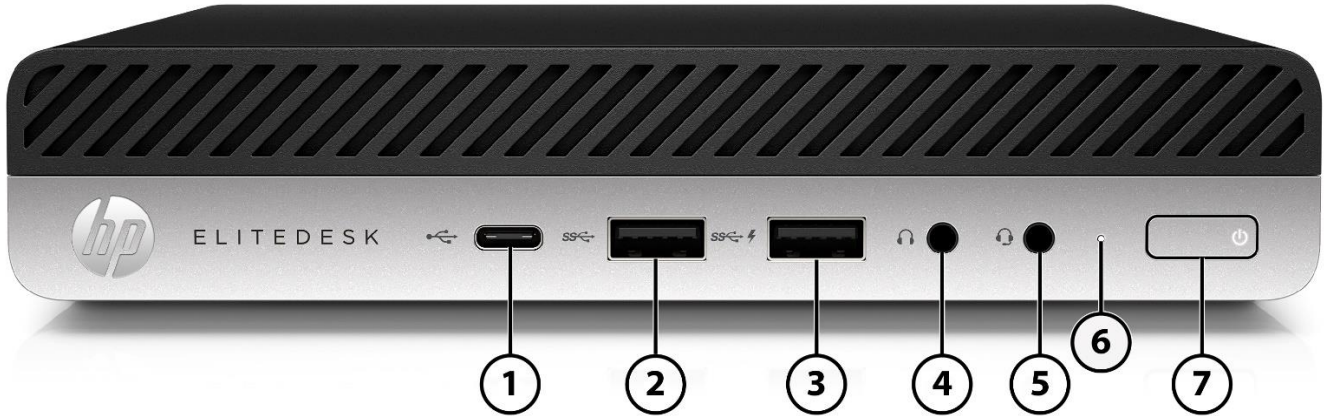


## Overview

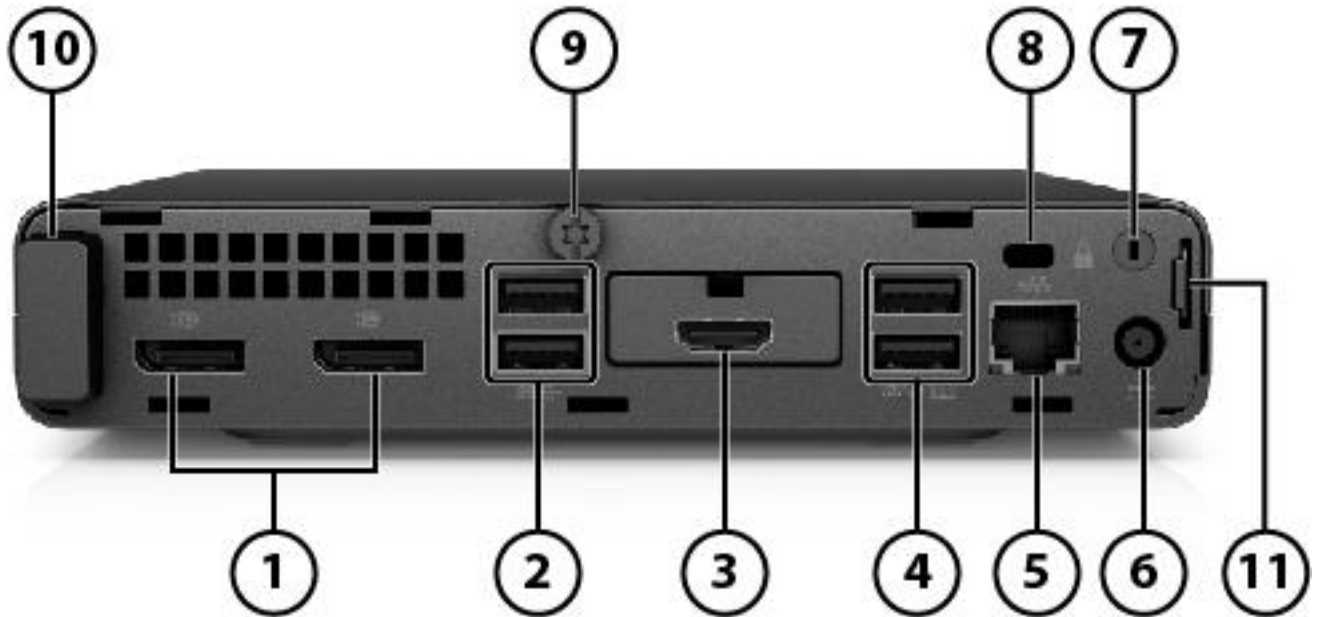
### HP EliteDesk 705 G5 Desktop Mini Business PC



- |    |   |    |  |
|----|---|----|--|
| 1. | USB Type-C™ 3.1 Gen 2 port (charge support up to 5V/3A) | 5. | Universal Audio Jack with CTIA headset support |
| 2. | USB 3.1 Gen 1   | 6. | Hard Drive activity light                      |
| 3. | USB 3.1 Gen 1 (fast charging)                           | 7. | Dual-state power button                        |
| 4. | Headset Connector                                       |    |  |

Overview

## HP EliteDesk 705 G5 Desktop Mini Business PC



- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1. DisplayPort™ 1.2</li> <li>2. 2 x USB 3.1 Gen 1</li> <li>3. Optional port with choice of VGA or HDMI 2.0a or DisplayPort™ 1.2 or Serial or Discrete Graphics (w DisplayPort™ 1.4 or USB-C™ Alt mode DisplayPort™ 1.2 with 100W Power Delivery or Thunderbolt 3.0 or USB-C™ Alt mode DisplayPort™ 1.2 15W output) Shown here with HDMI installed, availability depends on model</li> <li>4. 2 x USB 3.1 Gen 1 (bottom allows for wake from keyboard)</li> </ul> | <ul style="list-style-type: none"> <li>5. RJ-45 Network Adapter</li> <li>6. Power connector</li> <li>7. WLAN External Antenna Punchout</li> <li>8. Standard lock slot (10mm)</li> <li>9. Cover Release Thumbscrew</li> <li>10. WLAN Internal Antenna</li> <li>11. Padlock Loop</li> </ul> |
|---|---|

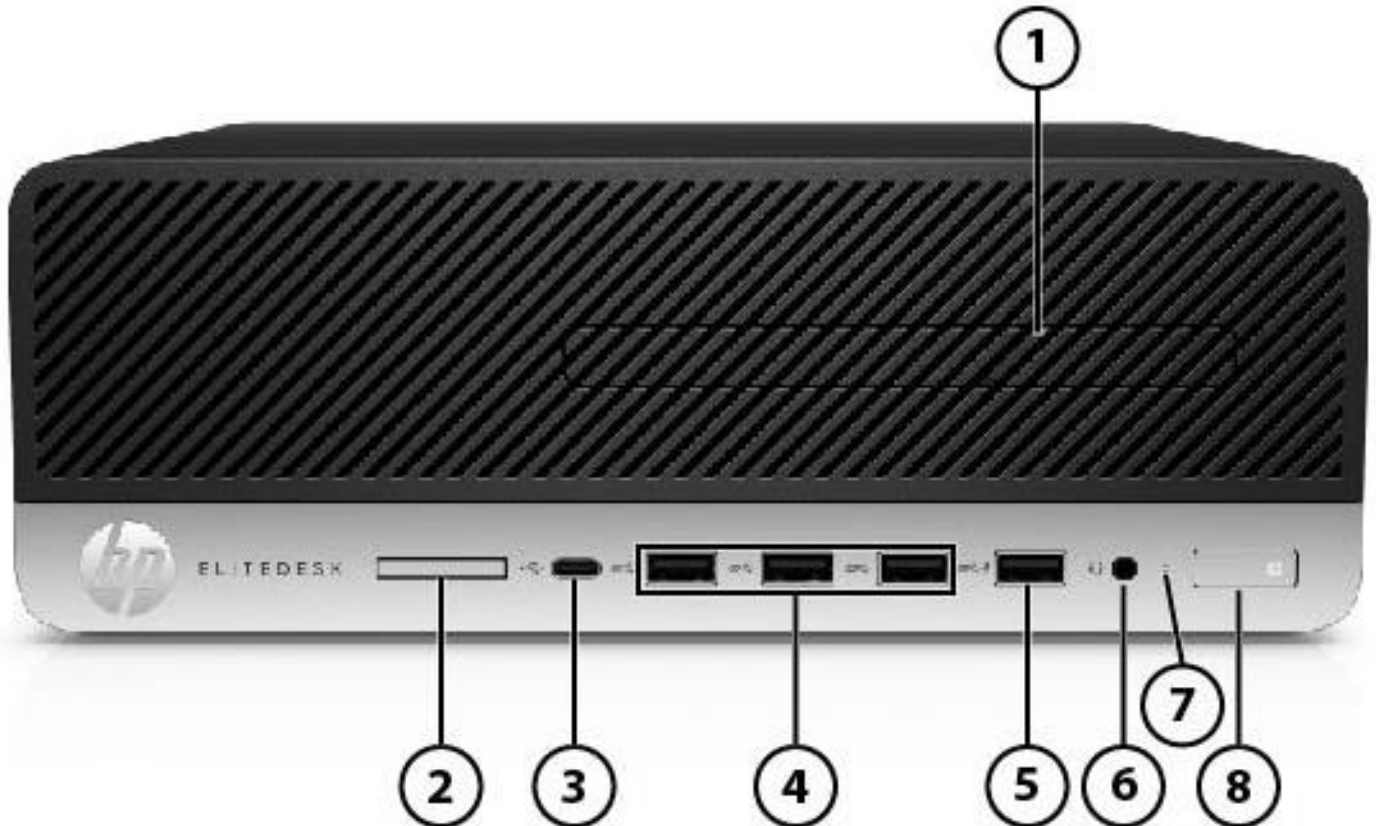
### Not Shown

- |  |
|--|
| <p>Slots (1) Internal M.2 2230 connector for WLAN<br/>(2) Internal M.2 SSD storage (2230 or 2280 connector)</p> <p>Bays (1) 2.5- inch SATA drive Bay</p> |
|--|

- |   |
|---|
| <p>Mounting Support for</p> <ul style="list-style-type: none"> <li>- VESA 100 mounting system on bottom of PC chassis</li> <li>- VESA Sleeve</li> <li>- Quick Release Bracket</li> <li>- B300/B500 Mounting bracket</li> <li>- 100mm VESA Plate Integrated</li> </ul> |
|---|

## Overview

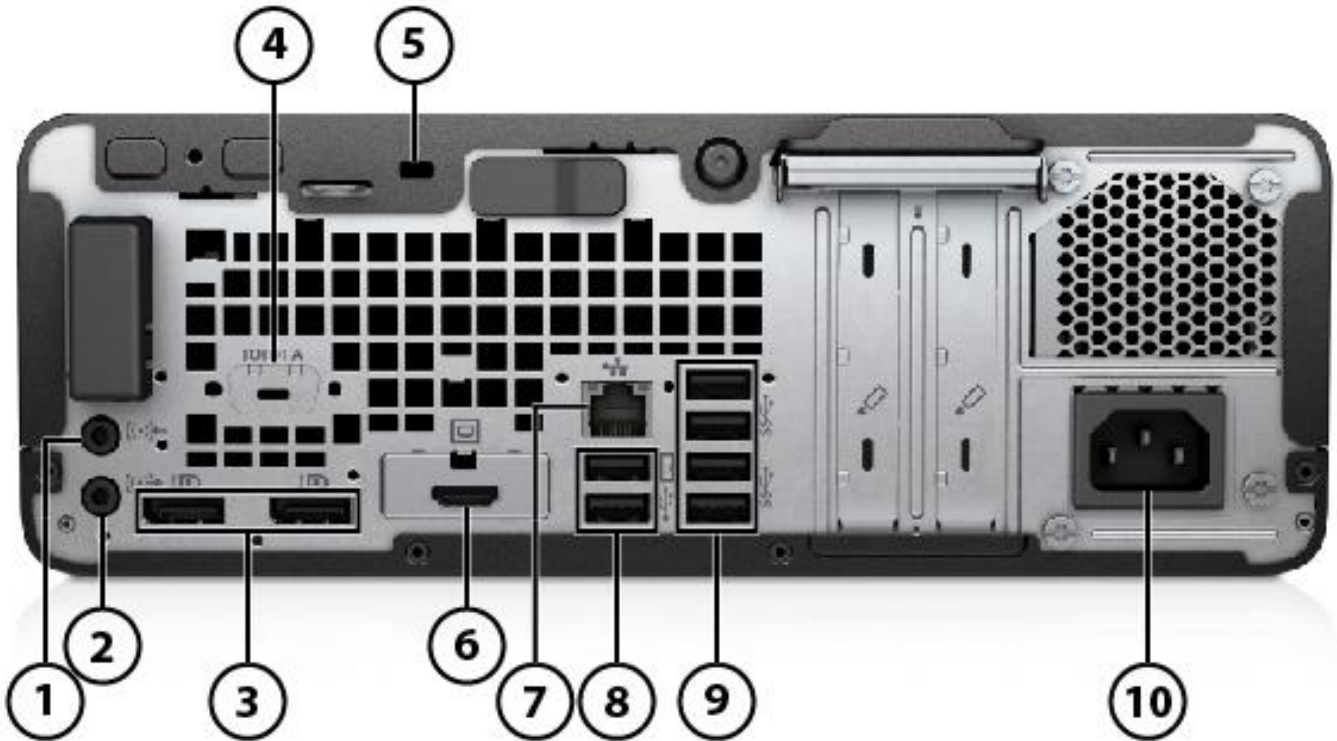
### HP EliteDesk 705 G5 Small Form Factor Business PC



