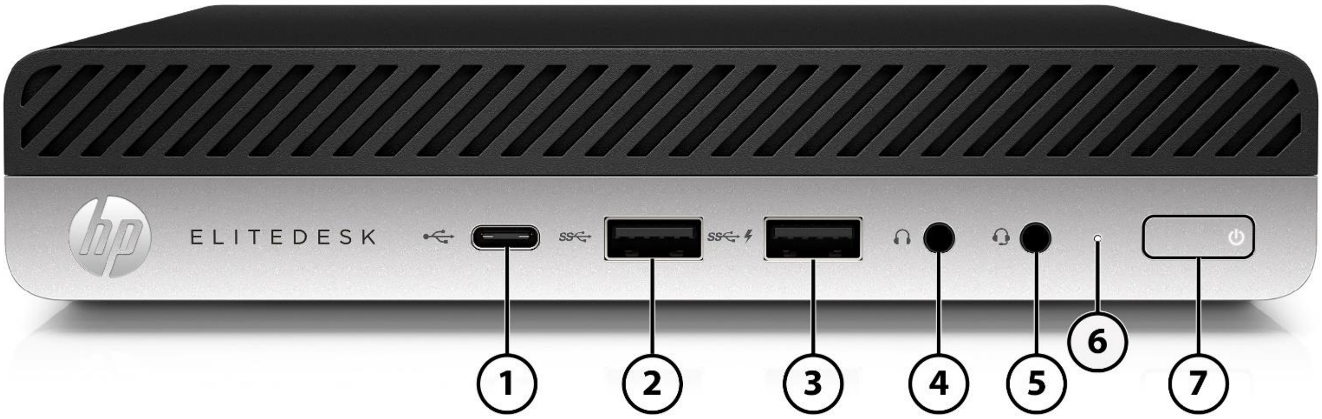
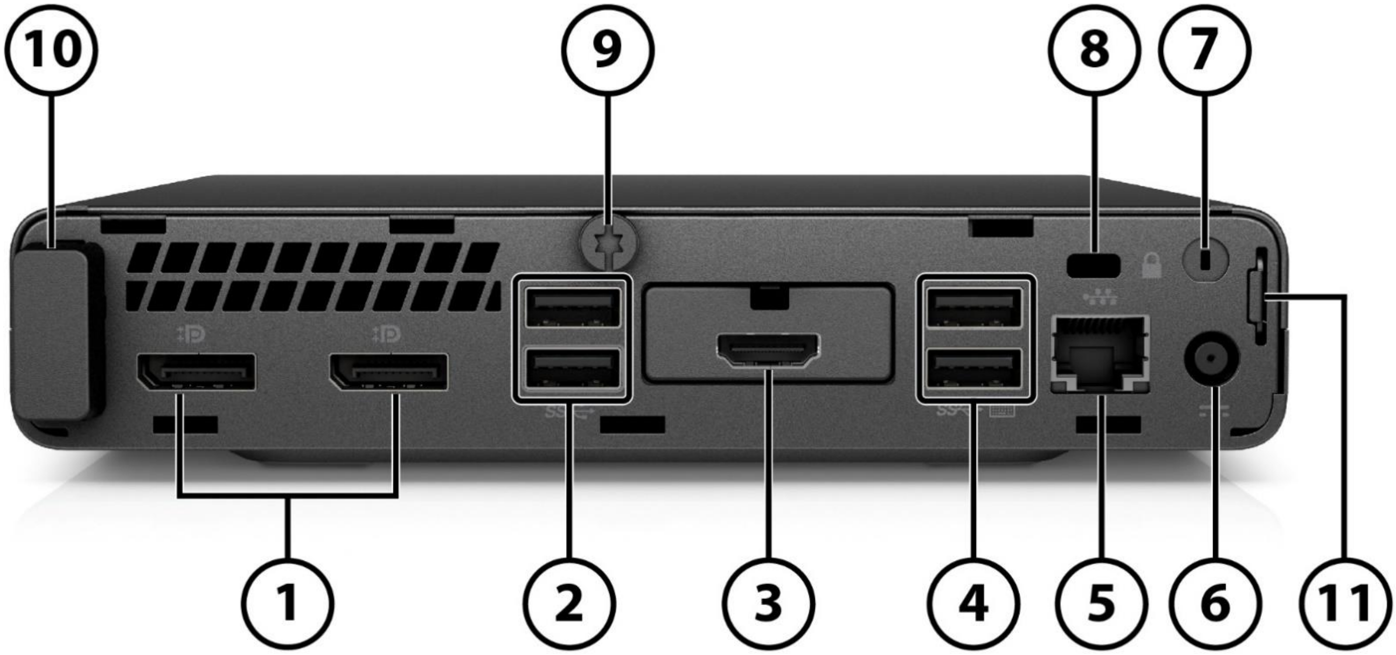
HP EliteDesk 705 G4 Desktop Mini Business PC



1. USB Type-C™ (charge support up to 5V/3A)
2. USB 3.1 Gen 1 Type A
3. USB 3.1 Gen 1 Type A (charge support up to 5V/1.5A)
4. Headset Connector
5. Universal Audio Jack with CTIA headset support
6. Hard Drive activity light
7. Dual-state power button

HP EliteDesk 705 G4 Desktop Mini Business PC

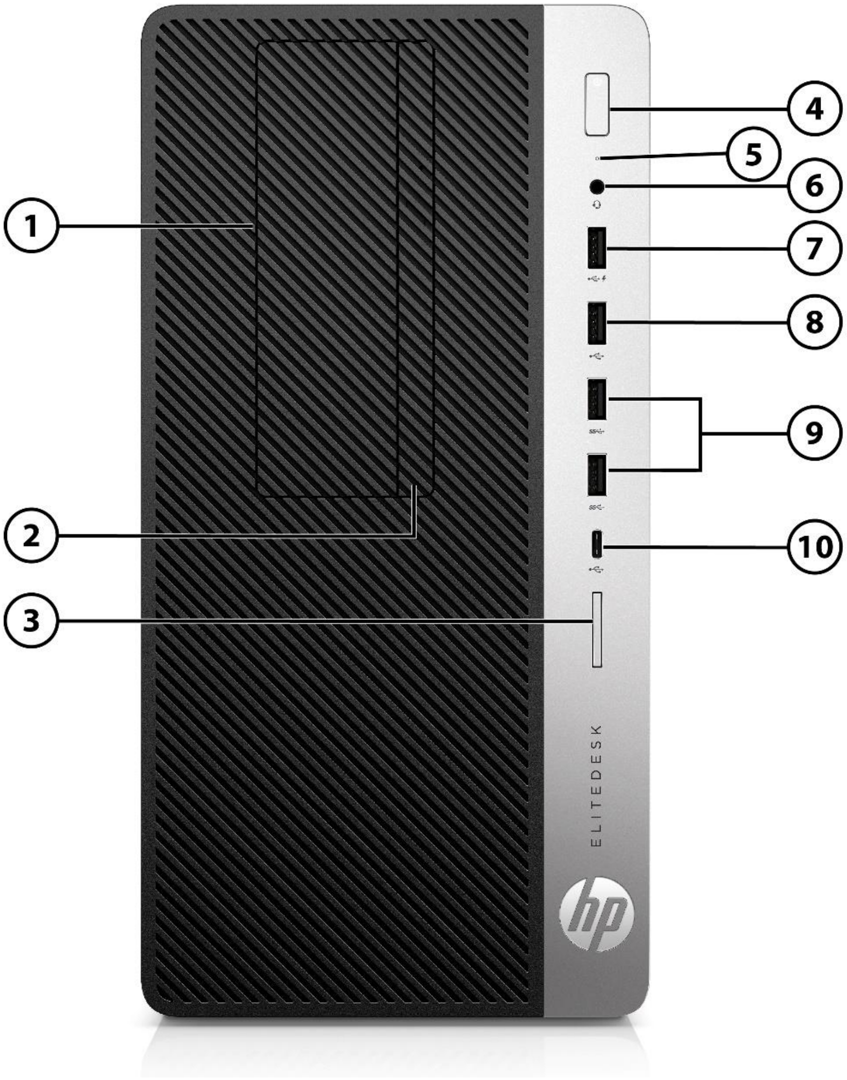


1. DisplayPort™ 1.2
2. USB 3.1 Gen 1 Type A
3. Configurable Option card slot (Choice of DisplayPort™ 1.2, HDMI™ 2.0, VGA, USB Type-C™ with alt mode display, Discrete Graphics Option Card with DisplayPort™ 1.4) (Availability depends on model)
4. USB 3.1 Gen 1 Type A
   allows for wake from S4 with keyboard/mouse when connected and enabled in BIOS
5. RJ-45 Network Adapter
6. Power connector
7. WLAN External Antenna Punchout
8. Standard lock slot (10 mm)
9. Cover Release Thumbscrew
10. WLAN Internal Antenna
11. Padlock Loop

Not Shown

Slots	(1) Internal M.2 2230 connector for WLAN (1) Internal M.2 SSD storage (2230 or 2280 connector)
Bays	(1) 2.5- inch SATA drive Bay
Mounting	Support for - VESA 100 mounting system on bottom of PC chassis - VESA Sleeve - Quick Release Bracket - B300/B500 Mounting bracket - 100mm VESA Plate Integrated

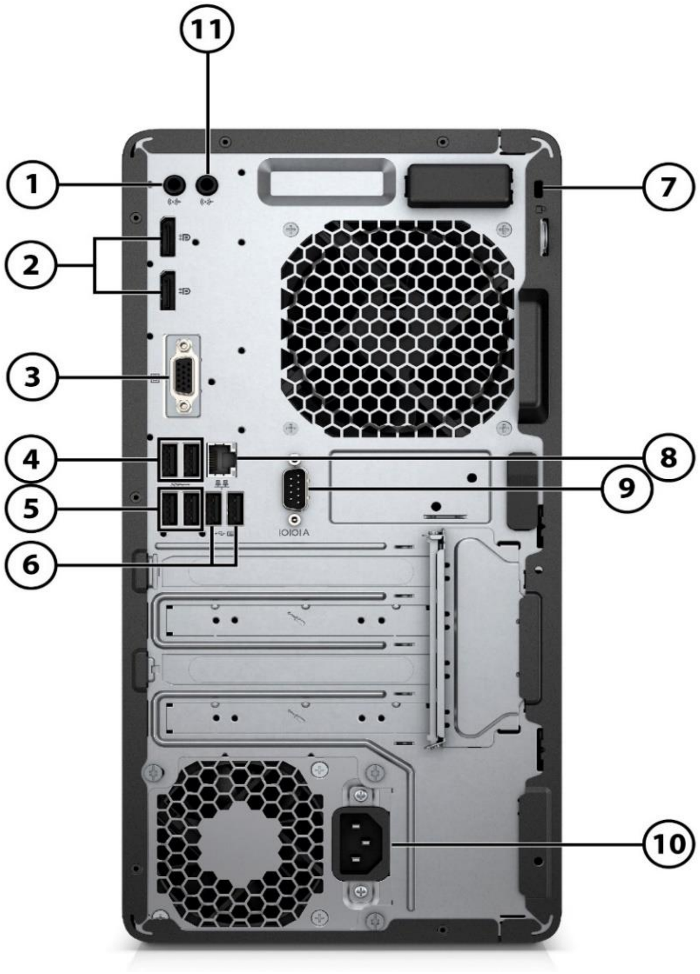
HP EliteDesk 705 G4 Microtower



1. 5.25-inch Half-Height Drive Bay (behind bezel)
2. Slim optical drive (optional)
3. SD 4 Card Reader (optional)
4. Dual-state power button
5. Hard Drive activity light
6. Universal Audio Jack with CTIA headset support
7. USB 2.0 port (charge support up to 5V/1.5A)
8. USB 2.0 port
9. USB 3.1 Gen 1 ports (2)
10. USB Type-C™ port (charge support up to 5V/3A)

Overview

HP EliteDesk 705 G4 Microtower



1. Audio-out jack for powered audio devices
2. Dual-Mode DisplayPort™ 1.2 (2)
3. Optional port (DisplayPort™ 1.2, HDMI, VGA or USB Type-C™) (USB-C™ option has alt mode DisplayPort™ 1.2 or 15W output) - shown here with VGA port installed
4. USB 3.1 Gen1 ports (2)
5. USB 2.0 ports (2)
6. USB 2.0 ports with wake from S4 (2)
7. Standard lock slot
8. RJ-45 Network Adapter
9. Optional serial port - shown here installed
10. Power connector
11. Audio-in

