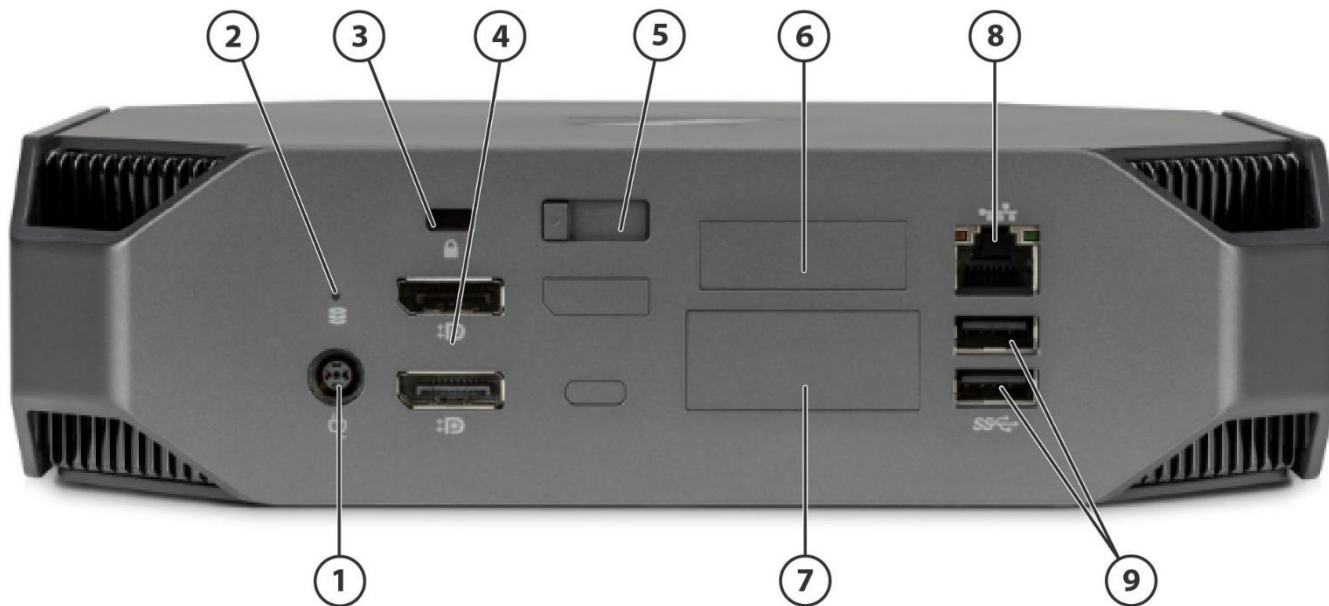# QuickSpecs

## Overview

### HP Z2 Mini G4 Workstation

**Front View**

1. Power Button
2. Headphones/Microphone combo port
3. 1 USB 3.0 Battery Charging Port
4. 1 USB 3.0 Port
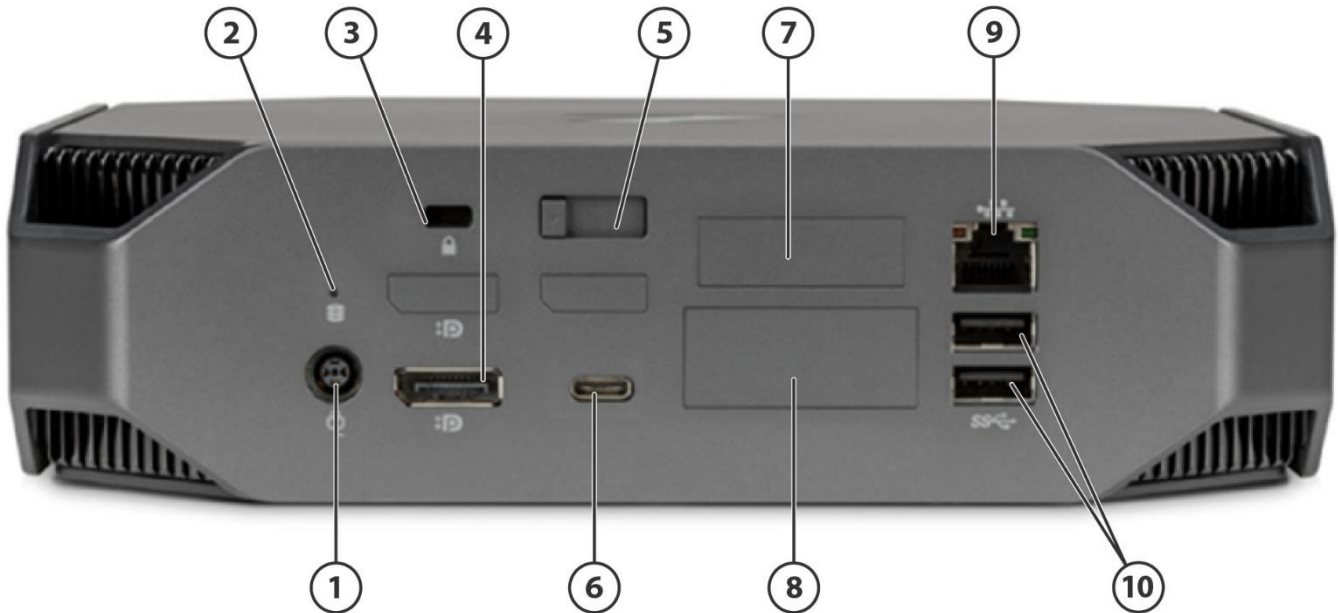5. 1 USB 3.1 Gen2 Type-C™ Battery Charging Port

## Overview



**HP Z2 Mini G4 Entry, back view**

1. DC In
2. HDD LED Status
3. Security Slot
4. (2) DisplayPorts™
5. Cover Latch
6. Optional Serial Port

7. Optional Flexible IO: Not loaded (Flex IO supports VGA/HDMI/DisplayPort™/2nd RJ-45/Fiber NIC/USB-C™ 3.1 Gen2 Charging Port with Alt mode)
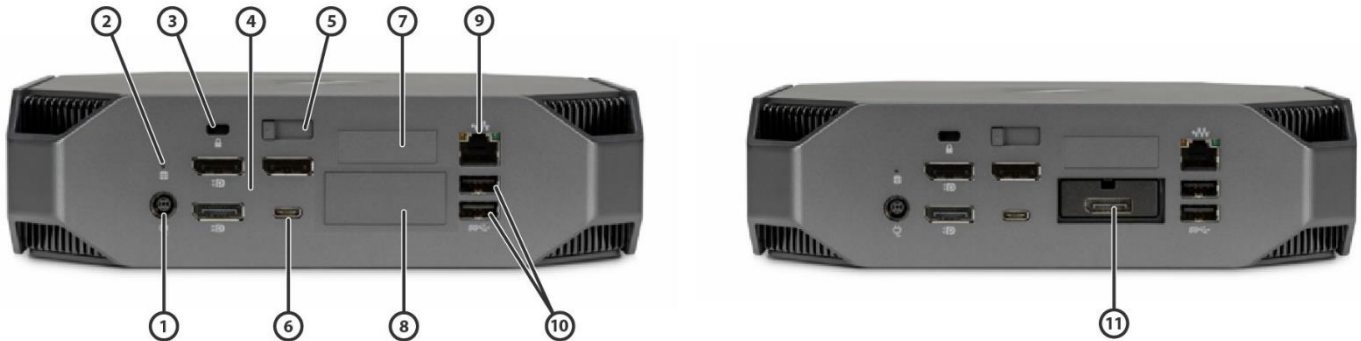8. RJ-45 (Ethernet
9. (2) USB 3.0 Ports

## Overview



**HP Z2 Mini G4 Performance with <u>no discrete graphics</u>, back view**

| | | | |
|---|---|---|---|
| 1. | DC Power Plug | 7. | Optional Serial Port |
| 2. | HDD LED status | 8. | Optional Flex-Port: No Load (Options include: VGA/HDMI/DisplayPort™/2nd RJ-45/USB-C™ 3.1 Gen 2 Charging Port with Alt mode) RJ-45 (Ethernet) |
| 3. | Kensington Lock slot | | |
| 4. | (1) DisplayPort™ Port | 9. | RJ-45 (Ethernet) |
| 5. | Cover latch | 10. | (2) USB 3.0 Ports |
| 6. | USB 3.1 Gen2 Type-C™ Port | | |

## Overview



**HP Z2 Mini G4 Performance with <u>discrete graphics</u>, back view**

1. DC Power Plug
2. HDD LED status
3. Kensington Lock slot
4. (3) DisplayPort™ Port
5. Cover latch
6. USB 3.1 Gen2 Type-C™ Port

7. Optional Serial Port
8. Optional Flex-Port: No Load (Options include: VGA/HDMI/DisplayPort™/2nd RJ-45/USB-C™ 3.1 Gen 2 Charging Port with Alt mode)
9. RJ-45 (Ethernet)
10. (2) USB 3.0 Ports
11. Optional Flex-Port:  DisplayPort™ (Options include: VGA/HDMI/DisplayPort™/2nd RJ-45/USB-C™ 3.1 Gen 2 Charging Port with Alt mode/No Load)

| | Mini Entry | Mini Performance – no Nvidia/AMD graphics | Mini Performance – Nvidia/AMD graphics |
|---|---|---|---|
| DisplayPort™ Ports | 2 | 1 | 3 |
| Flex IO Port DisplayPort™ Port | 1 | 1 | 1 |
| Total possible DisplayPorts™ with Flex IO Port set as DisplayPort™ | 3 | 2 | 4 |