- |   |   |
|---|---|
| 1. 9.5mm slim optical drive (optional)                | 5. USB 3.1 Gen 1 port (fast charging)             |
| 2. SD 4 media card reader (optional)                  | 6. Universal Audio Jack with CTIA headset support |
| 3. USB Type-C™ 3.1 Gen 2 (charge support up to 5V/3A) | 7. Hard Drive activity light                      |
| 4. 3 x USB 3.1 Gen 1 ports                            | 8. Dual-state power button                        |

Overview

## HP EliteDesk 705 G5 Small Form Factor Business PC



- |  |  |
|--|--|
| 1. Audio-in connector  | 7. RJ-45 Network Adapter                     |
| 2. Audio-out connector for powered audio devices   | 8. 2 x USB 2.0 (one with wake from keyboard) |
| 3. 2 x DisplayPort™ 1.2  | 9. 4 x USB 3.1 Gen1                          |
| 4. Optional serial port - shown here not installed   | 10. Power connector                          |
| 5. Standard lock slot  |  |
| 6. Optional port with choice of VGA or HDMI 2.0a or DisplayPort™ 1.2 or USB-C™ Alt mode DisplayPort™ 1.2 15W output or for models with discrete graphics: No optional port (Availability depends on configured processor).-Shown here with HDMI port installed |  |

### Slots

PCIex16 graphics (wired x8 for APU processors)  
 PCIex1  
 2 x internal M.2 SSD storage (1) x4 and (1) x2 2230 or 2280 slot  
 Internal M.2 WLAN (2230 connector)

### Bays

3.5" internal storage drive bay (convertible to two 2.5", requiring adapter supplied from factory only)  
 9.5mm slim optical drive bay

Standard Features and Configurable Components (availability may vary by country)

### AT A GLANCE

- Choice of two form factors: Small Form Factor and Desktop Mini
- HP developed and engineered UEFI V2.6 BIOS supporting security, manageability and software image stability
- 3rd generation AMD® Ryzen™ PRO CPU and 2nd generation of AMD® Ryzen™ PRO with Radeon™ Vega Graphics<sup>1</sup> APU processor
- Optional discrete graphic cards to configure systems to up to 7 displays<sup>2</sup>
- Intel® Wi-Fi® 6 + BT5 (802.11AX 2x2)<sup>3</sup>
- DDR4 Synchronous Dynamic Random Access Memory (SDRAM) (Transfer rates up to 3200 MT/s)<sup>7</sup>
- Support for up to three monitors via two standard DisplayPort™ 1.2 connectors with multi-stream<sup>4</sup> and an optional third display port connector which provides the following choices: VGA or HDMI 2.0a or DisplayPort™ 1.2, or USB Type-C™ with DisplayPort™ 1.2 for all platforms; discrete graphics with Display Port™ 1.4 for 705 G5 DM 35W and USB Type-C™ with DisplayPort™ 1.2 with 100W Power Delivery for 705 G5 DM (see Ports section for port availability by platform)
- Compatibility with HP Mini-In-One 24 Display<sup>5</sup> (DM)
- Models can be configured with dual data drives in a RAID array
- Industry-standard AMD® DASH manageability with BIOS-level KVM
- Enhanced security with:
  - HP Sure Click
  - HP Sure Start for AMD®
  - HP Sure Run Gen2
  - HP Sure Recover Gen2
  - HP MIK/SCCM Gen3
  - HP BIOSphere Gen5
  - HP Sure Sense
  - HP Client Security Manager Gen5
- High efficiency energy saving power supply options
- ENERGY STAR® certified. EPEAT® 2019 registered where applicable. EPEAT® registration varies by country. See <http://www.epeat.net> for registration status by country<sup>8</sup>. Search keyword generator on HP's 3rd party option store for solar generator accessories at <http://www.hp.com/go/options>.
- CCC, CECP and SEPA Certified
- PC chassis and all internal components and modules are manufactured with low halogen content<sup>6</sup>
- Dust filter available (SFF and DM 35W)
- Protected by HP Services, including limited warranties up to 3-3-3 (terms and conditions vary by country; certain restrictions and exclusions apply); Care Packs available with up to 5 years Next Business Day Onsite Hardware Support
- Integrated Synaptics Audio Codec
- Compliance with CE (Class B) / FCC (Class B) / UL (UL609501) / CSA (CSA C22.2 No.60950-1-07) / ICES-003 / CCC / VCCI (Class B) / KCC (Class B)

1. Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. AMD's numbering is not a measurement of clock speed.

2. Only available on Desktop Minis with 35W processor and Small Form Factor and with select Elite Displays with daisy chain support.

3. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi® 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi® 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the PC to communicate with other 802.11ax devices.

4. DisplayPort™ multi-stream monitors 'daisy-chained' together.

5. HP Mini-in-One 24 Display sold separately. PC must be configured with optional USB Type-C™ with DisplayPort™ 1.2 with 100W Power Delivery

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

7. Transfer rates determined by processor and memory configuration; up to 3200 MT/s with DDR4-3200 with single channel one rank memory on SFF with 3rd generation AMD® Ryzen™ PRO CPUs only.

8. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit <http://www.epeat.net> for more information



Standard Features and Configurable Components (availability may vary by country)

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

Standard Features and Configurable Components (availability may vary by country)

### PRODUCT NAME

HP EliteDesk 705 G5 Small Form Factor Business PC  
HP EliteDesk 705 G5 Desktop Mini Business PC

### OPERATING SYSTEM

#### Preinstalled

Windows® 10 Pro 64<sup>1</sup> - HP recommends Windows 10 Pro<sup>1</sup>  
Windows® 10 Pro 64 (National Academic License)<sup>2</sup>  
Windows® 10 Home 64<sup>1</sup>  
Windows® 10 Home Single Language 64<sup>1</sup>  
Windows® 10 Enterprise 64 (Web support)<sup>1</sup>  
FreeDos

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

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

### CHIPSET

	<u>DM</u>	<u>SFF</u>
AMD® PRO 560	X	X

Standard Features and Configurable Components (availability may vary by country)

## PROCESSORS<sup>1</sup>

### 3<sup>rd</sup> Generation of AMD® Ryzen™ PRO CPU (require discrete graphic card installed)

	<b><u>DM</u></b>	<b><u>SFF</u></b>
AMD Ryzen™ 9 PRO 3900 Processor (12C/24T, 70MB Cache, 4.4 GHz Max Boost)		<b>X</b>
AMD Ryzen™ 7 PRO 3700 Processor (8C/16T, 36MB Cache, 4.4 GHz Max Boost)		<b>X</b>
AMD Ryzen™ 5 PRO 3600 Processor (6C/12T, 35MB Cache, 4.2 GHz Max Boost)		<b>X</b>

### 2<sup>nd</sup> Generation of AMD® Ryzen™ with AMD® Radeon™ Vega Graphics APU

	<b><u>DM</u></b>	<b><u>SFF</u></b>
AMD Ryzen™ 5 PRO 3400G Processor (4C/8T, 6MB cache, 4.2GHz Max Boost) with Radeon™ Vega 11 Graphics	<b>X</b>	<b>X</b>
AMD Ryzen™ 5 PRO 3400GE Processor (4C/8T, 6MB cache, 3.9GHz Max Boost) with Radeon™ Vega 11 Graphics	<b>X</b>	
AMD Ryzen™ 3 PRO 3200G Processor (4C/4T, 6MB cache, 4.0GHz Max Boost) with Radeon™ Vega 8 Graphics	<b>X</b>	<b>X</b>
AMD Ryzen™ 3 PRO 3200GE Processor (4C/4T, 6MB cache, 3.7GHz Max Boost) with Radeon™ Vega 8 Graphics	<b>X</b>	
AMD Athlon™ PRO 300GE Processor (2C/4T, 5MB Cache, 3.4 GHz) with Radeon™ Vega 3 Graphics	<b>X</b>	<b>X</b>

1. Multi-core 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. AMD's numbering is not a measurement of clock speed.



Standard Features and Configurable Components (availability may vary by country)

### GRAPHICS

#### System Integrated Graphics

	<u>DM</u>	<u>SFF</u>
AMD® Radeon™ Vega 3 Graphics	X	X
AMD Radeon™ Vega 8 Graphics	X	X
AMD Radeon™ Vega 11 Graphics	X	X

#### Optional Discrete Graphics Solutions

	<u>DM</u>	<u>SFF</u>
AMD® Radeon™ RX 550X 4GB 1DP 1 HDMI Graphics Card		X
AMD® Radeon™ RX 560X 4GB GDDR5	X	
AMD® Radeon™ R7 430 2GB GDDR5 64bit DP+VGA <sup>1</sup>		X
AMD® Radeon™ R7 430 2GB GDDR5 64bit 2DP		X
NVIDIA GeForce GT 730 2GB DP DVI PCIe x8 GFX		X

1. Not available in all regions.

**NOTE:** As of 2019, AMD Radeon™ RX560 is renamed to AMD Radeon™ RX 560X

#### Adapters and Cables

	<u>DM</u>	<u>SFF</u>
HP DisplayPort™ Cable	X	X
HP DisplayPort™ to DVI-D Adapter	X	X
HP DisplayPort™ to HDMI 4K Adapter	X	X
HP DisplayPort™ to VGA Adapter	X	X
HP USB-C™ to USB 3.0	X	X
HP USB to Serial Port Adapter	X	X
HP DVI Cable	X	X

### STORAGE

#### 3.5 inch SATA Hard Disk Drives (HDD)

	<u>DM</u>	<u>SFF</u>
HDD 500GB 7200RPM 3.5in		X
HDD 1TB 7200RPM SATA-3 3.5in		X
HDD 2TB 7200RPM SATA-3 3.5in		X

#### 2.5 inch SATA Hard Disk Drives (HDD)

	<u>DM</u>	<u>SFF</u>
HDD 2 TB 5400RPM 2.5in		X
HDD 500GB 7200RPM 2.5in	X	X
HDD 1TB 7200RPM 2.5in	X	X
HDD 500GB 7200RPM 2.5in Self Encrypted Drive OPAL2*	X	X
HDD 500GB 7200RPM 2.5in Federal Information Processing Standard*	X	X

**NOTE\*:** Storage Drivelock does not work with Self Encrypting or Optane based storage.

Standard Features and Configurable Components (availability may vary by country)

### 2.5 inch Solid State Drives (SSD)

	<u>DM</u>	<u>SFF</u>
SSD 256GB 2.5in SATA Three Layer Cell	X	X
SSD 512GB 2.5in SATA Three Layer Cell	X	X
SSD 256GB 2.5in SATA Self Encrypted OPAL2 TLC*	X	X
SSD 512GB 2.5in SATA Self Encrypted OPAL2 TLC*	X	X
SSD 256GB 2.5in Federal Information Processing Standard*	X	X
SSD 512GB 2.5in Federal Information Processing Standard*	X	X

