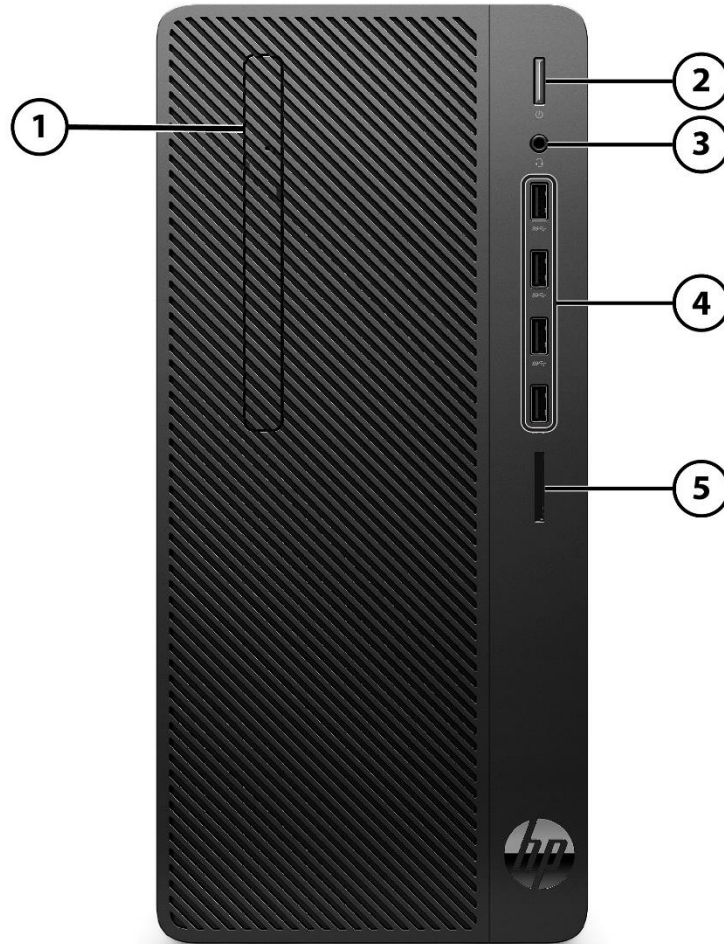


Overview

HP 290 G3 Microtower Business PC



Front

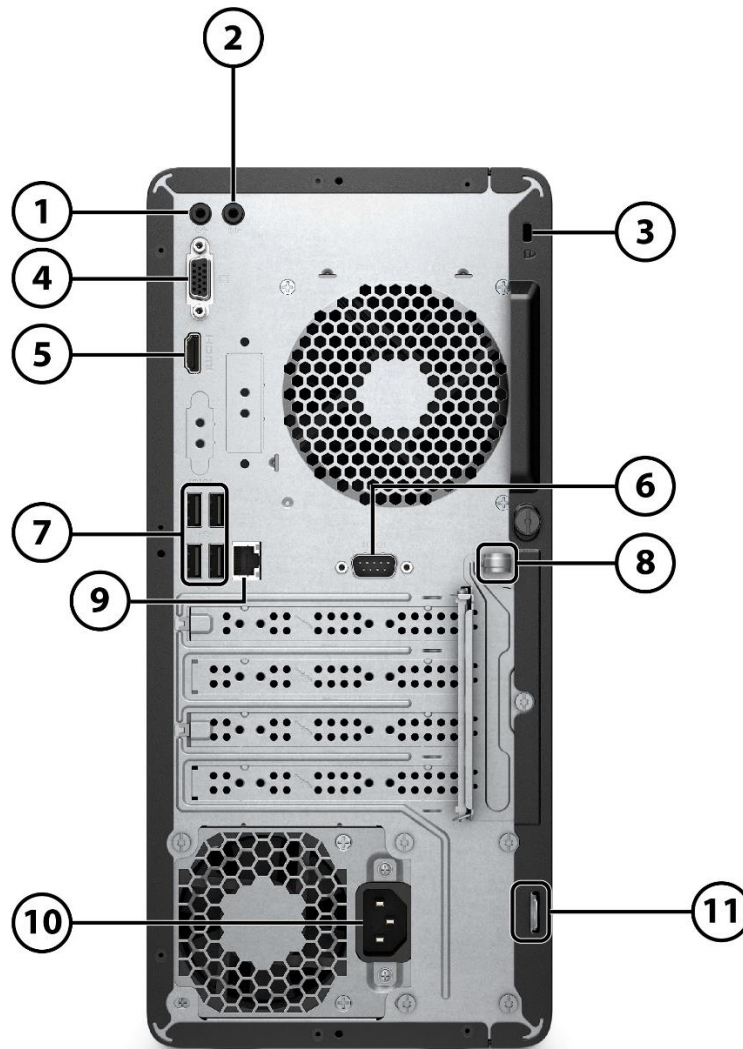
1. Slim-height Bay - supporting an optical disk drive (optional)
2. Power Button
3. Combo jack, Headphone/ Microphone
4. (4) USB 3.1 Gen1 Port
5. SD Card Reader (optional)

