.11ax MCS11(HE40)(6GHz) : +7.5dBm minimum</li><li>• 802.11ax MCS11(HE80)(6GHz) : +7.5dBm minimum</li><li>• 802.11ax MCS11(HE160)(6GHz) : +7.5dBm minimum</li><li>• 802.11be MCS13(EHT20)(6GHz) : 11.5dBm</li><li>• 802.11be MCS13(EHT40)(6GHz) : 7.5dBm</li><li>• 802.11be MCS13(EHT80)(6GHz) : 7.5dBm</li><li>• 802.11be MCS13(EHT160)(6GHz) : 6.5dBm</li><li>• 802.11be MCS13(EHT320)(6GHz) : 4.5dBm</li></ul>



### Technical Specifications – Networking

<b>Power Consumption</b>	Transmit mode : 3.4 W Receive mode : 1.8 W Idle mode (PSP) : 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connected Standby/Modern Standby : 10 mW Radio disabled : 8 mW
<b>Power Management</b>	ACPI and PCI Express compliant power management
<b>Receiver Sensitivity[3]</b>	<ul style="list-style-type: none"><li>• 802.11b, 1Mbps : -93.5dBm maximum</li><li>• 802.11b, 11Mbps : -85dBm maximum</li><li>• 802.11a/g, 6Mbps : -90.5dBm maximum</li><li>• 802.11a/g, 54Mbps : -72.5dBm maximum</li><li>• 802.11n, MCS0(HT20) : -90dBm maximum</li><li>• 802.11n, MCS7(HT20) : -71.5dBm maximum</li><li>• 802.11n, MCS0(HT40) : -88.5dBm maximum</li><li>• 802.11n, MCS7(HT40) : -68.5dBm maximum</li><li>• 802.11ac, MCS9(VHT20) : -88.5dBm maximum</li><li>• 802.11ac, MCS9(VHT40) : -65.5dBm maximum</li><li>• 802.11ac, MCS9(VHT80) : -60.5dBm maximum</li><li>• 802.11ac, MCS9(VHT160) : -58.5dBm maximum</li><li>• 802.11ax, MCS11(HE20)(6GHz) : -59.5dBm maximum</li><li>• 802.11ax, MCS11(HE40)(6GHz) : -56.5dBm maximum</li><li>• 802.11ax, MCS11(HE80)(6GHz) : -53.5dBm maximum</li><li>• 802.11ax, MCS11(HE160)(6GHz) : -51.5dBm maximum</li><li>• 802.11be, MCS13(EHT20)(6GHz) : -55.5dBm maximum</li><li>• 802.11be, MCS13(EHT40)(6GHz) : -53.5dBm maximum</li><li>• 802.11be, MCS13(EHT80)(6GHz) : -51.5dBm maximum</li><li>• 802.11be, MCS13(EHT160)(6GHz) : -48.5dBm maximum</li><li>• 802.11be, MCS13(EHT320)(6GHz) : -45.5dBm maximum</li></ul>
<b>Antenna type</b>	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
<b>Form Factor</b>	PCI-Express M.2 MiniCard with CNVi Interface
<b>Dimensions</b>	30.00 x 22.00 x 2.30 mm (1.18 x 0.87 x 0.09 inch)
<b>Weight</b>	1. Type 2230: 3.1 g 2. Type 1216: 0.8 g
<b>Operating Voltage</b>	3.3 v +/- 5 %
<b>Subtitle</b>	Integrated Bluetooth specifications
<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1/5.2/5.3/5.4 Compliant
<b>Frequency Band</b>	2042 to 2480 MHz
<b>Number of Available Channels</b>	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
<b>Data Rates and Throughput</b>	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps BLE : 1 Mbps data rate; throughput up to 0.2 Mbps Legacy : Synchronous

