

### Overview

### HP EliteOne 800 G4 23.8" Healthcare Edition All-in-One

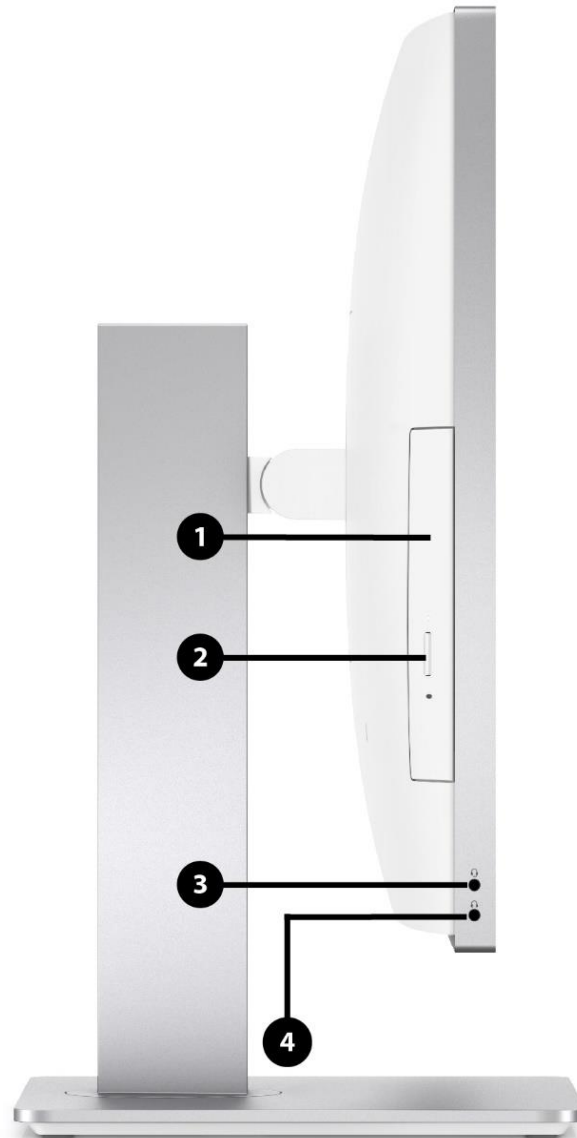


#### Front

1. Camera (optional)
2. FIPS fingerprint reader (optional)
3. RFID reader (optional)

### Overview

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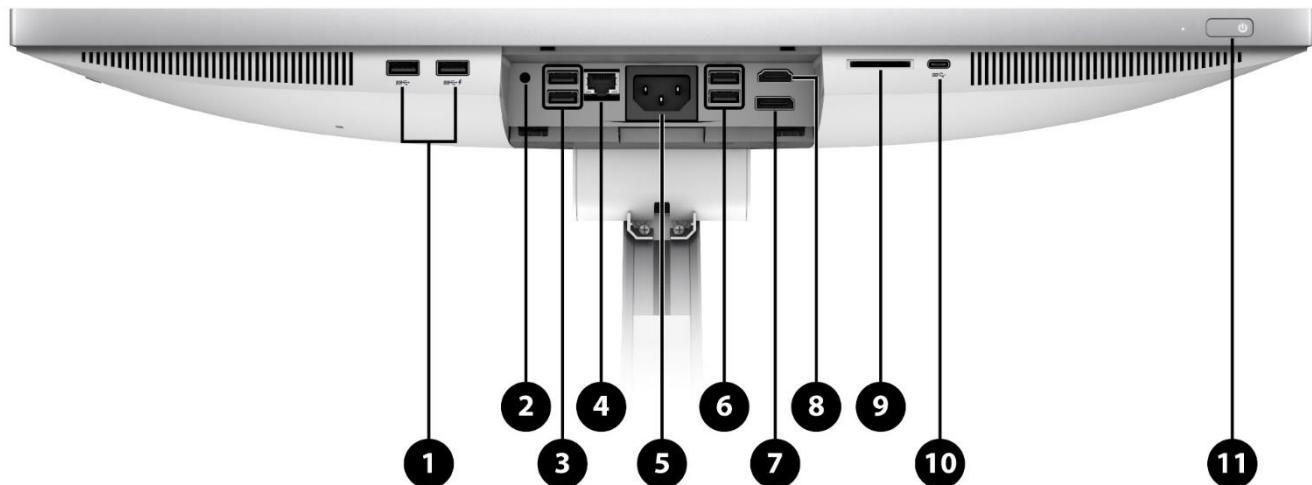


#### Side

- |   |   |
|---|---|
| 1. Optical disc drive (optional)              | 3. Universal audio jack with CTIA headset support |
| 2. Optical disc drive eject button (optional) | 4. Headphone connector                            |

### Overview

### HP EliteOne 800 G4 23.8" Healthcare Edition All-in-One

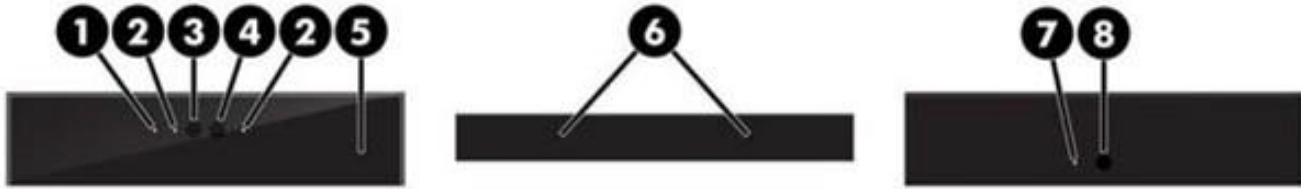


#### Bottom components and rear ports (behind security cover)

- |  |                                      |
|--|--------------------------------------|
| 1. USB 3.1 Gen 2 Type-A ports (2, 1 fast charging) | 7. HDMI 2.0a connector               |
| 2. Audio line-out connector                        | 8. Dual-Mode DisplayPort™ 1.2 (DP++) |
| 3. USB 3.1 Gen 1 Type-A ports (2)                  | 9. SD card reader 4.0 (optional)     |
| 4. RJ-45 (network) jack                            | 10. USB 3.1 Type-C™ Gen 2 port       |
| 5. Power connector                                 | 11. Dual-state power button          |
| 6. USB 3.1 Gen 2 Type-A ports (2) wake capable     |                                      |

### Overview

#### HP EliteOne 800 G4 23.8" Healthcare Edition All-in-One



#### Infrared (IR) and dual facing camera (optional)

1. Camera light
2. IR camera light
3. Full High Definition (FHD) camera
4. IR camera
5. Rear camera adjustment wheel
6. Digital microphones
7. Camera light
8. FHD camera



#### Full High Definition (FHD) camera (optional)

1. Camera light
2. FHD camera
3. Digital microphones

## Overview

### At a Glance

- All-in-One form factor (non-touch)
- Sanitizable with germicidal wipes every shift, every day<sup>1</sup>
- Optional, integrated dual-band RFID reader and FIPS-201 compliant fingerprint reader for integrated single sign-on support
- Intel® Q370 chipset
- Intel® 8th generation Core™ processors
- Intel® vPro™ Technology available with Core i5 and Core i7 processors
- Processor support - 65W
- Integrated Intel® UHD Graphics
- Windows 10
- Intel® Ethernet Connection I219LM GbE LOM integrated network connection
- EN 60601-1-2:2015 compliant
- Skype for Business® certified
- Vidyo Ready for telemedicine<sup>2</sup>
- Optional dual-facing and IR camera supports Windows Hello
- DDR4 Synchronous Dynamic Random Access Memory (SDRAM)
- HP Sure Start Gen4<sup>3</sup>
- HP Manageability Integration Kit Gen2<sup>4</sup>
- ENERGY STAR® certified. EPEAT® Gold registered where applicable/supported. Registration may vary by country. See <http://www.epeat.net> for registration status by country.
- CECP Certified
- TCO Edge for AiO
- PC chassis and all internal components and modules are manufactured with low halogen content<sup>5</sup>
- Protected by HP Services, including warranties up to 3-3-3 (terms and conditions vary by country; certain restrictions and exclusions apply)

1. Based on HP's internal analysis as of Nov. 1, 2017 of AiOs tested to simulate up to 10,000 wipes with germicidal towelettes over a 3-year period. See user guide for cleaning instructions. The HP EliteOne 800 G4 23.8 Healthcare Edition AiO is not intended for use in diagnosis, cure, treatment or prevention of disease or other medical conditions.

2. Vidyo software sold separately

3. HP Sure Start Gen4 is available on HP Elite and HP Pro 600 products equipped with Intel® 8th generation processors.

4. HP Manageability Integration Kit Gen2 can be downloaded from <http://www.hp.com/go/clientmanagement>.

5. External power supplies, power cords, cables and peripherals are not low halogen. Service parts obtained after purchase may not be low halogen.

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

## Features

### OPERATING SYSTEMS

<b>Preinstalled</b>	Microsoft Windows® 10 Pro <sup>1</sup> Microsoft Windows® 10 Pro (National Academic License) <sup>2</sup> Microsoft Windows® 10 Home <sup>1</sup> Microsoft Windows® 10 Home Single Language <sup>1</sup> FreeDos 2.0
<b>Web-supported only</b>	Microsoft Windows® 10 Enterprise 64 <sup>1</sup>

1. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com/>.