Not Shown

- Slots
- (1) PCI Express x16
 - (1) PCI Express x1
 - (1) PCI
 - (1) M.2 for WLAN
 - (1) M.2 2242/2280 storage
- Bays
- (1) 3.5" internal HDD bay or 2.5" internal SSD bay
 - (1) 3.5" or 2.5" internal HDD bay (share bay with caddy)
 - (1) 9.5mm internal optical drive bay

Overview

HP 290 G3 Microtower Business PC



Back

- | | |
|---------------------------|--------------------------------------|
| 1. Audio Line out | 6. Serial Port (optional) |
| 2. Audio Line in | 7. Connector (4) USB 2.0 port |
| 3. Standard lock slot | 8. Integrated accessories cable lock |
| 4. VGA Port ¹ | 9. RJ-45 Network |
| 5. HDMI Port ¹ | 10. Power Cord Connector |
| | 11. Padlock Loop |

Not Shown

- (1) PS/2 Port (optional)
- (1) Parallel Port (Optional via PCIe slot)
- (1) 4 Serial Port (Optional via PCIe slot)²
- (1) Internal Speaker (Optional)

1. Port will be covered up when configured with processor which is without internal graphics.

2. Available to selected regions

Standard Features and Configurable Modules

AT A GLANCE

- Windows 10 Pro, Windows 10 Home or FreeDos
- Intel®B365 chipset supporting Intel® 8th and 9th processors featuring Intel® UHD Graphics
- Supports an optional discrete graphics card
- Integrated 10/100/1000 Ethernet Controller or 802.11ac (1x1) Wi-Fi® and Bluetooth® 4.2 Combo
- Up to 32GB DDR4-2666 Unbuffered Memory (UDIMM)
- Independent monitor support via VGA and HDMI interfaces
- TPM 2.0 support dTPM¹
- Supports both Hard Disk Drives and SATA TLC / M.2 PCIe NVMe Solid State Drives
- 8 USB Ports (including 4 USB 3.1 Gen1 ports)
- 180W/310W 90% HE power supply
- Security cable lock supported (sold separately)
- Optional HP Care Services available; terms and conditions vary by country; certain restrictions and exclusions apply²

1. TPM feature will not be supported on machine pre-configured with FreeDOS in cases, machines pre-configured with Windows OS might ship with TPM turned off.

2. HP Care Services are optional. Service levels and response times for HP Care Services 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.

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

Standard Features and Configurable Modules

PRODUCT NAME

HP 290 G3 Microtower Business PC

OPERATING SYSTEM

Preinstalled	Windows 10 Pro 64 ¹ Windows 10 Home 64 ¹
Pre-installed (other)	FreeDOS

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

PROCESSORS

Intel® Celeron® Processors^{2,3}

CPU Intel Celeron G4900 Dual Core 3.1GHz 2400MHz 54W (3.1GHz, 2 MB cache, 2 cores)

CPU Intel Celeron G4930 Dual Core 3.2GHz 2400MHz 54W (3.2GHz, 2 MB cache, 2 cores)

Intel® Pentium® Processors^{2,3}

CPU Intel Pentium G5400 Dual Core 3.7GHz 2400MHz 54W (3.7GHz, 4 MB cache, 2 cores)

CPU Intel Pentium G5500 Dual Core 4.0GHz 2400MHz 54W (4.0GHz, 4 MB cache, 2 cores)