**NOTE\*:** Storage Drivelock does not work with Self Encrypting or Optane based storage.

### M.2 PCIe NVMe Solid State Drives (SSD)

	<u>DM</u>	<u>SFF</u>
SSD 256GB M.2 2280 PCIe NVMe	X	X
SSD 512GB M.2 2280 PCIe NVMe	X	X
SSD 128GB M.2 2280 PCIe-3x2 NVMe Three Layer Cell		X
SSD 256GB M.2 2280 PCIe NVMe Three Layer Cell	X	X
SSD 512GB M.2 2280 PCIe NVMe Three Layer Cell	X	X
SSD 1TB M.2 2280 PCIe NVMe Three Layer Cell	X	X
SSD 2TB M.2 2280 PCIe NVMe Three Layer Cell	X	X
SSD 256GB M.2 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer Cell*	X	X
SSD 512GB M.2 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer Cell*		X

**NOTE\*:** Storage Drivelock does not work with Self Encrypting or Optane based storage.

### Optical Disc Drives

	<u>DM</u>	<u>SFF</u>
HP 9.5mm Slim DVD-ROM Drive		X
HP 9.5mm Slim DVD Writer Drive		X
HP 9.5mm Slim Blu-Ray Writer Drive		X

### Media Card Reader

	<u>DM</u>	<u>SFF</u>
SD 4.0 with 5-in-1 Interface (Supports SD, SDXC, SDHC, UHS-I, UHS-II)		X

**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.

## MEMORY<sup>1,2</sup>

### Max Memory Configuration

	<u>DM</u>	<u>SFF</u>
DDR4-2666 (Transfer rates up to 2666 MT/s), 64 GB, 2 SODIMM	X	
DDR4-2666 (Transfer rates up to 2666 MT/s), 128 GB, 4 DIMM		X
DDR4-3200 (Transfer rates up to 2933 MT/s), 64 GB, 4 DIMM <sup>3</sup>		X

1. All memory slots are customer accessible/upgradeable.

2. Actual transfer rate will vary and is determined by the system's configured processor. See processor specifications for supported memory data rate.



Standard Features and Configurable Components (availability may vary by country)

3. Available for systems with 3rd generation AMD Ryzen™ PRO CPUs only.

Standard Features and Configurable Components (availability may vary by country)

### Memory Configuration

	<b>DM</b>	<b>SFF</b>
4 GB (1 x 4 GB)	<b>X</b>	<b>X</b>
8 GB (2 x 4 GB)	<b>X</b>	<b>X</b>
8 GB (1 x 8 GB)	<b>X</b>	<b>X</b>
16 GB (2 x 8 GB)	<b>X</b>	<b>X</b>
16 GB (1 x 16 GB)	<b>X</b>	<b>X</b>
32 GB (2 x 16 GB)	<b>X</b>	<b>X</b>
32 GB (4 x 8 GB)		<b>X</b>
32 GB (1 x 32 GB)	<b>X</b>	<b>X</b>
64 GB (4 x 16 GB)		<b>X</b>
64 GB (2 x 32 GB)	<b>X</b>	<b>X</b>
128 GB (4 x 32 GB)		<b>X</b>

### NETWORKING/COMMUNICATIONS

#### Ethernet (RJ-45)

	<b>DM</b>	<b>SFF</b>
Realtek® RTL8111EPH (standard)	<b>X</b>	<b>X</b>

#### Wireless<sup>1</sup>

	<b>DM</b>	<b>SFF</b>
Intel® Wi-Fi® 6 AX200 (2x2) and Bluetooth® M.2 Combo Card non-vPro™ <sup>2</sup>	<b>X</b>	<b>X</b>
Intel® Dual Band Wireless-AC Wi-Fi® 5 9260 (2x2) and Bluetooth® 5 M.2, non-vPro™ <sup>3</sup>	<b>X</b>	<b>X</b>
Intel® Dual Band Wireless-AC Wi-Fi® 5 8265 (2x2) and Bluetooth® Combo, card non-vPro™ <sup>3</sup>	<b>X</b>	<b>X</b>
Realtek RTL8822CE Wi-Fi® 5 (2x2) and Bluetooth® 5 Combo	<b>X</b>	<b>X</b>

1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited.
2. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi® 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices. Only available in countries where 802.11ax is supported..
3. Intel® Dual Band Wireless-AC Wi-Fi® 5 8265 (2x2) and Bluetooth® Combo, card non-vPro™: not available in all regions.

### KEYBOARDS AND POINTING DEVICES

#### Keyboards

	<b>DM</b>	<b>SFF</b>
HP USB Premium Keyboard	<b>X</b>	<b>X</b>
HP Conferencing USB Keyboard	<b>X</b>	<b>X</b>
HP Wireless Collaboration Keyboard	<b>X</b>	<b>X</b>
HP USB and PS/2 Washable Keyboard	<b>X</b>	<b>X</b>
HP USB Smart Card (CCID) Keyboard	<b>X</b>	<b>X</b>
HP USB Business Slim Keyboard	<b>X</b>	<b>X</b>
HP USB Keyboard	<b>X</b>	<b>X</b>
HP PS/2 Business Slim Keyboard		<b>X</b>
HP Wireless Business Slim Keyboard and Mouse	<b>X</b>	<b>X</b>
HP USB Business Slim Antimicrobial Keyboard <sup>1</sup>	<b>X</b>	<b>X</b>

Standard Features and Configurable Components (availability may vary by country)

1. Not available in all regions

<b>Mouse</b>	<b>DM</b>	<b>SFF</b>
HP PS/2 Mouse		X
HP USB Optical Mouse	X	X
HP USB Premium Mouse	X	X
HP 1000dpi Laser Mouse USB	X	X
HP USB and PS/2 Washable Mouse	X	X
Antimicrobial USB Mouse <sup>1</sup>	X	X
HP Hardened USB Mouse <sup>1</sup>	X	X
HP USB Fingerprint Reader Mouse	X	X

1. Not available in all regions

## PORTS

<b>I/O Ports – Standard</b>	<b>DM</b>	<b>SFF</b>
USB 3.1 Gen 1	2 front; 4 rear	4 front; 4 rear
USB 3.1 Gen2 Type-C™ (15W)	1 front; 1 rear (option)	1 front; 1 rear (option)
USB 2.0		2 rear
Video	2 DisplayPort™ 1.2 (rear), 1 Configurable video port (rear) (Choice of DisplayPort™ 1.2, HDMI™ 2.0, VGA, or USB Type-C™ with alt mode display or USB Type-C™ with power delivery) For models with discrete graphics: 1 DisplayPort™ 1.4 (rear)	2 DisplayPort™ 1.2 (rear), 1 Configurable video port (rear) (Choice of DisplayPort™ 1.2, HDMI™ 2.0, VGA, or USB Type-C™ with alt mode display port or 15W output) For models with discrete graphics: No optional port
Audio	1 Headset (front), 1 Universal Audio Jack with CTIA headset support (front)	1 Headset (front); 1 Audio-out (rear), 1 Audio-in (rear)
Network Interface	RJ45	RJ45

<b>I/O Ports – Optional</b>	<b>DM</b>	<b>SFF</b>
Serial (RS-232)	1 (rear)(option)	1 (rear) (option)
Serial (RS-232) and PS/2 combination	N/A	1 (rear) (option)

Standard Features and Configurable Components (availability may vary by country)

<b>I/O Ports – Internal Ports</b>	<b><u>DM</u></b>	<b><u>SFF</u></b>
Internal SATA storage connector(s)	N/A	3
Internal SATA storage connector (Data and Power)	1	N/A

**NOTE:** For Desktop Mini with M.2 Storage config, there will be no SATA drive bracket. If you plan to use or upgrade the storage with any 2.5" SATA drive, please select a DM SATA Drive Bracket (available as both factory configured and after market option). (Not applicable to all regions.)

<b>Slots</b>	<b><u>DM</u></b>	<b><u>SFF</u></b>
M.2 PCIe	(1) M.2 PCIe x1 2230 (for WLAN) (1) M.2 PCIe x2 2280/2230 Combo (for storage) (1) M.2 PCIe x4 2280/2230 Combo (for storage)	(1) M.2 PCIe x1 2230 (for WLAN) (1) M.2 PCIe x2 2280/2230 Combo (for storage) (1) M.2 PCIe x4 2280/2230 Combo (for storage)
PCI Express x1 (v3.0)	N/A	1
PCI Express x8 (v3.0) <sup>1</sup>	N/A	1
PCI Express x16 (v3.0) <sup>2</sup>	N/A	1

<b>Bays</b>	<b><u>DM</u></b>	<b><u>SFF</u></b>
9.5mm Slim ODD	N/A	1
Secure Digital (SD) Reader	N/A	1
2.5" internal storage drive	1 (optional)	2 <sup>3</sup>
3.5" internal storage drive	N/A	1

1. AMD® Ryzen™ PRO APU only

2. AMD® Ryzen™ PRO CPU only

3. SFF can be configured with either (1) 3.5" or (2) 2.5" internal storage drive (2.5" requiring adapter supplied from factory only)

SATA 2.5" internal storage drive cannot be selected if 2nd M.2, discrete graphic card, or 95W processor is selected

Standard Features and Configurable Components (availability may vary by country)

### SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

#### BIOS

- HP BIOSphere Gen5<sup>17</sup>
- HP DriveLock & Automatic DriveLock<sup>16, 20</sup>
- BIOS Update via Network
- Master Boot Record Security
- Power On Authentication
- HP Secure Erase<sup>18</sup>
- Absolute Persistence Module<sup>19</sup>
- Pre-boot Authentication
- HP Wake on WLAN

#### Software

- HP Hotkey Support
- HP JumpStart
- HP Support Assistant<sup>21</sup>
- HP Audio
- HP Privacy Settings
- HP Setup Integrated OOBE
- HP PC Hardware Diagnostics Windows
- Buy Office

#### Manageability Features

- HP Driver Packs<sup>22</sup>
- HP System Software Manager (SSM) (download)
- HP BIOS Config Utility (BCU) (download)
- HP Client Catalog (download)
- HP Manageability Integration Kit Gen3<sup>23</sup>
- Ivanti Management Suite (download)<sup>24</sup>
- HP Image Assistant Gen4
- HP Cloud Recovery<sup>38</sup>

#### Client Security Software

- HP Client Security Suite Gen5<sup>25</sup>
- HP Power On Authentication
- Windows Defender<sup>27</sup>

#### Security Management

- HP Secure Erase<sup>18</sup>
- TPM 2.0 (FW: 7.85) endpoint security controller (Infineon SLB9670) Common Criteria EAL4+ Certified. FIPS 140-2 Level 2 Certified.
- SATA 0,1 port disablement (via BIOS)
- USB enable/disable and boot control (via BIOS)
- Power-on password (via BIOS)
- Setup password (via BIOS)
- Support for chassis padlocks and cable lock devices
- Cover Removal Sensor
- HP Sure Start for AMD<sup>30</sup>
- HP Sure Click<sup>34</sup>
- HP Sure Run Gen2<sup>35</sup>
- HP Sure Recover Gen2<sup>36</sup>
- HP Sure Sense<sup>37</sup>

### Standard Features and Configurable Components (availability may vary by country)

16. HP Automatic Drive Lock is not supported on NVMe drives
17. HP BIOSphere Gen5 is available on select HP Pro and Elite PCs. See product specifications for details. Features may vary depending on the platform and configurations.
18. HP Sure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.
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. Storage Drivelock does not work with Self Encrypting or Optane based storage.
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 Manager Gen5 requires Windows and is available on the select HP Pro and Elite PCs. See product specifications for details.
27. Windows Defender Opt in and internet connection required for updates.
30. HP Sure Start for AMD is available on select HP PCs with AMD processors. See product specifications for availability
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, when Microsoft Office or Adobe Acrobat are installed.
35. HP Sure Run Gen2: See product specifications for availability.36. HP Sure Recover Gen2: See product specifications for availability. Requires an open, wired network connection. Not available on platforms with multiple internal storage drives. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. HP Sure Recover (Gen1) does not support platforms with Intel® Optane™.
36. HP Sure Recover is available on HP Elite PCs with 8th generation Intel® or AMD® processors and requires an open, wired network connection. Not available on platforms with multiple internal storage drives, Intel® Optane™. You must back up important files, data, photos, videos, etc. before use to avoid loss of data.
37. HP Sure Sense requires Windows 10. See product specifications for availability.
38. HP Cloud Recovery is available for HP Elite and Pro desktops and laptops PCs with Intel® or AMD processors and requires an open, wired 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/document/c05115630>.