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

**NOTE:** Your product does not support Windows 8 or Windows 7

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

### PROCESSORS

#### 8th Gen Intel® Core™ Processor

Intel® Core™ i7 8700 with Intel® UHD Graphics 630 (3.2 GHz, up to 4.6 GHz with Intel® Turbo Boost, 12 MB cache, 6 cores)

Intel® Core™ i7+ 8700 processor (Core i7 and 16 GB Intel® Optane™ memory) with Intel® UHD Graphics 630 (3.2 GHz, up to 4.6 GHz with Intel® Turbo Boost, 12 MB cache, 6 cores)

Intel® Core™ i5 8600 with Intel® UHD Graphics 630 (3.1 GHz, up to 4.3 GHz with Intel® Turbo Boost, 9 MB cache, 6 cores)

Intel® Core™ i5+ 8600 processor (Core i5 and 16 GB Intel® Optane™ memory) with Intel® UHD Graphics 630 (3.1 GHz, up to 4.3 GHz with Intel® Turbo Boost, 9 MB cache, 6 cores)

Intel® Core™ i5 8500 with Intel® UHD Graphics 630 (3.0 GHz, up to 4.1 GHz with Intel® Turbo Boost, 9 MB cache, 6 cores)

Intel® Core™ i5+ 8500 processor (Core i5 and 16 GB Intel® Optane™ memory) with Intel® UHD Graphics 630 (3.0 GHz, up to 4.1 GHz with Intel® Turbo Boost, 9 MB cache, 6 cores)

Intel® Core™ i3 8300 with Intel® UHD Graphics 630 (3.7 GHz, 8 MB cache, 4 cores)

Intel® Core™ i3 8100 with Intel® UHD Graphics 630 (3.6 GHz, 6 MB cache, 4 cores)

Intel® Pentium® Gold G5600 with Intel® UHD Graphics 630 (3.9 GHz, 4 MB cache, 2 cores)

Intel® Pentium® Gold G5500 with Intel® UHD Graphics 630 (3.8 GHz, 4 MB cache, 2 cores)

Intel® Pentium® Gold G5400 with Intel® UHD Graphics 610 (3.7 GHz, 4 MB cache, 2 cores)

Intel® Celeron® G4900 with Intel® UHD Graphics 610 (3.1 GHz, 2 MB cache, 2 cores)

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**NOTE:** 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.

**NOTE:** Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system.



### Features

#### CHIPSET

Intel® Q370

#### GRAPHICS

##### Integrated Intel® Graphics

Intel® UHD Graphics 630 (integrated on 8th gen Core i7/i5/i3, Pentium® Gold G5600, G5500)

Intel® UHD Graphics 610 (integrated on 8th Pentium® Gold G5400, Celeron® G4900)

#### DISPLAY FEATURES

##### HP EliteOne 800 G4 Healthcare Edition 23.8-in FHD Display

23.8" diagonal IPS widescreen WLED backlit LCD (1920 x 1080)

Non-Touch

Glass covered display

#### DISPLAY PANEL SPECIFICATIONS

##### 23.8" diagonal IPS widescreen WLED backlit anti-glare LCD (1920 x 1080)

Type	IPS WLED Backlit LCD
Active area (mm)	527.04 x 296.46
Native Resolution (HxV)	1920 x 1080
Aspect ratio	16:09
Pixel pitch (HxV)(mm)	0.2745 x 0.2745
Contrast ratio (typical)	1000:1
Brightness (typical)	250 nits
Viewing angle (typical) (HxV)	178 ° x 178 °
Backlight lamp life (to half brightness)	30,000 hours minimum
Color support	Over 16 million colors
Color gamut (typical)	NTSC 72%
Anti-glare	Yes
Default color temperature	Warm (6500K)

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

### Features

#### STORAGE AND DRIVES<sup>1</sup>

##### **2.5 inch 7.2k RPM Hard Disk Drives**

500GB SATA

1TB SATA

##### **2.5 inch Solid State Hybrid Drives (SSHD)**

500GB 5400RPM 2.5in 8GB Hybrid

1TB 5400RPM 2.5in 8GB Hybrid

2TB 5400RPM 2.5in 8GB Hybrid

##### **2.5 inch 5.4k RPM Hard Disk Drives**

2TB SATA

##### **2.5 inch Self-encrypting Drives (SED HDD)**

500GB 7200RPM 2.5in SED OPAL 2

500GB 5400RPM 2.5in Federal Information Processing Standard (FIPS) SED

##### **2.5 SATA SSD Drives**

128GB SATA TLC SSD

256GB SATA TLC SSD

512GB SATA TLC SSD

##### **2.5 inch Self-encrypting Drives (SED SSD)**

256GB TLC SED SSD OPAL 2 Drive

512GB TLC SED SSD OPAL 2 Drive

256GB TLC SED SSD 2.5in Federal Information Processing Standard (FIPS) SED

512GB TLC SED SSD 2.5in Federal Information Processing Standard (FIPS) SED

##### **PCIe NVMe SSD Drives**

256GB PCIe NVMe TLC SSD

256GB PCIe NVMe TLC SSD 2nd

512GB PCIe NVMe TLC SSD

512GB PCIe NVMe TLC SSD 2nd

1TB PCIe NVMe TLC SSD

1TB PCIe NVMe TLC SSD 2nd

128GB PCIe NVMe SSD

128GB PCIe NVMe SSD 2nd

256GB PCIe NVMe SSD

256GB PCIe NVMe SSD 2nd

512GB PCIe NVMe SSD

512GB PCIe NVMe SSD 2nd

##### **PCIe NVMe Self-encrypting Drives (PCIe NVMe SED SSD)**

256GB PCIe NVMe TLC SED SSD OPAL 2 Drive

**NOTE:** For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB (for Windows 10) of system disk is reserved for the system recovery software.



### Features

#### MEMORY

**Maximum**

32GB (16GB/slot)

**Memory Slots**

2 SODIMMs

DDR4-2666 (Transfer rates up to 2666 MT/s)

**Dual channel support**

Customer accessible/upgradeable

**Configurations**

4 GB (1 x 4 GB)

8 GB (2 x 4 GB)

8 GB (1 x 8 GB)

16 GB (2 x 8 GB)

16 GB (1 x 16 GB)

32 GB (2 x 16 GB)

Intel® Optane Memory 16GB SSD (cache)

**NOTE:** Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system.

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#### NETWORKING

**Wireless LAN**

Intel® 9560 802.11b/g/n/a/ac 2x2 Wi-Fi +Bluetooth® M.2 Combo Card non-vPro™

Intel® 9560 802.11b/g/n/a/ac 2x2 Wi-Fi +Bluetooth® M.2 Combo Card vPro™

Realtek RTL8822BE ac 2x2 Wi-Fi +Bluetooth® M.2 Combo Card

Realtek ac 1x1 +Bluetooth® M.2 Combo Card (2230 PCI-e+USB)

**Ethernet (RJ-45) Integrated**

Intel® I219LM Gigabit Network Connection LOM (standard)

**NOTE:** Wireless LAN is optional and must be bought at purchase

**NOTE:** Wireless access point and Internet service required and not included. Availability of public wireless access points limited.

**NOTE:** The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the device to communicate with other 802.11ac WLAN devices.

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### Features

#### AUDIO/MULTIMEDIA

##### Audio

Integrated Conexant CX5001 codec - up to 24-bit PCM  
High performance integrated stereo speakers(2watt)

##### High Definition Audio

Integrated  
Conexant CX5001

##### Webcams & Mic

Pop-up camera - 2MP FHD camera, up to 30 frames/sec, discrete dual array microphone (Fixed 2MP FHD 1080p)(maximum resolution of 1920 x1080)(optional)  
Pop-up camera - 2MP FHD camera with IR camera front-facing and 2nd rear-facing 2MP camera discrete dual array microphone (Dual Camera 480P IR+1080P RGB Fixed/2MP FHD 1080P Fixed)(maximum resolution of 1920x1080)(optional)  
IR camera (optional) supports Win10 Hello

**NOTE:** Universal Audio Jack with CTIA headset support (re-taskable for headphone/line out/microphone in/line in)

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

##### Keyboard and Mouse Combos

HP Premium Wireless Keyboard and Mouse  
HP USB Keyboard and Mouse Healthcare Edition  
HP Wireless Business Slim Keyboard and Mouse  
HP USB Keyboard and Mouse

##### Keyboards

HP USB Collaboration Wired Keyboard  
HP Collaboration Wireless Keyboard  
HP USB Business Slim Keyboard  
HP USB Business Slim Grey Keyboard  
HP USB Business Slim CCID SmartCard Keyboard  
HP USB Business Slim Antimicrobial Keyboard\*  
HP USB Wired Keyboard  
HP Wired Keyboard EPEAT®  
HP USB PS/2 Washable Standalone Wired Keyboard  
HP USB Conferencing Wired Keyboard

##### Mice

HP USB 1000dpi Laser Mouse  
HP Grey V2 Mouse  
HP USB Mouse  
HP USB Antimicrobial Mouse\*  
HP USB Hardened Mouse  
HP Washable Wired Mouse USB PS/2  
HP Optical USB Mouse

##### Other

HP Mouse Pad  
HP EliteOne G4 AiO Dust Filter

## Features

### Adapters and Cables

HP DisplayPort Cable  
HP DisplayPort to DVI-D Adapter  
HP DisplayPort to HDMI True 4K Adapter  
HP DisplayPort to VGA Adapter  
HP DVI Cable  
HP USB Type-C™ to Type-A Hub  
HP USB to Serial Port Adapter  
HP USB-C™ to USB 3.0 Adapter  
HP Type-C to DisplayPort Adapter