Intel® Pentium Gold^{2,3}

CPU Intel Pentium G5420 Dual Core 3.8GHz 2400MHz 54W (3.8GHz, 4 MB cache, 2 cores)

CPU Intel Pentium G5600 Dual Core 3.9GHz 2400MHz 54W (3.9 GHz 4 MB cache, 2 cores)

CPU Intel Pentium G5620 Dual Core 3.8GHz 2400MHz 54W (3.8GHz, 4 MB cache, 2 cores)

Intel 8th Processors

Intel® Core™ i3^{2,3}

CPU Intel Core i3-8100 Quad Core 3.6GHz 2400MHz 65W (3.6GHz, 6 MB cache, 4 cores)

Intel® Core™ i5^{2,3}

CPU Intel Core i5-8400 6C 2.8GHz 2666MHz 65W (2.8GHz, turbo up to 4GHz, 9 MB cache, 6 cores)

Intel® Core™ i5^{2,3}

CPU Intel Core i5-8500 6C 3.0GHz 2666MHz 65W (3GHz, turbo up to 4.1GHz, 9 MB cache, 6 cores)

Intel® Core™ i7^{2,3}

CPU Intel Core i7-8700 6C 3.2GHz 2666MHz 65W (3.2GHz, turbo up to 4.6GHz, 12 MB cache, 6 cores)

Intel 9th Processors

Intel® Core™ i3^{2,3}

CPU Intel Core i3-9100 4C 3.6GHz 2400MHz 65W (3.6GHz, turbo up to 4.2GHz, 6 MB cache, 4 cores)

CPU Intel Core i3-9300 4C 3.7GHz 2400MHz 62W (3.7GHz, turbo up to 4.3GHz, 8 MB cache, 4 cores)

Intel® Core™ i5^{2,3}

CPU Intel Core i5-9400 6C 2.9GHz 2666MHz 65W (2.9GHz, turbo up to 4.1GHz, 9 MB cache, 6 cores)*

CPU Intel Core i5-9400F 6C 2.9GHz 2666MHz 65W (2.9GHz, turbo up to 4.1GHz, 9 MB cache, 6 cores)

CPU Intel Core i5-9500 6C 3GHz 2666MHz 65W (3GHz, turbo up to 4.4GHz, 9 MB cache, 6 cores)

CPU Intel Core i5-9500F 6C 3GHz 2666MHz 65W (3GHz, turbo up to 4.4GHz, 9 MB cache, 6 cores)

CPU Intel Core i5-9600 6C 3.1GHz 2666MHz 65W (3.1GHz, turbo up to 4.6GHz, 9 MB cache, 6 cores)

Intel® Core™ i7^{2,3}

CPU Intel Core i7-9700 8C 3.0GHz 2666MHz 65W (3.0GHz, turbo up to 4.7GHz, 12 MB cache, 8 cores)

Standard Features and Configurable Modules

2. 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 8th or 9th generation and forward processors or provide any Windows® 8 or Windows 7 drivers on <http://www.support.hp.com>

3. 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. 64-bit computing system required. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering is not a measurement of higher performance.

***NOTE:** Only available on selected region

CHIPSET

Intel® B365 Chipset

GRAPHICS

Integrated^{4,5}

Intel® UHD

Graphics 630 (integrated on 8th and 9th Core i processors)

Intel® UHD

Graphics 610 (integrated on Pentium and Celeron)

Discrete Graphics

AMD Radeon™ R7 430 2GB GFX

AMD Radeon™ RX550X 4GB GFX

AMD Radeon™ 520 1GB GFX

NVIDIA® GeForce® GT730 2GB GFX

4. HD content required to view HD images.

5. Integrated Intel software is available on select models only and requires separately purchased projector, tv or computer monitor with an integrated or external receiver. External receivers connect to the projector, tv or computer monitor via a standard VGA, HDMI cable, also sold separately

MEMORY⁶

Form Factor	Type	Maximum	# of Slots
Microtower	DDR4 2666 (Transfer rates up to 2666 MT/s)	32 GB capacity	2 DIMM
	4GB DDR4-2666 UDIMM NECC (1x4GB)		
	8GB DDR4-2666 UDIMM NECC (1x8GB)		
	8GB DDR4-2666 UDIMM NECC (2x4GB)		
	16GB DDR4-2666 UDIMM NECC (1x16GB)		
	16GB DDR4-2666 UDIMM NECC (2x8GB)		

6. Memory modules support data transfer rates up to 2666 MT/s; actual data rate is determined by the system's configured processor. See processor specifications for supported memory data rate.