Standard Features and Configurable Components (availability may vary by country)

### ENVIRONMENTAL & INDUSTRY

#### ENERGY STAR® certified models available

EPEAT® 2019 registered where applicable. EPEAT® registration varies by country. See <http://www.epeat.net> for registration status by country<sup>1</sup>. Search keyword generator on HP's 3rd party option store for solar generator accessories at <http://www.hp.com/go/options>.

Low halogen (chassis, all internal components and modules)<sup>2</sup>

TAA compliant models available

1. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit <http://www.epeat.net> for more information

2. External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.

### UNIT ENVIRONMENT 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)<sup>1</sup>  
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                      Operating: 5000m  
(unpressurized)                      Non-operating: 50000ft (15240 m)

1. 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.

### HP EliteDesk 705 Desktop Mini G5 Business PC

#### Environmental Data

<b>Eco-Label Certifications &amp; declarations</b>	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: <ul style="list-style-type: none"><li>• IT ECO declaration</li><li>• US ENERGY STAR®</li><li>• EPEAT® 2019 registered where applicable. EPEAT® registration varies by country. 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></ul> <p>*Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit <a href="http://www.epeat.net">http://www.epeat.net</a> for more information.</p>
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Standard Features and Configurable Components (availability may vary by country)

<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, 50Hz</b>
Normal Operation (Short idle)	10.789	10.858	10.739
Normal Operation (Long idle)	10.488	10.538	10.458
Sleep	0.815	0.851	0.81
Off	0.756	0.809	0.74
	<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.		
<b>Heat Dissipation*</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>
Normal Operation (Short idle)	36.7905	37.0258	36.62
Normal Operation (Long idle)	35.7641	35.9346	35.6618
Sleep	2.7792	2.9019	2.7621
Off	2.578	2.7587	2.5234
	<b>NOTE:</b> Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.		
<b>Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)</b>	<b>Sound Power (L<sub>WAd</sub>, bels)</b>	<b>Sound Pressure (L<sub>pAm</sub>, decibels)</b>	
Typically Configured – Idle	3.1	20	
Fixed Disk – Random writes	4.4	33	
Longevity and Upgrading	This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:  Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.		
Batteries	This battery(s) in this product comply with EU Directive 2006/66/EC  Batteries used in the product do not contain: Mercury greater the 1ppm by weight Cadmium greater than 20ppm by weight  Battery size: CR2032 (coin cell) Battery type: Lithium		
<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> </ul>		

### Standard Features and Configurable Components (availability may vary by country)

	<ul style="list-style-type: none"> <li>• This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).</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	
	<b>Internal:</b>	PLASTIC/EPE (Expanded Polyethylene)	
		PLASTIC/Polyethylene low density	
<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>Packaging Usage</b>	<p>HP follows these guidelines to decrease the environmental impact of product packaging:</p> <ul style="list-style-type: none"> <li>• Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.</li> <li>• Eliminate the use of ozone-depleting substances (ODS) in packaging materials.</li> <li>• Design packaging materials for ease of disassembly.</li> <li>• Maximize the use of post-consumer recycled content materials in packaging materials.</li> <li>• Use readily recyclable packaging materials such as paper and corrugated materials.</li> <li>• Reduce size and weight of packages to improve transportation fuel efficiency.</li> <li>• Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.</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>		

Standard Features and Configurable Components (availability may vary by country)

	<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>                      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>
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### HP EliteDesk 705 Small Form Factor G5 Business PC

<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® 2019 registered where applicable. EPEAT® registration varies by country. 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> </ul> <p>*Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit <a href="http://www.epeat.net">http://www.epeat.net</a> for more information.</p>		
<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, 50Hz</b>
Normal Operation (Short idle)	16.85 W	16.52 W	16.57 W
Normal Operation (Long idle)	14.89 W	14.77 W	14.96 W
Sleep	1.14 W	1.1 W	1.14 W
Off	1.06 W	1.06 W	1.06 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, 50Hz</b>
Normal Operation (Short idle)	57.6 BTU/hr	56.5 BTU/hr	56.7 BTU/hr
Normal Operation (Long idle)	50.9 BTU/hr	50.5 BTU/hr	51.2 BTU/hr
Sleep	3.9 BTU/hr	3.8 BTU/hr	3.9 BTU/hr
Off	3.6 BTU/hr	3.6 BTU/hr	3.6 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)



### Standard Features and Configurable Components (availability may vary by country)

Typically Configured – Idle	3.3	23
Fixed Disk – Random writes	3.3	24
Longevity and Upgrading	<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>	
Batteries	<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>	
<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>• 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/Paperboard 1170 g
		PAPER/Paper 378 g
	<b>Internal:</b>	PLASTIC/Polyethylene low density 17 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> </ul>	



Standard Features and Configurable Components (availability may vary by country)

	<ul style="list-style-type: none"> <li>• Radioactive Substances</li> <li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</li> </ul>
<b>Packaging Usage</b>	<p>HP follows these guidelines to decrease the environmental impact of product packaging:</p> <ul style="list-style-type: none"> <li>• Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.</li> <li>• Eliminate the use of ozone-depleting substances (ODS) in packaging materials.</li> <li>• Design packaging materials for ease of disassembly.</li> <li>• Maximize the use of post-consumer recycled content materials in packaging materials.</li> <li>• Use readily recyclable packaging materials such as paper and corrugated materials.</li> <li>• Reduce size and weight of packages to improve transportation fuel efficiency.</li> <li>• Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.</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> <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>  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>

Standard Features and Configurable Components (availability may vary by country)

### SERVICE AND SUPPORT

On-site Warranty<sup>15</sup>: Three-year (3-3-3) limited warranty delivers three years of on-site, next business day<sup>16</sup> service for parts and labor and includes free support 24 x 7<sup>17</sup>. 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. To choose the right level of service for your HP product, visit HP Care Pack Central: <http://www.hp.com/go/cpc>.<sup>18</sup>

15. Terms and conditions may vary by country. Certain restrictions and exclusions apply. Other warranty variations may be offered in your region.

16. 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.

17. Technical telephone support applies only to HP-configured and third-party HP qualified hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

18. 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.

### CERTIFICATION AND COMPLIANCE

#### Energy Efficiency Compliance

ENERGY STAR<sup>®</sup> certified; EPEAT<sup>®</sup> 2019 registered where applicable. EPEAT<sup>®</sup> registration varies by country. See <http://www.epeat.net> for registration status by country <sup>19</sup>

19. \*Based on US EPEAT<sup>®</sup> registration according to IEEE 1680.1-2018 EPEAT<sup>®</sup>. Status varies by country. Visit <http://www.epeat.net> for more information.

## Technical Specifications – Graphics

**GRAPHICS****AMD Radeon™ Vega 3 Graphics (Integrated on AMD® Athlon PRO 300GE APUs)****AMD Radeon™ Vega 8 Graphics (Integrated on AMD® Ryzen™ PRO 3200G and 3200GE APUs)****AMD Radeon™ Vega 11 Graphics (Integrated on AMD® Ryzen™ PRO 3400G and 3400GE APUs)**

<b>Multi Display Support</b>	Maximum of 3 displays supported by the integrated graphics
<b>DisplayPort</b>	Two DisplayPort outputs are standard. One DisplayPort output is optional. AMD® PRO APUs and AMD® Ryzen™ APUs support DP1.2 features including DP++, Audio, MST, HBR2, HDCP1.4 and a maximum resolution of 5128x3880@30Hz or 3840x2160@60Hz.
<b>VGA Port (Optional)</b>	Maximum Resolution of 2048x1536 at 60Hz
<b>HDMI (Optional)</b>	AMD® PRO APUs support HDMI 2.0 features and AMD® Ryzen™ APUs support HDMI 2.0a features. All support HDCP1.4, audio and a maximum resolution of 4096x2160@60Hz
<b>USB-C (Optional)</b>	Supports DisplayPort Alt Mode
<b>Memory</b>	512MB when less than 8GB of system memory is installed 1GB when 8GB or more of system memory is installed
<b>Maximum Color Depth</b>	up to 10 bits
<b>Graphics/Video API Support</b>	AMD® PRO APUs: DirectX 12 OpenCL 1.2 OpenGL 4.1 Dedicated decoding of the H.264 format at up to 4K and 60Hz. Encoding H.264 video supported at 1080p120, 1440p60, and 2160p60  AMD® Ryzen™ APUs: DirectX 12 Vulkan 1.0 OpenCL 2.0 OpenGL 4.5 Hardware-based decode of HEVC/H.265 main10 profile videos at resolutions up to 3840x2160 at 60Hz with 10-bit color for HDR content. Dedicated decoding of the H.264 format at up to 4K and 60Hz. Decoding the VP9 format at resolutions up to 3840x2160 using a hybrid approach where the video and shader engines collaborate to offload work from the CPU. Encode HEVC/H.265 at 1080p240, 1440p120, and 2160p60. Encoding H.264 video is also supported at 1080p120, 1440p60, and 2160p60



## Technical Specifications – Graphics

### AMD® Radeon™ RX 550X 4GB PCIe x16

<b>Engine Clock</b>	1183MHz
<b>Memory Clock</b>	6 Gbps
<b>Memory Size(width)</b>	4 GB(128-bit)
<b>Memory Type</b>	GDDR5
<b>Max. Resolution(HDMI)</b>	4096x2160 @ 60Hz
<b>Max. Resolution(DP)</b>	5120x2880 @ 60Hz
<b>Multi Display Support</b>	2 displays
<b>HDCP Compliance</b>	Yes
<b>Rear I/O connectors(bracket)</b>	HDMI, DP
<b>Cooling(active/passive)</b>	Active fan-sink (Active cooling with dynamic speed)
<b>Total power consumption(W)</b>	<50W
<b>PCB form-factor with bracket</b>	LP (low profile) PCB with FH/LP bracket

### AMD® Radeon™ RX 560X

<b>Architecture</b>	Discrete GPU AMD® GPU drives the integrated panel and all of the graphics output ports
<b>DisplayPort</b>	Multimode capable; supports HDCP, HDR, Display Port Audio (6 streams max), DisplayPort HBR3 link rates and Multi-Stream Technology for a maximum of 5 displays (including the integrated panel and all attached displays)
<b>HDMI</b>	Supports HDMI 2.0b features Supports HDCP 2.2, HDR
<b>Memory</b>	4GByte, 128bit wide GDDR5
<b>Maximum Color Depth</b>	up to 12 bits/color
<b>Graphics/Video API Support</b>	DirectX 12 OpenCL 2.0 OpenGL 4.5 AMD® Unified Video Decoder (UVD)
<b>Rear I/O connector</b>	1 DP
<b>Max. Resolution (VGA)</b>	2048 x 1536@60Hz
<b>Max. Resolution (HDMI)</b>	4096 x 2160@60Hz
<b>Max. Resolution (DP)</b>	5120 x 2880@60Hz

### AMD® Radeon™ R7 430 2GB GDDR5 DP+VGA Graphics Card

<b>Engine Clock</b>	780 MHz
<b>Memory Clock</b>	1100 MHz
<b>Memory Size(width)</b>	2 GB (64-bit)
<b>Memory Type</b>	256M x 32 GDDR5
<b>Max. Resolution(VGA)</b>	2048x1536
<b>Max. Resolution(DP)</b>	4096x2160@60Hz
<b>Multi Display Support</b>	2 displays
<b>HDCP Compliance</b>	Yes
<b>Rear I/O connectors(bracket)</b>	DP+VGA



## Technical Specifications – Graphics

<b>Cooling(active/passive)</b>	Active fan-sink (Active cooling with dynamic speed)
<b>Total power consumption(W)</b>	<50W
<b>PCB form-factor with bracket</b>	LP PCB with FH/LP bracket