### Headsets

HP Business Headset v2

\*China Only

## HP BIOSPHERE

### HP BIOS

Key features of the HP BIOS include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP EliteOne 1000 Business PC into the enterprise, such as PXE, remote configuration, remote control, and BIOS (F10) Setup support for 14 languages.
- Network firmware updates – Update your BIOS via the cloud or standardize on a BIOS version hosted on an Enterprise network.
- Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- UEFI specification version 2.6
- Absolute Persistence agent – For tracking and tracing services, available in select countries, separate software and purchase of a subscription is required.
- Thermal and power management – The HP BIOS provides and enables thermal and power management technologies so component temperatures are managed for high reliability and to assist in operating the HP Business Desktop computer in any enterprise environment.
- Acoustic performance – Industry leading acoustic emissions across the range of operating conditions.
- Serviceability – HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery – HP BIOS provides numerous ways to upgrade HP Business Desktop computers, including BIOS updates from within Windows (HPBIOSUPDREC), HP Client Manager, and fail-safe recovery. In addition, the HP BIOS Configuration Utility enables replication of BIOS settings within Windows while the Replicated Setup feature provides the same capability within BIOS (F10) Setup. The BIOS Configuration Utility is available from the HP support website.
- HP BIOS uses PKI signing of the BIOS for trusted BIOS upgrades and recovery.
- Additional HP BIOS Features:
  - Power-On password – Helps prevent an unauthorized user from powering on the system.
  - Administrator password – Also known as the setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS cannot be updated and changes cannot be made to BIOS settings using BIOS Setup or under the OS.
- S5 Maximum Power Savings setting supports EU Lot6 requirement and allows the computer to power down below 0.5W in S5 (when turned off). When S5 Maximum Power Savings feature is enabled below features are turned off:
  - Power to expansion connectors / slots
  - Wake events other than power buttons (such as wake on LAN)
  - USB charging ports
- HP SureStart

### Features

- BIOS Integrity checking – Sure Start protection ensures that only trusted BIOS code is executed and not rootkits, viruses and malware. Verification is done upon boot up, shutdown and while On.
  - Sure Start is set by default to automatically repair the BIOS if corrupted or compromised but is policy driven for better manageability.
  - Protecting beyond BIOS – Integrity checking and repair is extended to other data that should be protected such as network configuration parameters (network name), platform specific information (i.e. system IDs) and other code the system needs to boot.
  - Audit enabled – System Audit via Sure Start Event Logs capture data such as incident, repair date and time for troubleshooting and investigating.
- 

### SOFTWARE AND SECURITY

#### BIOS

HP BIOSphere Gen4 <sup>17</sup>

HP DriveLock & Automatic DriveLock

BIOS Update via Network

Master Boot Record Security

Power On Authentication

Secure Erase <sup>18</sup>

Absolute Persistence Module <sup>19</sup>

Pre-boot Authentication

HP Wireless Wakeup

#### Software

HP Native Miracast Support <sup>15</sup>

HP LAN-Wireless Protection

HP Velocity

HP ePrint + JetAdvantage <sup>20</sup>

HP Hotkey Support - CMIT

HP Recovery Manager

HP Jumpstart

HP Support Assistant <sup>21</sup>

HP Noise Cancellation Software

HP PhoneWise <sup>29</sup>

Buy Office

### Features

#### **Manageability Features**

HP Driver Packs <sup>22</sup>  
HP System Software Manager (SSM)  
HP BIOS Config Utility (BCU)  
HP Client Catalog  
HP Manageability Integration Kit Gen2 <sup>23</sup>  
Ivanti Management Suite <sup>24</sup>  
HP Collaboration Keyboard

#### **Client Security Software**

HP Client Security Suite Gen4 including: <sup>25</sup>  
HP Security Manager <sup>26</sup> (including Credential Manager, HP Password Manager, HP Spare Key)  
Power On Authentication  
HP Fingerprint Sensor <sup>31</sup>  
HP Device Access Manager  
HP Power On Authentication  
Microsoft Defender <sup>27</sup>

#### **Security Management**

HP BIOSphere Gen4 <sup>17</sup>  
HP DriveLock & Automatic DriveLock  
BIOS Update via Network  
Secure Erase <sup>18</sup>  
Pre-boot Authentication  
TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified) <sup>32</sup>  
SATA 0,1 port disablement (viaBIOS)  
RAID configurations <sup>33</sup>  
Serial, USB enable/disable (viaBIOS)  
Power-on password (viaBIOS)  
Setup password (viaBIOS)  
Support for chassis padlocks and cable lock devices  
Integrated hood sensor  
HP Sure Click <sup>34</sup>  
HP Sure Start Gen4 <sup>30</sup>

### Features

15. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming
17. HP BIOSphere Gen4 features may vary depending on the PC platform and configurations requires 8th Gen Intel® processors.
18. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method.
19. Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: <http://www.absolute.com/company/legal/agreements/computrace-agreement>. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.
20. HP ePrint Drive requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see <http://www.hp.com/go/eprintcenter>). Print times and connection speeds may vary.
21. HP Support Assistant requires Windows and Internet access.
22. HP Driver Packs not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.
23. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>
24. Ivanti Management Suite subscription required.
25. HP Client Security Suite Gen 4 requires Windows and Intel® or AMD 8th generation processors.
26. HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. User may need to enable or allow the add-on / extension in the internet browser.
27. Microsoft Defender Opt in and internet connection required for updates.
29. HP PhoneWise Client is only available on select platforms. For supported platforms and HP PhoneWise system requirements see <http://www.hp.com/go/HPPhoneWise>.
30. HP Sure Start Gen4 is available on HP EliteBook products equipped with Intel® 8th generation processors
31. HP Fingerprint Sensor sold separately or as an optional feature.
32. Firmware TPM is version 2.0. Hardware TPM is v1.2, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT).
33. RAID configuration is optional and does require a second hard drive.
34. HP Sure Click is available on select HP platforms and supports Microsoft® Internet Explorer, Google Chrome, and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode. Check <http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA7-0922ENW> for all compatible platforms as they become available.

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### POWER

#### Power Supply

#### Internal

Internal 180W

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### Features

#### WEIGHTS & DIMENSIONS

##### Weight

##### Product Weight Unboxed

##### Without Stand

6.4 – 7kg, 14.1 – 15.4 lbs

##### Adjustable height stand:

9.5 – 9.53kg, 20.79 – 21.01 lbs

##### Dimensions (W x D x H)

##### Products Dimensions

##### Without Stand

540.4 x 54 x 341.96 mm

21.24 x 2.1 x 13.5 in

##### Adjustable height stand (0 degree)

540.4 x 220.16 x 468 mm

21.24 x 8.67 x 18.43 in

#### ENVIRONMENTAL AND INDUSTRY

##### UNIT ENVIRONMENTAL AND OPERATING CONDITIONS

##### General Unit Operating Guidelines

- Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.
- Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow.
- Never restrict airflow into the computer by blocking any vents or air intakes.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

##### Temperature Range

Operating: 50° to 95° F (10° to 35° C)\*

Non-operating: -22° to 140° F (-30° to 60° C)

##### Relative Humidity

Operating: 10% to 90% (non-condensing at ambient)

Non-operating: 5% to 95% (non-condensing at ambient)

##### Maximum Altitude (unpressurized)

Operating: 5000m

Non-operating: 50000ft (15240 m)

**NOTE:** Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.

### Features

<b>Eco-Label Certifications &amp; declarations</b>	<p>This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:</p> <ul style="list-style-type: none"> <li>• IT ECO declaration</li> <li>• US ENERGY STAR®</li> <li>• EPEAT® Gold registered in the United States. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country. Search keyword generator on HP's 3rd party option store for solar generator accessories at <a href="http://www.hp.com/go/options">http://www.hp.com/go/options</a>.</li> </ul>		
<b>System Configuration</b>	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Desktop model is based on a "Typically Configured Desktop".		
<b>Energy Consumption (in accordance with US ENERGY STAR® test method)</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 60Hz</b>
Normal Operation (Short idle)	21.98 W	22.24W	21.69 W
Normal Operation (Long idle)	11.35 W	11.60 W	11.22W
Sleep	4.10 W	4.11 W	3.98 W
Off	0.73 W	0.74 W	0.69 W
	<p><b>NOTE:</b> Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.</p>		
<b>Heat Dissipation*</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 60Hz</b>
Normal Operation (Short idle)	75 BTU/hr	76 BTU/hr	74 BTU/hr
Normal Operation (Long idle)	39 BTU/hr	40 BTU/hr	38 BTU/hr
Sleep	14 BTU/hr	14 BTU/hr	13 BTU/hr
Off	2 BTU/hr	2 BTU/hr	2 BTU/hr
	<p><b>NOTE:</b> Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.</p>		
<b>Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)</b>	Sound Power (L <sub>WAd</sub> , bels)		Sound Pressure (L <sub>pAm</sub> , decibels)
Typically Configured – Idle	3.2		20
Fixed Disk – Random writes	3.5		28
<b>Longevity and Upgrading</b>	<p>This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:</p> <p>Spare parts are available throughout the warranty period and or for up to "5" years after the end of production.</p>		
<b>Batteries</b>	<p>This battery(s) in this product comply with EU Directive 2006/66/EC</p> <p>Batteries used in the product do not contain:            Mercury greater the 1ppm by weight            Cadmium greater than 20ppm by weight</p> <p>Battery size: CR2032 (coin cell)            Battery type: Lithium</p>		