### Technical Specifications – Networking

<b>Transmit Power</b>	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)
<b>Power Consumption</b>	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR. Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Link Topology</b>	
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407; ETSI 300 328, ETSI 301 893, ETSI 303 687
<b>Bluetooth Profiles Supported</b>	2Mbps LE Advanced Audio Distribution Profile (A2DP) Basic Imaging Profile (BIP) Bluetooth 4.1 -ESR 5/6/7 Compliance Bluetooth 4.2 ESR08 Compliance Bluetooth 5.2 Bluetooth 5.3 wireless card Channel Selection Algo Encryption key size control enhancements ESR9/10 Compliance FAX Profile (FAX) Hands Free Profile (HFP) Headset Profile (HSP) LE Advertisement Extensions LE Data Packet Length Extension LE Dual Mode LE L2CAP Connection Oriented Channels LE Link Layer LE Link Layer Ping LE Long Range LE Low Duty Cycle Directed Advertising LE Privacy 1.2 –Extended Scanner Filter Policies LE Privacy 1.2 –Link Layer Privacy LE Secure Connection- Basic/Full Limited High Duty Cycle Non-Connectable Advertising Periodic Advertisement interval Train Nudging & Interlaced Scan Windows Bluetooth profiles support



### 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. 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).

<b>Intel® BE201 Wi-Fi 7</b>	<b>Wireless LAN Standards</b>	IEEE 802.11a
<b>Bluetooth® 5.4 vPro® WW</b>		IEEE 802.11ac
<b>WLAN [1]</b>		IEEE 802.11ax
		IEEE 802.11b
		IEEE 802.11be
		IEEE 802.11d
		IEEE 802.11e
		IEEE 802.11g
		IEEE 802.11h
		IEEE 802.11i
		IEEE 802.11k
		IEEE 802.11n
		IEEE 802.11r
		IEEE 802.11v
<b>Interoperability</b>		Wi-Fi certified
<b>Frequency Band</b>		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
		6.435 – 6.515 GHz
		6.535 – 6.875 GHz
		6.895 – 7.115 GHz
<b>Data Rates</b>		802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
		802.11ac : MCS0 ~ MCS9, (20MHz, 40MHz, 80MHz, 160MHz)
		802.11ax : MCS0 ~ MCS11, (20MHz, 40MHz, 80MHz, 160MHz)
		802.11b: 1, 2, 5.5, 11 Mbps
		802.11be : MCS0~13, (20MHz, 40MHz, ,80MHz, 160MHz, 320MHz)
		802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
		802.11n: MCS 0 ~ MCS 15, (20MHz, 40MHz)
<b>Modulation</b>		Direct Sequence Spread Spectrum
		1024QAM, 16-QAM, 256-QAM, 4096QAM, 64-QAM, BPSK, CCK,
		Direct Sequence Spread Spectrum, OFDM, QPSK



### Technical Specifications – Networking

#### Security

802.1x authentication  
AES-CCMP: 128 bit in hardware  
IEEE 802.11i  
IEEE and WiFi certified 64 / 128 bit WEP encryption for a/b/g mode only  
WAPI  
WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.  
WPA2 certification  
WPA3 (personal) certification

#### 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, 1Mbps : +17dBm minimum
- 802.11g, 6Mbps : +16dBm minimum
- 802.11a, 6Mbps : +17dBm minimum
- 802.11n, MCS7(HT20) : +14dBm minimum
- 802.11n, MCS7(HT40) : +13.5dBm minimum
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- 802.11ax MCS11(HE40)(6GHz) : +7.5dBm minimum
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- 802.11be MCS13(EHT320)(6GHz) : 4.5dBm

#### Power Consumption

Transmit mode : 3.4 W  
Receive mode : 1.8 W  
Idle mode (PSP) : 180 mW (WLAN Associated)  
Idle mode: 50 mW (WLAN unassociated)  
Connected Standby/Modern Standby : 10 mW  
Radio disabled : 8 mW