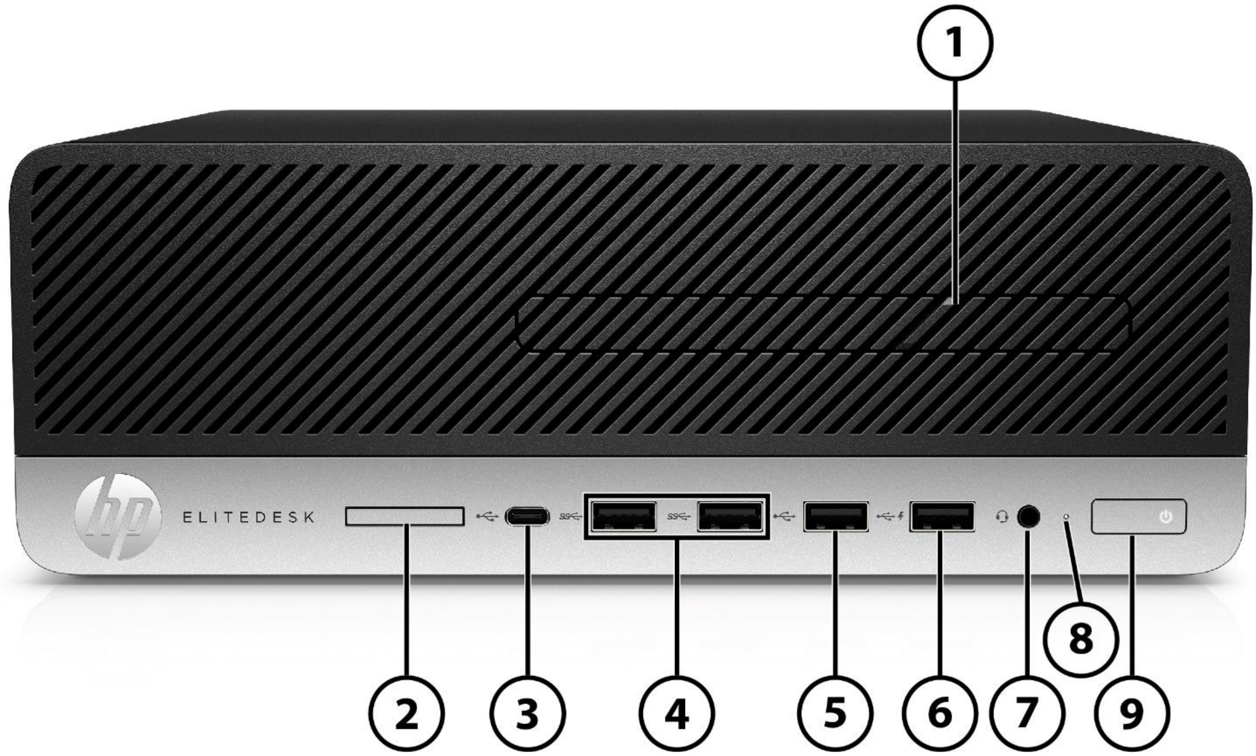
Not shown

Slots
(1) PCI Express x16 graphics connectors
(3) PCI Express x1
(1) internal M.2 SSD storage (2230 or 2280 connector)
(1) internal M.2 WLAN (2230 connector)

Bays
(2) 2.5" internal storage drive bay
(1) 3.5” internal storage drive bay (convertible to 2.5”)
(1) 9.5mm slim optical drive bay
(1) 5.25" external half-height drive bay

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

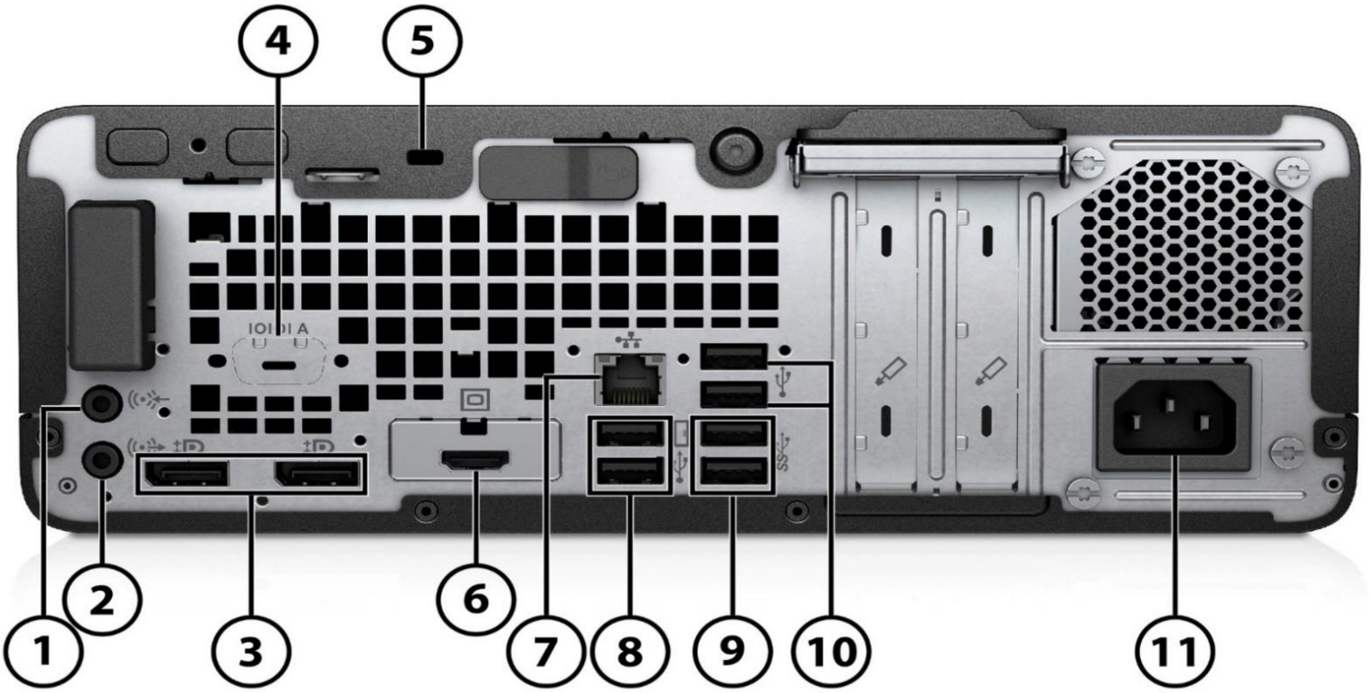
HP EliteDesk 705 G4 Small Form Factor Business PC



1. 9.5mm slim optical drive (optional)
2. SD 4 card reader (optional)
3. USB Type-C™ (charge support up to 5V/3A)
4. USB 3.1 Gen 1 ports (2)
5. USB 2.0 port
6. USB 2.0 port (charge support up to 5V/1.5A)
7. Universal Audio Jack with CTIA headset support
8. Hard Drive activity light
9. Dual-state power button

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

HP EliteDesk 705 G4 Small Form Factor Business PC



1. Audio-in connector
2. Audio-out connector for powered audio devices
3. Dual-Mode DisplayPort™ 1.2 (2)
4. Serial Port - shown here not installed
5. Standard lock slot
6. Optional port (DisplayPort™ 1.2, HDMI, VGA or USB Type-C™) (USB-C™ option has alt mode DisplayPort™ 1.2 or 15W output) - shown here with HDMI port installed
7. RJ-45 Network Adapter
8. USB 2.0 ports with wake from S4 (2)
9. USB 3.1 Gen 1 (2
10. USB 2.0 (2)
11. Power connector

Not shown

Slots

(1) PCI Express x16 graphics connectors
(1) PCI Express x1
(1) internal M.2 SSD storage (2230 or 2280 connector)
(1) internal M.2 WLAN (2230 connector)

Bays

(1) 3.5” internal storage drive bay (convertible to two 2.5”[1])
(1) 9.5mm slim optical drive bay

[1] SFF can be configured with either (1) 3.5” or (2) 2.5” internal storage drive (2.5-inch drive needs adapter that can only be purchased when configuring the PC from factory with a 2.5” drive)

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

AT A GLANCE

- Choice of three form factors: Microtower, Small Form Factor and Desktop Mini
- Latest AMD® Ryzen™ PRO and Athlon PRO Processor with Radeon™ Vega Graphics[1]
- 7th generation of AMD® Pro A-Series APU
- DDR4 Synchronous Dynamic Random Access Memory (SDRAM) (Transfer rates up to 2933 MT/s)[1]
- Processor support up to 65W on DM; up to 95W on MT/SFF
- Integrated AMD® Radeon™ Vega Graphics (AMD® Radeon™ on 7th gen) and optional Radeon™ RX discrete graphics
- Support for up to three monitors via two standard DisplayPort™ 1.2 connectors with multi-stream[2] and an optional third video port connector which provides the following choices: HDMI, VGA, DisplayPort™ 1.2, or USB Type-C™ with DisplayPort™ 1.2 for all platforms; USB Type-C™ with DisplayPort™ 1.2 for 705 G4 DM 35W (see Ports section for port availability by platform)
- Selection of discrete graphic cards to configure systems to up to 7 displays (MT, SFF and DM 35W)
- AMD® Radeon™ discrete graphics enabling viewing immersive VR
- MT and SFF models can be configured with dual data drives in a RAID (limited configurations)
- Industry-standard AMD® DASH manageability
- HP Sure Click
- HP Sure Start Gen4
- HP Sure Run
- HP Sure Recover
- HP BIOSphere Gen4
- HP Client Security Manager Gen4
- 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[4]. 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[3]
- Arsenic-free
- Dust filter available (MT, SFF and DM 35W)
- Lengthy purchase lifecycles and image stability
- 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 Conexant 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. DisplayPort™ multi-stream monitors 'daisy-chained' together.
3. External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be low halogen.
4. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit www.epeat.net for more information

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 G4 Microtower Business PC
HP EliteDesk 705 G4 Small Form Factor Business PC
HP EliteDesk 705 G4 Desktop Mini Business PC

OPERATING SYSTEM

Preinstalled	Windows® 10 Pro 64[1] Windows® 10 Pro 64 (National Academic License)[2] Windows® 10 Home 64[1] Windows® 10 Home Single Language 64[1] FreeDos
Web-supported only	Windows® 7 64 bit Windows 10 Enterprise 64

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

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

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

CHIPSET

	DM	SFF	MT
AMD® B350 FCH	X	X	X

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

PROCESSORS

AMD® Ryzen™ with AMD®Radeon™ Vega Graphics APU and CPU*	**DM**	**SFF**	**MT**
AMD Ryzen™ 7 PRO 2700X CPU* (4.1 GHz Max Boost, 3.6 GHz base frequency, 20 MB, 95W, Eight-Core)		X	X
AMD Ryzen™ 7 PRO 2700 CPU* (4.1 GHz Max Boost, 3.2 GHz base frequency, 20 MB, 65W, Eight-Core)		X	X
AMD Ryzen™ 5 PRO 2600 CPU* (3.9 GHz Max Boost, 3.4 GHz base frequency, 19 MB, 65W, Six-Core)		X	X
AMD® Ryzen™ 5 PRO 2400G APU with AMD®Radeon™ Vega Graphics (3.9 GHz Max boost, 3.6 GHz base frequency, 6MB, 65W, Quad Core)	X	X	X
AMD® Ryzen™ 5 PRO 2400GE APU with AMD®Radeon™ Vega Graphics (3.8 GHz Max boost, 3.2 GHz base frequency, 6MB, 35W, Quad Core)	X		
AMD® Ryzen™ 3 PRO 2200G APU with AMD®Radeon™ Vega Graphics (3.7 GHz Max boost, 3.5 GHz base frequency, 6MB, 65W, Quad Core)	X	X	X
AMD® Ryzen™ 3 PRO 2200GE APU AMD®Radeon™ Vega Graphics (3.6 GHz Max boost, 3.2 GHz base frequency, 6MB, 35W, Quad Core)	X		
AMD® Athlon™ PRO 200GE APU with AMD®Radeon™ Vega Graphics (3.2 GHz Max boost, 3.2 GHz base frequency, 5MB, 35W, Dual Core)	X		

7th Generation of AMD® Pro A-Series APU[1]	**DM**	**SFF**	**MT**
AMD® PRO A10-9700E APU with AMD® Radeon™ Graphics (3.5 GHz Max boost, 3.0 GHz base frequency, 2MB, 35W, Quad Core)	X		
AMD® PRO A10-9700 APU with AMD® Radeon™ Graphics (3.8 GHz Max boost, 3.5 GHz base frequency, 2MB, 65W, Quad Core)		X	X
AMD® PRO A8-9600 APU with AMD® Radeon™ Graphics (3.4 GHz Max boost, 3.1 GHz base frequency, 2MB, 65W, Quad Core)		X	X
AMD® PRO A6-9500 APU with AMD® Radeon™ Graphics (3.8 GHz Max boost, 3.5 GHz base frequency, 1MB, 65W, Dual core)		X	X
AMD® PRO A6-9500E APU with AMD® Radeon™ Graphics (3.4 GHz Max boost, 3.2 GHz base frequency, 1MB, 35W, Dual core)	X		
6th Generation of AMD® Pro A-Series APU[1]	**DM**	**SFF**	**MT**
AMD® PRO A12-8870E APU with AMD® Radeon™ Graphics (3.8 GHz Max boost, 2.9 GHz base frequency, 2MB, 35W, Quad Core)	X		
AMD® PRO A12-8870 APU with AMD® Radeon™ Graphics (4.2 GHz Max boost, 3.7 GHz base frequency, 2MB, 65W, Quad Core)		X	
AMD® PRO A10-8770E APU with AMD® Radeon™ Graphics (3.5 GHz Max boost, 2.8 GHz base frequency, 2MB, 35W, Quad Core)	X		
AMD® PRO A10-8770 APU with AMD® Radeon™ Graphics (3.8 GHz Max boost, 3.5 GHz base frequency, 2MB, 65W, Quad Core)		X	
AMD® PRO A6-8570E APU with AMD® Radeon™ Graphics (3.4 GHz Max boost, 3.0 GHz base frequency, 1MB, 35W, Dual Core)	X		
AMD® PRO A6-8570 APU with AMD® Radeon™ Graphics (3.8 GHz Max boost, 3.5 GHz base frequency, 1MB, 65W, Dual Core)		X	

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

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.