### Features

<b>Additional Information</b>	<ul style="list-style-type: none"> <li>• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.</li> <li>• This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.</li> <li>• This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).</li> <li>• This product is in compliance with the IEEE 1680 (EPEAT) standard at the &lt;gold&gt; level in the U.S. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at <a href="http://www.hp.com/go/options">http://www.hp.com/go/options</a></li> <li>• Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.</li> <li>• This product contains 0% post-consumer recycled plastic (by wt.)</li> <li>• This product is 95.1% recycle-able when properly disposed of at end of life.</li> </ul>		
<b>Packaging Materials</b>	<b>External:</b>	PAPER/Corrugated	1419 g
	<b>Internal:</b>	PLASTIC/EPE (Expanded Polyethylene)	694 g
		PLASTIC/Polyethylene low density	94 g
<b>Material Usage</b>	<p>This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf</a>):</p> <ul style="list-style-type: none"> <li>• Asbestos</li> <li>• Certain Azo Colorants</li> <li>• Certain Brominated Flame Retardants – may not be used as flame retardants in plastics</li> <li>• Cadmium</li> <li>• Chlorinated Hydrocarbons</li> <li>• Chlorinated Paraffins</li> <li>• Formaldehyde</li> <li>• Halogenated Diphenyl Methanes</li> <li>• Lead carbonates and sulfates</li> <li>• Lead and Lead compounds</li> <li>• Mercuric Oxide Batteries</li> <li>• Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.</li> <li>• Ozone Depleting Substances</li> <li>• Polybrominated Biphenyls (PBBs)</li> <li>• Polybrominated Biphenyl Ethers (PBBEs)</li> <li>• Polybrominated Biphenyl Oxides (PBBOs)</li> <li>• Polychlorinated Biphenyl (PCB)</li> <li>• Polychlorinated Terphenyls (PCT)</li> <li>• Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.</li> <li>• Radioactive Substances</li> <li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</li> </ul>		
<b>End-of-life Management and Recycling</b>	<p>HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <a href="http://www.hp.com/go/reuse-recycle">http://www.hp.com/go/reuse-recycle</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <a href="http://www.hp.com/go/recyclers">http://www.hp.com/go/recyclers</a>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.</p>		
<b>HP Inc. Corporate Environmental Information</b>	<p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report  <a href="http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html">http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html</a></p>		

### Features

	<p>Eco-label certifications  <a href="http://www8.hp.com/us/en/hp-information/environment/ecolabels.html">http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</a>            ISO 14001 certificates:  <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf</a>            and  <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</a></p>

### PORTS/SLOTS

#### Rear I/O Connectors

- (2) USB 3.1 Gen 1 Type A w/ S4/S5 Wake
- (3) USB 3.1 Gen 2 Type A
- (1) USB 3.1 Gen 2 Type A w/ BC 1.2
- (1) USB 3.1 Gen 2 Type-C DFP w/ 3.0A w/ BC1.2
- (1) LAN RJ45
- (1) DisplayPort 1.2
- (1) HDMI 2.0a
- (1) Audio Line-Out
- (1) SD Card Reader 4.0

#### Left I/O Connectors

- (1) Headphone
- (1) Headset - CTIA UAJ Headset w/o Virtual OMTP

#### M.2 Socket

- (1) M.2 Socket 1 Type 2230-E
- (2) M.2 Socket 3 Type 2230/80-M

#### Storage

- (2) SATA Power/Data Combo

### SERVICE AND SUPPORT

On-site Warranty <sup>16</sup>: Three-year (3-3-3) limited warranty delivers three years of on-site, next business day <sup>17</sup> service for parts and labor and complimentary limited technical support. Three-year onsite and labor are not available in all countries. Service offers terms up to 5 years by choosing an optional HP Care Pack. <sup>18</sup> To choose the right level of service for your HP product, visit HP Care Pack Central: <http://www.hp.com/go/cpc>

<sup>16</sup>. Terms and conditions may vary by country. Certain restrictions and exclusions apply. Other warranty variations may be offered in your region.

<sup>17</sup>. On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

<sup>18</sup>. Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit [www.hp.com/go/cpc](http://www.hp.com/go/cpc). HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

### Features

#### CERTIFICATION AND COMPLIANCE

ENERGY STAR® certified; EPEAT® Gold

**NOTE:** EPEAT® registered where applicable. EPEAT registration varies by country. See <http://www.epeat.net> for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at <http://www.hp.com/go/options>

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### Technical Specifications

#### RFID CARD READER

<b>Operating Frequencies</b>	125 kHz, 13.56 MHz
<b>Read Height</b>	1in (Typical)
<b>Device Class</b>	HID
<b>Protocol</b>	USB HID
<b>NFC RF Standards (in reading CSN)</b>	ISO/IEC 14443 A, ISO/IEC 14443 B ISO/IEC 15693
<b>NFC Forum Support</b>	Tag Type 1, Type 2, Type 3, and Type 4 in reading CSN
<b>Raw RF Data Rates</b>	Low-frequency Cards: 1,2050 to 7,812 bps High-frequency Cards: 106 to 848 bps AWID (RDR-698x Compatible) Cardax UID (RDR-6C8x Compatible) CASI-RUSCO (GE Security, UTC) (RDR-628x Compatible) CDVI COTAG Deister UID DIGITAG Dimpna UID EM 410x (RDR-6E8x Compatible) EM 410x Alternate Farpointe Data (Pyramid) PSC-1 26 Bit ( RDR-647x Compatible) Farpointe Data (Pyramid) UID GProx-II ID GProx-II UID (IRDR-6G8x Compatible) HID Prox (RDR-608x Compatible) HID Prox UID Hitag 1 & S (RDR-6H8x Compatible) Hitag 1 & S Alternate Hitag 2 (RDR-6H8x Compatible) Hitag 2 Alternate ID Teck (RDR-6A8x Compatible) ID Teck Alternate (128 bits) Indala ASP 26 bit (Motorola) (RDR-638x Compatible) Indala ASP UID (Motorola) Indala ASP+ UID (Motorola) IO Prox (Kantech) (RDR-678x Compatible) Isonas Keri NXT UID Keri PSC-1 26 Bit: (RDR-647x Compatible) Keri UID (RDR-6K8x Compatible) Nedap NexKey, Quadrakey, KeyMate, 2SmartKey (Honeywell) Nexwatch (Honeywell) (RDR-6N8x Compatible) Paradox Postech Pyramid (Farpointe Data) PSC-1 26 Bit Pyramid (Farpointe Data) UID Radio Key (Secura Key -02) RKCx-02 (RDR-6Z8x Compatible) ReadyKey Pro UID RDR-6R8x Compatible) Rosslare
<b>Card Types Supported – 125 kHz</b>	

### Technical Specifications

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Russwin UID  
Secura Key -01 RKCx-01

**Card Types Supported –  
13.56 MHz**

CEPAS  
e-TAG  
Felica (NFC Type 3)  
HID iCLASS  
I-Code  
ISO 14443B  
I-tag  
Legic Advant  
MIFARE Classic (32 bits)  
MIFARE DESFire  
MIFARE DESFire EV1  
MIFARE Plus  
MIFARE Ultralight  
my-d CSN (Infinion)  
NFC Type 1  
NFC Type 2  
NFC Type 4  
NTWare  
Oyster  
RDR-758x Equivalent (iCLASS, ISO 14443A, ISO 15693)  
Tag-It (Texas instruments)

**Card Types Supported –  
13.56 MHz ID (with HID SE  
Processor SIM)**

HID iCLASS ID  
HID iCLASS SE  
HID iCLASS Seos

**NOTE:** Dual-band RFID reader and fingerprint reader sold together as a configurable option

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## Technical Specifications

### CLEANING CARE GUIDE

Please refer to the HP EliteOne 800 G4 23.8 Healthcare Edition All-in-One Business PC user guide for instructions on cleaning this computer. Here are additional instructions for cleaning with specific germicidal wipes.

First turn off the computer to prevent electric shock or damage to components.

- Disconnect AC power
- Disconnect all powered external devices

Examine the computer for any visible soiling and then wipe the exterior of the computer with a soft, water-dampened cloth to remove the soil as needed.

- The cloth should be moist but not wet. Water dripping into the ventilation or other points of ingress can cause damage.

Next, clean the computer using any of the ready-to-use germicidal wipes that contain the below chemical solutions.

- Remember to start with the display, then wipe the rest of the computer and finish with any flexible cables
- Allow the unit to air-dry before use

(Refer to the directions for use provided by the manufacturer of the wipes)

Ready-to-use cleaning wipe solutions include:

#### • Solution 1

- Benzyl-C12-18-alkyldimethyl ammonium chlorides: <0.1%
- Quaternary ammonium compounds, C12-14-alkyl[(ethylphenyl)methyl]dimethyl, chlorides: <0.1%

#### • Solution 2

- Isopropanol: 10-20%
- 2-Butoxyethanol: <5%
- Quaternary ammonium compounds, C12-18-alkyl [(ethylphenyl) methyl] dimethyl, chlorides: <0.5%
- Benzyl-C12-18-alkyldimethyl ammonium chlorides: <0.5%

#### • Solution 3

- Quaternary ammonium compounds, C12-18-alkyl [(ethylphenyl) methyl] dimethyl, chlorides: <0.5%
- Benzyl-C12-18-alkyldimethyl ammonium chlorides: <0.5%

#### • Solution 4

- Isopropyl alcohol: 55.000%
- Alkyl dimethyl benzyl ammonium chlorides: 0.250%
- Alkyl (68% C12, 32% C14) dimethyl ethylbenzyl ammonium chloride: 0.250%

#### • Solution 5

- Isopropanol: 10-20%
- Ethylene Glycol Monobutyl Ether (2-Butoxyethanol): 1-5%
- Diisobutylphenoxyethoxyethyl dimethyl benzyl ammonium chloride: 0.1-0.5%

#### • Solution 6

- Sodium hypochlorite 0.1%–1.0%

#### • Solution 7

- Cellulose: 10-30%
- Ethyl alcohol: 0.10-1.00%

#### • Solution 8

- Isopropyl alcohol: 30-40%
- Water: 60-70%

Do not use cleaners that contain any petroleum based materials such as benzene, thinner, or any volatile substance to clean the screen or cabinet. These chemicals may damage the computer.

Occasionally clean air vents on all vented sides of the computer. Lint and dust can block the vents and limit the airflow.