#### Power Management

ACPI and PCI Express compliant power management

#### Receiver Sensitivity[2]

- 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

	<ul style="list-style-type: none"><li>• 802.11n, MCS7(HT40) : -68.5dBm maximum</li><li>• 802.11ac, MCS9(VHT20) : -88.5dBm maximum</li><li>• 802.11ac, MCS9(VHT40) : -65.5dBm maximum</li><li>• 802.11ac, MCS9(VHT80) : -60.5dBm maximum</li><li>• 802.11ac, MCS9(VHT160) : -58.5dBm maximum</li><li>• 802.11ax, MCS11(HE20)(6GHz) : -59.5dBm maximum</li><li>• 802.11ax, MCS11(HE40)(6GHz) : -56.5dBm maximum</li><li>• 802.11ax, MCS11(HE80)(6GHz) : -53.5dBm maximum</li><li>• 802.11ax, MCS11(HE160)(6GHz) : -51.5dBm maximum</li><li>• 802.11be, MCS13(EHT20)(6GHz) : -55.5dBm maximum</li><li>• 802.11be, MCS13(EHT40)(6GHz) : -53.5dBm maximum</li><li>• 802.11be, MCS13(EHT80)(6GHz) : -51.5dBm maximum</li><li>• 802.11be, MCS13(EHT160)(6GHz) : -48.5dBm maximum</li><li>• 802.11be, MCS13(EHT320)(6GHz) : -45.5dBm maximum</li></ul>
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<b>Frequency Band</b>	2042 to 2480 MHz
<b>Number of Available Channels</b>	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
<b>Data Rates and Throughput</b>	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)
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<b>Power Consumption</b>	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
<b>Bluetooth Software Supported</b>	Microsoft Windows Bluetooth Software
<b>Link Topology</b>	
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support



### Technical Specifications – Networking

<b>Certifications</b>	FCC (47 CFR) Part 15C/E, Section 15.247, 15.249, 15.407; ETSI 300 328, ETSI 301 893, ETSI 303 687
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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 CAT19 [1]

#### 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)



### Technical Specifications – Networking

<b>Wireless protocol standards</b>	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 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 Air Interface 3GPP Rel15 5G NR sub-6 LTE Rel15 3GPP Release 8 UMTS Specification Standalone/A-GPS (MS-A, MS-B) GPS L1 (1575.42MHz), GLONASS L1 (1602MHz), Beidou B1 (1561.098MHz), Galileo E1 (1575.42MHz), QZSS (1575.42MHz) SA 5G/NR sub-6 Peak: 4.67 Gbps(Download), 1.25 Gbps(Upload) HSPA+: 23.5 dBm LTE (all bands except B41): 23.0 dBm (Not support HPUE) NR (all band except n41, n77, n78, n79): 23.0 dBm (Not support HPUE)
<b>GPS</b>	
<b>GPS bands</b>	
<b>Maximum data rates</b>	
<b>Maximum output power</b>	



### Technical Specifications – Networking

<b>Maximum power consumption</b>	HPUE) NR n41, n77, n78, n79 HPUE: 26.0 dBm (Support HPUE) 5G Sub 6: 3,500 mA LTE: 2,500 mA (peak); mA (average)
<b>Form Factor</b>	M.2; 3052-S3 Key B
<b>Weight</b>	8.6 g (0.303 oz)
<b>Dimensions</b> <b>(Length x Width x Thickness)</b>	30.00 x 52.00 x 2.30 mm (1.18 x 2.05 x 0.09 inch)
<b>embedded eSIM</b>	Yes

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.

#### HP 4G CAT19 [1]

<b>Technology/Operating bands</b>	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)
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### Technical Specifications – Networking

<b>Wireless protocol standards</b>	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) LTE Rel15 3GPP Release 8 UMTS Specification Standalone/A-GPS (MS-A, MS-B) GPS L1 (1575.42MHz), GLONASS L1 (1602MHz), Beidou B1 (1561.098MHz), Galileo E1 (1575.42MHz), QZSS (1575.42MHz)
<b>GPS</b>	
<b>GPS bands</b>	(1575.42MHz), GLONASS L1 (1602MHz), Beidou B1 (1561.098MHz), Galileo E1 (1575.42MHz), QZSS (1575.42MHz)
<b>Maximum data rates</b>	UE Category DL 19 (1.6 Gbps Download) , UE Category UL 18 (211 Mbps Upload)
<b>Maximum output power</b>	LTE (all bands except B41): 23.0 dBm (Not support HPUE)
<b>Maximum power consumption</b>	LTE: 2,500 mA (peak)
<b>Form Factor</b>	M.2; 3052-S3 Key B
<b>Weight</b>	8.4 g (0.296 oz)
<b>Dimensions</b> <b>(Length x Width x Thickness)</b>	30.00 x 52.00 x 2.30 mm (1.18 x 2.05 x 0.09 inch)
<b>embedded eSIM</b>	Yes