*. AMD® Ryzen PRO CPU requires discrete graphic card attached.

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

GRAPHICS

System Integrated Graphics	DM	SFF	MT
AMD® Radeon™ R5 Graphics	X	X	X
AMD® Radeon™ R7 Graphics	X	X	X
AMD Radeon™ Vega 8 Graphics	X	X	X
AMD Radeon™ Vega 11 Graphics	X	X	X

Optional Discrete Graphics Solutions	DM	SFF	MT
AMD® Radeon™ RX 550 4GB FH PCIe x16		X	X
AMD® Radeon™ RX 560X 4GB GDDR5	X		
AMD® Radeon™ RX 580 4GB FH PCIe x16			X
AMD® Radeon™ RX 580 8GB FH GDDR5			X
AMD® Radeon™ R7 430 2GB VGA+DP Graphics Card		X	X
AMD® Radeon™ R7 430 2GB GDDR5 64bit DP+VGA		X	X
AMD® Radeon™ R7 430 2GB GDDR5 64bit 2DP		X	X
AMD® Radeon™ R7 430 2GB 2DP Graphics Card		X	X
AMD® Radeon™ 520 1GB VGA + DP Graphics Card			X
NVIDIA GeForce GTX 1060 3GB GFX			X
NVIDIA GeForce GT 730 2GB DP DVI PCIe x8 GFX		X	X
NVIDIA® GeForce® RTX 2060 6GB DP+HDMI+DVI-D			X

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

STORAGE

3.5 inch SATA Hard Disk Drives (HDD)	DM	SFF	MT
HDD 1TB 7200RPM SATA-3 3.5in		X	X
HDD 2TB 7200RPM SATA-3 3.5in		X	X
HDD 500GB 7200RPM 3.5in		X	X
HP 1TB 7200rpm 3.5 SATA 6.0Gb/s NCQ Smart IV Hard Drive (16MB)		X	X
HP 500GB 7200rpm 3.5 SATA 6.0Gb/s Smart IV Hard Drive		X	X

2.5 inch SATA Hard Disk Drives (HDD)	DM	SFF	MT
500 GB 5400RPM 2.5in SATA SSHD	X	X	X
1 TB 5400RPM 2.5in SATA SSHD	X	X	X
2 TB 5400RPM 2.5in SATA SSHD			X

2.5 inch Solid State Drives (SSD)	DM	SFF	MT
HDD 500GB 7200RPM 2.5in	X	X	X
HDD 1TB 7200RPM 2.5in	X	X	X
HDD 2TB 5400RPM 2.5in		X	X
HDD 500GB 7200RPM 2.5in Self Encrypted Drive OPAL2*	X	X	X
HDD 500GB 7200RPM 2.5in Federal Information Processing Standard*	X	X	X

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

2.5 inch SATA Solid State Hybrid Drives (SSHD)	DM	SFF	MT
HDD 500GB 5400RPM 2.5in SSHD	X	X	X
HDD 1TB 5400RPM 2.5in SSHD	X	X	X
HDD 2TB 5400RPM 2.5in SSHD			

2.5 inch Solid State Drives (SSD)	DM	SFF	MT
SSD 128GB 2.5in SATA Three Layer Cell	X	X	X
SSD 256GB 2.5in SATA Three Layer Cell	X	X	X
SSD 512GB 2.5in SATA Three Layer Cell	X	X	X
SSD 256GB 2.5in SATA Self Encrypted OPAL2 TLC*	X	X	X
SSD 512GB 2.5in SATA Self Encrypted OPAL2 TLC*	X	X	X
SSD 256GB 2.5in Federal Information Processing Standard*	X	X	X
SSD 512GB 2.5in Federal Information Processing Standard*	X	X	X

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

M.2 PCIe NMVe Solid State Drives (SSD)	DM	SFF	MT
SSD 128GB M.2 2280 PCIe NVMe		X	X
SSD 256GB M.2 2280 PCIe NVMe	X	X	X
SSD 512GB M.2 2280 PCIe NVMe	X	X	X
SSD 128GB M.2 2280 PCIe-3x2 NVMe Three Layer Cell		X	X
SSD 256GB M.2 2280 PCIe NVMe Three Layer Cell	X	X	X
SSD 512GB M.2 2280 PCIe NVMe Three Layer Cell	X	X	X
SSD 1TB M.2 2280 PCIe NVMe Three Layer Cell	X	X	X
SSD 256GB M.2 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer Cell*	X	X	X
SSD 512GB M.2 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer Cell*		X	X
HP 9.5mm Slim DVD-ROM Drive		X	X
HP 9.5mm Slim SuperMulti DVD Writer Drive		X	X
HP 9.5mm Slim Blu-Ray Writer Drive		X	X

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

Media Card Reader	DM	SFF	MT
SD 4.0 with 5-in-1 Interface (Supports SD, SDXC, SDHC, UHS-I, UHS-II)		X	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

Max Memory Configuration	DM	SFF	MT
DDR4-2666 (Transfer rates up to 2666 MT/s), 32 GB, 2 SODIMM[1]	X		

DDR4-2666 (Transfer rates up to 2666 MT/s), 64 GB, 4 DIMM		X	X

Memory Configuration

	DM	SFF	MT
4GB (1x4GB) 2666 DDR4 1.2v DIMM		X	X
8GB (2x4GB) 2666 DDR4 1.2v DIMM		X	X
8GB (1x8GB) 2666 DDR4 1.2v DIMM		X	X
16GB (2x8GB) 2666 DDR4 1.2v DIMM		X	X
16GB (1x16GB) 2666 DDR4 1.2v DIMM		X	X
32GB (2x16GB) 2666 DDR4 1.2v DIMM		X	X
32GB (4x8GB) 2666 DDR4 1.2v DIMM		X	X
64GB (4x16GB) 2666 DDR4 1.2v DIMM		X	X

	DM	SFF	MT
4 GB (1 x 4 GB) 2666 DDR4 SODIMM[1]	X		
8 GB (2 x 4 GB) 2666 DDR4 SODIMM[1]	X		
8 GB (1 x 8 GB) 2666 DDR4 SODIMM[1]	X		
16 GB (2 x 8 GB) 2666 DDR4 SODIMM[1]	X		
16 GB (1 x 16 GB) 2666 DDR4 SODIMM[1]	X		
32 GB (2 x 16 GB) 2666 DDR4 SODIMM[1]`	X		

1. Transfer rates up to 2133 MT/s: for processors with AMD Pro A-Series APU; Transfer rates up to 2666MT/s: for processors with AMD Ryzen™ with AMD Radeon™.

NETWORKING/COMMUNICATIONS

Ethernet (RJ-45)

	DM	SFF	MT
Realtek® RTL8111EPH (standard)	X	X	X

Wireless[1]

	DM	SFF	MT
Intel® 3168 802.11 AC 1x1 with Bluetooth® 4.0 (Brazil)	X	X	
Intel® 7265 802.11AC 2x2 with Bluetooth® M.2 Combo Card non-vPro™ (Brazil)	X	X	
Intel® 9260 802.11 AC 2x2 +Bluetooth® 5 PCIe non-vPro™	X	X	X
Realtek® 802.11 AC 1x1 with Bluetooth® 4.2 LE M.2 PCIe	X	X	X
Realtek® 802.11 AC 2x2 with Bluetooth® 4.2 LE M.2 PCIe		X	X
Intel® 8260 802.11AC 2x2 DualBand PCIe x1 Combo Card		X	
Intel® 8260 802.11AC 2x2 DualBand M.2 Combo Card	X		

1. Wireless access point and Internet service required and not included. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices

KEYBOARDS AND POINTING DEVICES

Keyboards

	DM	SFF	MT
HP Conferencing USB Keyboard	X	X	X

HP Wireless Collaboration Keyboard	X	X	X
HP USB and PS/2 Washable Keyboard	X	X	X
HP USB Smart Card (CCID) Keyboard	X	X	X
HP USB Business Slim Keyboard	X	X	X
HP USB Keyboard	X	X	X
HP PS/2 Business Slim Keyboard		X	X
HP Wireless Business Slim Keyboard and Mouse	X	X	X

Mouse	**DM**	**SFF**	**MT**
HP PS/2 Mouse		X	X
HP USB Optical Mouse	X	X	X
HP USB Premium Mouse	X	X	X
HP 1000dpi Laser Mouse USB	X	X	X
HP USB and PS/2 Washable Mouse	X	X	X
Antimicrobial USB Mouse[1]	X	X	X
HP Hardened USB Mouse[1]	X	X	X

1. Not available in all regions

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

SECURITY

	DM	SFF	MT
Trusted Platform Module (TPM) 2.0 (Infineon SLB9670). Common Criteria EAL4+ Certified. FIPS 140-2 Level 2 Certified	X	X	X

PORTS

I/O Ports – Standard	DM	SFF	MT
USB 2.0	N/A	2 including 1 fast charging (front); 4 including 2 wake from S4 (rear)	2 including 1 fast charging (front); 4 including 2 wake from S4 (rear)
USB 3.1 Gen 1	2 front; 4 rear	2 front; 2 rear	2 front; 2 rear
USB 3.0 Type-C™ (15W)	1 front; 1 rear (option)	1 front; 1 rear (option)	1 front; 1 rear (option)
Video	2 DisplayPort™ 1.2 (rear), 1 Configurable video port (rear) (Choice of DisplayPort™ 1.4, HDMI™ 2.0, VGA, or USB Type-C™ with alt mode display) 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)	2 DisplayPort™ 1.2 (rear), 1 Configurable video port (rear) (Choice of DisplayPort™ 1.2, HDMI™ 2.0, VGA, USB Type-C™ with alt mode display port or 15W output)
Audio	1 Headset (front), 1 Universal Audio Jack with CTIA headset support (front)	1 Headset (front); 1 Audio-out (rear), 1 Audio-in (rear)	1 Headset (front); 1 Audio-out (rear), 1 Audio-in (rear)
Network Interface	RJ45	RJ45	RJ45

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

I/O Ports – Internal Ports	DM	SFF	MT
Internal SATA storage connector(s)	N/A	3	4
Internal SATA storage connector(s)	N/A	3	4
Internal SATA storage connector (Data and Power)	1	N/A	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).

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

Slots	**DM**	**SFF**	**MT**
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 x1 2230 (for WLAN) (1) M.2 PCIe x2 2280/2230 Combo (for storage)	(1) M.2 PCIe x1 2230 (for WLAN) (1) M.2 PCIe x2 2280/2230 Combo (for storage)
PCI Express x1 (v3.0)	N/A	1	3
PCI Express x16 (v3.0)	N/A	1	1

Bays	**DM**	**SFF**	**MT**
5.25" Half Height ODD	N/A	N/A	1
9.5mm Slim ODD	N/A	1	1
Secure Digital (SD) Reader	N/A	1	1
2.5” internal storage drive	1 (optional)	2[3]	2
3.5” internal storage drive	N/A	1	1

NOTE: SFF can be configured with either (1) 3.5” or (2) 2.5” internal storage drive (2.5-inch drive needs adapter that can only be purchased when configuring the PC from factory with a 2.5" drive.)

NOTE: The MT can support a single graphics card up to 75W. When configured with dual graphics cards support is limited to 35W for each.

SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

BIOS
HP BIOSphere Gen4[17]
HP DriveLock & Automatic DriveLock[20]
BIOS Update via Network
Master Boot Record Security
Power On Authentication
HP Secure Erase[18]
Absolute Persistence Module[19]
Pre-boot Authentication
HP Wireless Wakeup

Software
HP Native Miracast Support[15]
HP LAN-Wireless Protection
HP Velocity

HP Hotkey Support – CMIT
HP Recovery Manager
HP JumpStart
HP Support Assistant[21]
HP Noise Cancellation Software
Buy Office

Manageability Features
HP Driver Packs[22]
HP System Software Manager (SSM)
HP BIOS Config Utility (BCU)
HP Client Catalog
HP Manageability Integration Kit Gen2[23]
Ivanti Management Suite[24]
HP Cloud Recovery[37]

Client Security Software
HP Client Security Suite Gen4[25] including:
HP Security Manager[26] (including Credential Manager, HP Password Manager, HP Spare Key)
HP Device Access Manager
HP Power On Authentication
Microsoft Defender[27]

Security Management
HP Secure Erase[18]
TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)[32]
SATA 0,1 port disablement (viaBIOS)
RAID configurations[33]
Serial, USB enable/disable (viaBIOS)
Power-on password (viaBIOS)
Setup password (viaBIOS)
Support for chassis padlocks and cable lock devices
Integrated hood sensor
HP Sure Start Gen4[30]
HP Sure Run[35]
HP Sure Recover[36]

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

15. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming
17. HP BIOSphere Gen4 requires Intel® or AMD® 8th Gen processors. Features may vary depending on the platform and configurations.
18. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method.
19. Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: http://www.absolute.com/company/legal/agreements/computrace-agreement. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.
20. 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 Suite Gen 4 requires Windows and Intel® or AMD® 8th generation processors.
26. HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. User may need to enable or allow the add-on / extension in the internet browser.
27. Windows Defender Opt in Windows 10 and internet connection required for updates.
30. HP Sure Start Gen4 is available on HP EliteDesk products equipped with Intel® 8th generation or AMD processors
32. Firmware TPM is version 2.0. Hardware TPM is v1.2, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT).
33. RAID configuration is optional and does require a second hard drive. RAID 1 is pre-installed and functionality will require a second hard drive.
35. HP Sure Run is available on HP Elite products equipped with 8th generation Intel® or AMD® processors.
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 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

ENVIRONMENTAL & INDUSTRY

Environmental Data HP EliteDesk 700 Desktop Mini G4 series

Eco-Label Certifications & declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: • IT ECO declaration • US ENERGY STAR® • EPEAT® 2019 registered where applicable. EPEAT ® registration varies by country. See http://www.epeat.net for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at http://www.hp.com/go/options. *Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit http://www.epeat.net for more information.		
System Configuration	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Desktop model is based on a "Typically Configured Desktop".		
Energy Consumption (in accordance with US ENERGY STAR® test method)	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 50Hz**
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
	NOTE: Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.		
Heat Dissipation*	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 50Hz**
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
	NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.		
Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L_{WAd}, bels)	Sound Pressure (L_{pAm}, decibels)	
Typically Configured – Idle	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		

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

	Batteries used in the product do not contain: Mercury greater the1ppm by weight Cadmium greater than 20ppm by weight Battery size: CR2032 (coin cell) Battery type: Lithium		
Additional Information	• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC. • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. • This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986). • Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043. • This product contains 0% post-consumer recycled plastic (by wt.) • This product is 95.1% recycle-able when properly disposed of at end of life.		
Packaging Materials	**External:**	PAPER/Corrugated	
	Internal:	PLASTIC/EPE (Expanded Polyethylene)	
		PLASTIC/Polyethylene low density	
Material Usage	This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf): • Asbestos • Certain Azo Colorants • Certain Brominated Flame Retardants – may not be used as flame retardants in plastics • Cadmium • Chlorinated Hydrocarbons • Chlorinated Paraffins • Formaldehyde • Halogenated Diphenyl Methanes • Lead carbonates and sulfates • Lead and Lead compounds • Mercuric Oxide Batteries • Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user. • Ozone Depleting Substances • Polybrominated Biphenyls (PBBs) • Polybrominated Biphenyl Ethers (PBBEs) • Polybrominated Biphenyl Oxides (PBBOs) • Polychlorinated Biphenyl (PCB) • Polychlorinated Terphenyls (PCT) • Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications. • Radioactive Substances • Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)		

Packaging Usage	HP follows these guidelines to decrease the environmental impact of product packaging: • Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.
End-of-life Management and Recycling	HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. 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. Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf

Environmental Data HP EliteDesk 700 Small Form Factor G4 series

Eco-Label Certifications & declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: • IT ECO declaration • US ENERGY STAR® • EPEAT® 2019 registered where applicable. EPEAT ® registration varies by country. See http://www.epeat.net for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at http://www.hp.com/go/options. *Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit http://www.epeat.net for more information.		
System Configuration	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Desktop model is based on a "Typically Configured Desktop".		
Energy Consumption (in accordance with US ENERGY STAR® test method)	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 50Hz**
Normal Operation (Short idle)	22.49	22.24	22.35
Normal Operation (Long idle)	21.1	21.25	20.87
Sleep	1.05	1.06	1.05
Off	1.08	1.09	1.08

	NOTE: Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Heat Dissipation*	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 50Hz**
Normal Operation (Short idle)	76.6909	75.8384	76.2135
Normal Operation (Long idle)	71.951	72.4625	71.1667
Sleep	3.5805	3.6146	3.5805
Off	3.6828	3.7169	3.6828
	NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.		

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L_{WAd}, bels)	Sound Pressure (L_{pAm}, decibels)
Typically Configured – Idle	3.9	28
Fixed Disk – Random writes	4.4	33
Active Mode *Pinnacle Ridge with GT730 graphic card	3.7	28

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 the1ppm by weight Cadmium greater than 20ppm by weight Battery size: CR2032 (coin cell) Battery type: Lithium
Additional Information	• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC. • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. • This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986). • Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043. • This product contains 0% post-consumer recycled plastic (by wt.) • This product is 95.1% recycle-able when properly disposed of at end of life.

Packaging Materials	**External:**	PAPER/Corrugated	
	Internal:	PLASTIC/EPE (Expanded Polyethylene)	
		PLASTIC/Polyethylene low density	

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

Material Usage	This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf): • Asbestos • Certain Azo Colorants • Certain Brominated Flame Retardants – may not be used as flame retardants in plastics • Cadmium • Chlorinated Hydrocarbons • Chlorinated Paraffins • Formaldehyde • Halogenated Diphenyl Methanes • Lead carbonates and sulfates • Lead and Lead compounds • Mercuric Oxide Batteries • Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user. • Ozone Depleting Substances • Polybrominated Biphenyls (PBBs) • Polybrominated Biphenyl Ethers (PBBEs) • Polybrominated Biphenyl Oxides (PBBOs) • Polychlorinated Biphenyl (PCB) • Polychlorinated Terphenyls (PCT) • Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications. • Radioactive Substances • Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)
Packaging Usage	HP follows these guidelines to decrease the environmental impact of product packaging: • Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.
End-of-life Management and Recycling	HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. 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. Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf

Environmental Data HP EliteDesk 700 MicroTower G4 series

<table>
<tr><td>Eco-Label Certifications & declarations</td><td colspan="3">This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:
• IT ECO declaration
• US ENERGY STAR®
• EPEAT® 2019 registered where applicable. EPEAT ® registration varies by country. See http://www.epeat.net for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at http://www.hp.com/go/options.

*Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit http://www.epeat.net for more information.</td></tr>
<tr><td>System Configuration</td><td colspan="3">The configuration used for the Energy Consumption and Declared Noise Emissions data for the Desktop model is based on a "Typically Configured Desktop".</td></tr>
<tr><td>Energy Consumption (in accordance with US ENERGY STAR® test method)</td><td>115VAC, 60Hz</td><td>230VAC, 50Hz</td><td>100VAC, 50Hz</td></tr>
<tr><td>Normal Operation (Short idle)</td><td>22.22</td><td>22.682</td><td>23.569</td></tr>
<tr><td>Normal Operation (Long idle)</td><td>21.409</td><td>21.432</td><td>21.753</td></tr>
<tr><td>Sleep</td><td>1.3327</td><td>1.2579</td><td>1.2692</td></tr>
<tr><td>Off</td><td>0.9518</td><td>0.8825</td><td>0.9171</td></tr>
<tr><td></td><td colspan="3">NOTE: Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.</td></tr>
<tr><td>Heat Dissipation*</td><td>115VAC, 60Hz</td><td>230VAC, 50Hz</td><td>100VAC, 50Hz</td></tr>
<tr><td>Normal Operation (Short idle)</td><td>75.7702</td><td>77.3456</td><td>80.3703</td></tr>
<tr><td>Normal Operation (Long idle)</td><td>73.0047</td><td>73.0831</td><td>74.1777</td></tr>
<tr><td>Sleep</td><td>4.5445</td><td>4.2894</td><td>4.328</td></tr>
<tr><td>Off</td><td>3.2456</td><td>3.0093</td><td>3.1273</td></tr>
<tr><td></td><td colspan="3">NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.</td></tr>
<tr><td>Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)</td><td>Sound Power (L_{WAd}, bels)</td><td colspan="2">Sound Pressure (L_{pAm}, decibels)</td></tr>
<tr><td>Typically Configured – Idle</td><td>3.9</td><td colspan="2">28</td></tr>
<tr><td>Fixed Disk – Random writes</td><td>4.4</td><td colspan="2">33</td></tr>
<tr><td>Longevity and Upgrading</td><td colspan="3">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.</td></tr>
<tr><td>Batteries</td><td colspan="3">This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:</td></tr>
</table>

	Mercury greater the1ppm by weight Cadmium greater than 20ppm by weight Battery size: CR2032 (coin cell) Battery type: Lithium		
Additional Information	• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC. • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. • This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986). • Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043. • This product contains 0% post-consumer recycled plastic (by wt.) • This product is 95.1% recycle-able when properly disposed of at end of life.		
Packaging Materials	**External:**	PAPER/Corrugated	
	Internal:	PLASTIC/EPE (Expanded Polyethylene)	
		PLASTIC/Polyethylene low density	
Material Usage	This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf): • Asbestos • Certain Azo Colorants • Certain Brominated Flame Retardants – may not be used as flame retardants in plastics • Cadmium • Chlorinated Hydrocarbons • Chlorinated Paraffins • Formaldehyde • Halogenated Diphenyl Methanes • Lead carbonates and sulfates • Lead and Lead compounds • Mercuric Oxide Batteries • Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user. • Ozone Depleting Substances • Polybrominated Biphenyls (PBBs) • Polybrominated Biphenyl Ethers (PBBEs) • Polybrominated Biphenyl Oxides (PBBOs) • Polychlorinated Biphenyl (PCB) • Polychlorinated Terphenyls (PCT) • Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications. • Radioactive Substances • Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)		

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

Packaging Usage	HP follows these guidelines to decrease the environmental impact of product packaging: • Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.
End-of-life Management and Recycling	HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. 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. Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf

SERVICE AND SUPPORT

On-site Warranty[15]: Three-year (3-3-3) limited warranty delivers three years of on-site, next business day[16] service for parts and labor and includes free support 24 x 7[17]. 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.[18]

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. 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.

GRAPHICS

AMD® Radeon™ 5 Graphics (Integrated on AMD® PRO A6-9500E & PRO A6-9500 APUs)
AMD® Radeon™ R7 Graphics (Integrated on AMD® PRO A10-9700E & PRO A10-9700 APUs)
AMD Radeon™ Vega 8 Graphics (Integrated on AMD® Ryzen™ 3 PRO 2200GE & Ryzen™ 3 PRO 2200G APUs)
AMD Radeon™ Vega 11 Graphics (Integrated on AMD® Ryzen™ 5 PRO 2400GE & Ryzen™ 5 PRO 2400G APUs)

Multi Display Support	Maximum of 3 displays supported by the integrated graphics
DisplayPort	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.
VGA Port (Optional)	Maximum Resolution of 2048x1536 at 60Hz
HDMI (Optional)	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
USB-C (Optional)	Supports DisplayPort Alt Mode
Memory	512MB when less than 8GB of system memory is installed 1GB when 8GB or more of system memory is installed
Maximum Color Depth	up to 10 bits
Graphics/Video API Support	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™ RX550 4GB FH PCIe x16

Engine Clock	1183MHz
Memory Clock	7 Gbps
Memory Size(width)	4 GB(128-bit)
Memory Type	GDDR5
Max. Resolution(HDMI)	4096x2160 @ 60Hz
Max. Resolution(DP)	5120x2880 @ 60Hz
Multi Display Support	3 displays
HDCP Compliance	Yes
Rear I/O connectors(bracket)	HDMI, DPx2
Cooling(active/passive)	Active fan-sink(Active cooling with dynamic speed)
Total power consumption(W)	<62W
PCB form-factor with bracket	ATX (Full height) PCB with ATX single slot bracket

AMD® Radeon™ RX 560X

Architecture	Discrete GPU AMD® GPU drives the integrated panel and all of the graphics output ports
DisplayPort	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)
HDMI	Supports HDMI 2.0b features Supports HDCP 2.2, HDR
Memory	4GByte, 128bit wide GDDR5
Maximum Color Depth	up to 12 bits/color
Graphics/Video API Support	DirectX 12 OpenCL 2.0 OpenGL 4.5 AMD® Unified Video Decoder (UVD)
Rear I/O connector	1 DP
Max. Resolution (VGA)	2048 x 1536@60Hz
Max. Resolution (HDMI)	4096 x 2160@60Hz
Max. Resolution (DP)	5120 x 2880@60Hz