**DISCLAIMER:** Solution tested as of December 4, 2017; chemical composition is subject to change.

### Technical Specifications

#### STORAGE AND DRIVES

<b>HP 500 GB 7.2K SATA 6.0Gb/s 2.5" Hard Disk Drive</b>	Capacity	500 GB
	Rotational Speed	7,200 rpm
	Interface	SATA 6 Gb/s
	Buffer Size	16 MB
	Logical Blocks	976,773,169
	Seek Time	13 ms (Average)
	Height	0.267 in/6.8 mm (nominal)
	Width	2.75 in/70 mm (nominal)
	Operating Temperature	41° to 131° F (5° to 55° C)

**NOTE:** For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB (for Windows 10) of system disk is reserved for the system recovery software.

<b>HP 1 TB 7.2K SATA 6.0Gb/s 2.5" Hard Disk Drive</b>	Capacity	1 TB
	Rotational Speed	7,200 rpm
	Interface	SATA 6 Gb/s
	Buffer Size	32 MB
	Logical Blocks	1,953,525,169
	Seek Time	13 ms (Average)
	Height	0.374 in/9.5 mm (nominal)
	Width	2.75 in/70 mm (nominal)
	Operating Temperature	41° to 131° F (5° to 55° C)

**NOTE:** For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB (for Windows 10) of system disk is reserved for the system recovery software.

<b>HP 500 GB SATA 6G 2.5" 8GB Solid State Hybrid Drive (SSHD)</b>	Capacity	500 GB
	Rotational Speed	5,400 rpm
	Drive Type	Solid State Hybrid Drive (SSHD) technology with NAND Flash
	Interface	SATA 6 Gb/s
	Buffer Size	64 MB
	NAND Flash	8GB
	Seek Time	13 ms (Average)
	Height	0.267 in/6.8 mm (nominal)
	Width	2.75 in/70 mm (nominal)
	Operating Temperature	41° to 131° F (5° to 55° C)

**NOTE:** For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

### Technical Specifications

#### HP 1 TB SATA 6G 2.5" 8GB Solid State Hybrid Drive (SSHD)

Capacity	1 TB
Rotational Speed	5,400 rpm
Drive Type	Solid State Hybrid Drive (SSHD) technology with NAND Flash
Interface	SATA 6 Gb/s
Buffer Size	64 MB
NAND Flash	8 GB
Seek Time	13 ms (Average)
Height	0.374 in/9.5 mm (nominal)
Width	2.75 in/70 mm (nominal)
Operating Temperature	41° to 131° F (5° to 55° C)

**NOTE:** For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software..

#### HP 2 TB SATA 6G 2.5" 8GB Solid State Hybrid Drive (SSHD)

Capacity	2 TB
Rotational Speed	5,400 rpm
Drive Type	Solid State Hybrid Drive (SSHD) technology with NAND Flash
Interface	SATA 6 Gb/s
Buffer Size	128 MB
NAND Flash	8GB
Seek Time	13 ms (Average)
Height	0.374 in/9.5 mm (nominal)
Width	2.75 in/70 mm (nominal)
Operating Temperature	41° to 131° F (5° to 55° C)

**NOTE:** For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software..

#### HP 2 TB 5.4K SATA 6.0Gb/s 2.5" Hard Disk Drive

Capacity	2 TB
Rotational Speed	5,400 rpm
Interface	SATA 6 Gb/s
Buffer Size	128 MB
Logical Blocks	3,907,050,336
Seek Time	13 ms (Average)
Height	0.374 in/9.5 mm (nominal)
Width	2.75 in/70 mm (nominal)
Operating Temperature	41° to 131° F (5° to 55° C)

**NOTE:** For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.



### Technical Specifications

#### GRAPHICS

##### Intel® UHD Graphics (integrated)

DisplayPort™

Multimode capable; supports HDCP 2.2, Display Port Audio (2 streams), HBR2 link rates and Multi-Stream Technology for a maximum of 3 displays (including the integrated panel)

HDMI

Supports HDMI 2.0a features

Memory

The actual amount of maximum graphics memory can be >4GB. System memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (DVMT), to provide an optimal balance between graphics and system memory use.

Maximum Color Depth

Up to 10 bits/color

Graphics/Video API Support

HEVC 10b Enc/Dec HW

VP9 10b Dec HW

HDR

Rec. 2020

DX12

#### Display Output chart.

Resolution	Refresh Rate	VGA (Using HP DP to VGA adapter)	DVI-D (Using HP DP to DVI-D adapter)	DisplayPort™	HDMI	Standard
640 x 480	60, 75, 85	X	X	X	X	VESA DMT, CVT 0.31M3
720 x 400	70	X	X	X	X	IBM VGA
800 x 600	60, 75, 85	X	X	X	X	VESA DMT, CVT0.48M3
1024 x 768	60, 75, 85	X	X	X	X	VESA DMT, CVT 0.79M3
1152 x 864	60, 75, 85	X	X	X	X	VESA DMT, CVT 0.83MA
1280 x 720	60, 75, 85	X	X	X	X	VESA DMT, CVT 0.92M9, CEA-770.3
1280 x 768	60, 60RB, 75, 85	X	X	X	X	VESA DMT, CVT 0.98M9/0.98M9-R
1280 x 800	60, 75, 85	X	X	X	X	VESA DMT
1280 x 960	60, 75, 85	X	X	X	X	VESA DMT
1280 x 1024	60, 75, 85	X	X	X	X	VESA DMT, CVT 1.31M4
1366 x 768	60, 60RB	X	X	X	X	VESA DMT
1440 x 900	60, 60RB	X	X	X	X	VESA DMT
1600 x 900	60, 60RB, 75, 85	X	X	X	X	VESA DMT
1680 x 1050	60, 60RB	X	X	X	X	VESA DMT, CVT 1.76MA/1.76MA-R
1920 x 1080	60	X	X	X	X	VESA DMT, CVT 2.07M9, SMPTE 274M
1920 x 1080	75			X	X	CVT-RBv2 (2.07M-R)
1920 x 1080	100			X	X	CVT-RBv2 (6.14M-R)
1920 x 1080	120			X	X	SMPTE 274M

### Technical Specifications

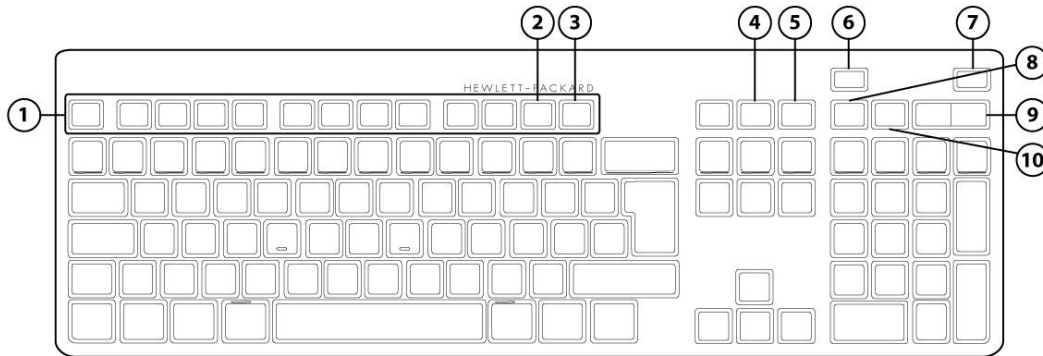
1920 x 1080	144			X	X	SMPTE 274M
1920 x 1200	60, 60RB	X <sup>1</sup>	X	X	X	DMT, CVT 2.30MA/2.30MA-R
1600 x 1200	60	X	X	X	X	VESA DMT, 1.92M3
1920 x 1440	60, 75, 85			X	X	VESA DMT, CVT 2.76M3
1920 X 1600	59.95			X	X	CVT-RBv2 (Not CVT Standard Aspect Ratio)
2048 x 1536	60			X	X	CVT 3.15M3
2560 x 1440	59.951			X	X	CVT 3.69M9-R
2560 x 1600	60, 60RB			X	X	VESA DMT, CVT 4.10MA/4.10MA-R
3440 x 1200	60			X	X	CVT-4.61M-R
3440 x 1440	49.987			X	X	CVT-RB v1
3440 x 1440	59.973			X	X	CVT-RB v1
3440 x 1440	60			X	X	Samsung Custom
3440 x 1440	100			X	X	CVT-RBv2 (4.95M-R)
3440 x 1440	120			X	X	CVT-RBv2 (4.95M-R)
3840 x 1600	30			X	X	CVT-RBv2 (6.14M-R)
3840 x 1600	59.994			X	X	CVT-RBv2
3840 x 2160	24			X	X	SMPTE 274M
3840 x 2160	25			X	X	SMPTE 274M
3840 x 2160	30			X	X	SMPTE 274M
3840 x 2160	29.981			X	X	CVT-RB v1
3840 x 2160	50			X	X	SMPTE 274M
3840 x 2160	59.997			X	X	CVT-RBv1 (8.29M9-R)
3840 x 2160	60			X	X	SMPTE 274M
4096 x 2160	24			X	X	SMPTE 274M
4096 x 2160	25			X	X	SMPTE 274M
4096 x 2160	30			X	X	SMPTE 274M
4096 x 2160	50			X	X	SMPTE 274M
4096 x 2160	59.94			X	X	CVT-RBv2
4096 x 2160	60			X	X	CVT-RBv2
1920 x 1080	60		X	X	X	VESA (SMPTE 274M)

**NOTE:** Other refresh rates and resolutions may also work, but have not been validated.  
 >60Hz refresh rates only for analog (VGA) signaling  
 1 - 60Hz Reduced Blanking only.