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

<b>NFC Mirage WNC XRAV-1</b>	<b>Dimensions (L x W x H)</b>	17.00 x 10.00 x 2.00 mm (0.67 x 0.39 x 0.08 inch)
	<b>Chipset</b>	NPC300
	<b>System interface</b>	I2C
	<b>NFC RF standards</b>	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
	<b>NFC Forum Support</b>	Type 1, Type 2, Type 3 / Type 4, NFCIP-1 / NFCIP-2
	<b>Reader (PCD-VCD) Mode</b>	ISO/IEC 14443 A ISO/IEC 14443 B



### Technical Specifications – Networking

<b>Card Emulation (PICC-VICC)</b>	ISO/IEC 15693
<b>Mode</b>	MIFARE 1K MIFARE 4K MIFARE DESFire FeliCa Jewel and Topaz
<b>Frequency</b>	ISO/IEC 14443 A
<b>NFC Modes Supported</b>	ISO/IEC 14443 B and B'
<b>Raw RF Data Rates</b>	MIFARE
<b>Operating temperature</b>	FeliCa
<b>Storage temperature</b>	13.56 MHz
<b>Humidity</b>	Reader/Writer, Peer-to-Peer
<b>Supply Operating voltage</b>	106 kbps, 212 kbps, 424 kbps, 848 kbps
<b>I/O Voltage</b>	Operating: 0 °C to 70 °C (32 °F to 158 °F) Storage: -20 °C to 125 °C (-4 °F to 257 °F)
<b>Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)</b>	Operating: 10% - 90% (non-condensing) Non-Operating: 5% - 95% (non-condensing)
<b>Mode</b>	Operating: 10% - 90% (non-condensing) Non-Operating: 5% - 95% (non-condensing)
<b>Polling</b>	4.35 to 5.25 Volts
<b>Detected Test Tag Type 1</b>	1.8V or 3.3V
<b>Detected Test Tag Type 2</b>	Booster enable, VBAT= 3.3V, VCC_BOOST = 5V
<b>Detected Test Tag Type 3</b>	
<b>Detected Test Tag Type 4</b>	
<b>Antenna</b>	Power Consumption, Typical
<b>Intel® I219-LM (vPro®) GbE PCIe NIC</b>	7.3 mA
	Total 283.8 mA
	Net Module 236.8 mA
	Total 288.8 mA
	Net Module 241.8 mA
	Total 287.7 mA
	Net Module 240.7 mA
	Total 282.3 mA
	Net Module 235.3 mA
	Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module.
<b>Connector</b>	RJ-45
<b>System Interface</b>	PCI (Intel proprietary) + SMBus
<b>Data rates supported</b>	1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 802.3 clauses 40) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)



### Technical Specifications – Networking

<b>IEEE Compliance</b>	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 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)						
<b>Performance</b>	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						
<b>Power consumption</b>	Cable Disconnection: 25 mW 100Mbps Full Run: 450 mW 1000Mbps Full Run: 1000 mW WoL Enable(S3/S4/S5): 50 mW WoL Disable(S3/S4/S5): 25 mW						
<b>Power Management</b>	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption						
<b>Management Interface</b>	Auto MDI/MDIX Crossover cable detection						
<b>IT Manageability</b>	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 Intel® vPro™ support with appropriate Intel® chipset components						
<b>Intel® I219-LM (vPro®) GbE PCIe NIC</b>	<table border="0"> <tr> <td><b>Connector</b></td><td>RJ-45</td></tr> <tr> <td><b>System Interface</b></td><td>PCI(Intel proprietary) + SMBus</td></tr> <tr> <td><b>Data rates supported</b></td><td>           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&amp; 100 Mbit/s         </td></tr> </table>	<b>Connector</b>	RJ-45	<b>System Interface</b>	PCI(Intel proprietary) + SMBus	<b>Data rates supported</b>	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
<b>Connector</b>	RJ-45						
<b>System Interface</b>	PCI(Intel proprietary) + SMBus						
<b>Data rates supported</b>	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						