STORAGE

SATA3 - 3.5" or 2.5" 6Gb/s HDDs

2TB 7200 RPM SATA Hard Disk Drive

1TB 7200 RPM SATA Hard Disk Drive

Standard Features and Configurable Modules

500GB 7200 RPM SATA Hard Disk Drive

128GB 2.5" TLC SSD

256GB 2.5" TLC SSD

Solid State Drives

128GB M.2 NVMe

256GB M.2 NVMe

512GB M.2 NVMe

SD Card Reader⁷

SD/SDHC/SDXC SD Card Reader

[7. Optional per configuration](#)

OPTICAL DISC DRIVES⁸

DVD-ROM 9.5mm

DVD-Writer 9.5mm*

[8. Optical drives are optional or add on features. Duplication of copyrighted material is strictly prohibited. Actual speeds may vary. Double Layer media compatibility will widely vary with some home DVD players and DVD-ROM drives.](#)

NETWORKING⁹

Ethernet (RJ-45)

Integrated 10/100/1000M GbE LAN

Wi-Fi[®] and Bluetooth[®]

802.11ac (1x1) Wi-Fi[®] and Bluetooth[®] 4.2 Combo

[9. Wireless cards are optional or add-on features and requires separately purchased wireless access point and internet service. Availability of public wireless access points limited.](#)

Standard Features and Configurable Modules

AUDIO / MULTIMEDIA

Integrated Hi-Definition Audio (optional)
Combo Jack, Headphone / Microphone
Line-in / Line-out (3.5mm)

KEYBOARDS AND POINTING DEVICES¹⁰

Keyboard

USB Business Slim Wired Keyboard
HP USB Wired Keyboard
Business Slim USB Antimicrobial Wired Keyboard (China)
Business Slim PS/2 Wired Keyboard
No KB Option

Mouse

Antimicrobial USB Mouse (China)
HP Optical USB Mouse
Universal Wired USB Mouse
USB Hardened Mouse (India)
HP PS/2 Mouse (for machine configured with PS/2 port)
No Mouse Option

[10. Keyboards and mouse are optional or add-on features.](#)

PORTS

Front

Slim-height Bay - supporting an optical disk drive (optional)
Power Button
Combo jack, Headphone / Microphone
SD Card Reader (optional)
(4) USB 3.1 Gen1 Port

Not Shown

(1) PCI Express x16
(1) PCI Express x1 Accessory slot
(1) Full-height PCI
(1) M.2 for WLAN
(1) M.2 2242/2280 storage

Rear

Audio Line out
Audio Line in

Standard Features and Configurable Modules

- HDMI Port¹¹
- VGA Port¹¹
- Serial Port (optional)
- Standard Lock Slot
- (4) USB 2.0 port
- RJ-45 Network connector
- Power cord connector
- Padlock loop
- Integrated accessories cable lock

Not Shown

- (2) PS/2 Port (optional)
- (1) Parallel Port (Optional via PCIe x1 slot)
- (1) 4x Serial port (Optional via PCIe x1 slot)¹¹
- (1) Internal Speaker (Optional)

11. Port will be covered up when configured with processor which is without internal graphics.

BAYS

- (1) 9.5mm external slimline ODD bay (optional)
- (1) 3.5" internal HDD or 2.5" internal SSD bay
- (1) 3.5 or 2.5" internal HDD bay (share bay with caddy)

Standard Features and Configurable Modules

SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

Security and Protection

McAfee* LiveSafe™ 12

Productivity

Buy Office (sold separately)

Dropbox¹³

ODD Playback

sMedio True DVD for HP

Movies

Netflix¹⁴

App Stores and Content Purchasing

Amazon¹⁴

HP Utilities and Support

HP Documentation

HP JumpStarts

HP Audio Switch¹⁵

HP Support Assistant

BTB

HP Setup Integrated OOBE

Hardware Enabling Drivers or software utility

HP System Event Utility

12. Free 1-year subscription of McAfee LiveSafe service included. Internet access required and not included. Subscription required after expiration

13. New Dropbox users are eligible to get 25 GB of Dropbox space free for 12 months from date of registration. For complete details and terms of use, including cancellation policies, visit the Dropbox website at <https://www.dropbox.com/help/space/hp-promotion>. Internet service required and not included.

