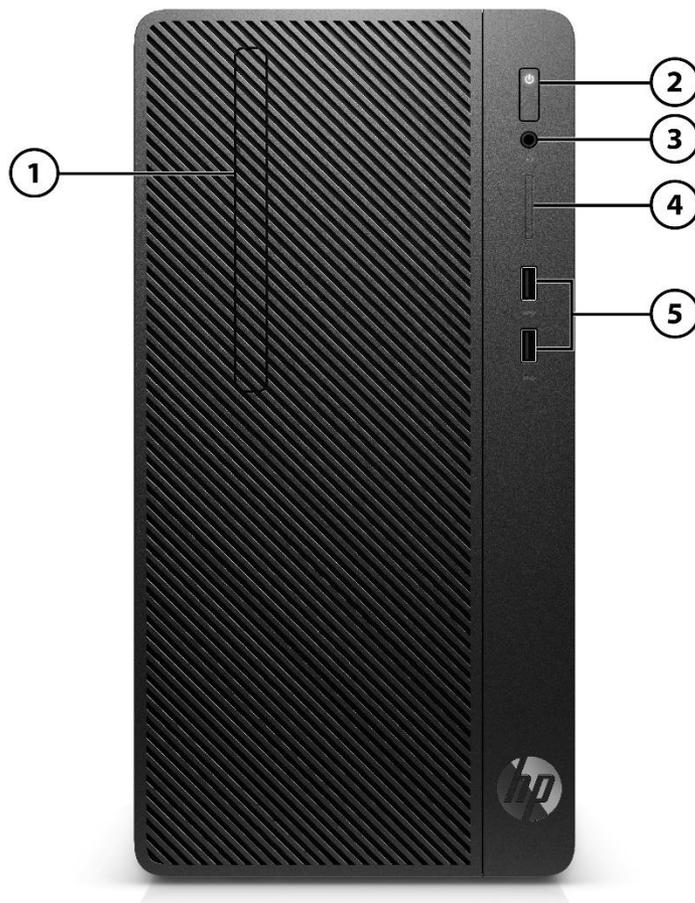


Overview

HP 285 G3 Microtower Business PC



Front

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

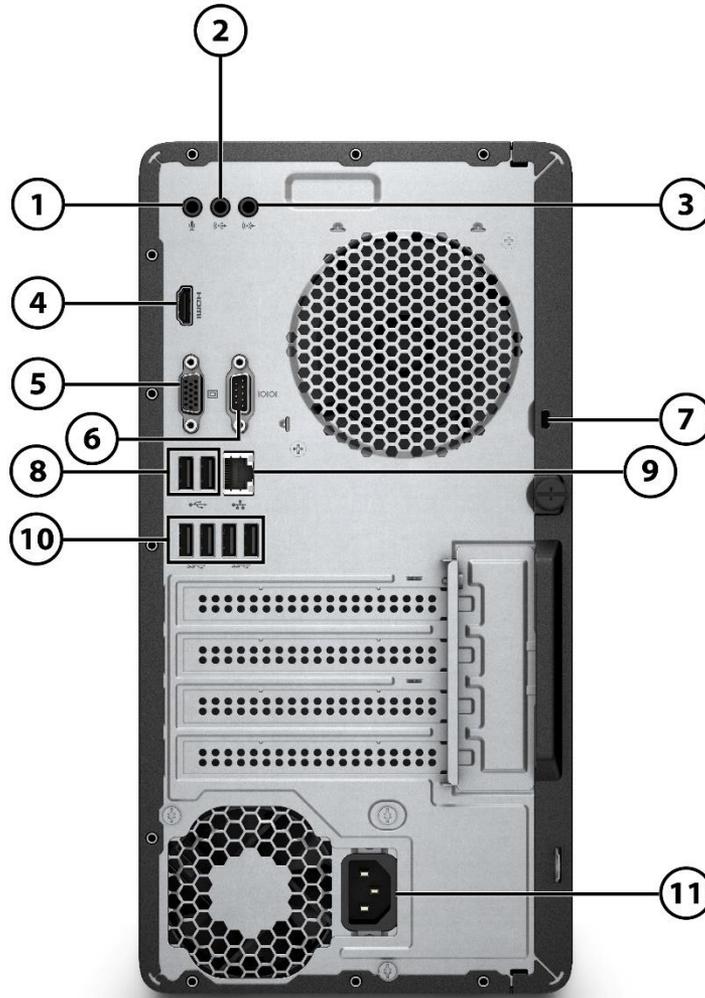
Not Shown

- (1) PCI Express x16
- (1) PCI Express x1
- (1) M.2 for WLAN
- (1) M.2 2230/2280 storage
- (1) 3.5" internal HDD bay
- (1) 3.5"/2.5" internal HDD bay (share bay)

1. All units have a SIM card slot and icon but units that do not support WWAN are shipped with a non-removable SIM slot plug

Overview

HP 285 G3 Microtower Business PC



Rear

1. Audio Mic in
2. Audio Line in
3. Audio Link out
4. HDMI Port (port will be covered up when discrete graphic card is configured on shipped machine)
5. VGA Port (port will be covered up when discrete graphic card is configured on shipped machine)
6. Serial Port
7. Security Lock Slot
8. (2) USB 2.0 Port
9. RJ-45 Network Connector
10. (4) USB 3.1 Gen1 Port
11. Power Cord Connector

Not Shown

- (2) PS/2 Ports (Optional)
- (1) Parallel Port (Optional via PCIe1 slot)

Overview

AT A GLANCE

- Windows 10 Pro, Windows 10 Home or FreeDos 2.0
- AMD B350 Chipset, supporting AMD Integrated Radeon™ R5/R7 Graphics
- Supports an optional discrete graphics card
- Integrated 10/100/1000 Ethernet Controller or Realtek ac 1x1+BT 4.2 LE with 1 Antenna
- Up to 32 GB DDR4-2666 Unbuffered Memory (UDIMM)
- Independent monitor support via VGA/HDMI interfaces
- Supports both Hard Disk Drives and SATA TLC / M.2 PCIe NVMe Solid State Drives
- Audio in, Audio out and Mic in support 5.1 channel
- 8 USB ports (including 6 USB 3.1 Gen1)
- 180W/310W 90% HE power supply
- Security cable lock supported (sold separately)
- Protected by HP Services; terms and conditions vary by country; certain restrictions and exclusions apply
- TPM 2.0 support (fTPM)¹
- Dust filter available

1. TPM feature will not be supported on machines pre-configured with FreeDOS

In selected countries, machines pre-configured with Windows OS will be shipped with TPM disabled.