### Technical Specifications – Networking

<b>IEEE Compliance</b>	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 802.3i 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3ab 1000BAE-T IEEE 802.3bz 2.5GBASE-T
<b>Performance</b>	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
<b>Power consumption</b>	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
<b>Power Management</b>	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
<b>Management Interface</b>	Auto MDI/MDIX Crossover cable detection
<b>IT Manageability</b>	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
<b>Security &amp; Manageability</b>	Intel® non-vPro™ support with appropriate Intel® chipset components
<b>Qualcomm 9205 LTE-M (CAT-M1 fSVC) [1]</b>	<b>Technology/Operating bands</b>  FDD LTE: 1700/2100 (Band 4), 1700/2100 (Band 66), 1800 (Band 3), 1900 (Band 2), 1900 (Band 25), 2100 (Band 1), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 14 upper), 700 (Band 28), 700 (band 85), 800 (Band 20), 800 (Band 27), 850 (Band 18 lower), 850 (Band 19 upper), 850 (Band 26), 850 (Band 5), 900 (Band 8) MHz  GSM/GPRS/EGPRS: 1800, 1900, 850, 900 MHz



### Technical Specifications – Networking

<b>Wireless protocol standards</b>	3GPP TS 21.111 V10.0.0: USIM and IC card requirements 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) 3GPP TS 27.007 V10.0.8: AT command set for User Equipment (UE) 3GPP TS 31.102 V10.11.0: Characteristics of the Universal 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 36.521-1 V14.3.0: User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Conformance testing 3GPP TS 51.010-1 V10.5.0: Mobile Station (MS) conformance specification; Part 1: Conformance specification 3GPP TS 51.011 V4.15.0: Specification of the Subscriber Identity Module -Mobile Equipment (SIM-ME) interface
<b>GPS</b>	Standalone GPS/Beidou/GLONASS/A-GPS (XTRA)
<b>GPS bands</b>	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz
<b>Maximum data rates</b>	LTE FDD: 375.00 Kbps(Download), 1119.00 Kbps(Upload) GPRS: 107.00 Kbps(Download), 85.60 Kbps(Upload) EGPRS: 296.00 Kbps(Download), 236.80 Kbps(Upload)
<b>Maximum output power</b>	LTE (all bands except B41): 21.5 dBm GSM: 34.0 dBm
<b>Maximum power consumption</b>	LTE: 151 mA(peak), 16 mA(average)
<b>Form Factor</b>	M.2
<b>Weight</b>	4.0 g (0.141 oz)
<b>Dimensions</b>	22.00 x 42.00 x 2.30 mm (0.87 x 1.65 x 0.09 inch)
<b>(Length x Width x Thickness)</b>	
<b>embedded eSIM</b>	Support

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



### Technical Specifications – Power

#### POWER

Power supply availability may vary by country.

<b>HP 100W Slim USB-C Straight AC Power Adapter Mario II</b>	<b>Dimensions</b>	5.354 x 2.362 x 0.866 in (13.6x6.0x2.2cm)
	<b>Weight</b>	340g ± 10g (Not including power cord. Power cord varies by country.)
	<b>Input</b>	100-240Vac
	<b>Input Efficiency</b>	81.50% min at 115 Vac/ 230 Vac @5.00V 86.70% min at 115 Vac/ 230 Vac @9.00V 88.00% min at 115 Vac/ 230 Vac @12.00V 89.00% min at 115 Vac/ 230 Vac @15.00V 89.00% min at 115 Vac/ 230 Vac @20.00V
	<b>Input frequency range</b>	47-63Hz
	<b>Input AC current</b>	Max. 1.6 A at 90 Vac
	<b>Output</b>	5V/15W 9V/27W 12V/60W 15V/75W 20V/100W
	<b>DC output</b>	5V/9V/12V/15V/20V
	<b>Hold-up time</b>	100% load 5ms at 115 Vac input/80% load 10ms at 115 Vac input
	<b>Output current limit</b>	5V/9V/12V/15V<125% max current, 20V<135% max current
	<b>Output Over Current Protection</b>	
	<b>Connector</b>	C6
	<b>Connector</b>	
	<b>Environmental Design</b>	
	<b>Operating temperature</b>	0° to 35° C (32° to 95° F)
	<b>Non-operating (storage) temperature</b>	-20° to 85° C (-4° to 185° F)
	<b>Altitude</b>	0 to 5,000 m (0 to 16,400 ft)
	<b>Humidity</b>	20% to 95%
	<b>Storage Humidity</b>	10% to 95%
	<b>EMI and Safety Certifications</b>	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, UL 62368-1 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, Ukraine(CoC+DoC+RoHS+ECO)