### AMD® Radeon™ R7 430 2GB 2DP Graphics Card

<b>Engine Clock</b>	780 MHz
<b>Memory Clock</b>	1100 MHz
<b>Memory Size(width)</b>	2 GB(64-bit)
<b>Memory Type</b>	256M x 32 GDDR5
<b>Max. Resolution(DP)</b>	4096x2160@60Hz
<b>Multi Display Support</b>	2 displays
<b>HDCP Compliance</b>	Yes
<b>Rear I/O connectors(bracket)</b>	DPx2
<b>Cooling(active/passive)</b>	Active fan-sink (Active cooling with dynamic speed)
<b>Total power consumption(W)</b>	<50W
<b>PCB form-factor with bracket</b>	LP PCB with FH/LP bracket
<b>Engine Clock</b>	780 MHz

### NVIDIA® GeForce® GT 730 2GB DP DVI PCIe x8 GFX

<b>Engine Clock</b>	902 MHz
<b>Memory Clock</b>	1250 MHz
<b>Memory Size(width)</b>	2 GB (64-bit)
<b>Memory Type</b>	256Mx32 GDDR5
<b>Max. Resolution(DVI)</b>	2560 x 1600 x 30 bpp @ 60Hz (Dual Link)
<b>Max. Resolution(DP)</b>	Up to 2 displays
<b>Multi Display Support</b>	Yes
<b>HDCP Compliance</b>	DL DVI-I + DP
<b>Rear I/O connectors(bracket)</b>	Active fan-sink (Active cooling with dynamic speed)
<b>Cooling(active/passive)</b>	35 W
<b>Total power consumption(W)</b>	2-pin fan connector for fan sink power/speed control
<b>PCB form-factor with bracket</b>	902 MHz

## Technical Specifications – Storage

### STORAGE

#### 3.5 inch SATA HARD DISC DRIVES (HDD)

##### 500 GB 7200RPM 3.5in SATA HDD

<b>Capacity</b>	500 GB
<b>Rotational Speed</b>	7,200 rpm
<b>Interface</b>	SATA 6.0 Gb/s
<b>Buffer Size</b>	32 MB
<b>Logical Blocks</b>	976,773,168
<b>Seek Time</b>	11 ms (Average)
<b>Height</b>	1 in/2.54 cm
<b>Width</b>	Media diameter: 3.5 in/8.89 cm Physical size: 4 in/10.2 cm
<b>Operating Temperature</b>	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.

##### 1 TB 7200RPM 3.5in SATA HDD

<b>Capacity</b>	1 TB
<b>Rotational Speed</b>	7,200 rpm
<b>Interface</b>	SATA 6 Gb/s
<b>Buffer Size</b>	64 MB
<b>Logical Blocks</b>	1,953,525,168
<b>Seek Time</b>	11 ms (Average)
<b>Height</b>	1 in/2.54 cm
<b>Width</b>	Media diameter: 3.5 in/8.89 cm Physical size: 4 in/10.2 cm
<b>Operating Temperature</b>	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.

##### 2 TB 7200RPM 3.5in SATA HDD

<b>Capacity</b>	2 TB
<b>Rotational Speed</b>	7,200 rpm
<b>Interface</b>	SATA 6 Gb/s
<b>Buffer Size</b>	64 MB
<b>Logical Blocks</b>	1,953,525,168
<b>Seek Time</b>	11 ms (Average)
<b>Height</b>	1.028 in/26.11 mm



### Technical Specifications – Storage

<b>Width (nominal)</b>	4.0 in/101.6 mm
<b>Operating Temperature</b>	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.

#### 2.5 inch SATA HARD DISC DRIVES (HDD)

##### 2 TB 5400RPM 2.5in SATA HDD

<b>Capacity</b>	2 TB
<b>Rotational Speed</b>	5,400 rpm
<b>Interface</b>	SATA 6 Gb/s
<b>Buffer Size</b>	128 MB
<b>Logical Blocks</b>	3,907,050,336
<b>Seek Time</b>	12 ms (Average)
<b>Height</b>	0.374 in/9.5 mm (nominal)
<b>Width (nominal)</b>	2.75 in/70 mm (nominal)
<b>Operating Temperature</b>	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.

##### 500 GB 7200RPM 2.5in SATA HDD

<b>Capacity</b>	500 GB
<b>Rotational Speed</b>	7,200 rpm
<b>Interface</b>	SATA 6 Gb/s
<b>Buffer Size</b>	16 MB
<b>Logical Blocks</b>	976,773,168
<b>Seek Time</b>	12 ms (Average)
<b>Height</b>	0.267 in/7.2 mm (Maximum)
<b>Width</b>	2.75 in/70 mm (nominal)
<b>Operating Temperature</b>	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.

##### 1 TB 7200RPM 2.5in SATA HDD

<b>Capacity</b>	1 TB
<b>Rotational Speed</b>	7,200 rpm
<b>Interface</b>	SATA 6 Gb/s
<b>Buffer Size</b>	32 MB
<b>Logical Blocks</b>	1,953,525,168



## Technical Specifications – Storage

<b>Seek Time</b>	12 ms (Average)
<b>Height</b>	0.374 in/9.5 mm (nominal)
<b>Width</b>	2.75 in/70 mm (nominal)
<b>Operating Temperature</b>	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.

**500 GB 7200RPM 2.5in Self Encrypted OPAL2 SATA HDD**

<b>Capacity</b>	500 GB
<b>Architecture</b>	Self-Encrypting (SED) Solid State Drive with SATA interface
<b>Interface</b>	SATA 6 Gb/s
<b>Buffer Size</b>	128 MB
<b>Logical Blocks</b>	976,773,168
<b>Seek Time</b>	12 ms (Average)
<b>Height</b>	0.267 in/7.2 mm (Maximum)
<b>Width</b>	2.75 in/70 mm (nominal)
<b>Operating Temperature</b>	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.

**500 GB 2.5" FIPS 140-2 SED Solid State Drive**

<b>Drive Weight</b>	500 GB
<b>Capacity</b>	Self-Encrypting (SED) Solid State Drive with SATA interface
<b>Height</b>	SATA 6 Gb/s
<b>Length</b>	128 MB
<b>Width</b>	976,773,168
<b>Interface</b>	12 ms (Average)
<b>Maximum Sequential Read</b>	0.267 in/7.2 mm (max.)
<b>Maximum Sequential Write</b>	2.75 in/70 mm (nominal)
<b>Logical Blocks</b>	41° to 131° F (5° to 55° C)
<b>Operating Temperature</b>	500 GB
<b>Features</b>	Self-Encrypting (SED) Solid State Drive with SATA interface

**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 – Storage

**2.5 inch SOLID STATE DRIVES (SSD)****256 GB 2.5in SATA Three Layer Cell SSD**

<b>Drive Weight</b>	<62g
<b>Capacity</b>	256 GB
<b>Height</b>	7mm
<b>Length</b>	100.45mm
<b>Width</b>	69.85mm
<b>Interface</b>	SATA 3.0 (6Gb/s)
<b>Maximum Sequential Read</b>	Up to 530MB/s
<b>Maximum Sequential Write</b>	Up to 450MB/s
<b>Logical Blocks</b>	500,118,192
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	DIPM; TRIM

**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.

**512 GB 2.5in SATA Three Layer Cell SSD**

<b>Drive Weight</b>	<50g
<b>Capacity</b>	512 GB
<b>Height</b>	7mm
<b>Length</b>	100.45mm
<b>Width</b>	69.85mm
<b>Interface</b>	SATA 3.0 (6Gb/s)
<b>Maximum Sequential Read</b>	Up to 530MB/s
<b>Maximum Sequential Write</b>	Up to 500MB/s
<b>Logical Blocks</b>	1,000,215,216
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	DIPM; TRIM

**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.

**256 GB 2.5in SATA Self Encrypted OPAL2 Three Layer Cell SSD**

<b>Drive Weight</b>	<50g
<b>Capacity</b>	256 GB
<b>Height</b>	7mm
<b>Length</b>	100.45mm
<b>Width</b>	69.85mm
<b>Interface</b>	SATA 3.0 (6Gb/s)
<b>Maximum Sequential Read</b>	Up to 530MB/s
<b>Maximum Sequential Write</b>	Up to 500MB/s
<b>Logical Blocks</b>	500,118,192

## Technical Specifications – Storage

<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	DIPM; TRIM; TCG-OPAL2.0 security

**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.

### 512 GB 2.5in SATA Self Encrypted OPAL2 Three Layer Cell SSD

<b>Drive Weight</b>	<50g
<b>Capacity</b>	512 GB
<b>Height</b>	7mm
<b>Length</b>	100.45mm
<b>Width</b>	69.85mm
<b>Interface</b>	SATA 3.0 (6Gb/s)
<b>Maximum Sequential Read</b>	Up to 530MB/s
<b>Maximum Sequential Write</b>	Up to 500MB/s
<b>Logical Blocks</b>	1,000,215,216
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	DIPM; TRIM; TCG-OPAL2.0 security

**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.

### 256 GB 2.5in SATA Self Encrypted Federal Information Processing Standard SSD

<b>Drive Weight</b>	<40g
<b>Capacity</b>	256 GB
<b>Height</b>	7mm
<b>Length</b>	100.45mm
<b>Width</b>	69.85mm
<b>Interface</b>	SATA 3.0 (6Gb/s)
<b>Maximum Sequential Read</b>	Up to 530MB/s
<b>Maximum Sequential Write</b>	Up to 500MB/s
<b>Logical Blocks</b>	500,118,192
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	DIPM; TRIM; FIPS 140-2 security

**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.

### 512 GB 2.5in SATA Self Encrypted Federal Information Processing Standard SSD

<b>Drive Weight</b>	<45g
<b>Capacity</b>	512 GB
<b>Height</b>	7mm
<b>Length</b>	100.45mm
<b>Width</b>	69.85mm



## Technical Specifications – Storage

<b>Interface</b>	SATA 3.0 (6Gb/s)
<b>Maximum Sequential Read</b>	Up to 530MB/s
<b>Maximum Sequential Write</b>	Up to 500MB/s
<b>Logical Blocks</b>	1,000,215,216
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	DIPM; TRIM; FIPS 140-2 security

**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.

### M.2 PCIe NVMe SOLID STATE DRIVES (SSD)

#### 256 GB M.2 2280 PCIe NVMe SSD

<b>Drive Weight</b>	< 10g
<b>Capacity</b>	256 GB
<b>Height</b>	2.38mm
<b>Length</b>	80mm
<b>Width</b>	22mm
<b>Interface</b>	PCIe Gen3
<b>Maximum Sequential Read</b>	Up to 1600MB/s
<b>Maximum Sequential Write</b>	Up to 780MB/s
<b>Logical Blocks</b>	500,118,192
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	APST; ASPM L1.2; NVMe spec 1.2

**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.

#### 512 GB M.2 2280 PCIe NVMe SSD

<b>Drive Weight</b>	< 10g
<b>Capacity</b>	512 GB
<b>Height</b>	2.38mm
<b>Length</b>	80mm
<b>Width</b>	22mm
<b>Interface</b>	PCIe Gen3
<b>Maximum Sequential Read</b>	Up to 1600MB/s
<b>Maximum Sequential Write</b>	Up to 860MB/s
<b>Logical Blocks</b>	1,000,215,216
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	APST; ASPM L1.2; NVMe spec 1.2

**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 – Storage

#### 128 GB M.2 2280 PCIe NVMe Three Layer Cell SSD

<b>Drive Weight</b>	< 10g
<b>Capacity</b>	128 GB
<b>Height</b>	2.38mm
<b>Length</b>	80mm
<b>Width</b>	22mm
<b>Interface</b>	PCIe Gen3x4
<b>Maximum Sequential Read</b>	Up to 2800MB/s
<b>Maximum Sequential Write</b>	Up to 600MB/s
<b>Logical Blocks</b>	250,069,680
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	APST; ASPM L1.2; NVME spec 1.2

**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.

#### 256 GB M.2 2280 PCIe NVMe Three Layer Cell SSD

<b>Drive Weight</b>	< 10g
<b>Capacity</b>	256GB
<b>Height</b>	2.38mm
<b>Length</b>	80mm
<b>Width</b>	22mm
<b>Interface</b>	PCIe Gen3x4
<b>Maximum Sequential Read</b>	Up to 2700MB/s
<b>Maximum Sequential Write</b>	Up to 1000MB/s
<b>Logical Blocks</b>	500,118,192
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	APST; ASPM L1.2; NVME spec 1.2