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

Features

PRODUCT NAME

HP 285 G3 Microtower Business PC

OPERATING SYSTEM

Preinstalled Windows 10 Pro 64¹
Windows 10 Home 64¹

Pre-installed (other) FreeDOS 2.0

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/>

PROCESSORS²

AMD® PRO A6
APU AMD PRO A6-9500 7Gen Dual Core 3.5GHz LGA 65W

AMD® PRO A8
APU AMD PRO A8-9600 7Gen Quad Core 3.1GHz LGA 65W

AMD® PRO A10
APU AMD PRO A10-9700 7Gen Quad Core 3.5GHz LGA 65W

AMD® Ryzen3 Pro
CPU AMD Ryzen3-Pro 1200 Quad Core 3.1GHz LGA 65W
APU AMD Ryzen3-Pro 1300 Quad Core 3.5GHz LGA 65W

AMD® Ryzen5 Pro
CPU AMD Ryzen5-Pro 1500 4C 3.5GHz LGA 65W

AMD® Ryzen3
APU AMD Ryzen3 2200G 4C 3.5GHz LGA 65W

AMD® Ryzen5
APU AMD Ryzen5 2400G 4C 3.6GHz LGA 65W

2. 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.

CHIPSET

AMD B350

Features

GRAPHICS³

Integrated

AMD Integrated HD Graphics varies by processors

Discrete Graphics

AMD Radeon R5 420 1GB FH DP VGA PCIe x8⁴

AMD Radeon R7 430 2GB FH DP VGA PCIe x8

NVIDIA GeForce GT730 1GB PCIe x8 HDMI GFX

NVIDIA GeForce GT730 2GB PCIe x8 DP GFX

3. HD content required to view HD images.

4. Selected countries only.

MEMORY⁵

Form Factor

Microtower

Type

DDR4 2666 1.2v (Transfer rates up to 2666 MT/s)

Maximum

32 GB capacity

of Slots

2 DIMM

4GB DDR4-2666 UDIMM NECC (1x4GB)

8GB DDR4-2666 UDIMM NECC (1x8GB)

8GB (2x4GB) 2666 DDR4 1.2v DIMM

16GB DDR4-2666 UDIMM NECC (1x16GB)

16GB DDR4-2666 UDIMM NECC (2x8GB)

5. Running at 2400 MT/s when configure w/ A-series APU.

Features

STORAGE⁶

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

2TB 7200 RPM SATA Hard Disk Drive
1TB 7200 RPM SATA Hard Disk Drive
500GB 7200 RPM SATA Hard Disk Drive
128GB 2.5" TLC SSD
256GB 2.5" TLC SSD

M.2 Solid State Drives

128GB M.2 NVMe (Value) SSD
256GB M.2 NVMe (Value) SSD

SD Card Reader⁷

SD/SDHC/SDXC SD Card Reader

6. 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.

7. Card sold separately

OPTICAL DISK 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.

NETWORKING/COMMUNICATIONS⁹

Networking

Integrated 10/100/1000M GbE LAN

Wi-Fi and Bluetooth[®]

ac 1x1 +Bluetooth 4.2 LE M.2 2230 PCI-e+USB WW with 1 Antenna

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.

AUDIO/MULTIMEDIA

Realtek ALC3601
Combo Jack, Headphone/ Microphone
Support 2W Internal speaker

Features

KEYBOARDS/POINTING DEVICES¹⁰

Keyboards

USB Business Slim Wired Keyboard
HP USB 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 Mouse USB
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/SLOTS

Front I/O Ports

Combo jack, Headphone/ Microphone
SD Card Reader
(2) USB 3.1 Gen1 Ports

Rear I/O Ports

Audio Mic in
Audio Line in
Audio Link out
HDMI Port (port will be covered up when discrete graphic card is configured on shipped machine)
VGA Port (port will be covered up when discrete graphic card is configured on shipped machine)

Serial Port

(2) USB 2.0 Port
RJ-45 Network Connector
(4) USB 3.1 Gen1 Port

Not Shown

(2) PS/2 Ports (Optional)
(1) Parallel Port (Optional via PCIe_x1 slot)

BAYS

9.5mm external slimline ODD bay (optional)
3.5" internal HDD bay
3.5 or 2.5" internal HDD bay (share bay)

Features

SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

Preinstalled Software (varies by country)

Preinstalled (varies by country)

Security and Protection

McAfee LiveSafe™ (1 year subscription)¹³

Productivity

Microsoft Office Pro 2016 and Office 365 (Office Centennial)

Dropbox¹²

ODD Playback and TV Tuners

Power Media Player 14 for HP Consumer PCs with DVD (ODD SKU only)

Movies

Netflix

App Stores and Content Purchasing

Amazon

HP Utilities and Support

HP Documentation

HP JumpStart

HP Recovery Manager

PBR

HP SSRM

HP Audio Switch

HP Support Assistant

BTB

HP Setup Integrated OOBE

Bing

Priceline

Hardware Enabling Drivers or software utility

HP ePrint¹¹

HP System Event Utility

Netclone

11. Requires an internet connection to HP web-enabled printer and HP ePrint account registration. For a list of eligible printers, supported documents and image types and other HP ePrint details, see <http://www.hp.com/go/businessmobileprinting>.