## Overview
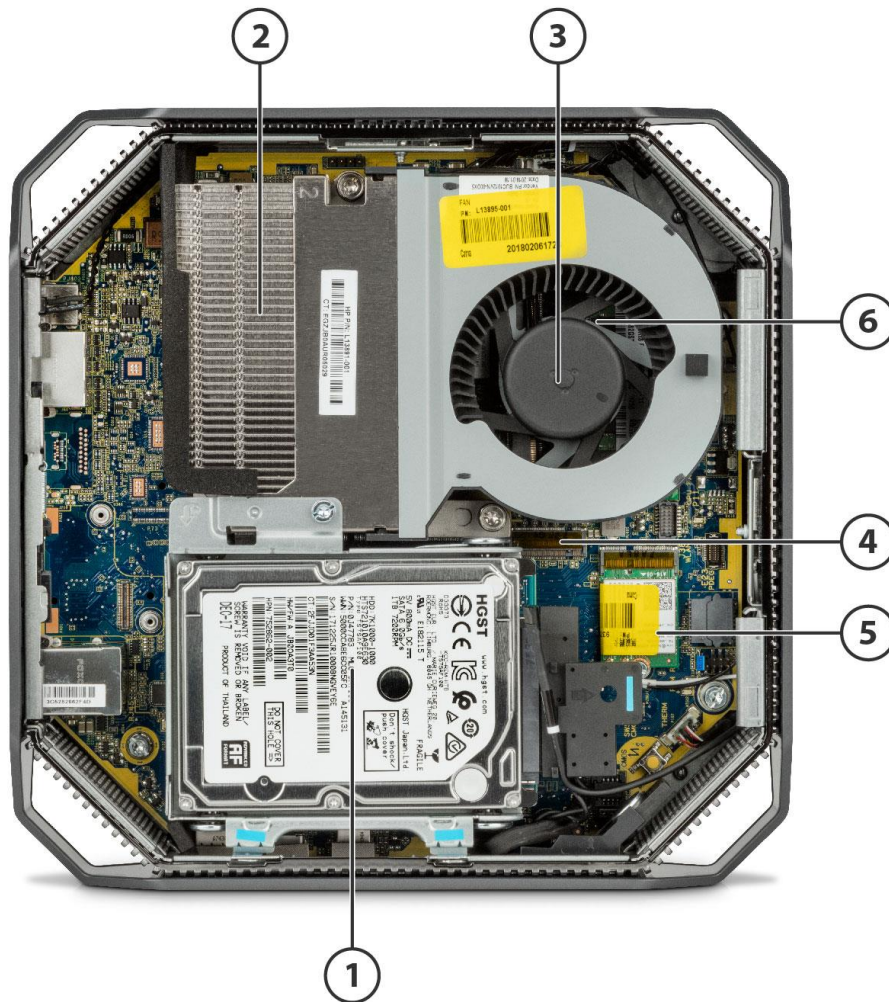


**HP Z2 Mini G4 Entry, Internal View**

1. SATA HDD/SSD (9.5mm 2.5")
2. CPU heatsink
3. CPU blower
4. M.2 80mm (PCIe SSD)

5. M.2 30mm WLAN/BT (location change, TBD)
6. (2) SODIMM memory slots

# QuickSpecs

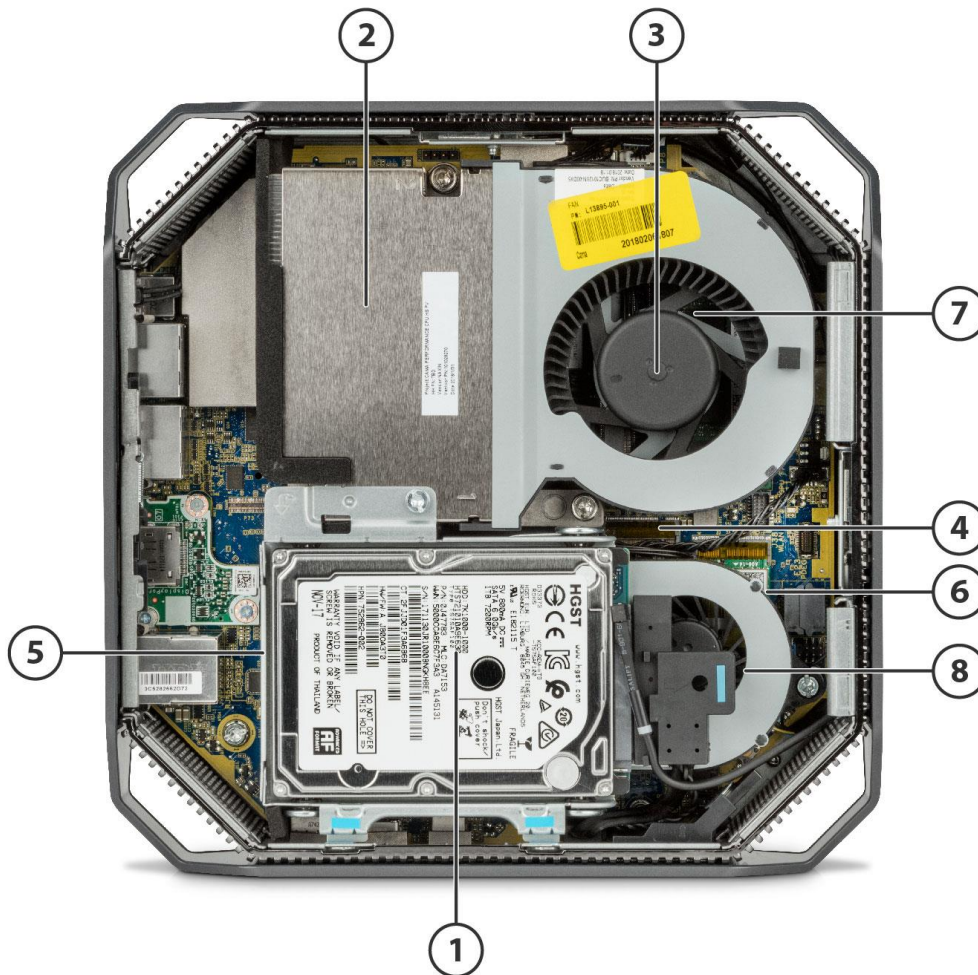## Overview



**HP Z2Mini G4 Performance, Internal View**

1. SATA HDD/SSD (9.5mm 2.5")
2. CPU heatsink
3. CPU blower
4. M.2 80mm (PCIe SSD)

5. GPU heatsink (underneath HDD/SSD cage)
6. M.2 30mm WLAN/BT (location change, TBD)
7. (2) SODIMM memory slots
8. GPU blower

## Overview



**HP Z2 G4 Mini, bottom view**

Removable bottom feet for access to integrated VESA mounting holes

## Overview

| | |
|---|---|
| **Form Factor** | Mini Form Factor |
| **Operating Systems** | Preinstalled: |

Preinstalled:
- Windows 10 Home[1]
- Windows 10 Pro[1]
- Windows 10 Pro (National Academic License)[1]
- Windows 10 Pro for Workstations – HP recommends Windows 10 Pro[1]
- HP Linux®-ready

Supported:
- Red Hat® Enterprise Linux Workstation (1 year paper license available; Preinstall not available)

    **Notes:** For detailed OS/hardware support information for Linux, see:
    http://www.hp.com/support/linux_hardware_matrix

- 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

# QuickSpecs

## Overview

### Processors*

| Name | Cores | Clock Speed (GHz) | Intel® Turbo Boost Technology[3] | Cache (MB) | Memory Speed (MT/s) | Hyper-Threading | Integrated Graphics | Featuring Intel® vPro™ Technology[4] | 16GB Intel® Optane™ memory[2] | TDP (W) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Z2 Mini G4 Performance base unit** | | | | | | | | | | |
| Intel® Xeon® processor E-2286G[1] | 6 | 4.0 | 4.9 | 12 | 2666 | Y | Intel® UHD Graphics P630 | Y | N | 95W |
| Intel® Xeon® processor E-2278G[1] | 8 | 3.4 | 5.0 | 16 | 2666 | Y | Intel® UHD Graphics P630 | Y | N | 80W |
| Intel® Xeon® processor E-2276G[1] | 6 | 3.8 | 4.9 | 12 | 2666 | Y | Intel® UHD Graphics P630 | Y | N | 80W |
| Intel® Xeon® processor E-2274G[1] | 4 | 4.0 | 4.9 | 8 | 2666 | Y | Intel® UHD Graphics P630 | Y | N | 80W |
| Intel® Xeon® processor E-2244G[1] | 4 | 3.8 | 4.8 | 8 | 2666 | Y | Intel® UHD Graphics P630 | Y | N | 80W |
| Intel® Xeon® processor E-2236[1] | 6 | 3.4 | 4.8 | 12 | 2666 | Y | N/A | Y | N | 80W |
| Intel® Xeon® processor E-2226G[1] | 6 | 3.4 | 4.7 | 12 | 2666 | Y | Intel® UHD Graphics P630 | Y | N | 80W |
| Intel® Xeon® processor E-2224G[1] | 4 | 3.4 | 4.6 | 8 | 2666 | Y | Intel® UHD Graphics P630 | Y | N | 80W |
| Intel® Xeon® processor E-2176G[1] | 6 | 3.7 | 4.7 | 12 | 2666 | Y | Intel® UHD Graphics P630 | Y | N | 80W |
| Intel® Xeon® processor E-2174G[1] | 4 | 3.8 | 4.7 | 8 | 2666 | Y | Intel® UHD Graphics P630 | Y | N | 71W |
| Intel® Xeon® processor E-2144G[1] | 4 | 3.6 | 4.5 | 8 | 2666 | Y | Intel® UHD Graphics P630 | Y | N | 71W |
| Intel® Xeon® processor E-2136[1] | 6 | 3.3 | 4.5 | 12 | 2666 | Y | N/A | Y | N | 80W |
| Intel® Xeon® processor E-2126G[1] | 6 | 3.3 | 4.5 | 12 | 2666 | N | Intel® UHD Graphics P630 | Y | N | 80W |
| Intel® Xeon® processor E-2124G[1] | 4 | 3.4 | 4.3 | 8 | 2666 | N | Intel® UHD Graphics P630 | Y | N | 71W |
| Intel® Xeon® processor E-2104G[1] | 4 | 3.2 | N/A | 8 | 2666 | N | Intel® UHD Graphics P630 | Y | N | 65W |
| Intel® Core™ i9-9900K processor[1,2] | 8 | 3.6 | 5.0 | 16 | 2666 | Y | Intel® UHD Graphics 630 | Y | Y | 95W |
| Intel® Core™ i9-9900 processor[1,2] | 8 | 3.1 | 5.0 | 16 | 2666 | Y | Intel® UHD Graphics 630 | Y | Y | 65W |
| Intel® Core™ i7-9700K processor[1,2] | 8 | 3.6 | 4.9 | 12 | 2666 | N | Intel® UHD Graphics 630 | Y | Y | 95W |
| Intel® Core™ i7-9700 processor[1,2] | 8 | 3.0 | 4.7 | 12 | 2666 | N | Intel® UHD Graphics 630 | Y | Y | 65W |
| Intel® Core™ i5-9600 processor[1,2] | 6 | 3.1 | 4.6 | 9 | 2666 | Y | Intel® UHD Graphics 630 | Y | Y | 65W |

## Overview

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Intel® Core™ i5-9500 processor[1,2] | 6 | 3.0 | 4.4 | 9 | 2666 | Y | Intel® UHD Graphics 630 | Y | Y | 65W |
| Intel® Core™ i3-9100 processor[1] | 4 | 3.6 | 4.2 | 8 | 2666 | Y | Intel® UHD Graphics 630 | Y | N | 65W |
| Intel® Core™ i7-8700 processor[1] | 6 | 3.2 | 4.6 | 12 | 2666 | Y | Intel® UHD Graphics 630 | Y | Y | 65W |
| Intel® Core™ i5-8500 processor[1] | 6 | 3.0 | 4.0 | 9 | 2666 | N | Intel® UHD Graphics 630 | Y | Y | 65W |
| Intel® Core™ i3-8100 processor[1] | 4 | 3.6 | N/A | 6 | 2400 | N | Intel® UHD Graphics 630 | N | N | 65W |
| Intel® Pentium™ G5400 processor[1] | 2 | 3.7 | N/A | 4 | 2400 | Y | Intel® UHD Graphics 610 | N | N | 54W |
| **Z2 Mini G4 Entry base unit** | | | | | | | | | | |
| Intel® Xeon® processor E-2104G[1] | 4 | 3.2 | N/A | 8 | 2666 | N | Intel® UHD Graphics P630 | Y | N | 65W |
| Intel® Core™ i7-8700 processor[1] | 6 | 3.2 | 4.6 | 12 | 2666 | Y | Intel® UHD Graphics 630 | Y | Y | 65W |
| Intel® Core™ i5-8500 processor[1] | 6 | 3.0 | 4.0 | 9 | 2666 | N | Intel® UHD Graphics 630 | Y | Y | 65W |
| Intel® Core™ i3-8100 processor[1] | 4 | 3.6 | N/A | 6 | 2400 | N | Intel® UHD Graphics 630 | N | N | 65W |
| Intel® Pentium™ G5400 processor[1] | 2 | 3.7 | N/A | 4 | 2400 | Y | Intel® UHD Graphics 610 | N | N | 54W |

[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. Intel's numbering, branding and/or naming is not a measurement of higher performance.

[2]Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system.

[3]The specifications shown in the Intel® Turbo Boost Technology column represent the maximum turbo frequency with one core active. Turbo boost stepping occurs in 100MHz increments. Processors that do not have turbo functionality are denoted as N/A. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See http://www.intel.com/technology/turboboost for more information.

[4]vPro. Some functionality of this technology, such as Intel® Active management technology and Intel® Virtualization technology, requires additional 3rd party software in order to run. Availability of future "virtual appliances" applications for Intel vPro technology is dependent on third-party software providers. Compatibility of this generation of Intel vPro technology-based hardware with future "virtual appliances" is yet to be determined.

**NOTES:**
Integrated Intel® UHD graphics P630 is supported on select Intel® Xeon® E processors.
Intel® Xeon® E, Intel® Core™ i3 and Pentium can support either ECC or non-ECC memory; Intel® Core™ i5/i7 processors only support non-ECC memory.

**NOTE:** 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.

## Overview

| | |
|---|---|
| **Color** | Space grey with black chrome accents |
| **Convertibility** | The Z2Mini G4 can either be placed flat on the desktop or mounted behind a display* or under a desk. |

**\* Mounting hardware sold separately.**

**Expansion Slots**
(see system board section
for more details)

1 MXM slot (PCIe Gen3 x16) *
1 80mm M.2 Storage slot (PCIe Gen3 x4)
1 30mm M.2 WLAN slot (PCIe Gen3 x1 / Intel CNVI) **

* Performance only
** For WLAN/BT M.2 module only

**Expansion Bays** (see
system board section for
more details)

1 internal 2.5" bay (for SATA HDDs & SSDs only)

**Front I/O**  Power button

**Slide I/O**  1 USB-A 3.0 Charging Data Port, 1 USB 3.0 data port, combo headset/microphone port
and 1 USB-C 3.1 Gen2 Charging Data Port.

**Rear I/O**  **Z2 Mini G4 Entry:** 2 DisplayPort™ (DP 1.2) outputs from Intel® UHD graphics, 2 USB 3.0 ports, 1 serial
port (optional), RJ-45 (LOM)
1 Flexible module port output (Optional Flexible module required)
**Z2 Mini G4 Performance[1]:** 3 DisplayPort™ (DP 1.2) outputs from discrete graphic module, 2 USB-A 3.0
ports, 1 USB 3.1 G2 Type-C™ ports, 1 serial port (optional), RJ-45 (LOM)
1 Flexible module port output (Optional Flexible module required)

**NOTE 1:** Performance system is capable of supporting 6 displays. 6 display solution is achieved using a
combination of Intel® UHD graphics and discrete graphics and is ONLY supported on Windows 10.