**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.

#### 512 GB M.2 2280 PCIe NVMe Three Layer Cell SSD

<b>Drive Weight</b>	< 10g
<b>Capacity</b>	512 GB
<b>Height</b>	2.38mm
<b>Length</b>	80mm
<b>Width</b>	22mm
<b>Interface</b>	PCIe Gen3x4
<b>Maximum Sequential Read</b>	Up to 2900MB/s
<b>Maximum Sequential Write</b>	Up to 1100MB/s
<b>Logical Blocks</b>	1,000,215,216
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]

## Technical Specifications – Storage

**Features** APST; ASPM L1.2; NVME spec 1.2

**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.

**1 TB M.2 2280 PCIe NVMe Three Layer Cell SSD**

**Drive Weight** < 10g  
**Capacity** 1 TB  
**Height** 2.38mm  
**Length** 80mm  
**Width** 22mm  
**Interface** PCIe Gen3x4  
**Maximum Sequential Read** Up to 3480MB/s  
**Maximum Sequential Write** Up to 3037MB/s  
**Logical Blocks** 2,000,409,264  
**Operating Temperature** 0° to 70°C (32° to 158°F) [ambient temp]  
**Features** TRIM; ASPM L1.2

**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.

**2 TB M.2 2280 PCIe NVMe Three Layer Cell SSD**

**Drive Weight** < 10g  
**Capacity** 2 TB  
**Height** 2.38mm  
**Length** 80mm  
**Width** 22mm  
**Interface** PCIe Gen3x4  
**Maximum Sequential Read** Up to 3000MB/s  
**Maximum Sequential Write** Up to 2900MB/s  
**Logical Blocks** 3,907,029,168  
**Operating Temperature** 0° to 70°C (32° to 158°F) [ambient temp]  
**Features** TRIM; ASPM L1.2

**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.

**256 GB M.2 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer Cell SSD**

**Drive Weight** < 10g  
**Capacity** 256 GB  
**Height** 2.38mm  
**Length** 80mm  
**Width** 22mm  
**Interface** PCIe Gen3x4



## Technical Specifications – Storage

<b>Maximum Sequential Read</b>	Up to 2700MB/s
<b>Maximum Sequential Write</b>	Up to 1000MB/s
<b>Logical Blocks</b>	500,118,192
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	APST; ASPM L1.2; NVME spec 1.2; TCG-OPAL2 security

**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.

### 512 GB M.2 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer Cell SSD

<b>Drive Weight</b>	< 10g
<b>Capacity</b>	512 GB
<b>Height</b>	2.38mm
<b>Length</b>	80mm
<b>Width</b>	22mm
<b>Interface</b>	PCIe Gen3x4
<b>Maximum Sequential Read</b>	Up to 2900MB/s
<b>Maximum Sequential Write</b>	Up to 1100MB/s
<b>Logical Blocks</b>	1,000,215,216
<b>Operating Temperature</b>	0° to 70°C (32° to 158°F) [ambient temp]
<b>Features</b>	APST; ASPM L1.2; NVME spec 1.2; TCG-OPAL2 security

**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.

## OPTICAL DISC DRIVES

### HP 9.5mm Slim DVD-ROM Drive

<b>Height</b>	9.5 mm height
<b>Orientation</b>	Either horizontal or vertical
<b>Interface type</b>	SATA/ATAPI
<b>Dimensions (W x H x D)</b>	5.04 x 0.37 x 5.0 in (128 x 9.5 x 127 mm) without bezel
<b>Weight (max)</b>	Up to 0.31 lb (140g) without bezel
<b>Read Speeds</b>	DVD+R/-R/+RW/ -RW/+R DL /-R DL Up to 8X DVD-ROM Up to 8X CD-ROM, CD-R Up to 24X CD-RW Up to 24X
<b>Access time (typical reads, including settling)</b>	Random: DVD-ROM: 170 ms (typical), CD-ROM: 170 ms (typical) Full stroke: DVD-ROM: 320 ms (typical), CD-ROM: 320 ms (typical)
<b>Power</b>	Source Slimline SATA DC power receptacle DC Power Requirement 5 VDC ± 5%-100 mV ripple p-p DC Current 5 VDC (< 1000 mA typical, 1600 mA maximum)

## Technical Specifications – Storage

<b>Environmental conditions (operating - non-condensing)</b>	Temperature 41° to 122° F (5° to 50° C) Relative Humidity 10% to 80% Maximum Wet Bulb Temperature 84° F (29° C)
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### HP 9.5mm Slim DVD Writer Drive

<b>Height</b>	9.5 mm height
<b>Orientation</b>	Either horizontal or vertical
<b>Interface type</b>	SATA/ATAPI
<b>Disc recording capacity</b>	Up to 8.5 GB DL or 4.7 GB standard
<b>Dimensions (W x H x D)</b>	5.04 x 0.37 x 5.0 in (128 x 9.5 x 127 mm) without bezel
<b>Weight (max)</b>	0.31 lb (140 g)

<b>Write Speeds</b>	DVD-R DL - Up to 6X DVD+R - Up to 8X DVD+RW - Up to 8X DVD+R DL - Up to 6X DVD-R - Up to 8X DVD-RW - Up to 6X CD-R - Up to 24X CD-RW - Up to 10X
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<b>Read Speeds</b>	DVD-RW, DVD+RW - Up to 8X DVD-R DL, DVD+R DL - Up to 8X DVD+R, DVD-R - Up to 8X DVD-ROM DL, DVD-ROM - Up to 8X CD-ROM, CD-R - Up to 24X CD-RW - Up to 24X
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<b>Access time (typical reads, including settling)</b>	Random DVD-ROM: 170 ms (typical), CD-ROM: 170 ms (typical) Full Stroke DVD-ROM: 320 ms (typical), CD-ROM: 320 ms (typical) Stop Time 6 seconds (typical)
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<b>Power</b>	Source Slimline SATA DC power receptacle DC Power Requirement 5 VDC ± 5%-100 mV ripple p-p DC Current 5 VDC (< 1000 mA typical, 1600 mA maximum)
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<b>Environmental conditions (operating - non-condensing)</b>	Temperature 41° to 122° F (5° to 50° C) Relative Humidity 10% to 80% Maximum Wet Bulb Temperature 84° F (29° C)
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### HP 9.5mm Slim Blu-Ray Writer Drive

<b>Height</b>	9.5 mm height
<b>Orientation</b>	Either horizontal or vertical
<b>Interface type</b>	SATA/ATAPI
<b>Disc recording capacity</b>	Up to 128 GB QL, 100 GB TL, 50 GB DL or 25 GB standard SL
<b>Dimensions (W x H x D)</b>	5.04 x 0.37 x 5.0 in (128 x 9.5 x 127 mm) without bezel
<b>Weight (max)</b>	0.29 lb (132 g)
<b>Write Speeds</b>	BD-R SL/DL Up to 6X BD-R TL/QL Up to 4X BD-RE Up to 2X DVD-R Up to 8X DVD-RW Up to 6X DVD+R Up to 8X DVD+RW Up to 8X DVD-RAM Up to 5X CD-R Up to 24X

## Technical Specifications – Storage

CD-RW Up to 10X

### Read Speeds

BD-ROM Up to 6X

BD-R Up to 6X

BD-RE SL/DL Up to 6X

BD-RE TL Up to 4X

DVD-ROM Up to 8X

DVD-R Up to 8X

DVD-RW Up to 8X

DVD+R Up to 8X

DVD+RW Up to 8X

BDMV (AACs Compliant Disc)

Up to 6x/2x (Read/Play)

DVD-RAM Up to 5x

DVD-Video (CSS

Compliant Disc)

Up to 8x/4x (Read/Play)

CD-R/RW/ROM Up to 24x

CD-DA (DAE) Up to 24X/10X (Read/Play)

### Access time

(typical reads, including settling)

Random BD-ROM: 205 ms (typical), DVD-ROM: 185 ms (typical),

CD-ROM: 165 ms (typical)

Full Stroke BD-ROM: 350 ms (typical), DVD-ROM: 345 ms (typical),

CD-ROM: 340 ms (typical)

### Power

Source Slimline SATA DC power receptacle

DC Power Requirement 5 VDC  $\pm$  5%-100 mV ripple p-p

DC Current 5 VDC -1200 mA typical, 2000 mA maximum

### Environmental conditions

(operating - non-condensing)

Temperature 41° to 122° F (5° to 50° C)

Relative Humidity 10% to 80%

Maximum Wet Bulb Temperature 84° F (29° C)

## Technical Specifications – Networking and Communications

### NETWORKING AND COMMUNICATIONS

<b>Realtek RTL8111EPH 10/100/1000 Integrated NIC</b>	
<b>Connector</b>	RJ-45
<b>System Interface</b>	PCIe + SMBus
<b>Controller</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>Data rates supported</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>IEEE Compliance</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>Performance</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</b>	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
<b>MAC/PHY Interconnect</b>	Auto MDI/MDIX Crossover cable detection
<b>Management Interface</b>	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only)

<b>Intel® 9260 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 5.0 Combo<sup>1</sup> 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>	802.11b/g/n • 2.402 – 2.482 GHz 802.11a/n • 4.9 – 4.95 GHz (Japan) • 5.15 – 5.25 GHz • 5.25 – 5.35 GHz



### Technical Specifications – Networking and Communications

	<ul style="list-style-type: none"> <li>• 5.47 – 5.725 GHz</li> <li>• 5.825 – 5.850 GHz</li> </ul>
<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>• 802.11a: 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, 80MHz &amp; 160MHz)</li> </ul>
<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
<b>Security<sup>1</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 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%



### Technical Specifications – Networking and Communications

<b>Temperature</b>	Operating	14° to 158° F (–10° to 70° C)
	Non-operating	–40° to 176° F (–40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON	

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. 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>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>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)





## Technical Specifications – Networking and Communications

<b>Intel® 3168 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>	802.11b/g/n • 2.402 – 2.482 GHz 802.11a/n • 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>	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
<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> </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

## Technical Specifications – Networking and Communications

	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>	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON	
<p>1. Check latest software/driver release for updates on supported security features.                  2. Maximum output power may vary by country according to local regulations.                  3. 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).</p>		

<b>Intel® 2 7265 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 4.2 Combo<sup>1</sup> 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>	802.11b/g/n • 2.402 – 2.482 GHz 802.11a/n • 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>	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
<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> </ul>



## Technical Specifications – Networking and Communications

	• WAPI	
<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> </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>	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON	

1. Check latest software/driver release for updates on supported security features.

2. Maximum output power may vary by country according to local regulations.

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

<b>Realtek RTL8822CE Wi-Fi® 5 (2x2) and Bluetooth® 5 Combo</b>	
<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac



### Technical Specifications – Networking and Communications

	<ul style="list-style-type: none"> <li>IEEE 802.11d</li> <li>IEEE 802.11e</li> <li>IEEE 802.11h</li> <li>IEEE 802.11i</li> <li>IEEE 802.11k</li> <li>IEEE 802.11r</li> <li>IEEE 802.11v</li> </ul>
<b>Interoperability</b>	Wi-Fi® certified
<b>Frequency Band</b>	<ul style="list-style-type: none"> <li>802.11b/g/n                             <ul style="list-style-type: none"> <li>• 2.402 – 2.482 GHz</li> </ul> </li> <li>802.11a/n/ac                             <ul style="list-style-type: none"> <li>• 4.9 – 4.95 GHz (Japan)</li> <li>• 5.15 – 5.25 GHz</li> <li>• 5.25 – 5.35 GHz</li> <li>• 5.47 – 5.725 GHz</li> <li>• 5.825 – 5.850 GHz</li> </ul> </li> </ul>
<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 &amp; 80MHz)</li> </ul>
<b>Modulation</b>	<ul style="list-style-type: none"> <li>Direct Sequence Spread Spectrum</li> <li>BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</li> </ul>
<b>Security<sup>1</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>• WAPI</li> </ul>
<b>Network Architecture Models</b>	<ul style="list-style-type: none"> <li>Ad-hoc (Peer to Peer)</li> <li>Infrastructure (Access Point Required)</li> </ul>
<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 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/Modern Standby: 10mW</li> <li>• Radio disabled: 8 mW</li> </ul>
<b>Power Management</b>	<ul style="list-style-type: none"> <li>ACPI and PCI Express compliant power management</li> <li>802.11 compliant power saving mode</li> </ul>
<b>Receiver Sensitivity<sup>3</sup></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> </ul>