AMD® Radeon™ RX580 4GB FH PCIe x16

Engine Clock	1266 MHz
Memory Clock	8gbs
Memory Size(width)	4 GB(256-bit)
Memory Type	128M x 32 GDDR5
Max. Resolution(HDMI)	4096x2160@60Hz
Max. Resolution(DP)	5120x3200@60Hz
Multi Display Support	4 displays
HDCP Compliance	Yes
Rear I/O connectors(bracket)	DP*3 + HDMI
Cooling(active/passive)	Active fan-sink (Active cooling with dynamic speed)

Total power consumption(W)	<150W
PCB form-factor with bracket	ATX (Full height) PCB with ATX dual slot bracket

AMD® Radeon™ RX580 8GB GDDR5 Graphics Card

Engine Clock	1266 MHz
Memory Clock	4000 MHz
Memory Size(width)	8 GB (256-bit)
Memory Type	256M x 32 GDDR5
Max. Resolution(HDMI)	4096x2160@60Hz
Max. Resolution(DP)	5120x3200@60Hz
Multi Display Support	4 displays
HDCP Compliance	Yes
Rear I/O connectors(bracket)	HDMI + DPx3
Cooling(active/passive)	Active fan-sink (Active cooling with dynamic speed)
Total power consumption(W)	<150W
PCB form-factor with bracket	ATX (Full height) PCB with ATX dual slot bracket

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

Engine Clock	780 MHz
Memory Clock	1100 MHz
Memory Size(width)	2 GB(128-bit)
Memory Type	128M x 32 GDDR5
Max. Resolution(VGA)	2048x1536
Max. Resolution(DP)	4096x2160@60Hz
Multi Display Support	2 displays
HDCP Compliance	yes
Rear I/O connectors(bracket)	VGA+DP
Cooling(active/passive)	Active fan-sink (Active cooling with dynamic speed)
Total power consumption(W)	<50W
PCB form-factor with bracket	LP PCB with FH/LP bracket

Technical Specifications - Graphics

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

Engine Clock	780 MHz
Memory Clock	1100 MHz
Memory Size(width)	2 GB(64-bit)
Memory Type	256M x 32 GDDR5
Max. Resolution(VGA)	2048x1536
Max. Resolution(DP)	4096x2160@60Hz
Multi Display Support	2 displays
HDCP Compliance	yes
Rear I/O connectors(bracket)	DP+VGA
Cooling(active/passive)	Active fan-sink (Active cooling with dynamic speed)
Total power consumption(W)	<50W
PCB form-factor with bracket	LP PCB with FH/LP bracket

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

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

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

Engine Clock	780 MHz
Memory Clock	1100 MHz
Memory Size(width)	2 GB(128-bit)
Memory Type	128M x 32 GDDR5
Max. Resolution(DP)	4096x2160@60Hz
Multi Display Support	2 displays
HDCP Compliance	yes
Rear I/O connectors(bracket)	2DP
Cooling(active/passive)	Active fan-sink(Active cooling with dynamic speed)
Total power consumption(W)	<50W
PCB form-factor with bracket	LP PCB with FH/LP bracket

Technical Specifications - Graphics

AMD® Radeon™ 520 1GB Graphics Card

Engine Clock	780 MHz
Memory Clock	1100 MHz
Memory Size(width)	1GB(32-bit)
Memory Type	256M x 32 GDDR5
Max. Resolution(VGA)	2048x1536
Max. Resolution(DP)	4096x2160@60Hz
Multi Display Support	2 displays
HDCP Compliance	Yes
Rear I/O connectors(bracket)	VGA+DP
Cooling(active/passive)	Active fan-sink (Active cooling with dynamic speed)
Total power consumption(W)	<50W
PCB form-factor with bracket	LP PCB with FH/LP bracket

NVIDIA® GeForce® GTX 1060 3 GB Graphics Card

Engine Clock	1506 MHz
Memory Clock	4004 MHz
Memory Size(width)	3 GB(192-bit)
Memory Type	128M x 32 GDDR5
Max. Resolution(DVI)	2560x1600@60Hz
Max. Resolution(HDMI)	4096x2160@60Hz
Max. Resolution(DP)	5120x3200@60Hz
Multi Display Support	4 displays
HDCP Compliance	Yes
Rear I/O connectors(bracket)	DVI-D+HDMI+DPx3
Cooling(active/passive)	Active fan-sink (Active cooling with dynamic speed)
Total power consumption(W)	<120W
PCB form-factor with bracket	ATX (Full height) PCB with ATX dual slot bracket

NVIDIA® GeForce® GT730 2GB DP DVI PCIe x8 GFX

Engine Clock	902 MHz
Memory Clock	1250 MHz
Memory Size(width)	2 GB (64-bit)
Memory Type	256Mx32 GDDR5
Max. Resolution(DVI)	2560 x 1600 x 30 bpp @ 60Hz (Dual Link)
Max. Resolution(DP)	4096 x 2160 x 24 bpp @ 60 Hz (DP1.2)
Multi Display Support	Up to 2 displays
HDCP Compliance	Yes
Rear I/O connectors(bracket)	DL DVI-I + DP
Cooling(active/passive)	Active fan-sink (Active cooling with dynamic speed)
Total power consumption(W)	35 W
PCB form-factor with bracket	2-pin fan connector for fan sink power/speed control

Technical Specifications - Graphics

NVIDIA® GeForce® RTX 2060 6 GB Graphics Card

Engine Clock	1680 MHz
Memory Clock	7000 MHz
Memory Size(width)	6 GB(192-bit)
Memory Type	256M x 32 GDDR6
Max. Resolution(DVI)	2560x1600@60Hz
Max. Resolution(HDMI)	4096x2160@60Hz
Max. Resolution(DP)	7680x4320@60Hz
Multi Display Support	3 displays
HDCP Compliance	Yes
Rear I/O connectors(bracket)	DVI+HDMI+DP
Cooling(active/passive)	Active fan-sink (Active cooling with dynamic speed)
Total power consumption(W)	<170W
PCB form-factor with bracket	ATX (Full height) PCB with ATX dual slot bracket

STORAGE

HP 500 GB 7.2K SATA 6.0Gb/s 2.5" Hard Disk Drive

Capacity	500 GB
Rotational Speed	7,200 rpm
Interface	SATA 6 Gb/s
Buffer Size	16 MB
Logical Blocks	976,773,168
Seek Time	12 ms (Average)
Height	0.267 in/6.8 mm (nominal)
Width	2.75 in/70 mm (nominal)
Operating Temperature	41° to 131° F (5° to 55° C)

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

HP 1 TB 7.2K SATA 6.0Gb/s 2.5" Hard Disk Drive

Capacity	1 TB
Rotational Speed	7,200 rpm
Interface	SATA 6 Gb/s
Buffer Size	32 MB
Logical Blocks	1,953,525,168
Seek Time	12 ms (Average)
Height	0.374 in/9.5 mm (nominal)
Width	2.75 in/70 mm (nominal)
Operating Temperature	41° to 131° F (5° to 55° C)

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

Technical Specifications - Storage

HP 500 GB SATA 6G 2.5” 8GB Solid State Hybrid Drive (SSHD)

Capacity	500 GB
Rotational Speed	5,400 rpm
Drive Type	Solid State Hybrid Drive (SSHD) technology with NAND Flash
Interface	SATA 6 Gb/s
Buffer Size	64 MB
NAND Flash	8 GB
Seek Time	12 ms (Average)
Height	0.267 in/6.8 mm (nominal)
Width	2.75 in/70 mm (nominal)

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

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

Capacity	1 TB
Rotational Speed	5,400 rpm
Drive Type	Solid State Hybrid Drive (SSHD) technology with NAND Flash
Interface	SATA 6 Gb/s
Buffer Size	64 MB
NAND Flash	8 GB
Seek Time	12 ms (Average)
Height	0.374 in/9.5 mm (nominal)
Width	2.75 in/70 mm (nominal)
Operating Temperature	41° to 131° F (5° to 55° C)

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

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

Capacity	2 TB
Rotational Speed	5,400 rpm
Drive Type	Solid State Hybrid Drive (SSHD) technology with NAND Flash
Interface	SATA 6 Gb/s
Buffer Size	128 MB
NAND Flash	8 GB
Seek Time	12 ms (Average)
Height	0.374 in/9.5 mm (nominal)
Width	2.75 in/70 mm (nominal)
Operating Temperature	41° to 131° F (5° to 55° C)

Technical Specifications - Storage

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

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

Capacity	2 TB
Rotational Speed	5,400 rpm
Interface	SATA 6 Gb/s
Buffer Size	128 MB
Logical Blocks	3,907,050,336
Seek Time	12 ms (Average)
Height	0.374 in/9.5 mm (nominal)
Width	2.75 in/70 mm (nominal)
Operating Temperature	41° to 131° F (5° to 55° C)

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

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

Capacity	500 GB
Architecture	Self-Encrypting (SED) Solid State Drive with SATA interface
Interface	SATA 6 Gb/s
Buffer Size	32 MB
Logical Blocks	976,773,168
Seek Time	12 ms (Average)
Height	0.267 in/6.8 mm (nominal)
Width	2.75 in/70 mm (nominal)
Operating Temperature	41° to 131° F (5° to 55° C)

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

HP 9.5mm Slim DVD-ROM Drive

Height	9.5 mm height
Orientation	Either horizontal or vertical
Interface type	SATA/ATAPI
Dimensions (W x H x D)	5.04 x 0.37 x 5.0 in (128 x 9.5 x 127 mm) without bezel
Weight (max)	Up to 0.31 lb (140g) without bezel
Read Speeds	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
Access time (typical reads, including settling)	Random: DVD-ROM: 170 ms (typical), CD-ROM: 170 ms (typical) Full stroke: DVD-ROM: 320 ms (typical), CD-ROM: 320 ms (typical)
Power	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)
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)

HP 9.5mm Slim DVD Writer Drive

Height	9.5 mm height
Orientation	Either horizontal or vertical
Interface type	SATA/ATAPI
Disc recording capacity	Up to 8.5 GB DL or 4.7 GB standard
Dimensions (W x H x D)	5.04 x 0.37 x 5.0 in (128 x 9.5 x 127 mm) without bezel
Weight (max)	0.31 lb (140 g)
Read Speeds	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 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
Write Speeds	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 24X
Access time (typical reads, including settling)	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)
Power	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)
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)

HP 9.5mm Slim Blu-Ray Writer Drive

Height	9.5 mm height
Orientation	Either horizontal or vertical
Interface type	SATA/ATAPI
Disc recording capacity	Up to 128 GB QL, 100 GB TL, 50 GB DL or 25 GB standard SL
Dimensions (W x H x D)	5.04 x 0.37 x 5.0 in (128 x 9.5 x 127 mm) without bezel
Weight (max)	0.29 lb (132 g)
Write Speeds	BD-R Up to 4X BD-RE Up to 2X BD-R Up to 6X 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 CD-RW Up to 10X
Read Speeds	BD-R Up to 6X BD-RE Up to 4X BD-ROM Up to 6X BD-R Up to 6X BD-RE Up to 6X 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 ± 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)

NETWORKING AND COMMUNICATIONS

HP EliteDesk 705 G4 Microtower

Realtek RTL8111EPH 10/100/1000 Integrated NIC	
Connector	RJ-45
System Interface	PCIe + SMBus
Controller	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
Data rates supported	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet)
IEEE Compliance	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling Jumbo Frame 9K
Performance	Cable Disconnetion: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
Power	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
MAC/PHY Interconnect	Auto MDI/MDIX Crossover cable detection
Management Interface	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status

Intel® Ethernet I210-T1 Gigabit Network Adapter	
Connector	RJ-45
System Interface	PCIe Express x1
Data rates supported	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s
IEEE Compliance	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet)
Performance	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling Jumbo Frame 9K

Technical Specifications – Networking and Communications

Power consumption	Cable Disconnection: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
Power Management	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
Management Interface	Auto MDI/MDIX Crossover cable detection
IT Manageability	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status

Intel 9260 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 5.0 Combo[1] Non-vPro	
Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi® certified
Frequency Band	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
Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 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, 80MHz & 160MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[1]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b : +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 • 802.11ac VHT160(5GHz) : +11.5dBm minimum	
Power Consumption	• Transmit mode2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[3]	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	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230: 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230: 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating Non-operating	14° to 158° F (–10° to 70° C) –40° to 176° F (–40° to 80° C)
Humidity	Operating Non-operating	10% to 90% (non-condensing) 5% to 95% (non-condensing)
Altitude	Operating Non-operating	0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)
LED Activity	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).