**Chassis Dimensions**
**(H x W x D)**

Standard desktop orientation: 58 x 216 x216 mm (2.28 x 8.5 x 8.5 in)

**Weight**  Exact weights depend upon configuration;

Minimum Weight: 1.93 kg (4.25 lb)
Typical Weight*: 2.18 kg (4.80 lb)
Maximum Weight: 2.23 kg (4.91 lb)

Max Supported Weight (desktop orientation): 35 kg (77 lb)

* Configured with 1 2.5" hard drive, 1 PCIe SSD, WLAN module, 2 DIMMs and 1 NVIDIA® Quadro®
graphics card

**Power Supply**  Z2 Mini G4 Entry:
135W 89% Efficiency

Z2 Mini G4 Performance:
200W 89% Efficiency
230W 89% Efficiency
**NOTES:** Customers placing their system in an enclosure should design their solution to accommodate
the size of the external power supply for the Z2 Mini G4

**Chipset**  Intel® C246 chipset

**Memory**  2 SODIMM slots, supporting up to 64GB ECC/non-ECC, DDR4 2666 MT/s

The CPUs determine the speed at which the memory is clocked. If a 2666 MT/s capable CPU is used in the system, the maximum
speed the memory will run at is 2666 MT/s regardless of the specified speed of the memory.
**Note:** Transfer rates up to 2666MT/s

## Overview

| | |
|---|---|
| **Workstation ISV Certifications** | See the latest list of certifications at<br>http://www.hp.com/united-states/campaigns/workstations/partnerships.html |

## Supported Components

| Processors | | Factory Configured | Option Kit |
|---|---|:---:|:---:|
| | **Intel® Xeon® processor E-2100 family[2]** | | |
| | Intel® Xeon® processor E-2286G | Y | N |
| | Intel® Xeon® processor E-2278G | Y | N |
| | Intel® Xeon® processor E-2276G | Y | N |
| | Intel® Xeon® processor E-2274G | Y | N |
| | Intel® Xeon® processor E-2244G | Y | N |
| | Intel® Xeon® processor E-2236 | Y | N |
| | Intel® Xeon® processor E-2226G | Y | N |
| | Intel® Xeon® processor E-2224G | Y | N |
| | Intel® Xeon® processor E-2176G[1] | Y | N |
| | Intel® Xeon® processor E-2174G[1] | Y | N |
| | Intel® Xeon® processor E-2144G[1] | Y | N |
| | Intel® Xeon® processor E-2136[1] | Y | N |
| | Intel® Xeon® processor E-2124G[1] | Y | N |
| | Intel® Xeon® processor E-2104G | Y | N |
| | **9th generation Intel® Core™ processor family** | | |
| | Intel® Core™ i9-9900K 3.6 2666 8C CPU | Y | N |
| | Intel® Core™ i9-9900 3.1 2666 8C CPU | Y | N |
| | Intel® Core™ i7-9700K 3.6 2666 8C CPU | Y | N |
| | Intel® Core™ i7-9700 3.0 2666 8C CPU | Y | N |
| | Intel® Core™ i5-9600 3.1 2666 6C CPU | Y | N |
| | Intel® Core™ i5-9500 3.0 2666 6C CPU | Y | N |
| | Intel® Core™ i3-9100 3.6 2666 4C CPU | Y | N |
| | **8th generation Intel® Core™ processor family[3]** | | |
| | Intel® Core™ i7-8700 3.2 26666 6C CPU | Y | N |
| | Intel® Core™ i5-8500 3.0 2666 6C CPU | Y | N |
| | **8th generation Intel® Core™ i3/Pentium processor family[2]** | | |
| | Intel® Core™ i3-8100 3.6 2400 4C CPU | Y | N |
| | Intel® Pentium® G5400 3.7 2400 2C CPU | Y | N |

**NOTE 1**: Only supported on Z2 Mini G4 Performance Base Unit
**NOTE 2:** These processor support either ECC or non-ECC memory
**NOTE 3:** These processors support only non-ECC memory
**NOTE 4:** Intel® Integrated Graphics P630 for Xeon® processors supports workstation-specific graphics drivers for improved compatibility and performance on select professional applications, compared to Intel® UHD Graphics 630.
**NOTE 5:** Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system.

| Monitors / Displays | Factory Configured | Option Kit | Option Kit Part Number |
|---|:---:|:---:|:---:|
| HP Z Display Z27n G2 27-inch IPS LED Backlit Monitor | | Y | 1JS10AA |
| HP Z Display Z24n G2 24-inch IPS LED Backlit Monitor | | Y | 1JS09AA |

## Supported Components

| | | | |
|---|---|---|---|
| HP Z Display Z24nf G2 23.8-inch IPS Backlit Monitor | Y | 1JS07AA |
| HP Z Display Z23n G2 23-inch IPS LED Backlit Monitor | Y | 1JS06AA |
| HP Z Display Z22n G2 21.5-inch IPS LED Backlit Monitor | Y | 1JS05AA |

**Notes**

Supported by all Operating Systems available from HP
Screen Size Diagonally Measured

## Supported Components

| SATA Hard Drives | | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|---|
| | 500GB SATA 7200 rpm 6Gb/s SFF HDD | Y | Y | T0K73AA |
| | 1TB SATA 7200 rpm 6Gb/s SFF HDD | Y | Y | T0K74AA |
| | 2 TB SATA 5400 rpm SFF HDD | Y | N | |
| **SATA Solid State Drives** | HP 256GB SATA 6Gb/s SSD | Y | Y | A3D26AA |
| | **Storage Acceleration** | | | |
| | 16GB Intel® Optane™ memory* | Y | Y | 2EB68AA |

*Intel® Optane™ memory (cache) is sold separately. Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system. Available for HP commercial desktops and notebooks and for select HP workstations (HP Z2 Tower/SFF/Mini G4, ZBook Studio, 15 and 17 G5) and requires a SATA HDD, 7th Gen or higher Intel® Core™ processor or Intel® Xeon® processor E3-1200 V6 product family or higher, BIOS version with Intel® Optane™ supported, Windows 10 version 1703 or higher, M.2 type 2280-S1-B-M connector on a PCH Remapped PCIe Controller and Lanes in a x2 or x4 configuration with B-M keys that meet NVMe™ Spec 1.1, and an Intel® Rapid Storage Technology (Intel® RST) 16.5 driver.

| PCIe SSDs | PCIe SSDs for HP Workstations* | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|---|
| | HP Z Turbo Drive G2 256GB TLC (Z2 Mini G4) | Y | Y | Y7B60AA |
| | HP Z Turbo Drive G2 512GB TLC (Z2 Mini G4) | Y | Y | 5SA16AA/AT |
| | HP Z Turbo Drive G2 1TB TLC (Z2 Mini G4) | Y | Y | 5RR60AA |
| | HP Z Turbo Drive G2 2TB TLC (Z2 Mini G4) | Y | Y | 3KP44AA |
| | HP Z Turbo Drive G2 256GB SED TLC (Z2Mini G4) | Y | Y | 5RR63AA |
| | HP Z Turbo Drive G2 512GB SED TLC (Z2 Mini G4) | Y | Y | 5RR64AA |
| | HP Z Turbo Drive G2 1TB SED TLC (Z2 Mini G4) | Y | Y | 6YT78AA |

** Installed in native M.2 storage slot on Z2 Mini G4 motherboard

*M.2 card heatsink is required for M.2 storage.

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

| Graphics | | Factory Configured | Option Kit | Option Kit Part Number | Supported # of cards |
|---|---|---|---|---|---|
| **Integrated Graphics** | **Integrated Intel® UHD Graphics (Z2G4)** | | | | |
| | Intel® UHD Graphics P630 | Y | N | | 1 |
| | Intel® UHD Graphics 630 | Y | N | | 1 |
| | Intel® UHD Graphics 610 | Y | N | | 1 |
| **Discrete Graphics** | NVIDIA® Quadro® P600 4GB Graphics[1] | Y | Y | 3TQ28AA | 1 |
| | NVIDIA® Quadro® P1000 4GB Graphics[1] | Y | Y | 3TQ30AA | 1 |
| | AMD Radeon™ Pro WX 3200 4GB Graphics[1] | Y | Y | 6YT72AA | 1 |
| | AMD Radeon™ Pro WX 4150 4GB Graphics[1,2] | Y | Y | 3TQ29AA | 1 |

# QuickSpecs

## Supported Components

| Graphics DisplayPort™ Cable Adapters | HP DisplayPort™ To DVI-D Adapter | Y | Y | FH973AA |
|---|---|---|---|---|
| | HP DisplayPort™ To VGA Adapter | N | Y | AS615AA |
| | HP DisplayPort™ to Dual Link DVI Adapter | N | Y | NR078AA |
| | HP DisplayPort™ to HDMI Adapter | N | Y | TBD |
| | HP USB-C to VGA Adapter | N | Y | 4SH06AA |
| | HP USB-C to HDMI Adapter | N | Y | 4SH07AA |
| | HP USB-C to DP Adapter | N | Y | 4SH08AA |

**Notes**

**NOTE 1:** Only offered on Z2 Mini G4 Performance base unit

**NOTE:** Intermixing integrated Intel® UHD graphics and discrete graphics cards to drive more than three displays can be enabled using the Computer (F10) Setup Utility. However, HP recommends using only discrete graphics when four or fewer displays are required to be supported. 6 display solution is achieved using a combination of Intel® UHD graphics and discrete graphics and is ONLY supported on Windows 10.

## Supported Components

| Memory | | Option Kit Part Number |
|---|---|---|
| | **DDR4-2666 ECC Unbuffered SODIMMs - CTO** | |
| | HP 8GB (1x8GB) DDR4-2666 ECC SODIMM | |
| | HP 16GB (2x8GB) DDR4-2666 ECC SODIMM | |
| | HP 32GB (2x16GB) DDR4-2666 ECC SODIMM | |
| | HP 64GB (2x32GB) DDR4-2666 ECC SODIMM | |
| | | |
| | **DDR4-2666 non-ECC Unbuffered SODIMMs - CTO** | |
| | HP 4GB (1x4GB) DDR4-2666 nECC SODIMM | |
| | HP 8GB (2x4GB) DDR4-2666 nECC SODIMM | |
| | HP 8GB (1x8GB) DDR4-2666 nECC SODIMM | |
| | HP 16GB (2x8GB) DDR4-2666 nECC SODIMM | |
| | HP 32GB (2x16GB) DDR4-2666 nECC SODIMM | |
| | HP 64GB (2x32GB) DDR4-2666 nECC SODIMM | |

| AMO | Option Kit Part Number |
|---|---|
| **DDR4-2666 ECC Unbuffered SODIMMs - AMO** | |
| HP 8GB (1x8GB) DDR4-2666 ECC RAM | 3TQ37AA |
| HP 16GB (1x16GB) DDR4-2666 ECC SODIMM | 3TQ38AA |
| HP 32GB (1x32GB) DDR4-2666 ECC SODIMM | 6FR90AA |
| HP 4GB (1x4GB) DDR4-2666 nECC RAM | 3TQ34AA |
| HP 8GB (1x8GB) DDR4-2666 nECC RAM | 3TQ35AA |
| HP 16GB (1x16GB) DDR4-2666 nECC RAM | 3TQ36AA |
| HP 32GB (1x32GB) DDR4-2666 nECC SODIMM | 6FR89AA |

**NOTES:** Only unbuffered DDR4 SODIMMs are supported.

Intel® Xeon® E, Intel® Core™ i3 and Intel® Pentium® processors can support either ECC or non-ECC memory; Intel® Core™ i5/i7 processors only support non-ECC memory.

Two channels of DDR4 memory are supported. To realize full performance at least one DIMM must be inserted into each channel.

The CPUs determine the speed at which the memory is clocked.  If a 2666 MT/s capable CPU is used in the system, the maximum speed the memory will run at is 2666 MT/s regardless of the specified speed of the memory.

Factory-configured CTO (xxxxxAV) and aftermarket AMO (xxxxxAA, xxxxxAT) HP memory part numbers designated as "2666" will be transitioned to use "3200" speed memory components. This does not affect HP part number availability, nor does it affect system performance or operation. All hardware configurations currently supporting HP memory part numbers designated as "2666" have been tested to work with "3200" memory and are fully supported by HP under standard support terms.

## Supported Components

| Multimedia and Audio Devices | | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|---|
| | Integrated Conexant CX20632 5.1 HAD Audio | Y | N | |

| Optical and Removable Storage | | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|---|
| | **HP SlimTray Optical Drives** | | | |
| | HP External Ultra-Slim DVD-RW Drive | N | Y | Y3T76AA |

Actual speeds may vary. Does not permit copying of commercially available DVD movies or other copyright protected materials. Intended for creation and storage of your original material and other lawful uses. Double Layer discs can store more data than single layer discs. However, double-layer discs burned with this drive may not be compatible with many existing single-layer DVD drives and players.

| Networking and Communications | | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|---|
| | Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro™ with Intel® AMT 12.0) | Y | N | |
| | Intel® 9560 Wireless LAN (802.11ac) and Bluetooth® 5 Module | Y | N | |
| | Allied Telesis 1 GbE LC Fiber 2pc Module | Y | N | |

**NOTE 1:** The integrated network connection is required to support Intel® vPro™ Technology.
**NOTE 2:** If AMT is provisioned, then network teaming with the integrated LAN port is not possible.
**NOTE 3:** "Gigabit" Ethernet indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

| Racking and Physical Security | | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|---|
| | HP Keyed Cable Lock 10mm | N | Y | T1A62AA |
| | Z2 Mini ePSU Sleeve | N | Y | 3RW68AA |
| | HP Z2 Mini Vertical Stand | N | Y | 3RW66AA |
| | HP Z2/Z4/Z6 G4 Depth Adjustable Fixed Rail Rack Kit | N | Y | 2HW42AA |
| | HP Z2 Mini/Z2 Tower/Z4/Z6 Depth Adjustable Fixed Rail Rack Kit | N | Y | 2A8Y5AA |
| | HP Z2 Mini Rack Tray Support Kit | N | Y | 1A4W4AA |

| Input Devices | | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|---|
| | HP USB Optical Mouse | Y | Y | QY777AA |
| | HP USB Hardened Mouse | Y | Y | P1N77AA |

## Supported Components

| | | | | |
|---|---|---|---|---|
| 3Dconnexion CADMouse | | N | Y | M5C35AA |
| HP USB Business SlimCCID SmartCard Keyboard | | Y | Y | |
| HP USB Business Slim Keyboard | | Y | Y | N3R87AA |
| HP USB Premium Keyboard | | Y | Y | Z9N40AT |
| HP Wireless Business Slim Keyboard & Mouse | | Y | Y | N3R88AA |

| Other Hardware | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|
| HP Serial Port Adapter | Y | N | PA716A |
| HP Z2 Mini G4 VESA Sleeve | N | Y | Y7B61AA |
| Z2 Mini G4 Z Display VESA Mount Solution - Current Displays | N | Y | N6N00AA* |
| Z2 Mini G4 Z Display VESA Mount Solution - Legacy Displays | N | Y | E5J35AA** |