14. Internet access required and not included.

15. Easily switch between speaker and microphone sources with intuitive controls and a consistent app experience.

*NOTE: Available for LA region only.

POWER SUPPLY¹⁶

180 W

ENERGY® STAR® Libra2 EPA90 (Gold) Full range 115V/230V

310 W

SFF ENTL EPA90 (Gold) Full range 115V/230V

16. All power supplies are not available in every region.

Standard Features and Configurable Modules

DIMENSIONS AND WEIGHT

Dimensions

6.12 x 11.93 x 13.28 in
(155 x 303 x 337 mm)

Weight

10.4 lbs / 4.7 kg

UNIT ENVIRONMENT AND OPERATING CONDITIONS

General Unit Operating Guidelines

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

Temperature Range	Operating: 32° to 104° F (0° to 40° C) ¹⁷ Non-operating: -22° to 140° F (-30° to 60° C)
Relative Humidity	Operating: 10% to 90% (non-condensing at ambient) Non-operating: 0% to 95% (non-condensing at ambient)
Maximum Altitude (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)

¹⁷ Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.

Standard Features and Configurable Modules

SERVICE AND SUPPORT

On-site Warranty 1: Available three-year (3-3-3) or one-year (1-1-1) limited warranty (varies by country) delivers on-site, next business day 2 service for parts and labor and complimentary limited technical support.³ 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.⁴ To choose the right level of service for your HP product, visit HP Care Pack Central: <http://www.hp.com/go/cpc>.

NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply. Other warranty variations may be offered in your region.

NOTE 2: 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.

NOTE 3: Technical support applies only to HP-configured and third-party HP qualified hardware and software.

NOTE 4: 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 <http://www.hp.com/go/cpc>. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

Technical Specifications - Graphics

GRAPHICS

Intel® UHD Graphics 630 (integrated on Core i7/i5/i3 processors) Intel® UHD Graphics 610 (integrated on Pentium and Celeron)	
DisplayPort™	Multimode capable; supports HDCP, DisplayPort™ Audio (2 streams), HBR2 link rates and Multi-Stream Technology for a maximum of 3 displays (including the integrated panel)
Memory	Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (DVMT), to provide an optimal balance between graphics and system memory use.
Maximum Graphics Memory	Windows 10: >4 GB
Maximum Color Depth	32 bits/pixel
Graphics/Video API Support	8 th and 9 th Generation Intel® Core Processors With Intel® UHD Graphics 630 Pentium® and Celeron® With Intel® UHD Graphics 610
Supported Display Resolutions and Refresh Rates	Max. Resolution (VGA) 2048 x 1536@60Hz Max. Resolution (HDMI) 4096 x 2160@60Hz
<p>Note: The actual amount of maximum graphics memory can be less than the amounts listed above depending upon your computer's configuration.</p> <p>Note: other resolutions may be available but are not recommended as they may not have been tested and qualified by HP Only supported on displays connected to the external DisplayPort™ connector.</p>	

Technical Specifications - Graphics

NVIDIA® GeForce® GT 730 2GB Graphics Card

Engine Clock	902 MHz
Memory Clock	1250 MHz
Memory Size(width)	2GB(64-bit)
Memory Type	256M x 32 GDDR5 @2pcs
Max. Resolution(DVI)	2560x1600@60Hz
Max. Resolution(DP)	4096x2160@60Hz
Multi Display Support	2 displays
HDCP Compliance	yes
Rear I/O connectors(bracket)	DVI+DP
Cooling(active/passive)	Active fan-sink(Active cooling with dynamic speed)
Total power consumption(W)	<35W
PCB form-factor with bracket	LP PCB with FH/LP bracket

AMD Radeon™ R7 430 2GB Graphics Card

Engine Clock	780 MHz
Memory Clock	1100 MHz
Memory Size(width)	2GB(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)	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