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 Wireless Technology

Bluetooth® Specification	4.0/4.1/4.2/5.0 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE: 1 Mbps data rate; throughput up to 0.2 Mbps
	Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +4 dBm for BR and EDR.

Technical Specifications – Networking and Communications

Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Electrical Interface	USB 2.0 compliant
Bluetooth® Software Supported Link Topology	Microsoft Windows Bluetooth® Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

Realtek 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 4.2 Combo[1]	
Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi® certified
Frequency Band	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
Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[3]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.

Technical Specifications – Networking and Communications

	• WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI	
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)	
Roaming	IEEE 802.11 compliant roaming between access points	
Output Power[2]	• 802.11b: +14dBm minimum • 802.11g: +12dBm minimum • 802.11a: +12dBm minimum • 802.11n HT20(2.4GHz): +12dBm minimum • 802.11n HT40(2.4GHz): +12dBm minimum • 802.11n HT20(5GHz): +10dBm minimum • 802.11n HT40(5GHz): +10dBm minimum • 802.11ac VHT80(5GHz): +10dBm minimum	
Power Consumption	• Transmit mode2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[3]	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	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230 : 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating Non-operating	14° to 158° F (–10° to 70° C) –40° to 176° F (–40° to 80° C)
Humidity	Operating Non-operating	10% to 90% (non-condensing) 5% to 95% (non-condensing)
Altitude	Operating Non-operating	0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)
LED Activity	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).

HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology	
Bluetooth® Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH)

Technical Specifications – Networking and Communications

	BLE: 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE: 1 Mbps data rate; throughput up to 0.2 Mbps
	Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5) Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Electrical Interface	USB 2.0 compliant
Bluetooth® Software Supported Link Topology	Microsoft Windows Bluetooth® Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

Technical Specifications – Networking and Communications

HP EliteDesk 705 G4 Small Form Factor Business PC

Realtek RTL8111EPH 10/100/1000 Integrated NIC	
Connector	RJ-45
System Interface	PCIe + SMBus
Controller	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
Data rates supported	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet)
IEEE Compliance	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling Jumbo Frame 9K
Performance	Cable Disconnetion: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
Power	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
MAC/PHY Interconnect	Auto MDI/MDIX Crossover cable detection
Management Interface	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status

Intel® 8260 2x2 Dual Band 802.11ac WLAN/ Bluetooth® Combo*		
Wireless LAN Standards	IEEE 802.11 ac/a/b/g/n	
System Interface	PCIe + SMBus	
Interoperability	Wi-Fi® certification	
	WLAN + Bluetooth® Combo M.2 Card device shall meet all of the requirements to support Bluetooth® 4.1 and backwards compatible with 2.1 with EDR	
Frequency Band	802.11b/g/n	2.402-2.482 GHz
	802.11a/n/ac	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 (Note: Indonesia does not support this band)
Antenna Interface	With antennas installed in the system, the antenna peak gain is less than +3dBi in the 2.4GHz band and less than +4dBi in the 5GHz band to allow the device to meet regulatory limits.	

Technical Specifications – Networking and Communications

Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: card will support rates for NSS=1 and NSS=2 for RX and TX for 20 and 40 MHz channels. Short and long guard interval shall be supported. • 802.11ac: card will support rates for NSS=1 and NSS=2 for RX and TX for 80 MHz channels. 433Mbps for 1x1 and 867Mbps for 2x2.
Security	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through V5 • WAPI
	Note: Check latest software/driver release for updates on supported security features.
Roaming	802.11r Fast Roaming
Output Power (Transmitting)	• 802.11b: +16dBm minimum • 802.11g: +14dBm minimum • 802.11a: +14dBm minimum • 802.11n HT20 (2.4GHz) : +14dBm minimum • 802.11n HT40 (2.4GHz) : +12dBm minimum • 802.11n HT20 (5GHz) : +14dBm minimum • 802.11n HT40 (5GHz) : +12dBm minimum • 802.11ac 80MHz (5GHz) : +12dBm minimum
	Notes: 1. RF Tx power have to meet minimum criteria and with +1.5dBm tolerance but -1.5dBm. 2. RF Parameter will be verified by R&S CMW500 via link mode. .
Power Consumption	Transmit: 2.0 Watts
	Receive: 1.6 Watts
	Idle mode (PSP): 180 mW (WLAN associated)
	Idle mode: 50 mW (WLAN unassociated)
	Connect Standby 10mW (WLAN+BT)
	Radio off: 5 mW
Bluetooth® Power Consumption	Peak operating: 330 mW
	Receive: 230 mW
	USB selective suspend: 17 mW
Power Management	The product conforms to the ACPI and PCI Express M.2 bus methods to manage power of the WLAN components. Supports all 802.11 compliant power-save modes. These include the basic Power Save Polling (PSP) in 802.11 and Automatic Power Save Delivery (APSD) defined in 802.11e.
Receiver Sensitivity for FER <10%	802.11b, 1Mbps: -94dBm maximum 802.11b, 11Mbps: -86dBm maximum 802.11a/g, 6Mbps: -88dBm maximum 802.11a/g, 54Mbps : -74dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm maximum 802.11ac, 1SS, MCS-0 : -86dBm maximum 802.11ac, 1SS, MCS-9 : -61dBm maximum 802.11ac, 2SS, MCS-0 : -83dBm maximum 802.11ac, 2SS, MCS-9 : -58dBm maximum

Technical Specifications – Networking and Communications

	Note: 1. Rx sensitivity have to meet maximum criteria and with -1.5dBm tolerance but +1.5dBm. 2. Note: RF Parameter will be verified by R&S CMW500 via link mode.	
Form Factors	PCI Express M.2 form factor	
Operating Voltage	The card will be powered by a 3.3V, ± 9% supply from the host system.	
Temperature	**Operating:**	14° to 158° F (-10° to 70° C)
	Non-operating:	-40° to 176° F (-40° to 80° C)
Humidity	**Operating:**	10% to 90% (non-condensing)
	Non-operating:	5% to 95% (non-condensing)
Altitude	**Operating:**	0 to 10,000 ft (3,048 m)
	Non-operating:	0 to 50,000 ft (15,240 m)

* Wireless access point and Internet service required and not included. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.

Intel® Ethernet I210-T1 Gigabit Network Adapter	
Connector	RJ-45
System Interface	PCI (Intel® proprietary) + SMBus
Data rates supported	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s
IEEE Compliance	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet)
Performance	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling Jumbo Frame 9K
Power consumption	Cable Disconnection: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
Power Management	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
Management Interface	Auto MDI/MDIX Crossover cable detection
IT Manageability	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
Security & Manageability	Intel® vPro™ support with appropriate Intel® chipset components

Technical Specifications – Networking and Communications

Intel® 9260 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 5.0 Combo[1] Non-vPro	
Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi® certified
Frequency Band	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
Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 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, 80MHz & 160MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[1]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b : +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 • 802.11ac VHT160(5GHz) : +11.5dBm minimum
Power Consumption	• Transmit mode2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	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	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230 : 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating	14° to 158° F (–10° to 70° C)
	Non-operating	–40° to 176° F (–40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED 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).

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 Wireless Technology	
Bluetooth® Specification	4.0/4.1/4.2/5.0 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE: 1 Mbps data rate; throughput up to 0.2 Mbps
	Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Electrical Interface	USB 2.0 compliant
Bluetooth® Software Supported Link Topology	Microsoft Windows Bluetooth® Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels

Technical Specifications – Networking and Communications

	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)

Intel® 3168 802.11a/b/g/n/ac (1x1) WiFi® and Bluetooth® 4.2 Combo[1]	
Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi® certified
Frequency Band	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
Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[3]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b : +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
Power Consumption	• Transmit mode2.0 W

	• Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[3]	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	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230 : 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating	14° to 158° F (–10° to 70° C)
	Non-operating	–40° to 176° F (–40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED 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).

HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology	
Bluetooth® Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE : 1 Mbps data rate; throughput up to 0.2 Mbps
	Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Electrical Interface	USB 2.0 compliant
Bluetooth® Software Supported Link Topology	Microsoft Windows Bluetooth® Software
Power Management	Microsoft Windows ACPI, and USB Bus Support

Technical Specifications – Networking and Communications

Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

Intel® 2 7265 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 4.2 Combo[1] Non-vPro™	
Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi® certified
Frequency Band	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
Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[3]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)

Technical Specifications – Networking and Communications

Roaming	IEEE 802.11 compliant roaming between access points	
Output Power[2]	• 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	
Power Consumption	• Transmit mode2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[3]	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	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230 : 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating Non-operating	14° to 158° F (–10° to 70° C) –40° to 176° F (–40° to 80° C)
Humidity	Operating Non-operating	10% to 90% (non-condensing) 5% to 95% (non-condensing)
Altitude	Operating Non-operating	0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)
LED Activity	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).

HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology	
Bluetooth® Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE : 1 Mbps data rate; throughput up to 0.2 Mbps
	Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)

Technical Specifications – Networking and Communications

Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Electrical Interface	USB 2.0 compliant
Bluetooth® Software Supported Link Topology	Microsoft Windows Bluetooth® Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

Realtek 802.11a/b/g/n/ac (1x1) WiFi® and Bluetooth® 4.2 Combo[1]	
Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi® certified
Frequency Band	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
Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM

Technical Specifications – Networking and Communications

Security[1]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI	
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)	
Roaming	IEEE 802.11 compliant roaming between access points	
Output Power[2]	• 802.11b : +14dBm minimum • 802.11g : +12dBm minimum • 802.11a : +12dBm minimum • 802.11n HT20(2.4GHz) : +12dBm minimum • 802.11n HT40(2.4GHz) : +12dBm minimum • 802.11n HT20(5GHz) : +10dBm minimum • 802.11n HT40(5GHz) : +10dBm minimum • 802.11ac VHT80(5GHz) : +10dBm minimum	
Power Consumption	• Transmit mode2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[3]	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	
Antenna type	High efficiency antenna. One embedded dual band 2.4/5 GHz antenna is provided to the card to support WLAN communications and Bluetooth communications	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230 : 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating Non-operating	14° to 158° F (–10° to 70° C) –40° to 176° F (–40° to 80° C)
Humidity	Operating Non-operating	10% to 90% (non-condensing) 5% to 95% (non-condensing)
Altitude	Operating Non-operating	0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)
LED Activity	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).

HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology	
Bluetooth® Specification	4.0/4.1/4.2 Compliant

Technical Specifications – Networking and Communications

Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE : 1 Mbps data rate; throughput up to 0.2 Mbps
	Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Electrical Interface	USB 2.0 compliant
Bluetooth® Software Supported Link Topology	Microsoft Windows Bluetooth® Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications **Power Management Certifications**	FCC (47 CFR) Part 15C, Section 15.247 & 15.249 ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

Intel® 9260 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 5.0 Combo[1] Non-vPro™	
Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi® certified
Frequency Band	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

Technical Specifications – Networking and Communications

Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 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, 80MHz & 160MHz)	
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM	
Security[1]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI	
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)	
Roaming	IEEE 802.11 compliant roaming between access points	
Output Power[2]	• 802.11b : +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 • 802.11ac VHT160(5GHz) : +11.5dBm minimum	
Power Consumption	• Transmit mode2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[3]	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	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230 : 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating Non-operating	14° to 158° F (–10° to 70° C) –40° to 176° F (–40° to 80° C)

Technical Specifications – Networking and Communications

Humidity	Operating Non-operating	10% to 90% (non-condensing) 5% to 95% (non-condensing)
Altitude	Operating Non-operating	0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)
LED Activity	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).

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 Wireless Technology	
Bluetooth® Specification	4.0/4.1/4.2/5.0 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE: 1 Mbps data rate; throughput up to 0.2 Mbps
	Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Electrical Interface	USB 2.0 compliant
Bluetooth® Software Supported Link Topology	Microsoft Windows Bluetooth® Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

Technical Specifications – Networking and Communications

HP EliteDesk 705 G4 Desktop Mini Business PC

Realtek RTL8111EPH 10/100/1000 Integrated NIC	
Connector	RJ-45
System Interface	PCIe + SMBus
Controller	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
Data rates supported	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet)
IEEE Compliance	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling Jumbo Frame 9K
Performance	Cable Disconnetion: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
Power	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
MAC/PHY Interconnect	Auto MDI/MDIX Crossover cable detection
Management Interface	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status

Intel® 8260 2x2 Dual Band 802.11ac WLAN/ Bluetooth® Combo*		
Wireless LAN Standards	IEEE 802.11 ac/a/b/g/n	
System Interface	PCIe + SMBus	
Interoperability	Wi-Fi® certification	
	WLAN + Bluetooth® Combo M.2 Card device shall meet all of the requirements to support Bluetooth® 4.1 and backwards compatible with 2.1 with EDR	
Frequency Band	802.11b/g/n	2.402-2.482 GHz
	802.11a/n/ac	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 (Note: Indonesia does not support this band)
Antenna Interface	With antennas installed in the system, the antenna peak gain is less than +3dBi in the 2.4GHz band and less than +4dBi in the 5GHz band to allow the device to meet regulatory limits.	