\* Current: "n" displays. This mounting kit supports the following displays:
HP Z22n; HP Z232; HP Z23n; HP Z24n; HP Z24nf; HP Z24nq; HP Z25n; HP Z27n; HP DreamColor Z32x

\*\* Legacy: "l" displays. This mounting kit supports the following displays:
HP Z24i; HP Z30i; HP DreamColor Z24x; HP DreamColor Z24x G2; HP Dreamcolor Z27x

| Rear Module Options | Factory Configured | Option Kit | |
|---|---|---|---|
| HP Flex IO module (VGA) | Y | Y | 3TK80AA |
| HP Flex IO module (HDMI)* | Y | Y | 3TK74AA |
| HP Flex IO module (DP) | Y | Y | 3TK72AA |
| HP Flex IO module (USB-C) | Y | Y | 4KY84AA |
| HP Flex IO module (Thunderbolt™ 3.0) | Y | Y | 3TQ25AA |
| HP Flex IO module (1 GbE LAN) | Y | Y | 3TQ26AA |
| HP Serial Port Mini module | Y | Y | 3TQ27AA |

*HP Flex IO module (HDMI) is only supported with Intel UHD graphics. The Z2 Mini G4 will automatically switch to Intel(R) UHD graphics on the Flex IO port when this module is inserted into the system.

| Software | Factory Configured | Option Kit | Support Notes |
|---|---|---|---|
| HP Performance Advisor | Y | N | See Note 1 |
| HP Velocity | Y | N | |
| HP Client Security Software | Y | N | |
| HP Remote Graphics Software (RGS) 7.x | Y | N | |
| HP PC Hardware Diagnostics UEFI | Y | N | See Note 2 |

**NOTE 1**: Supports, and preinstalled with Windows 10 only. Also available as a free download from http://www.hp.com/go/performanceadvisor
**NOTE 2:** Windows OS only

## Supported Components

| | |
|---|---|
| **Operating Systems** | Windows 10 Home |
| | Windows 10 Pro |
| | Windows 10 Pro (National Academic License) |
| | Windows 10 Pro for Workstations – HP recommends Windows 10 Pro |
| | Red Hat® Enterprise Linux® (RHEL) Workstation - Paper License (1yr) |

**NOTE:** For detailed QS/hardware support information for Linux, see:
http://www.hp.com/support/linux_hardware_matrix

## Supported Components

**HP BIOS**

Key features of the HP BIOS include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP Z2 G4 Workstation into the enterprise, such as PXE, remote recovery, remote configuration, remote control, and BIOS (F10) Setup support for 14 languages.
- Network firmware updates – Update your BIOS via the cloud or standardize on a BIOS version hosted on an Enterprise network.
- Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- UEFI specification version 2.6
- Absolute Persistence agent – For tracking and tracing services, available in select countries, separate software and purchase of a subscription is required.
- Thermal and power management – The HP BIOS provides and enables thermal and power management technologies so component temperatures are managed for high reliability and to assist in operating the HP Business Desktop computer in any enterprise environment.
- Acoustic performance – Industry leading acoustic emissions across the range of operating conditions.
- Serviceability – HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery – HP BIOS provides numerous ways to upgrade HP Business Desktop computers, including BIOS updates from within Windows (HP Firmware Update and Recovery), HP Client Manager, and fail-safe recovery. In addition, the HP BIOS Configuration Utility enables replication of BIOS settings within Windows while the Replicated Setup feature provides the same capability within BIOS (F10) Setup. The BIOS Configuration Utility is available from the HP support website.
- HP BIOS uses PKI signing of the BIOS for trusted BIOS upgrades and recovery.

  Additional HP BIOS Features:
- Power-On password – Helps prevent an unauthorized user from powering on the system.
- Administrator password – Also known as the BIOS Setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS cannot be updated and changes cannot be made to BIOS settings using BIOS Setup or under the OS. and changes cannot be made to BIOS settings using BIOS Setup or under the OS. and changes cannot be made to BIOS settings using BIOS Setup or under the OS.
- S4/S5 Maximum Power Savings setting supports EU Lot6 requirement and allows the computer to power down below 0.5W in S4/S5 (when turned off). When S4/S5 Maximum Power Savings feature is enabled below features are turned off:
  -Power to expansion connectors / slots
  -Wake events other than power buttons (such as wake on LAN)
  -USB charging ports

HP Sure Start Gen4 Start
- BIOS Integrity checking – Sure Start protection ensures that only trusted BIOS code is executed and not rootkits, viruses and malware. Verification is done upon boot up, shutdown and while the system is on.
- Sure Start is set by default to automatically repair the BIOS if corrupted or compromised but is policy driven for better manageability. Start is set by default to automatically repair the BIOS if corrupted or compromised but is policy driven for better manageability. Start is set by default to automatically repair the BIOS if corrupted or compromised but is policy driven for better manageability.

## Supported Components

- Protecting beyond BIOS – Integrity checking and repair is extended to other data that should be protected such as network configuration parameters, platform specific information (i.e. system IDs), secure boot credentials, and other code the system needs to boot. and repair is extended to other data that should be protected such as network configuration parameters, platform specific information (i.e. system IDs), secure boot credentials, and other code the system needs to boot. and repair is extended to other data that should be protected such as network configuration parameters, platform specific information (i.e. system IDs), secure boot credentials, and other code the system needs to boot.
- Audit enabled – System Audit via Sure Start Event Logs capture data such as incident, repair date and time for troubleshooting and investigating

HP Sure Start Gen4 is available on HP Workstation products equipped with Intel® 8th generation processors.

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**Remote Power On**

**Benefits of the Remote Power:**

- Make it easier to power-on HP Z2 Mini G4 Workstation by USB keyboard/mouse in some use scenarios.
- Support wired/wireless, USB low speed/full speed keyboards and mousses.
- Easy setup in BIOS menu.
- Support waking from both S4 (Hibernate) and S4/S5 (Shutdown).

**Limitations:**
- Waking from S4/S5 is limited to only via keyboard/mouse device.

**Instructions:**
1. Connect USB keyboard/mouse to USB port.
2. System must recognize USB keyboard/mouse in S0 first. (USB full speed keyboard/mouse, such as wireless keyboard/mouse or Smart card keyboard need to connect to system over 60 seconds in S0 to be recognized on charging port.)
3. Sleep to S4 or S5.
4. Wake system by any key on keyboard or clicking/movement* on mouse.

\* If mouse has the capability to wake system by movement

## SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

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

Software
HP Hotkey Support

## Supported Components

HP Performance Advisor
HP Velocity
HP Remote Graphics Software (RGS) 7.x

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]

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 Authentication
Microsoft Defender[27]

Security Management
Secure Erase[18]
TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)[32]
SATA port disablement (viaBIOS))
Serial, USB enable/disable (viaBIOS))
Power-on password (viaBIOS))
Setup password (viaBIOS))
HP Sure Click[35]
HP Sure Start Gen4[30]
HP Sure Run[33]
HP Sure Recover[34]

17. HP BIOSphere Gen4 requires Intel(R) 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. HP Secure Erase does not support platforms with Intel® Optane™.
19. Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S.  The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: http://www.absolute.com/company/legal/agreements/ computrace-agreement.  Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.-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.
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
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..  Some websites and applications may not be supported.  User may need to enable or allow the add-on / extension in the internet browser.
27. Microsoft Defender Opt in and internet connection required for updates. in and internet connection required for updates.
30. HP Sure Start Gen4 is available on HP Workstation products equipped with Intel® 8th generation processors
32. Firmware TPM is version 7.63. Hardware TPM is v2.0. .
33. HP Sure Run is available on HP Workstation products equipped with 8th generation Intel® or AMD® processors.

## Supported Components

34. 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.

35. HP Sure Click is available on most HP PCs and supports Microsoft® Internet Explorer, Google Chrome, and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode, when Microsoft Office or Adobe Acrobat are installed.

## System Technical Specifications

## System Board

| | |
|---|---|
| **System Board Form Factor** | Entry: 200mm x 200mm (7.9 x 7.9 inches)<br>Performance: 200mm x 200mm (7.9 x 7.9 inches) |
| **Processor Socket** | Single LGA 1151 |
| **CPU Bus Speed** | DMI link between CPU & PCH: Performance comparable to PCIe Gen3 x4 |
| **Chipset** | Intel® PCH C246 |
| **Memory Expansion Slots** | 2 SODIMM DDR4 memory slots |
| **Memory Type Supported** | DDR4, UDIMM (Unbuffered), ECC & non-ECC |
| **Memory Modes** | Non-Interleaved for single channel. Interleaved when both channels are populated. |
| **Memory Speed Supported** | 2666MHz DDR4 for Coffeelake processors; |
| **Memory Protection** | ECC available on data<br><br>*Requires ECC DIMMs to be installed, as well as a CPU that supports ECC |
| **Maximum Memory** | 64GB |
| **Memory Configuration (Supported)** | 4GB, 8GB, 16GB and 32GB non-ECC/ 8GB, 16GB and 32GB ECC unbuffered DIMMs are supported. ECC and non-ECC memory DIMMs cannot be mixed on the same system. |
| **Notes** | Maximum memory capacities assume 64-bit operating systems, such as Windows® 10 Professional 64-Bit or Red Hat Linux 64-bit. |
| **Supported Drive Interfaces** | **SATA** — Integrated (1) Serial ATA interfaces (6Gb/s SATA). |
| | **Integrated Graphics** — Intel® UHD Graphics 610 (on Pentium™ Gold-5xxx processors); Intel® UHD Graphics 630 (on Core™ i3/i5/i7-8xxx processors); Intel® UHD Graphics P630 for Xeon® E processors based on Unified Memory Architecture (UMA).<br><br>A region of system memory is reserved and dedicated to the graphics display.<br><br>Support for Microsoft DirectX 12.1, OpenGL 4.4 and OpenCL 2.0 on Intel® UHD Graphics P630.<br><br>**Entry:** (2) DP 1.2 graphics ports integrated on motherboard; (1) DP 1.2 graphic capable through use of Flexible DP module. Supports up to three simultaneous displays across DP outputs.<br>Max. resolution supported: 4096x2160 @60Hz<br><br>**Performance:** (1) DP 1.2 graphics ports integrated on motherboard switchable between intel® graphic and discrete graphic; (1) DP 1.2 graphic capable through use of Flexible DP module switchable between intel® |

## System Technical Specifications

graphic and discrete graphic. Supports up to three simultaneous displays from Intel® graphic across DP outputs. (2) DP 1.2 graphic port dedicated for display from discrete graphics
Max. resolution supported: 4096x2160 @60Hz

| Power Supply | Graphics options |
|---|---|
| 135W | Integrated Graphics |
| 200W | Nvidia P600 |
| 230W | Nvidia P1000, AMD WX4150, WX3200 |
| 230W with 95 CPU | Integrated Graphics, Nvidia P600 |

| | | |
|---|---|---|
| | **Network Controller** | Integrated Ethernet PHY Connection I219LM. Management capabilities: WOL, PXE 2.1 and AMT 12.0 |
| | **Serial** | 1 rear port (configurable option) |
| **IEEE 1394 Connector(s)** | | |
| **USB Connector(s)** | **Front** | Side I/O:<br>2 USB 3.0 Type-A<br>1 USB 3.1 G2 Type-C™ |
| | **Rear** | 2 USB 3.0 Type-A<br>1 USB 3.1 G2 Type-C™ (Z2 Mini G4 Performance only) |
| **HD Integrated Audio** | Yes; supports CTIA headset | |
| **Flash ROM** | Yes | |
| **Chassis Fan Header** | Yes<br>Additional CPU/GFX Cooler (Z2 Mini G4 Performance only) | |
| **Front Control Panel/Speaker Header** | Side I/O: Yes | |
| **CMOS Battery Holder - Lithium** | Yes | |
| **Integrated Trusted Platform Module** | Integrated TPM 2.0 | |
| **Power Supply Headers** | Yes, single DC-in jack for external power supplies | |
| **Power Switch, Power LED & Hard Drive LED Header** | 1. The power and failure LED are combined in the front power switch.<br><br>2. The HDD LED & DC-in LED are combined within one port on the Rear I/O. The LED will be lit once the AC power is plugged in. As soon as the system is booted up, the LED will function as a standard HDD activity LED. | |
| **Clear Password Jumper** | Yes | |
| **Keyboard/Mouse** | USB | |
| **Power Supply** | Z2 Mini G4 Entry: 135W, 89% efficiency, wide-ranging, active PFC Power Supply<br><br>Z2 Mini G4 Performance: 200W, 89% efficiency, wide-ranging, active PFC Power Supply<br>Z2 Mini G4 Performance: 230W, 89% efficiency, wide-ranging, active PFC Power Supply<br><br>The Z2 Mini G4 PSU Efficiency Report can be found at this link: TBD | |
| **Operating Voltage Range** | 90-265 VAC | |
| **Rated Voltage Range** | 100–240 VAC | |

# QuickSpecs

## System Technical Specifications

| | |
|---|---|
| **Rated Line Frequency** | 50-60 Hz |
| **Operating Line Frequency Range** | 47–63 Hz |
| **Rated Input Current** | Z2 Mini G4 Entry: 1.9A @ 90Vac<br>Z2 Mini G4 Performance: 2.9A @ 90Vac  (200W EPS)<br>Z2 Mini G4 Performance: 3.5A @ 90Vac  (230W EPS) |
| **Heat Dissipation** | Typical: TBD btu/hr (TBD kcal/hr)<br>Maximum: TBD btu/hr (TBD kcal/hr) |
| **ENERGY STAR® certified (Config Dependent)** | Yes |
| **FEMP Standby Power Compliant** | Yes, with Wake-on-LAN disabled: <1W in S4/S5- Power Off |
| **Surge Tolerant Full Ranging Power Supply (withstands power surges up to 2000V)** | Yes |