12. 25GB of storage for 12 months. Subscription required thereafter or for additional storage capacity.

13. Subscription required.

Features

POWER

Power Supply

180 W

EStar Libra2 EPA90 (Gold) Full range 115V/230V

310 W¹⁵

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

15. 310W PSU selected countries only.

DIMENSIONS & WEIGHT

(configured with 1 HDD and 1 ODD)

Chassis (H x W x D)

6.69 x 13.3 x 10.92 in (170 x 338 x 277.5 mm)

System Weight

11.9 lbs / 5.4 kg

Packaging dimensions and weight

Dimensions

11.46 x 15.35 x 19.65 in
291 x 390 x 499 mm

Weight

17.64lb / 8 kg

Security Features

TPM 2.0 support (fTPM)¹⁶

Security cable slot

16. TPM feature will not be supported on machines pre-configured with FreeDOS

In selected countries, machines pre-configured with Windows OS will be shipped with TPM disabled.

CERTIFICATIONS

CECP

SEPA

ENERGY STAR® certified

CEL

FCC

UL

RoHS

CCC

CE

17. EPEAT® registered where applicable/supported. EPEAT registration varies by country. See www.epeat.net for registration status by country.

Features

SERVICE AND SUPPORT

On-site Warranty: One-year (1-1-1) limited warranty delivers, next business day service for parts and labor and includes free support 24 x 7. One-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: 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. 24 x 7 support may not be available in some countries.

Technical Specifications

GRAPHICS

| | |
|---|--|
| Integrated AMD HD Graphics (Bristol Ridge & Summit Ridge & Raven Ridge) | |
| DisplayPort™ | <ul style="list-style-type: none"> • DP++ • DisplayPort audio: <ul style="list-style-type: none"> ○ Linear PCM, Dolby Digital (AC-3), Dolby® TrueHD, DTS Studio Sound™ ○ LPCM at sample rates: 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, and 192 kHz, Bits per sample: 16, 20, and 24 ○ Supports up to 8 channels • 4, 2, or 1-lane transmission • 5.4 Gbps (HBR2), 2.7 Gbps (HBR) , and 1.62 Gbps (RBR) link bit rates • DisplayPort Multi-Stream Transport (MST) for up to three independent video and audio streams on one DisplayPort connector. . The total number of supported displays is also limited by the bandwidth required by the attached DisplayPort capable displays. For example only one 3840 x2160 or 4096 x 2160 display can be connected to a DisplayPort output. • Supports HDCP2.1 • Supports stereoscopic 3D gaming, Blu-ray 3D, and stereoscopic 3D video for 120-Hz frame sequential monitors |
| Memory | Allocated at system startup and configurable using F10 setup with values of 128MB, 256MB, 512MB and 1024MB. Additional memory that is not in use by the host will be dynamically allocated and will vary depending on the total installed system memory. |
| Maximum Graphics Memory | Microsoft Windows 10:Variable* |
| Maximum Color Depth | 32 bits/pixel, 8-bits per color component |
| Graphics/Video API Support | <p>AMD Eyefinity AMD Eyefinity support for up to four displays when at least two displays are operating with DisplayPort 1.2 multi-streaming.</p> <p>Power Management</p> <ul style="list-style-type: none"> • AMD PowerPlay™ power management technology <ul style="list-style-type: none"> ○ Dynamic power gating for GPU, UVD, VCE, GFX, DCE, and Graphics Memory Controller (GMC)Dynamic refresh rate supported with digital panels that support this feature • Frame Buffer Compression <p>3D Acceleration Features DirectX® 12 compliant, including full speed 32-bit floating point per component operations:</p> <ul style="list-style-type: none"> • Shader Model 5 geometry and pixel support in a unified shader architecture <ul style="list-style-type: none"> ○ Graphics Core Next (GCN) architecture ○ Advanced shader instructions, including flexible flow control with CPU-level flexibility on branching ○ Read/Write caching system, replacing texture cache with a unified read-write two-level cache ○ Vertex, pixel, geometry, compute, domain, and hull shaders ○ 32-bit and 64-bit floating point processing per component ○ High performance dynamic branching and flow control ○ Shader instruction store, using an advanced caching system ○ Advanced shader design, with ultra-threading sequencer for high efficiency operations ○ Advanced, high performance branching support, including static and dynamic branching ○ High dynamic range rendering with floating point blending, texture filtering, and anti-aliasing support ○ 16-bit and 32-bit floating point components for high dynamic range computations ○ Full anti-aliasing on render surfaces up to and including 128-bit floating point formats • Support for OpenCL™ 1.2, DirectCompute 11 and Microsoft C++ AMP • Support for OpenGL 4.1/4.1+ • Motion Video Acceleration Features |

Technical Specifications

| | |
|--|---|
| | <ul style="list-style-type: none"> • Supports DVD, Blu-ray, and SDTV/HDTV content playback with low CPU usage • Supports stereoscopic 3D Blu-ray • Video compression engine: <ul style="list-style-type: none"> ○ Dedicated hardware (VCE 2.0) assisted encoding of HD video streams to H.264 (main profile) ○ Support H.264 SVC temporal scalability ○ Real-time transcoding by encoding the output from UVD with reduction of CPU utilization and power consumption • Motion video decode acceleration technology: <ul style="list-style-type: none"> ○ Dedicated hardware (UVD) for H.264, MPEG4, VC-1, MVC, and MPEG2 decode: ○ H.264 implementation based on the ISO/IEC 14496-10 specification ○ MPEG6 implementation based on the ISO/IEC 14496-2 specification ○ VC-1 implementation based on the SMPTE 421M specification ○ MPEG2 implementation based on the ISO 13818-2 specification ○ Multi View Coding (MVC) for Blu-ray 3D content ○ WMV-9 implementation ○ Real time high-definition and standard definition stream decode ○ Real time dual high-definition stream decode |
| Supported Display Resolutions and Refresh Rates | |
| Supported Display Resolutions and Refresh Rates | 640 x 480 @85Hz 720 x 400@70Hz 800 x 600@85Hz 1024 x 768@85Hz 1152 x 864@85Hz 1280 x 720@85Hz 1280 x 768@85Hz 1280 x 800@85Hz 1280 x 960@85Hz 1280 x 1024@85Hz 1366 x 768@60Hz 1440 x 900@60Hz 1600 x 900@85Hz 1680 x 1050@75Hz 1920 x 1080@60Hz 1920 x 1200@85Hz 1600 x 1200@85Hz 1920 x 1440@85Hz 2048 x 1536@75Hz 2560 x 1440@59.951Hz 2560 x 1600@60Hz 3840 x 2160@60Hz 4096 x 2160@60Hz |