AMD® Radeon™ RX550X 4 GB FH PCIe x16

Engine Clock	1183MHz
Memory Clock	6 Gbps
Memory Size(width)	4 GB(128-bit)
Memory Type	GDDR5
Max. Resolution(HDMI)	4096x2160 @ 60Hz
Max. Resolution(DP)	5120x2880 @ 60Hz
Multi Display Support	2 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)	<50W
PCB form-factor with bracket	LP (low profile) 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

Technical Specifications - Storage

STORAGE

HP 2 TB 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive

Capacity	2 TB
Rotational Speed	7,200 rpm
Interface	SATA 6Gb/s NCQ
Buffer Size	64 MB
Logical Blocks	3,907,029,168
Seek Time	Read: <8.5 ms Write: <9.5 ms
Height	1.028 in/26.11 mm
Width	4.0 in/101.6 mm
Operating Temperature	32° to 140° F (0° to 60° C)

1 TB 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive

Capacity	1 TB
Rotational Speed	7,200 rpm
Interface	Serial ATA 3.0 (6.0 Gb/s)
Buffer Size	32 MB
Logical Blocks	1,953,525,168
Seek Time	Single Track: 2.0 ms Average: 11 ms Full-Stroke: 21 ms
Height	1 in/2.54 cm
Width	Media diameter: 3.5 in/8.89 cm Physical size: 4 in/10.2 cm
Operating Temperature	41° to 131° F (5° to 55° C)

500 GB 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive

Capacity	500 GB
Rotational Speed	7,200 rpm
Interface	Serial ATA 3.0 (6.0 Gb/s)
Buffer Size	32 MB
Logical Blocks	1,953,525,168
Seek Time	Single Track: 2.0 ms Average: 11 ms Full-Stroke: 21 ms
Height	1 in/2.54 cm
Width	Media diameter: 3.5 in/8.89 cm Physical size: 4 in/10.2 cm
Operating Temperature	41° to 131° F (5° to 55° C)

Technical Specifications - Storage

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

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

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

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

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

Drive Weight	< 10g
Capacity	512GB
Height	2.38mm
Length	80mm
Width	22mm
Interface	PCIe Gen3x4
Maximum Sequential Read	Up to 2900MB/s
Maximum Sequential Write	Up to 1100MB/s
Logical Blocks	1,000,215,216

Technical Specifications - Storage

Operating Temperature	0° to 70°C (32° to 158°F) [ambient temp]
Features	APST; ASPM L1.2; NVME spec 1.2

256 GB M.2 2280 PCIe NVMe SSD

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

512 GB M.2 2280 PCIe NVMe SSD

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

128GB 2.5in SATA Three Layer Cell SSD

Drive Weight	<50g
Capacity	128GB
Height	7mm
Length	100.45mm
Width	69.85mm
Interface	SATA 3.0 (6Gb/s)
Performance	Up to Random Read/Write = 70K/40K IOPS
Maximum Sequential Read	Up to 530MB/s

Technical Specifications - Storage

Maximum Sequential Write	Up to 380MB/s
Logical Blocks	250,069,680
Operating Temperature	0° to 70°C (32° to 158°F) [ambient temp]
Features	DIPM; TRIM

256GB 2.5in SATA Three Layer Cell SSD

Drive Weight	<62g
Capacity	256GB
Height	7mm
Length	100.45mm
Width	69.85mm
Interface	SATA 3.0 (6Gb/s)
Performance	Up to Random Read/Write = 55K/68K IOPS
Maximum Sequential Read	Up to 530MB/s
Maximum Sequential Write	Up to 450MB/s
Logical Blocks	500,118,192
Operating Temperature	0° to 70°C (32° to 158°F) [ambient temp]
Features	DIPM; TRIM

Technical Specifications – Optical Drives

OPTICAL DISC DRIVES

HP 9.5mm Desktop G2 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
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 Desktop G2 Slim DVD-ROM 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

Technical Specifications – Optical Drives

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

**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 \pm 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)

Technical Specifications – Networking

NETWORKING

10/100/1000 NIC	Ethernet Features	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
	Power Management	ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
	Performance Features	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling Jumbo Frame 9K
	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
	Interface	PCIe + SMBus
	NIC Device Driver Name	PCIe GBE Ethernet Family Controller