## System Configurations

| *Z2 Mini G4 Configuration #1 (TBD)* **ENERGY STAR CERTIFIED** | | |
|---|---|
| Processor Info | 1x Intel® Core® i3-8100 3.6 6MB  4C |
| Memory Info | 8GB (1x8GB) DDR4-2666 ECC SO-DIMM |
| Graphics Info | Intel® UHD Integrated Graphics 630 |
| Disks/Optical/Floppy | 1x 1TB 7200 RPM SATA HDD / 1x Z Turbo Drive G2 512GB PCIe 1st SSD |
| Power Supply | 135W EPS |
| Other | Ethernet Capable |

**Energy Consumption (Watts)**

| | 115 VAC | | 230 VAC | | 100 VAC | |
|---|---|---|---|---|---|---|
| | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| Windows long Idle (S0) | 9.765 | | 9.900 | | 9.642 | |
| Windows short Idle (S0) | 10.042 | | 10.241 | | 10.146 | |
| Windows Busy Typ(S0) | 73.371 | | 74.665 | | 74.087 | |
| Windows Busy Max (S0) | 94.000 | | 95.034 | | 94.412 | |
| Sleep (S3) | 1.069 | 0.860 | 1.154 | 0.931 | 1.118 | 1.046 |
| Off (S5) | 0.858 | 0.748 | 0.928 | 0.815 | 0.856 | 0.755 |
| Zero Power Mode (ErP) | 0.364 | | 0.423 | | 0.366 | |

**Heat Dissipation (Btu/hr)**

| | 115 VAC | | 230 VAC | | 100 VAC | |
|---|---|---|---|---|---|---|
| | LAN Enabled | LAN Disabled | LAN Enabled | LAN Enabled | LAN Disabled | LAN Enabled |
| Windows long Idle (S0) | 33.318 | | 6.488 | | 32.899 | |
| Windows short Idle (S0) | 34.263 | | 34.942 | | 34.618 | |
| Windows Busy Typ(S0) | 250.342 | | 254.757 | | 252.785 | |
| Windows Busy Max (S0) | 320.728 | | 324.256 | | 322.133 | |
| Sleep (S3) | 3.647 | 2.934 | 3.937 | 3.177 | 3.815 | 3.569 |
| Off (S5) | 2.927 | 2.552 | 3.166 | 2.781 | 2.921 | 2.576 |
| Zero Power Mode (ErP) | 1.242 | | 1.443 | | 1.249 | |

## System Technical Specifications

| *Z2 Mini G4 Configuration #2 (TBD)* | Processor Info | 1x Intel® Core® i7-8700 3.2 12MB 6C |
|---|---|---|
| | Memory Info | HP 16GB (2x8GB) DDR4-2666 non-ECC SO-DIMM |
| | Graphics Info | NVIDIA Quadro P600 4GB next MXM |
| | Disks/Optical/Floppy | 1x 1TB Z Turbo Drive G2 M.2 SSD |
| | Power Supply | 200W EPS |
| | Other | Ethernet Capable |

| Energy Consumption (Watts) | | 115 VAC | | 230 VAC | | 100 VAC | |
|---|---|---|---|---|---|---|---|
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| | Windows long Idle (S0) | 15.577 | | 15.580 | | 15.528 | |
| | Windows short Idle (S0) | 17.197 | | 17.306 | | 17.557 | |
| | Windows Busy Typ(S0) | 171.57 | | 156.86 | | 161.7 | |
| | Windows Busy Max (S0) | 196.85 | | 192.95 | | 204.03 | |
| | Sleep (S3) | 1.169 | 1.05 | 1.206 | 1.111 | 1.174 | 1.111 |
| | Off (S5) | 1.024 | 0.859 | 1.056 | 0.923 | 0.946 | 0.865 |
| | Zero Power Mode (ErP) | 0.449 | | 0.489 | | 0.411 | |

| Heat Dissipation (Btu/hr) | | 115 VAC | | 230 VAC | | 100 VAC | |
|---|---|---|---|---|---|---|---|
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Enabled | LAN Disabled | LAN Enabled |
| | Windows long Idle (S0) | 53.149 | | 53.159 | | 52.981 | |
| | Windows short Idle (S0) | 58.676 | | 59.048 | | 59.904 | |
| | Windows Busy Typ(S0) | 585.397 | | 535.206 | | 551.720 | |
| | Windows Busy Max (S0) | 671.652 | | 658.345 | | 696.150 | |
| | Sleep (S3) | 3.987 | 3.583 | 4.115 | 3.791 | 4.006 | 3.791 |
| | Off (S5) | 3.494 | 2.931 | 3.603 | 3.149 | 3.228 | 2.951 |
| | Zero Power Mode (ErP) | 1.532 | | 1.668 | | 1.402 | |

| *Z2 Mini G4 Configuration #3 (TBD)* **ENERGY STAR CERTIFIED** | Processor Info | 1x Intel® Xeon™ E-2176G 3.7 12M 6C |
|---|---|---|
| | Memory Info | 32GB (2x16GB) DDR4-2666 ECC SO-DIMM |
| | Graphics Info | AMD Radeon Pro WX 4150 4GB MXM |
| | Disks/Optical/Floppy | 1x 500 GB 7200 RPM SATA HDD |
| | Power Supply | 230W EPS |
| | Other | Ethernet Capable |

| Energy Consumption (Watts) | | 115 VAC | | 230 VAC | | 100 VAC | |
|---|---|---|---|---|---|---|---|
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| | Windows long Idle (S0) | 21.060 | | 21.158 | | 19.434 | |
| | Windows short Idle (S0) | 21.114 | | 21.427 | | 20.238 | |
| | Windows Busy Typ(S0) | 184.74 | | 184.26 | | 200.1 | |
| | Windows Busy Max (S0) | 210.48 | | 201.97 | | 208.93 | |
| | Sleep (S3) | 1.184 | 1.096 | 1.181 | 1.105 | 1.204 | 1.119 |
| | Off (S5) | 0.841 | 0.718 | 0.845 | 0.724 | 0.857 | 0.729 |
| | Zero Power Mode (ErP) | 0.435 | | 0.441 | | 0.436 | |

| Heat Dissipation (Btu/hr) | | 115 VAC | | 230 VAC | | 100 VAC | |
|---|---|---|---|---|---|---|---|
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Enabled | LAN Disabled | LAN Enabled |
| | Windows long Idle (S0) | 71.857 | | 72.191 | | 66.309 | |
| | Windows short Idle (S0) | 72.041 | | 73.109 | | 69.052 | |
| | Windows Busy Typ(S0) | 630.333 | | 628.695 | | 682.741 | |

## System Technical Specifications

| | | | | | |
|---|---|---|---|---|---|
| Windows Busy Max (S0) | 718.158 | | 689.122 | | 712.869 | |
| Sleep (S3) | 4.040 | 3.740 | 4.030 | 3.770 | 4.108 | 3.818 |
| Off (S5) | 2.869 | 2.450 | 2.883 | 2.470 | 2.924 | 2.487 |
| Zero Power Mode (ErP) | 1.484 | | 1.505 | | 1.488 | |

## Declared Noise Emissions Z2 Mini G4 (Entry)

**Declared Noise Emissions** (Entry-level and High-end configurations)

**System Configuration (Entry level With HDD)**

| | |
|---|---|
| **Processor Info** | Intel® Core™ i3-8100 4C |
| **Memory Info** | 1 - 8GB DDR4-2666 SO-DIMM Memory |
| **Graphics Info** | Intel UHD Graphics |
| **Disks/SSD** | 1 - Hitachi 500GB SATA 7200RPM HDD<br>1 - Samsung 256GB PCIe M.2 SSD |

| **Declared Noise Emissions** (in accordance with ISO 7779 and ISO 9296) | **Sound Power** (LWAd, bels) | **Deskside Sound Pressure** (LpAm, decibels) |
|---|---|---|
| **Idle** | TBD | TBD |
| **Hard drive Operating** (random reads) | TBD | TBD |

**System Configuration (Entry level Only SSD)**

| | |
|---|---|
| **Processor Info** | Intel® Core™ i3-8100 4C |
| **Memory Info** | 1 - 8GB DDR4-2666 SO-DIMM Memory |
| **Graphics Info** | Intel UHD Graphics |
| **Disks/SSD** | N / A<br>1 - Samsung 256GB PCIe M.2 SSD |

| **Declared Noise Emissions** (in accordance with ISO 7779 and ISO 9296) | **Sound Power** (LWAd, bels) | **Deskside Sound Pressure** (LpAm, decibels) |
|---|---|---|
| **Idle** | TBD | TBD |
| **Hard drive Operating** (random reads) | TBD | TBD |

**System Configuration (High-end)**

| | |
|---|---|
| **Processor Info** | Intel® Core™ i7-8700 6C |
| **Memory Info** | 2 - 8GB DDR4-2666 SO-DIMM Memory |
| **Graphics Info** | Intel UHD Graphics |
| **Disks/SSD** | 1 - Hitachi 1TB SATA 7200RPM HDD<br>1 - Samsung 512GB PCIe M.2 SSD |

| **Declared Noise Emissions** (in accordance with ISO 7779 and ISO 9296) | **Sound Power** (LWAd, bels) | **Deskside Sound Pressure** (LpAm, decibels) |
|---|---|---|
| **Idle** | 3.14 | 19.2 |
| **Hard drive Operating** (random reads) | 3.18 | 19.4 |

## Declared Noise Emissions Z2 Mini G4 Performance

**Declared Noise Emissions** (Entry-level and High-end configurations)

**System Configuration (Entry level With HDD)**

| | |
|---|---|
| **Processor Info** | Intel® Core™ i3-8100 SR2HG/3.6G/6M/4c |
| **Memory Info** | 1 - 4GB DDR4-2666 SO-DIMM Memory |

# QuickSpecs

## System Technical Specifications

| | | |
|---|---|---|
| **Graphics Info** | NVIDIA® Quadro® P600 | |
| **Disks/SSD** | 1 - Hitachi 500GB SATA 7200RPM HDD<br>1 - Samsung 256GB PCIe M.2 SSD | |

| **Declared Noise Emissions** (in accordance with ISO 7779 and ISO 9296) | | **Sound Power** (LWAd, bels) | **Deskside Sound Pressure** (LpAm, decibels) |
|---|---|---|---|
| | **Idle** | 3.16 | 20.3 |
| | **Hard drive Operating** (random reads) | 3.17 | 20.4 |

| **System Configuration (Entry level Only SSD)** | **Processor Info** | Intel® Core™ i3-8100 SR2HG/3.6G/6M/4c |
|---|---|---|
| | **Memory Info** | 1 - 4GB DDR4-2666 SO-DIMM Memory |
| | **Graphics Info** | NVIDIA® Quadro® P600 |
| | **Disks/SSD** | N / A<br>1 - Samsung 256GB PCIe M.2 SSD |

| **Declared Noise Emissions** (in accordance with ISO 7779 and ISO 9296) | | **Sound Power** (LWAd, bels) | **Deskside Sound Pressure** (LpAm, decibels) |
|---|---|---|---|
| | **Idle** | 3.06 | 19.1 |
| | **Hard drive Operating** (random reads) | / | / |

| **System Configuration (High-end)** | **Processor Info** | Intel® Xeon® E-2144 QJ70/3.6G/8M/4c |
|---|---|---|
| | **Memory Info** | 2 - 8GB DDR4-2666 SO-DIMM Memory |
| | **Graphics Info** | NVIDIA® Quadro® P600 |
| | **Disks/SSD** | 1 - Hitachi 1TB SATA 7200RPM HDD<br>1 - Samsung 512GB PCIe M.2 SSD |

| **Declared Noise Emissions** (in accordance with ISO 7779 and ISO 9296) | | **Sound Power** (LWAd, bels) | **Deskside Sound Pressure** (LpAm, decibels) |
|---|---|---|---|
| | **Idle** | 3.21 | 22.2 |
| | **Hard drive Operating** (random reads) | 3.23 | 22.7 |

# QuickSpecs

## System Technical Specifications

| | | |
|---|---|---|
| **Environmental Requirements** | **Temperature** | Operating: 5° to 35° C (40° to 95° F)<br>Above 1524 m (5,000 feet) altitude, the maximum operating temperature is reduced by 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation<br>Non-operating: -40° to 60° C (-40° to 140° F)<br>Maximum rate of change: 10°C/hr |
| | **Humidity** | Operating: 10% to 85% RH, non-condensing, 35° C maximum wet bulb<br>Non-operating: 10% to 90% RH, non-condensing, 35° C maximum wet bulb |
| | **Maximum Altitude** | Operating (with Rotational Hard Drives): 3,048 m (10,000 feet)<br>Operating (with only Solid-State Drives): 5,000 m (16,404 feet)<br>Non-operating:  12,192 m (40,000 feet)<br>Maximum operating temperature is reduced as altitude increases. See **Temperature** for details. |
| | **Shock (non-repetitive)** | Operating ½-sine: 40g, 2-3ms (~62 cm/sec)<br>Non-operating ½-sine: 160 cm/s, 2-3 ms (~105 g)<br>Non-operating square: 422 cm/s, 20 g |
| | **Vibration** | Operating random: 0.5 g (rms), 5-300 Hz, up to 0.0025 g²/Hz<br>Non-operating random: 2.0 g (rms), 5-500 Hz, up to 0.0150 g²/Hz |