### Technical Specifications

#### INPUT/OUTPUT DEVICES

##### HP Conferencing Keyboard



- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. Function Keys</li> <li>2. F11 Lync or Skype for Business Contact list <sup>1</sup></li> <li>3. F12 Lync or Skype for Business Calendar<sup>2</sup></li> <li>4. Share Screen</li> <li>5. Stop Webcam</li> </ol> | <ol style="list-style-type: none"> <li>6. End/Decline a Call</li> <li>7. Answer a Call</li> <li>8. Microphone Mute</li> <li>9. Volume Up/Down</li> <li>10. Audio Mute</li> </ol> |
|--|--|

1. [Microsoft Lync 2013, or Skype for Business Contact list](#)
2. [Microsoft Lync 2013, or Skype for Business Calendar](#)

##### HP USB Premium Keyboard

<b>Physical Characteristics</b>	Keys	104, 105 layout (depending upon country)
	Dimensions (L x W x H)	17.04 x 5.55 x 0.52 in (433 x 141 x 13.2 mm)
	Weight	1.54 lb (698g)
	Operating voltage	5 VDC, +/-5%
	Power consumption	35mA (All LED on)
<b>Electrical</b>	System interface	USB Type A plug connector
	ESD	Contact Discharge: 8 KV Air Discharge: 15 KV
	EMI - RFI	Conforms to FCC rules for a Class B computing device
	Microsoft® PC 99 - 2001	Mechanically compliant
	Keycaps	Low-profile design
	Switch actuation	60±10g nominal peak force with tactile feedback
	Switch life	10 million keystrokes (Life tester)
<b>Mechanical</b>	Switch type	Contamination-resistant switch membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	6 ft (1.8 m)

### Technical Specifications

	Microsoft PC 99 - 2001	Mechanically compliant
	Acoustics	43-dBA maximum sound pressure level
	Operating temperature	50° to 122° F (10° to 50° C)
	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	10% to 90% (non-condensing at ambient)
	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
<b>Environmental</b>	Operating vibration	2-g peak acceleration
	Non-operating vibration	4-g peak acceleration
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
	Drop (in box)	30 in (76.2 cm) on concrete, 16-drop sequence
	Approvals	UL, FCC, CE Mark, TUV GS, VCCI, BSMI, C-Tick, KC
	Ergonomic compliance	TUVGS
	Kit contents	Keyboard, QSP
	Warranty Card	Product Notice
<b>Skylab USB wired Keyboard</b>		
	Keys	104, 105, 106, 107, 109 layout (depending upon country)
<b>Physical Characteristics</b>	Dimensions (L x W x H)	436.9*137.7*20.4mm
	Weight	615g
	Operating voltage	4.4-5.25VDC
	Power consumption	50-mA maximum (with 5 VDC power supplied and three LEDs ON)
<b>Electrical</b>	System interface	USB
	ESD	Contact Discharge: 2, 4,6,8KV Air Discharge: 2, 4, 8,10,12.5KV
	EMI - RFI	Conforms to FCC rules for a Class B computing device
	Keycaps	Low-profile design
	Switch actuation	60±15g nominal peak force with tactile feedback
<b>Mechanical</b>	Switch life	10 million keystrokes (Life tester)
	Switch type	Silicon rubber switch membrane
	Cable length	6 ft (1.8 m)
	Acoustics	43-dBA maximum sound pressure level
	Temperature	Minus 20 degrees to 60 degrees Celsius
<b>Environmental</b>	Humidity	90%RH+-2%, 24Hours
	Vibration	3mm amplitude oscillation, 60Hz
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence

### Technical Specifications

Drop (in box)	30 in (76.2 cm) on concrete, 16-drop sequence
Approvals	UL, FCC, CE Mark, TUV GS, VCCI, BSMI, RCM, KC, EAC
Ergonomic compliance	ISO 9241-410, TUVGS
Kit contents	

#### HP USB Premium Mouse

<b>Physical characteristics</b>	Dimensions (L x W x H)	4.21 x 2.64 x 1.52 in (107 x 67 x 38.7 mm)
	Weight w/o cable	0.19lb (90g)
	Operating temperature	50° to 122° F (10° to 50° C)
<b>Environmental</b>	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	10% to 90% (non-condensing at ambient)
	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
	Operating vibration	2-g peak acceleration
<b>Electrical</b>	Non-operating vibration	4-g peak acceleration
	Operating voltage	5 VDC, +/-5%
	Power consumption (typical)	12mA
	Connector	USB 2.0
<b>Mechanical</b>	Type	3D mouse (3 keys and wheel)
	Resolution	800, 1200, 1600 DPI
	Sensor	Pixart PAN3606DL
	Tracking speed	30 inch/sec (max)
	Tracking acceleration	8G(max), 1G=9.8m/s <sup>2</sup>
	Cable length	6 ft (1.8 m)
	Color	Jack Black
Regulatory Approvals	UL, FCC, CE Mark, TUV GS, VCCI, BSMI, C-Tick, KC	

#### HP USB Wired Keyboard

<b>Physical characteristics</b>	Dimensions (H x L x W)"	37mm*115mm*62.9mm
	Weight	90 +10g/- 5 g
<b>Physical characteristics</b>	Color	Black
	Connector	USB
	Resolution	800 DPI sensitivity
	Buttons	Two primary buttons and clickable scroll wheel

### Technical Specifications

#### AUDIO

Audio by HP Audio  
Internal 2watt stereo speaker  
3.5mm Combo Jack

#### High Definition Audio

<b>Type</b>	Integrated
<b>HD Audio Codec</b>	Conexant CX5001
<b>Audio I/O Ports</b>	Universal Audio Jack with CTIA headset support (re-taskable for headphone/line out/microphone in/line in)
<b>Wavetable Syntheses</b>	Yes - Uses OS soft wavetable
<b>Analog Audio</b>	Yes
<b>Internal Speaker</b>	Yes - two speakers
<b>DAC Sampling Rates</b>	44.1kHz/48kHz/96kHz/192kHz
<b>ADC Sampling Rates</b>	44.1kHz/48kHz/96kHz

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

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### Technical Specifications

#### POWER SUPPLY

**Operating Voltage Range** 90 – 264 VAC

**Rated Voltage Range** 100-240V AC

**Rated Line Frequency** 50 / 60 HZ

**Operating Line Frequency** 47 – 63 Hz

**Rated Input Current** 180 W : 2.5A

**Rated Input Current with** 180 W : 2.5A

**Energy Efficient\* Power** 180 W active PFC

**Supply** 87/90/87% efficient at 20/50/100% load (115V)

88/91/88% efficient at 20/50/100% load (230V)

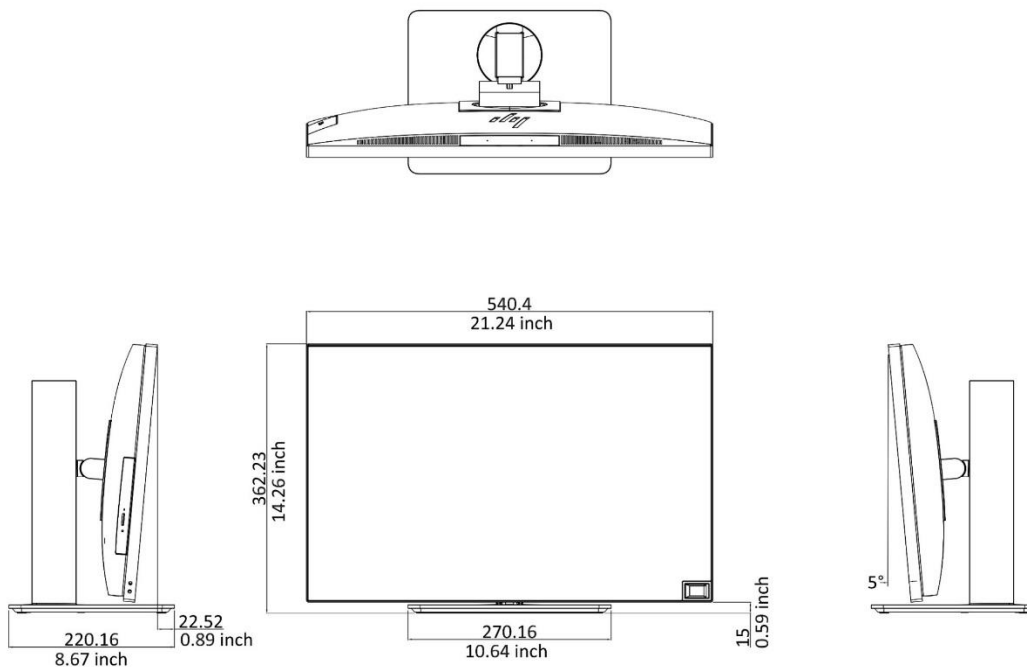
**DC Output** 12.1V/14.88A

**Current Leakage (NFPA 99: 2102)** Less than 300 microamps of leakage current at 120 Vac with the ground wire disconnected, as required for Non-patient Electrical Appliances and Equipment used in a patient care facility or that contact patients in normal use. Per section 10.3.5.1.

Less than 100 microamps of leakage current at 120 Vac with the ground wire intact with normal polarity, as required for Non-patient Electrical Appliances and Equipment used in a patient care facility or that contact patients in normal use. Per section 10.3.5.1.