### Technical Specifications – Networking and Communications

	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 with CNVi Interface	
<b>Dimensions</b>	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
<b>Weight</b>	1. Type 2230 : 2.8g 2. Type 126: 1.3g	
<b>Operating Voltage</b>	3.3v +/- 9%	
<b>Temperature</b>	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON	
<p>1. Check latest software/driver release for updates on supported security features.                  2. Maximum output power may vary by country according to local regulations.                  3. 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).</p>		
<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	
<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	

## Technical Specifications – Networking and Communications

	<p>LE L2CAP Connection Oriented Channels          Train Nudging &amp; 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)</p>
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<b>Intel® 3168 802.11a/b/g/n/ac (1x1) WiFi® and Bluetooth® 4.2 Combo<sup>1</sup></b>	
<b>Wireless LAN Standards</b>	<p>IEEE 802.11a          IEEE 802.11b          IEEE 802.11g          IEEE 802.11n          IEEE 802.11ac</p>
<b>Interoperability</b>	Wi-Fi® certified
<b>Frequency Band</b>	<p>802.11b/g/n          • 2.402 – 2.482 GHz          802.11a/n          • 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</p>
<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>	<p>Direct Sequence Spread Spectrum          BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</p>
<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>	<p>Ad-hoc (Peer to Peer)          Infrastructure (Access Point Required)</p>
<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> </ul>



### Technical Specifications – Networking and Communications

	• 802.11ac VHT80(5GHz) : +11.5dBm minimum	
<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>	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON	
1. Check latest software/driver release for updates on supported security features. 2. Maximum output power may vary by country according to local regulations. 3. 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).		

## Technical Specifications – Networking and Communications

<b>Intel® 2 7265 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 4.2 Combo<sup>1</sup> 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>	802.11b/g/n • 2.402 – 2.482 GHz 802.11a/n • 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>	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
<b>Security<sup>3</sup></b>	• IEEE and Wi-Fi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
<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>	• 802.11b : +18.5dBm minimum • 802.11g : +17.5dBm minimum • 802.11a : +18.5dBm minimum • 802.11n HT20(2.4GHz) : +15.5dBm minimum • 802.11n HT40(2.4GHz) : +14.5dBm minimum • 802.11n HT20(5GHz) : +15.5dBm minimum • 802.11n HT40(5GHz) : +14.5dBm minimum • 802.11ac VHT80(5GHz) : +11.5dBm minimum
<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 10mW • Radio disabled 8 mW
<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





## Technical Specifications – Networking and Communications

	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>	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF; LED White – Radio ON	
<p>1. Check latest software/driver release for updates on supported security features.                  2. Maximum output power may vary by country according to local regulations.                  3. 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).</p>		
<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>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	



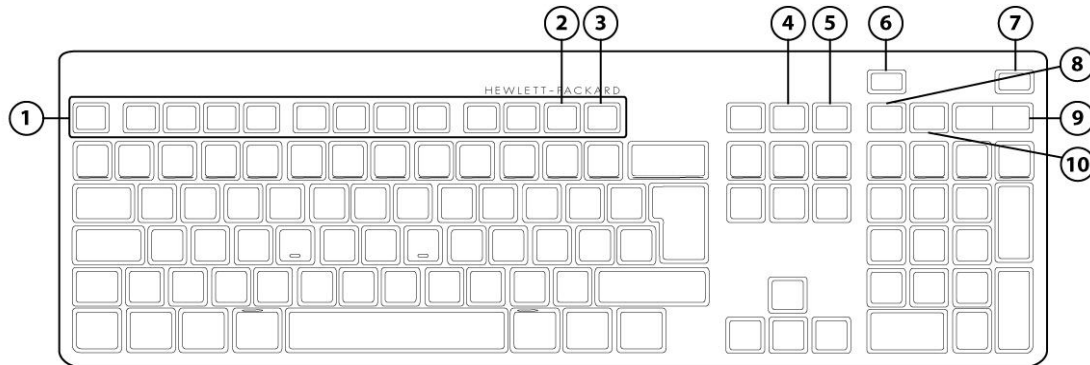
## Technical Specifications – Networking and Communications

	<ul style="list-style-type: none"><li>BT4.2 ESR08 Compliance</li><li>LE Secure Connection- Basic/Full</li><li>LE Privacy 1.2 –Link Layer Privacy</li><li>LE Privacy 1.2 –Extended Scanner Filter Policies</li><li>LE Data Packet Length Extension</li><li>FAX Profile (FAX)</li><li>Basic Imaging Profile (BIP)2</li><li>Headset Profile (HSP)</li><li>Hands Free Profile (HFP)</li><li>Advanced Audio Distribution Profile (A2DP)</li></ul>
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## Technical Specifications – Input/Output Devices

### I/O DEVICES

#### HP Conferencing Keyboard



- |    |  |     |                    |
|----|--|-----|--------------------|
| 1. | Function Keys  | 6.  | End/Decline a Call |
| 2. | F11 Lync or Skype for Business Contact list <sup>1</sup> | 7.  | Answer a Call      |
| 3. | F12 Lync or Skype for Business Calendar <sup>2</sup>     | 8.  | Microphone Mute    |
| 4. | Share Screen   | 9.  | Volume Up/Down     |
| 5. | Stop Webcam  | 10. | Audio Mute         |

1. Microsoft Lync 2013, or Skype for Business, or Microsoft Outlook 2013 Contact list

2. Microsoft Lync 2013, or Skype for Business, or Microsoft Outlook 2013 Calendar

#### HP USB Premium Keyboard

	Keys	104, 105 layout (depending upon country)
<b>Physical Characteristics</b>	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
<b>Mechanical</b>	Keycaps	Low-profile design
	Switch actuation	60±10g nominal peak force with tactile feedback
	Switch life	10 million keystrokes (Life tester)
	Switch type	Contamination-resistant switch membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	6 ft (1.8 m)
<b>Environmental</b>	Acoustics	43-dBA maximum sound pressure level

### Technical Specifications – Input/Output Devices

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
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

### Skylab USB Wired Keyboard

<b>Physical Characteristics</b>	Keys	104, 105, 106, 107, 109 layout (depending upon country)
	Dimensions (L x W x H)	171.97 x 68.35 x 8.27 in (436.8± 1.5 x 137.6± 1.0 x 21.0± 1.0 cm)
	Weight	1.32 lb (0.6± 0.08 kg)
	Operating voltage	4.4-5.25VDC
<b>Electrical</b>	Power consumption	50-mA maximum (with 5 VDC power supplied and three LEDs ON)
	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
<b>Mechanical</b>	Keycaps	Low-profile design
	Switch actuation	60±10g nominal peak force with tactile feedback
	Switch life	10 million keystrokes (Life tester)
	Switch type	Contamination-resistant switch membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	6 ft (1.8 m)
<b>Environmental</b>	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	Minus 30 degress to 60 degress Celsius

### Technical Specifications – Input/Output Devices

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
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

ANSI HFS 100, ISO 9241-4, and TUVGS

#### Kit contents

Keyboard, Installation Guide, Warranty card, Safety and Comfort Guide

### HP USB Premium Mouse

#### Dimensions (H x L x W)

4.21 x 2.64 x 1.52 in (107 x 67 x 38.7 mm)

#### Weight

0.19lb (90g)

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)

#### Environmental

Operating shock

50 g, 6 surfaces

Non-operating shock

80 g, 6 surfaces

Operating vibration

2 g peak acceleration

Non-operating vibration

4 g peak acceleration

Operating voltage

5 VDC, +/-5%

#### Electrical

Power consumption

12mA

Connector

USB 2.0

#### Mechanical

Type

3D mouse (3 keys and wheel)

Resolution

800, 1200, 1600 DPI

Sensor

Pixart PAN3606DL

Tracking acceleration

8G(max), 1G=9.8m/s<sup>2</sup>

#### Tracking speed

Cable length

6 ft (1.8 m)

Color

Jack Black

#### Regulatory approvals

Compliant

UL, FCC, CE Mark, TUV GS, VCCI, BSMI, C-Tick, KC

### Technical Specifications – Input/Output Devices

#### HP USB Mouse

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

### Technical Specifications – Audio/Multimedia

#### AUDIO/MULTIMEDIA

##### HP EliteDesk 705 G5 Small Form Factor Business PC

<b>Type</b>	Integrated
<b>HD Stereo Codec</b>	Conexant Zuma CX20632
<b>Audio I/O Ports</b>	Front: 1 - Headset connector supports a CTIA style headset and is re-taskable as a Line-in, Line-out, Microphone-in or Headphone-out port 1 - Headphone port Rear: Line-out Line-in which is retaskable as a Microphone Input All ports are 3.5mm and support stereo
<b>Internal Speaker Amplifier</b>	2W class D mono amplifier for the internal speaker only. External speakers must be powered externally
<b>Multi-streaming Capable</b>	Playback multi-streaming allows for independent audio streams to be sent to/from the front and rear jacks or integrated speaker
<b>Sampling</b>	Independent sampling rates for DAC's and ADC's; supports resolutions from 16 to 24-bit; 44.1 kHz to 192 kHz for DAC and 44.1 kHz to 96 kHz for ADC
<b>Wavetable Synthesis</b>	Yes - Uses OS soft wavetable
<b>Analog Audio</b>	Yes
<b># of Channels on Line-Out</b>	Stereo (Left & Right channels)
<b>Internal Speaker</b>	Yes

##### HP EliteDesk 705 G5 Desktop Mini Business PC

<b>Type</b>	Integrated
<b>HD Stereo Codec</b>	Conexant Zuma CX20632
<b>Audio I/O Ports</b>	Front: 1 - Headset connector supports a CTIA style headset and is re-taskable as a Line-in, Line-out, Microphone-in or Headphone-out port 1 - Headphone port All ports are 3.5mm and support stereo
<b>Internal Speaker Amplifier</b>	2W class D mono amplifier for the internal speaker only. External speakers must be powered externally
<b>Multi-streaming Capable</b>	Playback multi-streaming allows for independent audio streams to be sent to/from the front and rear jacks or integrated speaker
<b>Sampling</b>	Independent sampling rates for DAC's and ADC's; supports resolutions from 16 to 24-bit; 44.1 kHz to 192 kHz for DAC and 44.1 kHz to 96 kHz for ADC
<b>Wavetable Synthesis</b>	Yes - Uses OS soft wavetable
<b>Analog Audio</b>	Yes
<b># of Channels on Line-Out</b>	Stereo (Left & Right channels)
<b>Internal Speaker</b>	Yes

### Technical Specifications – Power

#### POWER

##### HP EliteDesk 705 G5 Small Form Factor Business PC

###### UNIT ENVIRONMENT AND OPERATING CONDITIONS

Temperature Range	Operating : 5°C ~50°C Non-Operating : -40°C ~66°C
Relative Humidity	Operating 5% to 90% relative humidity at max inlet temperature Non-Operating 5% to 90% relative humidity at max inlet temperature
Maximum Altitude (unpressurized)	Operating: 5000m Non-operating: 50,000 ft (15240 m)

##### HP EliteDesk 705 G5 Desktop Mini Business PC

###### UNIT ENVIRONMENT AND OPERATING CONDITIONS

Temperature Range	Operating : 5°C ~35°C Non-Operating : -40°C ~66°C
Relative Humidity	Operating 5% to 90% relative humidity at max inlet temperature Non-Operating 5% to 90% relative humidity at max inlet temperature
Maximum Altitude (unpressurized)	Operating: 5000m Non-operating: 50,000 ft (15240 m)

	DM	SFF
<b>80 PLUS Platinum</b>		180W active PFC 90/92/89% efficient at 20/50/100% load (115V) 91/93/90% efficient at 20/50/100% load (230V)
<b>Operating Voltage Range</b>	90Vac~264Vac	90Vac~264Vac
<b>Rated Voltage Range</b>	100Vac~240Vac	100Vac~240Vac
<b>Rated Line Frequency</b>	50HZ~60HZ	50HZ~60HZ
<b>Operating Line Frequency</b>	47HZ~63HZ	47HZ~63HZ
<b>Rated Input Current</b>	65W ≤ 1.6A 90W ≤ 1.2A 150WW ≤ 2.2A	180W ≤ 2.3A
<b>Rated Input Current with Energy Efficient* Power Supply</b>	65W ≤ 1.6A 90W ≤ 1.2A 150WW ≤ 2.2A	180W ≤ 2.3A
<b>DC Output</b>	+19.5V	+12V
<b>Current Leakage (NFPA 99: 2102)</b>	Less than 500 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 500 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.