## System Technical Specifications

## Physical Security and Serviceability

| | |
|---|---|
| **Access Panel** | Tool-less<br>Includes system board and memory information |
| **Hard Drives** | HDD cage requires the use of a screwdriver to remove the HDD |
| **Expansion Cards** | M.2 module requires a screwdriver to service and replace.<br>An option card requires a screwdriver to service and replace. |
| **Processor Socket** | Tool-less, except for the processor heatsink. |
| **Color-coordinated Cables and Connectors** | Yes |
| **Memory** | Tool-less |
| **System Board** | Screw-In |
| **Dual Color Power and HD LED on Front of Computer** | The Power LED is on the front of the system, but the HDD LED is located on the Rear of the system |
| **Configuration Record SW** | Yes |
| **Over-Temp Warning on Screen** | Yes |
| **Restore CD/DVD Set** | Consists of an operating system DVD (OSDVD) and a driver DVD (DRDVD). OSDVD restores the original operating system. DRDVD will provide all drivers for the system. The DRDVD may also contain applications that originally shipped with the system for optional installation. Applications can also be obtained from HP.com. OSDVD and DRDVD are orderable with the system and available from HP Support. |
| **Dual Function Front Power Switch** | Yes, causes a fail-safe power off when held for 4 seconds (default) or 15 seconds (can be configured by F10 BIOS setup\Advanced\System Options\Power button override) |
| **Cable Lock Support** | Yes, Kensington Cable Lock (optional): Locks top cover from being opened and secures chassis to furniture to prevent theft<br>3 mm x 7 mm slot at rear of system |
| **Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control** | Yes, enables or disables serial, USB, audio, and network ports (parallel port is not supported on the Z2 Mini G4 G4) |
| **Removable Media Write/Boot Control** | Yes, prevents ability to boot from removable media on supported devices (and can disable writes to media) |
| **Power-On Password** | Yes, prevents an unauthorized person from booting up the workstation |

## System Technical Specifications

| | |
|---|---|
| **Setup Password** | Yes, prevents an unauthorized person from changing the workstation configuration |
| **NIC LEDs (integrated) (Green & Amber)** | Yes |
| **CPUs and Heatsinks** | A T-15 Torx or flat blade screwdriver is needed to remove the CPU heatsink before the CPU can be removed. CPU removal is tool-less |
| **Power Supply Diagnostic LED** | Yes; this is located on the Rear of the chassis and combined with the HDD LED.<br>When the PSU adapter is plugged in, and the unit is powered off, the Power OK LED will glow. |
| **Front Power LED** | Yes, white (normal), red (fault) |
| **Internal Speaker** | Yes, on the side of the chassis |
| **System/Emergency ROM Flash Recovery** | Recovers corrupted system BIOS. |
| **Cooling Solution** | Air cooled forced convection |
| **CPU Heatsink Fan** | Z2 Mini G4 Entry & Performance CPU blower solution: 11.1 mm x 65mm x 82.1mm<br><br>Z2 Mini G4 Performance GPU blower solution: 29mm x 103.6mm x 102.2mm |
| **Chassis Fan** | Z2 Mini G4 Entry: Single system blower<br>Z2 Mini G4 Performance: Dual system blower |
| **Memory Heatsink Fan** | No |
| **HP PC Hardware Diagnostics UEFI** | HP PC Hardware Diagnostics (UEFI) enables hardware level testing outside the operating system on many components.  The diagnostics can be invoked by pressing F2 at POST, and is available as a download from HP Support. |
| **Access Panel Key Lock** | The Kensington lock slot on the chassis serves this purpose |
| **ACPI-Ready Hardware** | Advanced Configuration and Power Management Interface (ACPI).<br>• Allows the system to wake from a low power mode.<br>• 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 |
| **Trusted Platform Module Chip** | Yes |
| **M.2 Card Retention** | Yes, all M.2 modules are retained by a single screw<br>      M.2 storage card requires heatsink, which has another screw. |
| **Flash ROM** | Yes |
| **Diagnostic Power Switch LED on board** | Yes |
| **Clear Password Jumper** | Yes |

## System Technical Specifications

| | |
|---|---|
| **Clear CMOS Jumper** | Yes |
| **CMOS Battery Holder** | Yes: Z2 Mini G4 Entry<br>Yes: Z2 Mini G4 Performance |
| **DIMM Connectors** | Yes |

## System Technical Specifications

## Social and Environmental Responsibility

**Eco-Label Certifications & Declarations**

This product is low halogen except for power cords, cables and peripherals. Service parts obtained after purchase may not be Low Halogen.

- ENERGY STAR® (energy-saving features available on selected configurations –Windows® only)
- US Federal Energy Management Program (FEMP)
- China Energy Conservation Program (CECP)
- IT ECO declaration

**Batteries**

The battery in this product complies with EU Directive 2006/66/EC
Battery size: CR2032 (coin cell)
Battery type: Lithium Metal

The battery in this product does not contain:

- Mercury greater than 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 40ppm by weight

**Restricted Material Usage**

This product meets the material restrictions specified in HP's General Specification for the Environment. http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf
HP Inc. is committed to compliance with all applicable environmental laws and regulations, including the European Union Restriction of Hazardous Substances (RoHS) Directive. HP's goal is to exceed compliance obligations by meeting the requirements of the RoHS Directive on a worldwide basis.

**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/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. This product is greater than 90% recyclable by weight when properly disposed of at end of life.

**HP Inc. Corporate Environmental Information**

For more information about HP's commitment to the environment:
Living Progress Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html

Eco-label certifications
http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html

ISO 14001 certificates:
http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html

**Additional Information**

- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive - 2002/96/EC.
- Plastic parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product is >90% recycle-able when properly disposed of at end of life
- EPEAT®2019 Gold registered in the United States*

*Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. EPEAT® status varies by country. Visit www.epeat.net for more information.

**Packaging**

HP Workstation product packaging meets the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/society/gen_specifications.html

## System Technical Specifications

- Does not contain restricted substances listed in HP Standard 011-1 General Specification for the Environment
- Does not contain ozone-depleting substances (ODS)
- Does not contain heavy metals (lead, mercury, cadmium or hexavalent chromium) in excess of 100 ppm sum total for all heavy metals listed
- Maximizes the use of post-consumer recycled content materials in packaging materials
- All packaging material is recyclable
- All packaging material is designed for ease of disassembly
- Reduced size and weight of packages to improve transportation fuel efficiency
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards formatting

**Packaging Materials**

**Internal**      Cushions made from fabricated recycled expanded-polyethylene (EPE) or recycled expanded-polypropylene (EPP). May also be made from recycled molded paper-pulp (MPP).

**External**     Carton made from corrugated fiberboard with at least 35% recycled content.

## System Technical Specifications

## Manageability

**Intel® Active Management Technology (AMT) v12**

An advanced set of remote management features and functionality which provides network administrators the latest and most effective tools to remotely discover, heal, and protect networked client systems regardless of the system's health or power state. AMT 12 includes the following advanced management functions:

- Support for configuration of Intel AMT 12.0 new capabilities
- No reset after provisioning
- Support for Microsoft Windows Server 2012 R2
- Support for New Microsoft SQL Server Versions including Standard and Enterprise editions
- Support for Intel SSD Prop 2500 Series
- Support for Intel Enterprise Digital Fence
- The Platform Discovery Utility can now discover these additional Intel products:
- Intel SSD Pro 2500 Series; Enterprise Digital Fence
- Intel Identity Protection Technology with One Time Password; Public Key Infrastructure; Multi Factor Authentication
- Intel Identity Protection Technology with Intel WiGig
- New Profile Editor and Profile Editor Plugin Interface
- New Required Permissions for Solutions Framework

**HP Image Assistant**

Visit: http://ftp.hp.com/pub/caps-softpaq/cmit/HPIA.html

**System Software Manager**

Visit: http://www.hp.com/go/ssm

**Service, Support, and Warranty**

- Program to proactively communicate Product Change Notifications (PCNs) and Customer Advisories by email to customers, based on a user-defined profile.
- PCNs provide advance notification of hardware and software changes to be implemented in the factory providing time to plan for transition.
- Customer Advisories provide concise, effective problem resolution, greatly reducing the need to call technical support.

## Stable & Consistent Offerings

As part of its commitment to hardware, software, and solution innovation, HP is proud to introduce this breakthrough platform configuration stability to HP Workstation customers. HP Stable & Consistent Offerings are built on the foundation of a carefully chosen set of hardware and software designed and tested to work with all HP Z Workstation platforms through their end of life. These components and their corresponding HP Workstation platform compatibility are outlined in this section.

HP Stable & Consistent Offerings are available worldwide to all HP Workstation customers-no special programs, no additional cost, no kidding. Simply select your hardware and software components when you customize your HP Workstation and be assured that you'll be able to buy that same configuration throughout the lifecycle of the product.

| Processors | Product # | Offering |
|---|---|---|
| | | Intel® Xeon E-2124 3.4 8M GT2 4C |
| | | Intel® Xeon E-2144 3.6 8M GT2 4C |

| Hard Drives | Product # | Offering |
|---|---|---|
| | | HDD 1TB 7200RPM SATA 2.5 |
| | | SSD 512GB TLC M.2 |

| Graphics | Product # | Offering |
|---|---|---|
| | | NVIDIA® Quadro® P600 4GB Graphics |

## Technical Specifications - Processors

**Intel® Xeon® processor E-2100 family**

Intel® Xeon® processor E-2286G
Intel® Xeon® processor E-2278G
Intel® Xeon® processor E-2276G
Intel® Xeon® processor E-2274G
Intel® Xeon® processor E-2244G
Intel® Xeon® processor E-2236
Intel® Xeon® processor E-2226G
Intel® Xeon® processor E-2224G
Intel® Xeon® processor E-2176G
Intel® Xeon® processor E-2174G
Intel® Xeon® processor E-2144G
Intel® Xeon® processor E-2136
Intel® Xeon® processor E-2124G
Intel® Xeon® processor E-2104G

**9th generation Intel® Core™ processor family**

Intel® Core™ i9-9900K 3.6 2666 8C CPU
Intel® Core™ i9-9900 3.1 2666 8C CPU
Intel® Core™ i7-9700K 3.6 2666 8C CPU
Intel® Core™ i7-9700 3.0 2666 8C CPU
Intel® Core™ i5-9600 3.1 2666 6C CPU
Intel® Core™ i5-9500 3.0 2666 6C CPU
Intel® Core™ i3-9100 3.6 2666 4C CPU

**8th generation Intel® Core™ processor family**

Intel® Core™ i7-8700 3.2 26666 6C CPU
Intel® Core™ i5-8500 3.0 2666 6C CPU

**8th generation Intel® Core™ i3/Pentium processor family**

Intel® Core™ i3-8100 3.6 2400 4C CPU
Intel® Pentium® G5400 3.7 2400 2C CPU

# QuickSpecs

## Technical Specifications - Hard Drives

| SATA Hard Drives for HP Workstations | 500GB SATA 7200 rpm 6Gb/s 3.5" HDD | | |
|---|---|---|---|
| | | **Capacity** | 500GB |
| | | **Protocol** | SATA |
| | | **Form Factor** | SFF (2.5") |
| | | **Controller** | AHCI |
| | | **Rated for 24/7/365 operation** | NO |
| | | **Physical Size** (Height) | 0.28 in; .7 cm |
| | | **Physical Size** (Width) | 2.75 in; 6.99 cm |
| | | **Media Diameter** | 2.5 in; 6.36 cm |
| | | **Interface** | Serial ATA (6Gb/s), NCQ enabled |
| | | **Synchronous Transfer Rate** (Maximum) | Up to 600MB/s* |
| | | **Operating Temperature** | 32° to 140° F (0° to 60° C) |
| | | *Actual performance may vary. | |
| | **1TB SATA 7200 rpm 6Gb/s SFF HDD** | | |
| | | **Capacity** | 1TB |
| | | **Protocol** | SATA |
| | | **Form Factor** | SFF (2.5") |
| | | **Controller** | AHCI |
| | | **Rated for 24/7/365 operation** | NO |
| | | **Physical Size** (Height) | 0.28 in; .7 cm |
| | | **Physical Size** (Width) | 2.75 in; 6.99 cm |
| | | **Media Diameter** | 2.5 in; 6.36 cm |
| | | **Interface** | Serial ATA (6Gb/s), NCQ enabled |
| | | **Synchronous Transfer Rate** (Maximum) | Up to 600MB/s* |
| | | **Operating Temperature** | 32° to 140° F (0° to 60° C) |
| | | *Actual performance may vary. | |
| Performance PCIe SSDs for HP Workstations | HP Z Turbo Drive 256GB M.2 2280 TLC SSD | | |
| | | **Capacity** | 256GB |
| | | **Protocol** | PCIe |
| | | **Form Factor** | M.2 |
| | | **Controller** | NVMe |
| | | **NAND Type** | 3D TLC |
| | | **SED Support** | Opal 2 |
| | | **Endurance** | 200TB |
| | | **Reliability** (MTBF) | 1.5M hours |
| | | **Interface** | PCI Express 3.0 x4 electrical x4 physical |
| | | **Operating Temperature** | 32° to 158° F (0° to 70° C) |
| | | **Performance** | **Sequential Read** 3500 MB/s * |
| | | | **Sequential Write** 2200 MB/s * |
| | | | **Random Read** 240K IOPS * |
| | | | **Random Write** 480K IOPS * |
| | | *Actual performance may vary. | |