Realtek 802.11ac (1x1) Wi-Fi® and Bluetooth® 4.2 Combo *

Wireless LAN Standards¹	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac 1. Wireless access point and Internet service required and not included. Availability of public wireless access points limited.	
Interoperability	Wi-Fi® certified modules	
Frequency Bands	802.11b/g/n	2.402 – 2.482 GHz NOTE: The FCC has declared products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 & 15.249 or otherwise disable those channels.
	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

Data Rates	<p>802.11b: 1, 2, 5.5, 11 Mbps</p> <p>802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</p> <p>802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</p> <p>802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</p> <p>802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)</p>
Modulation	<p>Direct Sequence Spread Spectrum</p> <p>BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</p>
Security²	<p>IEEE and 64 / 128 bit WEP encryption for a/b/g mode only</p> <p>AES-CCMP: 128 bit in hardware</p> <p>802.1x authentication</p> <p>WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</p> <p>WPA2 certification</p> <p>IEEE 802.11i</p> <p>Cisco Certified Extensions, all versions through CCX4 and CCX Lite</p> <p>WAPI</p> <p>2 Check latest software/driver release for updates on supported security features.</p>
Network Architecture Models	<p>Ad-hoc (Peer to Peer)</p> <p>Infrastructure (Access Point Required)</p>
Roaming	<p>IEEE 802.11 compliant roaming between access points</p>
Output Power³	<p>802.11b : +14dBm minimum</p> <p>802.11g : +12dBm minimum</p> <p>802.11a : +12dBm minimum</p> <p>802.11n HT20(2.4GHz) : +12dBm minimum</p> <p>802.11n HT40(2.4GHz) : +12dBm minimum</p> <p>802.11n HT20(5GHz) : +10dBm minimum</p> <p>802.11n HT40(5GHz) : +10dBm minimum</p> <p>802.11ac VHT80(5GHz) : +10dBm minimum</p> <p>3. Maximum output power may vary by country according to local regulations.</p>
Power Consumption	<ul style="list-style-type: none"> •Transmit mode2.0 W •Receive mode1.6 W •Idle mode (PSP)180 mW(WLAN Associated) •Idle mode50 mW(WLAN unassociated) •Connected Standby 10mW •Radio disabled8 mW
Power Management	<p>ACPI and PCI Express compliant power management</p> <p>802.11 compliant power saving mode</p>

Technical Specifications – Networking

Receiver Sensitivity⁴	<p>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</p> <p><small>4 Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).</small></p>	
Antenna type	<p>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</p>	
Form Factors	<p>PCI-Express M.2 MiniCard</p>	
Dimensions	<p>Type 2230 : 2.3 x 22.0 x 30.0 mm</p>	
Weight	<p>Type 2230 : 2.8g</p>	
Operating Voltage	<p>3.3v +/- 9%</p>	
Temperature	<p>Operating:</p> <p>Non-operating:</p>	<p>14° to 158° F (-10° to 70° C) -40° to 176° F (-40° to 80° C)</p>
Humidity	<p>Operating:</p> <p>Non-operating:</p>	<p>10% to 90% (non-condensing) 5% to 95% (non-condensing)</p>
Altitude	<p>Operating:</p> <p>Non-operating:</p>	<p>0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)</p>
LED Activity	<p>LED Amber – Radio OFF; LED White – Radio ON</p>	
HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology		
Bluetooth® Specification	<p>4.0/4.1/4.2 Compliant</p>	
Frequency Band	<p>2402 to 2480 MHz</p>	
Number of Available Channels	<p>Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)</p>	
Data Rates and Throughput	<p>Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps</p>	
	<p>BLE : 1 Mbps data rate; throughput up to 0.2 Mbps Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels</p>	
	<p>Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)</p>	
Transmit Power	<p>The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of + 4 dBm for BR and EDR.</p>	

Technical Specifications – Networking

Receiver Sensitivity Legacy	
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Range	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Electrical Interface	USB 2.0 compliant
Bluetooth® Software Supported Link Topology	Microsoft Windows Bluetooth® Software
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Certifications Bluetooth® Profiles Supported	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	Microsoft Windows ACPI, and USB Bus Support
Certifications 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 - Audio

HIGH DEFINITION AUDIO (optional)

Type	Integrated
HD Stereo Codec	Realtek ALC3601
Audio I/O Ports	Front side Combo jack for supporting CTIA, Rear side Line-in/ Line-out/ Mic-in jacks
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.
HD Audio Codec	Realtek ALC3601
Sampling	Independent sampling rates for DAC's and ADC's; supports resolutions from 16 to 24-bit; 44.1K/ 48 K/96K / 192K Hz for DAC and 44.1K/ 48K/ 96K/ 192K Hz Hz for ADC
Wavetable Syntheses	Yes
Analog Audio	Yes
# of Channels on Line-Out	Stereo
Internal Speaker	Yes
External Speaker Jack	2W class D mono amplifier for the internal speaker only. External speakers must be powered externally.