Technical Specifications – Networking and Communications

Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: card will support rates for NSS=1 and NSS=2 for RX and TX for 20 and 40 MHz channels. Short and long guard interval shall be supported. • 802.11ac: card will support rates for NSS=1 and NSS=2 for RX and TX for 80 MHz channels. 433Mbps for 1x1 and 867Mbps for 2x2.
Security	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through V5 • WAPI
	Note: Check latest software/driver release for updates on supported security features.
Roaming	802.11r Fast Roaming
Output Power (Transmitting)	• 802.11b: +16dBm minimum • 802.11g: +14dBm minimum • 802.11a: +14dBm minimum • 802.11n HT20 (2.4GHz) : +14dBm minimum • 802.11n HT40 (2.4GHz) : +12dBm minimum • 802.11n HT20 (5GHz) : +14dBm minimum • 802.11n HT40 (5GHz) : +12dBm minimum • 802.11ac 80MHz (5GHz) : +12dBm minimum
	Notes: 1. RF Tx power have to meet minimum criteria and with +1.5dBm tolerance but -1.5dBm. 2. RF Parameter will be verified by R&S CMW500 via link mode. .
Power Consumption	Transmit: 2.0 Watts
	Receive: 1.6 Watts
	Idle mode (PSP): 180 mW (WLAN associated)
	Idle mode: 50 mW (WLAN unassociated)
	Connect Standby 10mW (WLAN+BT)
	Radio off: 5 mW
Bluetooth® Power Consumption	Peak operating: 330 mW
	Receive: 230 mW
	USB selective suspend: 17 mW
Power Management	The product conforms to the ACPI and PCI Express M.2 bus methods to manage power of the WLAN components. Supports all 802.11 compliant power-save modes. These include the basic Power Save Polling (PSP) in 802.11 and Automatic Power Save Delivery (APSD) defined in 802.11e.
Receiver Sensitivity for FER <10%	802.11b, 1Mbps: -94dBm maximum 802.11b, 11Mbps: -86dBm maximum 802.11a/g, 6Mbps: -88dBm maximum 802.11a/g, 54Mbps : -74dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm maximum 802.11ac, 1SS, MCS-0 : -86dBm maximum 802.11ac, 1SS, MCS-9 : -61dBm maximum 802.11ac, 2SS, MCS-0 : -83dBm maximum 802.11ac, 2SS, MCS-9 : -58dBm maximum

Technical Specifications – Networking and Communications

	Note: 1. Rx sensitivity have to meet maximum criteria and with -1.5dBm tolerance but +1.5dBm. 2. Note: RF Parameter will be verified by R&S CMW500 via link mode.	
Form Factors	PCI Express M.2 form factor	
Operating Voltage	The card will be powered by a 3.3V, ± 9% supply from the host system.	
Temperature	**Operating:**	14° to 158° F (-10° to 70° C)
	Non-operating:	-40° to 176° F (-40° to 80° C)
Humidity	**Operating:**	10% to 90% (non-condensing)
	Non-operating:	5% to 95% (non-condensing)
Altitude	**Operating:**	0 to 10,000 ft (3,048 m)
	Non-operating:	0 to 50,000 ft (15,240 m)
* Wireless access point and Internet service required and not included. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.		

Intel® 3168 802.11a/b/g/n/ac (1x1) WiFi® and Bluetooth® 4.2 Combo [1]	
Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi® certified
Frequency Band	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
Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[3]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b : +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

Technical Specifications – Networking and Communications

	• 802.11n HT20(5GHz) : +15.5dBm minimum • 802.11n HT40(5GHz) : +14.5dBm minimum • 802.11ac VHT80(5GHz) : +11.5dBm minimum	
Power Consumption	• Transmit mode2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[3]	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	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230 : 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating	14° to 158° F (–10° to 70° C)
	Non-operating	–40° to 176° F (–40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED 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).

HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology

Bluetooth® Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE : 1 Mbps data rate; throughput up to 0.2 Mbps
	Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Electrical Interface	USB 2.0 compliant

Technical Specifications – Networking and Communications

Bluetooth® Software Supported Link Topology	Microsoft Windows Bluetooth® Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

Intel® Ethernet I210-T1 Gigabit Network Adapter	
Connector	RJ-45
System Interface	PCI (Intel® proprietary) + SMBus
Data rates supported	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s
IEEE Compliance	IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet)
Performance	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling Jumbo Frame 9K
Power consumption	Cable Disconnetion: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW
Power Management	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
Management Interface	Auto MDI/MDIX Crossover cable detection

Technical Specifications – Networking and Communications

IT Manageability	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
Security & Manageability	Intel® vPro™ support with appropriate Intel® chipset components

Technical Specifications – Networking and Communications

Intel® 9260 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 5.0 Combo[1] Non-vPro™	
Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi® certified
Frequency Band	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
Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 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, 80MHz & 160MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[1]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b : +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 • 802.11ac VHT160(5GHz) : +11.5dBm minimum
Power Consumption	• Transmit mode2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	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	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230: 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230: 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating Non-operating	14° to 158° F (–10° to 70° C) –40° to 176° F (–40° to 80° C)
Humidity	Operating Non-operating	10% to 90% (non-condensing) 5% to 95% (non-condensing)
Altitude	Operating Non-operating	0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)
LED Activity	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).

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 Wireless Technology	
Bluetooth® Specification	4.0/4.1/4.2/5.0 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE: 1 Mbps data rate; throughput up to 0.2 Mbps
	Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Electrical Interface	USB 2.0 compliant
Bluetooth® Software Supported Link Topology	Microsoft Windows Bluetooth® Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels

	Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

Intel® 2 7265 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 4.2 Combo [1] Non-vPro™	
Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi® certified
Frequency Band	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
Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[3]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b : +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
Power Consumption	• Transmit mode2.0 W

Technical Specifications – Networking and Communications

	• Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[3]	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	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230: 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230: 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating	14° to 158° F (–10° to 70° C)
	Non-operating	–40° to 176° F (–40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED 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).

HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology	
Bluetooth® Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE: 1 Mbps data rate; throughput up to 0.2 Mbps
	Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Electrical Interface	USB 2.0 compliant
Bluetooth® Software Supported Link Topology	Microsoft Windows Bluetooth® Software
Power Management	Microsoft Windows ACPI, and USB Bus Support

Technical Specifications – Networking and Communications

Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

Intel® 3168 802.11a/b/g/n/ac (1x1) WiFi® and Bluetooth® 4.2 Combo[1]	
Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi® certified
Frequency Band	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
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Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[3]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)

Technical Specifications – Networking and Communications

Roaming	IEEE 802.11 compliant roaming between access points	
Output Power[2]	• 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	
Power Consumption	• Transmit mode2.0 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	
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Receiver Sensitivity[3]	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	
Antenna type	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	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230: 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230: 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating Non-operating	14° to 158° F (–10° to 70° C) –40° to 176° F (–40° to 80° C)
Humidity	Operating Non-operating	10% to 90% (non-condensing) 5% to 95% (non-condensing)
Altitude	Operating Non-operating	0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED White – Radio ON	

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2. Maximum output power may vary by country according to local regulations.
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	Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)

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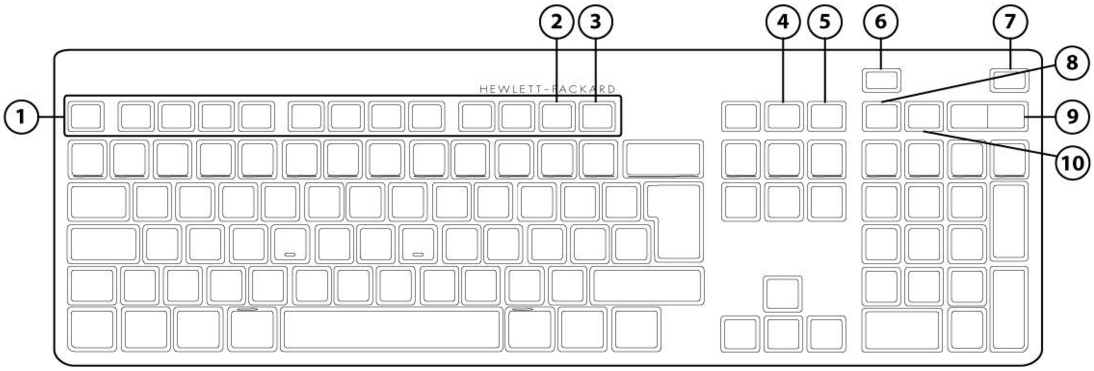
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

I/O DEVICES

HP EliteDesk 705 G4 Microtower

HP Conferencing Keyboard



1.	Function Keys	6.	End/Decline a Call
2.	F11 Lync or Skype for Business Contact list[1]	7.	Answer a Call
3.	F12 Lync or Skype for Business Calendar[2]	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		
Physical Characteristics	Keys	104, 105 layout (depending upon country)
	Dimensions (L x W x H)	17.04 x 5.55 x 0.52 in (433 x 141 x13.2 mm)
	Weight	1.54 lb (698g)
Electrical	Operating voltage	5 VDC, +/-5%
	Power consumption	35mA (All LED on)
	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
Mechanical	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)
Environmental	Acoustics	43-dBA maximum sound pressure level

	Operating temperature	50° to 122° F (10° to 50° C)
	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	10% to 90% (non-condensing at ambient)
	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
	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

Physical Characteristics	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)
Electrical	Operating voltage	4.4-5.25VDC
	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
Mechanical	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)
	Microsoft PC 99 - 2001	Mechanically compliant
Environmental	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 mmm)	
Weight	0.19lb (90g)	
Environmental	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	50 g, 6 surfaces
	Non-operating shock	80 g, 6 surfaces
	Operating vibration	2 g peak acceleration
	Non-operating vibration	4 g peak acceleration
Electrical	Operating voltage	5 VDC, +/-5%
	Power consumption	12mA
Mechanical	Connector	USB 2.0
	Type	3D mouse (3 keys and wheel)
	Resolution	800, 1200, 1600 DPI
	Sensor	Pixart PAN3606DL
Tracking speed	Tracking acceleration	8G(max), 1G=9.8m/s2
	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		
Dimensions (H x L x W)	37mm*115mm*62.9mm	
Weight	90 +10g/- 5 g	
Color	Black	
Connector	USB	
Mechanical	Resolution	800 DPI sensitivity
	Buttons	Two primary buttons and clickable scroll wheel

AUDIO/MULTIMEDIA

HP EliteDesk 705 G4 Microtower

Type	Integrated
HD Stereo Codec	Synaptics CX20632
Audio I/O Ports	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
Internal Speaker Amplifier	2W class D mono amplifier for the internal speaker only. External speakers must be powered externally
Multi-streaming Capable	Playback multi-streaming can be enabled in the audio control panel to allow independent audio streams to be sent to/from the front and rear jacks or integrated speaker.
Sampling	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
Wavetable Syntheses	Yes - Uses OS soft wavetable
Analog Audio	Yes
# of Channels on Line-Out	Stereo (Left & Right channels)
Internal Speaker	Yes

Technical Specifications – Audio

HP EliteDesk 705 G4 Small Form Factor Business PC

Type	Integrated
HD Stereo Codec	Conexant CX20632
Audio I/O Ports	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
Internal Speaker Amplifier	2W class D mono amplifier for the internal speaker only. External speakers must be powered externally
Multi-streaming Capable	Playback multi-streaming can be enabled in the audio control panel to allow independent audio streams to be sent to/from the front and rear jacks or integrated speaker.
Sampling	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
Wavetable Syntheses	Yes - Uses OS soft wavetable
Analog Audio	Yes
# of Channels on Line-Out	Stereo (Left & Right channels)
Internal Speaker	Yes

HP EliteDesk 705 G4 Desktop Mini Business PC

Type	Integrated
HD Stereo Codec	Conexant CX20632
Audio I/O Ports	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
Internal Speaker Amplifier	2W class D mono amplifier for the internal speaker only. External speakers must be powered
Multi-streaming Capable	Playback multi-streaming can be enabled in the audio control panel to allow independent audio streams to be sent to/from the front and rear jacks or integrated speaker.
Sampling	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
Wavetable Syntheses	Yes - Uses OS soft wavetable
Analog Audio	Yes
# of Channels on Line-Out	Stereo (Left & Right channels)
Internal Speaker	Yes

POWER

HP EliteDesk 705 G4 Microtower

UNIT ENVIRONMENT AND OPERATING CONDITIONS

Temperature Range	Operating : 5°C ~45°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: 50000ft (15240 m)