### Technical Specifications – Power

<b>AC Adapter 65 Watt nPFC</b>	<b>Dimensions</b>	3.543 x 2.008 x 1.122 in (9.0x5.1x2.85cm)
<b>Standard USB type C Straight</b>		
<b>1.8m (Ceto)</b>		
<b>Weight</b>		220g ± 10g (Not including power cord. Power cord varies by country.)
<b>Input</b>		100-240Vac
<b>Input Efficiency</b>		81.50% min at 115 Vac/ 230 Vac @5.00V 86.70% min at 115 Vac/ 230 Vac @9.00V 88.00% min at 115 Vac/ 230 Vac @12.00V 89.00% min at 115 Vac/ 230 Vac @15.00V 89.00% min at 115 Vac/ 230 Vac @20.00V
<b>Input frequency range</b>		47-63Hz
<b>Input AC current</b>		Max. 1.6 A at 90 Vac
<b>Output</b>		
<b>Output power</b>		5V/15W 9V/27W 12V/60W 15V/65W 20V/65W
<b>DC output</b>		5V/9V/12V/15V/20V
<b>Hold-up time</b>		100% load 5ms at 115 Vac input
<b>Output current limit</b>		< 8.0A
<b>Output Over Current Protection</b>		
<b>Connector</b>		C6
<b>Connector</b>		
<b>Environmental Design</b>		
<b>Operating temperature</b>		0° to 35° C (32° to 95° F)
<b>Non-operating (storage) temperature</b>		-20° to 85° C (-4° to 185° F)
<b>Altitude</b>		0 to 5,000 m (0 to 16,400 ft)
<b>Humidity</b>		20% to 95%
<b>Storage Humidity</b>		10% to 95%
<b>EMI and Safety Certifications</b>		CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL 62368-1 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 RCM, BIS, BSMI, UAE, UKCA DoC



### Technical Specifications – Power

<b>HP 65W GaN USB-C nPFC Straight AC Power Adapter Cappy</b>	<b>Dimensions</b>	2.68 x 2.1 x 0.875 in (6.8x5.3x2.2cm)
	<b>Weight</b>	105g ± 10g (Not including power cord. Power cord varies by country.)
	<b>Input</b>	100-240Vac
	<b>Input Efficiency</b>	81.50% min at 115 Vac/ 230 Vac @5.00V 86.70% min at 115 Vac/ 230 Vac @9.00V 89.00% min at 115 Vac/ 230 Vac @15.00V 89.00% min at 115 Vac/ 230 Vac @20.00V
	<b>Input frequency range</b>	47-63Hz
	<b>Input AC current</b>	Max. 1.6 A at 90 Vac
	<b>Output</b>	
	<b>Output power</b>	5V/15W 9V/27W 15V/65W 20V/65W
	<b>DC output</b>	5V/9V/15V/20V
	<b>Hold-up time</b>	100% load 5ms at 115 Vac input
	<b>Output current limit</b>	115%-125%
	<b>Output Over Current Protection</b>	
	<b>Connector</b>	
	<b>Connector</b>	C6
	<b>Environmental Design</b>	
	<b>Operating temperature</b>	0° to 35° C (32° to 95° F)
	<b>Non-operating (storage) temperature</b>	-20° to 85° C (-4° to 185° F)
	<b>Altitude</b>	0 to 5,000 m (0 to 16,400 ft)
	<b>Humidity</b>	20% to 95%
	<b>Storage Humidity</b>	10% to 95%
	<b>EMI and Safety Certifications</b>	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL 62368-1 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 RCM, BIS, BSMI, UAE, UKCA DoC

<b>HP 65W Slim USB-C Straight AC Power Adapter Taroko II</b>	<b>Dimensions</b>	3.819 x 2.106 x 0.827 in (9.7x5.35x2.1cm)
	<b>Weight</b>	200g ± 10g (Not including power cord. Power cord varies by country.)