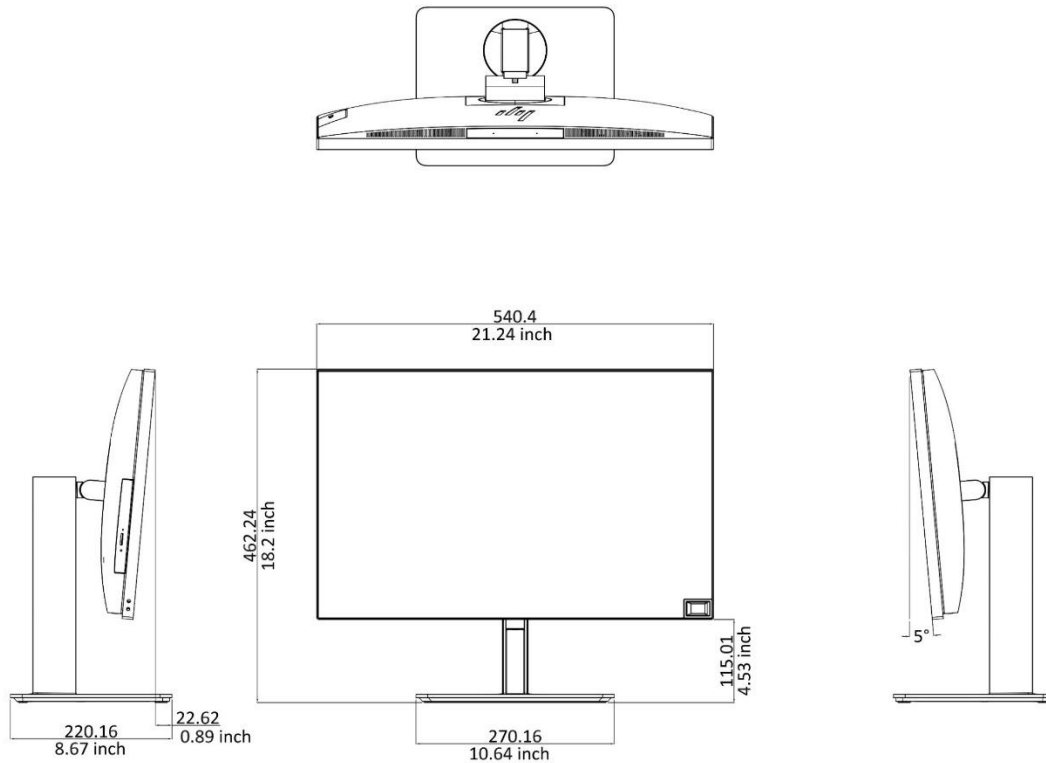
**Power cord length** 6.0 ft. (1.83 m)

#### DIMENSIONS



### Technical Specifications

#### Adjustable Height Stand Dimensions



<b>Height - Vertical/Landscape Adjustment</b>	101mm (±2 mm)
<b>Portrait Adjustment</b>	54mm (±2 mm)
<b>Tilt Angle</b>	5° to +20° (±3°) in landscape and portrait
<b>Rotation (Swivel)</b>	90° (±1°)
<b>Pivot</b>	Clockwise 90°



### Technical Specifications

#### NETWORKING AND COMMUNICATIONS

<b>Intel i219LM 10/100/1000 Integrated NIC</b>	
<b>Connector</b>	RJ-45
<b>System Interface</b>	PCI (Intel proprietary) + SMBus
<b>Data rates supported</b>	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s
<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 802.3az 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 Jumbo Frame 9K
<b>Power Consumption</b>	Cable Disconnection: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW 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 standby and hibernation (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® vPro™ support with appropriate Intel® chipset components
<b>NOTE:</b> Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices	

### Technical Specifications

<b>Intel 9560 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 5.0 Combo vPro</b>		
<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac	
<b>Interoperability</b>	Wi-Fi certified	
<b>Frequency Band</b>	<b>802.11b/g/n</b>	•2.402 – 2.482 GHz
	<b>802.11a/n</b>	•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
<b>Data Rates</b>	<ul style="list-style-type: none"> <li>•802.11b: 1, 2, 5.5, 11 Mbps</li> <li>•802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>•802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)</li> </ul>	
<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM	
<b>Security<sup>3</sup></b>	<ul style="list-style-type: none"> <li>•IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>•AES-CCMP: 128 bit in hardware</li> <li>•802.1x authentication</li> <li>•WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>•WPA2 certification</li> <li>•IEEE 802.11i</li> <li>•Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>•WAPI</li> </ul>	
<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<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b : +18.5dBm minimum</li> <li>• 802.11g : +17.5dBm minimum</li> <li>• 802.11a : +18.5dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +14.5dBm minimum</li> <li>• 802.11n HT20(5GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(5GHz) : +14.5dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +11.5dBm minimum</li> <li>• 802.11ac VHT160(5GHz) : +11.5dBm minimum</li> </ul>	
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>•Transmit mode2.0 W</li> <li>•Receive mode1.6 W</li> <li>•Idle mode (PSP)180 mW(WLAN Associated)</li> <li>•Idle mode50 mW(WLAN unassociated)</li> <li>•Connected Standby 10mW</li> <li>•Radio disabled8 mW</li> </ul>	
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	

### Technical Specifications

<b>Receiver Sensitivity<sup>3</sup></b>	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum	
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications	
<b>Form Factor</b>	PCI-Express M.2 MiniCard	
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm	
<b>Weight</b>	Type 2230 : 2.8g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	<b>Operating</b>	14° to 158° F (-10° to 70° C)
	<b>Non-operating</b>	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	<b>Operating</b>	10% to 90% (non-condensing)
	<b>Non-operating</b>	5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b>	0 to 10,000 ft (3,048 m)
	<b>Non-operating</b>	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON	
<b>HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 Wireless Technology</b>		
<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0 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 Link Topology</b>	Microsoft Windows Bluetooth Software	
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support	
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.249	
<b>Power Management Certifications</b>	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark	

### Technical Specifications

<b>Bluetooth Profiles Supported</b>	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)
<b>Security &amp; Manageability</b>	Intel® vPro™ support with appropriate Intel® chipset components
<b>NOTE:</b> Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices	

<b>Intel 9560 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 5.0 Combo non-vPro</b>					
<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac				
<b>Interoperability</b>	Wi-Fi certified				
<b>Frequency Band</b>	<table border="1"> <tr> <td><b>802.11b/g/n</b></td> <td>•2.402 – 2.482 GHz</td> </tr> <tr> <td><b>802.11a/n</b></td> <td>           •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         </td> </tr> </table>	<b>802.11b/g/n</b>	•2.402 – 2.482 GHz	<b>802.11a/n</b>	•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
<b>802.11b/g/n</b>	•2.402 – 2.482 GHz				
<b>802.11a/n</b>	•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				
<b>Data Rates</b>	<ul style="list-style-type: none"> <li>•802.11b: 1, 2, 5.5, 11 Mbps</li> <li>•802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>•802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)</li> </ul>				
<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM				
<b>Security<sup>3</sup></b>	<ul style="list-style-type: none"> <li>•IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>•AES-CCMP: 128 bit in hardware</li> <li>•802.1x authentication</li> <li>•WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>•WPA2 certification</li> <li>•IEEE 802.11i</li> <li>•Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>•WAPI</li> </ul>				
<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				

### Technical Specifications

<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b : +18.5dBm minimum</li> <li>• 802.11g : +17.5dBm minimum</li> <li>• 802.11a : +18.5dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +14.5dBm minimum</li> <li>• 802.11n HT20(5GHz) : +15.5dBm minimum</li> <li>• 802.11n HT40(5GHz) : +14.5dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +11.5dBm minimum</li> <li>• 802.11ac VHT160(5GHz) : +11.5dBm minimum</li> </ul>	
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode 2.0 W</li> <li>• Receive mode 1.6 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode 50 mW (WLAN unassociated)</li> <li>• Connected Standby 10mW</li> <li>• Radio disabled 8 mW</li> </ul>	
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
<b>Receiver Sensitivity<sup>3</sup></b>	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum	
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications	
<b>Form Factor</b>	PCI-Express M.2 MiniCard	
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm	
<b>Weight</b>	Type 2230 : 2.8g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	<b>Operating</b>	14° to 158° F (-10° to 70° C)
	<b>Non-operating</b>	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	<b>Operating</b>	10% to 90% (non-condensing)
	<b>Non-operating</b>	5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b>	0 to 10,000 ft (3,048 m)
	<b>Non-operating</b>	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON	
<b>HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 Wireless Technology</b>		
<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0 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.	

### Technical Specifications

<b>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
<b>Bluetooth Software Supported Link Topology</b>	Microsoft Windows Bluetooth Software
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
<b>Power Management Certifications</b>	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
<b>Bluetooth Profiles Supported</b>	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)
<b>NOTE:</b> Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices	

### Technical Specifications

<b>Realtek 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo</b>		
<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac	
<b>Interoperability</b>	Wi-Fi certified	
<b>Frequency Band</b>	<b>802.11b/g/n</b>	•2.402 – 2.482 GHz
	<b>802.11a/n</b>	•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
<b>Data Rates</b>	<ul style="list-style-type: none"> <li>•802.11b: 1, 2, 5.5, 11 Mbps</li> <li>•802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>•802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)</li> </ul>	
<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM	
<b>Security<sup>3</sup></b>	<ul style="list-style-type: none"> <li>•IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>•AES-CCMP: 128 bit in hardware</li> <li>•802.1x authentication</li> <li>•WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>•WPA2 certification</li> <li>•IEEE 802.11i</li> <li>•Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>•WAPI</li> </ul>	
<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<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b : +14dBm minimum</li> <li>• 802.11g : +12dBm minimum</li> <li>• 802.11a : +12dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +12dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +12dBm minimum</li> <li>• 802.11n HT20(5GHz) : +10dBm minimum</li> <li>• 802.11n HT40(5GHz) : +10dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +10dBm minimum</li> </ul>	
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>•Transmit mode2.0 W</li> <li>•Receive mode1.6 W</li> <li>•Idle mode (PSP)180 mW(WLAN Associated)</li> <li>•Idle mode50 mW(WLAN unassociated)</li> <li>•Connected Standby 10mW</li> <li>•Radio disabled8 mW</li> </ul>	
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	