# QuickSpecs

## Technical Specifications - Hard Drives

| HP ZTurbo Drive 512GB M.2 2280 TLC SSD | | |
|---|---|---|
| **Capacity** | 512GB | |
| **Protocol** | PCIe | |
| **Form Factor** | M.2 | |
| **Controller** | NVMe | |
| **NAND Type** | 3D TLC | |
| **SED Support** | Opal 2 | |
| **Endurance** | 300TB | |
| **Reliability** (MTBF) | 1.5M hours | |
| **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| **Performance** | **Sequential Read** | 3500 MB/s* |
| | **Sequential Write** | 2900 MB/s* |
| | **Random Read** | 460 K IOPS* |
| | **Random Write** | 500K IOPS* |

*Actual performance may vary.

| HP ZTurbo Drive 1TB M.2 2280 TLC SSD | | |
|---|---|---|
| **Capacity** | 1TB | |
| **Protocol** | PCIe | |
| **Form Factor** | M.2 | |
| **Controller** | NVMe | |
| **NAND Type** | 3D TLC | |
| **SED Support** | Opal 2 | |
| **Endurance** | 400TB | |
| **Reliability** (MTBF) | 1.5M hours | |
| **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| **Performance** | **Sequential Read** | 3500 MB/s* |
| | **Sequential Write** | 3000 MB/s* |
| | **Random Read** | 580K IOPS* |
| | **Random Write** | 500K IOPS* |

*Actual performance may vary.

| HP ZTurbo Drive 2TB M.2 2280 TLC SSD | | |
|---|---|---|
| **Capacity** | 2TB | |
| **Protocol** | PCIe | |
| **Form Factor** | M.2 | |
| **Controller** | NVMe | |
| **NAND Type** | 3D TLC | |
| **SED Support** | Opal 2 | |
| **Endurance** | 500TB | |
| **Reliability** (MTTF) | 1.5M hours | |
| **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| **Performance** | **Sequential Read** | 3300 MB/s* |

## Technical Specifications - Hard Drives

| | | |
|---|---|---|
| **Sequential Write** | 2400 MB/s* | |
| **Random Read** | 500K IOPS* | |
| **Random Write** | 440K IOPS* | |

*Actual performance may vary.*

| | | | |
|---|---|---|---|
| **Mainstream PCIe SSDs for HP Workstations** | **HP 256GB M.2 2280 TLC SSD** | **Capacity** | 256GB |
| | | **Protocol** | PCIe |
| | | **Form Factor** | M.2 |
| | | **Controller** | NVMe |
| | | **NAND Type** | 3D TLC |
| | | **Endurance** | 200TB |
| | | **Reliability** (MTBF) | 1.5M hours |
| | | **Interface** | PCI Express 3.0 x4 electrical x4 physical |
| | | **Operating Temperature** | 32° to 158° F (0° to 70° C) |
| | | **Performance** | **Sequential Read** 3100 MB/s * |
| | | | **Sequential Write** 1400 MB/s * |
| | | | **Random Read** 200 K IOPS * |
| | | | **Random Write** 320 K IOPS * |

*Actual performance may vary.*

| | | |
|---|---|---|
| **HP 512GB M.2 2280 TLC SSD** | **Capacity** | 512GB |
| | **Protocol** | PCIe |
| | **Form Factor** | M.2 |
| | **Controller** | NVMe |
| | **NAND Type** | 3D TLC |
| | **Endurance** | 300TB |
| | **Reliability** (MTBF) | 1.5M hours |
| | **Interface** | PCI Express 3.0 x4 electrical x4 physical |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) |
| | **Performance** | **Sequential Read** 3300 MB/s* |
| | | **Sequential Write** 2500 MB/s* |
| | | **Random Read** 225 K IOPS* |
| | | **Random Write** 430 K IOPS* |

*Actual performance may vary.*

| | | |
|---|---|---|
| **HP 1TB M.2 2280 TLC SSD** | **Capacity** | 1TB |
| | **Protocol** | PCIe |
| | **Form Factor** | M.2 |
| | **Controller** | NVMe |
| | **NAND Type** | 3D TLC |
| | **Endurance** | 400TB |
| | **Reliability (MTBF)** | 1.5M hours |
| | **Interface** | PCI Express 3.0 x4 electrical x4 physical |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) |
| | **Performance** | **Sequential Read** 3300 MB/s* |

## Technical Specifications - Hard Drives

|                       |                  |
|-----------------------|------------------|
| **Sequential Write**  | 2500 MB/s*       |
| **Random Read**       | 400 K IOPS*      |
| **Random Write**      | 440 K IOPS*      |

*Actual performance may vary.

**HP 2TB M.2 2280 TLC SSD**

| | | |
|---|---|---|
| **Capacity** | 2TB | |
| **Protocol** | PCIe | |
| **Form Factor** | M.2 | |
| **Controller** | NVMe | |
| **NAND Type** | 3D TLC | |
| **Endurance** | 500TB | |
| **Reliability** (MTBF) | 1.5M hours | |
| **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| **Performance** | **Sequential Read** | 3300 MB/s* |
| | **Sequential Write** | 2700 MB/s* |
| | **Random Read** | 430 K IOPS* |
| | **Random Write** | 500 K IOPS* |

*Actual performance may vary.

# QuickSpecs

## Technical Specifications - Graphics

| **Integrated Intel® UHD Graphics (Z2G4)** | **Form Factor** | Integrated in select Intel® Xeon® E, Intel® Core™ i7, Intel® Core™ i5, and Intel® Core™ i3 processors. |
|---|---|---|
| | | Check specific platform specifications for selections. |
| | **Graphics Controller** | Intel® UHD Graphics |
| | **Memory** | Unified Memory Architecture (UMA) frame buffer.  Graphics memory is shared with system memory. Size selectable between 32 MB to 1024 MB via BIOS setting. Default size is 128 MB. Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (Intel® DVMT), to provide an optimal balance between graphics and system memory use. |
| | **Connectors** | Check system platform specifications where Intel® HD Graphics are available. |
| | **Maximum Resolution** | DisplayPort™ 1.2: <br> - up to 4096x2160 x 24 bpp @ 60Hz <br> - supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST) <br><br> HDMI 2.0 output: <br> - up to 4096x2160 x 24 bpp @ 60Hz <br><br> Dual Link DVI(I) output: <br> - up to 2560 x 1600 x 32 bpp @ 60Hz <br><br> Single Link-DVI(I) output: <br> - up to 1920 x 1200 x 32 bpp @ 60Hz <br><br> VGA output: <br>  - 2048 × 1536 × 32 bpp @ 85 Hz <br><br> **Note:** For HDMI, DVI, and VGA outputs, separate adapters required. |
| | **Shading Architecture** | Shader Model 5.0 |
| | **Supported Graphics APIs** | OpenGL 4.4 <br> DirectX 12 |
| | **Available Graphics Drivers** | Windows 10 |

*Integrated graphics will depend on processor. HD content required to view HD images

# QuickSpecs

## Technical Specifications - Graphics

| NVIDIA® Quadro® P1000 4GB Graphics | Maximum Resolution | DisplayPort™ 1.2:<br>- up to 4096x2160 x 30 bpp @ 60Hz<br>- supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST)<br><br>HDMI 2.0 output*:<br>- up to 4096x2160 x 30 bpp @ 60Hz |
|---|---|---|
| | Image Quality Features | Stereoscopic 3D display support including NVIDIA® 3D Vision™ technology, 3D DLP, Interleaved, and passive stereo |
| | Display Output | Maximum number of displays:<br>- 4 direct attached monitors<br><br>Maximum number of DisplayPort™ displays possible per DisplayPort™ output (Multiple displays daisy-chained from one DisplayPort™ 1.2 port requires DisplayPort™ 1.2 MST capable displays or DisplayPort™ 1.2 MST capable hub):<br>- 4 1920x1200 @ 60 Hz<br>- 2 2560x1600 @ 60 Hz<br>- 1 4096x2160 @ 60 Hz<br><br>Maximum number of monitors across all available NVIDIA® Quadro® outputs is 4. |
| | Supported Graphics APIs | OpenGL 4.5<br>DirectX 12<br><br>API support includes:<br>CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran |
| | Available Graphics Drivers | Microsoft Windows 10<br>Linux ®<br><br>HP qualified drivers may be preloaded or available from the HP support Web site:<br>http://welcome.hp.com/country/us/en/support.html |

*HDMI Flex IO Module does not support discrete graphics and will automatically switch over to Intel® UHD graphics on the Flex IO Module port when inserted into the system. Discrete graphics can be used over HDMI from one of the DP ports with an external DP-to-HDMI dongle.

| NVIDIA® Quadro® P600 4GB Graphics | Maximum Resolution | DisplayPort™ 1.2:<br>- up to 4096x2160 x 30 bpp @ 60Hz<br>- supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST)<br><br>HDMI 2.0 output*:<br>- up to 4096x2160 x 30 bpp @ 60Hz |
|---|---|---|
| | Image Quality Features | Stereoscopic 3D display support including NVIDIA® 3D Vision™ technology, 3D DLP, Interleaved, and passive stereo |

## Technical Specifications - Graphics

| | |
|---|---|
| **Display Output** | Maximum number of displays:<br>- 4 direct attached monitors<br><br>Maximum number of DisplayPort™ displays possible per DisplayPort™ output (Multiple displays daisy-chained from one DisplayPort™ 1.2 port requires DisplayPort™ 1.2 MST capable displays or DisplayPort™ 1.2 MST capable hub):<br>- 4 1920x1200 @ 60 Hz<br>- 2 2560x1600 @ 60 Hz<br>- 1 4096x2160 @ 60 Hz<br><br>Maximum number of monitors across all available NVIDIA® Quadro® outputs is 4. |
| **Supported Graphics APIs** | OpenGL 4.5<br>DirectX 12<br><br>API support includes:<br>CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran |
| **Available Graphics Drivers** | Microsoft Windows 10<br>Linux®<br><br>HP qualified drivers may be preloaded or available from the HP support Web site:<br>http://welcome.hp.com/country/us/en/support.html |

\*HDMI Flex IO Module does not support discrete graphics and will automatically switch over to Intel® UHD graphics on the Flex IO Module port when inserted into the system. Discrete graphics can be used over HDMI from one of the DP ports with an external DP-to-HDMI dongle.

| | | |
|---|---|---|
| **AMD Radeon™ Pro WX 3200 4GB Graphics** | **Maximum Resolution** | DisplayPort™ 1.2:<br>- up to 4096x2160 x 30 bpp @ 60Hz<br>- supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST)<br><br>HDMI 2.0 output\*:<br>- up to 4096x2160 x 30 bpp @ 60Hz |
| | **Image Quality Features** | Stereoscopic 3D display support including NVIDIA® 3D Vision™ technology, 3D DLP, Interleaved, and passive stereo |
| | **Display Output** | Maximum number of displays:<br>- 5 direct attached monitors<br><br>Maximum number of DisplayPort™ displays possible per DisplayPort™ output (Multiple displays daisy-chained from one DisplayPort™ 1.2 port requires DisplayPort™ 1.2 MST capable displays or DisplayPort™ 1.2 MST capable hub):<br>- 4 1920x1200 @ 60 Hz<br>- 2 2560x1600 @ 60 Hz<br>- 1 4096x2160 @ 60 Hz |

## Technical Specifications - Graphics

|  |  |
|---|---|
|  | Maximum number of monitors across all available AMD Radeon® Pro outputs is 5. |
| **Supported Graphics APIs** | OpenGL 4.6<br>DirectX 12<br><br>API support includes:<br>CUDA C, CUDA C++, DirectCompute 5.0, OpenCL 2.0, Java, Python, and Fortran |
| **Available Graphics Drivers** | Microsoft Windows 10<br>Linux®<br><br>HP qualified drivers may be preloaded or available from the HP support Web site:<br>http://welcome.hp.com/country/us/en/support.html |

\*HDMI Flex IO Module does not support discrete graphics and will automatically switch over to Intel® UHD graphics on the Flex IO Module port when inserted into the system. Discrete graphics can be used over HDMI from one of the DP ports with an external DP-to-HDMI dongle.

| **AMD Radeon™ Pro WX 4150 4GB Graphics** | **Maximum Resolution** | DisplayPort™ 1.2:<br>- up to 4096x2160 x 30 bpp @ 60Hz<br>- supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST)<br><br>HDMI 2.0 output\*:<br>- up to 4096x2160 x 30 bpp @ 60Hz |
|---|---|---|
|  | **Image Quality Features** | Stereoscopic 3D display support including NVIDIA® 3D Vision™ technology, 3D DLP, Interleaved, and passive stereo |
|  | **Display Output** | Maximum number of displays:<br>- 5 direct attached monitors<br><br>Maximum number of DisplayPort™ displays possible per DisplayPort™ output (Multiple displays daisy-chained from one DisplayPort™ 1.2 port requires DisplayPort™ 1.2 MST capable displays or DisplayPort™ 1.2 MST capable hub):<br>- 4 1920x1200 @ 60 Hz<br>- 2 2560x1600 @ 60 Hz<br>- 1 4096x2160 @ 60 Hz<br><br>Maximum number of monitors across all available AMD Radeon® Pro outputs is 5. |
|  | **Supported Graphics APIs** | OpenGL 4.5<br>DirectX 12<br><br>API support includes:<br>CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran |

## Technical Specifications - Graphics

| | |
|---|---|
| **Available Graphics Drivers** | Microsoft Windows 10<br>Linux® |
| | HP qualified drivers may be preloaded or available from the HP support Web site:<br>http://welcome.hp.com/country/us/en/support.html |

*HDMI Flex IO Module does not support discrete graphics and will automatically switch over to Intel® UHD graphics on the Flex IO Module port when inserted into the system. Discrete graphics can be used over HDMI from one of the DP ports with an external DP-to-HDMI dongle.