### Technical Specifications – Power

<b>Input</b>	100-240Vac
<b>Input Efficiency</b>	81.50% min at 115 Vac/ 230 Vac @5.00V 86.70% min at 115 Vac/ 230 Vac @9.00V 88.00% min at 115 Vac/ 230 Vac @12.00V 89.00% min at 115 Vac/ 230 Vac @15.00V 89.00% min at 115 Vac/ 230 Vac @20.00V
<b>Input frequency range</b>	47-63Hz
<b>Input AC current</b>	Max. 1.6 A at 90 Vac
<b>Output</b>	
<b>Output power</b>	5V/15W 9V/27W 12V/60W 15V/65W 20V/65W
<b>DC output</b>	5V/9V/12V/15V/20V
<b>Hold-up time</b>	100% load 5ms at 115 Vac input
<b>Output current limit</b>	< 8.0A
<b>Output Over Current</b>	
<b>Protection</b>	
<b>Connector</b>	
<b>Connector</b>	C6
<b>Environmental Design</b>	
<b>Operating temperature</b>	0° to 35° C (32° to 95° F)
<b>Non-operating (storage) temperature</b>	-20° to 85° C (-4° to 185° F)
<b>Altitude</b>	0 to 5,000 m (0 to 16,400 ft)
<b>Humidity</b>	20% to 95%
<b>Storage Humidity</b>	10% to 95%
<b>EMI and Safety Certifications</b>	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL 62368-1 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 RCM, BIS, BSMI, UAE, UKCA DoC

### HP 65W Standard USB-C Halogen Free Straight AC Power Adapter Ceto+

<b>Dimensions</b>	3.543 x 2.008 x 1.122 in (9.0x5.1x2.85cm)
<b>Weight</b>	220g ± 10g (Not including power cord. Power cord varies by country.)
<b>Input</b>	100-240Vac



### Technical Specifications – Power

<b>Input Efficiency</b>	81.50% min at 115 Vac/ 230 Vac @5.00V 86.70% min at 115 Vac/ 230 Vac @9.00V 88.00% min at 115 Vac/ 230 Vac @12.00V 89.00% min at 115 Vac/ 230 Vac @15.00V 89.00% min at 115 Vac/ 230 Vac @20.00V
<b>Input frequency range</b>	47-63Hz
<b>Input AC current</b>	Max. 1.6 A at 90 Vac
<b>Output</b>	
<b>Output power</b>	5V/15W 9V/27W 12V/60W 15V/65W 20V/65W
<b>DC output</b>	5V/9V/12V/15V/20V
<b>Hold-up time</b>	100% load 5ms at 115 Vac input
<b>Output current limit</b>	< 8.0A
<b>Output Over Current Protection</b>	
<b>Connector</b>	C6
<b>Connector</b>	
<b>Environmental Design</b>	
<b>Operating temperature</b>	0° to 35° C (32° to 95° F)
<b>Non-operating (storage) temperature</b>	-20° to 85° C (-4° to 185° F)
<b>Altitude</b>	0 to 5,000 m (0 to 16,400 ft)
<b>Humidity</b>	20% to 95%
<b>Storage Humidity</b>	10% to 95%
<b>EMI and Safety Certifications</b>	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950-1 and IEC62368-1 : 2018, EN62368-1:2014+A11, UL 62368-1 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 RCM, BIS, BSMI, UAE, UKCA DoC

### HP 140W Slim USB-C Straight AC Power Adapter Daisy II

**Dimensions** 5.433 x 2.578 x 1.122 in (13.8x6.55x2.85cm)

**Weight** 415g(+/-10g) (Not including power cord. Power cord varies by country.)

**Input** 100-240Vac

**Input Efficiency** 81.50% min at 115 Vac/ 230 Vac @5.00V

86.70% min at 115 Vac/ 230 Vac @9.00V

88.00% min at 115 Vac/ 230 Vac @12.00V



### Technical Specifications – Power

<b>Input frequency range</b>	89.00% min at 115 Vac/ 230 Vac @15.00V
<b>Input AC current</b>	89.00% min at 115 Vac/ 230 Vac @20.00V
<b>Output</b>	89.00% min at 115 Vac/ 230 Vac @28.00V
<b>Output power</b>	47-63Hz
	Max. 2.5 A at 90 Vac
<b>DC output</b>	5V/15W
<b>Hold-up time</b>	9V/27W
<b>Output current limit</b>	12V/60W
<b>Output Over Current</b>	15V/75W
<b>Protection</b>	20V/100W
<b>Connector</b>	28V/140W
<b>Connector</b>	5V/9V/12V/15V/20V/28V
<b>Environmental Design</b>	100% load 5ms at 115 Vac input/80% load 10ms at 115 Vac input
<b>Operating temperature</b>	5V/9V/12V/15V/20V<125% max current, 28V<135% max current
<b>Non-operating (storage) temperature</b>	0° to 35° C (32° to 95° F)
<b>Altitude</b>	-20° to 85° C (-4° to 185° F)
<b>Humidity</b>	0 to 5,000 m (0 to 16,400 ft)
<b>Storage Humidity</b>	20% to 95%
<b>EMI and Safety Certifications</b>	10% to 95%
	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, UL 62368-1
	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, Ukraine(CoC+DoC+RoHS+ECO)