Technical Specifications

| VGA and DVI-A (analog) display modes | |
|--|--|
| Resolution/ Depth (bpp) /Refresh Rates | 640 x 480 @85Hz 720 x 400@70Hz 800 x 600@85Hz 1024 x 768@85Hz 1152 x 864@85Hz 1280 x 720@85Hz 1280 x 768@85Hz 1280 x 800@85Hz 1280 x 960@85Hz 1280 x 1024@85Hz 1366 x 768@60Hz 1440 x 900@60Hz 1600 x 900@85Hz 1680 x 1050@75Hz 1920 x 1080@60Hz 1920 x 1200@85Hz 1600 x 1200@85Hz 1920 x 1440@85Hz 2048 x 1536@75Hz 2560 x 1440@59.951Hz 2560 x 1600@60Hz 3840 x 2160@60Hz 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</p> | |

| | | |
|---|---------------------------------|--|
| AMD Radeon™ R5 420 1GB FH DP VGA PCIe x8 | Engine Clock | 700MHz |
| | Memory Clock | 900MHz |
| | Memory Size(width) | 1GB(64-bit) |
| | Memory Type | 128 M x 32 GDDR5 @ 2 |
| | Max. Resolution(Analog VGA) | 2048x1536x32bpp@75Hz |
| | Max. Resolution(HDMI) | N/A |
| | 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 | PCIex8 LP(half height)PCB with FH bracket |

Technical Specifications

| Resolution | Refresh Rate* | (DVI-VGA adapter) VGA | DVI-D | DisplayPort | Standard |
|-------------|------------------|--------------------------|-------|-------------|------------------------------------|
| 640 x 480 | 60, 75, 85 | X | | X | VESA DMT, C+I52:I89VT 0.31M3 |
| 720 x 400 | 70 | X | | X | IBM VGA |
| 800 x 600 | 60, 75, 85 | X | | X | VESA DMT, CVT0.48M3 |
| 1024 x 768 | 60, 75, 85 | X | | X | VESA DMT, CVT 0.79M3 |
| 1152 x 864 | 60, 75, 85 | X | | X | VESA DMT, CVT 0.83MA |
| 1280 x 720 | 60, 75, 85 | X | | X | VESA DMT, CVT 0.92M9, CEA-770.3 |
| 1280 x 768 | 60, 60RB, 75, 85 | X | | X | VESA DMT, CVT 0.98M9/0.98M9-R |
| 1280 x 800 | 60, 75, 85 | X | | X | VESA DMT |
| 1280 x 960 | 60, 75, 85 | X | | X | VESA DMT |
| 1280 x 1024 | 60, 75, 85 | X | | X | VESA DMT, CVT 1.31M4 |
| 1366 x 768 | 60, 60RB | X | | X | VESA DMT |
| 1440 x 900 | 60, 60RB | X | | X | VESA DMT |
| 1600 x 900 | 60, 60RB, 75, 85 | X | | X | VESA DMT |
| 1680 x 1050 | 60, 60RB, 75 | X | | X | VESA DMT, CVT 1.76MA/1.76MA-R |
| 1920 x 1080 | 60 | X | | X | VESA DMT, CVT 2.07M9, SMPTE 274M |
| 1920 x 1200 | 60, 60RB, 75, 85 | X | | X | DMT, CVT 2.30MA/2.30MA-R |
| 1600 x 1200 | 60, 75, 85 | X | | X | VESA DMT, 1.92M3 |
| 1920 x 1440 | 60, 75, 85 | X | | X | VESA DMT, CVT 2.76M3 |
| 2048 x 1536 | 60,75 | X | | X | CVT 3.15M3 |
| 2560 x 1440 | 59.951 | | | X | CVT 3.69M9-R |
| 2560 x 1600 | 60, 60RB | | | X | VESA DMT, CVT 4.10MA/4.10MA-R |
| 3840 x 2160 | 24 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 25 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |

Technical Specifications

| | | | | | |
|-------------|----|--|--|---|------------------------------------|
| 3840 x 2160 | 30 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 50 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 60 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 4096 x 2160 | 24 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 25 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 30 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 50 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 60 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 1920 x 1080 | 60 | | | X | VESA (SMPTE 274M) |
| 1920 x 1080 | 50 | | | X | SMPTE 274M |
| 1920 x 1080 | 30 | | | X | SMPTE 274M |
| 1920 x 1080 | 24 | | | X | SMPTE 274M |
| 1280 x 720 | 60 | | | X | VESA (CEA-770.3) |
| 1280 x 720 | 50 | | | X | SMPTE 296M |
| 720 x 480 | 60 | | | X | MHL (CEA-770.2) |

| | | |
|-------------------------------------|------------------------------|--|
| AMD Radeon™ R7 430 2GB FH DP | Engine Clock | 780 MHz |
| VGA PCIe x8 | Memory Clock | 1100 MHz |
| | Memory Size(width) | 2GB (128-bit) |
| | Memory Type | 128Mx32 DDR5@4pcs |
| | Max. Resolution(Analog VGA) | 2048x1536x32bpp @75Hz |
| | Max. Resolution(HDMI) | N/A |
| | 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 | PClex8 LP(half height)PCB with FH bracket |