## Technical Specifications - Optical and Removable Storage

| HP External Ultra-Slim DVD-RW Drive | Description | External 9.5mm high, tray-load | |
|---|---|---|---|
| | **Mounting Orientation** | Either horizontal or vertical | |
| | **Interface Type** | USB 2.0 | |
| | **Dimensions** (WxHxD) | 144 x 14 x 137.5mm | |
| | **Supported Media Types** | DVD-RAM<br>DVD+R<br>DVD+RW<br>DVD+R DL<br>DVD-R DL<br>DVD-R<br>DVD-RW<br>CD-R<br>CD-RW | |
| | **Disc Capacity** | **DVD-ROM** | 8.5 GB DL or 4.7 GB standard |
| | **Access Times** | **Full Stroke DVD** | 160ms (typical for Random Stroke) |
| | | **Full Stroke CD** | 140ms (typical for Random Stroke) |
| | **Maximum Data Transfer Rates** | **CD ROM Read** | CD-ROM, CD-R  Up to 24X<br>CD-RW  Up to 24X |
| | | **DVD ROM Read** | DVD-RAM  Up to 8X<br>DVD+RW  Up to 8X<br>DVD-RW  Up to 8X<br>DVD+R DL  Up to 8X<br>DVD-R DL  Up to 8X<br>DVD-ROM  Up to 8X<br>DVD-ROM DL  Up to 8X<br>DVD+R  Up to 8X<br>DVD-R  Up to 8X |
| | **Power** | **Source** | USB 2.0 DC power |
| | | **DC Power Requirements** | 5 VDC ± 5%-100 mV ripple p-p |
| | | **DC Current** | 5 VDC -< 800 mA typical, <1600 mA maximum |
| | **Operating Environmental** (all conditions non-condensing) | **Temperature** | 41° to 104° F (5° to 40° C) |
| | | **Relative Humidity** | 15% to 80% |
| | | **Maximum Wet Bulb Temperature** | 84° F (29° C) |
| | **Operating Systems Supported** | Windows 10 32-bit and 64-bit, Windows 8 32-bit and 64-bit, Windows 7 Professional 32-bit and 64-bit, Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*<br>Linux®<br><br>No driver is required for this device. Native support is provided by the operating system. | |
| | **Kit Contents** | HP External Ultra-Slim DVD-RW Drive DVD Writer drive, USB 2.0 type A to mini-B cable.<br>© Copyright 2021 HP Development Company, L.P.<br>The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. | |

## Technical Specifications - Optical and Removable Storage

HP shall not be liable for technical or editorial errors or omissions contained herein. The information contained herein is subject to change without notice.

# QuickSpecs

HP Z2 Mini G4 Workstation

## Technical Specifications - Networking and Communications

| | | |
|---|---|---|
| **Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro™ with Intel® AMT** 12.**0)** | **Connector** | RJ-45 |
| | **Controller** | Intel® I219LM GbE platform LAN connect networking controller |
| | **Memory** | 3 KB Tx and 3KB Rx FIFO packet buffer memory |
| | **Data Rates Supported** | 10/100/1000 Mbps |
| | **Compliance** | 802.1as/1588, 802.1p, 802.1Q, 802.3, 802.3ab, 802.3az, 802.3i, 802.3u, 802.3z |
| | **Bus Architecture** | PCI Express and SMBus |
| | **Data Transfer Mode** | PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx low power state) |
| | **Power Requirement** | Requires 3.3V (integrated regulators for core Vdc) |
| | **Boot ROM Support** | Yes |
| | **Network Transfer Mode** | Full-duplex; Half-duplex (not supported for the 1000BASE-T transceiver) |
| | **Network Transfer Rate** | 10BASE-T (half-duplex) 10 Mbps<br>10BASE-T (full-duplex) 20 Mbps<br>100BASE-TX (half-duplex) 100 Mbps<br>100BASE-TX (full-duplex) 200 Mbps<br>1000BASE-T (full-duplex) 2000 Mbps |
| | **Management Capabilities** | vPro, WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, ACPI, Advanced cable diagnostic, loopback modes, AMT 12.0 support, Circuit Breaker, VLAN, Multicast Listener Discovery (MLD) |
| **Intel® 9560 Wireless LAN (802.11ac) and Bluetooth 5 Module** | **Connector** | M.2 (Supports 2230 form factor; E Key) Motherboard Interface |
| | **Controller** | Intel® Dual Band Wireless-AC 9560 |
| | **Compliance** | Wireless LAN: IEEE 802.11abgn, 802.11ac, 802.11d, 802.11e, 802.11i, 802.11h, 802.11w, CCX 4.x/CCX Lite, WMM, WPA, WPA2, APS, WPS 2.0, Protected Management Frames<br>Bluetooth®: Dual Mode Bluetooth® 2.1, 2.1+EDR, 3.0, 4.0, BLE, 4.2, and 5 |
| | **Bus Architecture** | PCI Express Gen3 x1 and USB 2.0 |
| | **Power Requirement** | Requires 3.3V; 1.65W TDP |
| | **Management Capabilities** | Wake on WLAN (in all sleep states, excluding Max Power Savings mode), WFA Management Frame Protection (802.11w), vPro/WiAMT Not Currently Supported, F10 BIOS Menu option to disable/enable WLAN and Bluetooth® radios, supports seamless roaming between 802.11 wireless access points |
| | **Throughput** | Max PHY throughput 1.73 Gbps (802.11ac) for WLAN |
| **Allied Telesis 1GbE LC Fiber 2pc Module** | **Network Interface(s)** | 1 LC Fiber Connection |
| | **System Interface** | PCI Express Gen1.1x1 (via WLAN M.2 interface) |
| | **Network Cable** | 1GbE over Multimode LC Fiber. Distance is dependent upon network cable:<br>OM1 50/125um 500 MHz:km 550m<br>OM2 62.5/125um 200 MHz:km 275m<br>OM2 62.5/125um 160MHz:km 220m |
| | **Data Rates Supported** | 1 Gbps |

# QuickSpecs

HP Z2 Mini G4 Workstation

## Technical Specifications - Networking and Communications

| | |
|---|---|
| **LED Indicators** | Link/Activity LED (Green): Off = No Link, Solid = Link, Blinking = Activity |
| **Controller** | Broadcom BCM57762 |
| **Compliance** | IEE 802.3z Base1000SX<br>802.3x (Ethernet Flow Control)<br>802.1Q (VLANs)<br>802.1P (Quality of Service)<br><br>FCC B (USA)<br>CE (European Union)<br>ICES-003 B (Canada)<br>BSMI (Taiwan)<br>VCCI (Japan)<br>KCC (Korea)<br>CTICK (Australia/New Zealand)<br><br>UL (Safety)<br>RoHS (Restricted or Hazardous Substances) |
| **Power Requirement** | 2W (Typical) |
| **Operating Temperature** | 32° to 122° F (0° to 50° C) |
| **Physical Dimensions (LxW)** | LC Fiber Board: 37mm x 45mm x 13mm (WxLxH, including connector)<br>Cable: 200mm<br>M.2 Board: 22mm x 30mm x 1.75mm (WxLxH) |
| **Kit Contents** | LC fiber board, M.2 board, connecting cable, and 2 screws for attaching the LC fiber board to the motherboard<br>Product Warranty statement and the Installation Guide. |

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Technical Specifications – Miscellaneous Features

| HP Z2 Mini G4 VESA Sleeve | Mechanical | Dimensions (H x W x D) | Unpackaged | 70 mm x 224 mm x 223 mm (2.75 x 8.81 x 8.77 in) |
|---|---|---|---|---|
| | | | Packaged | 305 x 102 x 289 -mm (12 x 4 x 11.38 in) |
| | | **Weight** | Unpackaged | 1.7 kg (3.7 lb) |
| | | | Packaged | 2.27 (5.0-lb) |
| | **Other** | **Option kit contents** | | HP Z2 Mini G4 VESA Sleeve, mounting screws, installation guide, warranty card. |
| | **Limited Warranty** | | | The HP Z2 Mini G4 VESA Sleeve carries a one-year limited warranty. Technical support is available seven days a week, 24 hours a day, online and support forums. Certain restrictions and exclusions apply. |

## 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.
- Intel® Wired for Management support; industry wide initiative to make Intel® architecture based PCs, servers and mobile computers more inherently manageable out-of-the-box and over the network PCs, servers and mobile computers more inherently manageable out-of-the-box and over the network PCs, servers and mobile computers more inherently manageable out-of-the-box and over the network
- 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
- Diagnostic LED Explanation Table:
  - Power LED will blink red 2 to 5 times, then blink white 2 or more times, then repeat (with beep tones for each blink initially):
    - 2 red + 2 white   User must provide file for BIOS recovery (USB storage typically) + 2 white   User must provide file for BIOS recovery (USB storage typically) + 2 white   User must provide file for BIOS recovery (USB storage typically)
    - 2 red + 3 white   User must enter a key sequence to proceed with recovery by policy + 3 white   User must enter a key sequence to proceed with recovery by policy + 3 white   User must enter a key sequence to proceed with recovery by policy
    - 2 red + 4 white   BIOS recovery is in progress + 4 white   BIOS recovery is in progress + 4 white   BIOS recovery is in progress
    - 3 red + 2 white   Memory could not be initialized + 2 white   Memory could not be initialized + 2 white   Memory could not be initialized
    - 3 red + 3 white   Graphics adaptor could not be found + 3 white   Graphics adaptor could not be found + 3 white   Graphics adaptor could not be found
    - 3 red + 4 white   Power supply failure / not connected + 4 white   Power supply failure / not connected + 4 white   Power supply failure / not connected
    - 3 red + 5 white   Processor not installed + 5 white   Processor not installed + 5 white   Processor not installed
    - 3 red + 6 white   Current processor does not support an enabled feature + 6 white   Current processor does not support an enabled feature + 6 white   Current processor does not support an enabled feature
    - 4 red + 2 white   Processor has exceeded its temperature threshold / system thermal shutdown + 2 white   Processor has exceeded its temperature threshold / system thermal shutdown + 2 white   Processor has exceeded its temperature threshold / system thermal shutdown
    - 4 red + 3 white   System internal temperature has exceeded its threshold + 3 white   System internal temperature has exceeded its threshold + 3 white   System internal temperature has exceeded its threshold
    - 5 red + 2 white   System controller firmware is not valid
    - 5 red + 3 white   System controller detected BIOS is not executing
    - 5 red + 4 white   BIOS could not complete initialization / PCA failure
    - 5 red + 5 white   System controller rebooted the system after a health or recovery timer triggered rebooted the system after a health or recovery timer triggered rebooted the system after a health or recovery timer triggered
- HP PC Hardware Diagnostics UEFI:
  - This utility enables hardware level testing outside the operating system on many components. The diagnostics can be invoked by pressing F2 at POST, and is available as a download from HP Support
- System/Emergency ROM
- Flash ROM
- CMOS Battery Holder for easy replacement
- Flash Recovery with Video Configuration Record Software5 Aux Power LED on System PCA
- Processor ZIF Socket for easy Upgrade
- Over-Temp Warning on Screen (Requires IM Agents)

Technical Specifications – Miscellaneous Features

- Clear Password Jumper
- DIMM Connectors for easy Upgrade
- Clear CMOS Button
- NIC LEDs (integrated) (Green & Amber)
- 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

## Summary of Changes

| Date of change: | Version History: | | Description of change: |
|---|---|---|---|
| September 19, 2018 | From v1 to v2 | Changed | Supported components, System Configurations and Technical Specifications – Graphics sections, format changes |
| May 7, 2019 | From v2 to v3 | Added | Footnote to the HP Z2 Mini G4 Performance, back view section |
| May 9, 2019 | From v3 to v4 | Changed | Callouts section |
| May 20, 2019 | From v4 to v5 | Removed | RAID support |
| May 28, 2019 | From v5 to v6 | Added | Processors Refresh |
| June 12, 2019 | From v6 to v7 | Changed | Storage section |
| July 23, 2019 | From v7 to v8 | Removed | Integrated hood sensor from Security Management section |
| July 30, 2019 | From v8 to v9 | Removed | Support for chassis padlocks and cable lock devices from Security Management section |
| September 1, 2019 | From v9 to v10 | Added | HP Z Turbo Drive G2 256, 512GB and 1TB SED TLC (Z2Mini G4) to Storage section |
| October 26, 2019 | From v10 to v11 | Changed | Graphics section |
| November 2, 2019 | From v11 to v12 | Changed | System Board section |
| November 5, 2019 | From v12 to v13 | Changed | Processors section |
| December 5, 2019 | From v13 to v14 | Changed | Power Supply section |
| February 20, 2020 | From v14 to v15 | Changed | Processors Matrix and Memory section |
| April 23, 2020 | From v15 to v16 | Changed | Other Hardware section |
| July 18, 2020 | From v16 to v17 | Changed | Graphics and Racking and Physical Security section |
| January 5, 2021 | From v17 to v18 | Changed | Processors, Racking and Physical Security, Operating Systems and Hard Drives sections |