### MC 62Whr Long Life Polymer Fast charge 3 cell Battery

<b>Dimensions (H x W x L)</b>	L 255.8 mm* W 67.8mm* T 7.4mm
<b>Weight</b>	Max 236.0g
<b>Cells/Type</b>	3cell Lithium-Ion Polymer cell
<b>Energy</b>	
<b>Voltage</b>	11.58V
<b>Amp-hour capacity</b>	5355mAh / 5086mAh
<b>Watt-hour capacity</b>	62Whr



### Technical Specifications – Power

<b>Temperature</b>	
<b>Operating (Charging)</b>	0° C ~ 40° C
<b>Operating (Discharging)</b>	-10° C ~ 40° C
<b>Fuel Gauge LED</b>	
<b>Warranty</b>	
<b>Optional Travel Battery Available</b>	No

<b>MW 77Whr Long Life Polymer Fast charge 8 cell Battery</b>	<b>Dimensions (H x W x L)</b>	L 268 mm* W 73 mm* T 10.06 mm
	<b>Weight</b>	Max 300g
	<b>Cells/Type</b>	8cell Lithium-Ion Polymer cell
	<b>Energy</b>	
	<b>Voltage</b>	15.44V
	<b>Amp-hour capacity</b>	4988mAh / 4738mAh
	<b>Watt-hour capacity</b>	77Whr
	<b>Temperature</b>	
	<b>Operating (Charging)</b>	0° C ~ 40° C
	<b>Operating (Discharging)</b>	-10° C ~ 40° C
	<b>Fuel Gauge LED</b>	
	<b>Warranty</b>	
	<b>Optional Travel Battery Available</b>	No



### Technical Specifications – Audio

#### AUDIO

**HD Stereo Codec**

Realtek ALC3315

**Audio I/O Ports**

3.5mm Headset: CTIA only;Headphone-out

**Internal Speaker Amplifier**

Cirrus Logic High-Efficiency Boosted Class D Amplifier

**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 MSFT Behavior

DAC: Supports resolutions from 16-bit to 24-bit;48.0 kHz to 48.0 kHz

ADC: Supports resolutions from 16-bit to 24-bit;44.1 kHz to 48.0 kHz

Yes

**Sampling**

**Internal Speaker**

### Technical Specifications – Fingerprint Reader

#### FINGERPRINT READER

Sensor vendor	SYNAPTICS
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	2.7 V ~ 3.6 V
Operating Temperature	5°C ~ 60°C (41°F ~ 140°F)
Current Consumption Image	100 mA max
Low Latency Wait For Finger	260 uA
Capture Rate	50 frames/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	363 dpi / 7.4 x 6.0 mm sensor area
Fingerprint Reader	<b>Second Source</b>
Sensor vendor	ELAN
Sensor type	Capacitive
DPI resolution	363 DPI
Scan area	56 x 56 pixels
False Rejection Rate	< 3%
False Acceptance Rate	< 0.001%
Mobile Voltage Operation	2.8 V ~ 3.6 V
Operating Temperature	-20°C ~ 80°C (-4°F ~ 176°F)
Current Consumption Image	100 mA max
Low Latency Wait For Finger	300 uA
Capture Rate	50 frames/sec
ESD Resistance	IEC 61000-4-2 4B (+15KV)
Detection Matrix	363 dpi / 4.0 x 4.0 mm sensor area



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

### OPTIONS

Category	Description	Part Number
Audio/Video	TBD	TBD
Cases	TBD	TBD
Docking	TBD	TBD
Hub	TBD	TBD
Adapter	TBD	TBD
Keyboard/Combo	TBD	TBD
Mouse	TBD	TBD
Power	TBD	TBD
Commodity	TBD	TBD

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

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