Technical Specifications

| Resolution | Refresh Rate* | (DVI-VGA adapter) VGA | DVI-D | DisplayPort | Standard |
|-------------|------------------|--------------------------|-------|-------------|------------------------------------|
| 640 x 480 | 60, 75, 85 | X | | X | VESA DMT, CVT 0.31M3 |
| 720 x 400 | 70 | X | | X | IBM VGA |
| 800 x 600 | 60, 75, 85 | X | | X | VESA DMT, CVT0.48M3 |
| 1024 x 768 | 60, 75, 85 | X | | X | VESA DMT, CVT 0.79M3 |
| 1152 x 864 | 60, 75, 85 | X | | X | VESA DMT, CVT 0.83MA |
| 1280 x 720 | 60, 75, 85 | X | | X | VESA DMT, CVT 0.92M9, CEA-770.3 |
| 1280 x 768 | 60, 60RB, 75, 85 | X | | X | VESA DMT, CVT 0.98M9/0.98M9-R |
| 1280 x 800 | 60, 75, 85 | X | | X | VESA DMT |
| 1280 x 960 | 60, 75, 85 | X | | X | VESA DMT |
| 1280 x 1024 | 60, 75, 85 | X | | X | VESA DMT, CVT 1.31M4 |
| 1366 x 768 | 60, 60RB | X | | X | VESA DMT |
| 1440 x 900 | 60, 60RB | X | | X | VESA DMT |
| 1600 x 900 | 60, 60RB, 75, 85 | X | | X | VESA DMT |
| 1680 x 1050 | 60, 60RB, 75 | X | | X | VESA DMT, CVT 1.76MA/1.76MA-R |
| 1920 x 1080 | 60 | X | | X | VESA DMT, CVT 2.07M9, SMPTE 274M |
| 1920 x 1200 | 60, 60RB, 75, 85 | X | | X | DMT, CVT 2.30MA/2.30MA-R |
| 1600 x 1200 | 60, 75, 85 | X | | X | VESA DMT, 1.92M3 |
| 1920 x 1440 | 60, 75, 85 | X | | X | VESA DMT, CVT 2.76M3 |
| 2048 x 1536 | 60,75 | X | | X | CVT 3.15M3 |
| 2560 x 1440 | 59.951 | | | X | CVT 3.69M9-R |
| 2560 x 1600 | 60, 60RB | | | X | VESA DMT, CVT 4.10MA/4.10MA-R |
| 3840 x 2160 | 24 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 25 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |

Technical Specifications

| | | | | | |
|-------------|----|--|--|---|------------------------------------|
| 3840 x 2160 | 30 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 50 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 60 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 4096 x 2160 | 24 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 25 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 30 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 50 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 60 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 1920 x 1080 | 60 | | | X | VESA (SMPTE 274M) |
| 1920 x 1080 | 50 | | | X | SMPTE 274M |
| 1920 x 1080 | 30 | | | X | SMPTE 274M |
| 1920 x 1080 | 24 | | | X | SMPTE 274M |
| 1280 x 720 | 60 | | | X | VESA (CEA-770.3) |
| 1280 x 720 | 50 | | | X | SMPTE 296M |
| 720 x 480 | 60 | | | X | MHL (CEA-770.2) |

NVIDIA® GeForce® GT730 1GB HDMI DVI PCIe x8 HDMI GFX

| | |
|------------------------------|--|
| Engine Clock | 902 MHz |
| Memory Clock | 1250 MHz |
| Memory Size(width) | 1GB (64-bit) |
| Memory Type | 128Mx32 DDR5@2pcs |
| Max. Resolution(Analog VGA) | N/A |
| Max. Resolution(HDMI) | 4096x2160 @24Hz |
| Max. Resolution(DP) | N/A |
| Multi Display Support | 2 Displays |
| HDCP Compliance | Yes |
| Rear I/O connectors(bracket) | DVI-I + HDMI |
| Cooling(active/passive) | Active fan-sink(Active cooling with dynamic speed) |
| Total power consumption(W) | <35W |
| PCB form-factor with bracket | PCIex8 LP(half height)PCB with FH bracket |

Technical Specifications

| Resolution | Refresh Rate* | (DVI-VGA adapter) VGA | DVI-D | DisplayPort | Standard |
|-------------|------------------|--------------------------|-------|-------------|------------------------------------|
| 640 x 480 | 60, 75, 85 | X | | | VESA DMT, CVT 0.31M3 |
| 720 x 400 | 70 | X | | | IBM VGA |
| 800 x 600 | 60, 75, 85 | X | | | VESA DMT, CVT0.48M3 |
| 1024 x 768 | 60, 75, 85 | X | | | VESA DMT, CVT 0.79M3 |
| 1152 x 864 | 60, 75, 85 | X | | | VESA DMT, CVT 0.83MA |
| 1280 x 720 | 60, 75, 85 | X | | | VESA DMT, CVT 0.92M9, CEA-770.3 |
| 1280 x 768 | 60, 60RB, 75, 85 | X | | | VESA DMT, CVT 0.98M9/0.98M9-R |
| 1280 x 800 | 60, 75, 85 | X | | | VESA DMT |
| 1280 x 960 | 60, 75, 85 | X | | | VESA DMT |
| 1280 x 1024 | 60, 75, 85 | X | | | VESA DMT, CVT 1.31M4 |
| 1366 x 768 | 60, 60RB | X | | | VESA DMT |
| 1440 x 900 | 60, 60RB | X | | | VESA DMT |
| 1600 x 900 | 60, 60RB, 75, 85 | X | | | VESA DMT |
| 1680 x 1050 | 60, 60RB, 75 | X | | | VESA DMT, CVT 1.76MA/1.76MA-R |
| 1920 x 1080 | 60 | X | | | VESA DMT, CVT 2.07M9, SMPTE 274M |
| 1920 x 1200 | 60, 60RB, 75, 85 | X | | | DMT, CVT 2.30MA/2.30MA-R |
| 1600 x 1200 | 60, 75, 85 | X | | | VESA DMT, 1.92M3 |
| 1920 x 1440 | 60, 75, 85 | X | | | VESA DMT, CVT 2.76M3 |
| 2048 x 1536 | 60,75 | X | | | CVT 3.15M3 |
| 2560 x 1440 | 59.951 | | | | CVT 3.69M9-R |
| 2560 x 1600 | 60, 60RB | | | | VESA DMT, CVT 4.10MA/4.10MA-R |
| 3840 x 2160 | 24 | | | | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 25 | | | | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |

Technical Specifications

| | | | | | |
|-------------|----|--|--|--|------------------------------------|
| 3840 x 2160 | 30 | | | | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 50 | | | | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 60 | | | | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 24 | | | | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 25 | | | | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 30 | | | | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 50 | | | | VESA (SMPTE 274M) |
| 4096 x 2160 | 60 | | | | SMPTE 274M |
| 1920 x 1080 | 60 | | | | SMPTE 274M |
| 1920 x 1080 | 50 | | | | SMPTE 274M |
| 1920 x 1080 | 30 | | | | VESA (CEA-770.3) |
| 1920 x 1080 | 24 | | | | SMPTE 296M |
| 1280 x 720 | 60 | | | | MHL (CEA-770.2) |
| 1280 x 720 | 50 | | | | ITU-R BT.1358 |
| 720 x 480 | 60 | | | | CEA (VESA DMT) |
| 720 x 576 | 50 | | | | VESA DMT, CVT 0.31M3 |
| 640 x 480 | 60 | | | | IBM VGA |

Technical Specifications

| | | |
|--|---------------------------------|--|
| NVIDIA® GeForce® GT730 2GB DP DVI PCIe x8 GFX | Engine Clock | 902 MHz |
| | Memory Clock | 1250Mhz |
| | Memory Size(width) | 2GB (64-bit) |
| | Memory Type | 256Mx32 DDR5 @ 2pcs |
| | Max. Resolution(Analog VGA) | N/A |
| | Max. Resolution(HDMI) | 2560x1600 @60Hz |
| | Max. Resolution(DP) | 4096x2160 @60Hz |
| | Multi Display Support | 2 Displays |
| | HDCP Compliance | Yes |
| | Rear I/O connectors(bracket) | DVI-I+DP |
| | Cooling(active/passive) | Active fan-sink(Active cooling with dynamic speed) |
| | Total power consumption(W) | <35W |
| | PCB form-factor with bracket | PCIex8 LP(half height)PCB with FH bracket |

Technical Specifications

| Resolution | Refresh Rate* | (DVI-VGA adapter) VGA | DVI-D | DisplayPort | Standard |
|-------------|------------------|--------------------------|-------|-------------|------------------------------------|
| 640 x 480 | 60, 75, 85 | X | | X | VESA DMT, CVT 0.31M3 |
| 720 x 400 | 70 | X | | X | IBM VGA |
| 800 x 600 | 60, 75, 85 | X | | X | VESA DMT, CVT0.48M3 |
| 1024 x 768 | 60, 75, 85 | X | | X | VESA DMT, CVT 0.79M3 |
| 1152 x 864 | 60, 75, 85 | X | | X | VESA DMT, CVT 0.83MA |
| 1280 x 720 | 60, 75, 85 | X | | X | VESA DMT, CVT 0.92M9, CEA-770.3 |
| 1280 x 768 | 60, 60RB, 75, 85 | X | | X | VESA DMT, CVT 0.98M9/0.98M9-R |
| 1280 x 800 | 60, 75, 85 | X | | X | VESA DMT |
| 1280 x 960 | 60, 75, 85 | X | | X | VESA DMT |
| 1280 x 1024 | 60, 75, 85 | X | | X | VESA DMT, CVT 1.31M4 |
| 1366 x 768 | 60, 60RB | X | | X | VESA DMT |
| 1440 x 900 | 60, 60RB | X | | X | VESA DMT |
| 1600 x 900 | 60, 60RB, 75, 85 | X | | X | VESA DMT |
| 1680 x 1050 | 60, 60RB, 75 | X | | X | VESA DMT, CVT 1.76MA/1.76MA-R |
| 1920 x 1080 | 60 | X | | X | VESA DMT, CVT 2.07M9, SMPTE 274M |
| 1920 x 1200 | 60, 60RB, 75, 85 | X | | X | DMT, CVT 2.30MA/2.30MA-R |
| 1600 x 1200 | 60, 75, 85 | X | | X | VESA DMT, 1.92M3 |
| 1920 x 1440 | 60, 75, 85 | X | | X | VESA DMT, CVT 2.76M3 |
| 2048 x 1536 | 60,75 | X | | X | CVT 3.15M3 |
| 2560 x 1440 | 59.951 | | | X | CVT 3.69M9-R |
| 2560 x 1600 | 60, 60RB | | | X | VESA DMT, CVT 4.10MA/4.10MA-R |
| 3840 x 2160 | 24 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 25 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |

Technical Specifications

| | | | | | |
|-------------|----|--|--|---|------------------------------------|
| 3840 x 2160 | 30 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 50 | | | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 60 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 24 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 25 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 30 | | | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M |
| 4096 x 2160 | 50 | | | X | VESA (SMPTE 274M) |
| 4096 x 2160 | 60 | | | X | SMPTE 274M |
| 1920 x 1080 | 60 | | | X | SMPTE 274M |
| 1920 x 1080 | 50 | | | X | SMPTE 274M |
| 1920 x 1080 | 30 | | | X | VESA (CEA-770.3) |
| 1920 x 1080 | 24 | | | X | SMPTE 296M |
| 1280 x 720 | 60 | | | X | MHL (CEA-770.2) |
| 1280 x 720 | 50 | | | X | ITU-R BT.1358 |
| 720 x 480 | 60 | | | X | CEA (VESA DMT) |
| 720 x 576 | 50 | | | X | VESA DMT, CVT 0.31M3 |
| 640 x 480 | 60 | | | X | IBM VGA |