Technical Specifications - Power

POWER SUPPLY

Operating Voltage Range	90 – 264 VAC
Rated Voltage Range	100-240V AC
Rated Line Frequency	50/60 HZ
Operating Line Frequency	47 – 63 Hz
Rated Input Current	180W : <2.3A; 310W: <4A
Rated Input Current with Energy Efficient* Power Supply	180W active PFC 87/90/87% efficient at 20/50/100% load (115V) 88/91/88% efficient at 20/50/100% load (230V); 310W active PFC 87/90/87% efficient at 20/50/100% load (115V) 88/91/88% efficient at 20/50/100% load (230V)
DC Output	+12.1V
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.
Power Supply Fan	70*25mm (linear type)

Technical Specifications – Weights and Dimensions

WEIGHT AND DIMENSIONS

Chassis (W x H x D)	6.12 x 11.93 x 13.28 in (155 x 303 x 337 mm)
System Volume	15.1 L
System Weight*	10.4 lbs / 4.7 kg
Max Supported Weight (desktop orientation)	N/A
Packaged (H x W x D)	11.3 x 15.75 x 19.65 in 287 x 400 x 499 mm
Shipping Weight	17.64lb / 8 kg
Palletization Profile	6 units per layer 7layer max 42 per pallet Footprint -85.31x39.37x47.24 in (2167 x 1000 x1200 mm)

After-Market Options (availability may vary by region)

AFTERMARKET OPTIONS

Type	Description	Part #
Memory	HP 4GB DDR4-2666 DIMM	3TK85AA
	HP 8GB DDR4-2666 DIMM	3TK87AA
	HP 16GB DDR4-2666 DIMM	3TK83AA
Storage	HP 500GB SATA 6.0Gb/s Hard Drive	QK554AA
	HP 1TB 7200rpm SATA 6Gbps Hard Drive	QK555AA
	HP PCIe NVME TLC 256GB SSD M.2 Drive	1CA51AA
	HP 256GB SATA TLC Non-SED Solid State Drive	P1N68AA
	HP 9.5mm G3 8/6/4 SFF G4 400 SFF/MT DVD Writer	1CA53AA
Graphics	NVIDIA® GT 730 2GB DP Card	Z9H51AA
	AMD Radeon™ R7 430 2GB 2DP Card	5JW82AA
Security	HP Business PC Security Lock V3 Kit	3XJ17AA
	HP Keyed Cable Lock 10mm kit	T1A62AA
Graphics	NVIDIA® GT 730 2GB DP Card	Z9H51AA
	AMD Radeon™ R7 430 Card	1MX32AA
Security	HP Business PC Security Lock V2 Kit	N3R93AA
	HP Keyed Cable Lock 10mm kit	T1A62AA
Adapters	HP HDMI Standard Cable Kit	T6F94AA
	HP USB to Serial Port Adapter	J7B60AA
	HP PCIe x1 Parallel Port Card	N1M40AA
Networking	Intel Ethernet I210-T1 GbE NIC Card	E0X95AA
Input	HP USB Mouse	QY777AA
	HP USB Hardened Mouse	P1N77AA
	HP USB Grey v2 Mouse	Z9H74AA
	HP USB Keyboard	QY776AA
	HP PS/2 Business Slim Keyboard	N3R86AA
	HP USB Business Slim Keyboard	N3R87AA
	HP Conferencing Keyboard	K8P74AA
	HP Backlit USB Mechanical Keyboard	4RV35AA
	HP USB Antimicrobial Slim Keyboard and Mouse	Z9H50AA
Others	HP Business Headset v2	T4E61AA
	HP S101 Speaker bar	5UU40AA

Change Log

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Date of change:	Version History:	Change	Description of change:
	From v1 to v2		
	From V2 to V3		