### Technical Specifications – Power

	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.	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.
<b>Power Supply Fan</b>	N/A	50mm variable speed
<b>Power cord length</b>	6.0 ft. (1.83 m)	6.0 ft. (1.83 m)
<b>External Power Adapter</b>	External power supply 65W EPS, 88% average efficiency at 115V & 89% at 230Vac 90W EPS, 88% average efficiency at 115V & 89% at 230Vac 150W EPS, 88% average efficiency at 115V & 89% at 230Vac	Internal power supply
<b>Dimensions</b>	65W : 113.5mm x 55mm x 30mm 90W : 132.5mm x 57mm x 30.3mm 150W : 167.5mm x 80mm x 40.5mm	200mm x 85mm x 53mm

The harmonic input current requirements must be met under the following operating conditions:

Load Requirements: 50% and 100%

Input Voltage: 230Vac/50Hz.

For active power factor correction the power factor at 50% & 100% loads shall be greater than 0.9 over the entire nominal input voltage range (100-127VAC and 200-240VAC).

Condition	Standard Efficiency	82/85/82%	85/88/85%	87/90/87%	90/92/89%	Input Voltage
10% of Rated Load	-	75%	81%	84%	84%	115Vac/60HZ
20% of Rated Load	-	82%	85%	87%	90%	115Vac/60HZ
50% of Rated Load	-	85%	88%	90%	92%	115Vac/60HZ
	PF>0.9	PF>0.9	PF>0.9	PF>0.9	PF>0.95	
100% of Rated Load	70%	82%	85%	87%	89%	115Vac/60HZ
	PF>0.9	PF>0.9	PF>0.9	PF>0.9	PF>0.9	230Vac/50HZ

### Technical Specifications – Weights and Dimensions

#### WEIGHTS & DIMENSIONS

	<b>DM</b>	<b>SFF</b>
<b>Chassis (W x D x H) Not including bezel</b>	6.97 x 6.89 x 1.35 in 177 x 175 x 34.2mm	10.6 x 11.7 x 3.7 in 270 x 296 x 95 mm
<b>System Volume</b>	64 cu in 1.05 L	463 cu in 7.6 L
<b>Max System Weight</b>	1.265kg	5.88 KG
<b>Max Supported Weight (desktop orientation)</b>	0	77 lb 35kg
<b>Stand Dimensions</b>	160x117x18.5mm	
<b>Packaging (W x D x H)</b>	19.57 x 5.04 x 8.78 in 497 x 128 x 223 mm	15.71 x 9.06 x 19.65 in 399 x 230 x 499 mm
<b>Shipping Weight</b>	2.95 kg 6.49 lb	16.12 lb. 7.32 kg
<b>Shipping Weight (Molded Pulp)</b>		16.62 lb 7.54kg
<b>Multipack Packaging (10 units)</b>	20.28x16.54x25 in 515x420x636 mm	
<b>Palletization Profile</b>	18-units per layer 5 or 6 layers max depending on details of air freight 90 or 108 units per pallet depending on details of air freight 45.354 x 39.13 x 57.80 in, 1152 x 994 x 1468 mm (include pallet)	6-units per layer 60 per pallet 47.24 x 39.37 x 94.49 in (including pallet) 10 layer max

## Technical Specifications – Miscellaneous Features

### MISCELLANEOUS FEATURES

#### Management Features

- Advanced Configuration and Power Management Interface (ACPI). Allows the system to wake from a low power mode. Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.
- Dual State Power Button; acts as both an on/off button and a suspend-to-sleep button

#### Serviceability Features

- Dual colored power LED on front of computer to indicate either normal or fault condition
- System/Emergency ROM
- Flash ROM
- CMOS Battery Holder for easy replacement
- Flash Recovery with Video Configuration Record Software
- 5 Aux Power LED on System PCA
- Processor ZIF Socket for easy Upgrade
- Over-Temp Warning on Screen (Requires IM Agents)
- Clear Password Jumper
- DIMM Connectors for easy Upgrade
- Clear CMOS Button
- NIC LEDs (integrated) (Green & Amber)
- Dual Color Power and HD LED - To Indicate Normal Operations and Fault Conditions
- Color coordinated cables and connectors
- Tool-less Hood Removal
- Front power switch
- System memory can be upgraded without removing the system board or any internal components
- Tool-less Hard Drive, CD & Diskette Removal
- Green Pull Tabs, and Quick Release Latches for easy Identification

#### Additional Features

- Product can be oriented as either a desktop (horizontal) or a tower (vertical)

After Market Options

## AFTER MARKET OPTIONS

<b>Graphics Solutions</b>	<b>DM</b>	<b>SFF</b>	<b>Part Number</b>
AMD® Radeon™ R7 430 2GB Display Port VGA 64bit Card <sup>1</sup>		X	5JW81AA
AMD® Radeon™ RX550X 4GB Display Port Card		X	5LH79AA
NVIDIA GeForce GT730 DP 2GB PCIe x8 GFX		X	Z9H51AA
HP DisplayPort™ To HDMI True 4k Adapter	X	X	2JA63AA
HP DVI Cable Kit		X	DC198A
HP HDMI Standard Cable Kit	X	X	T6F94AA
HP DisplayPort™ Cable Kit	X	X	VN567AA
HP DisplayPort™ To DVI-D Adapter	X	X	FH973AA
HP DisplayPort™ To VGA Adapter	X	X	AS615AA

<sup>1</sup>.Not available in all regions

<b>Desktop Mini Accessories</b>	<b>DM</b>	<b>SFF</b>	<b>Part Number</b>
HP Desktop Mini Port Cover Kit	X		1ZE52AA
HP Mini 2.5-inch SATA Drive Bay Kit	X		3TK91AA
HP Desktop Mini LockBox V2 <sup>1</sup>	X		3EJ57AA
HP Desktop Mini DVD-Writer ODD Expansion Module	X (Either one)		K9Q83AA
HP Desktop Mini I/O Expansion Module			K9Q84AA
HP Desktop Mini Security/Dual VESA Sleeve v2 <sup>1</sup>	X		2JA32AA
HP Desktop Mini Security/Dual VESA Sleeve v2 with Power Supply Holder <sup>1</sup>	X		7DB36AA
HP B300 PC Mounting Bracket	X		2DW53AA
HP B300 PC Mounting Bracket with Power Supply Holder	X		7DB37AA
HP B500 PC Mounting Bracket	X		2DW52AA
HP Desktop Mini Vertical Chassis Stand	X		G1K23AA
HP DM VESA Power Supply Holder Kit v2	X		7DB38AA
HP Quick Release Bracket 2	X		6KD15AA
HP Single Monitor Arm	X		BT861AA

<sup>1</sup>.Not available in all regions

<b>Data Storage Drives</b>	<b>DM</b>	<b>SFF</b>	<b>Part Number</b>
HP 256GB SATA TLC Non-SED Solid State Drive	X	X	P1N68AA
HP PCIe NVME TLC 256GB SSD M.2 Drive	X	X	1CA51AA
HP PCIe NVME TLC 512GB SSD M.2 Drive	X	X	X8U75AA
HP 500GB 7200PRM SATA 6.0Gb/s 3.5" Hard Drive		X	QK554AA
HP 1TB 7200rpm SATA 6Gb/s 3.5" Hard Drive		X	QK555AA
HP 9.5mm Slim Removable SATA 500GB		X	T7G14AA



### After Market Options

<b>Input Devices</b>	<b>DM</b>	<b>SFF</b>	<b>Part Number</b>
HP USB (Grey) SmartCard CCID Keyboard		X	J7H70AA
HP USB Antimicrobial Business Slim Keyboard and Mouse (China Only)		X	Z9H50AA
HP USB Business Slim CCID SmartCard Keyboard		X	Z9H48AA
HP USB Business Slim (Grey) Keyboard (EMEA Only)		X	Z9H49AA
HP USB Business Slim Keyboard	X	X	N3R87AA
HP USB Business Slim Keyboard and Mouse and Mousepad	X	X	T4E63AA
HP USB Collaboration Keyboard	X	X	Z9N38AA
HP USB Conferencing Keyboard		X	K8P74AA
HP USB Keyboard	X	X	QY776AA
HP USB Keyboard and Mouse Healthcare Edition			1VD81AA
HP USB Premium Keyboard	X	X	Z9N40AA
HP USB PS/2 Washable Keyboard & Mouse	X	X	BU207AA
HP Wireless Business Slim Keyboard and Mouse	X	X	N3R88AA
HP Wireless Collaboration Keyboard	X	X	Z9N39AA
HP Wireless Premium Keyboard	X	X	Z9N41AA
HP PS/2 Business Slim Keyboard	X	X	N3R86AA
HP USB Grey v2 Mouse (EMEA only)		X	Z9H74AA
HP USB Premium Mouse		X	1JR32AA
HP PS/2 Mouse	X	X	QY775AA
HP USB 1000dpi Laser Mouse	X	X	QY778AA
HP USB Hardened Mouse		X	P1N77AA
HP USB Mouse	X	X	QY777AA

<b>System Memory</b>	<b>DM</b>	<b>SFF</b>	<b>Part Number</b>
HP 4GB DDR4-2666 DIMM		X	3TK85AA
HP 8GB DDR4-2666 DIMM		X	3TK87AA
HP 16GB DDR4-2666 DIMM		X	3TK83AA
HP 4GB DDR4-2666 SODIMM	X		3TK86AA
HP 8GB DDR4-2666 SODIMM	X		3TK88AA
HP 16GB DDR4-2666 SODIMM	X		3TK84AA

<b>Multimedia Devices</b>	<b>DM</b>	<b>SFF</b>	<b>Part Number</b>
HP Business Headset v2	X	X	T4E61AA
HP USB Business Speakers v2	X	X	N3R89AA

<b>Security Devices</b>	<b>DM</b>	<b>SFF</b>	<b>Part Number</b>
HP Solenoid Lock & Hood Sensor (MT)			J6L42AA
HP Business PC Security Lock v3 Kit		X	3XJ17AA
HP Dual Head Keyed Cable Lock		X	T1A64AA



## After Market Options

HP Keyed Cable Lock 10mm	<b>X</b>	<b>X</b>	T1A62AA
HP Master Keyed Cable Lock 10mm	<b>X</b>	<b>X</b>	T1A63AA

<b>I/O Devices</b>	<b>DM</b>	<b>SFF</b>	<b>Part Number</b>
HP DisplayPort™ Port Flex IO	<b>X</b> <sup>1</sup>	<b>X</b>	3TK72AA
HP HDMI Port Flex IO	<b>X</b> <sup>1</sup>	<b>X</b>	3TK74AA
HP Type-C™ USB 3.1 Gen2 Port Flex IO	<b>X</b> <sup>1</sup>	<b>X</b>	3TK78AA
HP VGA Port Flex IO	<b>X</b> <sup>1</sup>	<b>X</b>	3TK80AA
HP Serial Port Flex IO	<b>X</b> <sup>1</sup>	<b>X</b>	3TK76AA
HP Internal Serial Port (in rear wall)		<b>X</b>	3TK81AA
HP PCIe x1 Parallel Port PCIe Card		<b>X</b>	N1M40AA
HP Serial/ PS/2 Adapter (occupies PCIe slot)		<b>X</b>	1VD82AA

<sup>1</sup>.Not available in all regions

**NOTE:** For more detail on HP I/O Devices please refer to the [HP FLEX IO Option Cards QuickSpecs](http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c06042607). URL is:  
<http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c06042607>