### Technical Specifications

<b>Receiver Sensitivity<sup>3</sup></b>	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum	
<b>Antenna type</b>	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications	
<b>Form Factor</b>	PCI-Express M.2 MiniCard	
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm	
<b>Weight</b>	Type 2230 : 2.8g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	<b>Operating</b>	14° to 158° F (-10° to 70° C)
	<b>Non-operating</b>	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	<b>Operating</b>	10% to 90% (non-condensing)
	<b>Non-operating</b>	5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b>	0 to 10,000 ft (3,048 m)
	<b>Non-operating</b>	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON	
<b>HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology</b>		
<b>Bluetooth Specification</b>	4.0/4.1/4.2 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 Link Topology</b>	USB 2.0 compliant	
<b>Power Management</b>	Microsoft Windows Bluetooth Software	
<b>Certifications</b>	Microsoft Windows ACPI, and USB Bus Support	
<b>Power Management Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.249	
<b>Bluetooth Profiles Supported</b>	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark	



### Technical Specifications

	<p>BT4.1-ESR 5/6/7 Compliance</p> <p>LE Link Layer Ping</p> <p>LE Dual Mode</p> <p>LE Link Layer</p> <p>LE Low Duty Cycle Directed Advertising</p> <p>LE L2CAP Connection Oriented Channels</p> <p>Train Nudging &amp; Interlaced Scan</p> <p>BT4.2 ESR08 Compliance</p> <p>LE Secure Connection- Basic/Full</p> <p>LE Privacy 1.2 –Link Layer Privacy</p> <p>LE Privacy 1.2 –Extended Scanner Filter Policies</p> <p>LE Data Packet Length Extension</p> <p>FAX Profile (FAX)</p> <p>Basic Imaging Profile (BIP)2</p> <p>Headset Profile (HSP)</p> <p>Hands Free Profile (HFP)</p> <p>Advanced Audio Distribution Profile (A2DP)</p>
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<b>Realtek 802.11a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.2 Combo <sup>1</sup></b>		
<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac	
<b>Interoperability</b>	Wi-Fi certified	
<b>Frequency Band</b>	<b>802.11b/g/n</b>	•2.402 – 2.482 GHz
	<b>802.11a/n</b>	•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
<b>Data Rates</b>	<ul style="list-style-type: none"> <li>•802.11b: 1, 2, 5.5, 11 Mbps</li> <li>•802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>•802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>•802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)</li> </ul>	
<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM	
<b>Security<sup>3</sup></b>	<ul style="list-style-type: none"> <li>•IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only</li> <li>•AES-CCMP: 128 bit in hardware</li> <li>•802.1x authentication</li> <li>•WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>•WPA2 certification</li> <li>•IEEE 802.11i</li> <li>•Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>•WAPI</li> </ul>	
<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	

### Technical Specifications

<b>Output Power<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b : +14dBm minimum</li> <li>• 802.11g : +12dBm minimum</li> <li>• 802.11a : +12dBm minimum</li> <li>• 802.11n HT20(2.4GHz) : +12dBm minimum</li> <li>• 802.11n HT40(2.4GHz) : +12dBm minimum</li> <li>• 802.11n HT20(5GHz) : +10dBm minimum</li> <li>• 802.11n HT40(5GHz) : +10dBm minimum</li> <li>• 802.11ac VHT80(5GHz) : +10dBm minimum</li> </ul>	
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode 2.0 W</li> <li>• Receive mode 1.6 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode 50 mW (WLAN unassociated)</li> <li>• Connected Standby 10mW</li> <li>• Radio disabled 8 mW</li> </ul>	
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
<b>Receiver Sensitivity<sup>3</sup></b>	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum	
<b>Antenna type</b>	High efficiency antenna. One embedded dual band 2.4/5 GHz antenna is provided to the card to support WLAN communications and Bluetooth communications	
<b>Form Factor</b>	PCI-Express M.2 MiniCard	
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm	
<b>Weight</b>	Type 2230 : 2.8g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	<b>Operating</b>	14° to 158° F (-10° to 70° C)
	<b>Non-operating</b>	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	<b>Operating</b>	10% to 90% (non-condensing)
	<b>Non-operating</b>	5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b>	0 to 10,000 ft (3,048 m)
	<b>Non-operating</b>	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON	
<b>HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology</b>		
<b>Bluetooth Specification</b>	4.0/4.1/4.2 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.	

### Technical Specifications

<b>Power Consumption</b>	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
<b>Electrical Interface</b>	USB 2.0 compliant
<b>Bluetooth Software Supported Link Topology</b>	Microsoft Windows Bluetooth Software
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support
<b>Certifications</b>	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
<b>Power Management Certifications</b>	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
<b>Bluetooth Profiles Supported</b>	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)

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

Description	Part #
HP 16GB DDR4-2666 SODIMM	3TK84AA
HP 4GB DDR4-2666 SODIMM	3TK86AA
HP 8GB DDR4-2666 SODIMM	3TK88AA
HP 256GB SATA TLC Non-SED Solid State Drive	P1N68AA
HP 500GB SATA 6G 2.5 (8GB Cache) SSHD Drive	E1C62AA
HP PCIe NVME TLC 512GB SSD M.2 Drive	X8U75AA
HP PCIe NVME TLC 256GB SSD M.2 Drive	1CA51AA
Intel Optane Memory 16GB (cache) ****	1WV97AA
HP 9.5mm Slim Removable SATA 500GB	T7G14AA
HP 9.5mm AIO 800 G3 Slim DVD Writer	Z9H62AA
HP Type-C to USB3 Adapter	N2Z63AA
HP USB-C to USB-A HUB***	Z6A00AA
HP Single Monitor Arm **	BT861AA
HP EliteOne G3 800 AIO Recline Stand	Z9H67AA
HP EliteOne G3 800 AIO Adjustable Height Stand	Z9H66AA
HP (Bulk 48) G3/4 2.5 HD/SSD M3 Grommet Screw Kit	Z9H61A6
HP Keyed Cable Lock 10mm Kit	T1A62AA
HP DVI Cable Kit	DC198A
HP DVI Cable Kit 35 unit Bulk Pack	DC198A6
HP DisplayPort To DVI-D Adapter	FH973AA
HP DisplayPort To VGA Adapter	AS615AA
HP DisplayPort Cable Kit	VN567AA
HP DisplayPort To HDMI 4k Adapter	K2K92AA
HP DisplayPort to Dual Link DVI Adapter	NR078AA
HP DisplayPort To HDMI True 4k Adapter	ZJA63AA
HP USB Graphics Adapter	NL571AA
HP USB Graphics Adapter	NL571AT
HP HDMI Standard Cable Kit	T6F94AA
HP Business Headset v2	T4E61AA
HP UC Wireless Duo Headset	W3K09AA
HP USB Grey v2 Mouse	Z9H74AA
HP USB Mouse	QY777AA
HP (Bulk) USB Mouse	QY777A6
HP USB Grey Mouse	K7W54AA
HP USB 1000dpi Laser Mouse	QY778AA
HP (Bulk) USB 1000dpi Laser Mouse	QY778A6
HP PS/2 Mouse	QY775AA
HP (Bulk) PS/2 Mouse	QY775A6
HP Mouse Pad	AT485AA
HP (Bulk) Mouse Pad	AT485A6
HP USB PS/2 Washable Scroll Mouse	BM866AA
HP USB Hardened Mouse	P1N77AA
HP USB Collaboration Keyboard	Z9N38AA

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

HP WLess Collaboration Keyboard	Z9N39AA
HP USB Premium Keyboard	Z9N40AA
HP WLess Premium Keyboard	Z9N41AA
HP Bus Slim Wirles Localize Kit Nordic	2MY27AA
HP Bus Slim Localize Kit - Nordic USB	2MY28AA
HP USB Keyboard and Mouse Healthcare Edition	1VD81AA
HP Business Slim Smartcard Keyboard	Z9H48AA
HP USB (Grey) Business Slim Keyboard	Z9H49AA
HP USB Antimicrobial Slim Kybd and Mouse	Z9H50AA
HP Conferencing Keyboard	K8P74AA
HP USB Conferencing Keyboard	N8N57AA
HP Wireless Keyboard & Mouse	QY449AA
HP USB Keyboard	QY776AA
HP USB Keyboard/Mouse/Mousepad Kit	B1T09AA
HP (Bulk Pack) USB Keyobard	QY776AT
HP USB (Grey) Keyboard	B6B64AA
HP (Bulk Pack) USB (Grey) Keyboard	B6B64A6
HP PS/2 Keyboard	QY774AA
HP (Bulk Pack) PS/2 Keyboard	QY774A6
HP (Bulk Pack) USB Smart Card Keyboard	ED707A6#xxx
HP USB CCID Smartcard Keyboard	BV813AA#xxx
HP (Bulk Pack) USB CCID Smart Card Keyboard	BT824A6#xxx
HP USB PS2 Washable Keyboard	VF097AA#xxx
HP USB PS2 Washable Keyboard & Mouse	BU207AA#xxx
HP USB Smartcard CCID Keyboard	E6D77AA#xxx
HP (Bulk) USB Smartcard CCID Keyboard	E6D77A6#xxx
HP USB Grey Smartcard CCID Keyboard	J7H70AA#xxx
HP (Bulk) PS/2 Business Slim Keyboard	N3R86A6
HP USB Business Slim Keyboard	N3R87AA
HP (Bulk) USB Business Slim Keyboard	N3R87A6
HP Wireless Business Slim Keyboard and Mouse	N3R88AA
HP (Bulk) Wireless Business Slim Keyboard and Mouse	N3R88A6
HP USB Business Slim Keyboard and Mouse and MousePad	T4E63AA
HP (Bulk) USB Bus Slim Keyboard/Mouse/Mousepad	T4E63A6

### Summary of Changes

Date of change:	Version History:		Description of change:
	V1 to V2		

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