HP EliteDesk 705 G4 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 G4 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	MT
80 PLUS Platinum		180W active PFC 90/92/89% efficient at 20/50/100% load (115V) 91/93/90% efficient at 20/50/100% load (230V	250W active PFC / 80 PLUS Platinum 400W active PFC / 80 PLUS Platinum 90/92/89% efficient at 20/50/100% load (115V) 91/93/90% efficient at 20/50/100% load (230V)
Operating Voltage Range	90Vac~264Vac	90Vac~264Vac	90Vac~264Vac
Rated Voltage Range	100Vac~240Vac	100Vac~240Vac	100Vac~240Vac
Rated Line Frequency	50HZ~60HZ	50HZ~60HZ	50HZ~60HZ
Operating Line Frequency	47HZ~63HZ	47HZ~63HZ	47HZ~63HZ
Rated Input Current	65W≦1.6A 90W≦1.2A 150WW≦2.2A	250W≦3A 400W≦5.2A	250W≦3A 400W≦5.2A
Rated Input Current with Energy Efficient* Power Supply	65W≦1.6A 90W≦1.2A 150WW≦2.2A	250W≦3A 400W≦5.2A	250W≦3A 400W≦5.2A

Technical Specifications – Power

DC Output	+19.5V	+12V	+12V
Current Leakage (NFPA 99: 2102)	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 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 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 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 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 100 microamps of leakage current at 120 Vac with the ground wire intact with normal polarity, as required for Non-patient Electrical Appliances and Equipment used in a patient care facility or that contact patients in normal use. Per section 10.3.5.1.
Power Supply Fan	N/A	50mm variable speed	70mm variable speed
Power cord length	6.0 ft. (1.83 m)	6.0 ft. (1.83 m)	6.0 ft. (1.83 m)
External Power Adapter	External power supply 65W EPS, 89% average efficiency at 115V & 230Vac 90W EPS, 89% average efficiency at 115V & 230Vac 150W EPS, 89% average efficiency at 115V & 230Vac	Internal power supply	Internal power supply
Dimensions	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	165mm x 95mm x 73mm

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

WEIGHTS & DIMENSIONS

	DM	SFF	MT
Chassis (W x D x H) Not including bezel	6.97 x 6.89 x 1.35 in 177 x 175 x 34.2 mm	3.7 x 10.6 x 11.7 in 95 x 270 x 296 mm	6.69 x10.79 x 13.3 in 170 x 274 x 338 mm
System Volume	64 cu in 1.05 L	463 cu in 7.6 L	960 cu in 15.74 L
Max System Weight	1.265 kg	5.88 kg	7.14 kg
Max Supported Weight (desktop orientation)	N/A	77 lb 35 kg	77 lb 35 kg
Stand Dimensions	160 x 117 x 18.5 mm		
Packaging (W x D x H)	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	15.35 x 11.73 x 19.65 in 390 x 298 x 499 mm
Shipping Weight	2.95 kg 6.49 lb	16.12 lb 7.32 kg	22.64 lb 10.28 kg
Shipping Weight (Molded Pulp)		16.62 lb 7.54kg	23.15 lb 10.5kg
Multipack Packaging (10 units)	20.28x16.54x25 in 515x420x636 mm		
Palletization Profile	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	6-units per layer 42 per pallet 47.24 x 39.37 x 86.85 in (including pallet) 7 layer max

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

Graphics Solutions	**DM**	**SFF**	**TWR**	**Part Number**
AMD® Radeon™ R7 430 2GB 2DP Card		X		3TK71AA
AMD® Radeon™ RX550 4GB 2DP Card			X	3MQ82AA
HP DisplayPort™ To HDMI True 4k Adapter	X	X	X	2JA63AA
HP DVI Cable Kit		X	X	DC198A
HP HDMI Standard Cable Kit	X	X	X	T6F94AA
HP DisplayPort™ Cable Kit	X	X	X	VN567AA
HP DisplayPort™ To DVI-D Adapter	X	X	X	FH973AA
HP DisplayPort™ To VGA Adapter	X	X	X	AS615AA

Desktop Mini Accessories	**DM**	**SFF**	**TWR**	**Part Number**
HP Desktop Mini G3 Port Cover Kit	X			1ZE52AA
HP G4 Mini 2.5-inch SATA Drive Bay Kit	X			3TK91AA
HP Desktop Mini LockBox V2	X			3EJ57AA
HP Desktop Mini 500GB HDD/I/O Expansion Module	X			K9Q82AA
HP Desktop Mini DVD-Writer ODD Expansion Module	X			K9Q83AA
HP Desktop Mini I/O Expansion Module	X			K9Q84AA
HP Desktop Mini Security/Dual VESA Sleeve v2	X			2JA32AA
HP Desktop Mini Vertical Chassis Stand	X			G1K23AA
HP DM VESA Power Supply Holder Kit	X			1RL87AA

Desktop Mini Accessories	**DM**	**SFF**	**TWR**	**Part Number**
Intel® 9260 802.11ac non-vPro PCIe x1 Card		X	X	3TK89AA
Realtek 8822BE 802.11ac PCIe x1 Card		X	X	3TK90AA

Data Storage Drives	**DM**	**SFF**	**TWR**	**Part Number**
HP 256GB SATA TLC Non-SED Solid State Drive	X	X	X	P1N68AA
HP PCIe NVME TLC 256GB SSD M.2 Drive	X	X	X	1CA51AA
HP PCIe NVME TLC 512GB SSD M.2 Drive	X	X	X	X8U75AA
HP PCIe NVME TLC 512GB SSD PCIe Drive		X	X	Z4L70AA
HP 500GB 7200PRM SATA 6.0Gb/s 3.5" Hard Drive		X	X	QK554AA
HP 1TB 7200rpm SATA 6Gb/s 3.5" Hard Drive		X	X	QK555AA
HP SATA SuperMulti JB Drive			X	QS208AA
HP 9.5mm Slim Removable SATA 500GB		X	X	T7G14AA
HP 9.5mm G3 8/6/4 SFF G4 400 SFF/MT DVD Writer		X		1CA53AA

After Market Options

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

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

Multimedia Devices	**DM**	**SFF**	**TWR**	**Part Number**
HP Business Headset v2	X	X	X	T4E61AA
HP USB Business Speakers v2	X	X	X	N3R89AA

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

HP Keyed Cable Lock 10mm	X	X	X	T1A62AA
HP Master Keyed Cable Lock 10mm	X	X	X	T1A63AA

Stands and Accessories	**DM**	**SFF**	**TWR**	**Part Number**
HP B300 PC Mounting Bracket	X			2DW53AA
HP B500 PC Mounting Bracket	X			2DW52AA
HP Single Monitor Arm	X			BT861AA

I/O Devices	**DM**	**SFF**	**TWR**	**Part Number**
HP DisplayPort™ Port Flex IO	X	X	X	3TK72AA
HP HDMI Port Flex IO (705)	X	X	X	3TK75AA
HP Type-C™ USB 3.1 Gen2 Port Flex IO	X	X	X	3TK78AA
HP VGA Port Flex IO	X	X	X	3TK80AA
HP Internal Serial Port Flex IO	X			3TK76AA
HP Serial Port Adapter (2nd Serial Port)		X	X	PA716A
HP Internal Serial Port (600/705/800)		X	X	3TK82AA
HP PCIe x1 Parallel Port Card		X	X	N1M40AA
HP 800/600/400 G3 Serial/ PS/2 Adapter		X	X	1VD82AA

Change Log

Date	Version History	Action	Description of Change
June 20, 2018	From v1 to v2	Update	Weights & Dimensions
June 28, 2018	From v2 to v3	Added	Environmental tab
July 19, 2018	From v3 to v4	Added	Note for SATA Drive Bracket added to Internal Slots and Ports section
July 27, 2018	From v4 to v5	Remove	Checkmark off the SFF for the RX550 graphics card in the After Market Options section
July 30, 2018	From v5 to v6	Change	Graphic cards info moved to processors section and graphic removed off QS.
August 1, 2018	From v6 to v7	Add/remove	AMD Ryzer™ CPU added to processors USB mentions formatted to last statement requirements
August 9, 2018	From v7 to v8	Update	Processors order re-arranged
August 20, 2018	From v8 to v9	Update	Shipping weight (Molded Pulp) added to to weight and dimensions for SFF and MT Palletization profile updated
August 21, 2018	From v9 to v10	Update	Windows Home removed
August 27, 2018	From v10 to v11	Update	Windows Home re-attached
August 30, 2018	From v11 to v12	Update	Optional Discrete Graphics Solutions table section added GTX1060 and GT730 graphic cards specs added After market options corrected
September 6, 2018	From v12 to v13	Add	System Integrated Graphics and its specs added on both Graphics sections
September 13, 2018	From v13 to v14	Add	2700X CPU*, 2700 CPU* and 2600 CPU* processors information updated.
September 18, 2018	From v14 to v15	Removal	Duplicated AMD Ryzen™ 7 PRO 2700X CPU* removed from processors
September 19, 2018	From v15 to v16	Add	NVIDIA GeForce GT730 2GB DP DVI PCIe x8 GFX added to Graphics section for MT and SFF
September 27, 2018	From v16 to v17	Update	AMD Radeon RX 560 graphic card added Last bullet added to “At a Glance” section
October 5,2018	From v17 to v18	Update	Memory footnote change from 2400 to 2133
October 9, 2018	From v18 to v19	Update	Max boost and base frequency added to AMD Ryzen and PRO processors
October 11, 2018	From v19 to v20	Update	Footnote 33 updated to Raid 1 configuration
October 17, 2018	From v20 to v21	Update	AMD® Athlon™ PRO 200GE APU with AMD®Radeon added to processors
October 18, 2018	From v21 to v22	Update	VESA Plate Intergrated added to not shown call outs for Desktop Mini Athlon PRO" Processo added to “At a glance” second bullet

Change Log

			Foot note no. 4 removed from third bullet at "At a glance"section AMD Athlon™ PRO 200GE Processor put in AMD® Ryzen™ with AMD®Radeon processors section
November 14, 2018	From v22 to v23	Update	Max. Resolution added to AMD Radeon™ 560
November 21, 2018	From v23 to v24	Update	SSD Intel Optane 118GB 2280 PCIe NVME (Optane) removed from storage
November 28, 2018	From v24 to v25	Update	Active Mode Row added to SFF Environmental data table
December 17, 2018	From v25 to v26	Update	AMD Radeon™ R7 430 Graphics 2GB GDDR5 64bit 2DP, AMD Radeon™ R7 430 Graphics 2GB GDDR5 64bit DP+VGA and AMD Radeon™ RX 580 Graphics 8GB GDDR5 Added to graphics
January 2, 2019	From v26 to v27	Update	Max System Weight set for MT and SFF
January 23, 2019	From v27 to v28	Update	AMD® PRO A6-9500 APU Graphics processor added for SFF
February 1, 2019	From v28 to v29	Update	HP PhoneWise, HP WorkWise and HP ePrinter + Jet advantage removed.
February 11, 2019	From v29 to v30	Update	Support for VESA 100 mounting system on bottom of PC chassis" added to mounting in the call outs section for DM
March 11, 2019	From v30 to v31	Update	Type C port USB port (2.0 or 3.0) and PORTS information charging capability statement update and PORTS information, on USB type C port (15W) added.
April 1, 2019	From v31 to v32	Update	DVD and Blue-ray ROM´s added to Storage specs section
April 15, 2019	From v32 to v33	Update	AMO updated
April 16, 2019	From v33 to v34	Update	HP 9.5mm Slim DVD Writer Drive Write speeds updated
May 15, 2019	From v34 to v35	Update	AMD® PRO A12-8870, AMD® PRO A10-8770 APU, AMD® PRO A6-8570 APU and Intel® 8260 802.11AC 2x2 DualBand PCIe x1 Combo added.
May 28, 2019	From v35 to v36	Update	Web-supported only added
June 27, 2019	From v36 to v37	Update	EPEAT references updated RTL8111EPH NIC added on 705 G4 DM section HP Cloud Recovery and footnote added at software section
July 10, 2019	From v37 to v38	Update	Duplicated environmental tables removed Typo corrected in environmental table for SFF
July 29, 2019	From v38 to v39	Update	NVIDIA® GeForce® RTX 2060 6 GB and AMD® Radeon™ 520 1GB added to Graphics AMD® Radeon™ RX550 4GB made able for SFF
August 20, 2019	From v39 to v40	Update	Bays specs, and references updated Disclaimer added to SFF call outs back image Cable lock slot upgraded to Standard
September 10, 2019	From v40 to v41	Update	Windows 10 Enterprise 64 added to web supported only section
September 17, 2019	From v41 to v42	Update	Note added to Graphics
November 5, 2019	From v42 to v43	Update	EPEAT references updated / Power Factor table added to Power Supply
December 11, 2019	From v43 to v44	Update	Weights and dimensions typos corrected
February 18, 2020	From v44 to v45	Update	Drivelock note and disclaimer added
July 30, 2020	From v45 to v46	Update	DM rear image call out #4 corrected