Technical Specifications

STORAGE¹

| | | |
|--|------------------------------------|-----------------------------|
| 2 TB 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive | Capacity | 2 TB |
| | Rotational Speed | 7,200 rpm |
| | Interface | SATA 6.0 Gb/s |
| | Cache, Multi-segmented (MB) | 64 MB |
| | Height | 1.028 in/26.11 mm |
| | Width | 4.0 in/101.6 mm |
| | Depth | 5.787 in/146.99 mm |
| | Weight | 1.38 lb/626 g |
| | Operating Temperature | 41° to 131° F (5° to 55° C) |

| | | |
|--|--|---|
| 1 TB 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive | Capacity | 1 TB |
| | Rotational Speed | 7,200 rpm |
| | Interface | SATA 6.0 Gb/s |
| | Buffer Size | 32 MB |
| | Logical Blocks | 1,953,525,168 |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track: 2.0 ms Average: 11 ms Full-Stroke: 21 ms |
| | Height | 1 in/2.54 cm |
| | Width (nominal) | 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 |
| | Drive Type | Serial ATA 3.0 (6.0 Gb/s) |
| | Interface | 32 MB |
| | Buffer Size | 976,773,168 |
| | Seek Time | Single Track: 2.0 ms Average: 11 ms Full-Stroke: 21 ms |
| | Height (nominal) | 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

| | | |
|--|--|---|
| 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 |
| | 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 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 |

Technical Specifications

| | |
|--|--|
| 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 \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) |

128 GB PCIE NVME M.2 2280 Value (Non-SED) Solid State Drive

| | |
|---|--|
| Unformatted Capacity | 128GB |
| Architecture | 3D TLC NAND Flash |
| Interface | PCIE Gen3 x4 |
| Form Factor | M.2 2280 |
| Dimensions (W x H x D) | 22mm x 80mm x 2.23mm |
| Weight | < 10g |
| Bandwidth Performance | Sequential Read: Up to 770 MB/s Sequential Write: Up to 450 MB/s Random Read: Up to 35K IOPs Random Write: Up to 91K IOPs |
| Power | Total Power Consumption (TYP) 100mW (Active) 40mW (Idle) |
| Useful Drive Life | 72TBW |
| Environmental (all conditions, non-condensing) | Operating Temperature: 0° to 70°C Relative Humidity: 5% to 95% Shock: 1,000 G/0.5 ms |

Technical Specifications

| | | |
|---|---|--|
| 256GB PCIE NVME M.2 2280 Value (Non-SED) Solid State Drive | Unformatted Capacity | 256GB |
| | Architecture | 3D TLC NAND Flash |
| | Interface | PCIE Gen3 x4 |
| | Form Factor | M.2 2280 |
| | Dimensions (W x H x D) | 22mm x 80mm x 2.23mm |
| | Weight | < 10g |
| | Bandwidth Performance | Sequential Read: Up to 1570 MB/s Sequential Write: Up to 540 MB/s Random Read: Up to 71K IOPs Random Write: Up to 112K IOPs |
| | Power | Total Power Consumption (TYP) 100mW (Active) 40mW (Idle) |
| | Useful Drive Life | 144TBW |
| | Environmental (all conditions, non-condensing) | Operating Temperature: 0° to 70°C Relative Humidity: 5% to 95% Shock: 1,000 G/0.5 ms |

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.

| | | |
|--|---|---|
| 128GB M.2 2280 SATA TLC (Non-SED) Solid State Drive | Unformatted Capacity | 128GB |
| | Architecture | TLC NAND Flash |
| | Interface | SATA 3.2 (6.0 Gb/s) |
| | Form Factor | M.2 2280 |
| | Dimensions (W x H x D) | 22mm x 80mm x 2.23mm |
| | Weight | < 10g |
| | Bandwidth Performance | Sequential Read: Up to 520MB/s Sequential Write: Up to 450 MB/s Random Read: Up to 70K IOPs Random Write: Up to 30K IOPs |
| | Power | Total Power Consumption (TYP) 150mW (Active) 50mW (Idle) |
| | Useful Drive Life | 72TBW |
| | Environmental (all conditions, non-condensing) | Operating Temperature: 0° to 70°C Relative Humidity: 5% to 95% Shock: 1,000 G/0.5 ms |

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

| | | |
|--|---|---|
| 256GB M.2 2280 SATA TLC (Non-SED) Solid State Drive | Unformatted Capacity | 256GB |
| | Architecture | TLC NAND Flash |
| | Interface | SATA 3.2 (6.0 Gb/s) |
| | Form Factor | M.2 2280 |
| | Dimensions (W x H x D) | 22mm x 80mm x 2.23mm |
| | Weight | < 10g |
| | Bandwidth Performance | Sequential Read: Up to 520MB/s Sequential Write: Up to 450 MB/s Random Read: Up to 73K IOPs Random Write: Up to 50K IOPs |
| | Power | Total Power Consumption (TYP) 150mW (Active) 50mW (Idle) |
| | Useful Drive Life | 72TBW |
| | Environmental (all conditions, non-condensing) | Operating Temperature: 0° to 70°C Relative Humidity: 5% to 95% Shock: 1,000 G/0.5 ms |

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

HIGH DEFINITION AUDIO

| | |
|-----------------------------------|--|
| Type | Integrated |
| HD Stereo Codec | Realtek ALC3601 |
| Audio I/O Ports | <p>Front Combo jack, Headphone/ Microphone(Headphone-out 0.5 Ohm Output Impedance, expects at least a 32 ohm load, Microphone-in 150-K ohm Input Impedance)</p> <p>Rear Line-out(190 ohms Output Impedance, expects at least a 10-K ohm load). Mic-in(150-K ohm Input Impedance) Line-in(Input the audio signal to system via the loopback cable)</p> <p>When plug in all rear side jacks, can switch the function to 5.1 ch via audio GUI.</p> |
| Internal Speaker Amplifier | Codec embeded amp for supporting 2W mono speaker. |
| Multi-streaming Capable | Multi-streaming can be enabled in the Realtek control panel to allow independent audio streams to be sent to/from the front and rear jacks. |
| 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 16 bit, 44.1K/ 48K/ 96K/ 192K Hz for ADC |
| Wavetable Syntheses | Yes |
| Analog Audio | Yes |
| # of Channels on Line-Out | Stereo(Left channel/ Right channel) |
| Internal Speaker | Yes |
| External Speaker Jack | 2W class D mono amplifier for the internal speaker only. External speakers must be powered externally. |

Technical Specifications

NETWORKING

| | | |
|-----------------------------------|-------------------------------|--|
| Integrated 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 802.3 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 |

Technical Specifications

Realtek 802.11ac (1x1) WiFi and Bluetooth® 4.2 Combo¹

| | |
|-----------------------------|---|
| Wireless LAN Standards | IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac |
| Interoperability | Wi-Fi certified |
| Frequency Bands | 802.11b/g/n <ul style="list-style-type: none"> • 2.402 – 2.482 GHz 802.11a/n <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Transmit mode 2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10 mW • Radio disabled 8 mW |

Technical Specifications

| | | |
|--|--|--------------------------------|
| Power Management | ACPI and PCI Express compliant power management 802.11 compliant power saving mode | |
| Receiver Sensitivity | 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 Factors | 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 | |
| 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. | |
| Receiver Sensitivity Legacy | | |
| Power Consumption | Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW | |

Technical Specifications

| | |
|--|--|
| 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 |
| 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) |

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

Technical Specifications

POWER

| | |
|--|---|
| 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) |

DIMENSIONS & WEIGHT

| | |
|--------------------------------|---|
| Chassis (W x H x D) | 6.69 x 13.3 x 10.92 in (170 x 338 x 277.5 mm) |
| System Volume | 915.36cu in 15L |
| System Weight* | 11.9 lbs / 5.4 kg |
| Tower Stand (H x W x D) | 13.42 x 6.69 x 10.92 in (340.8 x 170 x 277.5 mm) |
| Packaged (H x W x D) | 11.46 x 15.35 x 19.65 in 291 x 390 x 499 mm |
| Shipping Weight | 17.64lb / 8 kg |
| Palletization Profile | 6 units per layer 7 layer max 42 per pallet Footprint -85.31x39.37x47.24 in (2167 x 1000 x1200 mm) |

Technical Specifications

ENVIRONMENTAL & INDUSTRY

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® Gold registered in the United States. See <http://www.epeat.net> for registration status in your country.

System Configuration The configuration used for the Energy Consumption and Declared Noise Emissions data for the Ultra-slim Desktop model is based on a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Energy Consumption (in accordance with US ENERGY STAR® test method)

| | 115VAC, 60Hz | 230VAC, 50Hz | 100VAC, 60Hz |
|-------------------------------|--------------|--------------|--------------|
| Normal Operation (Short idle) | 19.99 | 20.21 | 20.17 |
| Normal Operation (Long idle) | 16.54 | 17.23 | 16.53 |
| Sleep | 0.75 | 0.75 | 0.72 |
| Off | 0.32 | 0.35 | 0.32 |

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, 60Hz |
|-------------------------------|--------------|--------------|--------------|
| Normal Operation (Short idle) | 68.18 | 68.92 | 68.77 |
| Normal Operation (Long idle) | 56.39 | 58.76 | 56.37 |
| Sleep | 2.55 | 2.56 | 2.44 |
| Off | 1.1 | 1.2 | 1.1 |

NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

Technical Specifications

**Declared Noise Emissions
(in accordance with
ISO 7779 and ISO 9296)**

Sound Power
(L_{WAd} , bels)

Sound Pressure
(L_{pAm} , decibels)

Typically Configured – Idle

3.5

25.4

Fixed Disk – Random
writes

3.5

25.6

Batteries

This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:
Mercury greater than 1ppm 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).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the <gold> level, see www.epeat.net
- 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/EPS (Expanded Polyethylene)

PLASTIC/Polyethylene low density

The Plastic packaging material is made from 10.5% recycled content.

The corrugated paper packaging materials contains at least 43.8% recycled content.

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

Technical Specifications

- 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.

HP, Inc. Corporate Environmental Information

For more information about HP's commitment to the environment:

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 certifications:

<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842>

and

<http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf>

Technical Specifications

COUNTRY OF ORIGIN

China

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

| 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 Turbo Drive Gen2 256GB M.2 SSD 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 Card | 1MX32AA |
| Security | HP Business PC Security Lock V2 Kit | N3R93AA |
| | HP Keyed Cable Lock 10mm kit | T1A62AA |
| Adapters | HP PCIe x1 Parallel Port Card | N1M40AA |
| | HP HDMI Standard Cable Kit | T6F94AA |
| | HP USB to Serial Port Adapter | J7B60AA |
| Networking | Intel Ethernet I210-T1 GbE NIC Card | E0X95AA |
| Input | HP USB Mouse | QY777AA |
| | HP USB Hardened Mouse | P1N77AA |
| | HP USB Keyboard | QY776AA |
| | HP PS/2 Business Slim Keyboard | N3R86AA |
| | HP USB Business Slim Keyboard | N3R87AA |
| | HP Conferencing Keyboard | K8P74AA |
| | HP USB Antimicrobial Slim Keyboard and Mouse | Z9H50AA |
| Others | HP Business Headset v2 | T4E61AA |

Summary of Changes

| Date of change: | Version History: | | Description of change: |
|-----------------|------------------|--|--|
| | V1 to V2 | | Specs updated, Environmental table added |
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